

2 Transmission

20 CLUTCH

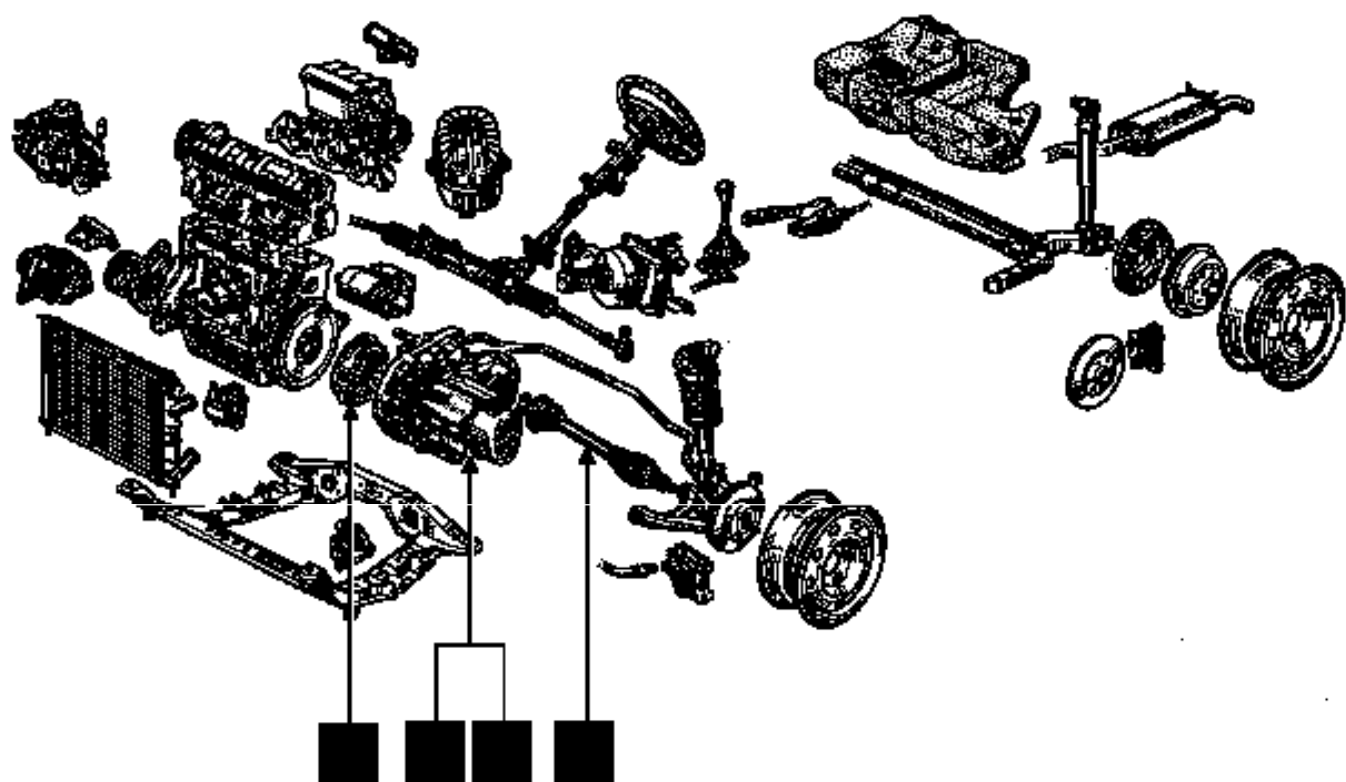
21 MANUAL GEARBOX

23 AUTOMATIC TRANSMISSION

29 DRIVESHAFTS

BA0A - BA0E - BA0F - BA0G - BA0L - BA0U

EXPLODED VIEW

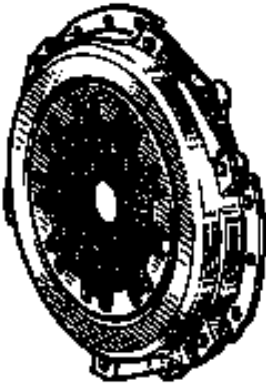
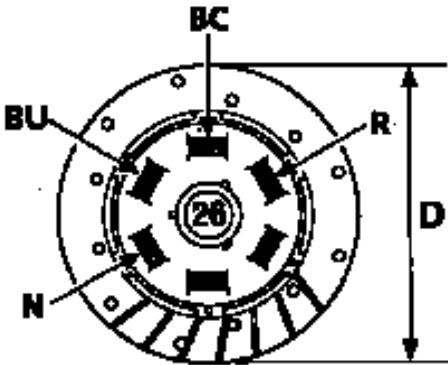


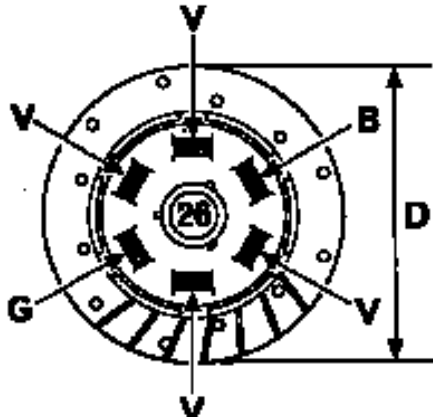



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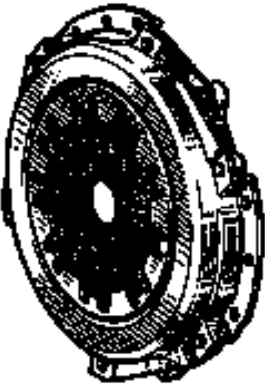
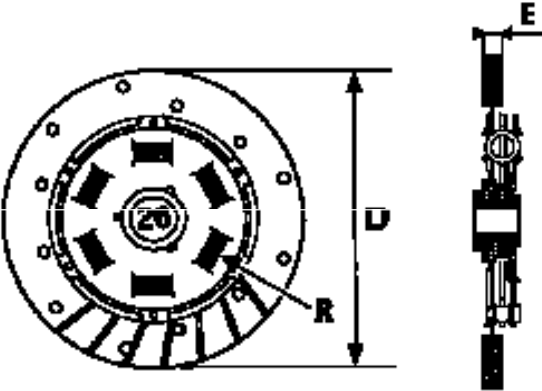
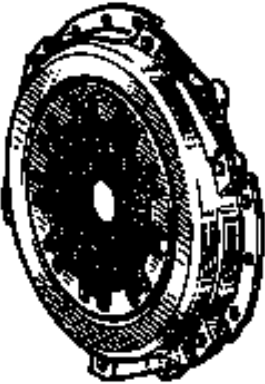
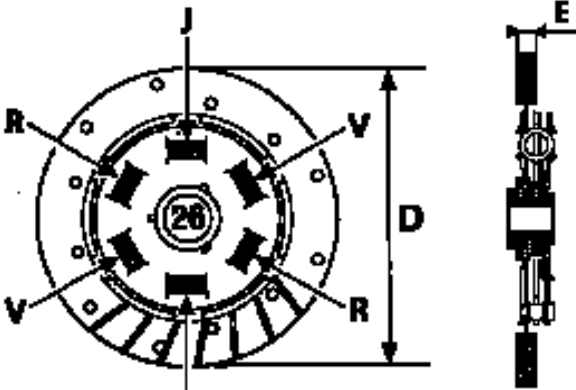
CLUTCH
Identification

20

ENGINE TYPE	MECHANISM	PLATE
E7J	 85873S 180 DST 3050	 90693R4 26 splines E = 8.5 mm D = 181.5 mm BC= White BU= Blue R = Red N = Black  76906R
E7J	 85873S 180 CP 3300	 90693R3 26 splines E = 8.3 mm D = 181.5 mm V = Green G = Grey blue B = White  76906R

CLUTCH
Identification

20

ENGINE TYPE	MECHANISM	PLATE
K7M	 200 HR 4000 85873S	 90693R5 26 splines D = 200 mm E = 8.3 mm R = Light pink 76906R
F8Q	 200 HRV 3100 85873S	 90693R6 26 splines D = 200 mm E = 8.3 mm R = Red V = Green J = Yellow 76906R

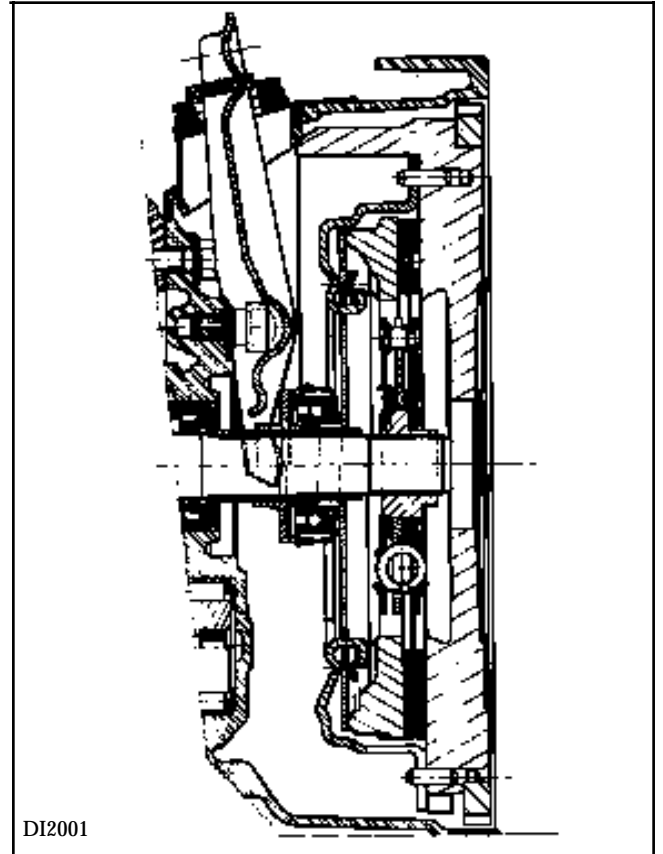
Dry operating cable controlled monodisc clutch.

Clutch plate with diaphragm.

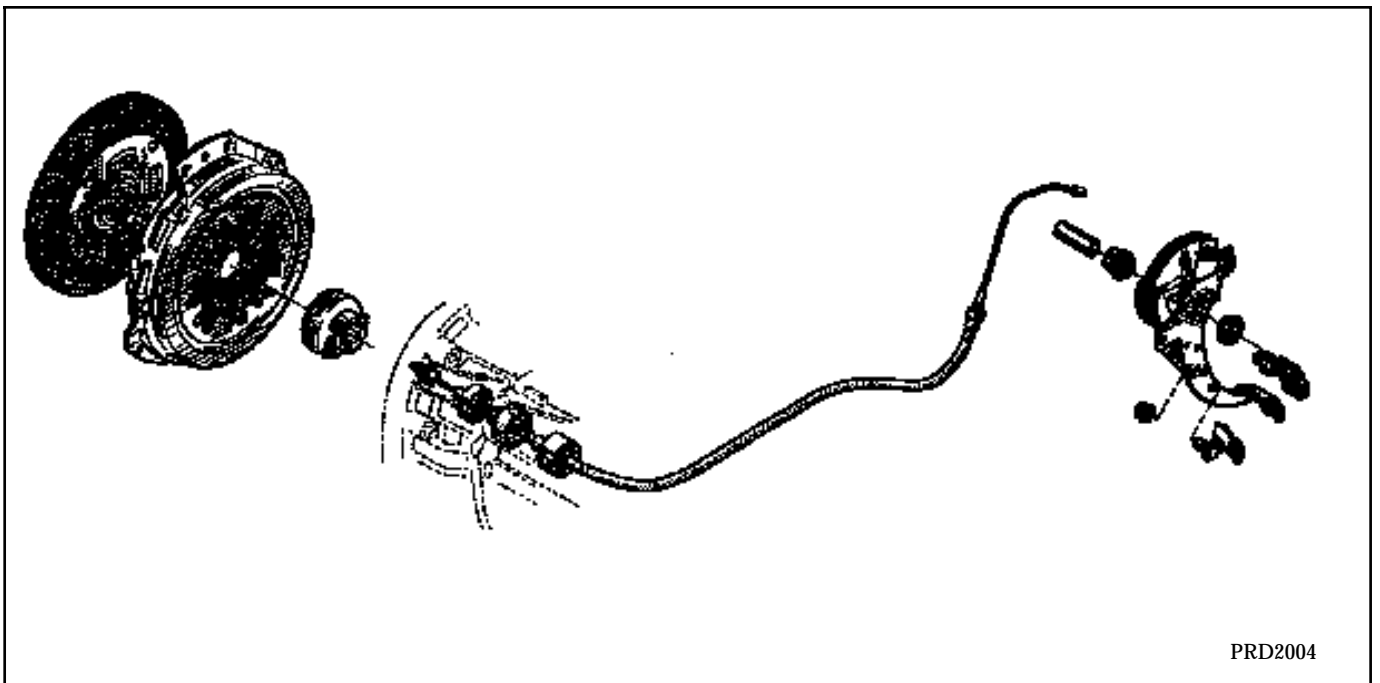
Rubber hub mounted clutch plate.

Self-centring guided and **constant pressure** thrust pad.

Automatic wear adjustment.

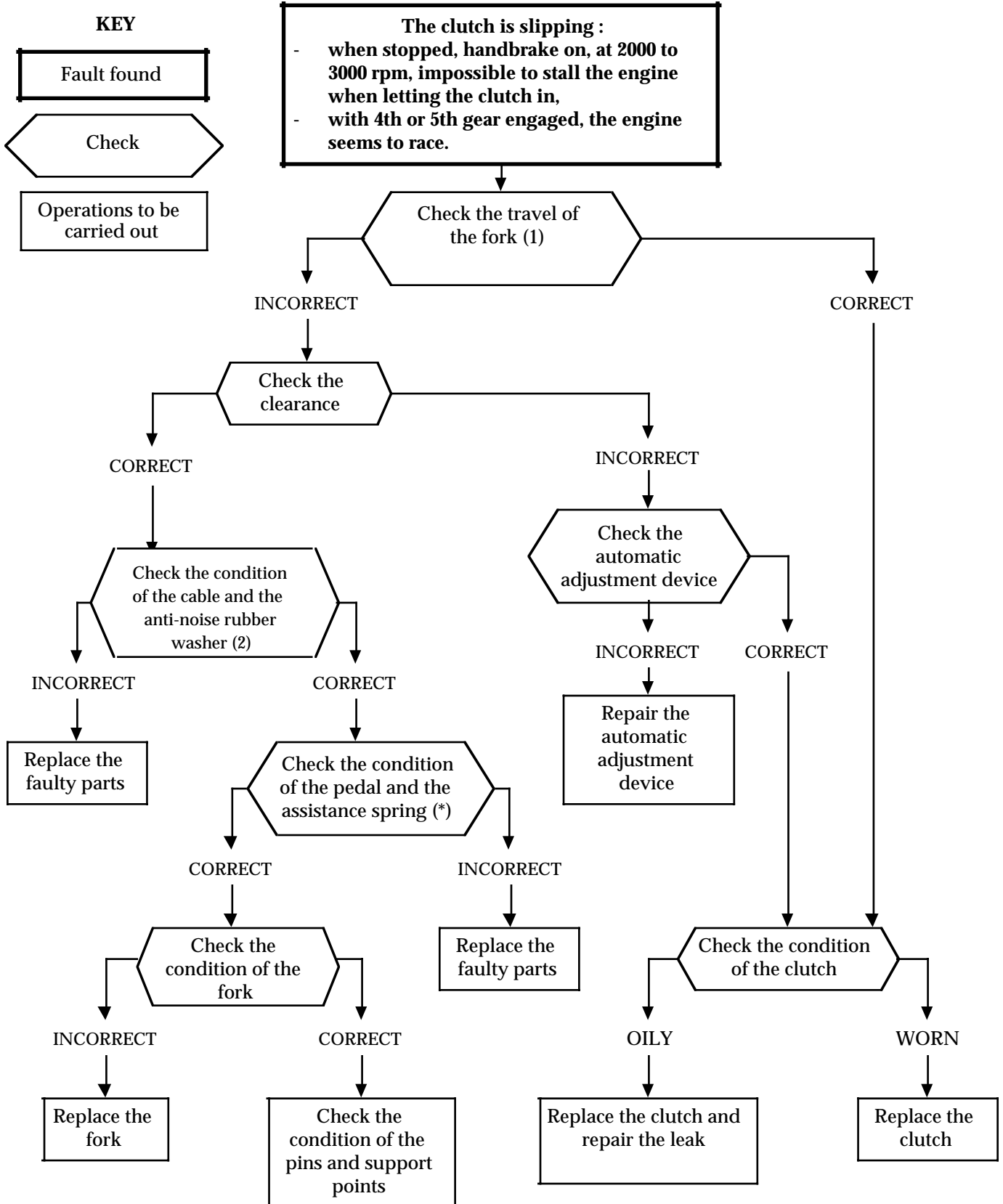


Exploded view



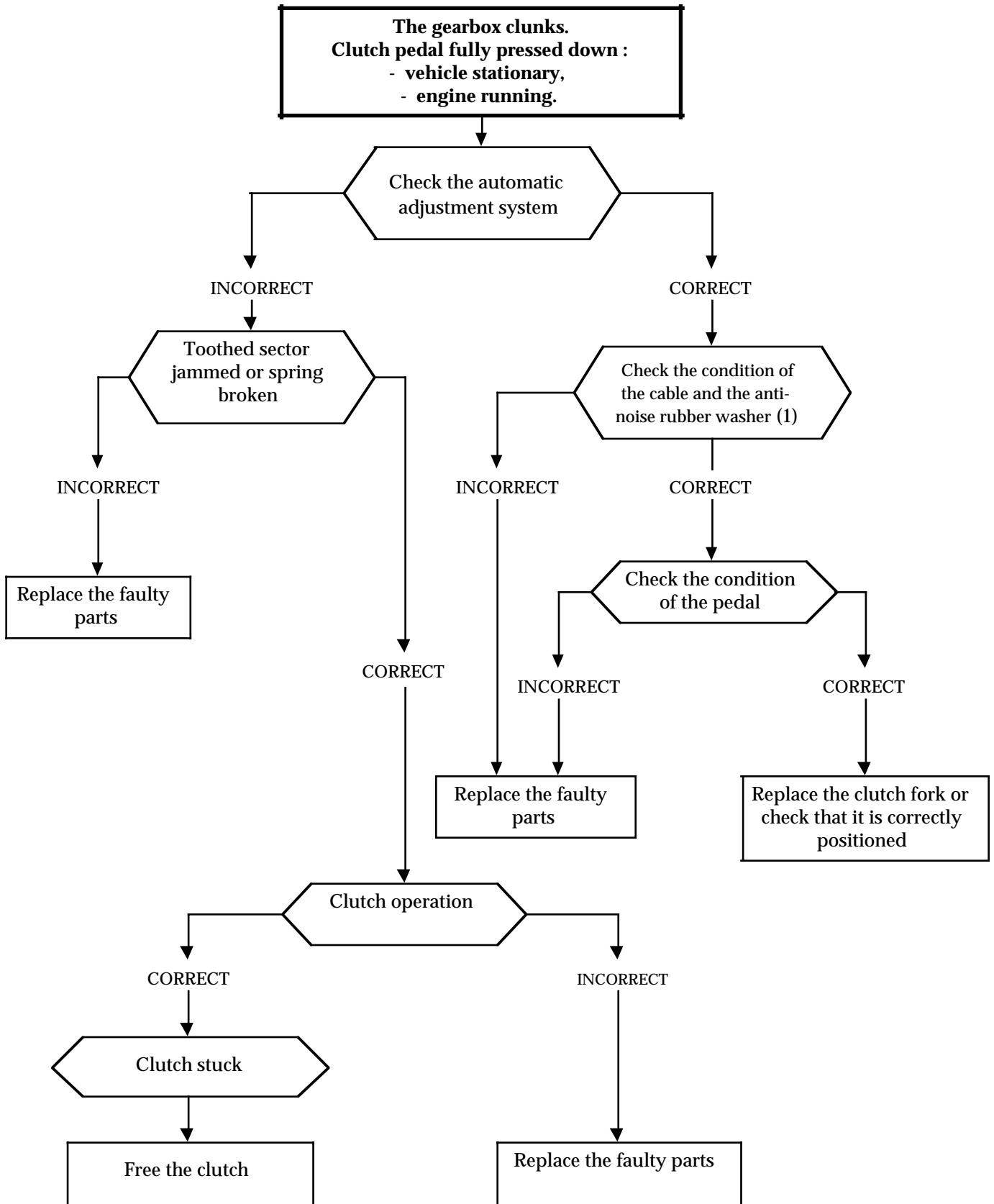
Type	Packaging	Part number	Component
MOLYKOTE BR2	1 kg tin	77 01 421 145	Splines of the right hand sunwheel Fork pivot Thrust pad guide Fork pads
LOCTITE 518	24 ml syringe	77 01 421 162	Housing assembly surfaces

CLUTCH



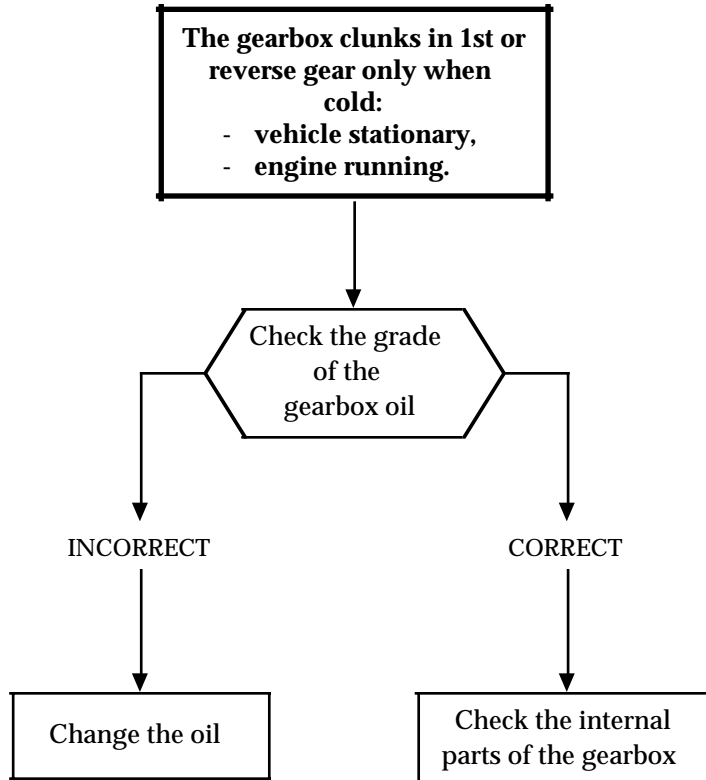
(*) Depending on version
 (1) See "Removal - Refitting" chapter

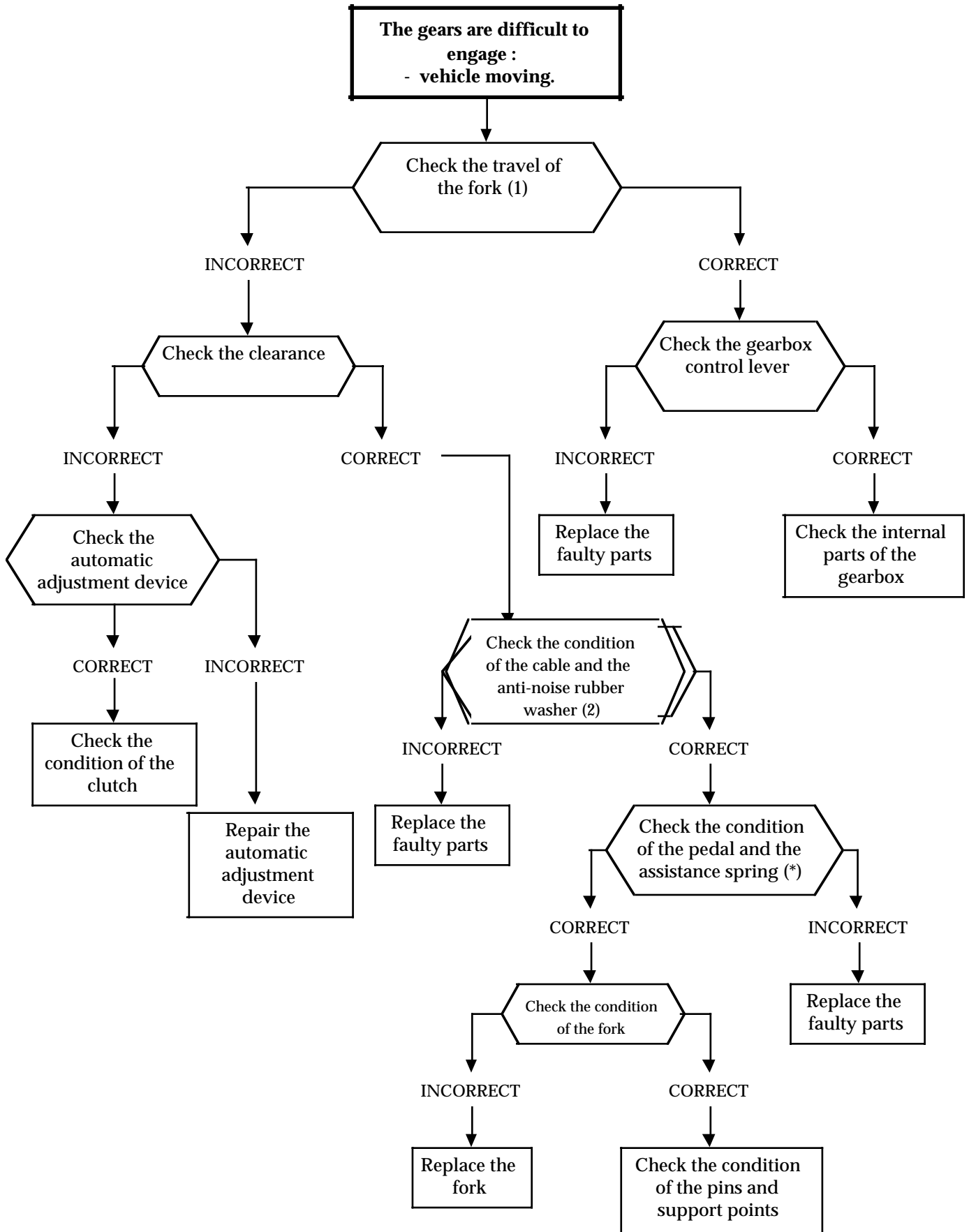
(2) Grommet placed on the end of the clutch cable on the gearbox end



Rare case, may occur
after the vehicle has been
stopped for a long time
(several months)

(1) Grommet placed on the end of the clutch cable on
the gearbox end

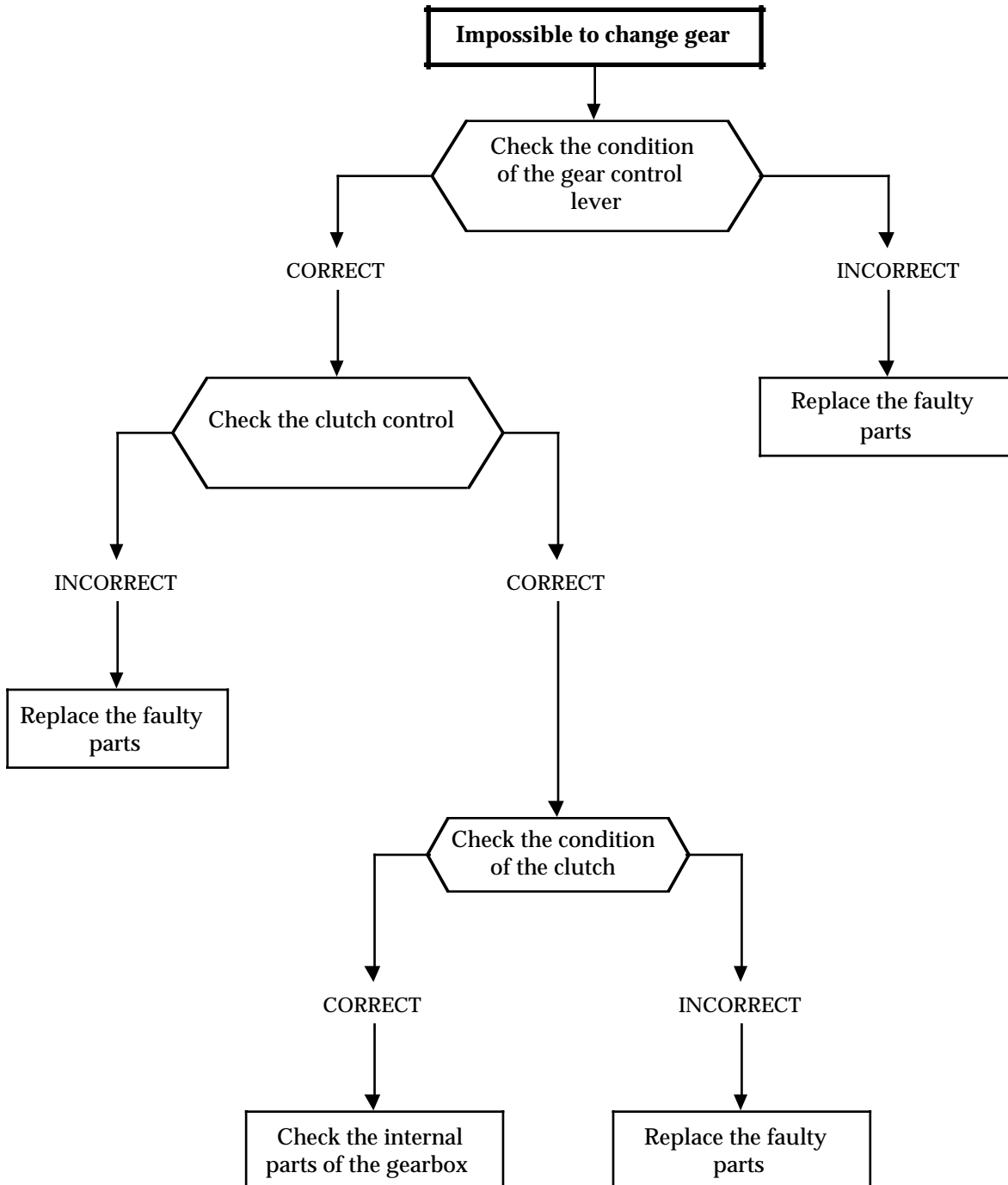


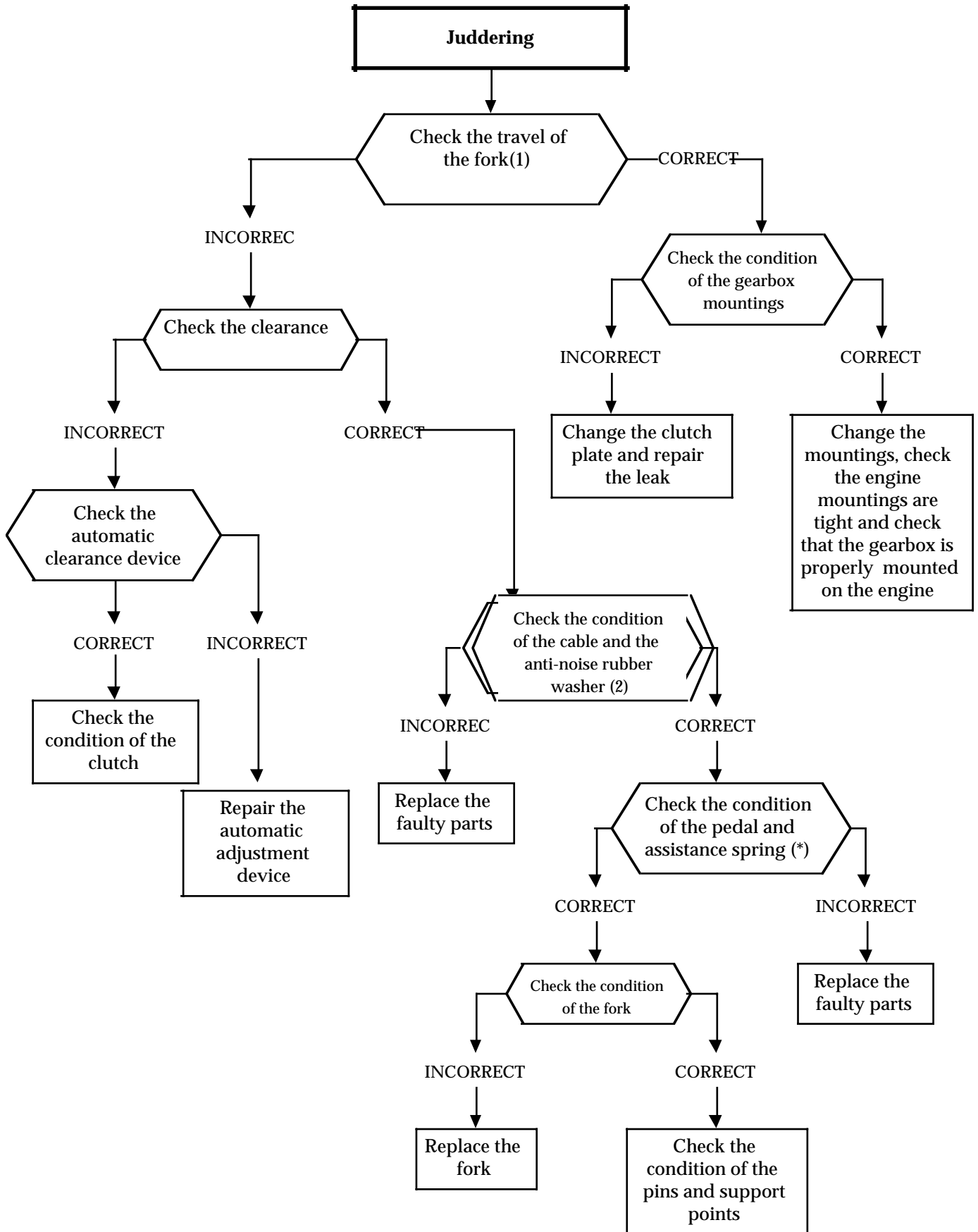


(*) Depending on version

(1) See "Removal - Refitting" chapter

(2) Grommet positioned on the end of the clutch cable on the gearbox end

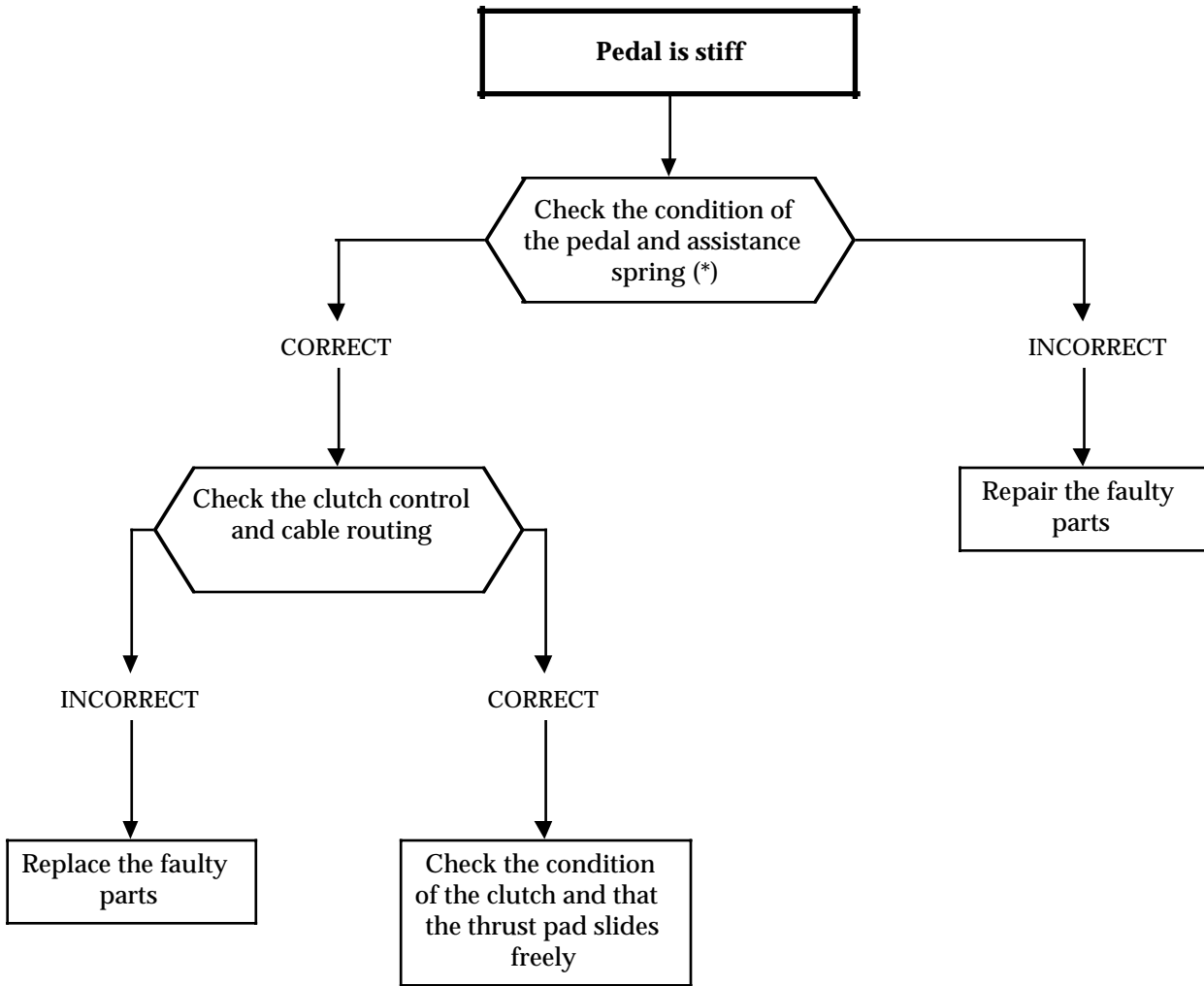




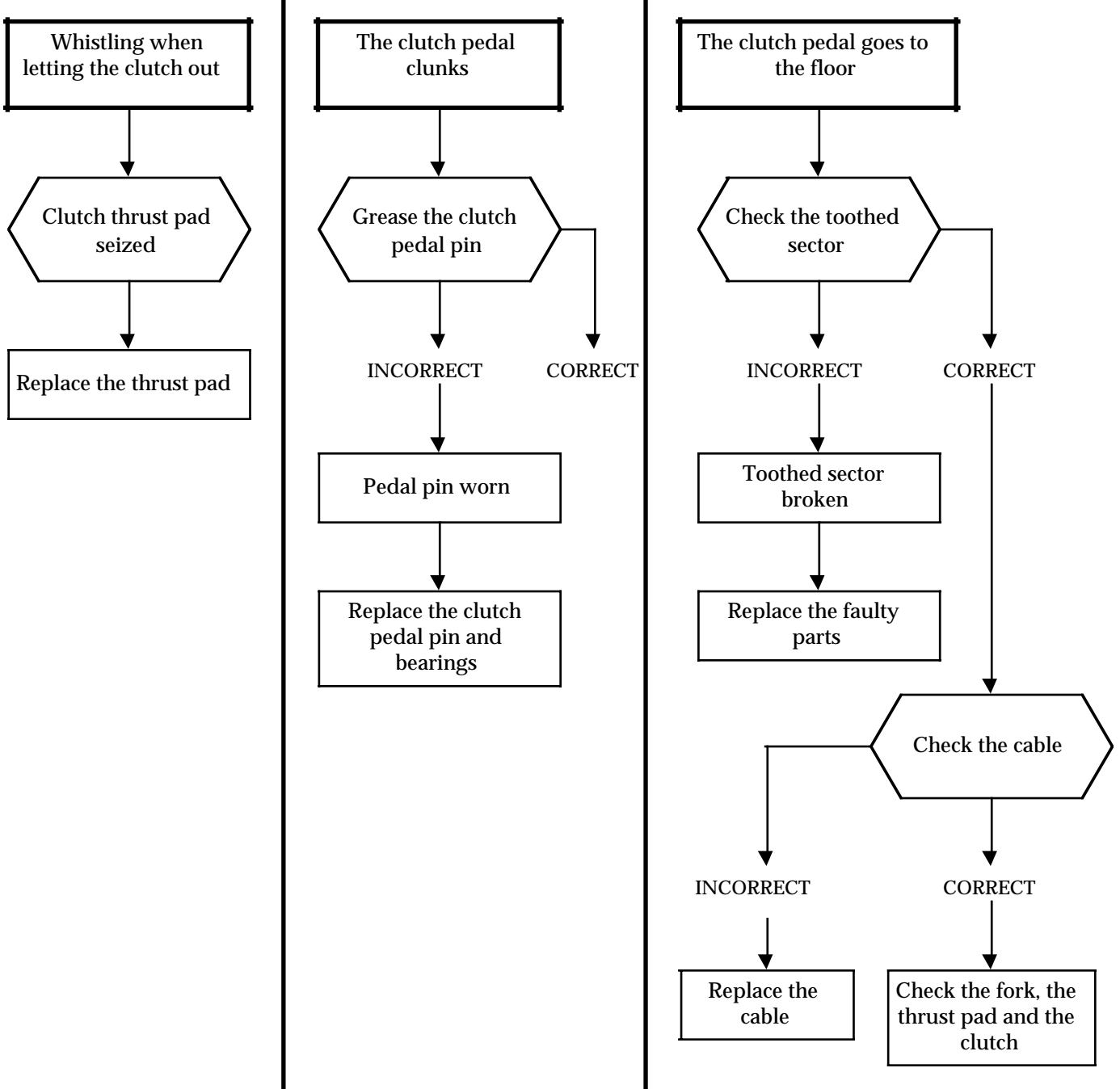
(*) Depending on version

(1) See "Removal - Refitting" chapter

(2) Grommet positioned on the end of the clutch cable on the gearbox side.



