TWINGO

3 Chassis

36B POWER – ASSISTED STEERING

V2 **Edition Anglaise**

1. SCOPE OF THIS DOCUMENT

This document presents the fault finding procedure applicable to all computers with the following specifications:

Vehicle(s): **New Twingo**	*Computer name:* **EPAS**
Function concerned: **Electric power steering**	*Vdiag No.:* **04 - 08**

2. PREREQUISITES FOR FAULT FINDING

Documentation type

Fault finding procedures (this manual):
– Assisted fault finding (integrated into the diagnostic tool), Dialogys.
Wiring Diagrams:
– Visu-Schéma (CD-ROM), paper.

Type of diagnostic tools

– CLIP + multiplex line sensor

Special tooling required

Special tooling required	
Multimeter	
Elé. 1681	**Universal bornier**

3. REMINDERS

Procedure

To run diagnostics on the vehicle computers, proceed as follows:
– turn the ignition key to APC,
– connect the **diagnostic tool** and perform the required operations.

To cut off + after ignition feed, proceed as follows:
– disconnect the **diagnostic tool**,
– turn the ignition key to OFF,
– switch off the ignition.

Faults

Faults are declared present or stored (depending on whether they appeared in a certain context and have disappeared since, or whether they remain present but are not diagnosed within the current context).

The **present** or **stored** status of faults should be taken into consideration when the diagnostic tool is switched on after the + after ignition feed (without any system components being active).

For a **present fault**, apply the procedure described in the **Interpretation of faults** section.

For a **stored fault**, note the faults displayed and apply the instructions in the **Notes** section.

If the fault is **confirmed** when the instructions in the Notes section are applied, the fault is present. Deal with the fault.

If the fault is **not confirmed**, check:
- the electrical lines which correspond to the fault,
- the connectors on these lines (corrosion, bent pins, etc.),
- the resistance of the component detected as defective,
- the condition of the wires (melted or split insulation, wear).

Conformity check

The aim of the conformity check is to check data that does not produce a fault on the diagnostic tool because the data is inconsistent. Therefore, this stage is used to:
- carry out fault finding on faults that do not have a fault display, and which may correspond to a customer complaint.
- check that the system is operating correctly and that there is no risk of a fault recurring after repairs.

This section gives the fault finding procedures for statuses and parameters and the conditions for checking them.

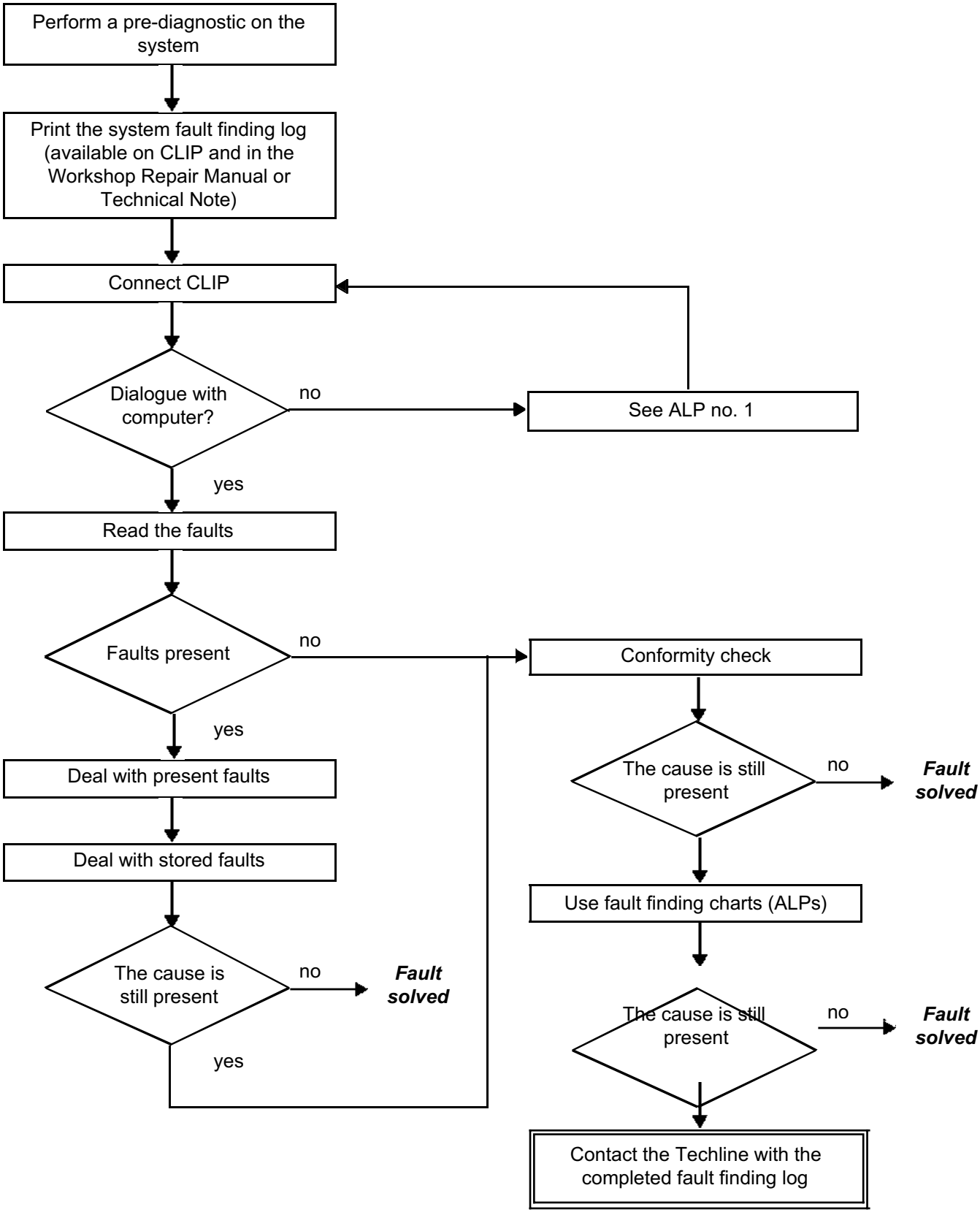
If a status is not behaving normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

Customer complaints - Fault finding chart

If the test with the **diagnostic tool** is OK but the customer complaint is still present, the fault should be processed by **customer complaints**.

A summary of the overall procedure to follow is provided on the following page in the form of a flow chart.

4. FAULT FINDING PROCEDURE



4. FAULT FINDING PROCEDURE (CONTINUED)

Wiring check

Note:
Carry out each requested check visually. Do not remove a connector if it is not required.

Note:
Repeated connections and disconnections alter the functionality of the connectors and increase the risk of poor electrical contact. Limit the number of connections/disconnections as much as possible.

Note:
The check is carried out on the 2 parts of the connection. There may be two types of connections:
- Connector / Connector
- Connector / Device

Fault finding problems
Disconnecting the connectors and/or manipulating the wiring harness may temporarily remove the cause of a fault. Electrical measurements of voltage, resistance and insulation are generally correct, especially if the fault is not present when the analysis is made (stored fault).

Visual inspection of the connection:
Check that the connector is connected correctly and that the male and female parts of the connection are correctly coupled.

Visual inspection of the area around the connection:
- Check the condition of the mounting (pin, strap, adhesive tape, etc.), that the connectors are attached to the vehicle.
- Check that there is no damage to the wiring trim (sheath, foam, adhesive tape, etc.) near the wiring.
- Check that there is no damage to the electrical wires at the connector outputs, in particular on the insulating material (wear, cuts, burns, etc.).

