

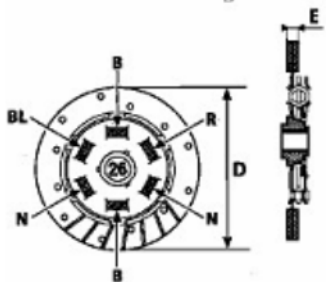


CHARACTERISTICS OF AUTOMATIC TRANSMISSION

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CHARACTERISTICS OF THE CLUTCH

Vehicle model	Transmission model	Engine model	Mechanism	Brake disc
C06 0	JH1 003 JH2 002	D7F		26 – gear wheel BL: blue E = 7.6mm B: white D = 181.5mm N: black R: red
C06 C	JH1 007	D4F	180DST 3500	 90693R14 76906R

DRIVE RATIOS OF THE TRANSMISSION

JH1									
Transmission model	Vehicle model	Cylinder torque	Speed torque	The 1st gear	The 2nd gear	The 3rd gear	The 4th gear	The 5th gear	Reverse gear
002	C06 6	15/56	21/19	11/37	22/41	28/37	30/29	41/31	11/39
003	C06 6	15/58	21/19	11/37	22/41	28/37	30/29	39/32	11/39
007	C06 C	15/61	21/19	11/37	22/41	28/37	30/29	39/32	11/39

Transmission oil – Volume

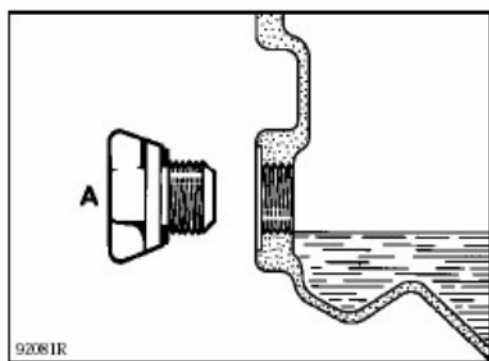
Volume

Five-gear transmission JH1 3,40l

Thickness quality

TRX 75W 80W

Control of transmission oil level



Fill the transmission oil to the position of the inlet.

PARTS RELATED TO MECHANICAL TRANSMISSION

Name	Related part
MOLYKOTE 33 (moderate) REF: 77 01 028 179	Control shaft's half-moon parts
FRENBLOC glue	Fixing bolt for brake ring

Frequently Changed Parts

Removed parts to be substituted:

- Automatic stop nut
- Seal ring
- Rubber ring

Hydraulic oil for the electronically controlled hydraulic unit

Every time that you perform check, you shall check on the hydraulic oil level. For the information about oil filling, refer to the section of "OIL TANK" in this document.

Special oil:

ELF RENAULTMATIC D3 SYN (purchase it from ELF), DEXRON III standard.

Volume measured with the unit of liter:

	Electronically controlled hydraulic unit
Total volume	0.6

BRIEF INTRODUCTION TO MECHANICAL TRANSMISSION

Automated mechanical transmission is a manual mechanical transmission equipped with an electronically controlled hydraulic unit, in which an embedded computer controls both operating of the clutch and changing of the drive ratio. Thus, there is no need to provide a clutch pedal and speed control is implemented through an electronic contact lever, and the accelerator and brake pedals are electronically connected to the engine through the embedded engine computer. This not only reduces the gear shifting time but also ensures more comfortable feeling delivered to the driver and passengers.

Dialogue: (you shall do the following things every time you come to a workshop)

Check:

- Hydraulic oil level (refer to the section of “OIL TANK”)
- Horn performance
 - Pull up the hand brake
 - Start the vehicle
 - Provide the vehicle with a speed (the letter “A” will be shown on the instrument board)
 - Open the driver-side door

The horn should be in good condition.

- Whether safety performance can prevent the vehicle from starting.
 - Pull up the hand brake
 - Provide the vehicle with a speed (do not step down the brake pedal)
 - Try to start the vehicle

The starter should be incapable of working.

Towing:

If the transmission gets stuck at some gear position:

- Ignite the engine
- Step down the brake pedal
- Select the neutral position
- Check that the transmission is really in the neutral position (as you can push the vehicle)

If it is impossible to change the transmission to the neutral position, you shall suspend the front wheels and tow the vehicle.

The engine must be turned off when you tow the vehicle.

SUGGESTIONS ABOUT MECHANICAL TRANSMISSION

Important:

Automated mechanical transmission

During any maintenance or repair of the electronically controlled hydraulic unit, it is a must to use detergent and compressed air for cleaning.

Do not let the hydraulic pipeline open; do not use any high-pressure cleaner for cleaning.

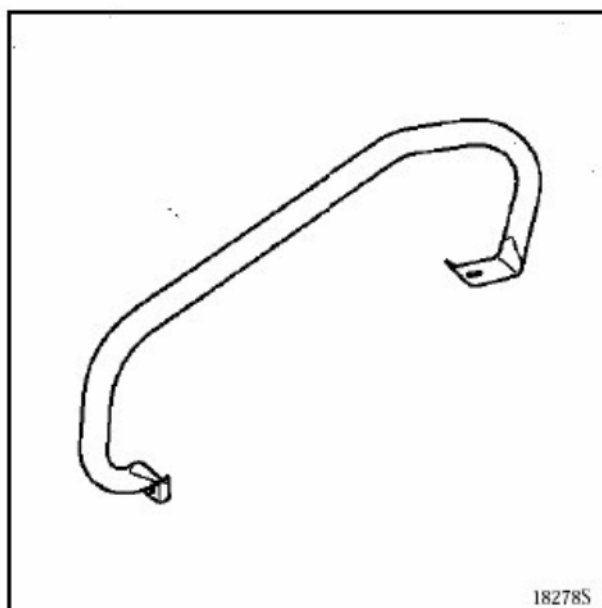
Throttle box

It is prohibited to remove or open the throttle box in any case.

Electronically controlled hydraulic unit

The accumulator shall be removed before maintenance of the entire system.

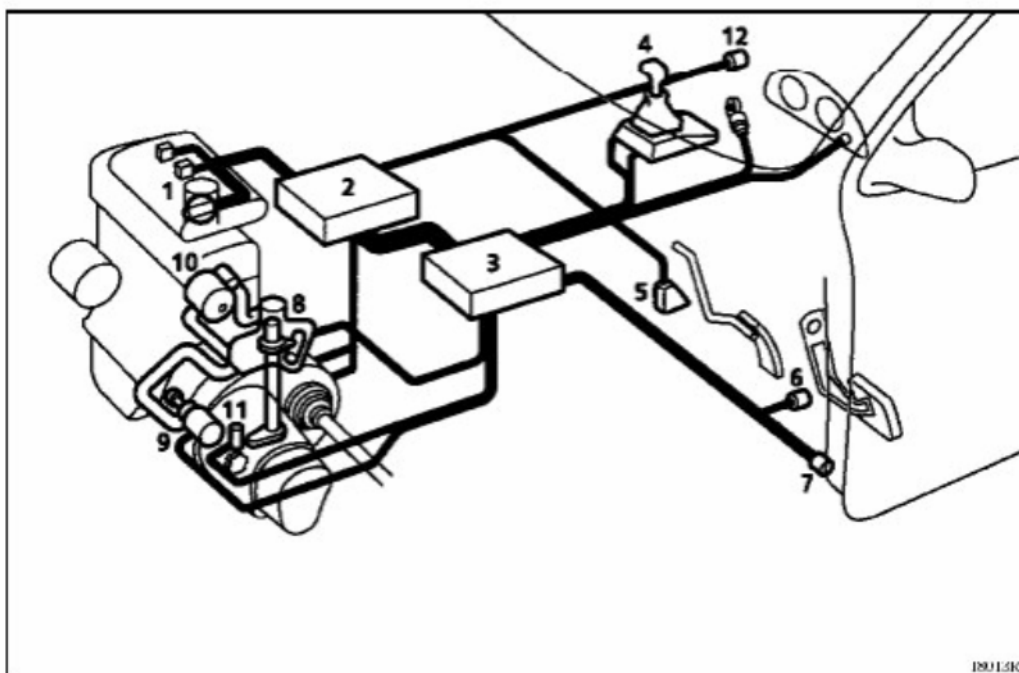
The carrying handle of the electronically controlled hydraulic unit shall be replaced to its former position after any removal of this unit.



Automated mechanical transmission computer

Be sure to switch off the ignition firstly and remove the computer one minute later.

SCHEMATIC DIAGRAM OF MECHANICAL TRANSMISSION



- | | |
|---|--|
| 1. Throttle | 7. Front-door contact |
| 2. Engine computer | 8. Transmission mechanism for gear position selection and speed change |
| 3. Transmission computer | 9. Transmission mechanism of the clutch |
| 4. Gearshift handle | 10. Power supply pack |
| 5. Position sensor for accelerator & brake pedals (load sensor) | 11. Original speed sensor |
| 6. Foot brake contact | 12. Handbrake contact |

MECHANICAL TRANSMISSION PERFORMANCE

The electronically controlled hydraulic system mounted on the transmission is comprised of two transmission mechanisms:

- ➡ Transmission mechanism for gear position selection and speed change
- ➡ Transmission mechanism for clutch and hydraulic unit

The entire hydraulic system is connected with transmission and engine computers.

Gear position selection is implemented through operating the gearshift handle:

- ➡ Automatic mode: the transmission computer carries out speed change according to the predetermined vehicle control policy.
- ➡ Manual mode: the driver sends a signal to the gearshift lever and further to the transmission computer for implementation of speed change.

When the vehicle speed is changed, the transmission computer will control the engine torque to restrict vibration so that the driver can place his/her foot onto the accelerator pedal.

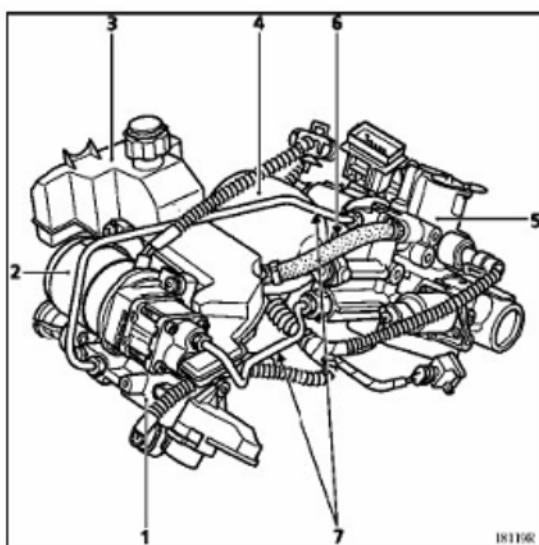
This automated mechanical transmission employs the automatic mode based on the DP0 design, which integrates control methods suitable for concrete drive modes and road surfaces.

The automated mechanical transmission is based on traditional manual transmission equipped with an electronically controlled hydraulic unit, thus realizing automatic five-speed transmission.