(*) Depending on version



REPLACEMENT

This operation is performed after the gearbox has been removed.

SPECIAL TOOLING REQUIRED	
Mot. 582	Locking piece
Plus the tooling for removing the gearbox	

TIGHTENING TORQUES (in daN.m)	
Diameter 7mm mechanism bolt for 160 and 180 diameter clutch	1.8
Diameter 8mm mechanism bolt for diameter 215 clutch	2.25

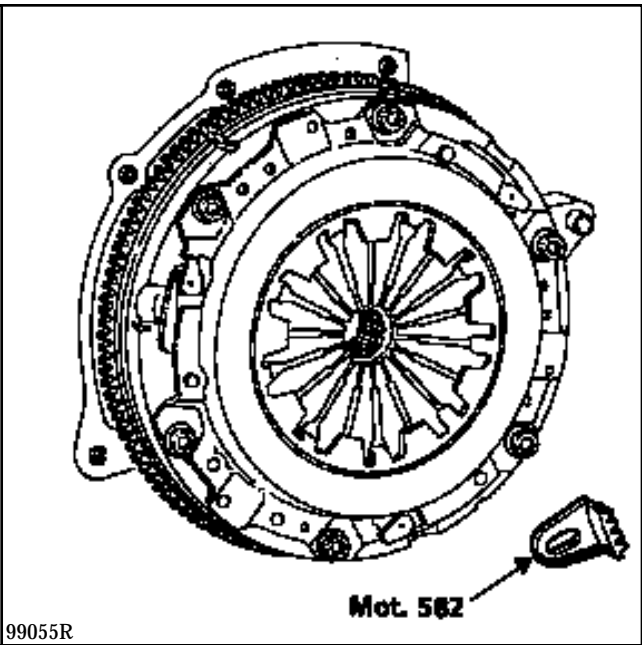


REMOVAL

- Fit:
- the locking piece **Mot. 582**,
 - the centring device (to prevent the friction plate falling out).

Remove the mounting bolts from the mechanism and remove the mechanism and the clutch plate.

Check and replace any faulty parts.

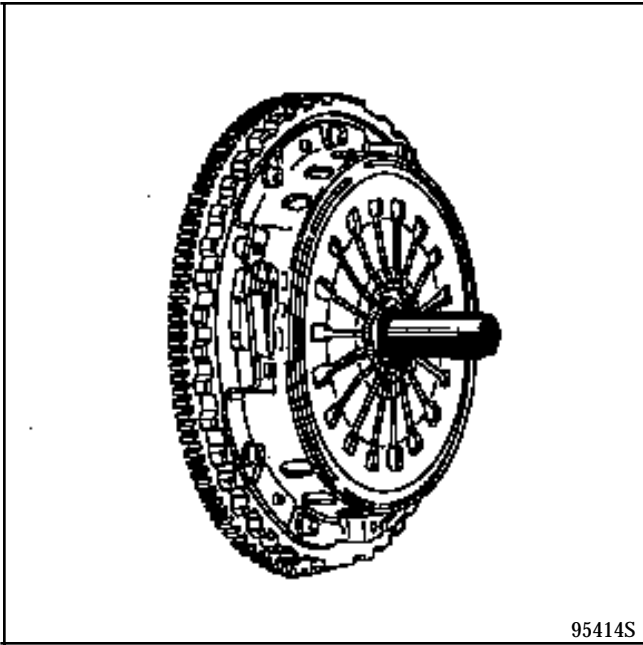


REFITTING

Degrease the mounting face of the flywheel.

Position the plate (hub offset fitted on the gearbox end).

Centre it using the tool supplied in the replacement kit.



Progressively tighten in a star arrangement, then lock the mechanism mounting bolts at the correct torque.

Remove the locking piece **Mot. 582**.

Coat with **MOLYKOTE BR2** grease:

- the guide tube,
- the fork pads.

REPLACING

This operation is performed after the gearbox has been removed.

REMOVAL

Pull out:

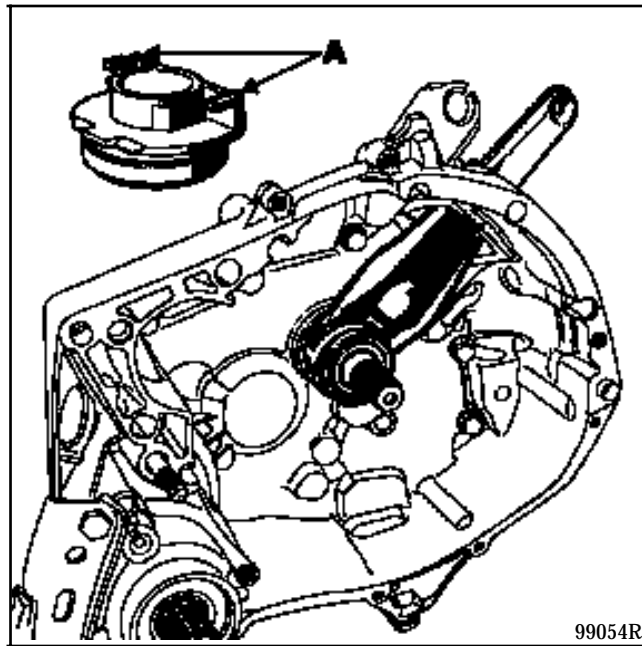
- the thrust pad by tilting the fork,
- the rubber protector and pull the fork towards the inside of the clutch housing.

REFITTING

Coat the sides of the guide tube and the fork pads with **MOLYKOTE BR2**.

Position the fork and replace the rubber protector.

Put the thrust pad on the guide tube by placing the lugs (A) into the fork.



Ensure that it slides freely.

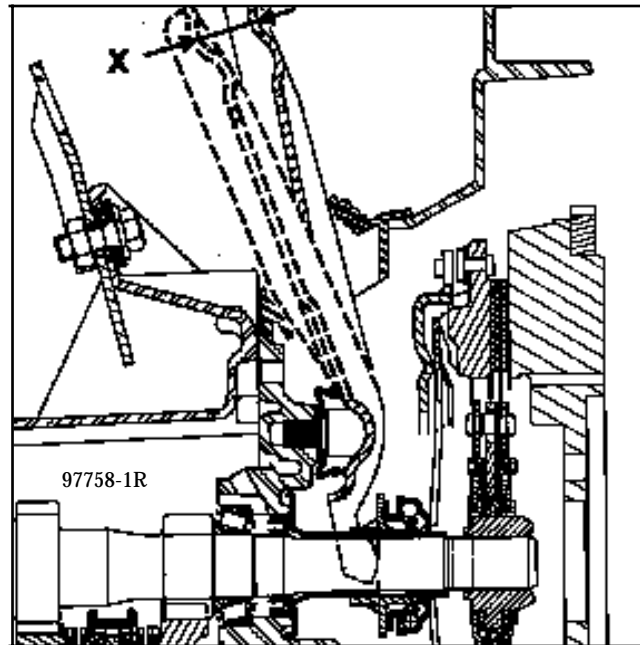
NOTE : when performing an operation which does not require the gearbox to be removed or after fitting the gearbox, **DO NOT LIFT** the fork since the lug (A) may be removed from the thrust pad.

After the gearbox has been refitted, position the cable on the clutch fork, reset the toothed sector and check that the play compensation device works.

Check the clutch travel.

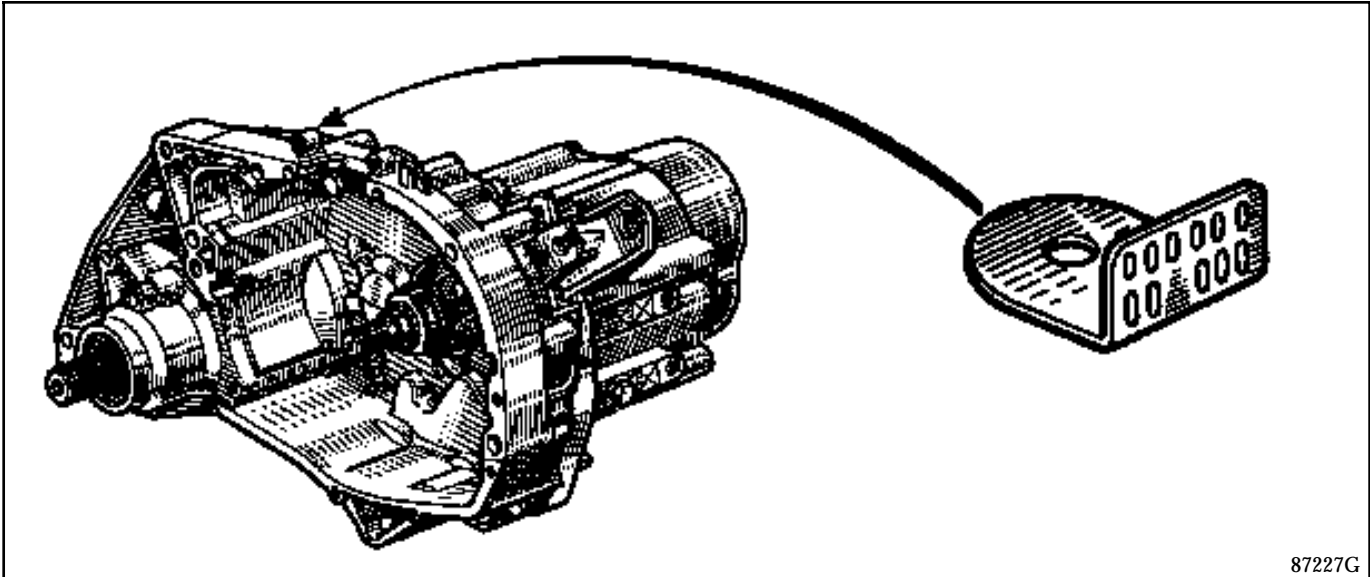
The fork travel should be:

$$X = 27.4 \text{ to } 30.7 \text{ mm}$$



B64 vehicles are fitted with JB or JC type gearboxes

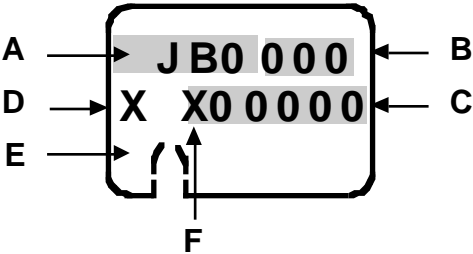
MR "B.V. JB" and MR "B.V. JC" cover the complete repair process for these components.



87227G

NEW IDENTIFICATION PLATE

- At A : the gearbox type
- At B : the gearbox suffix
- At C : the fabrication number
- At D : the factory of manufacture
- At E : a notch when the gearbox is assembled with an E engine
- At F : the letter preceding fabrication numbers greater than 999999



MANUAL GEARBOX
Ratios

21

JB1									
Suffix	Vehicle	Step down	Speedo gear	1st	2nd	3rd	4th	5th	Reverse
54 95	BA0E	$\frac{15}{61}$	$\frac{21}{19}$	$\frac{11}{41}$	$\frac{21}{43}$	$\frac{28}{37}$	$\frac{30}{29}$	$\frac{39}{31}$	$\frac{11}{39}$ 26
129 68	BA0U BA0A	$\frac{15}{56}$							
119 120 123 124	BA0L BA0F	$\frac{15}{58}$		$\frac{11}{37}$	$\frac{22}{41}$				

Gearbox	JB1		
Suffix	95	119	123
AC	X	X	X

JB3									
Suffix	Vehicle	Step down	Speedo gear	1st	2nd	3rd	4th	5th	Reverse
106	BA0G	$\frac{15}{61}$	$\frac{21}{19}$	$\frac{11}{34}$	$\frac{22}{41}$	$\frac{28}{37}$	$\frac{30}{29}$	$\frac{42}{31}$	$\frac{11}{39}$ 26

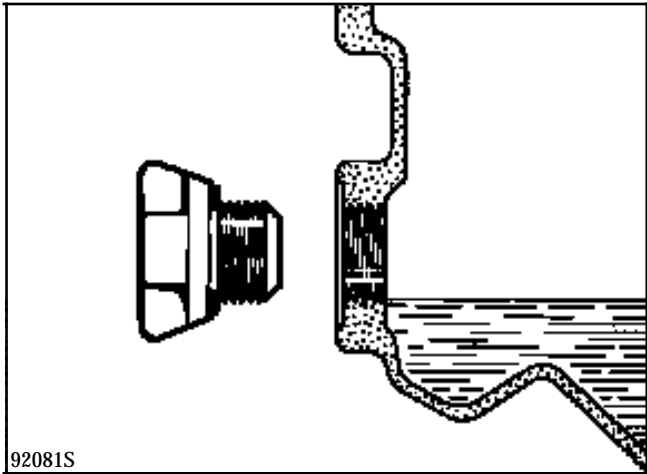
JC5									
Suffix	Vehicle	Step down	Speedo gear	1st	2nd	3rd	4th	5th	Reverse
35	BA09	$\frac{17}{56}$	$\frac{21}{19}$	$\frac{11}{41}$	$\frac{21}{43}$	$\frac{28}{37}$	$\frac{35}{34}$	$\frac{41}{31}$	$\frac{11}{39}$ 26
25	BA0H	$\frac{15}{61}$	$\frac{21}{18}$	$\frac{11}{37}$	$\frac{22}{41}$		$\frac{34}{35}$	$\frac{39}{32}$	

CAPACITY (in litres)

5-speed gearbox	
JB1	3.4
JB3	3.4
JC5	3.1

Viscosity - Grade
TRX 75W 80W

CHECKING THE LEVEL



Fill up to the level of the aperture.

Gearboxes:

JB1 } 5 forward gears
JB3 }
JC5 } 1 reverse gear

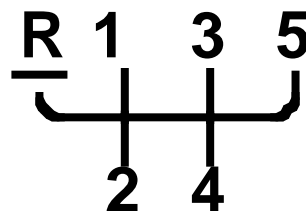
are fitted with BORG-WARNER synchros.

Special notes on the JB3 gearbox

The **JC5** gearbox differs from the **JB3** gearbox in the following ways :

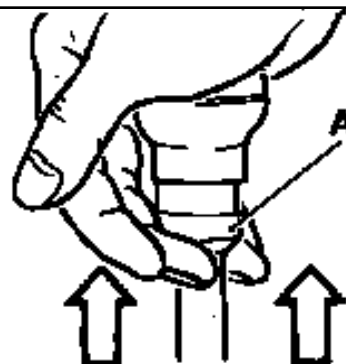
- wider teeth on the gears in 1st, 2nd, 3rd and 4th,
- rings under the gears in 2nd, 3rd and 4th,
- offset dog gears on the idle gears in 1st, 2nd and 4th,
- a new **65.5 mm** diameter 1st and 2nd synchro,
- the use of tapered bearings on the primary and secondary shafts,
- a guide tube with a double seal on the housing and clutch shaft which can be removed without opening the gearbox,
- mechanism and clutch housing reinforced ,
- wider torque teeth on the final drive .

GEAR LAYOUT



B.V. JB - JC

To engage reverse gear, lift the locking ring (A) and move the lever.



DI2118

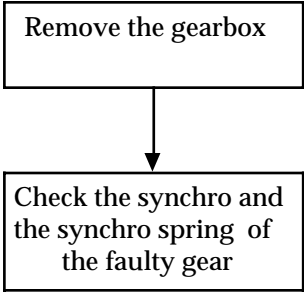
JB and JC

TYPE	PACKAGING	PART NUMBER	COMPONENT
MOLYKOTE BR2	1 kg tin	77 01 421 145	Clutch shaft splines Fork pivot Thrust pad guide Fork pads } Clutch
Loctite 518	24 ml syringe	77 01 421 162	Housing assembly faces
RHODORSEAL 5661 Eg : CAF 4/60 THIXO	100 g tube	77 01 404 452	Threaded plugs and switches Bearing plugs Ends of roll pins on driveshafts
LOCTITE FRENBLOC (locking and sealing resin)	24 cc bottle	77 01 394 071	Primary and secondary shaft nuts 5th gear fixed gear and hub Differential lock drive stud

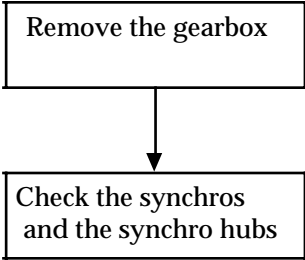
Parts to be systematically replaced

- When they have been removed:
- lip seals,
 - O rings
 - thrust pad guide tubes,
 - secondary shaft and differential nuts,
 - speedo gear and its pin,
 - speedo crown wheel,
 - roll pins,
 - rings under the gears.

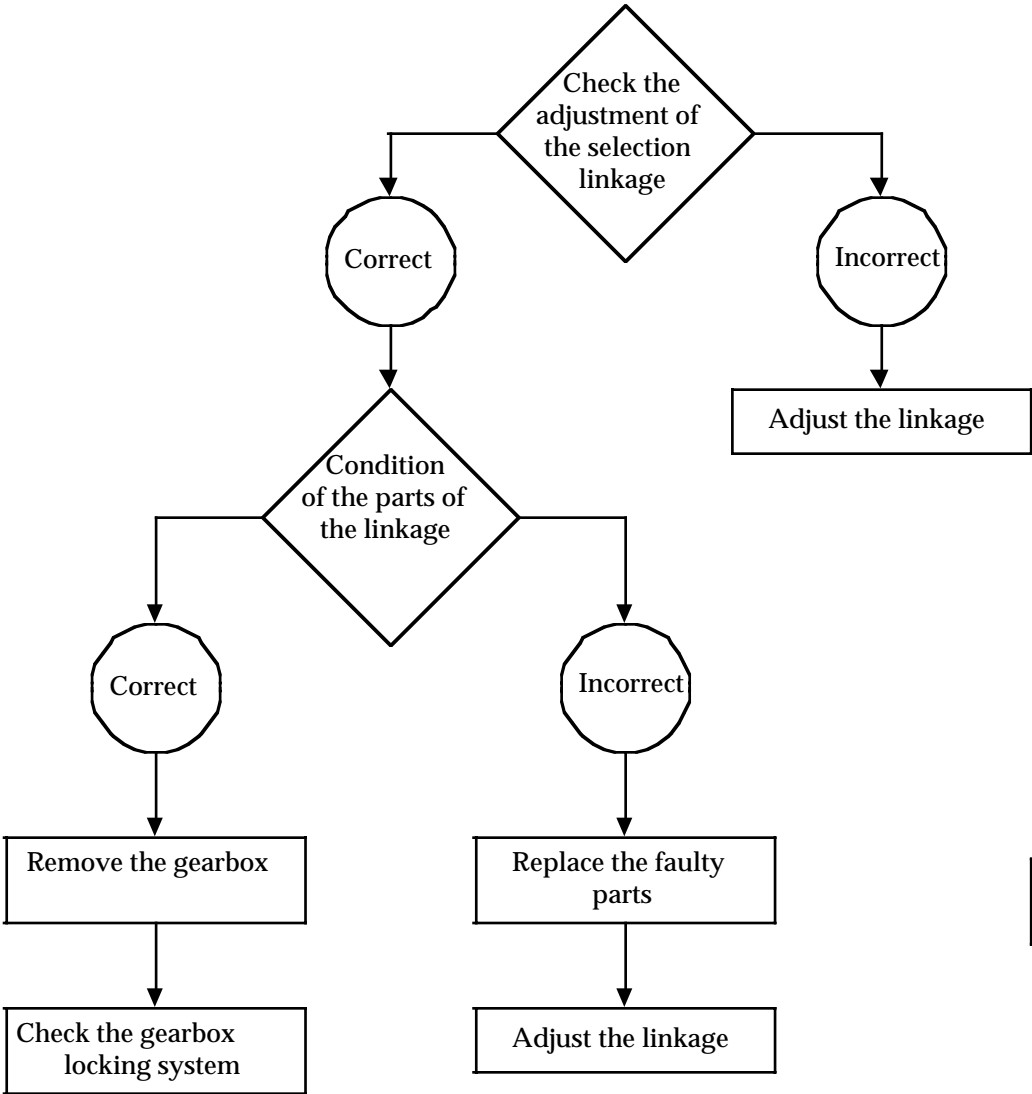
Grinding noise when
engaging a gear



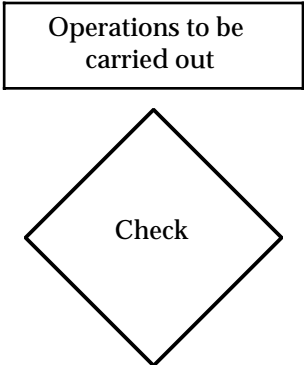
Clunking when each gear is
engaged
(after checking clutch)



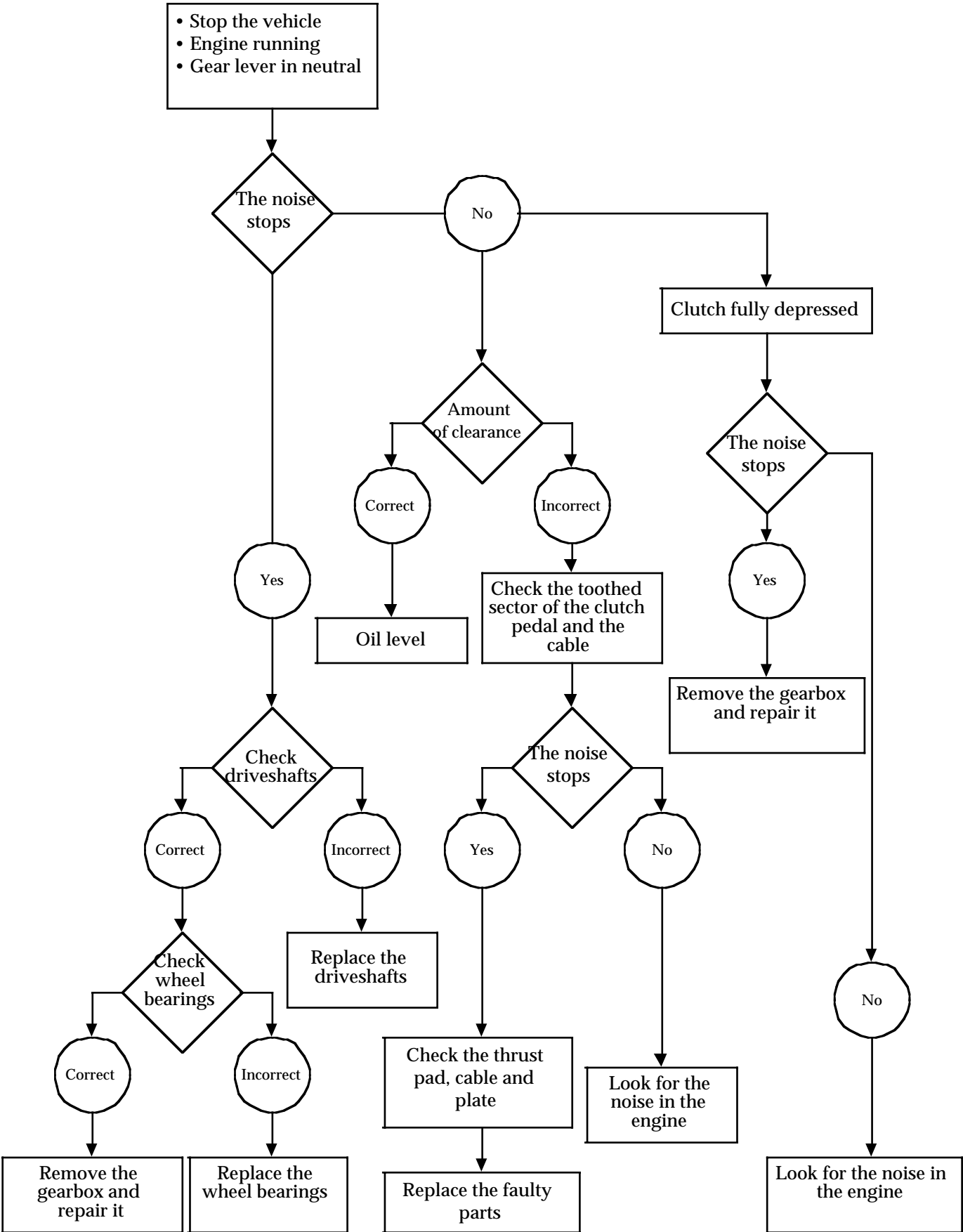
Impossible to engage gears
(after checking the clutch)



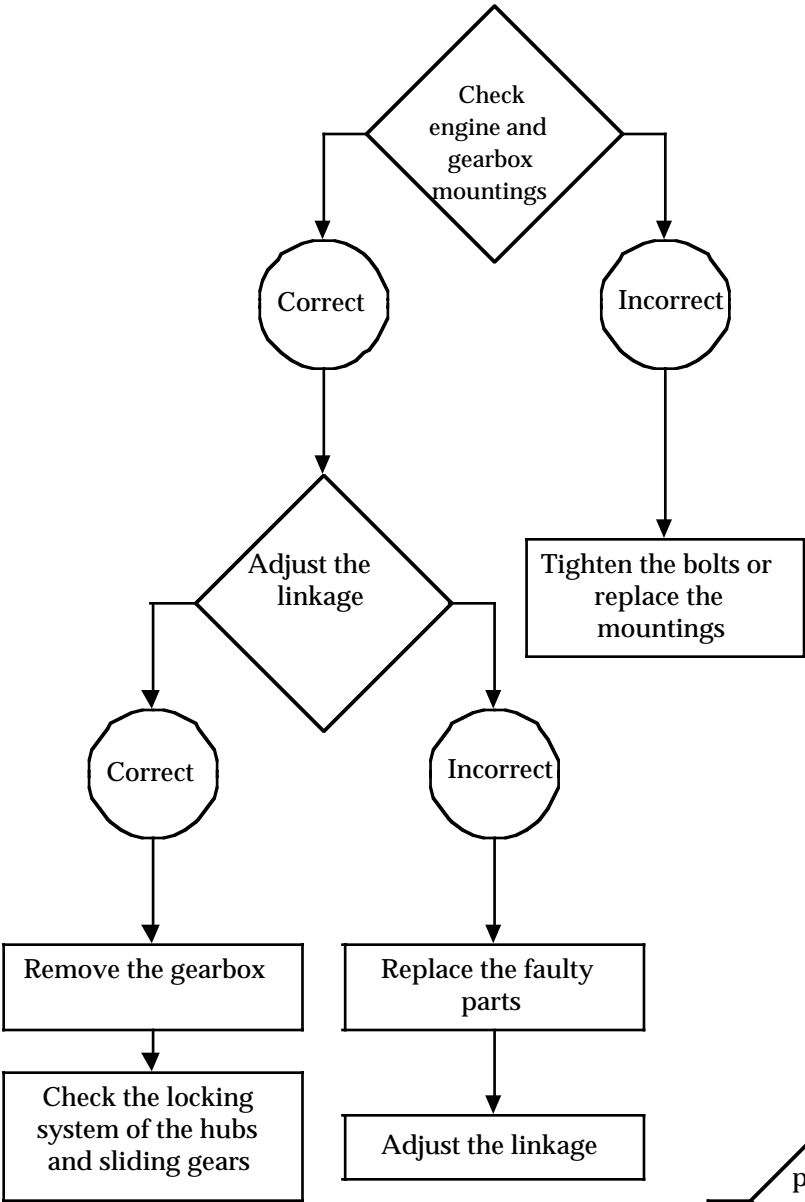
KEY



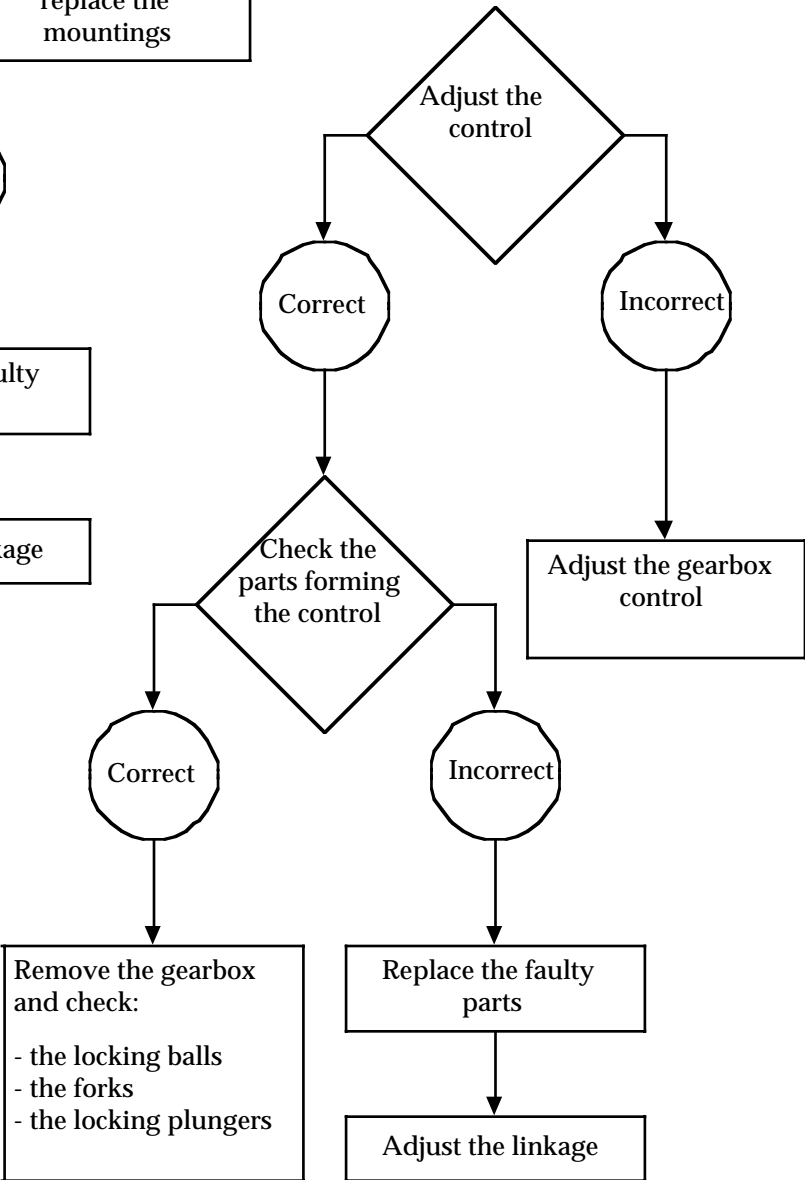
Abnormal noises when driving



Gears jump out



Gear sticking



SPECIAL TOOLING REQUIRED

B.Vi. 31-01

Set of pins

T.Av. 476

Ball joint extractor

TIGHTENING TORQUES (in daN.m)



Bolts of the rear linkage of the suspended engine mountings (tie-bar)	6
Bolts for securing battery mounting on body	2
Driveshaft gaiter mounting bolt	2.4
Gearbox mounting bolt	3.5
Gearbox control rod bolt	2.8
Shock absorber base bolt	17
Track rod end nut	3.5
Stub-axle key nut	6
Support mounting bolts	4.5
Wheel bolts	9
Caliper guide bolts	2.7

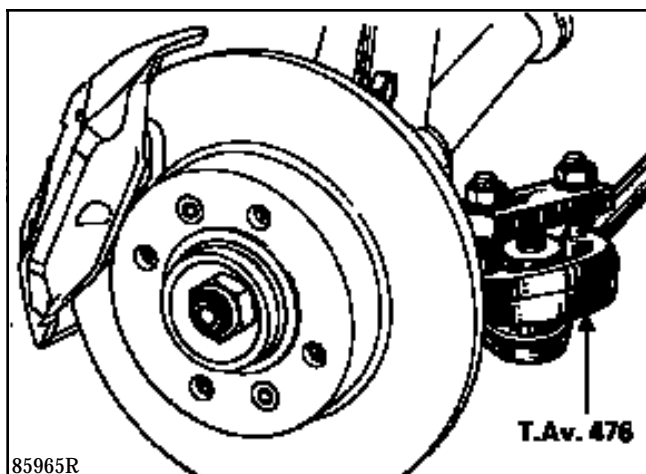
REMOVAL

- Put the vehicle on a two post lift.
- Disconnect the battery.
- Remove the front wheels.
- Remove the engine undertray.
- Drain the gearbox.

LEFT HAND SIDE OF THE VEHICLE:

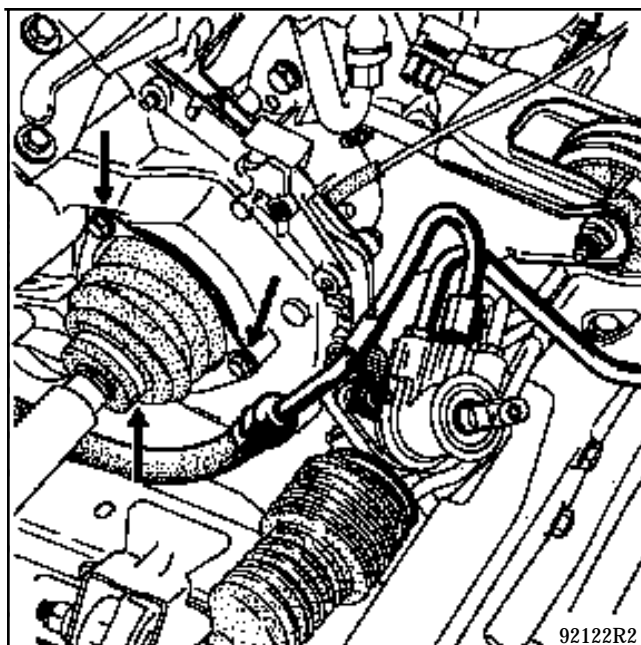
Remove:

- the wheel arch (protection),
- the track rod end using tool T.Av. 476.



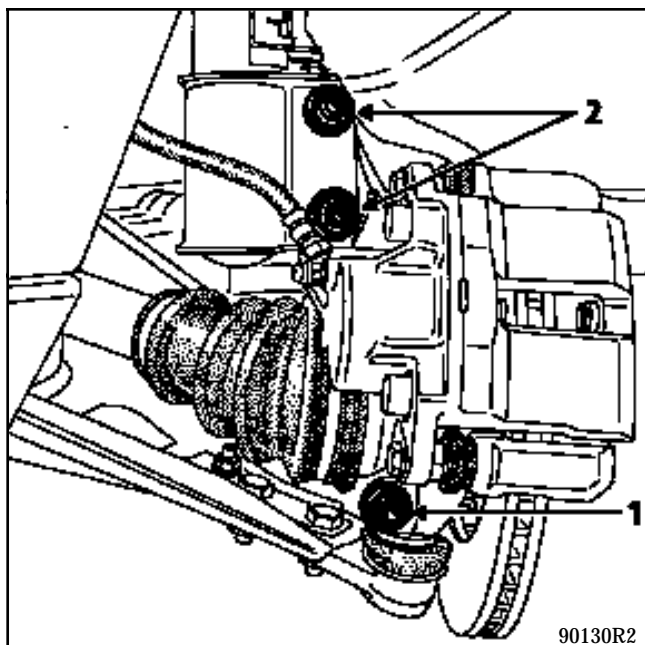
Remove:

- the two mounting bolts from the caliper by securing the caliper to the suspension spring to avoid stretching the pipe,
- the three mounting bolts of the driveshaft gaiter.

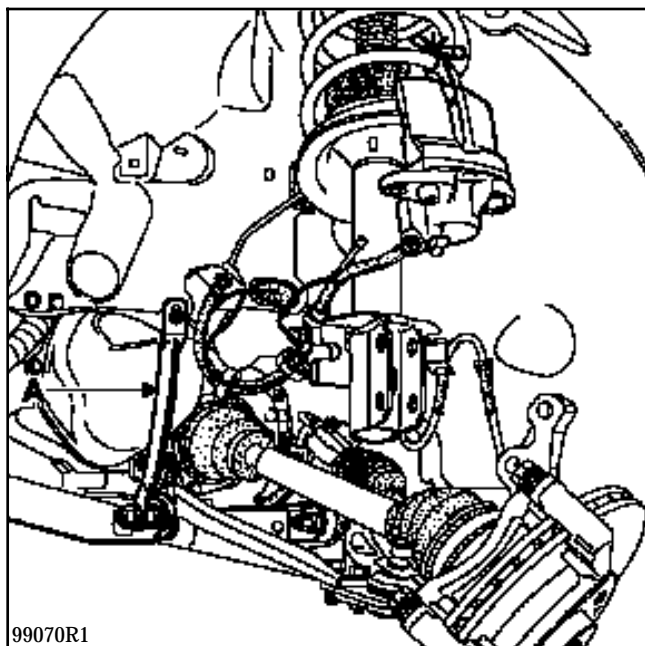


Remove :

- the bolt (1),
- the 2 mounting bolts (2) from the base of the shock absorber,



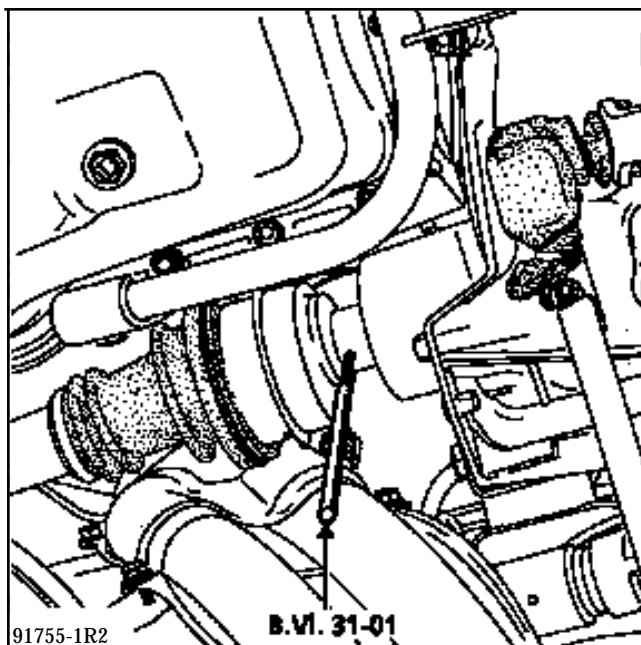
- the stub-axle carrier driveshaft assembly by releasing the lower ball joint,
- the sub-frame-side member tie rod (A).



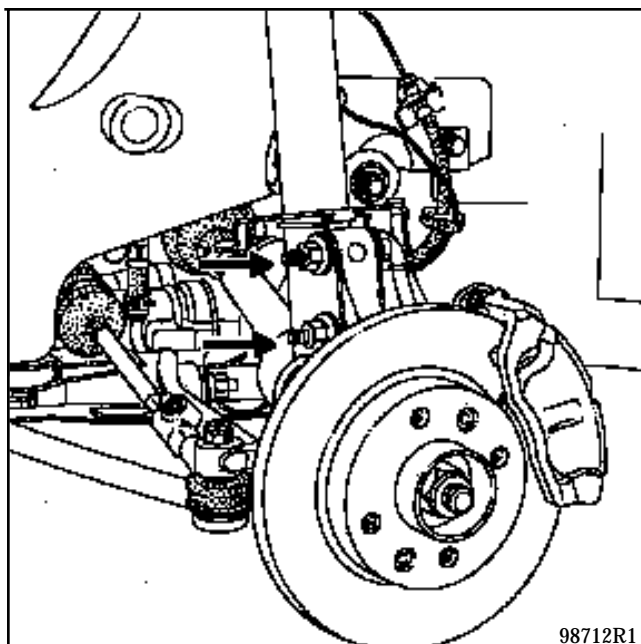
Check that the driveshaft rollers cannot be removed by hand. If this is the case, when refitting, check that the needles have not fallen into the gearbox.

RIGHT HAND SIDE OF THE VEHICLE:

Remove the driveshaft pins using tool **B.Vi. 31-01**



Remove the bolts from the base of the shock absorber.



Tilt the stub-axle carrier and release the driveshaft.

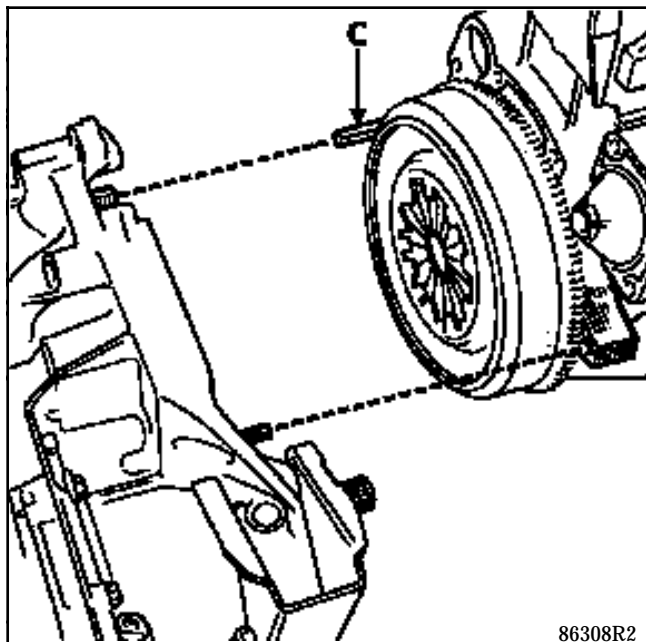
Remove the stub-axle carrier driveshaft assembly by releasing the lower ball joint.
Remove and secure the brake caliper.
Remove the mudguard.
Remove the sub-frame body tie rod.

