Vehicle type	Engine	Capacity (cm3)	Bore (mm)	Stroke (mm)	Compression ratio
L 481	F2 N 712 F2 N 716	1721	81	83.5	9.25
L 482	F2 N 710	1721	81	83.5	10.0
L 483	J7 R 750	1995	88	82	9.8

Engine workshop manuals to be consulted, depending on the type of engine to be repaired.

Workshop manual \ Engine	F2 N	J7 R
Mot F (E)	X	
Mot J (E)		X

We shall be describing, in the engine section of this workshop manual :

The operations involved in removing-refitting

The power unit assembly, to be carried out either on a 2 column lift after taking note of the precautions described in the ▽ General section,
- the engine and gearbox,
- the engine alone.

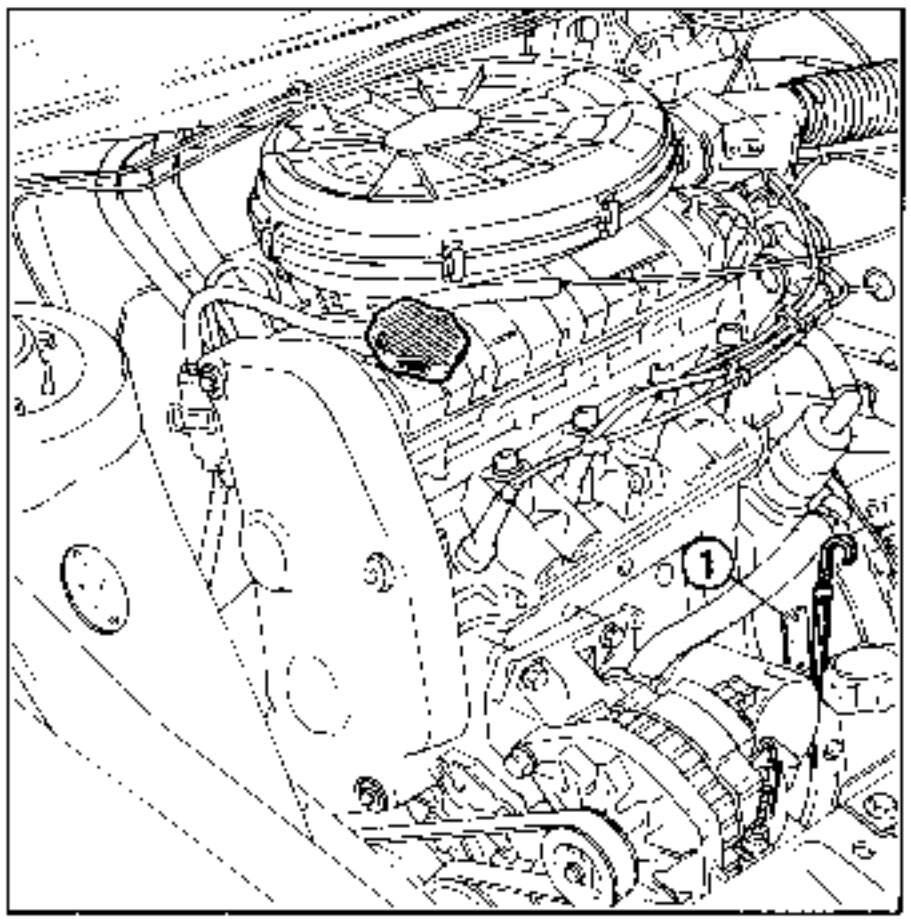
- Special features involved in working on the following systems :

- the cooling system,
- the drive belts,
- the exhaust system,
- the carburation/injection systems.

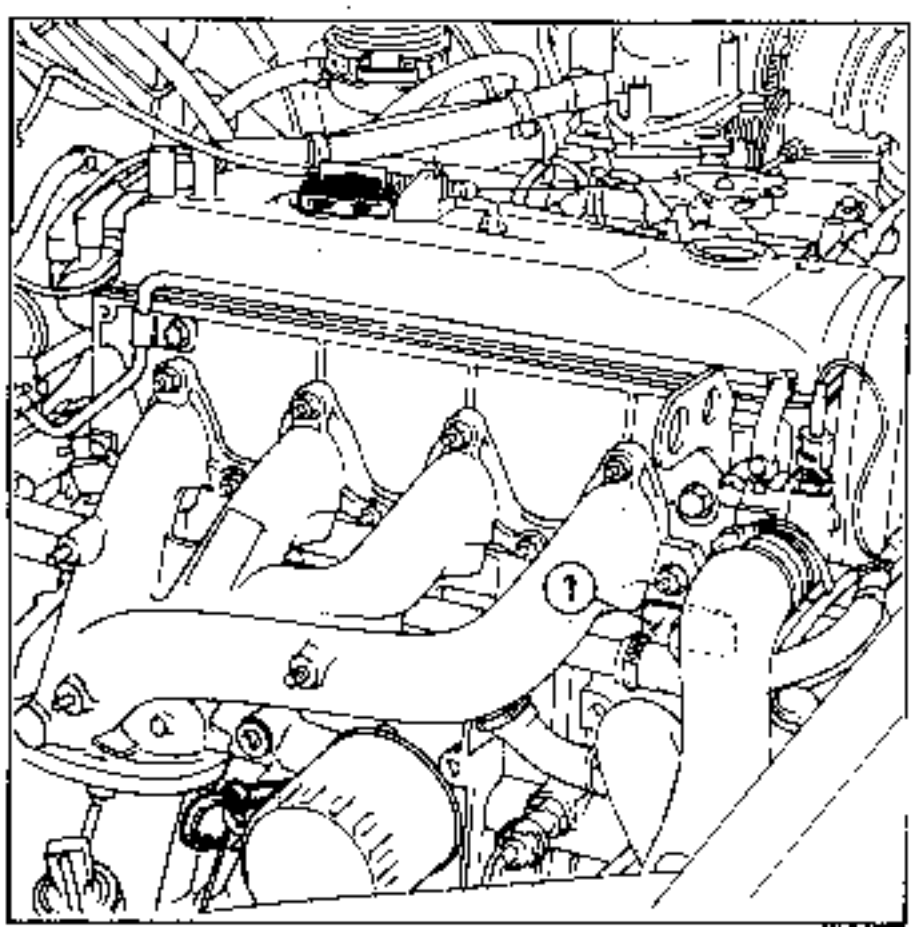
Although they can be carried out with the engine still in the vehicle, other operations such as "Replacing the cylinder head" - "Replacing the pistons and liners or pistons" are not described in this vehicle Workshop Manual, they being the same as the methods already described in the engine Workshop Manual.

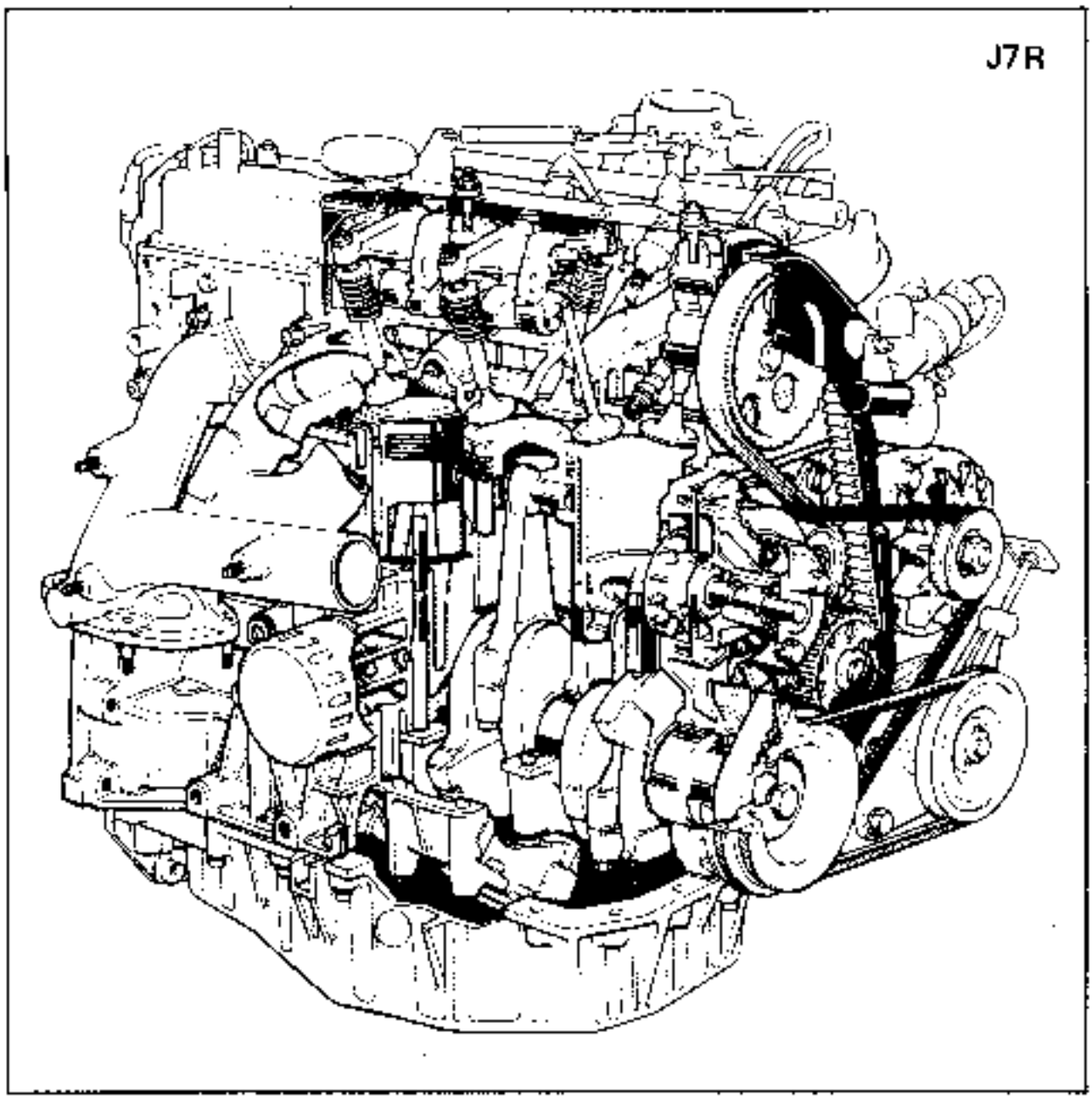
Positions of identification plates (1)

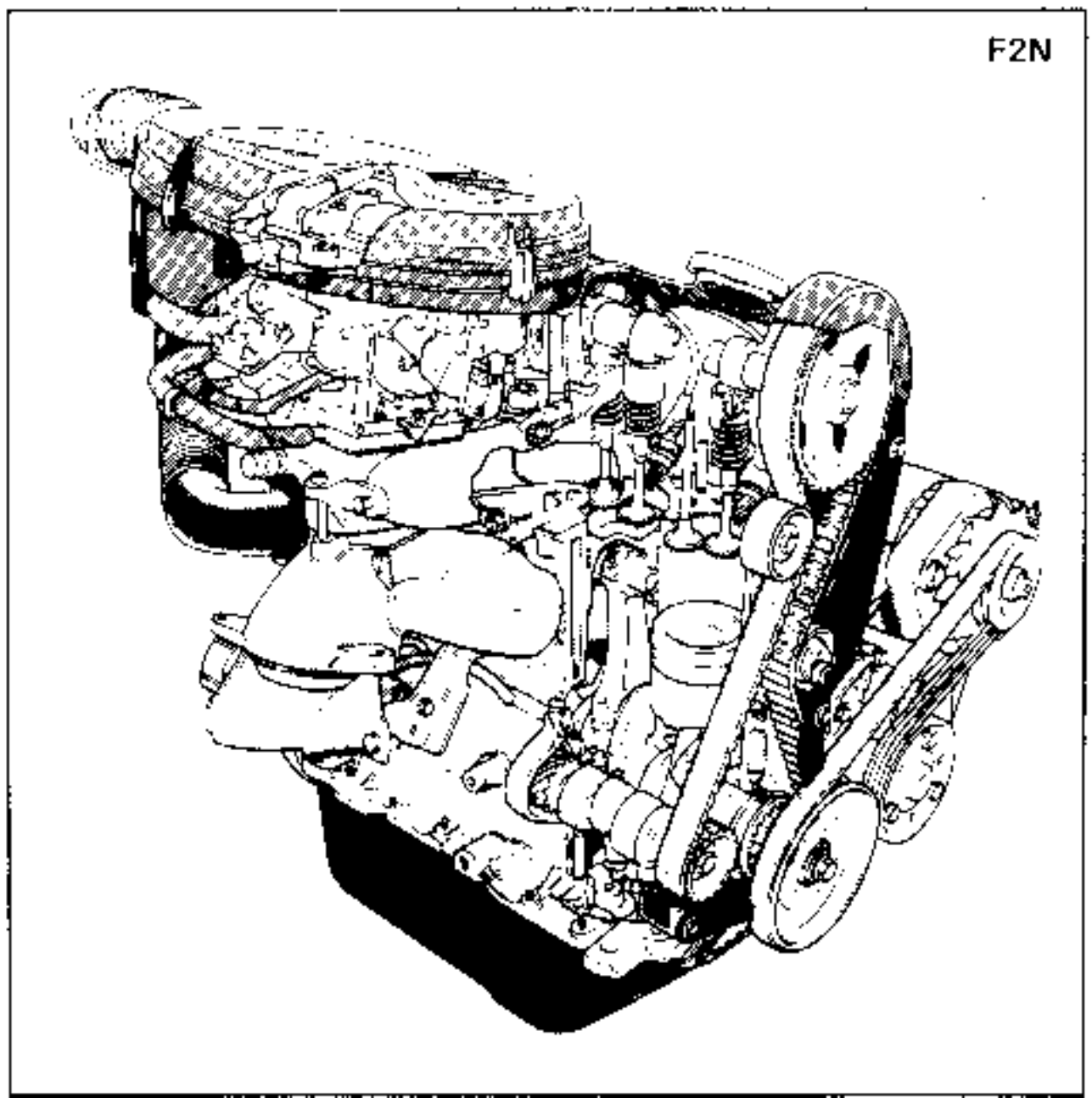
F2N



J7R




J7R


F2N

Type	Quantity	Units concerned
MOBIL No. 20 grease X57030	Coat	- Driveshaft splines at the gearbox end. - Clutch shaft splines.
CAF 4/60 THIXO	Coat	Driveshaft pin holes.
Loctite FRENBLOC (Locking and sealing resin).	Coat	Brake caliper bolts.
Loctite FRENETANCH (Locking and sealing resin)	Coat	Crankshaft pulley securing bolts.
ELF Multi	Coat	Wheel bolts.
MOLYKOTE CU. 7439	Coat	Wheel locating shoulders only.
FIREGUM	Coat	Sealing exhaust system.

Before all else read the safety instructions on pages 7 and 8 of chapter 1 "General" (section A).

ESSENTIAL SPECIAL TOOLS
Mot.1040 Dummy sub-frame for Removing and Refitting the power unit assembly

TIGHTENING TORQUES (in daN.m)	
Sub-frame securing bolts	8,5
Shock absorber upper cup securing bolts	2,5
Brake caliper bolts	10
Steering column universal joint bolts	2,5
Wheel bolts	9

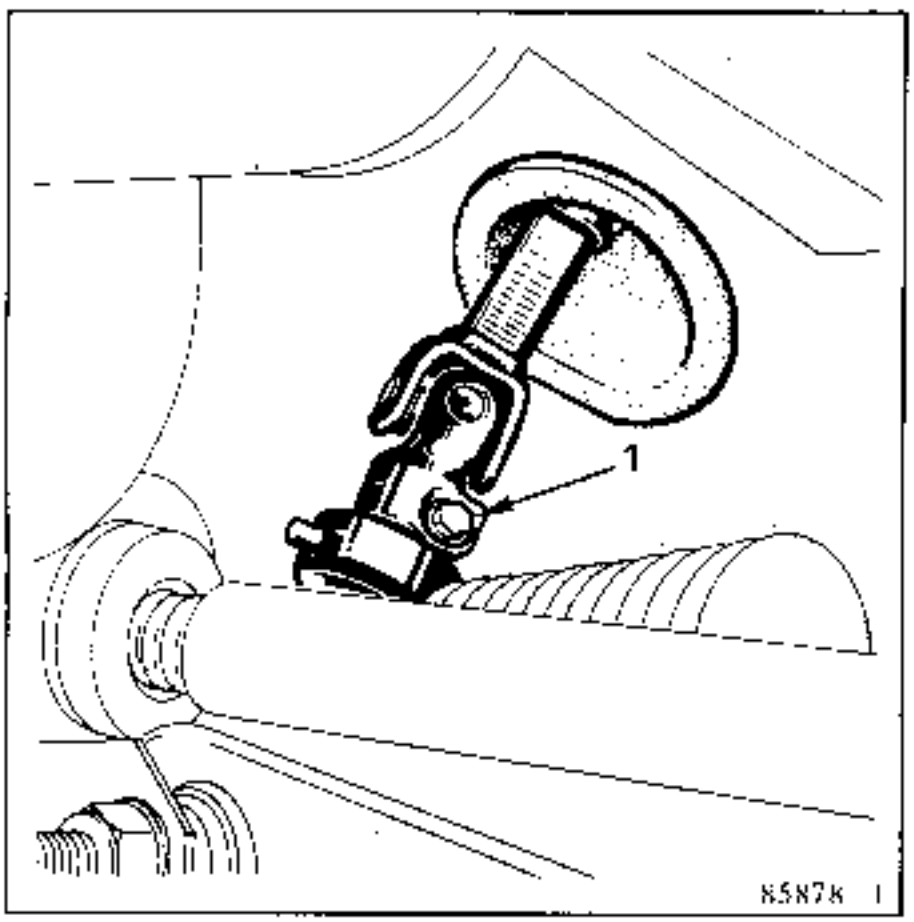
REMOVING

Disconnect the battery.

Remove the air filter.

Disconnect :

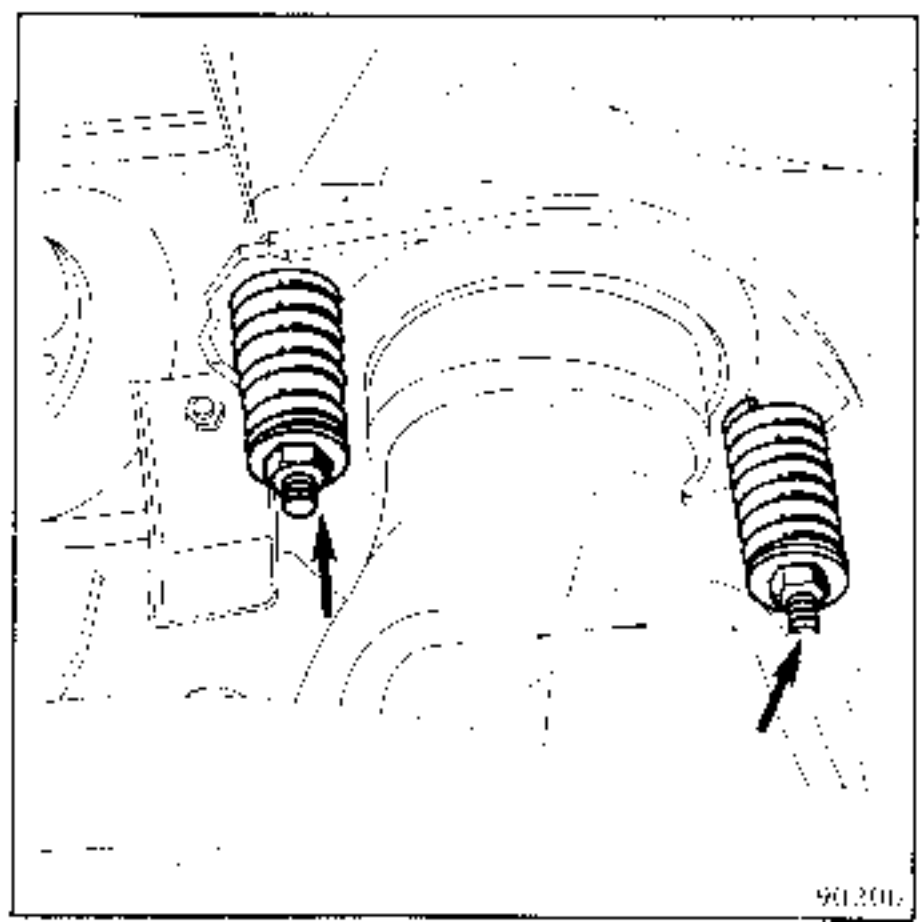
The choke cable.
The accelerator cable.
The speedometer drive cable.
The pipes.
The electrical wiring.
The gear shift control.
Bolt (1) on the steering column universal joint, after marking its position on the steering box.



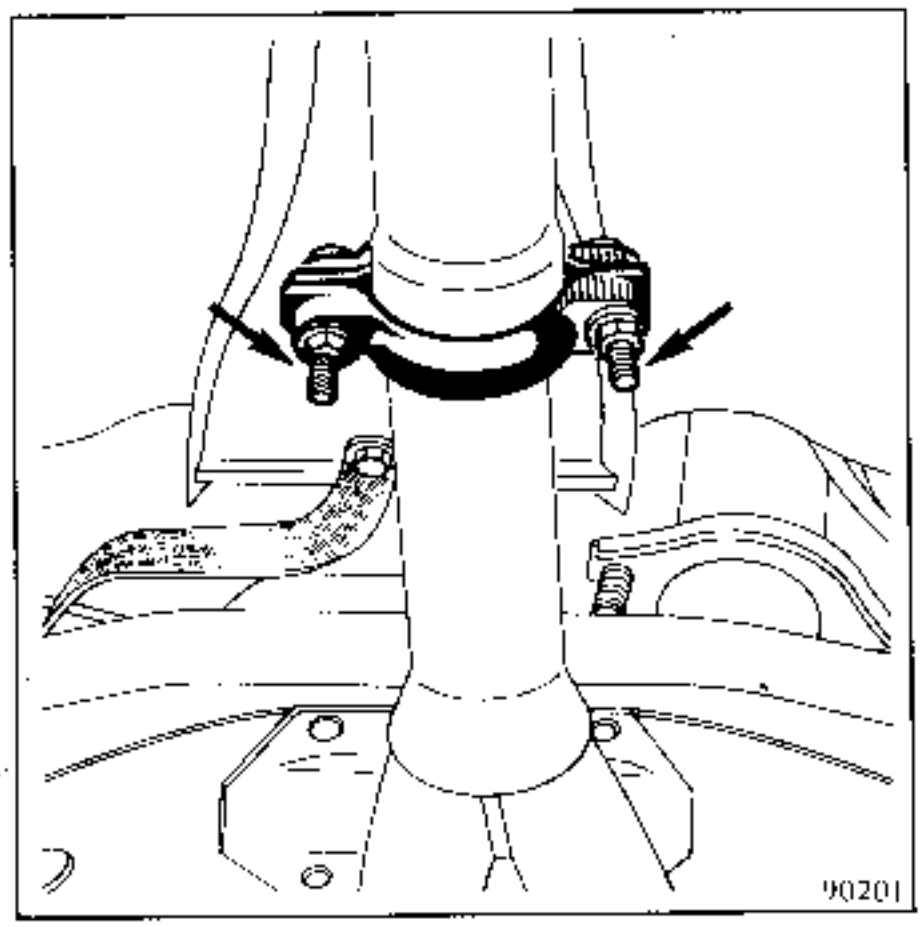
Remove :

The three bolts securing the pump support (on vehicles with power steering).

The exhaust pipe flange at the manifold.

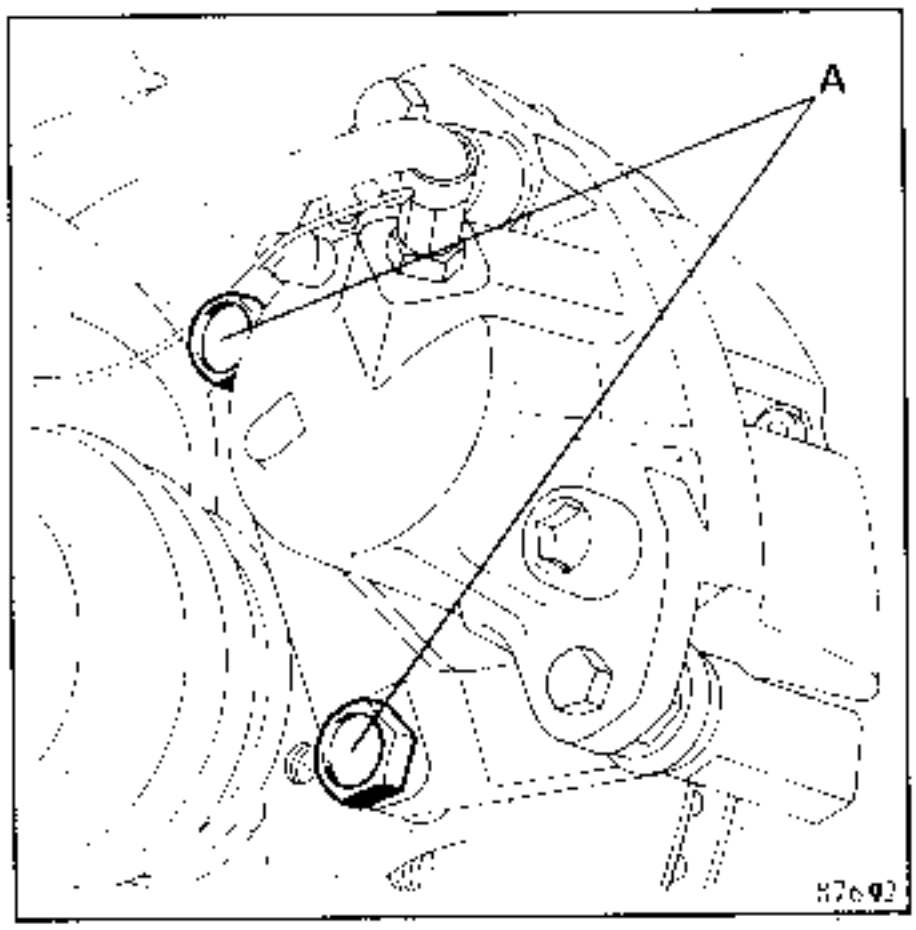


The exhaust down-pipe under the vehicle.

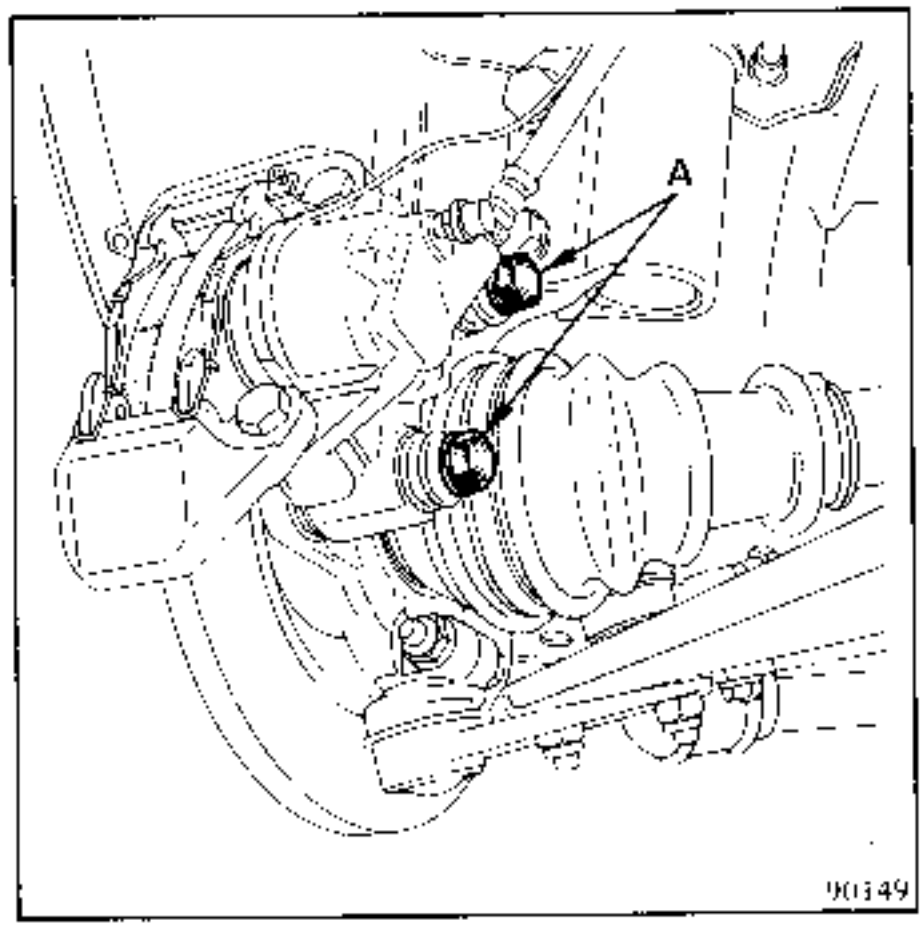


.The brake calipers (bolts A). Attach the calipers to the body.

GIRLING



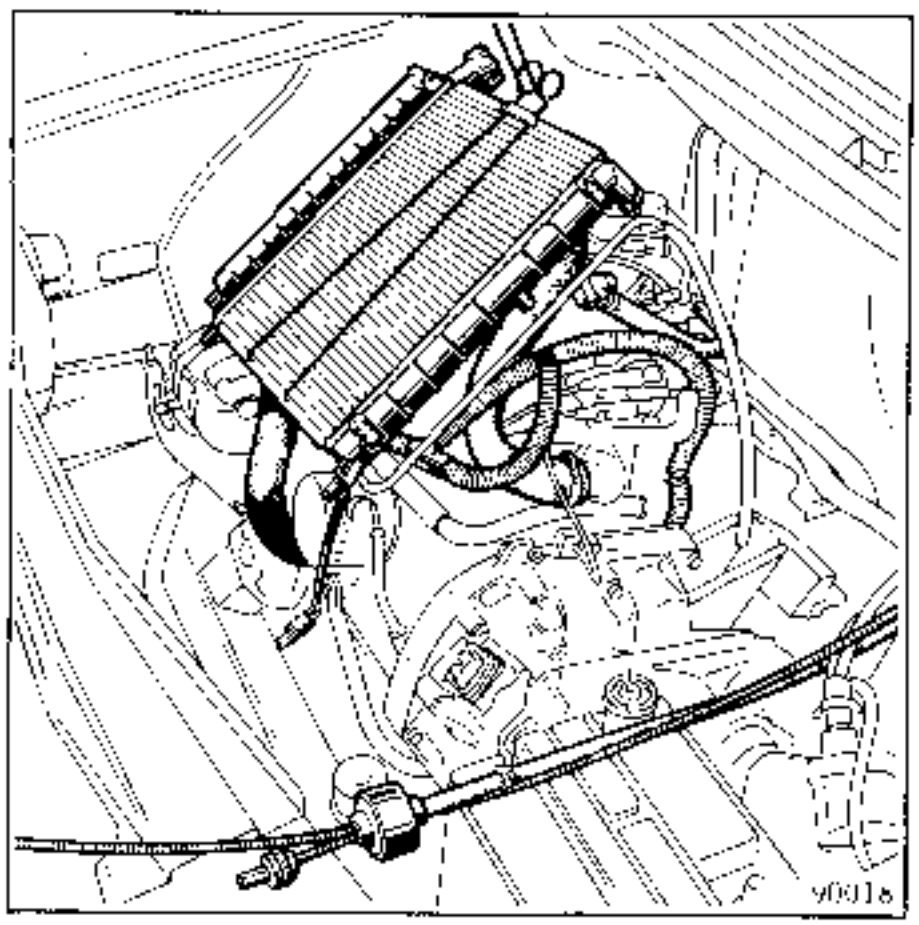
BENDIX series IV.



Disconnect :

The radiator temperature sensor.
The fan unit.

Unclip the radiator and secure it to the engine.



Fit the two clamps Mot.453-01 to the heater pipes then disconnect the pipes at the heater input and output points.

This operation involves modifying tool Mot.1040 as follows :

Drill 2 holes 11 mm Ø at a between centres dimension of 670 mm and make up 2 stud blocks (see drawings below).

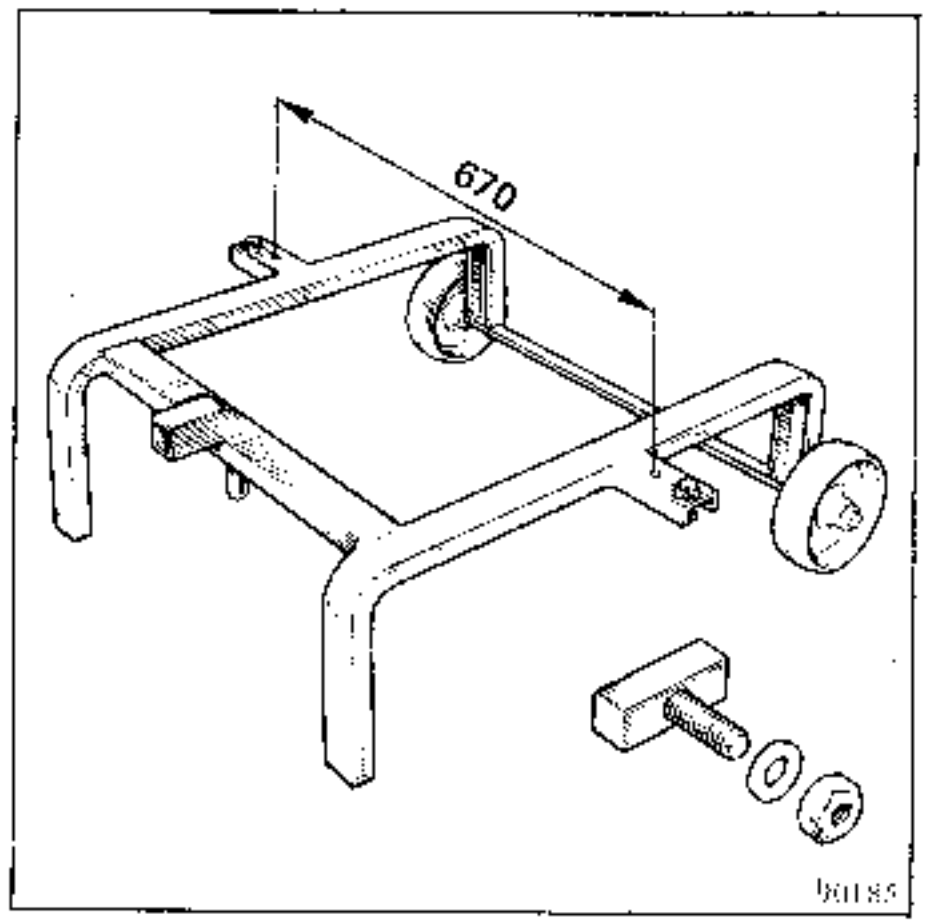
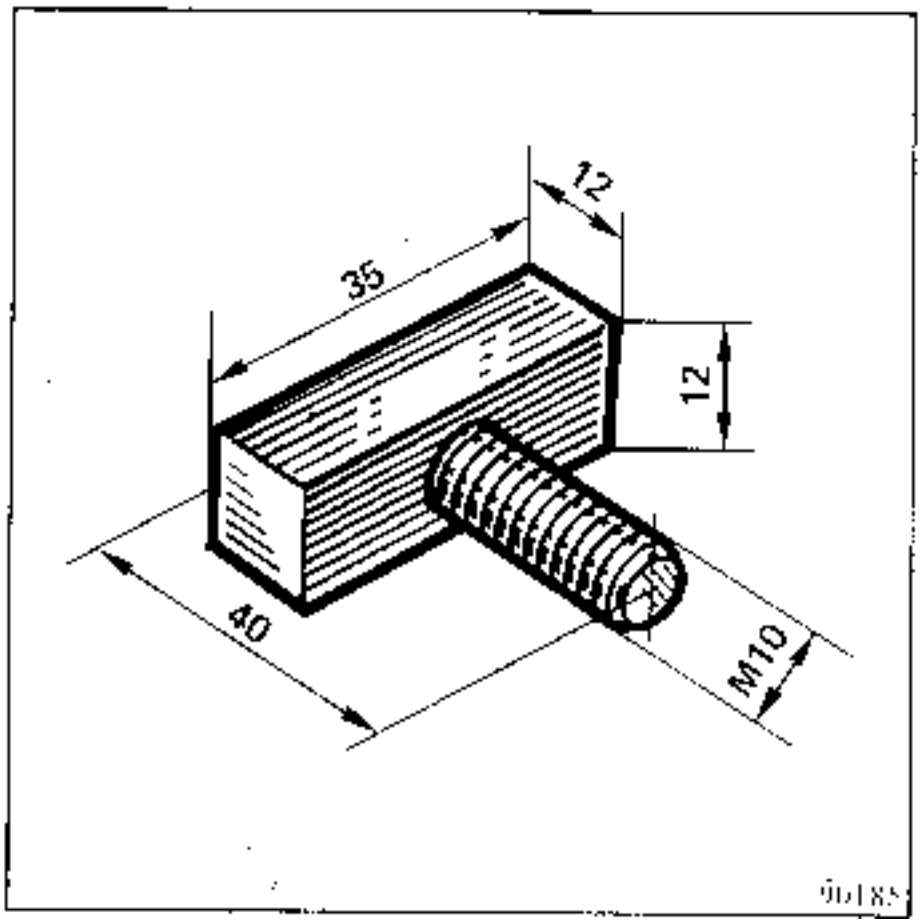
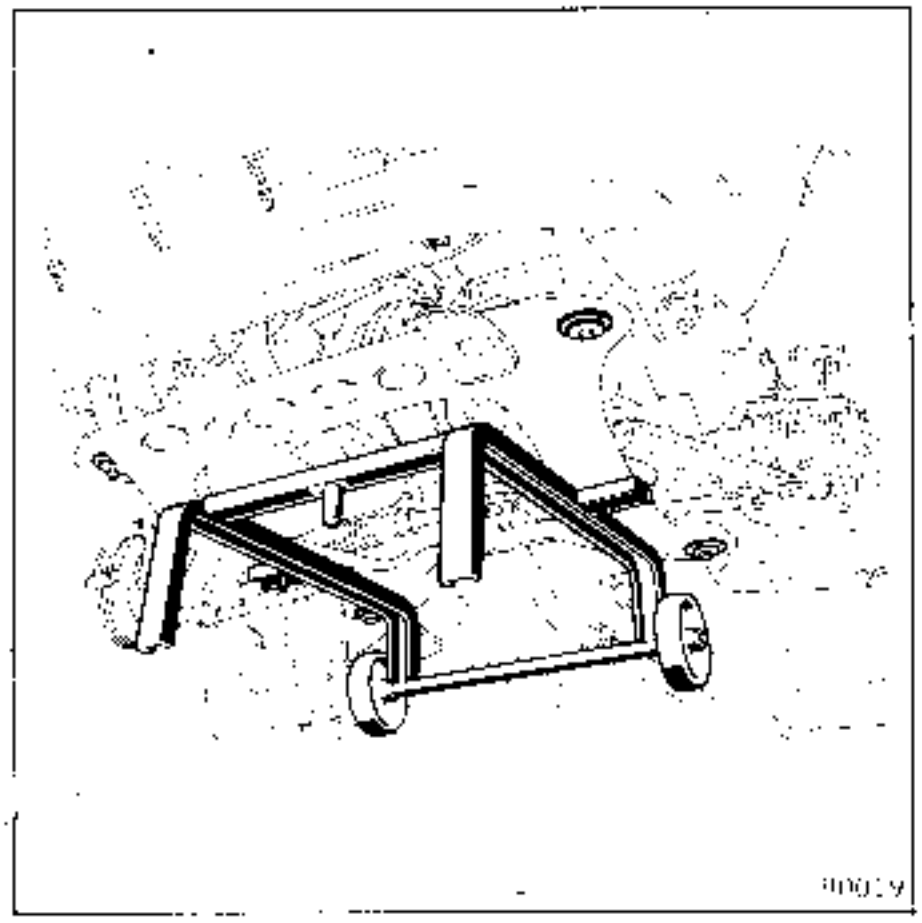


DIAGRAM OF TOOL TO BE MADE LOCALLY
(Dimensions in mm).



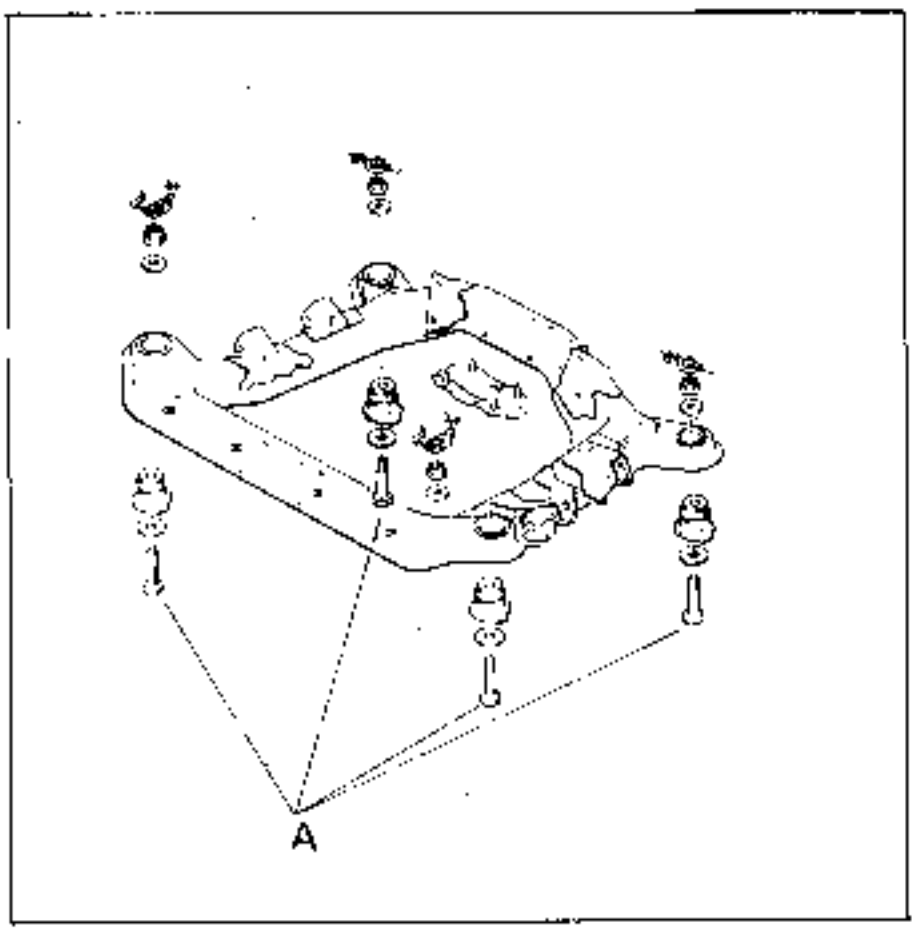
'it the studs to the sub-frame.



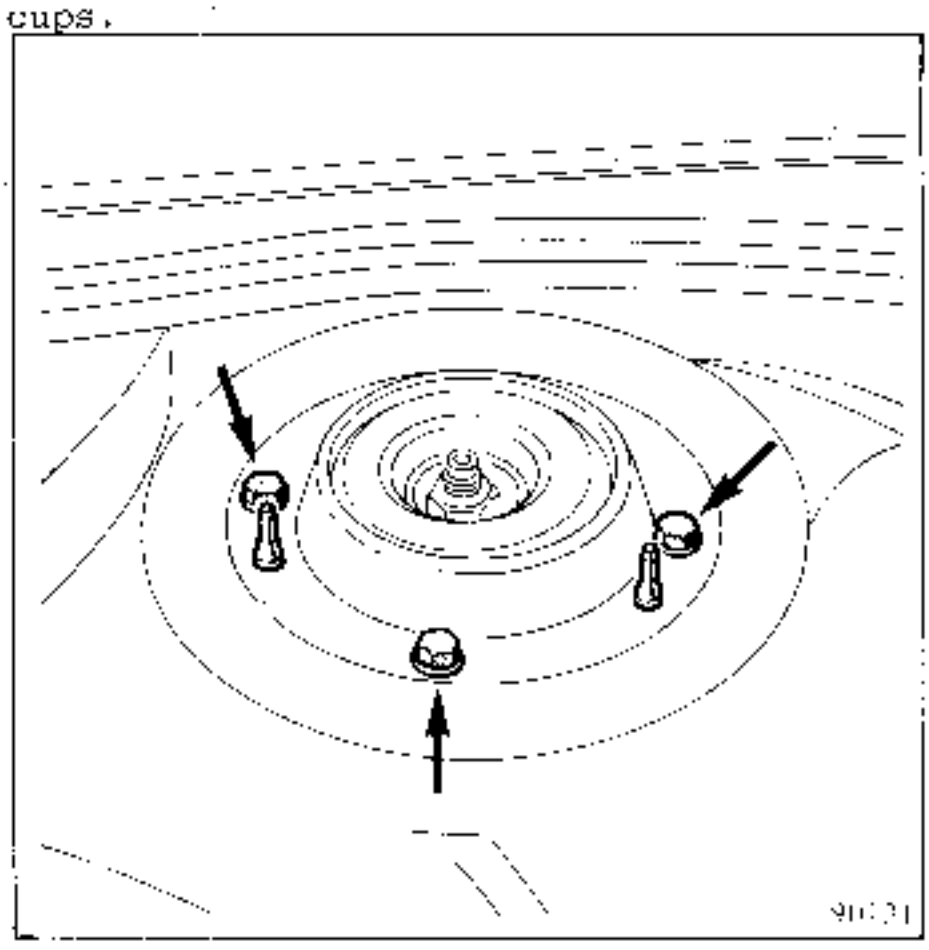
Lower the axle assembly until the tool makes contact with the floor.

Remove :

The four sub-frame securing bolts (A).

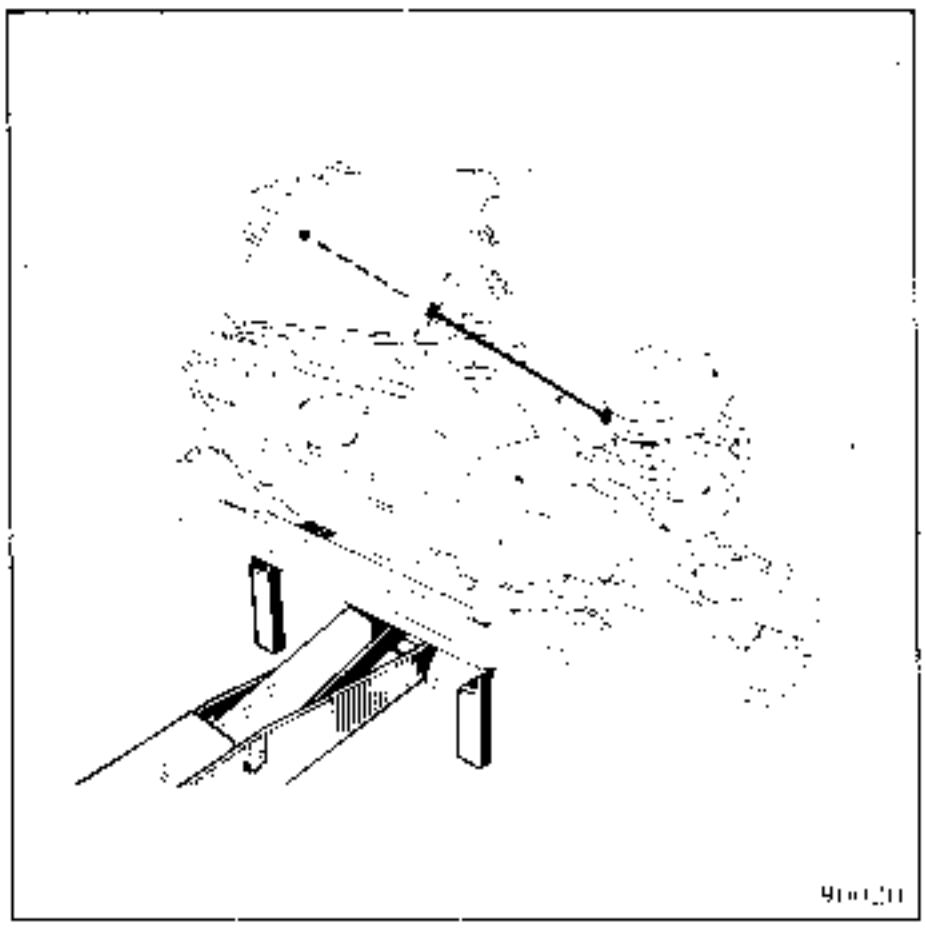


The bolts from the shock absorber upper cups.



Raise the body and take out the power unit assembly.

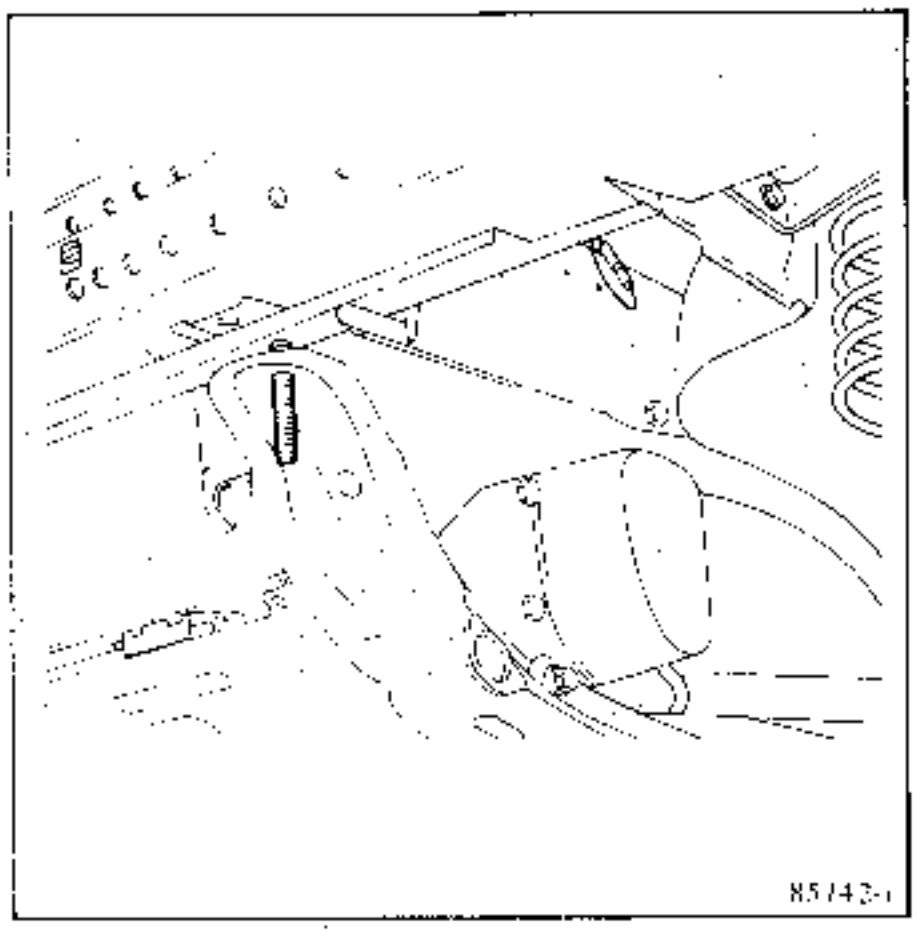
Power unit assembly after removal.



Tie the suspension leg assemblies in place with string.

REFITTING (special points).

Aligning the engine sub-frame with the body can be made easier by using screwed rods approximately 100 mm long.



To obtain the correct clutch clearance, see the CLUTCH section.

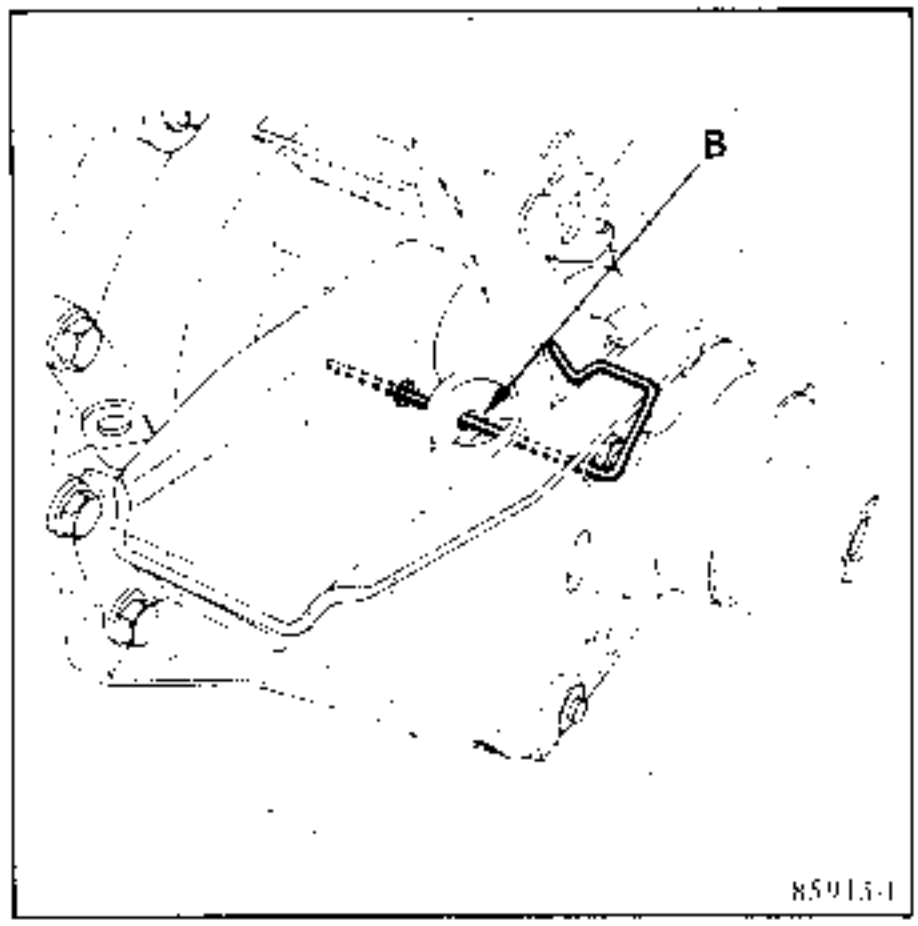
Tighten the brake caliper securing bolts to 10 daN.m after first coating them with Loctite Frenbloc resin.

Press the brake pedal a number of times to bring the caliper pistons into contact with the pads.

Fill and bleed the cooling system (see pages 29 and 30).

Place the steering column universal joint in the correct position before tightening it (see FRONT AXLE section).

Reconnect the speedometer drive cable, ensuring that the clip is in the correct position.



Adjust the accelerator and choke cables.

Retighten the exhaust pipe clamp fastenings until the springs are coilbound, then loosen them by one and a half turns.

ESSENTIAL SPECIAL TOOLS	
B.Vi.31-01	Punches for spring pins
Mot.898	Lifting chain and rings
T.Av.476	Ball joint extractor

TIGHTENING TORQUES (in daN.m)	
Brake caliper securing bolts ..	10
Shock absorber lower securing bolts	8
Steering ball joints	4
Mounting securing bolts	4
Wheel bolts	9
Driveshaft bellows clamping screw	2,5
Lower ball joint nut	6

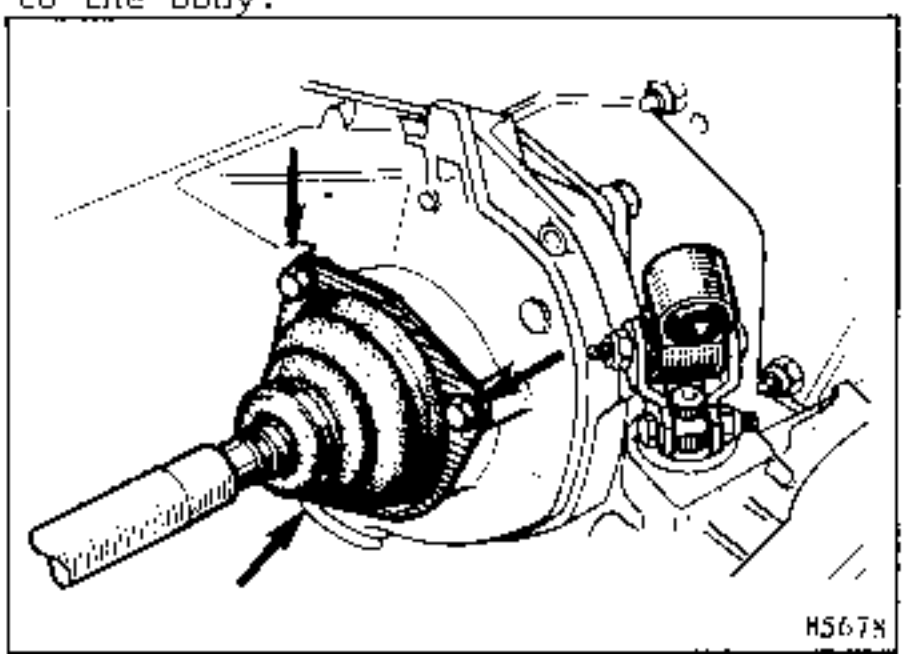
Removing the assembly presents no particular difficulties, however pay attention to the following points :

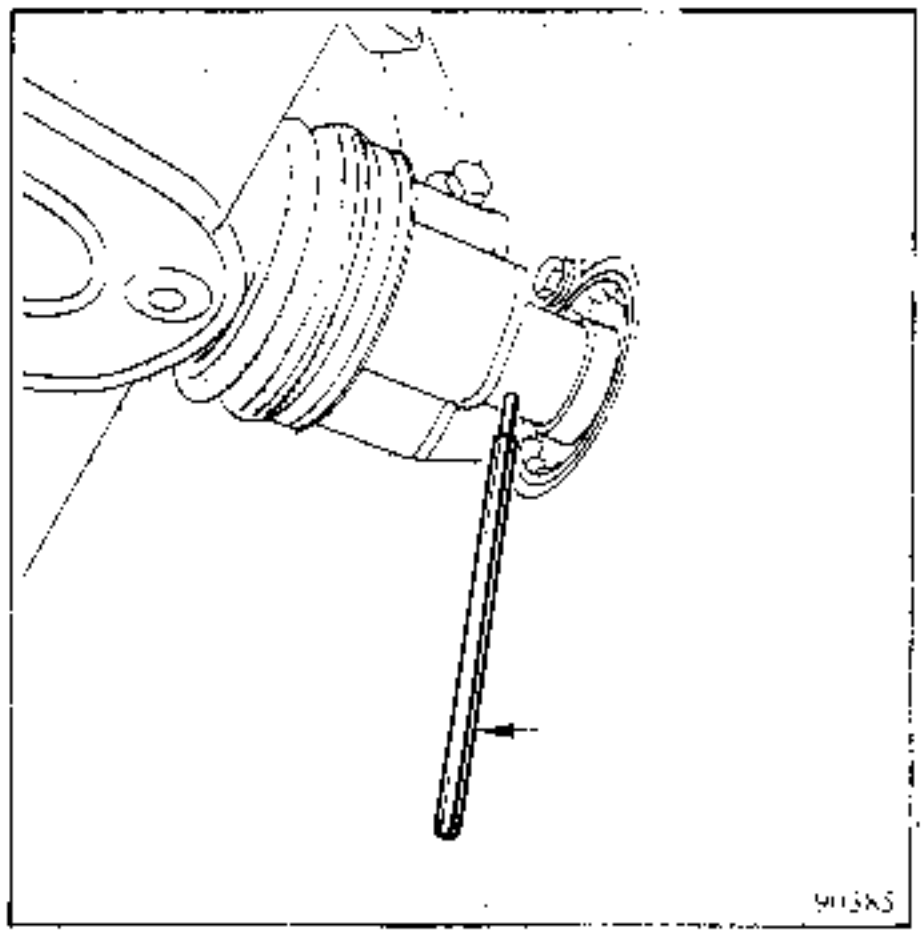
REMOVING

Disconnect :
The battery.
The electrical connectors.
The pipes.
The cables.

Drain :
The gearbox.
The engine, if necessary.

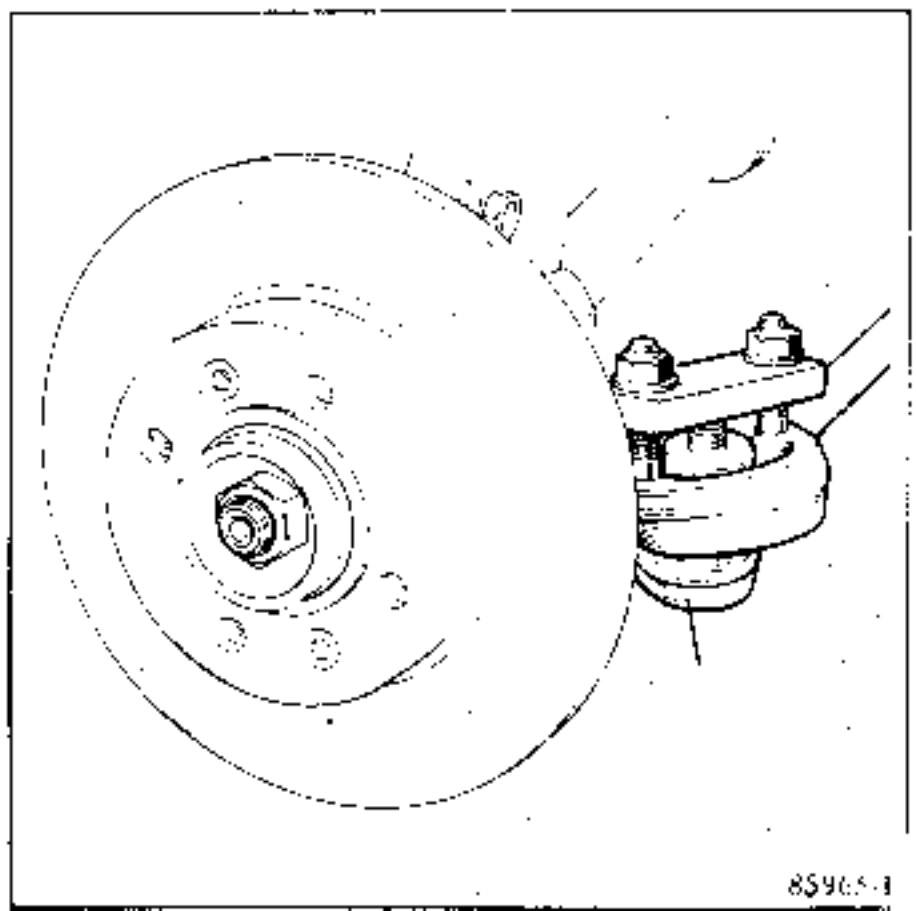
Remove :
The radiator.
The driveshaft pin using punches B.Vi. 31-01.
The three bolts from the front left hand bellows.
The front left hand caliper, attaching it to the body.





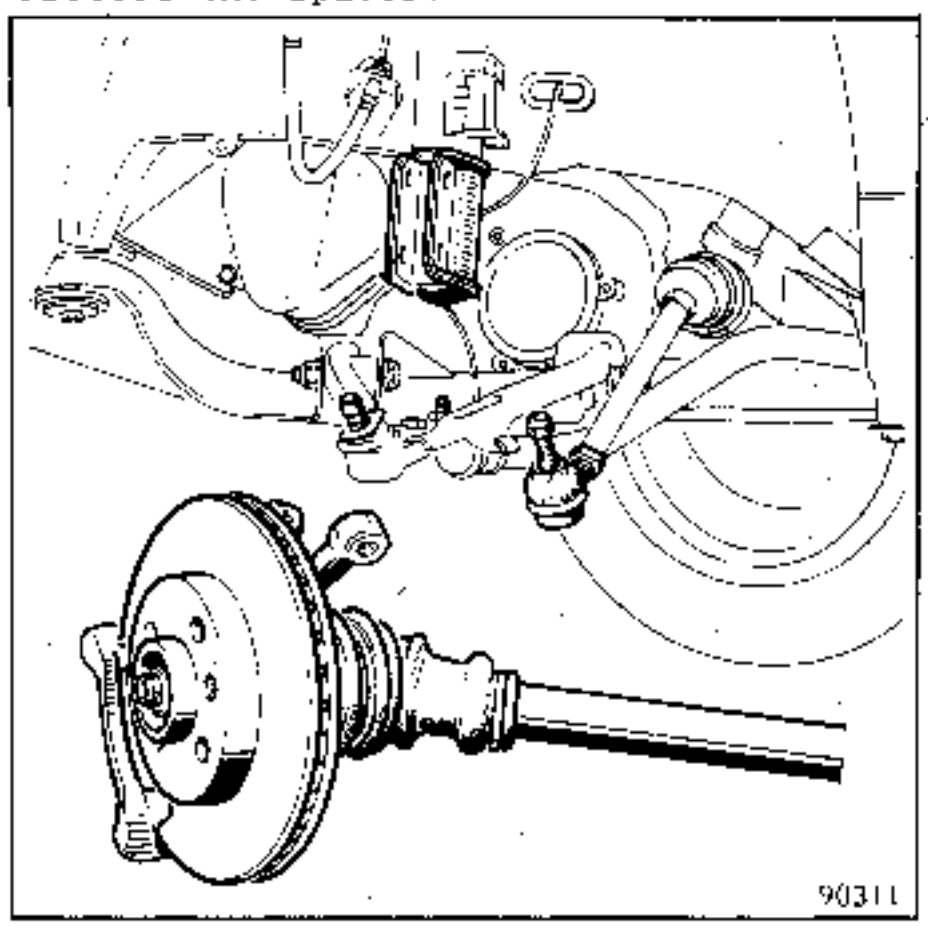
Free the driveshaft, taking care not to catch it on its bellows at the wheel end.

Disconnect the steering ball joints using extractor T.Av.476.



Remove the shock absorber lower securing bolts.

On the left hand side, remove the driveshaft and stub axle carrier assembly disconnecting it at the lower ball joint. Protect the spider.



The power unit is removed using lifting chain and rings Mot.878.

REFITTING

Tighten all the nuts and bolts to the correct torque.

Apply Loctite Frenbloc ▽ to the caliper securing bolts and tighten them to torque.

Depress the brake pedal a number of times to bring the pistons into contact with the brake pads.

Fill :

The gearbox with oil.

The engine with oil, if necessary.

The cooling system and then bleed it (see pages 29 and 30).

Tighten the exhaust pipe clamp fastenings until the springs are coilbound and then loosen them by one and a half turns.

Apply CAF 4/60 THIXO compound to the pin holes.

Adjust the accelerator and choke cables.

ESSENTIAL SPECIAL TOOLS	
Elé. 346.04	Tool for checking the drive belt tensions.
Mot. 878	Lifting chain and rings.

THE ENGINE ALONE CAN BE REMOVED BY LIFTING IT OUT FROM ABOVE THE VEHICLE.

TIGHTENING TORQUES (in daN.m)	
Engine mounting fastenings	4
Crankshaft pulley	10

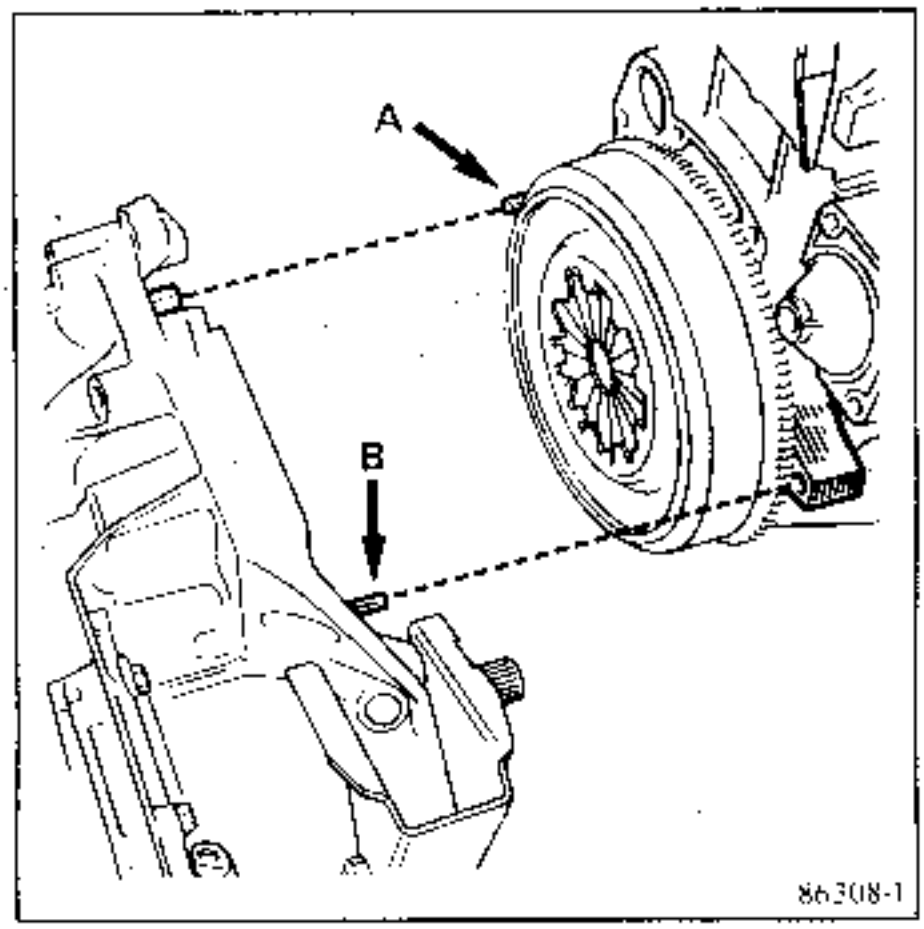
REMOVING

Disconnect :

The battery.
The electrical connectors.
The cables.

Remove :

The air filter.
The radiator, after having drained the cooling system.
The water pump-alternator belt.
The water pump pulley.
The crankshaft pulley.
The exhaust pipe flange.
The engine-gearbox tie rod.
Studs (A) and (B).



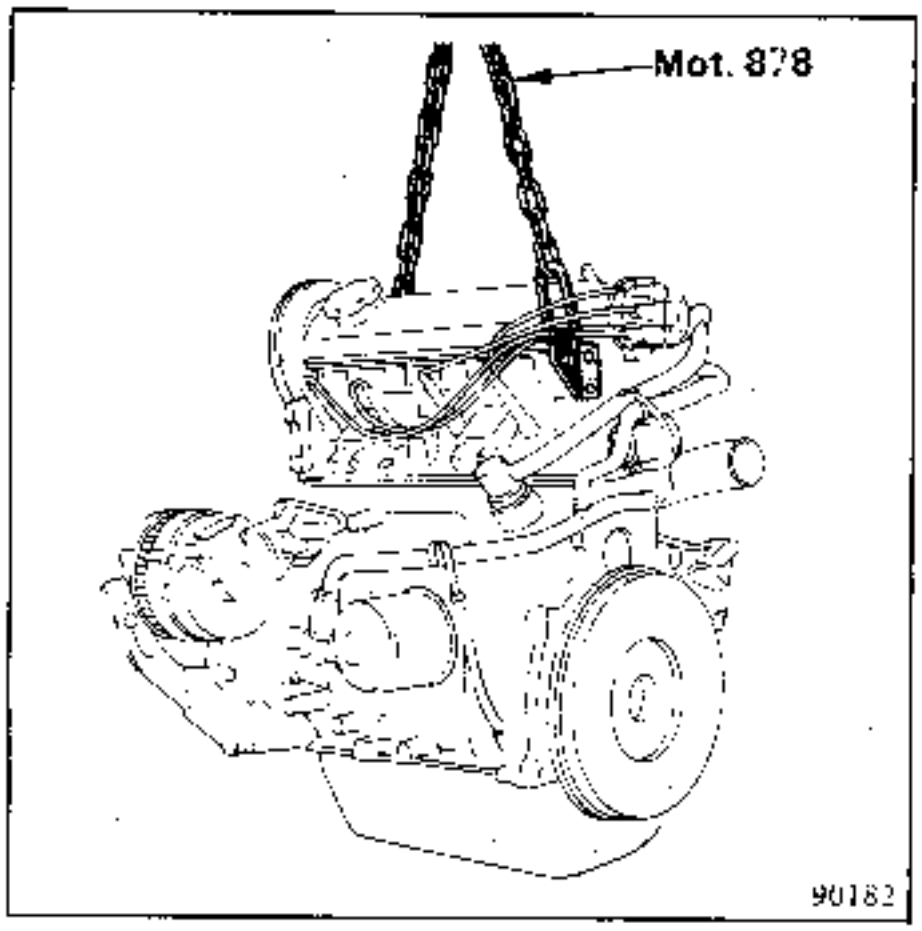
The bolts securing the gearbox.
The accelerator and choke cables.

Fit a lifting hook and tool Mot. 878.

Remove :

The front right hand engine mounting pad assembly. The front left hand gearbox rubber bush.

Move the gearbox to the left and lift the engine out of the engine compartment.



REFITTING (special points).

Grease the splines on the clutch shaft.

When refitting the pulleys, carry out the removing operations in reverse.

Fill :

The engine with oil if necessary.

The cooling system and then bleed it (see pages 29 and 30).

Tighten the exhaust pipe clamp fastenings until the springs are coilbound and loosen them by one and a half turns.

Adjust the belt tension using tool Ele. 346-04 (see pages 34 - 35).