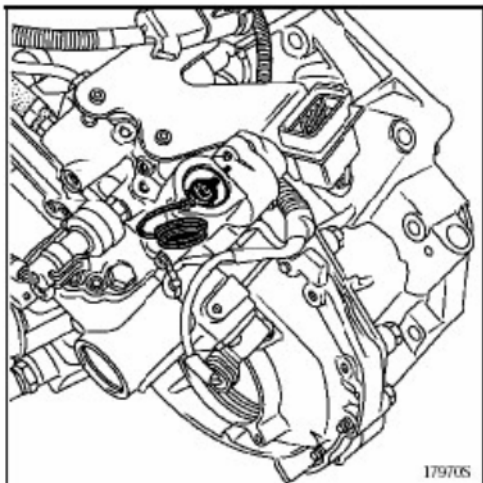
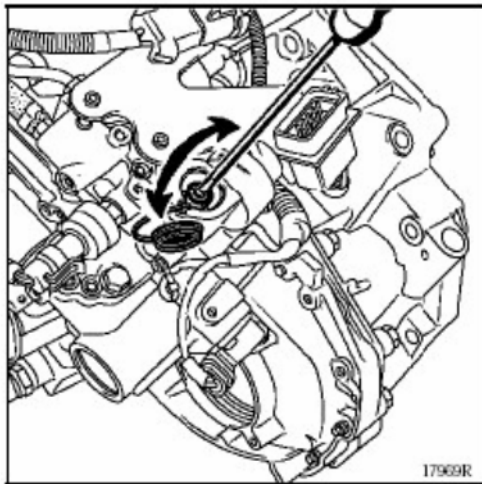
MECHANICAL TRANSMISSION – ELECTRIC CONTROLLED HYDRAULIC UNIT

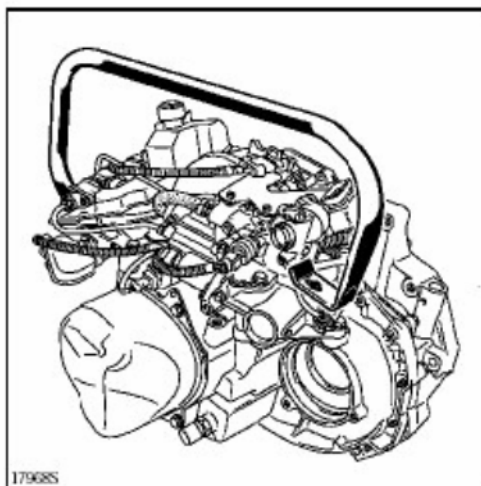
Overview:

1. Clutch
2. Pump
3. Oil tank
4. Energy storage
5. Transmission module
6. Low-pressure pipeline
7. High-pressure pipeline



MECHANICAL TRANSMISSION
– ELECTRONICALLY CONTROLLED HYDRAULIC UNIT

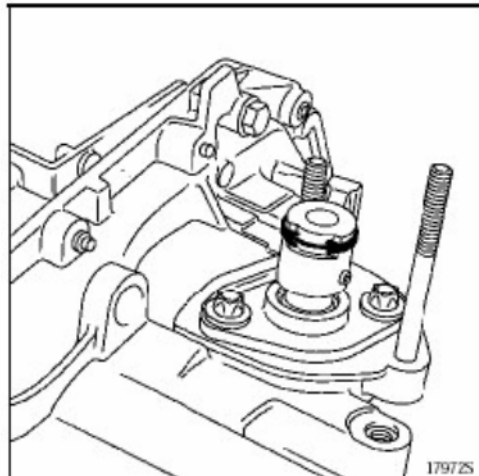
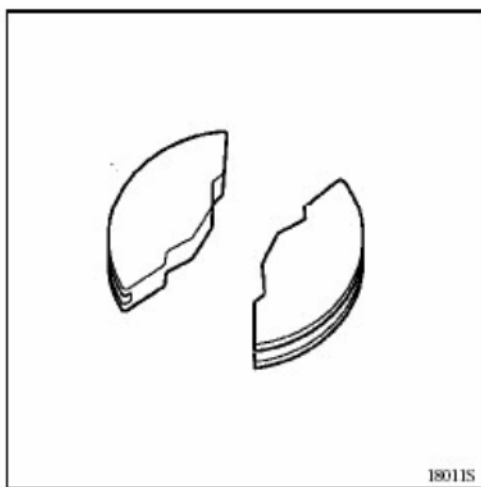
Tightening torque (unit: DAN.M) <table> <tr> <td>M8 bolt for electric pump set</td> <td>2.4</td> </tr> <tr> <td>M10 bolt for electric pump set</td> <td>4.4</td> </tr> <tr> <td>Nut for drive mechanism module</td> <td>2.1</td> </tr> <tr> <td>Pin for drive mechanism module</td> <td>0.8</td> </tr> <tr> <td>High-press pipeline coupler</td> <td>1.4</td> </tr> </table>	M8 bolt for electric pump set	2.4	M10 bolt for electric pump set	4.4	Nut for drive mechanism module	2.1	Pin for drive mechanism module	0.8	High-press pipeline coupler	1.4	
M8 bolt for electric pump set	2.4										
M10 bolt for electric pump set	4.4										
Nut for drive mechanism module	2.1										
Pin for drive mechanism module	0.8										
High-press pipeline coupler	1.4										
Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage. When doing this, comply with the control procedure described in the section of “ENERGY STORAGE”. Once accomplishing this procedure, the buzzer will make a buzzing sound. In order to confirm that the pressure therein has dropped into the specified range, refer to the section of “PR018 HYDRAULIC SYSTEM” to know the standard resultant pressure range. If you fail to do this, repeat the control procedure described in the section of “ENERGY STORAGE” until the pressure becomes very low and it has no risk to remove the high-pressure pipeline. Removal: Before removing the hydraulic unit, you shall remove its seat stand and the gearbox. With regard to how to remove the seat stand, refer to Chapter 21 of <i>Service Manual 305</i>. When removing the gearbox, you shall be careful not to damage the hydraulic unit. Remove the electronically controlled hydraulic unit of the transmission. Remove the clutch fork cable. Remove the connector of the original speed sensor. In order to loosen the speed transmission control shaft, rotate the shaft a quarter turns by using a screwdriver.	 179705 Lock the control shaft. The clearance on the shaft should be aligned with the mark.  179698 Loosen the control shaft. The clearance on the shaft and the mark are at the right angle.										
Handle used to fix the electronically controlled hydraulic unit.	Put two half-moon parts and circlip into the control shaft groove. Smear MOLYKOTE 33 (moderate) onto the two half-moon parts.										



Unscrew the six fixing bolts and remove the hydraulic unit.

Replace the two half-moon parts:

Check whether their positions are correct.

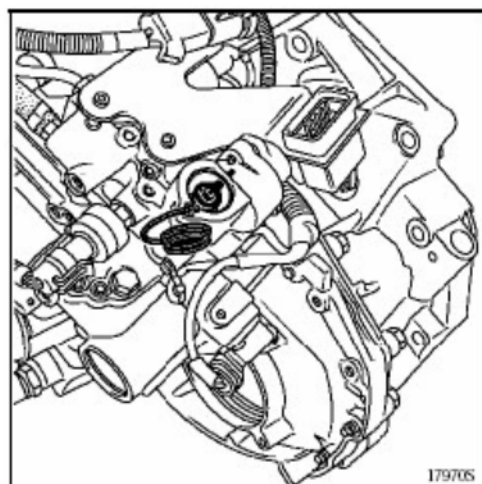


Place the control shaft onto the drive mechanism module and lock it.

Screwdriver impression and shaft pin should be aligned respectively with the marks.

Mount the flat washer.

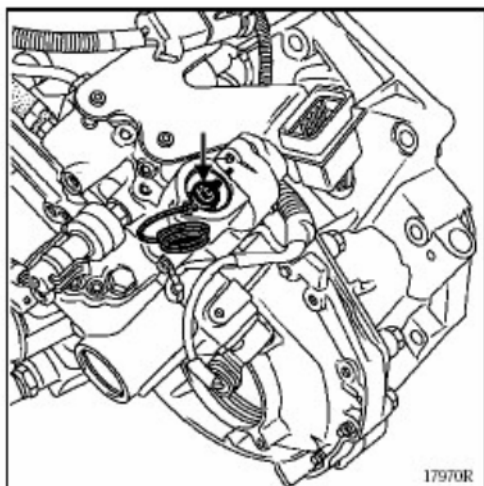
Remount the hydraulic unit onto the transmission.



MECHANICAL TRANSMISSION – ELECTRONICALLY CONTROLLED HYDRAULIC UNIT

Remove the handle of this hydraulic unit.

Fix the hydraulic unit to the transmission by tightening the fixing bolts.



Place back the control shaft cover (lubrication washer).

It is easy to remount the hydraulic unit onto the transmission and you need only to carry out the procedure opposite to the removal procedure.

Remove the outside washer for oil tank cap.

Fill the ELF RENAULT MATIC D3 SYN DEXRON oil to the degree that the oil level is 32 to 38 mm higher than the lowest mark line.

Perform the corresponding test by using a special tool. (Refer to the section “SPECIAL REQUIREMENTS ON CHANGE OF SYSTEM PARTS AND COMPONENTS”)

Oil filling into oil tank

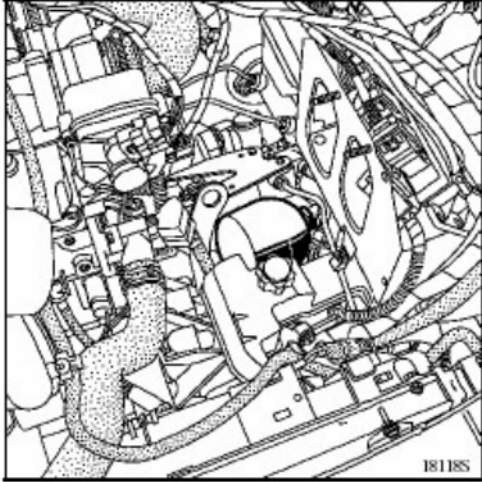
The mark shown on the oil tank is the lowest standard.

Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line.

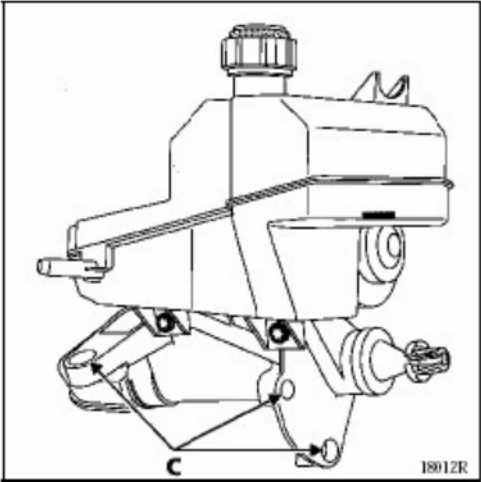
Important tip:

The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).

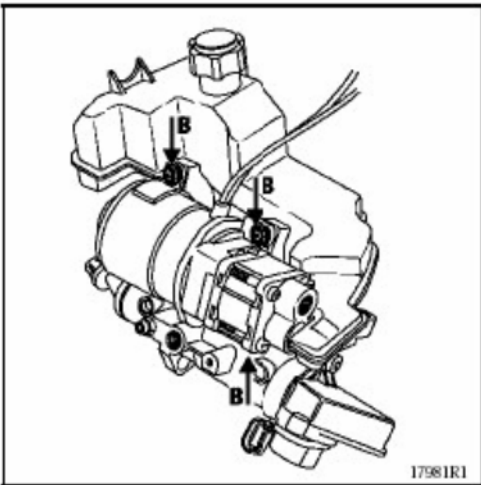
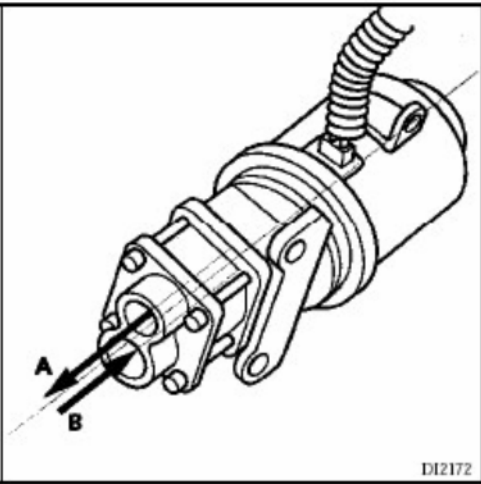
MECHANICAL TRANSMISSION – ENERGY STORAGE

Tightening torque (unit: DAN.M):  Energy storage 4 Lifting ring fixing 2.1	
Operation: Energy storage is used to ensure that the pump runs intermittently. Its full inflation can guarantee three speed loads of clutch engagement/disengagement. Rated operation pressure: 200C: 45 to 50 bar -300C: 35 to 44 bar Remarks: Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage. When doing this, comply with the control procedure described in the section of “ENERGY STORAGE” (AC081). In order to confirm that the pressure therein has dropped into the specified range, refer to the section of “PR018 HYDRAULIC SYSTEM” to know the standard resultant pressure range. If you fail to do this, repeat the control procedure described in the section of “ENERGY STORAGE” until the pressure becomes very low and it has no risk to remove the high-pressure pipeline. The pressure reading should be nearly zero. Removal: Remove the battery. Use the injector to evacuate the oil tank. Remove: - Fasteners on the transmission housing - Energy storage	 Remounting: Stick the warning label onto the energy storage. Carry out the remounting procedure that is opposite to the removal procedure. Fill the ELF RENAULT MATIC D3 SYN DEXRON oil to the degree that the oil level is 32 to 38 mm higher than the lowest mark line. Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section "special requirements on change of system parts and components of KIT electrically controlled hydraulic system") Oil filling into oil tank The mark shown on the oil tank is the lowest standard. Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line. Important tip: The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).