Disconnect the connector to continue the checks.

Visual inspection of the plastic casing:
- Check that there is no mechanical damage (casing crushed, cracked, broken, etc.), in particular to the fragile components (lever, lock, openings, etc.).
- Check that there is no heat damage (casing melted, darker, deformed, etc.).
- Check that there are no stains (grease, mud, liquid, etc.).

Visual inspection of the metal contacts:
(The female contact is called CLIP. The male contact is called TAB.)
- Check that there are no bent contacts (the contact is not inserted correctly and can come out of the back of the connector). The spring contact of the connector when the wire is pulled.
- Check that there is no damage (folded tabs, clips open too wide, blackened or melted contact, etc.).
- Check that there is no oxidation on the metal contacts.

5. FAULT FINDING LOG

IMPORTANT

IMPORTANT
Any fault on a complex system requires thorough fault finding with the appropriate tools.
The FAULT FINDING LOG, which should be completed during the procedure, enables you to keep track of the procedure which is carried out. It is an essential document when consulting the manufacturer.

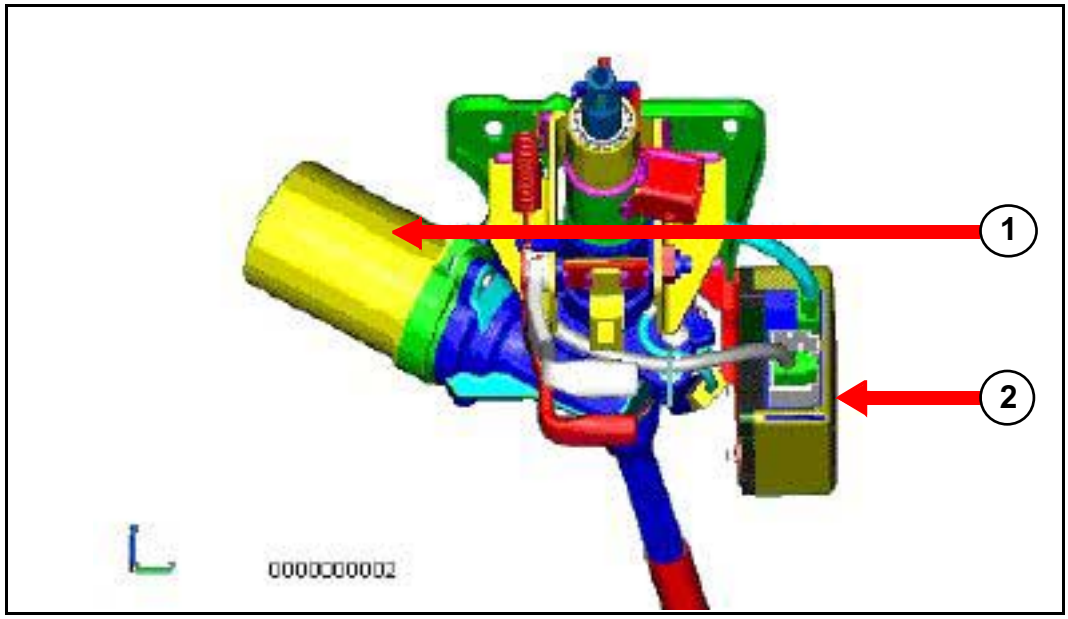
IT IS THEREFORE ESSENTIAL THAT THE FAULT FINDING LOG IS FILLED OUT EVERY TIME IT IS REQUESTED BY TECHLINE OR THE WARRANT RETURNS DEPARTMENT.

You will always be asked for this log:
- when requesting technical assistance from Techline,
- for approval requests when replacing parts for which approval is mandatory,
- to be attached to monitored parts for which reimbursement is requested. The log is needed for warranty reimbursement, and enables better analysis of the parts removed.

6. SAFETY INSTRUCTIONS

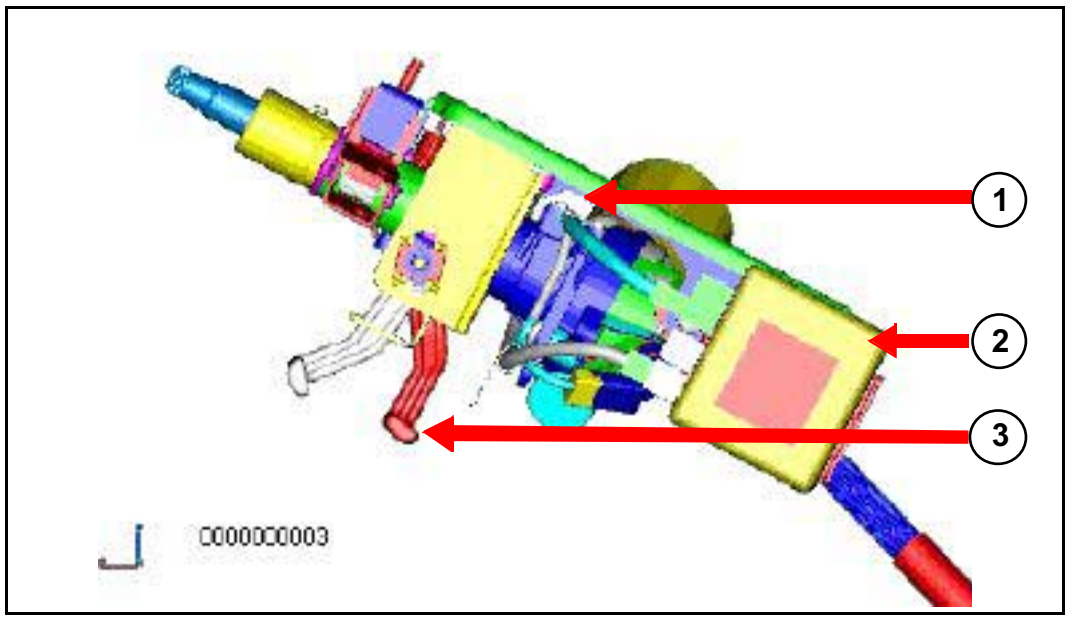
Safety rules must be observed during any work on a component to prevent any damage or injury:
- check the battery voltage to avoid incorrect operation of computer functions,
- use the appropriate tools,
- do not touch the discharge bulbs, and do not work on the COSLAD system when it is in operation, as the voltage can be above 20,000 V.

