

The design of the whole vehicle, including the clutch, is continually being improved. The latest technological advances have allowed a computer controlled automatic clutch to be developed.

The special feature of this clutch is that to perform the clutch - declutch operation, a clutch pedal no longer needs to be used.

The automatic system used in the clutch control requires the use of the following components :

- an electro-pump and hydraulic jack assembly which carries out the clutch - declutch action at the mechanism control,
- a computer to control the assembly,
- various sensors, one of which is located in the gear lever knob.

MAINTENANCE (to be carried out at each visit to the workshop)

Check:

- the level of the hydraulic fluid (see section "Hydraulic fluid level").
- the correct operation of the buzzer
 - start the vehicle,
 - engage a gear,
 - open the driver's door,and the buzzer should sound.
- the safety devices preventing the engine from starting :
 - apply the handbrake,
 - engage a gear,
 - try to start the engine,the starter should not operate.

SPECIAL NOTES FOR REMOVAL - REFITTING OPERATIONS

Apply the handbrake before any operation on the vehicle.

The connectors for the various components may only be disconnected when the ignition is off, the engine has stopped completely and the vehicle is stationary.

Pump - jack assembly

Before carrying out any operation on the pump - jack assembly discharge the accumulator (to do this see section "Discharging the accumulator").

It is forbidden to :

- separate the pump assembly from the jack,
- dismantle the various components of the pump assembly or the jack.
- add hydraulic fluid to the system. If the fluid level drops, replace the pump - jack assembly (to check the level of the hydraulic fluid see section "Hydraulic fluid level").

When handling the pump - jack assembly, always hold it by the motor or the accumulator.

The pump - jack assembly supplied by the Parts Department is filled with fluid.

To prevent leakage of hydraulic fluid during transport, the breather plug on the reservoir is blocked by a small rubber ring which should be removed only after the pump - jack assembly has been fitted to the vehicle.

Accelerator position sensor

As a safety measure the accelerator pedal is fitted with a return spring. Check that this spring is present before any operation is carried out on the vehicle.

Operations to be carried out using the XR25 after the remove - refit operations.

Programme the neutral position for the solenoid and the jack position (see section "Programming neutral position for the solenoid and the jack position") :

- each time the pump - jack assembly is removed,
- each time a modification is made to the adjustment at the fork.

Programme the full load and no load positions (see section "Programming full load and no load positions") :

- when the computer is replaced,
- when the accelerator position sensor is replaced, after prior adjustment of the sensor (see section "Accelerator position sensor").

Programme the gears (see section "Programming the gears") :

- when the computer is replaced,
- when the gear lever or gear linkage is removed,
- when the gear box is removed,
- when the engaged gear sensor is removed.

Erase the computer memory after every operation on the automatic clutch (see section "Fault finding").

Store the date of the After Sales operation in the computer after each operation on the automatic clutch (see section "Entering the date of After Sales operations").

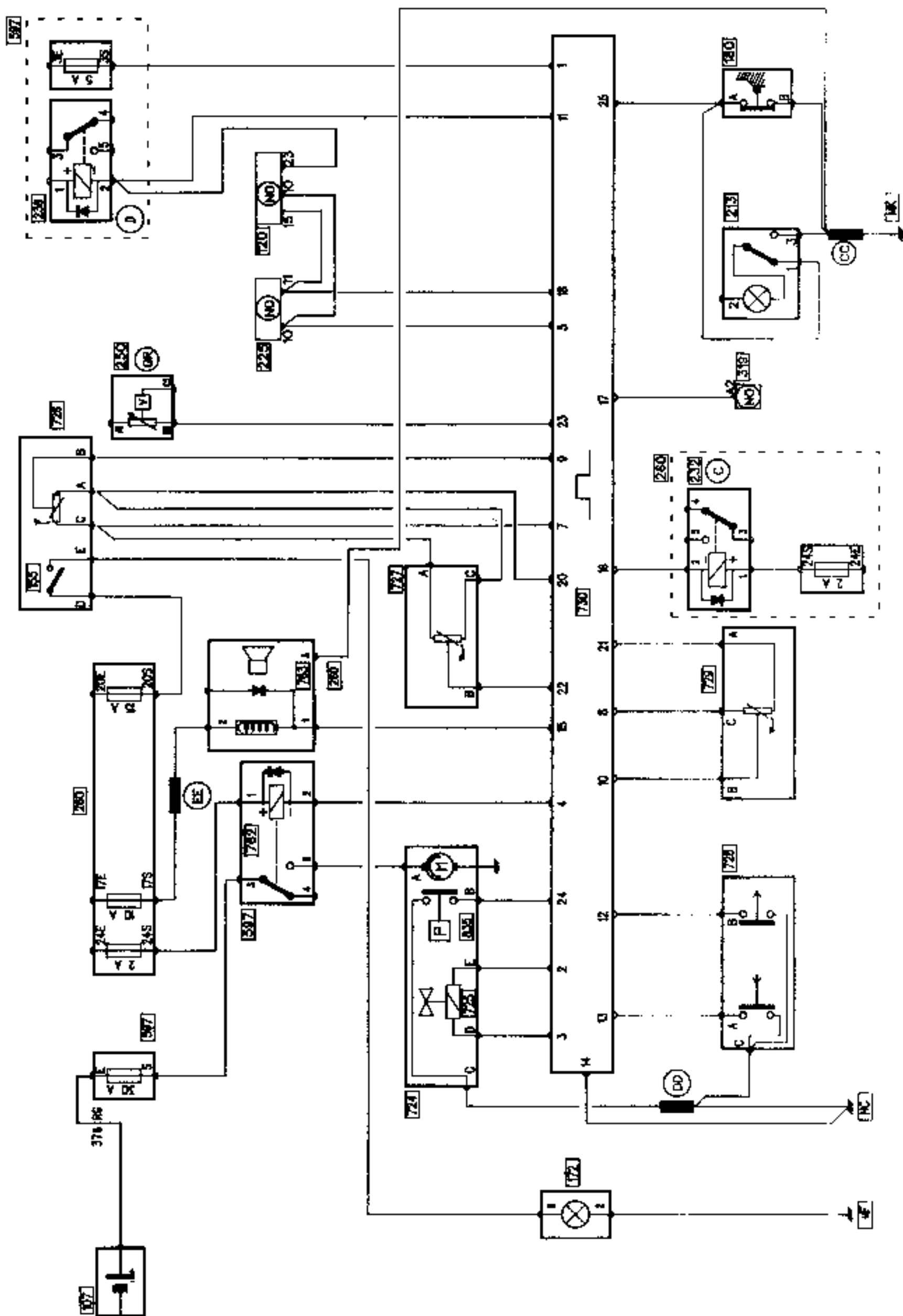
Note

If the battery is disconnected, after turning the ignition on again, wait 10 seconds before starting the vehicle so that the idle speed regulation stepping motor has time to reposition itself.

AUTOMATIC CLUTCH

Operating diagram

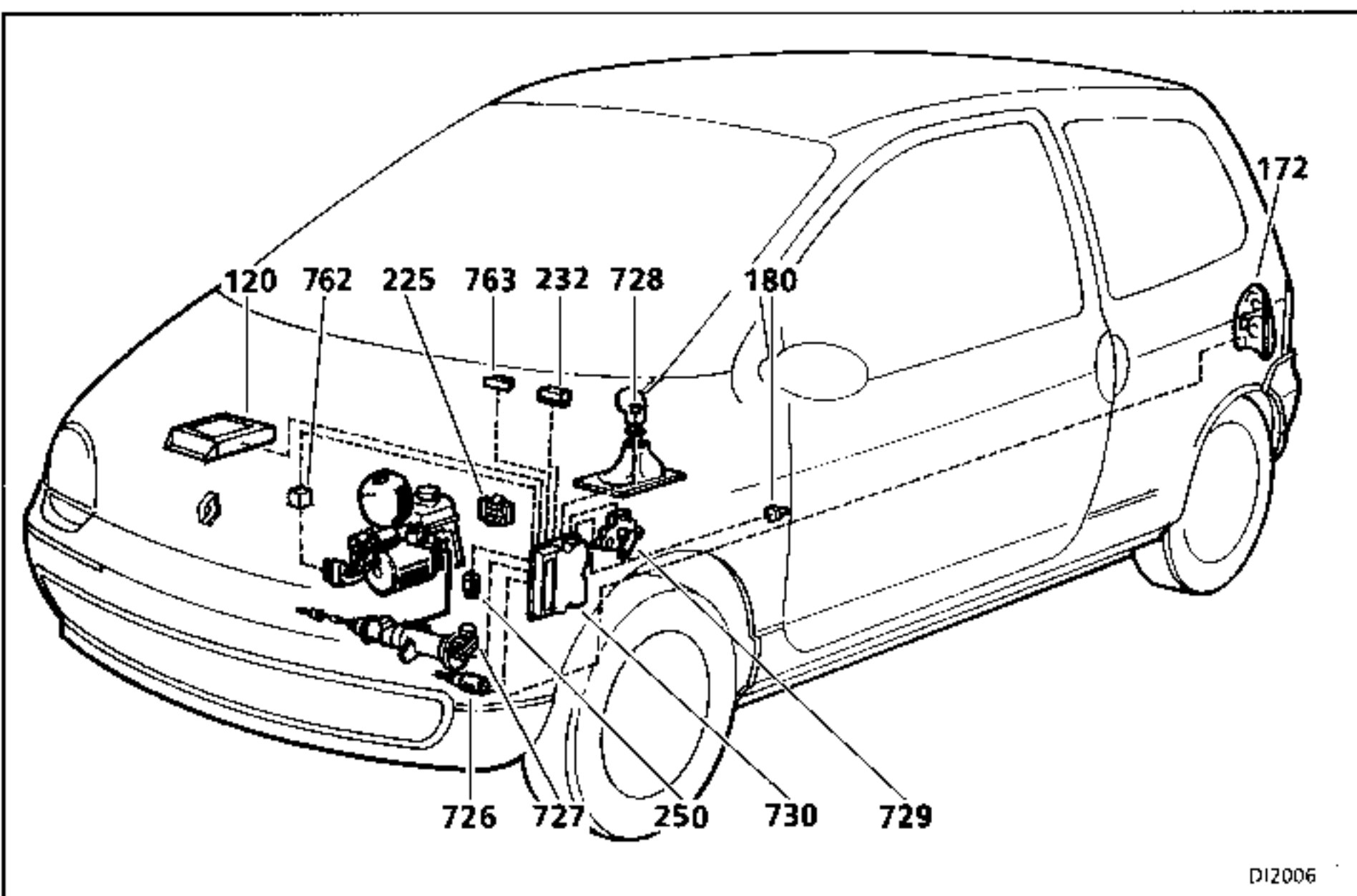
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AUTOMATIC CLUTCH

Location on the vehicle

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D12006

- 107 Battery
- 120 Injection computer
- 155 Reversing light switch
- 172 Reversing light
- 180 Driver's door switch
- 213 Front courtesy light
- 225 Diagnostic socket
- 232 Starter relay
- 236 Fuel pump relay
- 250 Vehicle speed sensor
- 260 Fuse box
- 299 Accessories board
- 319 Air conditioning control panel

- 597 Engine fuse box
- 724 Pump assembly
- 725 Solenoid valve
- 726 Engaged gear sensor
- 727 Clutch position sensor
- 728 Gear lever sensor
- 729 Accelerator position sensor
- 730 Computer
- 762 Pump assembly relay
- 763 Buzzer
- 835 Pressostat
- Hydraulic connections
- Electrical connections

DESCRIPTION

The pump and hydraulic jack assembly cannot be separated.

It comprises (see following page):

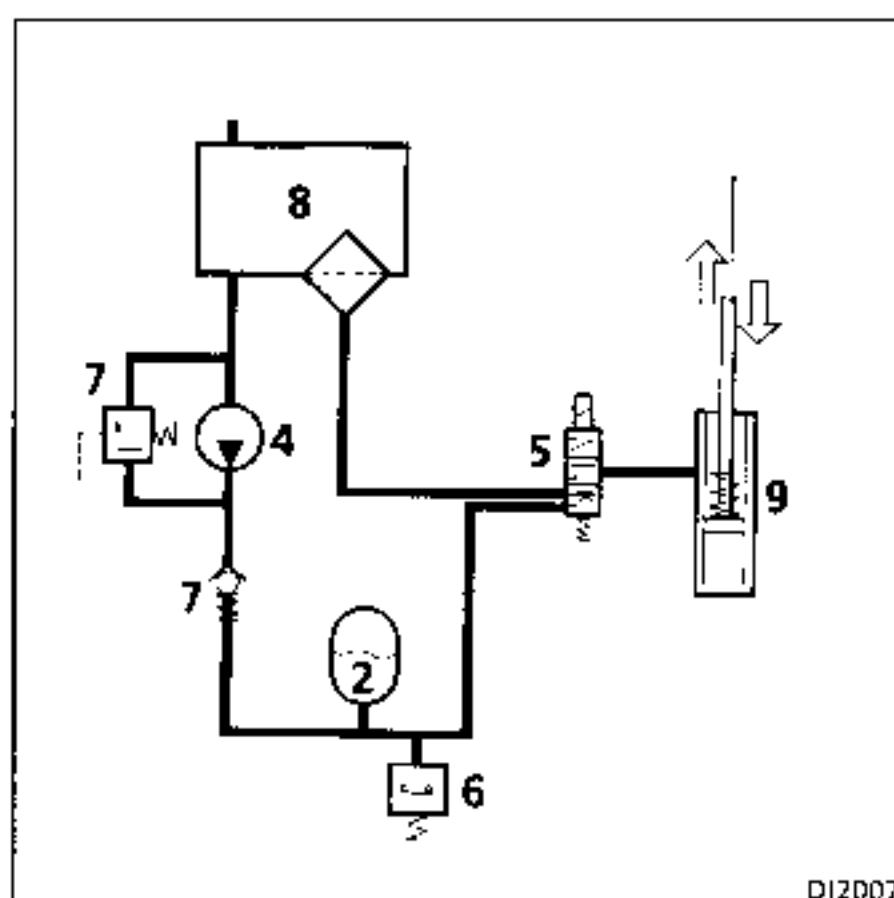
I an electro-pump (724) comprising:

- 1 a connector
- 2 a pressure accumulator
- 3 an electric motor
- 4 a hydraulic pump
- 5 a solenoid valve (725)
- 6 a pressostat (835)
- 7 a hydraulic unit (integrating the hydraulic circuits, a pressure release valve and a non-return valve)
- 8 a reservoir and a filter

II and a HYDRAULIC JACK, comprising :

- 9 a jack (slave cylinder)
- 10 a clutch position sensor (727)

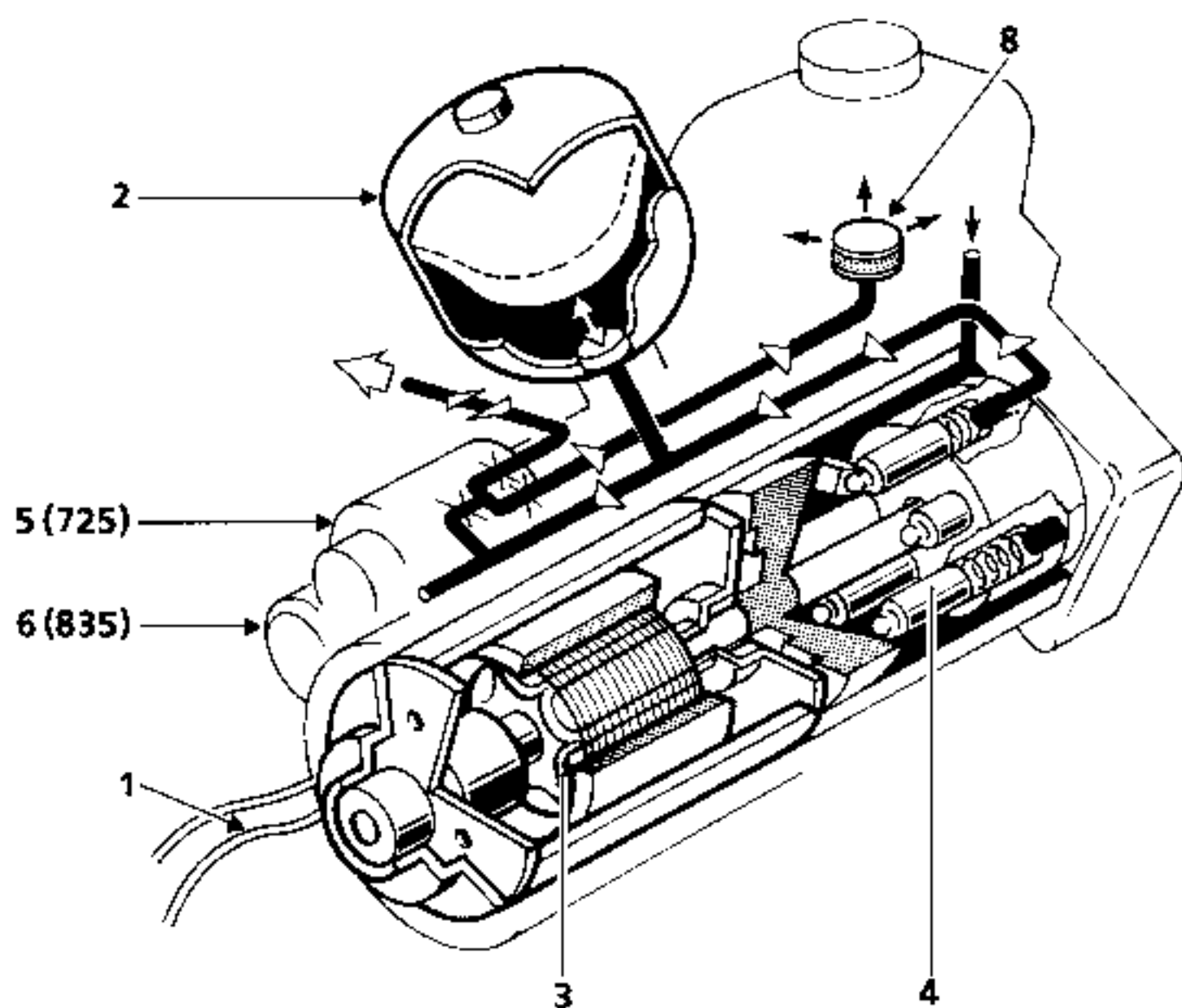
HYDRAULIC DIAGRAM



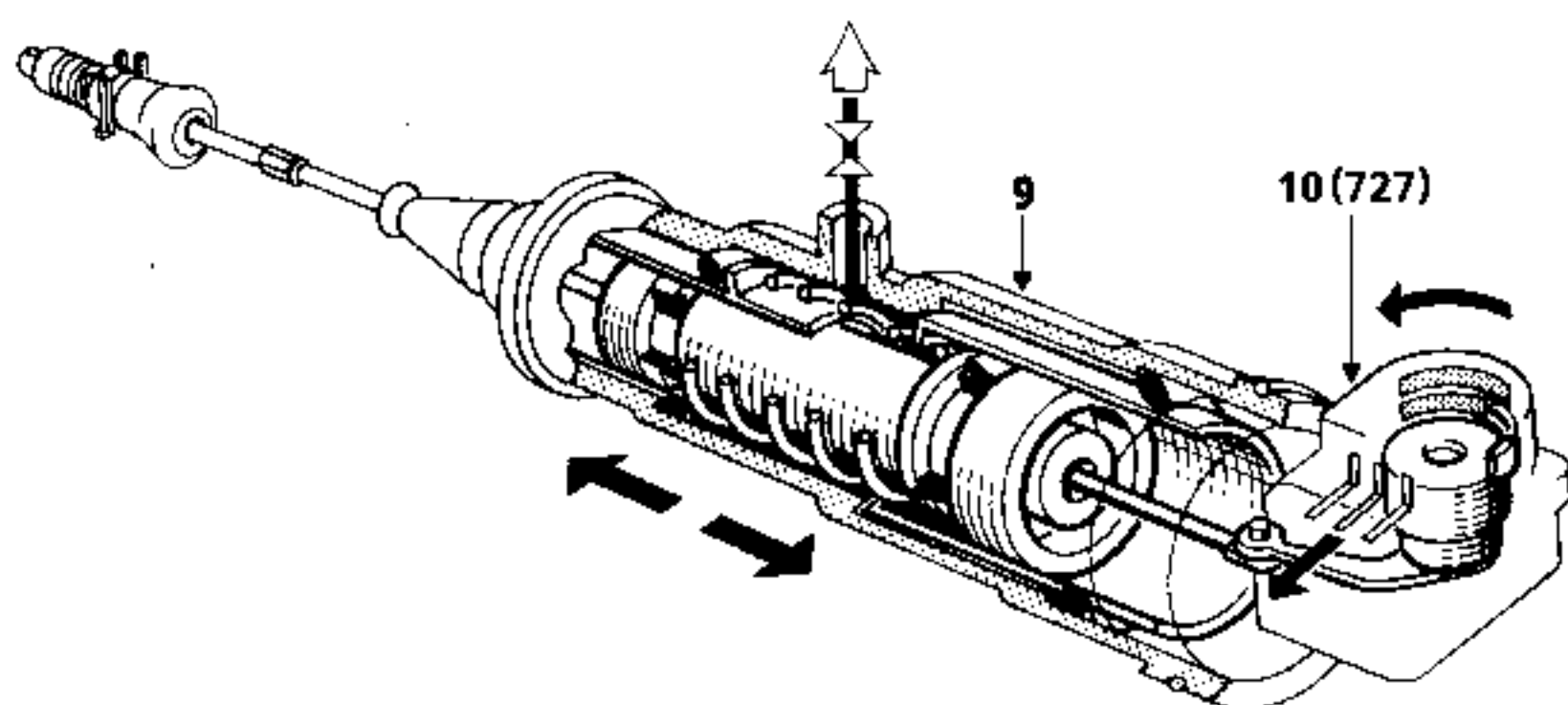
AUTOMATIC CLUTCH

Pump - hydraulic jack assembly

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D12008



D12009

I PUMP ASSEMBLY

1 - 5 track connector

Track A : + before ignition motor feed
Track B : Pressostat
Track C : Pressostat
Track D : Solenoid valve
Track E : Solenoid valve
Terminal for motor electrical earth

2 - Accumulator

The accumulator permits intermittent operation of the pump motor.

When the accumulator is full, the clutch may operate through 4 or 5 cycles before the accumulator requires refilling.

3 - Motor

The electric motor drives the hydraulic pump.

The computer operates the motor depending on:

- the information from the pressostat,
- + after ignition information

Feed voltage: 13,5 V

Average current: 7 A

Motor current when cold: 25 A

Resistance : 1 Ω

4 - Pump

This is driven by the electric motor.

It is of an axial type with 5 pistons.

It generates the hydraulic pressure required to supply the jack and fill the accumulator.

5 - Solenoid valve (725)

This is controlled by the computer.

The solenoid valve determines the position of the clutch by altering the flow.