Adjust the accelerator and choke cables.

Before all else read the safety instructions on pages 7 and 8 of the "General" chapter (section A).

ESSENTIAL SPECIAL TOOLS	
Mot. 1040-01	Dummy sub-frame for removing and refitting the power unit assembly

TIGHTENING TORQUES (in daN.m)	
Brake caliper bolts	10
Shock absorber cup securing bolts	2,5
Wheel bolts	9
Sub-frame securing bolts ...	8,5

REMOVING

Disconnect :

The battery.
The electrical connectors.
The accelerator cable.
The clutch cable.
The speedometer drive cable.

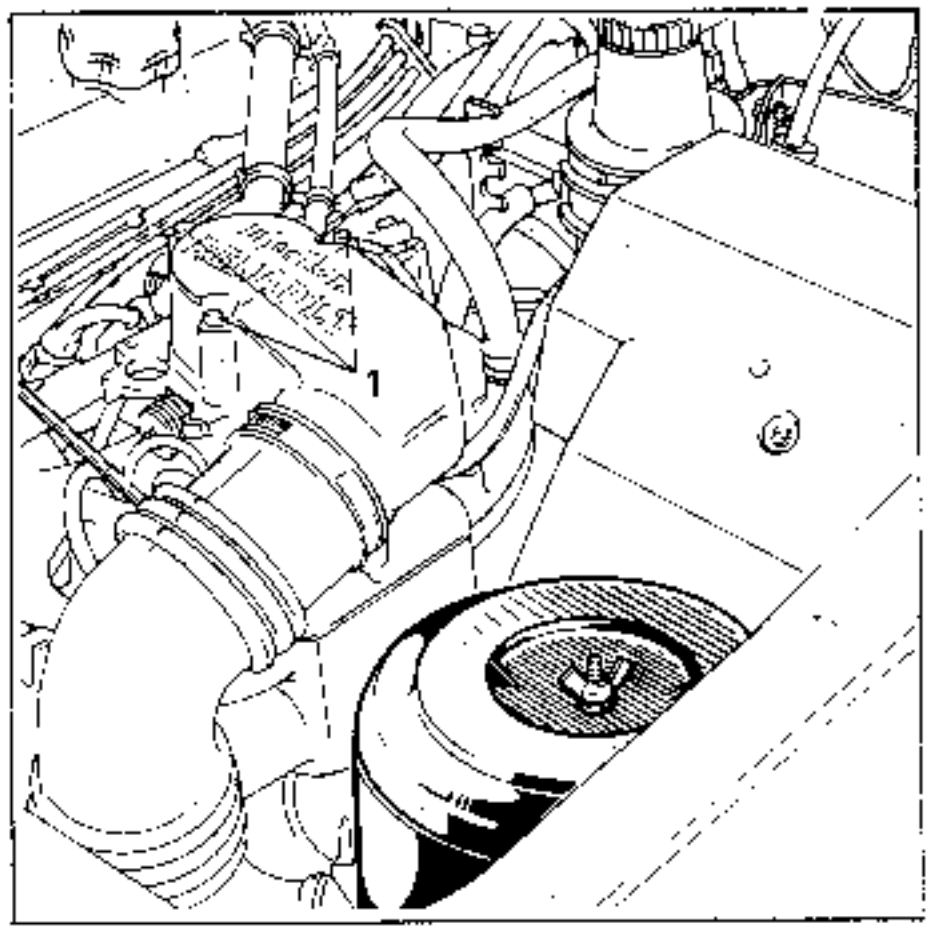
Drain :

The cooling system.
The engine.) if necessary
The gearbox.)

Disconnect :

The heater pipes.
The radiator hoses, as this will remain in the vehicle.

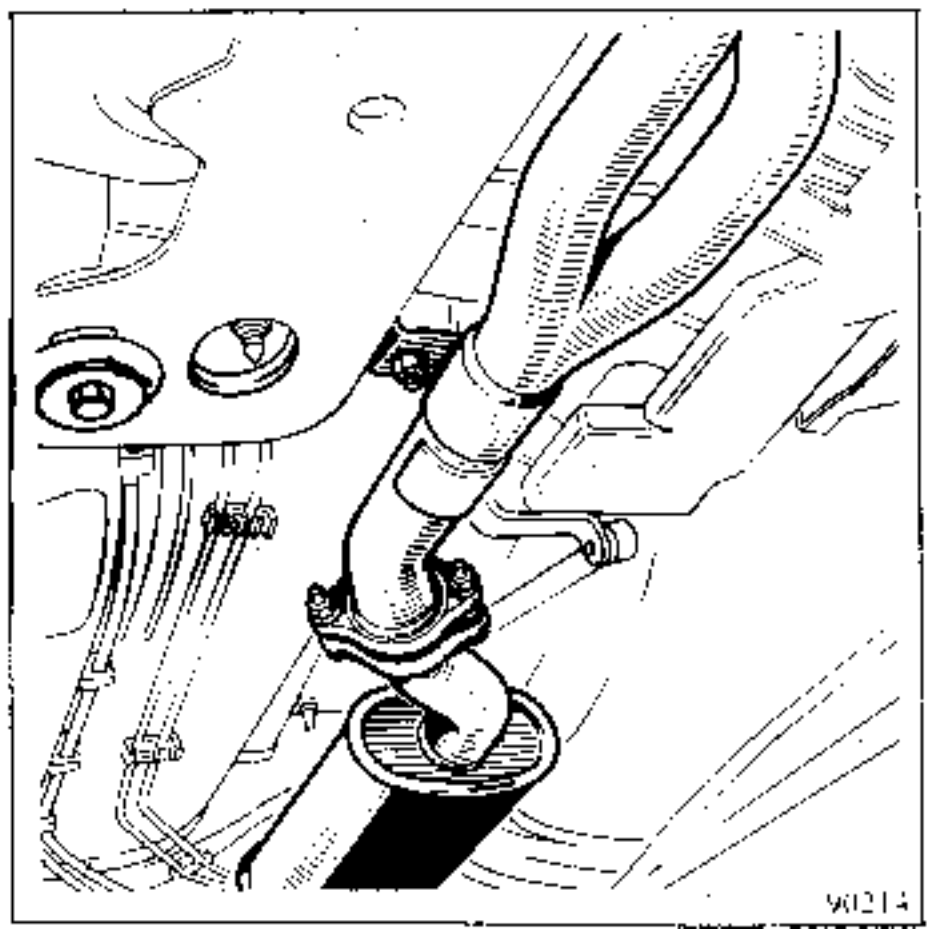
The earthing braids (between Engine and Gearbox).



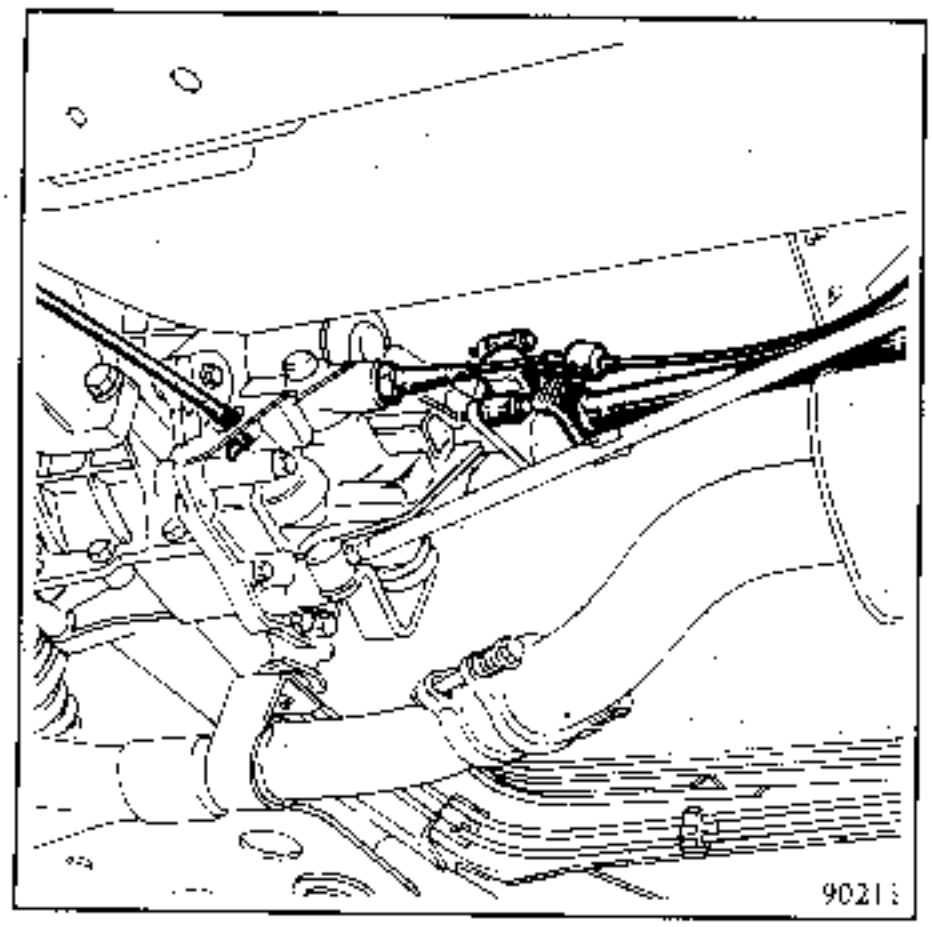
Remove :

The securing screws from the throttle casing cover (1).

The exhaust pipe ball joint.

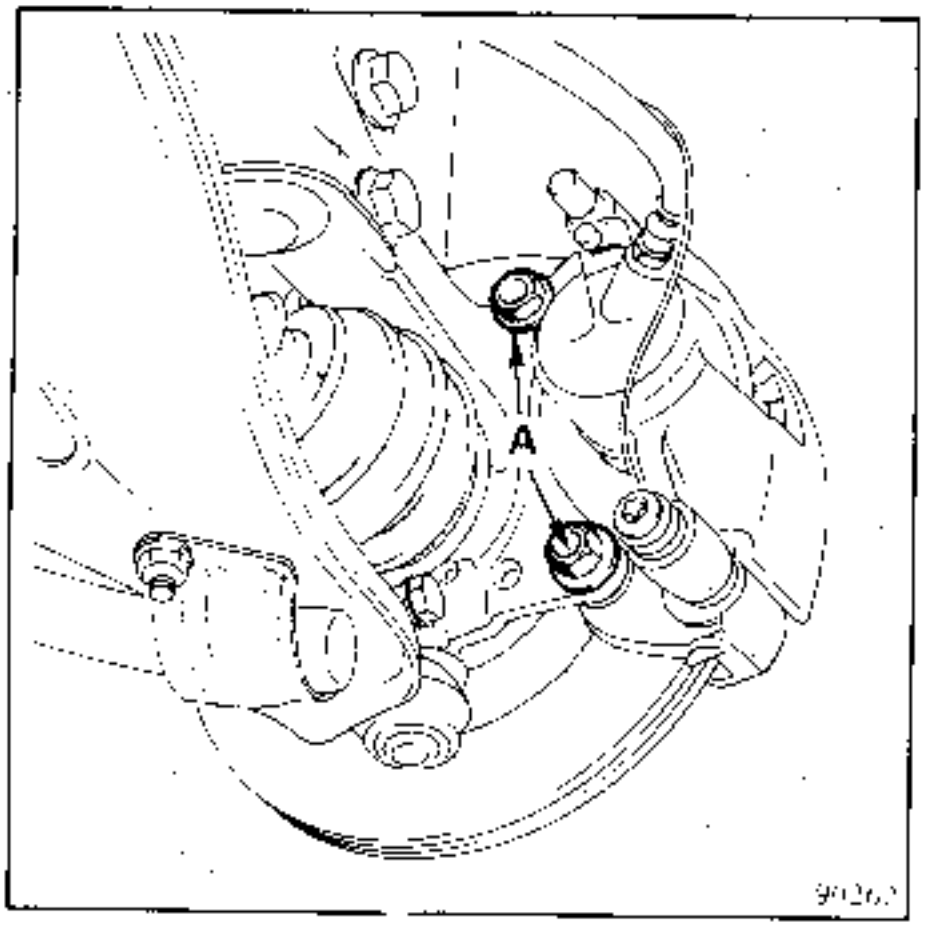


The gear shift controls.

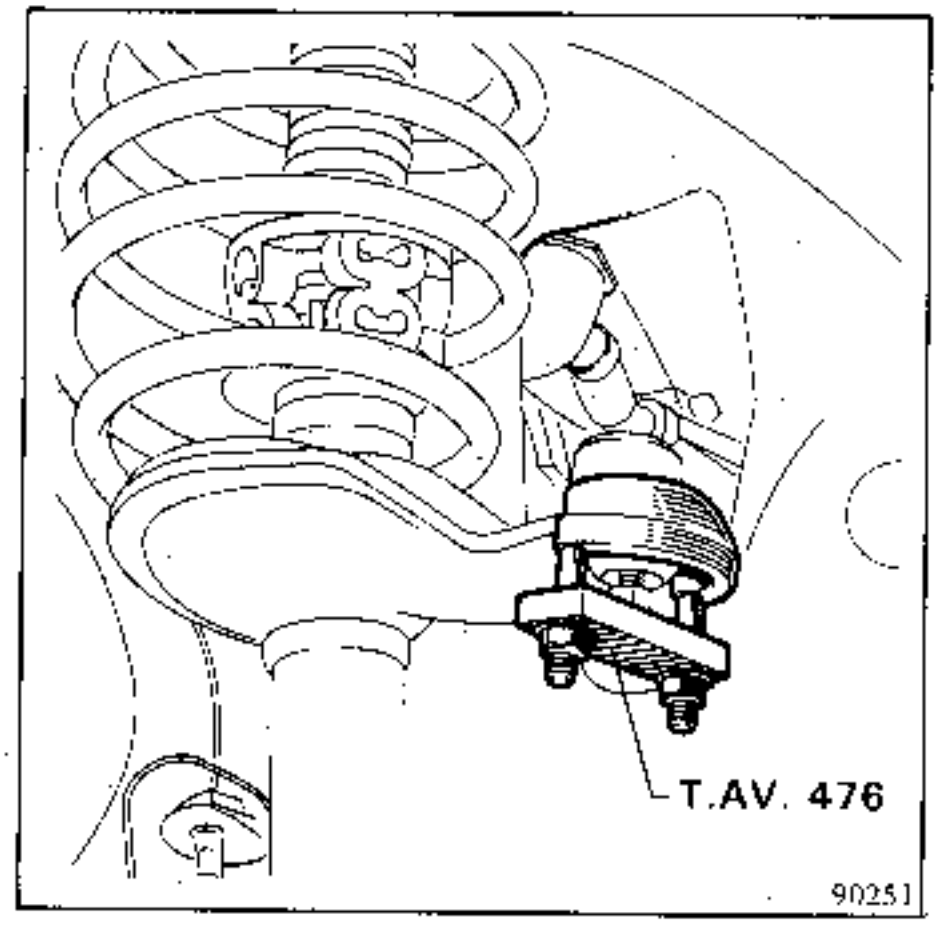


The wheels.

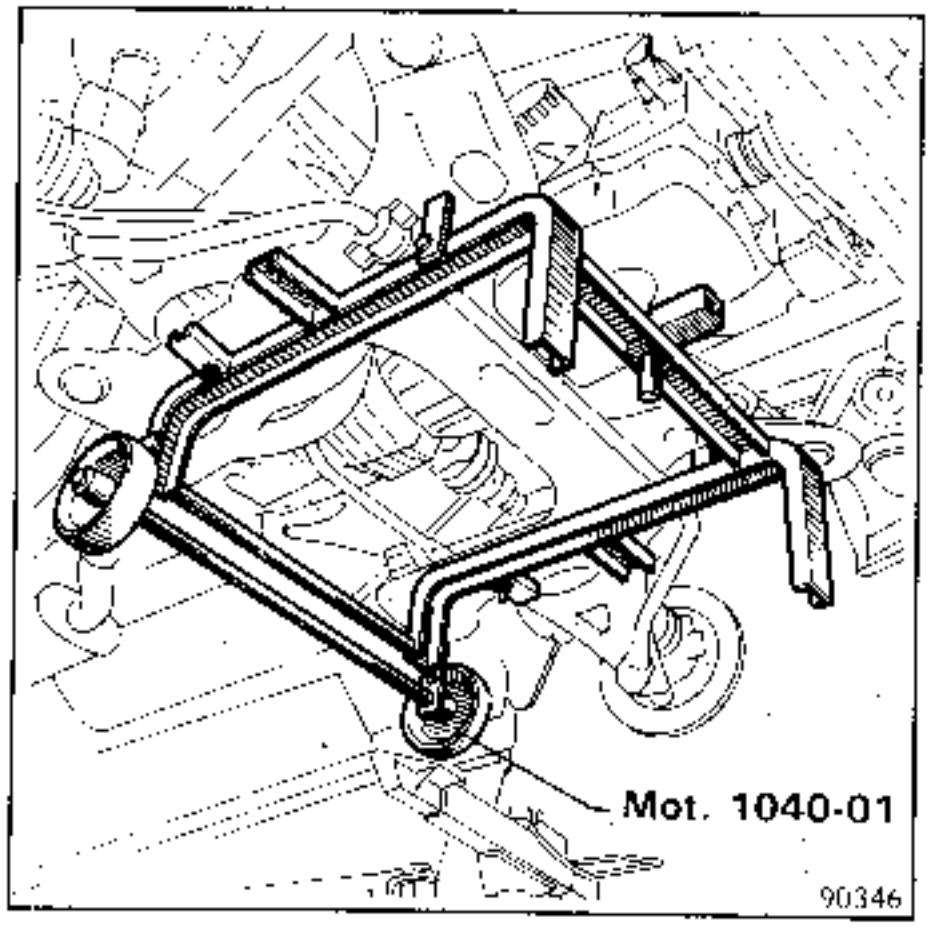
The brake calipers (bolts A), and attach them to the body.



The steering ball joints using tool T.Av. 476.



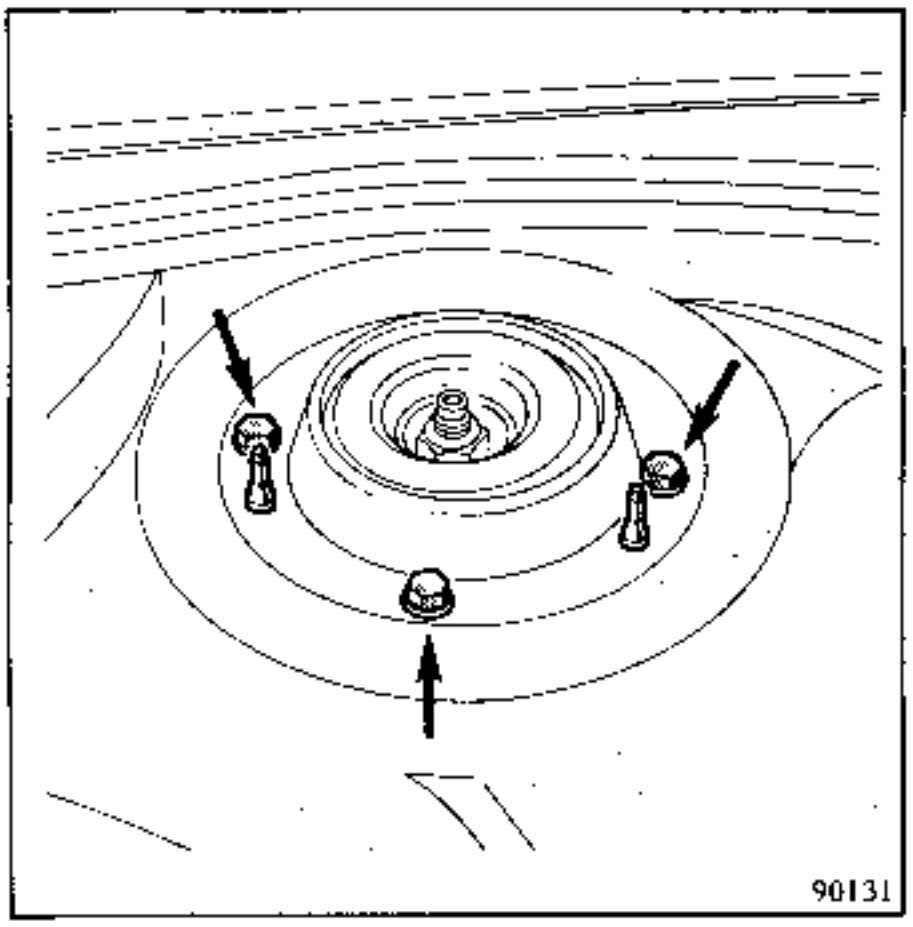
Fit tool Mot.1040-01 to the engine sub-frame.



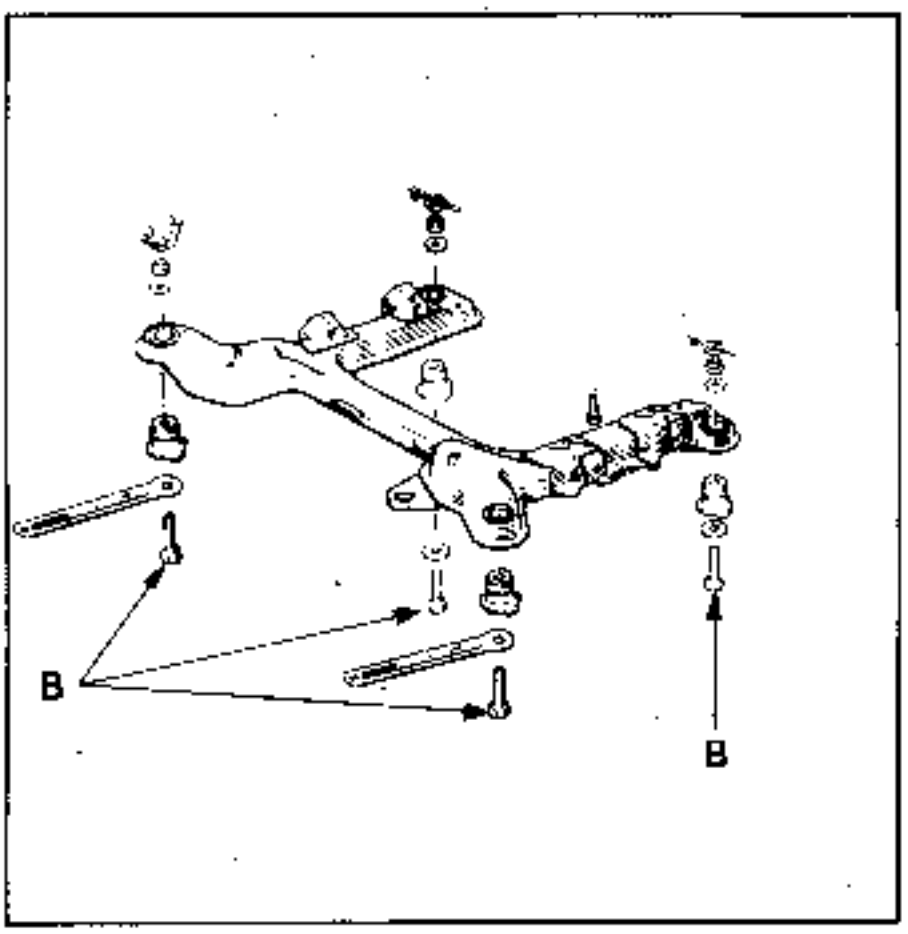
Lower the vehicle, with tool Mot.1040-01 in place, to the ground.

Remove :

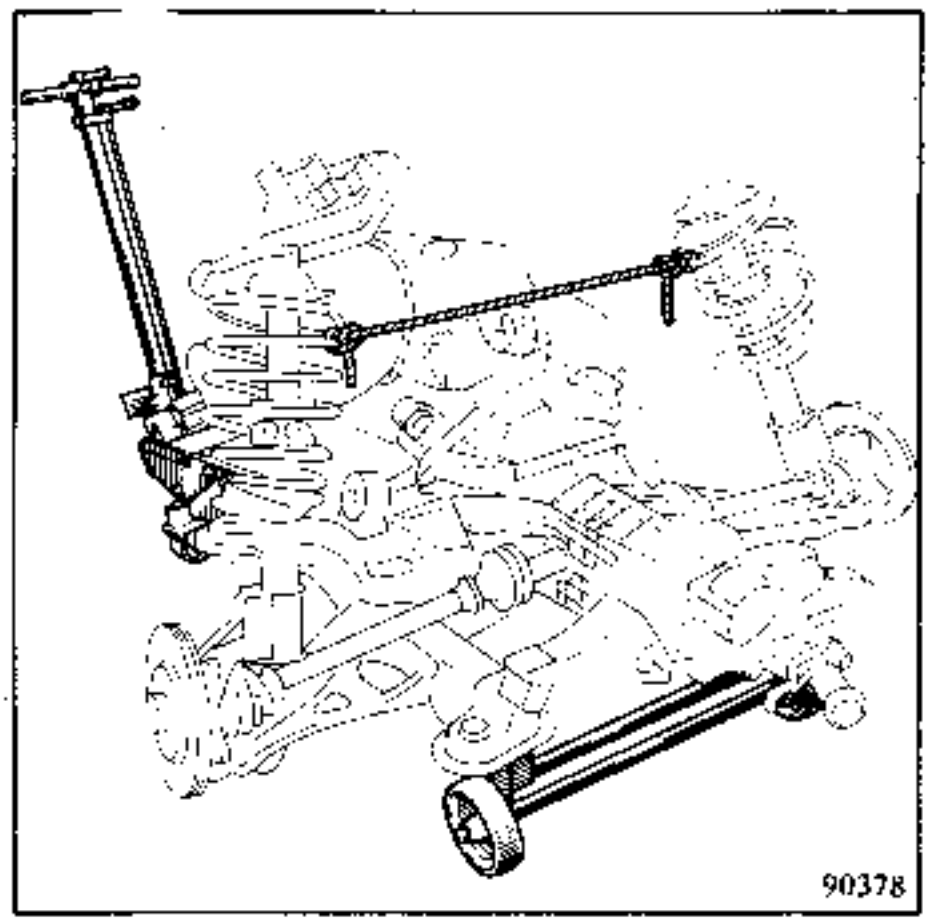
The securing bolts from the shock absorber upper cups.



The sub-frame securing bolts (B).



Take out the power unit assembly by lifting the body.



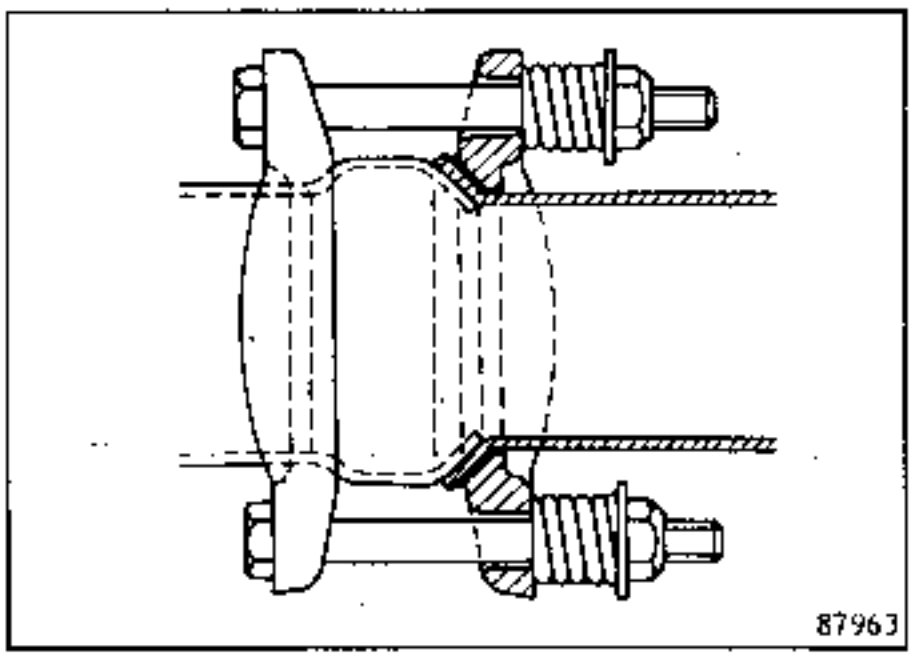
Tie the suspension legs together with string.

REFITTING (Special points)

Aligning the body with the engine sub-frame is made easier by using pieces of screwed rod approximately 100 mm long.
Tighten the nuts and bolts to torque.

Fill :

The engine and gearbox with oil (if necessary).
The cooling system, and bleed it (see pages 29 and 30).
Adjust the accelerator cable.
Tighten the spring loaded exhaust pipe clamps against the thermoplastic seal.



ESSENTIAL :
Replace the thermoplastic seal each time it is removed and tighten the clamps until the springs are coilbound (do not loosen them).

ESSENTIAL SPECIAL TOOLS	
B.Vi.31-01	Punches for spring pins.
Mot.878	Lifting chain and rings.
T.Av.476	Ball joint extractor.

TIGHTENING TORQUES (in daN.m)	
Shock absorber lower securing bolts	20
Steering ball joints	4
Mounting securing bolts	4
Wheel bolts	9

REMOVING

Disconnect the battery.

Remove :

The bonnet.
The front cross member.
The radiator grille.
The air filter.
The bumper shield.

On vehicles with power steering, remove the power steering pump and place it on one side.

Disconnect :

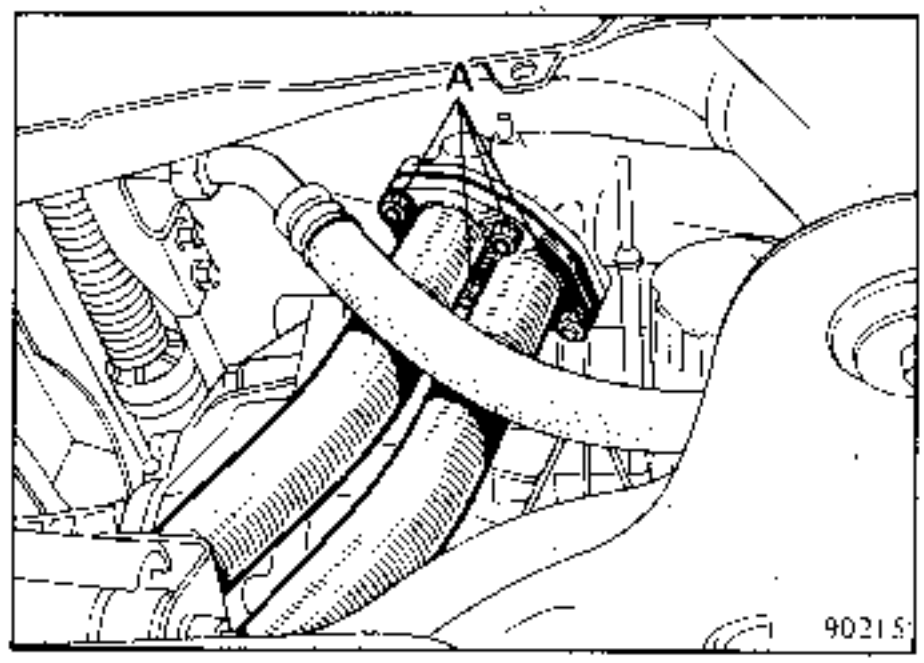
The electrical connections.
The accelerator cable.
The clutch cable.
The ignition sensor.

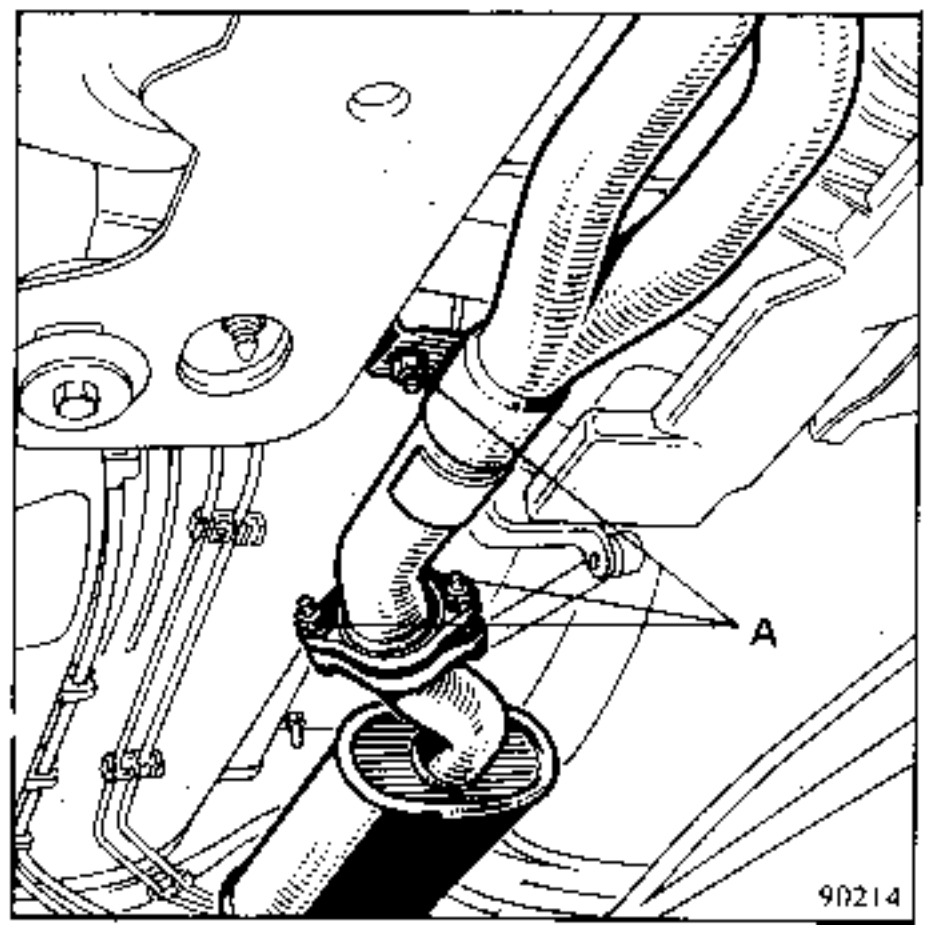
Drain :

The gearbox.
The engine, if necessary.

Disconnect :

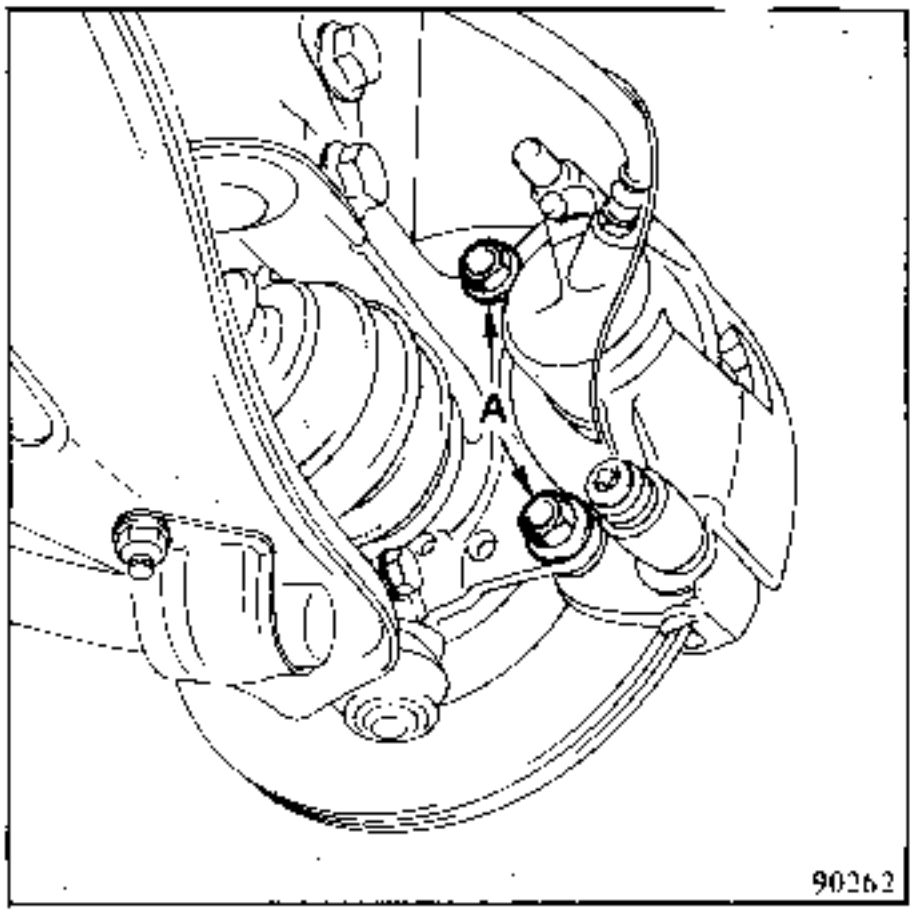
The exhaust downpipe at (A).



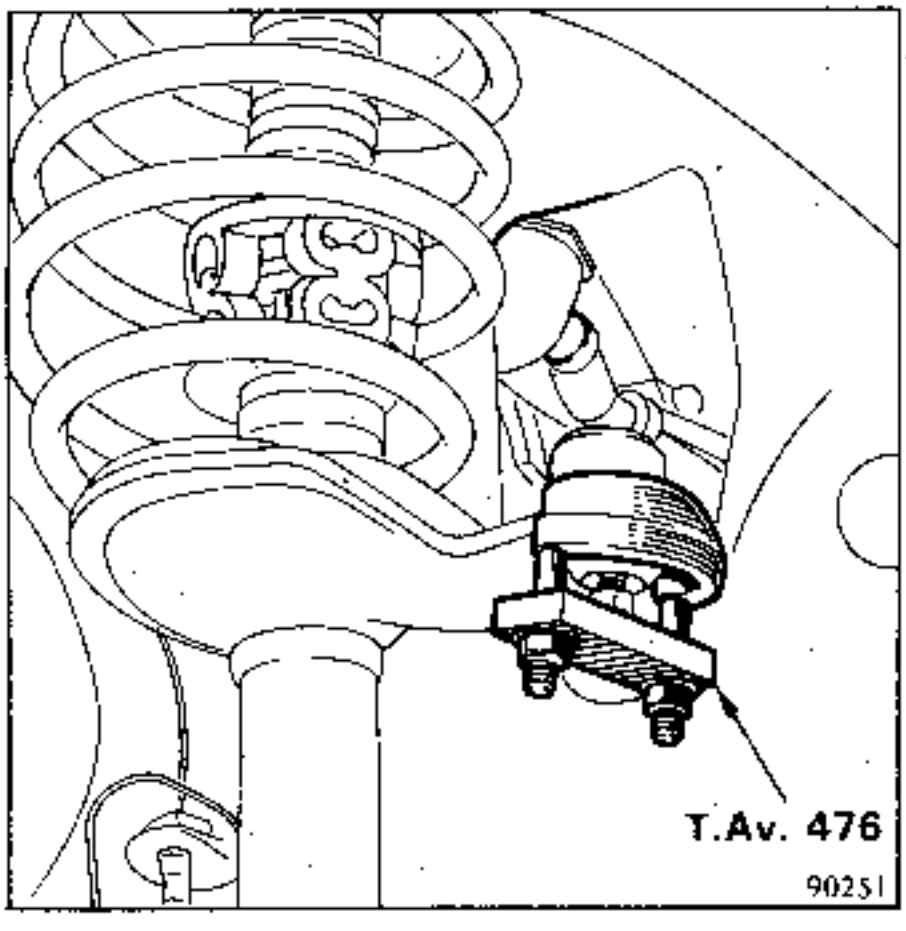


Remove :

The BENDIX series IV M calipers (bolts A).



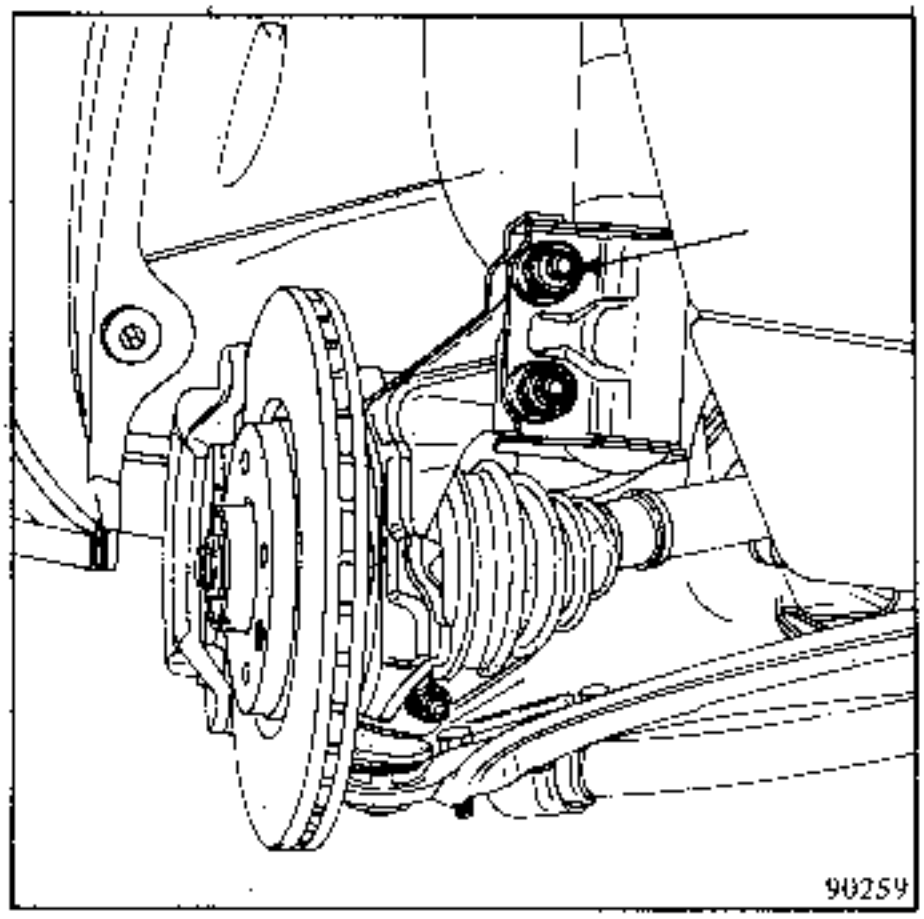
The driveshaft pins using punches B.Vi. 31-01.



The steering ball joint nuts. Extract the ball joints using tool T.Av.476.

Remove :

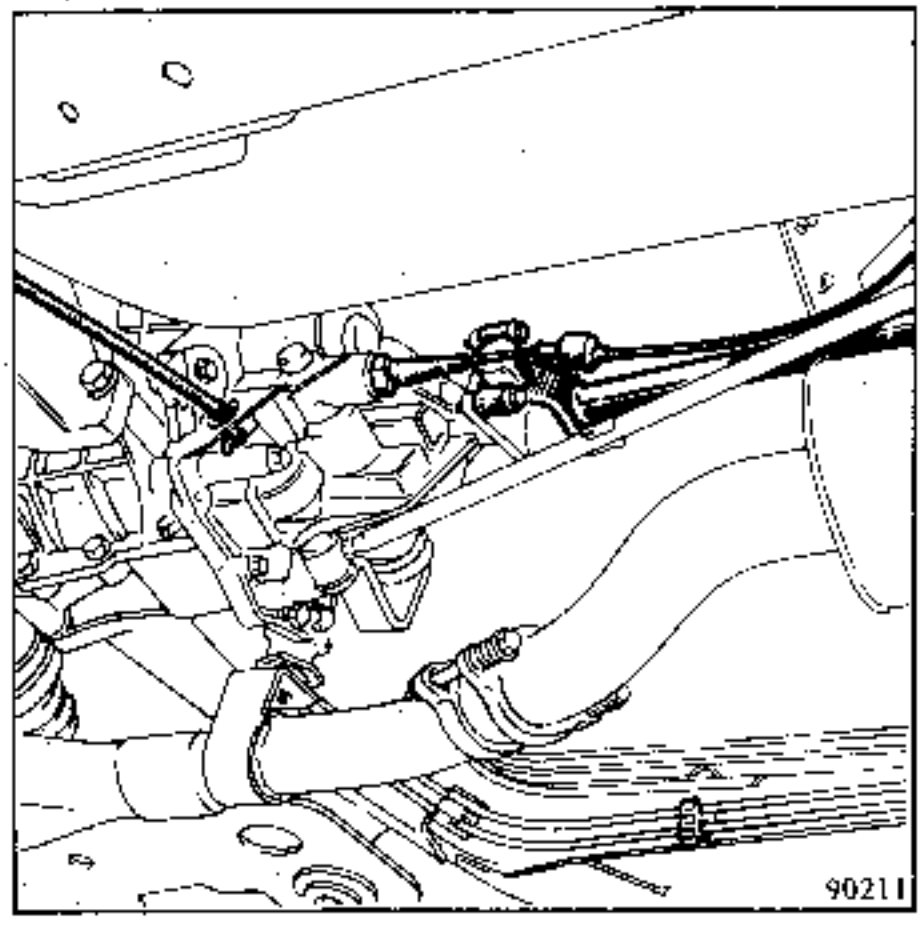
The upper bolts at the lower end of the shock absorbers. Loosen, but do not remove the lower bolts.



Disconnect :

The speedometer drive cable.

The gear shift control.



Remove :

The gearbox mounting pad fastenings.

Take out the engine-gearbox assembly using tool Mot.878.

REFITTING :

Carry out the removing operations in reverse.

Tighten the nuts and bolts to torque.

Fill :

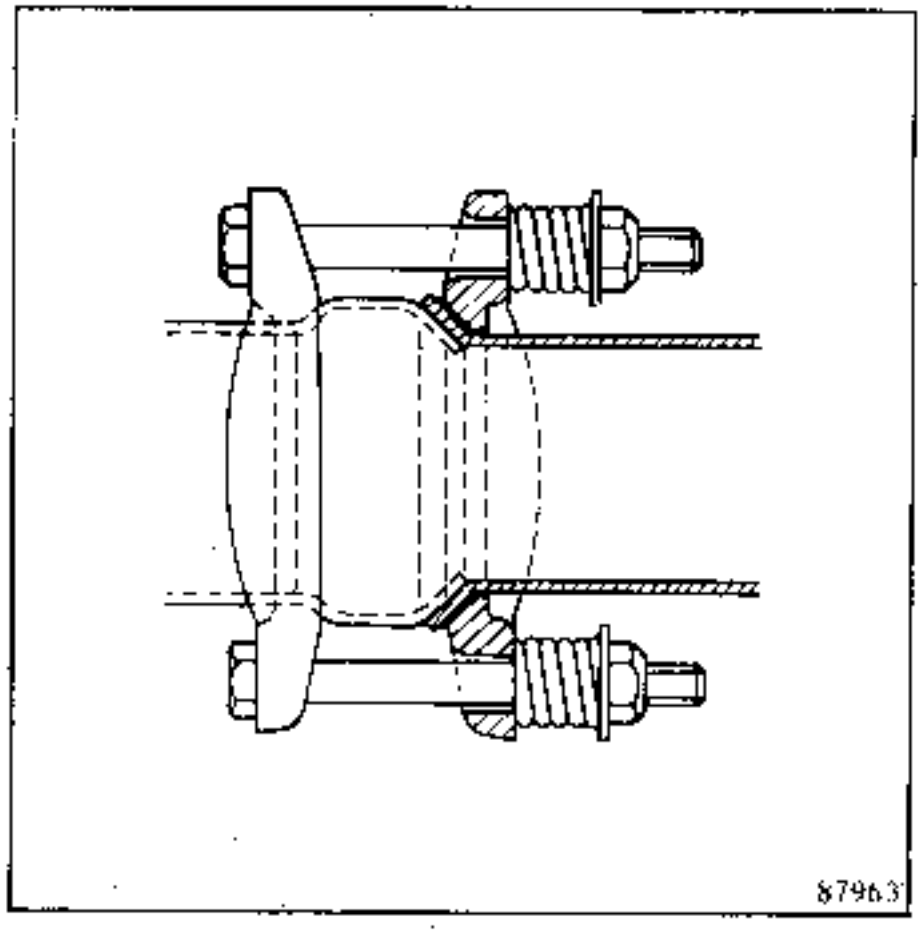
The gearbox with oil.

The engine with oil, if necessary.

The cooling system, and then bleed it (see pages 29 and 30).

Adjust the accelerator cable.

Tighten the spring loaded flange against the thermoplastic seal.



ESSENTIAL :

The thermoplastic seal must be replaced each time it is removed and the springs must be tightened until they are coil-bound (do not loosen them).

TIGHTENING TORQUES (in daN.m)	
Brake caliper bolts	10
Steering column universal joint bolts	2,5
Wheel bolts	9
Steering ball joint nuts	4
Lower ball joint nuts	6
Shock absorber lower securing bolts	20

REMOVING

Disconnect the battery.

Remove :

The bonnet.
The front cross member.

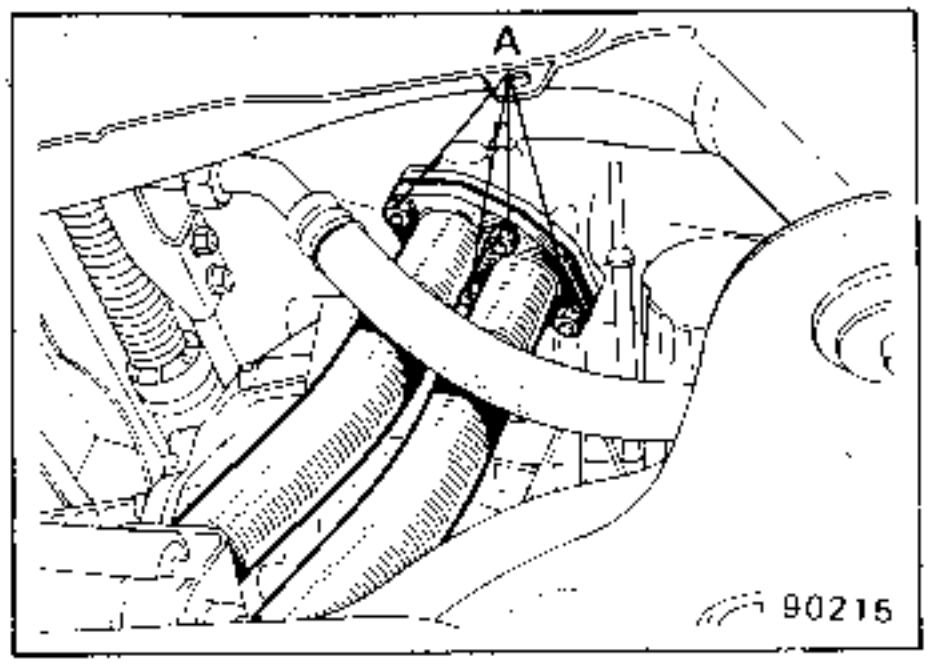
The power steering pump which is to be removed and placed on the side of the vehicle (on vehicles equipped with power steering).

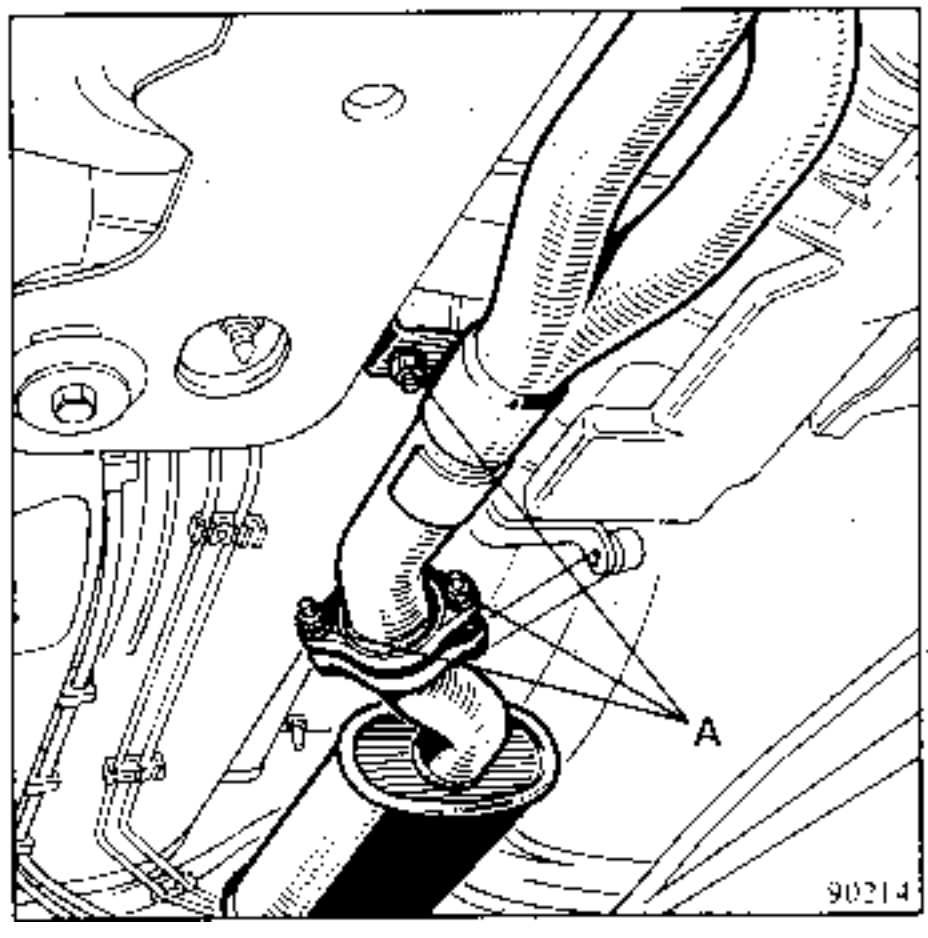
Disconnect :

The pipes.
The electrical connectors.
The accelerator cable.
The clutch cable.
The ingition sensor.

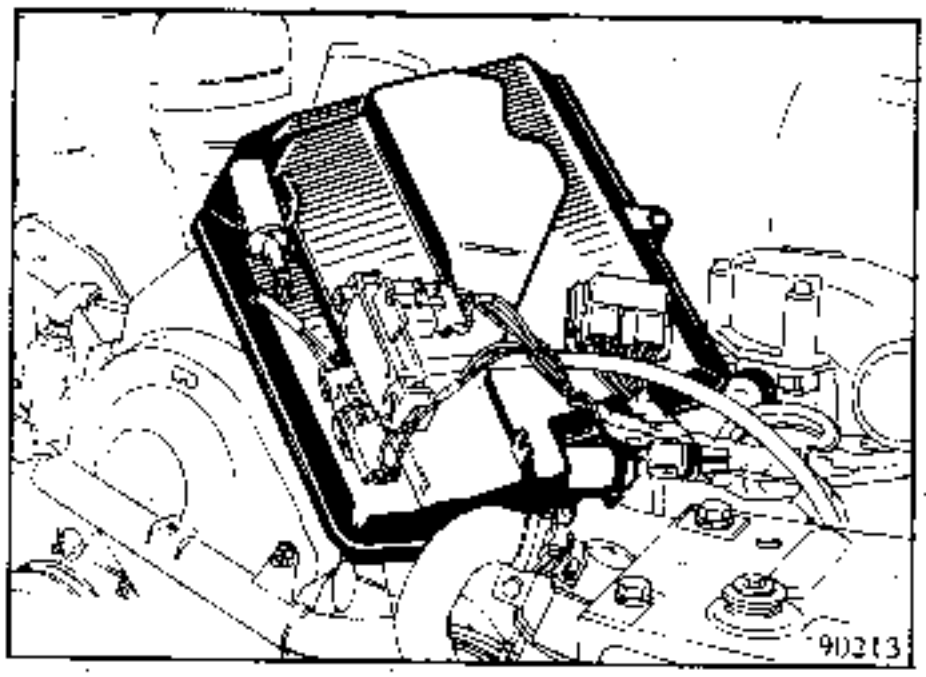
Disconnect :

The exhaust downpipe at (A).



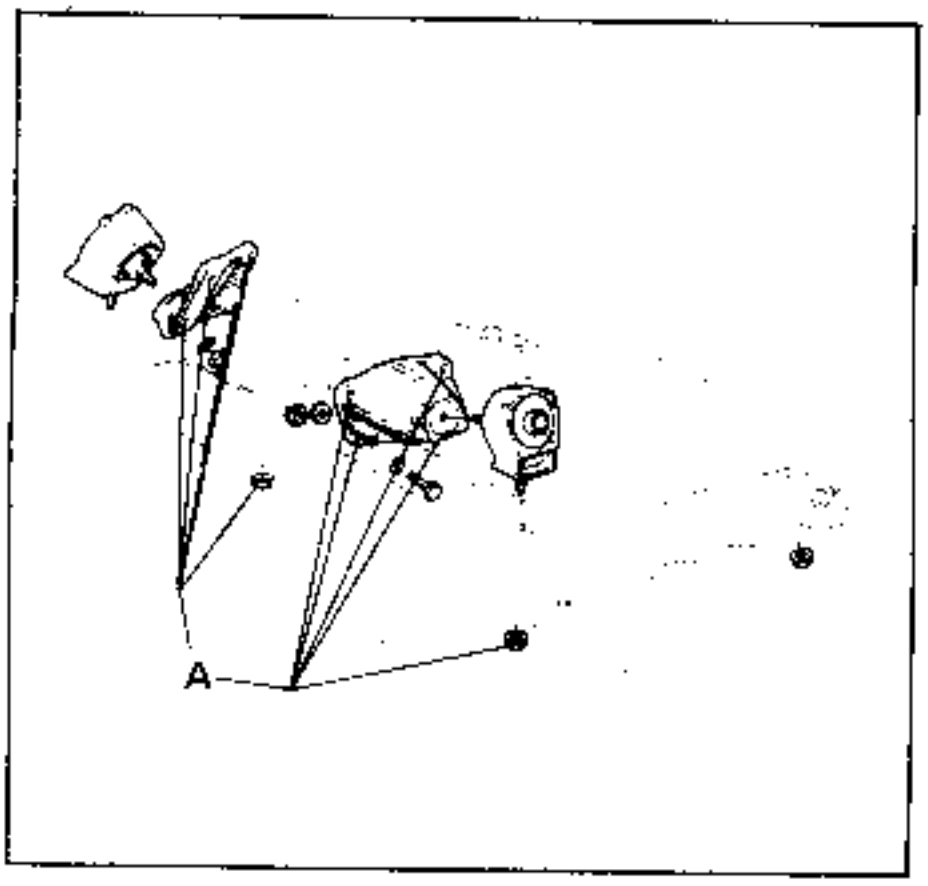


Disconnect the computer and place it on the engine.



Remove :

The bolts from round the gearbox.
Remove the engine mountings at (A).



Take out the engine using tool Mot.878.

REFITTING (Special points)

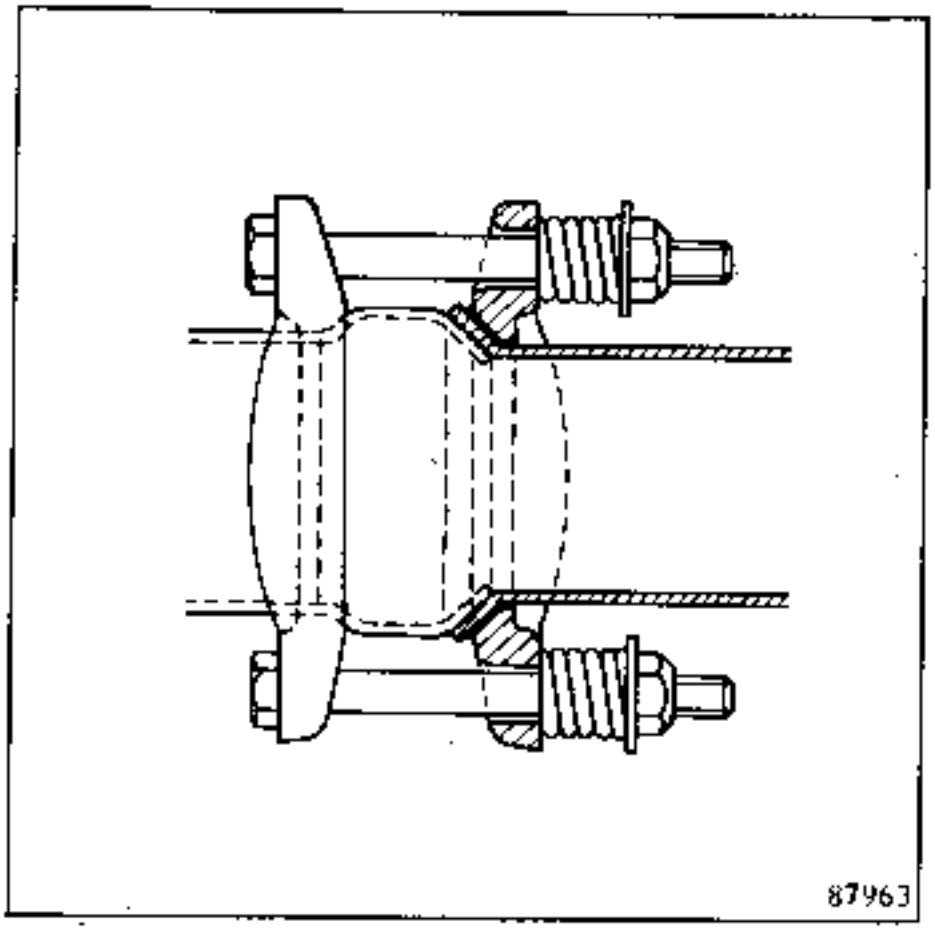
Fill :

The engine with oil, if necessary.

The cooling system and then bleed it (see pages 29 and 30).

Adjust the accelerator cable.

Tighten the spring loaded exhaust pipe clamp against the thermoplastic seal.



ESSENTIAL :

The thermoplastic seal must be replaced every time it is removed and the fastenings must be tightened until the springs are coilbound (do not loosen them).

Engine oil consumption of up to 1 litre per 1 000 km (621 miles) is acceptable.

Check that there is no external leakage.

For the check to be effective, one must drain the engine oil under certain specific conditions :

The engine must be warm.

Place the crankshaft at TDC, on the firing stroke, at No. 1 cylinder.

Remove the dipstick and filler cap.

Drain the engine, leaving it to fully drain for at least 15 minutes.

Refit the drain plug and "seal it" (a dab of paint across both plug and sump) to be able to check, later, that it has not been removed.

Measure the quantity of oil poured into the engine with a graduated flask.

Engine type : F2N : 4,7 ltires.
Engine type : J7R : 5,7 litres.

Refit and seal the filler cap.

Ask the owner to bring back the vehicle after he has driven 1 000 km (621 miles) during which time he must maintain a regular check on the oil level with the dipstick.

When the vehicle is returned, check that the drain plug and filler cap have not been removed.

Return the engine to the same conditions :

Engine warm.

Crankshaft at TDC on the firing stroke at No. 1 cylinder.

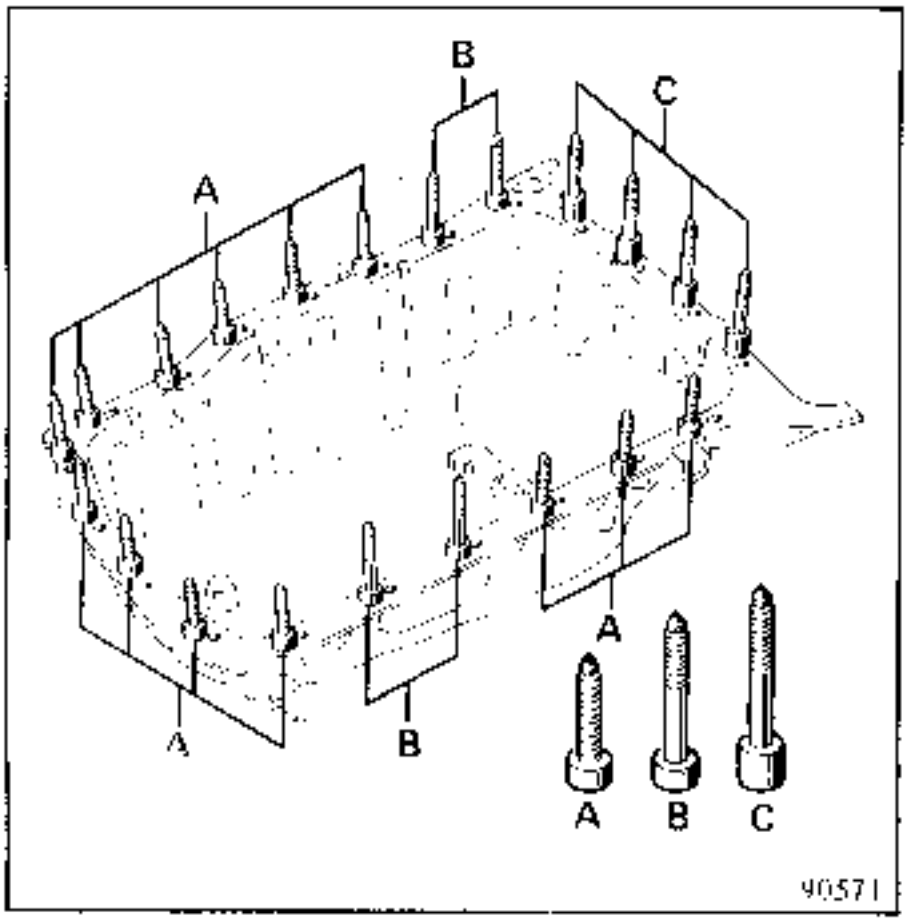
Dipstick and filler cap removed.

Drain the engine oil, measuring the quantity drained off with the graduated flask.

Calculate the oil consumption in litres per 1 000 km (621 miles) if the actual mileage is different.

TIGHTENING TORQUES (in daN.m)	
Aluminium sump bolts	1

Identification of sump bolts :
There are 3 types of bolt marked A, B, C.

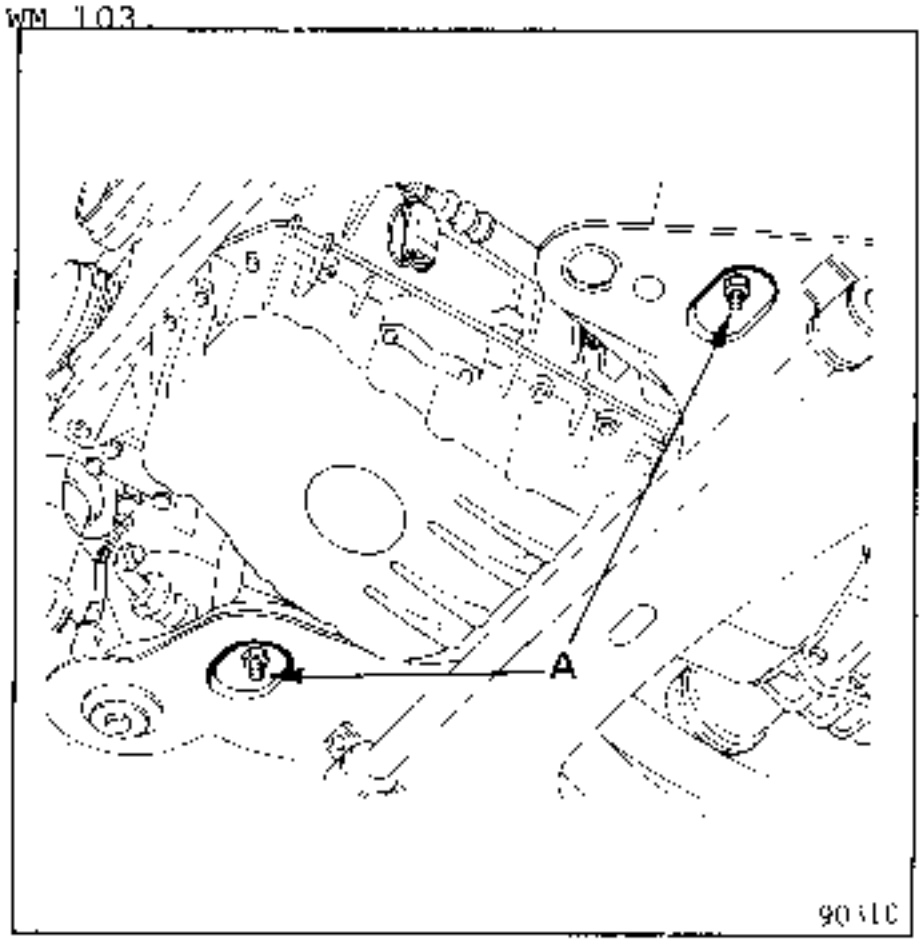


Drain the engine.

Special points, when removing the sump :

Remove the two nuts (A) and lift the engine with the FACOM tooling, using the front lifting lug.

(Engine lifting crosa piece and support) WM 103.



The bolts are of the torx type. Use tool Mot.1063.

Special points when refitting :

The gasket is fitted dry.

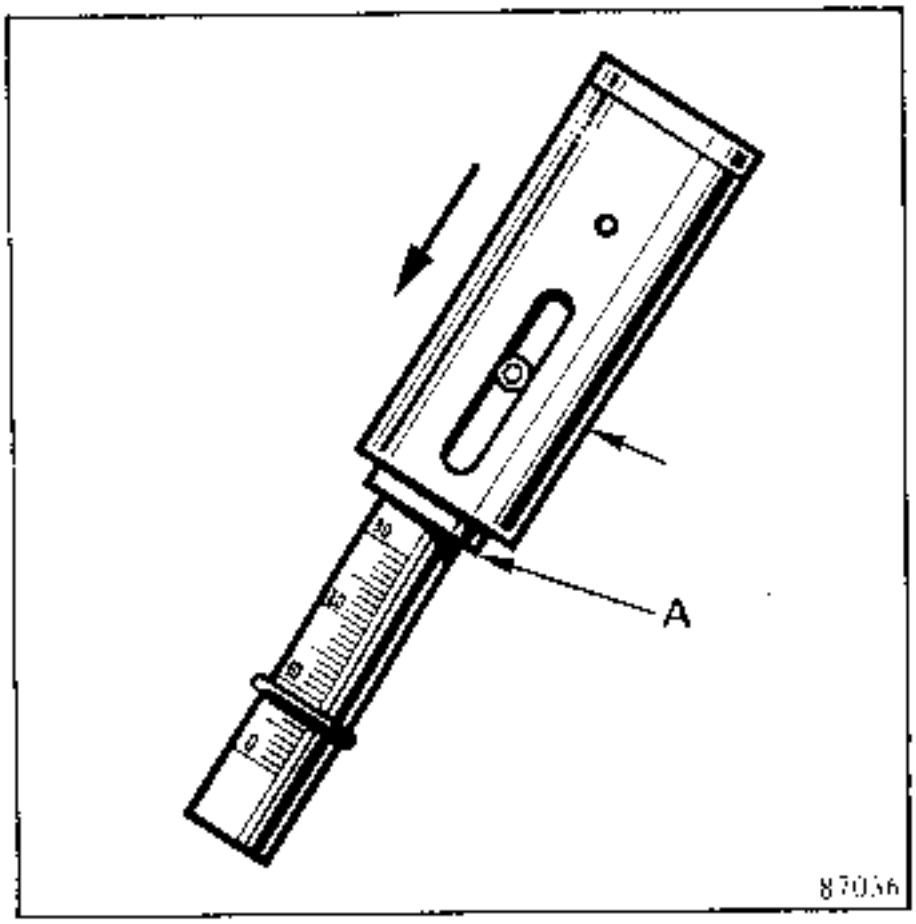
Do not refit the engine to the vehicle before tightening the sump bolts.

Tighten the three bolts connecting the sump to the clutch housing first.

ESSENTIAL SPECIAL TOOL
Ele 346-04 Belt tension tester

A belt must always be fitted with the tensioner in the released position so as not to apply undue force to the pulleys and the belt.

CHECKING METHOD



Ensure that the lower part of the rubber ring is in line with the zero on the plunger scale.

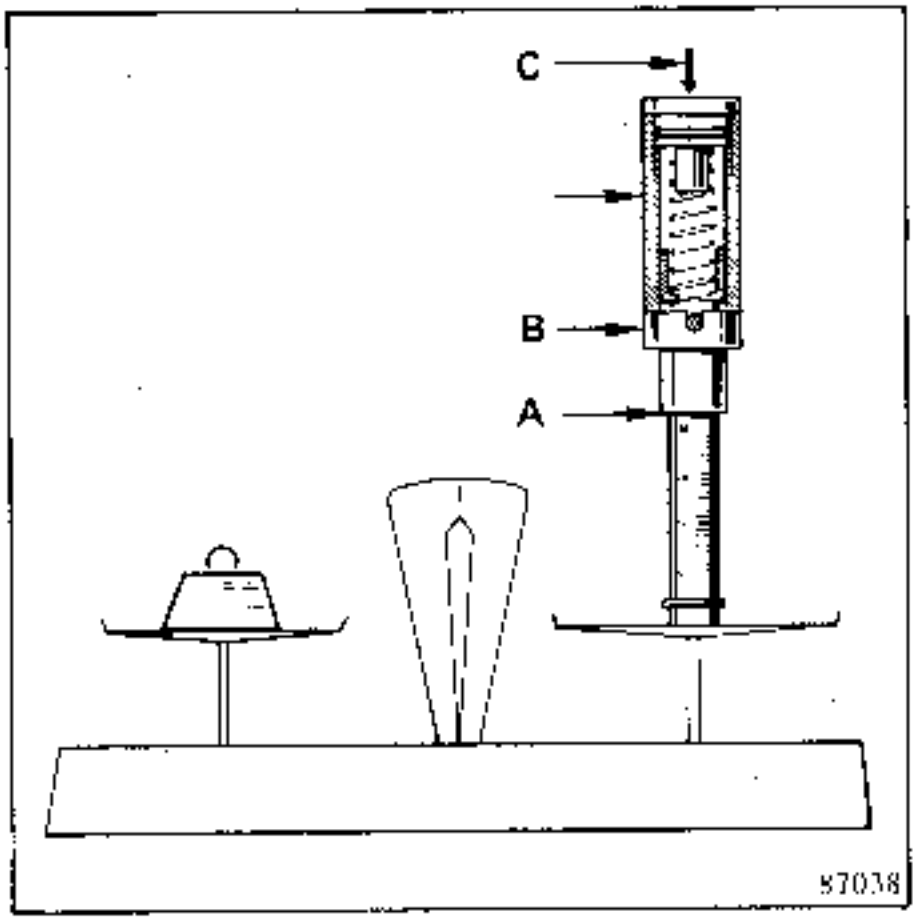
Press the bar against the belt, with the plunger halfway between the centres of the two pulleys.