MECHANICAL TRANSMISSION – ELECTRIC PUMP SET

Tightening torque (unit: DAN.M) 	
M8 bolt for electric pump set 2.4	
M10 bolt for electric pump set 4.4	
High-pressure pipeline coupler 1.4	
Energy storage 4	
Remarks:	
Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage. (Refer to the section of “ENERGY STORAGE”).	
Removal:	
Remove the battery.	
Use the injector to evacuate the oil tank.	
Remove:	
- The battery - The air casing	
Disconnect the clutch cable	Remounting:
Remove the electronic injection computer.	Carry out the remounting procedure that is opposite to the removal procedure.
Remove:	Fill the ELF RENAULT MATIC D3 SYN DEXRON oil to the degree that the oil level is 32 to 38 mm higher than the lowest mark line.
- High-pressure pipeline - Low-pressure pipeline - Connectors - Fasteners on the transmission housing - Energy storage - Three fixing bolts for electric pump set 	Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section “special requirements on change of system parts and components of KIT electrically controlled hydraulic system”)
	Oil filling into oil tank
	The mark shown on the oil tank is the lowest standard.
	Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line.
	Important tip:
	The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).

MECHANICAL TRANSMISSION – PUMP

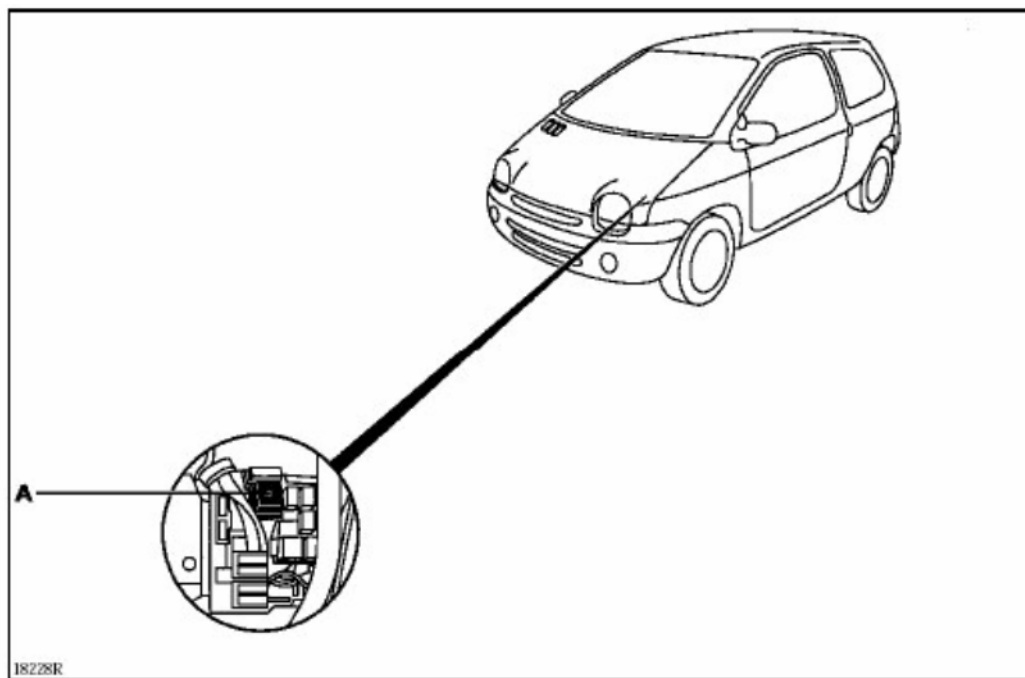
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M8 bolt for electric pump set	2.4										
M10 bolt for electric pump set	4.4										
High-pressure pipeline coupler	1.4										
Energy storage	4										
M6 bolt for electric pump	1										

Notice:

When you change the electric pump set, it is inevitable to change its relay.

The relay is probably damaged due to frequent ignition, and therefore if so, you shall replace the relay so as to avoid damaging the new electric pump set.

The relay (A) for electric pump set is within the interconnection box in the engine case.



Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section “special requirements on change of system parts and components of KIT electrically controlled hydraulic system”)

Oil filling into oil tank

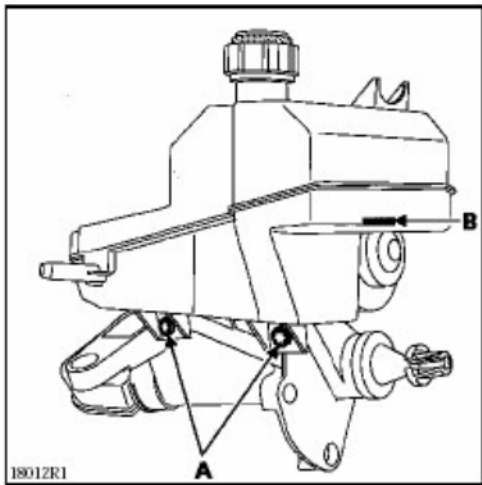
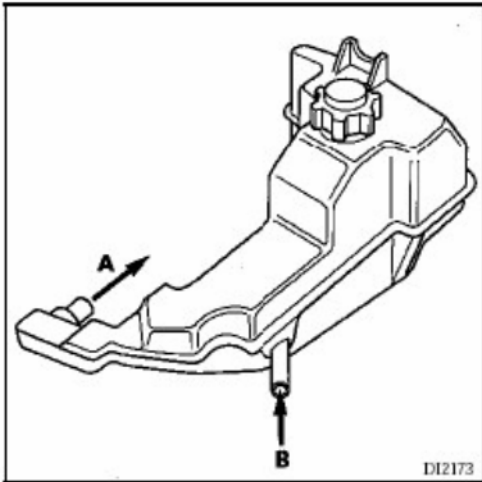
The mark shown on the oil tank is the lowest standard.

Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line.

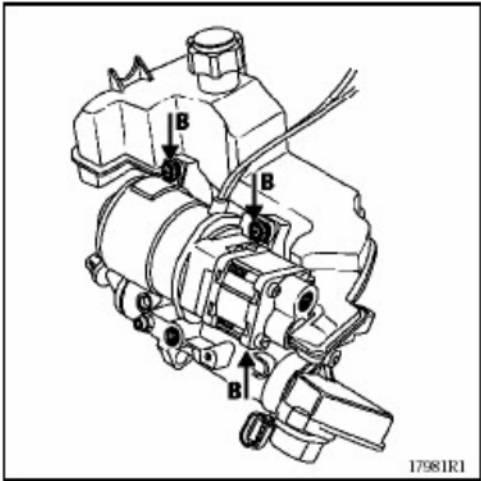
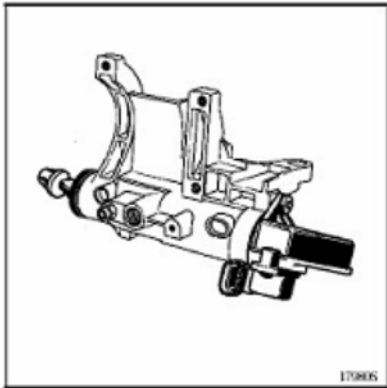
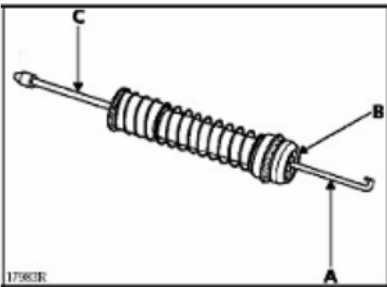
Important tip:

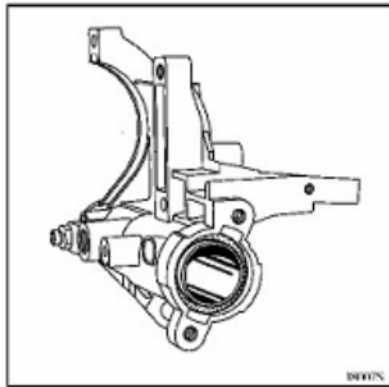
The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).

MECHANICAL TRANSMISSION – OIL TANK

Tightening torque (unit: DAN.M)  Energy storage 4 High-pressure pipeline coupler 1.4 Lifting ring fixing nut 2.1 Remarks: Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage (refer to the section of “ENERGY STORAGE”). Removal: Remove the battery. Use the injector to evacuate the oil tank. Remove: - Low-pressure pipeline - High-pressure pipeline - Transmission housing mounting bracket - Energy storage - Oil tank fixing bolts (A) Disconnect the clutch cable. Remove the electronic injection computer. Remove: - High-pressure pipeline - Low-pressure pipeline - Connectors - Fasteners on the transmission housing - Energy storage - Three fixing bolts for electric pump set  	 A: suck in B: flow back Remounting: Carry out the remounting procedure that is opposite to the removal procedure. Fill the ELF RENAULT MATIC D3 SYN DEXRON oil to the degree that the oil level is 32 to 38 mm higher than the lowest mark line. Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section “special requirements on change of system parts and components of KIT electrically controlled hydraulic system”). Oil filling into oil tank The mark shown on the oil tank is the lowest standard. Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38mm higher than the lowest mark line. Important tip: The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).
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MECHANICAL TRANSMISSION – CLUTCH MODULE

Tightening torque (unit: DAN.M)  <table> <tr> <td>Energy storage</td> <td>4</td> </tr> <tr> <td>High-pressure pipeline coupler</td> <td>1.4</td> </tr> <tr> <td>Lifting ring fixing nut</td> <td>2.1</td> </tr> <tr> <td>M8 bolt for electric pump set</td> <td>2.4</td> </tr> <tr> <td>M10 bolt for electric pump set</td> <td>4.4</td> </tr> <tr> <td>M6 bolt for electric pump</td> <td>1</td> </tr> </table>	Energy storage	4	High-pressure pipeline coupler	1.4	Lifting ring fixing nut	2.1	M8 bolt for electric pump set	2.4	M10 bolt for electric pump set	4.4	M6 bolt for electric pump	1	
Energy storage	4												
High-pressure pipeline coupler	1.4												
Lifting ring fixing nut	2.1												
M8 bolt for electric pump set	2.4												
M10 bolt for electric pump set	4.4												
M6 bolt for electric pump	1												
Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage. When doing this, comply with the control procedure described in the section of “Removal of Pressure Energy Storage”. (Refer to the section of “ENERGY STORAGE”). Removal: It is necessary to firstly remove the electric pump set before the clutch module. With regard to how to remove the electric pump set, refer to its removal procedure described on Page 12. Remove: - Oil tank - The pump through taking off the three bolts (B) 	Remove: - Sleeve joint - Dust boot - Clutch position sensor (be careful to not disconnect the clutch cylinder)  Remove: - Spring pin assembly - Potentiometer control - Piston (B) connector by using a screwdriver - Clutch cable  												
Remove the bushing and washers on the clutch.	Remounting: - The clutch cable in the piston  - Connector (B) - Potentiometer control (A)												

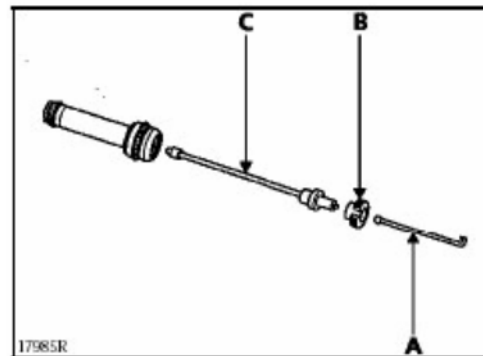
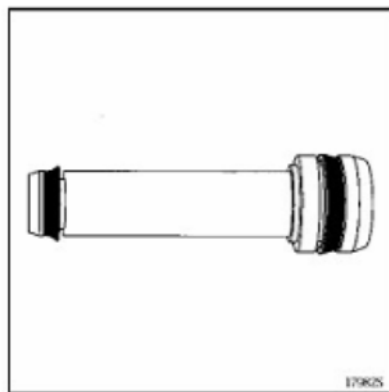


Remounting:

Notice:

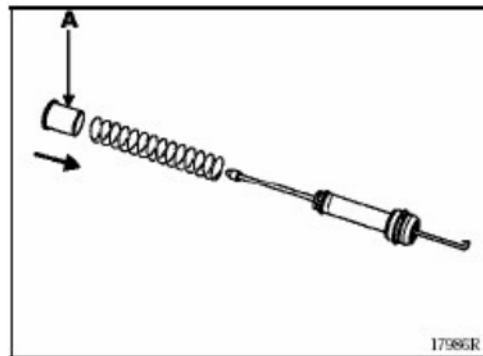
Piston washer shall have a correct mounting direction due to its unusual lip shape.