Special notes for E7J - K7M engines

Remove the engine/gearbox assembly from above (see Workshop Repair Manual Chap. 10).

Once the engine and transmission assembly is suitably clear, remove the bolts from around the gearbox.

Release the gearbox from the engine by removing the pin (C).



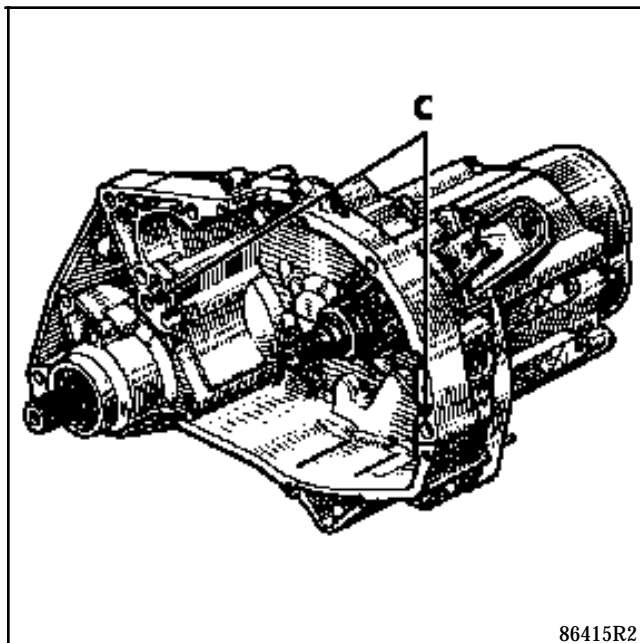
REFITTING

Coat the sides of the guide tube and the fork pads with **MOLYKOTE BR2** grease.

Position the fork on the notches of the clutch thrust pad.

Connect the engine to the gearbox.

Check that the rings (C) for centring the engine-gearbox are present and are in the correct position.



Refit:

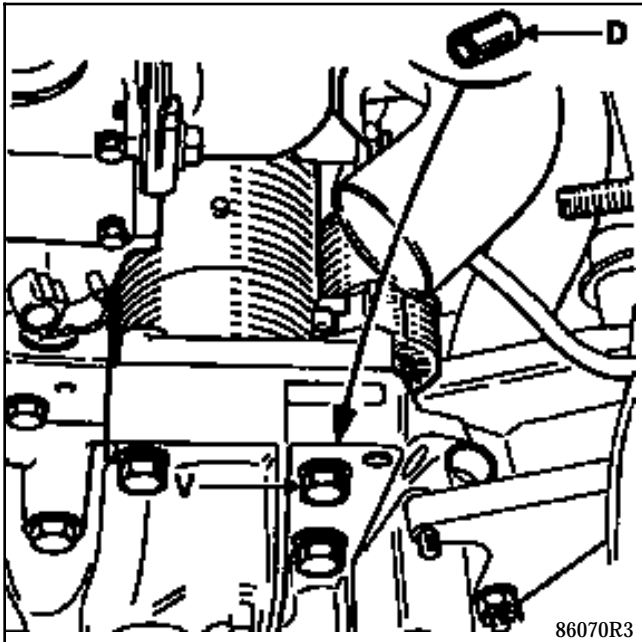
- the heat shield,
- the exhaust downpipe.

Refit the other components by carrying out the removal operations in reverse (see Workshop Repair Manual Chapter 10).

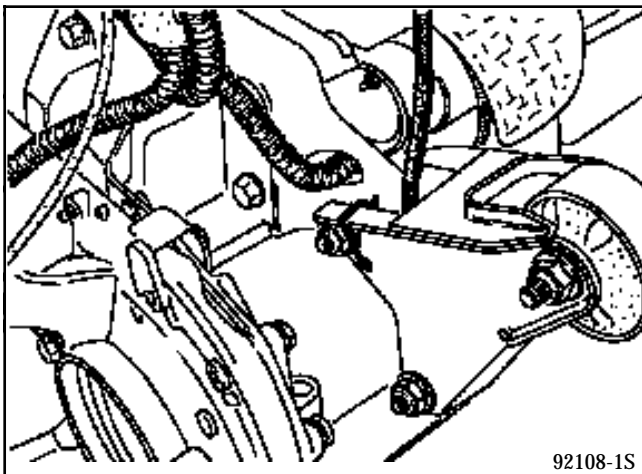
IMPORTANT

Fit the bolt (V) and the starter motor centring dowel (D) correctly :

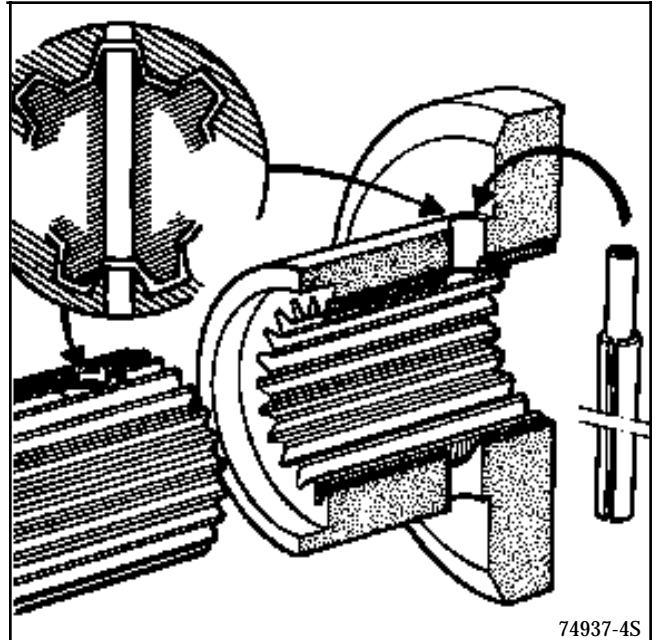
E and K engines



Reconnect the speedo cable, ensuring that the clip is the correct way round.



Position the driveshaft with respect to the sun-wheel, pivot the stub-axle carrier and engage the driveshaft into the sunwheel using the shouldered pin B.Vi. 31-01 in order to align the holes.



A chamfer on the leading edge of the sunwheel makes it easier to fit new roll pins.

Seal the ends (**RHODORSEAL 5661**).

Fill with fluids.

Fit the caliper mounting bolts with **Loctite FRENBLOC** and tighten to the correct torque.

Press the brake pedal several times to bring the pistons back into contact with the brake pads.

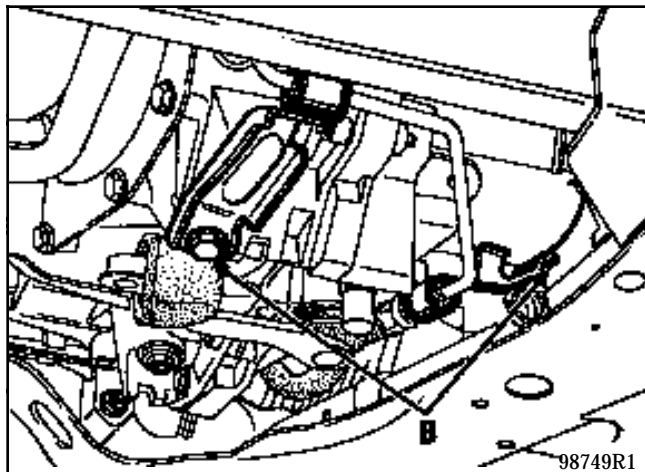


Tighten all nuts and bolts to the recommended torques.

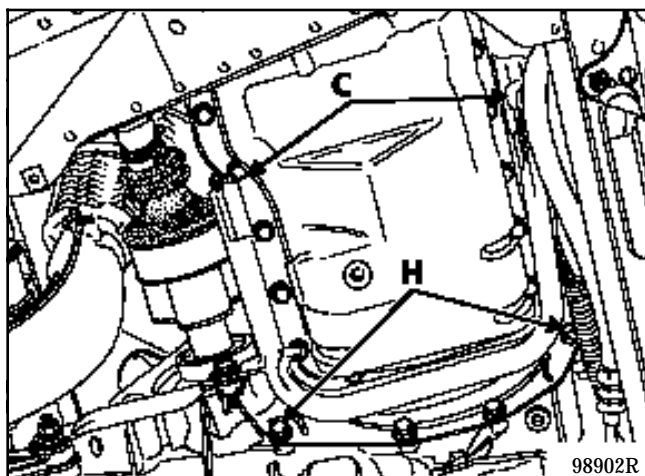
Fill the gearbox with oil.

Special notes for the F engine

Under the vehicle, remove the 2 mounting bolts (B) from the power assisted steering pipe clamps.

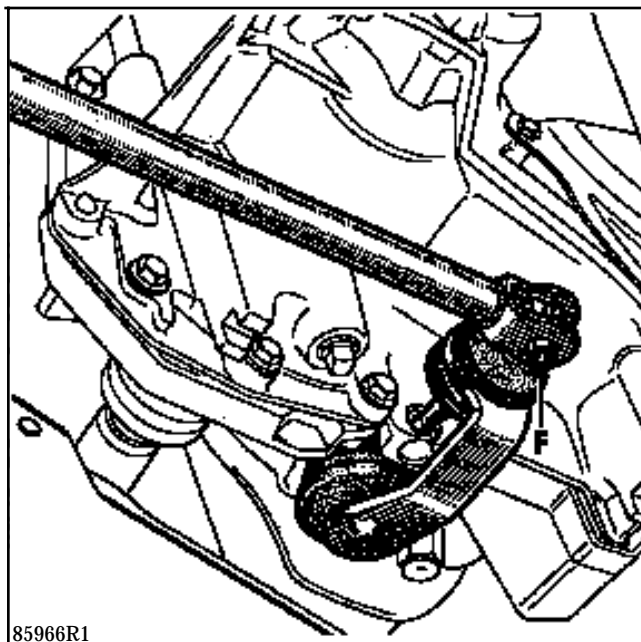


Remove the 2 bolts (H) from the engine-gearbox tie-rod.



Slacken the 2 mounting bolts (C) on the engine from the engine-gearbox tie-rod.

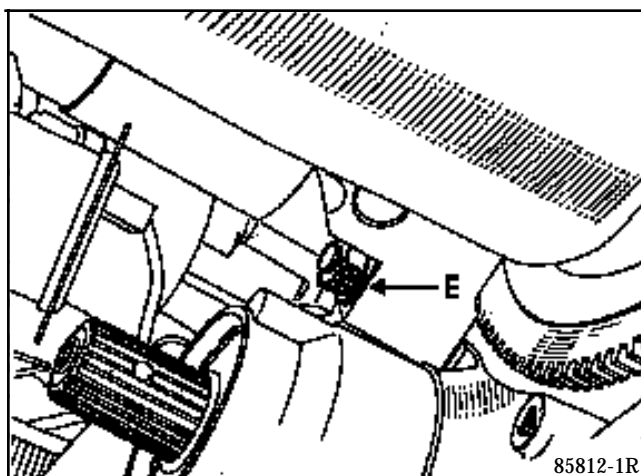
Remove gear control, bolt (F).



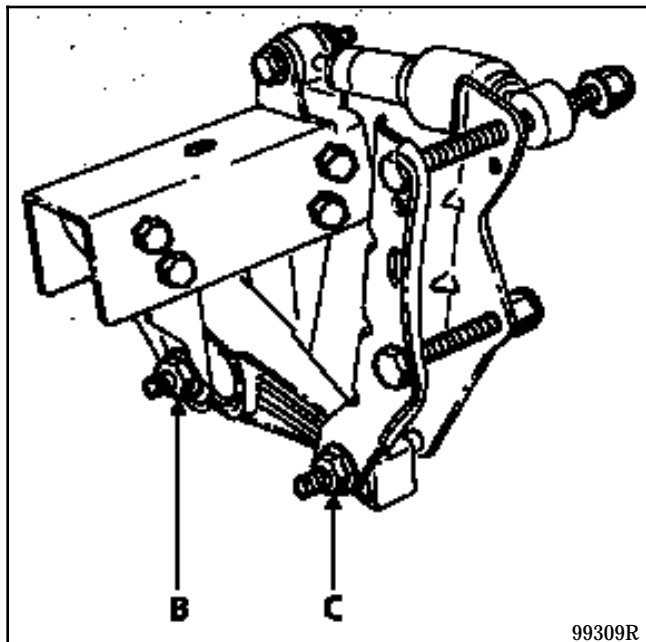
Disconnect:

- the wires from the starter motor,
- the reversing light switch,
- the speedo cable.

Remove the engine/gearbox mounting nut.



Slacken but do not remove bolt (B) then remove mounting bolt (C) from the suspended engine mounting rod.



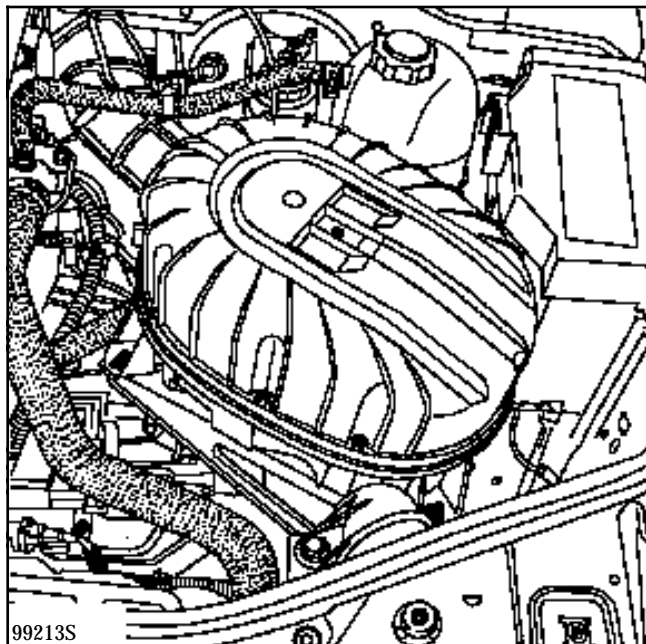
Remove the rear mounting.

Remove shock absorber actuator (on version F8Q).

Remove :

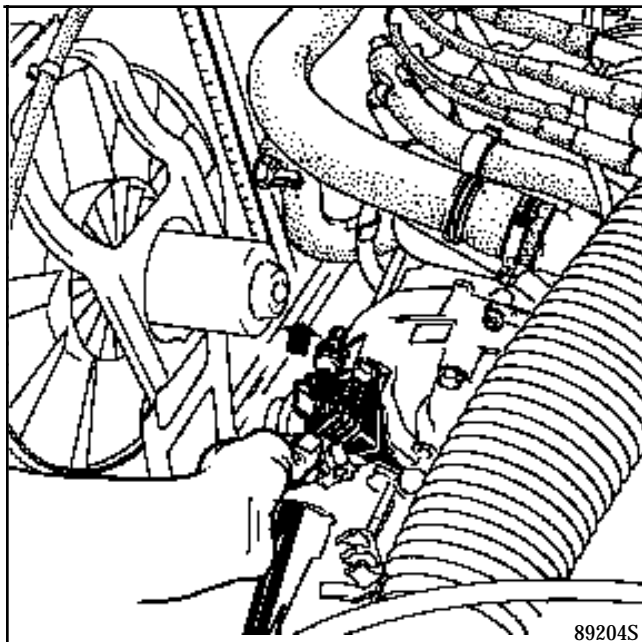
- the expansion bottle,
- the air filter mounting.

Release the wiring.

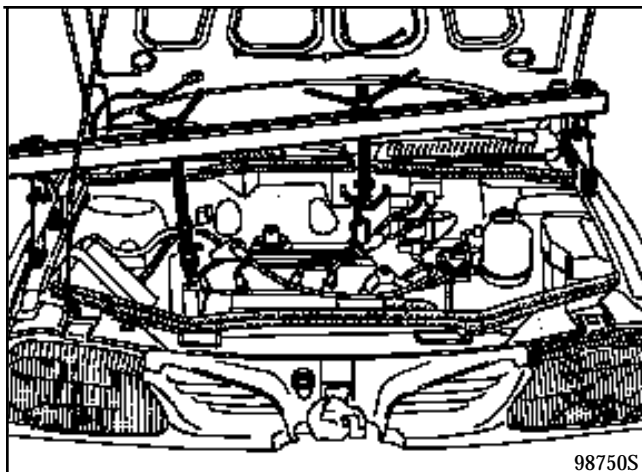


Remove :

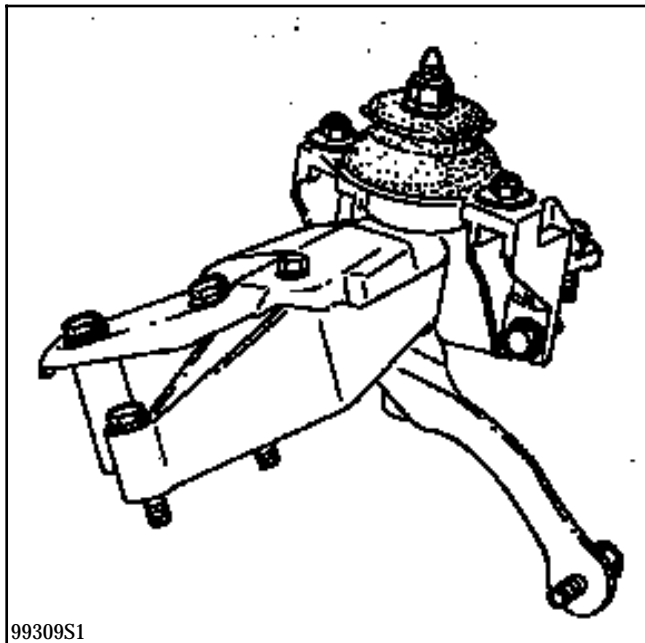
- the air filter sleeve,
- the tie-rod from the shock absorber turret,
- the clutch cable.



Position the engine support tool and take the weight of the engine and transmission assembly.



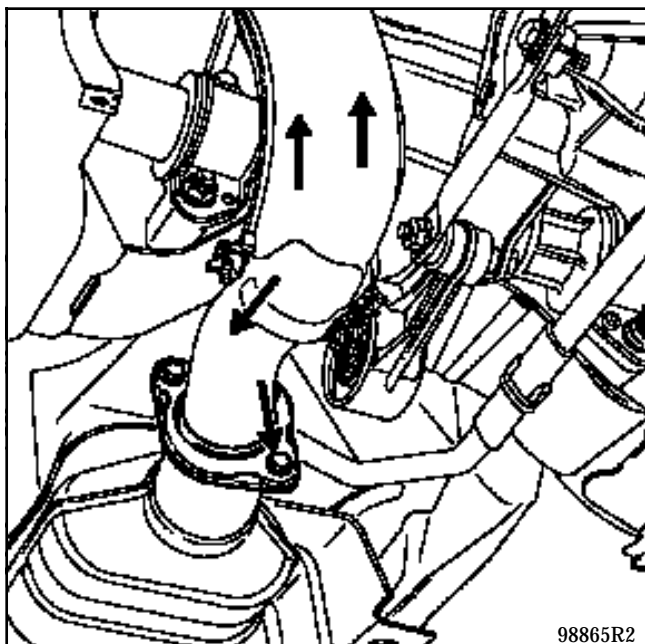
Remove the upper mounting assembly on the gearbox end .



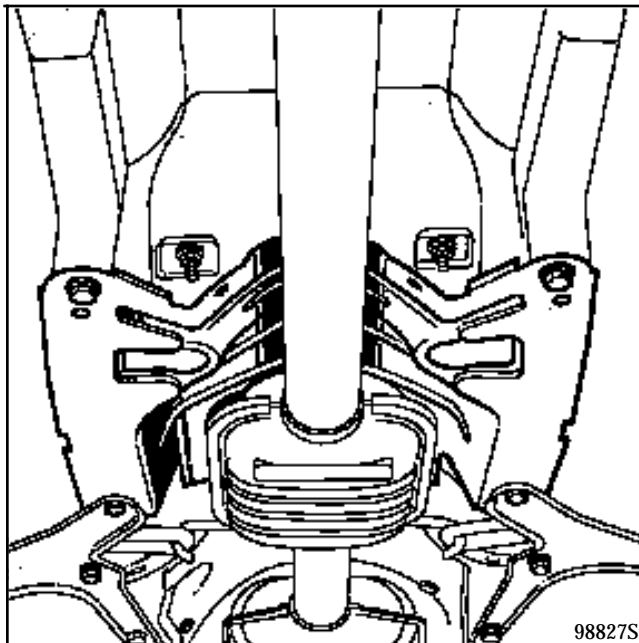
Remove :

- the bolts around the gearbox,
- the starter motor,
- the connectors linked to the gearbox.

Remove the exhaust downpipe.



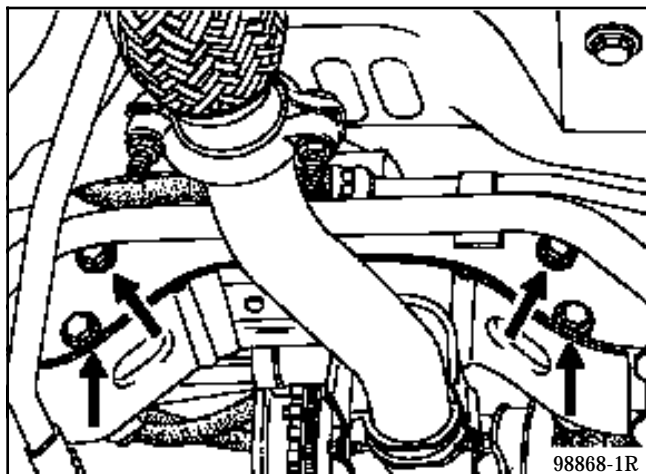
Remove the heat shield.



Remove gear lever return spring.

Move and secure the gear lever towards the rear.

Remove the steering box mounting bolts.



Remove the mounting bolts of the power assisted steering pipes from the sub-frame.

Secure the steering box to the **side members**.

Special notes for vehicles fitted with driver's AIRBAG

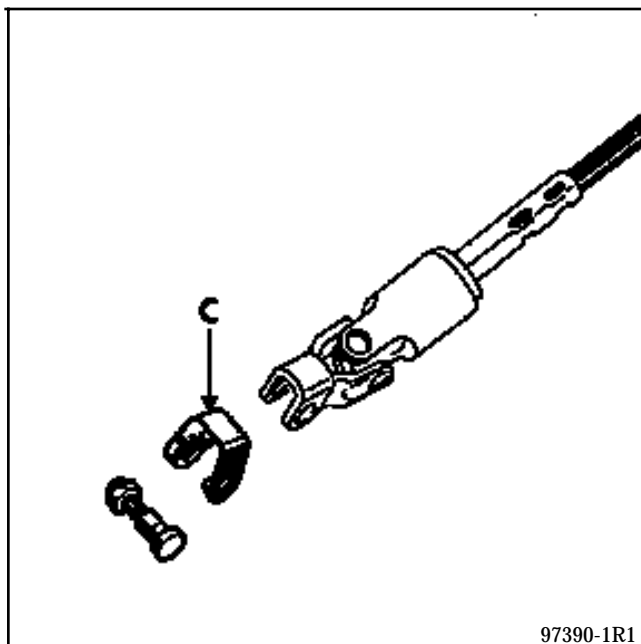
ATTENTION :

to prevent any damage being done to the rotating switch under the steering wheel, please follow these instructions :

- before releasing the steering column and the rack, the steering wheel **MUST** be immobilised, wheels straight, using the "steering wheel locking" tool throughout the duration of the repair,
- any doubts regarding the correct centring of the rotating switch means that the steering wheel has to be removed so as to apply the centring method as described in chapter 88 "AIR-BAG".

REMINDER: in this case, only qualified personnel who have received specific training may undertake this work.

Release the steering box and the steering column (be careful not to damage the clip (C)).

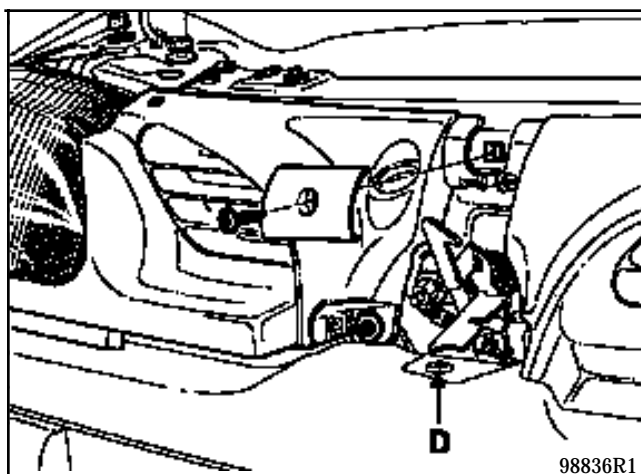


Remove the horn.

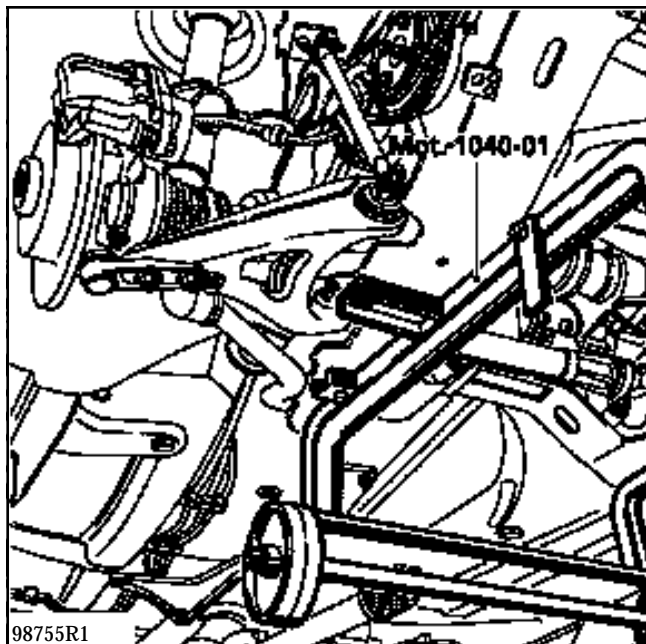
From above:

Secure the cooling assembly to the upper cross member.

Remove the upper mounting bolt from the bumper then the bolts located in the wheel arches.



Position the sub-frame support trolley and lower the vehicle.

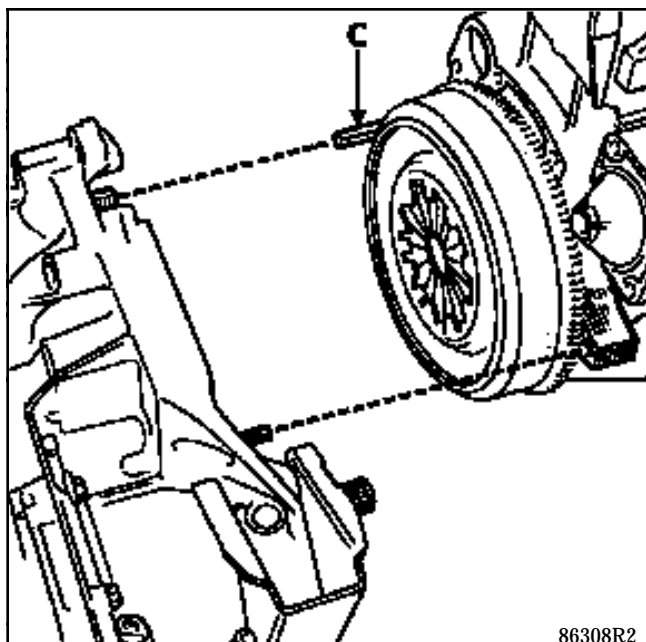


Remove the sub-frame by loosening the 4 mounting bolts.

Be careful not to forget to remove the power assisted steering pipe mounting from the sub-frame.

Under the vehicle :

- position the component jack under the gearbox without lifting it,
- release the gearbox and the engine by removing the studs (C).



REFITTING

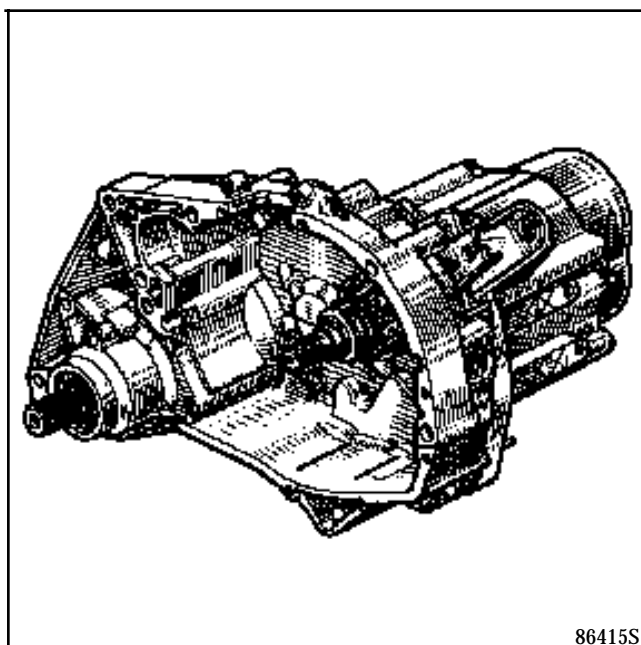
Coat the sides of the guide tube and the fork pads with **MOLYKOTE BR2** grease.

Position the fork on the notches of the clutch thrust pad.

Offer the gearbox up using the component jack.

Connect the engine to the gearbox.

Check that the dowels for centring the engine-gearbox are present and are in the correct position.



Refit:

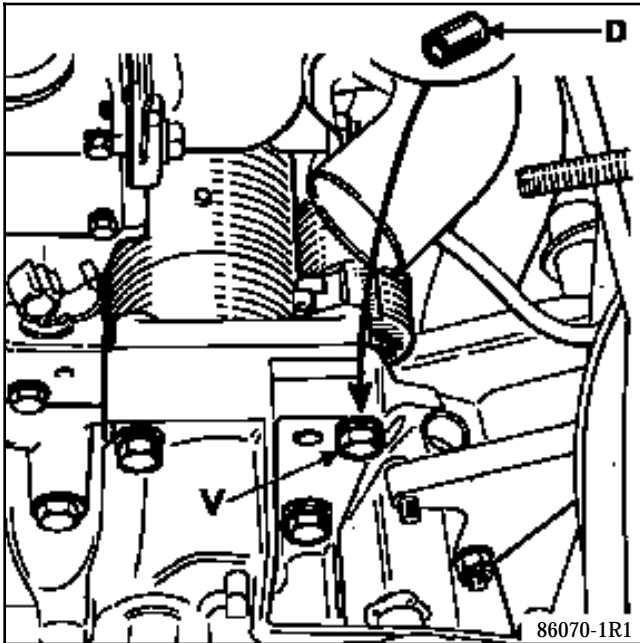
- the assembled support,
- the sub-frame,
- the steering.

Refit:

- the heat screen,
- the exhaust downpipe,
- the suspended engine mounting bar.

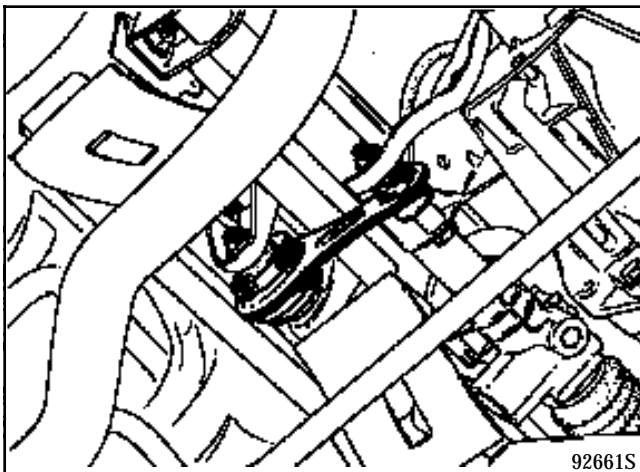
Refit the other components by carrying out the removal operations in reverse.

F engine

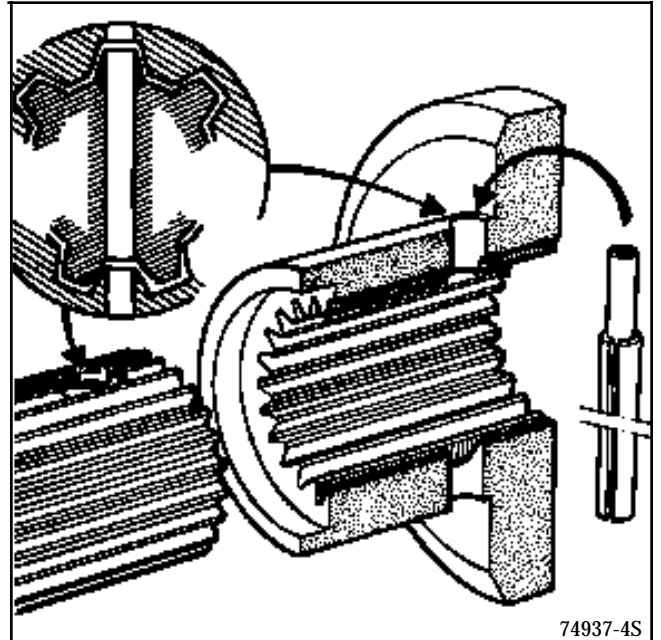


Check the adjustments of the upper mountings (refer to chapter 10).

Ensure that the movement limiter is mounted the correct way round: the nuts should be fitted on the exhaust pipe side.



Position the driveshaft with respect to the sunwheel, pivot the stub-axle carrier, engaging the driveshaft into the sunwheel using the shouldered pin **B.Vi. 31-01** in order to align the holes.



A chamfer on the leading edge of the sunwheel facilitates makes it easier to fit new roll pins.

Seal the ends (**RHODORSEAL 5661**).

Fill with fluids.

Fit the caliper mounting bolts with **Loctite FRENBLOC** and tighten to the correct torque.

Press the brake pedal several times to bring the pistons back into contact with the brake pads.



Tighten all nuts and bolts to the recommended torques.

Fill the gearbox with oil.

MANUAL GEARBOX

5th gear on the vehicle

21

SPECIAL TOOLING REQUIRED

B.Vi. 28-01	Extractor body
B.Vi. 31-01	Set of pins for extracting and fitting 5 mm diameter roll pins
B.Vi. 1003	5th gear hub extractor
B.Vi. 1007	Claws for B.Vi. 28-01



TIGHTENING TORQUES (In daN.m)

Primary shaft nut	13.5
Secondary shaft bolt	6.3

REMOVAL

Put the vehicle on a 2 post lift.

Remove the front left hand wheel.

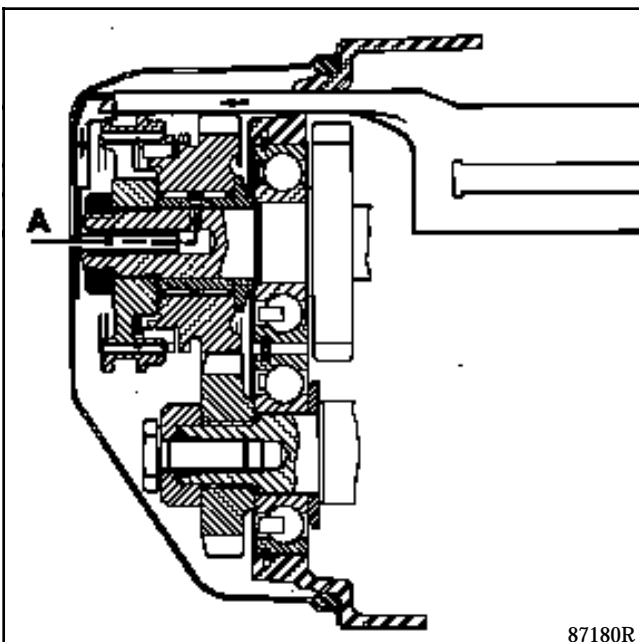
Remove the protection from the wheel arch.

Remove the sub-frame-side member tie-rod.

Remove the engine undertray.

Drain the gearbox

The rear housing must be removed along the horizontal axis of the gearbox since it contains a lubrication nozzle (A) which enters the primary shaft.



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CONSUMABLES

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

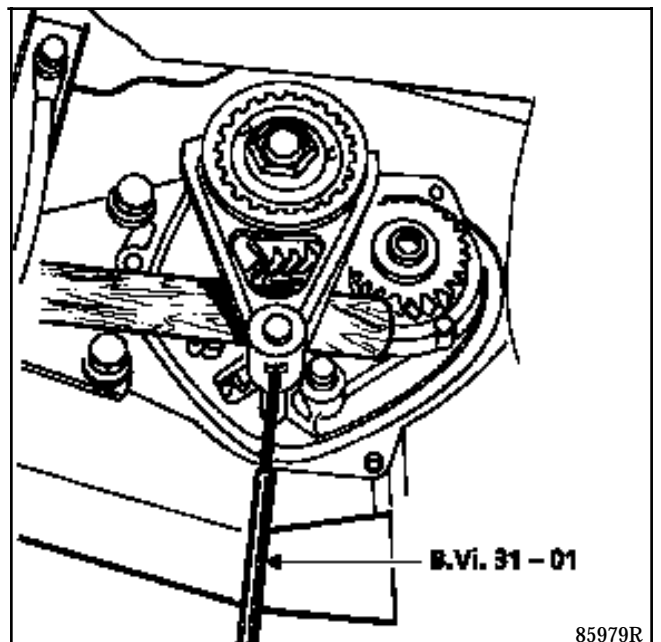
Position:

- a draining container under the rear housing and remove the housing,
- a wooden block between the 5th gear fork and the drive pinion to absorb the backlash; then remove the pin from the fork using **B.Vi. 31.01**.

SPECIAL NOTE

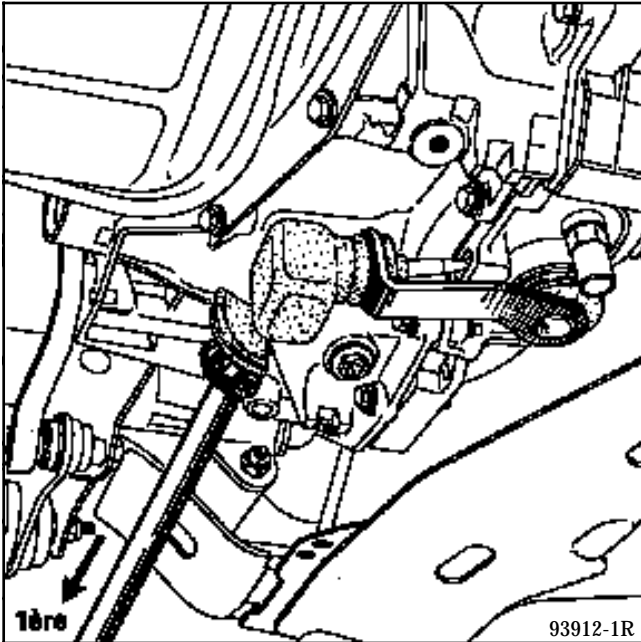
Do not pull the 5th gear fork pin outwards since the locking ball will fall into the gearbox, for safety, engage a gear (3rd or 4th).

Removing the pin can be made easier by slightly bending the pin of tool **B.Vi. 31.01** in order to prevent the gearbox being lifted.



85979R

Lock the gearbox by putting the gear lever in 1st gear and the gearbox in 5th gear by sliding the 5th gear fork inwards along its shaft.



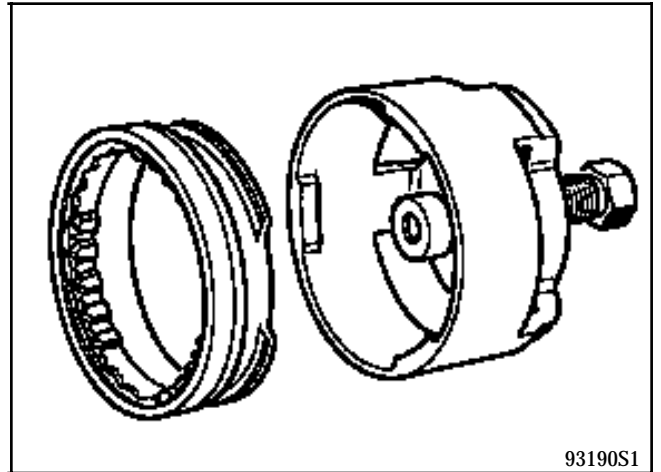
Release and remove the primary shaft nut and the secondary shaft bolt (65).

Put the gearbox in neutral.

On the primary shaft :

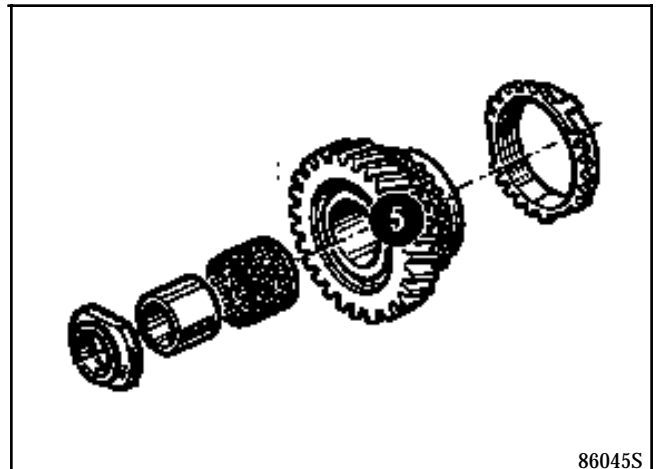
Remove the 5th gear fork and the sliding gear, taking care not to pull the 5th gear pin outwards.