Figure 1: Computer and motor



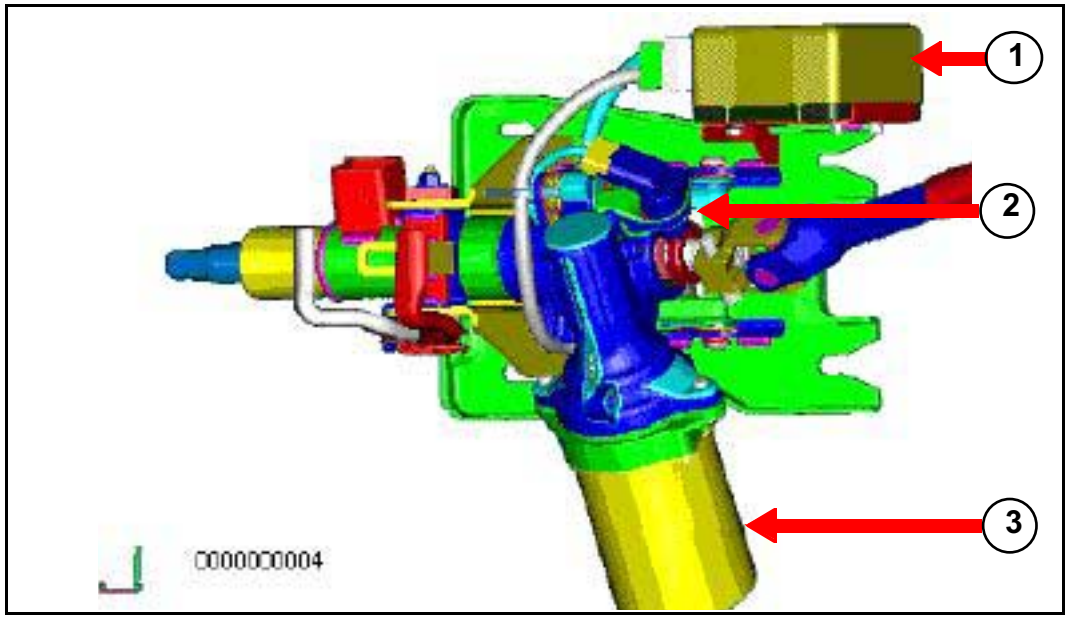
1 Engine
2 Computer

Figure 2: Torque sensor and column adjustment handle



1 Torque sensor
2 Computer
3 Column adjustment handle

Figure 3: Computer, Angle sensor and Motor



1 Computer
2 Angle sensor (on for Vdiag 04)
3 Engine

Angle sensor:

This sensor indicates the position of the steering wheel in real time (only for Vdiag 04).

Torque sensor:

This sensor enables the assistance torque to be controlled according to the force applied to the steering wheel by the driver.

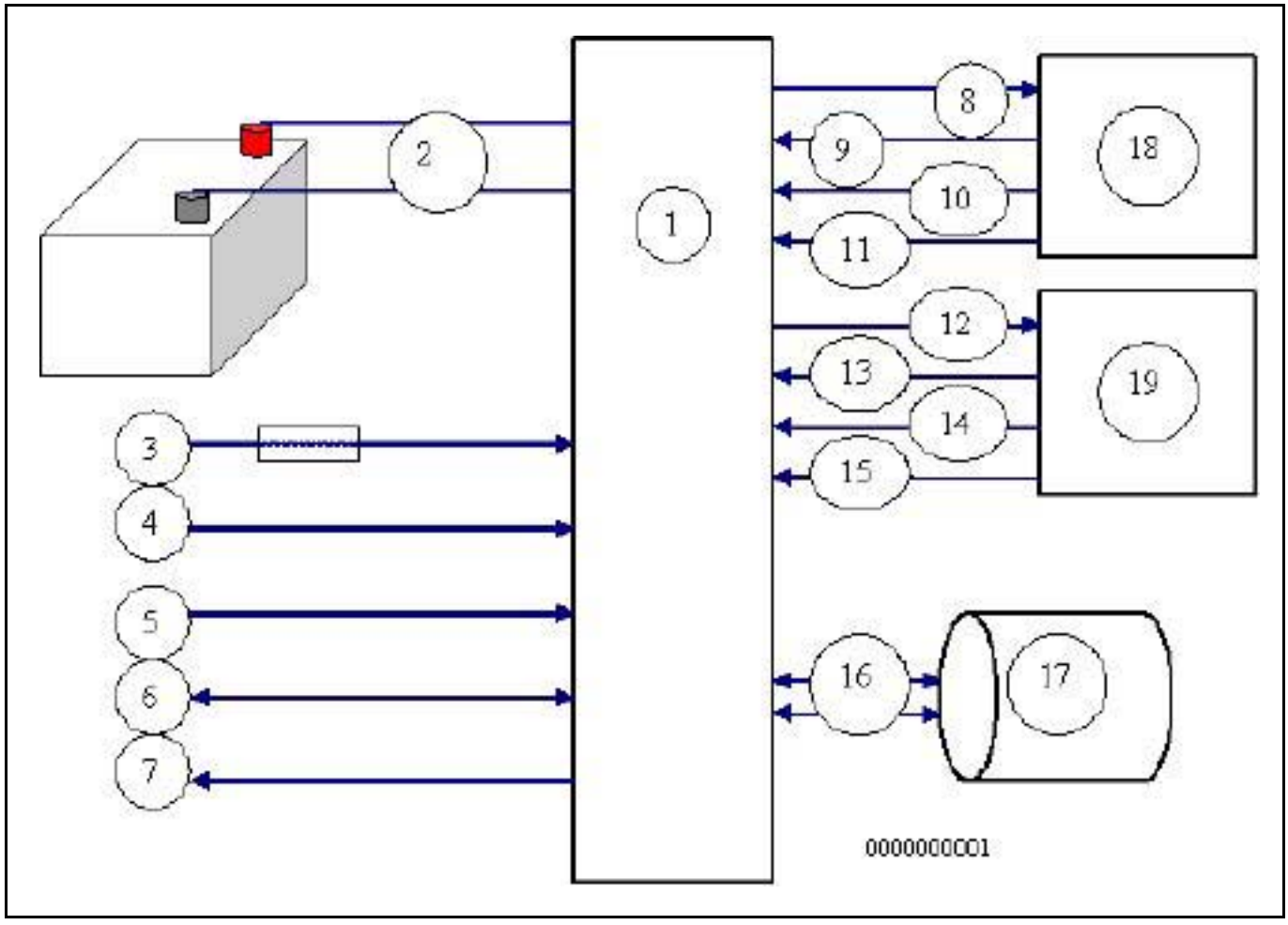
Computer:

This computer calculates the level of steering assistance required according to various parameters, including the vehicle speed and the steering wheel torque.

Motor:

The motor provides the necessary steering torque assistance according to driver requirements.

Column steering system



1 Computer
2 Computer supply
3 + after ignition feed
4 Vehicle speed
5 Engine speed
6 K line
7 Fault warning light
8 + torque sensor
9 Main signal
10 Secondary signal
11 0 V
12 + angle sensor (only in **Vdiag 04**)
13 Signal 1 (only in **Vdiag 04**)
14 Signal 2 (only in **Vdiag 04**)
15 0 V (only in **Vdiag 04)**
16 Brush motor supply
17 Power-assisted steering motor
18 Torque sensor
19 Angle sensor (only in **Vdiag 04**)

GENERAL OPERATION

On this vehicle, the steering system is power-assisted by an electric motor attached to the steering column.

The torque sensor and steering column angle sensor interpret any movement of the steering wheel as it is turned. Assistance is provided by an electric motor which applies more or less torque to the steering column, in one direction or the other.