Press on the sliding part of the plunger until the shoulder (A) is flush with the plunger body.

Remove the tool and read the belt deflection in line with the bottom of the rubber ring.

ZEROING TOOL Ele.346-04.

From time to time check that tool Ele. 346-04 is still accurate.



Apply a force of 3 daN (3 kg weight) to the tool. The shoulder (A) must be flush with the plunger body (B). If it is not, turn screw (C) to increase or reduce the spring pressure.

L 481 - L 482

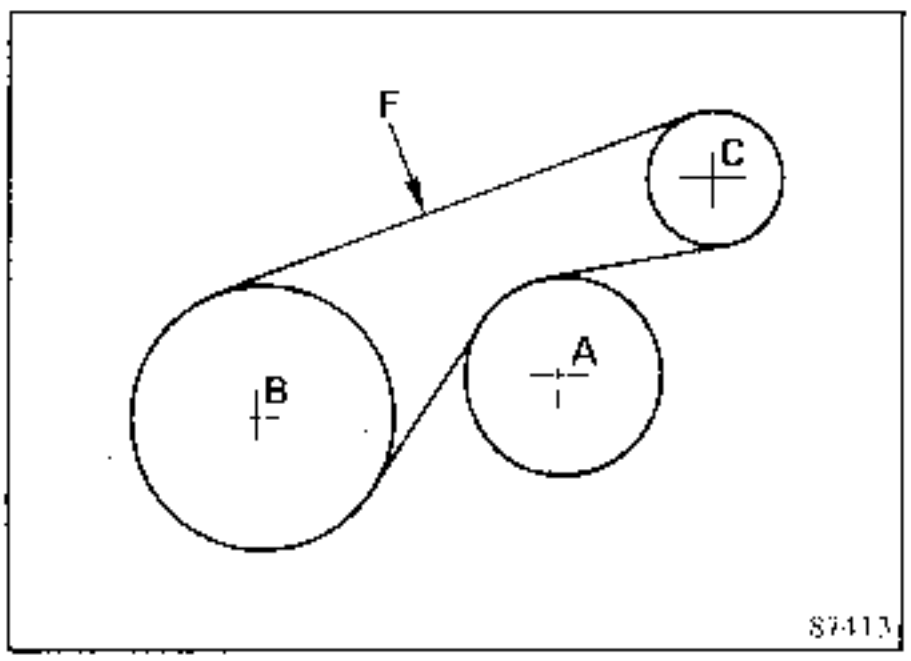
Water pump - alternator drive belt.

Tension, when cold. New belt.

Deflection (F) = 3 mm.

Run the engine until the fan cuts in then readjust the tension if necessary.

Deflection (F) = 4 mm, when warm.

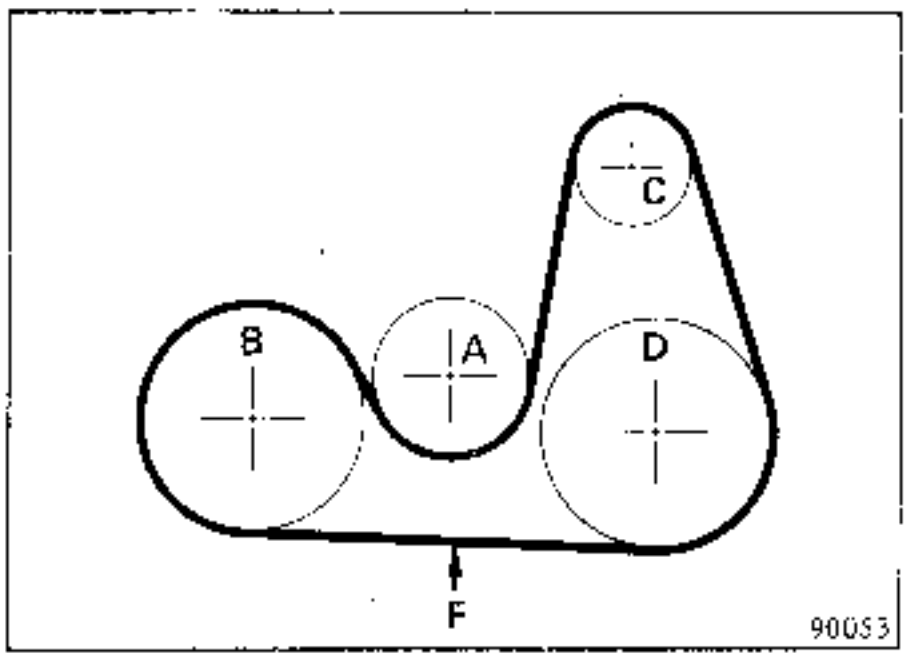


A : Water pump pulley.

B : Crankshaft pulley.

C : Alternator pulley.

D : Power steering pump pulley.

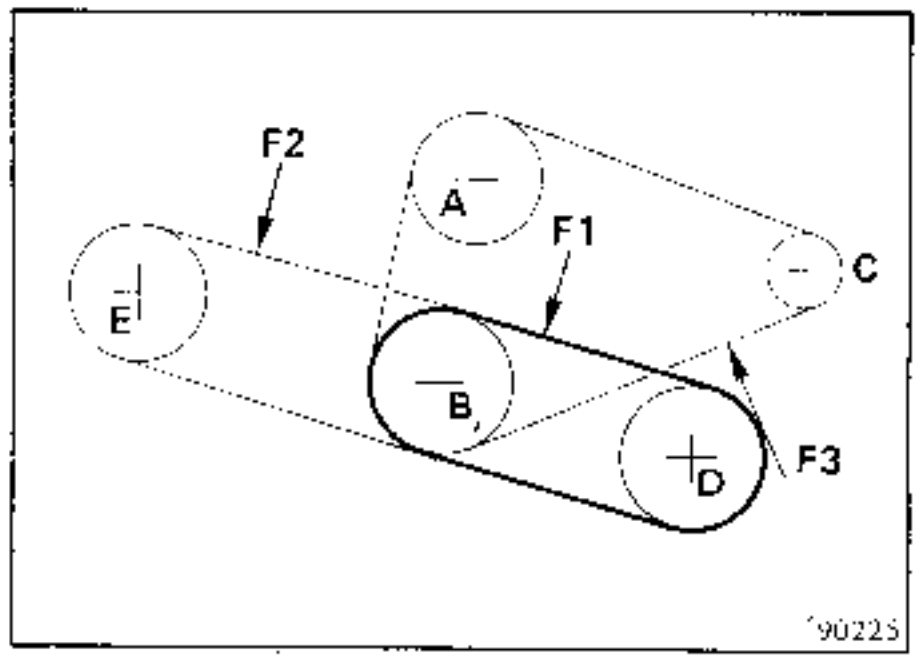


Water pump - Power steering - Alternator drive belts.

Checking :

cold : 2,5 to 3 mm.
warm : 3 to 3,5 mm.

L 483



A : Water pump pulley.

B : Crankshaft pulley.

C : Alternator pulley.

D : Power steering pulley.

E : Air conditioning compressor pulley.

Checking :

F1 = 3 - 3,5 mm.
F2 = 4 mm.
F3 = 4,5 - 5 mm.

warm :

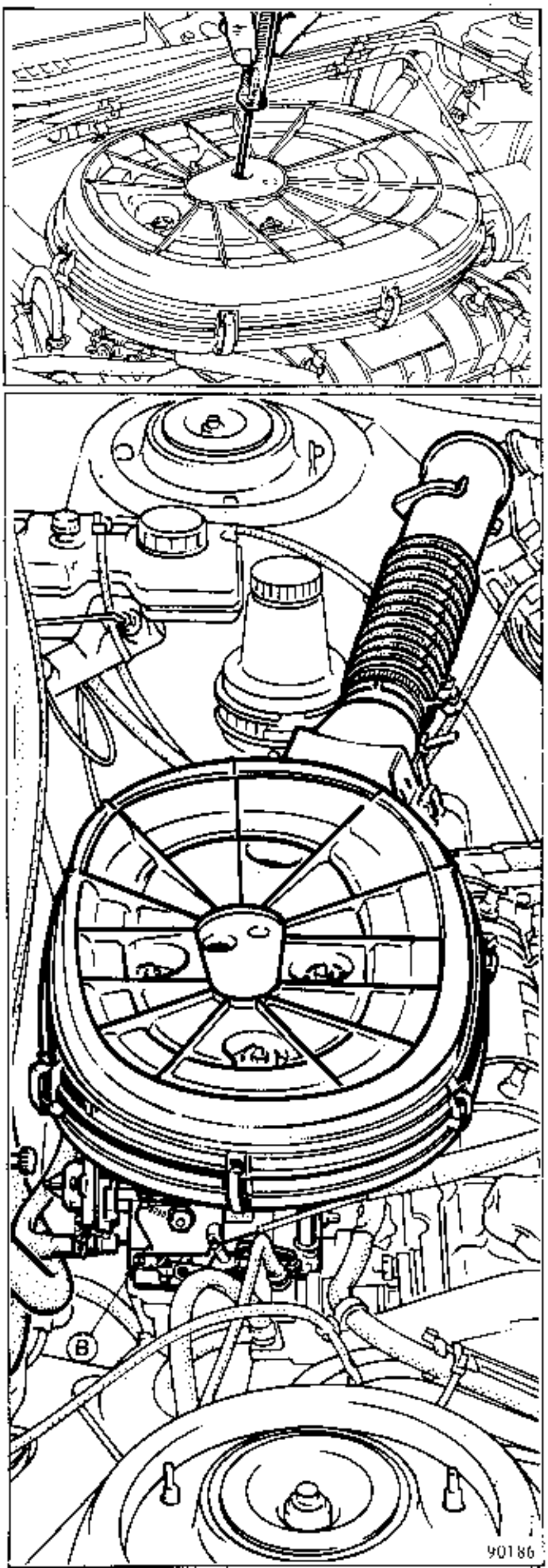
F1 = 4 - 5 mm.
F2 = 4,5 - 5,5 mm.
F3 = 6 - 6,5 mm.

This adjustment is to be carried out accurately so that the CO percentage remains stable between two consecutive inspections. We should also like to remind you that the adjustments must be carried out under clearly determined conditions :

1) The vehicle must be run-in : minimum mileage of 600 miles (1 000 km) (any adjustment carried out on a vehicle that is not run-in may alter very quickly).
2) The choke must not be operating (check this).
3) The engine must be at its normal operating temperature : to obtain this, run it at approximately 2 000 rpm until the thermostat opens. Do not leave it to warm up at idling speed however because if an engine has just run for a few minutes at idling speed, the CO percentage reading is inaccurate.
4) The idling speed must be that laid down by the manufacturer (see chart).
5) The air filter must be in place and its cartridge must be clean.
6) The ignition system must be in good condition and correctly adjusted.
7) There must be no air leakage into the system (through the vacuum pipes, emission control system etc.).
8) There must be no extensive leakage from the exhaust system.
9) None of the large electrical consumers must be operating (electric fan, headlights, heated rear screen etc.).

Adjusting using an exhaust gas analyser.

In those markets where one is fitted, remove the tamperproofing cap from the mixture screw (B).
Turn screw (A) to obtain the nominal idling speed stated on the chart for the vehicle concerned.
Turn screw (B) to obtain the CO percentage stated on the chart.
Turn screw (A) to obtain the correct idling speed.
Repeat these last two operations until both the CO percentage and the idling speed are correct.
In markets where regulations require it, fit a tamperproofing cap to screw (B) after completing the adjustment.



Vehicle	Engine	Capacity cm^3	Fuel	Fuel system	Ref.	Idling speed rpm	Co %
L 481 BM	F.2. N-712	1721	Super (1) O R 98	SOLEX 28 x 34 Z 10	867	700 ± 25	1 ± 0.5
L 482 BM	F.2. N-710	1721	Super (1) O.R98	SOLEX 28 x 34 Z 10	889 889 D(2)	700 ± 50	1.5 ± 0.5
L 483 BM	J.7. R-750	1995	SUPER O R 98		Throttle casing SOLEX 863	775 ± 50* Idling governor	1.5 ± 0.5

*Non-adjustable : Idling speed governor.
(1) Fuel grade GERMANY, AUSTRIA, SWITZERLAND : REGULAR.
(2) Vehicles with Power steering or air conditioning.

TAMPERPROOFING CAP

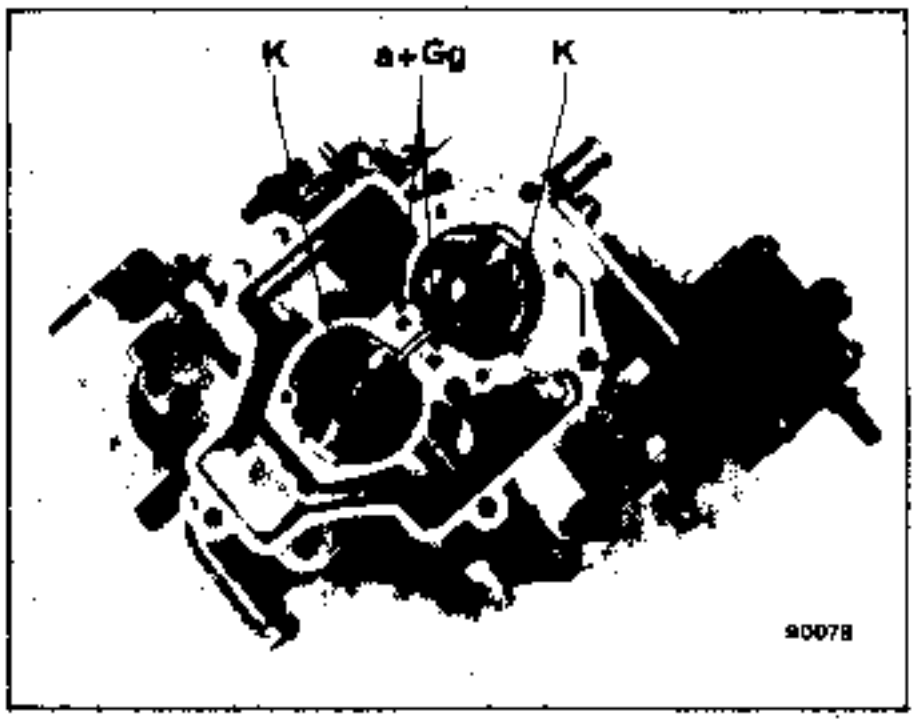
CARBURETTOR	Tamperproofing cap Part No.
SOLEX 28 x 34 Z 10	7701 200 831

IMPORTANT

For those operations not dealt with in this manual that concern :

The carburettor : Consult TECHNICAL NOTE No. 1162 and workshop manual : Carb. S.

Injection : See workshop manual INJ. R (E) published in June 1985.



90078

Item	867		889/889 D*	
	1st barrel	2nd barrel	1st barrel	2nd barrel
Choke tube (K)	20	26	20	27
Main jet (Gg)	97,5	122	100	145
Air correction jet (a)	200	145	210	190
Idling jet (g)	47	45	45-47*	50
Econostat		120		120
Enrichener	50		50	
Needle valve	1,8		1,8	
Float level (mm)	33,5 ± 0,5		33,5 + 0,5	
Gauge no.	71 64 40 82		71 64 40 82	
Accelerator pump inj.	40 | 35		40 | 35	
Accelerator pump travel	cam		cam	
Positive throttle opening (mm)	0,9 ± 0,1		1,0 ± 0,1	
Mechanical initial opening (mm)	24° ± 30'		25° 30' ± 0,30'	
Degassing valve (mm)	2,2 ± 0,1		2,2 ± 0,1	
Cold starting enrich.	2 ± 1		2 + 1	
Clearance before the diapragm moves dim.X mm	2,3 ± 0,1		2,3 ± 0,1	
Idling speed in rpm	700 ± 25		700 ± 50	
CO%	1 ± 0,5		1,5 ± 0,5	

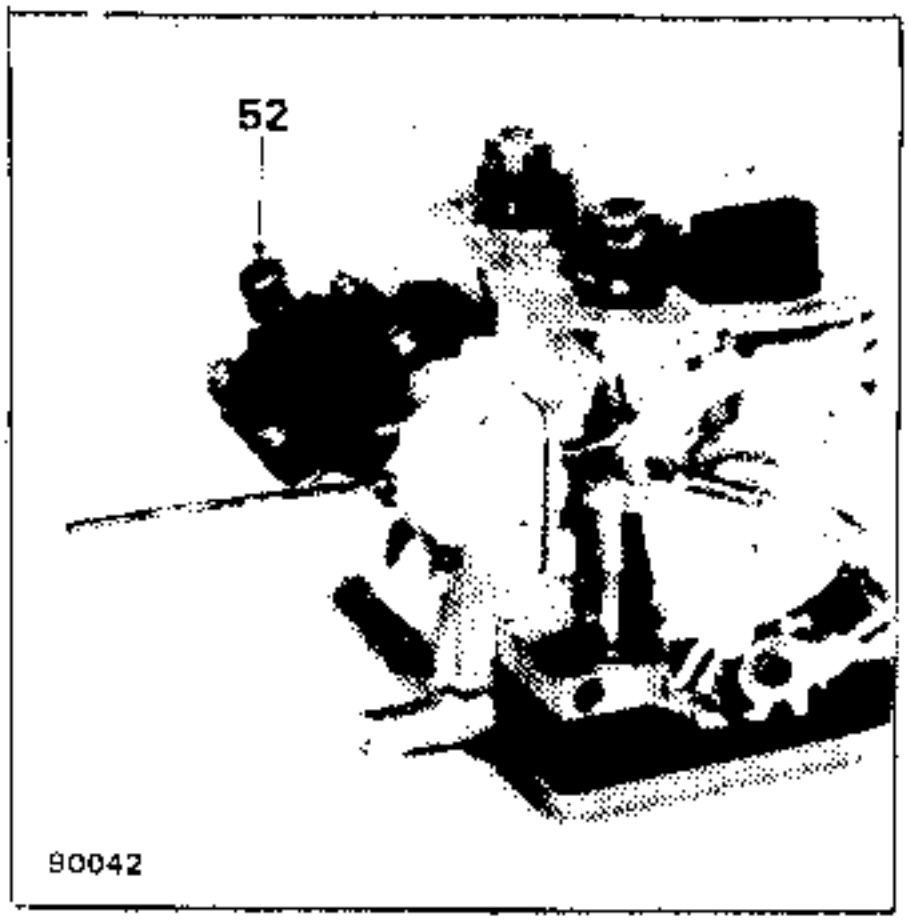
Vehicles with power steering :

On these vehicles, when the wheels are moved through full lock, a pressure switch on the power steering hydeulic system passes the vacuum in the manifold to the actuator by means of a solenoid valve. This restores the correct idling speed and prevents the engine stalling.

After adjusting the idling speed to the figures stated on page 50, operate the anti-stall system (without moving the wheels through full lock) by one of the 3 recommended methods.

The speed should be : 1050 $\pm$ 50 rpm.

Adjust it, if necessary, by turning screw (52).



Adjusting the fast idling speed on vehicles fitted with power steering :

- Engine hot.
- Normal idling speed already adjusted.
- Remove the air filter.

1st Method :

- Disconnect the pipe leading to the actuator (blue union).
- Connect a manual vacuum pump to the actuator.
- Start the engine and run it at idling speed.
- Apply a vacuum of 600 mbars to the actuator and maintain it.
- Adjust the speed by turning screw (52).

2nd Method :

- Disconect the pipe from the actuator (blue union).
- Disconnect the pipe with the red colour code from the carburettor).
- Connect a pipe between the 2 connectors (the one on the actuator and the other on the carburettor red union).
- Pinch flat the pipe with clamp Mot.453-01.
- Start the engine and run it at idling speed.
- Remove clamp Mot.453-01.
- Adjust the idling speed by turning screw (52).

3rd Method :

- Engine warm and running at idling speed.
- Disconnect the connector from the pressure switch.
- Interconnect the female terminals on the connector on the wiring harness side :
  - the engine speed should increase.
- Adjust the speed, if necessary, by turning screw (52).

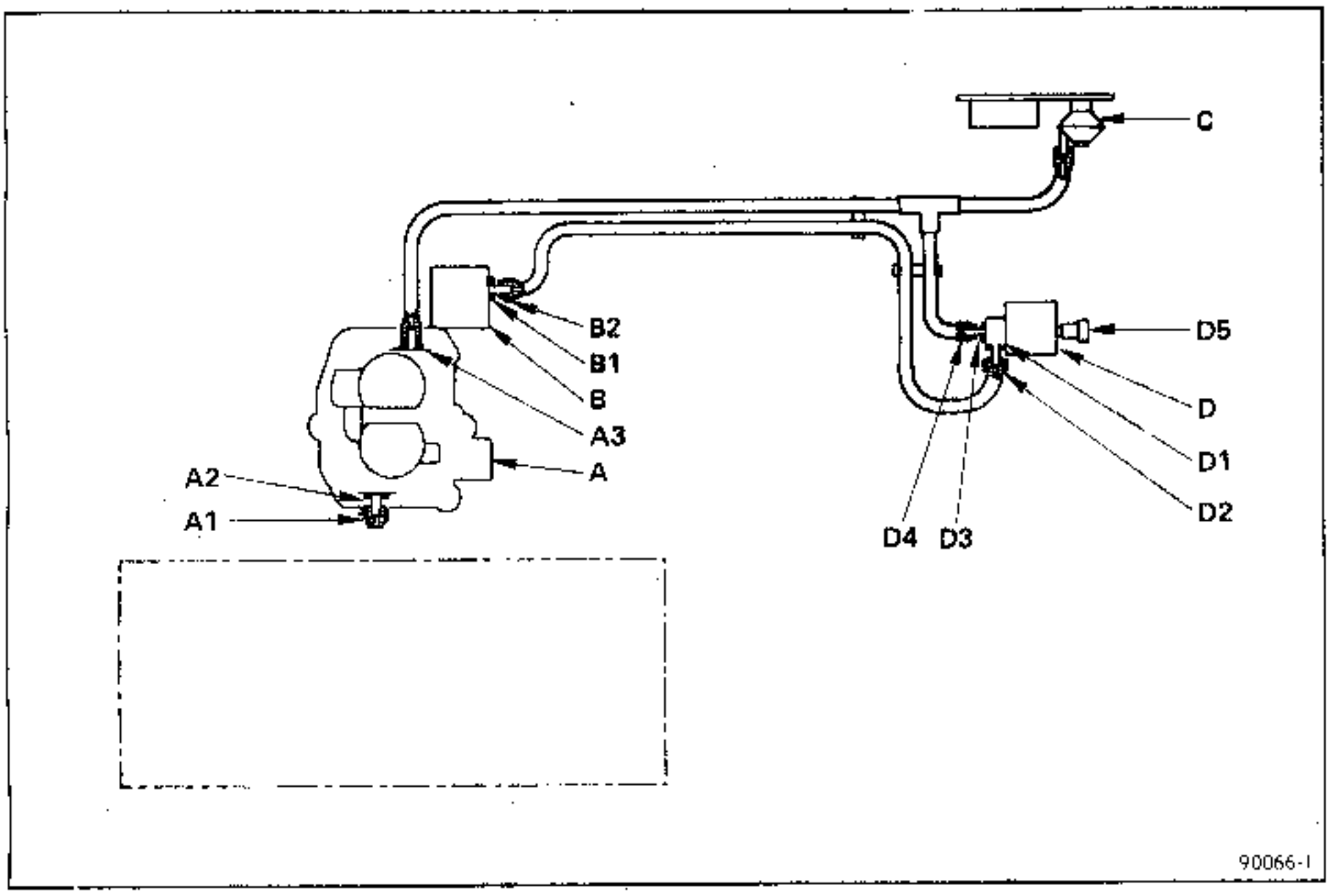
Vehicles with air conditioning :

The engine is to be warm.
Switch on the air conditioning system at idling speed :

- the fast idling speed should be 950 $\pm$ 50 rpm.

If necessary, adjust it by turning screw (52).

Vacuum system on vehicles equipped with air conditioning or power steering



A : Carburettor

A1 : Cap on black pipe.
A2 : Identification ring on carburettor, coloured red.
A3 : Identification ring on carburettor, coloured black.

B : Throttle actuator

B1 : Identification ring, coloured Blue, on actuator

C : A.E.I. system
On A.E.I. systems there is no identification mark.

D : Solenoid valve : near A.E.I. unit.

D5 : Filter on solenoid valve.

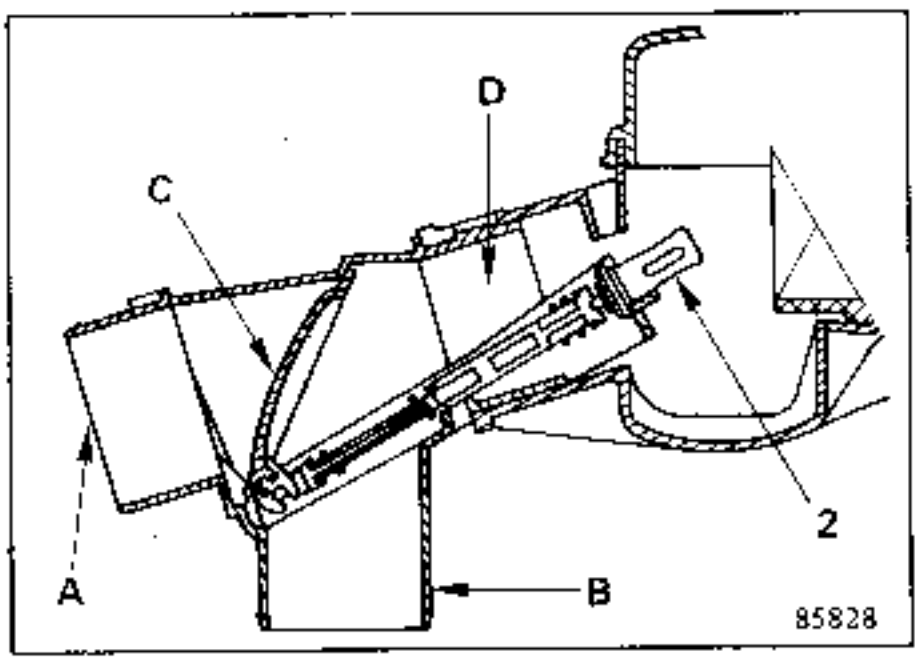
Type F.2.N engine

Vehicles fitted with the type F.2.N. engine are equipped with an intake heating system.

DESCRIPTION

This system comprises an air filter with a double inlet carrying a flap that meters the proportion of cold air entering.

The metering flap is controlled by a wax element type thermostat (2) mounted on the air filter casing, in the hot air/ cold air mixture flow.



A - Cold air intake.
B - Hot air intake.
C - Flap.
D - Mixture of air passing to carburettor.

CHECKING

Immerse the air filter casing in water up to the filter element.

After 5 minutes immersion :

- when the water is at 26°C, the flap should shut off the cold air inlet,
- when the water is at 36°C, the flap should shut off the hot air inlet.

ADJUSTMENT :

The air regulator system cannot be adjusted.

In case of defect, replace metering flap-thermostatic element assembly.

Removing :

- Disconnect the hot air pipe from the scoop.
- Disconnect the cold air pipe from its fastening on the scuttle.
- Unscrew the nuts that secure the filter to the carburettor.
- Disconnect the oil vapour reintake pipe.

Refitting :

Carry out the removing operations in reverse.

Filter element :

Replace every 10 000 miles (20 000 km).

REPLACING THE FILTER ELEMENT

Remove the air filter.
Unclip the air filter casing securing clips.
Replace the filter element.
Assemble the casing by using the clips.
Refit the filter element.

Type J.7.R. engine :

The air filter is mounted on a support which is, in turn, secured to the left hand shock absorber turret.

Removing :

The air filter clips on to its support. To remove it, simply pull it vertically upwards after first disconnecting the duct leading from the filter to the carburettor intake casing.

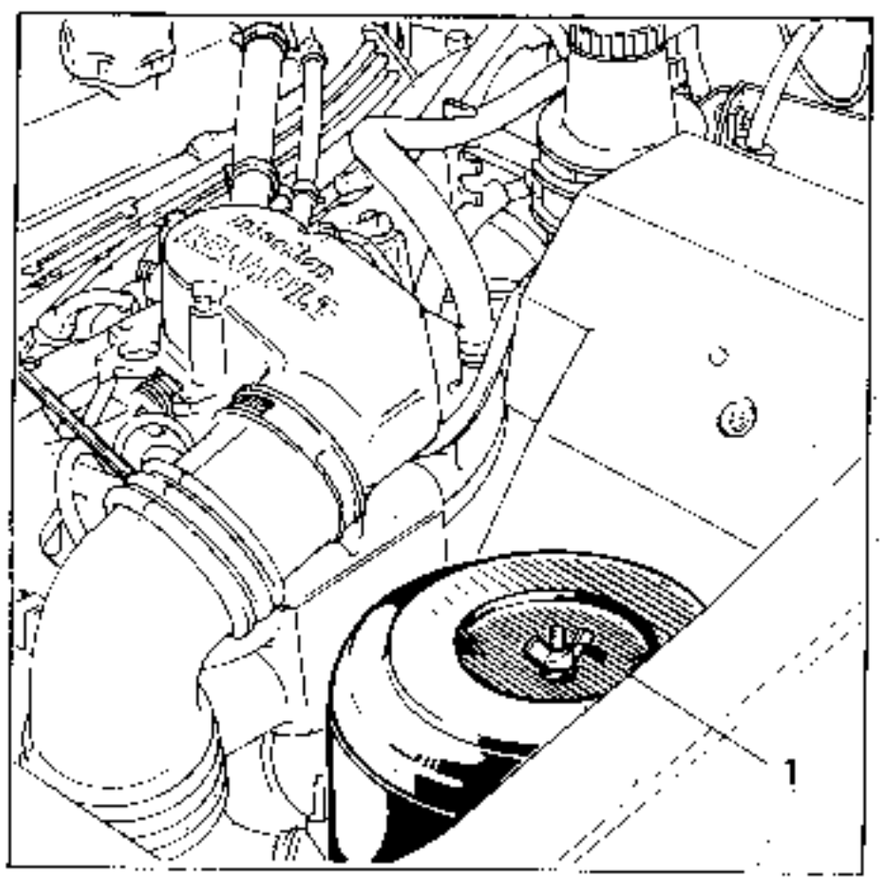
Refitting :

Ensure that the filter fits fully on to its support.

CHANGING THE FILTER ELEMENT :

Unscrew the screw (1) that secures the filter cover in place.
Remove the cover.
Take out the cartridge and fit the new one.

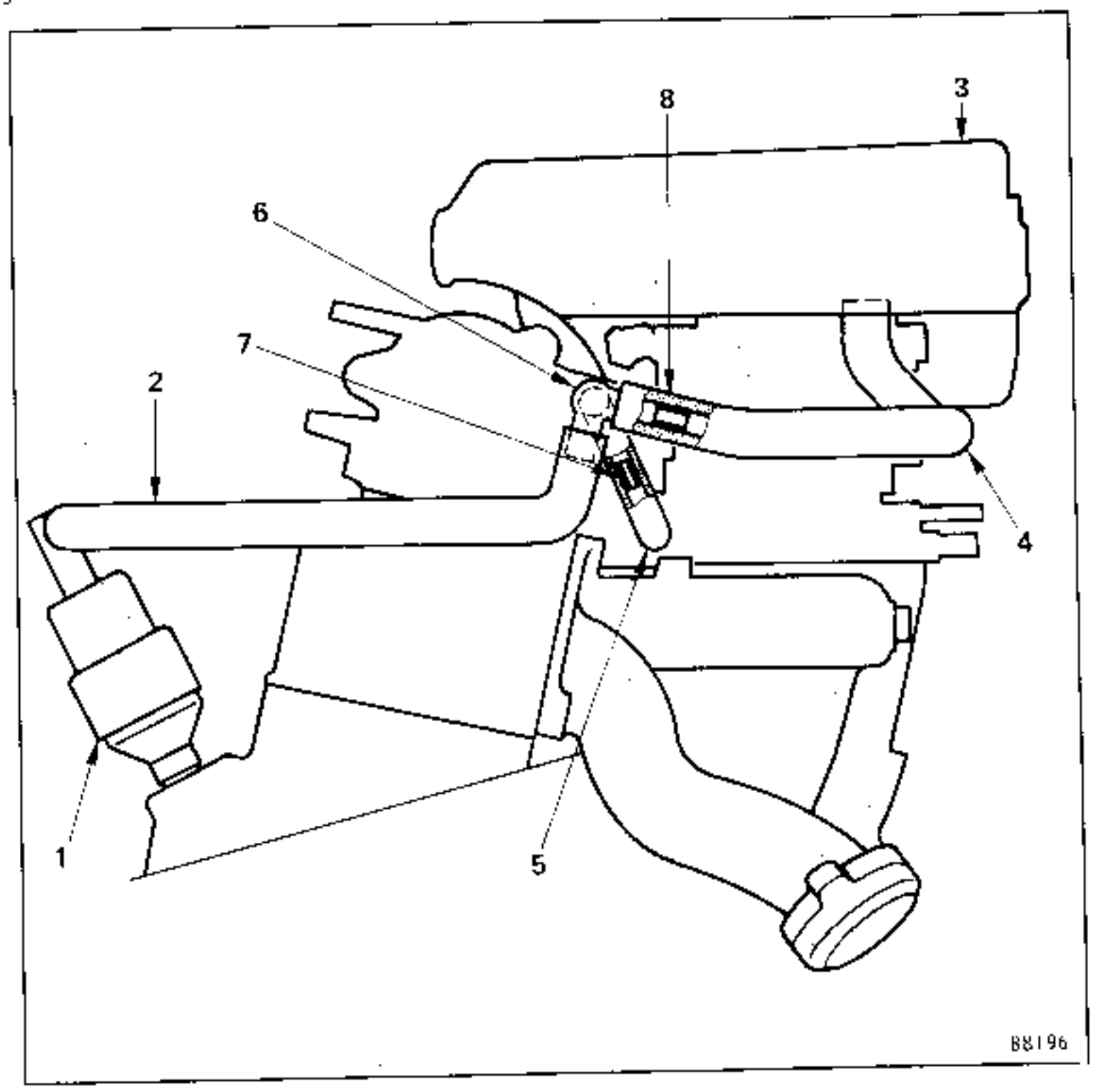
IMPORTANT :
On refitting, ensure that the cover



locates correctly on its locating spigot.

The crank case gasses are recycled by carrying them from the rocker arm cover to the inlet manifold through a dual circuit (input and output) so that they will be burnt in the combustion chambers.

F.2.N. engine



1 - Drain casing
2 - Piping (from drain casing to 3 way union)
3 - Air filter
4 - Piping (from filter to 3 way union)
5 - Piping (from 3 way union to carburettor base)
6 - 3 way union
7 - 1,7 mm Ø jet
8 - 7 mm Ø jet

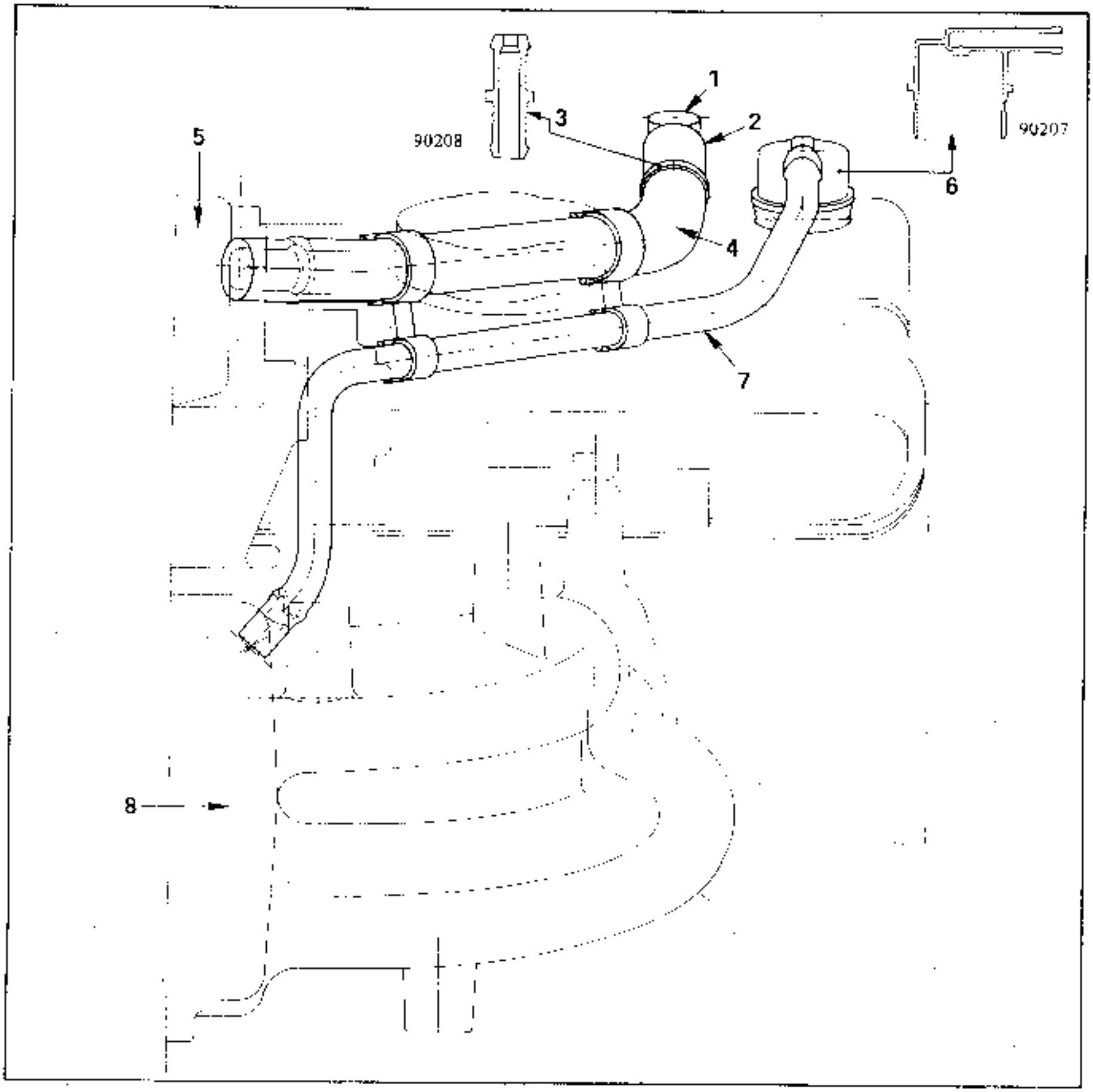
Checking

The oil vapour reintake circuit must be kept clean to ensure that the emission control system operates correctly.

Check that the jets are in position and are of the correct size.

The crank case gasses are recycled by carrying them from the rocker arm cover to the inlet mixer casing through two circuits (one on the input, the other on the output side) so that they are burnt in the combustion chambers.

J7.R. engine



1 — 2 way union
2 — Pipe between 2 way union and calibrated connector
3 — Calibrated connector : Ø 6,5 colour : Red
4 — Pipe between calibrated connector and air intake casing
5 — Air intake casing on throttle housing
6 — 2 way union
Internal jet : Ø 1,8 mm
7 — Pipe connecting the 2 way union with the jet to the mixer casing
8 — Mixer casing

Before carrying out any work or fault finding, consult manual MR INJ. R (E)

Vehicle	Type	Engine	Injection system
Renault 21	L 483	J.7. R-750	RENAULT R electronic
Fuel pump (on front of RH side of rear cross member)		Voltage : **12 Volts** Pressure : **3.0 Bar** Delivery : **130 l/h.**	
Fuel filter (beside fuel pump)		Replace every : 30 000 miles (50 000 km)	
Air filter, paper element		Replace every : 10 000 miles (20 000 km)	
Pressure regulator		Pressure : - zero vacuum : **2,5 ± 0,2** - vacuum 530 mbar : **2,0 ± 0,2**	
Solenoid injectors		Operated only by a computer : - Voltage : **12 Volts** - Resistance **2,5 ± 0,5 Ω**	
Throttle casing		SOLEX Single barrel ∅ **50**. Ref : **863**	
Regulator valve		Bosch Voltage : **12 Volts**	
Idling speed		- Idling **775 ± 50** (non-adjustable) - Mixture **1,5 ± 0,5 CO** - Tamperproofing cap : **7701 200 831**	
Computer		- Renix No. **S 100 805. 101.** - RNUR No. : **7700 733 848.** - Off. approval : **7700 731 803.**	
Diagnostic Code		**20.**	

Water temperature sensor	Temperature °C	20 ± 1	80 ± 1	90 ± 1
	Resistance	283 to 297	383 to 397	403 to 417
Air temperature sensor	Temperature °C	0 ± 1	20 ± 1	40 ± 1
	Resistance	254 to 266	283 to 297	315 to 329

The type "R" injection system fitted to the L 483.BM is characterised by :

Its throttle casing, which is 50 mm in diameter and is mounted on the top of the air mixer.

The idling regulator valve which is identical to that of the B 29 E and B 295 and is fitted to the radiator upper cross member.

The computer is mounted in a plastic protector which is itself contained in a plastic casing on the left hand shock absorber turret.

The relays are in the same casing as the computer.

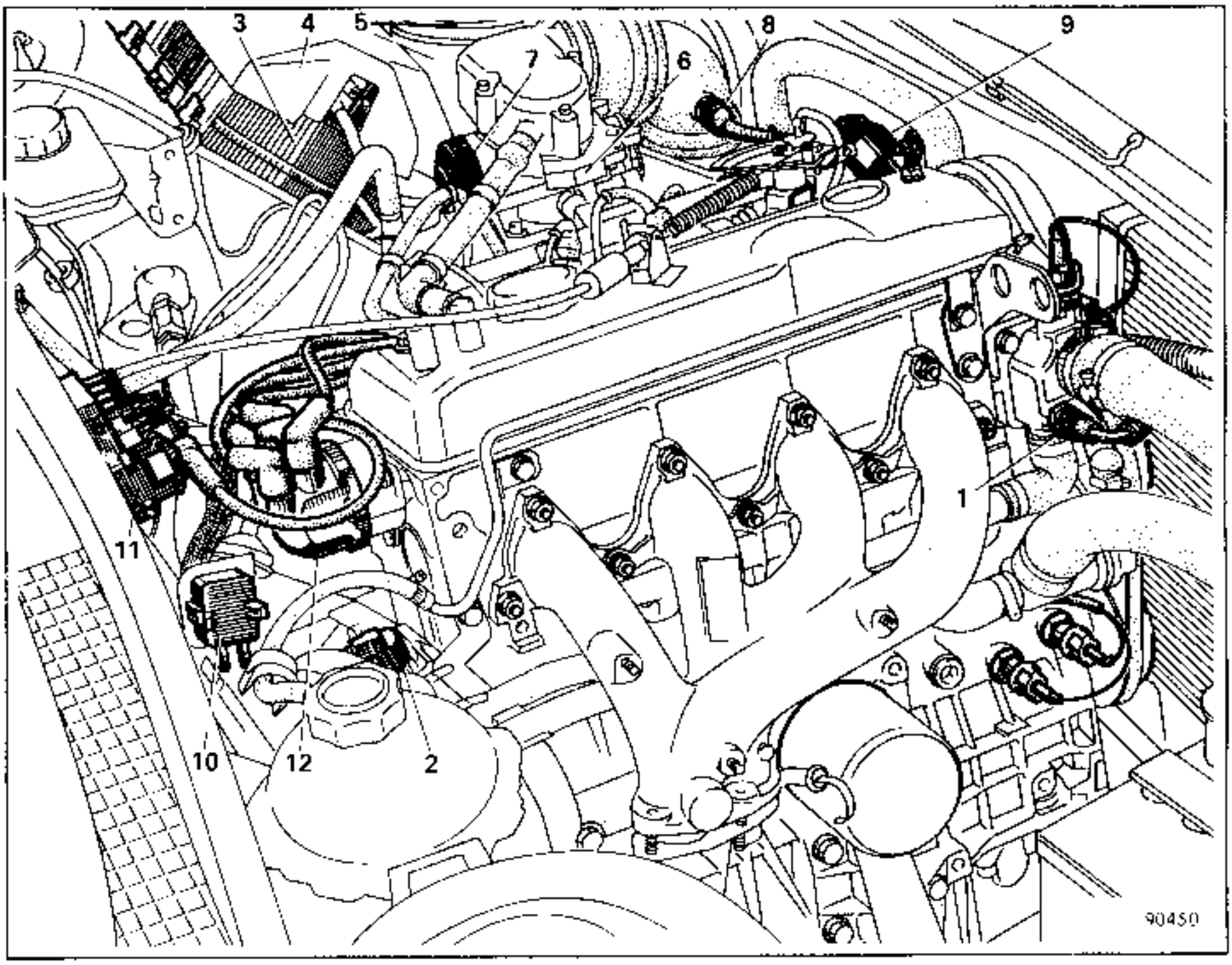
The absolute pressure sensor and the idling speed adjusting potentiometer are secured to the computer outer protection casing.

Access to them is gained by removing the outer casing.

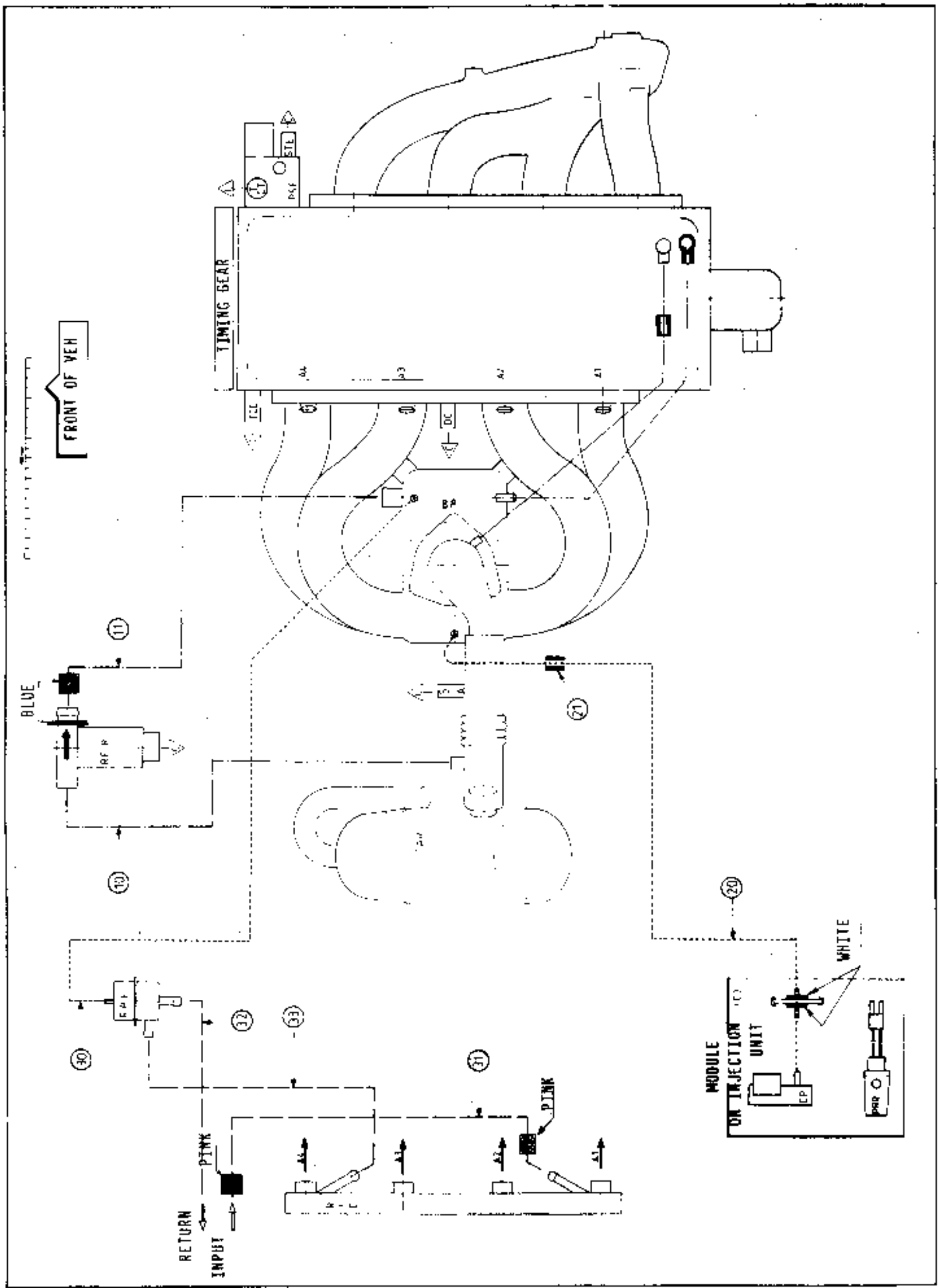
The specifications of the air temperature and warning temperature sensors are identical.

They are the same as those fitted to the B 295.

The computer controls both injection and ignition. The ignition initial timing is adjusted by a pre-ignition detector secured to the cylinder head between cylinders nos. 2 and 3, on the same side as the air mixer casing.



1 - Water temperature sensor
2 - Position and speed sensor
3 - Computer and protective housing
4 - Protective casing
5 - Air filter
6 - Throttle casing
7 - Throttle switch
8 - Air temperature sensor
9 - Idling speed regulator valve
10 - Diagnostic plug
11 - Ignition unit
12 - Distributor


FRONT OF VEH
TIMING GEAR
BLUE
PINK
PINK
RETURN
INPUT
WHITE
MODULE
UNIT

B.P : Throttle casing.
CP : Absolute pressure sensor.
RIE : Fuel injection gallery.
RER : Electronic idling speed regulator.
RPE : Fuel pressure regulator.
PRR : Idling mixture potentiometer.
FAR : Air filter, with resonator.

PSE : Water output pipe.
TCE : Thermistor.
TCT : Temperature switch.
STE : Water temperature sensor.
STA : Air temperature sensor.
DC : Pre-ignition detector.

ELECTRONIC IDLING SPEED REGULATOR				
REF	DESCRIPTION	CLIPS	COLOUR OF RING	REMARKS
10	Input pipe	2	None	On electronic regulator, blue ring
11	Return pipe	2	Blue	Return side

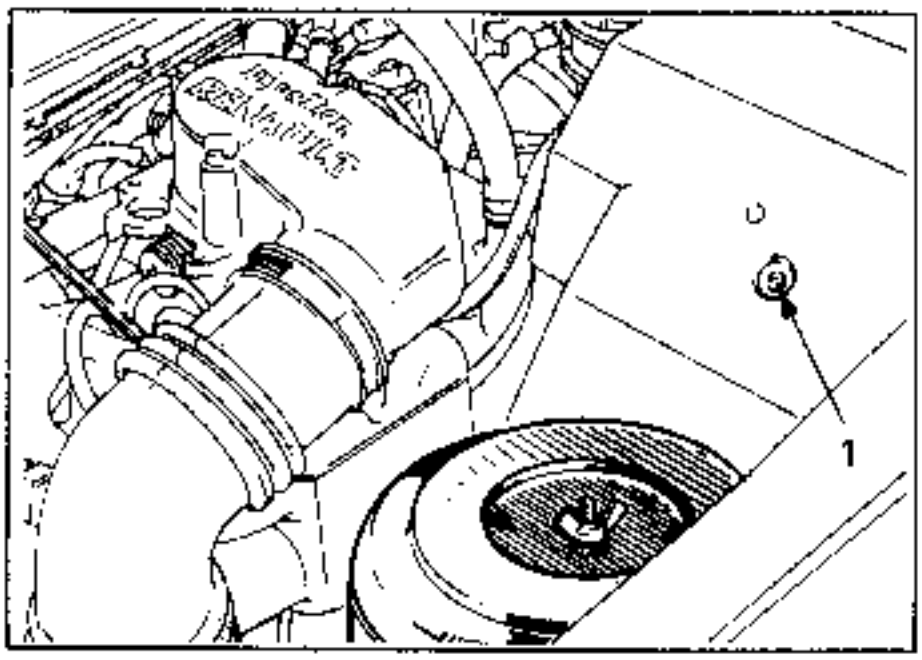
ABSOLUTE PRESSURE SENSOR (MAP SENSOR)				
REF	DESCRIPTION	COLOUR OF RING	CLIPS	
20		None	None	
21	1,5 Ø jet	White jet		

FUEL PIPES				
REF	DESCRIPTION	CLIPS	COLOUR OF RING	
30	Vacuum pipe	None	None	
31	Input pipe	2	Pink	
32	Return pipe	2	None	
33	Pipe between gallery and RPE.	2	None	

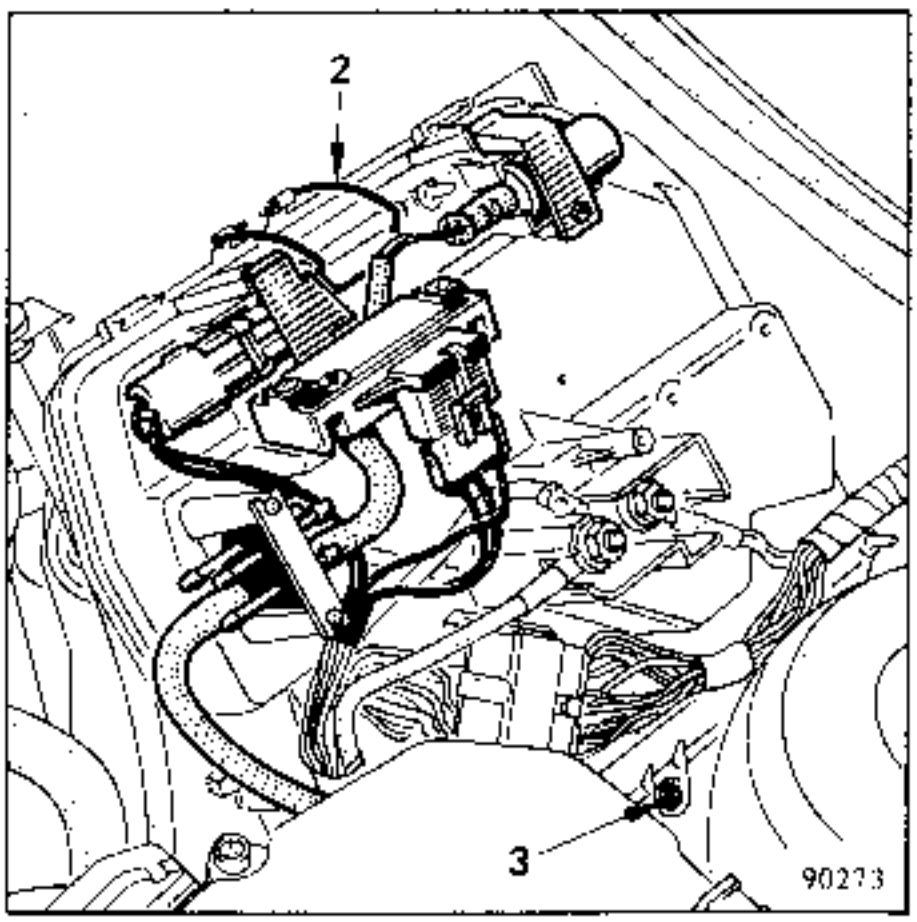
Removing the Computer :

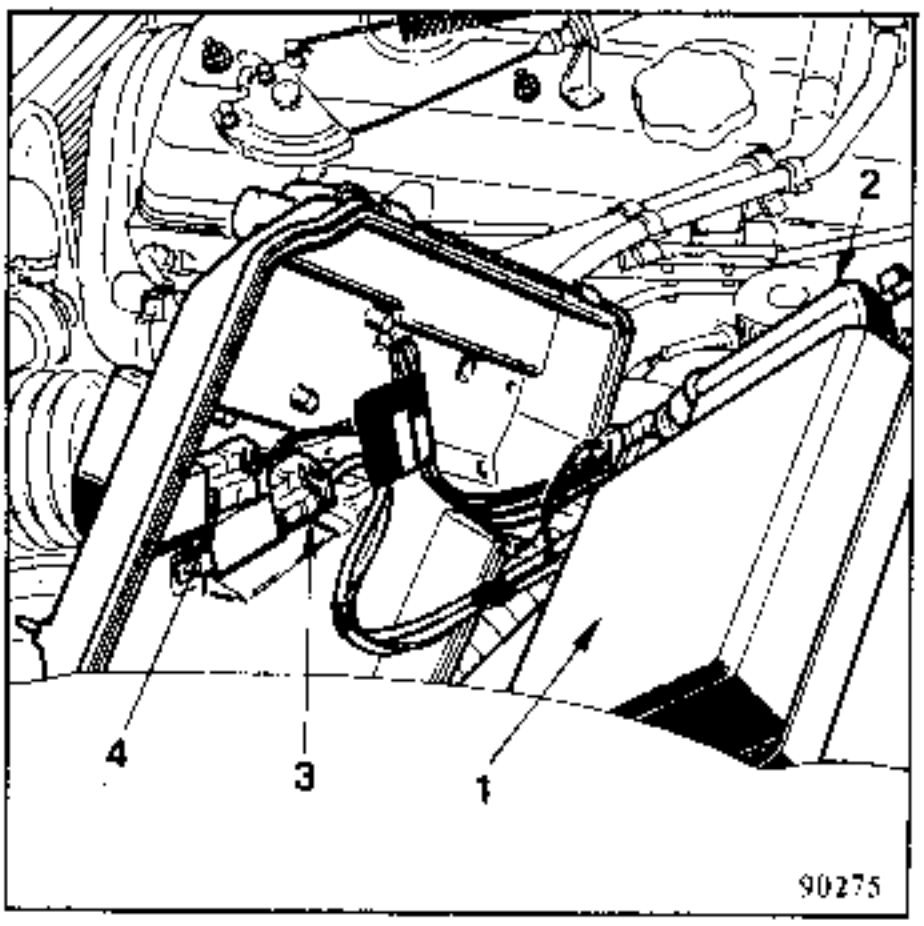
Removing :

- Unscrew the screw from the protective casing (1).



- Release the clip holding together the 2 parts of the casing that protect the computer (2).
- Separate the 2 parts of the casing by unscrewing the screw (3).
- Disconnect the computer harness connector.
- Unscrew the screws securing the computer to its protective casing.





1 - Computer
2 - Connector

Refitting :

Carry out the removing operations in reverse.

IMPORTANT :
On refitting, ensure that the locating studs on the computer protective casing enter the support before clipping the assembly retaining clip into place.

Removing the Relays :

The relays are in the top of the plastic casing that protects the computer.

3 - Pump relay (493)
4 - Supply relay (381).

Removing :

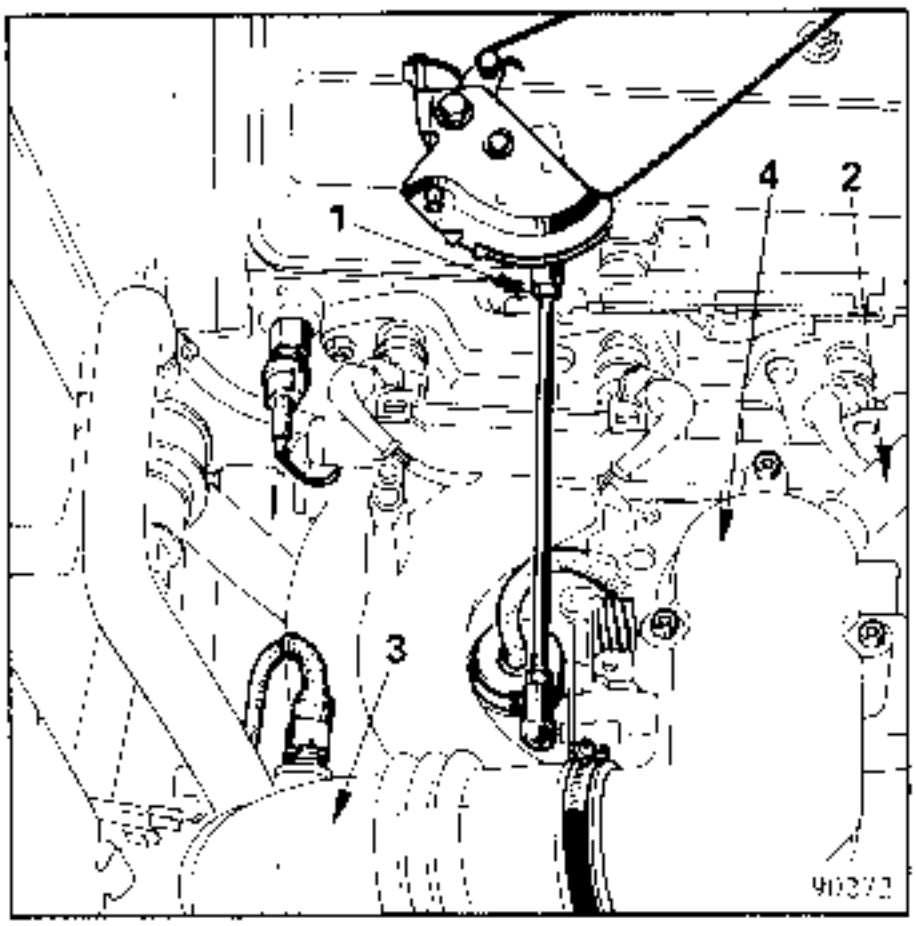
- Remove the housing secured to the computer protective casing.
- Dismantle the computer protective casing (See "Removing the computer").

IMPORTANT :
Before removing the relays, disconnect the battery.

Removing the Throttle casing.

Removing :

Disconnect :
- The throttle control (1)
- The oil vapour reintake pipe (2)
- The air intake ducting (3)
- The air intake casing (secured by 3 screws) (4)
- The throttle casing itself



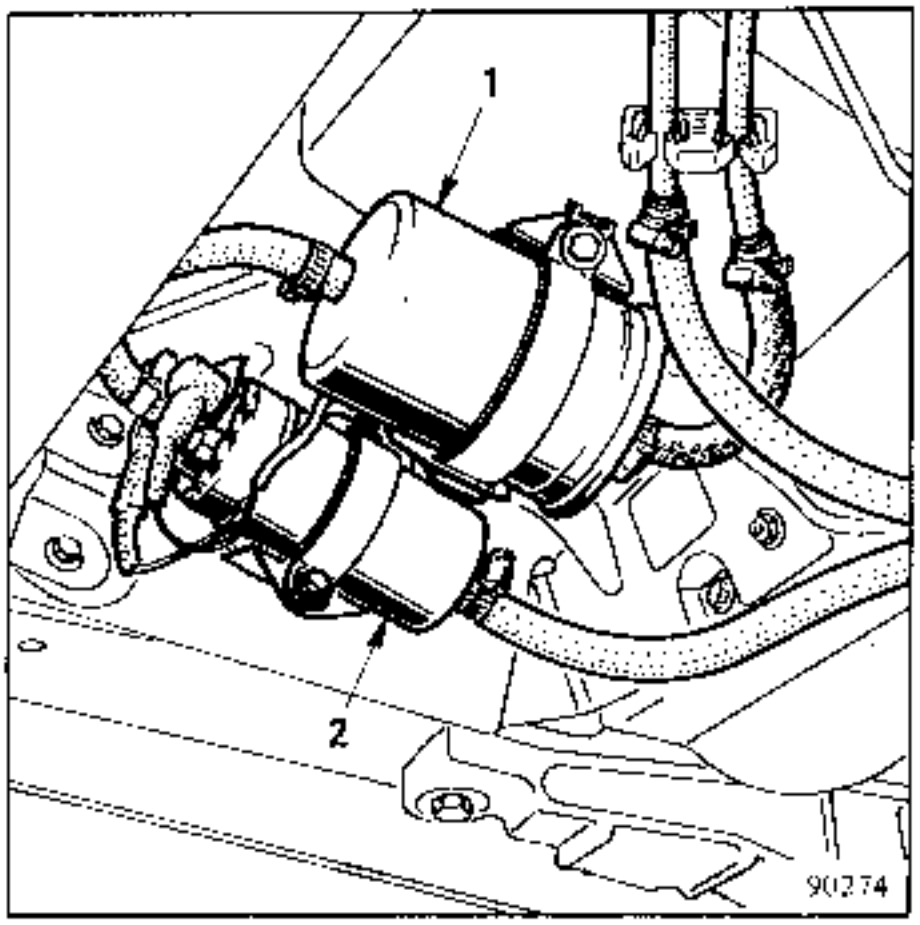
Refitting :

Fit a new seal.

Replacing the fuel filter :

This is to be replaced every 30 000 miles (50 000 km).

The fuel filter is mounted on a plate alongside the fuel pump, on the front of the rear cross member.
Replacing the filter is covered, in full, in the section on removing the fuel pump.



1 - Fuel filter
2 - Fuel pump

FUEL PUMP

ESSENTIAL SPECIAL TOOLS	
Mot.453-01	Hose clamp

Removing :

The pump is mounted on a plate together with the fuel filter.
- Fit clamps Mot.453-01 to the hoses and disconnect them,
- Disconnect the electrical wiring from the pump,
- Unscrew the clamp that retains the fuel pump,
- Take out the pump.

- Unscrew the clamp that secures the fuel filter.
- Take out the filter.

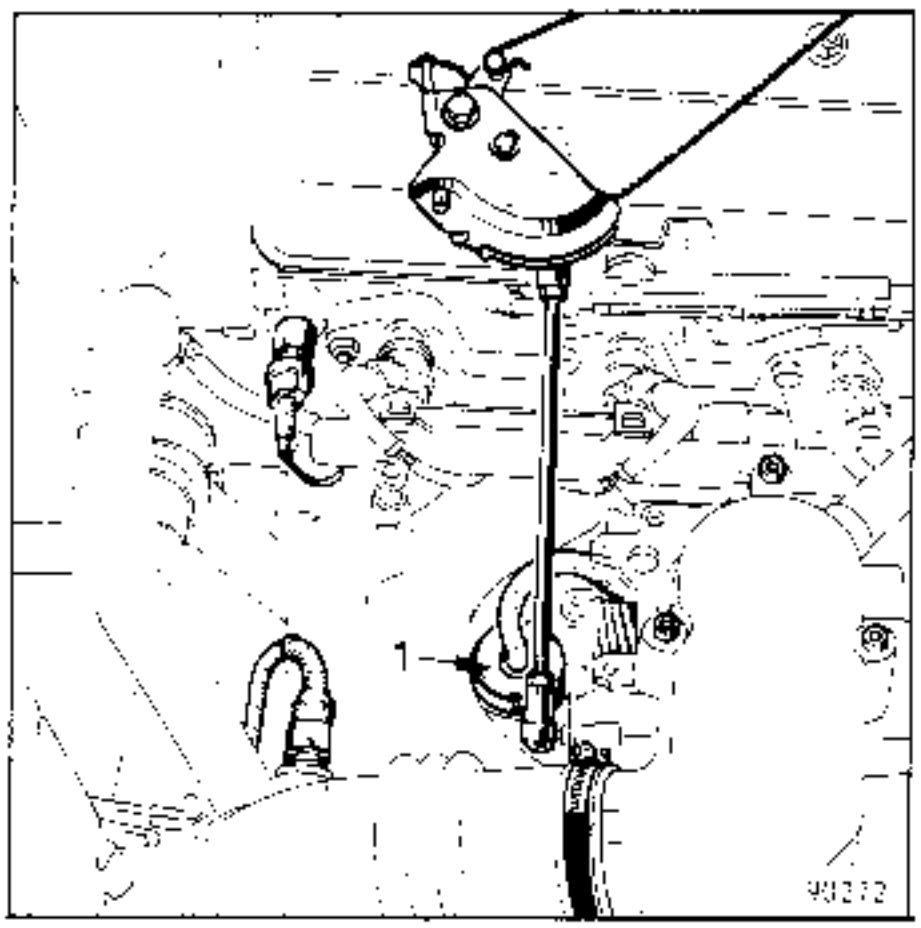
Refitting :

IMPORTANT :
- Check on the condition of the pipes and their connections and check the electrical wiring (the positive and negative poles are shown on the pump).
- The direction of fuel flow is shown on the filter.
- Replace the securing clamps.
- Remove hose clamps Mot.453-01.

PRESSURE REGULATOR

Removing :

- Fit clamps Mot.453-01 before disconnecting the fuel and vacuum pipes.
- Unscrew the 3 securing screws (under the mixer).
- Remove the regulator.



1 - Pressure regulator

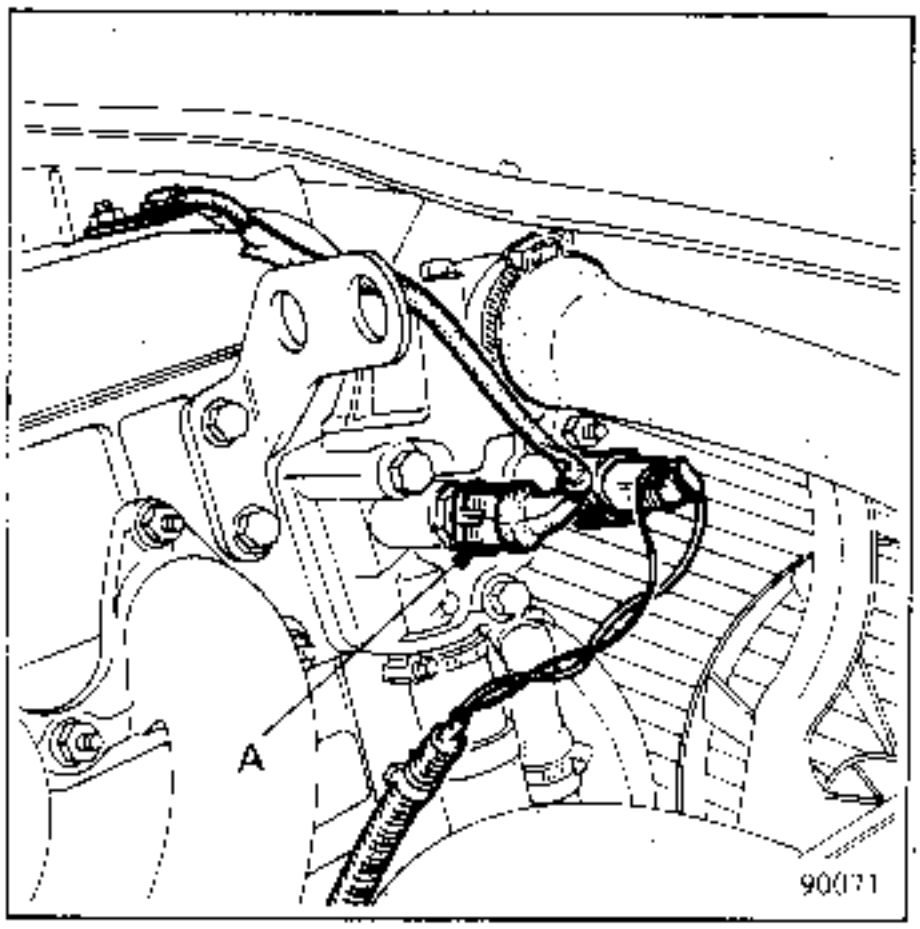
Refitting :

Remove clamps Mot.453-01
Check the system for leaks.

Replacing the water temperature sensor.

Precaution : Wait until the engine is cold.

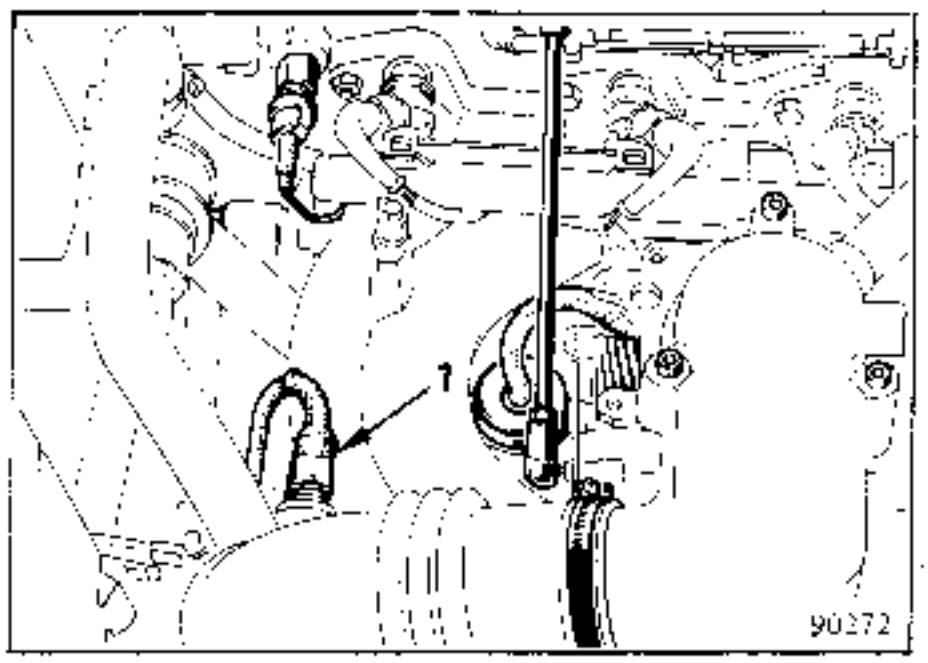
Disconnect the electrical wiring connector. Unscrew the sensor and quickly plug the hole in the water pump to avoid losing the coolant.