Extract the synchro hub using tool B.Vi. 1170.



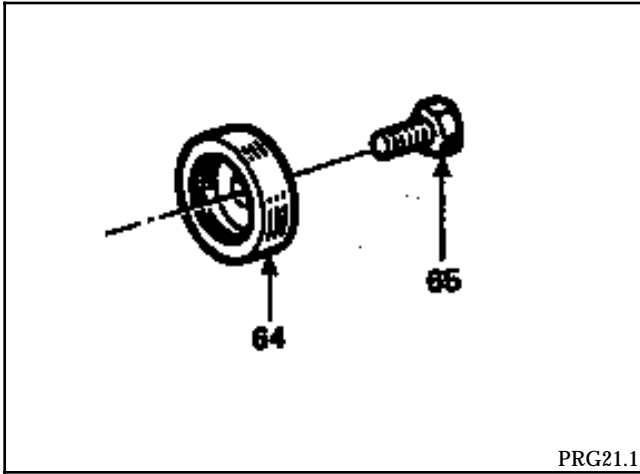
Position the sliding gear of tool B.Vi. 1170 as if to change into 5th gear and turn it so that the splines of the sliding gear are opposite the splines of the hub .

Extract the 5th gear assembly.

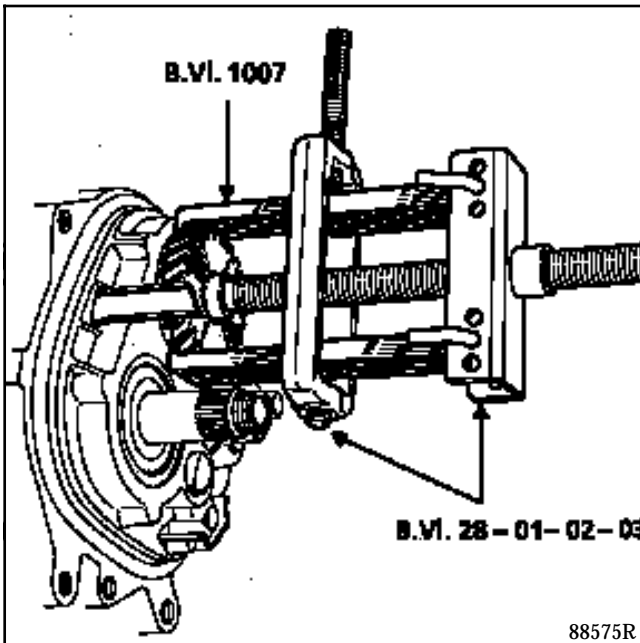


On the secondary shaft:

Remove the shouldered washer (64).



Extract the fixed gear using **B.Vi. 28-01** fitted with its 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).

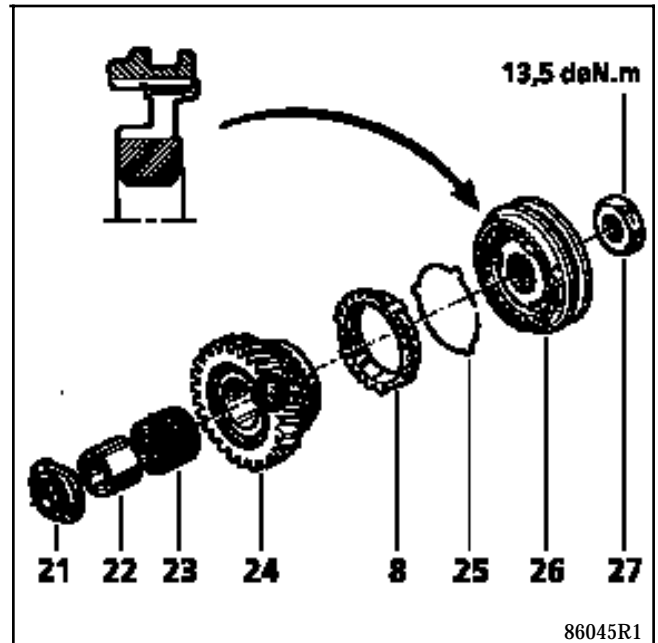
On the primary shaft :

Refit in the correct order (21) (shoulder facing the ring (22), (23), (24) and (8)).

Put the fork on the sliding gear (26) fitted with (25).

Apply 3 drops of **Loctite FRENBLOC** to the hub and replace the sliding gear hub and fork assembly.

Fit the synchro ring bosses in the lugs on the hub.

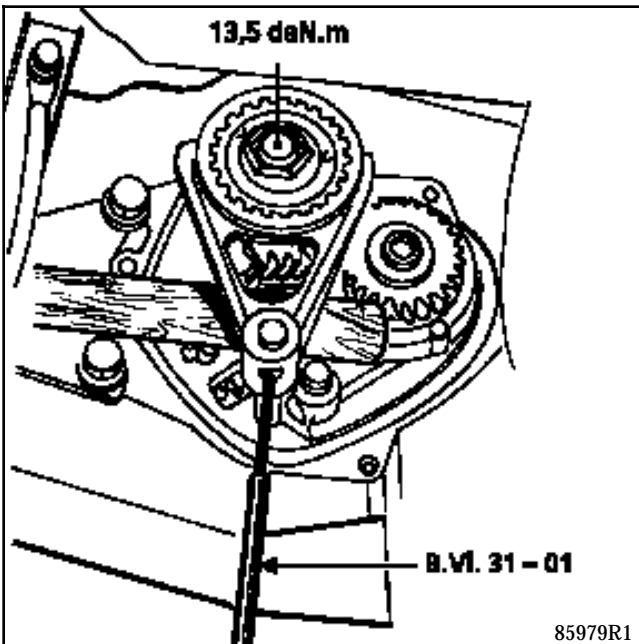
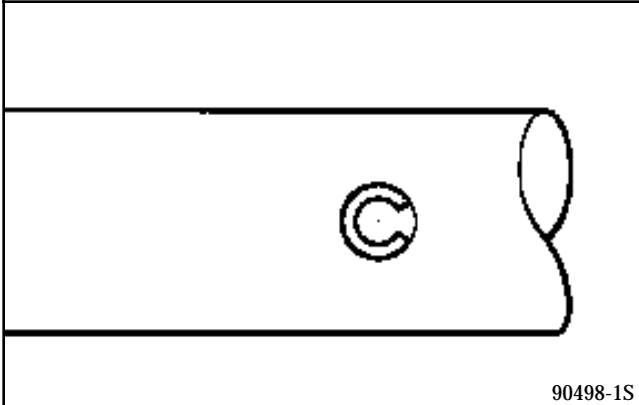


Put the gear lever in 1st gear and the gearbox in 5th gear by sliding the 5th gear fork on its shaft.

Apply 3 drops of **Loctite FRENBLOC**:

- to the primary shaft nut (27) and tighten it to a torque of **13.5 daN.m**,
- on bolt (65) and tighten it to a torque of **6.3 daN.m** to fit the fixed gear securely.

Put a wooden block between the 5th gear fork and the drive gear to take the backlash and refit a new pin into the 5th gear fork using **B.Vi. 31-01** complying with the assembly direction, the split should be pointing towards the rear housing.



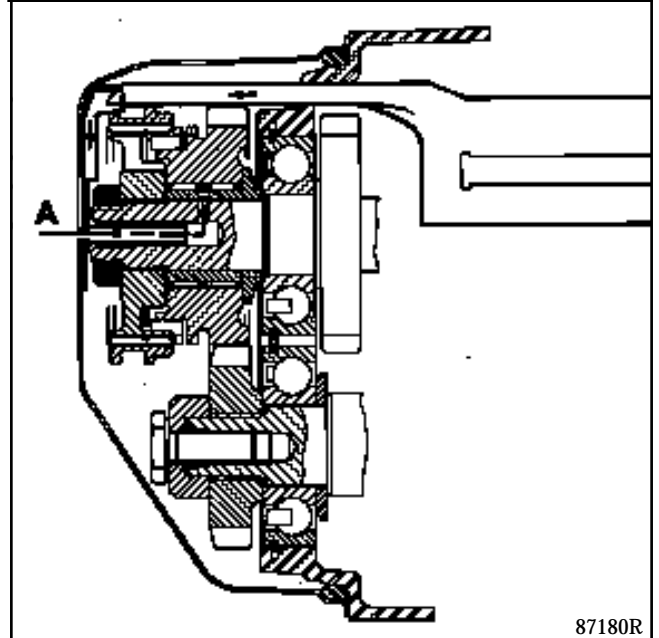
Fit a new O-ring to ensure that the rear housing is sealed.

Return the gearbox to neutral and check that all gears can be engaged.

If any problems occur, check that reverse gear is not engaged.

Fit the rear housing by engaging nozzle (A) into the primary shaft.

Tighten the mounting bolts to a torque of 2.4 daN.m.



Fill the gearbox with oil.

Check that the rear housing does not leak when the engine is running.

SPECIAL TOOLING REQUIRED		
B.Vi.	31-01	Set of pins
T.Av.	476	Ball joint extractor
B.Vi.	945	Mandrel for fitting differential seals
B.Vi.	1058	Mandrel for fitting differential seals (JB3 tapered bearings)



TIGHTENING TORQUES (in daN.m)	
Brake caliper mounting bolt	2.7
Shock absorber base mounting bolts	17
Track rod end	3.5
Wheel bolts	9

CONSUMABLES
Loctite FRENBLOC : Brake caliper mounting bolt
RHODORSEAL 5661 (Eg. CAF 4/60 THIXO) : Ends of driveshaft pins
MOLYKOTE BR2 : Right hand sunwheel splines

REMOVAL

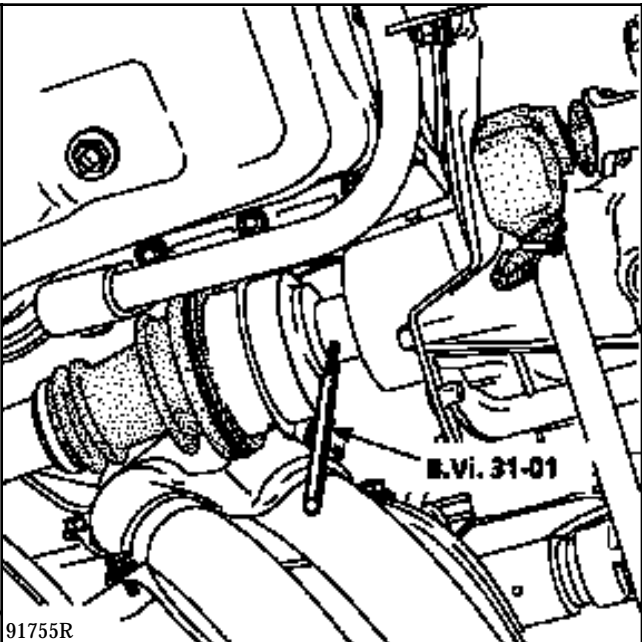
Remove the engine undertray.

Drain the gearbox.

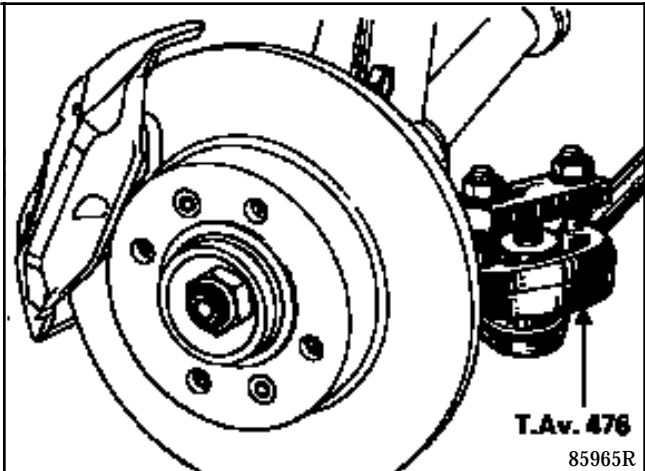
Put the front of the side being worked on on axle stands.

Remove the wheel.

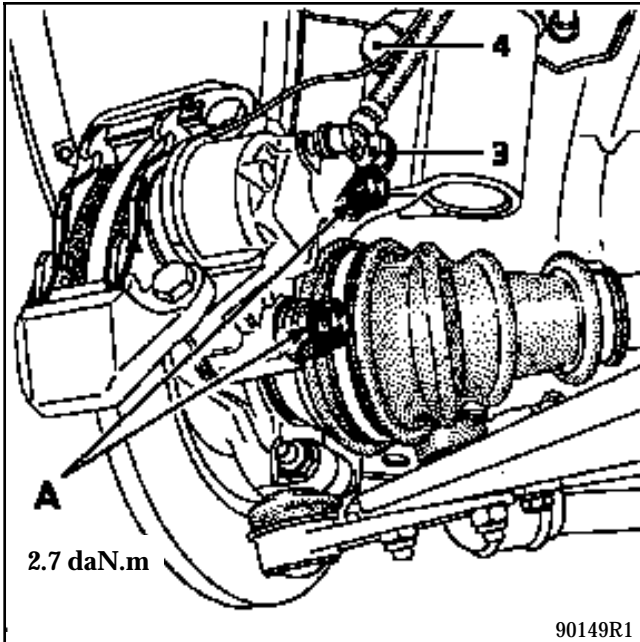
Extract the driveshaft pins using tool B.Vi. 31-01.



Remove :
- the track rod end (tool T.Av. 476),



- the two mounting bolts (A) of the brake assembly.



Secure the caliper to the suspension spring to prevent the pipe being damaged.

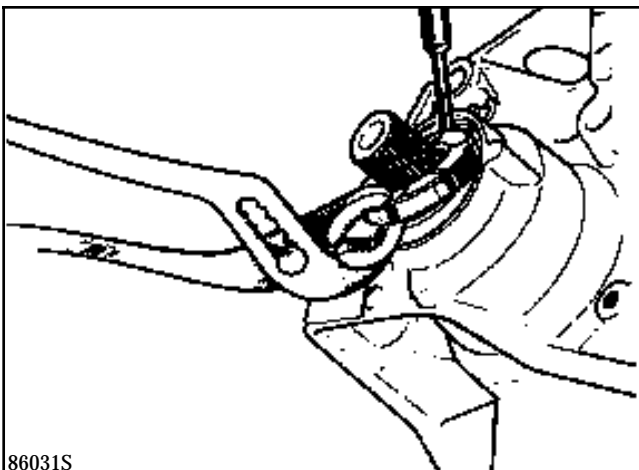
Slacken the lower bolt (3) from the base of the shock absorber and remove the upper bolt (4).

Tilt the stub-axle carrier and release the driveshaft (take care not to "damage" the gaiters during this operation).

Remove the O-ring from the sunwheel.

Tap the base of the lip seal using a pin extractor and a small hammer in order to extract it from its housing .

When the seal is released, remove it using pliers taking care not to damage the splines of the sunwheel.

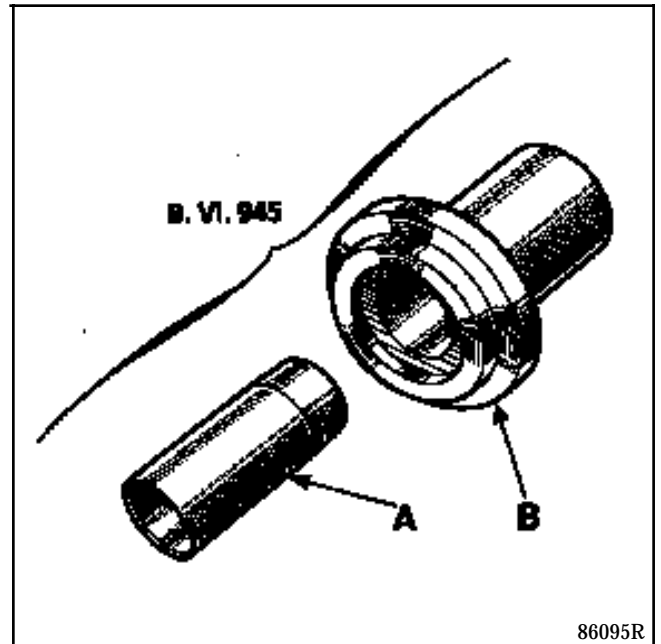


REFITTING

1. JB1 - JB3 gearboxes

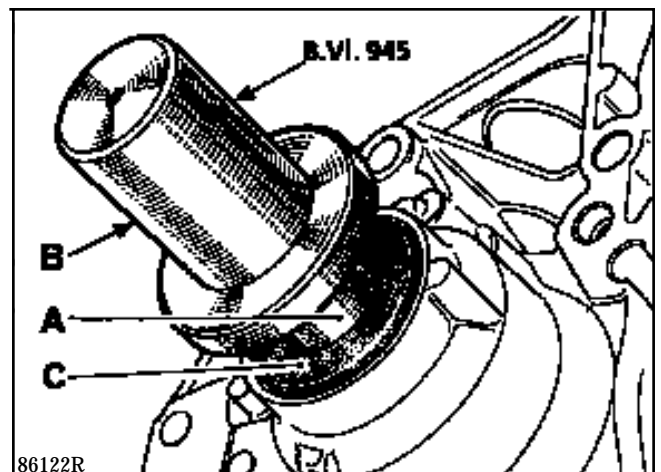
The seal is refitted using tool **B.Vi. 945** comprising:

- a seal protector (A),
- a tool for positioning the seal (B).

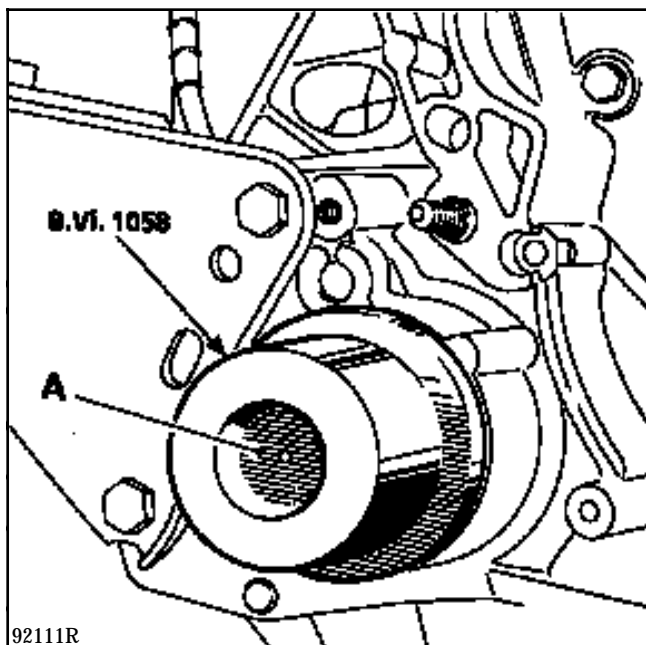


METHOD

Put the oiled protector (A) onto the sunwheel and position the oiled seal (C) with the tool (B).



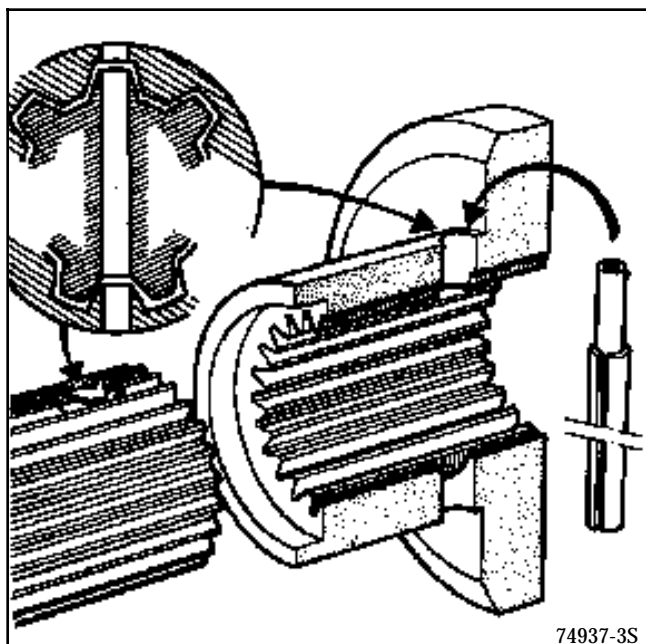
Continue in the same way but using tool **B.Vi. 1058** and protector (A) of **B.Vi. 945**.



Fit the O-ring to the sunwheel and coat the splines with **grease N° 20**.

Position the driveshaft with respect to the sun-wheel.

Pivot the stub-axle carrier, engaging the driveshaft into the sunwheel using pin **B.Vi. 31-01** to align the holes.



Fit new roll pins and seal the ends with **RHODORSEAL 5661** (Eg. **CAF 4/60 THIXO**).



Tighten the nuts and bolts to the recommended torques.

Refit the brake caliper and coat the bolts with **Loctite FRENBLOC**.

Fill the gearbox with oil.

REPLACEMENT

1st case :

Only the speedo gear or the pin is damaged.

REMOVAL

The gearbox does not have to be completely dismantled.

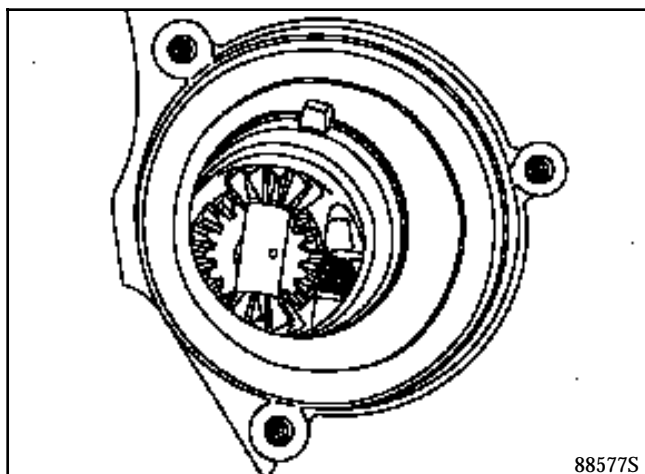
Release the left hand driveshaft.

Remove the sunwheel spider.

Rotate the differential by hand so that the speedo gear is accessible.

Unclip the pin by pulling it vertically using a pair of long nose pliers.

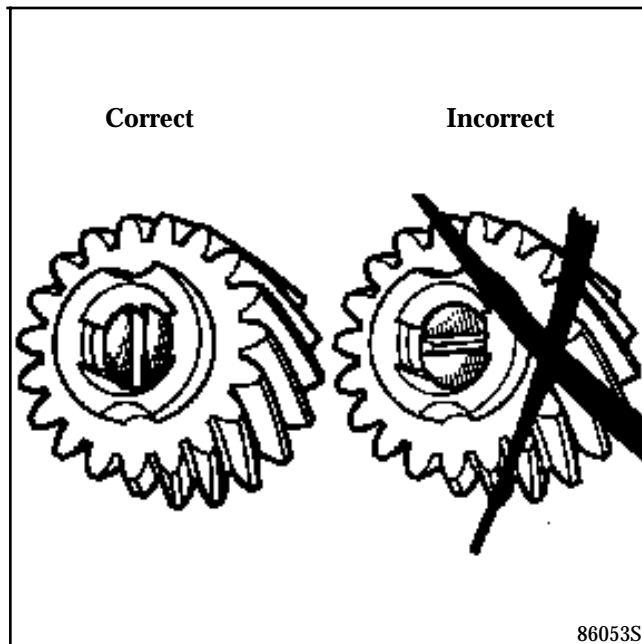
Using these pliers, remove the gear from its housing.



REFITTING

Refit a new speedo gear using a pair of flat nose pliers.

The gear and its pin should be refitted by hand. The pin must be correctly positioned with respect to the key lugs on the gear due to the elasticity of the lips of the pin.



Ensure that it is correctly clipped in.

Refit the sunwheel spider.

2nd case :

The speedo gear and crown wheel are damaged

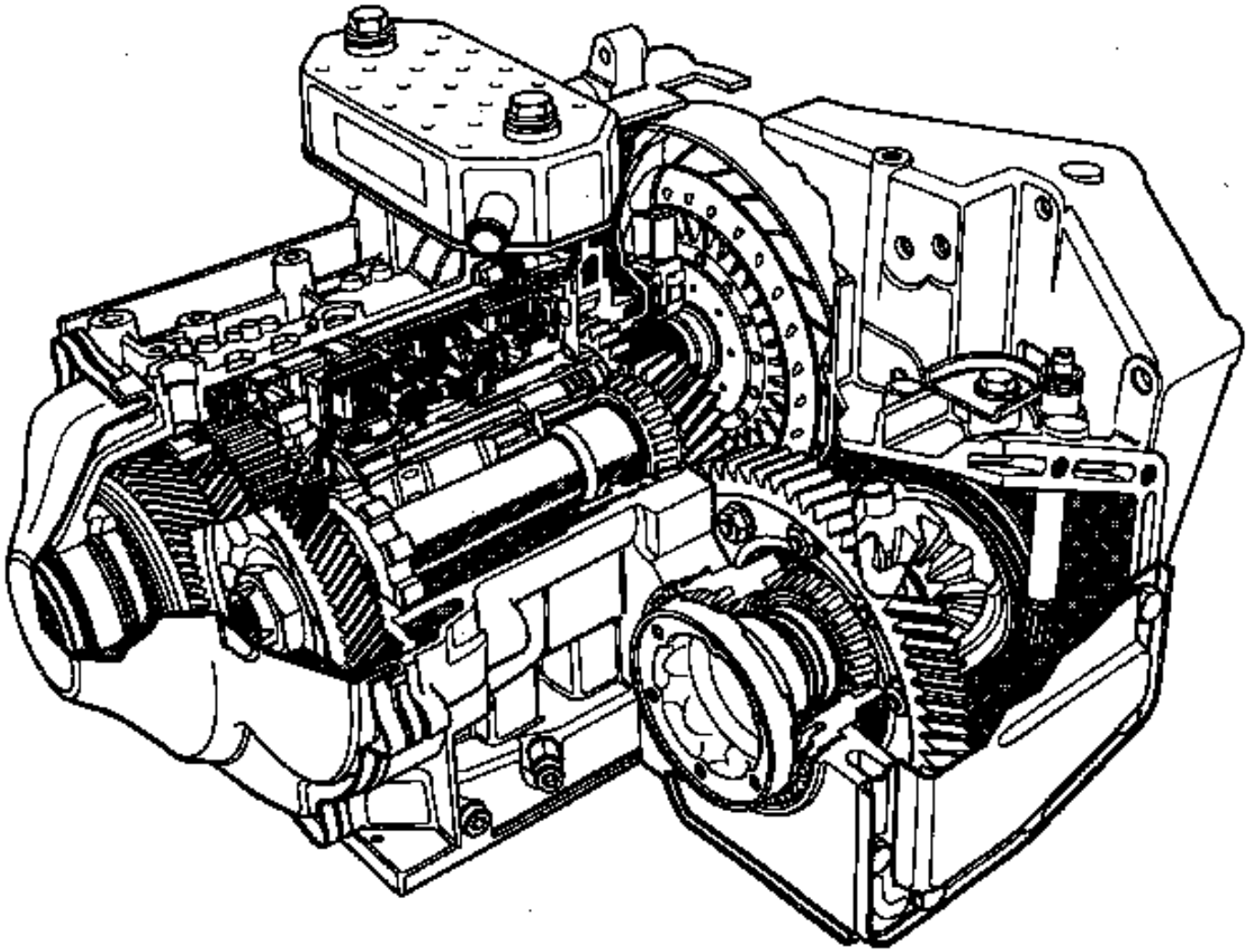
The gearbox has to be removed and the final drive has to be dismantled.

AUTOMATIC TRANSMISSION

Section view

23

TYPE AD4 AUTOMATIC TRANSMISSION



DI2302

DRIVING

The automatic transmission is lubricated under pressure and therefore this only occurs if the engine is running.

As a result, and with the risk of serious damage, the following instructions must be complied with:

- never drive with the ignition off (going downhill for example), we cannot stress enough how dangerous this practice is.
- never push a vehicle (eg. : to reach a petrol pump), except by following the instructions in the "Towing" paragraph.

In addition, the vehicle is only driven if the engine is running. It is therefore impossible to start the engine of a vehicle with automatic transmission by pushing it.

TOWING

In all cases, it is preferable to tow the vehicle on a trailer or with the front wheels off the ground. However, if this is not possible, the vehicle can be towed at a speed below **25 mph** (40 km/h and over a maximum distance of **30 miles** (50 km) (lever in N).

AUTOMATIC TRANSMISSION
Identification

VEHICLE	TRANS- MISSION TYPE	ENGINE	CONVERTER	STEP DOWN	RATIO	SPEEDO	ELECTRONIC UNIT*
BA0	AD4 013	K7M	227	69/77	19/65	22/20	114

* For identifying with the XR25 test kit, see **MR TA.A**.

Gear ratios

Gear	1st	2nd	3rd	4th	Reverse
Gear reduction	2.71	1.55	1	0.68	2.11
Overall reduction	10.35	5.92	3.82	2,6	8.06
Speed in km/h at 1000 rpm. with 1.76 m tyres	10.19	17.83	27.66	40.79	13.11

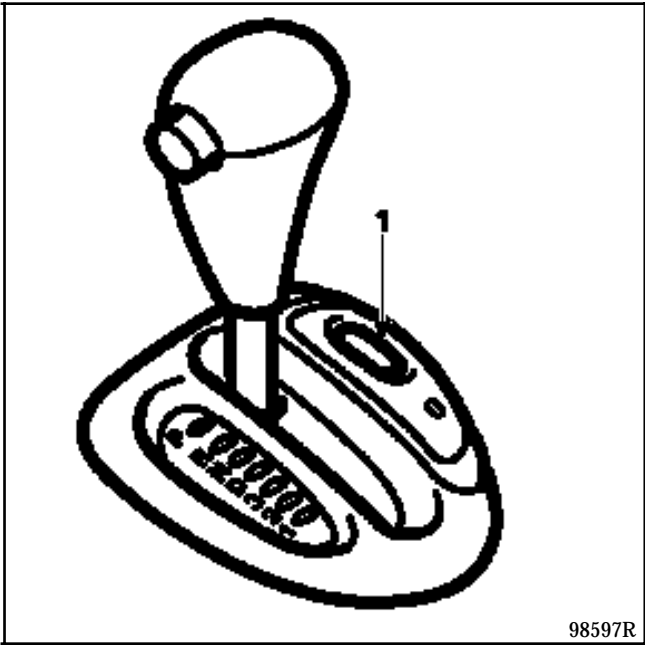
AUTOMATIC TRANSMISSION
Gear change thresholds

VEHICLES	TRANS- MISSION TYPE	ACCELER- ATOR POSITION	1 → 2		2 → 3		3 → 4		4 → 3		3 → 2		2 → 1	
			A	B	A	B	A	B	A	B	A	B	A	B
BA0	AD4	PL	16	20	40	46	64	73	50	59	32	34	7	15
		PF	41	49	76	95	126	149	107	127	65	81	28	32
		RC	52		96		158		146		90		48	

The figures given in the table represent the average theoretical speed values for changing gear in km/h
tolerances = ± 10 %.

- PL** : No load.
PF : Full load.
RC : Kickdown (changing to a lower gear).

- A** : Gear change thresholds are set lower down. Gears change at a lower speed. Switch **(1)** is not activated and the warning light **EXC** is extinguished.
- B** : Gear change thresholds are set higher up. Gears change at a higher speed. Switch **(1)** is activated and the warning light **EXC** is illuminated.



DESCRIPTION	COMPONENT AFFECTED
RHODORSEAL 5661 (Eg : CAF 4/60 THIXO)	Seals the driveshaft pins
MOLYKOTE BR2 grease	- Sunwheel splines - Converter centrer
Loctite FRENBLOC	Brake caliper mounting bolt

Parts to be systematically replaced

Parts to be replaced after they have been removed :

- roll pin,
- lock nuts,
- copper seals.

Oil

AD4 automatic transmission uses two grades of oil and has two levels.

MECHANISM : ELF RENAULTMATIC D2 (D20104).

In emergency, use:

- MOBIL ATF 220 D (D 20104 or D 21412).
- TEXAMATIC 4011.

FINAL DRIVE: TRANSELF TRX 75W 80W.

The mechanism is drained during the major service.

The oil level must be checked every 10000 miles (15 000 km) in case there is a slight oil leak.

The final drive is never drained ; it is filled for life.

The strainer is no longer replaced (NT 2261A).

Only the level may change due to a slight leak.

Oil capacity

	TOTAL volume
MECHANISM	5.7 l
FINAL DRIVE	1 l

NOTE : if the automatic transmission is replaced, only check the oil level since the transmission is supplied by the Parts Department full of oil.

Fault warning light

MESSAGE FROM THE ELECTRONIC FAULT
WARNING LIGHT

Normal operation :

- The warning light is not illuminated during normal operation whether the vehicle is being started, engine running or when the vehicle is stationary.

Presence of a fault :

- Vehicle stopped, engine running, or when driving, warning light permanently illuminated
- Vehicle moving, warning light illuminates and extinguishes without action at the ignition key.
- Vehicle moving, warning light illuminates briefly.

Oil temperature < - 20 °C or > + 140 °C

- Vehicle moving or stationary, warning light flashes at a rate of approximately **1 flash per second**, in this case, reduce the performance requirement by moderating acceleration.

SPECIAL TOOLING REQUIRED	
B.Vi. 1213	Automatic transmission drain spanner
MS 1019-10	XR25 test kit

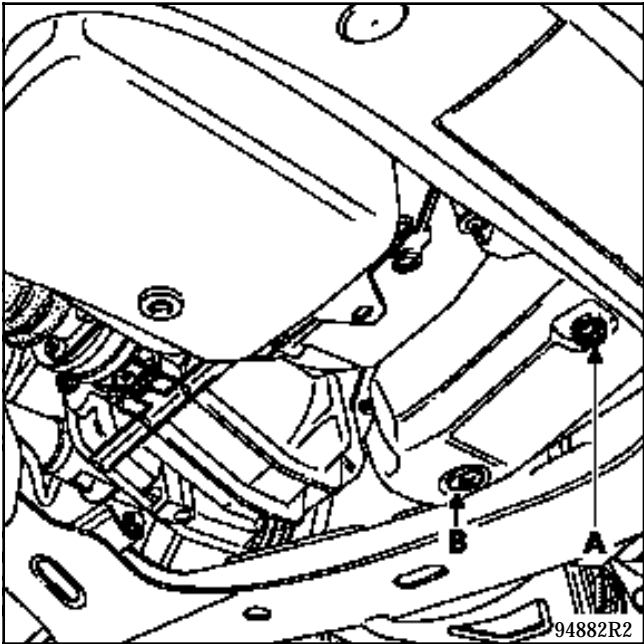
DRAINING

Mechanism :

Mechanism sump with two plugs:

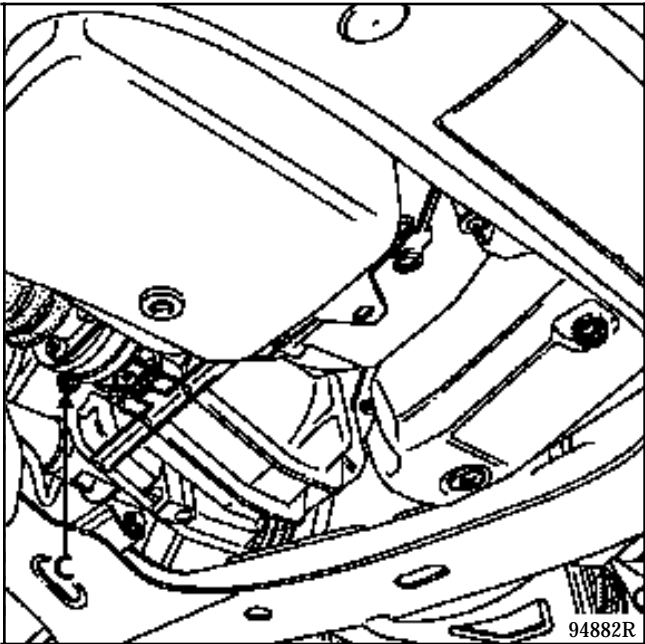
- A : Top-up plug.
- B : Drain plug (triangular socket).

Draining is performed by removing plug (B).



Final drive:

Filling and topping up are performed through plug (C) which overflows when the level is exceeded.



Reminder:
The final drive is never drained, it is filled for life.

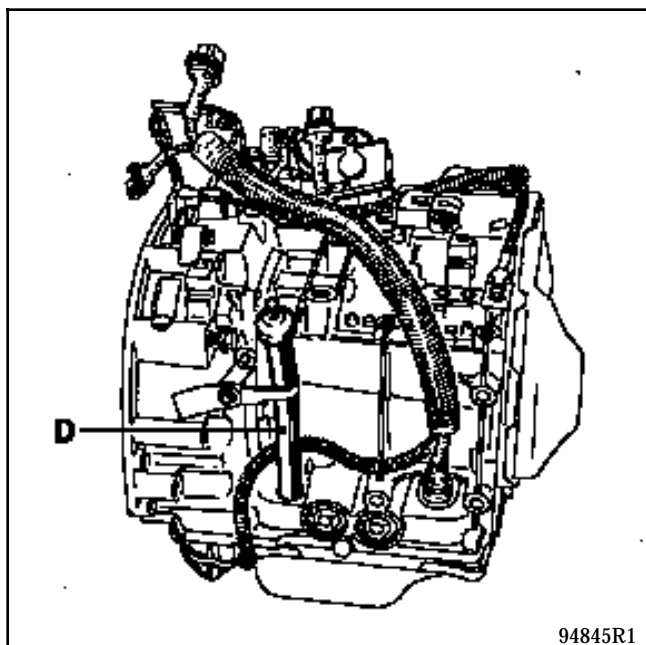
AUTOMATIC TRANSMISSION

Filling - Levels

23

FILLING - TOPPING UP

Filling is performed through tube (D).



Use a funnel fitted with a **15/100** filter so as to prevent any impurities entering.

The level **MUST** be **checked** in accordance with the following method:

Before starting:

- if the gearbox has been drained, fill it with **3.5 litres** of oil,
- if you are simply checking the level, you must add **0.5 litre** of the recommended type of oil.

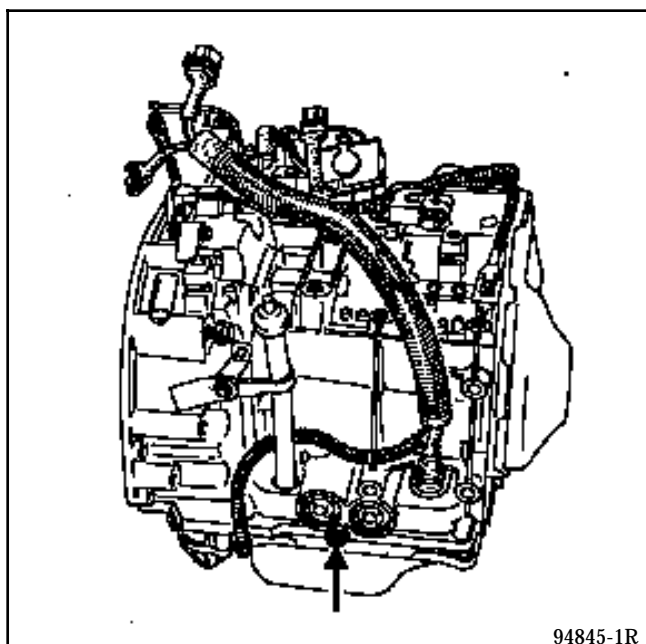
- 1 - Vehicle on a **4 post lift**, **transmission** at ambient temperature.
- 2 - Start the engine with the selector lever in the Park position.
- 3 - Connect the **XR25** test kit and enter:

D **1** **4** then **#** **0** **4**

- 4 - Raise the vehicle and allow the engine to run until it reaches a temperature of **60 °C**.
- 5 - When the desired temperature has been reached, open the top-up plug; **allow the excess oil to overflow** (must be more than **0.1 litre**) for **approximately 20 seconds**. Replace the plug
- 6 - If the volume of oil which flowed out is less than **0.1 litre**, the level is not correct. Repeat the operation.

In this case, add **1 litre** of the recommended oil and allow the transmission to cool down between successive operations.


Oil pressure



The transmission is fitted with an oil pressure take-off. Connect the **B.Vi. 1215** to check the automatic transmission pressure sensor only.

The oil pressure cannot be altered.

Its value is determined by the electronic computer.

TIGHTENING TORQUES (In daN.m)		
Strainer mounting bolts	0.5	
Sump mounting bolts	1	
Mounting bolts for engine mounting dampers on side member	2	
Rear support mounting bolts	6.5	
Wheel bolts	9	
Strainer mounting bolts	0.5	
Distributor mounting bolts	0.5	

REMOVAL

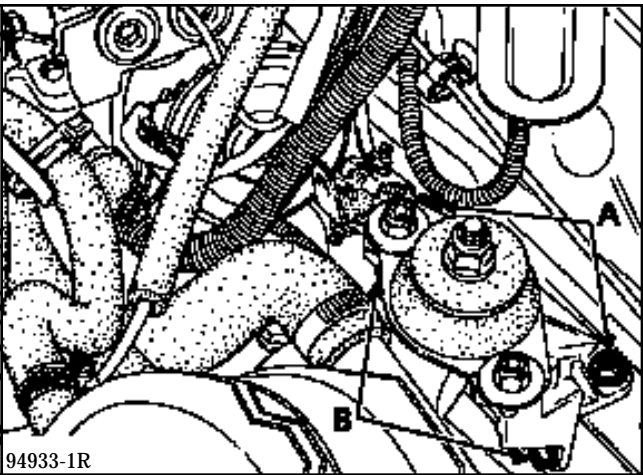
Put the vehicle on a 2 post lift.

