RENAULT

Workshop Repair Manual

N.T. 2492A

Basic manual: **M.R. 305**

Electric power assisted steering

77 11 187 649 **JANUARY 1996** **Edition anglaise**

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

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

CONTENTS

ELECTRONICALLY MANAGED SYSTEM
Electric power assisted steering

38

AIM OF THE ELECTRIC POWER ASSISTED STEERING

The assistance provided by the EPAS allows forces on the steering wheel to be reduced, especially parking and low speed manoeuvres.

Thus when parking, the steering wheel feels just like normal power assisted steering.

The assistance varies depending on the circumstances:

- When cornering (speed > 6 mph (10 km/h)) the assistance is progressive. As the force on the steering wheel increases due to the effects of the corner the assistance will still allow the driver to "feel" the severity of the corner.

  The assistance law is therefore "non uniform" compared with hydraulic steering valve laws so as not to provide too much assistance when starting to turn whilst subsequently ensuring limited maximum force.

- Depending on the speed, high assistance makes low speed manoeuvring easy but is no longer required at high speeds since on the one hand turns are smaller thus resulting in more limited forces at the steering wheel and on the other, there is not too much assistance at the steering wheel to ensure the driver's safety.

Above a threshold where manual steering is acceptable (43 mph) (70 km/h), the electric motor is no longer supplied and is also imperceivably disengaged from the steering column to increased safety.

The electric power assisted steering computer uses the vehicle speed information and therefore provides variable assistance which decreases with speed.

The computer alters the assistance laws automatically.

The system must be absolutely safe thus requiring it to:

- know how to detect faults systematically:
  → this is the fault finding function,
- provide a correcting action ensuring vehicle driver integrity :
  → this is the defect mode management function.

OPERATING PRINCIPLE

The operating principle of the electric power assisted steering is to assist steering forces when the steering wheel is turned.

The assistance torque is provided by an electric motor which acts in addition to the torque applied to the steering wheel by the driver.

The role of an electric power assisted steering column is therefore to transmit a torque to the pinion which is the sum of the torque applied to the steering wheel by the driver and the torque provided by the electric assistance motor.

Electric power assisted steering is a vehicle speed dependent Variable Assistance Steering system.

When a force appears at the steering wheel, this is transmitted mechanically to the rack and electrically to the computer through the torque sensor.

The steering wheel force causes a torsion bar fitted in series with the steering column to distort; this distortion is measured electrically then transmitted to the computer.

When the torque sensor records a force at the steering wheel, the computer provides the motor with an electric current depending on the steering wheel torque and also on the vehicle speed.

The clutch, then the gearbox, transmit the assistance force from the electric motor to the steering column.

The movement of the wheels, resulting from the direct force and the assistance force, is retransmitted by the pinion on the torsion bar thus providing the information "feed back".

LOCATION AND COMPOSITION

The system consists of the following components:

- **The actuators:**

  - The electric assistance motor is coupled mechanically to the steering column by means of a system consisting of a clutch and a gearbox and is also managed electrically by a computer.

    The electric power assisted steering system is fitted to a standard rack, in other words it is the same as a rack used on manual steering.

  - The clutch is of dry, single plate electromagnetic type.

  - The gearbox consists of a wheel and a worm screw.

- **The fault warning light:**

  This is incorporated into the warning light strip. This warning light is illuminated when the electric power assisted steering is earthed by the computer.

  The fault warning light is illuminated when the engine is stopped or if a fault occurs in the system.

DI3862

- **The torque sensor:**

  Of magnetic no contact type, this assembly consists of a torsion bar fitted to the steering column, an angular sensor and electronics which analyse the signal.

- **The speed sensor:**

  This is an electromagnetic sensor with incorporated electronics.

- **The engine speed sensor:**

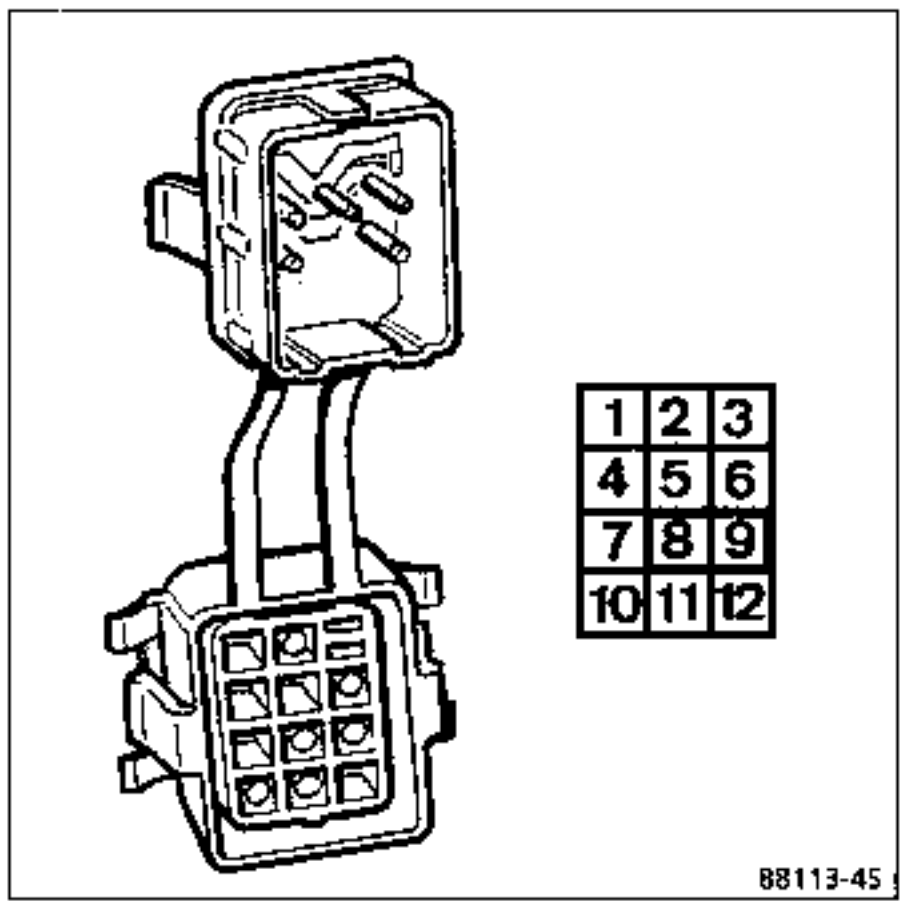
  Allows engine speed information to be received from the injection computer.

- **The computer:**

  Controls the electric motor by controlling the direction and the intensity of the current flowing through the electric motor, checks the system is working correctly, manages the system if a component fault occurs and facilitates maintenance.

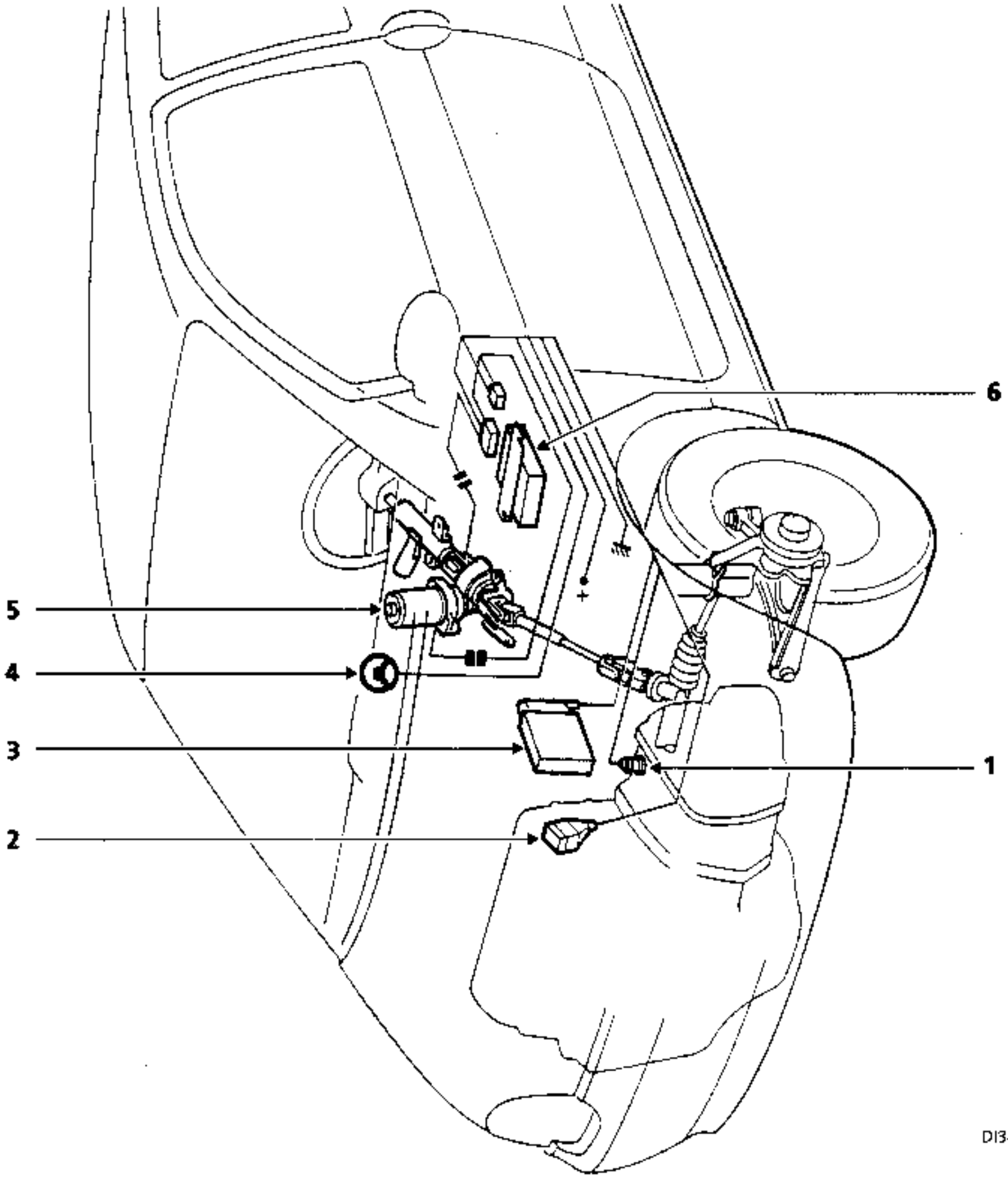
- **The diagnostic socket:**

  Allows the vehicles to be connected to the XR25 test kit in order to find faults (lines 8 and 9 are allocated to the electric power assisted steering).