Ensure that piston washer is in good condition.



Remount:

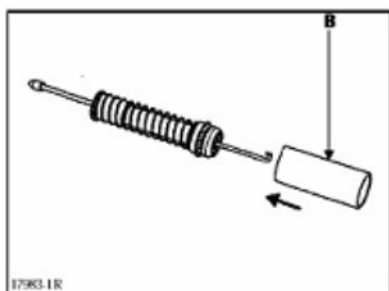
- Spring
- Remount the sleeve on condition that the compression spring is mounted in the correct direction so as to damage the piston washer.



Remount the sleeve (B) on condition that the lip-shaped washer is mounted in the correct direction so as to not be damaged.

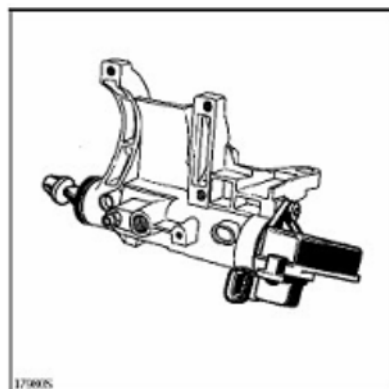
Remount:

- Dust boot
- Sleeve stop ring



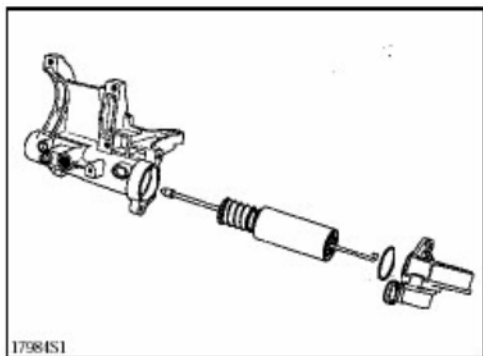
Remount:

- Sleeve/piston assembly in the clutch module
- Seal washer



Fix the potentiometer

Tighten the potentiometer into the clutch module through the compression spring.



Carry out the following steps according to the opposite sequence.

Fill the ELF RENAULT MATIC D3 SYN DEXRON oil to the degree that the oil level is 32 to 38 mm higher than the lowest mark line.

Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section “special requirements on change of system parts and components of KIT electrically controlled hydraulic system”)

Oil filling into oil tank

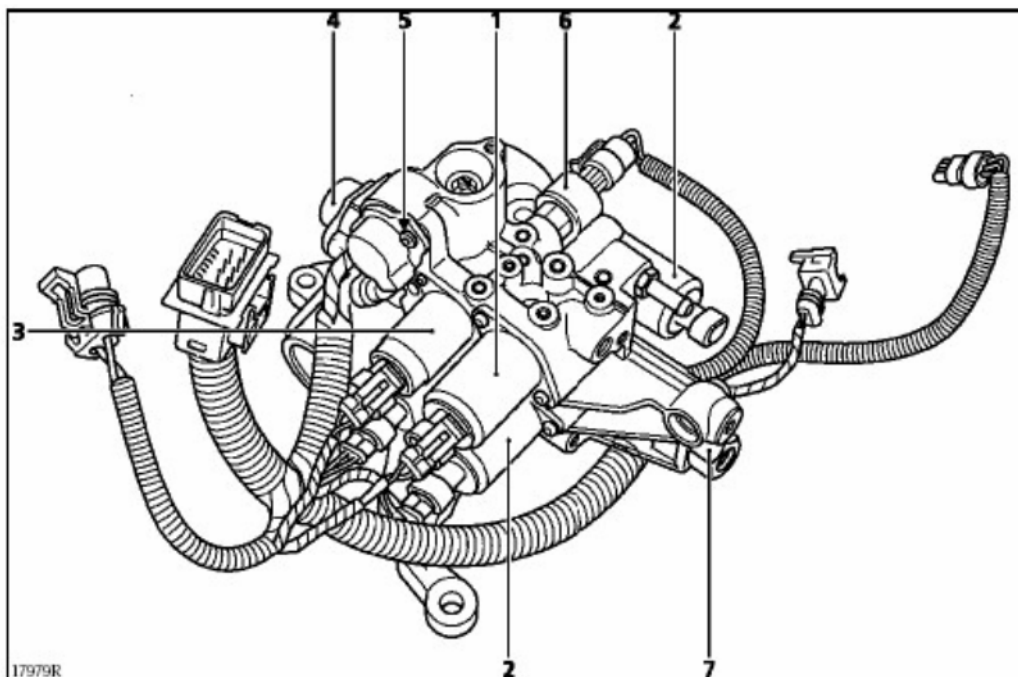
The mark shown on the oil tank is the lowest standard.

Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line.

Important tip:

The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).

MECHANICAL TRANSMISSION – DRIVE MECHANISM MODULE



Instruction of part and component:

1. Electromagnetic valve for clutch
2. Electromagnetic valve for gear engagement
3. Electromagnetic valve for gear position selection
4. Engagement position sensor
5. Gear position sensor
6. Pressure sensor
7. High-pressure filter

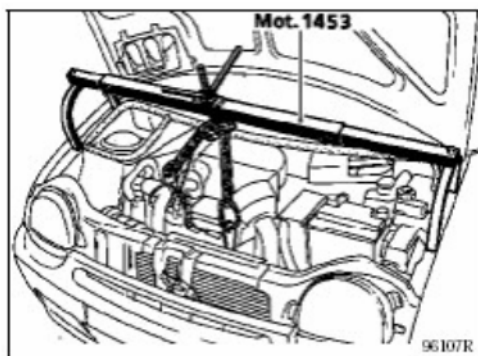
Tightening torque (unit: DAN.M) 		
Drive module pin	0.8	
Drive module nut	2.1	
Electromagnetic valve bolt	0.4	
Control shaft cover bolt	0.6	
High-pressure pipeline coupler	1.4	
Energy storage	4	
Remarks: Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage. (Refer to the section of “Energy Storage”). Remove: – Battery – Air casing – Electronic injection computer – Clutch cylinder fasteners		– High-pressure pipeline – Low-pressure pipeline – Oil tank – Left headlight – Wheels – Lamp used to indicate that left wheel is stuck in mud – Transmission weight Mount the engine support MOT.1453

- Supporting board for fasteners (A)

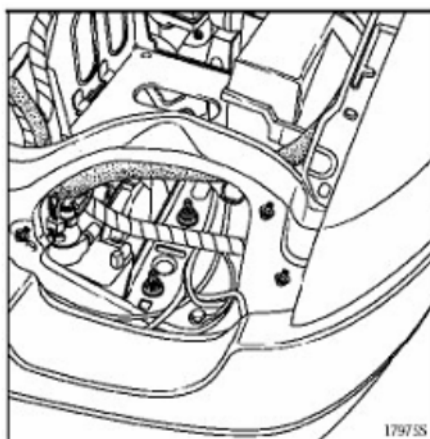


Remove:

- Mounting bracket for lifting ring (B)
- Energy storage 

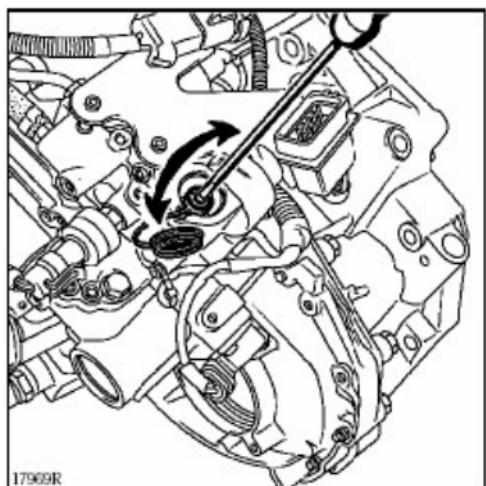


Remove the transmission support from the vehicle body.



Lower the transmission as possible as you can and take off the control shaft cover.

Rotate the control shaft a quarter turns by using a screwdriver so as to loosen it.

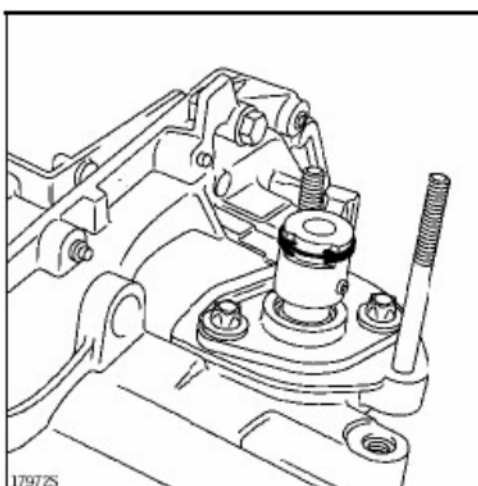


Remove the hydraulic unit

Remount it

Check whether positions of the two half-moon parts are correct.

Smear MOLYKOTE 33 (moderate) onto the two half-moon parts.

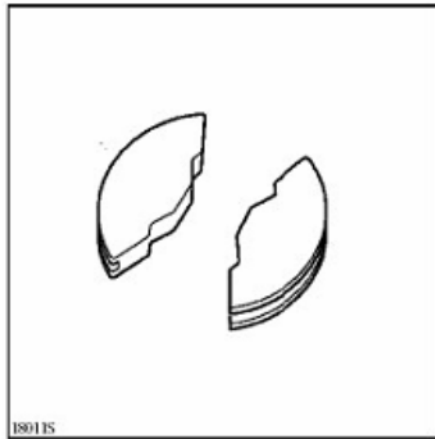


Place the control shaft onto the drive mechanism module and lock it.

Screwdriver impression and shaft pin should be aligned respectively with the marks.

Put the flat washer in place.

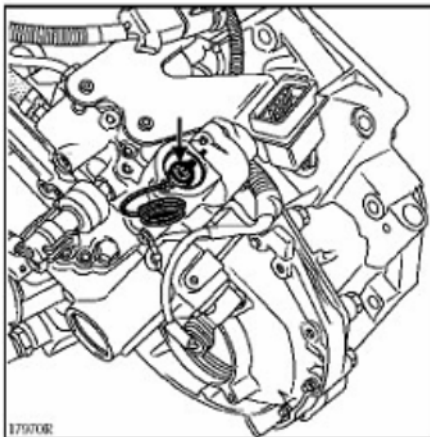
Remount the hydraulic unit onto the transmission.



Put two half-moon parts and circlip into the control shaft groove.

Fix the hydraulic unit onto the transmission by screwing its fixing bolts.

Hold the control shaft with a screwdriver so as to lock the drive module.



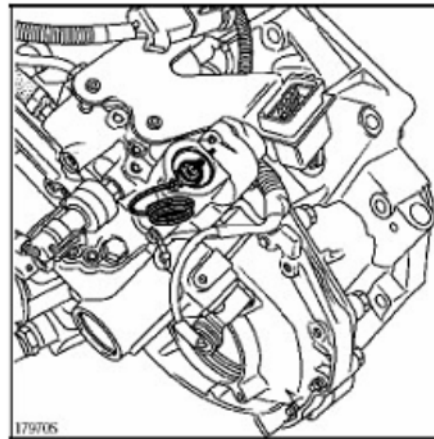
Connect:

- The bus bar to the drive mechanism
- Fasteners

Remount:

- Control shaft cover (smear grease onto the washer)
- The transmission support onto the vehicle body

Remove the engine support MOT.1453's handheld tool.



It is easy to carry out the following assembly procedure, which is opposite to the disassembly procedure.

Fill the ELF RENAULT MATIC D3 SYN DEXRON oil to the degree that the oil level is 32 to 38 mm higher than the lowest mark line.

Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section "special requirements on change of system parts and components of KIT electrically controlled hydraulic system")

Oil filling into oil tank

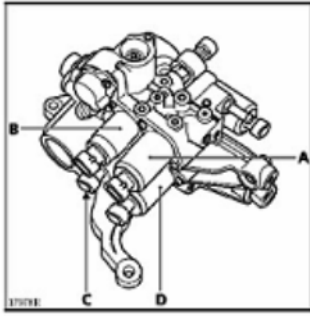
The mark shown on the oil tank is the lowest standard.

Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line.

Important tip:

The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).