Put the lever in the "P" (Park) position.

Drain the automatic transmission (mechanism section; drain plug with triangular socket).

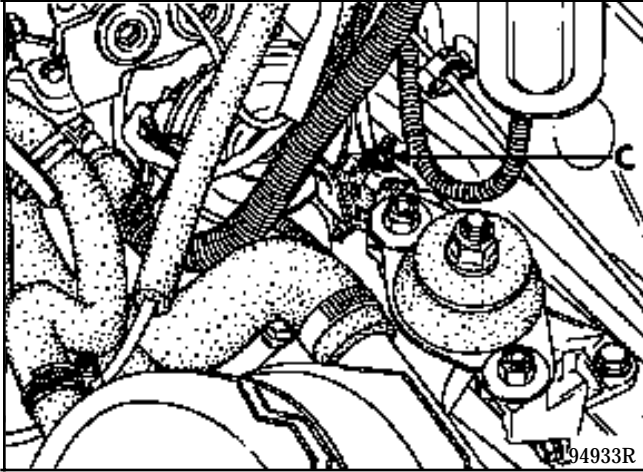
Remove:

- the expansion bottle,
- the air filter,
- the two upper bolts (A) of the engine mounting damper and slacken the other two (B), without removing them.



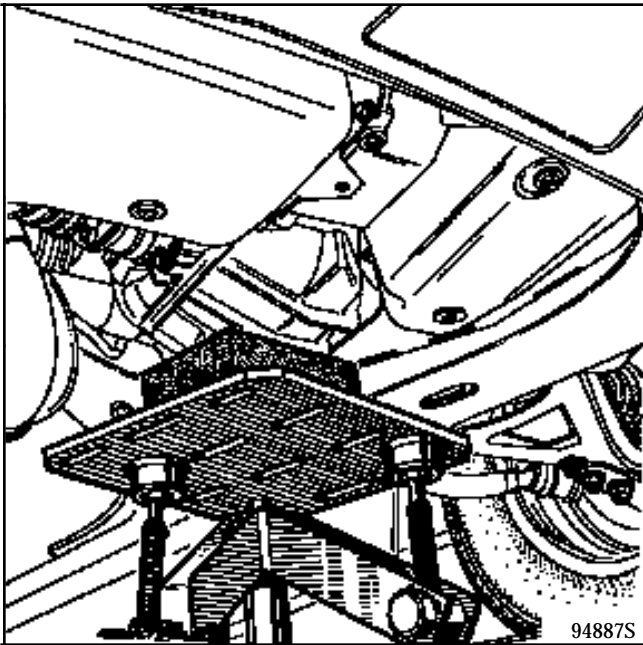
For versions with ABS

Remove the mounting nut (C) from the ABS electro-pump assembly on the rubber mounting.



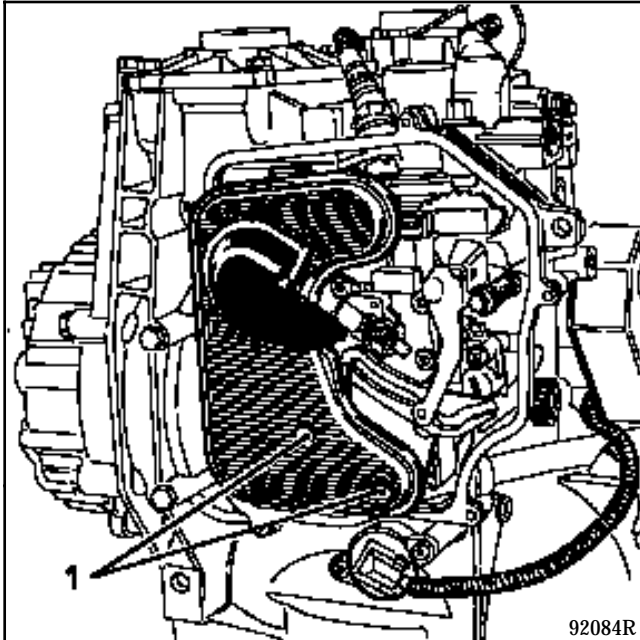
Remove the front left hand wheel and remove the plastic shield from the wheel arch (in order to be able to remove the two rear mounting bolts of the automatic transmission sump at a later stage).

Using the component jack, raise the automatic transmission.

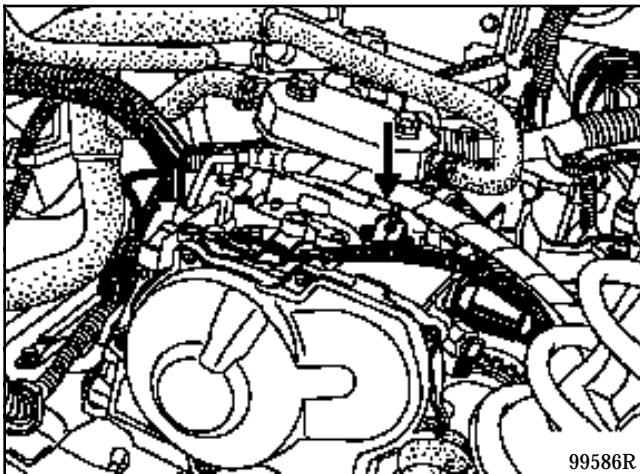


Remove:

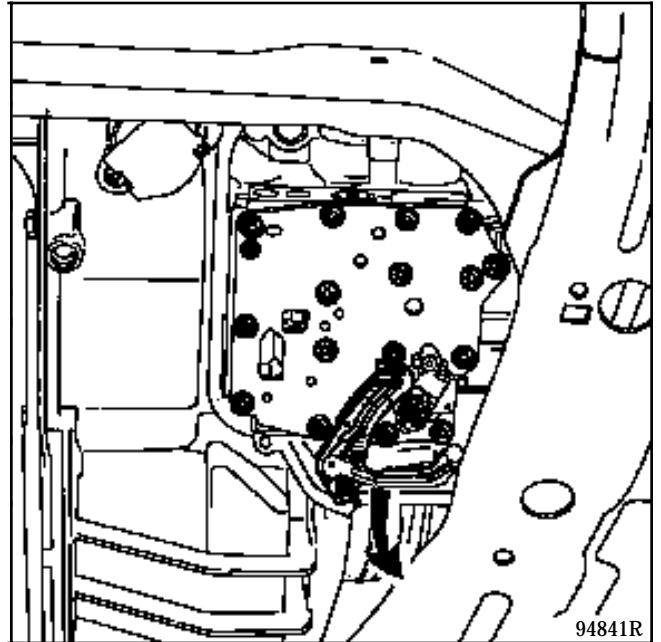
- the sump from the automatic transmission,
- the strainer and its seal (bolt 1),



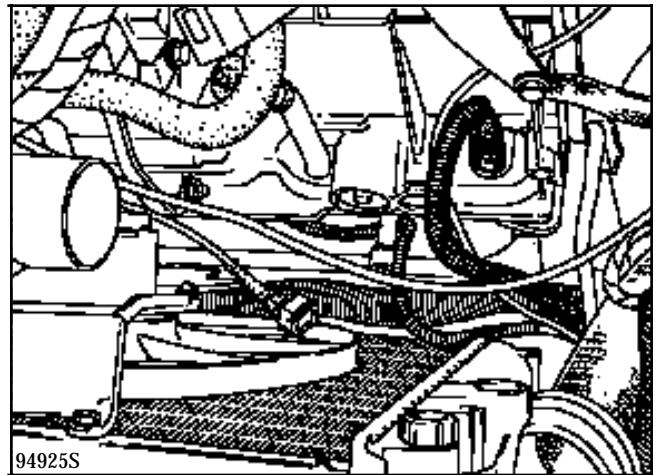
- the gear control cable from the selector (2) so that the lever can be moved past the "Park" position.



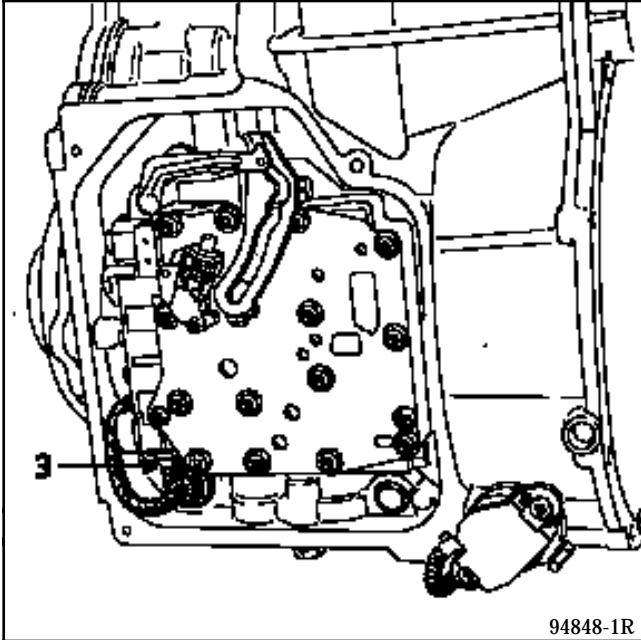
This extra travel is required to release the drive from the control sector of the manual valve.



Disconnect the sealed connector cable by pressing on the locking ring.

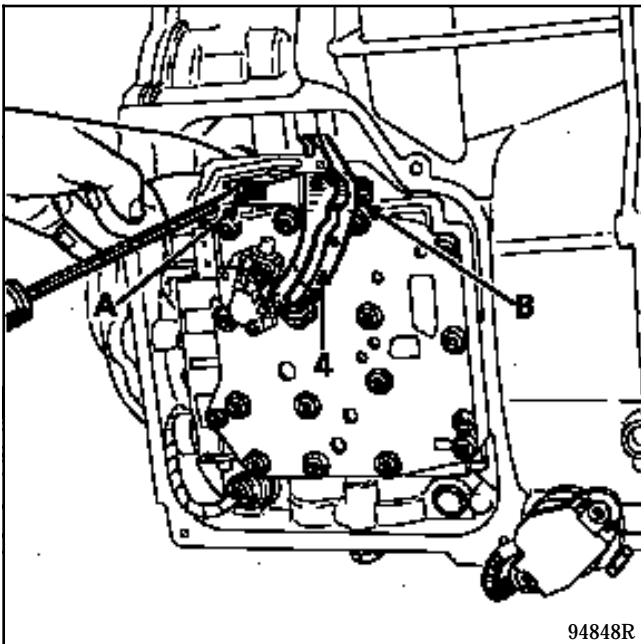


Remove the sealed connector after having removed the bolt (3).

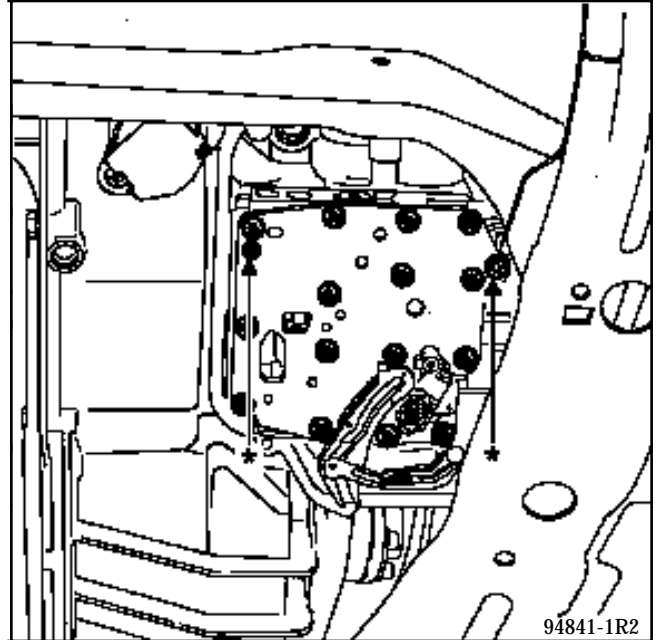


Remove the manual valve selector (4) by firstly releasing at (A) and then at (B).

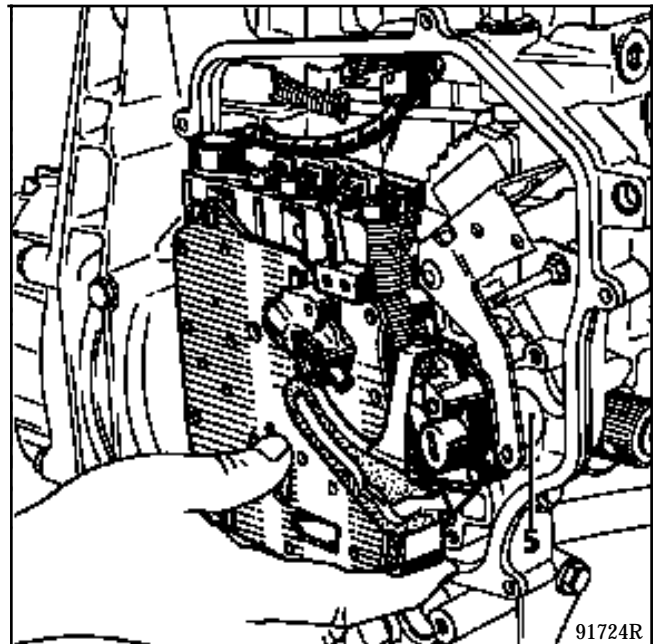
Extract the manual valve from the hydraulic distributor.



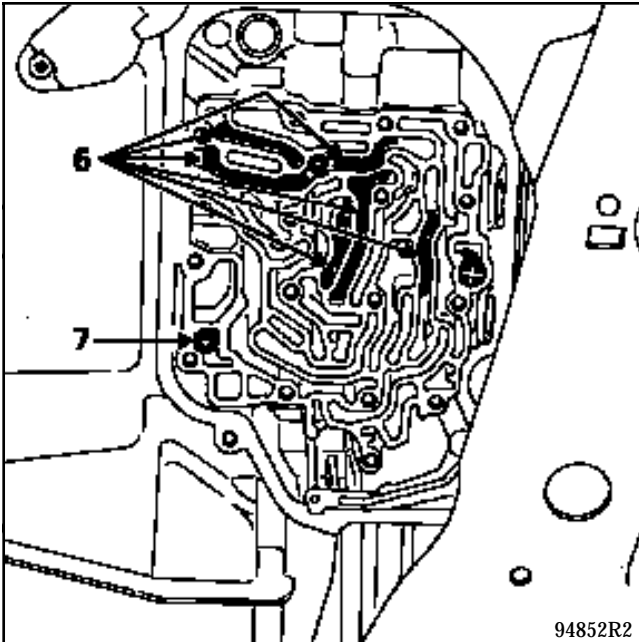
Remove the **16 mounting bolts** from the hydraulic distributor. The bolts marked (*) remain in place and secure the distributor closing plate.



Push the gear control selector in fully and release the hydraulic distributor by releasing the modulating solenoid valve from the sump (5).

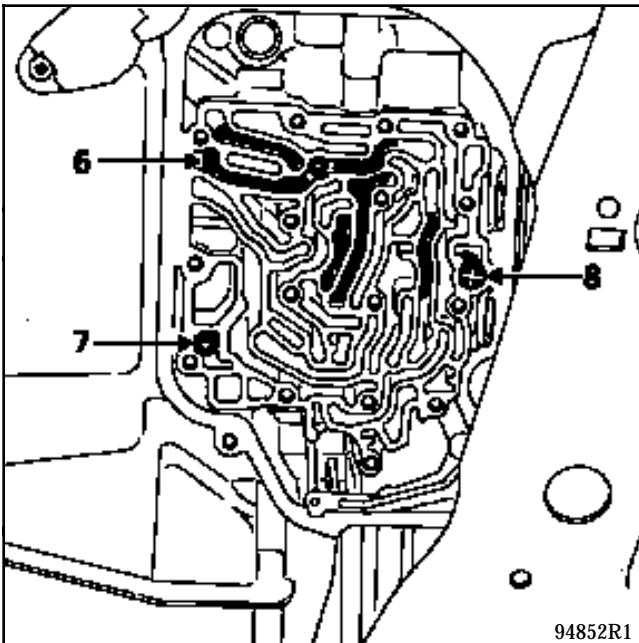


Ensure that the inserts (6) and the filter (7) have stayed in position in the sump's hydraulic circuit.



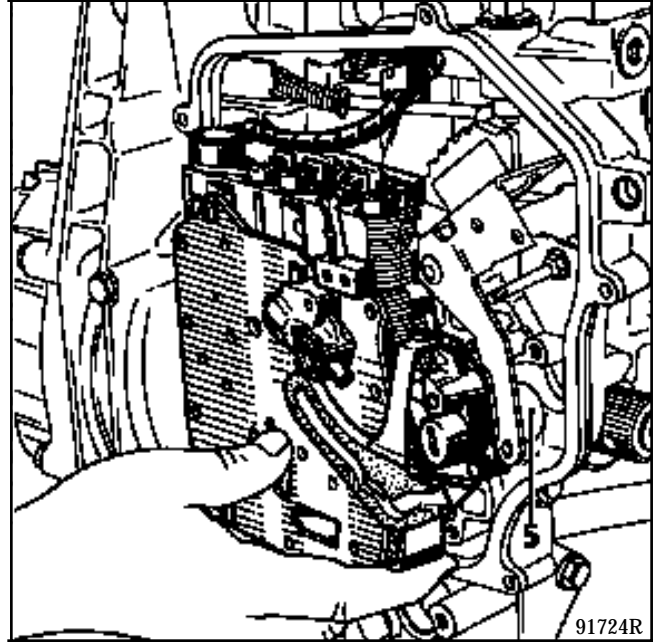
REFITTING

Ensure that the supply tube F1 (8), the modulating solenoid valve filter (7), and the circuit inserts (6) are in place.

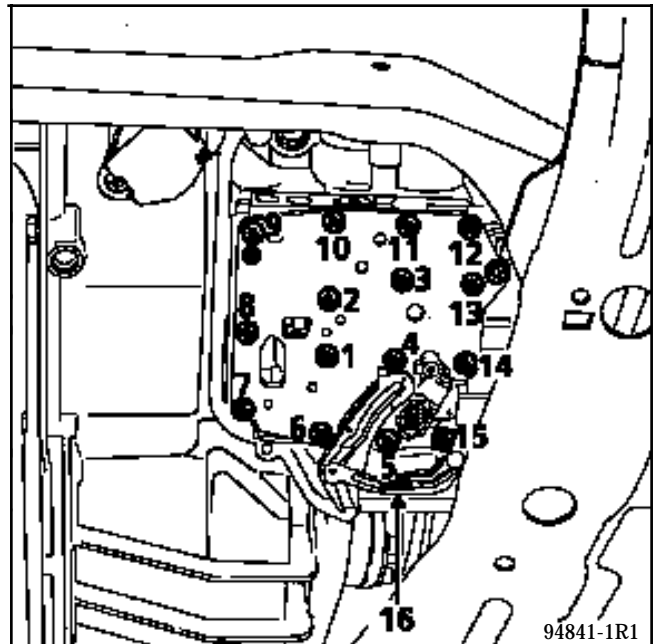


Engage the hydraulic distributor.

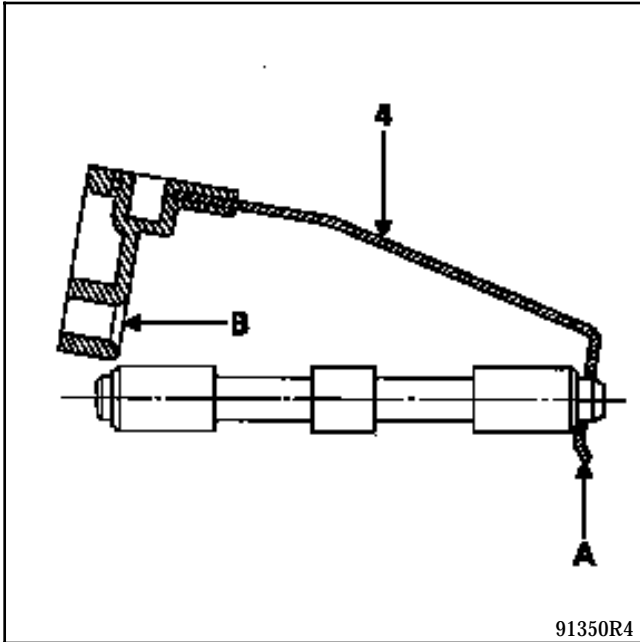
Push the gear control selector in fully taking care to engage the modulating solenoid valve into the sump (5) correctly.



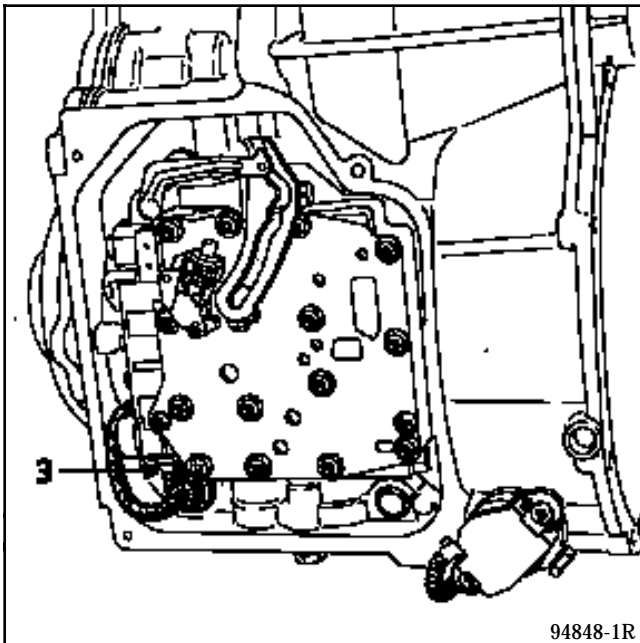
Replace the **16 bolts** for mounting the distributor onto the sump and **tighten them** to a **torque of 0.5 daN.m.** in accordance with the **order shown**.



Refit the manual valve and the selector (4) by engaging firstly part (A) and then part (B).

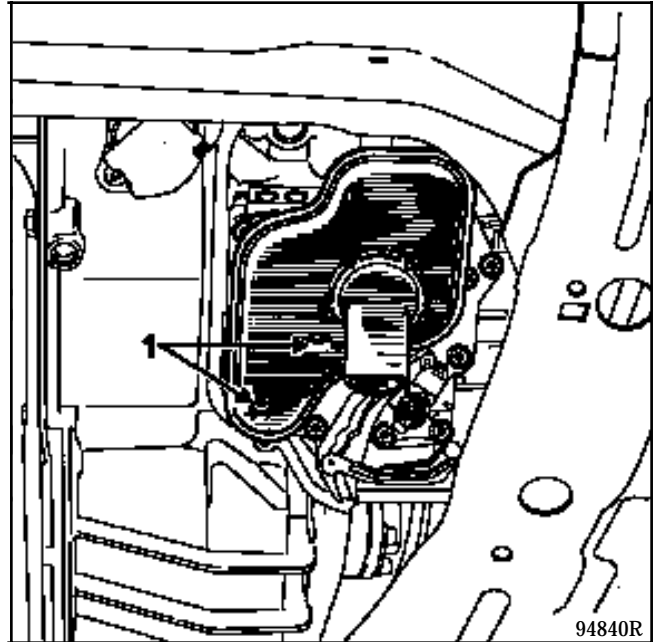


Refit the sealed connector fitted with its O-ring and bolt (3).



Fit a new strainer and new seal.

Tighten to a torque of **0.5 daN.m**.

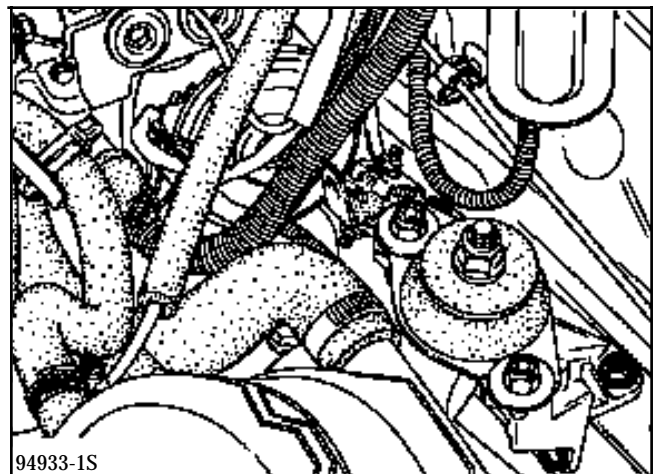


Replace the sump (Ensure that the seals are not damaged and check that the magnet is present).

Tighten the bolts to a torque of **1 daN.m**.

Refit the automatic transmission.

Replace the bolts of the transmission mounting dampers.

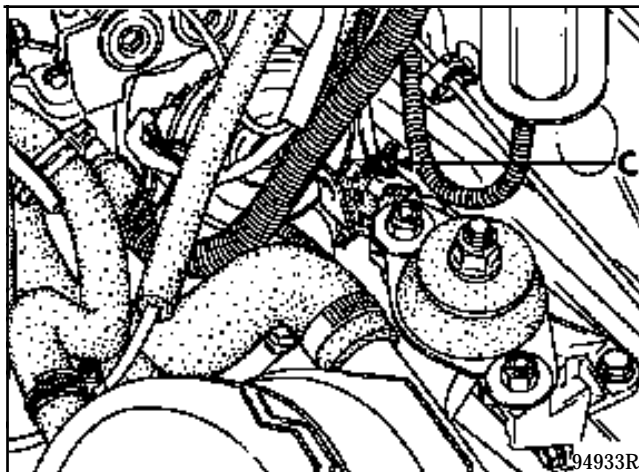


Reconnect the sealed connector.

Refit the gear selector.

On versions with ABS

Refit the mounting nut (C) from the ABS electro-pump unit on the rubber mounting.



Refit:


- the plastic shield in the front left wheel arch,
- the front left hand wheel,
- the air filter,
- the expansion bottle.

Fill with oil and check the level.

NOTE :every time the hydraulic distributor is replaced or removed, replace the modulating solenoid valve filter, the strainer and its seal.

REMOVING FROM UNDERNEATH

SPECIAL TOOLING REQUIRED	
Mot. 1040-01	Dummy cradle for removing-refitting the engine and transmission assembly
Mot. 1202	Hose clamp pliers
Mot. 1311-06	Tool for removing fuel pipes

TIGHTENING TORQUES (in daN.m)	
Sub-frame front mounting bolts	6
Sub-frame rear mounting bolts	11
Shock absorber upper cup mounting bolts	3
Wheel bolts	9
Brake caliper mounting bolts	3.5
Steering universal joint mounting bolt	3.5
Nut for mounting rubber engine mounting onto front left side-member mounting	4.5

Put the vehicle on a two post lift.

Disconnect the battery.

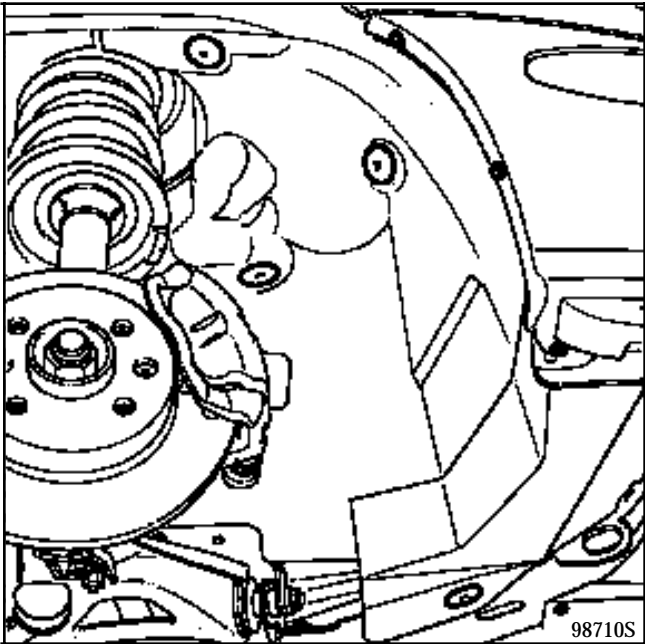
Drain:

- the cooling circuit through the lower radiator hose (radiator end),
- the engine if necessary.

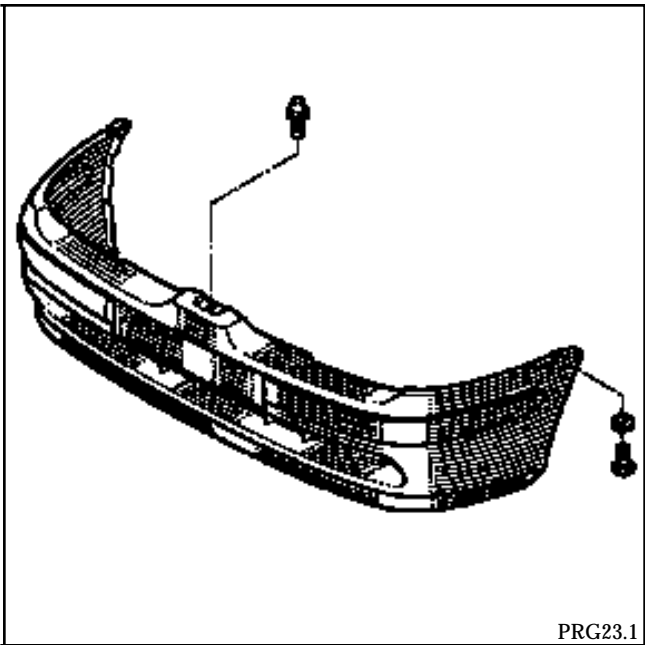
Remove:

- the front wheels,

- the left and right hand mudguards,



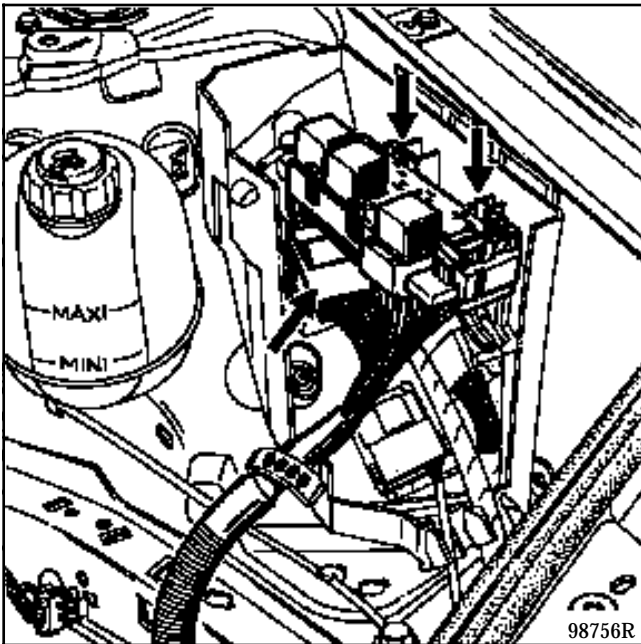
- the sub-frame-body tie-rods,
- the brake calipers and secure them to the body,
- the front bumper,



- the heat shield from the exhaust manifold,
- the catalytic converter (disconnect the oxygen sensor) and secure the exhaust pipe to the body,
- the horn,
- the acoustic tie-rod between the shock absorber turrets,
- the air filter,
- the earth strap,
- the absolute pressure sensor,
- the expansion bottle and secure it to the engine.

Disconnect:

- the accelerator cable as well as the kickdown switch connector,
- the brake servo pipe,
- the relay plate and the electrical connectors from the engine connection unit,

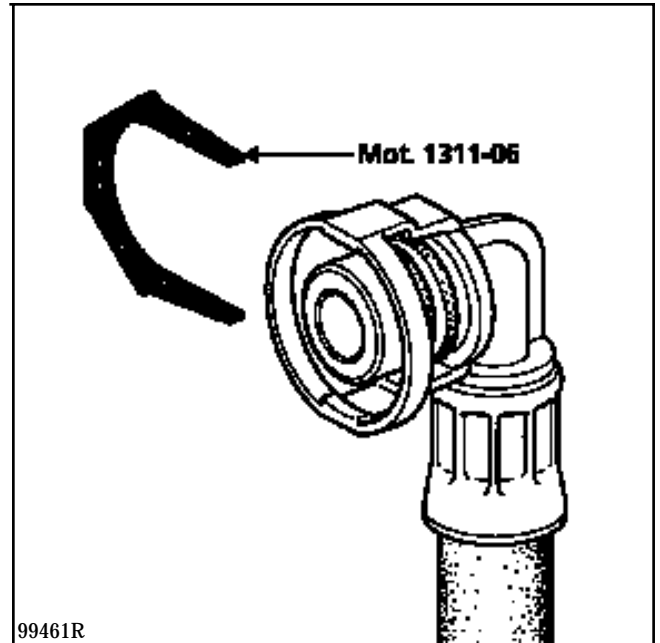


- the connector from the automatic transmission computer,
- the canister pipe.

Remove the battery mounting bracket.

Disconnect:

- the injection supply wire located in the scuttle panel as well as the starter motor supply,
- the fuel inlet and outlet hoses using **Mot. 1311-06**, unclip them from their support,

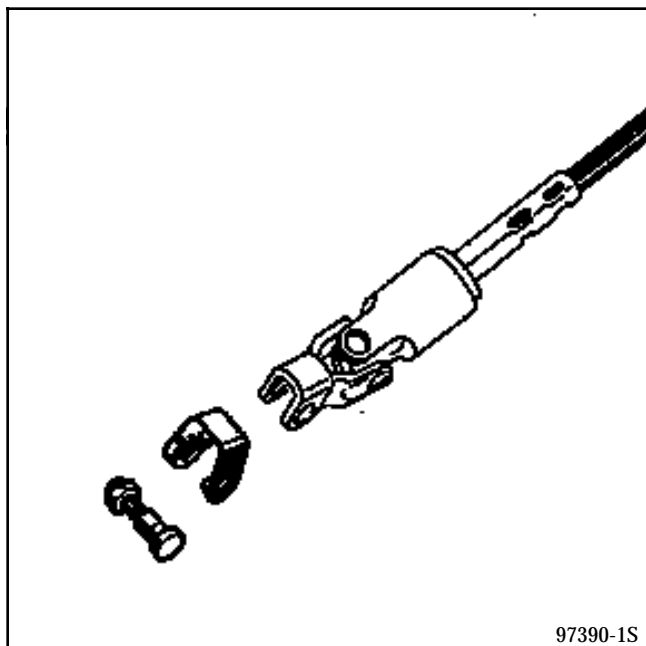


- the heating pipes on the thermostat.

Unclip the radiator and move it away by securing it to the engine.

Remove:

- the automatic transmission selector control,
- the nut and eccentric bolt (4) (remove it using the pin extractor) from the steering shaft yoke after having pushed back the protector.



SPECIAL NOTES FOR VEHICLES FITTED WITH DRIVER'S AIRBAG

ATTENTION :

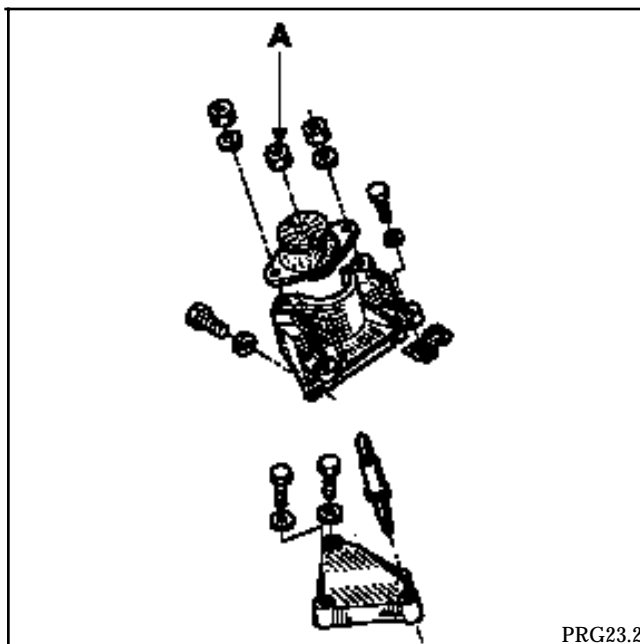
to prevent any damage being done to the rotating switch under the steering wheel, please follow these instructions :

Before releasing the steering column and the rack, the steering wheel **MUST** be immobilised, wheels straight, using the "steering wheel locking" tool throughout the duration of the repair. Any doubts regarding the correct centring of the rotating switch means that the steering wheel has to be removed so as to apply the centring method as described in chapter 88 "AIR-BAG".

REMINDER: in this case, only qualified personnel who have received specific training may undertake this work.

Put a wedge between the automatic transmission and the front left hand sub-frame.

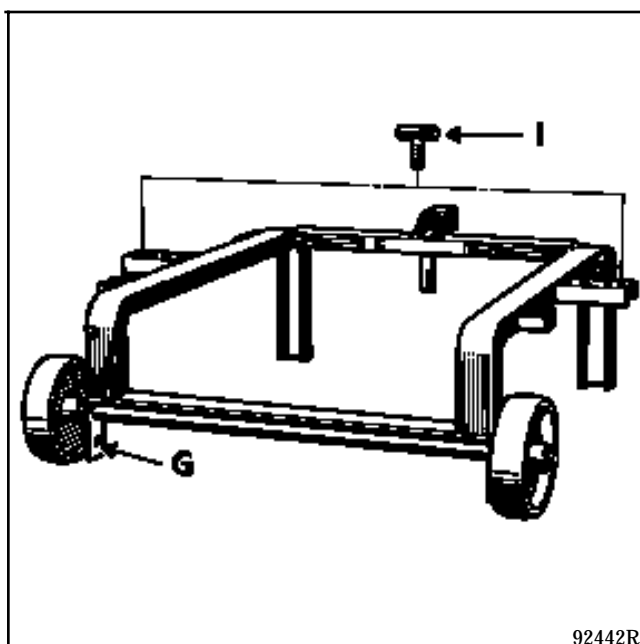
Remove the nut (A), then, using a copper hammer, hit the stud in the left hand suspended mounting in order to remove it.



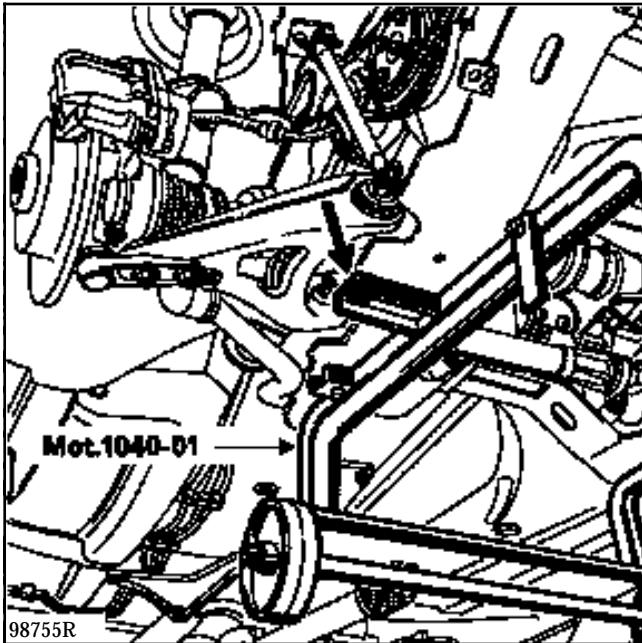
PREPARING TOOL MOT. 1040-01

Position the roller pin in the lower holes (G).

It is then secured to the sub-frame using the T-pieces (I).



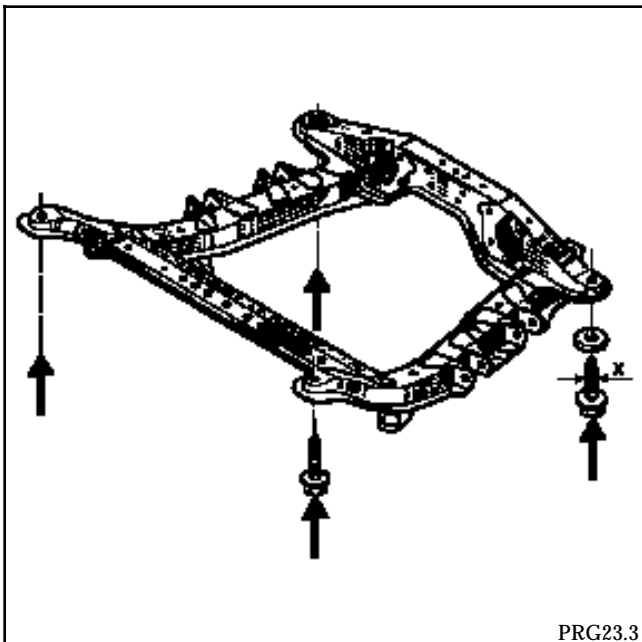
Secure **Mot. 1040-01** under the sub-frame.



Lower the final drive until the tool touches the ground.