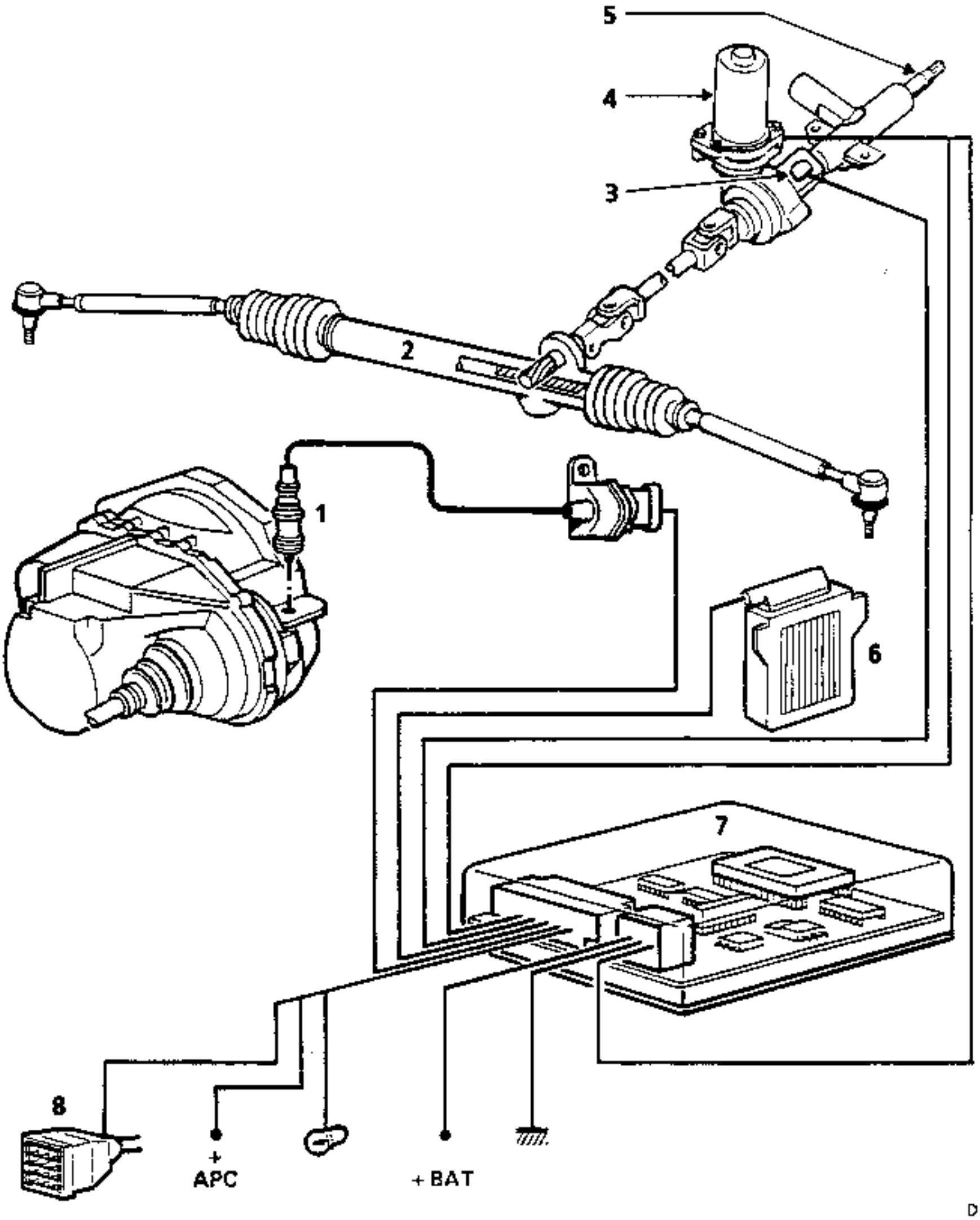
1	Not used
2	Earth
3	Mechanical fool proofing device
4	Not used
5	Not used
6	+ battery (12 V)
7	Not used
8	EPAS control line
9	EPAS information line
10	Line L
11	Line K
12	Not used

LOCATION AND COMPOSITION



1 Speed sensor
2 Diagnostic socket
3 Injection computer (engine speed)
4 EPAS warning light
5 Steering column
6 EPAS computer

ARCHITECTURE

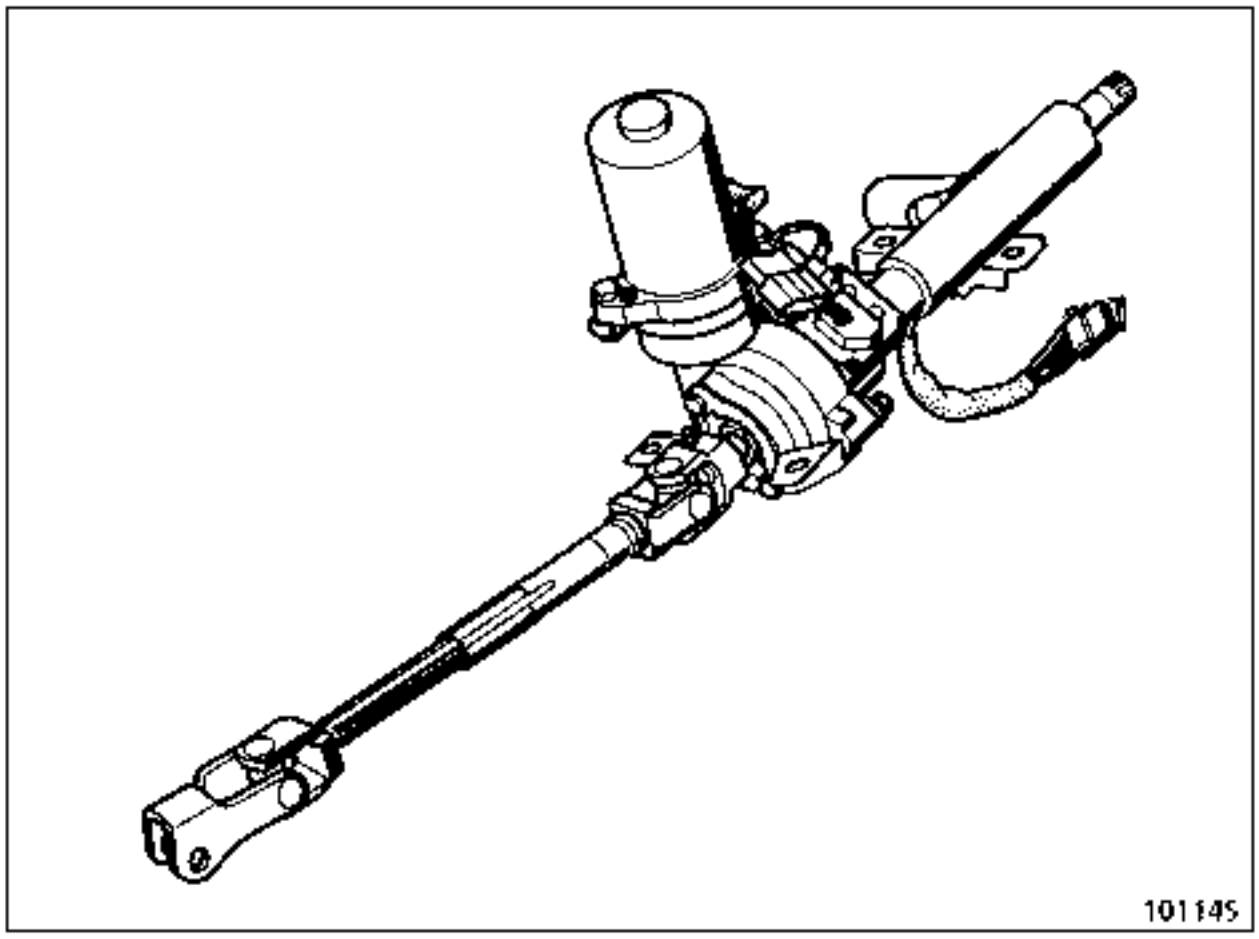


DI3B64

1 Speed sensor
2 Steering box
3 Torque sensor
4 Electric motor
5 Steering column
6 Injection computer
7 EPAS computer
8 Diagnostic socket

The system consists of four components:
- the complete steering column on its own,
- the complete intermediate shaft,
- the computer,
- the manual steering box.