MECHANICAL TRANSMISSION – ELECTROMAGNETIC VALVE

Tightening torque (unit: DAN.M)  <table> <tr> <td>Energy storage</td> <td>4</td> </tr> <tr> <td>High-pressure pipeline coupler</td> <td>1.4</td> </tr> <tr> <td>Lifting ring fixing nut</td> <td>2.1</td> </tr> <tr> <td>Electromagnetic valve bolt</td> <td>0.4</td> </tr> </table>	Energy storage	4	High-pressure pipeline coupler	1.4	Lifting ring fixing nut	2.1	Electromagnetic valve bolt	0.4	
Energy storage	4								
High-pressure pipeline coupler	1.4								
Lifting ring fixing nut	2.1								
Electromagnetic valve bolt	0.4								
Remarks: Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage (refer to the section of "ENERGY STORAGE"). Please refer to the related information in 21- 4. Disconnect: – Battery – Hydraulic unit wire harness connectors Remove: – Air casing – Air casing support – Computer – Transmission housing support – Energy storage  – Hydraulic unit wire harness connector support (A)	Disconnect the related connections for electromagnetic valves. Remove related electromagnetic valves according to the following removal sequence.  A: Electromagnetic valve (for the clutch) B: Electromagnetic valve 4 (for gear position selection) C: Electromagnetic valve 3 (for gear position selection) D: Electromagnetic valve 1 (for gear engagement) Remounting: Carry out the remounting procedure that is opposite to the removal procedure. Fill the ELF RENAULT MATIC D3 SYN DEXRON oil to the degree that the oil level is 32 to 38 mm higher than the lowest mark line. Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section “special requirements on change of system parts and components of KIT electrically controlled hydraulic system”) Oil filling into oil tank The mark shown on the oil tank is the lowest standard. Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line.								
 Remove: – Lifting ring (B) mounting support – Energy storage 	Important tip: The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).								

Electromagnetic valve 2:

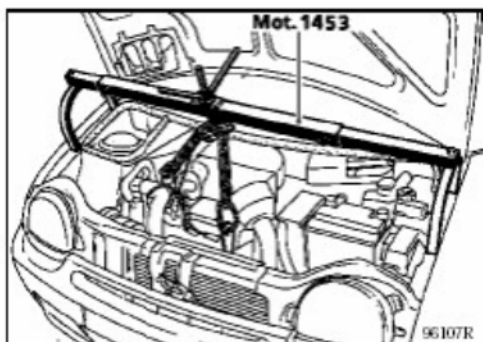
Removal:

It is necessary to lower the transmission to remove the clutch electromagnetic valve 2.

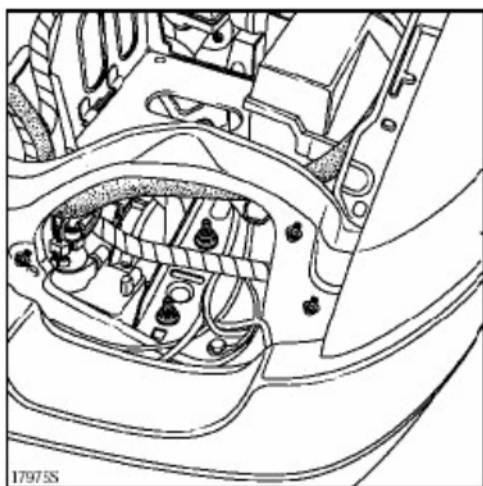
Remove:

- Battery
- Air casing
- Electronic injection computer
- Left headlight
- Wheels
- Lamp used to indicate that left wheel is stuck in mud
- Transmission weight

Mount the engine support MOT 1453.



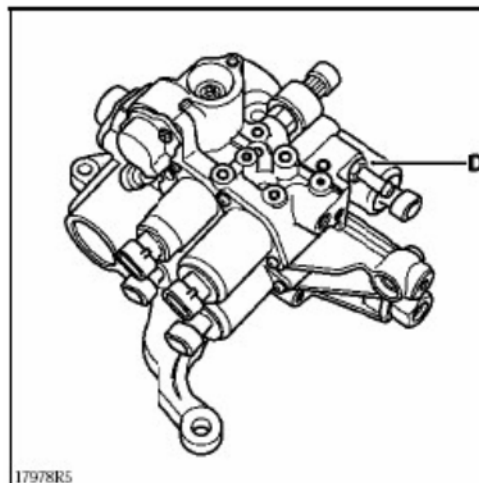
Remove the transmission support connections on the vehicle body.



Lower the transmission as possible as you can.

Disconnect the related connections for electromagnetic valves.

Remove the electromagnetic valve 2 (D).



Remounting:

Carry out the remounting procedure that is opposite to the removal procedure.

Fill the ELF RENAULT MATIC D3 SYN DEXRON oil to the degree that the oil level is 32 to 38 mm higher than the lowest mark line.

Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section "special requirements on change of system parts and components of KIT electrically controlled hydraulic system")

Oil filling into oil tank

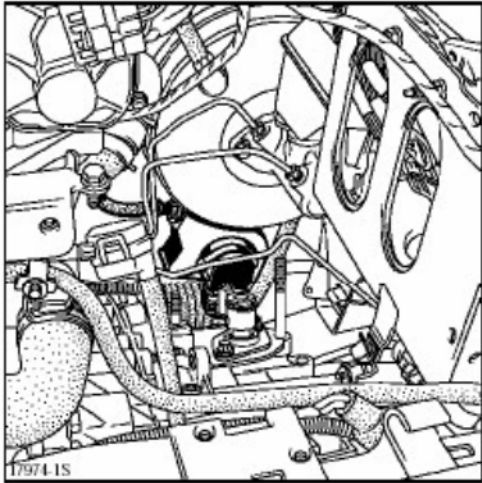
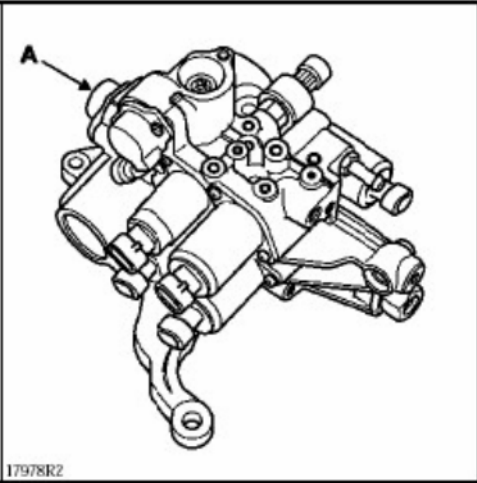
The mark shown on the oil tank is the lowest standard.

Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line.

Important tip:

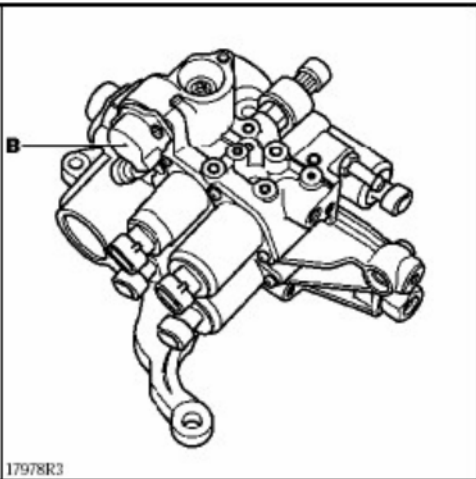
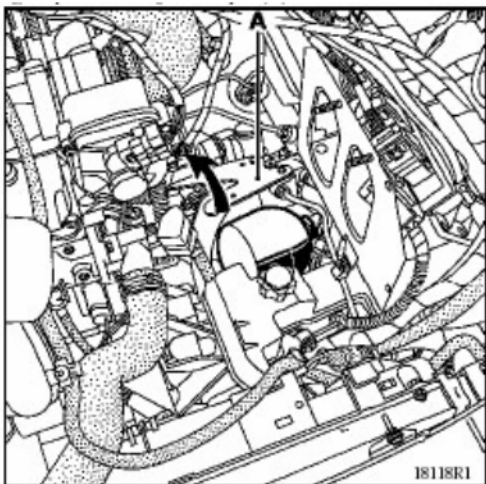
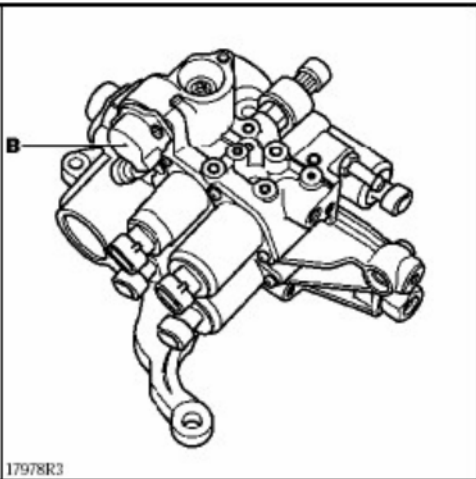
The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).

MECHANICAL TRANSMISSION – ENGAGEMENT POSITION SENSOR

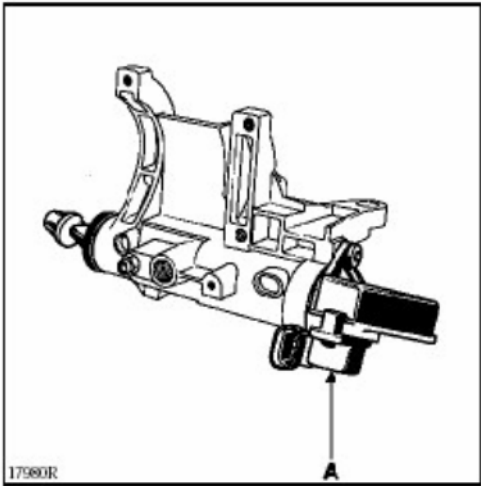
Tightening torque (unit: DAN.M)  <table> <tr> <td>Power on position sensor bolt</td> <td>0.4</td> </tr> <tr> <td>Drive mechanism module nut</td> <td>2.1</td> </tr> <tr> <td>Lifting ring fixing nut</td> <td>2.1</td> </tr> <tr> <td>High-pressure pipeline coupler</td> <td>1.4</td> </tr> <tr> <td>Energy storage</td> <td>4</td> </tr> </table>	Power on position sensor bolt	0.4	Drive mechanism module nut	2.1	Lifting ring fixing nut	2.1	High-pressure pipeline coupler	1.4	Energy storage	4	Disconnect the engagement position connector (A) Remove the engagement position sensor (A)
Power on position sensor bolt	0.4										
Drive mechanism module nut	2.1										
Lifting ring fixing nut	2.1										
High-pressure pipeline coupler	1.4										
Energy storage	4										
Remarks: Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage (refer to the section of "ENERGY STORAGE"). When removing the engagement position sensor, it is unnecessary to remove the drive mechanism module. Removal: Remove the potentiometer for accelerator and footbrake and its support. 	 17978R2 Remounting: Carry out the remounting procedure that is opposite to the removal procedure. Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section “special requirements on change of system parts and components of KIT electrically controlled hydraulic system”) Oil filling into oil tank The mark shown on the oil tank is the lowest standard. Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line. Important tip: The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).										

MECHANICAL TRANSMISSION

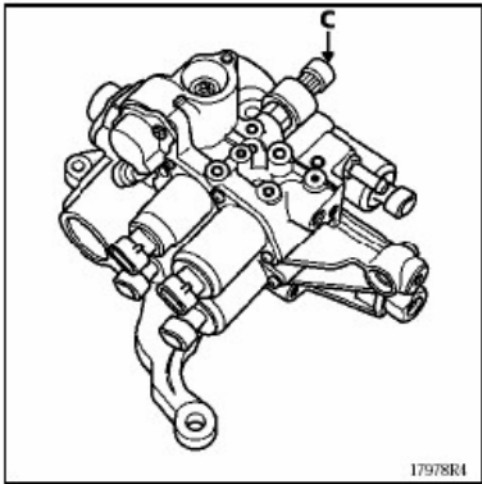
– GEAR POSITION SELECTION SENSOR

Tightening torque (unit: DAN.M)  Power on position sensor bolt 0.4 Electromagnetic valve 0.4 Lifting ring fixing nut 2.1 High-pressure pipeline coupler 1.4 Energy storage 4	Disconnect the gear position selection connector (B) Remove the gear position selection sensor (B)
Remarks: Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage (refer to the section of "ENERGY STORAGE"). Before removing the gear position selection sensor, it is necessary to change to the 1st gear. Removal: Disconnect the battery. Remove: – Air casing – Air casing support Disconnect the hydraulic unit wire harness connector (A). Remove the hydraulic unit wire harness connector support (A).  	 Remounting: Check the capability of the selective sensor to rotate freely. Carry out the following remounting procedure that is opposite to the removal procedure. Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section "special requirements on change of system parts and components of KIT electrically controlled hydraulic system") Oil filling into oil tank The mark shown on the oil tank is the lowest standard. Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line. Important tip: The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).