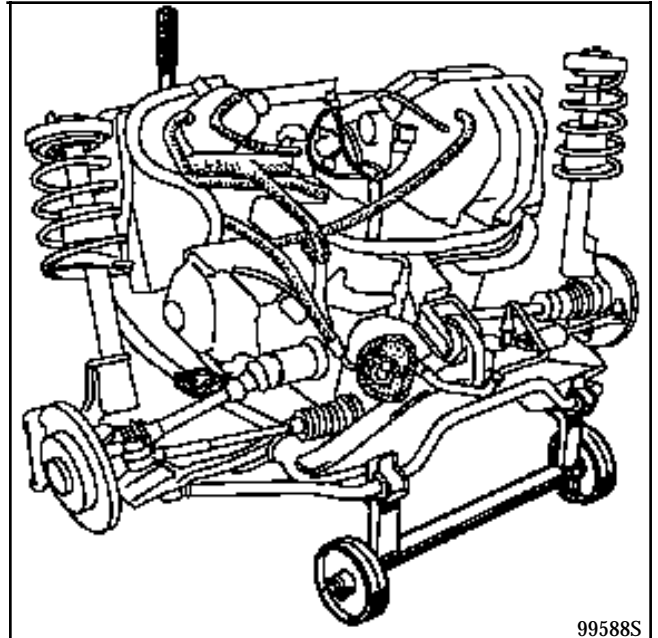
Remove:

- the shock absorber upper mounting bolts,
- the sub-frame mounting bolts.



Extract the engine and transmission assembly by lifting the body.

Secure the spring-shock absorber assembly with rope.



Separate the engine and transmission assembly from the sub-frame by removing:

- the upper radiator hose,
- the power assisted steering reservoir and the pump,
- the power assisted steering pipe mounting on the automatic transmission.

Unclip the wiring loom from the sub-frame.

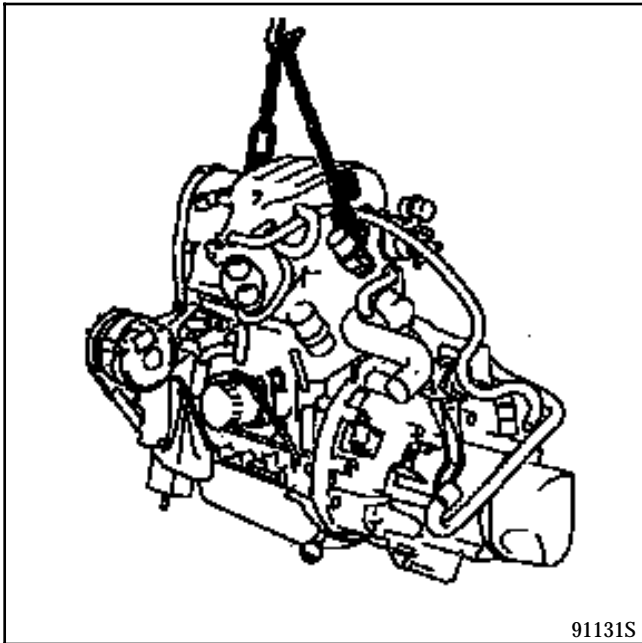
Position the lifting tool.

Remove:

- the right hand mounting,
- the engine tie-bar.

Release the driveshafts.

Lift the engine from the sub-frame.

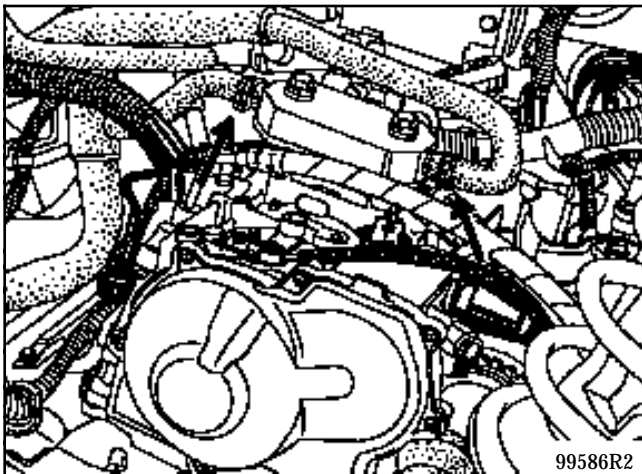


Separate the gearbox from the engine by :

- removing the starter motor,
- removing the bolts from the automatic transmission sump.

Remove:

- the hoses on the exchanger,



- the converter bolts
- the bolts around the gearbox and the TDC sensor.

Separate the automatic transmission from the engine.

REFITTING (special notes)

Refit the converter by positioning it with respect to the mounting bolts.

Tighten the bolts around the automatic transmission.

Refitting is the reverse of removal.

Aligning the engine sub-frame with the body will be made easier by positioning two approximately **100 mm** long threaded rods in the two front sub-frame-body mountings.

Tighten the sub-frame front mounting bolts to a torque of **6 daN.m.** and to a torque of **11 daN.m** at the rear.



Tighten all nuts and bolts to the recommended torque.

Fit the caliper mounting bolts using Loctite FRENBLOC and tighten them to the correct torque.

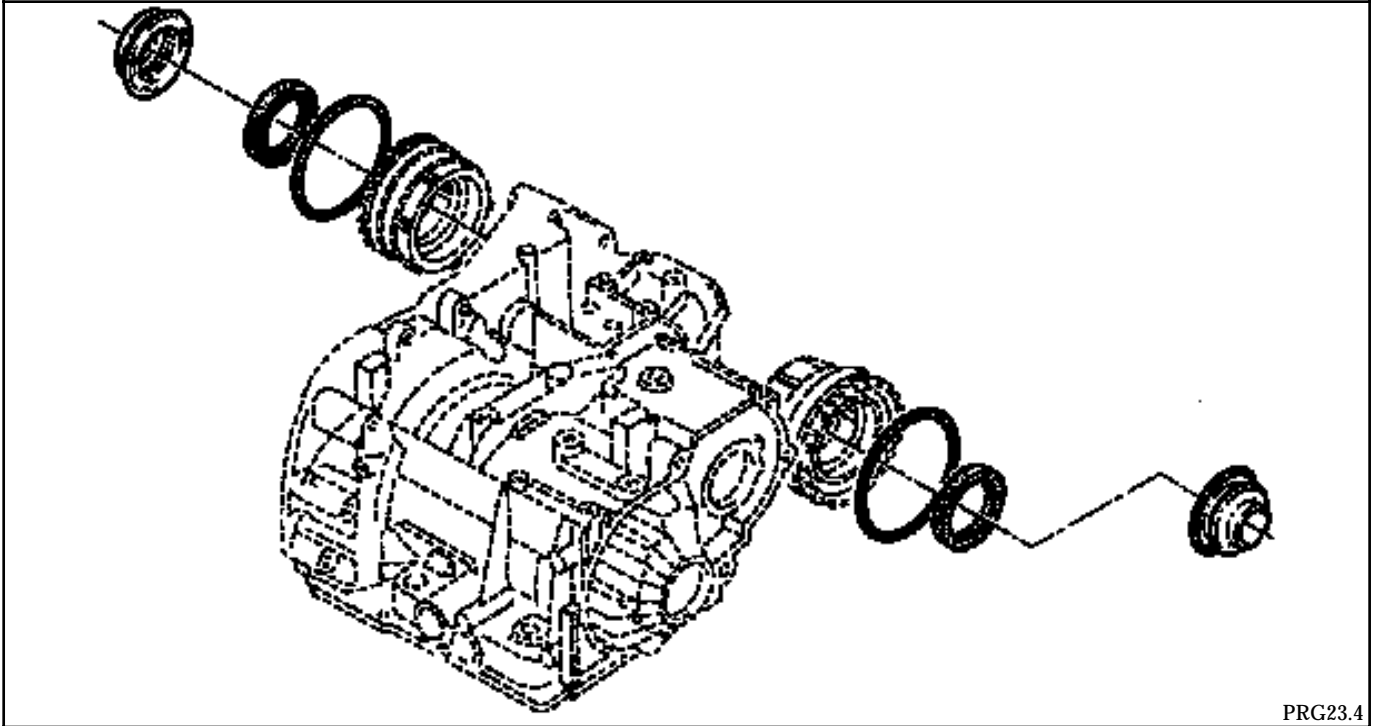
Press the brake pedal several times to bring the pistons back into contact with the brake pads.

Fill:

- the cooling circuit and purge it (see chapter 19),
- the engine with oil if necessary.

NOTE : check that the steering shaft yoke spacer is in place when refitting.

1) REPLACING A LEFT OR RIGHT HAND LIP SEAL

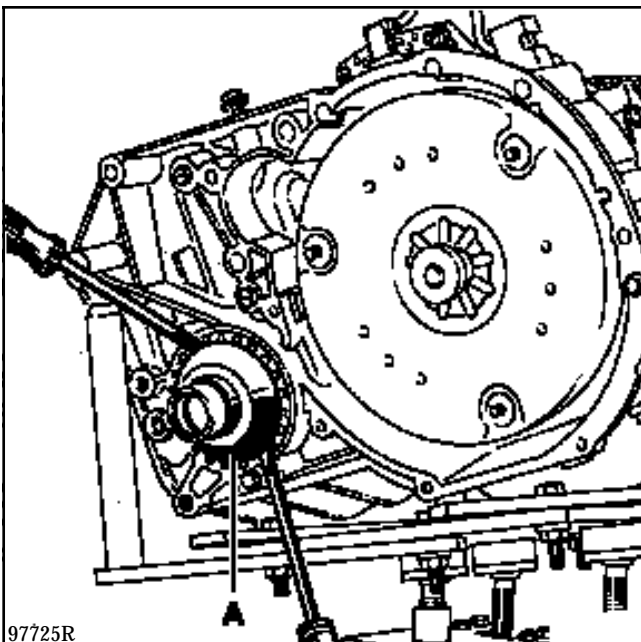


SPECIAL TOOLING REQUIRED

B. Vi. 1322	Tool for fitting differential output seals
-------------	--

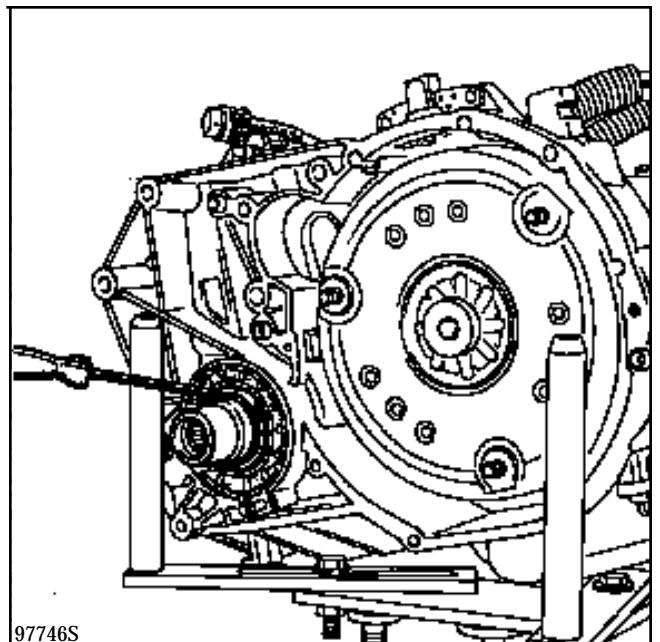
REMOVAL

Using a screwdriver, remove the protective shield (A).



The shield is fitted tight.

Using a screwdriver, remove the seal taking care not to damage the differential bolt as well as the output shaft.



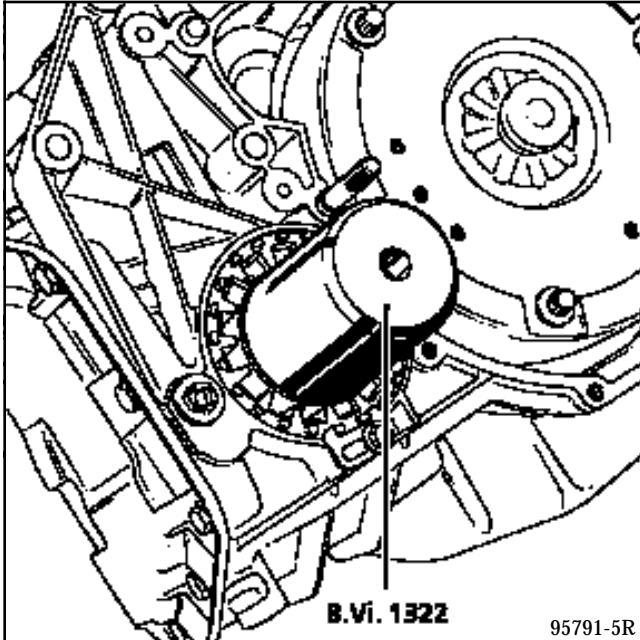
AUTOMATIC TRANSMISSION

Differential output seal

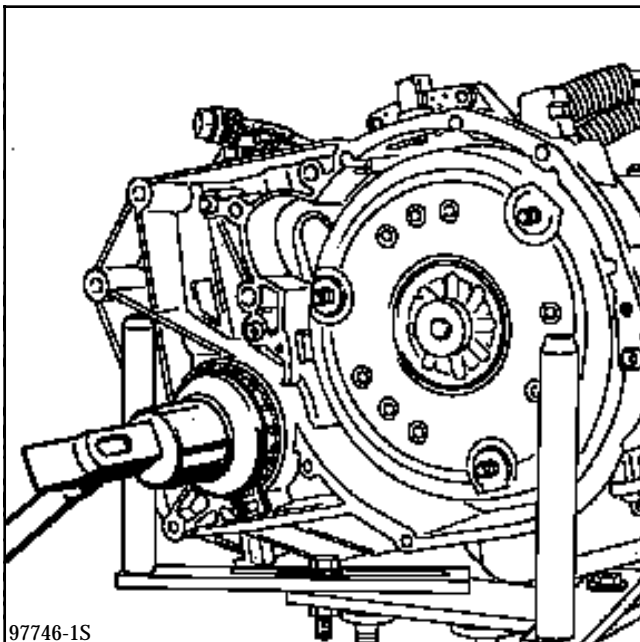
23

REFITTING

The lip seal (oiled) is positioned using tool **B.Vi. 1322** (this determines the correct position of the seal).



Refit the protective heat shield in the opposite order to removal using a **45 mm** diameter socket.



2) REPLACING THE O-RING

The principle is the same on both sides, but **only one side must be removed at a time**.

SPECIAL TOOLING REQUIRED

B. Vi. 1323	Tool for fitting differential output seals
--------------------	--

Special notes:

The is no flange on the driveshaft outputs, but instead a simple splined end piece protected by a shield.

AUTOMATIC TRANSMISSION

Differential output seal

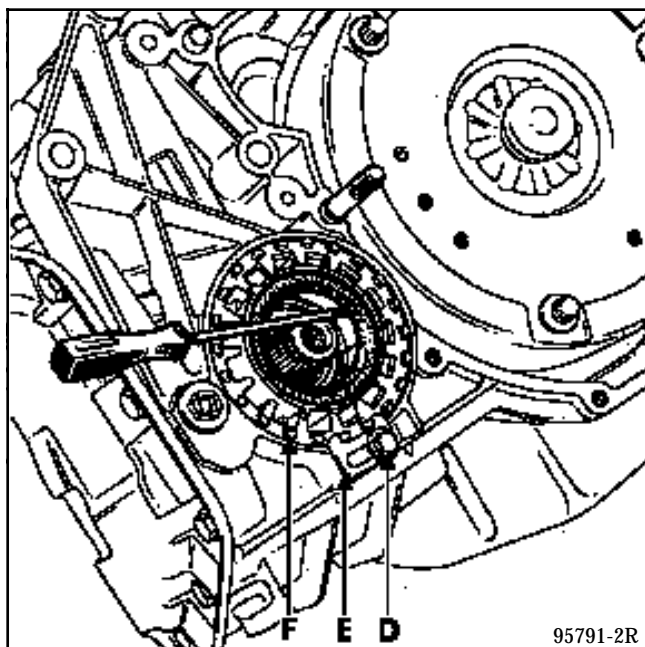
23

REMOVAL

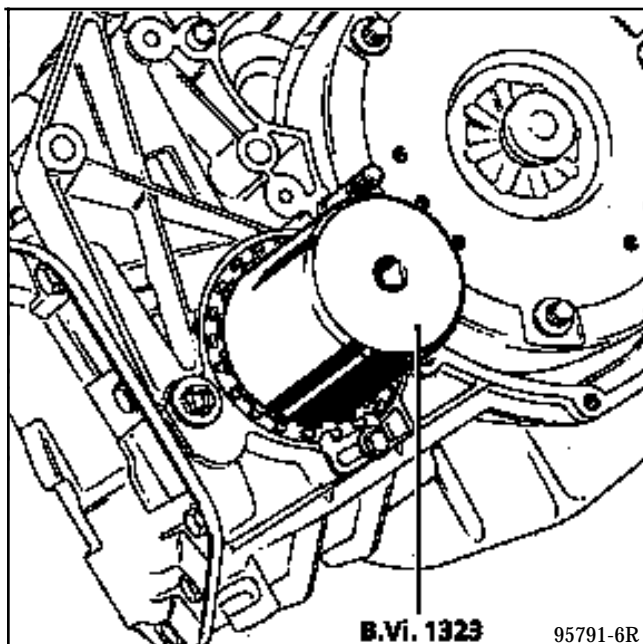
Drain the final drive and remove the shield, as explained in paragraph 1.

Locate the position of the nut (F) with respect to the sump by putting a mark on one of the teeth and on the face of the sump.

Remove bolt (D) and the locking plate (E) from the nut using tool **B.Vi. 1323**, remove the nut, counting the number of turns it takes.



Replace the O-ring on the nut, cleaning the seat properly and lubricating the new seal with final drive oil.



REFITTING

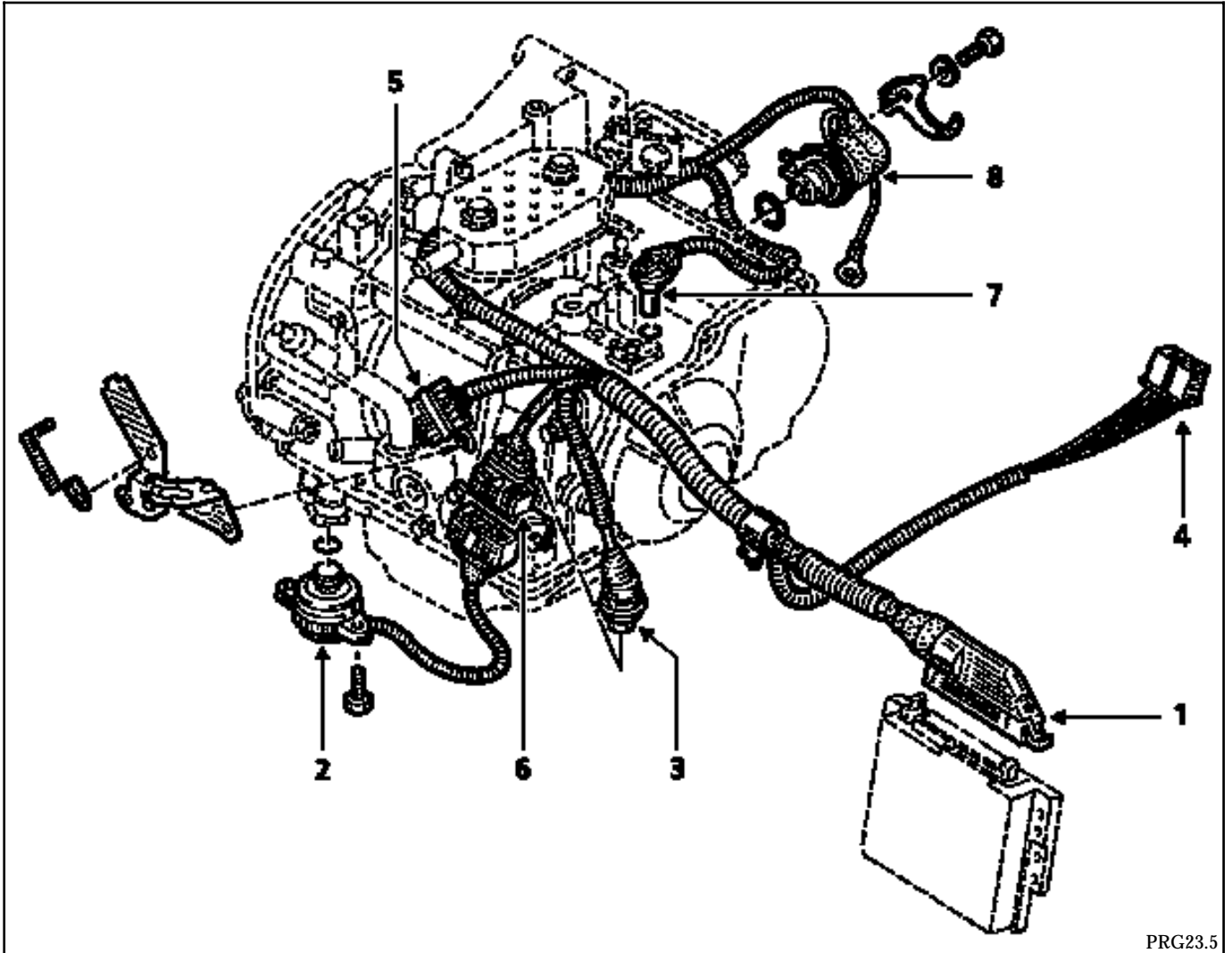
Refit the nut, turning the same number of turns as when it was removed.

Align the marks made on the nut and the sump. Replace the bolt (D) and the locking plate (E).

Refit the shield after having replaced the lip seal if necessary (see paragraph 1).

Fill the final drive with oil.

The new generation of A4.2 automatic transmission is fitted with monoblock wiring which means that many of the intermediate connectors are no longer required. As a result, the method for repairing sensors or switches is different.



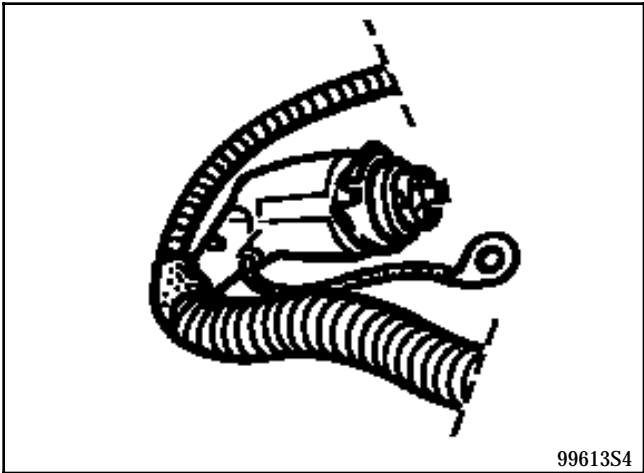
PRG23.5

- 1 - 55 track connector on the automatic transmission computer
- 2 - Oil pressure sensor
- 3 - Electro-hydraulic interface (sealed connector)
- 4 - Inter engine unit connection
- 5 - Injection/diagnostic connector
- 6 - Pressure sensor connector
- 7 - Speed sensor
- 8 - Multifunction switch

REPAIRING COMPONENTS

Most of the components comprising the mono-block wiring are not directly interchangeable. Only the pressure sensor can be replaced without having to cut the cable.

REPAIRING THE MULTIFUNCTION SWITCH

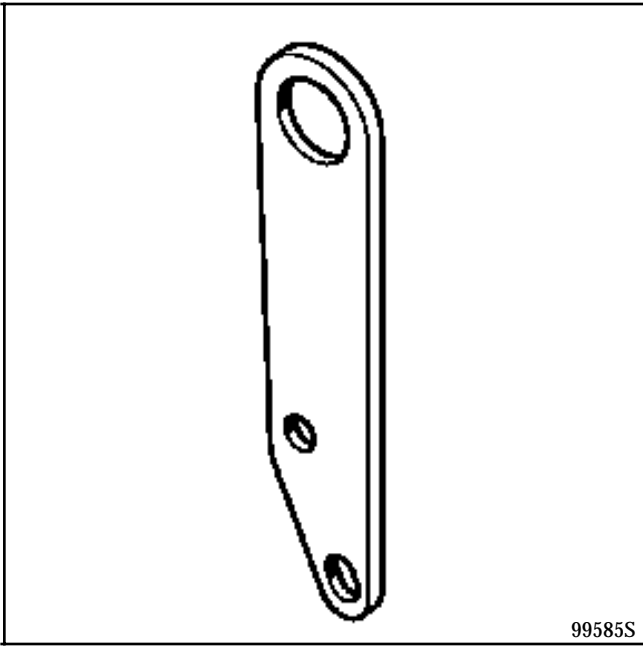


Initially, this is checked with the 55 track connector using the bornier **Sus. 1228** and the table below.

If this checking procedure highlights a fault, section the cable 15 cm from the switch and check between the section and the 55 track connector. See the wiring diagram and table below.

If one of the insulations or one of the continuities is not assured, replace the multifunction switch and refer to note 8074 for the repair procedure.

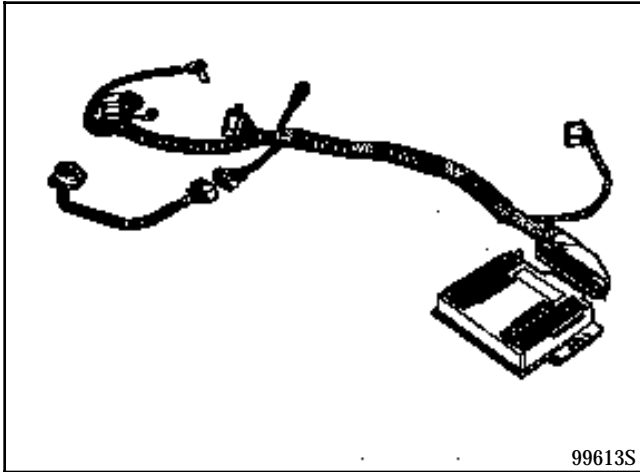
Refer to notes 8074 and 8075 for repairing the speed sensor and using the locally made lifting plate.



NOTE: remember to distribute the connection joints.

LEVER POSITION	ASSURED CONTINUITIES	ASSURED INSULATIONS
P/N	Terminal 44 / Earth	Terminals 51 and 52 / Earth Terminal 27 / Terminal 46
R	Terminal 27 / Terminal 46	Terminals 44, 51 and 52 / Earth
D	None	Terminals 44, 51 and 52 / Earth Terminal 27 / Terminal 46
3	Terminal 51 / Earth	Terminals 44 and 52 / Earth Terminal 27 / Terminal 46
2	Terminals 51 and 52 / Earth	Terminal 44 / Earth Terminal 27 / Terminal 46
1	Terminal 52 / Earth	Terminals 44 and 51 / Earth Terminal 27 / Terminal 46

Removing the wiring assembly is specific to the AD4 A4.2.

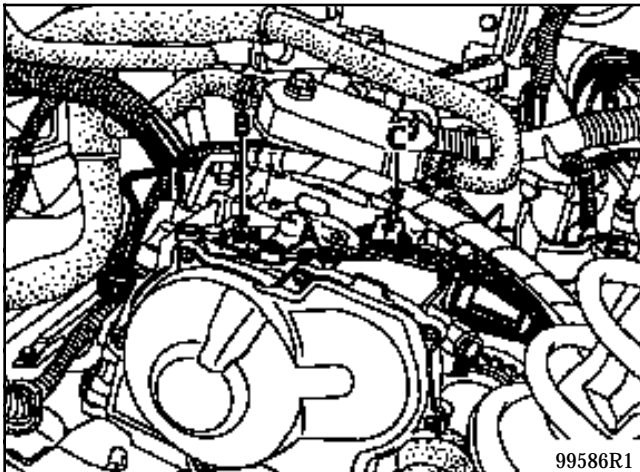


REMOVAL

Put the vehicle on a two post lift.
Disconnect the battery.
Remove the front left hand wheel.
From the wheel arch:

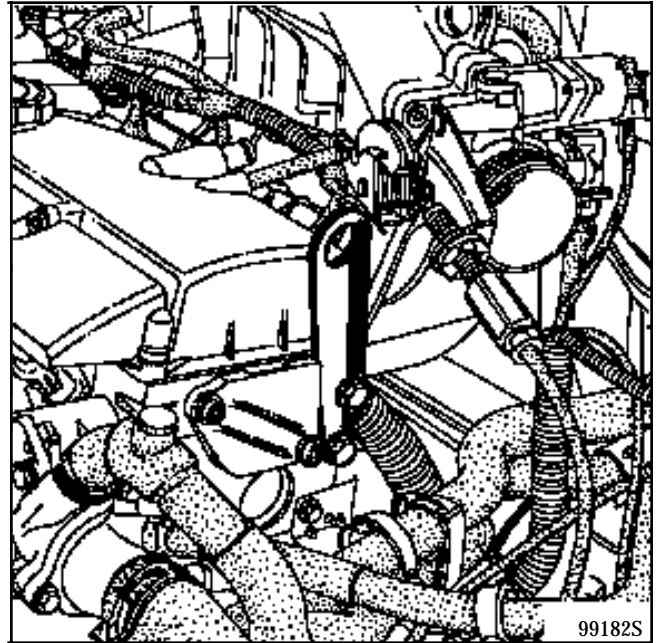
Remove:

- the earth wire from the multifunction sensor,
- the multifunction sensor mounting bolt (A).

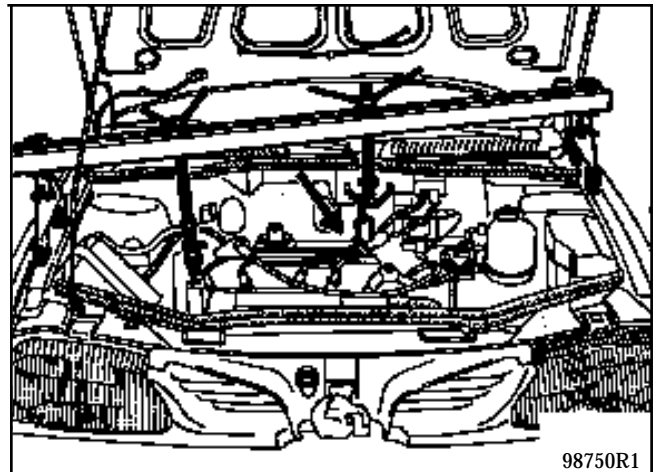


On the vehicle:

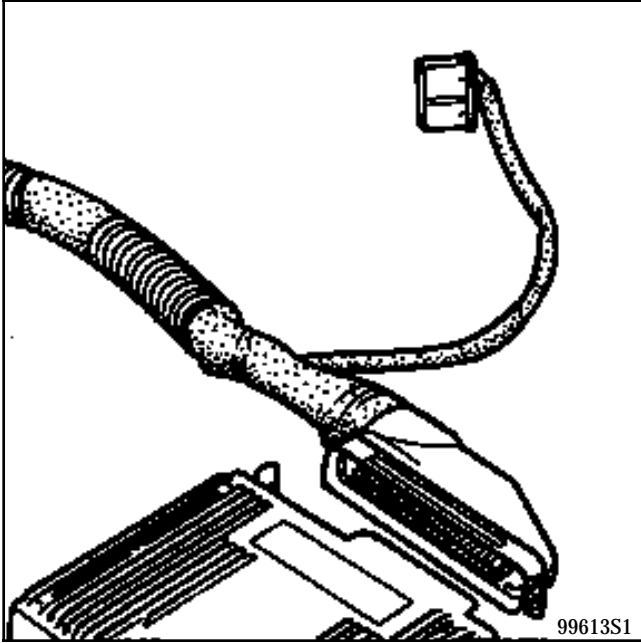
- position the lifting plate (tool made locally as described on the next page).



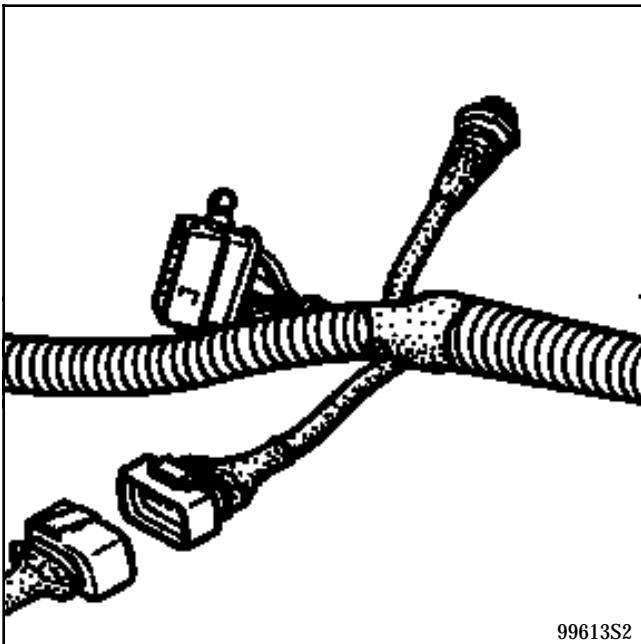
Fit the engine support tool with the support bracket on the left hand side.



Remove the engine torque traction link on the gearbox side.
Remove the speed sensor (mounting bolt (B)).
Remove gear selector control ball joint (C).
Remove all the wiring assembly, taking note of its position and mountings so that is refitted correctly.
Disconnect the 52 track connector and the connector in the inter engine unit.



Disconnect the connectors from the pressure sensor and the diagnostic/injection socket.
Disconnect the sealed connector switch.



Remove the wiring.

REFITTING

Replace the wiring without securing it.

Refit:

- the speed sensor,
- the multifunction sensor.

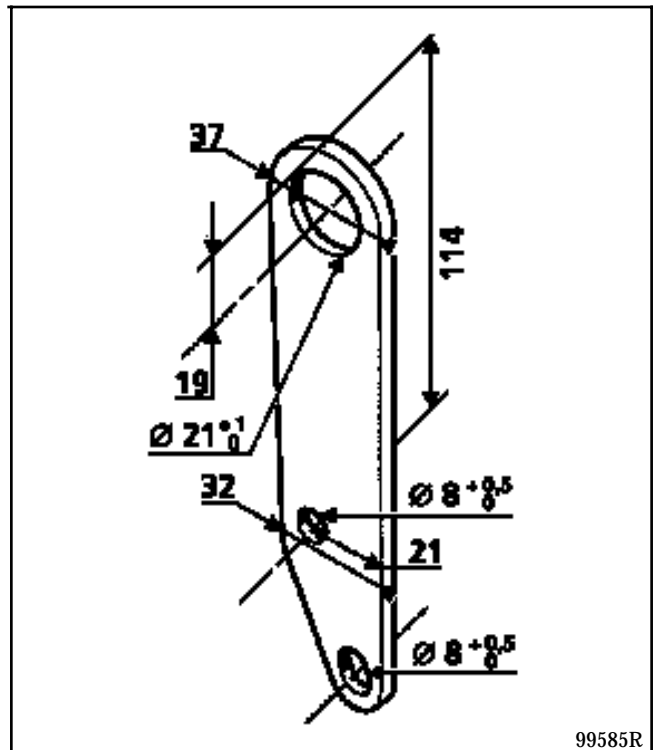
Refit the mounting on the gearbox side.

Remove the engine support tool.

Reconnect all the components.

Secure the wiring using its clips.

LIFTING PLATE



There are two possible solutions for manufacturing this plate.

- 1) By modifying the existing plate on the E7J engine (air filter support plate mounted onto the cylinder head).
- 2) By having it manufactured locally
 - Parts list:
 - 1 plate of thickness 4 or 5 mm in semi-hard steel,
 - 2 HEX M8 \times 20 bolts (collar bolts).

AUTOMATIC TRANSMISSION

Wiring diagram

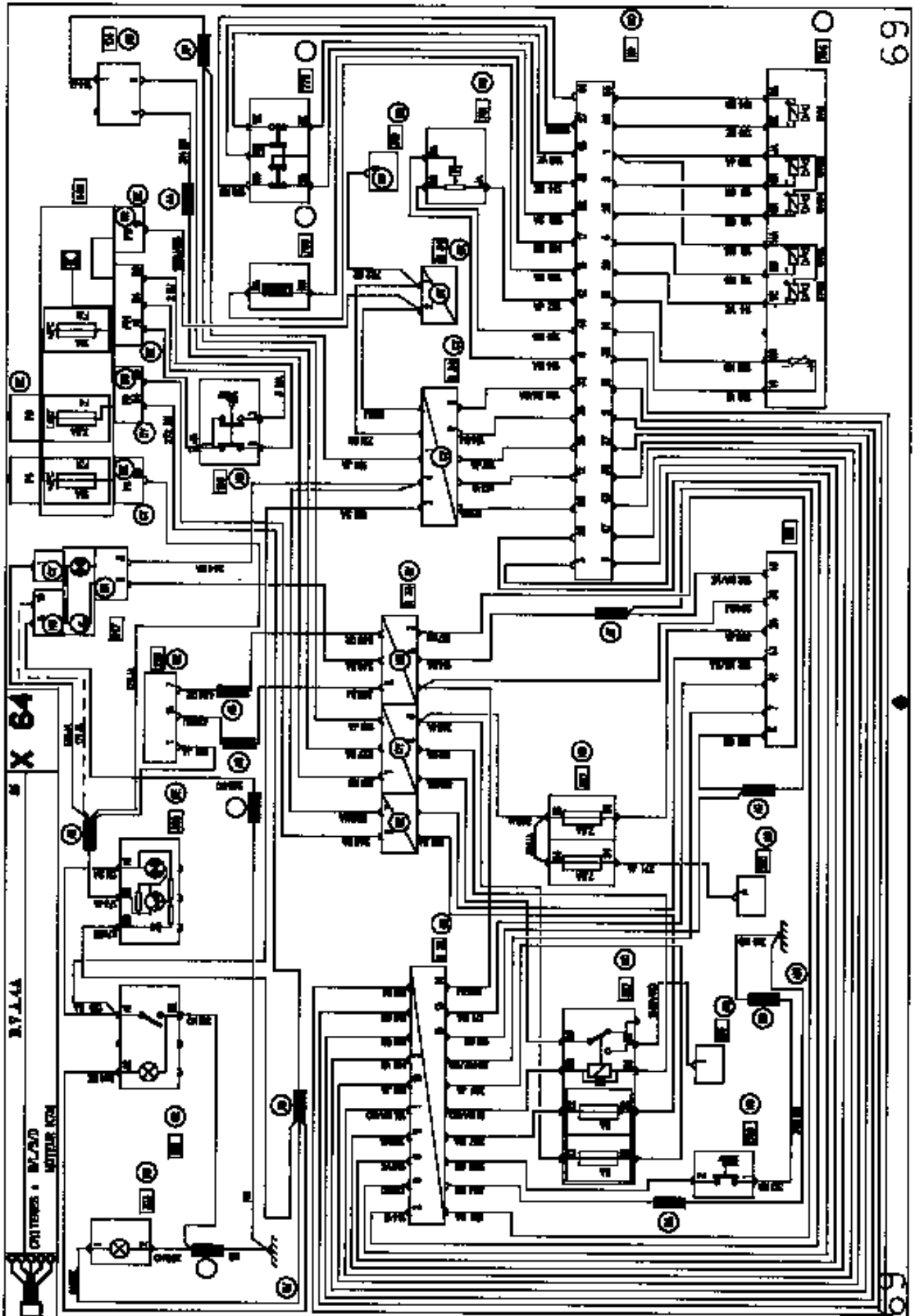
23

104 - Ignition switch
119 - Automatic transmission computer
120 - Injection computer
129 - ECO/PERF selector switch
160 - Stop switch
163 - Starter motor
225 - Diagnostic socket
247 - Double headlight relay
250 - Speed sensor
303 - Automatic transmission selector lighting
319 - Air conditioning control panel
535 - ECO/PERF selector switch warning light
569 - 4 speed automatic transmission kickdown
597 - Engine fuse box
645 - Passenger compartment connection unit
754 - Electrical/hydraulic interface
779 - Automatic transmission multifunction switch
780 - Automatic transmission turbine or vehicle speed sensor
781 - Line pressure sensor
R22 - Engine/automatic transmission
R34 - Engine/dashboard
MH - Engine electric earth
MJ - Front right pillar electric earth

AUTOMATIC TRANSMISSION

Wiring diagram

23



Put the vehicle on a two post lift.

Lift the vehicle until the wheels are a few centimetres off the ground.

Connect the **XR25**.

Put the **ISO** switch on **S8**.

Enter the A4.2 transmission code :

D 1 4

then #06 to display the engine speed.

Accelerate fully with the brake fully on.

The engine speed should stabilise to :

- **K7M engine: 2430 rpm.**

If this value is not correct, replace the converter.

A timing point which is **more than 200 rpm.** below the specified value requires the automatic transmission to be replaced.

NOTE : for all diagnostic questions, refer to MR TA.A, "General".