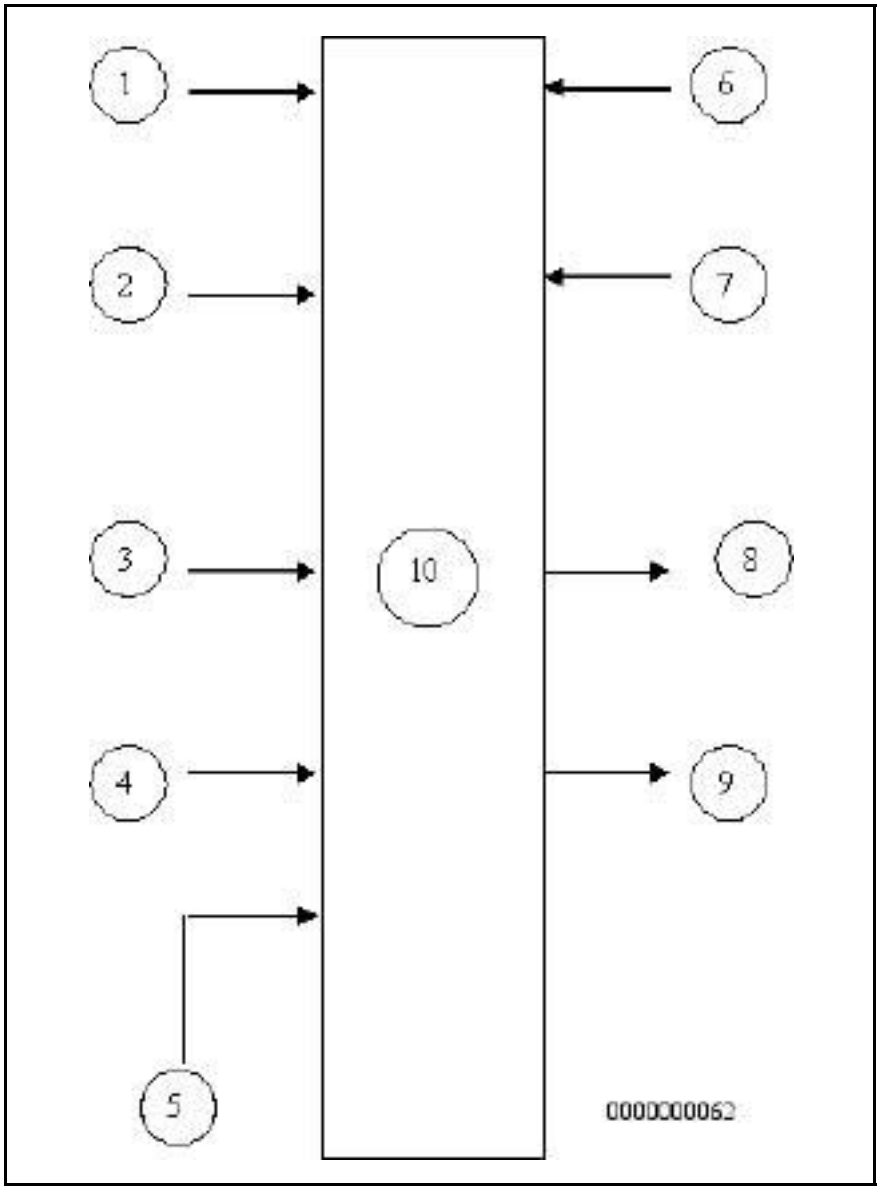
A computer controls this assistance according to several vehicle environment parameters, including the vehicle speed.

EPAS ALSO OFFERS THE FOLLOWING:
Active recall:
This function is made necessary by the design of the front axle of vehicles with electric power-assisted steering. It returns the steering wheel to the centre point when driving at low speeds (5 to 20 mph / 8 to 32 km/h) but not when the vehicle is stationary. This function is normal on hydraulic power-assisted steering vehicles or vehicles without assistance.
This function cannot be deactivated by the diagnostic tool.

Note:
When the computer detects a fault, the level of assistance can be modified depending on how serious the fault is. An incorrect or absent vehicle speed signal results in assistance equal to that provided at **72 mph (120 km/h)** without active return. The EPAS sends a "Steering wheel angle signal" to the ABS/ESP computer.

Depending on the operating conditions and the operations performed on the vehicle before switching on the ignition, the assistance system may take a certain amount of time to be activated after engine starting, for instance after battery cut-off or switching off the ignition (see Configurations and programming).

SIGNALS RECEIVED AND SENT



1 Vehicle speed
2 Engine speed
3 Power supply (permanent +)
4 Supply (+ after ignition feed)
5 Earth
6 Steering wheel angle (**Vdiag 04** only)
7 Steering wheel torque
8 Instrument panel indicator light on
9 Diagnostic socket
10 Power-assisted steering computer

Precautions for use
– The electric motor and upper column (EPAS system) assembly cannot be taken apart.
– Only reuse an EPAS system from one vehicle on another vehicle if the column and computer part numbers match.

WARNING
Never leave the ignition switched on or the engine running during a **mechanical operation** on the EPAS or the front axle. To avoid any accident, **the battery must be disconnected** (to prevent the risk of accidentally triggering the EPAS motor).

A. **Replacing the EPAS** (computer - top steering column assembly):

Before replacing the EPAS, run fault finding on the system: apply the appropriate fault finding procedure.
The EPAS may be replaced only with the consent of the **Techline**.
When replacing the electric power assisted steering, carry out the following operations **in order**:
– disconnect the vehicle battery,
– replace the EPAS (see **MR411 Mechanical systems, 36B, Power-assisted steering**),
– reconnect the vehicle battery,
– connect the diagnostic tool, switch on the ignition and establish dialogue with the electric power-assisted steering computer (EPAS computer),
– perform the configurations (see Configurations and programming),
– check that there are no faults, check the conformity of the variables, and check that the EPAS operates correctly (steering assistance provided when the engine is running),
– perform a road test then, without switching off the ignition, check that status **ET020 Steering wheel angle sensor programming** is **Programmed** (only for **Vdiag 04**).

B. **Replacing the intermediate shaft or the steering rack** (without changing the EPAS):
– disconnect the vehicle battery,
– replace the intermediate shaft or the steering rack (see **MR 411 Mechanical systems, 36A, Steering assembly**),
– reconnect the vehicle battery,
– connect the diagnostic tool, switch on the ignition and establish dialogue with the electric power-assisted steering computer (EPAS computer),
– check that there are no faults,
– check that the EPAS is working correctly (steering assistance available when the engine is running).

C. Replacing the power-assisted steering computer:
– disconnect the vehicle battery,
– replace the power-assisted steering computer,
– reconnect the vehicle battery,
– connect the diagnostic tool, switch on the ignition and establish dialogue with the electric power-assisted steering computer (EPAS computer),
– configure the computer (see Configurations and programming),
– check that there are no faults,
– check that the EPAS is working correctly (steering assistance available when the engine is running).

Summary table of configurations and configuration readings

Configuration		Configuration readings	
CF073	Strategy number	**LC002**	Strategy number
		LC001	Type of power-assisted steering

CONFIGURATION:

After replacing the EPAS computer, configure the computer using command **CF073 Strategy number**.
The following procedure must be followed for this configuration:

- connect the **diagnostic tool**,
- switch on the ignition and establish dialogue with the electric power-assisted steering computer,
- Clear the faults using command **RZ001 Fault memory**.
- select the Repair mode menu,
- use command **CF073 Strategy number** to perform the configuration and select the relevant strategy number using the table as a guide,
- make sure the configuration readings have been properly registered,
- check that the system is operating correctly (steering assistance available when the engine is running).

STEERING WHEEL ANGLE PROGRAMMING:

IMPORTANT
The steering wheel angle sensor is programmed automatically each time the vehicle is driven and therefore it cannot be programmed using the tool.