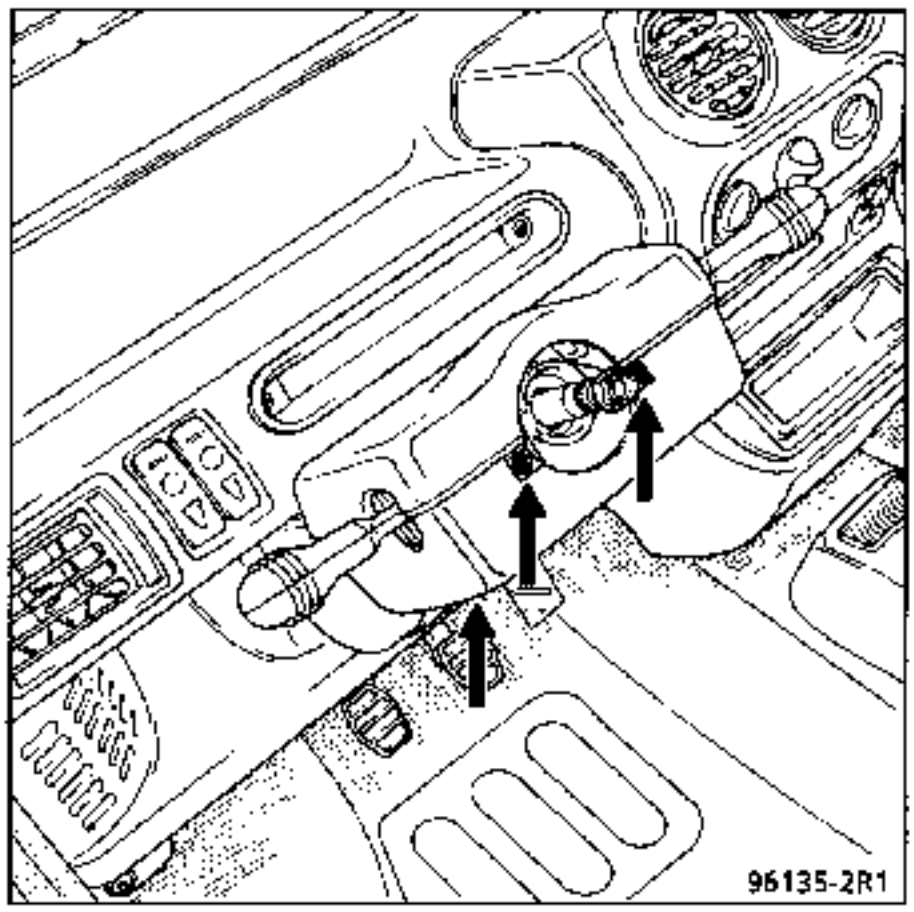
ELECTRIC STEERING COLUMN



TIGHTENING TORQUES (in daN.m)	
Steering wheel mounting bolt	4.5
Eccentric pinch bolt	2.5
Steering column mounting bolt	2.5

REMOVAL

After having disconnected the battery, remove:
- the steering wheel after having marked its position,
- the lower half shell by slackening the three bolts and pulling it downwards.



SPECIAL NOTES ON VEHICLES FITTED WITH AIRBAGS (refer to N.T. 2315A)

IMPORTANT

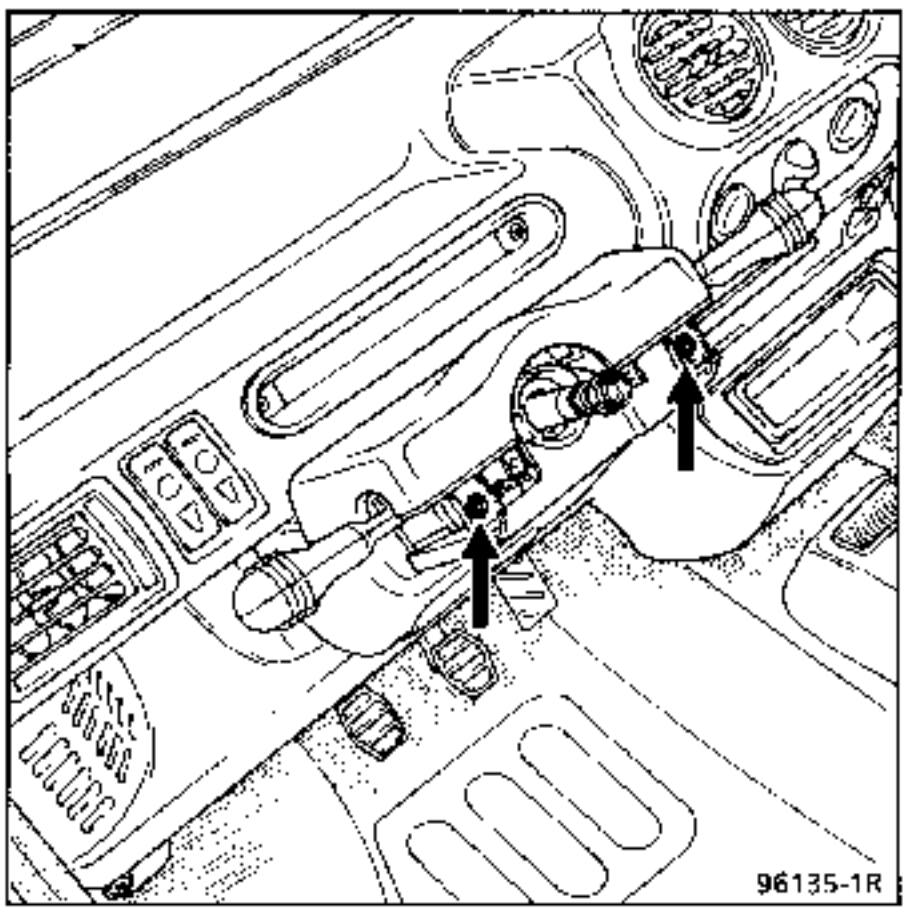
To avoid any risk of destroying the rotary switch under the steering wheel, the following instructions must be followed:

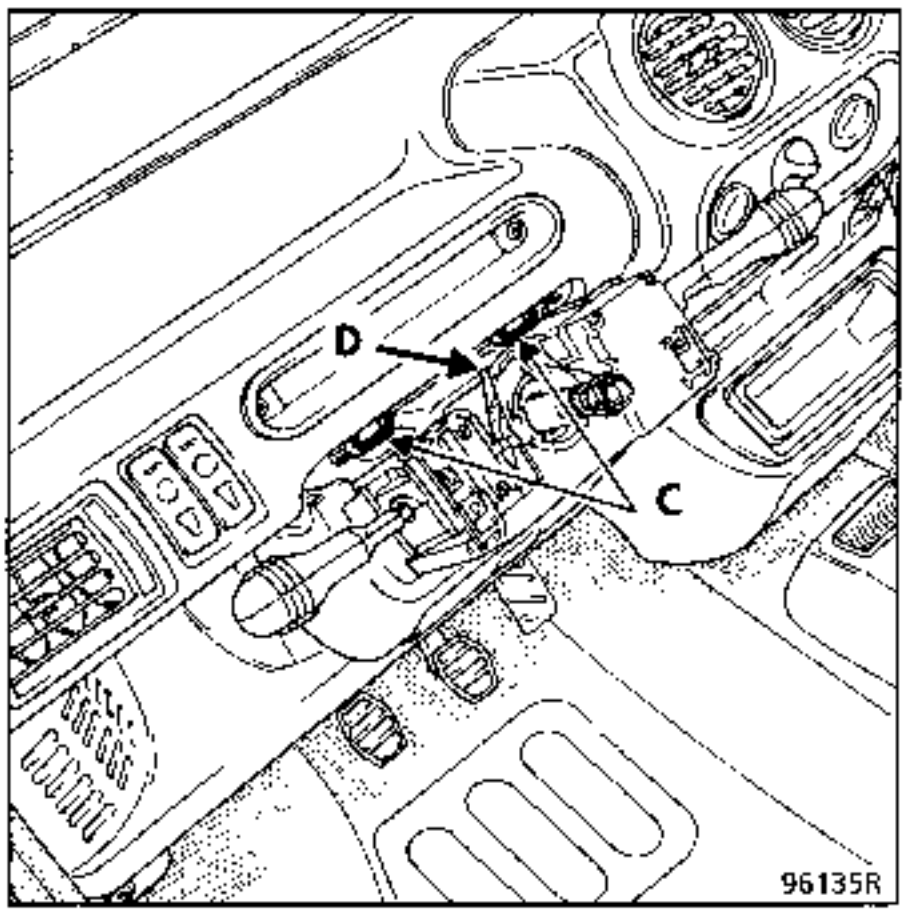
- **Before uncoupling the steering column and the rack, the steering wheel MUST be immobilised with the wheels straight using a "steering wheel lock" tool through the whole repair operation.**

- **Any doubts about the correct centring of the rotary switch require the steering wheel to be removed in order to perform the centring method described in section 88 "Airbag".**

REMINDER: in this case, only qualified and trained staff must perform this operation.