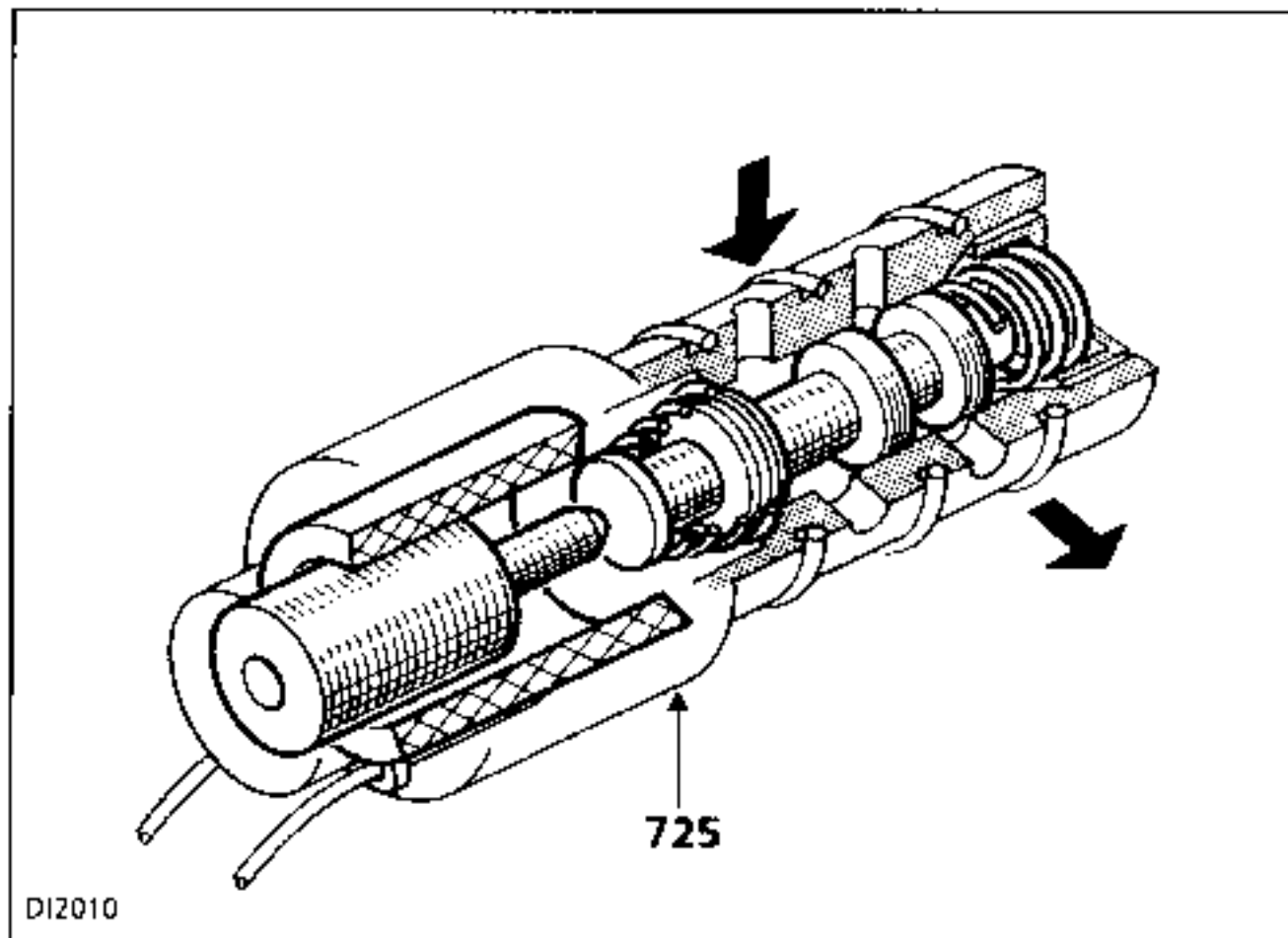
The valve has 4 main positions :

- hydraulic supply to the jack (increase in pressure),
- hydraulic isolation of the jack (maintenance of pressure),
- return to reservoir (decrease in pressure),
- defect mode position (fluid passes through a restrictor to return to the reservoir. This restrictor allows the fluid to leave the jack slowly, allowing the clutch to engage progressively).

Feed voltage : 12 V

Current: 0,9 A

Resistance : 5,6 Ω

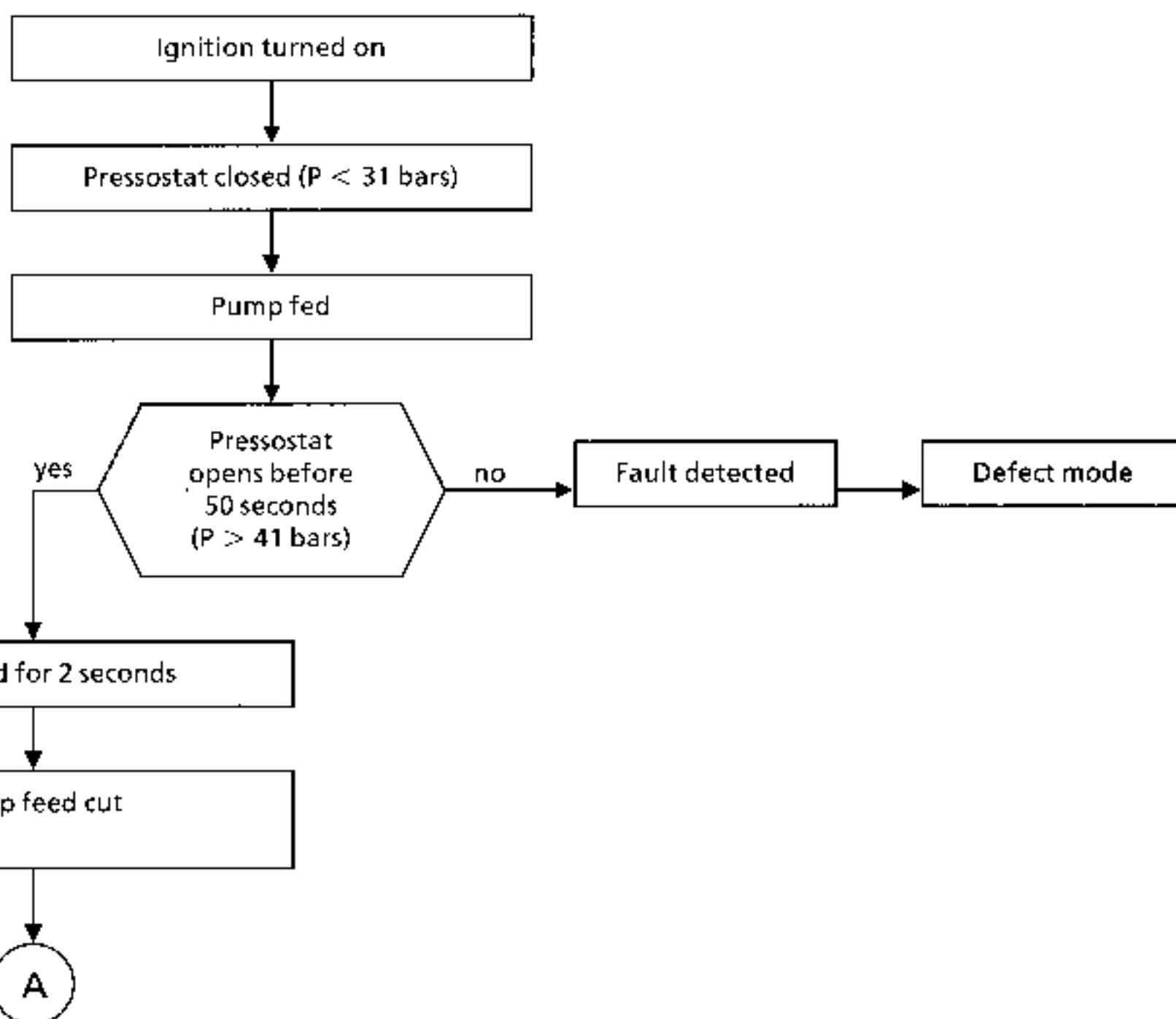
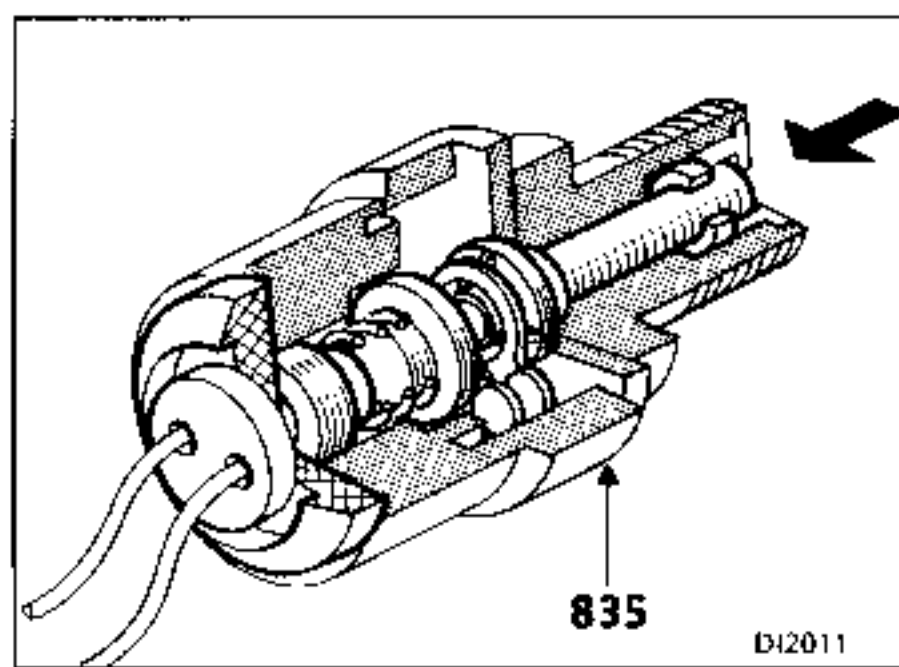


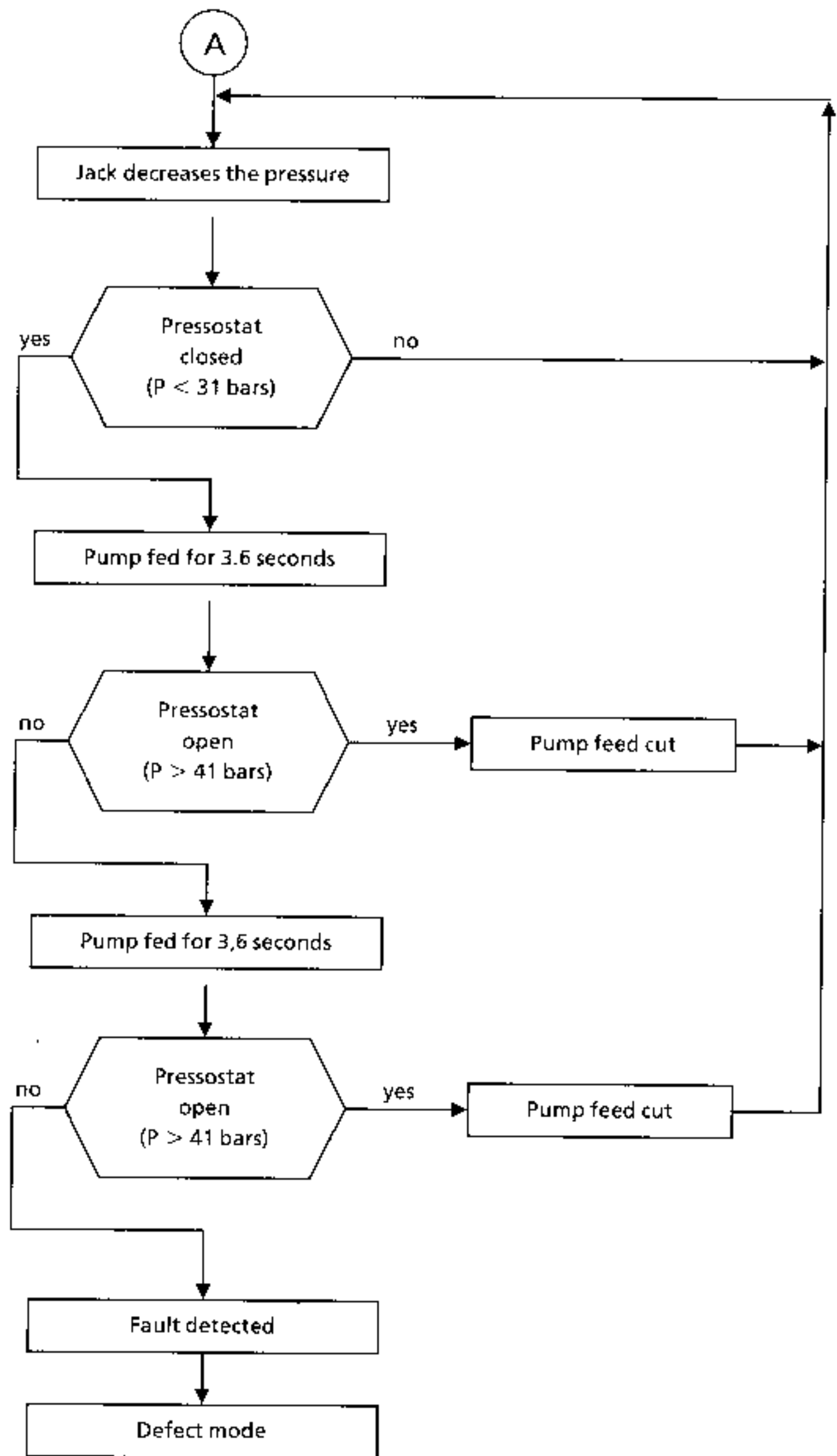
6 - Pressostat (835)

The change in state of the pressostat depends on the hydraulic pressure:

- Opens at 41 bars.
- Closes at 31 bars.

This information allows the operation of the hydraulic pump to be controlled.





7 - Pressure release valve

This protects the various components from excess pressure.

The valve opens at 80 bars.

8 - Reservoir

This contains the hydraulic fluid.

Its size is such that it is able to cope with the variations in level due to :

- the position of the jack,
- the fill level of the accumulator,
- clutch wear.

To check the level refer to the section "Hydraulic fluid level".

II HYDRAULIC JACK

9 - Jack (slave cylinder)

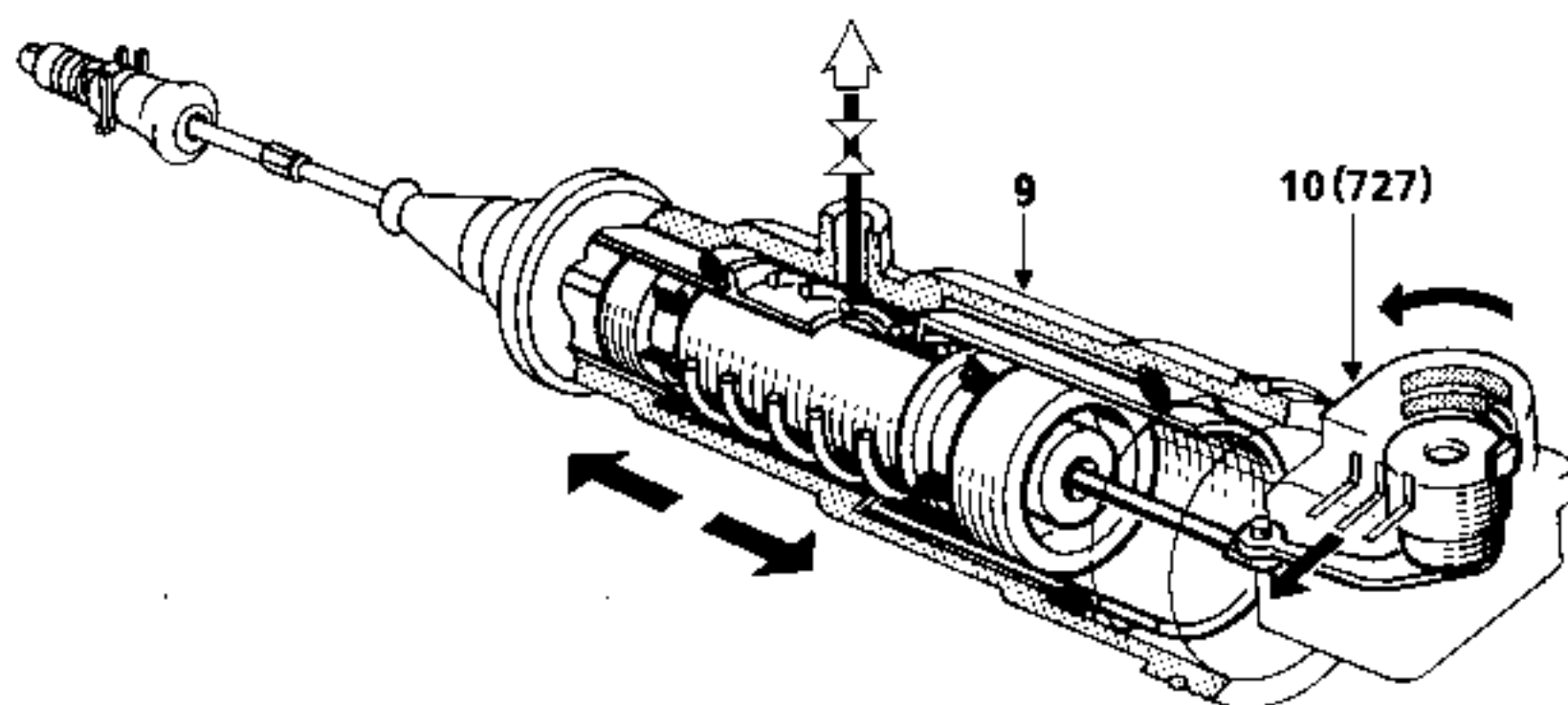
The jack receives hydraulic pressure from the pump assembly and controls the clutch fork.

The jack may have one of many positions. There are however 3 stable control positions:

- Clutch out position (vehicle stationary, no gear engaged).
- Slipping position (vehicle stationary, gear engaged during gear changing operation). This position gives a rapid response time.
- Clutch in position (vehicle moving, gear engaged; vehicle stationary, ignition off).

The variations in clutch position are compensated for by a grooved adjustment device. This device should be adjusted each time the pump - jack assembly is replaced (see section "Removal - refitting of the pump - jack assembly").

Clutch wear is compensated for by the automatic clutch system. This wear may be read (see section "Reading clutch wear").



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10 - Clutch position sensor (727)

The sensor (727), which is mechanically connected to the piston, informs the computer of the position of the clutch. (It cannot be separated from the jack).

3 track connector:

- A** : Earth
- B** : Clutch position information
- C** : + 5 Volts

REMOVAL - REFITTING

Special notes

Apply the handbrake before any operation on the vehicle.

The connectors for the various components may only be disconnected when the ignition is off, the engine has stopped completely and the vehicle is stationary.

Before carrying out any operation on the pump - jack assembly discharge the accumulator (to do this see section "Discharging the accumulator").

It is forbidden to :

- separate the pump assembly from the jack,
- dismantle the various components of the pump assembly or the jack (assembly is under pressure)
- add hydraulic fluid to the system. If the fluid level drops, replace the pump - jack assembly (to check the level of the hydraulic fluid refer to the section "Hydraulic fluid level").

REMOVAL

Put the vehicle on a 2 post lift.

Disconnect the battery.

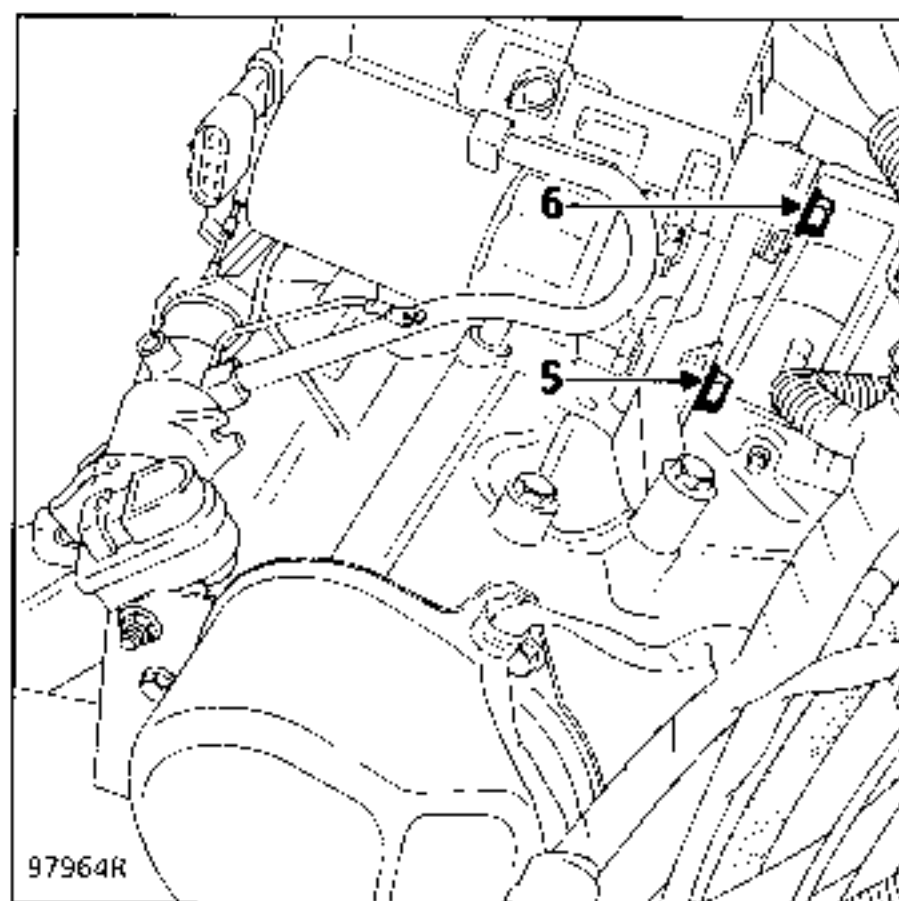
Remove the air filter cover.

Disconnect:

- the pump assembly connector (1) ,
- the pump motor earth (2) ,
- the clutch position sensor connector (3) .

Separate the fork - jack connection, leaving the clips in place so that clutch mechanism adjustment does not need to be made later.

