

RENAULT

1 Engine and peripherals

10A ENGINE AND CYLINDER BLOCK ASSEMBLY

11A TOP AND FRONT OF ENGINE

12A FUEL MIXTURE

12B TURBOCHARGING

13A FUEL SUPPLY

13B DIESEL INJECTION

13C PREHEATING

14A ANTIPOLLUTION

16A STARTING - CHARGING

17A IGNITION

17B PETROL INJECTION

X44

NOVEMBER 2009

EDITION ANGLAISE

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which the vehicles are constructed".

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19A COOLING

19B EXHAUST

19C TANK

19D ENGINE MOUNTING

X44

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TWINGO - Chapitre 1

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K4M

Special tooling required

Mot. 1385	Tool for fitting the crankshaft seal, timing end (35 x 47 x 7).
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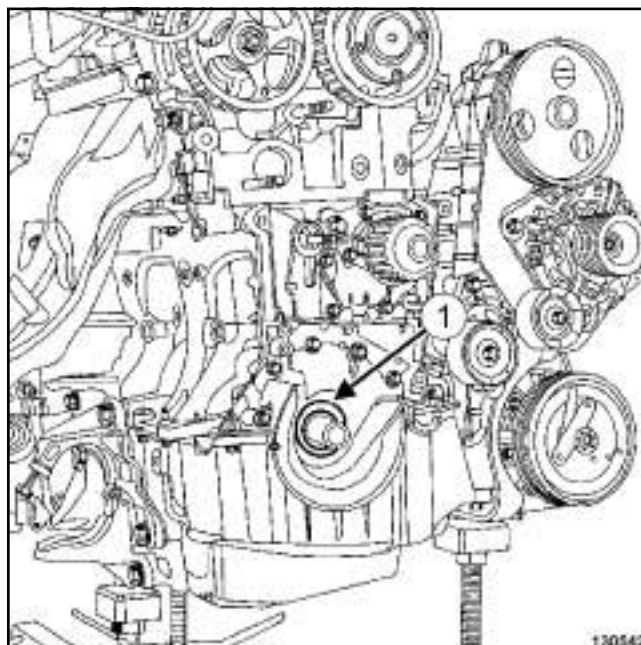
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),

- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
- the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-135) .

II - REMOVAL OPERATION



- Remove the crankshaft timing end seal (1) .

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Crankshaft seal on timing end.

K4M

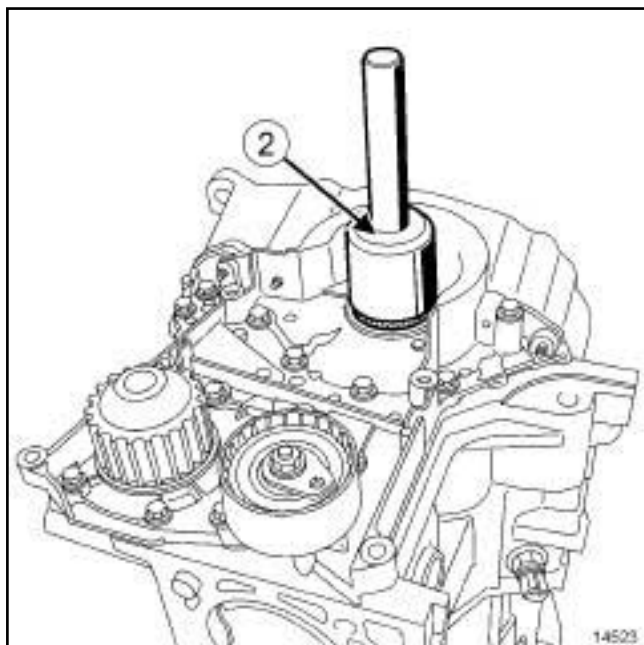
- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the mating face of the crankshaft seal at the timing end,
- the crankshaft seal housing at the timing end of the cylinder block.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION



- ❑ Refit a new crankshaft seal at the timing end, using the tool (**Mot. 1385**) (2) .

III - FINAL OPERATION

- ❑ Refit:
 - the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-135) ,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
- the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
- the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray.

- ❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

ENGINE AND CYLINDER BLOCK ASSEMBLY

Crankshaft seal, gearbox end: Removal - Refitting

10A

K4M

Special tooling required

Mot. 1129-01	Tool for fitting the crankshaft seal, flywheel end (80 x 100 x 8 seal).
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Equipment required

refrigerant charging station

REMOVAL

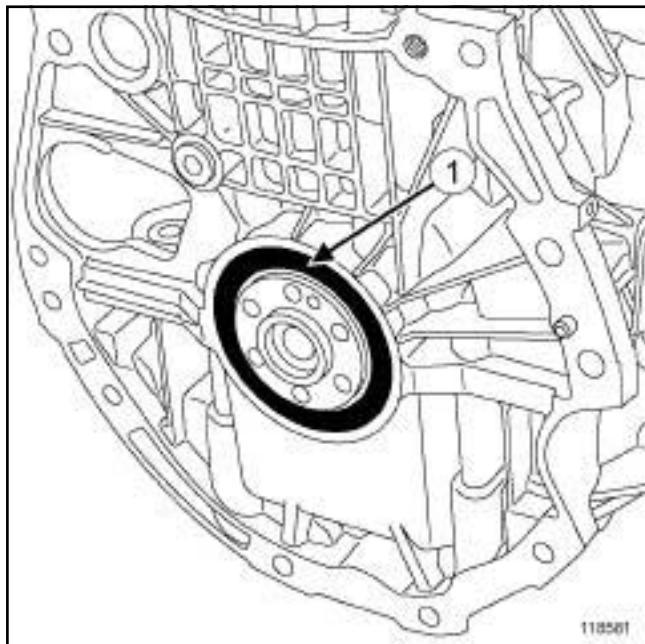
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the engine undertray,
 - the battery (see **Battery: Removal - Refitting**) (80A, Battery),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the petrol injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page 17B-20) ,
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).
- Drain:
 - the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
 - the engine cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) ,
 - the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
- Remove:
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,

- the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the differential output seals (see **Differential output seal: Removal - Refitting**) (21A, Manual gearbox),
- the « engine and gearbox » assembly (see **10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting**, page 10A-74) ,
- the manual gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).
- the « pressure plate - disc » assembly (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
- the flywheel (see **10A, Engine and cylinder block assembly, Flywheel: Removal - Refitting**, page 10A-107) .

K4M

II - REMOVAL OPERATION



- Remove the crankshaft seal (1) at the gearbox end using a screwdriver.

Note:

Take care not to damage the crankshaft mating face.

REFITTING

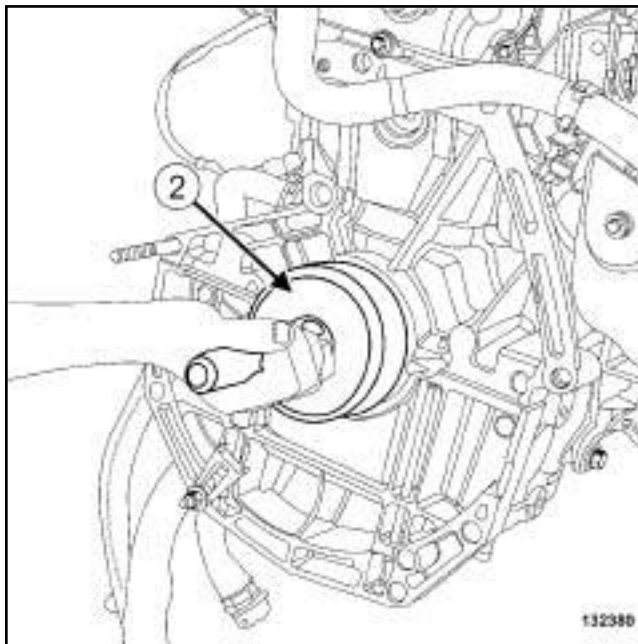
I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Crankshaft seal on gearbox end.**
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the mating face of the crankshaft seal at the gearbox end,
 - the crankshaft seal housing at the gearbox end of the cylinder block.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION



- Refit a new crankshaft seal at the gearbox end, using the tool (**Mot. 1129-01**) (2) .

III - FINAL OPERATION

- Refit:
 - the flywheel (see **10A, Engine and cylinder block assembly, Flywheel: Removal - Refitting**, page **10A-107**) ,
 - the « pressure plate - disc » assembly (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
 - the manual gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).
 - the « engine and gearbox » assembly (see **10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting**, page **10A-74**) ,
 - the differential output seals (see **Differential output seal: Removal - Refitting**) (21A, Manual gearbox),
 - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),

K4M


- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the petrol injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page **17B-20**),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
 - the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Refill:
- and bleed the engine cooling circuit (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**),
 - the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
 - the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
- Refit the engine undertray.


Lower cover: Removal - Refitting

K9K

Special tooling required	
Tav. 476	Ball joint extractor.
Tav. 1233-01	Tooling for carrying out operations on the axle subframe.

Equipment required	
flywheel immobiliser	
safety strap(s)	

Tightening torques 	
lower cylinder block bolts	14 Nm
multifunction support bolt on the sump	25 N.m
sump bolts on the gear-box casing	44 Nm
subframe front bolts	62 N.m
subframe rear bolts	105 Nm
subframe rear tie rod inner bolts	21 N.m
subframe rear tie rod outer bolts	90 N.m
lower ball joint bolts	62 N.m
track rod end nuts	37 N.m
subframe tie-rod upper bolts	21 N.m
subframe tie-rod lower bolts	62 N.m
bolts of the front right-hand driveshaft relay bearing	44 N.m
bolt of the front right-hand driveshaft relay bearing bracket	21 N.m
relay bearing bolts on the front right-hand driveshaft	44 N.m

Tightening torques 	
right-hand driveshaft relay bearing closure panel bolts	21 Nm
catalytic converter upstream stay bolt on the cylinder block	44 N.m
catalytic converter downstream stay bolt on the sump	44 Nm
catalytic converter downstream stay bolts on the catalytic converter	26 Nm
universal joint bolt	24 N.m

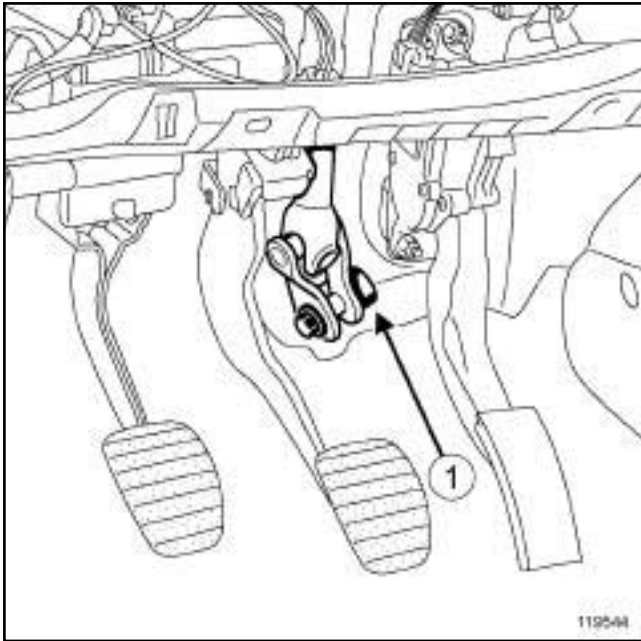
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

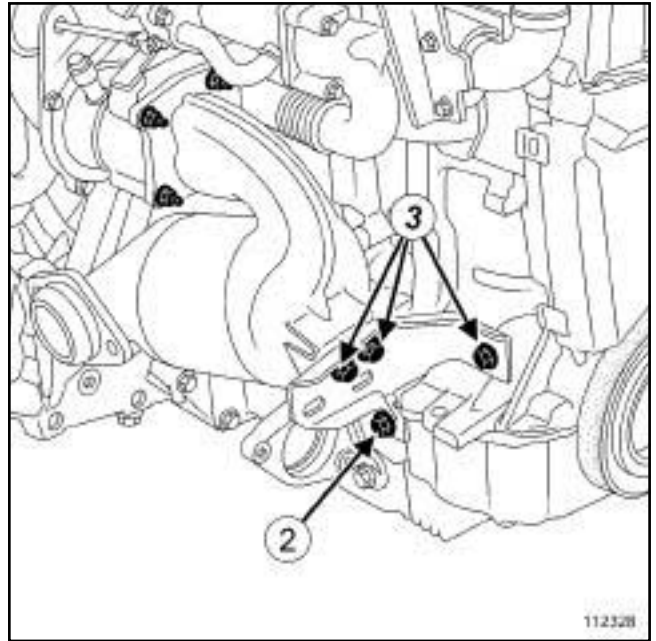
Lower cover: Removal - Refitting

K9K



119544

- Set the wheels straight ahead.
- Position the **flywheel immobiliser**.
- Remove the cover from the universal joint (do not keep).
- Remove the bolt (1) from the universal joint (do not keep).
- Remove the universal joint from the steering box.
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**).
- Remove the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**).

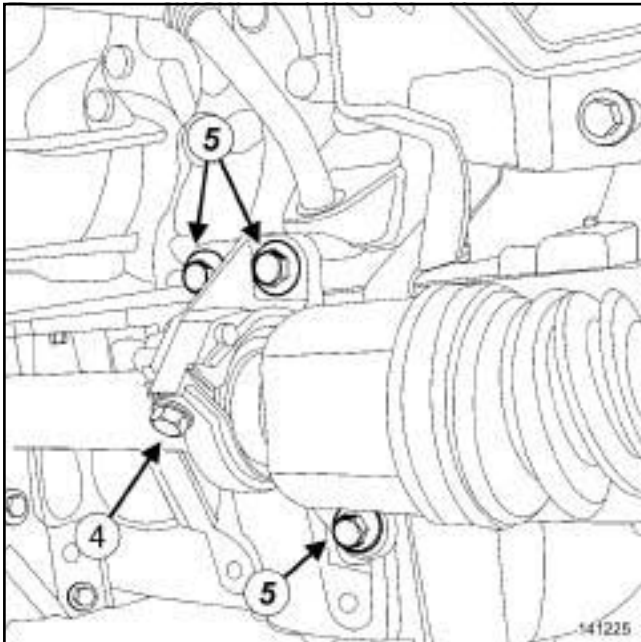


112328

- Undo the catalytic converter upstream stay bolt (2) on the sump by a few turns.
- Remove:
 - the three catalytic converter upstream stay bolts (3)
 - the catalytic converter upstream stay, by sliding it in relation to the bolt remaining on the sump.

K9K

K9K, and 718

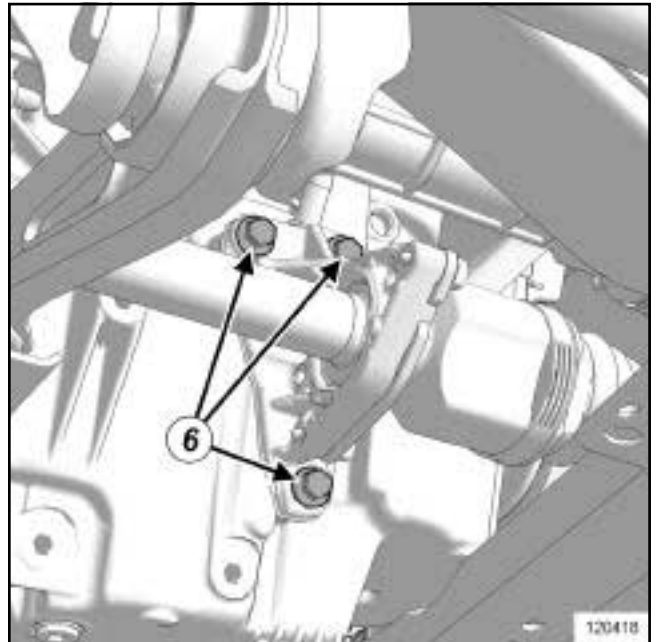


141225

Remove:

- the bolt (4) from the relay bearing flange,
- the bolts (5) from the relay bearing,
- the relay bearing.

K9K, and 740



120418

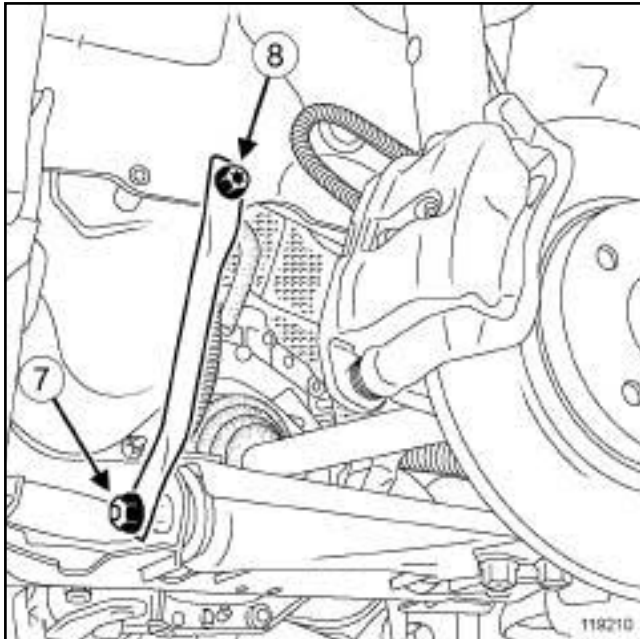
Remove:

- the bolts (6) from the relay bearing,
- the bolts of the relay bearing closure panel,
- the relay bearing closure panel.

- Pivot the relay bearing on the right-hand driveshaft then slide it towards the gearbox.

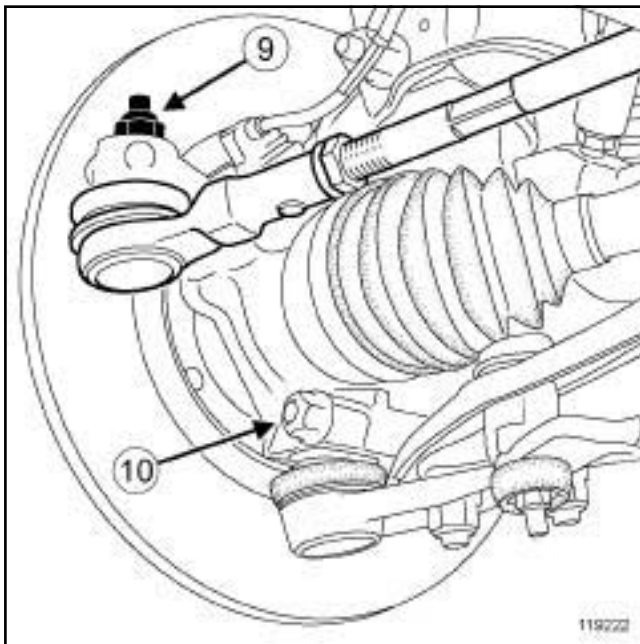
Lower cover: Removal - Refitting

K9K



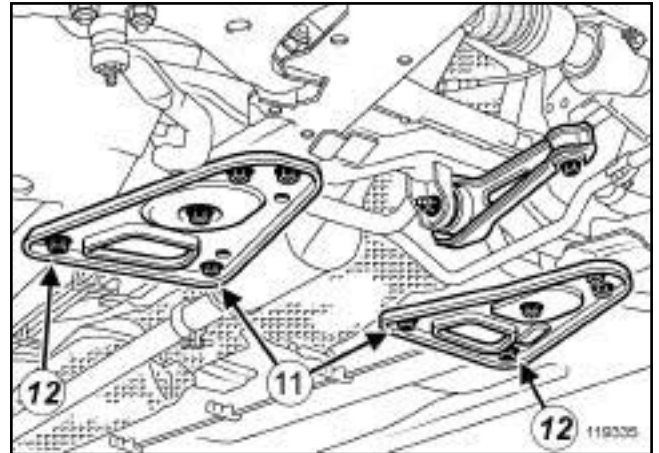
119210

- Loosen the lower bolts (7) of the subframe front tie rods.
- Remove the upper bolts (8) of the subframe front tie rods.



119222

- Remove:
 - the nuts (9) from the track rod ends,
 - the track rod ends using the (Tav. 476),
 - the bolts (10) from the lower ball joints,
 - the lower ball joints.



119335

- Remove:
 - the subframe rear tie rod inner bolts (11) ,
 - the subframe rear tie rod outer bolts (12) .

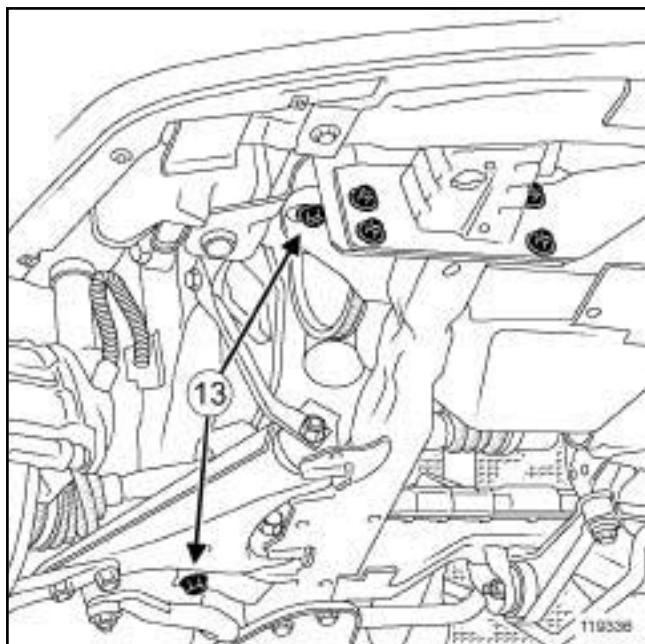
K9K, and 718

- Attach the radiator and the intercooler to the upper cross member using a **safety strap(s)**.

K9K, and 740

- Attach the radiator to the upper cross member using a **safety strap(s)**.
- Remove the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure).

K9K



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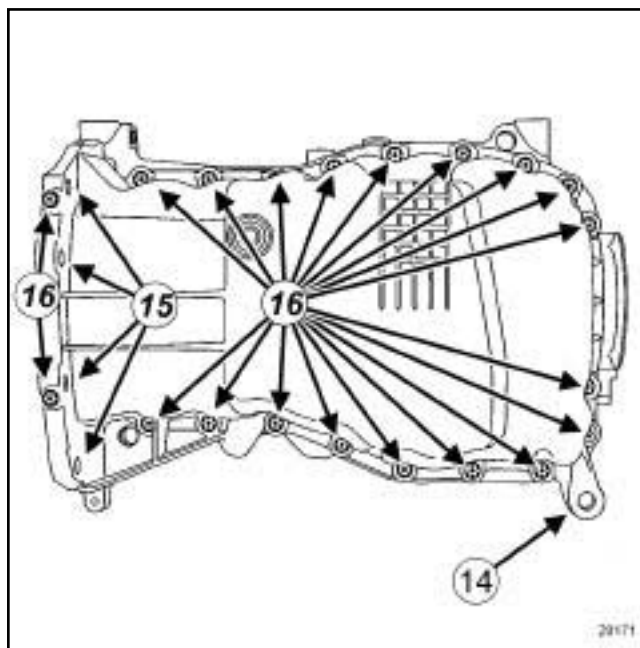
- ❑ Remove the subframe bolts (13) one by one, replacing them in turn with the threaded rods of the tool (Tav. 1233-01).

Note:

Make sure the threaded rod of the (Tav. 1233-01) is sufficiently screwed into the threaded hole and that the nut of the tool is properly resting on the subframe.

- ❑ Lower the subframe by several centimetres, gradually loosening the nuts of the (Tav. 1233-01).

II - OPERATION FOR REMOVAL OF PART CONCERNED



20171

- ❑ Remove:
 - the bolt (14) from the multifunction support on the cylinder block,
 - the sump bolts (15) on the gearbox casing,
 - the sump bolts (16) on the cylinder block,
 - the sump, by pivoting and tilting it to remove it from the oil pump strainer,
 - the sump seal.

Note:

Take care not to pull the sump to prevent damaging the oil pump strainer.

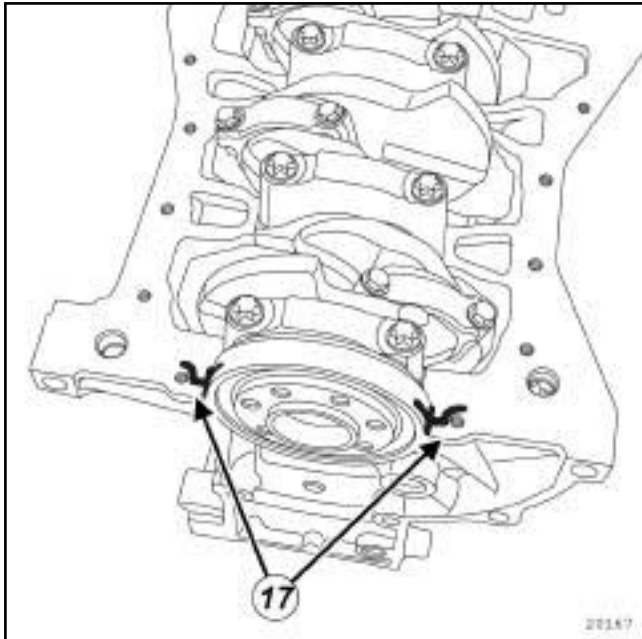
REFITTING

I - REFITTING PREPARATION OPERATION

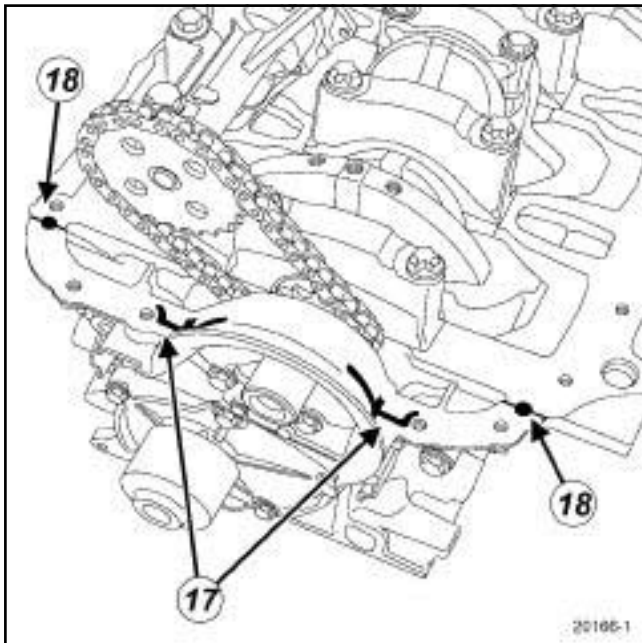
- ❑ parts always to be replaced: engine oil sump seal.
- ❑ parts always to be replaced: Front sub-frame bolt
- ❑ parts always to be replaced: Steering shaft yoke bolt
- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease the joint faces of the sump on the cylinder block and on the sump.

Lower cover: Removal - Refitting

K9K



20167



20166

Apply:

- four beads (17) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm**,

- two drops (18) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm** at the intersection between the cylinder block and the crankshaft nose closure panel.

II - REFITTING OPERATION FOR PART CONCERNED

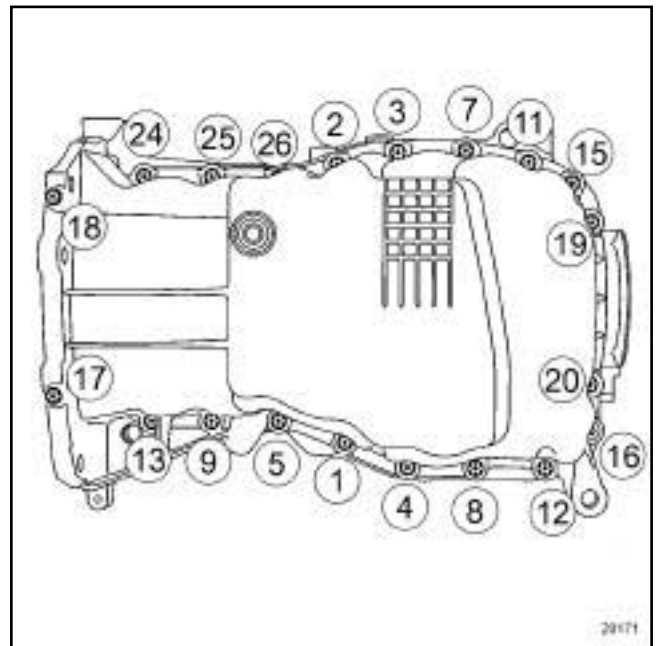
- Refit the oil sump fitted with a new seal.

Note:

Ensure that the oil pump strainer fits well into the correct location in the oil splash plate.

Note:

Take care not to damage the sump seal when fitting the sump on the cylinder block.



20171

- Tighten to torque and in order the **lower cylinder block bolts (14 Nm)**.
- Tighten the following until contact is made, and then to torque:
 - the **multifunction support bolt on the sump (25 N.m)**.
 - the **sump bolts on the gearbox casing (44 Nm)**.

III - FINAL OPERATION

- Refit the subframe, gradually tightening the nuts of the (**Tav. 1233-01**).
- Remove the threaded rods of the tool (**Tav. 1233-01**) one by one, replacing them with new subframe mounting bolts.
- Tighten to torque:
 - the **subframe front bolts (62 N.m)**,

Lower cover: Removal - Refitting

K9K

- the **subframe rear bolts (105 Nm)**,
 - the **subframe rear tie rod inner bolts (21 N.m)**,
 - the **subframe rear tie rod outer bolts (90 N.m)**.
- Refit the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure).

K9K, and 718

- Detach the radiator and the intercooler from the upper cross member using a **safety strap(s)**.

K9K, and 740

- Detach the radiator from the upper cross member using a **safety strap(s)**.

Refit:

- the rear engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
- the lower ball joints,
- the track rod ends.

Tighten to torque:

- the **lower ball joint bolts (62 N.m)**,
- the **track rod end nuts (37 N.m)**.

Refit the subframe tie rod upper bolts.

Tighten to torque:

- the **subframe tie-rod upper bolts (21 N.m)**,
- the **subframe tie-rod lower bolts (62 N.m)**.

K9K, and 718

Refit the front right-hand driveshaft relay bearing

Tighten to torque:

- the **bolts of the front right-hand driveshaft relay bearing (44 N.m)**,
- the **bolt of the front right-hand driveshaft relay bearing bracket (21 N.m)**.

K9K, and 740

- Fit the relay bearing on its bearing on the front right-hand driveshaft.
- Torque tighten the **relay bearing bolts on the front right-hand driveshaft (44 N.m)**.
- Refit the closure panel of the front right-hand driveshaft relay bearing

Note:

Ensure that the right-hand driveshaft relay bearing closure panel is refitted the right way round.

- Torque tighten the **right-hand driveshaft relay bearing closure panel bolts (21 Nm)**.

Refit the catalytic converter upstream stay, by sliding it in relation to the bolt remaining on the sump.

Tighten the following until contact is made and to torque:

- the **catalytic converter upstream stay bolt on the cylinder block (44 N.m)**,
- the **catalytic converter downstream stay bolt on the sump (44 Nm)**,
- the **catalytic converter downstream stay bolts on the catalytic converter (26 Nm)**.

Fit the steering box universal joint equipped with a new bolt.

Torque tighten the **universal joint bolt (24 N.m)**.

Remove the **flywheel immobiliser**.

Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

Fill up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**).

Lower cover: Removal - Refitting

D4F or D7F

Special tooling required

Tav. 476	Ball joint extractor.
Tav. 1233-01	Tooling for carrying out operations on the axle subframe.
Mot. 1716	Removes housing with silicone seals.

Equipment required

flywheel immobiliser

Tightening torques

sump bolts	10 N.m
front subframe bolts	62 N.m
rear subframe bolts	105 N.m
front end cross member bolts	21 N.m
subframe rear tie rod inner bolts	21 N.m
subframe rear tie rod outer bolts	90 N.m
lower ball joint bolts	62 N.m
track rod end nuts	37 N.m
subframe tie rod upper bolts	21 N.m
subframe tie rod lower bolts	62 N.m
universal joint	24 N.m

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

Note:

The sump is sealed in the factory using silicone adhesive sealant.

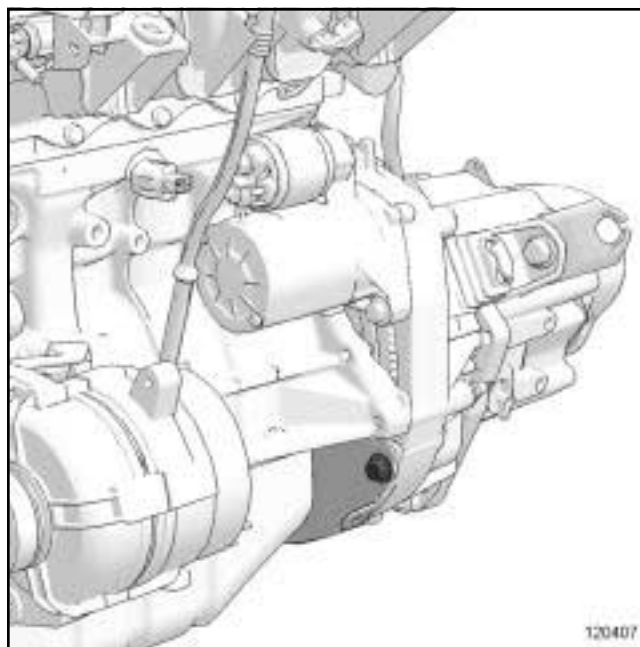
When removing the sump in a workshop, it is essential to use the After-Sales seal available from the Parts Department.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) .
- Remove the engine undertray.

D4F, and 772 – D7F



120407

120407

- Remove the engine flywheel guard

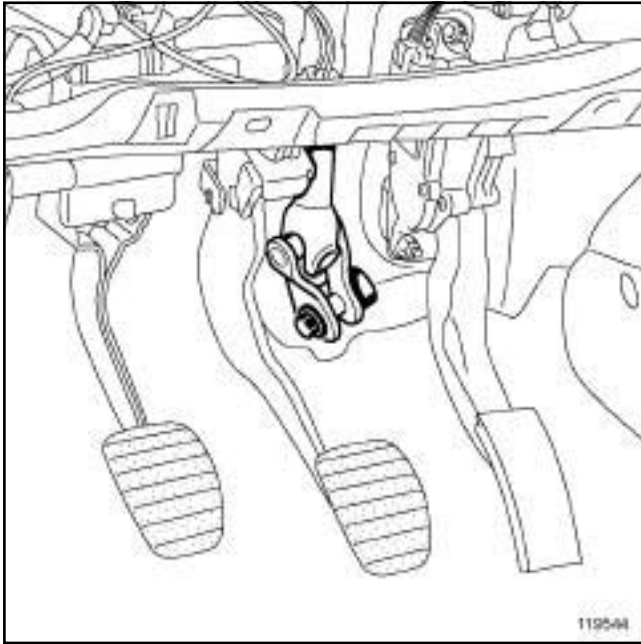
D4F, and 780 or 782

- Remove:
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),

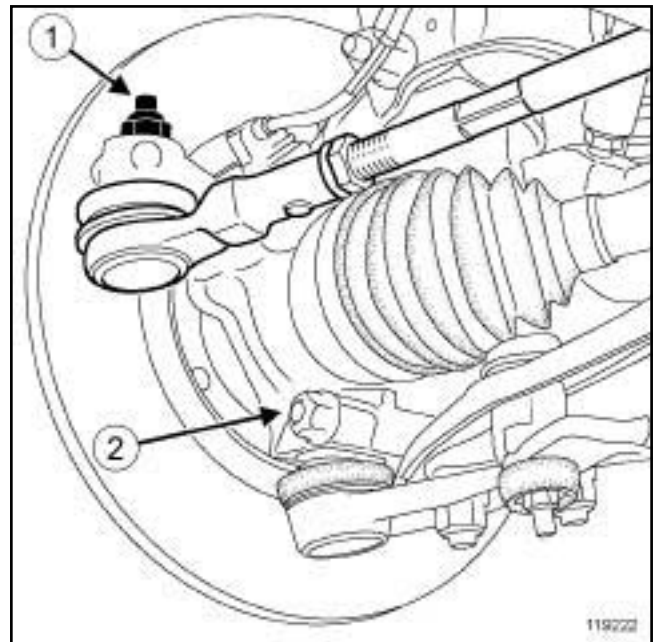
Lower cover: Removal - Refitting

D4F or D7F

- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).



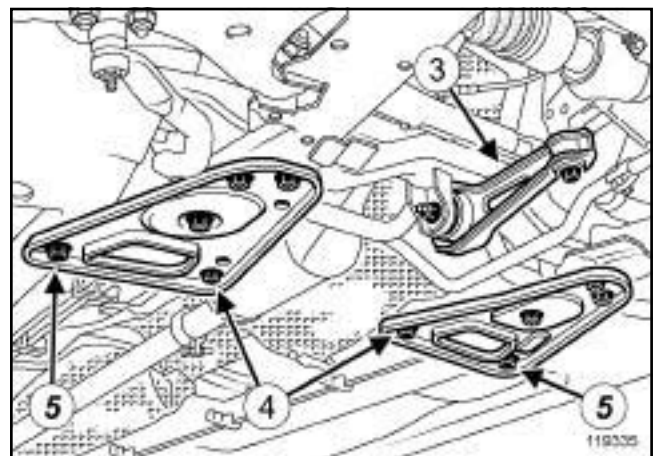
- Set the wheels straight ahead.
- Position the **flywheel immobiliser**.
- Remove the cover from the universal joint (do not keep).
- Remove the universal joint bolt (do not keep).
- Remove the universal joint from the steering box.
- Loosen the tie rod lower bolts.
- Remove the tie rod upper bolts.



119222

Remove:

- the nuts (1) from the track rod ends,
- the track rod ends using the (**Tav. 476**),
- the bolts (2) from the lower ball joints,
- the lower arm ball joints.



119335

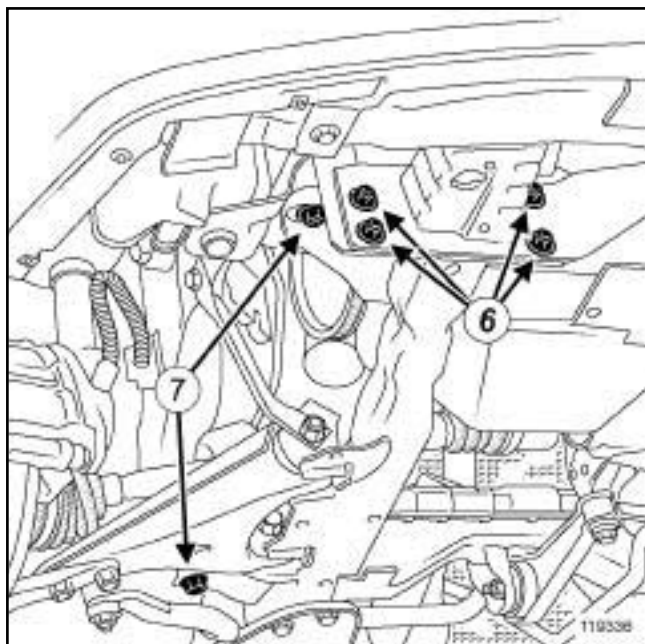
- Remove the lower engine tie-bar (3) (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18).

Remove:

- the subframe rear tie rod inner bolts (4),
- the subframe rear tie rod outer bolts (5).

Lower cover: Removal - Refitting

D4F or D7F



119336

- Attach the cooling radiator to the upper cross member.

Note:

This operation requires two people.

- Remove:
 - the bolts (6) from the front end cross member,
 - the subframe bolts (7) .
- Remove the threaded rods of the (Tav. 1233-01) one by one, replacing them with the subframe mounting bolts.

Note:

Make sure the threaded rod of the (Tav. 1233-01) is sufficiently screwed into the threaded hole and that the nut of the tool is properly resting on the subframe.

- Lower the subframe by several centimetres, gradually loosening the nuts of the (Tav. 1233-01).

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Removing the sump with silicone adhesive sealant

- Remove the sump bolts.
- Gradually remove the sump using the (Mot. 1716).
- Remove the sump by pivoting it anti-clockwise to prevent catching the oil pump strainer.

2 - Removing the sump with an After-Sales seal

- Remove:
 - the sump bolts,
 - the sump by pivoting it anti-clockwise to prevent catching the oil pump strainer,
 - the sump seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: engine oil sump seal.
- Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the joint faces:
 - of the cylinder block,
 - of the sump.
- Leave for approximately ten minutes.
- Remove the residue using a wooden spatula.
- Finish cleaning the parts using a **GREY ABRASIVE PAD** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease the joint faces:
 - of the cylinder block,
 - of the sump.

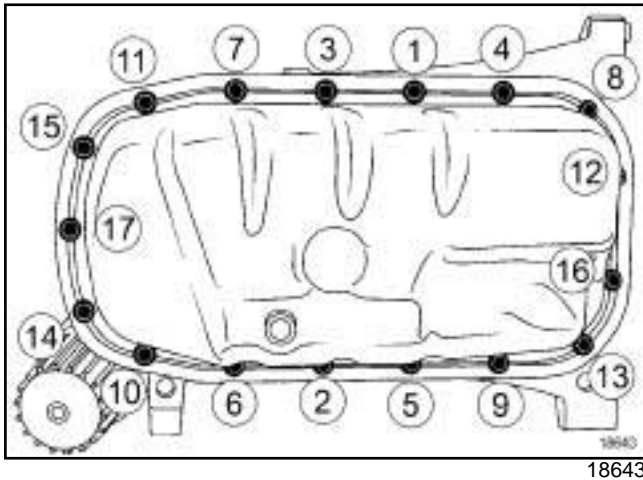
WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

Lower cover: Removal - Refitting

D4F or D7F

II - REFITTING OPERATION FOR PART CONCERNED



- Refit:
 - the sump fitted with a new seal,
 - the sump bolts.
- Tighten to torque and in order the **sump bolts (10 N.m)**.

III - FINAL OPERATION

D4F, and 772 – D7F

- Refit the engine flywheel guard.

D4F, and 780 or 782


- Refit the subframe, gradually tightening the nuts of the (**Tav. 1233-01**).
- Remove the threaded rods of the (**Tav. 1233-01**) one by one, replacing them with the subframe mounting bolts.
- Torque tighten:
 - the **front subframe bolts (62 N.m)**,
 - the **rear subframe bolts (105 N.m)**,
 - the **front end cross member bolts (21 N.m)**
 - the **subframe rear tie rod inner bolts (21 N.m)**,
 - the **subframe rear tie rod outer bolts (90 N.m)**.
- Refit:
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting, page 19D-18**),
 - the lower arm ball joints,
 - the lower ball joint bolts,
 - track rod ends,
 - the track rod end nuts,
- Torque tighten:
 - the **lower ball joint bolts (62 N.m)**,
 - the **track rod end nuts (37 N.m)**.
- Refit the subframe tie rod upper bolts.
- Torque tighten the **subframe tie rod upper bolts (21 N.m)**.
- Torque tighten the **subframe tie rod lower bolts (62 N.m)**.
- Fit the steering box universal joint.
- Refit the universal joint bolt.
- Torque tighten the **universal joint (24 N.m)**.
- Remove the **flywheel immobiliser**.
- Refit:
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

Lower cover: Removal - Refitting

D4F or D7F

- Fill up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**).
- Refit the engine undertray.

K4M

Tightening torques 	
sump bolts (initial torque)	14 N.m
sump bolts	14 N.m
sump bolts on the gear-box	44 N.m
bolt mounting the multi-function support on the sump	25 N.m
catalytic pre-converter upstream bracket bolt	44 N.m
driveshaft relay bearing bolts	44 N.m.
right-hand driveshaft bracket bolt on the relay bearing	21 N.m

IMPORTANT

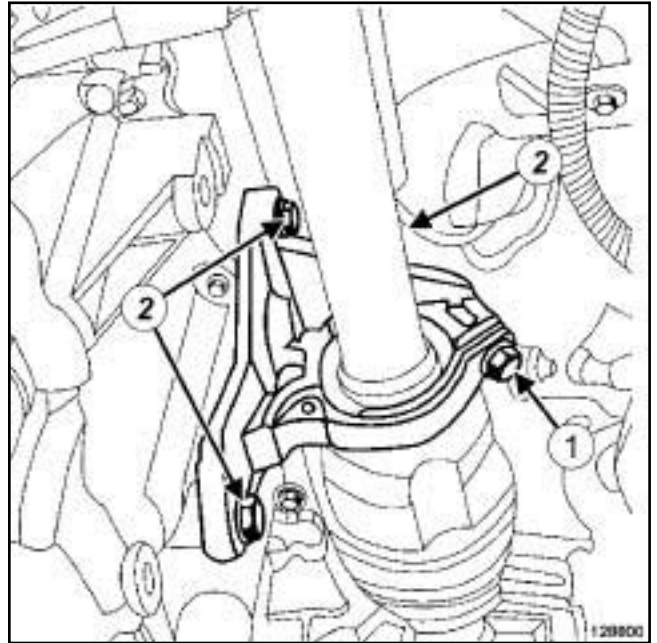
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the dipstick,
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray.
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) .
- Remove:
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),

- the rear engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
- the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).



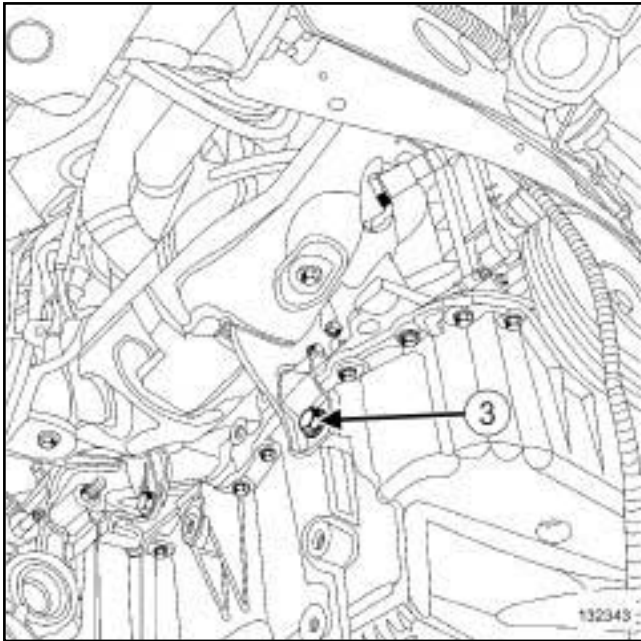
128800

Remove:

- the front right-hand driveshaft flange bolt (1) on the relay bearing,
- the bolts (2) from the front right-hand driveshaft relay bearing,
- the front right-hand driveshaft relay bearing.

Lower cover: Removal - Refitting

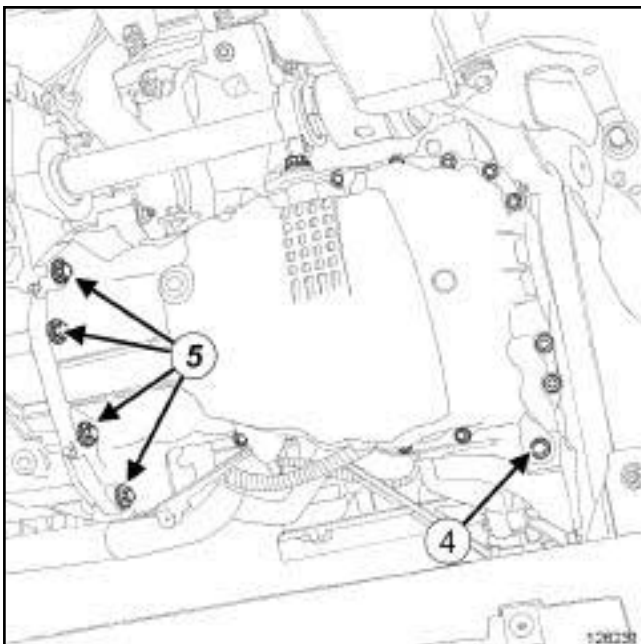
K4M



132343

- Remove the bolt (3) on the catalytic pre-converter upstream bracket.

II - REMOVAL OPERATION



126231

- Remove:
 - the bolt (4) from the multifunction support on the cylinder block,
 - the sump bolts (5) on the gearbox,
 - the sump bolts on the cylinder block,
 - the sump,

- the sump seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: engine oil sump seal.
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the sump joint face if it is to be reused,
 - the cylinder block gasket face.

WARNING

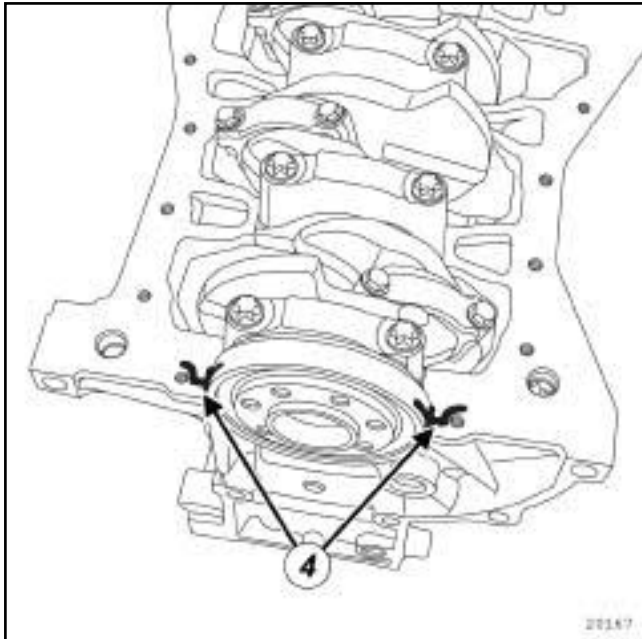
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

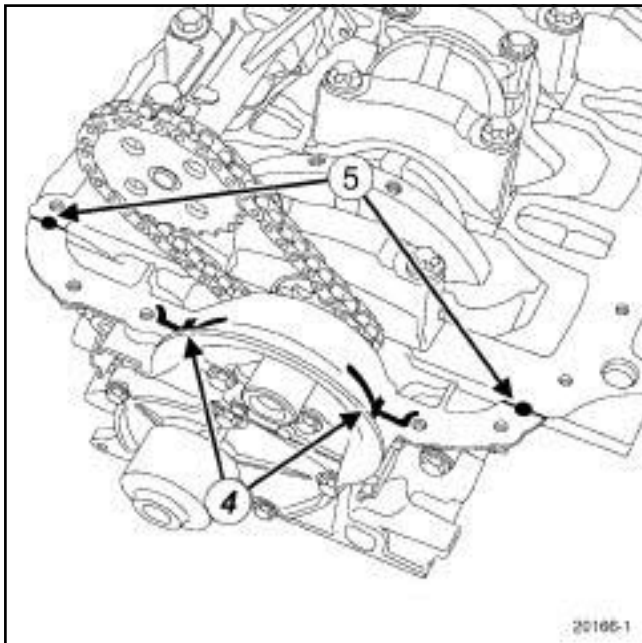
The joint faces must be clean, dry and free from grease (avoid finger marks).

Lower cover: Removal - Refitting

K4M



20167



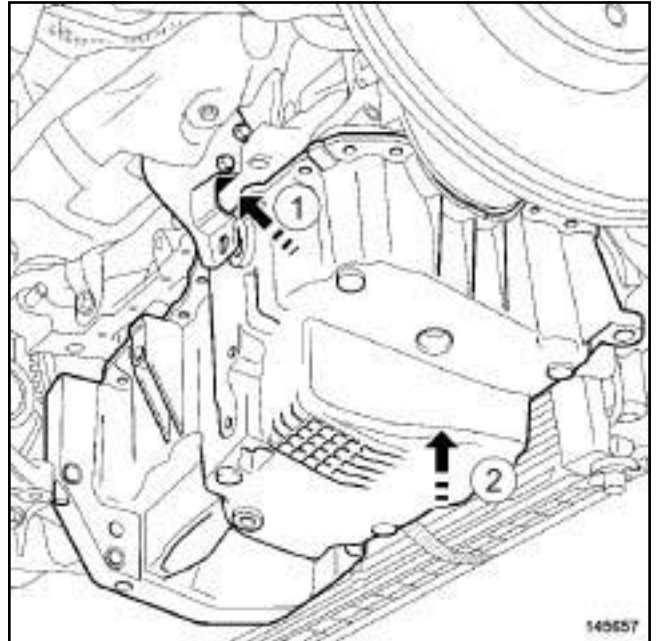
20166

- Use **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to apply:
 - a bead at (4) ,
 - a drop at (5) at the joint between the cylinder block and crankshaft closure panel.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

II - REFITTING OPERATION

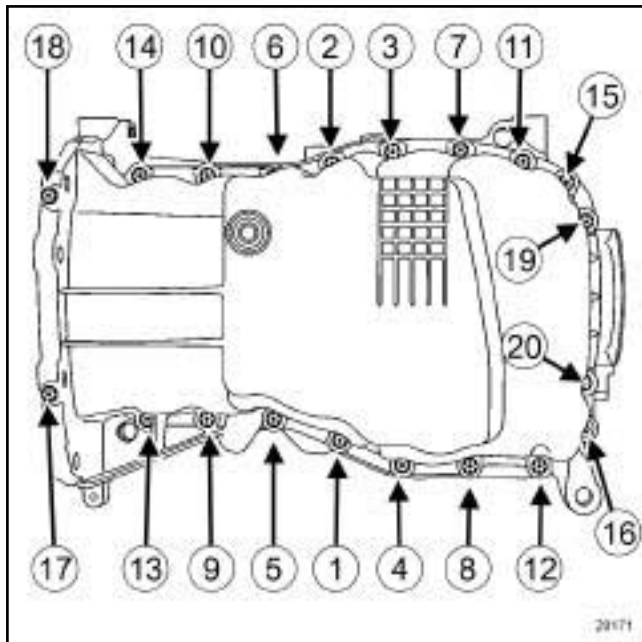


145657

- Refit:
 - a new sump seal,
 - the sump in the direction of the arrows.
- Finger tighten the sump bolts on the cylinder block.
- Finger tighten the 4 sump bolts on the gearbox housing.

Lower cover: Removal - Refitting

K4M



20171

- Pretighten in order (1) , (2) , (19) , (20) , (17) , (18) the **sump bolts (initial torque) (14 N.m)**.
- Tighten to torque and in order the **sump bolts (14 N.m)**.
- Torque tighten:
 - the **sump bolts on the gearbox (44 N.m)**,
 - the **bolt mounting the multifunction support on the sump (25 N.m)**.

III - FINAL OPERATION

- Torque tighten the **catalytic pre-converter upstream bracket bolt (44 N.m)**.
- Refit the driveshaft relay bearing.
- Torque tighten:
 - the **driveshaft relay bearing bolts (44 N.m.)**,
 - the **right-hand driveshaft bracket bolt on the relay bearing (21 N.m)**.
- Refit:
 - the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),
 - the rear engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),

- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the dipstick,
- the engine undertray.
- Top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) .

Engine oil: Draining - Refilling

D4F or D7F

Special tooling required

Mot. 1018 8 mm square engine drain plug spanner.

Equipment required

oil change wrench

oil recovery tray

torque wrench

oil change end piece with an 8 mm square drive

Tightening torques

drain plug **20 N.m**

Engine	Average oil capacity (adjusting using dipstick) (l)	
	Oil change without filter replacement	Oil change with filter replacement
D7F	3.8	4
D4F		

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

PARTS AND CONSUMABLES FOR THE REPAIR WORK

Parts always to be replaced :

- copper seal.

Consumable (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

- Engine oil (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants).

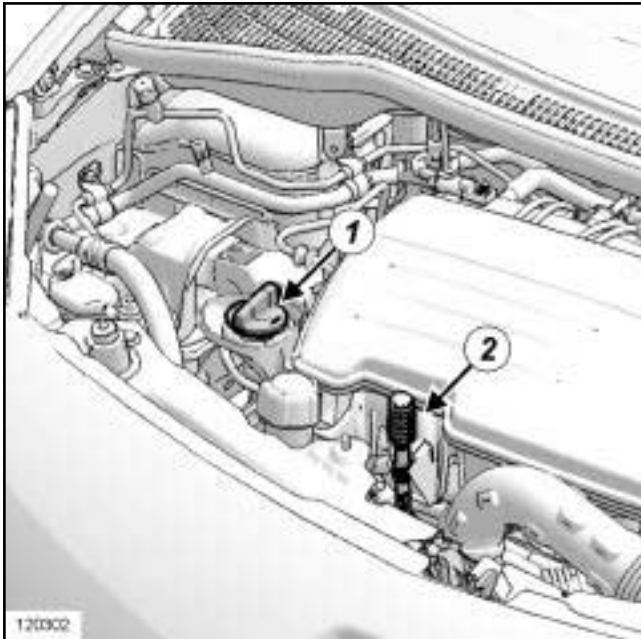
I - OIL SERVICE

Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

Engine oil: Draining - Refilling

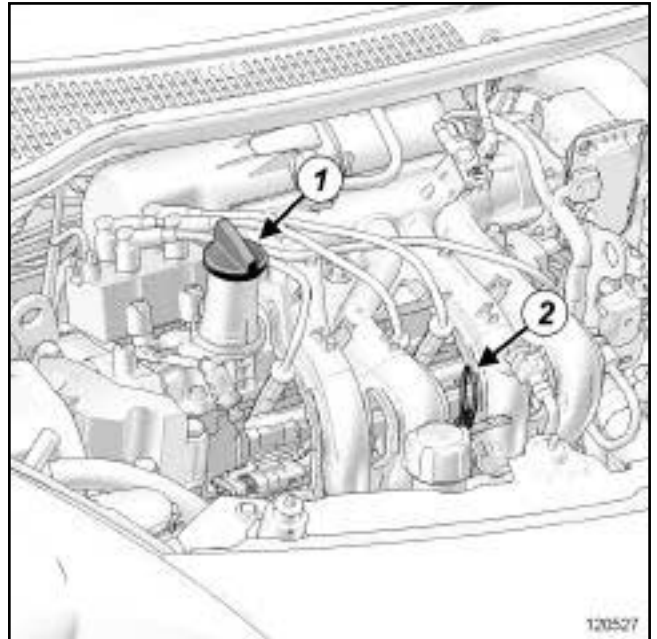
D4F or D7F

D4F 772 engine



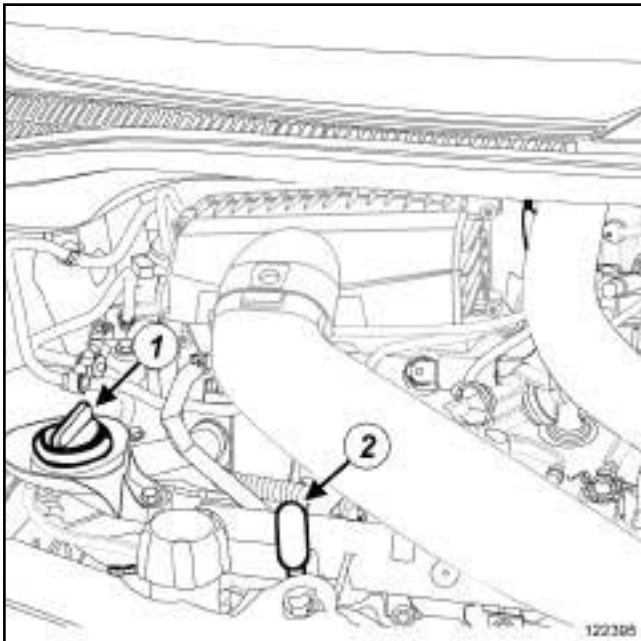
120302

D7F engine



120527

D4F 780 and 782 engines

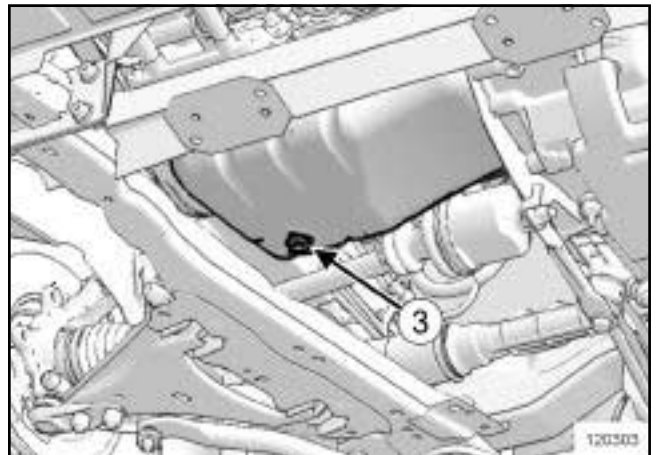


122395

Remove:

- the engine oil filler cap (1) ,
- the dipstick (2) ,

D4F and D7F engine:

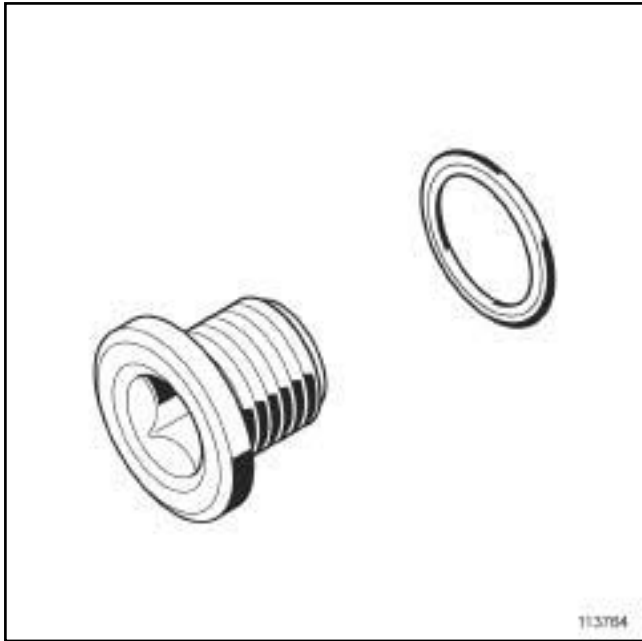


120303

- Remove the drain plug (3) from the engine oil sump using the **(Mot. 1018)** or a **oil change wrench**.
- Let the oil run into a **oil recovery tray**.

D4F or D7F

Copper seal



113764

- Refit the new seal on the plug, positioning the groove towards the plug.
- Torque tighten the **drain plug (20 N.m)** using **torque wrench** and a **oil change end piece with an 8 mm square drive**.

II - FILLING

- Fill the engine with oil, observing the recommended amount.
- Wait at least **10 minutes**.
- Check the oil level using the dipstick.
- Top up the engine oil level if necessary.
- Refit:
 - the engine oil filler cap,
 - the dipstick.

K4M

Equipment required

- oil recovery tray
- oil change wrench
- torque wrench
- oil change end piece with an 8 mm square drive

Tightening torques

engine oil sump drain plug	20 N.m
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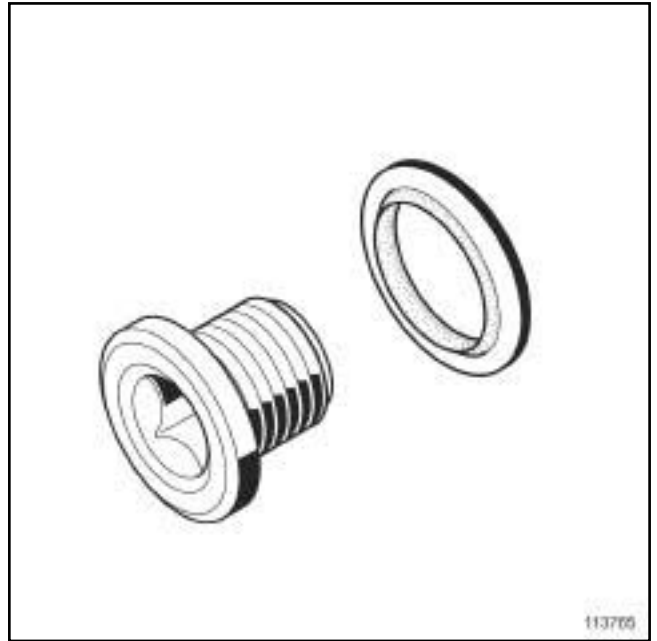
Average oil capacity (adjust with dipstick) (l)

Engine	Average oil capacity (adjust with dipstick) (l)	
	Draining	Oil change plus oil filter replacement
K4M	4.9	5

I - RECOMMENDATIONS FOR REPAIR

- Direction of fitting for a drain plug seal.

For a sheet metal engine oil sump



113765

- There is no direction of fitting for a seal fitted with a rubber lip.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

II - PARTS AND CONSUMABLES FOR THE REPAIR

- parts always to be replaced: Drain plug seal on engine oil sump.

- consumable:

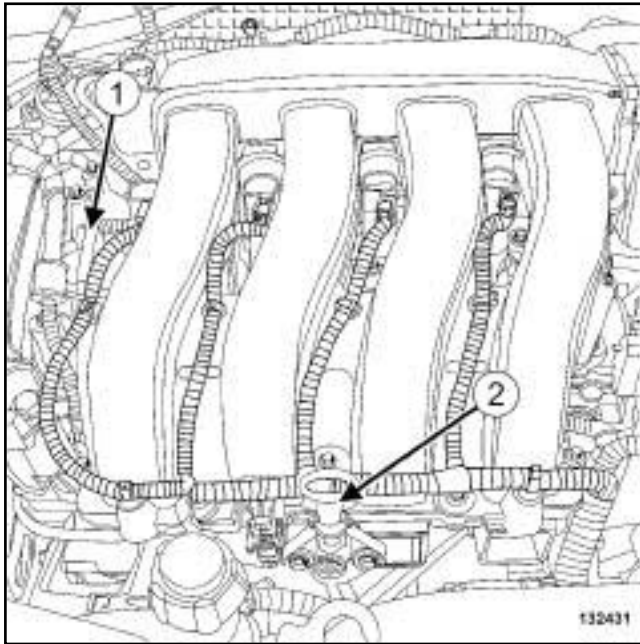
- engine oil (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants).

Engine oil: Draining - Refilling

K4M

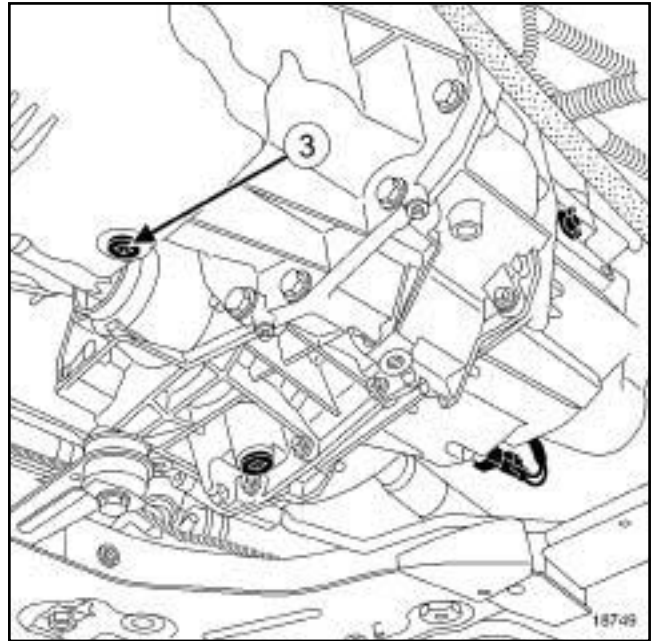
III - DRAINING

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (O2A, Lifting equipment).



132431

- Remove:
 - the engine oil filler cap (1) ,
 - the dipstick (2) ,
 - the engine undertray bolts,
 - the engine undertray.
- Place the **oil recovery tray** under the engine.



18749

- Remove the drain plug (3) from the engine oil sump using the **oil change wrench**.
- Let the engine oil run into the **oil recovery tray**.
- Remove the drain plug seal.
- Fit a new seal onto the engine oil drain plug.
- Torque tighten the **engine oil sump drain plug (20 N.m)** using a **torque wrench** and a **oil change end piece with an 8 mm square drive**.
- Wipe the oil drips on the sump using a cloth.
- Remove the **oil recovery tray**.
- Refit the engine undertray.

IV - FILLING

- Position the vehicle back on the ground.
- Fill the engine with oil, observing the recommended amount.
- Wait at least **10 minutes**.
- Check the oil level using the dipstick.
- Top up the engine oil level if necessary.
- Refit:
 - the dipstick,
 - the engine oil filler cap.

Engine oil: Draining - Refilling

K9K

Special tooling required

Mot. 1018 8 mm square engine drain plug spanner.

Equipment required

oil recovery tray

oil change wrench

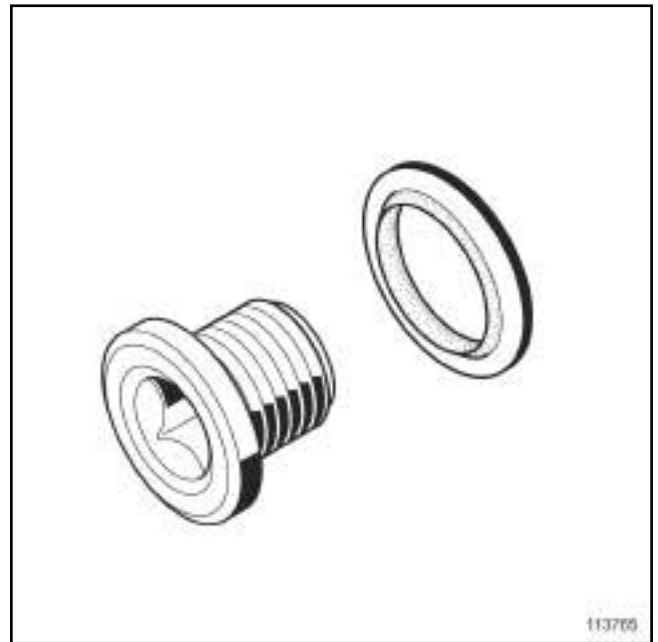
oil change end piece with an 8 mm square drive

Tightening torques

the drain plug **20 N.m**

Engine	Suffix	Average oil capacity (adjusting using dipstick) (l)	
		Oil change without fil- ter replace- ment	Oil change with filter replacement
K9K	740	4.3	4.4
	718	4.5	4.6

I - PRECAUTIONS FOR REPAIR



113765

- There is no direction of fitting for a seal fitted with a rubber lip.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

II - PARTS AND CONSUMABLES FOR THE REPAIR WORK

- parts always to be replaced: Drain plug seal on engine oil sump.

Consumable:

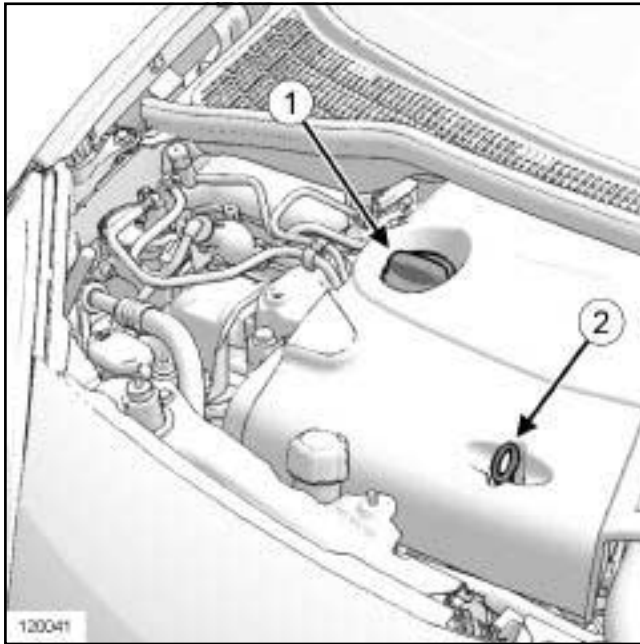
- engine oil (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants).

Engine oil: Draining - Refilling

K9K

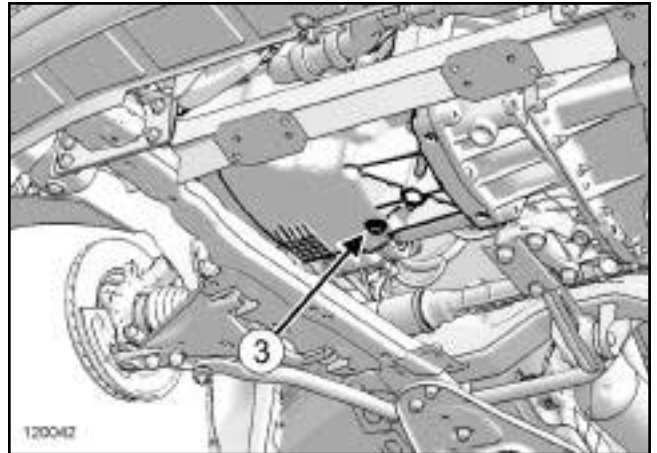
III - OIL SERVICE

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).



120041

- Remove:
 - the engine oil filler cap (1) ,
 - the dipstick (2) ,
 - the engine undertray bolts,
 - the engine undertray.
- Place the **oil recovery tray** under the engine.



120042

- Remove the drain plug (3) from the engine oil sump using the **(Mot. 1018)** or a **oil change wrench**.
- Let the engine oil flow out.
- Remove the drain plug seal.
- Refit the new seal to the drain plug.
- Torque tighten **the drain plug (20 N.m)** using a **oil change wrench** and a **oil change end piece with an 8 mm square drive**.
- Wipe the oil drips around the drain plug using a cloth.
- Remove the **oil recovery tray**.
- Refit the engine undertray.

IV - FILLING

- Position the vehicle back on the ground.
- Fill the engine with oil, observing the correct quantity of oil as recommended by the manufacturer.
- Wait at least **10 minutes**.
- Check the oil level using the dipstick.
- Top up the engine oil level if necessary.
- Refit:
 - the engine oil filler cap,
 - the dipstick.

Oil filter: Removal - Refitting

D4F or D7F

Special tooling required

Mot. 1330	Oil filter removing tool (66 mm diameter).
------------------	--

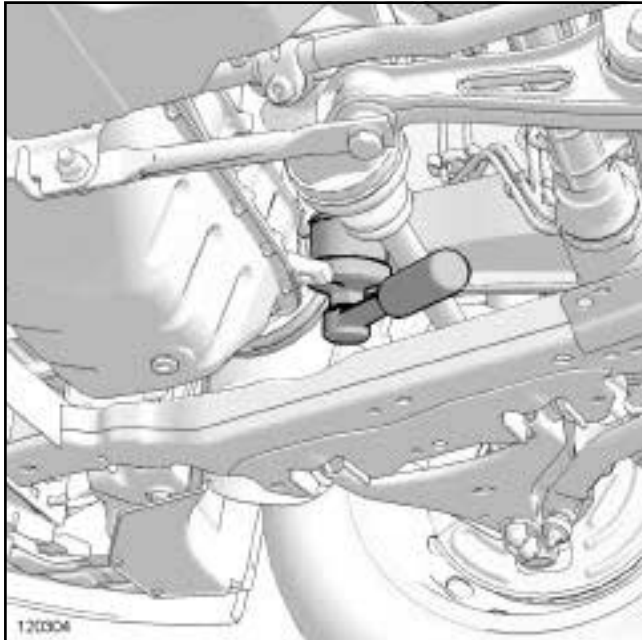
PARTS AND CONSUMABLES FOR THE REPAIR WORK

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) .

II - REMOVAL OPERATION FOR PART CONCERNED



120304

- Remove the oil filter using tool (**Mot. 1330**).

REFITTING

I - REFITTING PREPARATIONS OPERATION

- parts always to be replaced: Oil filter.

- Coat the new oil filter sealing ring with engine oil.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION FOR PART CONCERNED

- Tighten the oil filter until it makes contact.
- Tighten the **oil filter by 3/4 of a turn** with the (**Mot. 1330**).

III - FINAL OPERATION

- Wipe any oil run-off with a cloth.
- Top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) .
- Start the engine and leave it running for approximately **30 seconds**.
- Check that there are no leaks around the oil filter.
- Wait at least **10 minutes**.

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Oil filter: Removal - Refitting

C44, and K9K

Special tooling required

Mot. 1329	Oil filter removing tool (76 mm diameter)
------------------	---

PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Parts always to be replaced with new ones**
 - the oil filter
- Consumable:**
 - engine oil (see **Technical Note 6013, Engine oils, 04A, Lubricants, Engine oil: Specifications**).

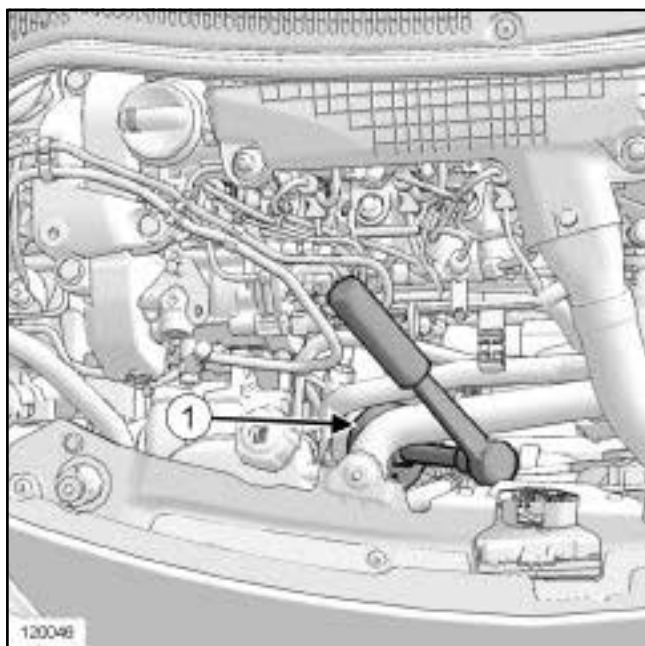
WARNING

Always check the oil level using the dipstick.
Do not exceed the maximum level on the dipstick (could destroy the engine).
Correct the engine oil level if necessary before delivering the vehicle to the customer.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).
- Remove the front engine cover.



120046

- Set up the **(Mot. 1329) (1)** .

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove the oil filter using the ratchet fitted with a long extension and a universal joint.
- Check that the oil filter seal is not in contact with the oil filter holder.
- Wipe off oil runs with a clean cloth.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Lubricate the oil filter seal with new engine oil.
- Tighten the oil filter until the seal makes contact with the oil filter holder.
- Tighten the oil filter three-quarters of a turn by hand.
- Start the engine.
- Allow the engine to run.

II - FINAL OPERATION.

- Check that there are no oil leaks.
- Switch off the engine.

Note:

Always wait **at least 10 min** for the oil to drain down before checking the level with the dipstick.

- Top up the engine oil.
- Refit the engine cover.

K4M

Special tooling required

Mot. 1329 Oil filter removing tool (76 mm diameter)

Equipment required

oil recovery tray

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Always check the oil level using the dipstick.
Do not exceed the maximum level on the dipstick (could destroy the engine).
Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

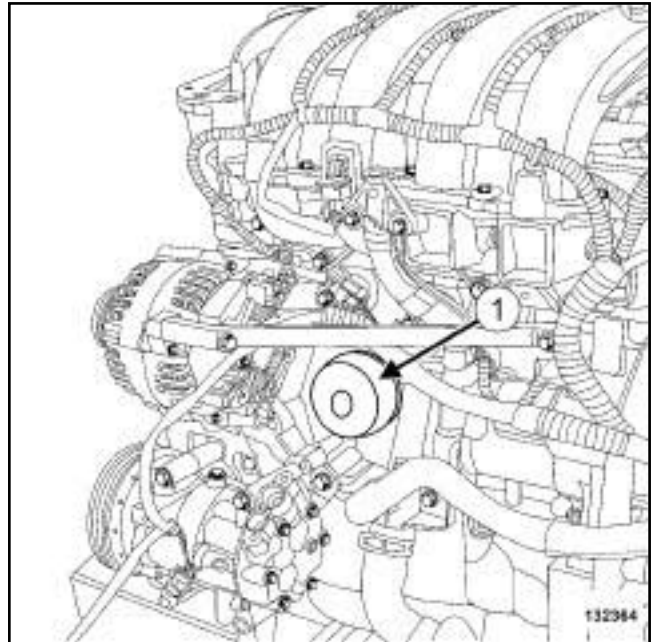
When removing the oil filter, check that the oil filter seal is not still stuck to the cylinder block or oil filter mounting.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove the engine undertray.
- Position **oil recovery tray** under the engine.

II - REMOVAL OPERATION



132364

- Remove the oil filter using the **(Mot. 1329)** (1) .

REFITTING

I - REFITTING PREPARATION OPERATION

- Using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products), clean and degrease the cylinder block joint faces.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

- parts always to be replaced: Oil filter.**
- Lubricate the oil filter seal with new engine oil.

II - REFITTING OPERATION

- Fit a new oil filter.
- Tighten the oil filter until it makes contact.
- Tighten the oil filter three-quarters of a turn using the **(Mot. 1329)**.

III - FINAL OPERATION

- Remove the **oil recovery tray**.

Oil filter: Removal - Refitting

K4M

- Wipe any oil run-off with a cloth.

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

- Top up the engine oil with oil recommended by the manufacturer (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Start the engine and wait until the oil pressure warning light goes out on the instrument panel.
- Check for leaks from the oil filter.
- Refit the engine undertray.
- Wait at least **10 minutes**.
- Check the oil level using the dipstick.
- Adjust the engine oil level if necessary.

ENGINE AND CYLINDER BLOCK ASSEMBLY

Oil-coolant heat exchanger: Removal - Refitting

10A

K9K

Special tooling required

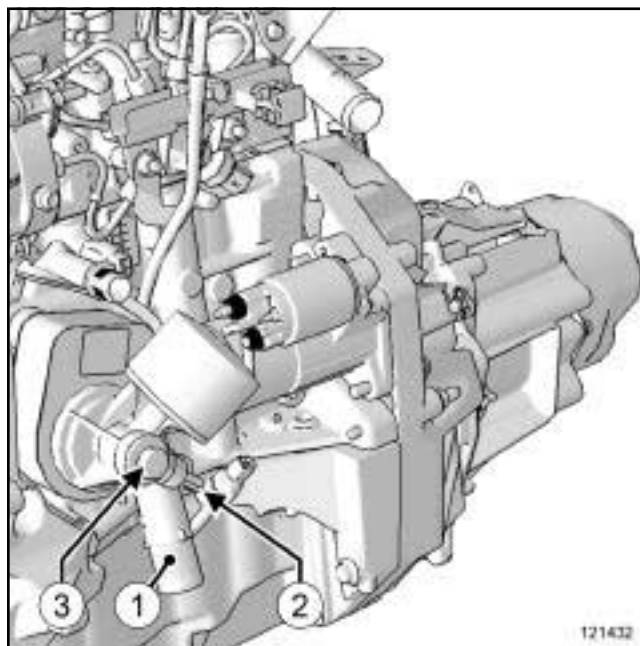
Mot. 1448 Remote operation pliers for hose clips.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Remove:
 - the engine cover,
 - the front wheels (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection).
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**).
- Remove the expansion bottle bolt.
- Remove the expansion bottle.
- Unclip the cooling hose on the lower section of the engine cooling fan.

II - OPERATION FOR REMOVAL OF PART CONCERNED



121432

- Disconnect:
 - the cooling hose (1) using the (**Mot. 1448**),
 - the oil pressure sensor connector (2).
- Remove:
 - the bolt (3) from the oil filter support,
 - the oil filter holder.

Note:

Be prepared for engine oil and coolant to flow out.

- Remove:
 - the oil cooler nipple,
 - the oil-water heat exchanger.

K9K

REFITTING

I - REFITTING PREPARATION OPERATION

- Using the buffing pads, clean the pressure faces of the oil-water heat exchanger and the cylinder block.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

WARNING

The gaskets must always be replaced with new gaskets.

- Fit new seals on the oil-water heat exchanger with soapy water.
- Check the condition of the oil-water heat exchanger nipple seals.

Note:

The oil-water heat exchanger nipple seals cannot be separated; the entire assembly must be replaced.

II - REFITTING OPERATION FOR PART CONCERNED

- Coat the nipple with high resistance thread lock.
- Refit:
 - the coolant-oil heat exchanger,
 - the oil-coolant heat exchanger nipple.
- Fit a new seal on the oil filter holder.
- Refit:
 - the oil filter holder,
 - the oil filter mounting bolt.
- Tighten the oil filter mounting bolt.
- Connect:
 - the oil pressure sensor connector,
 - the cooling hose using the **(Mot. 1448)**.

III - FINAL OPERATION

- Clip the cooling hose on to the lower section of the engine cooling fan.
- Position the expansion bottle.
- Refit the expansion bottle bolt.

- Fill the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**).

- Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
- the engine cover.

ENGINE AND CYLINDER BLOCK ASSEMBLY

Oil-coolant heat exchanger: Removal - Refitting

10A

D4F, and 780 or 782

Special tooling required

Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques

oil-coolant heat exchanger nipple	30 N.m
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IMPORTANT

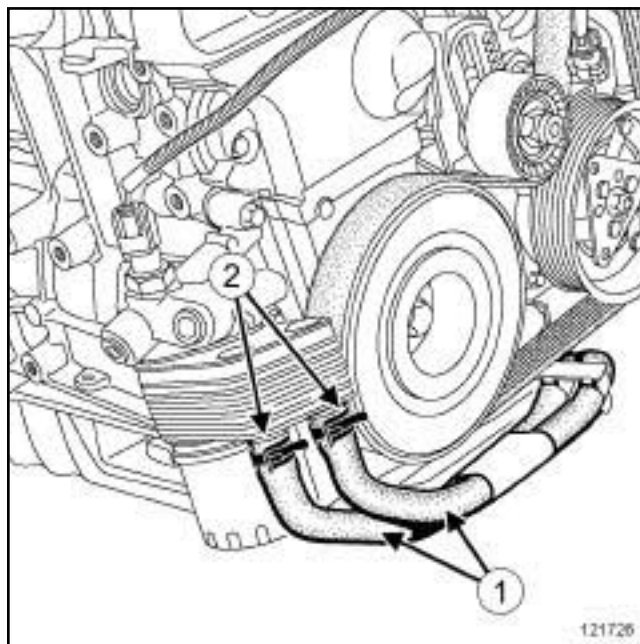
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page 10A-29) .

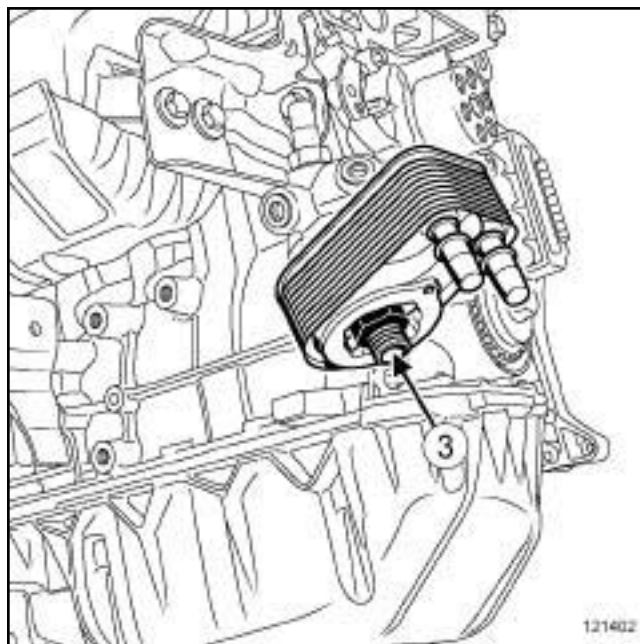
II - OPERATION FOR REMOVAL OF PART CONCERNED



121726

121726

- Fit the tool (**Ms. 583**) onto the oil-coolant heat exchanger hoses (1) .
- Release the clips (2) using the (**Mot. 1448**).
- Connect the oil-coolant heat exchanger hoses.



121402

121402

- Remove:
 - the nipple (3) from the oil-coolant heat exchanger,
 - the oil-water heat exchanger.

D4F, and 780 or 782

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block.**
- Use a **GREY ABRASIVE PAD** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the bearing faces of the oil-coolant heat exchanger and the cylinder block.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

II - REFITTING OPERATION FOR PART CONCERNED

- Coat the nipple with **HIGH STRENGTH THREAD-LOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
- Refit:
 - the oil-coolant heat exchanger,
 - the oil-coolant heat exchanger nipple.
- Torque tighten the **oil-coolant heat exchanger nipple (30 N.m)**.
- Connect the oil-coolant heat exchanger hoses.
- Refit the clips using the **(Mot. 1448)**.
- Remove the tools **(Ms. 583)**.

III - FINAL OPERATION

- Refit:
 - the oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page **10A-29**) ,
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**) .

ENGINE AND CYLINDER BLOCK ASSEMBLY

Conrod bearing shell: Removal - Refitting

10A

K9K

Special tooling required

Mot. 1914	Tool for fitting G9 con rod bearing shells
Mot. 1920	Tool for fitting F9 / K9 con rod bearing shells

Equipment required

safety strap(s)
component jack
indelible pencil
torque wrench
Diagnostic tool

Tightening torques

con rod cap bolts	20 N.m + 45° ± 6°
oil pump bolts	25 N.m

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Vehicle: Precautions for the repair**).

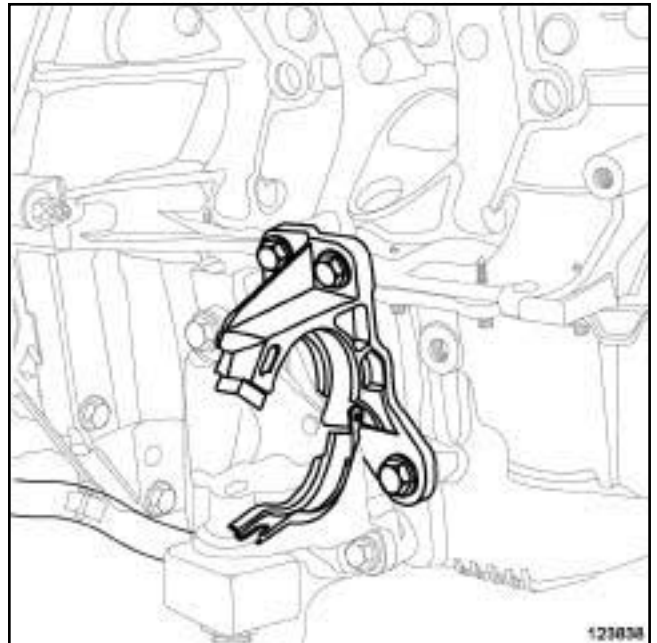
IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the engine undertray.
- Drain the oil from the engine (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22).
- Remove the oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page 10A-29).
- Remove the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18).
- Strap the radiator to the vehicle using **safety strap(s)**.
- Remove the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).



123838

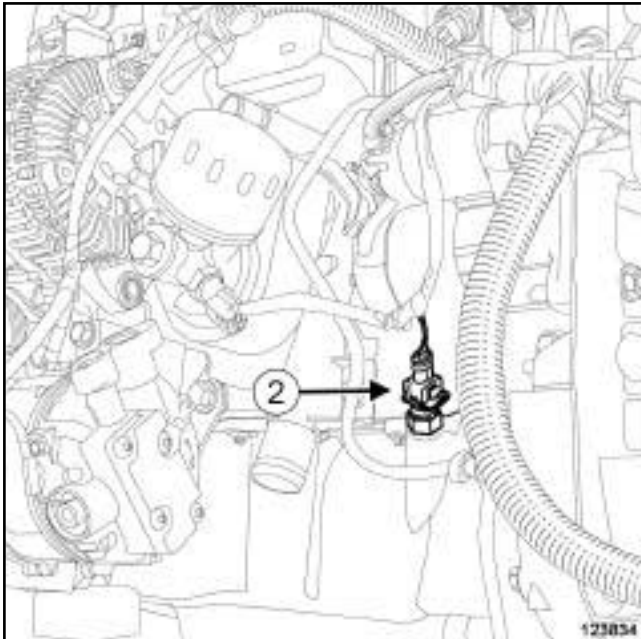
- Remove the relay bearing of the front right-hand wheel driveshaft.

ENGINE AND CYLINDER BLOCK ASSEMBLY

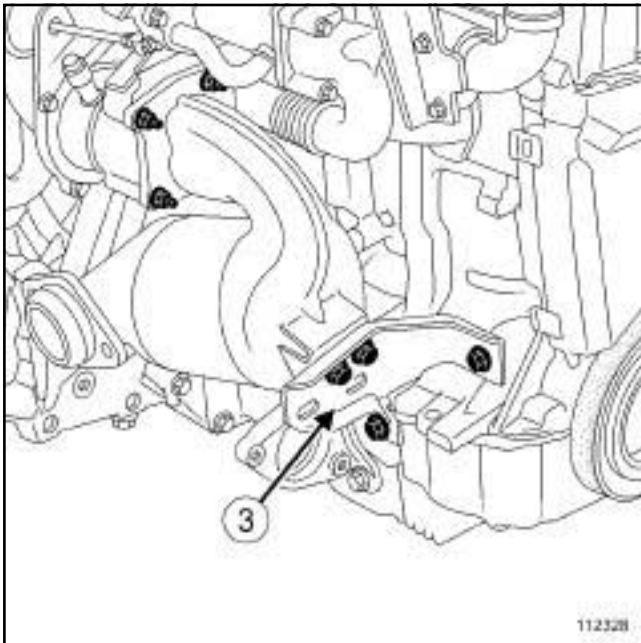
Conrod bearing shell: Removal - Refitting

10A

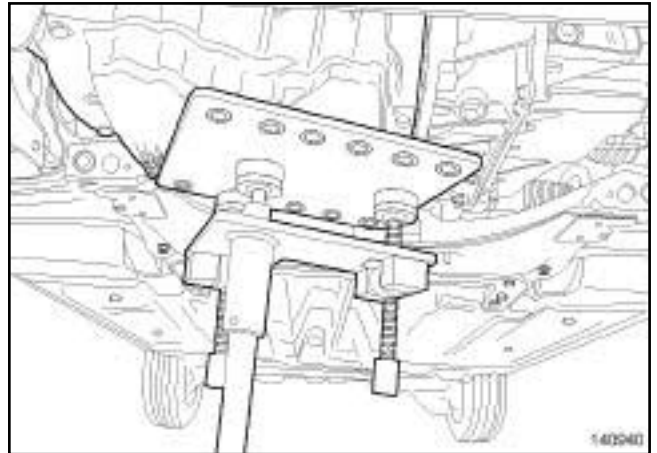
K9K



- ❑ Disconnect the oil level sensor connector (if equipped) (2) .



- ❑ Remove the catalytic converter upstream stay (3) .



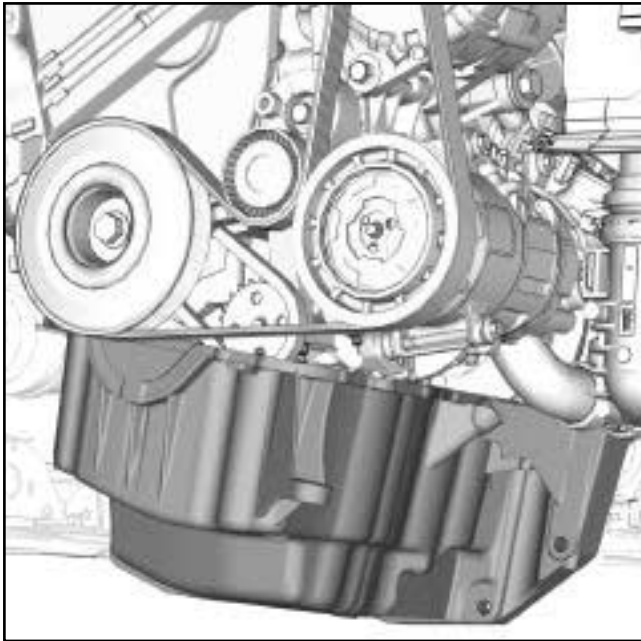
❑

WARNING

Failure to observe the following procedure may damage the oil pump strainer.

- Undo the bolts of the engine oil sump.
- ❑ Fit a **component jack** to support the engine oil sump.
- ❑ Remove the bolts from the engine oil sump.
- ❑ Detach the engine oil sump, while supporting it with the **component jack**.

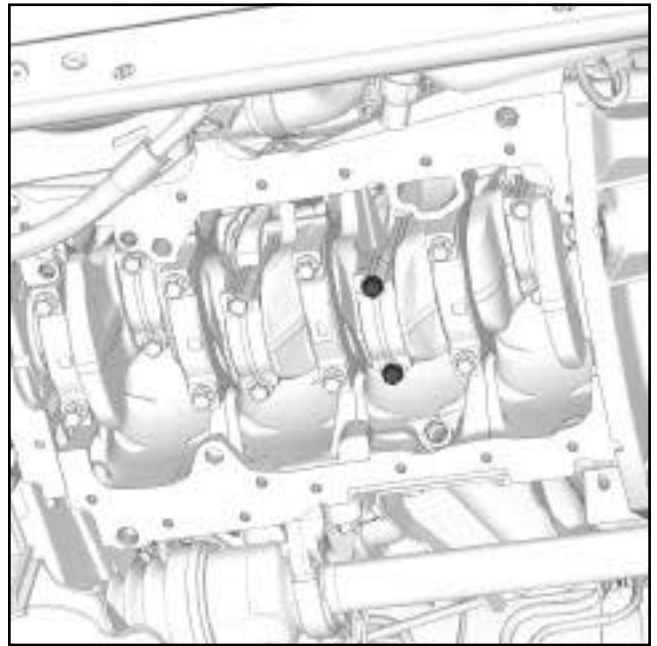
K9K



140917

- Tilt the engine oil sump forwards in order to access the oil pump bolts.
- Partially loosen the oil pump bolts **3 mm** to **5 mm**.
- Detach the oil pump from its position in order to remove the engine oil sump.
- Remove:
 - the engine oil sump,
 - the engine oil sump seal,
 - the oil pump.

II - REMOVAL OPERATION FOR THE CON ROD BEARING SHELLS NO.2



139306

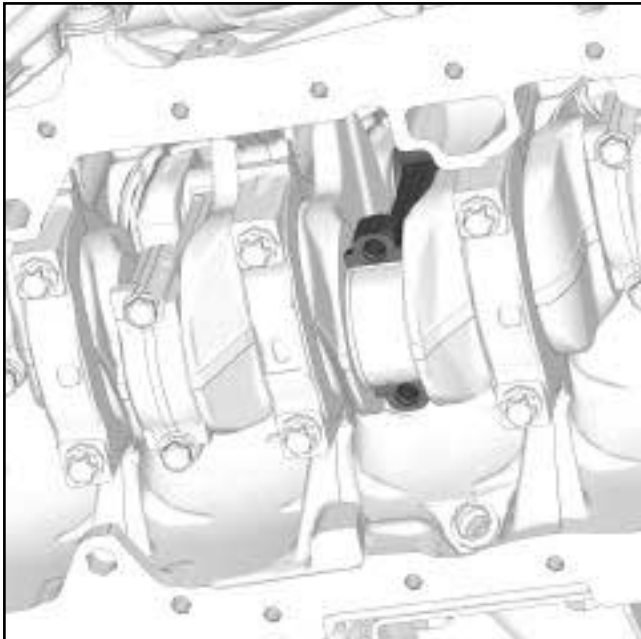
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the big ends.
- Mark the position of the con rod cap in relation to the con rod body using a **indelible pencil**.
- Position the crankshaft at Top Dead Centre.

ENGINE AND CYLINDER BLOCK ASSEMBLY

Conrod bearing shell: Removal - Refitting

10A

K9K



139300

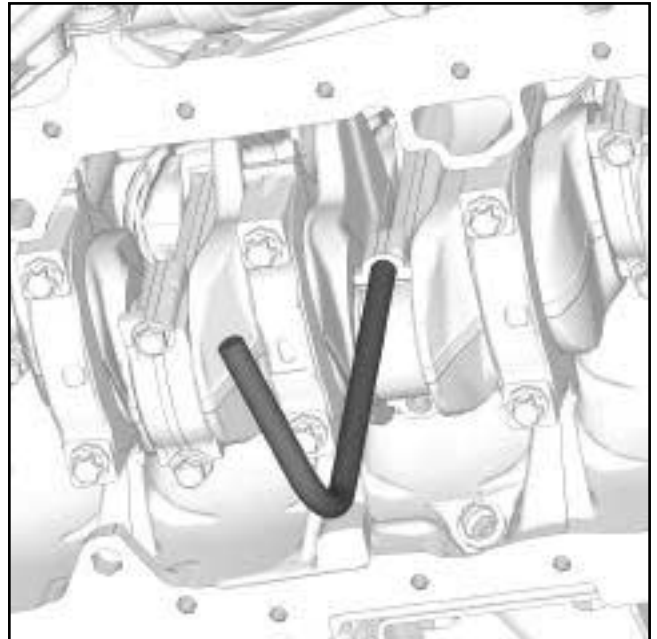
Remove:

- the con rod bolts,
- the con rod cap,
- the lower con rod bearing shell.

Note:

If reusing the con rod bearing shells, mark the position of the lower con rod bearing shell in relation to the con rod cap.

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - products) to clean the bearing mating face on the con rod cap.



139310

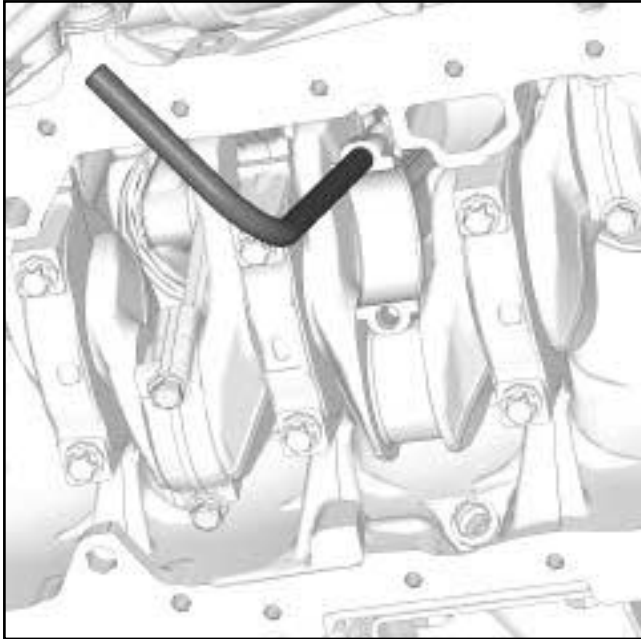
- Fit the tie rod of the tool (**Mot. 1914**) on the con rod body.
- Push the con rod upwards to release the con rod from the crankpin.
- Turn the crankshaft **90°** clockwise (timing end).

ENGINE AND CYLINDER BLOCK ASSEMBLY

Conrod bearing shell: Removal - Refitting

10A

K9K



139315

WARNING

Failure to observe the following procedure may damage the piston base cooling jets.

Pull the con rod - piston assembly using the tie rod of the tool (**Mot. 1914**), taking care not to allow the piston to touch the piston base cooling jets.

- Remove the upper con rod bearing shell.

Note:

If reusing the con rod bearing shells, mark the position of the upper con rod bearing shell in relation to the con rod body.

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - products) to clean the bearing mating face on the con rod body.

REFITTING

I - REFITTING OPERATION FOR THE CON ROD BEARING SHELLS ON CYLINDER NO.2

- parts always to be replaced: con rod cap bolts

Note:

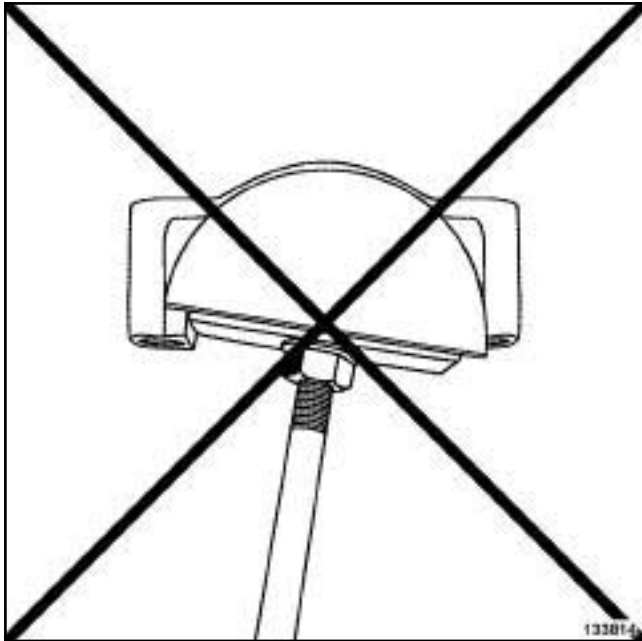
Always replace con rod bearing shells with a width of **20 mm** by con rod bearing shells with a width of **18 mm**.

If the set of con rod bearing shells only includes con rod bearing shells which are **18mm** wide, only use the head of the tool (**Mot. 1920**) with the marking "**K9K SUP**".

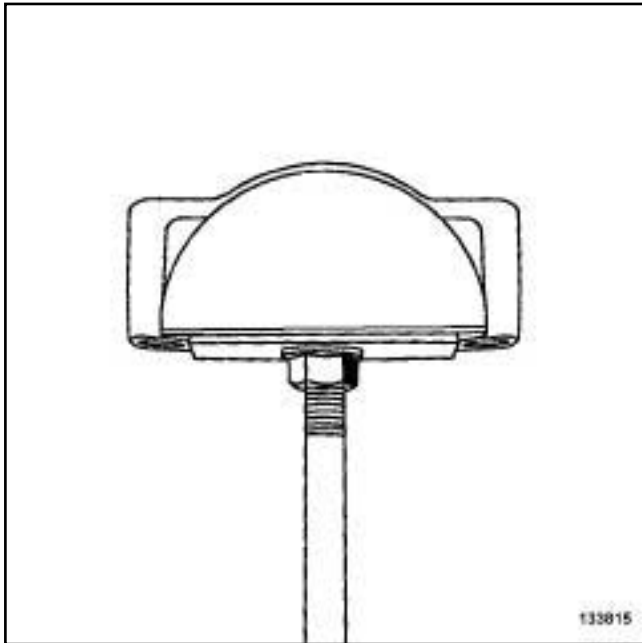
Fit the head of the tool (**Mot. 1920**) with the marking "**K9K INF**" on the threaded sleeve of the tool (**Mot. 1914**).

- Position the lower con rod bearing shell on the tool (**Mot. 1920**).

K9K



133814



133815

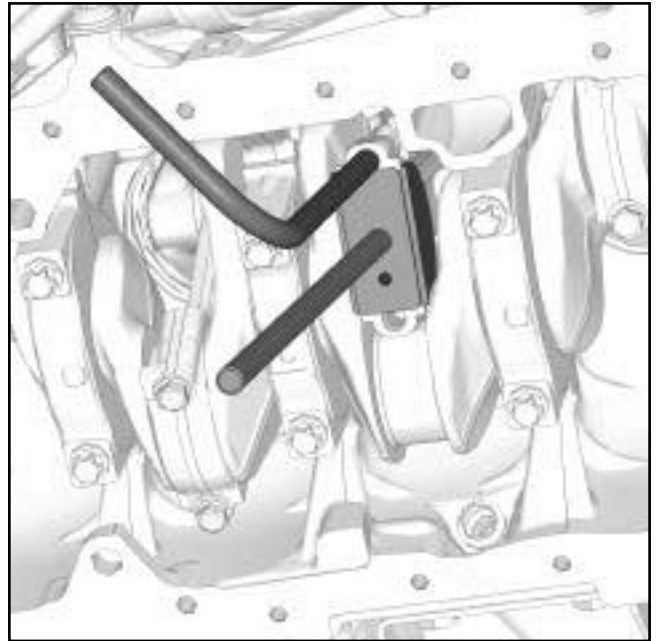
□

Note:

The contact surface between the bearing shell and the con rod must be dry and free of grease.

Fit the lower con rod bearing shell on the con rod cap using the tool (**Mot. 1920**).

- Position the lower con rod bearing shell so that the ends do not protrude beyond the con rod cap.
- Lubricate the surface of the con rod bearing shell (crankshaft end) using new engine oil.



139318

- Remove the tool head with the marking " K9K INF " and fit the head with the marking " K9K SUP " .
- Position the upper con rod bearing shell on the tool (**Mot. 1920**).
- Fit the upper con rod bearing shell on the con rod body using the tool (**Mot. 1920**).
- Position the upper con rod bearing shell so that the ends do not protrude beyond the con rod body.
- Lubricate the surface of the con rod bearing shell (crankshaft end) using new engine oil.
- Push the con rod - piston assembly back up into place.
- Turn the crankshaft **90°** anticlockwise.
- Lubricate the crankpin with new engine oil.
- Pull the con rod - piston assembly to position the con rod on the crankshaft.
-

Note:

Before refitting the con rod cap, ensure that there are no impurities (filings, cloth lint, etc.) on the con rod body or cap surfaces.

Refit:

- the con rod cap according to the mark made during removal,
- the new con rod bolts.

- Torque and angle tighten the **con rod cap bolts (20 N.m + 45° ± 6°)**.

K9K

II - REMOVAL - REFITTING OPERATIONS FOR THE CON ROD BEARING SHELLS ON CYLINDERS NO.3, 1 AND 4

- Perform the same removal - refitting operations as for the con rod bearing shells on cylinder no. 2.

Note:

For removing and refitting the con rod bearing shells on cylinders no. 1 and no. 4, position the pistons at Bottom Dead Centre before performing the same removal and refitting operations as for the con rod bearing shells on cylinder no. 2.

III - FINAL OPERATION

- parts always to be replaced: engine oil sump seal

parts always to be replaced: Oil filter

parts always to be replaced: Drain plug seal on engine oil sump

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

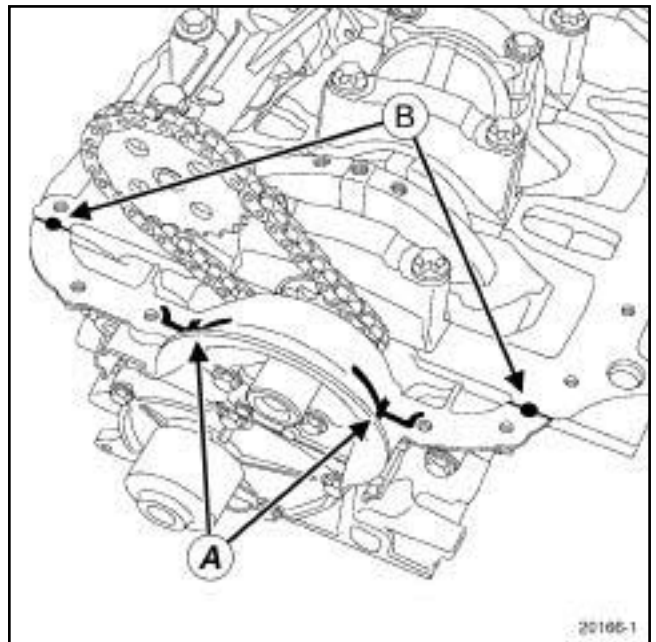
WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

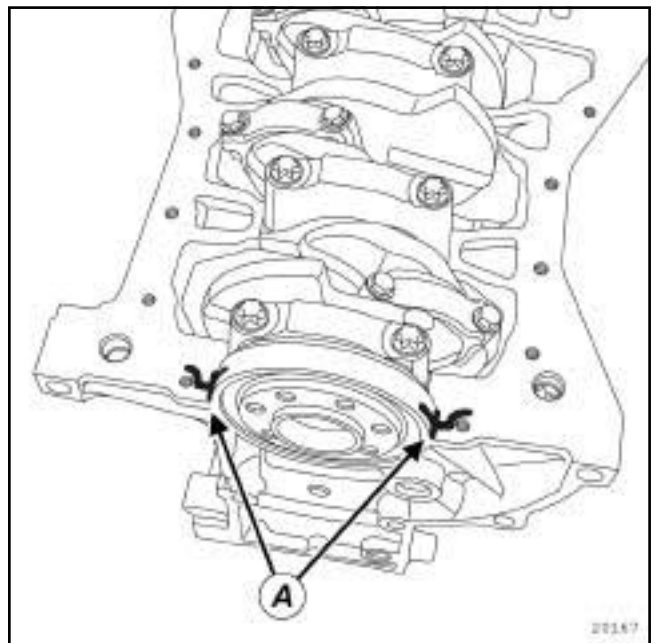
- Use a wooden spatula or an **ABRASIVE PAD** to clean the joint face of the cylinder block and engine oil sump.
- Refit the oil pump.
- Fit without tightening the oil pump bolts, while keeping a clearance of **3 mm to 5 mm**.
- Fit the engine oil sump seal.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).



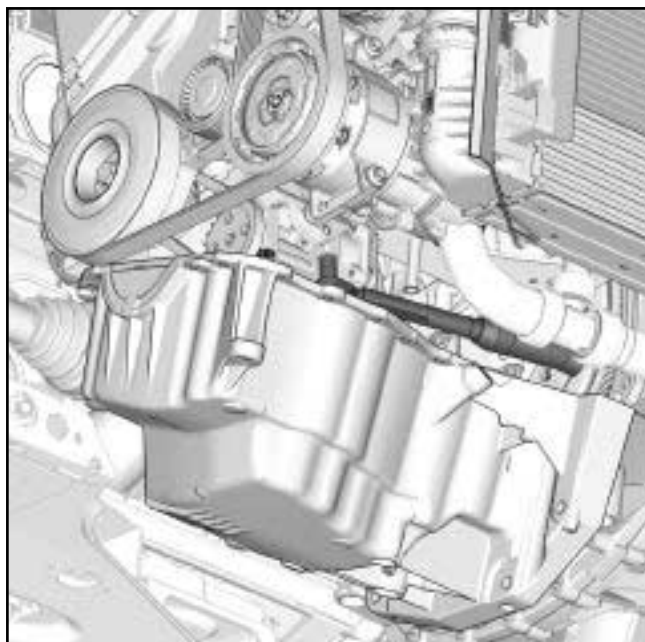
20166-1



20167

- Apply **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) :
 - four beads with a diameter of **5 mm** at (A) ,
 - two drops with a diameter of **5 mm** at (B) .
- Fit the engine oil sump while supporting it using a **component jack**.

K9K



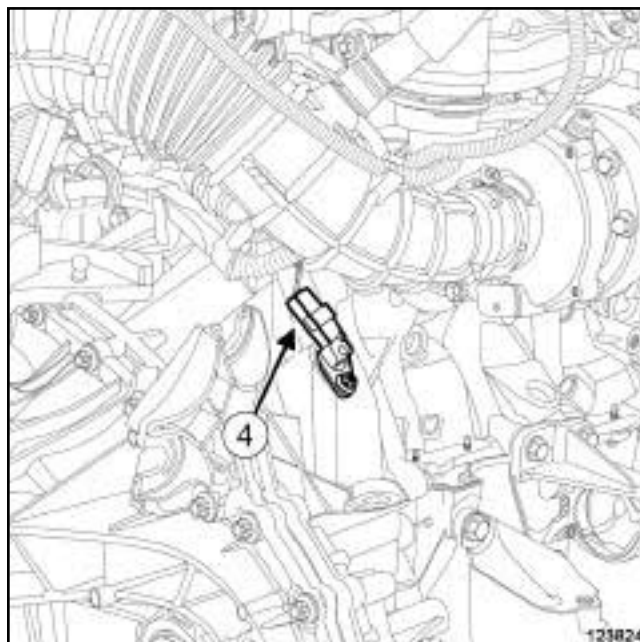
140918

- Tilt the engine oil sump forwards in order to access the oil pump bolts.
- Torque tighten the **oil pump bolts (25 N.m)** using the **torque wrench PROSTEEL**, part number **77 11 226 888** starting with the **13 mm** bolt.

Note:

Check that the engine oil sump seal is definitely in place before tightening the engine oil sump bolts.

- Refit the engine oil sump bolts.
- Torque tighten in order the engine oil sump bolts (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting**, page 10A-6) .
- Refit the catalytic converter upstream stay (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) .
- Connect the connector to the oil level sensor.
- Refit the relay bearing of the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) .
- Refit the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).
- Remove the **safety strap(s)** from the radiator.
- Refit the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) .



123824

- Disconnect the crankshaft position sensor (4) to prevent the engine from starting.
- Refit the oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page 10A-29)
- Fill up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) .
- Start the engine using the starter until the engine oil warning light goes out.
- Connect the crankshaft position sensor.
- Refit the engine undertray.
- Clear the present faults using the **Diagnostic tool**.

K9K

Special tooling required

Mot. 1495-01 22 mm socket for removal - refitting of oxygen sensors.

Equipment required

Diagnostic tool

Tightening torques

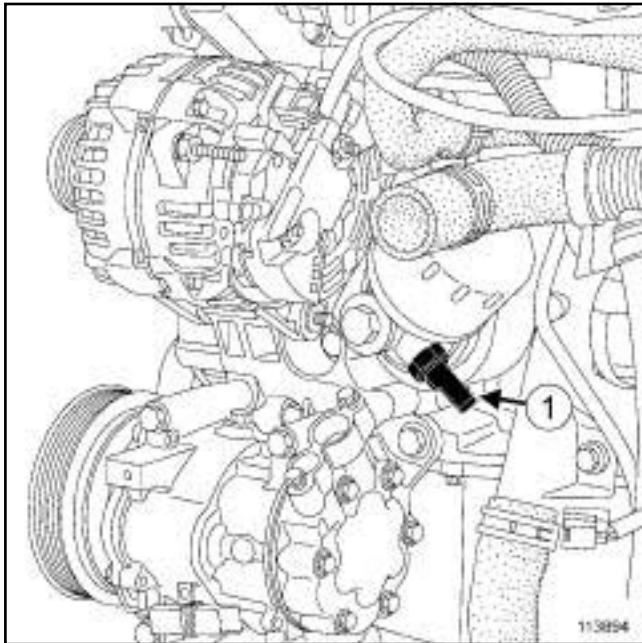
oil pressure sensor **35 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Disconnect the oil pressure sensor connector.
- Remove the oil pressure sensor (1) using the **(Mot. 1495-01)**.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the oil pressure sensor using the **(Mot. 1495-01)**.
- Torque tighten the **oil pressure sensor (35 Nm)**.

II - FINAL OPERATION.

- Connect the **Diagnostic tool** and check for any faults; deal with them if necessary.

ENGINE AND CYLINDER BLOCK ASSEMBLY

Oil pressure sensor: Removal - Refitting

10A

D4F, and 772 – D7F

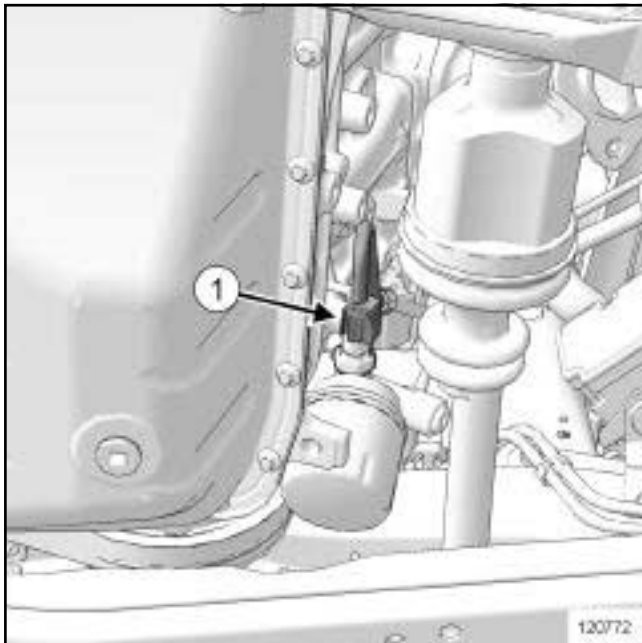
Tightening torques

oil pressure sensor	35 N.m
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REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).



120772

- Disconnect the oil pressure sensor connector (1) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove the oil pressure sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the oil pressure sensor.
- Torque tighten the **oil pressure sensor (35 N.m)**.

II - FINAL OPERATION

- Connect the oil pressure sensor connector.

D4F, and 780 or 782

Tightening torques 

oil pressure sensor	35 N.m
---------------------	--------

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Unclip the upstream oxygen sensor wiring harness from the turbocharger heat shield.

II - OPERATION FOR REMOVAL OF PART CONCERNED



121725

- Disconnect the oil pressure sensor connector (1) .
- Remove the oil pressure sensor (2) .

REFITTING

REFITTING OPERATION FOR PART CONCERNED

- Refit the oil pressure sensor.
- Torque tighten the **oil pressure sensor (35 N.m)**.
- Connect the oil pressure sensor connector.
- Clip the upstream oxygen sensor wiring harness onto the turbocharger heat shield.

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

ENGINE AND CYLINDER BLOCK ASSEMBLY

Oil pressure sensor: Removal - Refitting

10A

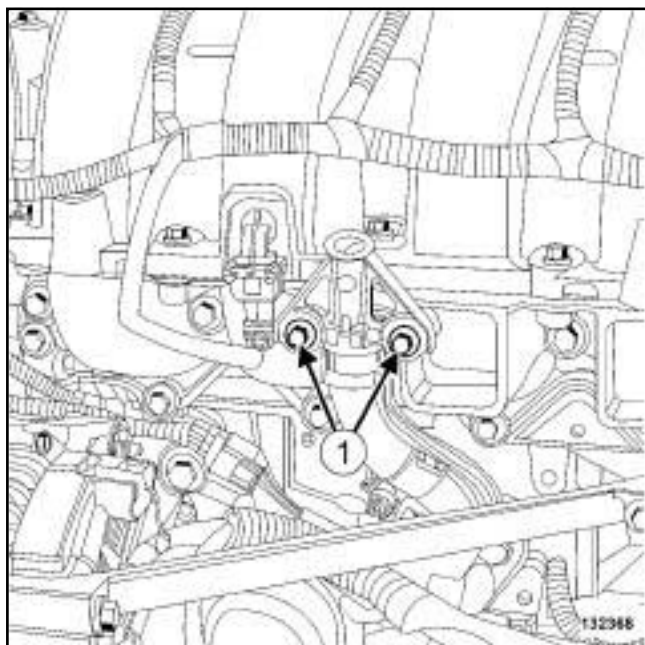
K4M

Tightening torques

oil pressure sensor	32 N.m
alternator strut bolts	25 N.m

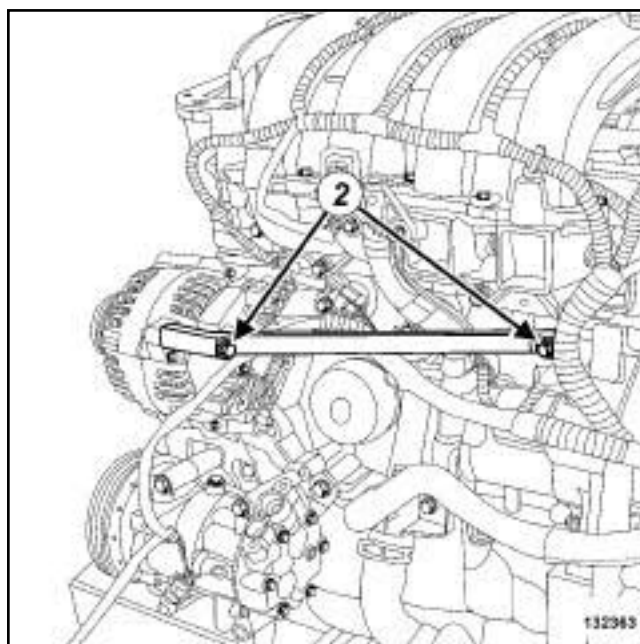
REMOVAL

I - REMOVAL PREPARATION OPERATION



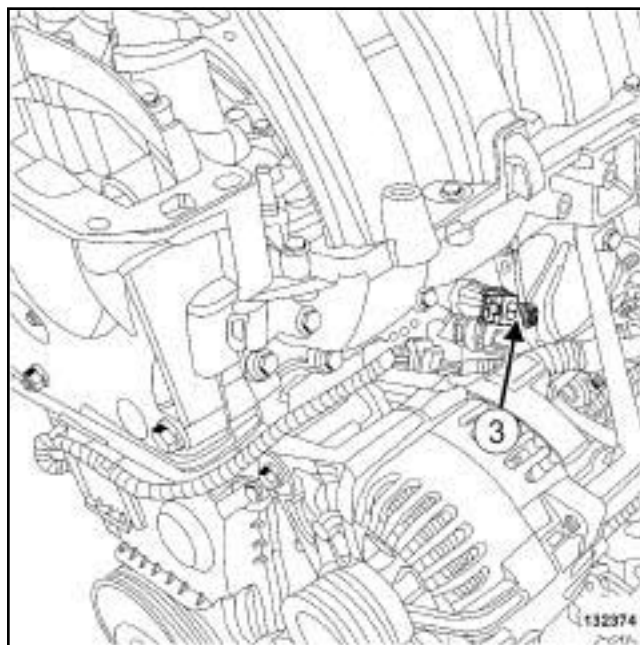
132368

- Remove:
 - the dipstick,
 - the dipstick guide bolts (1) .
- Move aside the dipstick guide.



132363

- Remove:
 - the alternator strut bolts (2) ,
 - the alternator strut.

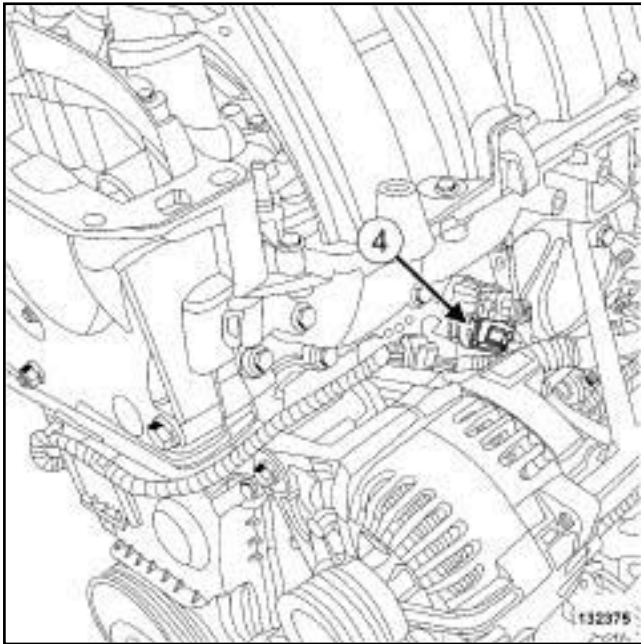


132374

- Disconnect the pink sensor connector (3) .

K4M

II - REMOVAL OPERATION



- Disconnect the oil pressure sensor connector (4) .
- Remove the oil pressure sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

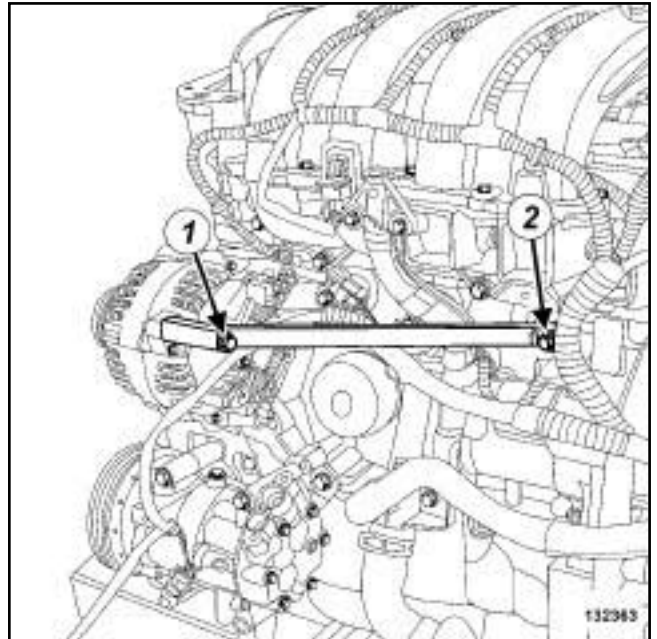
- Coat the threading of the oil pressure sensor with **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

II - REFITTING OPERATION

- Torque tighten the **oil pressure sensor (32 N.m)**.
- Connect the oil pressure sensor connector.

III - FINAL OPERATION

- Connect the pinking sensor connector.



- Refit the alternator strut.
- Tighten to torque and in order the **alternator strut bolts (25 N.m)**.
- Refit:
 - dipstick guide ,
 - the dipstick.

Oil pump: Removal - Refitting

K9K

Tightening torques 

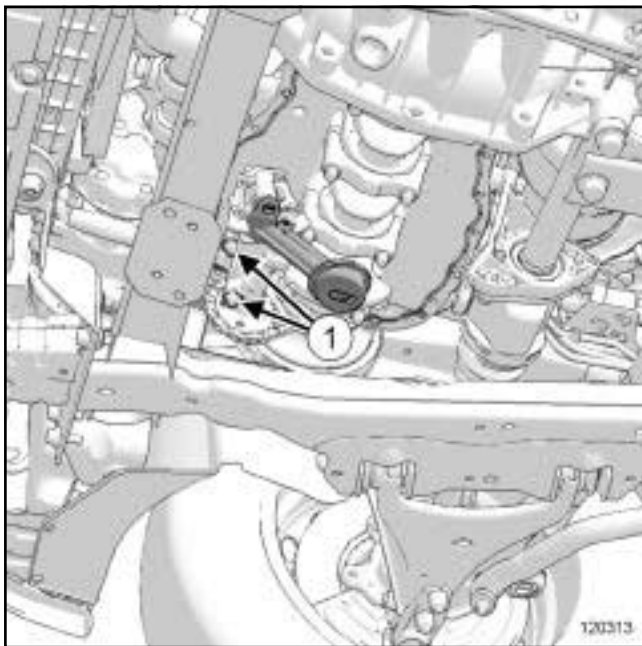
oil pump bolts	25 Nm
----------------	-------

REMOVAL

I - OPERATION FOR REMOVAL OF PART CONCERNED

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).
- Disconnect the battery ((see **Battery: Removal - Refitting**)).
- Remove the sump (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting, page 10A-6**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



120313

- Remove:
 - the oil pump bolts (1) ,
 - the oil pump.

REFITTING

I - REFITTING PREPARATION OPERATION

- Check for oil pump centering rings on the cylinder block.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the oil pump,
 - the oil pump bolts.
- Torque tighten the **oil pump bolts (25 Nm)**.


III - FINAL OPERATION.

- Refit the sump (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting, page 10A-6**) .
- Top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling, page 10A-22**) .
- Connect the battery ((see **Battery: Removal - Refitting**)).

Oil pump: Removal - Refitting

D4F or D7F

Special tooling required	
Mot. 1379	Engine support tool for cylinder head operations.
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1374	Oil pump seal extractor.
Mot. 1626	Tool for fitting the PTFE crankshaft seal, timing end.

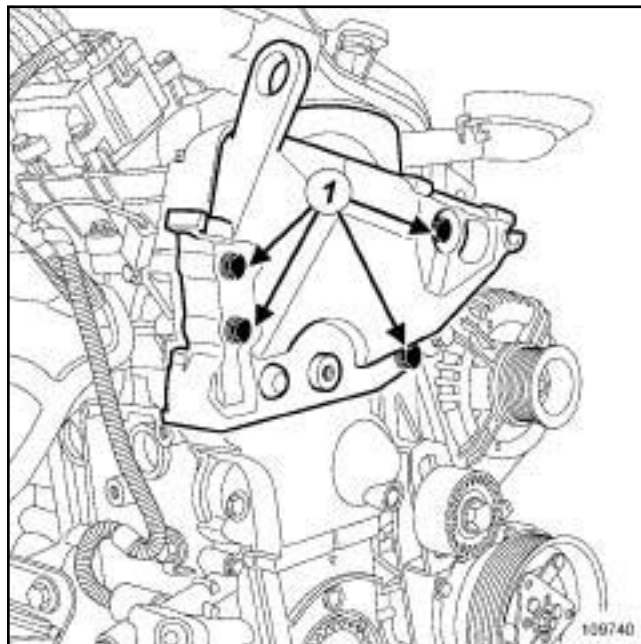
Tightening torques 	
oil pump bolts	10 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**) .
- Remove:
 - the oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page **10A-29**) ,
 - the dipstick,
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**) ,
 - the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) ,

- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-20**) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-27**) .



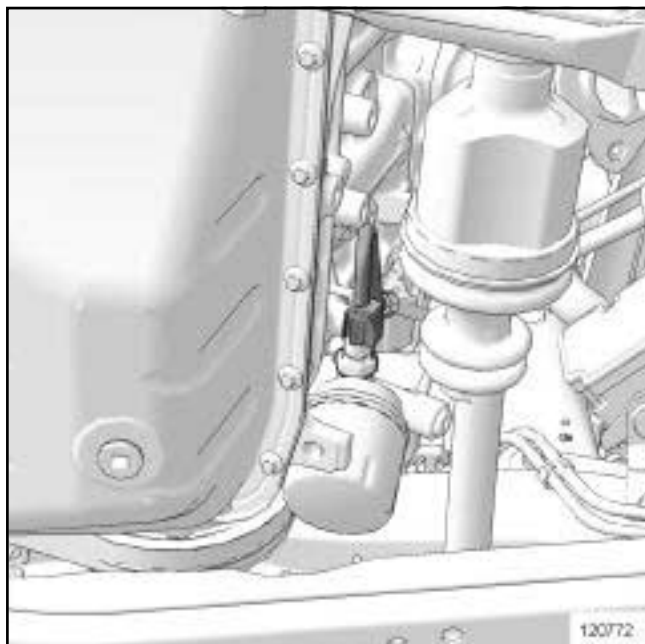
109740

- Refit:
 - the upper timing cover,
 - the upper timing cover bolts (1) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) .
- Remove the lower engine support tool (**Mot. 1379**).
- Remove the sump (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting**, page **10A-6**) .

Oil pump: Removal - Refitting

D4F or D7F

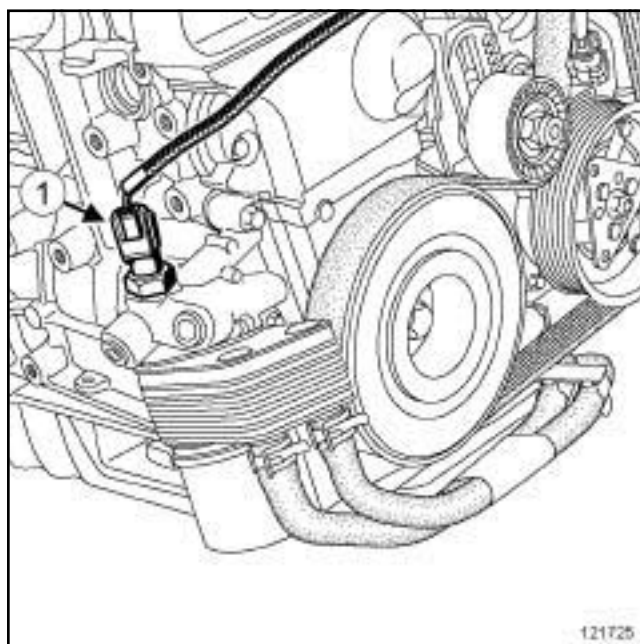
D4F, and 772 – D7F



120772

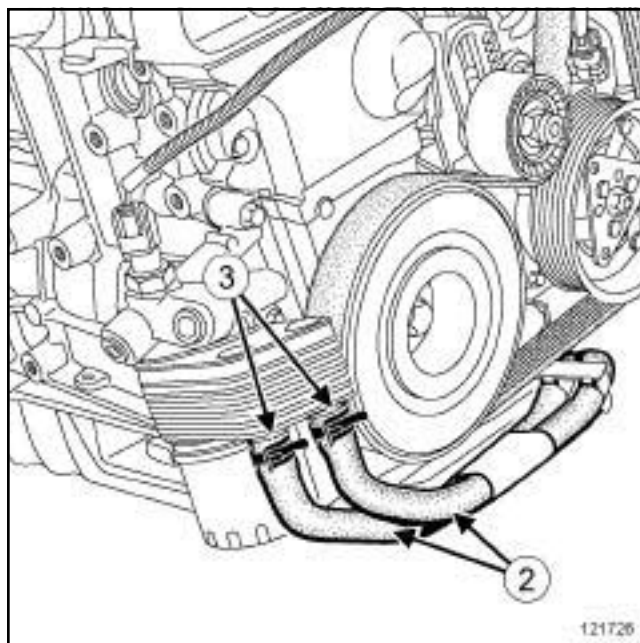
- Disconnect the oil pressure sensor connector.

D4F, and 780 or 782



121725

121725



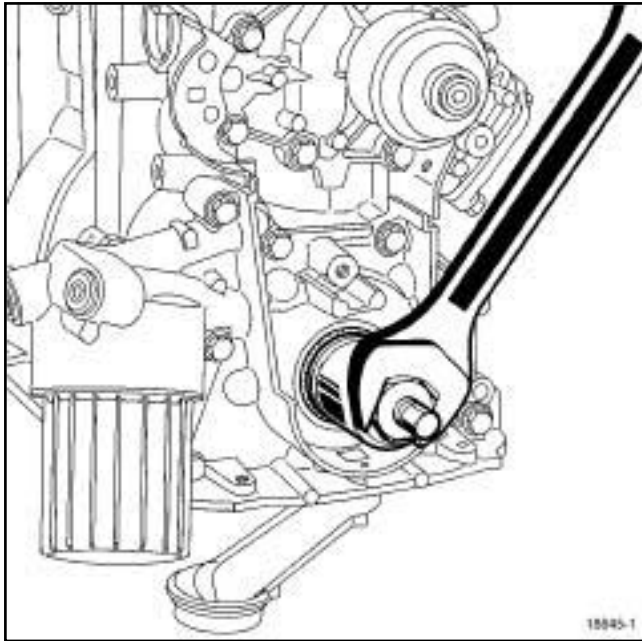
121726

121726

- Disconnect the oil pressure sensor connector (1) .
- Fit hose clamps (**Ms. 583**) onto the oil-coolant heat exchanger hoses (2) .
- Release the clips (3) using the (**Mot. 1448**).
- Disconnect the oil cooler hoses.
- Remove the timing sprocket.

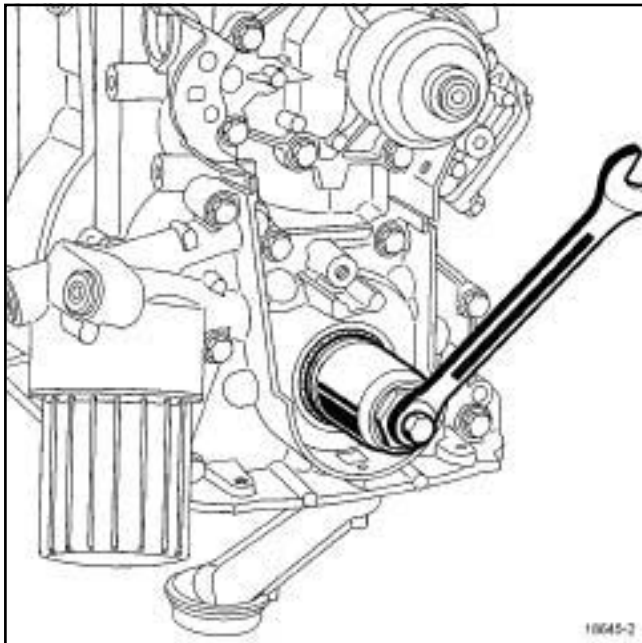
Oil pump: Removal - Refitting

D4F or D7F



18645-1

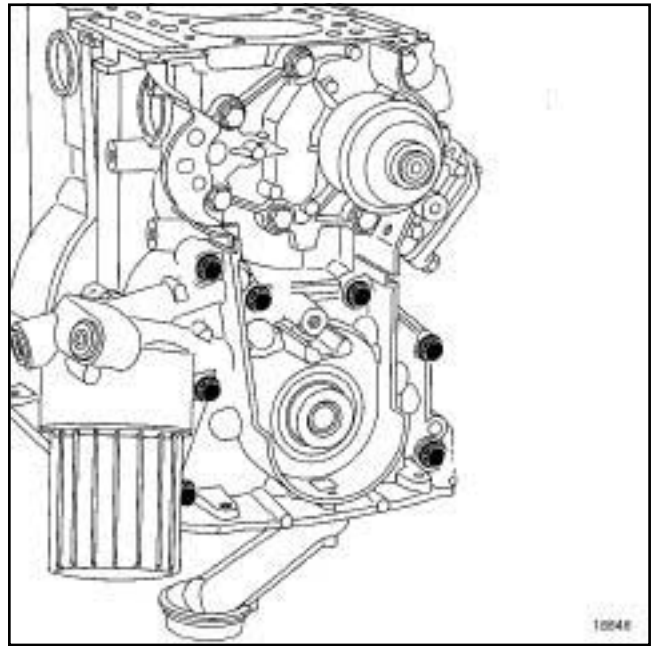
- Remove the crankshaft output seal by turning the **(Mot. 1374)**.



18645-2

- Remove the crankshaft output seal by turning the bolt of the **(Mot. 1374)**.

II - OPERATION FOR REMOVAL OF PART CONCERNED



18646

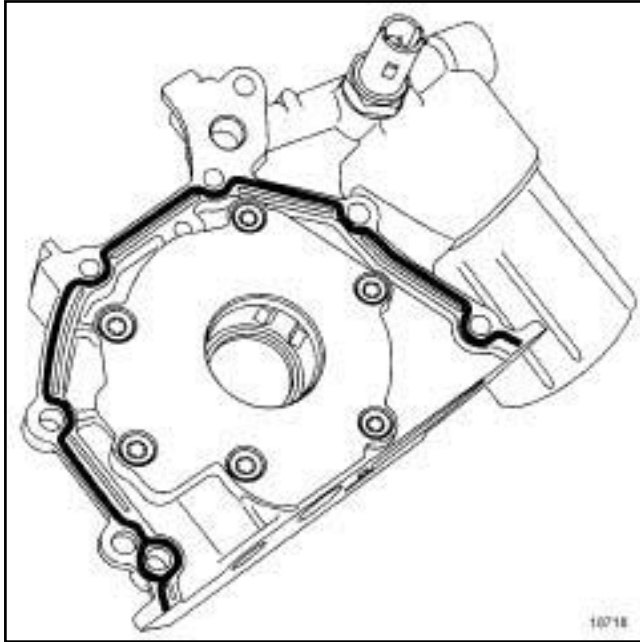
- Remove:
 - the oil pump strainer bolts,
 - the oil pump strainer,
 - the oil pump bolts,
 - the oil pump.

Oil pump: Removal - Refitting

D4F or D7F

REFITTING

I - REFITTING PREPARATION OPERATION



18718

- Clean the joint faces (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

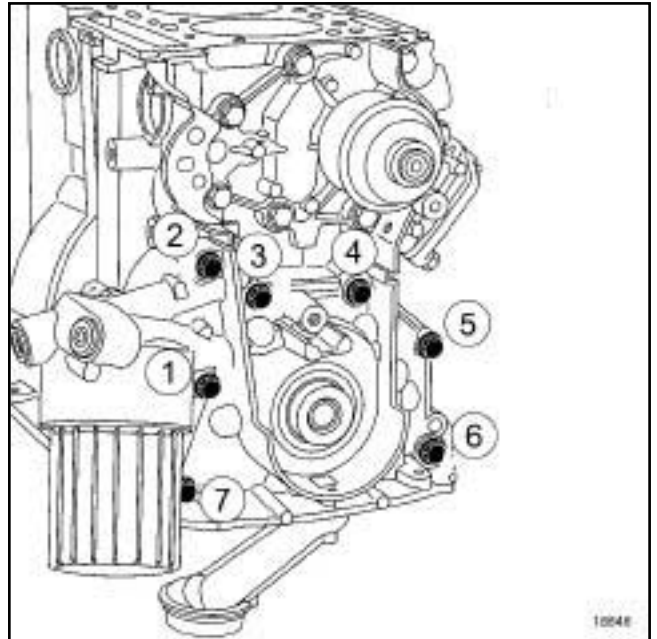
WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- parts always to be replaced: engine oil strainer seal.**
- parts always to be replaced: Crankshaft seal on timing end.**
- Apply a **BEAD OF SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a width of **1.3 mm** to ensure the sealing of the oil pump.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the oil pump, aligning the oil pump drive points with the flat surfaces of the crankshaft,
 - the oil pump bolts.

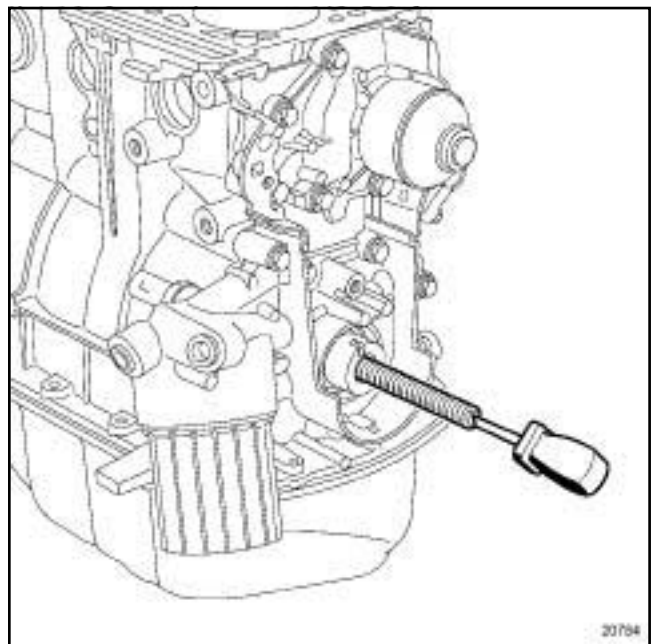


1084E

18646

- Tighten to torque and in order the **oil pump bolts (10 N.m)**.
- Refit:
 - the oil pump strainer with a new seal,
 - the oil pump strainer bolts.

III - FINAL OPERATION



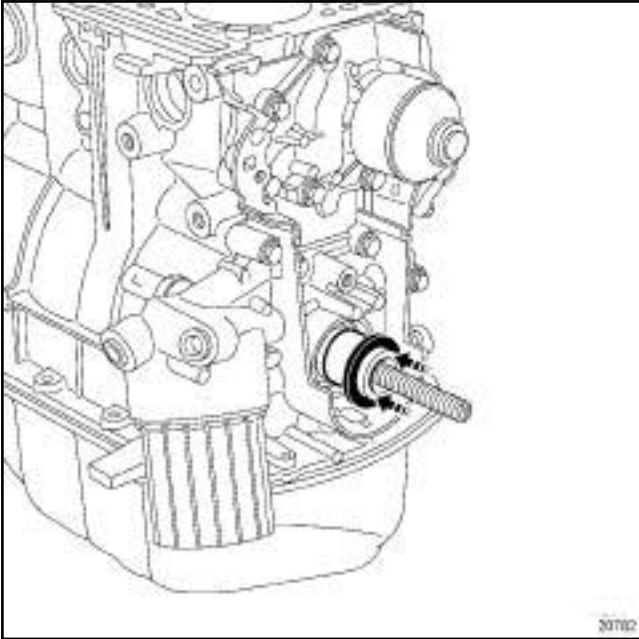
20784

20784

- Screw the threaded rod of the **(Mot. 1626)** into the crankshaft.

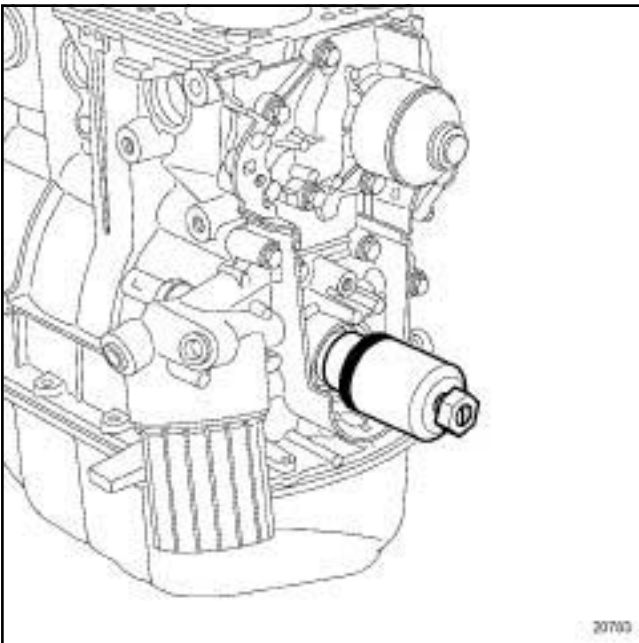
Oil pump: Removal - Refitting

D4F or D7F



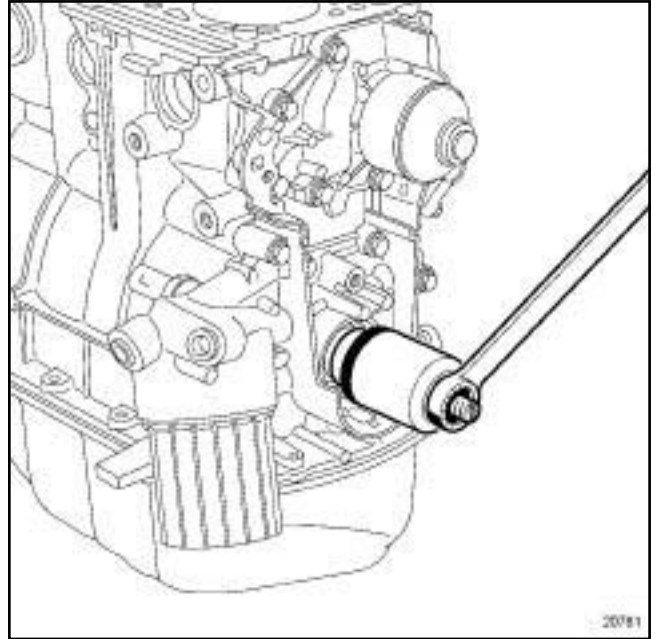
20782

- ❑ Fit the protector fitted with a new crankshaft output seal on the crankshaft, taking care not to touch the seal.

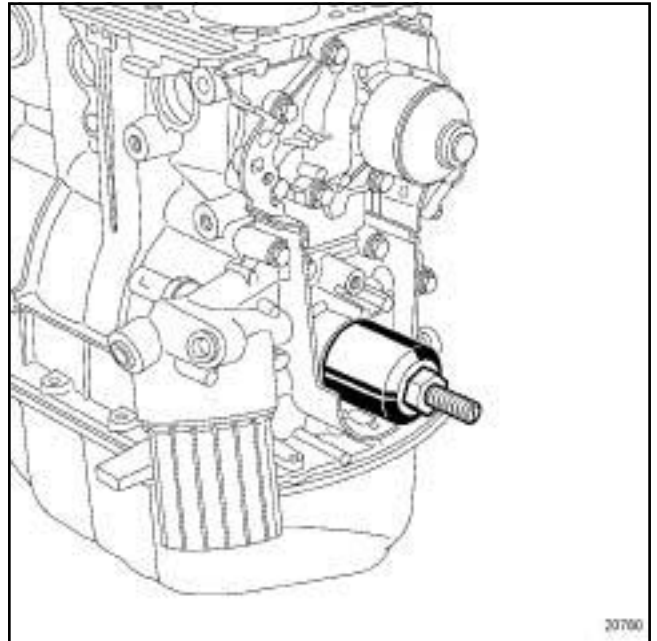


20783

- ❑ Fit the cover and the collar nut of the **(Mot. 1626)**.



20781

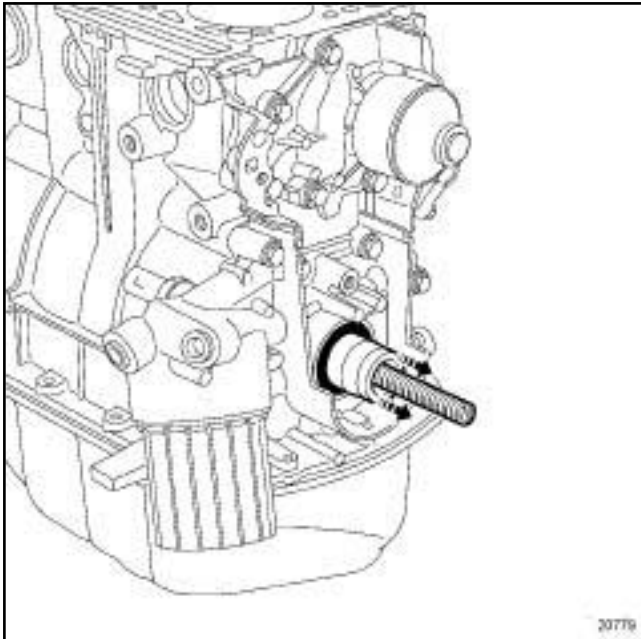


20780

- ❑ Tighten the collar nut until the cap touches the crankshaft closure panel.

Oil pump: Removal - Refitting

D4F or D7F



20779

 Remove:

- the nut,
- the cover,
- the guard,
- the threaded rod.

D4F, and 780 or 782

- Connect the oil-coolant heat exchanger hoses.
 - Put the clips (3) in place using the (Mot. 1448).
 - Remove the hose clamps (Ms. 583) from the oil-water heat exchanger hoses.
-
- Connect the oil pressure sensor connector.
 - Refit:
 - the timing sprocket,
 - the sump (see 10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting, page 10A-6) .
 - Fit the lower engine support tool (Mot. 1379).
 - Remove:
 - the right-hand suspended mounting support bolts,
 - the right-hand suspended mounting support,
 - the upper timing cover bolts,
 - the upper timing cover.

 Refit:

- the timing belt (see 11A, Top and front of engine, Timing belt: Removal - Refitting, page 11A-27) ,
- the crankshaft accessories pulley (see 11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting, page 11A-20) ,
- the right-hand suspended engine mounting (see 19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-13) .

 Remove the lower engine support tool (Mot. 1379).

 Refit:

- the engine tie-bar (see 19D, Engine mounting, Lower engine tie-bar: Removal - Refitting, page 19D-18) ,
 - the accessories belt (see 11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-3) ,
 - the engine undertray,
 - the front wheel arch liners (see Front wheel arch liner: Removal - Refitting) (55A, Exterior protection),
 - the front wheels (see Wheel: Removal - Refitting) (35A, Wheels and tyres),
 - the dipstick,
 - the oil filter (see 10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting, page 10A-29) .
- Top up the engine oil (see 10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling, page 10A-22) .
 - Top up the coolant level (see 19A, Cooling, Cooling system: Draining - Refilling, page 19A-9) .

Oil pump: Removal - Refitting

K4M

Tightening torques 

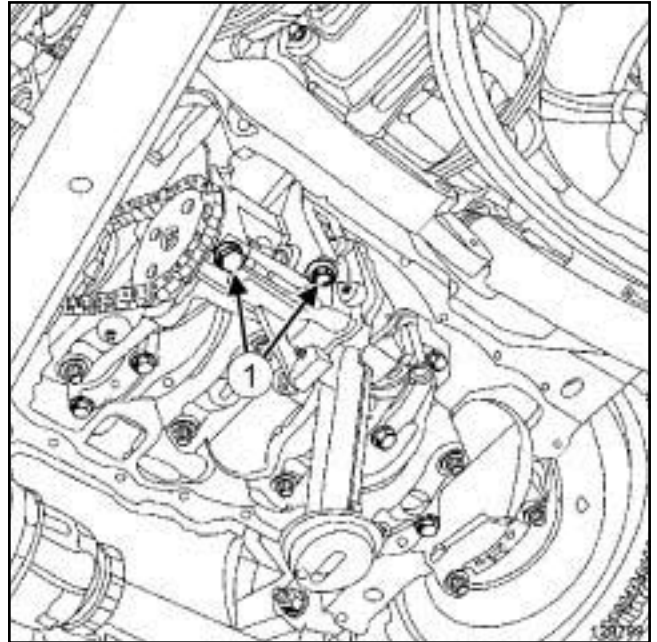
oil pump bolts 25 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray.
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**) .
- Remove:
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the rear engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**) ,
 - the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).
- Remove the sump (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting**, page **10A-6**) .

II - REMOVAL OPERATION



128799

- Remove:
 - the oil pump bolts (1) ,
 - the oil pump.

REFITTING

I - REFITTING OPERATION

- Position the oil pump pinion on the chain.
- Refit the oil pump.
- Torque tighten the **oil pump bolts (25 N.m)**.

II - FINAL OPERATION

- Refit the sump (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting**, page **10A-6**) .
- Refit:
 - the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),
 - the rear engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**) ,
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

K4M

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**).
- Refit the engine undertray.

Oil pressure: Check

D4F or D7F or K9K

Special tooling required

Mot. 836-05	Oil pressure gauge kit.
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Equipment required

roll pin punch
multimeter
1/2" long socket (12.7 mm square drive)

- Check the correct operation of the oil pressure sensor valve using the **roll pin punch** with a diameter of **2 mm** and the **multimeter**.

I - RECOMMENDATIONS FOR REPAIR

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

It is essential to monitor the engine oil pressure as the engine oil temperature rises (**approximately 80°C or the first time the engine cooling fan is activated**).

II - PARTS AND CONSUMABLES FOR THE REPAIR WORK

Parts which must be replaced:

- the sump plug sealing washer (in the event of an oil change),
- oil filter (if removed).

Consumable:

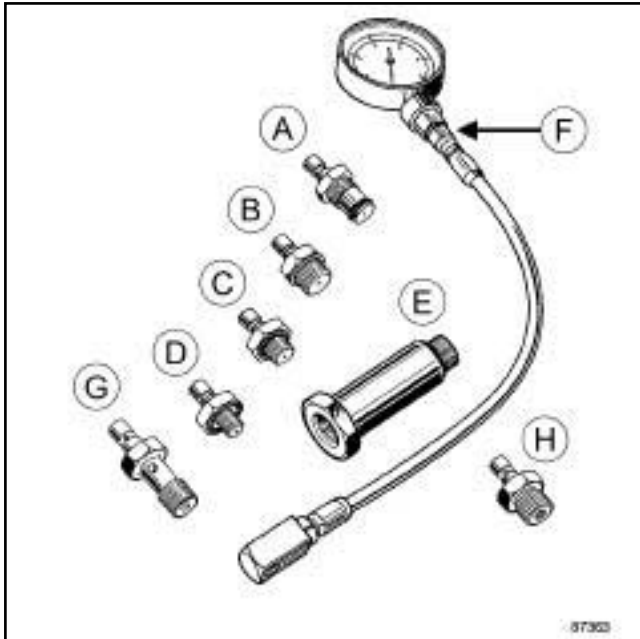
- Engine oil (see **Engine oil: Specifications**) (Technical Note 6013, 04A, Lubricants).

III - CHECK

- Remove the oil pressure sensor (see **10A, Engine and cylinder block assembly, Oil pressure sensor: Removal - Refitting**, page **10A-45**).

Oil pressure: Check

D4F or D7F or K9K



87363

- idling: **1.2 bar**
 - 3000 rpm: **< 3.5 bars**
- Switch off the engine.
 - Remove the **(Mot. 836-05)** with the end pieces.
 - Refit the oil pressure sensor (see **10A, Engine and cylinder block assembly, Oil pressure sensor: Removal - Refitting**, page **10A-45**).
 - Wipe any oil run-off with a cloth.
 - Wait at least **10 minutes**.
 - Check the oil level using the dipstick.
 - Top up the engine oil level if necessary.
 - Start the vehicle and check that there are no oil leaks at the oil pressure sensor.
- Position the engine oil pressure sensor tool **(Mot. 836-05)** fitted with suitable end pieces using the **(Mot. 1495-01)** or a **1/2" long socket (12.7 mm square drive)**.
 - End pieces:
 - **D4F** and **D7F** engines:
 - end piece **C + F**
 - **K9K** engine:
 - end piece **E + C + F**
 - Start the vehicle.
 - Monitor the engine oil pressure as the engine oil temperature increases (**approximately 80°C or the first time the engine cooling fan is triggered**) which must not be lower than the pressure at idle speed.
 - If the oil pressure is lower at idle speed, check that:
 - the oil filter is not clogged,
 - there is no dirt or swarf in the engine oil,
 - the oil pump is in good condition and being correctly driven.
 - Check the oil pressure at **3000 rpm**.
 - Check the values:
 - **D4F** and **D7F** engines:
 - Idling: **0.8 bar**
 - 3000 rpm: **< 3.5 bars**
 - **K9K** engine

Oil pressure: Check

K4M

Special tooling required

Mot. 836-05	Oil pressure gauge kit.
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Oil pressure tables:

Engine	Engine suffix	Minimum oil pressure (bar)		Maximum oil pressure (max)
		Idling speed	4000 rpm	4000 rpm
K4M	854	0.5	3.1	4.4

End pieces to be used:

Engine	End pieces
K4M	E+C+F

I - REMOVAL PREPARATION OPERATION

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

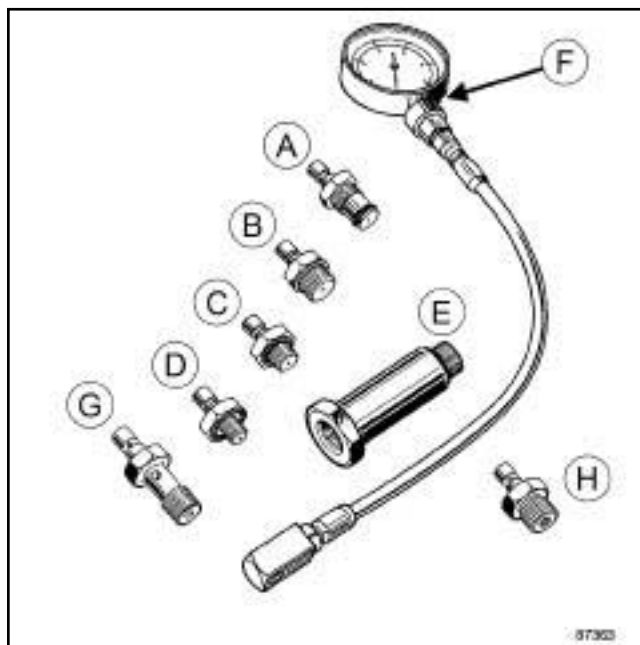
Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

II - CHECK

Remove the oil pressure sensor (see **10A, Engine and cylinder block assembly, Oil pressure sensor: Removal - Refitting**, page **10A-45**).



87363

In place of the oil pressure sensor, fit the **(Mot. 836-05)** with suitable adapters using the **(Mot. 1495-01)** or a **22 mm** long socket.

Start the vehicle.

Monitor the engine oil pressure as the oil temperature rises (approximately **80°C** or the first time the engine cooling fan is activated); it should not be less than the pressure at idle speed.

If the oil pressure is lower than the pressure at idle speed, check that:


- the oil filter is not clogged,
- dirt or swarf is not present in the engine oil,
- the oil pump is in good condition and being correctly driven.

Oil pressure: Check

K4M

- Check the oil pressure in comparison with the values given in the table above.
- Switch off the engine.
- Remove the **(Mot. 836-05)** with the end pieces.
- Refit the oil pressure sensor (see **10A, Engine and cylinder block assembly, Oil pressure sensor: Removal - Refitting**, page **10A-45**).
- Wipe any oil run-off with a cloth.
- Wait at least **10 minutes**.
- Check the oil level using the dipstick.
- Top up the oil level if necessary (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants).
- Start the vehicle and check that there are no oil leaks at the oil pressure sensor.

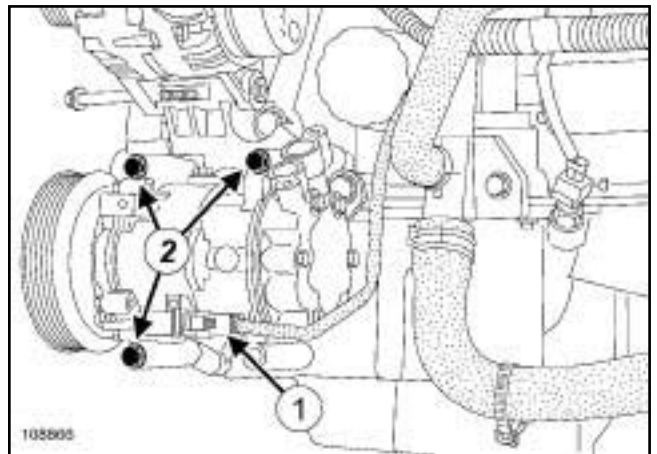
K9K, and AIR CONDITIONING

Tightening torques 	
bolts mounting the multifunction support on the cylinder block	44 N.m
bolt mounting the multifunction support on the sump	25 N.m
air conditioning compressor bolts	21 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).
- Disconnect the battery ((see **Battery: Removal - Refitting**)).
- Remove:
 - the engine cover,
 - the front wheels, (see **Wheel: Removal - Refitting**)
 - the front wheel arch liners ((see **Front wheel arch liner: Removal - Refitting**)),
 - the front bumper ((see **Front bumper: Removal - Refitting**)),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-3**) .



- Disconnect the clutch connector (1) from the air conditioning compressor.
- Remove the bolts (2) from the air conditioning compressor.
- Move the air conditioning compressor aside.

Note:

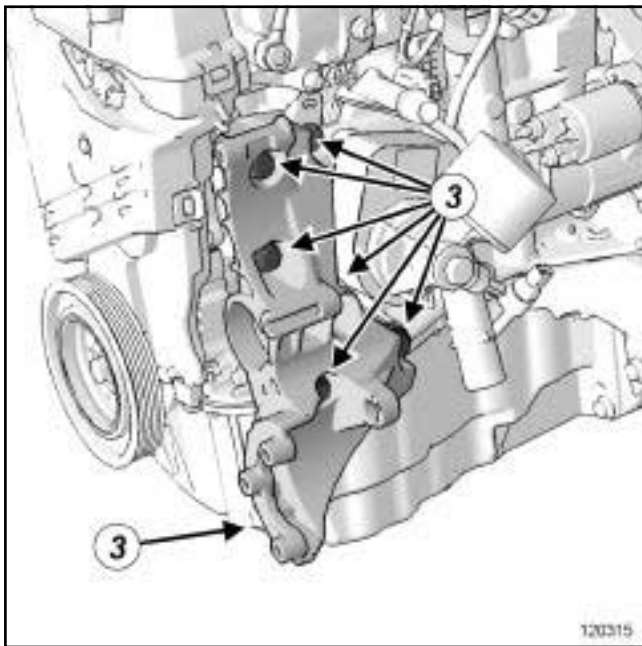
Take care not to constrain the compressor connecting pipes to prevent refrigerant leaking.

Note:

This operation does not require the AC system to be drained.

K9K, and AIR CONDITIONING

II - OPERATION FOR REMOVAL OF PART CONCERNED



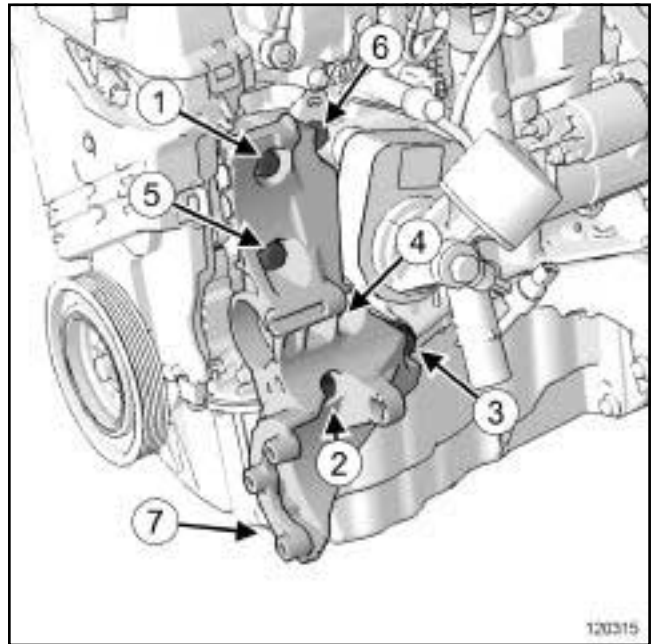
120315

❑ Remove:

- the multifunction support bolts (3) ,
- the multifunction support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED



120315

❑ Refit the multifunction support.

❑ Fit the multifunction support bolts on the cylinder block without tightening.

❑ Tighten to torque and in order:

- the **bolts mounting the multifunction support on the cylinder block (44 N.m)**,
- the **bolt mounting the multifunction support on the sump (25 N.m)**.

II - FINAL OPERATION

❑ Refit the air conditioning compressor bolts.

❑ Torque tighten the **air conditioning compressor bolts (21 N.m)**.

❑ Connect the air conditioning compressor clutch connector.

❑ Refit:

- the accessories belt (see 11A, **Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the front bumper ((see **Front bumper: Removal - Refitting**)),
- the front wheel arch liners ((see **Front wheel arch liner: Removal - Refitting**)),

K9K, and AIR CONDITIONING

- the front wheels (see **35A, Wheels and tyres, Wheels: Removal - Refitting**),
 - the engine cover.
- Connect the battery ((see **Battery: Removal - Refitting**)).

D4F, and 772, and STANDARD HEATING – D7F, and STANDARD HEATING

Tightening torques

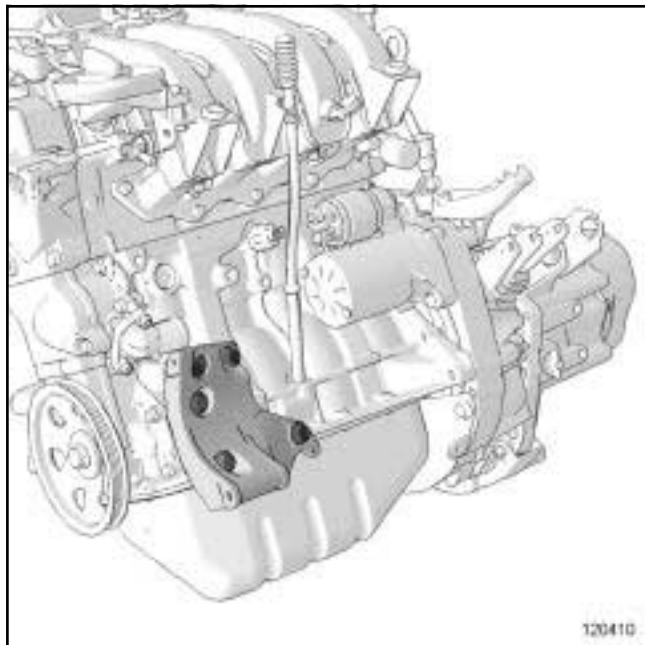
multifunction support bolts	50 N.m
-----------------------------	--------

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

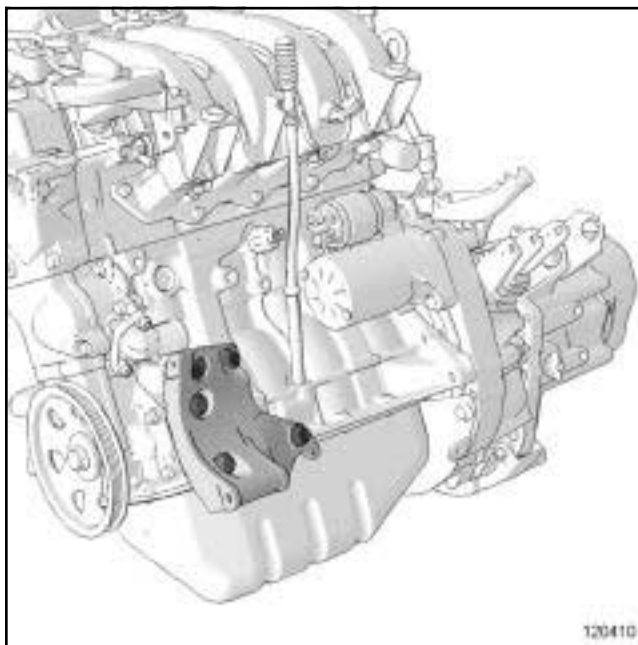


- Remove:
 - the multifunction support bolts,
 - the multifunction support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the multifunction support,
 - the multifunction support bolts.



- Torque tighten the **multifunction support bolts (50 N.m)**.

II - FINAL OPERATION

- Refit:
 - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) .
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

D4F, and 772, and AIR CONDITIONING – D7F, and AIR CONDITIONING

Tightening torques

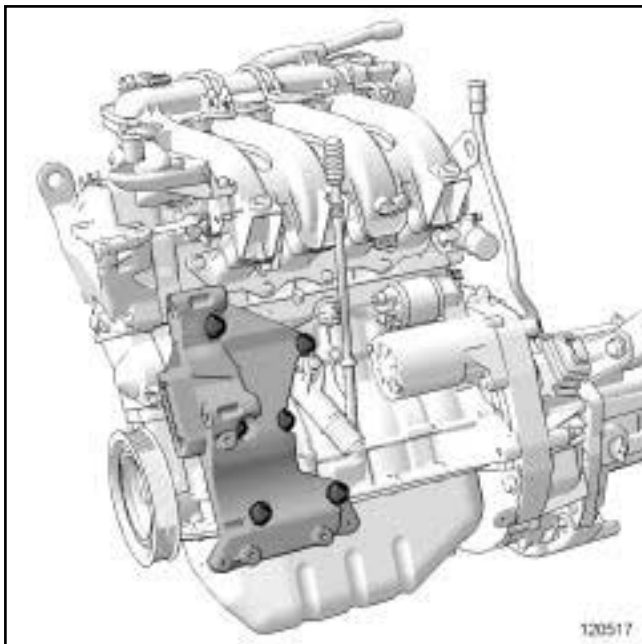
multifunction support bolts	50 N.m
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REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1) ,
 - the air conditioning compressor (see **Compressor: Removal - Refitting**) (62A, Air conditioning).

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove:
 - the multifunction support bolts,

- the coolant pump inlet pipe bolt,
- the multifunction support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the multifunction support,
 - the multifunction support bolts.
- Torque tighten the **multifunction support bolts (50 N.m)**.
- Refit the coolant pump inlet pipe bolt.

II - FINAL OPERATION

- Refit:
 - the air conditioning compressor (see **Compressor: Removal - Refitting**) (62A, Air conditioning),
 - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K, and STANDARD HEATING

The multifunction support is removed when the accessories belt is removed.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).
- Disconnect the battery ((see **Battery: Removal - Refitting**)).
- Remove:
 - the engine cover,
 - the front wheels, (see **Wheel: Removal - Refitting**)
 - the front wheel arch liners ((see **Front wheel arch liner: Removal - Refitting**)),
 - the front bumper ((see **Front bumper: Removal - Refitting**)).

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) .

REFITTING


I - REFITTING OPERATION FOR PART CONCERNED

- Refit the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) .

II - FINAL OPERATION

- Refit:
 - the front bumper ((see **Front bumper: Removal - Refitting**)),
 - the front wheel arch liners ((see **Front wheel arch liner: Removal - Refitting**)),
 - the front wheels (see **35A, Wheels and tyres, Wheels: Removal - Refitting**),
 - the engine cover.
- Connect the battery ((see **Battery: Removal - Refitting**)).

D4F, and 780 or 782

Tightening torques 	
multifunction support bolts	50 N.m
coolant pump inlet pipe bolts	10 N.m

REMOVAL

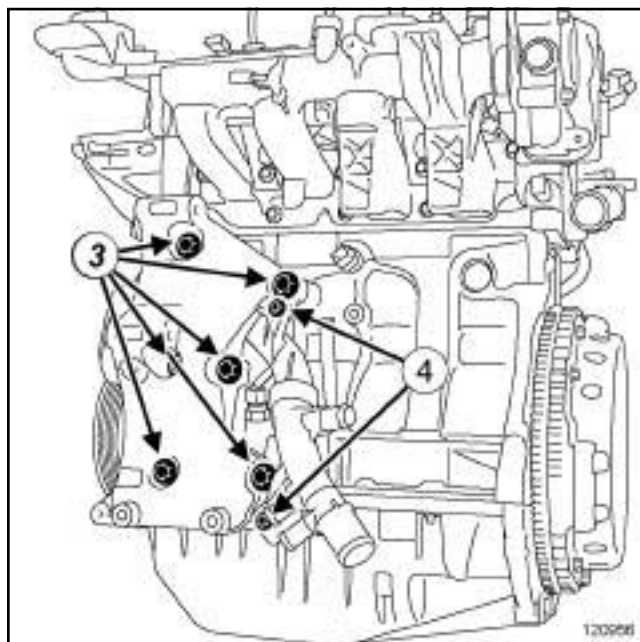
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**),
 - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page **16A-1**).

AIR CONDITIONING

- Remove the air conditioning compressor (see **Compressor: Removal - Refitting**) (62A, Air conditioning).

II - OPERATION FOR REMOVAL OF PART CONCERNED



120956

- Remove:
 - the bolt of the coolant-oil heat exchanger cooling pipes support from the multifunction support,
 - the bolts (4) from the coolant pump inlet pipe,
 - the multifunction support bolts (3),
 - the multifunction support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the multifunction support,
 - the multifunction support bolts,
 - the coolant pump inlet pipe bolts,
 - the bolt of the coolant-oil heat exchanger cooling pipes support on the multifunction support.
- Torque tighten:
 - the **multifunction support bolts (50 N.m)**,
 - the **coolant pump inlet pipe bolts (10 N.m)**.

D4F, and 780 or 782

II - FINAL OPERATION

AIR CONDITIONING

- Refit the air conditioning compressor (see **Compressor: Removal - Refitting**) (62A, Air conditioning).

- Refit:
 - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see) (80A, Battery).

K4M

Equipment required

refrigerant charging station

Tightening torques

multifunction support bolts 1 and 2 (initial torque)	5 N.m
--	--------------

multifunction support bolt 7 on the cylinder block (initial torque)	5 N.m
---	--------------

multifunction support bolts 6, 5, 4 and 3	5 N.m
---	--------------

multifunction support bolts	44 N.m
-----------------------------	---------------

multifunction support bolt on the cylinder block	25 N.m
--	---------------

- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3),
- the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1),
- the air conditioning compressor (see **Compressor: Removal - Refitting**) (62A, Air conditioning).

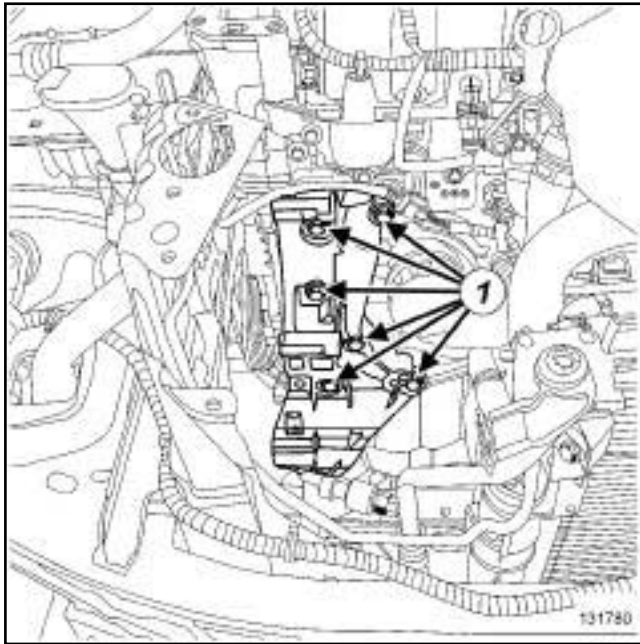
REMOVAL

I - REMOVAL PREPARATION OPERATION

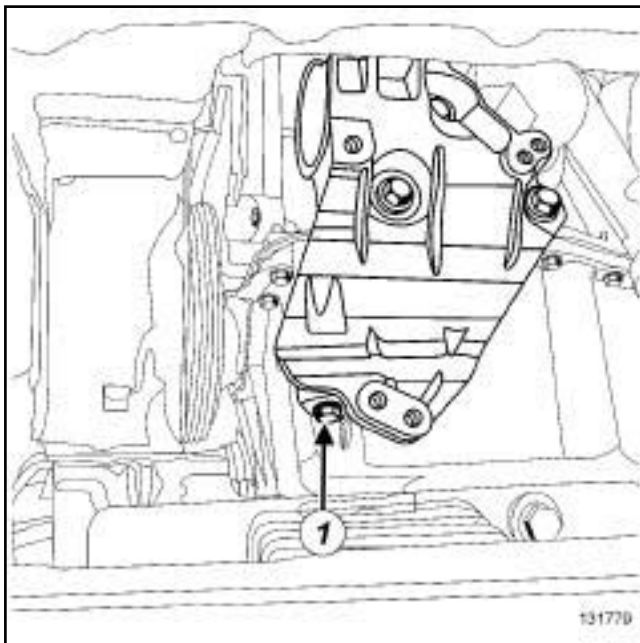
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove the engine undertray.
- Drain the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),

K4M

II - REMOVAL OPERATION



131780



131779

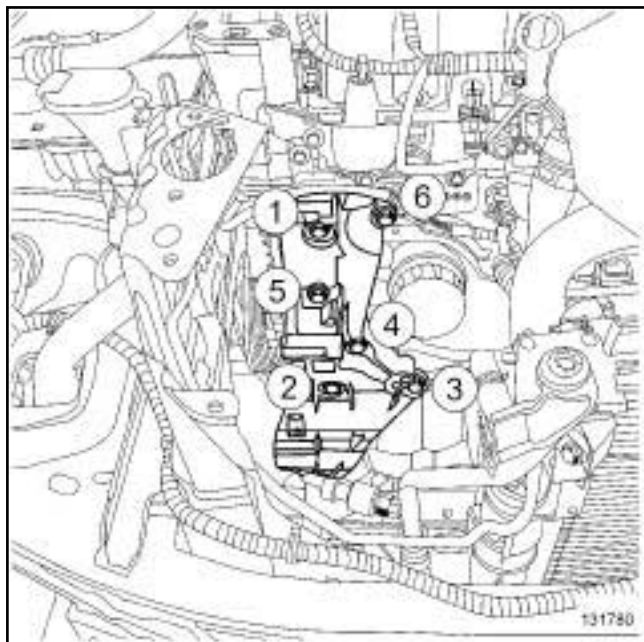
Remove:

- the multifunction support bolts (1) ,
- the multifunction support.

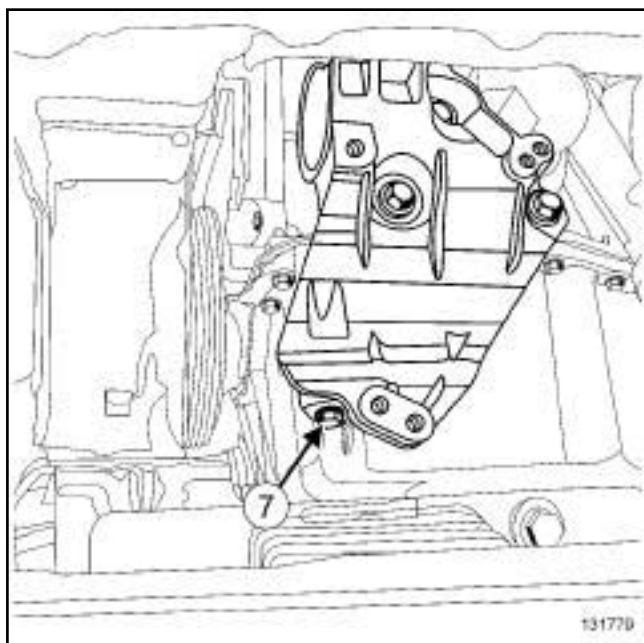
K4M

REFITTING

I - REFITTING OPERATION



131780



131779

- Refit the multifunction support.
- Pretighten to torque **multifunction support bolts 1 and 2 (initial torque) (5 N.m)**.
- Loosen bolts (1) and (2) on the multifunction support by one half-turn.
- Pre-tighten to torque:
 - **multifunction support bolt 7 on the cylinder block (initial torque) (5 N.m)**,

- multifunction support bolts 1 and 2 (initial torque) (5 N.m),
- multifunction support bolts 6, 5, 4 and 3 (5 N.m).

- Tighten to torque and in order:

- the **multifunction support bolts (44 N.m)**,
- the **multifunction support bolt on the cylinder block (25 N.m) (7)** .

II - FINAL OPERATION

- Refit:

- the air conditioning compressor (see **Compressor: Removal - Refitting**) (62A, Air conditioning),
- the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
- the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
- the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

- Fill the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

- Refit the engine undertray.

ENGINE AND CYLINDER BLOCK ASSEMBLY


Engine - gearbox assembly: Removal - Refitting

10A

D4F or D7F

Special tooling required	
Tav. 476	Ball joint extractor.
Ms. 583	Pipe clamps.
Mot. 1379	Engine support tool for cylinder head operations.
Mot. 1390	Support for removal - refitting of engine - gearbox assembly
Tav. 1233-01	Tooling for carrying out operations on the axle subframe.

Equipment required
flywheel immobiliser

Tightening torques 	
front subframe bolts	62 N.m
rear subframe bolts	105 N.m
subframe rear tie rod inner bolts	21 N.m
subframe rear tie rod outer bolts	90 N.m
engine tie-bar bolts on the gearbox	105 N.m
engine tie-bar bolt on the subframe	105 N.m
exhaust downpipe bolts	9 N.m
shock absorber base lower bolts	105 N.m
calliper mounting bolts	105 N.m
lower guide pin bolts	34 N.m
track rod end nuts	37 N.m
tie rod upper bolts	21 N.m
tie rod lower bolts	62 N.m
universal joint	24 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

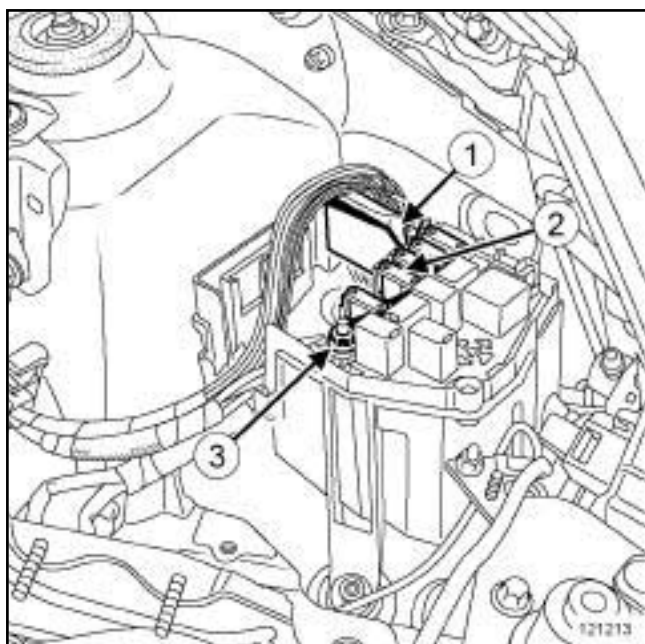
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

IMPORTANT

To prevent the vehicle from falling, lash it to the vehicle lift using a strap.

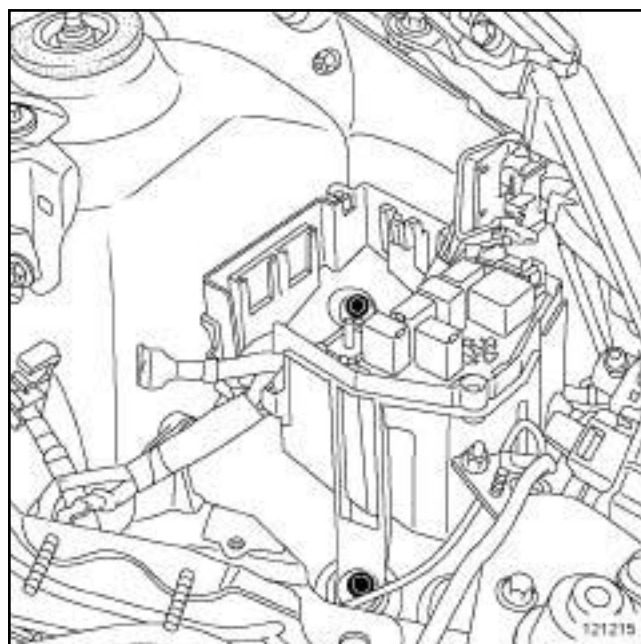
- Remove:
 - the battery (see) (80A, Battery),
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting, page 17B-20**) ,
 - the computer mounting bolts,
 - the computer mounting nuts,
 - the computer mounting,
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the engine compartment connection unit cover bolts,
 - the cover of the engine compartment connection unit.

D4F or D7F



121213

- Disconnect:
 - the connector (1) ,
 - the fuses (2) ,
 - the fuse holder.
- Remove the engine compartment connection unit supply nut (3) .

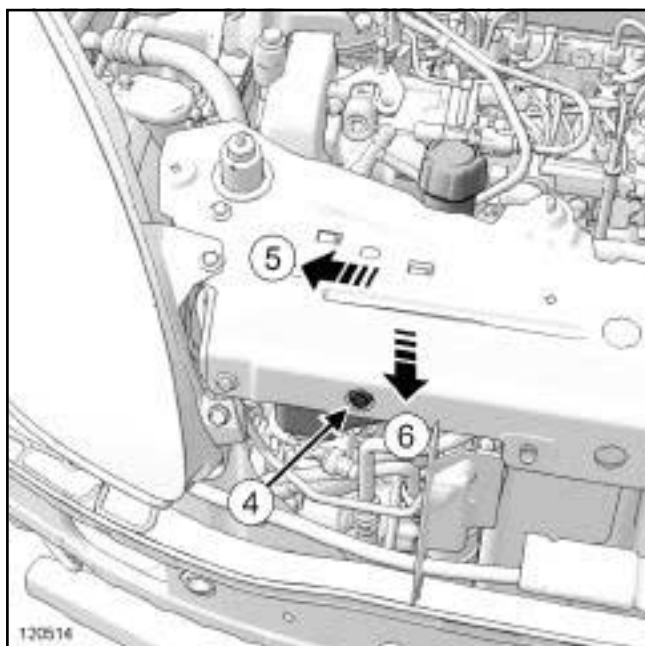


121215

- Unclip the fuse holder on the engine compartment connection unit.
- Remove:
 - the bolts from the engine compartment connection unit on the body,
 - the earth strap nuts on the front right-hand side member.
- Move aside the earth straps.
- Unclip the bonnet opening release cable on the cooling fan assembly.

D4F or D7F

JH3



120514

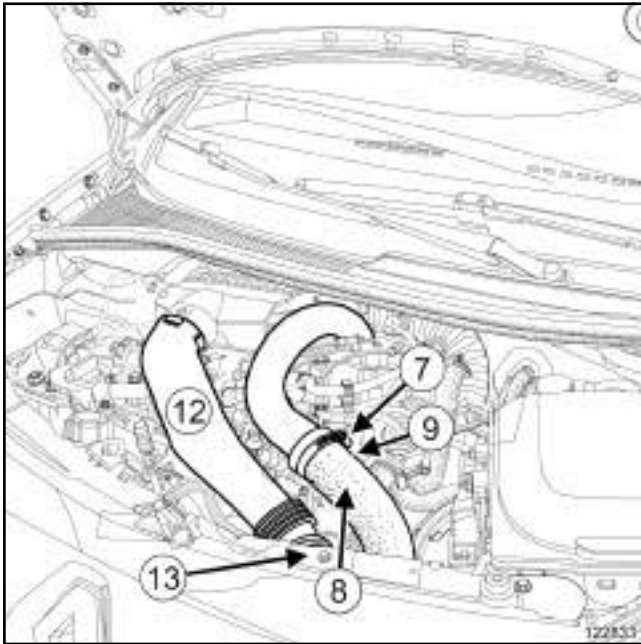
- Remove the bolt (4) from the expansion bottle.
- Move the expansion bottle aside following the arrows (5) and (6) .

D4F or D7F, and 772

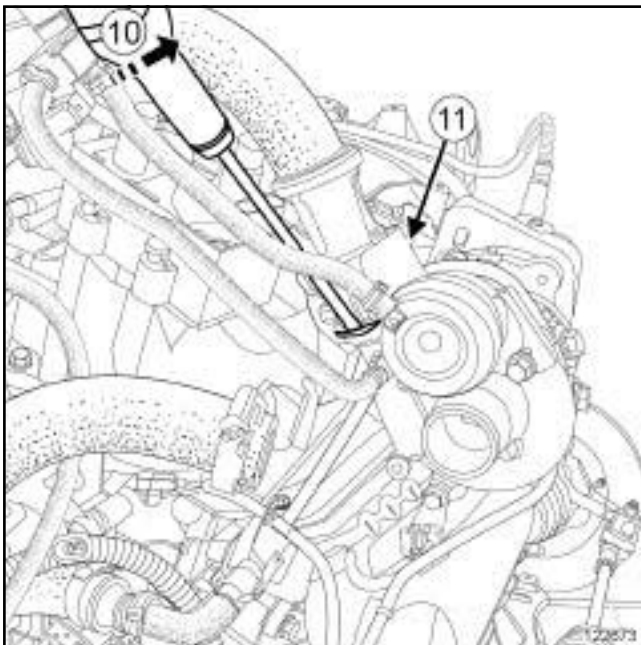
- Remove:
 - the air filter box air inlet pipe from the cross member,
 - the air filter unit air inlet pipe,
 - the cooling radiator upper bolts.

D4F or D7F

D4F, and 780 or 782



122833



122673

Note:

If the turbocharger outlet air pipe tightening clip (7) is removed, the rubber flexible pipe (8) and the tightening clip (7) must be replaced.

- Undo the clip from the intercooler outlet pipe.
- Disconnect the intercooler outlet air pipe.
- Remove the turbocharger air outlet rigid pipe bolt (9)

from the throttle valve.

- Detach the turbocharger air outlet pipe from the turbocharger in the direction of the arrow (10) .
- Disconnect the turbocharger air outlet pipe from the turbocharger.

Note:

If the clip (11) is removed from the heat resistant protector, the latter must be replaced.

- Unclip the intercooler air inlet pipe.
- Disconnect the intercooler air inlet pipe from the intercooler.
- Remove the turbocharger air outlet pipe.
- Disconnect the air filter box air inlet pipe from the air filter box cover (12) .

Remove:

- the air filter unit air inlet pipe bolt from the cross member (13) ,
- the air filter unit air inlet pipe.

Drain:

- the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) ,
- the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
- the engine if necessary (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) .

Attach the cooling unit to the engine.

Disconnect:

- the heater matrix hoses,
- the brake servo pipe on the brake servo,
- the petrol vapour rebreathing solenoid valve connector,
- the petrol vapour rebreather pipe.

D4F or D7F

AIR CONDITIONING

- ❑ Drain the coolant circuit (see **Refrigerant circuit: Draining - Filling**).

WARNING

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

- ❑ Remove:
 - the air conditioning pipe bolts on the compressor,
 - the air conditioning pipe bolt on the dehydrator reservoir.
- ❑ Disconnect the air conditioning pressostat connector.

❑

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

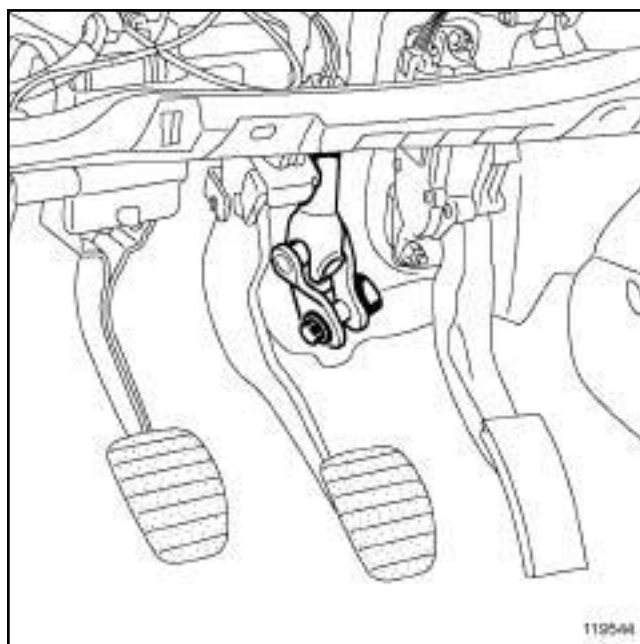
IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- ❑ Disconnect the fuel supply pipe union.
- ❑ Insert the blanking plugs.
- ❑ Unclip the fuel pipe on the upper timing cover.

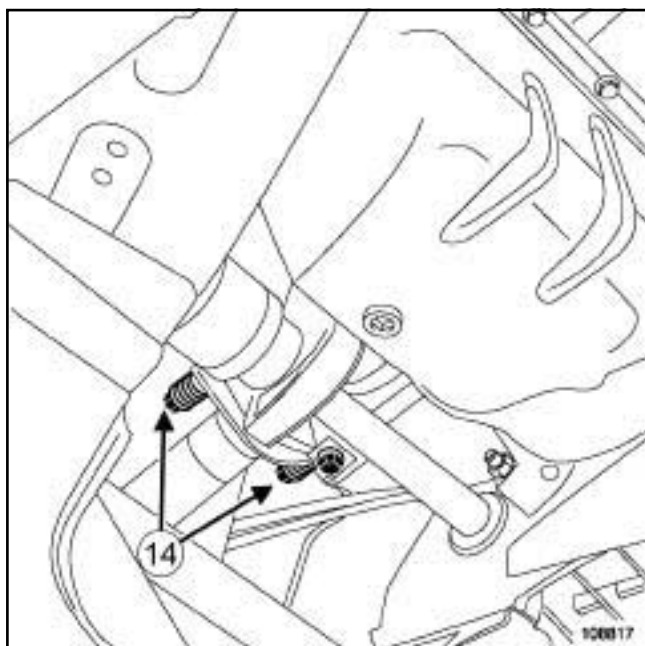


119544

- ❑ Set the wheels straight ahead.
- ❑ Position the **flywheel immobiliser**.
- ❑ Remove the cover from the universal joint (do not keep).
- ❑ Remove the universal joint bolt (do not keep).
- ❑ Remove the universal joint from the steering box.
- ❑ Detach the electrical wiring on the cross member.
- ❑ Loosen the tie rod lower bolts.
- ❑ Remove:
 - the tie rod upper bolts.
 - the track rod end nuts,
 - the track rod ends using the **(Tav. 476)**,
 - the lower guide pin bolts,
 - the brake pads,
 - the calliper mounting bolts,
 - the brake callipers, and attach them to the suspension springs,
 - the ABS sensor bolts (if fitted to the vehicle),
 - the ABS sensors,
 - the shock absorber base lower bolts,

D4F or D7F

D4F, and 780 or 782



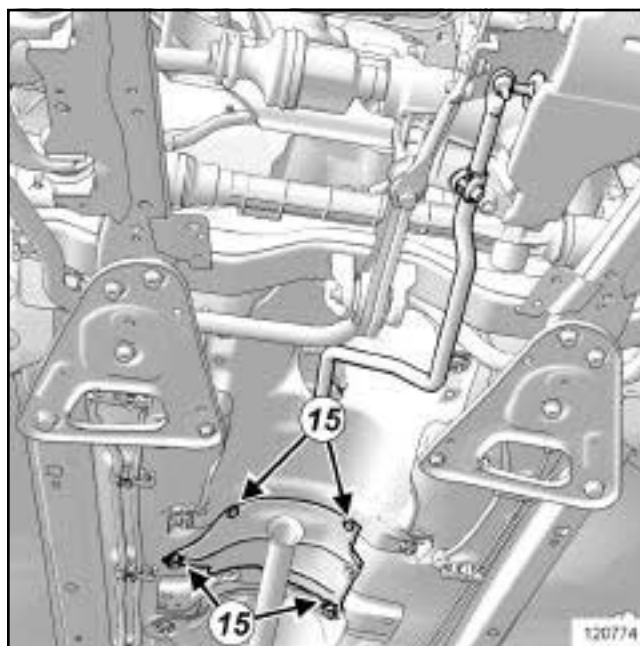
108817

- Remove the bolts (14) from the exhaust downpipe.
- Undo the intermediate pipe clip.
- Move the clip to one side.
- Remove the exhaust downpipe.

D4F, and 772 – D7F

- Remove the catalytic converter (see 19B, **Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12).

JB1 or JH1



120774

- Remove the clutch control cable on the manual gearbox.
- Remove:
 - the bolts (15) from the heat shield,
 - the heat shield.
- Detach the gear control linkage from:
 - the control lever on the gearbox,
 - the gear lever.
- Remove the gear control linkage.

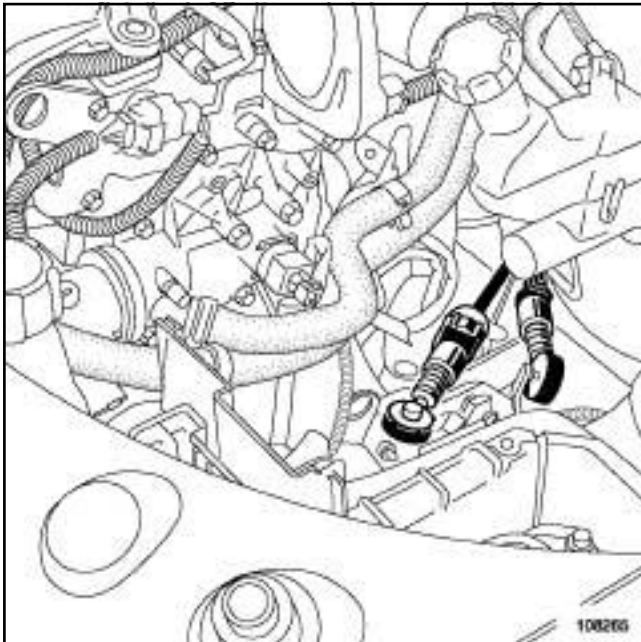
ENGINE AND CYLINDER BLOCK ASSEMBLY

Engine - gearbox assembly: Removal - Refitting

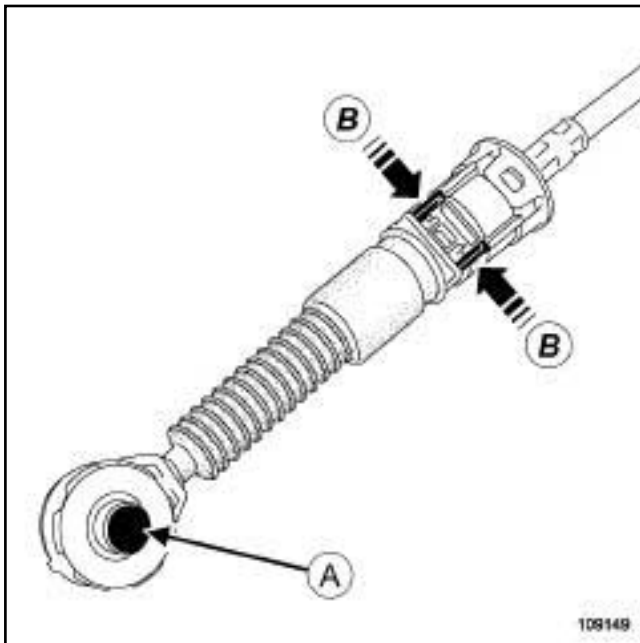
10A

D4F or D7F

JH3

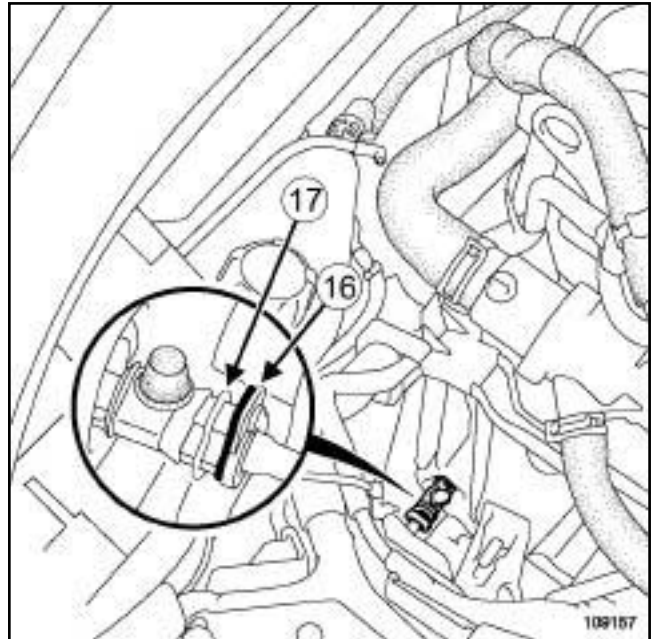


108265



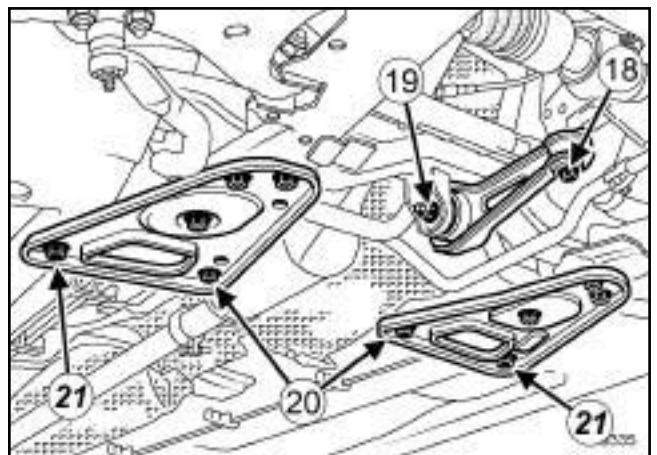
109149

- ❑ Remove:
 - the gear control cables on the gearbox by pushing at (A) ,
 - the control cables by pushing at (B) .



109157

- ❑ Place a hose clamp (**Ms. 583**) between the brake fluid reservoir and the clutch master cylinder.
- ❑ Disconnect the clutch slave cylinder by pulling the clips (16) and (17)
- ❑ Unclip the gearbox clutch pipe.
- ❑ Plug the openings.

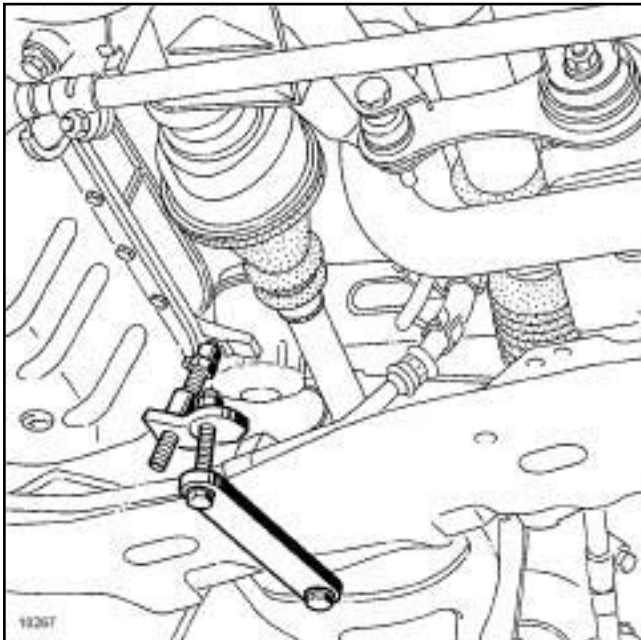


119335

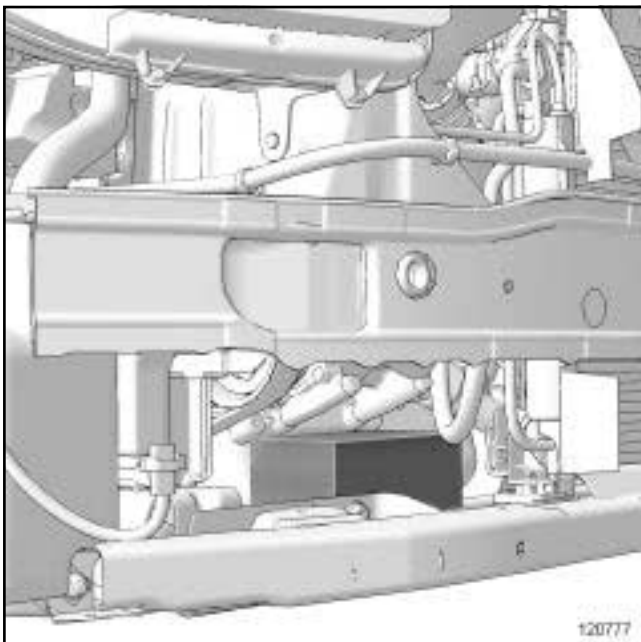
- ❑ Remove the bolt (18) from the engine tie-bar on the gearbox.
- ❑ Loosen the engine tie-bar bolt (19) on the subframe.
- ❑ Remove:
 - the subframe rear tie rod inner bolts (20) ,
 - the subframe rear tie rod outer bolts (21) .

D4F or D7F

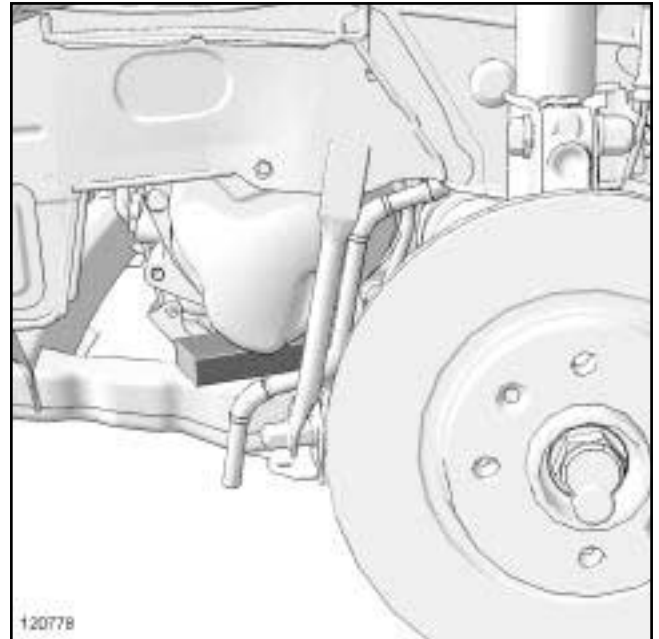
II - OPERATION FOR REMOVAL OF PART CONCERNED



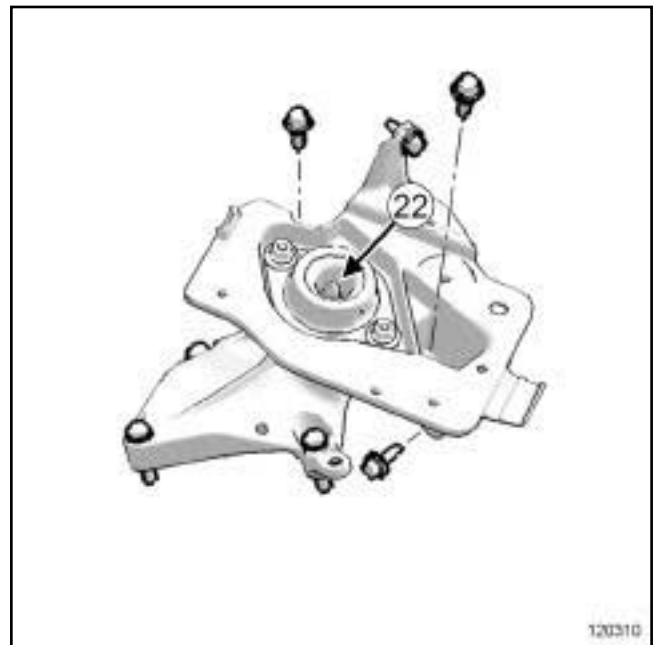
- ❑ Fit the engine support tool (**Mot. 1379**) by tilting the engine towards the rear.
- ❑ Remove the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-13**).



- ❑ Position a shim between the multifunction support and the subframe.

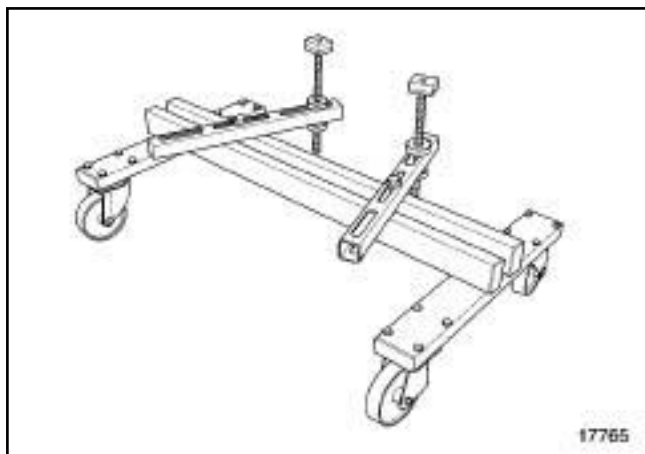


- ❑ Insert a shim between the gearbox and the subframe.



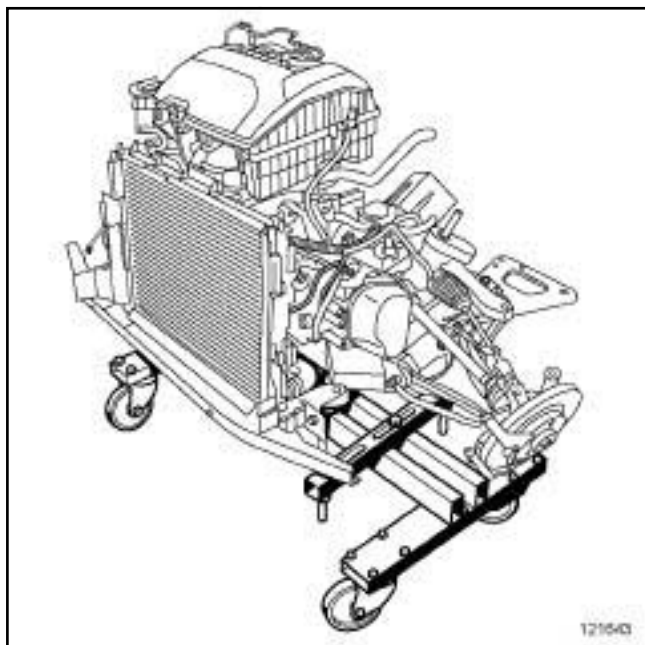
- ❑ Remove the left-hand suspended engine mounting nut (**22**).