Remove the upper half shell by slackening the two mountings and pulling towards the rear whilst maintaining the same angle so as to release the two lugs (C).



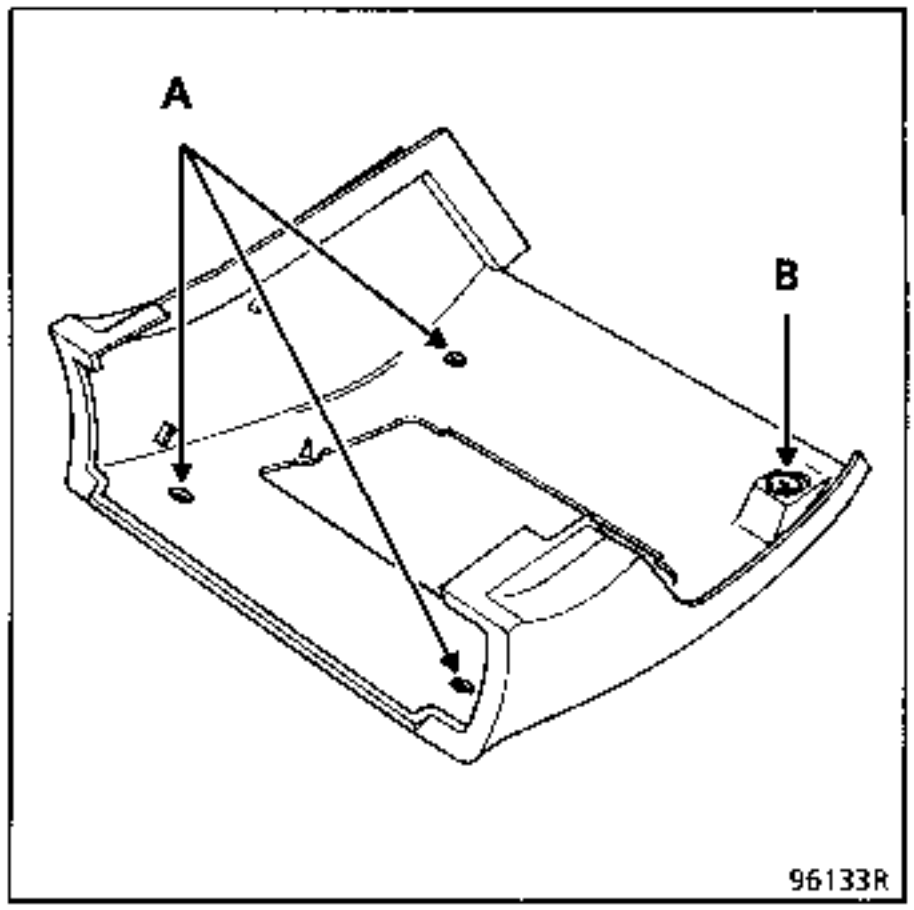


Remove the stalk mounting assembly by slackening the bolt (D).

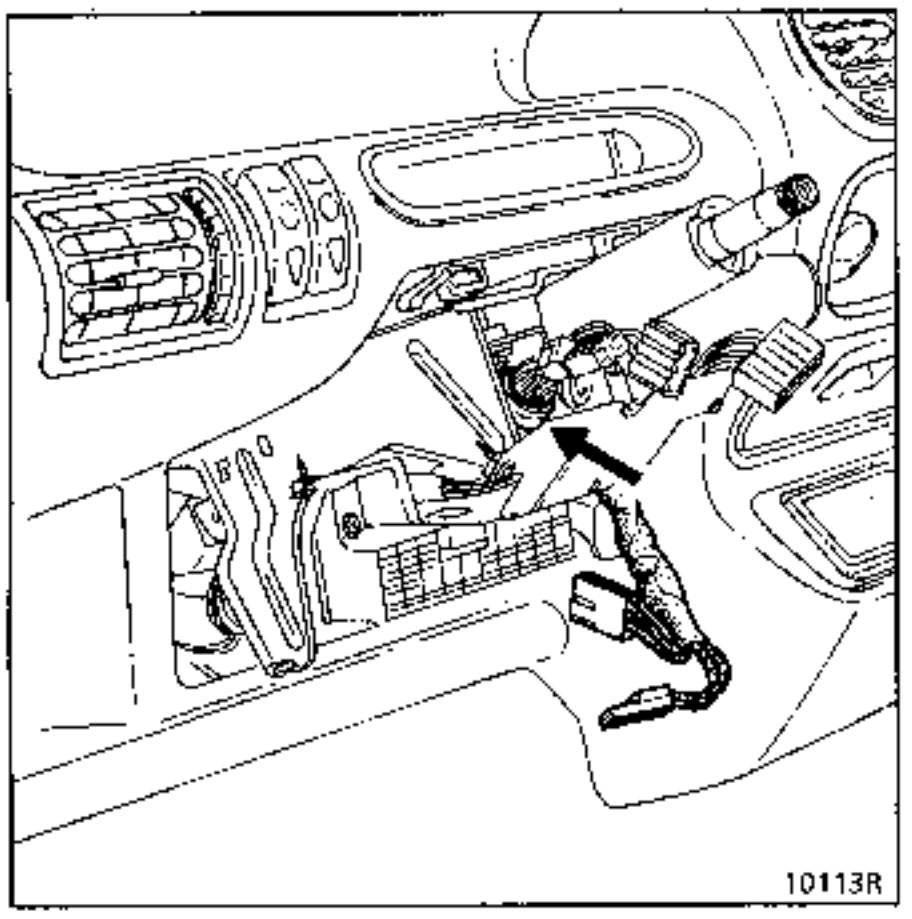
Pull the assembly slightly towards the rear.

Disconnect the connectors.

Remove:
- the stalk mounting assembly,
- the steering column cover (trim under the steering wheel) by slackening the three bolts (A) and pulling downwards to unclip the pin (B) located on the bottom right hand side.

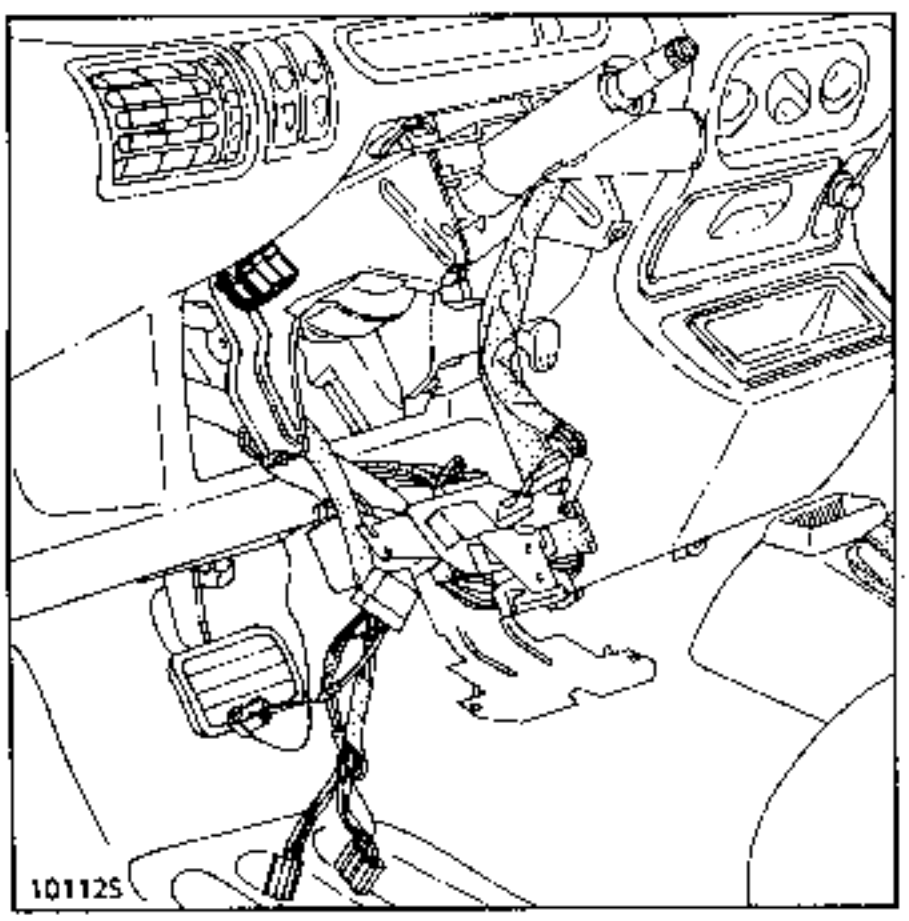


Release the wiring loom from the clip and remove the clip so as to make it easier to remove the steering column.