MECHANICAL TRANSMISSION – CLUTCH POSITION SENSOR

Tightening torque (unit: DAN.M) 	
Clutch position sensor bolt	0.4
M8 bolt for electric pump set	2.4
M10 bolt for electric pump set	4.4
High-pressure pipeline coupler	1.4
Lifting ring fixing nut	2.1
Energy storage	4
Remarks: Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage (refer to the section of "ENERGY STORAGE"). Remove: – Clutch actuator support Disconnect the clutch position sensor connector. Remove the clutch position sensor. (A) 	
Remounting: Carry out the following remounting procedure that is opposite to the removal procedure. Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section "special requirements on change of system parts and components of KIT electrically controlled hydraulic system") Oil filling into oil tank The mark shown on the oil tank is the lowest standard. Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line. Important tip: The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).	

MECHANICAL TRANSMISSION – PRESSURE SENSOR

Tightening torque (unit: DAN.M)  <table> <tr> <td>Position sensor bolt</td> <td>0.4</td> </tr> <tr> <td>Drive mechanism module nut</td> <td>1.4</td> </tr> <tr> <td>Lifting ring fixing nut</td> <td>2.1</td> </tr> <tr> <td>High-pressure pipeline coupler</td> <td>1.4</td> </tr> <tr> <td>Energy storage</td> <td>4</td> </tr> </table>	Position sensor bolt	0.4	Drive mechanism module nut	1.4	Lifting ring fixing nut	2.1	High-pressure pipeline coupler	1.4	Energy storage	4	
Position sensor bolt	0.4										
Drive mechanism module nut	1.4										
Lifting ring fixing nut	2.1										
High-pressure pipeline coupler	1.4										
Energy storage	4										
Remarks: Before maintaining the entire automated mechanical transmission, use a special repair tool to remove the energy storage (refer to the section of "ENERGY STORAGE"). Removal: Use an injector to evacuate the oil tank. Disconnect the pressure connector. Use a 14 mm precision wrench to remove the pressure sensor (C).  17978R4	Remounting: Carry out the following remounting procedure that is opposite to the removal procedure. Fill the ELF RENAULT MATIC D3 SYN DEXRON oil to the degree that the oil level is 32 to 38 mm higher than the lowest mark line. Perform the corresponding test by using a special tool. (Refer to the page 21-36 of section “special requirements on change of system parts and components of KIT electrically controlled hydraulic system”) Oil filling into oil tank The mark shown on the oil tank is the lowest standard. Carry out the energy storage removal procedure. Make sure that the oil level is 32 to 38 mm higher than the lowest mark line. Important tip: The oil level will be at the position indicated by the mark line (MIN) when the energy storage has been fully inflated (15 seconds after ignition).										

MECHANICAL TRANSMISSION – CLUTCH SPEED SENSOR

After replacing the transmission's clutch speed sensor, it is necessary to start the vehicle so as to recover the fault light to the condition of being not illuminated due to being free from fault and delete all the memories of the computer.

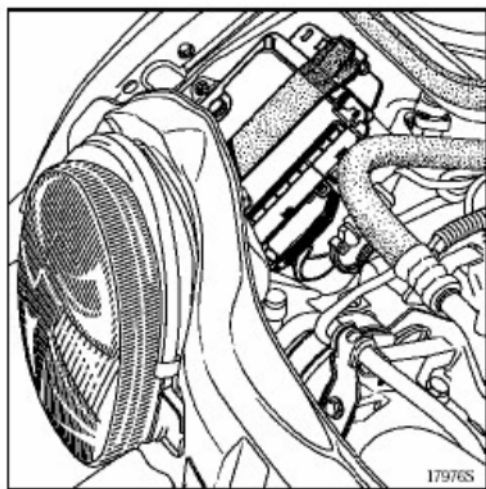
Only when the computer receives speed information from the clutch speed sensor, it will eliminate the fault(s).

MECHANICAL TRANSMISSION – COMPUTER

Position:

It is located on the front axle near the right front wheel within the engine compartment.

There are two connectors on it, i.e. 52-line connector and 28-line connector.



Removal and Installation:

Before maintaining the computer, you shall turn off the engine and cut off the battery.

Important tip:

After replacing it with a new computer, it is necessary to test it in advance.

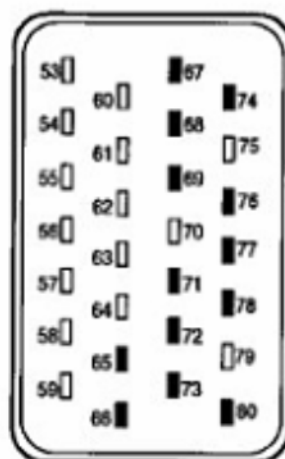
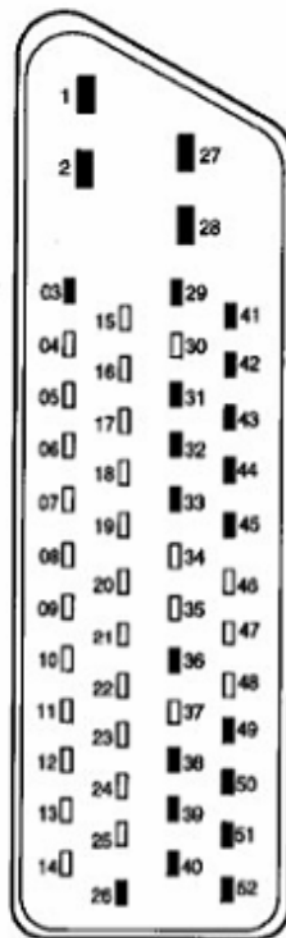
Line distribution:

52-line connector:

- 1 – power supply module 1
- 2 – power supply module 2
- 3 – gear position selection electromagnetic valve 4
- 26 <--- high drive ratio information
- 27 ---+ battery
- 28 ---+ after ignition
- 29 - ➡ gear position selection electromagnetic valve 4
- 31 - ➡ helix tube of power pump relay
- 32 - ➡ gear engagement electromagnetic valve control 1
- 33 - ➡➡ - acquire dialogue: CAN L connection
- 36 ➡ - vehicle speed signal
- 38 ➡ - junction box input speed sensor
- 39 ➡ - engagement position sensor signal
- 40 ➡ - pressure sensor signal
- 41 -- ➡ fault confirmation
- 42 -- ➡ helix tube of start-up device relay
- 43 -- ➡ clutch electromagnetic valve control
- 44 -- ➡ gear engagement electromagnetic valve control 2
- 45 -- ➡➡ - acquire dialogue: CAN H connection
- 49 - ➡➡ - dialogue line
- 50 ➡ - junction box input speed sensor
- 51 ➡ - gear position selection sensor signal
- 52 ➡ - engagement position sensor signal

28-line connector:

- 65 --- gearshift lever module
- 66 --- sensor module
- 67 ➡ - stable position information (spare)
- 68 ➡ - low drive ratio information
- 69 ➡ - footbrake connector
- 71 ➡ - handbrake connector
- 72 - ➡ instrument information
- 73 --- sensor information
- 74 ➡ - information about changing to the neutral position
- 76 ➡ - main information after start-up
- 77 ➡ - automatic ignition
- 78 ➡ - door connector
- 80 ➡ - horn control



SI2001

➡ Input ➡➡ Output

MECHANICAL TRANSMISSION – RELAY

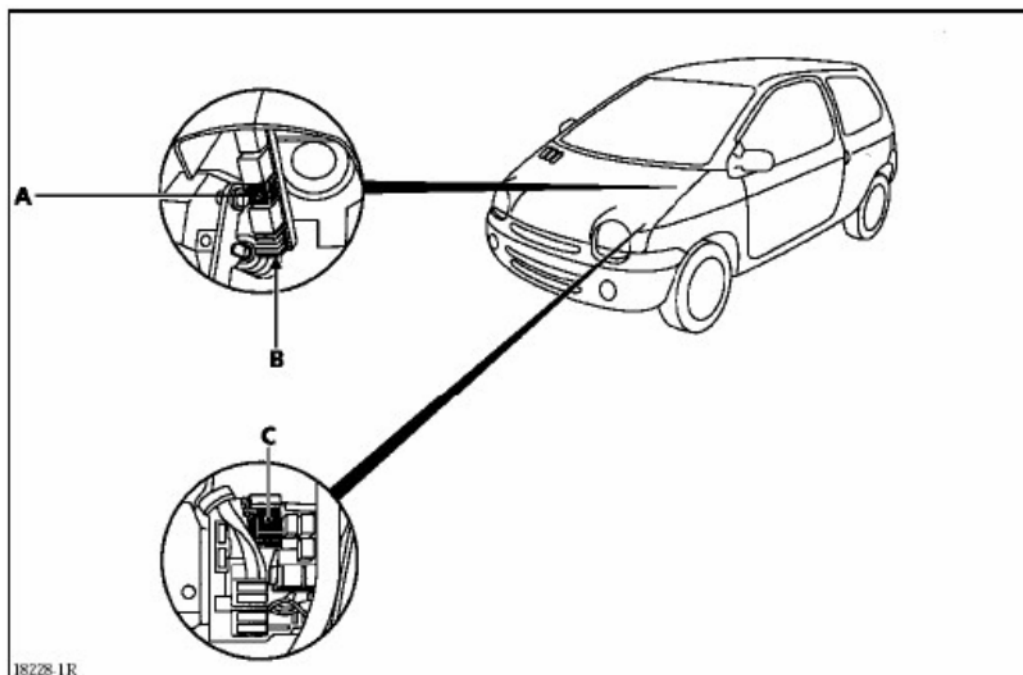
Position:

There are two relays that can be activated by the system:

- Start-up relay (A) near the buzzer under the instrument board (B).
- Pump relay (C) on the interconnection box within the engine compartment.

Removal and Installation

Before maintaining the system, you shall turn off the engine and cut off the battery.



MECHANICAL TRANSMISSION – FUSE

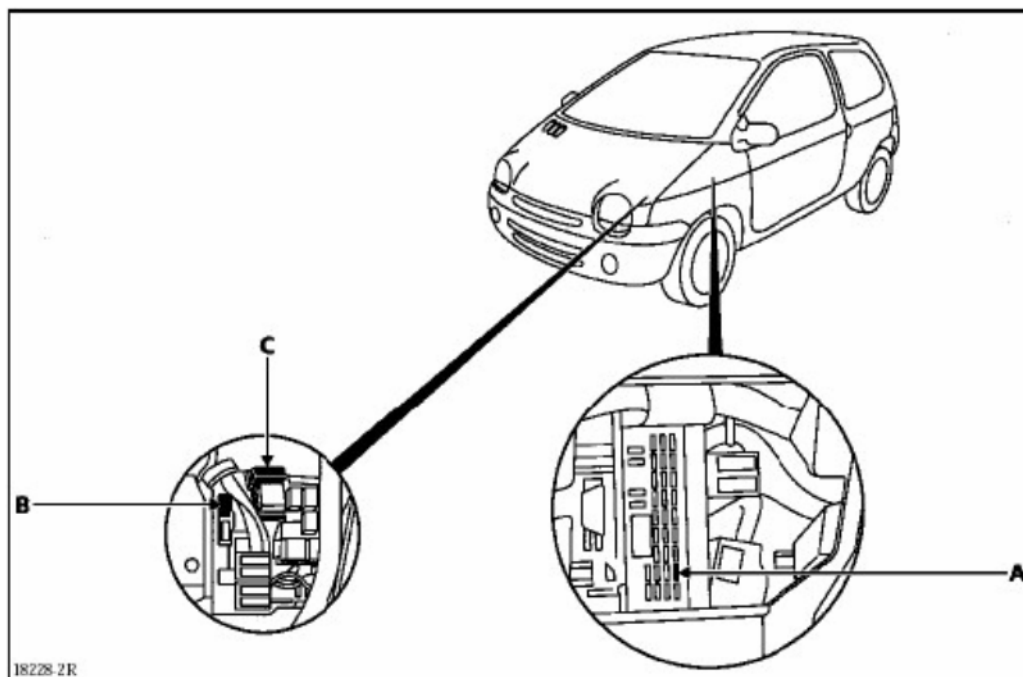
Position:

The system employs three fuses for power supply:

- 3A fuse (A) on the ignition switch's positive pole (+), located on the fuse side panel of driver compartment, connected to the main shaft 28 of the transmission computer connector.
- 20A fuse (B) on the battery's positive pole (+) within the interconnection box in the engine compartment, connected to the main shaft 27 of the transmission computer connector.
- 30A fuse (C) on the battery's positive pole (+) within the interconnection box in the engine compartment, used to supply the electric pump set with power.