A - Water tenperature sensor

Replacing the air temperature sensor

Disconnect the electrical wiring connector.
Remove the air duct leading from the air filter to the throttle casing.
On refitting, ensure that all the pipes are correctly connected.



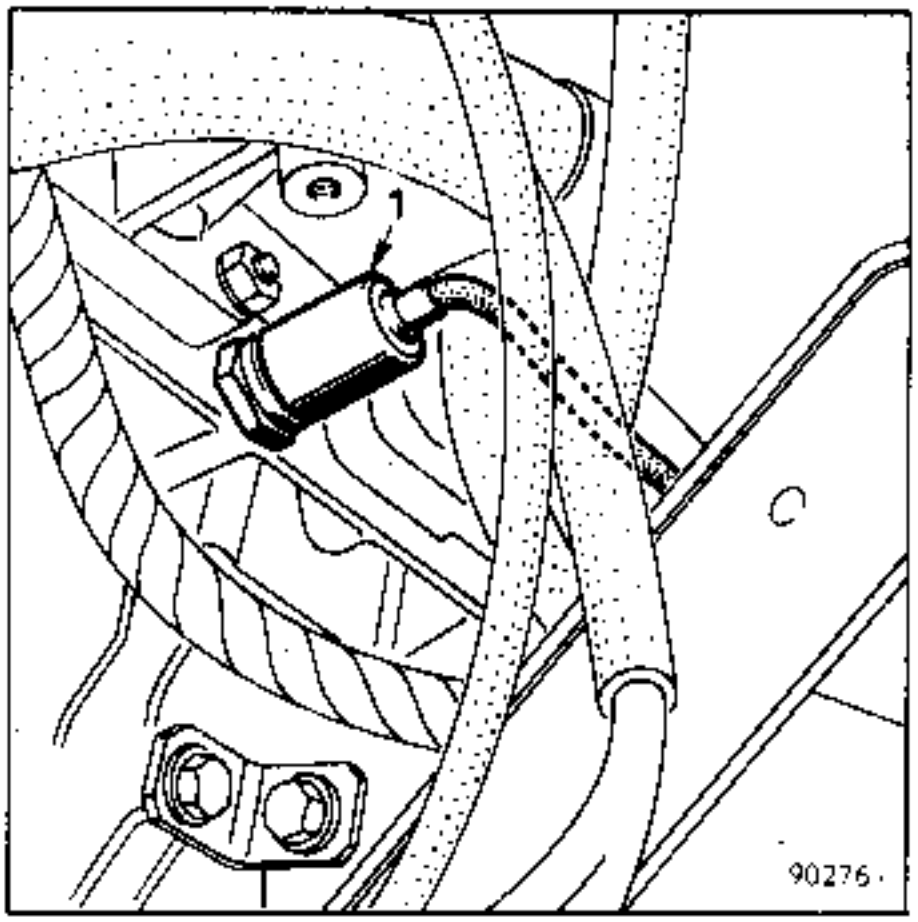
1 - Air temperature sensor.

Replacing the pre-ignition detector :

Removing :

Disconnect :
The air temperature sensor.
The duct connecting the air filter to the air intake casing.

Remove the air filter.
Disconnect the pre-ignition detector connector.
Loosen the pre-ignition detector (1) with a 24 mm open ended spanner, gaining access to it from under the air mixer.

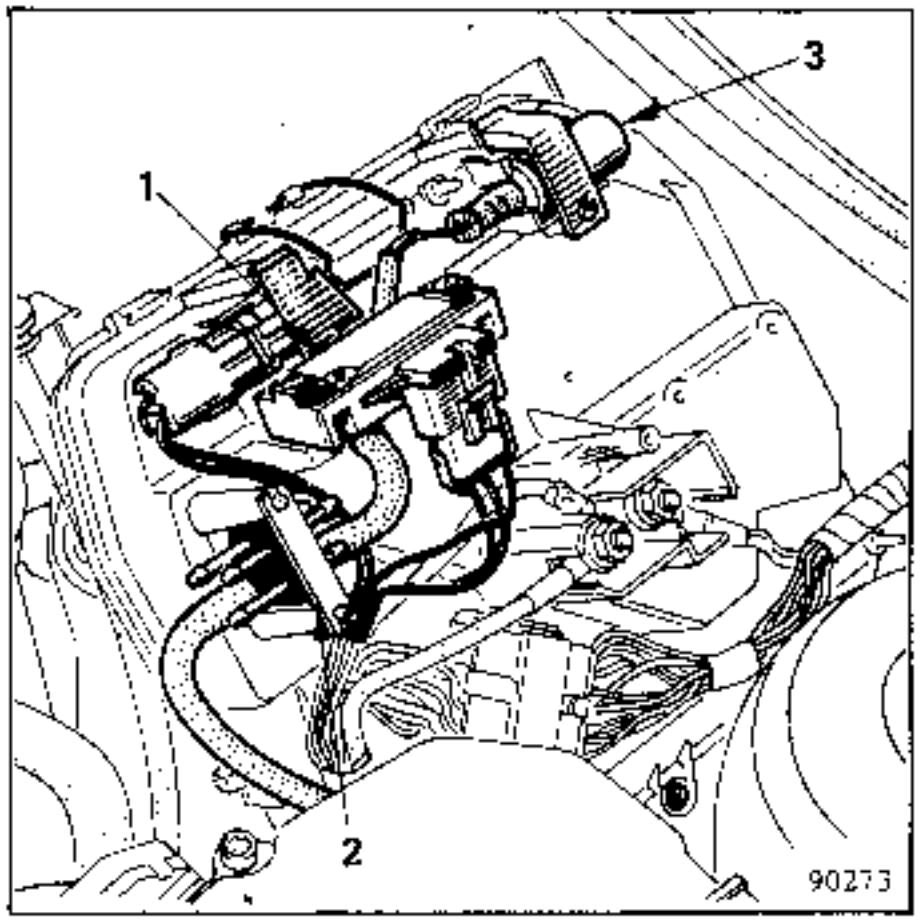


1 - Pre-ignition detector

Replacing the absolute pressure sensor (1).

Removing :

- First remove the plastic casing that protects the computer and its housing and then disconnect :
  - The connector on its electrical wiring harness.
- Remove the sensor from its support and disconnect the pipe at the 4 way vacuum union end (2). Lever off the pipe, at the sensor end, with a screwdriver. Do not pull the pipe.



1 - Absolute pressure sensor
2 - 4 way union
3 - Idling speed adjusting potentiometer.

Replacing the idling speed adjusting potentiometer (3).

Removing :

- Remove the absolute pressure sensor (see method in above paragraph).
- Loosen the screw that secures the idling speed adjusting potentiometer (it is under the absolute pressure sensor).
- Disconnect the connector that connects the idling speed adjusting potentiometer to the wiring harness.
- Unscrew the potentiometer securing screw.
- Take out the potentiometer.

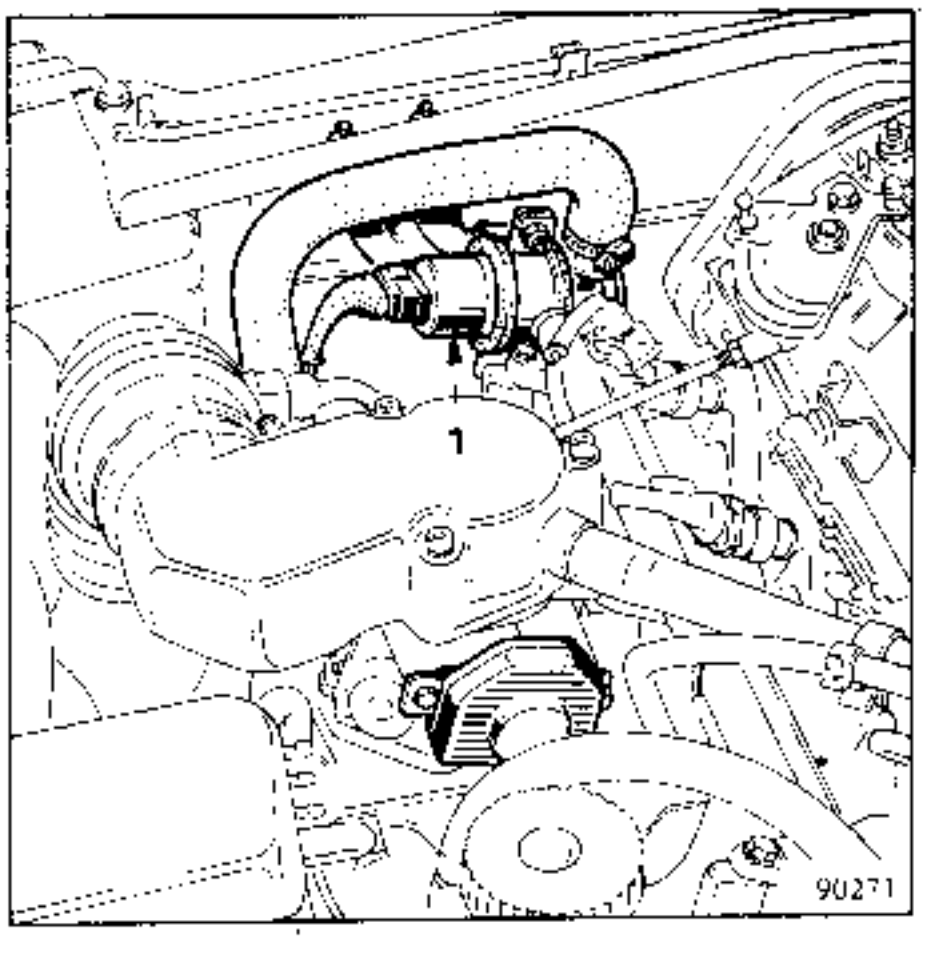
Refitting :

When refitting, ensure that the idling speed adjusting potentiometer is correctly positioned in its location.
The tamperproofing cap side is to be on the opposite side to the screw on the idling speed adjusting potentiometer securing lug.

Replacing the idling speed regulator valve (1)

Removing :

Disconnect :
- The regulator valve connector on the wiring harness.
- The air pipes.
- The screw from the clamp that retains the regulator valve.
- Remove the retaining clamp.
- Take out the regulator valve.



1 - Idling speed regulator valve.

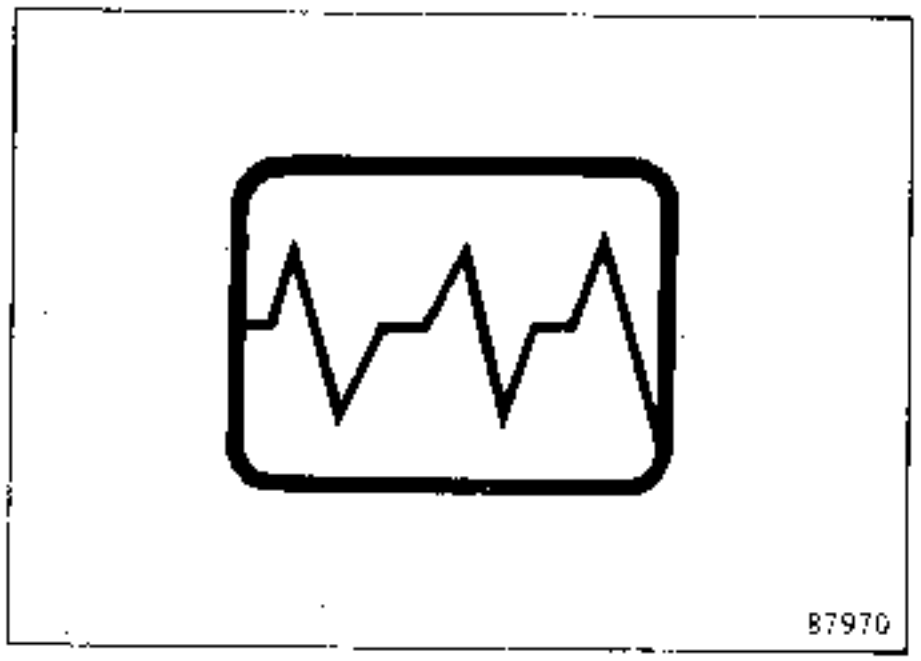
Refitting :

IMPORTANT :
- Position the pipes so that they are not under stress.
- Ensure that the unit is fitted the correct way round (the arrow on the base of the valve shows the direction of the air flow).

Special feature :

There is a warning light on the instrument panel which, if it switches on whilst the vehicle is being driven, indicates :

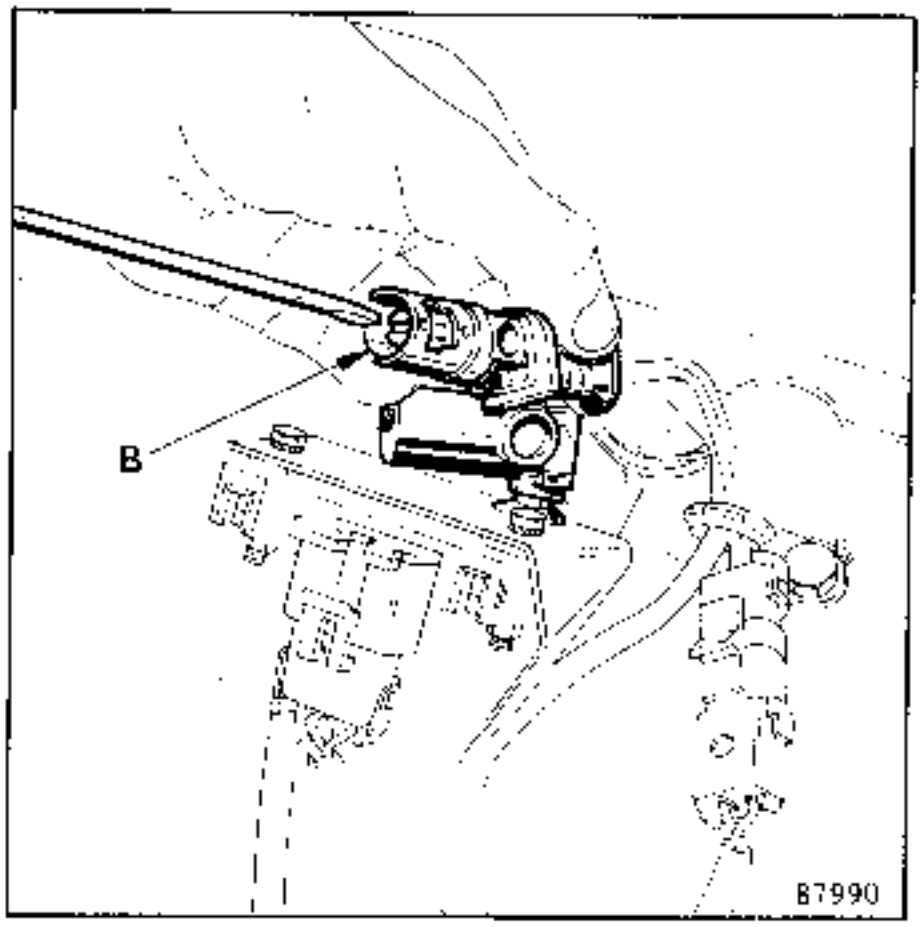
- On B.M. vehicles, a defect in the injection system.



Adjustment using an exhaust gas analyser:

- After removing the plastic casing that protects the computer and its housing, unscrew :
  - the screw from the idling speed adjusting potentiometer retaining lug.
  - take out the adjusting potentiometer from its location.

Where applicable, remove the tamperproofing cap.
Remove the idling speed adjusting potentiometer cover to gain access to the idling speed mixture screw (B).



Turn the mixture screw (B) to obtain the required CO percentage.
The engine speed is not adjustable. It is governed by a regulator valve (mounted on the radiator cross member) which is, itself, controlled by the injection computer.

Tamperproofing cap :

Part No. : 77 01 200 832.

Note : If the correct mixture cannot be obtained within the min-max rotational limits of screw (B) :
Disconnect the oil vapour reintake pipe from the rocker arm cover. If the strength of the mixture falls by more than 1%, the engine oil requires changing.

SOLEX THROTTLE CASING

Adjusting the throttle switch.

Check that the switch is operating correctly using an ohmmeter and a set of feeler gauges :

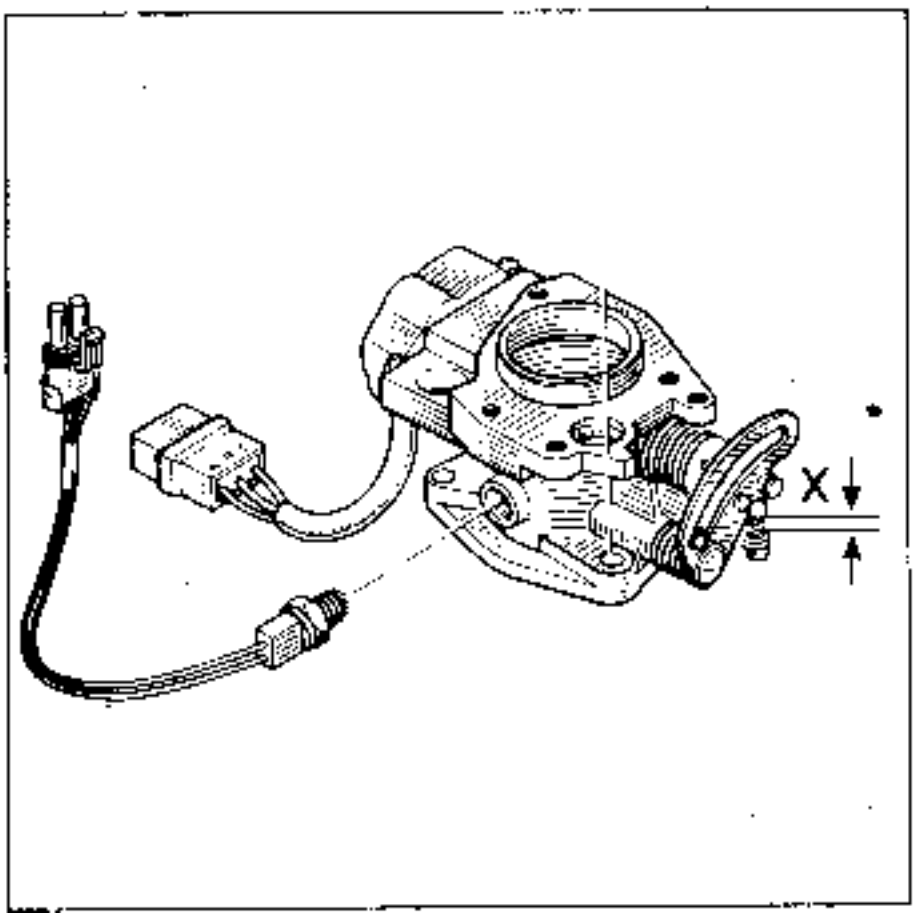
A Idling speed : foot lifted (the lower throttle plate should be open by (X) = 1 mm).

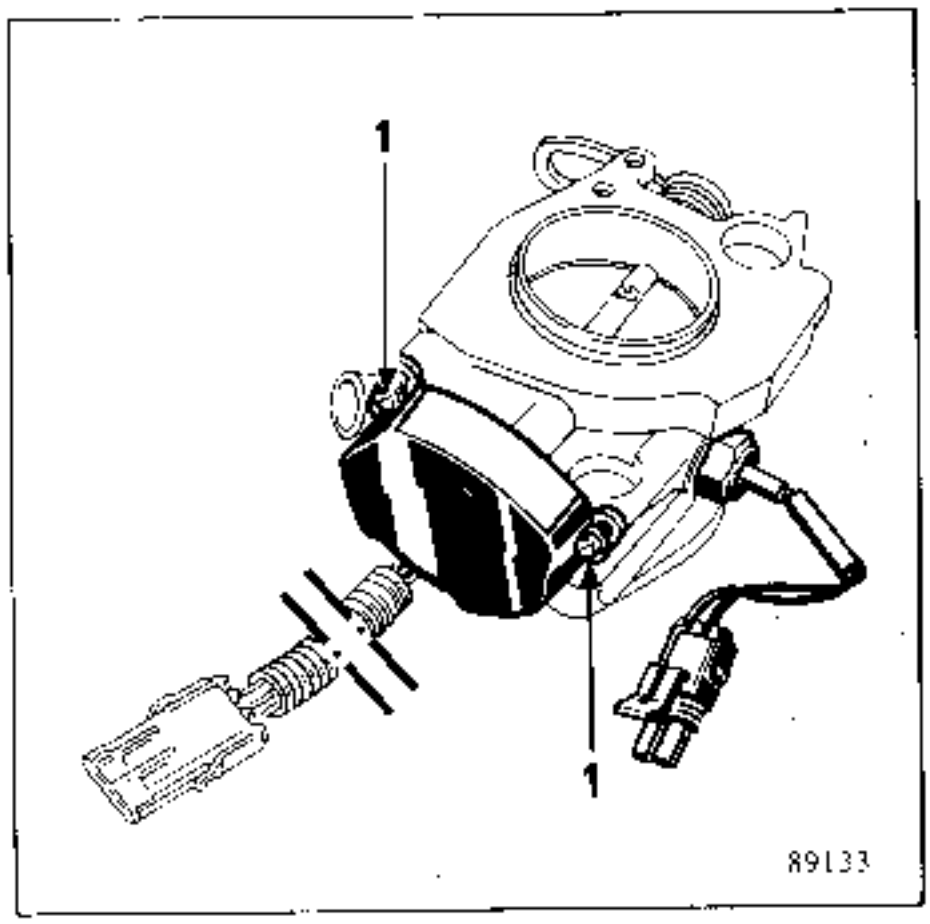
B Under partial load : the upper throttle plate should be open by (X) = 1,2 mm).

C Pedal fully depressed : the upper throttle plate should be open by 70° (a piece of rod 22 mm Ø should be able to pass between the plate and the body).

Throttle opening	Resistance across terminals in ohms	
	A and B	B and C
A	0	infinite
B	infinite	infinite
C	infinite	0

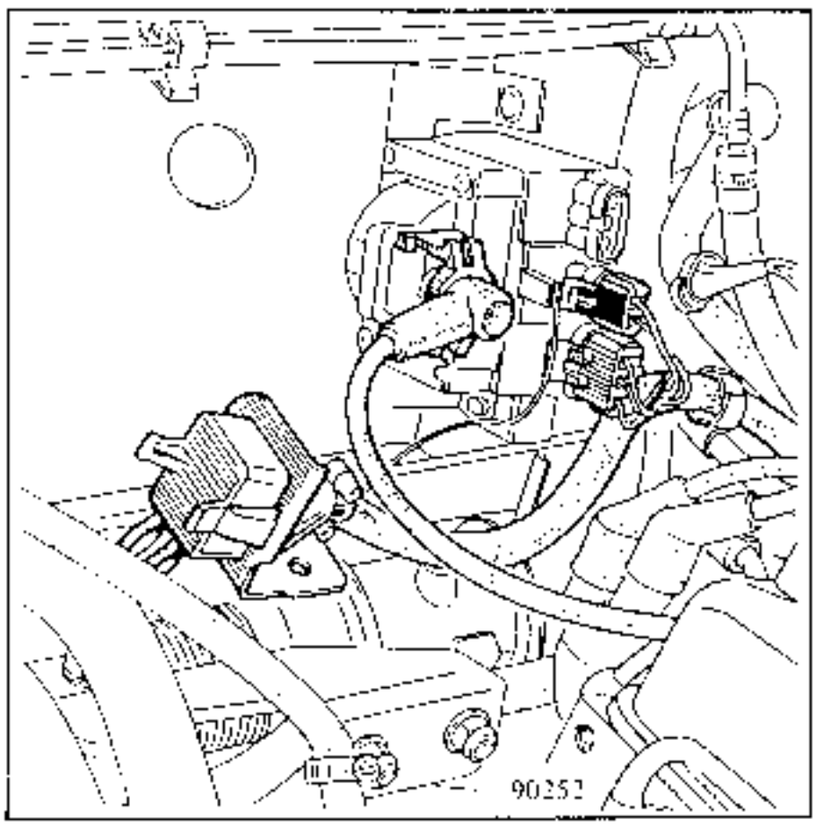
NOTE : the switch is adjusted by turning it on the throttle cable after first loosening screws (1).





Diagnostic plug :

This is mounted near the A.E.I. unit on a support which is, in its turn, secured to the vehicle scuttle.



Checking the electronic defect warning light.

With the ignition switched on and the engine stationary, the warning light should be swtiched on when the diagnostic plug cover is in position. If it is not, interconnect terminals 8 and 2 (earth) on the diagnostic plug. The warning light should switch on when the ignition is switched on.

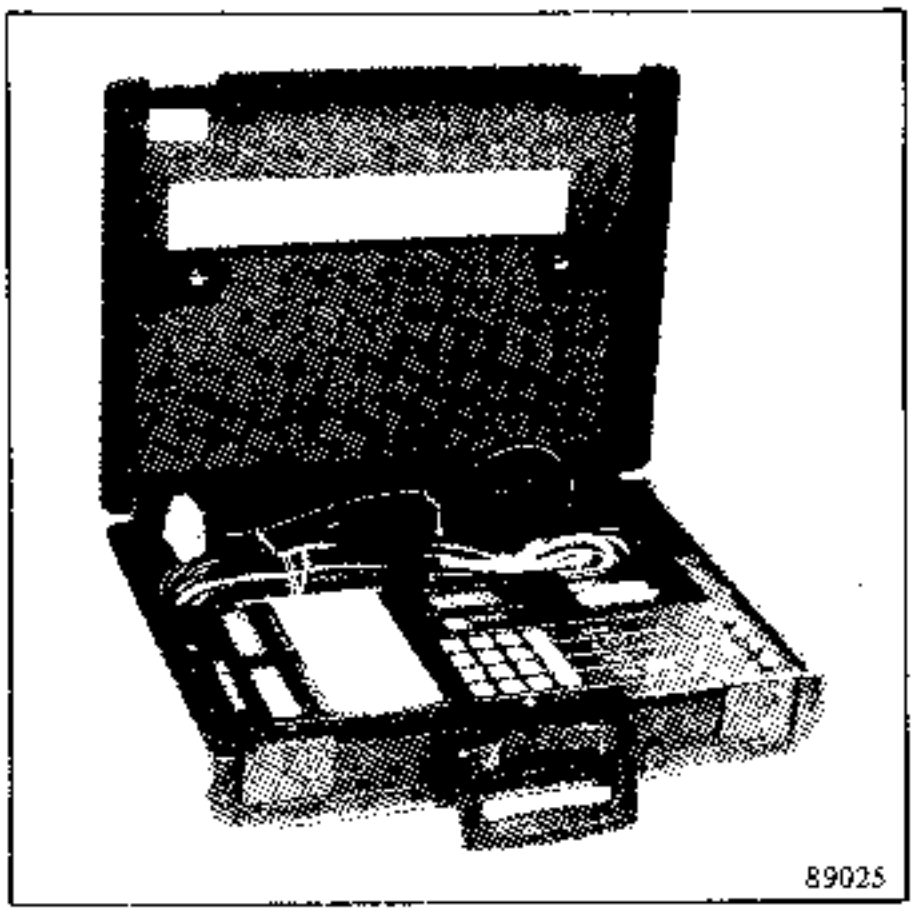
Note :

The diagnostic plug cover incorporates a jack that interconnects these terminals.

The diagnostic plug can be used to connect in tester XR 25 for testing the microprocessor system.

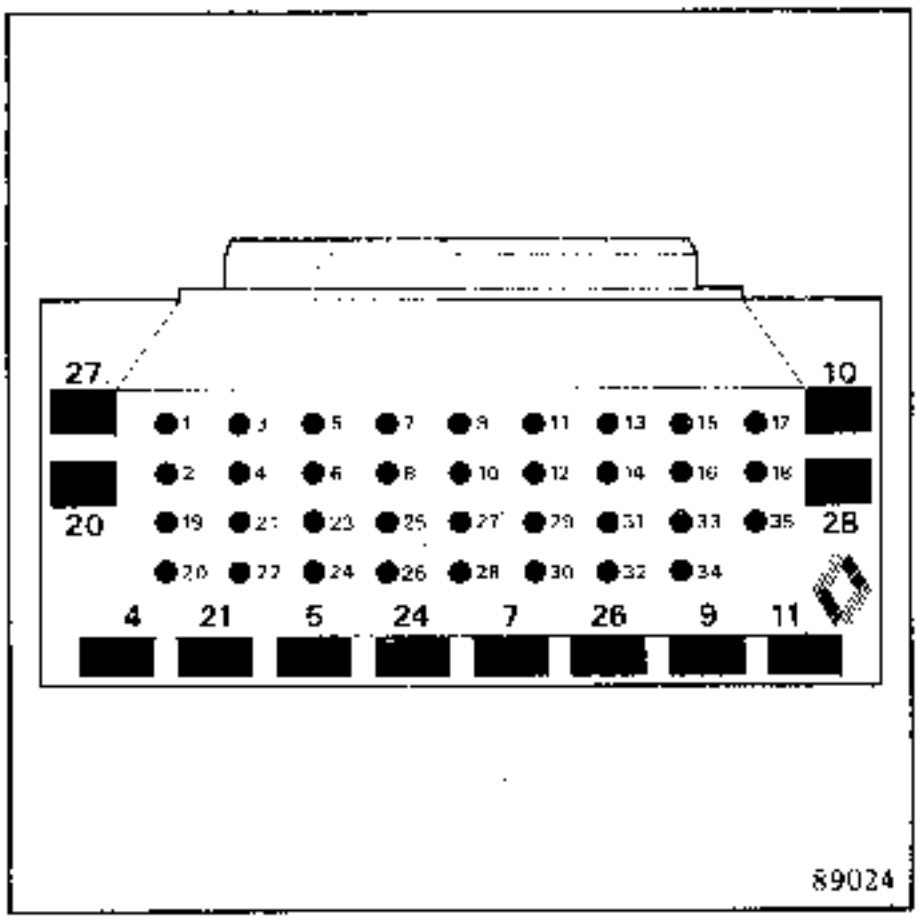
A tester, the XR 25, has been designed for testing microprocessor systems. It is connected to the diagnostic plug and permits the system to be checked and rectified by providing information on the condition of the computer and most of its peripheral equipment. See manual M.R. INJ. R(E)

Tester XR 25



89025

Connection block M.S. 1048



89024

PRECAUTIONS :
The computer must first be disconnected and no tests can be carried out on the computer itself.

During the electrical parts of the test, when using the voltmeter/ohmmeter or the terminal jack, take care not to connect the unit to any wires other than those stated for the test. Incorrect connections could cause damage to the injection system components.

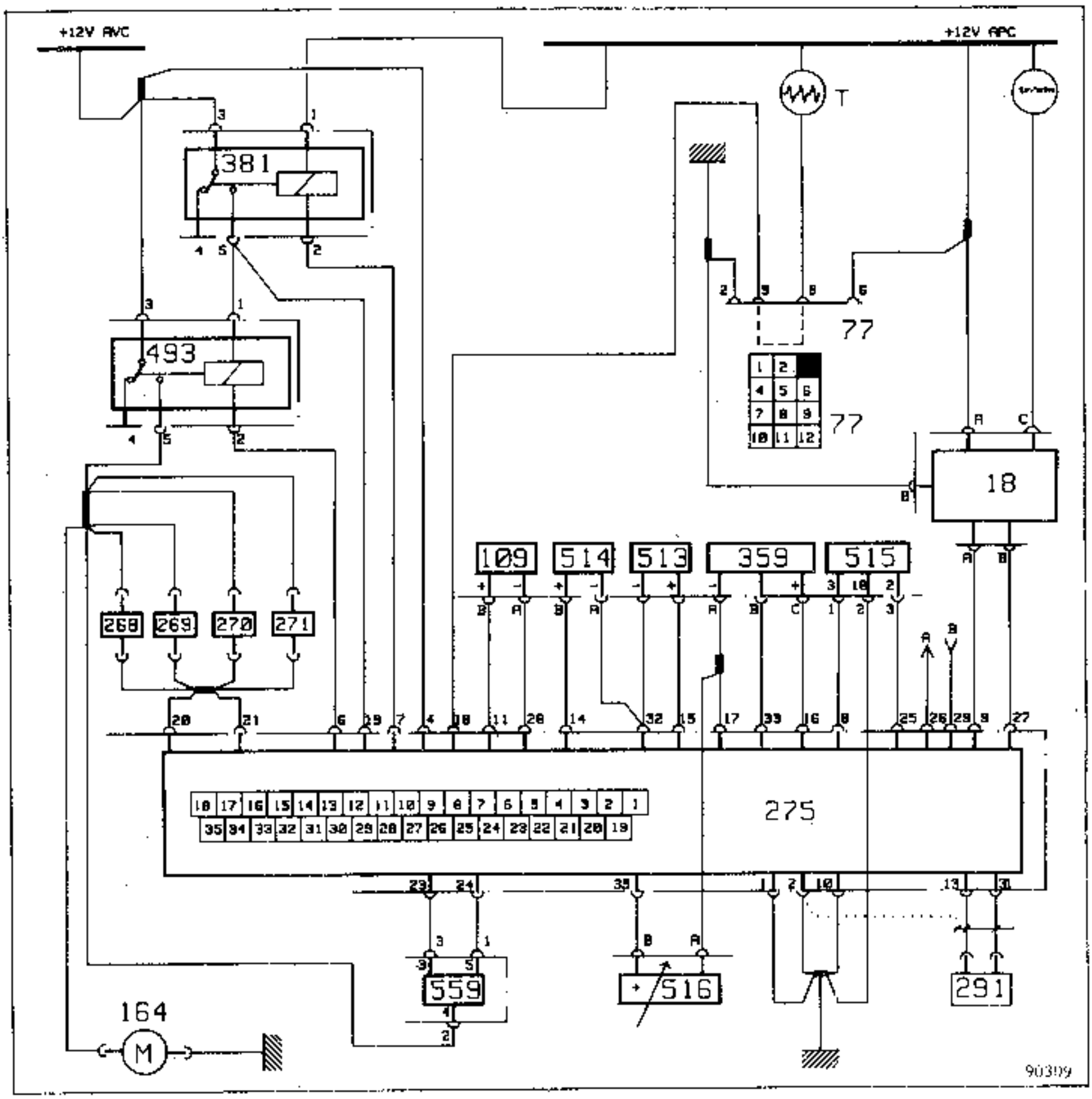
Checking the intake system for leaks.

If the idling speed is unstable (hunting) check the condition of the intake system pipes and connections.
Also check the throttle switch. It too can produce similar defects.

NOTE : M.S. 1048 - CONNECTION BLOCK

If the information provided by the XR 25 shows that electrical continuity from the main injection system connector requires checking, connecting this block to the connector provides easier access, with the probe, to the various contacts.

(M.S. 1048 consists of a 35 pin base secured to a printed circuit on which are 35 copper coated areas numbered 1 to 35).

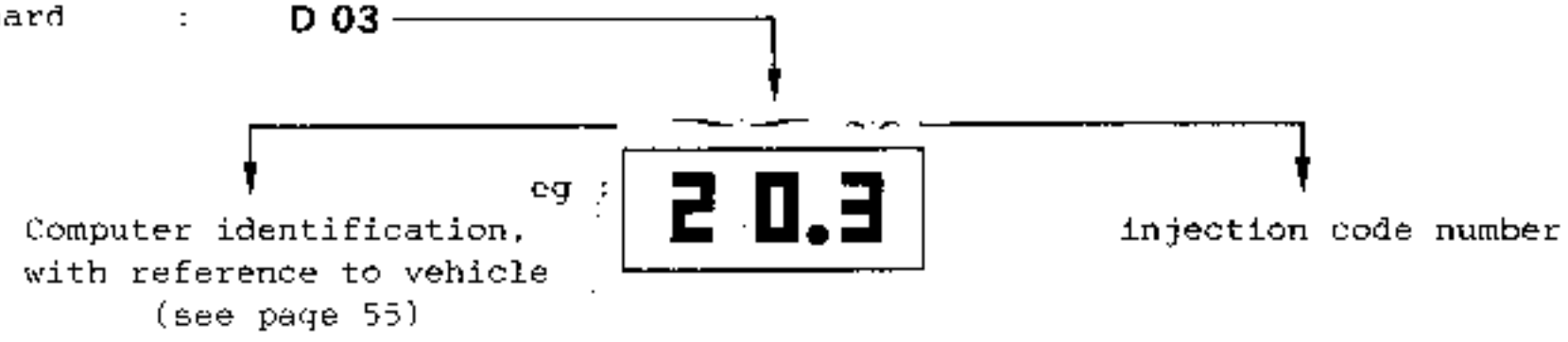


18	Ignition power unit MPA	514	Air temperature sensor
77	Diagnostic plug (plan view)	515	Throttle switch
109	Flywheel sensor	516	Adjusting potentiometer
164	Fuel pump (on engine)	559	Idling speed regulator valve
268 - 271	Injectors		
291	Pre-ignition sensor		
359	Pressure sensor	⅄	Connectors
381*	Supply relay	T	Diagnostic warning light
493	Pump relay	A	To flow sensor
513	Water temperature sensor	B	Information from starter
		'	2 wires on pin no. 5

TEST CARRIED OUT WITH CASSETTE No. 4

READINGS OBTAINED WHEN THERE ARE NO DEFECTS (taken from cassette no. 4).

- Connect tester XR 25 to the vehicle diagnostic plug.
- Switch on the ignition.
- Enter, on the keyboard : **D 03**



(XR 25 central display)

IMPORTANT

For those items not dealt with in this workshop manual, consult workshop manual :

INJ.R (E) published in June 1985

and the technical note specifically covering the XR 25 tester.

NT 1121 dated June 1985

QUANTITIES AND TYPES OF ANTI-FREEZE

Engine type	Quantity in litres	Type	Special features
F2N	5,2	GLACEOL AL (Type C)	Protection down to - 23° C for hot, temperate and cold climates. Protection down to - 40° C for very cold climates.
J7R	6,8		

THERMOSTAT

Engine Type	Starts to open at (° C)	Fully open at (° C)	Travel (in mm)
F2N	89	101	7,5
J7R			

ALUMINIUM MATRIX RADIATORS.

Certain vehicles are equipped with radiators with aluminium matrixes.

Flushing out

Do not flush out these radiators, or the cooling system, with caustic soda or alkaline products (there is a risk that it would corrode the light alloy components and cause leakage).

Storage

A radiator, after removal, can be stored without taking any particular precautions up to a maximum period of 48 hours.

After this, the particles of brazing flux used in the radiator, during manufacture, and the dichloride traces from the water that it previously contained start to corrode the aluminium parts of the radiator, as a result of their contact with the air and could cause leakage.

One must therefore, on a radiator which is to be stored for more than 48 hours :

- Either FLUSH IT OUT THOROUGHLY with water, BLOW through it with compressed air and PLUG all its apertures.
- Or keep it filled with coolant, if this is possible.

Anti-freeze and coolant

The correct type of anti-freeze solution must be used in these radiators.

AL type C pre-mixed coolant or GLACEOL AL type C concentrated anti-freeze, as marketed in the RENAULT network, fulfils the Design Office requirements of these radiators in that :

- They do not attack the various aluminium and cast iron components.
- Their alkaline content is specially determined with a view to use in light alloy systems.
- They contain special additives to provide effective protection against the acid products of combustion that occur both in high speed Diesels and in Petrol engines.
- Their density provides protection and efficient operation at all temperatures.

Pure anti-freeze type C

1 litre can	77 01 405 398
28 litre can	77 01 405 399
56 litre can	77 01 405 400
220 litre drum	77 01 405 401

Pre-prepared coolant type C

2 litre can	77 01 405 402
10 litre can	77 01 405 403
220 litre drum	77 01 405 404

Pre-prepared coolant type C, export

1 litre can	77 01 406 211
5 litre can	77 01 406 212
220 litre drum	77 01 406 214

ESSENTIAL SPECIAL TOOLS	
M.S. 554-03	Cooling system leak testing equipment.
M.S. 554-01	Adaptor for M.S.554-03
M.S. 554-04	Adaptor for M.S.554-03

1 - Testing the system for leaks

Fit adaptor M.S.554-01 in place of the expansion chamber valve.

Connect tool M.S.554-03 to it.

Warm up the engine and then stop it.

Pump the equipment to pressurise the system.

Stop pumping at 0,1 bars above the valve setting pressure.

The pressure should not drop. If it does, look for the leak.

Slowly unscrew the union on equipment M.S.554-03 to depressurise the cooling system then remove equipment M.S.554-01 and refit the expansion chamber cap, fitted with a new seal.

2 - Checking the valve pressure setting

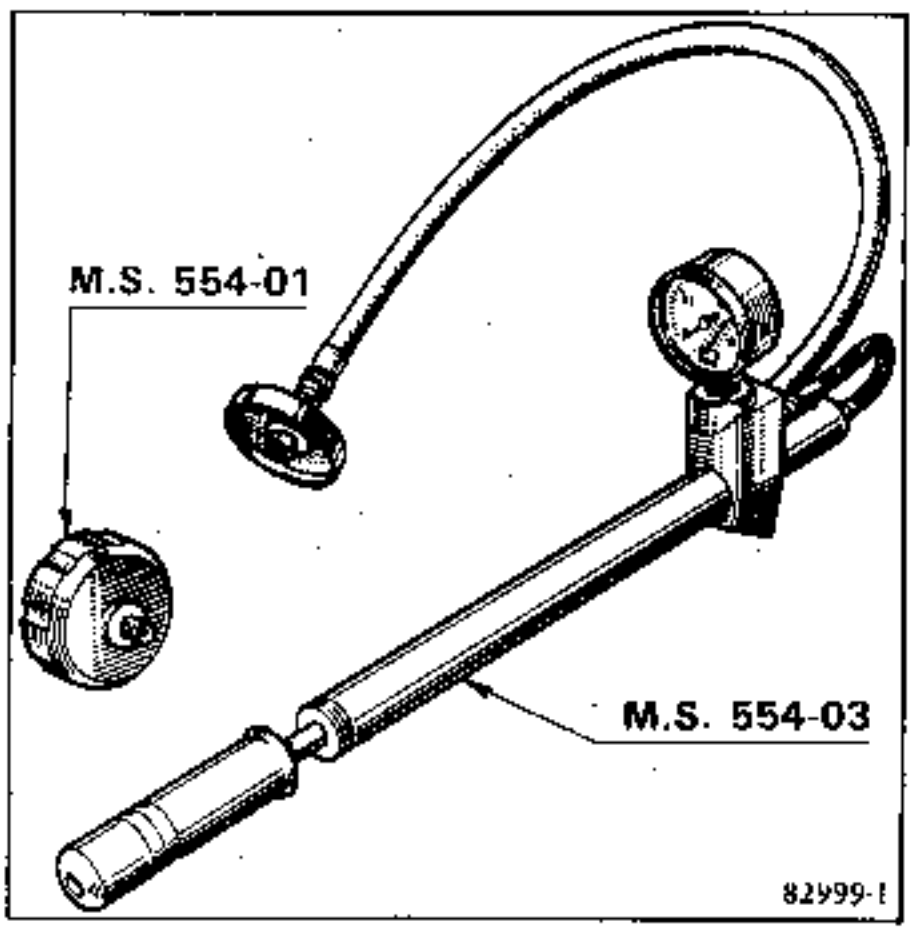
If coolant ever passes through the expansion chamber valve, the valve must be replaced by a new one.

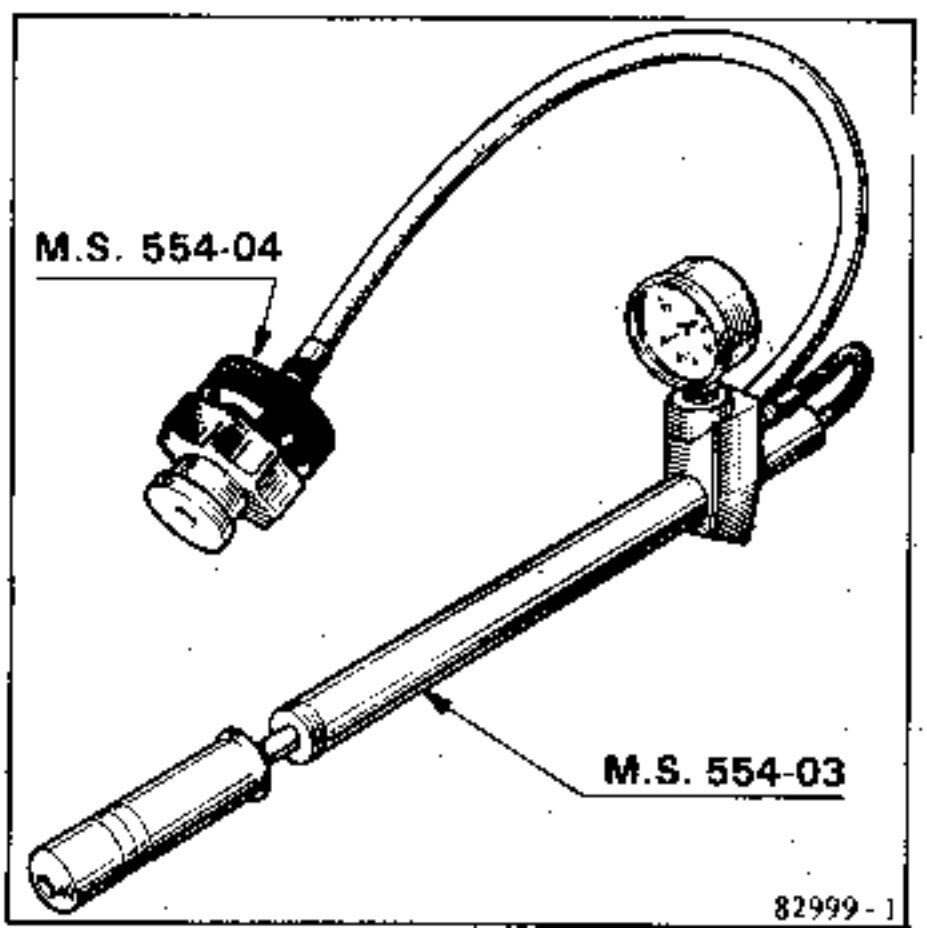
Fit adaptor M.S.554-04 to equipment MS. 554-03 and place the valve to be tested on it.

Raise the pressure. It should stabilise at the valve setting pressure. Checking tolerance ± 0,1 bar.

Valve pressure setting :

Brown plastic type valve 1,2 bars.





ESSENTIAL SPECIAL TOOLS
Refractometer : Supplier : Societe d'Optique precision electronique et mecanique 102, rue Chaptal 92306 LEVALLOIS PERRET Tel. : 47.57.31.05 or specific gravity meter 716 B

Take the coolant from the expansion chamber.

Measure its degree of protection with the refractometer.

Hot and temperate climates :

Protection - 23° C (35% anti-freeze solution).

Very cold climates

Protection - 40° C (50% anti-freeze solution).

The frost protection falls if the anti-freeze exceeds 60% of the solution.

The protection readings shown in the chart apply to coolant at a temperature of 40° C.

Using the chart.

If on a vehicle with a coolant capacity of 5,2 litres, the protection reading is - 15° C.

To increase the protection to - 23° C, 0,7 litres of the solution in the system will have to be replaced by 0,7 litres of pure anti-freeze.

To lower the protection to - 40° C, 1,7 litres of the solution in the system will have to be replaced by 1,7 litres of pure anti-freeze.

PURE ANTI-FREEZE TO BE ADDED

- 23° C

Hot and temperate climates

Protection reading at a coolant temperature of 40° C	System capacity (in litres) 5,2	6,8
- 5° C	1,4	1,8
- 10° C	1	1,3
- 15° C	0,7	1
- 20° C	0,2	0,3

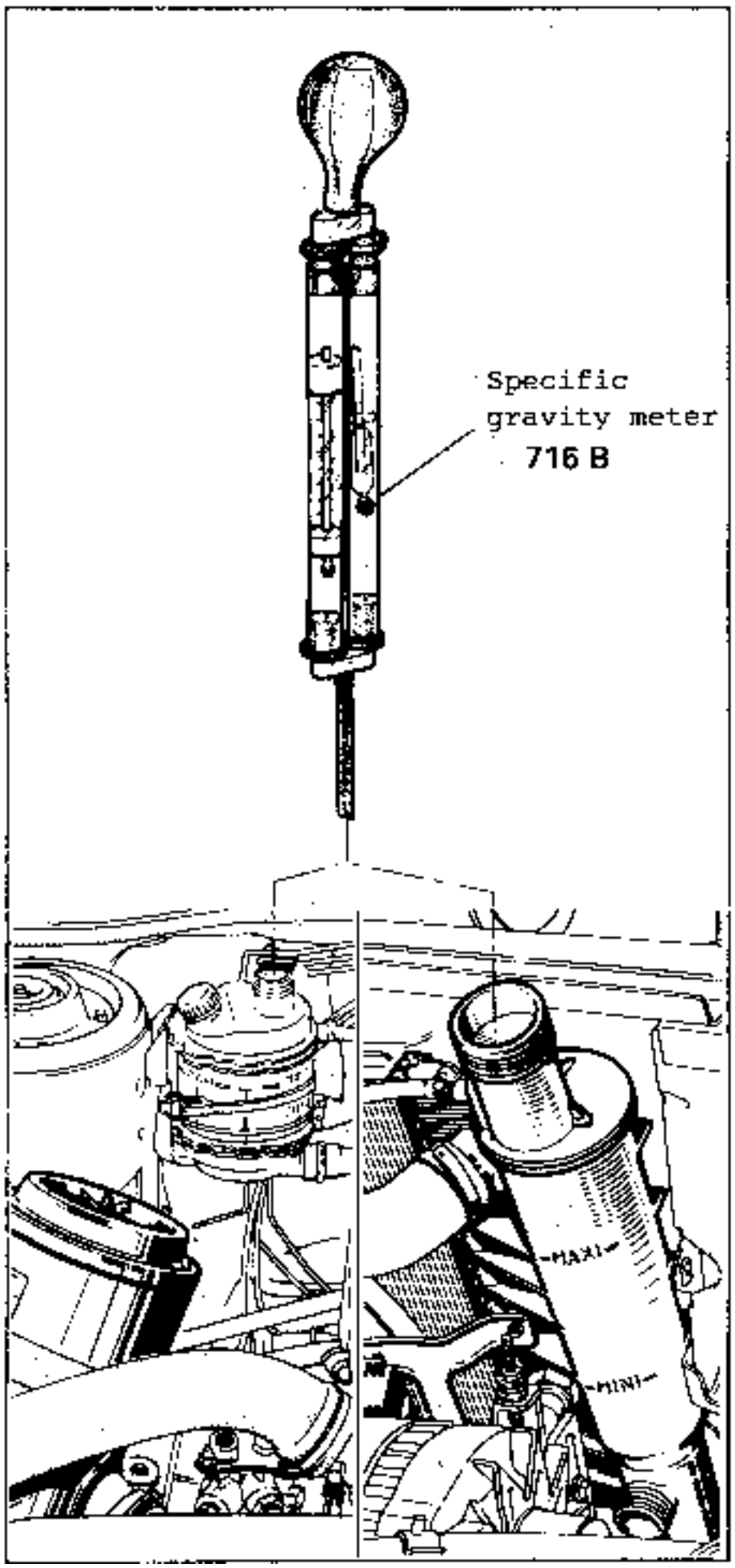
- 40° C

Very cold climates

Protection reading at a coolant temperature of 40° C	System capacity (in litres) 5,2	6,8
- 5° C	2,2	2,8
- 10° C	2	2,5
- 15° C	1,7	2,2
- 20° C	1,3	1,7
- 25° C	1,1	1,4
- 30° C	0,9	1,2
- 35° C	0,5	0,6

SPECIFIC GRAVITY METER 716 B

Draw up the coolant until it surrounds the base of the thermometer and causes the float to float freely.



Check that the float is not :

Touching the upper end of the tube (too much coolant).

Sticking to the wall of the tube. If necessary tap the tube lightly to free it.

Take the following readings :

The coolant temperature.
The anti-freeze density (SG).

Consult the correction table to find the actual protection provided by the coolant.

	3	5	10	15	20	30	40
10	0	0	5	8	11	14	18
20	1	2	6	10	14	18	24
30	2	3	8	12	17	24	33
40	3	5	10	15	20	30	40
50	4	7	12	18	24	35	
60	6	9	15	22	28	40	
70	8	12	18	25	32		
80	10	14	22	32	37		

CORRECTED PROTECTION IN DEGREES

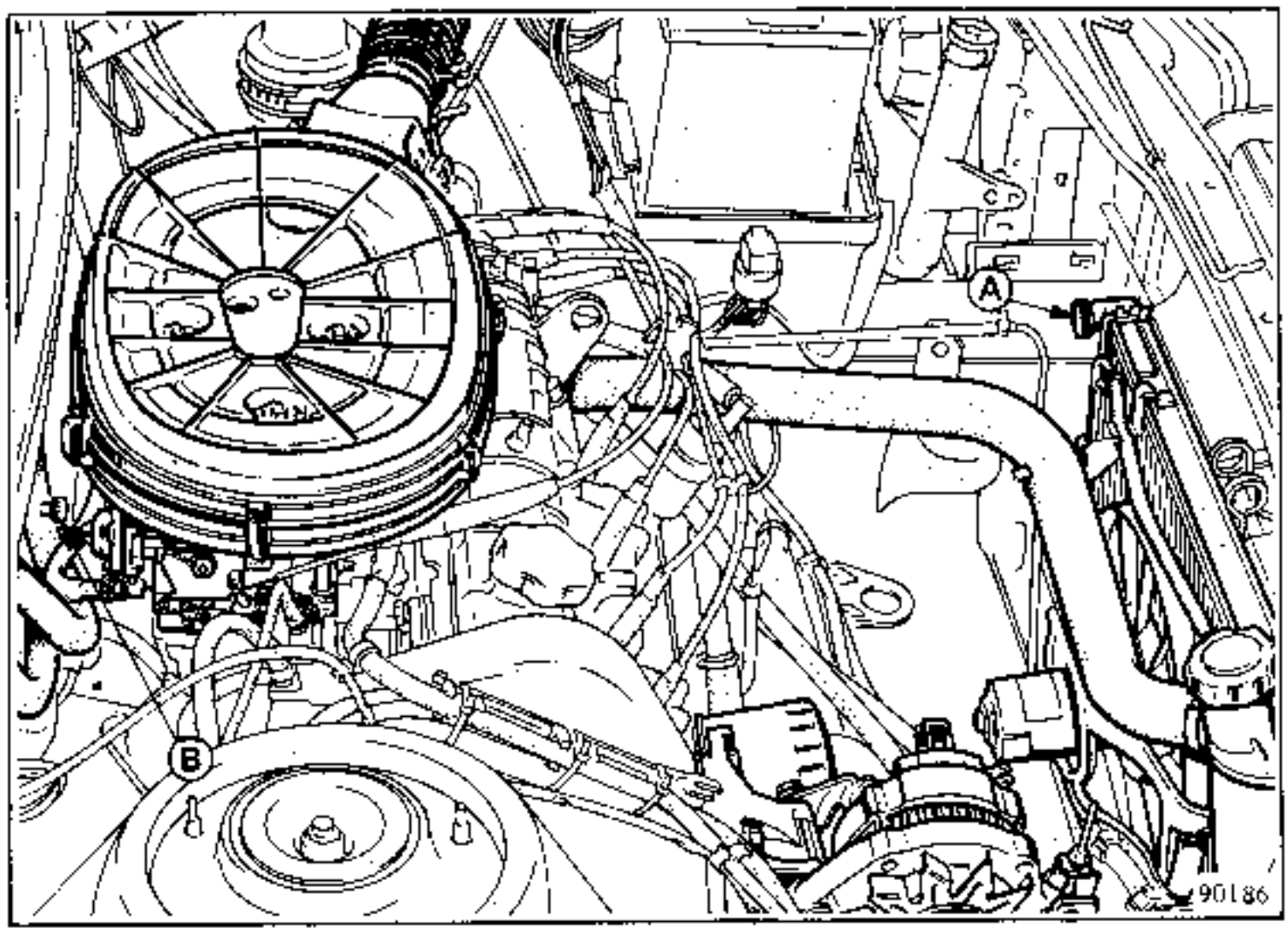
EXAMPLE (Thermometer reading : 60) Protection down
(SG reading : 10) MINUS 15° C

There is no hot water valve on the heater.
The coolant flow through the heater is continuous. It assists in the cooling of the engine.

FILLING

WARNING :

Ensure that the method described for filling and bleeding transverse engines is followed to the letter (the expansion chamber forms part of the radiator).



Open the bleed screw (A) on the radiator.

Open the bleed screw (B) on the heater pipe.

Slowly fill the system through the bottle.

Close bleed screws (A) and (B) as soon as the coolant flows from them in a continuous jet.

Start the engine (1500 rpm).

Press the accelerator 3 or 4 times (speed 3 to 4 000 rpm), then top up the level until the bottle overflows. Maintain this for approximately 4 minutes.

Close the bottle (cap and brown valve).

Allow the engine to run at 1 500 rpm for 10 minutes, until the cooling fan has cut in at least 3 times :
(this is necessary to automatically degas the system).

Check that the coolant level is around the "max" mark (a level higher than this is acceptable).

DO NOT OPEN THE BLEED SCREWS WITH THE ENGINE RUNNING.
RETIGHTEN THE EXPANSION BOTTLE CAP WHEN THE ENGINE IS WARM.

There is no heater hot water valve.
The flow through the heater is continuous and contributes towards cooling the engine.

FILLING

Check that the drain plug or plugs are tight.

Open the bleed screws.

Fill the system through the expansion bottle.

Close the bleed screws as soon as the coolant flows from them in a continuous jet.

Fill the system through the expansion bottle.

Start the engine (1 500 rpm).

Fill the bottle until it overflows and continue to do this for approximately 4 minutes.

Close the bottle (cap and brown valve).

BLEEDING THE SYSTEM

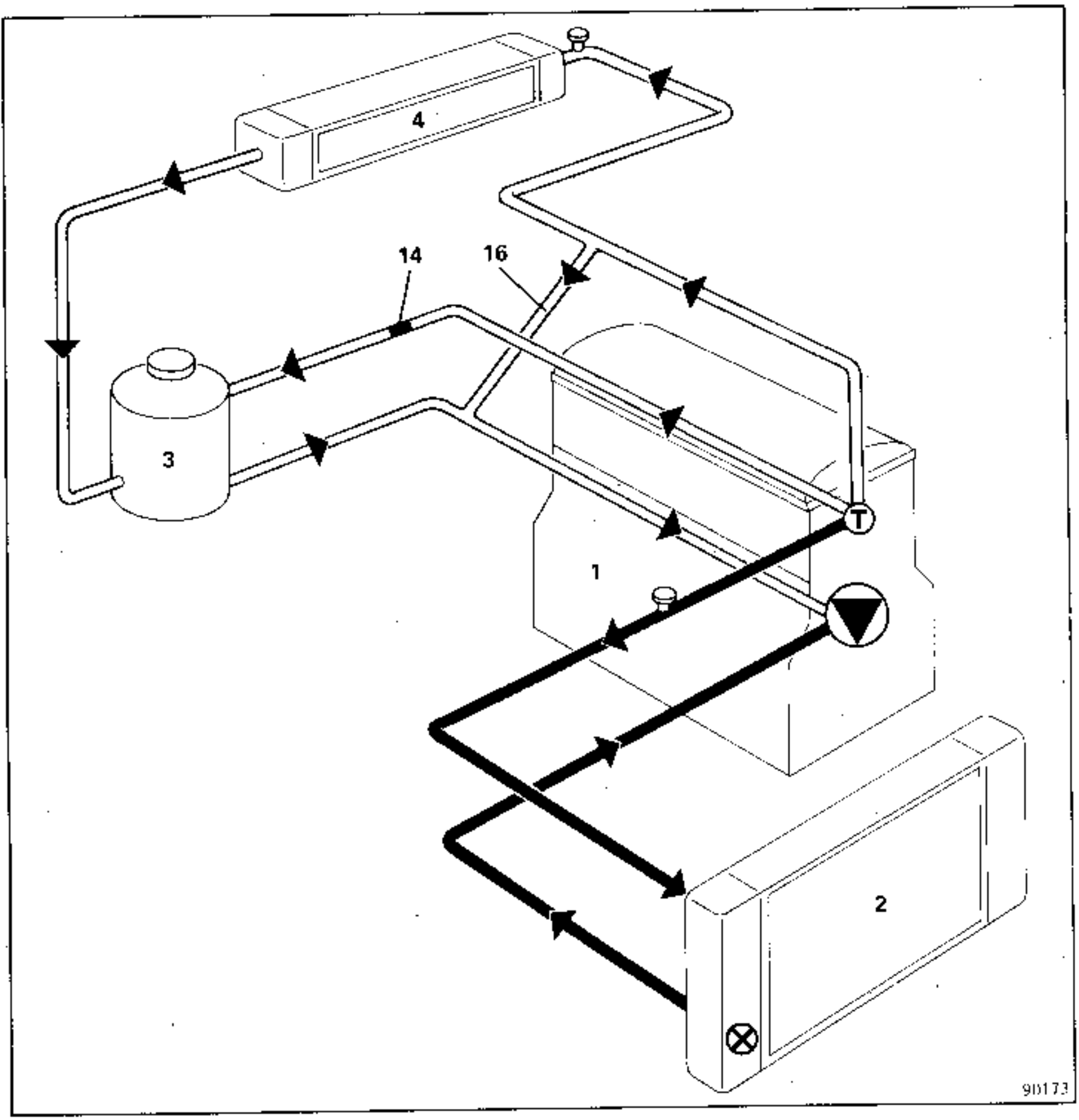
Allow the engine to run for 10 minutes at 1 500 rpm until the fan or fans cut in (time required to obtain automatic degassing).

Check that the coolant level is around the "Max" mark.

DO NOT OPEN THE BLEED SCREW OR SCREWS WITH THE ENGINE RUNNING.

RETIGHTEN THE EXPANSION BOTTLE CAP WHEN THE ENGINE IS WARM.

LONGITUDINAL ENGINE



1 : Engine.

2 : Radiator.

3 : "Hot" bottle with permanent degassing.

4 : Heater.

14 : 3,5 mm Ø jet.

16 : By-pass.

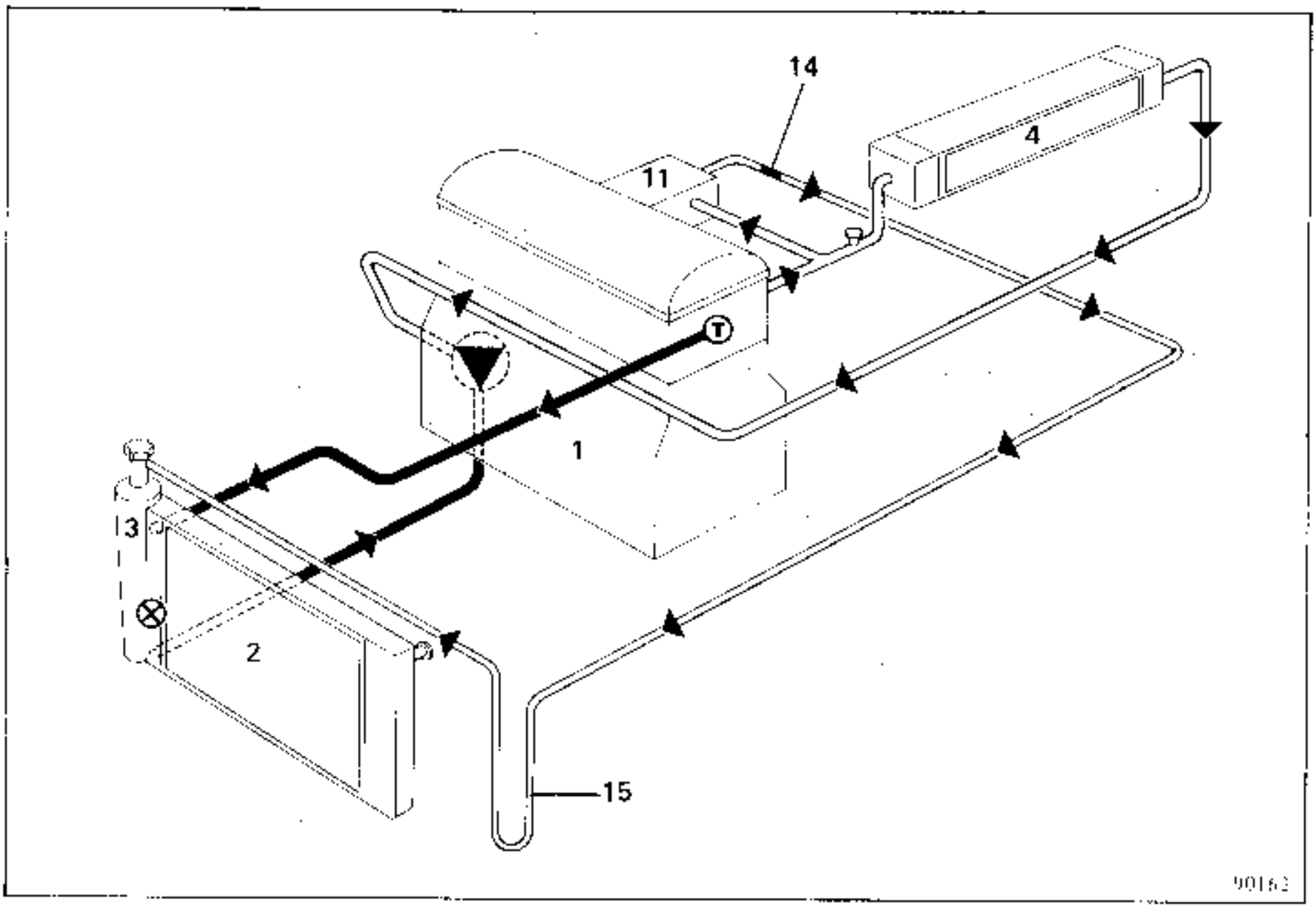
: Water pump.

T : Thermostat.

: Bleed screws (2 in number).

: Temperature switch

TRANSVERSE ENGINE



1 : Engine.

2 : Radiator.

3 : "Hot" bottle with permanent degassing.

4 : Heater.

11 : Heated carburettor.

14 : 3,5 mm Ø jet.

15 : Siphon loop.

: Water pump.

: Thermostat.

: Bleed screws (2 in number).

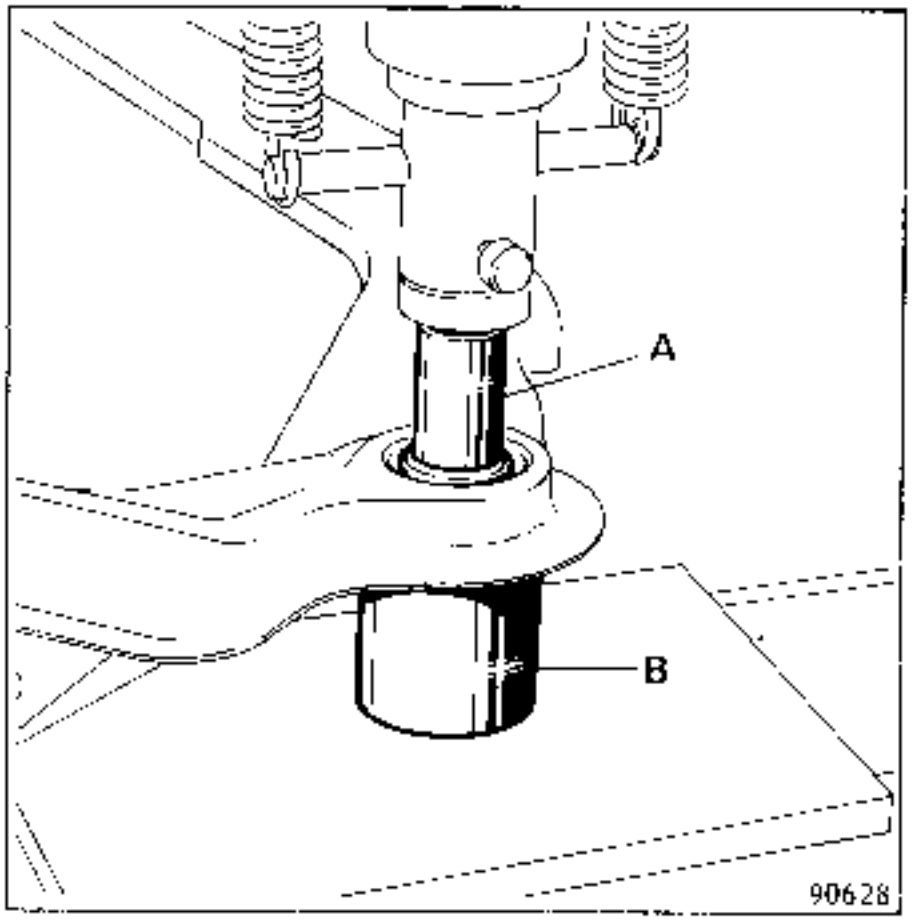
: Temperature switch.

After removal of the sub-frame.

REMOVING :

Extract the connecting stud with a tube (A) and a pin (B).

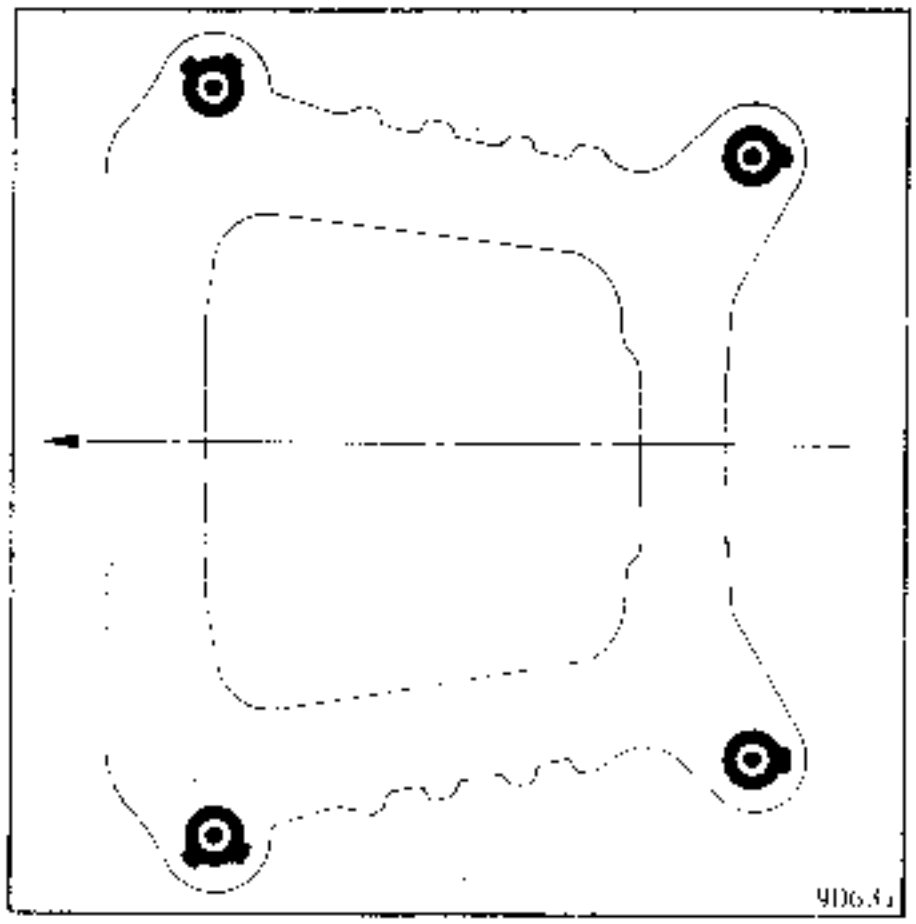
Dimensions : Tube (A) I.D. 72 $\pm$ 1 mm.
O.D. 80 $\pm$ 1 mm.
Pin (B) Ø 30 $\pm$ 5 mm.