D4F or D7F



17765

- Support the engine and gearbox assembly on **(Mot. 1390)**.
- Remove the bolts from the subframe.



121643

- Remove the engine and transmission assembly by lifting the body.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: refrigerant pipe seal.**
- Consumables** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products):
 - gearbox oil,

- engine oil (if necessary) (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants),
- coolant,
- refrigerant.

Note:

For an operation which requires the engine-gearbox assembly to be separated from the subframe, ensure that the position of the engine on the subframe is noted, by marking the position of the **(Mot. 1379)** and the position of the gearbox in relation to the subframe.

- For standard engine replacements (see **Standard replacement**) (Technical Note 6004A, 10A, Engine and peripherals).

II - REFITTING OPERATION FOR PART CONCERNED

Note:

Lining up the subframe with the body can be made easier by positioning two threaded rods of the **(Tav. 1233-01)**, in the two subframe/body front mountings.

- Position the engine and transmission assembly in the vehicle.
- Refit:
 - the front subframe bolts,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**),
 - the left-hand suspended engine mounting nut.
- Remove:
 - the **(Mot. 1390)**,
 - the **(Mot. 1379)**,
 - the shims.

III - FINAL OPERATION

- Refit:
 - the subframe rear tie rod bolts,
 - the engine tie-bar,
 - the engine tie-bar bolts on the gearbox,
 - the engine tie-bar bolt on the subframe.

ENGINE AND CYLINDER BLOCK ASSEMBLY

Engine - gearbox assembly: Removal - Refitting

10A

D4F or D7F

- Torque tighten:
 - the **front subframe bolts (62 N.m)**,
 - the **rear subframe bolts (105 N.m)**,
 - the **subframe rear tie rod inner bolts (21 N.m)**,
 - the **subframe rear tie rod outer bolts (90 N.m)**,
 - the **engine tie-bar bolts on the gearbox (105 N.m)**,
 - the **engine tie-bar bolt on the subframe (105 N.m)**.

JH3

- Refit the control cables onto the gearbox.
- Remove the blanking plugs from the openings.
- Clip the clutch pipe onto the gearbox.
- Connect the clutch slave cylinder.
- Remove the hose clamp (**Ms. 583**).
- Bleed the clutch circuit (see **Clutch circuit: Bleed**) .

JB1 or JH1

- Refit the gear control linkage.
- Attach the gear control linkage to:
 - the gear lever,
 - the control lever on the gearbox.
- Refit:
 - the heat shield,
 - the heat shield bolts.
- Refit the clutch control cable on the manual gearbox.

D4F, and 772 – D7F

- Refit the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting, page 19B-12**) .

D4F, and 780 or 782

- Refit the exhaust downpipe.
- Fit the clip.
- Tighten the intermediate pipe clip.
- Refit the exhaust downpipe bolts.
- Torque tighten the **exhaust downpipe bolts (9 N.m)**.

Refit:

- the shock absorber base lower bolts,
- the ABS sensors,
- the ABS sensor bolts (if fitted to the vehicle),
- the brake callipers,
- the calliper mounting bolts,
- the brake pads,
- the lower guide pin bolts,
- track rod ends,
- the track rod end nuts,
- the tie rod upper bolts.

Torque tighten:

- the **shock absorber base lower bolts (105 N.m)**,
- the **calliper mounting bolts (105 N.m)**,
- the **lower guide pin bolts (34 N.m)**,
- the **track rod end nuts (37 N.m)**,
- the **tie rod upper bolts (21 N.m)**,
- the **tie rod lower bolts (62 N.m)**.

Clip the electrical wiring on to the cross member.

Fit the steering box universal joint.

Refit the universal joint bolt.

Torque tighten the **universal joint (24 N.m)**.

Remove the **flywheel immobiliser**.

Clip the fuel pipe on to the upper timing cover.

Connect the fuel supply pipe union.

AIR CONDITIONING

Connect the air conditioning pressostat connector.

ENGINE AND CYLINDER BLOCK ASSEMBLY

Engine - gearbox assembly: Removal - Refitting

10A

D4F or D7F

Refit:

- the air conditioning pipe bolt on the dehydrator reservoir,
- the air conditioning pipe bolts on the compressor.

Tighten:

- the air conditioning pipe bolts on the dehydrator reservoir,
- the air conditioning pipe bolts on the compressor.

Fill the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

Connect:

- the petrol vapour rebreathing solenoid valve connector,
- the brake servo pipe on the brake servo,
- the heater matrix hoses.

Fit the cooling unit.

Refill:

- the engine oil, if necessary (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**),
- the gearbox oil (see **Manual gearbox oils: Draining - Filling**),
- and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**).

D4F, and 780 or 782

Refit:

- the air filter unit air inlet pipe,
- the air filter unit air inlet pipe bolt on the cross member.

Connect the air filter box air inlet pipe on the air filter box cover.

Refit the turbocharger outlet air pipe.

Push the intercooler air inlet pipe clip.

Connect the intercooler air inlet pipe on the intercooler.



122666

Push the turbocharger outlet air pipe clip, following the direction shown by the arrow (23).

Connect the turbocharger air outlet pipe onto the turbocharger.

Refit the turbocharger outlet rigid air pipe bolt on the throttle valve.

Connect the intercooler air outlet pipe to the intercooler.

Tighten the intercooler air outlet pipe clip.

D4F or D7F, and 772

Refit:

- the cooling radiator upper bolts.
- the air filter unit air inlet pipe,
- the air filter box air inlet pipe on the cross member,

Position the expansion bottle.

Refit the expansion bottle bolt.

Clip the bonnet opening release cable on to the cooling fan assembly.

Position the earth straps.

Refit the earth strap nuts on the front right-hand side member.

D4F or D7F

- Clip the fuse holder onto the engine compartment connection unit.
- Refit:
 - the engine compartment connection unit bolts,
 - the engine compartment connection unit supply nut.
- Connect:
 - the fuses,
 - the connector.
- Refit:
 - the engine compartment connection unit cover,
 - the engine compartment connection unit cover bolts.
- Refit:
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the computer mounting,
 - the computer mounting nuts,
 - the computer mounting bolts,
 - the injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page **17B-20**),
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the battery (see) (80A, Battery).

ENGINE AND CYLINDER BLOCK ASSEMBLY

Engine - gearbox assembly: Removal - Refitting

10A

K9K

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

Equipment required

refrigerant charging station

safety strap(s)

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page 13B-1).

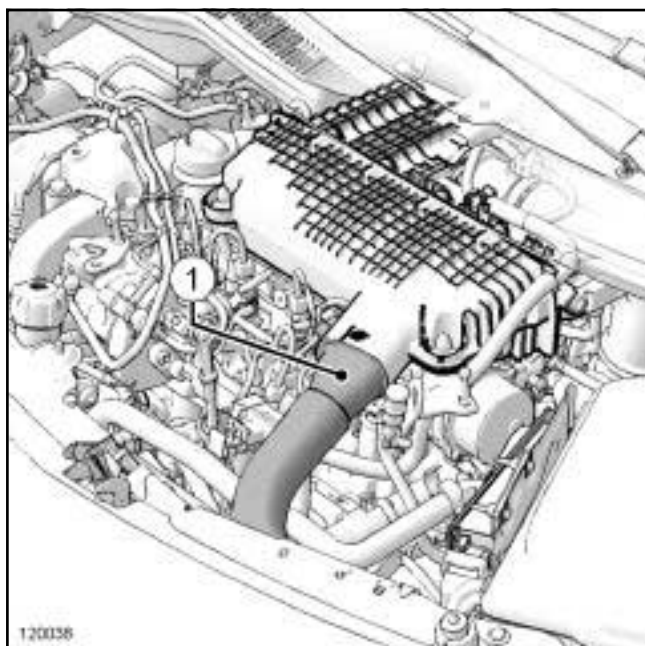
IMPORTANT

Wear protective gloves during the operation.

REMOVAL

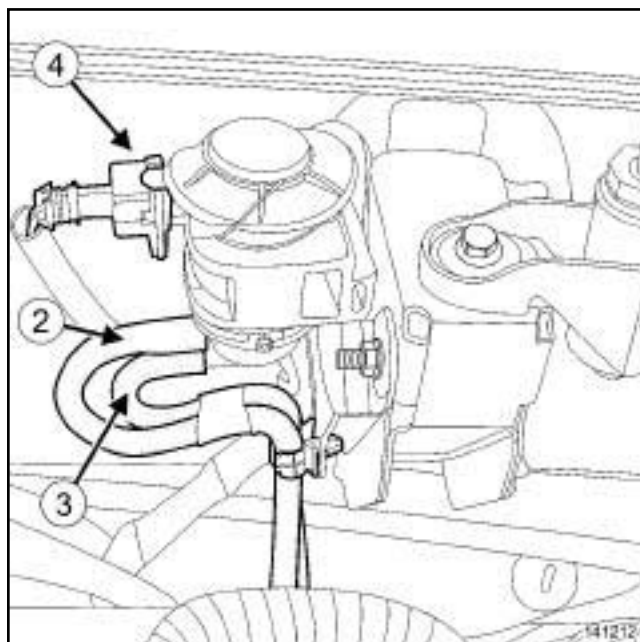
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the battery (see) (80A, Battery).



- Remove the air inlet pipe (1) from the air filter unit.

K9K, and 718



- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13)
- Disconnect:
 - the turbocharger regulation solenoid valve pipes (2) and (3),
 - the turbocharger regulation solenoid valve connector (4).
- Unclip:
 - the turbocharger regulation solenoid valve pipes,
 - the turbocharger regulation solenoid valve wiring.
- Disconnect the brake servo non-return valve pipe from the vacuum pump.
- Remove:
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the diesel injection computer (see **13B, Diesel injection, Diesel injection computer: Removal - Refitting**, page 13B-13),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

K9K

- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

□ Drain:

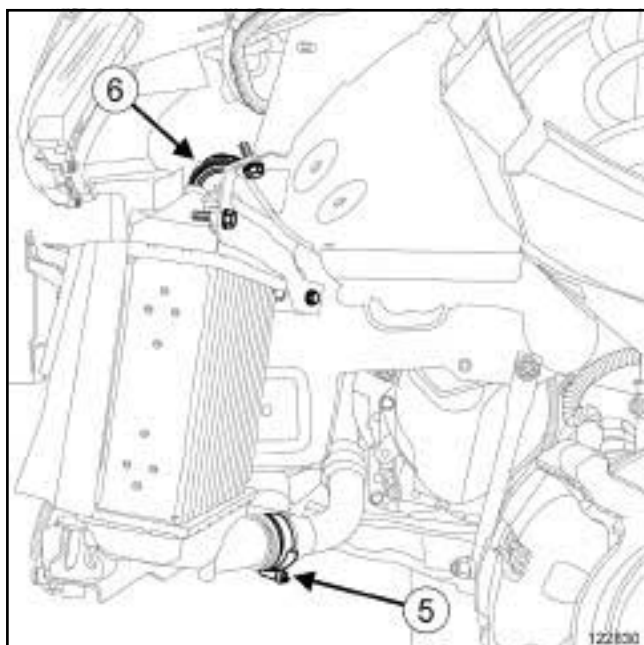
- the gearbox (see **Sequential gearbox oil: Draining - Filling**) (21A, Manual gearbox),

- the engine cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) ,

- the engine, if necessary (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) ,

- the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning) (if fitted).

K9K, and 718



122830

□ Loosen the clip (5) on the intercooler air outlet pipe.

□ Pull the clip (6) of the intercooler air inlet pipe.

□ Disconnect:

- the intercooler air outlet pipe,

- the intercooler air inlet pipe.

□ Attach the « engine cooling radiator - condenser - intercooler » assembly to the front upper cross member using a **safety strap(s)**.

K9K, and 740

□ Attach the « engine cooling radiator - condenser » assembly to the front upper cross member.

□ Remove:

- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,

- the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),

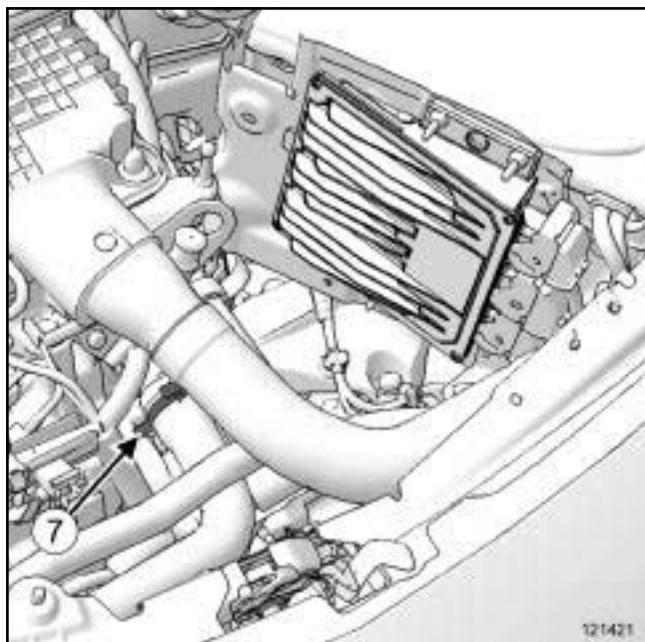
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),

- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),

- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),

- the front section of the intermediate pipe (see **19B, Exhaust, Intermediate pipe: Removal - Refitting**, page 19B-28) .

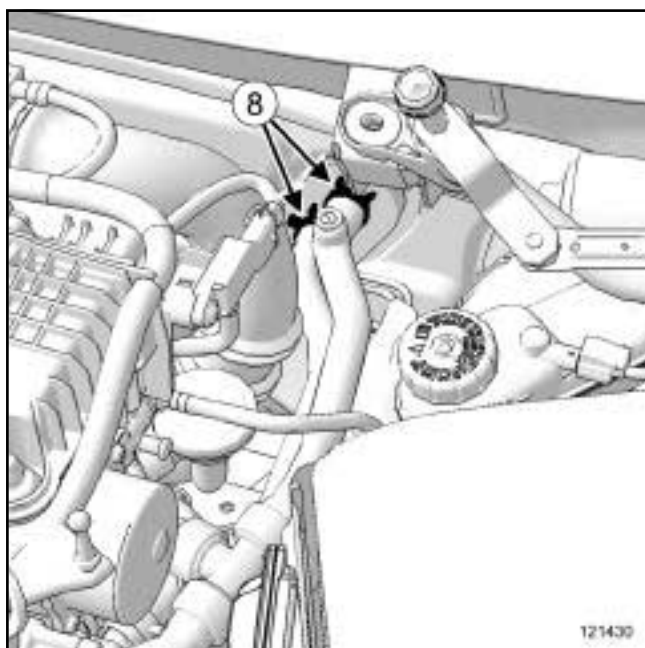
K9K



121421

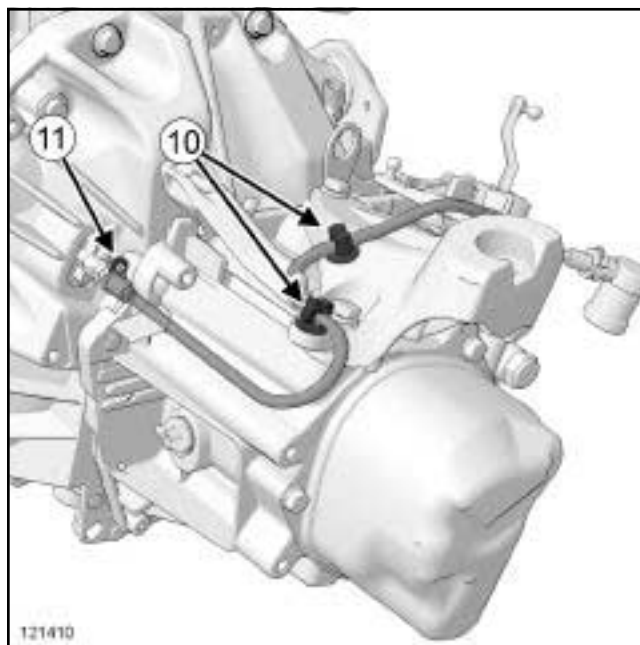


121438



121430

- Remove using the **(Mot. 1448)** :
 - the top hose (7) on the water chamber,
 - the hoses (8) on the heater matrix.
- Use the **(Mot. 1448)** to disconnect:
 - the top hose on the coolant outlet unit,
 - the hoses on the heater matrix.



121410

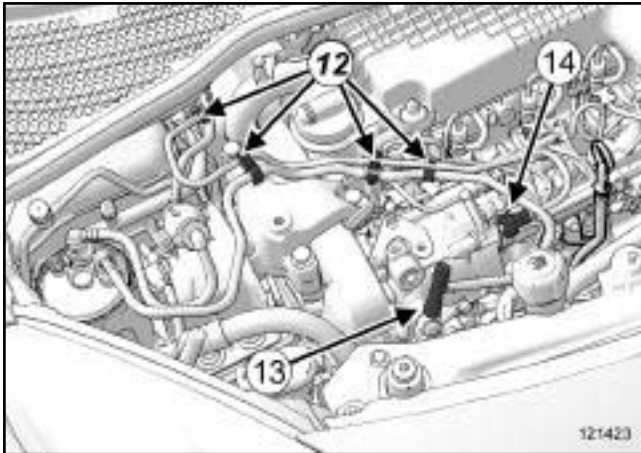
- Unclip:
 - the gear selector controls (9) on the gear selectors,
 - the gear selector controls on the cable sleeve stops,
 - the clutch control hydraulic pipe on the gearbox at (10) .
- Disconnect the clutch hydraulic control on the gearbox by pressing on the clip (11) .
- Fit blanking plugs on the clutch hydraulic control and on the control pipe.

ENGINE AND CYLINDER BLOCK ASSEMBLY

Engine - gearbox assembly: Removal - Refitting

10A

K9K



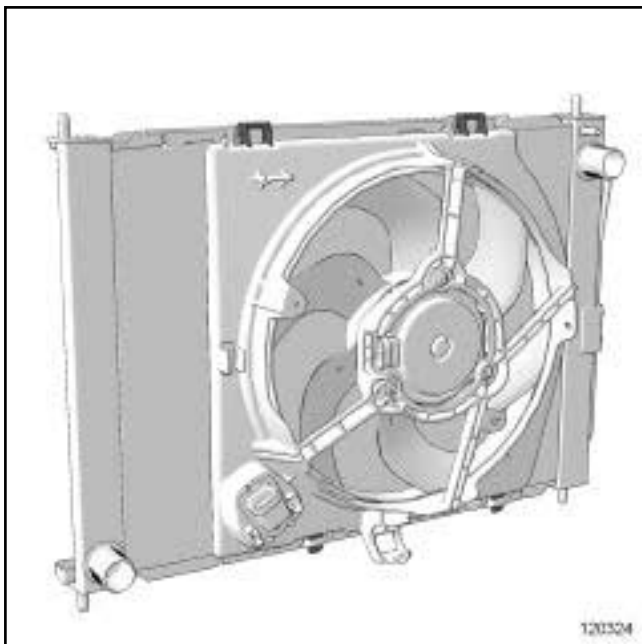
121423

- Unclip the fuel supply pipes at (12) .
- Disconnect the inlet pipe (13) from the high pressure pump.
- Disconnect the return pipe (14) from the high pressure pump.

WARNING

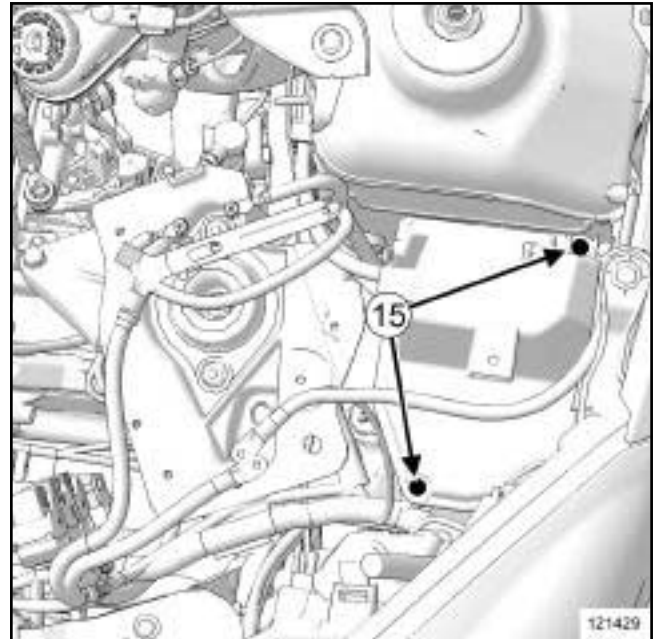
To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

- Insert the blanking plugs.



120324

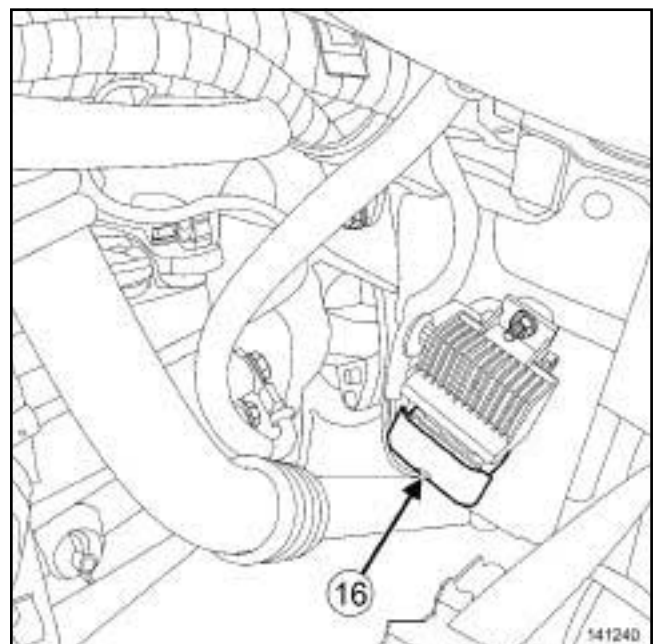
- Unclip the blower unit wiring.
- Disconnect the connectors from the fan assembly wiring.
- Cut the clip on the battery mounting.



121429

- Remove:
 - the engine compartment connection unit cover bolts (15) ,
 - the cover of the engine compartment connection unit.

K9K, and 718

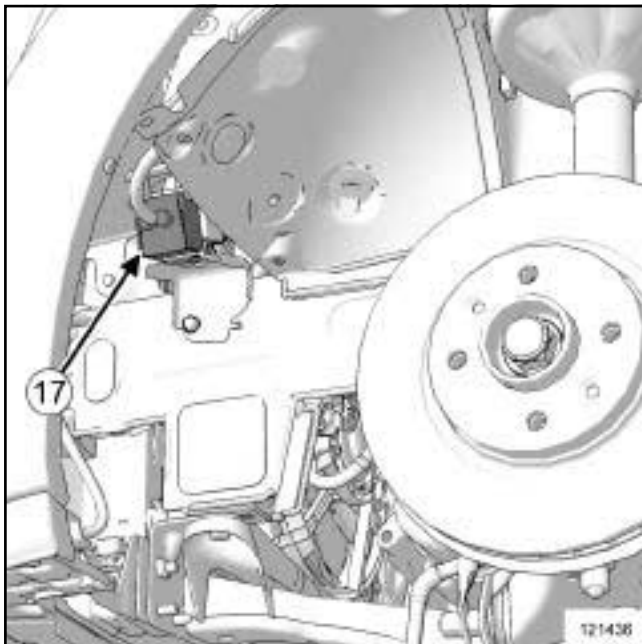


141240

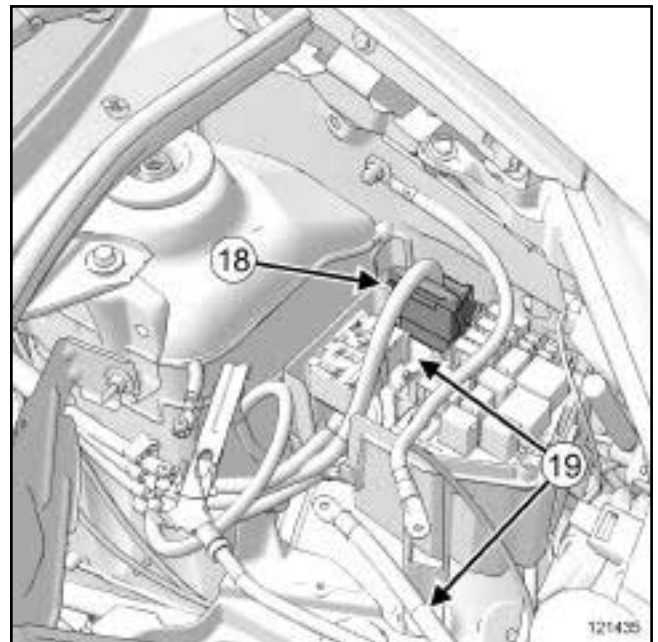
- Disconnect the connector (16) from the pre-postheating unit.

K9K

K9K, and 740

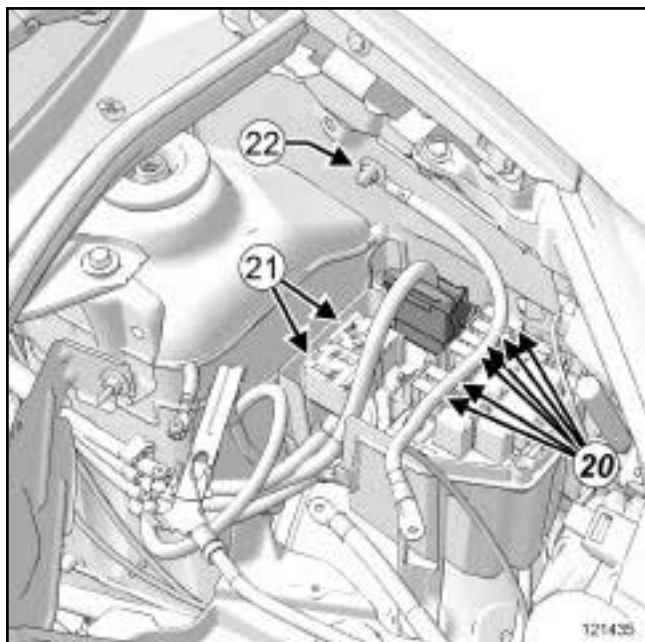


- Disconnect the connector (17) from the pre-postheating unit.



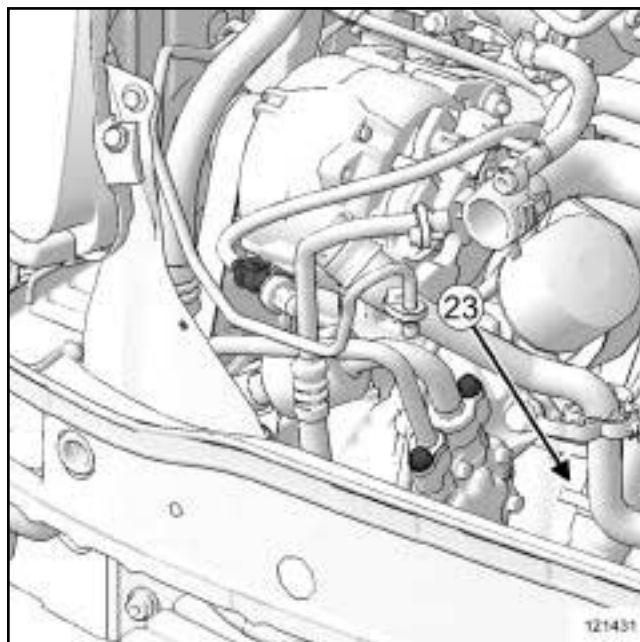
- Unclip the black connector (18) .
- Disconnect the black connector (18) .
- Remove the engine compartment connection unit mountings (19) on the body.
- Move the engine compartment connection unit to one side.
- Remove the earth nut on the front left-hand side member.

K9K



121435

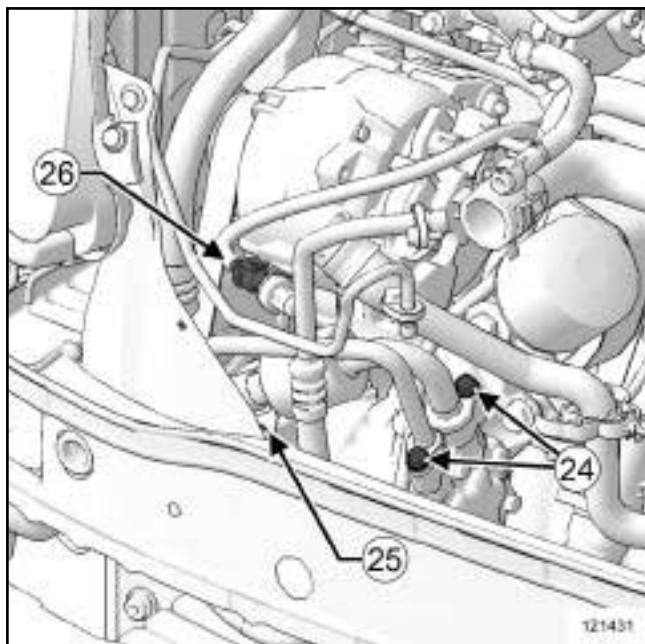
- Remove the fuses (20) .
- Unclip:
 - the fuse holders,
 - the engine compartment connection unit relay plates (21) .
- Remove the earth nut (22) on the front left-hand wing.
- Move the earth wiring away from the front left-hand wing.



121431

- Remove the clip (23) on the coolant pump inlet pipe hose using the tool (Mot. 1448).
- Disconnect the hose from the coolant pump inlet pipe.

K9K

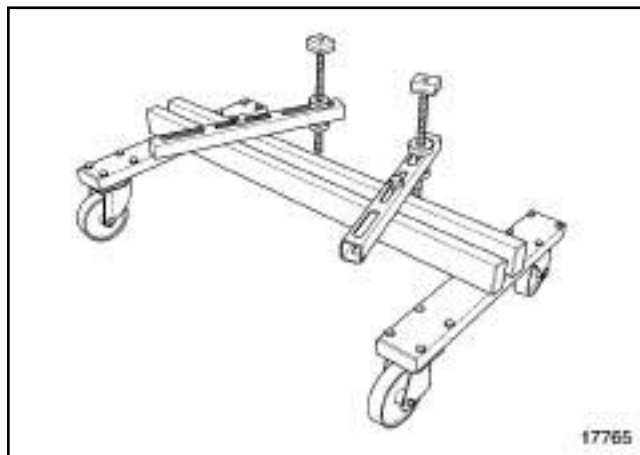


- Remove:
 - the connecting pipe union bolts (24) on the compressor,
 - the bolt (25) from the connecting pipe mounting on the compressor,
 - the connecting pipes on the compressor.
- Disconnect the pressostat connector (26) .
- Move aside the compressor connecting pipes.

WARNING

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

II - OPERATION FOR REMOVAL OF PART CONCERNED



17765

- Support the « engine-gearbox assembly » on the.
- Remove:
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) (19D, Engine mounting),
 - the left-hand suspended engine mounting (see **19D, Engine mounting, Left-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) (19D, Engine mounting).
- Remove the « engine and gearbox » assembly.

Note:

Strap the « engine - gearbox » assembly using the.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the « engine and gearbox » assembly,
 - the left-hand suspended engine mounting (see **19D, Engine mounting, Left-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) (19D, Engine mounting),
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) (19D, Engine mounting).

K9K

II - FINAL OPERATION

- Remove the.
- Lubricate the seals using recommended air conditioning oil to make fitting easier.

WARNING

To prevent any leaks, check that the seal and the surface of the pipe are in good condition. The seal and the surface must be clean and scratch free.

- Refit:
 - the connecting pipes to the compressor,
 - the connecting pipe union bolts on the compressor,
 - the bolt for the connecting pipe mounting on the compressor.
- Connect:
 - the pressostat connector,
 - the hose to the coolant pump inlet pipe using the tool **(Mot. 1448)**.
- Fit:
 - the hose clip on the coolant pump inlet pipe using the tool **(Mot. 1448)**,
 - the earth on the front left-hand wing.
- Refit the earth nut on the front left-hand wing.
- Clip:
 - the engine compartment connection unit relay plates,
 - the fuse holders.
- Refit the fuses.
- Connect the preheating unit connector.
- Refit the earth nut on the front left-hand side member.
- Fit the engine compartment connection unit.
- Refit the engine compartment connection unit mountings on the body.
- Connect the black connector.
- Clip on the black connector.
- Refit:
 - the engine compartment connection unit cover,
 - a new clip on the battery mounting to hold the electrical wiring.
- Connect the wiring connectors to the fan assembly.

- Clip the fan assembly wiring.
- Remove the blanking plugs.
- Connect the high pressure pump inlet pipe.
- Clip on the fuel supply pipe.
- Connect the high pressure pump return pipe.
- Clip on the fuel return pipe.
- Remove the blanking plugs on the clutch hydraulic control and on the control pipe.
- Connect the clutch hydraulic control to the gearbox.
- Clip:
 - the clutch control hydraulic pipe on the gearbox,
 - the gearbox controls on the cable sleeve stops,
 - the gearbox controls on the gear selectors.
- Connect:
 - the hoses to the heater radiator,
 - the top hose to the water chamber.
- Fit:
 - the hose clips on the heater radiator using the tool **(Mot. 1448)**,
 - the clip for the top hose on the water chamber using the tool **(Mot. 1448)**.
- Refit:
 - the front section of the intermediate pipe (see **19B, Exhaust, Intermediate pipe: Removal - Refitting**, page **19B-28**) ,
 - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
 - the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),
 - the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**) .

K9K

K9K, and 718

- Detach the « engine cooling radiator - air conditioning condenser - intercooler » assembly from the front upper cross member.
- Clip on the clip of the intercooler air inlet pipe.
- Connect:
 - the intercooler air outlet pipe,
 - the intercooler air inlet pipe.
- Tighten the clip on the intercooler outlet pipe.

K9K, and 740

- Detach the « engine cooling radiator - condenser » assembly from the front upper cross member.
- Refit:
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the diesel injection computer (see **13B, Diesel injection, Diesel injection computer: Removal - Refitting**, page 13B-13) ,
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the non-return valve pipe on the vacuum pump.

K9K, and 718

- Clip:
 - the turbocharger regulation solenoid valve wiring,
 - the turbocharger regulation solenoid valve pipes.
- Connect:
 - the turbocharger regulation solenoid valve connector,
 - the turbocharger regulation solenoid valve pipes.
- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Refit:
 - the air pipe at the air filter unit inlet,
 - the battery (see) (80A, Battery).
- Refill:
 - the gearbox (see **Sequential gearbox oil: Draining - Filling**) (21A, Manual gearbox),
 - the engine cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) ,
 - the engine if necessary (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) ,
 - the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning) (if fitted),
 - the brake fluid reservoir.
- Bleed the clutch circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component controls).

K9K

ENGINE AND CYLINDER BLOCK ASSEMBLY

Engine - gearbox assembly: Removal - Refitting

10A

K4M

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

Equipment required

refrigerant charging station

Tightening torques

rubber pad mounting bolts for the suspended engine mounting on the gearbox	21 N.m
bolts of the suspended mounting rubber pad	62 N.m
suspended engine mounting shaft nut	62 N.m

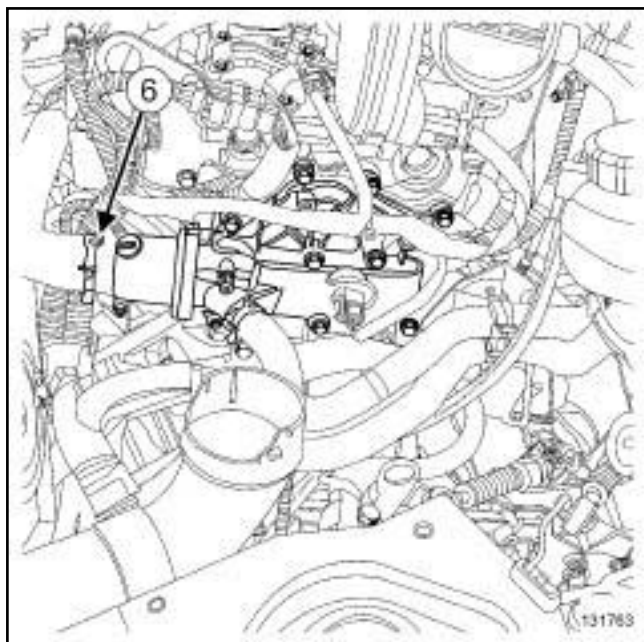
REMOVAL

I - REMOVAL PREPARATION OPERATION

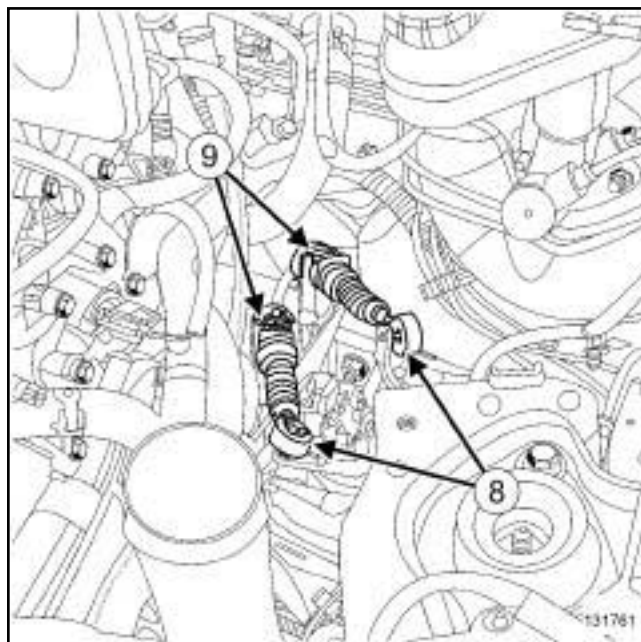
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Remove the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the petrol injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page 17B-20) ,
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray,
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).
- Drain:
 - the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),

- the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) ,
- the engine, if necessary (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) ,
- the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
- Attach the « engine cooling radiator - condenser » assembly to the front upper cross member.
- Remove:
 - the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
 - the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the differential output seal (see **Differential output seal: Removal - Refitting**) (21A, Manual gearbox).
- Remove the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) .

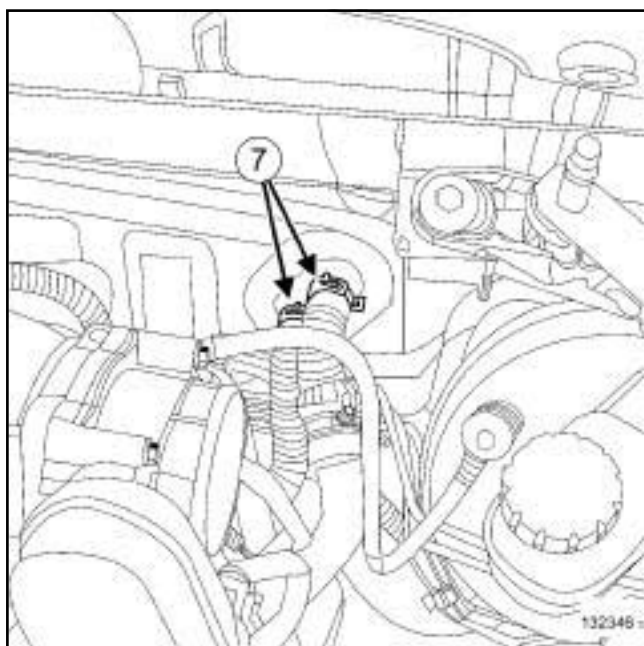
K4M



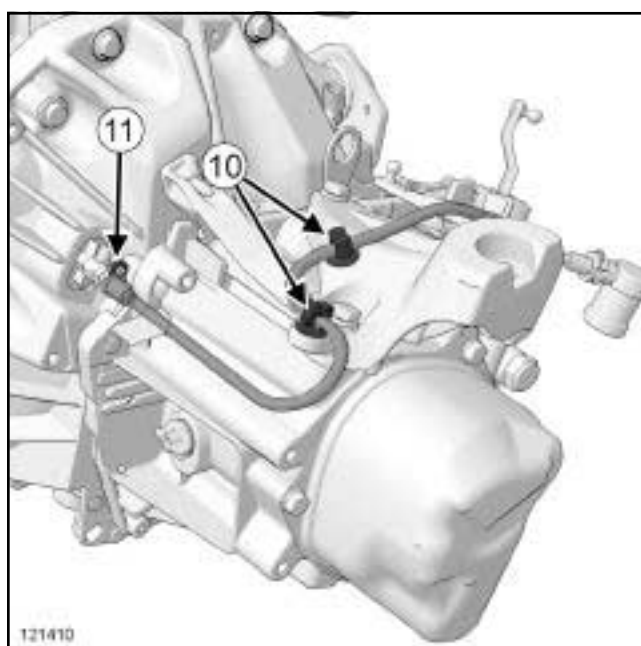
131763



131761



132346

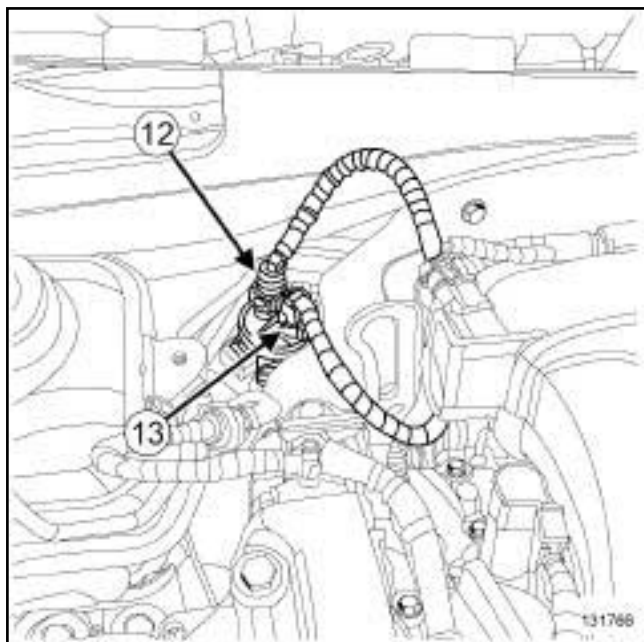


121410

- Remove using the **(Mot. 1448)** :
 - the clip **(6)** from the top hose on the water chamber,
 - the clip **(7)** from each heater matrix hose.
- Disconnect:
 - the top hose on the water chamber,
 - the heater matrix hoses.

- Unclip:
 - the gearbox controls **(8)** on the gear selectors,
 - the gearbox controls on the cable sleeve stops at **(9)**,
 - the hydraulic clutch control pipe on the gearbox at **(10)**.
- Disconnect the hydraulic clutch control pipe from the gearbox by pressing on the clip **(11)**.
- Fit blanking plugs on the hydraulic clutch control pipe openings and on the opening of the clutch thrust bearing.

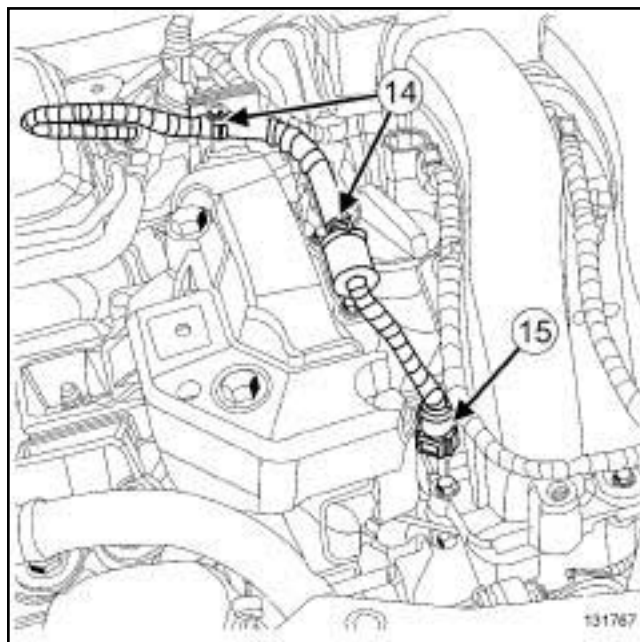
K4M



131766

Disconnect:

- the fuel vapour absorber bleed solenoid valve pipe (12) ,
- the fuel vapour absorber bleed solenoid valve connector (13) .



131767

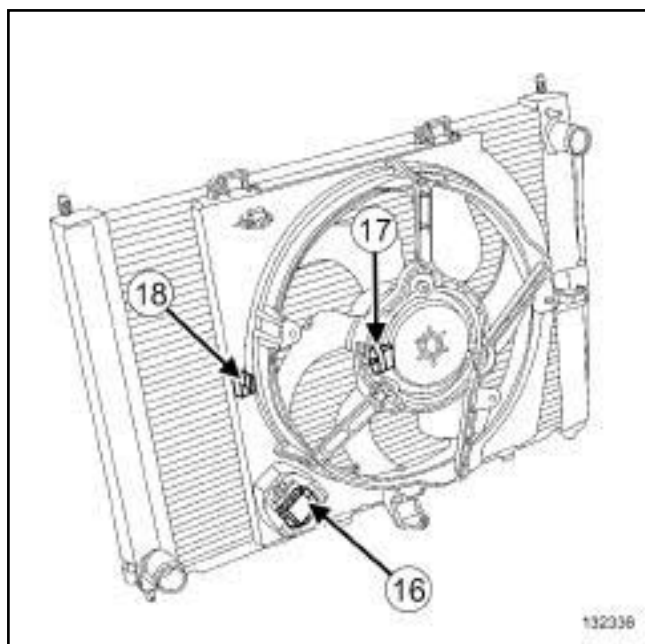
- Unclip the fuel supply pipe at (14) .

- Disconnect the fuel supply pipe (15) .

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

K4M



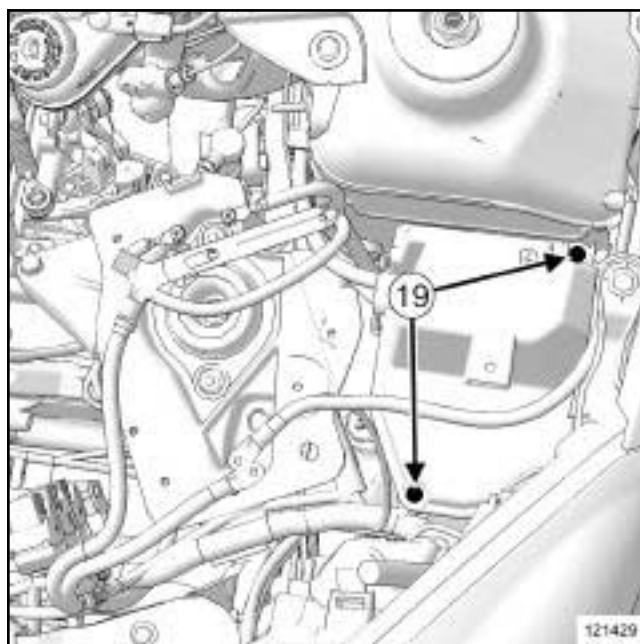
132336

Disconnect:

- the engine cooling fan assembly resistor connector (16) ,
- the engine cooling fan assembly connector (17) .

Unclip:

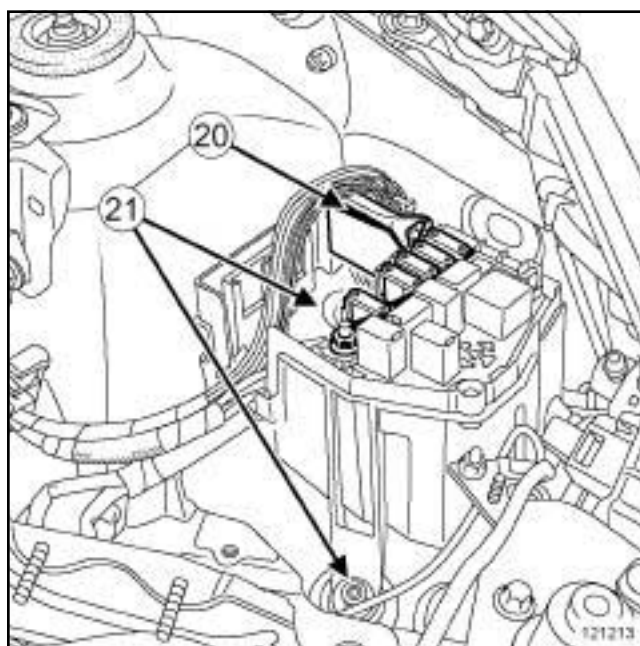
- the engine cooling fan assembly wiring at (18) ,
- the cooling radiator top and bottom hose from the engine cooling fan assembly.



121429

Remove:

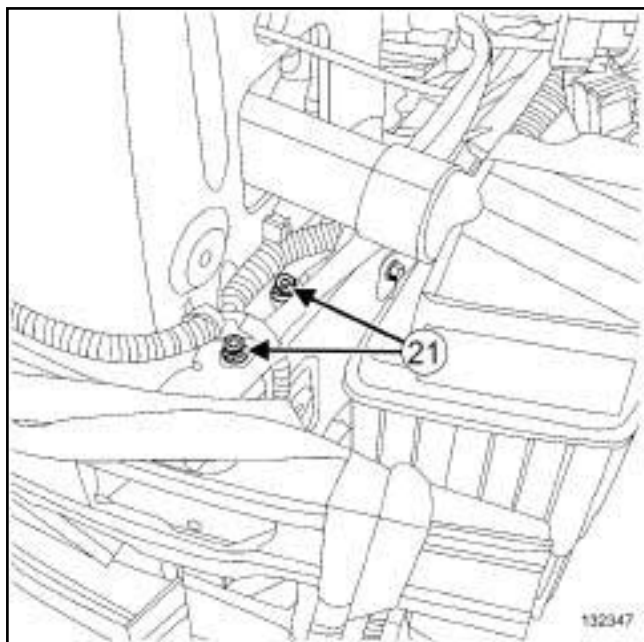
- the engine compartment connection unit cover bolts (19) ,
- the cover of the engine compartment connection unit.



121213

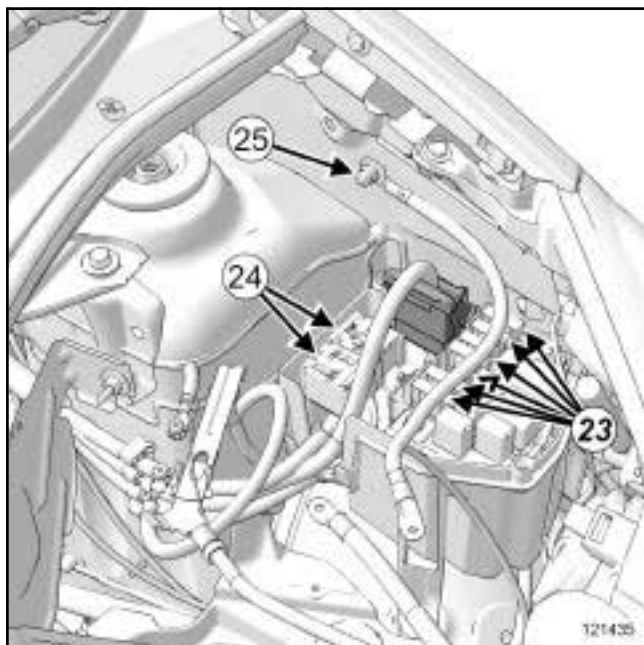
- Disconnect the connector (20) from the engine compartment connection unit.
- Remove the engine compartment connection unit nuts (21) from the body.
- Move the engine compartment connection unit to one side.

K4M



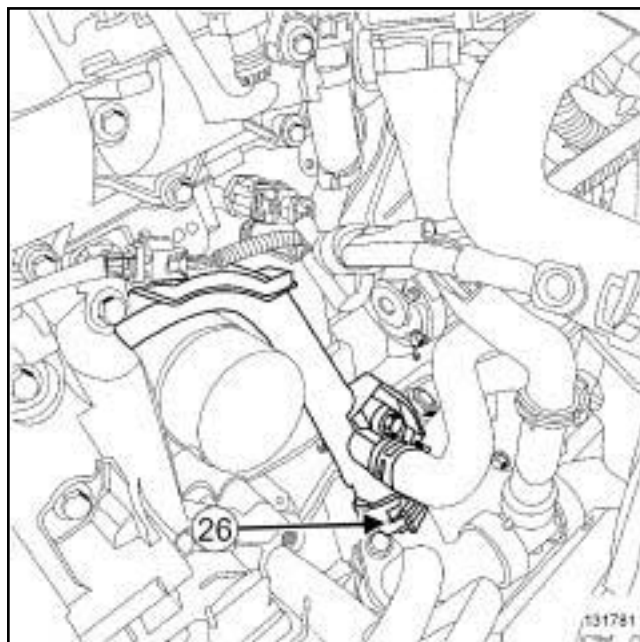
132347

- Remove the earth nuts (22) .



121435

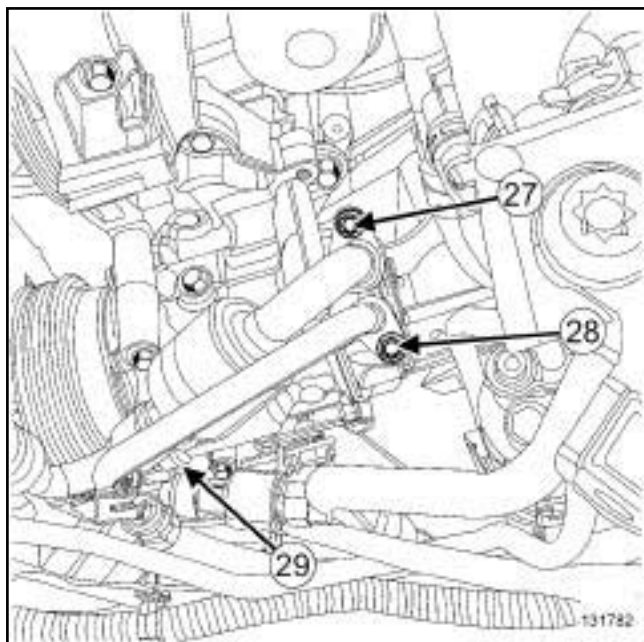
- Disconnect the fuses (23) .
- Unclip:
 - the fuse-holders,
 - the engine compartment connection unit relay plates (24) .
- Remove the earth nut (25) .



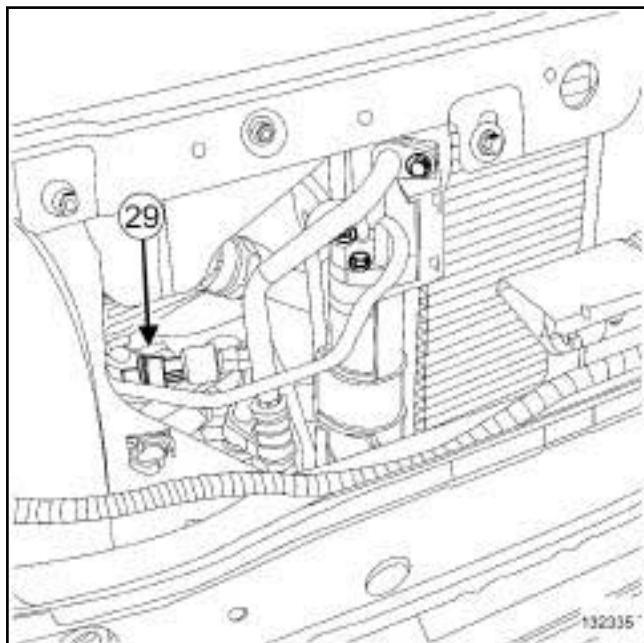
131781

- Remove the coolant pump inlet pipe hose clip (26) using the tool (Mot. 1448).
- Disconnect the hose from the coolant pump inlet pipe.

K4M



131782



132335

Remove:

- the bolt (27) from the « compressor - intermediate pipe » connecting pipe,
- the bolt (28) on the « compressor - condenser » connecting pipe,
- the bolt (29) from the « compressor - intermediate pipe » connecting pipe mounting.

Disconnect:

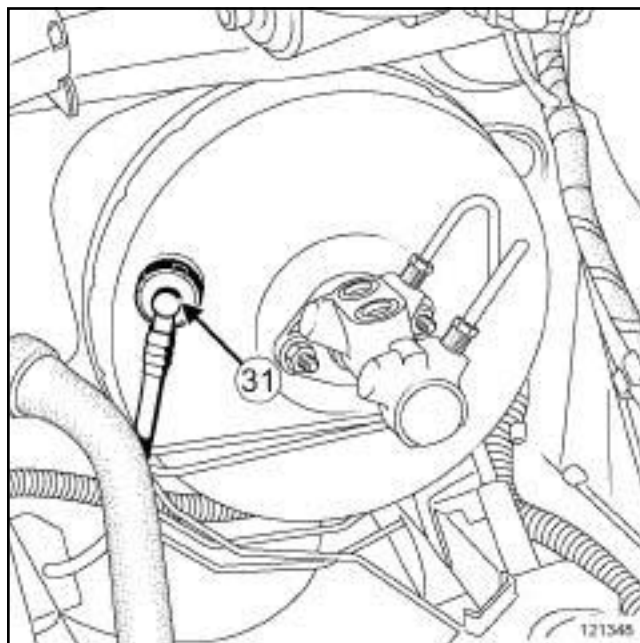
- the pressure sensor connector (30) ,
- the « compressor - intermediate pipe » connecting pipe,

- the « compressor - condenser » connecting pipe.

- Insert the blanking plugs.

WARNING

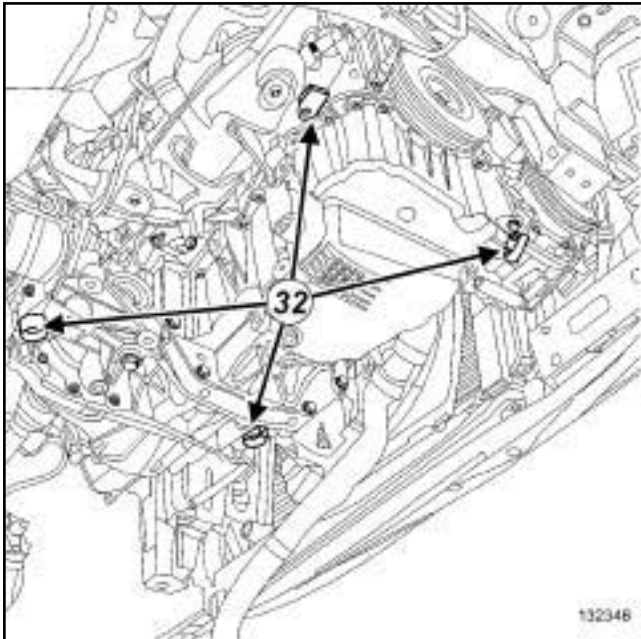
To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.



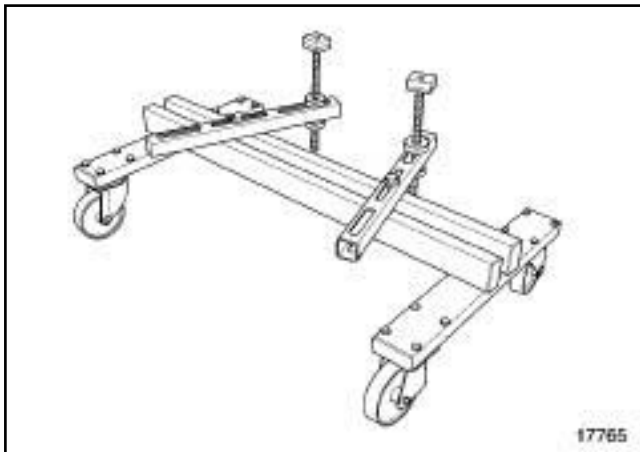
121348

- Disconnect the brake servo vacuum pipe union (31)

K4M



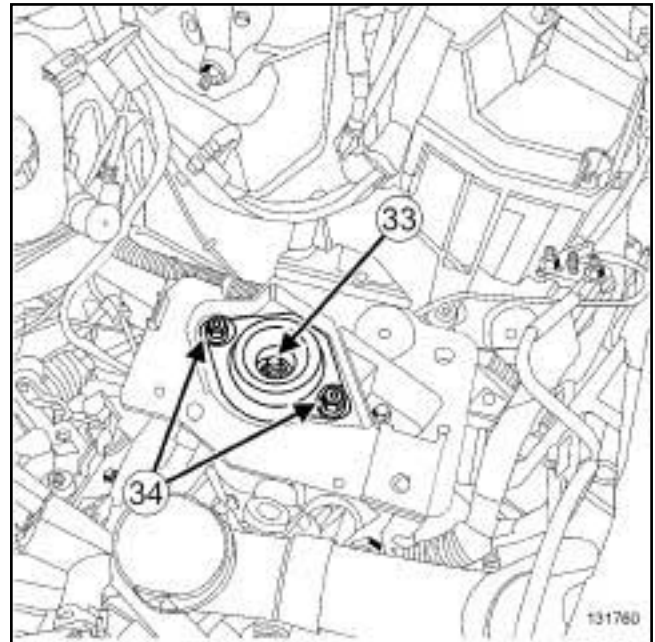
132348



17765

- Support the engine - gearbox assembly on that (32) .

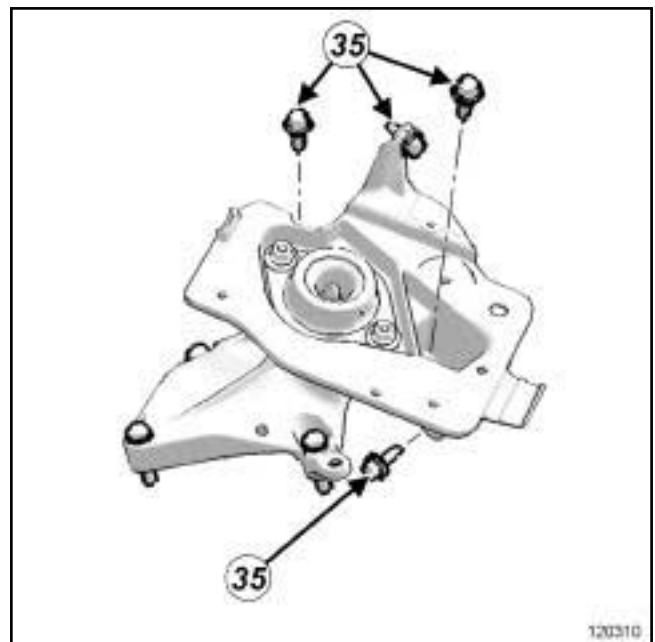
II - REMOVAL OPERATION



131780

- Remove:

- the nut (33) from the suspended engine mounting rubber pad shaft on the gearbox.
- the bolts (34) of the rubber pad of the suspended engine mounting from the gearbox,
- the suspended engine mounting rubber pad from the gearbox.



120310

- Remove:

- the rubber pad mounting bolts (35) from the suspended engine mounting on the gearbox,

K4M

- the rubber pad mounting from the suspended engine mounting on the gearbox.

- Remove the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**).
- Lift the vehicle to remove the "engine and gearbox" assembly.

Note:

Check no component obstructs the movement of the body around the engine - gearbox assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

- For standard engine replacement (see **Standard replacement**) (Technical Note 6023A, 10A, Engine and peripherals).

II - REFITTING OPERATION

- Position the "engine and gearbox" assembly in the body.
- Refit the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**).
- Refit the rubber pad mounting from the suspended engine mounting on the gearbox.
- Torque tighten the **rubber pad mounting bolts for the suspended engine mounting on the gearbox (21 N.m)**.
- Refit the suspended engine mounting rubber pad.
- Torque tighten:
 - the **bolts of the suspended mounting rubber pad (62 N.m)**,
 - the **suspended engine mounting shaft nut (62 N.m)**.

III - FINAL OPERATION

- Remove the.
- Remove the blanking plugs.
- Connect:
 - the union of the brake servo vacuum pipe,
 - the « compressor - condenser » connecting pipe,

- the « compressor - intermediate pipe » connecting pipe,

- the pressure sensor connector,

- Connect the hose on the coolant pump inlet pipe.
- Fit the hose clip on the coolant pump inlet pipe using the **(Mot. 1448)**.
- Refit the earth nuts.
- Clip:
 - the relay plates on the engine compartment connection unit,
 - the fuse holders.

Connect the fuses.

Refit the engine compartment connection unit on the body.

Connect the connector to the engine compartment connection unit.

Refit the engine compartment connection unit cover.

Clip:

- the wiring on the engine cooling fan assembly,
- the cooling radiator top and bottom hoses on the engine cooling fan assembly.

Connect:

- the engine cooling fan assembly resistor connector,
- the engine cooling fan assembly connector.

Remove the blanking plug from the fuel supply pipe opening and the injector rail fuel opening.

Reconnect the fuel supply pipe.

Clip the fuel supply pipe in place.

Connect:

- the fuel vapour absorber bleed solenoid valve connector,
- the fuel vapour absorber bleed solenoid valve pipe.

Fit the gearbox control cables.

Clip the manual gearbox control cables onto:

- the gear selectors,
- the cable sleeve stops.

Remove the blanking plug from the hydraulic clutch control pipe opening and the opening of the clutch thrust bearing.

Connect the hydraulic clutch control pipe.

Clip the hydraulic clutch control pipe on the gearbox.

K4M

- Connect:
 - the top hose on the water chamber,
 - the hoses on the heater matrix.
- Using the (**Mot. 1448**), fit:
 - the clip on the top hose on the water chamber,
 - the clip on each hose on the heater matrix.
- Refit the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-12**).
- Refit:
 - the differential output seal (see **Differential output seal: Removal - Refitting**) (21A, Manual gearbox),
 - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
 - the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),
 - the strap of the « engine cooling radiator - condenser » assembly on the front upper cross member,
 - the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the fuel injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page **17B-20**).
- Refit the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**).
- Refill:
 - the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
 - and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**),
 - the engine if necessary (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**),
 - the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
- Bleed the clutch circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component controls).
- Refit the engine undertray.

Valves: Adjustment

C44, and K9K

- Parts always to be replaced:**
 - rocker cover gasket
- Remove the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-66**).
- To adjust the valves (see **Technical Note 6006A, Diesel Engine - High-Pressure Common Rail - 4-cylinder cast iron, 10A, Engine and peripherals, Rebuilding the cylinder head**).

Valves: Adjustment

D4F or D7F

I - PREPARATION STAGE FOR ADJUSTING THE VALVE CLEARANCES

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).
- Disconnect the battery ((see **Battery: Removal - Refitting**)).
- Remove:
 - the front right-hand wheel, (see **Front wheel arch liner: Removal - Refitting**)
 - the front right-hand wheel arch liner (see **MR 412 Bodywork, 55A, Exterior protection, Wheel arch liner: Removal - Refitting**),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the inlet manifold (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66) .

II - ADJUSTING THE VALVE CLEARANCES

D4F

- Adjust the valve clearances (see **Technical Note 6004A, Petrol engine - 4 cylinder - D4, 10A, Timing-Cylinder head: Refitting**).

D7F

- Adjust the valve clearances (see **MR Components, MR - Mot - D - (E), 4 cylinder cast-iron engine (petrol), 10 Engine and peripherals, Engine repair**).

III - FINAL OPERATION

- Refit:
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66) ,
 - the inlet manifold (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,

- the front right-hand wheel arch liner (see **MR 412 Bodywork, 55A, Exterior protection, Wheel arch liner: Removal - Refitting**),

- the front right-hand wheel ((see **Wheel: Removal - Refitting**)).

- Connect the battery ((see **Battery: Removal - Refitting**)).

Flywheel: Removal - Refitting

D4F – D7F – K9K

Special tooling required

Mot. 582-01 Flywheel locking tool.

Tightening torques

D4F, D7F flywheel bolts **18 Nm + 110° ± 10°**

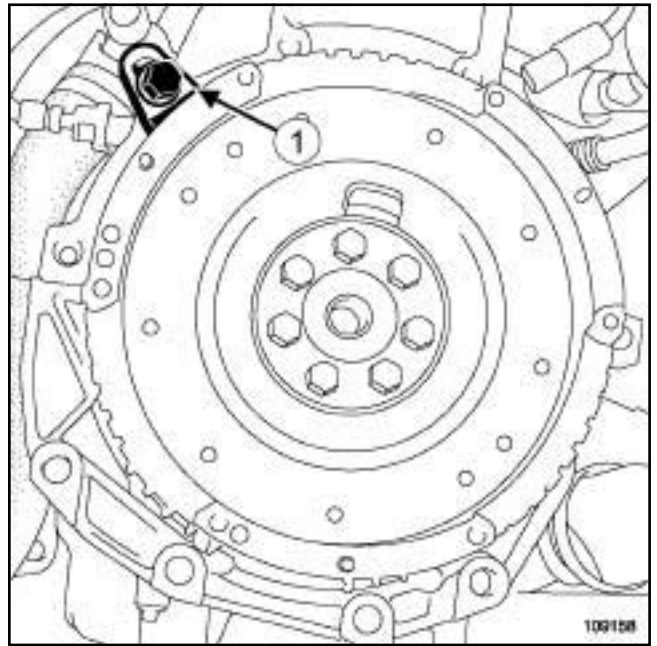
K9K flywheel bolts **70 Nm**

REMOVAL

I - REFITTING PREPARATIONS OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (MR 411, 80A, Battery).
- Remove:
 - the gearbox (see **Manual gearbox: Removal - Refitting**),
 - the clutch plate and pressure plate (see **Pressure plate - Disc: Removal - Refitting**).

II - OPERATION FOR REMOVAL OF PART CONCERNED



109158

- Lock the engine using tool (**Mot. 582-01**) (1) .
- Remove:
 - the flywheel bolts,
 - the flywheel,
 - tool (**Mot. 582-01**).

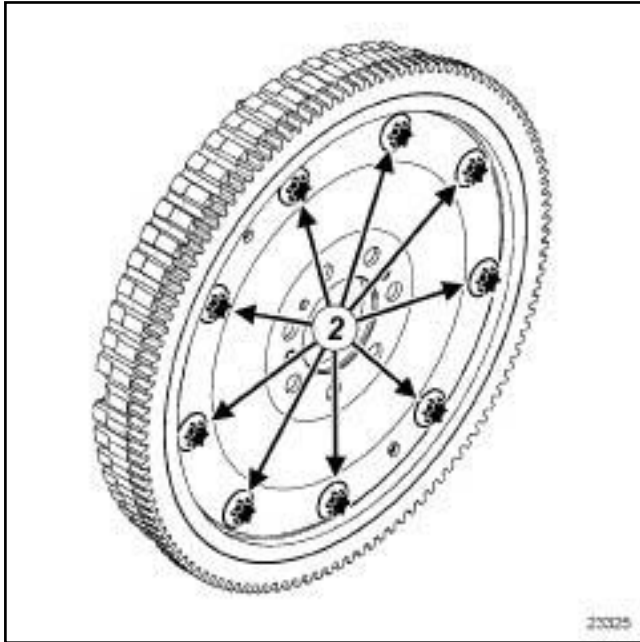
Flywheel: Removal - Refitting

D4F - D7F - K9K

REFITTING

I - REFITTING PREPARATIONS OPERATION

K9K

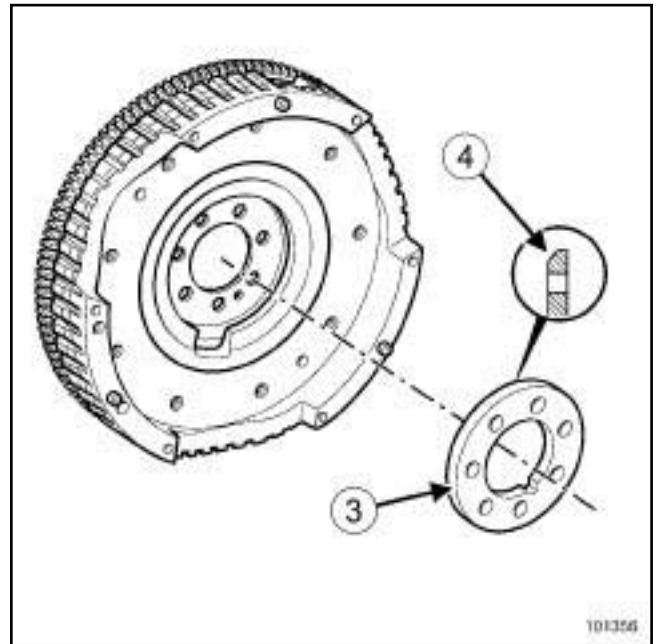


- Do not remove the flywheel drive plate bolts (2) .

- On the crankshaft, clean the flywheel bolt threading.

II - OPERATION FOR REMOVAL OF PART CONCERNED

K9K



- Refit the spacer (3) observing the direction of fitting for the chamfer (4) on the flywheel side.

- Always replace the flywheel mounting bolts with new ones.

- Refit:
 - the flywheel,
 - the new flywheel bolts.

- Lock the engine using tool (Mot. 582-01).

D4F – D7F – K9K

Tightening order



23326

- Observe the tightening order.

D4F – D7F

- Torque and angle tighten, in order, the **D4F, D7F flywheel bolts (18 Nm + 110° ± 10°)**.

K9K

- Tighten to torque and in order the **K9K flywheel bolts (70 Nm)**.

- Remove tool (**Mot. 582-01**).

III - FINAL OPERATION.

- Refit:

- the clutch plate and pressure plate (see **Pressure plate - Disc: Removal - Refitting**),

- the gearbox (see **Manual gearbox: Removal - Refitting**).

- Connect the battery (see **Battery: Removal - Refitting**) (MR 411, 80A, Battery).

Flywheel: Removal - Refitting

K4M

Special tooling required

Mot. 1677 Flywheel locking tool.

Equipment required

refrigerant charging station

Tightening torques

flywheel bolts **70 N.m**

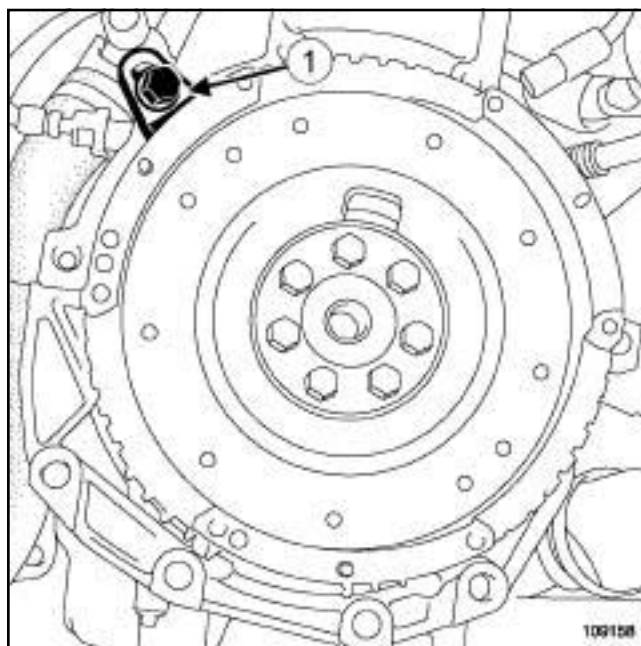
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the engine undertray,
 - the battery (see **Battery: Removal - Refitting**) (80A, Battery),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the petrol injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page 17B-20) ,
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).
- Drain:
 - the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
 - the engine cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) ,
 - the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

- Remove:
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),
 - the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the differential output seals (see **Differential output seal: Removal - Refitting**) (21A, Manual gearbox),
 - the « engine - gearbox » assembly (see **10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting**, page 10A-74) (21A, Manual gearbox),
 - the manual gearbox (see **Manual gearbox: Removal - Refitting**) ,
 - the « pressure plate - disc » assembly (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch).

II - REMOVAL OPERATION



109158

- Remove:
 - the flywheel bolts,
 - the **(Mot. 1677) (1)** ,

K4M

- the flywheel.

REFITTING

I - REFITTING PREPARATION OPERATION

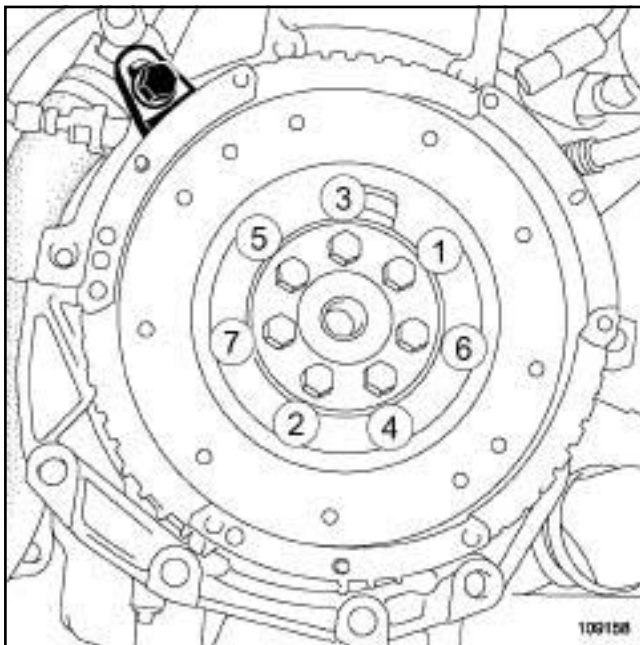
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the flywheel bearing face if reusing,
- the crankshaft bearing face.

- Always replace the flywheel bolts.

II - REFITTING OPERATION

- Fit the flywheel.
- Fit the new flywheel bolts without tightening them.
- Position the (**Mot. 1677**).



- Tighten to torque and in order the **flywheel bolts (70 N.m)**.

III - FINAL OPERATION

- Refit:
 - the « pressure plate - disc » assembly (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
 - the manual gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

- the « engine and gearbox » assembly (see **10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting**, page **10A-74**),

- the differential output seals (see **Differential output seal: Removal - Refitting**) (21A, Manual gearbox),

- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),

- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),

- the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components),

- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),

- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),

- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),

- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),

- the petrol injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page **17B-20**),

- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),

- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

- Perform the following operations:

- fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**),

- fill the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

- fill the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

- Refit the engine undertray.

TOP AND FRONT OF ENGINE

Pressure at end of compression: Check

11A

K4M

Equipment required

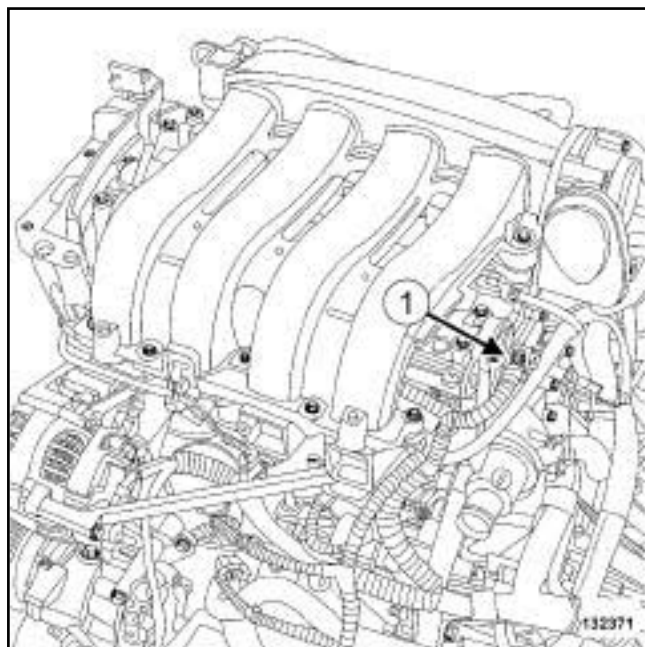
petrol compression gauge

CHECK

I - PREPARATION OPERATION FOR CHECK

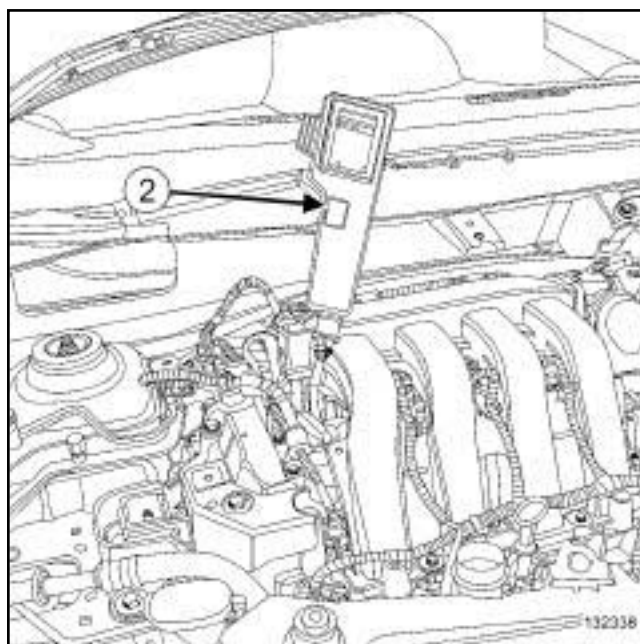
❑ Remove:

- the coils (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-1**) ,
- the spark plugs (see **17A, Ignition, Plugs: Removal - Refitting**, page **17A-12**) .



132371

❑ Disconnect the injector wiring connector (1) .



132338

❑ Connect a **petrol compression gauge** (2) .

❑ Put the vehicle under the starting conditions by positioning the gear lever in neutral.

II - TEST OPERATION

❑ Activate the starter until the needle of the **petrol compression gauge** stabilises.

❑ Measure the cylinder compressions, cylinder by cylinder.

❑ Fully depress the accelerator pedal in order to open the throttle valve during the compression measurements.

Note:

It is necessary to wait for at least **10 seconds** before starting the engine each time (the starter will not run due to its thermal protection).

III - FINAL OPERATION

❑ Disconnect the **petrol compression gauge**.

❑ Connect the injector wiring connector.

❑ Refit:

- the spark plugs (see **17A, Ignition, Plugs: Removal - Refitting**, page **17A-12**) ,

- the coils (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-1**) .

TOP AND FRONT OF ENGINE

Pressure at end of compression: Check

11A

D4F

Equipment required

petrol compression gauge

Diagnostic tool

CHECK

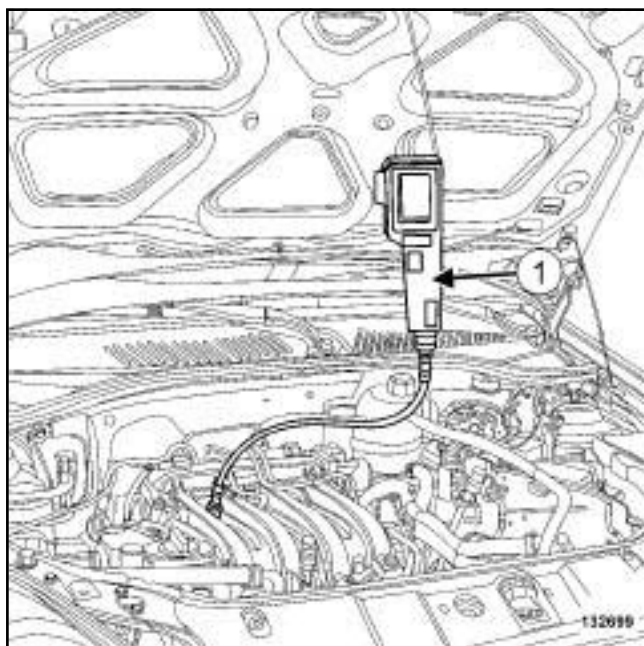
I - PREPARATION OPERATION FOR CHECK

- Remove the plugs (see **17A, Ignition, Plugs: Removal - Refitting**, page 17A-12) .

Note:

Use a petrol compression gauge compatible with the special tools.

The petrol compression gauge must be equipped with a universal end piece (rubber), or a gaz 1/4 thread bolt.



132699

- Connect a **petrol compression gauge (1)** .
- Run command with **Diagnostic tool** :
 - **RZ009: VEHICLE FUNCTION PROGRAMMING**,
 - **VP036: FUEL SUPPLY INHIBITION**.
- Put the vehicle under the starting conditions by positioning the gear lever in neutral.

II - TEST OPERATION

- Activate the starter until the needle of the **petrol compression gauge** stabilises.
- Measure the cylinder compressions, cylinder by cylinder.
- Fully depress the accelerator pedal in order to open the throttle valve during the compression measurements.

Note:

It is necessary to wait for at least **10 seconds** before starting the engine each time (the starter will not run due to its thermal protection).

III - FINAL OPERATION

- Disconnect the **petrol compression gauge**.
- Refit the plugs (see **17A, Ignition, Plugs: Removal - Refitting**, page 17A-12) .
- Run command **VP037: "STOP INHIBIT FUEL SUPPLY"** using the **Diagnostic tool**.
- Start the engine.

Note:

If the engine does not start, run command **VP037: STOP FUEL SUPPLY INHIBITION** using the **Diagnostic tool** or switch off the ignition and wait **1 min** before starting the engine again.

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

D4F, and 772, and STANDARD HEATING – D7F, and STANDARD HEATING

Special tooling required

Mot. 1715	Belt tension checking tool (frequency indicator).
Mot. 1505	Belt tension setting tool (frequency meter)

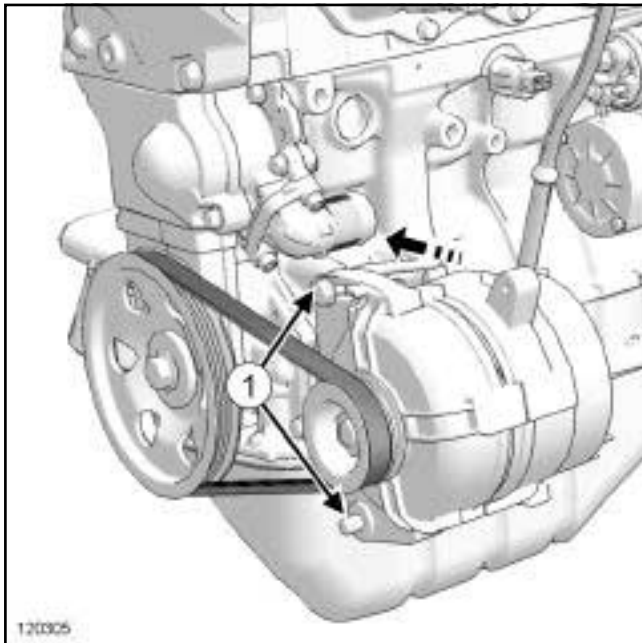
Tightening torques

alternator lower bolt	50 N.m
alternator upper bolt	25 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



120305

- Undo the alternator bolts (1) .
- Swing the alternator towards the engine.

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove the accessories belt.

REFITTING

I - REFITTING PREPARATION OPERATION

- Use a brush to remove any deposits from the crankshaft accessories pulley V grooves.

WARNING

Only use brushes with plastic or non-corrosive metal (brass) bristles.

- parts always to be replaced: Accessories belt.**

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the accessories belt.

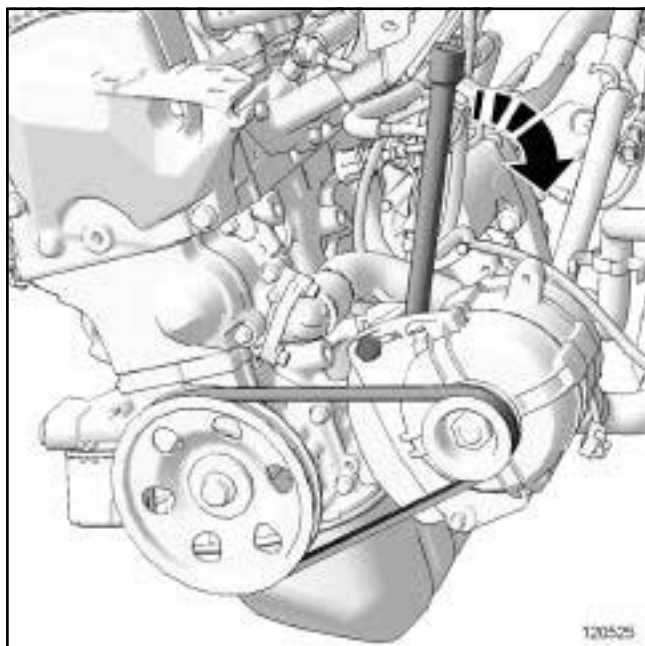
TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

D4F, and 772, and STANDARD HEATING – D7F, and STANDARD HEATING

Accessories belt tensioning process



120525

- Tension the accessories belt by swinging the alternator towards the front using a lever.
- Set the accessories belt tension using the **(Mot. 1715)** or the **(Mot. 1505)** to a value of **244 Hz ± 5**.
- Torque tighten:
 - the **alternator lower bolt (50 N.m)**,
 - the **alternator upper bolt (25 N.m)**.
- Turn the engine three revolutions clockwise (timing end) to position the accessories belt correctly.
- Check the accessories belt tension using the **(Mot. 1715)** or the **(Mot. 1505)**.
- If the accessories belt tension is outside permitted tolerance values, readjust the tension.

III - FINAL OPERATION

- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

K9K, and AIR CONDITIONING

Special tooling required

Mot. 1672 Lower engine support.

Tightening torques

tensioning roller bolt	40 Nm
alternator bolts	25 Nm

PARTS AND CONSUMABLES FOR THE REPAIR WORK

Parts always to be replaced:

- accessories belt,
- accessories belt tensioning roller,
- accessories belt tensioning roller bolt,
- axle sub-frame bolts.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove:
 - the wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (MR 411, 85A, Wipers - Washers),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment).
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the left-hand and right-hand headlights (see **Halogen headlight: Removal - Refitting**) (MR 411, 80B, Headlights).

Remove:

- the air filter inlet air pipe bolt from the front upper cross member,
- the expansion bottle bolt from the front upper cross member,
- the cooling radiator retaining bracket bolt from the front upper cross member.

Unclip and then remove from the front upper cross member:

- the air filter inlet air pipe,
- the expansion bottle.

Remove the bonnet catch bolts.

Remove the « cable - bonnet catch » assembly.

Remove:

- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (MR 412, 42A, Upper front structure),
- the air conditioning pipe clip from the right-hand headlight carrier panel,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Removing the accessories belt

- Raise the engine using the (**Mot. 1672**) to access the tensioning roller.
- Relax the accessories belt using a ratchet, an extension and a **16 mm** socket.

Note:

Shift the engine forwards slightly by hand to facilitate setting up the tools.

- Remove the belt, passing it over its slot between the headlight carrier panel and the alternator pulley.
- Lower the engine using tool (**Mot. 1672**).

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

K9K, and AIR CONDITIONING

- ❑ Remove the accessories belt, passing it over its slot between the RH side member and the crankshaft accessories and air conditioning compressor pulleys.

Note:

Shift the engine forwards or backwards slightly by hand if necessary to facilitate removing the accessories belt.

- ❑ Discard the accessories belt

2 - Removing the tensioning roller

- ❑

Note:

The tensioning roller must be replaced every time the accessories belt is replaced.

- ❑ Raise the engine using the **(Mot. 1672)**.
- ❑ Disconnect the connector on the alternator.
- ❑ Remove the nut from the alternator harness.
- ❑ Move the alternator harness to one side.
- ❑ Remove the alternator upper bolt.
- ❑ Loosen the alternator lower bolt.
- ❑ Remove:
 - the alternator with its lower bolt fitted,
 - the tensioning roller bolt,
 - the tensioning roller.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

1 - Refit the tensioning roller

- ❑ Refit:
 - the new tensioning roller,
 - the new tensioning roller bolt.
- ❑ Torque tighten the **tensioning roller bolt (40 Nm)**.
- ❑ Refit:
 - the alternator with its lower bolt fitted,
 - the alternator upper bolt.
- ❑ Torque tighten the **alternator bolts (25 Nm)**.
- ❑ Fit the alternator harness.

- ❑ Refit the nut to the alternator wiring harness.
- ❑ Attach the connector to the alternator.

2 - Refit the accessories belt

- ❑ Lower the engine using the **(Mot. 1672)**.
- ❑ Partially refit the new accessories belt, passing it over its slot between the RH side member and the crankshaft accessories and air conditioning compressor pulleys.

Note:

Shift the engine forwards or backwards slightly by hand if necessary, to facilitate refitting the accessories belt.

- ❑ Raise the engine using the **(Mot. 1672)**.
- ❑ Fit the belt on the crankshaft accessories, air conditioning compressor and tensioning roller pulleys.
- ❑ Swing the accessories belt auto tensioner clockwise using a ratchet, an extension and a **16 mm** socket

Note:

Shift the engine forwards slightly by hand to facilitate setting up the tools.

- ❑ Fit the belt on the alternator pulley, passing it over its slot between the headlight carrier panel and the alternator pulley.
- ❑ Gently release the tensioning roller.
- ❑ Check that the accessories belt is correctly mounted on the crankshaft accessories, air conditioning compressor and alternator pulleys.
- ❑ Turn the engine two revolutions.
- ❑ Check that the accessories belt is correctly mounted on the crankshaft accessories, air conditioning compressor, alternator and tensioning roller pulleys.
- ❑ Adjust the engine using the **(Mot. 1672)** to restore the engine's approximate original position.

II - FINAL OPERATION.

- ❑ Refit:
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**).
 - the air conditioning pipe clip onto the right-hand headlight carrier panel,

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

K9K, and AIR CONDITIONING

- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (MR 412, 42A, Upper front structure),
- Fit the « cable - bonnet catch » assembly.
- Refit the bonnet catch nuts.
- Clip the following onto the front upper cross member:
 - the air filter inlet air pipe,
 - the expansion bottle.
- Refit:
 - the air filter inlet air pipe bolt onto the front upper cross member,
 - the expansion bottle bolt onto the front upper cross member,
 - the cooling radiator retaining bracket bolt onto the front upper cross member.
 - the left-hand and right-hand headlights (see **Halogen headlight: Removal - Refitting**) (MR 411, 80B, Headlights).
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment).
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),
 - the wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (MR 411, 85A, Wipers - Washers),
- Connect the battery (see) (MR 411, 80A, Battery).
- Adjust the headlights (see **Halogen headlight: Adjustment**) (MR 411, 80B, Headlights).

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

D4F, and 772 or 780 or 782, and AIR CONDITIONING – D7F, and AIR CONDITIONING

Special tooling required

Mot. 1715 Belt tension checking tool (frequency indicator).

Mot. 1505 Belt tension setting tool (frequency meter)

Equipment required

open-ended spanner

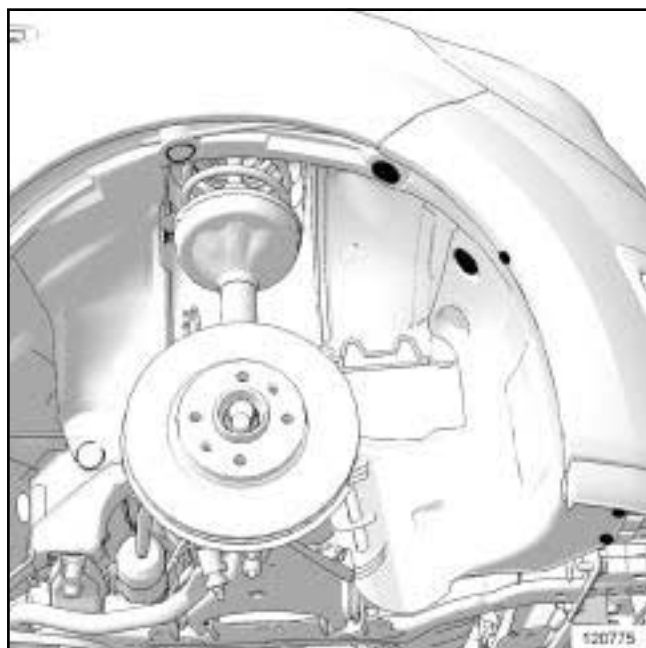
Tightening torques

tensioning roller bolt **44 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

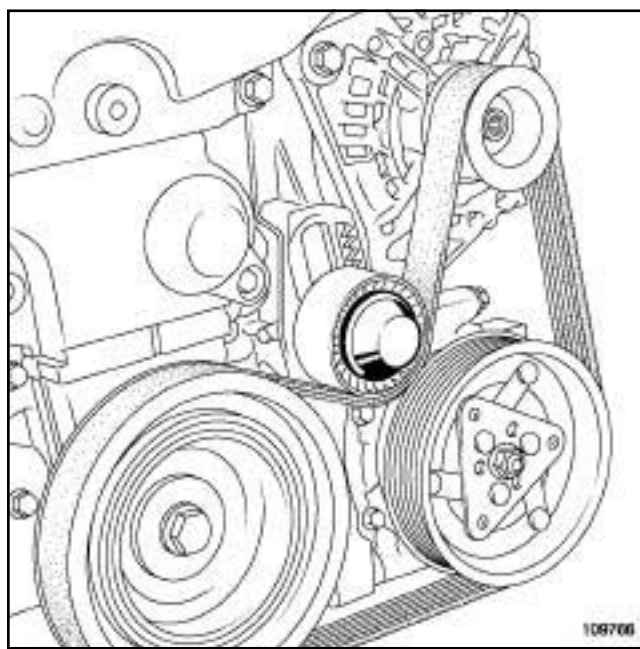
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



120775

- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner clips,
 - the front right-hand wheel arch liner bolts,
- Remove the lower section of the front right-hand wheel arch liner.

II - OPERATION FOR REMOVAL OF PART CONCERNED



109766

IMPORTANT

Wear cut-resistant gloves during the operation.

- Remove the accessories belt tensioning roller protector.
- Undo the accessories belt tensioning roller bolt.
- Remove:
 - the accessories belt,
 - the accessories belt tensioning roller bolt,
 - the accessories belt tension wheel.

REFITTING

I - REFITTING PREPARATION OPERATION

- Use a brush to remove any deposits from the crankshaft pulley V-grooves.

WARNING

Only use brushes with plastic or non-corrosive metal (brass) bristles.

- parts always to be replaced: Accessories belt.**
- parts always to be replaced: Accessories belt tensioning roller.**

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

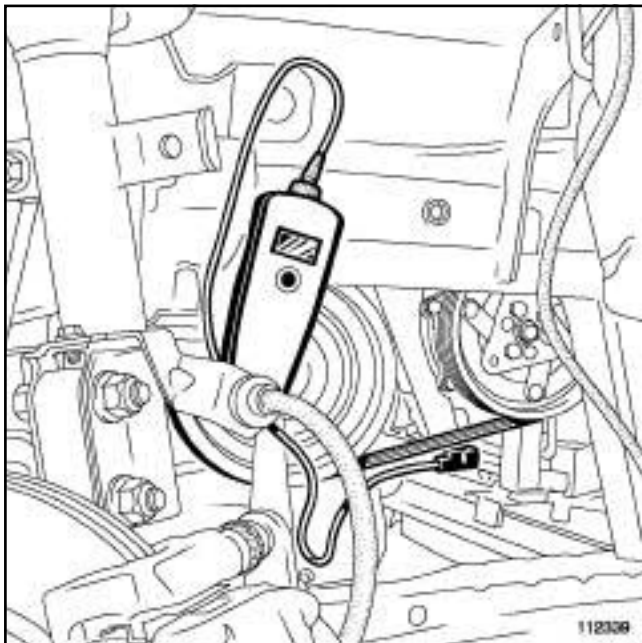
11A

D4F, and 772 or 780 or 782, and AIR CONDITIONING – D7F, and AIR CONDITIONING

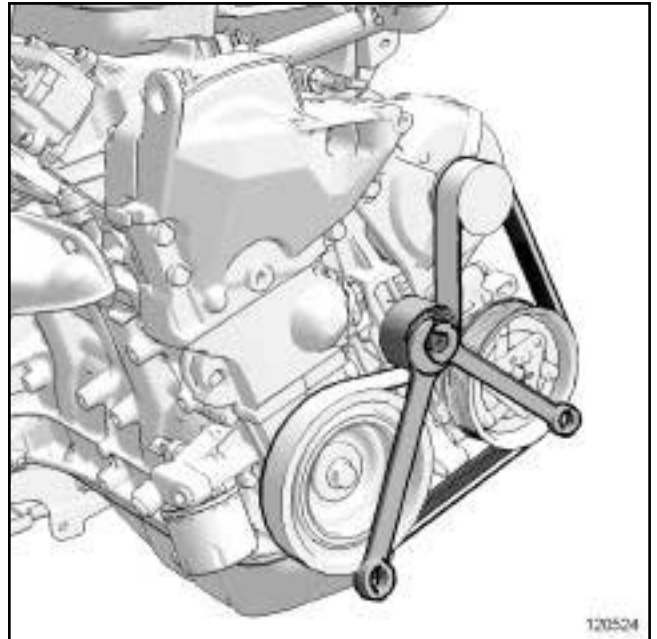
- parts always to be replaced: **Accessories tensioning roller bolt** (to be replaced by the hexagonal head bolt, part no. **77 03 101 075**).
- Refit:
 - the new accessories belt tensioning roller,
 - the accessories belt tensioning roller hexagonal-head bolt

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the accessories belt.
- Tension the accessories belt by turning the tensioning roller anti-clockwise using an open-jawed spanner.



- Adjust the accessories belt tension using the **(Mot. 1715)** or **(Mot. 1505)**.



120524

- Fit the accessories belt tensioning roller bolt without tightening it, maintaining the accessories belt tension at a setting value of **274 Hz ± 4**.
- Torque tighten the **tensioning roller bolt (44 N.m)** using a torque wrench fitted with a **open-ended spanner**, maintaining the accessories belt tension at the adjustment value of **277 Hz ± 5** using an open-jawed spanner.
- Turn the engine three revolutions clockwise (timing end) to position the accessories belt correctly.
- Check the accessories belt tension using the **(Mot. 1715)** or **(Mot. 1505)**.
- If the accessory belt tension is outside permitted tolerance values, readjust it.
- Refit the accessories belt tension wheel protector.

III - FINAL OPERATION

- Fit the lower section of the front right-hand wheel arch liner.
- Refit:
 - the front right-hand wheel arch liner bolts,
 - the front right-hand wheel arch liner clips,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

K9K, and STANDARD HEATING

Tightening torques	
air conditioning compressor substitute pulley bolts	25 Nm
tensioning roller bolt	40 Nm
bolts mounting the multifunction support on the cylinder block	44 Nm
bolt mounting the multifunction support on the sump	25 Nm
alternator bolts	25 Nm

PARTS AND CONSUMABLES FOR THE REPAIR WORK

Parts always to be replaced:

- accessories belt,
- accessories belt tensioning roller,
- accessories belt tensioning roller bolt
- the air conditioning compressor substitute pulley,
- axle sub-frame bolts.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the left-hand and right-hand headlights (see **Halogen headlight: Removal - Refitting**) (MR 411, 80B, Headlights).

Remove:

- the air filter inlet air pipe bolt from the front upper cross member,
- the expansion bottle bolt from the front upper cross member,
- the cooling radiator retaining bracket bolt from the front upper cross member.

Unclip and then remove from the front upper cross member:

- the air filter inlet air pipe,
- the expansion bottle.

Remove the bonnet catch bolts.

Remove the « cable - bonnet catch » assembly.

Remove the front upper cross member (see **Front upper cross member: Removal - Refitting**) (MR 412, 42A, Upper front structure).

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Removing the accessories belt

- Relax the accessories belt using a **16 mm** spanner.
- Remove the accessories belt from the air conditioning compressor substitute pulley.
- Remove the accessories belt, passing it over its slot between the RH side member and the crankshaft accessories and alternator pulleys.
- Discard the accessories belt

2 - Removing the tensioning roller and the air conditioning compressor substitute pulley

Note:

The tensioning roller and air conditioning compressor substitute pulley must be replaced every time the accessories belt is replaced.

- Disconnect the connector on the alternator.
- Remove the nut from the alternator harness.
- Move the alternator harness to one side.
- Remove the alternator upper bolt.
- Loosen the alternator lower bolt.
- Remove the alternator with its lower bolt fitted.

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

K9K, and STANDARD HEATING

Remove:

- the multifunction support bolts from the cylinder block,
- the multifunction support bolt from the sump,
- the equipped multifunction support.

Place the multifunction support in a vice.

Remove:

- the tensioning roller bolt,
- the tensioning roller,
- the air conditioning compressor substitute pulley bolts,
- the air conditioning compressor substitute pulley.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

1 - Refit the tensioning roller

Place the multifunction support in a vice.

Refit:

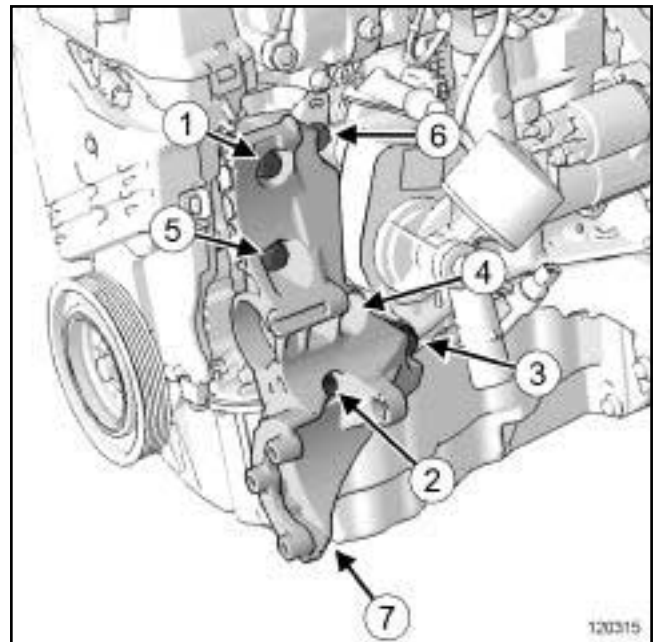
- the new air conditioning compressor substitute pulley.
- the air conditioning compressor substitute pulley bolts,
- the new tensioning roller,
- the tensioning roller bolt,

Torque tighten:

- the **air conditioning compressor substitute pulley bolts (25 Nm)**,
- the **tensioning roller bolt (40 Nm)**,

Refit:

- the equipped multifunction support,
- the multifunction support bolt onto the sump,
- the multifunction support bolts onto the cylinder block.



120315

Tighten to torque and in order:

- the **bolts mounting the multifunction support on the cylinder block (44 Nm)**,
- the **bolt mounting the multifunction support on the sump (25 Nm)**.

Refit:

- the alternator with its lower bolt fitted,
- the alternator upper bolt.

Torque tighten the **alternator bolts (25 Nm)**.

Position the alternator wiring harness.

Refit the nut to the alternator wiring harness.

Attach the connector to the alternator.

2 - Refit the accessories belt

Partially refit the new accessories belt:

- positioning it between the air conditioning compressor substitute pulley and the multifunction support,
- passing it over its slot between the RH side member and the crankshaft accessories, tensioning roller and alternator pulleys.

Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner

Fit the belt on the air conditioning compressor substitute pulley.

Gently release the tensioning roller.

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

K9K, and STANDARD HEATING

- Check that the accessories belt is correctly mounted on the crankshaft accessories, air conditioning compressor and alternator pulleys.
- Turn the engine two revolutions.
- Check that the accessories belt is correctly fitted on the crankshaft accessories, air conditioning compressor substitute, alternator and tensioning roller pulleys.

II - FINAL OPERATION.

- Refit the front upper cross member (see **Front upper cross member: Removal - Refitting**) (MR 412, 42A, Upper front structure).
- Fit the « cable - bonnet catch » assembly.
- Refit the bonnet catch nuts.
- Clip the following onto the front upper cross member:
 - the air filter inlet air pipe,
 - the expansion bottle.
- Refit:
 - the air filter inlet air pipe bolt onto the front upper cross member,
 - the expansion bottle bolt onto the front upper cross member,
 - the cooling radiator retaining bracket bolt onto the front upper cross member.
 - the left-hand and right-hand headlights (see **Halogen headlight: Removal - Refitting**) (MR 411, 80B, Headlights).
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
- Connect the battery (see) (MR 411, 80A, Battery).
- Adjust the headlights (see **Halogen headlight: Adjustment**) (MR 411, 80B, Headlights).

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

D4F, and 780 or 782, and STANDARD HEATING

Special tooling required

Mot. 1715	Belt tension checking tool (frequency indicator).
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Mot. 1505	Belt tension setting tool (frequency meter)
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Equipment required

repositioner

Tightening torques

tensioning roller bolt	44 N.m
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sub-frame tie-rod lower bolt	62 N.m
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sub-frame tie-rod upper bolt	21 N.m
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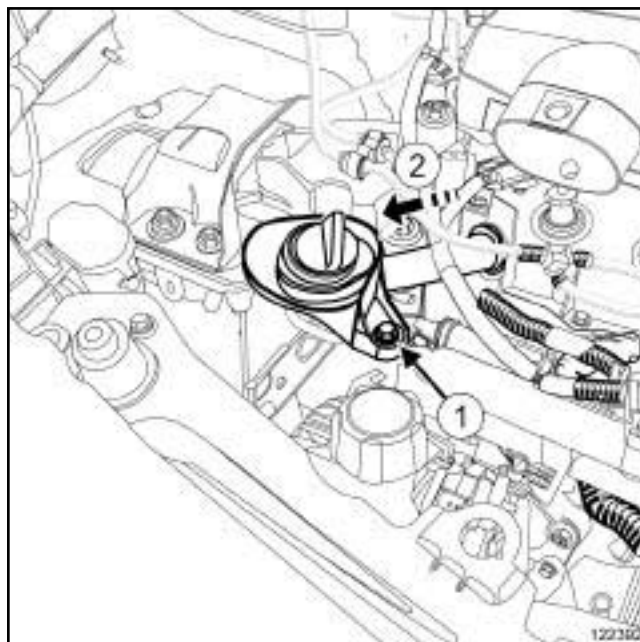
IMPORTANT

Wear cut-resistant gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).



122392

Remove:

- the filler neck bolt (1) ,
- the filler neck in the direction of the arrow (2) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

Undo the lower bolt on the sub-frame tie-rod.

Remove the upper bolt from the sub-frame tie-rod.

Remove the sub-frame tie-rod.

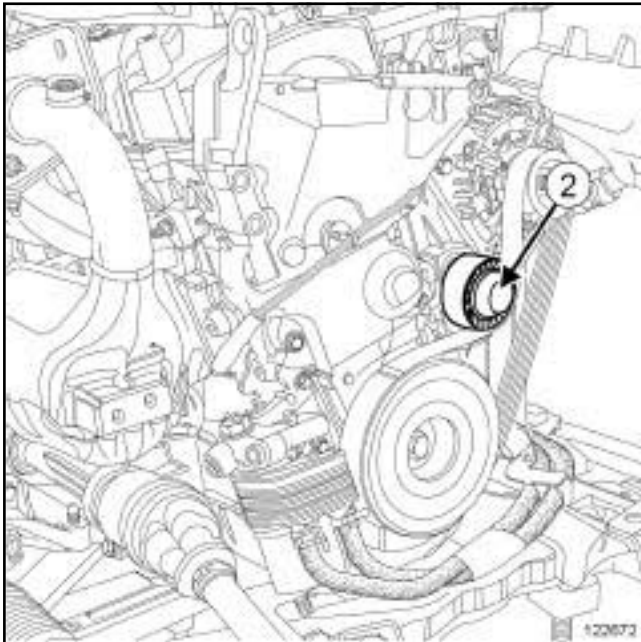
TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

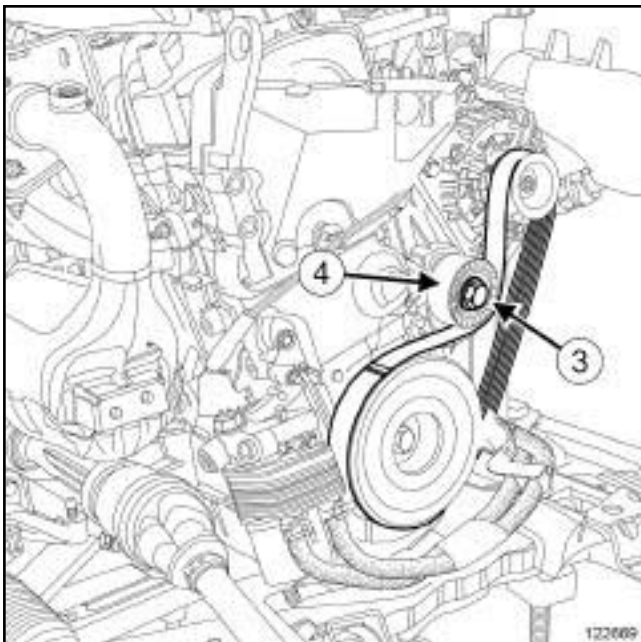
D4F, and 780 or 782, and STANDARD HEATING

II - OPERATION FOR REMOVAL OF PART CONCERNED



122672

- Remove the accessories belt tensioning roller protector (2) .



122669

- Loosen the accessories belt tensioning roller bolt (3) .
- Remove:
 - the accessories belt,
 - the tensioning roller bolt,
 - the accessories belt tension wheel (4) .

REFITTING

I - REFITTING PREPARATION OPERATION

- Use a brush to remove any deposits from the crankshaft pulley V-grooves.

WARNING

Only use brushes with plastic or non-corrosive metal (brass) bristles.

- parts always to be replaced: Accessories belt,
- parts always to be replaced: Accessories belt tensioning roller,
- parts always to be replaced: Accessories tensioning roller bolt (to be replaced by the hexagonal head bolt, part no. 77 03 101 075).

II - REFITTING OPERATION FOR PART CONCERNED

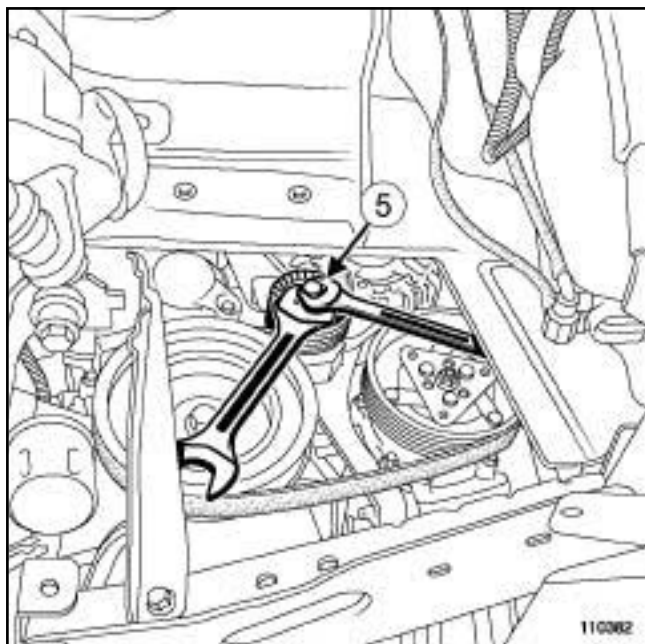
- Refit:
 - the new accessories belt tensioning roller,
 - the new tensioning roller bolt,
 - the new accessories belt.

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

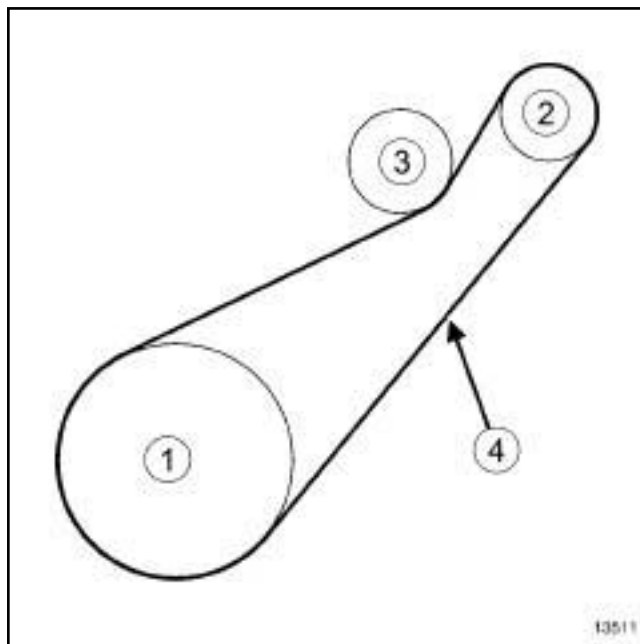
11A

D4F, and 780 or 782, and STANDARD HEATING



110382

- Tension the accessories belt by turning the tensioning roller anti-clockwise with a **20 mm** open-jawed spanner.
- Adjust the accessories belt tension using the (**Mot. 1715**) or (**Mot. 1505**) (see) (Technical Note 3786A, 10A, Engine and peripherals).
- Without locking, tighten the bolt (5) on the tensioning roller with a **16 mm** open-jawed spanner, while keeping the tensioning roller tension at the adjustment value using a **20 mm** open-jawed spanner.



13511

- (1) Crankshaft
- (2) Alternator
- (3) Tensioning roller
- (4) Measuring point

- The accessories belt tension value is **210 Hz ± 10**.
- Torque tighten the **tensioning roller bolt (44 N.m)** using a **16 mm** socket and a **repositioner**, while keeping the tensioning roller tension at the adjustment value with a **20 mm** open-jawed spanner.
- Turn the engine three revolutions clockwise (timing end) to position the accessories belt correctly.
- Check the accessories belt tension using the (**Mot. 1715**) or (**Mot. 1505**).
- If the accessory belt tension is outside permitted tolerance values, readjust it.
- Refit the accessories belt tension wheel protector.

III - FINAL OPERATION

- Fit the sub-frame tie-rod.
- Refit the upper bolt on the sub-frame tie-rod.
- Torque tighten:
 - the **sub-frame tie-rod lower bolt (62 N.m)**,
 - the **sub-frame tie-rod upper bolt (21 N.m)**.
- Refit:
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

D4F, and 780 or 782, and STANDARD HEATING

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the filler neck,
- the filler neck bolt.

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

K4M

Tightening torques

tensioning roller	40 N.m
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WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

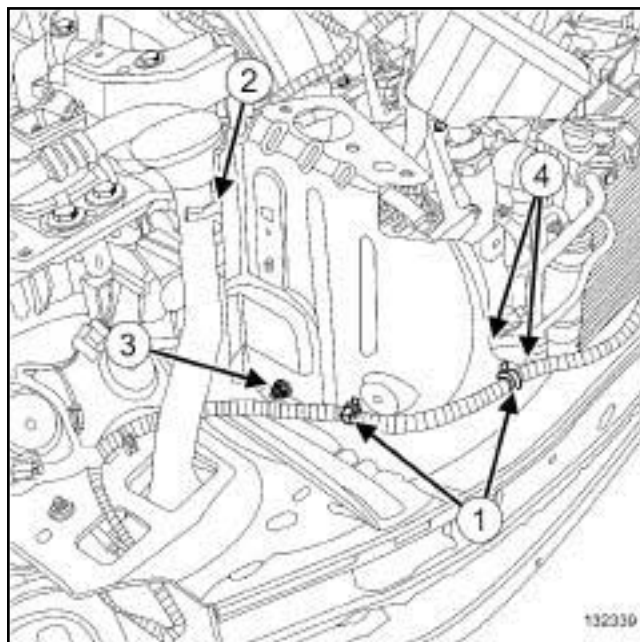
IMPORTANT

Wear cut-resistant gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure).

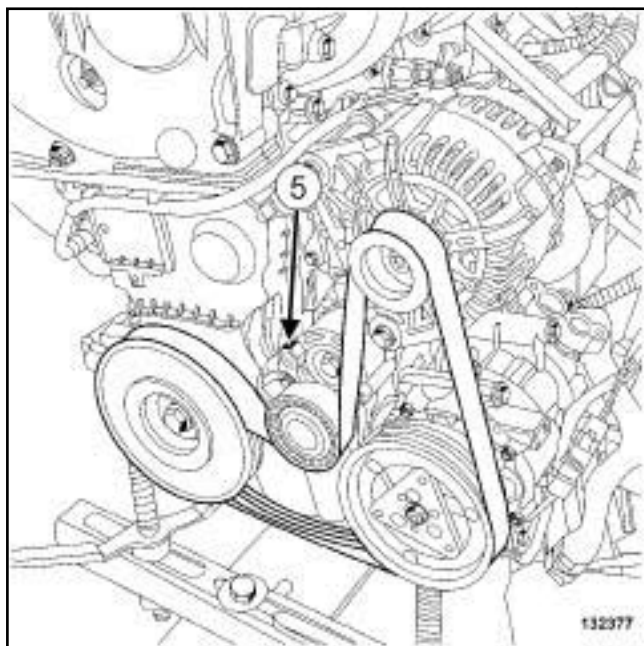


132339

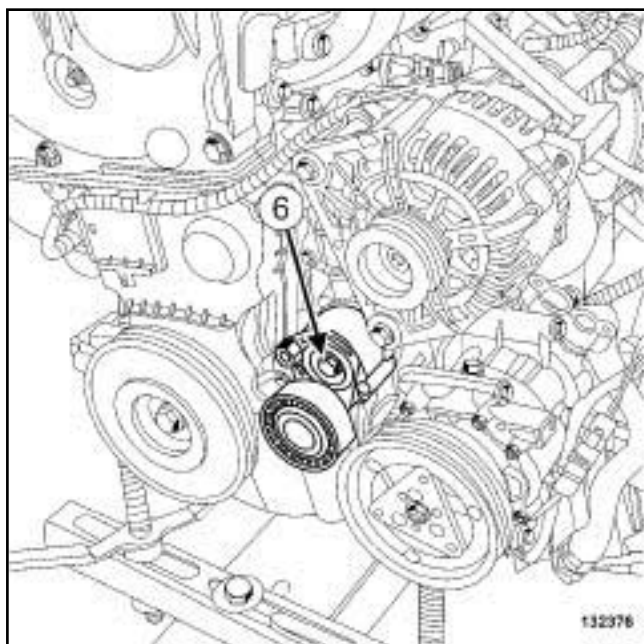
- Unclip:
 - the wiring at (1) ,
 - the windscreen washer bottle filler neck at (2) ,
 - the air conditioning pipe from the right-hand headlight carrier panel.
- Remove:
 - the nut (3) from the right-hand headlight carrier panel,
 - the bolts (4) from the right-hand headlight carrier panel,
 - the right-hand headlight carrier panel.

K4M

II - REMOVAL OPERATION



- Turn the accessories belt tensioning roller clockwise using a **16 mm** spanner (**5**) .
- Remove the accessories belt.



- Remove:
 - the tensioning roller bolt (**6**) ,
 - the tensioning roller.

REFITTING

I - REFITTING PREPARATION OPERATION

- Use a brush to remove any deposits from the crankshaft pulley V-grooves.
- parts always to be replaced: Accessories belt.**
- parts always to be replaced: Accessories belt tensioning roller.**

II - REFITTING OPERATION

- Refit a new tensioning roller.
- Torque tighten the **tensioning roller (40 N.m)**.
- Turn the accessories belt tensioning roller clockwise using a **16 mm** spanner.
- Refit a new accessories belt.
- Gently release the tensioning roller.
- Rotate the crankshaft clockwise twice to balance the accessories belt tension on all pulleys.

III - FINAL OPERATION

- Refit the right-hand headlight carrier panel.
- Clip:
 - the air conditioning pipe on the right-hand headlight carrier panel,
 - the screen washer bottle filler neck,
 - the wiring.
- Refit:
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray.

TOP AND FRONT OF ENGINE

Accessories belt: Removal - Refitting

11A

K4M

- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE

Crankshaft accessories pulley: Removal - Refitting

11A

D4F or D7F, and AIR CONDITIONING or STANDARD HEATING

Special tooling required

Mot. 582-01 Flywheel locking tool.

Tightening torques

crankshaft accessories pulley bolt	40 N.m + 75° ± 6
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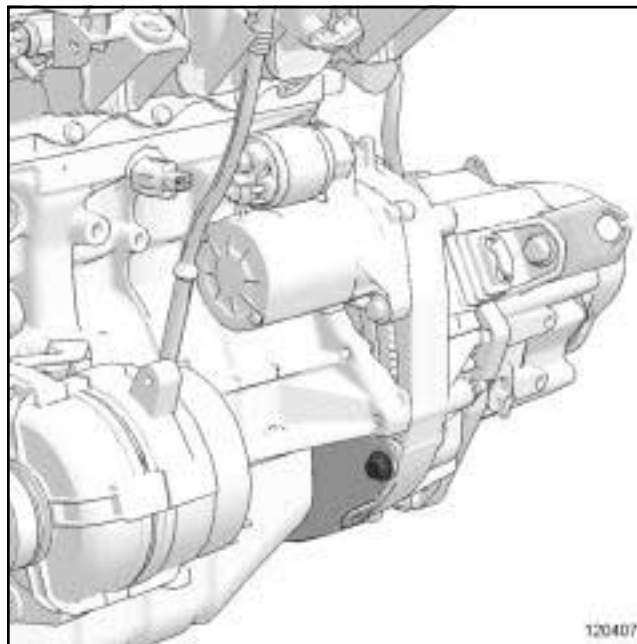
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**).

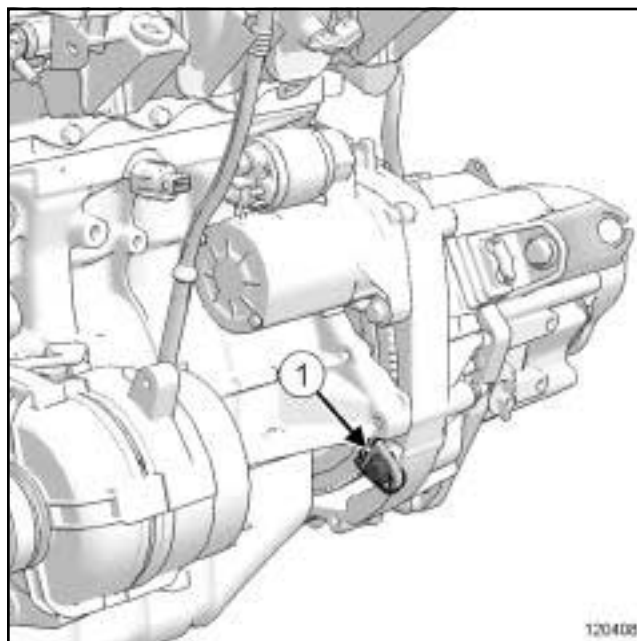
II - OPERATION FOR REMOVAL OF PART CONCERNED

D4F, and 772 – D7F



120407

- Remove the flywheel protector.



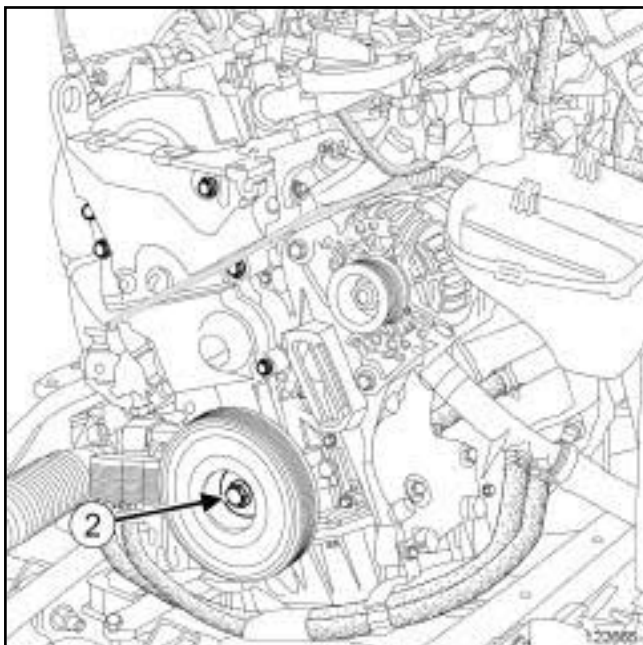
120408

- Fit the immobilising tool (1) (**Mot. 582-01**).

D4F or D7F, and AIR CONDITIONING or STANDARD HEATING

D4F, and 780 or 782

- Lock the flywheel by inserting a large flat-blade screwdriver into the gearbox aperture.



122665

- Remove:
 - the accessories pulley bolt (2) ,
 - the accessories pulley.

REFITTING

I - REFITTING PREPARATION OPERATION

- Clean the crankshaft accessories pulley V-grooves with a brush to prevent any deposits.

WARNING

Only use brushes with plastic or non-corrosive metal (brass) bristles.

AIR CONDITIONING

- parts always to be replaced: Accessories belt,**
- parts always to be replaced: Accessories belt tensioning roller,**
- parts always to be replaced: Accessories tensioning roller bolt** (to be replaced by the hexagonal head bolt, part no. **77 03 101 075**),
- parts always to be replaced: Crankshaft accessories pulley bolts.**

STANDARD HEATING

- parts always to be replaced: Accessories belt,**
- parts always to be replaced: Crankshaft accessories pulley bolts.**

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the crankshaft accessories pulley using a new bolt.
- Torque tighten the **crankshaft accessories pulley bolt (40 N.m + 75° ± 6)**.

D4F, and 780 or 782

- Remove the large flat screwdriver from the opening in the gearbox.

D4F, and 772 – D7F

- Remove the immobilising tool (**Mot. 582-01**).
- Refit the flywheel protector.

III - FINAL OPERATION

- Refit:
 - the accessories belt (see 11A, **Top and front of engine, Accessories belt: Removal - Refitting, page 11A-3**) ,

TOP AND FRONT OF ENGINE

Crankshaft accessories pulley: Removal - Refitting


11A

D4F or D7F, and AIR CONDITIONING or STANDARD HEATING

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray.

Crankshaft accessories pulley: Removal - Refitting

C44, and K9K

Tightening torques 	
crankshaft accessories pulley bolt	80 Nm

PARTS AND CONSUMABLES FOR THE REPAIR WORK

Parts always to be replaced:

- accessories belt,
- accessories belt auto tensioner,
- accessories belt auto tensioner bolt.

REMOVAL

I - REMOVAL PREPARATION OPERATION

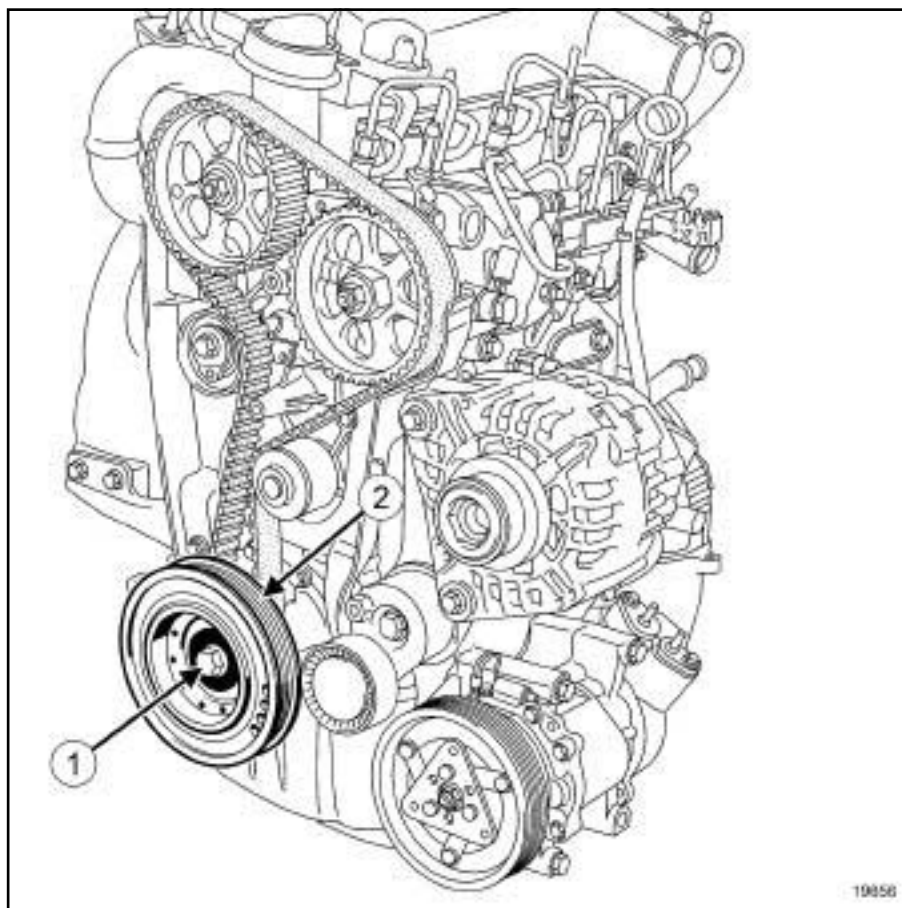
- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).

- Disconnect the battery ((see **Battery: Removal - Refitting**)).

Remove:

- the front right-hand wheel ((see **Wheel: Removal - Refitting**)),
- the front right-hand wheel arch liner ((see **Front wheel arch liner: Removal - Refitting**)),
- the accessories belt (see 11A, **Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the accessories belt auto tensioner.

II - OPERATION FOR REMOVAL OF PART CONCERNED



Remove:

- the crankshaft position sensor (see 13B, **Diesel injection, Crankshaft position sensor: Removal -**

Refitting, page 13B-15) ,

Crankshaft accessories pulley: Removal - Refitting

C44, and K9K

- the crankshaft accessories pulley bolt (1) , locking the flywheel using a flat screwdriver at the point of the crankshaft position sensor,
- the crankshaft accessories pulley (2) .

REFITTING**I - REFITTING PREPARATIONS OPERATION**

- If reusing the crankshaft accessories pulley, clean the pulley V-grooves with a brush to eliminate any deposits.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the crankshaft accessories pulley,
 - the crankshaft accessories pulley bolt.
- Torque tighten the **crankshaft accessories pulley bolt (80 Nm)**, locking the flywheel using a flat screwdriver at the point of the crankshaft position sensor.
- Refit the crankshaft position sensor (see **13B, Diesel injection, Crankshaft position sensor: Removal - Refitting**, page **13B-15**) .

III - FINAL OPERATION.

- Refit:
 - the new accessories belt auto tensioner,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**) .
- Refit:
 - the front right-hand wheel arch liner ((see **Front wheel arch liner: Removal - Refitting**)),
 - the front right-hand wheel ((see **Wheel: Removal - Refitting**)).
- Connect the battery ((see **Battery: Removal - Refitting**)).

TOP AND FRONT OF ENGINE

Crankshaft accessories pulley: Removal - Refitting

11A

K4M

Tightening torques

crankshaft accessories pulley bolts	120 N.m + 95° ± 10°
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IMPORTANT

Wear cut-resistant gloves during the operation.

WARNING

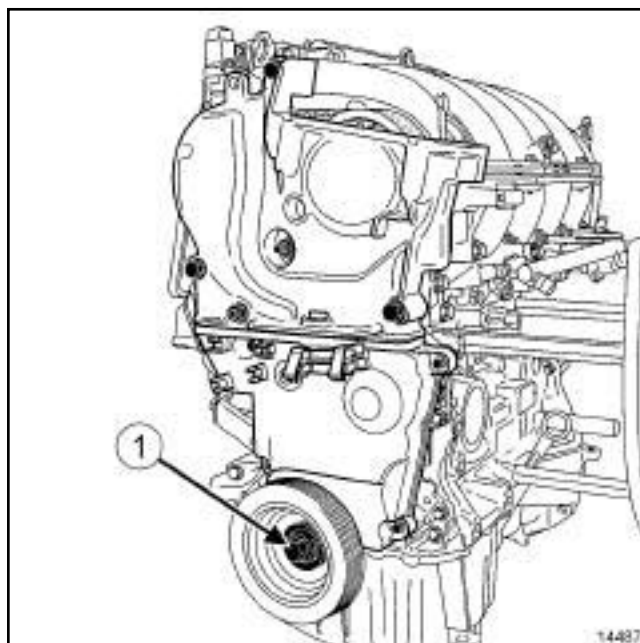
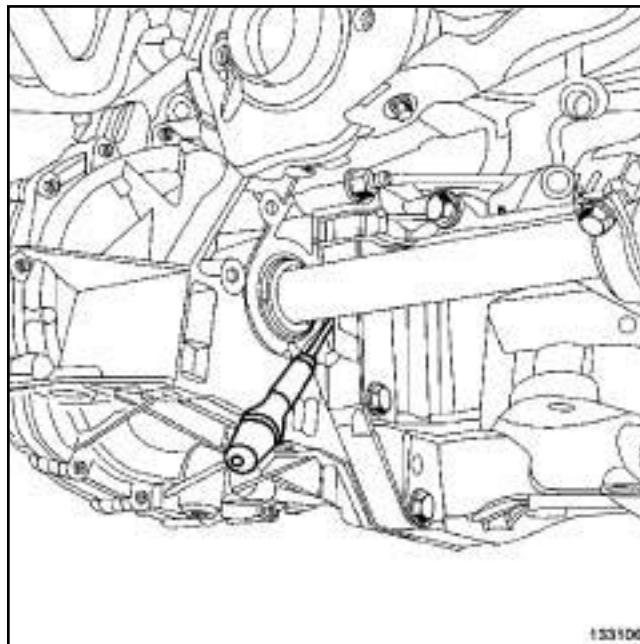
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray,
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the accessories belt (see 11A, **Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3).

II - REMOVAL OPERATION



- Remove:
 - the bolt (1) from the crankshaft accessories pulley by locking the flywheel using a screwdriver,
 - the crankshaft accessories pulley.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Crankshaft accessories pulley bolts.

Crankshaft accessories pulley: Removal - Refitting

K4M

- Use a brush to remove any deposits from the crankshaft accessories pulley V grooves.

II - REFITTING OPERATION

- Refit the crankshaft accessories pulley.
- Tighten to torque and angle the **crankshaft accessories pulley bolts (120 N.m + 95° ± 10°)** by locking the engine flywheel using a flat-blade screwdriver.

III - FINAL OPERATION

- Refit:
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-3**).
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE


Timing belt: Removal - Refitting

11A

D7F, and 800

Special tooling required	
Mot. 1379	Engine support tool for cylinder head operations.
Mot. 1054	TDC setting pin.
Mot. 1386	Tool for pre-tensioning the timing belt.
Mot. 1135-01	Timing belt tensioner.
Mot. 1715	Belt tension checking tool (frequency indicator).
Mot. 1505	Belt tension setting tool (frequency meter)

Equipment required
torque wrench

Tightening torques 	
tensioning roller nut	50 N.m
upper timing cover bolts	33 N.m

PARTS AND CONSUMABLES FOR THE REPAIR WORK

Parts always to be replaced:

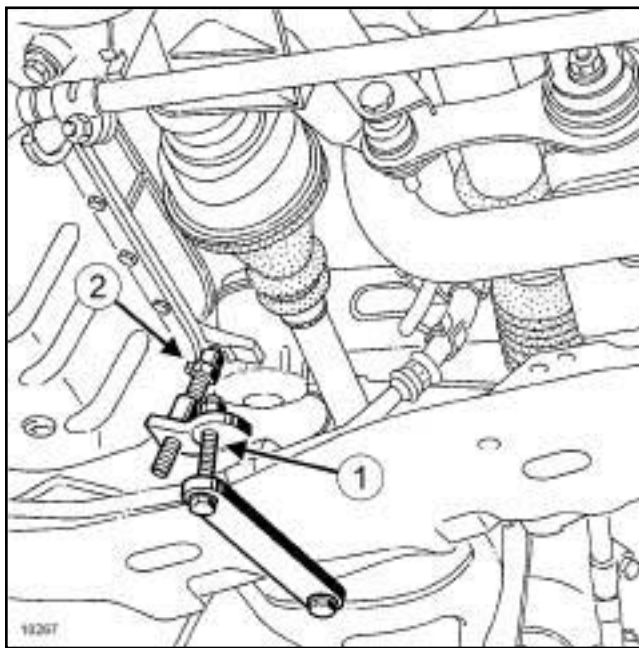
- the timing belt,
- the tensioning roller,
- the accessories pulley bolt.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**).
- Disconnect the battery ((see **Battery: Removal - Refitting**)).
- Remove:
 - the front right-hand wheel arch liner (see) (see) ,
 - the front right-hand wheel ((see **Wheel: Removal - Refitting**)),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**) ,

- the accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-20**) ,
- the rear suspended engine mounting (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**) .



10267

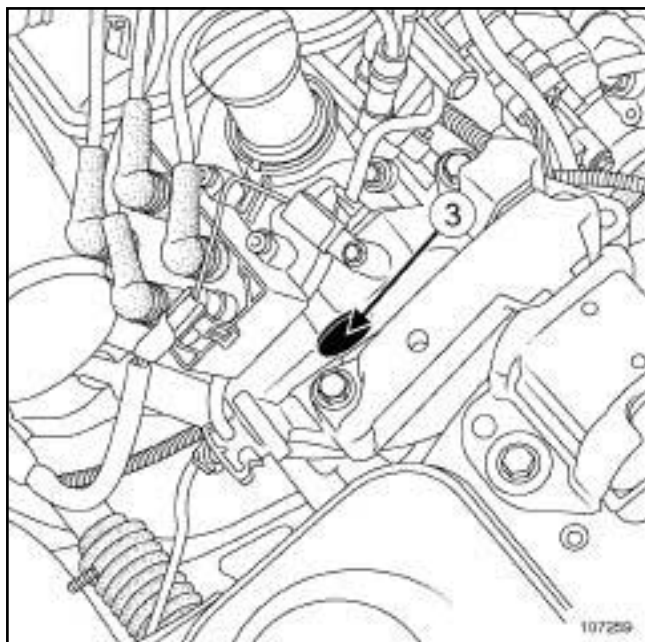
- Set up the engine support tool (**Mot. 1379**) (1) .
- Tighten the bolt (2) to pre-stress the engine stand.
- Remove the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) .

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

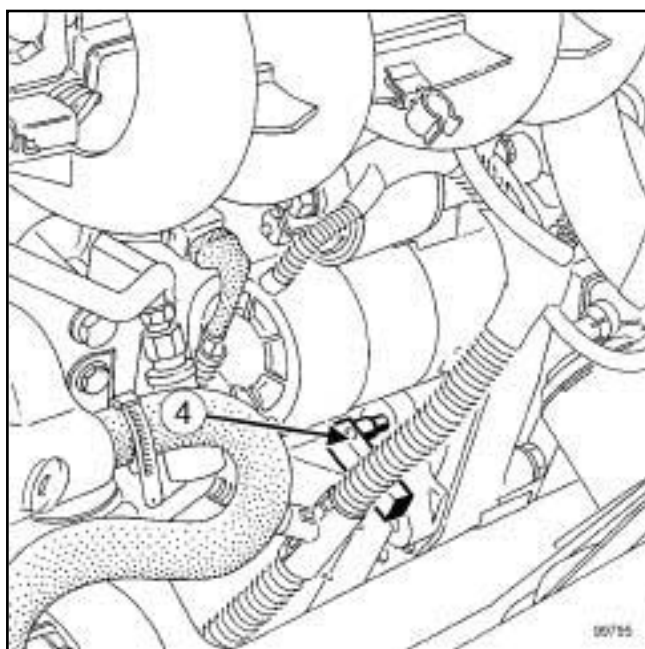
11A

D7F, and 800



107259

- Remove the cap (3) from the upper timing cover.
- Turn the engine clockwise (timing end) until the mark on the camshaft sprocket is aligned with the mark on the upper timing cover.

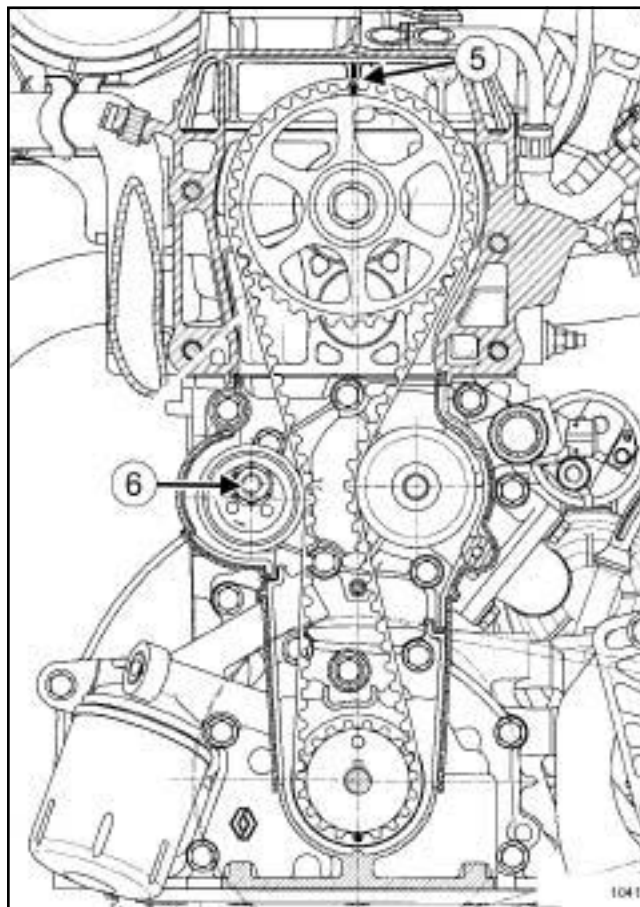


99795

- Insert the TDC setting pin (**Mot. 1054**) (4)
- Remove the ignition interference suppressor.
- Disconnect the fuel supply pipe.
- Remove the following covers:
 - upper timing,
 - middle timing,

- lower timing.

II - REMOVAL OF PART CONCERNED



1041

- Make a marking on the rocker cover (5) in line with the camshaft sprocket mark
- Undo the tensioning roller nut (6) .
- Remove the timing belt.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

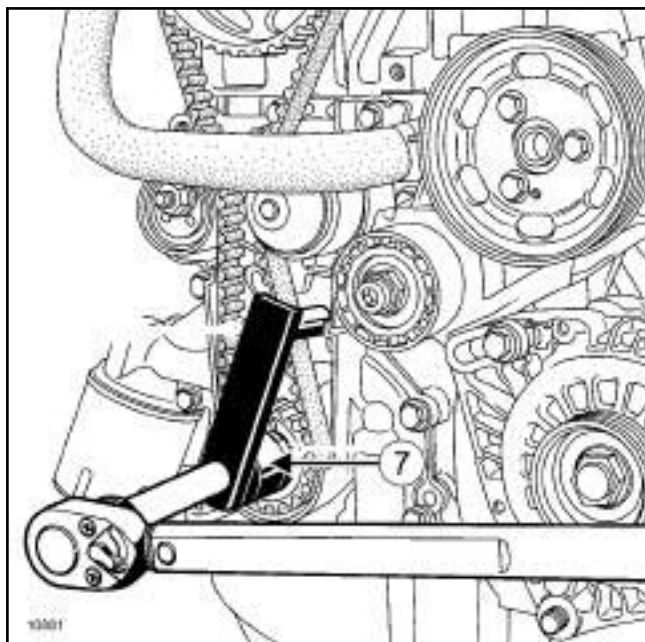
- Line up the marks on the timing belt with those on the camshaft sprocket and crankshaft sprocket.
- Refit:
 - the new timing belt,
 - the new tensioning roller.
- Tighten the tensioning roller.
- Remove the TDC setting rod (**Mot. 1054**).

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

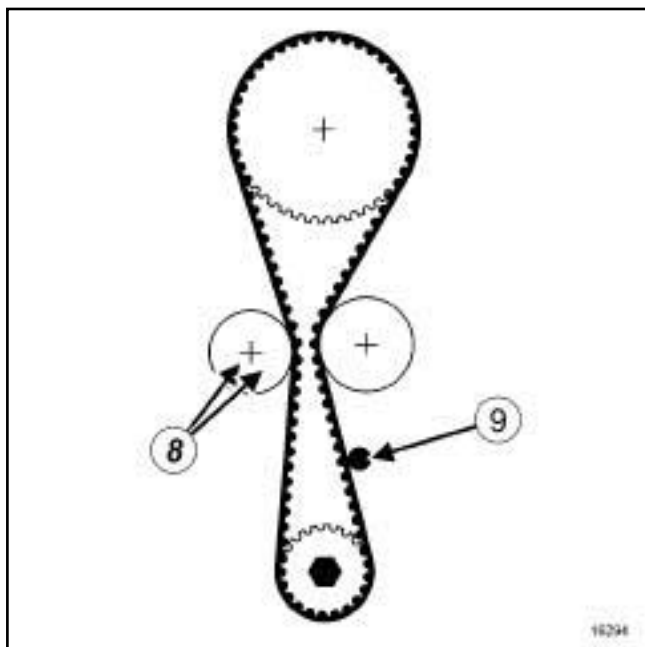
11A

D7F, and 800



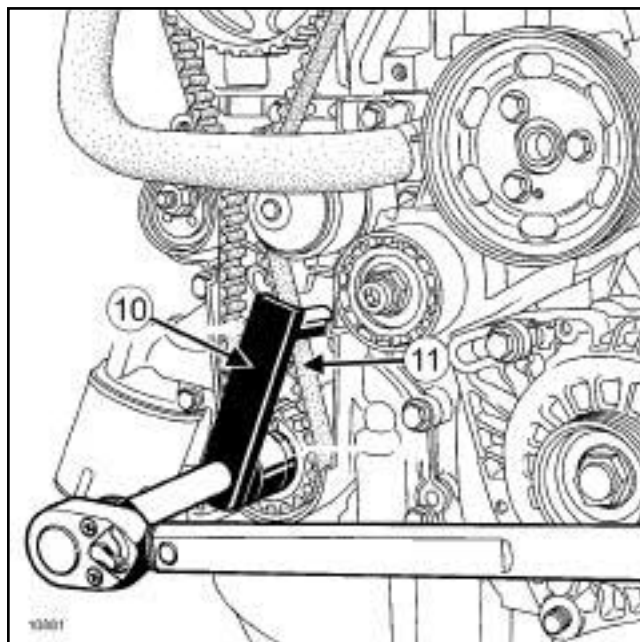
10881

- Position the spacer (7) of the timing belt pre-tensioning tool (Mot. 1386).



16294

- Position the timing belt tensioner (Mot. 1135-01) at (8) on the tensioning roller.
- Turn the tensioning roller anti-clockwise until a belt tension of 139 ± 3 Hz is obtained with frequency meter (Mot. 1715) (9) or (Mot. 1505).
- Tighten the tensioning roller nut.



10881

- Position the (Mot. 1386) (10).
- Apply a pretensioning torque to the timing belt section (11) using a torque wrench set to 10 Nm.
- Make sure that the timing belt tension is 139 ± 3 Hz using the frequency meter (Mot. 1715) or (Mot. 1505) : otherwise, adjust it using the (Mot. 1135-01).
- Torque tighten the tensioning roller nut (50 N.m).
- Turn the crankshaft through four revolutions.
- Set the timing using the TDC setting pin (Mot. 1054).
- Apply a pretensioning torque to the timing belt section (11) using a torque wrench set to 10 Nm.
- Make sure that the timing belt tension is 139 ± 3 Hz using the frequency meter (Mot. 1715) or (Mot. 1505) : otherwise, adjust it using the (Mot. 1135-01).

II - FINAL OPERATION

- Refit the timing covers.
- Torque tighten clockwise the upper timing cover bolts (33 N.m).
- Refit:
 - the right-hand suspended engine mounting (see 19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-13) ,
 - the accessories pulley (see 11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting, page 11A-20) ,

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

D7F, and 800

- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-3**),
 - the front right-hand wheel arch liner (see **MR 412 Bodywork, 55A, Exterior protection, Front wheel arch liner: Removal-Refitting**),
 - the front right-hand wheel ((see **Wheel: Removal - Refitting**) .
- Connect the battery ((see **Battery: Removal - Refitting**) .

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

D4F

Special tooling required

Mot. 1379	Engine support tool for cylinder head operations.
Mot. 1054	TDC setting pin.

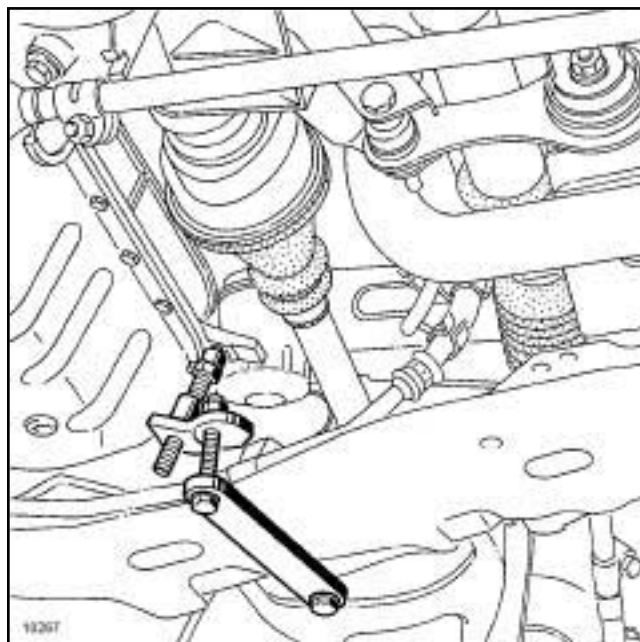
Tightening torques

tensioning roller nut	24 N.m
lower timing cover bolt	10 N.m
intermediate timing cover bolts	10 N.m
upper timing cover bolts	37 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the rear suspended engine mounting (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) .



10267

- Set up the engine support tool (**Mot. 1379**), shifting the engine forwards.
- Lift the engine slightly using the (**Mot. 1379**).
- Remove:
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) .
- Refit the crankshaft accessories pulley bolt.
- Unclip the fuel pipe from the upper timing cover.

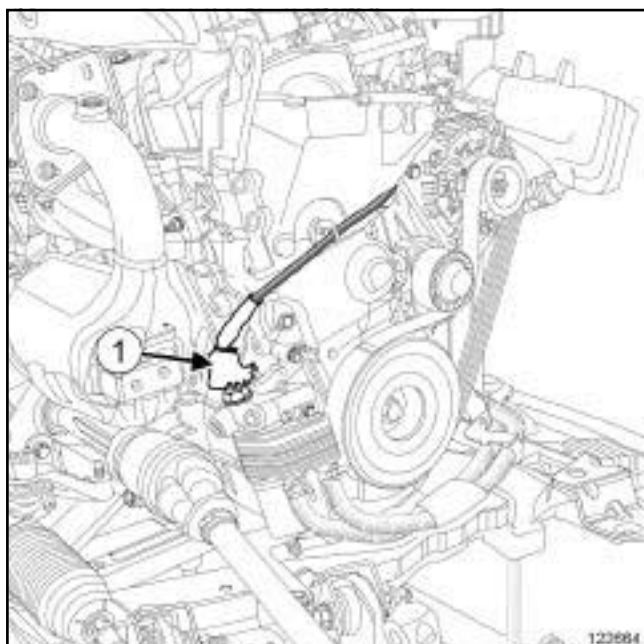
TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

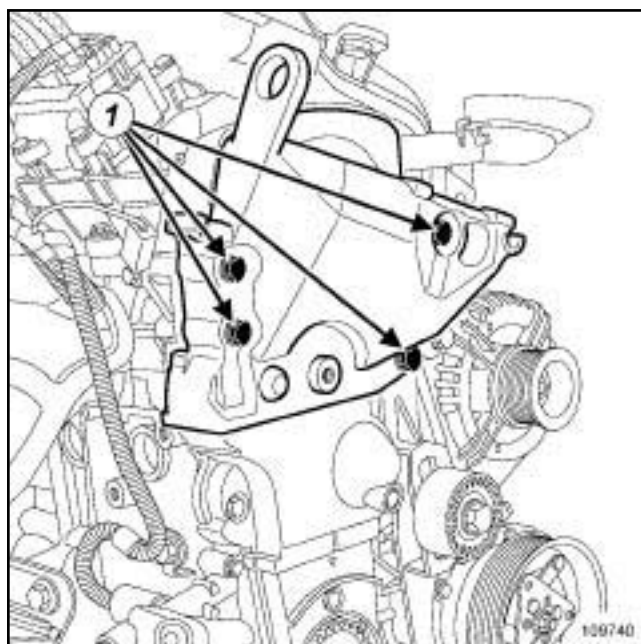
11A

D4F

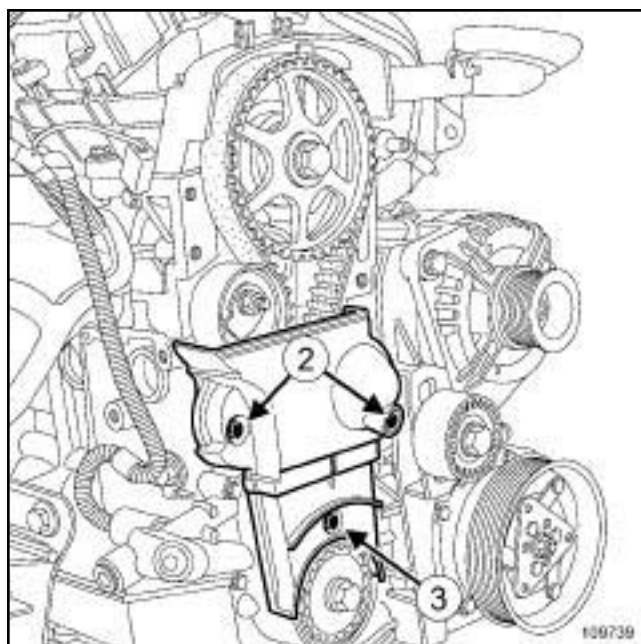
D4F, and 780 or 782



- Move the flexible heat shield away from the oil pressure sensor connector.
- Disconnect the oil pressure sensor connector (1) .
- Unclip the oil pressure sensor wiring from the upper timing cover.
- Move the oil pressure sensor connector to one side.



- Remove:
 - the bolts (1) from the upper timing cover,
 - the upper timing cover.



- Remove:
 - the intermediate timing cover bolts (2) ,
 - the timing intermediate housing,
 - the lower timing cover bolt (3) ,
 - the lower timing cover.

TOP AND FRONT OF ENGINE

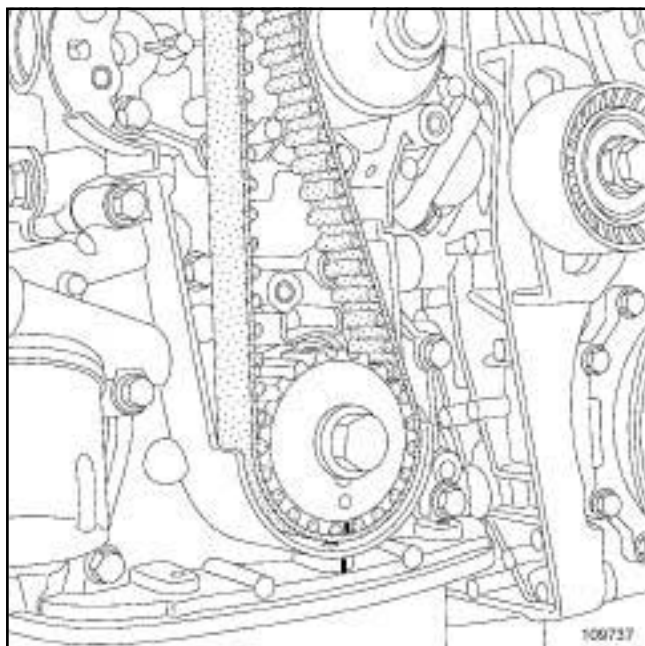
Timing belt: Removal - Refitting

11A

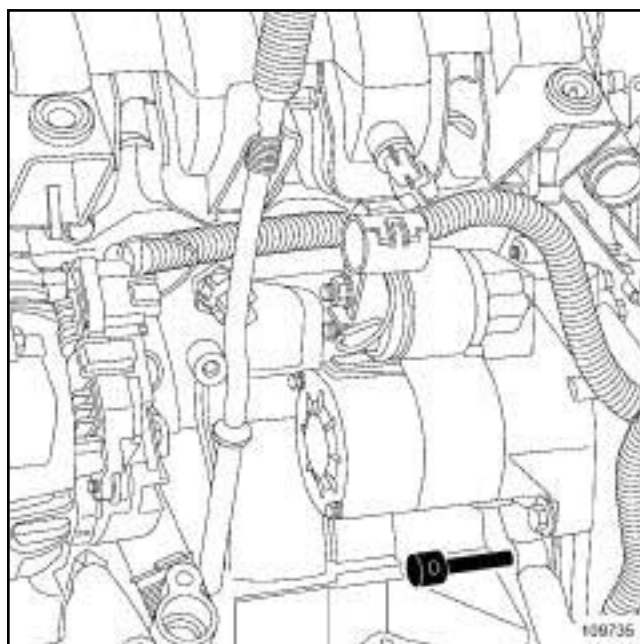
D4F

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Adjusting the timing



- ❑ Turn the crankshaft clockwise (timing end). Stop a half-tooth before the crankshaft sprocket mark is lined up with the fixed marking.



❑

Note:

Certain vehicles are fitted with a flywheel protector positioned on the setting opening.

In this case, it is necessary to remove the starter and protector to be able to insert the TDC setting pin.

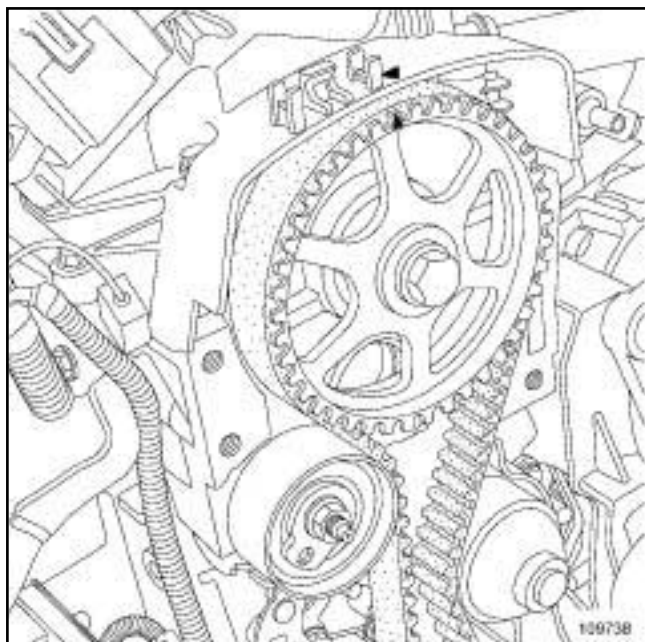
- ❑ Insert the TDC setting pin (**Mot. 1054**).
- ❑ Turn the crankshaft clockwise until it is stopped.

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

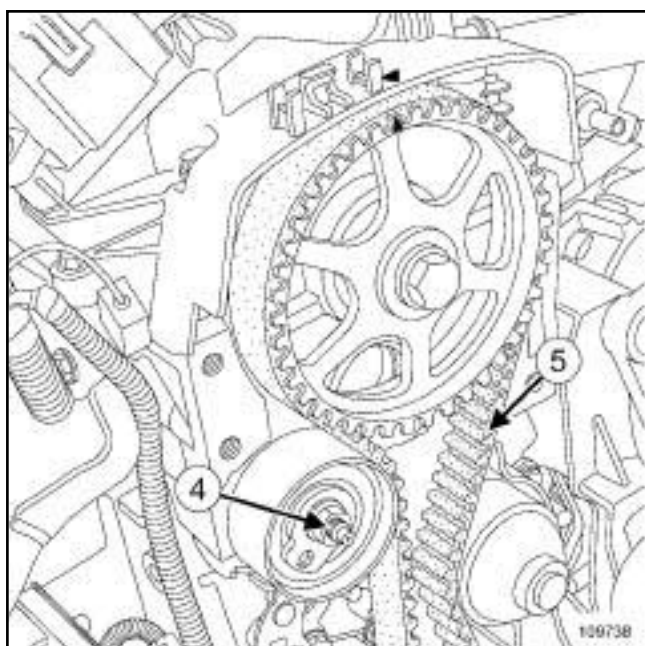
D4F



109738

- ❑ Make sure that the mark on the camshaft sprocket and the mark on the crankshaft sprocket are aligned with their fixed markings.

2 - Removing the timing belt



109738

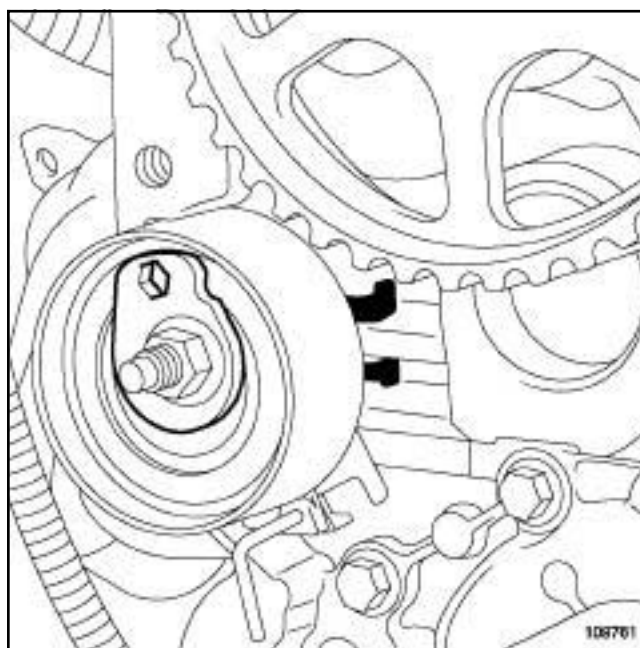
- ❑ Remove:
 - the nut (4) from the tensioning roller,
 - the tensioning roller,
 - the timing belt (5) .

REFITTING

I - REFITTING PREPARATION OPERATION

- ❑ parts always to be replaced: Timing belt,
 - parts always to be replaced: Timing belt tensioning roller,
 - parts always to be replaced: Crankshaft accessories pulley bolts.

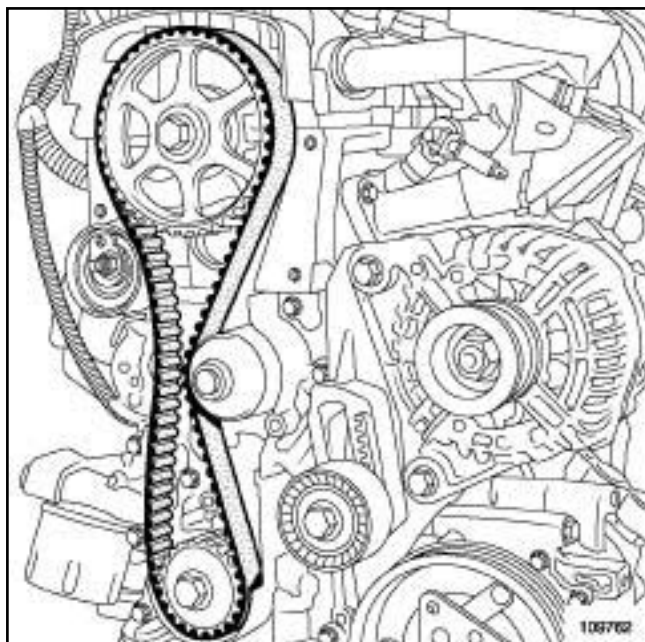
II - REFITTING OPERATION FOR PART CONCERNED



109761

- ❑ Refit the new tensioning roller, making sure:
 - that the cylinder head ribbing is between the two tensioning roller lugs,
 - that the tensioning roller pin is properly positioned,
 - that the tensioning roller is positioned as in the diagram.
- ❑ Do not remove the pin from the new tensioning roller before refitting the timing belt.
- ❑ Screw on the tensioning roller nut without tightening it.

D4F



109762

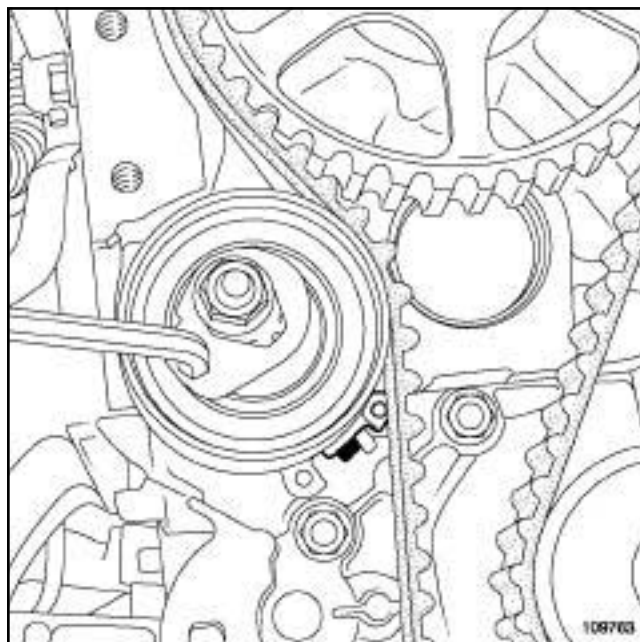
Refit the new timing belt:

- by lining up the crankshaft sprocket mark with the mark on the inside of the timing belt,
- by lining up the camshaft sprocket mark with the mark on the outside of the timing belt.

Procedure for tensioning timing belt

Remove:

- the TDC setting pin,
- the tension wheel pin.



109763

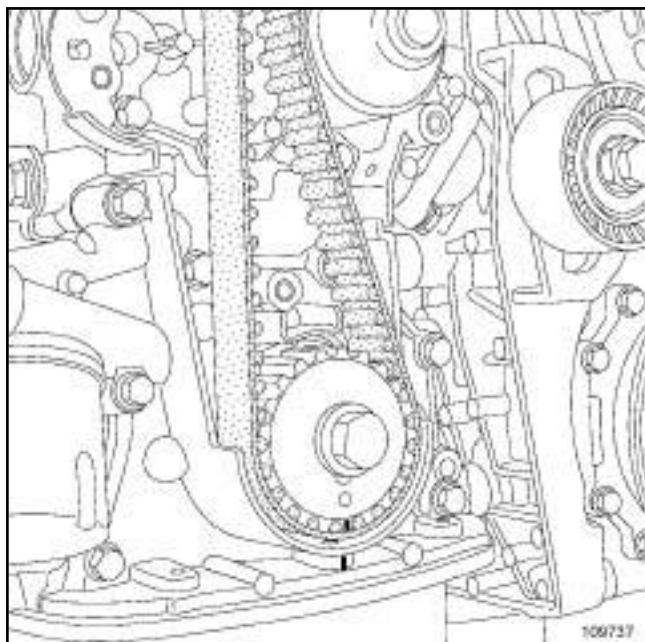
- Turn the tensioning roller eccentric anti-clockwise, using a **6 mm** Allen key, to bring the adjustable index level with the fixed index.
- Torque tighten the **tensioning roller nut (24 N.m)**.
- Rotate the crankshaft through six revolutions in a clockwise direction (timing end).
- Set the timing using the TDC setting pin (**Mot. 1054**).

TOP AND FRONT OF ENGINE

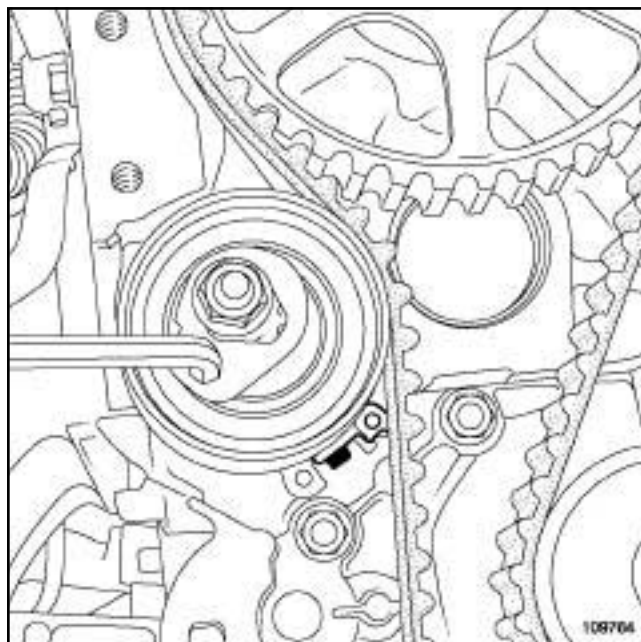
Timing belt: Removal - Refitting

11A

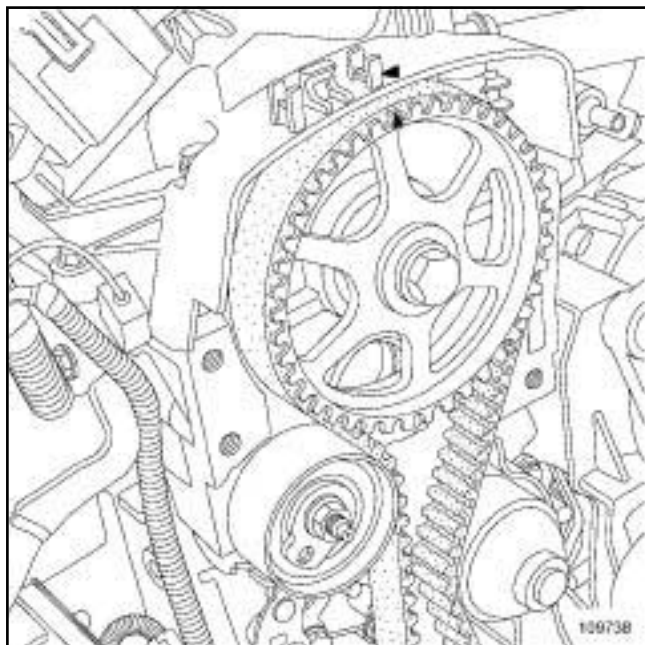
D4F



109737



109764



109738

- ❑ Make sure that the mark on the camshaft sprocket and the mark on the crankshaft sprocket are aligned with their fixed markings.
- ❑ Remove the TDC setting rod (**Mot. 1054**).

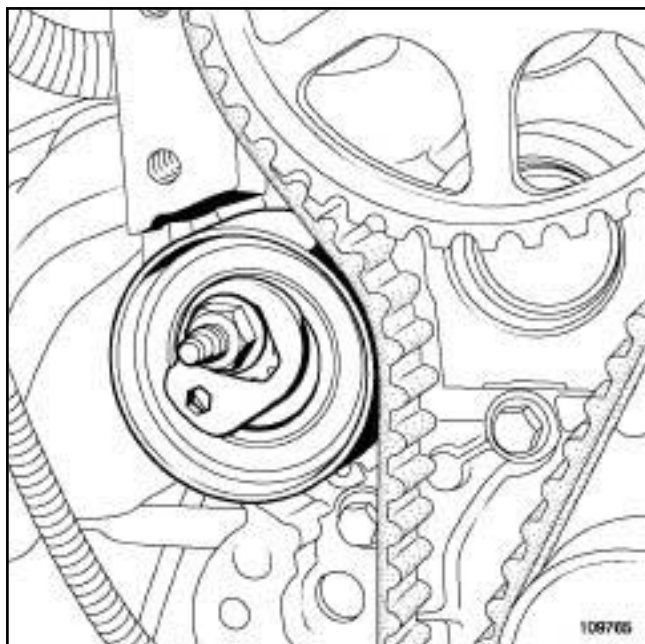
- ❑ Loosen the tensioning roller nut up to one turn, maintaining the position of the tensioning roller eccentric using a **6 mm** Allen key.
- ❑ Turn the tensioning roller eccentric clockwise, using a **6 mm** Allen key, to bring the adjustable index to the centre of the two fixed indexes.
- ❑ Torque tighten the **tensioning roller nut (24 N.m)**, maintaining the position of the eccentric using a **6 mm** Allen key.

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

D4F



109765

- Check that the tensioning roller does not come into contact with the cylinder head.
- If the tensioning roller is in contact with the cylinder head:
 - set the engine to Top Dead Centre,
 - remove the tensioning roller and the timing belt,
 - insert the tensioning roller pin,
 - repeat the timing belt refitting method from the beginning, step by step.

III - FINAL OPERATION

- Refit:
 - the lower timing cover,
 - the lower timing cover bolt,
 - the timing intermediate housing,
 - the intermediate timing cover bolts,
 - the upper timing cover,
 - the upper timing cover.
- Torque tighten:
 - the **lower timing cover bolt (10 N.m)**,
 - the **intermediate timing cover bolts (10 N.m)**,
 - the **upper timing cover bolts (37 N.m)**

D4F, and 780 or 782

- Fit the oil pressure sensor connector.
 - Clip the oil pressure sensor wiring on the upper timing cover.
 - Connect the oil pressure sensor connector.
 - Fit the flexible heat shield on the oil pressure sensor connector.
-
- Clip the fuel pipe on to the upper timing cover.
 - Refit:
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**),
 - the rear suspended engine mounting (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**).
 - Remove the tool (**Mot. 1379**).
 - Refit:
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-20**),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
 - Connect the battery (see) (80A, Battery).


TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K9K

Special tooling required	
Mot. 1672	Lower engine support.
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

Tightening torques 	
tensioning roller bolt	27 N.m
camshaft pulley wheel bolts	14 N.m
TDC setting pin plug	25 N.m
cylinder head suspended mounting bolts	25 Nm

IMPORTANT

Wear protective gloves during the operation.

WARNING

The belt must be replaced with a new one if it has been removed.

WARNING

When replacing the belt, always replace the tension wheels and idler pulleys.

WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Remove:

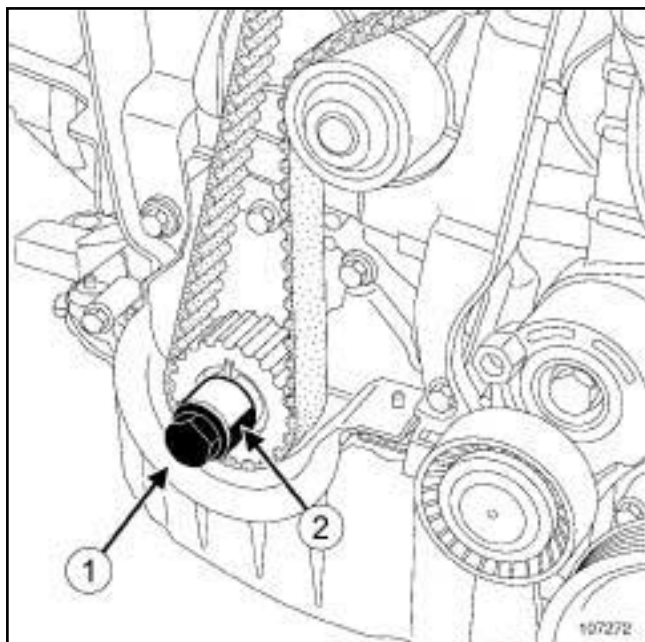
- the engine cover,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the halogen headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-14) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) .

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

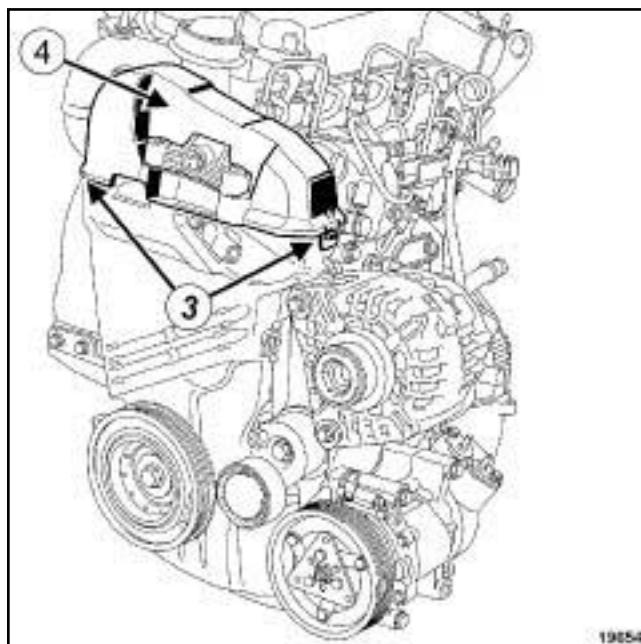
K9K



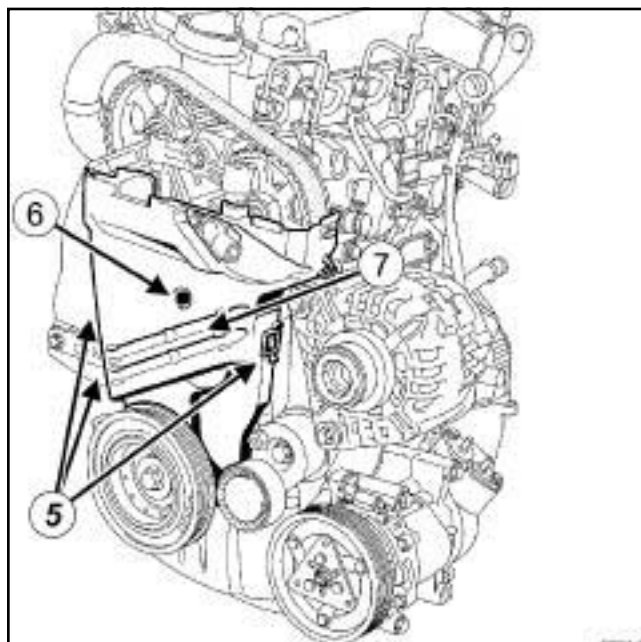
107272

- ❑ Refit the old crankshaft accessories pulley bolt (1) fitted with a spacer (2) (which does not cover the timing sprocket mark).

K9K, and 740



19654



19654-1

- ❑ Unclip the upper timing cover at (3) .
- ❑ Remove the upper timing cover (4) .
- ❑ Raise the engine using the lower tool (**Mot. 1672**).
- ❑ Unclip the lower timing cover at (5) .
- ❑ Lower the engine using the lower tool (**Mot. 1672**).
- ❑ Remove:
 - the plastic clip (6) from the lower timing cover,

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K9K

- the lower timing cover (7) .



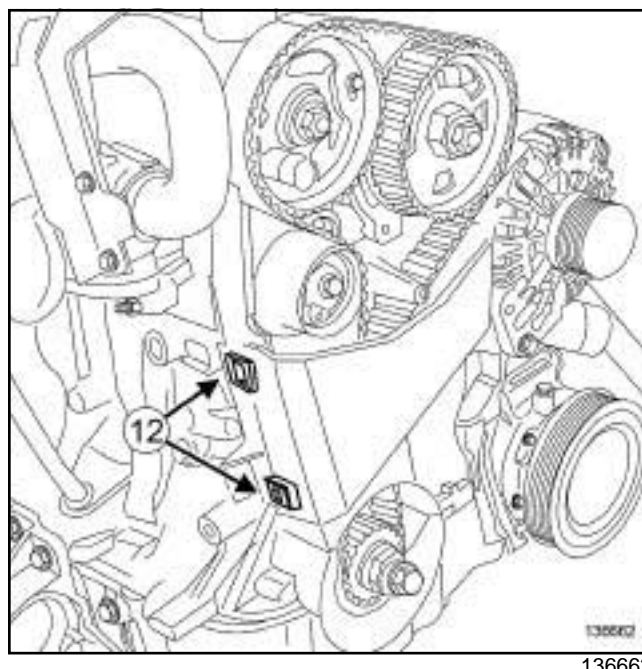
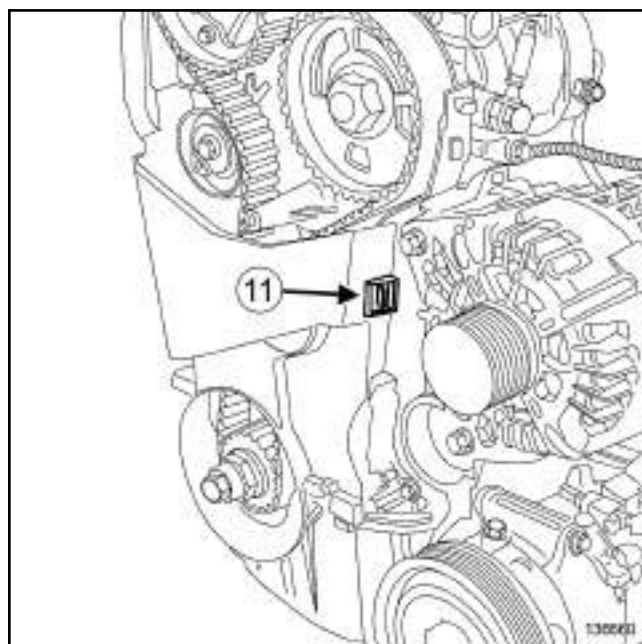
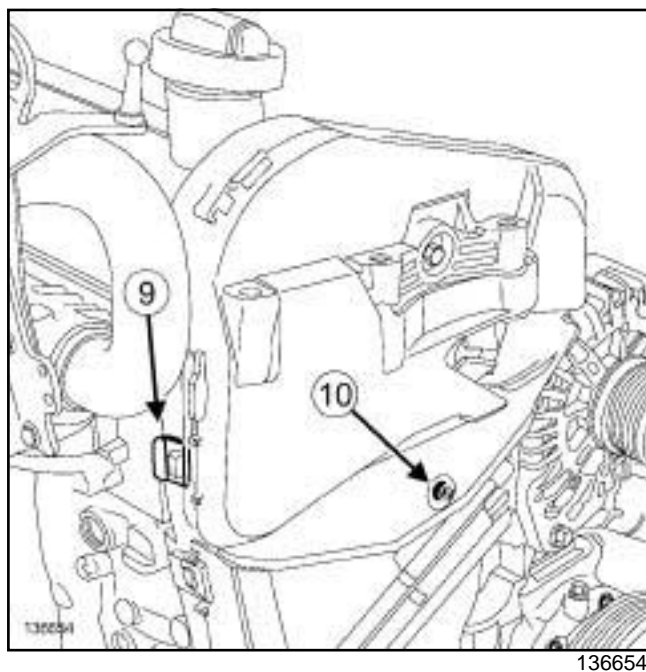
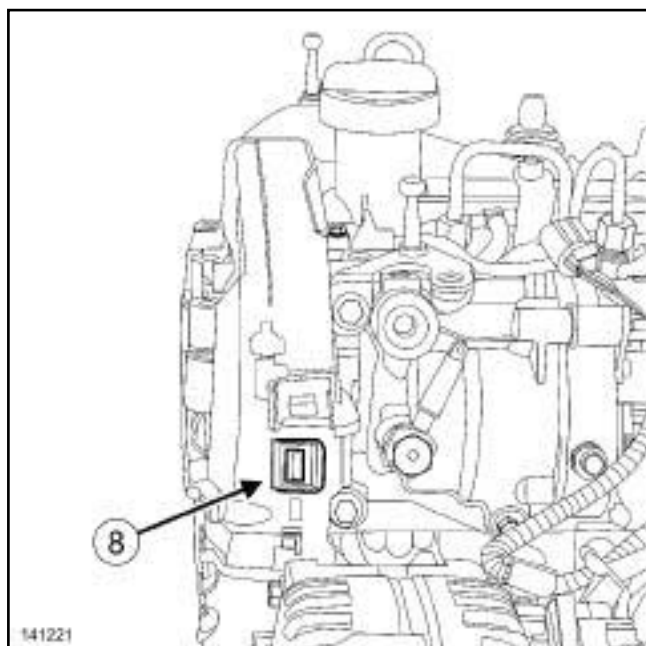
TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K9K

K9K, and 718



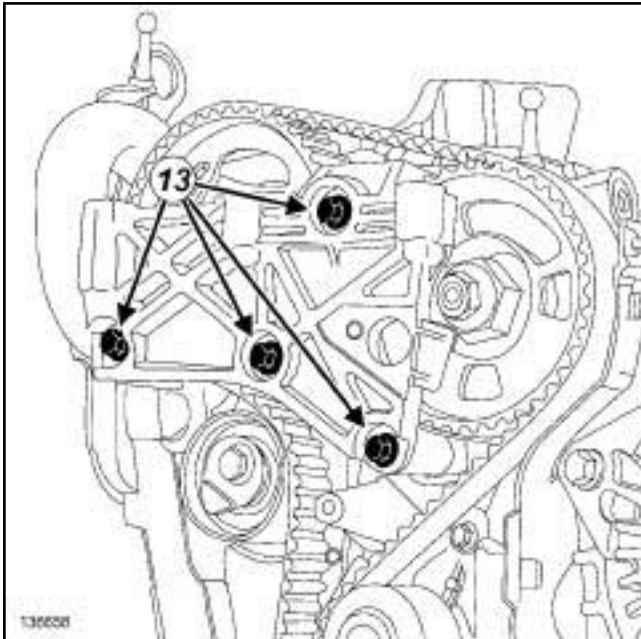
- Unclip the upper timing cover at (8) and (9)
- Remove:
 - the plastic clip (10) from the upper timing cover,
 - the upper timing cover.
- Unclip the lower timing cover at (11) and (12) .
- Remove the lower timing cover.
- Raise the engine using the lower tool (**Mot. 1672**).

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

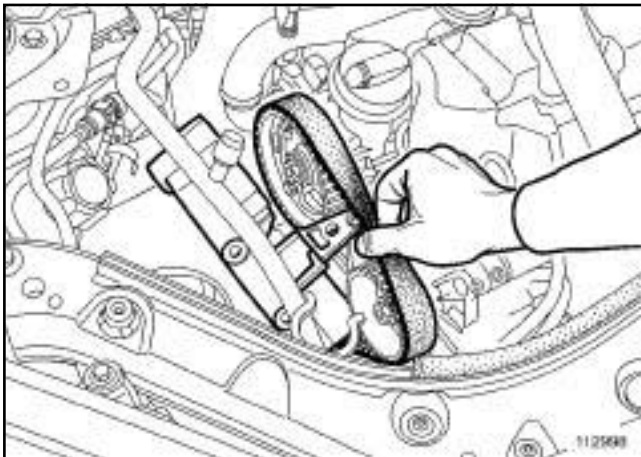
11A

K9K



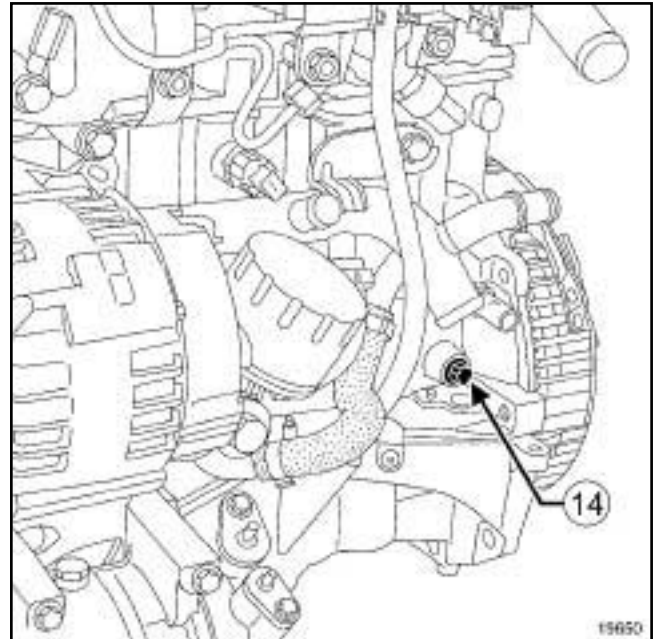
136658

- ❑ Remove the bolts (13) from the suspended mounting on the cylinder head.



112998

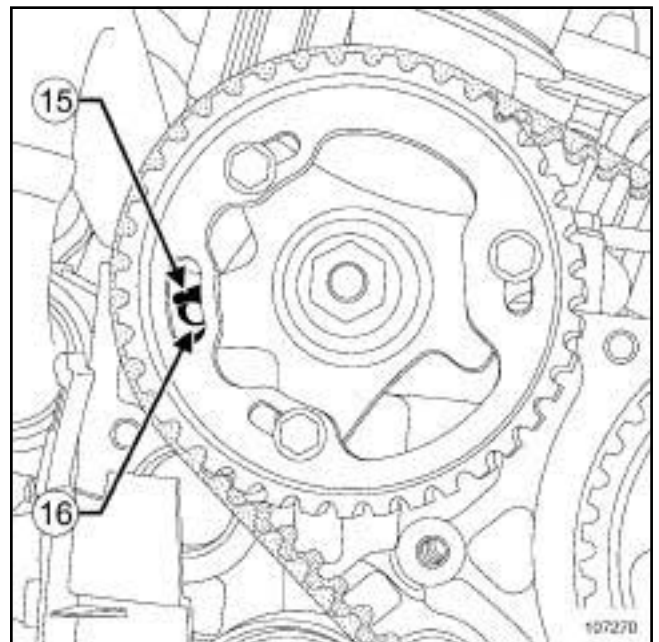
- ❑ Twist the timing belt slightly (to facilitate removing the suspended mounting from the cylinder head).
- ❑ Remove the suspended mounting from the cylinder head.



19650

- ❑ Remove the plug (14) from the TDC setting pin.

II - OPERATION FOR REMOVAL OF PART CONCERNED



107270

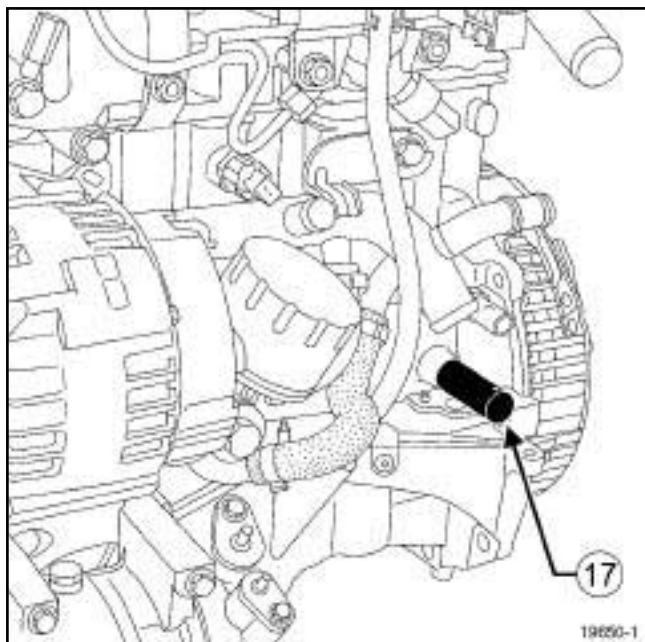
- ❑ Turn the crankshaft to position the camshaft pulley hole (15) almost opposite the cylinder head hole (16)

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

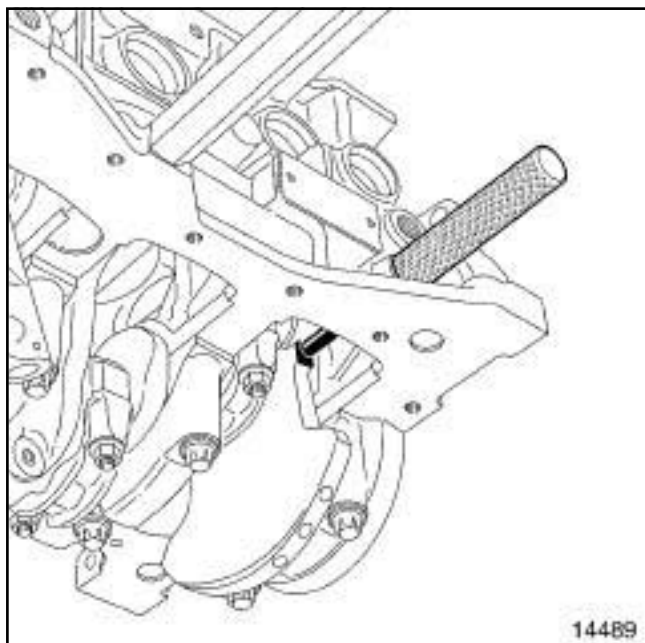
11A

K9K



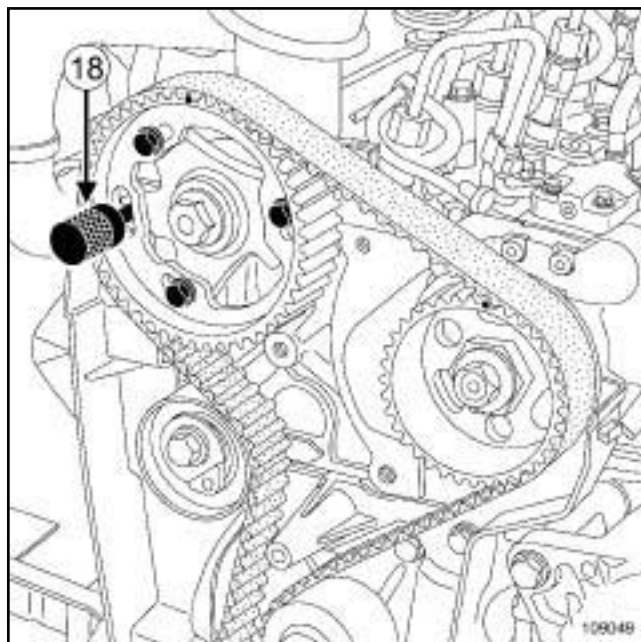
19650-1

- ❑ Fit the tool (**Mot. 1489**) (17) on the cylinder block.



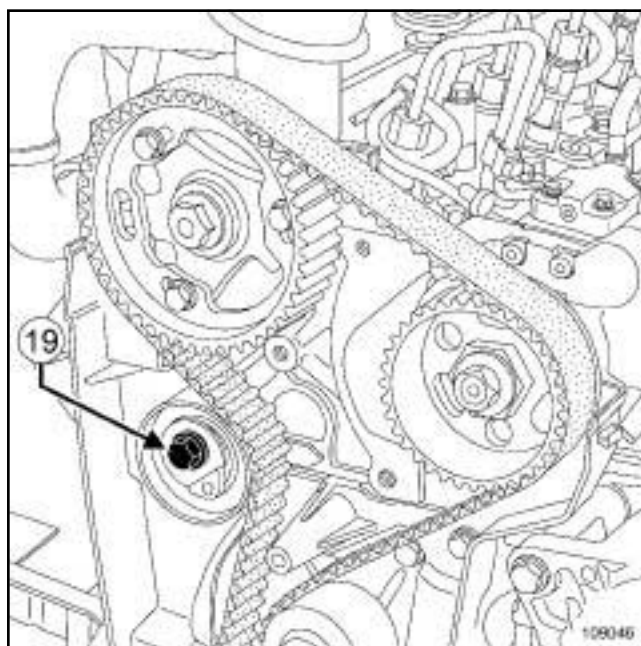
14489

- ❑ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft is pressed against the TDC setting pin.



109049

- ❑ Insert the (**Mot. 1430**) (18) in the camshaft pulley and cylinder head holes.



109046

- ❑ Loosen the timing tensioning roller bolt (19) to relax the timing belt.
- ❑ Remove:
 - the timing belt,
 - the timing tensioning roller bolt,
 - the timing tensioning roller.

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

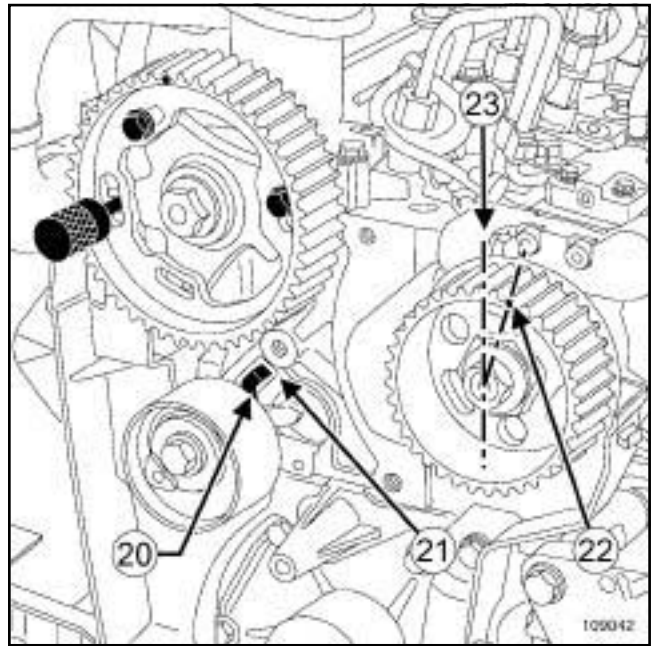
K9K

REFITTING

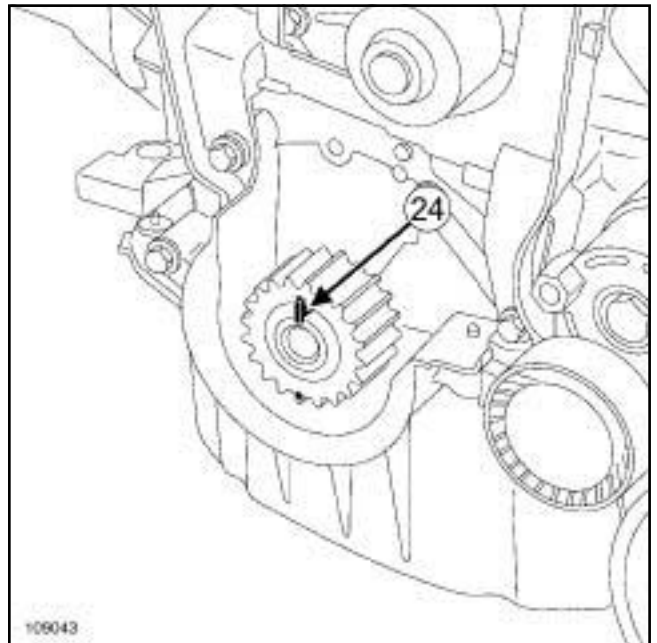
I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Timing belt
- parts always to be replaced: Timing belt tensioning roller

II - REFITTING OPERATION FOR PART CONCERNED



109042



109043

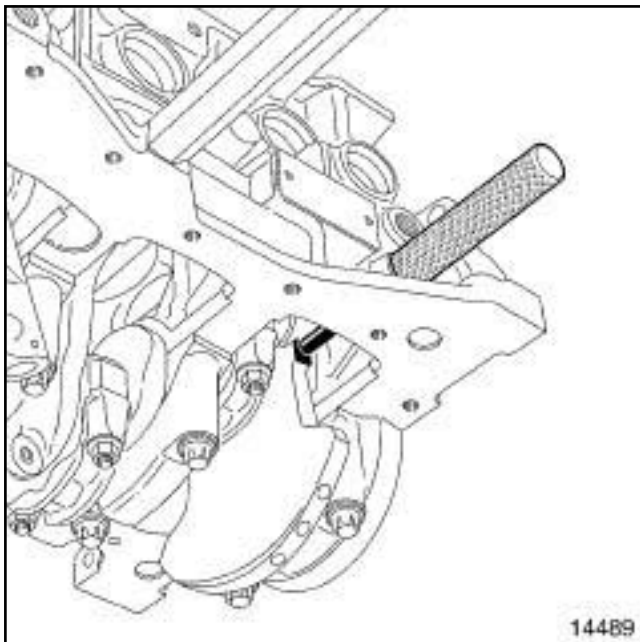
- Refit a new timing tensioning roller.
- Check that:
 - the lug (20) of the tensioning roller is in place in the groove (21) of the cylinder head,
 - the high pressure pump mark (22) is one tooth to the right from the vertical axis (23) ,
 - the crankshaft is resting on the tool (**Mot. 1489**) (the cotter (24) of the crankshaft timing sprocket upwards).

TOP AND FRONT OF ENGINE

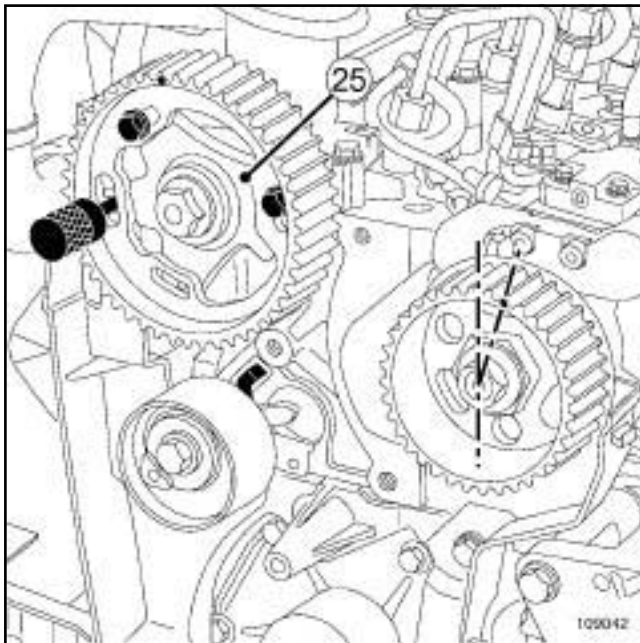
Timing belt: Removal - Refitting

11A

K9K



14489



109042

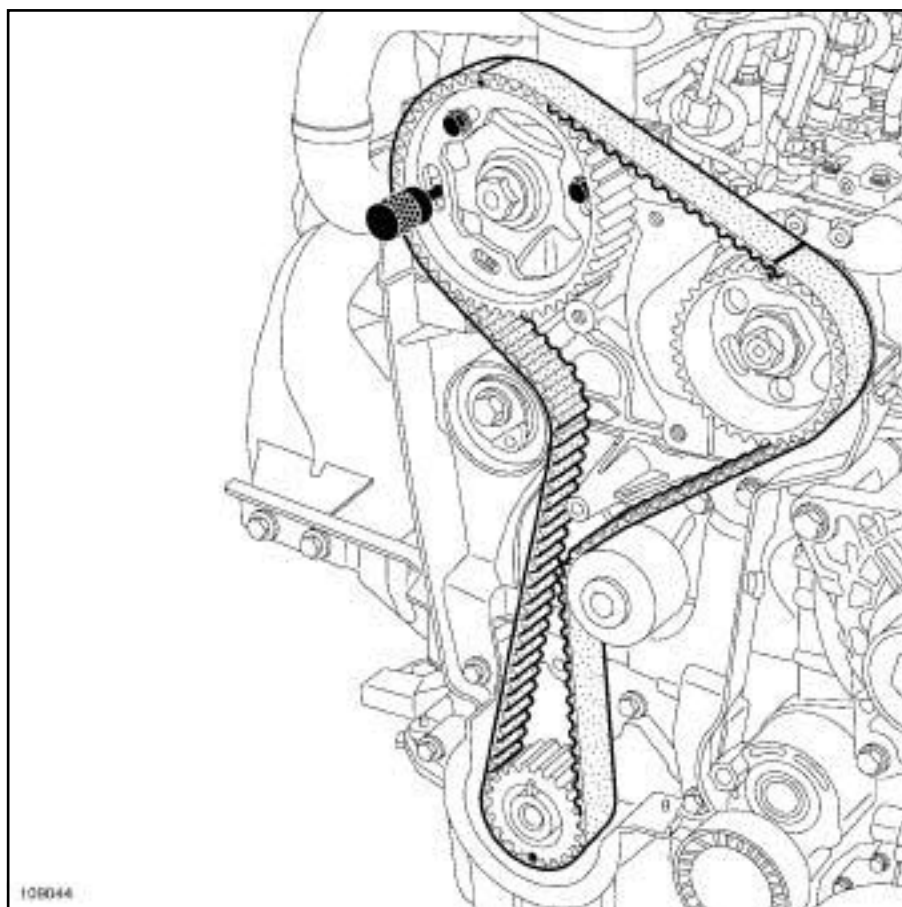
- Remove a bolt from the camshaft pulley wheel **(25)** .
- Loosen the two other camshaft pulley wheel bolts by one turn.

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

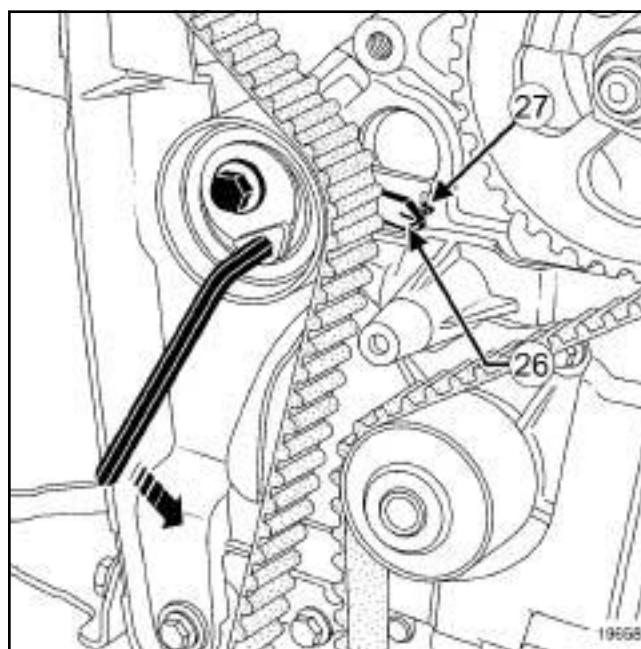
11A

K9K



109044

- ❑ Fit the timing belt, starting with the crankshaft sprocket, aligning the marks on the belt with those on the crankshaft sprockets, the camshaft and the high-pressure pump. There should be 19 tooth spaces between the sprocket marks and 51 tooth spaces between the crankshaft sprockets and the high pressure pump.



19658

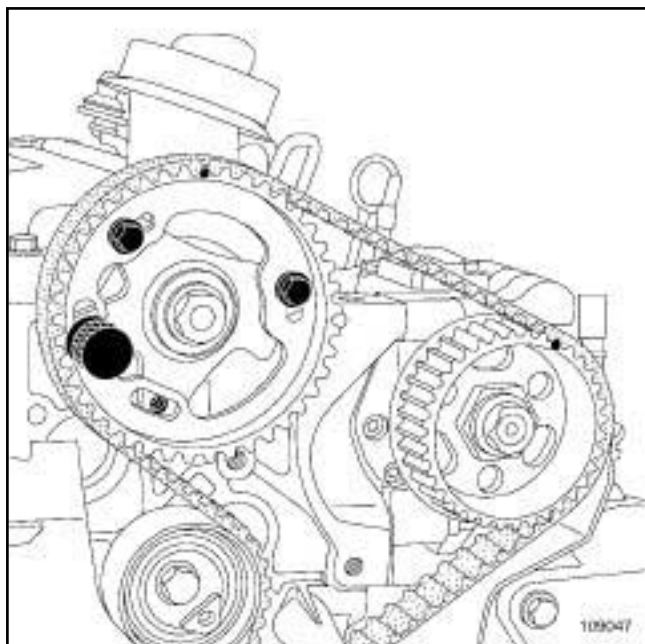
- ❑ Bring the tensioning roller adjustable index (26) opposite the lug (27) using a 6 mm Allen key, turning anti-clockwise.
- ❑ Tighten the tensioning roller bolt.

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

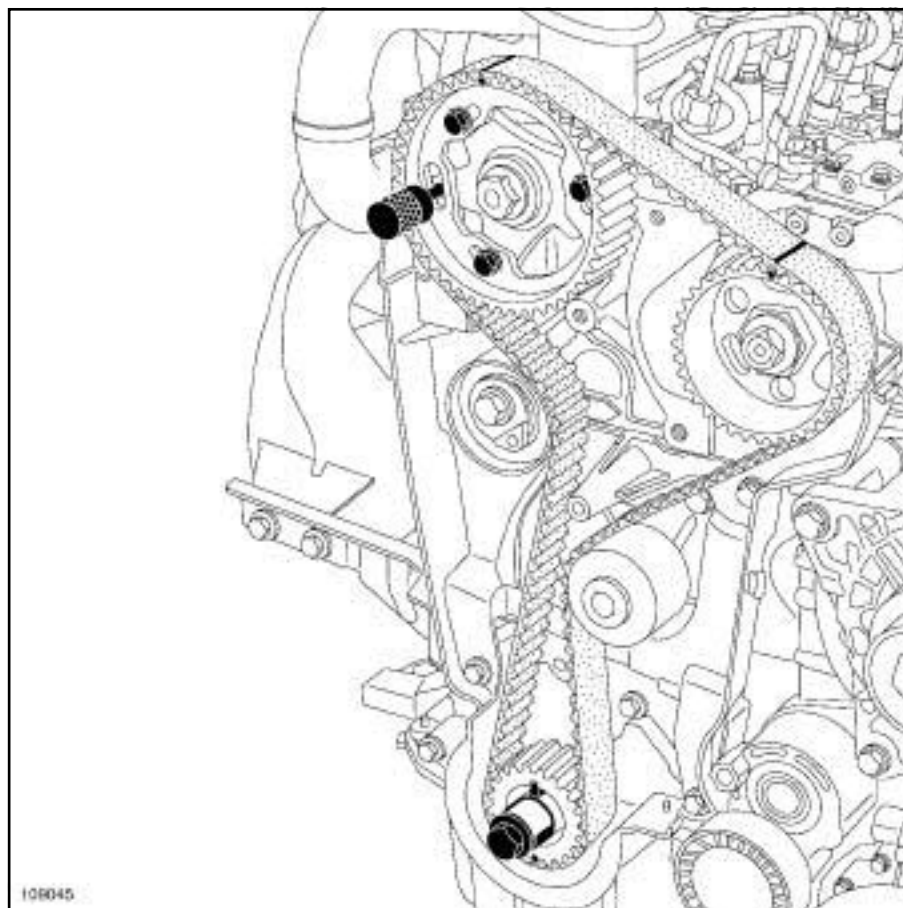
11A

K9K



109047

- Check that the camshaft pulley hub bolts are not fully up against the camshaft pulley wheel.