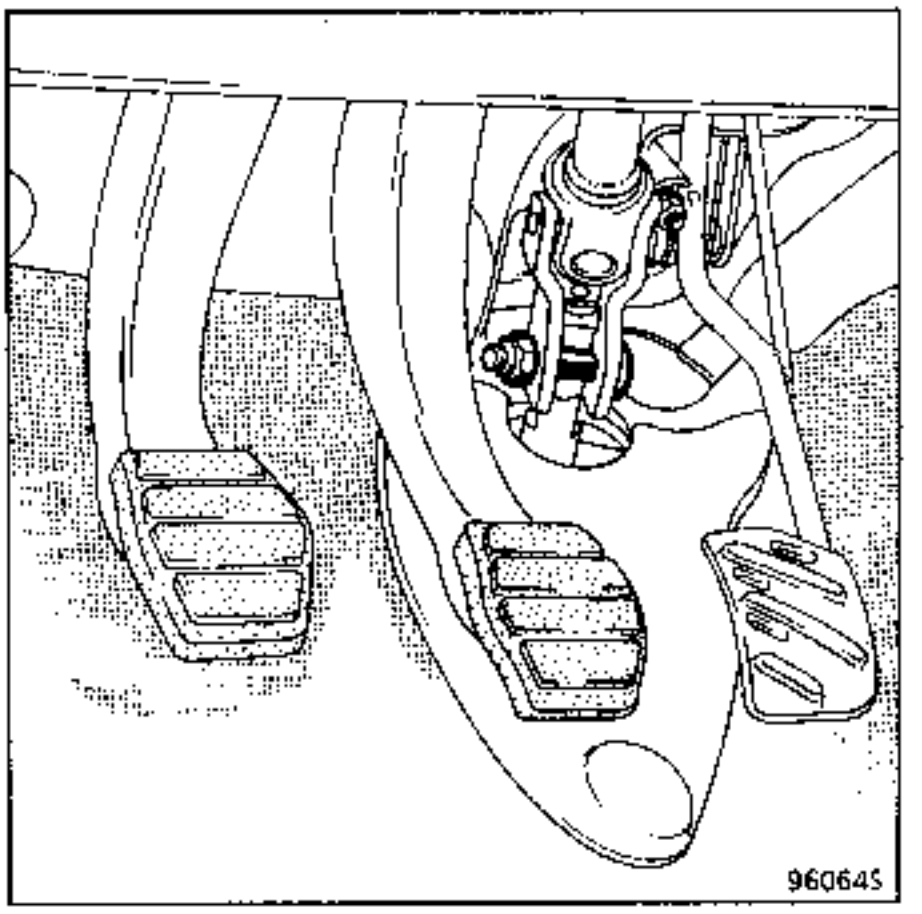


Disconnect the ignition switch connectors (black and grey).

Remove:
- the two mounting bolts of the main wiring and fuse plate,



- the nut and eccentric pinch bolt.



Disconnect the two steering column feed connectors (located to the left of the steering column).

Remove the four steering column mounting bolts and remove the assembly.

REFITTING

Check the length of the retractable pin (see corresponding paragraph).

When the steering column is locked by the ignition switch, the steering wheel is in the mid-point.

Consequently:

- Position the rack in the mid-point (wheel straight).
- Position the steering column (locked) and engage the pinch bolt into the stem of the steering pinion.

Secure the column (tighten the bolts on the left starting with those at the top, then those on the right).

Reconnect the steering column feed connectors.

Secure the main wiring and fuse plate.

Reconnect the ignition switch connectors.

Secure the clip and the wiring loom of the stalk mounting assembly.

Replace:
- the stalk mounting assembly,
- the steering wheel upper and lower half shells,
- the lower cover under the steering wheel,
- the steering wheel in the position which was marked when removed,
- the eccentric bolt,
- the steering wheel bolt and tighten it to the correct torque (use a new pre-bonded bolt).

RETRACTABLE PIN

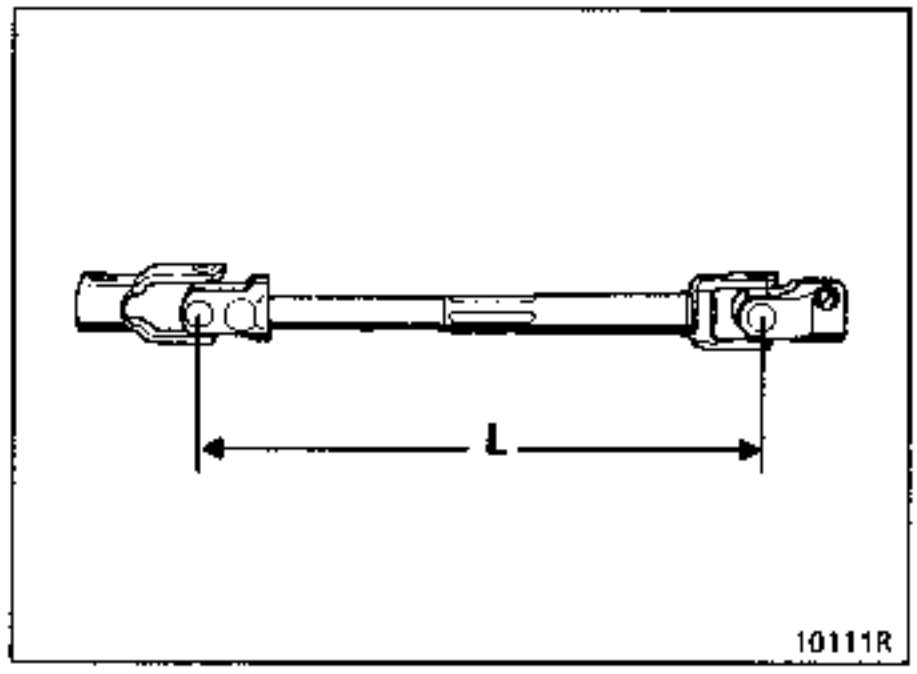
TIGHTENING TORQUES (in daN.m)	
Column retractable pin mounting bolt	3

The retractable pin can be removed.

If it is impossible to tighten the eccentric bolt of the pinch bolt, check the length of the pin is correct, otherwise replace it.

Check:

L = 273.4 ± 1 mm



COMPUTER

TIGHTENING TORQUES (in daN.m)	
Computer mounting bolt	1.1

REMOVAL

To access the computer, the dashboard has to be removed (refer to MR 305 section 83).

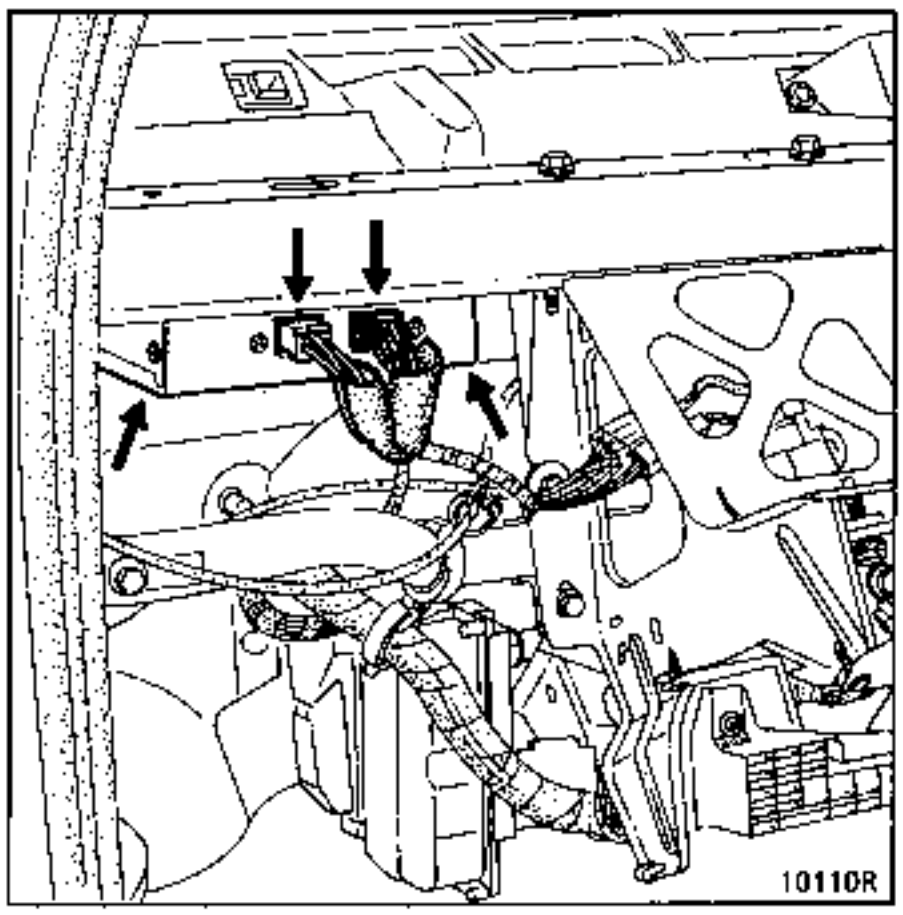
Disconnect the 4 track and 16 track connectors.

Remove the two computer mounting bolts

Remove the computer.