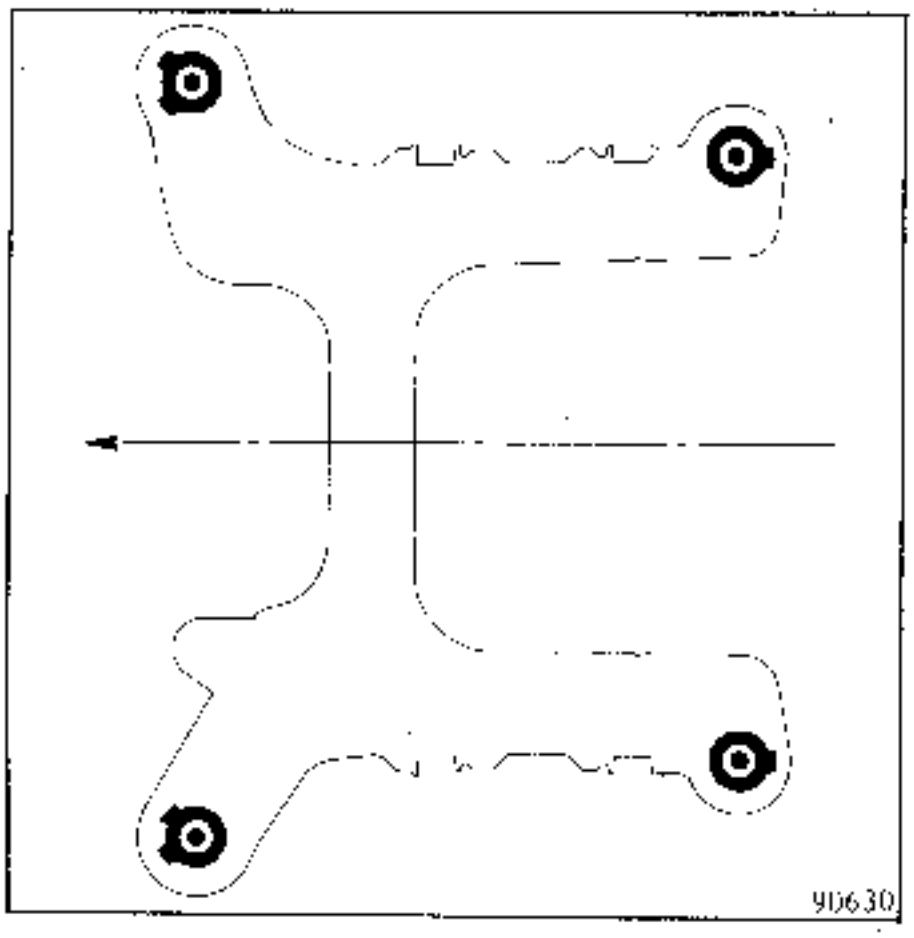
REFITTING :

Take care with the position of the studs (position of lugs) see diagram).

Transverse Engine.



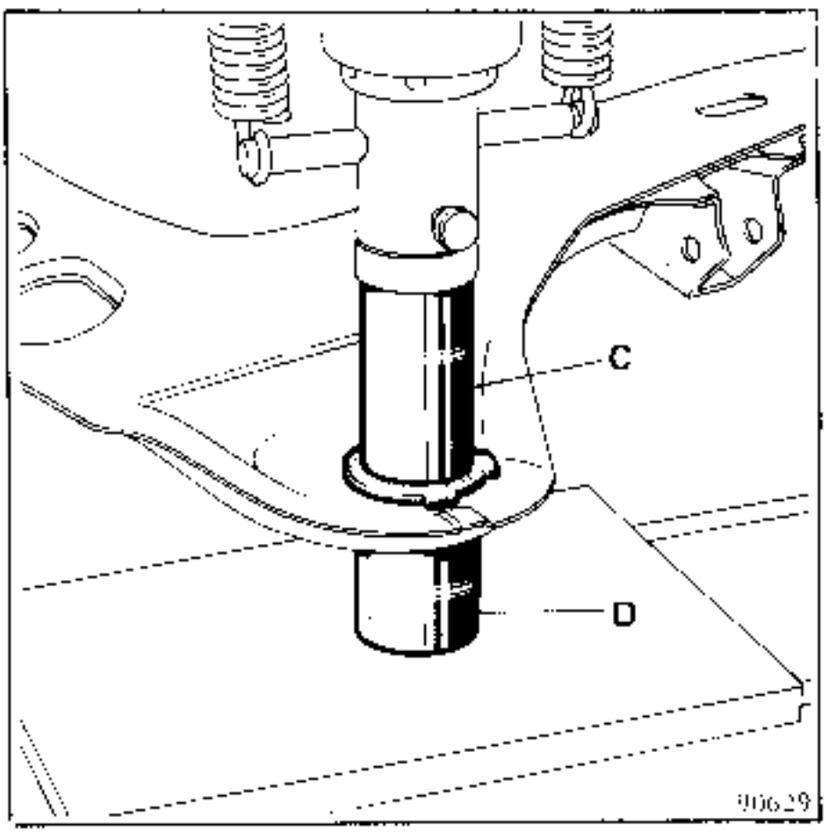
Longitudinal Engine.



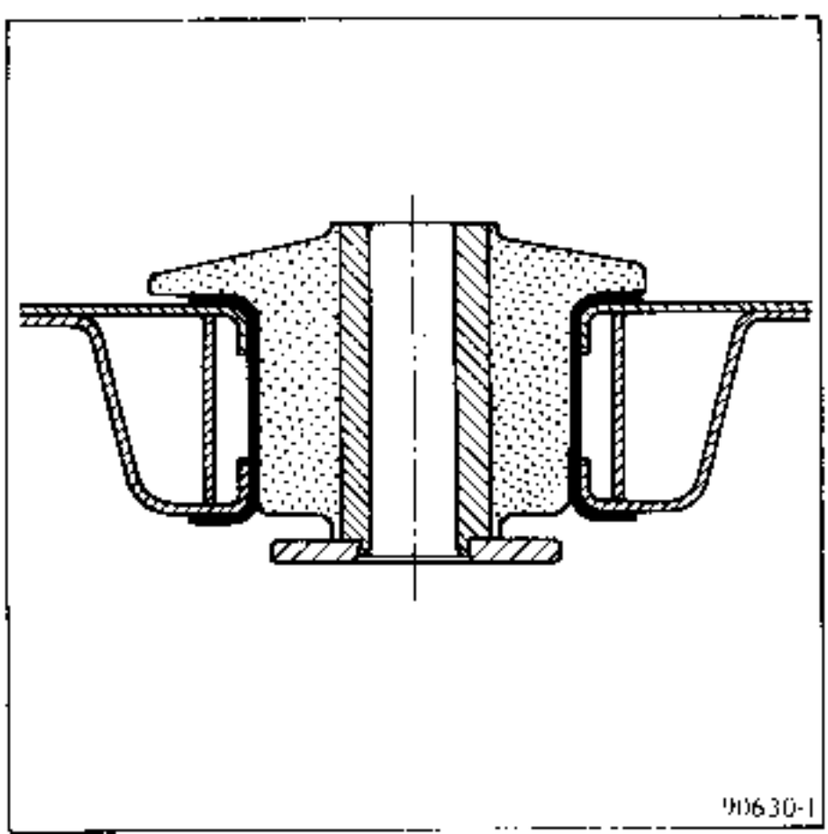
Front and centreline of vehicle.

Coat the stud with soapy water and fit it, on the press, using two tubes (C) and (D).

Dimensions : Tube (C) I.D. 40 $^{+}_{-}$ 1 mm.
O.D. 50 $^{+}_{-}$ 1 mm.
Tube (D) I.D. 52 $^{+}_{-}$ 1 mm.
O.D. 60 $^{+}_{-}$ 1 mm.



Position of stud after fitting.



To describe the repair methods we have prepared diagrams that permit immediate identfiication of the various points.

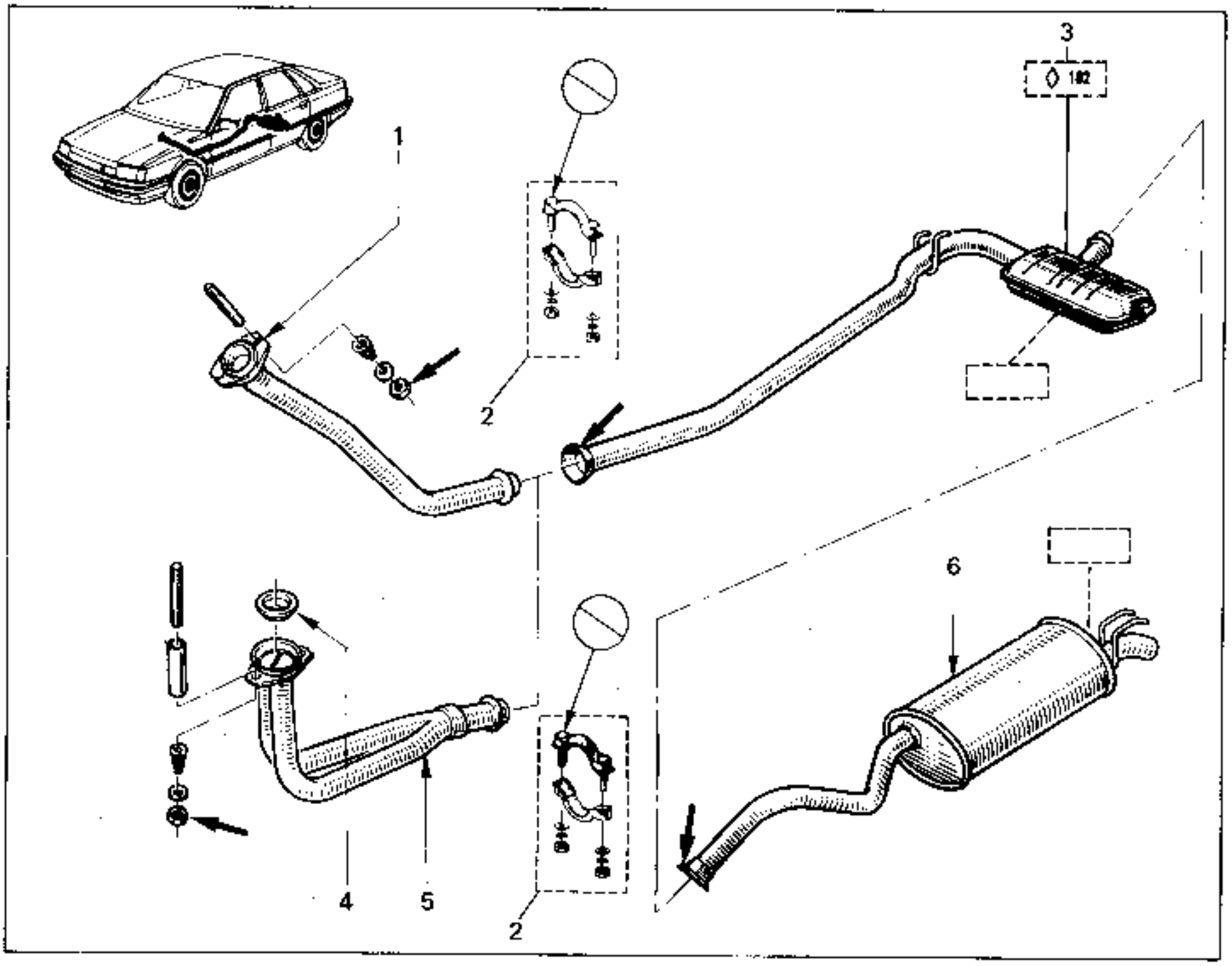
To avoid having to put too many inscriptions on them we have used conventional symbols showing the details of the operations to be carried out.

Unscrew, entirely, for removal.

Cut :
- either with a flame torch,
- or with a pipe cutter.

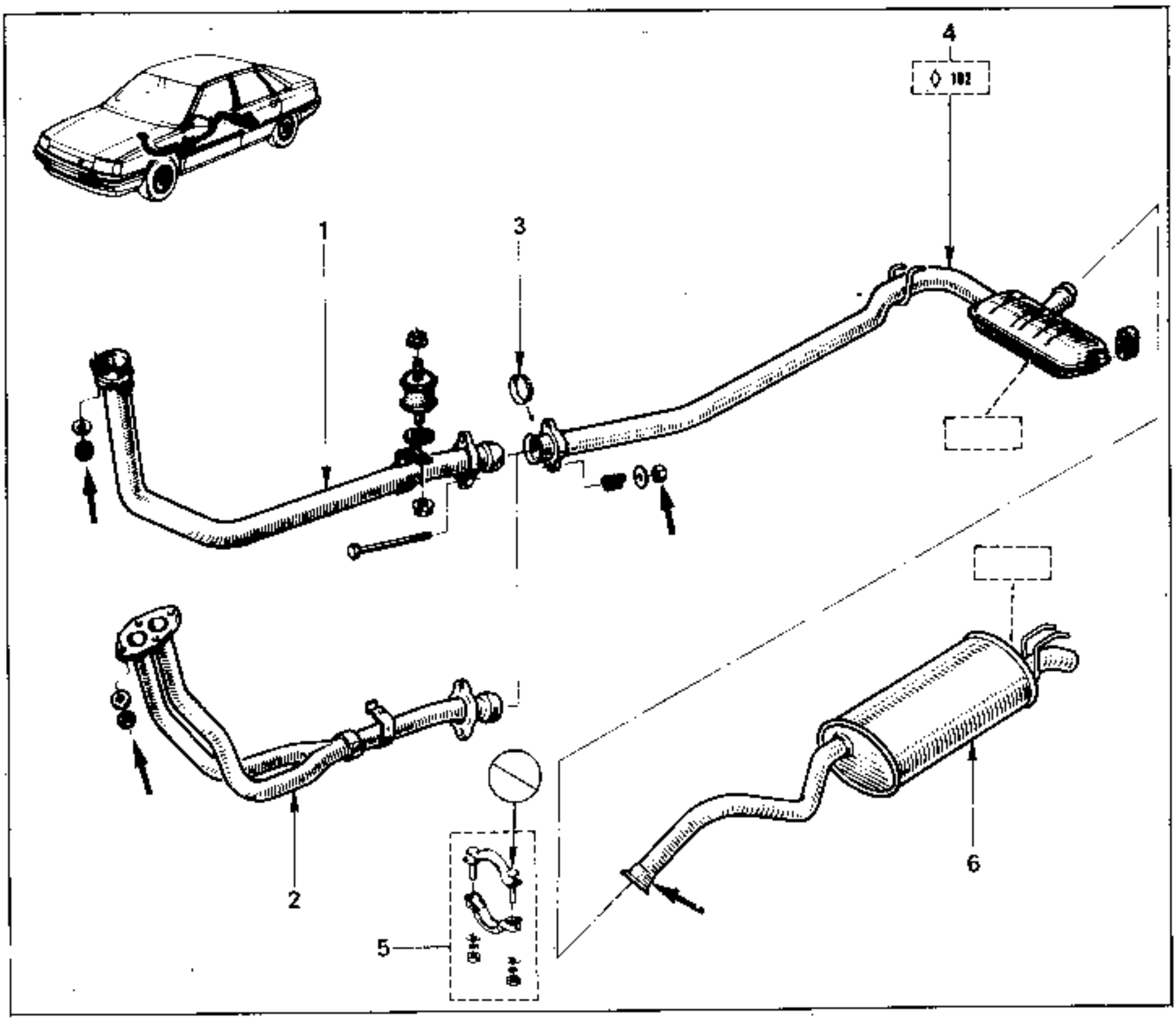
Cut only with a flame torch :
- clamps,
- outer tube of a sleeve joint.

On the L 481 and L 482



1 Downpipe (L 481).
2 Securing clamp.
3 — Intermediate pipe and expansion chamber.
4 Joint (L 482).
5 Downpipe (L 482).
6 — Silencer (L 481, L482).

On the L 483, L 486 and L 488 :

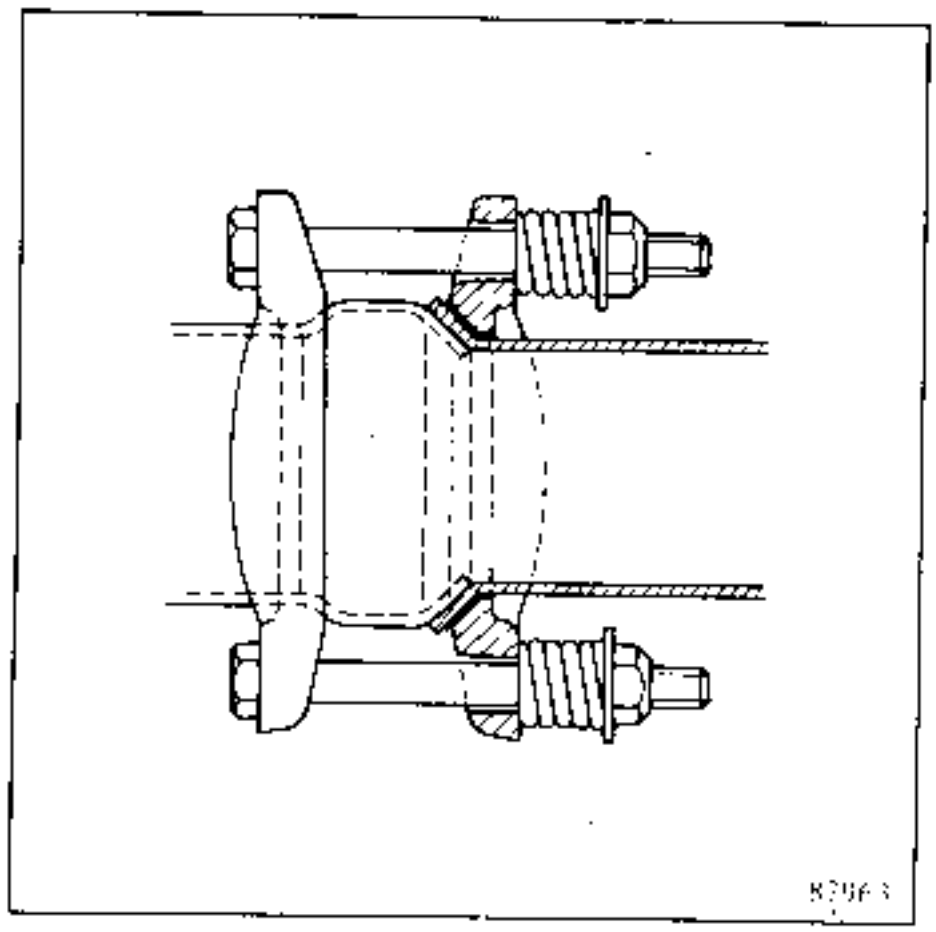


1 - Downpipe, L 486, L 488
2 - Downpipe, L 483
3 - Thermoplastic seal
4 - Intermediate pipe plus expansion chamber, L 483, L 486, L 488
5 - Securing clamps
6 - Silencer, L 483, L 486 and L 488

To ensure that the exhaust system is correctly aligned and the clamps properly tightened :

- Tighten the various connections one after the other starting at the exhaust manifold and finishing at the silencer.
- Position the clamps so that their clamping areas bear evenly on both the pipes to be clamped.
- Tighten the clamp bolts to the correct torque : 8 mm diameter bolts : 2 daNm, to avoid distorting the pipes and the clamps : which could cause leakage.

Tighten the spring loaded clamp with the thermoplastic seal.



ESSENTIAL : The thermoplastic seal must be replaced every time it is removed and the clamp fastenings must be tightened until the springs are coilbound (do not loosen them).

NOTE :
- As a safety measure, keep a CO2 type extinguisher near the place where the operations are carried out.

ESSENTIAL SPECIAL TOOLS	
Mot.213-01	Pressure gauge
Mot.453-01	Hose clamps

TEST METHOD

Before disconnecting the pipe that leads from the fuel pump to the carburettor, run the engine at idling speed to ensure that the carburettor float chamber is filled to its maximum level.

Stop the engine.

Disconnect the pipe at the pump outlet.

Connect pressure gauge Mot.213-01 in its place.

Pinch flat the return to tank pipe with clamp Mot.453-01.

The pressure gauge pipe must be :

- transparent,
- as short as possible.

Holding the pressure gauge as high as possible (pipe roughly vertical) start the engine and run it at idling speed.

When the height of the fuel in the pipe stabilises, lower the pressure gauge until the fuel level is in line with the pump diaphragm.

Read the static pressure.

Static pressure (no pump delivery) :

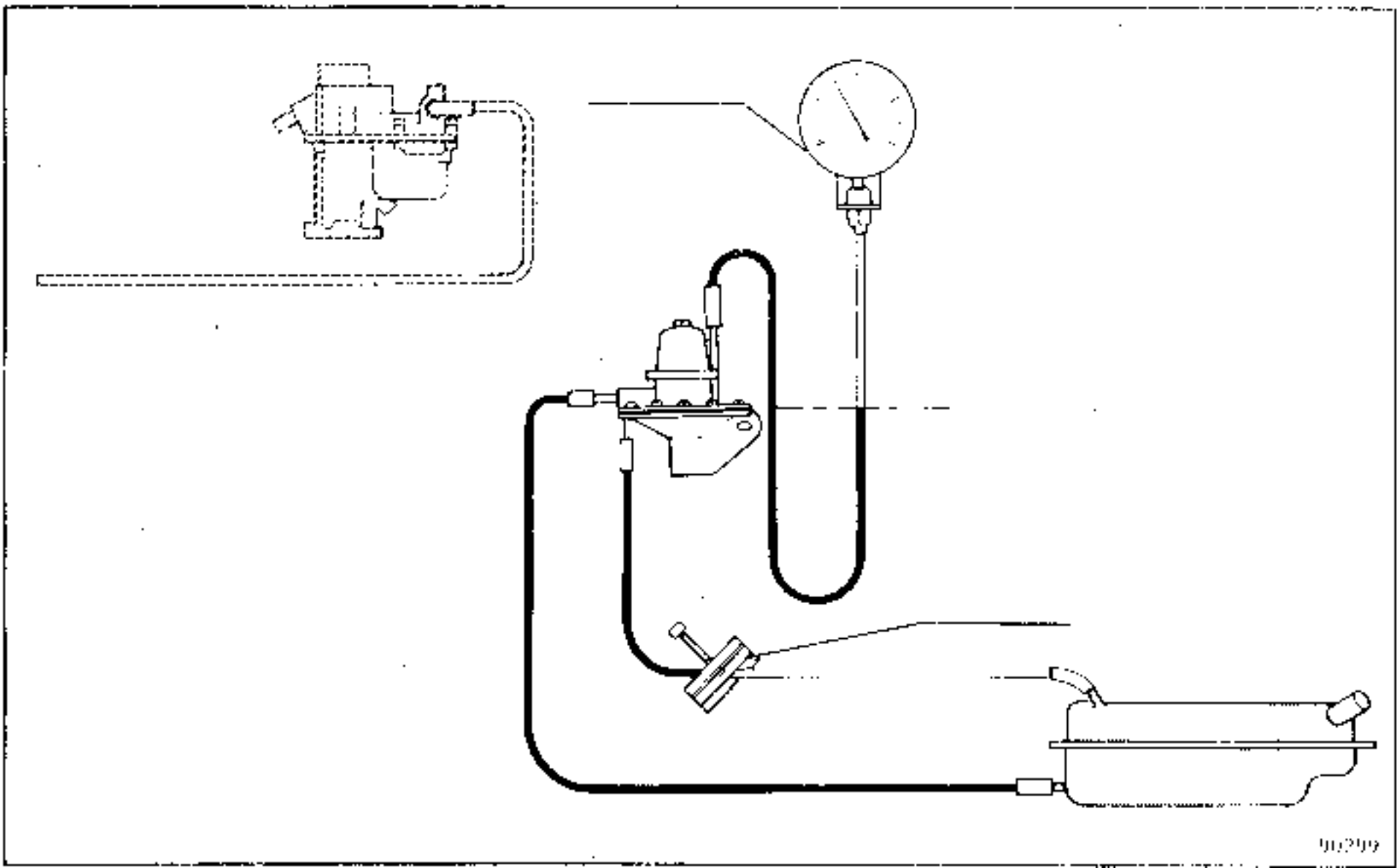
- min : 0,170 bars
- max : 0,325 bars.

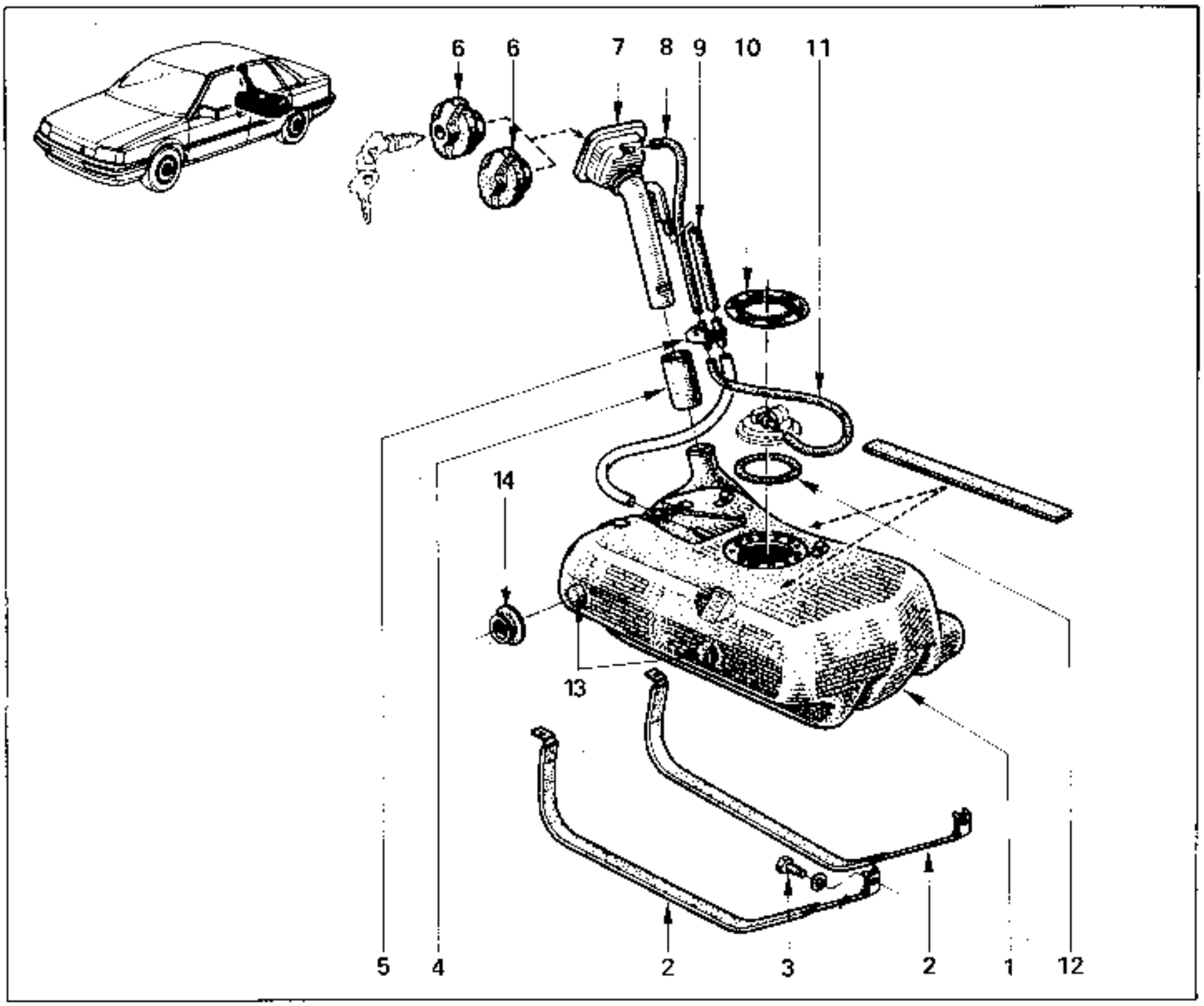
PRECAUTIONS

Under no circumstances must the pressure gauge be connected "in by-pass".

Check the return to tank.

Check that this circuit is not blocked by loosening clamp Mot.453-01. This should cause the pressure to drop from 0,01 to 0,02 bars.





1 Tank
2 – Securing straps
3 Securing bolts
4 Filler sleeve
5 – Double connection
6 Filler cap
7 – Filler pipe
8 Tank vent pipe
9 Tank vent pipe
10 – Clamping ring
11 Tank vent pipe
12 – Tank unit gasket
13 Studs locating tank on chassis
14 Spacer

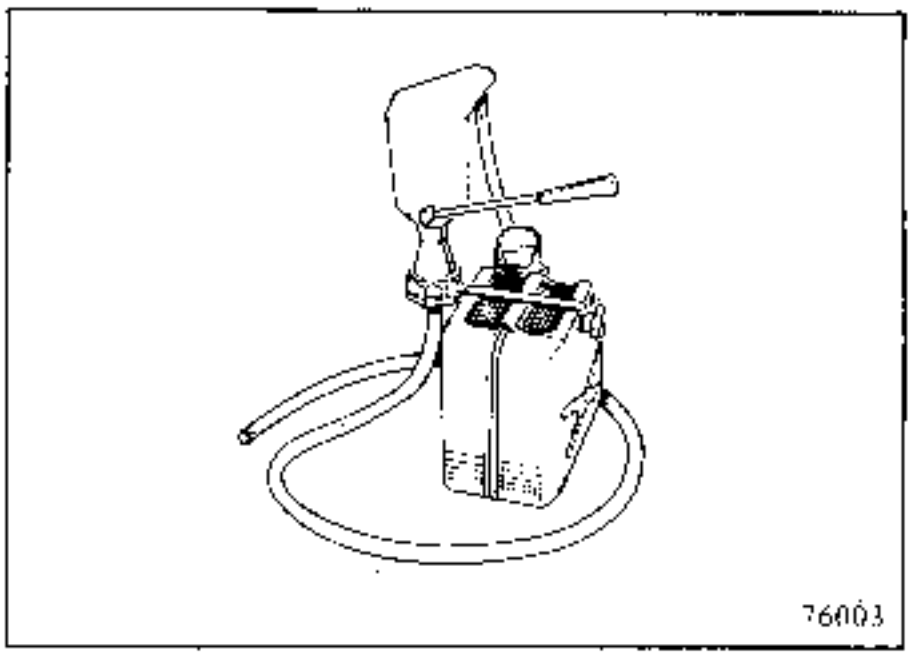
REMOVING

- Place the vehicle on a lift.

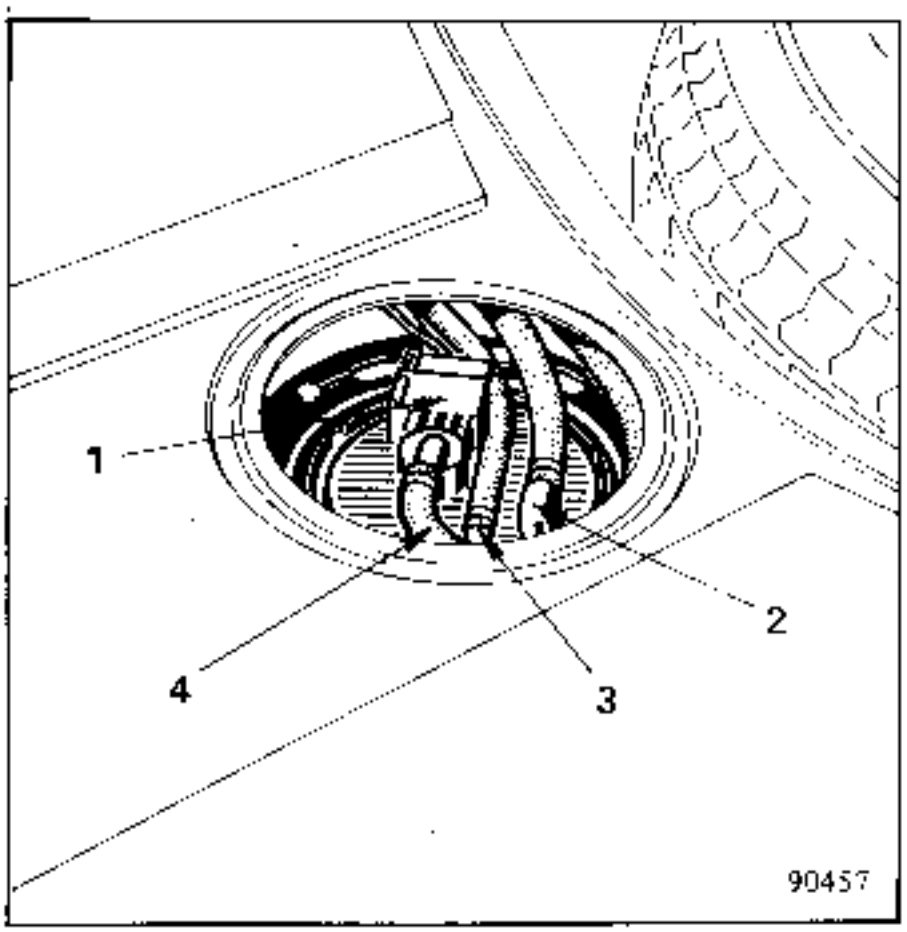
Before raising the vehicle :

- Disconnect the battery.
- Remove any fuel contained in the tank using, for example, the "type 3 000 piston pump" distributed by :

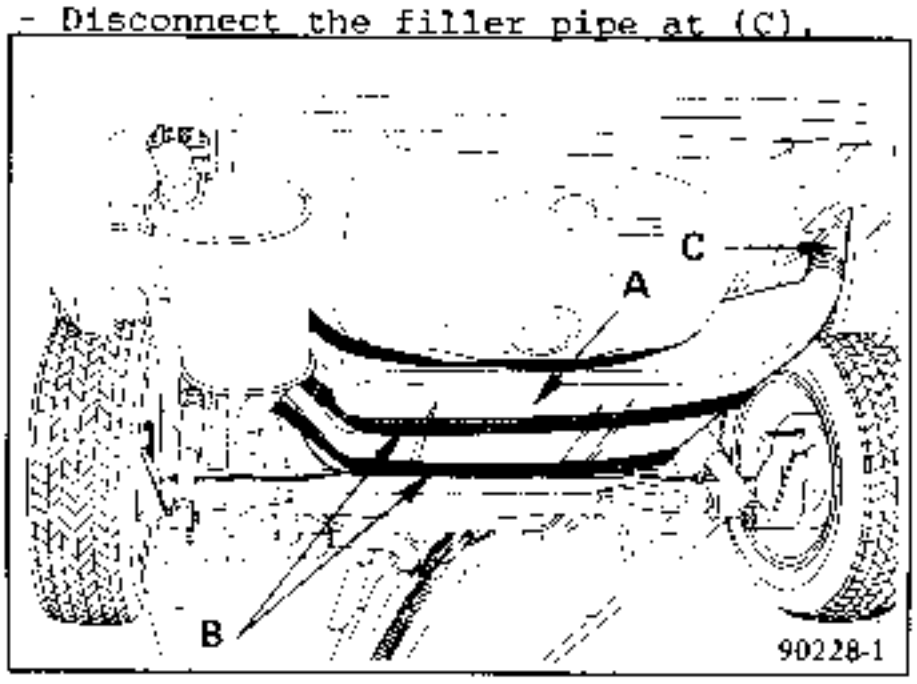
La Compagnie des Pompes et Distributeurs
7, rue J. Mace - 92150 Suresnes
Tel. : 45.06.23.95



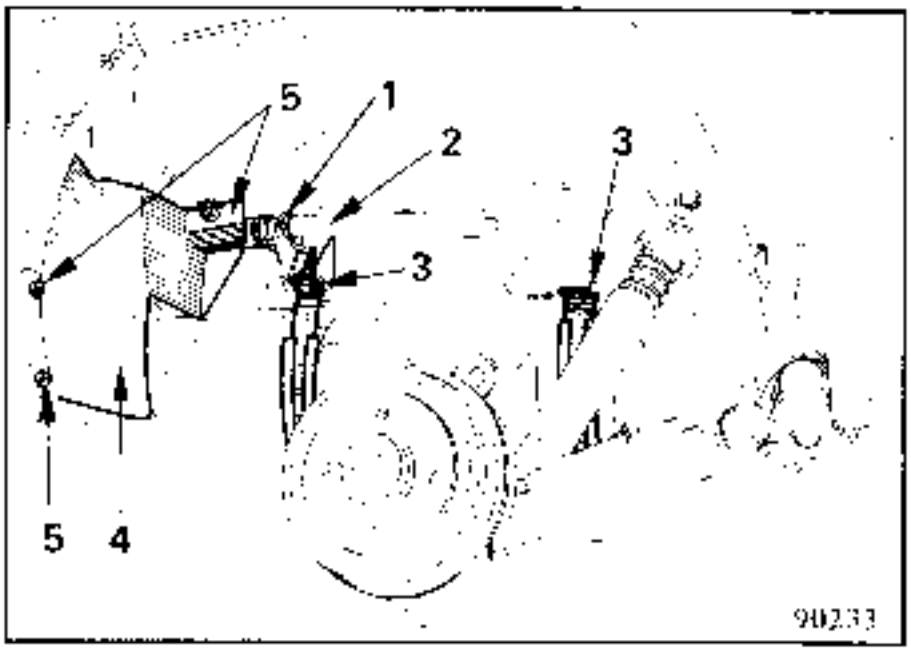
- Lift the boot mat to gain access to the tank unit connector.
- Disconnect the tank unit connector (1).
- Disconnect the feed (2), return (3) and vent (4) pipes from the tank unit well.



- Remove the right hand rear wheel.
- Disconnect the 2 vent pipes from the double connector (1).
- Remove the protector (4) by taking out bolts (5).
- Disconnect the filler pipe at (C).



A - Tank
B - Securing straps
C - Connection between filler and tank.



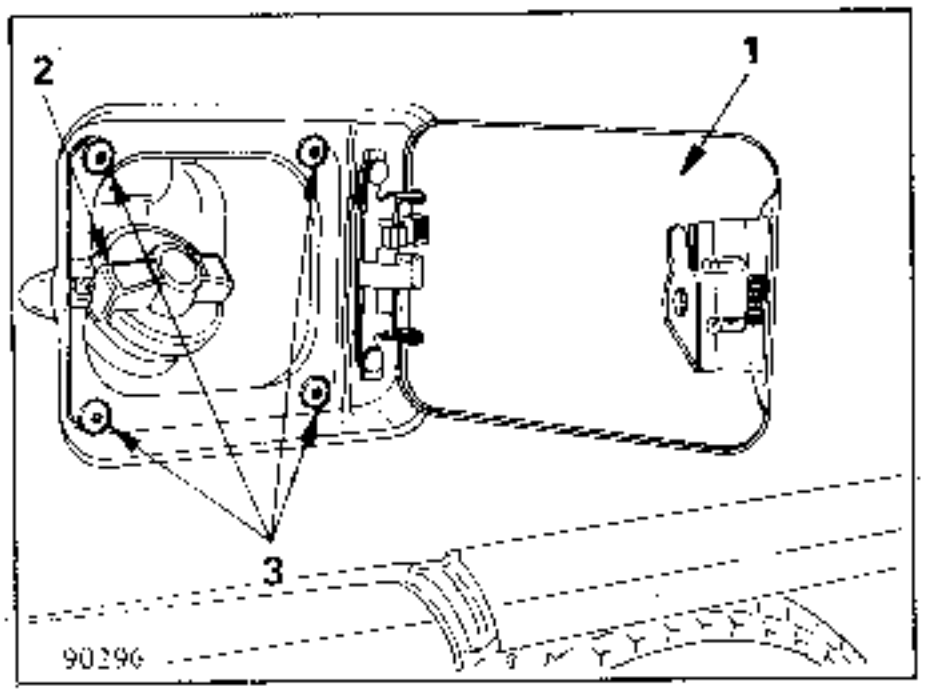
1 - Double connector
2 - Vent pipes
3 - Tank securing bolts
4 - Protector
5 - Securing bolts

Remove the tank fastenings (3) and, using for example, the Desvil V 710 stand, slowly lower the tank.

Filler pipe :

Removing :

The upper part of the filler pipe (the cap end) is riveted to the bodywork.
To remove this part, the rivets securing it to the bodywork will have to be drilled out.

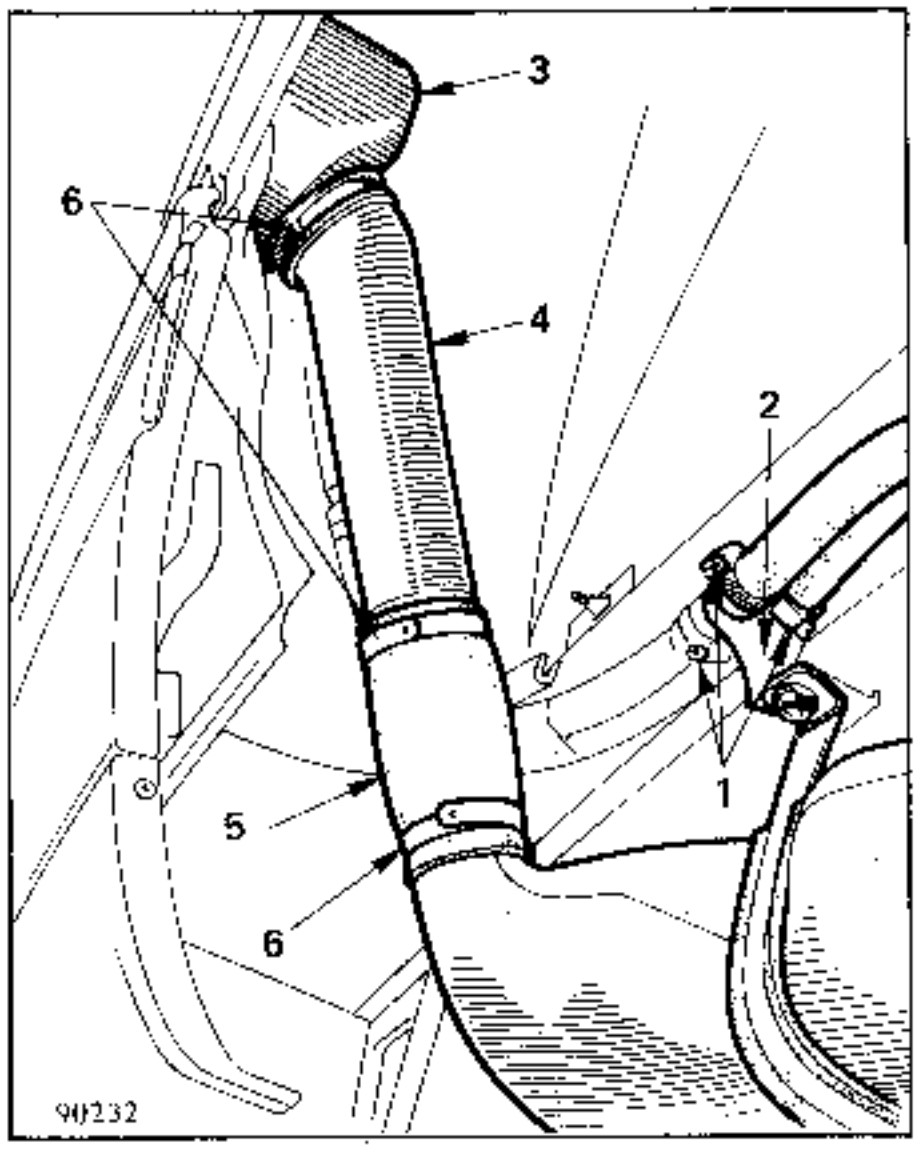


1 - Flap
2 - Filler cap
3 - Securing rivets

- Disconnect the vent pipes from the filler pipe side of the double connector (2).
- Disconnect the sleeve connecting the filler pipe to the tank at (5) and (6).
- Remove the assembly.

Refitting :

IMPORTANT :
Take care, when refitting, not to trap the pipes.
Fit new aluminium rivets
Ø 4,8 L = 12 mm and
Head Ø = 12 mm



1 - Vent pipes
2 - Double connector
3 - Filler neck
4 - Filler pipe
5 - Connecting sleeve
6 - Clips

Refitting the tank :

Take care, on refitting, not to trap the pipes.
Place the tank locating studs in their slots in the chassis.

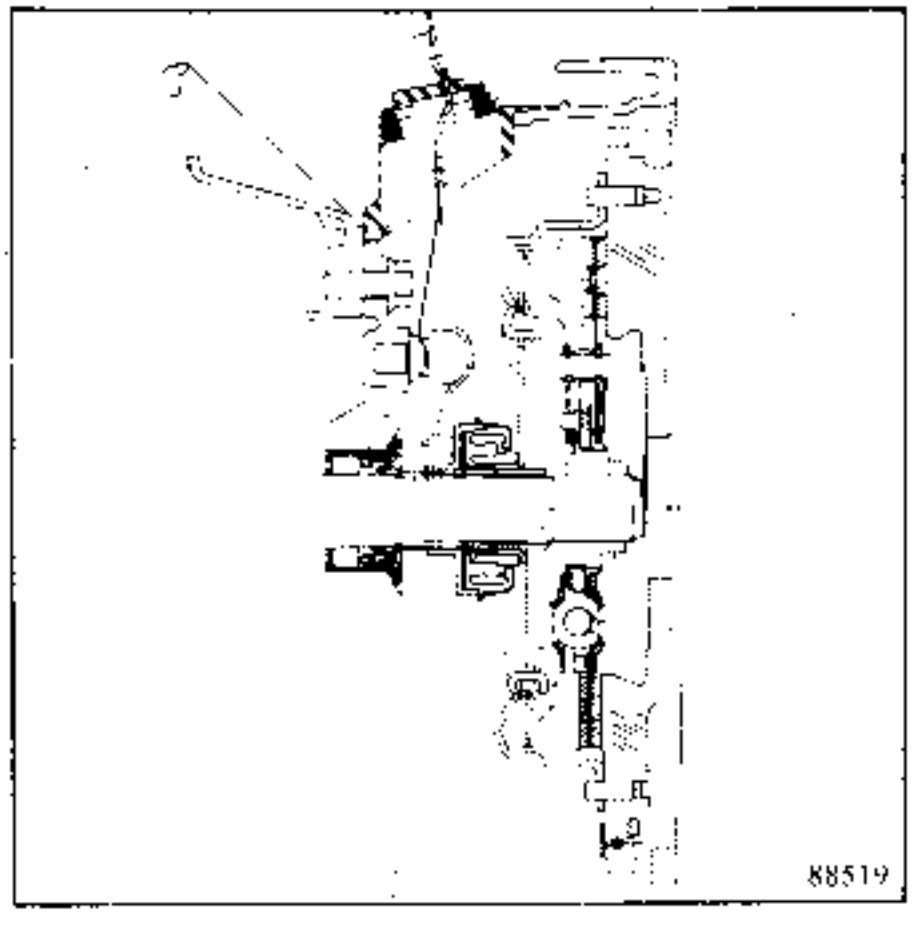
FILLING THE TANK

The usable tank capacity is 66 $\pm$ 1 litre.

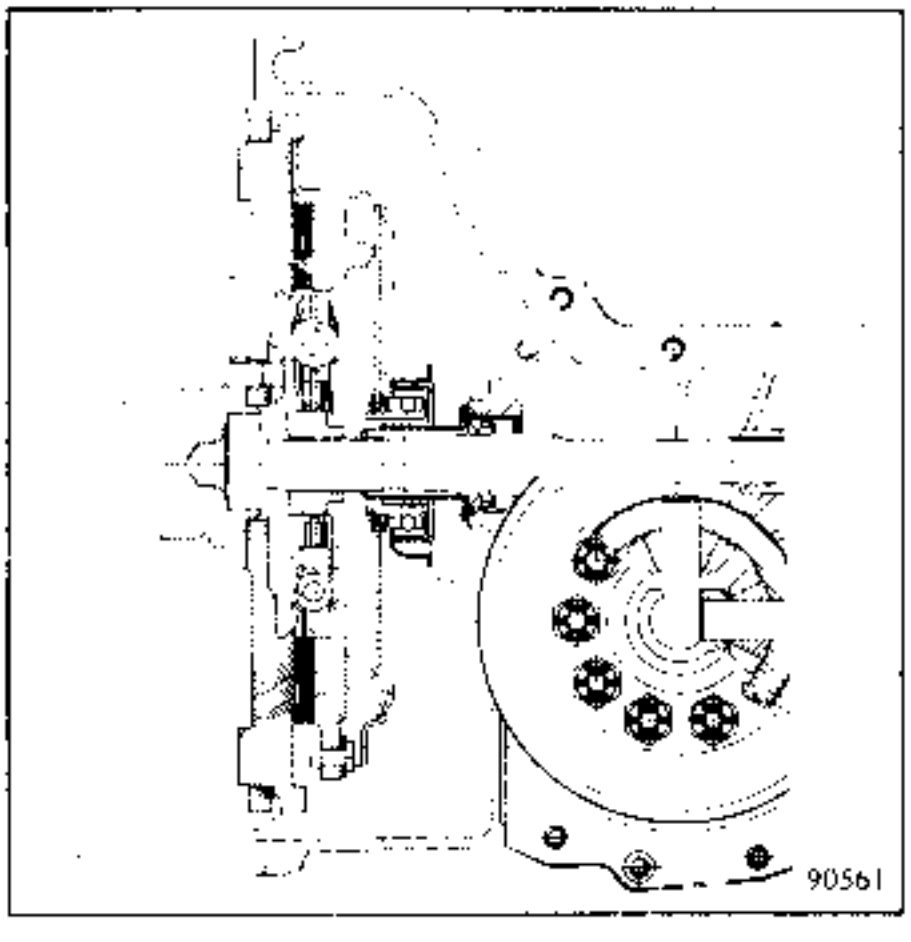
IMPORTANT :

When filling the tank it is essential to stop the **first** time the pump filler nozzle cuts out because otherwise the presence of a non-return valve in the tank may cause fuel supply defects.

L 481 L 482



L 483



Single disc, dry, clutch, cable operated.

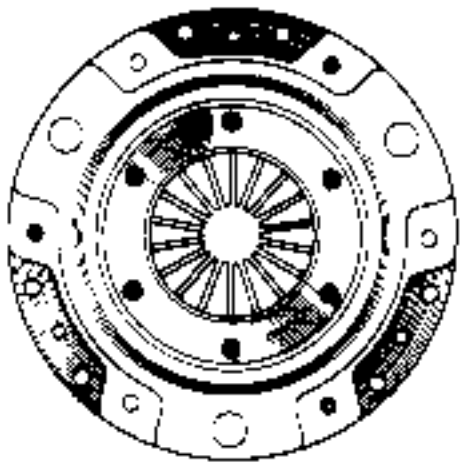
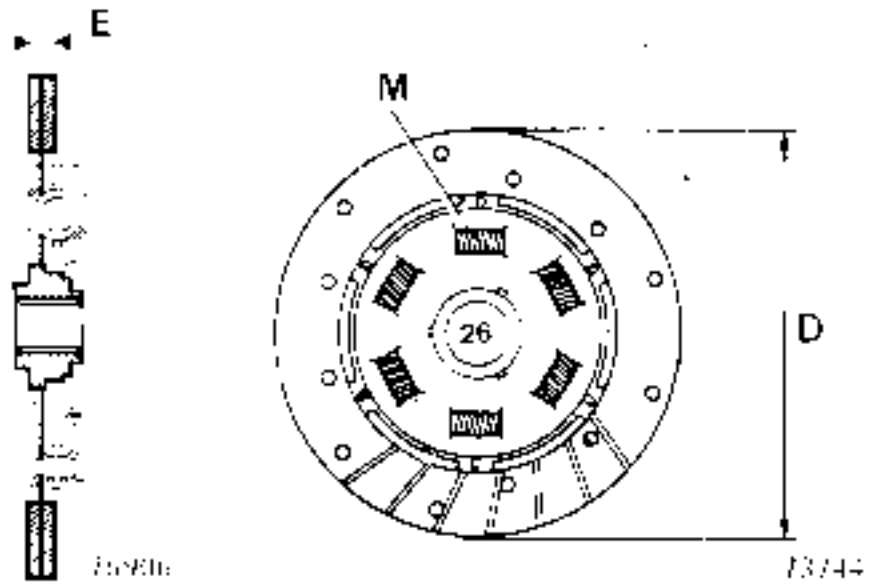
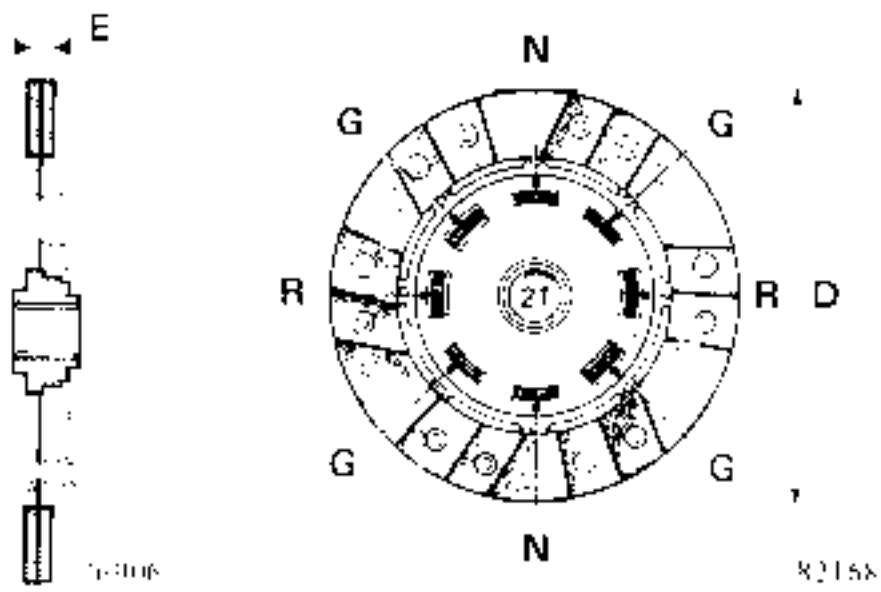
Diaphragm spring clutch plate.

Clutch disc with elastic hub.

Self-centering, guided, ball type release bearing in constant contact. (Transverse Engine).

Ball type release bearing secured to diaphragm. "Pulled" type clutch. (Longitudinal Engine).

Automatic wear take-up system.

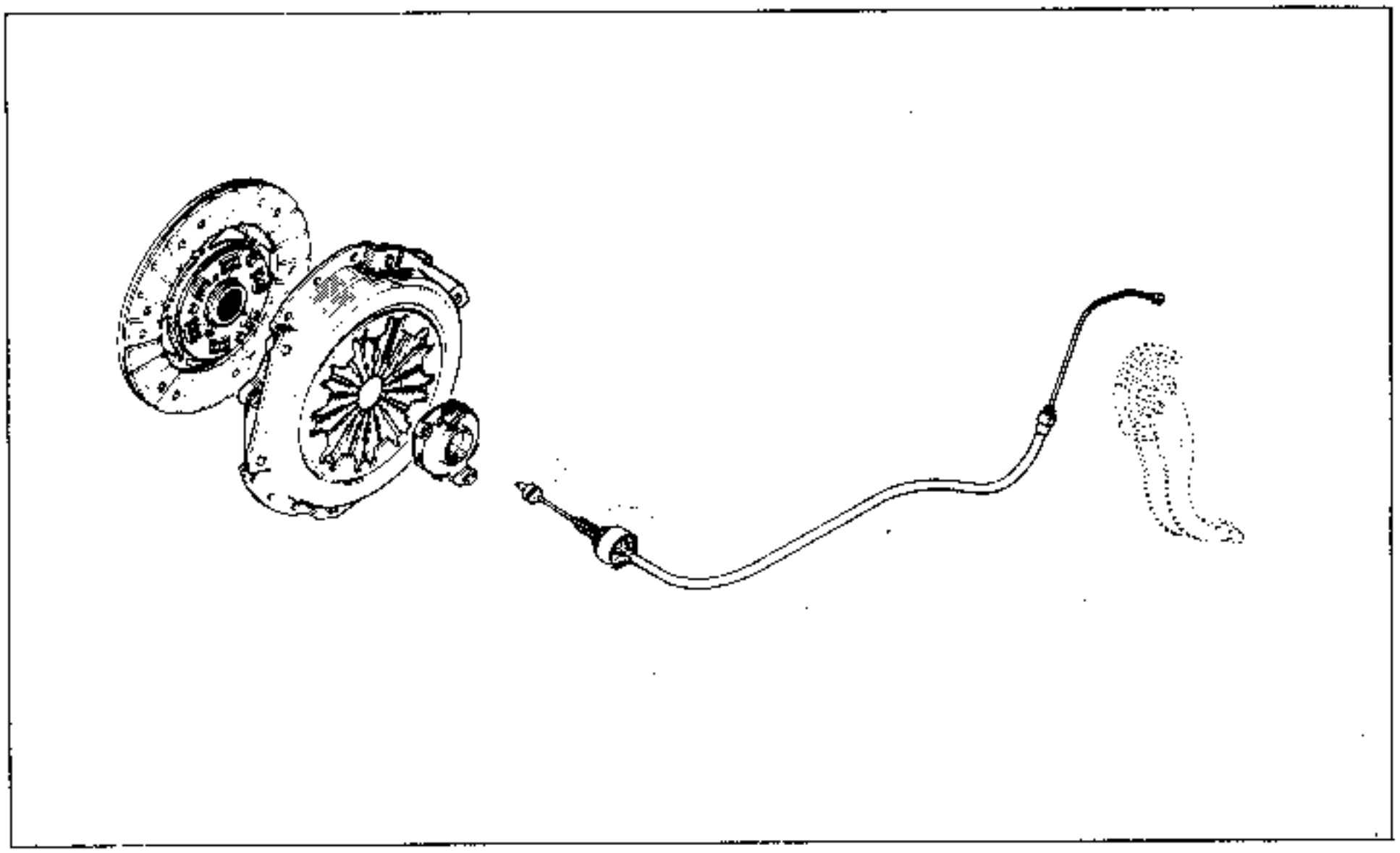
Vehicle type	MECHANISM	DISC
L 481 L 482	 200 CP 425	 **26** splines **M** : 6 springs, light pink. E : 7,7 mm. D : 200 mm.
L 483	 215 DT 475	 **21** splines G = Grey E = 6,8 mm **N** – Black D = 215 mm **R** = Red

CONSUMABLES

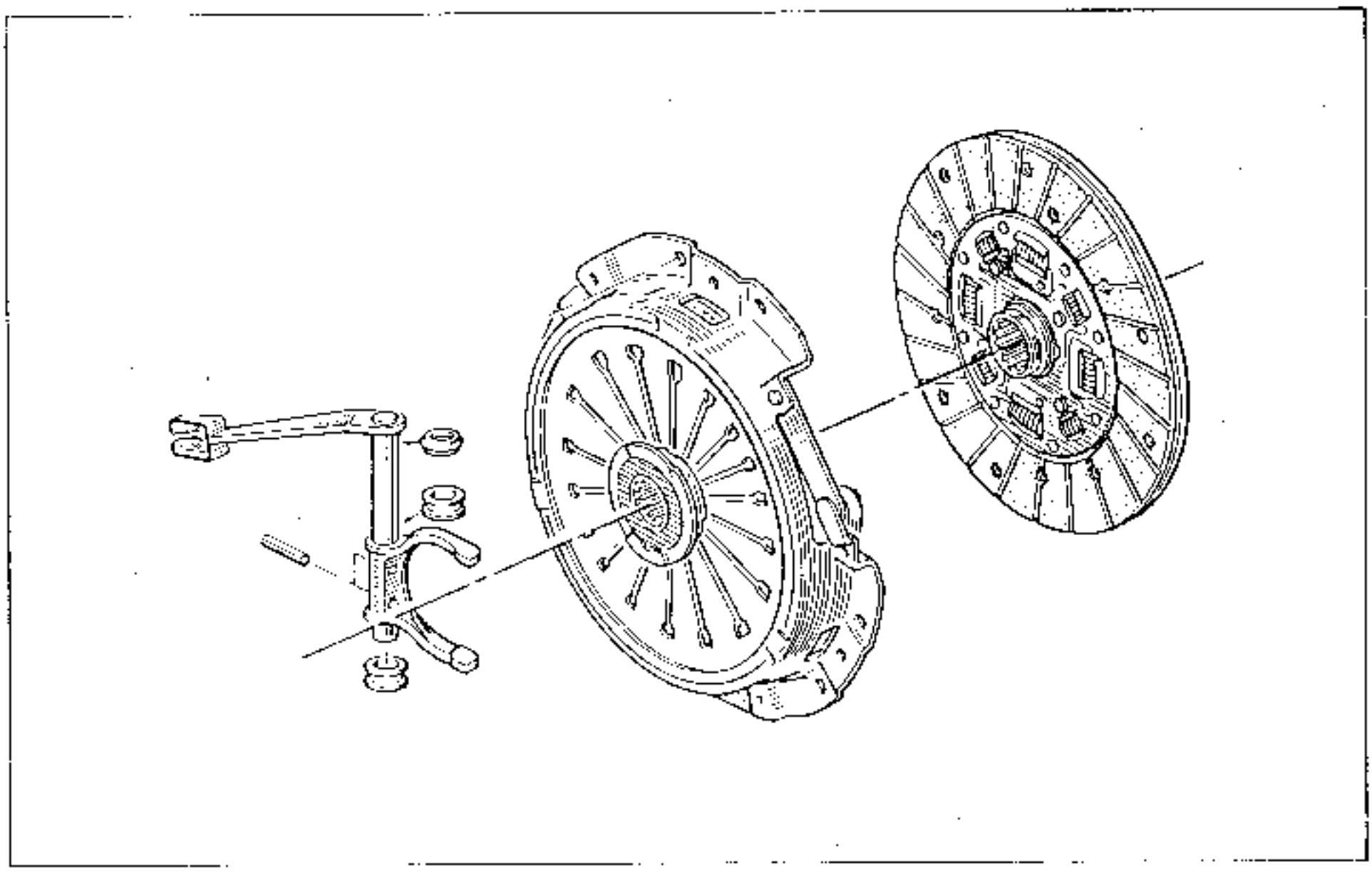
Type	Quantity	Unit
N° 20 Mobil x 57 030	7 gr	Clutch shaft splines Sun wheel splines Release bearing bore splines Release bearing guide tube bore
LOCTITE FRENBLOC	3 drops	5th speed fixed gear 5th speed hub Primary shaft nut. Secondary shaft bolt or nut
CAF 4/60 THIXO	Coat	Screw thread on nut on reverse positive lock 5th speed locking system Ends of spring pins on driveshafts.
LOCTITE 518	Coat	Housing joint faces

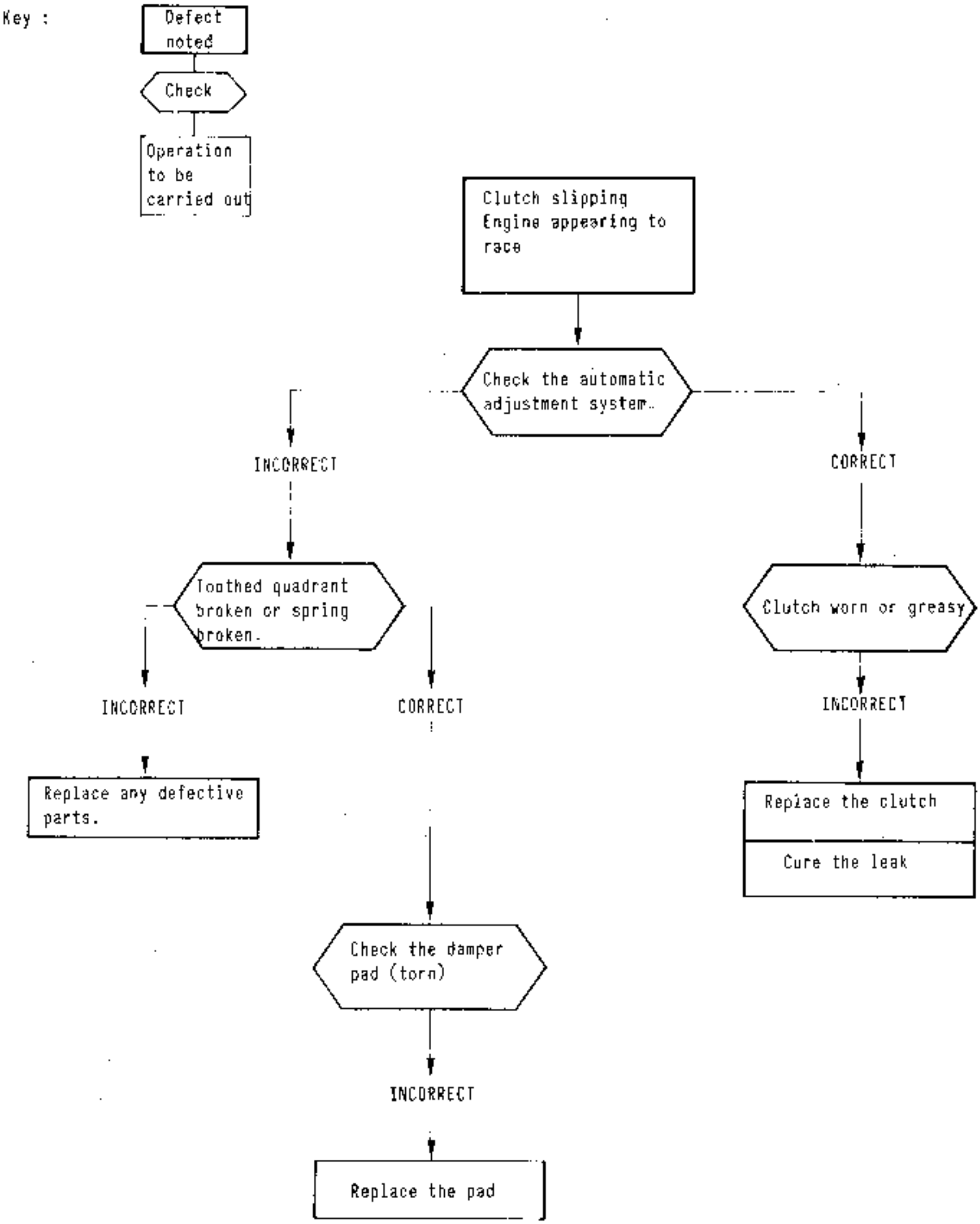
Exploded views

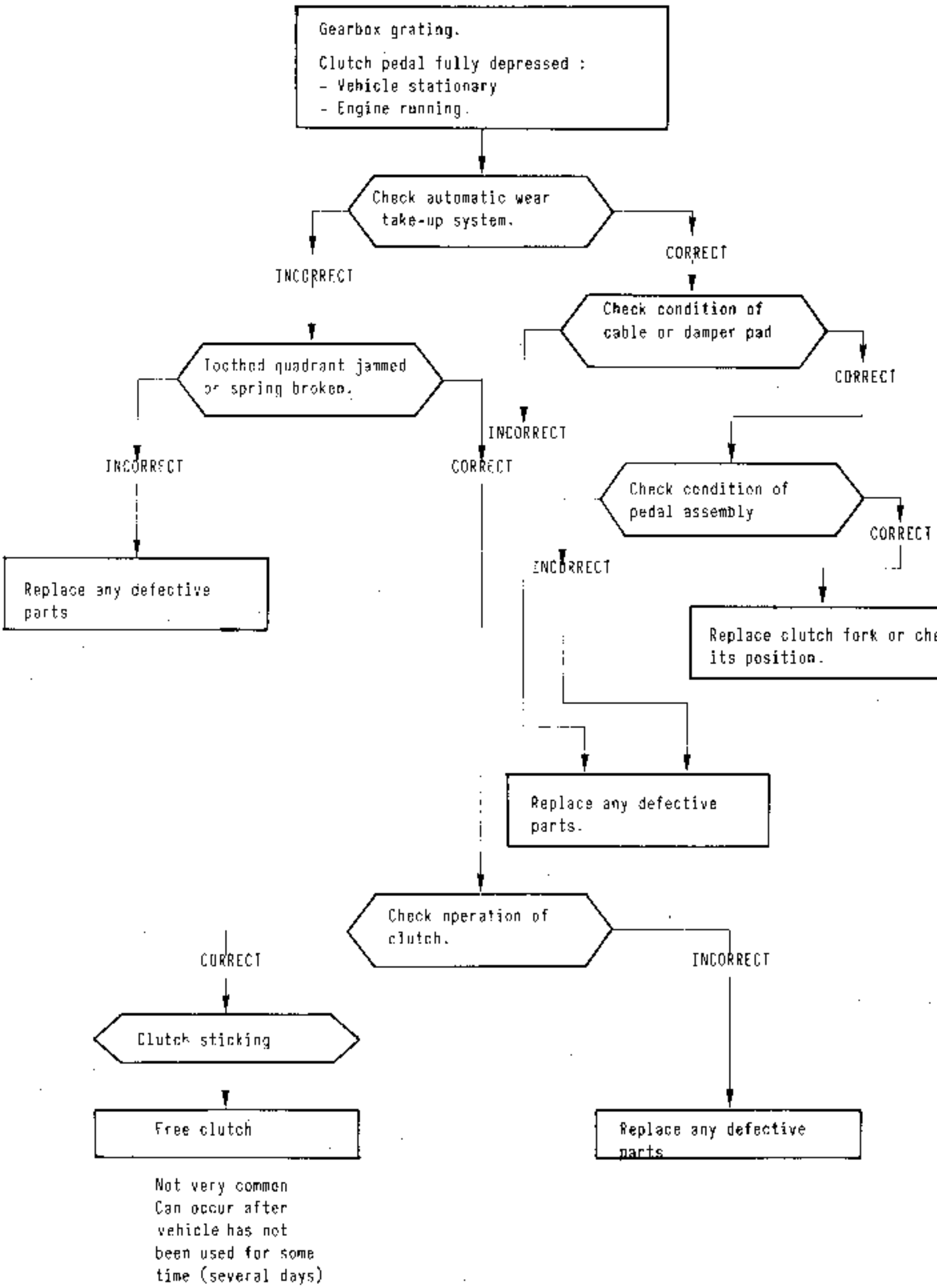
I - "PUSHED" type clutch

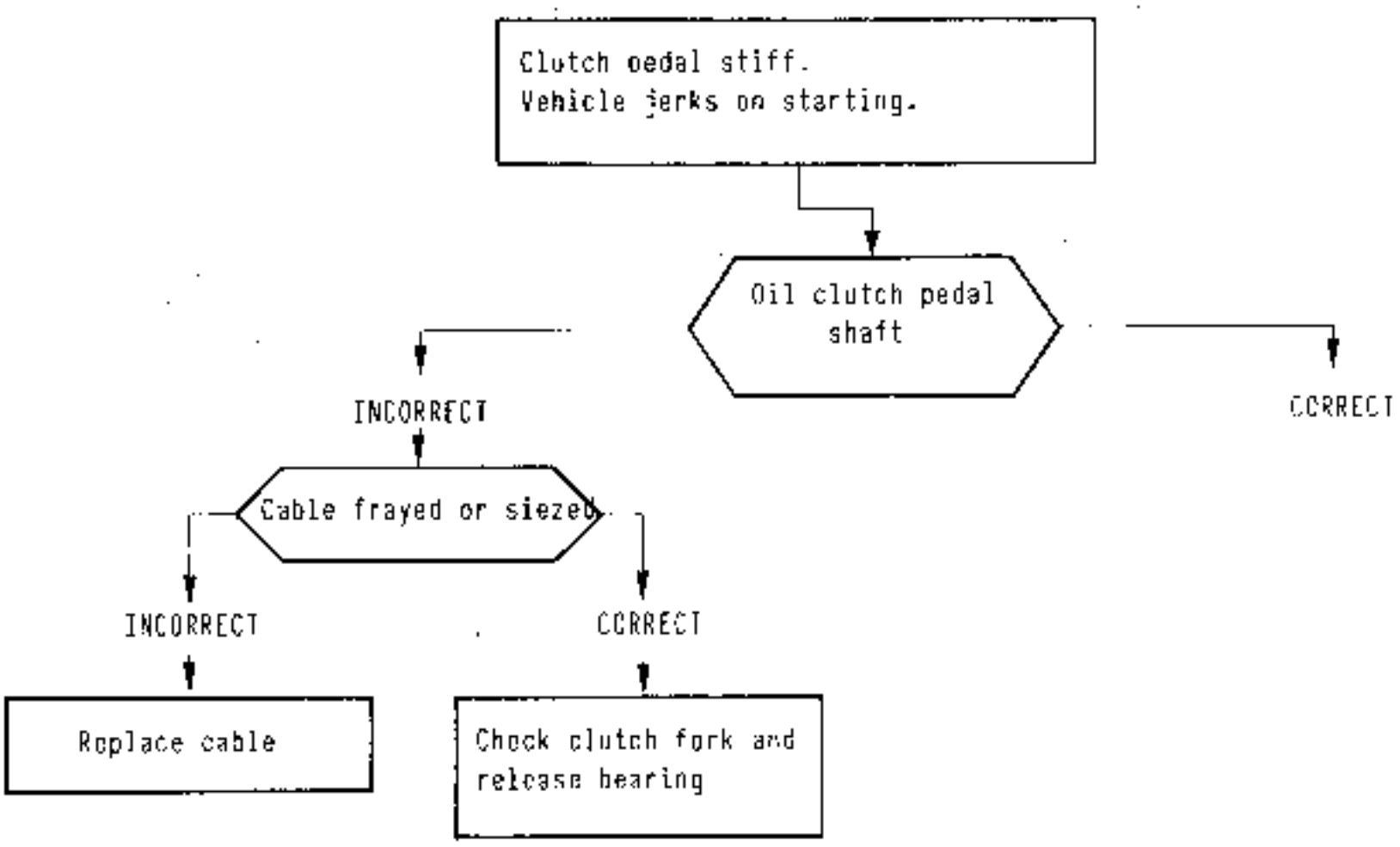


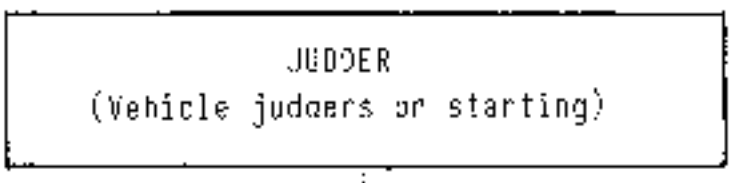
II - "PULLED" type clutch

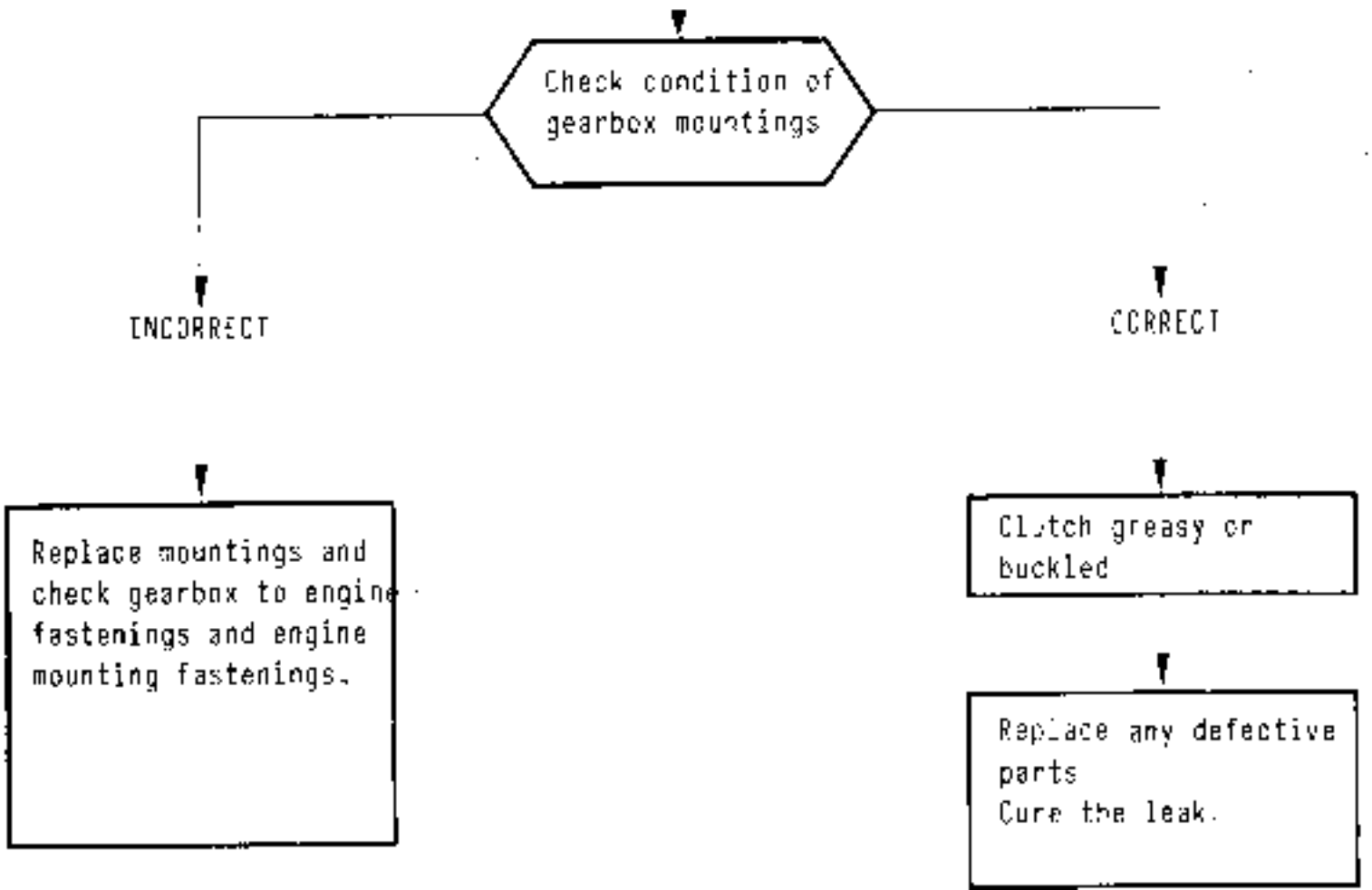


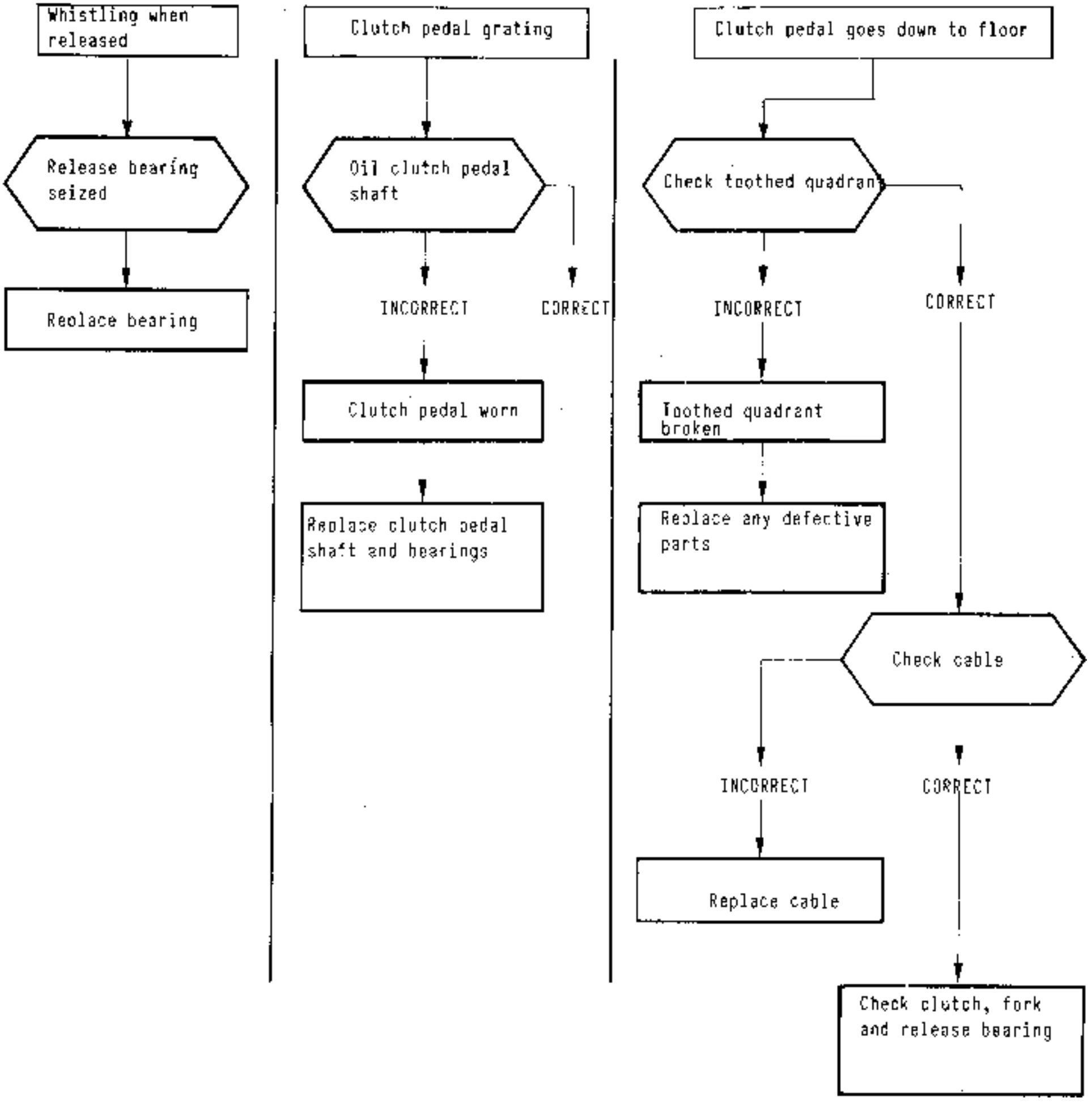

Key :
Defect noted
Check
Operation to be carried out
Clutch slipping
Engine appearing to race
Check the automatic adjustment system
INCORRECT
CORRECT
Toothed quadrant broken or spring broken.
Clutch worn or greasy
INCORRECT
CORRECT
INCORRECT
Replace any defective parts.
Replace the clutch
Cure the leak
Check the damper pad (torn)
INCORRECT
Replace the pad


Gearbox grating.
Clutch pedal fully depressed :
- Vehicle stationary
- Engine running.
Check automatic wear take-up system.
INCORRECT
CORRECT
Check condition of cable or damper pad
CORRECT
Toothed quadrant jammed or spring broken.
INCORRECT
INCORRECT
CORRECT
Check condition of pedal assembly
CORRECT
INCORRECT
Replace any defective parts
Replace clutch fork or check its position.
Replace any defective parts.
Check operation of clutch.
CORRECT
INCORRECT
Clutch sticking
Free clutch
Not very common
Can occur after vehicle has not been used for some time (several days)
Replace any defective parts


Clutch oedal stiff.
Vehicle jerks on starting.
Oil clutch pedal shaft
INCORRECT
CORRECT
Cable frayed or siezed
INCORRECT
CORRECT
Replace cable
Chock clutch fork and release bearing


JUDDER
(Vehicle judders or starting)


Check condition of gearbox mountings
INCORRECT
CORRECT
Replace mountings and check gearbox to engine fastenings and engine mounting fastenings.
Clutch greasy or buckled
Replace any defective parts
Cure the leak.