109045

- Refit the camshaft pulley wheel bolt.
- Tighten the camshaft pulley wheel bolts.
- Remove:
 - the TDC setting pin (**Mot. 1489**),

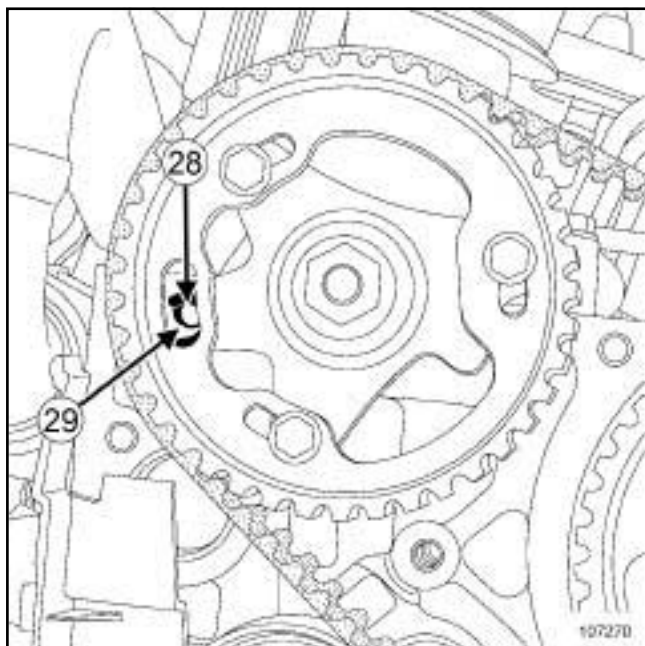
TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

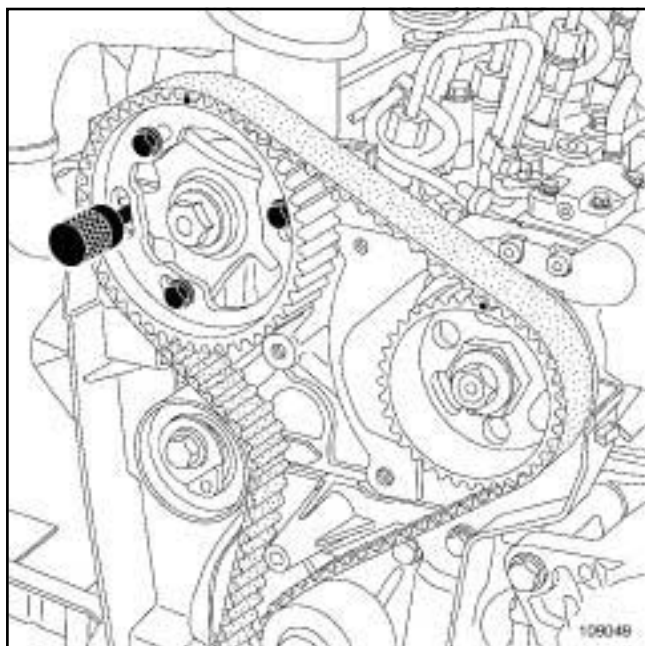
K9K

- the camshaft pulley timing pin (**Mot. 1430**).



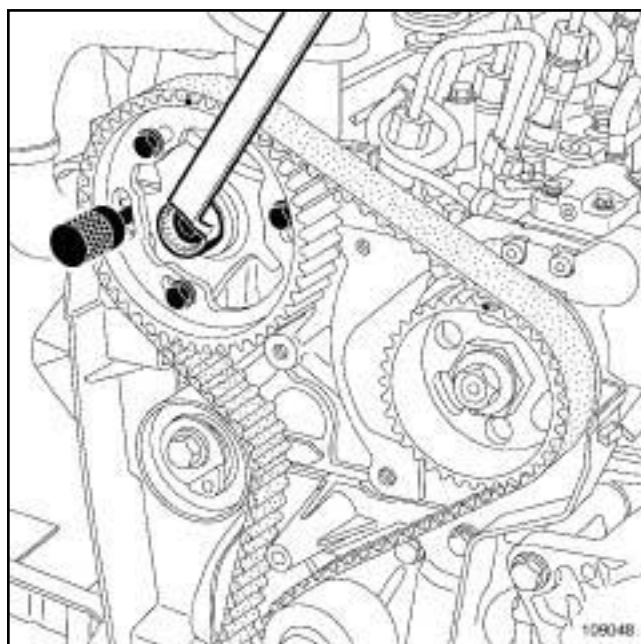
107270

- Rotate the crankshaft twice clockwise (timing end) before the camshaft pulley hole (28) is opposite the cylinder head hole (29) .
- Screw tool (**Mot. 1489**) into the cylinder block.
- Bring the crankshaft slowly and smoothly into contact with the tool (**Mot. 1489**).



109049

- Set the camshaft pulley using the (**Mot. 1430**).



109048

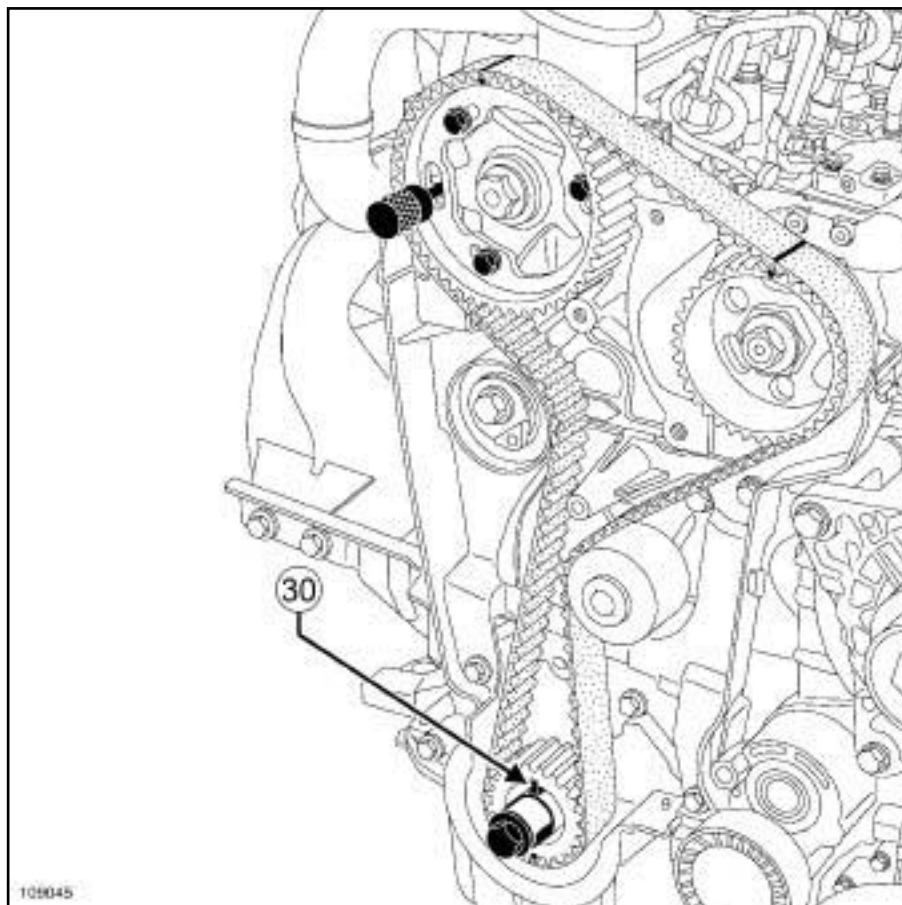
- If the (**Mot. 1430**) does not fit in, loosen the camshaft pulley wheel bolts by up to one turn.
- Turn the camshaft pulley hub using an offset spanner to set the camshaft pulley hub.
- Do not tighten the camshaft pulley wheel bolts.

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K9K



109045

- ❑ Check that the crankshaft timing sprocket collet (**30**) is positioned vertically at the top.

Note:

After two turns, the tension wheel index markers may be in two different positions.

The rotation of the tension wheel eccentric depends on the position.

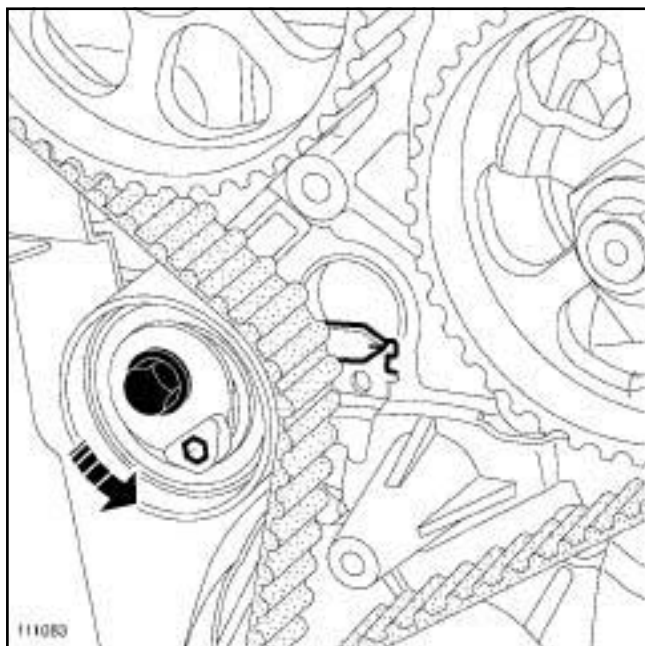
TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

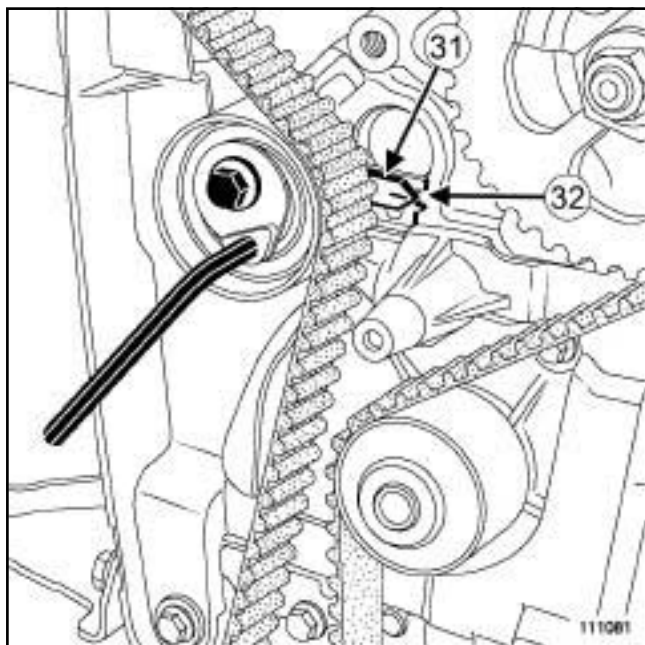
11A

K9K

1 - First position



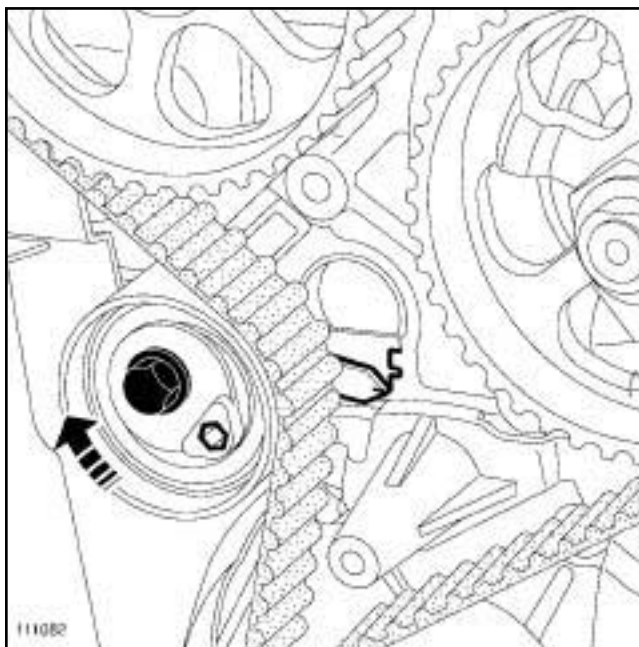
111083



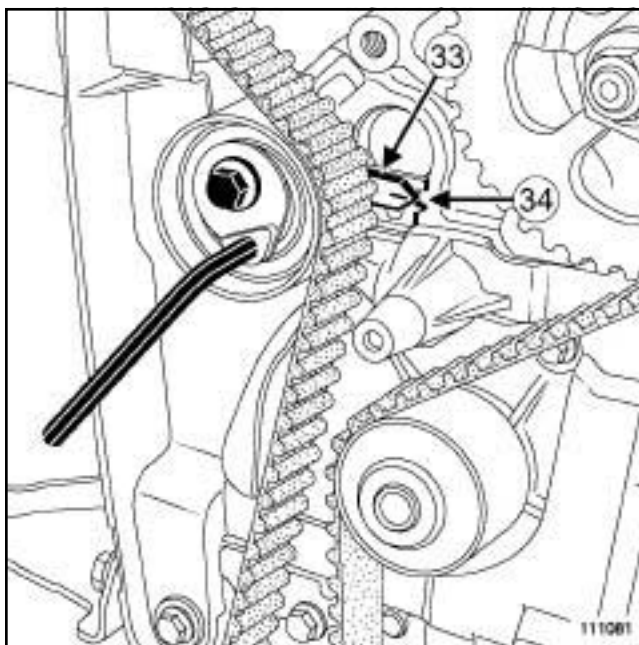
111081

- ❑ Loosen the tensioning roller bolt by up to one turn, holding it with a **6 mm** Allen key.
- ❑ Gradually align the adjustable index (**31**) in the middle of the timing window (**32**), turning the key anti-clockwise.

2 - Second position



111082



111081

- ❑ Loosen the tensioning roller bolt by up to one turn, holding it with a **6 mm** Allen key.
- ❑ Gradually align the adjustable index (**33**) in the middle of the timing window (**34**), turning the key clockwise.
- ❑ Torque tighten the **tensioning roller bolt (27 N.m)**.
- ❑ Torque tighten the **camshaft pulley wheel bolts (14 N.m)**.

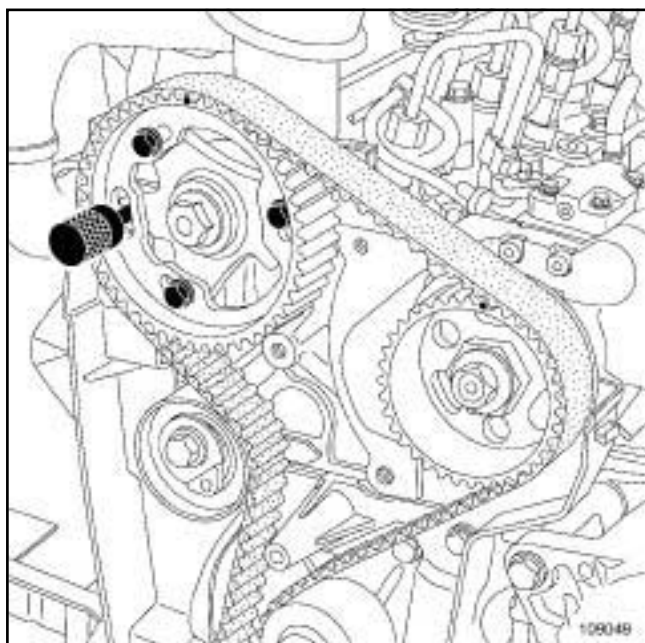
TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K9K

- ❑ Remove:
 - the **(Mot. 1489)**,
 - the **(Mot. 1430)**.
- ❑ Rotate the crankshaft twice clockwise (timing end) before the camshaft pulley hole is opposite the cylinder head hole.
- ❑ Screw tool **(Mot. 1489)** into the cylinder block.
- ❑ Bring the crankshaft slowly and smoothly against the TDC setting pin.

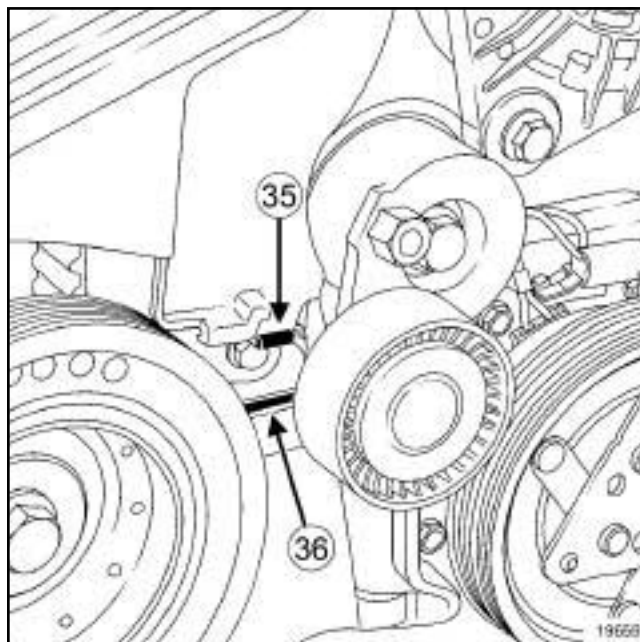


109049

- ❑ Set the camshaft pulley using the **(Mot. 1430)**.
- ❑ If this is not possible, repeat the operation for refitting the timing belt.
- ❑ Remove:
 - the **(Mot. 1489)**,
 - the **(Mot. 1430)**.

III - FINAL OPERATION

- ❑ Refit the TDC pin plug, coating the thread with **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
- ❑ Torque tighten the **TDC setting pin plug (25 N.m)**.
- ❑ Refit the cylinder head suspended mounting .
- ❑ Torque tighten the **cylinder head suspended mounting bolts (25 Nm)**.



19659

- ❑ Refit the lower timing cover, positioning the tab **(35)** in the opening **(36)** of the inner timing cover.
- ❑ Refit:
 - the upper timing cover,
 - the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-14) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the halogen headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K9K

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the engine cover.
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE


Timing belt: Removal - Refitting


11A

K4M

Special tooling required	
Mot. 1489	TDC locating pin.
Mot. 1368	Tool for tightening eccentric tensioning roller bolt. 8 mm Torx wrench and 12.7 mm square.
Mot. 1496	Camshaft timing tool.
Mot. 1750	Additional tool to support the camshaft adjusting tool, Mot. 1496.
Mot. 1490-01	For locking and adjusting the camshaft pulleys.
Mot. 1487	Tool for refitting camshaft covers (57 mm diameter).
Mot. 1488	Tool for refitting camshaft covers (43 mm diameter).

Equipment required
indelible pencil

Tightening torques 	
fixed roller bolt	50 N.m
lower timing cover bolts	12 N.m
exhaust camshaft pulley nut	30 N.m + 84°
camshaft dephaser pulley bolt	100 N.m
timing tension wheel nut	27 N.m
TDC setting pin plug	20 N.m
upper timing cover bolts	41 N.m
upper timing cover nuts	41 N.m
rear suspended engine reinforcement bolt	105 N.m

Tightening torques 	
rear suspended engine mounting bolt on the rear suspended engine mounting support	105 N.m
rear suspended engine mounting bolt on the subframe	105 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),

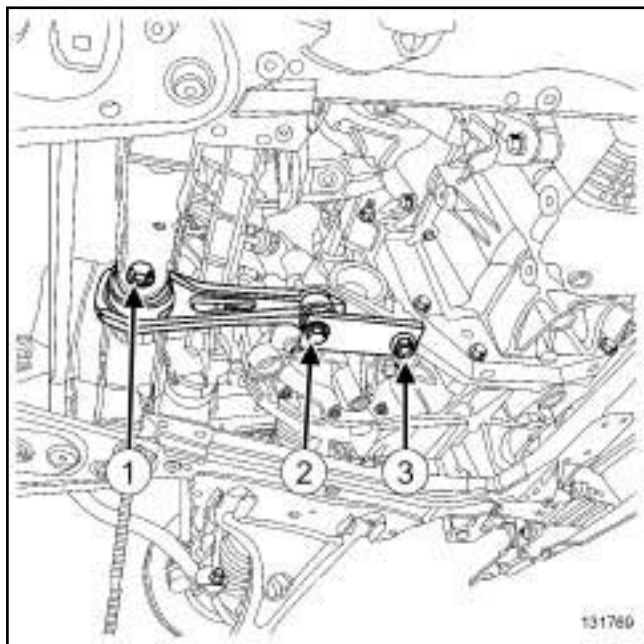
TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K4M

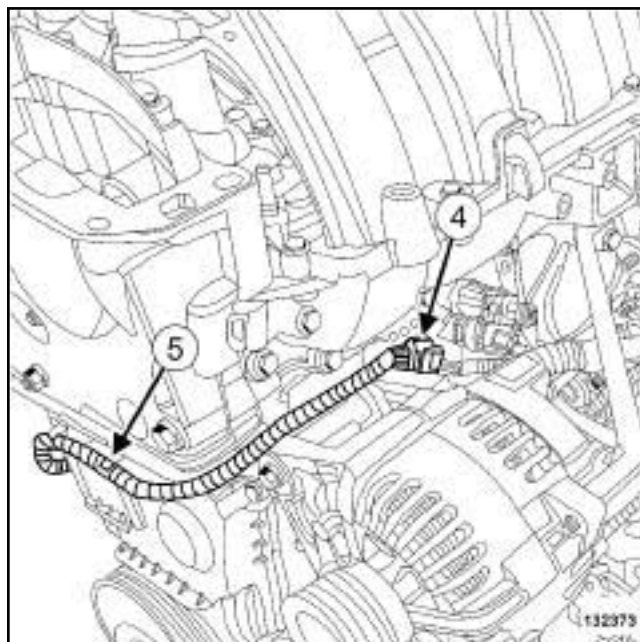
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).



131769

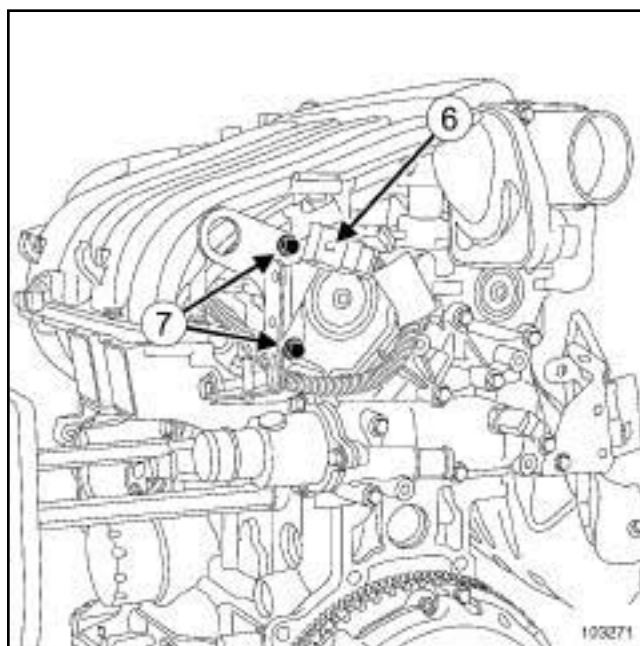
Remove:

- the rear suspended engine mounting bolt (1) from the subframe,
- the rear suspended engine mounting bolt (2) from the rear suspended engine mounting support,
- the rear suspended engine mounting reinforcement bolt (3) ,
- the rear suspended engine mounting,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) .



132373

- Disconnect the upstream oxygen sensor connector (4) .
- Unclip the wiring from the upstream oxygen sensor at (5) .
- Move the upstream oxygen sensor wiring aside.



103271

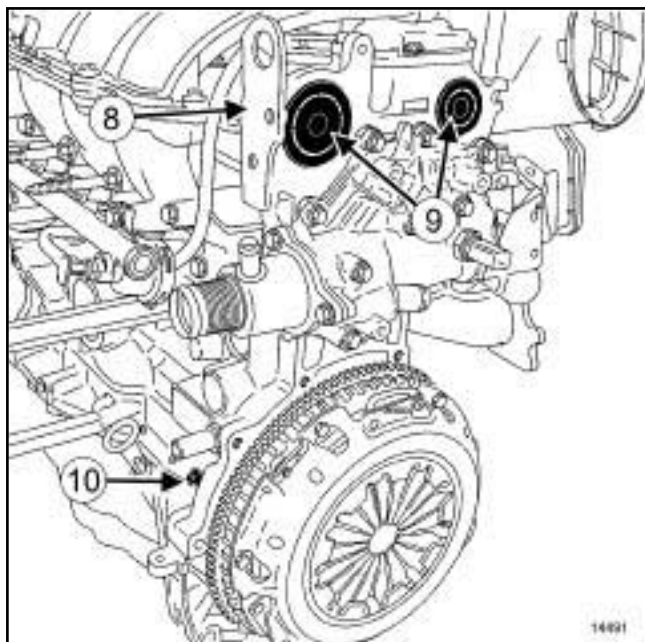
- Unclip the connector (6) from the lifting eye.
- Remove the lifting eye bolts (7) .

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

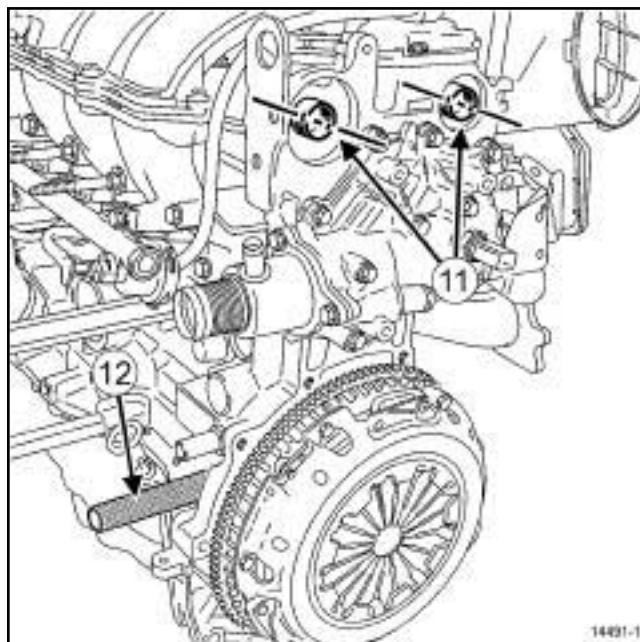
11A

K4M



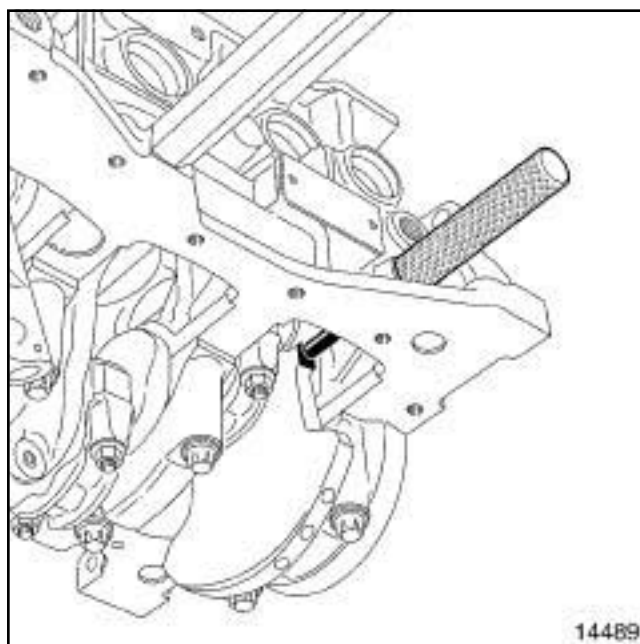
14491

- ❑ Remove the lifting eye (8) .
- ❑ Pierce the centre of the plugs (9) at the camshaft ends with a screwdriver.
- ❑ Remove:
 - the plugs from the camshaft ends with a screwdriver,
 - the TDC setting pin plug (10) .



14491-1

- ❑ Position the camshaft grooves (11) almost horizontally and offset towards the bottom turning the crankshaft in the operating direction (clockwise at timing end).
- ❑ Screw in the TDC setting pin (**Mot. 1489**) (12) .



14489

14489

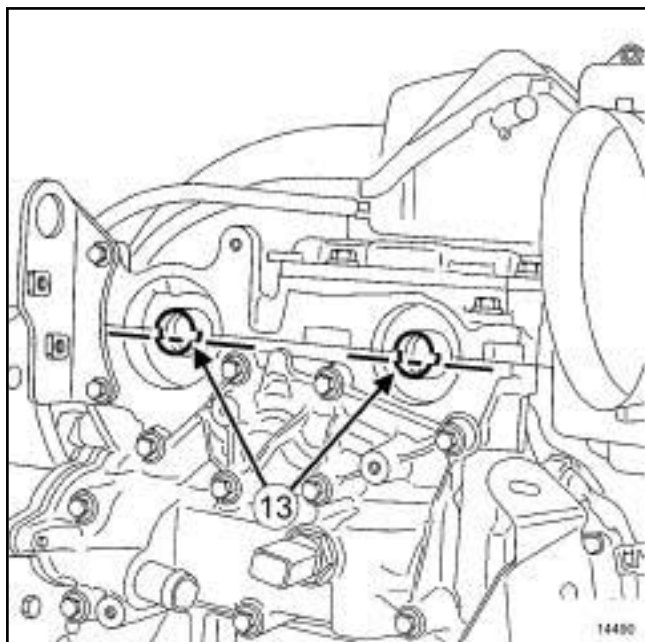
- ❑ Turn the crankshaft in its operating direction (clockwise at timing end), until the crankshaft presses against the TDC setting pin (**Mot. 1489**).

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

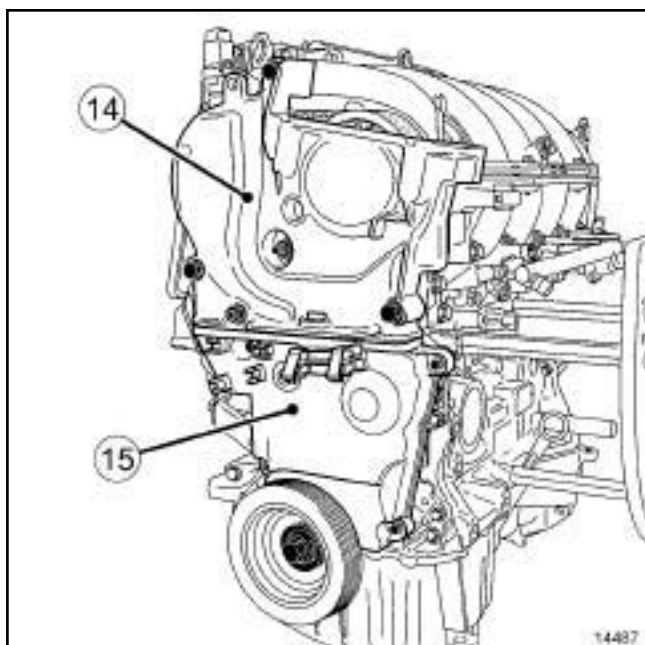
11A

K4M



14490

- The camshaft grooves (13) must be horizontal and offset downwards.
- Remove the TDC setting pin (**Mot. 1489**).



14487

- Remove:
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-20**),
 - the upper timing cover bolts (14),
 - the upper timing cover nuts (14),
 - the upper timing cover (14),

- the lower timing cover bolts (15),
- the lower timing cover (15).

II - REMOVAL OPERATION

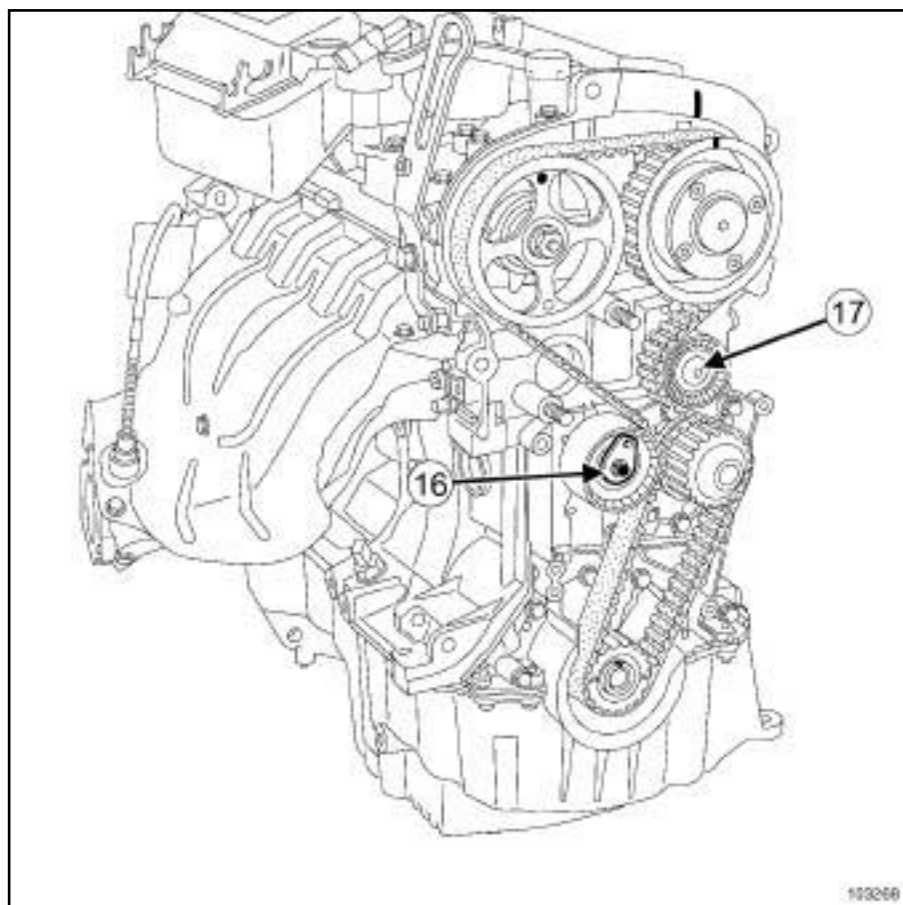
- The crankshaft sprocket is cotteder on this engine, the timing setting and belt tensioning procedure require that the sprocket and dephaser be loosened on the camshafts.

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K4M



- Loosen the nut (16) of the timing tensioning roller.
- Remove:
 - the fixed roller bolt (17) using the (Mot. 1368),
 - the timing fixed roller,
 - the timing belt,
 - the timing tensioning roller nut,
 - the timing tensioning roller,
 - the crankshaft timing sprocket.

REFITTING

I - REMOVAL PREPARATION OPERATION

- Remove the camshaft dephaser (see 11A, Top and front of engine, Camshaft dephaser: Removal - Refitting, page 11A-135) .

- parts always to be replaced: Timing belt
- parts always to be replaced: Timing belt tensioning roller
- parts always to be replaced: Timing fixed roller
- parts always to be replaced: Crankshaft accessories pulley bolts
- parts always to be replaced: Inlet camshaft cap
- parts always to be replaced: Exhaust camshaft cap
- parts always to be replaced: Camshaft dephaser sprocket bolt
- parts always to be replaced: Exhaust camshaft pulley nut

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K4M

II - REFITTING OPERATION

1 - Adjusting the timing

□

Note:

If the stud loosens with the nut (see **11A, Top and front of engine, Camshaft: Removal - Refitting**, page **11A-82**) (Technical Note 3887A, 11A, Top and front of engine).

WARNING

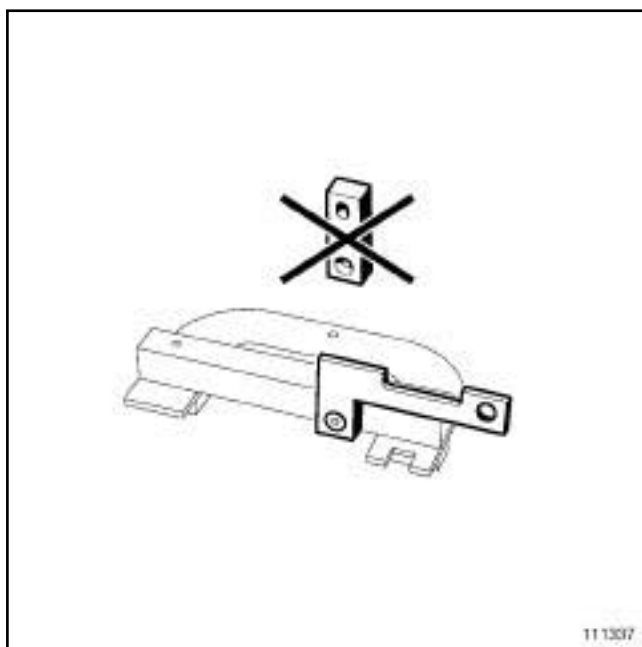
Always degrease:

- the end of the crankshaft (timing end),
- the timing sprocket bore and bearing faces,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

This slippage leads to engine damage.

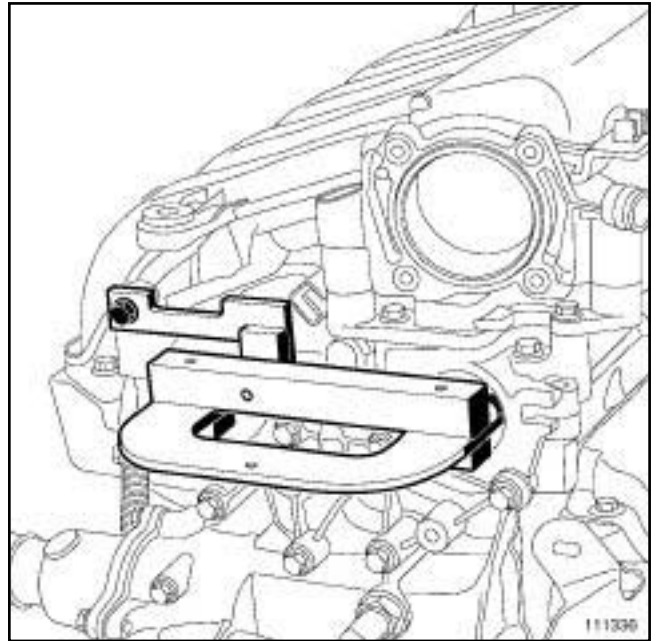
- Set the camshaft grooves horizontally and below the centre line by turning the camshafts with the **(Mot. 1496)** if necessary.



111337

111337

- Fit the **(Mot. 1496)** with the **(Mot. 1750)**.



111336

- Fit:

- the **(Mot. 1496)** fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt to secure the **(Mot. 1496)**.

- If fitting a new camshaft dephaser, check the dephaser locking mechanism (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page **11A-135**).

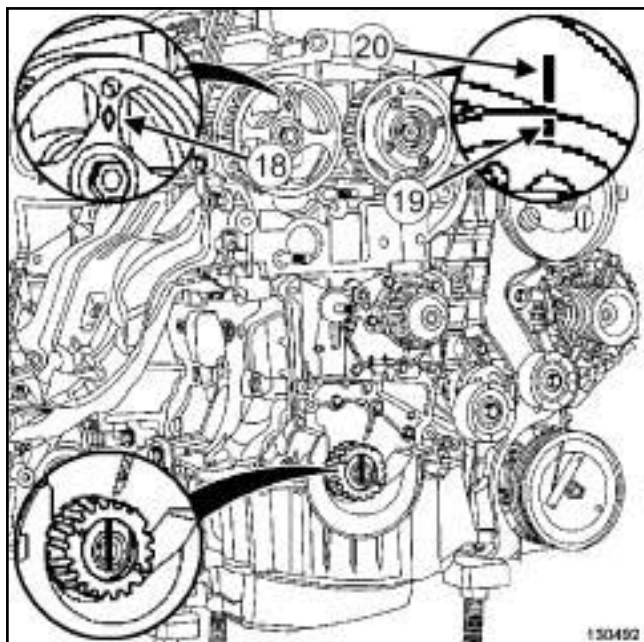
- Refit the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page **11A-135**).

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K4M

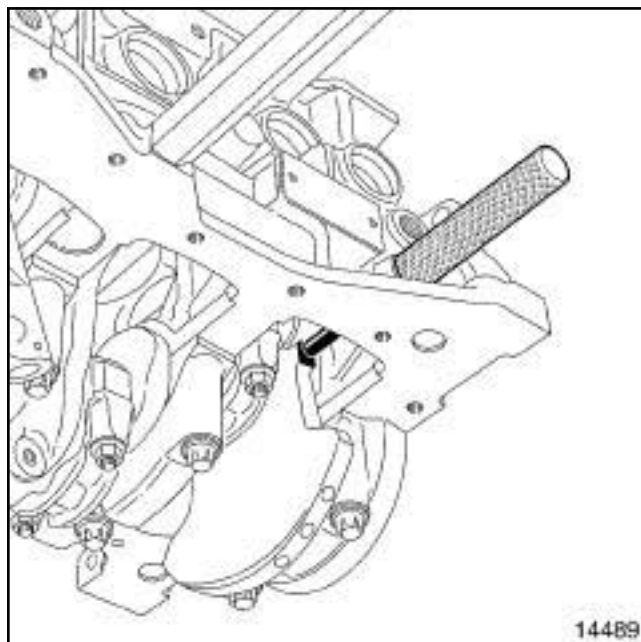


130492

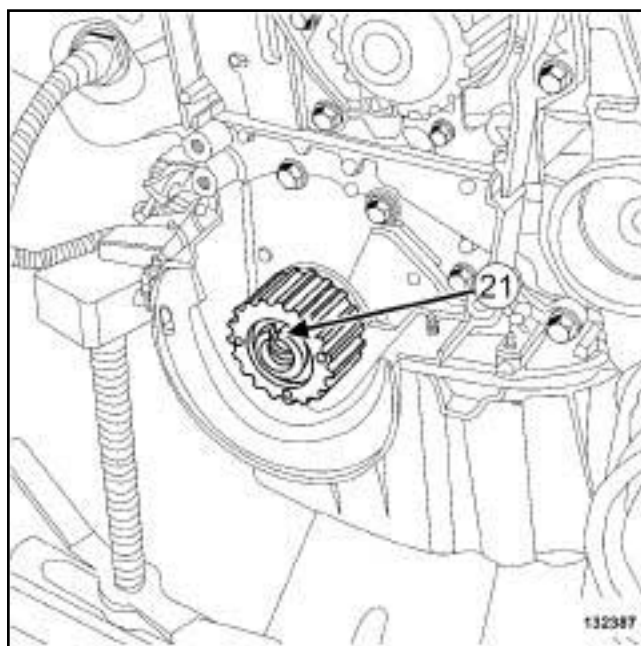
□ Position:

- the RENAULT badge (18) etched on the exhaust camshaft pulley stem vertically and pointing upwards,
- the camshaft dephaser pulley mark (19) vertically and facing upwards.

- Make a mark (20) using an **indelible pencil** between the camshaft dephaser pulley and the rocker cover.



14489



132387

- Check that the crankshaft is pressing against the TDC setting pin (**Mot. 1489**). The crankshaft groove (21) must be upwards.

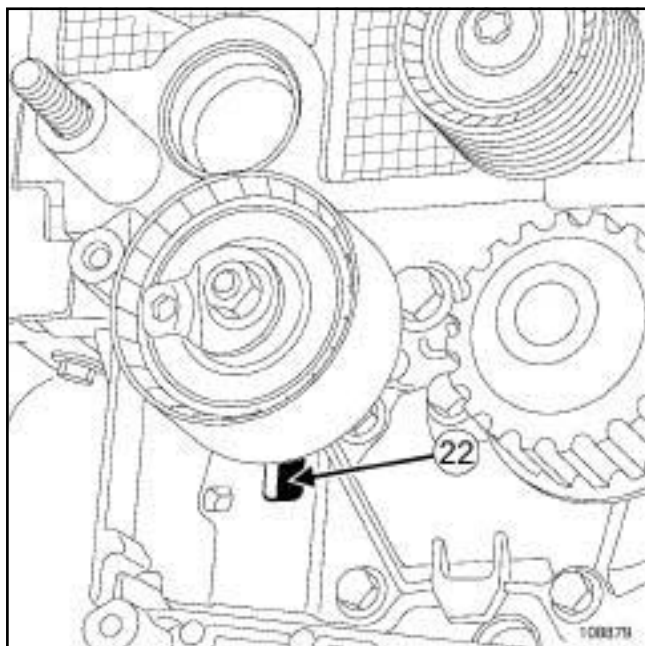
TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

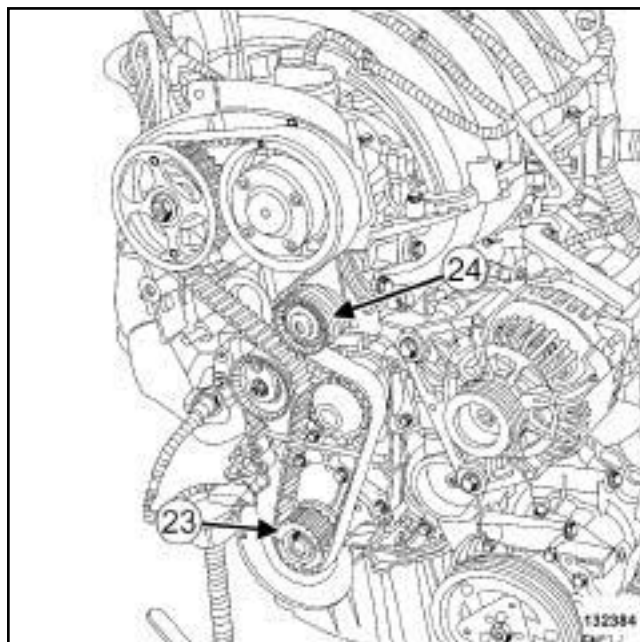
K4M

2 - Refitting the timing belt



108879

- Fit a new tensioning roller by positioning the tensioning roller lug in the rib (22) .
- Screw on the tensioning roller nut without tightening it.



132384

- Refit:
 - the cottered crankshaft timing sprocket (23) ,
 - a new timing belt,
 - a new fixed roller (24) .

Note:

Take care to properly tighten the timing belt between the two camshaft sprockets.

- Position the **(Mot. 1490-01)** on the camshaft sprockets.

Note:

Before torque tightening the fixed roller, always adjust the junior torque wrench to 25 N.m (tighten using the Mot. 1368 tool) to obtain a tightening torque of 50 N.m on the fixed roller bolt. The 25 N.m adjustment value is only valid for a 300 mm long torque wrench (length measured between the square drive and the centre of the handle). If the length of the torque wrench is different, a new adjustment value must be used (see **Tightening torques: General information**) (01D, Mechanical introduction).

- Torque tighten the **fixed roller bolt (50 N.m)** using the tool **(Mot. 1368)**, a junior torque wrench and a **15 mm** socket.
- Remove the tool **(Mot. 1490-01)**.

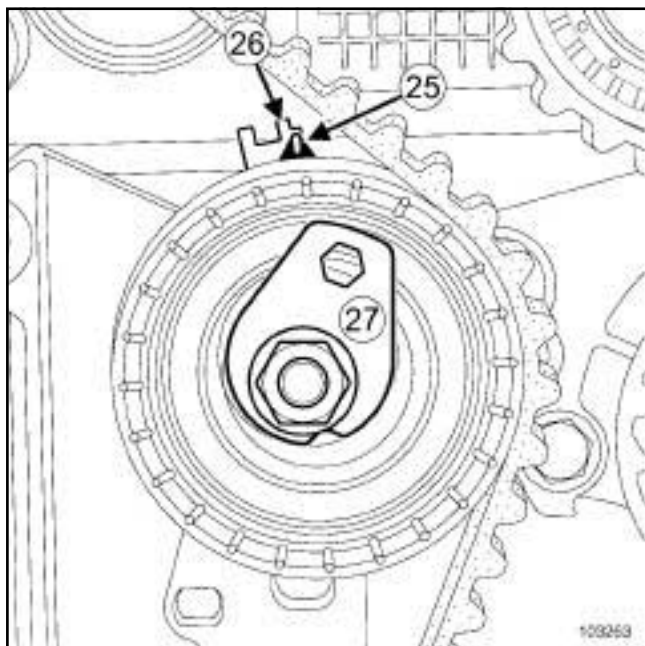
TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

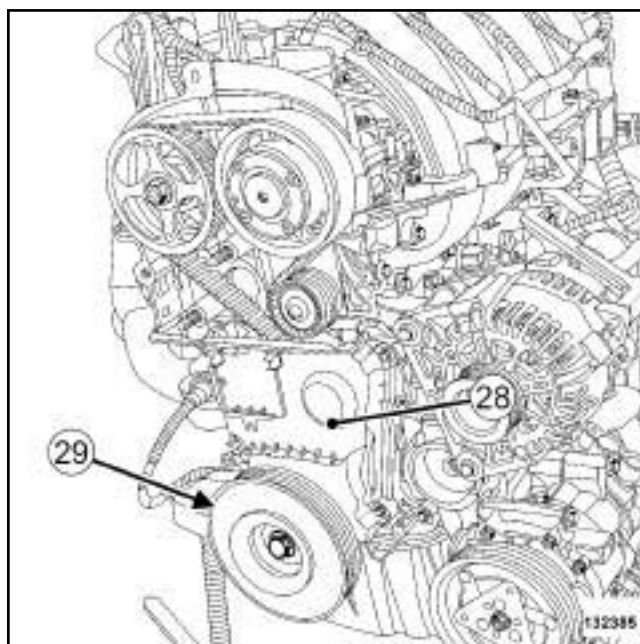
11A

K4M

3 - Timing belt tension



- Position the adjustable index (25) opposite the mark (26) , by turning the eccentric (27) clockwise using a 6 mm Allen key.
- Torque tighten the **tensioning roller nut**(7 N.m).



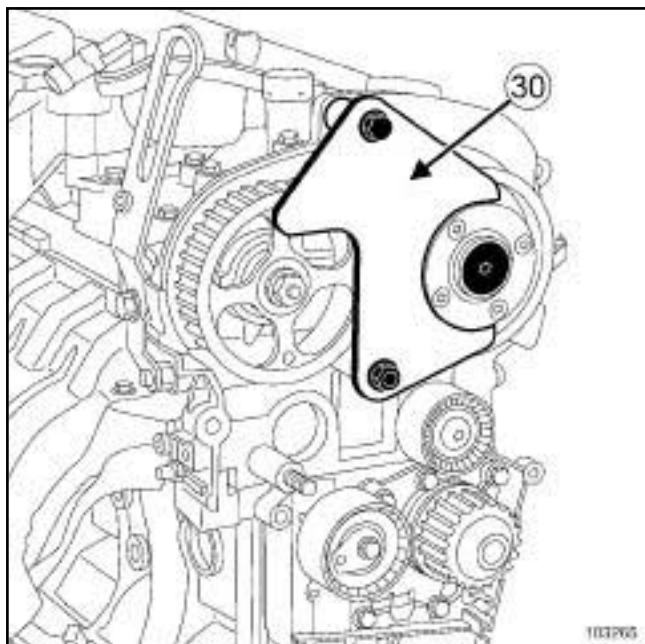
- Refit:
 - the lower timing cover (28) ,
 - the crankshaft accessories pulley (29) (see 11A, **Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) .
- Tighten to torque the **lower timing cover bolts** (12 N.m).

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

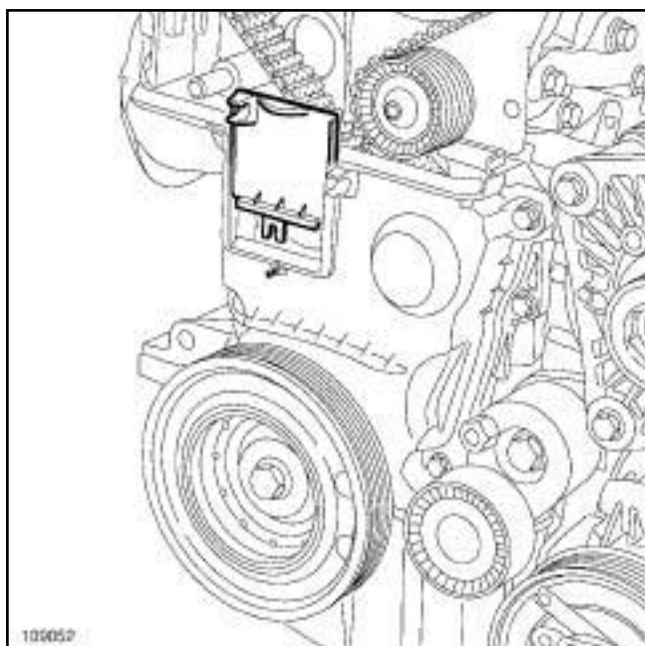
11A

K4M



103265

- Position the **(Mot. 1490-01)** (30) on the camshaft pulleys.
- Torque tighten:
 - and angle tighten the **exhaust camshaft pulley nut (30 N.m + 84°)**,
 - the **camshaft dephaser pulley bolt (100 N.m)**.
- Refit the dephaser pulley bolt cover.



109052

- Remove:
 - the timing flap from the lower timing cover,
 - the **(Mot. 1496)**,

- the TDC setting pin **(Mot. 1489)**,
- the **(Mot. 1490-01)**.

4 - Checking the tension

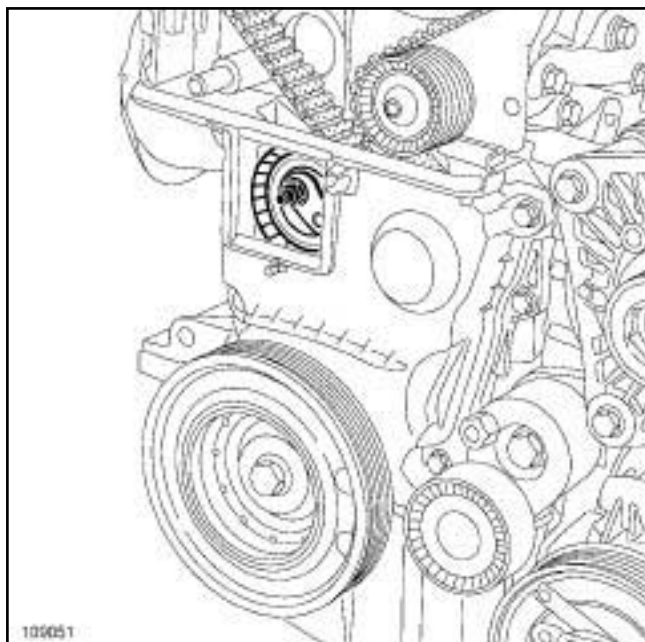
- Rotate the crankshaft twice in a clockwise direction, on the timing end, before aligning the marks (on the camshaft dephaser) already made by the operator.
- Screw in the TDC setting pin **(Mot. 1489)**.
- Move the crankshaft slowly and smoothly to rest on the TDC setting pin.
- Remove the TDC setting pin **(Mot. 1489)**.

TOP AND FRONT OF ENGINE

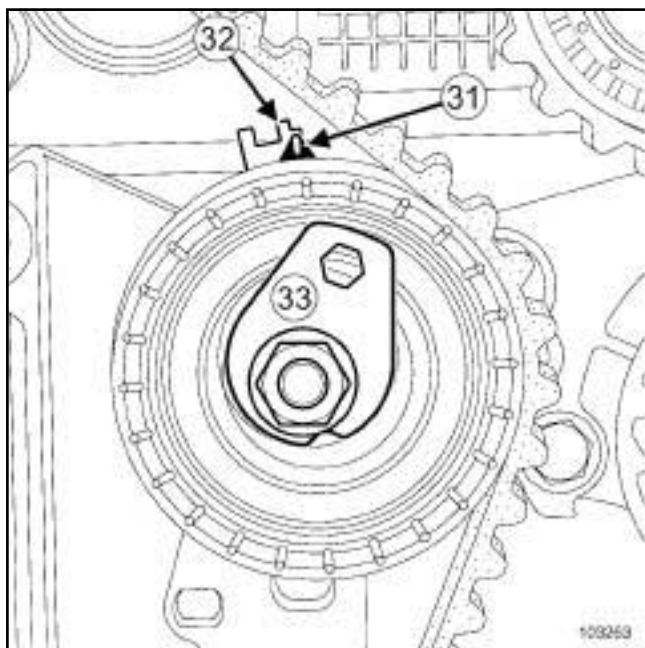
Timing belt: Removal - Refitting

11A

K4M



109051

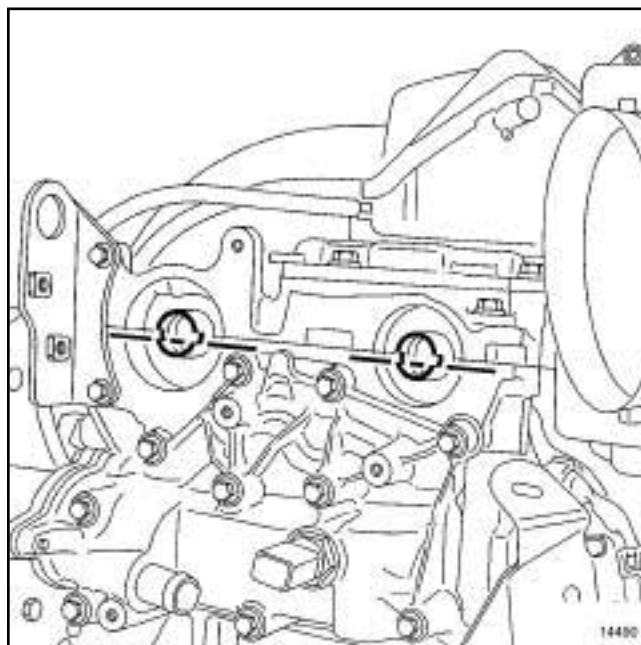


103263

- Check through the lower timing cover window that the adjustable index (31) is opposite the notch (32), if this is not the case:
 - loosen the timing tensioning roller nut by up to one turn while holding the eccentric with a **6 mm** Allen key,
 - gradually move the adjustable index marker (31) opposite the mark (32) turning the eccentric cam (33) clockwise.
- Torque tighten the **timing tension wheel nut (27 N.m)**.

5 - Checking the timing

- Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.
- Screw in the TDC setting pin (**Mot. 1489**).
- Bring the crankshaft slowly and smoothly to rest against the TDC setting pin (**Mot. 1489**).



14490

- Position (without forcing) the camshaft setting tool (**Mot. 1496**) fitted with the (**Mot. 1750**) (the camshaft end grooves must be horizontal and offset towards the bottom).

Note:

The timing adjustment and tensioning operation must be repeated if the camshaft setting tool does not engage.

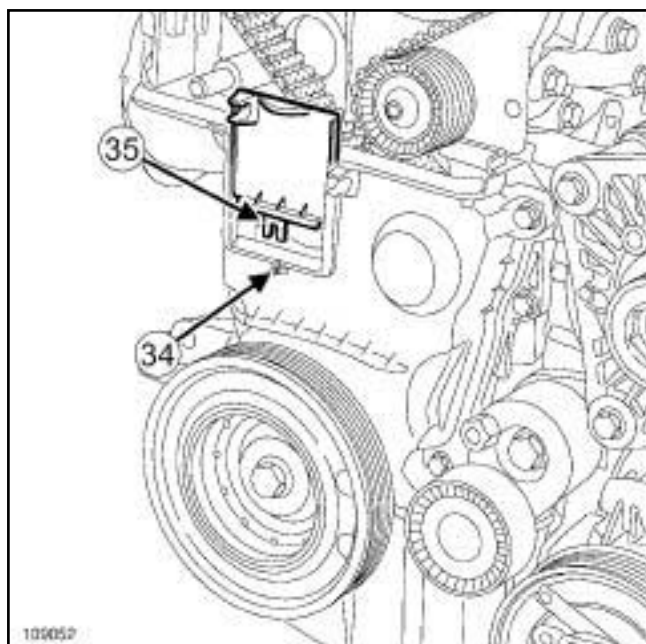
- Remove:
 - the timing tool (**Mot. 1496**) fitted with the (**Mot. 1750**),
 - the TDC setting pin (**Mot. 1489**).

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

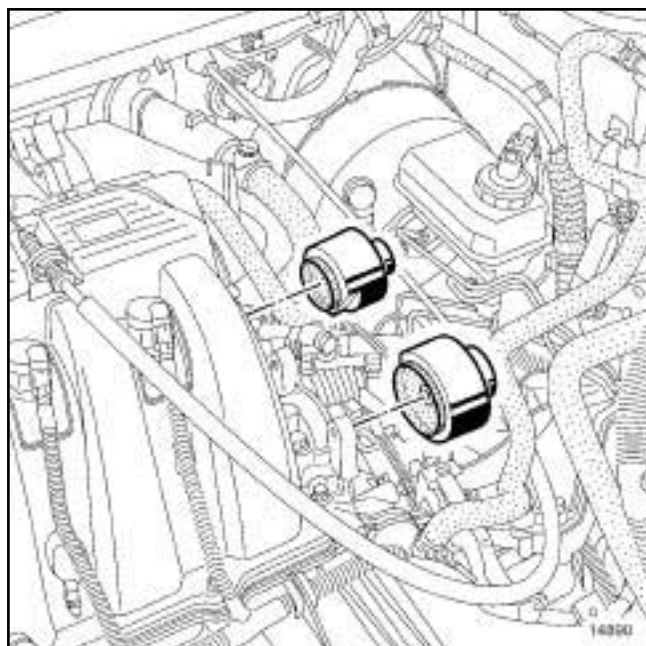
K4M



109052

- ❑ Refit the lower timing cover flap, checking that the locating pin (34) fits properly in the notch (35) .

III - FINAL OPERATION



14890

- ❑ Refit:
 - a new inlet camshaft plug using the (Mot. 1487),
 - a new exhaust camshaft plug using the (Mot. 1488),
 - the lifting eye.
- ❑ Clip the wiring onto the lifting eye.

- ❑ Place a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) on the thread of the TDC setting pin plug.
- ❑ Torque tighten the **TDC setting pin plug (20 N.m)**.
- ❑ Refit the upper timing cover.
- ❑ Torque tighten:
 - the **upper timing cover bolts (41 N.m)**,
 - the **upper timing cover nuts (41 N.m)**.
- ❑ Position the wiring of the upstream oxygen sensor.
- ❑ Attach the upstream oxygen sensor wiring.
- ❑ Connect the upstream oxygen sensor connector.
- ❑ Refit:
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**),
 - the rear suspended engine mounting.
- ❑ Torque tighten:
 - the **rear suspended engine reinforcement bolt (105 N.m)**,
 - the **rear suspended engine mounting bolt on the rear suspended engine mounting support (105 N.m)**,
 - the **rear suspended engine mounting bolt on the subframe (105 N.m)**.
- ❑ Refit:
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-20**),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),

TOP AND FRONT OF ENGINE

Timing belt: Removal - Refitting

11A

K4M

- the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray.
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

D7F

Tightening torques

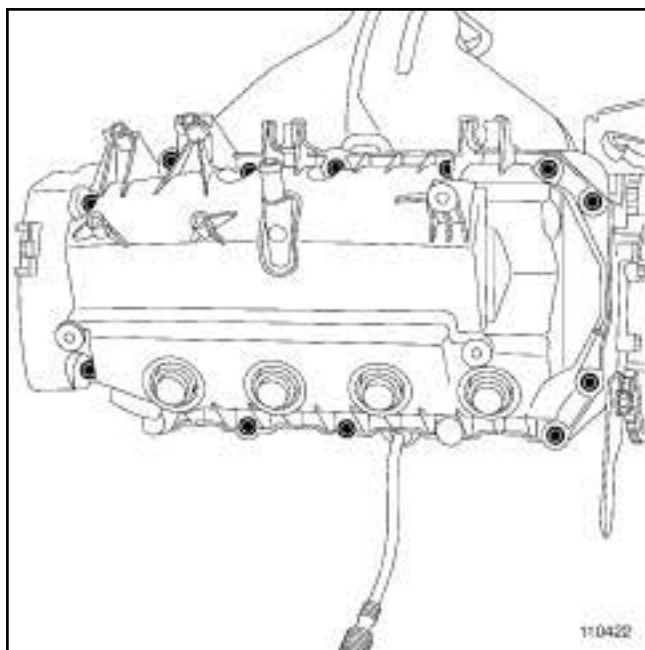
rocker cover bolts	10 Nm
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REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery ((see **Battery: Removal - Refitting**)).
- Remove:
 - the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Unclip:
 - The harness from the heat shield,
 - the brake servo pipe from the heat shield.
- Disconnect the ignition coil supply.

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove:
 - the rocker cover bolts,
 - the rocker cover.

ON THE WORKBENCH

- Remove:
 - the ignition coil,
 - the heat shield.

REFITTING

I - REFITTING PREPARATIONS OPERATION

ON THE WORKBENCH

- Refit:
 - the heat shield,
 - the ignition coil.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the rocker cover,
 - the rocker cover bolts.
- Torque tighten the **rocker cover bolts (10 Nm)**.

III - FINAL OPERATION.


- Connect the ignition coil supply.
- Clip:
 - the brake servo pipe onto the heat shield,
 - the harness onto the heat shield.
- Refit:
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) .
- Connect the battery ((see **Battery: Removal - Refitting**)).

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

C44, and K9K

Tightening torques 	
rocker cover bolts	12 N.m
timing end lifting bracket bolts	12 N.m

PARTS AND CONSUMABLES FOR THE REPAIR WORK

Parts always to be replaced :

- axle sub-frame bolts,
- air inlet metal tube seals,
- rocker cover seal on the cylinder head.

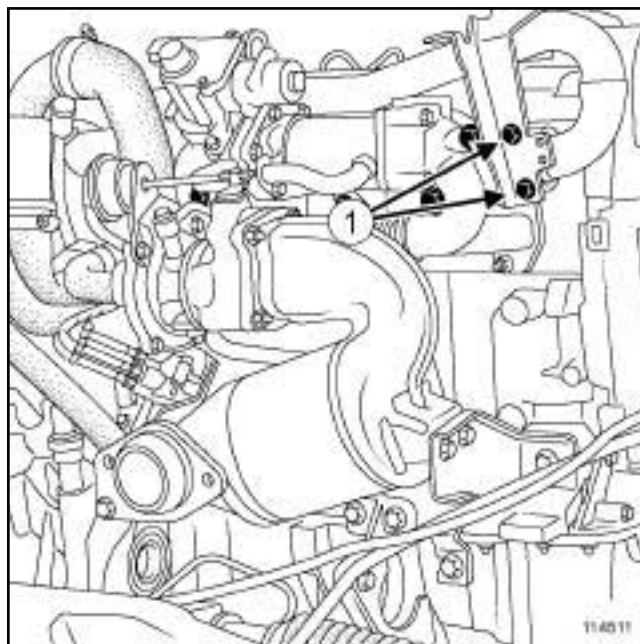
Consumables : (see **Vehicle: Parts and consumables for the repair**)

- surface cleaner,
- adhesive silicone sealant.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).
- Remove:
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .



114511

Remove:

- the lifting bracket bolts (1) on the timing end,
- the lifting bracket on the timing end,
- air inlet metal tube.

Unclip the upper timing cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED

Remove:

- the cylinder head cover bolts,
- the rocker cover.

REFITTING

I - REFITTING PREPARATION OPERATION

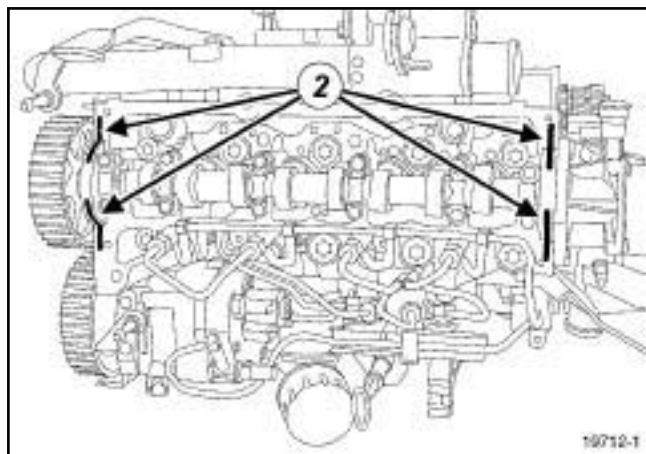
- Using **SURFACE CLEANER**, degrease the rocker cover gasket face on the cylinder head.
- Refit a new seal on the rocker cover.

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

C44, and K9K

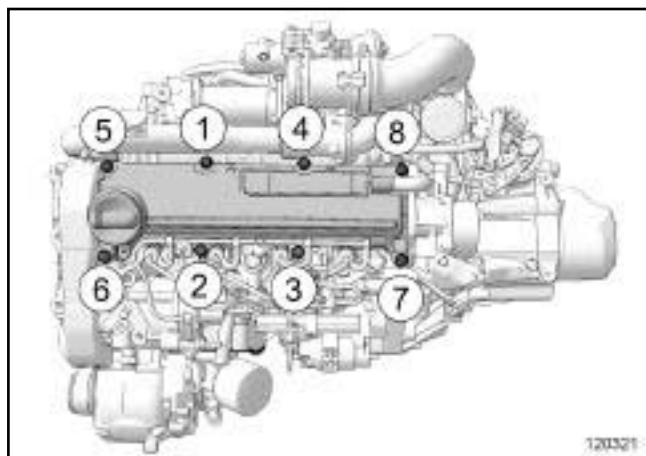


19712-1

- Apply four beads (2) of **SILICONE ADHESIVE SEALANT**, 2 mm in diameter.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the rocker cover,
 - the rocker cover bolts.



120321

- Torque tighten the **rocker cover bolts (12 N.m)** in order.

III - FINAL OPERATION

- Clip on the upper timing cover.
- Refit:
 - the air inlet metal tube,
 - the lifting bracket on the timing end.
- Finger tighten and then torque tighten the **timing end lifting bracket bolts (12 N.m)**.

- Refit:
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) .

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

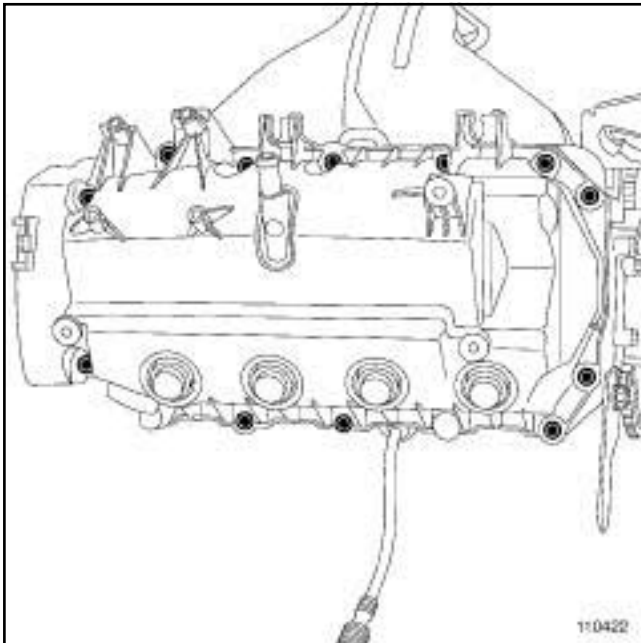
D4F, and 772

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) .
- Unclip the rocker cover electric wiring harnesses.

II - OPERATION FOR REMOVAL OF PART CONCERNED



110422

- Remove:
 - the rocker cover bolts,
 - the rocker cover,
 - the rocker cover gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

- Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any part of the seal still adhering.

WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

- parts always to be replaced: rocker cover seal.**

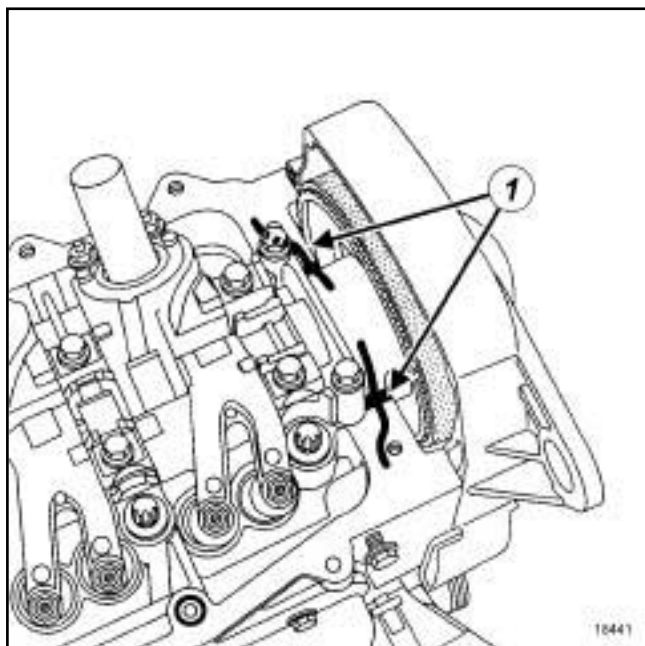
TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

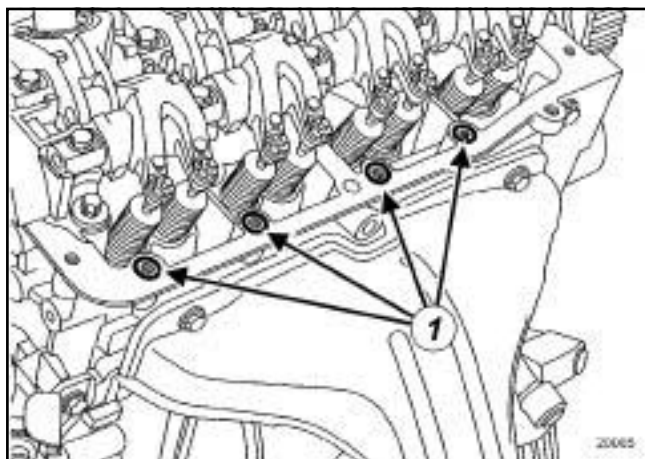
11A

D4F, and 772

II - REFITTING OPERATION FOR PART CONCERNED

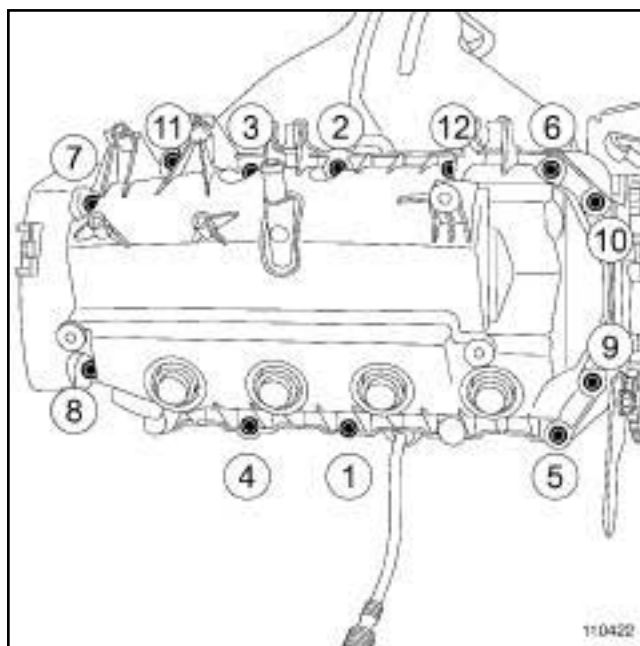


18441



20005

- Apply a bead (1) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the camshaft bearings 1 and 5, as well as around the rocker cover rear bolts.
- Fit the rocker cover with a new gasket.



110422

- Tighten the rocker cover bolts in order.

III - FINAL OPERATION


- Refit:
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Clip on the rocker cover electric wiring harnesses.
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

D4F, and 780 or 782 or 784

Tightening torques 	
rocker cover bolts (initial torque)	5 N.m
rocker cover bolts	13 N.m
heat shield bolts	8 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

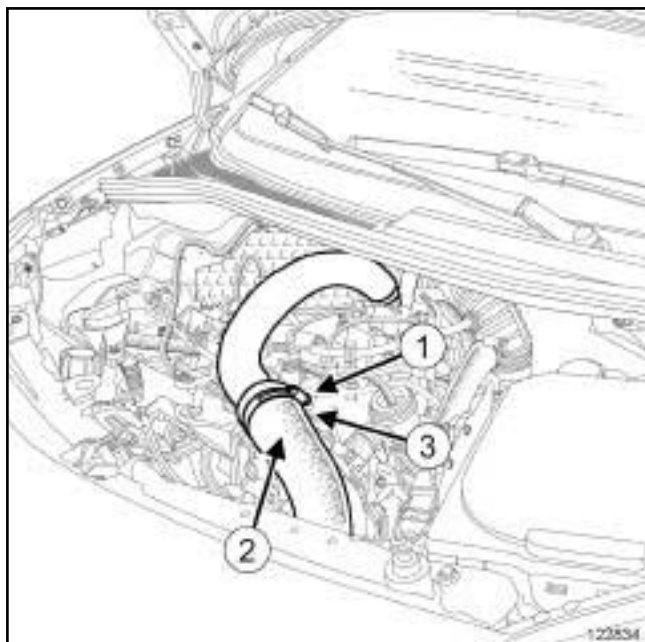
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
 - the air filter box strut bolt,
 - the air filter box strut.

TOP AND FRONT OF ENGINE

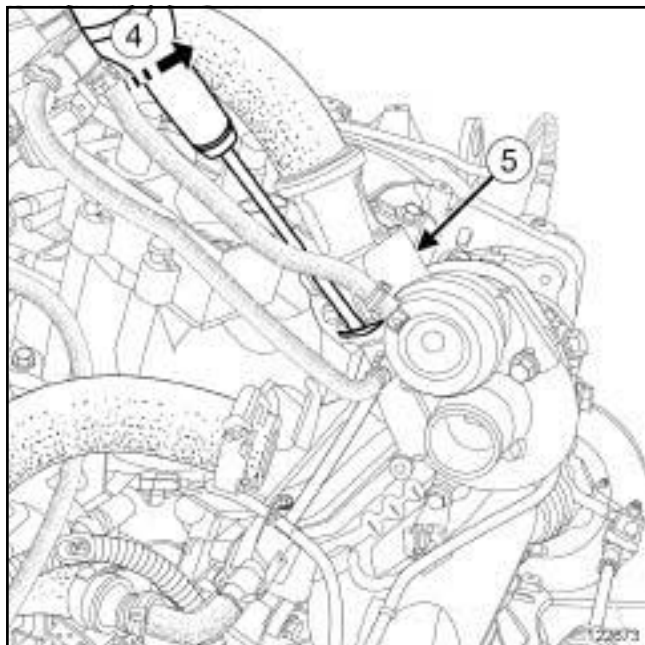
Rocker cover: Removal - Refitting

11A

D4F, and 780 or 782 or 784



122834



122673

Note:

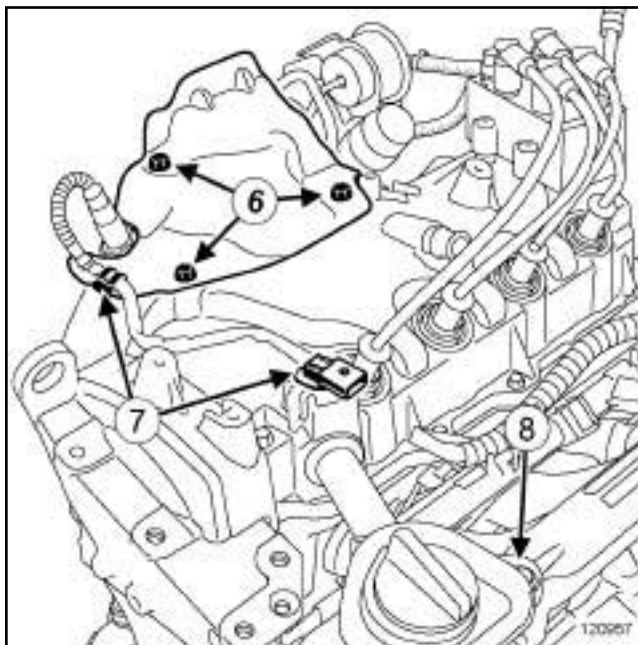
If the turbocharger air outlet pipe tightening clip (1) is removed, the flexible rubber pipe (2) and the tightening clip (1) must be replaced.

- Remove the turbocharger outlet air pipe bolt (3) on the throttle valve.
- Move the turbocharger outlet air pipe on the turbocharger to one side, following the direction shown by the arrow (4) .

Note:

If the clip (5) is removed from the heat resistant protector, the latter must be replaced.

- Disconnect the turbocharger air outlet pipe from the turbocharger.
- Move aside the turbocharger air outlet pipe.



120957

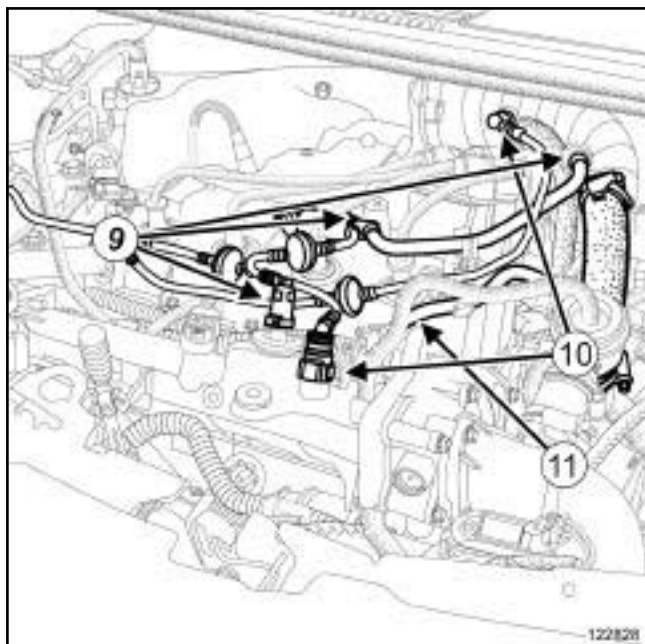
- Unclip the wiring harness from the upstream oxygen sensor (7) .
- Remove:
 - the bolts (6) from the heat shield,
 - the heat shield,
 - the filler neck bolt (8) ,
 - the filler neck,
 - the ignition coil (see 17A, **Ignition, Coils: Removal - Refitting**, page 17A-1) .

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

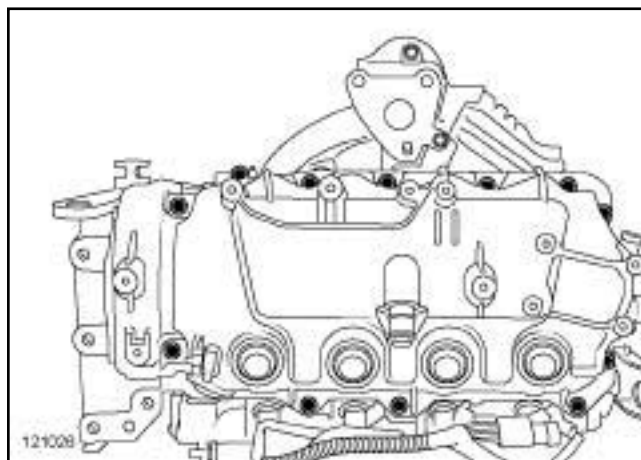
D4F, and 780 or 782 or 784



122828

- Disconnect the oil vapour rebreathing circuit unions (9).
 - on the inlet distributor,
 - on the air filter box outlet air pipe,
 - on the rocker cover.
- Remove the oil vapour rebreathing circuit.
- Disconnect the fuel vapour rebreathing circuit unions (10).
 - on the air filter box outlet air pipe,
 - to the inlet distributor.
- Move the fuel vapour rebreathing pipes to one side.
- Disconnect the vacuum pipe from the brake servo (11).
- Move the brake servo vacuum pipe to one side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



121026

- Remove:
 - the rocker cover bolts,
 - the rocker cover,
 - the rocker cover gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

- Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any part of the seal still adhering.

WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

- parts always to be replaced: rocker cover seal.**

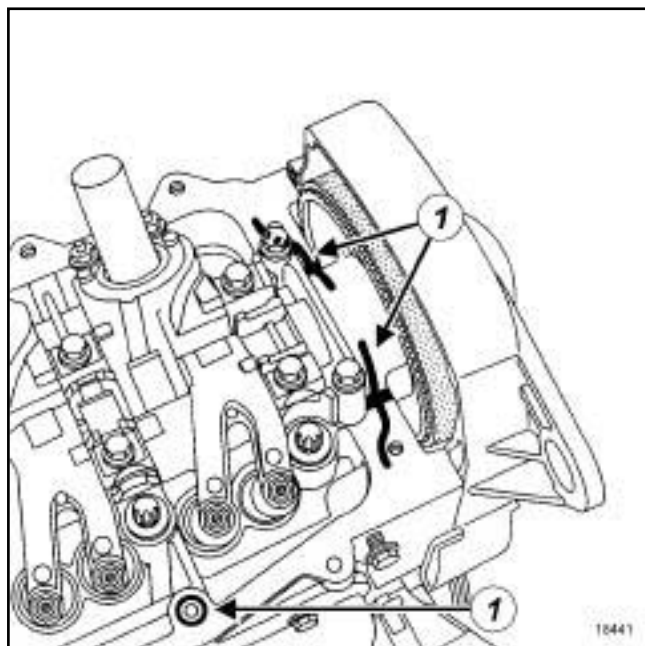
TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

D4F, and 780 or 782 or 784

II - REFITTING OPERATION FOR PART CONCERNED



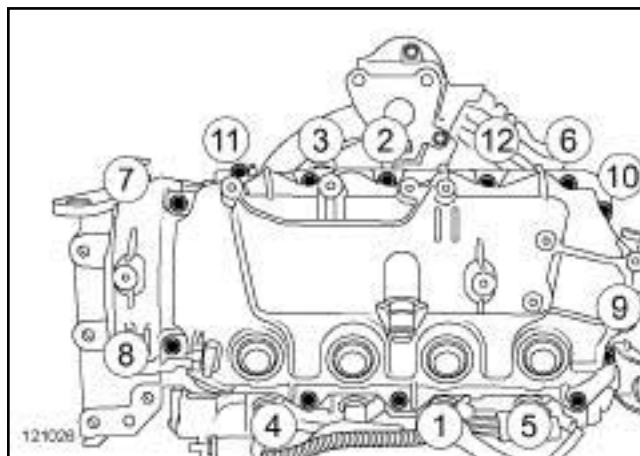
18441

- ❑ Apply beads (1) of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) around the rocker cover rear bolts (lower bolts, exhaust side) and on camshaft bearing **no.5**.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

- ❑ Fit the new rocker cover seal, starting with bearing **No. 5**, then gradually insert the seal studs as the rocker cover fits into the groove.



121026

- ❑ Refit:
 - the rocker cover fitted with a new seal,
 - the rocker cover bolts.
- ❑ Pretighten to torque and in order the **rocker cover bolts (initial torque) (5 N.m)**.
- ❑ Torque tighten in order the **rocker cover bolts (13 N.m)**.

III - FINAL OPERATION

- ❑ Fit the brake servo vacuum pipe.
- ❑ Connect the brake servo vacuum pipe.
- ❑ Fit the fuel vapour rebreathing pipes.
- ❑ Connect the fuel vapour rebreathing circuit unions:
 - on the inlet distributor,
 - on the air filter box outlet air pipe.
- ❑ Fit the oil vapour rebreathing circuit.
- ❑ Connect the oil vapour rebreathing circuit unions:
 - on the rocker cover,
 - on the air filter box outlet air pipe,
 - to the inlet distributor.
- ❑ Refit:
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-1**),
 - the filler neck,
 - the filler neck bolt,
 - the heat shield,
 - the heat shield bolts.
- ❑ Torque tighten the **heat shield bolts (8 N.m)**.

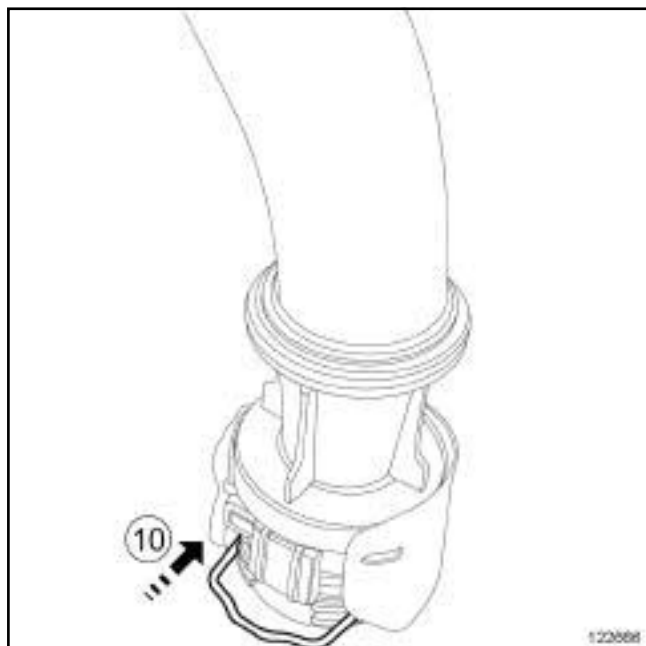
TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

D4F, and 780 or 782 or 784

- ❑ Clip the upstream oxygen sensor wiring harness into place.




- ❑ Position the turbocharger air outlet pipe.
- ❑ Push the turbocharger outlet air pipe clip, following the direction shown by the arrow (10) .
- ❑ Connect the turbocharger air outlet pipe onto the turbocharger.
- ❑ Refit:
 - the turbocharger outlet air pipe bolt on the throttle valve,
 - the air filter unit support,
 - the air filter box mounting bolt,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

K4M

Tightening torques 	
rocker cover bolts 22, 23, 20 and 13 (initial torque)	8 N.m
rocker cover bolts 1 to 12, 14 to 19 and 21 to 24	13 N.m
rocker cover bolts 22, 23, 20 and 13	13 N.m
camshaft sensor bolt	8 N.m
camshaft dephaser solenoid valve bolt	10 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the oil decanter (see **11A, Top and front of engine, Oil decanter: Removal - Refitting**, page 11A-147) ,
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

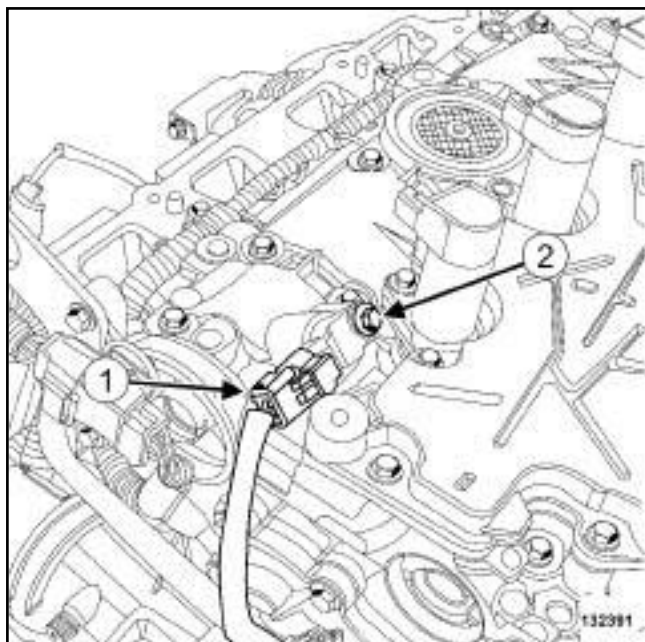
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
- the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
- the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-135) ,
- the camshaft seals on the timing end (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-138) .

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

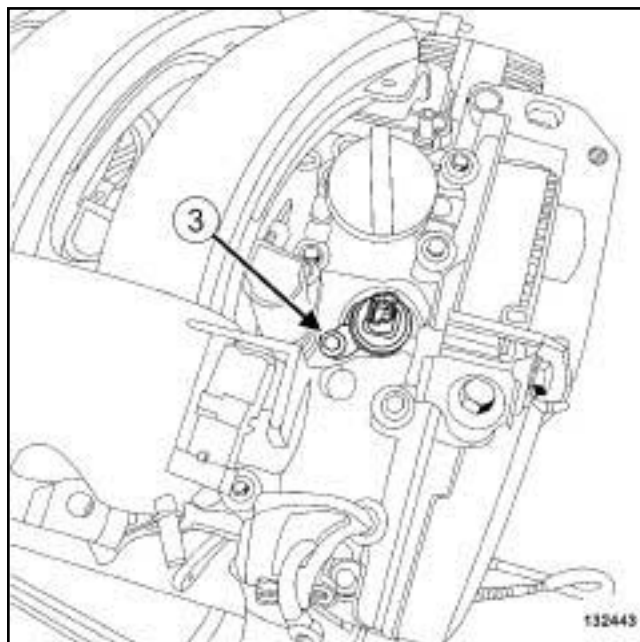
11A

K4M



132391

- Disconnect the connector (1) from the camshaft position sensor.
- Remove:
 - the bolt (2) from the camshaft position sensor,
 - the camshaft position sensor,
 - the camshaft position sensor seal.



132443

- Disconnect the camshaft dephaser solenoid valve connector.
- Remove:
 - the bolt (3) from the camshaft dephaser solenoid valve sensor,
 - the camshaft dephaser solenoid valve,
 - the camshaft dephaser seal.

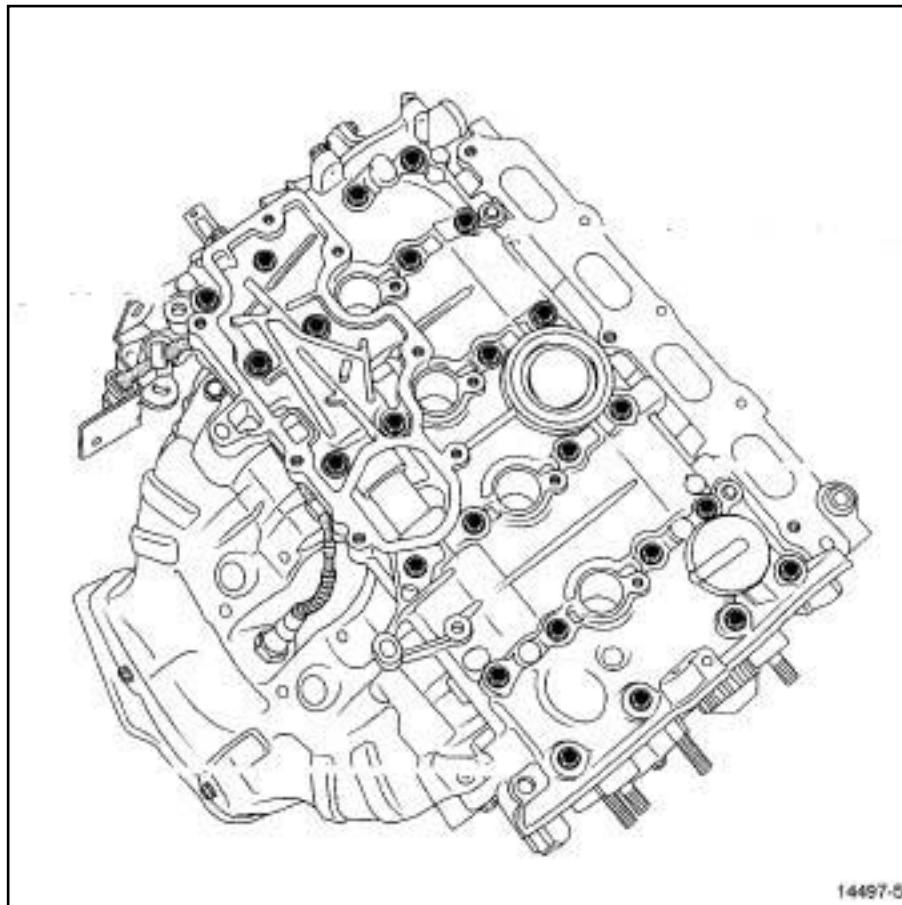
TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

K4M

II - REMOVAL OPERATION



14497-5

14497-5

- Remove the rocker cover bolts.

Note:

The rocker cover bolts are not the same length; mark their positions.

- Detach the rocker cover using a screwdriver.
- Remove the rocker cover.

REFITTING

I - REFITTING PREPARATION OPERATION

- Always replace:
 - the camshaft position sensor seal,
 - the camshaft dephaser solenoid valve seal.
- Use **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:
 - the rocker cover joint face if it is to be re-used,
 - the cylinder head joint face.

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:
 - the rocker cover joint face if it is to be re-used,
 - the cylinder head joint face.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

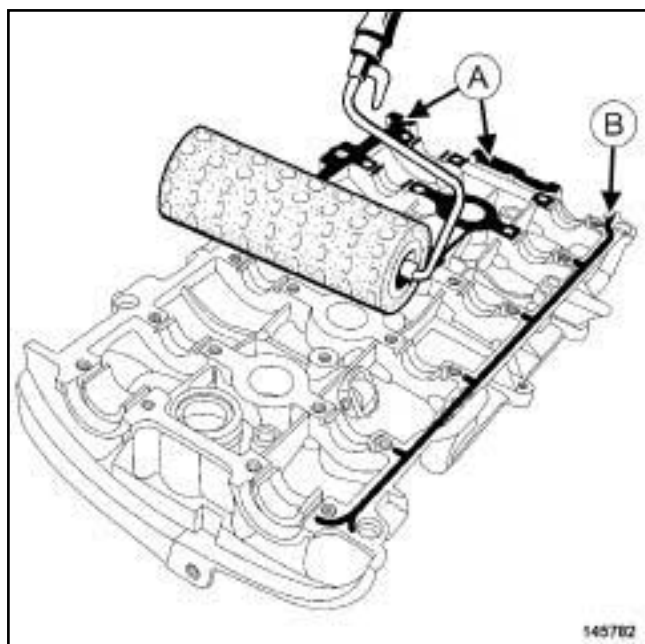
The joint faces must be clean, dry and free from grease (avoid finger marks).

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

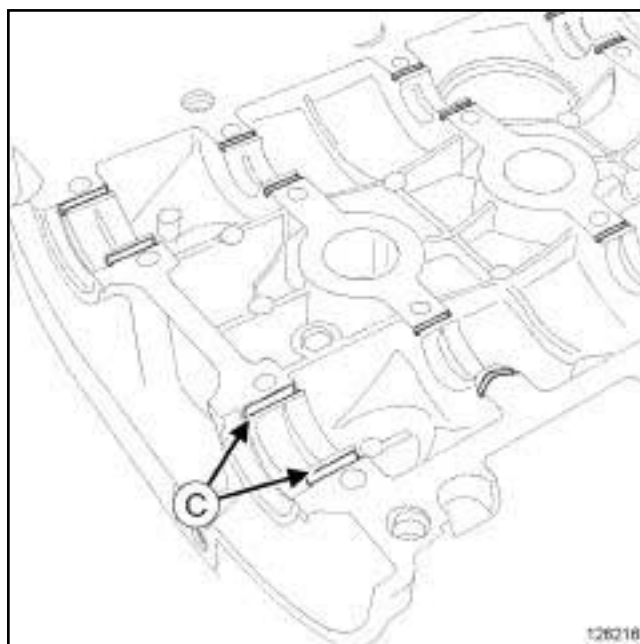
K4M



- ❑ Use a stipple roller to apply **RESIN ADHESIVE** (see) (04B, Consumables - Products) on the section (A) of the rocker cover joint face until the rocker cover joint face is completely coated.
- ❑ Apply a bead of **SILICONE ADHESIVE SEALANT** (see) (04B, Consumables - Products) with a diameter of **1 to 2 mm** on the section (B) of the rocker cover joint face.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).



- ❑ Use a cloth to remove the **RESIN ADHESIVE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) or the **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) (depending on fitting) on the rocker cover bearings (C) .

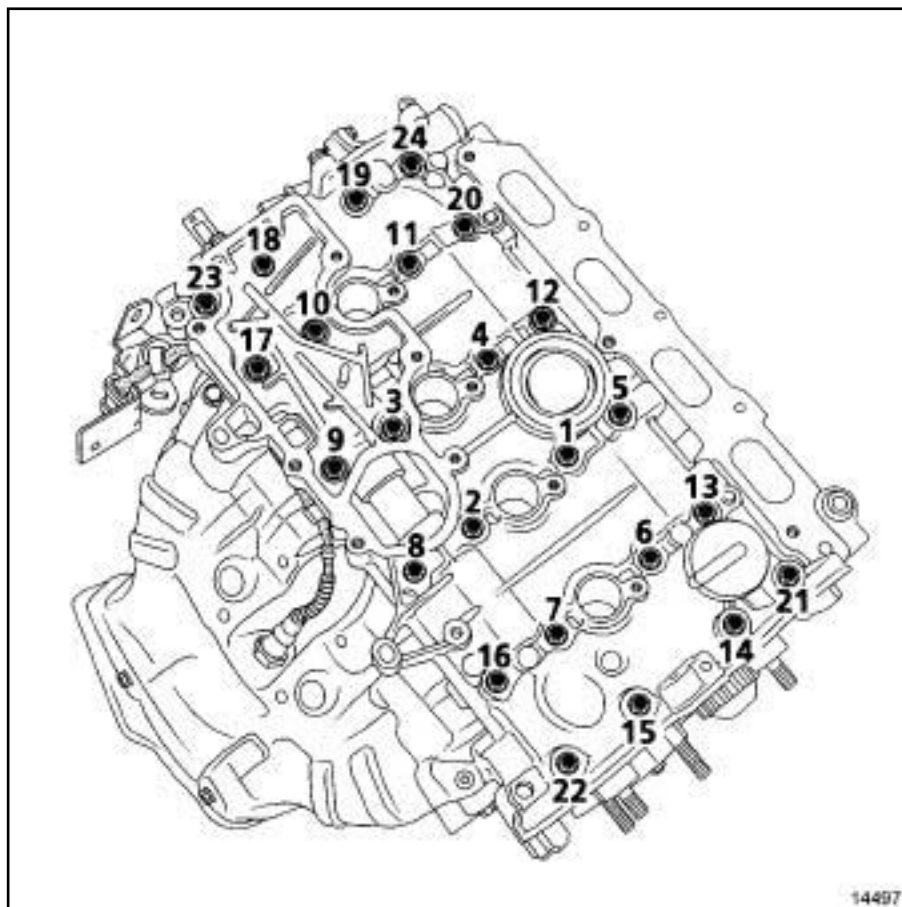
TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

K4M

II - REFITTING OPERATION



14497

- Refit the rocker cover.
- Pretighten **rocker cover bolts 22, 23, 20 and 13 (initial torque) (8 N.m)**.
- Tighten to torque **rocker cover bolts 1 to 12, 14 to 19 and 21 to 24 (13 N.m)**.
- Loosen rocker cover bolts 22, 23, 20 and 13.
- Torque tighten **rocker cover bolts 22, 23, 20 and 13 (13 N.m)**.

III - FINAL OPERATION

- Refit the camshaft sensor fitted with a new seal.
- Torque tighten the **camshaft sensor bolt (8 N.m)**.
- Connect the camshaft sensor connector.
- Refit the camshaft dephaser solenoid valve equipped with a new seal.
- Torque tighten the **camshaft dephaser solenoid valve bolt (10 N.m)**.
- Connect the camshaft dephaser solenoid valve connector.

Refit:

- the camshaft seals on the timing end (see 11A, **Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-138) .
- the camshaft dephaser (see 11A, **Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-135) ,
- the timing belt (see 11A, **Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
- the crankshaft accessories pulley (see 11A, **Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the right-hand suspended engine mounting (see 19D, **Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the air filter unit (see 12A, **Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
- the accessories belt (see 11A, **Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,

TOP AND FRONT OF ENGINE

Rocker cover: Removal - Refitting

11A

K4M

- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray,
 - the oil decanter (see **11A, Top and front of engine, Oil decanter: Removal - Refitting**, page 11A-147) ,
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
 - the coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).


TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 772

Special tooling required	
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1381	Camshaft seal extractor tool 30 x 42 x 7.
Mot. 1605	Tool for fitting cylinder head plugs.
Mot. 1587	Tool for fitting camshaft "PTFE" seal.

Tightening torques 	
camshaft bearing cap no.5 bolts	5 Nm
camshaft bearing cap bolts (initial torque)	5 N.m
camshaft bearing cap bolt	7 N.m + 50° ± 6
camshaft pulley bolt	30 N.m + 45° ± 6

REMOVAL

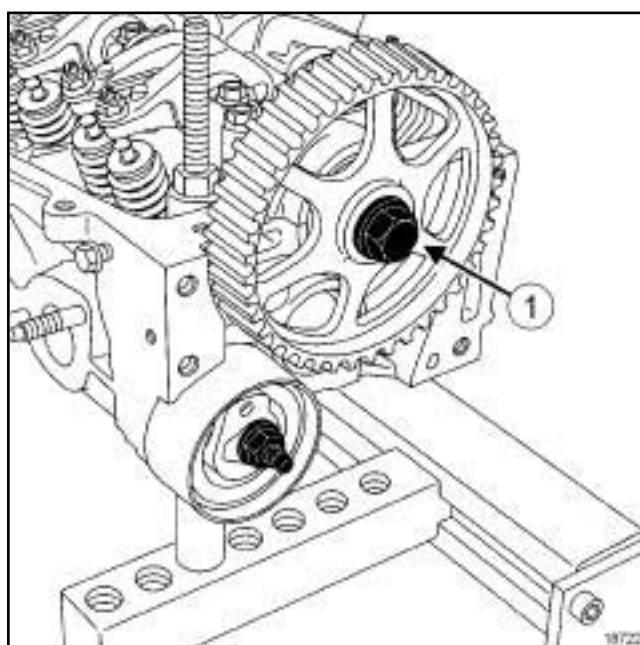
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3),
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20),
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27),

- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13),
- the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29),
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66).

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Removing the camshaft sprocket



18722

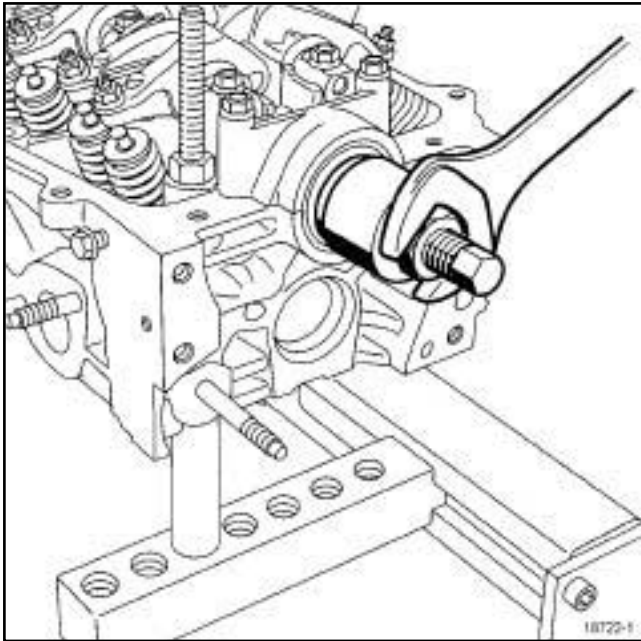
- Remove:
 - the camshaft pulley bolt (1) using the (**Mot. 799-01**),
 - the camshaft sprocket.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

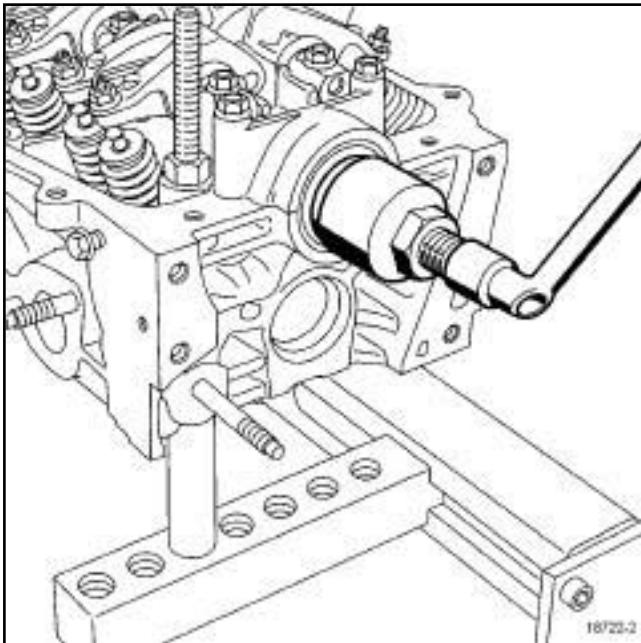
11A

D4F, and 772



18722-1

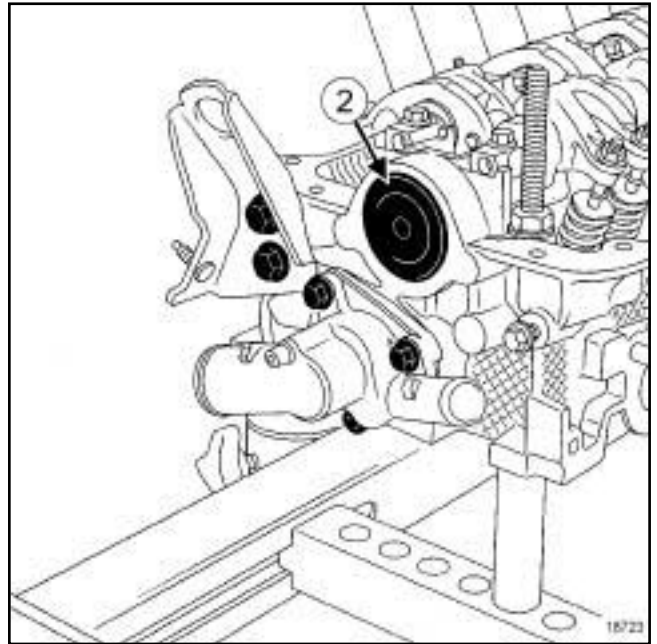
- Position the **(Mot. 1381)**.



18722-2

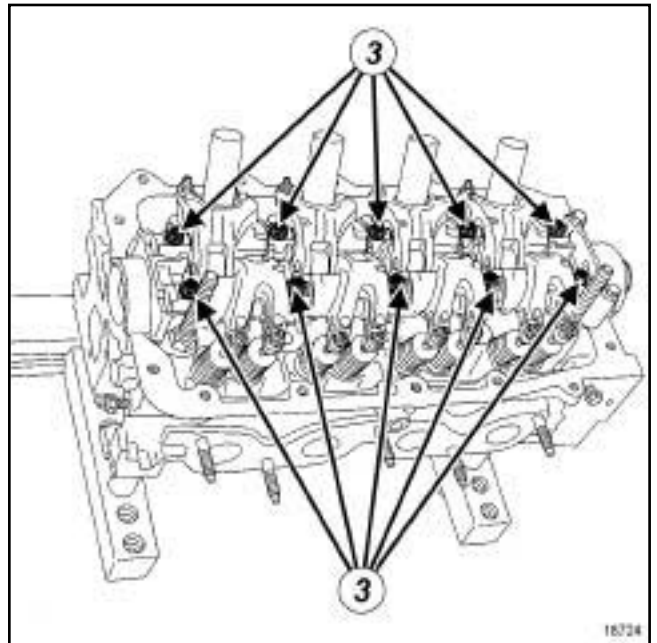
- Tighten the bolt of the **(Mot. 1381)**.
- Remove the lip seal.

2 - Removing the camshaft



18723

- Remove the camshaft plug **(2)** .



18724

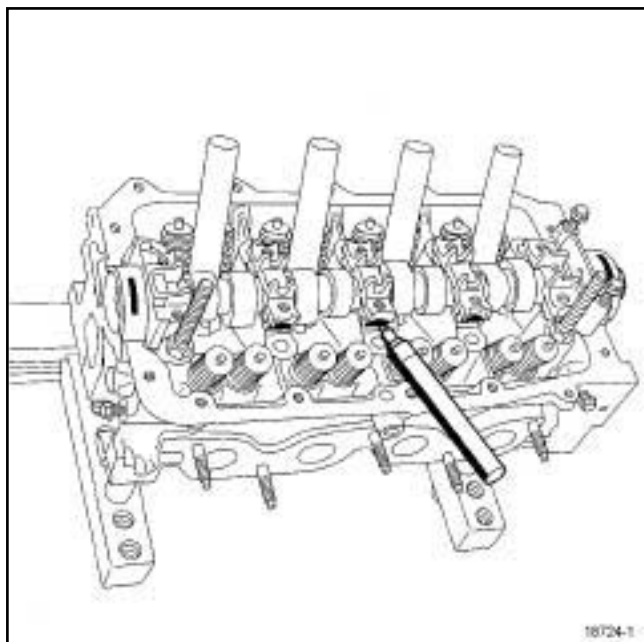
- Remove:
 - the rocker shaft bolts **(3)** ,
 - the camshafts.

TOP AND FRONT OF ENGINE

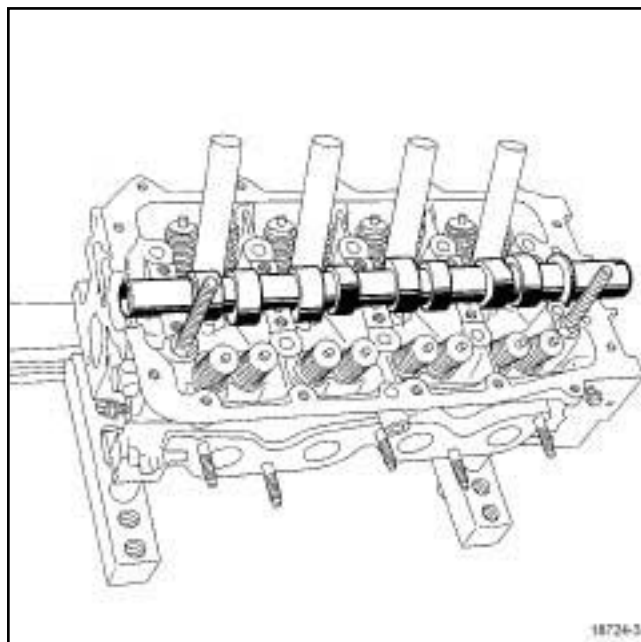
Camshaft: Removal - Refitting

11A

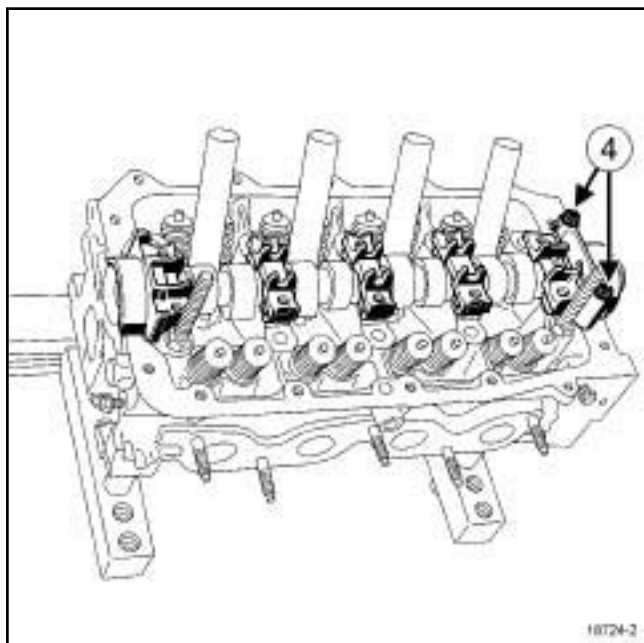
D4F, and 772



- ❑ Mark the camshaft caps using an indelible pencil.



- ❑ Remove the camshaft.



- ❑ Remove:
 - the bolts (4) from camshaft bearing cap no. 5,
 - the camshaft bearing caps.

REFITTING

I - REFITTING PREPARATION OPERATION

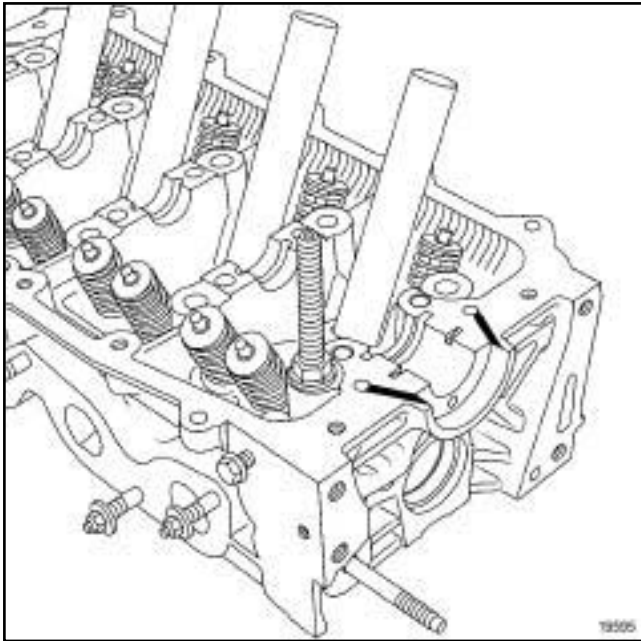
- ❑ parts always to be replaced: rocker cover seal.
- ❑ parts always to be replaced: Camshaft seal on timing end.
- ❑ Parts always to be replaced :
 - camshaft plug.
- ❑ Clean the joint face with **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

TOP AND FRONT OF ENGINE

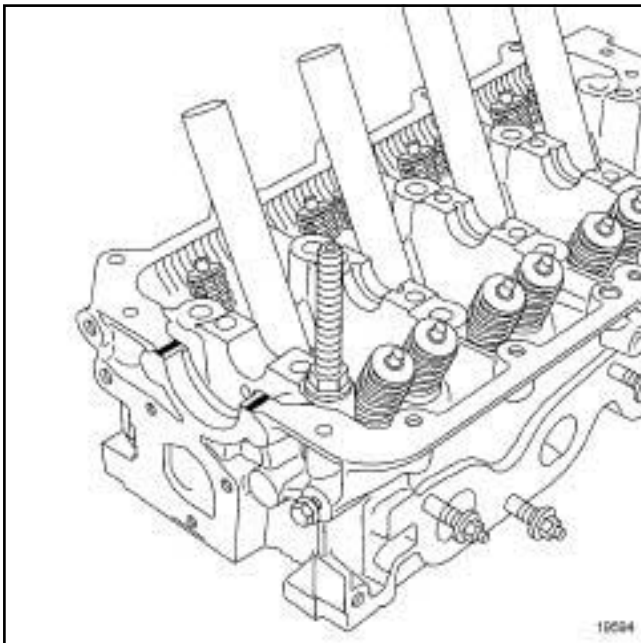
Camshaft: Removal - Refitting

11A

D4F, and 772



19595



19594

Apply:

- two beads of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a width of **2 mm** at the bearing No.5 end of the cylinder head,

- two points of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a width of **2 mm** at the bearing No.1 end of the cylinder head.

Apply a drop of oil to the camshaft bearings.

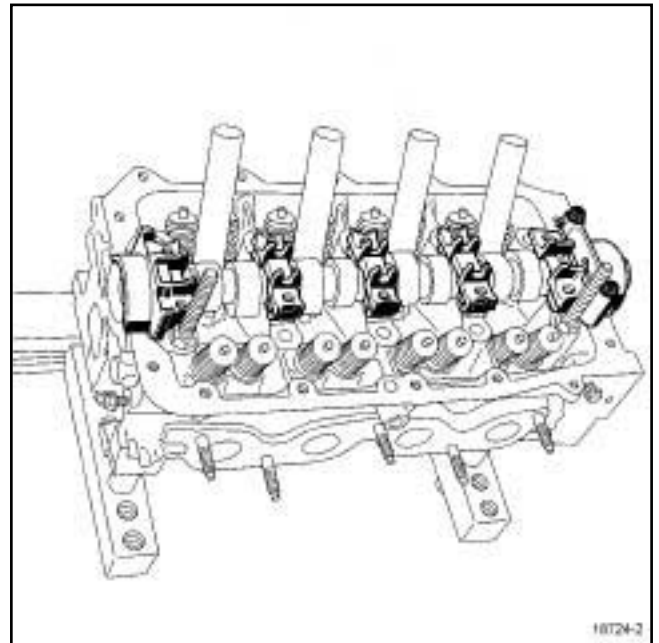
II - REFITTING OPERATION FOR PART CONCERNED

1 - Refitting the camshaft

Position the pistons at mid-stroke to prevent any contact with the valves when tightening the camshaft bearings.

Refit:

- the camshaft,
- the camshaft caps.



18724-2

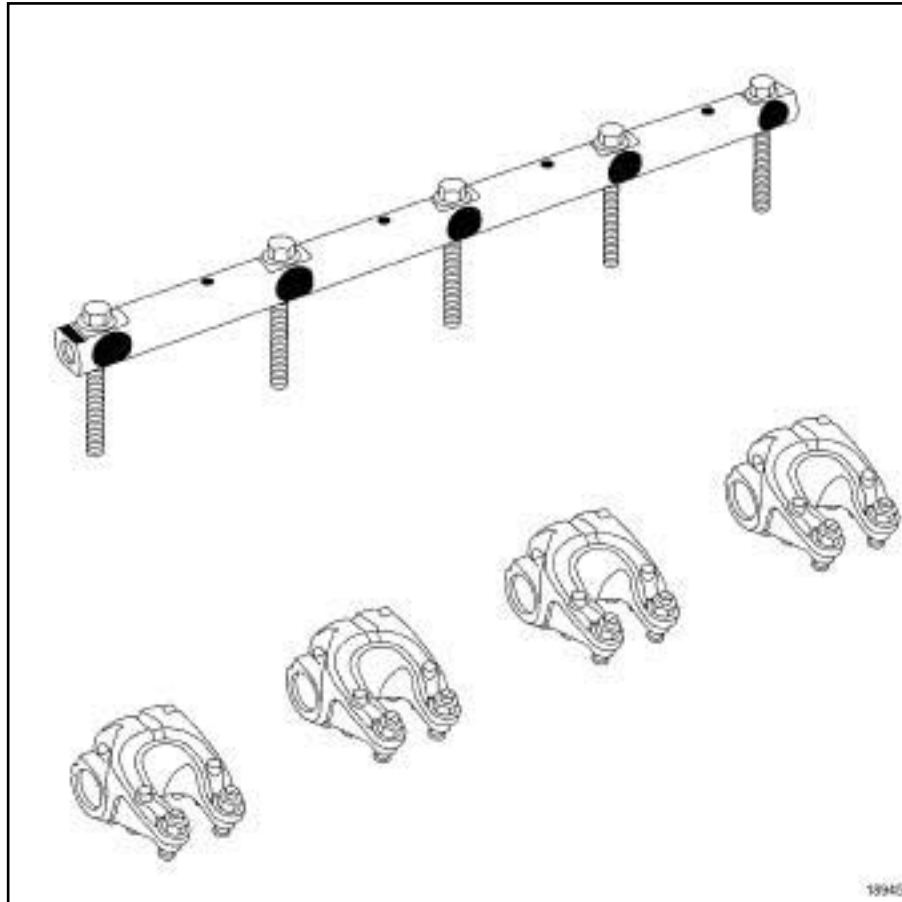
Torque tighten the **camshaft bearing cap no.5 bolts (5 Nm)**.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

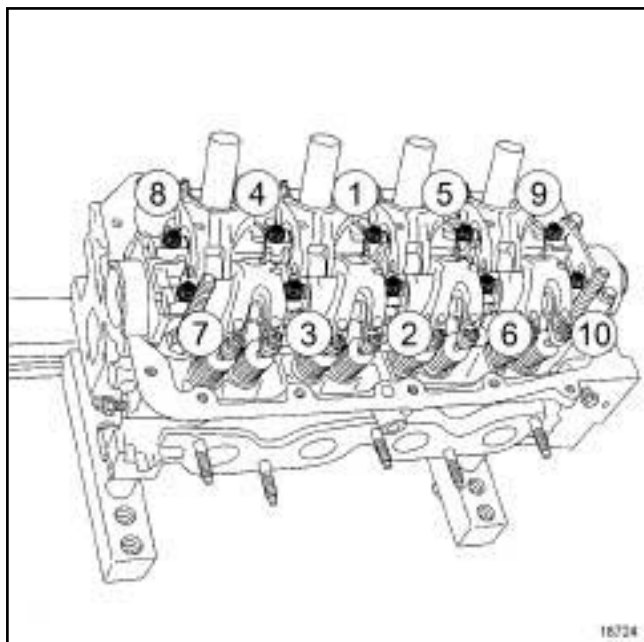
D4F, and 772



18945

- Refit the rocker shafts, positioning:
 - the rails in relation to the tappets,
 - the marks on the flywheel end.

D4F, and 772

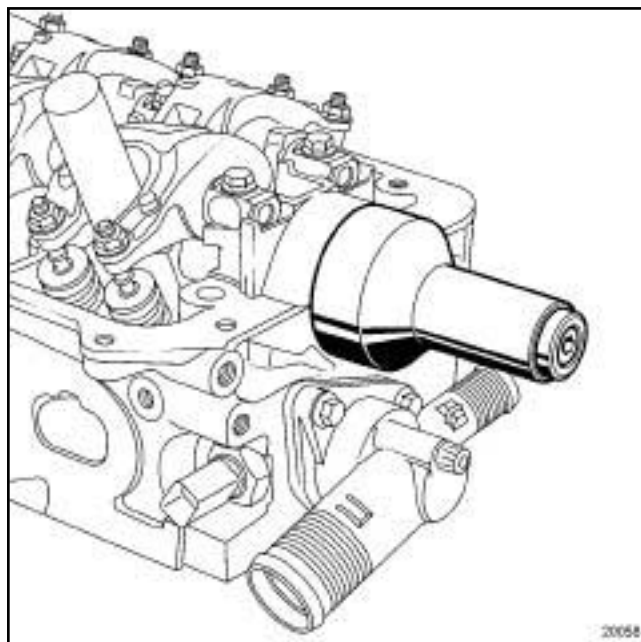


18724

- Pre-tighten to torque and in order the **camshaft bearing cap bolts (initial torque) (5 N.m)**.
- Repeat the following operation for each camshaft bearing cap bolt, following the correct tightening order:
 - loosen the bolts,
 - torque and angle tighten the **camshaft bearing cap bolt (7 N.m + 50° ± 6)**.

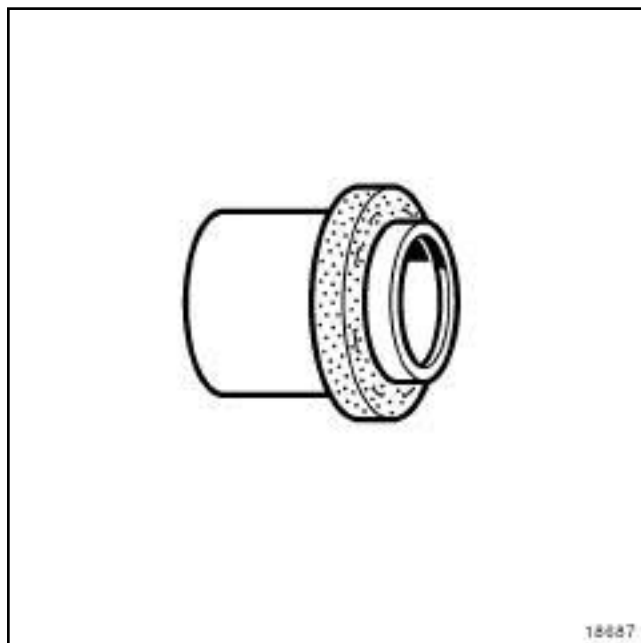
2 - Fitting the camshaft plug

- Check that the camshaft support surfaces are clean.



20058

- Refit the camshaft plug using the tool (**Mot. 1605**).



18687

- Fit the lip seal.

3 - Fitting the camshaft lip seal

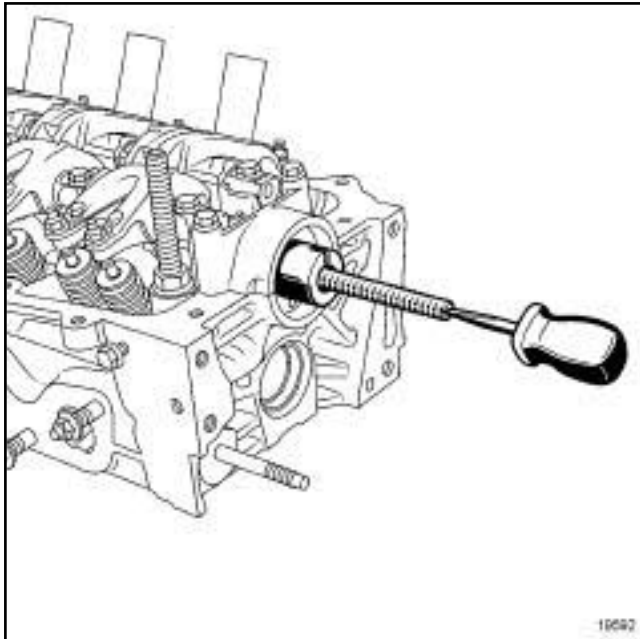
- Check that the camshaft support surfaces are clean.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

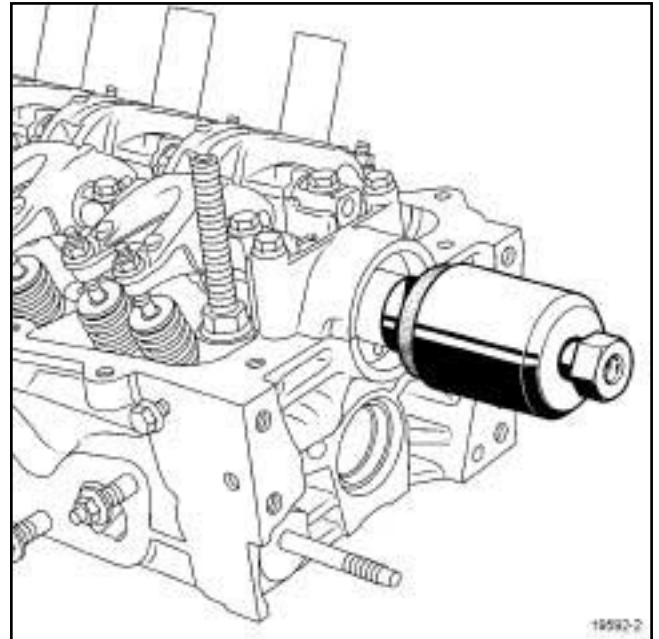
11A

D4F, and 772



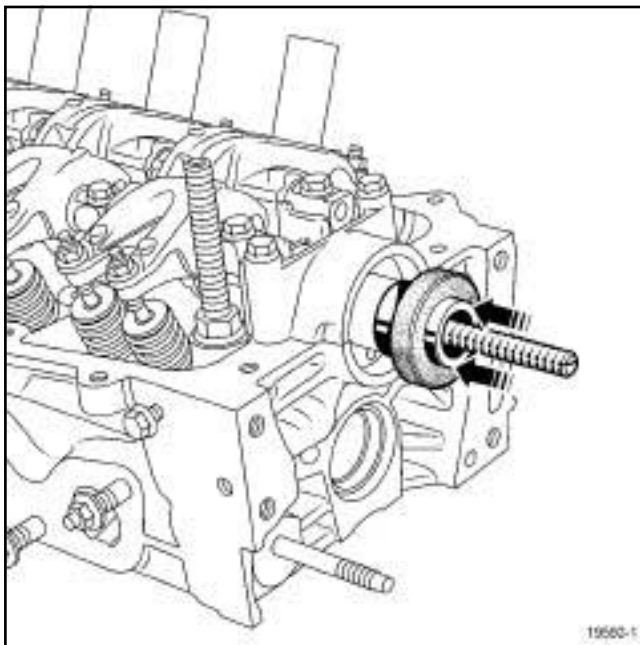
19592

- Screw the threaded rod of the **(Mot. 1587)** into the camshaft.



19592-2

- Fit the cover and the collar nut of the **(Mot. 1587)**.



19592-1

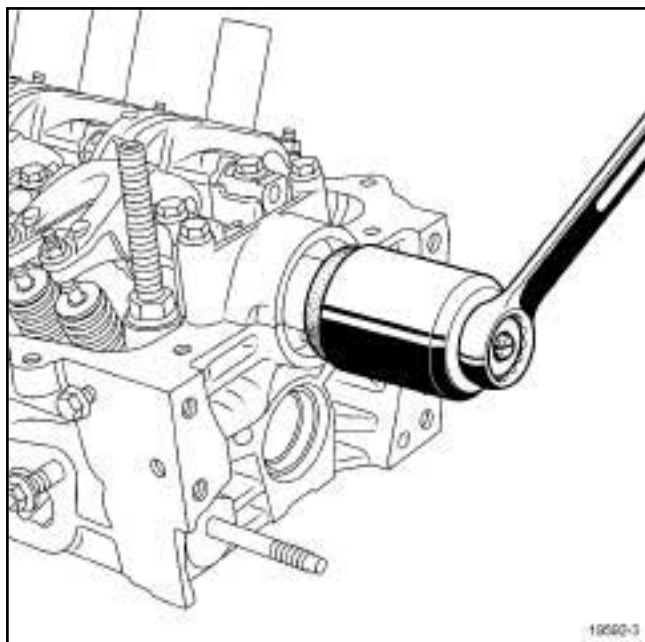
- Fit the protector with the new seal on the camshaft, taking care not to touch the seal.

TOP AND FRONT OF ENGINE

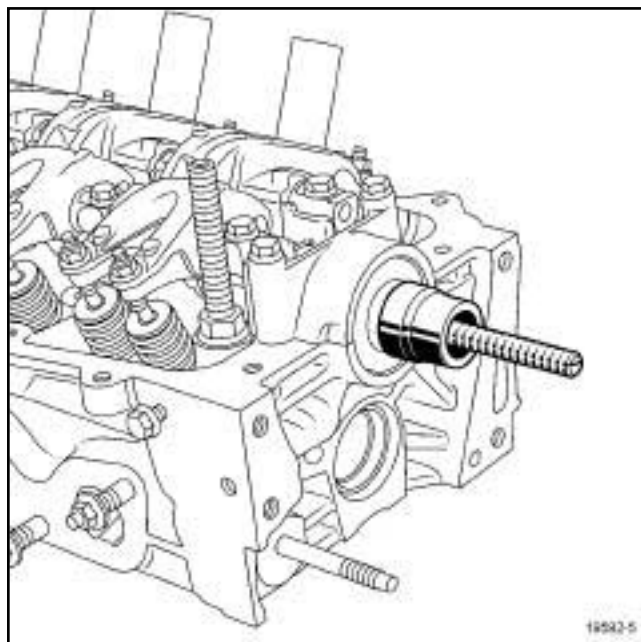
Camshaft: Removal - Refitting

11A

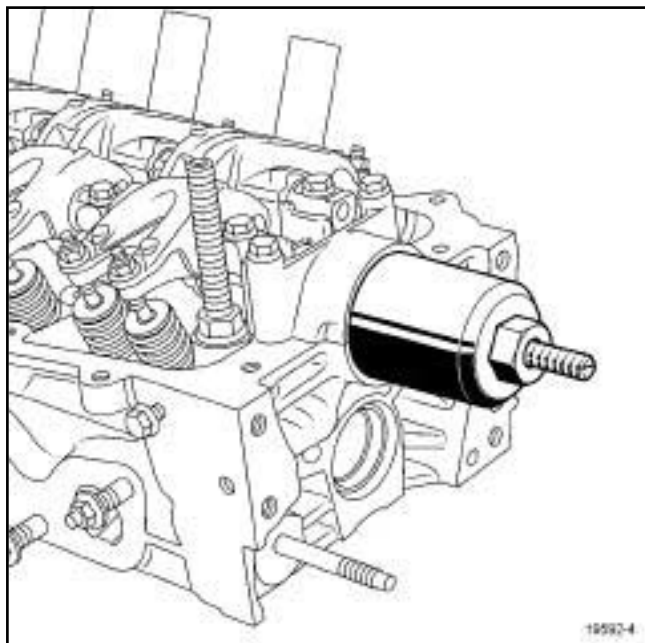
D4F, and 772



19592-3



19592-5



19592-4

- Screw on the collar nut until the cover touches the cylinder head.

Remove:

- the nut from the **(Mot. 1587)**,
- the cover from the **(Mot. 1587)**,
- the seal protector,
- the threaded rod of the **(Mot. 1587)**.

4 - Refitting the camshaft pulley

Refit:

- the camshaft pulley,
- the camshaft pulley bolt.

- Torque and angle tighten the **camshaft pulley bolt** (**30 N.m + 45° ± 6**) using the **(Mot. 799-01)**.

III - FINAL OPERATION

Refit:

- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-66**),
- the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-29**),
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-27**),
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-20**),

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 772

- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 780 or 782

Special tooling required

Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1381	Camshaft seal extractor tool 30 x 42 x 7.
Mot. 1587	Tool for fitting camshaft "PTFE" seal.

Tightening torques

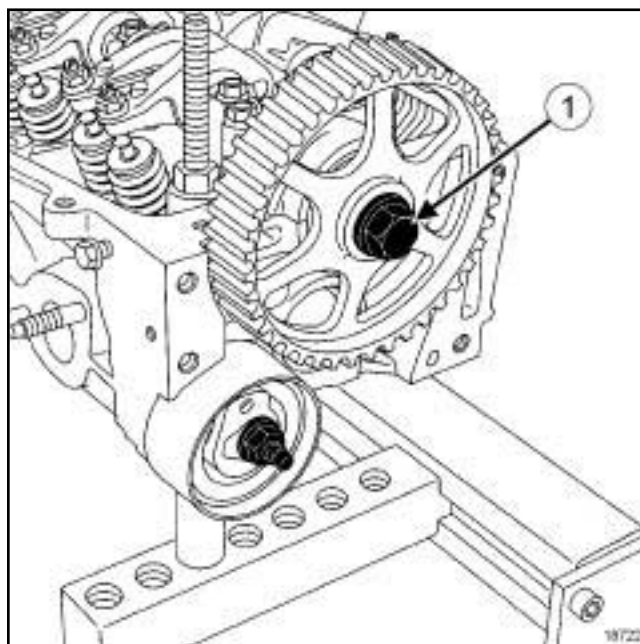
bolts for camshaft bearing cap no.5	5 Nm
camshaft bearing cap bolt	7 N.m + 50° ± 6°
camshaft pulley bolt	30 N.m + 45° ± 6°

REMOVAL

I - REMOVAL PREPARATION OPERATION

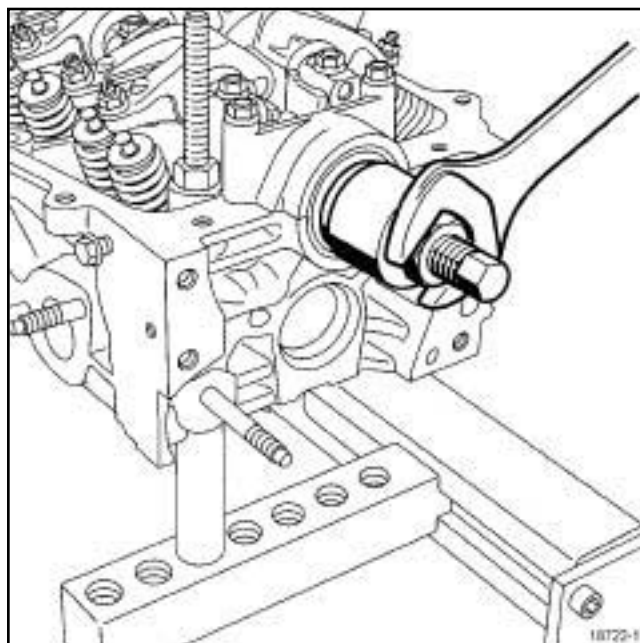
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,

- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66) .



18722

- Remove:
 - the camshaft pulley bolt (1) using the (**Mot. 799-01**),
 - the camshaft pulley.



18722-1

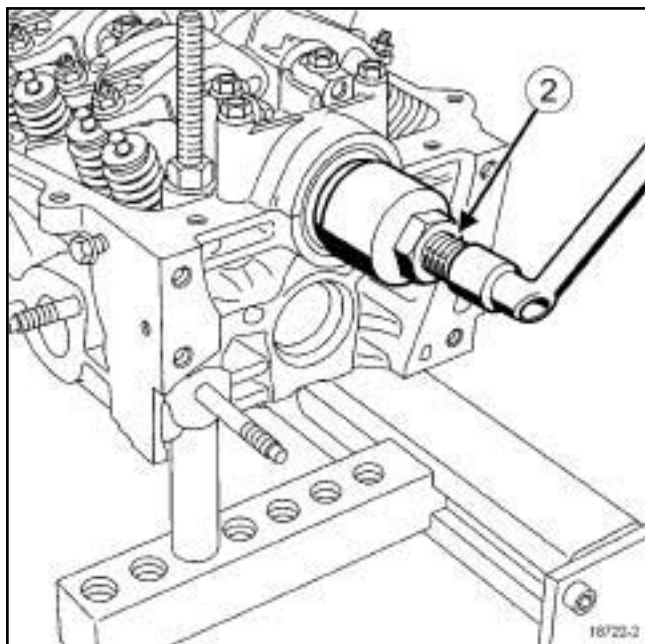
- Position the (**Mot. 1381**).

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

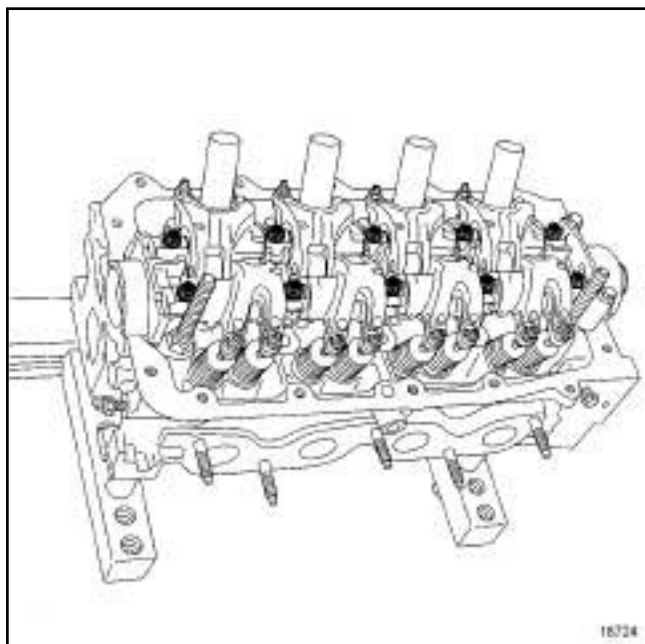
D4F, and 780 or 782



18722-2

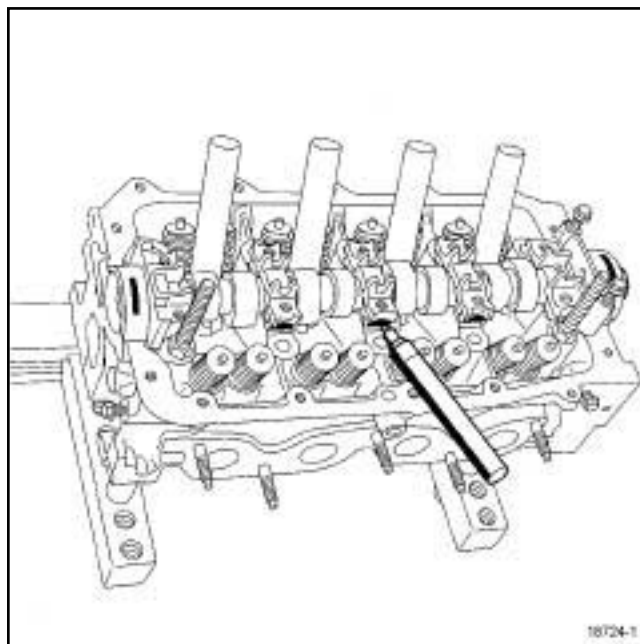
- ❑ Remove the seal by tightening the bolt (2) on the (Mot. 1381).

II - OPERATION FOR REMOVAL OF PART CONCERNED



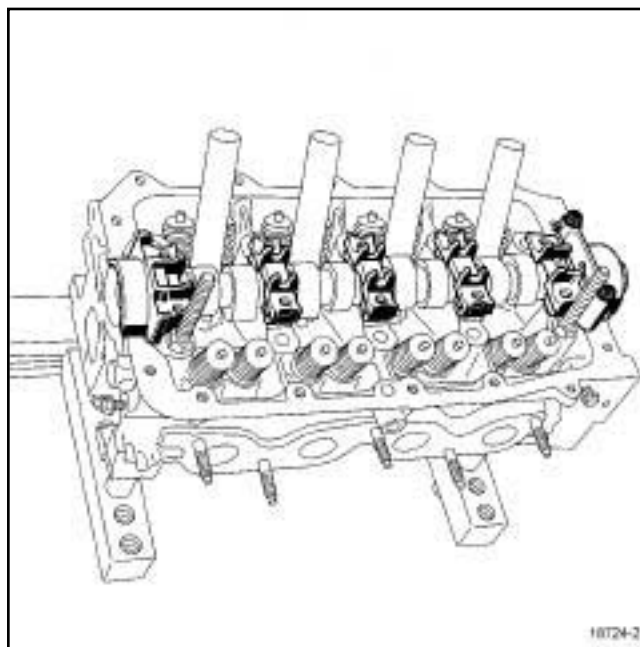
18724

- ❑ Remove:
 - the camshaft bolts,
 - the camshafts.



18724-1

- ❑ Mark the camshaft bearing caps with a permanent marker pen.



18724-2

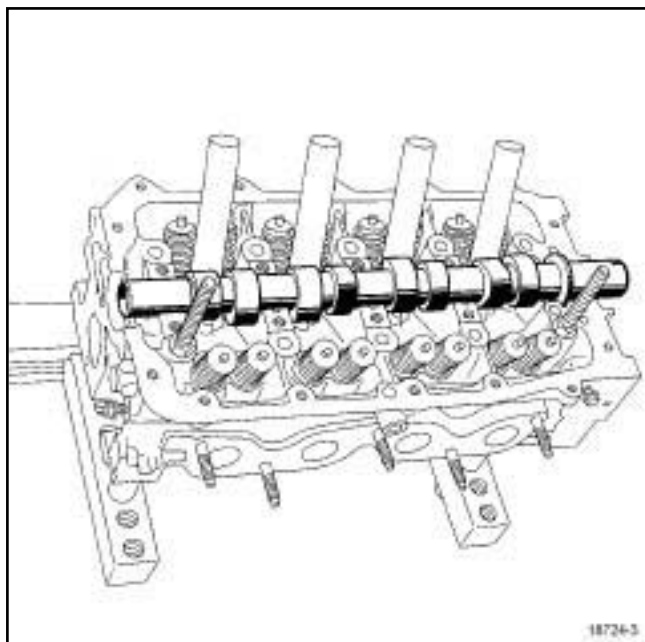
- ❑ Remove the camshaft bearing caps.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 780 or 782



18724-3

- Remove the camshaft.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Camshaft seal on timing end.**
- Always replace the camshaft pulley bolt.
- Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any part of the seal still adhering.

WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

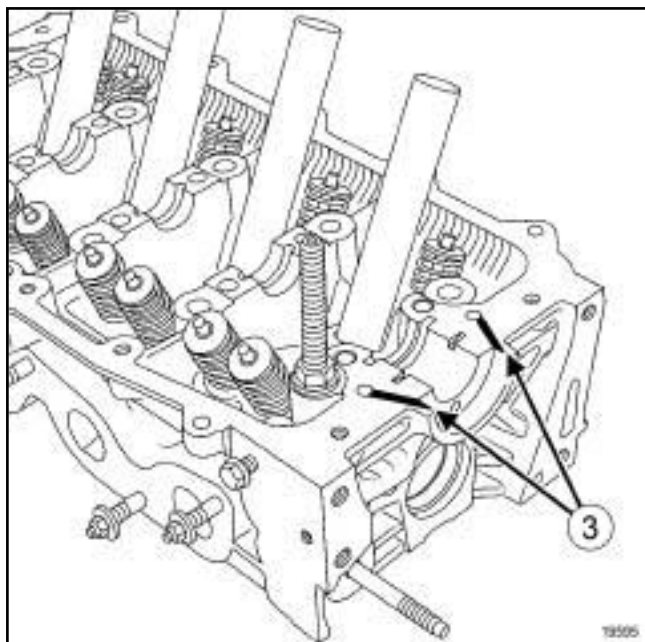
Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

TOP AND FRONT OF ENGINE

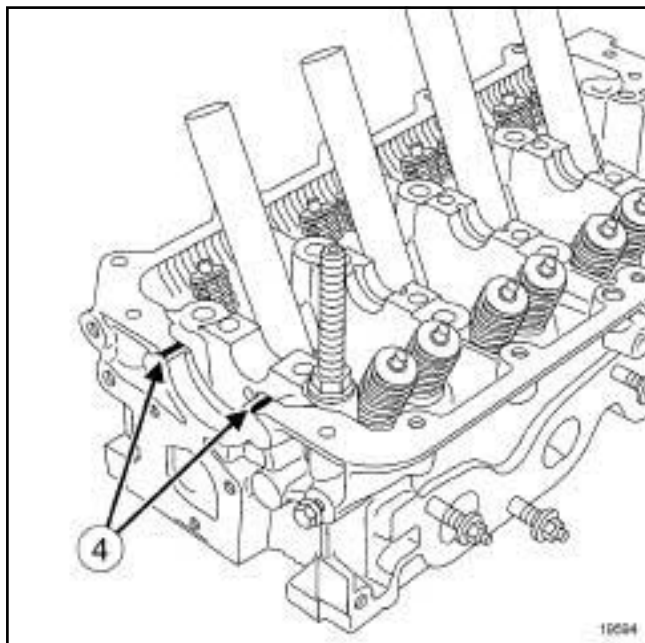
Camshaft: Removal - Refitting

11A

D4F, and 780 or 782



19595



19594

Apply:

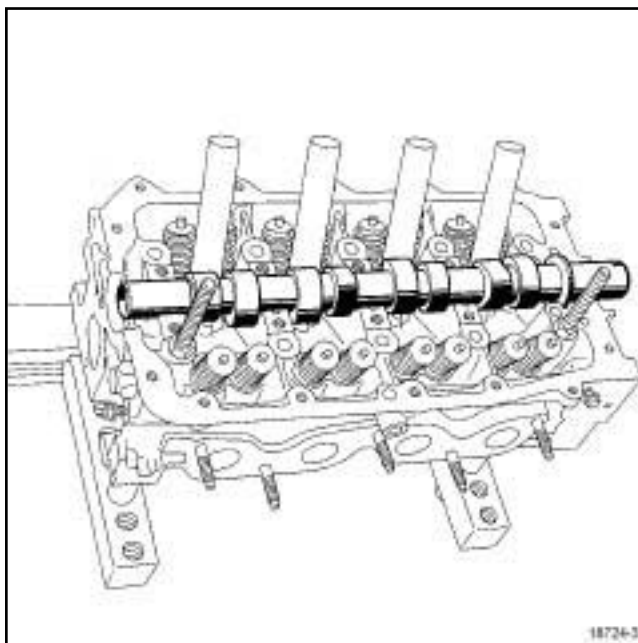
- two beads (3) of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a width of **2 mm** to bearing No.5 on the cylinder head,
- two points (4) of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to bearing No.1 on the cylinder head.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

- Apply a blob of oil to the camshaft bearings.

II - REFITTING OPERATION FOR PART CONCERNED



18724-3

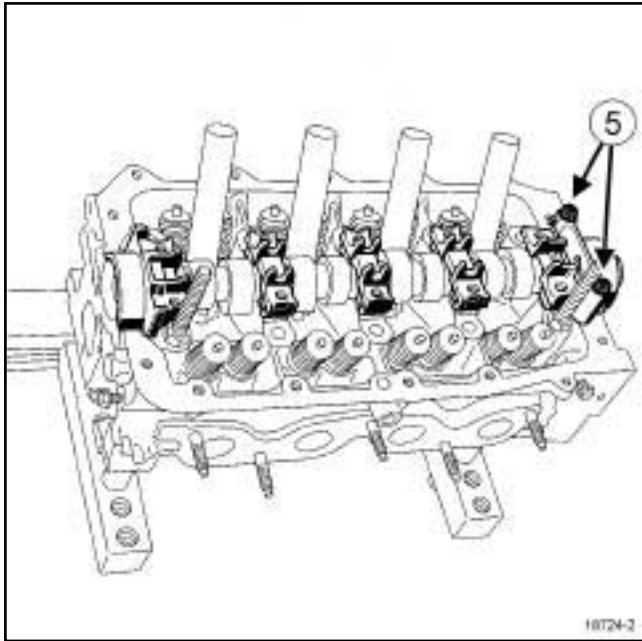
- Refit the camshaft.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 780 or 782



18724-2

- Refit the camshaft bearing caps.
- Torque tighten the **bolts for camshaft bearing cap no.5 (5 Nm) (5)** .

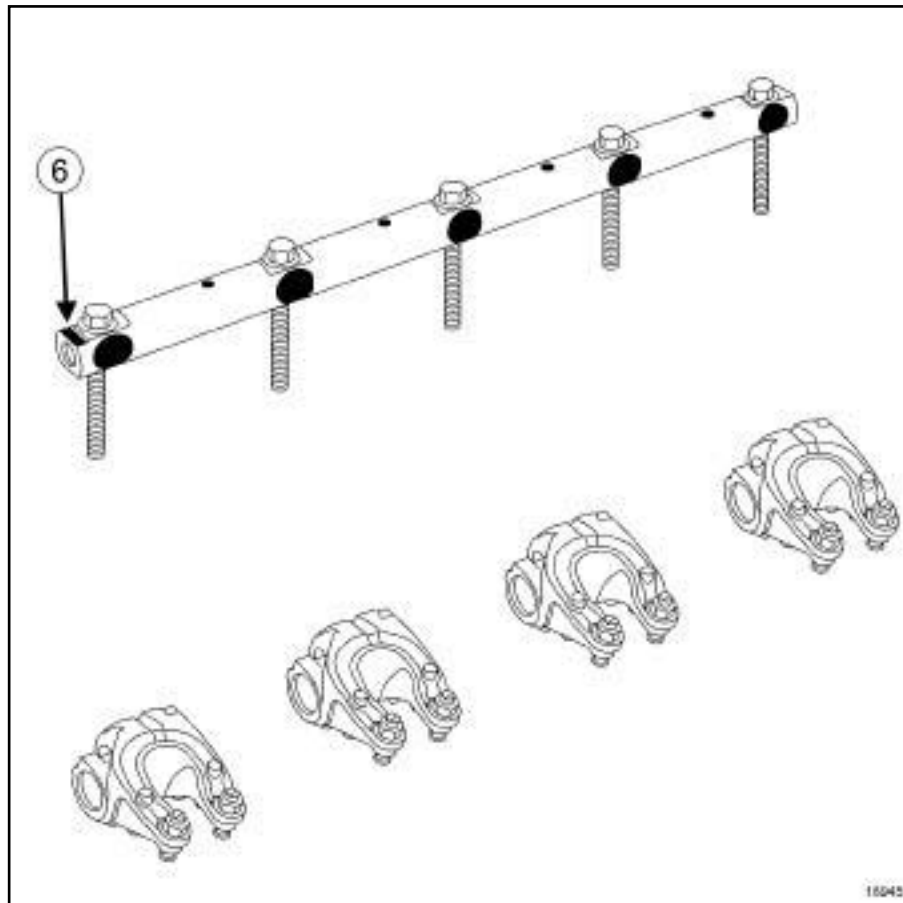
TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 780 or 782

Inlet rocker shaft



18945

18945

□ Refit the inlet rocker shaft by positioning:

- the rails in relation to the tappets,
- the marking (6) on the timing end.

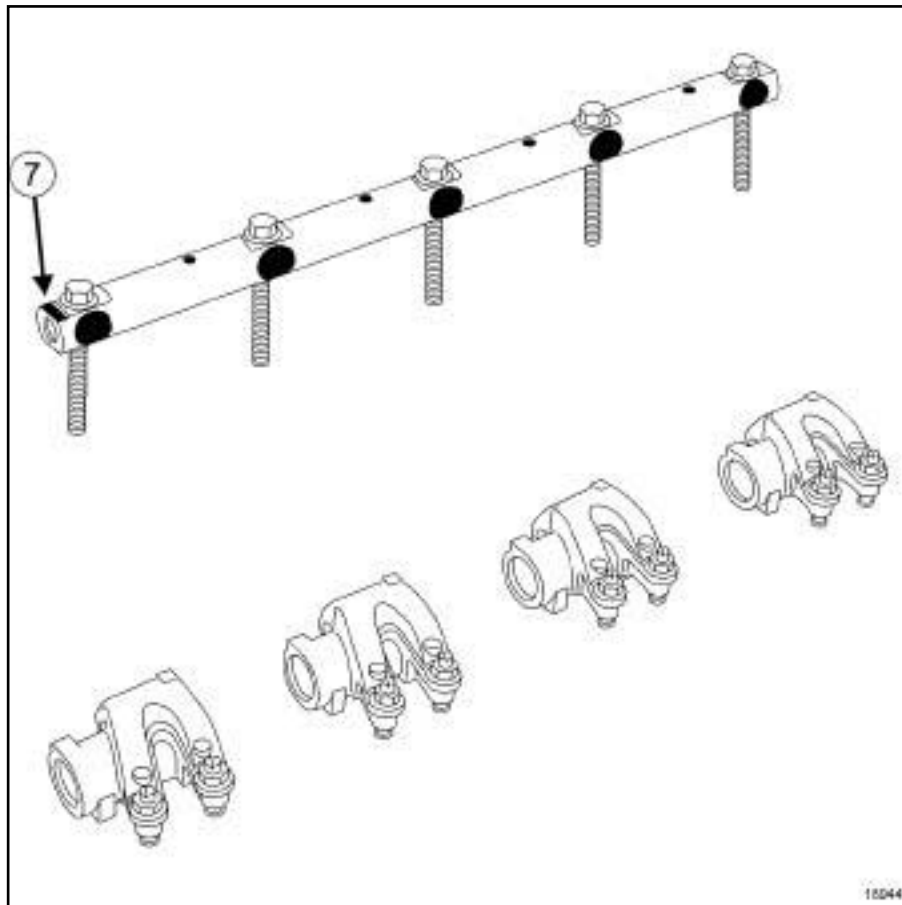
TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 780 or 782

Exhaust rocker shaft



18944

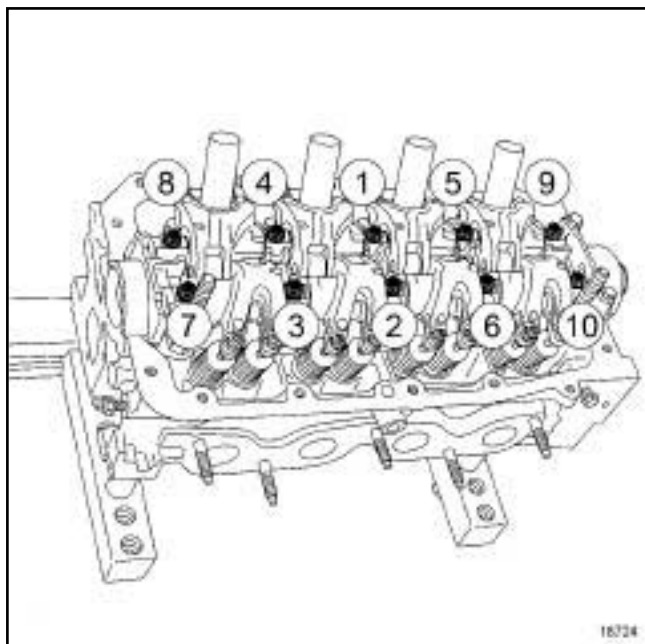
- Refit the exhaust rocker shaft by positioning:
 - the rails in relation to the tappets,
 - the marking (7) on the flywheel end.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

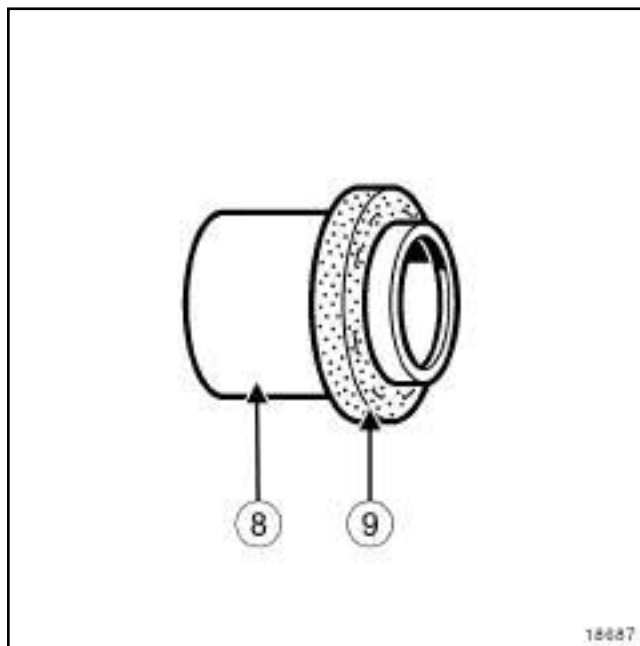
D4F, and 780 or 782



18724

- Tighten to torque and in order the **camshaft bearing cap bolts (5 N.m)**.
- Completely loosen bolt (1) .
- Torque and angle tighten the **camshaft bearing cap bolt (7 N.m + 50° ± 6°)**.
- Carry out the previous operations for each bolt from (2) to (10) .

III - FINAL OPERATION



18687

- Prepare the camshaft seal with its protector.

Note:

This type of seal is extremely fragile. Only touch the protective part (8) when handling the gasket. Touching the camshaft seal (9) is strictly forbidden in order to avoid any oil leaks once the camshaft seal is fitted on the engine.

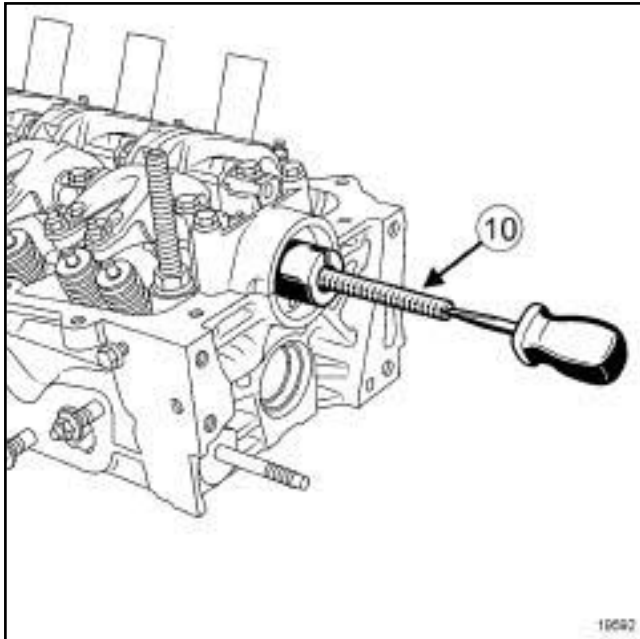
- Fit the camshaft seal with tool (**Mot. 1587**).

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

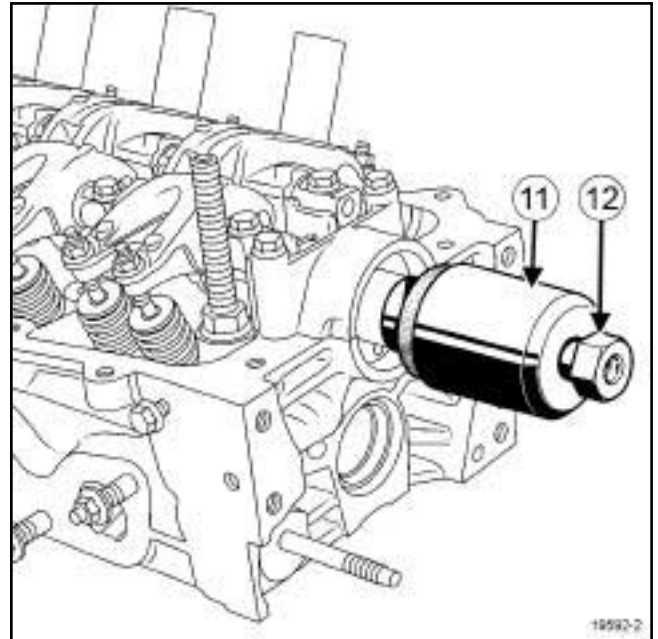
11A

D4F, and 780 or 782



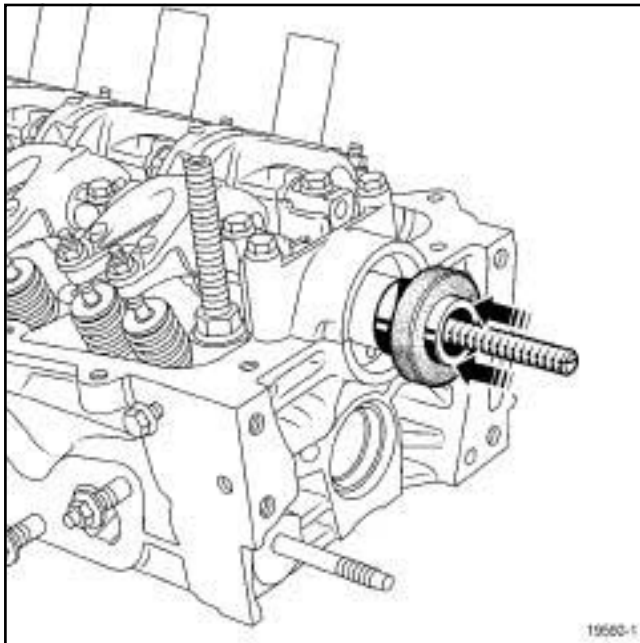
19592

- ❑ Fit the threaded rod (10) of the (Mot. 1587) into the camshaft.



19592-2

- ❑ Fit the cover (11) and the collar nut (12) of the (Mot. 1587).



19592-1

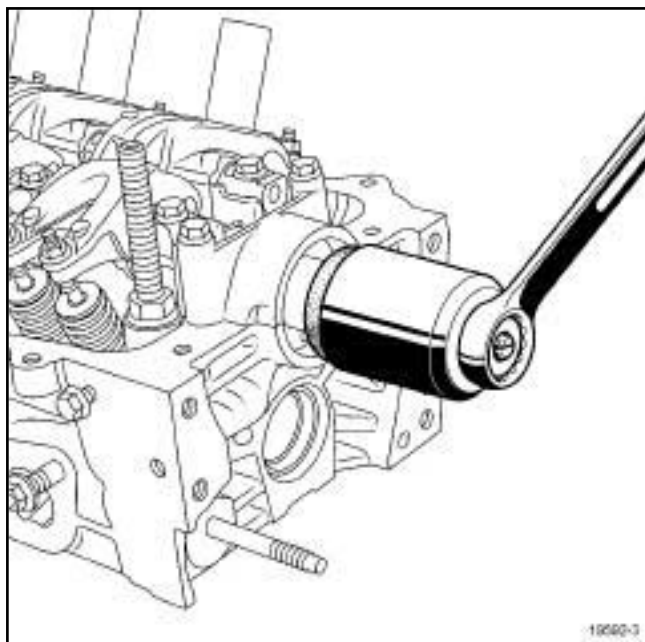
- ❑ Fit the protector with the camshaft seal on the camshaft, taking care not to touch the seal.

TOP AND FRONT OF ENGINE

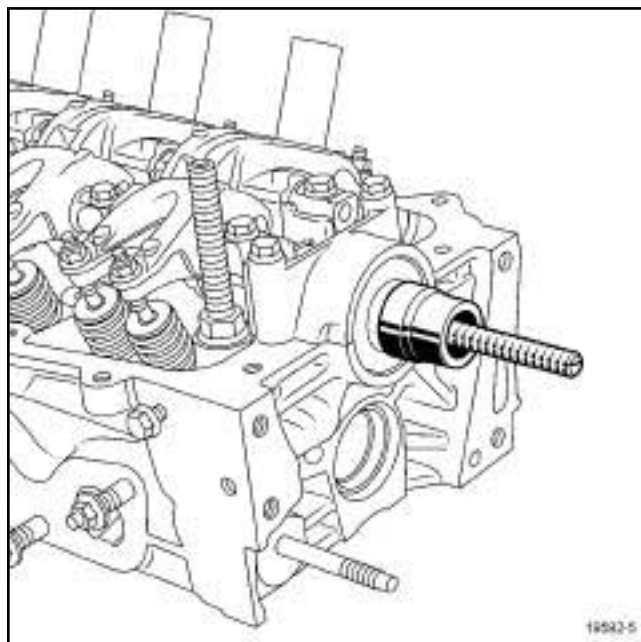
Camshaft: Removal - Refitting

11A

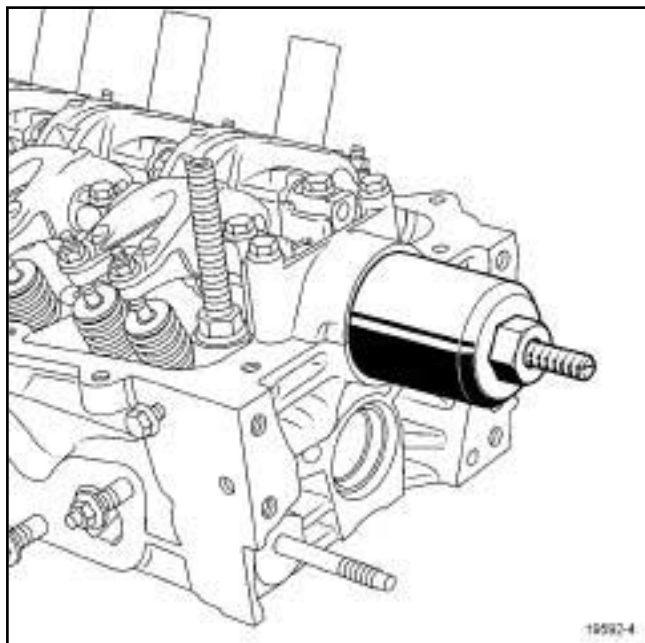
D4F, and 780 or 782



19592-3



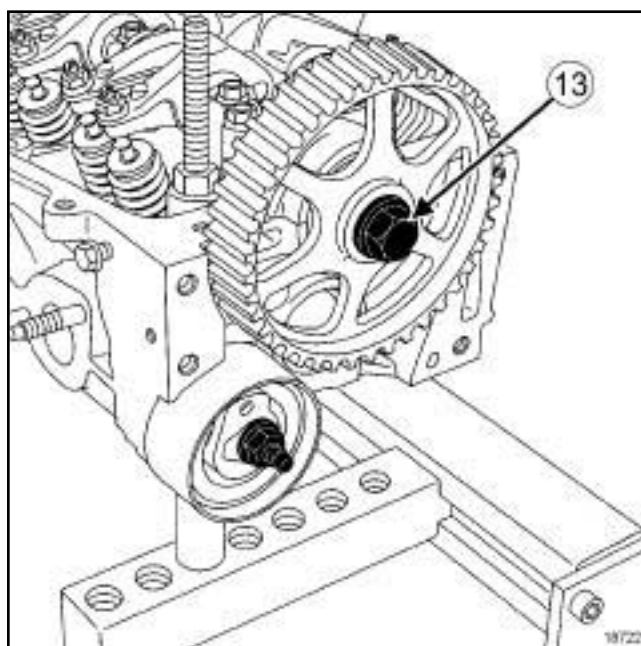
19592-5



19592-4

- Tighten the collar nut until the cover comes into contact with the cylinder head.

- Remove:
 - the nut,
 - the cover,
 - the guard,
 - the threaded rod.



18722

- Refit:
 - the camshaft pulley,
 - the new camshaft pulley bolt (13) .
- Torque and angle tighten the **camshaft pulley bolt (30 N.m + 45° ± 6°)** using the **(Mot. 799-01)**.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 780 or 782

Refit:

- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-66**) ,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-27**) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**) ,
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-1**) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) ,
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (**55A, Exterior protection**),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (**35A, Wheels and tyres**).
- Connect the battery (see **Battery: Removal - Refitting**) (**80A, Battery**).


TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D7F

Special tooling required	
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1381	Camshaft seal extractor tool 30 x 42 x 7.
Mot. 1587	Tool for fitting camshaft "PTFE" seal.

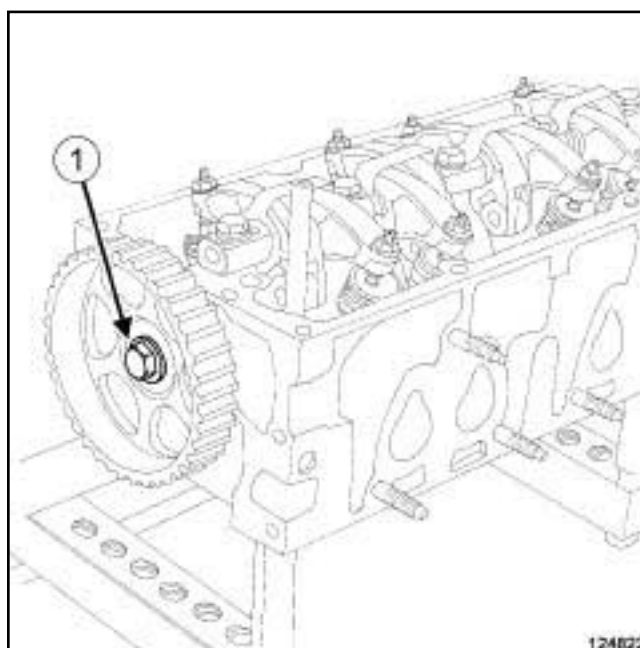
Tightening torques 	
camshaft flange bolts ¹²	Nm
bolts of the cylinder head	23 N.m + 36°
bolt of the camshaft sprocket bolt	45 Nm

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Perform the following operations:
 - drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) ,
 - drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,

- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
- the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66) .



124822

- Remove:
 - the bolt (1) from the camshaft sprocket using the (**Mot. 799-01**),
 - the camshaft sprocket,
 - the cylinder head (see) .

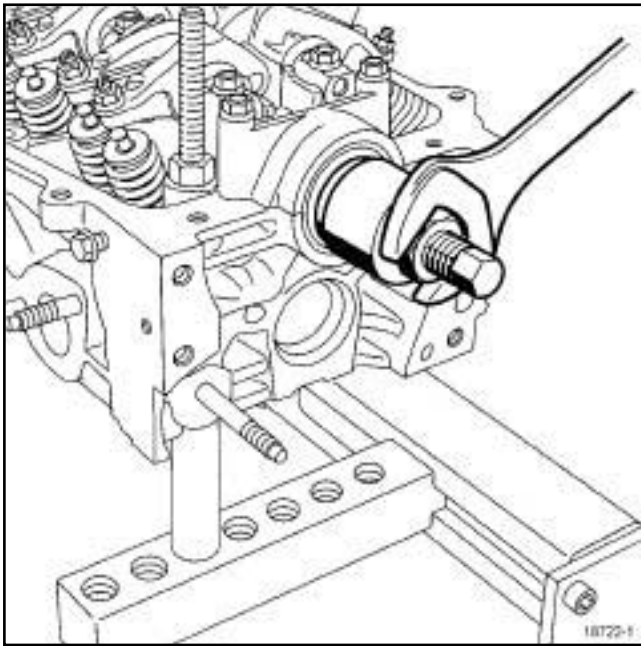
TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

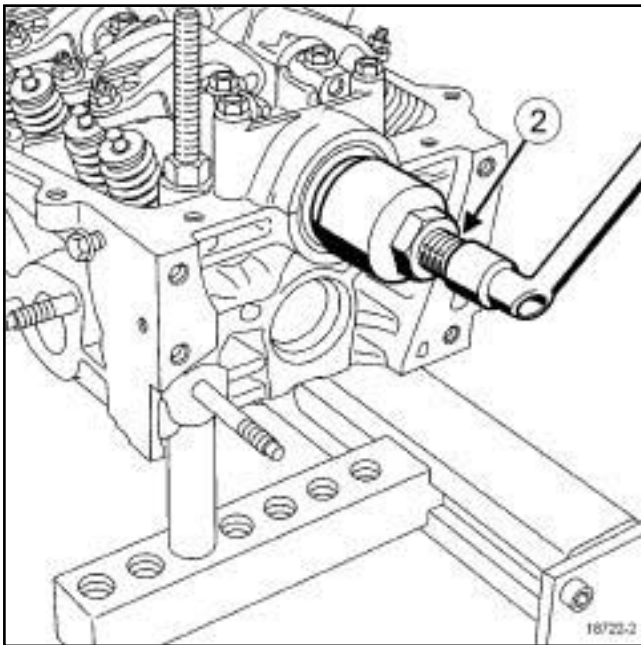
D7F

II - OPERATION FOR REMOVAL OF PART CONCERNED



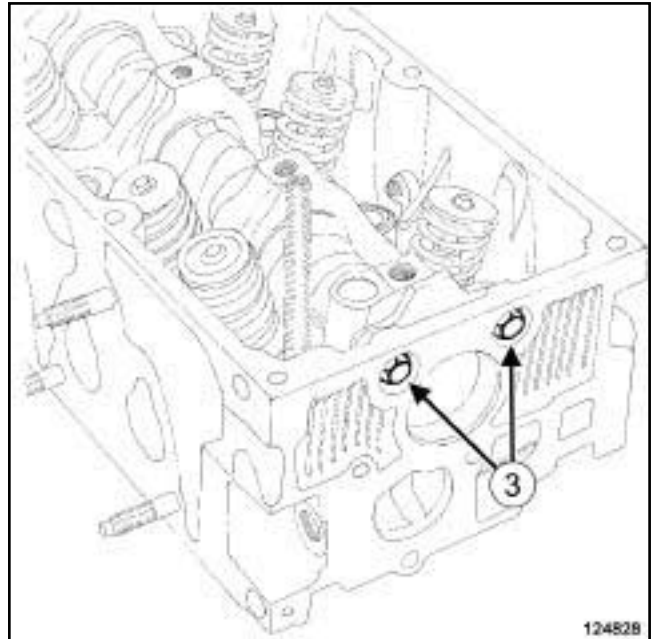
18722-1

- ❑ Fit the extractor (**Mot. 1381**).



18722-2

- ❑ Remove the camshaft seal while tightening the bolt (2) of the tool (**Mot. 1381**).



124828

124828

- ❑ Remove:
 - the camshaft flange (3) bolts,
 - the camshaft flange,
 - the camshaft.

REFITTING

I - REFITTING PREPARATION OPERATION

- ❑ Always replace:
 - the camshaft seal,
 - the camshaft pulley bolt.

WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

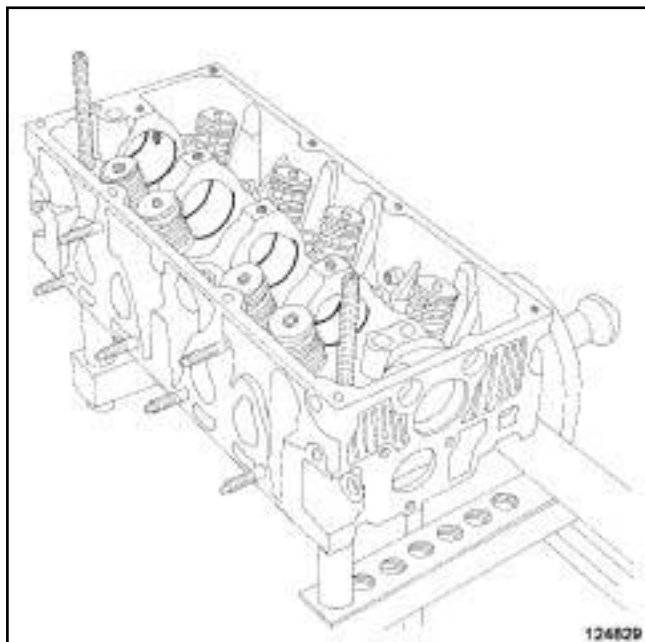
TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

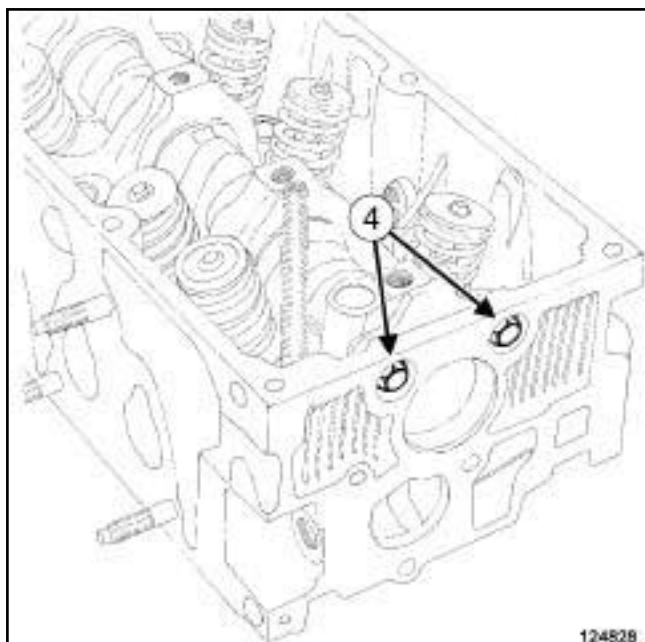
11A

D7F

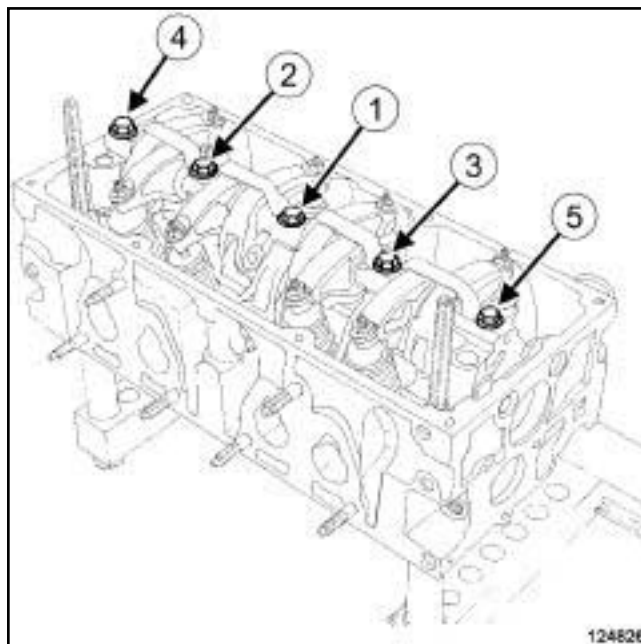
II - REFITTING OPERATION FOR PART CONCERNED



- Apply one drop of engine oil on:
 - the camshaft bearings,
 - the camshaft.
- Refit the camshaft.

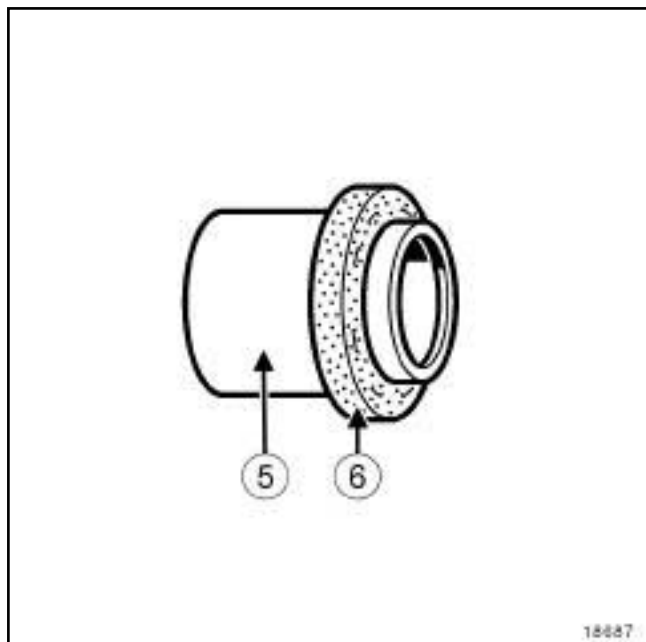


- Refit the camshaft bracket.
- Torque tighten the **camshaft flange bolts 12 (Nm)**.



- Refit the camshaft.
- Tighten in order, to torque and to angle the **bolts of the cylinder head (23 N.m + 36°)**.

D7F



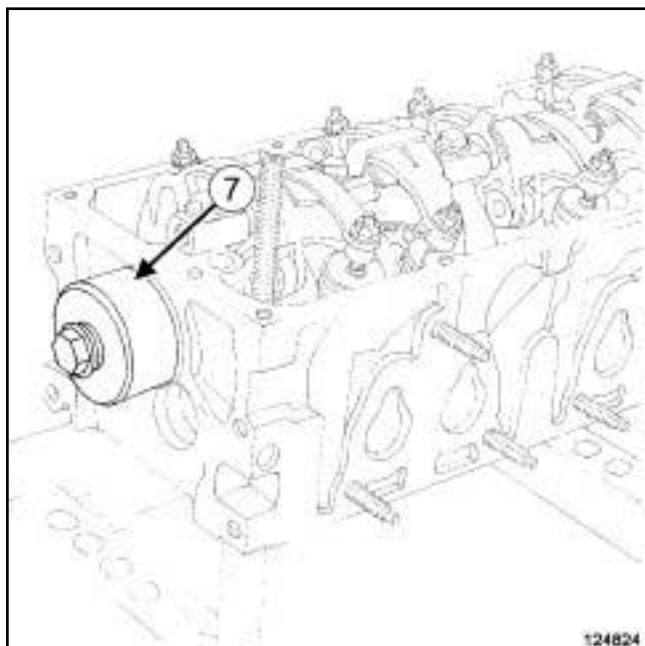
18687
18687

□

Note:

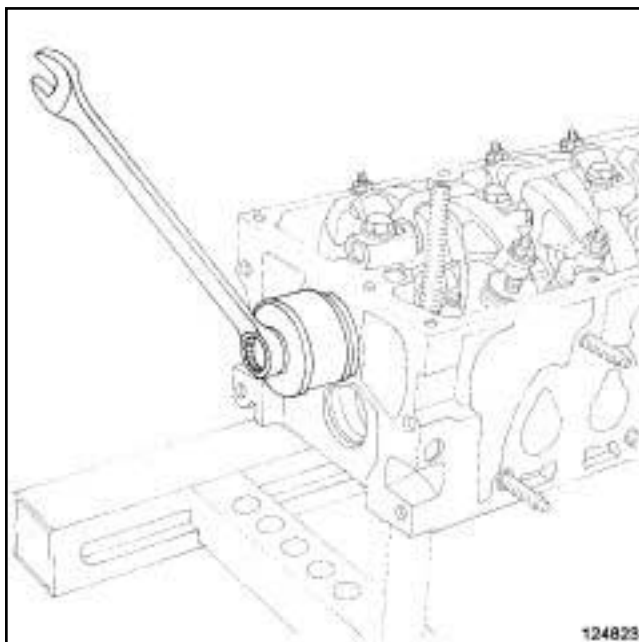
This type of seal is extremely fragile. Only touch the protective part (5) when handling the gasket. It is strictly forbidden to touch the seal (6). This is to prevent any oil leaks once the seal is fitted to the engine.

□ Prepare the camshaft seal with its protector.



124824
124824

□ Fit the camshaft seal with tool (Mot. 1587) (7) .

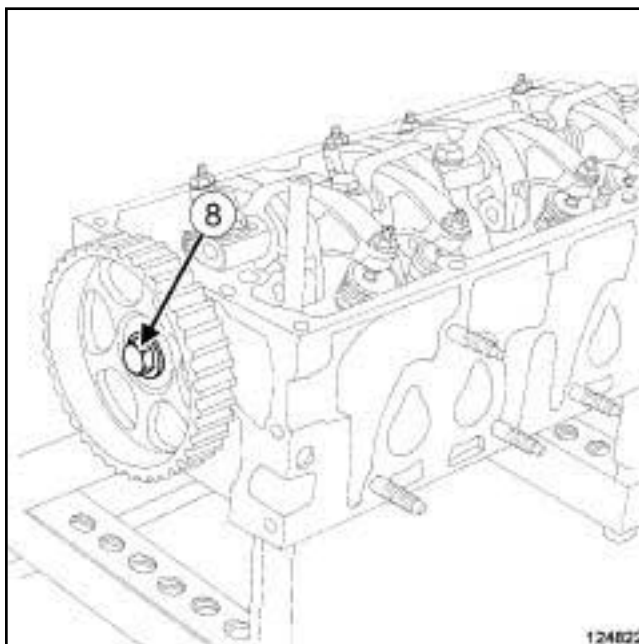


124823
124823

□ Screw on the collar nut until the cover touches the cylinder head.

□ Remove the (Mot. 1587).

III - FINAL OPERATION.



124822
124822

□ Refit:

- the cylinder head (see) ,
- the camshaft sprocket.

□ Torque and angle tighten the **bolt of the camshaft sprocket bolt (45 Nm)** using tool (Mot. 799-01).

D7F

Refit:

- the cylinder head (see) ,
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-66**) ,
- the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-29**) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-27**) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-20**) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**) ,
- the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) ,
- the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-1**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Perform the following operations:

- top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**) ,
- fill and bleed the coolant circuit (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**) .

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K9K

Tightening torques

bolts of the camshaft bearings	10 N.m
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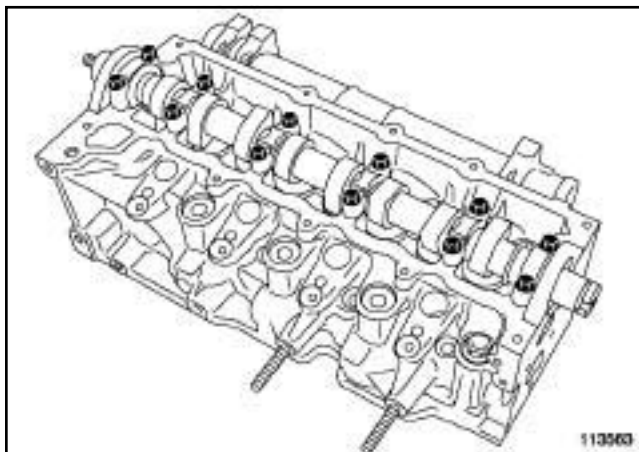
REMOVAL

I - REMOVAL PREPARATION OPERATION

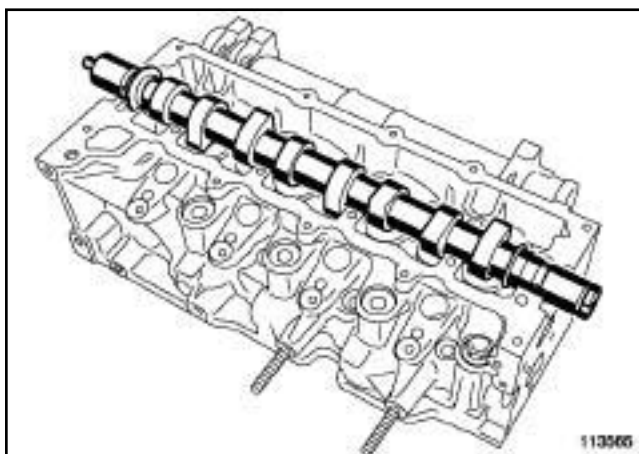
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the front engine cover.
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the halogen headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,

- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-14) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66) ,
- the vacuum pump (see **Vacuum pump: Removal - Refitting**) (37A, Mechanical component controls).

II - OPERATION FOR REMOVAL OF PART CONCERNED



113563



113565

- Mark the position of the camshaft bearings.
- Remove:
 - the camshaft bearing bolts,
 - the camshaft bearings,
 - the camshaft,

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K9K

- the camshaft seal (see 11A, **Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-138) .

REFITTING

I - REFITTING PREPARATION OPERATION

- Always replace:
 - the nut from the camshaft pulley,
 - the camshaft seal.

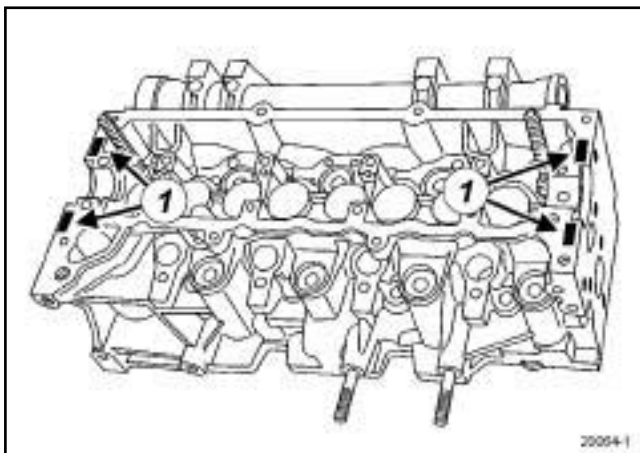
WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

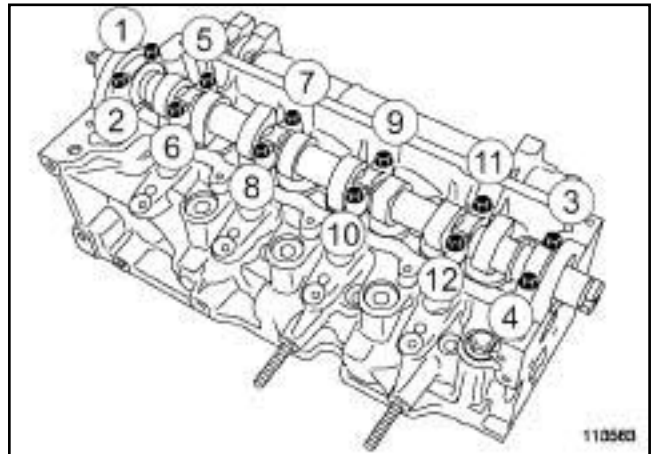
- Using **ABRASIVE PADS** clean the load-bearing surfaces of the camshaft bearings.
- Degrease the load-bearing surfaces of the camshaft bearings using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and a **CLEAN CLOTH**.



- Apply four beads (1) of **RESIN ADHESIVE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) 7 mm in diameter on the cylinder head.

II - REFITTING OPERATION FOR PART CONCERNED

- Position the camshaft by positioning the timing end camshaft groove vertically.
- Refit the camshaft bearings in accordance with their original positions (bearing No. 1 engine flywheel end).



113563

- Refit in order bolts (1) , (3) , (4) and (2) of the camshaft bearings.
- Tighten the camshaft bearing bolts (1) , (3) , (4) and (2) in order.
- Refit the camshaft bearing bolts in order.
- Tighten to torque and in order the **bolts of the camshaft bearings (10 N.m)**.

III - FINAL OPERATION

- Refit:
 - the camshaft seal (see 11A, **Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-138) ,
 - the vacuum pump (see **Vacuum pump: Removal - Refitting**) (37A, Mechanical component controls),
 - the rocker cover (see 11A, **Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66) ,
 - the timing belt (see 11A, **Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
 - the camshaft position sensor (see 13B, **Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-14) ,
 - the crankshaft accessories pulley (see 11A, **Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,

K9K

- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**),
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**),
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the halogen headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Refit the engine cover.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K4M

Equipment required

roller-type stud removal tool

Tightening torques

camshaft dowel **8 N.m**

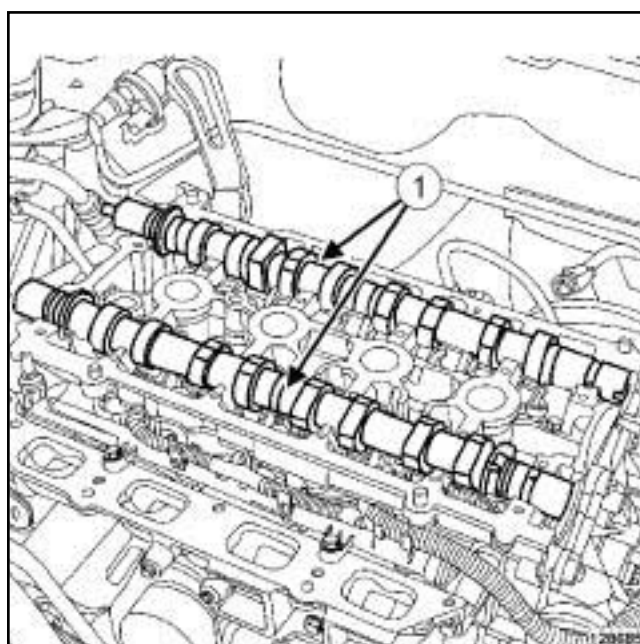
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1),
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20),
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29),
 - the oil decanter (see **11A, Top and front of engine, Oil decanter: Removal - Refitting**, page 11A-147),
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),

- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3),
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13),
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13),
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20),
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27),
- the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-135),
- the camshaft seals on the timing end (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-138),
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66).

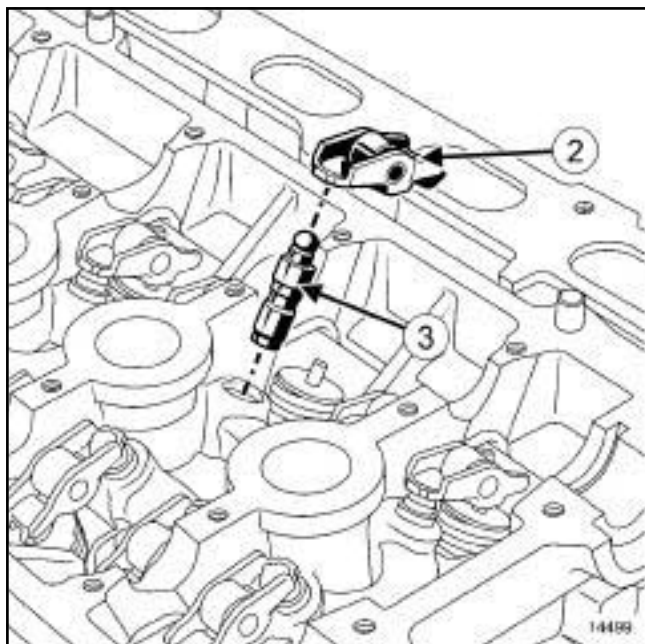
II - REMOVAL OPERATION



128685

- Remove the camshafts (1).

K4M



Remove:

- the valve rockers (2) ,
- the hydraulic tappets (3) .

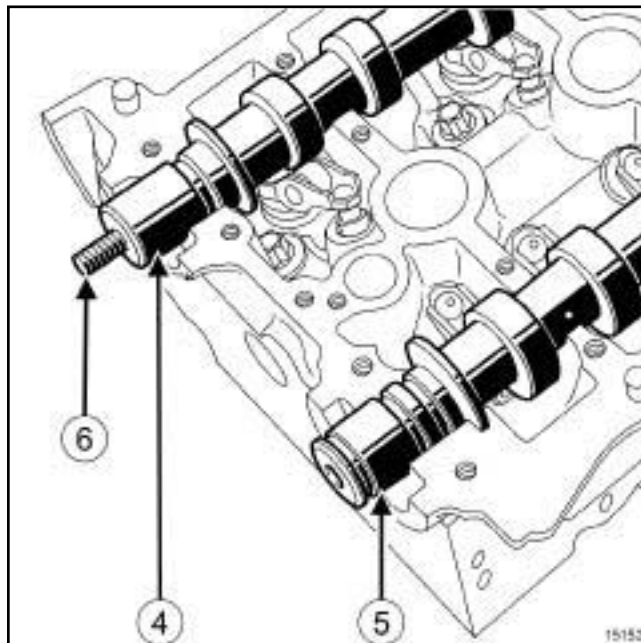
Note:

To prevent any risk of unpriming the hydraulic tappets make sure that they are vertical.

REFITTING

I - REFITTING PREPARATION OPERATION

1 - Camshaft marking



- (4) Exhaust camshaft
- (5) Inlet camshaft

Note:

The camshafts are identified by the pulley mountings.

- Always replace the exhaust camshaft dowel (6) if the dowel loosens at the same time as the exhaust camshaft nut.

2 - Replacing a camshaft dowel

WARNING

It is essential to replace the camshaft dowel if it comes loose at the same time as the nut.

a - Removal

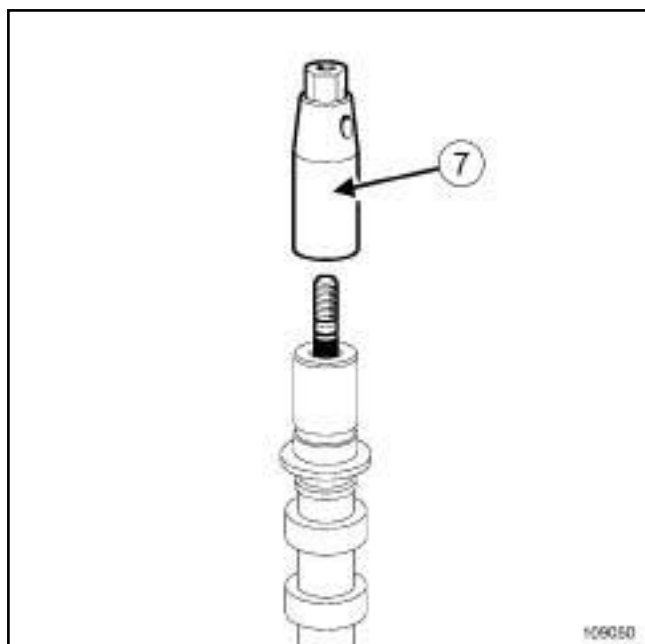
- Place the camshaft in a vice with **ALUMINIUM JAWS**.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K4M



- ❑ Remove the dowel using a **roller-type stud removal tool (7)**.

b - Cleaning the camshaft

❑

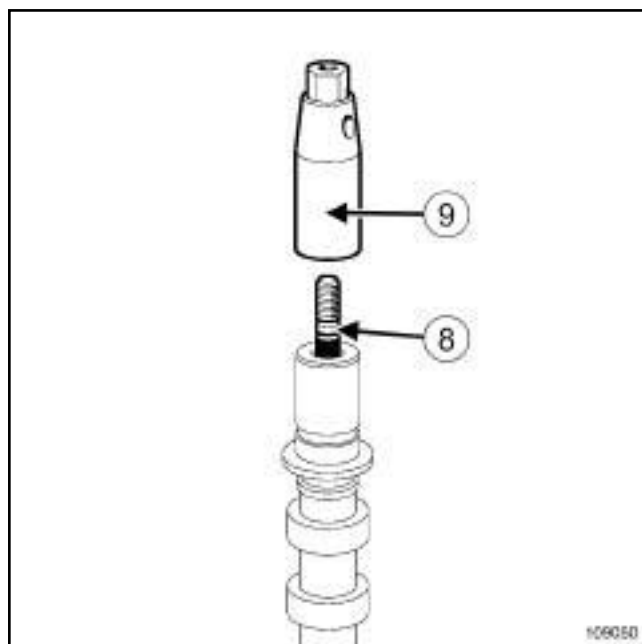
WARNING

Clean the thread hole of the camshaft carefully to prevent foreign bodies from entering the camshaft.

Failure to follow this advice could lead to the blocking of the oil inlet holes, which would quickly result in engine damage.

c - Refitting

- ❑ Place the camshaft in a vice with **ALUMINIUM JAWS**.



- ❑ Refit the new camshaft dowel (precoated section **(8)** on the camshaft side).
- ❑ Torque tighten the **camshaft dowel (8 N.m)** using a **roller-type stud removal tool (9)**.

II - REFITTING OPERATION

- ❑ To check if re-priming is necessary, press the top of the tappet with your thumb. If the tappet piston depresses, immerse the tappets in a container full of diesel then reprime them.

Note:

It is essential to reprime the hydraulic tappets as these may become drained if removed for a long time.

- ❑ Refit:
 - the hydraulic tappets,
 - the valve rockers,
 - the inlet camshaft, by lubricating the inlet camshaft bearings,
 - the exhaust camshaft, by lubricating the exhaust camshaft bearings.

III - FINAL OPERATION

- ❑ Refit:
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting, page 11A-66**),

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K4M

- the camshaft seals on the timing end (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-138) ,
 - the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-135) ,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray,
 - the oil decanter (see **11A, Top and front of engine, Oil decanter: Removal - Refitting**, page 11A-147) ,
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
 - the coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K9K

Special tooling required

Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)
Mot. 1448	Remote operation pliers for hose clips.

Equipment required

cylinder head bolt tightening gauge (angular measuring type)

Tightening torques

cylinder head bolts (initial torque)	25 N.m
cylinder head bolts	270° ±10°

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the front engine cover.
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the halogen headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) .

- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

- Remove:

- the nut from the dipstick guide,
- the dipstick guide.

- Disconnect:

- the injector connectors,
- the heater plug connectors ,
- the connectors to the high pressure pump,
- injector rail pressure sensor connector,
- the accelerometer connector.

- Remove the nut from the engine wiring channel.

- Move aside the engine wiring.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

- Disconnect the fuel inlet and return pipes from the high pressure pump.

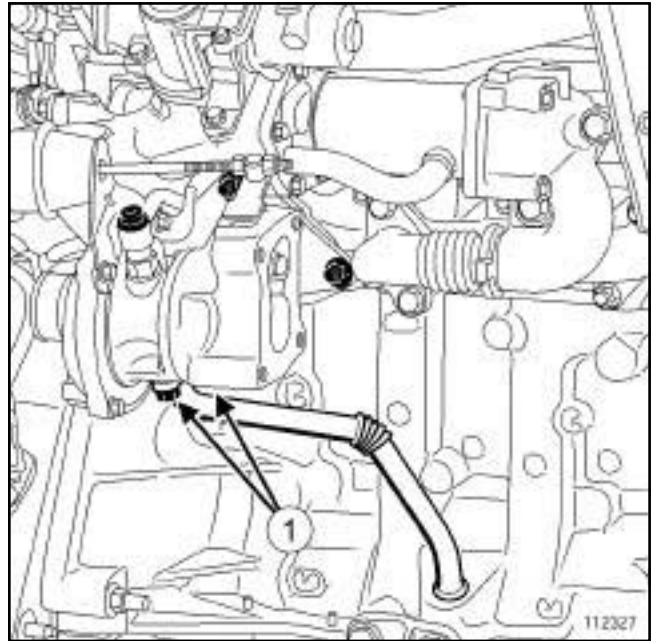
TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K9K

- ❑ Fit blanking plugs to the fuel pipes and the high pressure pump (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page **13B-1**) .
- ❑ Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .
- ❑ Unclip:
 - the breather pipe on the gearbox,
 - the wiring on the engine lifting eye on the gearbox side.
- ❑ Move aside the engine wiring.
- ❑ Disconnect the brake servo pipe from the vacuum pump.
- ❑ Remove the cooling hose clip from the EGR cooler using the **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.
- ❑ Disconnect the cooling hose from the EGR cooler.
- ❑ Separate the clip on the cooling hose of the coolant pump inlet pipe using the tool **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.
- ❑ Disconnect the cooling hose from the coolant pump inlet pipe.
- ❑ Remove the heater matrix cooling hose clip from the water chamber using the **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.
- ❑ Disconnect:
 - the heater matrix cooling hose from the water chamber,
 - the coolant temperature sensor connector.
- ❑ Remove the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-12**) .



112327

- ❑ Remove:
 - the oil return pipe bolts (1) from the turbocharger,
 - the oil return pipe by detaching it from the cylinder block,
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-66**) ,
 - the two high pressure pipes between the rail and injector at the timing end (see **13B, Diesel injection, High pressure pipe between rail and injector: Removal - Refitting**, page **13B-39**) ,
 - the timing end bracket bolt from the air filter box,
 - the timing end bracket from the air filter box.

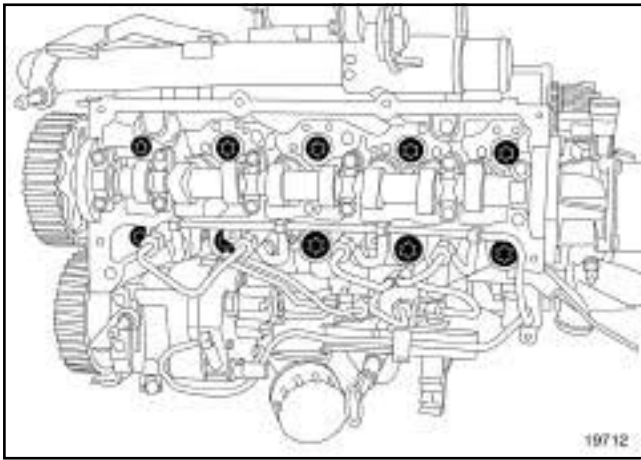
TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove:
 - the cylinder head bolts,
 - the cylinder head,
 - the cylinder head gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Cylinder head gasket.
- parts always to be replaced: cylinder head bolts.
- parts always to be replaced: turbocharger oil pipe seal.

1 - Cleaning the cylinder head

- Apply **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the areas to be cleaned.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

WARNING

Protect the oilway so that foreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.

Note:

The cylinder head bolts must not be lubricated before being fitted.

- Wait for approximately ten minutes.
- Remove the residue using a wooden spatula.
- Finish cleaning with a grey abrasive pad.

2 - Checking the gasket face

- Check the flatness of the cylinder head gasket face (see **Cylinder head: Check**) .

WARNING

No regrinding of the cylinder head is permitted.

3 - Optional additional operations

- When replacing the cylinder head, strip the cylinder head (see **Cylinder head: Stripping - Rebuilding**) .

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K9K

- ❑ If necessary, carry out a complete check of the cylinder head (see **Cylinder head: Check**).

II - REFITTING OPERATION FOR PART CONCERNED

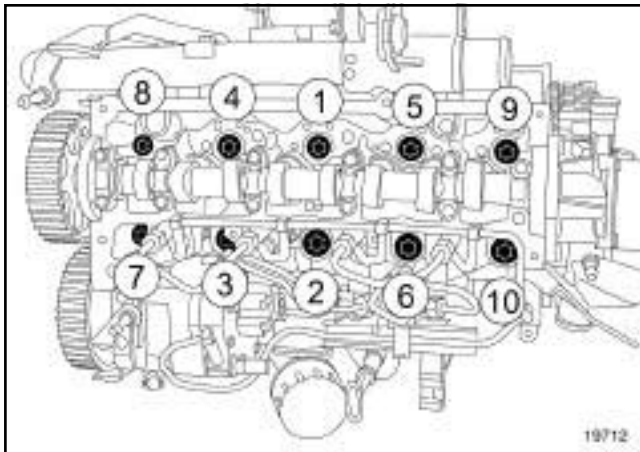
- ❑ Bring the pistons to mid-stroke position to prevent them from coming into contact with the valves during the tightening of the cylinder head.
- ❑ Refit:
 - a new cylinder head gasket,
 - the cylinder head.

WARNING

In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

Cylinder head tightening procedure

- ❑ Refit the cylinder head bolts.
- ❑ Fit the cylinder head bolts, without tightening them.



19712

- ❑ Tighten to torque and in order the **cylinder head bolts (initial torque) (25 N.m)**.
- ❑ Check that the cylinder head bolts are tightened to **25 Nm**.
- ❑ Angle tighten the **cylinder head bolts ($270^\circ \pm 10^\circ$)** in order using a **cylinder head bolt tightening gauge (angular measuring type)**.

III - FINAL OPERATION

- ❑ Refit:
 - the timing end bracket on the air filter box.
 - the timing end bracket bolt on the air filter box,

- the two high pressure pipes between the rail and injector at the timing end (see **13B, Diesel injection, High pressure pipe between rail and injector: Removal - Refitting**, page **13B-39**),

- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-66**),

- the oil return pipe fitted with new seals, fitting it into the cylinder block (see **12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting**, page **12B-12**).

- ❑ Refit the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-12**).

- ❑ Connect:

- the coolant temperature sensor connector,
- the heater matrix cooling hose to the water chamber.

- ❑ Fit the clip on the heater matrix cooling hose onto the water chamber using the **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.

- ❑ Connect the coolant pump inlet pipe cooling hose.

- ❑ Fit the cooling hose clip at the coolant pump inlet pipe end using the **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.

- ❑ Connect the EGR cooler cooling hose.

- ❑ Fit the cooling hose clip at the EGR cooler end using the **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.

- ❑ Connect the brake servo pipe onto the vacuum pump.

- ❑ Fit the engine wiring.

- ❑ Clip:

- the breather pipe onto the gearbox,
- the wiring on the engine lifting eye on the gearbox side.

- ❑ Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**).

- ❑ Remove the blanking plugs from the fuel pipes and high pressure pump.

- ❑ Connect the fuel inlet and return pipes to the high pressure pump.

- ❑ Fit the engine wiring.

- ❑ Connect:

- the accelerometer connector,
- injector rail pressure sensor connector,

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K9K

- the connectors to the high pressure pump,
- the heater plug connectors ,
- the injector connectors.
- Refit:
 - the engine wiring channel nut,
 - the dipstick guide,
 - the dipstick guide nut.
- Refit:
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) .
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the halogen headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- Connect the battery (see) (80A, Battery).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Refit the engine cover.

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K4M

Special tooling required

Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Tightening torques

cylinder head bolts (initial torque)	20 N.m
cylinder head bolts	240° ± 6°

IMPORTANT

Wear cut-resistant gloves during the operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove the engine undertray.
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1),

- the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20),
- the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29),
- the oil decanter (see **11A, Top and front of engine, Oil decanter: Removal - Refitting**, page 11A-147),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
- the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3),
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13),
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18),
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13),
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20),
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27),
- the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-135),
- the camshaft seals on the timing end (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-138),
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66),

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K4M

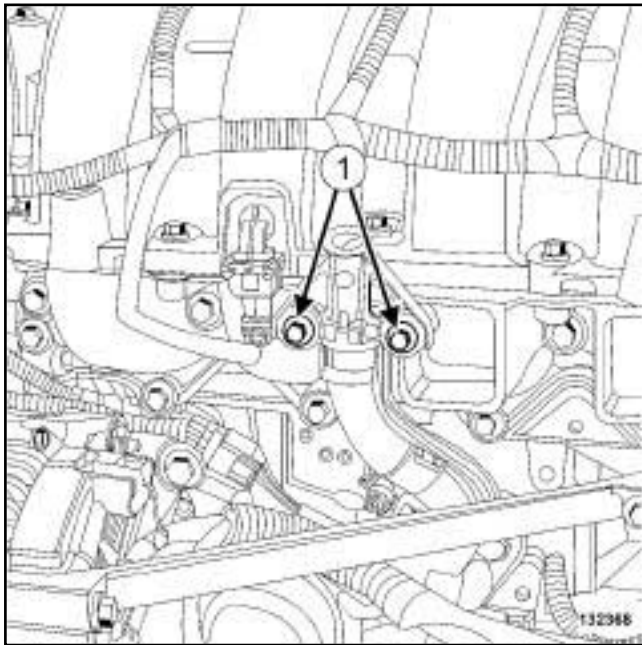
- the camshafts (see **11A, Top and front of engine, Camshaft: Removal - Refitting**, page 11A-82) .

Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

Remove:

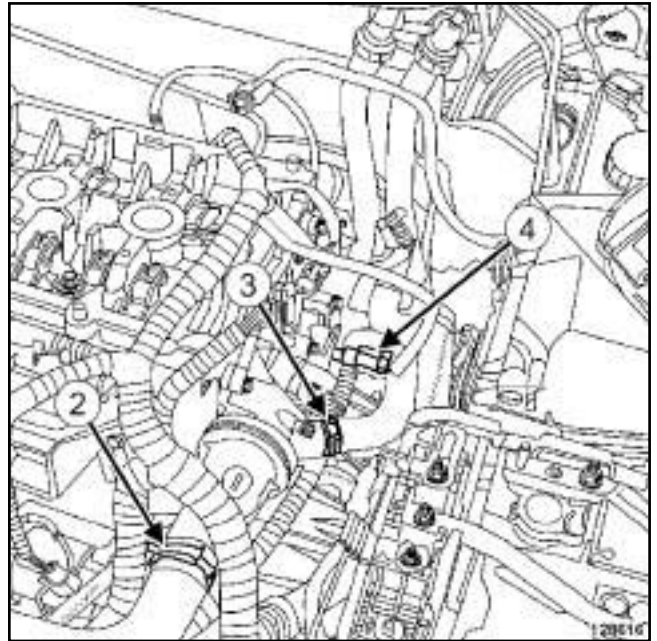
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),

- the exhaust manifold (see **12A, Fuel mixture, Exhaust manifold: Removal - Refitting**, page 12A-48) .



Remove:

- the dipstick,
- the bolts (1) from the dipstick guide,
- the dipstick guide.



Using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)** remove:

- the cooling radiator top hose clip (2) on the water chamber.
- the heater matrix inlet hose clip (3) on the water chamber.

Disconnect:

- the cooling radiator top hose from the water chamber.
- the heater matrix inlet hose of the water chamber,
- the connector (4) from the coolant temperature sensor.

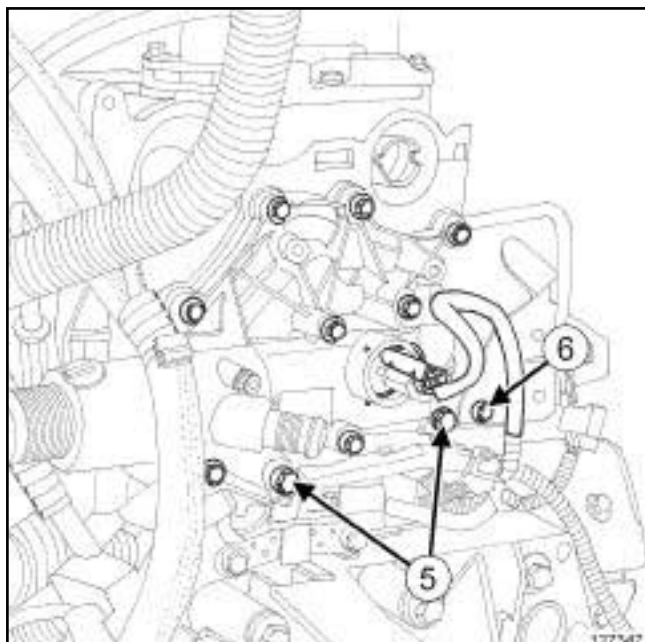
Unclip the water chamber wiring.

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

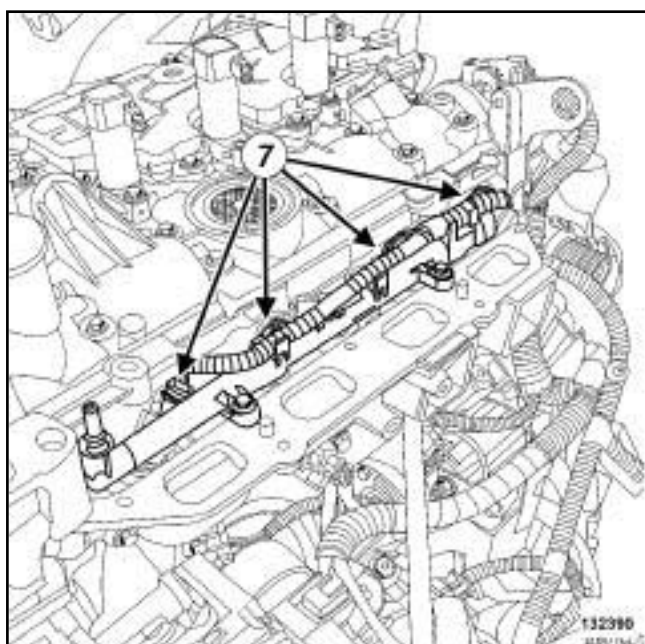
11A

K4M



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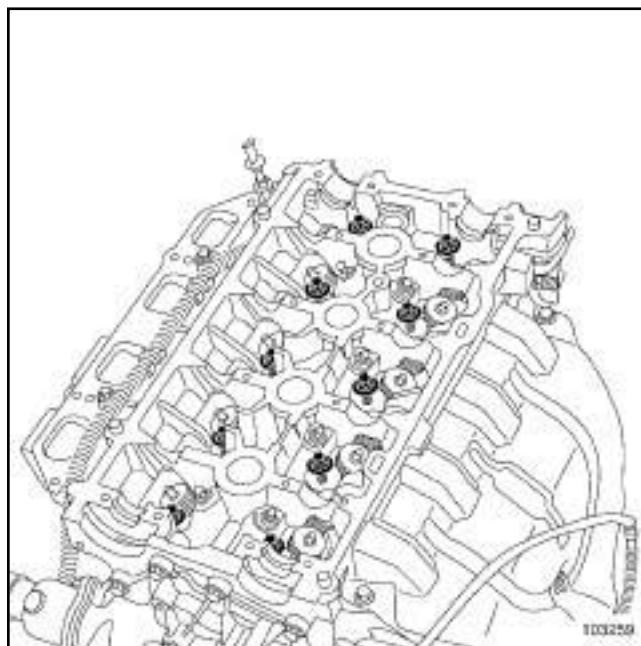
- Remove:
 - the bolts (5) of the engine wiring channel,
 - the wiring bracket bolt (6) .
- Move the wiring bracket away from the water chamber.



132390

- Disconnect the injector connectors (7) .
- Move the injector wiring to one side.

II - REMOVAL OPERATION



103259

- Remove:
 - the cylinder head bolts,
 - the cylinder head,
 - the cylinder head gasket.

REMOVAL

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: cylinder head bolts.
- parts always to be replaced: Cylinder head gasket.

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K4M

CLEANING THE CYLINDER HEAD

□

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

- Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the cylinder head gasket face if being reused,
- the cylinder block gasket face.

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

- the cylinder head gasket face if being reused,
- the cylinder block gasket face.

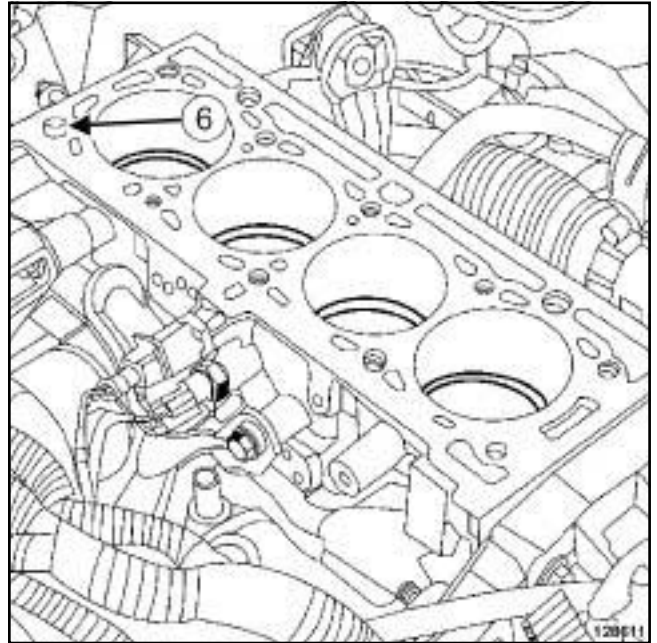
- Check for gasket face deformation using a ruler and a set of shims.

The maximum deformation is **0.05 mm**.

WARNING

No regrinding of the cylinder head is permitted.

- Strip the cylinder head (see **Cylinder head: Stripping - Rebuilding**) (Technical Note 6023A, 10A, Engine and peripherals).
- Test the cylinder head for possible cracks using the cylinder head test kit (see **Garage Equipment Catalogue**).
- Rebuild the cylinder head (see **Cylinder head: Stripping - Rebuilding**) (Technical Note 6023A, 10A, Engine and peripherals).



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- Position the pistons at mid-stroke.
- Check that the centring dowel (6) is on the cylinder block.
- Refit a new cylinder head gasket.

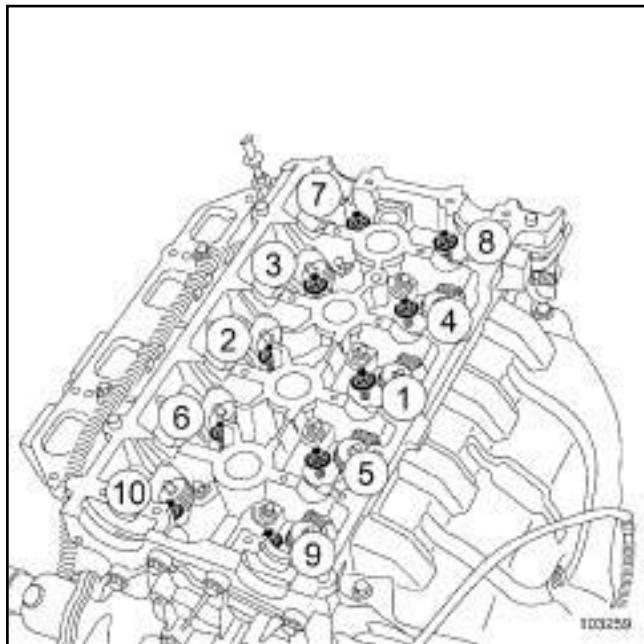
TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K4M

II - REFITTING OPERATION



103259

❑ Refit:

- the cylinder head,
- the new cylinder head bolts.

WARNING

In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

WARNING

Do not oil the new bolts. Be sure to oil bolts being reused.

- ❑ Without tightening, fit the cylinder head bolts in order.
- ❑ Pretighten to torque and in order the **cylinder head bolts (initial torque) (20 N.m)**.
- ❑ Check that all of the new cylinder head bolts are tightened to the correct torque (**20 N.m**).
- ❑ Angle tighten in order the **cylinder head bolts (240° ± 6°)**.

WARNING

Do not retighten the cylinder head bolts after applying this procedure.

III - FINAL OPERATION

- ❑ Position the injector wiring.
- ❑ Connect the injector connectors.
- ❑ Fit the wiring bracket on the water chamber.
- ❑ Refit:
 - the wiring bracket bolt on the water chamber,
 - the bolts of the engine wiring channel.
- ❑ Clip on the water chamber wiring.
- ❑ Connect:
 - the coolant temperature sensor connector,
 - the heater matrix inlet hose to the water chamber,
 - the cooling radiator top hose to the water chamber.
- ❑ Using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)** fit:
 - the cooling radiator top hose clip on the water chamber,
 - the heater matrix inlet hose clip on the water chamber.
- ❑ Refit:
 - dipstick guide ,
 - the dipstick,
 - the exhaust manifold (see **12A, Fuel mixture, Exhaust manifold: Removal - Refitting**, page **12A-48**) .
 - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (**29A, Driveshafts**),
 - the camshafts (see **11A, Top and front of engine, Camshaft: Removal - Refitting**, page **11A-82**) ,
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-66**) ,
 - the camshaft seals on the timing end (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page **11A-138**) ,
 - the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page **11A-135**) ,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-27**) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-20**) ,

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

K4M

- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**),
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the oil decanter (see **11A, Top and front of engine, Oil decanter: Removal - Refitting**, page **11A-147**),
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-29**),
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-20**),
 - the coils (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-1**),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).
- Perform the following operations:
- fill the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).
 - fill and bleed the coolant circuit (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**).
- Refit the engine undertray.
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

D7F – D4F, and 772

Special tooling required

Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Tightening torques

cylinder head bolts (initial torque)	20 N.m
cylinder head bolts	230° ± 6

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).

D4F

- Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

- Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) .

D4F

- Remove:

- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
- the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) .

D7F

- Remove:

- the inlet manifold (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
- the air filter box retaining belts,
- the air filter unit.

- Remove:

- the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66) .
- Perform the following operations:
 - drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-22) ,
 - drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

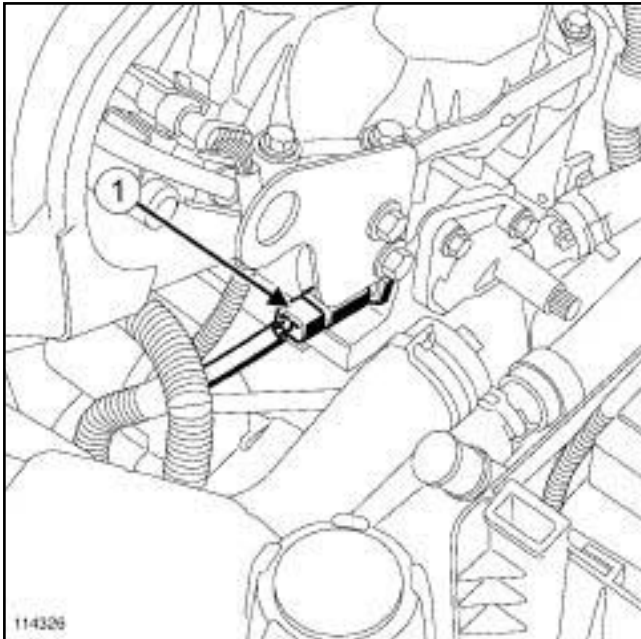
- Remove the oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page 10A-29) .

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

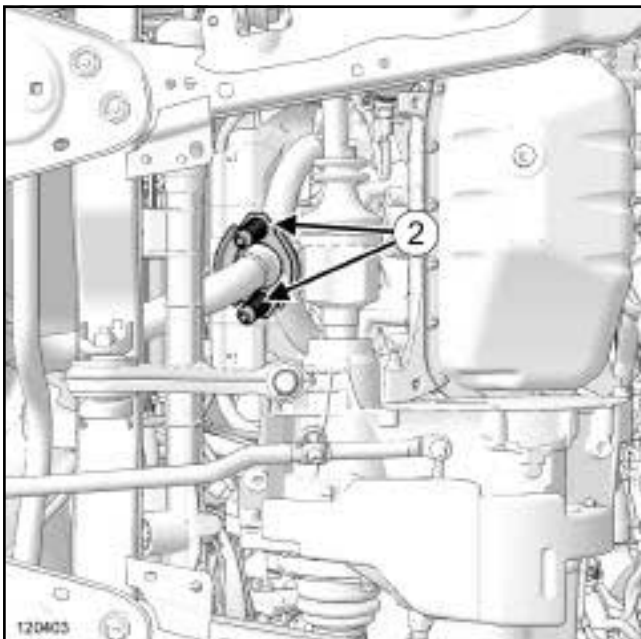
11A

D7F - D4F, and 772



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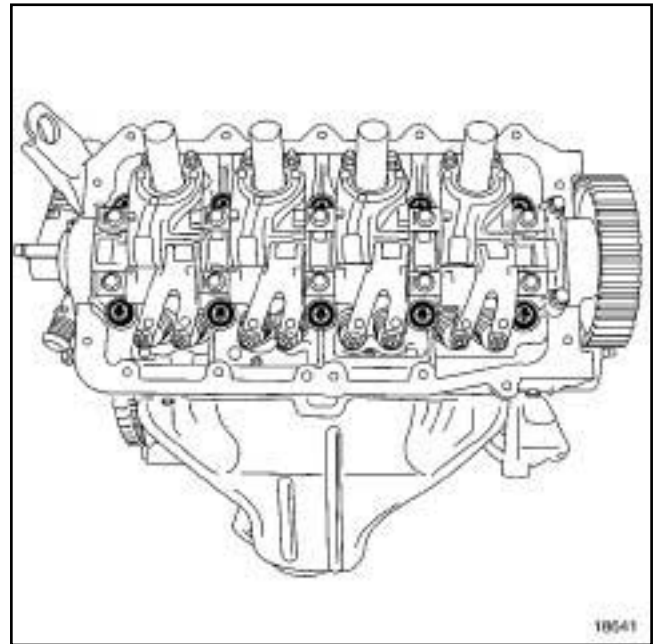
- Disconnect the coolant temperature sensor connector (1) .
- Separate the water chamber hose clips side using the tool (Mot. 1448) or (Mot. 1202-01) or (Mot. 1202-02).
- Disconnect the water chamber hoses.



120403

- Remove the ball joint bracket bolts (2) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



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- Remove:
 - the cylinder head bolts,
 - the cylinder head,
 - the cylinder head gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Cylinder head gasket.
- parts always to be replaced: cylinder head bolts.

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

D7F – D4F, and 772

1 - Cleaning the cylinder head

- Apply **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the areas to be cleaned.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to avoid any foreign bodies entering the oil return and supply pipes.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

WARNING

Protect the oilway so that foreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.

Note:

The cylinder head bolts must not be lubricated before being fitted.

- Wait for approximately ten minutes.
- Remove the residue using a wooden spatula.
- Complete the cleaning operation using a grey abrasive pad.

2 - Checking the gasket face

- Check the flatness of the cylinder head gasket face (see **Cylinder head: Check**) .

WARNING

No regrinding of the cylinder head is permitted.

3 - Optional additional operations

- When replacing the cylinder head, strip the cylinder head (see **Cylinder head: Stripping - Rebuilding**) .
- If necessary, carry out a complete check of the cylinder head (see **Cylinder head: Check**) .

II - REFITTING OPERATION FOR PART CONCERNED

- Bring the pistons to mid-stroke position to prevent them from coming into contact with the valves during the tightening of the cylinder head.
- Check for the cylinder head centring dowels on the cylinder block.
- Refit:
 - a new cylinder head gasket,
 - the cylinder head.

WARNING

In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

Cylinder head tightening procedure

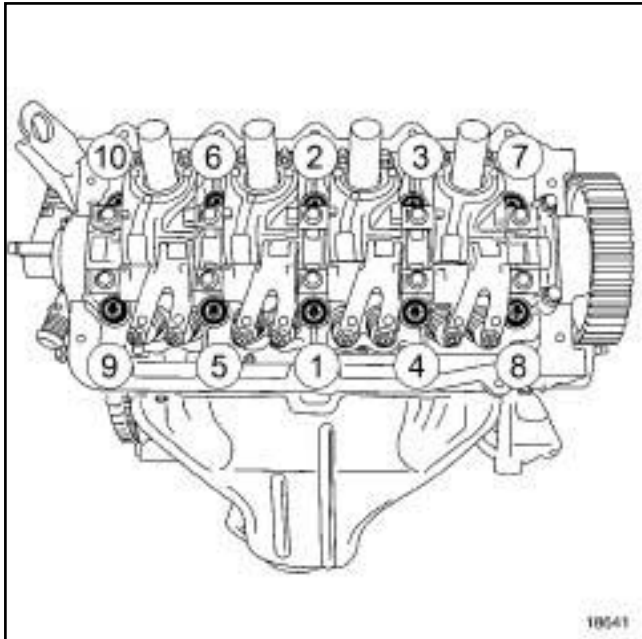
- Refit the new cylinder head bolts.
- Fit the cylinder head bolts, without tightening them.

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

D7F – D4F, and 772



18641

- Tighten to torque and in order the **cylinder head bolts (initial torque) (20 N.m)**.
- Check that all the cylinder head bolts are pretightened to **20 Nm**.
- Angle tighten in order the **cylinder head bolts (230° ± 6)**.

III - FINAL OPERATION

- Refit the exhaust bracket bolts.
- Tighten the exhaust bracket bolts.
- Connect the water chamber hoses.
- Fit the water chamber hose clips using the tool (**Mot. 1448**) or (**Mot. 1202-01**) or (**Mot. 1202-02**).
- Connect the coolant temperature sensor connector.
- Refit:
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-66**) ,
 - the ignition coil.

D4F

- Refit:
 - the inlet manifold (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-29**) ,

- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .

D7F

- Refit:
 - the air filter unit,
 - the air filter box retaining belts,
 - the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-29**) .
- Refit:
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-27**) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-20**) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**) .

D4F

- Refit:
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (**56A**, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (**56A**, Exterior equipment).
- Refit:
 - a new oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page **10A-29**) ,
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (**55A**, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (**35A**, Wheels and tyres).
- Perform the following operations:
 - top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**) ,

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

D7F – D4F, and 772

- fill and bleed the coolant circuit (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**).

- Connect the battery (see) (80A, Battery).
- Check that there are no leaks.

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

D4F, and 780 or 782

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

Tightening torques

cylinder head bolts (initial torque) **20 N.m**

cylinder head bolts **230° ± 6°**

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

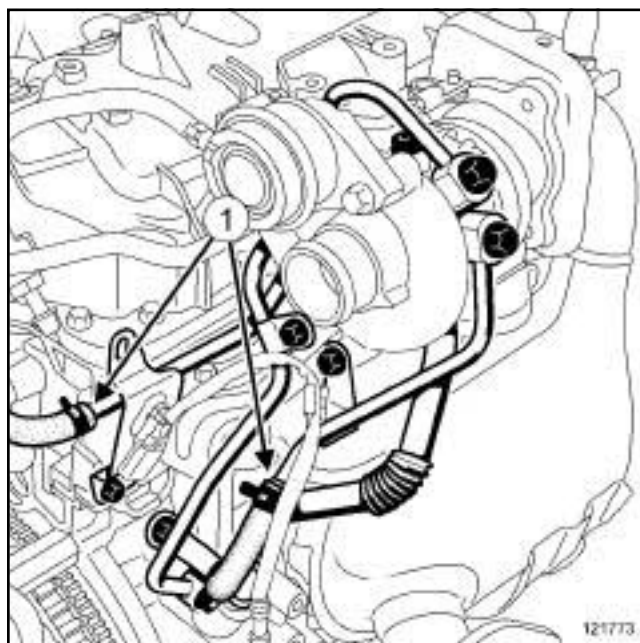
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Remove:
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page 17B-13) ,
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,

- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66) ,
- the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) ,
- the turbocharger oil pipes (see **12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting**, page 12B-12) .



121773

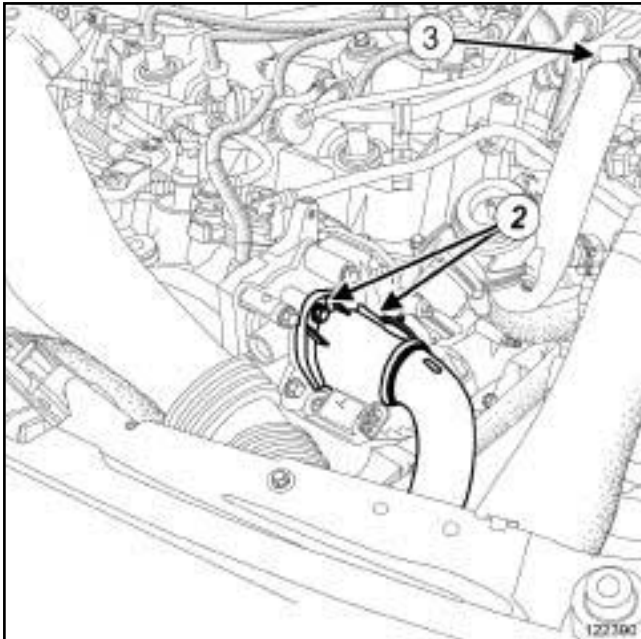
- Unclip the wiring from the turbocharger coolant rigid pipe bracket.
- Separate the clips (1) on the turbocharger cooling hoses using the tool (**Mot. 1448**).
- Disconnect the turbocharger cooling hoses.
- Remove:
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) .

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

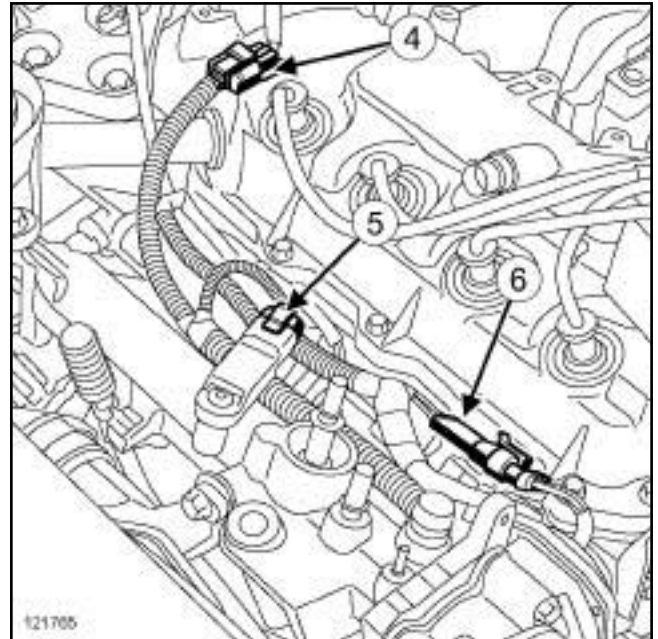
11A

D4F, and 780 or 782



122390

- Remove the bolts (2) on the intercooler outlet air pipe.
- Move the intercooler outlet air pipe away from the throttle valve.
- Undo the compressor discharge valve air pipe clip (3).
- Disconnect:
 - the turbocharging solenoid valve connector to the turbocharger,
 - the compressor discharge valve air pipe from the air filter unit outlet air pipe.



121765

- Unclip the injection wiring from the inlet manifold.
- Disconnect:
 - the upstream oxygen sensor connector (4) .
 - the air inlet pressure connector (5) ,
 - the injector rail - injector wiring connector (6) ,
 - the fuel vapour rebreather solenoid valve connector,
 - the throttle body connector ,
 - the coolant temperature sensor connector.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

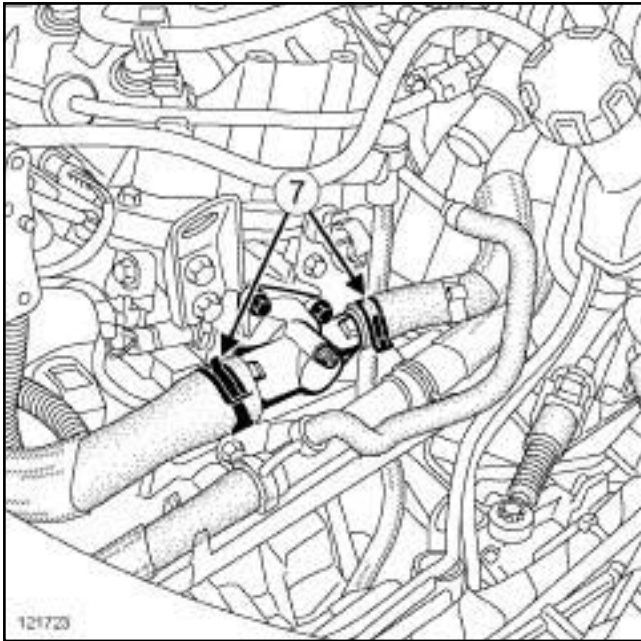
- Disconnect the petrol supply union on the injector rail - injector.
- Plug the openings.
- Move aside the engine wiring.

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

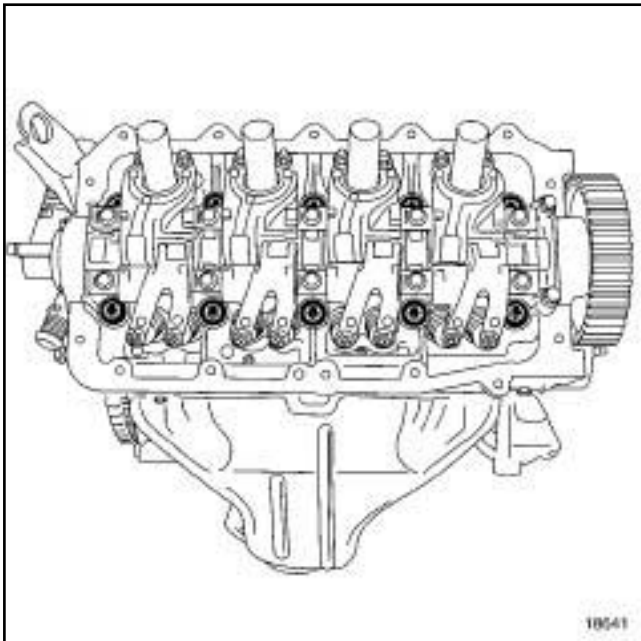
D4F, and 780 or 782



121723

- Move aside the clips (7) from the cooling hoses using the (Mot. 1448).
- Disconnect the cooling hoses.

II - OPERATION FOR REMOVAL OF PART CONCERNED



18641

- Remove:
 - the cylinder head bolts,
 - the cylinder head,
 - the cylinder head gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Cylinder head gasket.
- parts always to be replaced: cylinder head bolts.

1 - Cleaning the cylinder head

- Apply **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the areas to be cleaned.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

WARNING

Protect the oilway so that foreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.

Note:

The cylinder head bolts must not be lubricated before being fitted.

- Wait for approximately ten minutes.
- Remove the residue using a wooden spatula.
- Finish cleaning with a grey abrasive pad.

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

D4F, and 780 or 782

2 - Checking the gasket face

- ❑ Check the flatness of the cylinder head gasket face (see **Cylinder head: Check**).

WARNING

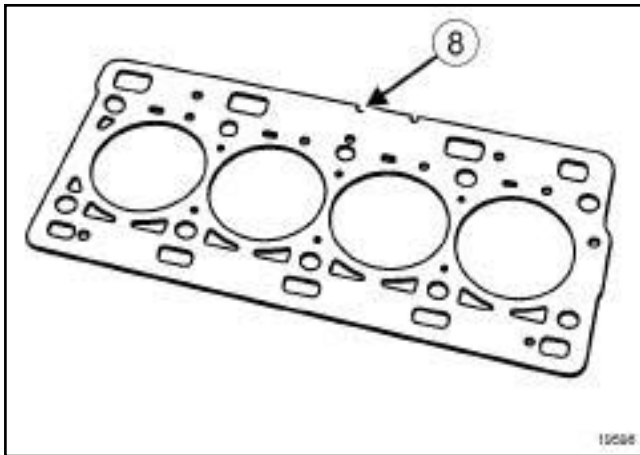
No regrinding of the cylinder head is permitted.

3 - Optional additional operations

- ❑ When replacing the cylinder head, strip the cylinder head (see **Cylinder head: Stripping - Rebuilding**).
- ❑ If necessary, carry out a complete check of the cylinder head (see **Cylinder head: Check**).

II - REFITTING OPERATION FOR PART CONCERNED

- ❑ Bring the pistons to mid-stroke position to prevent them from coming into contact with the valves during the tightening of the cylinder head.
- ❑ Check for the cylinder head centring dowels on the cylinder block.



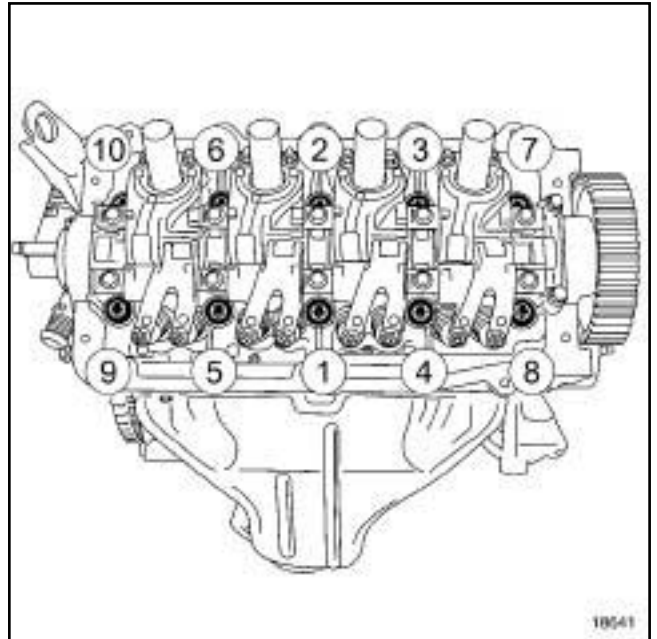
- ❑ Fit a new cylinder head gasket onto the cylinder block, positioning the marking (8) on the oil filter side.
- ❑ Refit the cylinder head.

WARNING

In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

Cylinder head tightening procedure

- ❑ Refit the cylinder head bolts.
- ❑ Fit the cylinder head bolts, without tightening them.



- ❑ Tighten to torque and in order the **cylinder head bolts (initial torque) (20 N.m)**.
- ❑ Check that the cylinder head bolts are tightened to **20 N.m**.
- ❑ Angle tighten in order the **cylinder head bolts (230° ± 6°)**.

III - FINAL OPERATION

- ❑ Connect the cooling hoses.
- ❑ Refit:
 - the cooling hose clips using the (**Mot. 1448**),
 - the engine wiring.
- ❑ Remove the blanking plugs.
- ❑ Connect:
 - the petrol inlet union on the injector rail - injectors.
 - the coolant temperature sensor connector,
 - the throttle body connector ,
 - the fuel vapour rebreather solenoid valve connector,
 - the injector rail - injector wiring connector,
 - the air inlet pressure connector.
 - the upstream oxygen sensor connector.
- ❑ Clip the injection wiring onto the inlet manifold.
- ❑ Connect:
 - the compressor discharge valve air pipe to the air filter unit outlet air pipe,

TOP AND FRONT OF ENGINE

Cylinder head: Removal - Refitting

11A

D4F, and 780 or 782

- the turbocharging solenoid valve connector to the turbocharger.
 - Tighten the compressor discharge valve air pipe clip.
 - Position the intercooler outlet air pipe on the throttle valve.
 - Refit:
 - the intercooler air outlet pipe bolts,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) .
 - Connect the turbocharger cooling hoses.
 - Fit the turbocharger cooling hose clips using the tool (**Mot. 1448**).
 - Clip the wiring onto the turbocharger coolant rigid pipe bracket.
 - Refit:
 - the turbocharger oil pipes (see **12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting**, page 12B-12) ,
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) ,
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-66) ,
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
 - the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page 17B-13) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
 - Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
 - Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Refit:
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

TOP AND FRONT OF ENGINE

Camshaft dephaser: Removal - Refitting

11A

K4M

Special tooling required

Mot. 1490-01	For locking and adjusting the camshaft pulleys.
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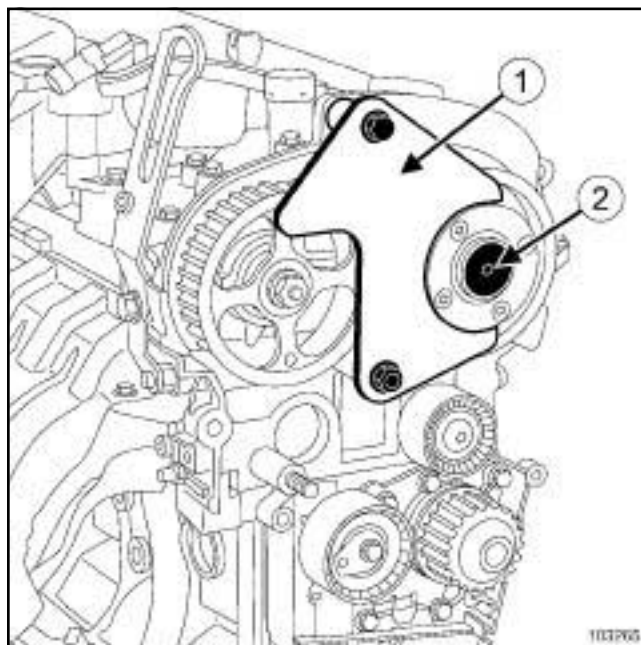
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),

- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) .

II - REMOVAL OPERATION



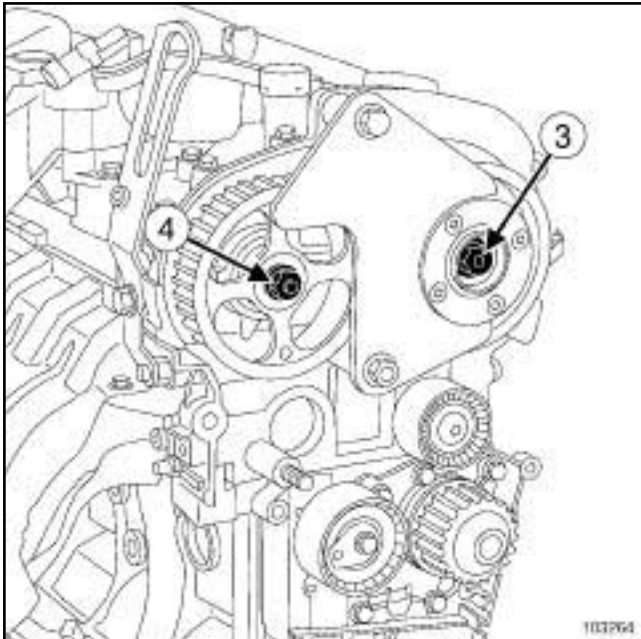
- Position the **(Mot. 1490-01)** (1) .
- Remove the camshaft dephaser pulley blanking cover (2) .

TOP AND FRONT OF ENGINE

Camshaft dephaser: Removal - Refitting

11A

K4M



103264

Remove:

- the camshaft dephaser pulley bolt (3) ,
- the exhaust camshaft pulley nut (4) ,
- the **(Mot. 1490-01)**,
- the exhaust camshaft pulley.
- the camshaft dephaser pulley.

REFITTING

I - REFITTING PREPARATION OPERATION

- **parts always to be replaced: Exhaust camshaft pulley nut.**

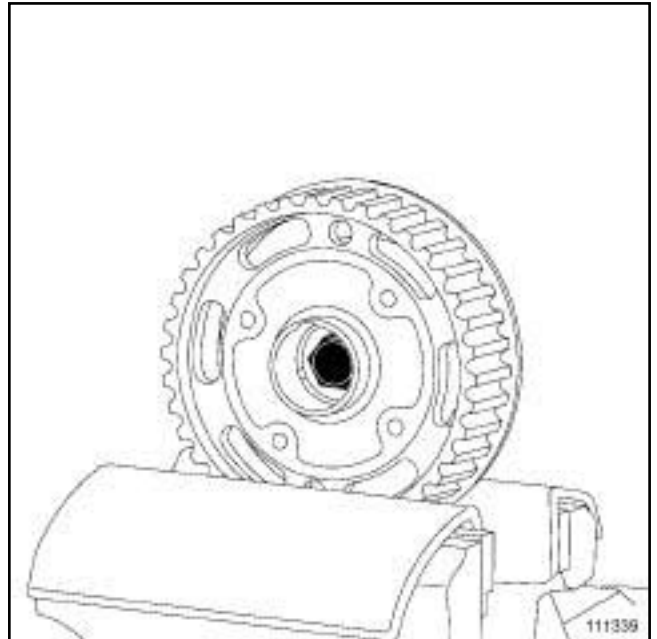
parts always to be replaced: Camshaft dephaser sprocket bolt.

parts always to be replaced: Camshaft dephaser sprocket cap.

WARNING

Failure to adhere to the following procedure may cause the timing belt to be incorrectly timed.

- If fitting a new camshaft dephaser pulley, check that it is locked by following the procedure described below:
- Fit a stud to the camshaft dephaser pulley hub and tighten it.



111339

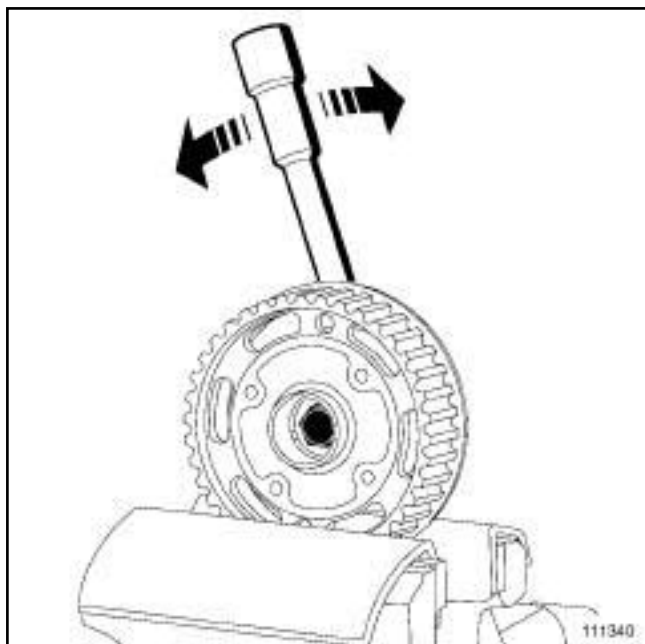
- Place the inlet camshaft dephaser in a vice fitted with jaws.

TOP AND FRONT OF ENGINE

Camshaft dephaser: Removal - Refitting

11A

K4M



111340

- Mechanically lock the camshaft dephaser pulley by rotating it to the left or right using a tubular hexagon box spanner.
- Check that the camshaft dephaser pulley is correctly locked (the hub does not rotate in relation to the wheel to the left or right).
- If the hub rotates in relation to the wheel, the camshaft dephaser pulley is faulty and must be replaced.
- Degrease the end of the inlet camshaft (timing end) and clean the bores and bearing faces of the camshaft dephaser pulley.

II - REFITTING OPERATION

- Refit:
 - the exhaust camshaft pulley.
 - the camshaft dephaser pulley.
- Fit without tightening:
 - the exhaust camshaft pulley bolt,
 - the camshaft dephaser pulley nut.

III - FINAL OPERATION

- Refit:
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray.
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TOP AND FRONT OF ENGINE


Camshaft seal, timing end: Removal - Refitting

11A

K9K

Special tooling required	
Mot. 1606	High pressure pump pulley support tool.
Mot. 1632	Tool for fitting camshaft PTFE seal
Mot. 799-01	Timing gear wheel immobiliser.

Equipment required	
roller-type stud removal tool	
cylinder head bolt tightening gauge (angular measuring type)	

Tightening torques 	
camshaft hub nut	30 Nm + 86° ± 6°

PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Parts always to be replaced:
 - the timing end camshaft seal,
 - the timing end camshaft stud,
- Consumables (see **Vehicle: Parts and consumables for the repair**) (MR 411, 04B, Consumables - Products):
 - **SURFACE CLEANER.**

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (see MR 411, 02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (see MR 411, 80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (MR 411, 85A, Wipers - Washers),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),

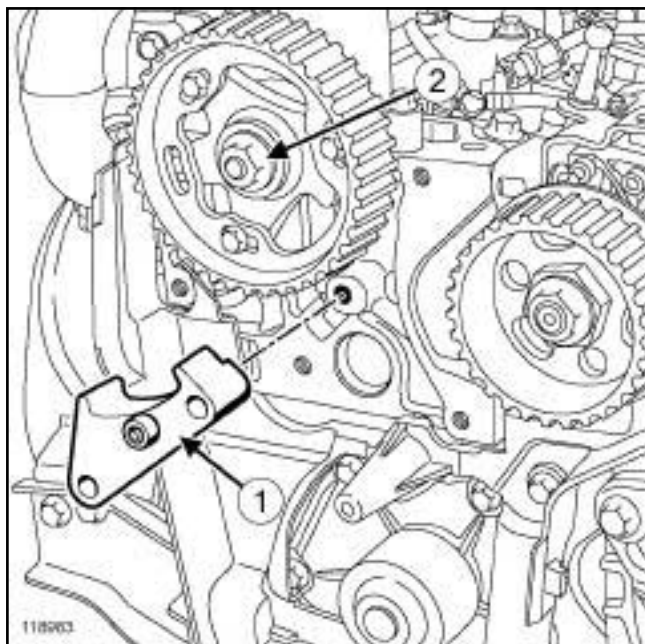
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
- the halogen headlights (see **Halogen headlight: Removal - Refitting**) (MR 411, 80B, Halogen headlights),
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (MR 412, 42A, Upper front structure),
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-14) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) .

TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

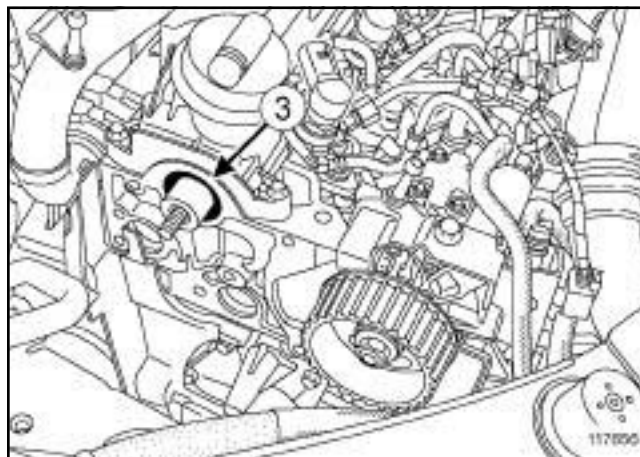
K9K



118983

- Fit the **(Mot. 1606)** (1) on the cylinder head to lock the camshaft timing sprocket.
- Remove:
 - the camshaft timing sprocket hub nut (2) ,
 - the camshaft timing sprocket,
 - the cylinder head tool **(Mot. 1606)**.

II - OPERATION FOR REMOVAL OF PART CONCERNED



117656

- Remove the camshaft timing end seal (3) using a flat screwdriver.

WARNING

Do not scratch the aluminium joint faces: any surface damage to the joint faces may cause leaks.

REFITTING

I - REFITTING PREPARATIONS OPERATION

- Remove the camshaft stud using a **roller-type stud removal tool** (see) (TN 6006A, Engine K9K, 10A, Engine and peripherals).
- Clean the gasket faces using **SURFACE CLEANER**.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the new camshaft timing end seal using the **(Mot. 1632)** (see) (TN 6006A, 10A, Engine and peripherals),
 - the new camshaft stud using the **(Mot. 799-01)** and a **roller-type stud removal tool** (see) (TN 6006A, 10A, Engine and peripherals).

TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

K9K

III - FINAL OPERATION.

Refit:

- the camshaft pulley hub,
- the camshaft pulley hub nut, locking it using the **(Mot. 799-01)**.

Torque and angle tighten using a **cylinder head bolt tightening gauge (angular measuring type)** the **camshaft hub nut (30 Nm + 86° ± 6°)**.

Refit the camshaft pulley wheel.

Fit the camshaft pulley wheel bolts, without tightening them.

Refit:

- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
- the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-14) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (MR 412, 42A, Upper front structure),
- the halogen headlights (see **Halogen headlight: Removal - Refitting**) (MR 411, 80B, Halogen headlights),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),

- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (MR 411, 85A, Wipers - Washers).

Connect the battery (see **Battery: Removal - Refitting**) (see MR 411, 80A, Battery).

TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

K4M

Special tooling required

Mot. 1577	Lip seal extractor (shaft diameter 28 mm to 42 mm).
Mot. 1632	Tool for fitting camshaft PTFE seal

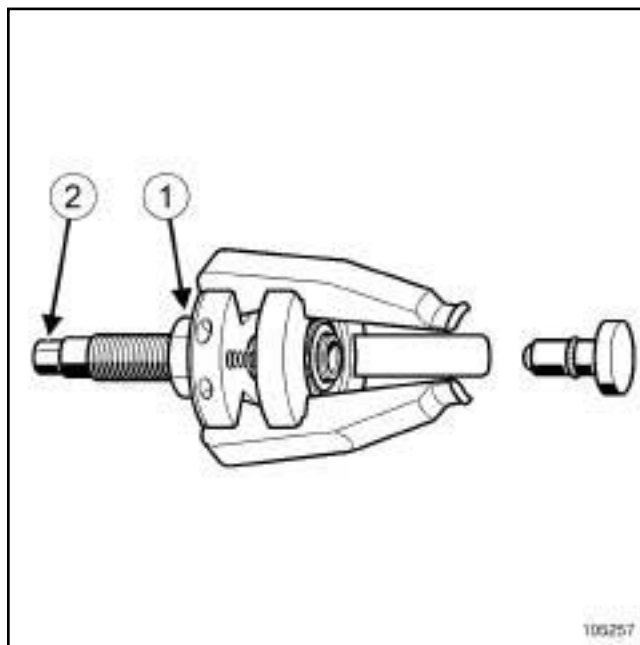
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),

- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
- the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-135) .

II - REMOVAL OPERATION



105257

- Note:**

The camshaft seal is removed using the **(Mot. 1577)**.
- Completely unscrew the nut (1) and the bolt **(Mot. 1577)** of the (2) .

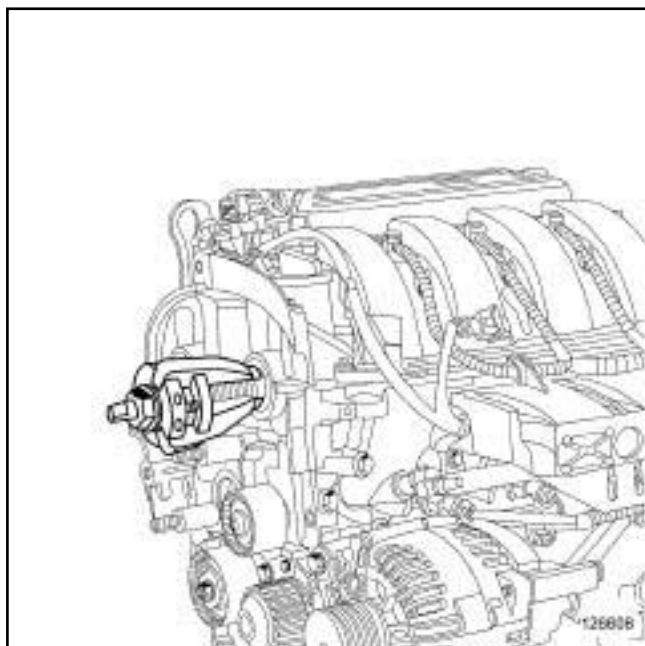
TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

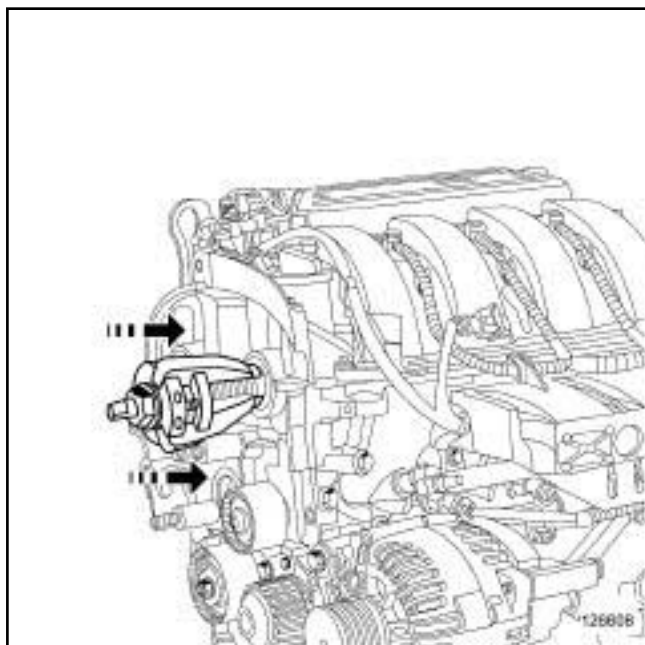
K4M

Removing the seal on the exhaust side and inlet side



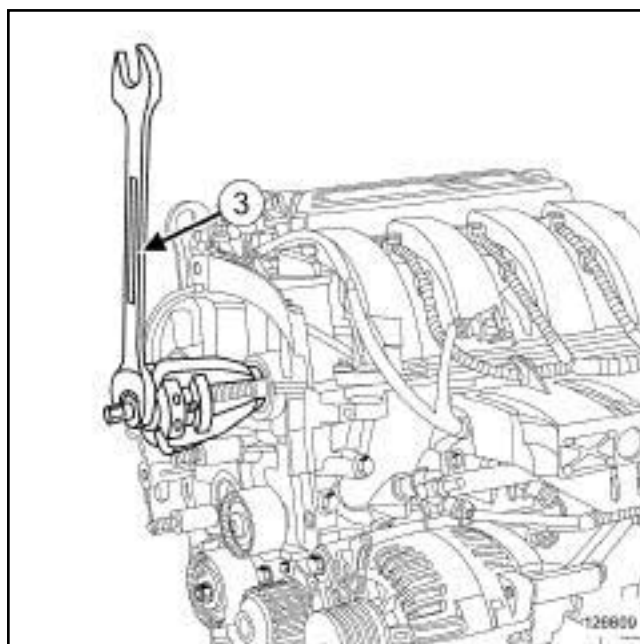
126608

- ❑ Position the claws of the **(Mot. 1577)** on the camshaft.



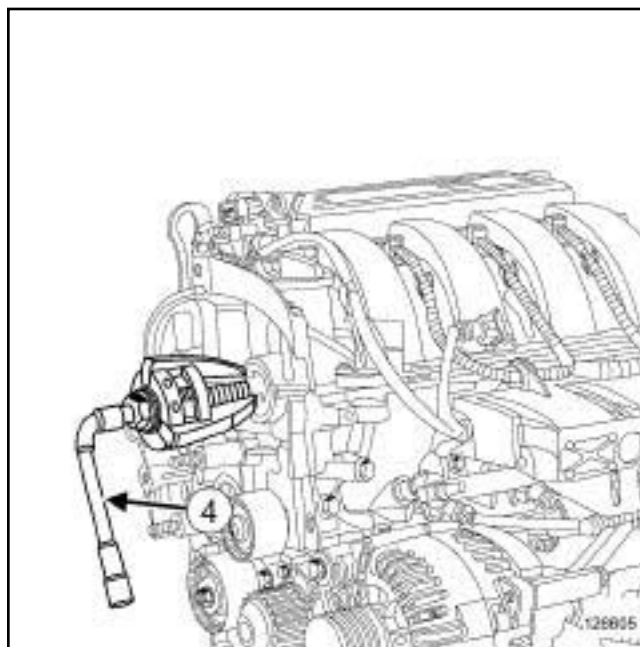
126608

- ❑ Push the **(Mot. 1577)** until contact is made between the ends of the claws and the camshaft seal.



126609

- ❑ Separate the claws by turning the nut **(3)** clockwise using an open-jawed spanner.



126605

- ❑ Remove the camshaft seal by turning the bolt clockwise using a spanner **(4)**.

TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

K4M

REFITTING

I - REFITTING PREPARATION OPERATION

- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the seal mating face of each camshaft,
 - the cylinder head seal housings.

WARNING

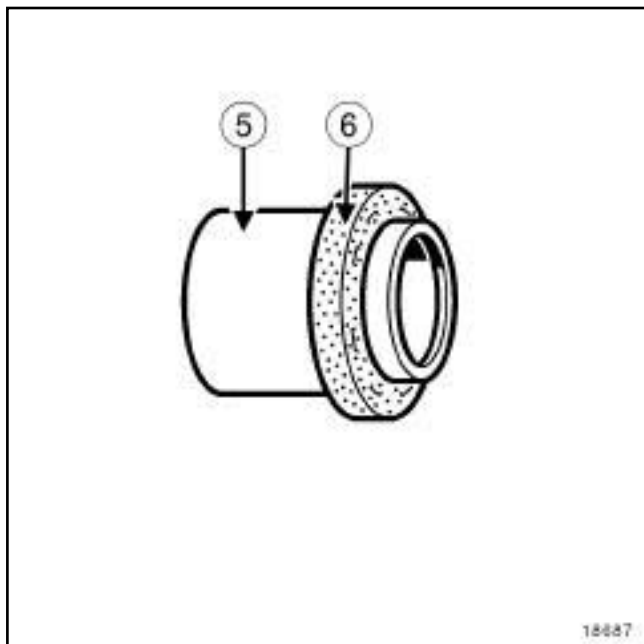
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

- ❑ **parts always to be replaced: Camshaft seal on timing end.**

II - REFITTING OPERATION

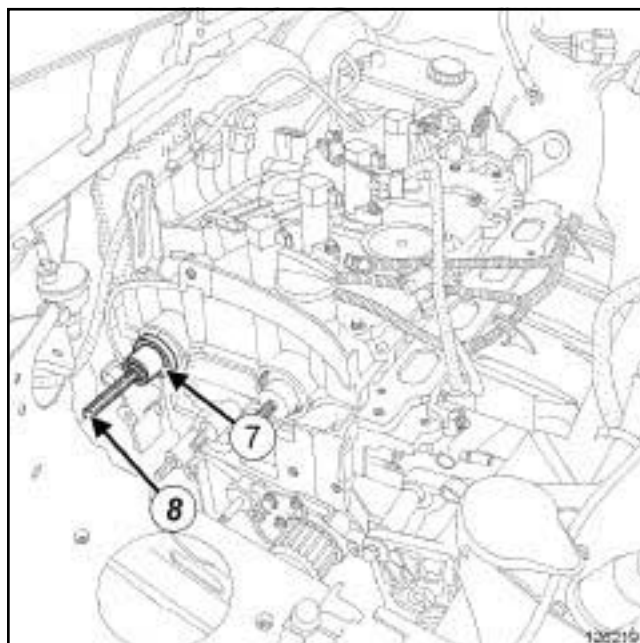
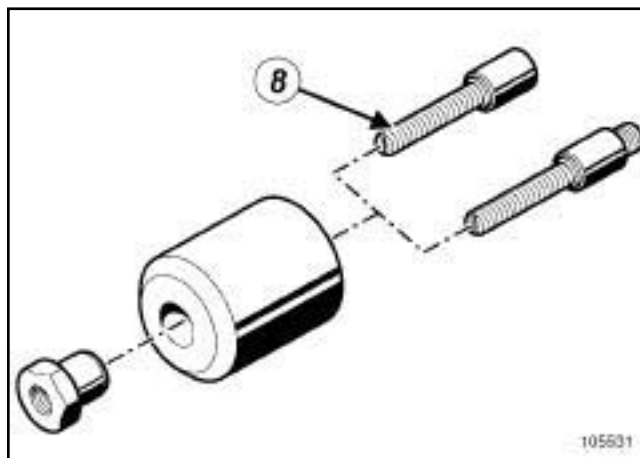


❑

Note:

Always hold the camshaft seal with the protector (5) when handling, as this type of camshaft seal is very FRAGILE. Touching the camshaft seal (6) is strictly forbidden in order to avoid any oil leaks once the camshaft seal is fitted on the engine.

1 - Refitting the exhaust side seal



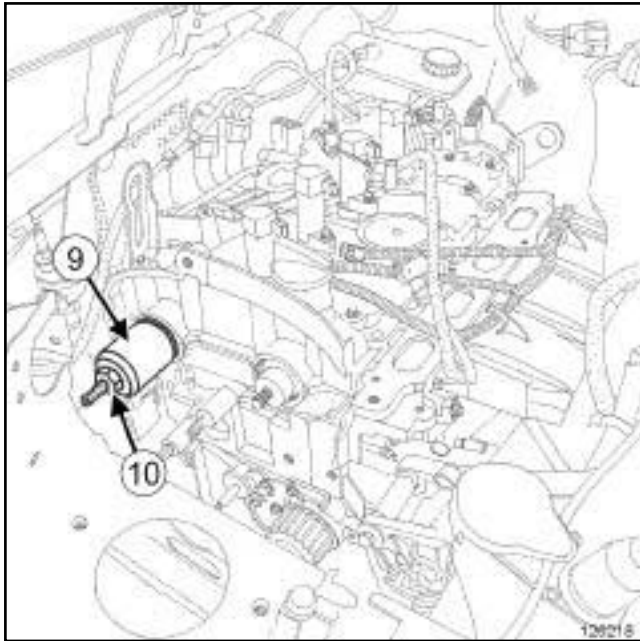
- ❑ Position the protector fitted with a new seal (7) on the camshaft (taking care not to touch the seal).
- ❑ Screw the stud (8) of the (**Mot. 1632**) onto the camshaft.

TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

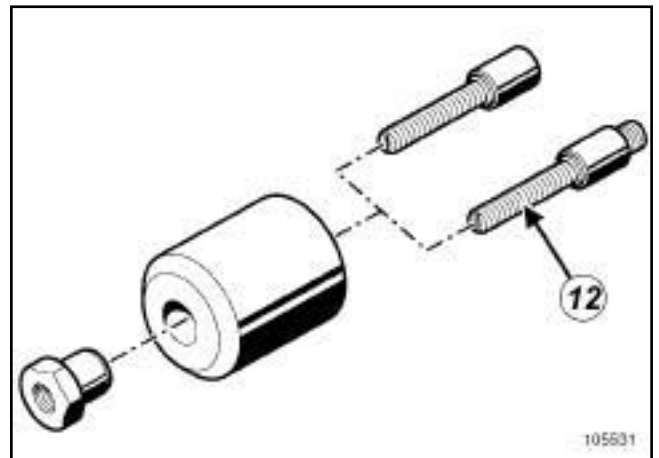
K4M



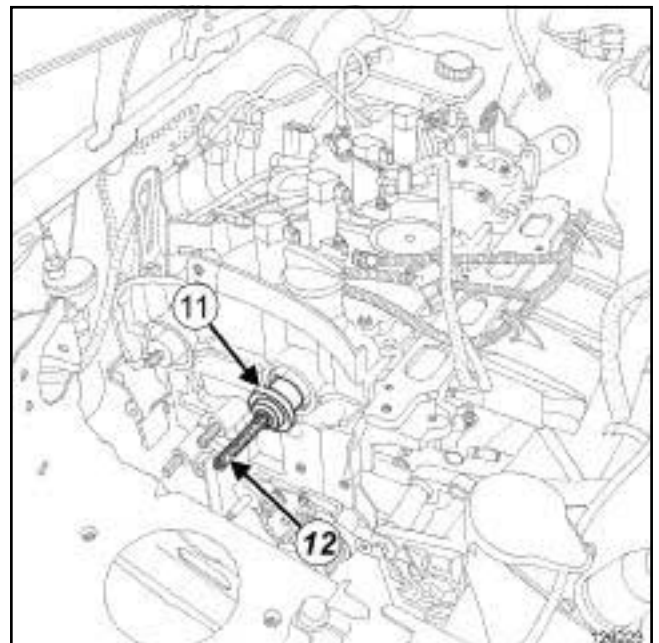
126218

- Fit the cover (9) and the collar nut (10) of the (Mot. 1632).
- Screw on the collar nut until the cover touches the cylinder head.
- Remove:
 - the collar nut from the (Mot. 1632),
 - the cover from the (Mot. 1632),
 - the stud of the (Mot. 1632),
 - the camshaft seal protector.

2 - Refitting the inlet side seal



105531



126223

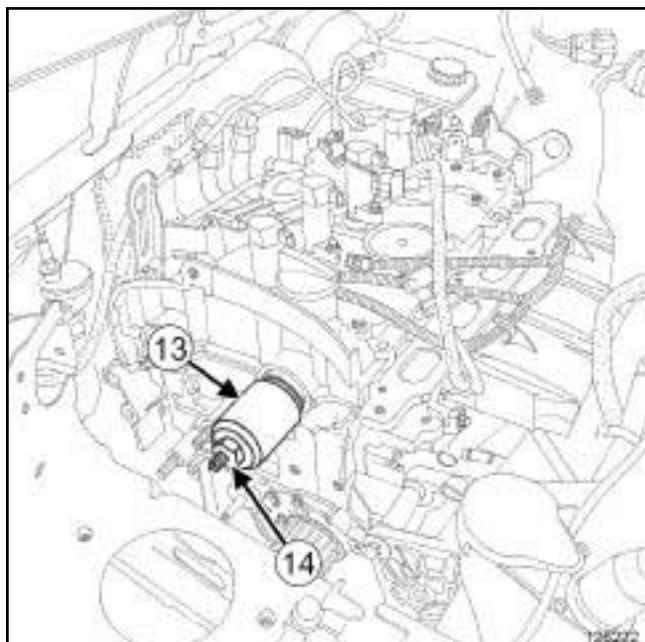
- Position the protector fitted with a new seal (11) on the camshaft (taking care not to touch the seal).
- Remove the camshaft seal protector.
- Screw the stud (12) of the (Mot. 1632) onto the camshaft.

TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

K4M



126222

- Fit the cover (13) and the collar nut (14) of the (Mot. 1632).
- Screw on the collar nut until the cover touches the cylinder head.
- Remove:
 - the collar nut from the (Mot. 1632),
 - the cover from the (Mot. 1632),
 - the stud from the (Mot. 1632).

III - FINAL OPERATION

- Refit:
 - the camshaft dephaser (see 11A, Top and front of engine, Camshaft dephaser: Removal - Refitting, page 11A-135) ,
 - the timing belt (see 11A, Top and front of engine, Timing belt: Removal - Refitting, page 11A-27) ,
 - the right-hand suspended engine mounting (see 19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-13) ,
 - the scoop under the scuttle panel grille (see Scoop under the scuttle panel grille: Removal - Refitting) (56A, Exterior equipment),
 - the scuttle panel grille (see Scuttle panel grille: Removal - Refitting) (56A, Exterior equipment),
 - the windscreen wiper arms (see Windscreen wiper arm: Removal - Refitting) (85A, Wiping - Washing),

- the throttle valve (see 12A, Fuel mixture, Throttle valve: Removal - Refitting, page 12A-20) ,
 - the air filter unit (see 12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-13) ,
 - the accessories belt (see 11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-3) ,
 - the front upper cross member (see Front upper cross member: Removal - Refitting) (42A, Upper front structure),
 - the bonnet catch (see Bonnet lock: Removal - Refitting) (52A, Non-side opening element mechanisms),
 - the headlights (see Halogen headlight: Removal - Refitting) (80B, Headlights),
 - the front bumper (see Front bumper: Removal - Refitting) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see Front wheel arch liner: Removal - Refitting) (55A, Exterior protection),
 - the front right-hand wheel (see Wheel: Removal - Refitting) (35A, Wheels and tyres),
 - the engine undertray.
- Connect the battery (see Battery: Removal - Refitting) (80A, Battery).

TOP AND FRONT OF ENGINE
Camshaft seal, timing end: Removal - Refitting

11A

K4M

TOP AND FRONT OF ENGINE

Oil decanter: Removal - Refitting

11A

K4M

Tightening torques

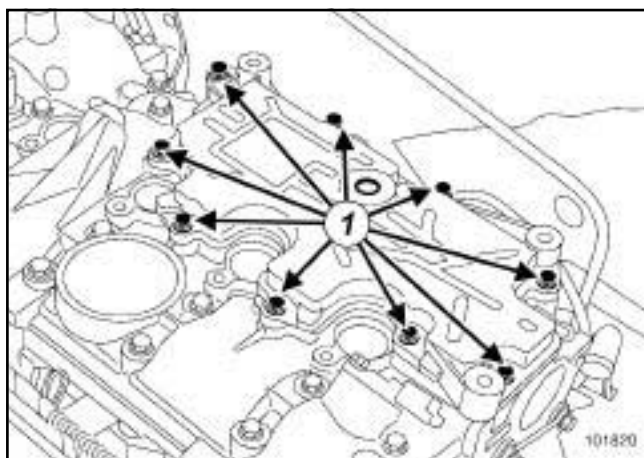
oil separator bolts	10 N.m
---------------------	--------

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove:
 - the bolts (1) from the oil separator,
 - the oil decanter,
 - the oil separator seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Oil decanter seal.
- parts always to be replaced: oil decanter bolt.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

When cleaning parts, it is essential that the parts do not impact on each other, otherwise their mating faces may be damaged and therefore their adjustments may be altered, which could damage the engine.

- Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:
 - the oil separator joint face if it is to be re-used,
 - the rocker cover joint face.
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:
 - the oil separator joint face if it is to be re-used,
 - the rocker cover joint face.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

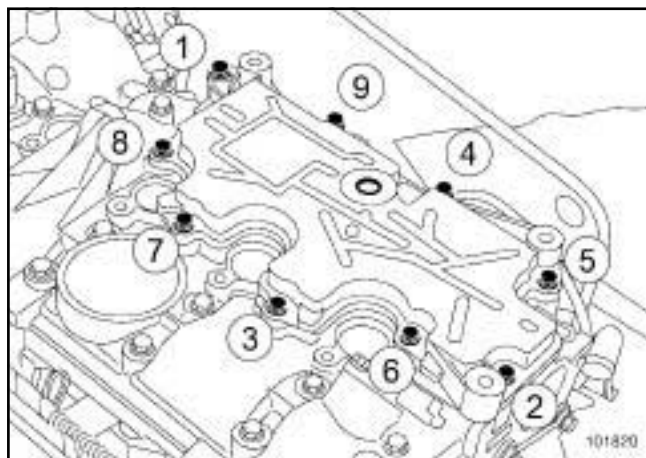
TOP AND FRONT OF ENGINE

Oil decanter: Removal - Refitting

11A

K4M

II - REFITTING OPERATION FOR PART CONCERNED



- Refit:
 - a new seal on the oil separator,
 - the oil decanter.
- Tighten to torque and in order the **oil separator bolts (10 N.m)**.

III - FINAL OPERATION

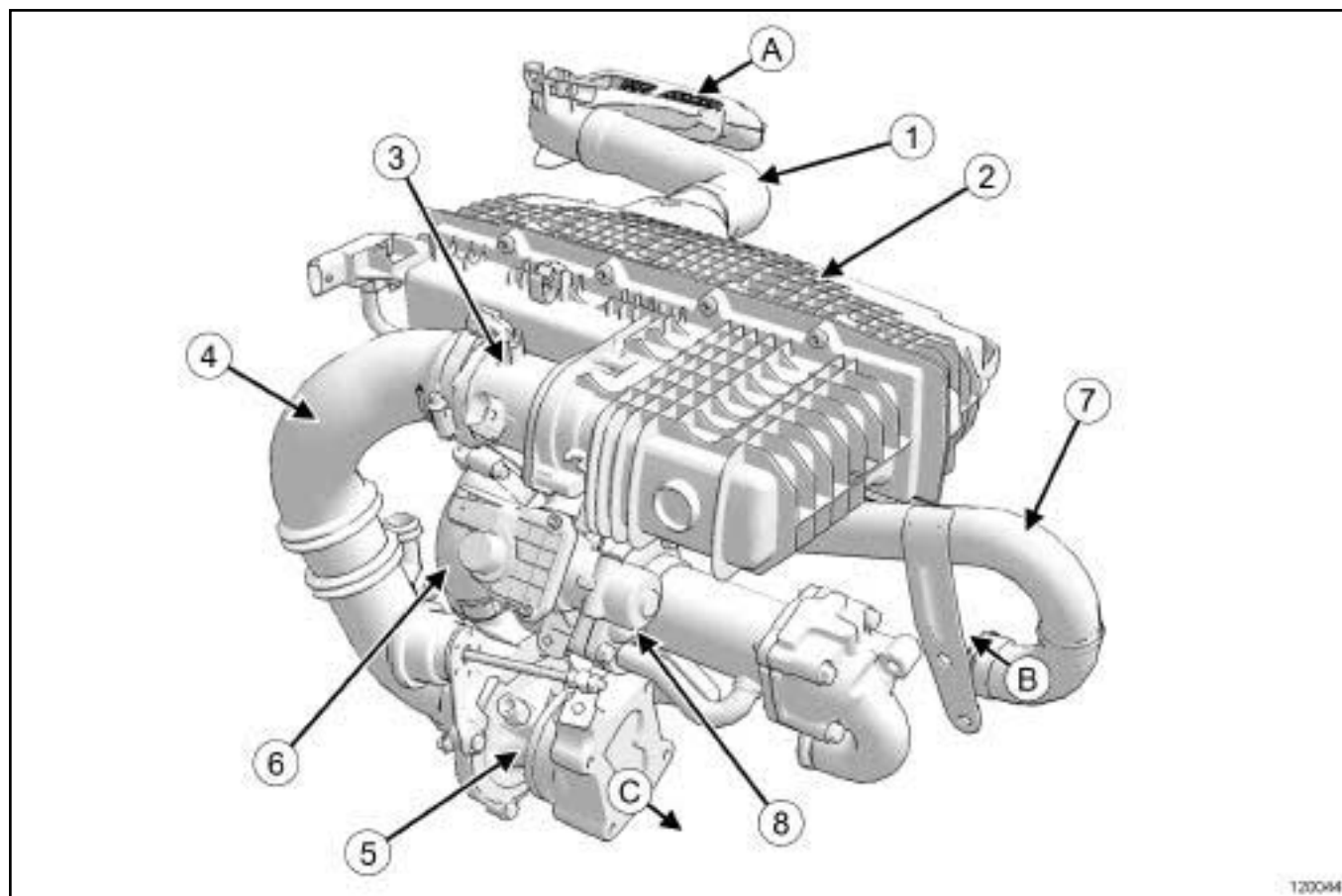
- Refit:
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).
- Connect the battery (see) (80A, Battery).

FUEL MIXTURE

Air inlet: Description

12A

C44, and K9K, and 740



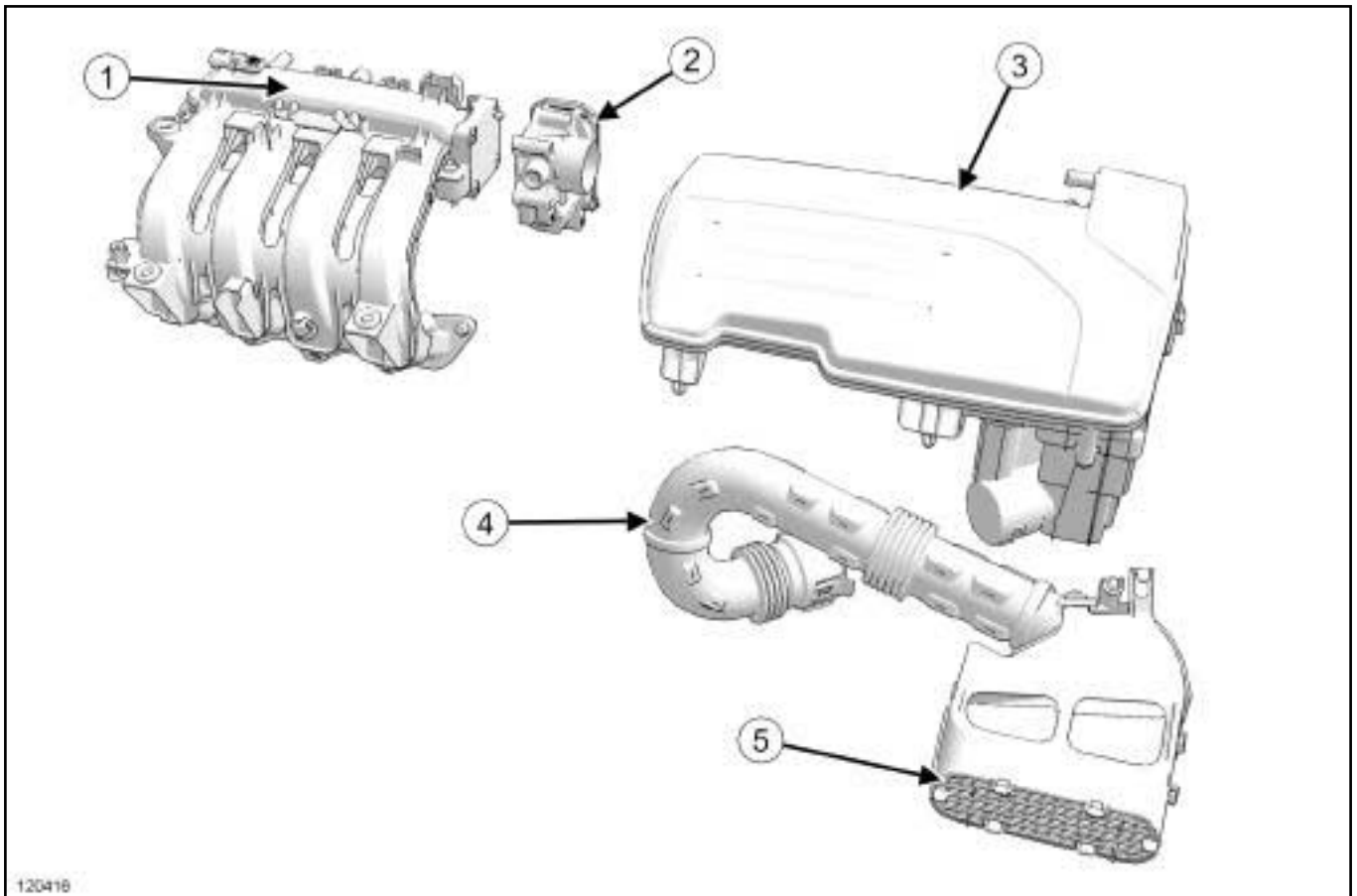
- | | |
|-----|---------------------------------------|
| (1) | Air filter box air inlet pipe |
| (2) | Air filter unit |
| (3) | Air flowmeter |
| (4) | Air filter box air outlet pipe |
| (5) | Turbocharger |
| (6) | Turbocharger air outlet pipe |
| (7) | Metal air inlet tube |
| (8) | Exhaust gas recirculation assembly |
| (A) | Air inlet in the air inlet circuit |
| (B) | Air inlet in the engine |
| (C) | Air outlet towards the exhaust system |

FUEL MIXTURE

Air inlet: Description

12A

D4F, and 772



120416

120416

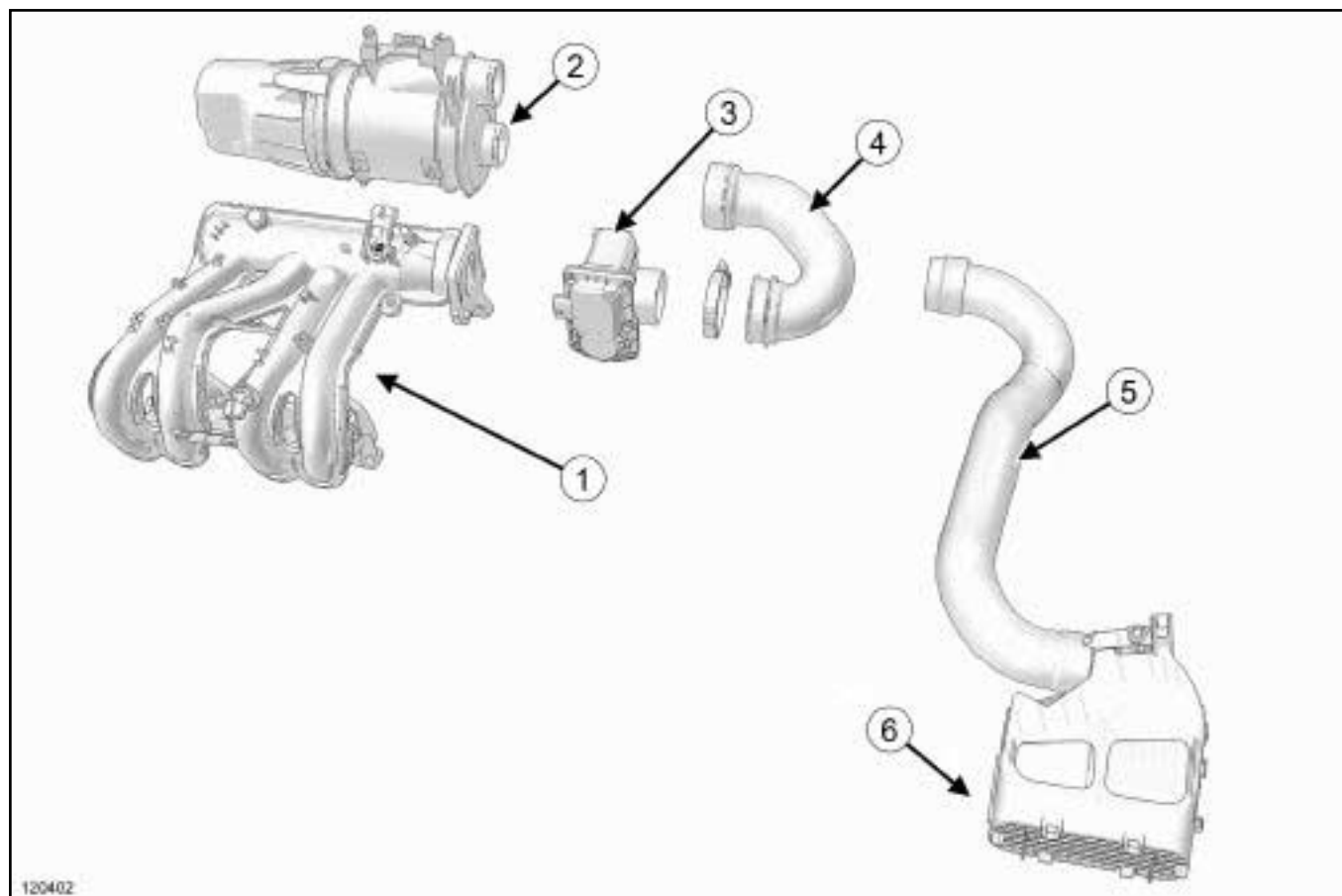
- | | |
|-----|--------------------------------------|
| (1) | Inlet distributor |
| (2) | Motorised throttle valve |
| (3) | Air filter unit |
| (4) | Air inlet pipe of the air filter box |
| (5) | Air scoop |

FUEL MIXTURE

Air inlet: Description

12A

D7F



120402

120402

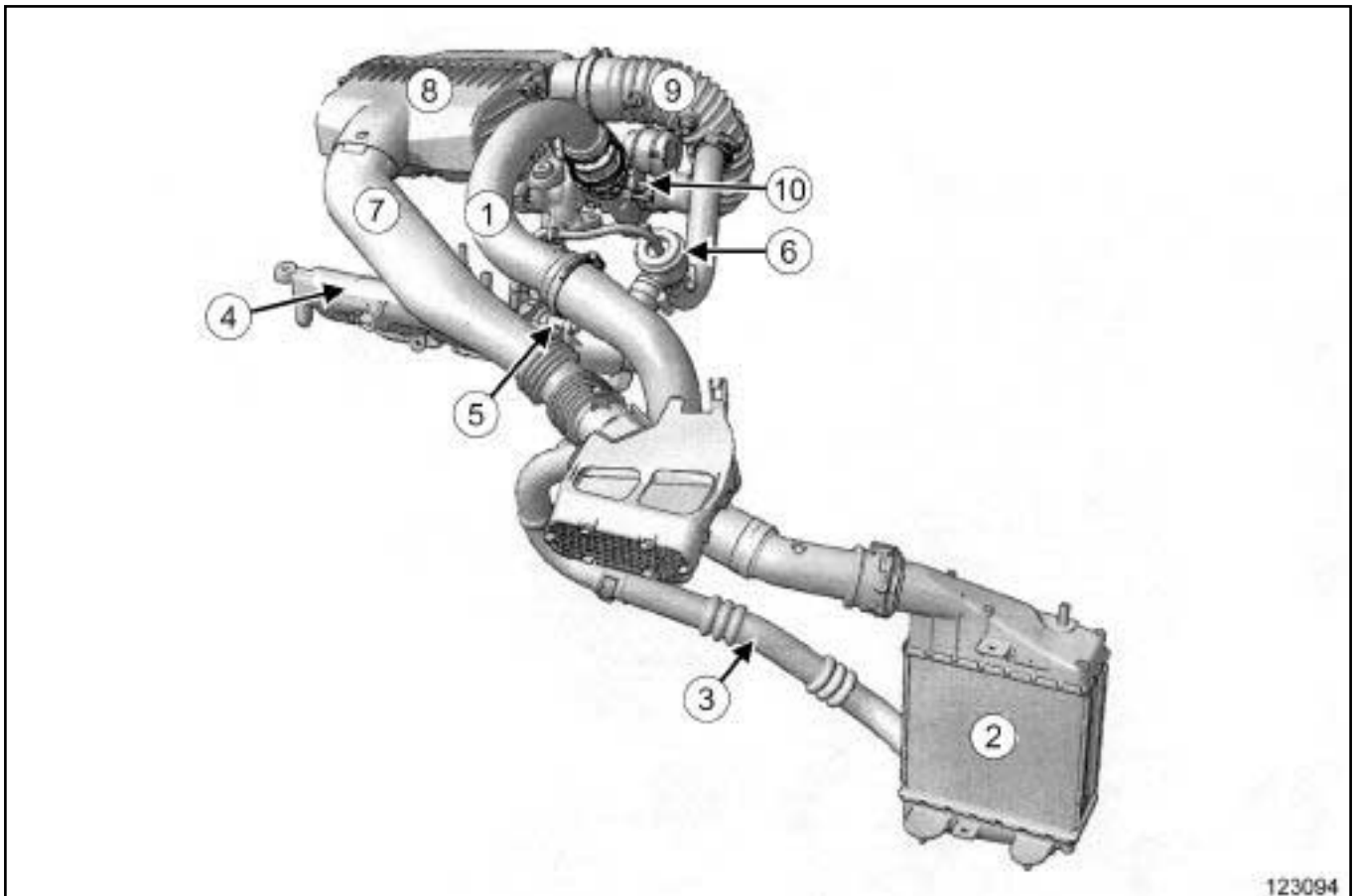
- | | |
|-----|--------------------------------|
| (1) | Intake distributor |
| (2) | Air filter box |
| (3) | Motorised throttle valve |
| (4) | Air filter box outlet air pipe |
| (5) | Air filter box air inlet pipe |
| (6) | Air scoop |

FUEL MIXTURE

Air inlet: Description

12A

D4F, and 780 or 782



123094

123094

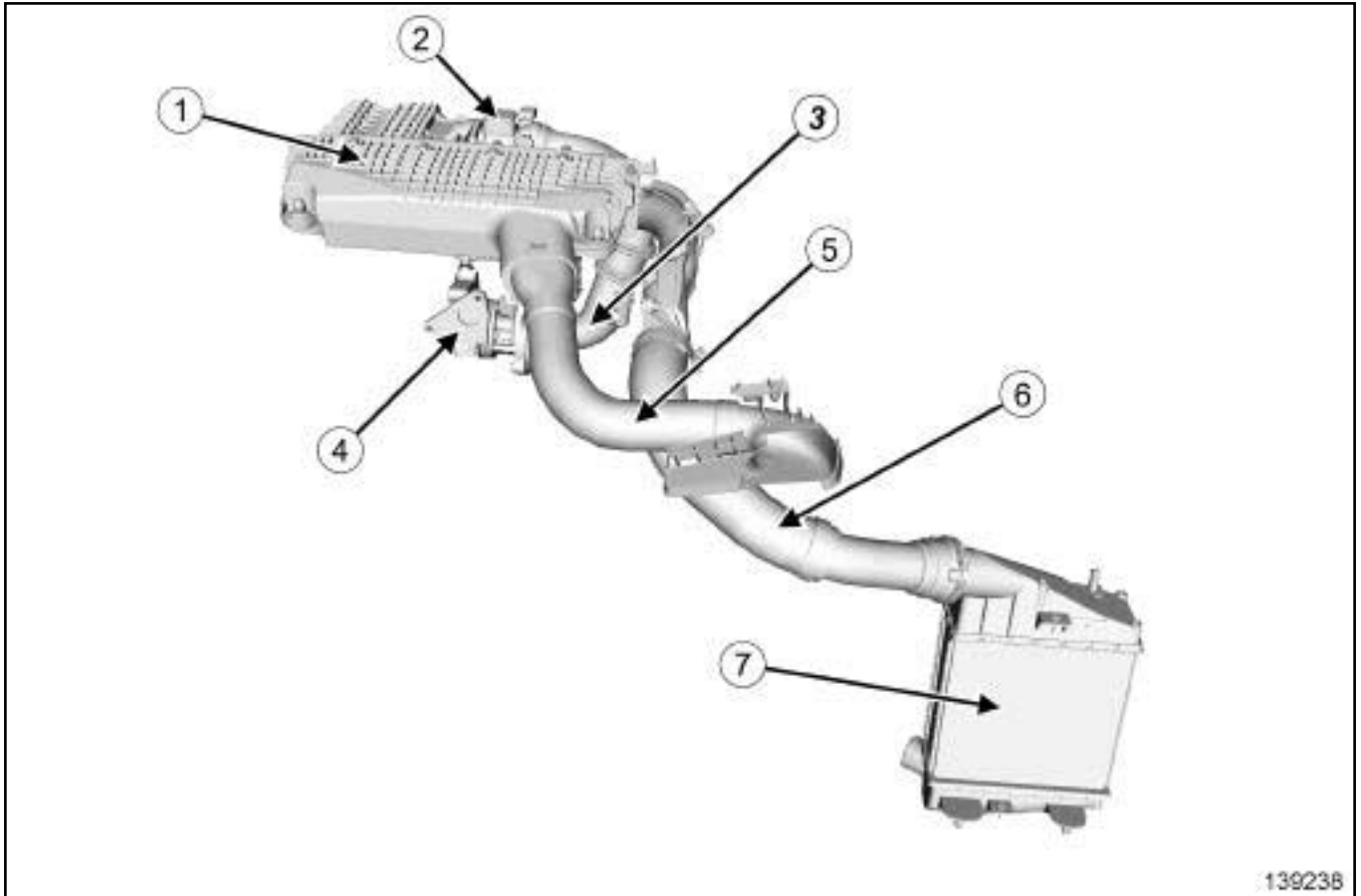
- | | |
|------|--------------------------------------|
| (1) | Turbocharger air outlet pipe |
| (2) | Intercooler |
| (3) | Intercooler air outlet pipe |
| (4) | Inlet distributor |
| (5) | Throttle valve |
| (6) | Compressor discharge valve |
| (7) | Air inlet pipe of the air filter box |
| (8) | Air filter unit |
| (9) | Air filter unit air outlet pipe |
| (10) | Turbocharger |

FUEL MIXTURE

Air inlet: Description

12A

K9K, and 718



139238

139238

- | | |
|-----|--------------------------------------|
| (1) | Air filter unit |
| (2) | Air flowmeter |
| (3) | Air filter unit air outlet pipe |
| (4) | Turbocharger |
| (5) | Air inlet pipe of the air filter box |
| (6) | Intercooler air inlet pipe |
| (7) | Intercooler |

FUEL MIXTURE

Air filter: Removal - Refitting

12A

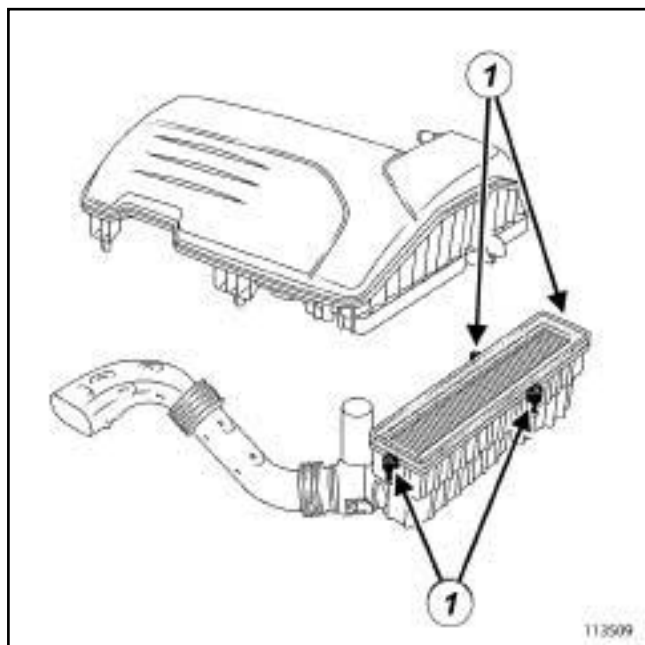
D4F, and 772

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove the air filter unit (see 12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



113509

- Remove:
 - the bolts (1) from the air filter box cover,
 - the air filter.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Air filter.
- Clean the air filter housing.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the air filter,
 - the air filter unit cover bolts.

III - FINAL OPERATION

- Refit the air filter unit (see 12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-13) .

FUEL MIXTURE

Air filter: Removal - Refitting

12A

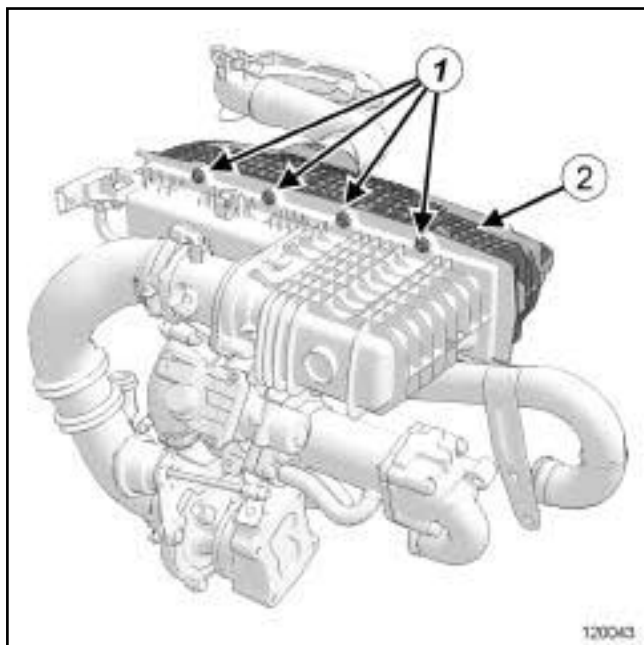
C44, and K9K

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove:
 - the engine cover,
 - the air filter box (see 12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



120043

- Remove the bolts (1) of the air filter box cover (2) .
- Raise the cover of the air filter box to remove it from its mountings.
- Move aside the air filter cover.
- Remove the air filter and discard it.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit a new air filter.

Note:

Ensure that the air filter is correctly positioned in its box.

- Refit:
 - the air filter box cover,

- the air filter box cover bolts

II - FINAL OPERATION.

- Refit:
 - the air filter box (see 12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-13) ,
 - the engine cover.

FUEL MIXTURE

Air filter: Removal - Refitting

12A

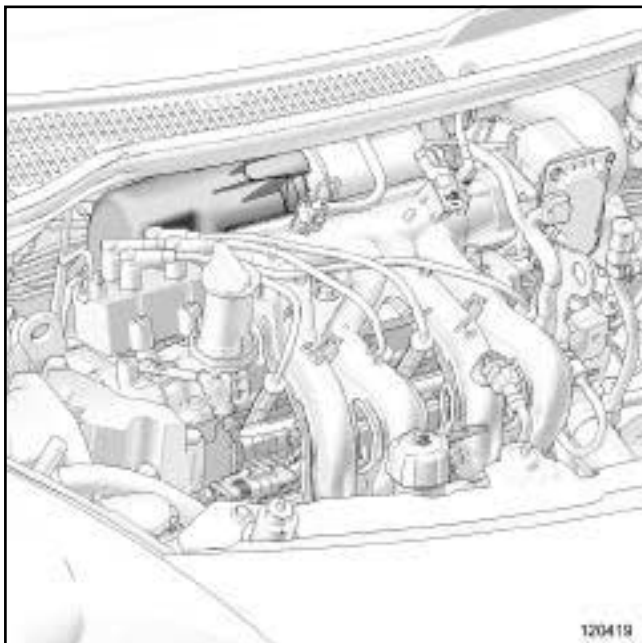
D7F

PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Parts always to be replaced:
 - the air filter.

REMOVAL

OPERATION FOR REMOVAL OF PART CONCERNED



120419

- Unclip the air filter box cover.
- Move aside the air filter cover.
- Remove the air filter.

REFITTING

REFITTING OPERATION FOR PART CONCERNED

- Refit the new air filter.
- Fit the air filter box cover.
- Clip on the air filter box cover.

FUEL MIXTURE

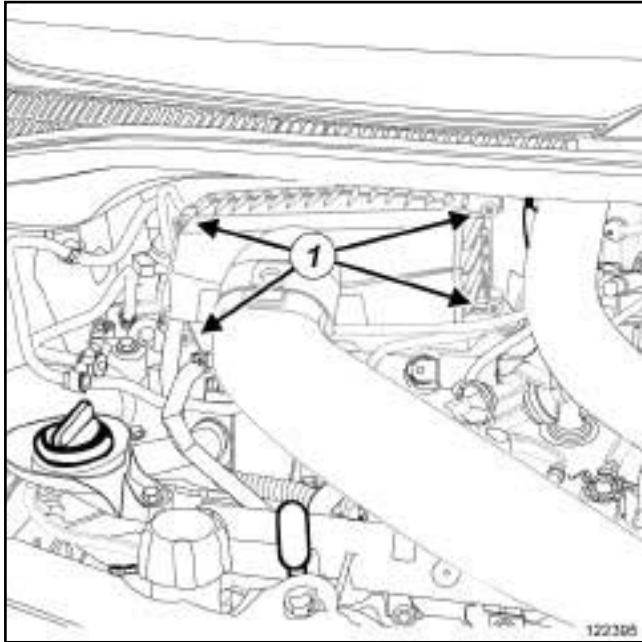
Air filter: Removal - Refitting

12A

D4F, and 780 or 782

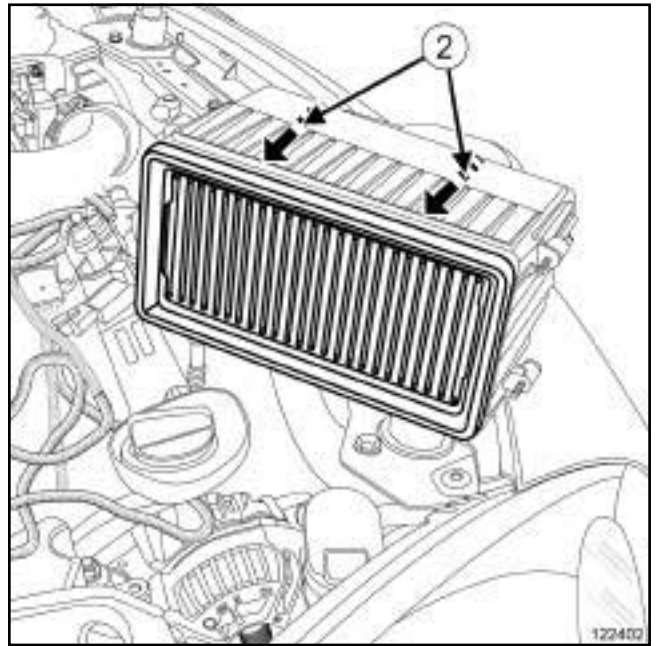
REMOVAL

I - REMOVAL PREPARATION OPERATION



- Remove the bolts (1) from the air filter unit cover on the air filter unit.
- Move the air filter unit air inlet pipe and the air filter unit cover to one side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove the air filter unit in the direction of the arrows (2) .

REFITTING

I - REFITTING PREPARATION OPERATION

- Clean the air filter unit.

II - REFITTING OPERATION FOR PART CONCERNED

- Correctly fit the air filter into the air filter unit cover.

WARNING

If the air filter is fitted incorrectly in the air filter unit, unfiltered air may enter the engine.

III - FINAL OPERATION

- Position the air filter unit air inlet pipe and the air filter unit cover on the air filter unit.
- Refit the air filter unit cover bolts.
- Tighten the air filter unit cover bolts.

FUEL MIXTURE

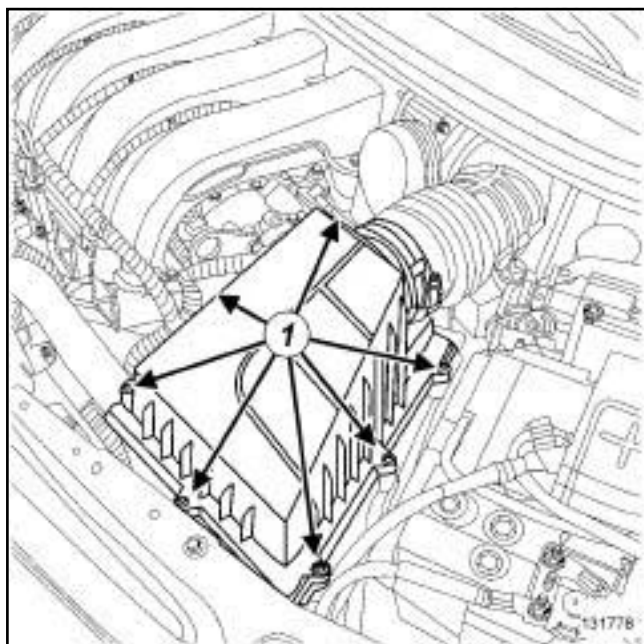
Air filter: Removal - Refitting

12A

K4M

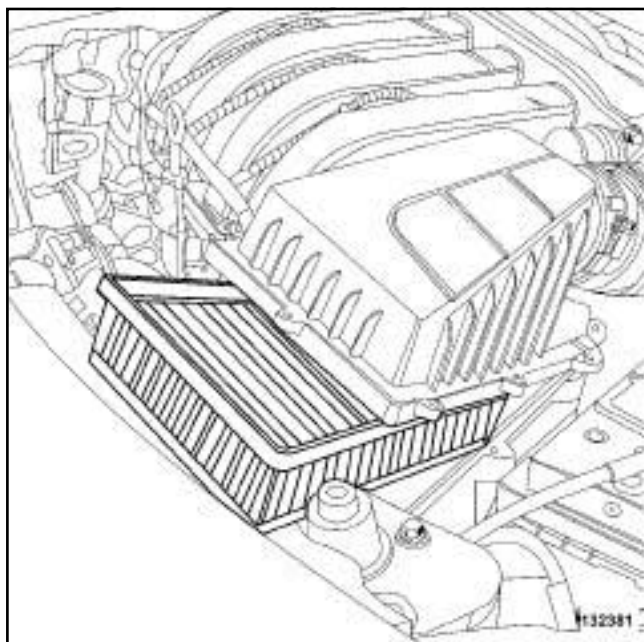
REMOVAL

REMOVAL OPERATION



131778

- Remove the bolts (1) from the air filter unit cover.



132381

- Raise the air filter unit cover.
- Remove the air filter.

REFITTING

I - REFITTING PREPARATION OPERATION

- Clean the air filter housing.

WARNING

If the air filter is fitted incorrectly in the air filter unit, unfiltered air may enter the engine.

II - REFITTING OPERATION

- Refit:
 - the air filter,
 - the air filter unit cover.

FUEL MIXTURE

Air filter: Removal - Refitting

12A

K9K, and 718 or 740

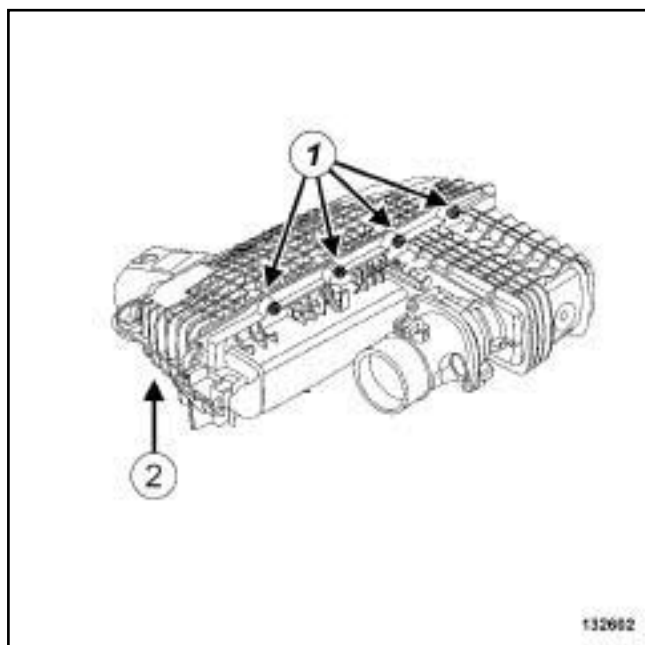
REMOVAL

I - REMOVAL PREPARATION OPERATION

- ❑ Remove the air filter unit (see 12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

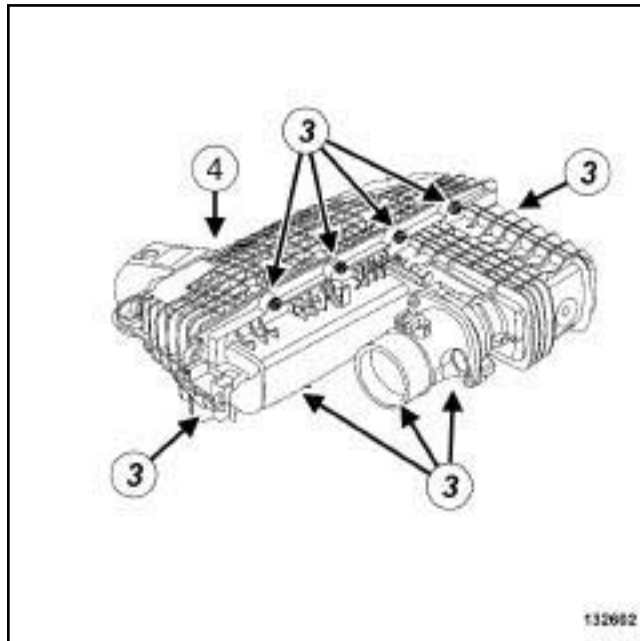
1 - First fitting of air filter unit



132602

- ❑ Remove the 4 bolts (1) from the air filter unit.
- ❑ Pivot the hinged cover (2) of the air filter unit in relation to the air filter unit tank.
- ❑ Move aside the air filter unit cover (2) .

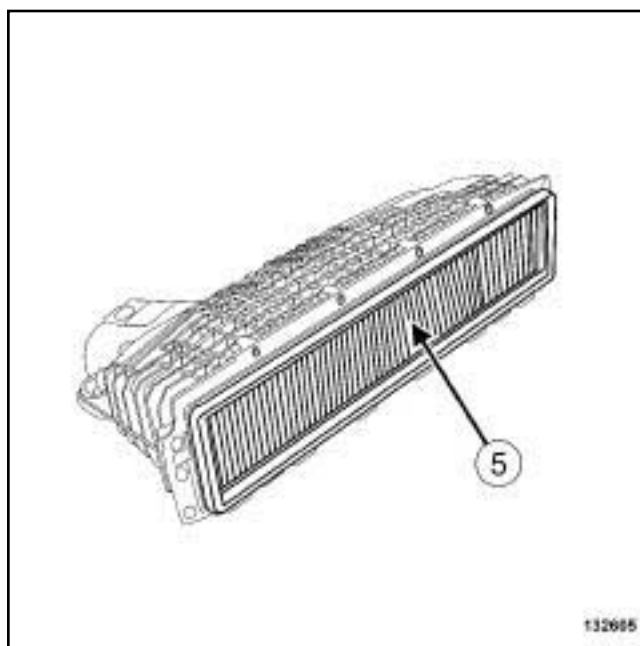
2 - Second fitting of air filter unit



132602

132602

- ❑ Remove the 9 bolts (3) from the air filter unit.
- ❑ Move aside the air filter unit cover (4) .



132605

132605

- ❑ Remove the air filter (5) from the air filter unit cover.

REFITTING

I - REFITTING PREPARATION OPERATION

- ❑ Clean the air filter unit.

FUEL MIXTURE

Air filter: Removal - Refitting

12A

K9K, and 718 or 740

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the air filter in the air filter unit cover.

WARNING

If the air filter is fitted incorrectly in the air filter unit, unfiltered air may enter the engine and cause the engine to malfunction.

- Fit the air filter unit cover.

III - FINAL OPERATION

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .

FUEL MIXTURE

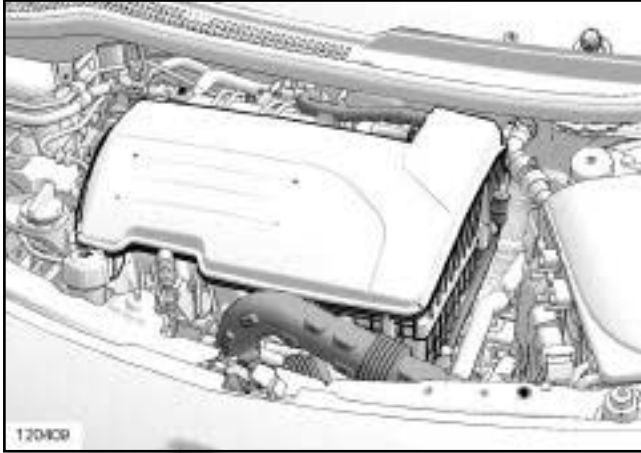
Air filter unit: Removal - Refitting

12A

D4F, and 772

REMOVAL

I - REMOVAL PREPARATION OPERATION



120409

- Remove the air duct on the front end panel.
- Loosen the air filter box clip .
- Disconnect the oil vapour rebreathing hose.
- Unclip the gearbox breather.

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove the air filter unit:
 - lift out the air filter unit to remove it from the rocker cover,
 - push the air filter unit towards the right to remove it from the motorised throttle valve.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refitting the air filter unit:
 - push the air filter unit towards the left to attach it to the motorised throttle valve,
 - lower the air filter unit to attach it to the rocker cover.

II - FINAL OPERATION.

- Tighten the air filter unit clip.
- Connect the oil vapour rebreathing hoses.
- Clip on the gearbox breather.
- Refit the air duct on the front end panel.

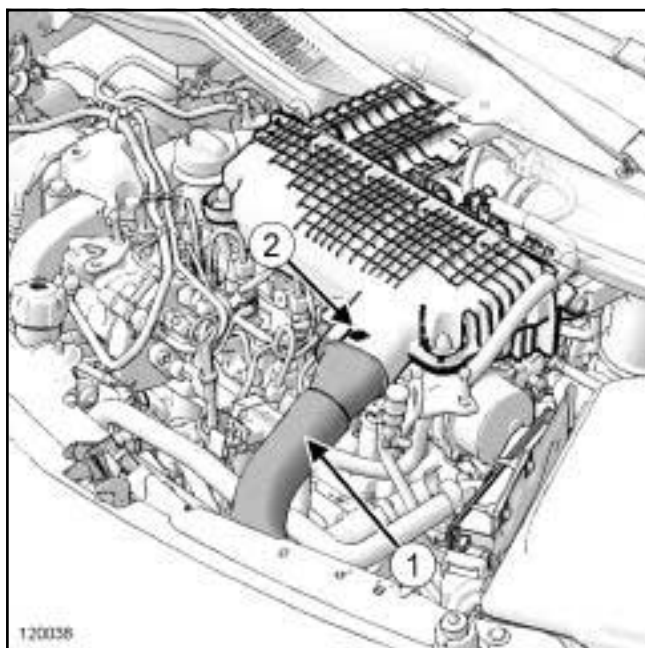
K9K

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove the front engine cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED

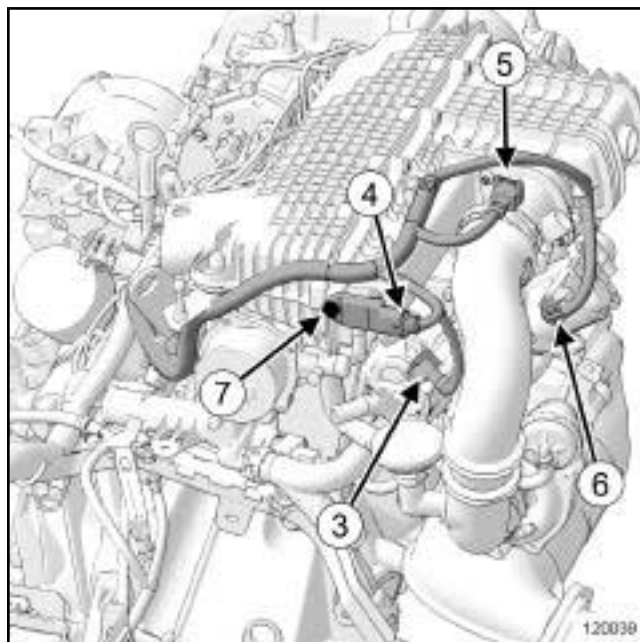


- Unclip:
 - the air filter air inlet pipe (1) on the vehicle,
 - the air filter air inlet pipe from the air filter unit.

Note:

Make sure you do not break the pins (2) .

- Remove the air filter air inlet pipe.



- Unclip the air filter box harnesses.
- Disconnect the connectors:
 - from the air inlet temperature sensor downstream of the turbocharger (3) ,
 - the turbocharger pressure sensor (4) ,
 - from the air inlet temperature sensor upstream of the turbocharger (5) ,
 - from the EGR (6) .
- Remove the bolt (7) from the turbocharger pressure sensor on the air filter box.
- Move aside the turbocharger pressure sensor.
- Loosen the clip at the inlet of the air filter outlet air pipe.
- Unclip the air filter outlet air pipe from the air filter box.
- Raise the cover of the air filter box to remove it from its mountings.
- Slide the air filter box towards the timing end.
- Remove the air filter box.

FUEL MIXTURE

Air filter unit: Removal - Refitting

12A

K9K

REMOVAL

I - REFITTING OPERATION FOR PART CONCERNED

- Slide the air filter box towards the gearbox side.

Note:

Ensure that the centring lug of the box is fully inserted in the cylinder head.

- Check the condition of the air filter box mountings, replace them if necessary.
- Clip:
 - the air filter box onto its mountings,
 - the air filter air outlet pipe to the air filter.
- Tighten the air pipe clip on the air filter outlet.
- Refit the air filter air inlet pipe on the vehicle.
- Position the turbocharger pressure sensor on the air filter box.
- Refit the bolt mounting the turbocharger pressure sensor on the air filter box.
- Connect the connectors:
 - of the inlet air temperature sensor,
 - of the turbocharging pressure sensor,
 - of the flow sensor,
 - of the EGR.
- Clip on the air filter box harnesses.
- Clip the air filter inlet air pipe to the air filter box.

II - FINAL OPERATION.

- Refit the engine cover.

D7F

Equipment required

compressed air nozzle

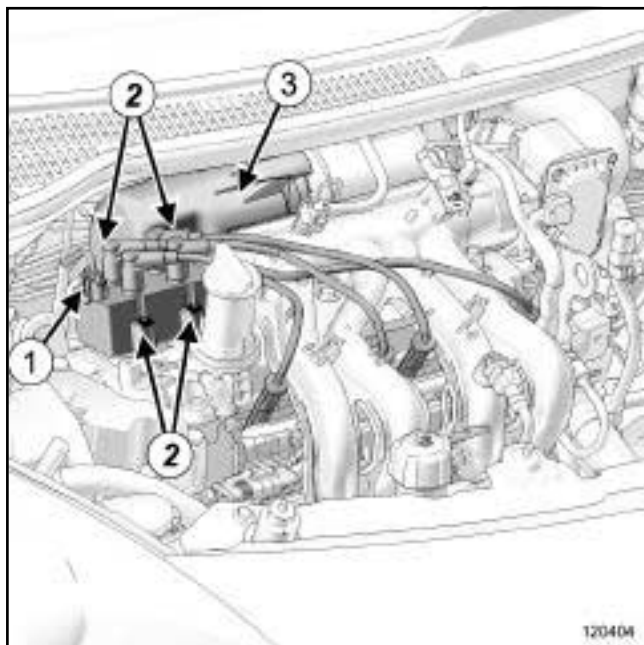
PARTS AND CONSUMABLES FOR THE REPAIR WORK

❑ Parts always to be replaced :

- the air filter.

REMOVAL

I - REMOVAL PREPARATION OPERATION



120404

- ❑ Remove the anti-interference wire bolt.
- ❑ Disconnect the ignition coil connector (1) .
- ❑ Remove the ignition coil bolts (2) .
- ❑ Move aside the ignition coil.
- ❑ Remove the air filter box cover (3) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

- ❑ Disconnect:
 - the non-return valve pipe on the brake servo,
 - the petrol vapour rebreather pipe union from the intake distributor.
- ❑ Move aside the air filter box air inlet duct.
- ❑ Undo the air filter box air outlet duct clip.
- ❑ Remove the air filter box air outlet duct.
- ❑ Unclip the air filter box elastic straps.
- ❑ Remove:
 - the air filter box,
 - the air filter from the air filter unit.

REFITTING

I - REFITTING PREPARATIONS OPERATION

If reusing the air filter box

- ❑ Use a **compressed air nozzle** to clean the air filter housing to get rid of any foreign bodies.

II - REFITTING OPERATION FOR PART CONCERNED

- ❑ Refit the air filter box fitted with a new seal.
- ❑ Clip on the air filter box elastic straps.
- ❑ Refit the air filter box air outlet duct.
- ❑ Tighten the air filter box air outlet duct clip.
- ❑ Refit the air filter box air inlet duct.
- ❑ Connect:
 - the non-return valve pipe on the brake servo,
 - the petrol vapour rebreather pipe union from the intake distributor.

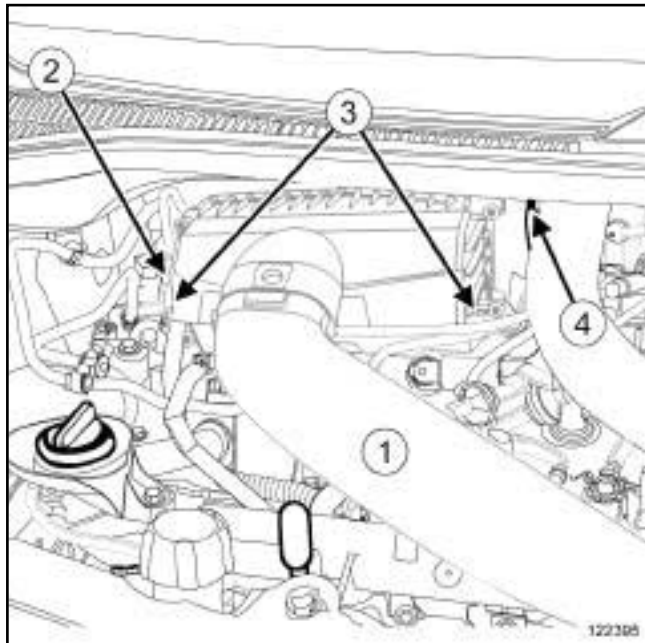
III - FINAL OPERATION.

- ❑ Fit the ignition coil.
- ❑ Refit the ignition coil bolts.
- ❑ Connect the connector of the ignition coil.
- ❑ Refit the anti-interference wire bolt.

D4F, and 780 or 782

REMOVAL

I - REMOVAL PREPARATION OPERATION



122395

- Disconnect the air inlet pipe from the air filter unit (1).
- Move aside the air inlet pipe from the air filter unit.
- Unclip the wiring (2) from the oxygen sensor upstream of the air filter unit.
- Remove the bolts (3) from the air filter unit.
- Loosen the clip (4) on the air filter unit air outlet pipe by gently moving it away from the air filter unit.
- Disconnect the air filter unit air outlet pipe from the air filter unit.

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove the air filter unit.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the air filter unit.

Note:

Position the air filter unit centring pin in the slot provided for it.

II - FINAL OPERATION

- Connect the air filter unit air outlet pipe to the air filter unit.
- Tighten the clip of the air filter unit air outlet pipe on the air filter unit.
- Refit the air filter unit bolts.
- Clip the upstream oxygen sensor wiring onto the air filter unit.
- Refit the air filter unit air inlet pipe.

FUEL MIXTURE

Air filter unit: Removal - Refitting

12A

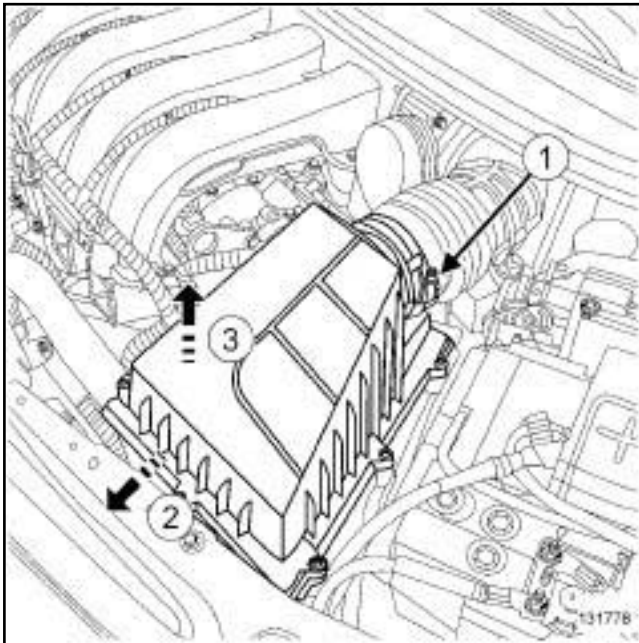
K4M

Tightening torques

clip of the air outlet pipe on the air filter unit ³	.5 N.m
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REMOVAL

REMOVAL OPERATION



131778

- Loosen the clip (1) of the air outlet pipe on the air filter unit.
- Disconnect the air outlet pipe from the air filter unit.
- Move aside the air filter unit in the order of the arrows.
- Disconnect the air inlet pipe from the air filter unit.
- Remove the air filter unit.

REFITTING

REFITTING OPERATION

- Connect the air inlet pipe to the air filter unit.
- Refit the air filter unit.
- Connect the air outlet pipe of the air filter unit.
- Torque tighten the **clip of the air outlet pipe on the air filter unit³ (.5 N.m)**.

FUEL MIXTURE

Air resonator: Removal - Refitting

12A

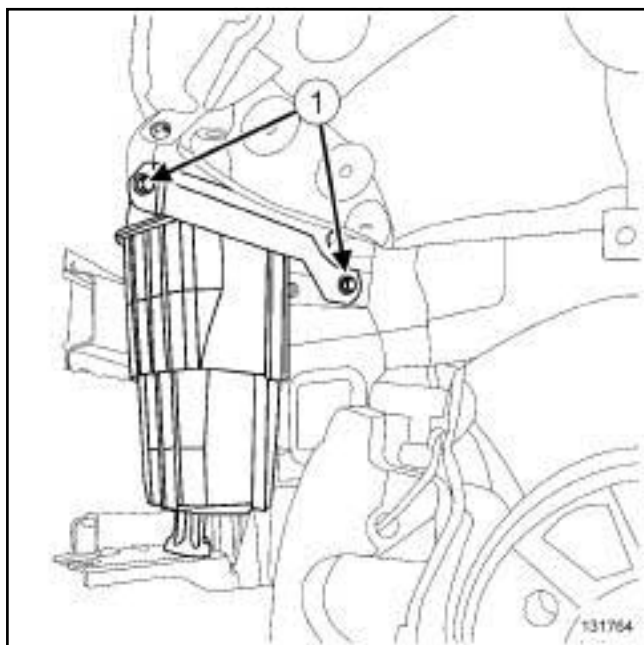
K4M

REMOVAL

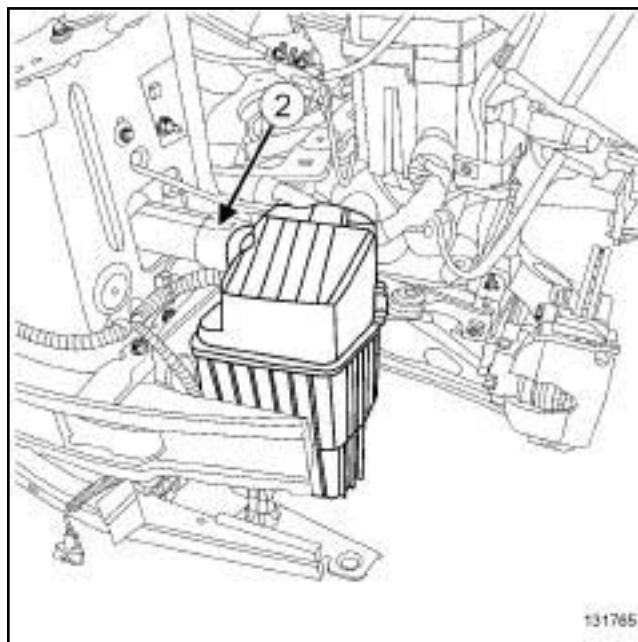
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the engine undertray,
 - the front left-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

II - REMOVAL OPERATION



- Remove the air resonator mounting bolts (1) .



- Disconnect the air resonator pipe (2) .
- Remove the air resonator .

REFITTING

I - REFITTING OPERATION

- Refit the air resonator.
- Connect the air resonator pipe.

II - FINAL OPERATION

- Refit:
 - the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front left-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray.

FUEL MIXTURE

Throttle valve: Removal - Refitting

12A

D4F, and 772

Tightening torques

throttle valve bolts	10 N.m
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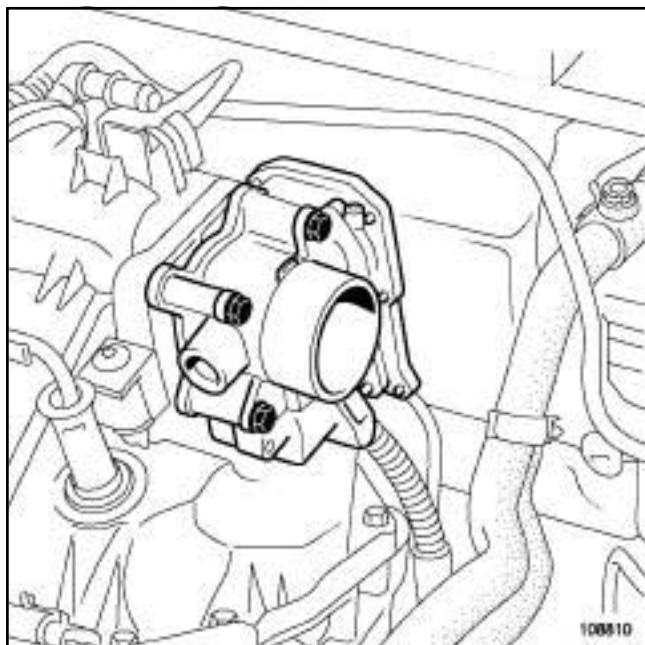
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Disconnect the throttle valve connector.



108810

- Remove:
 - the throttle valve bolts,
 - the throttle valve,
 - the throttle valve seal.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- parts always to be replaced: Throttle valve seal.

- Refit:
 - the new seal on the throttle valve,
 - the throttle valve,
 - the throttle valve bolts.
 - Torque tighten the **throttle valve bolts (10 N.m)**.
 - Connect the throttle valve connector.
- ### II - FINAL OPERATION
- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
 - Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
 - Reinitialise the programming of the stops (see **Fault finding - Replacement of components**) (17B, Petrol injection).

FUEL MIXTURE

Throttle valve: Removal - Refitting

12A

D4F, and 780 or 782

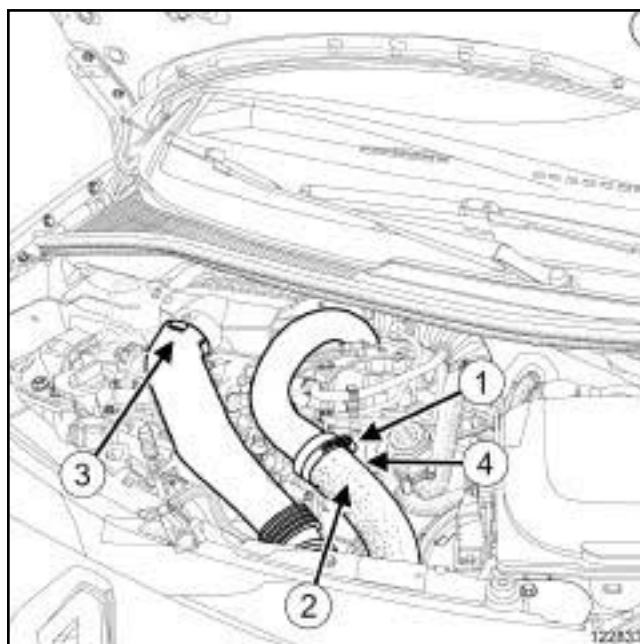
Tightening torques

throttle valve bolts	10 N.m
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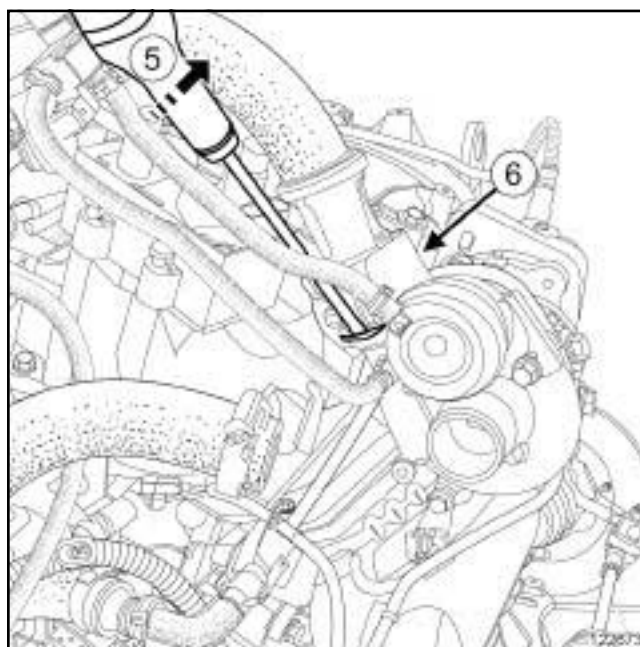
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (80A, Battery).



122833



122673

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Note:

If the intercooler air inlet pipe tightening clip (1) is removed, the flexible rubber pipe (2) and the tightening clip (1) must be replaced.

- Disconnect the air inlet pipe from the air filter box (3).
- Move aside the air inlet pipe from the air filter unit.
- Remove the bolt (4) of the intercooler air inlet pipe from the throttle valve.

Throttle valve: Removal - Refitting

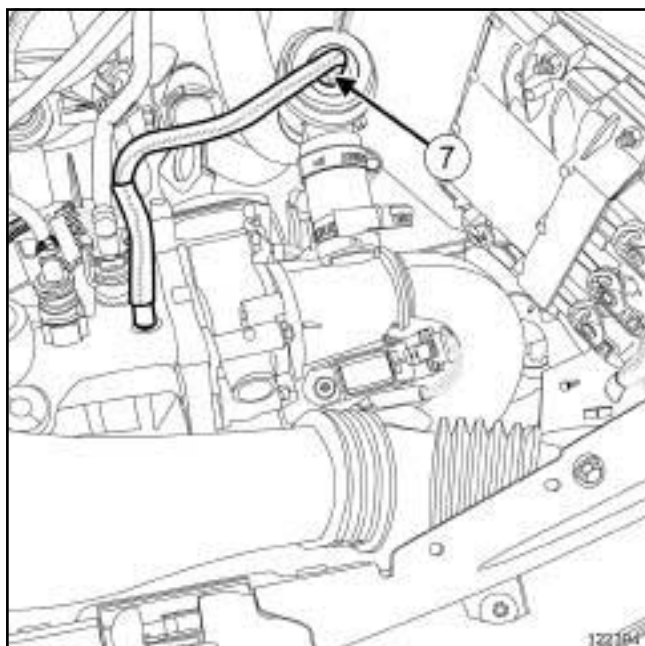
D4F, and 780 or 782

- ❑ Move the intercooler air inlet pipe clip away from the turbocharger in the direction of the arrow (5).

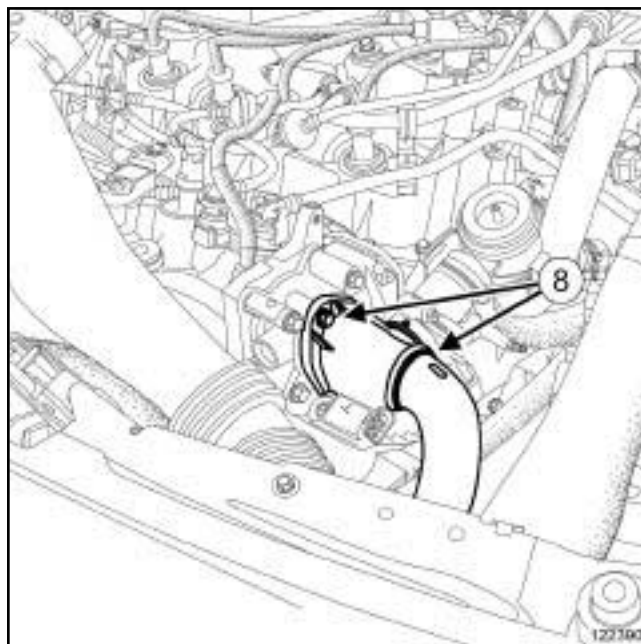
Note:

If the clip (6) is removed from the heat resistant protector, the latter must be replaced.

- ❑ Disconnect the intercooler air inlet pipe from the turbocharger.
- ❑ Move aside the intercooler air inlet pipe.

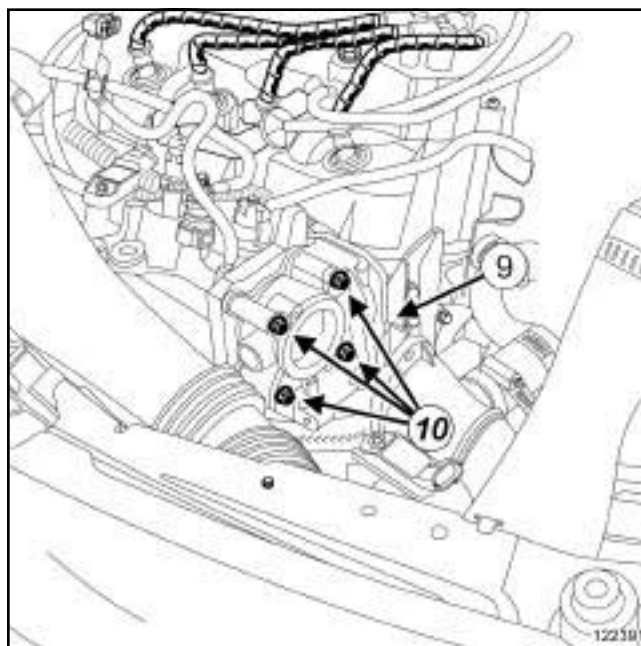


- ❑ Disconnect the vacuum pipe on the turbocharger discharge solenoid valve (7).



- ❑ Remove the intercooler air outlet pipe bolts (8) from the throttle valve.
- ❑ Move the intercooler air outlet pipe to one side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



- ❑ Disconnect the throttle valve connector (9).
- ❑ Unclip the throttle valve wiring.
- ❑ Remove:
 - the throttle valve bolts (10),

FUEL MIXTURE

Throttle valve: Removal - Refitting

12A

D4F, and 780 or 782

- the throttle valve,
- the throttle valve seal.

REFITTING

I - REFITTING PREPARATION OPERATION

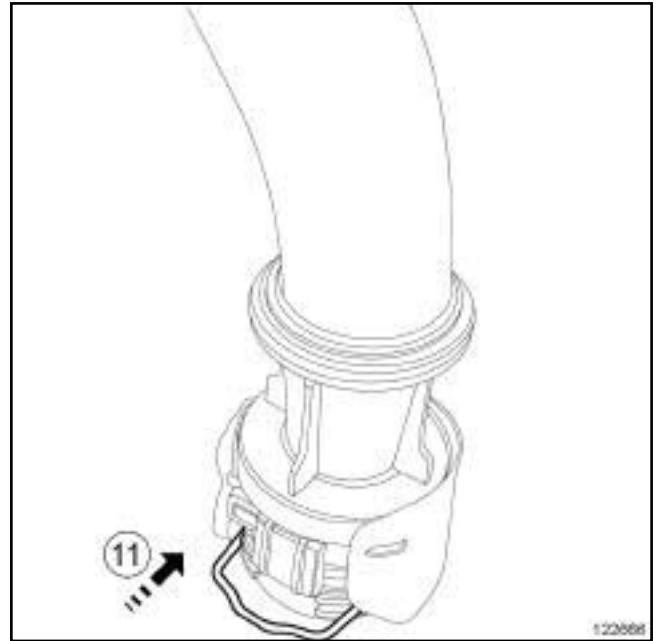
- parts always to be replaced: Throttle valve seal.**
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the bearing faces:
 - on the inlet distributor,
 - on the throttle valve if it is to be reused.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - a new seal on the throttle valve,
 - the throttle valve,
 - the throttle valve bolts.
- Torque tighten the **throttle valve bolts (10 N.m)**.
- Connect the throttle valve connector.
- Clip the wiring onto the throttle valve.

III - FINAL OPERATION

- Refit:
 - the intercooler air outlet pipe on the throttle valve,
 - the intercooler air outlet pipe bolts.
- Tighten the intercooler air outlet pipe bolts.
- Connect the vacuum pipe onto the turbocharger discharge solenoid valve.




- Push the intercooler air inlet pipe clip in the direction of the arrow (11) .
- Fit the intercooler air inlet pipe.
- Connect the intercooler air inlet pipe on the turbocharger.
- Refit the intercooler air inlet pipe bolt on the throttle valve.
- Fit the air filter box air inlet pipe.
- Connect:
 - the air filter unit air inlet pipe,
 - the battery (see) (80A, Battery).
- Program the throttle valve (see **Fault finding - Replacement of components**) (17B, Petrol injection).

FUEL MIXTURE

Throttle valve: Removal - Refitting

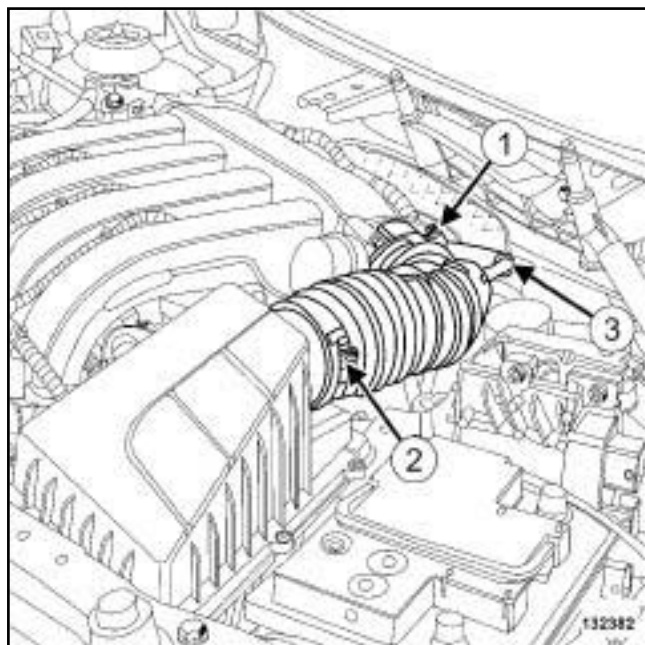
12A

K4M

Tightening torques 	
throttle valve bolts	10 N.m
clip of the air filter unit air outlet pipe on the throttle valve	3.5 N.m
clip of the air filter unit air outlet pipe on the air filter unit	3.5 N.m

REMOVAL

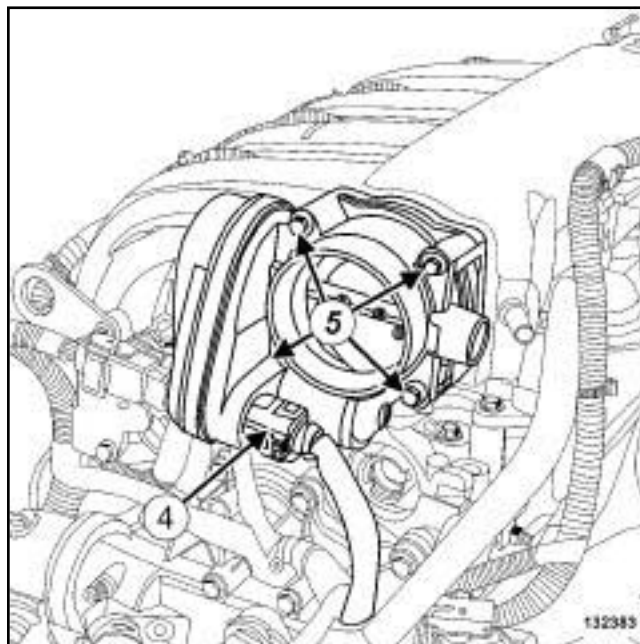
I - REMOVAL PREPARATION OPERATION



132382

- Undo:
 - the clip (1) of the air filter unit air outlet pipe on the throttle valve side,
 - the clip (2) of the air filter unit air outlet pipe on the air filter unit side.
- Disconnect:
 - the oil vapour rebreathing pipe (3) from the air filter unit air outlet pipe,
 - the air outlet pipe of the air filter unit.
- Remove the air outlet pipe from the air filter box.

II - REMOVAL OPERATION



132383

- Disconnect the connector (4) from the throttle valve.
- Remove:
 - the throttle valve bolts (5) ,
 - the throttle valve,
 - the throttle valve seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Throttle valve seal.
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the throttle valve joint face if it is to be re-used,
 - the inlet distributor seal housing.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

FUEL MIXTURE

Throttle valve: Removal - Refitting

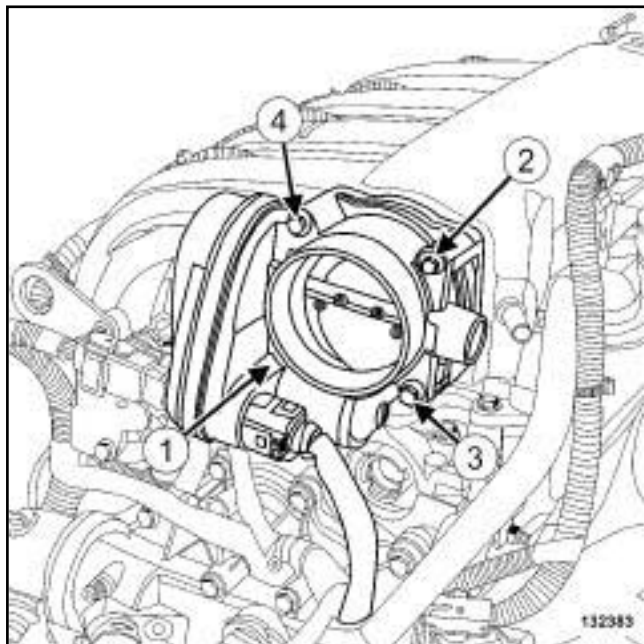
12A

K4M

II - REFITTING OPERATION

Refit:

- a new seal on the inlet distributor,
- the throttle valve.



132383

- In order, torque tighten the **throttle valve bolts (10 N.m)**.
- Connect the throttle valve connector.

III - FINAL OPERATION

- Refit the air outlet pipe onto the air filter unit.
- Connect:
- the air outlet pipe of the air filter unit,
 - the oil vapour rebreathing pipe on the air filter unit air outlet pipe.
- Torque tighten:
- the **clip of the air filter unit air outlet pipe on the throttle valve (3.5 N.m)**,
 - the **clip of the air filter unit air outlet pipe on the air filter unit (3.5 N.m)**.

FUEL MIXTURE

Throttle valve: Cleaning

12A

D4F or D7F or K4M

Equipment required

compressed air nozzle

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

Always wear protective gear (gloves, goggles and breathing masks).

Note:

Be sure to work in a clean environment so as not to allow any contamination of the throttle valve.

CLEANING

I - CLEANING PREPARATION OPERATION

- Remove the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-20**)

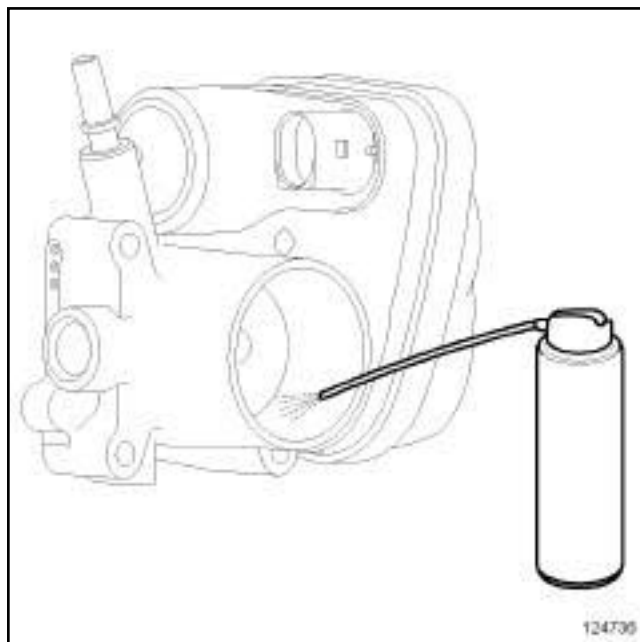
II - CLEANING THE PART CONCERNED

-

Note:

The **CARBURETTOR CLEANING** product damages the seals.

- Remove the seal(s) of the throttle valve.



124736

- Hold the throttle valve flap open manually.

Note:

Do not spray any cleaning product onto the outside of the cylinder, inside the spring housing or onto the connector.

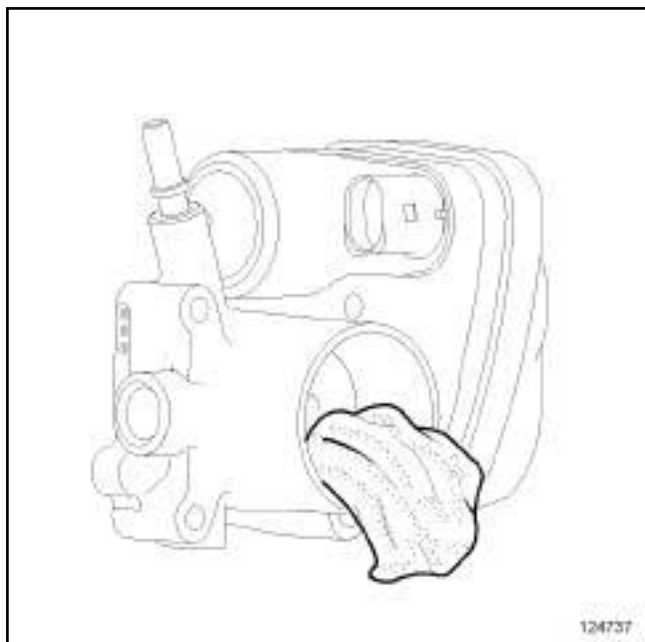
- Spray **CARBURETTOR CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) into the air vent until all traces of clogging have disappeared.

FUEL MIXTURE

Throttle valve: Cleaning

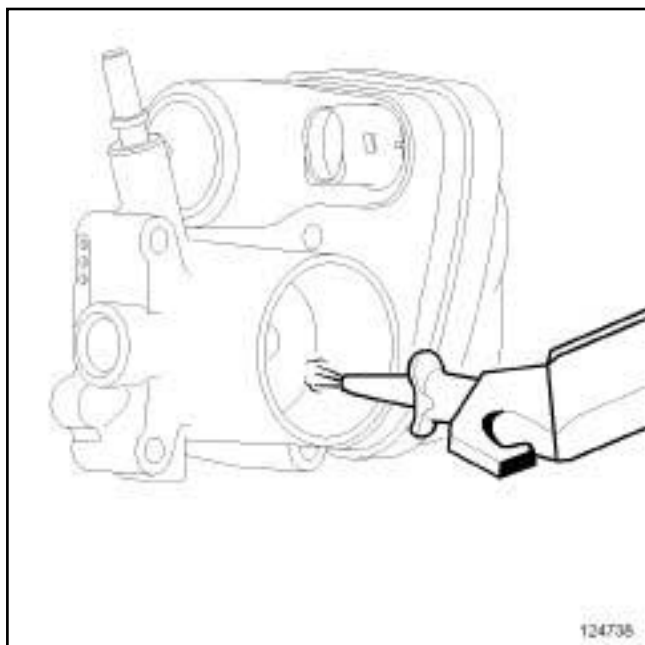
12A

D4F or D7F or K4M



124737

- ❑ Remove the residues of **CARBURETTOR CLEANER** and the residual dirt using a **LINT-FREE CLOTH** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).



124738

- ❑ Use a **compressed air nozzle** to blast the throttle valve edges and the air vent.
parts always to be replaced: Throttle valve seal.

Note:

If the throttle valve is dropped or receives any other impact, it will need to be replaced.

III - FINAL OPERATION

- ❑ Refit the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20)

FUEL MIXTURE

Air flowmeter: Removal - Refitting

12A

C44, and K9K

PARTS AND CONSUMABLES FOR THE REPAIR WORK

□ Parts always to be replaced:

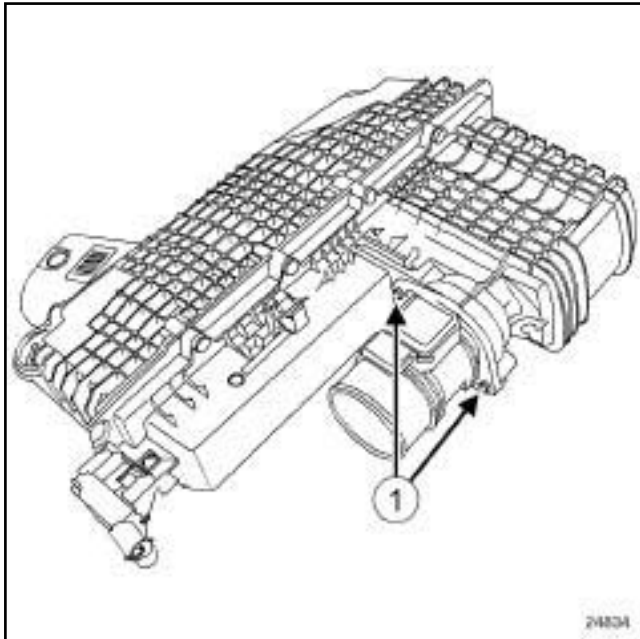
- the air flowmeter seal on the air filter box.

REMOVAL

I - OPERATION FOR PREPARATION OF PART CONCERNED

- Remove the air filter box (see 12A, **Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



24834

- on the workbench, remove the two bolts (1) from the air flowmeter on the air filter box.
- Remove the air flowmeter seal on the air filter box and discard it.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED


□ Refit:

- a new air flowmeter seal on the air filter box,
- the air flowmeter on the air filter box,
- the air flowmeter bolts.

II - FINAL OPERATION.

- Refit the air filter box (see 12A, **Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

D7F

Tightening torques 	
injector rail bolts	7 N.m
motorised throttle valve bolts	10 N.m
inlet distributor nuts on the cylinder head (initial torque)	8 N.m
inlet distributor bolts on the rocker cover (initial torque)	3 N.m
inlet distributor nuts on the cylinder head	17 N.m
inlet distributor bolts on the rocker cover	10 N.m
motorised throttle valve bolts	10 N.m

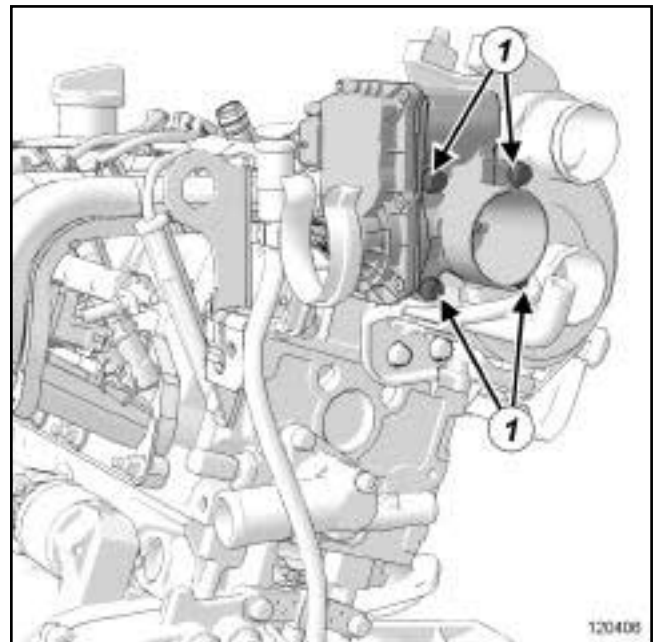
PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Parts always to be replaced**
 - inlet distributor seals.
- Consumables** (see **Vehicle: Parts and consumables for the repair**)
 - FLUOSTAR 2L grease.

REMOVAL

I - REMOVAL PREPARATION OPERATION

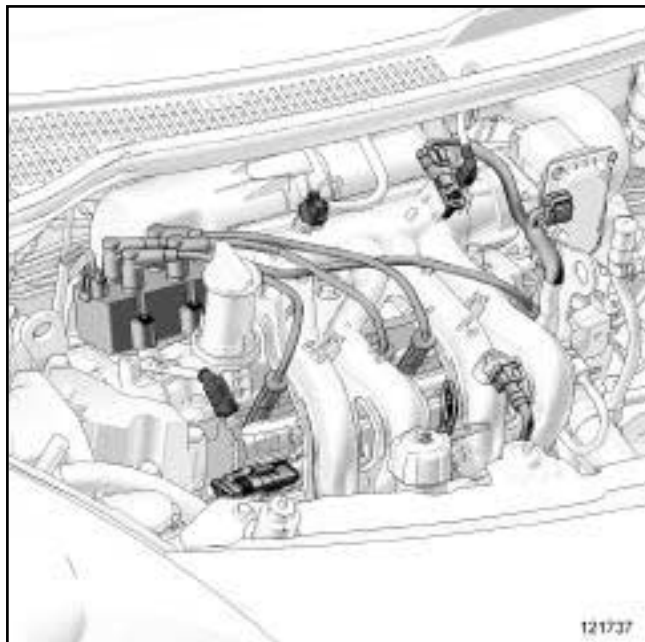
- Remove:
 - the air inlet scoop on the front end panel,
 - the air filter unit air inlet pipe,
 - the air filter unit air outlet pipe.
- Disconnect the motorised throttle valve connector.



120406

- Remove:
 - the intermediate bracket bolts on the throttle valve,
 - the intermediate plate,
 - the motorised throttle valve bolts (1) ,
 - the motorised throttle valve.

D7F



121737

- Disconnect the spark plug high voltage wiring harness (2) .
- Move aside the spark plug high voltage wiring harness.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

IMPORTANT

Wear latex gloves during the operation.

- Disconnect:
 - the petrol vapour rebreather pipe from the inlet distributor (3) ,
 - the non-return valve pipe on the inlet distributor (4) ,
 - the air inlet pressure sensor connector (5) ,
 - the air temperature sensor connector (6) ,
 - the injector connector (7) ,

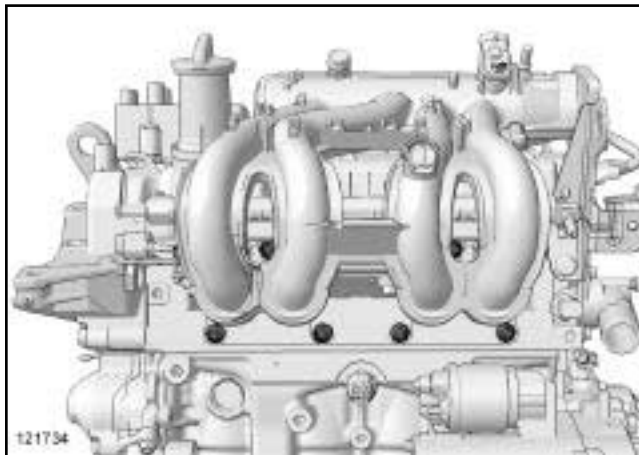
- the fuel supply pipe intermediate union (8) ,
- the oil vapour rebreathing pipe from the inlet distributor.

- Remove the dipstick.

AIR CONDITIONING

- Remove:
 - the accessories belt (see 11A, **Top and front of engine, Accessories belt: Removal - Refitting, page 11A-3**) ,
 - the alternator upper bolt.
- Tilt the alternator forward.

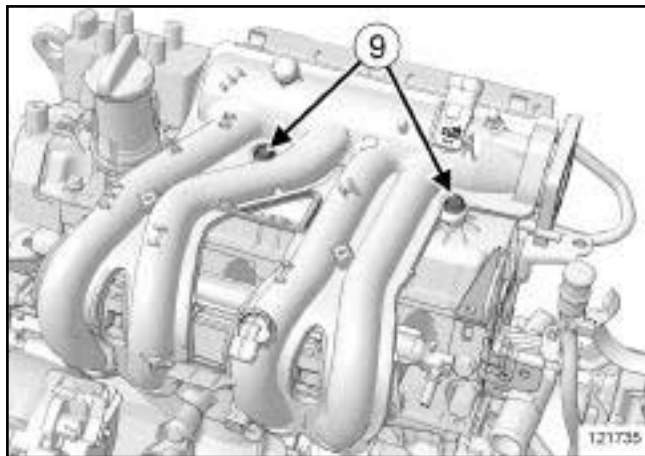
II - OPERATION FOR REMOVAL OF PART CONCERNED



121734

- Remove the nuts from the air inlet distributor on the cylinder head.

D7F



- Remove:
 - the air inlet distributor bolts on the rocker cover (9) ,
 - the inlet distributor.

When replacing the inlet distributor

- Remove:
 - the fuel supply pipe from the injector rail,
 - the injector rail bolts,
 - the injector rail.

REFITTING

I - REFITTING PREPARATION OPERATION

- Always replace the inlet distributor seals.

When replacing the inlet distributor

- Refit:
 - the injector rail fuel supply pipe on the inlet distributor,
 - the injector rail,
 - the injector rail bolts.
- Torque tighten the **injector rail bolts (7 N.m)**.
- Refit:
 - the motorised throttle valve with a new seal,
 - the motorised throttle valve bolts.
- Torque tighten the **motorised throttle valve bolts (10 N.m)**.

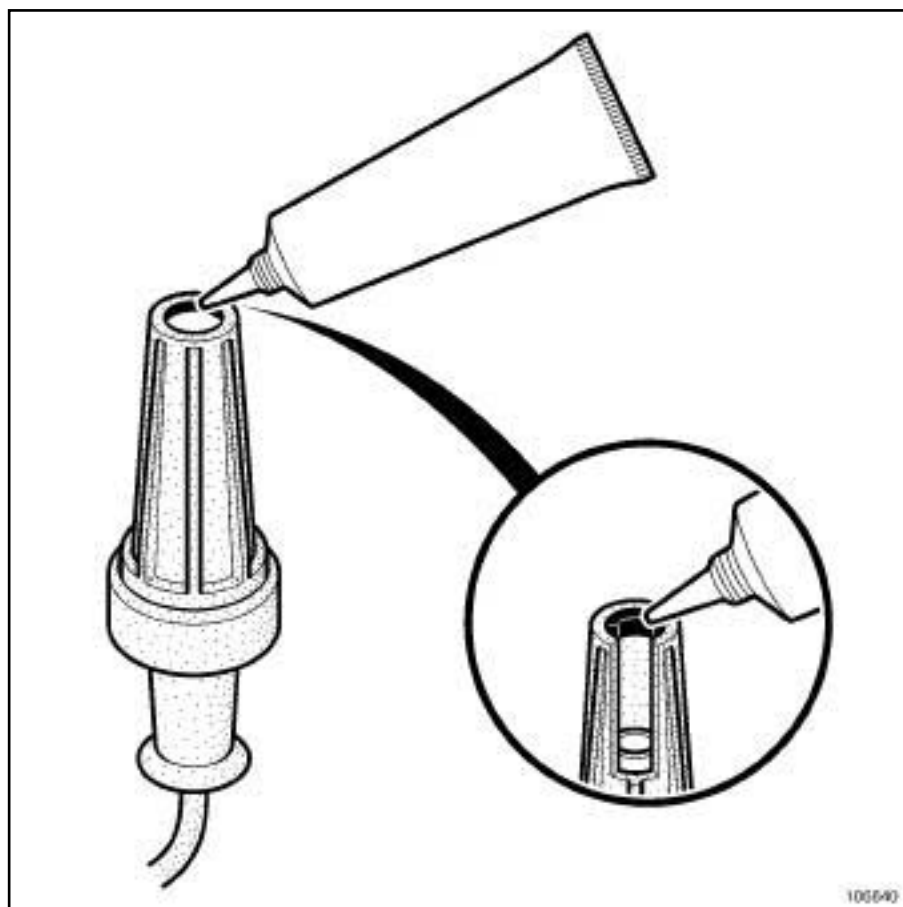
II - REFITTING OPERATION FOR PART CONCERNED

- Fit the inlet distributor with new seals
- Fit without tightening:
 - the inlet distributor nuts on the cylinder head,
 - the inlet distributor bolts on the rocker cover.
- Pre-tighten to torque:
 - the **inlet distributor nuts on the cylinder head (initial torque) (8 N.m)**,
 - the **inlet distributor bolts on the rocker cover (initial torque) (3 N.m)**.
- Torque tighten:
 - the **inlet distributor nuts on the cylinder head (17 N.m)**,
 - the **inlet distributor bolts on the rocker cover (10 N.m)**.

III - FINAL OPERATION

- Connect:
 - the oil vapour induction pipe from inlet distributor ,
 - the fuel supply pipe intermediate union,
 - the injector connectors,
 - the air temperature sensor connector,
 - the air inlet pressure sensor connector,
 - the non-return valve pipe on the inlet distributor,
 - the petrol vapour rebreather pipe.

D7F



106640
106640


- It is essential to apply a bead of **FLUORSTAR 2L** grease with a diameter of **2 mm** around the inner edge of the high tension caps.
- Connect the high voltage wiring harness to the spark plugs.
- Clip the high voltage wiring harness onto the inlet distributor.
- Refit:
 - the intermediate plate,
 - the intermediate bracket bolts on the throttle valve,
 - the motorised throttle valve,
 - the motorised throttle valve bolts.
- Torque tighten the **motorised throttle valve bolts (10 N.m)**
- Refit:
 - the dipstick,
 - the air filter unit air outlet pipe.
 - the air filter unit air inlet pipe,
 - the air inlet scoop on the front end panel.

AIR CONDITIONING

- Fit the alternator in place.
- Refit:
 - the alternator upper bolt,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-3**) .

Inlet distributor: Removal - Refitting

D4F, and 772

Tightening torques 	
throttle valve bolts	10 N.m
injector rail bolts	7 N.m
inlet distributor nuts on the rocker cover (initial torque)	8 N.m
inlet distributor bolts on the cylinder head (initial torque)	3 N.m
inlet distributor nuts on the rocker cover	17 N.m
inlet distributor bolts on the cylinder head	9 N.m

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

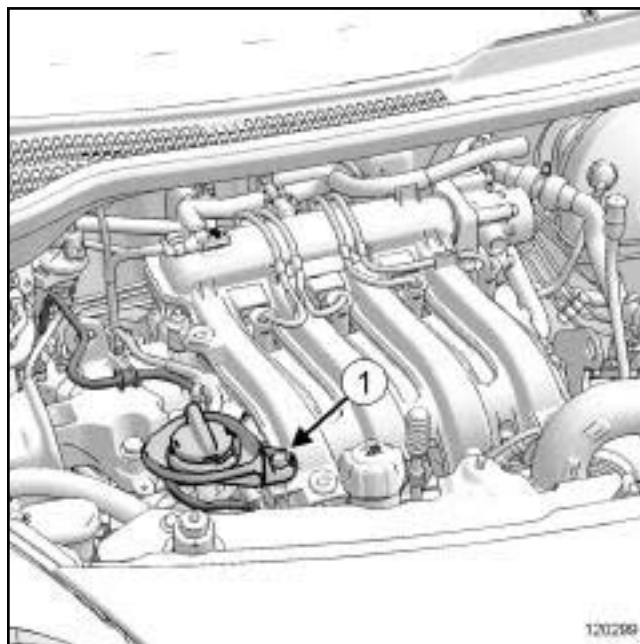
WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .
- Unclip the fuel supply pipe on the engine oil filler neck.

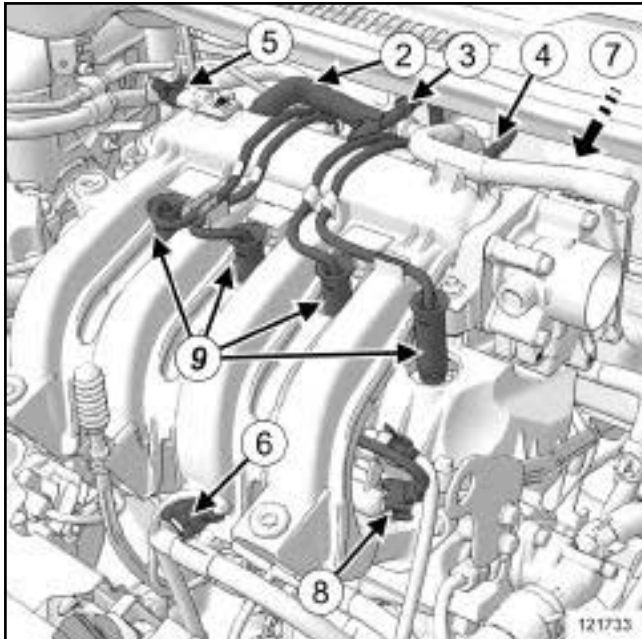


120299

Remove:

- the bolt (1) from the engine oil filler neck,
- the engine oil filler neck.

D4F, and 772



121733

Disconnect:

- the oil vapour rebreathing pipe from the inlet distributor (2) ,
- the non-return valve pipe on the brake servo (3) ,
- the petrol vapour rebreather pipe from the inlet distributor (4) ,
- the air inlet pressure sensor connector (5) ,
- the inlet air temperature sensor connector (6)
- the throttle valve connector (7) ,
- the injector connectors (8) .

WARNING

To disconnect the spark plug leads, pull on the extensions and not on the leads.

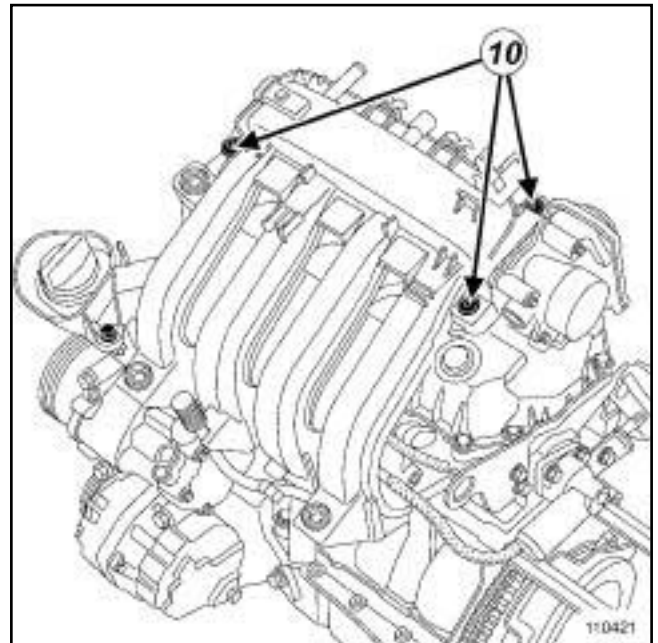
Disconnect:

- the spark plug high voltage wiring harnesses (9) ,
- the fuel supply pipe union on the injector rail.

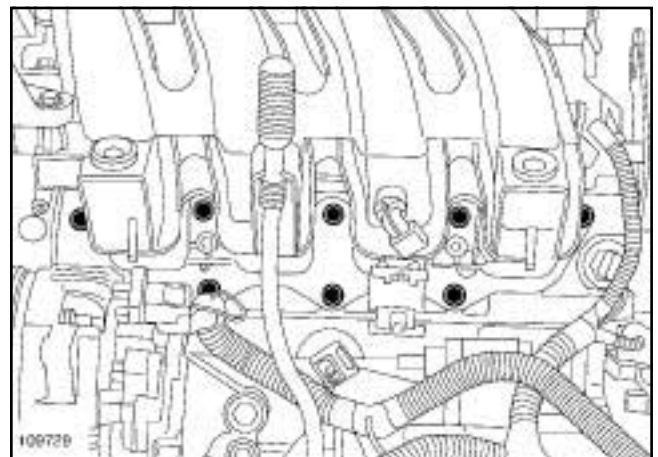
Unpick the engine wiring from the inlet distributor.

Remove the dipstick.

II - OPERATION FOR REMOVAL OF PART CONCERNED



110421



109729

Remove:

- the nuts (10) from the inlet distributor on the rocker cover,
- the inlet distributor bolts from the cylinder head,
- the inlet distributor.

When replacing the inlet distributor

Using the workbench, remove:

- the fuel supply pipe to the injector rail,
- the injector rail bolts,
- the throttle valve bolts,
- the throttle valve.

Inlet distributor: Removal - Refitting

D4F, and 772

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: inlet distributor seal.

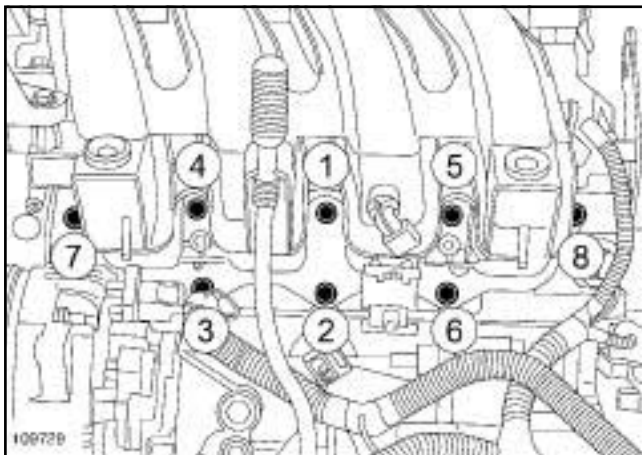
When replacing the inlet distributor

- Refit:
 - the throttle valve with a new seal,
 - the throttle valve bolts.
- Torque tighten the **throttle valve bolts (10 N.m)**.
- Refit:
 - the injector rail,
 - the injector rail bolts.
- Torque tighten the **injector rail bolts (7 N.m)**.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the inlet distributor, with its new seals.
- Fit without tightening:
 - the inlet distributor nuts on the rocker cover,
 - the inlet distributor bolts from the cylinder head,
- Pre-tighten to torque:
 - the **inlet distributor nuts on the rocker cover (initial torque) (8 N.m)**,
 - the **inlet distributor bolts on the cylinder head (initial torque) (3 N.m)**.

- the inlet distributor bolts on the cylinder head (9 N.m).



109729

- Torque tighten in order:
 - the **inlet distributor nuts on the rocker cover (17 N.m)**,

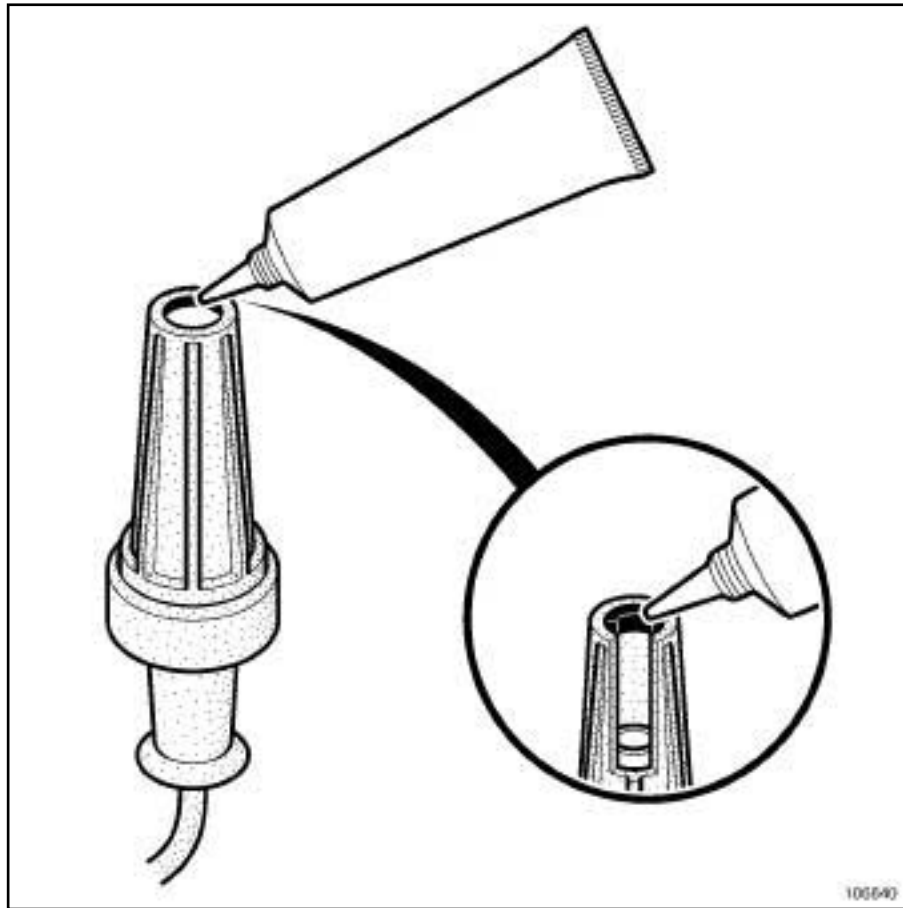
FUEL MIXTURE

Inlet distributor: Removal - Refitting

12A

D4F, and 772

III - FINAL OPERATION



106640

106640

- It is essential to apply a bead of **FLUOSTAR 2L** grease (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) **2 mm** in diameter on the inner edge of the high tension caps.
- Connect:
 - the high voltage wiring harnesses to the spark plugs,
 - the fuel supply pipe union on the injector rail,
 - the motorised throttle valve connector,
 - the injector connectors,
 - the air inlet temperature sensor connector,
 - the non-return valve pipe on the brake servo,
 - the petrol vapour rebreather pipe.
- Refit the dipstick.
- Clip the engine wiring onto the inlet distributor.
- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

D4F, and 780 or 782

Tightening torques

inlet distributor bolts (initial torque)	4 N.m
inlet distributor bolts	12 N.m

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

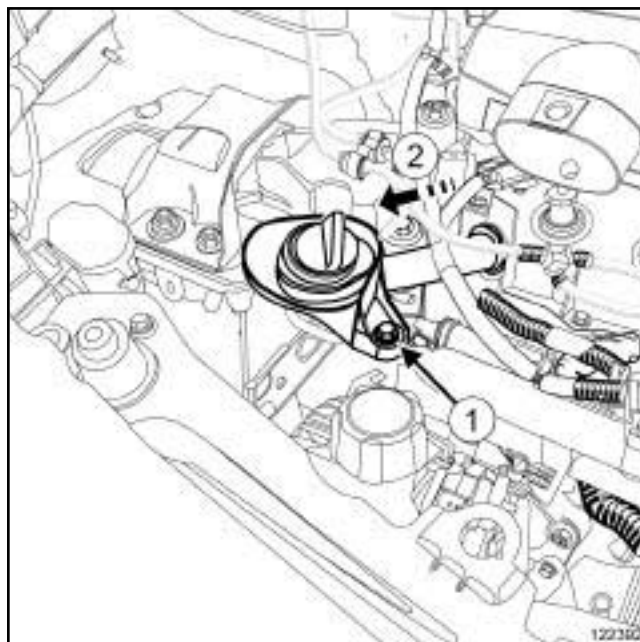
IMPORTANT

Wear goggles with side protectors for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

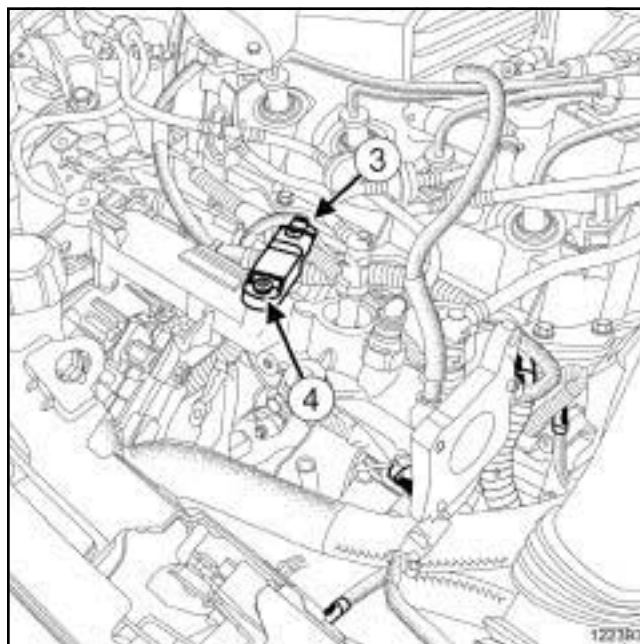
- Remove the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-20**)



122392

- Remove:

- the engine oil filler neck bolt (1) ,
- the engine oil filler neck in the direction of the arrow (2) .



122393

- Disconnect the inlet distributor pressure sensor (3) .

- Remove:

- the inlet distributor pressure sensor bolts (4) ,
- the pressure sensor.

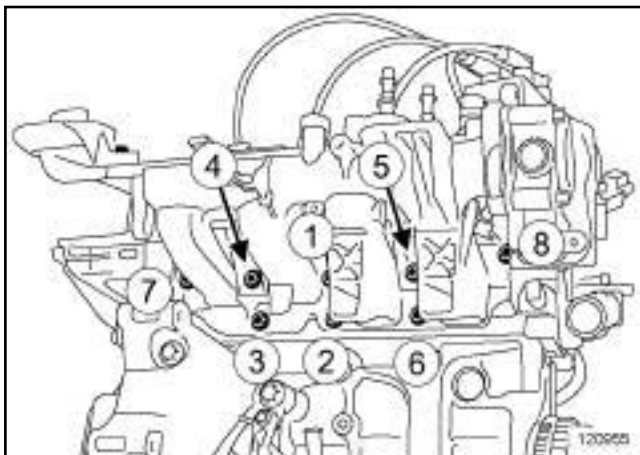
D4F, and 780 or 782

- ❑ Remove the « injector rail - injector » assembly (see **17B, Petrol injection, Injector rail - Injectors: Removal - Refitting**, page **17B-27**).

II - OPERATION FOR REMOVAL OF PART CONCERNED

D4F, and 780

- ❑ Disconnect:
 - the air temperature sensor connector from the intercooler air outlet pipe,
 - the air pressure sensor connector from the intercooler air outlet pipe.
- ❑ Unclip:
 - the inlet distributor wiring,
 - the throttle valve wiring on the inlet distributor.
- ❑ Move the throttle valve wiring to one side.
- ❑ Disconnect the non-return valve pipe from the inlet distributor.
- ❑ Move the non-return valve pipe to one side.



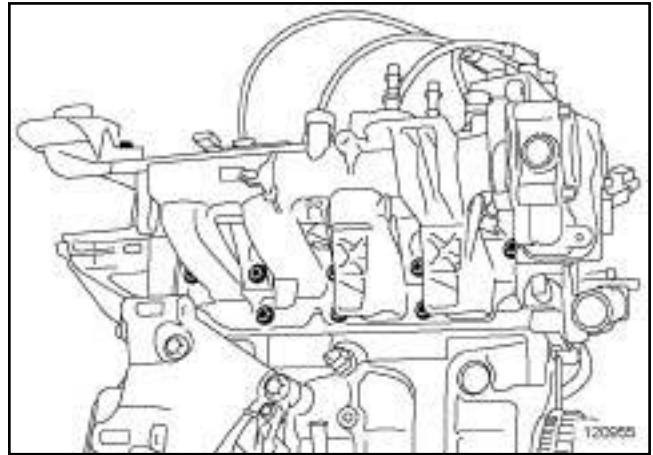
120955

- ❑ Remove:
 - the inlet distributor bolts,
 - the inlet distributor,
 - the inlet distributor seal.

REFITTING

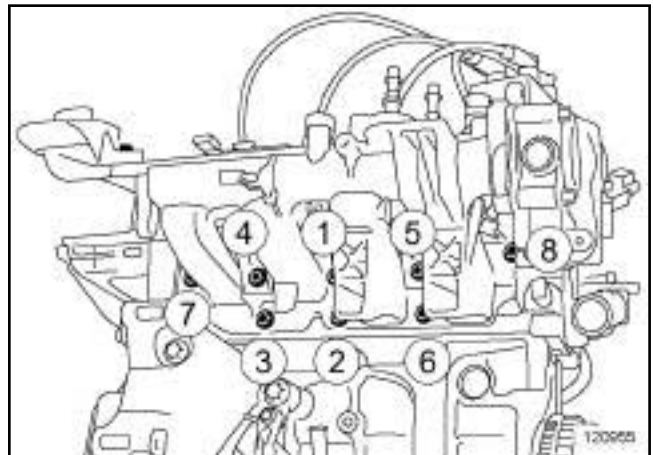
REFITTING PREPARATION OPERATION

- ❑ **parts always to be replaced: inlet distributor seal.**



120955

- ❑ Apply a drop of **FRENETANCHE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the inlet distributor bolts.
- ❑ Refit:
 - the inlet distributor fitted with a new seal,
 - the inlet distributor bolts.



120955

- ❑ Pretighten to torque and in order the **inlet distributor bolts (initial torque) (4 N.m)**.
- ❑ Tighten to torque and in order the **inlet distributor bolts (12 N.m)**.
- ❑ Position the non-return valve pipe on the inlet distributor.
- ❑ Connect the non-return valve pipe on the inlet distributor.
- ❑ Fit the throttle valve electrical wiring.
- ❑ Clip:
 - the throttle valve wiring on the inlet distributor,
 - the wiring on the inlet distributor.

Inlet distributor: Removal - Refitting

D4F, and 780 or 782

D4F, and 780

 Connect:

- the air pressure sensor connector on the intercooler air outlet pipe,
- the air temperature sensor connector on the intercooler air outlet pipe.


 Refit:

- the injector rail (see **17B, Petrol injection, Injector rail - Injectors: Removal - Refitting**, page **17B-27**)
- the distributor pressure sensor,
- the pressure sensor bolt.

 Connect the distributor pressure sensor connector. Refit:

- the filler neck,
- the filler neck bolt,
- the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-20**) .

K4M

Tightening torques 	
throttle valve bolts	10 N.m
inlet distributor bolts	12 N.m
clip of the air filter unit air outlet pipe on the throttle valve	3.5 N.m
clip of the air filter unit air outlet pipe on the air filter unit	3.5 N.m

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

WARNING

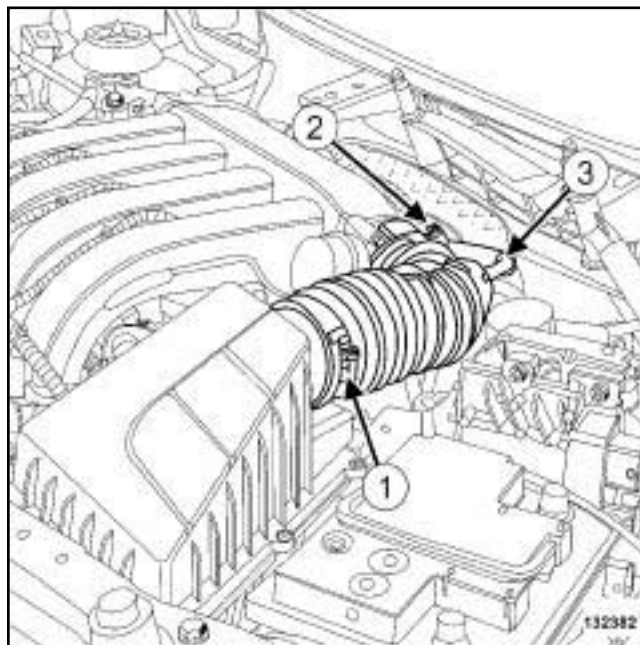
To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the dipstick.



132382

Undo:

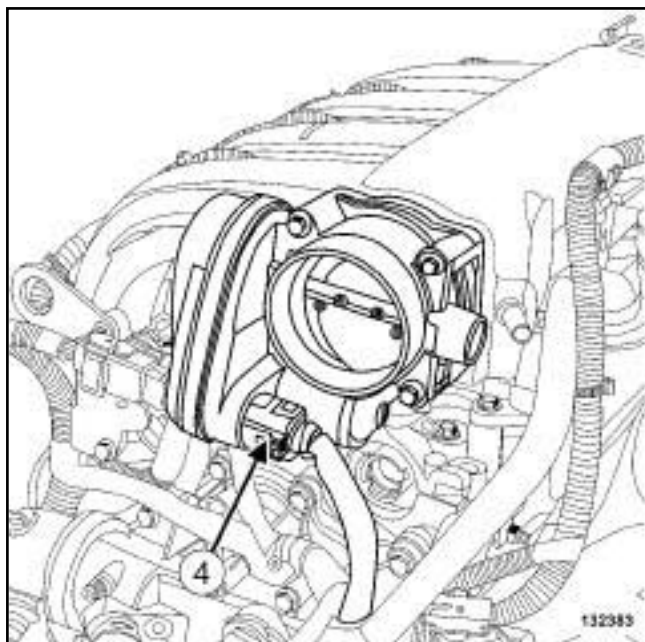
- the clip (1) of the air filter unit air outlet pipe on the air filter unit side,
- the clip (2) of the air filter unit air outlet pipe on the throttle valve side.

Disconnect:

- the oil vapour rebreathing pipe (3) from the air filter unit air outlet pipe,
- the air outlet pipe of the air filter unit.

- Remove the air outlet pipe from the air filter box.

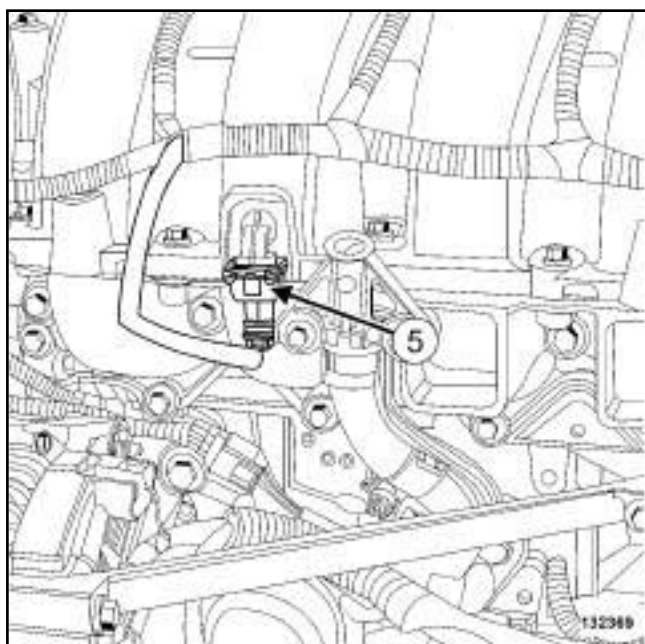
K4M



132383

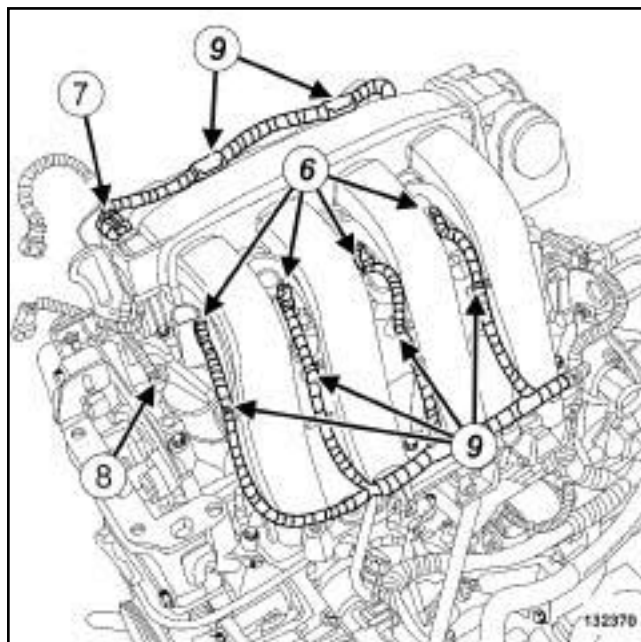
Disconnect:

- the throttle valve connector (4) ,
- the brake servo non-return valve at the inlet distributor.



132369

- Disconnect the air inlet temperature sensor connector (5) .



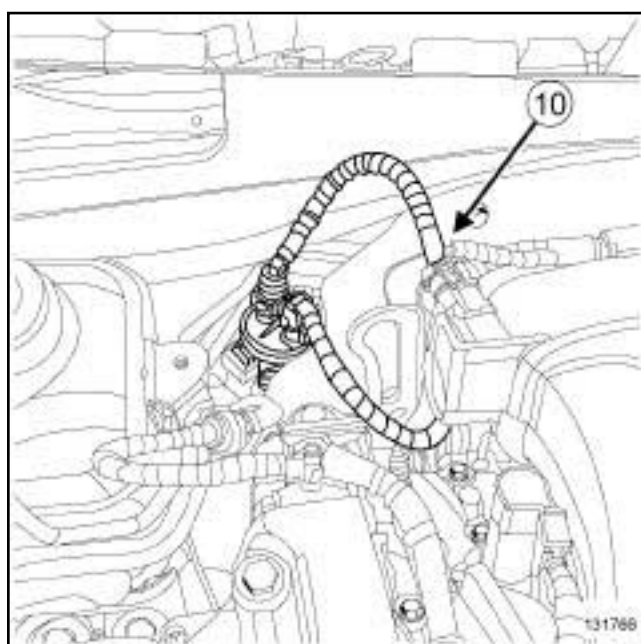
132370

Disconnect:

- all coil connectors (6) ,
- the inlet air pressure sensor connector (7) ,
- the camshaft dephaser solenoid valve connector (8) .

- Unpick the wiring (9) .

- Move aside the wiring.



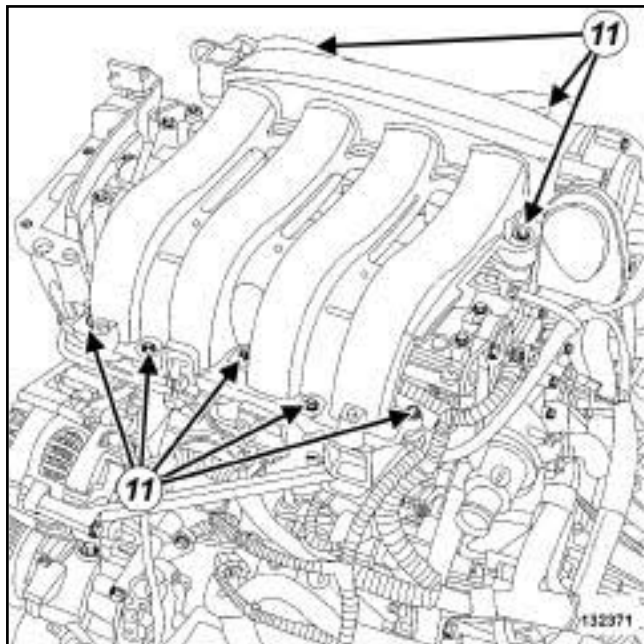
131768

- Disconnect the petrol vapour recirculation pipe (10) .

Inlet distributor: Removal - Refitting

K4M

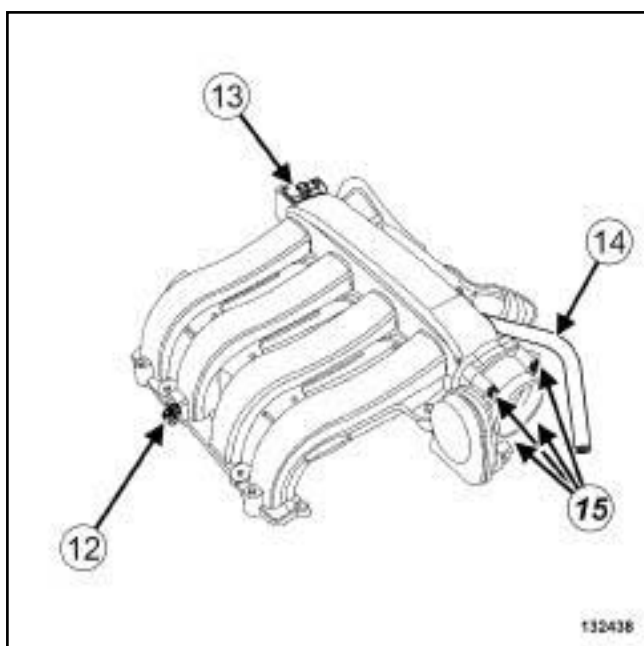
II - REMOVAL OPERATION



Remove:

- the inlet distributor bolts (11) ,
- the inlet distributor,
- the inlet distributor seals.

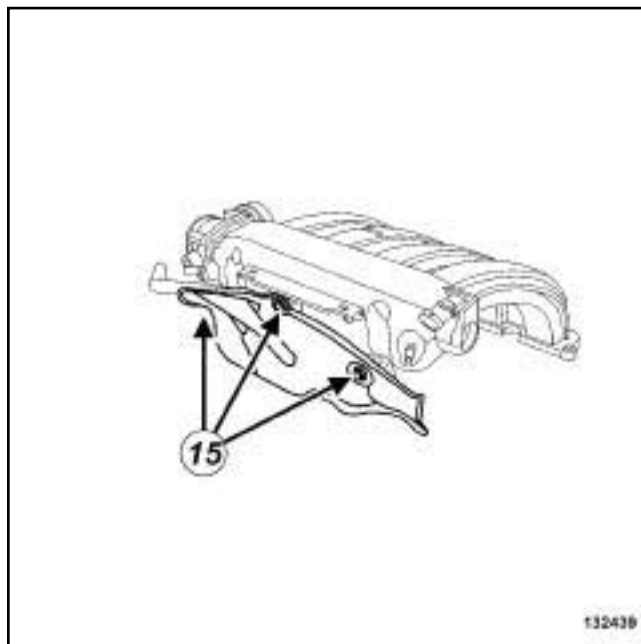
When replacing the inlet distributor



Remove:

- the air inlet temperature sensor (12) ,
- the air inlet pressure sensor (13) ,

- the throttle valve,
- the throttle valve seal.



Remove:

- the bolts (15) from the heat shield,
- the heat shield,
- the oil vapour rebreathing pipe.

REFITTING

I - REFITTING PREPARATION OPERATION

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the inlet distributor joint face,
- the joint face of the injector holder shim.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

- parts always to be replaced: inlet distributor seal.**

K4M

- Fit new seals to the inlet distributor.

When replacing the inlet distributor

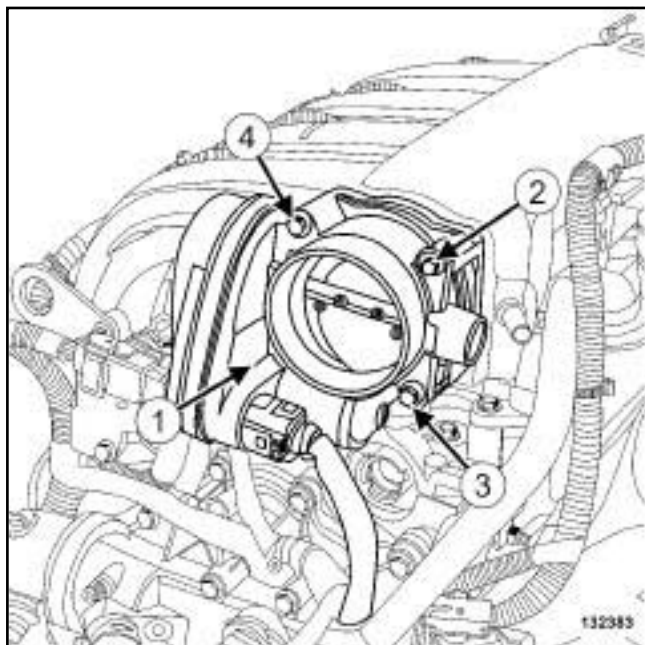
- parts always to be replaced: Throttle valve seal.**
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the throttle valve joint face if it is to be re-used,
 - the inlet distributor seal housing.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.



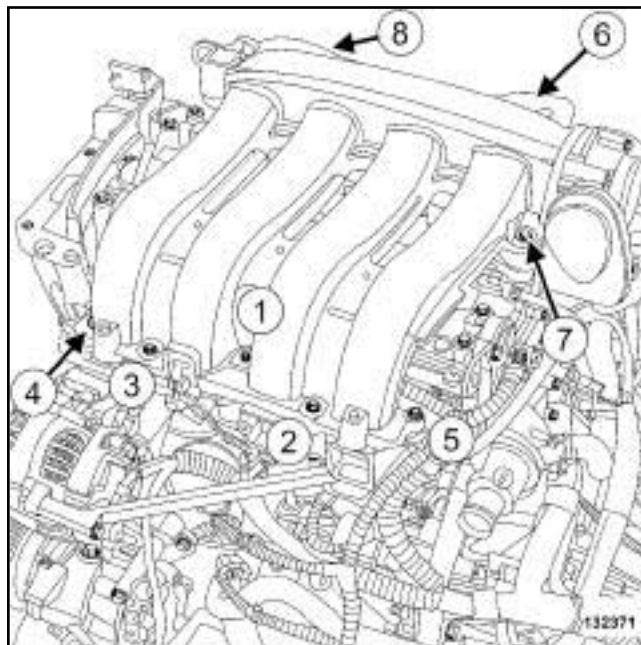
132383

- Refit:
 - a new seal on the inlet distributor,
 - the throttle valve.
- In order, torque tighten the **throttle valve bolts (10 N.m)**.
- Refit:
 - the oil vapour rebreathing pipe,
 - the heat shield,
 - the air inlet pressure sensor,

- the air inlet temperature sensor.

II - REFITTING OPERATION

- Refit:
 - a new seal between the injector holder shim and the inlet distributor,
 - the inlet distributor.



132371

- Tighten to torque and in order the **inlet distributor bolts (12 N.m)**.

III - FINAL OPERATION


- Connect the petrol vapour recirculation pipe.
- Position the wiring.
- Clip on the wiring.
- Connect:
 - the camshaft dephaser solenoid valve connector,
 - the air inlet pressure sensor connector,
 - the connector of each coil,
 - the air inlet temperature sensor connector,
 - the brake servo non-return valve,
 - the throttle valve connector.
- Refit the air outlet pipe onto the air filter unit.
- Connect:
 - the air outlet pipe of the air filter unit,
 - the oil vapour rebreathing pipe on the air filter unit air outlet pipe.

Inlet distributor: Removal - Refitting

K4M

- Torque tighten:
 - the **clip of the air filter unit air outlet pipe on the throttle valve (3.5 N.m)**,
 - the **clip of the air filter unit air outlet pipe on the air filter unit (3.5 N.m)**.
- Refit:
 - the dipstick,
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

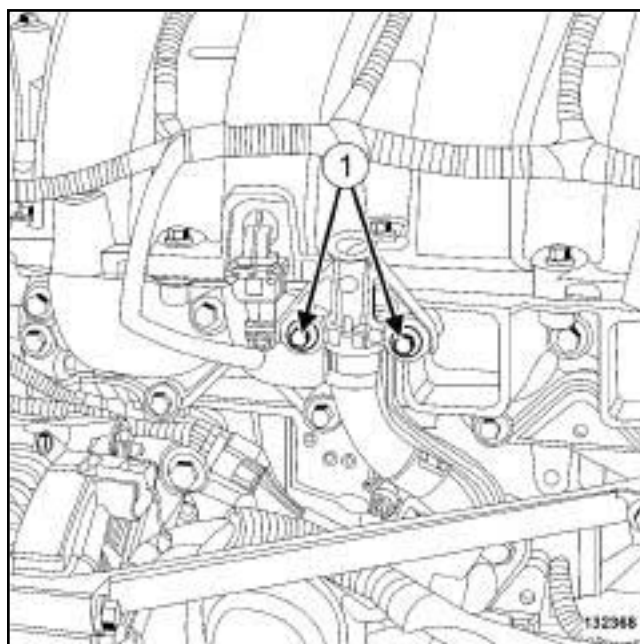
K4M

Tightening torques 	
bolts 1 and 2 on the injector holder shim	30 N.m
bolts 3, 4, 5, 6, 7, 8, 9 and 10 on the injector holder shim	25 N.m
upper timing cover bolt	40 N.m
bolt on the right-hand suspended engine mounting cover	62 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).



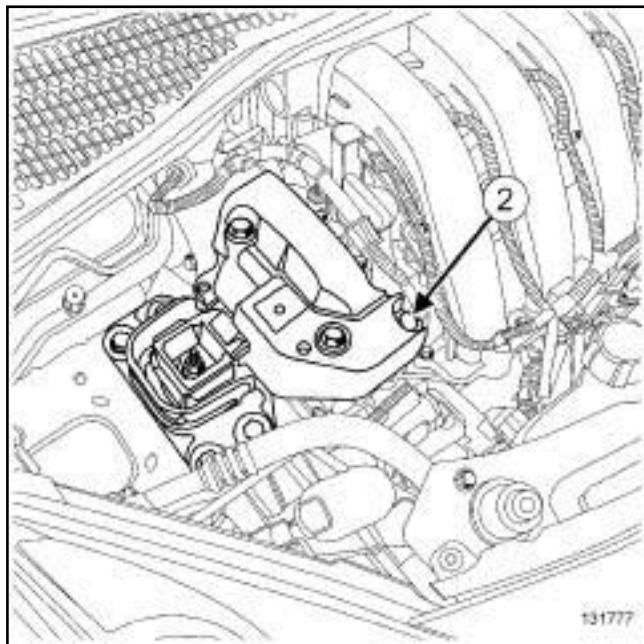
132368

- Remove:
 - the dipstick,
 - the dipstick guide bolts (1) .
- Move aside the dipstick guide.
- Remove:
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) ,
 - the « injector rail - injector » assembly (see **17B, Petrol injection, Injector rail - Injectors: Removal - Refitting**, page 17B-27) .

Injector holder shim: Removal - Refitting

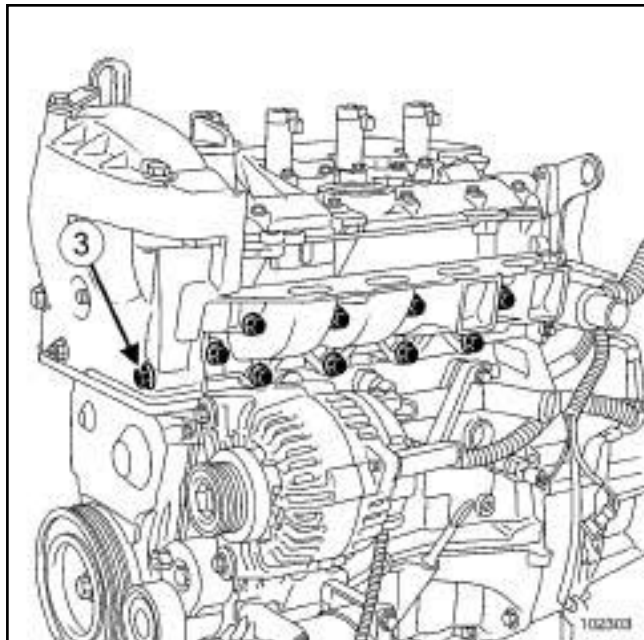
K4M

II - REMOVAL OPERATION



131777

- Remove the bolt (2) from the right-hand suspended engine mounting cover.



102303

- Remove:
 - the bolt (3) from the upper timing cover,
 - the injector holder shim bolts,
 - the injector holder shim,
 - the injector holder shim seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Inlet shim seal.
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the cylinder head joint face,
 - the gasket face of the injector holder shim, in case of reuse.

WARNING

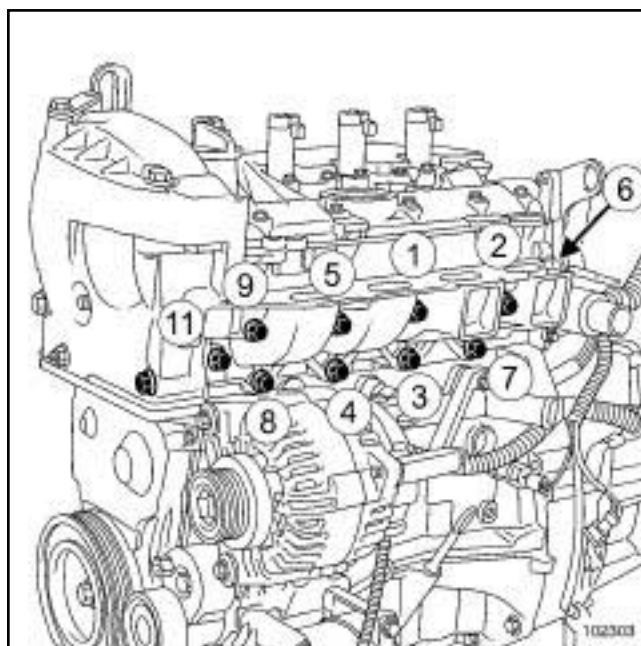
The joint faces must be clean, dry and free from grease (avoid finger marks).

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

II - REFITTING OPERATION

- Refit:
 - a new seal on the injector holder shim,
 - the injector holder shim.



102303

- Tighten to torque and in order:
 - **bolts 1 and 2 on the injector holder shim (30 N.m),**

Injector holder shim: Removal - Refitting

K4M

- bolts 3, 4, 5, 6, 7, 8, 9 and 10 on the injector holder shim (25 N.m).

Torque tighten:

- the upper timing cover bolt (40 N.m),

- the bolt on the right-hand suspended engine mounting cover (62 N.m).

III - FINAL OPERATION

Refit:

- the « injector rail - injector » assembly (see **17B, Petrol injection, Injector rail - Injectors: Removal - Refitting**, page **17B-27**),

- the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-29**),

- dipstick guide ,

- the dipstick,

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),

- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).

Connect the battery (see) (80A, Battery).

Exhaust manifold: Removal - Refitting

D4F, and 772 – D7F

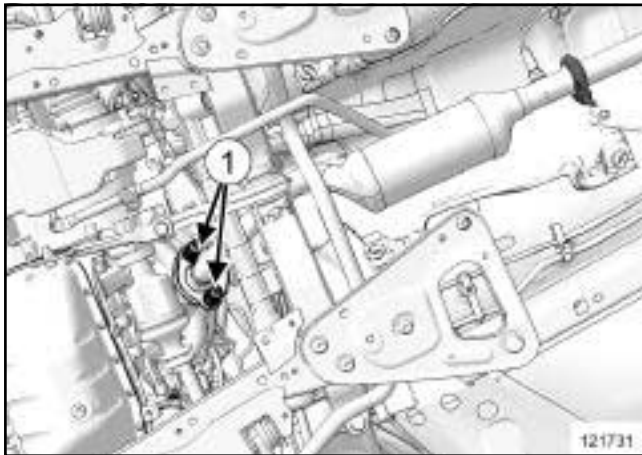
Tightening torques

exhaust manifold studs on the cylinder head	10 N.m
exhaust manifold nuts	25 N.m

REMOVAL

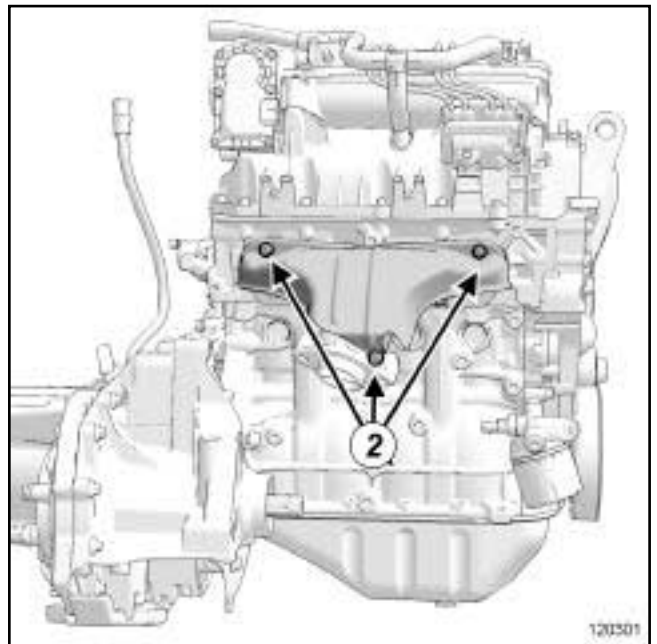
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).



- Remove the nuts (1) from the exhaust flange.

D4F

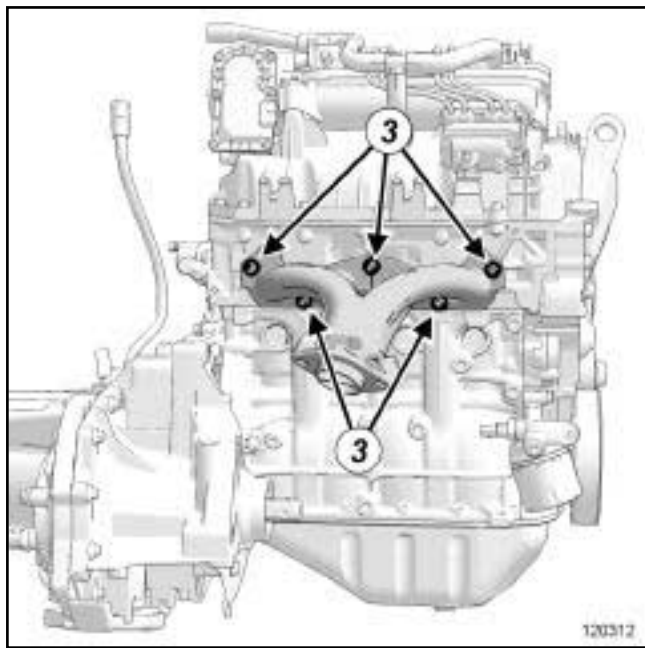


- Remove:
 - the bolts (2) from the heat shield,
 - the heat shield.

Exhaust manifold: Removal - Refitting

D4F, and 772 – D7F

II - OPERATION FOR REMOVAL OF PART CONCERNED



Remove:

- the nuts (3) from the exhaust manifold,
- the exhaust manifold,
- the exhaust manifold gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

- Clean the joint faces.
- parts always to be replaced: exhaust manifold seal.**
- parts always to be replaced: ring between exhaust manifold and catalytic converter.**

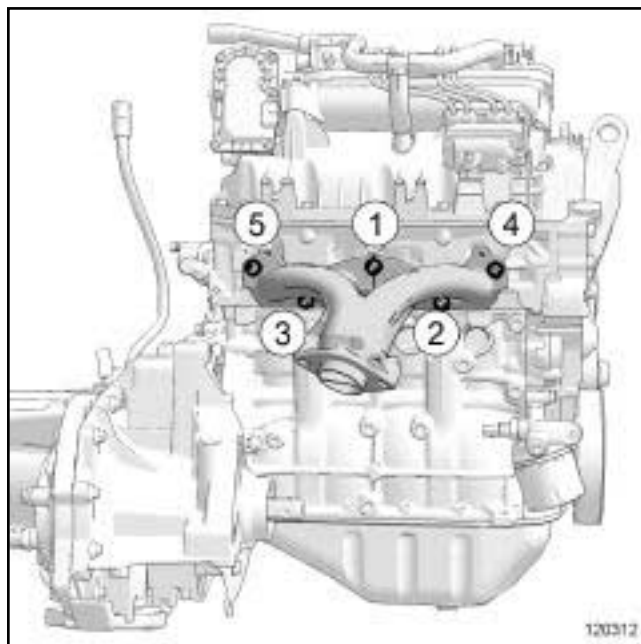
Note:

If any of the studs become loose during these operations, coat them with **HIGH STRENGTH THREAD LOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

- Torque tighten the **exhaust manifold studs on the cylinder head (10 N.m)**.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the exhaust manifold nuts.



120312

- Tighten to torque and in order the **exhaust manifold nuts (25 N.m)**.

III - FINAL OPERATION

D4F

Refit:

- the heat shield on the exhaust manifold,
- the heat shield bolts on the exhaust manifold.

- Refit the exhaust flange nuts.

Check:

- that there is no exhaust gas leak,
- that there is no contact between the underbody and the exhaust pipe,

K9K

Equipment required

cleaning trough

parts washer

compressed air nozzle

Tightening torques

exhaust manifold studs on the cylinder head **9 N.m**

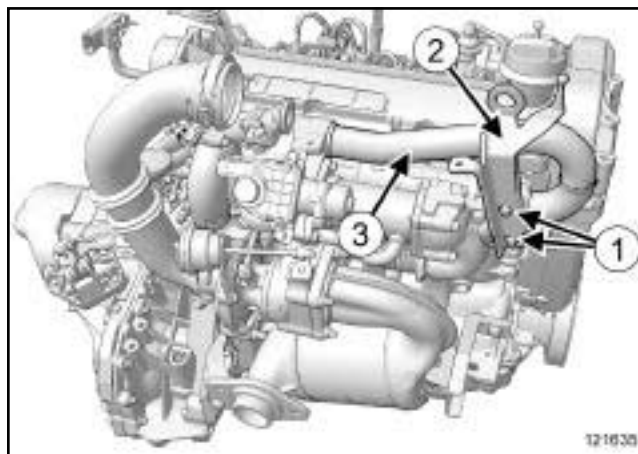
exhaust manifold nuts **26 N.m**

exhaust gas recirculation unit bolts **25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the engine cover,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the EGR solenoid valve (see **14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting**, page 14A-10) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) ,
 - the turbocharger (see **12B, Turbocharging, Turbocharger: Removal - Refitting**, page 12B-4) .

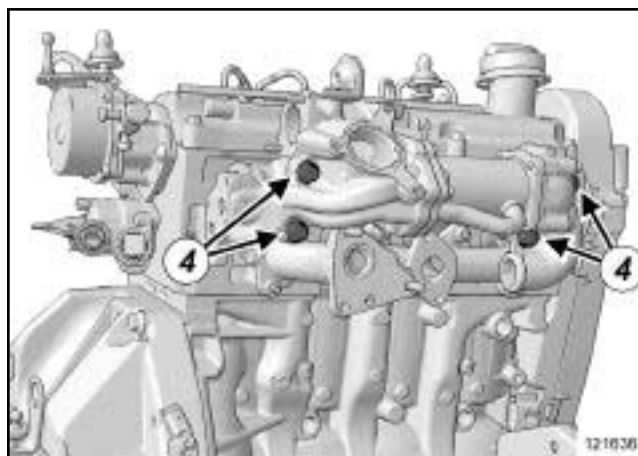


121635

- Remove:
 - the bolts (1) from the lifting eye at the timing end,
 - the lifting eye (2) ,
 - air inlet metal tube (3) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

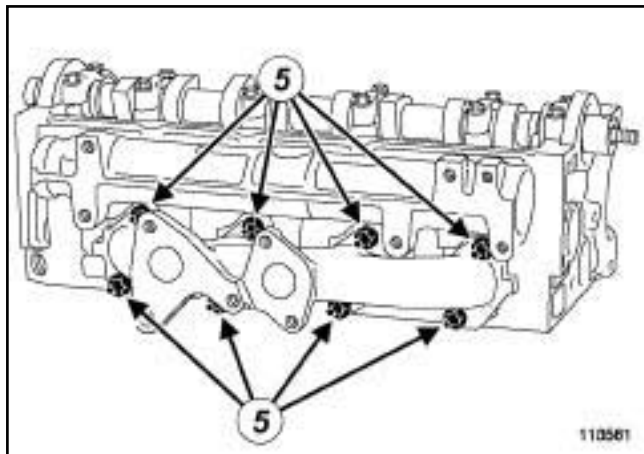
- Remove the rigid exhaust gas recirculation pipe (see **14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting**, page 14A-19) .