Removal and Installation:

Before maintaining the system, you shall turn off the engine and cut off the battery.



MECHANICAL TRANSMISSION – WIRE HARNESS

The wire harness is integrated with the hydraulic unit and bundles eleven connectors for different components.

Five main electromagnetic valves are placed together on one sleeve and the plate is fixed onto the hydraulic block.

The electric pump is mounted onto the clutch cylinder body.

Connection with the vehicle wire harness is implemented through the 24-line SICMA connector on the system.

Line distribution of the connector:

A8 - ➡ control + electric pump set

B2 ➡ control + clutch electromagnetic valve

B3 ➡ control + gear engagement electromagnetic valve 2

B4 ➡ control + gear position selection electromagnetic valve 3

B5 ➡ control + gear engagement electromagnetic valve 1

B6 ➡ control + gear position selection electromagnetic valve 4

Sensor:

– For power on

C1 --- – For clutch

– For pressure

C2 ➡ gear engagement sensor signal

C3 ➡ gear position selection sensor signal

C4 ➡ clutch sensor signal

C5 ➡ pressure sensor signal

C6 --- blocky – transmission input speed sensor

C7 ➡ signal + transmission input speed sensor

Control + sensor:

- For power on

C8 - ➡ gear position selection

– For clutch

– For pressure

➡ - Input

- ➡ Output

	1	2	3	4	5	6	7	8
A								5AE X
B		5FG X	5FF X	5FC X	5FE X	5FD X		
C	57AD X	5FA X	5FB X	5AN X	5AD X	5OB X	5OA X	57AF X

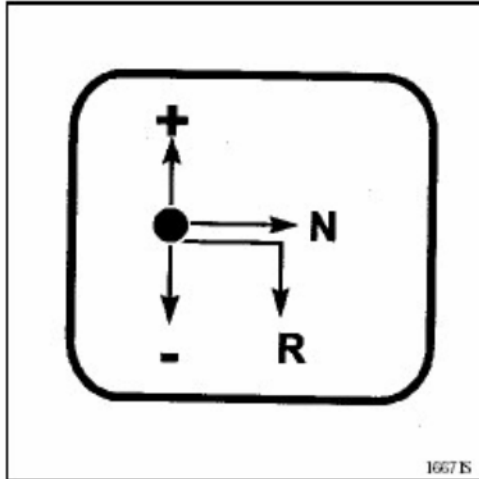
SE2040

MECHANICAL TRANSMISSION – GEARSHIFT LEVER

Method of application:

For control lever type gearshift, there is only one stable position.

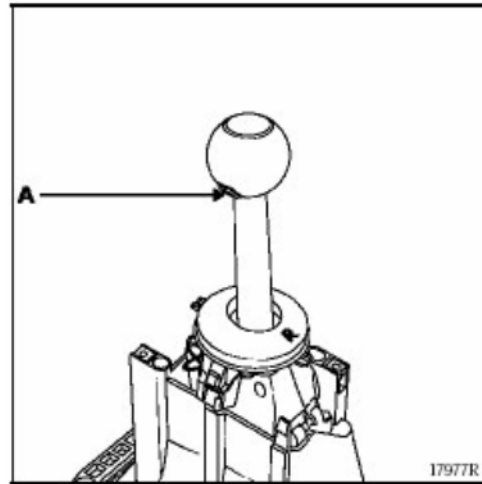
Any operation of the gearshift lever from this position will produce a pulse, which is also called “signal”.



- Forwards (+): to high drive ratio
- Backwards (-): to low drive ratio
- Rightwards (N): to the neutral position
- Rightwards and backwards ® : to the reverse gear

The button “A” is used to activate or inactivate the automatic mode depending on what the driver needs.

The display in the center of the instrument board indicates the actual drive ratio in use. The letter ® on the base frame of the gearshift lever is used to indicate that changing to this position will change to the reverse gear.



Operation:

Its control of the automated mechanical transmission is an electric control.

Gearshift lever position is converted into electric signal through the connector located at the bottom of the control module and then sent to the transmission computer.

Removal:

Disconnect the battery.

Remove:

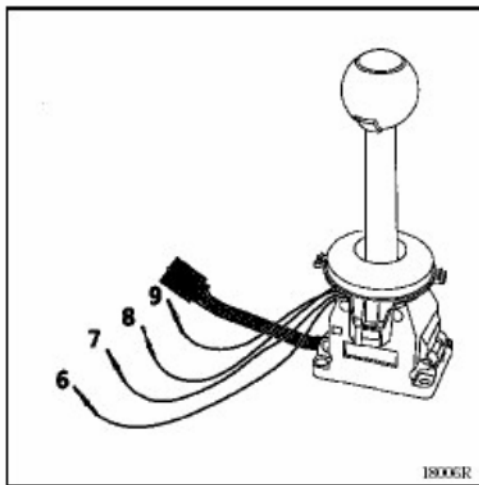
- Gearshift lever base frame dust boot
- Transmission base

Disconnect electric connection of the gearshift lever.

Take out the following two electric wires of the gearshift lever's electric connector:

Line 8 – power wire for the automatic operation button

Line 9 – power wire for the serial operation button



On the main shaft of the connector, line distribution (10 lines) is as follows:

Line 1: control lever mechanism

Line 2: information of changing to high drive ratio

Line 3: information of changing to low drive ratio

Line 4: stable position information (spare)

Line 5: information of changing to the neutral position

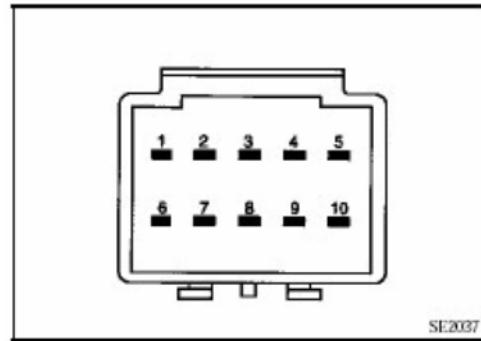
Line 6: whole module

Line 7: information of changing to the reverse gear

Line 8: whole module

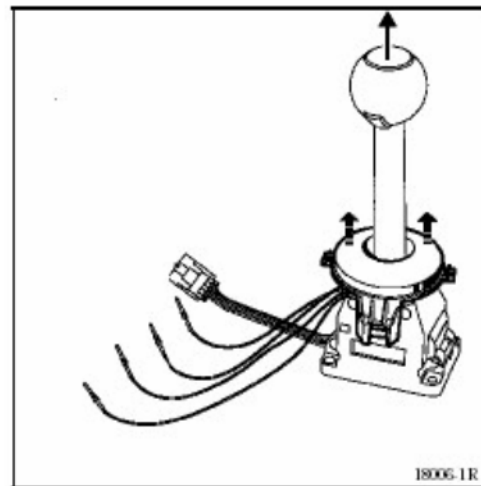
Line 9: information of changing to the automatic mode

Line 10: no connection



Undo the circlip that surrounds the gearshift lever base washer.

Remove the ball ring on the top of the gearshift lever by applying an upward force on it, as shown in the arrow.



Remove the four fixing bolts for gearshift lever base from its mounting base.

Replace any worn parts.

Reassembly:

It is easy to carry out the reassembly procedure, which is opposite to the disassembly procedure.

MECHANICAL TRANSMISSION – SPECIAL REQUIREMENTS ON REPLACEMENT OF SYSTEM AND COMPONENTS

KIT hydraulic unit/computer/transmission/reprogramming

(A) Ignition

Re-initialization after all experiments (attempts) are carried out: **RZ002 “attempt”**

(B) Title: control of **VP008 “Gear position selection & gear engagement attempt”**

Wait until the program comes to an end

Turn off the engine

Wait for one minute

Ignite the engine (if any fault occurs, the buzzer will be started)

If the check result is **OK**, **ET061 “Region Qualified”** will be shown. If the **“Region finished”** or **ET063 “Electromagnetic valve is null”** is shown, repeat the procedure (B).

(C) Apply all drive ratios (the information shown on the display on the instrument board should be **OK**)

(D) Place the gearshift lever to the neutral position

Start the engine

Wait for ten seconds (used in important clutch experiments) and provide no speed.

If the check result is **OK**, **ET062 “Important experiments finished”** will be shown. Otherwise, repeat the procedure (D).

(E) When the "clutch temperature" information **PR095** is less than **1800C**, repeat the engine start-up process with halfload five to six times (used in step-by-step attempt for clutch)

Turn off the engine

Wait for one minute

Ignite the engine

If the check result is **OK**, **ET065 “Step-by-step attempt finished”** will be shown. Check whether the “Step-by-step” information is changing, and if not so, repeat the procedure (E).

(F) Title: control of **CF321 “Transmission model” selection: short-size or long-size**

Check that the **“Transmission model”** information shown is really that model that the operator selected.

(G) Turn off the engine

Engagement position sensor/gear position selection sensor

(A) Ignition

Ensure no fault

(B) Title: Control of **VP008 “Gear position selection & gear engagement attempt”**

Wait until the program comes to an end

Wait for one minute

Ignition (if any fault occurs, the buzzer will be started)

If the check result is **OK**, **ET061 “Region Qualified”** will be shown. If the **“Region finished”** or **ET063 “Electromagnetic valve is null”** is shown, repeat the procedure (B).

Apply all drive ratios (the information shown on the display on the instrument board should be **OK**)

(C) Turn off the engine

Clutch position sensor/clutch

(A) Ignition

Ensure no fault

- (B) Title: control of **RZ003 “Important Attempts”**
- (C) Place the gearshift lever to the neutral position
Start the engine
Wait for ten seconds (used in important clutch experiments) and provide no speed.
If the check result is OK, ET062 “Important experiments finished” will be shown. Otherwise, repeat the procedure (C).
- (D) When the “clutch temperature” information **PR095** is less than **1800C**, repeat the engine start-up process with halfload five to six times (used in step-by-step attempt for clutch).
Turn off the engine
Wait for one minute
Ignition
If the check result is **OK**, **ET065 “Step-by-step attempt finished”** will be shown. Check whether the “Step-by-step” information is changing, and if not so, repeat the procedure (D).
- (E) Turn off the engine

Pressure sensor

- (A) Ignition
Ensure no fault
- (B) Title: control of **AC011 “Hydraulic unit overflow port”**
Wait until the program comes to an end
Turn off the engine

Gear position selection electromagnetic valve/gear engagement electromagnetic valve

- (A) Ignition
Ensure no fault
- (B) Title: control of **AC001 “Hydraulic unit overflow port screw plug”**
Wait until the program comes to an end
Turn off the engine
- (C) Apply all drive ratios (the information shown on the display on the instrument board should be **OK**)
- (D) Turn off the engine

Clutch electromagnetic valve

- (A) Ignition
Ensure no fault
- (B) Open the hydraulic unit overflow port screw plug
- (C) Title: control of **AC009 “The second-stage clutch pipeline overflow port”**
Wait until the program comes to an end (eight minutes)
- (D) Title: control of **AC011 “Hydraulic unit overflow port screw plug”**
Wait until the program comes to an end
Turn off the engine

Gear position selection/gear engagement/oil tank/energy storage/single pump

- (A) Ignition
Ensure no fault

- (B) Title: control of AC011 “Hydraulic unit overflow port screw plug”
Wait until the program comes to an end
Turn off the engine
Wait for one minute
Ignition (if any fault occurs, the buzzer will be started)
If the check result is OK, ET061 “Region Qualified” will be shown. If the “Region finished” or ET063 “Electromagnetic valve is null” is shown, repeat the procedure (B).
- (D) Apply all drive ratios (the information shown on the display on the instrument board should be OK)
- (E) Turn off the engine