Whistling when released
Release bearing seized
Reolace bearing
Clutch pedal grating
Oil clutch pedal shaft
INCORRECT
CORRECT
Clutch pedal worn
Replace clutch pedal shaft and bearings
Clutch pedal goes down to floor
Check toothed quadrant
INCORRECT
CORRECT
Toothed quadrant broken
Replace any defective parts
Check cable
INCORRECT
CORRECT
Replace cable
Check clutch, fork and release bearing

This operation is carried out after first removing the gearbox

ESSENTIAL SPECIAL TOOLS
Mot. 582 Retaining clamp Plus tools required to remove gearbox.

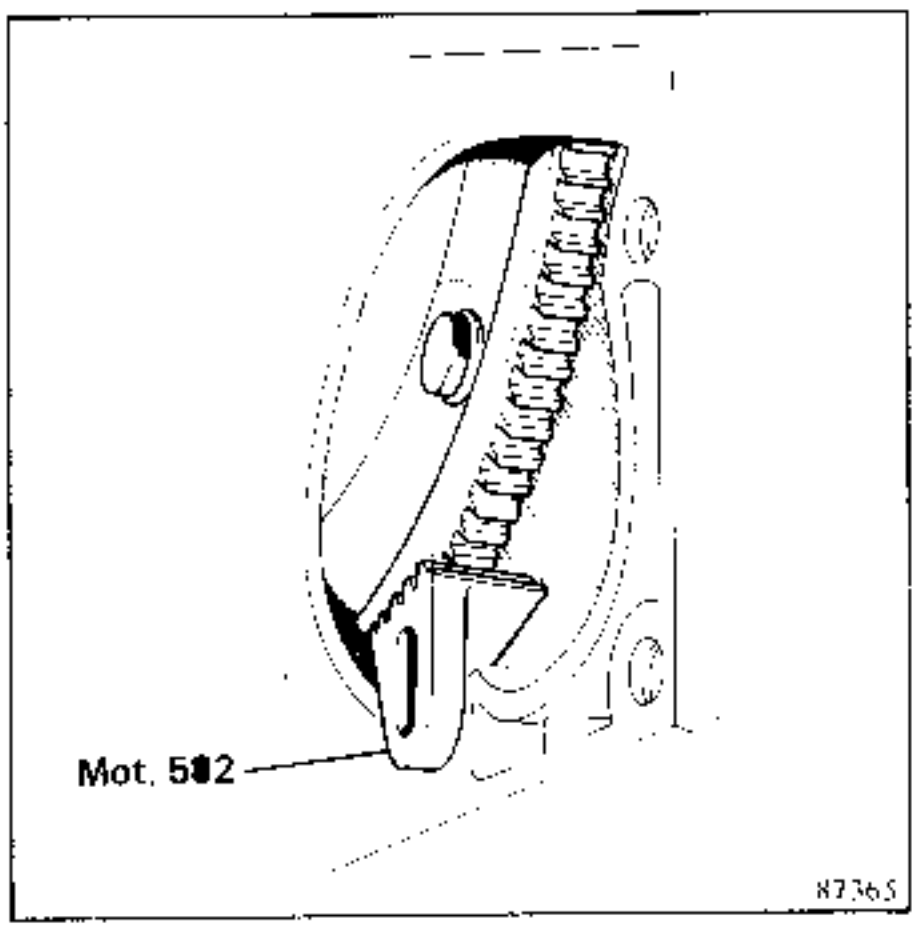
TIGHTENING TORQUE (in daN.m)	
Clutch securing bolts	2,5

REMOVING

Fit retainer Mot.582.

Remove the clutch unit securing bolts and take out the unit and the disc.

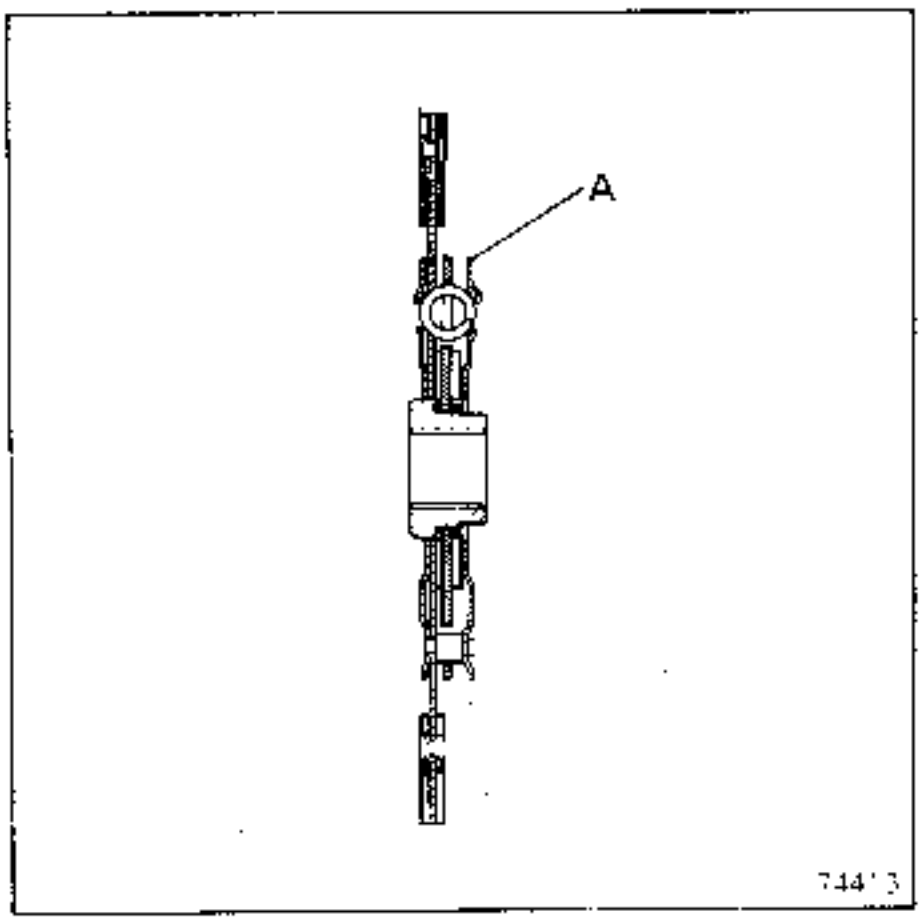
Check and replace any defective parts.



REFITTING

Degrease the mounting face on the flywheel.

Place the disc in position (with its hub offset (A) towards the gearbox) : centralise it, by eye, without using any tool.



Screw up the unit securing bolts, evenly, then tighten them to torque.

Remove retainer Mot.582.

Coat the release bearing bore, the guide tube and the splines on the clutch shaft with No. 20 grease (Mobil x 57030).

After refitting the gearbox, reset the toothed quadrant (see section on replacing the cable).

This operation is carried out after having first removed the gearbox and taken off the clutch housing.

See Workshop Manual "TYPE JB GEARBOX" section : "SEPARATING THE HOUSINGS".

TIGHTENING TORQUES (in daN.m)	
Housing bolts	2,5

REMOVING

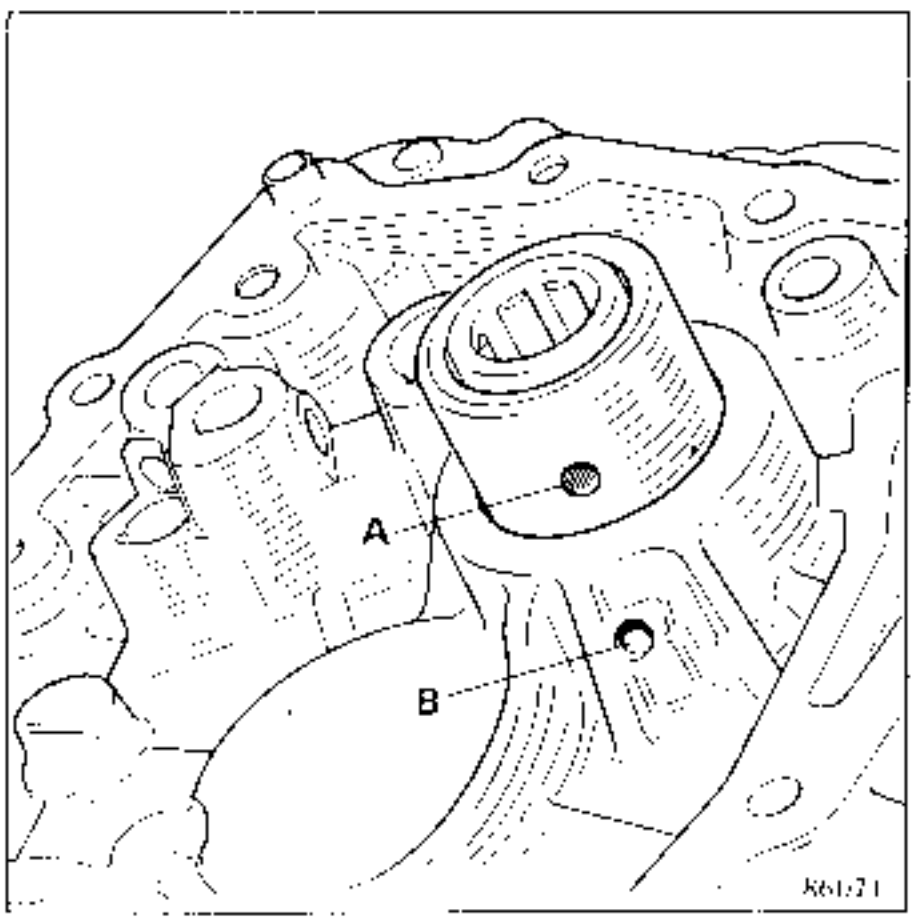
Take out the guide tube on the press.

After the guide tube has been removed, on the press, it cannot be refitted.

REFITTING

Apply a film of grease No. 20 (Mobil x 57030) to the walls of the bore.

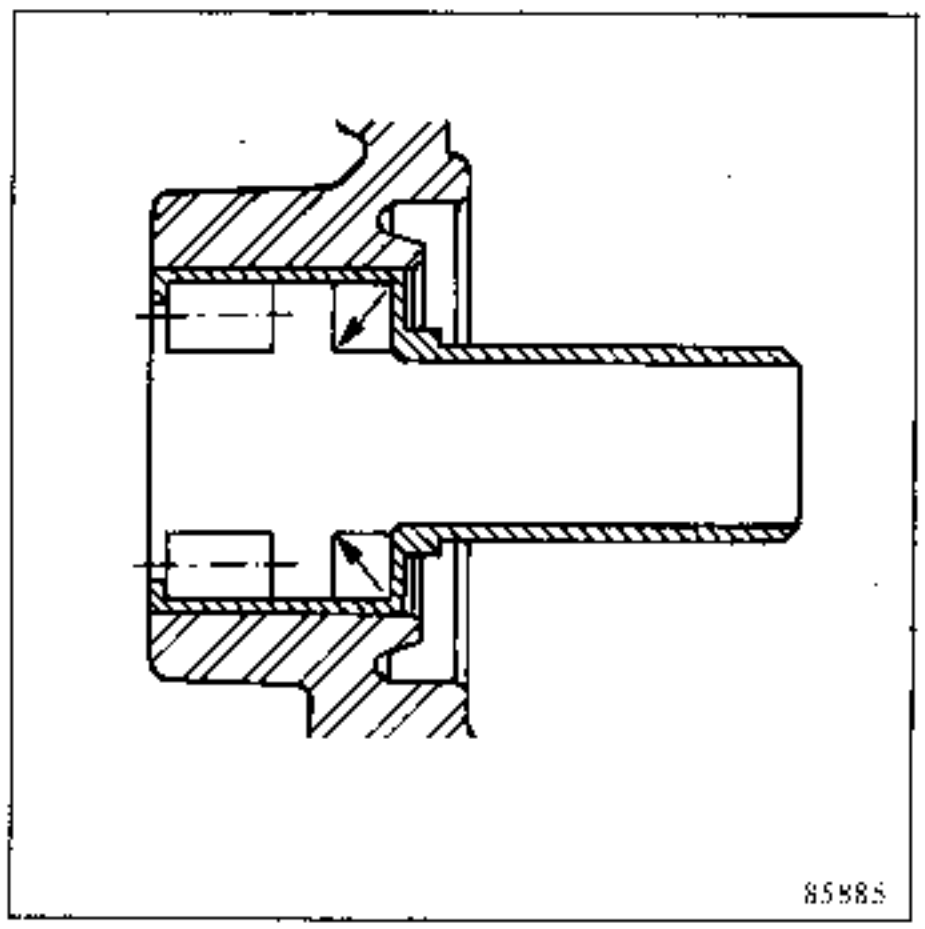
Align the bearing lubrication hole (A) in the guide tube with that in the clutch housing (B).



Insert the guide tube, on the press, until it makes contact with the inside face of the housing.

Oil the seal before fitting the shaft.

Wrap the clutch shaft splines with adhesive paper.



Coat the face of the housing with Loctite 518.

Refit the housing and secure it in place by tightening the bolts to a torque of 2,5 daN.m.

Coat the guide tube with grease No. 20 (Mobil x 57030).

This operation is carried out after first removing the gearbox and taking off the clutch housing.

Consult WORKSHOP MANUAL "TYPE XG GEARBOX" Section : SEPARATING THE HOUSINGS.

There is a lip seal on the bearing outer track ring with which care must be taken during fitting. This seal is lubricated from above through a hole in the housing.

Replacing the housing bearing involves also replacing the clutch shaft if its bearing area is not in good condition because the rollers make direct contact with the shaft.

TIGHTENING TORQUES (in daN.m)	
Housing bolts :	
Ø 10	3,5
Ø 8	2,5

REMOVING

Extract the guide tube on the press.

When the guide tube has been extracted on the press it cannot be refitted.

REFITTING

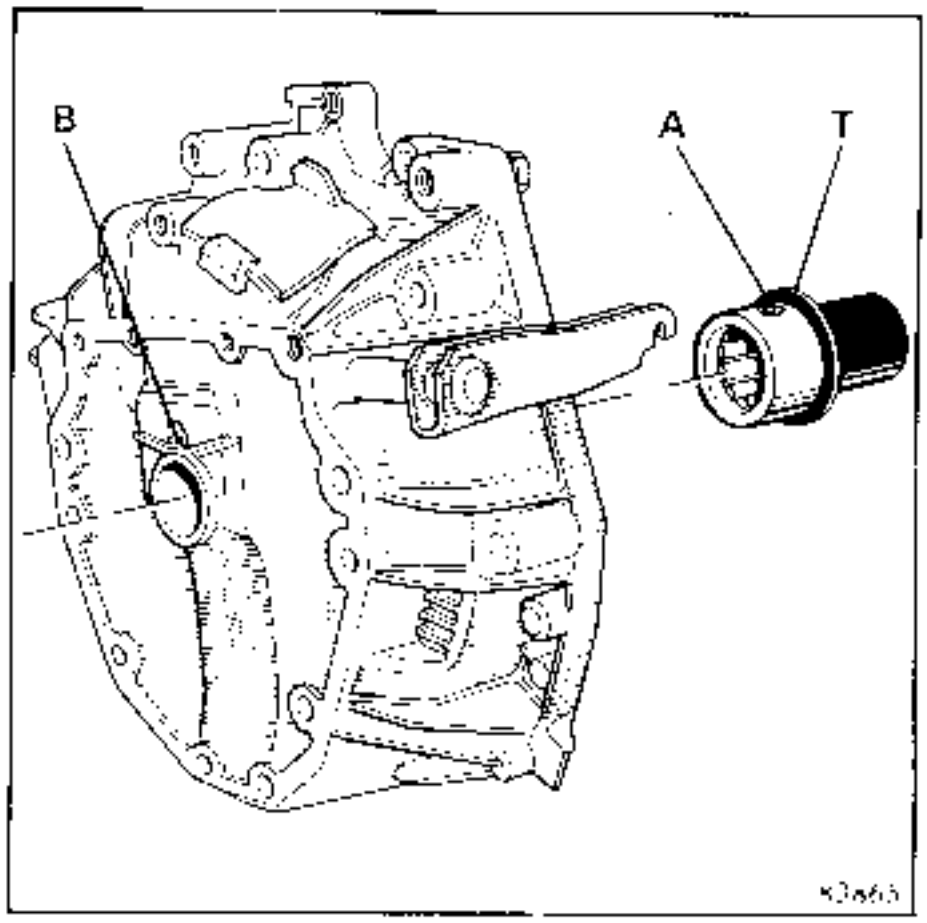
Apply a film of grease No. 20 (Mobil x 57030) to the walls of the bore.

Place the O ring seal (T) on the guide tube.

Offer up the guide tube to the clutch housing and align the bearing lubrication hole in the guide tube with that in the clutch housing.

Insert the guide tube on the press as far as it will go.

Check that the lubrication hole in the guide tube (A) is in line with that in the clutch housing (B).



Oil the seal before fitting the shaft.

Wrap adhesive paper round the clutch shaft splines to protect the lip on the seal.

Fit the housing in place with its gasket coated with "Perfect-Seal" jointing compound.

Tighten the bolts to torque.

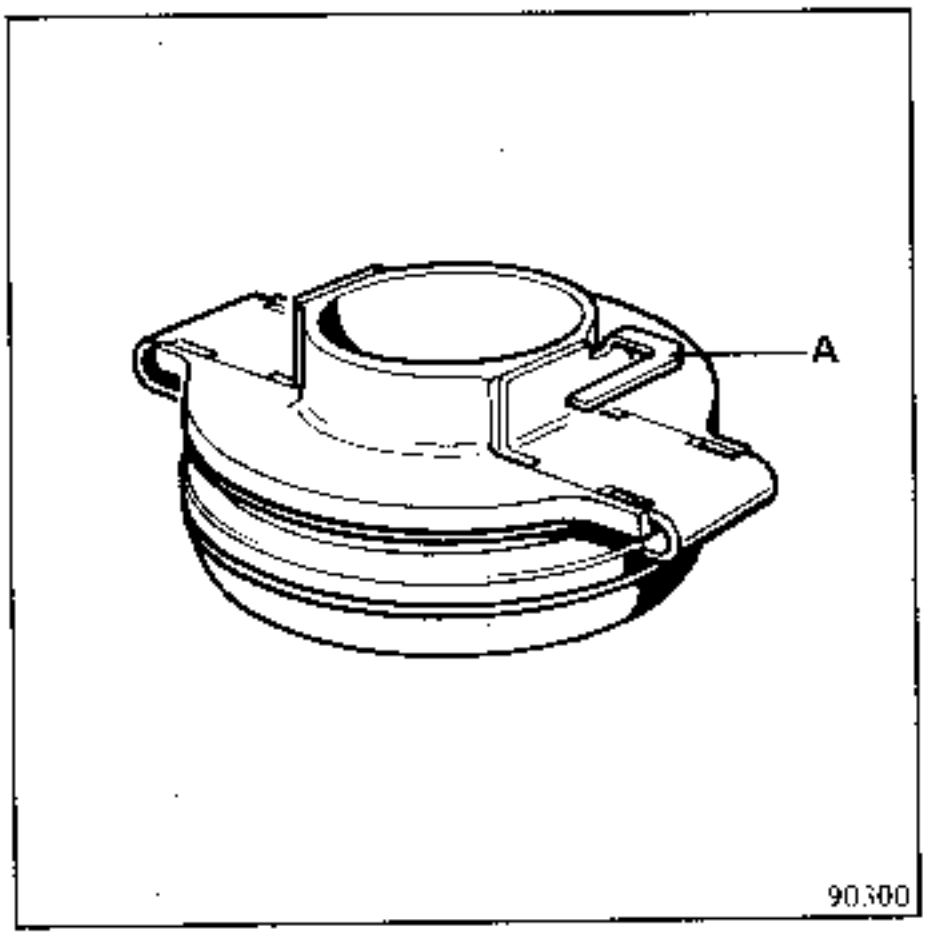
Ø 10 mm : 3,5 daN.m.
Ø 8 mm : 2,5 daN.m.

Coat the release bearing guide tube with grease No. 20 (Mobil x 57030).

This operation is carried out after removing the gearbox.

REMOVING

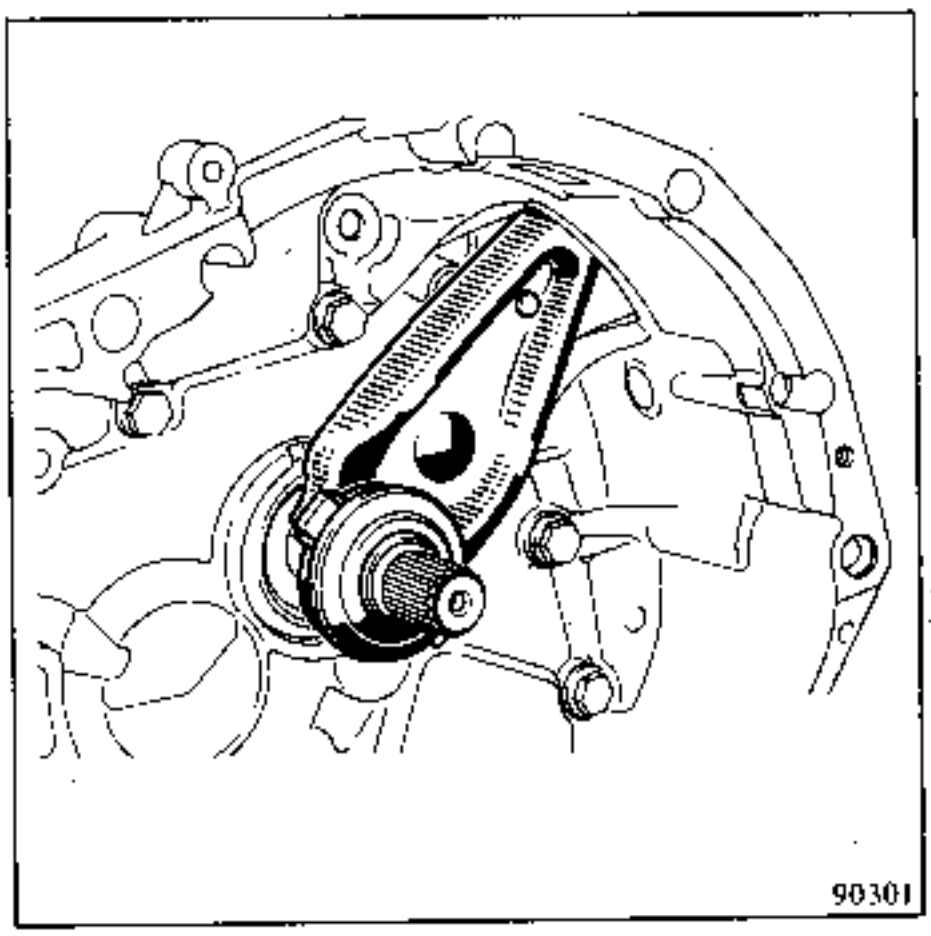
Remove the release bearing by tilting the fork.



REFITTING

Coat the walls of the bearing guide tube with grease No. 20 (Mobil x 57030).

Place the release bearing on the guide tube with lug (A) in the fork.



WITHDRAWAL FORK
Replacing

Transverse Engine

This operation is carried out after removing the gearbox.

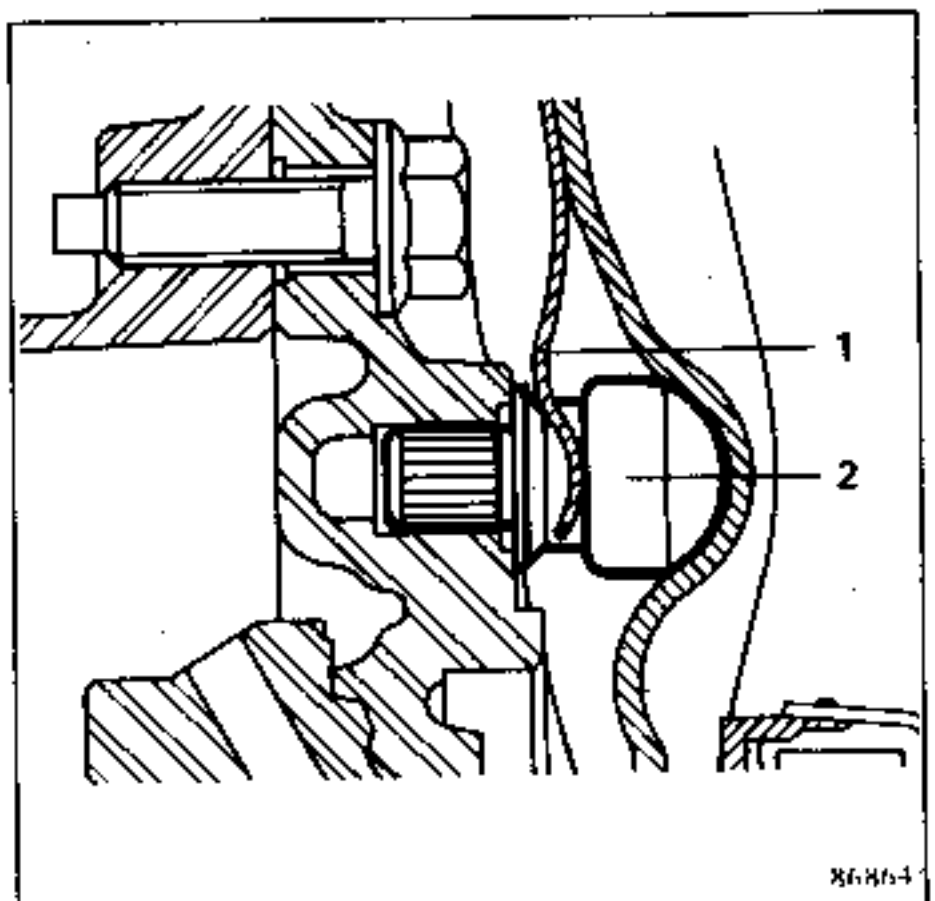
REMOVING

Remove the protective rubber and pull the fork towards the inside of the box.

REFITTING

Place the fork in position with the spring (1) behind the cup (2).

Check that it operates correctly.

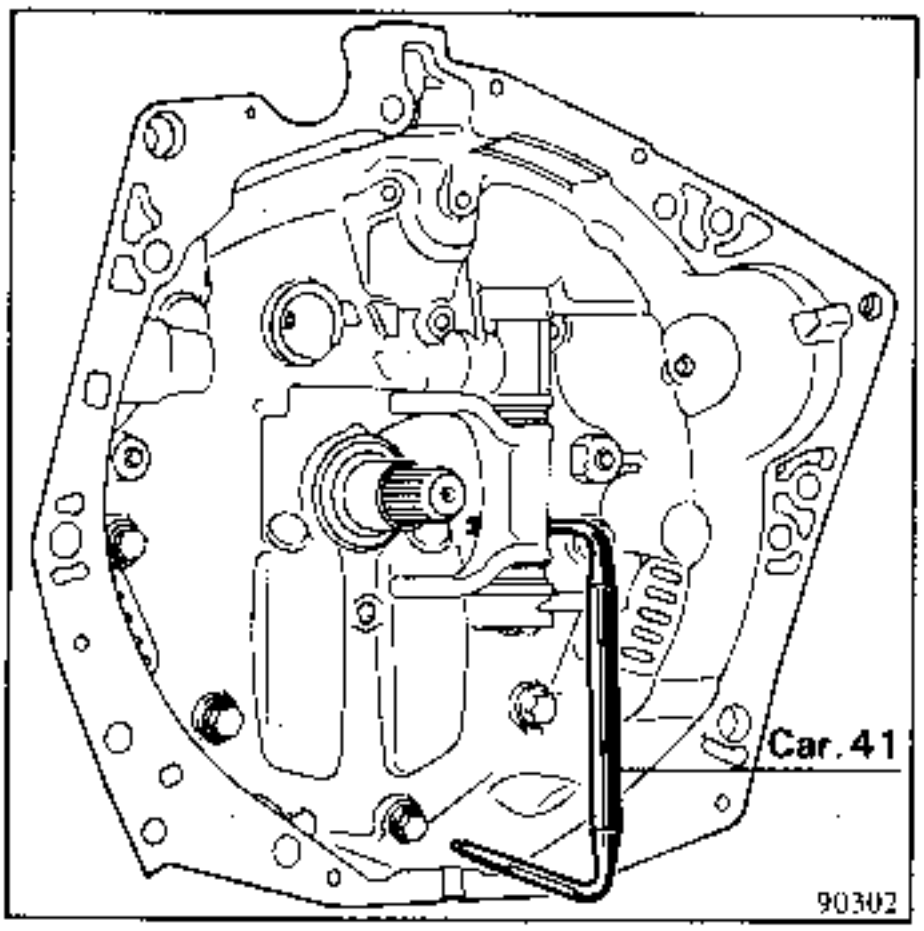


ESSENTIAL SPECIAL TOOLS	
B.Vi. 606	Set of punches
Car. 41	Cranked punch

This operation is carried out after removthe gearbox.

REMOVING

Knock out the pins that retain the fork, to half their length, using tool B.Vi.606, then finish knocking them out with tool Car.41.



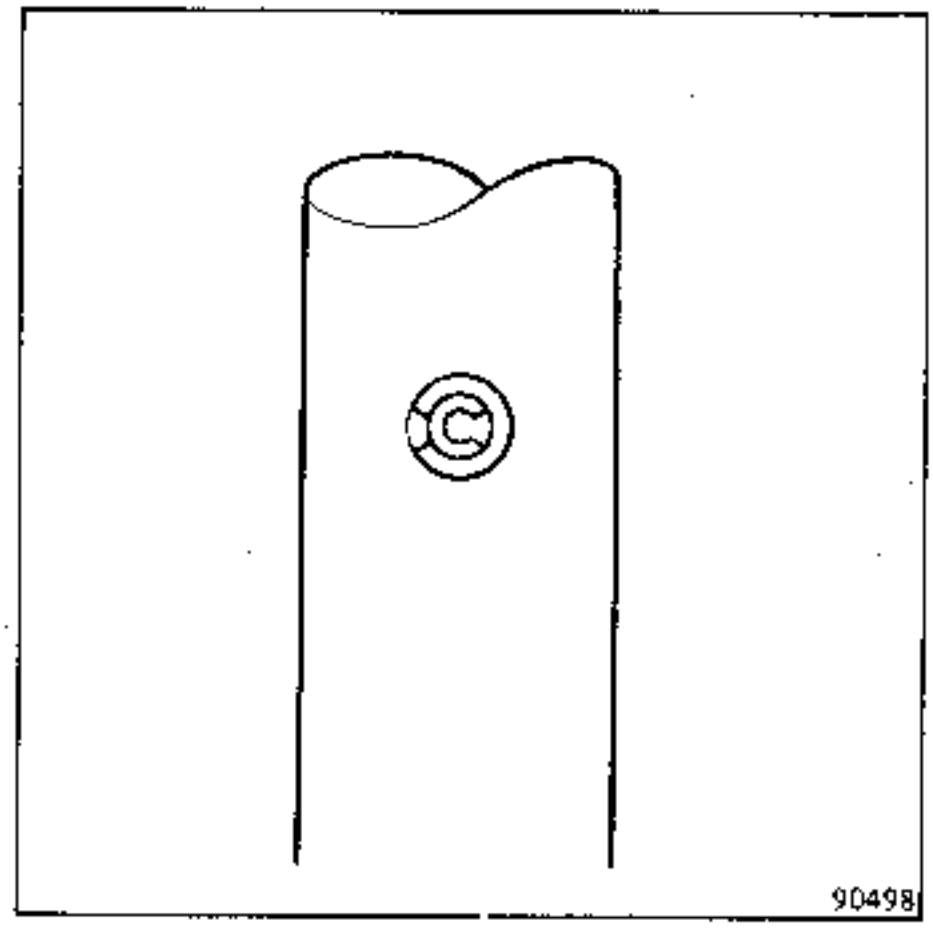
REFITTING

Lightly grease the fork shaft (grease No. 20 Mobil x 57030).

Insert the shaft (fitted with its sealing rubber) and place the fork in position together with the two plastic spacers. Ensure that the fork is the correct way round.

Align the holes in the fork with those in the shaft and fit the pins.

Ensure that the pins are correctly positioned. Their slits must be perpendicular to the fork centreline and on opposite sides to one another.



PLAY TAKE-UP SYSTEM

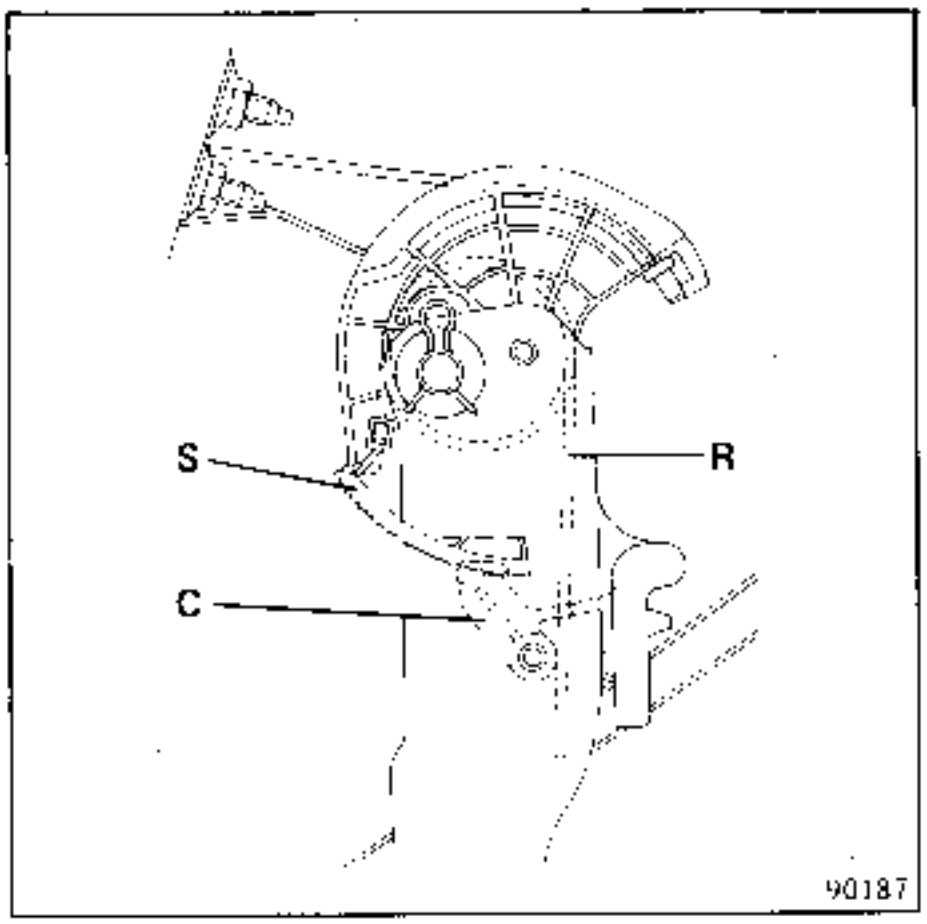
Spring (R) applies permanent tension to the play take-up quadrant (S).

As the cable is always under tension, it moves the fork and holds the release bearing in permanent contact with the diaphragm.

Adjustment is therefore automatic.

"CLUTCH RELEASE" OPERATION

When the pedal is depressed, the teeth on its wear take-up quadrant (S) engage with the toothed cam (C) to prevent it pivoting and permit the cable to be pulled.



Replacing

REMOVING

Removing the clutch cable involves removing the lower part of the fascia panel.

Removing :

In the engine compartment : unhook the cable from the fork.

Inside the vehicle : remove the screws that secure the lower part of the fascia panel.

Disconnect the cigar lighter.

Unclip the fuse holder connectors.

Open the glove box.

Remove the lower cover.

Press the pedal to pull on the cable. Hold the cable in its location on the quadrant (S).

Release the pedal and take out the cable end stop from its location.

Free the cable from the pedal assembly.

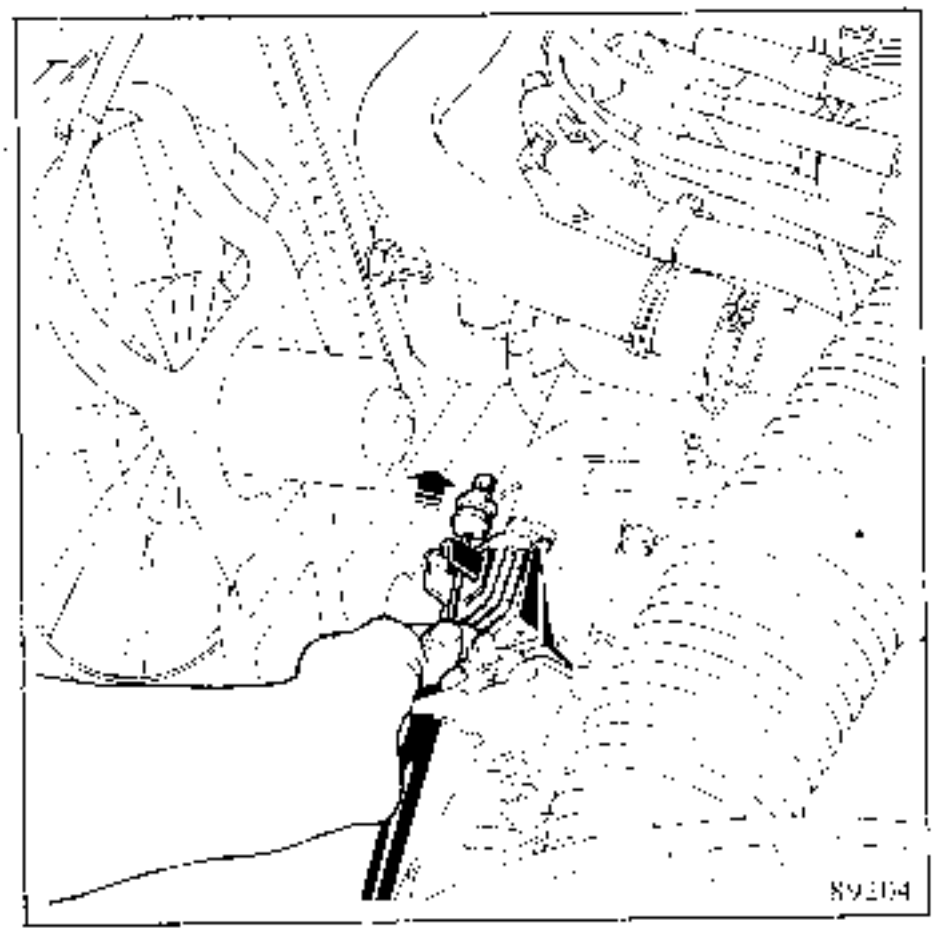
Take out the cable cover end stop from the scuttle.

Take out the complete cable through the engine compartment.

REFITTING

Pass the cable through into the interior of the vehicle, from the engine compartment.

Inside the vehicle :
Place the cable on the quadrant (S) and place the cable end stop in its location.



Fit the cable at the clutch fork end.

Ensure that the cable cover end stop is correctly aligned with the scuttle.

Press the clutch pedal to clip the cable cover into the scuttle. Adjustment is automatic.

To ensure that the assembly operates correctly :

1 - Check that the toothed cam (C) pivots round its shaft.

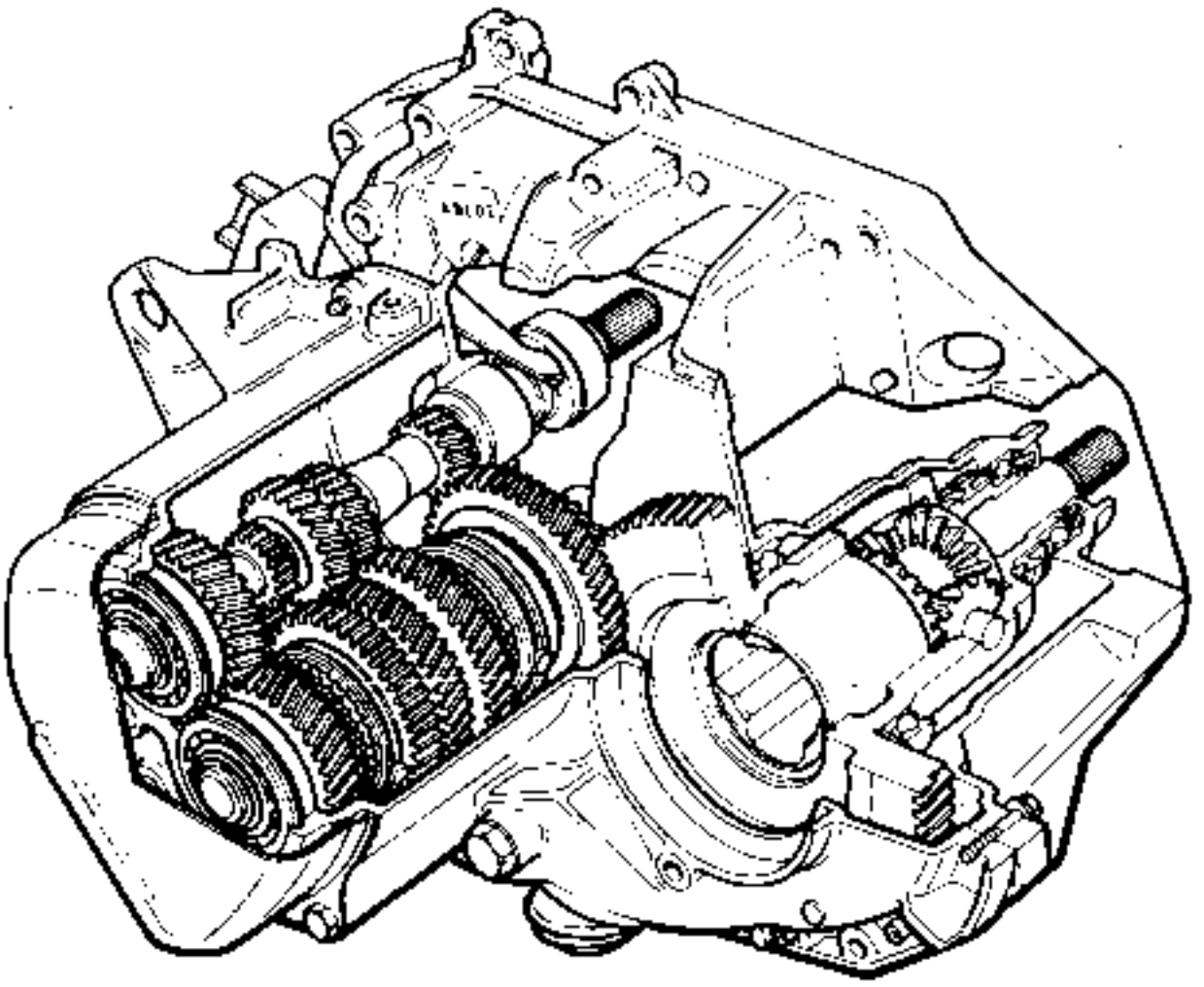
2 - Pull the cable at the clutch fork end, i.e. at the gearbox.

There should be at least 2 cm of "slack" in the cable.

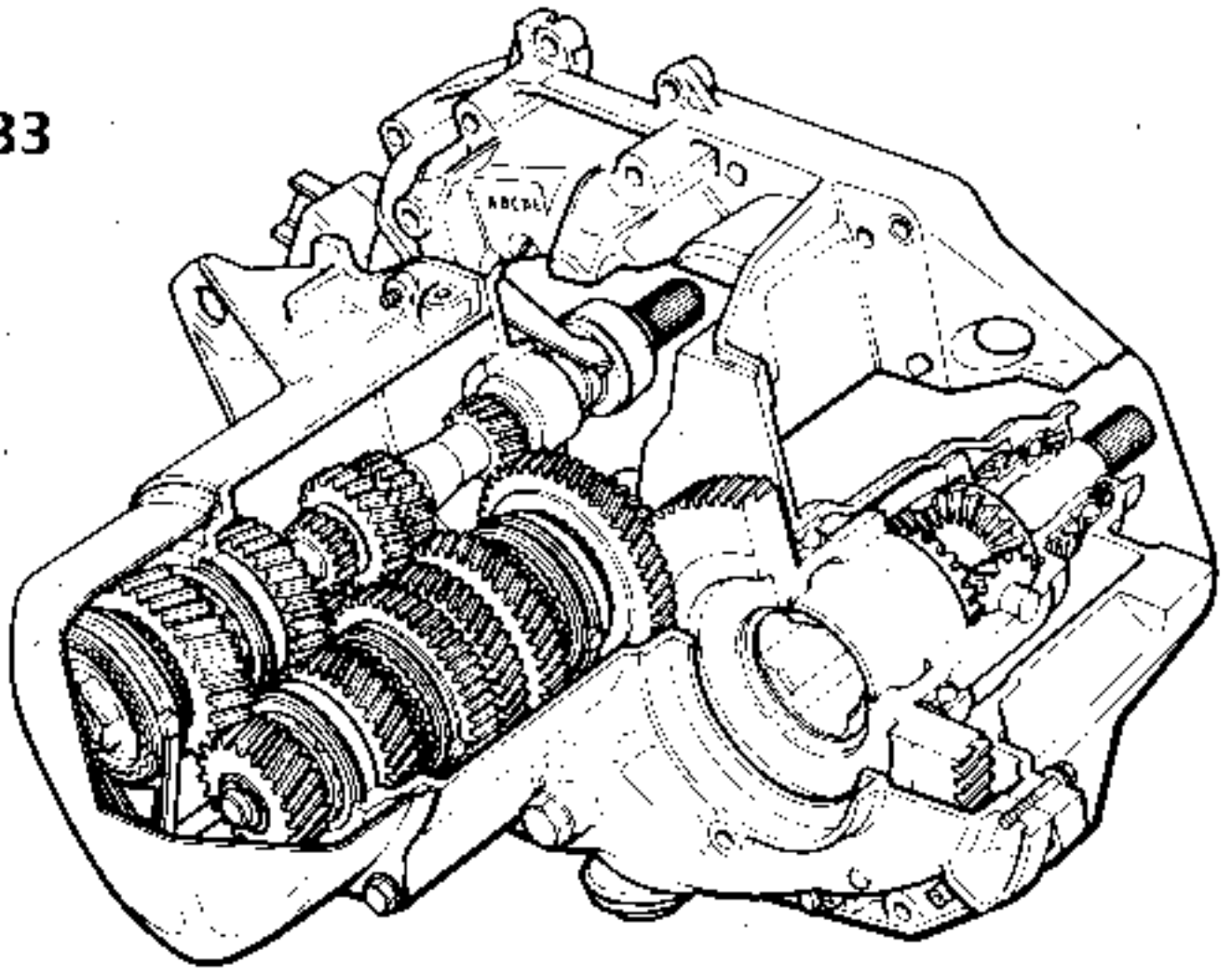
This check ensures that the toothed cam (C) and the toothed quadrant (S) are free when in the "clutch engaged" position.

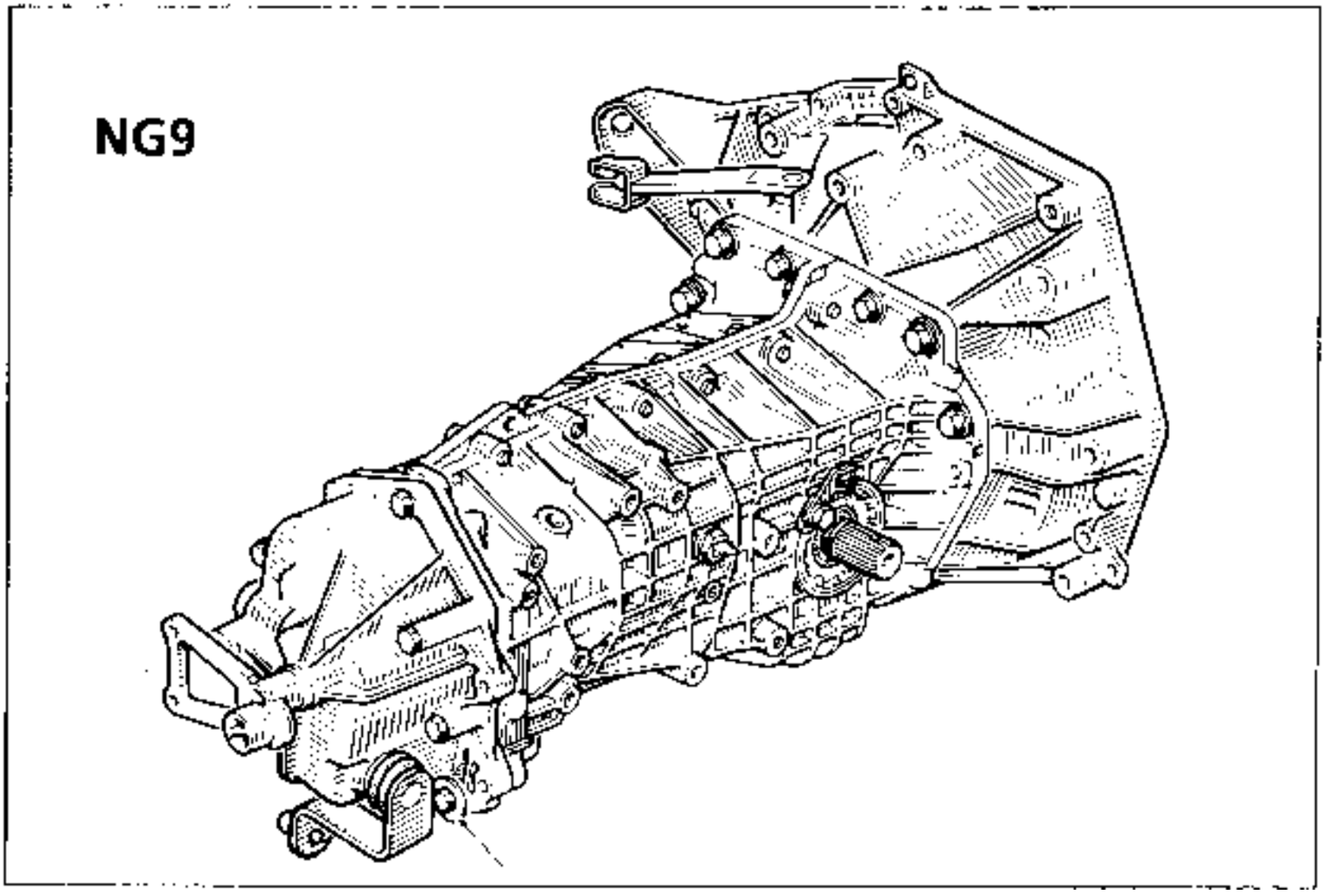
This check is to be carried out before carrying out any other work on the clutch itself.

JB2



JB3




NG9

L48 vehicles are fitted, depending on the version, with either a JB or NG type gearbox.

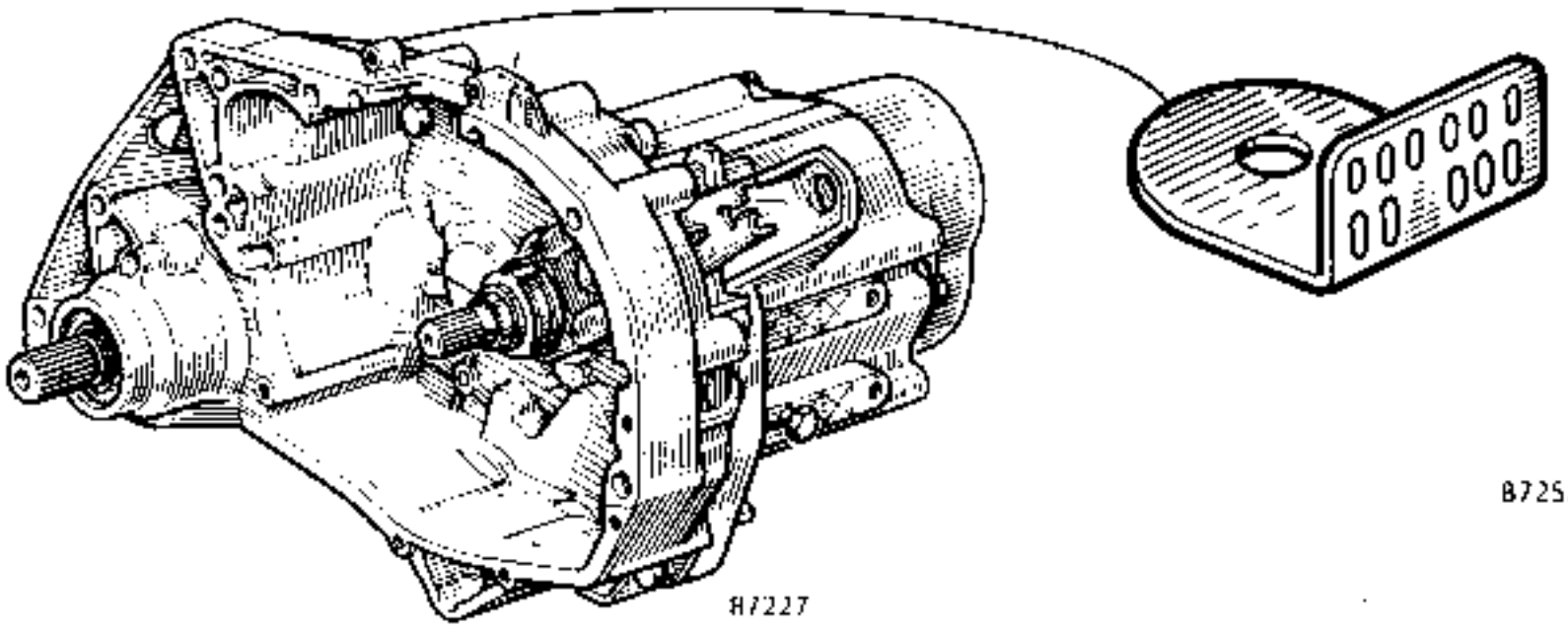
Workshop manuals "JB gearbox" and NG gearbox" deal with the complete overhaul of these units.

We shall therefore describe, in this chapter, the following operations :

- Removing and refitting a gearbox.
- Working on the 5th speed assembly, on the vehicle.
- Removing and refitting the reverse positive lock.
- Removing and refitting the external gear shift control.

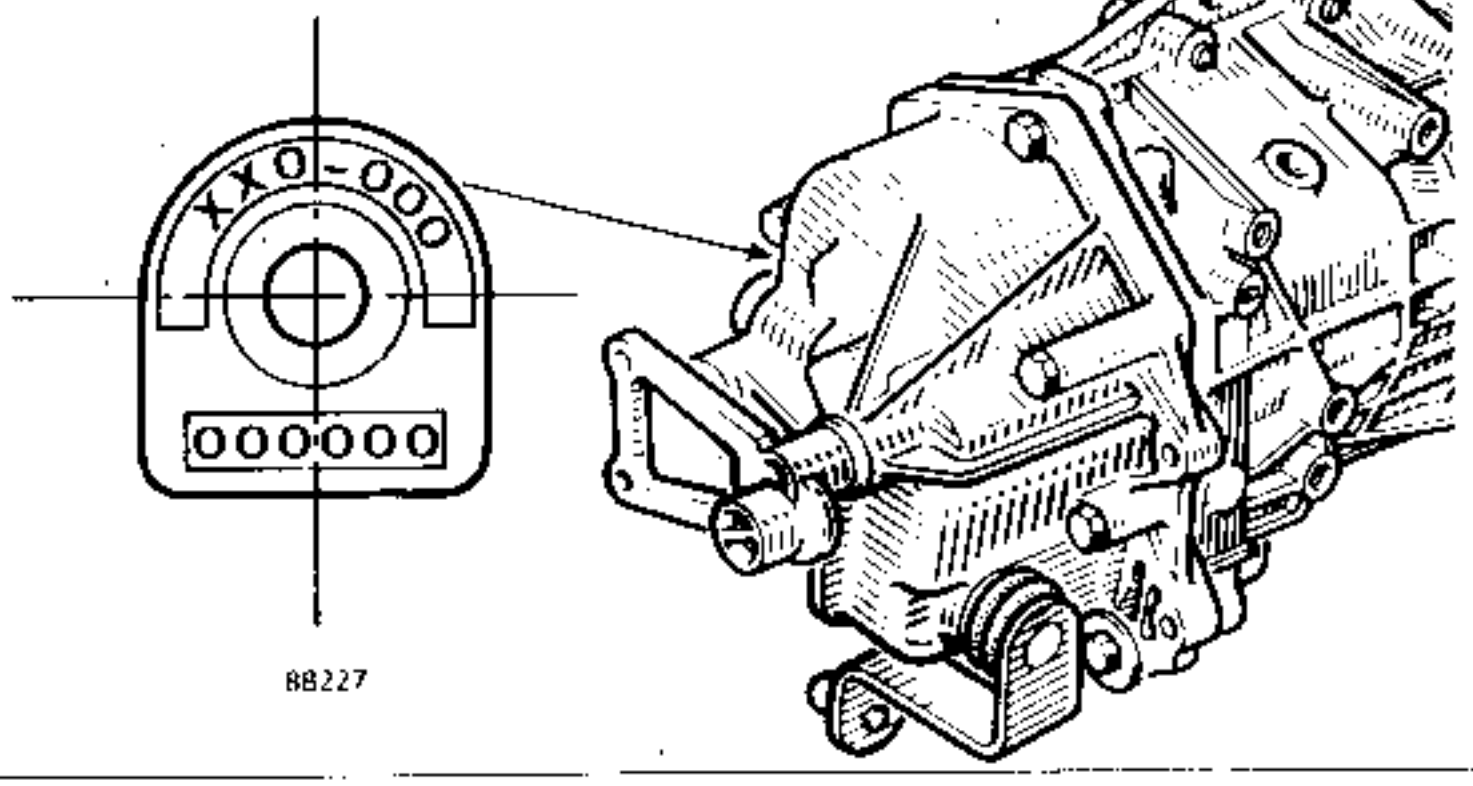
The type, suffix and serial numbers are shown on a number plate secured to the clutch housing in the case of the JB gearbox or the rear housing in the case of the NG gearbox.
This plate is coloured and acts as a reference code for the driveshafts (transverse engine).
The letter proceeding the serial no. identifies the factory in which it was assembled.

Vehicle	Gearbox	
	Type	Suffix
L 481	JB2	000 (4 V)
L 482	JB3	010 (5 V)
L483	NG9	000 (5 V)



B7252

B7227



BB227

The following gearbox types :

JB2 : 4 forward speeds
1 reverse

JB3 : 5 forward speeds
1 reverse

are equipped with BORG-WARNER synchronisers.

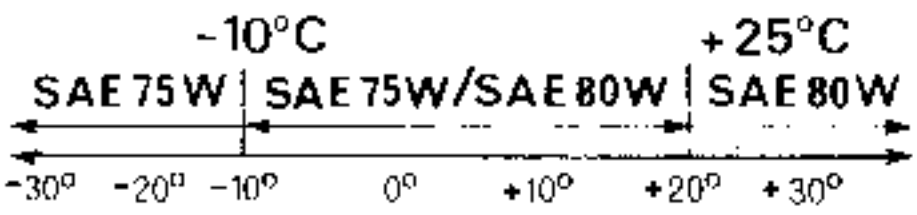
NG type gearboxes are equipped with the following type synchronisers :

- RENAULT on 1st and 2nd
- BORG-WARNER on 3rd, 4th and 5th.

OIL

Grade : APIGL5 or MIL L2105B or C

Viscosity :

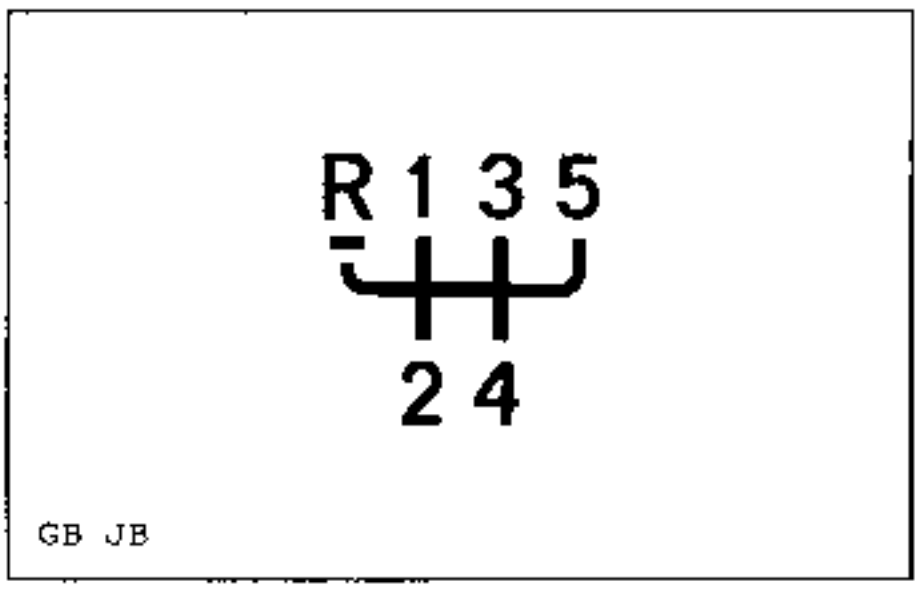


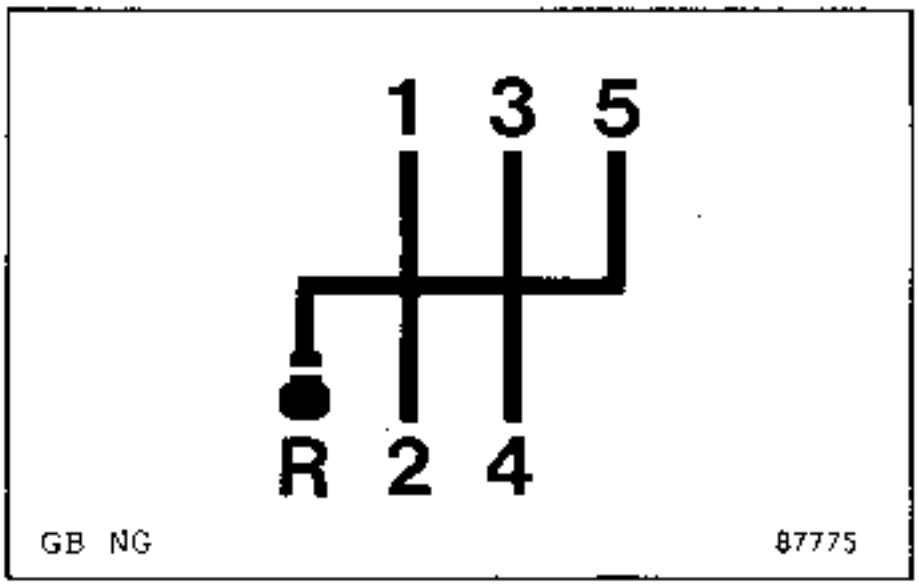
87117

Quantities :

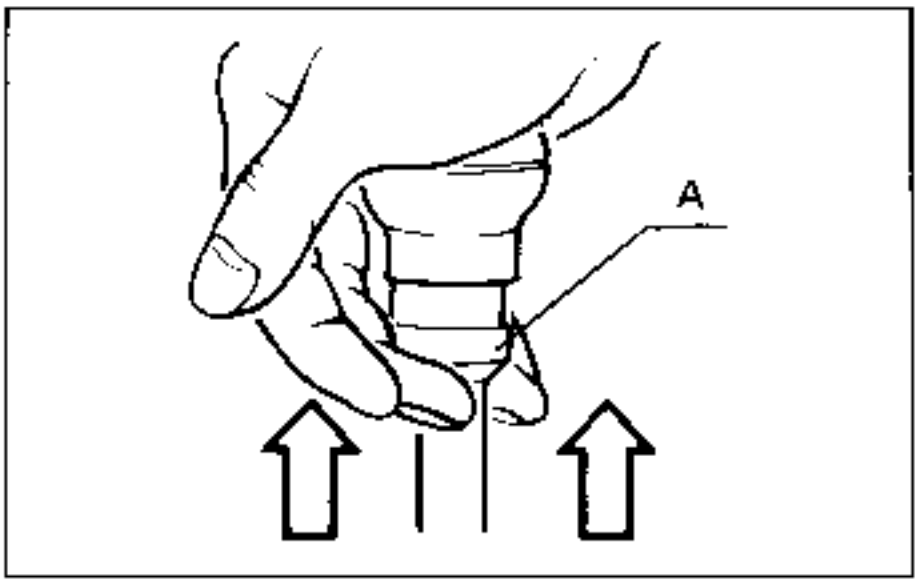
GB JB2 : **3,25**
GB JB3 : **3,40**
GB NG9 : **2,20**

GEAR SHIFT PATTERN





To select reverse, lift the release (A) and move the lever.