TYPE	QUANTITY	COMPONENT CONCERNED
Loctite SCELBLOC	Coating	Stub axle splines
RHODORSEAL 5661 (example : CAF 4/60 THIXO)	Coating	Driveshaft roll pins on gearbox end
MOLYKOTE BR2	Coating	Seal splines on gearbox end
FRENBLOC	Coating	Brake caliper bolt
MOBIL CVJ 825	320 g	GE 86 seal
Black Star	140 g	AC 1700 seal
or	160 g	RC 490 seal
MOBIL EXF 57C	130 g	GI 62 seal

Allocation of seals on vehicles

SEALS	Right hand driveshaft	Left hand driveshaft	Wheel end	Gearbox end
GE 86	X	X	X	
AC 1700	X	X	X	
RC 490	X			X
GI 62	X			X
GI 69		X		X

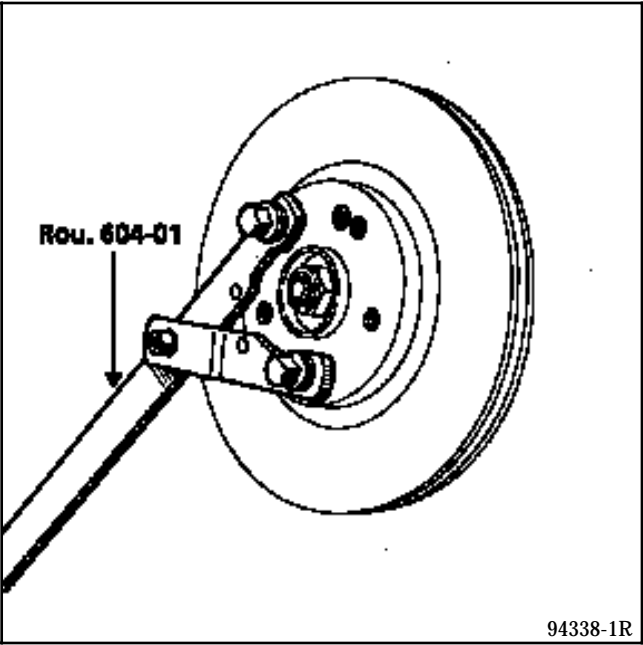
SPECIAL TOOLING REQUIRED	
Rou. 604 -01	Hub immobiliser
T.Av. 476	Ball joint extractor
T.Av. 602	Driveshaft puller
T.Av. 1050-01	Hub extractor
B.Vi. 31-01	Roll pin punch

TIGHTENING TORQUES (in daN.m)	
Driveshaft nut	25
Gaiter mounting bolt on gearbox	2.5
Wheel bolt	9
Shock absorber base nut	17
Brake caliper mounting bolt	10
Track rod end nuts	3.5



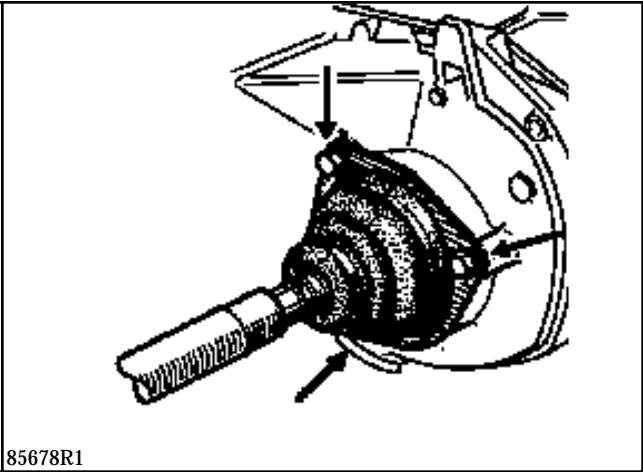
REMOVAL

- Remove:
- the brake assembly (suspend it from the chassis so as not to damage the brake pipe),
 - the driveshaft nut: tool Rou. 604-01.



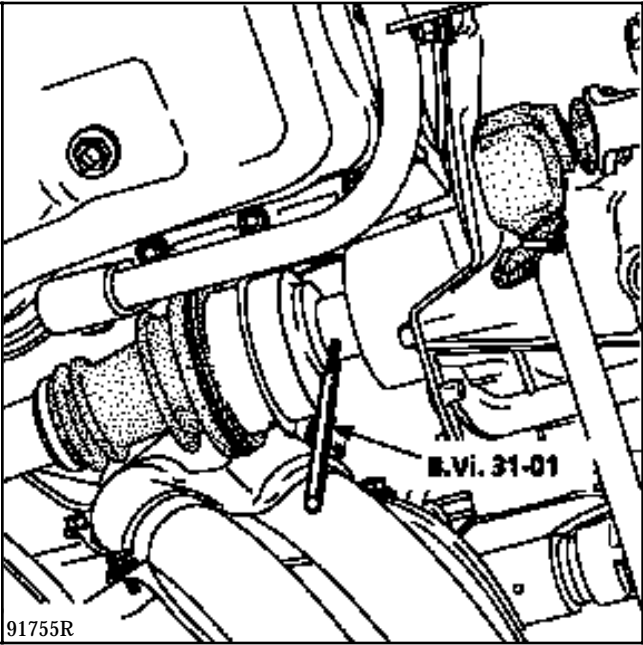
Left hand side

- Drain the gearbox.
- Remove the three bolts



Right hand side

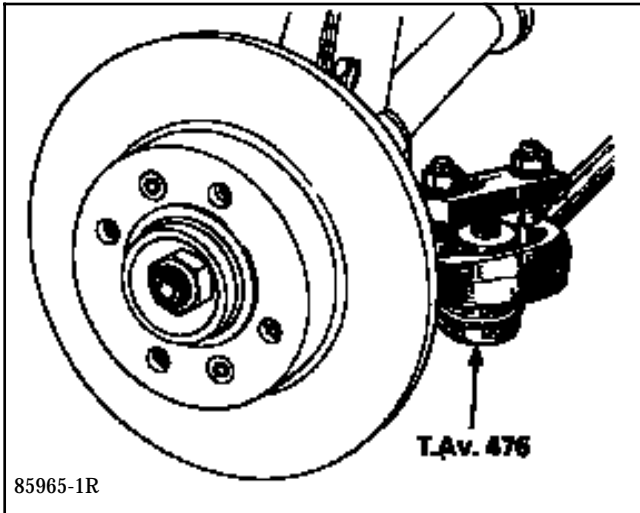
- Remove the pin: tool B.Vi. 31-01.



On both sides

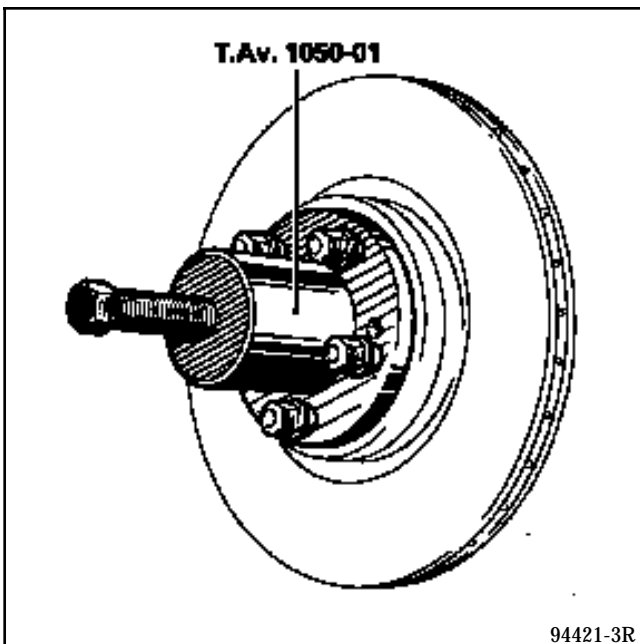
Remove:

- the track rod end nut : tool T.Av. 476,

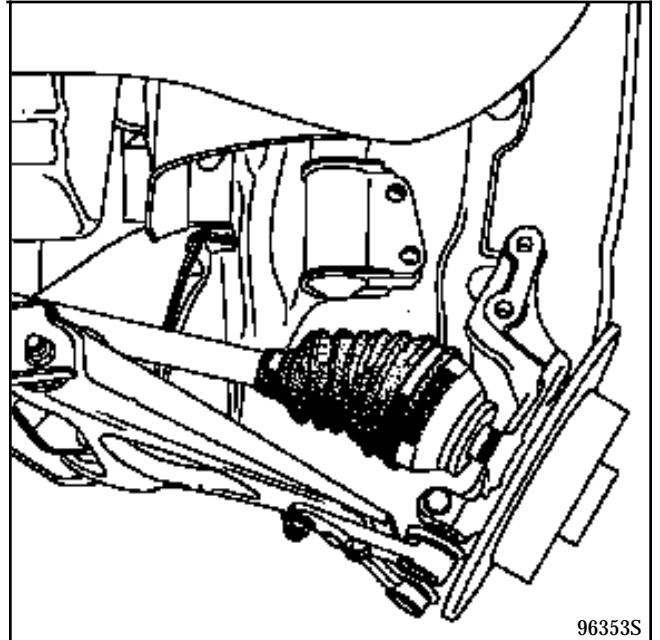


- the upper mounting bolt of the shock absorber base.

These vehicles are fitted with bonded driveshafts. They therefore have to be pushed back using tool T.Av. 1050-01.



Remove the lower mounting bolt on the shock absorber base and extract the driveshaft

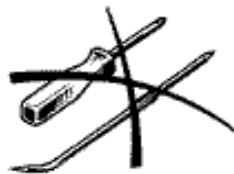
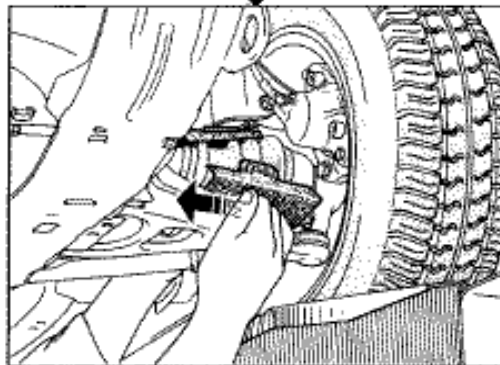
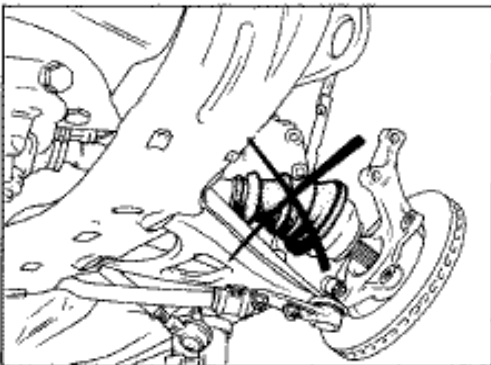
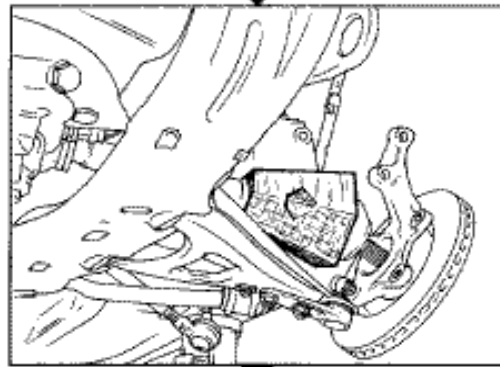
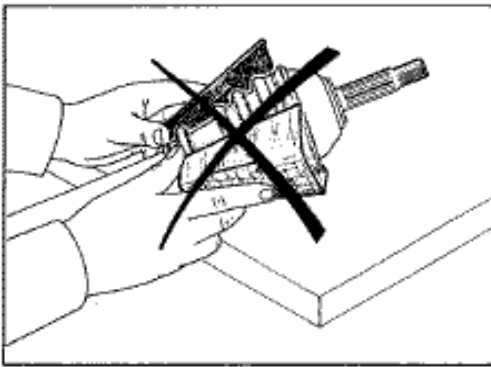
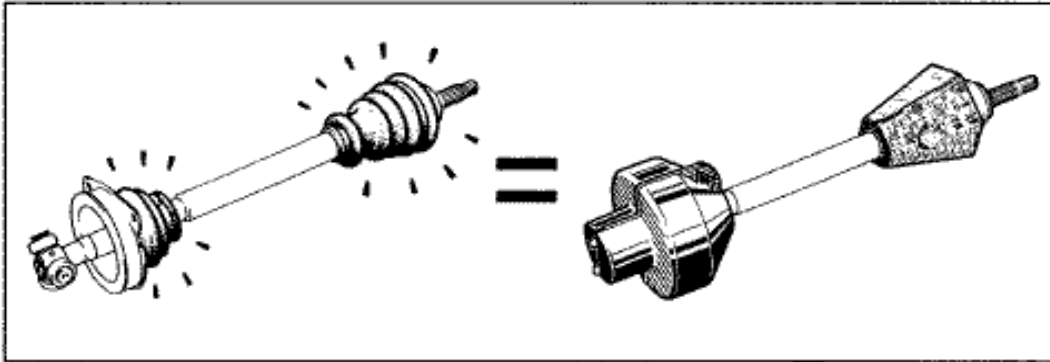


Take care not to "damage" the gaiters during this operation.

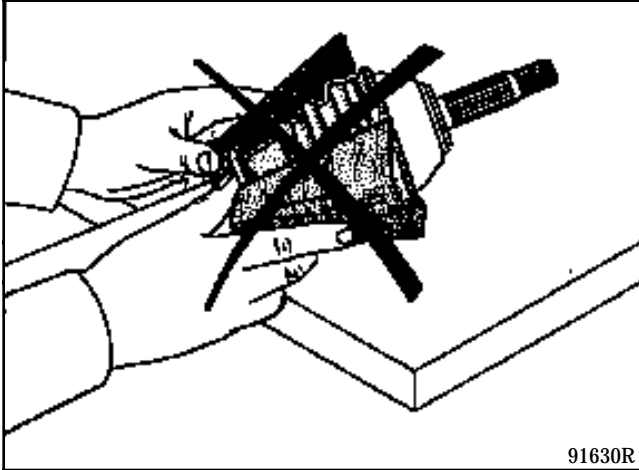
REFITTING

NOTE : the Parts Department now supplies driveshafts fitted with protectors and accompanied with assembly instructions. These instructions must be complied with in order to ensure correct assembly of maximum QUALITY, given that the slightest knock to these gaiters will result in the rubber splitting in time and will lead to the driveshaft being destroyed.

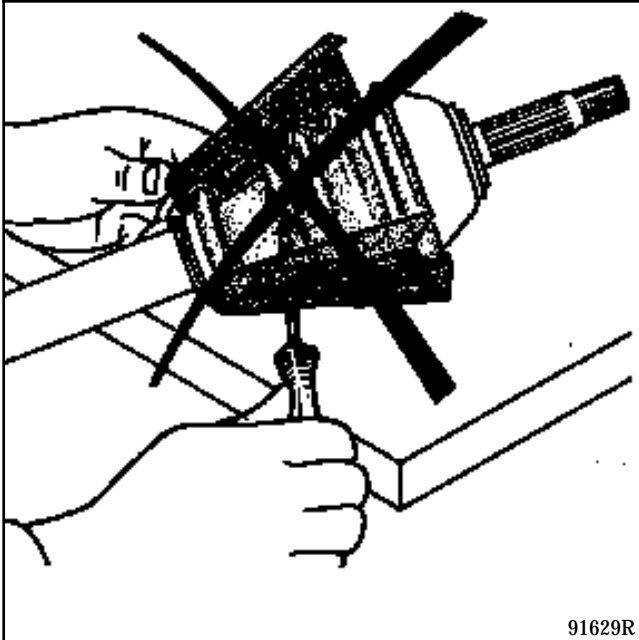
COMPULSORY ASSEMBLY INSTRUCTIONS



Never remove the cardboard protectors before the driveshaft is fitted onto the vehicle.

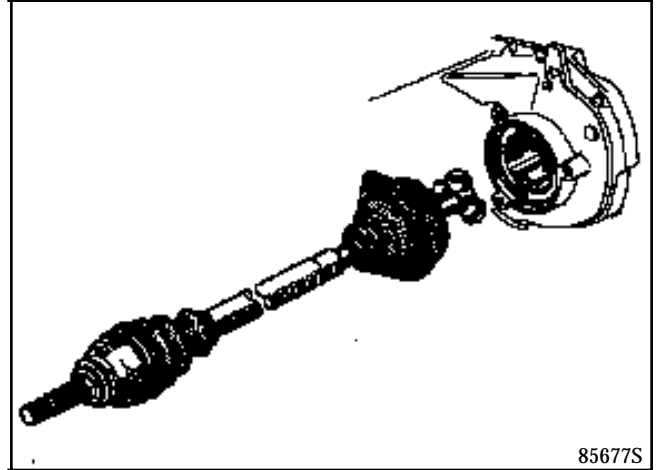


Never use a sharp object which might "damage" the gaiter.



Left hand side

Remove the plastic protector from the bearing gaiter and engage the driveshaft as horizontally as possible.



Right hand side

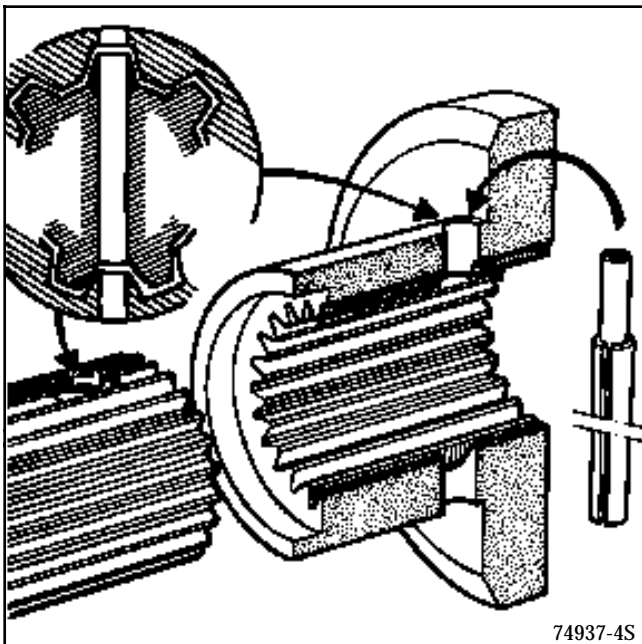
With the protector in place, coat the splines of the seal on the gearbox side with **MOLYKOTE BR2** grease.

Position the driveshaft with respect to the sun-wheel and engage it.

Check its position with the angled pin of tool **B.Vi. 31-01**.

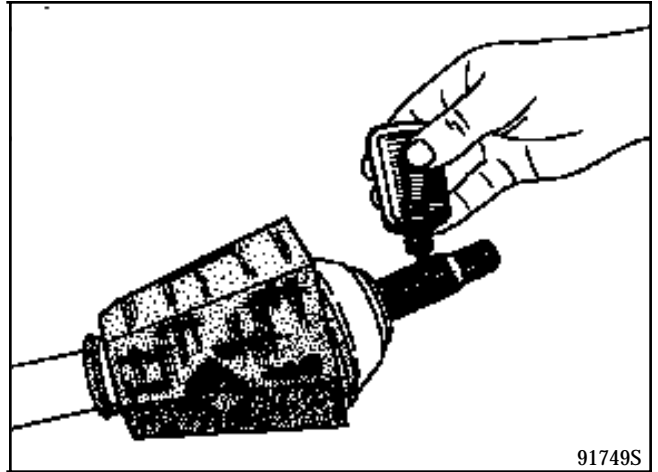
Fit two new roll pins : tool **B.Vi. 31-01**. Seal the pin holes with **RHODOSEAL 5661** (eg. : **CAF 4/60 THIXO**).

NOTE : chamfers on the leading edges of the sun-wheels make it easier to fit new roll pins.



On both sides

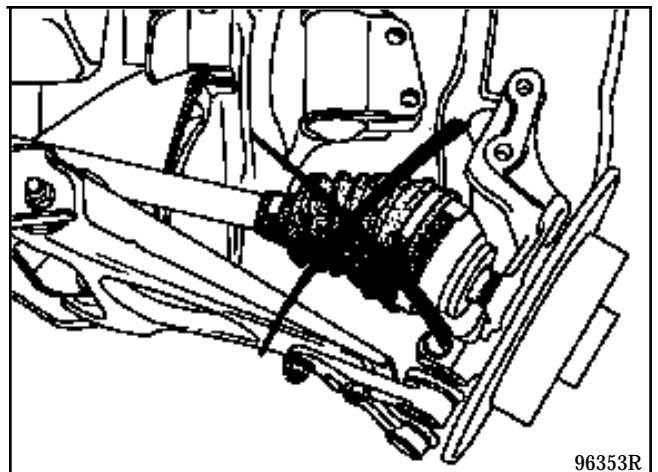
Coat the splines of the stub axle with **Loctite SCELBLOC**.

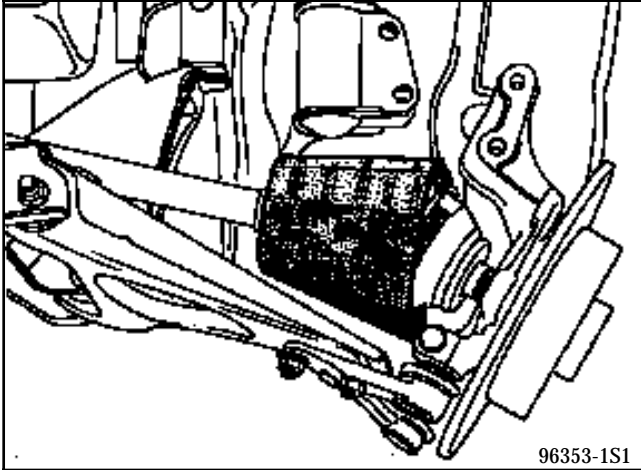


Insert the driveshaft stub axle into the hub.

It should enter freely until the thread shows allowing the stub axle nut to be fitted.

If any problems arise, use tool **T. Av. 602**.

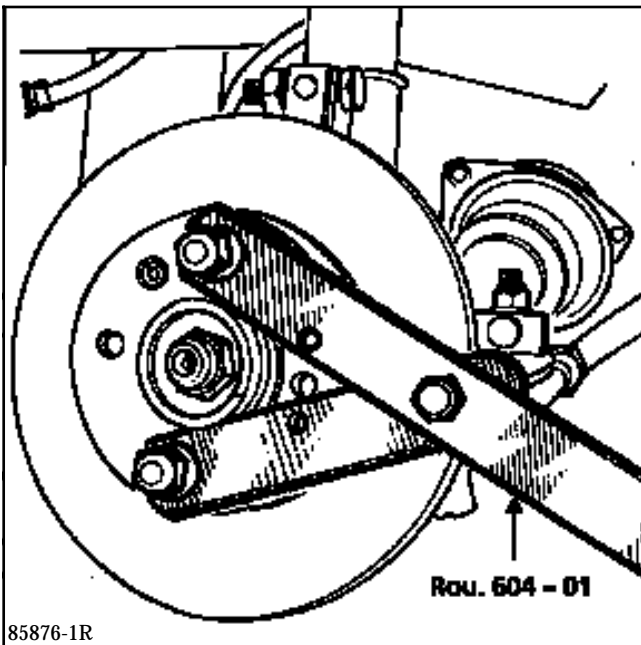




Refit:

- the two bolts at the base of the shock absorber on the stub axle carrier and tighten them to the correct torque,
- the track rod end, tighten the nut to the correct torque.

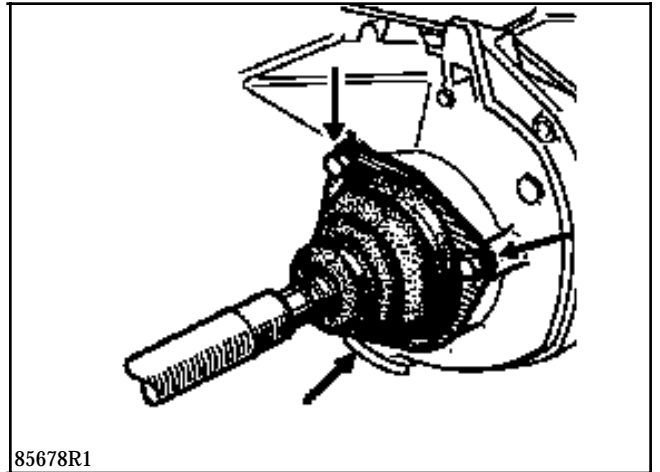
Tighten the driveshaft nut to the correct torque:
tool **Rou. 604-01**.



On the left hand side

Clean the face of the gaiter on the gearbox, refit the gaiter and the plate.

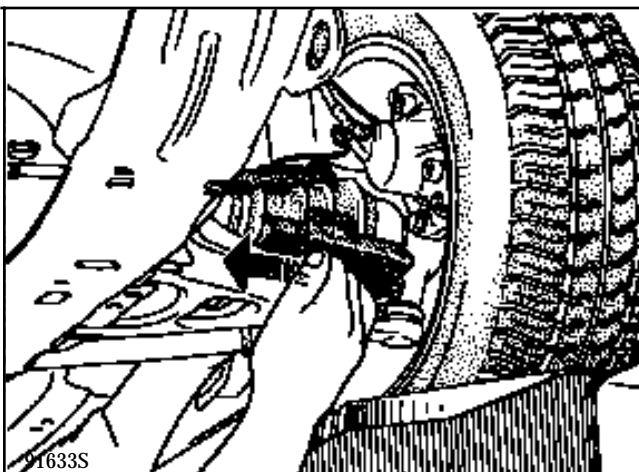
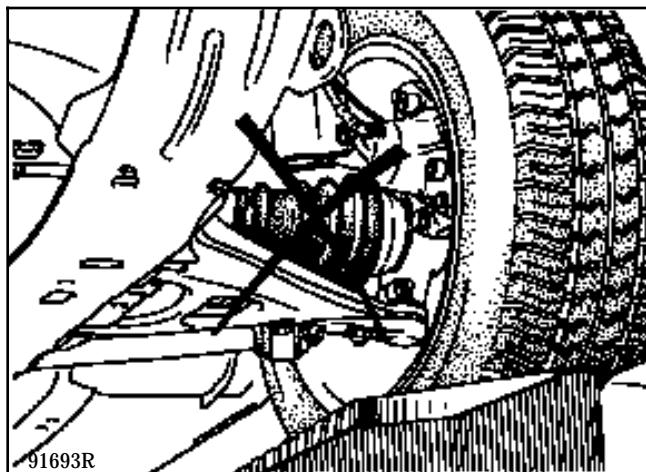
Position the gaiter as horizontally as possible and tighten the three bolts to the correct torque.



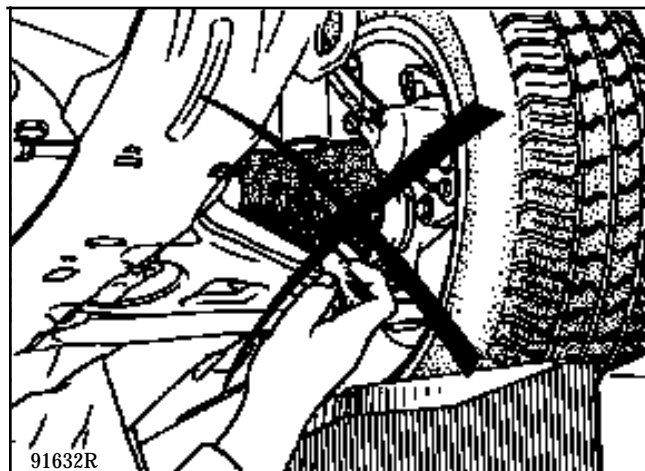
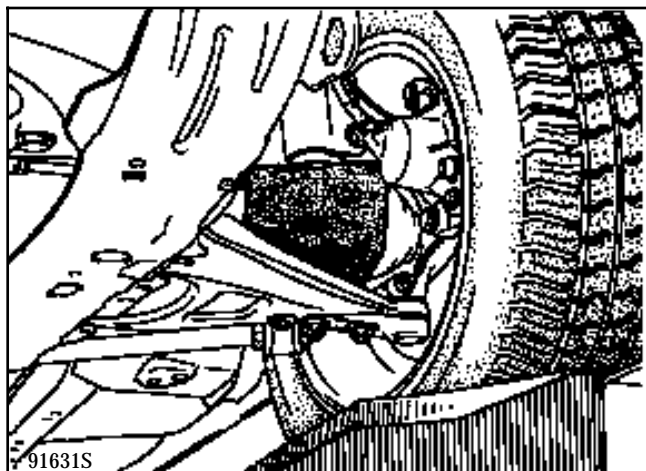
On both sides

Position the brake calipers, coat the bolts with **Loctite FRENBLOC** and tighten to the correct torque.

Lower the vehicle back down onto its wheels.



And never use a sharp object which might "damage" the gaiter.



Press the brake pedal several times to bring the piston back into contact with the linings.

If the left hand driveshaft has been replaced, refill the gearbox with oil.

ABS TARGET

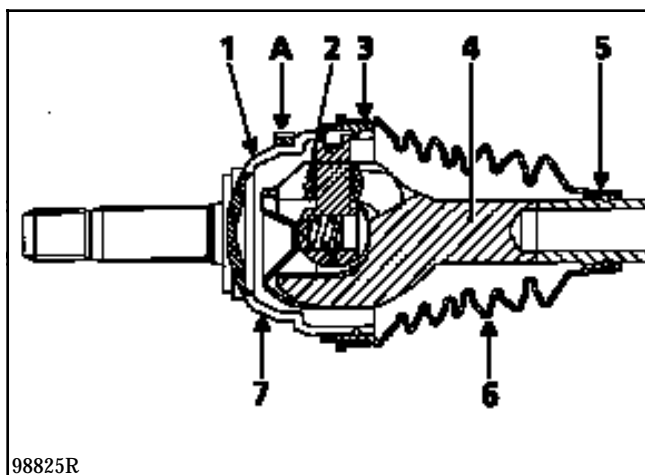
ABS targets cannot be removed (sintered steel).

The Parts Department supplies replacement machined driveshafts fitted with ABS targets.

SPECIAL TOOLING REQUIRED

T. Av. 1256	Pliers for crimping OETIKER clips
T. Av. 1168	Pliers for CAILLAU clips

- 1 Stub axle cup
- 2 Spider
- 3 and 5 Retaining clips
- 4 Yoke shaft
- 6 Thermoplastic gaiter
- 7 Retaining star
- A ABS ring (option)

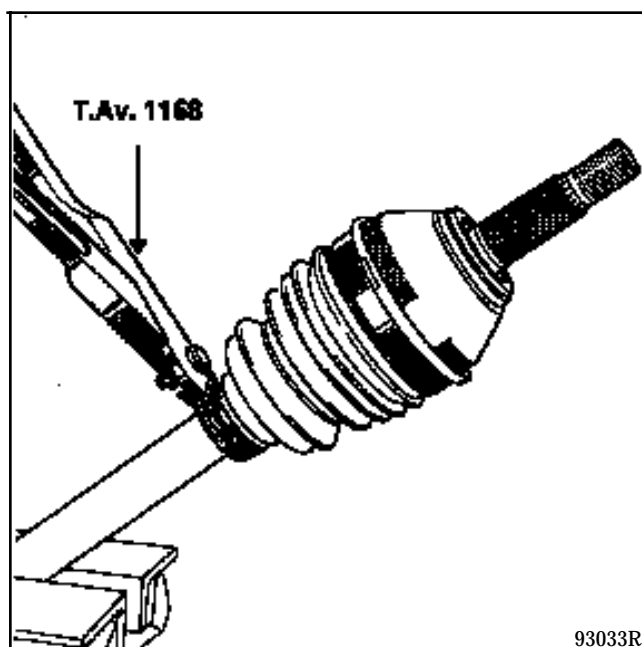


98825R

REMOVAL

Remove the gaiter from the gearbox side, referring to the method below.

Unclip the small clip using tool T. Av. 1168.

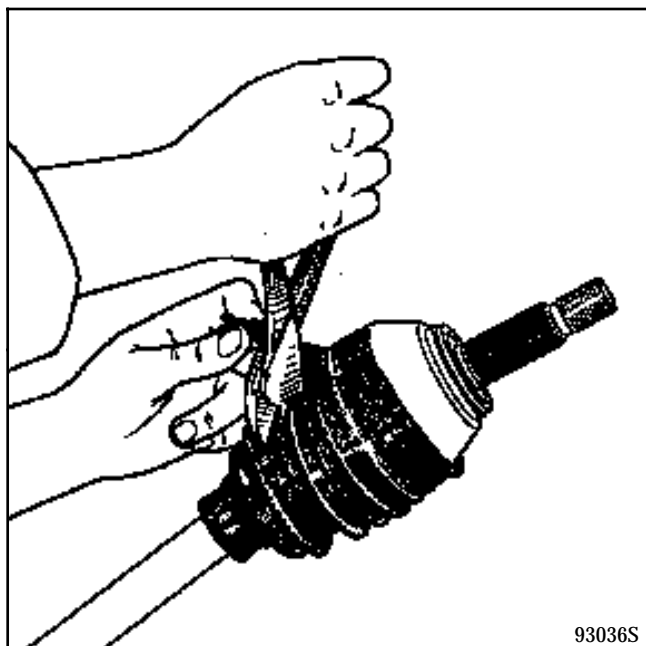


93033R

Saw the existing large clip taking care not to damage the channel of the stub axle cup.



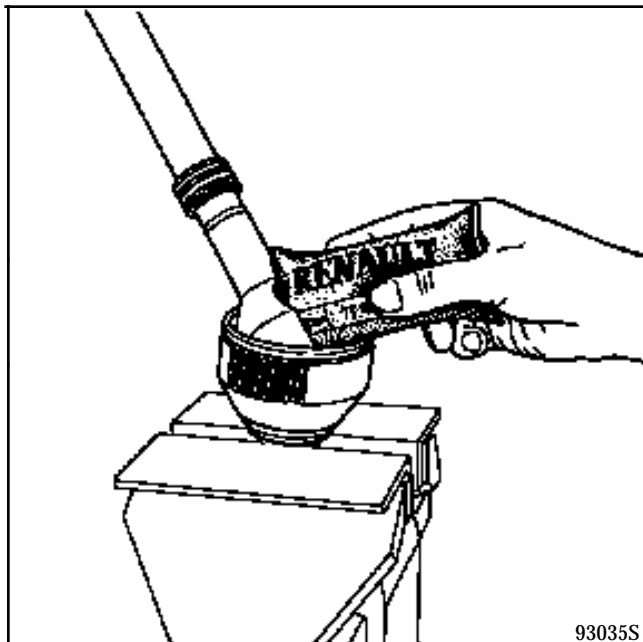
Cut the gaiter



Remove as much grease as possible.

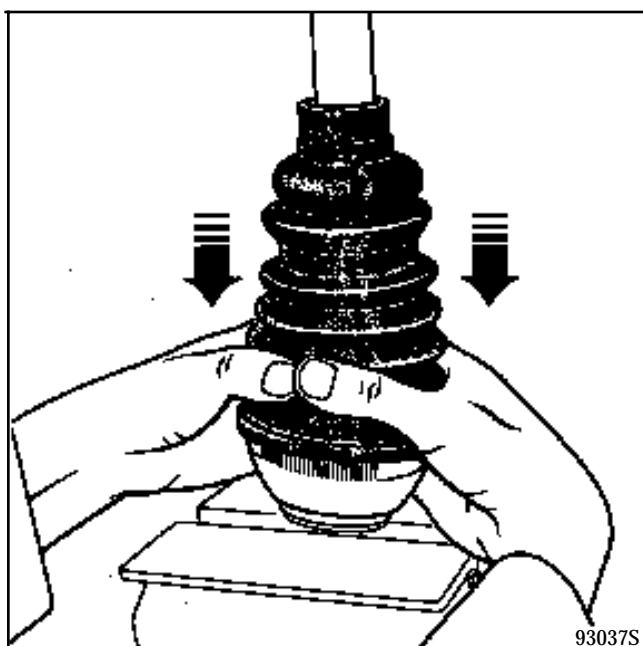
REFITTING

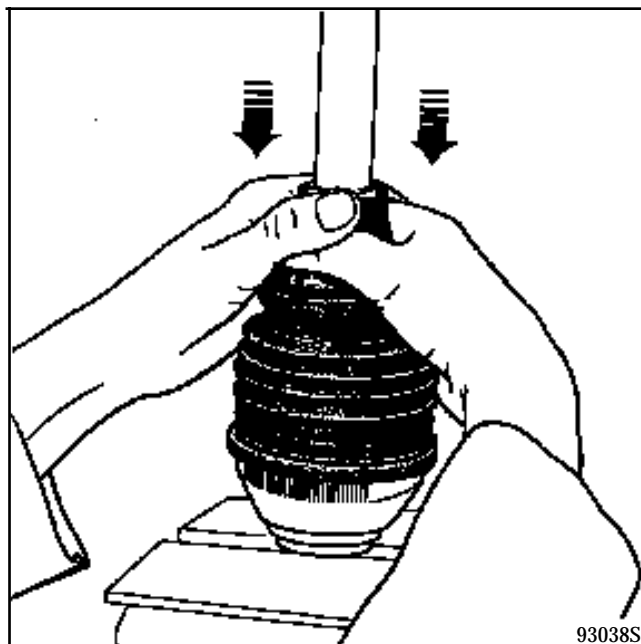
Empty the content of the grease sachet into the gaiter and into the stub axle cup.



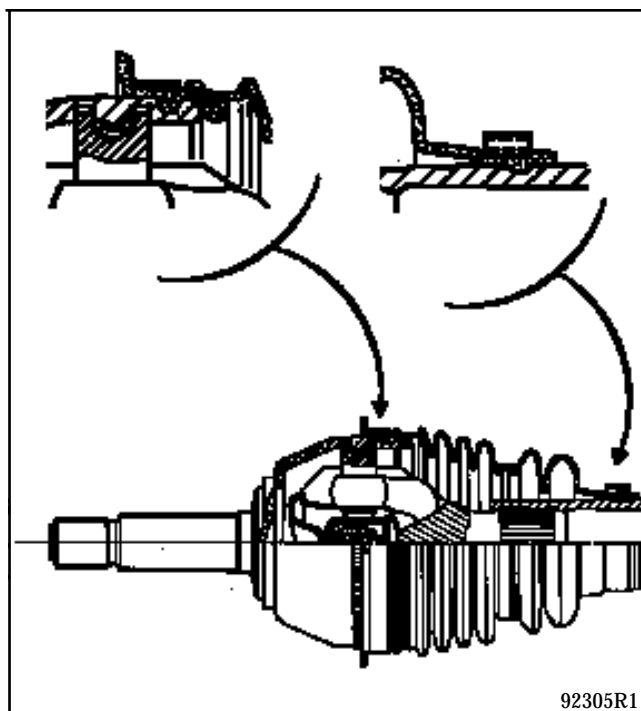
NOTE : the amount of grease, given in the "Consumables" chapter must be complied with.

Push the gaiter and insert it correctly into the channel of the stub axle cup and then into the tube channel.





Position the ends of the gaiter.



Work the seal by hand to check that both ends are correctly positioned and to expel the air.

Fit the clips and tighten them with the tool corresponding to the type of clips supplied in the kit (CAILLAU or OETIKER).

SPECIAL TOOLING REQUIRED

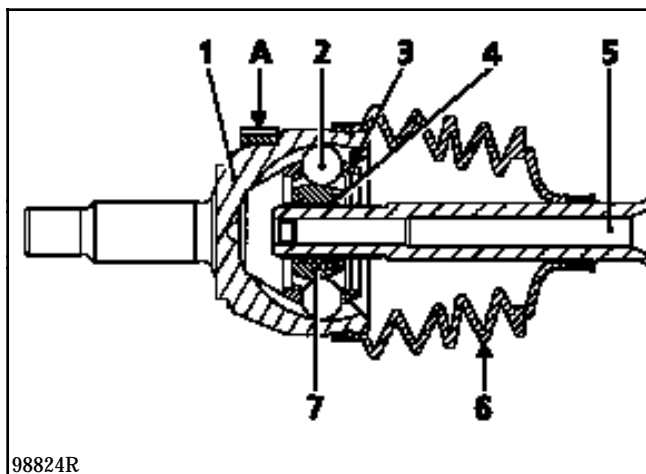
T. Av.	1256	Pliers for crimping OETIKER clips
T. Av.	1168	Pliers for CAILLAU clips

A driveshaft can be partially repaired on the wheel side:

- replacing the seal,
- replacing the gaiter.

CONSTANT VELOCITY JOINT ON THE WHEEL END

- 1 Stub axle cup
- 2 Balls
- 3 Ball cage
- 4 Locking ring
- 5 Driveshaft
- 6 Gaiter
- 7 Ball hub
- A ABS ring (option)



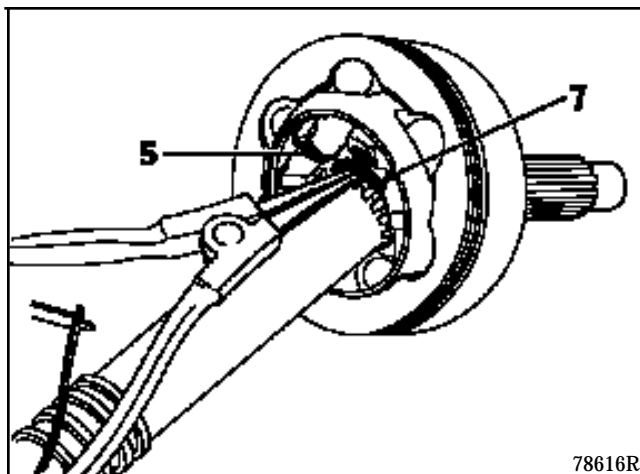
REMOVAL

Cut the clips and the gaiter along the whole length.

Remove as much grease as possible

Move the locking ring (7) and simultaneously tap the front face of the ball hub several times with a mallet (5).

Then separate the seal from the driveshaft.

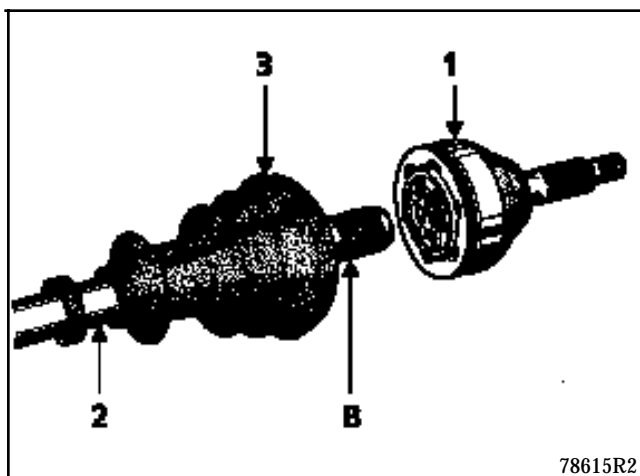


REFITTING

Put onto the shaft:

- the small collar,
- the gaiter (3).