121636

- Undo the EGR unit bolts (4) a few turns.

K9K



Remove:

- the nuts (5) from the exhaust manifold,
- the exhaust manifold,
- the exhaust manifold gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: exhaust manifold seal.**
- Always replace:
 - the air inlet metal tube seals.
- If the exhaust manifold is being reused, clean it using a **cleaning trough** or a **parts washer** then dry it using a **compressed air nozzle**.
- Clean the bearing faces using **ABRASIVE PADS** on:
 - of the cylinder head - exhaust manifold,
 - of the exhaust manifold - EGR rigid pipe,
 - of the exhaust manifold - turbocharger,
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and **CLEAN CLOTHS** to degrease the bearing faces:
 - of the cylinder head - exhaust manifold,
 - of the exhaust manifold - EGR rigid pipe,
 - of the exhaust manifold - turbocharger,

WARNING

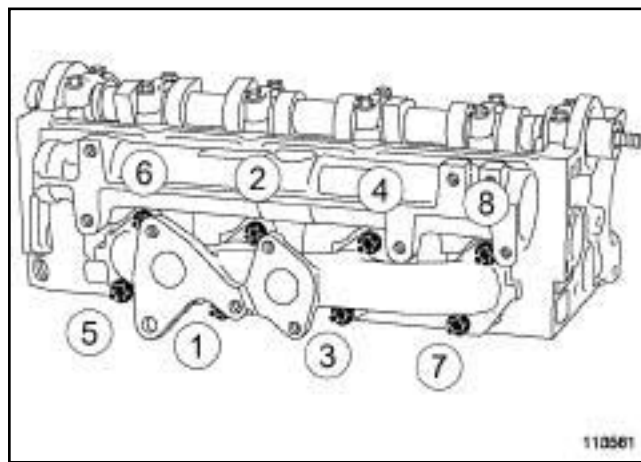
The joint faces must be clean, dry and free from grease (avoid finger marks).

- If replacing, torque tighten the **exhaust manifold studs on the cylinder head (9 N.m)**.

II - REFITTING OPERATION FOR PART CONCERNED

Refit:

- a new exhaust manifold seal,
- the exhaust manifold.



- Torque tighten in order the **exhaust manifold nuts (26 N.m)**.
- Fit the exhaust gas recirculation unit bolts.
- Torque tighten the **exhaust gas recirculation unit bolts (25 N.m)**.
- Refit the rigid exhaust gas recirculation pipe (see **14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting**, page 14A-19) .

III - FINAL OPERATION

Refit:


- a new seal on the air inlet metal tube,
- the air inlet metal tube,
- the lifting eye on the timing end,
- the bolts from the lifting eye, timing end,
- the turbocharger (see **12B, Turbocharging, Turbocharger: Removal - Refitting**, page 12B-4) ,
- the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) ,
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,

Exhaust manifold: Removal - Refitting

K9K

- the EGR solenoid valve (see **14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting**, page **14A-10**),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the engine cover.
- Connect the battery (see) (80A, Battery).

D4F, and 780 or 782

Tightening torques 	
exhaust manifold heat shield bolts	18 N.m
exhaust manifold nuts (initial torque)	20 N.m
exhaust manifold nuts	30 N.m

IMPORTANT

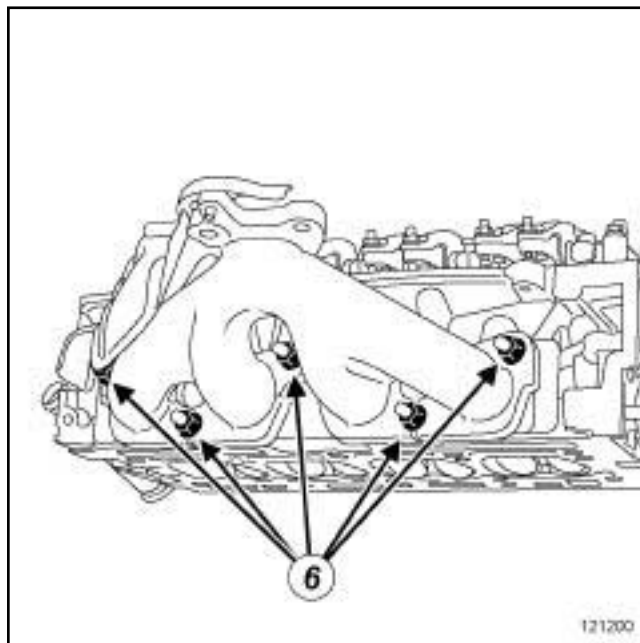
Wear cut-resistant gloves during the operation.

REMOVAL

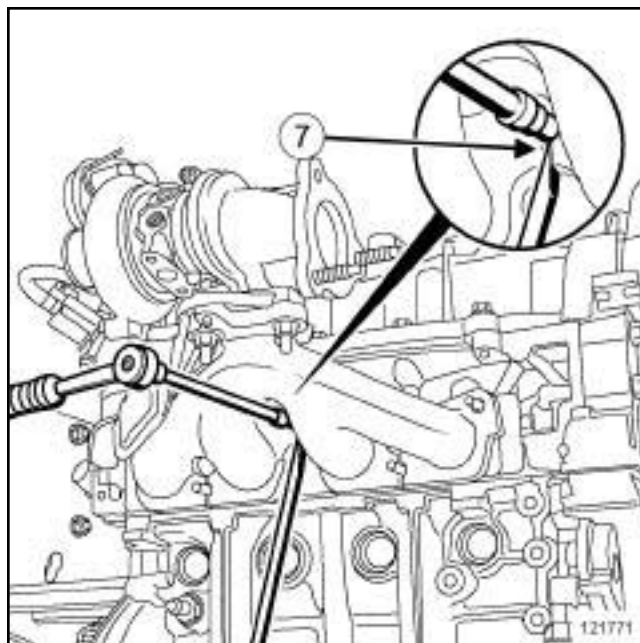
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the engine undertray,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page 17B-13) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) ,
 - the turbocharger (see **12B, Turbocharging, Turbocharger: Removal - Refitting**, page 12B-4) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove the exhaust manifold nuts (6) .



- Remove:
 - the exhaust manifold by undoing the central stud with a male torx socket and removing the manifold with a large screwdriver as shown at (7) ,
 - the exhaust manifold heat shield bolts,
 - the exhaust manifold heat shield,
 - the exhaust manifold gasket.

Exhaust manifold: Removal - Refitting

D4F, and 780 or 782

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: exhaust manifold seal.


II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the exhaust manifold heat shield,
 - the exhaust manifold heat shield bolts.
- Torque tighten the **exhaust manifold heat shield bolts (18 N.m)**.
- Refit:
 - a new exhaust manifold gasket,
 - the exhaust manifold.
- Refit the exhaust manifold nuts.
- Pretighten to torque the **exhaust manifold nuts (initial torque) (20 N.m)**.
- Torque tighten the **exhaust manifold nuts (30 N.m)**.

III - FINAL OPERATION

- Refit:
 - the turbocharger (see **12B, Turbocharging, Turbocharger: Removal - Refitting**, page **12B-4**) ,
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-12**) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**) ,
 - the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page **17B-13**) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) ,
 - the engine undertray.
- Connect the battery (see) (80A, Battery).

K4M

Tightening torques 	
exhaust manifold studs	9 N.m
heat shield bolts	12 N.m
upstream and downstream oxygen sensors	44 N.m
strut mounting bolt on the cylinder block	75 N.m
upstream strut bolt (initial torque)	14 N.m
exhaust manifold nuts	26 N.m
upstream and downstream	strut bolts 44 N.m
upstream strut bolts	44 N.m
driveshaft relay bearing bolts	21 N.m

IMPORTANT

Wear cut-resistant gloves during the operation.

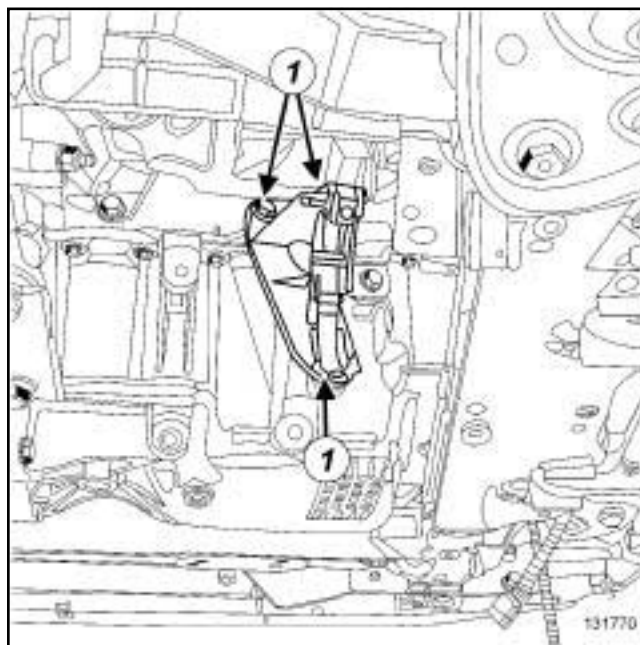
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).
- Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

Remove:

- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
- the upstream expansion chamber (see **19B, Exhaust, Expansion chamber: Removal - Refitting**, page 19B-23) .

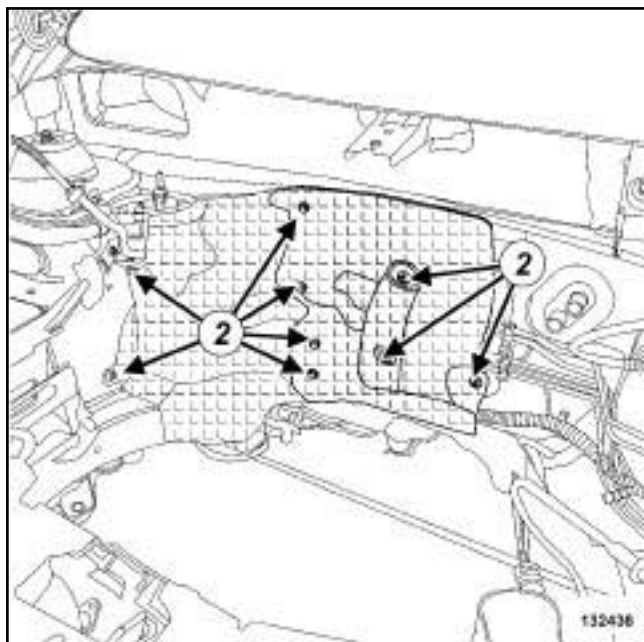


131770

Remove:

- the bolts (1) from the driveshaft relay bearing,
- the driveshaft relay bearing.

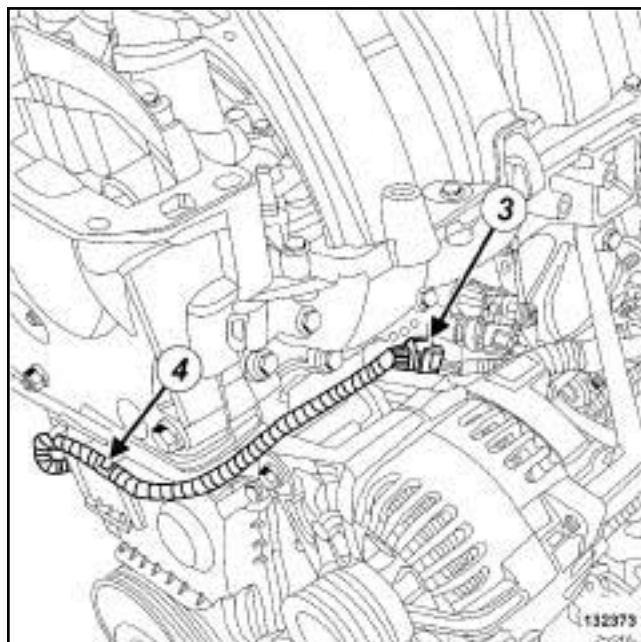
K4M



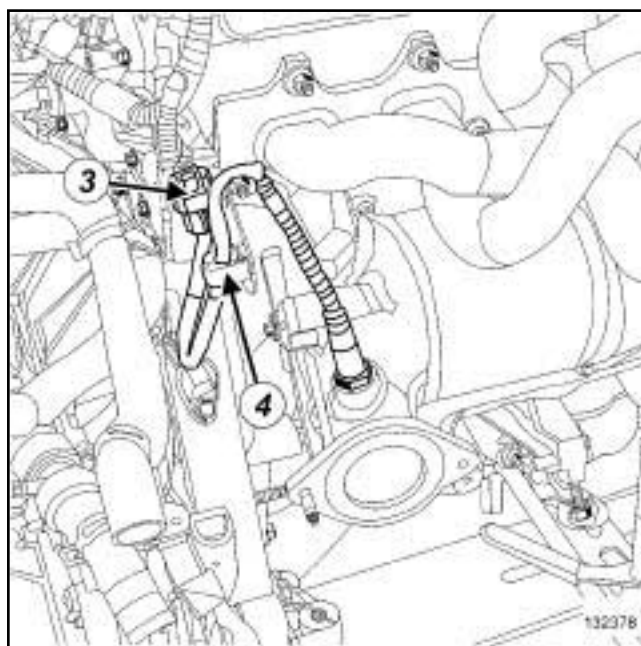
132436

□ Remove:

- the bulkhead heat shield bolts (2) ,
- the bulkhead heat shields.



132375



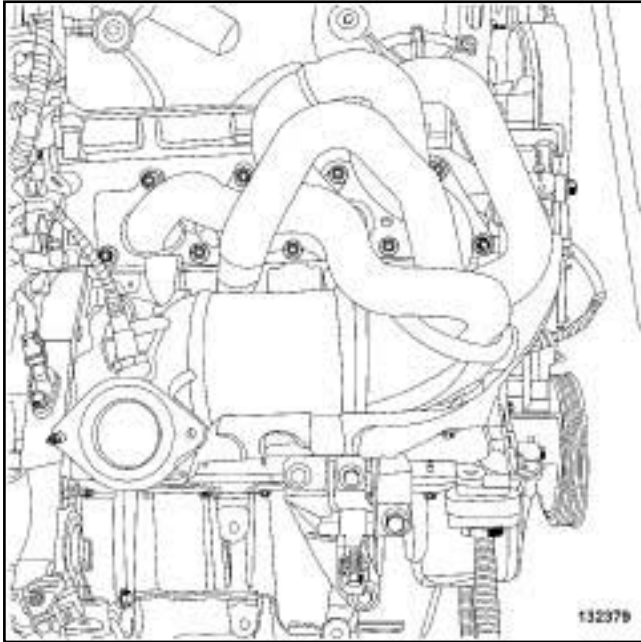
132378

- Disconnect the oxygen sensor connectors (3) .
- Unclip the oxygen sensor wiring at (4) .

Exhaust manifold: Removal - Refitting

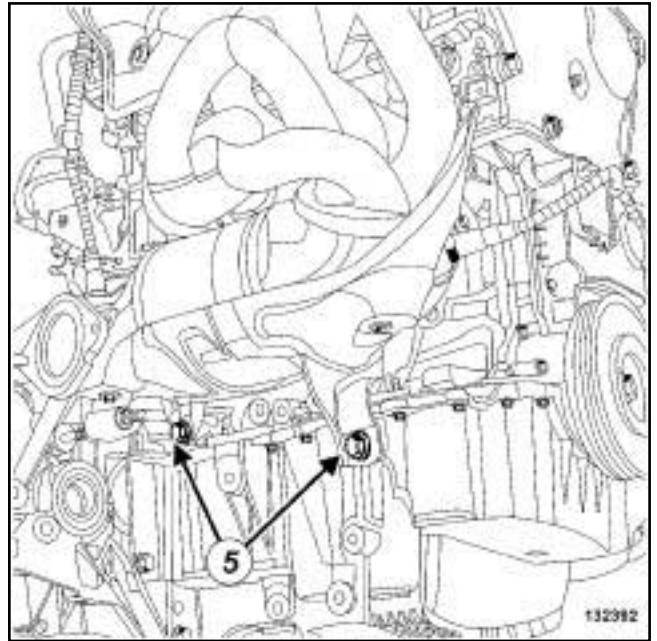
K4M

II - REMOVAL OPERATION

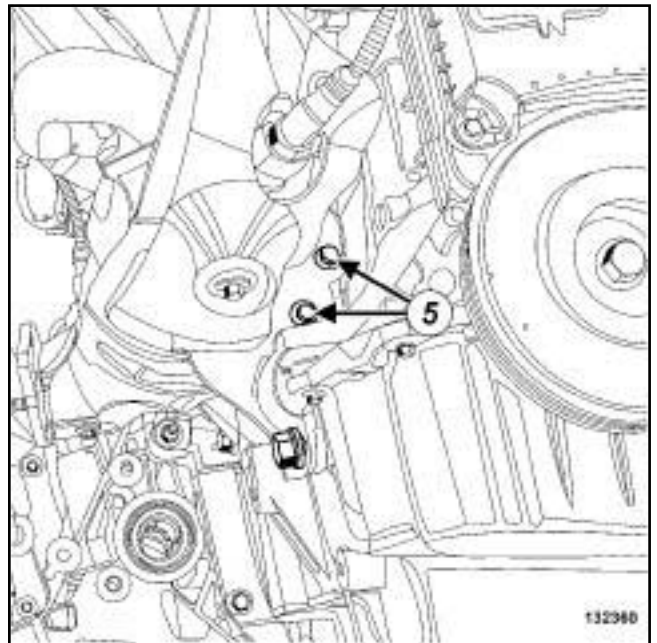


132379

- Remove the exhaust manifold nuts.



132392



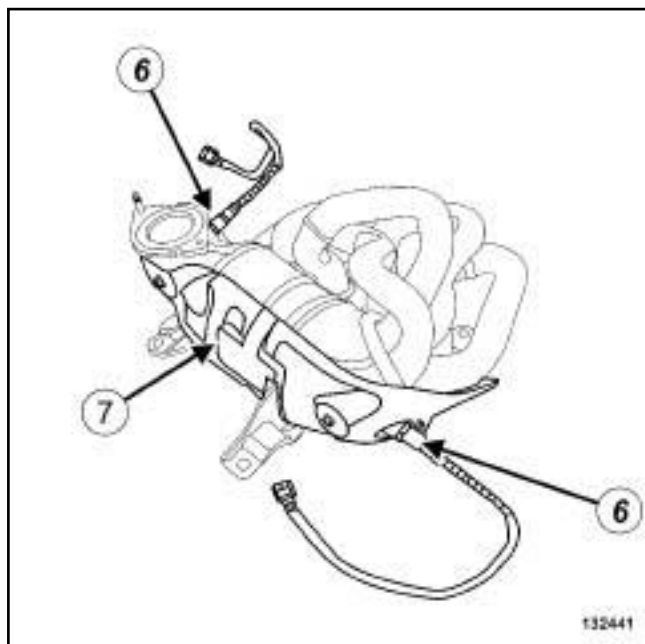
132360

- Remove:
 - the bolts (5) from the « exhaust manifold - catalytic converter » assembly,
 - the « exhaust manifold - catalytic converter » assembly,
 - the seal from the « exhaust manifold - catalytic converter » assembly.

Exhaust manifold: Removal - Refitting

K4M

If replacing the « exhaust manifold - catalytic converter » assembly



132441

❑ Remove:

- the upstream and downstream oxygen sensors (6)
- the heat shield (7) .

REFITTING

I - REMOVAL PREPARATION OPERATION

- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the exhaust manifold joint face if it is to be re-used,
 - the cylinder head joint face.
- ❑ **parts always to be replaced: exhaust manifold seal.**

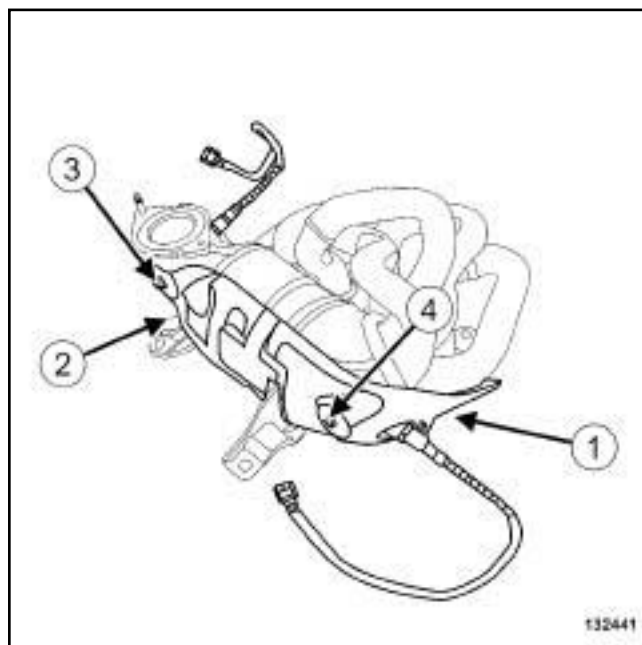
Note:

If a stud loosens during removal, coat it with **HIGH RESISTANCE THREADLOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

- ❑ Torque tighten the **exhaust manifold studs (9 N.m)**.

If replacing the « exhaust manifold - catalytic converter » assembly

- ❑ Clean the threading of the upstream and downstream oxygen sensors using a wire brush.
- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the thread holes of the upstream and downstream oxygen sensors on the exhaust manifold,
 - the threading of the upstream and downstream oxygen sensors.



132441

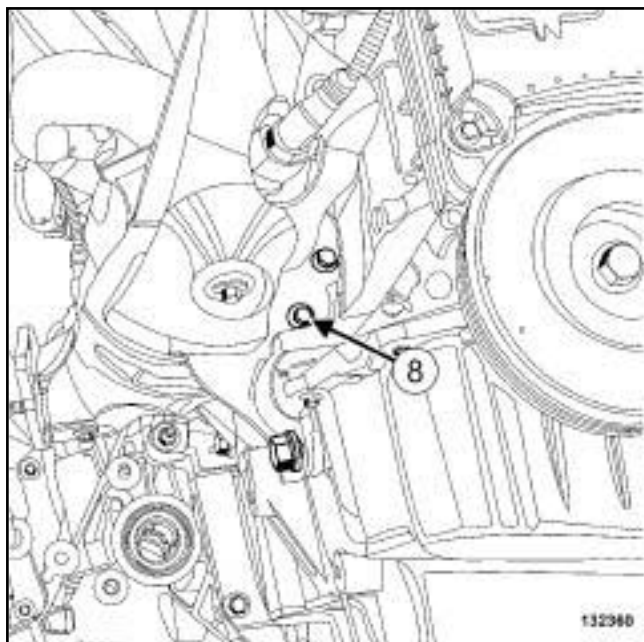
- ❑ Refit the heat shield.
- ❑ Tighten:
 - to torque and in order the **heat shield bolts (12 N.m)**,
 - to torque the **upstream and downstream oxygen sensors (44 N.m)**.
- ❑ If the strut mounting bolt on the cylinder block becomes loose, torque tighten the **strut mounting bolt on the cylinder block (75 N.m)**.

II - REFITTING OPERATION

- ❑ Refit:
 - a new seal on the « exhaust manifold - catalytic converter » assembly,
 - the « exhaust manifold - catalytic converter » assembly.

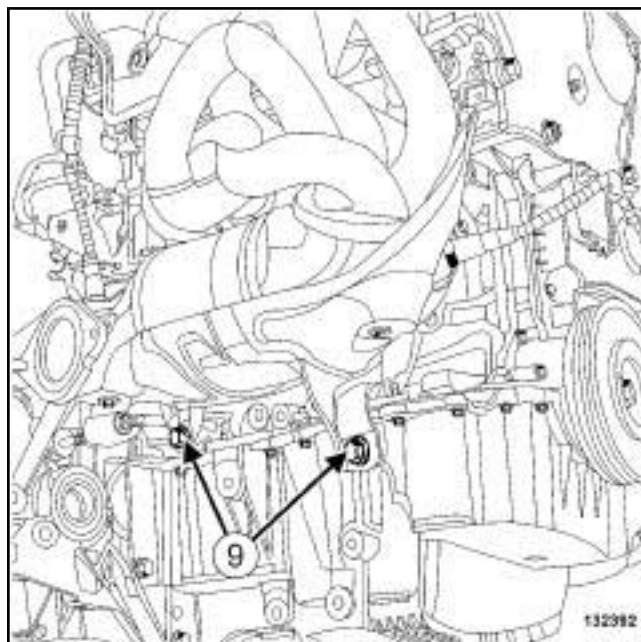
Exhaust manifold: Removal - Refitting

K4M



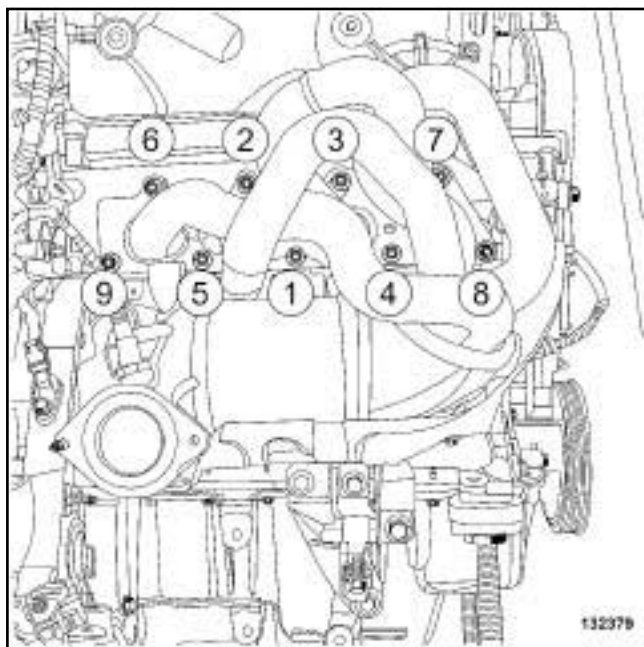
132360

- Pretighten the **upstream strut bolt (initial torque) (14 N.m) (8)** .



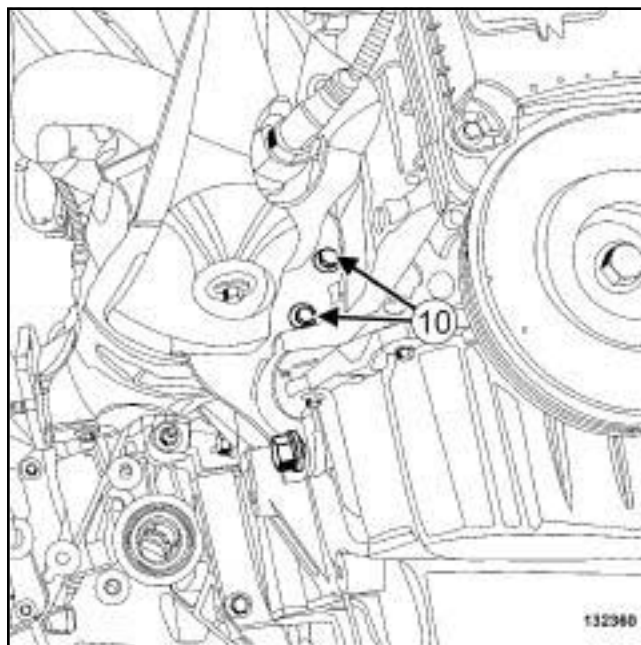
132392

- Torque tighten the **upstream and downstream (strut bolts 44 N.m) (9)** .



132379

- Torque tighten in order the **exhaust manifold nuts (26 N.m)**.



132360

- Torque tighten the **upstream strut bolts (44 N.m) (10)** .

III - FINAL OPERATION

- Clip on the oxygen sensor wiring.
- Connect the oxygen sensor connectors.
- Refit:
 - the bulkhead heat shields,

Exhaust manifold: Removal - Refitting

K4M

- the driveshaft relay bearing.
- Torque tighten the **driveshaft relay bearing bolts (21 N.m)**.
- Refit:
 - the upstream expansion chamber (see **19B, Exhaust, Expansion chamber: Removal - Refitting**, page **19B-23**),
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
 - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting** (29A, Driveshafts).
- Fill the gearbox (see **Manual gearbox oils: Draining - Filling** (21A, Manual gearbox).
- Refit:
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting** (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting** (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting** (85A, Wiping - Washing),
 - the front right-hand wheel (see **Wheel: Removal - Refitting** (35A, Wheels and tyres),
 - the engine undertray.
- Connect the battery (see **Battery: Removal - Refitting** (80A, Battery).

Turbocharging: Precautions for the repair

D4F or K9K

Equipment required

parts washer

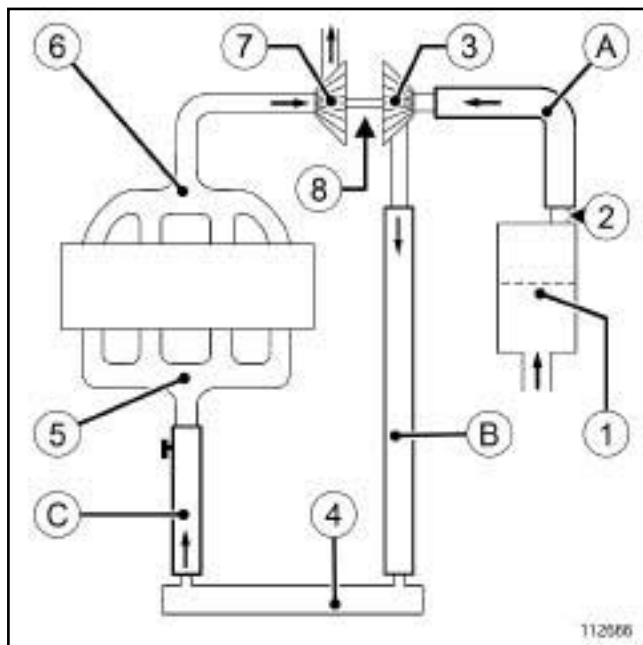
I - TURBOCHARGER: GENERAL INSTRUCTIONS

For the turbocharging pressure regulator check (see **Fault finding - Tests**) (Technical Note 3419A, 12B, Turbocharging).

WARNING

The turbocharger pressure regulator rod must not be adjusted.

II - TURBOCHARGER CIRCUIT DIAGRAM



112666

- | | |
|-----|--|
| (1) | Air filter unit |
| (2) | Air flowmeter |
| (3) | Compressor wheel |
| (4) | Intercooler |
| (5) | Inlet distributor |
| (6) | Exhaust manifold |
| (7) | Turbine wheel |
| (8) | Bearing system (bearing + wheel shaft) |
| (A) | Air filter box air outlet pipe |
| (B) | Turbocharger air outlet pipe |
| (C) | Intercooler air outlet pipe |

III - APPLICATION CONDITIONS OF INSTRUCTIONS

The instructions below must be followed when replacing a turbocharger due to mechanical damage:

- damage to the bearing system,
- broken shaft or turbine wheel,
- compressor wheel rubbing against the turbocharger casing,
- broken or damaged compressor wheel,
- extensive clogging of the turbine wheel casing (hard deposits).

FOR THE AIR CIRCUIT:

- Consequences:
 - swarf or metal objects in the turbocharger inlet and outlet pipes,
 - oil in the air circuit (collected in the intercooler).
- Risks (after replacing the turbocharger):
 - metal objects sucked in by the compressor wheel (destruction of the turbocharger).

FOR THE LUBRICATION CIRCUIT:

- Consequences:
 - swarf found in the engine oil circuit,
 - circulation of swarf within the circuit.
- Risks (after replacing the turbocharger):
 - premature wear on the bearing system (destruction of turbocharger).

WARNING

Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

Failure to follow the INSTRUCTIONS listed will lead to the turbocharger breaking again.

INSTRUCTIONS:

- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-22**)
- Replace the oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page **10A-29**).
- Replace the seals and fittings,
- Carry out the following only if the compressor wheel is broken or rubbing against the turbocharger casing:
 - Drain the intercooler,

Turbocharging: Precautions for the repair

D4F or K9K

- Clean the turbocharger air pipes.

Note:

When carrying out an operation on the air or lubrication circuit, it is necessary to plug the open holes to prevent any risk of foreign bodies entering the system.

IV - AIR CIRCUIT*: INSTRUCTIONS FOLLOWING MECHANICAL DAMAGE TO THE TURBOCHARGER

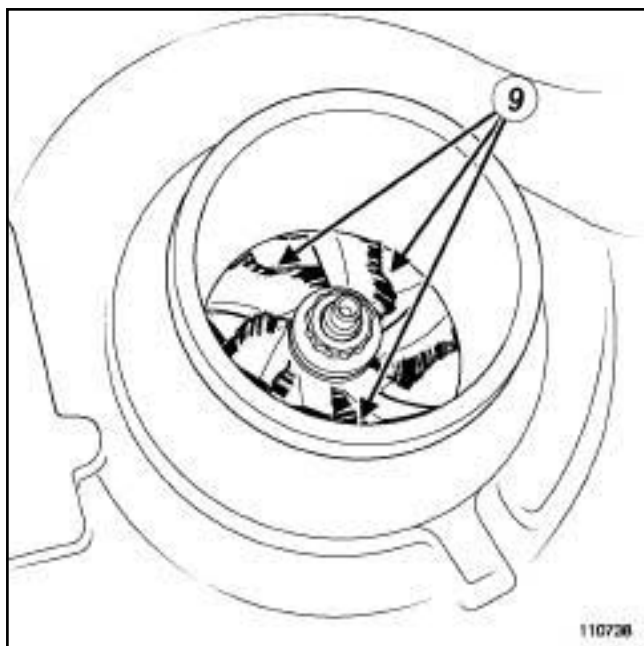
Note:

(*) These instructions for the air circuit are only to be followed in the case of:

- broken compressor wheel,
- compressor wheel rubbing against the turbocharger casing.

Remove the intercooler if fitted to the vehicle (see **12B, Turbocharging, Intercooler: Removal - Refitting**, page **12B-18**).

Turn the intercooler over and allow the oil inside to drain out.



110738

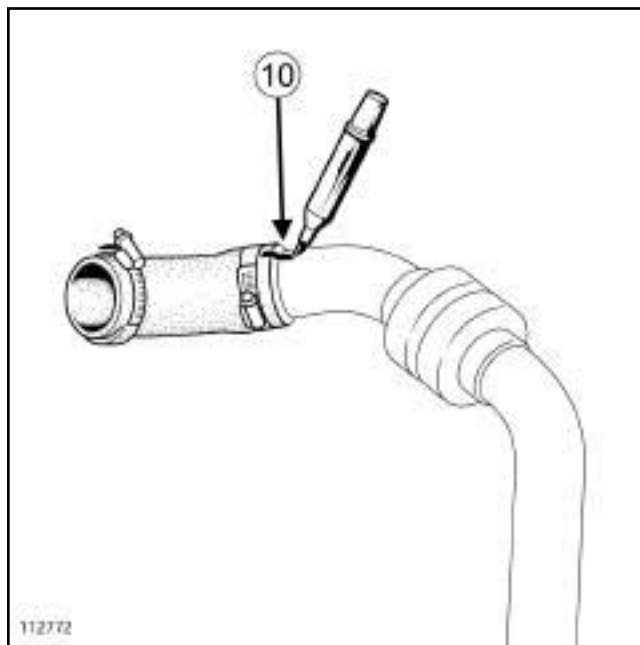
Note:

If the compressor wheel (9) is damaged, metal objects are ejected inside the air pipes.

Check that there are no metal objects inside the air flowmeter (2).

Remove:

- the air pipe (between the air filter unit and the turbocharger) (A),
- the air pipe (B) (between the turbocharger and the intercooler).



112772

For air pipes comprising several components:

- mark (10) the fitting position of each component,
- separate all the components.



112770

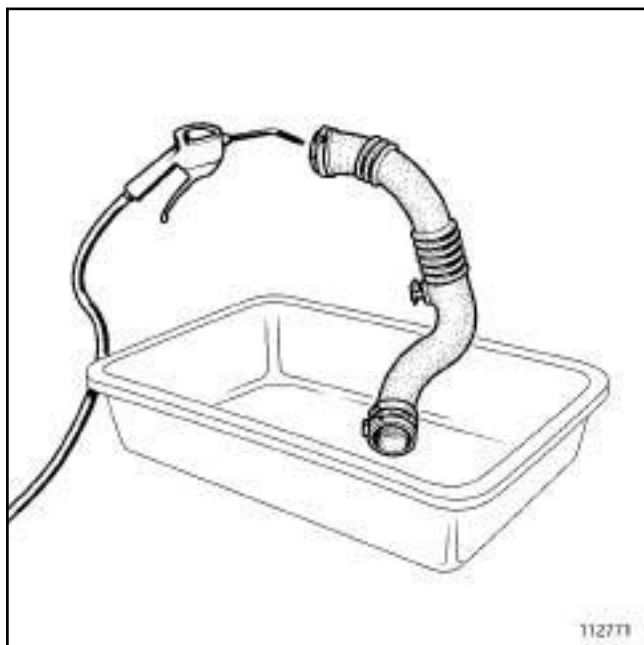
112770

Turbocharging: Precautions for the repair

D4F or K9K

One by one, clean the pipes removed with the **parts washer** :

- brush as much of the inside of the pipe as possible (only use brushes with plastic bristles),
- wash plenty of cleaning product from the cleaning station through the pipe,
- allow the cleaned pipe to drain by standing it upright,
- ensure the cleaning product has drained out completely (check areas where liquid may be retained, e.g. gaiters, resonators etc.).



112771

Dry the pipes one by one using a compressed air spray gun.

For pipes comprising several components:

- assemble the components, taking note of their correct fitting position **(10)** .

Refit:

- the air pipe (between the air filter unit and the turbocharger) **(A)** ,
- the air pipe **(B)** (between the turbocharger and the intercooler).

Refit the intercooler, if fitted to the vehicle (see **12B, Turbocharging, Intercooler: Removal - Refitting, page 12B-18**) .

V - LUBRICATION CIRCUIT**: INSTRUCTIONS FOLLOWING MECHANICAL DAMAGE TO THE TURBOCHARGER

Note:

(**) These instructions relating to the lubrication circuit must always be followed in all cases of mechanical damage as listed above.

Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling, page 10A-22**) .

Replace the oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting, page 10A-29**) .

Only fill the engine with a suitable oil type (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants).

VI - GENERAL INSTRUCTIONS TO BE FOLLOWED WHEN REMOVING A TURBOCHARGER

Always replace:

- the oil supply pipe:
 - if the pipe is blocked, even partially (due to scale, carbonised oil etc.),
 - if the pipe is fitted with self-retaining seals.
- the oil return pipe:
 - if the pipe is blocked, even partially (due to scale, carbonised oil etc.),
 - if the pipe is fitted with self-retaining seals.
- all seals that have been removed,
- all fittings that have been removed.

WARNING

Failure to observe the following procedure may lead to destruction of the turbocharger.

When starting the engine:

- do not accelerate,
- allow the engine to run for **1 minute**, the time taken for the oil circuit pressure to increase (until the oil pressure warning light on the instrument panel goes out),
- accelerate several times at no load,
- check the air circuit and the oil circuit for leaks.

TURBOCHARGING

Turbocharger: Removal - Refitting

12B

K9K

Equipment required	
cleaning trough	
parts washer	
compressed air nozzle	

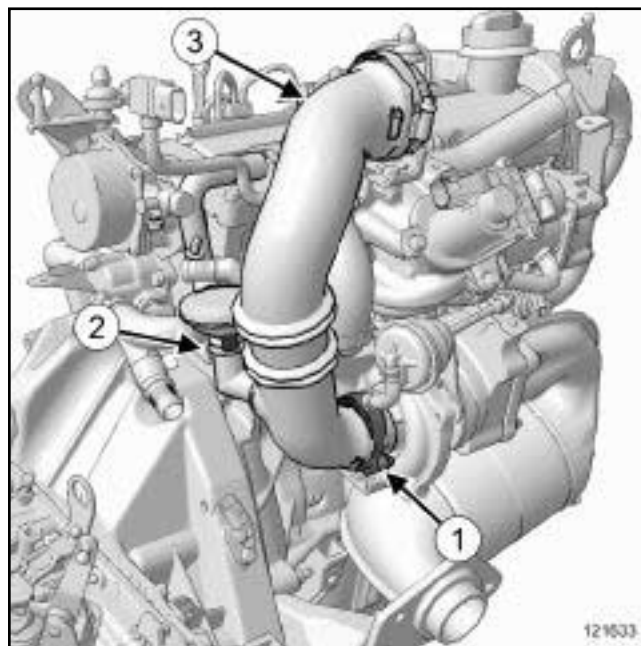
Tightening torques	
studs on the turbo-charger	9 N.m
turbocharger nuts	28 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the engine cover,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the EGR solenoid valve (see **14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting**, page 14A-10) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



121633

- Loosen the clip (1) of the air outlet pipe on the air filter unit.
- Disconnect the oil vapour rebreathing pipe (2) .
- Remove:
 - the air outlet pipe of the air filter unit (3) ,
 - the turbocharger oil pipes (see **12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting**, page 12B-12) .

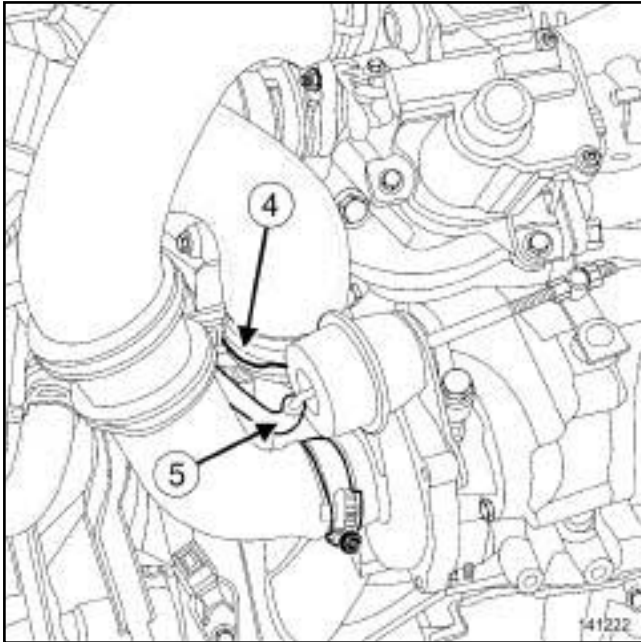
TURBOCHARGING

Turbocharger: Removal - Refitting

12B

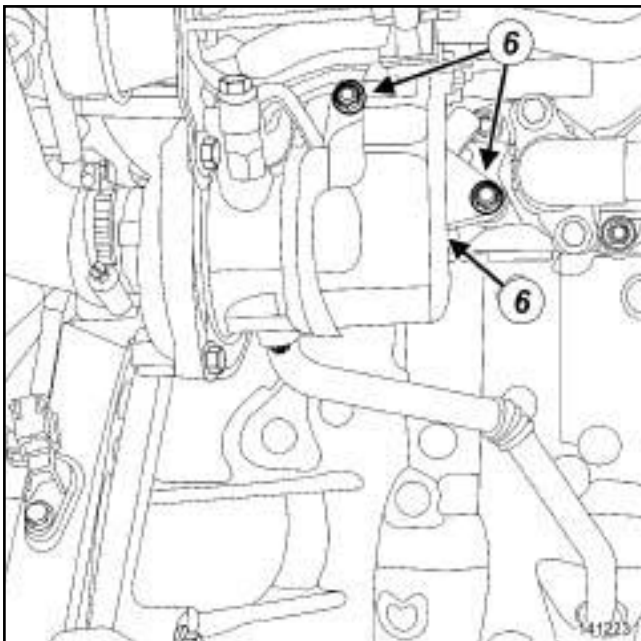
K9K

K9K, and 718



141222

- Pull the intercooler air inlet pipe clip (4) on the turbocharger side.
- Disconnect:
 - the air-air intercooler air inlet pipe at the turbocharger end,
 - the turbocharging pressure regulator pipe (5) .

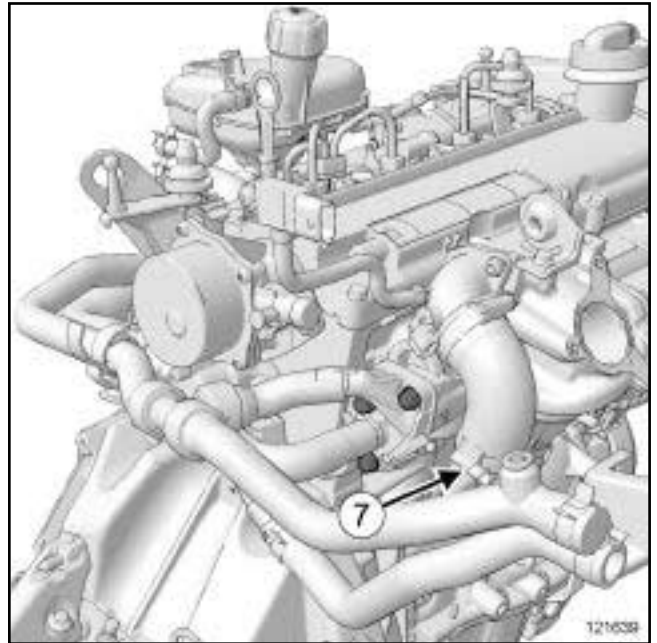


141223

- Remove:
 - the turbocharger nuts (6) ,

- the turbocharger,
- the turbocharger seal.

K9K, and 740



121639

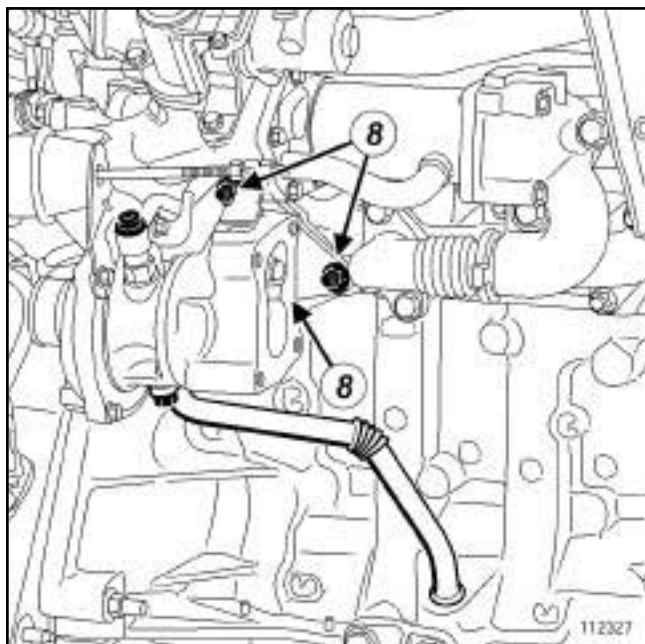
- Loosen the turbocharger air outlet pipe clip (7) from the turbocharger.
- Disconnect the turbocharger air outlet pipe from the turbocharger.

TURBOCHARGING

Turbocharger: Removal - Refitting

12B

K9K



Remove:

- the turbocharger nuts (8) ,
- the turbocharger,
- the turbocharger seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: seal between exhaust manifold and turbocharger.**
- If there has been a fault in the turbocharger, check that the inlet circuit assembly is not full of oil. If it is, remove the components to be cleaned, and clean them using a **cleaning trough** or a **parts washer** then dry them using a **compressed air nozzle**.
- If the turbocharger is being reused, clean it using a **cleaning trough** or a **parts washer** then dry it using a **compressed air nozzle**.
- Use **ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the bearing faces:
 - the exhaust manifold - turbocharger,
 - the turbocharger - catalytic converter,
 - the turbocharger - oil return pipe.

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and clean cloths to degrease the mating faces:
 - of the exhaust manifold on the turbocharger side,
 - of the turbocharger on the exhaust manifold side,
 - of the turbocharger on the catalytic converter side,
 - of the turbocharger on the oil return pipe side,
 - of the catalytic converter on the turbocharger side.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

- In the event of replacement, torque tighten the **studs on the turbocharger (9 N.m)**.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the turbocharger fitted with a new seal.
- Torque tighten the **turbocharger nuts (28 N.m)**.

K9K, and 718

- Connect:
 - the turbocharging pressure regulator pipe,
 - the intercooler air inlet pipe on the turbocharger side.
- Clip the intercooler air inlet pipe on the turbocharger side.

K9K, and 740

- Connect the turbocharger air outlet pipe to the turbocharger.
- Tighten the clip of the turbocharger air outlet pipe on the turbocharger.
- Refit the turbocharger oil pipes (see **12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting, page 12B-12**) .
- Refit the air outlet pipe onto the air filter unit.

TURBOCHARGING

Turbocharger: Removal - Refitting

12B

K9K

III - FINAL OPERATION

Refit:

- the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-12**),
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
- the EGR solenoid valve (see **14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting**, page **14A-10**),
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the engine cover.

- Connect the battery (see) (80A, Battery).

TURBOCHARGING

Turbocharger: Removal - Refitting

12B

D4F, and 780 or 782

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques	
turbocharger nuts	21 N.m
turbocharger cooling pipe hollow bolts	30 N.m
turbocharger cooling pipe bracket bolts	10 N.m

IMPORTANT
Wear cut-resistant gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove the engine undertray.
- Drain the manual gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).
- Remove:
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page 17B-13) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove the turbocharger oil return pipe (see **12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting**, page 12B-12) .



121773

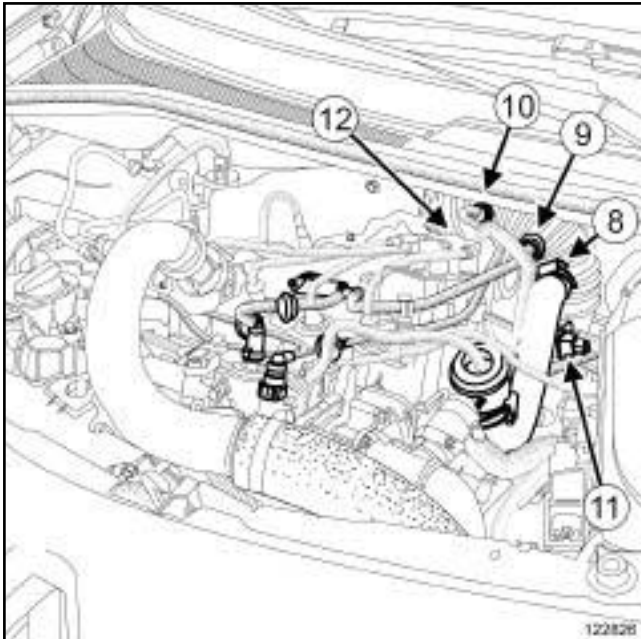
- Fit the tools (**Ms. 583**) onto the turbocharger cooling hoses (6) .
- Remove the turbocharger cooling hose clips using the tool (**Mot. 1448**).
- Disconnect the turbocharger cooling hoses.
- Remove the turbocharger cooling pipe strut bolt (7) .
- Remove the turbocharger oil supply pipe (see **12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting**, page 12B-12) .

TURBOCHARGING

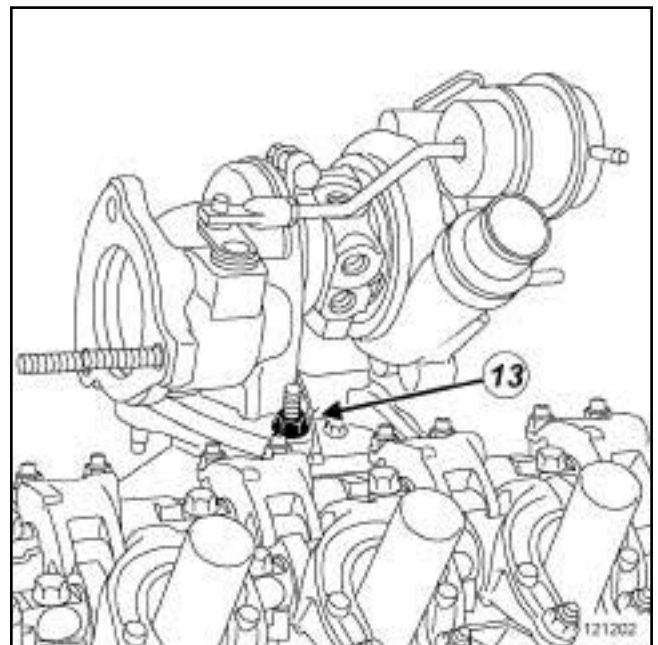
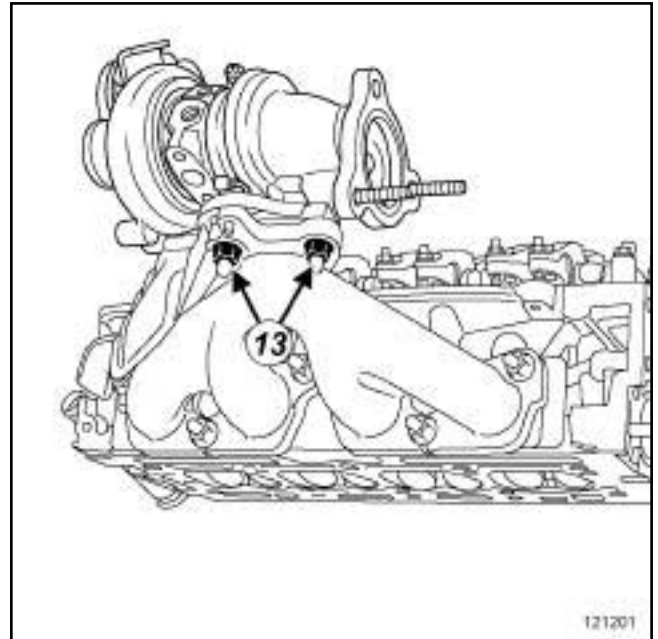
Turbocharger: Removal - Refitting

12B

D4F, and 780 or 782



- Undo the compressor discharge air pipe clip (8) .
- Disconnect:
 - the turbocharger discharge air pipe,
 - the oil vapour recirculation pipe from the air filter unit air outlet pipe (9) ,
 - the petrol vapour recirculation pipe from the air filter unit air outlet pipe (10) ,
 - the turbocharging regulation solenoid valve connector from the turbocharger (11) ,
 - the ignition coil connector (12) .
- Unclip the wiring from the turbocharger coolant rigid pipe strut.



- Remove:
 - the upper and lower nuts (13) from the turbocharger,
 - the turbocharger,
 - the turbocharger seal.

If replacing the turbocharger

- Unclip the clips of the turbocharging pressure regulation pipes.
- Disconnect the turbocharging pressure regulation pipes.

TURBOCHARGING

Turbocharger: Removal - Refitting

12B

D4F, and 780 or 782

- Loosen the clip of the air filter unit air outlet pipe.
- Remove:
 - the air outlet pipe of the air filter unit,
 - the turbocharger cooling pipe bracket bolt,
 - the turbocharger cooling hollow pipe bolts,
 - the turbocharger cooling pipes.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Turbocharger nut.**
- parts always to be replaced: seal between exhaust manifold and turbocharger.**
- parts always to be replaced: Turbocharger coolant pipe** if replacing the turbocharger.
- Use a **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease the sealing surfaces:
 - of the turbocharger (if being reused),
 - of the exhaust manifold.

WARNING

Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.

Check that the turbocharger oil return pipe is not partially or completely blocked by scale. Check that there are no leaks. If there are, replace the part.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - a new turbocharger seal,
 - the turbocharger,
 - new turbocharger nuts.
- Torque tighten the **turbocharger nuts (21 N.m)**.

1 - If replacing the turbocharger

- Refit:
 - the turbocharger cooling pipes,
 - the turbocharger cooling hollow pipe bolts,
 - the turbocharger cooling pipe bracket bolts,

- the air outlet pipe of the air filter unit.
- Tighten the clip of the air outlet pipe on the air filter unit.
- Torque tighten:
 - the **turbocharger cooling pipe hollow bolts (30 N.m)**,
 - the **turbocharger cooling pipe bracket bolts (10 N.m)**.

Note:

During this operation, use a set of feeler gauges to ensure that there is a minimum clearance of **3 mm** between the turbocharger water outlet pipe and the turbocharger heat shield.

- Connect the turbocharging pressure regulation pipes.
- Clip on the clips of the turbocharging pressure regulation pipes.

2 - If the turbocharger is not being replaced

- Clip the wiring onto the turbocharger coolant rigid pipe strut.
- Connect:
 - the turbocharger discharge air pipe,
 - the oil vapour recirculation pipe on the air filter unit air outlet pipe,
 - the petrol vapour recirculation pipe on the air filter unit air outlet pipe,
 - the turbocharging regulation solenoid valve connector from the turbocharger,
 - the ignition coil connector.
- Tighten the turbocharger discharge air pipe clip.
- Refit the turbocharger oil supply pipe (see **12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting**, page **12B-12**).
- Refit the turbocharger cooling pipe strut bolt.
- Connect the turbocharger cooling hoses.
- Fit the turbocharger cooling hose clips using the tool (**Mot. 1448**).
- Remove the tools (**Ms. 583**).
- Refit the turbocharger oil return pipe (see **12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting**, page **12B-12**).

TURBOCHARGING

Turbocharger: Removal - Refitting

12B


D4F, and 780 or 782

III - FINAL OPERATION

- Refit:
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-12**),
 - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
 - the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page **17B-13**),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Refill:
 - and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**),
 - the manual gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).
- Refit the engine undertray.

Turbocharger oil pipe: Removal - Refitting

D4F, and 780 or 782

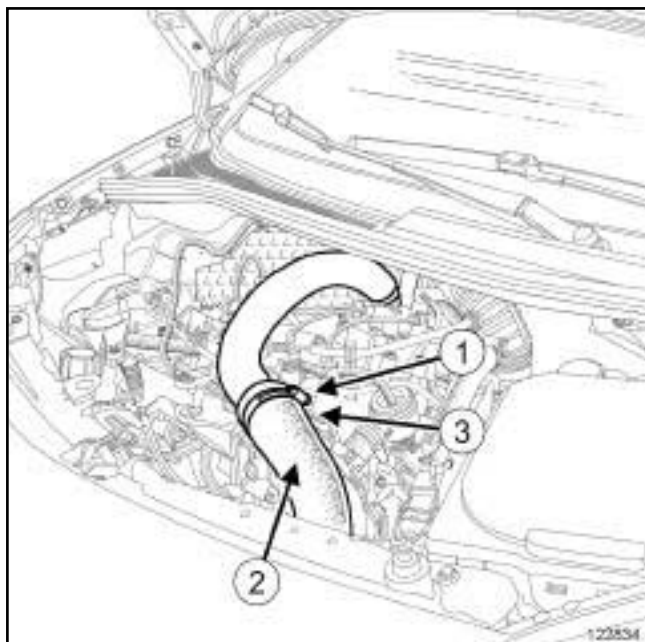
Tightening torques 	
turbocharger oil return pipe bolts	10 N.m
turbocharger oil supply pipe bolt on the cylinder block	19 N.m
turbocharger oil supply pipe bolt on the turbocharger	19 N.m
turbocharger oil supply pipe bolt	10 N.m

REMOVAL**I - REMOVAL PREPARATION OPERATION**

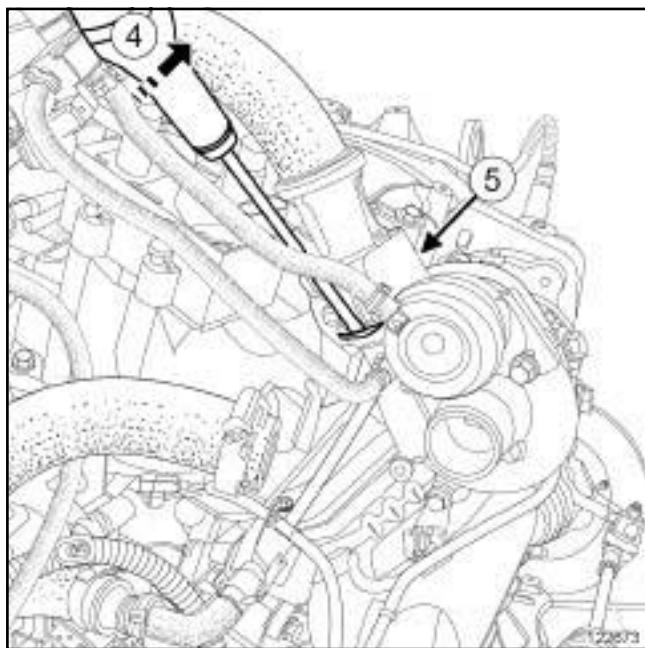
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the air filter box strut bolt,
 - the air filter box strut,
 - the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page 17B-13) .

Turbocharger oil pipe: Removal - Refitting

D4F, and 780 or 782



122834



122673

Note:

If the turbocharger air outlet pipe tightening clip (1) is removed, the flexible rubber pipe (2) and the tightening clip (1) must be replaced.

- Remove the turbocharger air outlet pipe bolt (3) on the throttle valve.
- Unclip the turbocharger air outlet pipe on the turbocharger in the direction of the arrow (4) .
- Disconnect the turbocharger air outlet pipe from the

turbocharger.

Note:

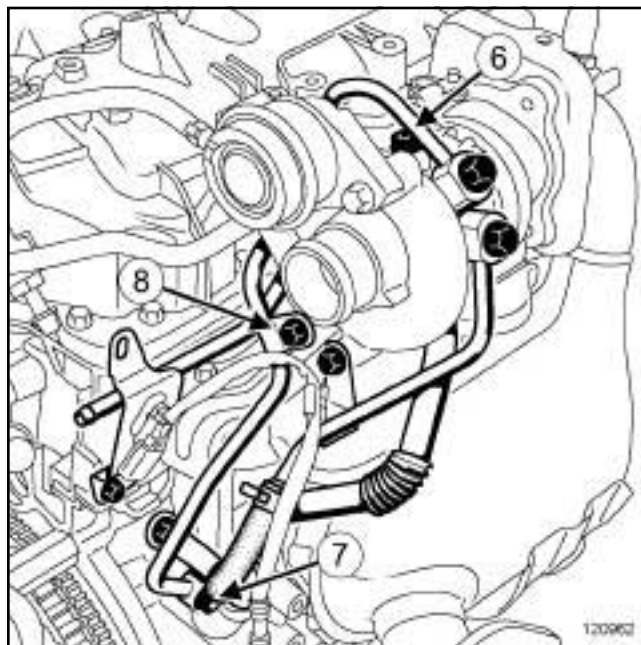
If the clip (5) is removed from the heat resistant protector, the latter must be replaced.

- Move aside the turbocharger air outlet pipe.
- Remove the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove:
 - the lower bolts from the heat shield,
 - the upper bolts from the heat shield,
 - the heat shield.

1 - Oil supply pipe



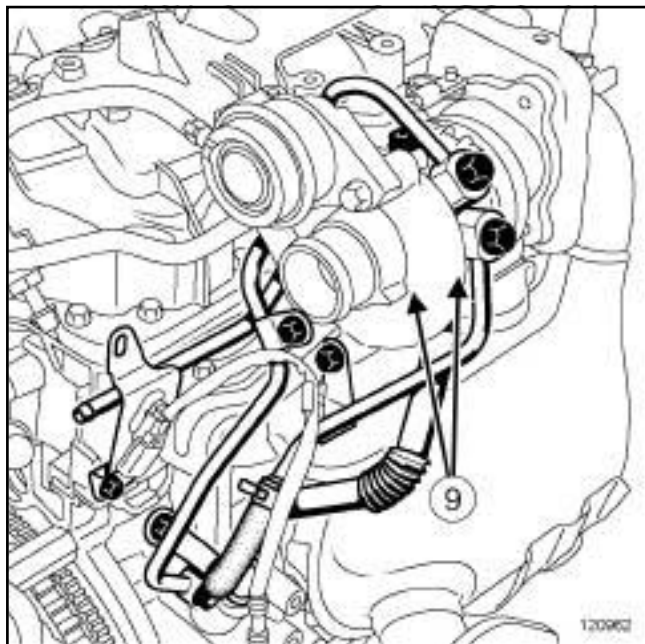
120962

- Remove:
 - the bolt (6) from the turbocharger oil supply pipe on the turbocharger,
 - the bolt (7) on the turbocharger oil supply pipe on the cylinder block,
 - the turbocharger oil supply pipe bolt (8) ,
 - the turbocharger oil supply pipe.

Turbocharger oil pipe: Removal - Refitting

D4F, and 780 or 782

2 - Oil return pipe



120962

- Remove:
 - the bolts (9) from the turbocharger oil return pipe,
 - the turbocharger oil return pipe.
- Fit a blanking plug to the opening on the cylinder block after removal of the turbocharger oil return pipe.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Turbocharger oil pipe.**
- Remove the protective plug from the opening on the cylinder block.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the new turbocharger oil return pipe fitted with new seals,
 - the turbocharger oil return pipe bolts.
- Torque tighten the **turbocharger oil return pipe bolts (10 N.m).**
- Refit:
 - the new turbocharger oil supply pipe fitted with its new seals,

- the turbocharger oil supply pipe bolt on the cylinder block,
- the turbocharger oil supply pipe bolt on the turbocharger,
- the turbocharger oil supply pipe bolt.

Torque tighten:

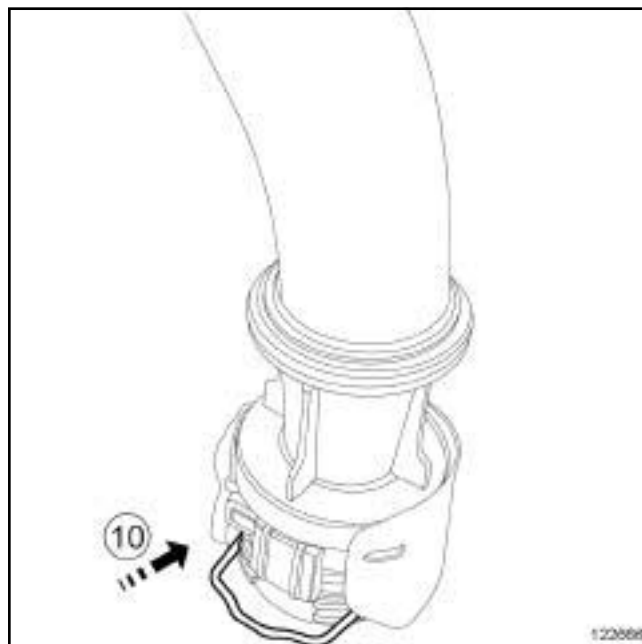
- the **turbocharger oil supply pipe bolt on the cylinder block (19 N.m),**
- the **turbocharger oil supply pipe bolt on the turbocharger (19 N.m),**
- the **turbocharger oil supply pipe bolt (10 N.m).**

Refit:

- the heat shield,
- the upper bolts from the heat shield,
- the lower bolts of the heat shield.

III - FINAL OPERATION

- Refit the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-12**).



122666

- Fit the turbocharger air outlet pipe.
- Push the clip of the turbocharger air outlet pipe (10).
- Connect the turbocharger air outlet pipe to the turbocharger.
- Refit the turbocharger air outlet pipe bolt on the throttle valve.

Turbocharger oil pipe: Removal - Refitting

D4F, and 780 or 782

- Refit:
 - the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page **17B-13**),
 - the air filter box strut,
 - the air filter box strut bolt,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Turbocharger oil pipe: Removal - Refitting

C44, and K9K

Special tooling required

Mot. 1746 Offset wrench for tightening High Pressure pump pipes.

Tightening torques

nut of the oil supply pipe on the cylinder head **35 Nm**

bolt of the turbocharger oil supply pipe on the turbocharger **14 Nm**

turbocharger oil return pipe bolts **12 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the front engine cover.
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

1 - Turbocharger oil supply pipe

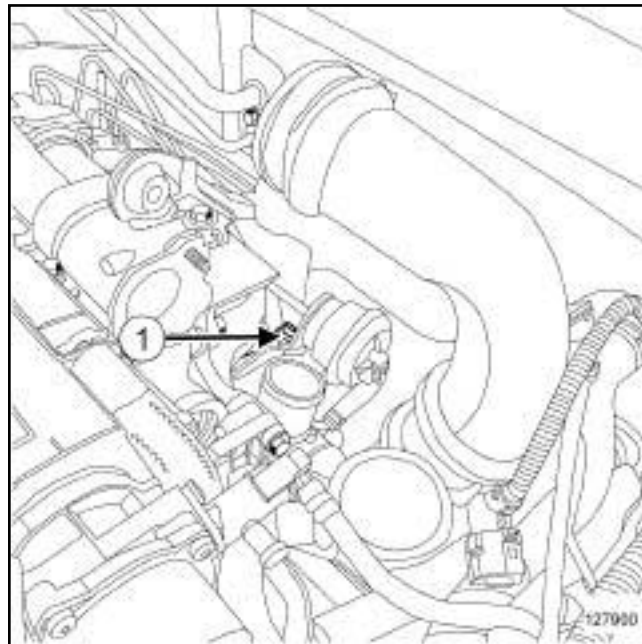
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13),
 - the exhaust gas recirculation solenoid valve (see **14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting**, page 14A-10).

2 - turbocharger oil return pipe

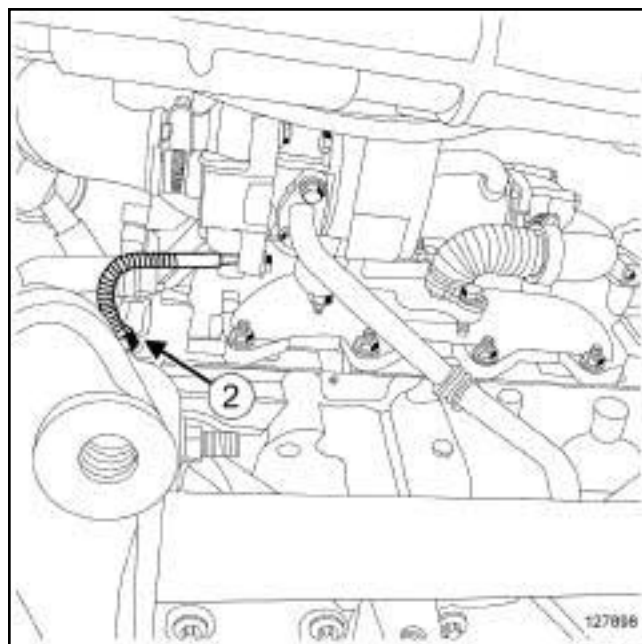
- Remove the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12).

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Turbocharger oil supply pipe



- Remove the bolt (1) of the turbocharger oil supply pipe from the turbocharger.

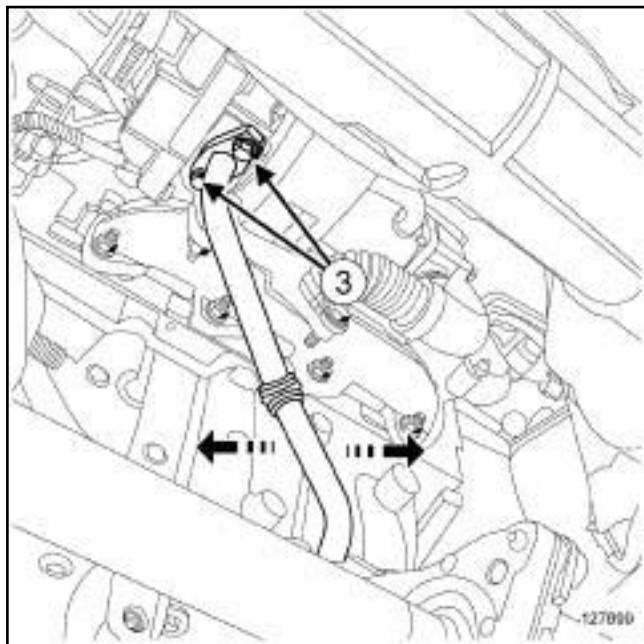


- Undo the nut (2) of the turbocharger oil supply pipe on the cylinder head.
- Remove the nut of the turbocharger oil supply pipe on the cylinder head.
- Remove the turbocharger oil supply pipe.

Turbocharger oil pipe: Removal - Refitting

C44, and K9K

2 - Oil return pipe



127899

- Remove the bolts (3) of the oil return pipe from the turbocharger.
- In the direction of the arrows, rotate the oil return pipe of the turbocharger to facilitate its removal.
- Remove the turbocharger oil pipe from the cylinder block.

REFITTING

I - REMOVAL PREPARATION OPERATION

- Always replace:
 - the turbocharger oil supply pipe,
 - the flat seal of the oil return pip on the turbocharger,
 - the O-ring of the oil return pip on the turbocharger.
- Lubricate the O-ring of the oil return pipe on the turbocharger with engine oil.

II - REFITTING OPERATION FOR PART CONCERNED

1 - Turbocharger oil supply pipe

- Fit the turbocharger oil supply pipe.
- Refit:
 - the turbocharger oil supply pipe nut on the cylinder head,

- the bolt of the turbocharger oil supply pipe onto the turbocharger.

- Torque tighten:

- the nut of the oil supply pipe on the cylinder head (35 Nm) using the (Mot. 1746),
- the bolt of the turbocharger oil supply pipe on the turbocharger (14 Nm).

2 - turbocharger oil return pipe

- Fit the oil return pipe on the cylinder block.
- Refit the turbocharger oil return pipe bolts.
- Torque tighten the turbocharger oil return pipe bolts (12 N.m).

III - FINAL OPERATION.

1 - Turbocharger oil supply pipe

- Refit:
 - the exhaust gas recirculation solenoid valve (see 14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting, page 14A-10) ,
 - the air filter box (see 12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-13) ,
 - the scoop under the scuttle panel grille (see Scoop under the scuttle panel grille: Removal - Refitting) (56A, Exterior equipment),
 - the scuttle panel grille (see Scuttle panel grille: Removal - Refitting) (56A, Exterior equipment),
 - the windscreen wiper arms (see Windscreen wiper arm: Removal - Refitting) (85A, Wiping - Washing).
- Connect the battery (see Battery: Removal - Refitting) (80A, Battery).

2 - turbocharger oil return pipe

- Refit the catalytic converter (see 19B, Exhaust, Catalytic converter: Removal - Refitting, page 19B-12) .
- Connect the battery (see Battery: Removal - Refitting) (80A, Battery).
- Refit the engine cover.

TURBOCHARGING

Intercooler: Removal - Refitting

12B

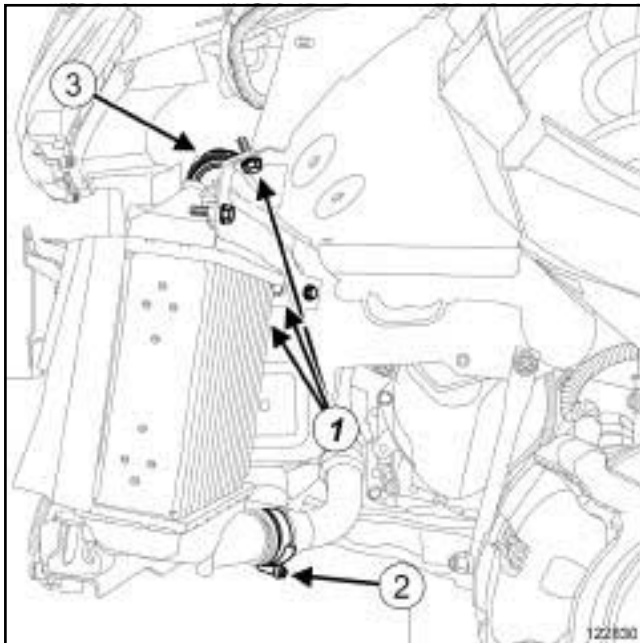
D4F, and 780 or 782 – K9K, and 718

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

II - OPERATION FOR REMOVAL OF PART CONCERNED



122830

- Remove the intercooler bolts (1) .
- Loosen the clip on the intercooler air outlet pipe (2) .
- Disconnect the intercooler air outlet pipe.
- Unclip the turbocharger air outlet pipe (3) .
- Disconnect the turbocharger air outlet pipe.
- Remove:
 - the intercooler,
 - the air deflector clips,
 - the air deflector,
 - the metal mounting.

REFITTING

I - REFITTING PREPARATION OPERATION

- Check that the intercooler is not full of oil. In this case, clean it with cleaning agent and let it dry (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

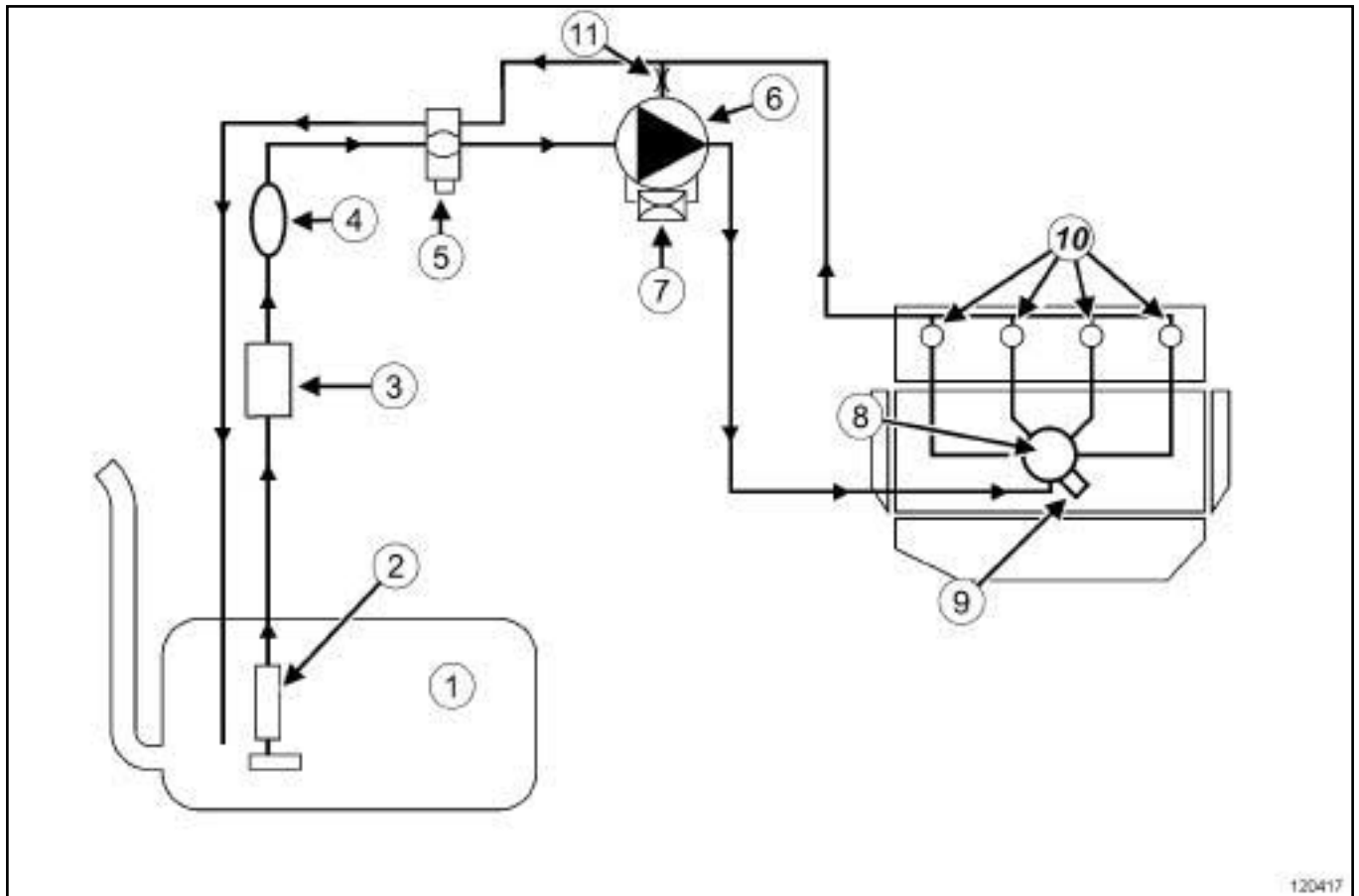
II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the metal mounting,
 - the air deflector,
 - the air deflector clips,
 - the intercooler.
- Connect the turbocharger air outlet pipe.
- Clip on the turbocharger air outlet pipe.
- Connect the intercooler air outlet pipe.
- Tighten the clip on the intercooler outlet pipe.
- Refit the intercooler bolts.

III - FINAL OPERATION

- Refit:
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

K9K



120417

120417

- | | |
|------|---------------------------------|
| (1) | Fuel tank |
| (2) | Dipstick |
| (3) | Electrical diesel fuel reheater |
| (4) | Manual priming pump |
| (5) | Diesel filter |
| (6) | High pressure pump |
| (7) | Fuel flow actuator |
| (8) | Injector rail |
| (9) | Injector rail pressure sensor |
| (10) | Diesel injector |
| (11) | Venturi |

The diesel fuel supply system includes a diesel injection computer and various sensors.

IMPORTANT

Loosening a high pressure pipe union when the engine is running is strictly prohibited.

WARNING

It is forbidden:

- to dismantle the interior of the pump or injectors.
- to remove the pressure sensor from the fuel rail (because of circuit contamination problems). If the pressure sensor fails, the pressure sensor, the rail and the five high pressure pipes must be replaced,
- to dismantle the flow regulator solenoid valve and the pressure regulator solenoid valve on the high pressure pump.

Manual priming pump: Removal - Refitting

K9K

PARTS AND CONSUMABLES FOR THE REPAIR WORK

CONSUMABLES:

- cleaning cloths.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page **13B-1**).

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

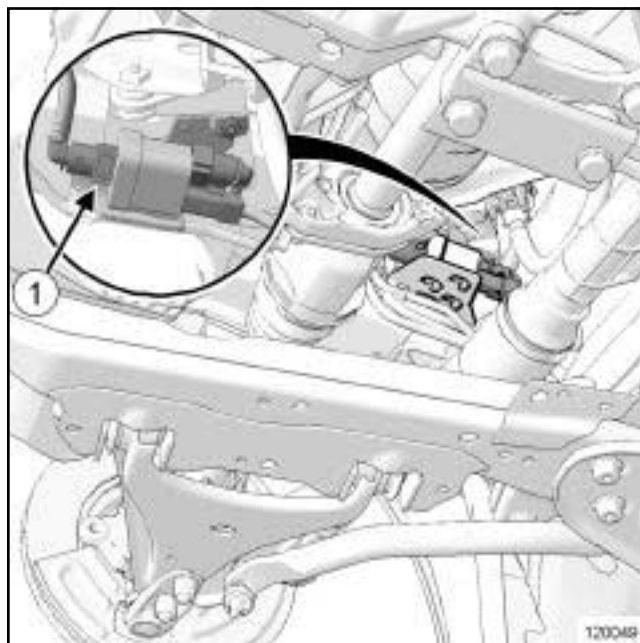
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Remove the front engine cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Detach the fuel pipe from the body.

WARNING

Prepare for the flow of fluid, and protect the surrounding components.



120049

- Disconnect the electric diesel fuel heater fuel pipe union (1).

WARNING

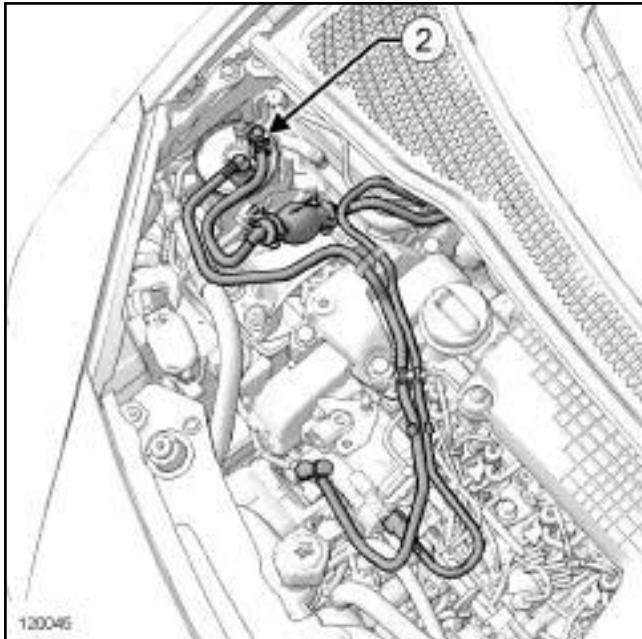
To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

WARNING

Keep the pipe unions away from contaminated areas.

- Unclip the fuel pipe.

K9K



120045

- Disconnect the fuel pipe union (2) .
- Remove the manual priming pump.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

- Refit the manual priming pump.
- Connect the fuel pipe union.
- Clip on the fuel pipe.
- Connect the fuel pipe union to the electric diesel fuel heater.
- Clip the fuel pipe on to the body.

II - FINAL OPERATION.

- Open the bleed screw on top of the fuel filter.
- Prime the fuel circuit using a manual priming pump until the disconnected pipes are filled with fuel.
- Close the bleed screw on top of the fuel filter.

- Check that there are no fuel leaks.
- Start the engine.
- Check that there are no fuel leaks.
- Switch off the engine.
- Refit the engine cover.

FUEL SUPPLY

Fuel filter: Removal - Refitting

13A

K9K

PARTS AND CONSUMABLES FOR THE REPAIR WORK

❑ CONSUMABLES:

- cleaning cloths.

- ❑ Make sure you have a new diesel filter before opening the fuel circuit.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page **13B-1**).

Note:

Periodically bleed the water contained in the diesel filter via the bleed screw (see **maintenance handbook** for vehicle concerned).

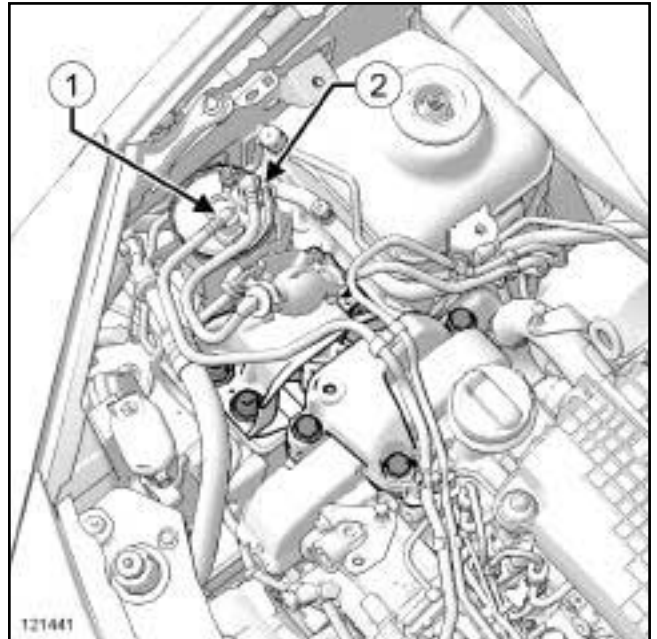
WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- ❑ Remove the front engine cover.



- ❑ Disconnect the fuel filter:

- the high pressure pump inlet pipe (1) ,
- the manual priming pump outlet pipe (2) .

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

WARNING

Keep the pipe unions away from contaminated areas.

- ❑ Remove the fuel supply pipes (1) and (2) .

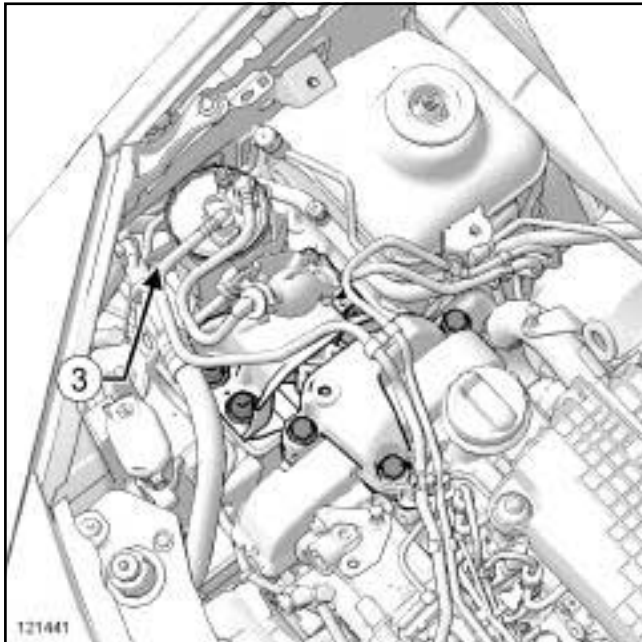
FUEL SUPPLY

Fuel filter: Removal - Refitting

13A

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove:
 - the fuel filter mounting nut (3) ,
 - the fuel filter from its mounting.

Note:

If the fuel filter is to be reused, fit blanking plugs to the fuel supply pipes and fuel filter openings, using the appropriate blanking plug kit, depending on the engine (see **13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1**).

- Detach the water detection sensor offset connector on the fuel filter mounting (if fitted).

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

- Attach the water detection sensor offset connector to the fuel filter mounting (if fitted).
- Refit the fuel filter to its mounting.
- Fit the fuel filter mounting nut.

Note:

Check that the fuel filter is correctly positioned and secure on its mounting by shaking it: the filter must not move.

II - FINAL OPERATION.

- Position the fuel pipes.
- Connect to the fuel filter:
 - the manual priming pump outlet pipe,
 - the high pressure pump inlet pipe.
- Open the bleed screw on top of the fuel filter.
- Prime the fuel circuit using a manual priming pump until the disconnected pipes are filled with fuel.
- Close the bleed screw on top of the fuel filter.
- Check that there are no fuel leaks.
- Start the engine.
- Check that there are no fuel leaks.
- Switch off the engine.
- Refit the engine cover.

BLEEDING

- Remove the fuel filter mounting nut.
- Detach the manual priming pump.
- Remove the fuel filter without pulling on the water detection sensor wiring harness in the diesel fuel.

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

- Position a container under the fuel filter which has been removed from its mounting.
- Turn the bleed cap or the water detection sensor in the diesel fuel (depending on equipment) by no more than one turn.
- Allow it to flow until diesel fuel appears.
- Close the bleed cap or the water detection sensor (depending on equipment).

FUEL SUPPLY

Fuel filter: Removal - Refitting

13A

K4M

The fuel filter is incorporated in the "fuel level sensor module". To remove the fuel filter, remove the "fuel level sensor module" (see **19C, Tank, Fuel level sensor module: Removal - Refitting**, page **19C-13**).

Electric diesel fuel heater: Removal - Refitting

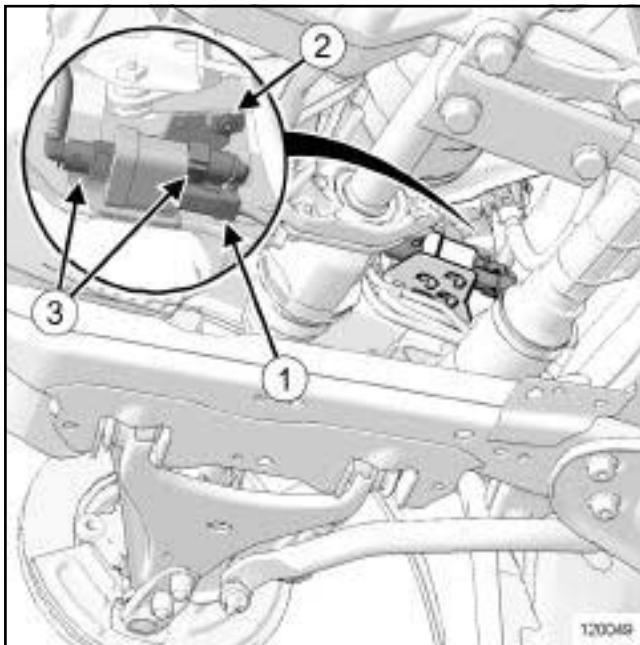
C44, and K9K

REMOVAL

I - OPERATION FOR REMOVAL OF PART CONCERNED

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).

II - OPERATION FOR REMOVAL OF PART CONCERNED



120049

- Disconnect the electric diesel fuel heater electrical connector (1) .
- Remove the nut (2) from the electric diesel fuel heater mounting on the body.
- Disconnect the inlet and outlet fuel supply pipes (3) from the electric diesel fuel heater.

Note:

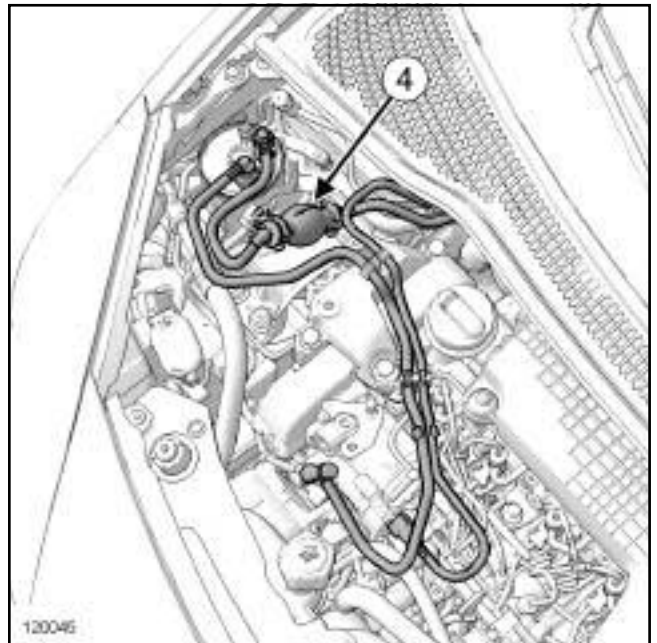
Make preparations for fuel outflow.

- Remove the electric diesel fuel heater and its mounting from the vehicle.
- Separate the electric diesel fuel heater from its mounting, letting it flow.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Fit then lock the electric diesel fuel heater to its mounting.
- Fit the electric diesel fuel heater and its mounting to the vehicle.
- Connect the electric diesel fuel heater inlet and outlet fuel supply pipes.
- Refit the electric diesel fuel heater mounting nut on the body.
- Tighten the diesel heater mounting nut on the body.
- Connect the electric diesel fuel heater electrical connector.



120045

- Prime the diesel circuit using the manual priming pump (4) .
- Start the engine then let it run for a few minutes to check that it starts properly and to check that there are no leaks.

II - FINAL OPERATION.

- Deal with possible fuel leaks.

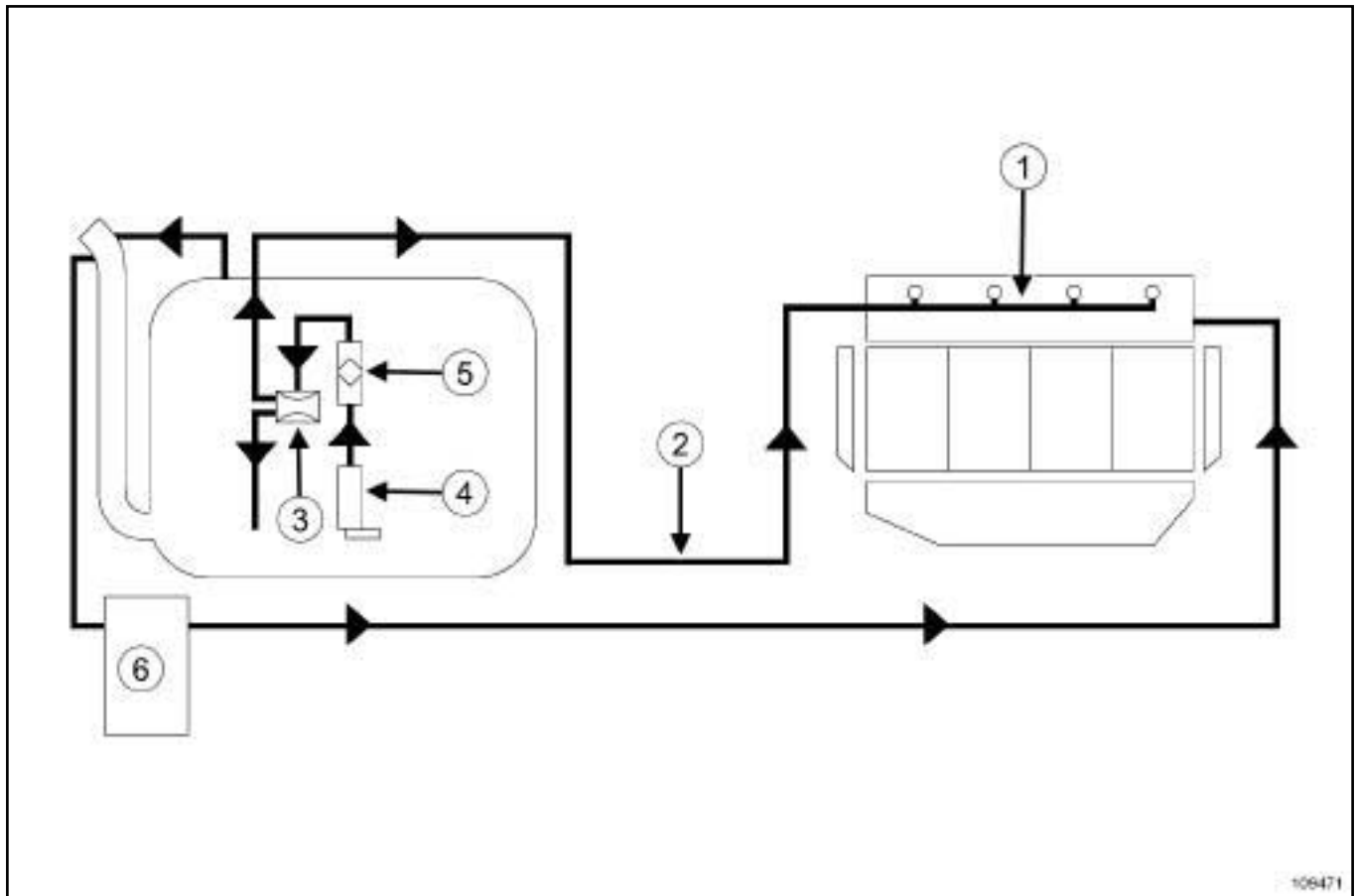
FUEL SUPPLY

Fuel circuit: Operating diagram

13A

D4F or D7F or K4M

Operating diagram of the fuel supply circuit (« pump - sender - fuel filter » assembly)



109471

The fuel supply circuit does not have a return.

The fuel pressure does not vary with engine load.

The circuit comprises:

- a rail (1) without a return pipe union and without a supply pressure regulator,
- a single pipe (2) coming from the tank,
- a « pump - sender - fuel filter » supply assembly fitted with a pressure regulator (3) , fuel pump (4) and fuel filter (5) (all located in the tank),
- a fuel vapour recirculation tank (6) .

FUEL SUPPLY

Fuel pressure: Check

13A

D4F or D7F

Special tooling required

Mot. 1311-01	Pressure gauges and petrol pressure measuring unions.
Mot. 1311-08	Union for taking fuel pressure measurements.

CHECK

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

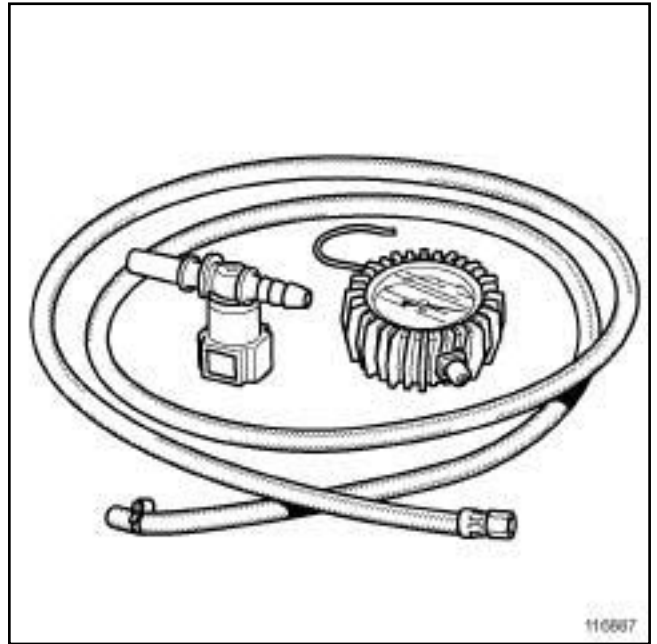
IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

I - PREPARATION OPERATION FOR CHECK



116887

- Ensure you have a checking tool (**Mot. 1311-01**) and a "T" union (**Mot. 1311-08**).

D4F

- Remove the oil filler neck.

II - TEST OPERATION

- Disconnect the petrol inlet pipe from the injector rail.

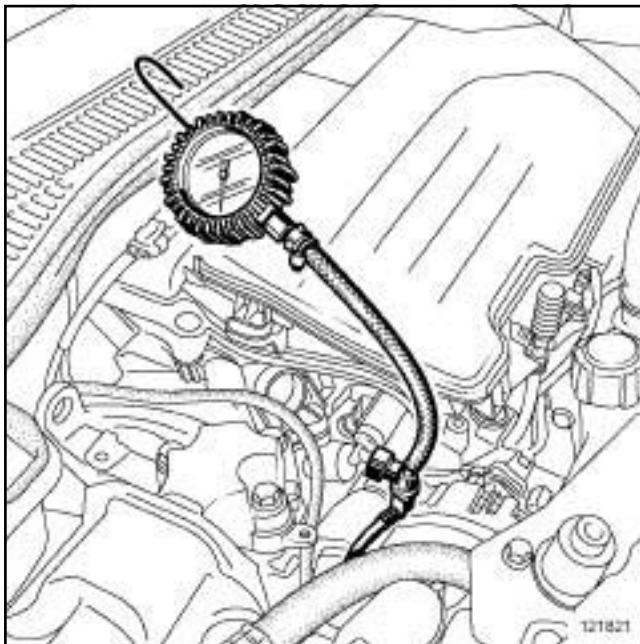
FUEL SUPPLY

Fuel pressure: Check

13A

D4F or D7F

D4F, and 772



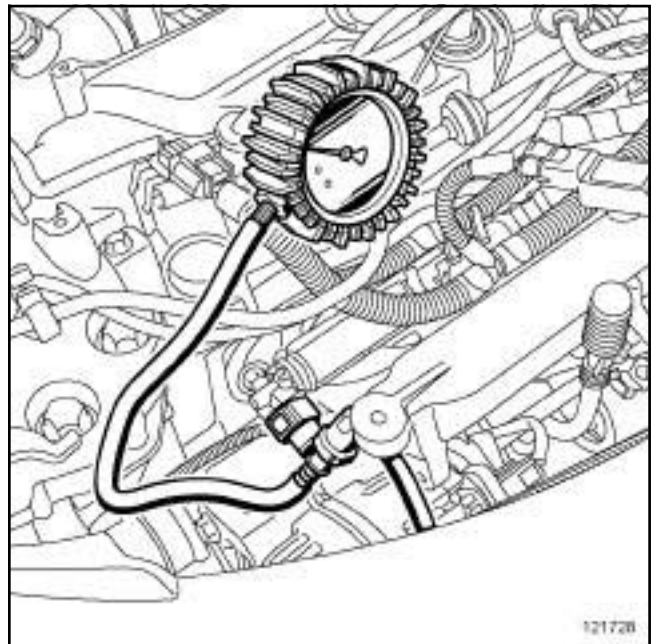
121821

Connect:

- the pipe fitted with a pressure checking gauge with the "T" union of the tool (**Mot. 1311-08**),
- the "T" union to the rail,
- the petrol inlet duct to the "T" union.

Refit the oil filler neck.

D4F, and 780 or 782



121728

Connect:

- the pipe fitted with a pressure checking gauge with the "T" union of the tool (**Mot. 1311-08**),
- the "T" union to the rail,
- the petrol inlet duct to the "T" union.

Refit the oil filler neck.

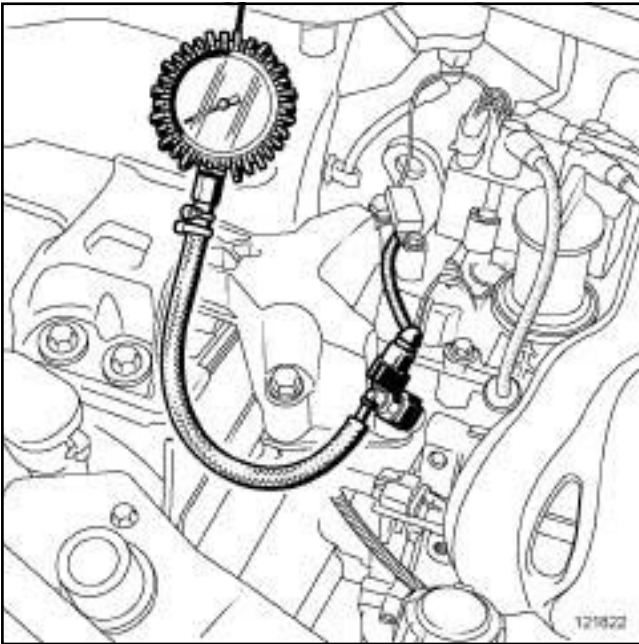
FUEL SUPPLY

Fuel pressure: Check

13A

D4F or D7F

D7F



121822

- Connect:
 - the pipe fitted with a pressure checking gauge with the "T" union of the tool (**Mot. 1311-08**),
 - the "T" union to the rail,
 - the petrol inlet duct to the "T" union.

- Start the engine.
- Determine the pressure:
 - the pressure must be a constant **3.5 bar**,
 - It may take a few seconds to obtain a correct injector rail pressure reading.
- Switch off the engine.

III - FINAL OPERATION

D7F

- Remove the "T" union (**Mot. 1311-08**).

D4F

- Remove:
 - the oil filler neck,

- the "T" union (**Mot. 1311-08**).

- Connect the fuel supply union.

D4F

- Refit the oil filler neck.

FUEL SUPPLY

Fuel pressure: Check

13A

K4M

Special tooling required

Mot. 1311-01	Pressure gauges and petrol pressure measuring unions.
Mot. 1311-08	Union for taking fuel pressure measurements.

CHECK

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

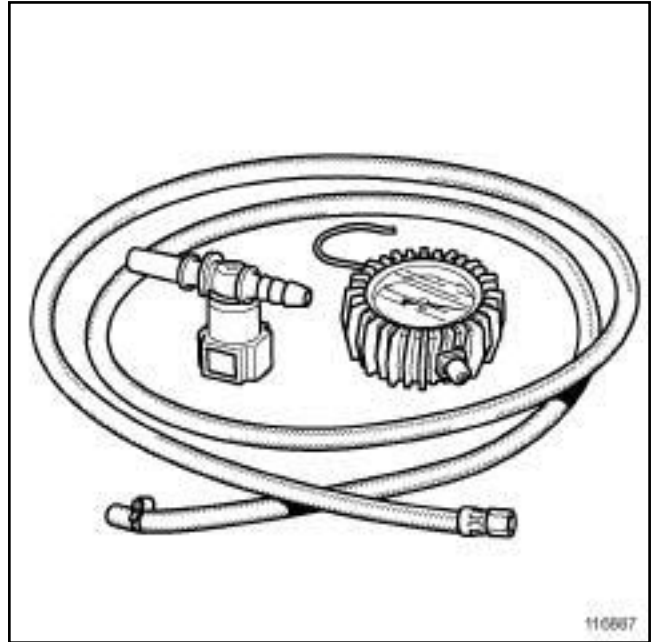
IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

I - PREPARATION OPERATION FOR CHECK

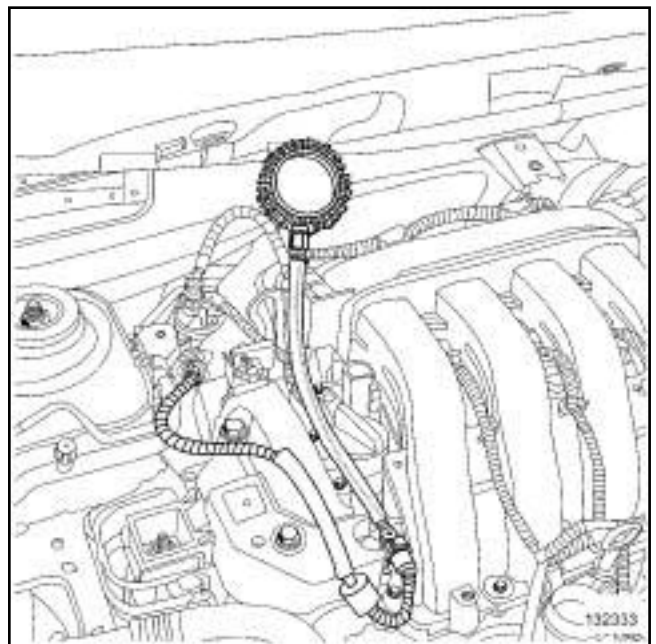


116887

116887

- Ensure you have a checking tool (**Mot. 1311-01**) and a "T" union (**Mot. 1311-08**).

II - TEST OPERATION



132333

132333

- Disconnect the fuel supply union from the injector rail.
- Connect:
 - the pipe fitted with a test pressure gauge (**Mot. 1311-01**) with the "T" union (**Mot. 1311-08**),
 - the "T" union (**Mot. 1311-08**) on the injector rail,

FUEL SUPPLY

Fuel pressure: Check

13A

K4M

- the injector rail fuel supply union to the "T" union
(**Mot. 1311-08**).

- Start the engine.
- Record the pressure; this should be constant at **3.5 bar**.

Note:

It may take a few seconds to obtain a correct injector rail pressure reading.

- Switch off the engine.

III - FINAL OPERATION

- Disconnect the "T" union (**Mot. 1311-08**) from the injector rail.
- Connect the fuel supply pipe union on the injector rail.

FUEL SUPPLY

Fuel flow: Check

13A

D4F or D7F

Special tooling required

Mot. 1311-08 Union for taking fuel pressure measurements.

Equipment required

graduated measuring cylinder

CHECK

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

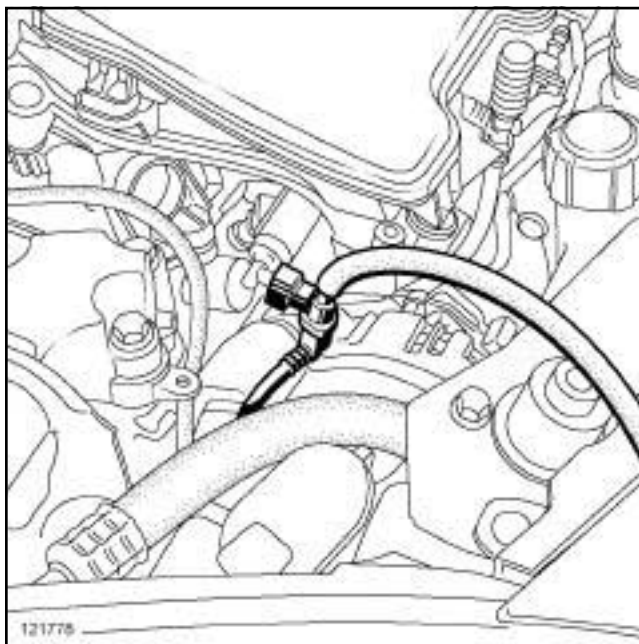
I - PREPARATION OPERATION FOR CHECK

D4F

Remove the oil filler neck.

Disconnect the fuel supply union.

D4F, and 772



121778

Fit a "T" union to the fuel supply union (**Mot. 1311-08**).

Fit a pipe which is long enough to drain the pump into a container to the "T" outlet union.

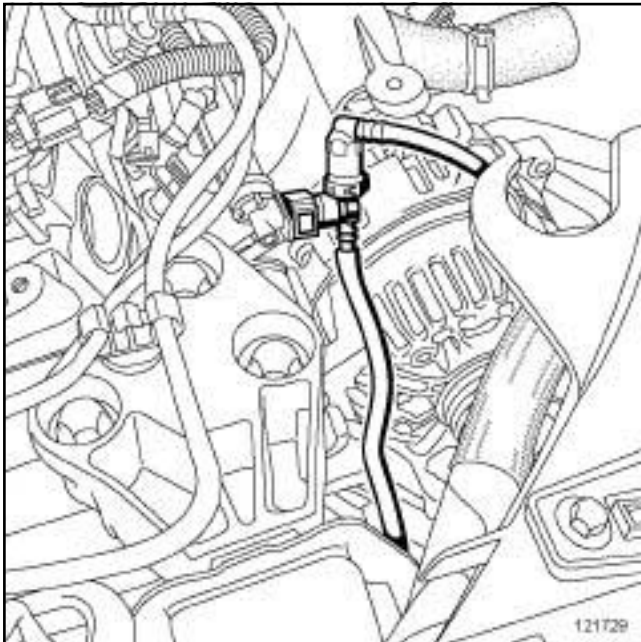
FUEL SUPPLY

Fuel flow: Check

13A

D4F or D7F

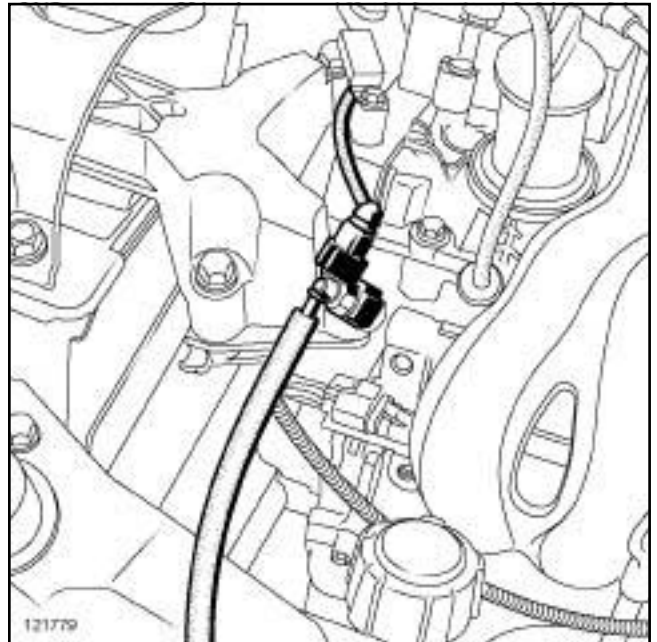
D4F, and 780 or 782



121729

- Fit a "T" union to the fuel supply union (**Mot. 1311-08**).
- Fit a pipe which is long enough to drain the pump into a container to the "T" outlet union.

D7F



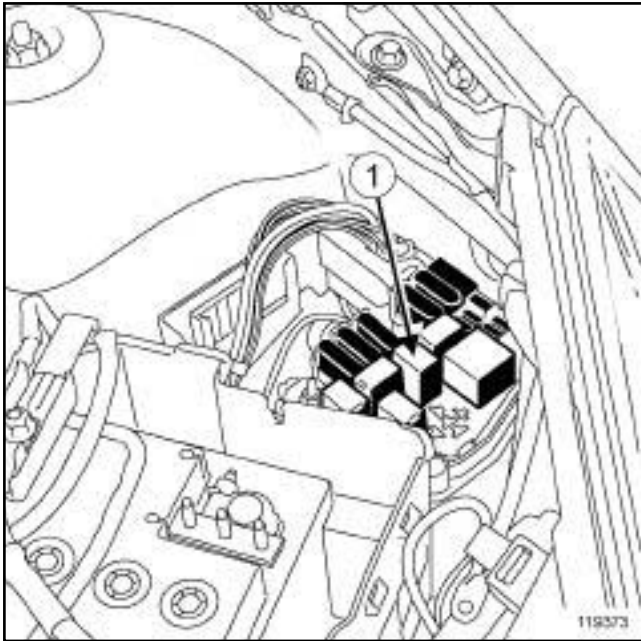
121779

- Fit a "T" union to the fuel supply union (**Mot. 1311-08**).
- Fit a pipe which is long enough to drain the pump into a container to the "T" outlet union.

II - CHECK

- Immerse the pipe into a **graduated measuring cylinder (2000 ml)**.
- Remove the cover from the engine compartment connection unit.

D4F or D7F



119373

- Remove the relay (1) .
- Shunt the relay to supply the electric fuel pump.

Note:

The flow reading should be **80 to 120 l/h**.

III - FINAL OPERATION

- Refit:
 - the fuel pump relay,
 - the cover of the engine compartment connection unit.
- Remove the "T" union (**Mot. 1311-08**).
- Connect the fuel supply union.

D4F

- Refit the oil filler neck.

K4M

Special tooling required

Mot. 1311-01	Pressure gauges and petrol pressure measuring unions.
Mot. 1311-08	Union for taking fuel pressure measurements.

Equipment required

graduated measuring cylinder

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

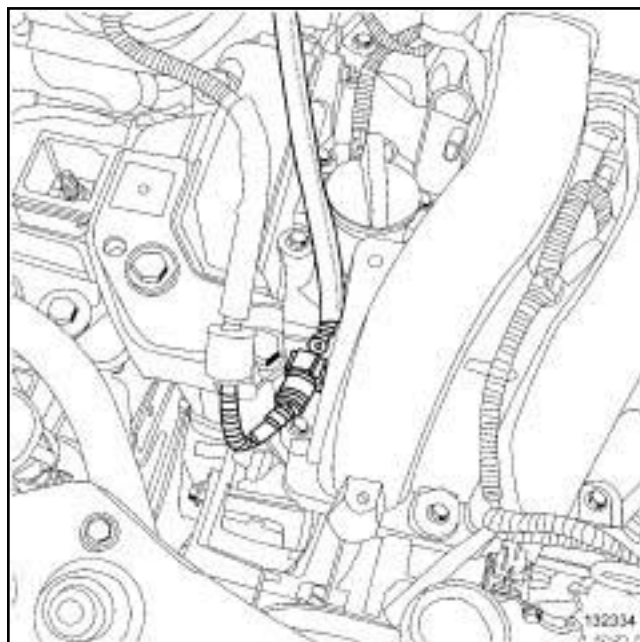
Wear goggles with side protectors for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

I - PREPARATION OPERATION FOR CHECK

- Ensure you have a checking tool (**Mot. 1311-01**) and a "T" union (**Mot. 1311-08**).
- Assemble the long hose of the test tool (**Mot. 1311-01**) and the "T" union (**Mot. 1311-08**).
- Disconnect the fuel supply union on the injector rail.



132334

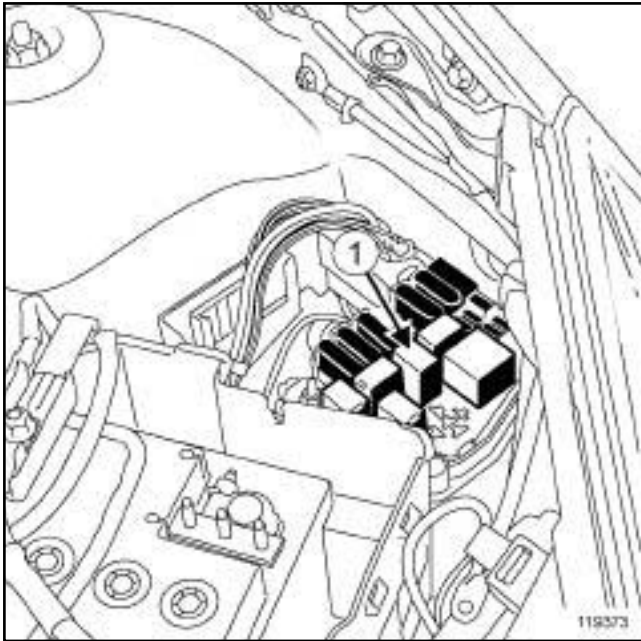
Connect:

- the "T" union (**Mot. 1311-08**) on the injector rail,
- the fuel supply union to the "T" union (**Mot. 1311-08**).

II - FUEL FLOW CHECK

- Immerse the hose in a **2000 ml graduated measuring cylinder**.
- Remove the cover from the engine compartment connection unit.

K4M



119373

- Remove the relay (1) .
- Shunt the relay in order to supply the electric fuel pump.

Note:

The flow reading should be **80 to 120 l/h**.

III - FINAL OPERATION

- Refit:
 - the relay,
 - the engine compartment connection unit cover.
- Disconnect:
 - the fuel supply union on the "T" union (**Mot. 1311-08**),
 - the "T" union (**Mot. 1311-08**) from the injector rail.
- Connect the fuel supply union on the injector rail.
- Separate the test tool (**Mot. 1311-01**) from the "T" union (**Mot. 1311-08**).

Diesel injection: Precautions for the repair

K9K

I - RISKS RELATING TO CONTAMINATION

The high-pressure direct injection system is highly sensitive to contamination. The risks caused by contamination are:

- damage to or destruction of the high pressure injection system,
- a component seizing,
- a component not being properly sealed.

All After-Sales operations must be performed under very clean conditions. Having carried out an operation in good conditions means that no impurities (particles a few microns in size) have penetrated the system during dismantling.

The cleanliness principle must be applied from the filter to the injectors.

What are the sources of contamination?

- metal or plastic swarf,
- paint,
- fibres:
 - cardboard,
 - brushes,
 - paper,
 - clothing,
 - cloth,
- foreign bodies such as hair,
- ambient air,
- etc.

WARNING

Do not clean the engine with a high pressure cleaner to prevent damaging the connections.

1 - Cleaning cloths

Use lint-free cleaning cloths (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

It is prohibited to use cloths or ordinary paper towels: these produce lint and lose fibres, which then contaminate the fuel circuit.

Each cloth must only be used once.

2 - Blanking plugs

The blanking plugs are used to cap the fuel circuit once it is opened and to therefore prevent contaminants from entering.

A set of blanking plugs should be used once only and used plugs must be discarded after use: once used, the plugs are soiled and cleaning them is not sufficient to make them reusable.

Unused plugs must also be discarded and must not be used when carrying out work on an injection system.

Part number for set of blanking plugs: (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

Note:

There is no specific set of blanking plugs for S9U and S9W engines. In order to comply with the cleanliness recommendations, use plugs that are compatible with the blanking plug sets for F9Q, G9U, G9T or ZD3 engines.

3 - Protective bags

Use hermetically-resealable plastic bags, using adhesive tape, for example, to store components which will be refitted and reused. Stored parts will therefore be less subject to the risk of contamination.

These are single-use bags: after use they must be discarded.

4 - Cleaning products

Two cleaning products can be used:

- an injector cleaner (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- an aerosol spray brake cleaner (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

To use the injector cleaner, be sure to have a clean brush in good condition (the brush must not lose any bristles) as well as a clean container which has no impurities in it.

Note:

Use a new injector cleaner each time work is carried out (a used cleaning agent will contain impurities).

Diesel injection: Precautions for the repair

K9K

II - ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

- 1) Carry out the work in a clean working area and take care to protect removed components from dust using plastic bags which are hermetically-resealable, for example.
- 2) Always order the following from the Parts Department before carrying out work:
 - a new set of blanking plugs, specific to the engine,
 - enough lint-free cleaning cloths.
 - one of the two cleaning products for fuel pipe unions,
 - the parts that are always to be replaced after each removal operation, mentioned in the operational procedures specific to the vehicle (see related Workshop Repair Manual).
- 3) Wear safety goggles fitted with side shields to prevent the cleaning product from splashing the eyes.
- 4) Wear leaktight protective gloves (Nitrile type) to avoid prolonged contact with the skin.

Note:

When using leather protective gloves, wear a pair of leaktight protective gloves (Nitrile type) over the top.

- 5) Before carrying out work on the injection system, use plastic bags or clean rags, for example, to protect:
 - the accessories and timing belts,
 - the electrical accessories (starter, alternator, power-assisted steering pump, sensors and electrical connectors),
 - the flywheel face.

III - INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Wash your hands before and while carrying out the work.

Replace leaktight protective gloves (Nitrile type) when they are soiled or damaged.

All components removed from the injection system must be stored in a hermetically sealed plastic bag once they have been capped.

Reseal the bag hermetically, for example using adhesive tape, even if the bag must be opened shortly afterwards: ambient air can be a source of impurities.

After opening the fuel circuit, the use of brushes, cleaning agents, air blow guns, rifle-type brushes or standard cloths is strictly prohibited: these items are likely to allow impurities to enter the system.

When replacing a component with a new one or when refitting it after storing it in a plastic bag, do not unpack it until it is time to fit it on the vehicle.

IV - CLEANING

There are currently two procedures for cleaning the fuel circuit before opening it in order to carry out work in the workshop.

These procedures enable the fuel circuit to be cleaned to prevent contamination from entering: they both have the same end result and neither is preferred over the other.

1 - Cleaning using injector cleaner

Clear the access to the unions that need opening, following the work procedures specific to the vehicle (see the relevant Workshop Repair Manual).

Protect sections which are sensitive to fuel leaks.

Pour the injector cleaning agent into a container which is free from impurities.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

Dip a clean brush, which is not shedding bristles, into the container of injector cleaning agent.

IMPORTANT

Wear goggles with side protectors for this operation.

Clean the unions carefully using the brush and the injector cleaning agent.

Blast the components that have been cleaned with compressed air (tools, workbench, and also parts, unions and around the injection system). Check that no bristles from the brush have come away and that the area is clean.

Wipe the sections that were cleaned with fresh cleaning cloths.

Open the circuit at the unions and immediately fit the relevant blanking plugs.

Diesel injection: Precautions for the repair

K9K

WARNING

To prevent impurities from entering, once the fuel circuit is opened, it must not be blasted with compressed air. Use cleaning cloths only, if necessary.

2 - Using the brake cleaner

Clear the access to the unions that need opening, following the work procedures specific to the vehicle (see the relevant Workshop Repair Manual).

Protect sections which are sensitive to fuel leaks.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

Wear goggles with side protectors for this operation.

Spray the brake cleaner onto the unions to be opened.

Clean the unions carefully using fresh cleaning cloths.

Blast the components that have been cleaned with compressed air (tools, workbench, and also parts, unions and around the injection system). Check that no bristles from the brush have come away and that the area is clean.

Open the circuit at the unions and immediately fit the relevant blanking plugs.

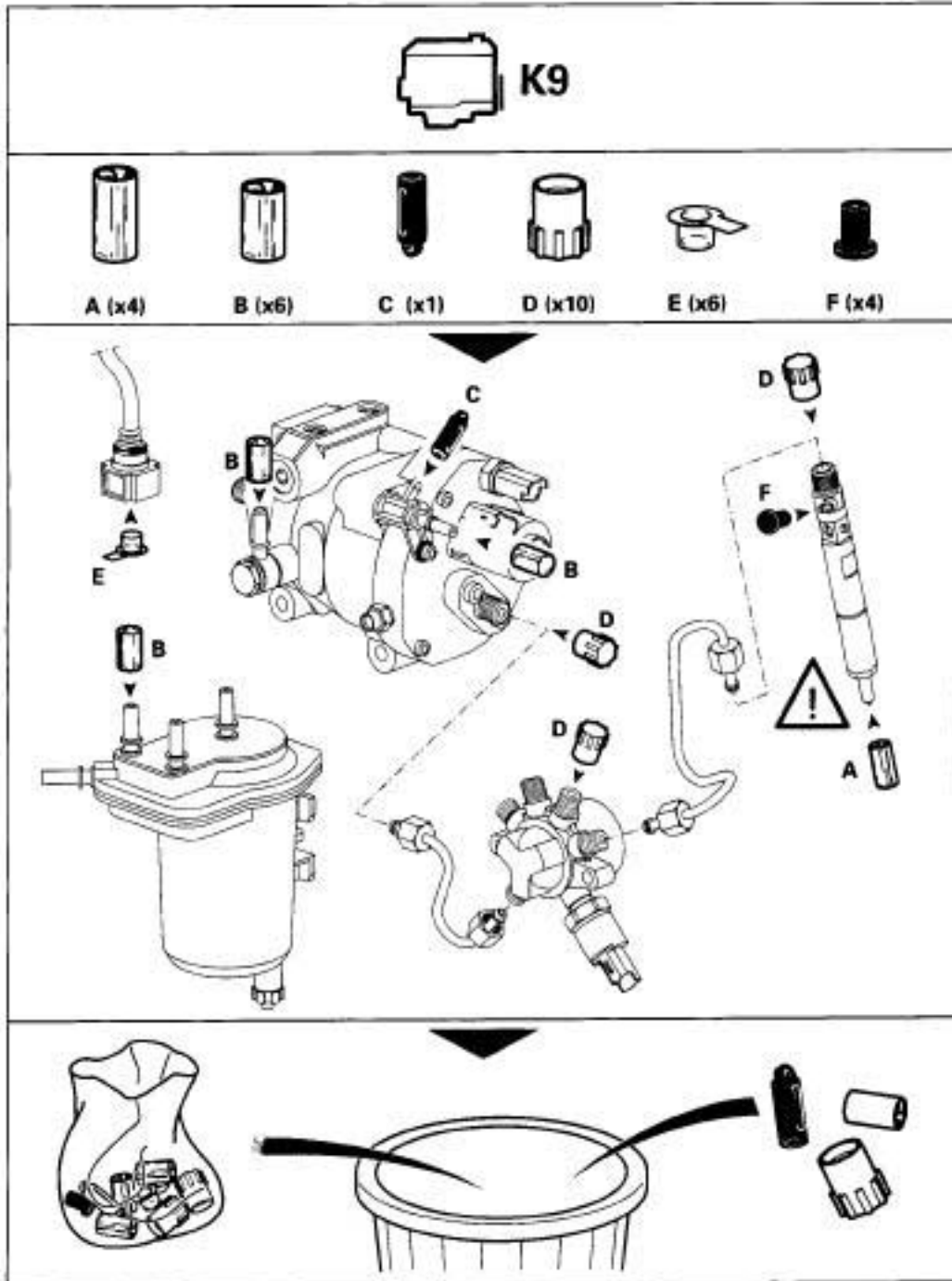
WARNING

To prevent impurities from entering, once the fuel circuit is opened, it must not be blasted with compressed air. Use cleaning cloths only, if necessary.

Diesel injection: Precautions for the repair

K9K

Set of plugs for DELPHI injection:



20977

DIESEL INJECTION

Diesel injection: Precautions for the repair

13B

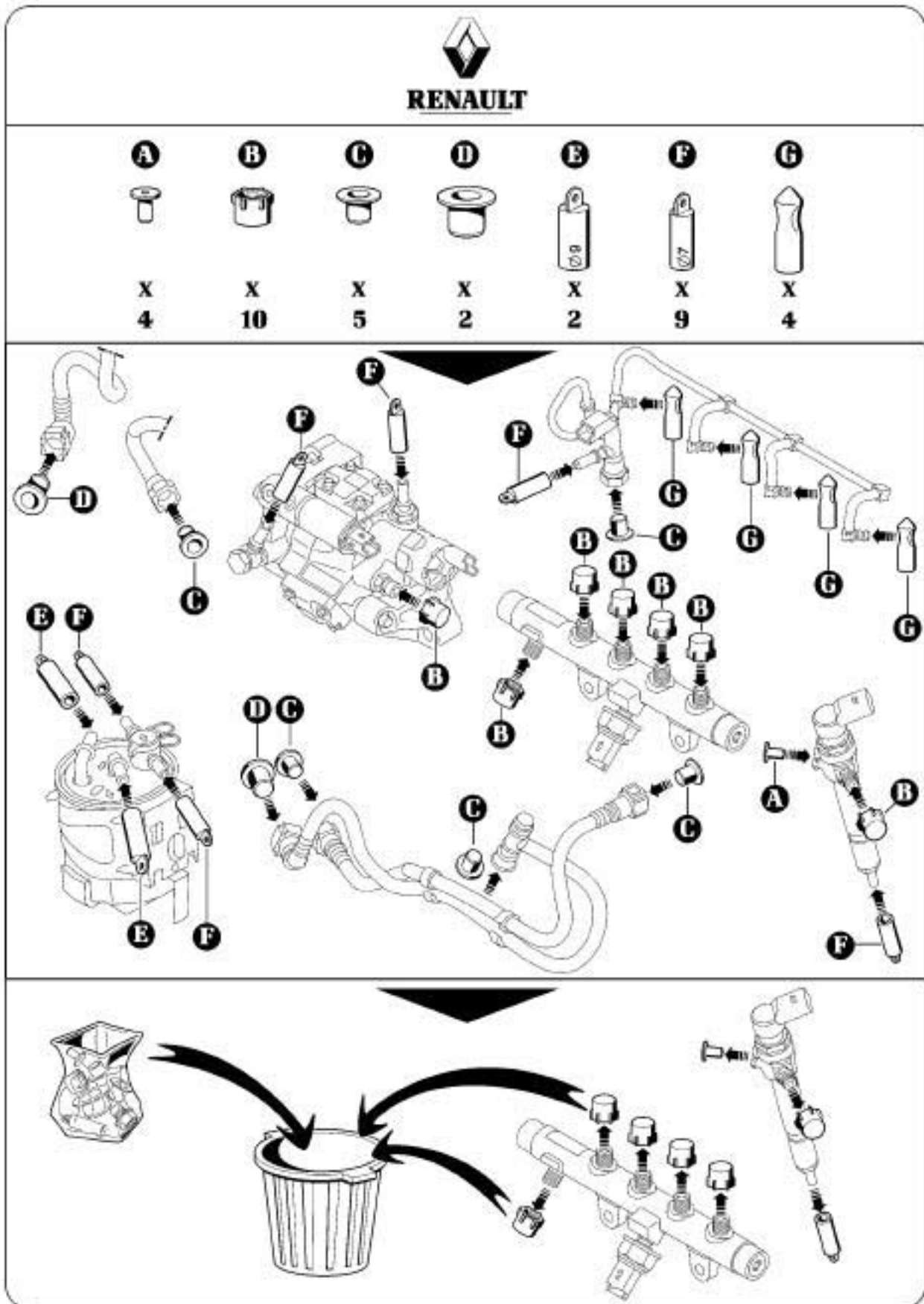
K9K

20977

Diesel injection: Precautions for the repair

K9K

Set of plugs for SIEMENS injection:



T13430

DIESEL INJECTION
Diesel injection: Precautions for the repair

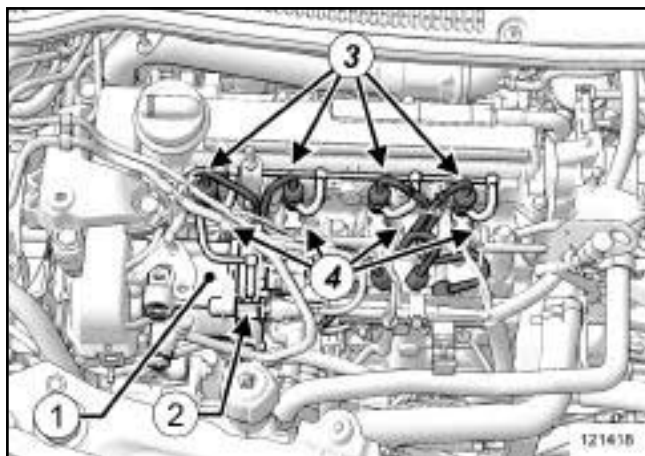
13B

K9K

113430

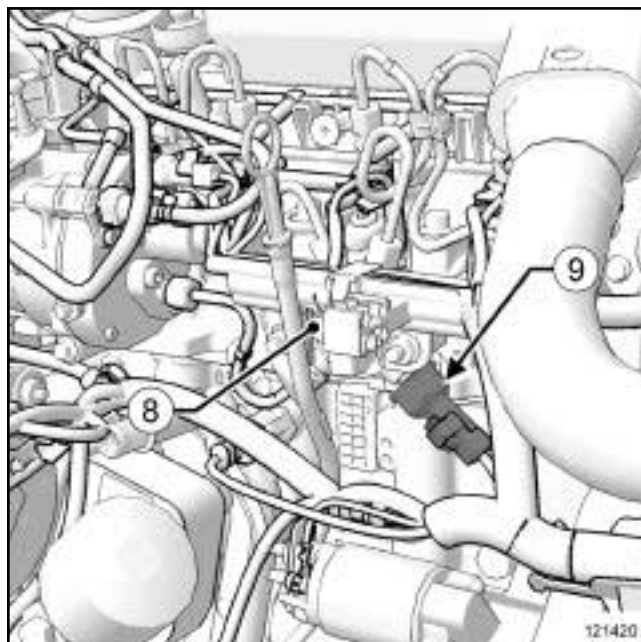
Diesel injection: List and location of components

K9K, and 740



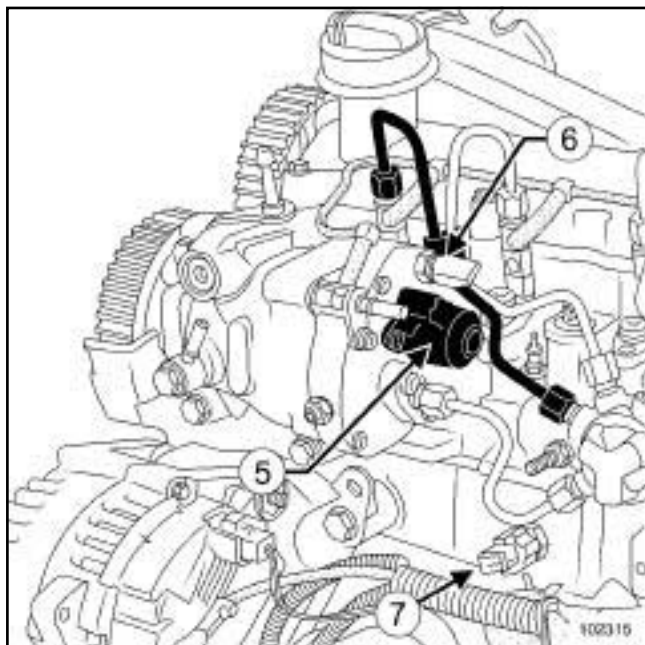
121418

- (1) High pressure pump
- (2) Venturi
- (3) Injectors
- (4) Heater plugs



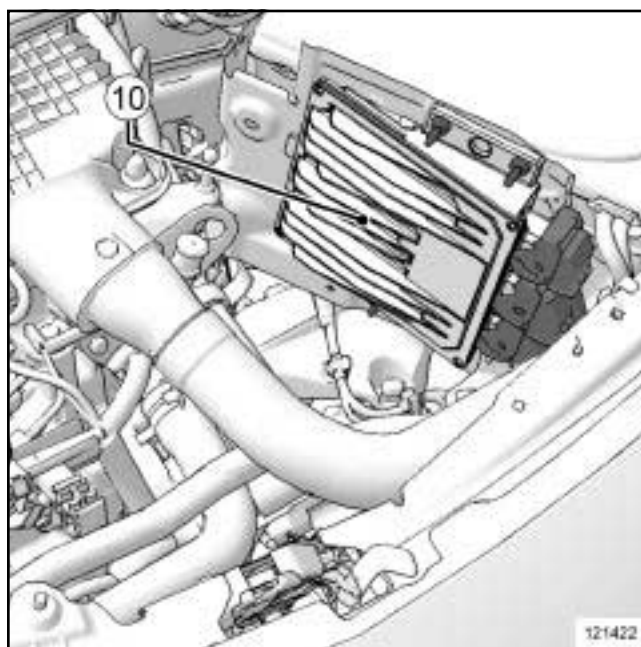
121420

- (8) Injector rail
- (9) Injector rail pressure sensor



102315

- (5) Fuel flow actuator
- (6) Diesel fuel temperature sensor
- (7) Accelerometer

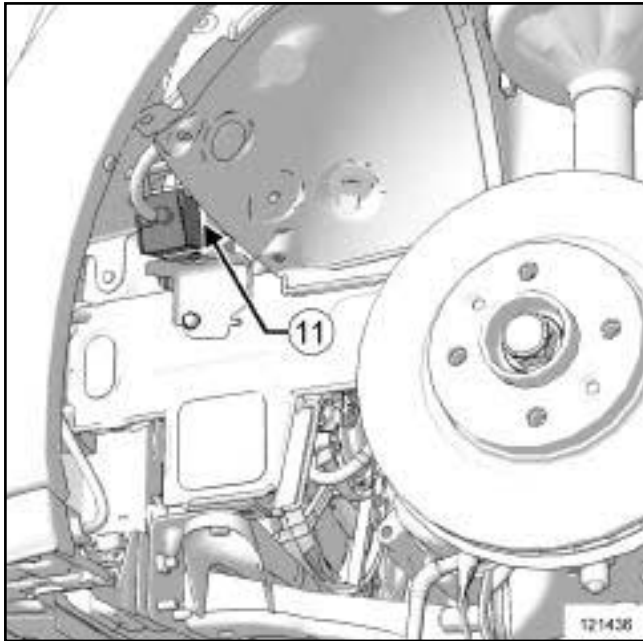


121422

- (10) Diesel injection computer

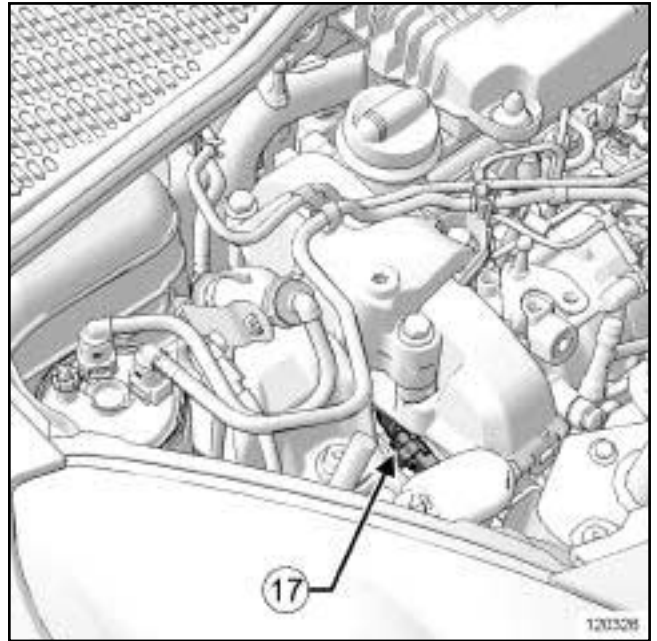
Diesel injection: List and location of components

K9K, and 740



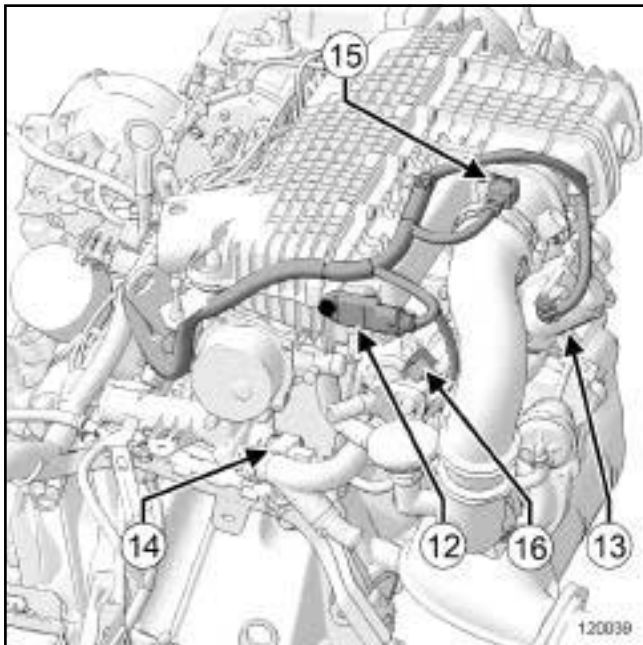
121436

(11) Pre-postheating unit



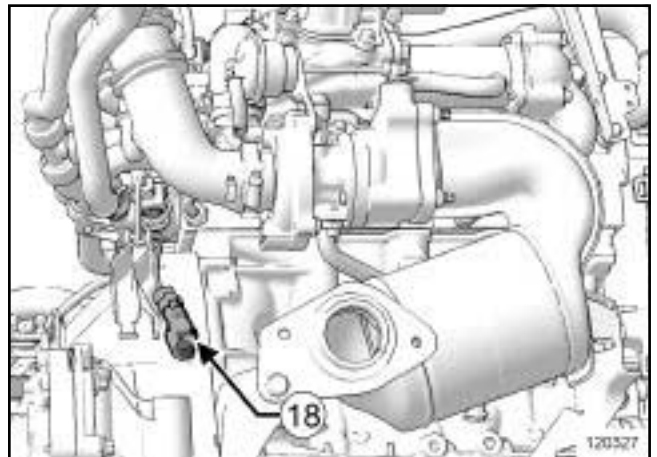
120326

(17) Cylinder position sensor



120039

- (12) Turbocharging pressure sensor
- (13) Exhaust gas recirculation solenoid valve
- (14) Coolant temperature sensor
- (15) Turbocharger upstream inlet air temperature sensor
- (16) Turbocharger downstream inlet air temperature sensor

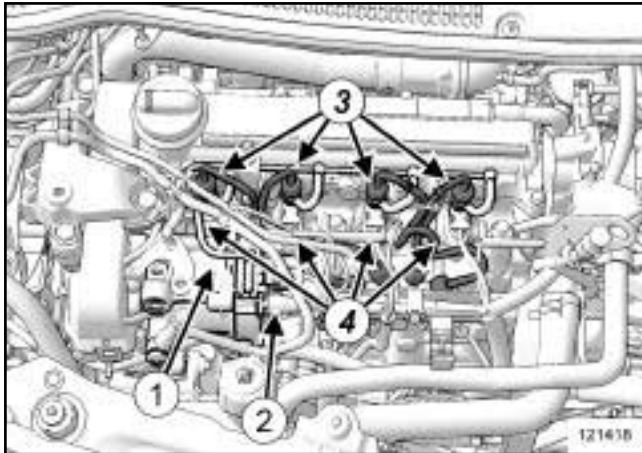


120327

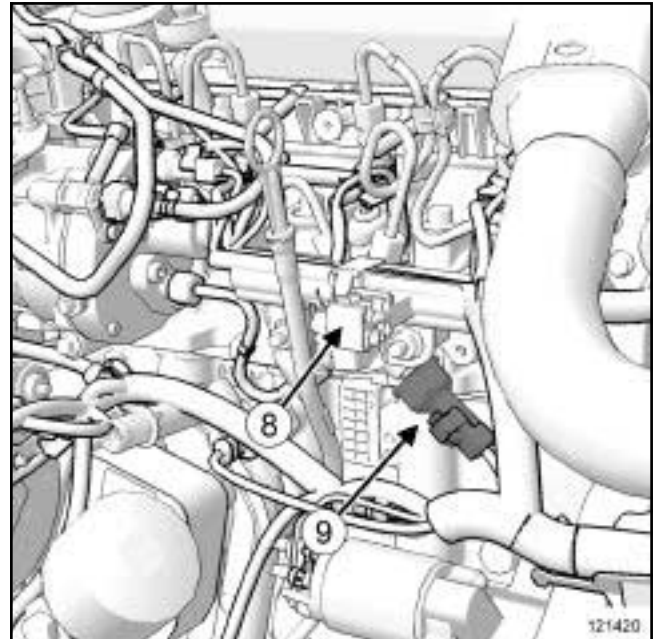
(18) Engine speed and position sensor

Diesel injection: List and location of components

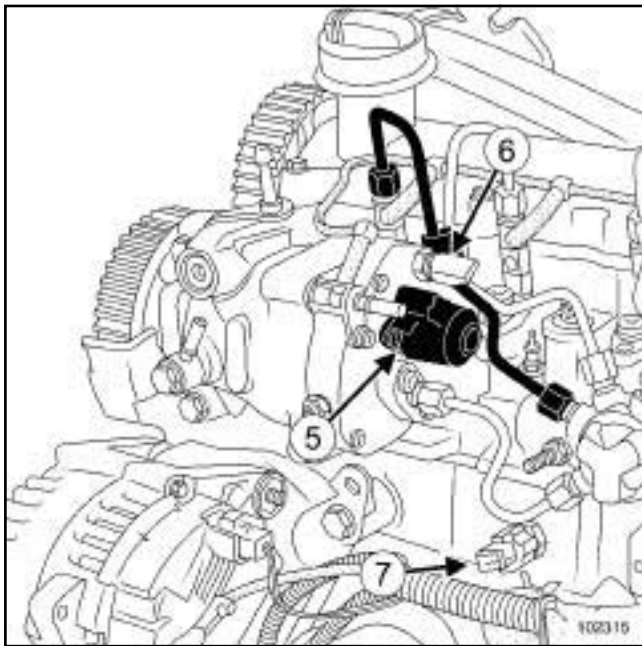
K9K, and 718



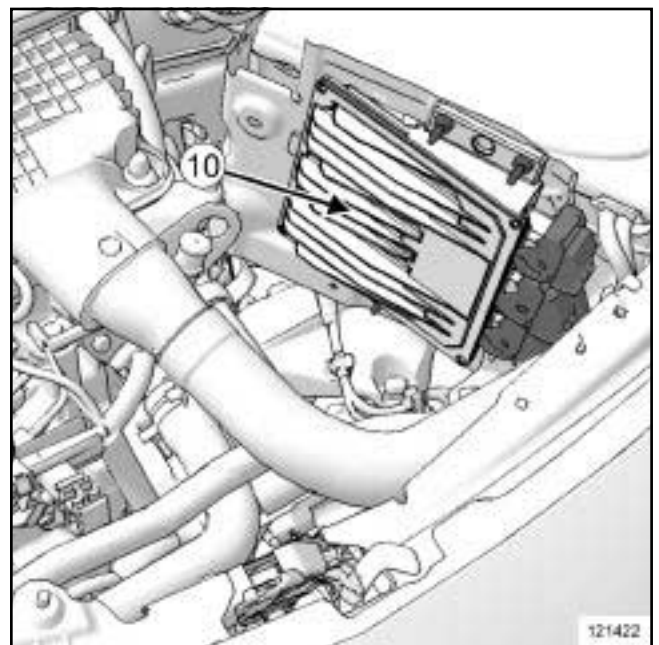
- (1) High pressure pump
- (2) Venturi
- (3) Injectors
- (4) Heater plugs



- (8) Injector rail
- (9) Injector rail pressure sensor



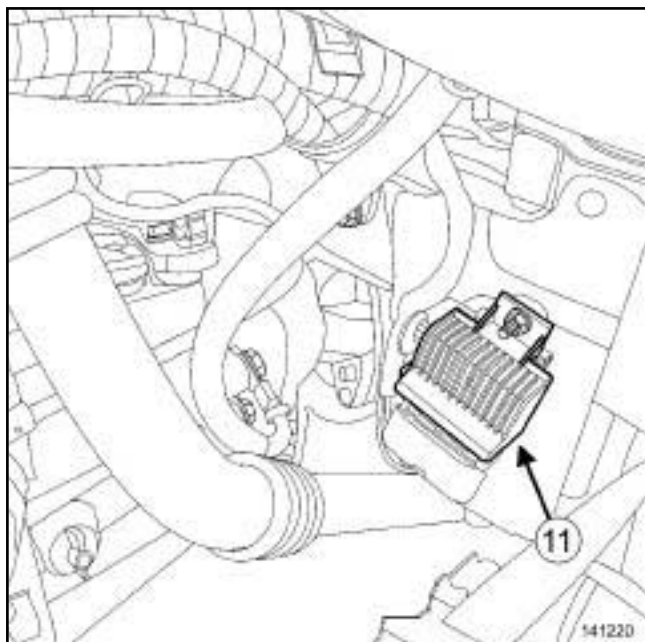
- (5) Fuel flow actuator
- (6) Diesel temperature sensor
- (7) Accelerometer



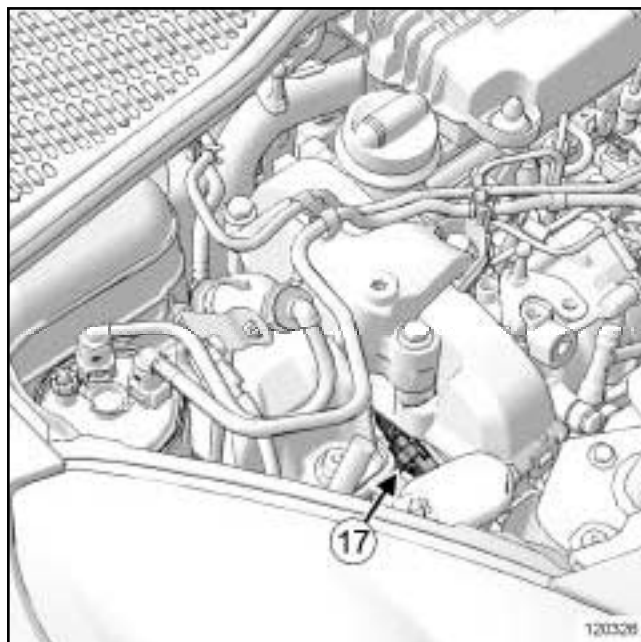
- (10) Diesel injection computer

Diesel injection: List and location of components

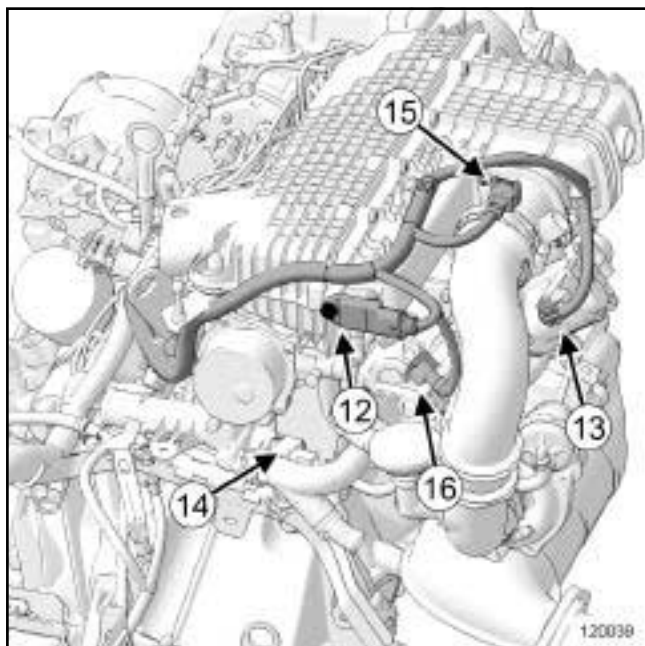
K9K, and 718



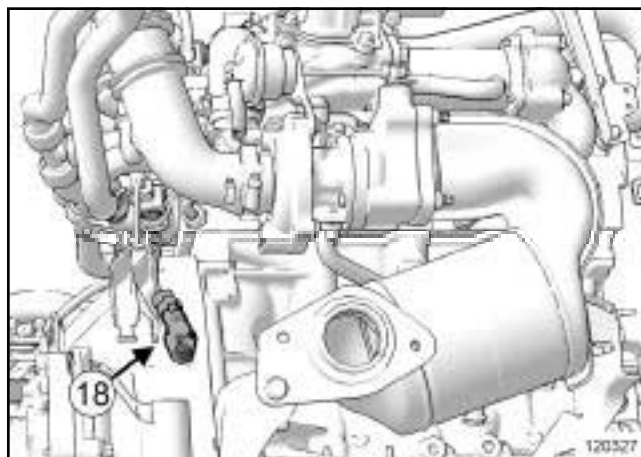
(11) Pre-postheating unit



(17) Cylinder reference sensor



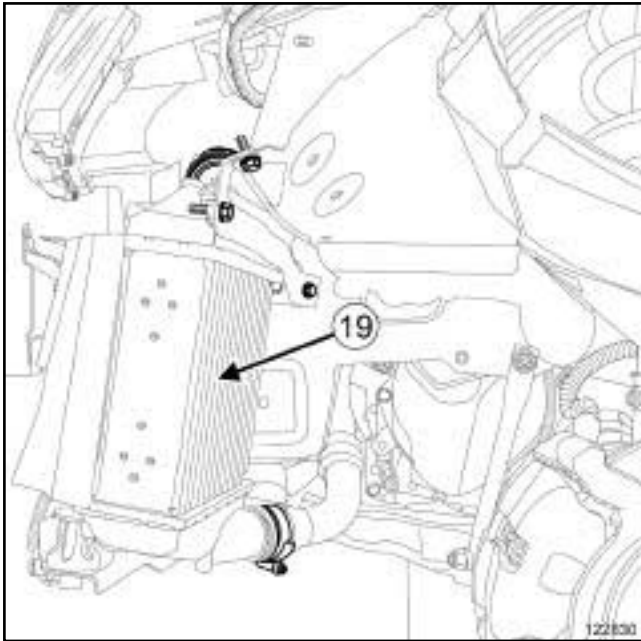
- (12) Turbocharger pressure sensor
- (13) Exhaust gas recirculation solenoid valve
- (14) Coolant temperature sensor
- (15) Air inlet temperature sensor upstream of the turbocharger
- (16) Air inlet temperature sensor downstream of the turbocharger



(18) Crankshaft position sensor

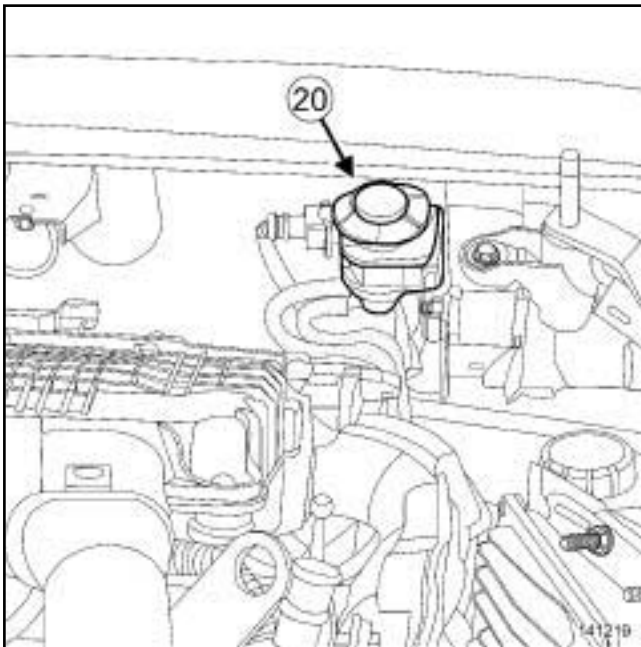
Diesel injection: List and location of components

K9K, and 718



122830

(19) Intercooler



141219

(20) Turbocharging pressure solenoid valve

Diesel injection computer: Removal - Refitting

K9K

Tightening torques

computer nuts	4 Nm
---------------	------

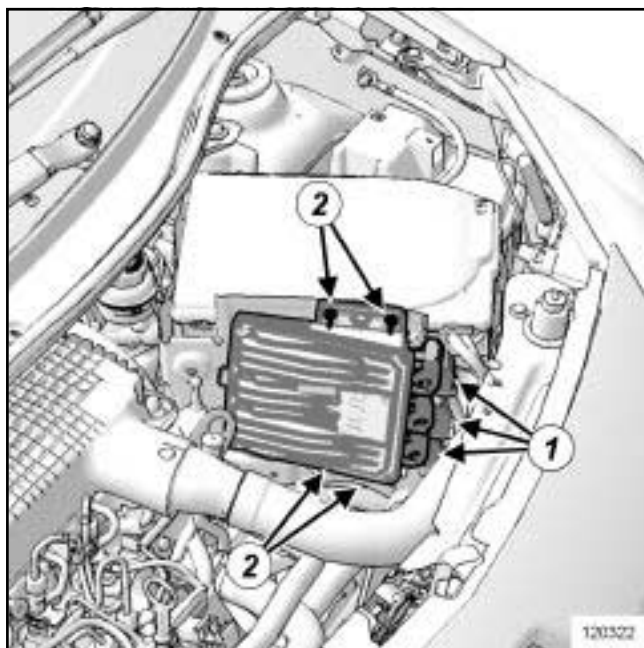
To configure the diesel injection computer (see **MR 413 Fault finding, 13B, Diesel injection, Fault finding - Replacement of components**).

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove the front engine cover.
- Disconnect the battery ((see **Battery: Removal - Refitting**)).

II - OPERATION FOR REMOVAL OF PART CONCERNED



120322

- Disconnect the injection computer connectors (1) .
- Remove the nuts (2) from the computer on the battery tray.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Position the new injection computer making sure the positioning lug is engaged, then fit the computer onto the studs.
- Refit the computer nuts on the battery tray.

- Torque tighten the **computer nuts (4 Nm)**.

- Connect the injection computer.

II - FINAL OPERATION.

- Connect the battery ((see **Battery: Removal - Refitting**)).

- Refit the engine cover.

Camshaft position sensor: Removal - Refitting

C44, and K9K

Special tooling required

Mot. 1672 Lower engine support.

Tightening torques

camshaft position sensor bolt	8 Nm
-------------------------------	-------------

PARTS AND CONSUMABLES FOR THE REPAIR WORK

Parts always to be replaced:

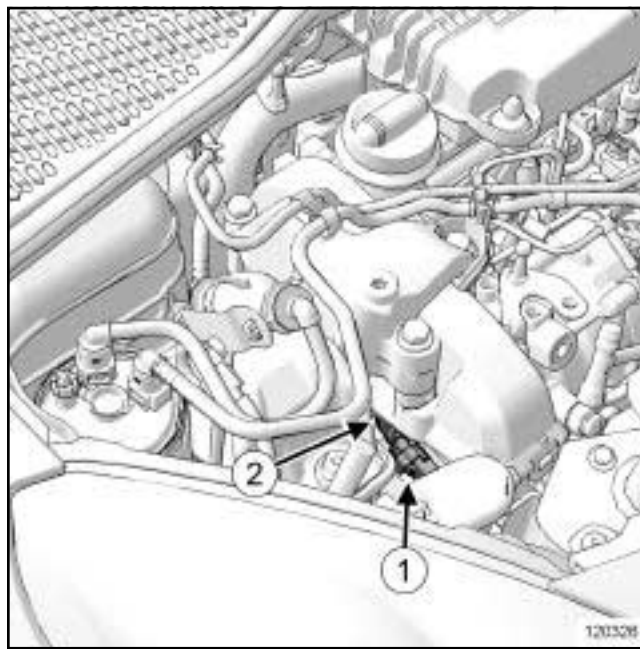
- axle subframe bolt.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).
- Remove the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) .
- Lift the engine with the support of the (**Mot. 1672**) so as to be able to easily access the camshaft position sensor bolt.

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Disconnect the connector (1) from the camshaft position sensor.
- Remove:
 - the bolt (2) from the camshaft position sensor,
 - the camshaft position sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the camshaft position sensor,
 - the camshaft position sensor bolt.
- Torque tighten the **camshaft position sensor bolt (8 Nm)**.
- Connect the camshaft position sensor connector.

II - FINAL OPERATION.

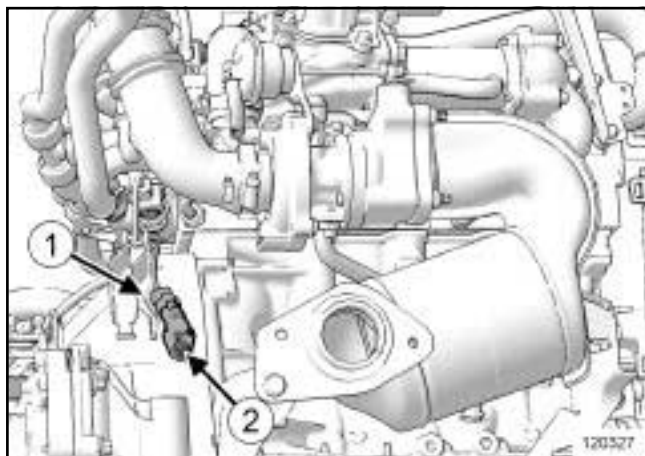
- Lower the engine with the support of the (**Mot. 1672**) to position the engine, approximately in its normal position.
- Refit the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) ,

Crankshaft position sensor: Removal - Refitting

C44, and K9K

REMOVAL**I - REMOVAL PREPARATION OPERATION**

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).

II - OPERATION FOR REMOVAL OF PART CONCERNED

120327

- Disconnect the crankshaft position sensor connector (1) from underneath the vehicle.
- Remove:
 - the crankshaft position sensor bolt (2) ,
 - the crankshaft position sensor.

REFITTING**REFITTING OPERATION FOR PART CONCERNED**

- Refit:
 - the crankshaft position sensor,
 - the crankshaft position sensor bolt.
- Tighten the crankshaft position sensor bolt.
- Connect the crankshaft position sensor electrical connector from underneath the vehicle.

High pressure pump: Removal - Refitting

K9K

Special tooling required	
Mot. 1672	Lower engine support.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1606	High pressure pump pulley support tool.
Mot. 1525	Gear extractor for tapered hub injection pump.
Mot. 1525-02	Adapter claws for Mot. 1525.

Equipment required
Diagnostic tool

Tightening torques	
high pressure pump bolts on the cylinder head	23 N.m
high pressure pump pulley nut	70 N.m
cylinder head suspended mounting bolts	25 N.m

IMPORTANT

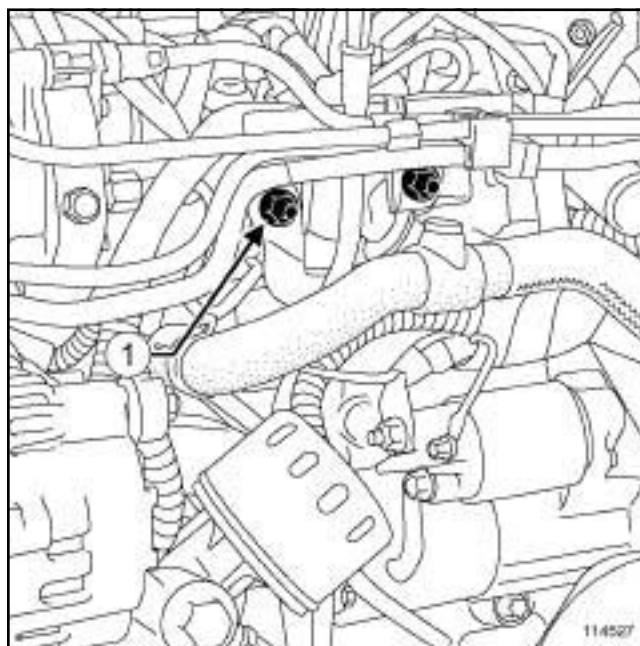
Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page 13B-1) .

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the front engine cover.
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).



114527

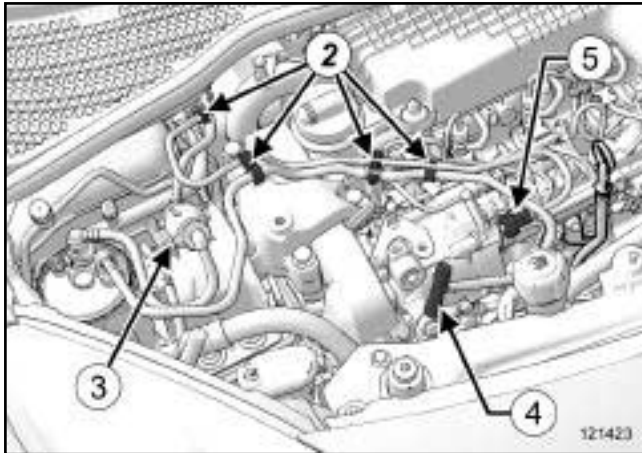
- Remove:
 - the dipstick,
 - the oil level dipstick nut (1) ,
 - the oil level dipstick guide.
- Plug the oil level dipstick guide inlet opening on the cylinder block.
- Disconnect the following connectors :
 - the heater plugs,
 - of the injectors,
 - the flow actuator,
 - the diesel temperature sensor.
- Protect the alternator from fuel outflow.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K



WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

Clean the union on the diesel fuel supply pipe high pressure pump (see **13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1**) .

Unclip:

- the fuel supply and return pipes at (2) ,
- the priming pump (3) .

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

Disconnect the high pressure pump from:

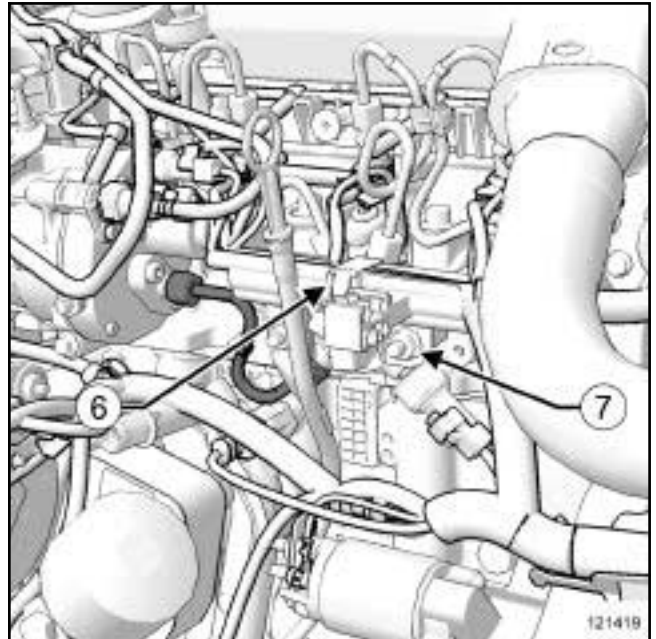
- the diesel supply pipe (4) ,
- the diesel return pipe (5) to the diesel filter.

Insert the blanking plugs.

Remove the fuel supply pipes from the pump.

Remove:

- the fuel filter (see **13A, Fuel supply, Fuel filter: Removal - Refitting, page 13A-4**) ,
- the fuel filter mounting bolts,
- the fuel filter holder,



121419

Unclip the engine wiring channel at (6) .

Move the engine wiring away from the engine wiring channel.

Remove:

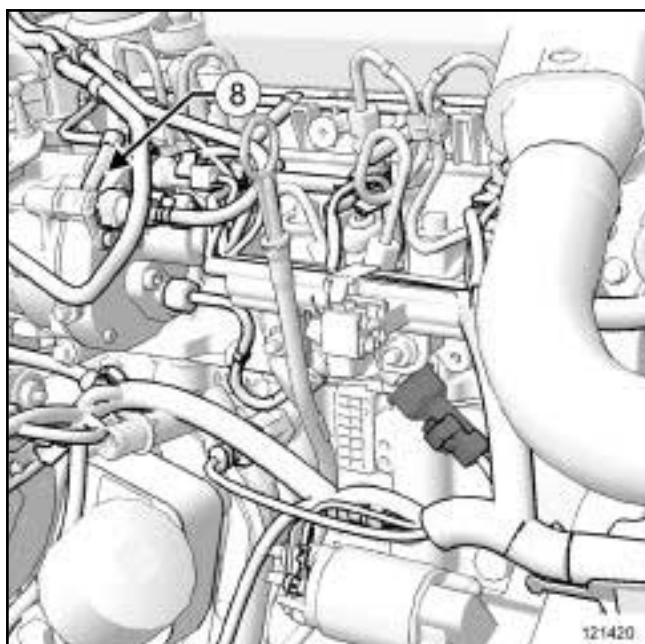
- the nut (7) from the channel,
- the channel,
- the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting, page 19D-18**) .

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K



121420

❑

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

Disconnect the diesel return pipe (8) on the venturi.

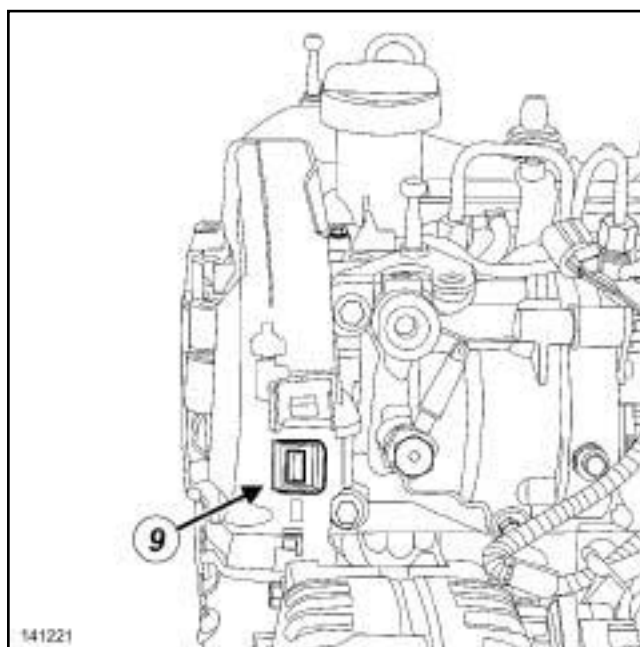
- ❑ Insert the blanking plugs.
- ❑ Remove the high pressure pipe between the pump and the rail (see 13B, Diesel injection, High pressure pipe between pump and rail: Removal - Refitting, page 13B-35)
- ❑ Remove the right-hand suspended engine mounting (see 19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-13) .
- ❑ Lift the engine a few centimetres using the (Mot. 1672).

Note:

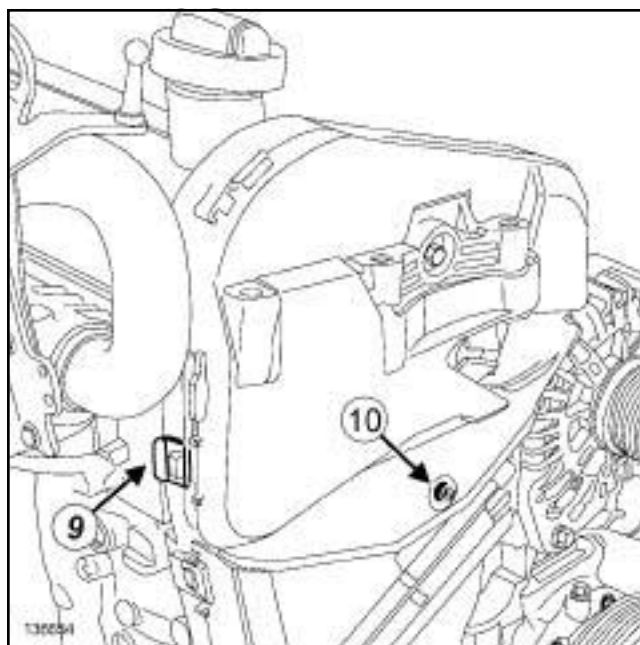
Do not disconnect the right-hand driveshaft when raising the engine.

- ❑ Remove the camshaft position sensor (see 13B, Diesel injection, Camshaft position sensor: Removal - Refitting, page 13B-14) .

K9K, and 718



141221



136654

- ❑ Unclip the upper timing cover at (9) .

❑ Remove:

- the plastic bolt (10) ,
- the upper timing cover.

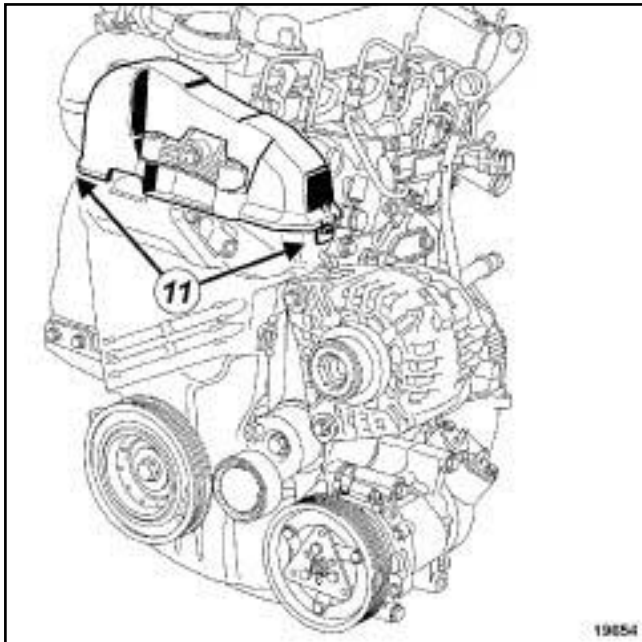
DIESEL INJECTION

High pressure pump: Removal - Refitting

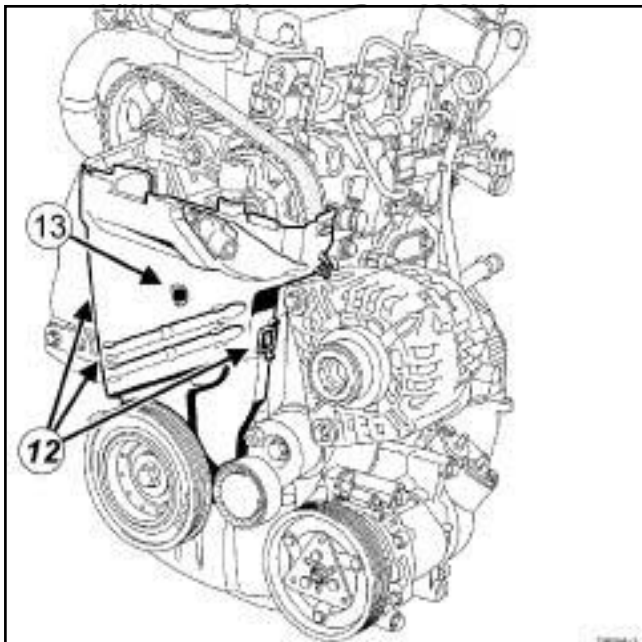
13B

K9K

K9K, and 740



19654
19654



19654-1

- Remove the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**)
- Unclip the upper timing cover at **(11)** .
- Remove the upper timing cover.
- Unclip the lower timing cover at **(12)** .
- Remove:
 - the plastic bolt **(13)** on the lower timing cover,

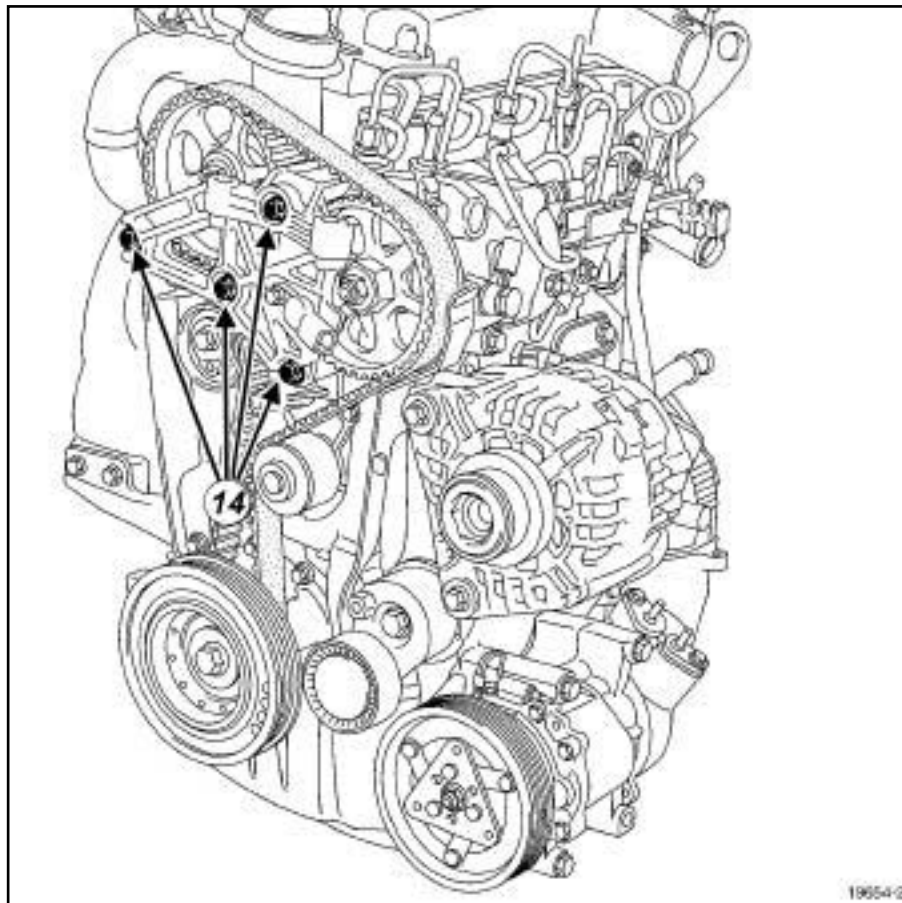
- the lower timing cover.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K



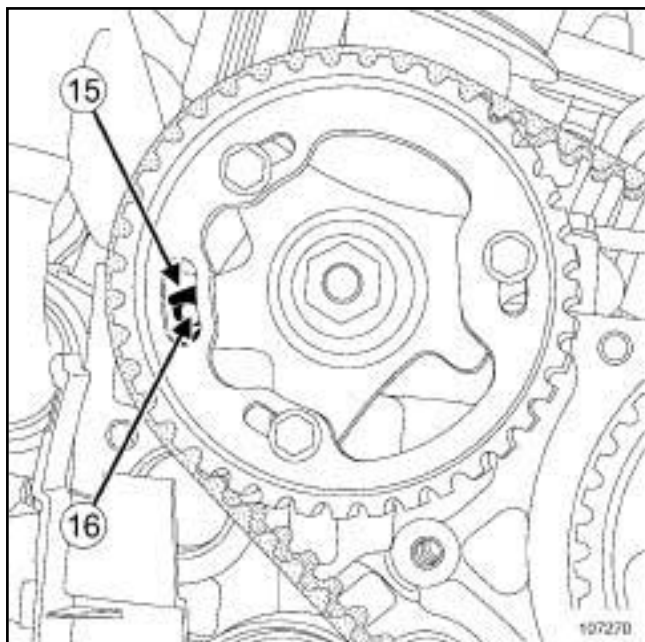
19654-2
19654-2

Remove:

- the bolts (14) from the cylinder head suspended mounting,
- the suspended mounting on the cylinder head.

High pressure pump: Removal - Refitting

K9K

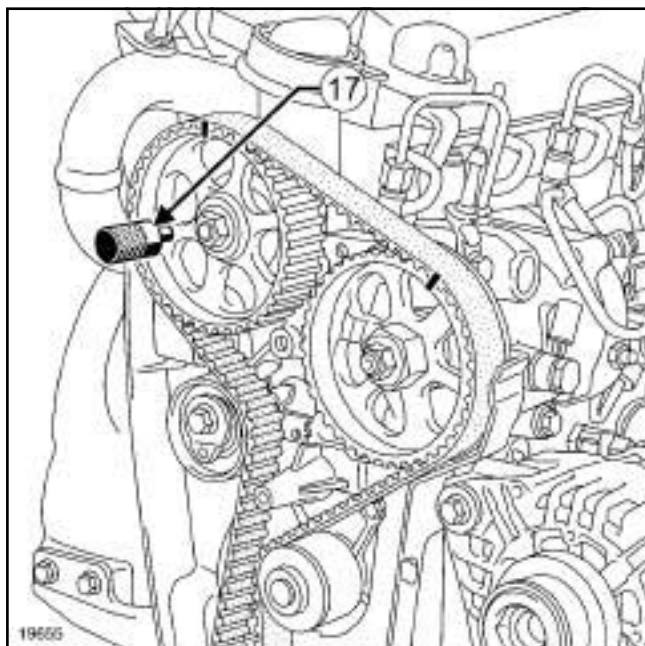


107270

- Position the engine at Top Dead Centre. The camshaft pulley hole (15) should be opposite the cylinder head hole (16) .

Note:

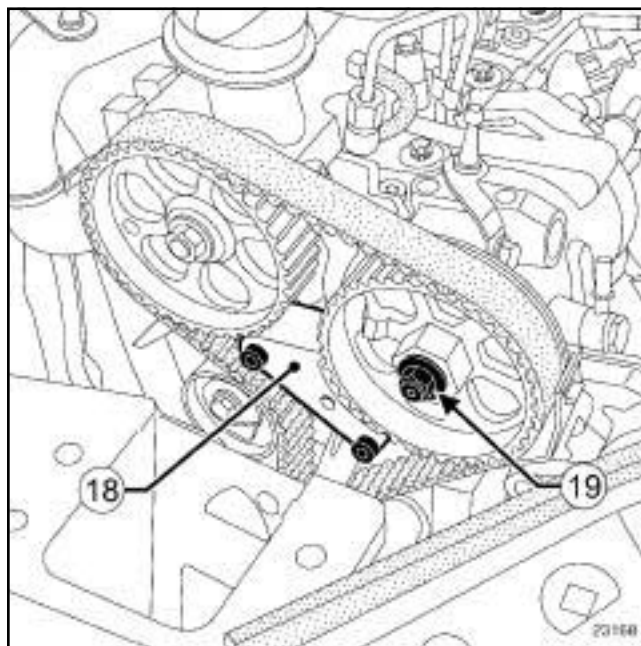
Never run the engine in the opposite direction to that of normal operation.



19655

- Insert the (Mot. 1430) (17) in the camshaft pulley hole and in the cylinder head hole to check that the engine is correctly positioned at top dead centre.

- Remove the (Mot. 1430) once the engine is in position.



23168

- Fit the (Mot. 1606) (18) on the cylinder head.

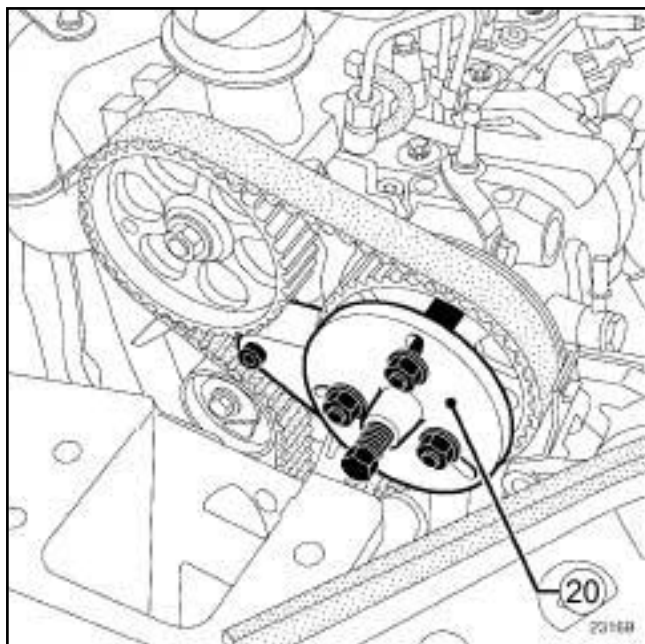
Note:

If necessary, turn the engine slowly to adjust the position of the (Mot. 1606) on the high pressure pump pulley teeth.

- Immobilise the high pressure pump pulley using a clé de 32 mm then remove the nut (19) from the pulley.

High pressure pump: Removal - Refitting

K9K



23169

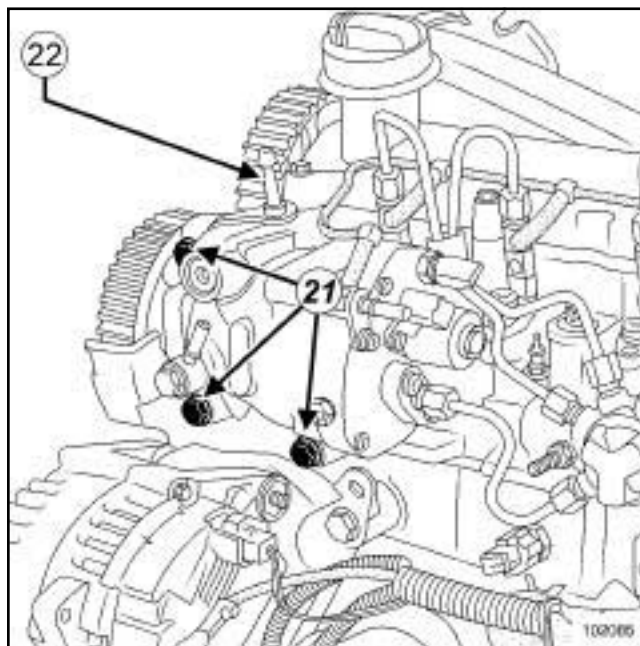
- Fit the **(Mot. 1525)** (20) with the **(Mot. 1525-02)** on the high pressure pump pulley.

Note:

If necessary, remove the spacer at the end pushrod of the **(Mot. 1525)** to improve the positioning.

- Screw the **(Mot. 1525)** pushrod until it makes contact with the high pressure pump shaft.
- Check that the **(Mot. 1525)** pushrod is correctly orientated and is pressing against the high pressure pump shaft. adjust the tool if necessary.

II - OPERATION FOR REMOVAL OF PART CONCERNED



102085

- Remove:
 - the bolts (21) from the high pressure pump on the cylinder head,
 - the air filter unit bracket (22) .
- Gradually screw the pushrod of the **(Mot. 1525)** until the high pressure pump becomes detached.

Note:

Guide and support the high pressure pump as it is being removed using the **(Mot. 1525)**.

- Remove the high pressure pump.

Note:

If the high pressure pump is being reused, keep it in a sealed bag during the removal operation.

- Remove the **(Mot. 1525)** and **(Mot. 1525-02)** from the high pressure pump pulley.

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K

REFITTING

I - REFITTING PREPARATION OPERATION

□

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

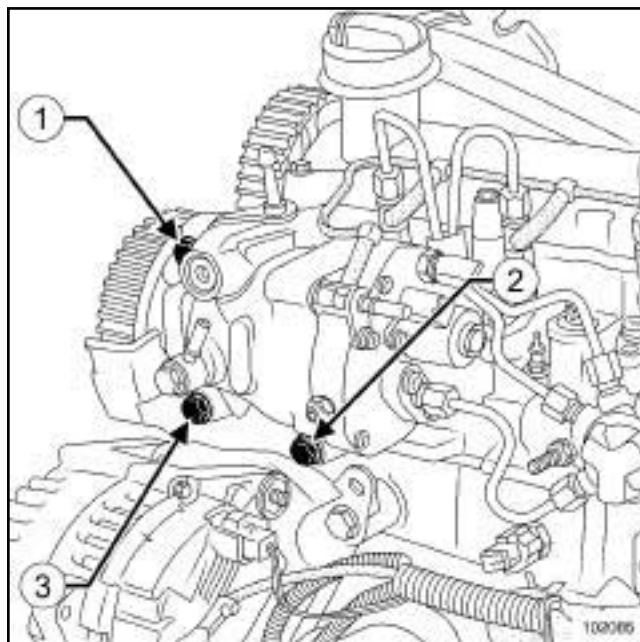
- **parts always to be replaced: Injection pump sprocket nut**
- **parts always to be replaced: Front sub-frame bolt**

II - REFITTING OPERATION FOR PART CONCERNED

- Check that there is an indexing pin on the high pressure pump shaft.
- Position the high pressure pump on the cylinder head whilst inserting it in its pulley.

Note:

Check that the high pressure pump shaft is correctly orientated in relation to the pulley.



102085

- Fit the air filter unit bracket.
- Fit the high pressure pump bolts on the cylinder head, without tightening them, until contact is made.
- Tighten to torque and in order the **high pressure pump bolts on the cylinder head (23 N.m)**.
- Refit the high pressure pump pulley, holding the high pressure pump pulley with a **32 mm** spanner.
- Torque tighten the **high pressure pump pulley nut (70 N.m)** while holding the high pressure pump pulley using a **32 mm** spanner.
- Check that the timing belt is correctly positioned and in good condition.
- Remove the **(Mot. 1606)** from the cylinder head.

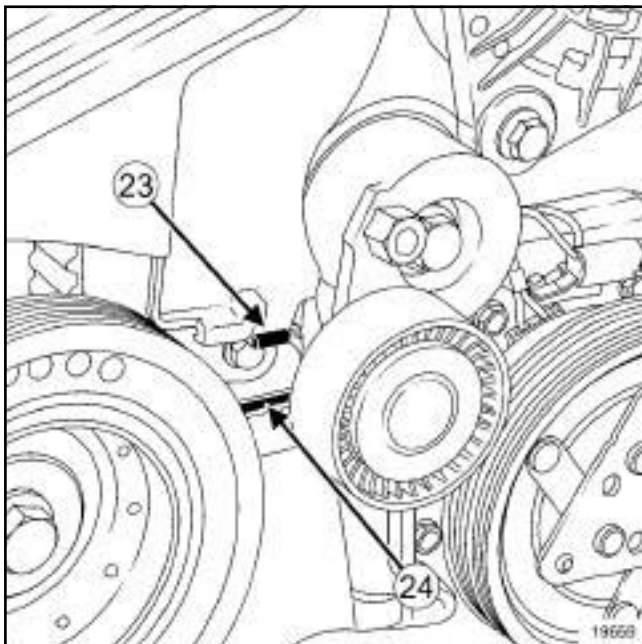
III - FINAL OPERATION

- Refit the suspended mounting on the cylinder head.
- Torque tighten the **cylinder head suspended mounting bolts (25 N.m)**.

High pressure pump: Removal - Refitting

K9K

K9K, and 740



19659

- Refit the lower timing cover.

Note:

Make sure that the tab (23) is positioned opposite the mark (24) .

- Refit the accessories belt (see 11A, **Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3)

- Refit:

- the upper timing cover,
- the camshaft position sensor (see 13B, **Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-14) ,
- the right-hand suspended engine mounting (see 19D, **Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) .

- Remove the blanking plugs.
- Refit a high pressure pipe between the pump and the rail (see 13B, **Diesel injection, High pressure pipe between pump and rail: Removal - Refitting**, page 13B-35) .
- Connect the diesel return pipe to the venturi fitted to the high pressure pump.

- Refit:

- the fuel filter mounting,
- the fuel filter (see 13A, **Fuel supply, Fuel filter: Removal - Refitting**, page 13A-4) .

- Refit:

- the engine tie-bar (see 19D, **Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
- the engine harness channel.

- Fit the engine wiring on the engine wiring channel.

- Clip on the engine wiring channel.

- Connect to the high pressure pump:

- the diesel supply pipe,
- the diesel return pipe to the diesel filter.

- Clip on the high pressure pump pipes.

- Remove the protection on the alternator to prevent fuel flowing out.

- Connect the connectors of:

- the diesel temperature sensor,
- the flow actuator,
- the injectors,
- the heater plugs.

- Remove the blanking cover which protects the oil level dipstick guide inlet opening on the cylinder block.

- Refit:

- the dipstick guide,
- the dipstick,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).

- Prime the fuel circuit with a manual priming pump until the disconnected pipes are filled with fuel; if necessary, bleed the fuel filter (see 13A, **Fuel supply, Fuel filter: Removal - Refitting**, page 13A-4) .

- Check that there are no fuel leaks.

- Connect the battery (see) (80A, Battery).

DIESEL INJECTION

High pressure pump: Removal - Refitting

13B

K9K

- Check the high pressure circuit (see **13B, Diesel injection, High pressure pipe: Check**, page 13B-34)
- Use the **Diagnostic tool** to check for an absence of stored faults; deal with these and clear them as necessary.
- Refit the engine cover.

REPLACING THE HIGH PRESSURE PUMP

- If replacing the high pressure pump, reprime the diesel circuit using the **Diagnostic tool**.

Note:

Never start the engine until the pump has been reprimed.

Also comply with the operation instructions provided to prevent the high pressure pump from being damaged internally, due to running with no load and no diesel lubrication.

- Connect the **Diagnostic tool** to the vehicle.
- Connect to the diesel injection computer.
- Run command **AC212 « NEW PUMP CHAMBER FILLING »** (see **Fault finding - Replacement of components**) (13B, Diesel injection).
- Follow the instructions on the **Diagnostic tool** until the command is completed.
- Start the engine.

Note:

The starting phase may last up to **20 seconds**.

- If the engine does not start or if the startup sequence is interrupted:
 - switch off the ignition,
 - wait **30 seconds**,
 - restart the engine.
- Using the **Diagnostic tool**, clear any faults stored in the diesel injection computer.

DIESEL INJECTION

Flow actuator: Removal - Refitting

13B

K9K

Special tooling required

Mot. 1746 Offset wrench for tightening High Pressure pump pipes.

Equipment required

Diagnostic tool

Tightening torques

fuel flow actuator bolts on the high pressure pump	6 Nm
--	-------------

high pressure pipe unions between the rail and injector number 4 (yellow)	24 Nm
---	--------------

high pressure pipe unions between the rail and injector number 4 (silver)	28 Nm
---	--------------

PIECES ET INGREDIENTS POUR LA REPARATION

Pièces à remplacer systématiquement :

- the high pressure pipe between the rail and injector number 4,
- the clip between high pressure pipes number 3 and 4.

Ingédients :

- cleaning cloths,
- set of K9K blanking plugs (injection **DELPHI**).

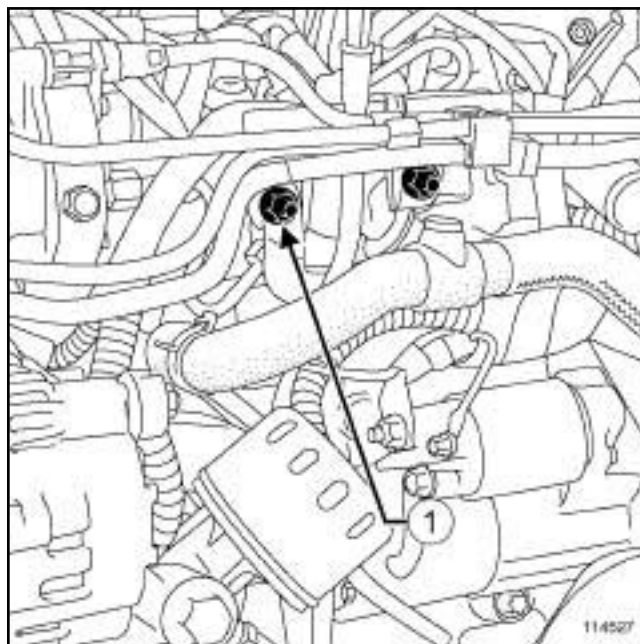
IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page **13B-1**).

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove the front engine cover.



114527

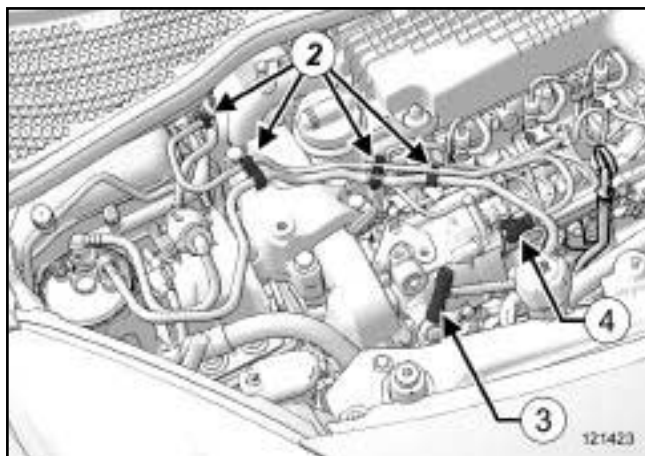
- Remove:
 - the dipstick,
 - the dipstick guide nut (1) ,
 - the oil level dipstick guide.
- Block the dipstick guide inlet opening on the cylinder block.
- Disconnect the connectors:
 - the heater plugs,
 - the injectors,
 - the flow actuator,
 - diesel fuel temperature sensor.
- Protect the alternator from fuel outflow.

DIESEL INJECTION

Flow actuator: Removal - Refitting

13B

K9K



121423

- ❑ Clean the diesel pipe unions on the high pressure pump (see 13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1) .

WARNING

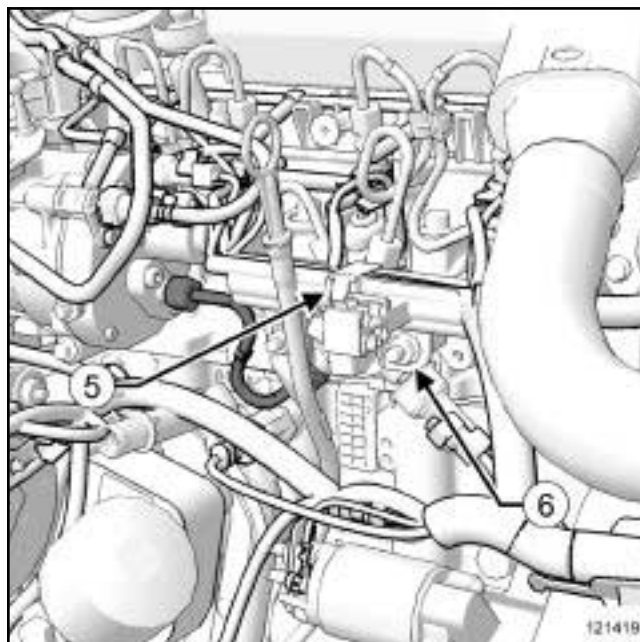
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- ❑ Unclip the fuel supply pipes at (2) .
- ❑ Disconnect the high pressure pump from:
 - the diesel supply pipe (3) ,
 - the diesel return pipe (4) to the diesel filter.

WARNING

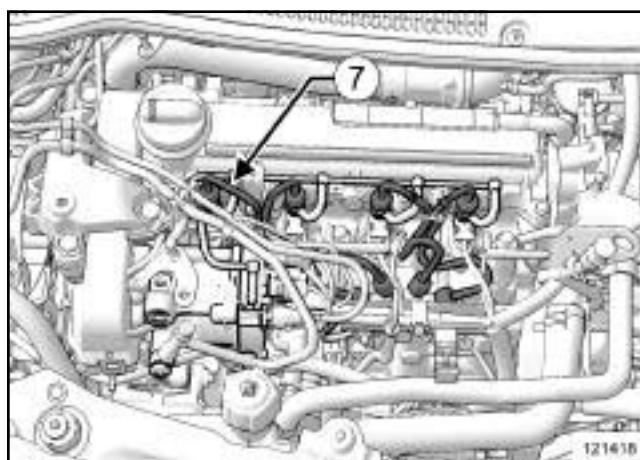
To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

- ❑ Remove the high pressure pump pipes.



121419

- ❑ Unclip the neck at (5) .
- ❑ Remove the neck wiring harness.
- ❑ Remove:
 - the neck nut (6) ,
 - the neck.



121418

- ❑ Clean the high pressure pipe unions (7) between the rail and injector number 4 (see 13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1) .

WARNING

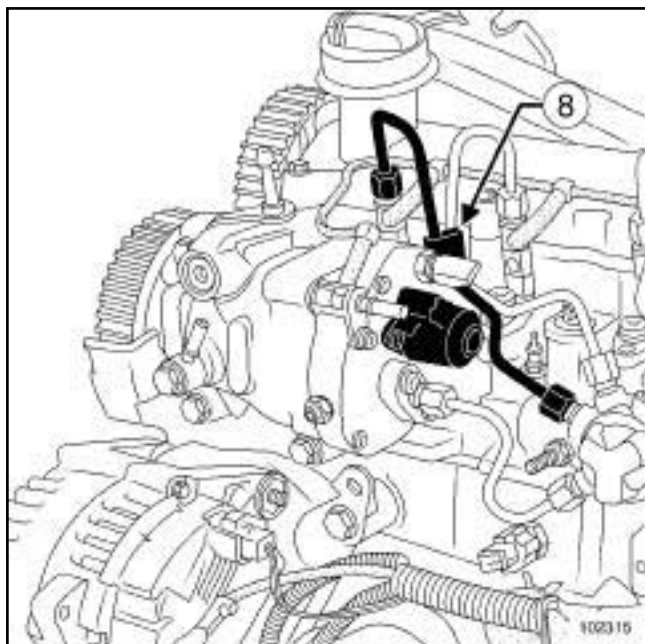
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

DIESEL INJECTION

Flow actuator: Removal - Refitting

13B

K9K



102315

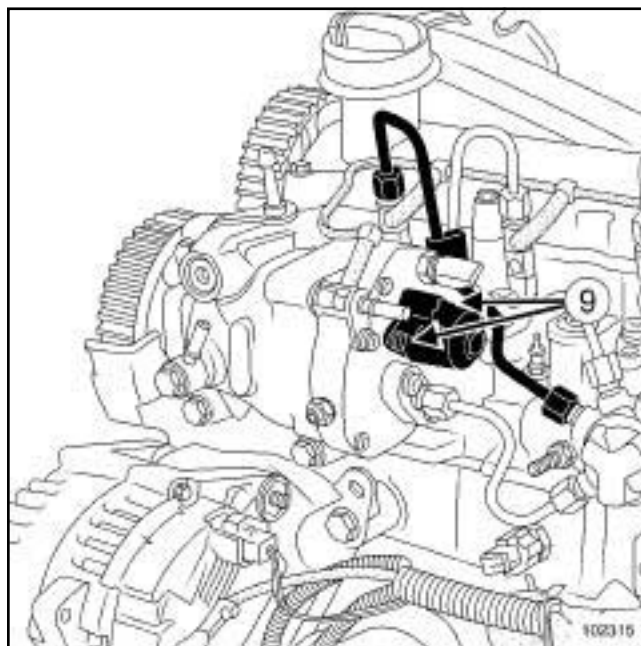
Remove:

- the clip (8) from the high pressure pipes between the rail and injectors number 3 and 4,
- the high pressure pipe between the rail and injector number 4 and discard it.

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

II - OPERATION FOR REMOVAL OF PART CONCERNED



102315

- Remove the bolts (9) from the fuel flow actuator on the high pressure pump.
- Remove the fuel flow actuator (by hand with small tugs and successive turns).

WARNING

Do not use the electrical connector as a lever arm.

- Make sure that no impurities enter the high pressure pump when the fuel flow actuator is removed.

WARNING

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Only use cleaning cloths.

DIESEL INJECTION

Flow actuator: Removal - Refitting

13B

K9K

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

□

WARNING

Do not remove the blanking plugs from each component until the last moment.

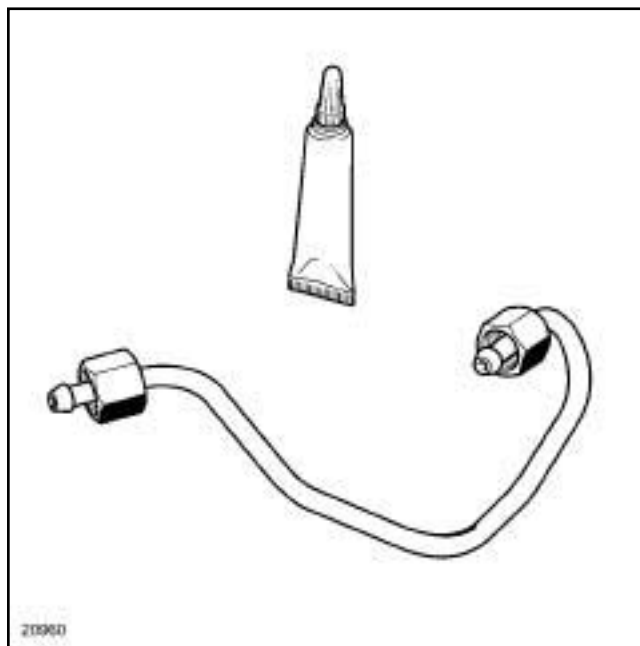
Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

Note:

Do not lubricate the seals with grease or old diesel fuel. Use the applicator provided in the kit for the new part.

- Fit the fuel flow actuator onto the high pressure pump.
- Tighten the fuel flow actuator bolts on the high pressure pump until contact is made, without tightening them.
- Torque tighten the **fuel flow actuator bolts on the high pressure pump (6 Nm)**.

II - FINAL OPERATION.



20960

□

WARNING

Before fitting a new high pressure pipe, lightly lubricate the nut threads with the oil from the applicator provided in the new parts kit.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

- Fit a new high pressure pipe between the rail and injector number 4.
- Fit the high pressure pipe unions between the rail and injector number 4 until contact is made, without tightening them.
- Fit and lock a new clip between the high pressure pipes on the rail and injectors number 3 and 4.
- Using the **(Mot. 1746)**, tighten to torque:
 - the **high pressure pipe unions between the rail and injector number 4 (yellow) (24 Nm)**,
 - the **high pressure pipe unions between the rail and injector number 4 (silver) (28 Nm)**.
- Refit:
 - the channel,
 - the neck nut.
- Fit the neck wiring harness.
- Clip the neck on.

DIESEL INJECTION

Flow actuator: Removal - Refitting

13B

K9K

- Fit the high pressure pump pipes.
- Connect to the high pressure pump:
 - the diesel fuel supply pipe,
 - the diesel return pipe.
- Attach the high pressure pump pipes.
- Remove the protection on the alternator to prevent fuel flowing out.
- Connect the connectors:
 - the heater plugs,
 - the injectors,
 - the flow actuator,
 - diesel fuel temperature sensor.
- Remove the blanking cover protecting the dipstick guide inlet orifice on the cylinder block.
- Refit:
 - the dipstick guide,
 - the dipstick guide nut,
 - the oil level dipstick.
- Refit the neck nuts.
- Prime the fuel circuit with a manual priming pump until the disconnected pipes are filled with fuel; if necessary, bleed the fuel filter (see **13A, Fuel supply, Fuel filter: Removal - Refitting**, page **13A-4**).
- Connect the battery (see) (MR 411, 80A, Battery).
- Check that there are no fuel leaks.
- Check the high pressure circuit (see **13B, Diesel injection, High pressure pipe: Check**, page **13B-34**).
- Use the **Diagnostic tool** to check for an absence of stored faults; deal with these and clear them as necessary.
- Refit the engine cover.

DIESEL INJECTION

Venturi: Removal - Refitting

13B

K9K

Tightening torques

venturi bolt on the high pressure pump	5.5 Nm
--	--------

PARTS AND CONSUMABLES FOR THE REPAIR WORK

Consumable:

- cleaning cloths (Part no. 77 11 211 707).

Note:

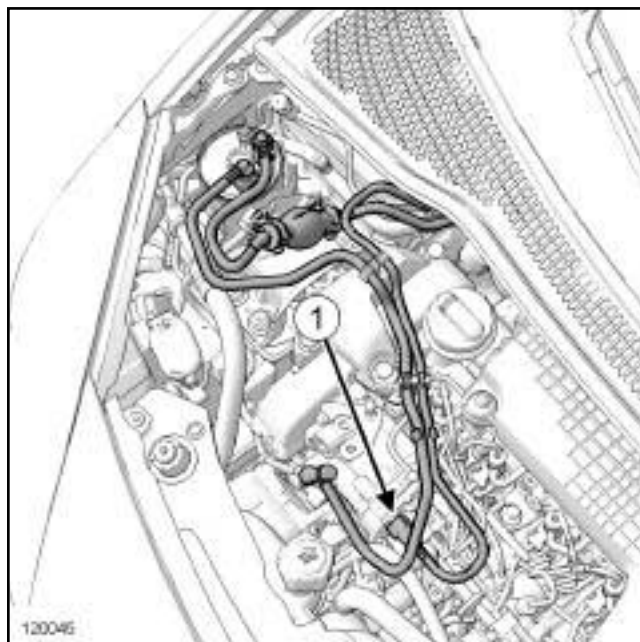
Observe the repair precautions (see 13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1) .

Make sure that you have a new venturi before opening the fuel circuit.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove the front engine cover.
- Protect the alternator from fuel outflow.



120045

- Disconnect the diesel return pipe from the high pressure pump (1) .

Note:

Be prepared for the outflow of diesel.

WARNING

Keep the pipe unions away from contaminated areas.

- Insert the blanking plugs.
- Unclip the diesel return pipe on the neck then remove it from the high pressure pump.

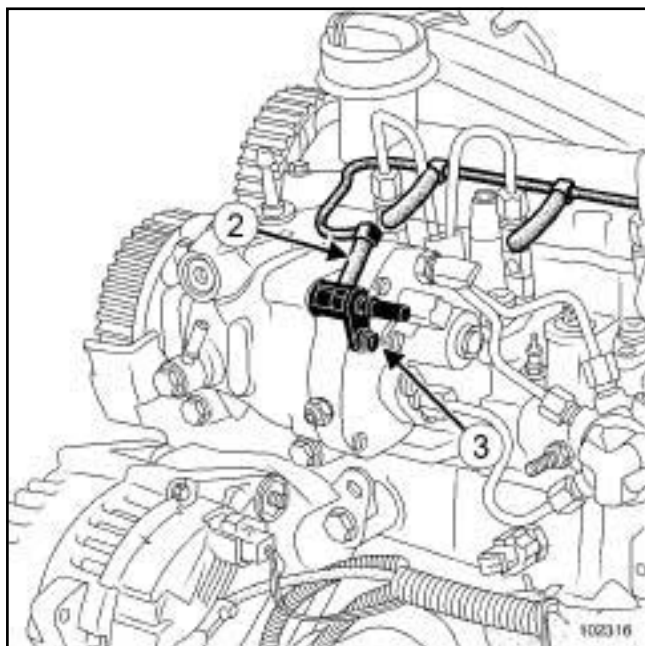
DIESEL INJECTION

Venturi: Removal - Refitting

13B

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



102316

- Disconnect the diesel return pipe (2) on the venturi.

Note:

Make preparations for fuel outflow.

- Fit anti-contamination caps.
- Remove the high pressure pump venturi bolt (3) .
- Remove the venturi (by hand with small tugs and successive turns).

Note:

Make preparations for fuel outflow.

- Make sure that no impurities enter the high pressure pump when the venturi is removed.

WARNING

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Only use cleaning cloths.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

WARNING

Do not remove the components from their packaging until just before fitting them to the vehicle.

- Refit the venturi to the high pressure pump.

Note:

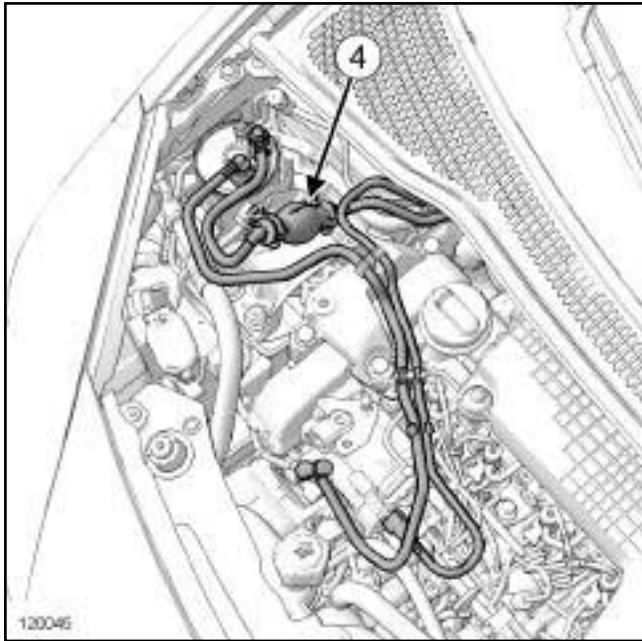
Do not lubricate the seals with grease or old diesel fuel. Use the applicator provided in the kit for the new part.