Tool fault	Diagnostic tool title	Associated DTC	Customer complaints and warning light coming on
DF001	Motor thermal protection	**5660**	Steering assistance intermittent reduction (no warning light or buzzer)
DF002	Computer	**5640**	No assistance on start-up or sudden loss of assistance with EPAS fault warning light, STOP warning light and buzzer
DF017	Motor circuit	**5630**	Sudden loss of assistance with EPAS fault warning light, STOP warning light and buzzer
DF023	+ after ignition feed	**5622**	Gradual loss of assistance with EPAS fault warning light, STOP warning light and buzzer
DF028	Engine speed zero	**5621**	Incorrect level of assistance (no warning light or buzzer)
DF037	Battery voltage	**5650**	Sudden loss of assistance with EPAS fault warning light, STOP warning light and buzzer
DF038	Angle sensor	**5610**	Loss of "active return" function with no warning light
DF039	Torque sensor circuit	**5603**	Sudden loss of assistance with EPAS fault warning light, STOP warning light and buzzer
DF043	Vehicle speed	**5620**	Incorrect level of assistance (no warning light or buzzer)
DF048	Torque sensor circuit	**5602**	Sudden loss of assistance with EPAS fault warning light, STOP warning light and buzzer
DF050	Torque sensor circuit signal 2	**5601**	Sudden loss of assistance with EPAS fault warning light, STOP warning light and buzzer
DF054	Torque sensor	**5600**	Sudden loss of assistance with EPAS fault warning light, STOP warning light and buzzer

DF001 PRESENT OR STORED	MOTOR THERMAL PROTECTION DEF: Operating temperature too high

NOTES	**Conditions for applying the fault finding procedure to stored faults:** Apply this fault finding procedure even if the fault is stored.
	Notes: This fault does not indicate a system failure, but indicates overheating either of the Electric Power-Assisted Steering (**EPAS**) motor or of the computer during repeated manoeuvres.This fault may appear after the steering wheel is moved repeatedly (parking) and causes a gradual reduction in steering but the fault warning light does not come on.

Use the **diagnostic tool** to check the conformity of **PR129 Motor power (60 A) and PR130 Motor power (45 A) (zero in absence of PR001 Torque applied to steering wheel)**.
Contact the Techline in the event of any nonconformity.

Check the conformity of the computer and steering column (**45 or 60 A**) in relation to the table below:

		Left-hand drive	Right-hand drive
Torque sensor wiring harness		blue	black
Motor wiring	**45 A**	green	black
Motor wiring	**60 A**	blue	grey

	45 A	**60 A**
Computer label	yellow	white

In the event of a nonconformity, consult "RENAULTNET" to repair the vehicle according to the technical vehicle definition.

Disconnect the battery then allow the **electric power-assisted steering** to cool down.
Reconnect the battery, clear the faults, start the vehicle and check the operation of the **electric power-assisted steering** by turning the steering wheel full lock to the left or right.
The fault should not recur in the next **30 seconds**.

If the fault recurs as present or stored, contact the Techline.

AFTER REPAIR	Deal with any other faults. Clear the stored faults. Check that the **EPAS** is working.

DF002 PRESENT OR STORED	COMPUTER 1. DEF: + After relay supply fault 2. DEF: Internal electronic fault

NOTES	**Priority in the event of a number of faults:** In the event of numerous faults, deal with the other present and stored faults before applying the fault finding procedure for this fault.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure even if the fault is stored.
	Notes: This fault causes: No assistance on start-up or sudden loss of assistance with illumination of the **Fault warning light + STOP + Beep**.

Contact Techline.

AFTER REPAIR	Deal with any other faults. Clear the stored faults. Check that the **EPAS** is working.

DF017 PRESENT OR STORED	MOTOR CIRCUIT DEF : Short circuit to earth or short circuit to 12 V CC.O : Short circuit to earth CO : Open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after the engine was started and after turning the steering wheel from lock to lock, then returning it to the centre.
	Notes: This fault causes: Sudden loss of steering assistance with illumination of the **Fault warning light + STOP + Beep**.
	Use the Wiring Diagram Technical Note for **New Twingo**.

With + after ignition feed off, check the connection and condition (possible wiring damage) of the connector of **component 502** and its clips.
If the connector is faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the connector, otherwise replace the steering column.
Connector of **component 502** and component **540** disconnected: check the **insulation** against +, -, and between the connections and check the **continuity** of the following connections:

- Connection **109R**
- Connection **109S**

If the connection or connections are faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the connectors or the wiring, otherwise replace the steering column.

If the fault is still present, contact the Techline.

AFTER REPAIR	Deal with any other faults. Clear the stored faults. Check that the **EPAS** is working.

DF023 **STORED**	+ AFTER IGNITION FEED CO.O: Open circuit or short circuit to earth

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is stored after the after ignition feed is switched off at speeds over **6 mph (10 km/h)**.
	Notes: This fault causes: Sudden loss of steering assistance with illumination of the **Fault warning light + STOP + Beep**.
	Use the Wiring Diagram Technical Note for **New Twingo**.

Important note: this fault may indicate the system is being incorrectly used by the customer (ignition cut off at speeds over 6 mph (10 km/h)). In this instance, this fault should be ignored.
With + after ignition feed off, check the connection and condition (possible wiring damage) of the connector of **component 502** and its clips. If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. With the connector of component **1016** disconnected, check the insulation and continuity of connection **AP23** between components **502** and **1016**. If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, perform a conformity check of component **1016**.
If the fault is still present, contact the Techline.

AFTER REPAIR	Deal with any other faults. Clear the stored faults. Check that the **EPAS** is working.

DF028 PRESENT OR STORED	ENGINE SPEED ABSENT DEF: Open circuit, short circuit to earth or short circuit to + **12 V**

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after having started the engine and turned the steering wheel from lock to lock, then returning it to the centre.
	Notes: This fault causes: No assistance with illumination of the **Fault warning light + STOP + Beep**.
	Use the Wiring Diagram Technical Note for **New Twingo**.

Start the vehicle and use the **diagnostic tool** to check the conformity of **PR004 Engine speed** (not zero).
If necessary, carry out a fault finding procedure on the injection system.

With **+ after ignition feed** off, check the connection and condition (possible wiring damage) of the connector of **component 502** and its clips.
If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
With the connector of **component 502** and intermediate connector **R107** disconnected: check **the insulation and the continuity** of connection **H7** between **component 502** and intermediate connector **R107**.
Connector of components **119** and **120** disconnected: check **the insulation and the continuity** of connection **H7** between component **120** and intermediate connector **R107**.
If the connection or connections are faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace the wiring.

If the fault is still present, contact the Techline.

AFTER REPAIR	Deal with any other faults. Clear the stored faults. Check that the **EPAS** is working.

DF037 PRESENT OR STORED	BATTERY VOLTAGE 1. DEF: Under voltage 2. DEF: Excess voltage

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after starting the engine and turning the steering wheel from lock to lock left to right.
	Notes: This fault causes: Sudden loss of steering assistance with illumination of the **Fault warning light + STOP + Beep**.
	Use the Wiring Diagram Technical Note for **New Twingo**.

Check the tightness and condition of the battery terminals (see **80A, Battery**).
Check the charging circuit (see **16A, Starting - Charging**).

Check the condition and position of the **80 A** fuse in the **engine fuse and relay box**.
Check the condition and position of fuse **F3** (**15 A)** fuse in the **passenger compartment fuse box** (see **81C, Fuse box**).

With the ignition on and the engine stopped, check for a voltage equal to the battery voltage on connections **BP81** and **AP23** against earth **ML**.

With the connectors of component **502** disconnected, check the condition and conformity of the connectors and their clips.
If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
With the connectors of components **597** and **1016** disconnected:
Check the **continuity and insulation** of **connection BP81** between components **502** and **597**.
Check the **continuity and insulation** of **connection AP23** between components **502** and **1016**.
Check the **continuity and insulation** of **connection ML** of component **502**.
If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.
If the checks reveal no faults, check the conformity of components **597** and **1016**.

If the fault is still present, contact the Techline.

AFTER REPAIR	Deal with any other faults. Clear the stored faults. Check that the **EPAS** is working.

DF038 PRESENT OR STORED	ANGLE SENSOR DEF: Open circuit, short circuit to earth or short circuit to **+ 12 V**

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after having started the engine and turned the steering wheel from lock to lock, then returning it to the centre.
	Notes: This fault causes: Loss of the "active return" function **with no fault warning light or Beep**.
	Use the Wiring Diagram Technical Note for **New Twingo**.