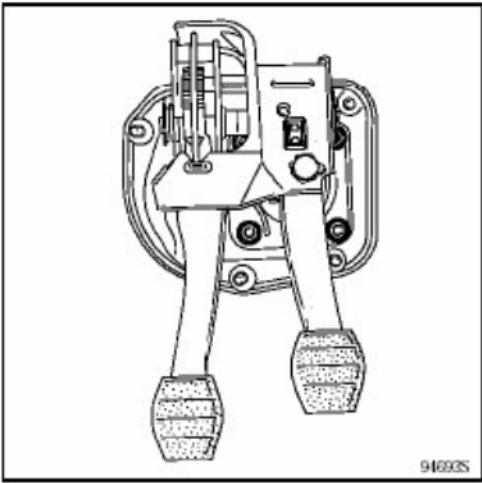
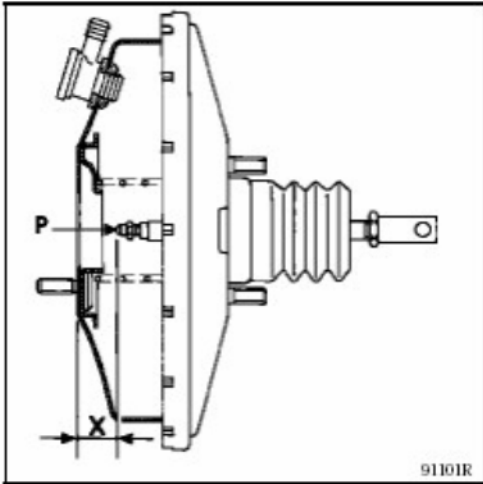
Clutch cylinder/liquid leakage during replacement of clutch sensor

- (A) Ignition
Ensure no fault
- (B) Open the hydraulic unit overflow port screw plug
Title: control of AC008 “The first-stage clutch pipeline overflow port”
When there is any liquid flowing out without air bubble, close the overflow screw plug
Wait until the program comes to an end (six minutes)
- (C) Title: control of AC009 “The second-stage clutch pipeline overflow port”
Wait until the program comes to an end (eight minutes)
- (D) Title: control of RZ003 “Important Attempts”
- (E) Place the gearshift lever to the neutral position
Start the engine
Wait for ten seconds (used in important clutch experiments) and provide no speed.
If the check result is OK, ET062 “Important experiments finished” will be shown. Otherwise, repeat the procedure (E)
- (F) Turn off the engine

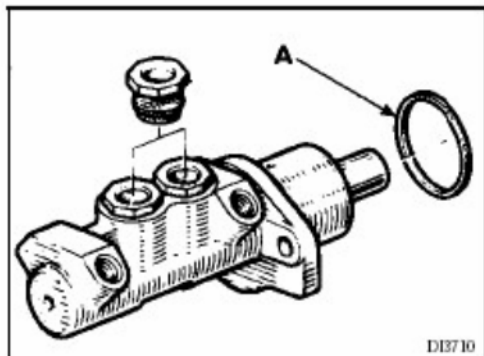
High-pressure pipeline

- (A) Ignition
Ensure no fault
- (B) Open the hydraulic unit overflow port screw plug
Title: control of AC008 “The first-stage clutch pipeline overflow port”
When there is any liquid flowing out without air bubble, close the overflow screw plug
Wait until the program comes to an end (six minutes)
- (C) Title: control of AC009 “The second-stage clutch pipeline overflow port”
Wait until the program comes to an end (eight minutes)
Turn off the engine

CONTROL OF MACHINE PARTS – MAIN CYLINDER

Tightening torque (unit: DAN.M) 	
M10×100 Main cylinder bolt Servo brake bolt	Reassembly: Check on the length of the pushrod. Size: X = 22.3MM
Removal: Disconnect the battery. Remove: – Battery mounting support – Battery – Plastic computer protection cover Disconnect and remove the computer Use the injector to evacuate the brake oil tank. Remove the oil tank and be careful to prevent the brake fluid from flowing out. Therefore, it is necessary that a rag is available in advance. Remove: – Two brake oil pipes and make corresponding marks – Main cylinder fasteners Loosen the four fixing fasteners for servo brake in the driver compartment.  Rotate the servo brake downwards so as to take out the main cylinder.	It can be adjusted by using the measuring rod (P) according to its particular model. 

Remarks: the vehicle is equipped with the master cylinder that is integrated with the servo brake. The servo brake sealing is directly associated with the master cylinder. It is necessary to substitute a new washer (A) when in repair. The master cylinder shall be placed in parallel to the servo brake, so that the pushrod (P) can accurately and directly move into the master cylinder body.



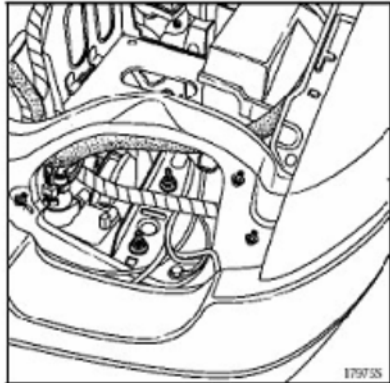
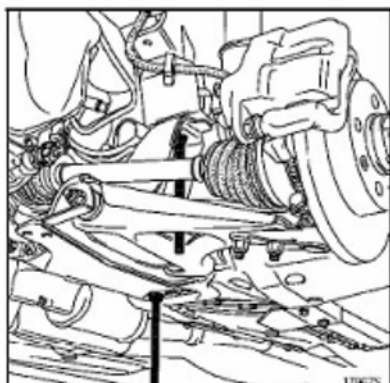
Reconnect:

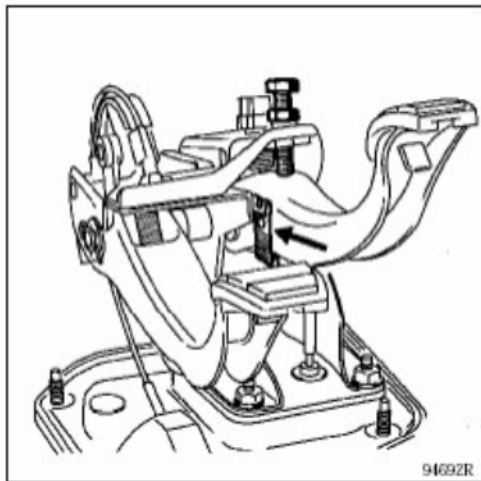
- The pipes **near the marks made when they were previously removed.**
- The compensation tank by pressing to make it well stuck in the master cylinder.

Clean the brake line.

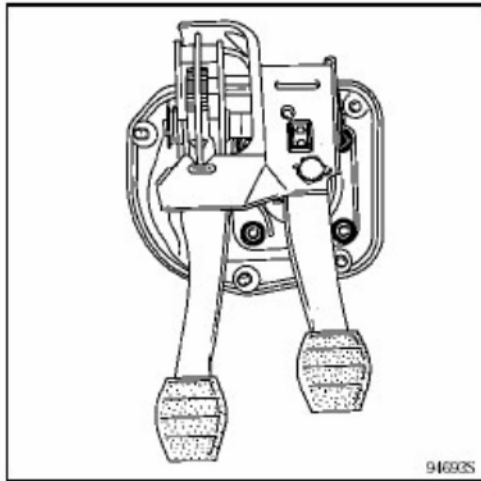
CONTROL OF MACHINE PARTS – SERVO BRAKE

Indispensable special tools	
ELE 1294-01	Glass cleaning tool
MOT. 1453	Engine bracket
2* TAV. 1233-01	Seat frame tool

Tightening torque (unit: DAN.M) 	
M10×100	1.3
Main cylinder bolt	1.5
Servo brake bolt	2
Housing bracket bolt	4.5
Seat frame bolt	6.5
Nut for upper glass cleaning	1.6
Nut for lower glass cleaning	1.2
Servo brake cannot be repaired and you can only maintain the following parts: ■ Air filter ■ Check valve Disconnect the battery. Reassembly: Remove the main cylinder. See the disassembly procedure described on the previous page. Use the tool ELE. 1294-01 to remove two fixing bolts for glass cleaning. Disassembly: ■ Air inlet DURIT ■ Three fixing bolts for glass cleaning engine ■ Glass cleaning engine ■ Check valve on the servo brake ■ Left front mirror Keep the MOT.1453 bracket bolts in place. Disassembly the housing bracket bolts.	
 Put the two AV. 1233-01 tools that have the same diameter of 8MM. 	
Disassembly: – Remove the clip and then the bracket shaft connecting footbrake and pushrod.	Gradually lower the mechanical power set and its seat frame so as for the servo brake to be taken off. Assembly: Carry out the reassembly procedure, which is opposite to the removal procedure. Before reassembly, you shall check: Size, L = 94.5MM



- Servo brake fixing bolts

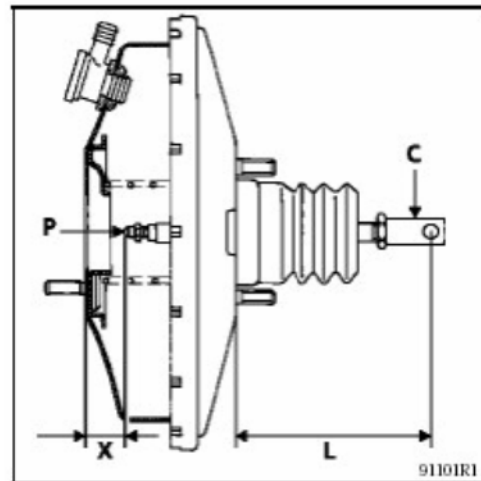


- Steering cover nut
- Two bolts for connecting rod used to gain force moment

It can be adjusted by using the measuring rod © according to its particular model.

Size: $X = 22.3\text{mm}$

It can be adjusted by using the measuring rod (P) according to its particular model.



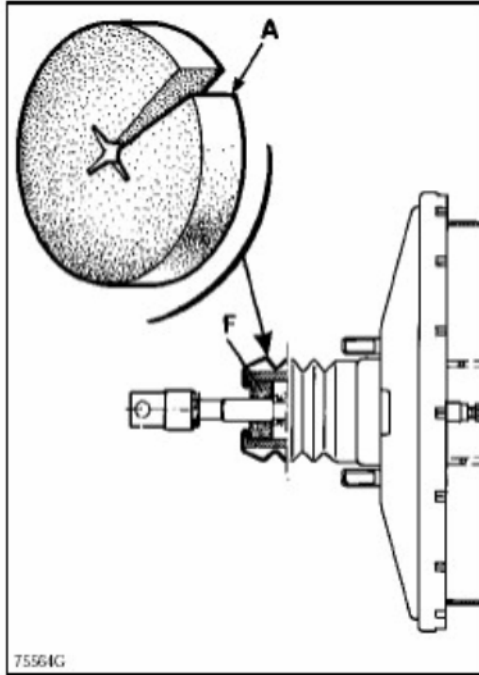
Put the master cylinder in place (refer to the relevant chapter).

Clean the brake line.

CONTROL OF MACHINE PARTS
– AIR FILTER & SERVO BRAKE CHECK VALVE



Change of air filter



When replacing the air filter element, it is unnecessary to remove the servo brake.

Take out the worn filter element (F) from below the pedal support by using a screwdriver or metal hook. Cut the new filter element into the shape “A” (see the figure), mount it around the pushrod, and sent it into the chamber slowly. Make sure that it shall fully stretch in the boring hole to prevent the unfiltered air from going through.

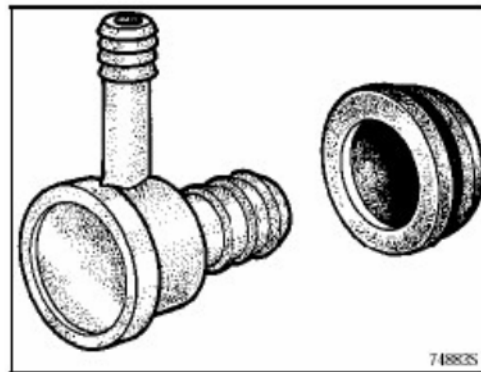
Replace the check valve

This operation can be carried out in the vehicle.

Disassembly:

Disconnect the servo relief inlet pipe.

Move the rubber seal ring by rotating the check valve and take it out.



Reassembly:

Check the seal washer and check valve.

Replace any faulty parts.

Place back the assembly.