REFITTING

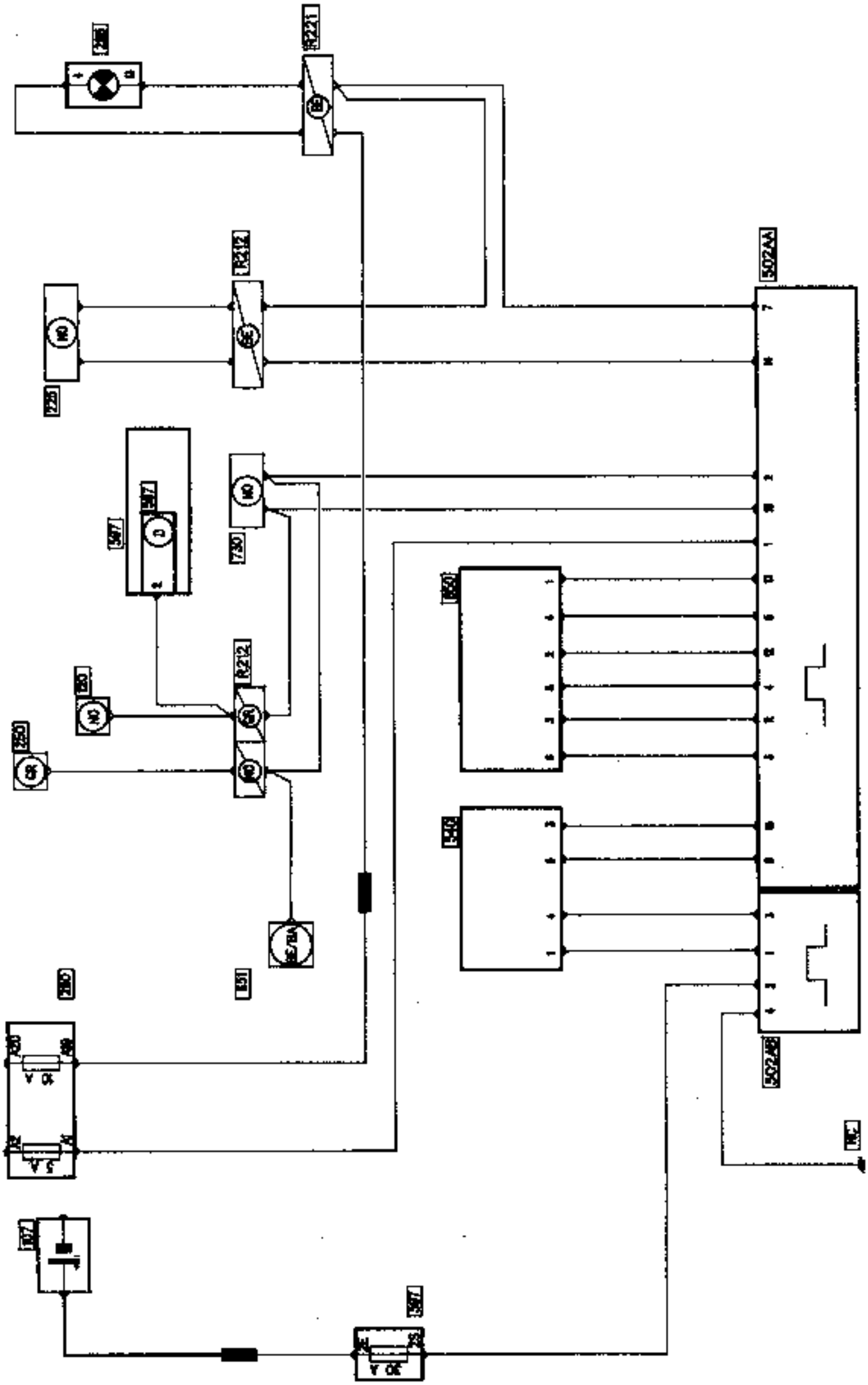
Refitting is the reverse of removal.



STEERING BOX

Refer to M.R. 305 section 36 since the procedure is the same.

WIRING DIAGRAM



PRJ10122

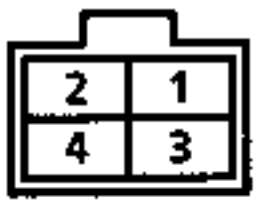
WIRING DIAGRAM PARTS LIST

107	Battery
120	Injection computer
225	Diagnostic socket
250	Speed sensor
260	Fuse box
295	EPAS fault warning light
502AA	16 track computer connector
502AB	4 track computer connector
540	Motor / clutch
597	Engine fuse box
651	Instrument panel
730	Managed clutch computer (option)
850	Torque sensor
NC	Front left hand footwell earth
R212	Engine wiring / passenger compartment wiring connector
R221	Dashboard / passenger compartment wiring connector

PIN ALLOCATION OF THE TWO CONNECTORS ON THE COMPUTER

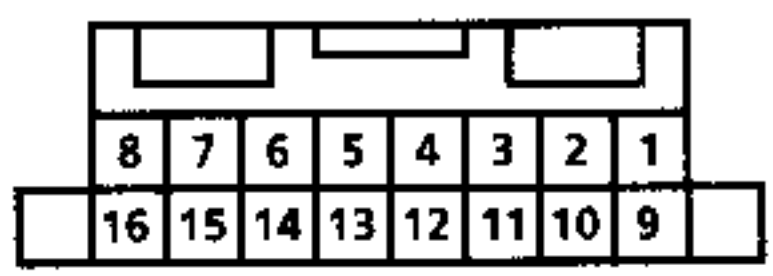
4 track connector

Track	Allocation
1	EPAS motor
2	+ battery
3	EPAS motor
4	Earth



16 track connector

Track	Allocation
1	+ after ignition
2	Vehicle speed information
3	Torque sensor feed
4	Torque sensor information
5	Torque sensor earth
6	Not used
7	EPAS fault warning light
8	EPAS clutch
9	Not used
10	Engine speed information
11	Torque sensor feed
12	Torque sensor information
13	Torque sensor earth
14	Diagnostic line - terminal 8 on socket
15	Not used
16	EPAS clutch



FAULT FINDING - INTRODUCTION

GRADING FAULTS

Depending on the type of fault detected, the defect mode will not be switched in the same way. This depends on the risk created by the detected fault and the operating point of the vehicle.

The detection response time and switching to defect mode is quicker when the fault poses a higher risk. Likewise, returning to normal mode depends on the type of fault detected.

MANAGING DEFECT MODE

Defect mode means that assistance is prevented. This can be performed by stopping the electric motor control or releasing the clutch or else by opening the clutch and electric motor feed relay.

In addition, depending on where the vehicle's operating point is in the system, defect mode can be switched to instantly or progressively.

SETTING UP A DIALOGUE BETWEEN THE XR25 TEST KIT AND THE COMPUTER

- Connect the XR25 to the diagnostic socket.
- Switch on S6
- Enter **D37** **I.dAE**

NOTES BEFORE FAULT FINDING

Read the customer complaint: EPAS warning light illuminated and power assisted steering not working.

Then connect the XR25, then using fiche n° 37 read the illuminated fault bargraph and its definition (example: command *01 corresponds to the fault which caused bargraph 1 LH to be illuminated).

Then with the ignition off, disconnect the battery for approximately 30 seconds. Then reconnect the battery and perform a road test.

If the fault persists, start the fault finding process.

PRECAUTION

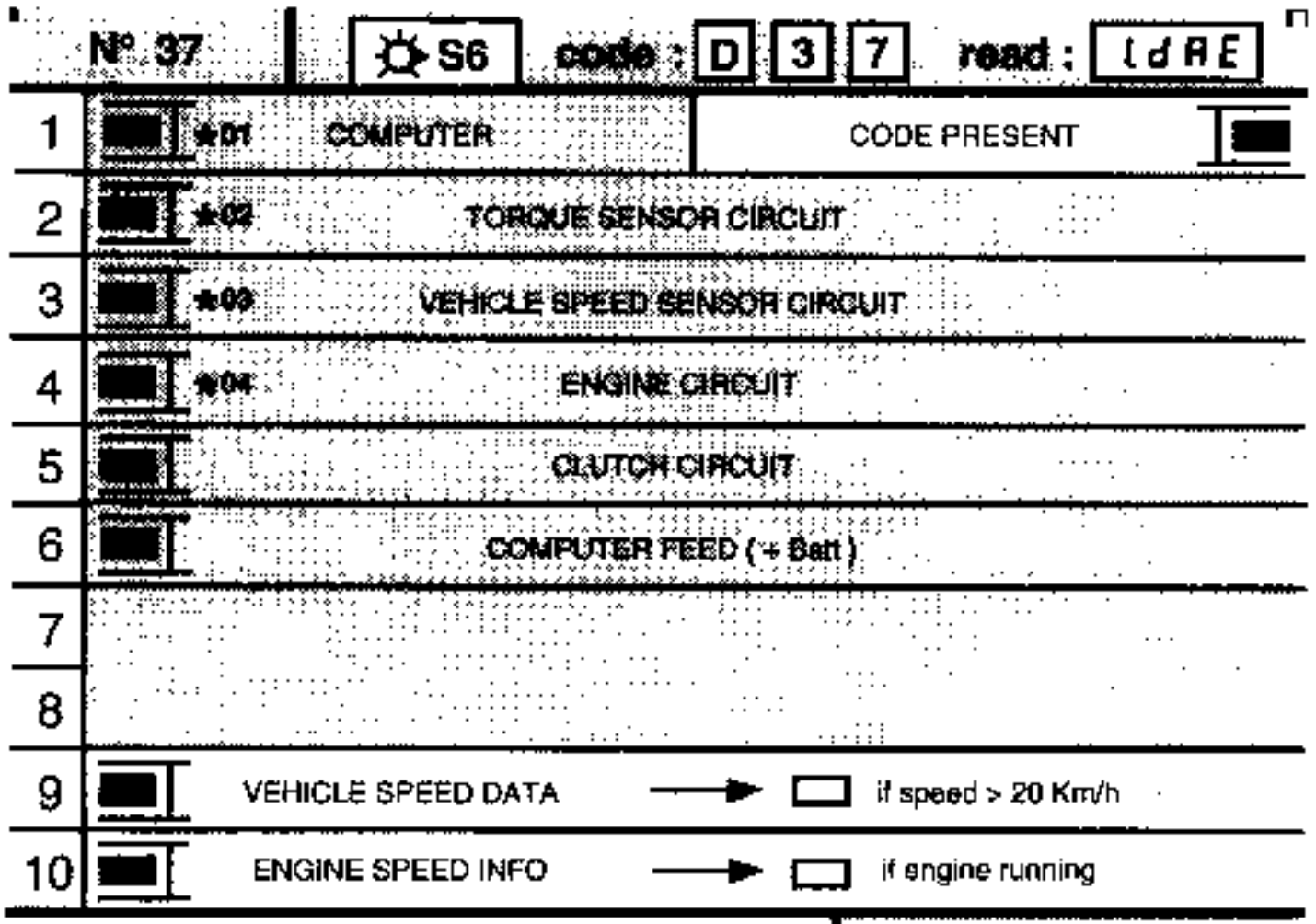
When performing continuity tests using a multimeter, avoid using a sharp pointer on the connectors, the size of which may damage the clips and result in poor contact.