- Refit the venturi bolt to the high pressure pump.
- Torque tighten the **venturi bolt on the high pressure pump (5.5 Nm)**.
- Remove the blanking plugs.
- Connect the diesel return pipe to the venturi.

II - FINAL OPERATION.

- Clip the high pressure pump diesel return pipe onto the neck.
- Remove the blanking plugs.
- Connect the diesel return pipe to the high pressure pump.
- Attach the diesel return pipe to the neck.
- Remove the protection on the alternator to prevent fuel flowing out.

K9K



120045

- Prime the fuel circuit using the manual priming pump (4) until the disconnected pipes are filled with fuel (automatic degassing).
- Check that there are no fuel leaks.
- Start the engine.
- Check that there are no fuel leaks.
- Refit the engine cover.

DIESEL INJECTION

High pressure pipe: Check

13B

K9K

Equipment required

Diagnostic tool

Note:

Check that there are no diesel leaks after each operation.

Note:

The **Diagnostic tool** can be used to test the high pressure circuit with the engine running. This command can be used to run fault finding on a leak due to an incorrectly fitted or tightened union. This command only works if the engine coolant temperature is greater than **60°**. The fault finding procedure will not reveal small leaks due to incorrect tightening.

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1**).

CHECK

- Remove the front engine cover.
- Prime the fuel circuit with the manual priming pump until the disconnected pipes are filled with fuel (automatic degassing).
- Check that there are no fuel leaks.
- Connect the **Diagnostic tool** to the vehicle.

- Deal with present faults,

Note:

Certain faults will prevent this test from being carried out: deal with them first.

Note:

The engine automatically runs a cycle of four accelerations and decelerations to lower the rail pressure.

Note:

Do not leave anything on the engine compartment during the test phase (significant vibration).

- Activate command **AC029 "high pressure circuit sealing test"**.
- Check that there are no fuel leaks.
- Deal with the causes of any possible leaks.
- Use the **Diagnostic tool** to check for stored faults; deal with these and clear them as necessary.
- Disconnect the **Diagnostic tool**.
- Refit the engine cover.

K9K

Special tooling required

Mot. 1746 Offset wrench for tightening High Pressure pump pipes.

Equipment required

Diagnostic tool

Tightening torques

high pressure pipe unions between the pump and the yellow rail **24 Nm**

high pressure pipe unions between the pump and the silver rail **28 Nm**

PARTS AND CONSUMABLES FOR THE REPAIR

Pièces à remplacer systématiquement :

- the high pressure pipe between the pump and the rail.

Ingrédients :

- cleaning cloths,
- set of K9K blanking plugs (injection **DELPHI**).

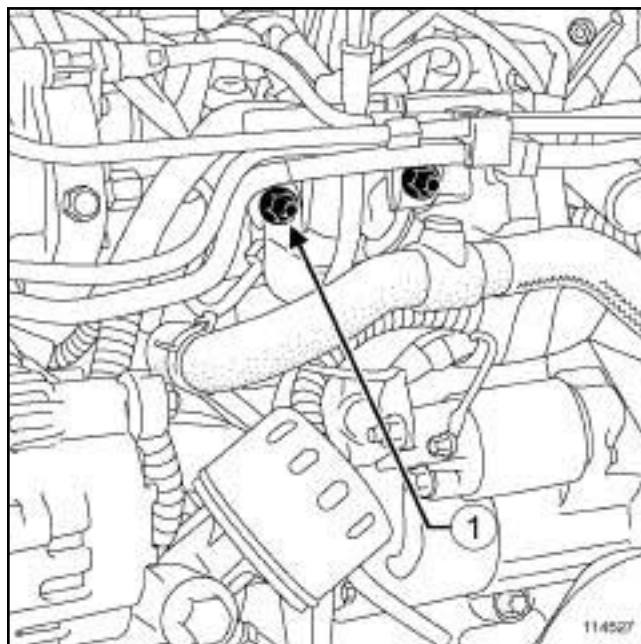
IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page **13B-1**).

REMOVAL

I - REMOVAL PREPARATION OPERATION

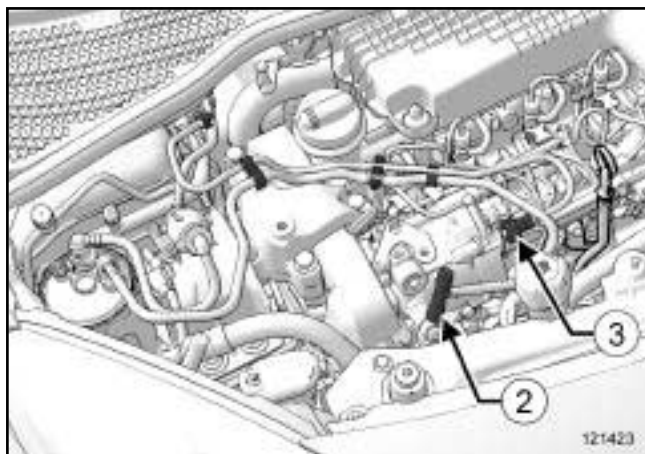
- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove the front engine cover.



114527

- Remove:
 - the dipstick,
 - the dipstick guide nut (1) ,
 - the oil level dipstick guide.
- Block the dipstick guide inlet opening on the cylinder block.
- Disconnect the connectors:
 - the heater plugs,
 - the injectors,
 - the flow actuator,
 - diesel fuel temperature sensor.
- Protect the alternator and the starter from fuel out-flow.

K9K

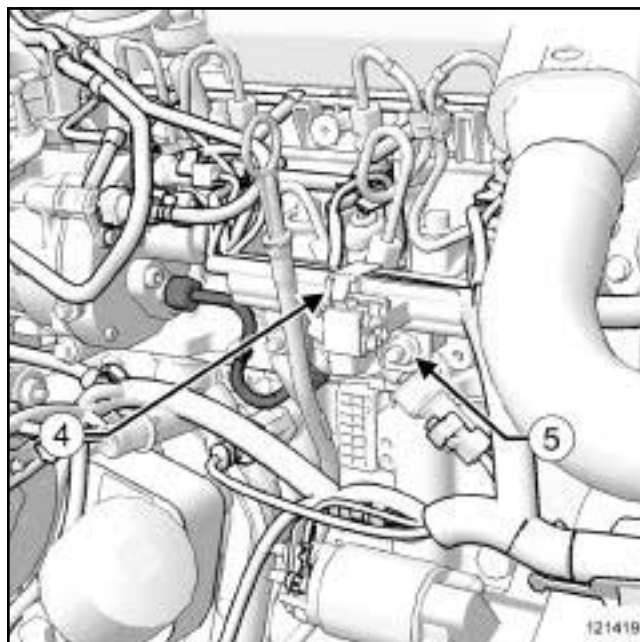


- ❑ Clean the diesel pipe unions on the high pressure pump (see 13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1) .

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

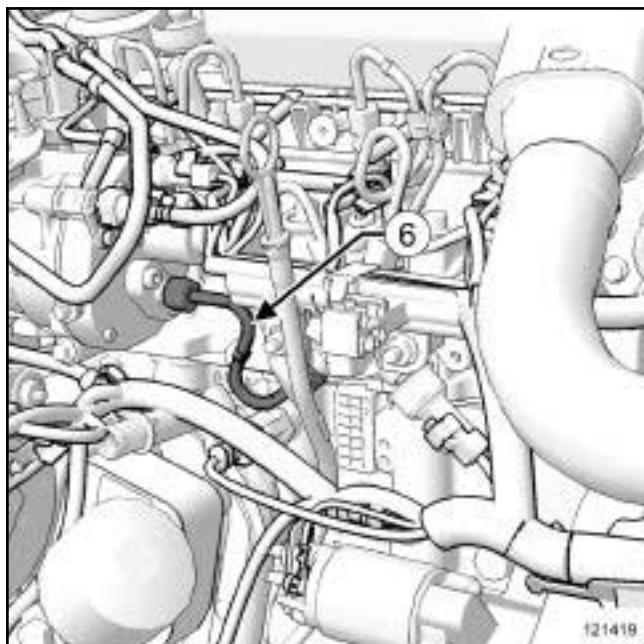
- ❑ Disconnect the high pressure pump from:
 - the diesel supply pipe (2) ,
 - the diesel return pipe (3) to the diesel filter.
- ❑ Fit suitable blanking plugs on:
 - the high pressure pump,
 - the high-pressure pipes.



- ❑ Unclip the neck at (4) .
- ❑ Remove the neck wiring harness.
- ❑ Remove:
 - the neck nut (5) ,
 - the neck.

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



121419

- Clean the high pressure pipe unions (6) between the pump and the rail (see 13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1) .

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- Remove the high pressure pipe (6) between the pump and the rail and discard it.
- Fit suitable blanking plugs on:
 - the high pressure pump,
 - the injector rail.

REFITTING

I - REFITTING PREPARATIONS OPERATION

WARNING

Only remove the blanking plugs from the protected components at the last possible moment.

Also, do not remove the components from their packaging until just before fitting them to the vehicle.

II - REFITTING OPERATION FOR PART CONCERNED



20960

WARNING

Before fitting a new high pressure pipe, lightly lubricate the nut threads with oil from the applicator provided in the new part.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator; these pipes are self-lubricating.

- Fit a new high pressure pipe between the pump and the rail.
- Screw on the high pressure pipe unions between the pump and the rail without tightening them until contact is made.
- Using the (Mot. 1746), tighten to torque:
 - the high pressure pipe unions between the pump and the yellow rail (24 Nm),
 - the high pressure pipe unions between the pump and the silver rail (28 Nm).

III - FINAL OPERATION.

- Refit:
 - the channel,
 - the neck nut.
- Fit the neck wiring harness.

K9K

- Clip the neck on.
- Connect to the high pressure pump:
 - the diesel fuel supply pipe,
 - the diesel return pipe to the diesel filter.
- Remove the protection on the alternator and starter.
- Connect the connectors:
 - the heater plugs,
 - the injectors,
 - the flow actuator,
 - diesel fuel temperature sensor.
- Remove the blanking cover protecting the dipstick guide inlet orifice on the cylinder block.
- Refit:
 - the dipstick guide,
 - the dipstick guide nut,
 - the dipstick,
 - the neck nuts.
- Prime the fuel circuit with a manual priming pump until the disconnected pipes are filled with fuel; if necessary, bleed the fuel filter (see **13A, Fuel supply, Fuel filter: Removal - Refitting**, page **13A-4**).
- Check that there are no fuel leaks.
- Connect the battery (see) (MR 411, 80A, Battery).
- Check the high pressure circuit (see **13B, Diesel injection, High pressure pipe: Check**, page **13B-34**).
- Use the **Diagnostic tool** to check for an absence of stored faults; deal with these and clear them as necessary.
- Refit the engine cover.

K9K

Special tooling required

Mot. 1746 Offset wrench for tightening High Pressure pump pipes.

Equipment required

Diagnostic tool

Tightening torques

high pressure pipe unions between the pump and the yellow rail **24 Nm**

high pressure pipe unions between the pump and the silver rail **28 Nm**

PARTS AND CONSUMABLES FOR THE REPAIR

Pièces à remplacer systématiquement :

- the high pressure pipes between the rail and the injectors.

Ingrédients :

- cleaning cloths,
- set of K9K blanking plugs (injection **DELPHI**).

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page **13B-1**) .

WARNING

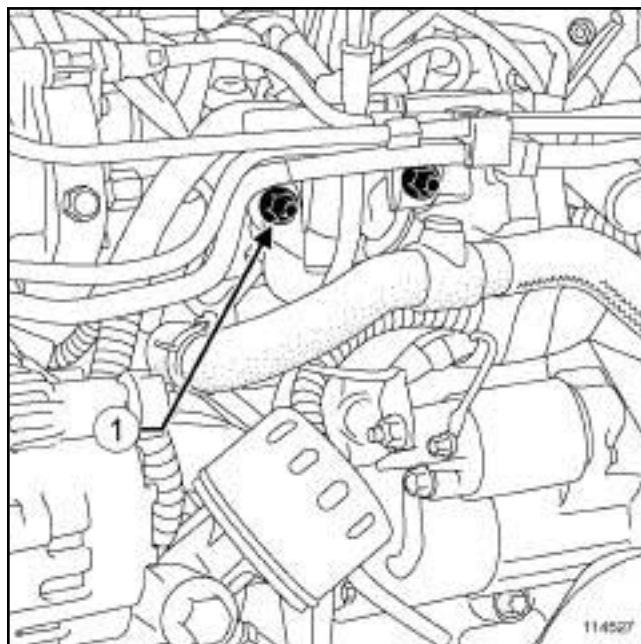
Obtain the special high pressure injection circuit blanking plugs kit.

Always replace any high pressure pipe or high pressure pipe clip removed with a new one.

REMOVAL

I - REMOVAL PREPARATION OPERATION

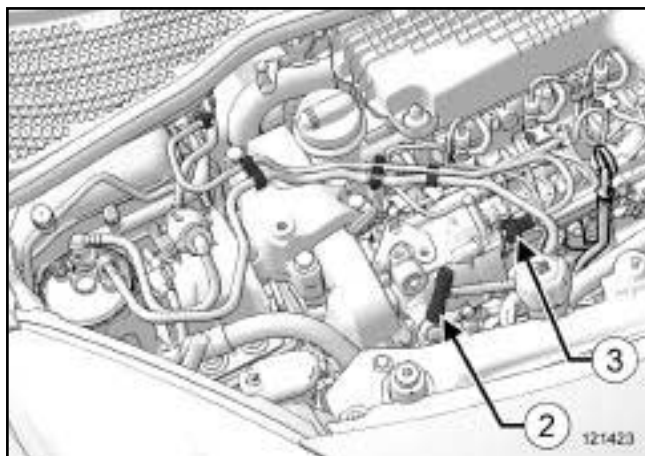
- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove the front engine cover.



114527

- Remove:
 - the dipstick,
 - the dipstick guide nut (1) ,
 - the oil level dipstick guide.
- Block the dipstick guide inlet opening on the cylinder block.
- Disconnect the connectors:
 - the heater plugs,
 - the injectors,
 - the flow actuator,
 - diesel fuel temperature sensor.
- Protect the alternator and the starter from fuel out-flow.

K9K



- ❑ Clean the diesel pipe unions on the high pressure pump (see 13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1) .

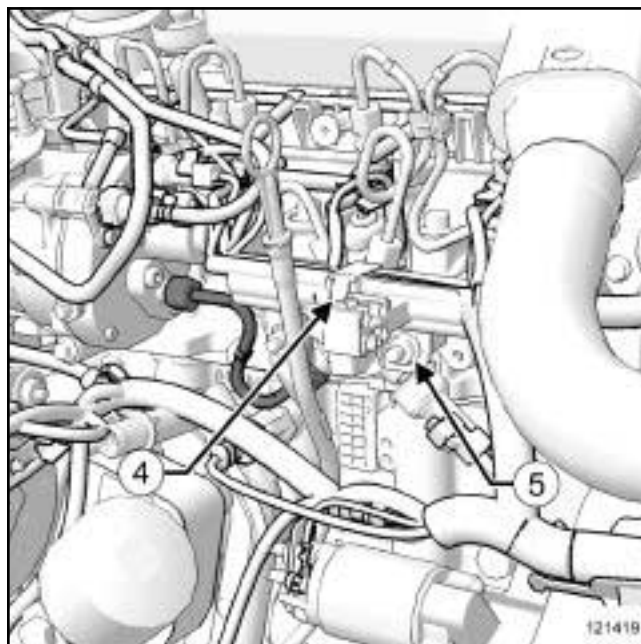
WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- ❑ Disconnect from the high pressure pump:
 - the diesel supply pipe (2) ,
 - the diesel return pipe (3) to the diesel filter.

WARNING

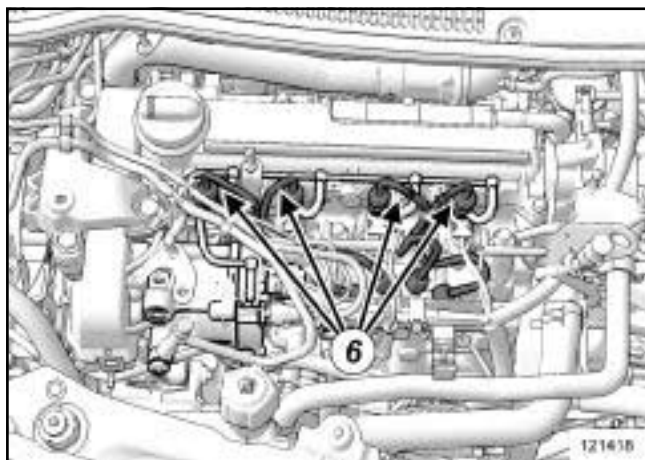
To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.



- ❑ Unclip the neck at (4) .
- ❑ Remove the neck wiring harness.
- ❑ Remove:
 - the neck nut (5) ,
 - the neck.

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



121418

- ❑ Clean the high pressure pipe unions (6) between the rail and the injectors (see 13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1) .

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

Note:

Do not damage the injector return nozzle.

- ❑ Remove then dispose of:
 - the clips between the high pressure pipes,
 - the high pressure pipes (6) between the rail and the injectors.

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

REFITTING

I - REFITTING PREPARATIONS OPERATION

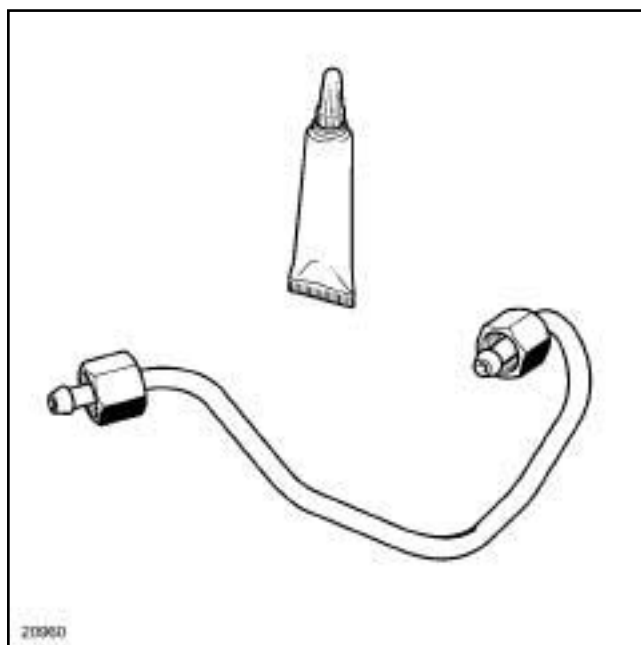
❑

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

II - REFITTING OPERATION FOR PART CONCERNED



20960

❑

WARNING

Before fitting a new high pressure pipe, lightly lubricate the nut threads with the oil from the applicator provided in the new parts kit.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

- ❑ Fit the new high pressure pipes between the rail and the injectors.
- ❑ Screw on the high pressure pipe unions between the rail and the injectors until contact is made, but do not tighten them.

K9K

- Fit and lock a new clip between the high pressure pipes between the rail and the injectors.
- Using the **(Mot. 1746)**, tighten to torque:
 - the **high pressure pipe unions between the pump and the yellow rail (24 Nm)**,
 - the **high pressure pipe unions between the pump and the silver rail (28 Nm)**.

III - FINAL OPERATION.

- Refit:
 - the channel,
 - the neck nut.
- Fit the neck wiring harness.
- Clip the neck on.
- Connect to the high pressure pump:
 - the diesel fuel supply pipe,
 - the diesel return pipe to the diesel filter.
- Remove the protection on the alternator and starter.
- Connect the connectors:
 - the heater plugs,
 - the injectors,
 - the flow actuator,
 - diesel fuel temperature sensor.
- Remove the blanking cover protecting the dipstick guide inlet orifice on the cylinder block.
- Refit:
 - the dipstick guide,
 - the dipstick guide nut,
 - the oil level dipstick.
- Refit the neck nuts.
- Prime the fuel circuit with a manual priming pump until the disconnected pipes are filled with fuel; if necessary, bleed the fuel filter (see **13A, Fuel supply, Fuel filter: Removal - Refitting**, page **13A-4**) .
- Check that there are no fuel leaks.
- Connect the battery (see) (MR 411, 80A, Battery).
- Check the high pressure circuit (see **13B, Diesel injection, High pressure pipe: Check**, page **13B-34**) .
- Use the **Diagnostic tool** to check for an absence of stored faults; deal with these and clear them as necessary.
- Refit the engine cover.

DIESEL INJECTION

Injector rail: Removal - Refitting

13B

K9K

Special tooling required

Mot. 1746 Offset wrench for tightening High Pressure pump pipes.

Tightening torques

studs of the injection rail on the cylinder head	8 Nm
--	-------------

injector rail nuts	28 Nm
--------------------	--------------

unions for the high pressure pipes between the rail and the yellow-coloured injector	24 Nm
--	--------------

unions for the high pressure pipes between the rail and the silver-coloured injector	28 Nm
--	--------------

unions for the high pressure pipes between the pump and the yellow-coloured rail	24 Nm
--	--------------

unions for the high pressure pipes between the pump and the silver-coloured rail	28 Nm
--	--------------

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page **13B-1**).

IMPORTANT

Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

Working on the circuit with the engine running is strictly forbidden.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

IMPORTANT

Wear leaktight gloves (nitrile type) for this operation.

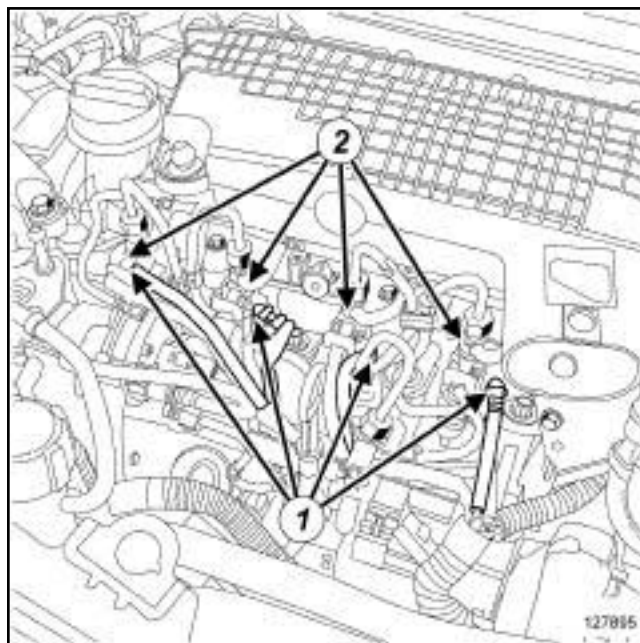
WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment)
- Remove the front engine cover.
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



127895

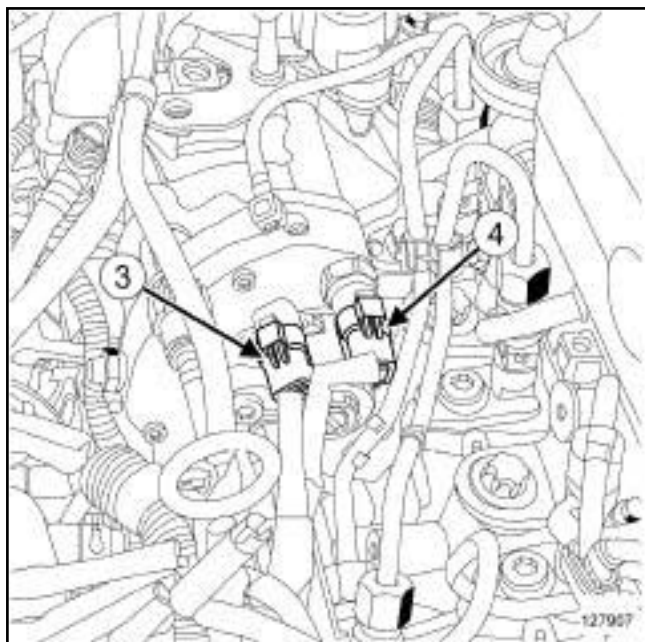
- Disconnect:
 - the heater plug connectors (1),
 - the connectors (2) from the injectors.

DIESEL INJECTION

Injector rail: Removal - Refitting

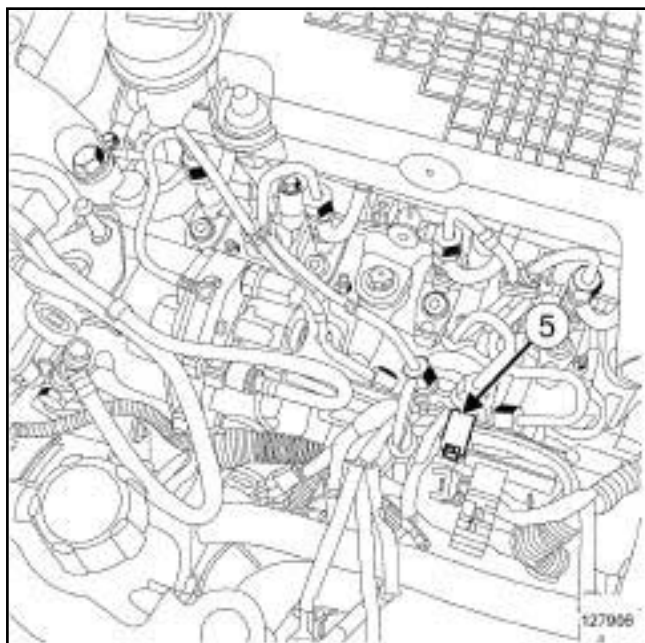
13B

K9K



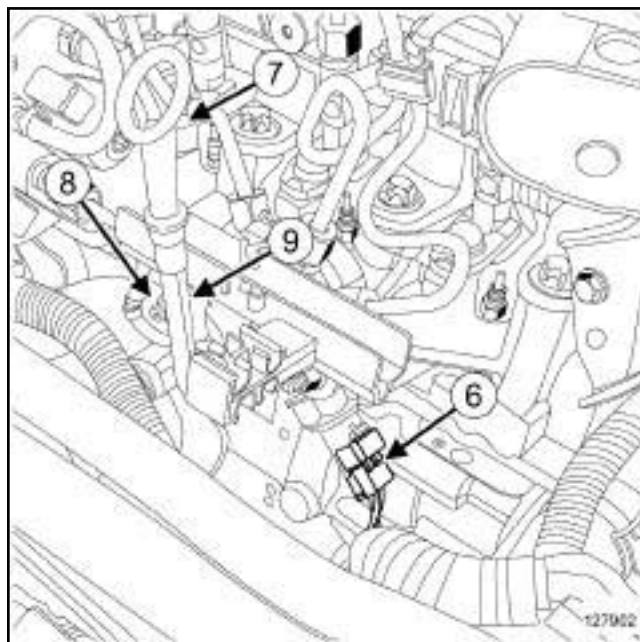
127907

- Disconnect:
 - the fuel flow actuator (3) ,
 - the diesel temperature sensor (4) .



127906

- At (5) , unclip the electrical wiring from the neck.
- Move the electrical wiring to one side.



127902

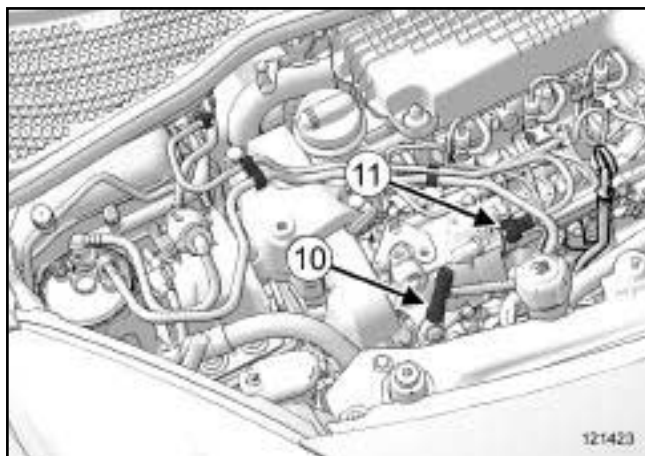
- Disconnect the injector rail pressure sensor connector (6) .
- Remove:
 - the dipstick (7) ,
 - the oil level dipstick nut (8) ,
 - the oil level dipstick guide (9) .
- Plug the oil level dipstick guide inlet opening on the cylinder block.
- Remove:
 - the bolt on the neck of the injection rail.
 - the neck of the injection rail.

DIESEL INJECTION

Injector rail: Removal - Refitting

13B

K9K



121423

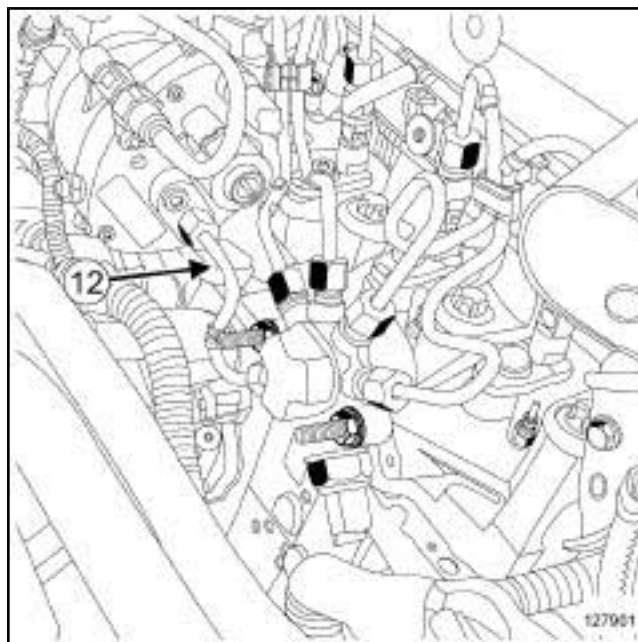
- ❑ Clean the fuel pipe unions on the high pressure pump (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page 13B-1) .

❑

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- ❑ Disconnect the high pressure pump from:
 - the fuel supply pipe (10) ,
 - the fuel return pipe (11) to the fuel filter.
- ❑ Insert the blanking plugs.



127901

- ❑ Clean the high pressure pipe unions (12) between the pump and the rail (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page 13B-1) .

❑

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

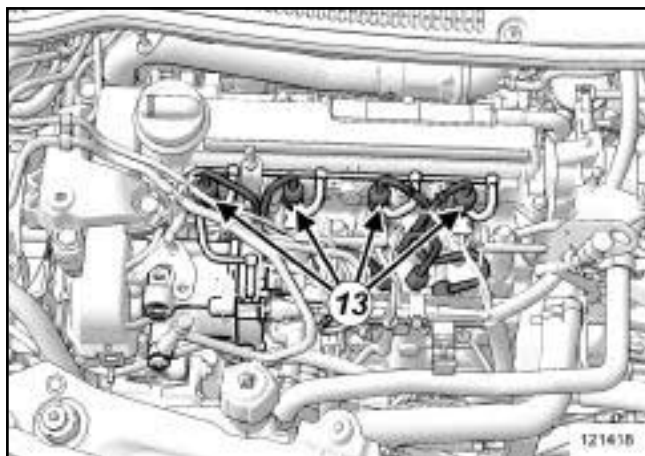
- ❑ Remove the high pressure pipe (12) between the pump and the injection rail and discard it.
- ❑ Insert the blanking plugs.

DIESEL INJECTION

Injector rail: Removal - Refitting

13B

K9K



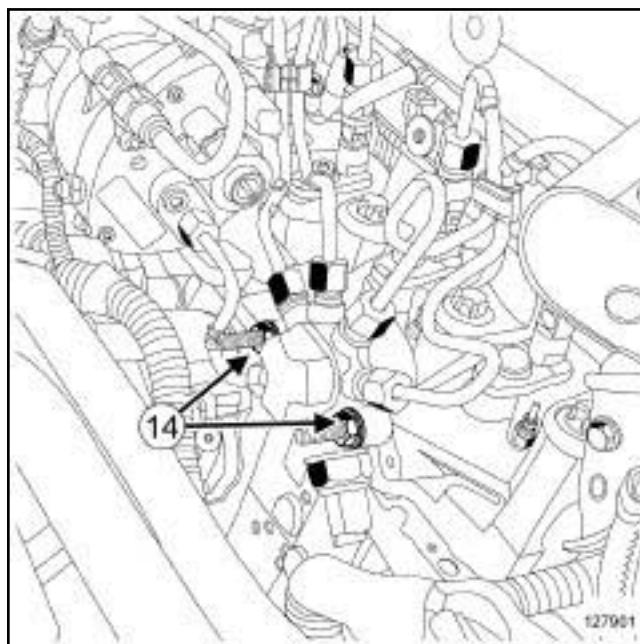
- ❑ Clean the high pressure pipe unions (13) between the injection rail and the injectors (see 13B, Diesel injection, Diesel injection: Precautions for the repair, page 13B-1)

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- ❑ Remove then dispose of:
 - the clips between the high pressure pipes,
 - the high pressure pipes between the rail and the injectors.
- ❑ Insert the blanking plugs.

II - OPERATION FOR REMOVAL OF PART CONCERNED



- ❑ Remove:
 - the nuts (14) from the injector rail,
 - the injector rail.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

- ❑ Always replace:
 - the high pressure pipe between the pump and the rail,
 - the high pressure pipes between the rail and the injector
- ❑ In the event of replacement, torque tighten the **studs of the injection rail on the cylinder head (8 Nm)**.

II - REFITTING OPERATION FOR PART CONCERNED

- ❑ Take the injector rail out of its packaging.

DIESEL INJECTION

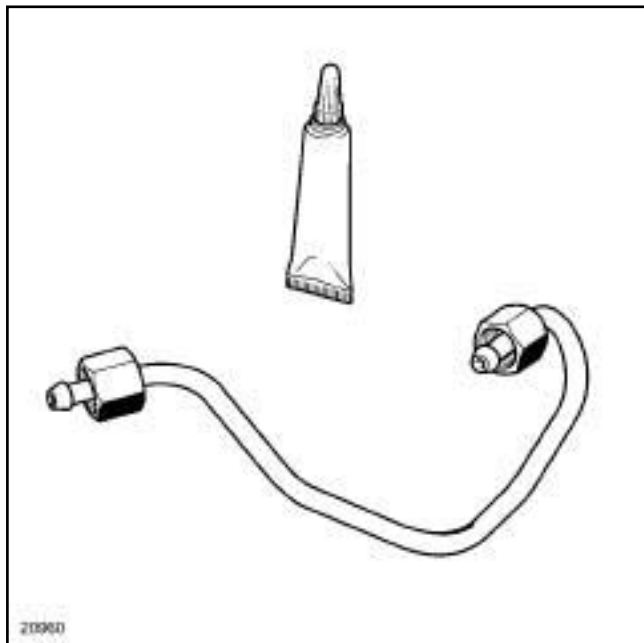
Injector rail: Removal - Refitting

13B

K9K

- Remove the blanking plugs.
- Fit the injector rail.
- Fit the injector rail nuts without tightening them.

III - FINAL OPERATION.



20960

WARNING

Before fitting a new high-pressure pipe, lightly lubricate the nut threads with the oil from the applicator provided in the new parts kit.

Be careful not to allow oil into the high-pressure pipe.

Do not lubricate high-pressure pipes supplied without an applicator, as these high-pressure pipes are self-lubricating.

- Remove the blanking plugs from the high pressure pump and the injection rail and discard them.
- Fit the high pressure pipe between the high pressure pump and the injection rail.
- Tighten the high pressure pipe unions between the pump and the rail until contact is made.
- Remove the blanking plugs on the injection rail and the diesel fuel injectors then discard them.
- Fit the new high-pressure pipes between the rail and the injectors.
- Tighten until contact the unions of the high pressure pipes between the rail and injector.

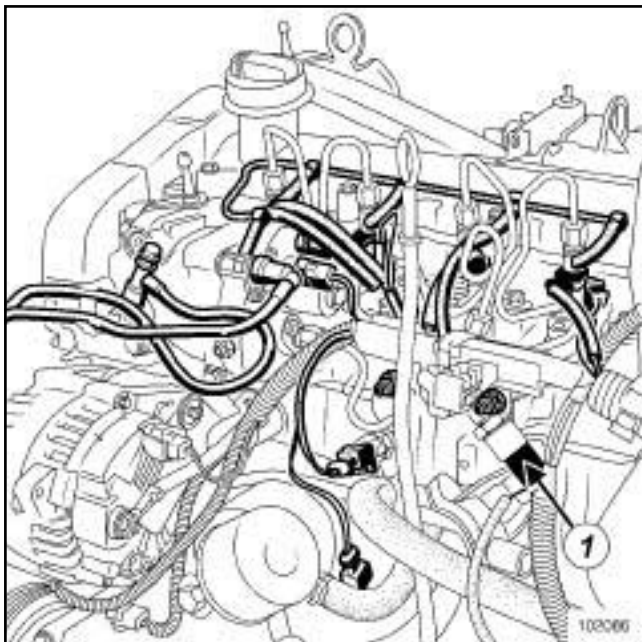
- Fit and lock the new clips between the high pressure pipes on the rail and injectors.
- Tighten to torque:
 - the **injector rail nuts (28 Nm)**,
 - the **unions for the high pressure pipes between the rail and the yellow-coloured injector (24 Nm)** using the tool (**Mot. 1746**),
 - the **unions for the high pressure pipes between the rail and the silver-coloured injector (28 Nm)** using the tool (**Mot. 1746**),
 - the **unions for the high pressure pipes between the pump and the yellow-coloured rail (24 Nm)** using the tool (**Mot. 1746**),
 - the **unions for the high pressure pipes between the pump and the silver-coloured rail (28 Nm)** using the tool (**Mot. 1746**),
- Connect to the high pressure pump:
 - the fuel return pipe to the fuel filter,
 - the fuel supply pipe.
- Refit the neck on the injection rail.
- Remove the protection fitted on the inlet opening of the oil level dipstick on the cylinder block.
- Refit:
 - the dipstick guide,
 - the oil level dipstick nut,
 - the oil level dipstick.
- Connect the injector rail pressure sensor connector.
- Position the wiring harness in its channel.
- Fasten the electrical wiring to the channel.
- Connect:
 - the diesel temperature sensor,
 - the fuel flow actuator,
 - the injector connectors,
 - the heater plug connectors.
- Prime the fuel circuit using a manual priming pump until the disconnected pipes are filled with fuel.
- Check that there are no fuel leaks.
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Check the high pressure circuit (see **13B, Diesel injection, High pressure pipe: Check**, page 13B-34).
- Refit the engine cover.

DIESEL INJECTION

Rail pressure sensor: Removal - Refitting

13B

K9K



102086

- ❑ The pressure sensor (1) cannot be removed from the spherical injector rail.

If the pressure sensor is faulty, replace the « pressure sensor - high pressure pipes and rail » assembly (see **13B, Diesel injection, Injector rail: Removal - Refitting**, page 13B-43) .

Fuel temperature sensor: Removal - Refitting

C44, and K9K

Equipment required

Diagnostic tool

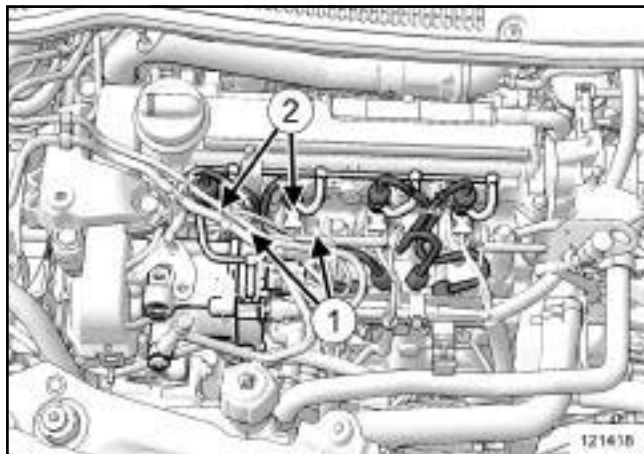
Tightening torques

fuel temperature sensor	15 Nm
-------------------------	-------

REMOVAL

I - REMOVAL PREPARATION OPERATION

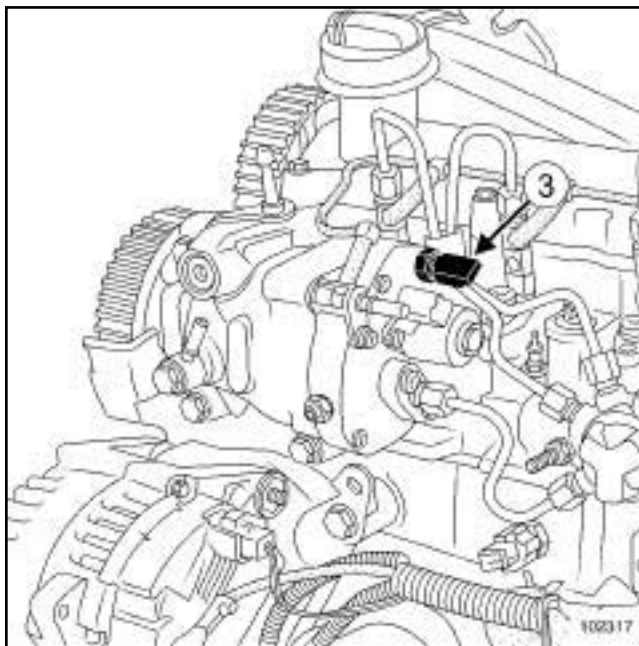
- Remove the front engine cover.
- Disconnect the battery ((see **Battery: Removal - Refitting**)).
- Protect the alternator from fuel outflow.



121418

- Disconnect:
 - the heater plug connectors (1) from cylinders 3 and 4,
 - the injector connectors (2) from cylinders 3 and 4.

II - OPERATION FOR REMOVAL OF PART CONCERNED



102317

- Disconnect the fuel temperature sensor connector.
- Remove the fuel temperature sensor (3) from the high pressure pump.

Note:

Prepare for the outflow of fuel.

- Make sure that no impurities enter the high pressure pump when the fuel sensor is removed.

WARNING

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Only use cleaning cloths.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the fuel temperature sensor onto the high pressure pump.

Note:

Do not lubricate the seals with grease or old diesel fuel.

Use the applicator provided in the kit for the new part.

Fuel temperature sensor: Removal - Refitting

C44, and K9K

- Torque tighten the **fuel temperature sensor (15 Nm)**.
- Connect the fuel temperature sensor connector.

II - FINAL OPERATION.

- Connect:
 - the injector connectors for cylinders 3 and 4,
 - the heater plug connectors for cylinders 3 and 4.
- Remove the protection on the alternator to prevent fuel flowing out.
- Connect the battery ((see **Battery: Removal - Refitting**)).
- Start the engine and check that there are no leaks.
- Refit the engine cover.
- Use the **Diagnostic tool** to check for an absence of stored faults; deal with these and clear them as necessary.

DIESEL INJECTION

Injector leak flow: Check

13B

K9K

Special tooling required

Mot. 1711 Kit for measuring the injector fuel flow rate.

Equipment required

Diagnostic tool

PIECES ET INGREDIENTS POUR LA REPARATION

Ingrédients :

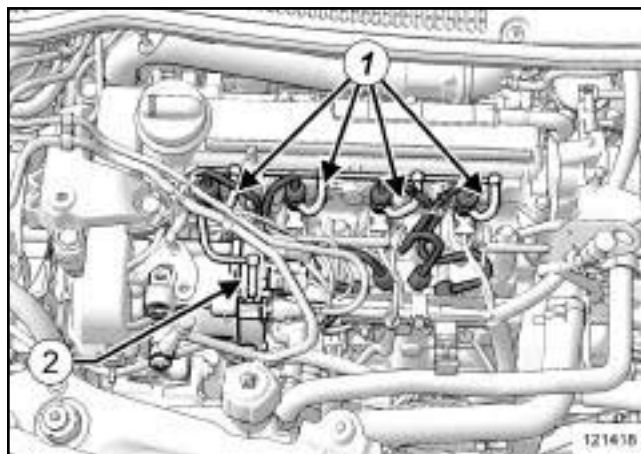
- cleaning cloths,
- set of K9K blanking plugs (**DELPHI** injection).

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B, Diesel injection, Diesel injection: Precautions for the repair**, page **13B-1**).

CHECK

- Remove the front engine cover.



121418

- Disconnect:
 - the diesel return pipes (1) on the injectors,
 - the diesel return pipe (2) on the Venturi fitted on the high pressure pump.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- Fit the correct blanking plug on the Venturi.

Note:

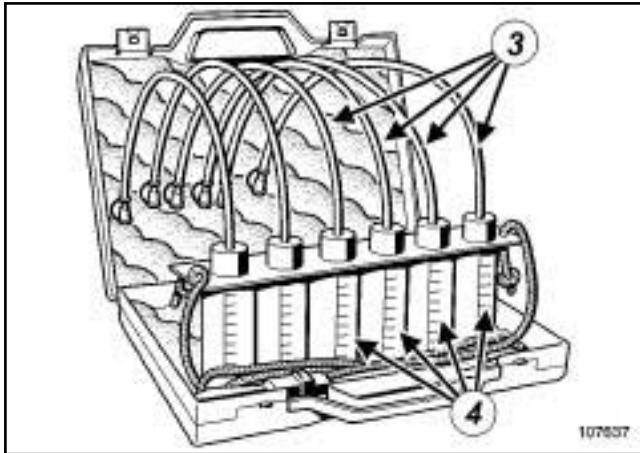
It is essential to fit an appropriate blanking plug to the Venturi to avoid depriving the diesel return circuit.

DIESEL INJECTION

Injector leak flow: Check

13B

K9K



107637

- Connect four of the transparent pipes (3) of the (Mot. 1711) onto the diesel injector return.
- Insert these pipes in the four graduated measuring cylinders (4) of the (Mot. 1711).

Note:

If necessary, attach the graduated measuring cylinder rail of the (Mot. 1711) to the bonnet.

- Connect the **Diagnostic tool** to the vehicle.
- Follow the instructions given (depending on the engine suffix) (see **Fault finding - tests**)(MR 413, 13B, Diesel injection).
- Disconnect the transparent pipes from the (Mot. 1711).
- Remove the transparent pipes from the graduated measuring cylinder of the (Mot. 1711).
- Empty the diesel fuel out of the graduated measuring cylinders.
- Connect:
 - the diesel return pipes on the injectors,
 - the diesel return pipe to the Venturi attached to the high pressure pump.
- Replace the faulty injector(s) (see) .
- Check that there are no fuel leaks.
- Use the **Diagnostic tool** to check for an absence of stored faults; deal with these and clear them as necessary.
- Refit the engine cover.

DIESEL INJECTION

Accelerometer: Removal - Refitting

13B

K9K

Special tooling required

Emb. 1797 Socket (24 mm) for removal - refitting of the clutch master cylinder

Equipment required

Diagnostic tool

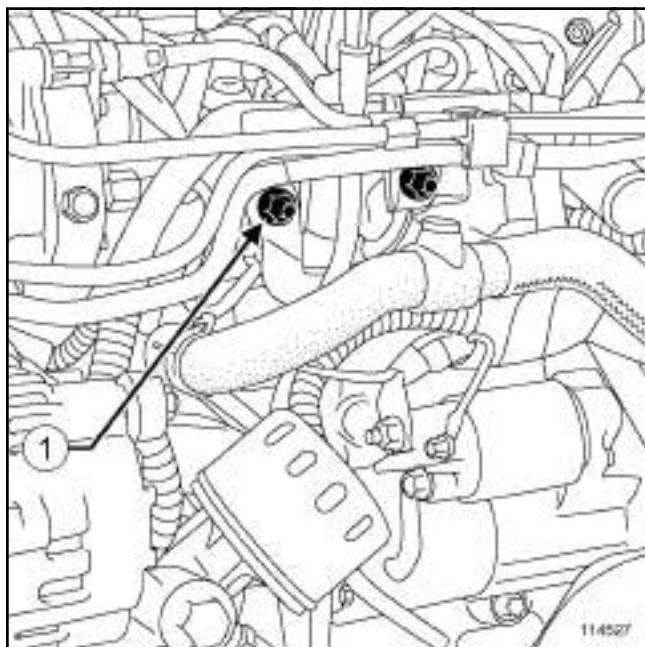
Tightening torques

accelerometer **20 N.m**

REMOVAL

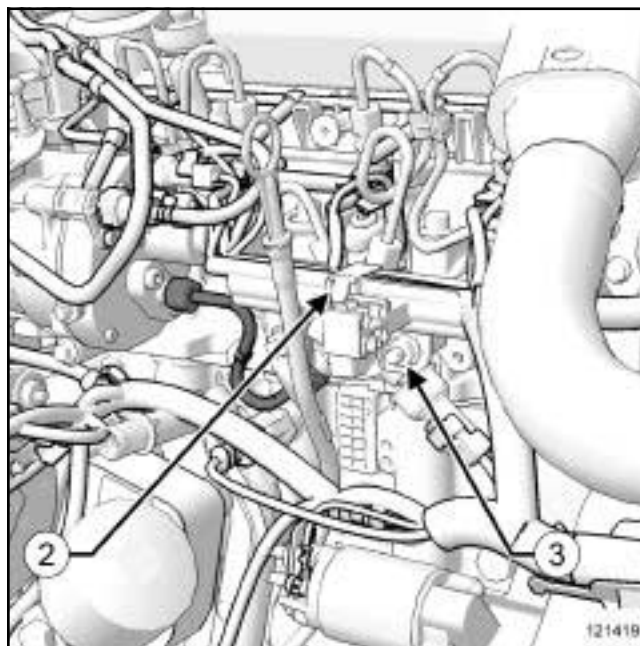
I - REMOVAL PREPARATION OPERATION

- Remove the front engine cover.



- Remove:
 - the dipstick,
 - the oil level dipstick nut (1) ,
 - the oil level dipstick guide.
- Plug the oil level dipstick guide inlet opening on the cylinder block.
- Disconnect the following connectors :
 - the heater plugs,
 - the injectors,
 - the flow actuator,

- the diesel temperature sensor.



- Detach the channel at (2) .
- Move the wiring away from the channel.
- Remove:
 - the nut (3) from the channel,
 - the neck.

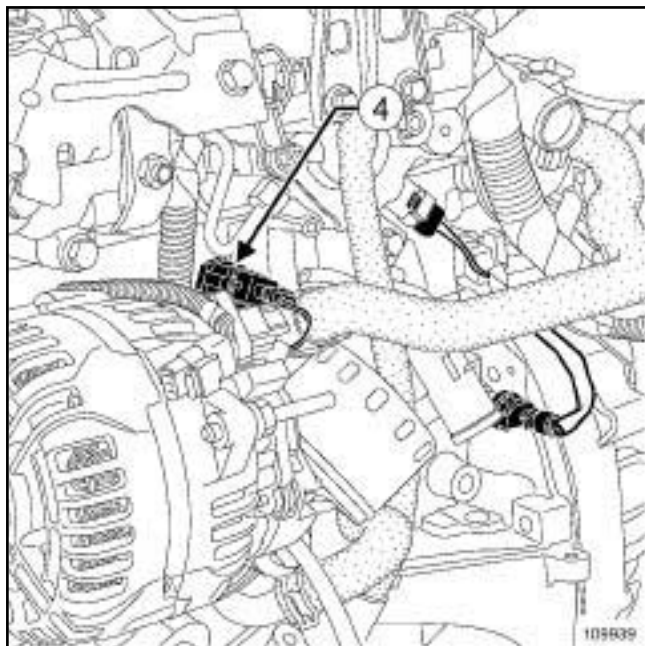
DIESEL INJECTION

Accelerometer: Removal - Refitting

13B

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



109939

- Disconnect the accelerometer connector (4) .
- Remove the accelerometer (4) using the (**Emb. 1797**).

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the accelerometer.
- Torque tighten the **accelerometer (20 N.m)** using the (**Emb. 1797**).
- Connect the accelerometer connector.

II - FINAL OPERATION

- Refit:
 - the channel,
 - the channel nut.
- Position the channel wiring harness.
- Clip on the channel.
- Connect the connectors of:
 - the heater plugs,
 - the injectors,
 - the flow actuator,
 - the diesel temperature sensor.

- Remove the blanking cover which protects the oil level dipstick guide inlet opening on the cylinder block.
- Refit:
 - the dipstick guide,
 - the oil level dipstick nut,
 - the dipstick.
- Refit the channel nuts.
- Refit the engine cover.

Note:

When replacing the accelerometer, run the appropriate command (see Fault finding repair manual) using the **Diagnostic tool** in order to carry out the necessary programming.

Pre-postheating unit: Removal - Refitting

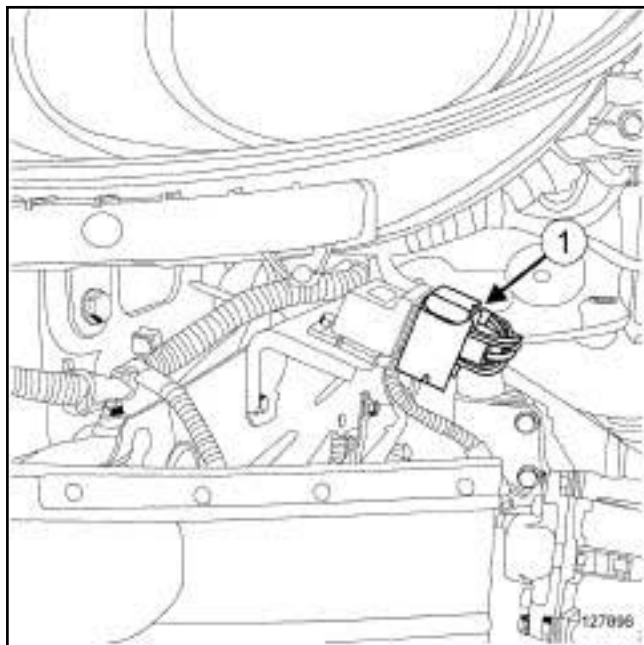
K9K

REMOVAL

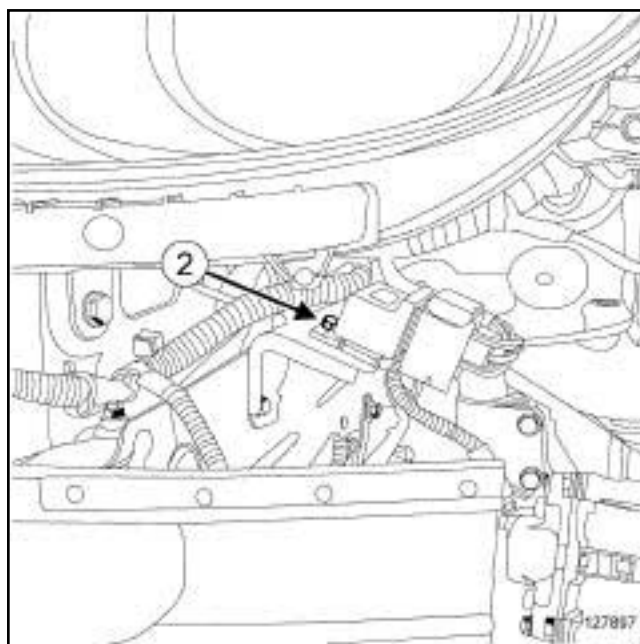
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Disconnect the pre-postheating unit connector (1) .



- Remove:
 - the pre-postheating unit nut.
 - the pre-postheating unit (2) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the pre-postheating unit.
- Connect the pre-postheating unit connector.

II - FINAL OPERATION.

- Refit:
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Heater plugs: Removal - Refitting

K9K

Equipment required

compressed air nozzle

hinged wrench for heater plug

Tightening torques

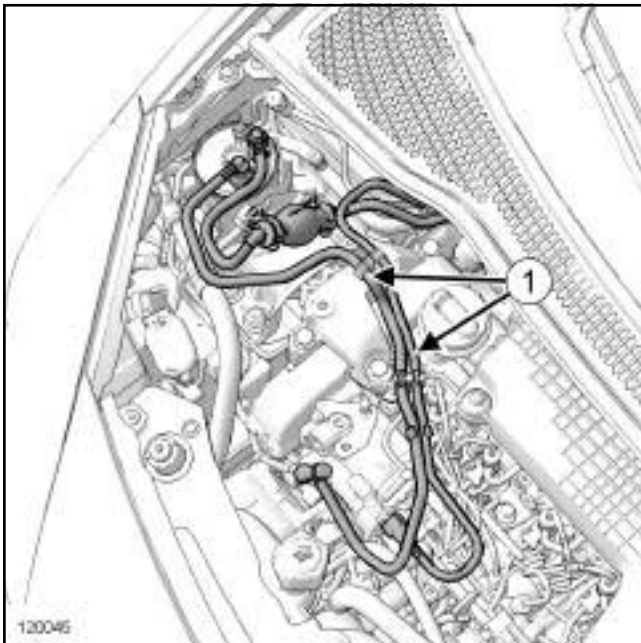
heater plugs

15 Nm

REMOVAL

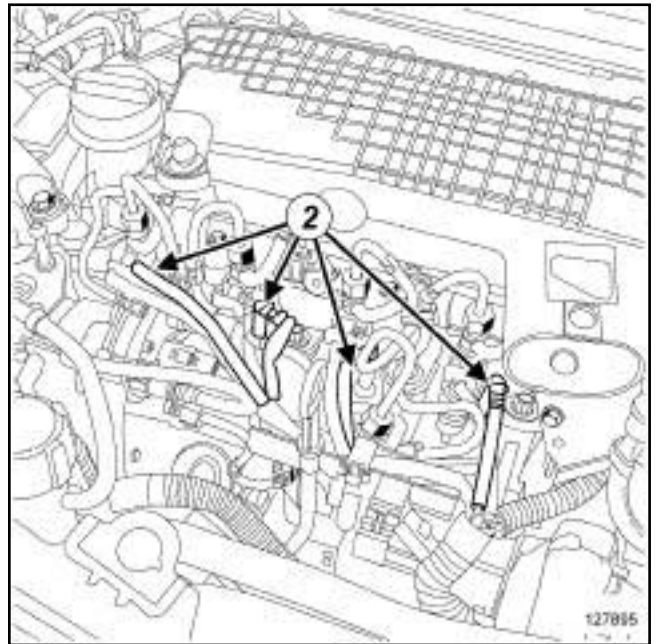
I - REMOVAL PREPARATION OPERATION

- Remove the front engine cover.



- Unclip the fuel supply pipes (1) from the right-hand suspended engine mounting.
- Move the fuel supply pipes away from the right-hand suspended engine mounting.

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Disconnect the heater plug connectors (2) .

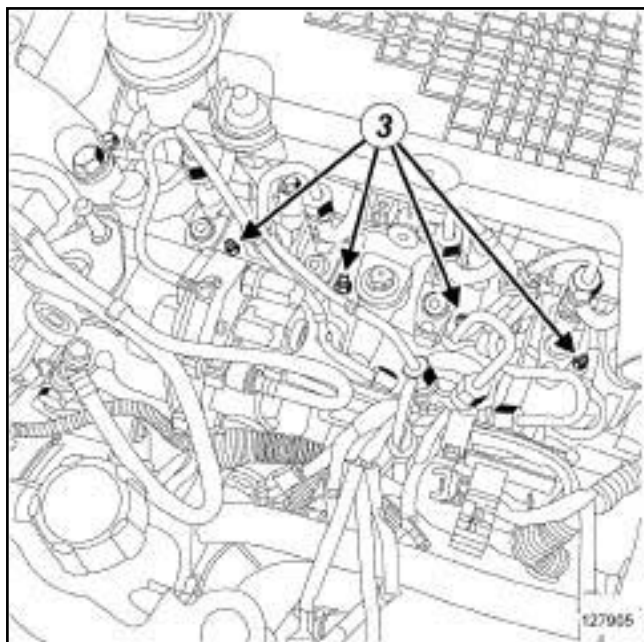
IMPORTANT

Wear goggles with side protectors for this operation.

- Clean the edges of the heater plugs using a **compressed air nozzle** to avoid any impurities getting into the cylinders.

Heater plugs: Removal - Refitting

K9K



127905

Note:

If the heater plugs jam, use the heater plug removal tool (see) (Technical Note 5197A, 06A, Tools).

- Loosen the heater plugs (3) using a **10 mm** long radio socket connected to a universal joint or a **hinged wrench for heater plug**.
- Use a hose to unscrew the heater plugs completely.
- Remove the heater plugs.
- Block the plug wells on the cylinder head using clean cloths throughout the removal operation.

REFITTING**I - REFITTING OPERATION FOR PART CONCERNED**

- Remove the protection on the openings of the plug well(s) on the cylinder head.
- Bolt without tightening the heater plugs using the hose.
- Torque tighten the **heater plugs (15 Nm)**.
- Connect the heater plug connectors.

II - FINAL OPERATION.

- Fit the fuel pipes on the right-hand suspended engine mounting.

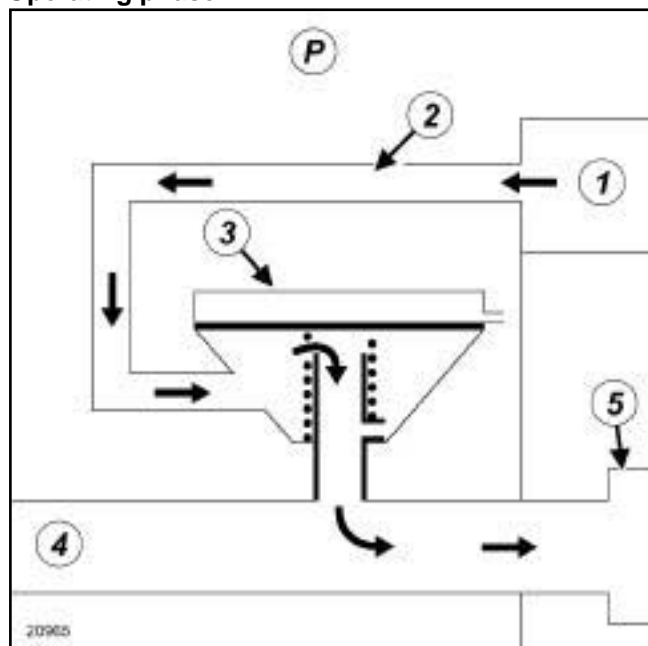
- Clip the fuel supply pipes onto the right-hand suspended engine mounting.
- Refit the engine cover.

Oil vapour rebreathing circuit: Descriptions

K9K

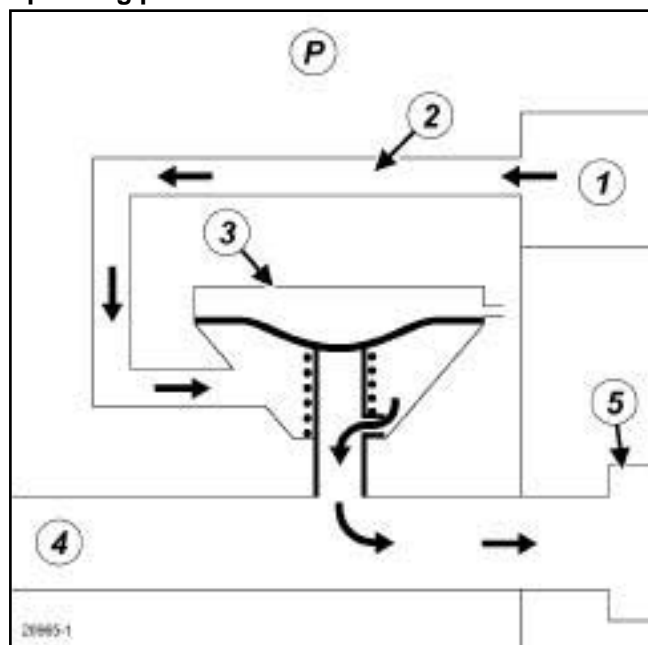
I - PRESENTATION OF THE CIRCUIT

Operating phase A



20965

Operating phase B



20965-1

- (P) Atmospheric pressure
- (1) Rocker cover
- (2) Oil vapour recirculation pipe
- (3) Oil vapour recirculation valve
- (4) Air filter box outlet air pipe
- (5) Turbocharger

Operating phase A :

- with the engine at low load, the vacuum in the air pipe at the air filter box outlet is not sufficient to activate the membrane of the oil vapour rebreathing valve, fitted with a weighted spring. Oil vapours are aspirated in large quantities due to the vacuum in the air pipe at the air filter box outlet.

Operating phase B :

- At engine medium and high load, the vacuum in the pipe at the air filter box outlet attracts the membrane of the oil vapour rebreathing valve. The hole allowing the oil vapours to pass through in large quantities is therefore closed and the oil vapours are aspirated in low quantities via a calibrated jet.

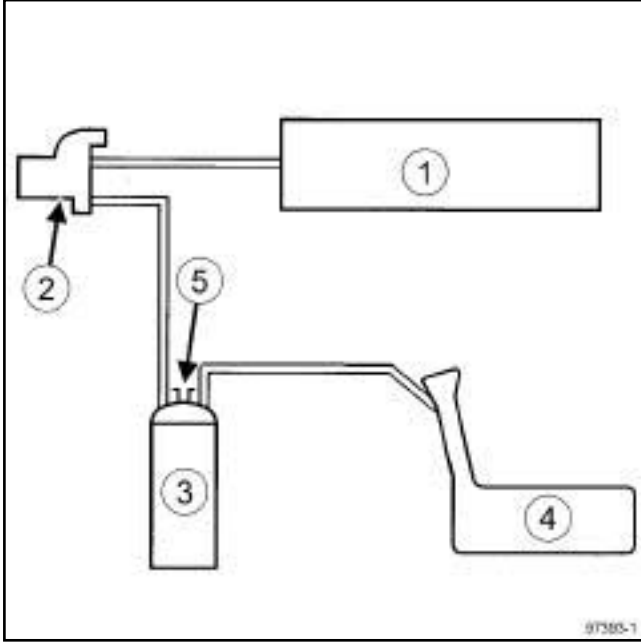
II - CHECK

To ensure the antipollution system works properly, the oil vapour rebreathing circuit must be kept clean and in good condition.

Fuel vapour recirculation circuit: Operating diagram

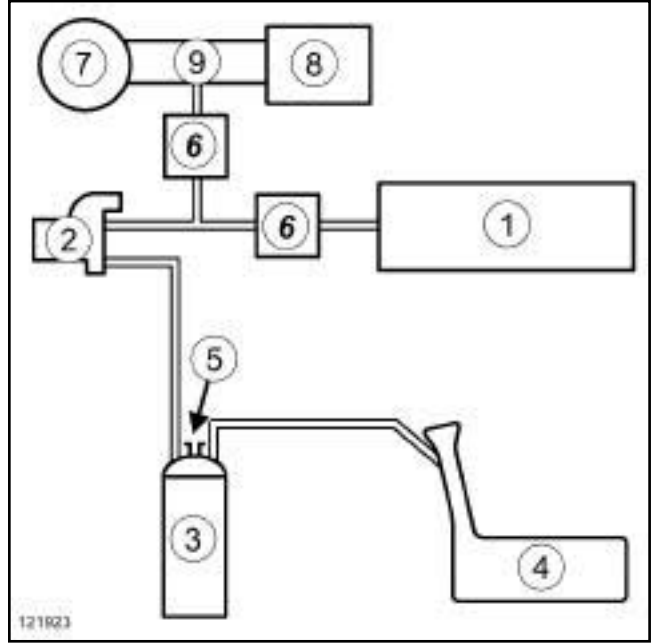
D4F or D7F

D4F, and 772 – D7F



- (1) Inlet distributor
- (2) Fuel vapour absorber bleed solenoid valve
- (3) Petrol vapour absorber
- (4) Tank
- (5) Fresh air vent

D4F, and 780 or 782



- (1) Inlet distributor
- (2) Fuel vapour absorber bleed solenoid valve
- (3) Petrol vapour absorber
- (4) Tank
- (5) Fresh air vent
- (6) Anti-return valve
- (7) Turbocharger
- (8) Air filter unit
- (9) Air filter box air outlet pipe

Fuel vapour recirculation circuit: Check

D4F or D7F

Equipment required

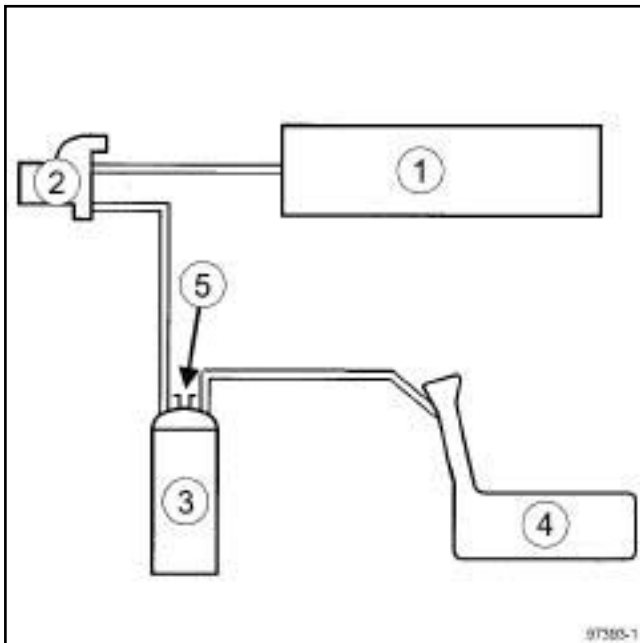
Diagnostic tool

Note:

Incorrect operation of the system may result in rough idle or engine stalling.

I - CHECKING THE OPERATION OF THE FUEL VAPOUR ABSORBER BLEED

D4F, and 772 – D7F

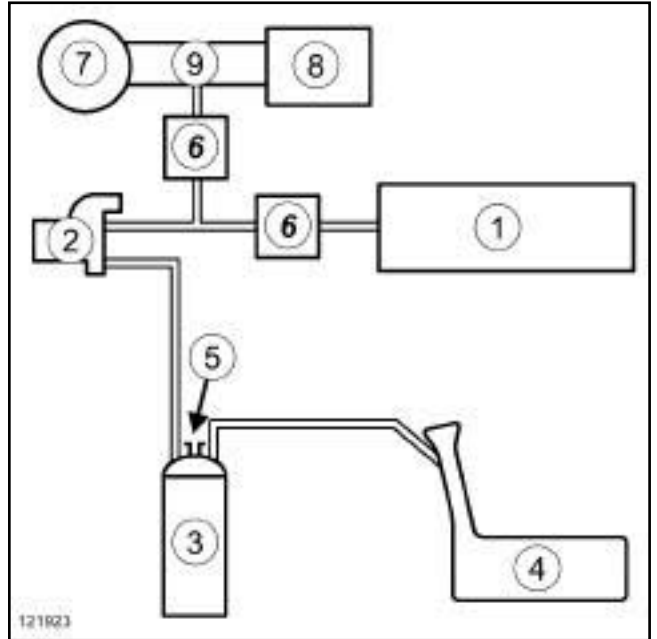


97393-1

- (1) Inlet distributor
- (2) Fuel vapour absorber bleed solenoid valve
- (3) Petrol vapour absorber
- (4) Tank
- (5) Fresh air vent

Check the condition of the pipes to the tank.

D4F, and 780 or 782



121923

121923

- (1) Inlet distributor
- (2) Fuel vapour absorber bleed solenoid valve
- (3) Petrol vapour absorber
- (4) Tank
- (6) Anti-return valve
- (7) Turbocharger
- (8) Air filter unit
- (9) Air filter box air outlet pipe

Check the condition of the pipes to the tank.

II - FUEL VAPOUR ABSORBER BLEED CONDITIONS

The fuel vapour absorber bleed solenoid valve is controlled by the computer.

During « on board diagnostic » fault finding, fuel vapour absorber bleeding is not authorised.

The opening cyclic ratio of the fuel vapour absorber bleed solenoid valve can be viewed on the **Diagnostic tool** by reading parameter « Fuel vapour absorber bleed solenoid valve OCR » .

The solenoid valve is closed for a value below **1.2%**.

Fuel vapour absorber: Removal - Refitting

D4F or D7F or K4M, and TECHNICAL REG: GERMANY or TECHNICAL REG: AUSTRIA or TECHNICAL REG: BALKANS or TECHNICAL-LEGISLATIVE BELGIUM or TECHNICAL REG: BOSNIA or TECHNICAL REG: CYPRUS-MALTA or CZECH REP AND SLOVAKIA or TECHNICAL REG: DENMARK or TECHNICAL REG: DOM (FRENCH OVERSEAS SUBDIVISION) or TECHNICAL REG: SPAIN or TECHNICAL REG: FINLAND or TECHNICAL REG: FRANCE or TECHNICAL REG: GREAT BRITAIN or TECHNICAL REG: GREECE or TECHNICAL-LEGISLATIVE HOLLAND or TECHNICAL REG: HUNGARY or TECHNICAL REG: IRELAND or TECHNICAL REG: ICELAND or TECHNICAL REG: ISRAEL or TECHNICAL REG: ITALY or TECHNICAL REG: JAPAN or TECHNICAL REG: NORTH or TECHNICAL REG: NORWAY or TECHNICAL REG: POLAND or TECHNICAL REG: PORTUGAL or TECHNICAL REG: SLOVENIA or TECHNICAL REG: SWEDEN or TECHNICAL REG: SWITZERLAND or TECHNICAL REG: TOM (FRENCH OVERSEAS TERRITORIES)

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

WARNING

Keep the pipe unions away from contaminated areas.

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

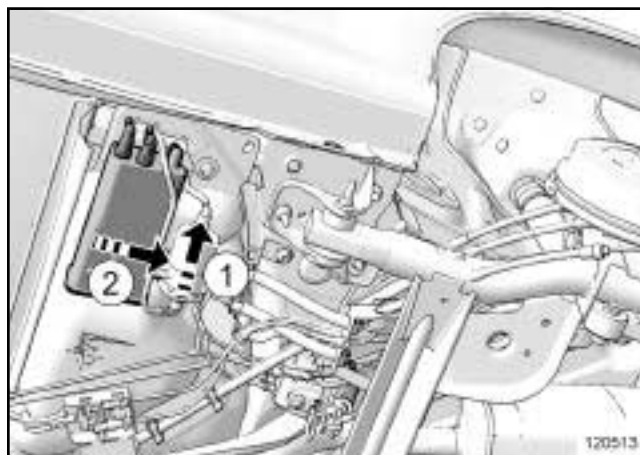
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

II - REMOVAL OPERATION

D4F or D7F



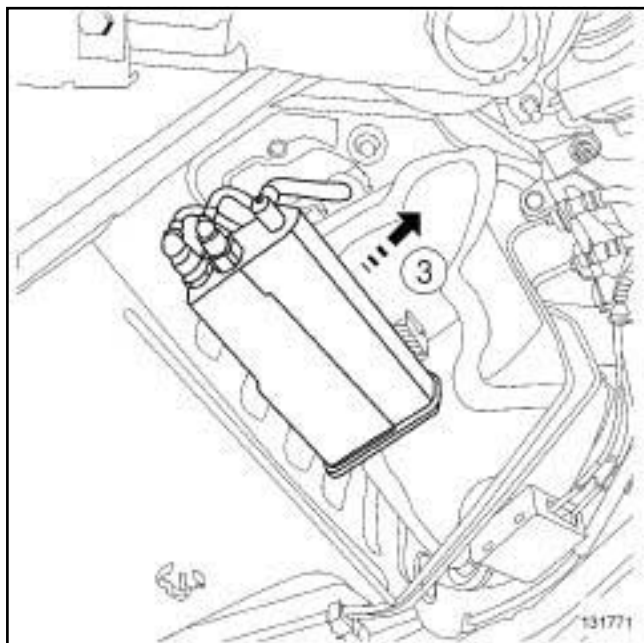
120513

- Unclip:
 - the fuel filter on the fuel vapour absorber in the direction of the arrow (1) ,
 - the fuel vapour absorber in the direction of the arrow (2) .

Fuel vapour absorber: Removal - Refitting

D4F or D7F or K4M, and TECHNICAL REG: GERMANY or TECHNICAL REG: AUSTRIA or TECHNICAL REG: BALKANS or TECHNICAL-LEGISLATIVE BELGIUM or TECHNICAL REG: BOSNIA or TECHNICAL REG: CYPRUS-MALTA or CZECH REP AND SLOVAKIA or TECHNICAL REG: DENMARK or TECHNICAL REG: DOM (FRENCH OVERSEAS SUBDIVISION) or TECHNICAL REG: SPAIN or TECHNICAL REG: FINLAND or TECHNICAL REG: FRANCE or TECHNICAL REG: GREAT BRITAIN or TECHNICAL REG: GREECE or TECHNICAL-LEGISLATIVE HOLLAND or TECHNICAL REG: HUNGARY or TECHNICAL REG: IRELAND or TECHNICAL REG: ICELAND or TECHNICAL REG: ISRAEL or TECHNICAL REG: ITALY or TECHNICAL REG: JAPAN or TECHNICAL REG: NORTH or TECHNICAL REG: NORWAY or TECHNICAL REG: POLAND or TECHNICAL REG: PORTUGAL or TECHNICAL REG: SLOVENIA or TECHNICAL REG: SWEDEN or TECHNICAL REG: SWITZERLAND or TECHNICAL REG: TOM (FRENCH OVERSEAS TERRITORIES)

K4M



131771

- Unclip the fuel vapour absorber in the direction of the arrow (3) .

- Disconnect the fuel vapour absorber pipes.
- Remove the fuel vapour absorber.

REFITTING

I - REFITTING OPERATION

- Refit the fuel vapour absorber.
- Connect the fuel vapour absorber pipes.

D4F or D7F

- Clip on:
 - the fuel vapour absorber,

- the fuel filter on the fuel vapour absorber.

K4M

- Clip on the fuel vapour absorber.

II - FINAL OPERATION

- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Fuel vapour absorber: Removal - Refitting

D4F, and SOUTH AFRICA

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

WARNING

Keep the pipe unions away from contaminated areas.

WARNING

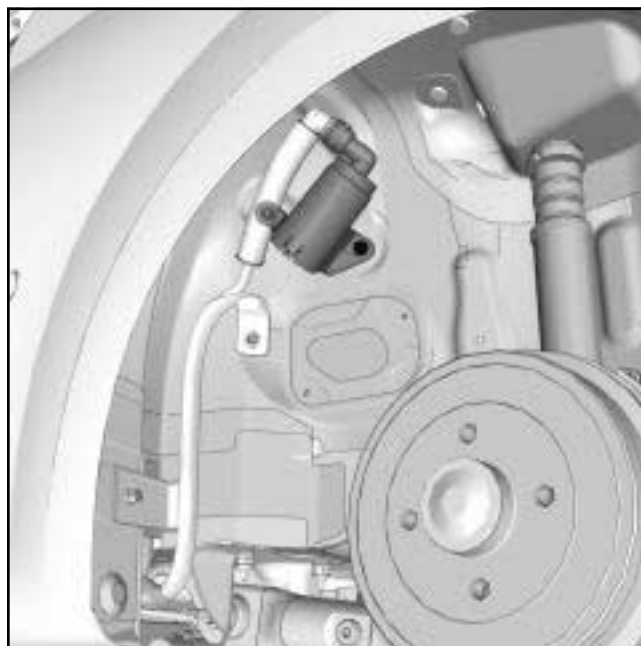
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**)
- Disconnect the battery (see **Battery: Removal - Refitting**)
- Remove the rear left-hand wheel (see **Wheel: Removal - Refitting**)
- Remove the rear left-hand wheel arch liner (see)

II - OPERATION FOR REMOVAL OF PART CONCERNED



143884

- Unclip the petrol vapour absorber pipe.
- Remove:
 - the petrol vapour absorber bolts.
 - the petrol vapour absorber.

REFITTING

REFITTING OPERATION FOR PART CONCERNED

- Refit.
 - the petrol vapour absorber.
 - the petrol vapour absorber bolts
- Clip on the petrol vapour absorber pipe.

FINAL OPERATION

- Refit the rear left-hand wheel arch liner (see)
- Refit the rear left-hand wheel (see **Wheel: Removal - Refitting**)
- Reconnect the battery (see **Battery: Removal - Refitting**)

ANTIPOLLUTION

Fuel vapour absorber: Check

14A

D4F or D7F

Special tooling required

Mot. 1311-01 Pressure gauges and petrol pressure measuring unions.

Equipment required

Diagnostic tool

manual vacuum and pressure pump

I - CHECKING THE FUEL VAPOUR ABSORBER

- On the fuel vapour absorber, plug the circuit coming from the fuel tank.
- Connect the pressure gauge of the **(Mot. 1311-01)** to the fuel vapour absorber breather outlet.
- With the engine at idle speed, check that no vacuum is present at the fuel vapour absorber breather outlet. In the same way, the control value read by the **Diagnostic tool** in parameter « fuel vapour absorber bleed solenoid valve OCR » remains minimal **X less than or equal to 1.5%**.

Is there a vacuum?

- Yes: With the ignition off, use a **manual vacuum and pressure pump** to apply a vacuum of **500 mbar** to the solenoid valve outlet. The vacuum pressure should not vary by more than **10 mbar** over **30 seconds**.

- Does the pressure vary?

- Yes: the solenoid valve is faulty, replace it (see **17B, Petrol injection, Petrol injection: List and location of components**, page 17B-1) .

- No: if it is an electrical problem, check the circuit (see **MR 413 Fault finding, 17B, Petrol injection, Fault finding - Interpretation of faults, Canister bleed solenoid valve circuit**).

- No: In bleeding condition (see «bleeding condition »), the vacuum should increase. In the same time, the value of the parameter on the **Diagnostic tool** increases.

II - CHECKING THE FUEL VAPOUR ABSORBER-TANK CONNECTION

- Check this connection by connecting a **manual vacuum and pressure pump** to the pipe leading to the fuel vapour absorber.

K4M

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

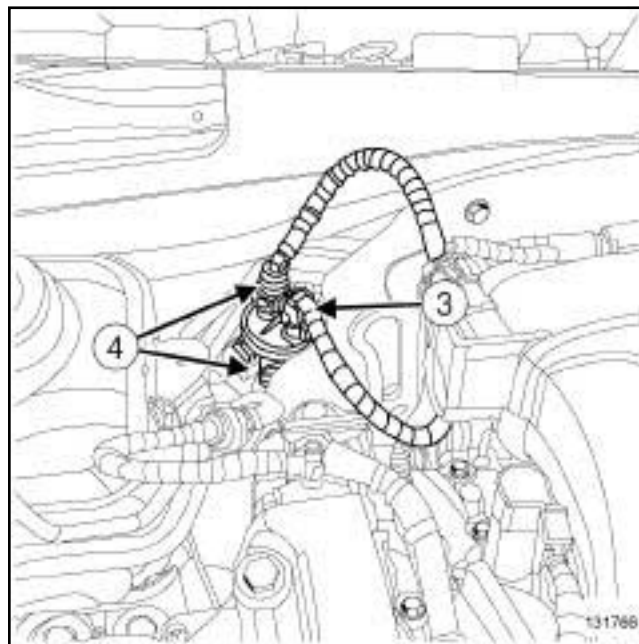
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

II - REMOVAL OPERATION



131766

- Disconnect:
 - the fuel vapour absorber bleed solenoid valve connector (3) ,
 - the fuel vapour absorber bleed solenoid valve pipes (4) .
- Insert the blanking plugs.

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

- Unclip the fuel vapour absorber bleed solenoid valve.

REFITTING

I - REFITTING OPERATION

- Clip on the fuel vapour absorber bleed solenoid valve.
- Remove the blanking plugs.
- Connect:
 - the fuel vapour absorber bleed solenoid valve pipes,
 - the fuel vapour absorber bleed solenoid valve connector.

K4M

II - FINAL OPERATION

- Refit:
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Tightening torques

exhaust gas recirculation solenoid valve bolts	10 Nm
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PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Consumables (see **Vehicle: Parts and consumables for the repair**) (02A, Parts and consumables):

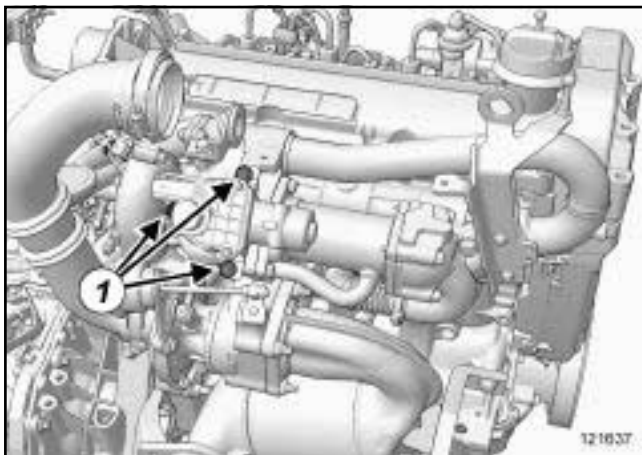
- **ABRASIVE PAD,**
- **SURFACE CLEANER.**

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove:
 - the engine cover,
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



121637

- Remove:
 - the bolts (1) from the exhaust gas recirculation solenoid valve,
 - the exhaust gas recirculation solenoid valve,
 - the exhaust gas recirculation solenoid valve seal.

REFITTING

I - REFITTING PREPARATIONS OPERATION

- Using the **ABRASIVE PADS**, clean the joint faces of the exhaust gas recirculation solenoid valve.
- Afterwards, degrease these bearing faces using **SURFACE CLEANER** and clean cloths.
- Refit a new seal on the exhaust gas recirculation solenoid valve.

II - REFITTING OPERATION FOR PART CONCERNED


- Refit:
 - the exhaust gas recirculation solenoid valve with its new seal,
 - the bolts to the exhaust gas recirculation solenoid valve.
- Torque tighten the **exhaust gas recirculation solenoid valve bolts (10 Nm)**.

III - FINAL OPERATION.

- Refit:
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the engine cover.
- If the EGR solenoid valve is being replaced, carry out the necessary programming (see **MR 413 Fault finding, 13B, Fault finding - Replacement of components, Operation for replacing the EGR solenoid valve**).

Exhaust gas cooler: Removal - Refitting

K9K

Tightening torques 	
mounting bolts (gear-box side) on the cooler	12 N.m
bolts of the exhaust gas recirculation rigid pipe on the exhaust gas cooler	12 N.m
bolts of the exhaust gas recirculation rigid pipe bracket	25 N.m
mounting bolts on the cooler	12 N.m
exhaust gas recirculation rigid pipe bolts	36 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

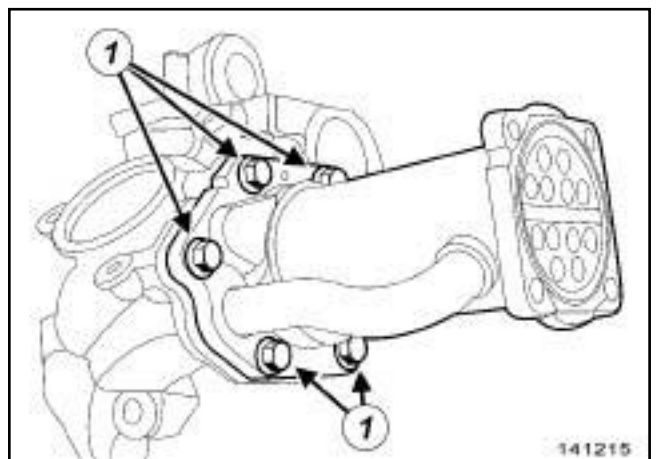
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the engine cover,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the EGR solenoid valve (see **14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting**, page 14A-10) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) ,

- the exhaust gas recirculation rigid pipe (see **14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting**, page 14A-19) ,

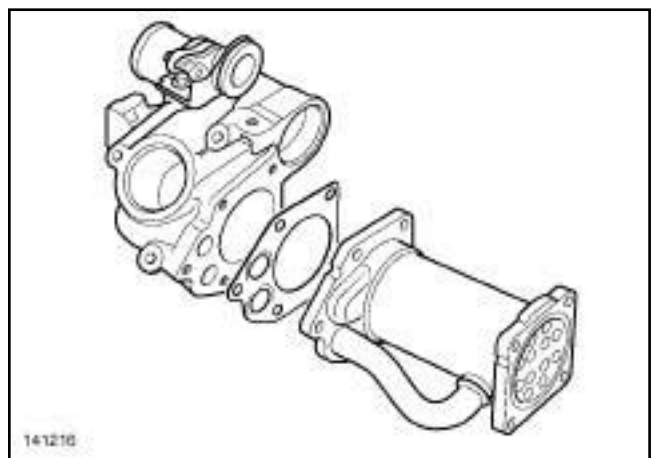
- the exhaust gas recirculation assembly (see **14A, Antipollution, Exhaust gas recirculation assembly: Removal - Refitting**, page 14A-15) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

K9K, and 718



141215



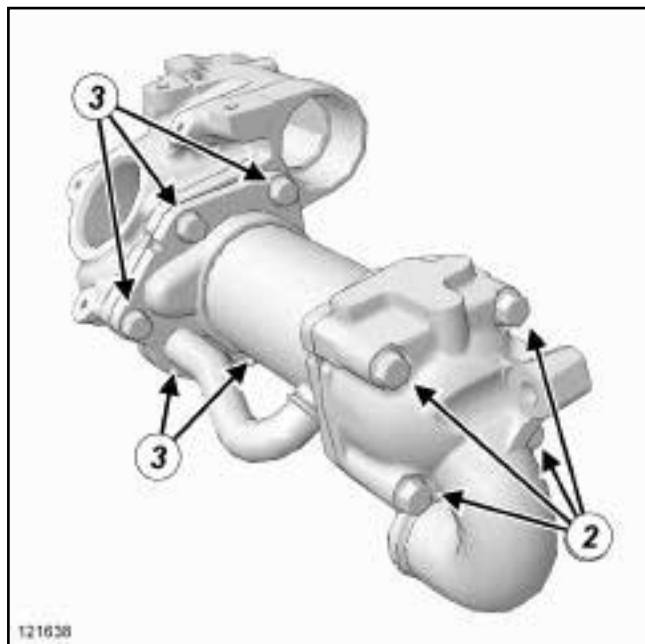
141216

- Using the workbench, remove:
 - the cooler bolts (1) on its mounting (gearbox side),
 - the mounting on the gearbox side,
 - the mounting seal on the gearbox side.

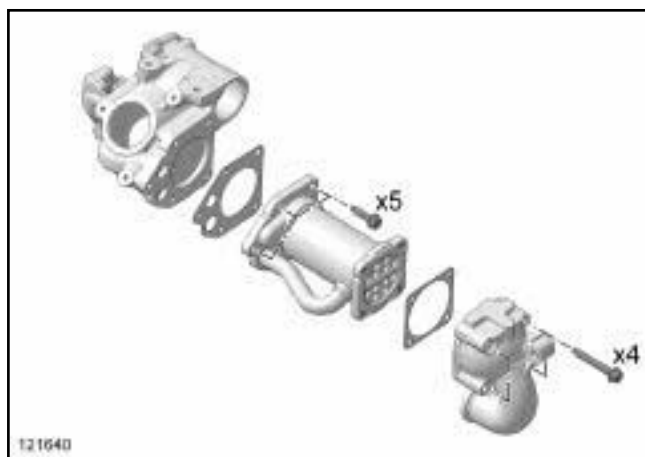
Exhaust gas cooler: Removal - Refitting

K9K

K9K, and 740



121638



121640

- Using the workbench, remove:
 - the cooler bolts (2) on its mounting (timing end),
 - the mounting on the timing end,
 - the mounting seal on the timing end,
 - the cooler bolts on its mounting (gearbox side),
 - the mounting (3) on the gearbox side,
 - the mounting seal on the gearbox side.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: exhaust gas cooler seal
- parts always to be replaced: Exhaust gas cooler cover seal

K9K, and 718

- parts always to be replaced: Exhaust gas recirculation pipe seal
- parts always to be replaced: Exhaust gas recirculation rigid pipe

- Use an **ABRASIVE PAD** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the bearing faces:

- the intercooler and its mountings,
- the coolant circulation cover within the exhaust gas cooler.

- Use **CLEAN CLOTHS** and **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease the bearing faces.

WARNING

Ensure that the seals between the cooler and its two supports are correctly positioned to avoid any coolant leaks.

Exhaust gas cooler: Removal - Refitting

K9K

II - REFITTING OPERATION FOR PART CONCERNED

K9K, and 718

- On the workbench, refit the following to the intercooler:
 - a new mounting seal on the gearbox side,
 - the mounting on the gearbox side,
 - the mounting bolts (gearbox side) onto the intercooler without tightening them,
 - a new exhaust gas recirculation rigid pipe,
 - the bolts of the exhaust gas recirculation rigid pipe bracket on the cooler without tightening them.

Note:

The cooler must absolutely be able to move in relation to the mounting (gearbox side) and to the exhaust gas recirculation rigid pipe so that it can be properly adjusted afterwards on the cylinder head.

- Fit the exhaust gas recirculation assembly onto the cylinder head.
- Adjust the mounting (gearbox side) and the exhaust gas recirculation rigid pipe until they are flat against the cylinder head.
- Fit the exhaust gas recirculation unit assembly bolts, without tightening them.
- Tighten the bolts of the mounting (gearbox side) and of the exhaust gas recirculation rigid pipe on the exhaust gas cooler to secure them on the exhaust gas cooler.
- Remove the exhaust gas recirculation assembly.
- On the workbench, torque tighten:
 - the **mounting bolts (gearbox side) on the cooler (12 N.m)**,
 - the **bolts of the exhaust gas recirculation rigid pipe on the exhaust gas cooler (12 N.m)**,
 - the **bolts of the exhaust gas recirculation rigid pipe bracket (25 N.m)**.

K9K, and 740

- On the workbench, refit the following to the intercooler:
 - a new mounting seal on the gearbox side,
 - the mounting on the gearbox side,
 - the mounting bolts (gearbox side) onto the intercooler without tightening them,
 - a new mounting seal on the timing end,
 - the mounting on the timing end,
 - the mounting bolts (timing end) onto the intercooler without tightening them.

Note:

The cooler must absolutely be able to move in relation to its two mountings so that it can be properly adjusted afterwards on the cylinder head.

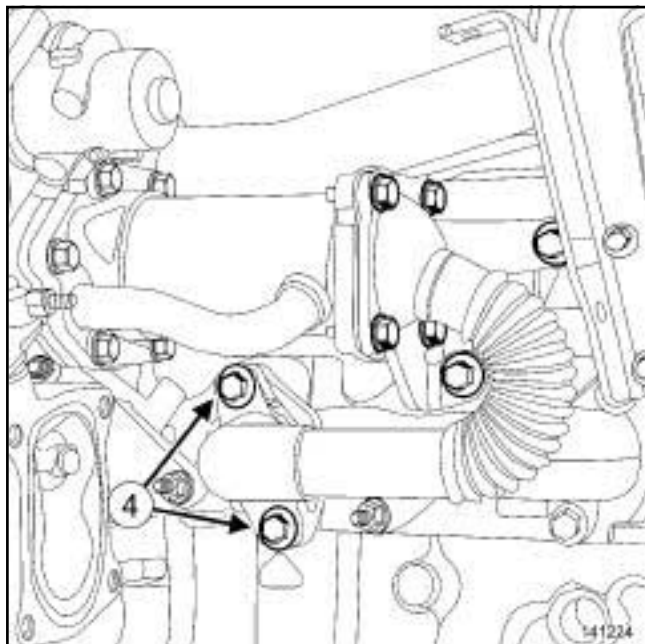
- Fit the exhaust gas recirculation assembly onto the cylinder head.
- Adjust the two mountings until they are flat against the cylinder head.
- Fit the exhaust gas recirculation unit assembly bolts, without tightening them.
- Tighten the bolts of the two mountings on the exhaust gas cooler to immobilise them on the exhaust gas cooler.
- Remove the exhaust gas recirculation assembly.
- On the workbench, torque tighten the **mounting bolts on the cooler (12 N.m)**.

III - FINAL OPERATION

- Refit the exhaust gas recirculation assembly (see **14A, Antipollution, Exhaust gas recirculation assembly: Removal - Refitting, page 14A-15**).

K9K

K9K, and 718



141224

- Refit the bolts (4) of the exhaust gas recirculation rigid pipe on the exhaust manifold.
- Torque tighten the **exhaust gas recirculation rigid pipe bolts (36 N.m)**.

K9K, and 740

- Refit the rigid exhaust gas recirculation pipe (see **14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting**, page 14A-19) .
- Refit:
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the EGR solenoid valve (see **14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting**, page 14A-10) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),

- Top up the coolant level.
- Connect the battery (see) (80A, Battery).
- Bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Refit the engine cover.

K9K

Special tooling required

Ms. 583 Pipe clamps.

Tightening torques

exhaust gas recirculation unit assembly bolts **25 N.m**

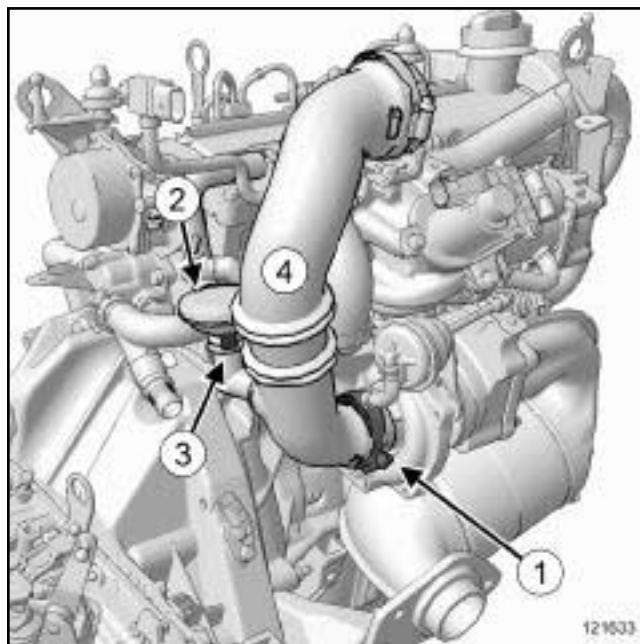
coolant circulation cover bolts on the exhaust gas cooler **12 N.m**

intercooler air outlet pipe clip at the damper valve end **5.5 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the engine cover,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing)
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the EGR solenoid valve (see **14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting**, page 14A-10) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) ,
 - the rigid exhaust gas recirculation pipe (see **14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting**, page 14A-19) .

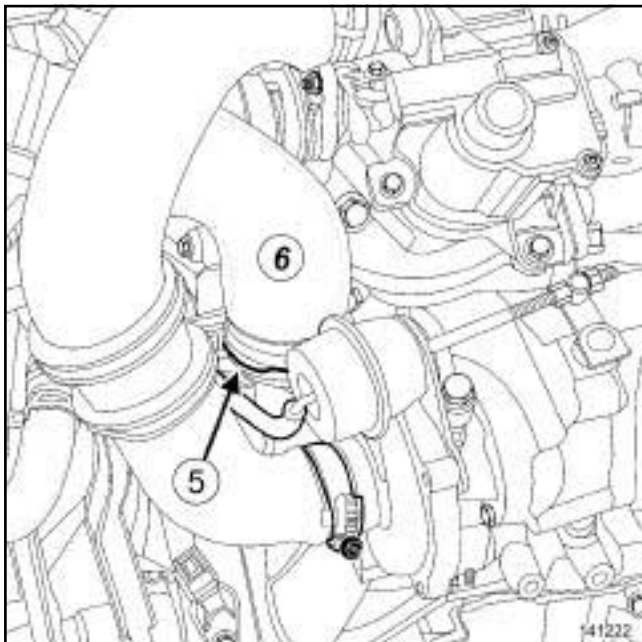


121633

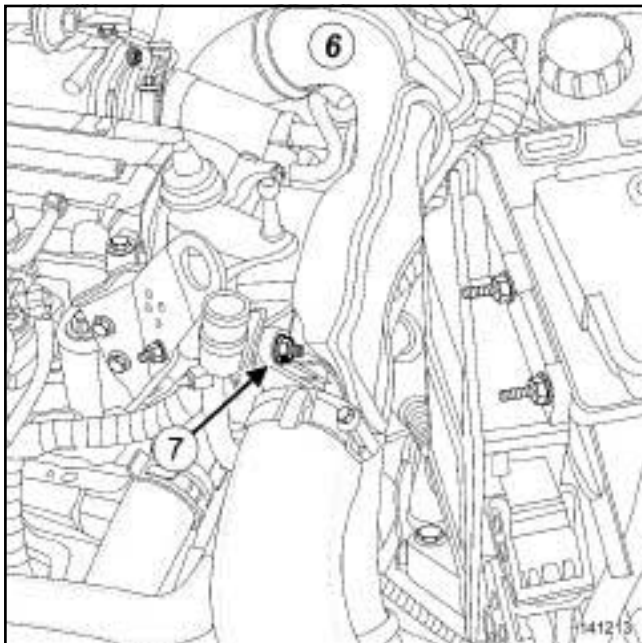
- Undo the clip (1) of the air filter unit air outlet pipe on the turbocharger.
- Disconnect the oil vapour rebreathing pipe (2) by carefully separating the brackets (3) .
- Remove the air outlet pipe from the air filter box (4) .

K9K

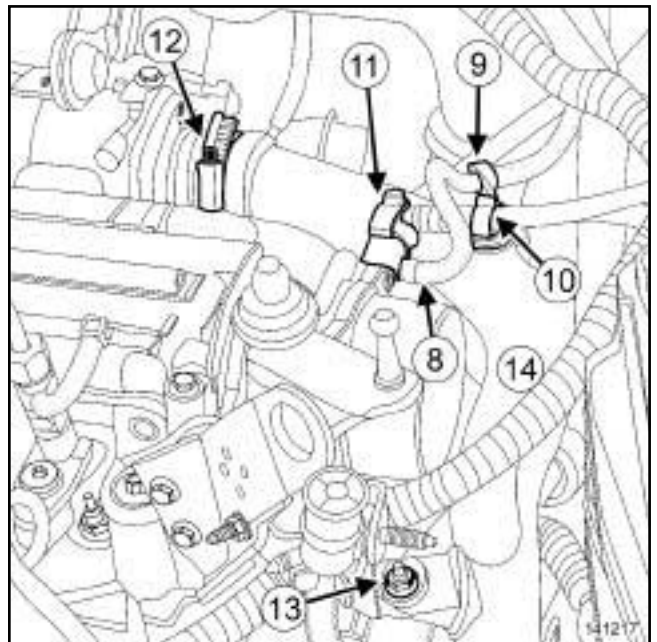
K9K, and 718



141222



141213

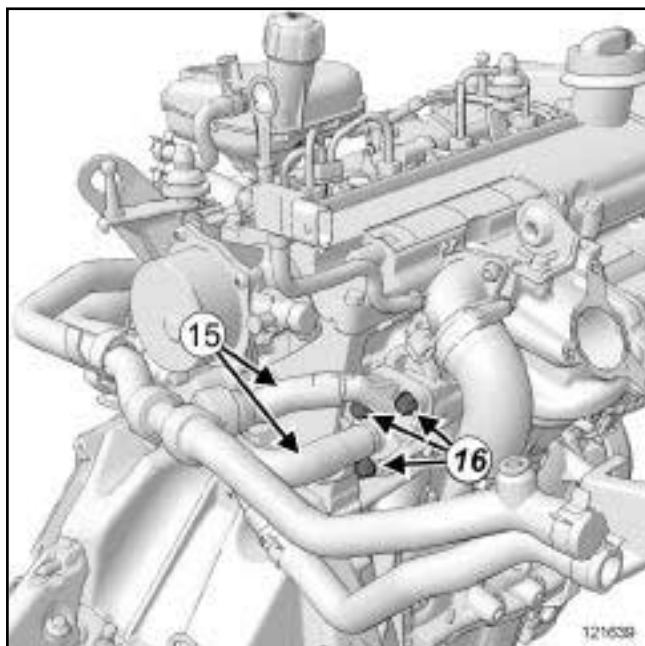


141217

- Pull the intercooler air inlet pipe clip (5) on the turbo-charger side.
- Disconnect the intercooler air inlet pipe (6) at the tur-bocharger end.
- Remove the intercooler air inlet pipe nut (7) at the turbocharger end.
- Move aside the intercooler air inlet pipe (6) at the tur-bocharger end.
- Disconnect the vacuum pipe (8) from the turbo-charging pressure regulator.
- Unclip:
 - the turbocharging pressure regulator vacuum pipe at (9) ,
 - the brake servo vacuum pipe at (10) .
- Disconnect the brake servo vacuum pipe (11) .
- Loosen the clamp (12) for the air-air intercooler air outlet pipe at the damper valve end.
- Disconnect the intercooler air outlet pipe (14) at the damper valve end.
- Remove the nut (13) from the intercooler air outlet pipe.
- Move the intercooler air outlet pipe (14) to one side.

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED

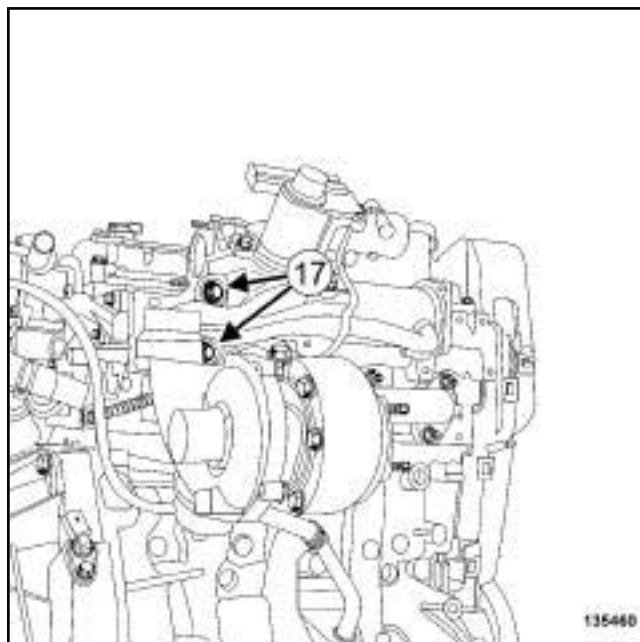


121639

- Fit the tool (**Ms. 583**) on the coolant inlet and outlet hoses (**15**) of the exhaust gas cooler.
- Remove:
 - the bolts (**16**) of the exhaust gas cooler cover,
 - the exhaust gas cooler cover,
 - the seals of the exhaust gas cooler cover.

Note:

Be prepared for the escape of coolant.



135460

- Remove:
 - the bolts (**17**) from the exhaust gas recirculation assembly,
 - the exhaust gas recirculation assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Exhaust gas cooler cover seal.**
- Use an **ABRASIVE PAD** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the bearing faces of:
 - the turbocharger and the catalytic converter,
 - the exhaust gas recirculation solenoid valve and the exhaust gas recirculation unit,
 - the coolant circulation cover within the exhaust gas cooler.
- Degrease the bearing faces using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and **CLEAN CLOTHS**.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the exhaust gas recirculation assembly.
- Torque tighten the **exhaust gas recirculation unit assembly bolts (25 N.m)**.

K9K

- Refit:
 - new seals on the coolant circulation cover,
 - the coolant circulation cover on the exhaust gas cooler.
- Torque tighten the **coolant circulation cover bolts on the exhaust gas cooler (12 N.m)**.
- Remove the tool (**Ms. 583**) from the coolant inlet and outlet hoses of the exhaust gas cooler.

III - FINAL OPERATION


K9K, and 718

- Fit the intercooler air outlet pipe at the damper valve end.
 - Connect the intercooler air outlet pipe on the side of the damper valve.
 - Torque tighten the **intercooler air outlet pipe clip at the damper valve end (5.5 N.m)**.
 - Refit the intercooler air outlet pipe nut on the lifting eye.
 - Connect the turbocharging pressure regulator vacuum pipe.
 - Clip:
 - the turbocharging pressure regulator vacuum pipe,
 - the vacuum pipe from the brake servo.
 - Connect the brake servo vacuum pipe.
 - Fit the intercooler air inlet pipe at the turbocharger end.
 - Refit the intercooler air inlet pipe nut at the turbocharger end on the lifting eye.
 - Connect the intercooler air inlet pipe at the turbocharger end.
 - Clip on the intercooler air inlet pipe clip at the turbocharger end.
-
- Refit the air outlet pipe onto the air filter unit.
 - Tighten the air filter unit air outlet pipe clip on the turbocharger.
 - Connect the oil vapour rebreathing pipe.
 - Refit:
 - the exhaust gas recirculation rigid pipe (see **14A, Antipollution, Exhaust gas recirculation rigid pipe: Removal - Refitting**, page **14A-19**),

- the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-12**),
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
- the EGR solenoid valve (see **14A, Antipollution, Exhaust gas recirculation solenoid valve: Removal - Refitting**, page **14A-10**),
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- Connect the battery (see) (80A, Battery).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**).
- Refit the engine cover.

Exhaust gas recirculation rigid pipe: Removal - Refitting

K9K

Tightening torques 	
bolts of the exhaust gas recirculation rigid pipe on the exhaust manifold	36 N.m
bolts of the exhaust gas recirculation rigid pipe on the exhaust gas cooler	12 N.m
bolts of the exhaust gas recirculation rigid pipe bracket	25 N.m
rigid exhaust gas recirculation pipe clip	5 N.m
bolts of the exhaust gas recirculation rigid pipe on the exhaust manifold	36 N.m

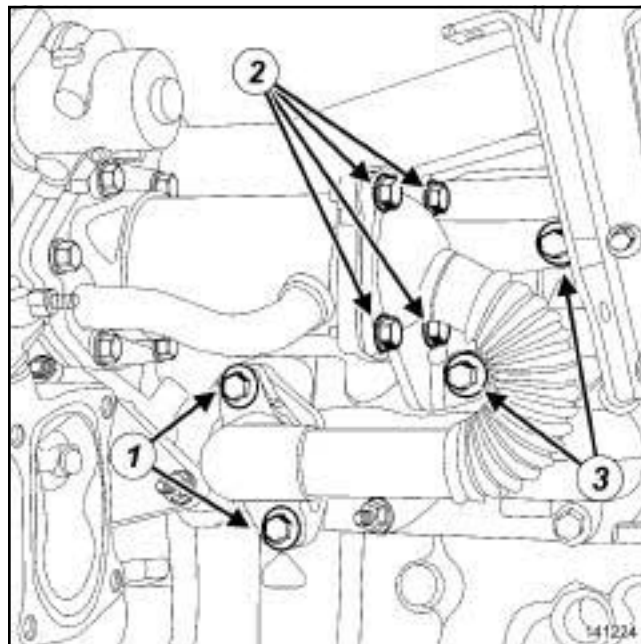
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the engine cover,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page 19B-12) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

K9K, and 718

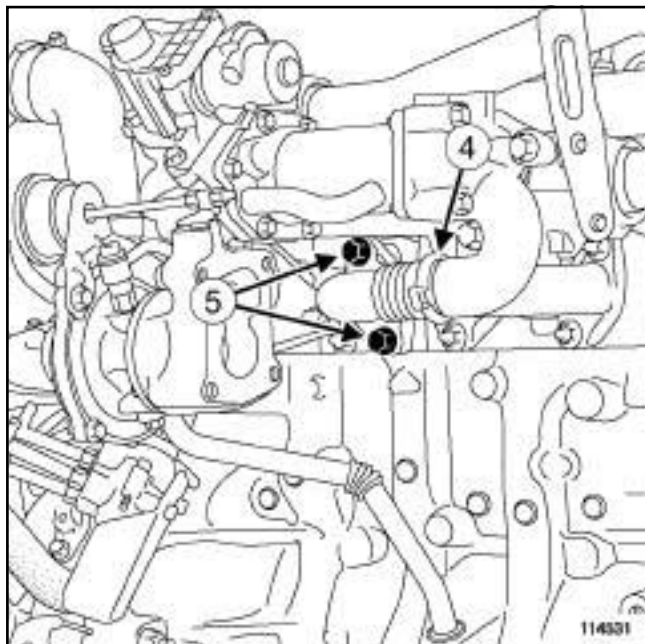


141224

- Remove:
 - the bolts (1) from the exhaust gas recirculation rigid pipe on the exhaust manifold,
 - the bolts (2) of the exhaust gas recirculation rigid pipe on the exhaust gas cooler,
 - the bolts (3) of the exhaust gas recirculation rigid pipe bracket,
 - the EGR rigid pipe.

K9K

K9K, and 740



114531

- Remove:
 - the clip (4) of the exhaust gas recirculation rigid pipe,
 - the bolts (5) from the EGR rigid pipe,
 - the EGR rigid pipe.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Exhaust gas recirculation rigid pipe
- parts always to be replaced: exhaust gas recirculation pipe bolt
- parts always to be replaced: Exhaust gas recirculation pipe seal

K9K, and 718

- parts always to be replaced: exhaust gas cooler seal

K9K, and 740

- parts always to be replaced: Exhaust gas recirculation pipe clip
- Using an **ABRASIVE PAD** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products), clean the bearing face of the exhaust gas recirculation rigid pipe on the cylinder head.
- Use **SURFACE CLEANER** and **CLEAN CLOTHS** to degrease the bearing face of the exhaust gas recirculation rigid pipe on the cylinder head (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

II - REFITTING OPERATION FOR PART CONCERNED

K9K, and 718

- Refit the rigid exhaust gas recirculation pipe.
- Check that the rigid exhaust gas recirculation pipe is not constrained.
- Tighten to torque:
 - the **bolts of the exhaust gas recirculation rigid pipe on the exhaust manifold (36 N.m)**,
 - the **bolts of the exhaust gas recirculation rigid pipe on the exhaust gas cooler (12 N.m)**,
 - the **bolts of the exhaust gas recirculation rigid pipe bracket (25 N.m)**.

Exhaust gas recirculation rigid pipe: Removal - Refitting

K9K

K9K, and 740

- Refit the exhaust gas recirculation rigid pipe with a new clip.
- Fit the rigid exhaust gas recirculation pipe bolts, without tightening them.
- Adjust the rigid exhaust gas recirculation pipe in relation to the exhaust gas recirculation assembly.
- Torque tighten the **rigid exhaust gas recirculation pipe clip (5 N.m)**.
- Check that the rigid exhaust gas recirculation pipe is not constrained.
- Torque tighten the **bolts of the exhaust gas recirculation rigid pipe on the exhaust manifold (36 N.m)**.

III - FINAL OPERATION


- Refit:
 - the catalytic converter (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-12**),
 - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the engine cover.
- Connect the battery (see) (80A, Battery).

STARTING - CHARGING

Alternator: Removal - Refitting

16A

D4F or D7F, and STANDARD HEATING

Tightening torques 	
alternator bolts	25 Nm
sub-frame tie-rod lower bolt	62 Nm
sub-frame tie-rod upper bolt	21 Nm

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection).
- Undo the lower bolt on the sub-frame tie-rod.
- Remove the upper bolt from the sub-frame tie-rod.
- Remove the sub-frame tie-rod.
- Remove the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) .

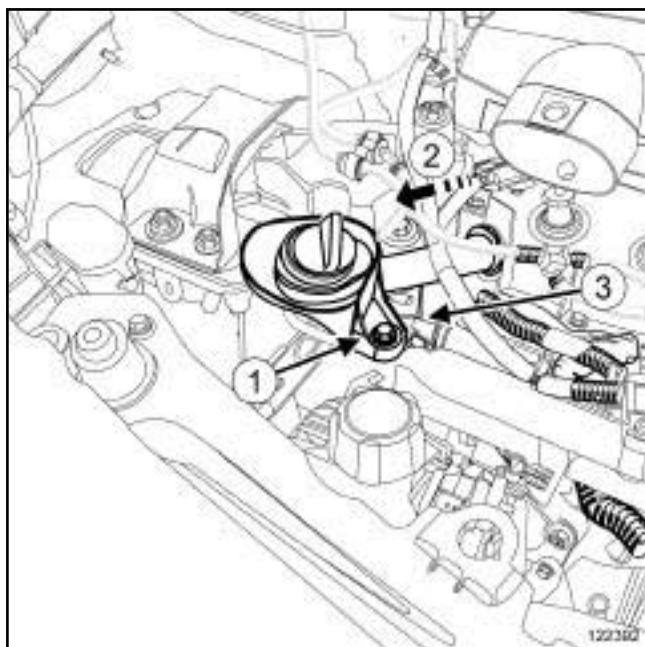
STARTING - CHARGING

Alternator: Removal - Refitting

16A

D4F or D7F, and STANDARD HEATING

D4F, and 780



Remove:

- the filler neck bolt (1) ,
- the filler neck in the direction of the arrow (2) ,
- the dipstick.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

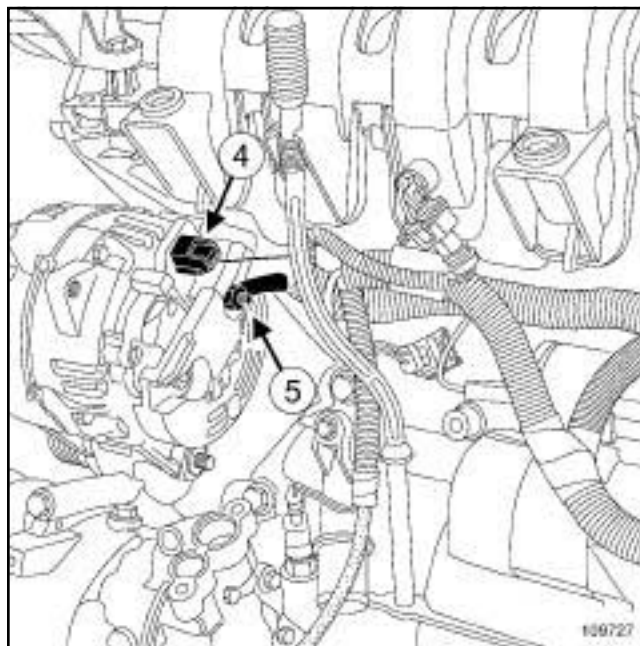
Wear latex gloves during the operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- Disconnect the fuel pipe (3) from the injector rail.

II - REMOVAL OPERATION FOR PART CONCERNED



- Disconnect the connector (4) from the alternator wiring harness.

Remove:

- the alternator wiring harness nut (5) ,
- the alternator bolts,
- the alternator.

REFITTING

I - REFITTING PREPARATIONS OPERATION

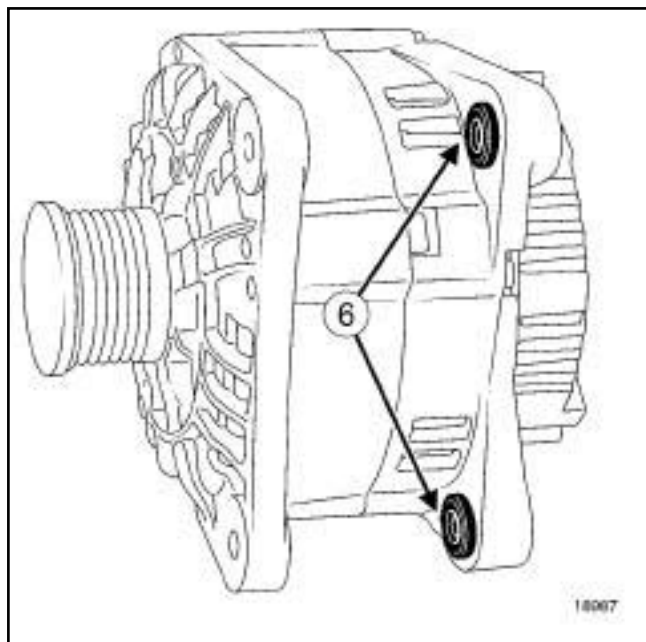
- Clean the alternator pulley V-grooves to remove any deposits.

STARTING - CHARGING

Alternator: Removal - Refitting

16A

D4F or D7F, and STANDARD HEATING



18987

- Press in the rings (6) using pliers or a vice to make the fitting operation easier.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the alternator,
 - the alternator bolts.
- Torque tighten the **alternator bolts (25 Nm)**.
- Refit:
 - the power lead on the alternator,
 - the power lead nut on the alternator.
- Connect the alternator excitation lead connector.

III - FINAL OPERATION

D4F, and 780

- Connect the fuel pipe to the injector rail.
- Refit:
 - the dipstick,
 - the filler neck,
 - the filler neck bolt.

- Always replace the accessories belt.

- Refit the new accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) .
- Fit the sub-frame tie-rod.
- Refit the upper bolt on the sub-frame tie-rod.
- Torque tighten:
 - the **sub-frame tie-rod lower bolt (62 Nm)**,
 - the **sub-frame tie-rod upper bolt (21 Nm)**.
- Refit:
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres).
- Connect the battery (see) (MR 411, 80A, Battery).

STARTING - CHARGING

Alternator: Removal - Refitting

16A

D4F or D7F, and AIR CONDITIONING

Tightening torques

alternator bolts	25 N.m
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REMOVAL

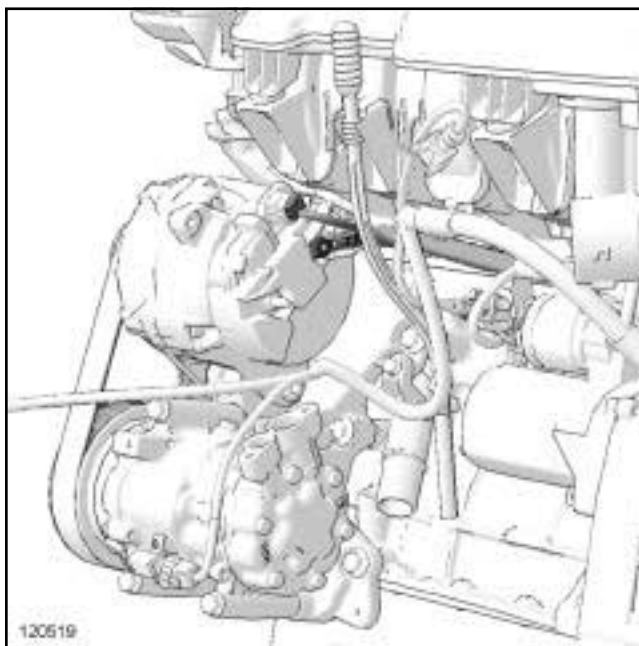
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) .

D4F

- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Remove the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



120519

- Disconnect the alternator connector.
- Remove the alternator positive terminal nut.
- Remove:
 - the alternator bolts,
 - the alternator.

STARTING - CHARGING

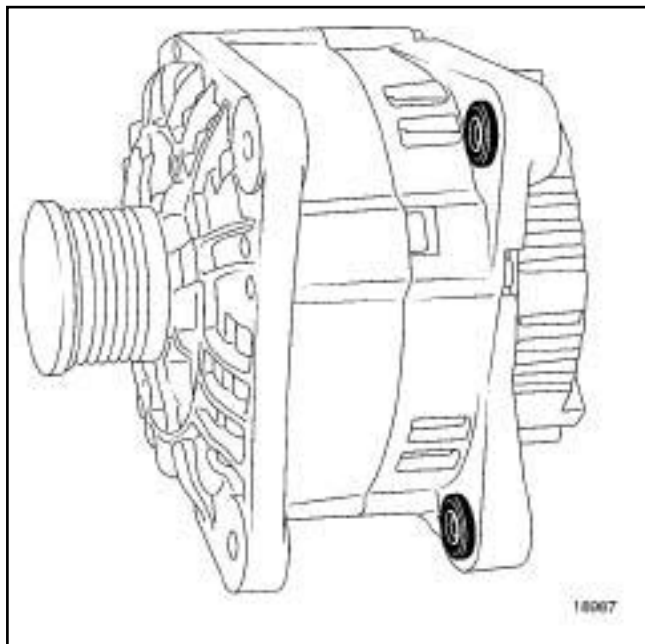
Alternator: Removal - Refitting

16A

D4F or D7F, and AIR CONDITIONING

REFITTING

I - REFITTING PREPARATION OPERATION



18987

- Push in the alternator rings using pliers or a vice to facilitate fitting the alternator.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the alternator,
 - the alternator bolts.
- Torque tighten the **alternator bolts (25 N.m)**.
- Refit the alternator positive terminal nut.
- Connect the alternator connector.

III - FINAL OPERATION

- Refit the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29)

D4F

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

- Refit:
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

STARTING - CHARGING

Alternator: Removal - Refitting

16A

K9K

AIR CONDITIONING or CLIMATE CONTROL

- For removing and refitting the alternator (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) .

STANDARD HEATING

- For removing and refitting the alternator (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) .

STARTING - CHARGING

Alternator: Removal - Refitting

16A

K4M

Tightening torques

alternator bolts	25 N.m
nut for the positive terminal of the alternator	21 N.m
alternator strut bolts	25 N.m

WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

IMPORTANT

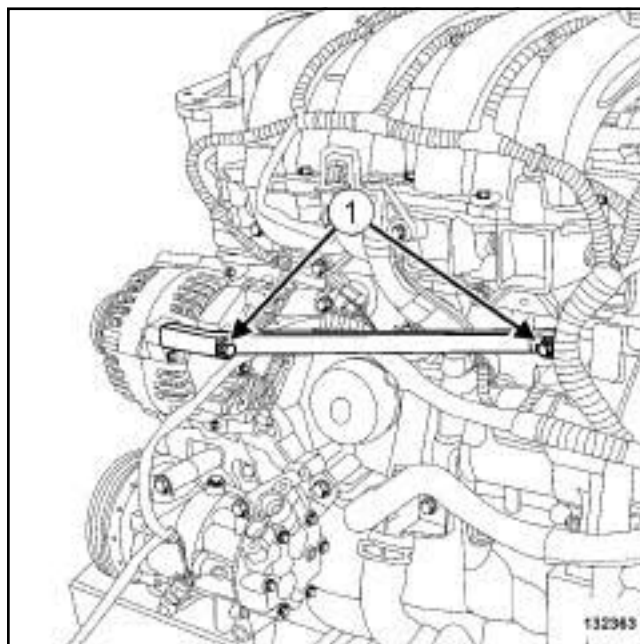
Wear cut-resistant gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

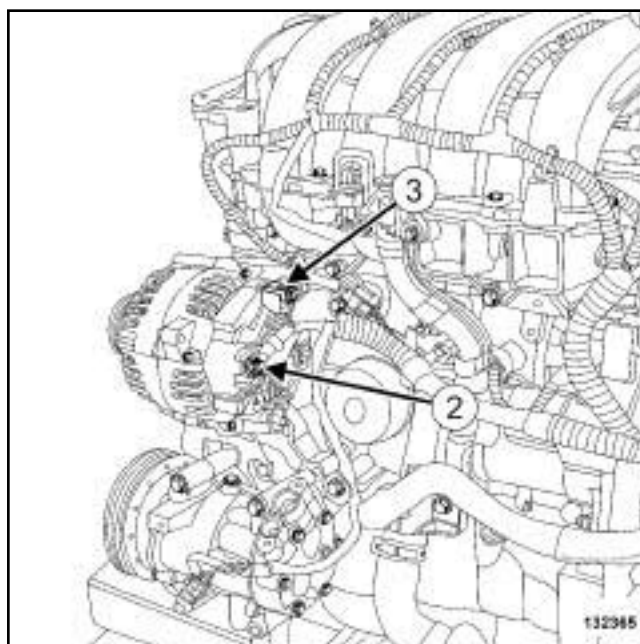
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the engine undertray,
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3).

II - REMOVAL OPERATION



132363

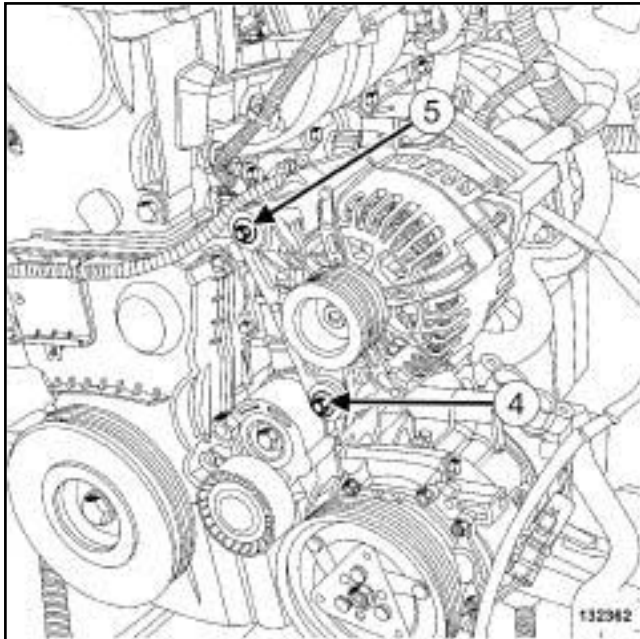
- Remove:
 - the alternator strut bolts (1),
 - the alternator strut.



132365

- Remove the nut (2) on the alternator positive terminal.
- Disconnect the alternator connector (3).

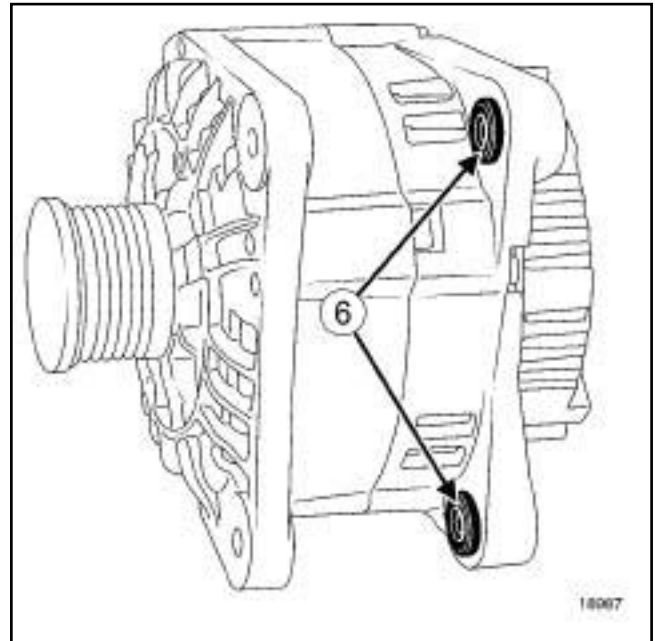
K4M



- Loosen the alternator lower bolt (4) .
- Remove the alternator upper bolt (5) .
- Move the alternator away from the multifunction support using a screwdriver.
- Remove the alternator.

REFITTING

I - REFITTING PREPARATION OPERATION

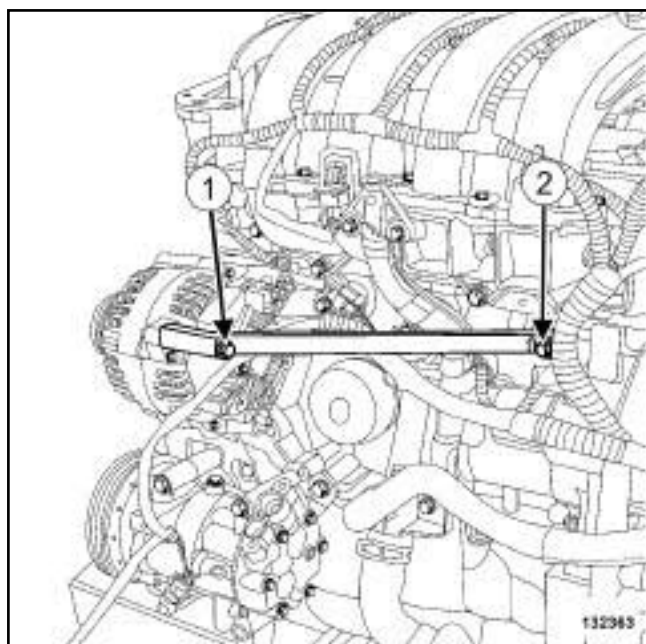


- Compress the alternator rings (6) using pliers or a vice to facilitate fitting.

II - REFITTING OPERATION

- Refit the alternator.
- Torque tighten the **alternator bolts (25 N.m)**.
- Connect the alternator connector.
- Torque tighten the **nut for the positive terminal of the alternator (21 N.m)**.

K4M



132363

- Refit the alternator strut.
- Tighten to torque and in order the **alternator strut bolts (25 N.m)**.

III - FINAL OPERATION


- Refit:
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-3**),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray.
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

STARTING - CHARGING

Starter: Removal - Refitting

16A

D4F or D7F

Tightening torques 	
starter upper bolt	44 N.m
starter electrical supply nut	8N.m

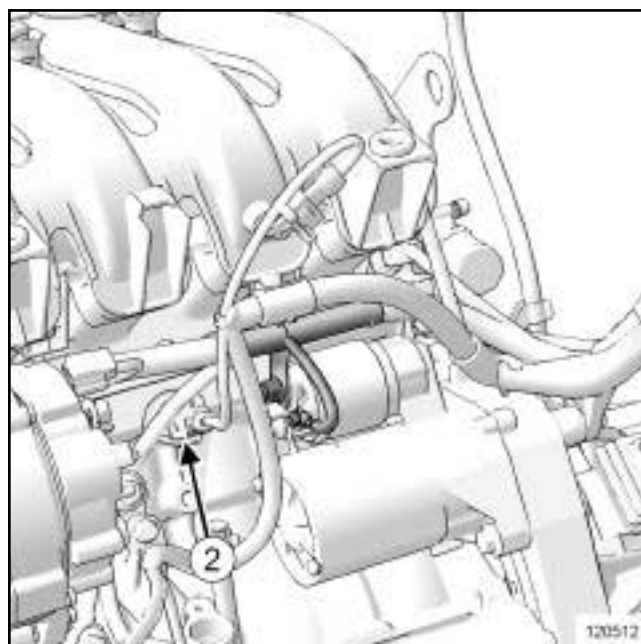
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (80A, Battery).
- Remove the engine oil dipstick.

D4F, and 772

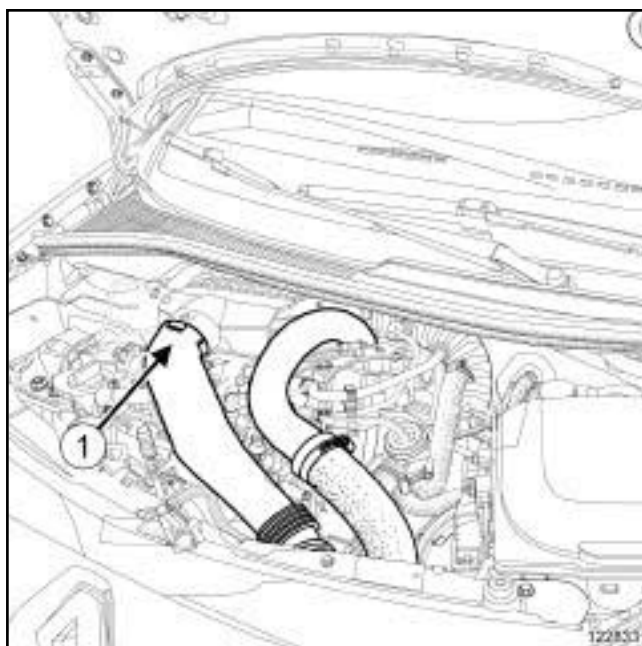
- Remove the air filter unit (see 12A, **Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .



120512

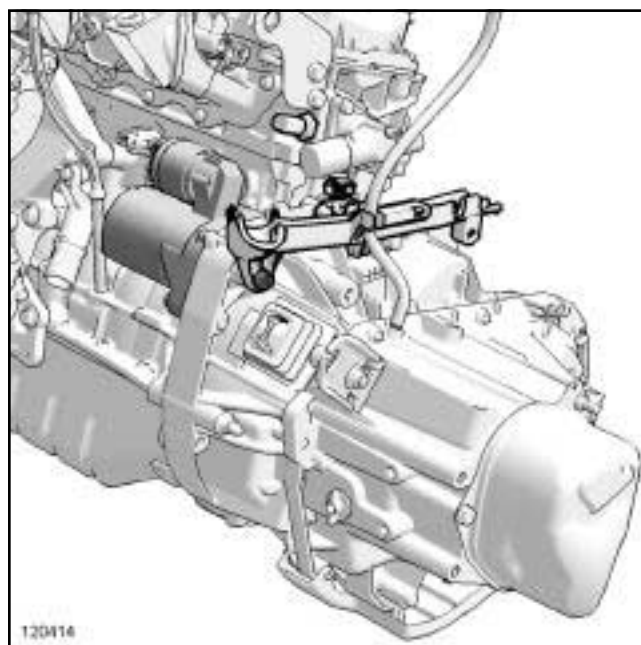
- Disconnect the pink sensor connector (2) .

D4F, and 780 or 782



122833

- Disconnect the air filter unit air inlet pipe from the air filter unit cover (1) .
- Move the air filter unit air inlet pipe away from the air filter unit cover.



120414

- Remove the engine wiring channel bolt from the gearbox.
- Unclip the engine wiring channel from the gearbox.
- Move aside the engine wiring channel.

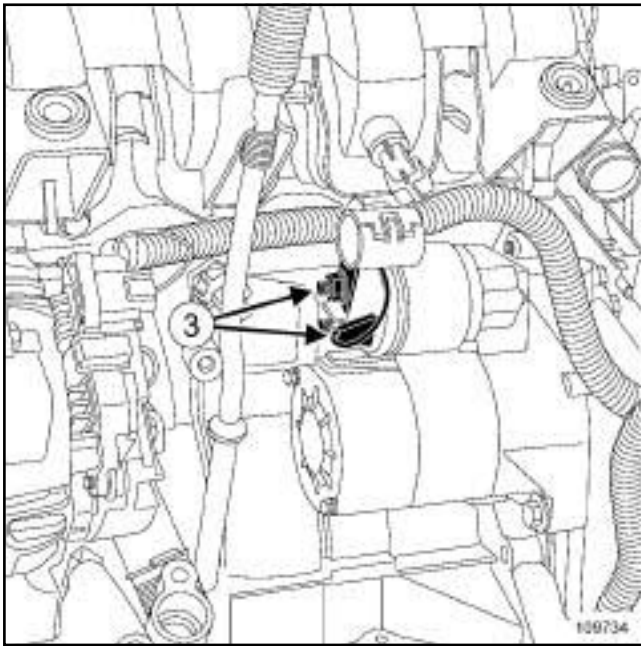
STARTING - CHARGING

Starter: Removal - Refitting

16A

D4F or D7F

II - OPERATION FOR REMOVAL OF PART CONCERNED



109734

- ❑ Remove the starter electrical wiring nuts (3) .

Note:

Depending on fitting, the starter wiring harness is screwed on or clipped on for solenoid excitation.

- ❑ Move the starter electrical wiring aside.

D4F, and 780 or 782



122826

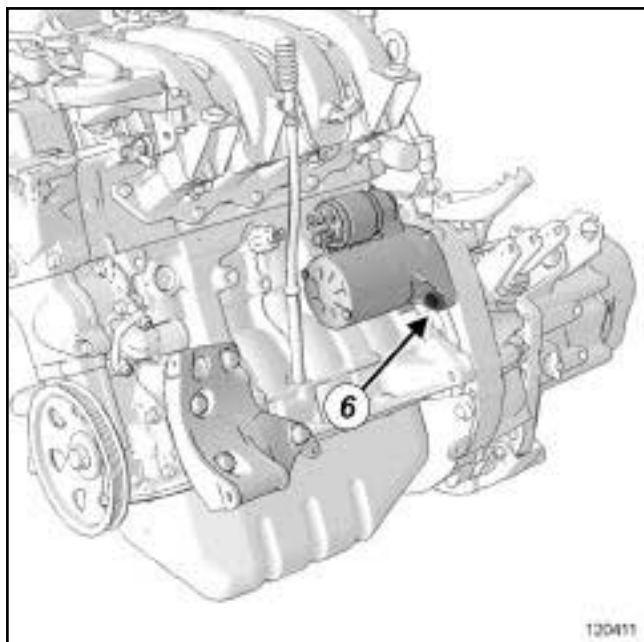
- ❑ Disconnect the air pipe (4) from the turbocharger discharge solenoid valve.
- ❑ Undo the turbocharger discharge air pipe clip (5) on the intercooler air outlet pipe.
- ❑ Disconnect the turbocharger discharge air pipe from the intercooler air outlet pipe.
- ❑ Move the turbocharger discharge air pipe away from the intercooler air outlet pipe.

STARTING - CHARGING

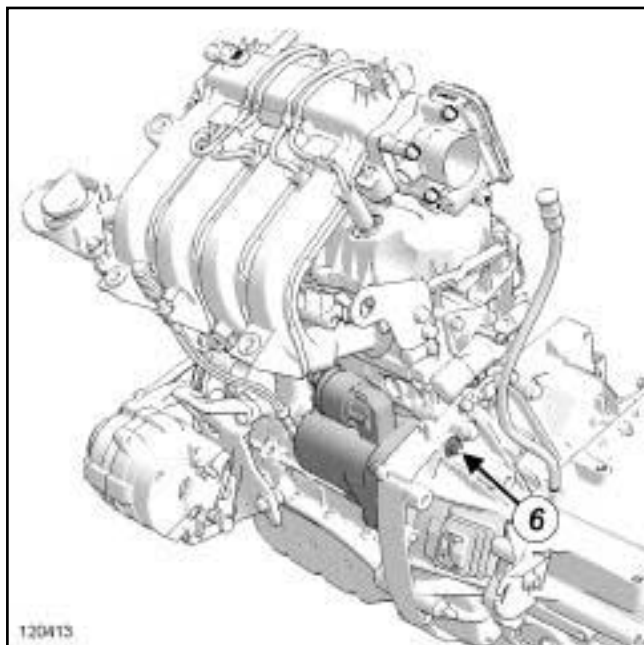
Starter: Removal - Refitting

16A

D4F or D7F



120411



120413

- Remove:
 - the starter bolts (6) ,
 - the starter.

REFITTING

I - REFITTING PREPARATION OPERATION

- Check that the starter centring dowel is in place.

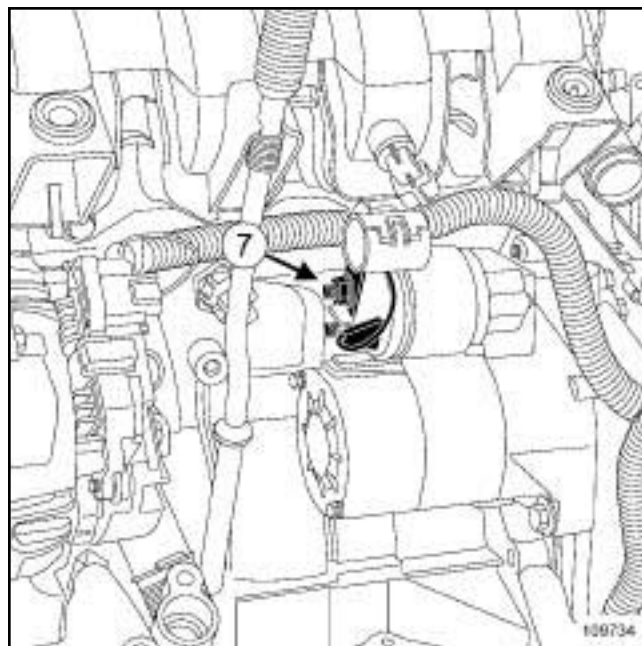
II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the starter,
 - the starter bolts.
- Tighten:
 - the starter lower bolt,
 - to torque the **starter upper bolt (44 N.m)**.

D4F, and 780 or 782

- Fit the turbocharger discharge air pipe.
- Connect the turbocharger discharge air pipe onto the intercooler air outlet pipe.
- Tighten the turbocharger discharge air pipe clip.
- Connect the air pipe to the turbocharger discharge solenoid valve.

- Fit the starter electrical wiring.
- Refit the starter electrical wiring nuts.
- Tighten the nut of the starter excitation terminal.



109734

- Torque tighten the **starter electrical supply nut (8N.m) (7)** .

III - FINAL OPERATION

- Fit the engine wiring channel.

STARTING - CHARGING

Starter: Removal - Refitting

16A

D4F or D7F

- Clip the engine wiring channel onto the gearbox.
- Refit the engine wiring channel bolt to the gearbox.
- Tighten the engine wiring channel bolt on the gearbox.
- Connect the pinking sensor connector.

D4F, and 780 or 782

- Fit the air filter unit air inlet pipe on the air filter unit cover.
- Connect the air filter unit air inlet pipe on the air filter unit cover.

D4F, and 772

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

- Refit the engine oil dipstick.
- Connect the battery (see) (80A, Battery).

K9K

Tightening torques

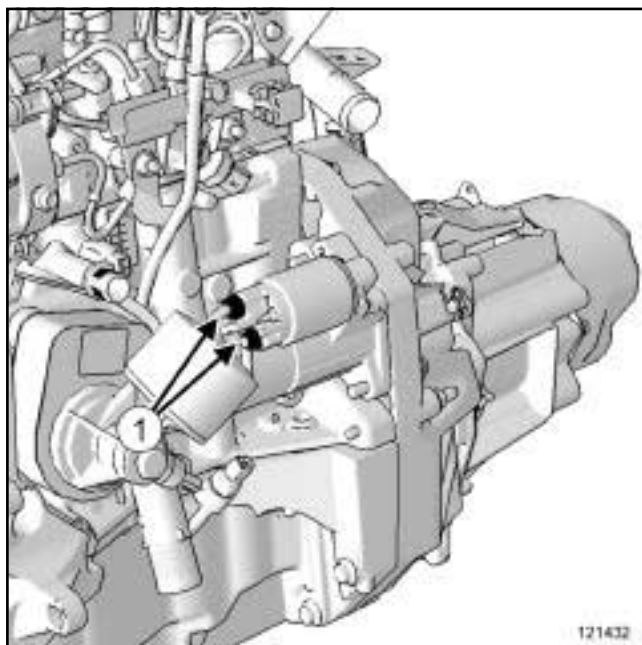
electrical connection nut	5 N.m
electrical connection nut	8 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

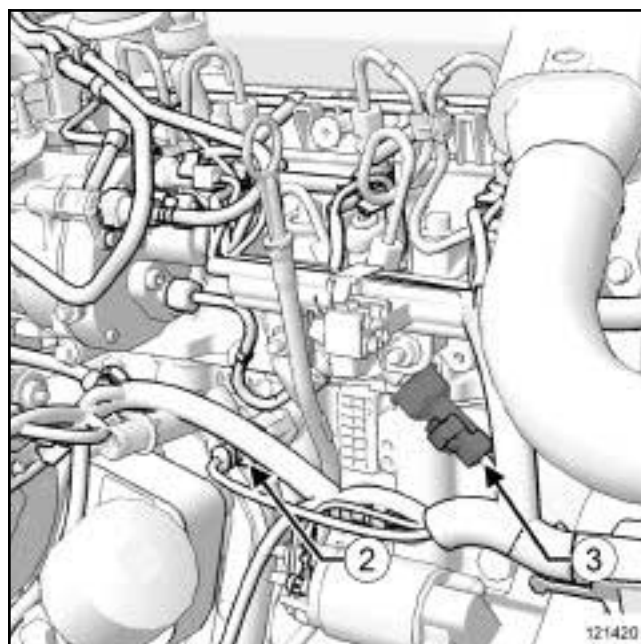
- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove the front engine cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED



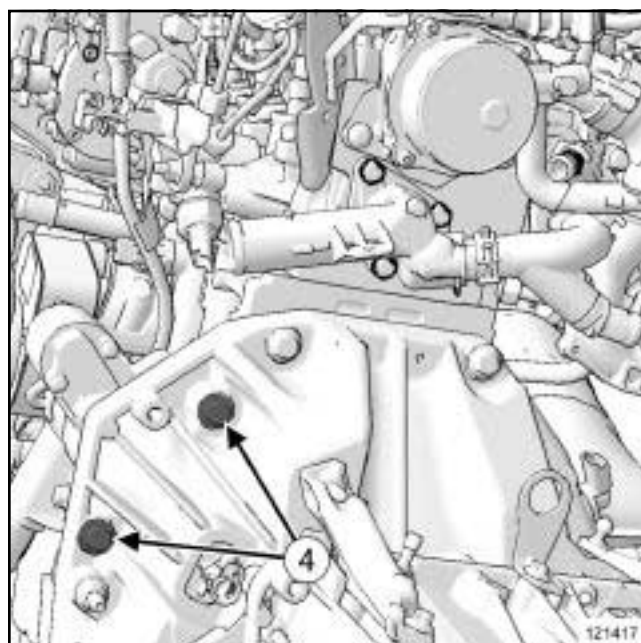
121432

- Remove:
 - the electrical connection nuts,
 - the electrical connections (1) from the starter,
 - the wiring channel mounting clip from the gearbox.



121420

- Disconnect:
 - the accelerometer connector (2) ,
 - the connector (3) from the rail pressure sensor.
- Remove:
 - the gearbox wiring channel,
 - the starter electrical harness.



121417

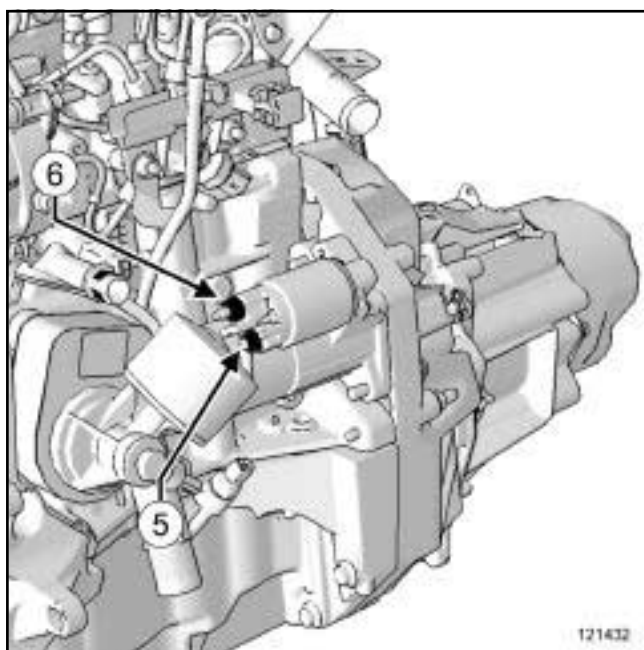
- Remove:
 - the starter bolts (4) ,
 - the starter.

K9K

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the starter,
 - the starter bolts.
- Tighten the starter bolts.
- Fit:
 - the starter wiring harness,
 - the gearbox wiring channel.



121432

- Refit:
 - the wiring channel mounting clip on the gearbox,
 - the electrical connections on the starter,
 - the electrical connection nuts.
- Tighten to torque:
 - the **electrical connection nut (5 N.m) (5)** ,
 - the **electrical connection nut (8 N.m) (6)** .
- Connect:
 - the accelerometer connector,
 - the rail pressure sensor connector.

II - FINAL OPERATION

- Refit the engine cover.
- Connect the battery (see) (MR 411, 80A, Battery).

STARTING - CHARGING

Starter: Removal - Refitting

16A

K4M

Tightening torques

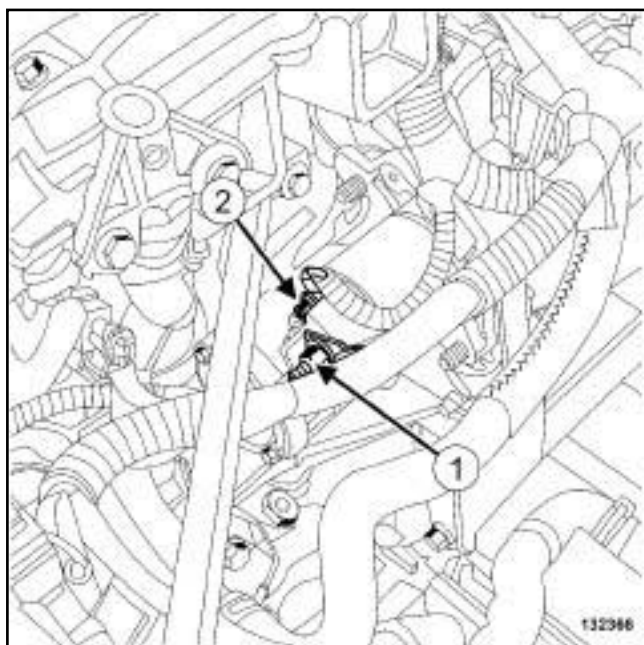
starter supply cable nut	8 N.m
starter excitation cable nut	5 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

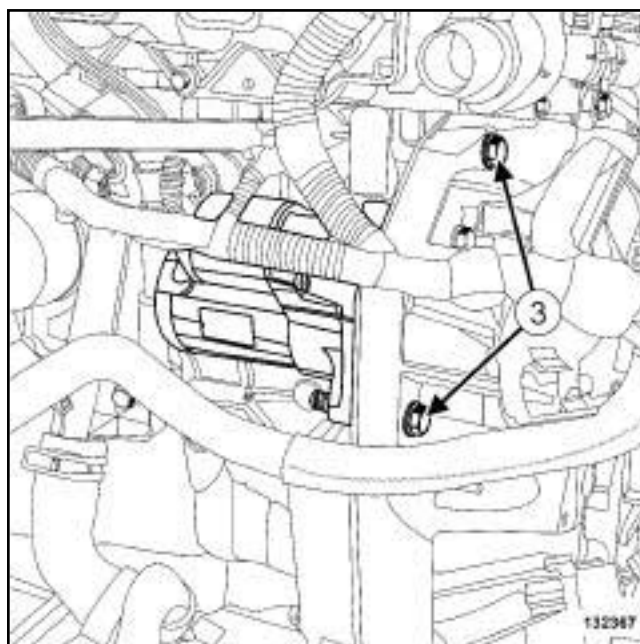
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

II - REMOVAL OPERATION



132366

- Remove:
 - the starter supply cable nut (1) ,
 - the starter excitation cable nut (2) .
- Move the starter wiring aside.



132367

- Remove:
 - the starter bolts (3) ,
 - the starter.

REFITTING

I - REFITTING PREPARATION OPERATION

- Check that the centring dowel is in place.

II - REFITTING OPERATION

- Refit the starter.
- Fit the starter wiring.
- Torque tighten:
 - the **starter supply cable nut (8 N.m)**,
 - the **starter excitation cable nut (5 N.m)**.

III - FINAL OPERATION

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

STARTING - CHARGING

Alternator pulley: Removal - Refitting

16A

K9K – K4M

- To remove and refit the alternator pulley (see **16A, Starting - Charging, Alternator pulley: Removal - Refitting**, page **16A-17**) (Technical Note 5008A, 16A, Starting - Charging).

IGNITION

Coils: Removal - Refitting

17A

D7F

PARTS AND CONSUMABLES FOR THE REPAIR WORK

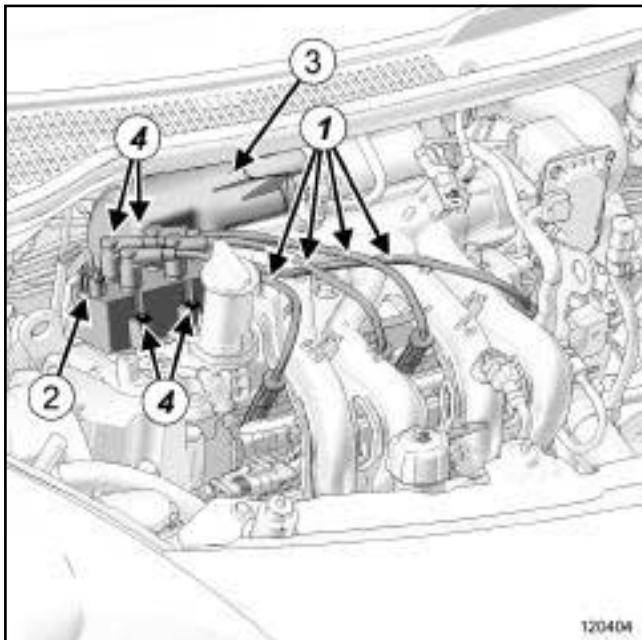
- Consumable** (see **Vehicle: Parts and consumables for the repair**) :
 - Fluostar 2L.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery ((see **Battery: Removal - Refitting**)).

II - OPERATION FOR REMOVAL OF PART CONCERNED



120404

WARNING

To disconnect the spark plug leads, pull on the extensions and not on the leads.

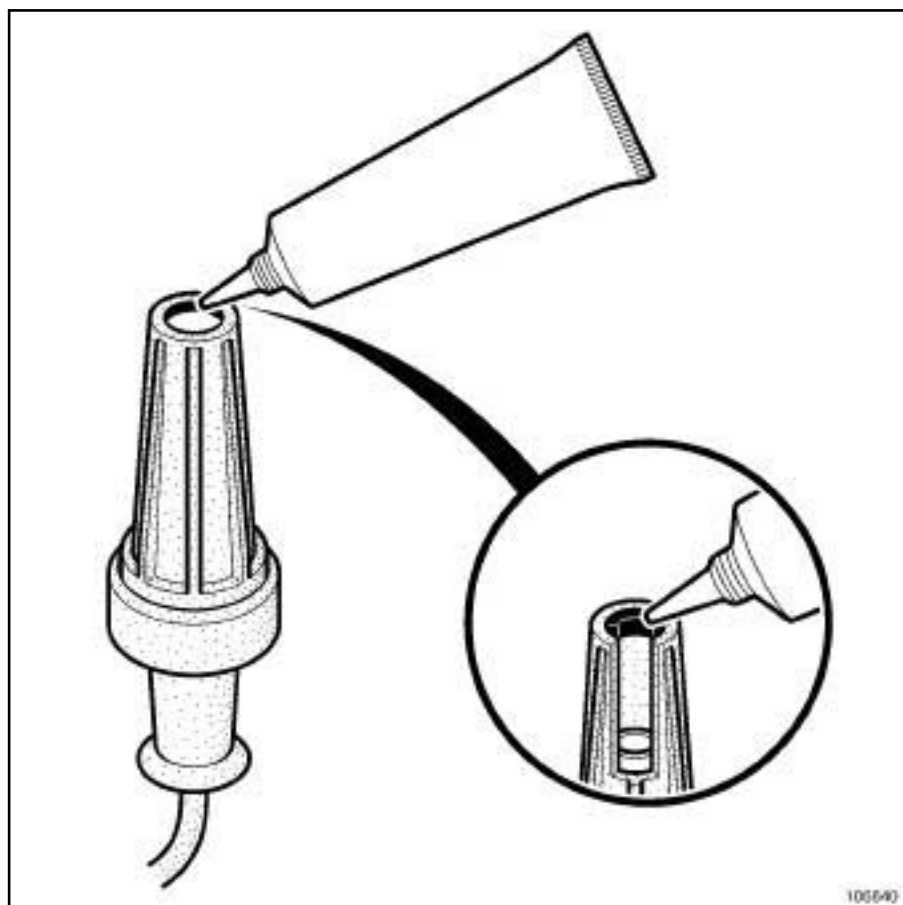
- Disconnect:**
 - the wiring (1) from the ignition coil,
 - the connector (2) from the ignition coil.
- Remove the bolt from the interference suppressor.
- Move aside the air filter unit cover (3) .
- Remove:**
 - the bolts (4) from the ignition coil,
 - the ignition coil.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:**
 - the ignition coil,
 - the ignition coil bolts.
- Refit the air filter unit cover.

D7F



106640

- When refitting the spark plug wiring, always apply a bead of **FLUOSTAR 2L** (2 mm in diameter) to the inner edge of the high-tension caps on the side of the spark plugs and coil.
- Connect:
 - the ignition coil connector,
 - the ignition coil wiring.

II - FINAL OPERATION

- Connect the battery ((see **Battery: Removal - Refitting**)).

IGNITION

Coils: Removal - Refitting

17A

D4F, and 772

PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Consumable** (see **Vehicle: Parts and consumables for the repair**) :

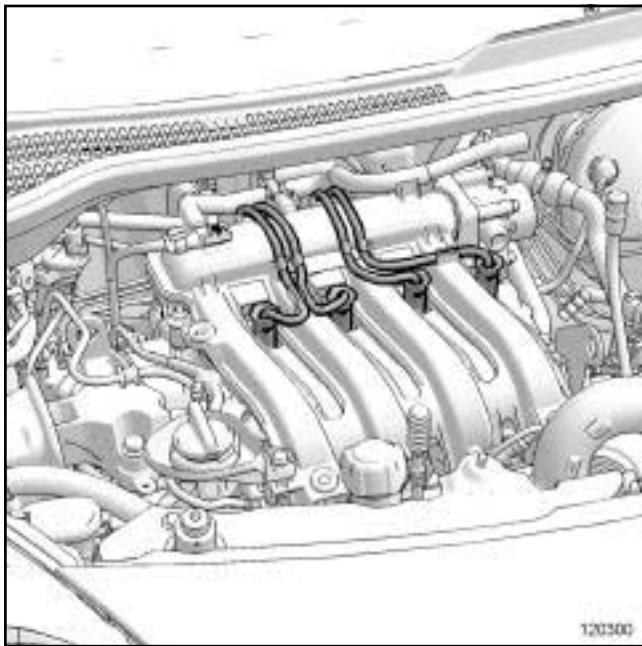
- Fluostar 2L.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see **Battery: Removal - Refitting**) .
- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



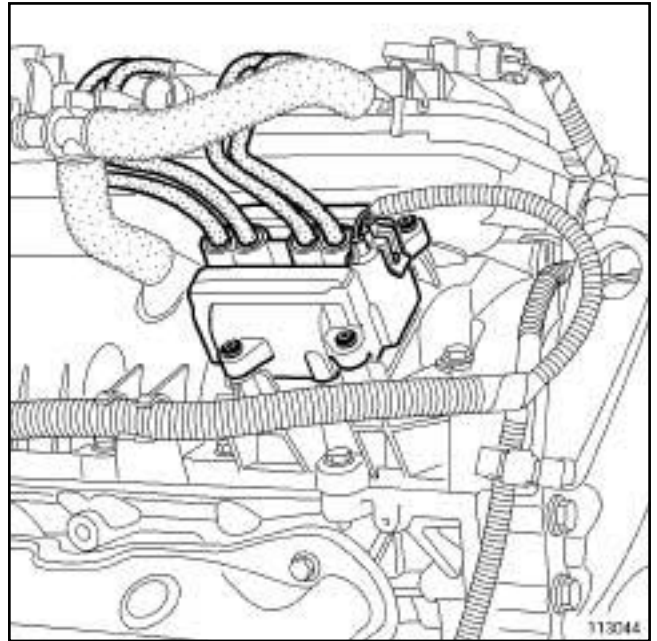
120300

WARNING

To disconnect the spark plug leads, pull on the extensions and not on the leads.

- Disconnect:

- the ignition coil high voltage wiring harness,
- the ignition coil connector.



113044

- Remove:

- the ignition coil bolts ,
- the ignition coil.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:

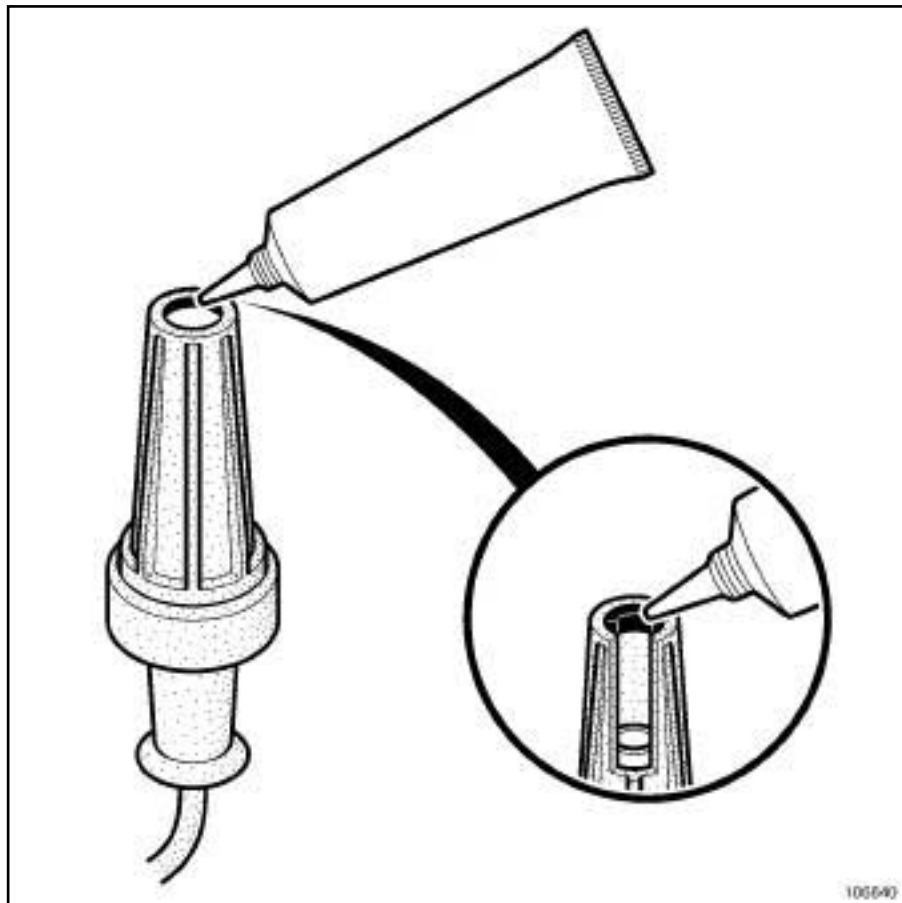
- the ignition coil,
- the ignition coil bolts.

IGNITION

Coils: Removal - Refitting

17A

D4F, and 772



106640
106640

- When refitting the spark plug wiring, always apply a bead of **FLUOSTAR 2L** (2 mm in diameter) to the inner edge of the high-tension caps on the side of the spark plugs and coil.
- Connect:
 - the ignition coil connector,
 - the ignition coil high voltage wiring harness.

II - FINAL OPERATION

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Connect the battery (see **Battery: Removal - Refitting**) .

IGNITION

Coils: Removal - Refitting

17A

D4F, and 780 or 782

Tightening torques 	
--	--

ignition coil bolts	10 N.m
---------------------	--------

IGNITION

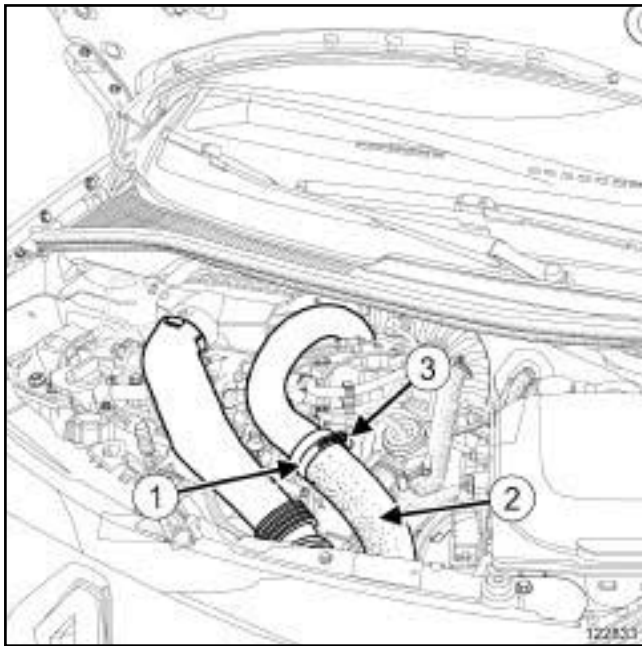
Coils: Removal - Refitting

17A

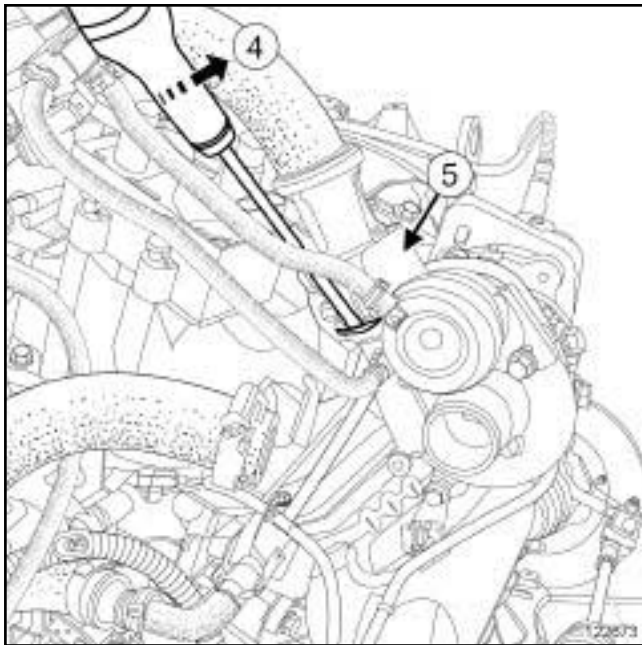
D4F, and 780 or 782

REMOVAL

OPERATION FOR REMOVAL OF PART CONCERNED



122833



122673

- Detach the turbocharger air outlet pipe from the turbocharger in the direction of the arrow (4) .

Note:

If the clip (5) is removed from the heat resistant protector, the latter must be replaced.

- Disconnect the turbocharger air outlet pipe from the turbocharger.
- Move aside the turbocharger air outlet pipe.

Note:

If the turbocharger air outlet pipe tightening clip (1) is removed, the flexible rubber pipe (2) and the tightening clip (1) must be replaced.

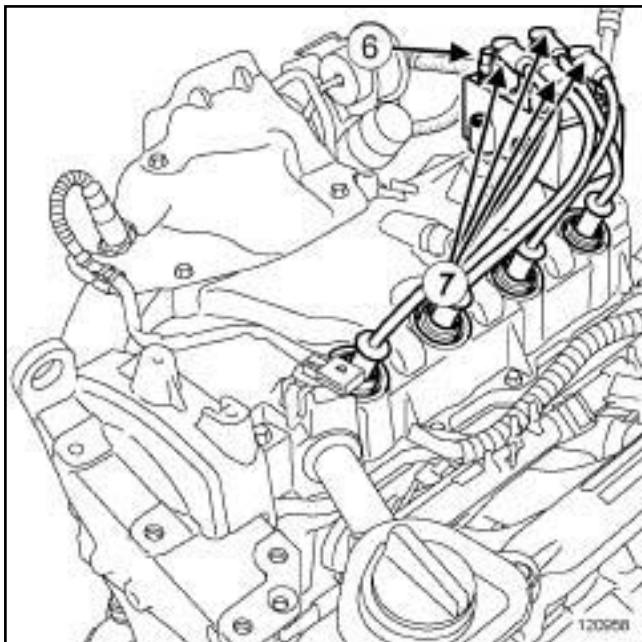
- Remove the turbocharger air outlet pipe bolt (3) from the throttle valve.

IGNITION

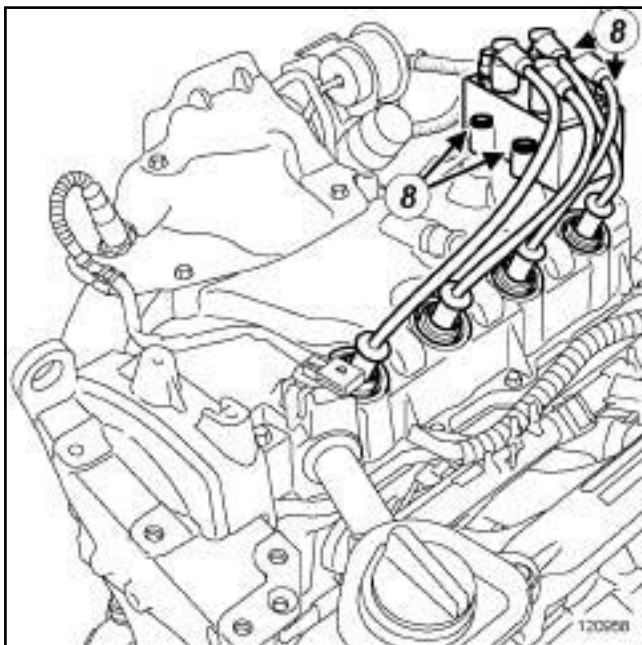
Coils: Removal - Refitting

17A

D4F, and 780 or 782



120958



120958

- Disconnect:
 - the ignition coil connector (6) ,
 - the spark plug lead high-tension caps (7) from the ignition coil.
- Remove:
 - the bolts (8) from the ignition coil,
 - the ignition coil.

IGNITION

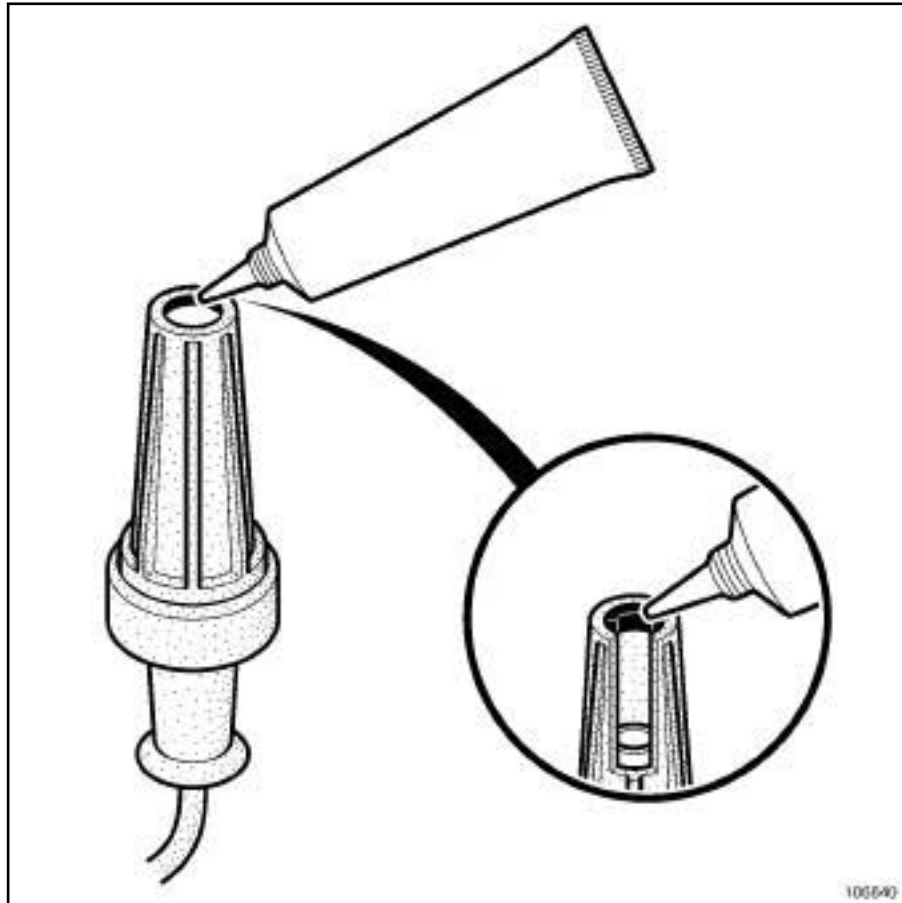
Coils: Removal - Refitting

17A

D4F, and 780 or 782

REFITTING

I - REFITTING PREPARATION OPERATION



106640

- It is essential to apply a bead of **FLUOSTAR 2L** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **2 mm** to the inner edge of the high-tension caps on the ignition coil side.

II - REFITTING OPERATION FOR PART CONCERNED

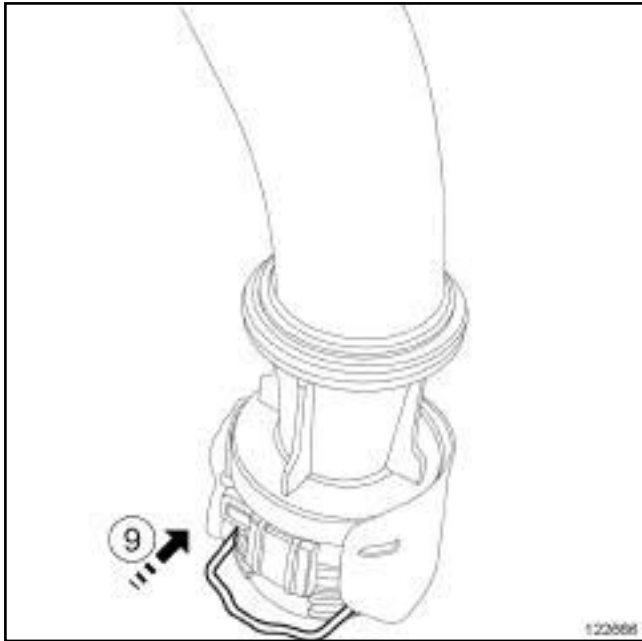
- Refit:
 - the ignition coil,
 - the ignition coil bolts.
- Torque tighten the **ignition coil bolts (10 N.m)**.
- Check the spark plug leads and the ignition coil match.
- Connect:
 - the spark plug lead high-tension caps to the ignition coil,
 - the ignition coil connector.

IGNITION

Coils: Removal - Refitting

17A

D4F, and 780 or 782



122666

- Push the turbocharger air outlet pipe clip (9) .
- Connect the turbocharger air outlet pipe to the turbo-charger.
- Refit the turbocharger air outlet pipe bolt to the throt-tle valve.
- Tighten the turbocharger air outlet pipe bolt on the throttle valve.

IGNITION

Coils: Removal - Refitting

17A

K4M

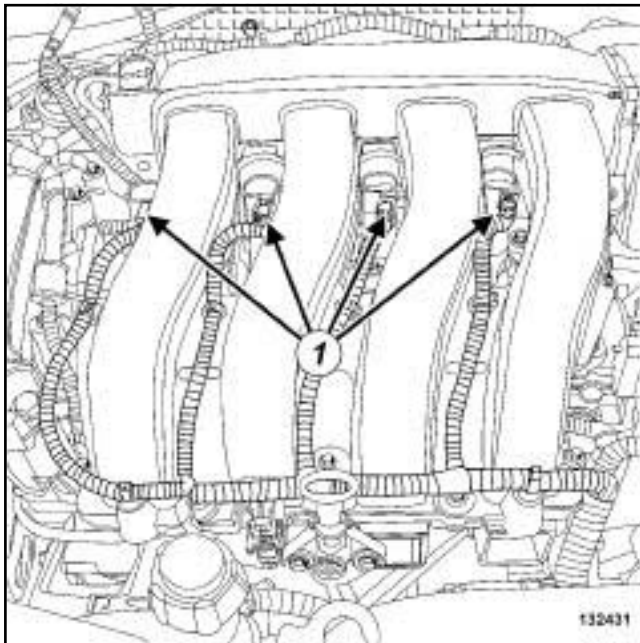
Tightening torques

new coil bolts

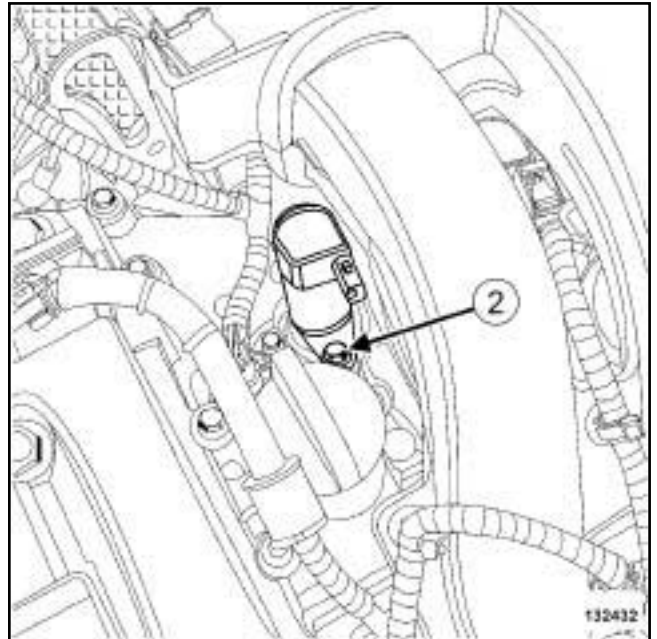
14 N.m

REMOVAL

OPERATION FOR REMOVAL OF PART CONCERNED



- Disconnect the coil connectors (1) .



- Remove:
 - the coil bolts (2) ,
 - the coils.

IGNITION

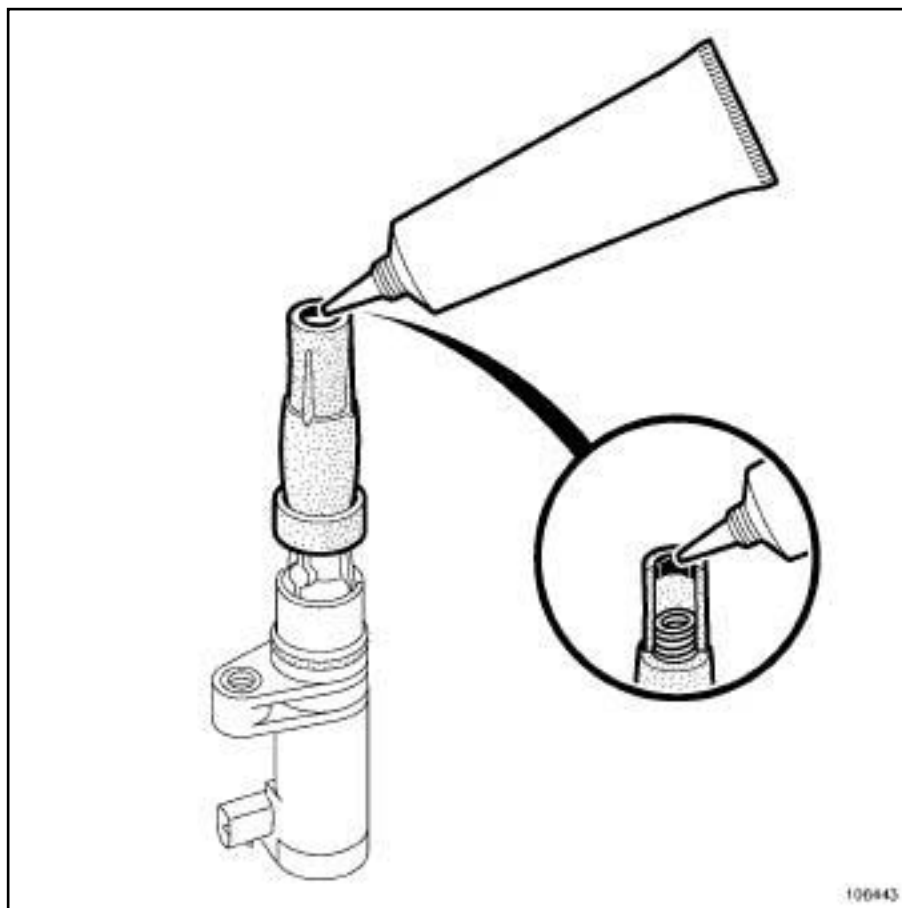
Coils: Removal - Refitting

17A

K4M

REFITTING

I - REFITTING PREPARATION OPERATION



106443

106443

- Put a bead of **FLUOSTAR 2L** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) **2 mm** in diameter on the internal perimeter of the high-tension caps on the four coils.
- Always replace the coil bolts.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the coils.
- Torque tighten the **new coil bolts (14 N.m)**.
- Connect the coil connectors.

IGNITION

Plugs: Removal - Refitting

17A

D7F

Special tooling required

Ele. 1933	23 N.m tightening wrench for spark plugs
Ele. 1382-01	14 mm Plug spanner.

Tightening torques

spark plugs	23 N.m
-------------	---------------

Spark plug electrode gap

Type of spark plug	Gap (mm)
EYQUEM	0.90 ± 0.05

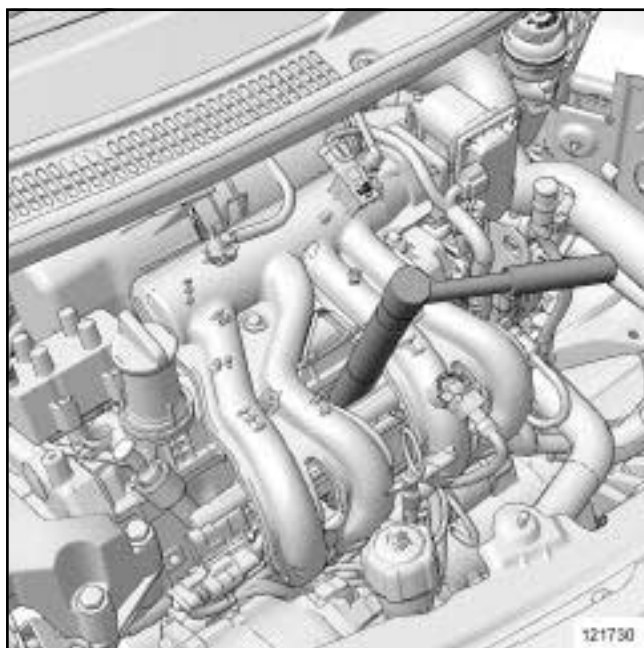
REMOVAL

OPERATION FOR REMOVAL OF PART CONCERNED

WARNING

To disconnect the spark plug leads, pull on the extensions and not on the leads.

Disconnect the spark plug wiring.



121730

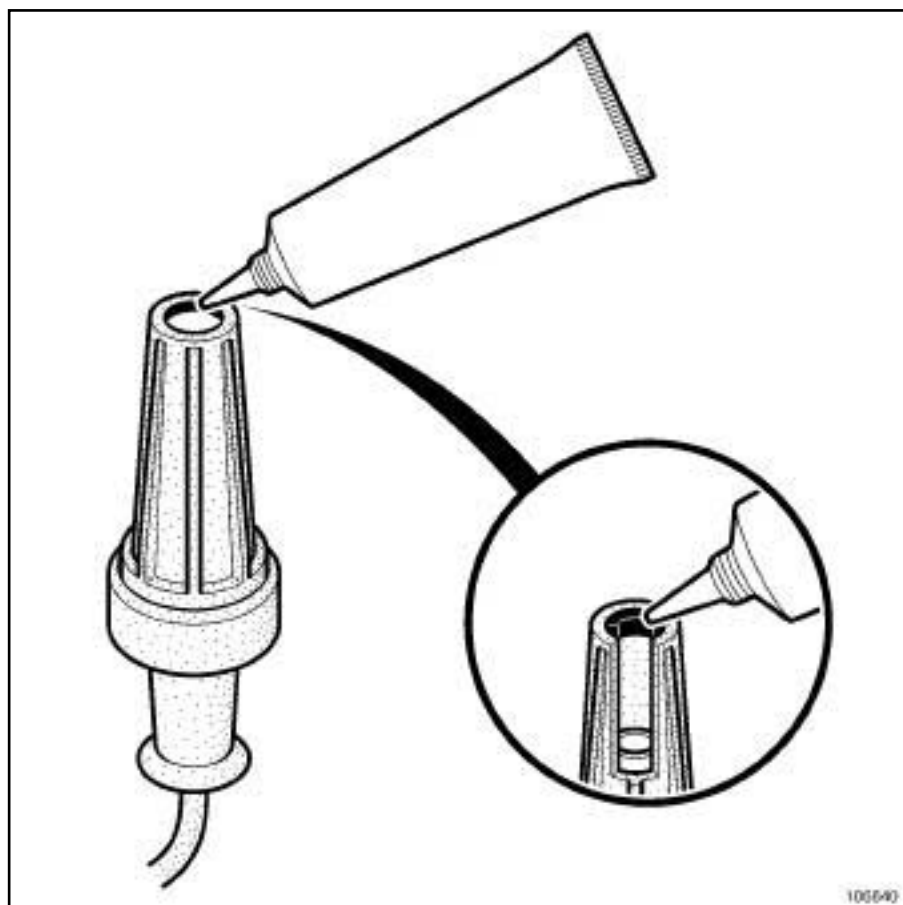
Remove the spark plugs using the **(Ele. 1933)** equipped with the **(Ele. 1382-01)**.

REFITTING

I - REFITTING PREPARATION OPERATION

Check and, if necessary, correct the spark plug electrode gaps using a set of feeler gauges.

D7F



106640

- ❑ When refitting the ignition wiring harness, it is essential to apply a bead of **FLUOSTAR 2L** (2 mm in diameter) to the internal edge of the high tension caps on the spark plug and coil sides (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

II - REFITTING OPERATION FOR PART CONCERNED

- ❑ Refit the spark plugs.
- ❑ Torque tighten the **spark plugs (23 N.m)** using the **(Ele. 1933)** fitted with the **(Ele. 1382-01)**.

III - FINAL OPERATION

- ❑ Connect the spark plug wiring.

D4F, and 780 – D4F, and 782

Special tooling required

Ele. 1933 23 N.m tightening wrench for spark plugs

Ele. 1382-01 14 mm Plug spanner.

Equipment required

set of feeler gauges

Tightening torques

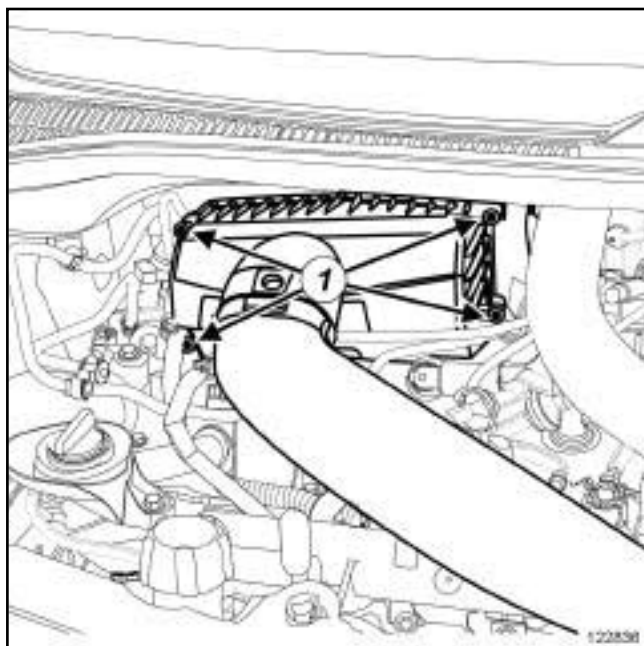
spark plugs **23 N.m**

Spark plug electrode gap

Type of spark plug	Gap (mm)
NGK	0.65 ± 0.05

REMOVAL

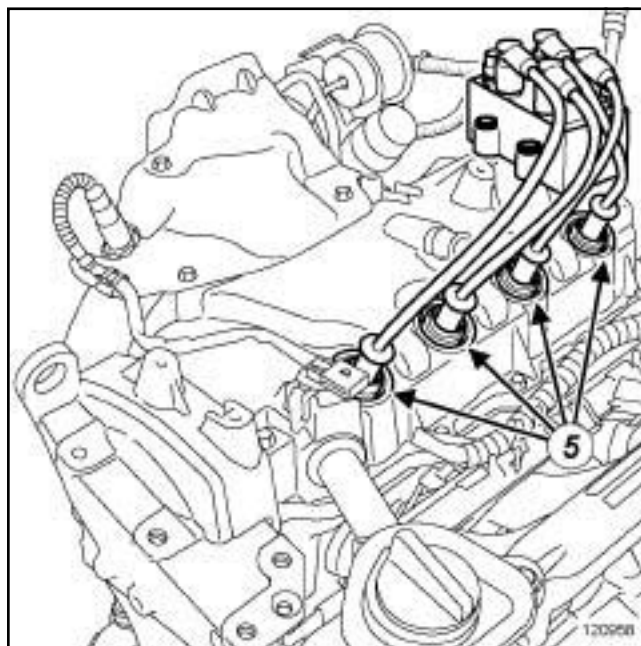
I - REMOVAL PREPARATION OPERATION



122836

- Remove the air filter box cover bolts (1) .
- Remove the air filter box cover and the air filter box air inlet pipe.

II - OPERATION FOR REMOVAL OF PART CONCERNED



120958

WARNING

To disconnect the spark plug leads, pull on the extensions and not on the leads.

Disconnect the spark plug ignition wiring harnesses (5) .

- Remove the spark plugs using the (Ele. 1933) equipped with the (Ele. 1382-01).

REFITTING

I - REFITTING PREPARATION OPERATION

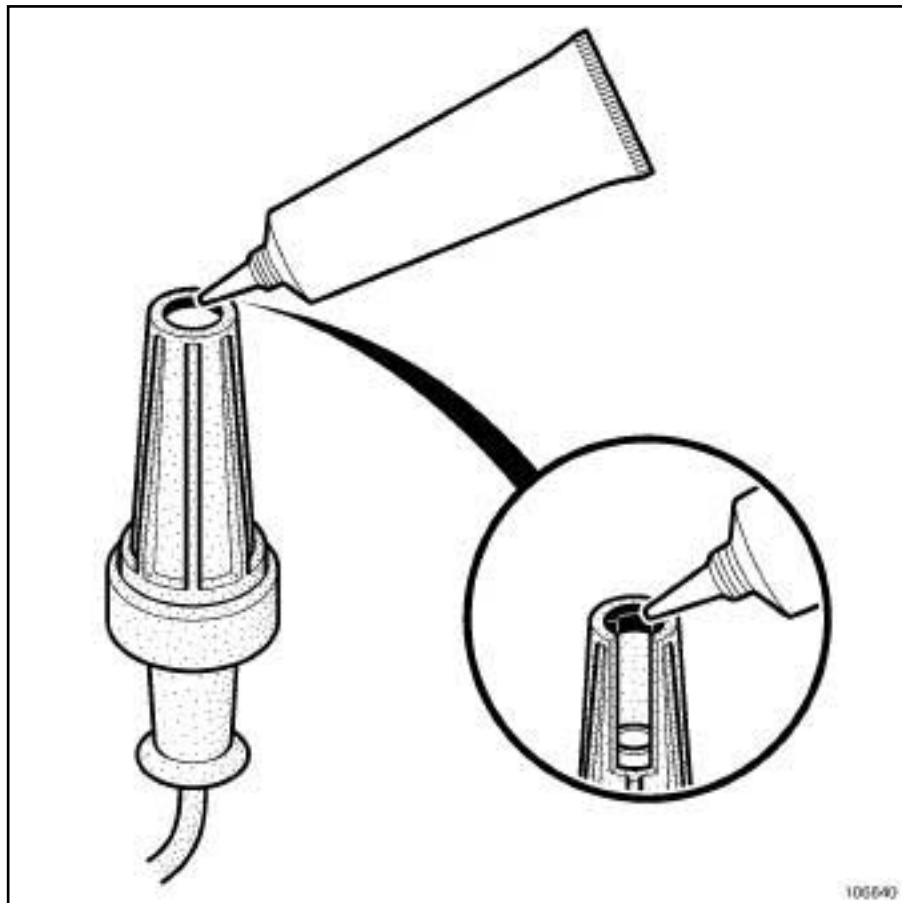
- Check and, if necessary, correct the spark plug electrode gaps using a set of feeler gauges.

IGNITION

Plugs: Removal - Refitting

17A

D4F, and 780 – D4F, and 782



106640
106640

- ❑ It is essential to apply a bead of **FLUOSTAR 2L** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **2 mm** to the inner edge of the high tension caps on the spark plug and ignition coil side.

II - REFITTING OPERATION FOR PART CONCERNED

- ❑ Refit the spark plugs.
- ❑ Torque tighten the **spark plugs (23 N.m)** using the **(Ele. 1933)** fitted with the **(Ele. 1382-01)**.

III - FINAL OPERATION

- ❑ Connect the ignition wiring harnesses to the spark plugs.
- ❑ Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .

K4M

Special tooling required

Ele. 1382	Set of plug wrenches 16 & 21 mm torque 17.5 & 28 N.m + square adapter 9-9.52 for wrench Ele. 1086
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Tightening torques

spark plugs	28 N.m
-------------	---------------

Spark plug electrode gap

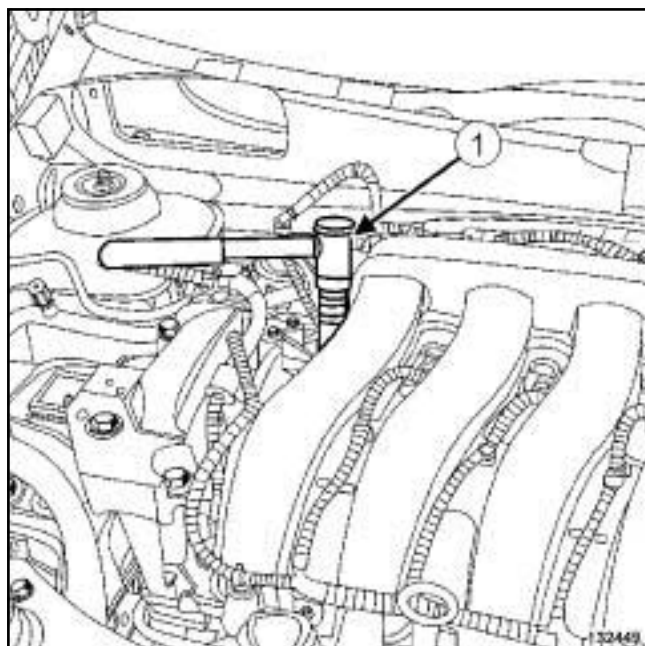
Type of spark plug	Gap (mm)
CHAMPION	0.95 ± 0.05
EYQUEM	0.95 ± 0.05
NGK	0.95 ± 0.05

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove the ignition coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



132449

- Remove the spark plugs using (**Ele. 1382**) (1) .

REFITTING

I - REFITTING PREPARATION OPERATION

- Check and, if necessary, correct the electrode gap for each spark plug.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the spark plugs.
- Torque tighten the **spark plugs (28 N.m)** using (**Ele. 1382**) fitted with the **grey sleeve**.

III - FINAL OPERATION

- Refit the ignition coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) .

D4F, and 772

Special tooling required

Ele. 1933 23 N.m tightening wrench for spark plugs

Ele. 1382-01 14 mm Plug spanner.

Equipment required

set of feeler gauges

Tightening torques

spark plugs **23 N.m**

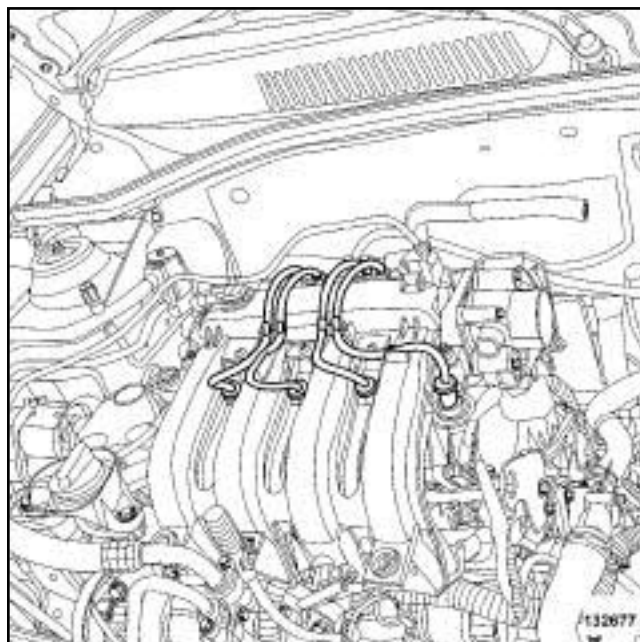
Spark plug electrode gap

Type of spark plug	Gap (mm)
CHAMPION	0.90 ± 0.05
NGK	0.85 ± 0.05

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove the air filter unit (see 12A, **Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .



132677

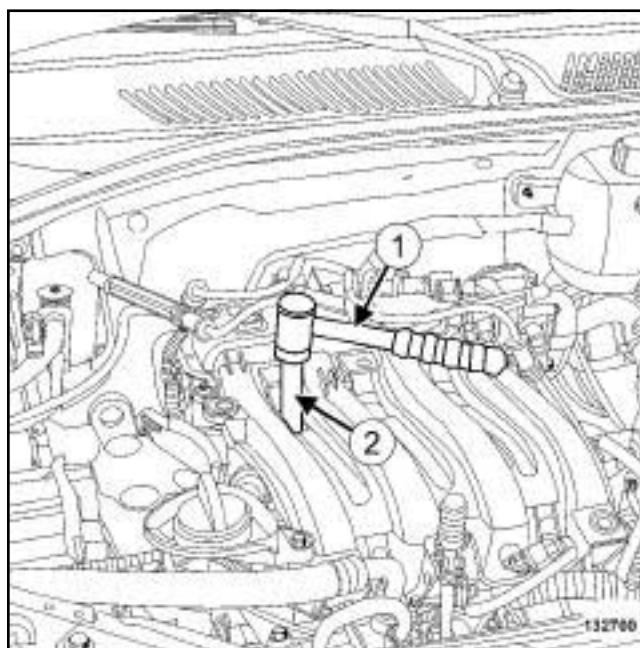


WARNING

To disconnect the spark plug leads, pull on the extensions and not on the leads.

Disconnect the spark plug wiring.

II - OPERATION FOR REMOVAL OF PART CONCERNED



132700

- Remove the spark plugs using the **(Ele. 1933)** (1) equipped with the **(Ele. 1382-01)** (2) .

IGNITION

Plugs: Removal - Refitting

17A

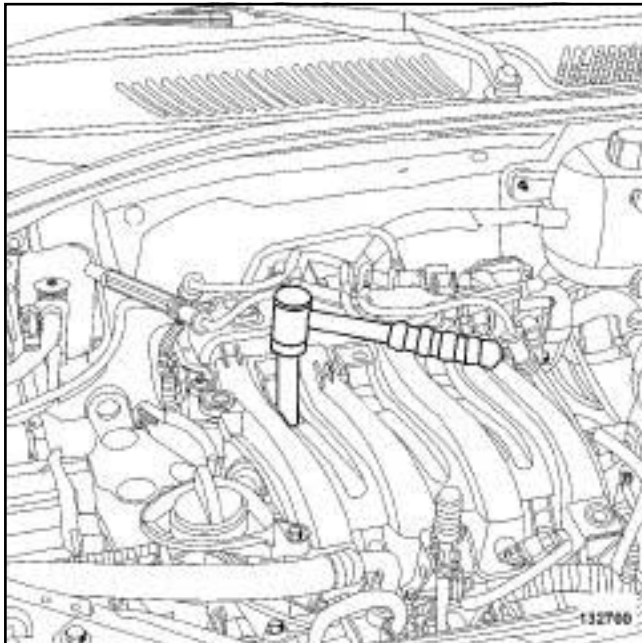
D4F, and 772

REFITTING

I - REMOVAL PREPARATION OPERATION

- Check and, if necessary, correct the spark plug electrode gaps using a **set of feeler gauges**.

II - REFITTING OPERATION FOR PART CONCERNED



132700

- Refit the spark plugs.
- Torque tighten the **spark plugs (23 N.m)** using the **(Ele. 1933)** fitted with the **(Ele. 1382-01)**.