With + after ignition feed off, check the connection and condition (possible wiring damage) of the connector of **component 502** and its clips.
With + after ignition feed off, check the connection and condition (possible wiring damage) of connector E and its clips of **component 583**.
If the connector is faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**) repair the wiring, otherwise replace it.
Visually check the condition of the wiring harness of **component 583** (for possible wiring damage).
If the connection or connections are faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace the steering column.
With the connectors of **components 502 and 583** disconnected: **check the continuity and insulation** of the following connections between components **502 and 583:**

- Connection **109F**
- Connection **109Z**
- Connection **109X**
- Connection **109I**

If the connection or connections are faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace the steering column.

Check the condition of the tabs of the connections of **component 502**.
Contact the Techline in the event of any nonconformity.

If the fault is still present, contact the Techline.

AFTER REPAIR	Deal with any other faults. Clear the stored faults. Check that the **EPAS** is working.

DF039 **DF048** **DF050** **DF054** **PRESENT** **OR** **STORED**	TORQUE SENSOR CIRCUIT TORQUE SENSOR CIRCUIT TORQUE SENSOR CIRCUIT SIGNAL 2 TORQUE SENSOR CO.O: Open circuit or short circuit to earth

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after having started the engine and turned the steering wheel from lock to lock, then returning it to the centre.
	Notes: This fault causes: Sudden loss of steering assistance with illumination of the **Fault warning light + STOP + Beep**.
	Use the Wiring Diagram Technical Note for **New Twingo**.

With **+ after ignition feed** off, check the connection and condition (possible wiring damage) of connector C and its clips of **component 502**.
If the connector is faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**) repair the wiring, otherwise replace it.
Visually check the condition of the wiring harness of **component 850** (for possible wiring damage).
If the connection or connections are faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace the steering column.
With the connectors of **components 502 and 850** disconnected, **check the continuity and insulation** of the following connections between **components 502 and 850**.

- Connection **109K**
- Connection **109M**
- Connection **109N**
- Connection **109P**

If the connection or connections are faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace the steering column.
With + after ignition feed off, disconnect and check the condition and conformity of connector C and its clips.
Visually check the condition of the torque sensor wiring harness.
In the event of a nonconformity, replace the steering column.

Check the condition of the connection pins of components **502** and **850**.
Contact the Techline in the event of any nonconformity.

If the fault is still present, contact the Techline.

AFTER REPAIR	Deal with any other faults. Clear the stored faults. Check that the **EPAS** is working.

DAE_V04_DF039/DAE_V08_DF039/DAE_V04_DF048/DAE_V08_DF048
DAE_V04_DF050/DAE_V08_DF050/DAE_V04_DF054/DAE_V08_DF054

DF043 PRESENT OR STORED	VEHICLE SPEED DEF: Open circuit, short circuit to earth or to + 12 V

NOTES	**Notes:** This fault causes: Assistance in defect mode with **no fault warning light or Beep** (Insufficient assistance).
	Use the Wiring Diagram Technical Note for **New Twingo**.

Carry out a road test.
Check the consistency of the speed signal on the instrument panel.
If necessary, carry out fault finding on the **ABS/ESP** system (see **38C, Anti-lock braking system**).
Then use the **diagnostic tool** to check that **PR003** is not zero.

With **+ after ignition feed** off, check the **connection and condition** (possible wiring damage) of the connector of **component 502** and its clips.
If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
With the intermediate connector **R107** and the connector of component **502** disconnected, check the continuity and insulation of **connection 47F** between component 502 and intermediate connector R107.
With the connector of components **1579**, **261** and **1094** disconnected: check the continuity and insulation of **connection 47F** between component 1094 and intermediate connector R107.
If the connection or connections are faulty (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace the wiring.
If the checks reveal no faults, check the conformity of components **1579**, **261** and **1094**.

If the fault is still present, contact the Techline.

AFTER REPAIR	Deal with any other faults. Clear the stored faults. Check that the **EPAS** is working.

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool**. **Application conditions: ignition on, engine stopped, no movement of the steering wheel, front wheels set straight ahead**.

MAIN SCREEN

Function	Parameter or Status Checked or Action		Display and notes	Fault finding
Wire information	**PR003:**	Vehicle speed	**X = 0 mph (km/h)**	In the event of a fault, apply the interpretation of parameter **PR003**.
	PR004:	Engine speed	**0 = rpm**	In the event of a fault, apply the interpretation of parameter **PR004**.
Assistance	**PR001:**	Torque applied to the steering wheel	**0 Nm (+ 0.2 Nm)**	In the event of a fault, apply the interpretation of parameter **PR001**.
Steering wheel angle (**Vdiag 04** only)	**PR121:**	Steering wheel angle	**- 5° < X < 5°**	In the event of a fault, apply the interpretation of parameter **PR121**.

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool**. **Application conditions: ignition on, engine stopped, no movement of the steering wheel, front wheels set straight ahead.**

SUB-FUNCTION: ASSISTANCE

Function	Parameter or Status Checked or Action		Display and notes	Fault finding
Power supply	**PR032:**	Feed voltage	**0 V**	In the event of a fault on this parameter, apply the fault finding procedure of **DF037 Battery voltage**.
Wire information	**PR003:**	Vehicle speed	**0 mph**	In the event of a fault, apply the interpretation of parameter **PR003**.
	PR004:	Engine speed	**0 rpm**	In the event of a fault, apply the interpretation of parameter **PR004**.
Steering wheel angle (**Vdiag 04** only)	**ET020:**	Steering wheel angle sensor programming	**Not programmed**	In the event of a fault, apply the interpretation of status **ET020**.
	PR121:	Steering wheel angle	**- 5° < X < 5°**	In the event of a fault, apply the interpretation of parameter **PR121**.
Faults	**ET021:**	Motor thermal protection indicator	**Not active**	In the event of a fault, apply the interpretation of status **ET021**.
	ET025:	Fault indicator	**Off**	In the event of a fault, apply the interpretation of status **ET025**.

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool**. **Application conditions: ignition on, engine stopped, no movement of the steering wheel, front wheels set straight ahead.**

SUB-FUNCTION: ASSISTANCE (CONTINUED)

Function	Parameter or Status Checked or Action		Display and notes	Fault finding
Assistance	**PR001:**	Torque applied to the steering wheel	**0 Nm (+ 0.2 Nm)**	In the event of a fault, apply the interpretation of parameter **PR001**.
Output	**PR132:**	Current setpoint (45 A)	**0 A** Note: these two parameters must be approximately the same.	In the event of a fault, apply the interpretation of parameters **PR132** and **PR130**.
	PR130:	Motor power (45 A)		
	PR131:	Current setpoint (60 A)	**0 A** Note: these two parameters must be approximately the same.	In the event of a fault, apply the interpretation of parameters **PR131** and **PR129**.
	PR129:	Motor power (60 A)		

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool**. **Application conditions: engine at idle speed, no movement of the steering wheel, front wheels straight ahead.**

MAIN SCREEN

Function	Parameter or Status Checked or Action	Display and notes	Fault finding
Wire information	**PR003:** Vehicle speed	**0 mph**	In the event of a fault, apply the interpretation of parameter **PR003**.
	PR004: Engine speed	**850 +/- 50 rpm**	In the event of a fault, apply the interpretation of parameter **PR004**.
Assistance	**PR001:** Torque applied to the steering wheel	**0 Nm (+ 0.2 Nm)**	In the event of a fault, apply the interpretation of parameter **PR001**.
Steering wheel angle (**Vdiag 04** only)	**PR121:** Steering wheel angle	**- 5° < X < 5°**	In the event of a fault, apply the interpretation of parameter **PR121**.