ERASING THE MEMORY

After repairing the electric power assisted steering system, with the ignition off, disconnect the battery for approximately 30 seconds to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - XR25 FICHE



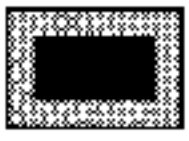
FI21537

h06011.0

FAULT FINDING - XR25 FICHE

MEANING OF THE BARGRAPHS

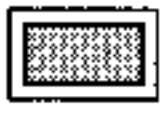
FAULTS (always on coloured background)



If illuminated, this signals a fault on a product, the associated text defines the fault.

This bargraph can be:
- Permanently illuminated : fault present.
- Flashing : fault memorised.
- Extinguished : no fault or not detected.

STATUS (always on a coloured background)



Bargraph always located in the top right.

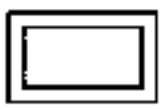
If illuminated, this signals that a dialogue has been set up between the computer and the product.

If it remains extinguished:
- the code does not exist,
- there is a fault in the tool, the computer or the XR25 / computer connection

The representation of the following bargraphs shows their initial state:
Initial state: (ignition on, engine stopped, no operator action)


or

Undefined


Extinguished

is illuminated when the function or condition stated on the fiche is present


Illuminated

is extinguished when the function or condition stated on the fiches is no longer present

ADDITIONAL INFORMATION

Some bargraphs have a *. The command *..., when the bargraph is illuminated, allows additional information on the type of fault or status detected to be displayed.

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS

GENERAL NOTES	Refer to this fault chart before starting the fault finding process.

Check for the presence of earth on track 4 of the computer's 4 track connector.

Ignition off, check for the presence of ≃ 12 V on track 2 of the computer's 4 track connector.

Ignition on, check for the presence of ≃ 12 V on track 1 of the computer's 16 track connector.

If these voltages are not present, check the system fuses are correctly clipped in.

If the fault persists, check the continuity and the insulation with respect to earth and the + 12 V of the wiring between:

- computer's 4 track connector { 2 engine fuse box and 4 NC earth in front left hand footwell

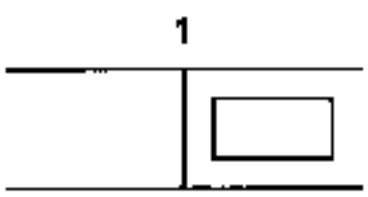
- computer's 16 track connection track 1 and the fuse box.

Repair the faulty wiring.

AFTER REPAIR	Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS



Bargraph 1 RH extinguished

Fiche n° 37

COMMUNICATION WITH XR25

XR25 aid: Bargraph extinguished ignition on means there is a diagnostic signal fault

NOTES

Before starting the fault finding process, refer to the general note.

Ignition off, connect the XR25. The test kit should display "r25".

If the test kit does not display "r25", repair the wiring between the diagnostic socket tracks :
- 2 and earth,
- 6 and the fuse box.

Turn the ignition on. Switch on position 56. Enter D37. "I.dAE" should be read on the display.

Is "I.dAE" on the display?

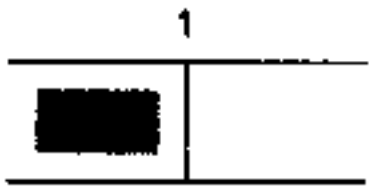
YES	Start of fault finding operation.
NO	If horizontal lines are displayed in the screen, check: - the position of switch S6, - the conformity of the cassette, - the connection between the XR25 and the diagnostic socket. Repair the faulty component if necessary.
	Connect the **MS 1048** bornier instead of the computer and check the continuity of the wiring between tracks: Diagnostic socket { 8 and 14 / 9 and 7 } Computer's 16 track connector Repair the wiring.

AFTER REPAIR

Start of fault finding operation.

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS



Bargraph 1 LH illuminated

Fiche n° 37

COMPUTER

XR25 aid: *01 = 1.dEF : safety relay fault
2.dEF : feed fault
3.dEF : software fault

NOTES

Ignition off, bargraph 1 LH is always illuminated: ignore this.
Before starting the fault finding process, refer to the general note.

1.dEF

NOTES None

Replace the computer.

2.dEF

NOTES None

Check the continuity and the insulation with respect to earth and the + 12 V of the wiring between tracks:

Computer's 16 track connector { 3 and 11 } { 6 and 3 } Torque sensor 6 track connector

Repair the wiring if necessary.

Ignition on, check for the presence of ≃ 8 V between the computer's 16 track connector track:
- 3 and the vehicle earth
- 11 and the vehicle earth

Is this voltage present?

YES	Replace the steering column.
NO	Replace the computer.

AFTER REPAIR

Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS

1 [redacted] CONT	

3.dEF	*NOTES*	None

Replace the computer.

AFTER REPAIR	Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS

2 	**Bargraph 2 LH illuminated** Fiche n° 37 TORQUE SENSOR CIRCUIT **XR25 aid: *01 = 1.dEF : main torque sensor fault** **2.dEF : secondary torque sensor fault** **3.dEF : different measurements between the 2 sensors**

NOTES	Before starting the fault finding process, refer to the general note.

1.dEF	***NOTES*** None

Check the continuity and the insulation with respect to earth and the + 12 V of the wiring between tracks:

Computer's 16 track connector { 3 and 6 / 4 and 5 / 5 and 4 } Torque sensor 6 track connector

Repair the wiring if necessary.

Ignition on, check for the presence of ≃ 8 V between track 3 of the computer's 16 track connector and the vehicle earth.

If this voltage is not present, replace the computer.

Ignition on, check for the presence of ≃ 2.5 V between track 4 of the computer's 16 track connector and the vehicle earth.

If this voltage is not present, replace the computer.

Disconnect the wiring of track 4 of the computer's 16 track connector, then turn the ignition on and check for the presence of ≃ 6.5 V between track 5 of the torque sensor 6 track connector and the vehicle earth.

Is this voltage present?

YES	Replace the computer.
NO	Replace the steering column.

AFTER REPAIR	**Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).**

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS

2 CONT	

2.dEF	***NOTES***	None

Check the continuity and the insulation with respect to earth and the + 12 V of the wiring between tracks:

Computer's 16 track connector { 11 and 12 and 13 } { 3 and 2 and 1 } Torque sensor 6 track connector

Repair the wiring if necessary.

Ignition on, check for the presence of ≃ 8 V between track 11 of the computer's 16 track connector and the vehicle earth.

If this voltage is not present, replace the computer.

Ignition on, check for the presence of ≃ 2.5 V between track 12 of the computer's 16 track connector and the vehicle earth.

If this voltage is not present, replace the computer.

Disconnect the wiring of track 12 of the computer's 16 track connector, then turn the ignition on and check for the presence of ≃ 6.5 V between track 2 of the torque sensor 6 track connector and the vehicle earth.

Is this voltage present?

YES	Replace the computer.
NO	Replace the steering column.

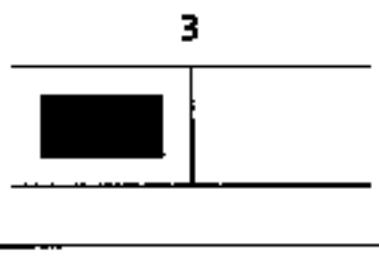
3.dEF	***NOTES***	If *02 = 1.dEF initially, deal with diagnostic 1.dEF If*02 = 2.dEF initially, deal with diagnostic 2.dEF

Replace the steering column.

AFTER REPAIR	Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS



Bargraph 3 LH illuminated

Fiche n° 37

VEHICLE SPEED SENSOR CIRCUIT

XR25 aid: ***03 = 1.dEF : no speed signal**
2.dEF : signal not plausible

NOTES

If the speed information and the mileometer are not working on the instrument panel, refer to the corresponding fault chart in section 8 of MR 305. Before starting the fault finding process, refer to the general note.

Switch the XR25 to pulse detection.

Lift one of the front two wheels and check for the presence of pulses on track 2 of the computer's 16 track connector by rotating the wheel, ignition on.

Are there pulses when the wheel is rotated?