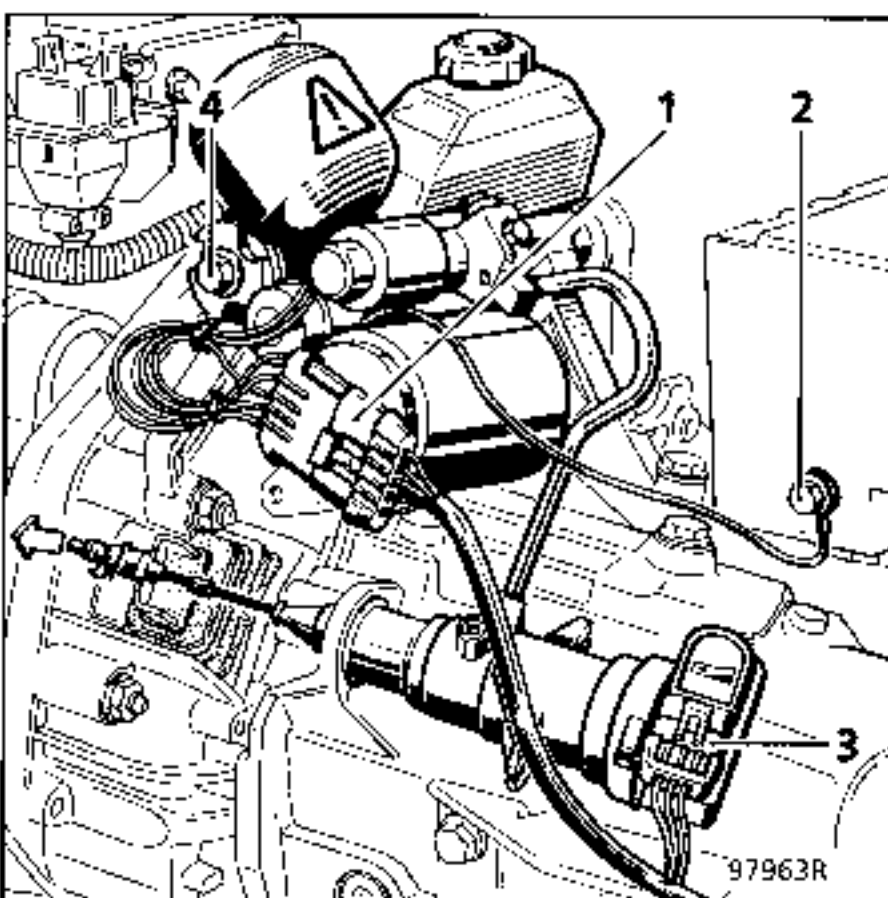
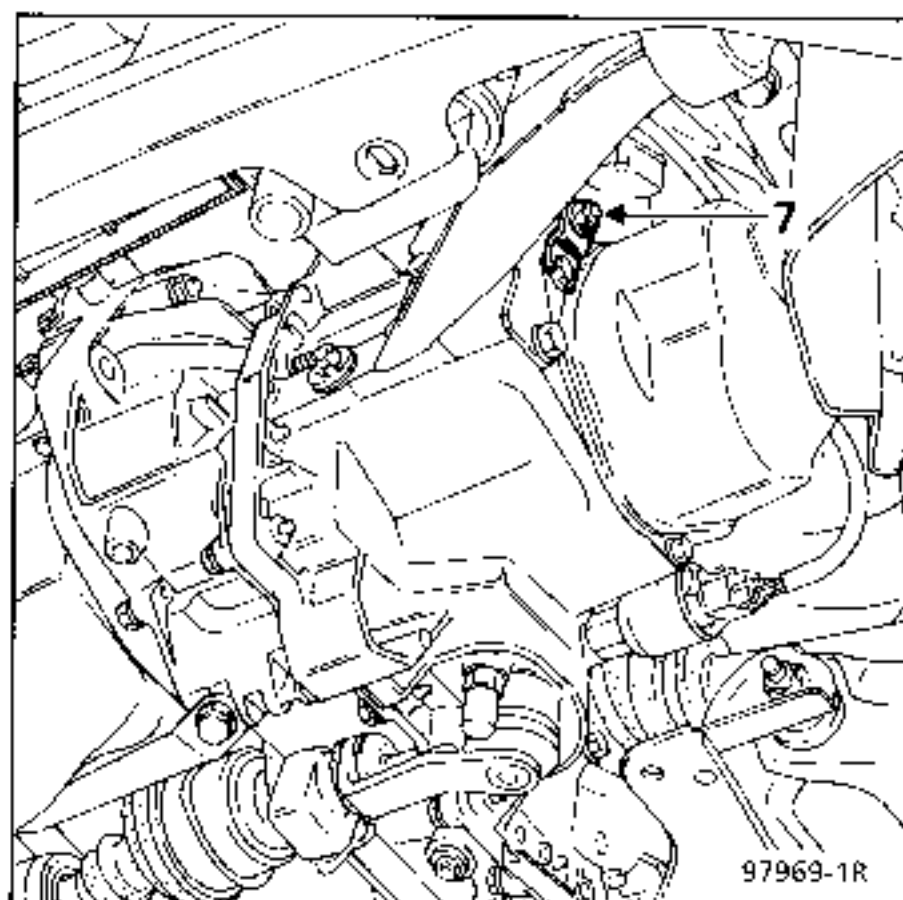
Remove the pump assembly mounting bolt (4) .



Lift the vehicle.

Remove:

- the engine undertray.
- the jack mounting nut (7) .



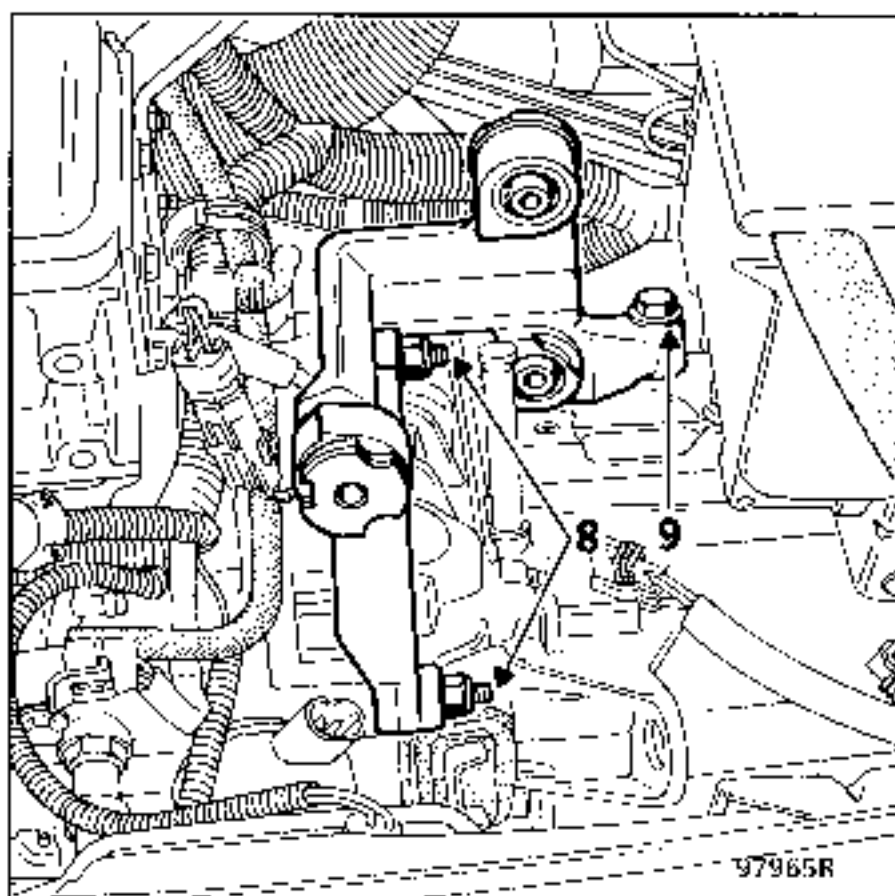
Remove the pump assembly mounting bolts (5) and (6) .

Lower the vehicle.

Push the jack back to allow the cable and ball joint to pass through the jack pressure ring.

Extract the pump - jack assembly (handle the assembly by the motor or the accumulator to avoid damaging it).

To remove the pump assembly mounting, unscrew the 2 nuts on the edge of the gear box (8) and bolt (9) on the housing.

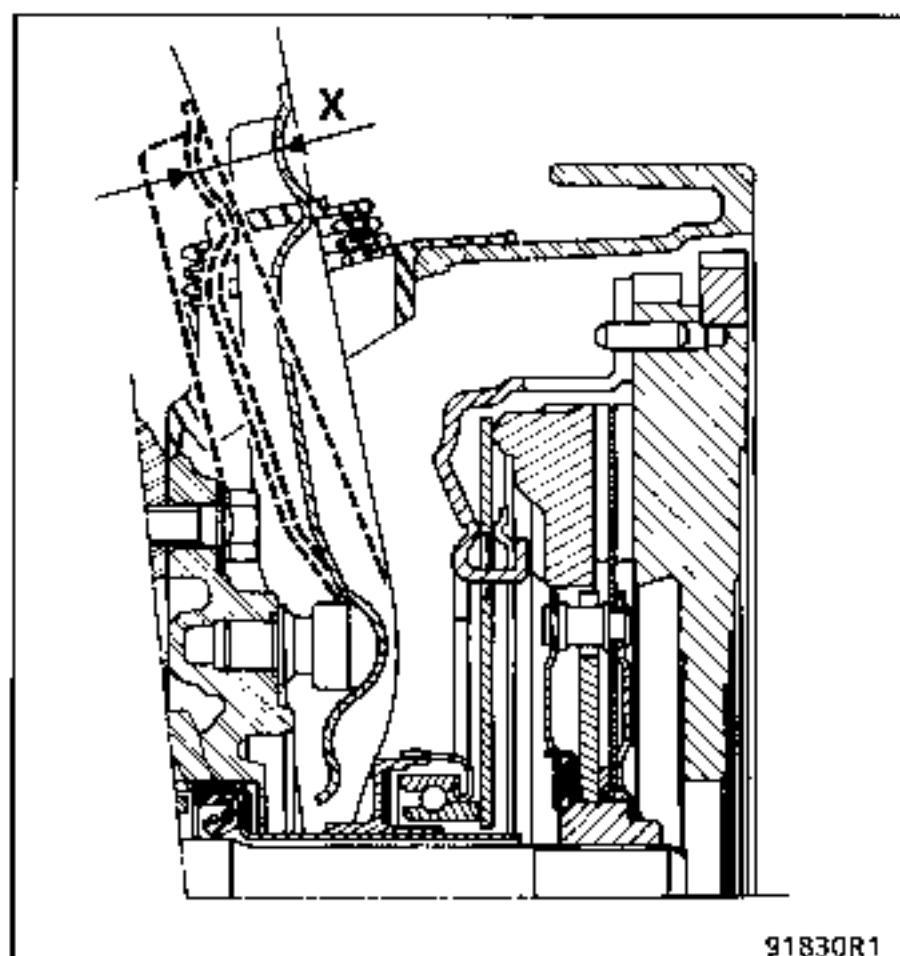


REFITTING

To refit the pump assembly mounting tighten the 2 nuts (8) on the edge of the gear box to a torque of **4 daN.m**, then tighten the bolt (9) on the housing to a torque of **4 daN.m**.

The fork travel should be:

$$X = 17 \text{ to } 18 \text{ mm.}$$



Reposition the pump assembly. It is supplied full of fluid.

Thread the cable through the jack pressure ring (having first removed the adjustment shim and memorised its position for new pump - jack assemblies).

Refit the three pump assembly mounting bolts (4), (5), (6). Tighten them to a torque of **2 daN.m**.

Lift the vehicle.

Refit the jack mounting nut (7) (check the jack is correctly positioned on the pressure ring).

Refit the engine undertray.

Lower the vehicle.

AUTOMATIC CLUTCH

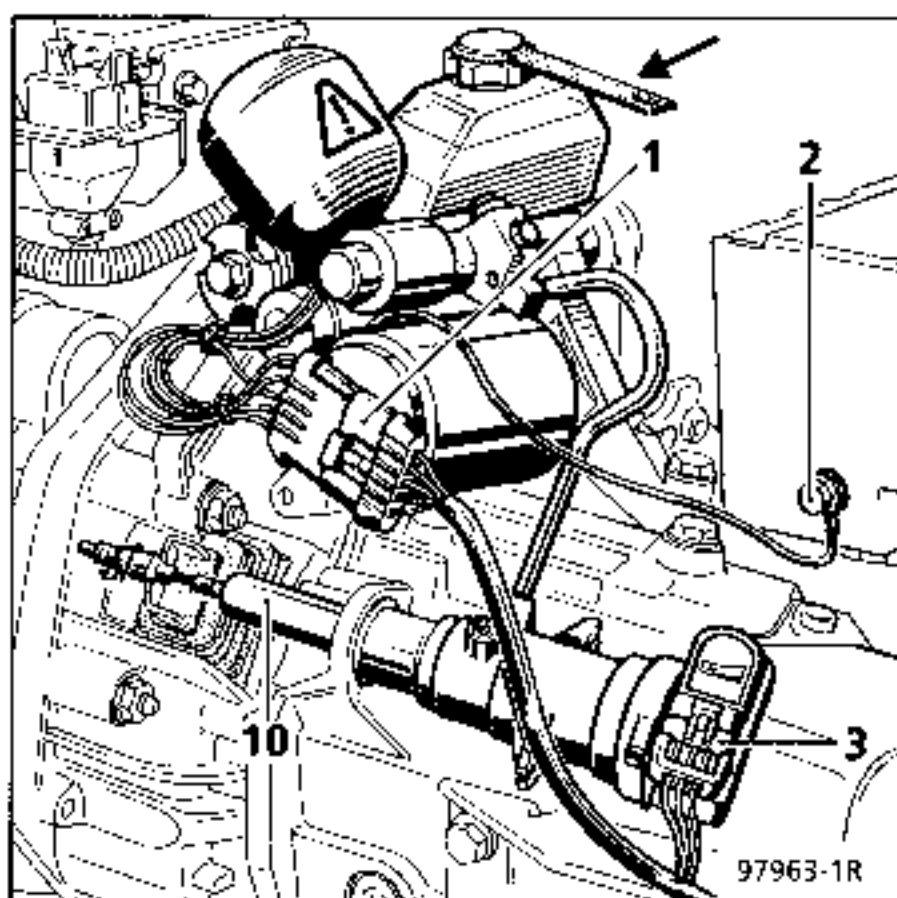
Pump - hydraulic jack assembly

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Reconnect:

- The clutch position sensor connector (3)
- The pump motor earth (2)
- The pump assembly connector (1).

Remove the rubber ring on the reservoir breather (this prevents leakage of hydraulic fluid during transport).



ADJUSTING THE CLUTCH MECHANISM (after replacing the pump - jack assembly)

To adjust the clutch mechanism the adjusting sleeve (10) must be used. This is supplied with the pump - jack assembly.

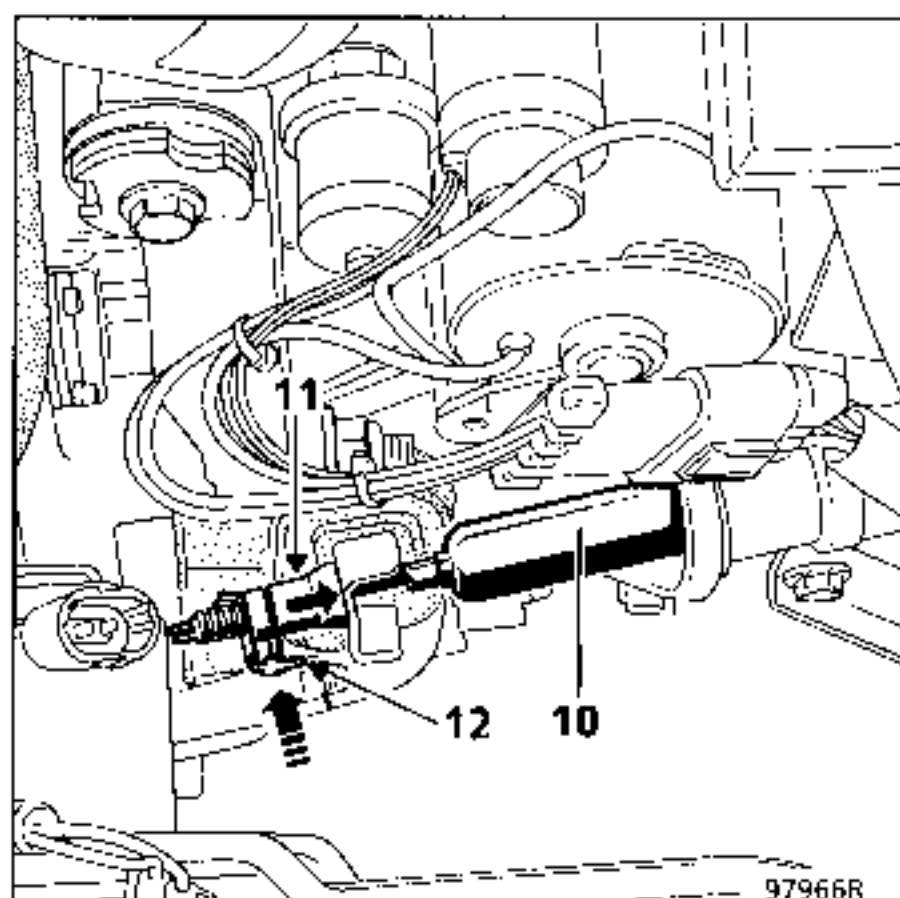
This sleeve is correctly positioned when it touches the body of the jack at one end and the steel washer on the cable at the other end.

Position the cable and the ball joint (11) on the fork.

Slide the ball joint (11) until it touches the fork (push against the fork very gently to eliminate any play).

Press the retaining clips (12) into the adjustment groove which is closest to the ball joint (11).

Remove the plastic adjustment shim (10).



Refit the air filter.

Reconnect the battery.

IMPORTANT :

After each replacement of the pump - jack assembly it is necessary to :

- programme the neutral position for the solenoid valve and the position of the jack (see section "Programming the neutral position for the solenoid and the jack position "),
- enter the date of the After Sales operation (see section "Entering the date of After Sales operations"),
- erase the computer memory (see section "Fault finding").

DESCRIPTION

There are two switches in the gear lever knob:

- a pull switch (switch closes when the gear lever is pulled),
- a push switch (switch closes when the gear lever is pushed).

A force applied to the gear lever knob by the driver which is greater than a pre-determined threshold closes one of the two switches, connecting it to earth.

This information tells the computer that the driver wishes to change gear. If there is a fault with the sensor, the information is extrapolated from the signal from the gear engaged sensor.

When this sensor is replaced, the gears must be programmed (see section "Programming the gears").

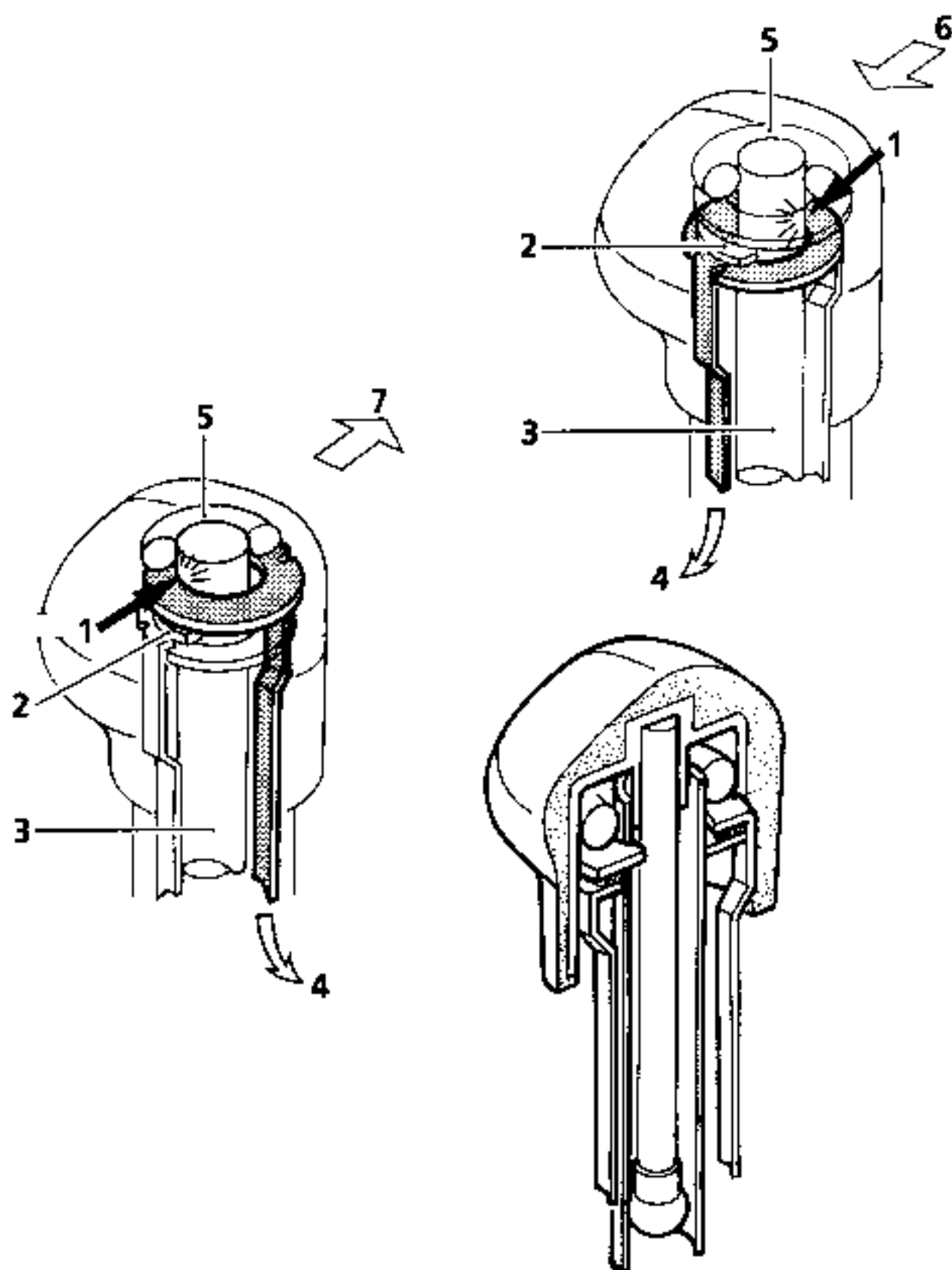
3 track connector:

- A** : Push information
- B** : Pull information
- C** : Earth

AUTOMATIC CLUTCH

Gear lever sensor (728)

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DI2012

KEY

- 1 Switch
- 2 Insulation
- 3 Earth
- 4 To computer
- 5 Load ring
- 6 Push force
- 7 Pull force

AUTOMATIC CLUTCH

Gear lever sensor (728)

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REMOVAL

Switch off the ignition and disconnect the battery.

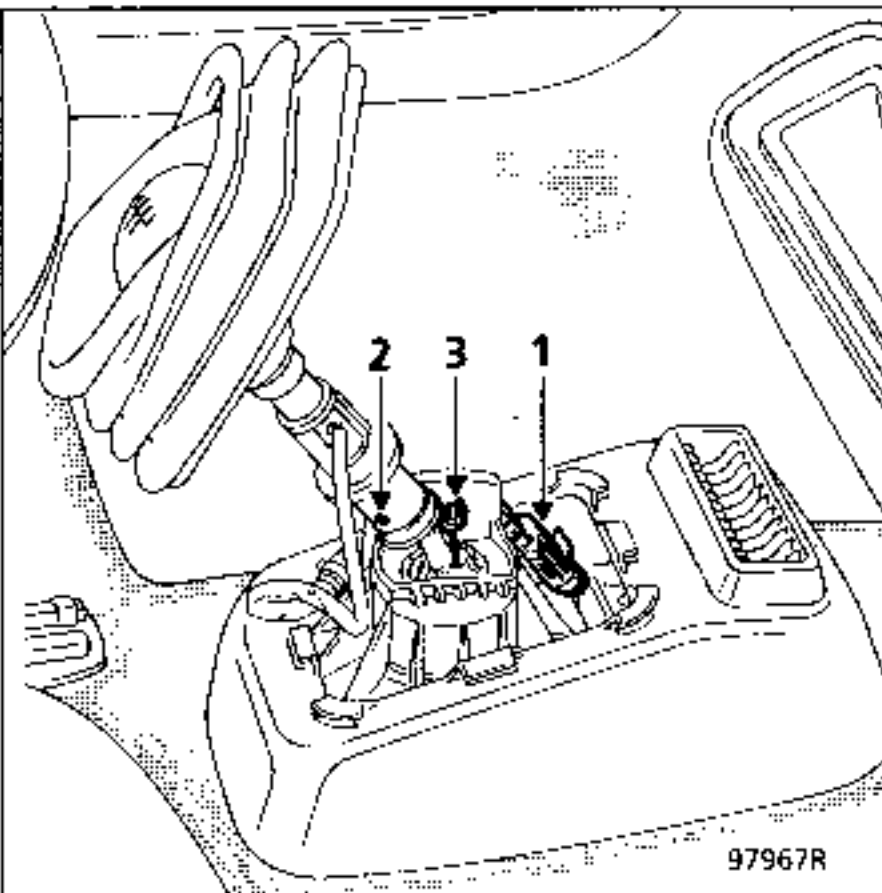
Unclip the protective boot.