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool**. **Application conditions: engine at idle speed, no movement of the steering wheel, front wheels straight ahead.**

SUB-FUNCTION: ASSISTANCE

Function	Parameter or Status Checked or Action		Display and notes	Fault finding
Power supply	**PR032:**	Feed voltage	**12 < X < 16 V**	In the event of a fault on this parameter, apply the fault finding procedure of **DF037 Battery voltage**.
Wire information	**PR003:**	Vehicle speed	**0 mph**	In the event of a fault, apply the interpretation of parameter **PR003**.
	PR004:	Engine speed	**850 +/- 50 rpm**	In the event of a fault, apply the interpretation of parameter **PR004**.
Steering wheel angle (**Vdiag 04** only)	**ET020:**	Steering wheel angle sensor programming	**Not programmed**	In the event of a fault, apply the interpretation of status **ET020**.
	PR121:	Steering wheel angle	**- 5° < X < 5°**	In the event of a fault, apply the interpretation of parameter **PR121**.
Faults	**ET021:**	Motor thermal protection indicator	**Not active**	In the event of a fault, apply the interpretation of status **ET021**.
	ET025:	Fault indicator	**Off**	In the event of a fault, apply the interpretation of status **ET025**.

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool**. **Application conditions: engine at idle speed, no movement of the steering wheel, front wheels straight ahead.**

SUB-FUNCTION: ASSISTANCE (CONTINUED)

Function	Parameter or Status Checked or Action		Display and notes	Fault finding
Assistance	**PR001:**	Torque applied to the steering wheel	**0 Nm (+ 0.2 Nm)**	In the event of a fault, apply the interpretation of parameter **PR001**.
Output	**PR132:**	Current setpoint (45 A)	**0 A** Note: these two parameters must be approximately the same.	In the event of a fault, apply the interpretation of parameters **PR132** and **PR130**.
	PR130:	Motor power (45 A)		
	PR131:	Current setpoint (60 A)	**0 A** Note: these two parameters must be approximately the same.	In the event of a fault, apply the interpretation of parameters **PR131** and **PR129**.
	PR129:	Motor power (60 A)		

Tool status	Diagnostic tool title
ET020	Steering wheel angle programming
ET021	Motor thermal protection indicator
ET025	Fault indicator

ET020	PROGRAMMING THE STEERING WHEEL ANGLE SENSOR

NOTES	**Note:** Deal first with **DF038 Angle sensor**.
	Special note: Every time the ignition is switched on, status **ET020** is **NOT PROGRAMMED**. Programming is performed automatically each time the vehicle is driven.

Drive the vehicle, then switch off the ignition and check that status **ET020** is **PROGRAMMED**.
If status **ET020** remains **NOT PROGRAMMED** after the vehicle is driven, carry out the fault finding procedure for fault **DF038 Angle sensor**.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

ET021	THERMAL PROTECTION INDICATOR

NOTES	**Special note:** The status is declared correct when it is **NOT ACTIVE**.

If status **ET021** is active after approximately one hour without any manoeuvring, carry out the fault finding procedure for fault **DF001 Motor thermal protection**.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

ET025	FAULT INDICATOR

NOTES	**Special note:** The status is declared correct when it is **NOT ACTIVE**.

If status **ET025** is **ACTIVE**, consult the possible faults.
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

Tool parameter	Diagnostic tool title
PR001	Torque applied to the steering wheel
PR003	Vehicle speed
PR004	Engine speed
PR121	Steering wheel angle
PR129	Motor power (60 A)
PR130	Motor power (45 A)
PR131	Current setpoint (60 A)
PR132	Current setpoint (45 A)

PR001	TORQUE APPLIED TO THE STEERING WHEEL

NOTES	**None.**

This parameter indicates the torque applied by the driver to the steering column.
If the parameter does not conform with the values indicated in the **Conformity check**, consult the interpretation of fault **DF054 Torque sensor**.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

PR003	VEHICLE SPEED

NOTES	**None.**

This parameter indicates the vehicle speed sent by the **ABS/ESP** on the multiplex line.
If the parameter does not correspond to the values indicated in the **Conformity check**, consult the interpretation of fault **DF043 Vehicle speed**.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

PR004	ENGINE SPEED

NOTES	None.

This parameter indicates the engine speed sent by the injection computer.
If the parameter does not correspond to the values indicated in the **Conformity check**, consult the interpretation of fault **DF028 No engine speed**.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

PR121	STEERING WHEEL ANGLE

NOTES	**None.**

This parameter indicates the position of the steering wheel in relation to zero.
The steering wheel angle programming is performed automatically by the power-assisted steering computer every time the vehicle is driven.
This parameter is positive to the right and negative to the left.

If the parameter does not correspond to the values indicated in the **Conformity check**, consult the interpretation of fault **DF038 Angle sensor**.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

PR129 **PR131**	MOTOR POWER (60 A) CURRENT SETPOINT (60 A)

NOTES	**None.**

Parameter **PR131 Current setpoint (60 A)** indicates the current setpoint (power) sent by the **EPAS** computer to the steering motor according to the torque applied to the steering wheel. Parameter **PR129 Motor power (60 A)** indicates the electric current actually consumed by the **EPAS** motor.

The value of parameter **PR131 Current setpoint (60 A)** must be approximately equal to the value of parameter **PR129 Motor power (60 A)**.
If the parameters are not the same, contact the Techline.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

PR130 **PR132**	MOTOR POWER (45 A) CURRENT SETPOINT (45 A)

NOTES	**None.**

Parameter **PR130 Current setpoint (45 A)** indicates the current setpoint (power) sent by the **EPAS** computer to the steering motor according to the torque applied to the steering wheel. Parameter **PR132 Motor power (45 A)** indicates the electric current actually consumed by the **EPAS** motor.

The value of parameter **PR130 Current setpoint (45 A)** must be approximately equal to the value of parameter **PR132 Motor power (45 A)**.
If the parameters are not the same, contact the Techline.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

NO DIALOGUE WITH THE COMPUTER	→ ALP 1
POOR VEHICLE HANDLING	→ ALP 2
SUDDEN LOSS OF ASSISTANCE	→ ALP 3
GRADUAL LOSS OF ASSISTANCE	→ CHART 4
INTERMITTENT ASSISTANCE	→ ALP 5
ASSISTANCE RETURN	→ ALP 6
PERMANENT ASSISTANCE	→ ALP 7
EXCESSIVE PERMANENT ASSISTANCE	→ ALP 8
STEERING WHEEL VIBRATION OR PULSATING	→ ALP 9
NO ASSISTANCE ON START-UP	→ ALP 10
WARNING LIGHT ON WITH NO FAULT	→ ALP 11
STEERING WHEEL NOT RETURNING TO CENTRE POINT	→ ALP 12

ALP 1	No dialogue with the computer

NOTES	Use the Technical Note wiring diagram for **New Twingo**.