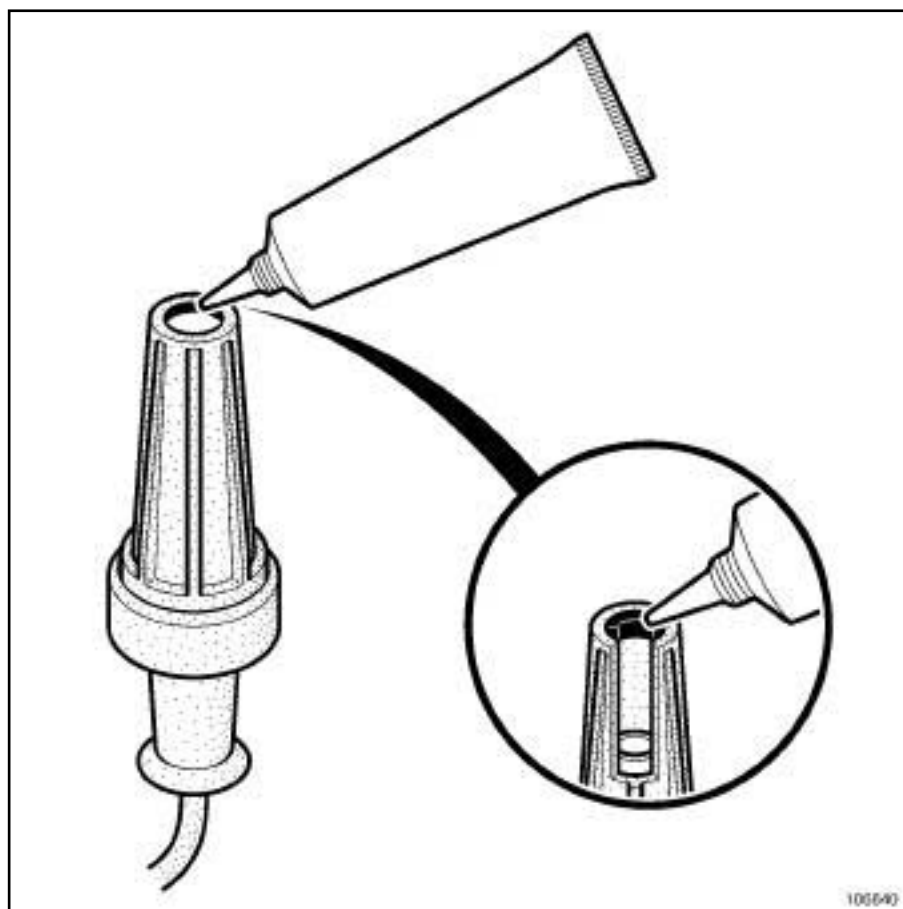
IGNITION

Plugs: Removal - Refitting

17A

D4F, and 772

III - FINAL OPERATION

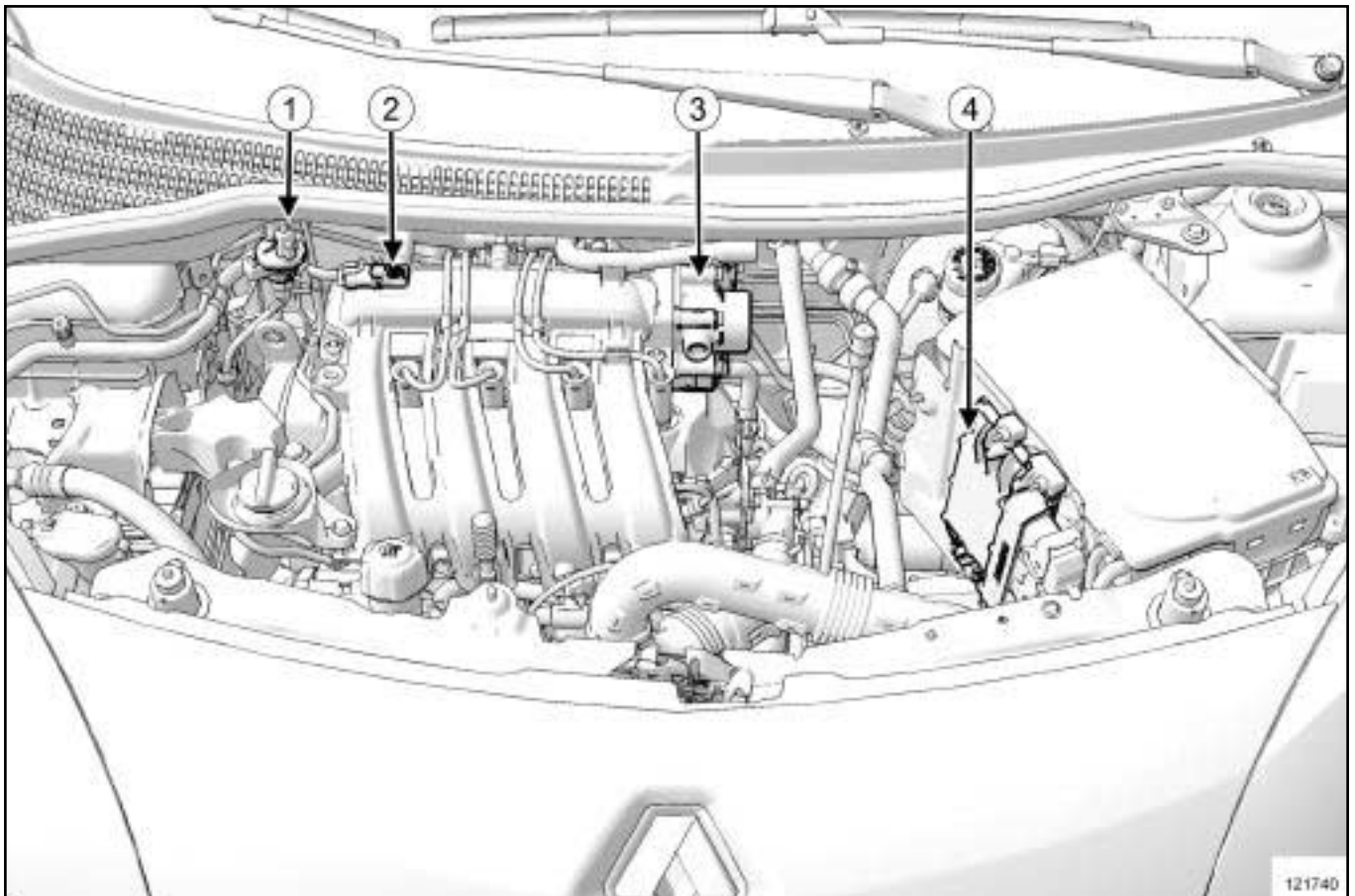


106640

- Apply a bead of **FLUORSTAR 2L** grease (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) **2 mm** in diameter on the internal perimeter of the high-tension caps at the spark plug end.
- Connect the spark plug wiring.
- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

Petrol injection: List and location of components

D4F, and 772

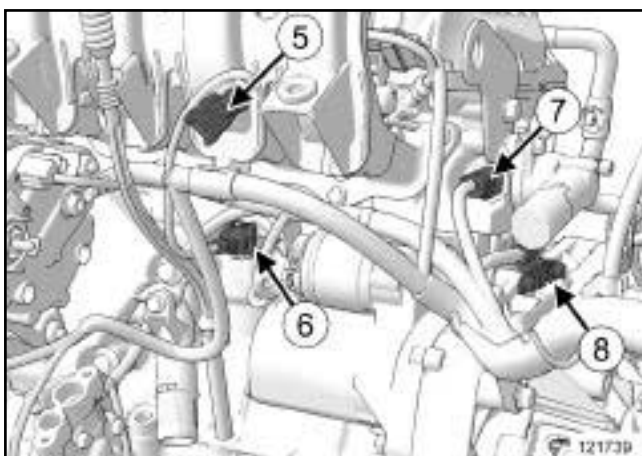


121740

121740

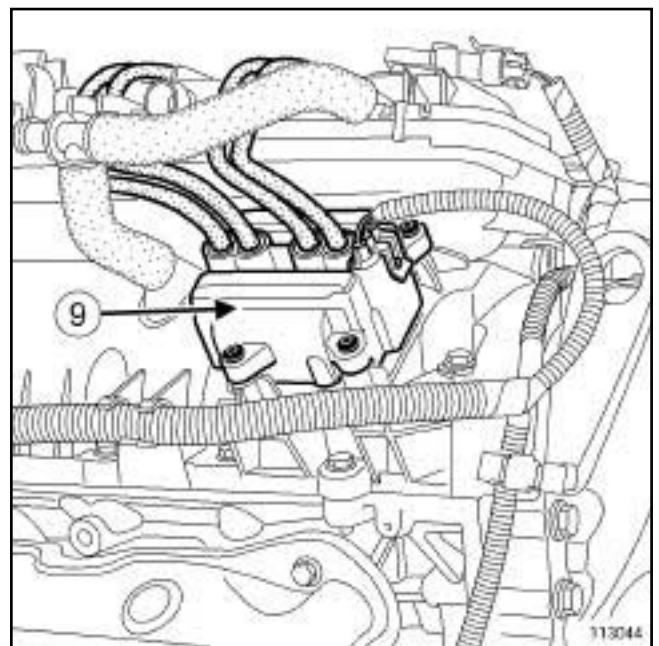
- (1) Petrol vapour rebreathing solenoid valve
- (2) Intake air pressure sensor
- (3) Motorised throttle valve
- (4) Injection computer

- (7) Coolant temperature sensor
- (8) Engine speed and flywheel position sensor



121739

- (5) Intake air temperature sensor
- (6) Pinking sensor



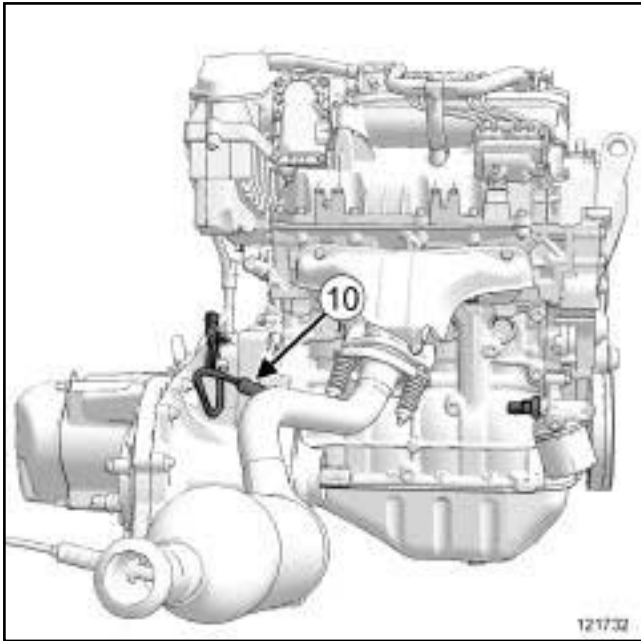
113044

113044

- (9) Ignition coil

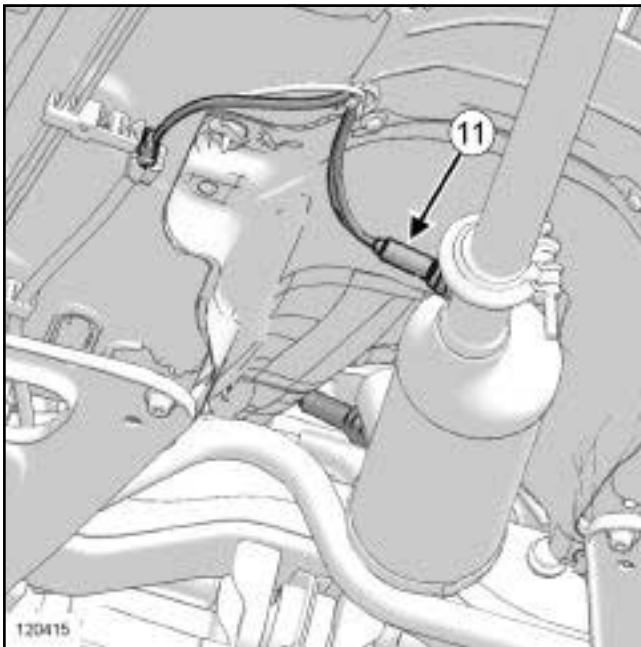
Petrol injection: List and location of components

D4F, and 772



121732

(10) Upstream oxygen sensor

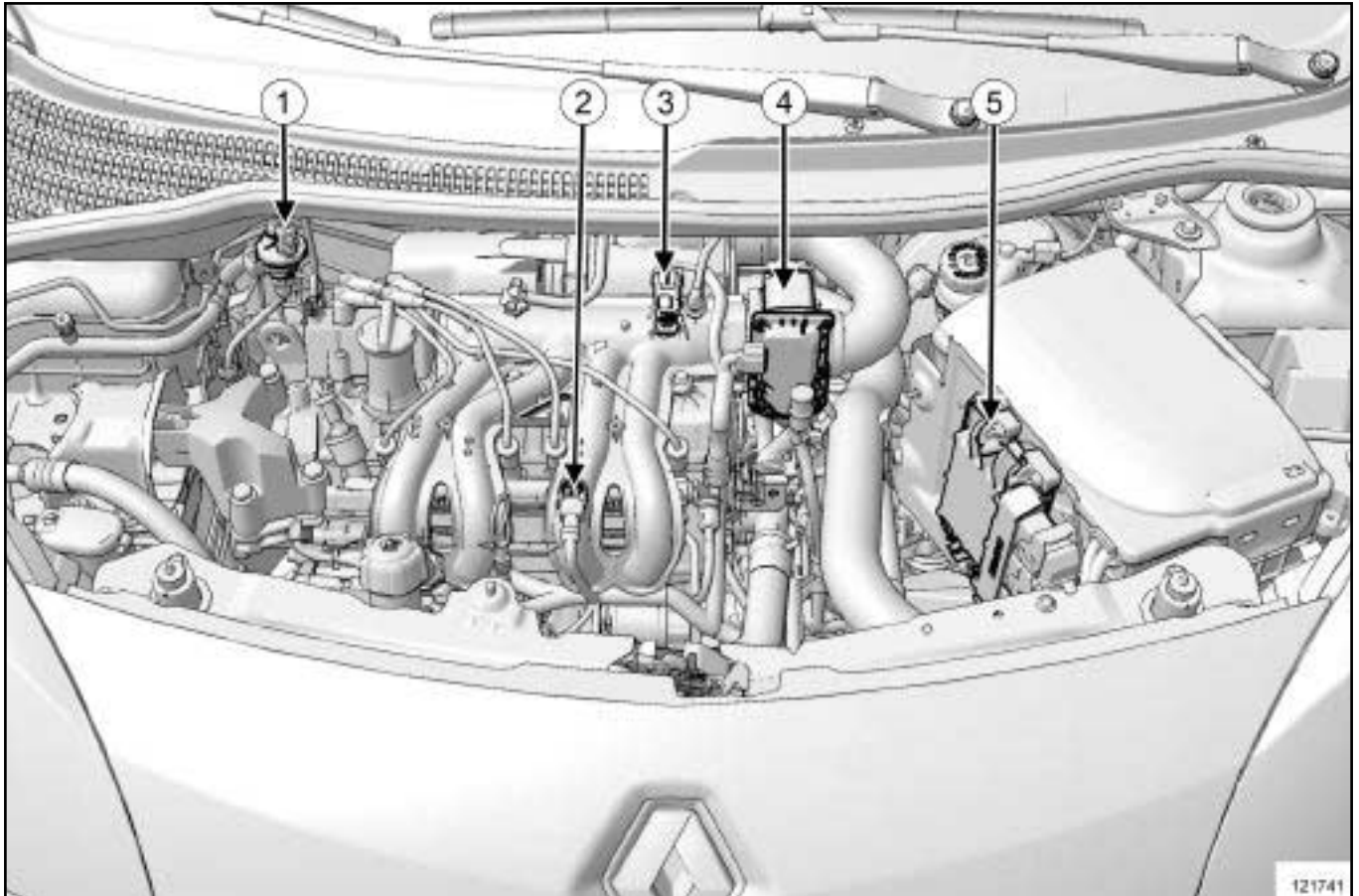


120415

(11) Downstream oxygen sensor

Petrol injection: List and location of components

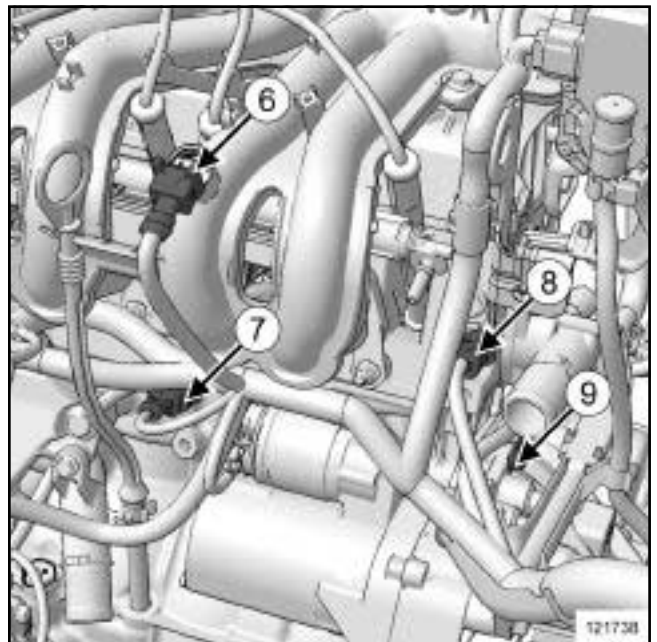
D7F, and 800



121741

121741

- (1) Petrol vapour rebreathing solenoid valve
- (2) Intake air temperature sensor
- (3) Intake air pressure sensor
- (4) Motorised throttle valve
- (5) Injection computer



121738

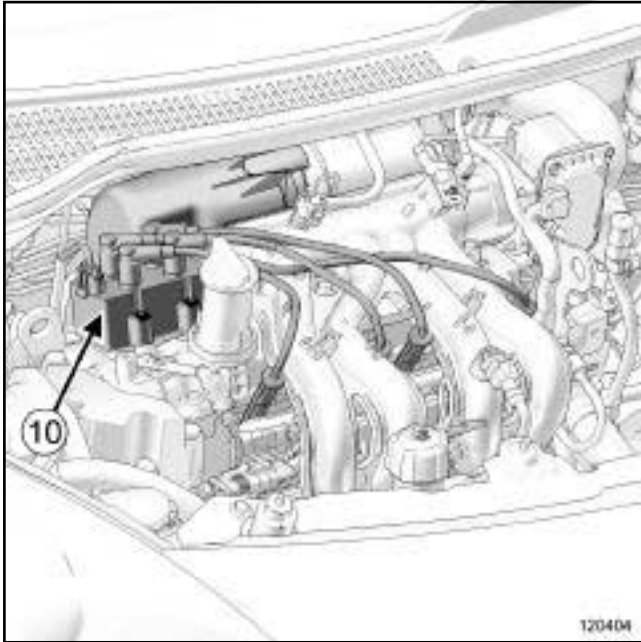
121738

- (6) Intake air temperature sensor
- (7) Pinking sensor

Petrol injection: List and location of components

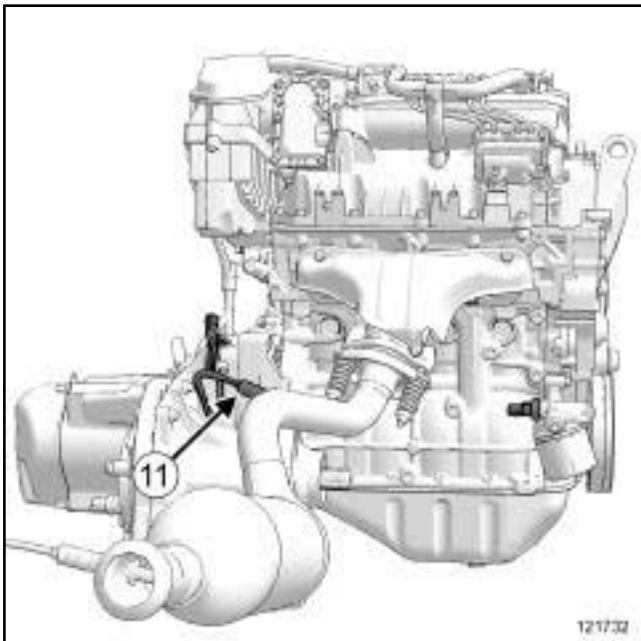
D7F, and 800

- (8) Coolant temperature sensor
- (9) Engine speed and position sensor



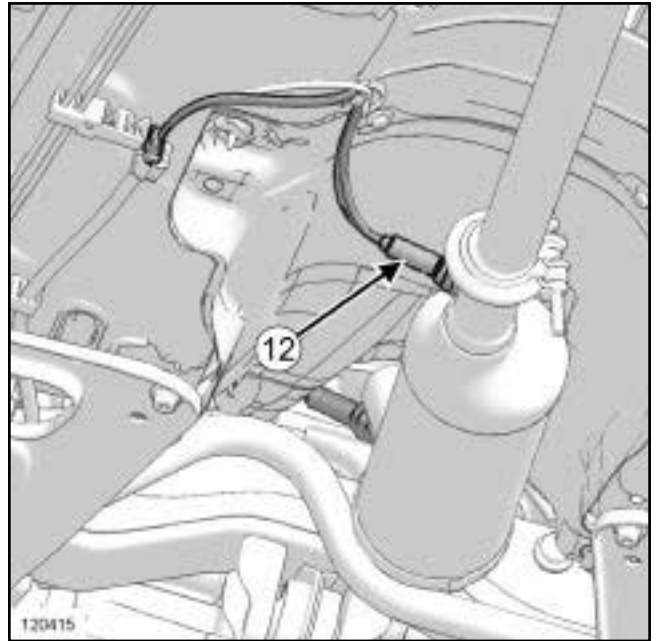
120404

- (10) Ignition coil



121732

- (11) Upstream oxygen sensor

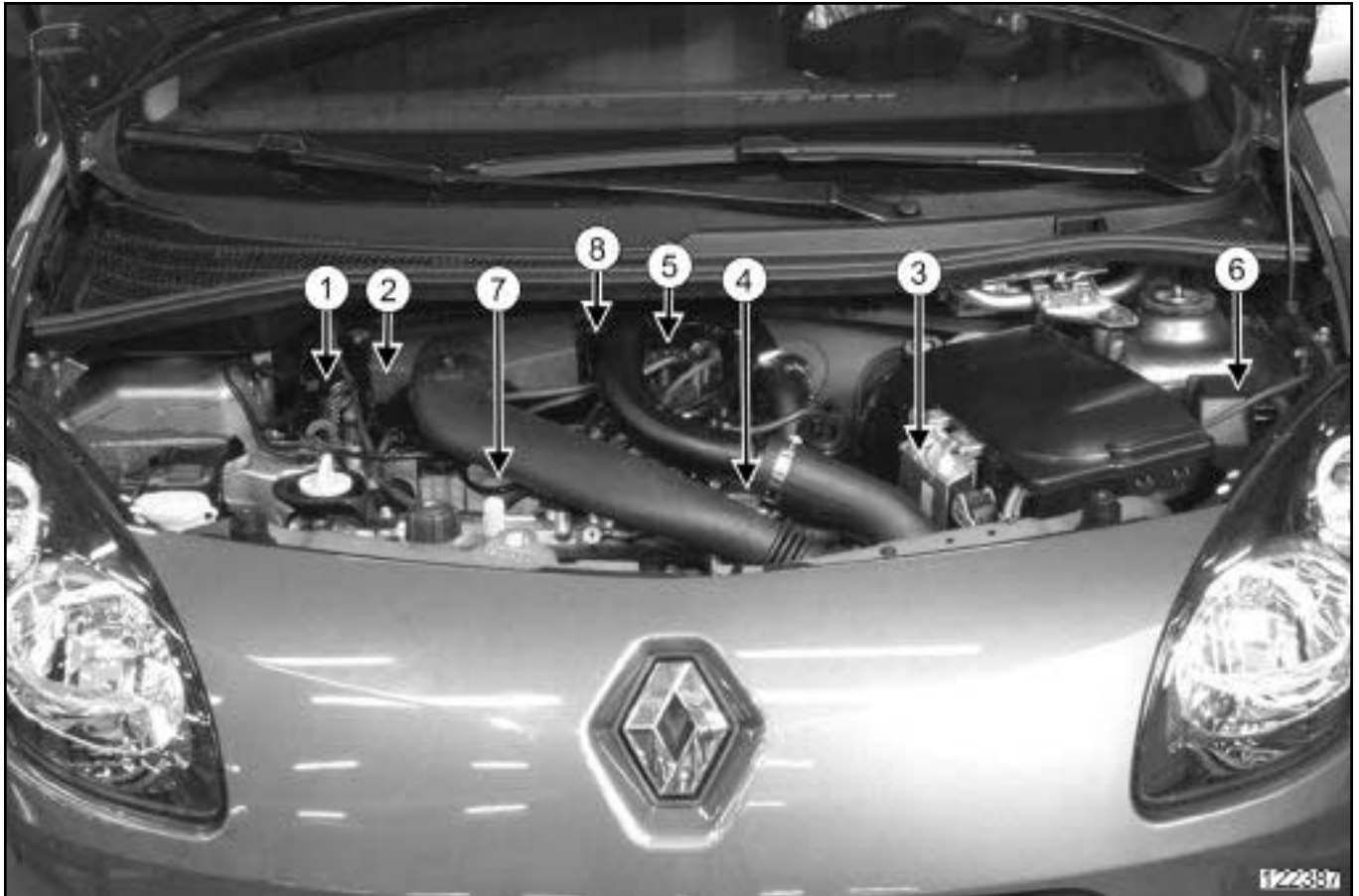


120415

- (12) Downstream oxygen sensor

Petrol injection: List and location of components

D4F, and 780 or 782



122387

- (1) Fuel vapour recirculation solenoid valve
- (2) Upstream oxygen sensor
- (3) Petrol injection computer
- (4) Motorised throttle valve
- (5) Ignition coil
- (6) Engine compartment connection unit
- (7) Intake distributor pressure sensor
- (8) Turbocharger

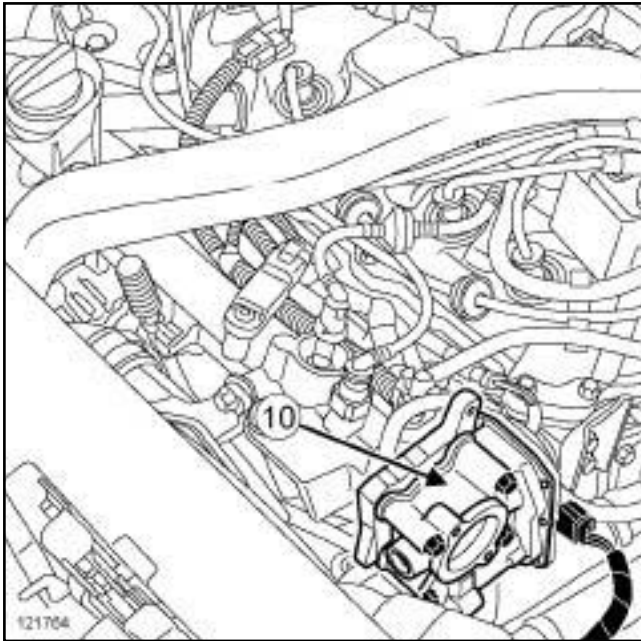


108254

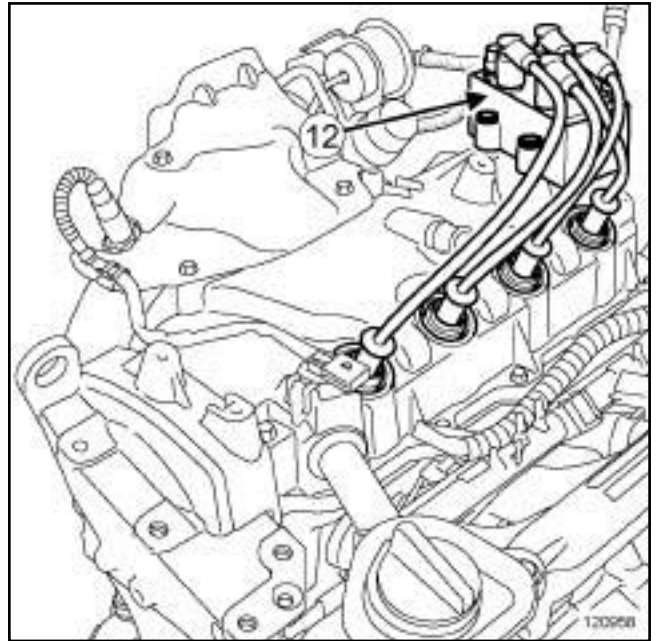
- (9) Fuel injection computer

Petrol injection: List and location of components

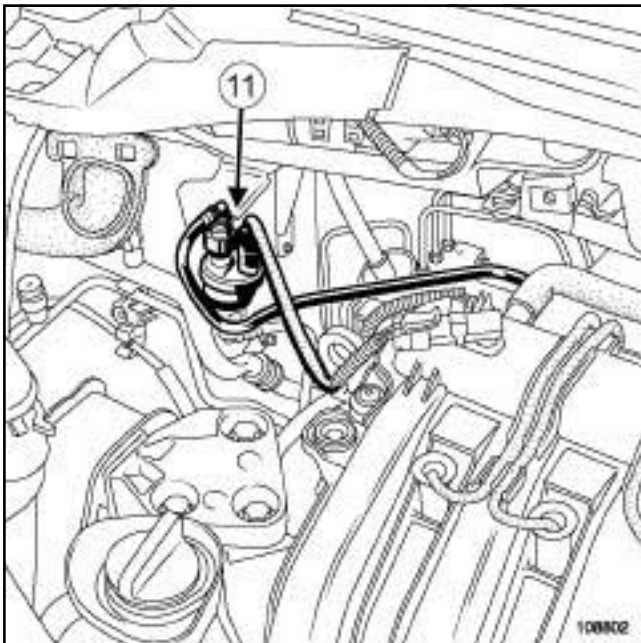
D4F, and 780 or 782



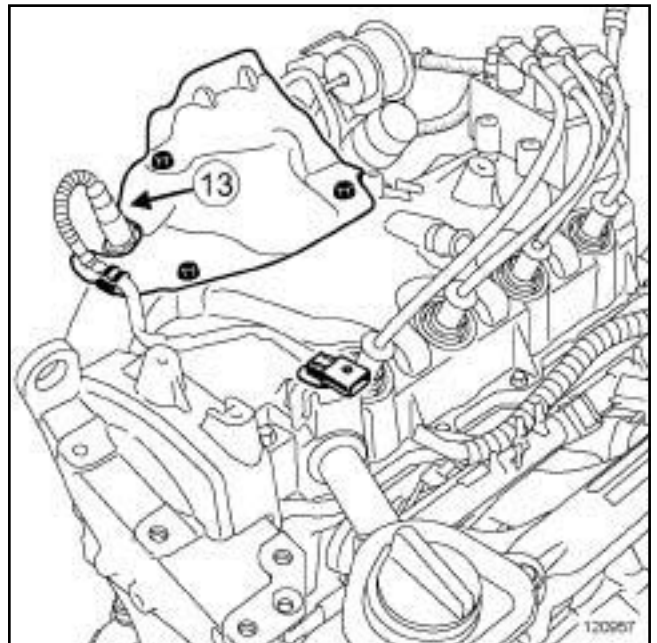
(10) Throttle valve



(12) Ignition coil



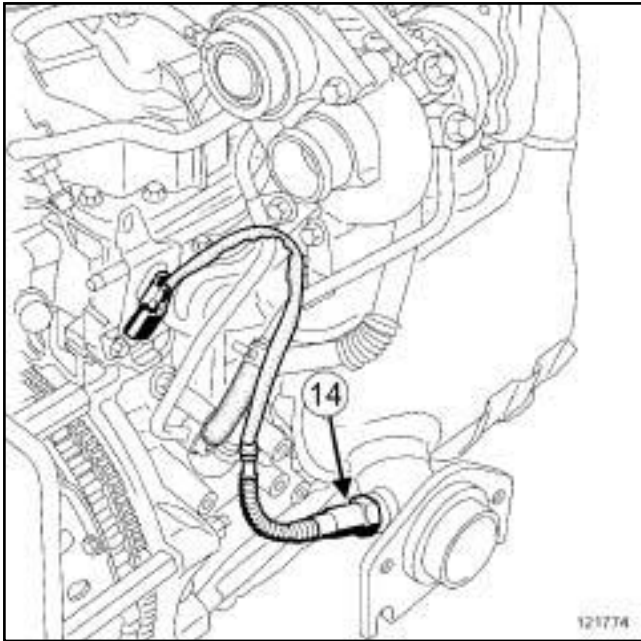
(11) Fuel vapour recirculation solenoid valve



(13) Upstream oxygen sensor

Petrol injection: List and location of components

D4F, and 780 or 782



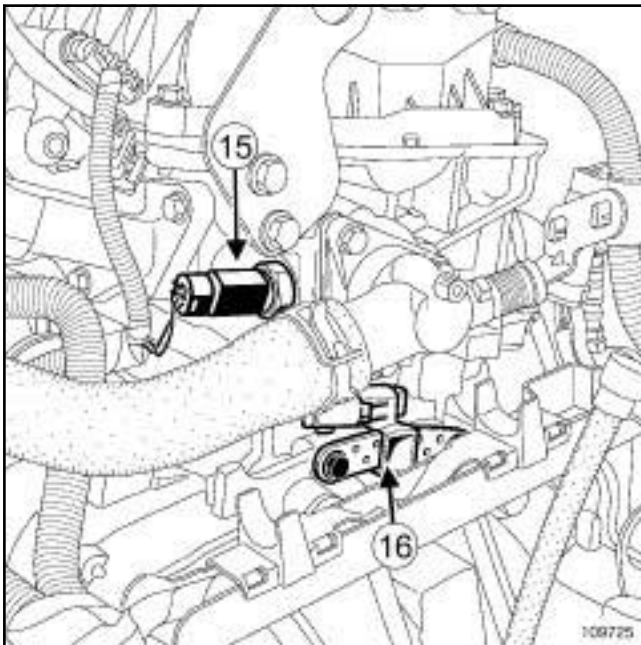
121774
121774

(14) Downstream oxygen sensor



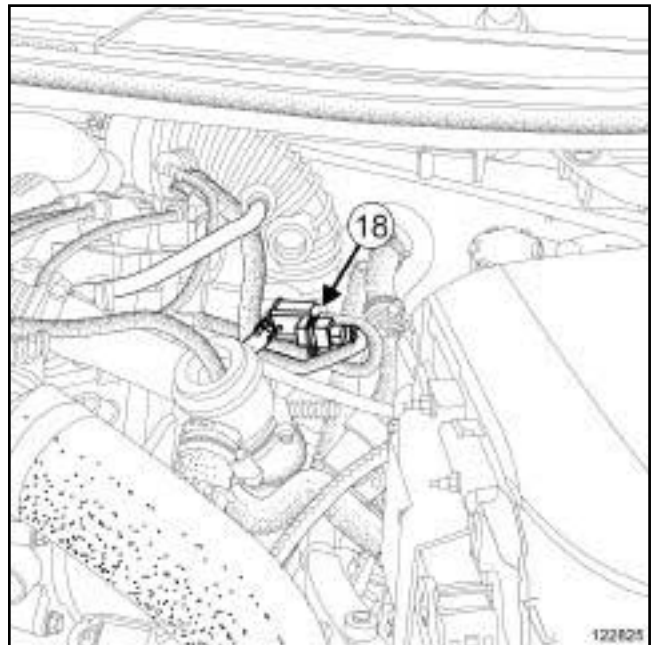
121725
121725

(17) Oil pressure sensor



109725
109725

(15) Coolant temperature sensor
(16) Crankshaft position sensor

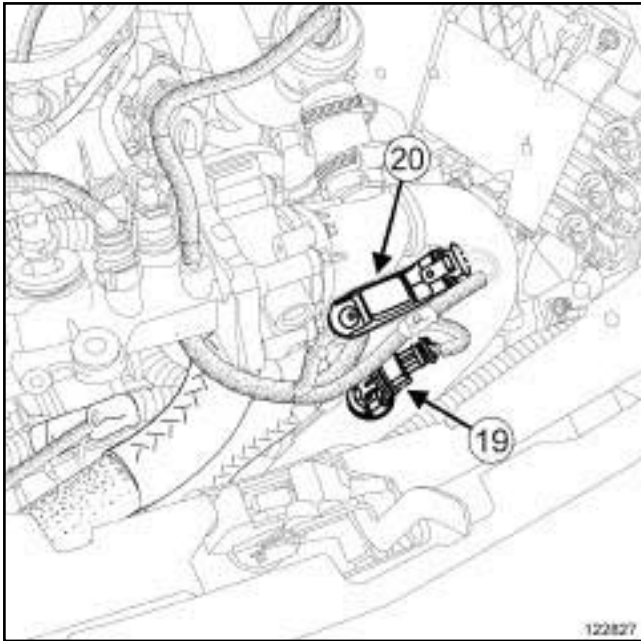


122825
122825

(18) Turbocharging pressure limiter solenoid valve

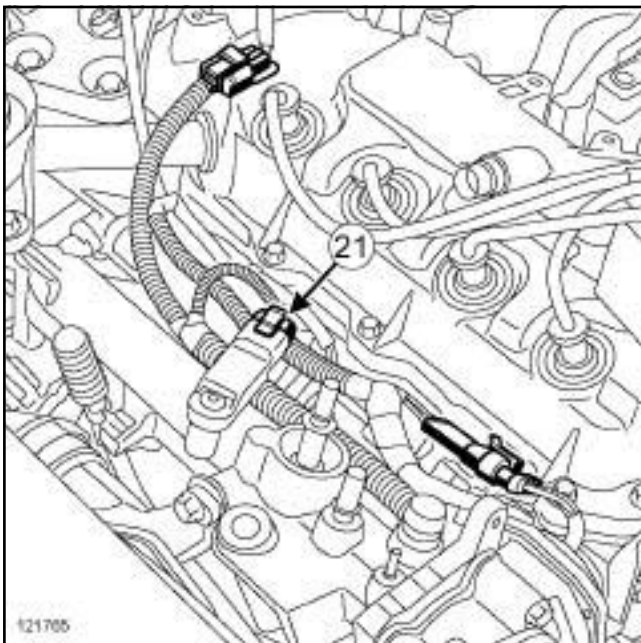
Petrol injection: List and location of components

D4F, and 780 or 782



122827

- (19) Inlet temperature sensor
- (20) Inlet pressure sensor

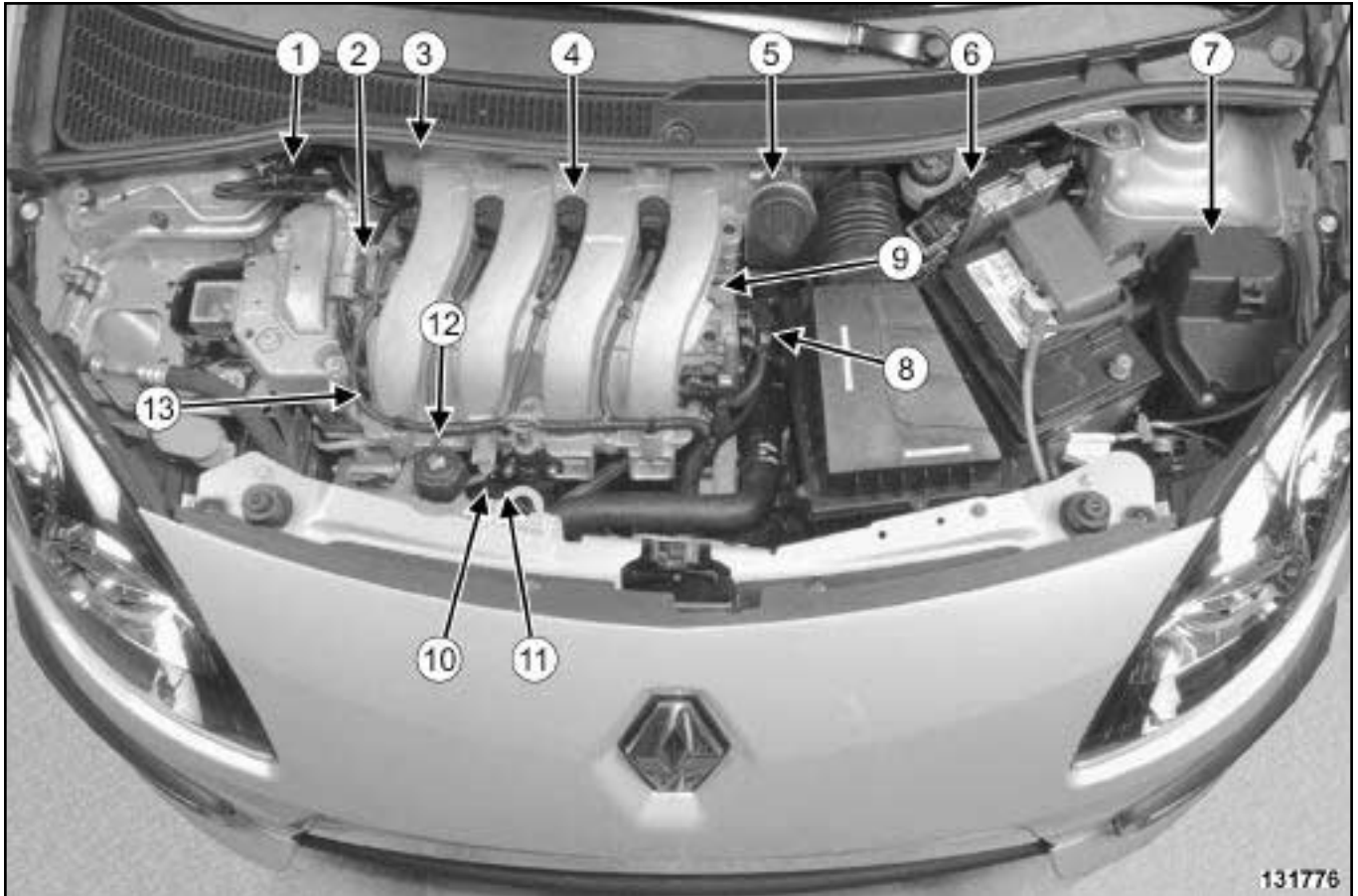


121765

- (21) Inlet pressure sensor

Petrol injection: List and location of components

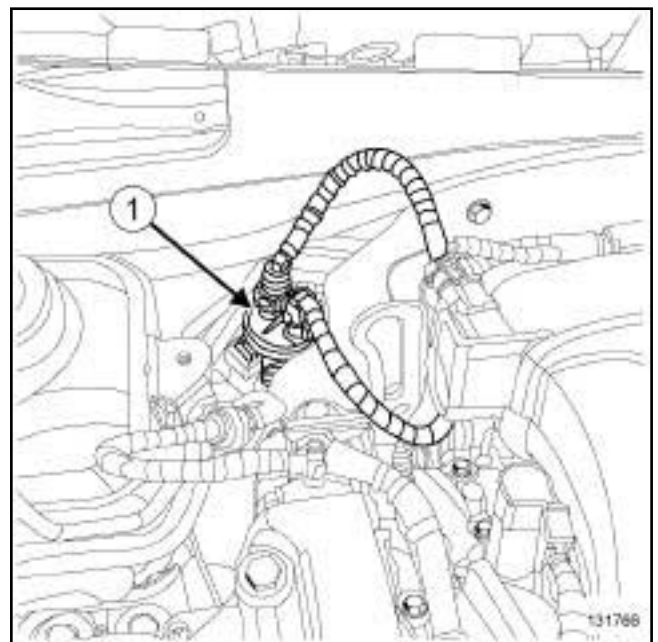
K4M



131776

131776

- | | |
|------|---|
| (1) | Fuel vapour absorber bleed solenoid valve |
| (2) | Camshaft dephaser solenoid valve |
| (3) | Air inlet pressure sensor |
| (4) | Coil |
| (5) | Throttle valve |
| (6) | Petrol injection computer |
| (7) | Switching protection unit |
| (8) | Coolant temperature sensor |
| (9) | Camshaft position sensor |
| (10) | Pinking sensor |
| (11) | Oil pressure sensor |
| (12) | Air temperature sensor |
| (13) | Injector rail |

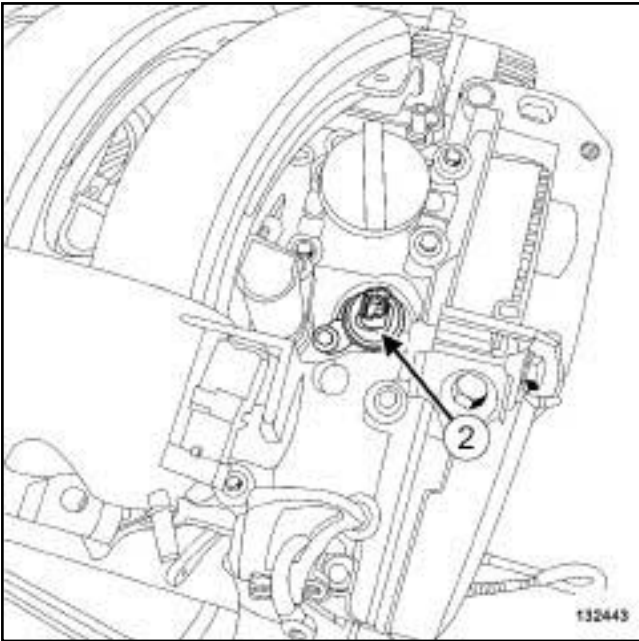


131788

- | | |
|-----|---|
| (1) | Fuel vapour absorber bleed solenoid valve |
|-----|---|

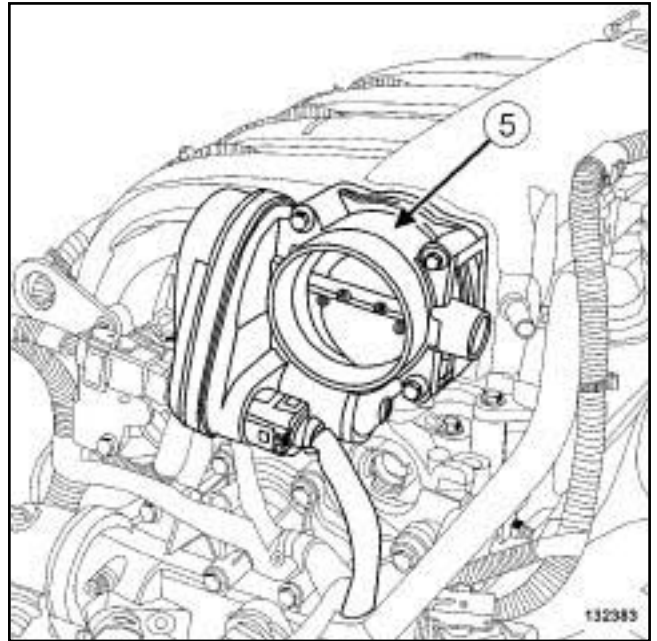
Petrol injection: List and location of components

K4M



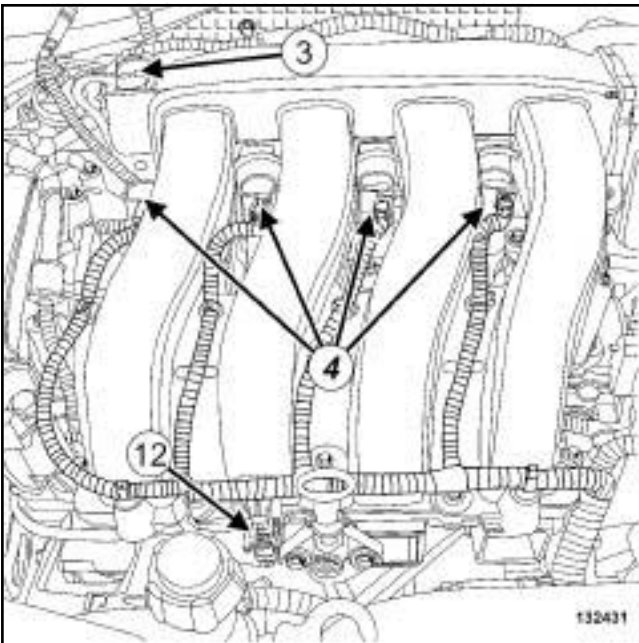
132443

(2) Camshaft dephaser solenoid valve



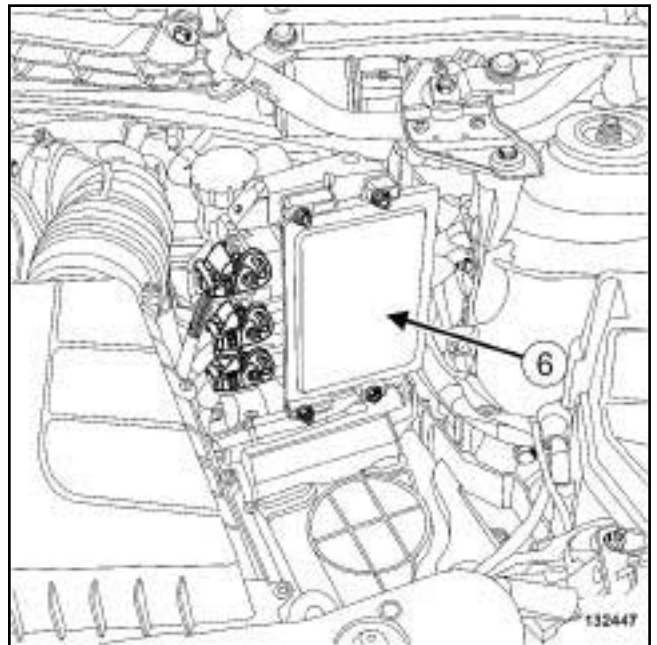
132383

(5) Throttle valve



132431

(3) Air inlet pressure sensor
 (4) Coils
 (12) Air temperature sensor

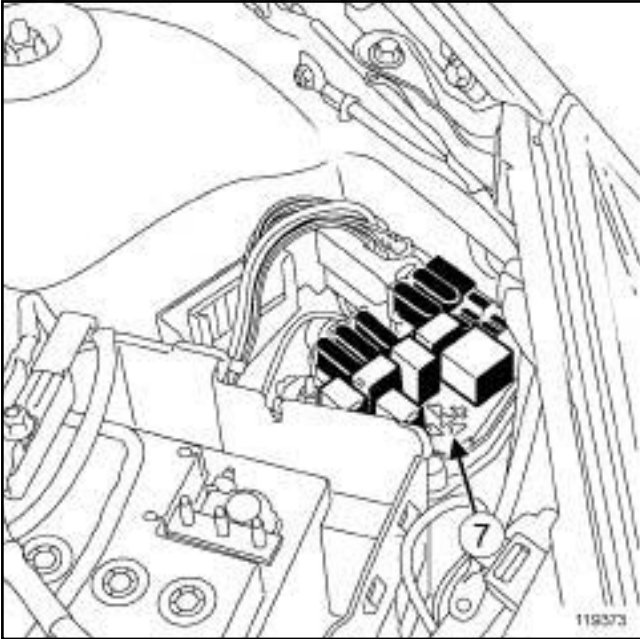


132447

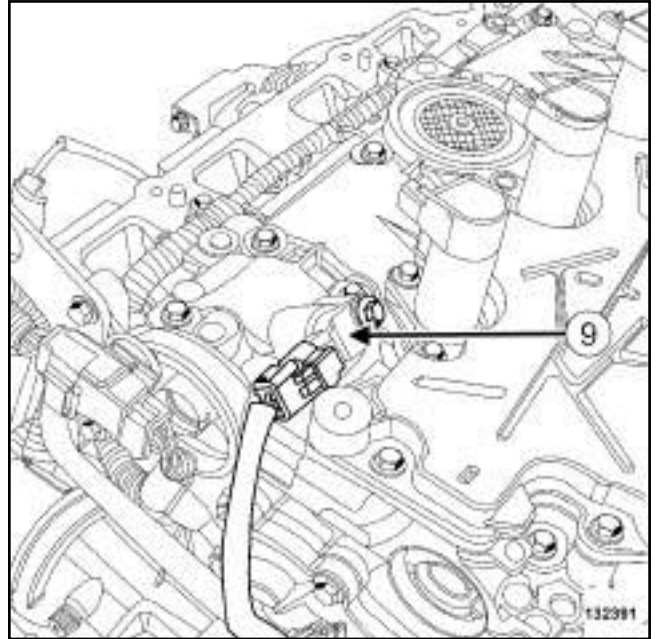
(6) Petrol injection computer

Petrol injection: List and location of components

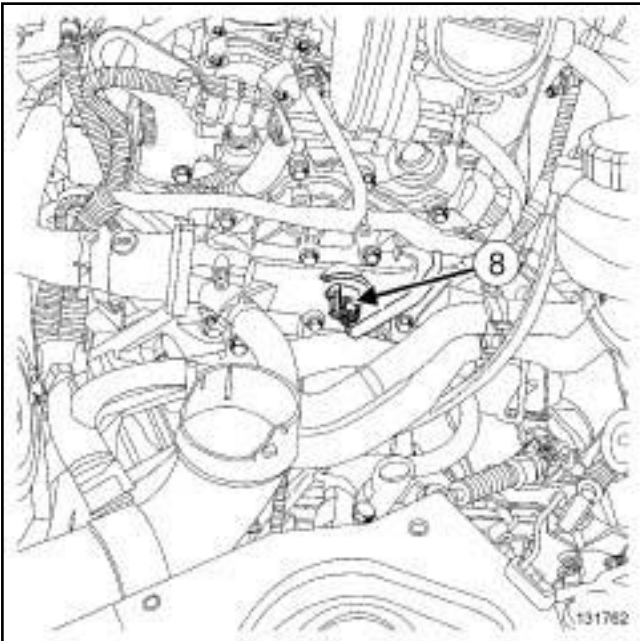
K4M



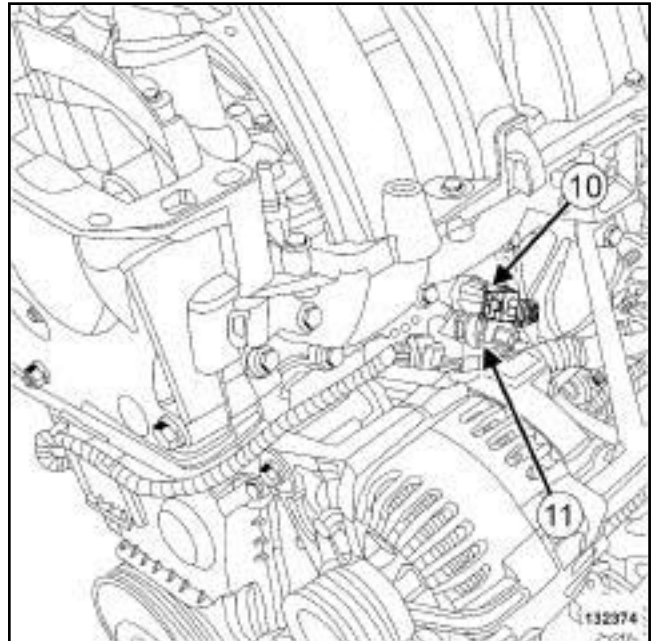
(7) Switching protection unit



(9) Camshaft position sensor



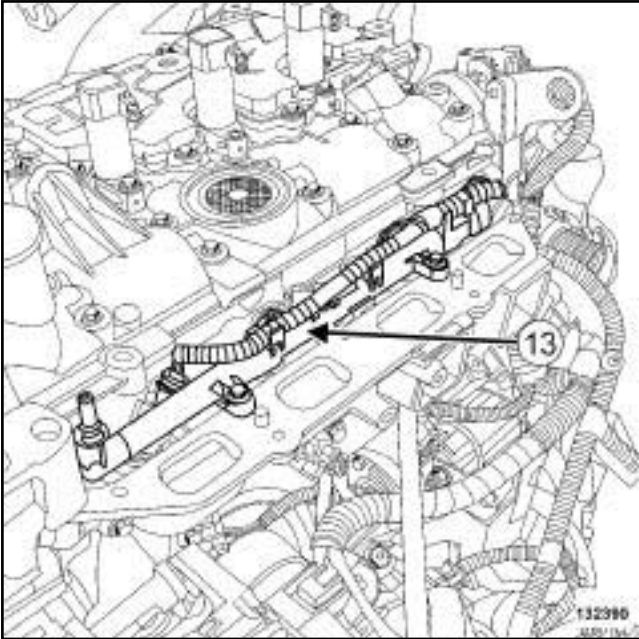
(8) Coolant temperature sensor



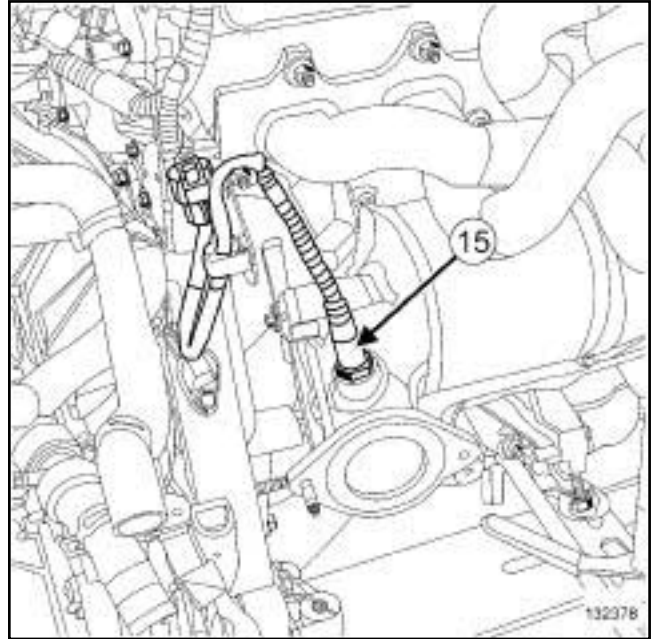
(10) Pinking sensor
(11) Oil pressure sensor

Petrol injection: List and location of components

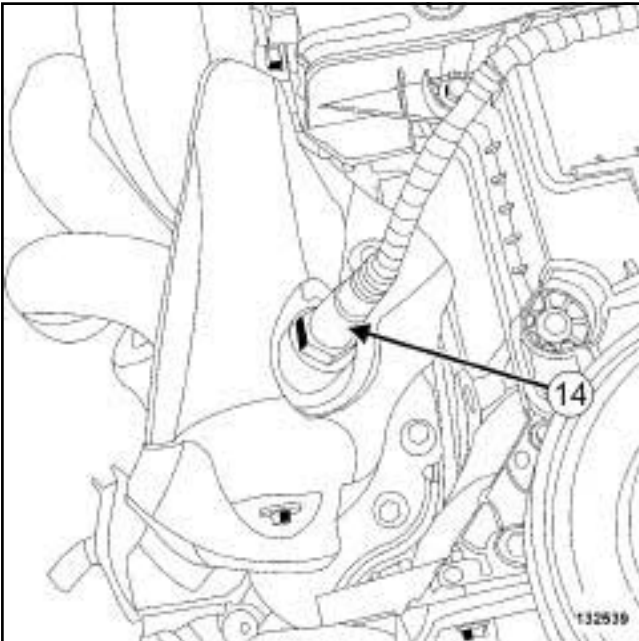
K4M



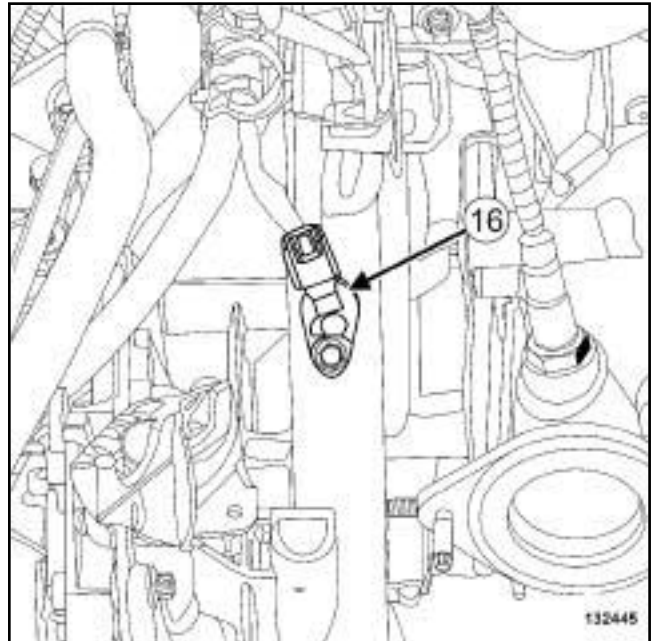
(13) Injector rail



(15) Downstream oxygen sensor



(14) upstream oxygen sensor



(16) Crankshaft position sensor

PETROL INJECTION

Oxygen sensors: Removal - Refitting

17B

D4F, and 772 – D7F

Equipment required

open-ended spanner

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

WARNING

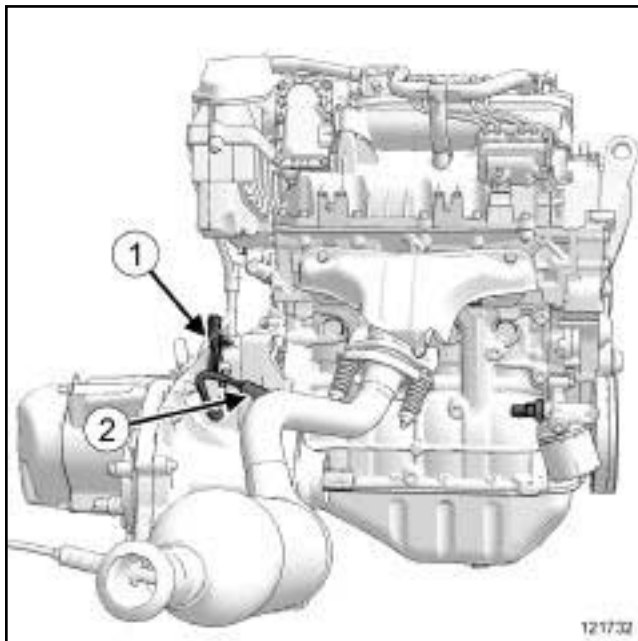
If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**)(Technical Note 6015A, 88A, Wiring).

REMOVAL

I - REMOVAL PREPARATION OPERATION

- ❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

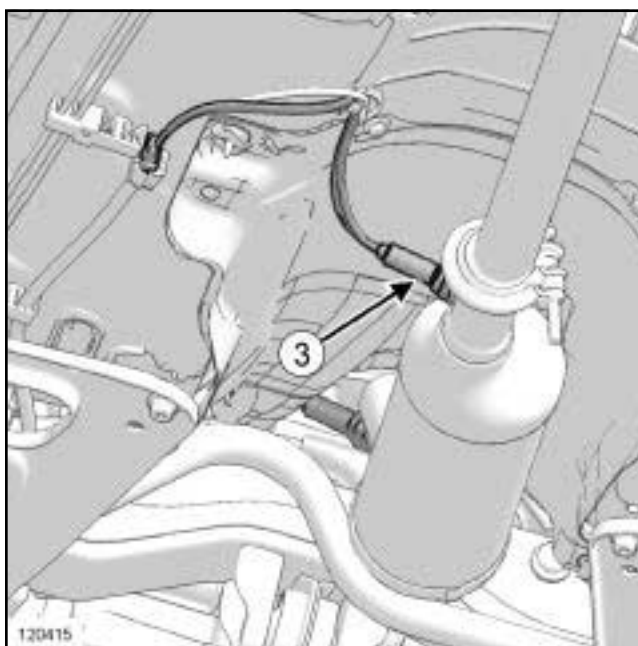
II - REMOVING THE UPSTREAM OXYGEN SENSOR



121732

- ❑ Disconnect the upstream oxygen sensor connector (1).
- ❑ Remove the upstream oxygen sensor (2) using a **24mm open-ended spanner**.

III - REMOVING THE DOWNSTREAM OXYGEN SENSOR



120415

- ❑ Disconnect the downstream oxygen sensor connector.
- ❑ Remove the downstream oxygen sensor (3) using a **24mm open-ended spanner**.

PETROL INJECTION

Oxygen sensors: Removal - Refitting

17B

D4F, and 772 – D7F

REFITTING

I - REFITTING THE UPSTREAM OXYGEN SENSOR

- Refit the upstream oxygen sensor.
- Tighten the upstream oxygen sensor using a **24mm open-ended spanner**.
- Connect the upstream oxygen sensor connector.

II - REFITTING THE DOWNSTREAM OXYGEN SENSOR

- Refit the downstream oxygen sensor.
- Tighten the downstream oxygen sensor using a **24mm open-ended spanner**.
- Connect the downstream oxygen sensor connector.

D4F, and 780 or 782

Special tooling required

Mot. 1495-01 22 mm socket for removal - refitting of oxygen sensors.

Tightening torques

upstream oxygen sensor	45 N.m
------------------------	---------------

turbocharger heat shield bolts	8 N.m
--------------------------------	--------------

downstream oxygen sensor	45 N.m
--------------------------	---------------

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

WARNING

If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**) (Technical Note 6015A, 88A, Wiring).

REMOVAL

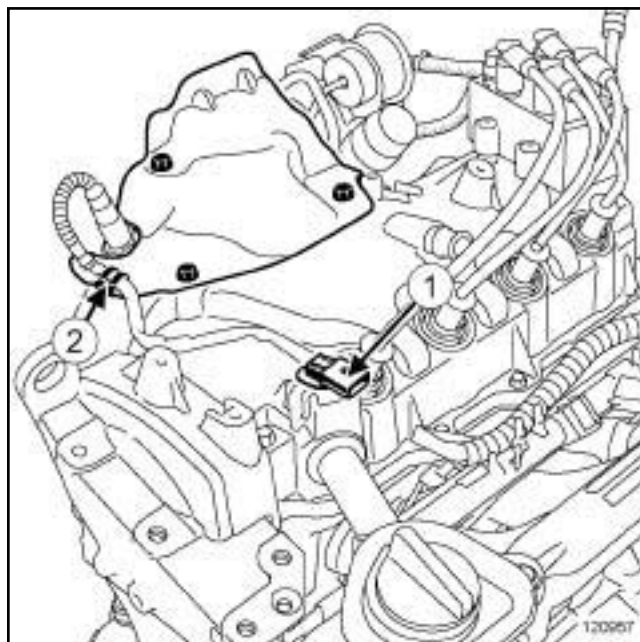
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED

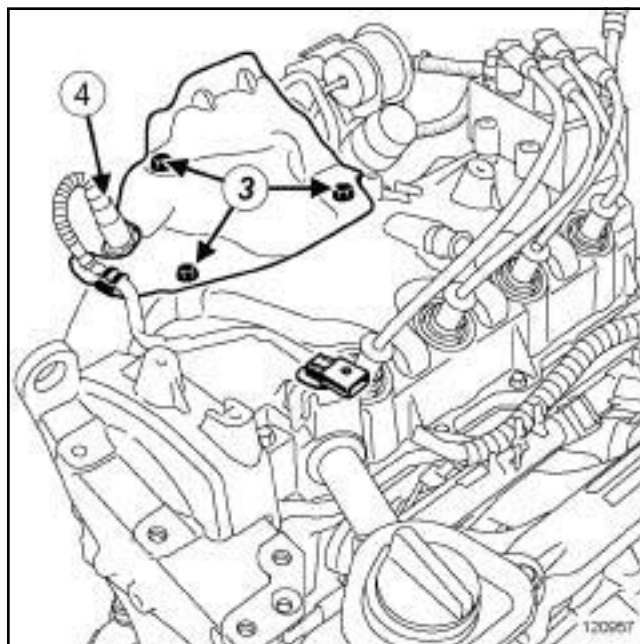
1 - Removing the upstream oxygen sensor

- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .



120957

- Disconnect the upstream oxygen sensor connector (1) .
- Unclip the upstream oxygen sensor connector from the rocker cover.
- Unclip the upstream oxygen sensor wiring (2) .



120957

- Remove:
 - the bolts (3) from the exhaust manifold heat shield,
 - the turbocharger heat shield,
 - the upstream oxygen sensor (4) from the catalytic converter using the tool (**Mot. 1495-01**).

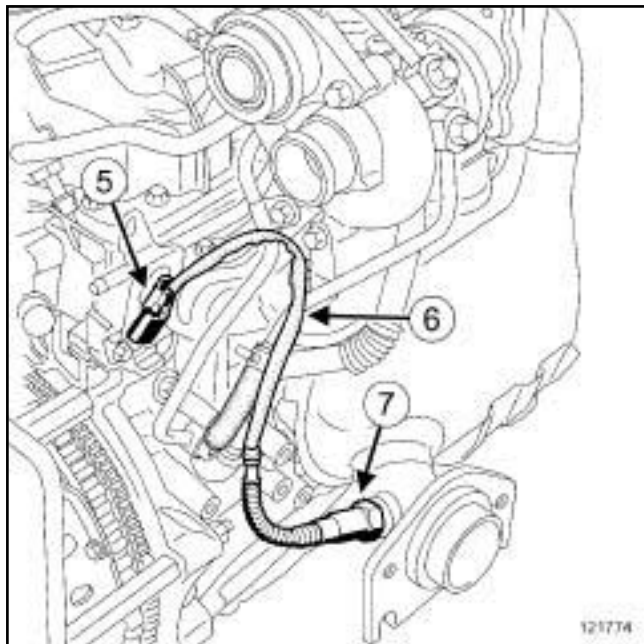
PETROL INJECTION

Oxygen sensors: Removal - Refitting

17B

D4F, and 780 or 782

2 - Removal of the downstream oxygen sensor



- Disconnect the catalytic converter downstream oxygen sensor connector (5) .
- Unclip the downstream oxygen sensor connector from the catalytic converter.
- Unclip the wiring of the catalytic converter downstream oxygen sensor at (6) .
- Remove the downstream oxygen sensor (7) from the catalytic converter using the tool (Mot. 1495-01).

REFITTING

REFITTING OPERATION FOR PART CONCERNED

1 - Refitting the upstream oxygen sensor

- Refit the upstream oxygen sensor.
- Torque tighten the **upstream oxygen sensor (45 N.m)** using the (Mot. 1495-01).
- Refit:
 - the turbocharger heat shield,
 - the turbocharger heat shield bolts.
- Torque tighten the **turbocharger heat shield bolts (8 N.m)**.
- Clip:
 - the upstream oxygen sensor wiring,
 - the upstream oxygen sensor connector onto the rocker cover.

- Connect the upstream oxygen sensor connector.
- Refit the air filter unit (see 12A, **Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

2 - Refitting the downstream oxygen sensor

- Refit the downstream oxygen sensor.
- Torque tighten the **downstream oxygen sensor (45 N.m)** using the tool (Mot. 1495-01).
- Clip the downstream oxygen sensor wiring onto the catalytic converter.
- Clip the downstream oxygen sensor connector onto the catalytic converter.
- Connect the downstream oxygen sensor connector.

Oxygen sensors: Removal - Refitting

K4M

Special tooling required

Mot. 1495	22 mm socket for removal - refitting of oxygen sensors - 1/2" square drive and 24 mm hexagonal ext.
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques

upstream oxygen sensor	90°
downstream oxygen sensor	45 N.m

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice prevents the oxygen sensor from operating correctly and results in failure to comply with the emission control standard.

WARNING

If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**) (Technical Note 6015A, 88A, Wiring).

Note:

This procedure is for removal - refitting of the upstream oxygen sensor and the downstream oxygen sensor.

REMOVING THE UPSTREAM OXYGEN SENSOR

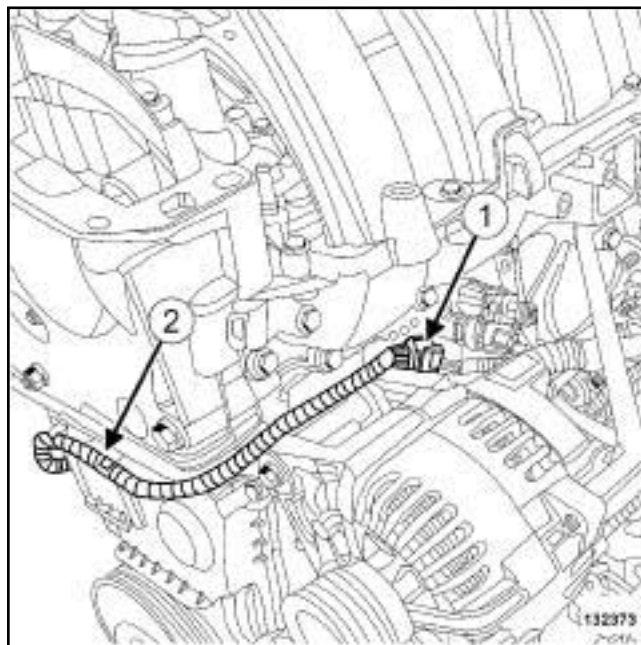
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

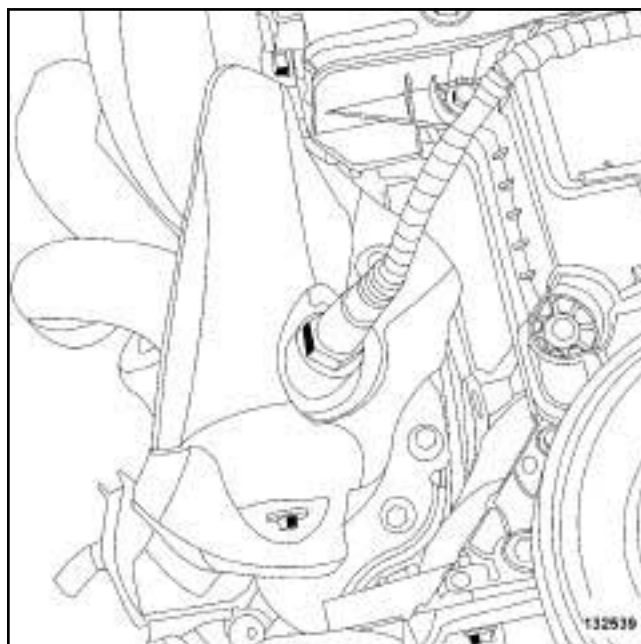
- the engine undertray.

II - REMOVAL OPERATION



132373

- Disconnect the upstream oxygen sensor connector (1).
- Unclip the wiring from the upstream oxygen sensor at (2).



132539

- Remove the upstream oxygen sensor.

PETROL INJECTION

Oxygen sensors: Removal - Refitting

17B

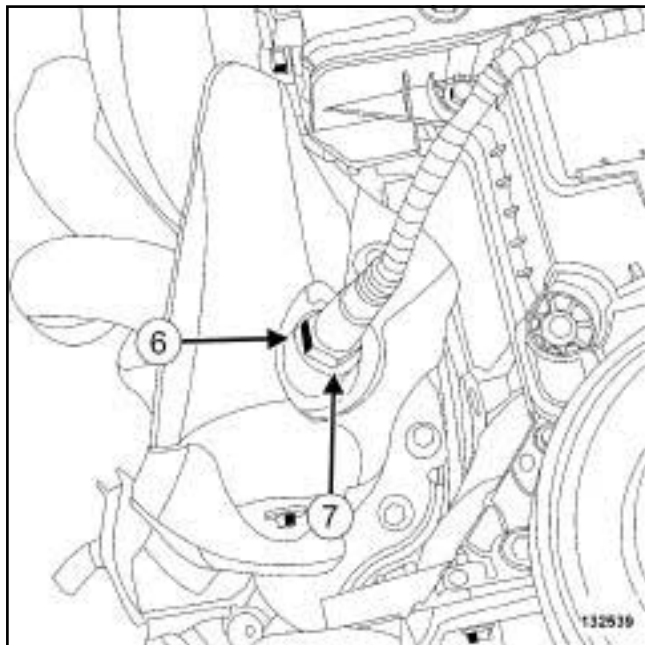
K4M

REFITTING THE UPSTREAM OXYGEN SENSOR

I - REFITTING PREPARATION OPERATION

- Clean the threading of the upstream oxygen sensor using a **WIRE BRUSH**.
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the thread hole of the upstream oxygen sensor on the exhaust manifold,
 - the threading of the upstream oxygen sensor if it is to be reused.

II - REFITTING OPERATION



132539

- Refit the upstream oxygen sensor.
- Angle tighten the **upstream oxygen sensor (90°)**.

Note:

For angular tightening, make a mark (6) on the catalytic pre-converter in the middle of the flat surface of the upstream oxygen sensor. Move the upstream oxygen sensor stop (7) to the mark (6).

- Attach the upstream oxygen sensor wiring.
- Connect the upstream oxygen sensor connector.

III - FINAL OPERATION

- Refit:
 - the engine undertray.
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

REMOVAL OF THE DOWNSTREAM OXYGEN SENSOR

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

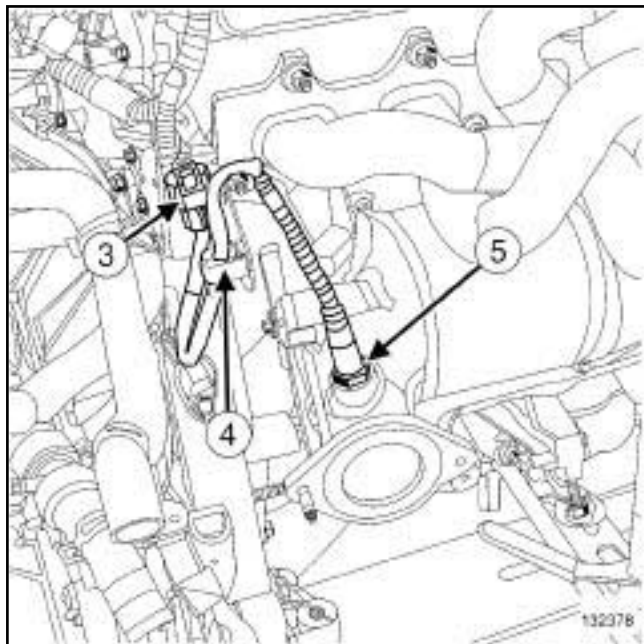
PETROL INJECTION

Oxygen sensors: Removal - Refitting

17B

K4M

II - REMOVAL OPERATION



132378

- Disconnect the downstream oxygen sensor connector (3) .
- Unclip the wiring from the downstream oxygen sensor at (4) .
- Remove the downstream oxygen sensor (5) using the tool (**Mot. 1495**).

REFITTING THE DOWNSTREAM OXYGEN SENSOR

I - REFITTING PREPARATION OPERATION

- Clean the threading of the downstream oxygen sensor using a **WIRE BRUSH**.
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the thread hole of the downstream oxygen sensor on the exhaust manifold,
 - the threading of the downstream oxygen sensor if it is to be reused.

II - REFITTING OPERATION

- Refit the downstream oxygen sensor.
- Torque tighten the **downstream oxygen sensor (45 N.m)** using the tool (**Mot. 1495-01**).
- Clip on the downstream oxygen sensor wiring.
- Connect the downstream oxygen sensor connector.

III - FINAL OPERATION

- Refit:
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).
- Connect the battery (see) (80A, Battery).

Petrol injection computer: Removal - Refitting

D4F or D7F

Equipment required

Diagnostic tool

Tightening torques

injection computer nuts **8 N.m**

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice prevents the oxygen sensor from operating correctly and results in failure to comply with the emission control standard.

WARNING

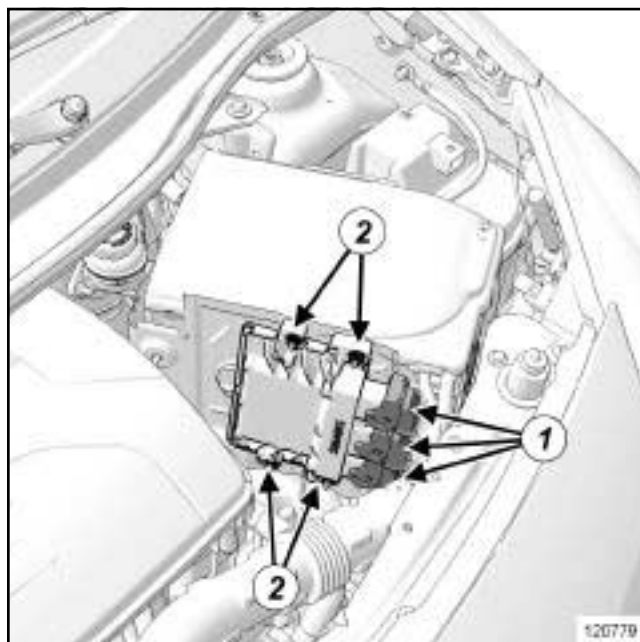
If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**) (Technical Note 6015A, 88A, Wiring).

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (MR 411, 80A, Battery).

II - OPERATION FOR REMOVAL OF PART CONCERNED



120779

- Disconnect the injection computer connectors (1) .
- Remove:
 - the injection computer nuts (2) ,
 - the injection computer.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the injection computer,
 - the injection computer nuts.
- Torque tighten the **injection computer nuts (8 N.m)**.
- Connect the injection computer connectors.

II - FINAL OPERATION

- Connect the battery (see) (MR 411, 80A, Battery).
- Carry out the necessary configurations and/or programming, using the **Diagnostic tool** (see **Fault finding - Replacement of components**) (MR 413, 17B, Petrol injection).

Petrol injection computer: Removal - Refitting

K4M

Special tooling required

Mot. 1844 Drill bush for removing the tamper-proof bolts from the injection computer protective cover

Equipment required

drill

Diagnostic tool

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice prevents the oxygen sensor from operating correctly and results in failure to comply with the emission control standard.

WARNING

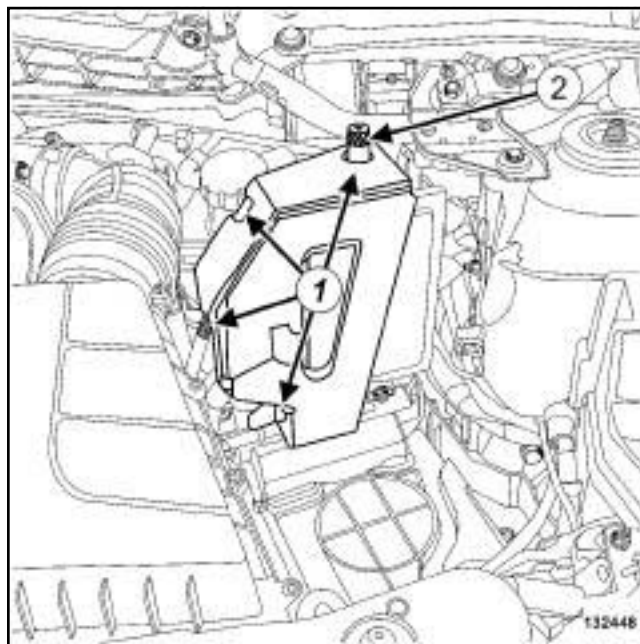
If the connections are corroded, repair the wiring (see Wiring: Precautions for repair) (Technical Note 6015A, 88A, Wiring).

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Remove the battery (see **Battery: Removal - Refitting**) (80A, Battery).

RIGHT-HAND DRIVE



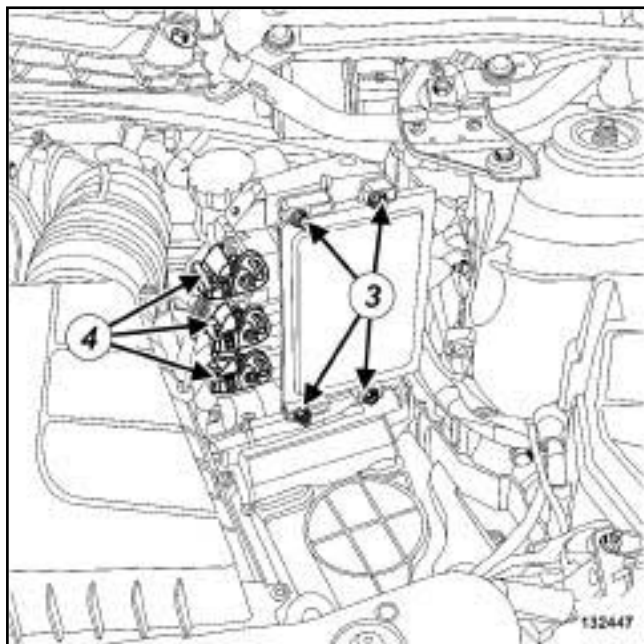
132448

- Remove:
 - the tamperproof bolts (1) using the tool (**Mot. 1844**) (2) and a **drill**,
 - the petrol injection computer protector.

Petrol injection computer: Removal - Refitting

K4M

II - REMOVAL OPERATION



132447

- Remove the nuts (3) from the petrol injection computer.
- Disconnect the connector (4) from the petrol injection computer.
- Remove the petrol injection computer.

REFITTING

I - REFITTING OPERATION

- Connect the petrol injection computer connectors.
- Refit the petrol injection computer

II - FINAL OPERATION

RIGHT-HAND DRIVE

- Refit:
 - the injection computer protector,
 - the tamperproof bolts available from the Parts Department.
 - Tighten the tamperproof bolts until the head splits.
-
- Refit the battery (see **Battery: Removal - Refitting**) (80A, Battery).

- Carry out the necessary configurations and/or programming, using the **Diagnostic tool** (see **Fault finding - Replacement of components**) (17B, Petrol injection).

Pinking sensor: Removal - Refitting

K4M

Special tooling required

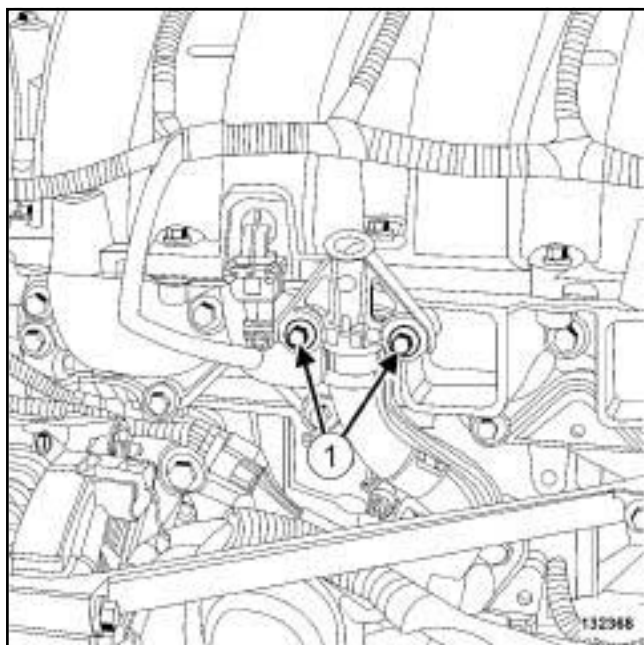
Emb. 1797 Socket (24 mm) for removal - refitting of the clutch master cylinder

Tightening torques

pinking sensor	20 N.m
alternator strut bolts	25 N.m

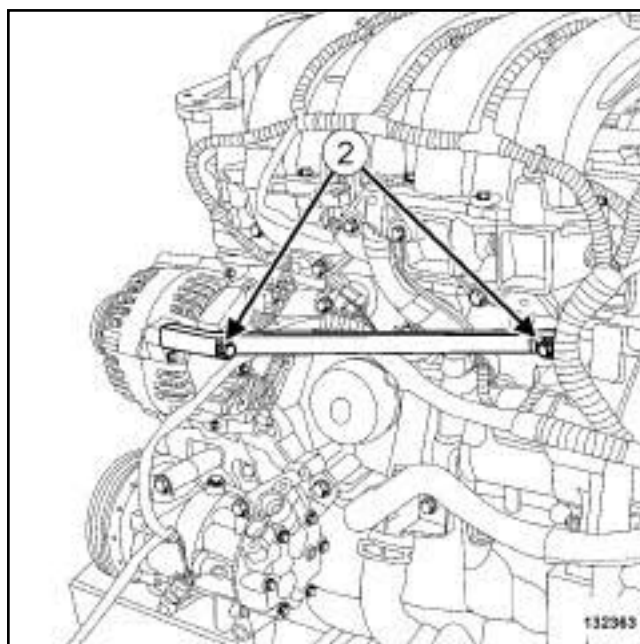
REMOVAL

I - REMOVAL PREPARATION OPERATION



132368

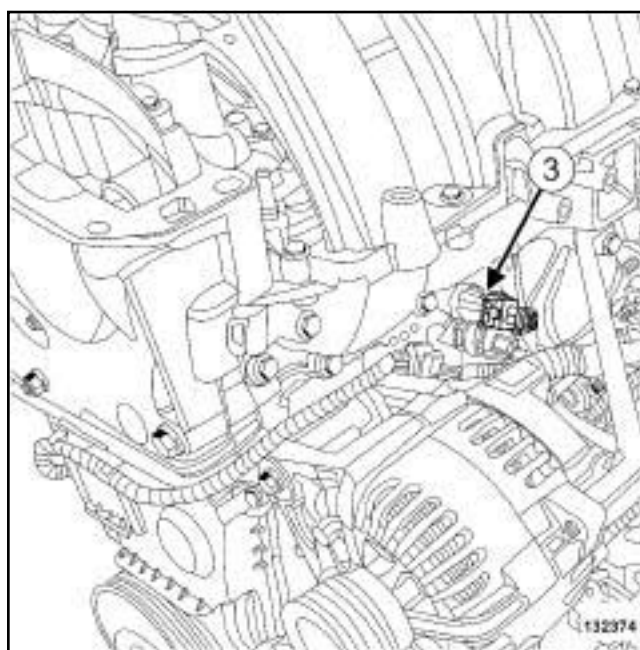
- Remove:
 - the dipstick,
 - the dipstick guide bolts (1) .
- Move aside the dipstick guide.



132363

- Remove:
 - the alternator strut bolts (2) ,
 - the alternator strut.

II - REMOVAL OPERATION



132374

- Disconnect the pinking sensor connector (3) .
- Remove the pinking sensor using the tool (**Emb. 1797**).

PETROL INJECTION

Pinking sensor: Removal - Refitting

17B

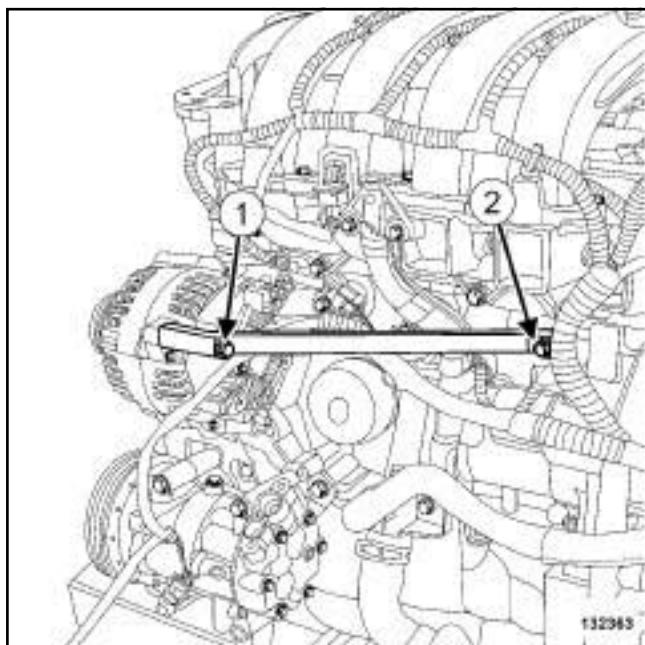
K4M

REFITTING

I - REFITTING OPERATION

- Refit the pinking sensor.
- Torque tighten the **pinking sensor (20 N.m)** using the tool (**Emb. 1797**).
- Connect the pinking sensor connector.

II - FINAL OPERATION



132363

- Refit the alternator strut.
- Tighten to torque and in order the **alternator strut bolts (25 N.m)**.
- Refit:
 - dipstick guide ,
 - the dipstick.

Crankshaft position sensor: Removal - Refitting

D4F or D7F

REMOVAL

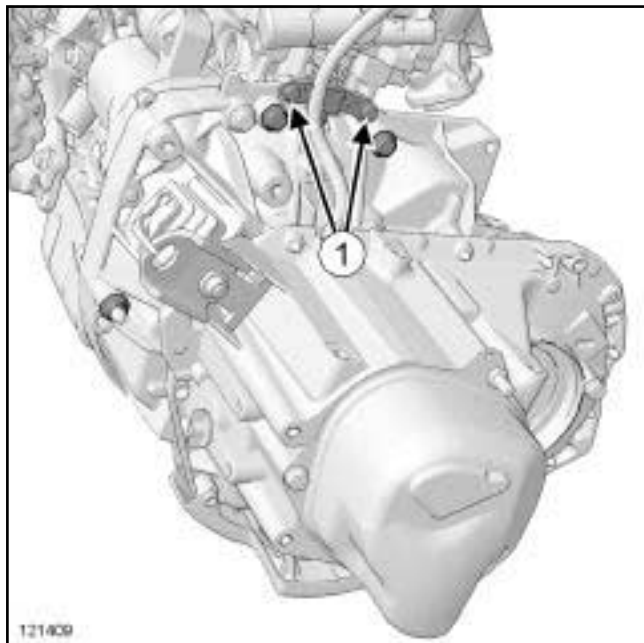
I - REMOVAL PREPARATION OPERATION

D4F

- Remove the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .

- Remove the engine wiring bolt from the gearbox.
- Move the engine wiring harness to one side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



121409

- Disconnect the engine speed and position sensor connector.
- Remove the bolts (1) from the engine speed and position sensor.
- Remove the engine speed and position sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the engine speed and position sensor,
 - the engine speed and position sensor bolts.

- Connect the engine speed and position sensor connector.

II - FINAL OPERATION.

- Connect the engine wiring to the gearbox.
- Refit the engine wiring bolt to the gearbox.

D4F

- Refit the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .

Crankshaft position sensor: Removal - Refitting

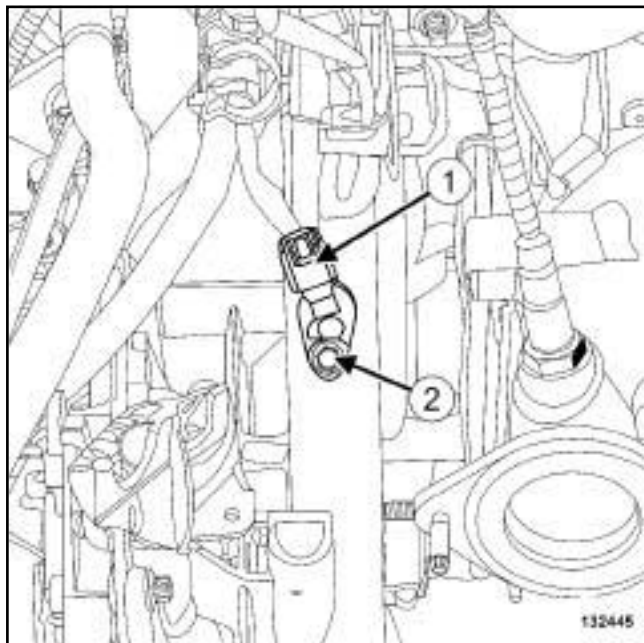
K4M

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the engine undertray.

II - REMOVAL OPERATION



132445

- Disconnect the crankshaft position sensor connector (1).
- Remove:
 - the crankshaft position sensor bolt (2),
 - the crankshaft position sensor.

REFITTING

I - REFITTING OPERATION

- Refit the crankshaft position sensor.
- Connect the crankshaft position sensor connector.

II - FINAL OPERATION

- Refit the engine undertray.

Injector rail - Injectors: Removal - Refitting

D4F, and 772

PARTS AND CONSUMABLES FOR THE REPAIR WORK

Pièces à remplacer systématiquement :

- injector O-ring's,
- injector retaining clips.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see **Battery: Removal - Refitting**).
- Remove:
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) .

IMPORTANT

During this operation, be sure to:

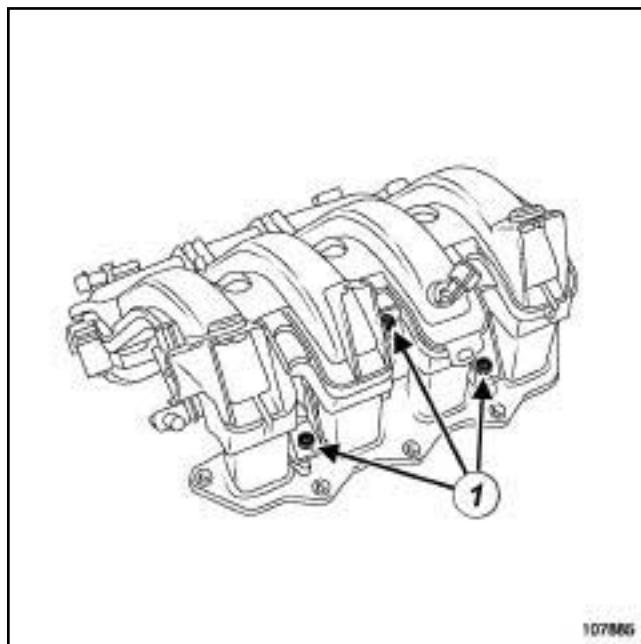
- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear latex gloves during the operation.

II - OPERATION FOR REMOVAL OF PART CONCERNED

On the workbench



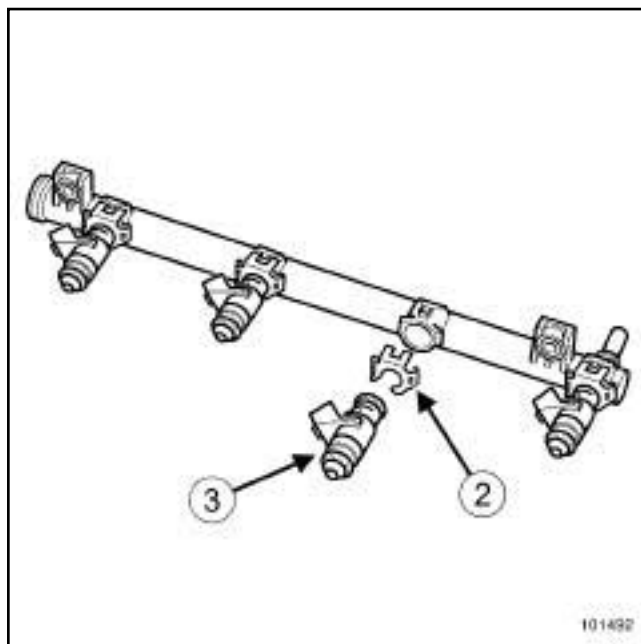
107886

107885

- Disconnect the injector wiring harness.

Remove:

- the injector rail bolts (1) ,
- the injector rail,
- the injector wiring harness.



101492

101492

- Remove:

- the clips (2) from the injectors,

D4F, and 772

- the injectors (3) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

Refit:

- the injectors,
- the injector clips,
- the injector wiring harness,
- the injector rail,
- the injector rail bolts.

Connect the injector wiring harness.

II - FINAL OPERATION.

Refit:

- the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-29**) ,
- the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .

Connect the battery (see **Battery: Removal - Refitting**) .

Injector rail - Injectors: Removal - Refitting

D4F, and 780 or 782

Tightening torques

injector rail - injector bolts	4.5 N.m
--------------------------------	---------

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

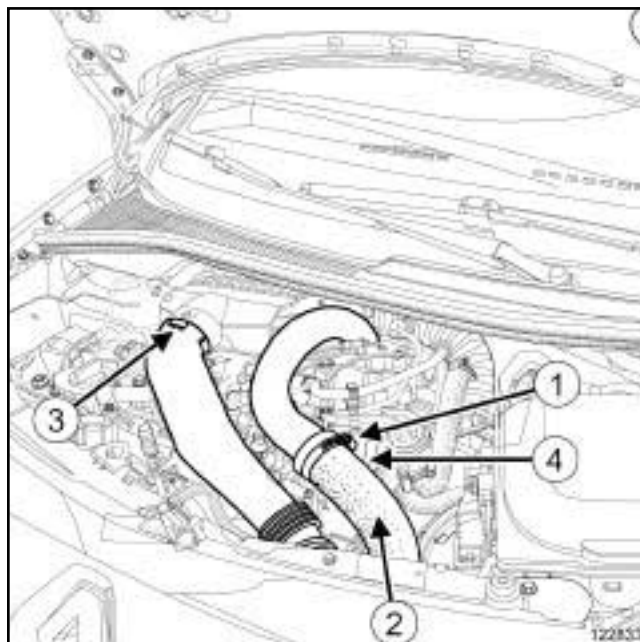
IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

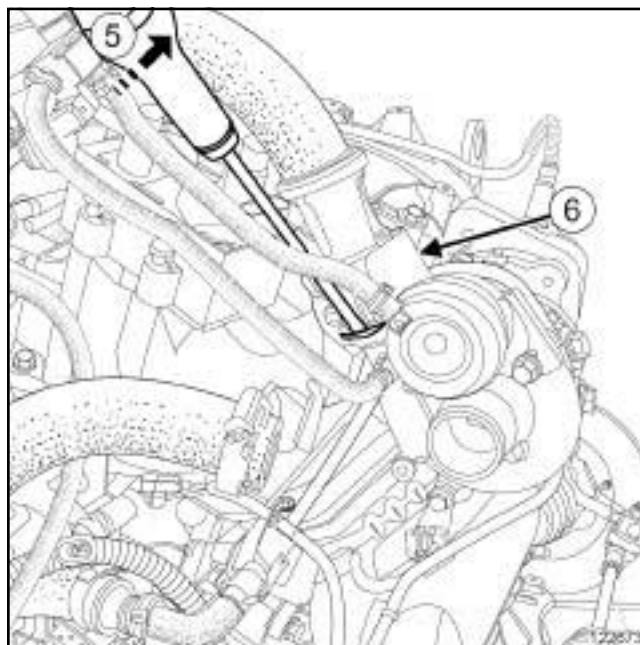
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (80A, Battery).



122833



122673

-

Note:

If the tightening clip (1) of the intercooler air inlet pipe is removed, the flexible rubber pipe (2) and the tightening clip (1) must be replaced.

- Disconnect the air filter unit air inlet pipe (3) on the air filter unit cover.
- Move aside the air inlet pipe from the air filter unit.
- Remove the bolt (4) of the intercooler air inlet pipe from the throttle valve.

Injector rail - Injectors: Removal - Refitting

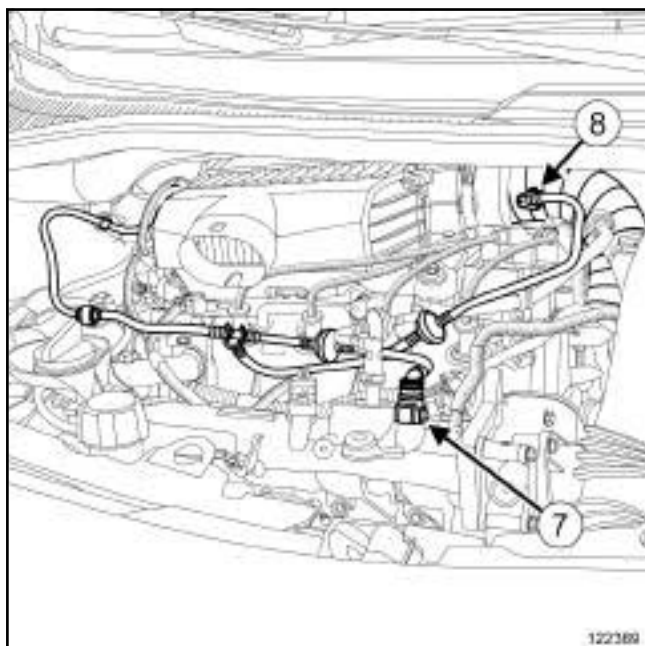
D4F, and 780 or 782

- Unclip the intercooler air inlet pipe from the turbocharger in the direction of the arrow (5) .
- Disconnect the intercooler air inlet pipe from the turbocharger.

Note:

If the clip (6) is removed from the heat resistant protector, the latter must be replaced.

- Move aside the intercooler air inlet pipe.



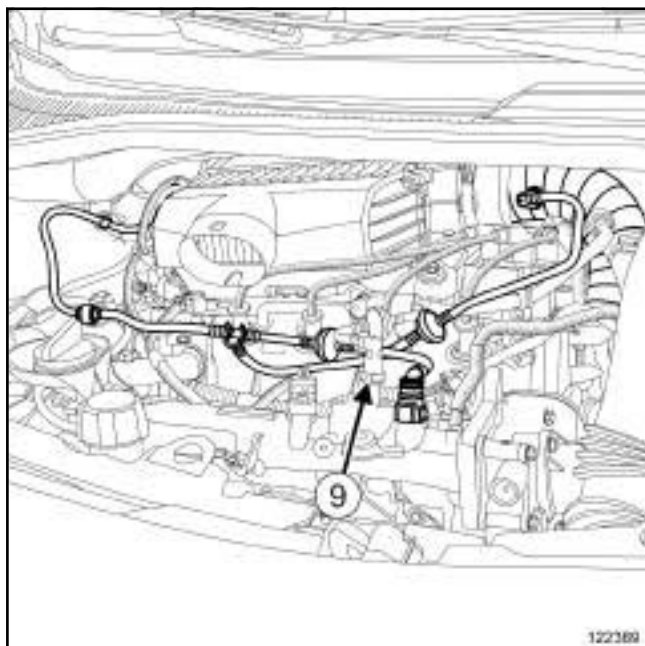
122389
122389

- Disconnect the petrol vapour rebreathing pipe from:
 - the inlet distributor (7) ,
 - the air filter unit air outlet pipe (8) .
- Unclip the petrol vapour rebreathing pipe.
- Remove the petrol vapour rebreathing pipe.

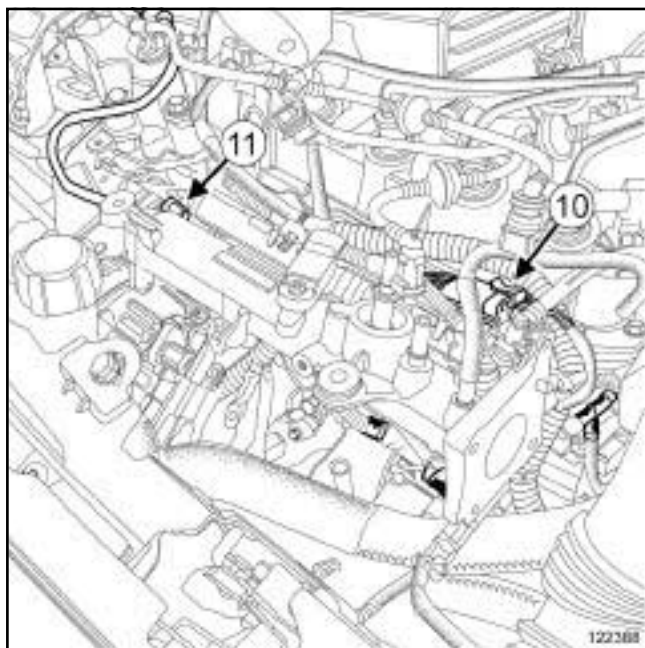
Injector rail - Injectors: Removal - Refitting

D4F, and 780 or 782

II - OPERATION FOR REMOVAL OF PART CONCERNED



122389

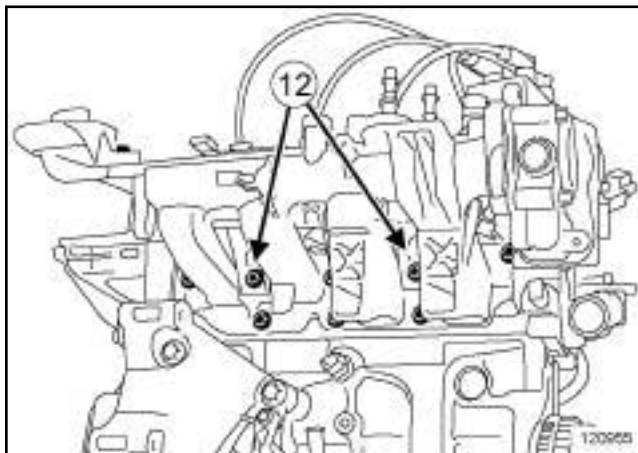


122388

- Remove the dipstick.
- Disconnect:
 - the oil vapour rebreathing pipe from the inlet distributor (9) ,
 - the injector rail electrical wiring connector (10) ,
 - the injector rail fuel supply pipe (11) .

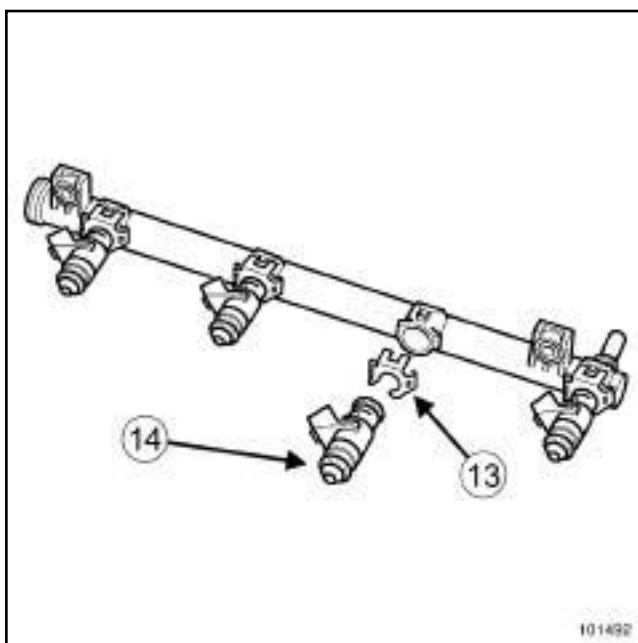
WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.



120955

- Remove:
 - the injector rail bolts (12) ,
 - the « injector rail - injector » assembly by pulling it gently.
- Disconnect the injector electrical wiring connectors.
- Remove the electrical wiring from the « injector rail - injector » assembly.



101492

- Remove:
 - the clips (13) from the injectors,
 - the injectors (14) .

Injector rail - Injectors: Removal - Refitting

D4F, and 780 or 782

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: injector clip on injector rail.
- parts always to be replaced: injector seal.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the injectors with new seals,
 - new clips on the injectors,
 - the injector rail - injector electrical wiring.
- Connect the connectors of the electrical wiring to the injectors.
- Refit:
 - the « injector rail - injector » assembly,
 - the « injector rail - injector » assembly bolts.
- Torque tighten the **injector rail - injector bolts (4.5 N.m)**.
- Connect:
 - the fuel supply pipe on the injector rail,
 - the electrical wiring connector to the injector rail,
 - the oil vapour rebreathing pipe on the inlet distributor.
- Refit the dipstick.

III - FINAL OPERATION

- Fit the petrol vapour rebreathing pipe.
- Clip on the petrol vapour rebreathing pipe.
- Connect the petrol vapour rebreathing pipe to:
 - the air outlet pipe of the air filter unit,
 - the inlet distributor.



122666

- Push the clip of the intercooler air inlet pipe in the direction of the arrow (15) .
- Connect the intercooler air inlet pipe on the turbo-charger.
- Refit the bolt of the intercooler air inlet pipe on the throttle valve.
- Fit the air filter unit air inlet pipe.
- Connect:
 - the air filter unit air inlet pipe on the air filter unit cover,
 - the battery (see) (80A, Battery).

Injector rail - Injectors: Removal - Refitting

K4M

Tightening torques

injector rail bolts	10 N.m
---------------------	--------

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

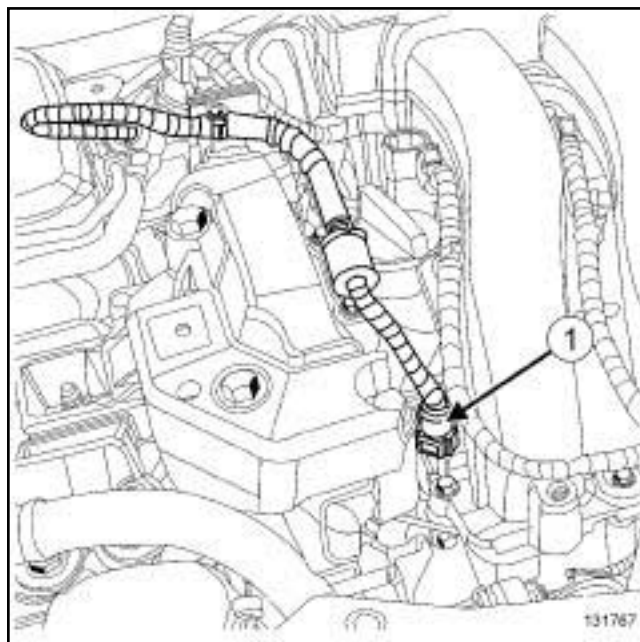
IMPORTANT

Wear goggles with side protectors for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Disconnect the battery (see) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).



131767

WARNING

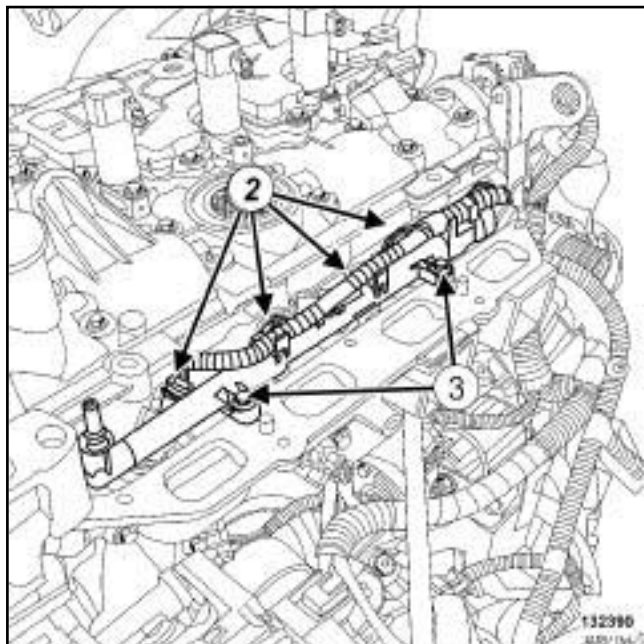
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- Disconnect the fuel supply pipe (1) from the injector rail.
- Insert the blanking plugs.
- Remove the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-29) .

Injector rail - Injectors: Removal - Refitting

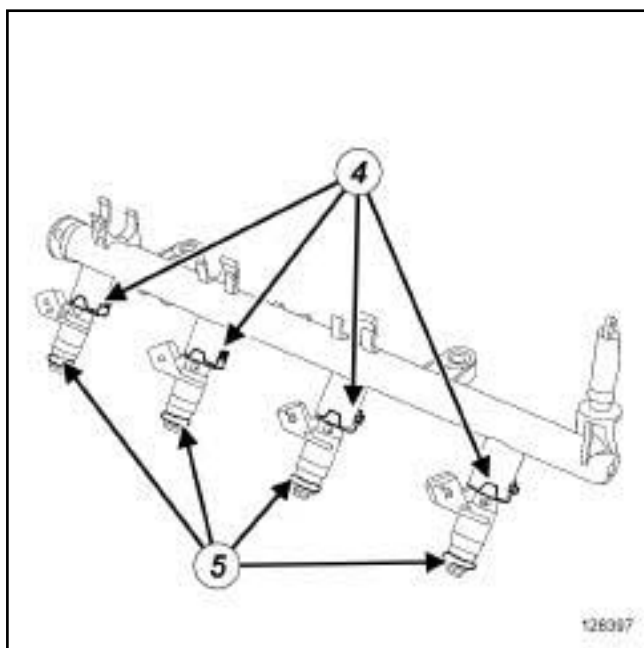
K4M

II - REMOVAL OPERATION



132390

- Disconnect the connector (2) from each injector.
- Unclip the wiring on the injector rail.
- Remove:
 - the « injector rail - injector » assembly bolts (3) ,
 - the « injector rail - injector » assembly.



128397

- Remove:
 - the clip (4) from each injector,
 - the injectors (5) from the injector rail.

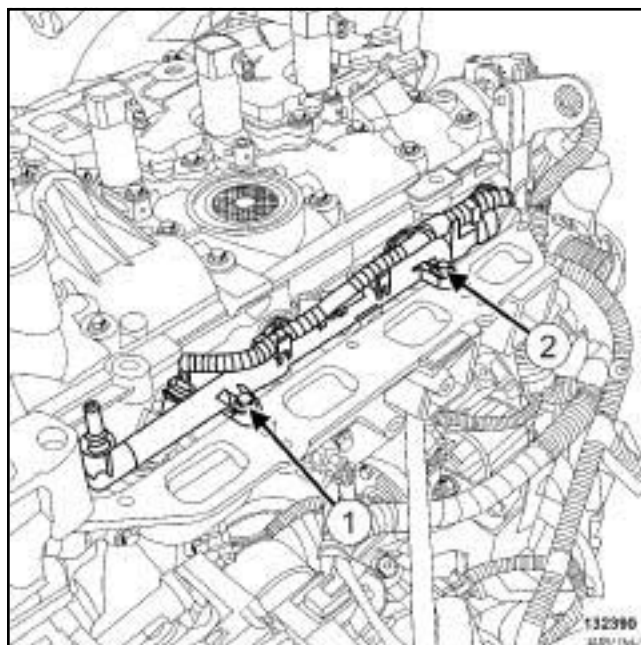
REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: injector clip on injector rail.
- Always replace the injector seals.
- Refit:
 - new seals on the injectors,
 - the injectors on the injector rail,
 - new clips on each injector.

II - REFITTING OPERATION

- Refit the « injector rail - injector » assembly.
- Clip the wiring on the injector rail.
- Connect the connector on each injector.



132390

- Torque tighten in order the injector rail bolts (10 N.m).

III - FINAL OPERATION

- Refit the inlet distributor (see 12A, Fuel mixture, Inlet distributor: Removal - Refitting, page 12A-29)
- Remove the blanking plugs.
- Connect the fuel supply pipe union on the injector rail.

Injector rail - Injectors: Removal - Refitting

K4M

 Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).

-
- Connect the battery (see) (80A, Battery).

Engine cooling system: Specifications

D4F or D7F or K4M or K9K

Vehicles in the current range have cooling systems with the following basic specifications:

- hermetically-sealed pressurised circuit (with expansion bottle valve),
- circuit using only type « D » fluid,
- passenger compartment heating system equipped with a « heater matrix » type radiator located under the dashboard which helps to cool the engine.

Coolant quantities

Engine	Quantity (litres)	Grade
D7F 800	5.5	Only use coolant GLACEOL RX (type D)
D4F 772	5.5	
K9K 740	5.7	
D4F 780	5.7	
D4F 782	5.7	
K4M 854	5.7	

Special notes:

- protection down to $-25^{\circ}\text{C} \pm 2$ for cold and temperate countries,
- protection down to $-40^{\circ}\text{C} \pm 2$ for "extreme cold" countries.

Thermostat opening temperatures

Engine	Start of opening ($^{\circ}\text{C}$)	Fully open ($^{\circ}\text{C}$)
D7F	89	99
D4F	89	99 ± 2
K9K	83 ± 3	95
K4M	89	101

Engine cooling system: Check

Special tooling required

Mot. 1700	Fault finding and filling - bleeding the cooling circuit.
Ms. 554-07	Instrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

Note:

There are two procedures for checking the cooling system:

- the procedure using the **(Mot. 1700)**
- the procedure using the **(Ms. 554-07)**

Expansion bottle cap valve rating:

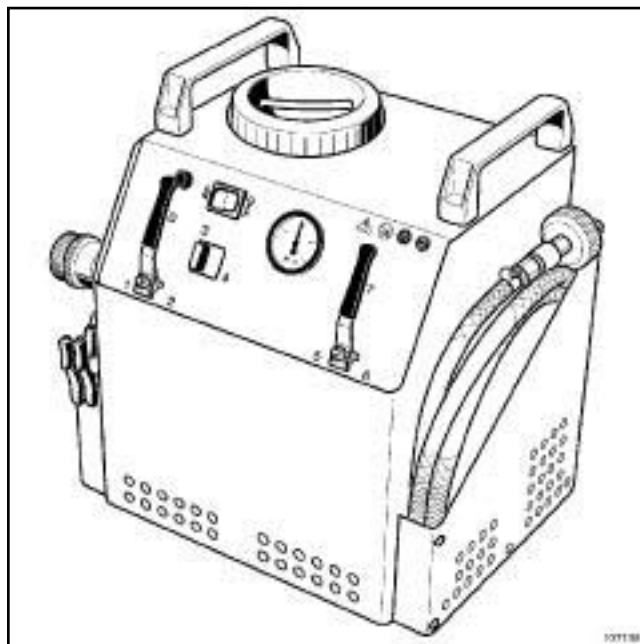
Expansion bottle cap with ...	Valve rating
... a brown circle	1.2 bar
... a yellow marking	1.4 bar
... a white marking	1.6 bar
... a grey marking	1.8 bar

I - CHECKING THE COOLING SYSTEM USING THE TOOL (MOT. 1700)

WARNING

If the coolant is leaking from the expansion bottle cap, replace the valve.

1 - Checking the expansion bottle cap valve



107138

- Use the cooling system filling and diagnostic tool **(Mot. 1700)**. Consult the user's manual for this tool (see **Cooling system filling and diagnostic tool: Use**) (Technical Note 3857A, 19A, Cooling).

2 - Checking the sealing of the cooling circuit

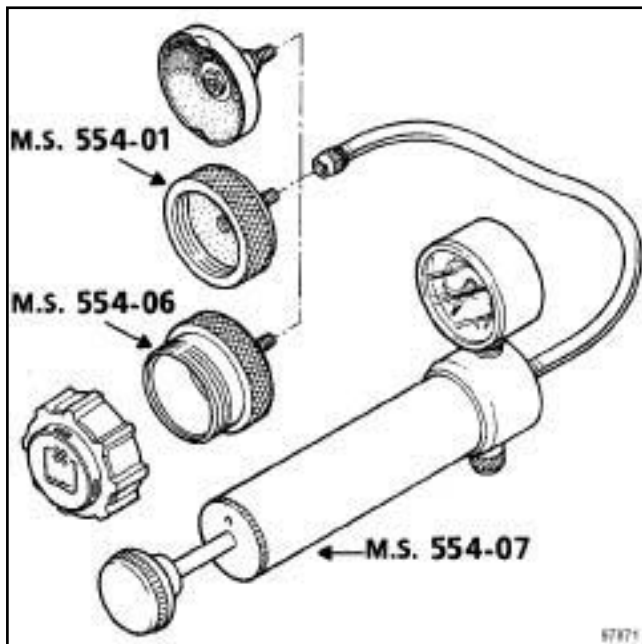
- Use the cooling system filling and diagnostic tool **(Mot. 1700)**. Consult the user's manual for this tool (see **Cooling system filling and diagnostic tool: Use**) (Technical Note 3857A, 19A, Cooling).

II - CHECKING THE COOLING SYSTEM USING THE TOOL (MS. 554-07)

WARNING

If the coolant is leaking from the expansion bottle cap, replace the valve.

1 - Checking the expansion bottle cap valve



97871

- Fit onto the tester (**Ms. 554-07**), the adapter (**Ms. 554-06**).
- Fit the expansion bottle cap to the adapter (**Ms. 554-06**).

Note:

The pressure should not drop; if it does, look for the leak.

- Pump with the (**Ms. 554-07**), the pressure should stabilise at the expansion bottle cap valve rating with a test tolerance of ± 0.1 bar.

2 - Checking the sealing of the cooling circuit

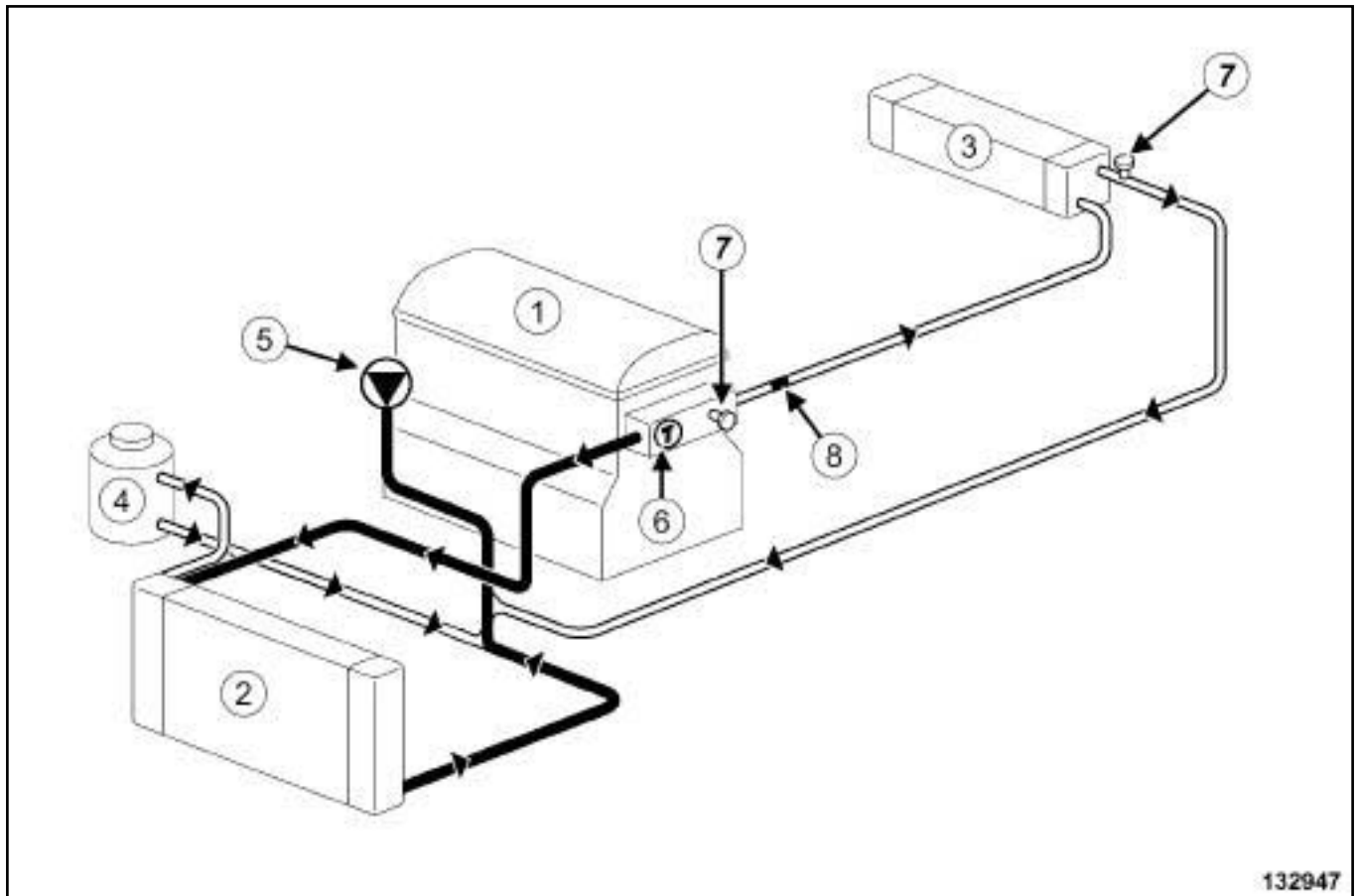
- Replace the expansion bottle cap with the adapter (**Ms. 554-01**).
- Connect on the adapter (**Ms. 554-01**) the tool (**Ms. 554-07**).
- Pump with the (**Ms. 554-07**) to put the cooling circuit under pressure.
- Stop pumping at **0.1 bar** below the valve rating for the expansion bottle cap valve.

Note:

The pressure should not drop; if it does, look for the leak.

- Gradually unscrew the union of the (**Ms. 554-07**) to decompress the cooling system then remove the adapter (**Ms. 554-01**) and refit the expansion bottle cap.

K4M



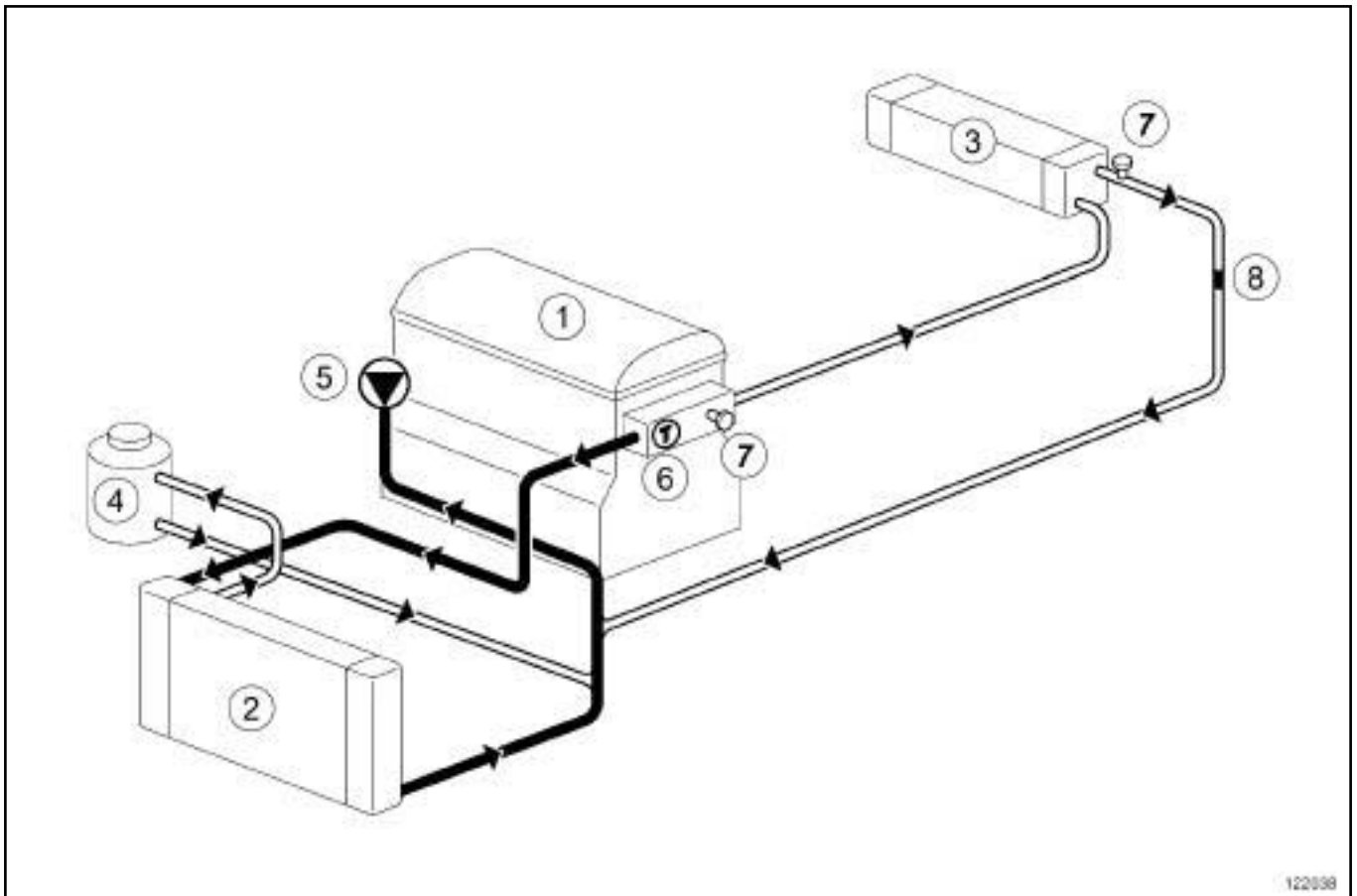
132947

132947

- | | |
|-----|------------------|
| (1) | Engine |
| (2) | Cooling radiator |
| (3) | Heater matrix |
| (4) | Expansion bottle |
| (5) | Water pump |
| (6) | Thermostat |
| (7) | Bleed screws |
| (8) | Choke |

Engine cooling system: Operating diagram

D4F, and 772 – D7F



122038

122038

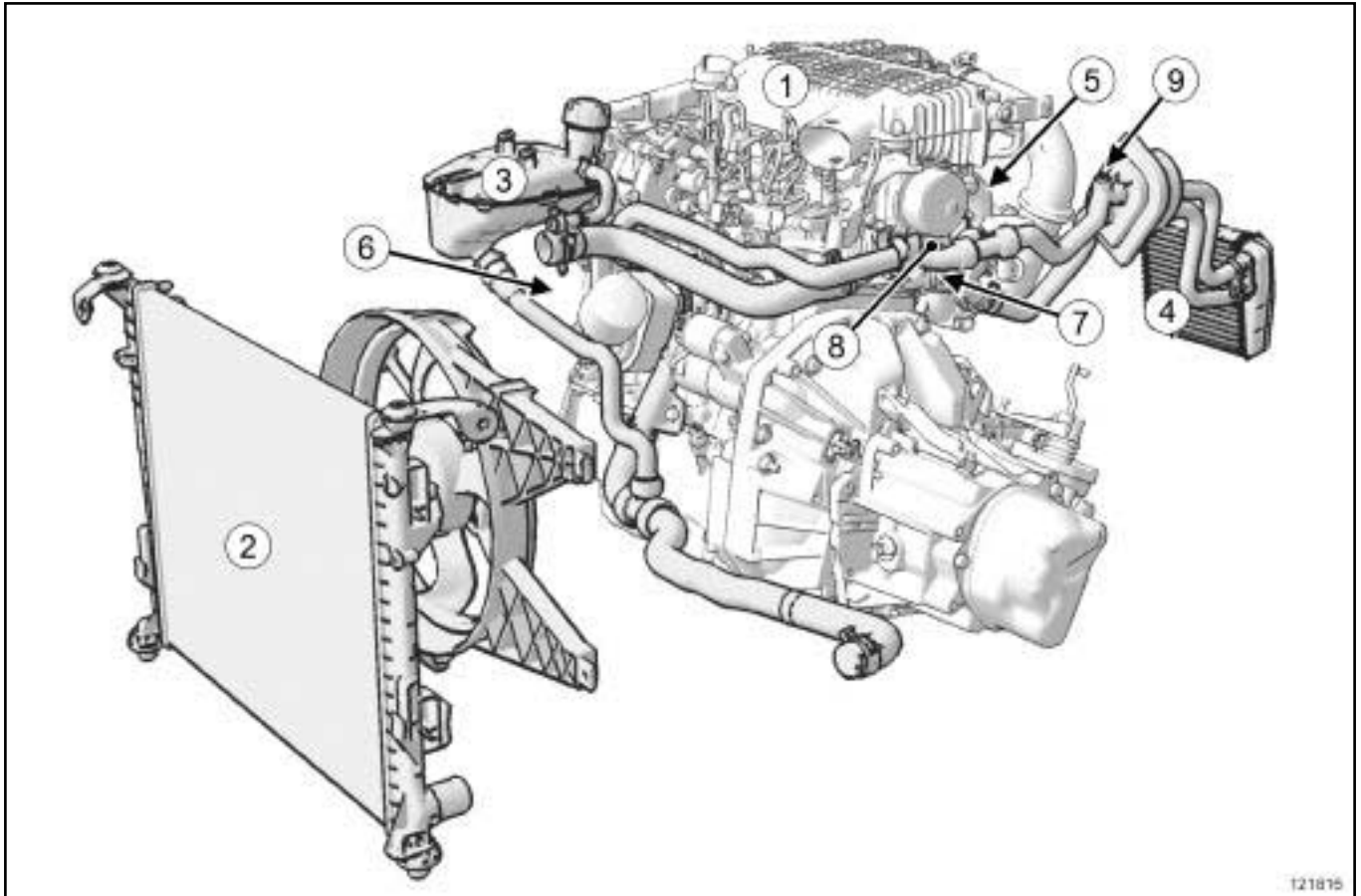
- | | |
|-----|-------------------|
| (1) | Engine |
| (2) | Radiator |
| (3) | Heater matrix |
| (4) | Expansion bottle |
| (5) | Water pump |
| (6) | Thermostat |
| (7) | Bleed screws |
| (8) | 10 mm restriction |

Note:

The expansion bottle degassing valve rating is **1.4 bar**.

Engine cooling system: Operating diagram

K9K



121815

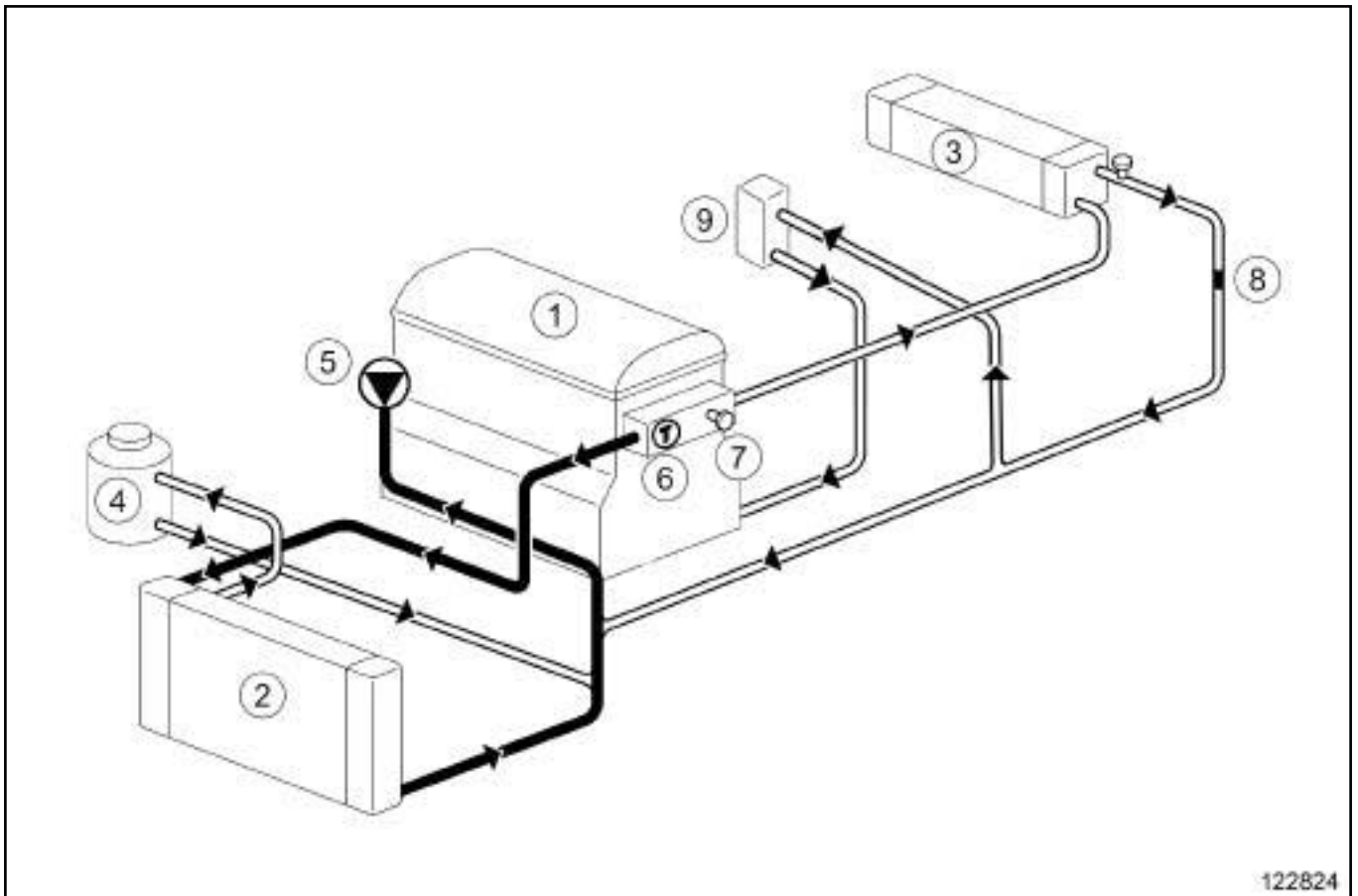
121816

- | | |
|-----|--|
| (1) | Engine |
| (2) | Radiator |
| (3) | Expansion bottle |
| (4) | Heater matrix |
| (5) | Cooled EGR |
| (6) | Water pump |
| (7) | Water chamber with integrated thermostat |
| (8) | Bleed screw on the water chamber |
| (9) | Bleed screw on the heater matrix hose |

The expansion bottle valve rating is **1.4 bar**.

Engine cooling system: Operating diagram

D4F, and 780 or 782



122824

122824

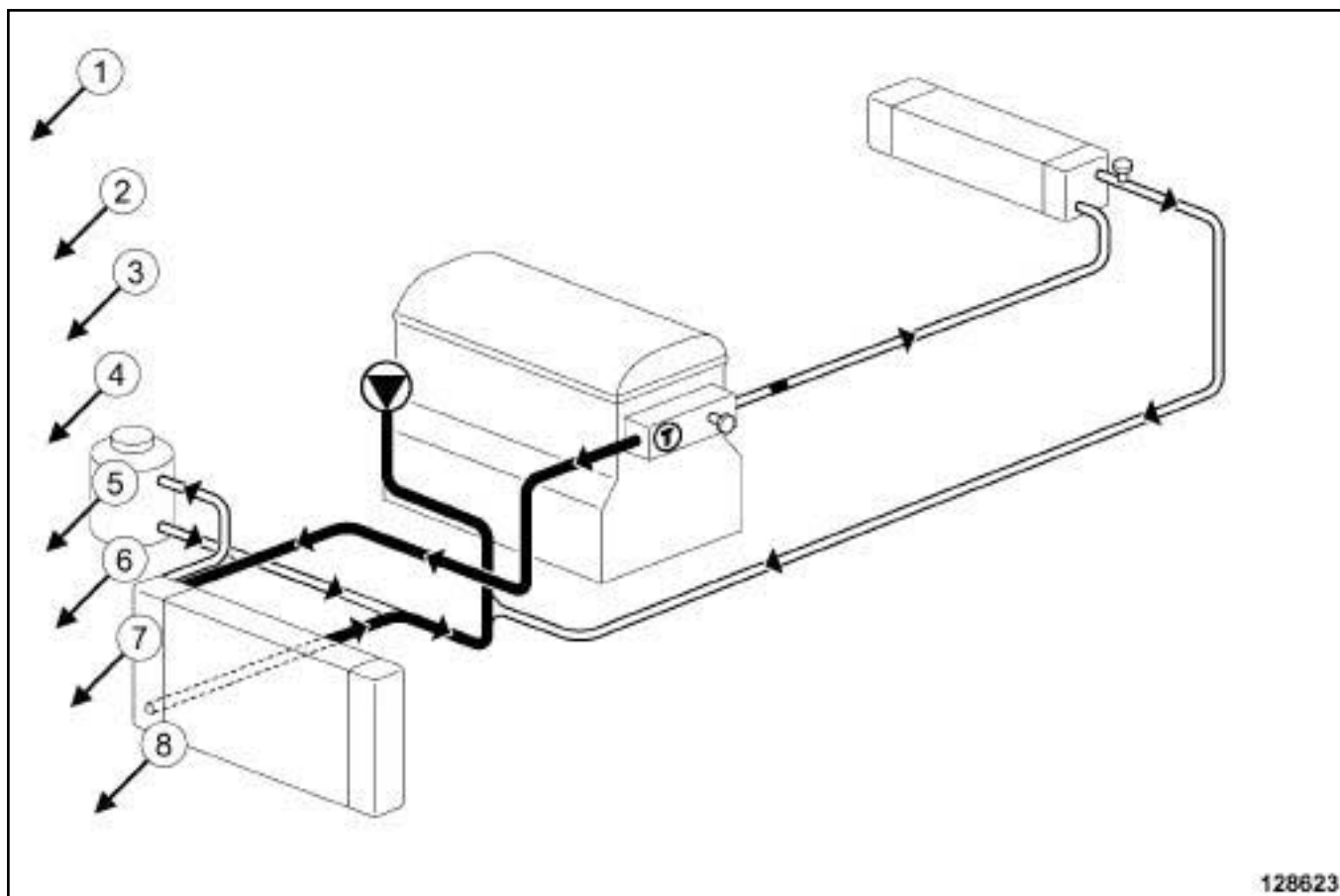
- | | |
|-----|-------------------|
| (1) | Engine |
| (2) | Radiator |
| (3) | Heater matrix |
| (4) | Expansion bottle |
| (5) | Coolant pump |
| (6) | Thermostat |
| (7) | Bleed screws |
| (8) | 10 mm restriction |
| (9) | Turbocharger |

Note:

The rating of the expansion bottle degassing valve is **1.4 bar**.

Engine cooling system: Operating diagram

K4M



128623

128623

- | | |
|-----|------------------|
| (1) | Engine |
| (2) | Cooling radiator |
| (3) | Heater matrix |
| (4) | Expansion bottle |
| (5) | Water pump |
| (6) | Thermostat |
| (7) | Bleed screws |
| (8) | Choke |

Cooling system: Draining - Refilling

D4F or D7F or K4M or K9K

Special tooling required	
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.
Mot. 1700	Fault finding and filling - bleeding the cooling circuit.
Ms. 554-07	Instrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06

Equipment required
coolant recovery tray
compressed air nozzle
pedal press

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

I - DRAINING

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the expansion bottle cap.

K4M

- Remove the engine undertray.
- Position the **coolant recovery tray** under the vehicle.
- Remove the cooling radiator bottom hose clip using the tool (**Mot. 1202-01**) or (**Mot. 1202-02**) or (**Mot. 1448**).
- Open the cooling system by removing the cooling radiator bottom hose using the tool (**Car. 1363**).
- Use a **compressed air nozzle** to blow air into the system through the expansion bottle opening to remove as much coolant as possible.

II - CLEANING

- Fill the cooling system with water through the expansion bottle.
- Let the water run until the water collected by the cooling radiator bottom hose becomes clear.
- Use a **compressed air nozzle** to blow air into the circuit through the expansion bottle opening to remove as much water as possible.
- Refit the hose which was removed.

III - FILLING

Note:

There are two procedures for filling the cooling system:

- the method using the (**Mot. 1700**) tool is recommended by Renault. It saves a considerable amount of time because it does not require the cooling system bleed screws to be opened,
- the procedure without a special tool.

1 - Filling procedure with the tool (Mot. 1700)

- Fill the cooling system with engine coolant recommended by the manufacturer (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) using the tool (**Mot. 1700**).

For the use of this tool (see **Cooling system filling and diagnostic tool: Use**) (NT 3857A, 19A, Cooling).

Cooling system: Draining - Refilling

D4F or D7F or K4M or K9K

2 - Filling method without special tools

WARNING

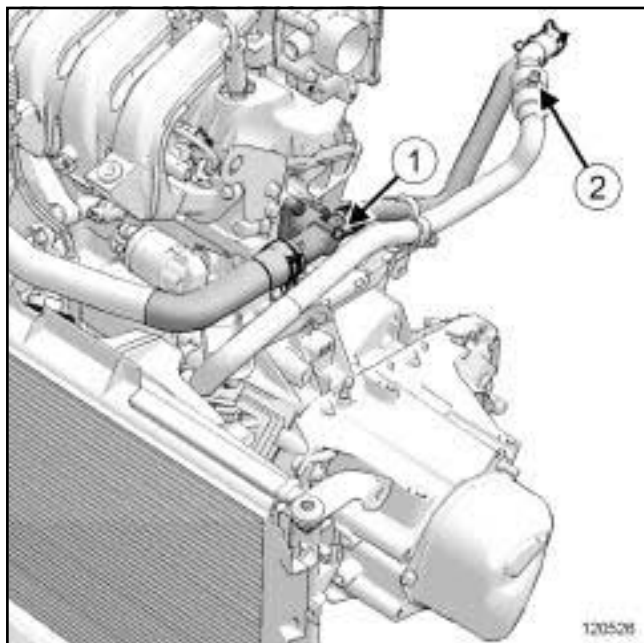
It is essential to open all of the bleed screws to remove as much as air as possible in the cooling system. Failure to perform this procedure may prevent the cooling system from filling properly and may damage the engine.

D4F, and 772 – K4M

- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

K9K

- Remove the front engine cover.



120526

- Open the bleed screws (1) and (2) .
- Fill the cooling system with engine coolant recommended by the manufacturer (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) via the expansion bottle until it overflows.
- Close all the bleed screws as soon as the coolant starts to flow in a continuous stream.

D4F, and 772 – K4M

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

K9K

- Refit the engine cover.
- Pressurise the system using the (**Ms. 554-07**) to check that there are no leaks (see **19A, Cooling, Engine cooling system: Check**, page 19A-2) .
- Refit the expansion bottle cap.
- Clean any surfaces soiled by the coolant.

IV - BLEEDING

WARNING

Do not open the bleed screw whilst the engine is running; this would damage the engine.

- Start the engine.

D4F, and 772 – D7F, and 800

- Maintain the engine speed at **2500 rpm** using the **pedal press** for **5 min**.
- Stabilise the engine speed at **2000 rpm** until the fan assembly has been activated twice.

D4F, and 780 or 782

- Maintain the engine speed at **2500 rpm**, using the **pedal press** for **5 minutes**.
- Stabilise the engine speed at **2000 rpm** until the fan assembly is activated.
- Note the coolant level in the expansion bottle after this first activation.
- Accelerate at a minimum of **4000 rpm** for several seconds, until the level of coolant fluid in the expansion bottle drops.

Cooling system: Draining - Refilling

D4F or D7F or K4M or K9K

K9K

- Maintain the engine speed at **1500 rpm**, sharply varying the engine speed (up to the maximum) 2 to 3 times approximately every **2 minutes** until the fan assembly starts for the second time.

K4M

- Maintain the engine speed at **3000 rpm** using a **pedal press**, until the fan assembly has been activated for a third time.

- Check that the heating is operating correctly.
- Allow the engine to cool until the engine coolant temperature is less than **50°C**.
- Remove the expansion bottle cap.
- Adjust the coolant fluid level to the "Max" mark.
- Refit the expansion bottle cap.

V - FINAL OPERATION

- Remove the coolant recovery tray.

K4M

- Refit the engine undertray.

Cooling radiator: Removal - Refitting

D4F or D7F, and AIR CONDITIONING

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

Equipment required

safety strap(s)

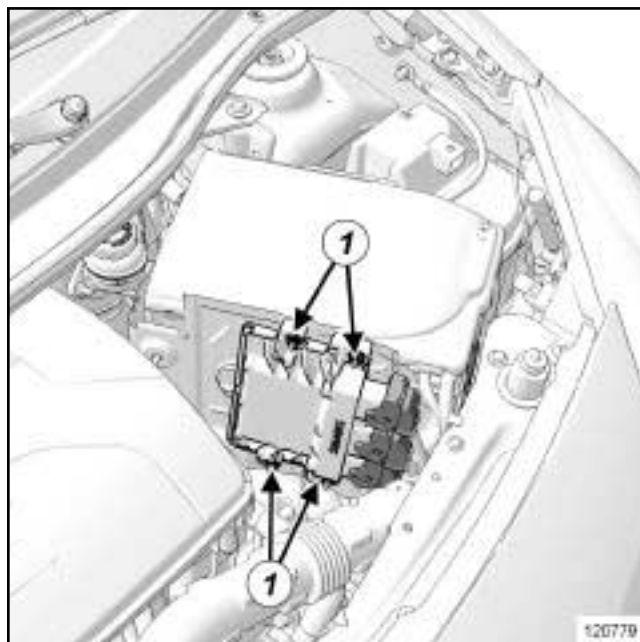
PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Consumable** : (see **Vehicle: Parts and consumables for the repair**)
 - COOLANT.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).
- Remove:
 - the battery ((see **Battery: Removal - Refitting**)),
 - the battery tray ((see **Battery tray: Removal - Refitting**)),
 - the front wheels ((see **Wheel: Removal - Refitting**)), (see **Front wheel arch liner: Removal - Refitting**)
 - the wheel arch liners (see **MR 412 Bodywork, 55A, Exterior protection, Wheel arch liners: Removal-Refitting**),
 - the front bumper ((see **Front bumper: Removal - Refitting**)).



120779

- Disconnect the injection computer connectors.
- Remove:
 - the computer mounting bolts (1) ,
 - the computer wiring harness clip nut,
 - the computer mounting.
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Remove the engine cooling fan assembly (see **19A, Cooling, Engine cooling fan assembly: Removal - Refitting**, page 19A-51) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

IMPORTANT

Wear protective gloves during the operation.

- Remove:
 - the air deflector on the dehydrator reservoir side,
 - the engine cooling system radiator upper right-hand retaining lug,
 - the engine cooling system radiator upper left-hand retaining lug.
- Using the (**Mot. 1448**), remove:
 - the engine cooling system radiator degassing hose,
 - the engine cooling system radiator top hose,

Cooling radiator: Removal - Refitting

D4F or D7F, and AIR CONDITIONING

- the engine cooling system radiator bottom hose.
- Attach the condenser to the upper cross member of the front end panel with a **safety strap(s)**.
- Remove the condenser bolts from the radiator.
- Uncouple the condenser from the cooling radiator.
- Remove the radiator mounting cross member ((see **Radiator mounting cross member: Removal - Refitting**)).
- Withdraw the air deflectors from the sliding adjusters.
- Remove the engine cooling system radiator.

REFITTING**I - REFITTING OPERATION FOR PART CONCERNED**

- Refit the engine cooling system radiator.
- Fit the air deflector to the sliding adjusters.
- Refit the radiator mounting cross member ((see **Radiator mounting cross member: Removal - Refitting**)).
- Couple the condenser to the engine cooling system radiator.
- Detach the condenser from the front end panel upper cross member.
- Using the (**Mot. 1448**), refit:
 - the engine cooling system radiator degassing hose,
 - the engine cooling system radiator top hose,
 - the engine cooling system radiator bottom hose.
- Refit:
 - the engine cooling system radiator upper retaining lug on the dehydrator reservoir side,
 - the engine cooling system radiator upper left-hand retaining lug.
- Refit the air deflector on the dehydrator reservoir side.

II - FINAL OPERATION

- Refit the engine cooling fan assembly (see **19A, Cooling, Engine cooling fan assembly: Removal - Refitting**, page **19A-51**) .
- Refit:
 - the computer mounting.

- the computer wiring harness clip nut,
- the computer mounting bolts.
- Connect the injection computer connectors.
- Refit:
 - the battery tray ((see **Battery tray: Removal - Refitting**)),
 - the battery ((see **Battery: Removal - Refitting**)),
 - the front bumper ((see **Front bumper: Removal - Refitting**)),
 - the wheel arch liners (see **MR 412 Bodywork, 55A, Exterior protection, Wheel arch liners: Removal-Refitting**),
 - the front wheels ((see **Wheel: Removal - Refitting**)).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**) .

Cooling radiator: Removal - Refitting

K9K

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

Equipment required

refrigerant charging station

safety strap(s)

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

WARNING

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to $-25^{\circ}\text{C} \pm 2$ for cold and temperate countries,
- protection down to $-40^{\circ}\text{C} \pm 2$ for "extreme cold" countries.

WARNING

The coolant helps to keep the engine running properly (heat exchange).

The system does not operate using pure water.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).

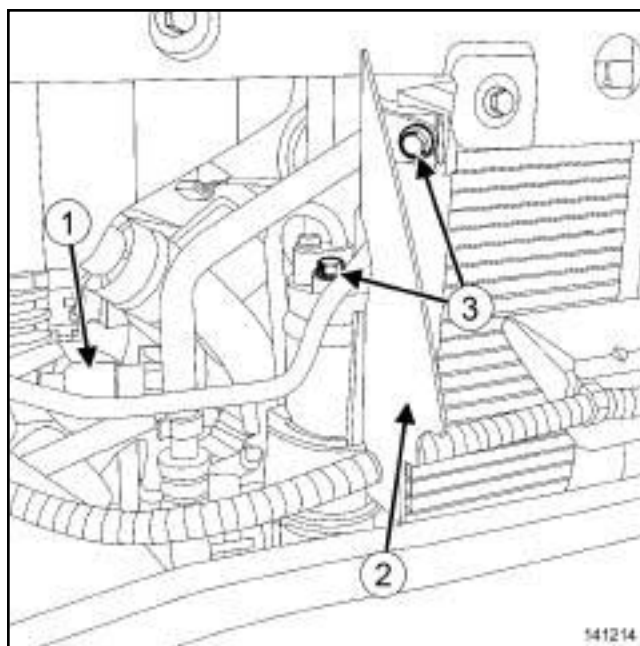
AIR CONDITIONING

- Drain the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

- Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

K9K, and 718, and AIR CONDITIONING



141214

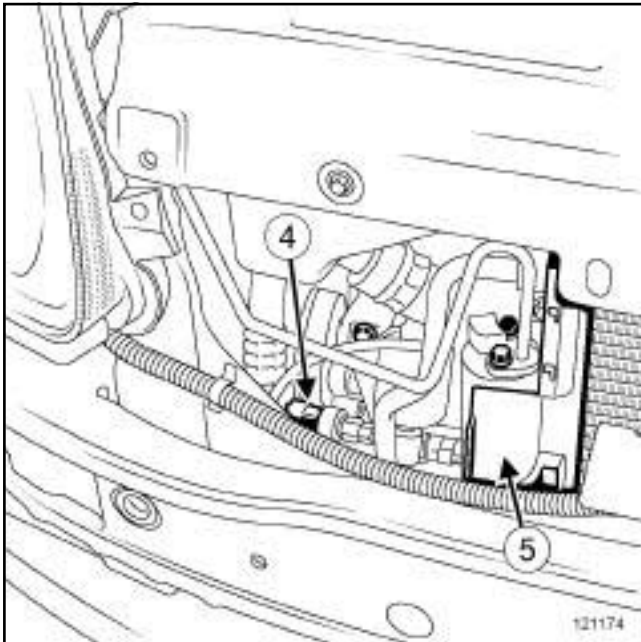
141214

- Disconnect the pressostat connector (1) .
- Remove the plastic cover (2) from the condenser.
- Unscrew the condenser connecting pipe unions (3) .

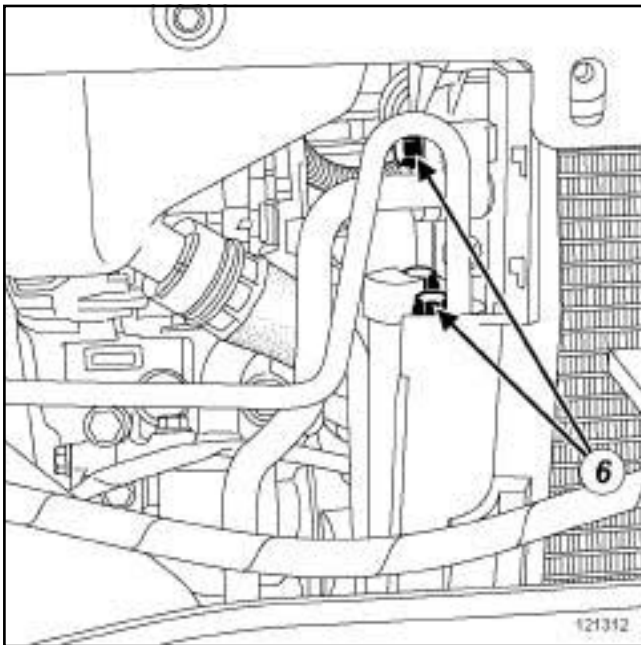
Cooling radiator: Removal - Refitting

K9K

K9K, and 740, and AIR CONDITIONING



121174



121312

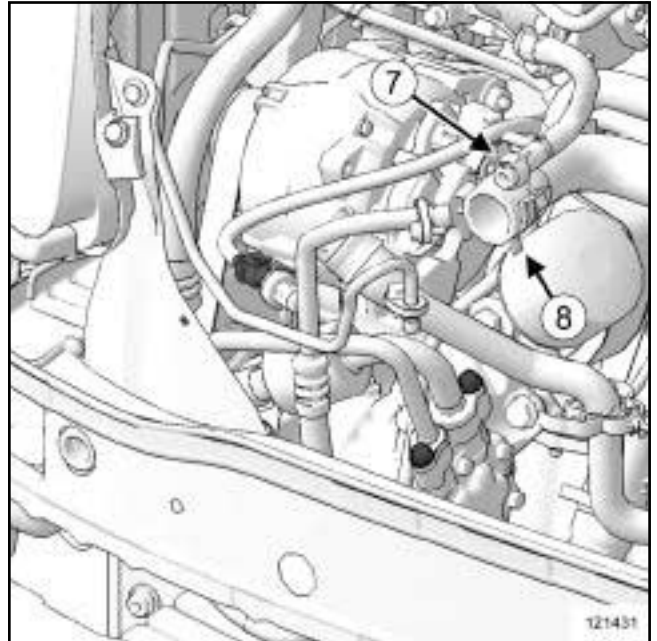
- Disconnect the pressostat connector (4) .
- Remove the plastic cover (5) from the condenser.
- Unscrew the condenser connecting pipe unions (6) .

- Uncouple the connecting pipes from the condenser.

WARNING

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

- Drain the cooling system (see 19A, **Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

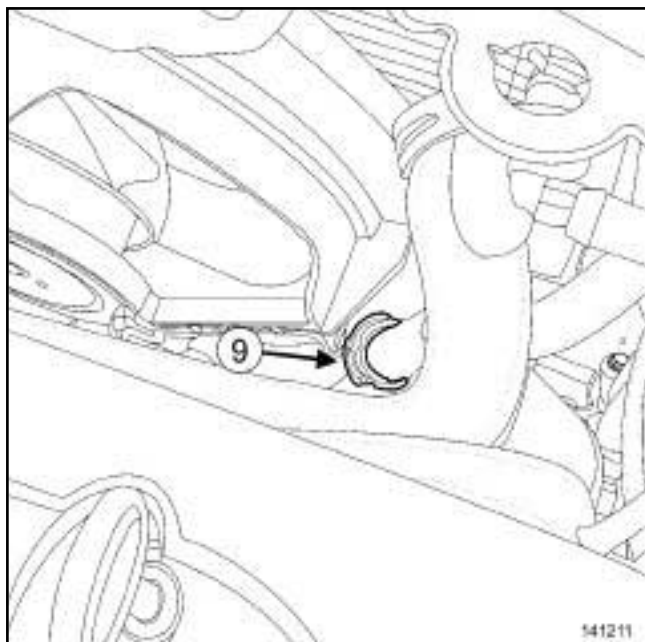


121431

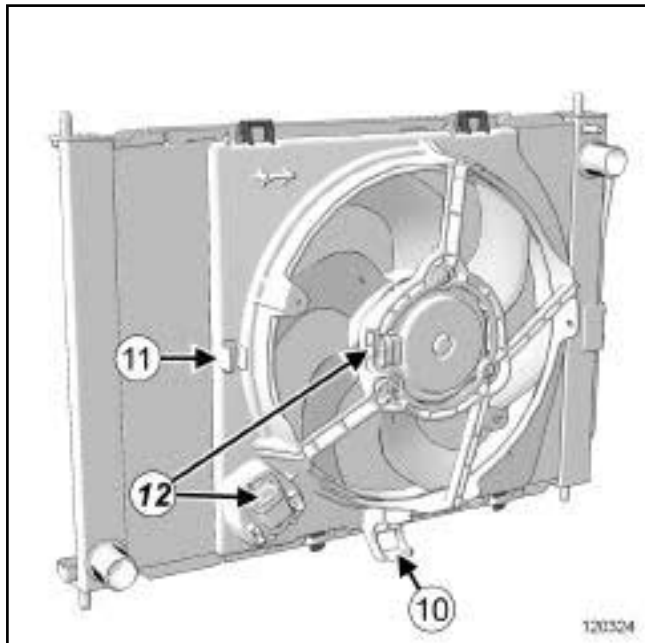
- Use the (**Mot. 1448**) to disconnect:
 - the top hose (7) on the radiator,
 - the degassing hose (8) on the radiator.

Cooling radiator: Removal - Refitting

K9K



141211



120324

- Unclip:
 - the expansion bottle hose (9) from the engine cooling fan assembly,
 - the bottom hose (10) from the engine cooling fan assembly,
 - the wiring (11) from the engine cooling fan assembly.
- Disconnect the engine cooling fan assembly connectors (12) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Attach the radiator and the intercooler to the upper cross member with a **safety strap(s)**.
- Remove:
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
 - the « radiator - condenser - engine cooling fan» assembly using the **safety strap(s)**.

Stripping the cooling radiator

- Remove the plastic covers from the radiator.
- Unclip the engine cooling fan assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

Rebuilding the cooling radiator

- Clip the engine cooling fan assembly in place.
- Refit the plastic covers to the radiator.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the « radiator - condenser - engine cooling fan» assembly using a **safety strap(s)**,
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure).
- Remove the **safety strap(s)**.

III - FINAL OPERATION

- Connect the engine cooling fan assembly connectors.
- Clip:
 - the wiring to the engine cooling fan assembly,
 - the bottom hose to the engine cooling fan assembly,
 - the expansion bottle hose to the engine cooling fan assembly.
- Use the (**Mot. 1448**) to connect:
 - the degassing hose on the radiator,

Cooling radiator: Removal - Refitting

K9K

- the top hose on the radiator,
- the bottom hose on the radiator.

AIR CONDITIONING

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

WARNING

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

- Lubricate the seals with the recommended air conditioning oil to facilitate fitting.
- Fit the condenser connecting pipes.
- Fit the connecting pipe unions to the condenser.
- Refit the plastic cover on the condenser.
- Connect the pressostat connector.

 Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see) (80A, Battery).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

AIR CONDITIONING

- Check that the system is operating correctly (see **Air conditioning: Check**) (62A, Air conditioning).
- Fill the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
- Check the refrigerant circuit (see **Refrigerant circuit: Check**) (62A, Air conditioning).

Cooling radiator: Removal - Refitting

D4F or D7F, and STANDARD HEATING

Special tooling required

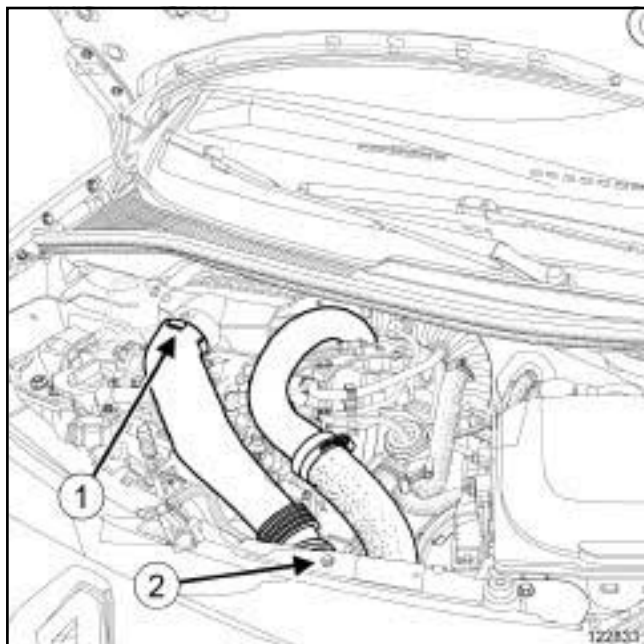
Mot. 1448 Remote operation pliers for hose clips.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove:
 - the front wheels (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection).

D4F, and 780



122833

- Disconnect the air filter unit air inlet pipe (1) from the air filter unit cover.
- Remove:
 - the air filter unit air inlet pipe bolt from the cross member (2) ,

- the air filter unit air inlet pipe.

- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Remove using the (**Mot. 1448**) :
 - the radiator top hose clip,
 - the radiator degassing hose clip.
- Disconnect:
 - the radiator top hose,
 - the radiator degassing hose.
- Unclip:
 - the lower hose from the engine cooling fan assembly,
 - the wiring harness from the engine cooling fan assembly.
- Disconnect the engine cooling fan assembly connectors.

II - REMOVAL OPERATION FOR PART CONCERNED

- Remove:
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 412, 41A, Front lower structure),
 - the « radiator / engine cooling fan assembly » unit.

Stripping the cooling radiator

- Remove the radiator plastic deflectors.
- Unclip the engine cooling fan assembly.

REFITTING

I - REFITTING PREPARATIONS OPERATION

Rebuilding the cooling radiator

- Clip the engine cooling fan assembly in place.
- Refit the radiator plastic deflectors.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the « radiator / engine cooling fan assembly » unit,

Cooling radiator: Removal - Refitting

D4F or D7F, and STANDARD HEATING

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 412, 41A, Front lower structure).

III - FINAL OPERATION

- Connect the engine cooling fan assembly connectors.
- Clip:
 - the wiring harness to the engine cooling fan assembly,
 - the bottom hose to the engine cooling fan assembly.
- Connect:
 - the radiator degassing hose,
 - the radiator top hose.
- Using the (**Mot. 1448**), fit:
 - the radiator degassing hose clip,
 - the radiator top hose clip.

D4F, and 780

- Refit:
 - the air filter box air inlet pipe,
 - the air filter unit air inlet pipe bolt on the cross member.
 - Connect the air filter unit air inlet pipe to the air filter unit cover.
-
- Refit:
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres).
 - Connect the battery (see) (MR 411, 80A, Battery).
 - Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

Cooling radiator: Removal - Refitting

K4M

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

Equipment required

refrigerant charging station

safety strap(s)

Tightening torques

bolt of the dehydrator reservoir - « expansion valve connecting pipe » **8 N.m**

compressor - condenser «connecting pipe bolt » **8 N.m**

air conditioning connecting pipe bolts **8 N.m**

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

WARNING

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

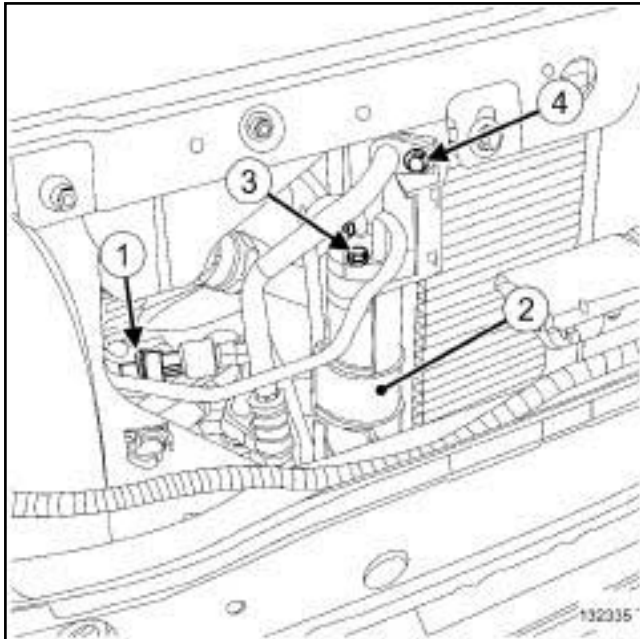
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Drain the air conditioning circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
- Remove:
 - the engine undertray bolts,
 - the engine undertray,
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

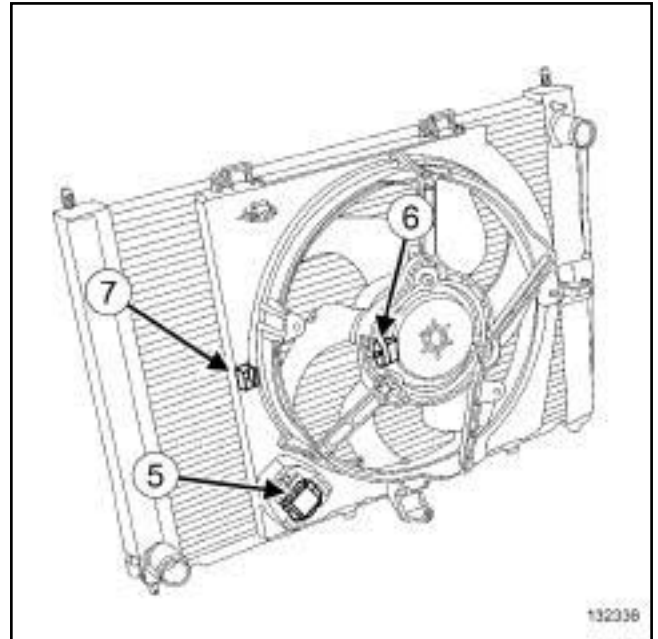
Cooling radiator: Removal - Refitting

K4M



132335

- Disconnect the connector (1) from the air conditioning pressure sensor.
- Remove:
 - the condenser protector (2) ,
 - the « dehydrator reservoir - expansion valve » connecting pipe bolt (3) ,
 - the « compressor - condenser » connecting pipe bolt (4) .
- Disconnect:
 - the « dehydrator reservoir - expansion valve » connecting pipe,
 - the « compressor - condenser » connecting pipe.
- Fit protective plugs onto the air conditioning pipe unions.
- Remove using the **(Mot. 1448)** :
 - the cooling radiator top hose clip,
 - the cooling radiator degassing hose clip.
- Disconnect:
 - the cooling radiator top hose,
 - the cooling radiator degassing hose.



132336

- Disconnect:
 - the engine cooling fan assembly resistor connector (5) ,
 - the engine cooling fan assembly connector (6) .
- Unclip:
 - the engine cooling fan assembly wiring at (7) ,
 - the cooling radiator top and bottom hose from the engine cooling fan assembly.

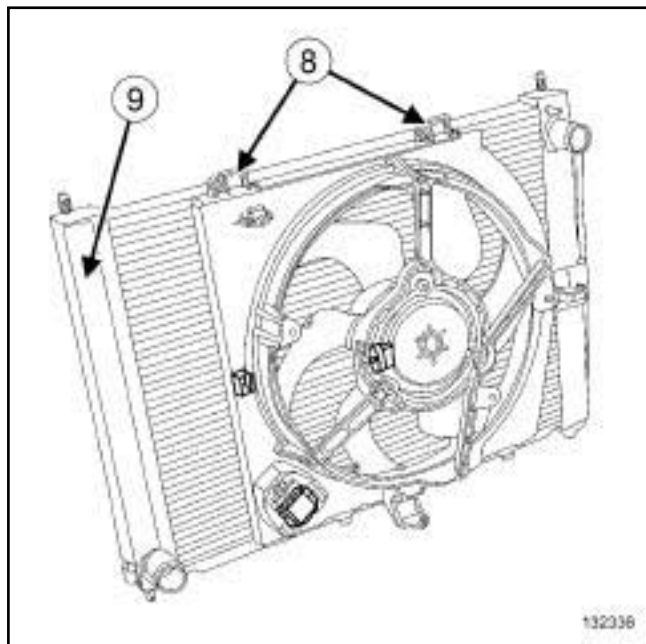
II - OPERATION FOR REMOVAL OF PART CONCERNED

- Attach the « radiator - condenser- fan » assembly to the upper cross member using a **safety strap(s)**.
- Remove:
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
 - the « radiator - condenser- fan » assembly by loosening the **safety strap(s)**.

Cooling radiator: Removal - Refitting

K4M

On the workbench



132336

- Unclip:
 - the engine cooling fan assembly from the radiator at (8) by pushing it upwards to detach the brackets holding it,
 - the cooling radiator protector (9) .

REFITTING

I - REFITTING PREPARATION OPERATION

- Always replace the seals on the air conditioning pipes.

On the workbench

- Clip:
 - the radiator protector,
 - the engine cooling fan assembly to the cooling radiator.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the « radiator - condenser - fan » assembly,
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure).

III - FINAL OPERATION.

- Clip:
 - the cooling radiator top and bottom hose on the engine cooling fan assembly,
 - the engine cooling fan assembly wiring.
- Connect:
 - the engine cooling fan assembly connector,
 - the engine cooling fan assembly resistor connector.
- Connect:
 - the cooling radiator top hose,
 - the cooling radiator degassing hose.
- Using the (**Mot. 1448**), fit:
 - the cooling radiator top hose clip,
 - the cooling radiator degassing hose clip.
- Refit the new seals on the air conditioning pipes.
- Connect:
 - the « dehydrator reservoir - expansion valve » connecting pipe,
 - the « compressor - condenser » connecting pipe.
- Tighten to torque:
 - the **bolt of the dehydrator reservoir - « expansion valve connecting pipe » (8 N.m)**,
 - the **compressor - condenser « connecting pipe bolt » (8 N.m)**.
- Torque tighten the **air conditioning connecting pipe bolts (8 N.m)**.
- Refit the condenser protector.
- Connect the air conditioning pressure sensor connector.
- Refit:
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Cooling radiator: Removal - Refitting

K4M

- Perform the following operations:
 - fill the air conditioning circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning),
 - fill and bleed the coolant circuit (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Refit the engine undertray.

Coolant pump: Removal - Refitting

D4F or D7F

Tightening torques

coolant pump bolts	10 N.m
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REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the front wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) .
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

AIR CONDITIONING

- Remove the rigid coolant pipe bolt on the multifunction support.
- Move the rigid water pump pipe aside.

D4F, and 780 or 782

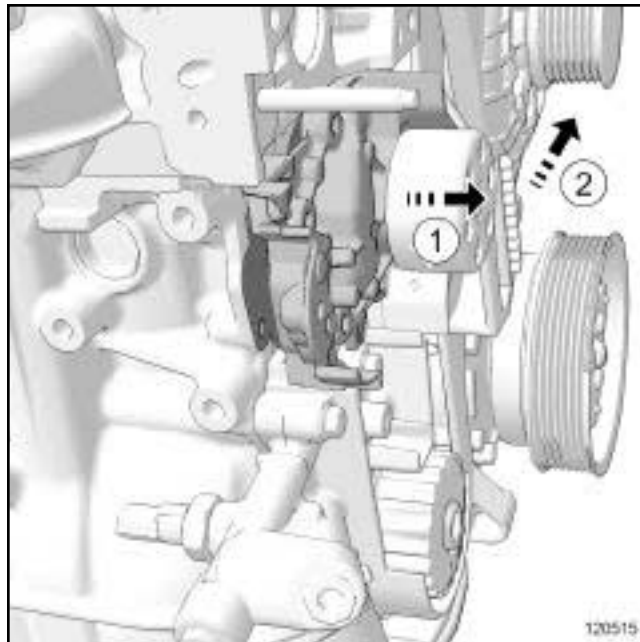
- Remove the coolant pump inlet pipe (see **19A, Cooling, Coolant pump inlet pipe: Removal - Refitting**, page 19A-58) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

STANDARD HEATING

- Remove:
 - the coolant pump bolts,
 - the coolant pump,
 - the coolant pump seal.

AIR CONDITIONING



120515

- Remove the coolant pump bolts.
- Move the coolant pump **5 mm** away from its bearing face.
- Pivot the coolant pump casing in the direction of the arrows, (1) and then (2) .
- Remove:
 - the coolant pump,

Coolant pump: Removal - Refitting

D4F or D7F

- the coolant pump seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- Apply **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (MR 411, 04B, Consumables - Products) to the areas to be cleaned.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT

Wear latex gloves during the operation.

- Leave for approximately ten minutes.
- Remove the residue using a wooden spatula.
- Complete the cleaning of the parts using an abrasive pad.
- Degrease the joint faces with **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (MR 411, 04B, Consumables - Products).

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the water pump fitted with a new seal,
 - the coolant pump bolts.



120516

- Tighten to torque and in order the **coolant pump bolts (10 N.m)**.

D4F, and 780 or 782

- Refit the coolant pump inlet pipe (see **19A, Cooling, Coolant pump inlet pipe: Removal - Refitting, page 19A-58**).

III - FINAL OPERATION

AIR CONDITIONING

- Fit the rigid water pump pipe with a new seal.
- Refit the rigid coolant pipe bolt on the multifunction support.
- Refit:
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting, page 11A-27**),
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-13**),
 - the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting, page 19D-18**),

Coolant pump: Removal - Refitting

D4F or D7F

- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-3**),
 - the front wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**).
- Connect the battery (see) (MR 411, 80A, Battery).

Coolant pump: Removal - Refitting

K9K

Tightening torques

coolant pump bolts	10 N.m
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WARNING

The coolant helps to keep the engine running properly (heat exchange).

The system does not operate using pure water.

WARNING

Drain with the engine warm.

Flush and refill with the engine cold or warm.

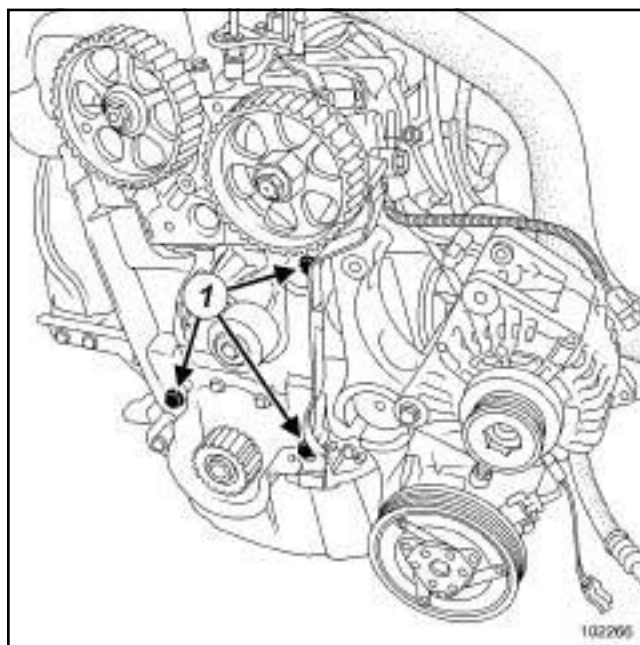
Never flush a hot engine (risk of major thermal shock).

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the halogen headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),

- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-14) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) .



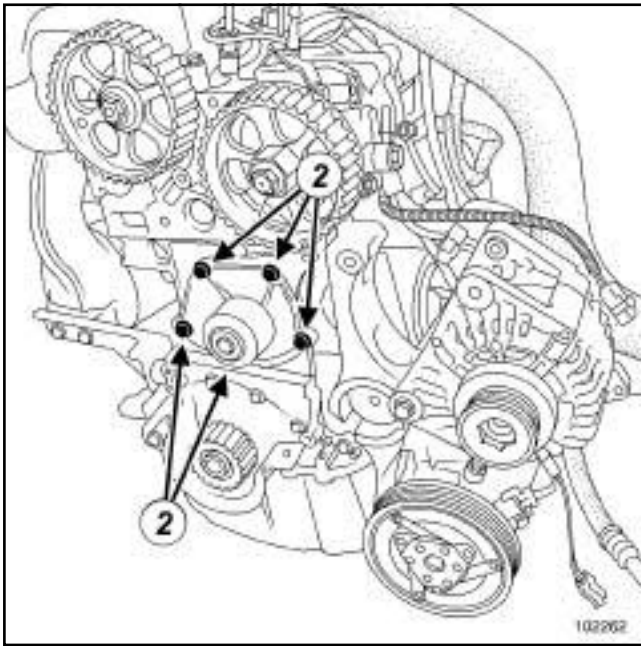
102266

- Remove:
 - the inner timing cover bolts (1) ,
 - the inner timing cover.
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

Coolant pump: Removal - Refitting

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



102262

- Remove:
 - the coolant pump bolts (2) ,
 - the coolant pump,
 - the coolant pump seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: coolant pump seal.
- Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any part of the seal still adhering.

- Apply the product to the areas to be cleaned, wait about 10 minutes, then remove the residue using a wooden spatula.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear protective gloves during the operation.

- Apply one to two drops of **FRENETANCHE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) on the coolant pump bolts before refitting.

II - REFITTING OPERATION FOR PART CONCERNED

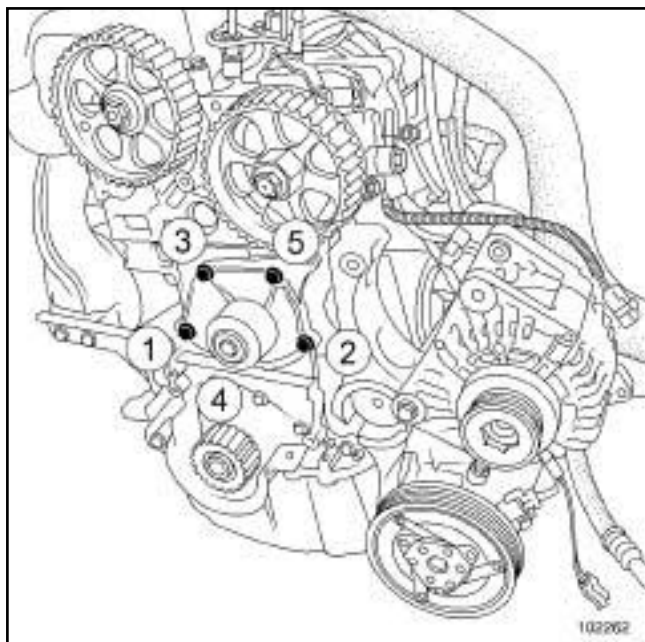
- Refit:
 - a new seal on the coolant pump,
 - the coolant pump,
 - the coolant pump bolts.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

Coolant pump: Removal - Refitting

K9K



102262

- Tighten to torque and in order the **coolant pump bolts (10 N.m)**.

III - FINAL OPERATION

- Refit:

- the inner timing cover,
- the inner timing cover bolts,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
- the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-14) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) ,
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),

- the halogen headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing).

- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

Coolant pump: Removal - Refitting

K4M

Tightening torques

bolt 1 of the coolant pump	27 N.m
bolts 2 to 8 of the water pump	10 N.m

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

WARNING

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

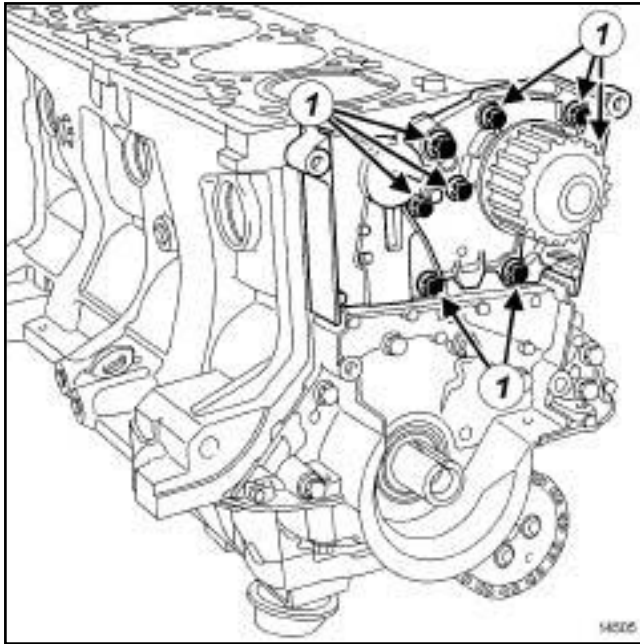
Remove:

- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
- the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
- the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
- the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-20) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-27) ,
- the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-135) .

Coolant pump: Removal - Refitting

K4M

II - REMOVAL OPERATION



14505

 Remove:

- the coolant pump bolts (1) ,
- the coolant pump.

REFITTING

I - REFITTING PREPARATION OPERATION

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

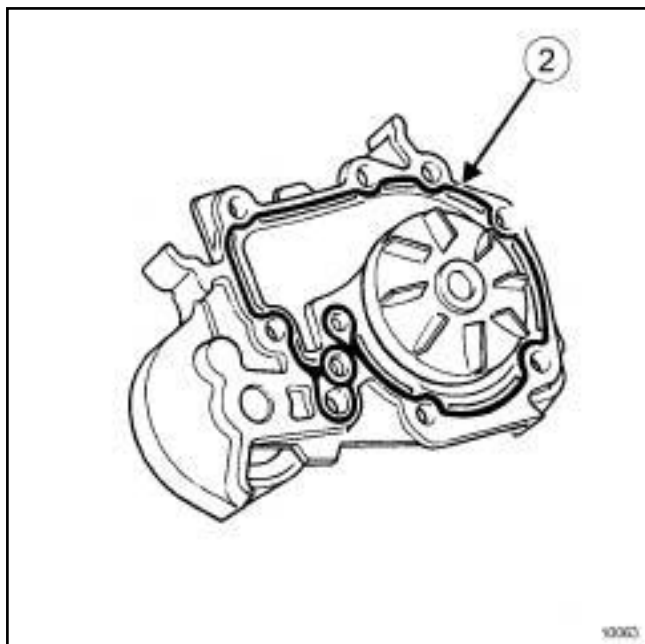
WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

- Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:
 - the coolant pump sealing face if it is to be reused,
 - the cylinder block gasket face.
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:
 - the coolant pump sealing face if it is to be reused,
 - the cylinder block gasket face.

Coolant pump: Removal - Refitting

K4M



10063

**WARNING**

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

- Apply a bead (2) of **SEALING RESIN** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a width of **0.6 to 1 mm**.

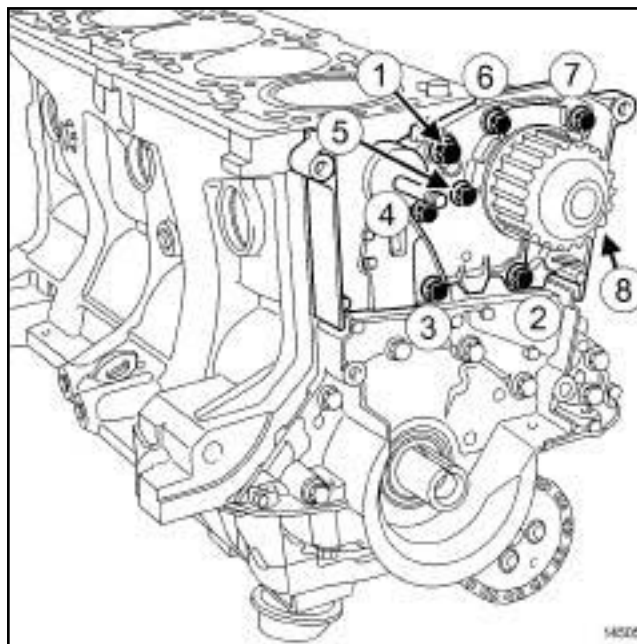
WARNING

Failure to observe the following procedure may cause irreparable damage to the water pump bearing.

Note:

To fit the pump on the two pins of the cylinder block, never apply pressure to the water pump pinion; instead use the pump mounting bolts by pre-tightening them.

II - REFITTING OPERATION



14505



Note:

Apply one to two drops of **FRENETANCHE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the coolant pump bolts (1) and (4) .

- Refit the coolant pump.
- Tighten to torque and in order:
 - **bolt 1 of the coolant pump (27 N.m)**,
 - **bolts 2 to 8 of the water pump (10 N.m)**.

III - FINAL OPERATION

- Refit:
 - the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page **11A-135**) ,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-27**) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-20**) ,
 - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) ,

Coolant pump: Removal - Refitting

K4M

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20) ,
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Refit the engine undertray.

D4F, and 772 – D7F

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Parts always to be replaced :**
 - water chamber seal.
- Consumable** (see **04B, Parts and consumables for the repair**):
 - **COOLANT.**

REMOVAL

I - REMOVAL PREPARATION OPERATION

D4F

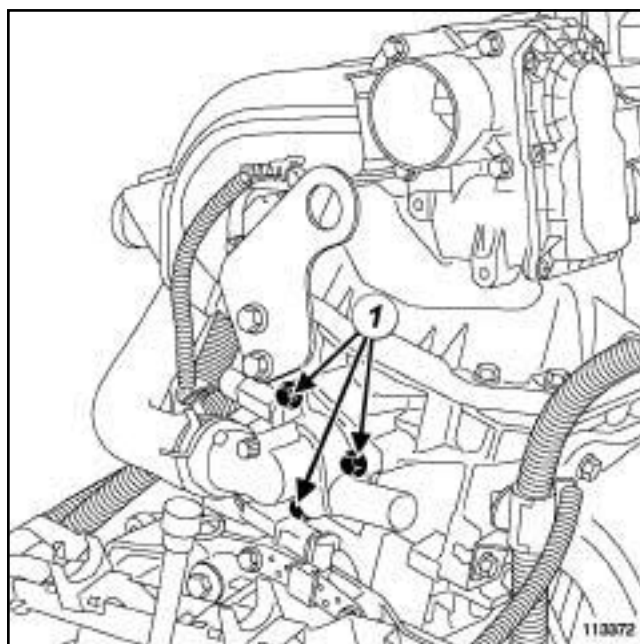
- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

D7F

- Remove the air filter box inlet pipe .
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Clean the cooling system if necessary (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Separate the clips on the water chamber top hose and the heater matrix hose on the water chamber using the tool (**Mot. 1448**).
- Disconnect the water chamber top hose and the heater matrix hose on the water chamber.



113372

- Remove:
 - the water chamber bolts (1) ,
 - the cylinder head water chamber.

REFITTING

I - REFITTING PREPARATION OPERATION

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

- It is imperative to replace the cylinder head water chamber seal.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the cylinder head water chamber,
 - the cylinder head water chamber bolts.
- Connect the water chamber top hose and the heater matrix hose on the water chamber.
- Fit the clips of the water chamber top hose and the heater matrix hose on the water chamber using the tool (**Mot. 1448**).

Thermostat: Removal - Refitting

D4F, and 772 – D7F

III - FINAL OPERATION

D4F

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

D7F

- Refit the air filter unit air inlet pipe.
- Bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Fill the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

Thermostat: Removal - Refitting

K9K

To remove and refit the thermostat (see **19A, Cooling, Water chamber: Removal - Refitting**, page **19A-40**) .

Thermostat: Removal - Refitting

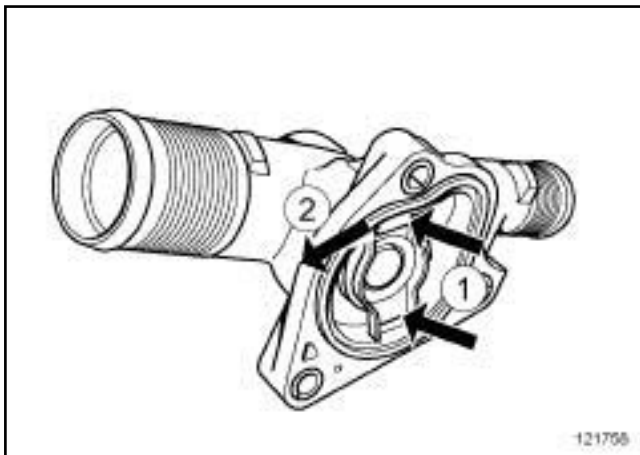
D4F, and 780 or 782

REMOVAL

I - REMOVAL PREPARATION OPERATION

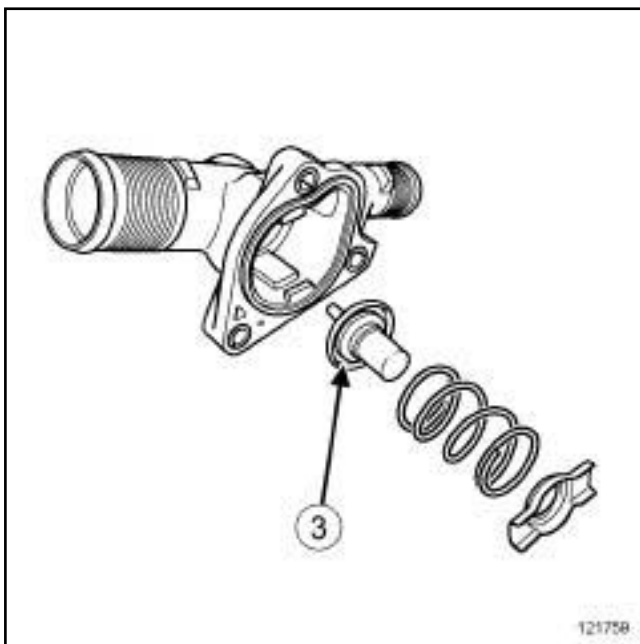
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9).
- Remove the water chamber (see **19A, Cooling, Water chamber: Removal - Refitting**, page 19A-40).

II - OPERATION FOR REMOVAL OF PART CONCERNED



121758

- Press on the spring mounting (1).
- Turn the spring mounting (2).



121759

- Remove the thermostat (3).

REFITTING

I - REFITTING PREPARATION OPERATION

- Always replace:
 - the thermostat,
 - the thermostat seal.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the thermostat fitted with a new seal.
- Fit:
 - the spring,
 - the spring mounting.
- Press on the spring mounting.
- Turn the spring mounting.

III - FINAL OPERATION

- Refit the water chamber (see **19A, Cooling, Water chamber: Removal - Refitting**, page 19A-40).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9).

COOLING
Thermostat: Removal - Refitting

19A

D4F, and 780 or 782



Thermostat: Removal - Refitting

K4M

- The thermostat cannot be separated from the water chamber.

Replace the « water chamber - thermostat » assembly if the thermostat is faulty (see **19A, Cooling, Water chamber: Removal - Refitting**, page **19A-40**).

Water chamber: Removal - Refitting

D4F, and 772 – D7F

Special tooling required

Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Tightening torques

water chamber bolts	10 Nm
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PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Part always to be replaced:
 - water chamber seal.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).

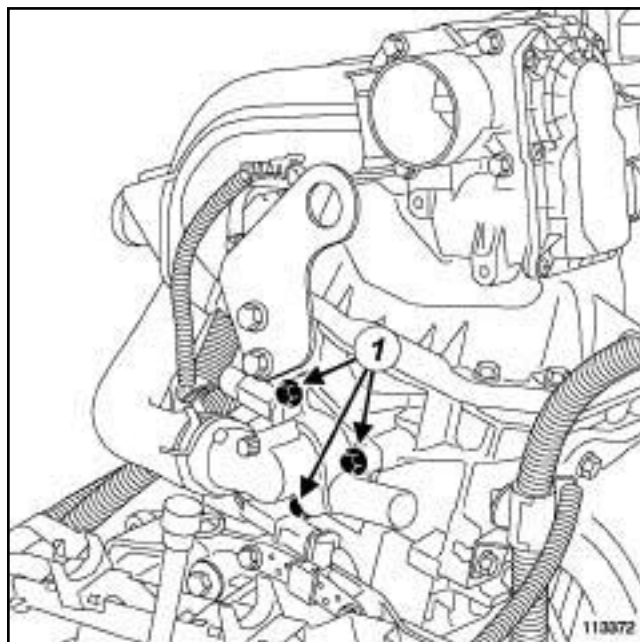
D4F

- Remove the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .

- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Move the water chamber hose clips to one side using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.
- Disconnect the water chamber hoses.



113372

- Remove:
 - the water chamber bolts (1) ,
 - the water chamber.

REFITTING

I - REFITTING PREPARATIONS OPERATION

- Clean the gasket faces.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the water chamber with a new seal,
 - the water chamber bolts.
- Torque tighten the **water chamber bolts (10 Nm)**.
- Connect the water chamber hoses.
- Fit the water chamber hose clips using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

Water chamber: Removal - Refitting

D4F, and 772 – D7F

III - FINAL OPERATION.

D4F

- Refit the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .

- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**) .

Water chamber: Removal - Refitting

K9K

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

Tightening torques

water chamber bolts **10 N.m**

intercooler air outlet pipe clip at the damper valve end **5.5 N.m**

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

WARNING

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

WARNING

The coolant helps to keep the engine running properly (heat exchange).

The system does not operate using pure water.

WARNING

Take care not to damage the bearing faces to prevent any risk of coolant leaks.

REMOVAL

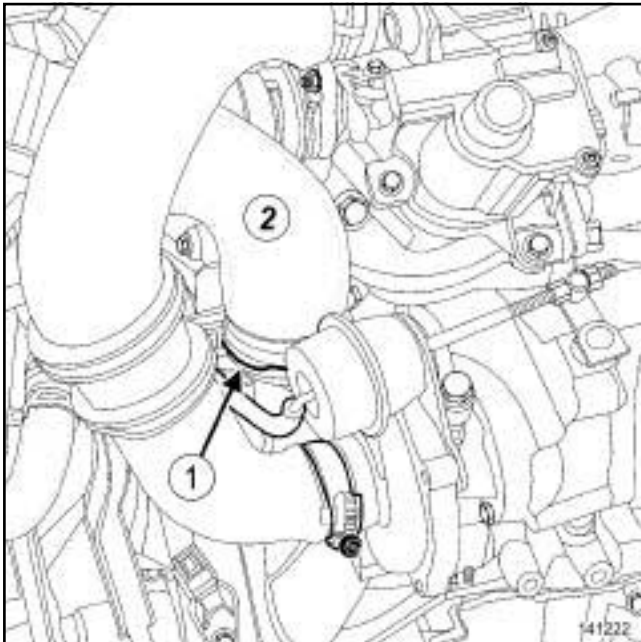
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the front engine cover.

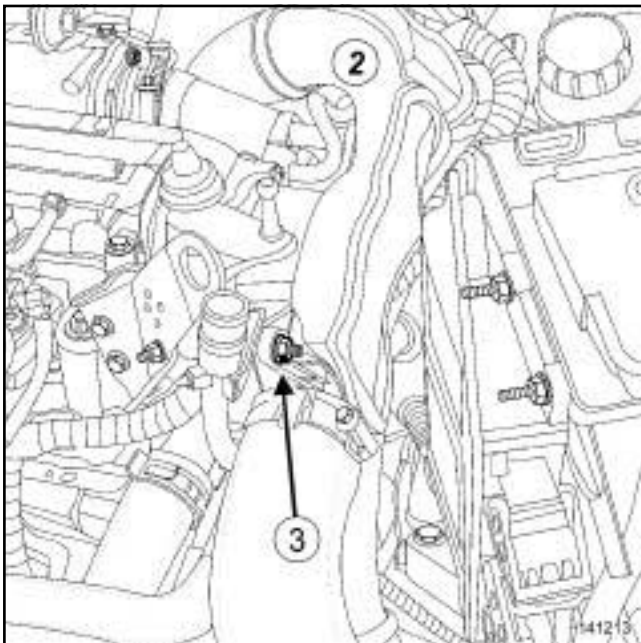
Water chamber: Removal - Refitting

K9K

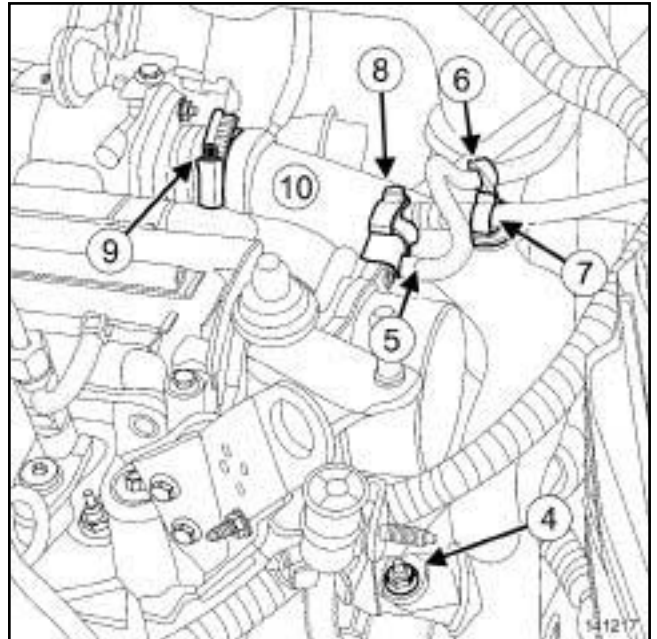
K9K, and 718



141222



141213



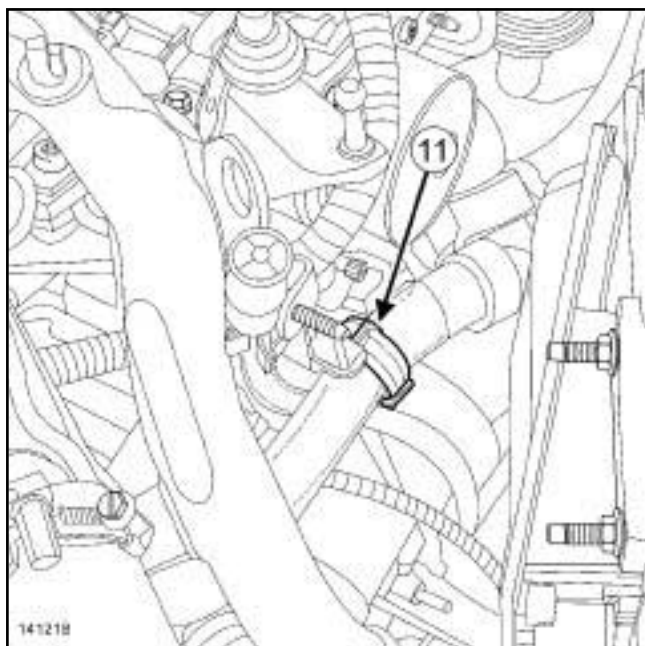
141217

- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .
- Pull the intercooler air inlet pipe clip (1) at the turbocharger end.
- Disconnect the intercooler air inlet pipe (2) at the turbocharger end.
- Remove the nut (3) from the intercooler air inlet pipe at the turbocharger end.
- Move aside the intercooler air inlet pipe (2) at the turbocharger end.
- Remove the nut (4) from the intercooler air outlet pipe at the damper valve end.
- Disconnect the turbocharging pressure regulator vacuum pipe (5) .
- Unclip:
 - the turbocharging pressure regulator vacuum pipe at (6) ,
 - the brake servo vacuum pipe at (7) .
- Disconnect the brake servo vacuum pipe (8) .
- Loosen the clamp (9) for the air-air intercooler air outlet pipe at the damper valve end.
- Disconnect the intercooler air outlet pipe (10) at the damper valve end.
- Move aside the intercooler air outlet pipe (10) at the damper valve end.

Water chamber: Removal - Refitting

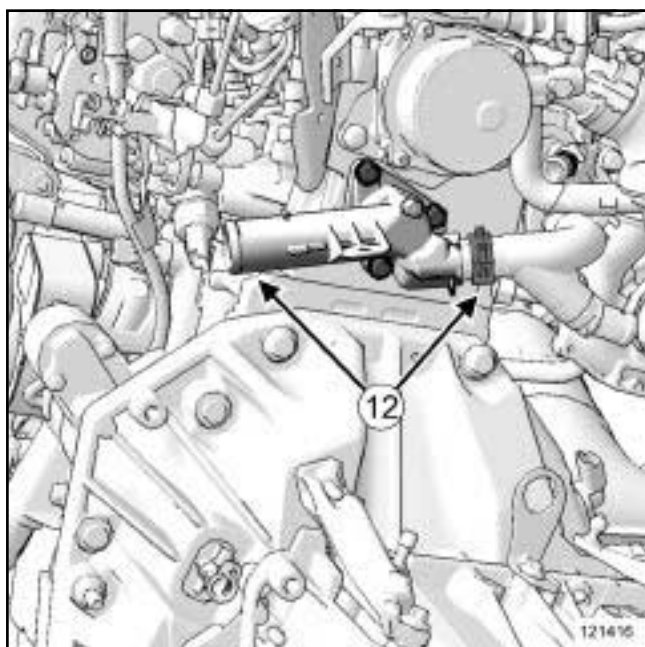
K9K

- ❑ Drain the cooling system (see 19A, Cooling, Cooling system: Draining - Refilling, page 19A-9) .



141218

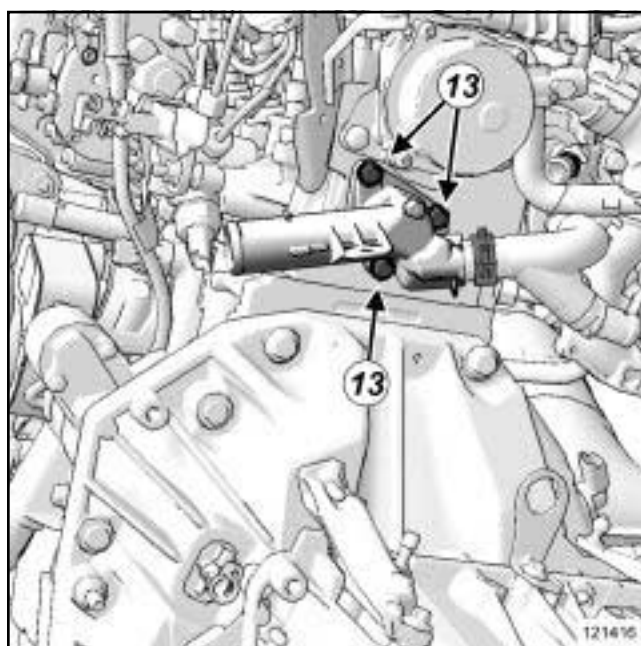
- ❑ Unclip the cooling hose of the coolant-oil heat exchanger at (11) .
- ❑ Move aside the cooling hose of the coolant-oil heat exchanger.



121416

- ❑ Separate the clips of the water chamber cooling hoses (12) using the (Mot. 1448).
- ❑ Disconnect:
 - the water chamber cooling hoses (12) ,
 - the coolant temperature sensor connector.

II - OPERATION FOR REMOVAL OF PART CONCERNED



121416

- ❑ Remove:
 - the water chamber bolts (13) ,
 - the water chamber,
 - the water chamber seal.
- ❑ Turn the thermostat one quarter of a turn.
- ❑ Remove the thermostat from the water chamber.

REFITTING

I - REFITTING PREPARATION OPERATION

- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- ❑ **parts always to be replaced: Cylinder head coolant outlet unit seal**

Water chamber: Removal - Refitting

K9K

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the thermostat to the water chamber.
- Refit:
 - a new water chamber seal,
 - the water chamber.
- Torque tighten the **water chamber bolts (10 N.m)**.

III - FINAL OPERATION

- Connect the cooling hoses on the water chamber.
- Position the cooling hose clips on the water chamber using the tool (**Mot. 1448**).
- Clip on the cooling hose of the coolant-oil heat exchanger.

K9K, and 718

- Connect the intercooler air outlet pipe on the side of the damper valve.
 - Torque tighten the **intercooler air outlet pipe clip at the damper valve end (5.5 N.m)**.
 - Connect the brake servo vacuum pipe.
 - Clip:
 - the turbocharging pressure regulator vacuum pipe,
 - the vacuum pipe from the brake servo.
 - Connect the turbocharging pressure regulator vacuum pipe.
 - Refit the nuts of the air hoses on the lifting eye.
 - Connect the intercooler air inlet pipe at the turbocharger end.
 - Clip on the intercooler air inlet pipe clip at the turbocharger end.
-
- Fill the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
 - Refit the engine cover.

Water chamber: Removal - Refitting

D4F, and 780 or 782

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

Tightening torques

water chamber bolts **10 N.m**

REMOVAL - REFITTING

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

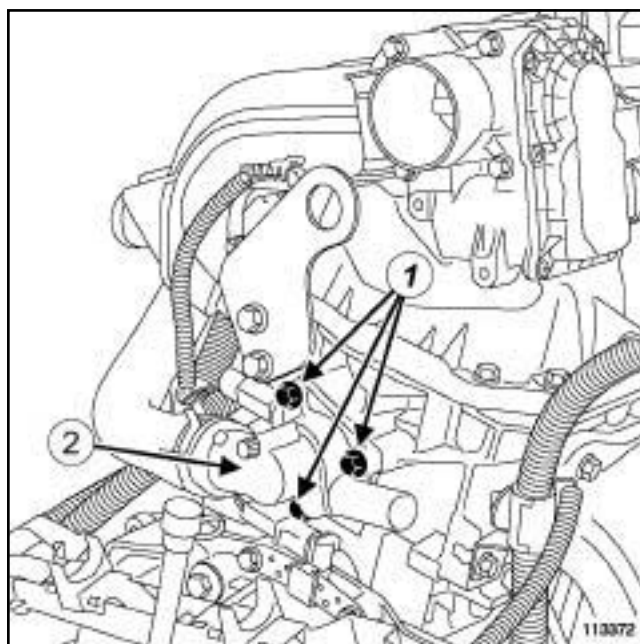
II - OPERATION FOR REMOVAL OF PART CONCERNED

- Detach the turbocharger cooling pipe from the cylinder head.
- Remove the water chamber hose clips using the (**Mot. 1448**).

Note:

Use a cloth to protect the TDC sensor to prevent any coolant entering the opening on the gearbox.

- Disconnect the water chamber hoses.
- Remove the pipe from the heater matrix under the water chamber.



113372

- Remove:
 - the water chamber bolts (1) ,
 - the water chamber (2) ,
 - the water chamber seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- Always replace the water chamber seal.

WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION FOR PART CONCERNED

- Position the water chamber with a new seal.
- Screw on the water chamber bolts without tightening them.
- Torque tighten the **water chamber bolts (10 N.m)**.
- Connect the water chamber hoses.
- Fit the heater matrix pipe under the water chamber.
- Refit the water chamber hose clips using the (**Mot. 1448**).
- Clip the turbocharger cooling pipe onto the cylinder head.

Water chamber: Removal - Refitting

D4F, and 780 or 782

III - FINAL OPERATION

- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9).

Water chamber: Removal - Refitting

K4M

Special tooling required

Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Tightening torques

water chamber bolts (initial torque)	4 N.m
water chamber bolts	12 N.m
heater matrix hose bracket bolt	10 N.m

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

WARNING

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

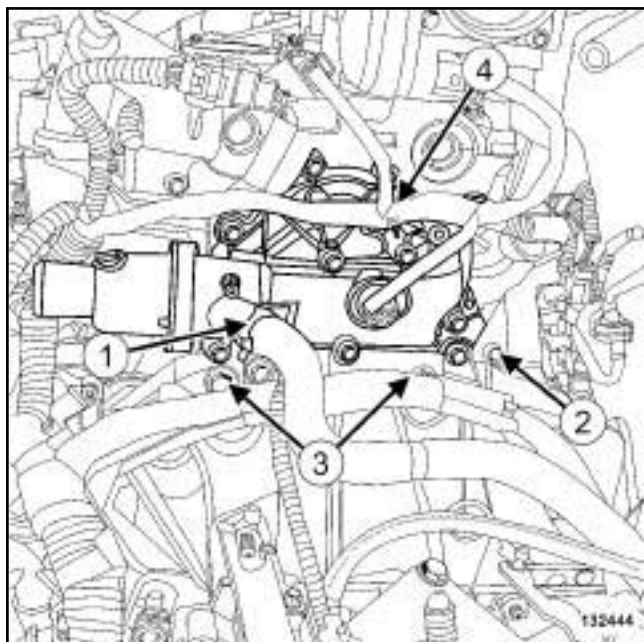
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the engine undertray.
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

Water chamber: Removal - Refitting

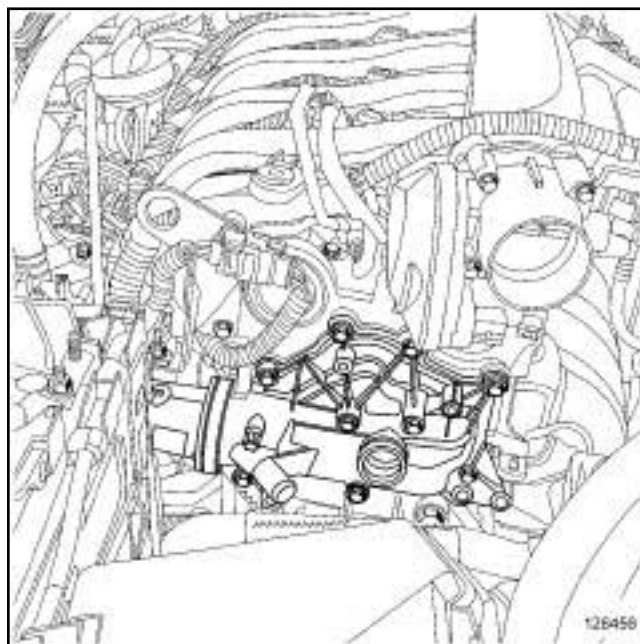
K4M



132444

- Using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)** remove:
 - the cooling radiator top hose clip on the water chamber,
 - the heater matrix hose clip **(1)** on the water chamber.
- Disconnect from the water chamber:
 - the cooling radiator top hose,
 - the heater matrix hose.
- Remove:
 - the bolt **(2)** from the heater matrix hose bracket,
 - the heater matrix hose bracket,
 - the bolts **(3)** of the engine wiring channel,
 - the coolant temperature sensor (see **19A, Cooling, Coolant temperature sensor: Removal - Refitting, page 19A-66**).
- Move aside the engine wiring channel.
- Unclip the wiring at **(4)**.

II - REMOVAL OPERATION



128456

- Remove:
 - the coolant outlet unit bolts,
 - the water chamber,
 - the water chamber seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Cylinder head coolant outlet unit seal.**
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the cylinder head joint face,
 - the coolant outlet unit housing if it is being reused.

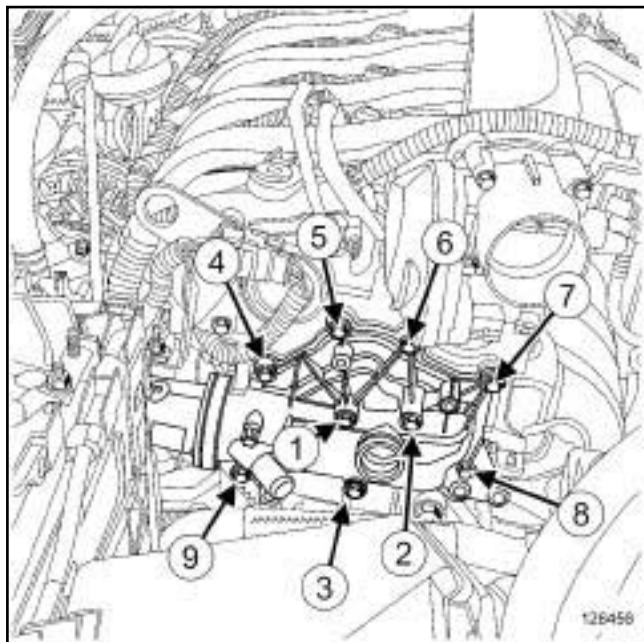
WARNING

The joint faces must be clean, dry and free from grease (avoid finger marks).

Water chamber: Removal - Refitting

K4M

II - REFITTING OPERATION



128456

- Refit the coolant outlet unit with a new seal.
- Pretighten in order and to torque the **water chamber bolts (initial torque) (4 N.m)**.
- Torque tighten in order the **water chamber bolts (12 N.m)**.

III - FINAL OPERATION

- Clip the wiring onto the water chamber.
- Fit the engine wiring channel.
- Refit:
 - the coolant temperature sensor (see **19A, Cooling, Coolant temperature sensor: Removal - Refitting**, page **19A-66**),
 - the heater matrix hose bracket.
- Torque tighten the **heater matrix hose bracket bolt (10 N.m)**.
- Connect to the coolant outlet unit:
 - the heater matrix hose,
 - the cooling radiator top hose.
- Using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)** fit:
 - the heater matrix hose clip,
 - the cooling radiator top hose clip.
- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**).

- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**).
- Refit the engine undertray.

Engine cooling fan assembly: Removal - Refitting

C44, and K9K

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**))
- Disconnect the battery ((see **Battery: Removal - Refitting**)).
- Remove:
 - the engine undertray bolts,
 - the engine undertray,
 - the front bumper ((see **Front bumper: Removal - Refitting**)),
 - the left-hand and right-hand headlights (see **Halo-gen headlight: Removal - Refitting**) .
- Remove:
 - the cooling radiator retaining lug bolt,
 - the expansion bottle bolt onto the front upper cross member,
 - the air filter inlet air pipe bolt on the front upper cross member.
- Unclip and then remove from the front upper cross member:
 - the air filter inlet air pipe,
 - the expansion bottle.
- Remove the bonnet lock nuts.
- Remove the « cable - bonnet catch » assembly.

Note:

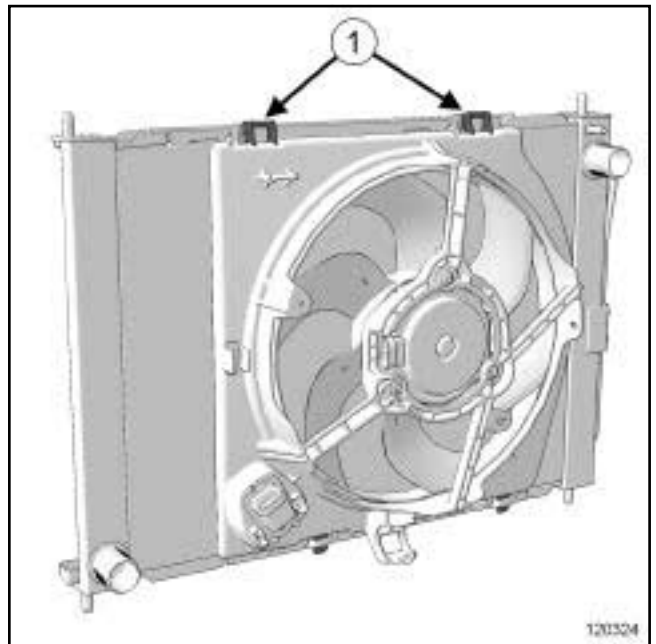
Do not unclip the bonnet release cable to avoid damaging the cable clip on the lock.

- Remove the front upper cross member ((see **Front upper cross member: Removal - Refitting**))

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Disconnect the electrical connectors on the engine cooling fan assembly.
- Unclip:
 - the engine cooling fan assembly wiring,
 - the coolant hose at the bottom of the engine cooling fan assembly.

AIR CONDITIONING



120324

- Press on the engine cooling fan assembly locking tabs (1) on the cooling radiator.

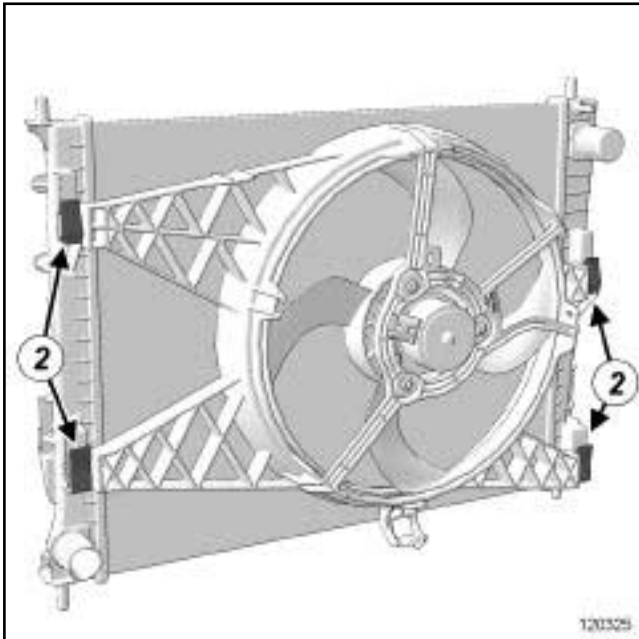
Note:

Be careful not to press too hard on the tabs to avoid breaking them.

Engine cooling fan assembly: Removal - Refitting

C44, and K9K

STANDARD HEATING



120325

- Press on the engine cooling fan assembly locking tabs (2) on the cooling radiator.

Note:

Be careful not to press too hard on the tabs to avoid breaking them.

- Withdraw the engine cooling fan assembly from the cooling radiator from above, while pressing on the locking tabs.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Fit the engine cooling fan assembly to the cooling radiator.
- Clip the engine cooling fan assembly to the cooling radiator.

Note:

Check that the tabs lock the engine cooling fan assembly on the cooling radiator correctly.

- Connect the electrical connectors to the engine cooling fan assembly.

- Clip:

- the engine cooling fan assembly wiring in place,
- the coolant hose at the bottom of the engine cooling fan assembly.

II - FINAL OPERATION

- Refitting the front upper cross member (see **MR 412 Bodywork, 42A, Upper front structure, Cross member: Removal - Refitting**).

- Fit the « cable - bonnet catch » assembly.

- Refit the bonnet catch nuts.

- Clip and move away from the front upper cross member:

- the expansion bottle,
- the air filter inlet air pipe.

- Refit:

- the air filter inlet air pipe bolt onto the front upper cross member,
- the expansion bottle bolt onto the front upper cross member,
- the cooling radiator retaining lug bolt.

- Tighten on the front upper cross member:

- the air filter inlet air pipe bolt onto the front upper cross member,
- the expansion bottle bolt onto the front upper cross member,
- the cooling radiator retaining lug bolt.

- Refit:

- the left-hand and right-hand headlights (see **80B, Headlights, Halogen headlights: Removal - Refitting**),
- the front bumper ((see **Front bumper: Removal - Refitting**)),
- the engine undertray,
- the engine undertray bolts.

- Tighten the engine undertray bolts until contact is made.

- Connect the battery ((see **Battery: Removal - Refitting**)).

Engine cooling fan assembly: Removal - Refitting

D4F, and 772, and AIR CONDITIONING or STANDARD HEATING – D7F, and AIR CONDITIONING or STANDARD HEATING

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).

AIR CONDITIONING

- Remove:
 - the battery ((see **Battery: Removal - Refitting**)),
 - the battery tray ((see **Battery tray: Removal - Refitting**)),
 - the engine computer mounting,

- Remove:
 - the air filter unit air inlet pipe bolt on the front end panel,
 - the air filter unit air inlet pipe,
 - the air scoop.

- Remove the bonnet catch.

- Move the bonnet lock and release cable unit aside.