Disconnect the electrical connection (1).

Unclip the reverse gear safety cable (3).

Put the gear lever in 4th gear; use a punch to extract the roll pin (2).

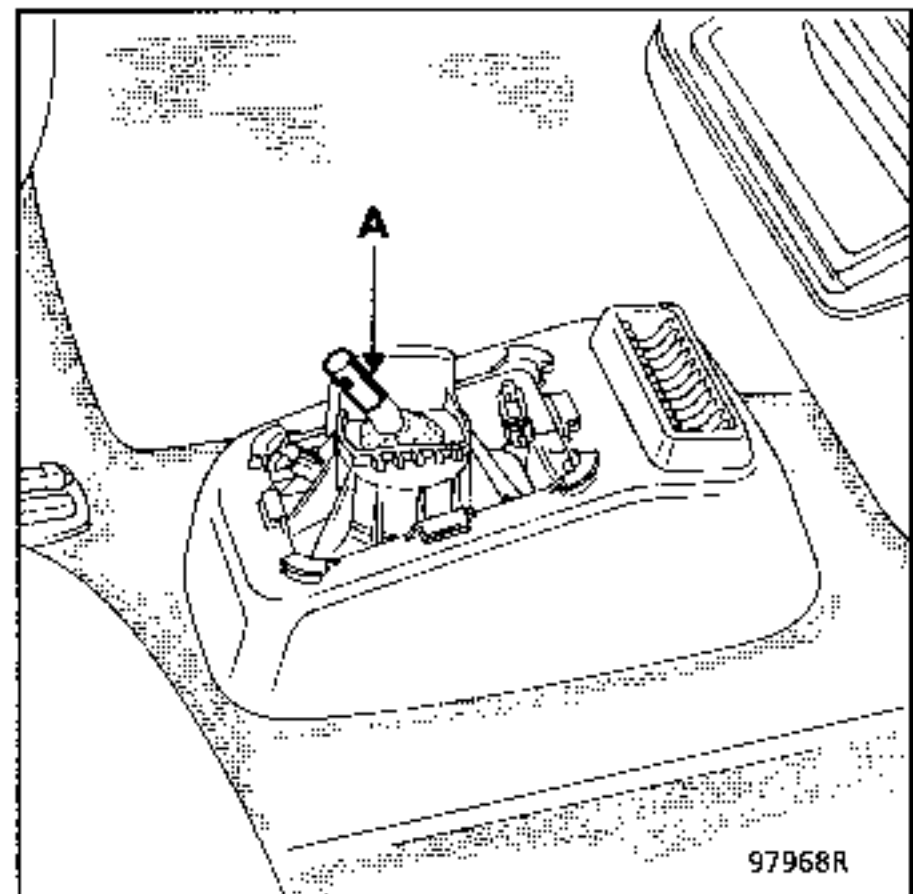
Extract the upper section of the gear lever. Take care as this is bonded as well as being secured by a roll pin.



REFITTING

Clean section (A) of the lever using solvent S 56 (Part Number 77 01 421 513).

On section (A) of the lever apply a thin bead of Loctite SCELLOC (Part Number 77 01 394 072).



Replace the lever. Check the alignment of the holes in the upper and lower sections through which the roll pin is fitted.

If any excess adhesive is present, wipe it off using a cloth.

Replace the roll pin (2).

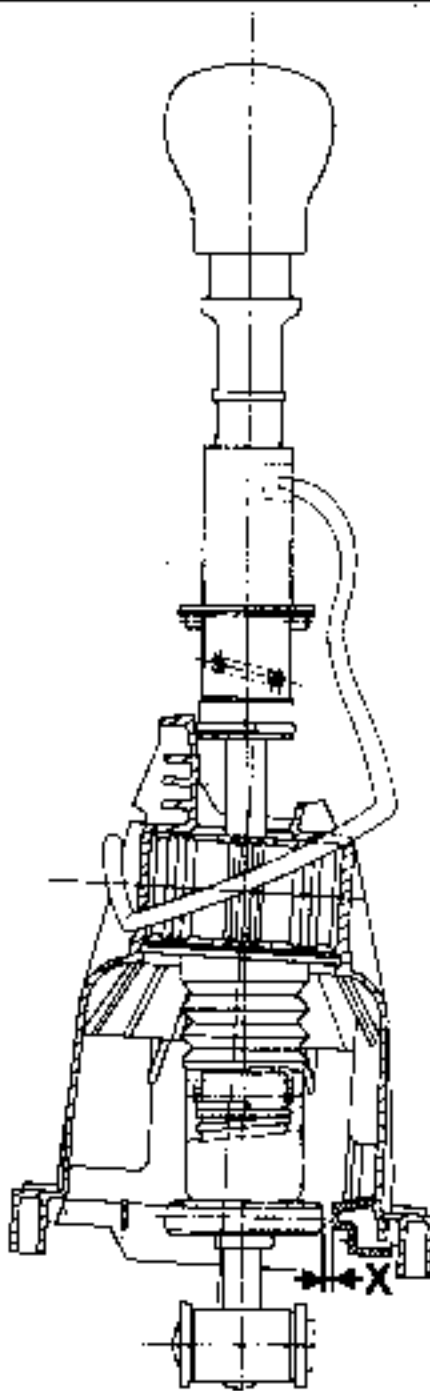
Refit the reverse gear safety cable (3).

Reconnect the electrical connection.

Refit the protective boot.

Check that reverse gear engages correctly.

Check the play **X**. In 1st and 2nd gears it should be $4\text{ mm} \pm 0,7$.



DI3709

ATTENTION

The sensor in the gear lever knob is extremely fragile and should be handled with care.

IMPORTANT

After removing the gear lever, it is necessary to:

- programme the gears (see section "Programming the gears"),
- erase the computer memory (see section "Fault finding"),
- enter the date of the After Sales operation (see section "Entering the date of After Sales operations").

DESCRIPTION

The sensor comprises :

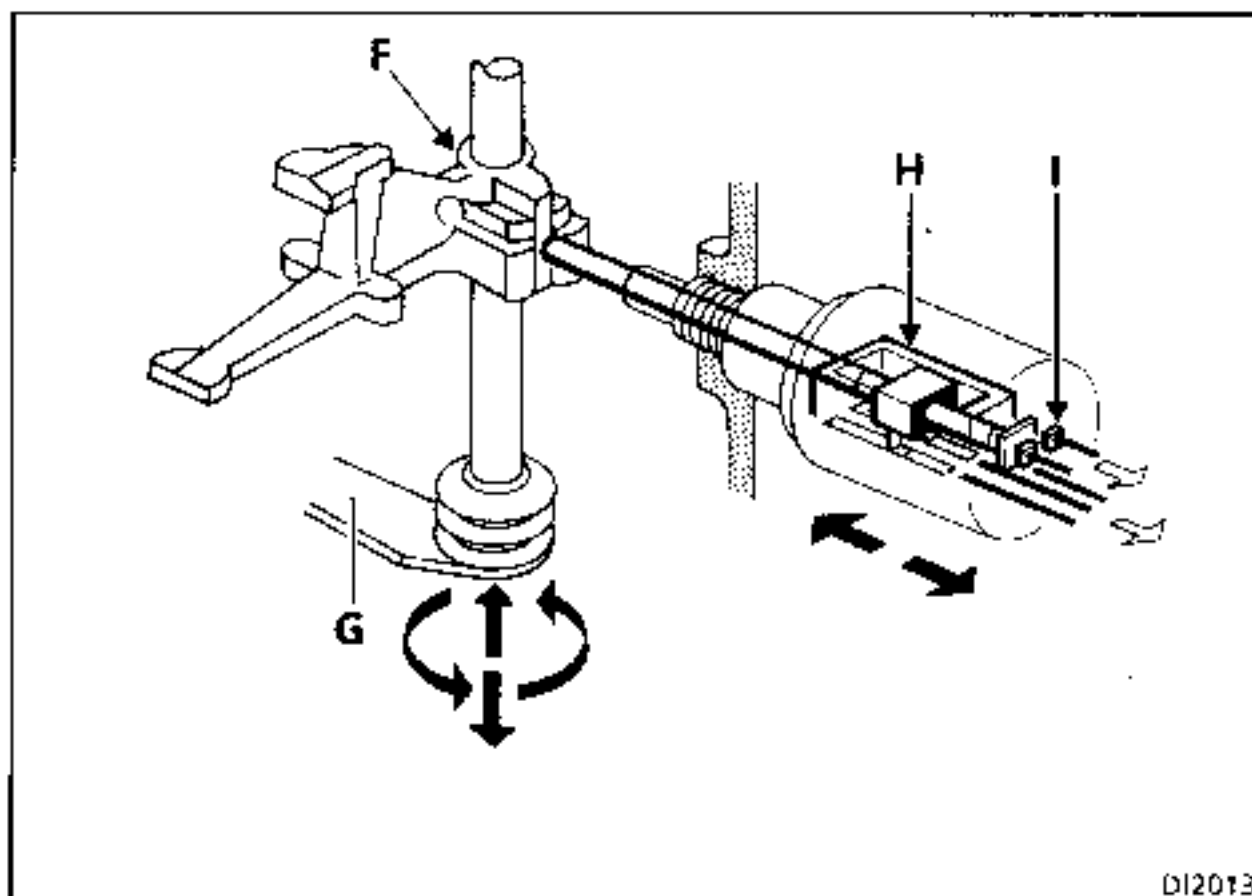
- a linear potentiometer,
- a reversing light switch,

It is mounted on the gear box housing.

A cam which is part of the selection device actuates the potentiometer follower. A switch at the end of travel stop feeds the reversing light.

5 track connector:

- A : 1 5 Volts feed
- B : Gear engaged information
- C : Earth
- D : } Reversing light switch
- E : }



Key:

- F : Selection finger with cam
- G : Gear control
- H : Potentiometer
- I : Reversing light switch

AUTOMATIC CLUTCH

Engaged gear sensor (726)

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The engaged gear sensor optimises the operation of the automatic clutch by informing the computer of:

- the beginning and end of gear changing operations,
- the gear engaged.

For each gear, the computer has a pre-determined memorised value range. If the information received does not correspond to the set range, the computer is able to initiate a defect mode and to warn the driver with a buzzer message.

GEAR SELECTED	Predetermined gear range (no units) value between 0 and 255
Neutral	113 - 142
1st - 2nd	147 - 200
3rd - 4th	72 - 115
5th	12 - 71
Reverse	199 - 242

To determine the difference between gears:

- from 1st to 2nd
- from 3rd to 4th

the computer uses the "push or pull" information.

REMOVAL

Put the vehicle on a 2 post lift.

Turn the ignition off and disconnect the battery.

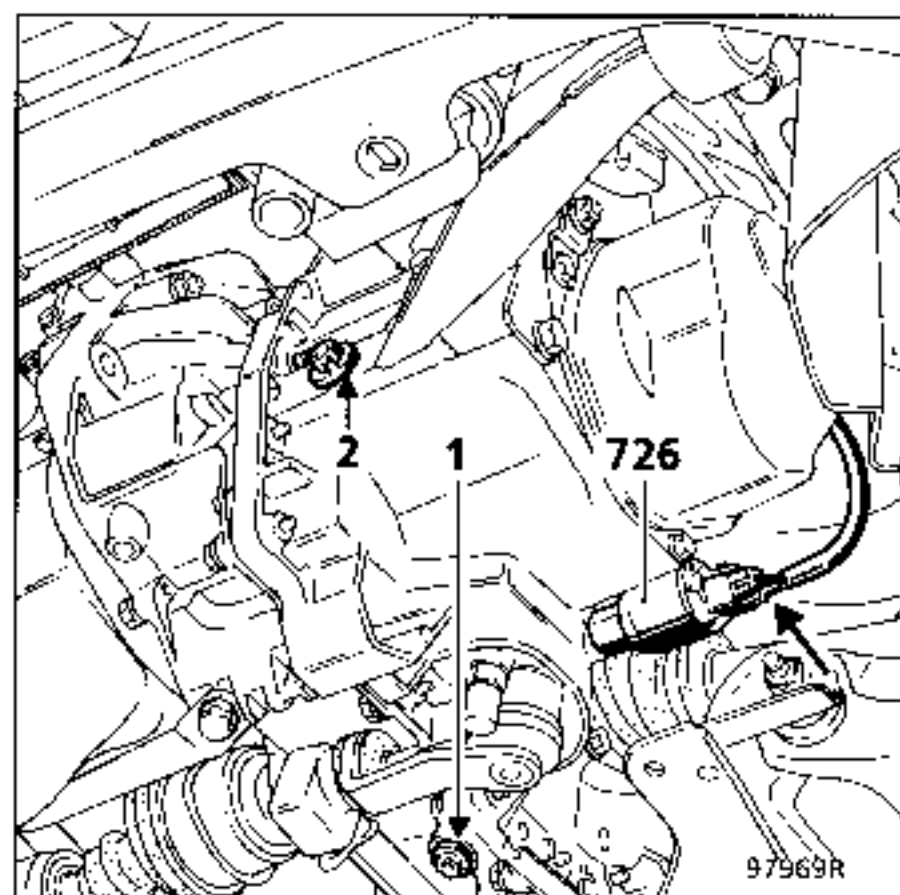
Lift the vehicle.

Remove the engine undertray.

Drain the gear box (plug 1).

Disconnect the engaged gear sensor.

Unscrew the sensor (726).



REFITTING

Screw the engaged gear sensor (726) back into position using **Loctite FRENETANCH**. Tighten it to a torque of 2 daN.m.

Reconnect the connector to the sensor (726).

Fill the gear box and check the level (plug 2). The level is measured by overflow.

Refit the engine undertray.

IMPORTANT :

After removing the engaged gear sensor it is necessary to:

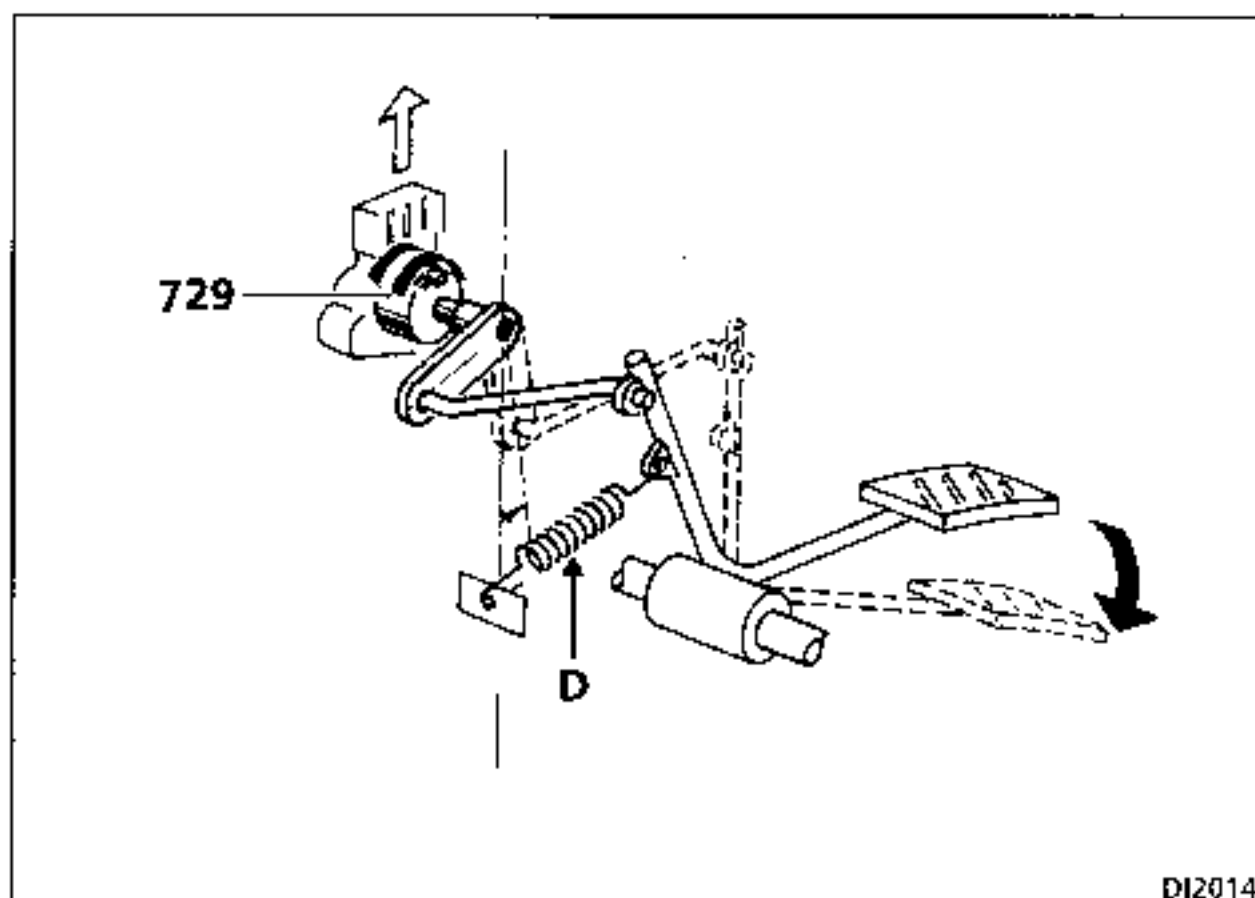
- programme the gears (see section "Programming the gears"),
- erase the computer memory (see section "Fault finding"),
- enter the date of the After Sales operation (see section "Entering the date of After Sales operations").

DESCRIPTION

The rotary potentiometer mounted on the pedal floor is operated by the accelerator pedal. It informs the computer of the engine load requested by the driver.

3 track connector:

- A : + 5 Volts feed
- B : Engine load information
- C : Earth



REMOVAL

Apply the handbrake before any operation on the accelerator position sensor. Also, check the return spring (D) is correctly positioned on the accelerator pedal.

If it is not present the vehicle could move:

- if there were a direct action on the throttle in the engine compartment
- if a gear were engaged,
- if the engine were running.

AUTOMATIC CLUTCH

Accelerator position sensor (729)

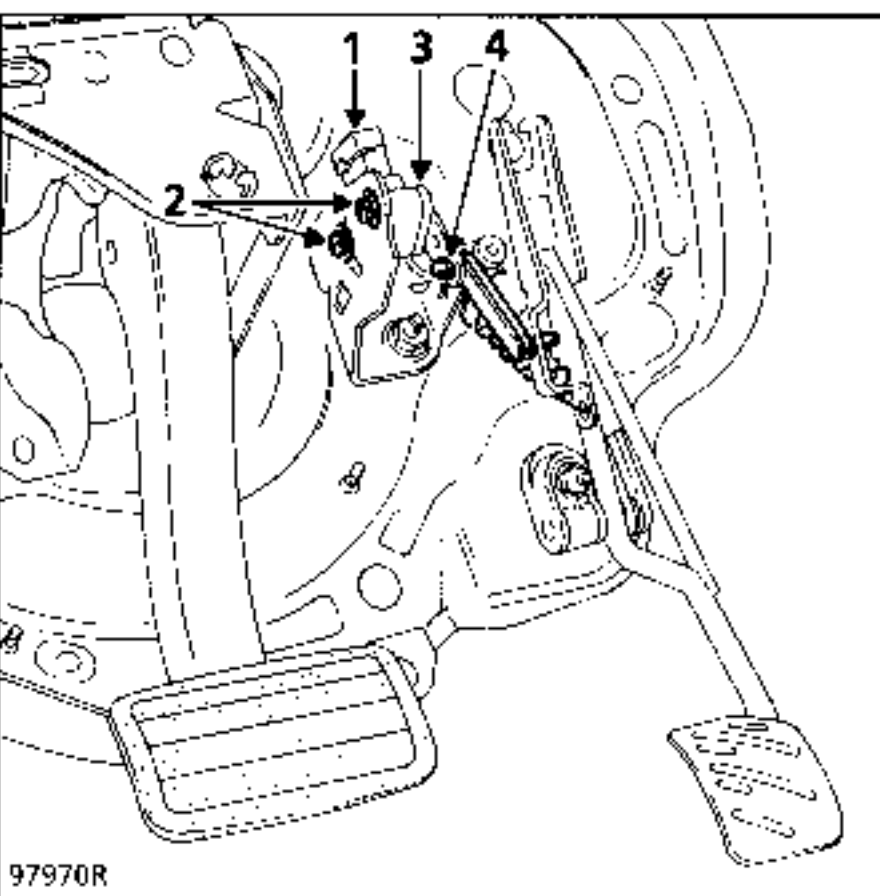
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Disconnect the return lever (4) from the potentiometer.

Disconnect the electrical wiring (1).

Remove the 2 bolts (2).

Remove the potentiometer. The steel plate (3) should also be removed.



REFITTING

Refitting is the reverse of removal.

IMPORTANT :

After removing the potentiometer, it must be adjusted using the XR25.

ADJUSTING THE ACCELERATOR POSITION SENSOR

Connect the XR25 to the diagnostic socket.

Set the selector to 58.

Enter the code for the automatic clutch:

D 2 6

The display shows:

1. EP

Enter:

0 2

To adjust the potentiometer, slightly loosen the 2 bolts (2), then rotate the body of the potentiometer. For no load, the value should be between 31 and 41.

Tighten the 2 bolts again (2).

SPECIAL NOTES

After each adjustment it is necessary to:

- programme the no load and full load positions (see section "Programming full load and no load positions"),
- erase the computer memory (see section "Fault finding"),
- enter the date of the After Sales operation (see section "Entering the date of After Sales operations").

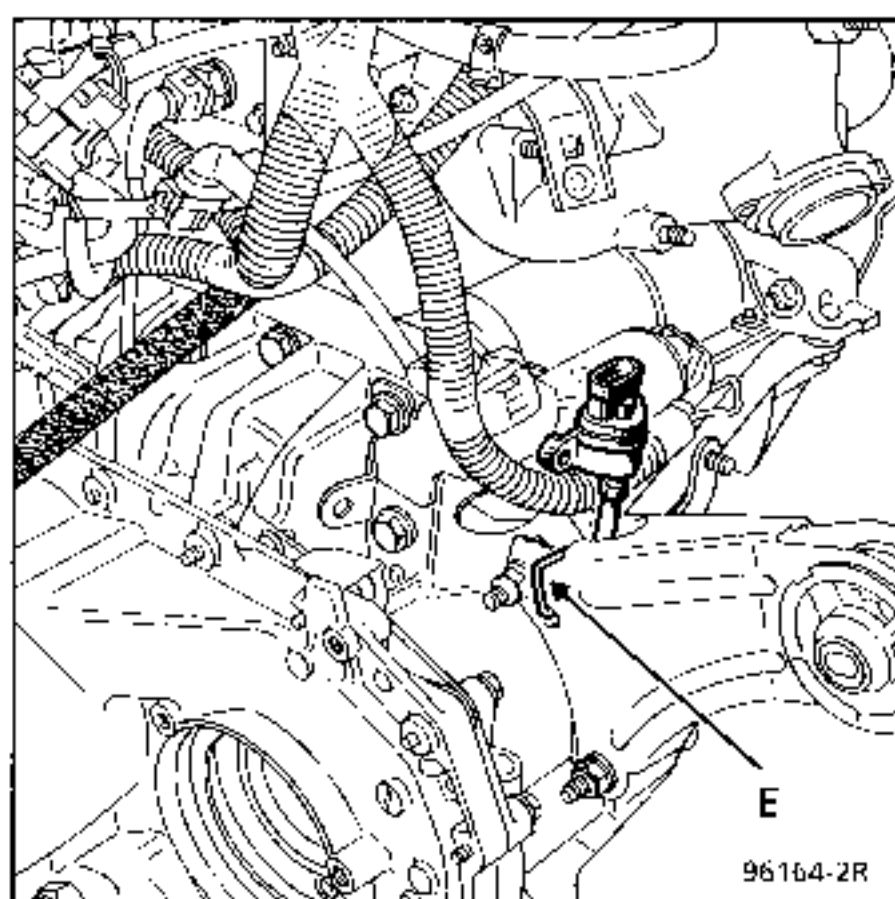
DESCRIPTION

This sensor informs the computer of the vehicle's speed.