Try to establish dialogue with a computer on another vehicle to check that **the diagnostic tool** is not faulty. If the tool is not faulty and no dialogue is established with any other computer of the same vehicle, check the tightness and condition of the battery terminals (see **80A, Battery**). Check the charging circuit (see **16A, Starting - Charging**).
With connector A of component **502** and the connector of **components 1222 and 1094** disconnected, check the continuity and insulation of **connection HK** between components **502** and **225**. If the connection(s) are faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, check the conformity of **components 1022** and **1094**.
Check the condition and the position of the **80 A** fuse in the **engine fuse and relay box**. Check the condition and the position of fuse **F3** (**15 A)** in the **passenger compartment fuse box**.
With the ignition on and the engine stopped, check for a voltage equal to the battery voltage on connections **BP81** and **AP23** against earth **ML**.
Connectors of component 502 disconnected, check the condition and conformity of the connectors and clips. If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. With the connectors of components **597** and **1016** disconnected: Check the continuity and insulation of **connection BP81** between components **502** and **597**. Check the continuity and insulation of **connection AP23** between components **502** and **1016**. Check the continuity and insulation of **connection ML** of component **502**. If the connection(s) are faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, check the conformity of components **597** and **1016**.
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

ALP 2	CUSTOMER COMPLAINTS CONCERNING ASSISTANCE

NOTES	Only consult this customer complaint after a **complete check** with the **diagnostic tool**.

Check that the steering column and steering rack are in sound mechanical condition. Repair if necessary.
Check the pressure and condition of the tyres, the condition of the joints and the front axle geometry.
Check that the configuration reading **LC002 Strategy number** corresponds to the vehicle equipment. Configure the computer correctly using the diagnostic tool, if necessary (**see Configuration and Programming**).

AFTER REPAIR	Perform a check using the **diagnostic tool**.

ALP 3	SUDDEN LOSS OF ASSISTANCE

NOTES	Only consult this customer complaint after a **complete check** with the **diagnostic tool**.
	Use the Technical Note wiring diagram for **New Twingo**.

Connectors of component 502 disconnected, check the condition and conformity of the connectors and clips. If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. With the connector of component **597** disconnected: Check the continuity and insulation of **connection BP81** between components **502** and **597**. Check the continuity and insulation of **connection ML** of component **502**. If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, perform a conformity check of component **597**.
Check the pressure and condition of the tyres, the steering, joints and the front axle geometry.
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a check using the **diagnostic tool**.

CHART 4	GRADUAL LOSS OF ASSISTANCE

NOTES	Only consult this customer complaint after a **complete check** with the **diagnostic tool**.
	Use the Technical Note wiring diagram for **New Twingo**.

Connectors of component 502 disconnected, check the condition and conformity of the connectors and clips. If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. With the connector of component **1016** disconnected: Check the continuity and insulation of **connection AP23** between components **502** and **1016**. Check the continuity and insulation of **connection ML** of component **502**. If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, perform a conformity check of component **1016**.
Check the pressure and condition of the tyres, the condition of the joints and the front axle geometry.
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a check using the **diagnostic tool**.

ALP 5	INTERMITTENT ASSISTANCE

NOTES	Only consult this customer complaint after a **complete check** with the **diagnostic tool**.
	Use the wiring diagram Technical Note for **New Twingo**.

Connectors of component 502 disconnected, check the condition and conformity of the connectors and clips. If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. With the connector of component **1016** disconnected: Check the continuity and insulation of **connection AP23** between components **502** and **1016**. Check the continuity and insulation of **connection ML** of component **502**. If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, perform a conformity check of component **1016**.
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a check using the **diagnostic tool**.

ALP 6	ASSISTANCE RETURN WHILE DRIVING

NOTES	Only address this customer complaint after a **complete check** with the **diagnostic tool**.
	Use the wiring diagram Technical Note for **New Twingo**.

Connectors of component 502 disconnected, check the condition and conformity of the connectors and clips. If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. With the connector of component **597** disconnected: Check the continuity and insulation of **connection BP81** between components **502** and **597**. Check the continuity and insulation of **connection ML** of component **502**. If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, perform a conformity check of component **597**. Check the pressure and condition of the tyres, the condition of the joints and the front axle geometry.
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

ALP 7	PERMANENT ASSISTANCE

NOTES	Only consult this customer complaint after a **complete check** with the **diagnostic tool**.

Check the conformity of the computer and the steering column (45 or 60 A) in relation to the table below:

		Left-hand drive	Right-hand drive
Torque sensor wiring harness		blue	black
Motor wiring	45 A	green	black
Motor wiring	60 A	blue	grey

	45 A	60 A
ECU label	yellow	white

In the event of non-conformity, consult **RENAULT NET** to repair the vehicle according to the technical vehicle definition.

Check that the configuration reading **LC002 Strategy number** corresponds to the vehicle equipment. Configure the computer correctly using the diagnostic tool, if necessary (**see Configuration**).

Check the pressure and condition of the tyres, the condition of the joints and the front axle geometry.

If the fault is still present, contact Techline.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

ALP 8	EXCESSIVE PERMANENT ASSISTANCE

NOTES	Only consult this customer complaint after a **complete check** with the **diagnostic tool**.

Check that the configuration reading **LC002 Strategy number** corresponds to the vehicle equipment. Configure the computer correctly using the diagnostic tool, if necessary (**see Configuration and Programming**).
Apply the fault finding procedure for fault **DF043 Vehicle speed**.
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a check using the **diagnostic tool**.

ALP 9	STEERING WHEEL VIBRATION OR PULSATING

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.
	Use the Technical Note wiring diagram for **New Twingo**.

Connectors of component 502 disconnected, check the condition and conformity of the connectors and clips. If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. With the connector of component **1016** disconnected: Check the continuity and insulation of **connection AP23** between components **502** and **1016**. Check the continuity and insulation of **connection ML** of component **502**. If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, perform a conformity check of component **1016**.
Check the conformity of **PR001 Torque applied to steering wheel** (see **Conformity check**). If the value of this parameter changes drastically without any movement of the steering wheel, contact the Techline
Check the conformity of **PR129 Motor power (60 A)** or **PR130 Motor power (45 A)** (see **Conformity check**). If the value of this parameter changes drastically without any movement of the steering wheel, contact the Techline.
If the incident is still present, contact the Techline.

AFTER REPAIR	Perform a check using the **diagnostic tool**.

ALP 10	NO ASSISTANCE ON START-UP

NOTES	Only consult this customer complaint after a **complete check** with the **diagnostic tool**.
	Use the Technical Note wiring diagram for **New Twingo**.

Connectors of component 502 disconnected, check the condition and conformity of the connectors and clips. If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. With the connector of component **1016** disconnected: Check the continuity and insulation of **connection AP23** between components **502** and **1016**. Check the continuity and insulation of **connection ML** of component **502**. If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, perform a conformity check of component **1016**.
Check the battery voltage and carry out any operations necessary to obtain a correct voltage **(10 V < battery voltage < 16 V, see MR 411 Mechanical systems, 16A, Starting - Charging)**.
Apply the fault finding procedure for fault **DF028 No engine speed**.
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

ALP 11	WARNING LIGHT ON WITH NO FAULT

NOTES	Only consult this customer complaint after a **complete check** with the **diagnostic tool**.
	Use the Technical Note wiring diagram for **New Twingo**.

With the connectors of components **502** and **247** disconnected, check the continuity and insulation of connection **109H** between components **502** and **247**. If the connection is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the checks reveal no faults, perform a conformity check of component **247**.
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a test using the **diagnostic tool**.

CHART 12	STEERING WHEEL NOT RETURNING TO CENTRE POINT

NOTES	Only consult this customer complaint after a **complete check** with the **diagnostic tool**.
	Conditions: The steering automatic return function is effective within a speed range of **5** and **20 mph** (8 to 32 km/h).

Carry out a complete check of the axle assemblies on an axle adjustment bench (see MR 411, 30A, General information, for the checking values).
If the fault is still present, contact Techline.

AFTER REPAIR	Perform a test using the **diagnostic tool**.