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Disconnect the engine cooling fan assembly connectors.
- Unclip the fan assembly wiring harness.
- Move the motor-driven fan assembly wiring harness aside.
- Unclip:
 - the expansion bottle hose from the cooling fan assembly,
 - the cooling radiator bottom hose from the cooling fan assembly.
- Unclip the engine cooling fan assembly.
- Remove the engine cooling fan assembly from above. .
- If replacing the fan:
 - Remove the engine cooling fan bolts.
 - Remove the fan from the fan assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

- If replacing the fan:
 - Fit the engine cooling fan to the motor-driven fan assembly.
 - Refit the cooling fan bolts.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit the engine cooling fan assembly from above.
- Clip the engine cooling fan assembly in place.
- Clip:
 - the expansion bottle hose from the cooling fan assembly,
 - the cooling radiator bottom hose from the cooling fan assembly.
- Fit the motor-driven fan assembly wiring harness.
- Connect the fan assembly connectors.
- Clip the fan assembly wiring harness.

III - FINAL OPERATION

- Refit the bonnet catch.

AIR CONDITIONING

- Refit:
 - the engine computer mounting,
 - the battery tray ((see **Battery tray: Removal - Refitting**)),
 - the battery ((see **Battery: Removal - Refitting**)).

- Refit:
 - the air scoop,
 - the air filter unit air inlet pipe,
 - the air filter unit air inlet pipe bolt on the front end panel.

Engine cooling fan assembly: Removal - Refitting

D4F, and 780 or 782

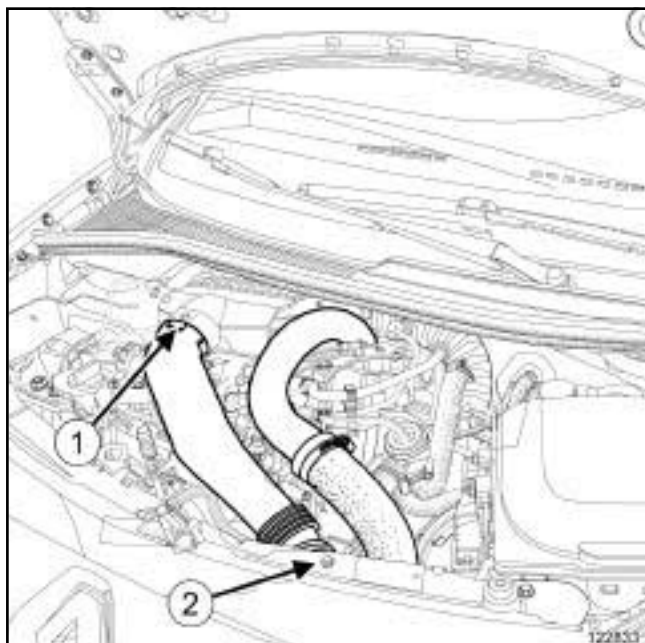
Special tooling required

Mot. 1448	Remote operation pliers for hose clips.
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REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove:
 - the front wheels (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection).



122833

- Disconnect the air filter unit air inlet pipe (1) from the air filter unit cover.
- Remove:
 - the air filter unit air inlet pipe bolt (2) from the cross member,
 - the air filter unit air inlet pipe.
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

- Remove using the (**Mot. 1448**) :
 - the radiator top hose clip,
 - the radiator degassing hose clip.
- Disconnect:
 - the radiator top hose,
 - the radiator degassing hose.
- Unclip:
 - the lower hose from the engine cooling fan assembly,
 - the wiring harness from the engine cooling fan assembly.
- Disconnect the engine cooling fan assembly connectors.

II - REMOVAL OPERATION FOR PART CONCERNED

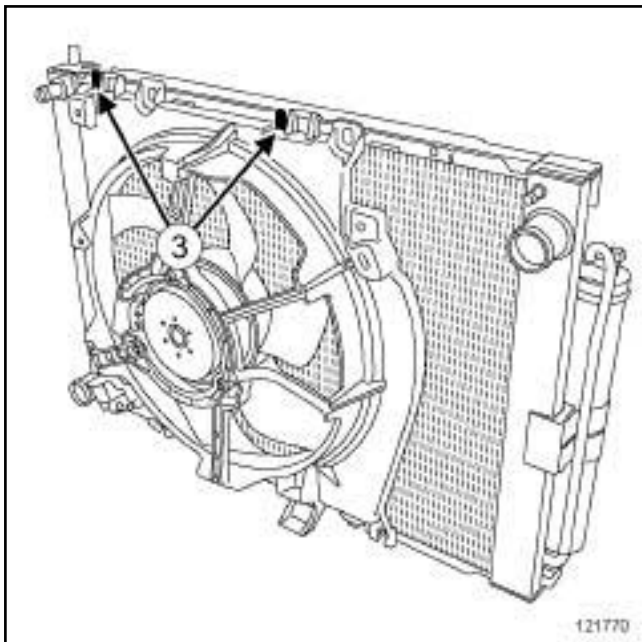
Note:

Hold the radiator during the removal of the radiator lower cross member.

- Remove:
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 412, 41A, Front lower structure),
 - the « radiator / engine cooling fan assembly » unit.

Engine cooling fan assembly: Removal - Refitting

D4F, and 780 or 782



121770

- Remove the tabs (3) .
- Remove the engine cooling fan assembly.

REFITTING**I - REFITTING PREPARATIONS OPERATION****Rebuilding the cooling radiator**

- Refit the engine cooling fan assembly.
- Clip on the engine cooling fan assembly tabs.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the « radiator / engine cooling fan assembly » unit,
 - the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 412, 41A, Front lower structure).

III - FINAL OPERATION

- Connect the engine cooling fan assembly connectors.
- Clip:
 - the wiring harness to the engine cooling fan assembly,
 - the bottom hose to the engine cooling fan assembly.

- Connect:
 - the radiator degassing hose,
 - the radiator top hose.
- Using the (**Mot. 1448**), fit:
 - the radiator degassing hose clip,
 - the radiator top hose clip.
- Refit:
 - the air filter box air inlet pipe,
 - the air filter unit air inlet pipe bolt on the cross member.
- Connect the air filter unit air inlet pipe to the air filter unit cover.
- Refit:
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres).
- Connect the battery (see) (MR 411, 80A, Battery).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**) .

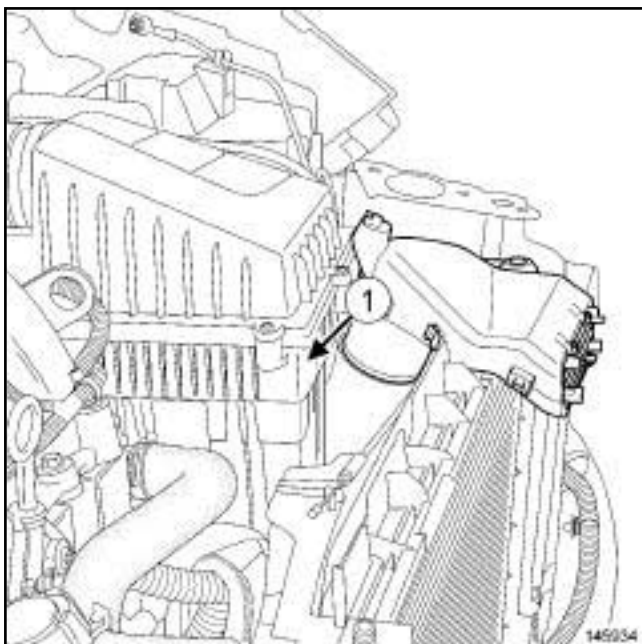
Engine cooling fan assembly: Removal - Refitting

K4M

REMOVAL

I - REMOVAL PREPARATION OPERATION

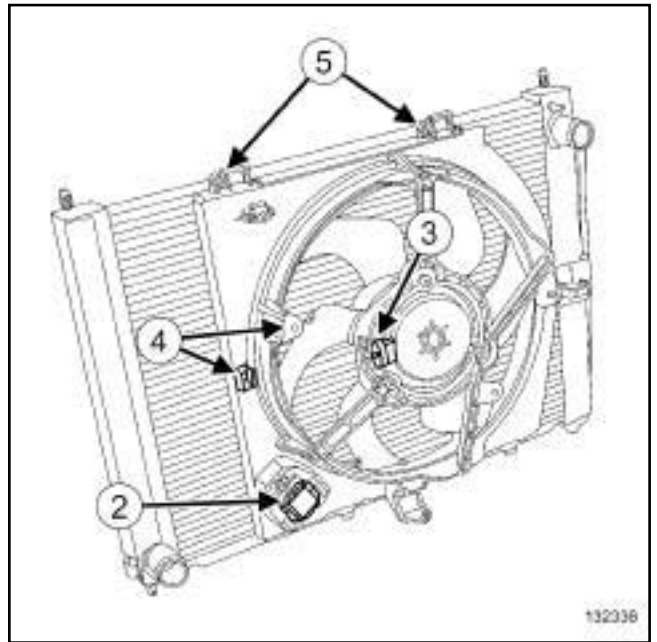
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
 - the engine undertray,
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure).



145934

- Remove the air inlet pipe scoop (1) .

II - REMOVAL OPERATION



132336

132336

- Disconnect:
 - the engine cooling fan assembly resistor connector (2) ,
 - the engine cooling fan assembly connector (3) .
- Unclip:
 - the engine cooling fan assembly wiring at (4) ,
 - the cooling radiator top and bottom hose from the engine cooling fan assembly.
- Unclip the engine cooling fan assembly from the radiator at (5) by pushing it upwards to detach the brackets holding it.
- Remove the engine cooling fan assembly upwards.

REFITTING

I - REFITTING OPERATION

- Fit the engine cooling fan assembly:
- Clip the engine cooling fan assembly to the cooling radiator.
- Clip:
 - the cooling radiator top and bottom hose on the engine cooling fan assembly,
 - the engine cooling fan assembly wiring.
- Connect:
 - the engine cooling fan assembly connector,

Engine cooling fan assembly: Removal - Refitting

K4M

- the engine cooling fan assembly resistor connector.

II - FINAL OPERATION Refit:

- the air inlet pipe scoop,
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (42A, Upper front structure),
 - the bonnet catch (see **Bonnet lock: Removal - Refitting**) (52A, Non-side opening element mechanisms),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the engine undertray.
-
- Connect the battery (see
- Battery: Removal - Refitting**
-) (80A, Battery).

Coolant pump inlet pipe: Removal - Refitting

K9K

Special tooling required

Mot. 1672	Lower engine support.
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques

subframe front bolt	62 Nm
subframe rear bolt	105 Nm

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see).

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

WARNING

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

WARNING

The coolant helps to keep the engine running properly (heat exchange).

The system must not operate using pure water.

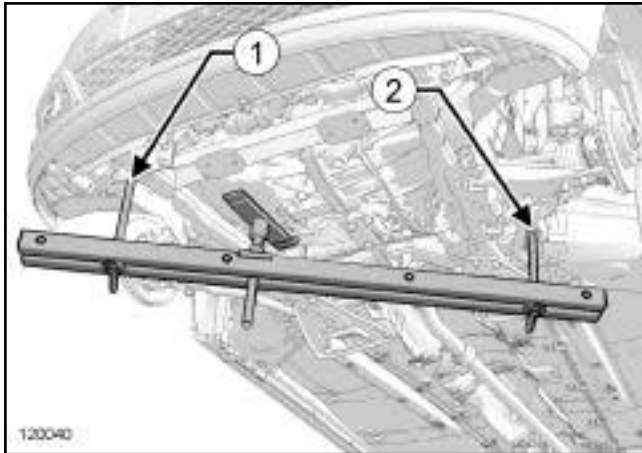
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Disconnect the battery (see) (MR 411, 80A, Battery).
- Remove:
 - the engine cover,
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (MR 411, 85A, Wipers - Washers),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),
 - the front wheels (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (MR 411, 80B, Headlights),
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (MR 412, 42A, Upper front structure).
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Remove the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) .

Coolant pump inlet pipe: Removal - Refitting

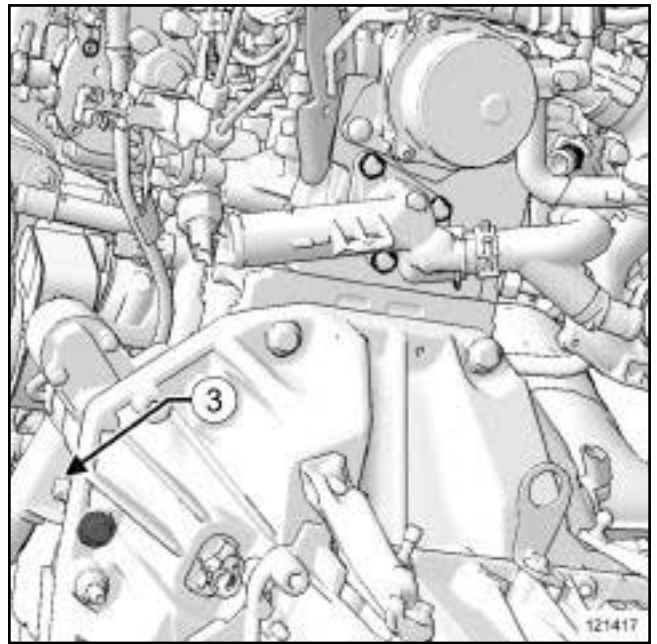
K9K



120040

- Remove:
 - the front bolt (1) from the subframe,
 - the rear bolt (2) from the subframe.
- Position the **(Mot. 1672)**.
- Remove:
 - the right-hand suspended engine mounting (see 19D, **Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-13) ,
 - the accessories belt (see 11A, **Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,
 - the multifunction support (see 10A, **Engine and cylinder block assembly, Multifunction support: Removal - Refitting**, page 10A-63) ,
 - the oil cooler (see 10A, **Engine and cylinder block assembly, Oil-coolant heat exchanger: Removal - Refitting**, page 10A-33) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



121417

- Remove:
 - the bolt (3) from the coolant pump inlet pipe,
 - the coolant pump inlet pipe,
 - the coolant pump inlet pipe seal.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the new water pump inlet pipe seal,
 - the coolant pump inlet pipe,
 - the coolant pump inlet pipe bolt.
- Connect the cooling hose using the tool **(Mot. 1448)**.

II - FINAL OPERATION.

- Refit:
 - the coolant-oil heat exchanger (see 10A, **Engine and cylinder block assembly, Oil-coolant heat exchanger: Removal - Refitting**, page 10A-33) ,
 - the multifunction support (see 10A, **Engine and cylinder block assembly, Multifunction support: Removal - Refitting**, page 10A-63) ,
 - the accessories belt (see 11A, **Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-3) ,

Coolant pump inlet pipe: Removal - Refitting

K9K

- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-13**) .
- Remove the **(Mot. 1672)**.
- Refit:
 - the new subframe front bolt,
 - the new subframe rear bolt.
- Torque tighten:
 - the **subframe front bolt (62 Nm)**,
 - the **subframe rear bolt (105 Nm)**.
- Refit the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**) .
- Fill the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**) .
- Refit:
 - the front upper cross member (see **Front upper cross member: Removal - Refitting**) (MR 412, 42A, Upper front structure),
 - the headlights (see **Halogen headlight: Removal - Refitting**) (MR 411, 80B, Headlights),
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 412, 55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (MR 411, 35A, Wheels and tyres),
 - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),
 - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 412, 56A, Exterior equipment),
 - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (MR 411, 85A, Wipers - Washers),
 - the engine cover.
- Connect the battery (see) (MR 411, 80A, Battery).

Coolant pump inlet pipe: Removal - Refitting

D4F, and 780 or 782

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

Tightening torques

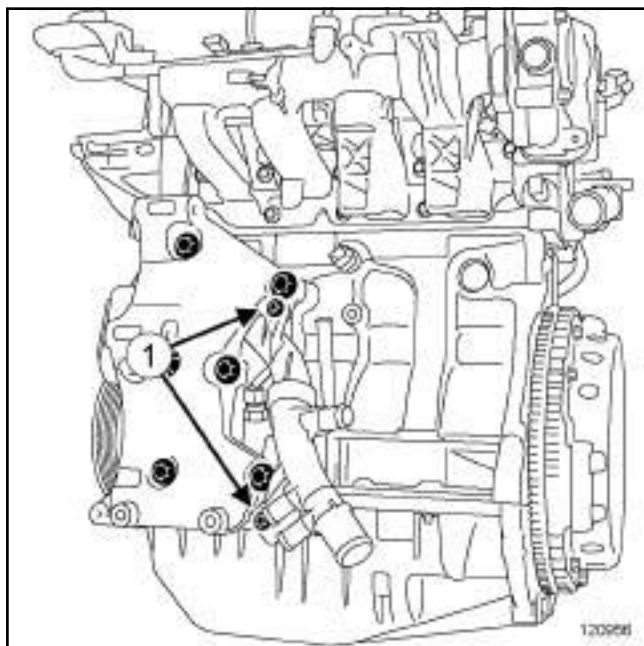
coolant pump inlet pipe bolts **10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove the engine undertray.
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



120956

- Separate the clips on the coolant pump inlet pipe hoses using the tool (**Mot. 1448**).
- Disconnect the coolant pump inlet pipe hoses.
- Remove:
 - the bolts (1) from the coolant pump inlet pipe,
 - the coolant pump inlet pipe,

- the coolant pump inlet pipe seal.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: seal between coolant pump inlet pipe and coolant pump.
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the bearing surfaces of the coolant pump inlet pipe.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - a new seal on the coolant pump inlet pipe,
 - the coolant pump inlet pipe,
 - the coolant pump inlet pipe bolts.
- Torque tighten the **coolant pump inlet pipe bolts (10 N.m)**.
- Connect the hoses to the coolant pump inlet pipe.
- Refit the clips on the coolant pump inlet pipe hoses using the tool (**Mot. 1448**).

III - FINAL OPERATION

- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .
- Refit the engine undertray.
- Connect the battery (see) (80A, Battery).

Coolant pump inlet pipe: Removal - Refitting

K4M

Special tooling required

Mot. 1448 Remote operation pliers for hose clips.

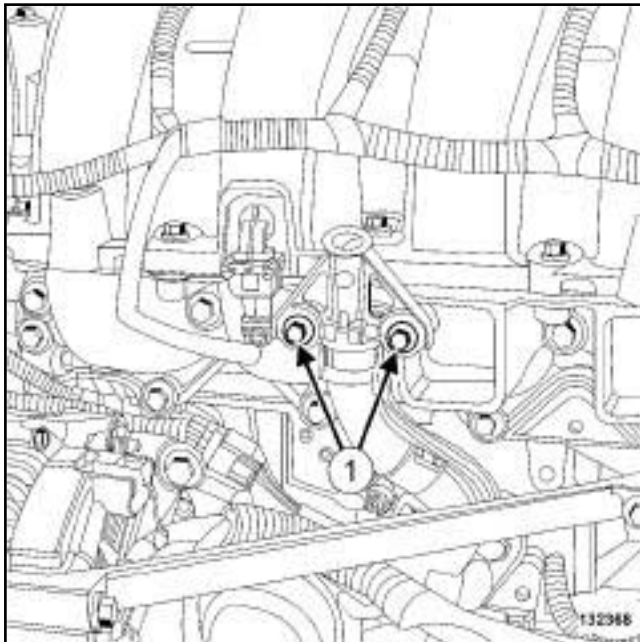
Tightening torques 

coolant pump inlet pipe **25 N.m**
bolts

REMOVAL

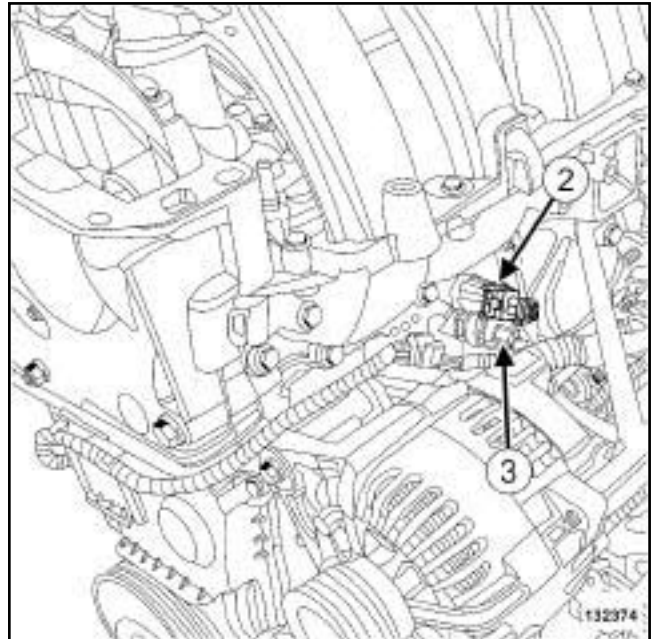
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see) (80A, Battery).
- Remove the engine undertray.
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .



132368

- Remove:
 - the dipstick,
 - the bolts (1) from the dipstick guide,
 - the dipstick guide.



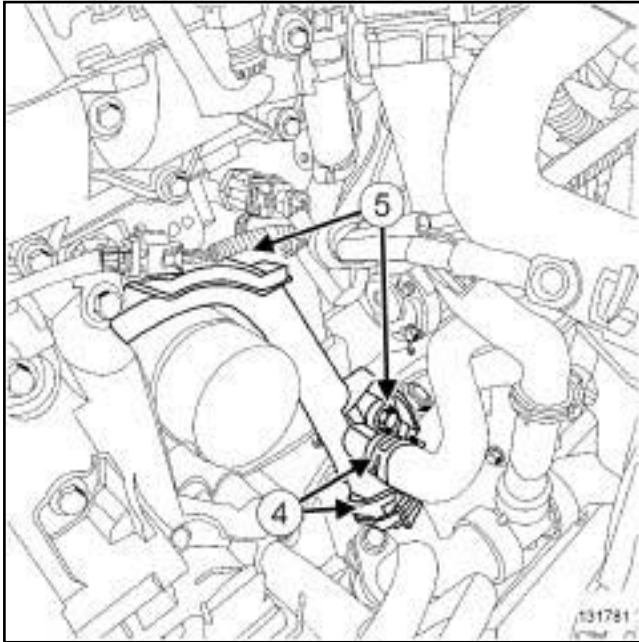
132374

- Disconnect:
 - the pink sensor connector (2) ,
 - the oil pressure sensor connector (3) .

Coolant pump inlet pipe: Removal - Refitting

K4M

II - REMOVAL OPERATION



131781

- Remove the clip (4) from each cooling hose using the tool (**Mot. 1448**).
- Disconnect the cooling hoses from the coolant pump inlet pipe.
- Remove:
 - the bolts (5) from the coolant pump inlet pipe,
 - the coolant pump inlet pipe.

REFITTING

I - REFITTING PREPARATION OPERATION

- parts always to be replaced: seal between coolant pump inlet pipe and coolant pump.**
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the seal housing in the cylinder block,
 - the coolant pump inlet pipe seal housing if it is being reused.

II - REFITTING OPERATION

- Refit the coolant pump inlet pipe fitted with a new seal.



131781

- Torque tighten in order the **coolant pump inlet pipe bolts (25 N.m)**.
- Connect the cooling hoses to the coolant pump inlet pipe.
- Fit each cooling hose clip using the tool (**Mot. 1448**).

III - FINAL OPERATION

- Connect:
 - the oil pressure sensor connector,
 - the pinking sensor connector.
- Refit:
 - dipstick guide ,
 - the dipstick.
- Connect the battery (see) (80A, Battery).
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling, page 19A-9**).
- Refit the engine undertray.

Expansion bottle: Removal - Refitting

D4F or D7F or K4M or K9K

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

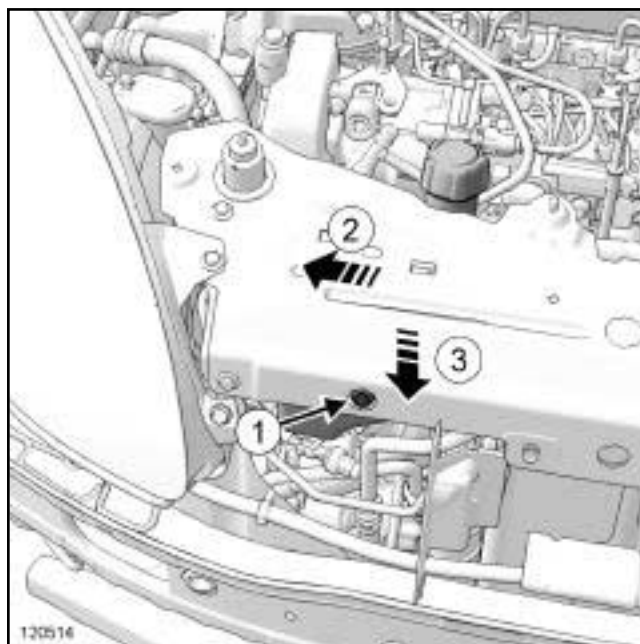
K9K

- Remove the front engine cover.

D4F

- Remove the oil filler neck.

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove the bolts (1) from the expansion bottle.
- Move the expansion bottle aside following the arrows (2) and (3) .
- Fit the tool (**Ms. 583**) on the expansion bottle hoses.
- Using the (**Mot. 1448**) or (**Mot. 1202-01**) or (**Mot. 1202-02**) remove:
 - the clip of the expansion bottle top hose,
 - the clip of the expansion bottle bottom hose.
- Disconnect:
 - the expansion bottle top hose,
 - the expansion bottle bottom hose.
- Remove the expansion bottle.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Connect:
 - the expansion bottle bottom hose,
 - the expansion bottle top hose.
- Using the (**Mot. 1448**) or (**Mot. 1202-01**) or (**Mot. 1202-02**) fit:
 - the clip of the expansion bottle bottom hose,
 - the clip of the expansion bottle top hose.

Expansion bottle: Removal - Refitting

D4F or D7F or K4M or K9K

- Remove the tool (**Ms. 583**) from the expansion bottle hoses.
- Refit the expansion bottle.

II - FINAL OPERATION

- Top up the coolant level in the expansion bottle.
- Refit:
 - the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
 - the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

K9K

- Refit the engine cover.
-

D4F

- Refit the oil filler neck.
-

Coolant temperature sensor: Removal - Refitting

D4F or D7F

PARTS AND CONSUMABLES FOR THE REPAIR WORK

- Parts always to be replaced :
 - coolant temperature sensor seal.
- Consumable (see **Vehicle: Parts and consumables for the repair**) :
 - COOLANT.

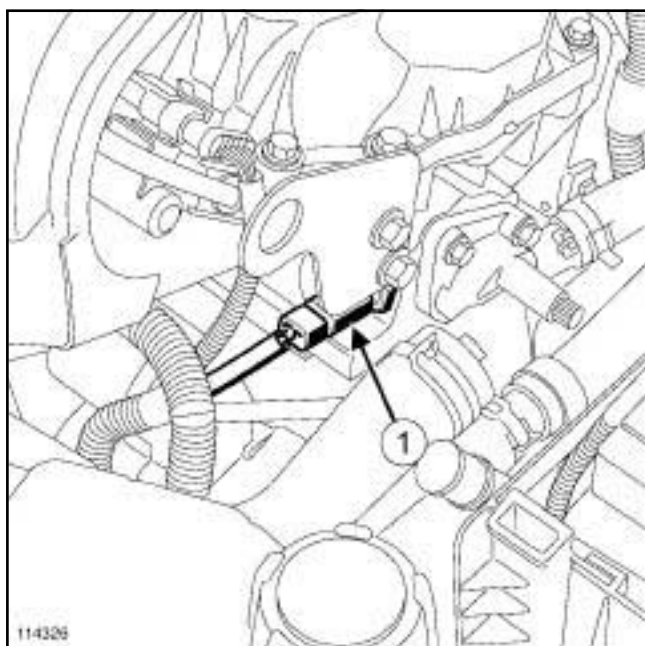
REMOVAL

I - REMOVAL PREPARATION OPERATION

D4F

- Remove the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



114326

- Disconnect the coolant temperature sensor connector (1) .
- Remove the coolant temperature sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the new coolant temperature sensor seal,
 - the coolant temperature sensor.
- Tighten the coolant temperature sensor.
- Connect the coolant temperature sensor connector.

II - FINAL OPERATION

D4F

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .
- Top up the coolant fluid level.
- Bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

Coolant temperature sensor: Removal - Refitting

K9K

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

WARNING

The coolant helps to keep the engine running properly (heat exchange).

The system does not operate using pure water.

REMOVAL**I - REMOVAL PREPARATION OPERATION**

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Remove the front engine cover.
- Unclip the neck on the gearbox.

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Disconnect the coolant temperature sensor connector.
- Remove:
 - the coolant temperature sensor clip,
 - the coolant temperature sensor,
 - the coolant temperature sensor seal.

REFITTING**I - REFITTING PREPARATIONS OPERATION****WARNING**

The seals must always be replaced.

II - REFITTING OPERATION FOR PART CONCERNED

Refit:

- the new seal on the coolant temperature sensor,
- the coolant temperature sensor,
- the coolant temperature sensor clip.

Connect the coolant temperature sensor connector.

III - FINAL OPERATION.

- Clip the channel to the gearbox.
- Fill the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**).
- Refit the engine cover.

Coolant temperature sensor: Removal - Refitting

D4F, and 780

Tightening torques 

coolant temperature sensor	23 Nm
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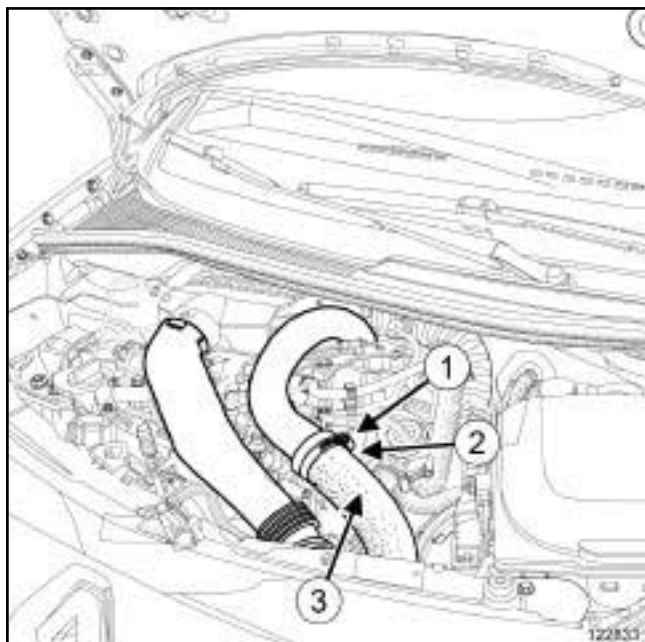
REMOVAL

I - REMOVAL PREPARATION OPERATION

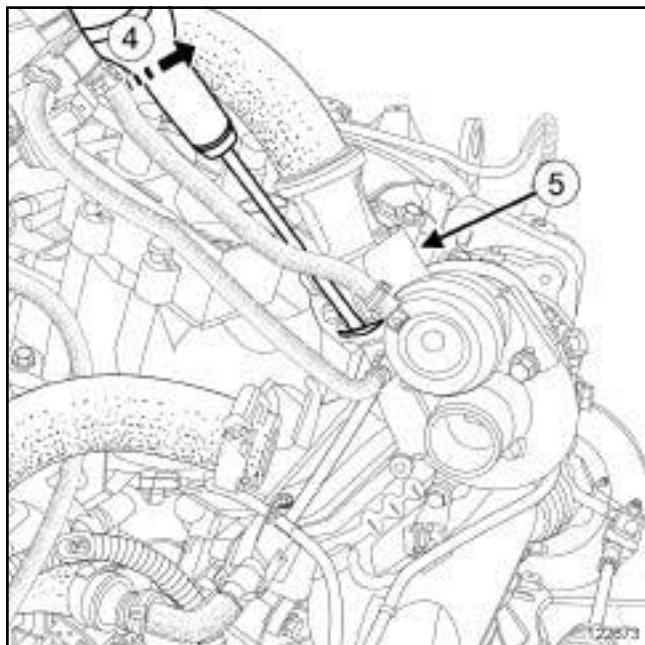
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).

Coolant temperature sensor: Removal - Refitting

D4F, and 780



122833



122673

□

Note:

If the tightening clip (1) is removed from the turbocharger air outlet pipe, the flexible rubber pipe (2) and tightening clip (1) must be replaced.

Remove the turbocharger air outlet pipe bolt (3) from the throttle valve.

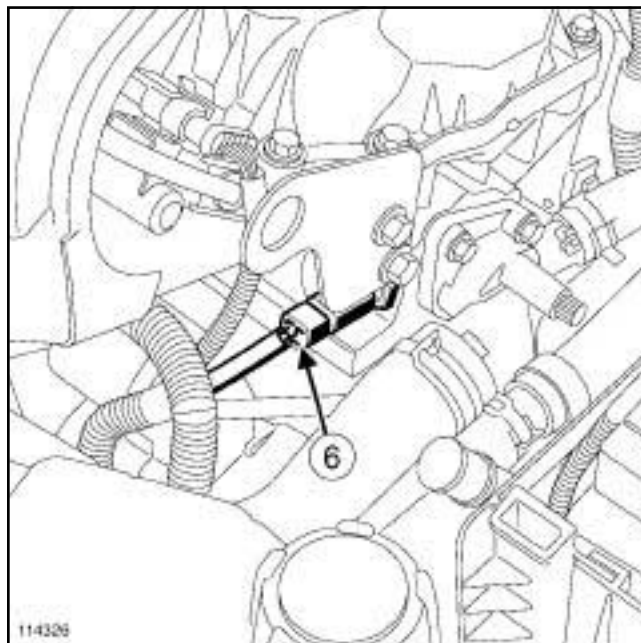
- Detach the turbocharger air outlet pipe from the turbocharger in the direction of the arrow (4) .

Note:

If the clip (5) is removed from the heat resistant protector, the latter must be replaced.

- Disconnect the turbocharger air outlet pipe from the turbocharger.
- Remove the throttle valve (see 12A, **Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-20)
- Drain the cooling system (see 19A, **Cooling, Cooling system: Draining - Refilling**, page 19A-9) .

II - REMOVAL OPERATION FOR PART CONCERNED



114326

- Disconnect the coolant temperature sensor connector (6) .
- Remove the coolant temperature sensor.

REFITTING

I - REFITTING PREPARATIONS OPERATION

- Always replace the coolant temperature sensor O-ring.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the new coolant temperature sensor O-ring,

Coolant temperature sensor: Removal - Refitting

D4F, and 780

- the coolant temperature sensor.

- Torque tighten the **coolant temperature sensor (23 Nm)**.
- Connect the coolant temperature sensor connector.

III - FINAL OPERATION

- Refit the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-20**)



122666

- Push the turbocharger air outlet pipe clip in the direction of the arrow (7) .
- Connect the turbocharger air outlet pipe onto the turbocharger.
- Refit the turbocharger air outlet pipe bolt on the throttle valve.
- Fill and bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**) .

Coolant temperature sensor: Removal - Refitting

K4M

IMPORTANT

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

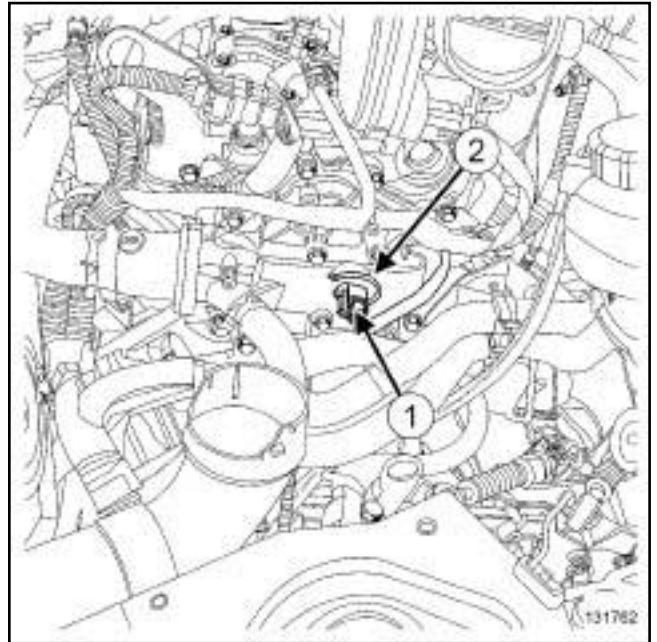
WARNING

The coolant helps to keep the engine running properly (heat exchange).

The system does not operate using pure water.

REMOVAL**I - REMOVAL PREPARATION OPERATION**

- Remove the air filter unit (see 12A, **Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) .

II - REMOVAL OPERATION

131762

- Disconnect the coolant temperature sensor connector (1) .
- Remove:
 - the coolant temperature sensor clip (2) ,
 - the coolant temperature sensor,
 - the coolant temperature sensor seal.

REFITTING**I - REFITTING PREPARATION OPERATION**

- parts always to be replaced: coolant temperature sensor seal.**
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
 - the seal housing in the water chamber,
 - the seal mating face of the coolant temperature sensor if reused.

II - REFITTING OPERATION

- Refit:
 - the coolant temperature sensor fitted with a new seal,
 - the coolant temperature sensor clip.
- Connect the coolant temperature sensor connector.

Coolant temperature sensor: Removal - Refitting

K4M

III - FINAL OPERATION

- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .
- Perform the following operations:
 - top up the coolant level,
 - bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-9**) .

EXHAUST

Exhaust: List and location of components

19B

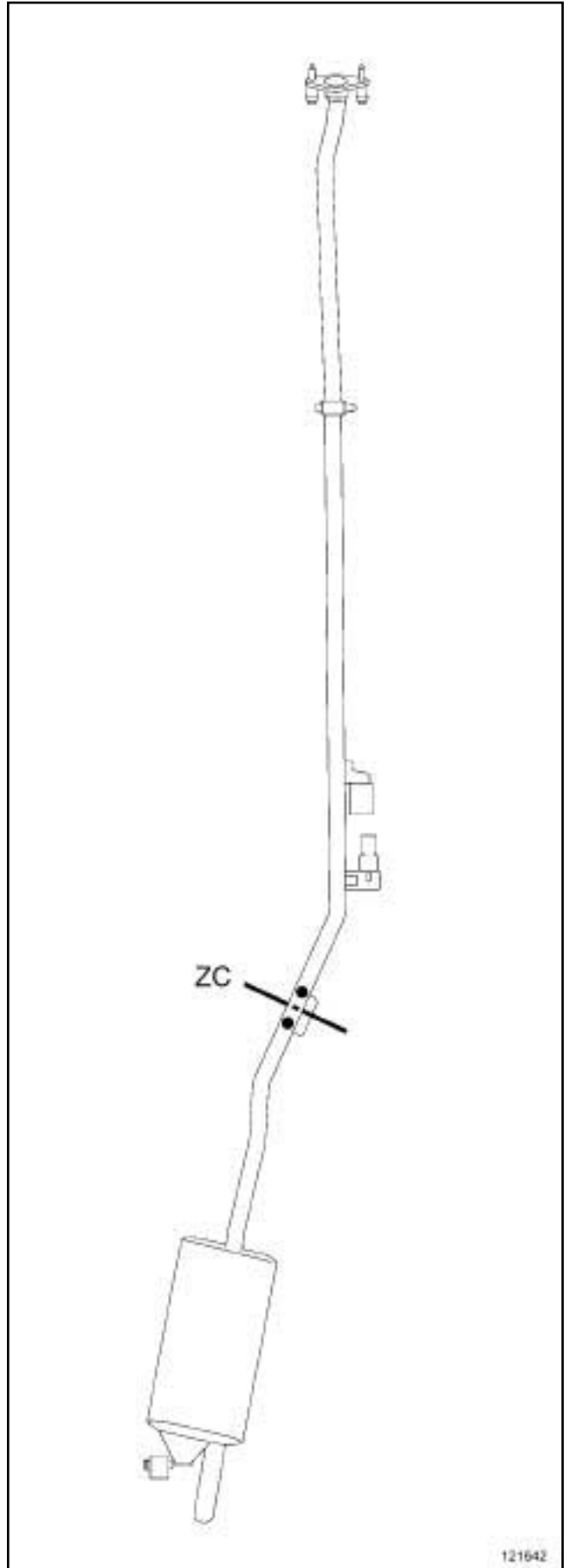
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EXHAUST

Exhaust: List and location of components

19B

K9K – D4F, and 780



121642

121642

EXHAUST

19B

Exhaust: List and location of components

(ZC) : Area to be cut

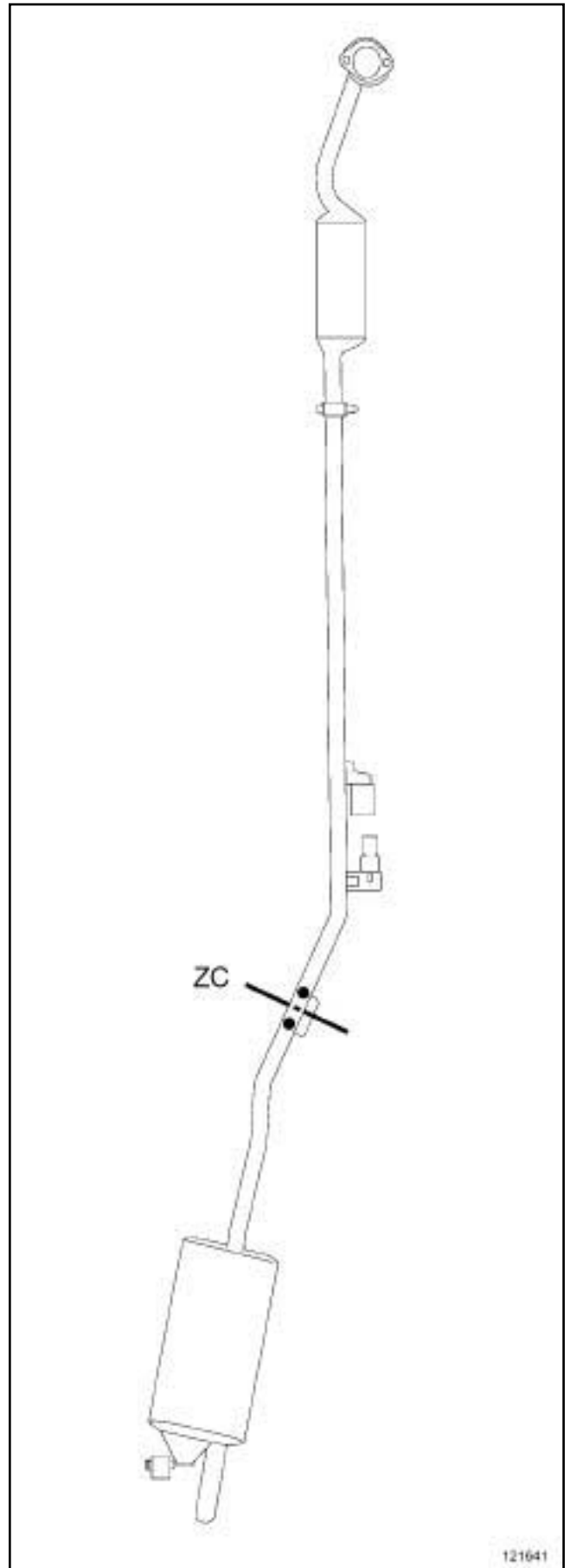


EXHAUST

Exhaust: List and location of components

19B

D4F, and 772 – D7F



121641

121641

EXHAUST

19B

Exhaust: List and location of components

(ZC) : Area to be cut

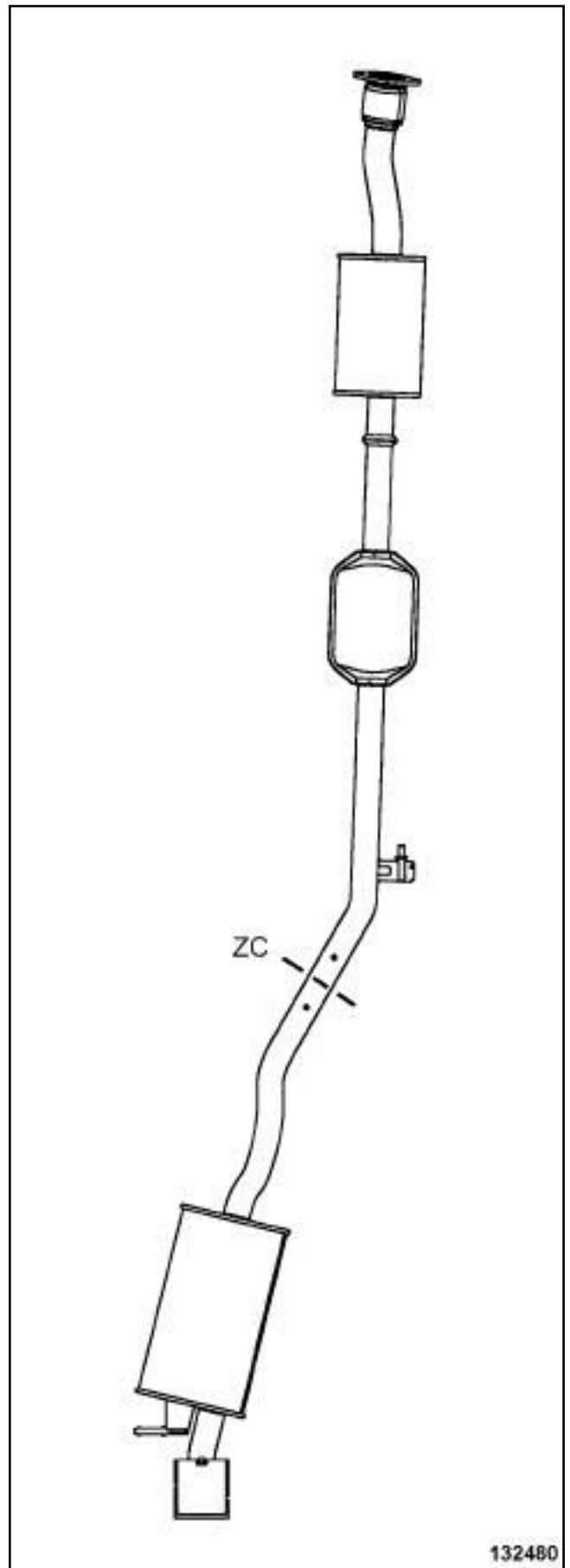


EXHAUST

Exhaust: List and location of components

19B

K4M



132480

132480

EXHAUST

19B

Exhaust: List and location of components

(ZC) : Area to be cut



Exhaust: Precautions for the repair

Special tooling required

Mot. 1199-01	Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.
---------------------	---

I - PARTS AND CONSUMABLES FOR THE REPAIR

1 - Parts always to be replaced:

- the exhaust trunking (if fitted)
- the seal or sealing ring on the connection between the catalytic converter or catalytic pre-converter and the rest of the exhaust system
- the exhaust clip(s) (if fitted)

2 - Consumables (see part no. in Technical Note 5068, 04B, Consumables - Products):

- exhaust mastic
- surface cleaner
- abrasive pads

II - ADVICE TO OBSERVE

IMPORTANT

Do not park and run the engine in a place where combustible substances and materials such as grass or leaves can come into contact with the hot exhaust system.

IMPORTANT

Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

1 - During removal and refitting, the catalytic converter or catalytic pre-converter must not receive any knocks or impacts as this could damage it.

2 - The whole exhaust pipe is made of stainless steel.

3 - After working on the bracket between the catalytic converter or catalytic pre-converter and the rest of the exhaust system, ensure that the connection is perfectly sealed.

To do this:

- clean the pressure faces of the connection using the **ABRASIVE PADS**,

- degrease the pressure faces of the connection using **SURFACE CLEANER** and clean cloths,
- always replace the seal or sealing ring on the connection.

III - SPECIAL NOTES ON THE SINGLE UNIT EXHAUST PIPE

1 - Cutting the single unit exhaust pipe

The exhaust pipe is a « single unit type » .

To replace different parts of the exhaust system it must be cut.

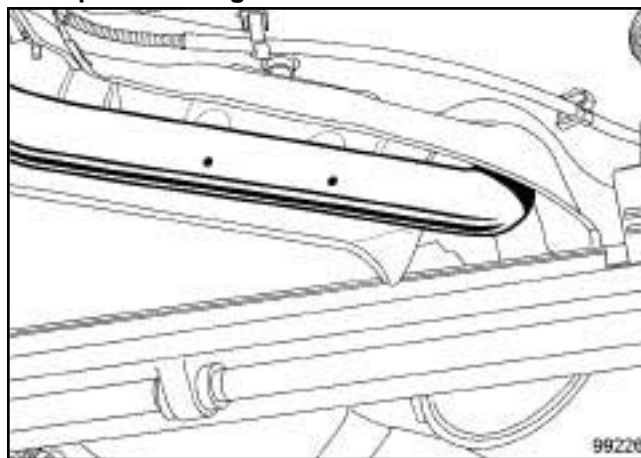
To do this be sure to carry out these precautions in the following order:

- correctly identify the area to be cut, as explained below,
- use the cutting tool correctly (**Mot. 1199-01**),
- position the exhaust trunking correctly.

2 - Identifying the area of the exhaust system to be cut

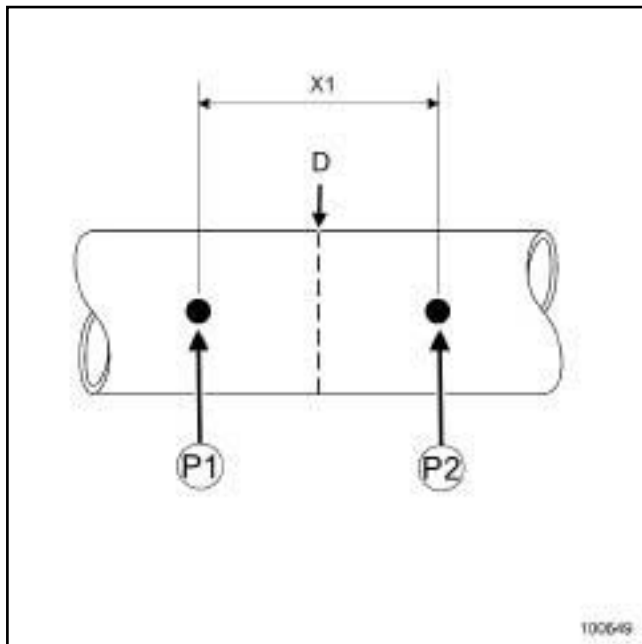
Two marks made on the exhaust system define the area to be cut (see **Exhaust: Parts and consumables for the repair**) (see MR for vehicle concerned, 19B, Exhaust).

Example of cutting area



99226

Exhaust: Precautions for the repair



100649

Before cutting the exhaust system, draw a line (D) between the two marks (P1) and (P2) .

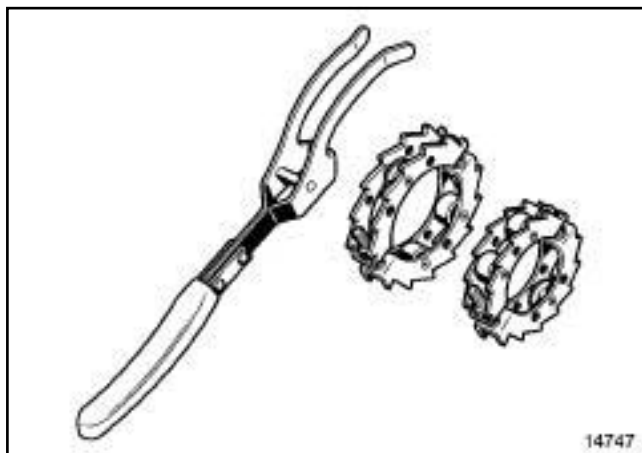
The distance between the two marks on the exhaust pipe is (X1) : **90 mm** (all types except RENAULT SPORT).

The distance between the two marks on the exhaust pipe is (X1) : **80 mm** (RENAULT SPORT).

Note:

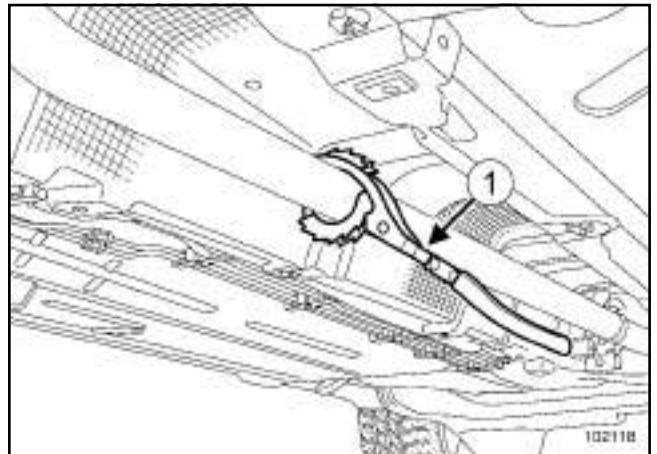
For CLIO II RENAULT SPORT with F4R*730, F4R*732 and F4R*736 engines, the cutting area is shown by a single mark on the exhaust pipe.

Cut the exhaust pipe by placing the (Mot. 1199-01) on the mark.

3 - Operate tool Mot. 1199-01

14747

14747



102118

Fit the (Mot. 1199-01) (1) on the exhaust pipe.

Tighten the two bolts on the tool until they touch the pipe in order to clamp the tool onto the pipe.

Turn the cutting tool using the handle and pressing it against the pipe (as indicated in the diagram above).

Tighten the two bolts on the tool whilst cutting, until the pipe is completely cut.

Note:

Do not over-tighten the tool onto the pipe to avoid deforming it.

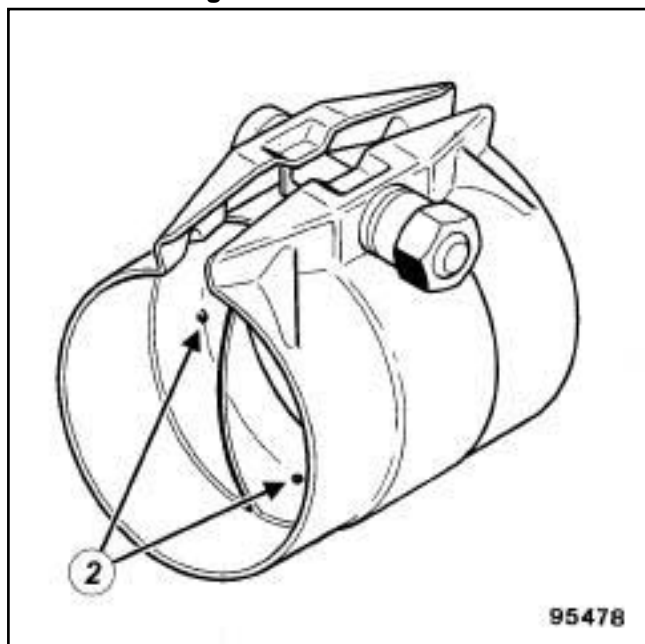
Once the pipe is cut, file and deburr the end of the pipe to be used on the vehicle again.

4 - Positioning the exhaust trunking**WARNING**

Do not reuse an old exhaust trunking.

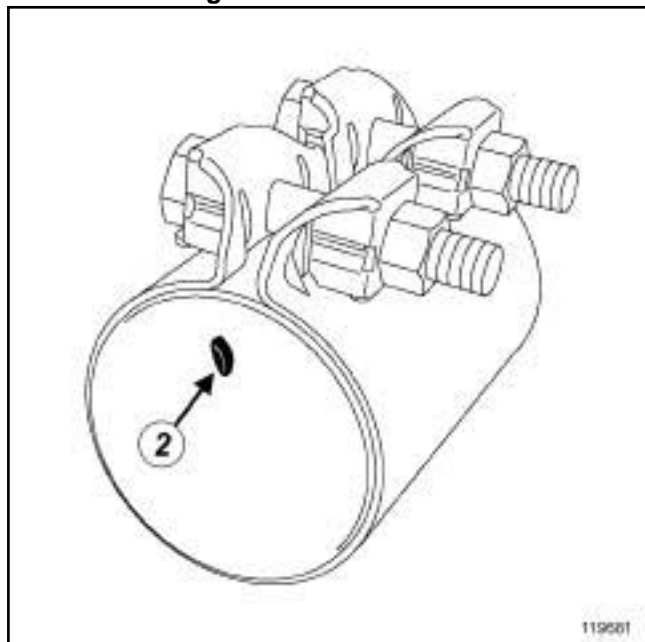
Exhaust: Precautions for the repair

Exhaust trunking with 1 bolt



95478

Exhaust trunking with 2 bolts



119681

Fit the exhaust trunking onto the part of the exhaust system fitted to the vehicle.

Position the pipe onto the lugs (2) inside the exhaust trunking.

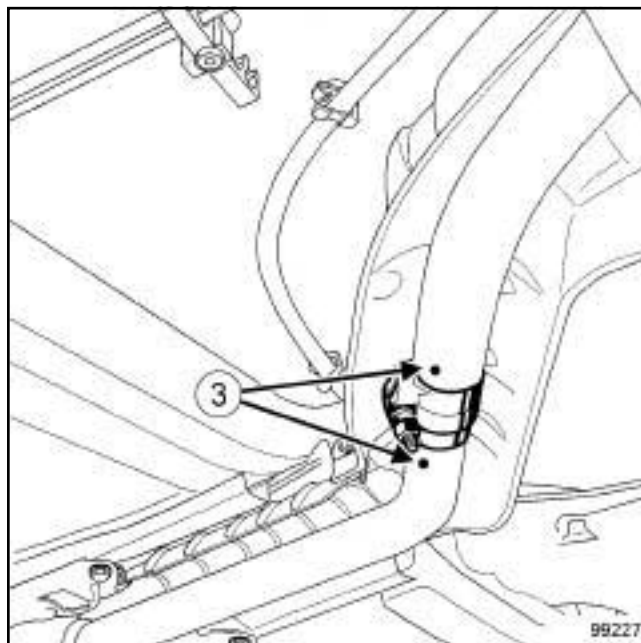
Tighten the exhaust trunking bolt(s) slightly (depending on the version).

Position the second part of the exhaust system under the vehicle, fitting it in the exhaust trunking.

Note:

If necessary, use a workshop jack to lift and hold the heavy and bulky components of the exhaust system.

Position the second exhaust pipe onto the lugs inside the exhaust trunking.



99227

Check that the two cut marks (3) are aligned (if applicable).

Position the trunking so that there is no risk of contact between its bolt or bolts and the heat shields.

Torque tighten

- the **exhaust trunking nut with 1 bolt (25 N.m)** (if fitted),
- the **exhaust trunking nuts with 2 bolts (18 N.m)** (if fitted).

Check the following and deal with if necessary:

- no underbody contact between the exhaust system and the heat shields,
- all of the heat shields are present and secure.

Note:

Any damaged heat shields must be replaced.

Start the engine.

Check that there are no leaks: deal with any leaks.

Exhaust: Precautions for the repair

Note:

If there are leaks from the **EXHAUST TRUNKING WITH 1 BOLT**, apply **EXHAUST MASTIC** to the trunking (see part no. in Technical Note 5068, 04B Consumables - Products).

If the application of exhaust mastic does not fix the leak:

- remove and replace the used exhaust trunking,
- check the condition of the exhaust pipes (condition of the pipe surface, deburring of the area cut, damage to the pipes).
- fit the new trunking in accordance with the instructions given before.

Catalytic converter: Removal - Refitting

K9K

Tightening torques 	
catalytic converter studs on the turbocharger	9 Nm
catalytic converter nuts on the turbocharger	26 Nm
catalytic converter upstream strut bolts on the engine	44 Nm
catalytic converter downstream strut bolts on the gearbox	21 Nm
catalytic converter downstream strut nut on the gearbox	21 Nm
catalytic converter upstream strut bolts on the catalytic converter	26 Nm
catalytic converter downstream strut bolt on the catalytic converter	21 Nm
exhaust pipe bolts on the catalytic converter	21 Nm

PARTS AND CONSUMABLES FOR THE REPAIR

Pièces à remplacer systématiquement :

- air inlet pipe seals,
- the catalytic converter seal on the turbocharger,
- any stud and/or nut on the turbocharger or damaged catalytic converter,
- The exhaust system sealing ring on the catalytic converter.

Ingrédients :

- **ABRASIVE PADS,**
- **SURFACE CLEANER.**

IMPORTANT

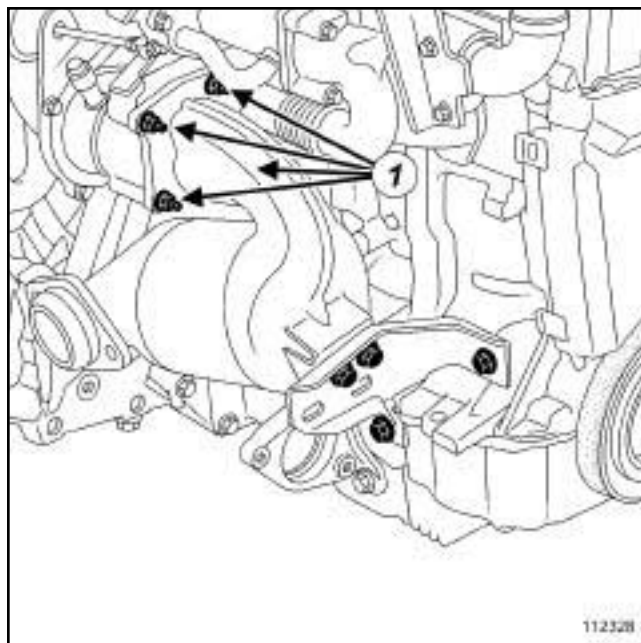
Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **19B, Exhaust, Exhaust: Precautions for the repair, page 19B-8**).

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).
- Disconnect the battery ((see **Battery: Removal - Refitting**)).
- Remove:
 - the windscreen wiper arms ((see **Windscreen wiper arm: Removal - Refitting**)),
 - the scuttle panel grille ((see **Scuttle panel grille: Removal - Refitting**)),
 - the scoop under the scuttle panel grille ((see **Scoop under the scuttle panel grille: Removal - Refitting**)),
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-13**) .

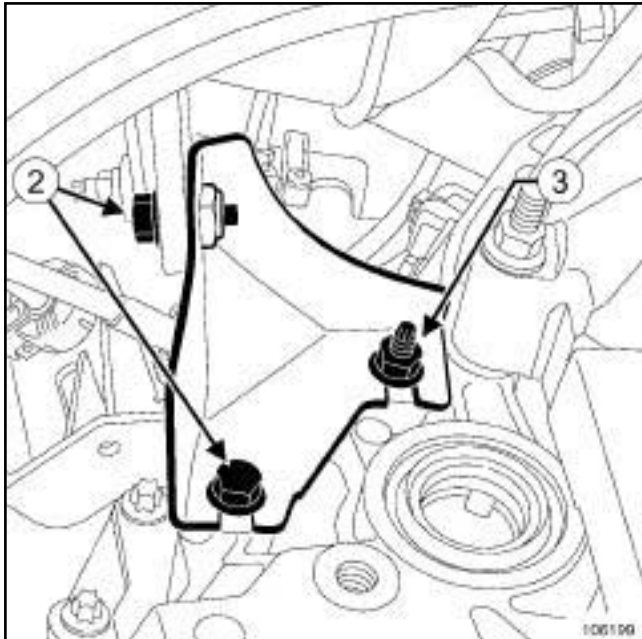
II - OPERATION FOR REMOVAL OF PART CONCERNED

112328
112328

- Remove the catalytic converter bolts (1) on the turbocharger.
- Raise the vehicle.
- Remove the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting, page 19D-18**) .

Catalytic converter: Removal - Refitting

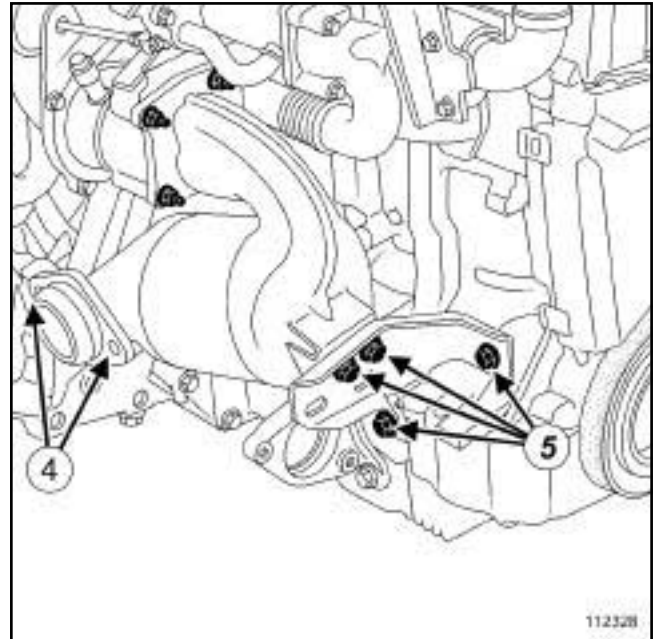
K9K



106199

 Remove:

- the catalytic converter downstream strut bolts (2) ,
- the catalytic converter downstream strut nut (3) .



112328

 Remove:

- the exhaust pipe springs and bolts (4) on the catalytic converter,
 - the sealing ring of the exhaust pipe on the catalytic converter and throw it in the bin.
- Remove the exhaust pipe towards the rear of the vehicle.

Note:

Remove the exhaust pipe from its underbody mountings to push it back further, if necessary.

- Remove the catalytic converter upstream strut bolts (5) .
- Remove the catalytic converter from the studs on the turbocharger.
- Remove the seal between the catalytic converter and the turbocharger and throw it in the bin.

REFITTING**I - REFITTING PREPARATION OPERATION**

- Use **ABRASIVE PADS** to clean the bearing faces:
 - the turbocharger and the catalytic converter,
 - the catalytic converter and the exhaust system.
- Next, clean the bearing faces with **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) and clean cloths.

Catalytic converter: Removal - Refitting

K9K

- If they are replaced, torque tighten the **catalytic converter studs on the turbocharger (9 Nm)**.

II - REFITTING OPERATION FOR PART CONCERNED

- From underneath the vehicle, fit:
 - the catalytic converter on the turbocharger fitted with a new seal between the catalytic converter and the turbocharger,
 - one of the catalytic converter nuts on the turbocharger.

Note:

Check that there is no contact between the catalytic converter and the turbocharger oil return pipe during the entire catalytic converter tightening operation.

- In order, fit (without tightening):
 - the catalytic converter upstream strut bolts on the engine,
 - the catalytic converter downstream strut bolt and nut on the gearbox,
 - the catalytic converter upstream strut bolts on the catalytic converter,
 - the catalytic converter downstream strut bolt on the catalytic converter,
 - the catalytic converter nuts on the turbocharger,
- Torque tighten and in order:
 - the **catalytic converter nuts on the turbocharger (26 Nm)**,
 - the **catalytic converter upstream strut bolts on the engine (44 Nm)**,
 - the **catalytic converter downstream strut bolts on the gearbox (21 Nm)**,
 - the **catalytic converter downstream strut nut on the gearbox (21 Nm)**,
 - the **catalytic converter upstream strut bolts on the catalytic converter (26 Nm)**,
 - the **catalytic converter downstream strut bolt on the catalytic converter (21 Nm)**.
- Fit in order:
 - a new exhaust system sealing ring on the catalytic converter,
 - the exhaust pipe on the catalytic converter,
 - the exhaust pipe springs and bolts on the catalytic converter.

- Torque tighten the **exhaust pipe bolts on the catalytic converter (21 Nm)**.
- Check the following and deal with if necessary:
 - that there is no contact with the underbody,
 - the presence and correct positioning of all the exhaust pipe heat shields.

III - FINAL OPERATION.

- Refit:
 - the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**),
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
 - the scoop under the scuttle panel grille ((see **Scoop under the scuttle panel grille: Removal - Refitting**)),
 - the scuttle panel grille ((see **Scuttle panel grille: Removal - Refitting**)),
 - the windscreen wiper arms ((see **Windscreen wiper arm: Removal - Refitting**)).
- Connect the battery ((see **Battery: Removal - Refitting**)).
- Start the engine.
- Check that there are no leaks and deal with them if necessary.

Catalytic converter: Removal - Refitting

D4F, and 772 – D7F

Special tooling required

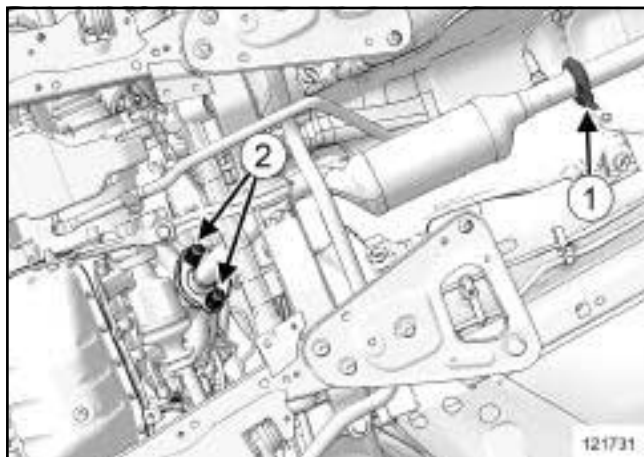
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.
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REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (O2A, Lifting equipment).
- Disconnect the downstream oxygen sensor connector.
- Unclip the wiring harness from the downstream oxygen sensor.
- Disconnect the upstream oxygen sensor connector.
- Unpick the wiring harness from the upstream oxygen sensor.

II - OPERATION FOR REMOVAL OF PART CONCERNED



121731

- Remove:
 - the clip (1) between the catalytic converter and the intermediate pipe,
 - the bolts (2) from the exhaust flange,
 - the catalytic converter,
 - the exhaust pipe sealing ring on the catalytic converter.

Dismantling the catalytic converter

- Using the **(Mot. 1495-01)**, remove:
 - the downstream oxygen sensor,
 - the upstream oxygen sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

Reassembling the catalytic converter

- Using the **(Mot. 1495-01)**, refit:
 - the upstream oxygen sensor,
 - the downstream oxygen sensor.

II - REFITTING OPERATION FOR PART CONCERNED

WARNING

Always replace the sealing ring between the catalytic converter and the exhaust pipe with a new component.


- Refit:
 - the catalytic converter,
 - the exhaust bracket bolts,
 - the clip between the catalytic converter and the intermediate pipe.
- Tighten:
 - the exhaust bracket bolts,
 - the clip between the catalytic converter and the intermediate pipe.

III - FINAL OPERATION

- Clip the upstream oxygen sensor wiring harness into place.
- Connect the upstream oxygen sensor connector.
- Attach the downstream oxygen sensor wiring harness.
- Connect the downstream oxygen sensor connector.

Catalytic converter: Removal - Refitting

D4F, and 780 or 782

Tightening torques 	
catalytic converter lower bracket bolt on the gearbox	44 N.m
bolts of the catalytic converter lower bracket on the engine	25 N.m
side bracket bolts on the catalytic converter	21 N.m
side bracket bolts on the engine	21 N.m
catalytic converter nuts on the turbocharger (initial torque)	20 N.m
catalytic converter nuts on the turbocharger	30 N.m
bolts of the catalytic converter lower bracket on the catalytic converter (initial torque)	20 N.m
bolts of the catalytic converter lower bracket on the catalytic converter	30 N.m
exhaust downpipe bolts	21 N.m
catalytic converter strut nut	21 N.m
catalytic converter strut bolt on the rocker cover	21 N.m

REMOVAL

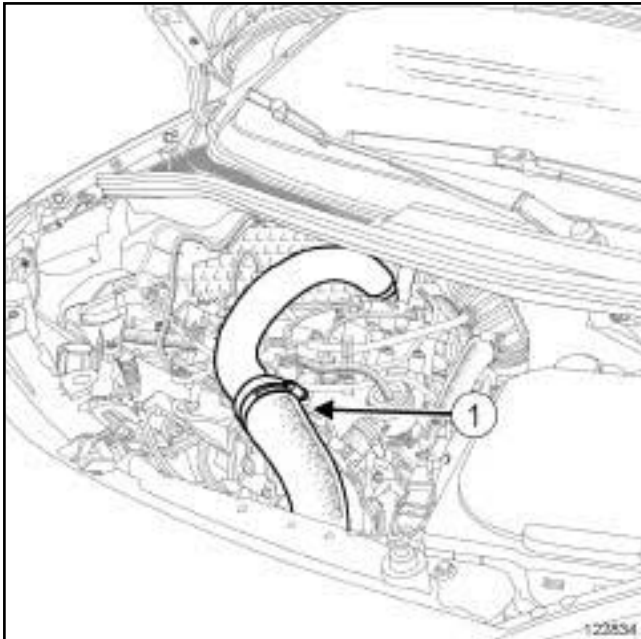
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (MR 411, 80A, Battery).
- Remove:
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,
 - the air filter box strut bolt,

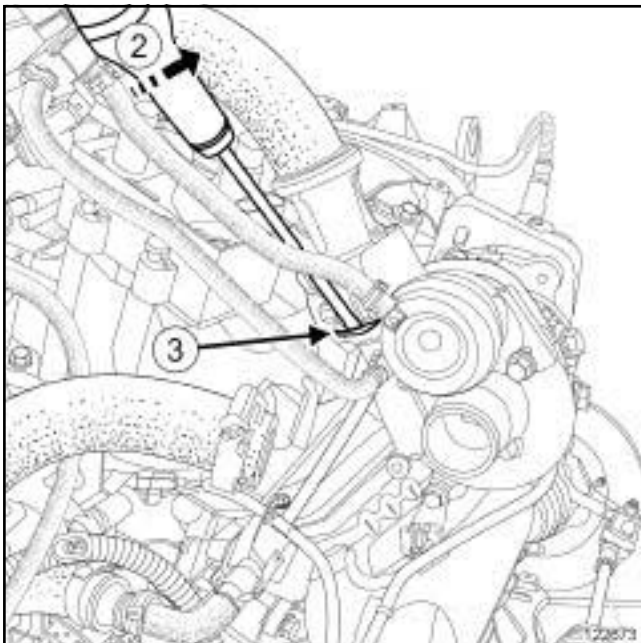
- the air filter box strut,
- the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page 17B-13) .

Catalytic converter: Removal - Refitting

D4F, and 780 or 782



122834



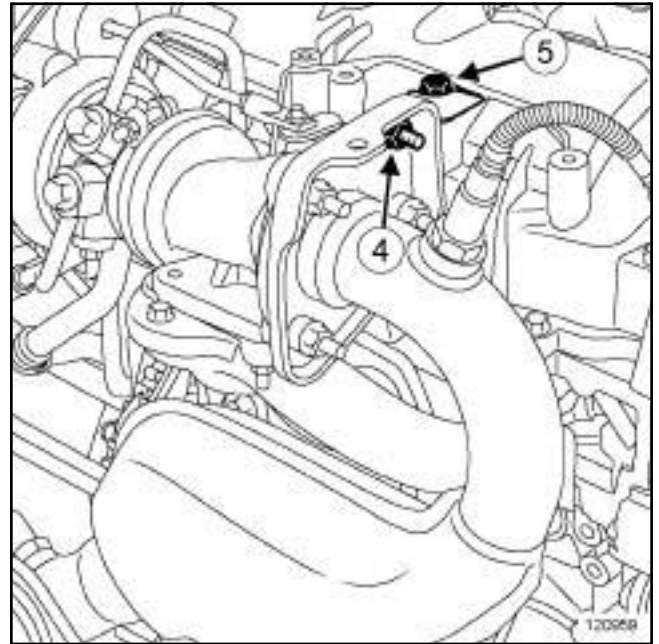
122673

- Remove the turbocharger air outlet rigid pipe bolt (1) from the throttle valve.
- Detach the turbocharger air outlet pipe from the turbocharger in the direction of the arrow (2) .
- Disconnect the turbocharger air outlet pipe from the turbocharger.

Note:

Removing the heat-resistance protector clip (3) requires the turbocharger air outlet pipe to be replaced.

- Move aside the turbocharger air outlet pipe.

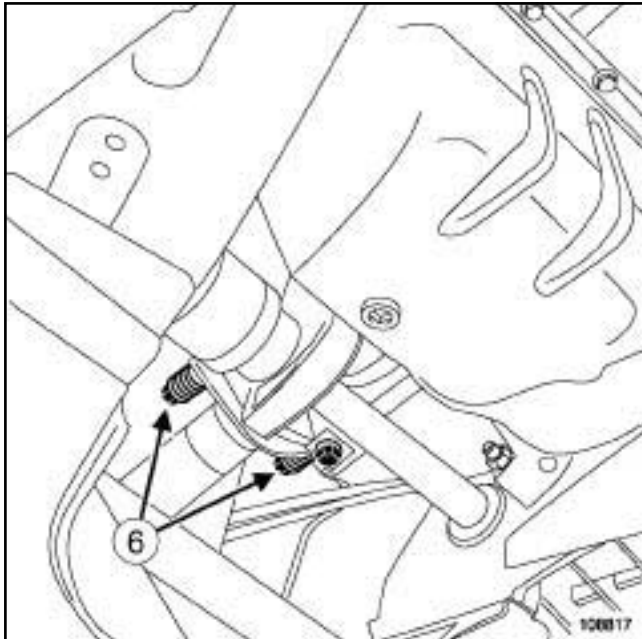


120959

- Remove:
 - the catalytic converter strut nut (4) ,
 - the catalytic converter strut bolt (5) from the rocker cover,
 - the turbocharger strut.
 - the rear suspended engine mounting (see 19D, **Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) .

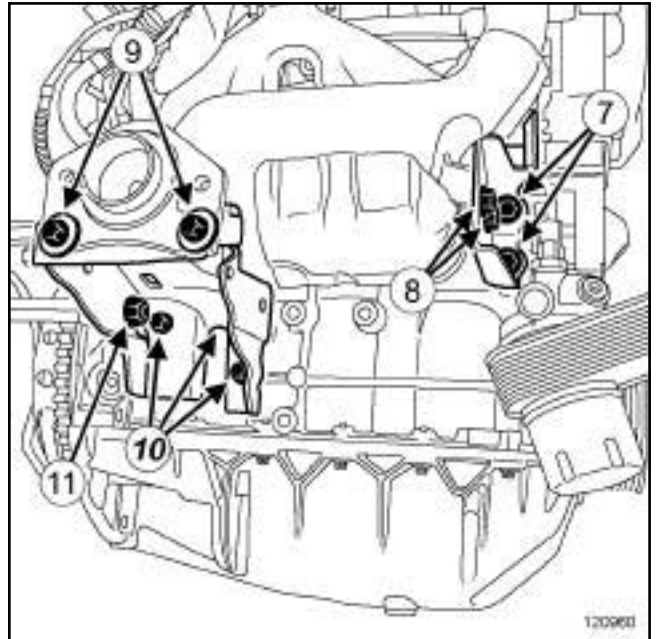
Catalytic converter: Removal - Refitting

D4F, and 780 or 782



108817

- Remove the exhaust bracket bolts (6) at the catalytic converter outlet.
- Undo the intermediate pipe clip.
- Remove the intermediate pipe clip.
- Remove the exhaust downpipe.



120960

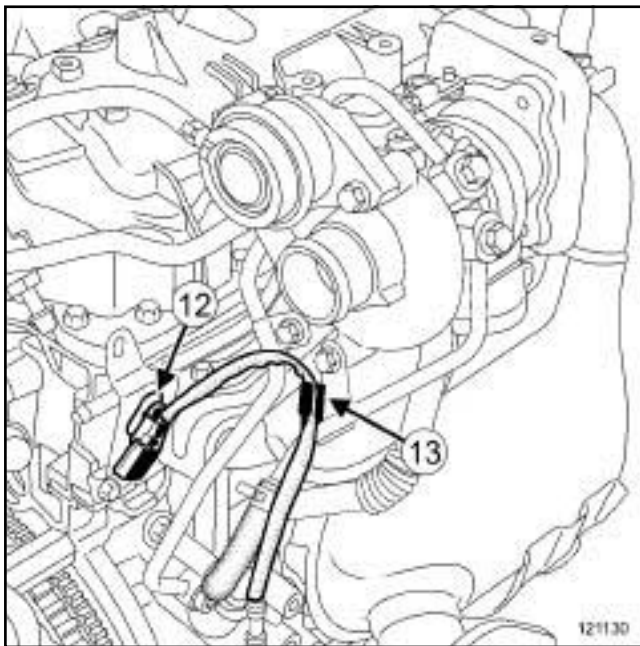
120960

- Remove:
 - the side bracket bolts (7) from the engine,
 - the side bracket bolts (8) from the catalytic converter,
 - the side exhaust bracket from the catalytic converter.
- Loosen the bolts (9) of the catalytic converter lower bracket on the catalytic converter.
- Remove:
 - the bolts (10) of the catalytic converter lower bracket on the engine,
 - the bolt (11) securing the catalytic converter lower bracket on the gearbox,
 - the catalytic converter lower exhaust bracket.

Catalytic converter: Removal - Refitting

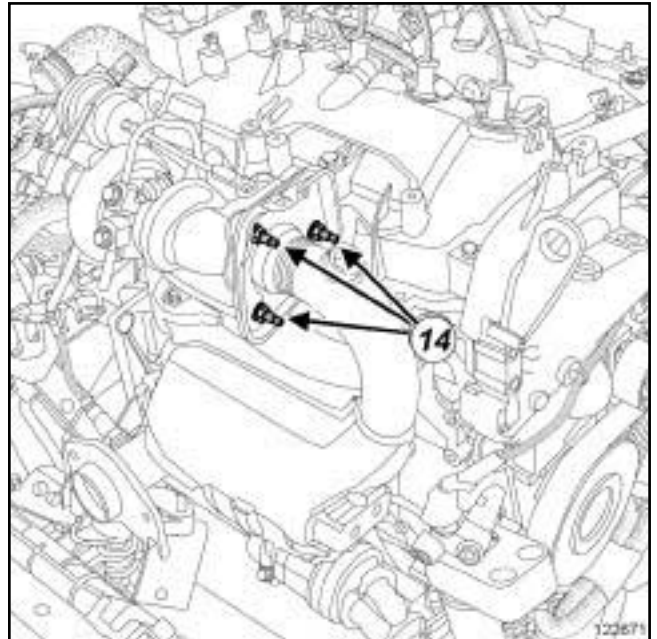
D4F, and 780 or 782

II - OPERATION FOR REMOVAL OF PART CONCERNED



121130

- Disconnect the catalytic converter downstream oxygen sensor connector (12) .
- Unclip the downstream oxygen sensor connector from the catalytic converter.
- Unpick the catalytic converter downstream oxygen sensor wiring harness (13) .



122671

- Remove:
 - the catalytic converter nuts (14) on the turbocharger,
 - the catalytic converter by rotating it while tilting the engine,
 - the catalytic converter seal on the turbocharger.

IMPORTANT

Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

REFITTING**I - REFITTING PREPARATION OPERATION**

- Always replace:
 - the catalytic converter seal,
 - the catalytic converter nuts on the turbocharger.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the catalytic converter seal on the turbocharger,
 - the catalytic converter by rotating it while tilting the engine,

Catalytic converter: Removal - Refitting

D4F, and 780 or 782

- the new nuts with the catalytic converter spacers on the turbocharger.

- Attach the downstream oxygen sensor wiring harness to the catalytic converter.
- Clip on the catalytic converter downstream oxygen sensor connector.
- Connect the catalytic converter downstream oxygen sensor connector.

III - FINAL OPERATION

 Refit:

- the catalytic converter lower exhaust bracket,
- the bracket bolt on the gearbox,
- the bracket bolts on the engine,
- the catalytic converter side exhaust bracket,
- the catalytic converter side bracket bolts,
- the engine side bracket bolts.

 Torque tighten:

- the **catalytic converter lower bracket bolt on the gearbox (44 N.m)**,
- the **bolts of the catalytic converter lower bracket on the engine (25 N.m)**,
- the **side bracket bolts on the catalytic converter (21 N.m)**,
- the **side bracket bolts on the engine (21 N.m)**,
- the **catalytic converter nuts on the turbocharger (initial torque) (20 N.m)**,
- the **catalytic converter nuts on the turbocharger (30 N.m)**,
- the **bolts of the catalytic converter lower bracket on the catalytic converter (initial torque) (20 N.m)**,
- the **bolts of the catalytic converter lower bracket on the catalytic converter (30 N.m)**.

 Refit:

- the exhaust downpipe,
- the intermediate pipe clip.

 Tighten the intermediate pipe clip. Refit the exhaust downpipe bolts on the catalytic converter. Torque tighten the **exhaust downpipe bolts (21 N.m)**. Refit:

- the rear suspended engine mounting (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-18**) ,

- the turbocharger strut.

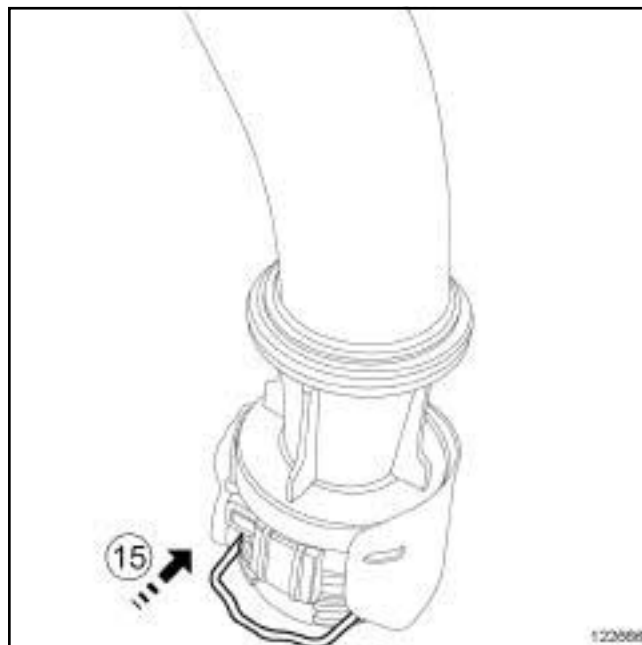
- the catalytic converter strut bolt on the rocker cover,

- the catalytic converter strut nut.

 Torque tighten:

- the **catalytic converter strut nut (21 N.m)**,

- the **catalytic converter strut bolt on the rocker cover (21 N.m)**.



122666

 Position the turbocharger air outlet pipe. Push the turbocharger air outlet pipe clip (15) in the direction of the arrow. Connect the turbocharger air outlet pipe onto the turbocharger. Refit:

- the turbocharger air outlet rigid pipe bolt on the throttle valve,

- the upstream oxygen sensor (see **17B, Petrol injection, Oxygen sensors: Removal - Refitting**, page **17B-13**) ,

- the air filter box strut,

- the air filter box strut bolt,

- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**) .

Catalytic converter: Removal - Refitting

D4F, and 780 or 782

- Connect the battery (see **Battery: Removal - Refitting**) (MR 411, 80A, Battery).

Catalytic converter: Removal - Refitting

K4M

- The catalytic converter cannot be separated from the exhaust manifold.

Replace the "exhaust manifold - catalytic converter" assembly if the catalytic converter is faulty (see **12A, Fuel mixture, Exhaust manifold: Removal - Refitting**, page **12A-48**).

Expansion chamber: Removal - Refitting

D4F, and 780 or 782

Tightening torques 

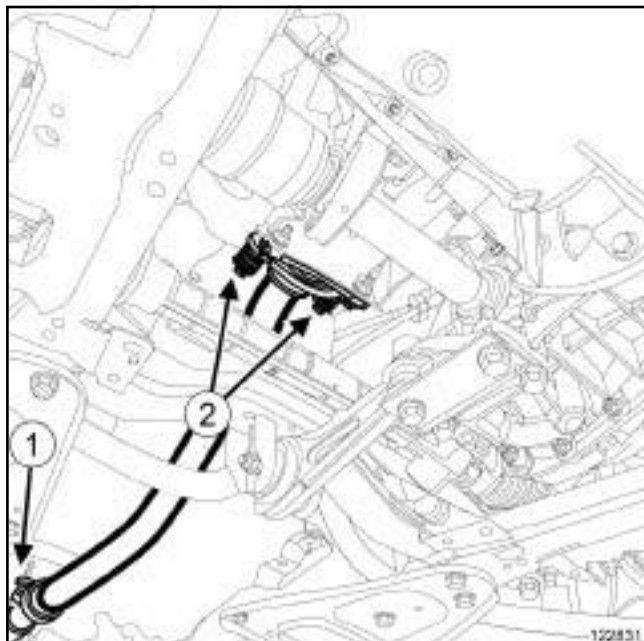
expansion chamber front section bolts on the catalytic converter	21 Nm
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IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **19B, Exhaust, Exhaust: Precautions for the repair, page 19B-8**).

REMOVING THE FRONT SECTION OF THE EXPANSION CHAMBER**I - REMOVAL PREPARATION OPERATION**

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).

II - REMOVAL OPERATION FOR PART CONCERNED

122831

- Remove:
 - the clip (1) between the front section of the expansion chamber and the expansion chamber,
 - the bolts (2) and the springs from the front section of the expansion chamber on the catalytic converter,

- the front section of the expansion chamber,
- the exhaust downpipe sealing ring from the catalytic converter and discard it.

REFITTING THE FRONT SECTION OF THE EXPANSION CHAMBER

- Parts always to be replaced:
 - any stud and/or nut from the damaged catalytic converter,
 - the exhaust system sealing ring on the catalytic converter,
 - clip.

I - REFITTING PREPARATIONS OPERATION

- Using **RUBBING PADS** clean the bearing faces of:
 - on the catalytic converter,
 - on the exhaust system.
- Then, degrease the bearing faces with **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (MR 411, 04B, Consumables - Products).

II - REFITTING OPERATION FOR PART CONCERNED

- Place the front section of the expansion chamber on the catalytic converter fitted with a new sealing ring.
- Refit:
 - the expansion chamber front section bolts and springs on the catalytic converter,
 - a new clip between the front section of the expansion chamber and the expansion chamber,
- Torque tighten the **expansion chamber front section bolts on the catalytic converter (21 Nm)**.

REMOVING THE EXPANSION CHAMBER**I - REMOVAL PREPARATION OPERATION**

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).

II - REMOVAL OPERATION FOR PART CONCERNED

- Remove the clip between the front section of the expansion chamber and the expansion chamber.
- Remove the expansion chamber.

Expansion chamber: Removal - Refitting

D4F, and 780 or 782

- Cut the exhaust pipe (see **19B, Exhaust, Exhaust: Precautions for the repair**, page **19B-8**) in the area designated to be cut (see) .
- Remove:
 - the expansion chamber rubber mounting bush bolt from the body,
 - the expansion chamber,
 - the rubber mounting bush bolt from the expansion chamber,
 - the expansion chamber rubber mounting bush.

Note:

If the rubber mounting bushes are damaged, mark the position of the support on the body, then replace the «support - rubber mounting bush » assembly.

REFITTING THE EXPANSION CHAMBER**I - REMOVAL OPERATION FOR PART CONCERNED**

- Refit:
 - the expansion chamber rubber mounting bush,
 - the expansion chamber rubber mounting bush bolt.

Note:

If replacing the rubber mounting bush, spray the inside of the rubber mounting bush with **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (MR 411, 04B, Consumables - Products) to facilitate fitting.

- Fit the expansion chamber.
- Attach the expansion chamber to the vehicle using the expansion chamber rubber mounting bush bolt.
- Fit a new After-Sales sleeve (see **19B, Exhaust, Exhaust: Precautions for the repair**, page **19B-8**) .
- Tighten the exhaust trunking.
- Tighten the expansion chamber rubber mounting bush bolt on the body.
- Refit a new clip between the front section of the expansion chamber and the expansion chamber.
- Tighten the clip between the front section of the expansion chamber and the expansion chamber.

II - FINAL OPERATION

- Check the following and deal with if necessary:
 - that there is no contact with the underbody,
 - the presence and correct positioning of all the exhaust pipe heat shields.
- Start the vehicle.
- Check that there are no leaks and deal with them if necessary.

Expansion chamber: Removal - Refitting

K4M

Equipment required

roller-type stud removal tool

Tightening torques

catalytic converter studs	7 N.m
catalytic converter bracket nuts	21 N.m

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **19B, Exhaust, Exhaust: Precautions for the repair**, page **19B-8**).

IMPORTANT

Wear protective gloves during the operation.

IMPORTANT

Wear heat protective gloves during the operation.

WARNING

To prevent the surrounding components from overheating, do not damage (tear, pierce bend etc.) a heat shield.

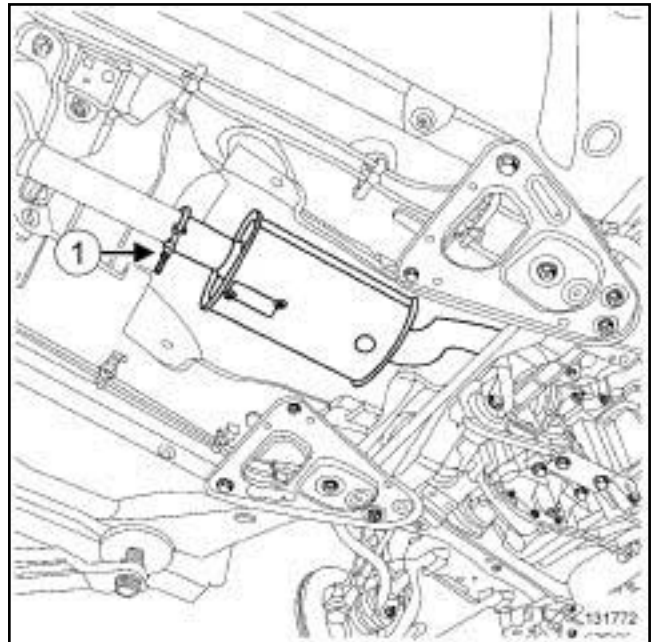
All damaged heat shields must be replaced.

REMOVING THE EXHAUST PIPE FRONT EXPANSION CHAMBER

I - REMOVAL PREPARATION OPERATION

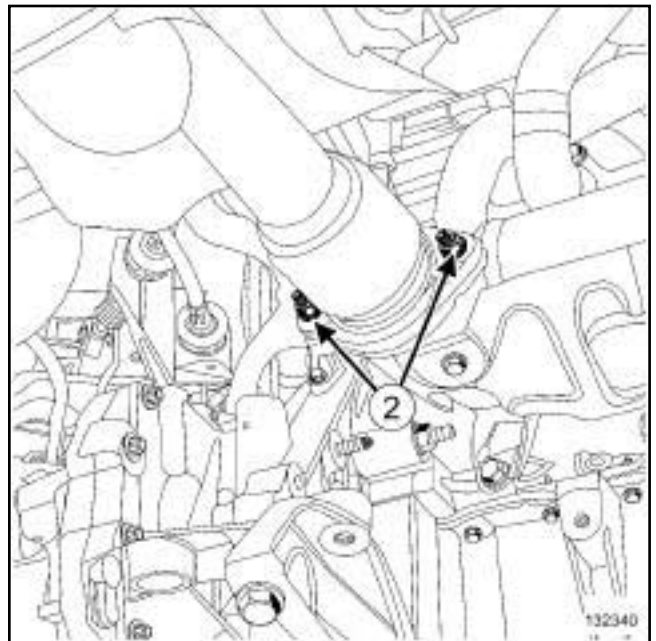
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the engine undertray bolts,
 - the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED



131772

- Remove the expansion chamber clip (1).



132340

- Remove:
 - the nuts (2) on the catalytic converter bracket,
 - the expansion chamber,
 - the catalytic converter seal,
 - the catalytic converter studs using a **roller-type stud removal tool**.

Expansion chamber: Removal - Refitting

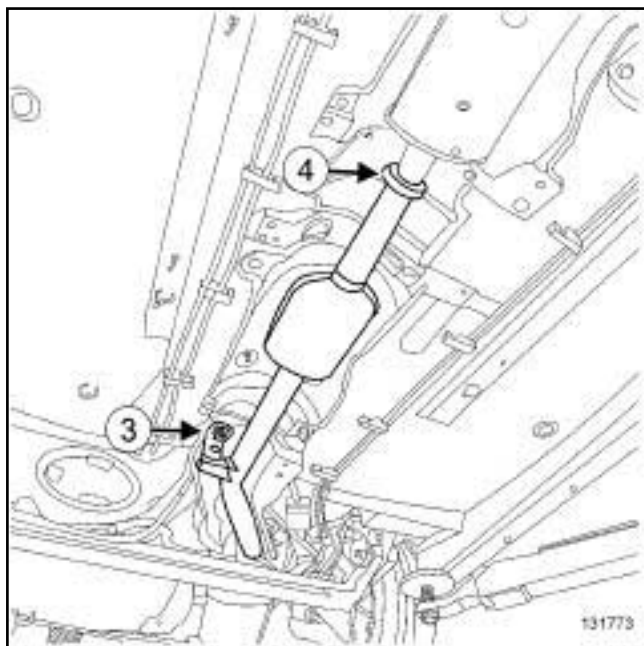
K4M

REMOVING THE EXHAUST PIPE REAR EXPANSION CHAMBER**I - REMOVAL PREPARATION OPERATION**

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Cut the exhaust pipe (see **19B, Exhaust, Exhaust: Precautions for the repair**, page **19B-8**) in the designated cutting area downstream from the expansion chamber (see).



131773

- Remove:
 - the rubber mounting bush bolt (3) ,
 - the clip (4) from the expansion chamber,
 - the expansion chamber.

REFITTING THE EXHAUST PIPE FRONT EXPANSION CHAMBER**I - REFITTING PREPARATION OPERATION**

- Use **ABRASIVE PADS** to clean the bearing faces of the expansion chamber on the catalytic converter (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

- Next, degrease these bearing faces using **SURFACE CLEANER** and clean cloths (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

- Always replace:
 - the catalytic converter seal,
 - the expansion chamber clip,
 - the catalytic converter studs.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit new studs on the catalytic converter.
- Torque tighten the **catalytic converter studs (7 N.m)**.
- Refit:
 - a new catalytic converter seal,
 - the expansion chamber,
 - the clip on the expansion chamber.
- Torque tighten the **catalytic converter bracket nuts (21 N.m)**.
- Tighten the clip bolt while guiding the exhaust pipe to ensure correct alignment.
- Check:
 - that all the exhaust pipe heat shields are in place and properly attached.
 - that there is no contact with the underbody,
 - that there are no leaks.

III - FINAL OPERATION.

- Refit the engine undertray.

REFITTING THE EXHAUST PIPE REAR EXPANSION CHAMBER**I - REFITTING PREPARATION OPERATION**

- Always replace the expansion chamber clip.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the expansion chamber,
 - an expansion chamber clip.

Expansion chamber: Removal - Refitting

K4M

- Fit a new sleeve between the expansion chamber and the silencer (see **19B, Exhaust, Exhaust: Precautions for the repair**, page **19B-8**).

WARNING

Position the « nut and bolt securing the sleeve » assembly so that the assembly cannot come into contact with the underbody.

- Tighten the sleeve while supporting the exhaust pipe to ensure they are aligned.
- Check:
 - that all the exhaust pipe heat shields are in place and properly attached.
 - that there is no contact with the underbody,
 - that there are no leaks.

Intermediate pipe: Removal - Refitting

K9K

Tightening torques 

exhaust pipe bolts on the catalytic converter	21 Nm
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PARTS AND CONSUMABLES FOR THE REPAIR

Pièces à remplacer systématiquement :

- any stud and/or nut from the damaged catalytic converter,
- the exhaust system sealing ring on the catalytic converter,
- clip.

Ingrédients :

- **ABRASIVE PADS,**
- **SURFACE CLEANER.**

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **19B, Exhaust, Exhaust: Precautions for the repair, page 19B-8**).

REMOVING THE FRONT SECTION OF THE INTERMEDIATE PIPE

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove:
 - the exhaust pipe springs and bolts on the catalytic converter,
 - the clip between the front section of the intermediate pipe and the intermediate pipe,
 - the front section of the intermediate pipe,
 - the sealing ring of the exhaust pipe on the catalytic converter and throw it in the bin.

REFITTING THE FRONT SECTION OF THE INTERMEDIATE PIPE

I - REFITTING PREPARATION OPERATION

- Using **RUBBING PADS** clean the bearing faces of:
 - on the catalytic converter,
 - on the exhaust system.
- Next, degrease these bearing faces using **SURFACE CLEANER** ((see **Vehicle: Parts and consumables for the repair**)) and clean cloths.

II - REFITTING OPERATION FOR PART CONCERNED

- Fit the intermediate pipe, fitted with a new sealing ring, onto the catalytic converter.
- Refit a new clip between the front section of the intermediate pipe and the intermediate pipe.
- Refit the exhaust pipe springs and bolts on the catalytic converter.
- Torque tighten the **exhaust pipe bolts on the catalytic converter (21 Nm)**.

REMOVING THE INTERMEDIATE PIPE

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove the clip between the front section of the intermediate pipe and the intermediate pipe.
- Remove the intermediate pipe.
- Cut the exhaust pipe (see **19B, Exhaust, Exhaust: Precautions for the repair, page 19B-8**) in the designated area to be cut (see) .
- Remove:
 - the intermediate pipe rubber mounting bush bolt on the body,
 - the connector pipe,
 - the rubber mounting bush bolt on the intermediate pipe,
 - the intermediate pipe rubber mounting bush.

Intermediate pipe: Removal - Refitting

K9K

REFITTING THE INTERMEDIATE PIPE

REFITTING OPERATION FOR PART CONCERNED

 Refit:

- the rubber mounting bush of the intermediate pipe,
- the rubber mounting bush bolt on the intermediate pipe.

Note:

If replacing the rubber mounting bush, spray the inside of the rubber mounting bush with **BRAKE CLEANER** ((see **Vehicle: Parts and consumables for the repair**)) in the form of an aerosol spray to facilitate fitting.

- Fit the intermediate pipe.
- Attach the intermediate pipe to the vehicle using the intermediate pipe rubber mounting bush bolt.
- Fit a new After-Sales sleeve and follow the instructions (see **19B, Exhaust, Exhaust: Precautions for the repair, page 19B-8**).
- Refit a new clip between the front section of the intermediate pipe and the intermediate pipe.
- Check the following and deal with if necessary:
 - that there is no contact with the underbody,
 - the presence and correct positioning of all the exhaust pipe heat shields.
- Start the engine.
- Check that there are no leaks and deal with them if necessary.

Intermediate pipe: Removal - Refitting

D4F, and 772 – D7F

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Remove the clip between the catalytic converter and the intermediate pipe.
- Remove the intermediate pipe
- Cut the exhaust pipe (see **19B, Exhaust, Exhaust: Precautions for the repair**, page **19B-8**) in the designated area to be cut (see) .
- Remove:
 - the intermediate pipe rubber mounting bush bolt on the body,
 - the connector pipe,
 - the rubber mounting bush bolt on the intermediate pipe,
 - the intermediate pipe rubber mounting bush.

REFITTING

REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the rubber mounting bush of the intermediate pipe,
 - the rubber mounting bush bolt on the intermediate pipe.

Note:

If replacing the rubber mounting bush, spray the inside of the rubber mounting bush with aerosol spray **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to facilitate fitting.

- Fit the intermediate pipe.
- Attach the intermediate pipe to the vehicle using the intermediate pipe rubber mounting bush bolt.
- Fit a new After-Sales sleeve and follow the instructions (see **19B, Exhaust, Exhaust: Precautions for the repair**, page **19B-8**) .
- Refit a new clip between the front section of the intermediate pipe and the intermediate pipe.

- Check the following and deal with if necessary:
 - that there is no contact with the underbody,
 - the presence and correct positioning of all the exhaust pipe heat shields.
- Start the vehicle.
- Check that there are no leaks and deal with them if necessary.

EXHAUST

Silencer: Removal - Refitting

19B

D4F or D7F or K9K

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).

II - REMOVAL OPERATION FOR PART CONCERNED

D4F, and 780

- Remove the expansion chamber rubber mounting bush bolt from the body.
- Cut the exhaust pipe (see **19B, Exhaust, Exhaust: Precautions for the repair**, page **19B-8**) in the designated area to be cut (see).
- Detach the rubber mounting bush rear silencer.
- Remove the rear silencer.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

-

Note:

If replacing the rubber mounting bush, spray the inside of the rubber mounting bush with brake cleaner (see **Vehicle: Parts and consumables for the repair**) (MR 411, 04B, Consumables - products) to facilitate fitting.

- Fit:
 - the rear silencer,
 - the new After-Sales sleeve (see **19B, Exhaust, Exhaust: Precautions for the repair**, page **19B-8**).
- Tighten the exhaust trunking.

D4F, and 780

- Refit the expansion chamber rubber mounting bush bolt on the body.

II - FINAL OPERATION

- Check (and correct if necessary):
 - that there is no contact with the underbody,
 - the presence and correct positioning of all the exhaust pipe heat shields.
- Start the vehicle.
- Check that there are no leaks and deal with them if necessary.

EXHAUST

Silencer: Removal - Refitting

19B

K4M

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **19B, Exhaust, Exhaust: Precautions for the repair, page 19B-8**).

IMPORTANT

Wear heat protective gloves during the operation.

WARNING

To prevent the surrounding components from overheating, do not damage (tear, pierce bend etc.) a heat shield.

All damaged heat shields must be replaced.

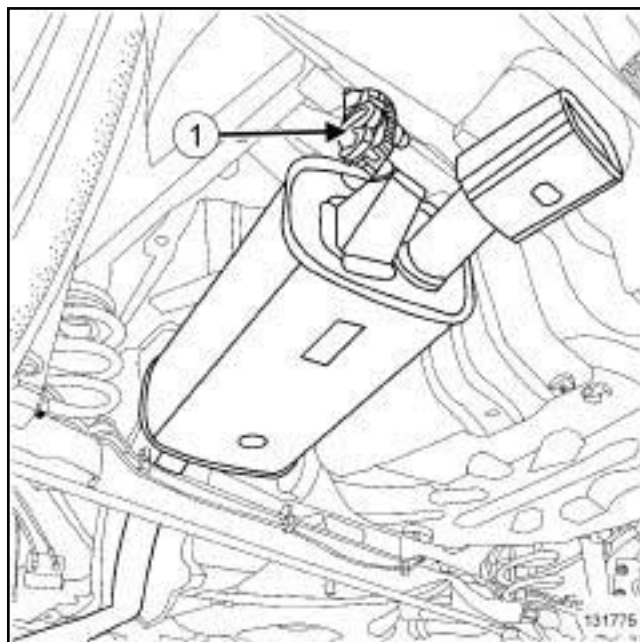
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED

- Cut the exhaust pipe (see **19B, Exhaust, Exhaust: Precautions for the repair, page 19B-8**) in the designated area to be cut (see).



131775

- Unclip the silencer from the rubber mounting bush at (1).
- Remove the silencer.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the silencer.
- Clip the silencer onto the rubber mounting bush.
- Fit a new sleeve between the expansion chamber and the silencer (see **19B, Exhaust, Exhaust: Precautions for the repair, page 19B-8**).

IMPORTANT

Position the « nut and bolt securing the sleeve » assembly so that the assembly cannot come into contact with the underbody.

- Tighten the sleeve while supporting the exhaust pipe to ensure they are aligned.

II - FINAL OPERATION.

- Check:
 - that all the exhaust pipe heat shields are in place and properly attached.
 - that there is no contact with the underbody,
 - that there are no leaks.

TANK

Fuel tank: Draining

19C

K9K

Equipment required

pneumatic transfer pump for fuels

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

WARNING

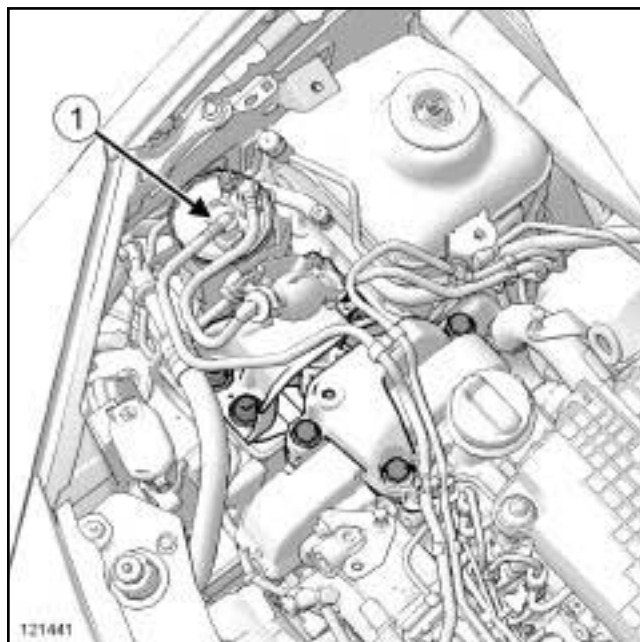
To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

I - DRAINING PREPARATION OPERATION

- Disconnect the battery (see) (MR 441, 80A, Battery).
- Remove the front engine cover.



121441

- Disconnect the engine fuel supply quick-release union (1) from the fuel filter outlet.

II - DRAINING THE FUEL TANK

- Connect a **pneumatic transfer pump for fuels** to the fuel filter outlet.
- Drain the fuel tank.

III - FINAL OPERATION.

- Disconnect the **pneumatic transfer pump for fuels** from the fuel filter.
- Connect the engine fuel filter outlet engine supply quick-release union to the fuel filter.
- Refit the engine cover.
- Connect the battery (see) (MR 441, 80A, Battery).

TANK

Fuel tank: Draining

19C

D4F or D7F or K4M

Special tooling required

Mot. 1311-08 Union for taking fuel pressure measurements.

Equipment required

pneumatic transfer pump for fuels

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

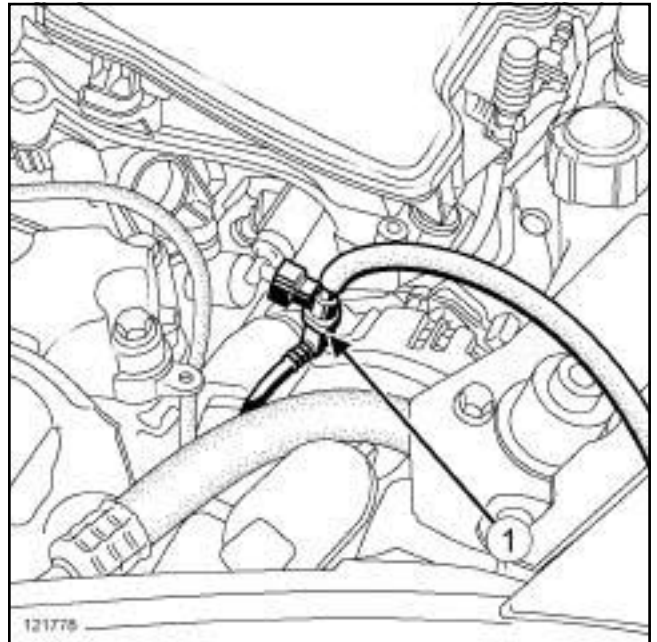
I - DRAINING PREPARATION OPERATION

- Disconnect the battery (see) (80A, Battery).

D4F

- Remove the engine oil filler neck.

D4F



121778

- Disconnect the fuel supply union (1) from the injector rail.
- Fit a T (**Mot. 1311-08**) union.

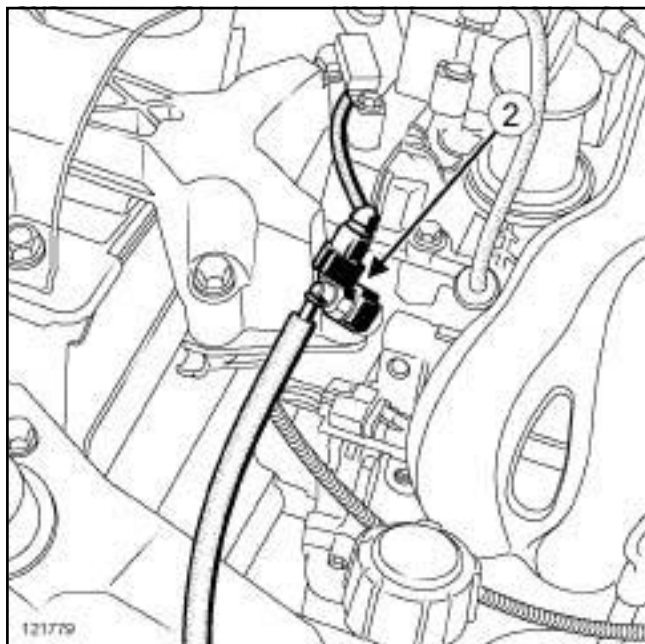
TANK

Fuel tank: Draining

19C

D4F or D7F or K4M

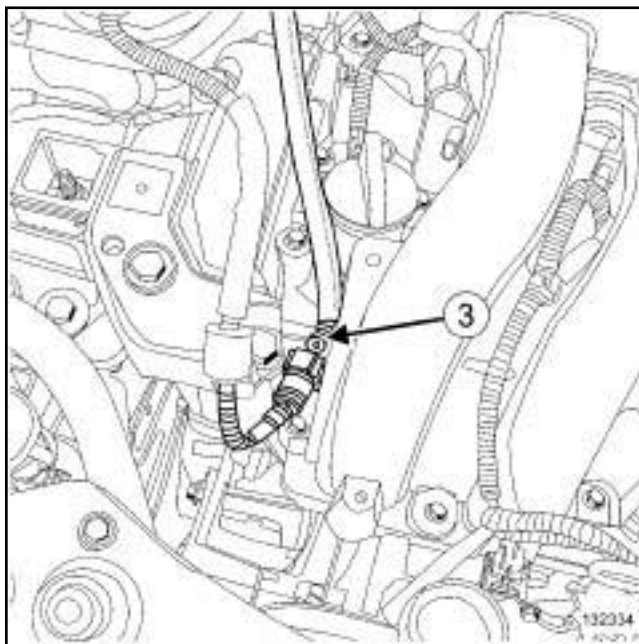
D7F



121779

- Disconnect the fuel supply union (2) from the injector rail.
- Fit a T (Mot. 1311-08) union.

K4M



132334

- Disconnect the fuel supply union (3) from the injector rail.
- Fit a T (Mot. 1311-08) union.

II - TANK DRAINING PROCEDURE

- Connect a **pneumatic transfer pump for fuels** on the outlet of the "T" union.
- Drain the fuel tank.

III - FINAL OPERATION.

- Disconnect the **pneumatic transfer pump for fuels**.
- Remove the "T" union (Mot. 1311-08).
- Connect the fuel supply union.

D4F

- Refit the engine oil filler neck.
- Connect the battery (see) (80A, Battery).

D4F or D7F or K4M or K9K

Equipment required

component support

Tightening torques 

tank bolts	21 N.m
exhaust pipe rubber mounting bush bolt	21 N.m
clip between the catalytic converter and the rear silencer	21 N.m

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

Wear goggles with side protectors for this operation.

WARNING

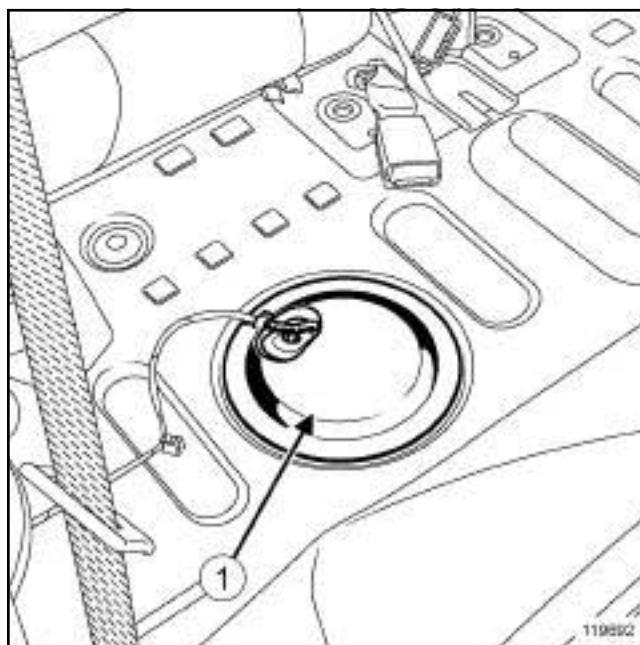
To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL**I - REMOVAL PREPARATION OPERATION**

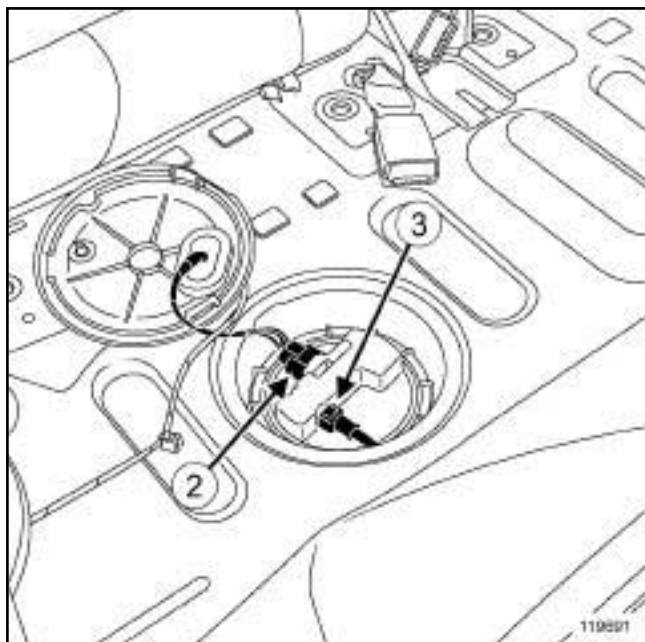
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Drain the fuel tank (see **19C, Tank, Fuel tank: Draining**, page **19C-1**).
- Lift up:
 - the rear bench seat,
 - the carpet.



119692

- Remove the access flap (1) to the fuel level sensor module.

D4F or D7F or K4M or K9K



119691

- Disconnect:
- the fuel level sensor module connector (2) ,
 - the fuel level sensor module pipe union (3) .

WARNING

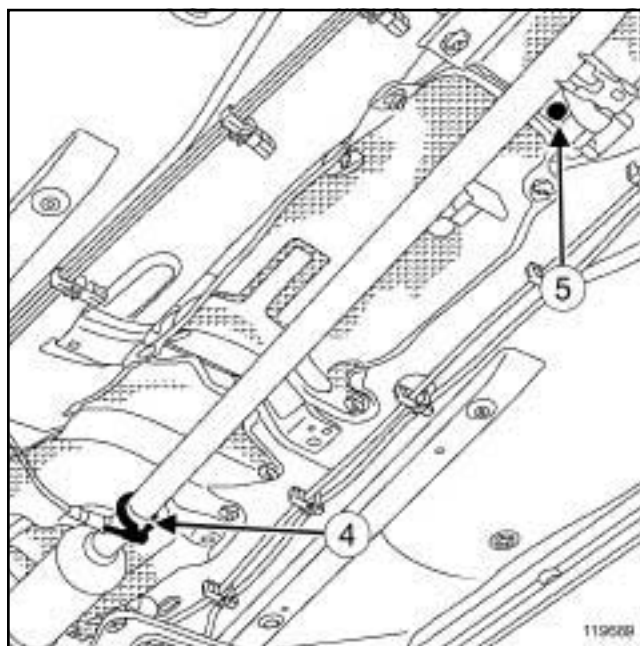
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

- Remove the rear wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

D4F or D7F or K9K

- Remove the rear brake drums (see **Rear brake drum: Removal - Refitting**) (33A, Rear axle components).
- Unclip:
- the handbrake cable from the secondary brake shoe,
 - the handbrake cable from the flange.

D4F or D7F or K9K



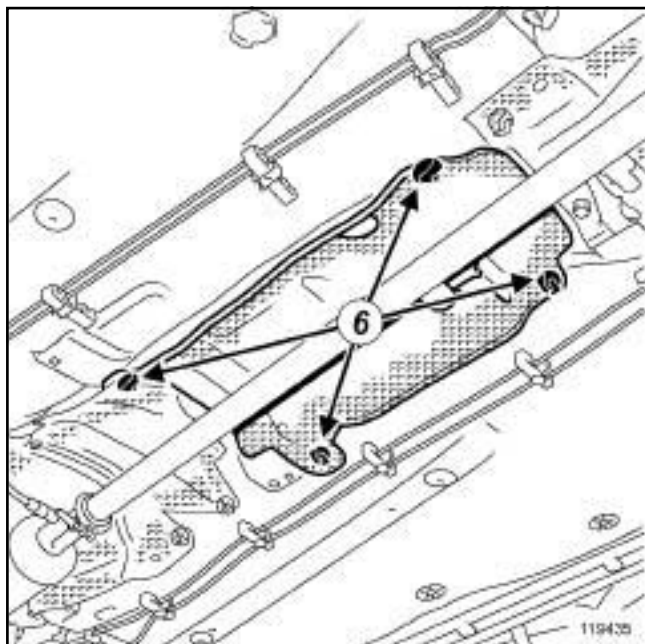
119689

- Remove:
- the clip (4) between the catalytic converter and the rear silencer,
 - the exhaust pipe rubber mounting bush bolt (5) .

Fuel tank: Removal - Refitting

D4F or D7F or K4M or K9K

D4F or D7F or K9K

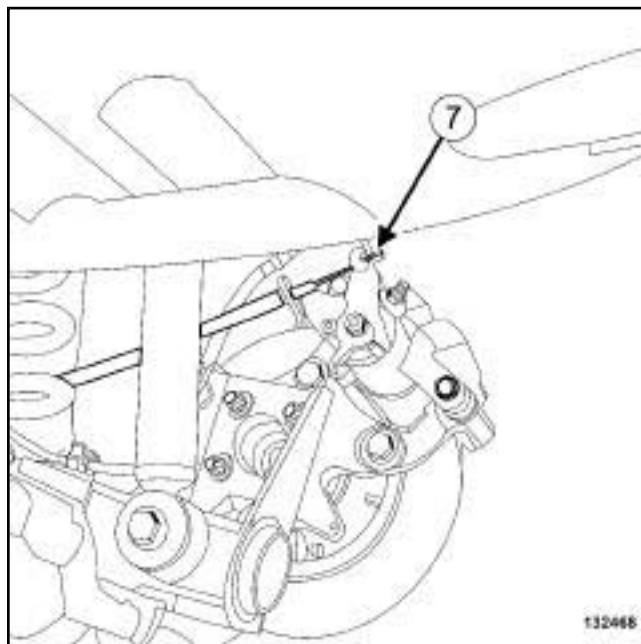


119435

 Remove:

- the heat shield clips (6) under the tank,
- the heat shield under the tank.

K4M



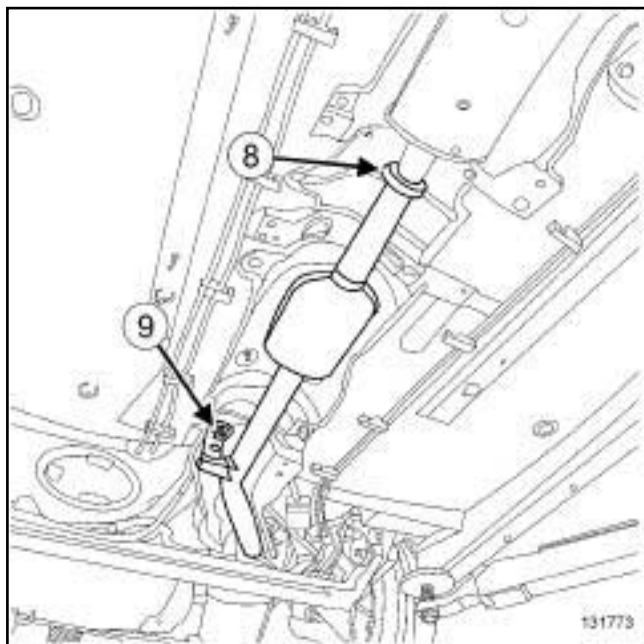
132468

 Release the parking brake lever.

- Unclip the parking brake cables from the callipers at (7).

D4F or D7F or K4M or K9K

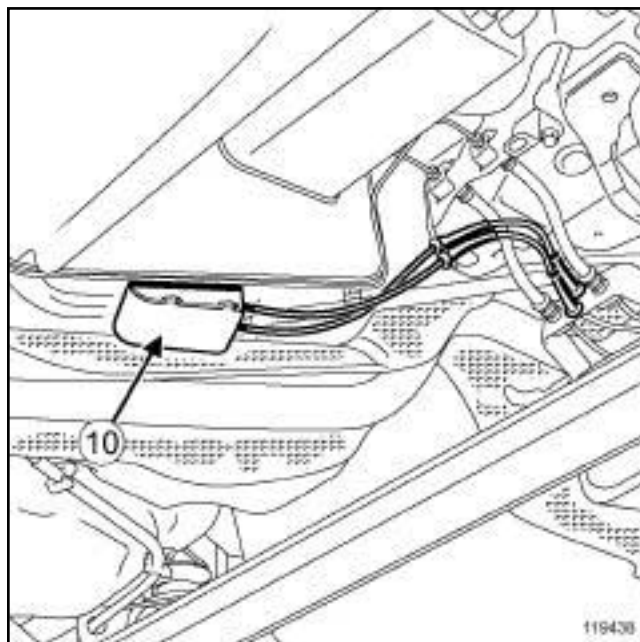
K4M



131773

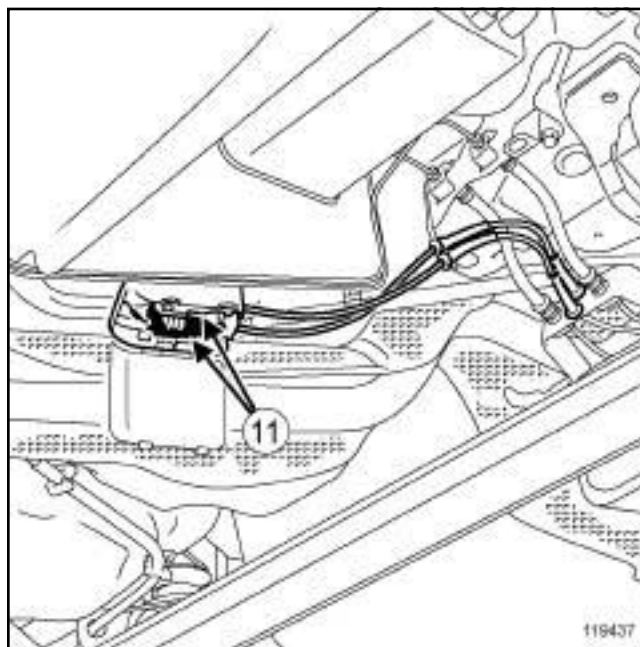
 Remove:

- the clip (8) between the catalytic converter and the expansion chamber,
- the exhaust pipe rubber mounting bush bolt (9) ,
- the heat shield clips under the tank,
- the heat shield under the tank.



119438

-
- Open the ABS sensor connector protective unit (10)

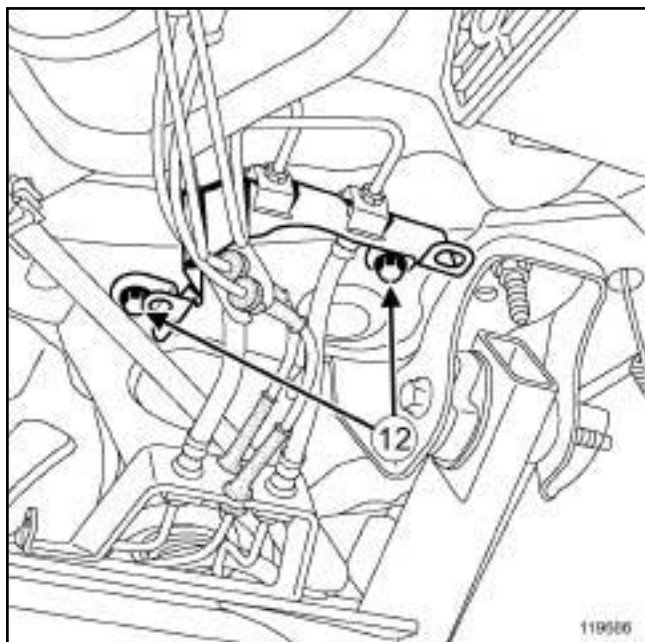


119437

-
- Disconnect the ABS sensor connectors (11) .
-
-
- Detach the anti-lock braking connectors protective housing from the tank.

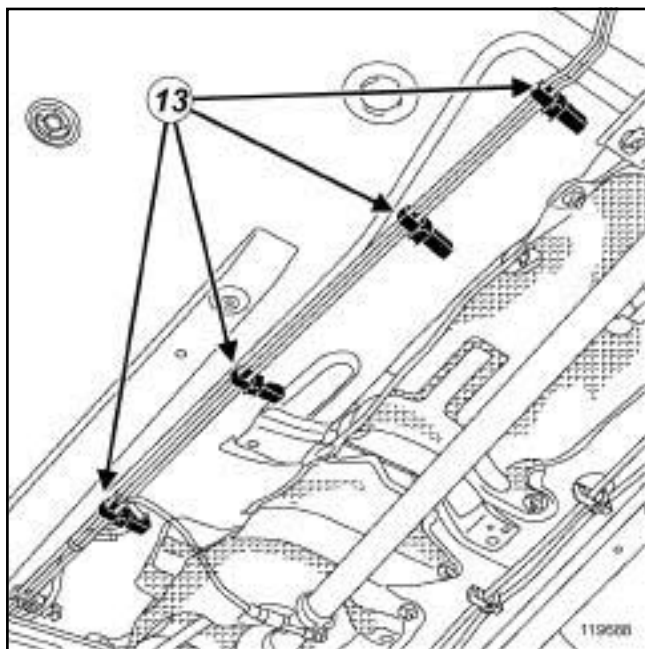
Fuel tank: Removal - Refitting

D4F or D7F or K4M or K9K



119686

- Remove the bolts (12) from the rear brake hose mounting.



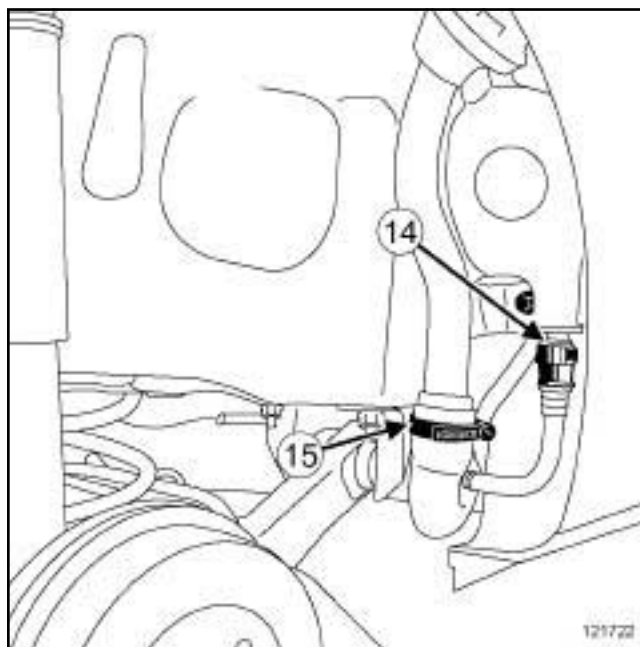
119688

- Detach the brake pipes from the body (13) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

D4F or D7F or K4M

- Remove the fuel vapour absorber (see 14A, Anti-pollution, Fuel vapour absorber: Removal - Refitting, page 14A-4) .



121722

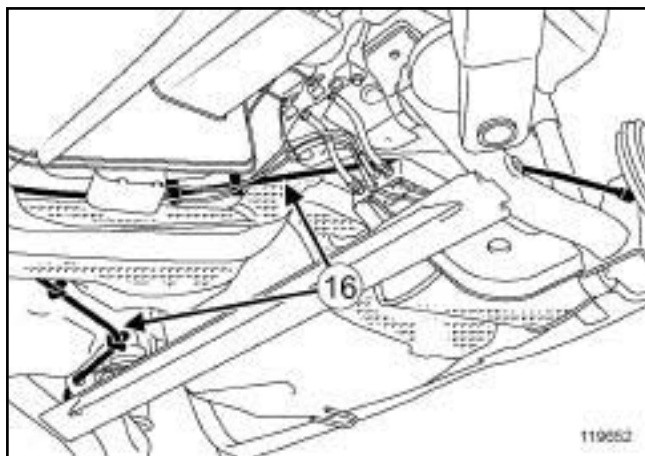
- Disconnect the anti-splashback pipe (14) .
- Remove the clip (15) from the filling pipe.
- Disconnect the filling pipe.

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

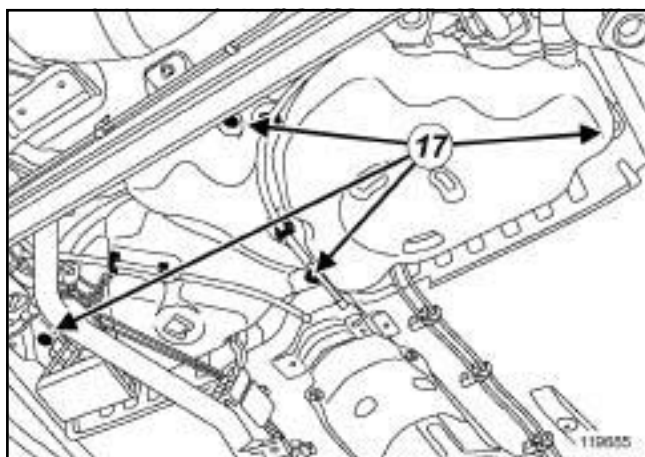
Fuel tank: Removal - Refitting

D4F or D7F or K4M or K9K



119652

- Detach the brake cables (16) on the tank.



119685

- Fit a **component support** under the fuel tank.
- Remove:
 - the tank bolts (17) ,
 - the tank.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the tank.
- Torque tighten the **tank bolts (21 N.m)**.
- Attach the brake cables to the tank.
- Connect the filler pipe.
- Refit the filler pipe clip on the neck.
- Connect the anti-splashback pipe.

D4F or D7F or K4M

- Refit the fuel vapour absorber (see 14A, **Antipollution, Fuel vapour absorber: Removal - Refitting**, page 14A-4) .

II - FINAL OPERATION.

- Connect the brake pipes to the body.
- Refit the rear brake hose mounting bolts.
- Clip the protective housing of the ABS connectors onto the tank.
- Connect the ABS sensor connectors.
- Close the anti-lock braking system sensor connector protective housing.

K4M

- Refit:
 - the heat shield under the tank.
 - the heat shield clips under the tank,
 - the exhaust system rubber mounting bush bolt,
 - the clip between the catalytic converter and the expansion chamber,
- Clip the calliper parking brake cables onto the tank and the callipers.

Fuel tank: Removal - Refitting

D4F or D7F or K4M or K9K

D4F or D7F or K9K

- Refit:
 - the heat shield under the tank,
 - the heat shield clips under the tank
- Tighten to torque:
 - the **exhaust pipe rubber mounting bush bolt (21 N.m)**,
 - the **clip between the catalytic converter and the rear silencer (21 N.m)**.
- Clip:
 - the handbrake cable onto the flange,
 - the handbrake cable onto the secondary brake shoe.
- Refit the rear brake drums (see **Rear brake drum: Removal - Refitting**) (33A, Rear axle components).
- Refit the rear wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect:
 - the fuel level sensor module pipe union,
 - the fuel level sensor module connector.
- Refit the access flap for the fuel level sensor module.
- Refit the rear bench seat.
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

TANK

Filler neck: Removal - Refitting

19C

D4F or D7F or K4M or K9K

Tightening torques

filler neck earth bolt	21 N.m
------------------------	--------

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

WARNING

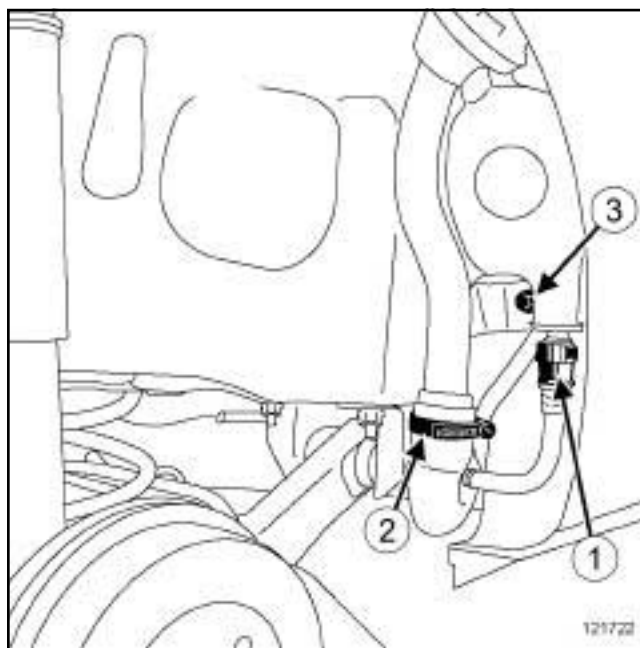
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

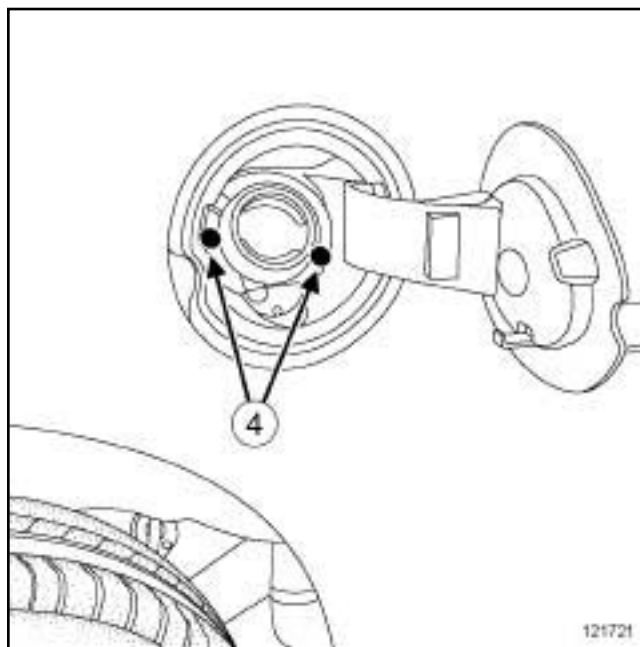
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Drain the fuel tank (see **19C, Tank, Fuel tank: Draining**, page 19C-1) .
- Remove the rear right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

II - OPERATION FOR REMOVAL OF PART CONCERNED



121722

- Disconnect the anti-splashback pipe (1) .
- Remove:
 - the clip (2) from the filling pipe,
 - the filler neck earth bolt (3) .



121721

- Remove:
 - the fuel filler cap from the tank,
 - the bolts (4) from the filler neck on the fuel filler flap,

TANK

Filler neck: Removal - Refitting

19C

D4F or D7F or K4M or K9K

- the filler neck.

REFITTING

I - REFITTING PREPARATION OPERATION

- Always replace the filler pipe clip.

II - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the filler neck,
 - the filler pipe clip,
 - the tank filler cap.
- Torque tighten the **filler neck earth bolt (21 N.m)**.
- Connect the anti-splashback pipe.

III - FINAL OPERATION.

- Refit the rear right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Fuel level sensor module: Removal - Refitting

D4F or D7F or K4M or K9K

Special tooling required

Mot. 1397 Universal spanner for removing fuel gauge nuts.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

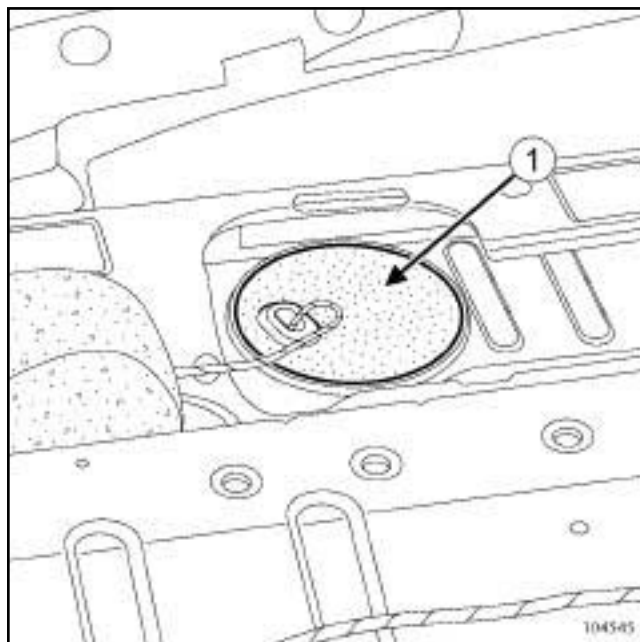
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL**I - REMOVAL PREPARATION OPERATION**

- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Drain the tank (see **19C, Tank, Fuel tank: Draining**, page **19C-1**).
- Lift up:
 - the rear bench seat base (see **Rear bench seat base: Removal - Refitting**) (76A, Rear seat frames and runners),
 - the carpet under the rear bench seat base.



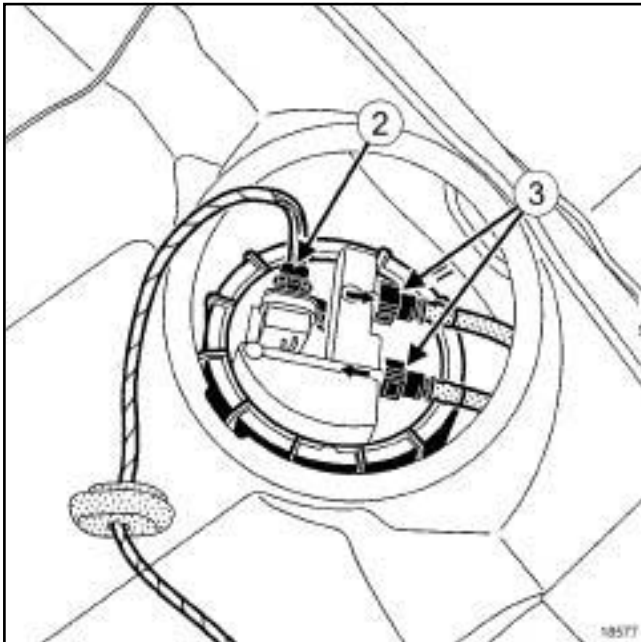
104545

- Remove the inspection flap blanking cover (1).

Fuel level sensor module: Removal - Refitting

D4F or D7F or K4M or K9K

D4F or D7F or K9K



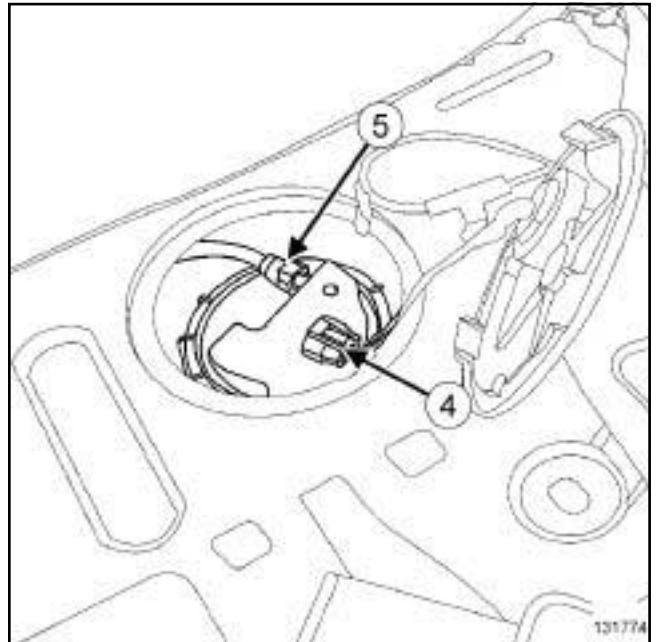
18577

- Disconnect:
- the fuel level sensor module connector (2) ,
 - the fuel pipes (3) .

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

K4M



131774

- Disconnect:
- the fuel level sensor module connector (4) ,
 - the fuel pipe (5) .

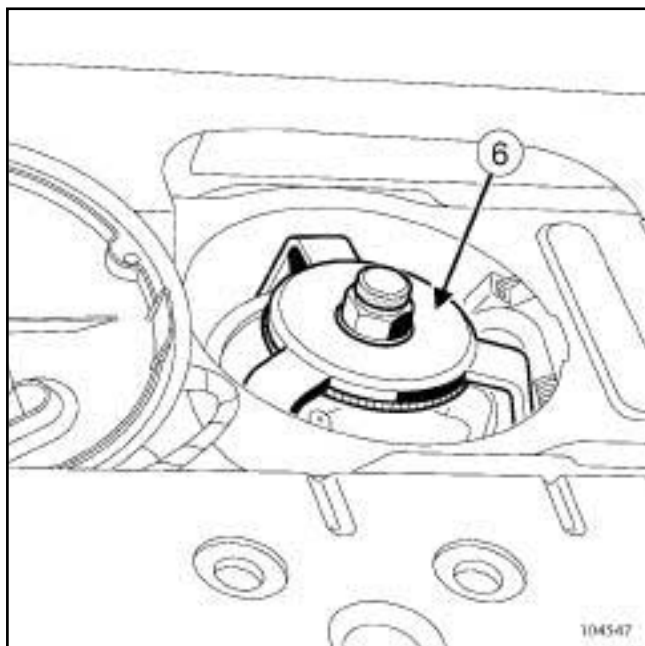
WARNING

Prepare for the flow of fluid, and protect the surrounding components.

Fuel level sensor module: Removal - Refitting

D4F or D7F or K4M or K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



104547

❑ Remove:

- the nut from the fuel level sensor module using the tool (**Mot. 1397**) (6) ,
- the fuel level sensor module.

WARNING

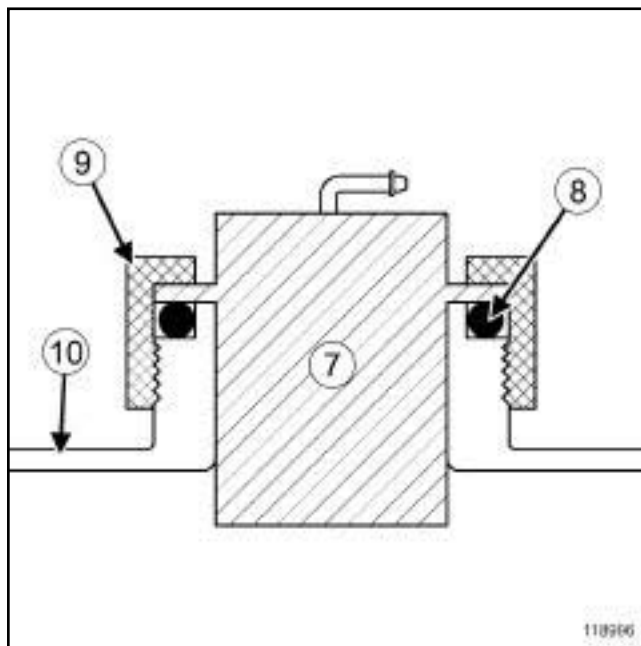
To prevent the tank from deforming, refit the fuel sender unit nut to the tank well immediately.

REFITTING**I - REFITTING PREPARATION OPERATION**

❑ Always replace:

- the nut of the fuel level sensor module,
- the fuel level sensor module seal.

II - REFITTING OPERATION FOR PART CONCERNED



118996

❑ Position:

- the new seal (8) in the neck correctly,
- the fuel level sensor module (7) on the fuel tank (10) .

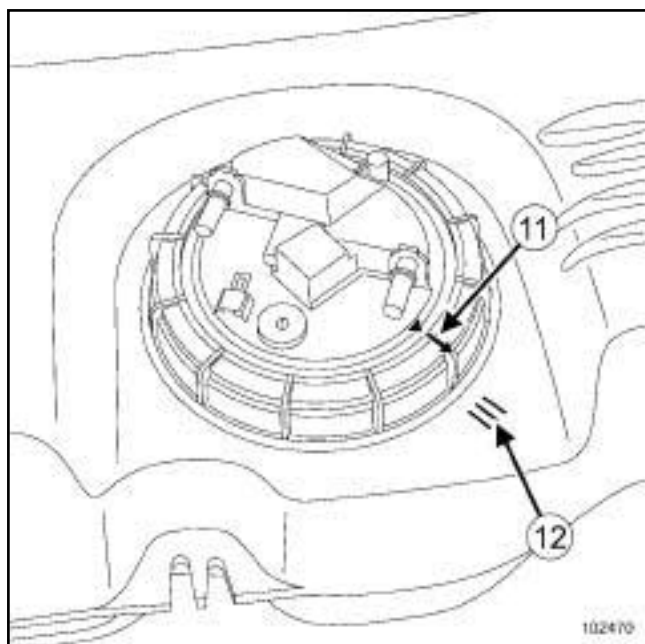
Note:

A lug on the fuel level sensor module and a recess in the fuel tank ensure correct positioning in the fuel tank.

- ❑ Use a hand to press the fuel level sensor module to grip the seal.
- ❑ Manually pretighten the new nut (9) on the fuel tank.

Fuel level sensor module: Removal - Refitting

D4F or D7F or K4M or K9K



102470

- Tighten the fuel level sensor module nut using the tool (**Mot. 1397**) until the nut mark (11) corresponds with the fuel tank mark (12) .

III - FINAL OPERATION

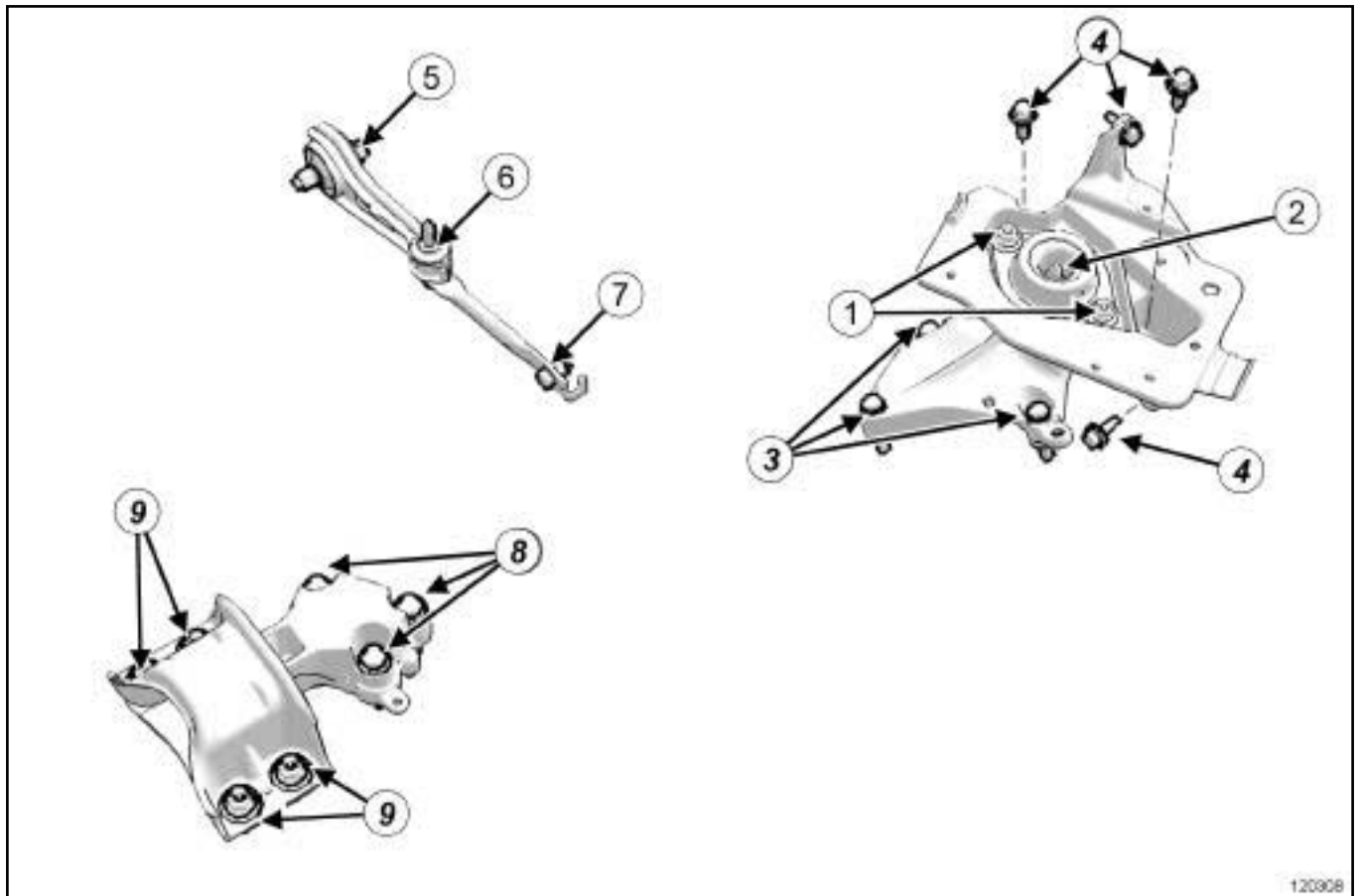
K4M

- Connect:
 - the fuel pipe,
 - the fuel level sensor module connector.

D4F or D7F or K9K

- Connect:
 - the fuel pipes,
 - the fuel level sensor module connector.
- Refit the inspection flap cover.
- Fit:
 - the carpet under the rear bench seat base.
 - the rear bench seat base (see **Rear bench seat base: Removal - Refitting**) (76A, Rear seat frames and runners).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

D4F



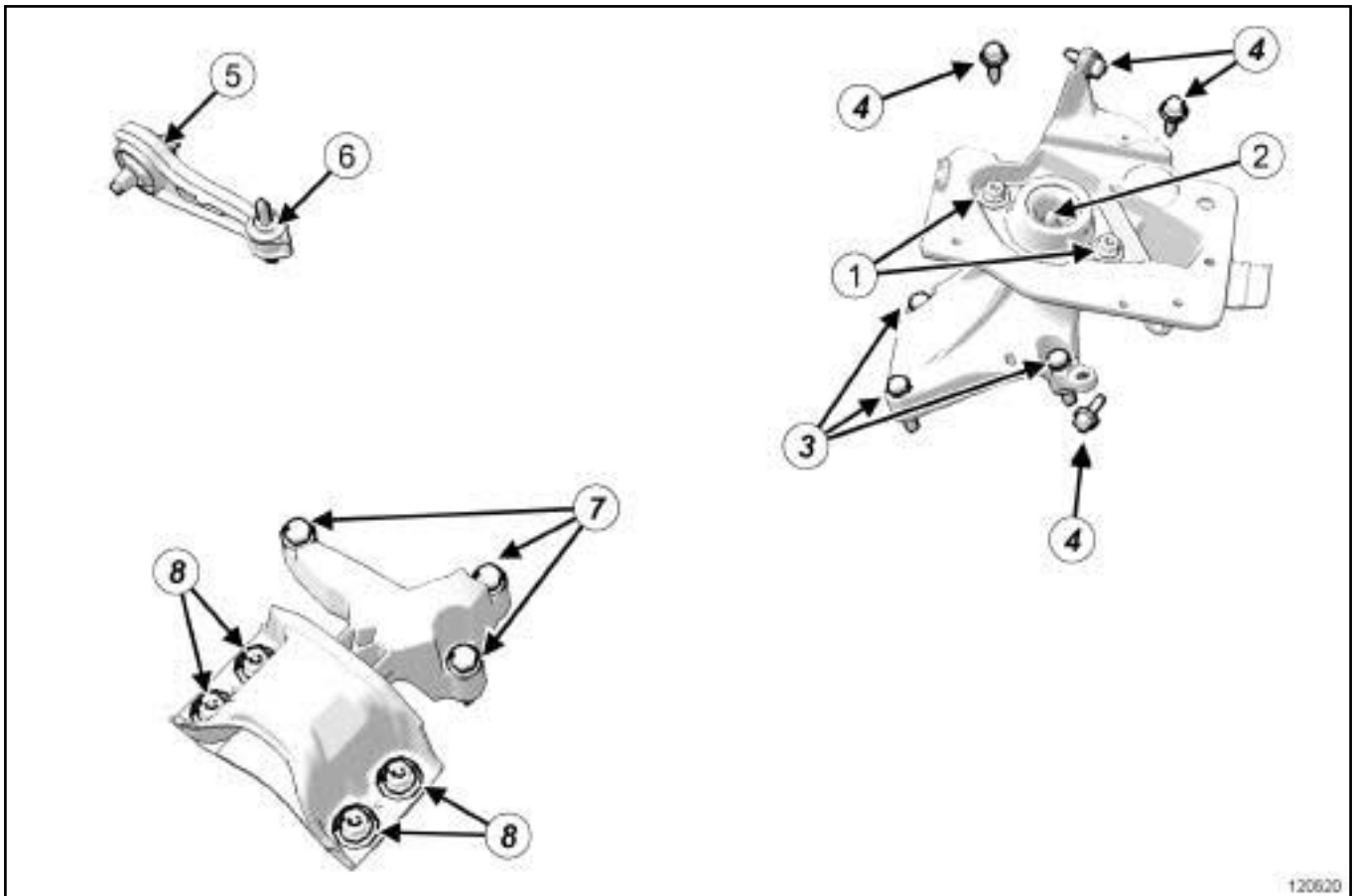
120308

120308

|

No.	Description	Tightening torque (Nm)
(1)	Right-hand rubber pad bolt on the body mounting	62
(2)	Gearbox left-hand rubber pad nut	105
(3)	Left hand suspended mounting bolt on the gearbox	62
(4)	Left-hand suspended mounting support bolt on the body	21
(5)	Lower engine tie-bar bolt on the subframe	105
(6)	Engine tie-bar bolt on the gearbox	105
(7)	Engine tie-bar reinforcement bolts	62
(8)	Right-hand suspended mounting support bolt on the engine	62
(9)	Right-hand suspended mounting support bolt on the body	62

D7F

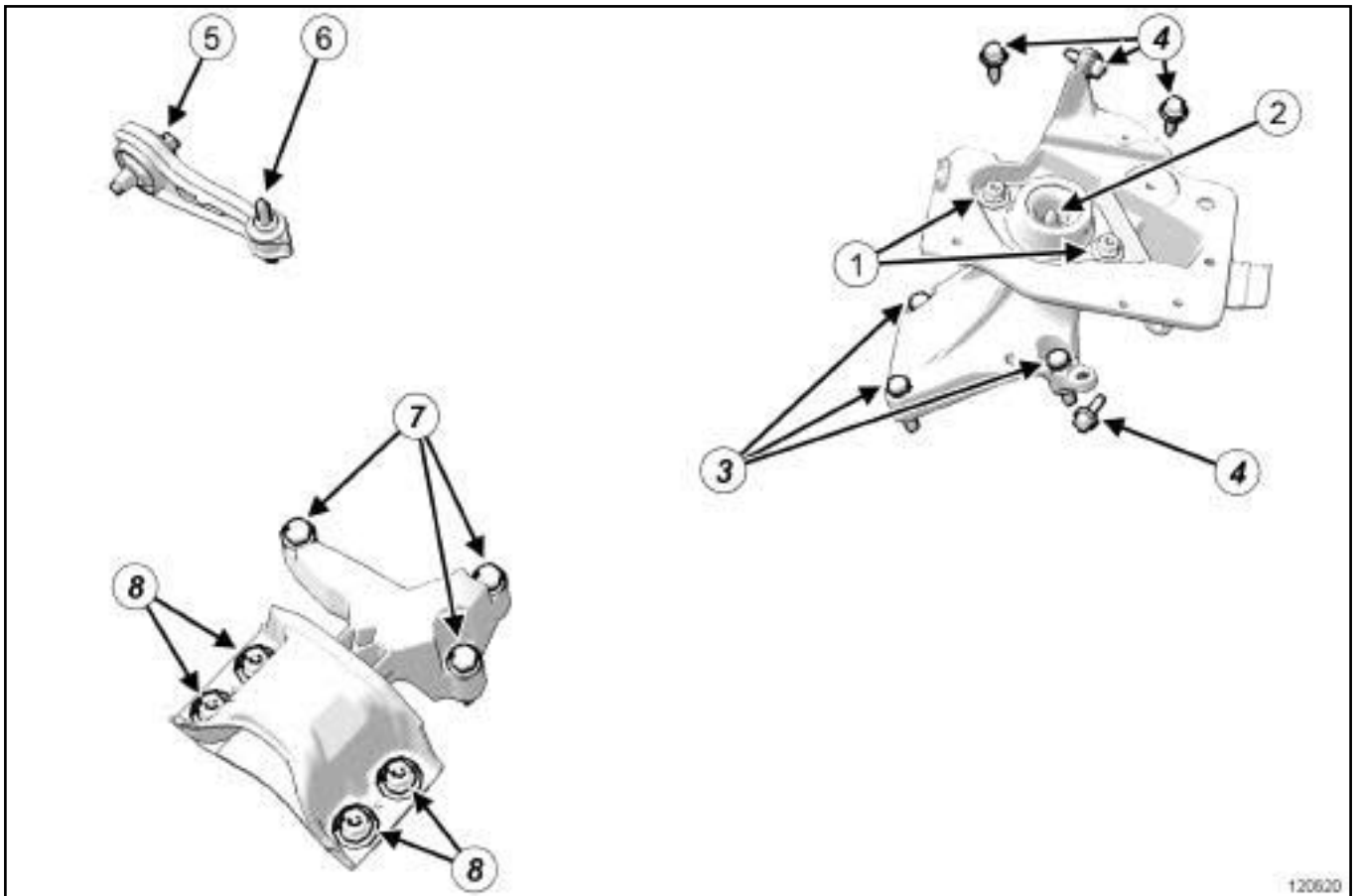


120520

|

No.	Description	Tightening torque (Nm)
(1)	Right-hand rubber pad bolt on the body mounting	62
(2)	Gearbox left-hand rubber pad nut	105
(3)	Left hand suspended mounting bolt on the gearbox	62
(4)	Left-hand suspended mounting support bolt on the body	21
(5)	Lower engine tie-bar bolts on the subframe	105
(6)	Engine tie-bar bolt on the gearbox	105
(7)	Right-hand suspended mounting support bolt on the engine	62
(8)	Right-hand suspended mounting support bolt on the body	62

K9K



120620

120520

|

No.	Description	Tightening torque (Nm)
(1)	Right-hand rubber pad bolt on the body mounting	62
(2)	Gearbox left-hand rubber pad nut	105
(3)	Left hand suspended mounting bolt on the gearbox	62
(4)	Left-hand suspended mounting support bolt on the body	21
(5)	Lower engine tie-bar bolts on the subframe	105
(6)	Engine tie-bar bolt on the gearbox	105
(7)	Right-hand suspended mounting support bolt on the engine	62
(8)	Right-hand suspended mounting support bolt on the body	62

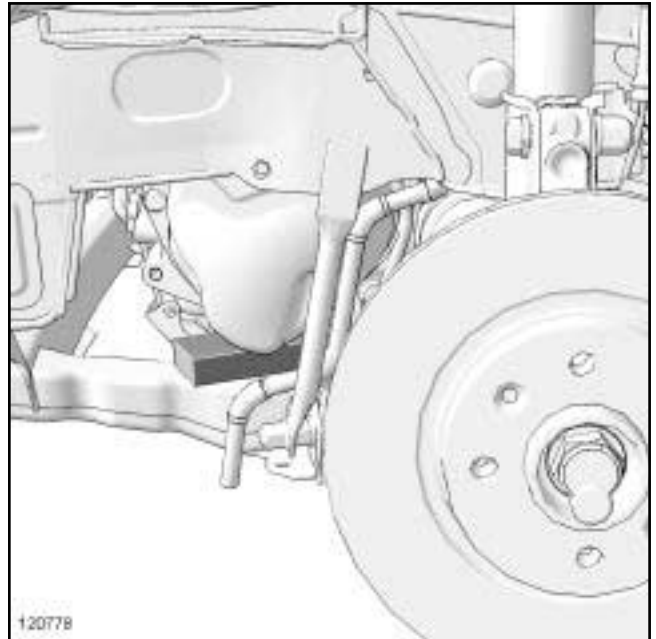
D4F or D7F

Equipment required

indelible pencil

Tightening torques

bolts of the left-hand suspended engine mounting cover	62 N.m
left-hand suspended engine mounting shaft	105 N.m
bolts of the left-hand suspended engine mounting rubber pad support	21 N.m
bolts of the left-hand suspended engine mounting rubber pad	62 N.m
central nut of the left-hand suspended engine mounting shaft	62 N.m



120778

- Put a **20 mm** shim between the gearbox and the front axle subframe.

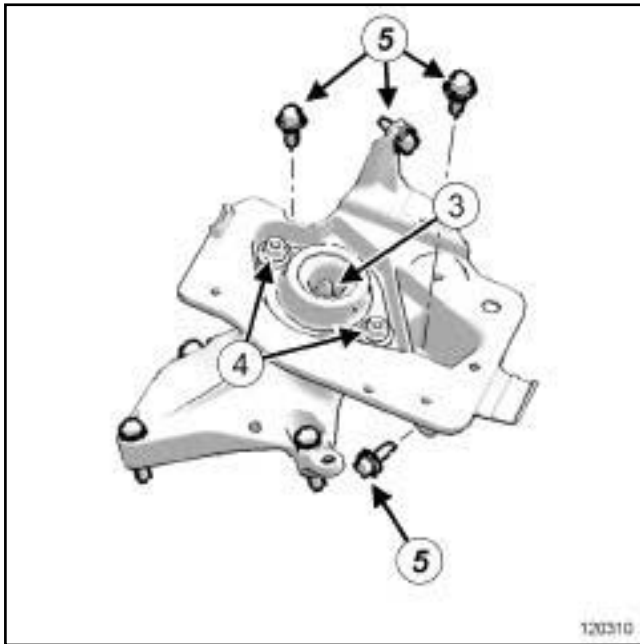
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the battery (see) (80A, Battery),
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the front left-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the petrol injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page **17B-20**),
 - the petrol injection computer mounting bolts,
 - the petrol injection computer mounting nuts.
- Remove:
 - the engine wiring nut,
 - the petrol injection computer mounting.
- Mark the position of the left-hand suspended engine mounting using an **indelible pencil**.

D4F or D7F

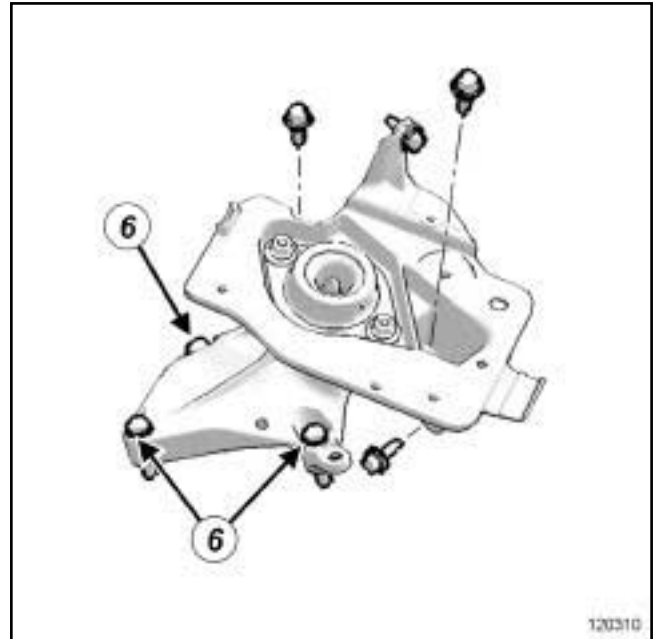
II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove:
 - the central nut (3) from the left-hand suspended engine mounting shaft,
 - the bolts (4) from the left-hand suspended engine mounting rubber pad,
 - the left-hand suspended engine mounting rubber pad,
 - the bolts (5) of the left-hand suspended engine mounting rubber pad support.
- Move the wiring away from the left-hand suspended engine mounting rubber pad support.
- Remove the rubber pad support from the left-hand suspended engine mounting.

JH1

- Remove the electro-hydraulic unit (see **Electro-hydraulic unit: Removal - Refitting**) (21B, Sequential gearbox).



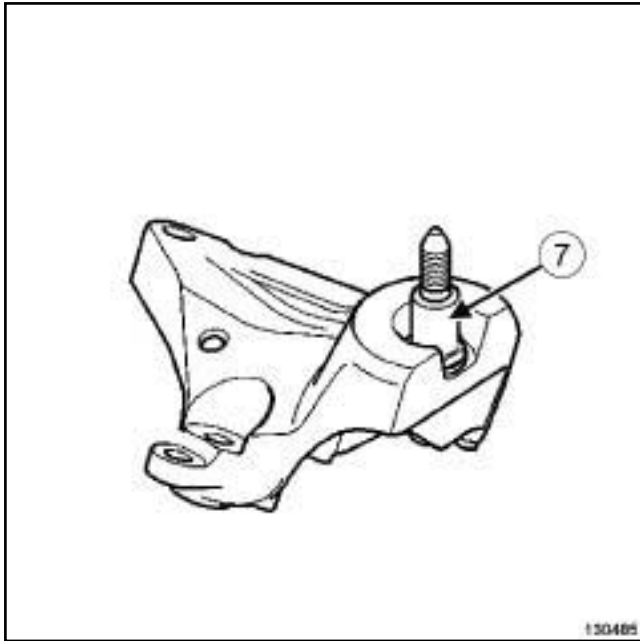
- Remove:
 - the bolts (6) from the left-hand suspended engine mounting cover,
 - the cover from the left-hand suspended engine mounting.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the cover of the left-hand suspended engine mounting.
- Torque tighten the **bolts of the left-hand suspended engine mounting cover (62 N.m)**.

D4F or D7F



130485

- Torque tighten the **left-hand suspended engine mounting shaft (105 N.m) (7)** .

JH1

- Refit the electro-hydraulic unit (see **Electro-hydraulic unit: Removal - Refitting**) (21B, Sequential gearbox).
- Refit the rubber pad support for the left-hand suspended engine mounting.
- Torque tighten the **bolts of the left-hand suspended engine mounting rubber pad support (21 N.m)**.
- Refit the wiring on the left-hand suspended engine mounting rubber pad support.
- Refit:
 - the left-hand suspended engine mounting rubber pad,
 - the central nut of the left-hand suspended engine mounting shaft.
- Torque tighten:
 - the **bolts of the left-hand suspended engine mounting rubber pad (62 N.m)**,
 - the **central nut of the left-hand suspended engine mounting shaft (62 N.m)**.

II - FINAL OPERATION

- Remove the shim between the gearbox and the front axle subframe.
- Refit:
 - the petrol injection computer mounting,
 - the petrol engine wiring nut.
- Refit:
 - the petrol injection computer mounting nuts,
 - the petrol injection computer mounting bolts,
 - the petrol injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page **17B-20**) ,
 - the front left-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the battery (see) (80A, Battery).

K9K

Special tooling required

Mot. 1672 Lower engine support.

Tightening torques

mounting bolt on the suspended engine mounting unit	62 N.m
---	---------------

suspended engine mounting shaft	105 N.m
---------------------------------	----------------

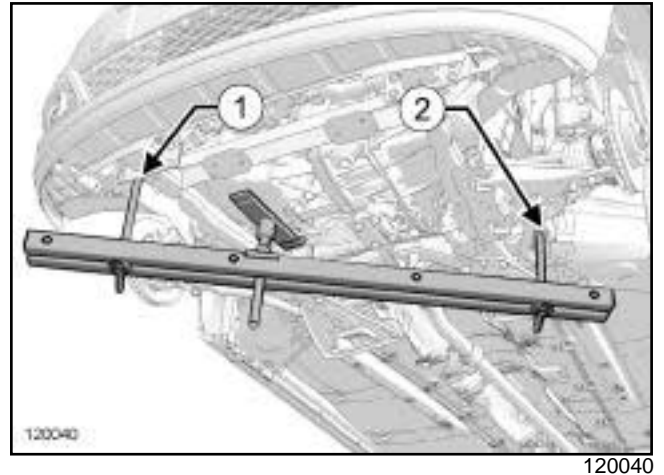
mounting bolts on the suspended engine mounting body	21 N.m
--	---------------

bolts of the suspended mounting rubber pad	62 N.m
--	---------------

suspended engine mounting rubber pad shaft nut	62 N.m
--	---------------

front subframe bolt	62 N.m
---------------------	---------------

rear subframe bolt	105 N.m
--------------------	----------------



Remove:

- the front bolt (1) from the subframe,
- the rear bolt (2) from the subframe.

Position the **(Mot. 1672)**.

- Mark the position of the left-hand suspended engine mounting.

REMOVAL

I - REMOVAL PREPARATION OPERATION

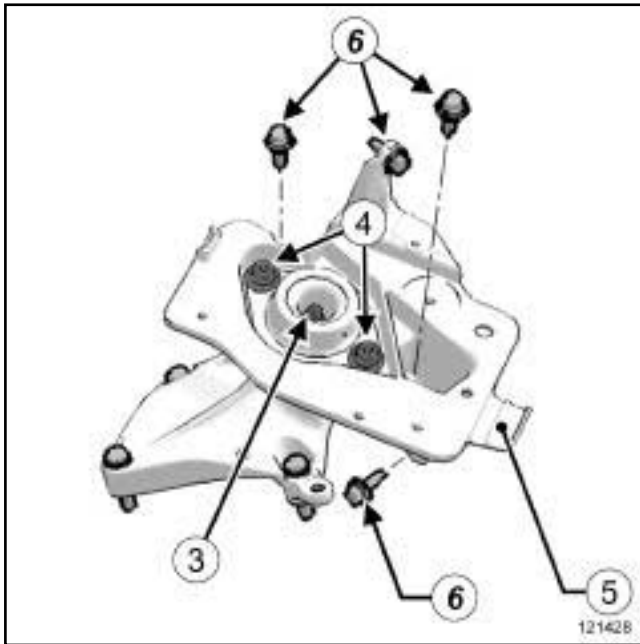
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

Remove:

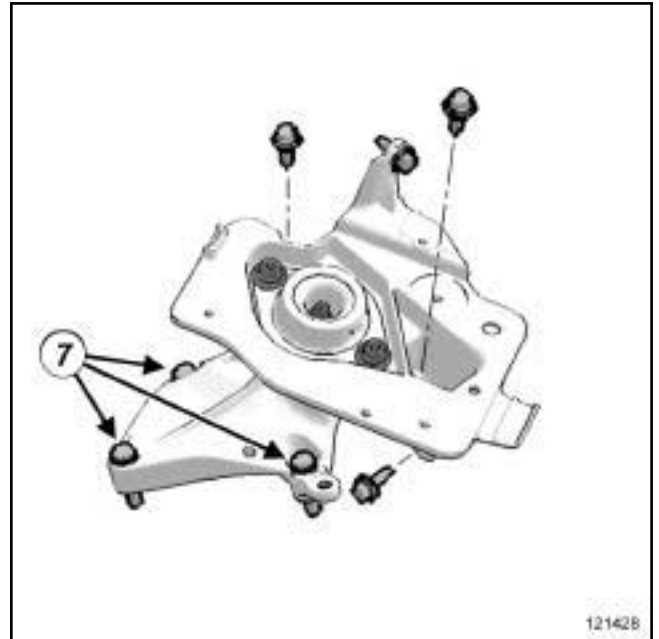
- the battery (see) (80A, Battery)
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the diesel injection computer (see **13B, Diesel injection, Diesel injection computer: Removal - Refitting**, page 13B-13) .

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



- Remove:
 - the central nut (3) of the suspended engine mounting shaft,
 - the bolts (4) of the suspended engine mounting rubber pad,
 - the rubber pad on the suspended engine mounting.
- Cut the electrical wiring clip on the mounting on the suspended engine mounting body (5) .
- Unclip the clutch control pipe on the mounting on the suspended engine mounting body.
- Remove the bolts (6) from the mounting on the suspended engine mounting body.
- Remove the mounting from the suspended engine mounting body.



121428

- Remove:
 - the bolts (7) from the mounting on the suspended engine mounting unit,
 - the mounting on the suspended engine mounting unit.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit the mounting onto the suspended engine mounting unit.
- Torque tighten the **mounting bolt on the suspended engine mounting unit (62 N.m)**.

K9K



130485

- Torque tighten the **suspended engine mounting shaft (105 N.m) (8)** .
- Refit the mounting on the suspended engine mounting body.
- Torque tighten the **mounting bolts on the suspended engine mounting body (21 N.m)**.
- Clip the clutch control pipe onto the mounting on the suspended engine mounting body.
- Refit:
 - the rubber pad on the suspended engine mounting,
 - the suspended engine mounting shaft nut.
- Tighten to torque:
 - the **bolts of the suspended mounting rubber pad (62 N.m)**,
 - the **suspended engine mounting rubber pad shaft nut (62 N.m)**.
- Refit a new electrical wiring clip on the left-hand suspended engine mounting.

II - FINAL OPERATION


- Remove the **(Mot. 1672)**.
- Refit:
 - a new front bolt on the subframe,
 - a new rear bolt on the subframe.
- Tighten to torque:
 - the **front subframe bolt (62 N.m)**,

- the **rear subframe bolt (105 N.m)**.

Refit:

- the diesel injection computer (see **13B, Diesel injection, Diesel injection computer: Removal - Refitting**, page **13B-13**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the battery (see) (80A, Battery).

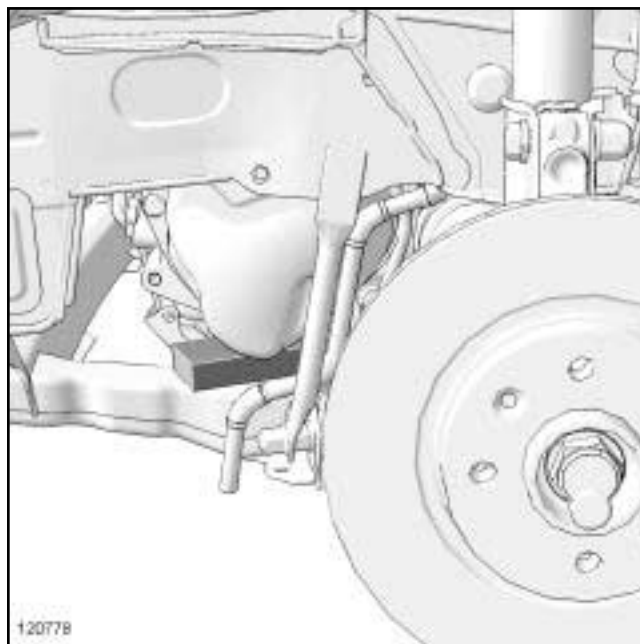
K4M

Tightening torques 	
bolts of the suspended engine mounting support on the gearbox	62 N.m
gearbox suspended engine mounting rubber pad shaft	105 N.m
bolts of the suspended engine mounting support on the body	21 N.m
bolts of the suspended mounting rubber pad	62 N.m
suspended engine mounting shaft nut	62 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
 - the battery (see **Battery: Removal - Refitting**) (80A, Battery),
 - the petrol injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page **17B-20**),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-13**),
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the front left-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).
- Mark the position of the left-hand suspended engine mounting.

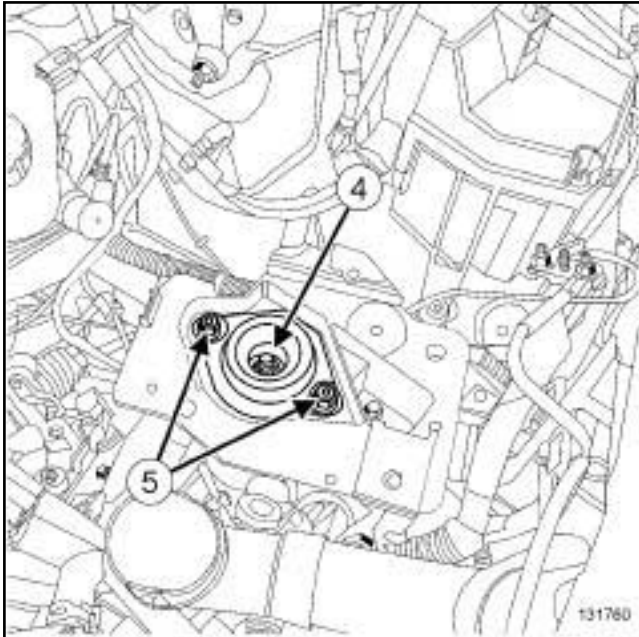


120778

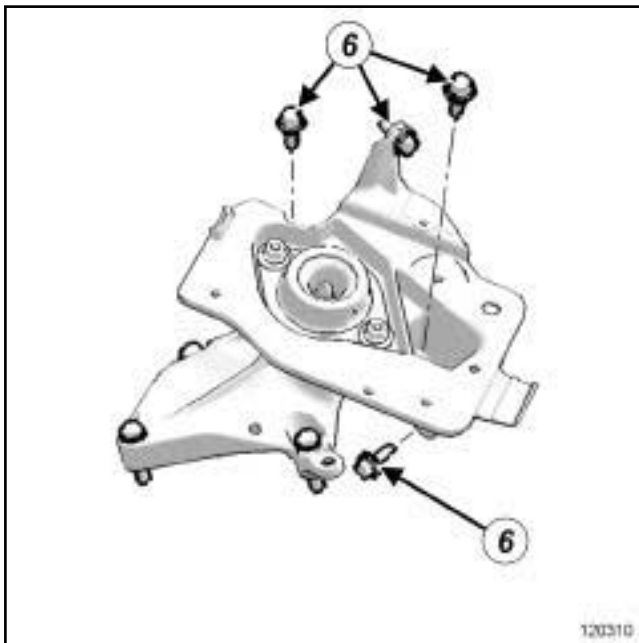
- Put a **20 mm** shim between the gearbox and the sub-frame.

K4M

II - REMOVAL OPERATION



131760

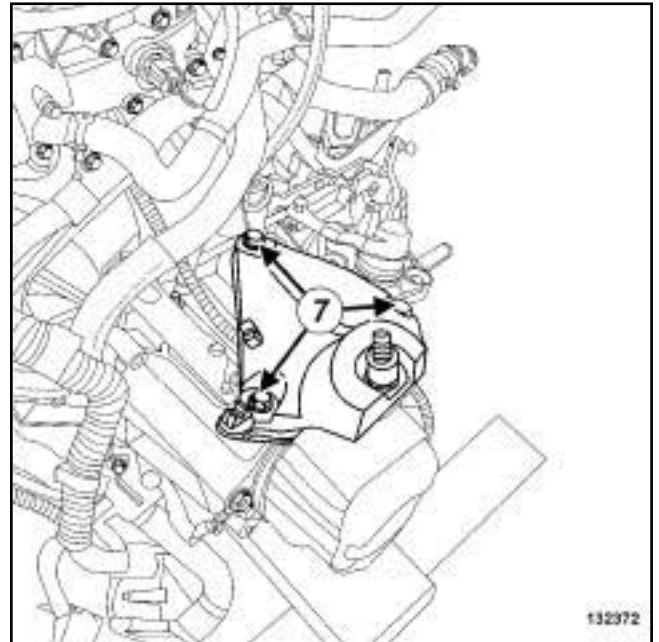


120310

- Remove:
 - the suspended engine mounting shaft nut (4) ,
 - the bolts (5) of the suspended engine mounting rubber pad,
 - the rubber pad on the suspended engine mounting,
 - the bolts (6) from the suspended engine mounting support on the body.
- Move aside the wiring from the suspended engine mounting support on the body.
- Remove the suspended engine mounting support on

the body.

- Unclip the clutch pipe from the suspended engine mounting support on the gearbox.



132372

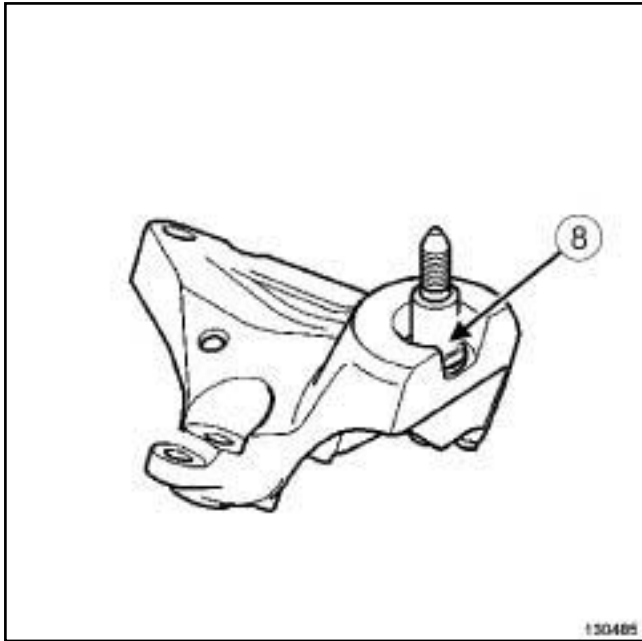
- Remove:
 - the bolts (7) from the suspended engine mounting support on the gearbox,
 - the suspended engine mounting support on the gearbox.

REFITTING

I - REFITTING OPERATION

- Refit the suspended engine mounting support on the gearbox.
- Torque tighten the **bolts of the suspended engine mounting support on the gearbox (62 N.m)**.
- Clip the clutch pipe onto the suspended engine mounting support on the gearbox.
- Refit the suspended engine mounting support on the body.

K4M



130485

- Torque tighten:
 - the **gearbox suspended engine mounting rubber pad shaft (105 N.m) (8)** ,
 - the **bolts of the suspended engine mounting support on the body (21 N.m)**.
- Fit the wiring of the suspended engine mounting support on the body.
- Refit the suspended engine mounting rubber pad.
- Torque tighten:
 - the **bolts of the suspended mounting rubber pad (62 N.m)**,
 - the **suspended engine mounting shaft nut (62 N.m)**.

II - FINAL OPERATION

- Remove the shim between the gearbox and the sub-frame.
- Refit:
 - the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the front left-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
 - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-13) ,

- the petrol injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page 17B-20) ,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

C44, and K9K

Special tooling required

Mot. 1672 Lower engine support.

Tightening torques

right-hand suspended engine mounting bolts on the engine	62 Nm
--	--------------

right-hand suspended engine mounting bolts on the body	62 Nm
--	--------------

axle sub-frame front bolts	62 Nm
----------------------------	--------------

axle sub-frame rear bolts	105 Nm
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PARTS AND CONSUMABLES FOR THE REPAIR WORK

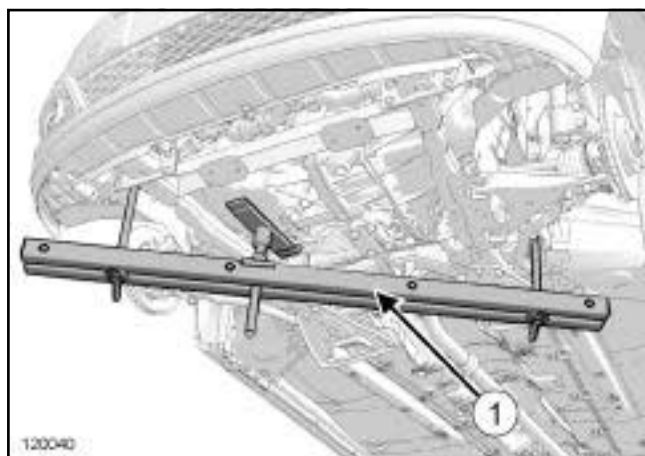
Parts always to be replaced:

- axle sub-frame bolt.

REMOVAL

I - REMOVAL PREPARATION OPERATION

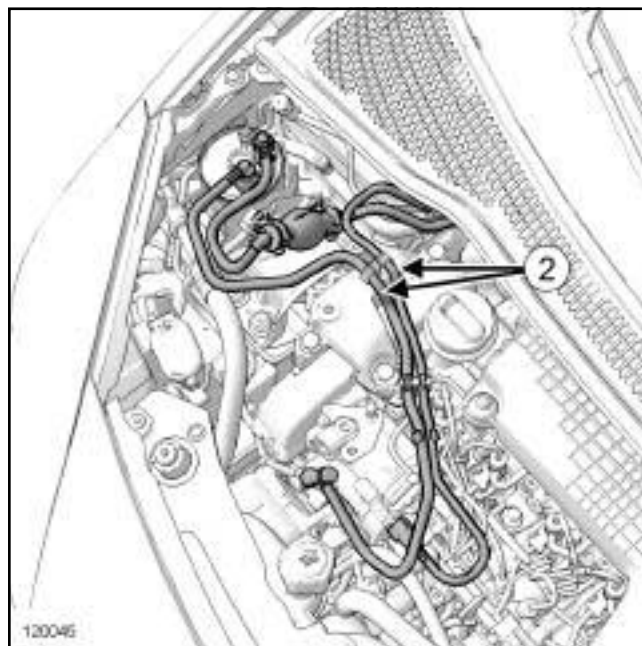
- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).



120040

- Fit the **(1) (Mot. 1672)** to the vehicle after removing the front right-hand bolt on the axle sub-frame and the rear left-hand bolt on the axle sub-frame.
- Support the lower engine cover on the **(Mot. 1672)** by pressing on the tool support.

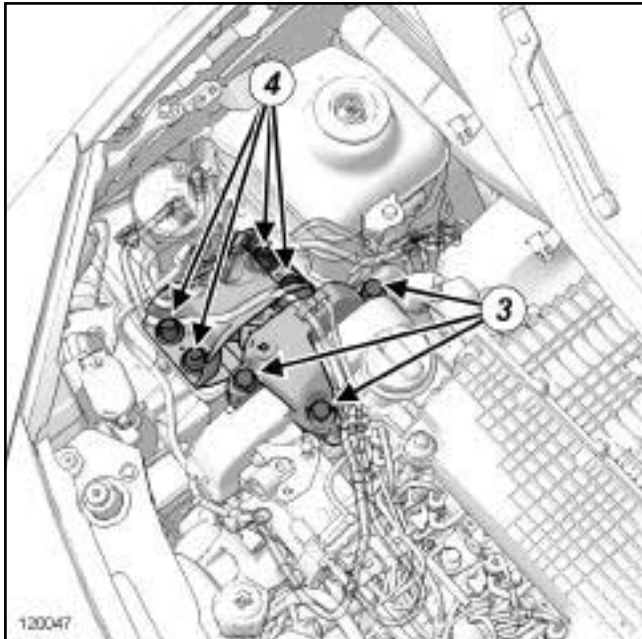
II - OPERATION FOR REMOVAL OF PART CONCERNED



120045

- Unclip the fuel supply pipes **(2)** from the right-hand suspended engine mounting.
- Undo the clip on the right-hand suspended engine mounting.
- Remove the fuel filler cap from the expansion bottle.
- Undo the nut on the fuel filter cage.
- Remove the fuel filter.
- Remove the fuel filter cage bolts.
- Remove the fuel filter cage.

C44, and K9K



120047

- Remove:
 - the right-hand suspended engine mounting bolts (3) on the engine,
 - the right-hand suspended engine mounting bolts (4) on the body,
 - the right-hand suspended engine mounting.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- Refit:
 - the right-hand suspended engine mounting,
 - the right-hand suspended engine mounting bolts on the body,
 - the right-hand suspended engine mounting bolts on the engine.
- Tighten all bolts on the suspended engine mounting until they make contact.
- Torque tighten:
 - the **right-hand suspended engine mounting bolts on the engine (62 Nm)**,
 - the **right-hand suspended engine mounting bolts on the body (62 Nm)**.
- Fit the clip to the right-hand suspended engine mounting.
- Position the fuel filter cage.

- Refit the fuel filter cage bolts.
- Position the fuel filter.
- Tighten the fuel filter cage nut.
- Clip on the fuel pipes.

Note:

Make sure that the clip on the high pressure pump side is properly clipped onto the right-hand suspended engine mounting.

II - FINAL OPERATION.

- Refit the expansion bottle bolt.
- Remove the **(Mot. 1672)**.
- Tighten the new bolts on the axle sub-frame until they make contact.
- Torque tighten:
 - the **axle sub-frame front bolts (62 Nm)**,
 - the **axle sub-frame rear bolts (105 Nm)**.

D4F or D7F

Special tooling required

Mot. 1379 Engine support tool for cylinder head operations.

Tightening torques

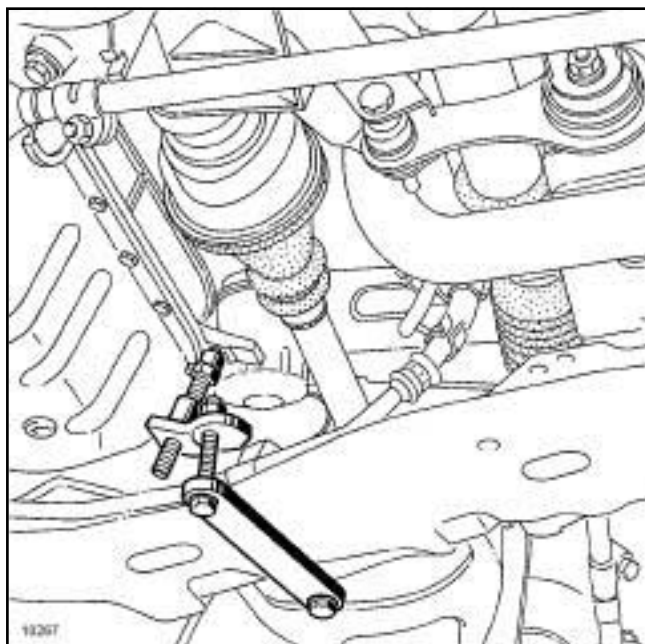
rubber pad bolts on the body **62 Nm**

suspended mounting bolts on the engine **62 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).
- Remove the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-18) .



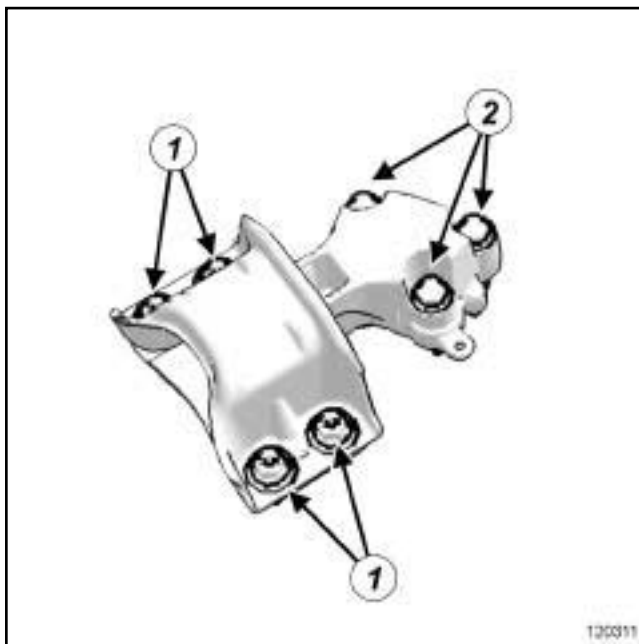
10267

- Position (**Mot. 1379**).

II - REMOVAL OPERATION FOR PART CONCERNED

- Mark the position of the suspended engine mounting on the body.

D4F



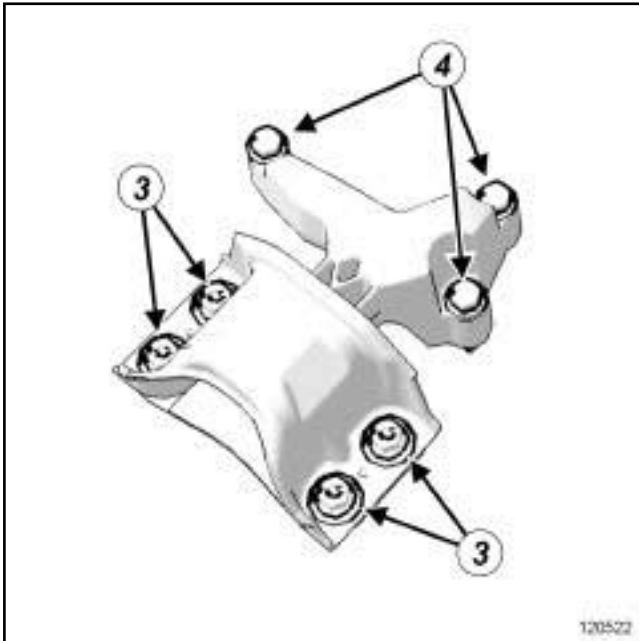
120311

120311

- Remove:
 - the bolts (1) from the rubber pad on the body,
 - the bolts (2) from the suspended mounting on the engine,
 - the suspended engine mounting.

D4F or D7F

D7F



120522

Remove:

- the bolts (3) from the rubber pad on the body,
- the bolts (4) from the suspended mounting on the engine,
- the suspended engine mounting.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

Refit:

- the suspended engine mounting following the position marked during the removal operation,
- the rubber pad bolts on the body,
- the suspended mounting bolts on the engine.

Torque tighten:

- the **rubber pad bolts on the body (62 Nm)**,
- the **suspended mounting bolts on the engine (62 Nm)**.

II - FINAL OPERATION

- Remove the **(Mot. 1379)**.

- Refit the engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting, page 19D-18**).

K4M

Special tooling required

Mot. 1672 Lower engine support.

Tightening torques

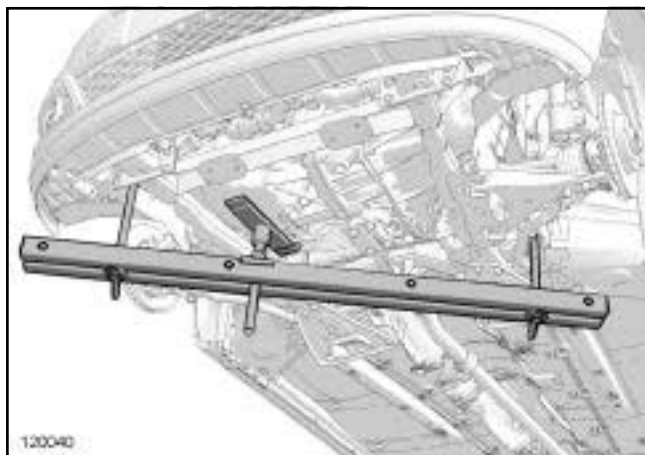
suspended engine mounting cover bolts **62 N.m**

suspended engine mounting rubber pad bolts **62 N.m**

REMOVAL

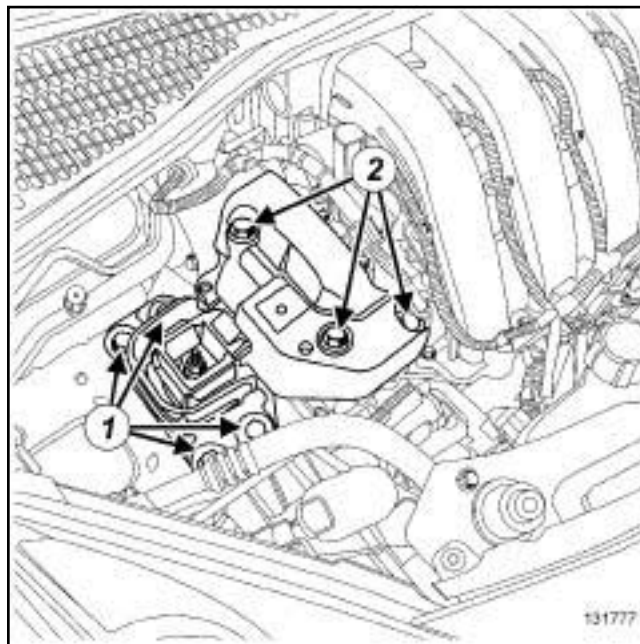
I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the engine undertray.



- Fit the **(Mot. 1672)** on the vehicle.
- Support the engine oil sump on the tool **(Mot. 1672)**.
- Mark the position of the suspended engine mounting rubber pad.

II - REMOVAL OPERATION



- Remove the bolts **(1)** from the suspended engine mounting rubber pad.
- Slightly raise the engine using the **(Mot. 1672)** until the rubber pad detaches from the suspended engine mounting.
- Remove:
 - the bolts **(2)** from the suspended engine mounting cover,
 - the suspended mounting from engine.

REFITTING

I - REFITTING OPERATION

- Fit the suspended engine mounting.
- Torque tighten the **suspended engine mounting cover bolts (62 N.m)**.
- Lower the engine until the rubber pad touches the suspended engine mounting.
- Position the suspended engine mounting rubber pad in line with the mark made during removal.
- Torque tighten the **suspended engine mounting rubber pad bolts (62 N.m)**.

II - FINAL OPERATION


- Remove the tool **(Mot. 1672)**.
- Refit the engine undertray.

ENGINE MOUNTING

Lower engine tie-bar: Removal - Refitting

19D

C44, and K9K

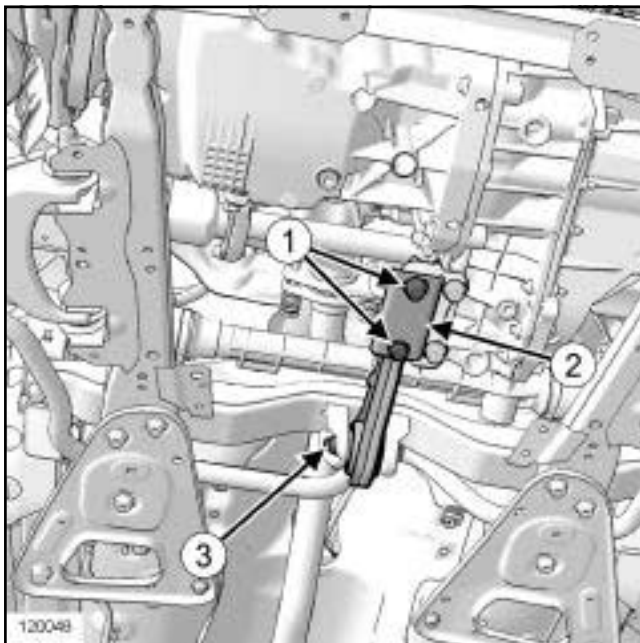
Tightening torques 	
engine tie-bar bolt	105 Nm
engine tie-bar tie rod bolts	105 Nm

REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift ((see **Vehicle: Towing and lifting**)).

II - OPERATION FOR REMOVAL OF PART CONCERNED



120048

- Remove:
 - the bolts (1) from the engine tie-bar tie rod (2) ,
 - the engine tie-bar tie rod,
 - the engine tie-bar bolt (3) on the front axle sub-frame,
 - the engine tie-bar.

REFITTING

REFITTING OPERATION FOR PART CONCERNED

- Fit the engine tie-bar fitted with its bolt onto the front axle sub-frame.


- Fit the engine tie-bar tie rod fitted with its bolts onto its mounting.
- Torque tighten:
 - the engine tie-bar bolt (105 Nm),
 - the engine tie-bar tie rod bolts (105 Nm).

ENGINE MOUNTING

Lower engine tie-bar: Removal - Refitting

19D

D4F or D7F

Tightening torques 	
engine tie-bar reinforcement bolt	62 N.m
engine tie-bar bolt on the gearbox	105 N.m
engine tie-bar bolt on the subframe	105 N.m

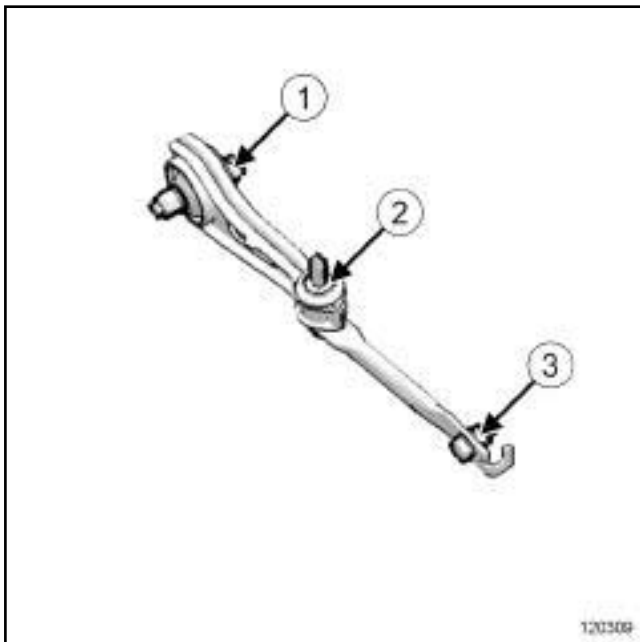
REMOVAL

I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 411, 02A, Lifting equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED

D4F, and 772

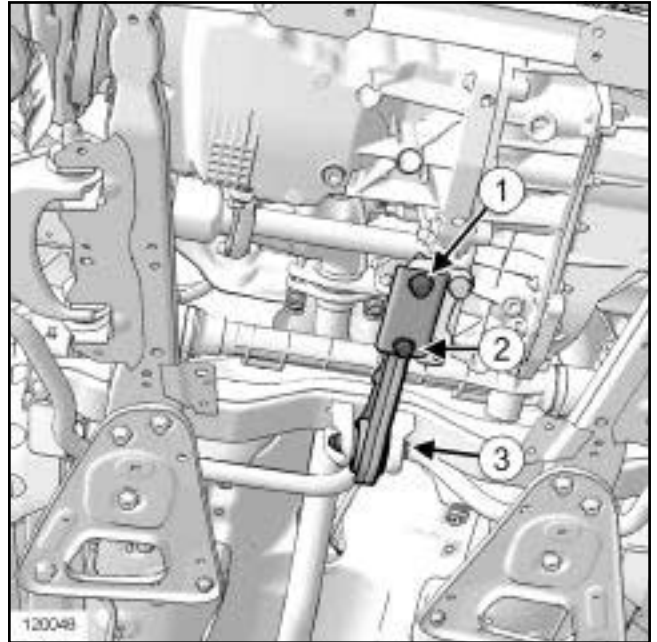


120309

- Remove:
 - the engine tie-bar bolt (1) from the subframe,
 - the engine tie-bar bolt (2) on the gearbox,
 - the engine tie-bar reinforcement bolt (3) ,

- the engine tie-bar .

D4F, and 780 or 782



120048

- Remove:
 - the engine tie-bar reinforcement bolt (1) ,
 - the engine tie-bar bolt (2) on the gearbox,
 - the engine tie-bar bolt (3) from the subframe,
 - the engine tie-bar.

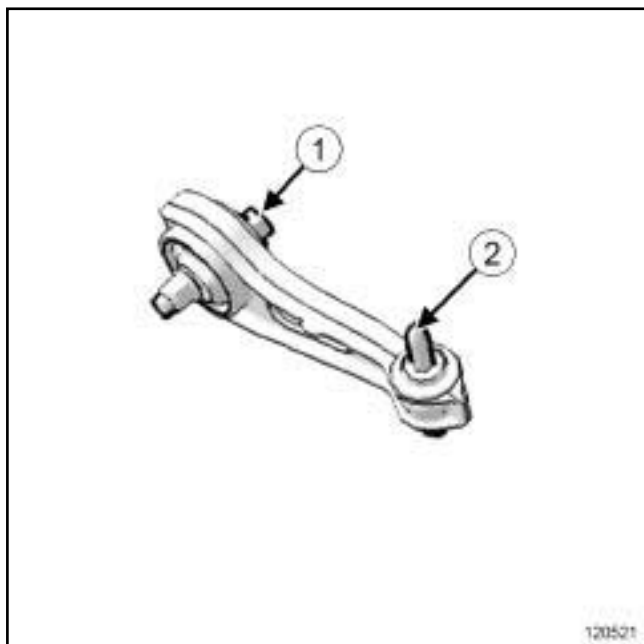
ENGINE MOUNTING

Lower engine tie-bar: Removal - Refitting

19D

D4F or D7F

D7F



120521

- Remove:
 - the engine tie-bar bolt (1) from the subframe,
 - the engine tie-bar bolt (2) on the gearbox.
 - the engine tie-bar.

REFITTING

REFITTING OPERATION FOR PART CONCERNED

D7F

- Refit:
 - the engine tie-bar,
 - the engine tie-bar bolt (2) on the gearbox,
 - the engine tie-bar bolt (1) on the sub-frame.

D4F, and 780 or 782

- Refit:
 - the engine tie-bar,
 - the engine tie-bar bolt (3) from the subframe,

- the engine tie-bar bolt (2) on the gearbox,
- the bolt (1) from the engine tie-bar reinforcement.

D4F, and 772

- Refit:
 - the engine tie-bar,
 - the engine tie-bar reinforcement bolt (3) ,
 - the engine tie-bar bolt (2) on the gearbox,
 - the engine tie-bar bolt (1) on the sub-frame.

D4F


- Torque tighten the **engine tie-bar reinforcement bolt (62 N.m)**.
- Torque tighten:
 - the **engine tie-bar bolt on the gearbox (105 N.m)**,
 - the **engine tie-bar bolt on the subframe (105 N.m)**.

ENGINE MOUNTING

Lower engine tie-bar: Removal - Refitting

19D

K4M

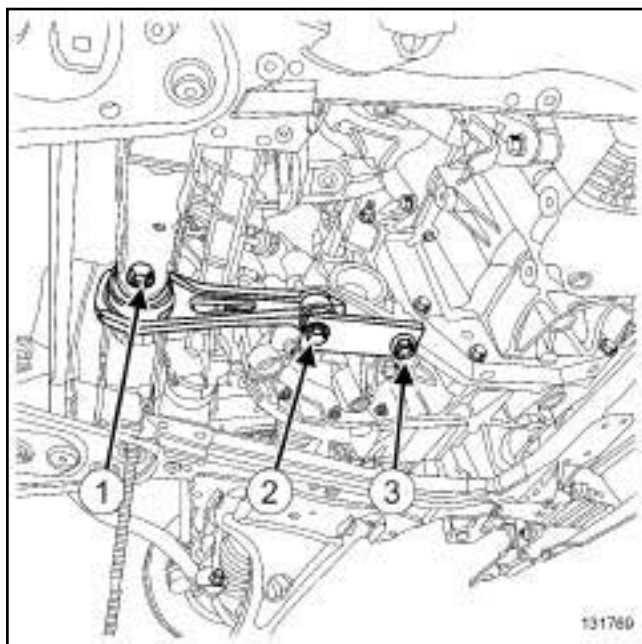
Tightening torques 	
rear suspended engine mounting support bolt	62 N.m
rear suspended engine mounting support bolts	105 N.m
rear suspended engine reinforcement bolt	105 N.m
rear suspended engine mounting bolt on the rear suspended engine mounting support	105 N.m
rear suspended engine mounting bolt on the subframe	105 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

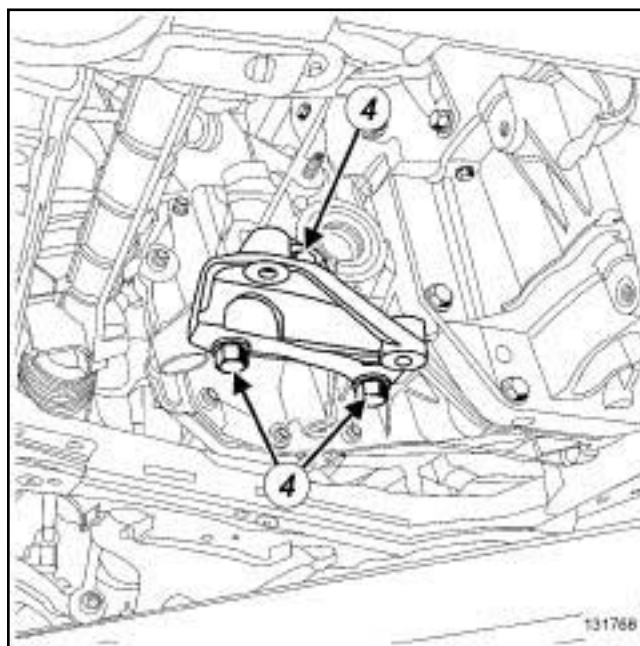
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the engine undertray.

II - REMOVAL OPERATION



- Remove:
 - the rear suspended engine mounting bolt (1) from the subframe,

- the rear suspended engine mounting bolt (2) from the rear suspended engine mounting support,
- the rear suspended engine mounting reinforcement bolt (3) ,
- the rear suspended engine mounting.



- Remove:
 - the rear suspended engine mounting support bolts (4) ,
 - the rear suspended engine mounting support.

ENGINE MOUNTING

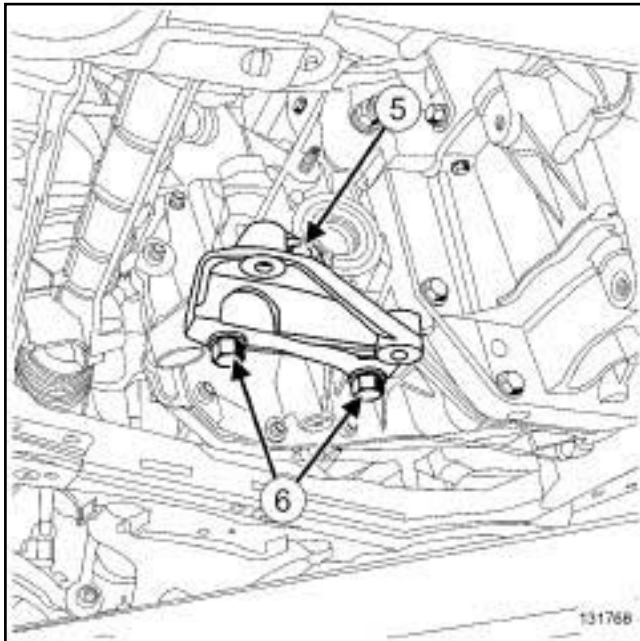
Lower engine tie-bar: Removal - Refitting

19D

K4M

REFITTING

I - REFITTING OPERATION



131768

- Refit the rear suspended engine mounting support.
- Torque tighten:
 - the **rear suspended engine mounting support bolt (62 N.m) (5)** ,
 - the **rear suspended engine mounting support bolts (105 N.m) (6)** .
- Refit the rear suspended engine mounting.
- Torque tighten:
 - the **rear suspended engine reinforcement bolt (105 N.m)**,
 - the **rear suspended engine mounting bolt on the rear suspended engine mounting support (105 N.m)**,
 - the **rear suspended engine mounting bolt on the subframe (105 N.m)**.

II - FINAL OPERATION

- Refit the engine undertray.