REMOVAL

When the engine is not running, disconnect the electrical connector.

Remove pin (E) and disconnect the speedometer cable



REFITTING

Refitting is the reverse of removal.

DESCRIPTION

This information is provided by the injection computer.

The information is taken from the fuel pump relay.

Air conditioning information (319)

DESCRIPTION

The air conditioning computer provides the information:

- 12 Volts : compressor engaged
- 0 Volts : compressor not engaged

to the injection computer and the automatic clutch computer on track 17.

The injection computer uses this information to modify its reference value for the idle speed.

The automatic clutch computer uses this information to determine whether a change in the engine speed is due to a change in operation of the air conditioning compressor or an action by the driver.

Door switch (180)

DESCRIPTION

The door switch is used for safety reasons. The computer operates the buzzer when the following information is received :

- driver's door open,
- gear engaged,
- engine running.

This warning is given to remind the driver to select neutral before leaving the vehicle.

The driver's door switch earths track 25 on the computer when the door is open.

DESCRIPTION

The computer is connected to the harness by a 25 track connector.

Computer tracks:

Track	Allocation	Track	Allocation
1	+ 12 V battery	14	Computer earth
2	Solenoid valve –	15	Buzzer control
3	Solenoid valve +	16	Starter relay control
4	Pump assembly relay control	17	Information on air conditioning operation
5	Diagnostic line L	18	Diagnostic line K
6	Not used	19	Not used
7	Earth for engaged gear sensor and clutch position sensor	20	Feed (+ 5 V) - engaged gear sensor and clutch position sensor
8	Earth for accelerator pedal position sensor	21	Feed (+ 5 V) - accelerator position sensor
9	Information from engaged gear sensor	22	Information from clutch position sensor
10	Information from accelerator position sensor	23	Information from vehicle speed sensor
11	Engine speed information from injection computer	24	Pressostat switch (Pump assembly)
12	Gear lever sensor (pull)	25	Door switch
13	Gear lever sensor (push)		

The computer controls the various components in the automatic clutch system.

The computer receives + after ignition information on track 4 from the pump relay coil (762).

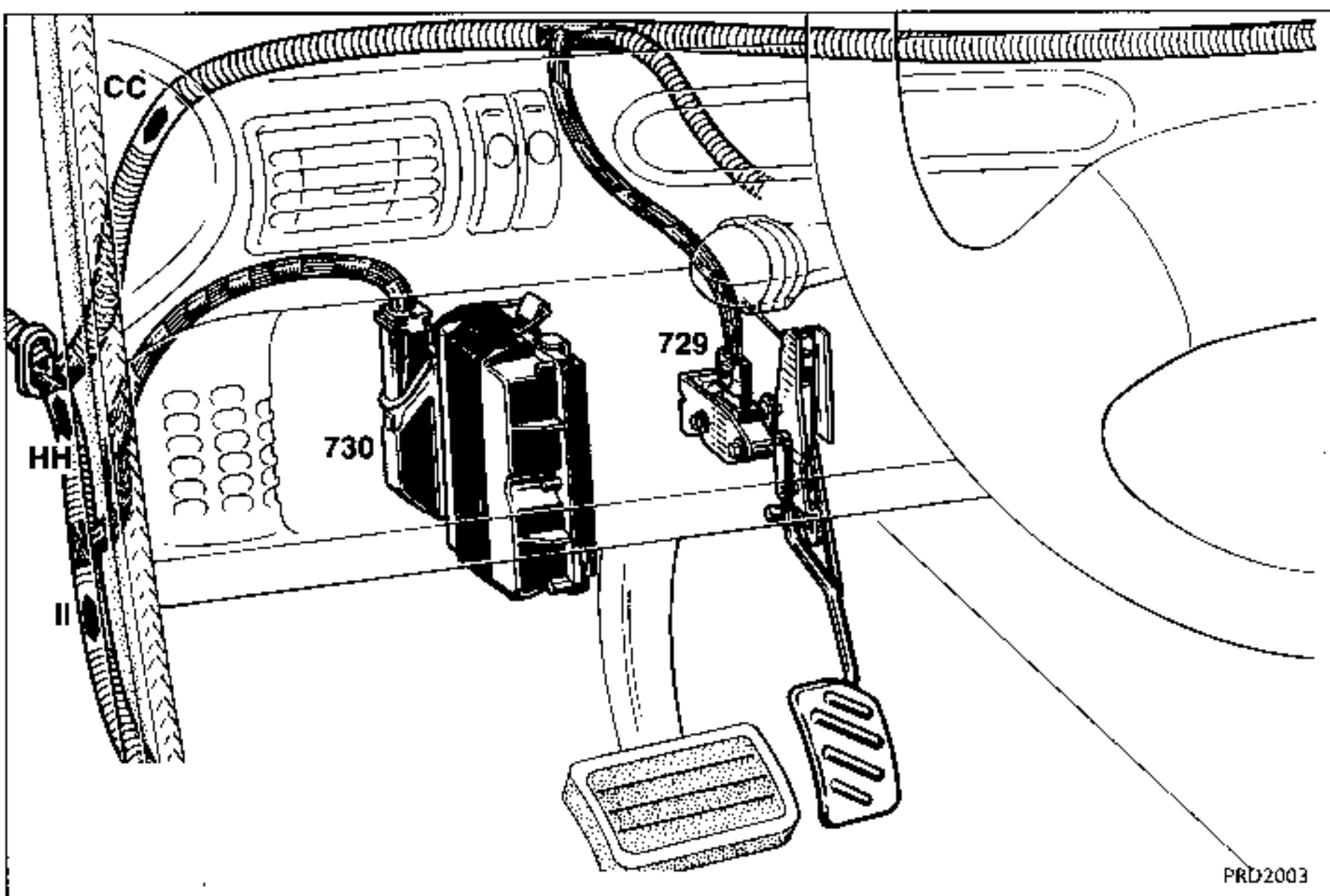
REMOVAL - REFITTING

Before any operation on the computer, turn the ignition off and disconnect the battery.

Remove the elastic strap.

Disconnect the computer 25 track connector.

Remove the computer.



IMPORTANT :

Following replacement of the computer it is necessary to:

- programme the no load and full load positions (see section "Programming the no load and full load positions"),
- programme the gears (see section "Programming the gears"),
- enter the date of the After Sales operation (see section "Entering the date of After Sales operations").

Programming of the neutral position for the solenoid and the position of the jack occurs automatically when the ignition is turned on. When programming is complete, the buzzer will beep. The values are stored 10 seconds after turning the ignition off.

AUTOMATIC CLUTCH

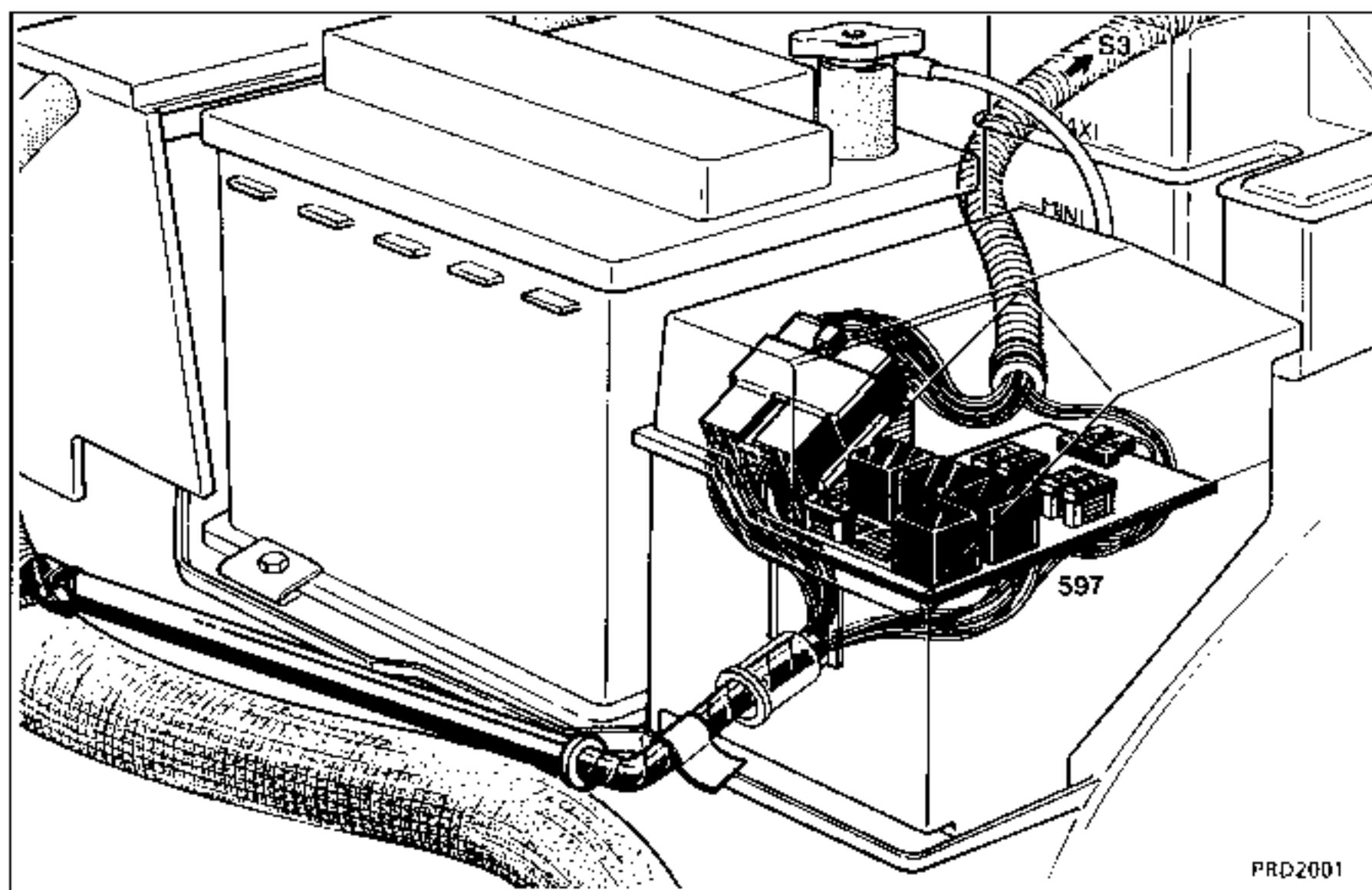
Pump assembly relay (762)

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DESCRIPTION

The computer controls the pump assembly by earthing the pump assembly relay coil (762) on track 4.

This is located on the board (597).

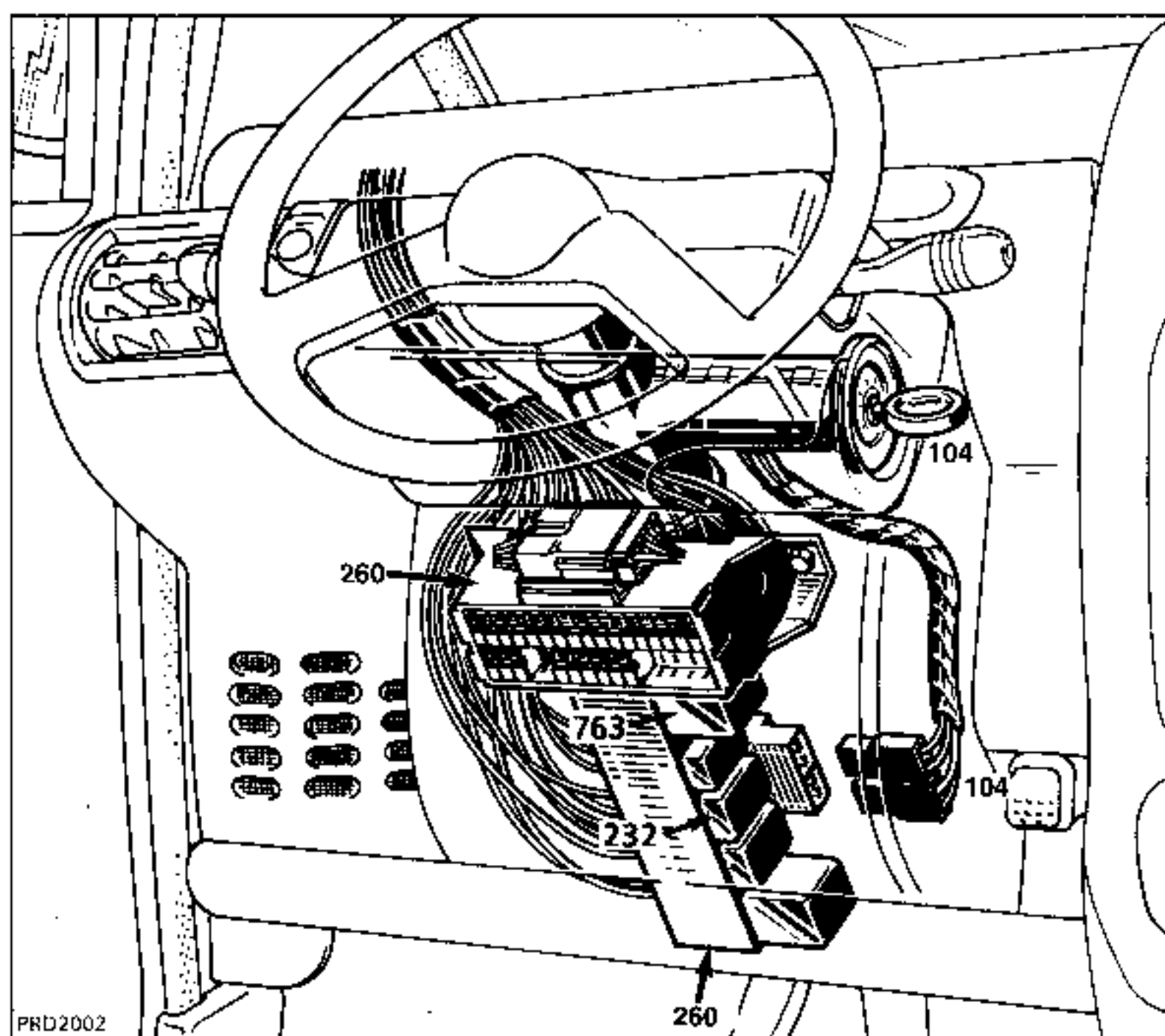


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DESCRIPTION

The computer authorises the engine to be started by earthing the starter relay (232) on track 16 :

- if the engine is stationary,
- if the gear box is in neutral,
- if there is no pressure on the gear lever (push and pull switches open),
- if no major fault is detected.



DESCRIPTION

The computer uses the buzzer to alert the driver in the case of :

- manoeuvres which are dangerous for the clutch or the driver. It must be emphasised that the driver must heed the message informing him that the vehicle must not be left with the engine running and a gear engaged.
- faults being detected.

Refer to the section "Fault finding" for information on the messages given and their meaning.

The computer controls the buzzer on track 15.

If the connection between the buzzer and computer track 15 is cut, the buzzer is sounded continuously until the electrical wiring is repaired (for the location on the vehicle, see the previous page).

VEHICLE AND ENGINE STATIONARY (STOPPED)

When the vehicle and engine are stopped, the clutch is in.

When the ignition is turned on, the automatic clutch computer makes the following checks:

- push / pull switch not activated,
- engine not running,
- no critical fault was detected during the last period of operation.

If the checks are correct, the computer earths the coil of the pump motor relay (762). The pump then generates hydraulic pressure.

To be able to start the engine, **neutral must be engaged**. If neutral is engaged, the computer uses the solenoid to :

- control the clutch,
- earth the coil of the starter relay (232) (the engine may be started before there is sufficient pressure to completely open the clutch).

If the vehicle has been left with a gear engaged (on a slope for example), the above checks are carried out and the system is put under pressure.

The clutch is engaged only when the driver exerts a pressure on the gear lever. This pressure lets the clutch out and allows neutral to be selected. The engine may then be started.

VEHICLE STATIONARY, ENGINE RUNNING

The clutch is disengaged when the vehicle is:

- in neutral,
- stationary - parked,
- engine running at idle speed.

The clutch slips when:

- there is a gear engaged,
- stationary - parked,
- engine running at idle speed.

In this position, the vehicle is immobilised.

STARTING THE VEHICLE MOVING

To start the vehicle the driver selects a gear.

To begin the clutch operation phase the computer requires two pieces of information:

- accelerator pedal position greater than a predetermined threshold,
- engine speed greater than a minimum of **400rpm** in relation to the memorised idle speed (the engine speed varies according to engine temperature; warm engine, it is **730 rpm**). An engine speed of **730 + 400, or 1130 rpm** is therefore required.

The automatic clutch computer memorises the id' speed when the vehicle is stationary, engine running.

When the air conditioning is selected, the injection computer specifies an idle speed of **930rpm** for a warm engine. In order to be able to differentiate between an increase in engine speed caused by the air conditioning computer or one requested by the driver, the automatic clutch computer receives air conditioning selected information.

If the gear selected, ie, 2nd or 3rd, to start the vehicle moving causes excessive slip, the computer sounds the buzzer during the period of slippage.

To reduce clutch slip, the automatic clutch computer compares engine speed information with vehicle speed information according to the gear engaged.

If a stationary vehicle with a gear engaged and the engine running is left to descend a slope and gain speed, at a given speed the clutch will be engaged progressively.

CHANGING UP THE GEARS

To change gear, the driver applies a pressure to the gear lever either by pushing or pulling it, and releases the pressure at the accelerator pedal at the same time. These actions cause the clutch to be disengaged and a new gear to be selected.

The end of the gear changing operation is detected when the signal from the engaged gear sensor lies within a range allocated to a given gear.

From this moment on the clutch is once more engaged.

No account is taken of pressure applied to the gear lever in the same direction as the last pressure to change gear, and this will not cause the clutch to be disengaged. In addition, the pressure exerted by a driver's hand left on the gear lever knob inadvertently is not sufficient to earth one of the two switches. These two features prevent the clutch from operating at the incorrect moment.

CHANGING DOWN THE GEARS

This operation is carried out in the same manner as changing up, described above (pressure is applied to the gear lever knob, pressure at the accelerator pedal is released and the gear lever is moved to the required position). If the driver wishes to increase the gear changing comfort, and is used to increasing the engine speed slightly before selecting a lower gear, this manoeuvre may be carried out by accelerating when the gear lever is in neutral.

If the driver selects a gear which may cause over revving of the engine (example : changing from 5th to 2nd), the clutch is engaged in a controlled manner to limit engine speed (6,000 rpm for petrol engines).

The clutch will slip until the vehicle speed and engine speed are compatible for the gear selected.

The driver is warned by the buzzer.

STOPPING AFTER DRIVING

When the vehicle stops, the clutch disengages to stop the engine from stalling.

If the driver takes his foot off the accelerator pedal the vehicle is slowed by engine braking until the memorised idle speed plus 200 rpm is reached. From this moment, the clutch begins to slip.

TURNING THE IGNITION OFF

After turning the ignition key to the "Stop" position, the computer remains operational for a few seconds to carry out the following functions:

- Storage of faults noted previously (or present in the system) in the memory.
- Maintenance of the clutch in the declutched position for a short period to allow the engine to stop.
- Authorisation for the clutch to engage progressively.

PUSH STARTING THE VEHICLE

This assumes that the battery voltage is within acceptable limits > 7 volts.

If the ignition key is put in the "Running" position the automatic clutch system is able to reach operating pressure and let the clutch out if the gear box is in neutral.

If the battery does not have sufficient voltage, the clutch will not disengage. It is then **inadvisable** to push the vehicle or tow it in order to start it.

If the clutch is disengaged and the gear box is in neutral, the vehicle may be pushed or towed. At a speed of 4 mph (7 km/h) a beep will be heard which means that 2nd gear may be selected, causing the clutch to engage and the engine to be driven. Once the engine has started, neutral may be selected and the engine speed may be increased as necessary.

OPERATION IN DEFECT MODE

The vehicle may still be driven even if minor faults have been detected. In the case of intermittent minor faults, the computer is programmed to resume normal operation as soon as the faults have disappeared.

If there is a major fault, the system turns off. In most cases this is seen by the slow engagement of the clutch (the clutch remains engaged if it was already in that position). However, under certain circumstances: if the vehicle is moving at a speed less than 2.5 mph (4 km/h), and if the accelerator pedal is depressed by less than 10 % of its complete travel, the clutch will disengage.

If the system's electrical feed is accidentally cut, the clutch will engage. The time taken for the clutch to re-engage is defined by the passage of hydraulic fluid through a restrictor.

If a fault was noted during the last check, when the ignition is turned on again, the buzzer will sound three times. If the fault does not re-appear during the this check, the warning will be cancelled when the ignition is next turned on.

SPECIAL NOTE

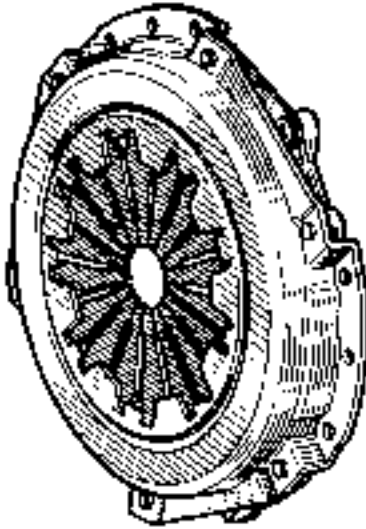
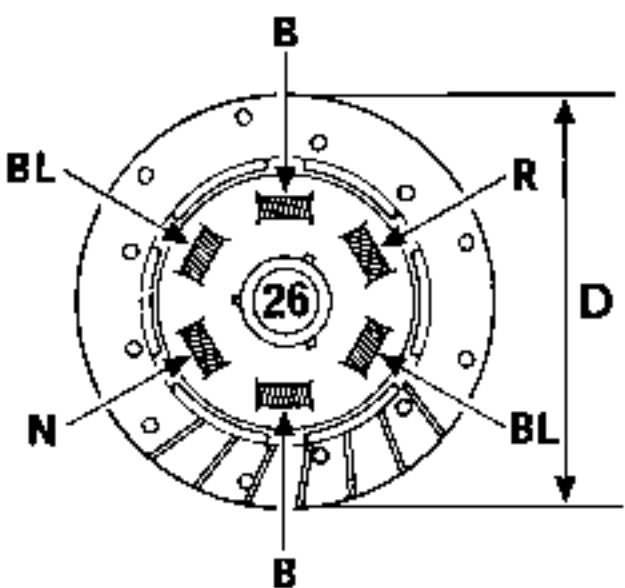
The system compensates for clutch wear.