RATIOS	Final drive	Speedo. drive	1st	2nd	3rd	4th	5th	Reverse
JB2 000	Parallel 17/56	21/19	11/41	19/39	25/33	31/28	–	11/39 26
JB3 010	16/57	21/19	11/41	19/39	25/33	30/29	34/27	11/39 26
NG9 000	Bevel 9/31	6/18	11/45	17/37	22/31	33/34	36/31	11/39 23

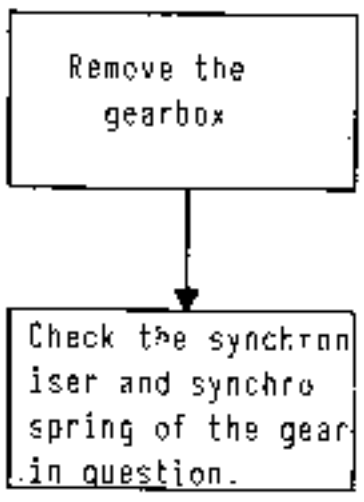
Type	Quantity	Unit
Grease no. 20 **Mobil X57 030**	2 grammes	- Clutch shaft splines - Sun wheel splines - Release bearing bore splines - Release bearing guide tube bore
LOCTITE FRENBLOC	3 drops	- 5th speed fixed gear - 5th speed hub - Primary shaft nut - Secondary shaft nut or bolt
CAF 4/60 THIXO	Coat	- Thread on reverse positive lock nut - 5th speed locking system plug - Ends of spring pins on driveshafts
LOCTITE 518	Coat	- Housing joint faces
PERFECT-SEAL	Coat	- Rear housing joint face (NG gearbox)
Medium 33 grease	Coat	- Gear shift pivot points

Parts that must be replaced

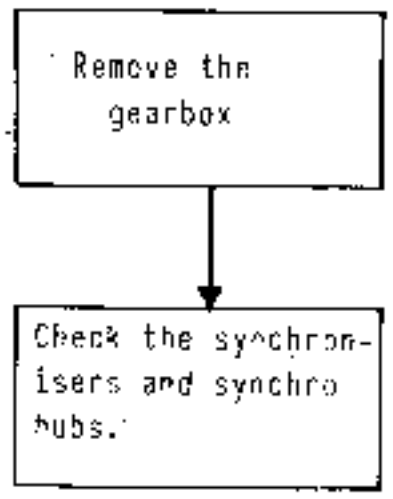
Whenever the following are removed, they must be replaced by new parts :

- the driveshaft and gear shift control spring pins,
- the primary and secondary shaft nuts,
- the thermoplastic seal (on the exhaust).

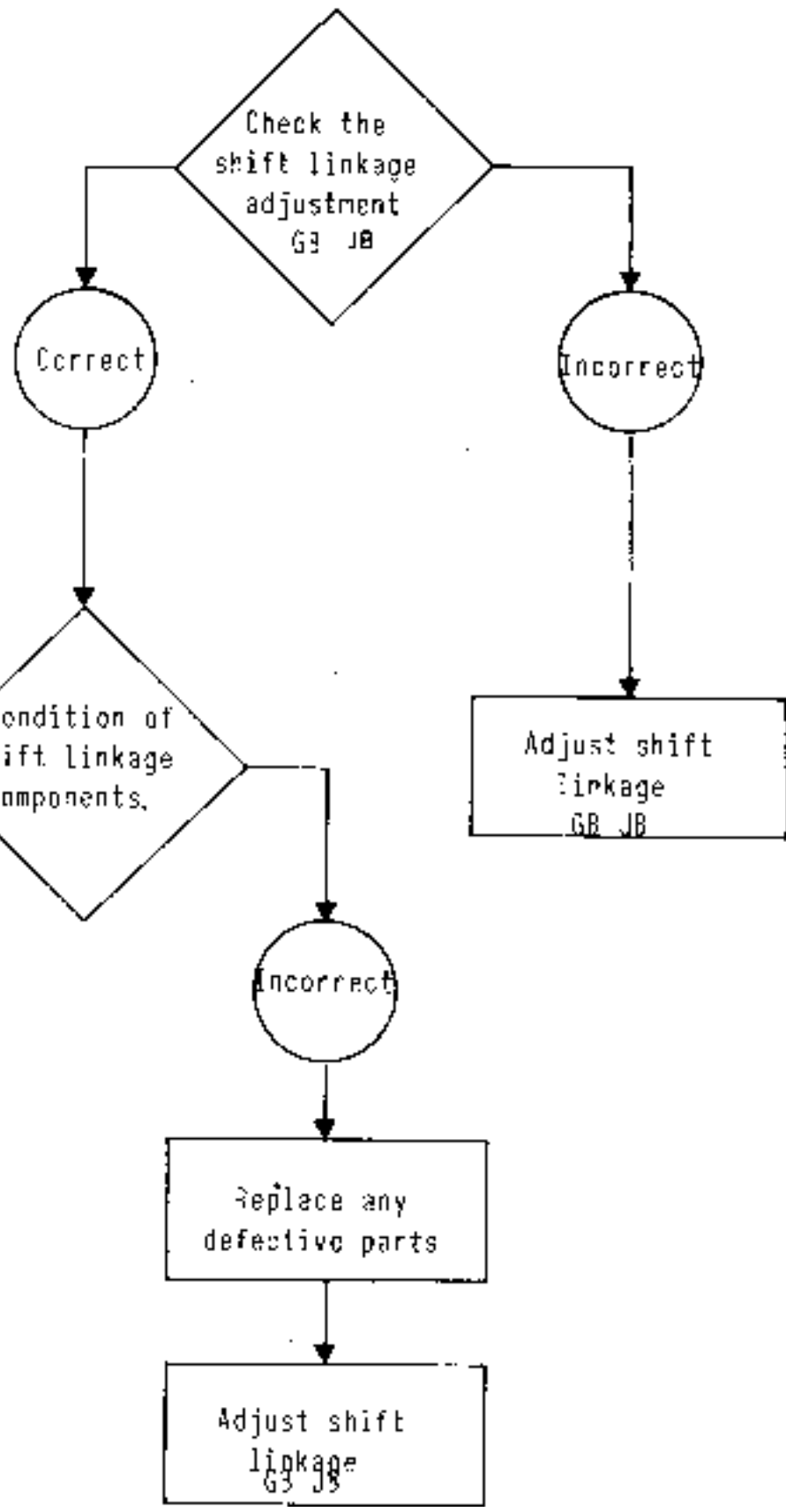
Grating when one gear is engaged



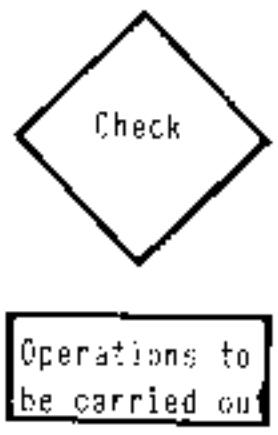
Grating when any gear is engaged (first check the clutch)

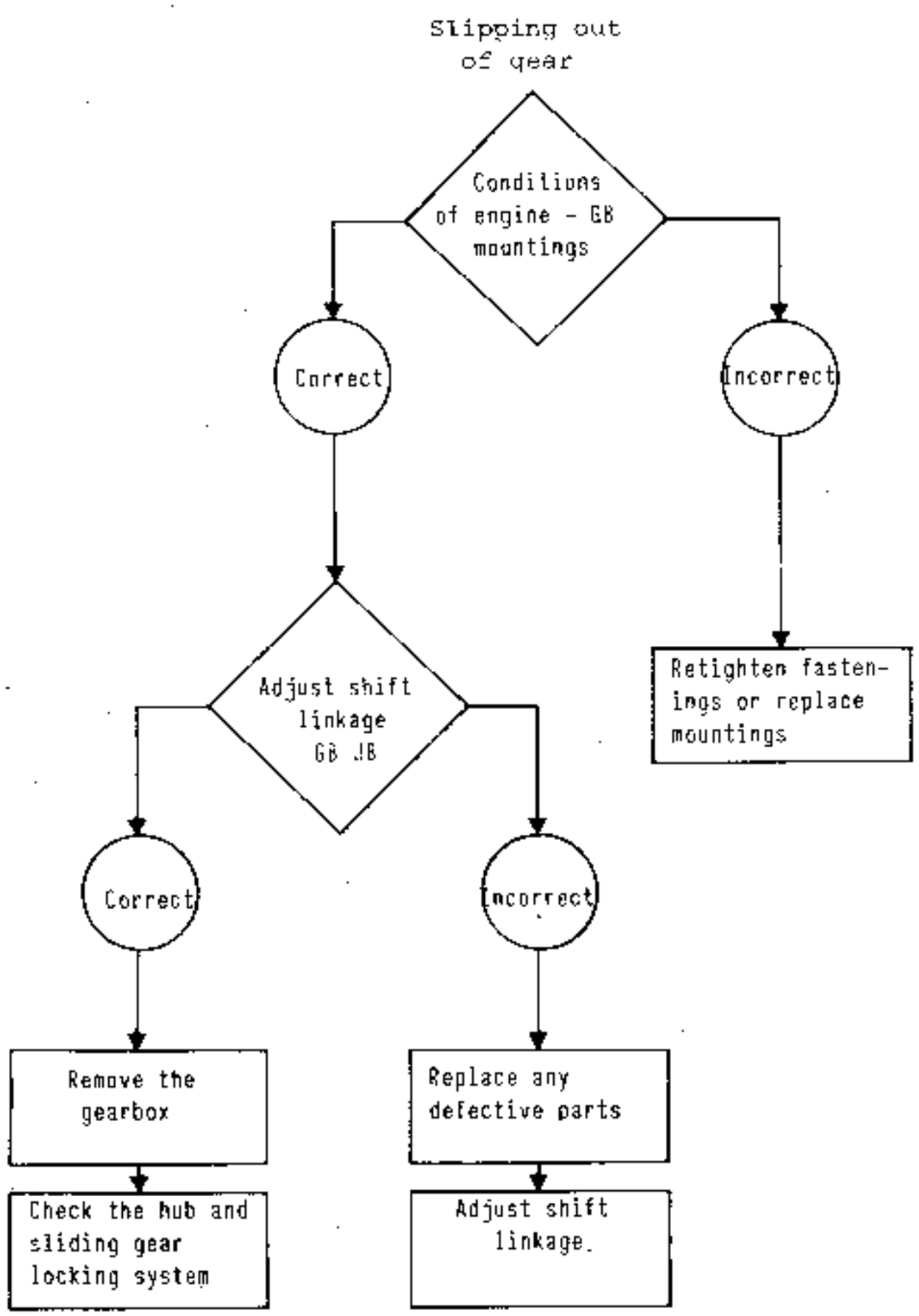


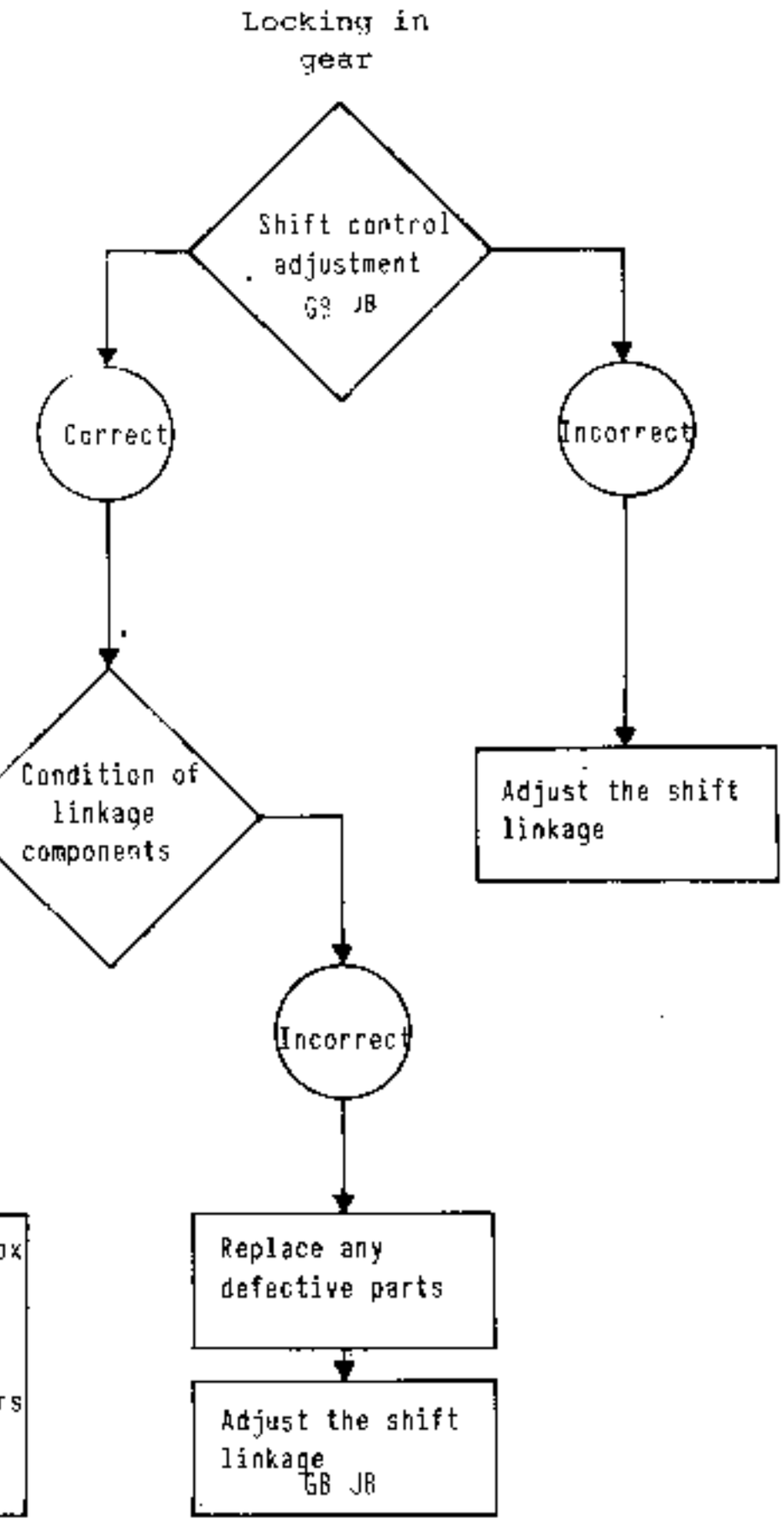
Impossible to engage a gear (first check the clutch)



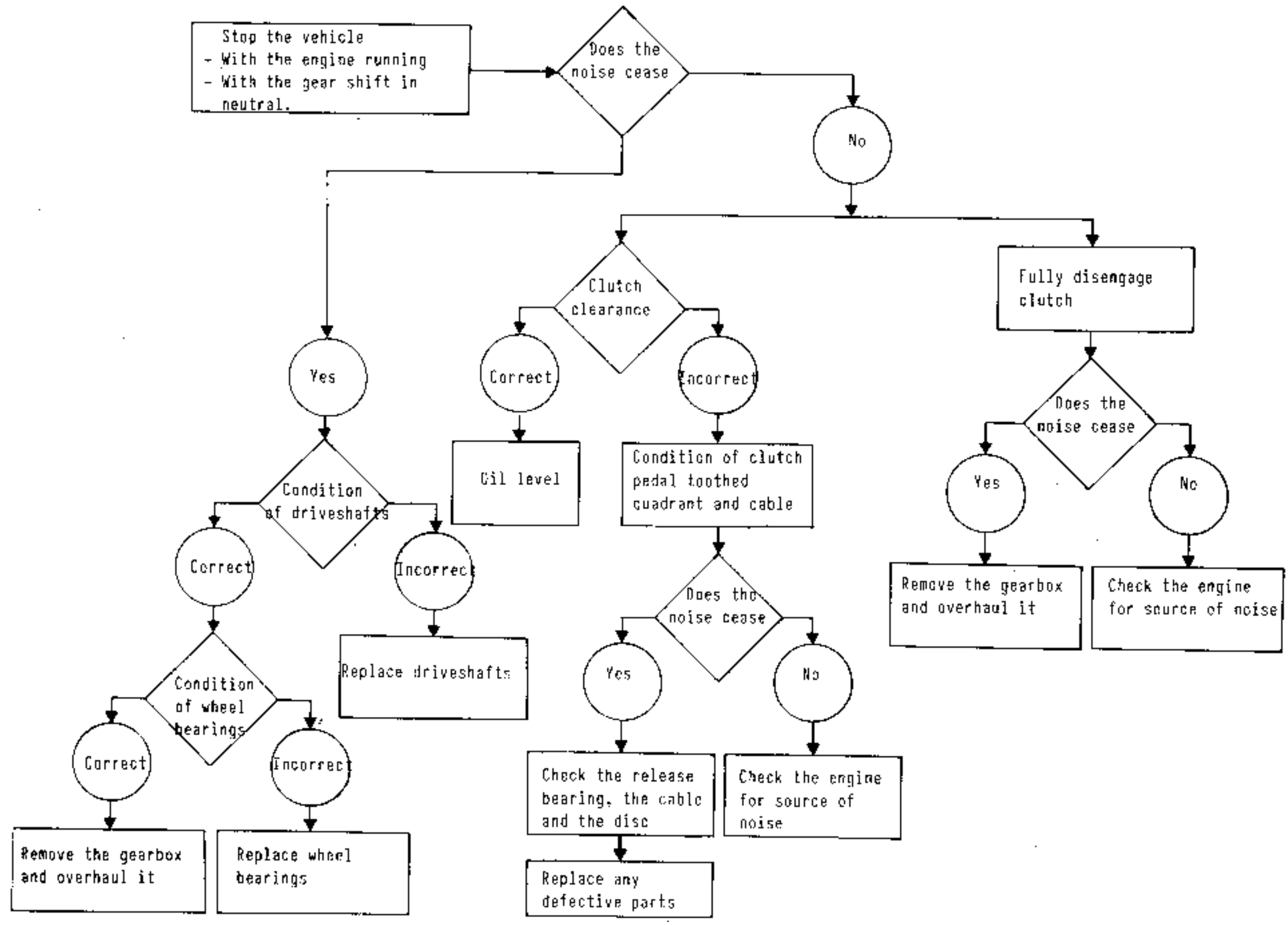
Key




Slipping out of gear
Conditions of engine - GB mountings
Correct
Incorrect
Retighten fastenings or replace mountings
Adjust shift linkage GB JB
Correct
Incorrect
Remove the gearbox
Check the hub and sliding gear locking system
Replace any defective parts
Adjust shift linkage.


Locking in gear
Shift control adjustment GB JB
Correct
Incorrect
Adjust the shift linkage
Condition of linkage components
Correct
Incorrect
Remove the gearbox and check the :
- locking balls
- shift forks
- locking plungers
Replace any defective parts
Adjust the shift linkage

Abnormal noises whilst vehicle is being driven



TIGHTENING TORQUES (in daN.m)	
Mounting pad securing nuts	4
Brake caliper securing bolts	10
Wheel bolts	9
Shock absorber lower securing nuts	8

REMOVING :

The gearbox, alone can be removed.

Place the vehicle on a lift on axle stands.

Drain the gearbox.

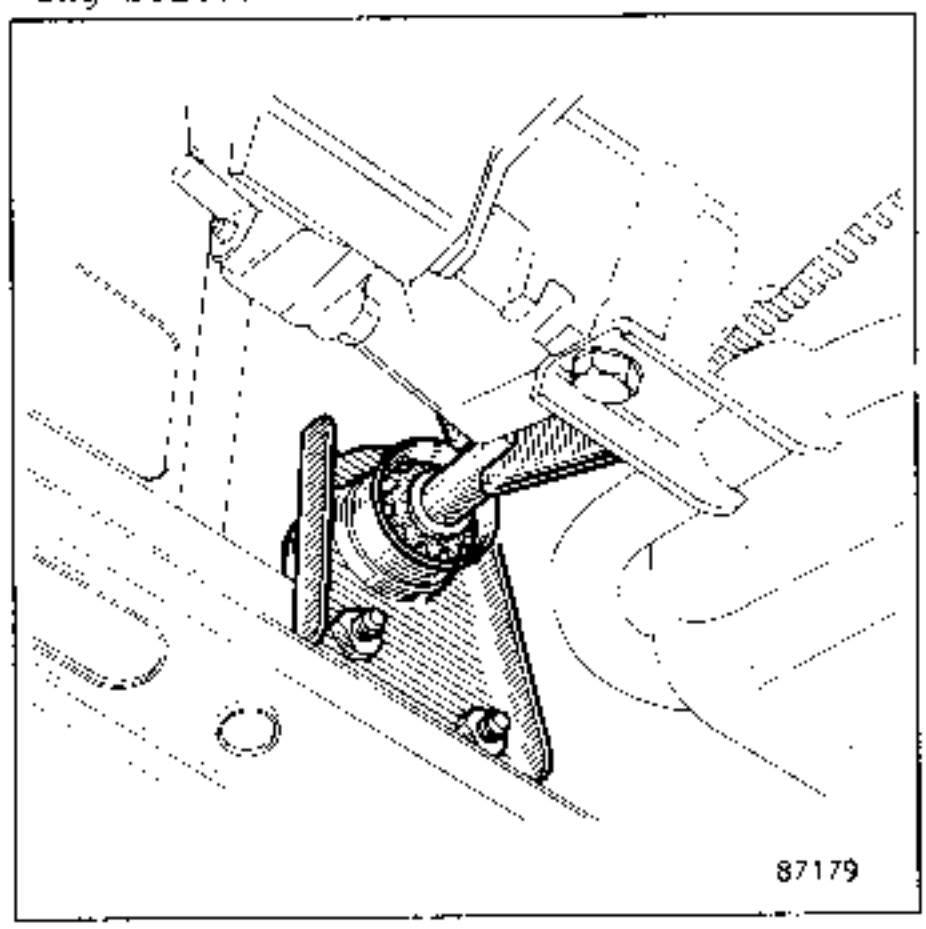
Remove the front wheels and disconnect the driveshafts (see "Front axle" section).

On the left hand side, remove the driveshaft/stub axle carrier assembly by disconnecting at the lower ball joint. Ensure that the driveshaft rollers cannot be removed by hand. If they can, check, on reassembly, that the needles have not fallen into the gearbox.

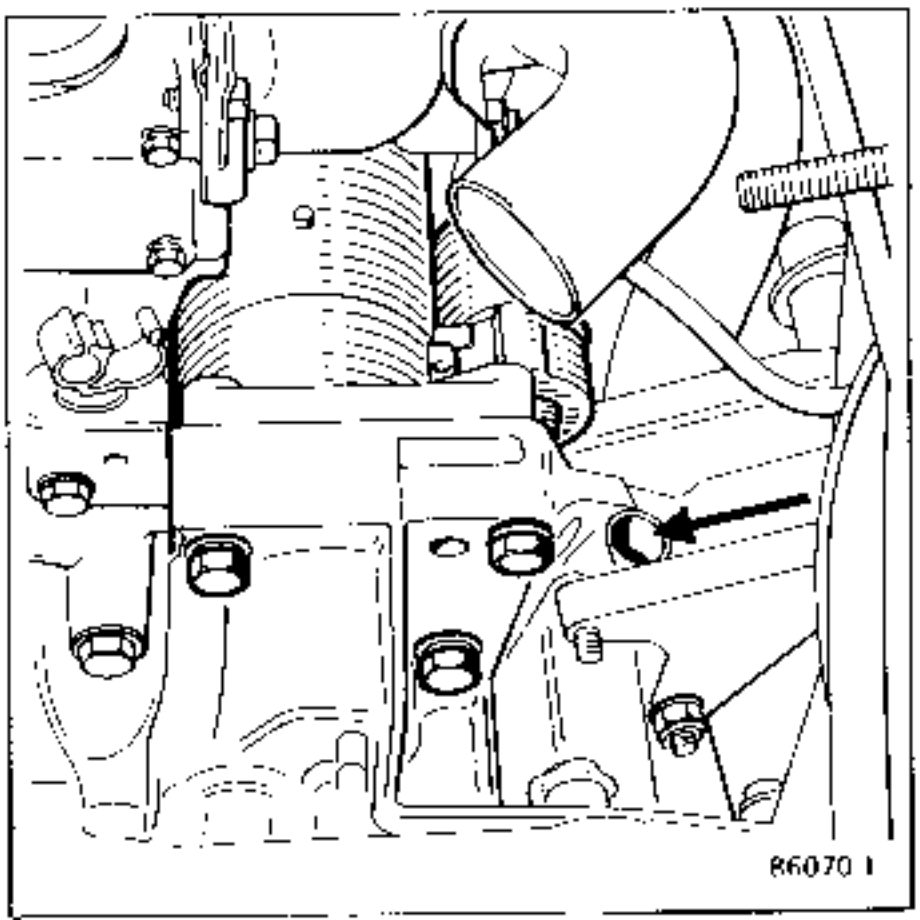
Remove :
- the TDC sensor,
- the clutch cable,
- the earthing braid,
- the speedometer drive cable.

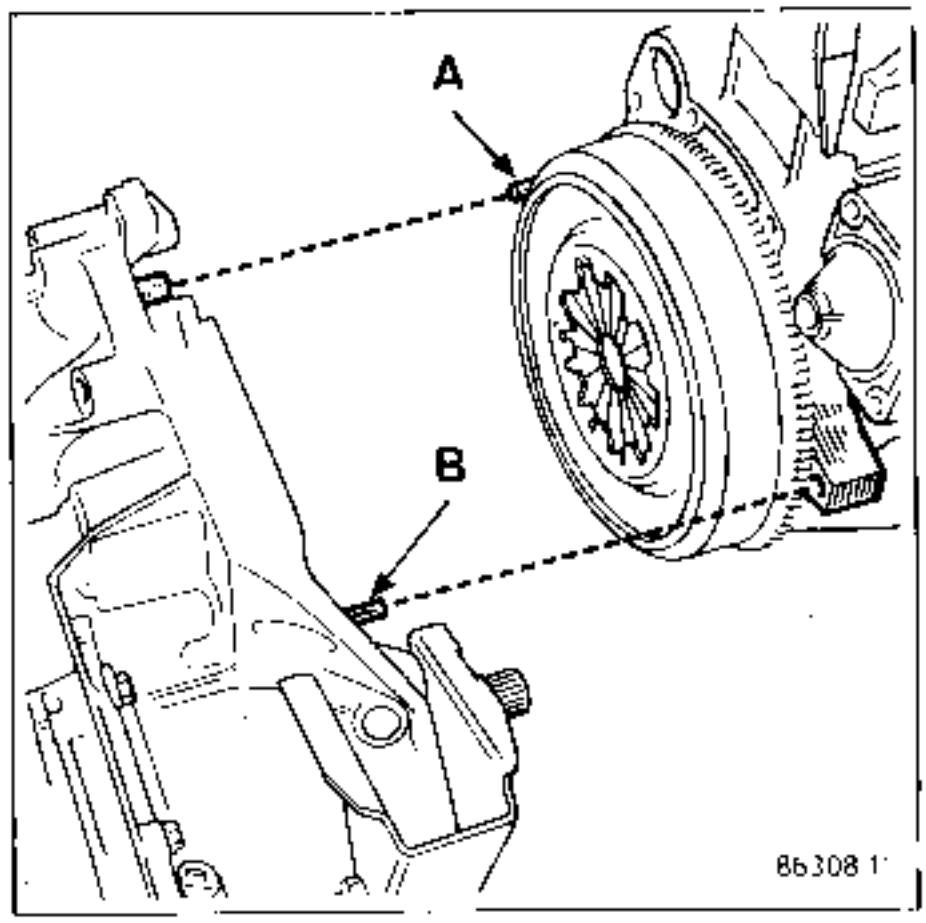
Under the vehicle, remove :

- the gear shift control,
- the tie rod between the engine and the gearbox,
- the movement limiter,
- the clutch protection screen,
- switch wires,
- the nuts from the gearbox front and rear mounting bolts (loosen the engine mounting bolts).



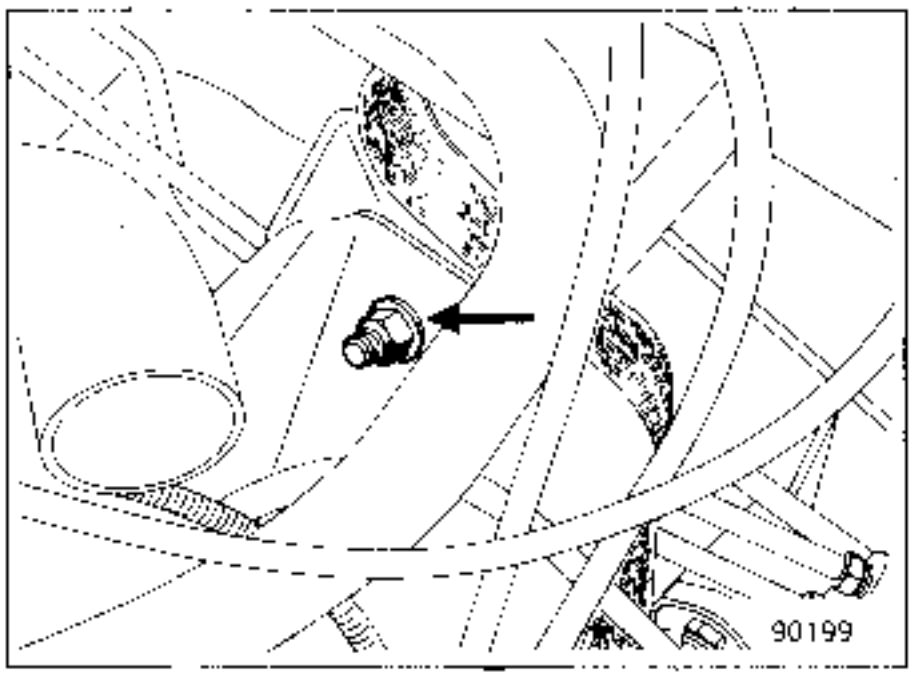
Remove studs (A) and (B) with a nut and a lock nut, using a cranked spanner and a ball jointed socket wrench.





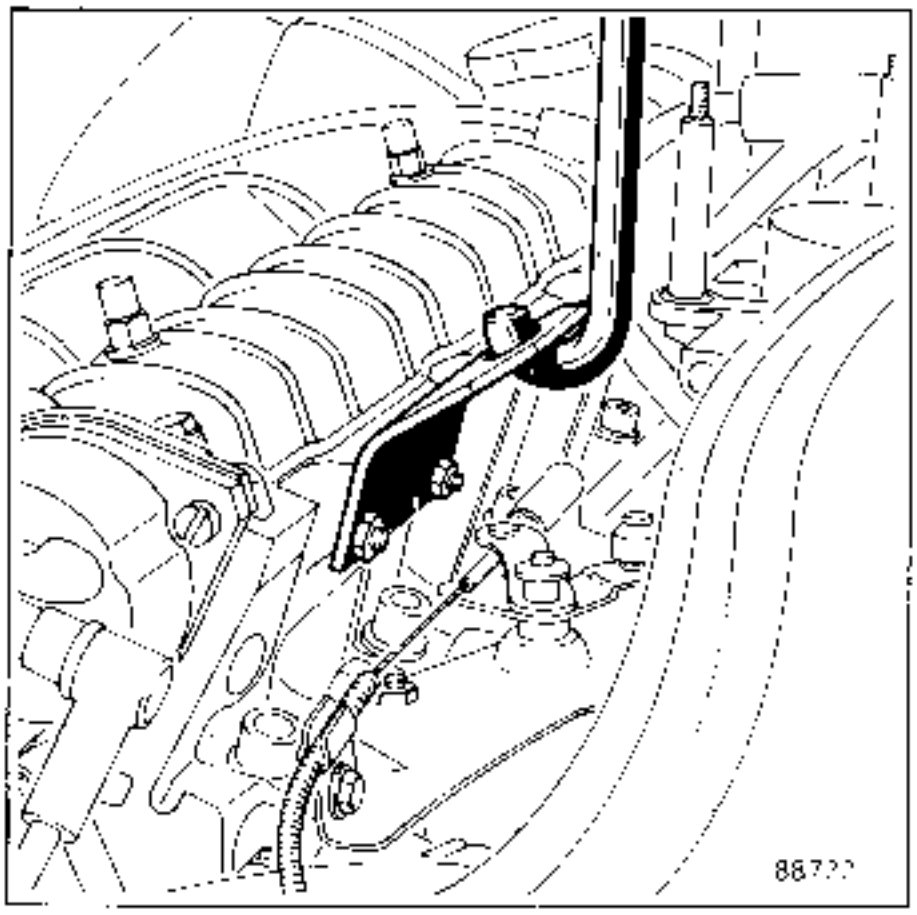
From above, remove :

- the nut from the rear engine mounting pad,

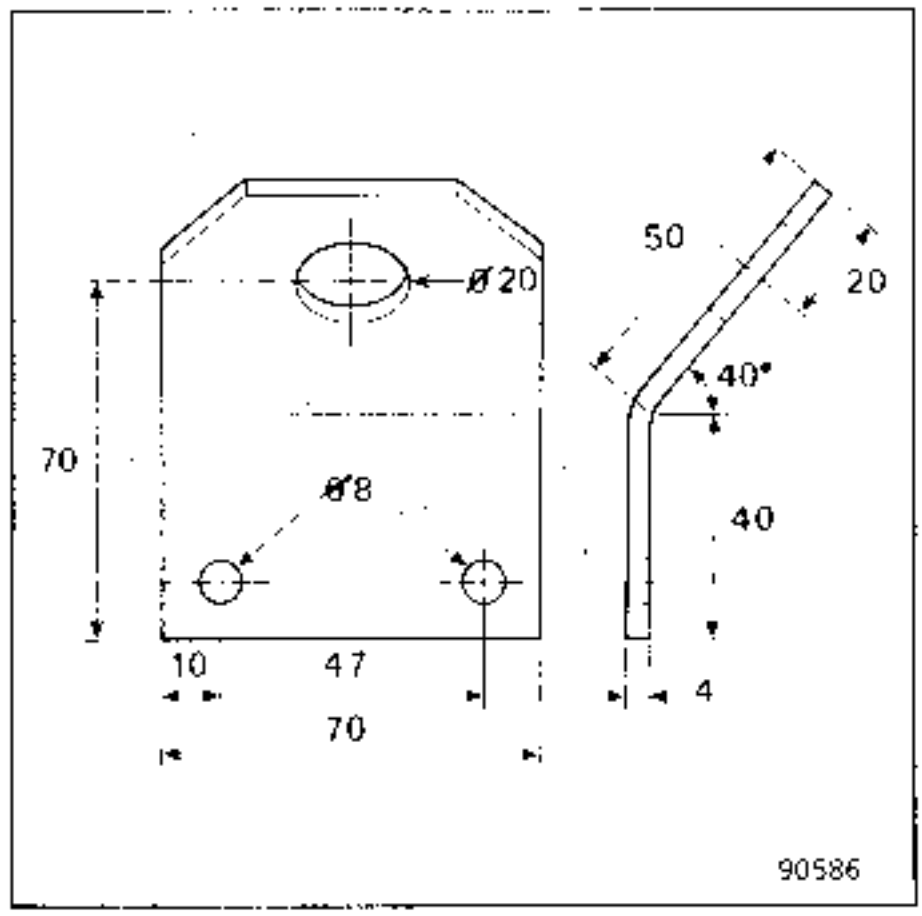


- the air filter, plugging the carburettor inlet orifice so that no foreign body can fall down it.

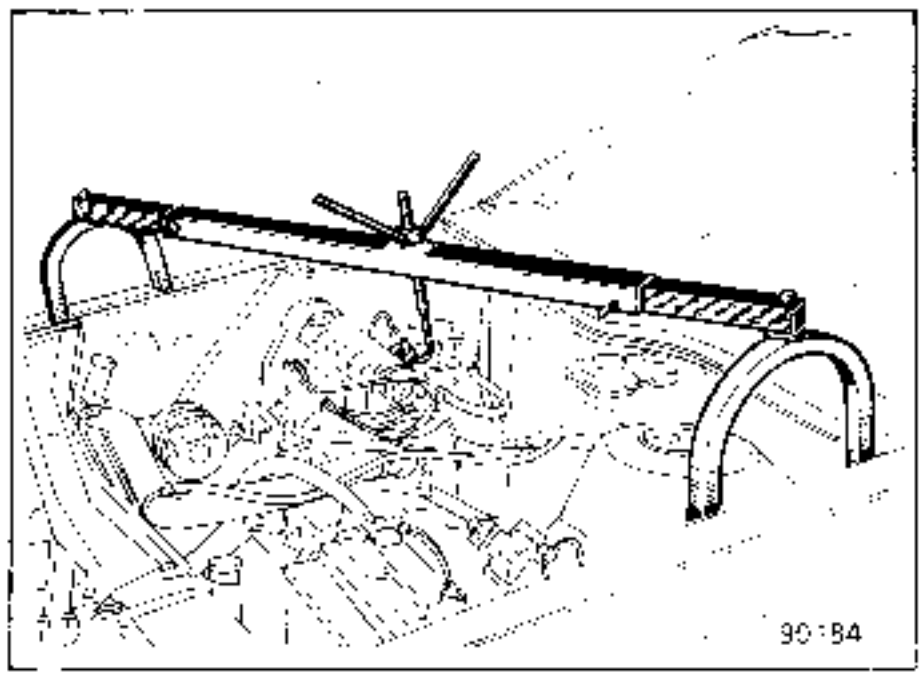
Disconnect the choke cable from the carburettor.



From the cylinder head, remove the air filter mounting plate and secure the locally manufactured lug in its place so that CELETTE tool ref. WN 103 can be hooked into it.



Take the weight of the engine and remove the rear mounting.



Remove :

- the starter securing bolts,
- the bolts round the periphery of the gearbox.

Hook the gearbox on to a workshop crane using as securing points the clutch cable support lug and one of the gearbox securing bolts fitted in place of the stud (B).

Remove the front mounting pad.

Slightly lower the engine.

Free the gearbox from the engine by sliding the 5th speed housing between the vehicle side members and the engine subframe.

Lift the engine.

Slightly pivot the gearbox to the left to free the final drive assembly and then remove the gearbox from the vehicle.

REFITTING (Special points) :

Coat the clutch shaft splines in the right hand sun wheel with grease no. 20 (Mobil X57 030).

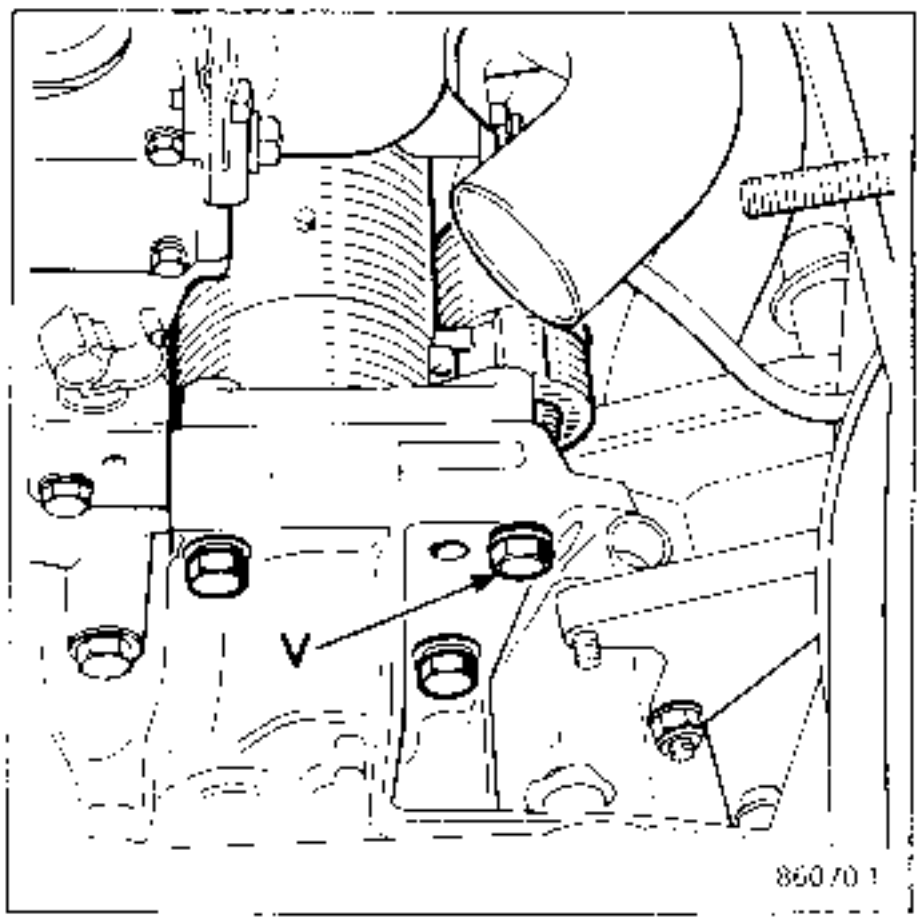
Place the gearbox in position.

Ensure that the locating bushes are correctly positioned in their locations.

Refit the studs (A) and (B) in the same way as they were removed. They act as alignment locators for the gearbox. Fit the bolts round the outside of the gearbox.

Tighten the bolts round the outside of the gearbox to a torque of 2,5 daN.m.

WARNING :
Ensure that bolt (V) is in the correct position.

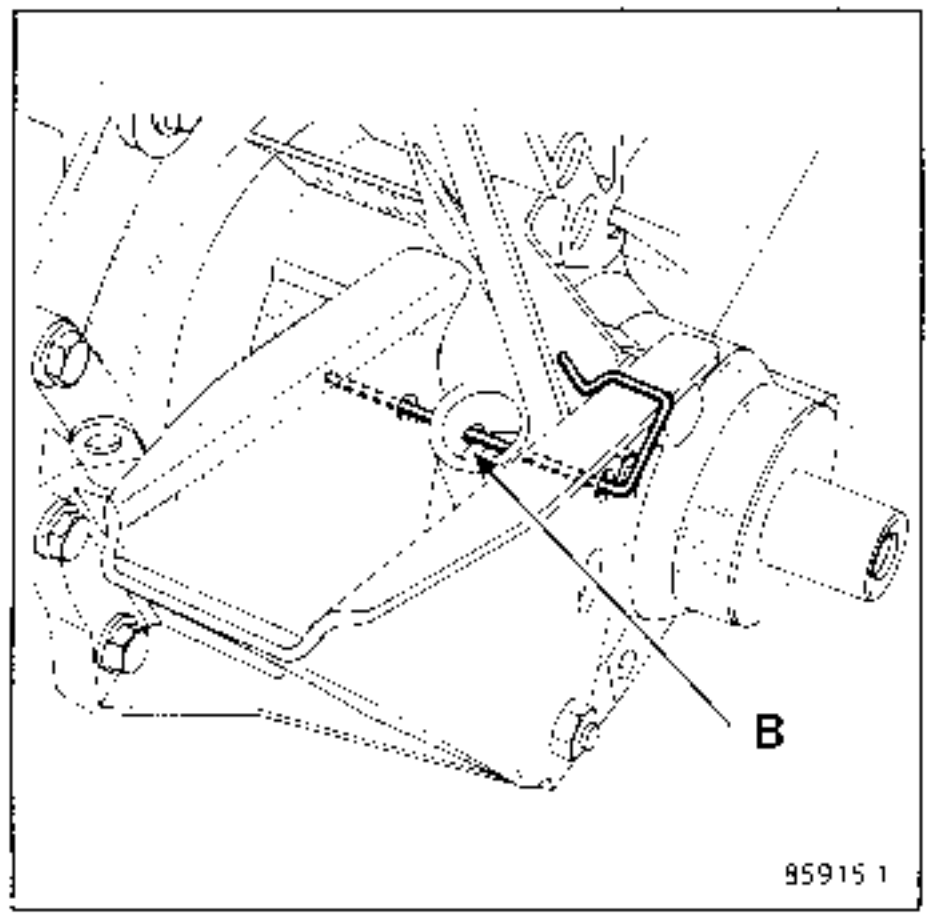


Ensure that the rollers on the left hand driveshaft are not damaged and that all the needles are in position.

Refit the right hand driveshaft and seal its spring pin holes with CAF 4/60 THIXO.

Tighten :
- the shock absorber lower securing bolts to a torque of 8 daN.m,
- the brake caliper securing bolts to a torque of 10 daN.m,
- the lower ball joint bolt to a torque of 6 daN.m,
- the mounting pad nuts to a torque of 4 daN.m.

Refit :
- the gear shift control,
- the clutch cable,
- the sensor,
- the speedometer drive cable, locking it with its clip (B).



- the choke cable.

Remove the plug from the carburettor and fit the air filter.

Fill the gearbox with oil.

JB2 : 3,25 litres
JB3 : 3,40 litres

Tighten the wheel bolts to a torque of 9 daN.m.

ESSENTIAL SPECIAL TOOLS	
B.Vi. 28-01	Extractor body
B.Vi. 31-01	Set of punches for inserting and removing 5 mm Ø spring pins
B.Vi. 1003	5th speed hub extractor
B.Vi. 1007	Claw for B.Vi.28-01

TIGHTENING TORQUES (in daN.m)	
Primary shaft nut	13,5
Secondary shaft bolt	8
Mounting pad nuts	4

CONSUMABLES	
Loctite FRENBLOC :	Primary shaft nut Secondary shaft bolt 5th speed fixed gear 5th speed hub

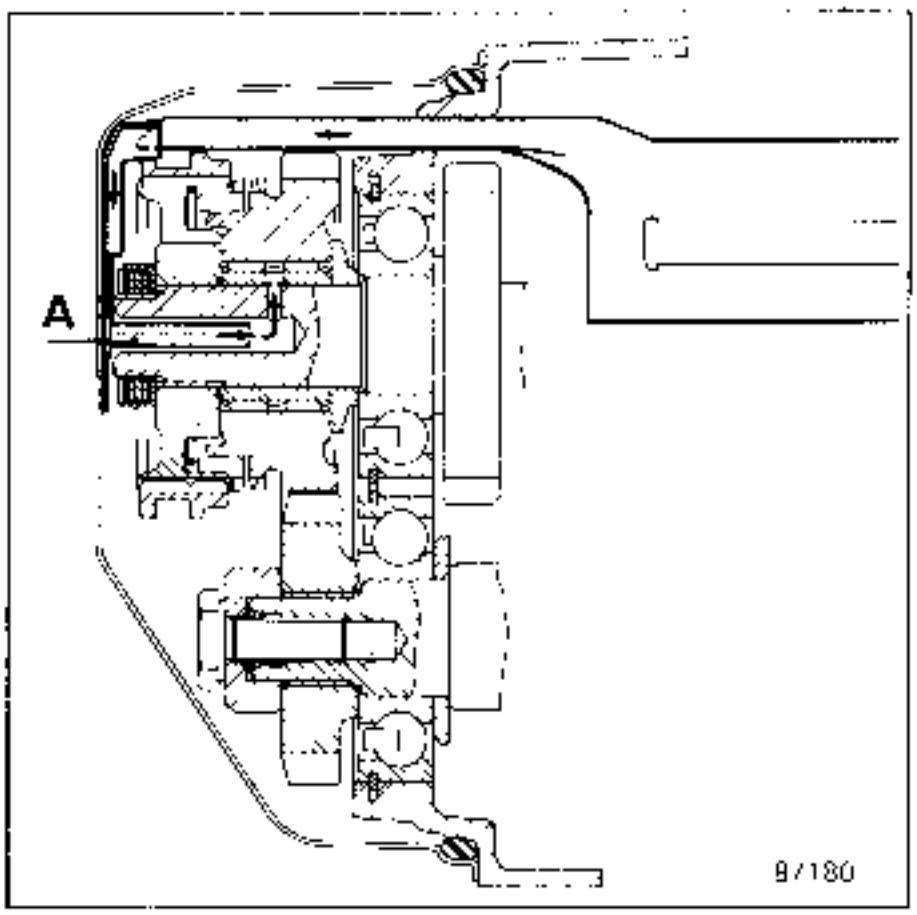
SPECIAL POINT

Do not pull the 5th speed shift fork shaft outwards because its locking system would fall into the gearbox. To avoid this happening, engage a gear (3rd or 4th).

REMOVING

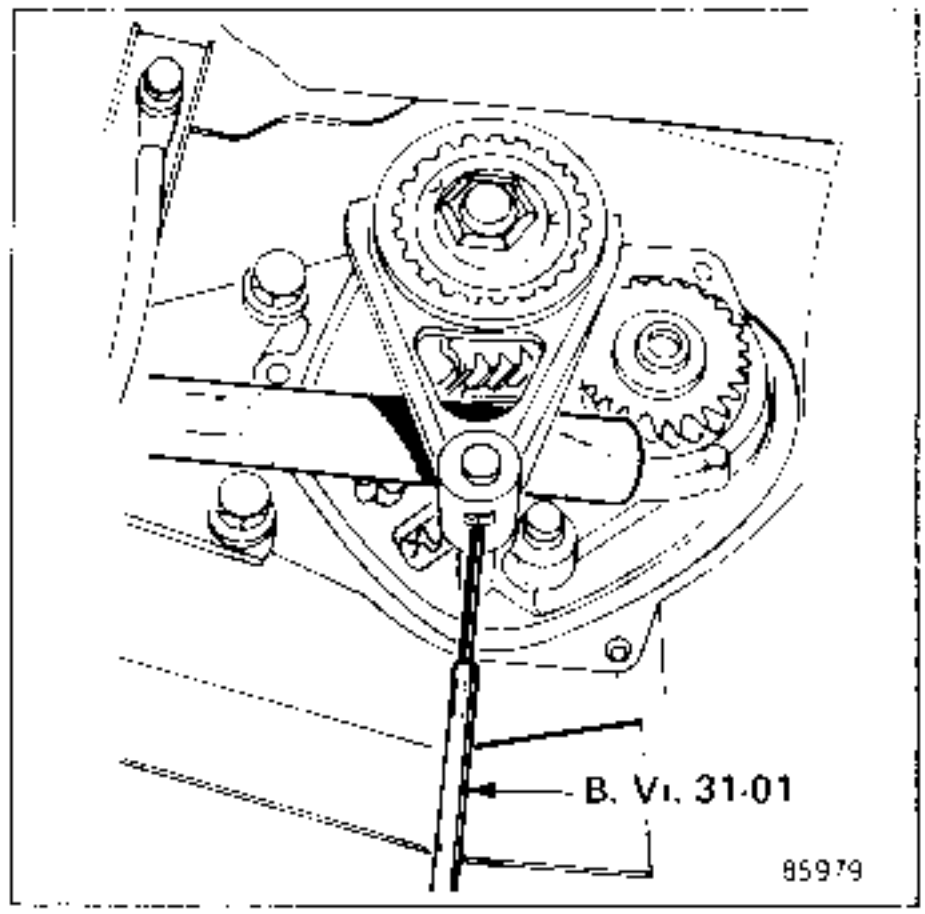
Drain the gearbox.

The housing is to be removed from the box, horizontally, because it incorporates an oil pipe (A) which projects into the primary shaft.



Place :
- a drain tray under the rear housing and remove the housing,
- a wooden block between the 5th speed shift fork and the drive gear to support it, then remove the pin from the fork, using B.Vi.31.01.

Removing this pin can be made easier by slightly bending the end of punch B.Vi. 31.01 so that it is not necessary to lift the gearbox.



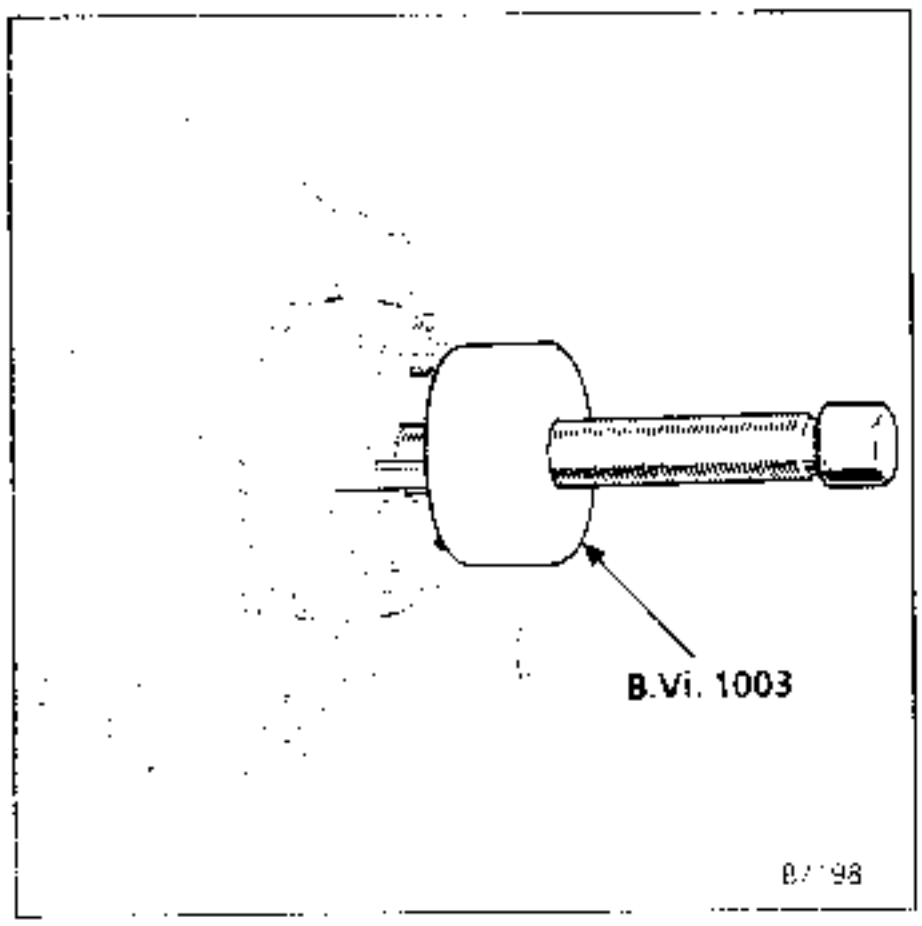
On the primary shaft :

Select 1st speed at the shift lever end and 5th speed at the box end by sliding the 5th speed fork on its shaft.

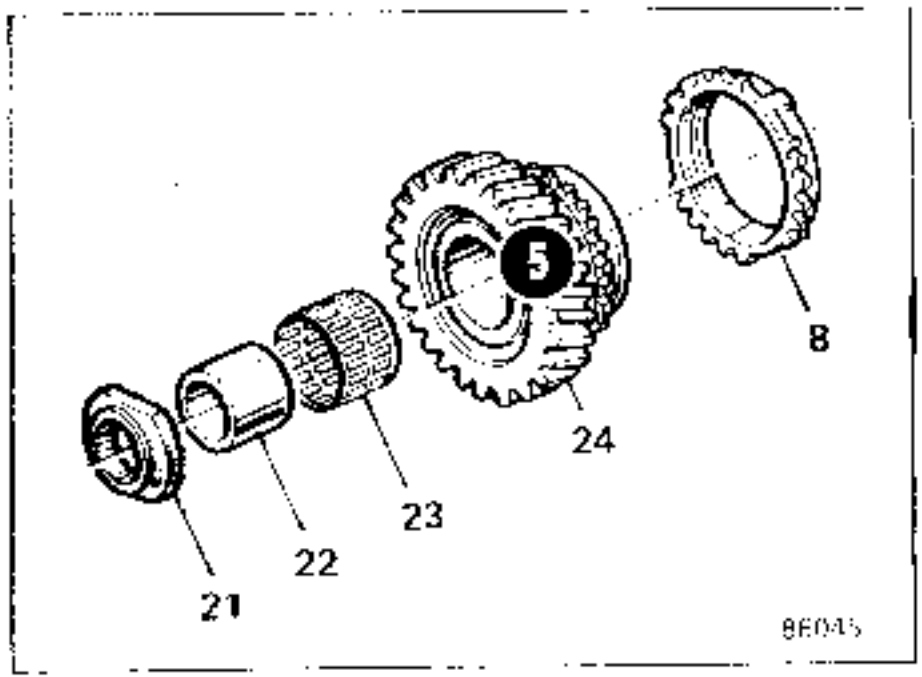
Loosen and remove the nut from the primary shaft and the bolt from the secondary shaft (65).

Return the box to neutral.

Place tool B.Vi.1003 in the slots on the 5th speed hub and remove the hub-sliding gear and fork assembly.

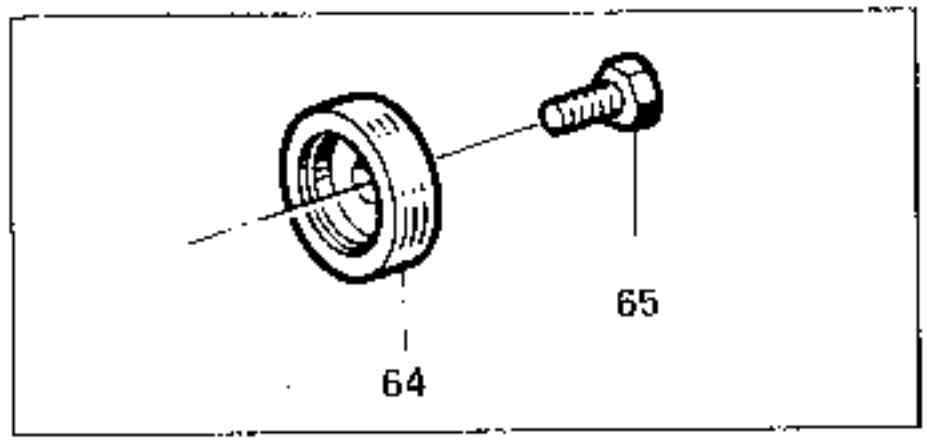


Remove components (8) and (24) to (21) in that order.

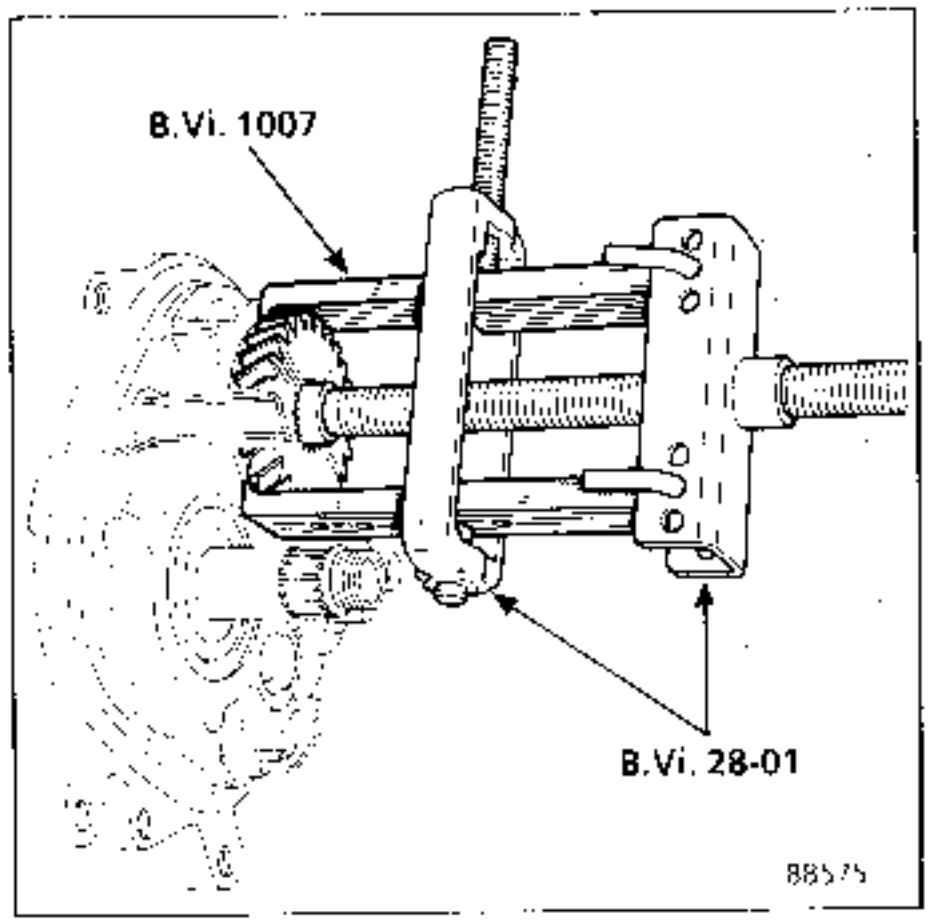


From the secondary shaft :

Remove the shouldered washer (64).



Remove the fixed gear using B.Vi.28-01 fitted with claws B.Vi.1007.



REFITTING

On the secondary shaft :

Apply 3 drops of Loctite FRENBLOC to the splines of the fixed gear.

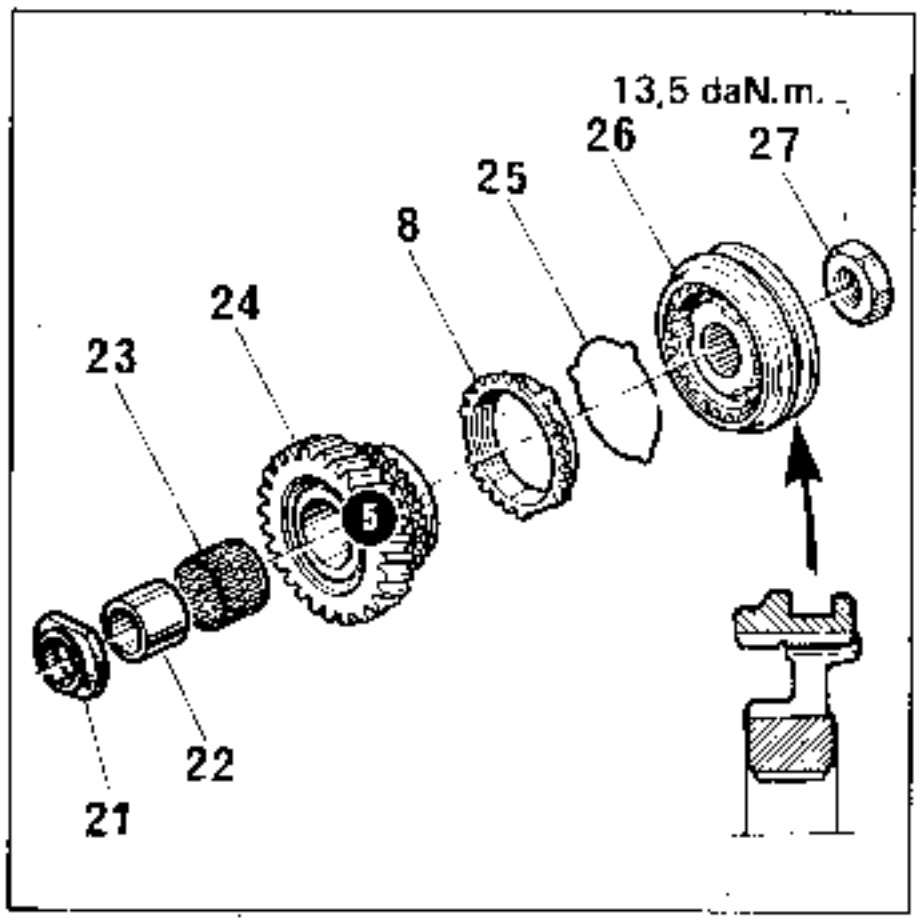
Fit the shouldered washer (64).

On the primary shaft :

- Refit, in the following order : (21) (shoulder against bearing)(22), (23), (24), (8).
- Fit the fork to the sliding gear (26), together with (25).

Apply 3 drops of Loctite FRENBLOC to the hub and refit the hub, sliding gear and fork assembly.

Place the bosses on the synchro ring in the slots on the hub.

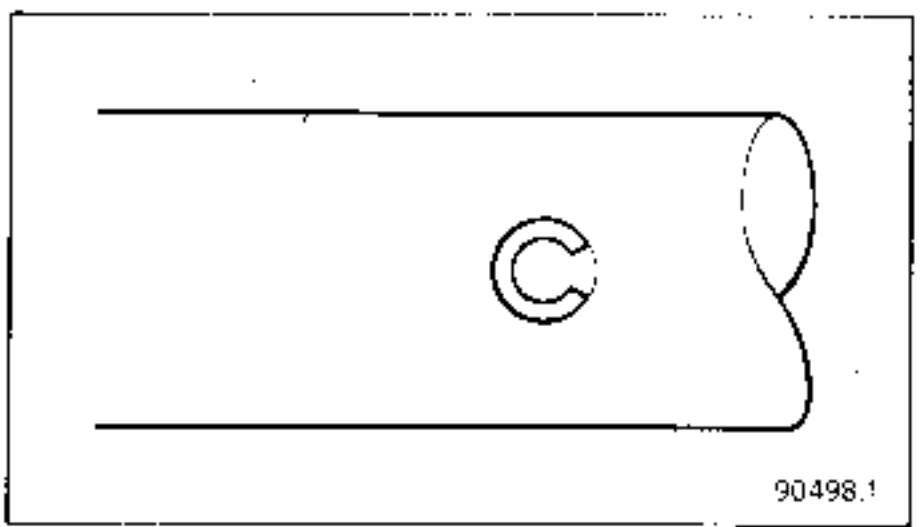


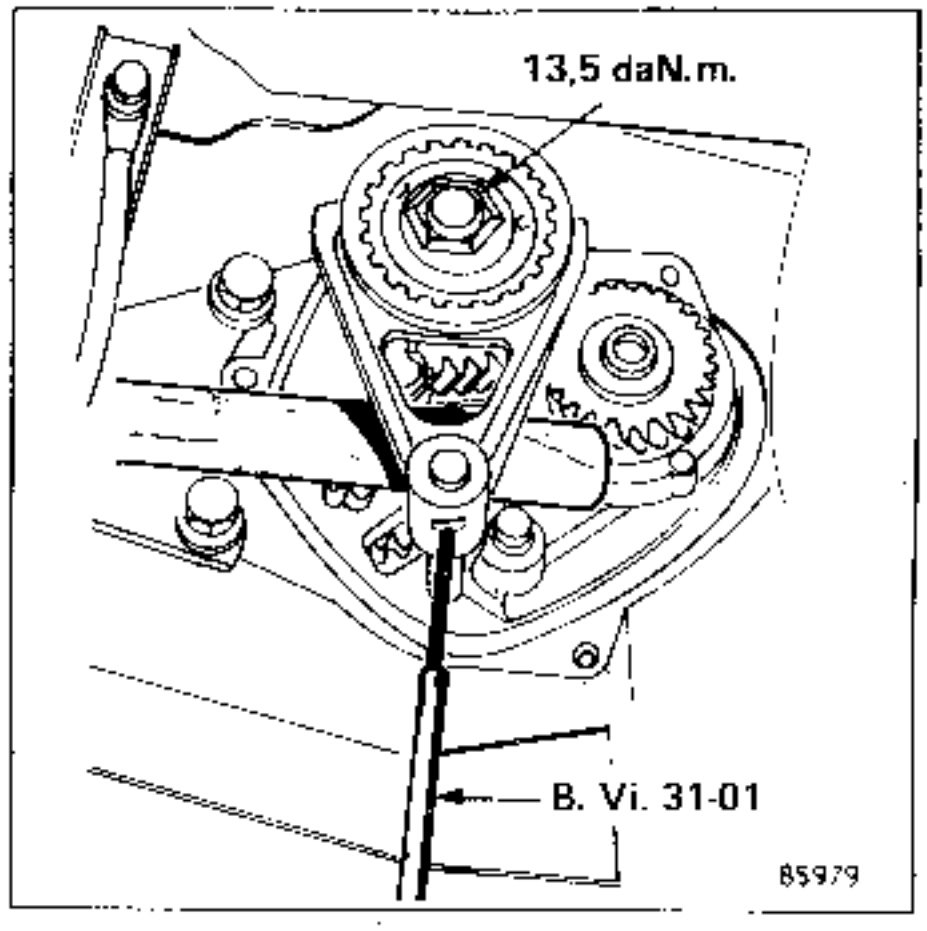
Select 1st gear at the shift lever and 5th at the box by sliding the 5th speed fork on its shaft.

Apply 3 drops of Loctite FRENBLOC :

- to the primary shaft nut (27) and tighten it to a torque of 13,5 daN.m.
- to the bolt (65) and tighten it to a torque of 8 daN.m to push in the fixed gear.

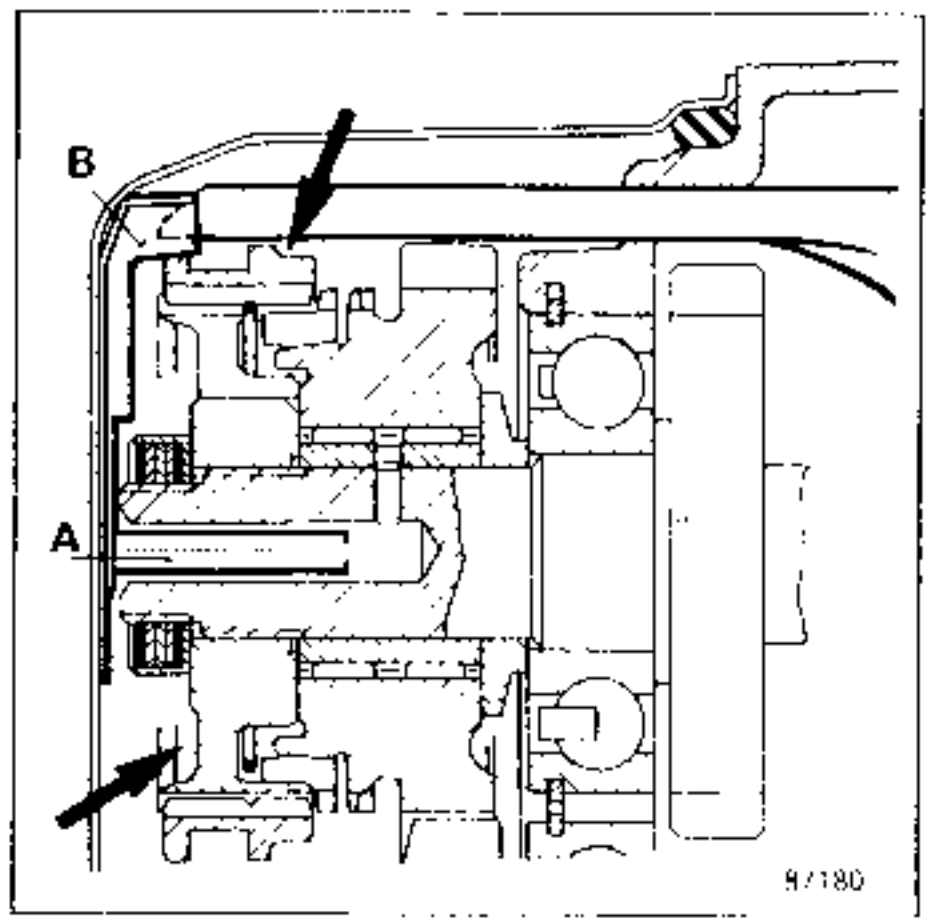
Place a wooden block between the 5th speed fork and the drive gear to support it. Fit a new pin to the 5th speed fork using punch B.Vi.31-01. Ensure that it is the correct way round with its slot towards the rear housing.





Fit a new rear housing O ring seal.