YES

Replace the computer.

NO

Check the continuity and the insulation with respect to earth and the + 12 V of the following wiring:

Speed sensor 3 track connector { A1 fuse box; B1 and 2 of the computer's 16 track connector; C1 vehicle earth }

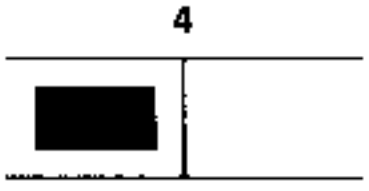
Repair the faulty wiring.

AFTER REPAIR

Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS



Bargraph 4 LH illuminated

Fiche n° 37

MOTOR CIRCUIT

XR25 aid: *04 = 1.dEF : wiring fault
2.dEF : excess voltage
3.dEF : motor jammed
4.dEF : servo-system fault

NOTES Before starting the fault finding process, refer to the general note.

1.dEF

NOTES None

Using a multimeter and with the ignition off measure the resistance between tracks 1 and 3 of the computer's 4 track connector.

Is there a resistance greater than 1 Ω ?

YES

Check the continuity and the insulation with respect to earth and the + 12 V of the wiring between tracks:

Computer's 4 track connector { 1 and 1 ; 3 and 4 } Motor / clutch 6 track connector

Is the wiring correct?

The wiring is correct: replace the steering column.

The wiring is faulty: repair the wiring.

NO

Replace the computer.

2.dEF

NOTES None

Replace the computer.

If the fault persists, replace the steering column.

AFTER REPAIR Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS

4	
CONTINUED	

3.dEF	*NOTES*	None

Replace the steering column.

4.dEF	*NOTES*	None

Using a multimeter and with the ignition off, measure the resistance between tracks 1 and 3 of the computer's 4 track connector.

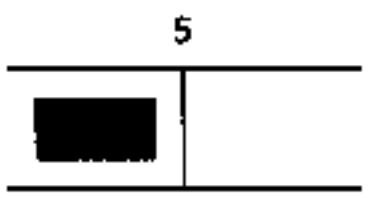
Is there a resistance greater than 1 Ω ?

YES	Check the continuity and the insulation with respect to earth and the + 12 V of the wiring between tracks: Computer's 4 track connector { 1 and 1 ; 3 and 4 } Motor / clutch 4 track connector. Is the wiring correct?
	The wiring is correct: replace the steering column.
	The wiring is faulty: repair the wiring.
NO	Replace the computer.

AFTER REPAIR	Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS



Bargraph 5 LH illuminated Fiche n° 37

CLUTCH CIRCUIT

XR25 aid: faulty wiring

NOTES

Before starting the fault finding process, refer to the general note.

Using a multimeter and with the ignition off, measure the resistance between tracks 8 and 16 of the computer's 16 track connector.

Is there a resistance of 15 ± 1 Ω ?

YES

Check the continuity and the insulation with respect to earth and the + 12 V of the wiring between tracks:

Computer's 16 track connector { 8 and 5 ; 16 and 3 } Motor / clutch 4 track connector

Is the wiring correct?

The wiring is correct: replace the steering column.

The wiring is faulty: repair the wiring.

NO

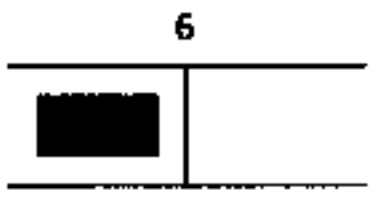
Replace the computer.

AFTER REPAIR

Disconnect the battery for ≈ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS



Bargraph 6 LH illuminated

Fiche n° 37

COMPUTER FEED CIRCUIT

XR25 aid: Feed fault + battery

NOTES	Before starting the fault finding process, refer to the general note. Check the condition of the battery. Check the condition of the 30A fuse in the engine fuse box.

Check the continuity and the insulation with respect to earth and the + 12 V of the wiring between:
- track 2 of the computer's 4 track connector and the engine fuse box,
- the engine fuse box and the battery,
- track 4 of the computer's 4 track connector and the vehicle NC earth.

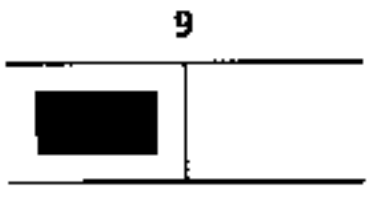
Repair the wiring.

If the fault persists, replace the computer.

AFTER REPAIR	Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS



Bargraph 9 LH illuminated with speed > 20 km/h Fiche n° 37

SPEED SENSOR CIRCUIT

NOTES

Before starting the fault finding process, refer to the general note.
If bargraph 3 LH illuminated, refer to bargraph 3 LH

Switch the XR25 to pulse detection.

Lift one of the front two wheels and check for the presence of pulses on track 2 of the computer's 16 track connector by rotating the wheel, ignition on.

Are there pulses when the wheel is rotated?

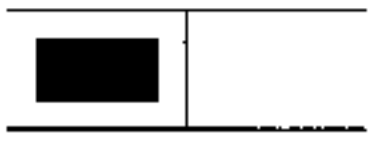
YES	Replace the computer.
NO	Check the continuity and the insulation with respect to earth and the + 12 V of the following wiring: Speed sensor 3 track connector { A1 fuse box; B1 and 2 of the computer's 16 track connector; C1 vehicle earth Repair the faulty wiring.

AFTER REPAIR

Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - INTERPRETATION OF XR25 BARGRAPHS

10 	**Bargraph 10 LH illuminated engine running** Fiche n° 37 ENGINE SPEED INFORMATION CIRCUIT

NOTES	**Before starting the fault finding process, refer to the general note.**

Switch the XR25 to pulse detection.

With the engine running, check for the presence of pulses on track 10 of the computer's 16 track connector.

Are there pulses?

YES	Replace the computer.
NO	XR25 still in pulse detection and engine running, are there pulses on track 23 of the injection computer?
	There are pulses: repair the wiring between track 10 of the computer's 16 track connector and track 23 of the injection computer.
	There are no pulses: replace the injection computer.

AFTER REPAIR	Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - CUSTOMER COMPLAINTS

NOTES	Only refer to these customer complaints after having carried out a complete check with the XR25.

The EPAS warning light flashes permanently	**Fault chart 1**
The EPAS warning light never illuminates	**Fault chart 2**
The power assisted steering does not work	
Without EPAS warning light illuminating	**Fault chart 3**
With EPAS warning light illuminating	**Fault chart 4**

FAULT FINDING - FAULT CHART

Fault chart 1	THE WARNING LIGHT FLASHES PERMANENTLY (without XR25 connected)
NOTES	Before starting the fault finding process, refer to the general note. Carry out the tests without the XR25 connected.

Check the insulation with respect to earth of the wiring between track 14 of the computer's 16 track connector and track 8 of the diagnostic socket.

Is the wiring correct?

YES	Replace the diagnostic socket. If the fault persists, replace the computer.
NO	Repair the wiring.

AFTER REPAIR	Disconnect the battery for ≈ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - FAULT CHART

Fault chart 2	THE WARNING LIGHT NEVER ILLUMINATES

NOTES	Before starting the fault finding process, refer to the general note. Check the condition of the 10A EPAS fuse.

Check the continuity and the insulation with respect to earth and the + 12 V of the wiring between tracks:

Dashboard 15 track connector { 4 fuse box; 13 and 7 of the computer's 16 track connector through connector R221 dashboard / monoblock

Repair the wiring or connectors if necessary.

Connect track 7 of the computer's 16 track connector to earth.

Does the EPAS warning light illuminate?

YES	Replace the computer.

NO	Replace the instrument panel strip.

AFTER REPAIR	Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - FAULT CHART

Fault chart 3	POWER ASSISTED STEERING DOES NOT WORK WITHOUT EPAS WARNING LIGHT ILLUMINATING

NOTES	Before starting the fault finding process, refer to the general note

Ignition off, check for the presence of ≃ 12 V on track 2 of the computer's 4 track connector.

Ignition on, check for the presence of ≃ 12 V on track 1 of the computer's 16 track connector.

Are these voltages present?

YES	Replace the computer.
NO	Repair the wiring between track 2 of the computer's 4 track connector and the engine fuse box or between track 1 of the computer's 16 track connector and the fuse box.

AFTER REPAIR	Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0

FAULT FINDING - FAULT CHART

Fault chart 4	POWER STEERING DOES NOT WORK WITH EPAS WARNING LIGHT ILLUMINATING

NOTES	Before starting the fault finding process, refer to the general note. On fiche n° 37 : If bargraph 1LH illuminated, refer to bargraph 1LH. If BG 2LH illuminated, refer to BG 2LH. If BG 3LH illuminated, refer to BG 3LH. If BG 4LH illuminated, refer to BG 4LH. If BG 5LH illuminated, refer to BG 5LH.

Check the continuity and the insulation with respect to earth and the 12 V of the wiring between track 23 of the injection computer and track 10 of the computer's 16 track connector.

Repair the wiring or connectors if necessary.

Ignition on, check for the presence of ≃ 12 V on track 10 of the computer's 16 track connector.

Is this voltage present?

YES	Replace the computer.
NO	Replace the injection computer.

AFTER REPAIR	Disconnect the battery for ≃ 30 seconds in order to erase the fault. Reconnect the battery then turn the ignition on and wait for 10 seconds (injection initialisation).

h06011.0