To read this wear refer to section "Reading clutch wear").

AUTOMATIC CLUTCH

Clutch identification

20

VEHICLE TYPE	GEAR BOX TYPE	ENGINE TYPE	MECHANISM	PLATE
C06	JB1 057 JB1 069*	C3G	 <p>858735</p> <p>180 DST 340</p>	 <p>90693R2</p> <p>76906R</p> <p>26 splines E = 7,4 mm D = 180 mm</p> <p>BL = Blue B = White N = Black R = Red</p>

* Vehicle fitted with air conditioning.

The computer is identified using the Parts Department Part Number.

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch.

D
2
6

The display shows:

1
E
P

Enter:

G
7
0
*

The display shows the first 4 figures of the Part Number (example) :

7
7
0
0

Then the next 3 figures:

8
6
4

Then the last 3 figures:

1
4
5

The Part Number is shown in the same manner for a second time (with cassette n° 13 for the XR25, the Part Number is shown as a sequence of 3 sets of 4 figures, where the final 2 figures represent a suffix).

Vehicle type	Engine type	Gear box type	Computer identification
C06	C3G	JB1 057 (A)	77 00 864 145
		JB1 069 (B)	77 00 868 443

- A : vehicle without air conditioning
 B : vehicle with air conditioning

The filling plug must never be opened and therefore no hydraulic fluid may be added.

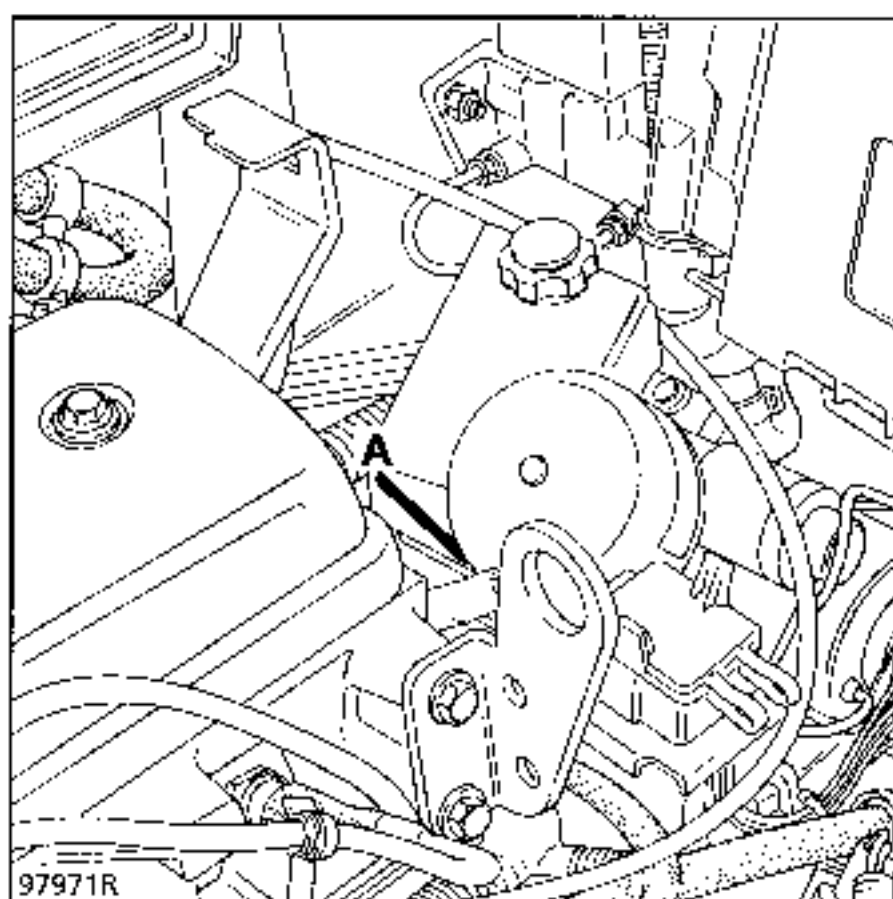
The type of hydraulic fluid used is of a specific type which is not commercially available.

If the hydraulic fluid level is incorrect, replace the pump - jack assembly.

CHECKING THE LEVEL

The level is checked after discharging the accumulator (see following page), with the vehicle stationary and on horizontal ground.

The level of the hydraulic fluid should not be below the reference mark (A) moulded on the reservoir (tolerance 5 mm). If the level is below reference mark (A), replace the pump - jack assembly.



AUTOMATIC CLUTCH

Discharging the accumulator

20

The pressure in the accumulator must be discharged:

- before any operation is carried out on the pump - jack assembly.
- to check the level of the hydraulic fluid.

CONDITIONS FOR DISCHARGING

- Engine speed zero,
- Vehicle speed zero.

DISCHARGE METHOD USING THE XR25

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch:

D 2 6

The display shows:

1.E P

Enter:

G 0 6 *

If the conditions are observed, the display shows:

ACt

Then 10 times:

On

OFF

Then:

Fin

Then:

1.E P

Repeat the operation by entering **G06***.

The accumulator is discharged.

Turn the ignition off and carry out the required operation.

MANUAL DISCHARGE METHOD

Remove the 30 A fuse for the hydraulic assembly located on board 597 in the engine compartment.

Turn the ignition on, press and release the accelerator pedal until the jack is immobilised. Turn the ignition off and replace the fuse after carrying out the required operation.

IMPORTANT :

Discharging the accumulator will cause pressure faults to be memorised. The computer memory must therefore be erased (see section "Fault finding").

AUTOMATIC CLUTCH

Programming full load and no load positions

20

To ensure correct operation of the automatic clutch the no load and full load positions must be programmed after replacing:

- the computer,
- the sensor (in this case the sensor must also be adjusted beforehand. See section "Accelerator position sensor").

CONDITIONS FOR PROGRAMMING

- Engine speed zero,
- Vehicle speed zero,
- Gear box in neutral.

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Enter the code for the automatic clutch:

D 2 6

The display shows:

1EP

Enter:

G 2 0 *

The display shows:

APP

If the programming conditions have been observed, the display flashes:

PF

Validate full load (PF) by pressing the accelerator pedal down fully for 5 seconds and waiting until a beep is heard.

The display flashes:

PL

Validate the no load position (PL) by releasing the accelerator pedal and waiting until a beep is heard.

The display shows:

bon

Then:

1EP

IMPORTANT :

Erase the computer memory (see section "Fault finding").

Turn the ignition off for 10 seconds to store the new values.

Turn the ignition on again.

Enter the code for the automatic clutch.

Check the full load and no load positions have been validated correctly. Bargraph 9 RH side should be extinguished.

Only the following bargraphs should be illuminated : 1RH side - 11RH side - 12LH side - 18LH side.

Fully depress the accelerator pedal - bargraph 11 RH side should extinguish and bargraph 11 LH side should illuminate.

AUTOMATIC CLUTCH

Programming the gears

20

To ensure correct operation of the automatic clutch the gears must be programmed after:

- replacing the computer,
- removing the gear lever or the linkage,
- removing the gear box,
- removing the engaged gear sensor.

PROGRAMMING CONDITIONS

- Vehicle speed zero.
- Engine speed zero.
- No load and full load positions programmed correctly.

Connect the XR25 to the diagnostic socket.

Set the selector to 58.

Turn the ignition on.

Enter the code for the automatic clutch.

D 2 6

The display shows:

1EP

Enter:

G 2 2 *

The display shows:

APP

If the programming conditions have been observed, the display flashes:

0

Put the gear lever in neutral and wait for the beep.

The display shows:

ban

Then flashes:

r

Engage reverse gear, keeping pressure on the lever and wait for the beep.

The display shows:

ban

Then flashes:

1

Engage 1st gear keeping pressure on the lever and wait for the beep.

The display shows:

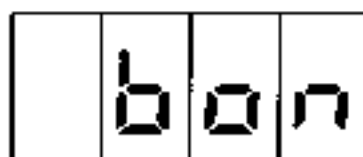
ban

Then flashes:

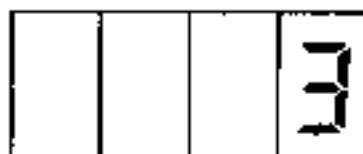
2

Engage 2nd gear keeping pressure on the lever and wait for the beep.

The display shows:

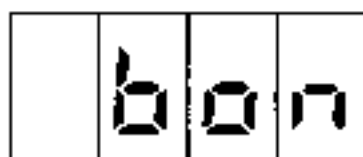


Then flashes:

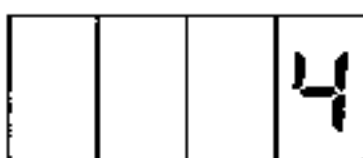


Engage 3rd gear keeping pressure on the lever and wait for the beep.

The display shows:

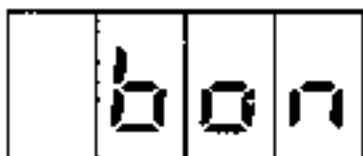


Then flashes:

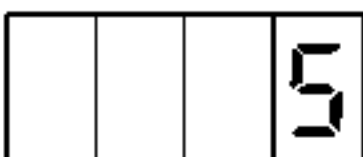


Engage 4th gear keeping pressure on the lever and wait for the beep.

The display shows:



Then flashes:

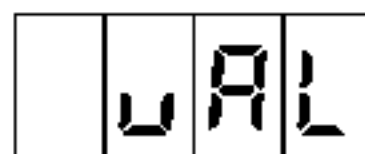


Engage 5th gear keeping pressure on the lever and wait for the beep.

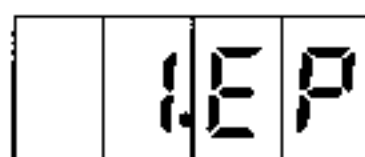
The display shows :



Then:



Then:



IMPORTANT :

Turn the ignition off for 10 seconds to store the new values.

Turn the ignition on again.

Enter the code for the automatic clutch.

Check that the gears have been correctly programmed. Bargraph 9LH side should be extinguished.

Change from neutral through 1st, 2nd, 3rd, 4th, 5th and reverse in succession - bargraphs 12LH side - 13 LH side - 13RH side - 14LH side - 14RH side - 15LH side - 15RH side should illuminate in turn.

Erase the computer memory (see section "Fault finding").

Enter the date of the After Sales operation (see section "Entering the date of After Sales operations").

Programming neutral position for the solenoid and jack position

The neutral position for the solenoid and the position of the jack must be programmed :

- each time the pump - jack assembly is removed,
- each time a modification is made to the fork adjustment.

This operation is carried out to compensate for variations:

- in pressure from one pump assembly to another,
- in position of the jack due to the groove adjustment system.

IMPORTANT :

After this operation has been carried out the clutch wear information is not longer valid. The date of the After Sales operation must be entered on completion of the operation (see section "Entering the date of After Sales operations")

PROGRAMMING CONDITIONS

- Engine speed zero.
- Vehicle speed zero.
- Gear lever in neutral.

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch:

The display shows:

D 2 6

1EP

Enter:

G 2 3 *

The display shows:

EFF

If the programming conditions have been observed, the display shows:

bon

Then:

1EP

Bargraph 10 LH side should illuminate.

Enter

G 2 4 *

The display shows:

EFF

If the programming conditions have been observed, the display shows:

bon

Then:

1EP

Bargraph 10 RH side should then illuminate (bargraph 10 LH side should remain illuminated).

IMPORTANT :

Turn the ignition off for 10 seconds to validate the erasing of the values.

When the ignition is turned on again, the values are programmed automatically.

The buzzer will sound when the computer has programmed the values correctly.

Enter the code for the automatic clutch.

Check that the neutral position for the solenoid and then position of the jack have been memorised. Bargraphs 10 LH side and 10 RH side should be extinguished.

Erase the computer memory (see section "Fault finding"). Only bargraphs 1RH side - 11RH side - 12LH side - 18LH side should be illuminated.

AUTOMATIC CLUTCH

Reading clutch wear

20

The automatic clutch computer allows the level of clutch wear to be read.

For the reading to be valid, the following conditions must be observed:

- the original computer must still be fitted,
- the pump - jack assembly must not have been removed since fitting in the factory,
- the position of the jack should not have been programmed since the vehicle left the factory.

Use the XR25 to determine whether these factors are correct.

Read the date of the last After Sales operation, (see section "Reading the date of After Sales operations").

If the date read is 00-00-00, the level of wear shown by the XR25 is valid.

TO READ THE WEAR

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch:

D 2 6

The display shows:

1. EP

From cassette n° 14 and above, enter:

0 8

For cassette n° 13, enter:

0 9

The wear value (no units) is shown on the display:

57

This may be used for fault finding:

- new clutch : 0
- worn clutch : 57

AUTOMATIC CLUTCH

Reading the date of After Sales operations

20

It is possible to read the date of the last operation on the automatic clutch, which is stored in the computer memory.

To do this:

Connect the XR25 to the diagnostic socket.

Set the selector to 58.

Turn the ignition on.

Enter the code for the automatic clutch:

D 2 6

The display shows:

1EP

Enter:

G 7 3 *

The display shows the day:

J

J = Day

Then the month:

n

n = Month

Then the year:

A

A = Year

Then the day, month and year again.

Then:

F n

Then:

1EP

AUTOMATIC CLUTCH

Entering the date of After Sales operations

20

After each operation on the automatic clutch, the date of the operation **MUST** be entered:

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch:

D 2 6

The display shows:

1EP

Enter:

G 7 2 *

The display shows:

7.2

Enter the day of the operation (tens, then units).

x x

Validate by pressing:

The display shows:

7.2

Enter the month of the operation (tens, then units)

x x

Validate by pressing:

The display shows:

1.2

Enter the year of the operation (tens, then units) :

x x

Validate by pressing:

The display shows:

1.2

Then:

7.2

Then:

1.2

Then the day, month and year again.

Then:

7.2

Then:

1.2

GENERAL

The computer has a management system for controlling the peripheral components of the automatic clutch system.

If there is a fault with one of these peripheral components, the computer warns the driver by sounding the buzzer.

At the same time, the clutch system is put into defect mode operation.

The fault which triggered the sounding of the buzzer may be visualised using the XR25.

Visualised faults are stored in the memory and are therefore saved after the ignition is turned off.

USING BORNIER Elé. 1332

If information obtained using the XR25 requires verification of electrical continuity, connect bornier **Elé. 1332** in place of the automatic clutch computer to facilitate access to the various contact points.

(Bornier **Elé 1332** has a solid 25 track base integrated with a printed circuit on which are 25 copper coated contacts, numbered from 1 to 25).

IMPORTANT :

- All tests using the **Elé. 1332** may only be carried out after disconnecting the battery.
- The bornier is designed to be used only with an ohmmeter. Under no circumstances should 12 Volts be applied to the contact points.

USING THE XR 25

The XR25 must be used for fault finding on the automatic clutch, regardless of the origin of the faults.

It has a microprocessor which permits:

- all the information from the various sensors to be read;
- diagnostic messages from the computer to be read,
- various values to be programmed,
- the computer memory to be erased.

USING DIAGNOSTIC FICHE N° 29

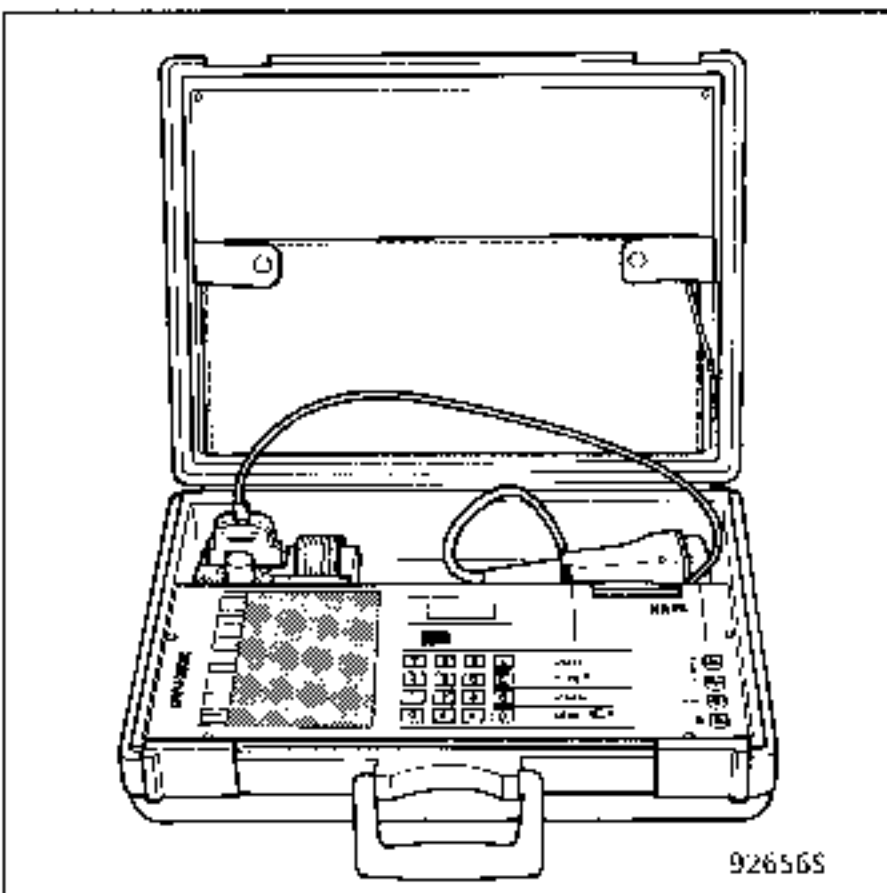
Connect the XR25 to the diagnostic socket.

Enter the code for the automatic clutch:

D 2 6

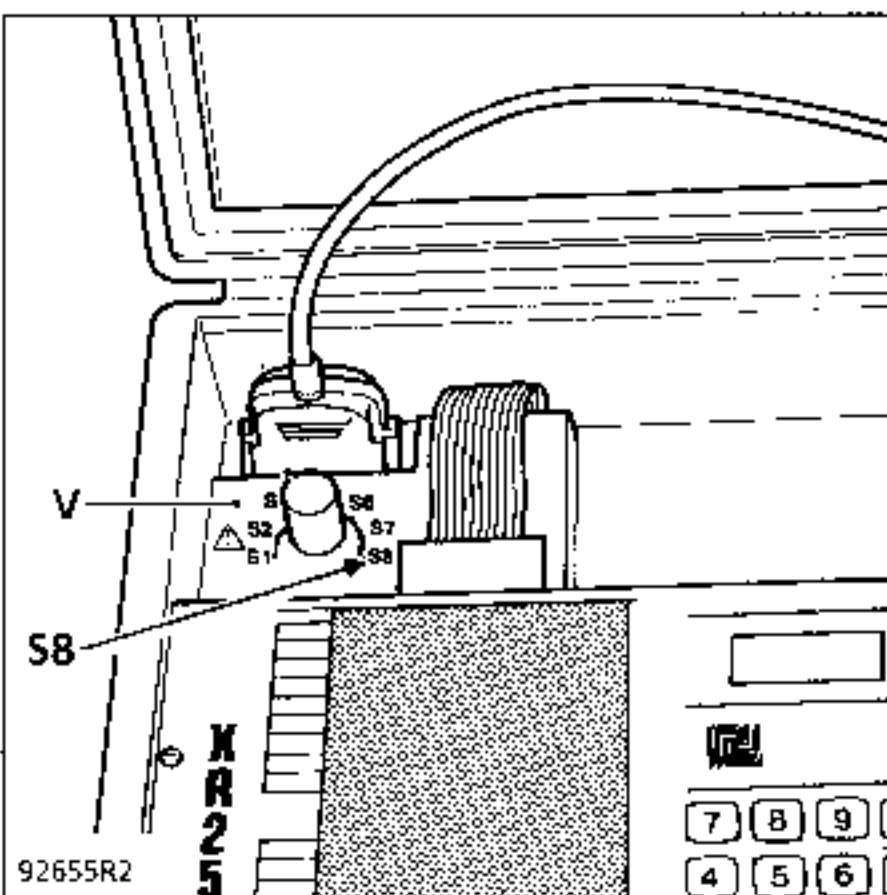
The display shows:

1EP



Turn the ignition on but do not start the engine.

Set the selector to S8.



AUTOMATIC CLUTCH

Fault finding

20

BUZZER MESSAGES

If there is a fault with one of the automatic clutch components or if a dangerous manoeuvre is being carried out, the computer sounds the buzzer.

If a fault occurs (0.8 second beep)

	Fault detected		
	Major	Minor	Intermittent (major or minor)
When the ignition is turned on	9 beeps	3 beeps	3 beeps
While driving	9 beeps every 3 minutes	none	none

If there is an intermittent fault, the warning message disappears when the ignition is turned on for a second time after the fault appeared (major or minor fault), as long as the fault has not reappeared.

During a dangerous manoeuvre (0.4 second beep during the complete manoeuvre)

Dangerous manoeuvre:

- Starting the engine with a gear engaged. This action is prohibited, but if the starter relay is faulty (eg. relay switch stuck) the engine may be started with a gear engaged.
- Engine running, gear engaged, driver's door open (for driver safety)
- Clutch overheating:
 - . during gear changing,
 - . when starting (inappropriate gear engaged),
 - . when anti-overrevving programming is effective (clutch slipping).

When starting the vehicle by pushing

When the vehicle speed is greater than 4 mph (7 km/h), the buzzer sounds. When this beep is heard, the engine may be started. To do this, engage 2nd gear.

DEFECT MODES IN THE CASE OF FAULTS

If there is a fault with one of the components of the automatic clutch system, the computer initiates defect mode operation.

Depending on the type of fault present (major or minor), the system may select various defect modes :

- Defect mode selected for minor faults:

The system is still active, the clutch remains controlled but the faulty component is ignored. If the fault disappears, the system returns to normal operation.

The buzzer sounds three 0.8 second beeps when the ignition is next turned on.

- Defect mode selected for major faults:

The system is de-activated in the following manner:

- . if the vehicle speed < 2.5 mph (4 km/h),
- . if the accelerator pedal position < 10 %,
 - the clutch is opened,
- . otherwise it is progressively let in.

In addition, the vehicle may not be started.

The buzzer sounds nine 0.8 second beeps every 3 minutes from when the fault appears.

If the fault disappears, the ignition must be turned off to cancel the major fault defect mode. In this case the system returns to normal operation, and the buzzer sounds three 0.8 seconds beeps when the ignition is turned on again for the first time.

Faulty component	Type of fault	Fault memorised	Notes
Engaged gear sensor	Major	yes	-
Computer	Major	yes	-
Gear lever sensor	Minor	yes	Replacement information is extracted from the engaged gear sensor stored values
Starter authorisation relay	Minor	yes	The vehicle may not be started
Pump relay	Minor	yes	Normal operation if residual pressure is sufficient

AUTOMATIC CLUTCH

Fault finding

Faulty component	Type of fault	Fault memorised	Notes
Accelerator position sensor	Minor	yes	Half load replacement value
Clutch position sensor	Major	yes	-
Solenoid	Major	yes	-
Jack adjustment	Major	yes	Gear changing becomes worse
Vehicle speed	Minor	yes	The system is in starting mode, the vehicle speed is recalculated each time the gear is changed
Clutch plate	Minor	yes	Clutch slips
Pump assembly (pump motor or pressostat)	Minor	yes	Normal if the residual pressure is sufficient
Engine speed	Major	yes	-

The computer may regard faults with the pump relay, clutch position sensor and the pump assembly as major faults if they are detected during certain phases of operation.