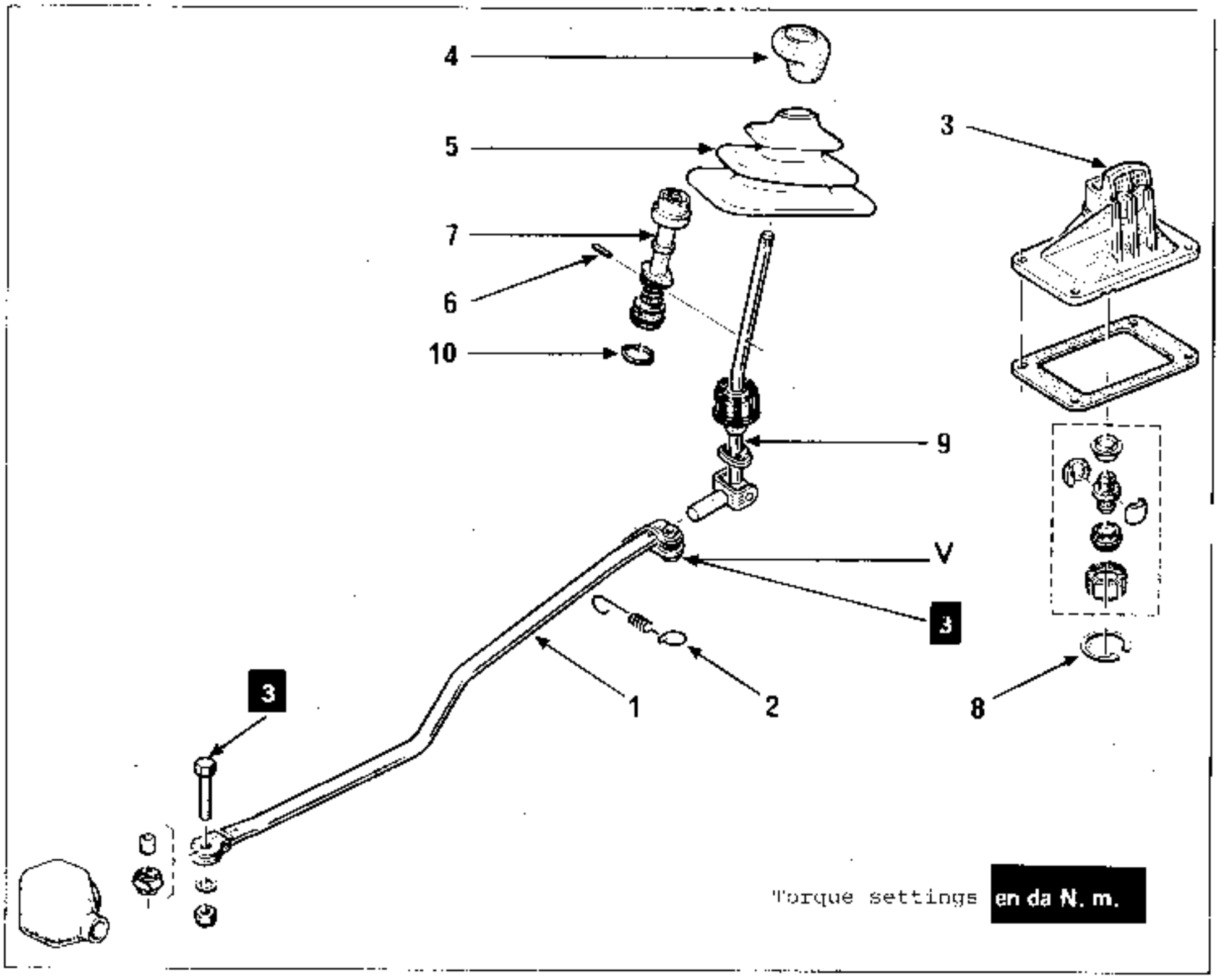
Return the box to neutral then fit the rear housing, inserting the tube (A) into the primary shaft and the lubrication duct into the oil input rail (B). Tighten the bolts to a torque of 2,5 daN.m.



Check that all the gears select correctly.

Fill the box with oil. Type JB3 : 3,40 litres.

Check the rear housing for leaks with the engine running.

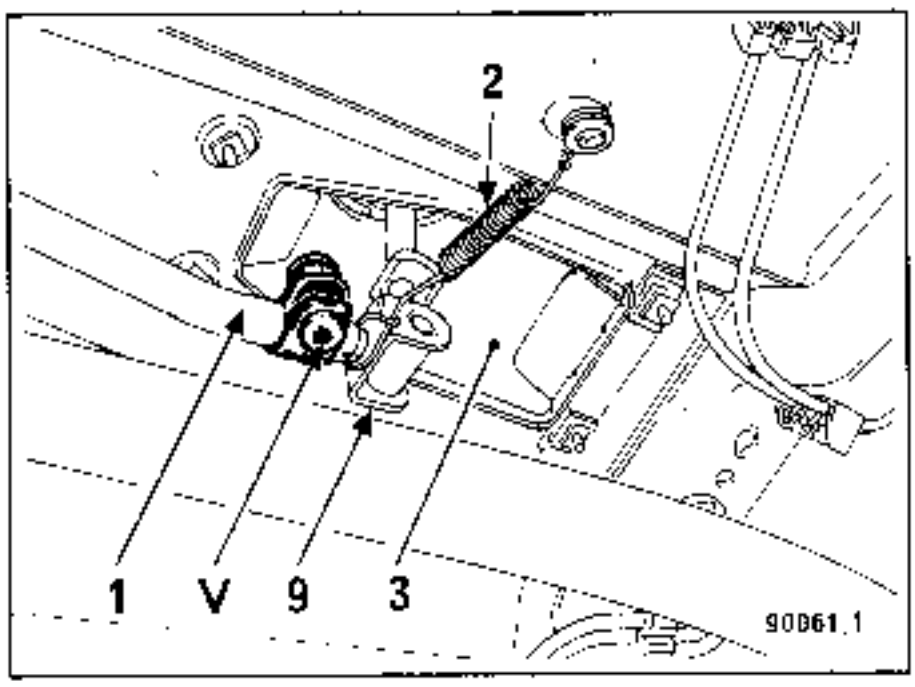


Torque settings **en da N. m.**

	Link	6	Spring pin
7	Spring	7	Lock release
3	Housing	8	Circlip
4	Knob	9	Lever
5	Bellows	10	O ring

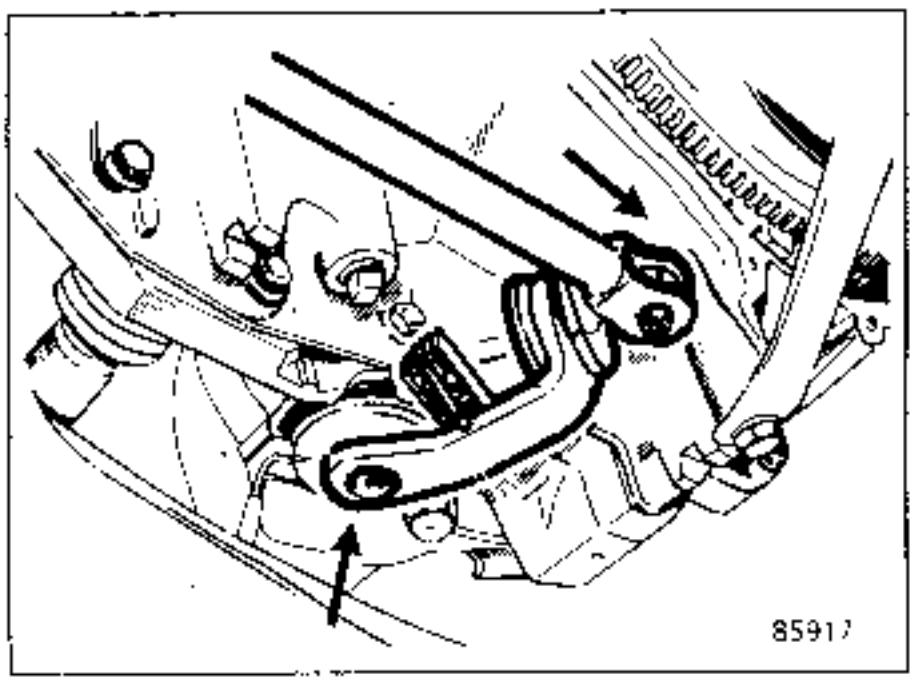
REMOVING

- Inside the vehicle : unclip the bellows (5) from the console.
- Under the vehicle : disconnect the link from the clevice (9) and disconnect the spring (2). Then remove the housing assembly (3) and the shift lever.
- Grip the shift lever clevice (9) in a vice fitted with soft jaws and remove parts (4) to (10) in that order.



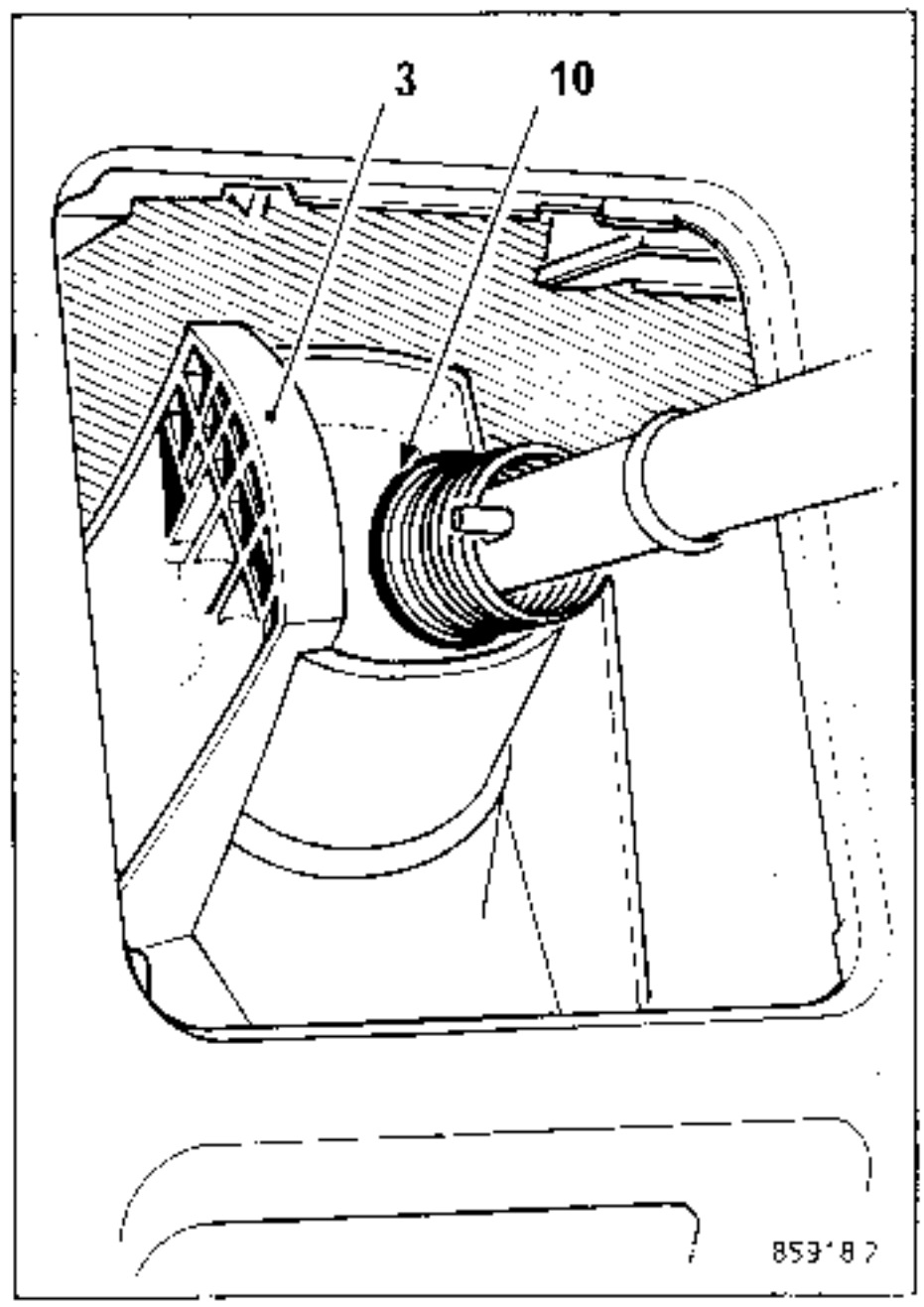
REFITTING (Special points)

Coat the gear shift lever pivot points with Medium 33 grease.



Select 2nd at the gearbox and clamp the gearbox input lever in the full travel position.

Push the O ring (10) against the housing ramp (3).



Fit the link (1) to the lever clevice (9).

Leave a space of 5 mm between the link and the clevice body.

In this position :
- tighten screw (V),
- check that the clip on the link (1) is fully tight,
- refit the spring (2) and the bellows (5),
- bond the knob (4) to the lever.

Check that the gears select correctly.

ESSENTIAL SPECIAL TOOLS	
B.Vi. 31-01	Set of pin punches
T.Av. 476	Ball joint extractor

TIGHTENING TORQUES (in daN.m)	
Mounting pad nuts	4
Wheel bolts	9
Shock absorber lower securing nuts	20
Steering link ball joint nut	4

The gearbox can be removed alone.

REMOVING

Place the vehicle on a lift.

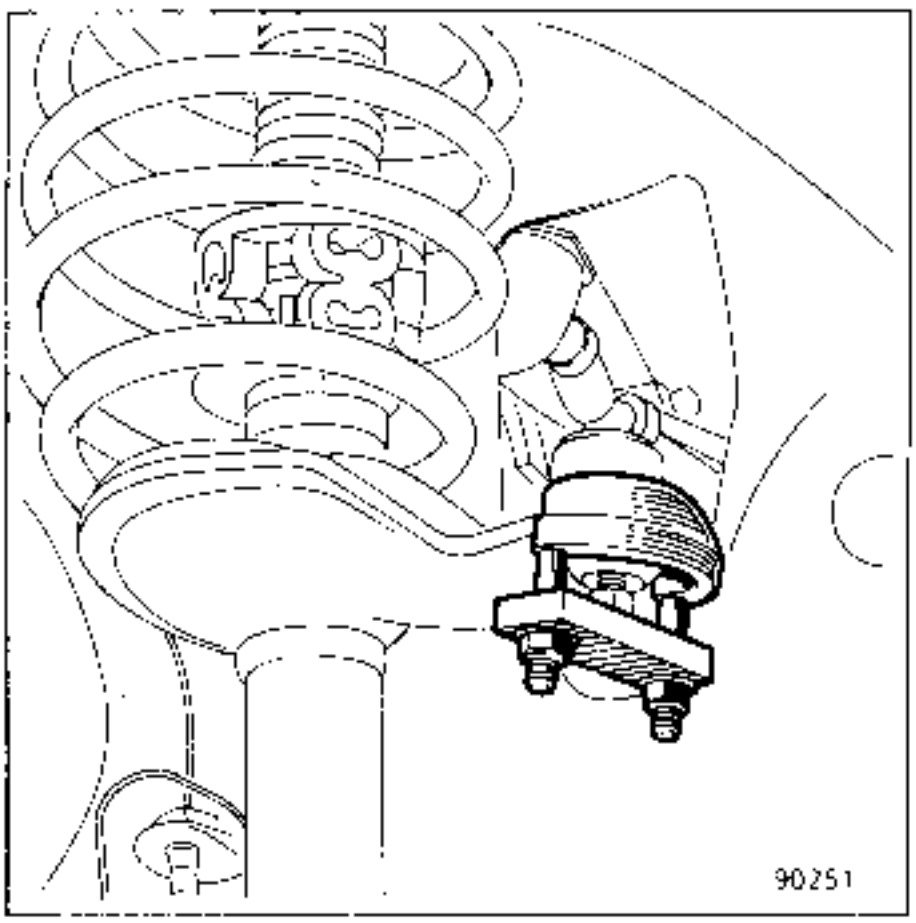
Disconnect the battery.

Remove the front wheels.

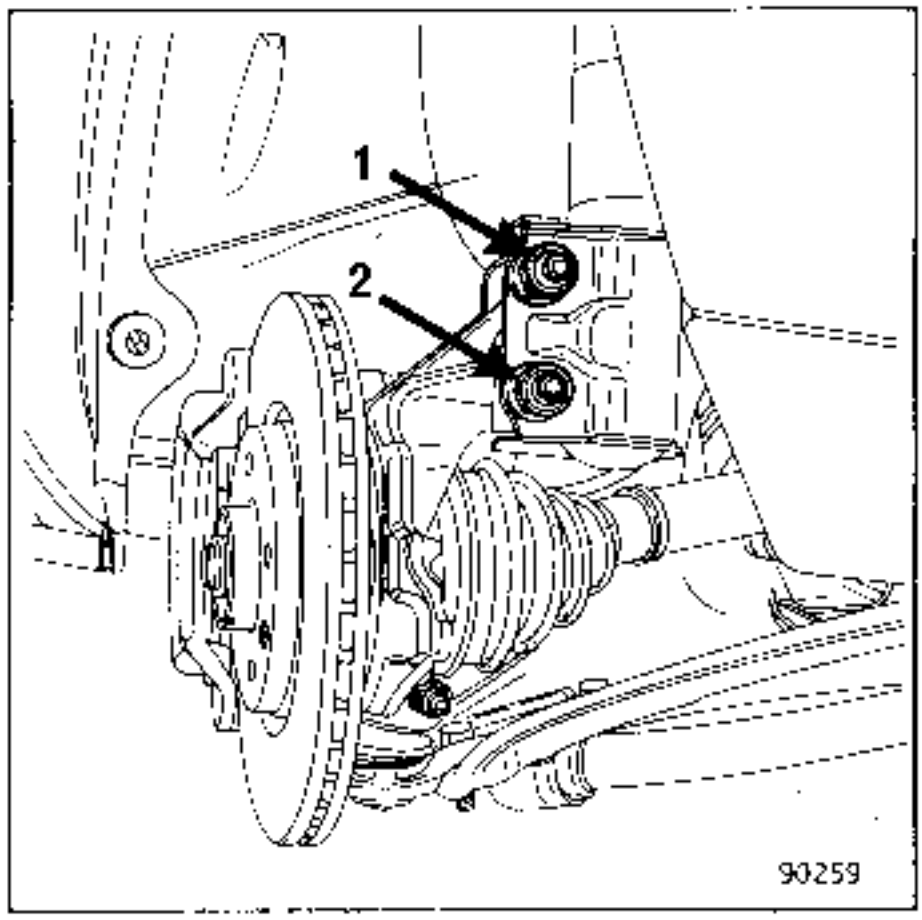
If necessary drain the gearbox.

Knock out the driveshaft pins.

Disconnect one steering ball joint.



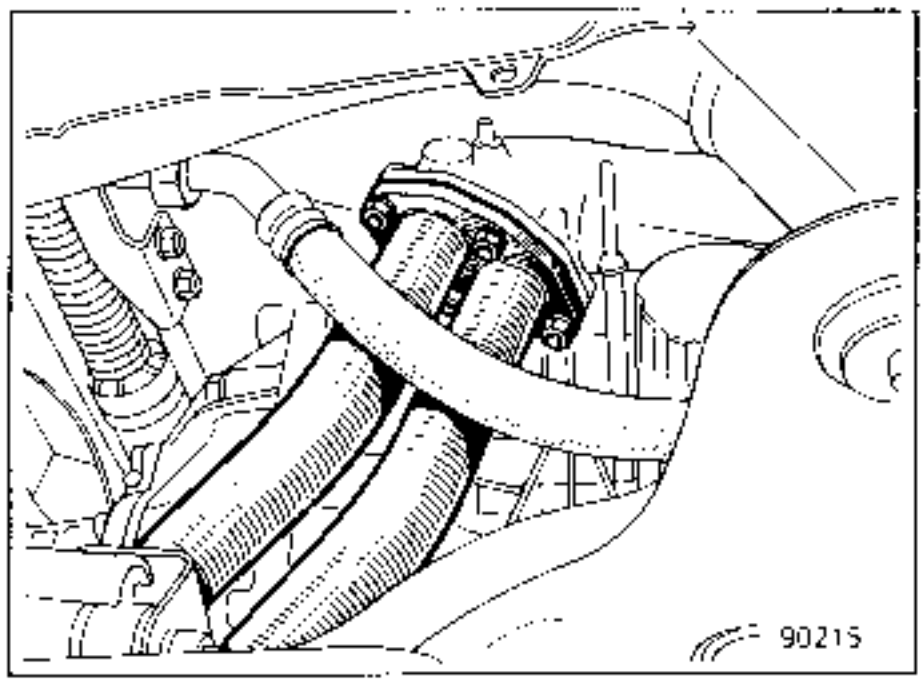
Loosen the shock absorber lower bolts (2) and remove the upper bolts (1) on both RH and LH sides.



Note : the bolts have serrations on them and will have to be knocked out with a mallet.

Tilt the stub axle carriers and disconnect the driveshafts.

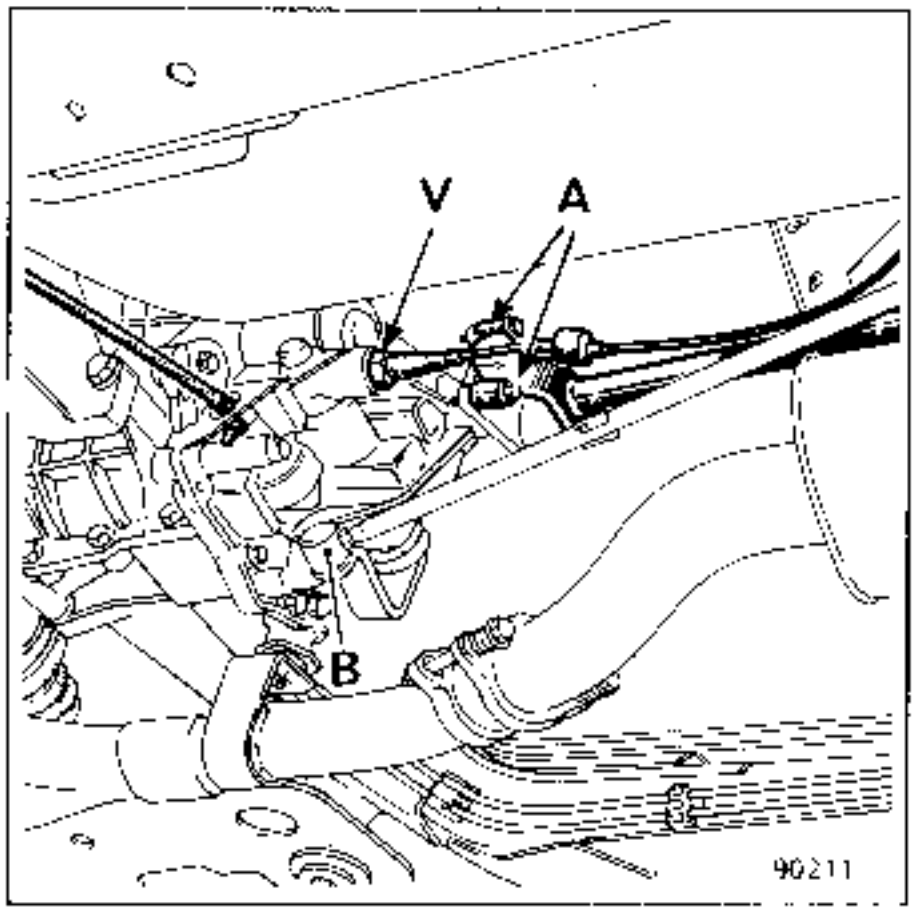
Remove :
- the A.E.I. sensor,
- the upper bolts from round the gearbox,
- the starter securing bolts,
- the exhaust down-pipe securing nuts.



Disconnect :
- the clutch cable,
- the wires from the reversing light switch.

From under the vehicle, remove :

- the transverse bar,
- the exhaust down-pipe,
- the gear shift controls
  at (A) the 2 securing bolts
  at (B), disconnect the ball joint
- the reverse lock (V).



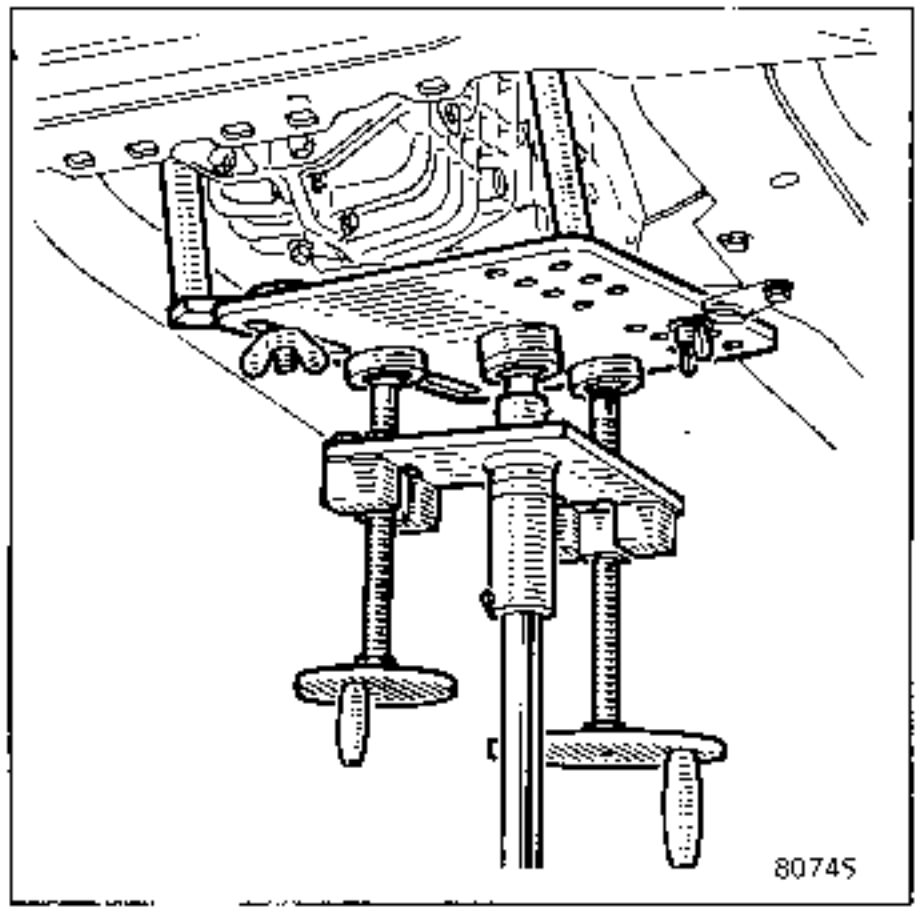
Disconnect the speedometer drive cable.

Remove :
- the earthing braid,
- the lower bolts from round the gearbox.

Place the DESVIL V 710 or SEF 6050 unit support in position.

Remove the gearbox side mounting.

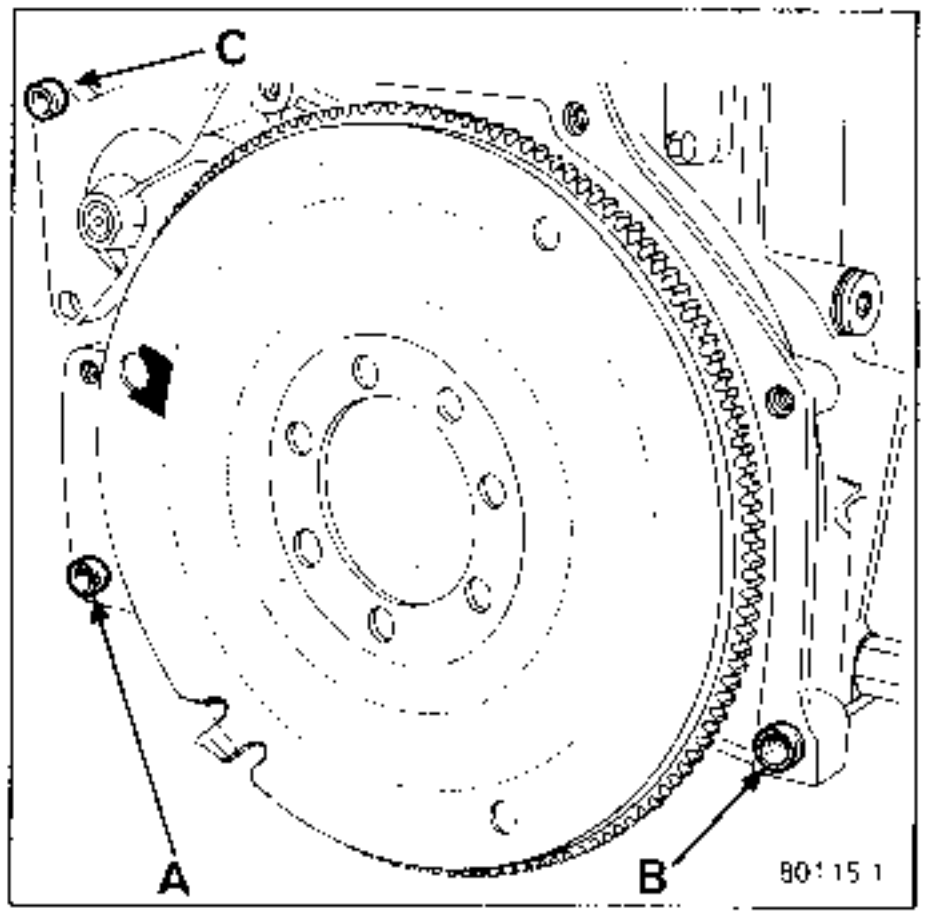
Pull the gearbox towards the rear, taking care not to catch the clutch fork control.



REFITTING (Special points)

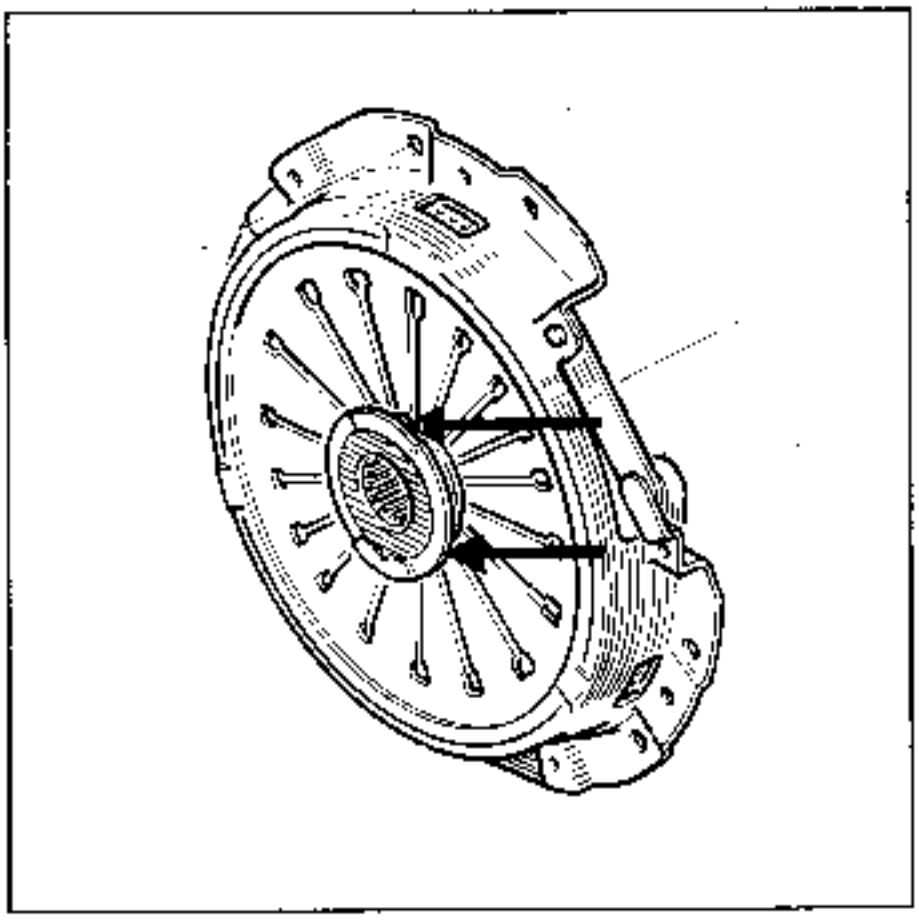
Before refitting the gearbox to the vehicle, check that the locating bushes (A),and (B) on the cylinder block and (C) on the starter, are in position.

Coat the splines on the release bearing bore, the clutch shaft and the sun wheels with grease no. 20 (Mobil X57 030).



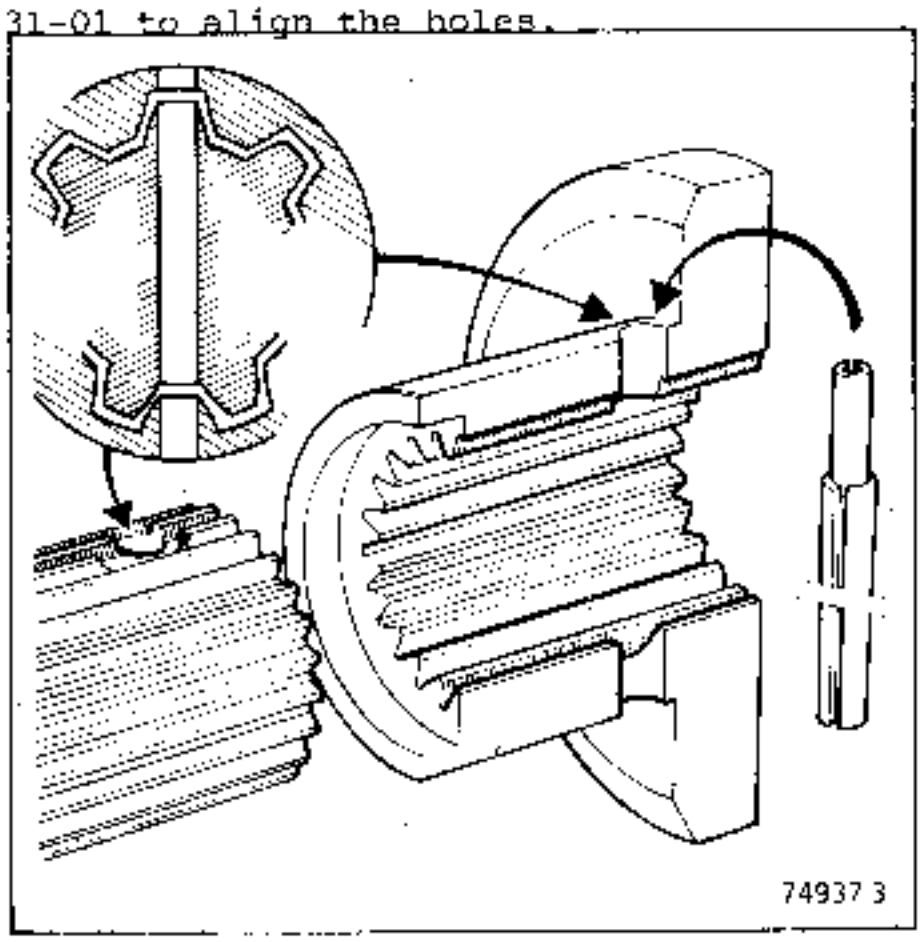
REFITTING

Place the gearbox in position, ensuring that the clutch fork lugs are correctly positioned behind the shoulder on the release bearing (the bearing is secured to the clutch unit which is of the "Pulled" type).



Secure the gearbox to the engine and refit its side mountings.

Correctly position the driveshaft with reference to the sun wheel, swing the stub axle carrier and insert the driveshaft into the sun wheel. Use cranked pin punch B.Vi. 31-01 to align the holes.

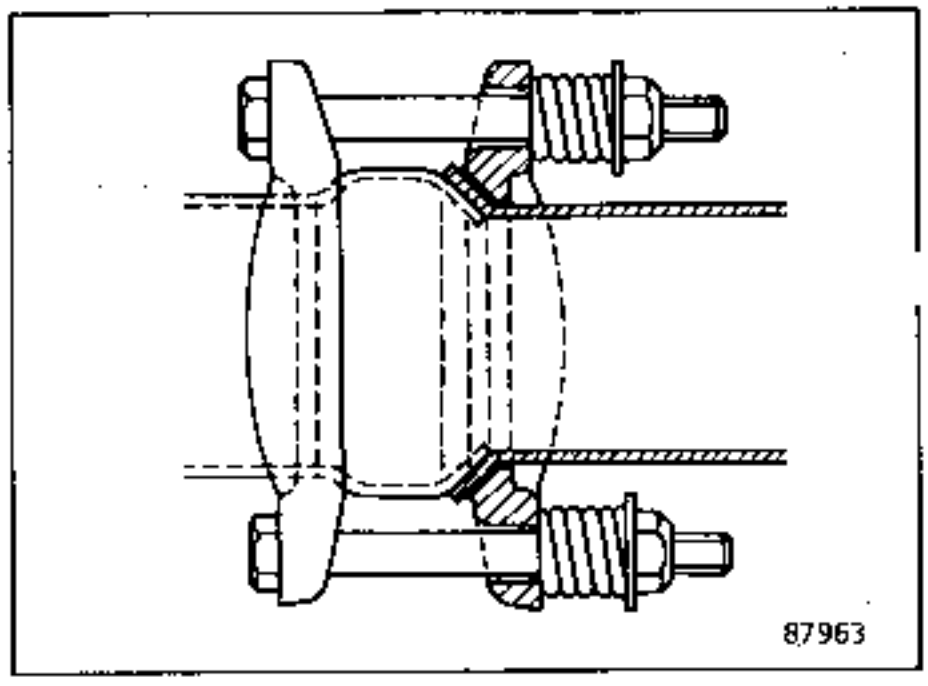


Fit new spring pins and seal their holes (with CAF 4/60 THIXO).

Tighten :
- the shock absorber lower securing nuts to a torque of 20 daN.m.
- the nut on the steering ball joint to a torque of 4 daN.m.

Refit the exhaust down-pipe.

Ensure that the exhaust pipe clamp is correctly tightened.



NOTE : replace the thermoplastic seal each time it is removed.

Tighten the springs on the clamp until they are COILBOUND.

Refit :
- the gear shift control,
- the speedometer drive cable,
- the transverse bar,
- the earthing braid,
- the A.E.I. sensor.

Reconnect the clutch cable and check that the automatic wear take-up system operates correctly.

Fill the gearbox with oil. Type NG9 : 2,2 litres.

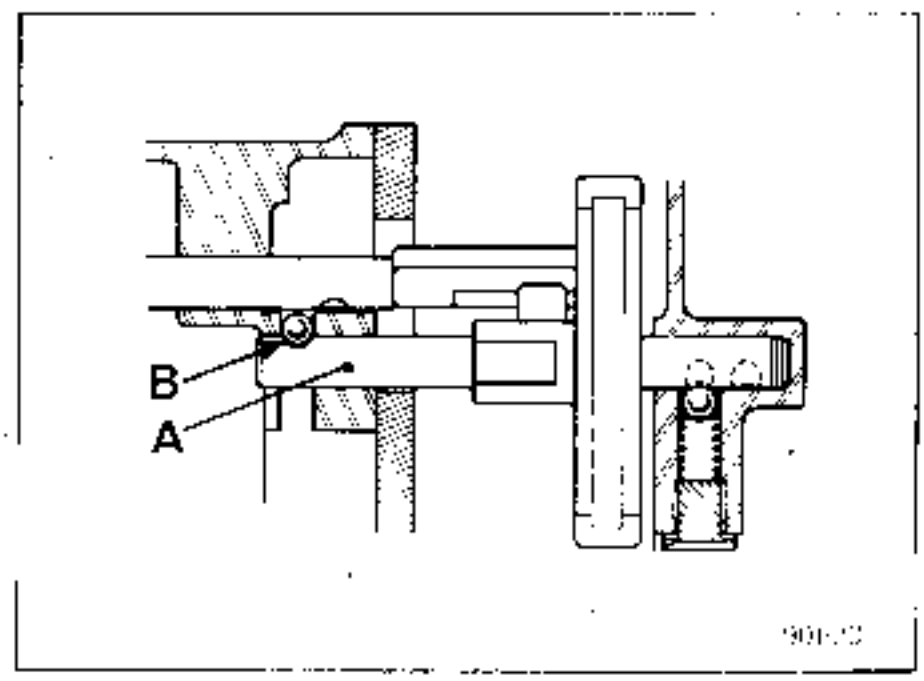
Tighten the wheel bolts to a torque of 9 daN.m.

ESSENTIAL SPECIAL TOOLS	
B.Vi.204-01	Spanner for secondary shaft nut

TIGHTENING TORQUES (in daN.m)	
Primary shaft nut	13
Secondary shaft nut	15
Rear housing bolts	1,5

It is not possible to replace the 5th speed gear assembly on the vehicle because it is essential not to remove the 5th speed shift fork shaft (A) because of the risk of the locking ball (B) falling inside the gearbox

.owever, we are covering removing the 5th speed housing, on the vehicle, to permit work on the housing itself or to replace the speedometer drive gears.

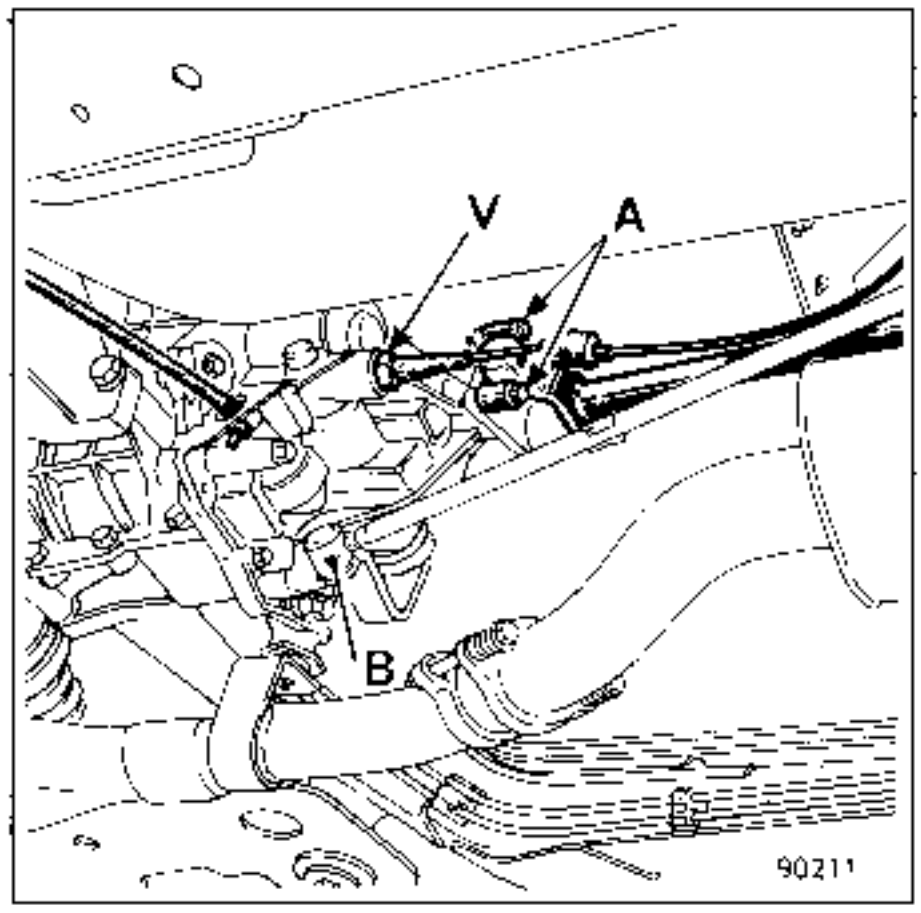


REMOVING

Drain the gearbox.

Remove :
- the gear shift controls :
  at (A) the 2 securing bolts
  at (B) disconnect the ball joint
- the reverse lock (V),
- the 5th speed locking system.

Disconnect the speedometer drive cable after removing the plastic pin.



Select 4th speed to avoid the 5th speed locking ball falling inside the gearbox.

Remove the 5th speed housing.

Replacing the secondary shaft nut :

- return the gearbox to neutral,
- select both 1st and 5th,
- unlock and loosen the secondary shaft nut using spanner B.Vi.204-01 and a torque wrench.

REFITTING

Carry out the removing operations in reverse.

Apply 3 drops of Loctite FRENBLOC to the thread on the new nut and tighten it to a torque of 15 daN.m.

Return the gearbox to neutral, engage 4th and refit the housing (its joint face is to be coated with PERFECT SEAL jointing compound).

Tighten the bolts to a torque of 1,5 daN.m.

Check that all the gears select correctly.

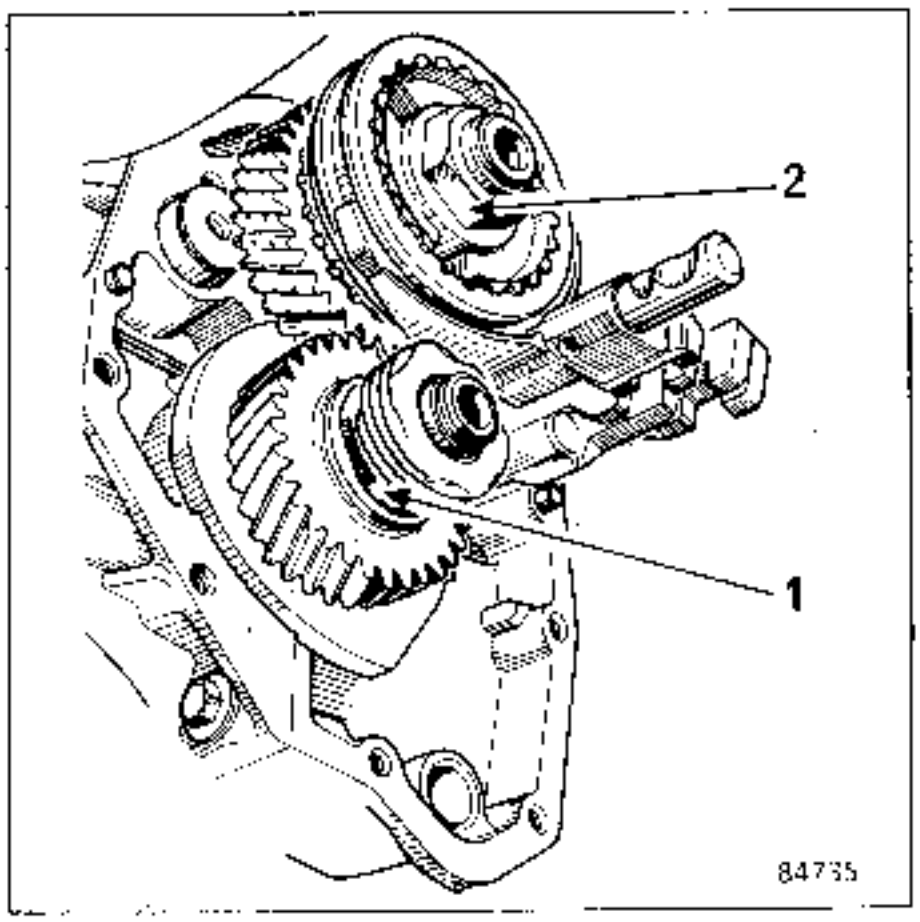
Coat the threads on the 5th speed locking system and reverse positive lock plug with CAF 4/60 THIXO.
Fill the gearbox with oil.GB NG9:2,2 lit.

ESSENTIAL SPECIAL TOOLS	
B.Vi. 28-01	Extractor body
B.Vi. 31-01	Set of 5 mm Ø pin punches
B.Vi.204-01	Spanner for second. shaft nut
B.Vi. 1003	5th speed hub extractor
B.Vi. 1007	Claws for B.Vi.28-01

TIGHTENING TORQUES (in daN.m)	
Primary shaft nut	13
Secondary shaft nut	15
Rear housing bolts	1,5

This operation is carried out after removing the gearbox from the vehicle and removing the 5th speed housing (see preceeding page).

Mark the positions of the hub and the sliding gear.

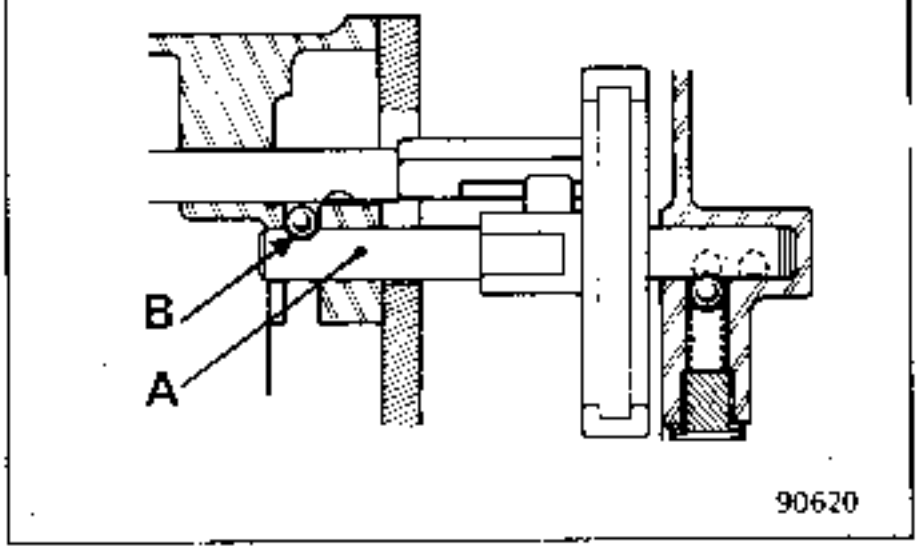


Select both 1st and 5th.

Unlock and loosen the primary shaft nut (2).

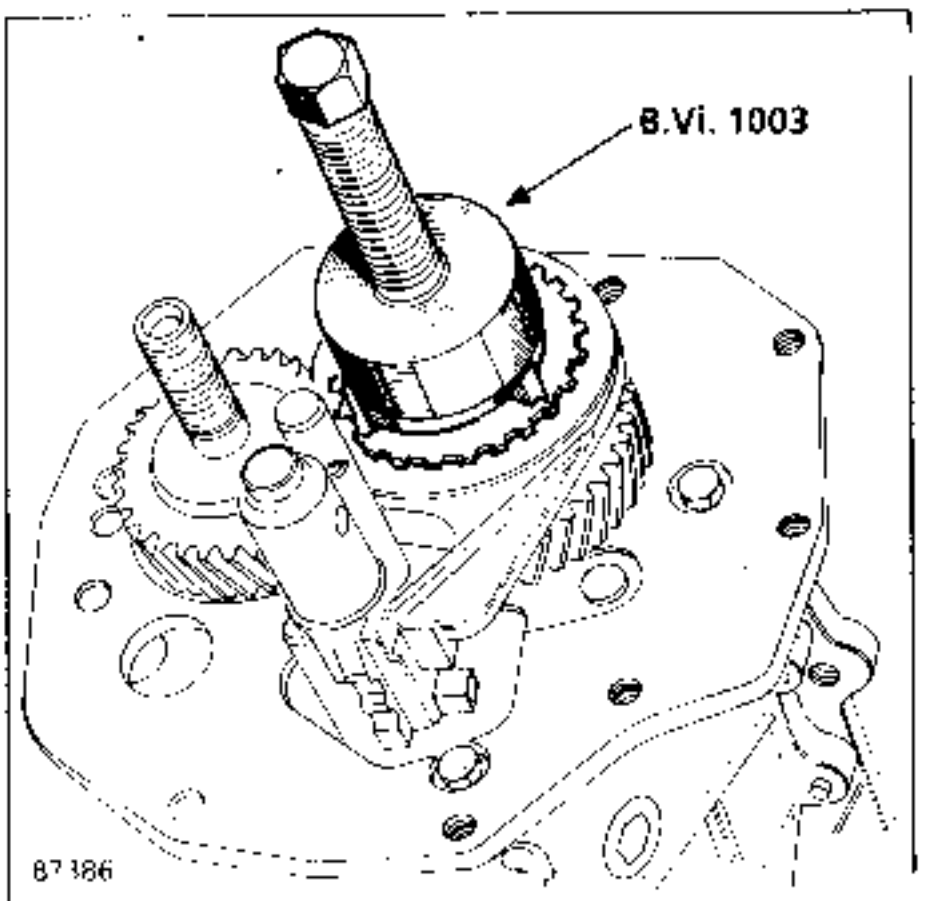
Unlock and remove the secondary shaft nut (1) using spanner B.Vi.204-01 and a torque wrench.

When removing the 5th speed shift fork and shaft, without separating the half housings, it is essential that the box should be laid on the same side as the reversing light switch to prevent the locking ball falling into the gearbox.



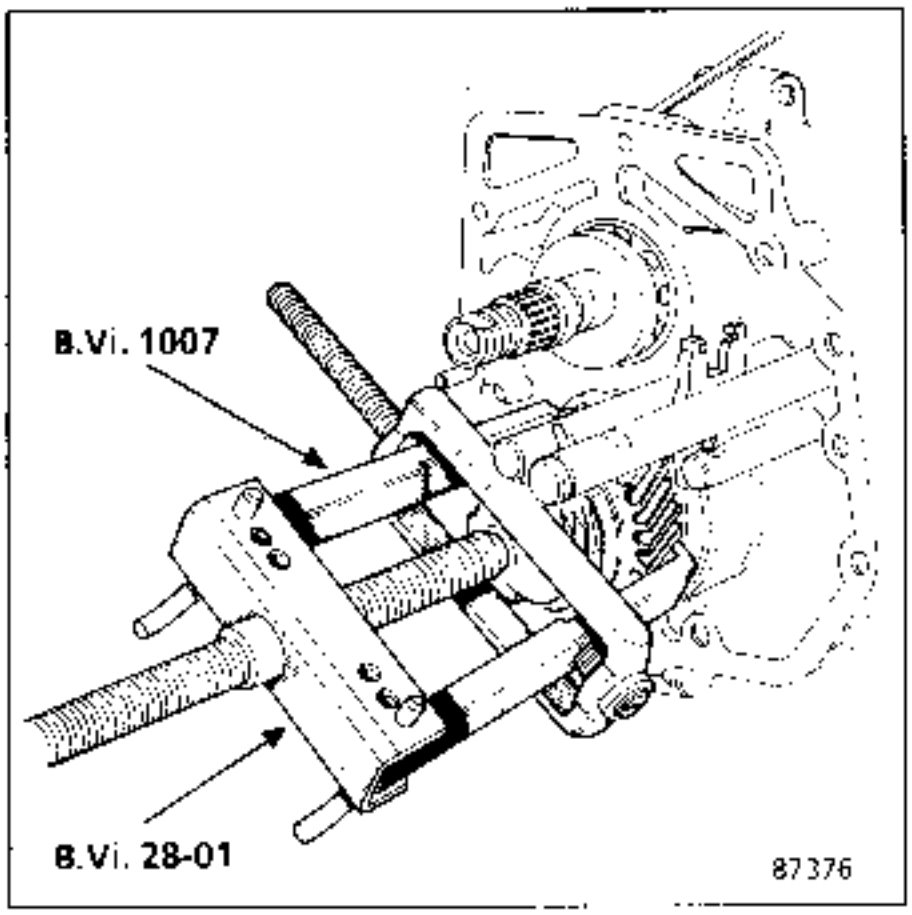
Return the gearbox to neutral.

Remove the 5th speed synchroniser assembly (hub, sliding gear and shaft-fork) using B.Vi.1003.



Remove the 5th speed idle wheel, the bearing and the bush.

Remove the 5th speed fixed gear using B.Vi. 28-01 fitted with claws B.Vi.1007.

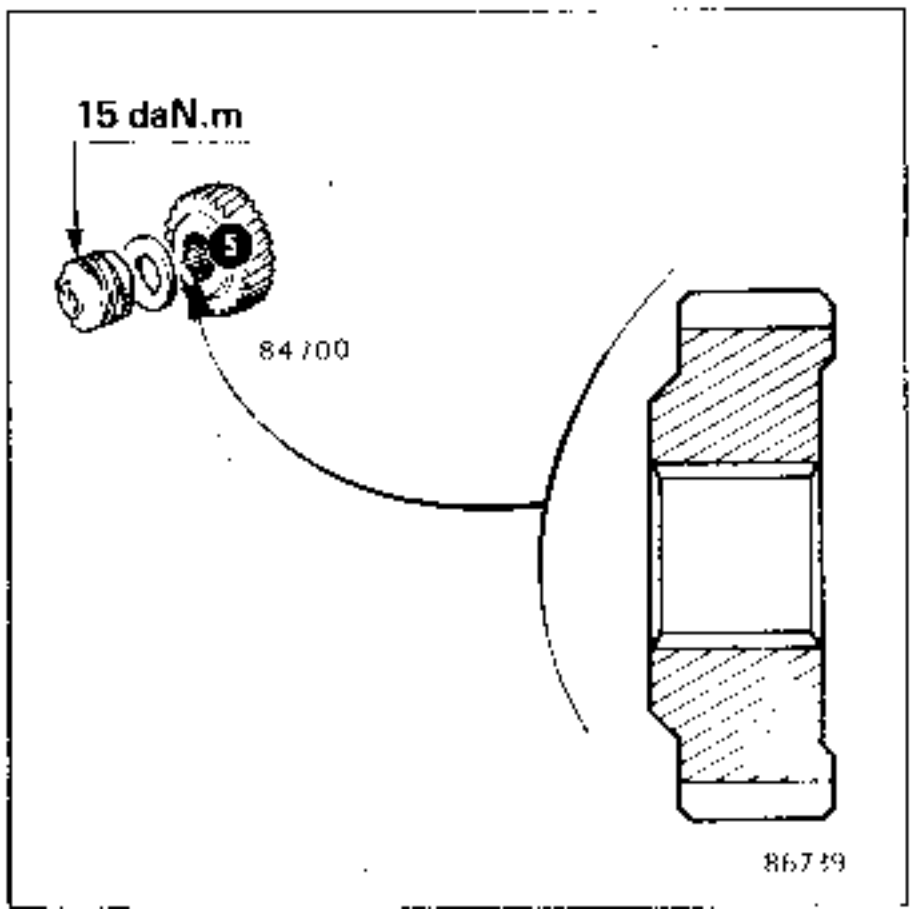


REFITTING

Carry out the removing operations in reverse.

On the secondary shaft :

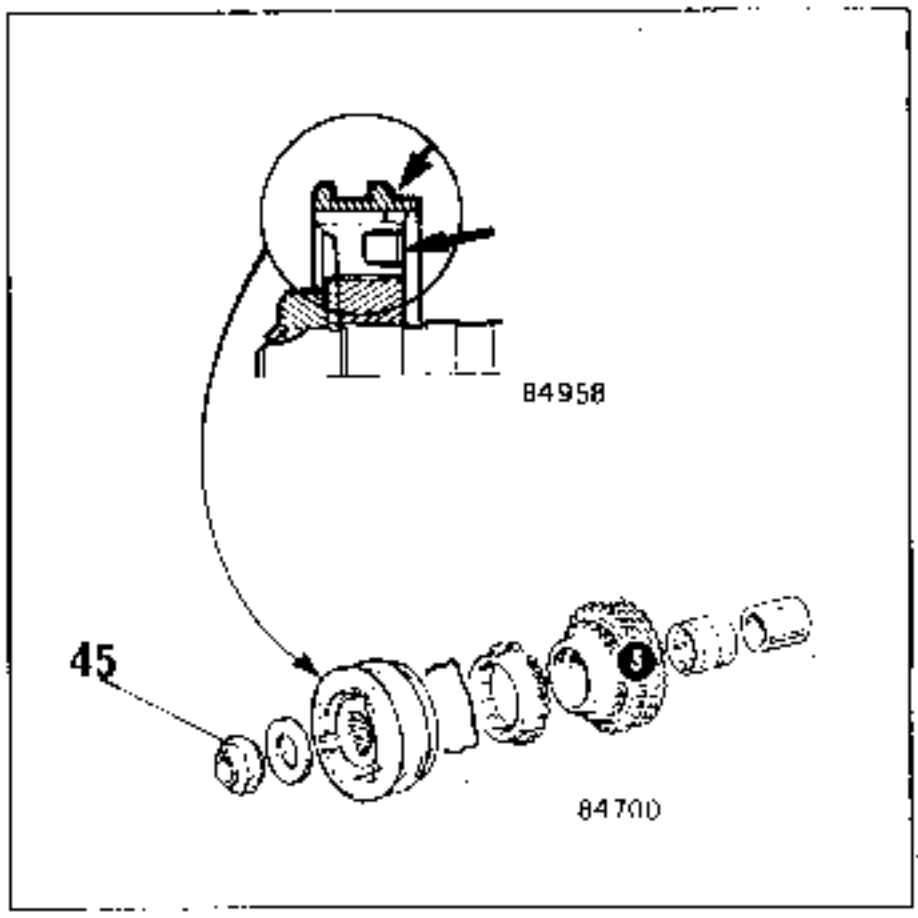
Ensure that the fixed gear is fitted the correct way round and bond it in place with



Loctite FRENBLOC.

On the primary shaft :

Bond the hub in place with Loctite FRENBLOC and ensure that the assembly is fitted the correct way round.



Place the bosses on the synchroniser ring in the slots on the hub.

Refit the 5th speed synchroniser assembly, the hub, the sliding gear, the shift fork and its shaft in place.

Select both 1st and 5th.

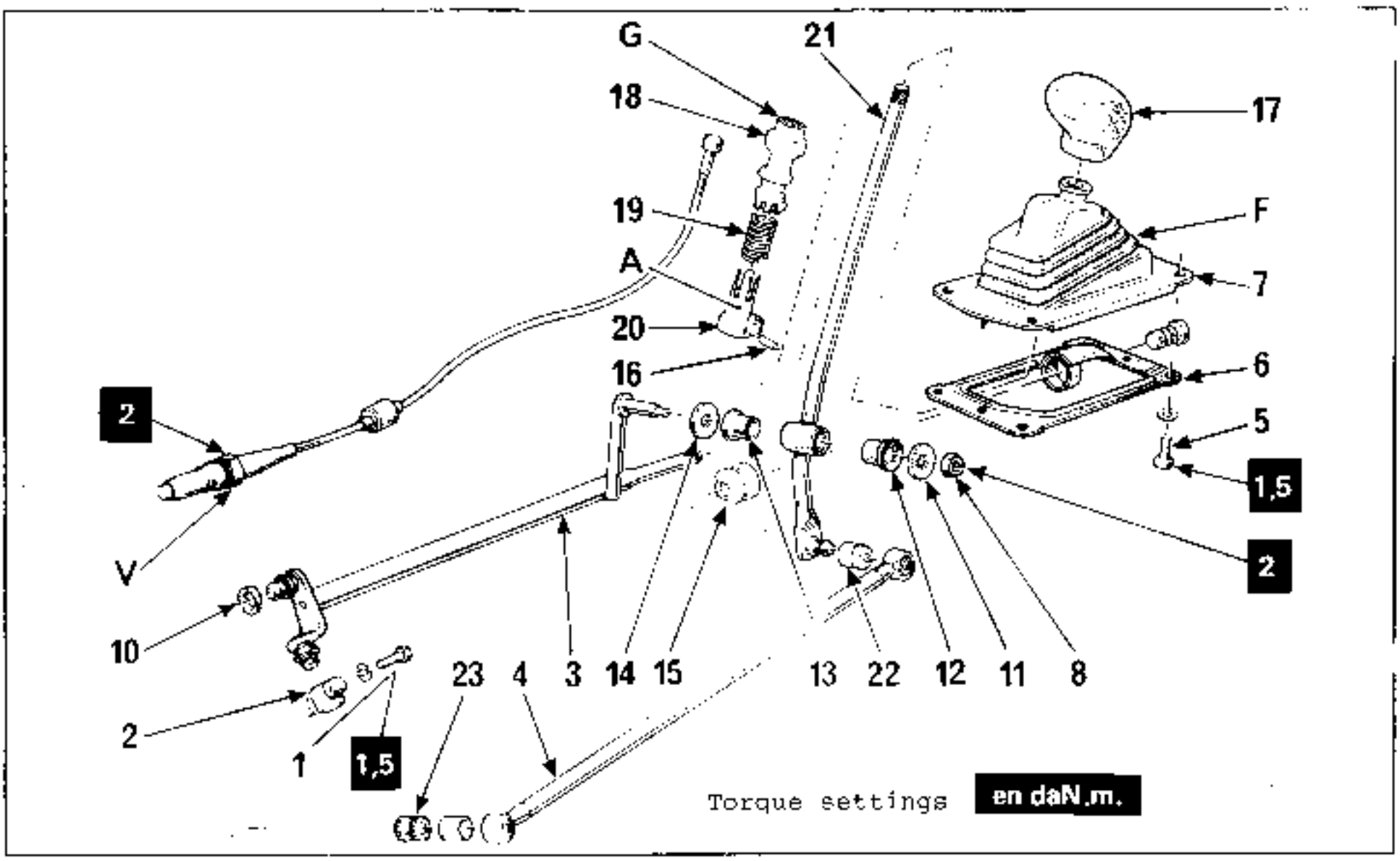
Apply 3 drops of Loctite FRENBLOC to the threads on the new nuts, tighten them to torque and lock them :

Primary shaft : 13 daN.m
Secondary shaft : 15 daN.m

Refit the 5th speed housing.

Check that all the gears select correctly.

EXTERNAL GEAR SHIFT CONTROL
Removing - Refitting



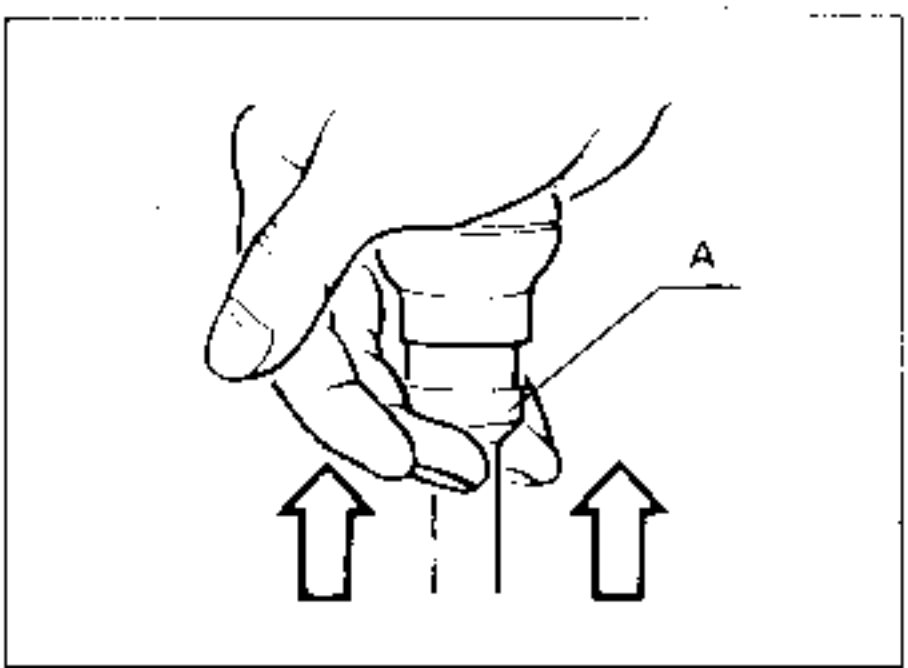
REVERSE POSITIVE LOCK

This system prevents grating, accidentally, against reverse, when selecting quickly from 3rd to 2nd.

Operation :

To select reverse, lift the lock release (A) and move the lever. The lock release operates through a cable on a locking finger mounted in the gearbox rear housing.

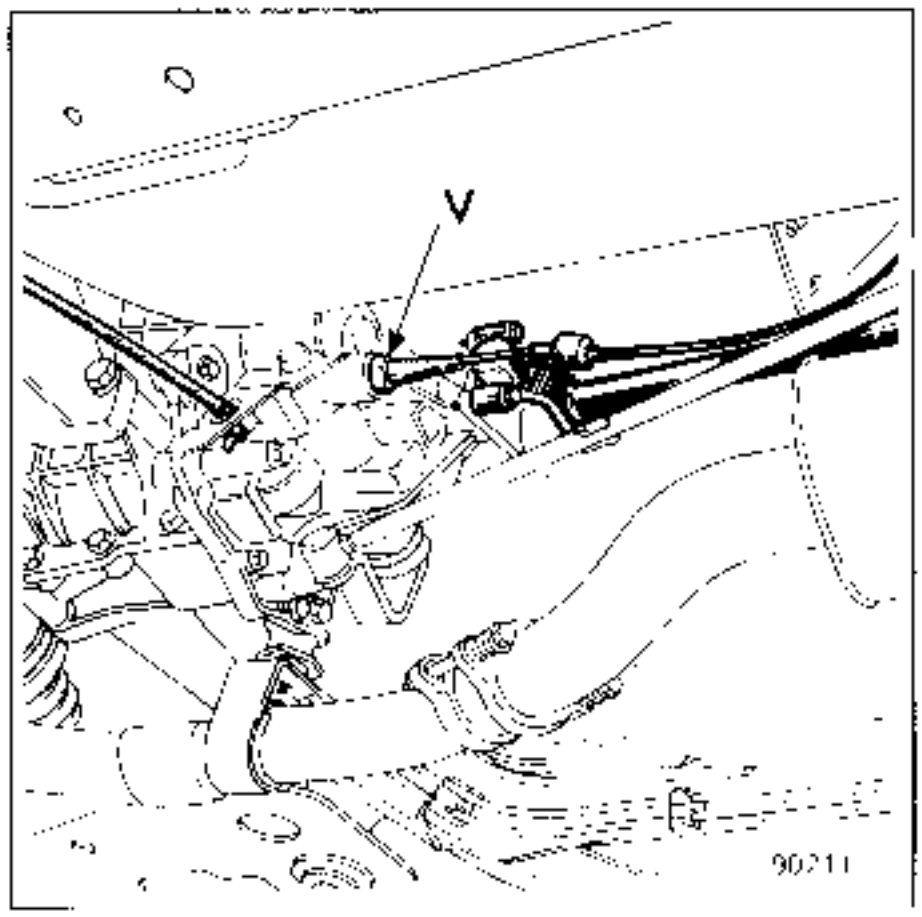
When this finger is pulled out of the way, reverse can be selected.



REMOVING (the lock cable)

It is not necessary to drain the gearbox to remove the cable.

Unscrew and remove the lock (V) from the box.



Lift the bellows (F).

Unclip the cable end clamp from the lock release (G).

Remove the cable cover and its end (A).

REFITTING

Apply a fillet of CAF 4/60 THIXO compound to the threads on the lock and tighten it to a torque of 2 daN.m.

2 ROD GEAR SHIFT CONTROL :

REMOVING

Remove the parts in the order (1) to (8).

Retrieve parts (10) to (14).

Remove (15) from (6).

Unpin (16).

Remove parts (17) to (20), in that order.

Retrieve (21).

If necessary replace (22) and (23).
The green component is to be at the gearbox end.
The self coloured component is to be at the lever end.

REFITTING (Special points)

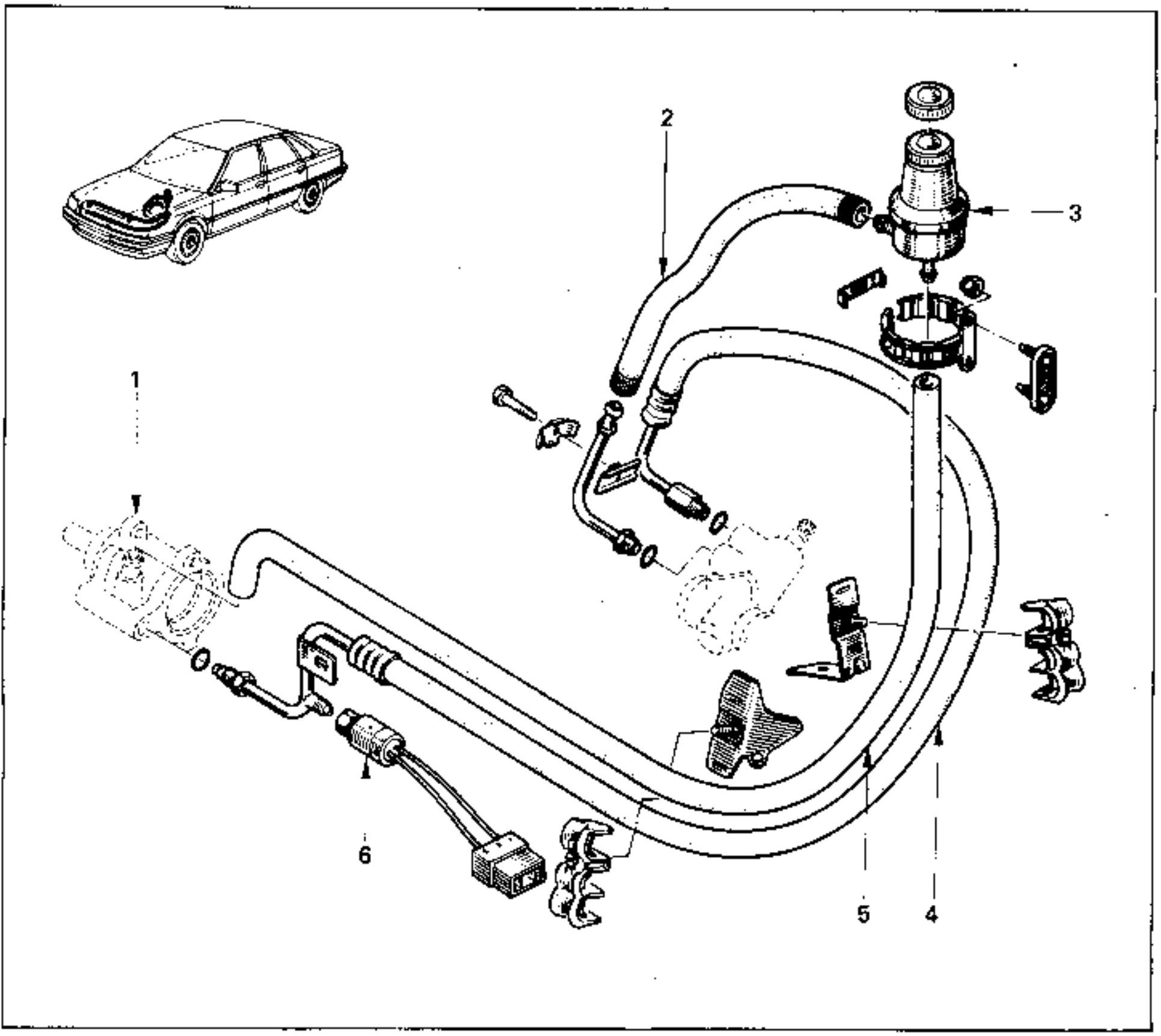
Bond (17) to lever (21).

Apply a small amount of grease 33 Medium to the inside of (15), (22) and (23).

Tighten the nuts to torque.

Positions of components :

Pressure switch :



1 - Power steering pump
2 - Pipe from reservoir to steering box
3 - Power steering reservoir
4 - Pipe from power steering pump steering box
5 - Pipe from power steering pump to reservoir
6 - Anti-stall system pressure swtich.

Solenoid valve :

The solenoid valve that controls the anti-stall system vacuum circuit is on a support near the A.E.T.. It is secured to the left hand shock absorber turret.