AUTOMATIC CLUTCH

Fault finding

20





















DIAGNOSTIC FICHE

N° 29

 S8

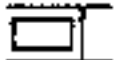



















code : **D 2 6**

read : **I . E P**

1		COMPUTER	CODE PRESENT	
2		CLUTCH CYLINDER ADJUSTMENT	SOLENOID CIRCUITS	
3		*03 CLUTCH CONTROL SYSTEM	CLUTCH SLIPPING *23	
4		PUMP RELAY CONTROL CIRCUIT	START-UP AUTHORIZATION *24	
5		GEAR LEVER	GEAR ENGAGED	
6		CLUTCH CYLINDER POSITION	ACCELERATOR PEDAL	
7		ENGINE SPEED	VEHICLE SPEED	
8		PRESSURE INCREASE	MIN. PRESSURE	
9		GEAR	NO LOAD or FULL LOAD	
10		SOLENOID ZERO POINT	CLUTCH CYLINDER	

CONTROLLED CLUTCH

Memory del. : G 0 ★ ★
End of diagnosis : G 1 3 ★

11		FULL LOAD ← ACCELERATOR POSITIONS → NO LOAD	
12		N	
13		1	
14		3	
15		5	
16		A/C ACTIVE	
17		PUSH → GEAR LEVER ← PULL	
18		START-UP AUTHORIZATION	
19		BUZZER CONTROL	
20		BONNET SWITCH	

ADDITIONAL CHECKS : # . .

- 01 Measurement and no. of gear engaged
- 02 Accel. pedal pos. (initial pos.)
- 05 Vehicle speed rpm
- 06 Engine speed rpm
- 07 Clutch cyl. pos. (initial pos.)
- 08 Clutch wear
- 12 Accel. pedal position (calculated)
- 17 Clutch cyl. position (calculated)

CONTROL MODE : G . . ★

- 01 Test buzzer
- 02 Test pump
- 03 Start-up authorization relay
- 06 Accu. pressure discharge
- 07 Actuator control end
- 20 No load and full load revalidation
- 22 Gear revalidation
- 70 Part Number
- 72 After Sales date, write
- 73 After Sales date, read

14 ANG

FI21429

Bargraphs on a coloured background are fault bargraphs.
Bargraphs on a white background are status bargraphs.

SIGNIFICATION OF THE BARGRAPHS FOR XR 25 FICHE N° 29

The tests specified in this fault finding section are only to be applied if the automatic clutch system buzzer signals the presence of a fault by beeping 3 or 9 times when the ignition is turned on (fault present).

If the fault appears on a road test, the XR 25 should be used with the gear lever in neutral, after turning the ignition off for approximately 10 seconds beforehand.

If no beep is heard when the ignition is turned on, the faults in the memory of the computer are only memorised faults (no faults are present).

BARGRAPH 1 RH SIDE EXTINGUISHED / COMMUNICATION FAULT WITH COMPUTER

- Ensure the XR 25 is not the cause of the fault by trying to establish dialogue with the computer on another vehicle.
- Check that the ISO switch is on position S8 and that the correct cassette and code are being used.
- Check the battery voltage (10.5 volts < voltage < 16 volts).
- Check the 5A and 2A fuses for the automatic clutch (the 5A fuse is located on the engine interconnection unit).
- Check the connection and condition of the connections on the computer connector and connection R212 (engine / passenger compartment).
- Check the computer is correctly fed:
 - Electronic earth (0 V) on track 14 of the 25 track connector.
 - + before ignition on track 1 of the 25 track connector.
 - + after ignition on track 4 of the 25 track connector (across the pump relay coil).
- Check the continuity and insulation of the connecting lines between the diagnostic socket and the computer:
 - Track 10 on the diagnostic socket and track 5 on the computer via track D1 of R212.
 - Track 11 on the diagnostic socket and track 18 on the computer via track D2 of R212.
- Check the diagnostic socket is correctly fed:
 - Earth on track 2 of the diagnostic socket.
 - + before ignition on track 6 of the diagnostic socket.

Replace the computer if dialogue is still not established after these various operations and follow the procedures for programming the values after replacing the computer (see section "Computer").

COMPUTER FAULT

- Check the connections on the computer.
- Erase the computer memory.
- Replace the computer if the fault re-appears and follow the procedures for programming the values after replacing the computer (see section "Computer").



SOLENOID CIRCUIT FAULT

- Turn the ignition off and disconnect the 5 track connector for the hydraulic assembly.
 - Measure the resistance of the solenoid coil between tracks D and E on the hydraulic assembly.
Is the resistance $5\ \text{ohms} \pm 1$?
 - . no : Replace the hydraulic assembly.
 - . yes : Disconnect the computer connector and check / ensure the following continuities:
 - Between track 3 on the computer connector and track D on the hydraulic assembly connector.
 - Between track 2 on the computer connector and track E on the hydraulic assembly connector
- Check / ensure the insulation between these 2 lines.
 Check / ensure the insulation between these 2 lines and other computer / hydraulic assembly connecting lines (tracks A, B and C on the assembly connector).
 Check the insulation from earth of terminals D and E on the hydraulic assembly.
 Check the various connections.
 If all the continuities and insulations are correct, erase the computer memory and turn the ignition off for 10 seconds.
 Replace the computer if the fault re-appears and follow the procedures for programming the values after replacing the computer (see section "Computer").



JACK TRAVEL FAULT

- If the fault appears on a new vehicle or after replacement of the clutch or jack, check the mounting of the jack and its adjustment using the special shim.
- Erase the computer memory then turn the ignition off for 10 seconds.
- Apply the procedure for programming the neutral point for the solenoid and the jack position.
- If the fault persists, replace the jack and , after adjustment, programme the 2 values specified above.

1dEF FAULT ON COMPARISON OF ENGINE AND VEHICLE SPEEDS

2dEF CLUTCH SLIP FAULT

If one of bargraphs 5 RH side, 7 RH side or 7 LH side is also illuminated, treat that bargraph before 3 RH side.

Otherwise enter code *23 on the XR 25.

What display is shown on the XR25?

1dEF

- Check the computer is correct for the vehicle type (special computer if the vehicle has air conditioning).
- Check the gear box is correct for the vehicle type (special gear box if the vehicle has air conditioning).
- Check the vehicle speed / engine speed information lines:
 - Ensure continuity and insulation of the line between track B1 on the vehicle speed sensor and track 23 on the computer connector.
 - Ensure continuity and insulation of the line between track 23 on the injection computer connector and track 11 on the automatic clutch computer connector.
- Check the operation of the engaged gear potentiometer (mechanical fault in the sensor) :

Use function #01 on the XR 25, move the gear lever through all the gear positions and monitor the display on the XR25.

 - If when a new gear is engaged, the XR25 still shows the display for the previous gear for a certain time, replace the engaged gear potentiometer and follow the procedure for programming the gears.
 - If when a new gear is engaged the XR25 shows a value followed by ". = " (130. -), check the gear box control, the fitting and tightness of the engaged gear potentiometer.
- Use bargraphs 17 LH and RH sides to check the coherence of the push / pull information (switches in the gear lever knob incorrectly wired).

2dEF

- Check there is no oil on the clutch plate.
- Read the clutch wear value in the following manner:
 - Using cassette N° 14 : Use function #08 on the XR25.
 - Using cassette N° 13 : Use function #09 on the XR25.

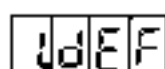
NOTE : This value is not representative of actual clutch wear if the jack position has been programmed without the clutch being replaced (wear value is reset to zero).

- The theoretical wear value for a completely worn clutch is 57.
- Replace the clutch if the value is close to 57 and follow the procedure for programming the neutral position for the solenoid and the jack position (refer to this Repair Manual).

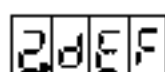
If the wear value is relatively below 57, a measurement must be made of the actual clutch wear to confirm the reading. This measurement is made between the pressure surface of the jack on the gear box housing and the end of the cable end section, when the clutch is in (ignition off).

The dimension is 130 mm when the clutch is new if the jack is correctly fitted and adjusted with the special shim.

Replace the clutch if the measurement is approximately 140 mm (without modifying the adjustment) and follow the procedure for programming the neutral position for the solenoid and the jack position.

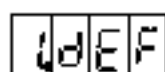


SOLENOID SEIZING OR NOZZLE BLOCKED



CLUTCH CONTROL FAULT

Enter code *03 on the XR 25.
What display is shown on the XR25?



Treat bargraph 6 LH side first if it is also illuminated.

- Check the clutch cable is not broken or unclipped.
- Turn the ignition off and disconnect the 5 track hydraulic assembly connector.
- Measure the resistance of the solenoid coil between tracks D and E on the hydraulic assembly.

Is the resistance 5 ohms \pm 1 ?

- no : Replace the hydraulic assembly.
- yes : Disconnect the computer connector and check / ensure insulation between the following lines:
 - Between track 3 on the computer connector and track D on the hydraulic assembly connector.
 - Between track 2 on the computer connector and track E on the hydraulic assembly connector

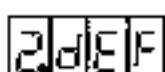
Check / ensure the insulation between these 2 lines and other computer / hydraulic assembly connecting lines (tracks A, B and C on the assembly connector).

Check the insulation from earth of terminals D and E on the hydraulic assembly.

Check / ensure continuity between earth and track C on the hydraulic assembly connector and between track B on the assembly connector and track 24 on the computer connector.

Check the connections on the hydraulic assembly and on the computer. If the connections and continuities are correct, erase the computer memory then turn the ignition off for 10 seconds.

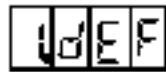
Replace the hydraulic assembly / clutch jack if the fault re-appears (solenoid or jack seized, pressostat faulty,...) and follow the procedure for programming the solenoid neutral position and the jack position.



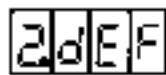
Treat any other illuminated bargraph first

- Check the clutch cable is not broken or unclipped.
- Look for a short circuit in the solenoid or the solenoid wiring:
 - Measure the resistance of the solenoid coil between tracks D and E on the assembly and replace the assembly if the resistance is not approximately 5 ohms \pm 1.
 - Ensure the insulation from earth of terminals D and E on the hydraulic assembly.
 - Ensure the insulation between the 2 lines on the solenoid and the insulation of these 2 lines from other computer / hydraulic assembly connecting lines.
 - Ensure the insulation from earth of terminals D and E on the hydraulic assembly.
- Check / ensure continuity between earth and track C on the hydraulic assembly connector and between track B on the assembly connector and track 24 on the computer connector
- Check the connections on the hydraulic assembly and on the computer. If the connections and continuities are correct, erase the computer memory then turn the ignition off for 10 seconds.

Replace the hydraulic assembly / clutch jack if the fault re-appears (solenoid or jack seized, pressostat faulty,...) and follow the procedure for programming the solenoid neutral position and the jack position.



STARTER RELAY FAULT



STARTER CIRCUIT FAULT, STARTING FAULT OUTSIDE OF AUTHORISATION CONDITIONS

Enter code *24 on the XR 25.
What display is shown on the XR25?

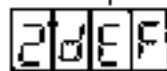


Check the resistance of the relay coil (between pins 1 and 2)
Is it 65 ohms \pm 10 % ?

- no : replace the starter relay.
- yes : Check / ensure continuity and insulation (CC.0 and CC.1) of the line between track 16 on the computer connector and terminal 2 on the base of the relay.
Ensure there is + after ignition feed present at terminal 1 on the relay base.

If the continuity and insulation is correct, erase the computer memory and turn the ignition off for 10 seconds.

Replace the computer if the fault re-appears and refer to this Repair Manual for application of the procedures for programming values after replacing the computer.



Try to start the engine with a gear engaged.
Does the engine start ?

- no : Ignore this information.
Erase the computer memory.
- yes : Remove the starter relay and measure the voltage at terminal 5 on the relay base when the starter is activated.
If the voltage is zero, replace the starter relay (switch is stuck).
If there is 12 volts, ensure the insulation from 12 volts of the line between this terminal 5 and the starter.
Intermediate connection: connection R212 (engine / passenger compartment) on track A7.

After the operation, erase the computer memory then turn the ignition off for 10 seconds.

PUMP MOTOR RELAY CONTROL FAULT

If bargraph 4 LH side is permanently illuminated after turning the ignition off and using the XR25, the only fault which maybe present on the vehicle is a permanent + after ignition feed fault on track 4 of the computer connector (short circuit relay coil, ...).

- Replace the pump motor relay.
- Ensure insulation of the line between track 4 of the computer connector and terminal 2 of the pump motor relay base.

After the operation, erase the computer memory then turn the ignition off for 10 seconds.

Replace the computer if the fault re-appears and refer to this Repair Manual for application of the procedures for programming values after replacing the computer.
An open circuit or short circuit to earth will not be detected by the XR 25 as a check puts the computer out of service if there is no + after ignition feed on track 4 when the ignition is turned on.

ENGAGED GEAR POTENTIOMETER CIRCUIT FAULT

Are bargraphs 6 RH side and 6 LH side also illuminated (or flashing) ?

- yes: The fault is caused by a short circuit on one of the 3 potentiometers or a short circuit to earth on one of the 2 potentiometer 5 volt feed lines (tracks 20 and 21 on the computer).
 - Turn the ignition off and check the 3 potentiometers.
 - Replace the potentiometer with a short circuit between tracks A and C.
 - Check and ensure insulation from earth for the following lines:
 - . Between track 20 on the computer connector and tracks A on the engaged gear potentiometer connector and track C on the jack position potentiometer connector.
 - Intermediate connection: R212 (passenger compartment / engine) on track D5.
 - . Between track 21 on the computer connector and track A on the accelerator position potentiometer connector.
- no : Use function #01 on the XR 25 with the gear lever in neutral.

If the value for #01 is coherent (between 119 and 138) ; move the lever to see if the value changes to a value in the range for a potentiometer fault (value < 5 or > 250). In this case check the gear box control, the mounting and tightening of the potentiometer.

Replace the engaged gear potentiometer if necessary.

Erase the computer memory, turn the ignition off for 10 seconds then follow the procedure for programming the gears.

If the value for #01 equals 0., 255. = or 255.r, carry out the following tests:

- Check the condition of the engaged gear potentiometer connector and the quality of its connections.
- Ensure continuity and insulation of the following lines:
 - . Between track 20 on the computer connector and track A on the potentiometer connector.
 - Intermediate connection R212 (passenger compartment / engine) on track D5.
 - . Between track 9 on the computer connector and track B on the potentiometer connector.
 - Intermediate connection R212 (passenger compartment / engine) on track D6.
- Ensure continuity between track 7 on the computer connector and track C on the potentiometer connector
- Intermediate connection R212 (passenger compartment / engine) on track D4.
- Also ensure insulation between the potentiometer lines.
- Ensure insulation from earth of the line between track 20 on the computer connector and track C on the clutch jack position potentiometer connector.
- Replace the engaged gear potentiometer, erase the memory then follow the procedure for programming the gears (before draining the gear box to make the replacement, use function #01 to test the correct operation of the system by connecting the new potentiometer in place of the old one and actuating the follower).

After the operation, erase the computer memory then turn the ignition off for 10 seconds.

Replace the computer if the fault re-appears and follow the procedures for programming the values after replacing the computer (see section "Computer").

GEAR LEVER PUSH / PULL SWITCH CIRCUIT FAULT

A) Bargraph 5 LH side permanently illuminated:

If bargraph 5 LH side is permanently illuminated after the ignition has been turned off and the XR25 set up, there is a permanent earth on tracks 12 and 13 on the computer (CC.0 on the 2 lines for the push and pull switches, which corresponds to the lever being in a pushed and pulled condition at the same time). Bargraphs 17 LH and RH sides are extinguished as the fault is present.

- Disconnect the 3 track connector located at the bottom of the gear lever and check the condition of the switches in the knob without touching the lever:
 - If there is continuity between tracks C and A and between tracks C and B, replace the lever.
 - If the lever is not faulty, ensure insulation from earth for the following lines:
 - Between track 12 on the computer connector and track B on the 3 track lever connector.
 - Between track 13 on the computer connector and track A on the 3 track lever connector.

B) Bargraph 5 LH side flashing:

In this case bargraphs 17 LH and RH sides are operational as the lever is not in a pushed and pulled condition at the same time.

Is either bargraph 17 LH or RH side illuminated with no action on the lever ?

- yes :
 - Bargraph 17 RH side permanently illuminated : "Pull" switch is faulty or short circuit to earth on the line between track 12 on the computer connector and track B on the 3 track lever connector. Replace the lever if there is continuity between tracks C and B on the lever connector or repair the wiring.
 - Bargraph 17 LH side permanently illuminated : "Push" switch is faulty or short circuit to earth on the line between track 13 on the computer connector and track A on the 3 track lever connector. Replace the lever if there is continuity between tracks C and A on the lever connector or repair the wiring.
- no :
 - Move the lever and check to see if there is alternate right / left illumination of bargraph 17.
If one side of bargraph 17 is illuminated without action on the lever, carry out the checks specified above for the appropriate bargraph illuminated.

ACCELERATOR POSITION POTENTIOMETER CIRCUIT FAULT

Are bargraphs 5 RH side and 6 LH side also illuminated (or flashing) ?

- yes : Follow the fault finding for bargraph 5 RH side
- no : Use the function #02 on the XR 25 for no load.

If the value for #02 is different to 0 or 255 :

- Check the mounting of the accelerator position potentiometer and its immediate environment (pedal floor, linkage, upper stop...).
- Re-adjust the potentiometer if the value for #02 is not between 31 and 41.
- Erase the computer memory then turn the ignition off for 10 seconds.
- Follow the procedure for programming full load and no load positions.

If the fault re-appears, replace the potentiometer and repeat the procedure for erasing the memory and programming the full load and no load positions.

If the value for #02 is equal to 0 or 255 :

- Check the load potentiometer connector and the quality of the connections.
- Ensure continuity and insulation of the line between track 10 on the computer connector and track B on the accelerator position potentiometer connector.
- Ensure continuity and insulation from earth of the line between track 21 on the computer connector and track A of the accelerator position potentiometer connector.
- Ensure continuity between track 8 on the computer connector and track C of the accelerator position potentiometer connector.
- Also ensure insulation between the lines of the potentiometer.
- Replace the accelerator position potentiometer and adjust it, erase the computer memory then turn the ignition off for 10 seconds. Follow the procedure for programming the full load and no load positions.

After the operation, erase the computer memory then turn the ignition off for 10 seconds.

Replace the computer if the fault re-appears and follow the procedures for programming the values after replacing the computer (see section "Computer").

JACK POSITION POTENTIOMETER CIRCUIT FAULT

Are bargraphs 5 RH side and 6 RH side also illuminated (or flashing) ?

- yes : Follow the fault finding for bargraph 5 RH side
- no : Use the function #07 on the XR 25, clutch out (lever in neutral + accelerator pedal not depressed).

If the value for #07 is coherent (between 28 and 151 clutch out) :

- Press the accelerator pedal down completely to let the clutch in fully.
- Replace the jack if the value for #07 is in the range for a potentiometer fault (value > 250).

Erase the computer memory then turn the ignition off for 10 seconds.

Follow the procedure for programming the neutral position for the solenoid and the jack position.

If the value for #07 is incorrect or is equal to 0 or 255 :

- Check the jack position potentiometer connector and the quality of its connections.
- Ensure continuity and insulation of the line between track 22 on the computer connector and track B on the jack position potentiometer connector.
- Ensure continuity and insulation from earth of the line between track 20 on the computer connector and track C on the jack position potentiometer connector.
- Ensure continuity between track 7 on the computer connector and track A on the jack position potentiometer connector
- Also ensure insulation between the potentiometer lines.

If all these tests are correct, erase the computer memory, turn the ignition off for 10 seconds then follow the procedure for programming the neutral position for the solenoid and the jack position.

If the fault re-appears, replace the clutch control jack and follow the procedure for programming the neutral position for the solenoid and the jack position.

Replace the computer if the fault re-appears and follow the procedures for programming the values after replacing the computer (see section "Computer").

VEHICLE SPEED SENSOR CIRCUIT FAULT

If bargraph 5 RH side is also illuminated, treat that bargraph before bargraph 7 RH side.

Even if this fault is present on the vehicle it may only be signalled by a flashing bargraph on the XR25 (under the conditions specified at the start of this fault finding section) as it is only taken into account by the computer when the vehicle is moving.

A road test must be carried out to determine the origin of the fault.

For information, the vehicle speed for #05 is 10 times the value shown on the instrument panel (50 km/h — > 500 wheel revolutions for #05).

- If, when on a road test, the vehicle speed information on the instrument panel is not coherent or is zero, carry out a complete test of the vehicle speed sensor :
 - Check the connections on the sensor connector.
 - after ignition on track A1 of the sensor connector
 - earth on track C1 of the sensor connector

Replace the sensor if necessary.

- If, during the road test, the vehicle speed information for #05 is zero but this is coherent with the instrument panel, the following tests should be carried out :
 - Check / ensure continuity and insulation of the line between track 23 on the computer connector and track B1 of the vehicle speed sensor connector.
 - Intermediate connection: R212 (engine / passenger compartment) on track B4.
 - Also check the condition of the connections along the whole length of the line.

ENGINE SPEED INFORMATION FAULT

If either of bargraphs 5 RH side or 5 LH side is also illuminated, treat that bargraph before bargraph 7 LH side.

The engine speed signal is sent by the injection computer on the fuel pump relay control line. Even if this fault is present on the vehicle it may only be signalled by a flashing bargraph on the XR25 (under the conditions specified at the start of this fault finding section) as it is only taken into account by the computer when the vehicle is moving.

- If the engine does not start there is a short circuit to earth on this line.
- If the vehicle starts but is immobilised as the jack is not engaged, the computer is not receiving TDC information.

In both of these cases the following checks should be made:

- Check / ensure continuity and insulation from earth of the line between track 11 on the automatic clutch computer connector and terminal 2 on the fuel pump relay base.
- Intermediate connection: R212 (engine / passenger compartment) on track D3.
- Also check the condition of the connections along the whole length of the line.
- Check / ensure continuity and insulation from earth of the line between terminal 2 on the fuel pump relay base and track 23 on the injection computer connector.

After the operation, erase the computer memory then turn the ignition off for 10 seconds.

Replace the computer if the fault re-appears and follow the procedures for programming the values after replacing the computer (see section "Computer").

MINIMUM PRESSURE INFORMATION FAULT

If bargraph 2 LH side is also illuminated, treat that bargraph before bargraph 8 RH side.

This fault may occur after using the command mode for discharging the pressure in the hydraulic assembly. In this case, just erase the computer memory.

If the command mode has not been used :

- Replace the pump motor relay if the pump motor is running continuously (in this case the motor runs very noisily due to the action of the pressure release valve).
- Check the condition of the connections at the relay base (sealing, ...).
- Check / ensure continuity between earth and track C on the hydraulic assembly connector and between track B on the assembly connector and track 24 on the computer connector
- Check the connections on the hydraulic assembly and the computer.
- If the connections and continuity are good, wait for 5 minutes with the ignition off while the pressure drops in the hydraulic assembly then check the continuity between tracks B and C on the assembly connector, on the assembly side.
 - . If there is no continuity between the two tracks, replace the hydraulic assembly (pressostat faulty).
 - . If continuity is present, erase the computer memory and turn the ignition off for 10 seconds.

Replace the computer if the fault re-appears and follow the procedures for programming the values after replacing the computer (see section "Computer").

MAINTAINED PRESSURE CONTROL FAULT

This fault may occur after using the command mode for discharging the pressure in the hydraulic assembly. In this case, just erase the computer memory.

If the command mode has not been used :

- Start command mode G02* on the XR25.

Does the pump operate after the jack has been actuated 5 times?

- yes : Check for leaks in the hydraulic circuit and repair them (check the level in the reservoir).

Check the operation of the pressostat :

- Turn the ignition off then on again.
- When the pump stops operating, turn the ignition off and disconnect the 5 track hydraulic assembly connector and use a multimeter to check the condition of the pressostat switch between tracks C and B. Replace the hydraulic assembly if there is continuity between tracks C and B with pressure maintained. Ensure the insulation from earth of the line between track B on the hydraulic assembly connector and track 24 on the computer connector.

Check the connections on the hydraulic assembly and the computer.

After the operation, erase the computer memory then turn the ignition off for 10 seconds.

Replace the computer if the fault re-appears and follow the procedures for programming the values after replacing the computer (see section "Computer").

- no : Check the condition of the 30A pump motor fuse.

Check that the pump motor earth wire is correctly fitted to the battery mounting.

Ensure continuity / insulation of the following lines:

- Between terminal 3 on the motor relay mounting and + battery.
- Between terminal 5 on the motor relay mounting and track A of the 5 track hydraulic assembly connector, harness side.
- Check the condition of the connections on the relay base.

Use function G02* on the XR 25 again and replace the motor relay if the pump motor still does not operate.

Replace the hydraulic assembly and follow the procedure for programming the neutral position for the solenoid and the jack position.

FULL LOAD AND NO LOAD POSITIONS FOR THE ACCELERATOR PEDAL ARE NOT PROGRAMMED

- Treat any other fault present first, then erase the computer memory and turn the ignition off for 10 seconds.
 - Start command mode G20* on the XR25 (conditions for operation: vehicle and engine speed zero, gear lever in neutral).
 - Depress the accelerator pedal fully when the display shows a flashing PF (full load)
 - Release the accelerator pedal when the buzzer beeps (PL flashes on the XR25 - no load)
- The following should then be displayed "Bon", "Fin" then "I.EP" when the procedure has been completed successfully.
Bargraph 9 RH side should be extinguished.
- Turn the ignition off for 10 seconds.

If the values cannot be programmed, a load value is outside the permitted value range (value for #02 less than 150 for full load or greater than 102 for no load). In this case, repeat the programming sequence.

If the values cannot be programmed again, check the fitting and adjustment of the accelerator position potentiometer.

If the values obtained for #02 are both correct in relation to the thresholds specified above, replace the computer and follow the procedures for programming the values after replacing the computer (see section "Computer").

GEAR ENGAGEMENT POSITIONS ARE NOT PROGRAMMED

- Treat any other fault present first, then erase the computer memory and turn the ignition off for 10 seconds.
 - Start command mode G22* on the XR25 (Conditions for operation: vehicle and engine speed zero, full load and no load positions programmed).
 - Follow the display for changing the gears.
0 : Neutral, r : Reverse, 1 : 1st,
- During programming the lever must be held by the knob and must be held against the gear stop (pushed or pulled) for each of the gears (the buzzer beeps after each gear has been programmed).
- Turn the ignition off for 10 seconds.

If a gear position cannot be programmed the value obtained is outside of the permitted value range for this gear. In this case begin the programming procedure again.

If a gear cannot be programmed for a second time, check the value for #01 for the gear which is causing the fault and compare it to the table of permitted values in the Repair Manual.

- If the value obtained for #01 is correct, replace the computer and follow the procedures for programming the values after replacing the computer (see section "Computer").
- If the value obtained is outside the range, check the mounting and tightening of the potentiometer and the gearbox control.

JACK POSITION AND NEUTRAL POSITION FOR THE SOLENOID NOT PROGRAMMED

When the hydraulic assembly, the jack or the clutch is replaced, the neutral position for the solenoid and the position of the jack must be programmed.

These two values are programmed automatically when the ignition is turned on for the first time following erasure of the previous values by two separate XR25 commands.

Treat any other fault present first, then erase the computer memory and turn the ignition off for 10 seconds.

Follow the specified procedure in this Repair Manual.

These two bargraphs only show that the previous values have been erased.

NOTE : When the jack position is programmed, the clutch wear value is reset to zero.

Never carry out this programming unless the hydraulic assembly, the jack or the clutch have been replaced.

ACCELERATOR FULL LOAD OR NO LOAD POSITION



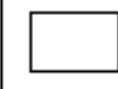


- Illuminated on right hand side: No load position recognised.
- Illuminated on left hand side: Full load position recognised.

If bargraph 11 does not illuminate alternately on the left and right hand sides, check the mounting and adjustment of the accelerator position potentiometer then reprogramme the no load and full load positions (command G20* with vehicle and engine speed zero, gear lever in neutral).

Note : Both sides of bargraph 11 are extinguished in the majority of cases where there is an accelerator position potentiometer fault (Bargraph 6 RH side illuminated).

ENGAGED GEAR STATUS

These bargraphs show the gear engaged in the gear box and the neutral position of the gear lever.

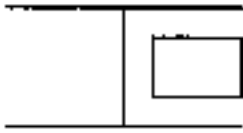
	16	<p>DRIVER'S FRONT DOOR STATUS</p> <p>Door open : Bargraph illuminated Door closed : Bargraph extinguished</p>
	16	<p>AIR CONDITIONING STATUS</p> <p>Air conditioning on : Bargraph illuminated Air conditioning off : Bargraph extinguished</p> <p>This bargraph allows visualisation of the recognition of "air conditioning on" information by the automatic clutch computer as part of its programming which takes account of idle speed.</p>
	17	<p>GEAR LEVER CONDITION IF IT IS MOVED BY THE KNOB</p> <p>Illuminated on right hand side : "Pull" switch in lever knob closed Illuminated on left hand side : "Push" switch in lever knob closed</p> <p>These 2 bargraphs allow the operation of the 2 switches in the gear lever knob to be checked.</p> <p>Note: if one of the bargraphs remains illuminated when there is no action on the gear lever knob, look for a short circuit to earth on the line for the switch concerned.</p>
	18	<p>PUMP MOTOR RELAY CONTROL</p> <p>This bargraph allows visualisation of pump motor control by the computer.</p>
	18	<p>CONDITIONS FOR STARTING THE ENGINE ARE CORRECT</p> <p>This bargraph shows that all the conditions for starting the engine have been met and the computer authorises the engine to be started : gear lever in neutral and push/pull switches in gear lever knob are open (bargraph 17 RH and LH sides extinguished when no pressure is applied to the gear lever knob).</p>



19

BUZZER CONTROL

This bargraph allows visualisation of buzzer control by the computer.



20

XR 25 MEMORY FUNCTION

The XR25 has a memory function which is activated by pressing key 0. This function memorises all the computer operating parameters at a given moment.



20

BONNET SWITCH CIRCUIT FAULT

Not used for TWINGO.

AUTOMATIC CLUTCH

Fault finding

20

READING THE VARIOUS

#

Connect the XR25 to the diagnostic socket.

Position the selector on SB.

Turn the ignition on.

Enter the code for the automatic clutch:

D 2 6

The display shows:

1.EP

Then enter # followed by 2 numbers to gain access to various information from the computer

0 1

Engaged gear: the value read represents the position of the engaged gear sensor (value expressed from 0 to 255 for the first 3 display sections, gear engaged shown on 4th display section).

Gear engaged

Pre-determined gear range

Reverse

199.5

242.5

1st

147.1

200.1

2nd

147.2

200.2

Neutral

113.0

142.0

3rd

72.3

115.3

4th

72.4

115.4

5th

12.5

71.5

Number of gear engaged

0 2 Accelerator pedal position (approximate load*, value expressed from 0 to 255)

1
2
5

When the accelerator position sensor has been adjusted the value should be between 31 and 41 for no load. It should be a maximum of 250 for full load.

0 5 Vehicle speed (value expressed in wheel revolutions per minute)

9
2
0

This is a function of vehicle speed.
It is equal to 10 times the speed shown on the instrument panel (50 km/h → 500 wheel revolutions per minute)

0 6 Engine speed (value expressed in rpm.)

3
2
0
1

This varies from 0 to 6000 rpm.

0 7 Clutch position (approximate travel*, value expressed from 0 to 255)

1
2
5

This indicates the position of the clutch.

- Clutch in : from 138 to 250
- Clutch out : from 28 to 151

0 8 Clutch wear (only from cassette N° 14, value expressed from 0 to 255). (For cassette 13 enter # 09)

2
3

This indicates the clutch wear.

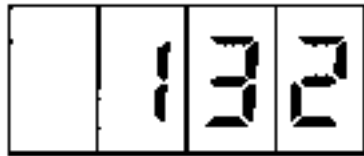
- New clutch : 0
- Worn clutch : 57

1 2 Accelerator pedal position (calculated load *, value expressed from 0 to 255)

2
3
9

This varies from no load to full load, from 0 to 255.

1 7 Clutch position (calculated travel**, value expressed from 0 to 255)



This indicates the position of the clutch.
 - Clutch in : from 3 to 34
 - Clutch out : from 201 to 254

6 5 Pressostat switch status

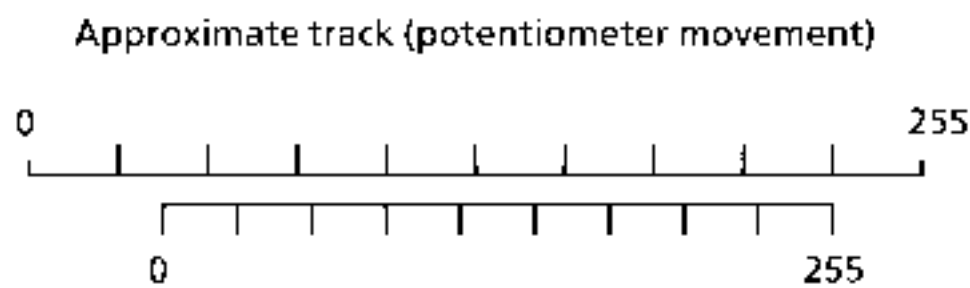


Switch open (pressure $>$ 41 bars or open circuit in the circuit)



Switch closed (pressure $<$ 31 bars or short circuit in the circuit)

* The approximate value represents the actual position of the slide in relation to the total length of the potentiometer track. (Points 0 and 255 correspond to the ends of the track).



Calculated track (movement of the component connected to the potentiometer)

** The calculated value represents the position of the slide in relation to the track actually used. This distance is less than that of the potentiometer range. By subdividing only the track actually used, the intervals are made smaller and the precision of the reading is increased.

COMMAND MODES

IMPORTANT : Certain command modes may cause faults to be memorised. It is therefore necessary to erase the computer memory after fault finding has been completed.

1 - SEQUENTIAL CONTROL OF THE BUZZER

This command tests the operation of the buzzer. It is **activated then de-activated 8 times**.

Connect the XR25 to the **diagnostic socket**.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch:

D 2 6

The display shows:

 1 E P

Enter:

G 0 1 *

The display shows:

 A C t

Then 8 times:

 O n

 O F F

The buzzer should sound each time ON is displayed.

The display shows:

 F i n

Then:

 1 E P

2 - PUMP TEST

The command mode allows pump operation to be tested.

To avoid excess pressure being created when the pump operates, the command mode discharges the accumulator by operating the jack 5 times before the pump is tested.

Test conditions:

- Engine speed zero.
- vehicle speed zero.

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch :

D 2 6

The display shows:

	1	E	P
--	---	---	---

Enter:

G	0	2	*
---	---	---	---

If the test conditions have been observed, the display shows

	A	C	t
--	---	---	---

Then 5 times:

	O	n	
--	---	---	--

	O	F	F
--	---	---	---

After the jack has been operated, the display shows:

	F	i	n
--	---	---	---

Then:

	1	E	P
--	---	---	---

The pump should operate at the end of the test.

3 - SEQUENTIAL CONTROL OF THE STARTER AUTHORISATION RELAY

This command mode is used to test the correct operation of the starter authorisation relay.

The relay is fed then the feed is cut 8 times in succession. The relay should be heard to click.

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch:

D	2	6
---	---	---

The display shows:

	1	E	P
--	---	---	---

Enter:

G	0	3	*
---	---	---	---

The display shows:

	A	C	t
--	---	---	---

Then 8 times:

	O	n	
--	---	---	--

	O	F	F
--	---	---	---

The relay should click 8 times.

The display shows:

	F	i	n
--	---	---	---

Then:

	1	E	P
--	---	---	---

4 JACK CONTROL WITH MAINTAINED PRESSURE

This command mode allows the correct operation of the jack to be tested by visualising its movement.

Test conditions:

- Engine speed zero.
- Vehicle speed zero.
- Gear engaged.

Engaging a gear makes the clutch slip.

The movement of the jack from the following positions may be visualised:

- slipping to clutch out (mode G04*),
- slipping to clutch in (mode G05*).

Clutch out (mode G04*)

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch:

D 2 6

The display shows:

1EP

Enter:

G 0 4 *

The display shows:

ACT

If the test conditions have been observed, the display shows:

On

Then:

Fin

Then:

1EP

The clutch has moved from the slipping position to the clutch out position, then from the clutch out position to the slipping position.

Clutch in (mode G05*)

Enter:

G 0 5 *

If the test conditions have been observed, the display shows:

ACT

Then:

OFF

Then:

1EP

The clutch has moved from the slipping position to the clutch in position, then from the clutch in position to the slipping position.

5 - DISCHARGING THE ACCUMULATOR PRESSURE

Refer to the section "Discharging the accumulator" for the significance of this command mode.

6 - PROGRAMMING FULL LOAD AND NO LOAD POSITIONS

Refer to the section "Programming full load and no load positions" for the significance of this command mode.

7 - PROGRAMMING THE GEARS

Refer to the section "Programming the gears" for the significance of this command mode.

8 - PROGRAMMING THE NEUTRAL POSITION FOR THE SOLENOID AND THE JACK POSITION

Refer to the section "Programming the neutral position for the solenoid and the jack position" for the significance of this command mode.

9 - READING THE PART NUMBER

Refer to the section "Computer identification" for the significance of this command mode.

10 - ENTERING THE DATE OF AFTER SALES OPERATIONS

Refer to the section "Entering the date of After Sales operations" for the significance of this command mode.

11 - READING THE DATE OF AFTER SALES OPERATIONS

Refer to the section "Reading the date of After Sales operations" for the significance of this command mode.

12 - ENDING ACTUATOR CONTROL

Command modes may be stopped at any moment (eg. : Discharging the accumulator pressure, sequential buzzer control).

To do this:

Enter:

G	0	7	*
---	---	---	---

The display shows:

	A	C	t
--	---	---	---

Then:

	F	i	n
--	---	---	---

Then:

	1	E	P
--	---	---	---

13 - ERASING THE MEMORY

At the end of each fault finding session the computer memory must be erased

To do this:

Connect the XR25 to the diagnostic socket.

Set the selector to S8.

Turn the ignition on.

Enter the code for the automatic clutch:

D 2 6

The display shows:

1.EP

Enter:

G 0 *

The display shows:

EFF

Enter:

The display shows:

ban

Then:

1.EP

The memory is erased.

IMPORTANT :

Turn the ignition off for 10 seconds.

Turn the ignition on again.

Enter the code for the automatic clutch.

The only bargraphs illuminated should be 1 RH side, 11 RH side, 12 LH side, 18 LH side, when the gear lever is in neutral and the accelerator pedal is not depressed - no load.

14 - ENDING FAULT FINDING

Enter:

G 1 3 *

The display shows:

F in

Then:

dp

Turn the ignition off.

The XR25 may be disconnected.

CUSTOMER COMPLAINT WITHOUT DEFECT CODE EMISSION

A) No dialogue between the XR25 and the computer

- Ensure the XR25 is not at fault by trying to communicate with another computer on another vehicle.
- Check the ISO switch is on position S8 and that the correct XR25 cassette and access code are being used.
- Check the battery voltage (10.5 volts < voltage < 16 volts).
- Check the connection and condition of the connections on the computer connector and the intermediate connection R212 (engine / passenger compartment).
- Check / ensure continuity and insulation of the lines between the diagnostic socket and the computer.
 - . Track 10 on diagnostic socket and track 5 on computer via track D1 of R212.
 - . Track 11 on diagnostic socket and track 18 on computer via track D2 of R212.
- Check that the diagnostic socket is correctly fed:
 - . Earth on track 2 of the diagnostic socket.
 - . + before ignition on track 6 of the diagnostic socket.

B) Permanent operation of the buzzer when the ignition is turned on and no dialogue between the XR25 and the computer

- Check the battery voltage (10.5 volts < voltage < 16 volts).
- Check the 5A and 2A fuses for the automatic clutch (the 5A fuse is on the engine connection unit).
- Check the connection and condition of the connections on the computer connector and the intermediate connection R212 (engine / passenger compartment).
- Check the computer is correctly fed:
 - . Electronic earth (0 V) on track 14 of the 25 track connector.
 - . - before ignition on track 1 of the 25 track connector.
 - . + after ignition on track 4 of the 25 track connector (across the pump motor relay coil).

C) Permanent operation of the buzzer (dialogue between the XR25 and the computer is correct)

- Ensure continuity and insulation from earth of the line between track 15 on the computer connector and terminal 1 of the buzzer base.

D) Buzzer does not operate

- Ensure the vehicle meets the conditions required for buzzer operation :
 - . Door open, engine running and a gear engaged.
 - . Starting in 3rd gear.

If the buzzer does not operate in these two cases ensure the buzzer is correctly fed:

- . + after ignition on terminal 2 on the buzzer base.
- . Earth on terminal 5 on the buzzer base.

Replace the buzzer if necessary.

If the buzzer does not operate only in the case where the door is open, check the operation of the door switch.

CUSTOMER COMPLAINT WITHOUT DEFECT CODE EMISSION (cont)

E) Noise when changing gear quickly

- Check that bargraphs 17 RH side and LH side operate correctly according to whether the lever is pushed or pulled.

If bargraph 17 never illuminates, disconnect the 3 track connector from the bottom of the gear lever and check / ensure continuity with earth of track C on the harness side.

If only bargraph 17 RH side does not operate correctly, ensure continuity between track B on the 3 track connector and track 12 on the computer connector. If continuity is established, check the operation of the switch in the gear lever knob using a multimeter and replace the lever if it is faulty.

If only bargraph 17 LH side does not operate correctly, ensure continuity between track A on the 3 track connector and track 13 on the computer connector. If continuity is established, check the operation of the switch in the gear lever knob using a multimeter and replace the lever if it is faulty.

- In all cases, follow the procedure for programming the gears.

F) Clutch is slow to let in or does not let in after changing gear (the clutch engages when the lever is pressed repeatedly)

- Follow the procedure for programming the gears.

G) Vehicle is immobilised as the jack does not engage on acceleration

- Ensure continuity of the line between track 11 on the computer connector and terminal 2 on the fuel pump relay base.
Intermediate connection : R212 (engine / passenger compartment) on track D3.

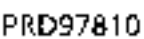
KEY

107	:	Battery
120	:	Injection computer
155	:	Reversing light switch
172	:	Reversing light
180	:	Driver's door switch
213	:	Front courtesy light
225	:	Diagnostic socket
232	:	Starter relay
236	:	Fuel pump relay
250	:	Speed sensor
260	:	Fuse box
299	:	Accessories board
319	:	Air conditioning control panel
597	:	Engine fuse box
724	:	Pump assembly
725	:	Solenoid valve
726	:	Engaged gear sensor
727	:	Clutch position sensor
728	:	Gear lever sensor
729	:	Accelerator position sensor
730	:	Automatic clutch computer
762	:	Pump assembly relay
763	:	Buzzer
835	:	Pressostat

KEY TO CONNECTIONS AND EARTHS

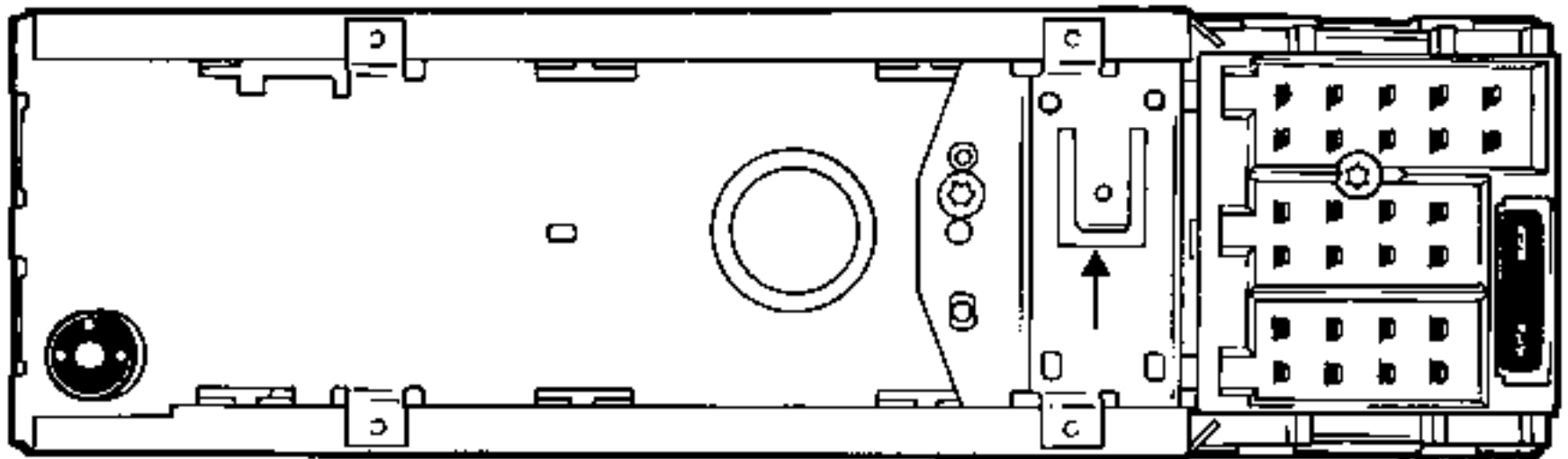
R212	:	Engine / passenger compartment
MF	:	Rear right hand electrical earth
MK	:	Front left hand pillar electrical earth
NC	:	Front left hand pillar electronic earth

20



CONNECTING A RADIO

The pump assembly causes interference which may cause problems with the reception of certain radio frequencies. To remedy this, when fitting a radio as an After Sales operation, the radio housing should be connected to earth. Certain radios have a special terminal for this purpose (see example below).



949115

REMOVAL OF AND/OR REPAIRS TO THE GEAR BOX

To remove the gearbox, the pump - jack assembly, its mounting and the engaged gear sensor must be removed beforehand.

Before repairing a JB type gear box, the engaged gear sensor must be removed.

This sensor is replaced once the refitting operations have been completed.

ATTENTION :

Whenever any work is carried out on the gearbox or the gear selector linkage and before turning over the engine, check the coherence of the information given by the engaged gear sensor in #01. This sensor is fragile, its deterioration could seriously damage the gearbox, to the extent of it being irreparable.