Insert the ball seal (1) fitted with its locking ring (new) on the splines of the shaft until it presses up against the shaft grooved section (B).



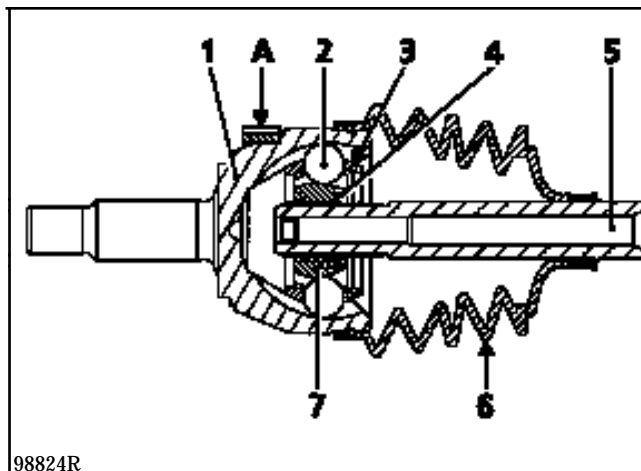
TRANSMISSION

Gaiter on wheel end

Empty the contents of the grease sachet into the gaiter and into the stub axle cup.

NOTE : the amount of grease, given in the "Consumables" chapter must be complied with.

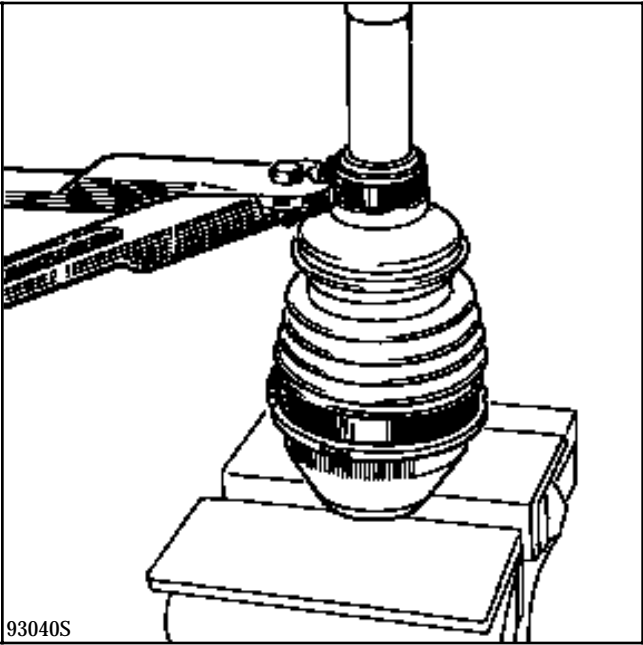
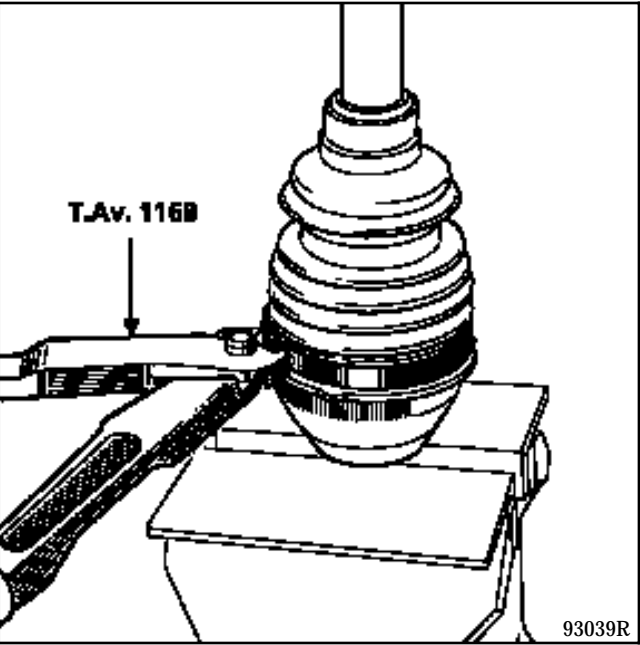
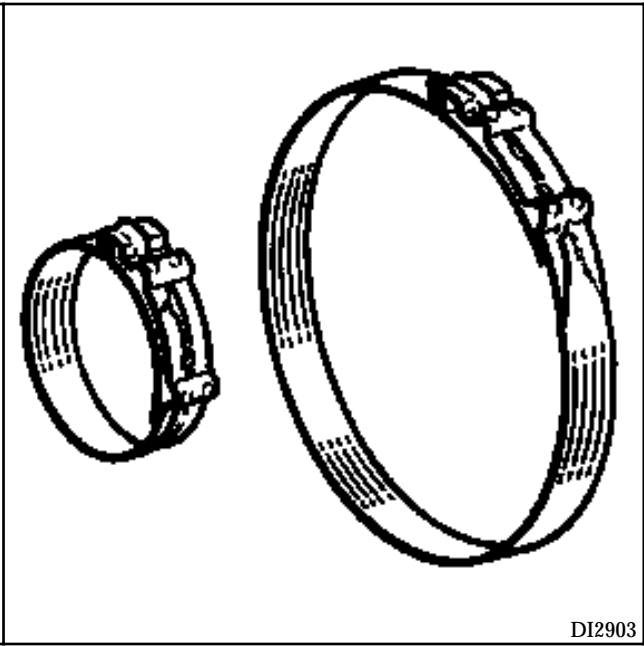
Insert the lips of the gaiter into the channels of the cup (1) and the driveshaft (5).



Fit the clips and tighten them with the tool corresponding to the type of clips supplied in the kit (CAILLAU or OETIKER).

CAILLAU CLIP

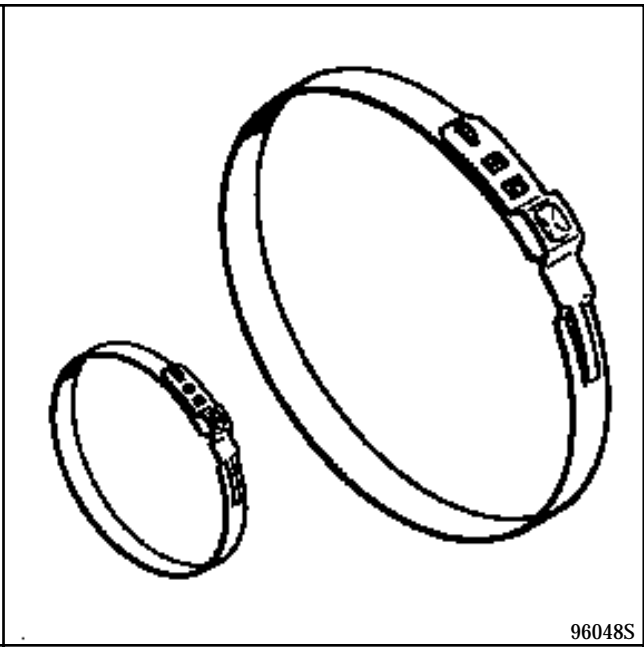
SPECIAL TOOLING REQUIRED	
T.Av. 1168	Pliers for CAILLAU clips



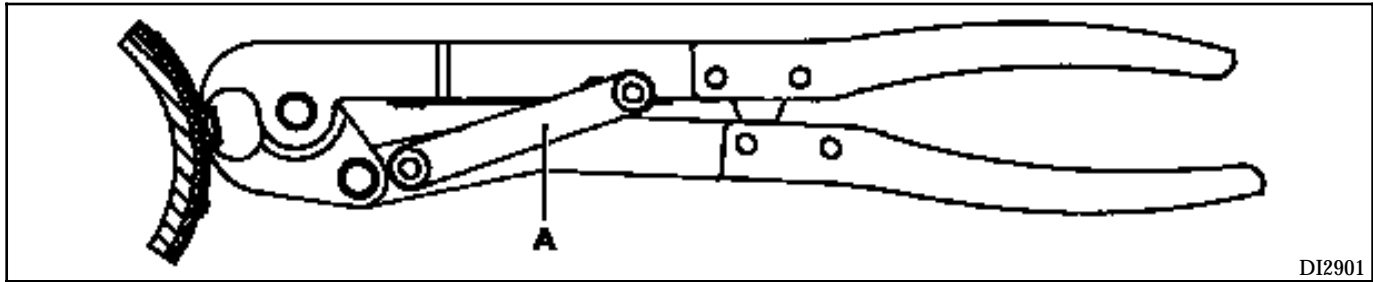
NOTE : CAILLAU clips cannot be reused.

OETIKER CLIPS

SPECIAL TOOLING REQUIRED	
T.Av. 1256	Pliers for crimping OETIKER clips

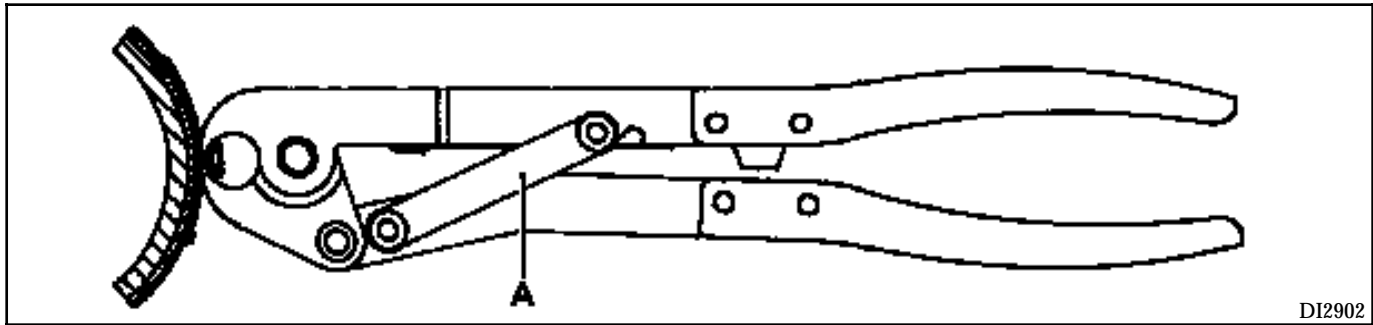


POSITION 1 - Precrimping and positioning the clip



Put the connecting bar (A) in the lower notch and close the pliers fully. The precrimped clip slides onto the gaiter and can be positioned.

POSITION 2 - Crimping



Put the connecting bar (A) in the upper notch and close the pliers fully.

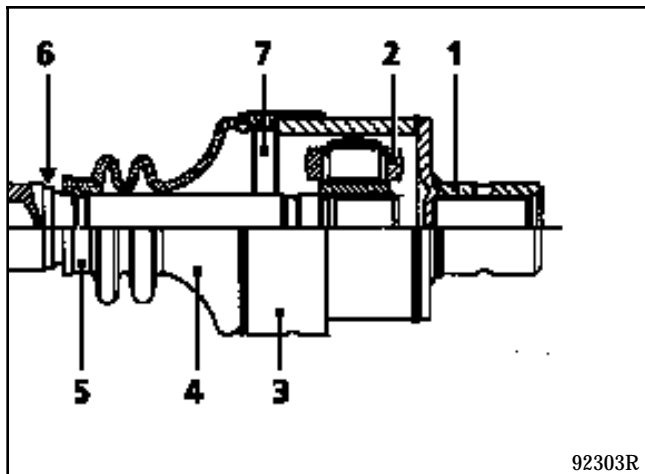
SEAL ON RIGHT HAND DRIVESHAFT

SPECIAL TOOLING REQUIRED

T.Av. 1034

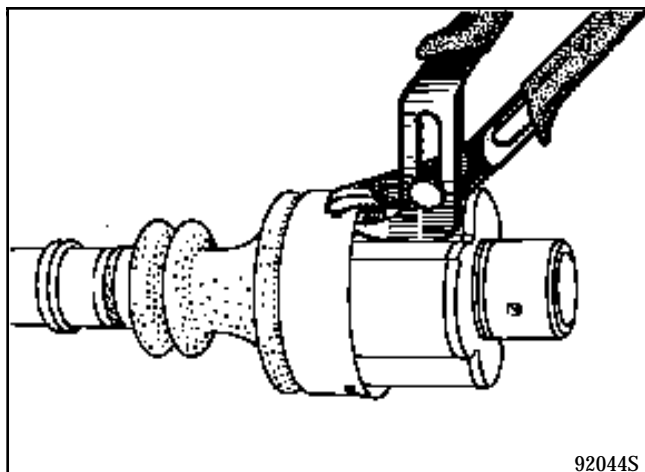
Pliers for crimping driveshaft clips

- 1 Yoke
- 2 Spider
- 3 Metal retaining cover
- 4 Rubber gaiter
- 5 Retaining clip
- 6 Driveshaft
- 7 Metal insert

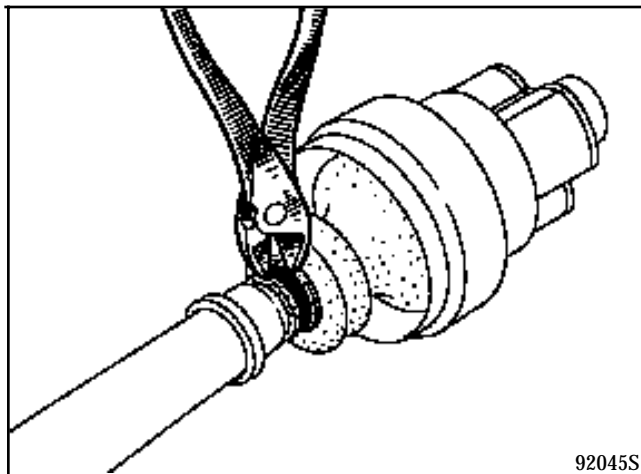


REMOVAL

Unclip the three points of the metal cover with the pliers.

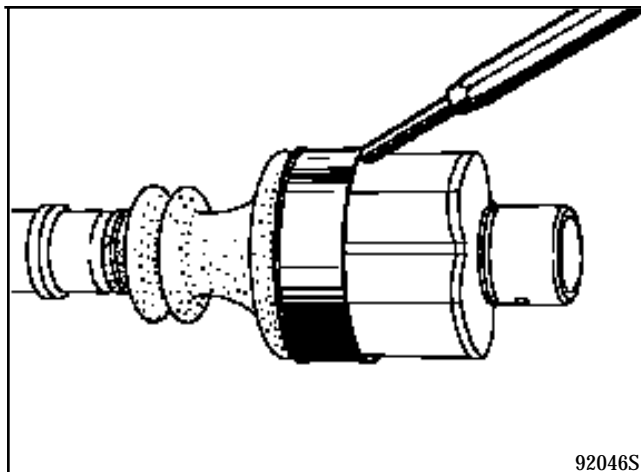


Cut the retaining clip and the gaiter along its whole length.

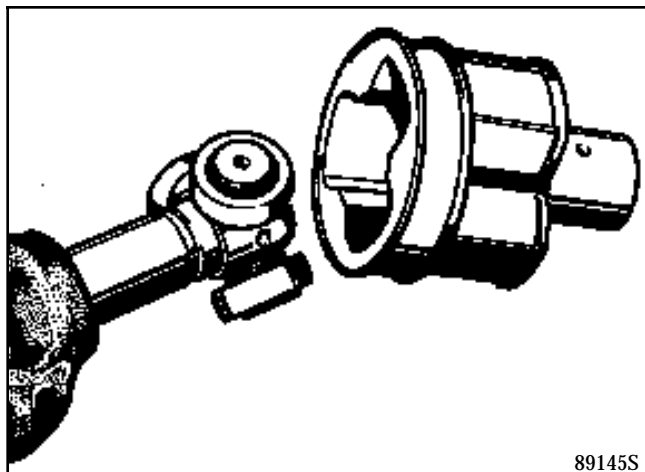


Remove as much grease as possible

Ease off the metal retaining cover.



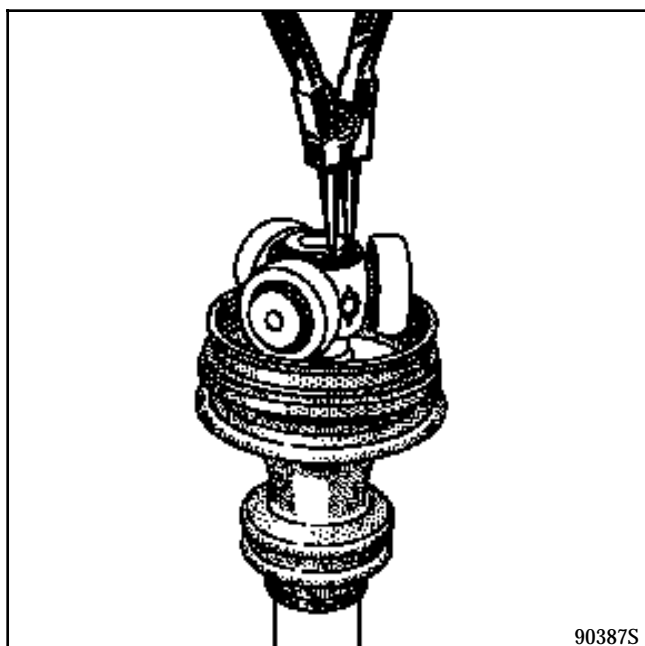
Remove the yoke.



NOTE : as the yoke does not have a stop tab, it can be removed without using force.

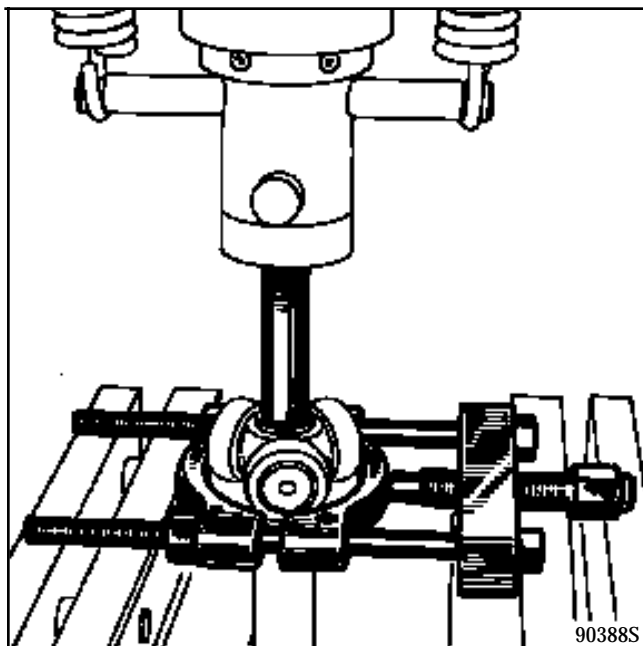
Do not remove the rollers from their respective journals since the rollers and the needles match each other and should never be interchanged.

Remove the circlips (depending on the model).



Never using thinners for cleaning these components.

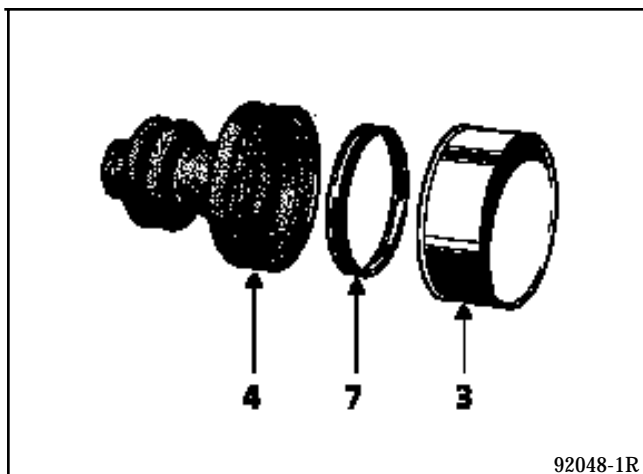
With a press, extract the triaxe component by using a **FACOM U53G** type extractor tool.



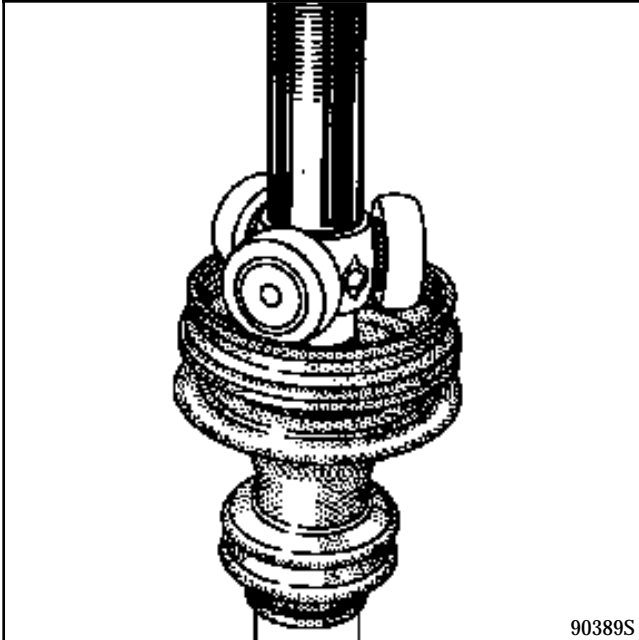
REFITTING

Lubricate the driveshaft and slide on:

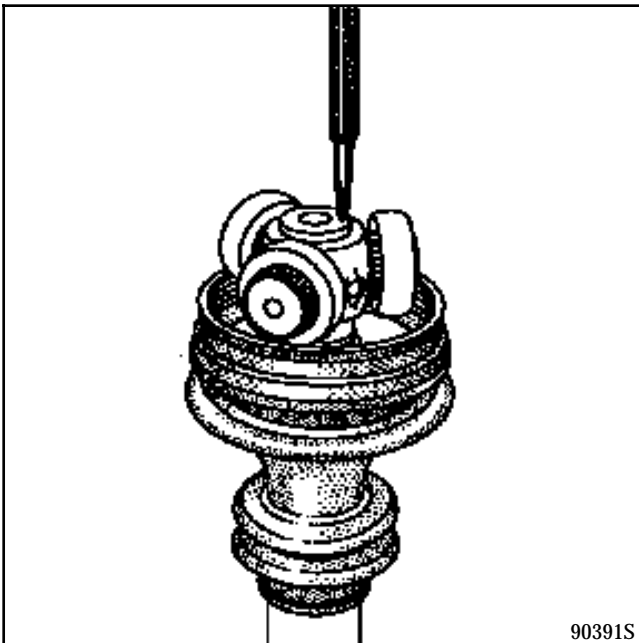
- a new retaining clip,
- the rubber gaiter (4) with the metal insert (7) and the metal retaining cover (3).



Refit the triaxe component onto the splined shaft.



Replace the retaining circlips or make three crimping points at 120° by pressing the metal from the splines onto the driveshaft.



Grease the yoke and engage it onto the triaxe component.

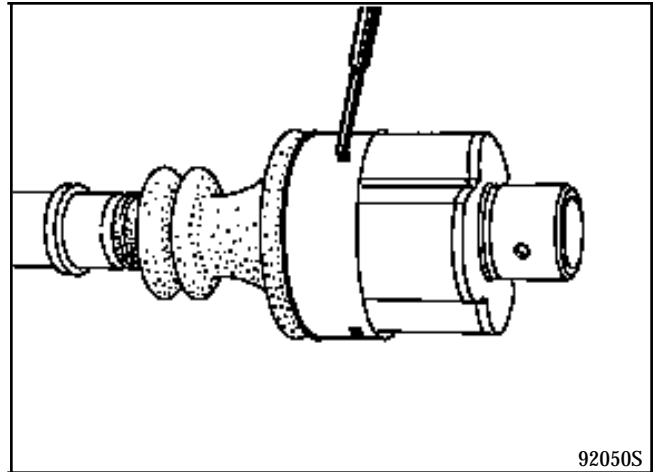
Distribute the quantity of grease into the gaiter and yoke.

NOTE : the amount of grease, given in the "Consumables" chapter must be complied with.

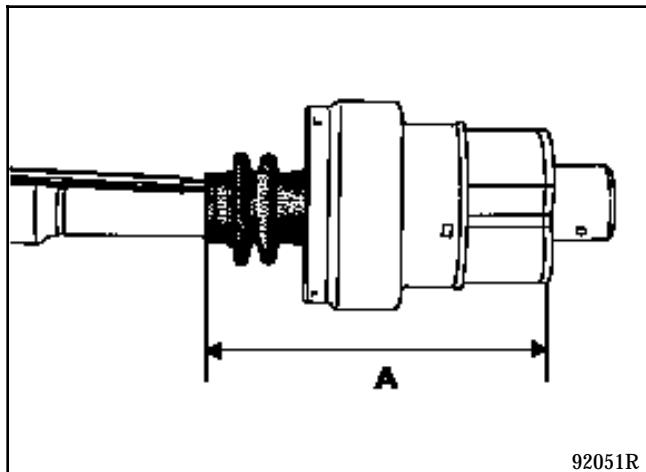
Position:

- the gaiter and its metal insert into the metal retaining cover,
- the metal retaining cover by sliding it up until it touches the guide plate on the yoke.

In this position, form three crimps in the holes designed for this purpose on the guide plate.



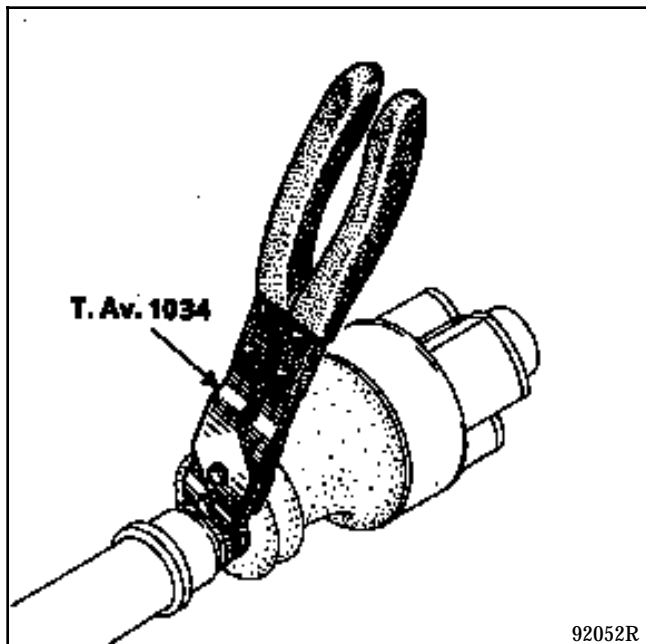
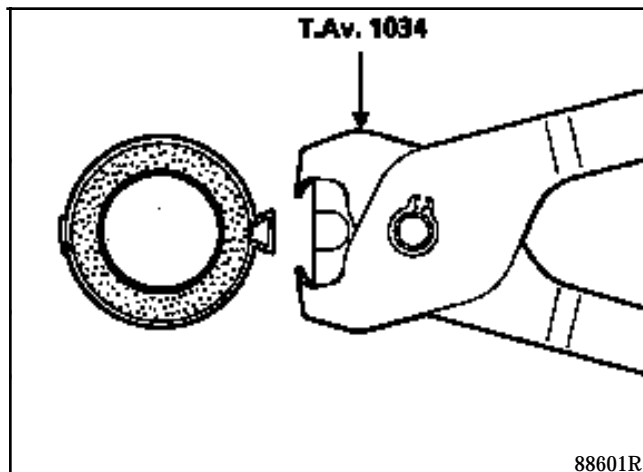
Insert a blunt rod with a rounded end between the gaiter and the shaft in order to expel the air inside the seal.



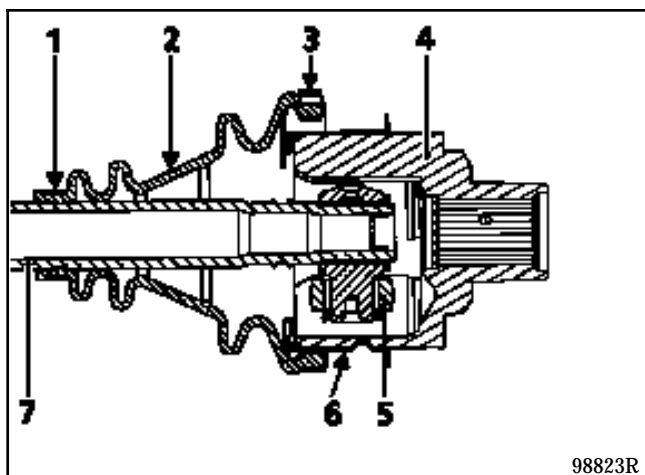
Extend or shorten the seal until it reaches a length of **A = 156 ± 1 mm** (dimension between the end of the gaiter and the machined face of the largest part of the yoke).

In this position, remove the rod

Fit the clip onto the gaiter and tighten it using tool **T.Av. 1034**.



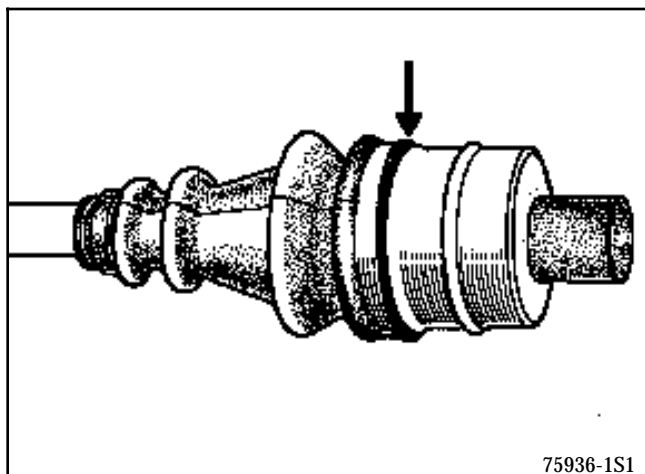
- 1 and 3 Retaining clips
- 2 Rubber gaiter
- 4 Yoke
- 5 Spider
- 6 Metal cover
- 7 Driveshaft



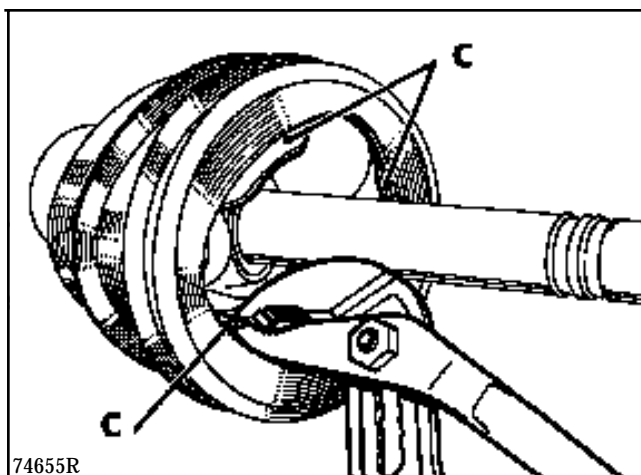
REMOVAL

Cut the crimped clip and the gaiter along its whole length.

Remove as much grease as possible.



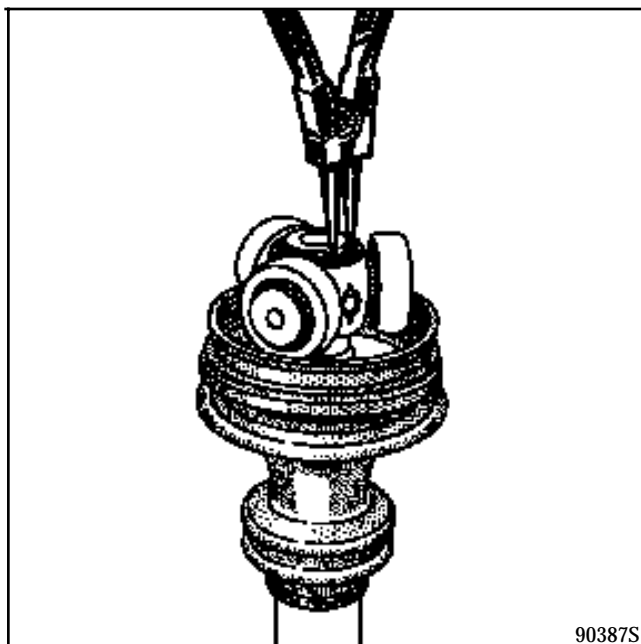
Using pliers, remove each end of the retainer plate (C), then remove the yoke.



Do not remove the rollers from their respective journals since the rollers and the needles match each other and should never be interchanged.

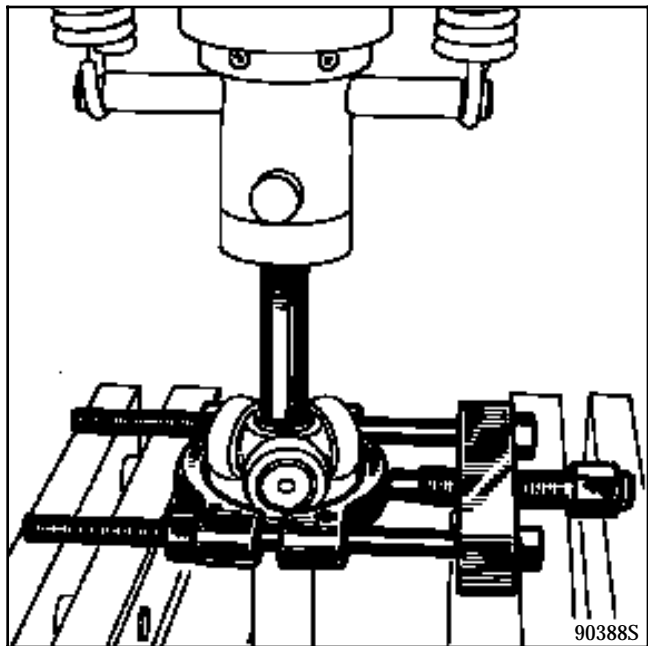
Never use thinners to clean these components.

Depending on the assembly, remove the circlips



GI 62 seal

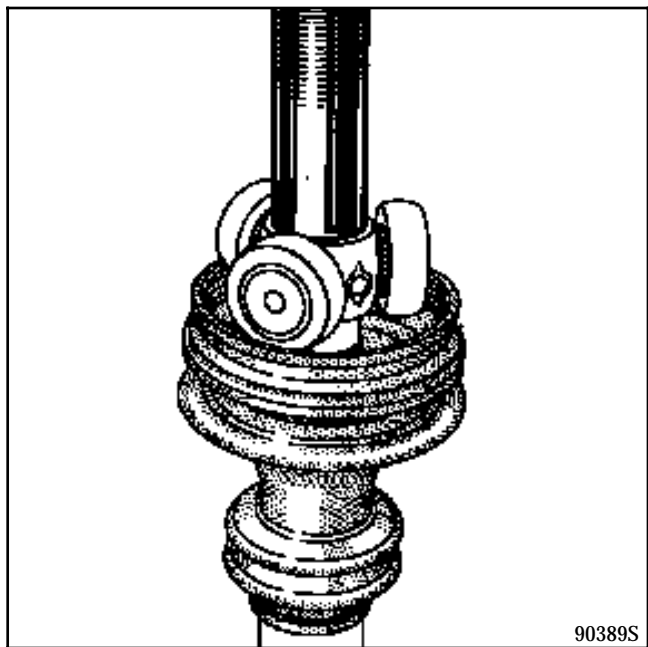
With a press, extract the triaxe component by using an extractor tool.



REFITTING

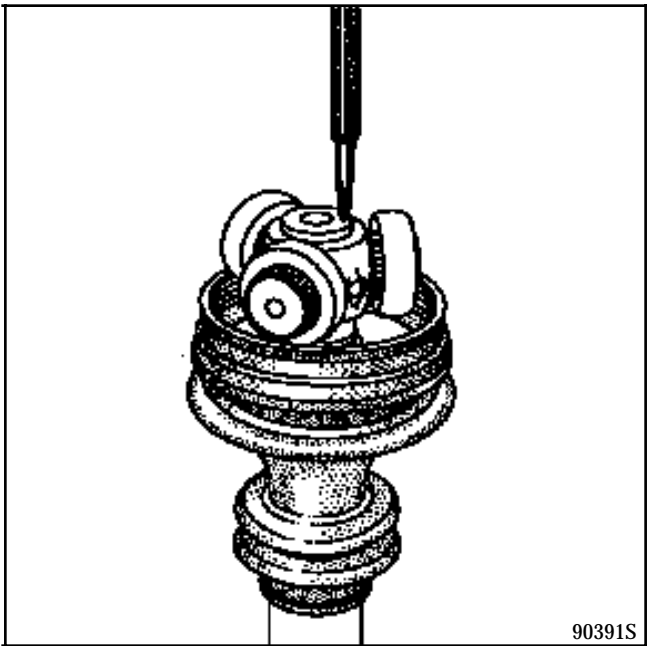
Lubricate the driveshaft and slide on the new ring and gaiter.

Refit the triaxe component on the splined shaft.

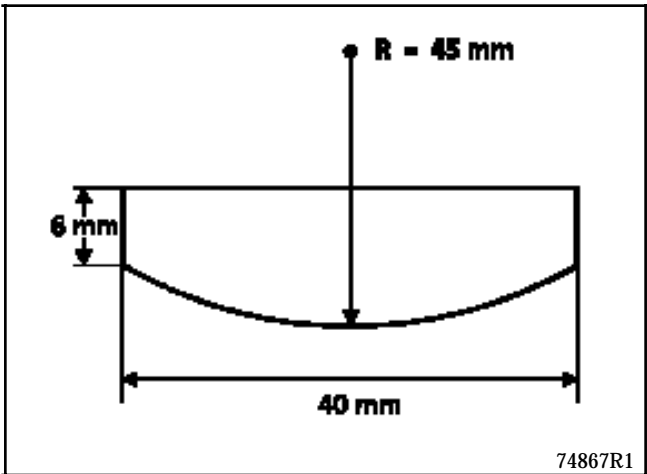


Replace the retaining circlips or make three crimping points at 120° by pressing the metal from the splines onto the driveshaft.

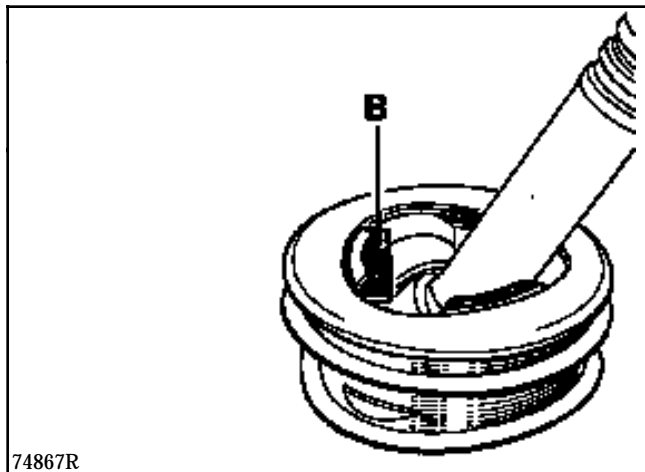
NOTE : the amount of grease, given in the "Consumables" chapter must be complied with.



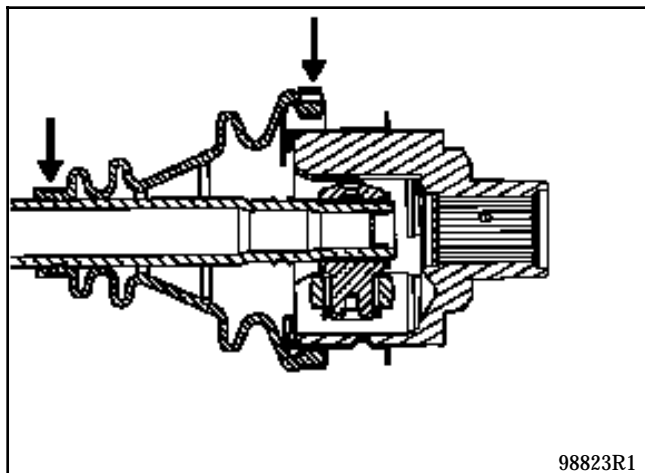
Put a shim (B) of thickness 2.5 mm, manufactured according to the following diagram, between the retainer plate and the yoke.



With a copper hammer, carefully put the plate into its original position, then remove the shim (B).

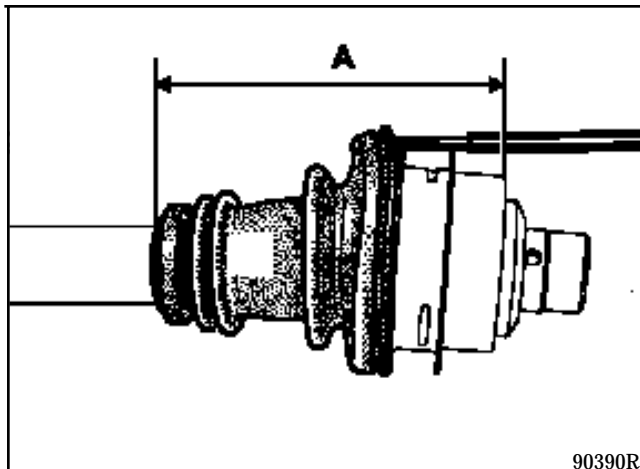


Position the lips of the gaiter in the grooves of the driveshaft and on the metal cover.



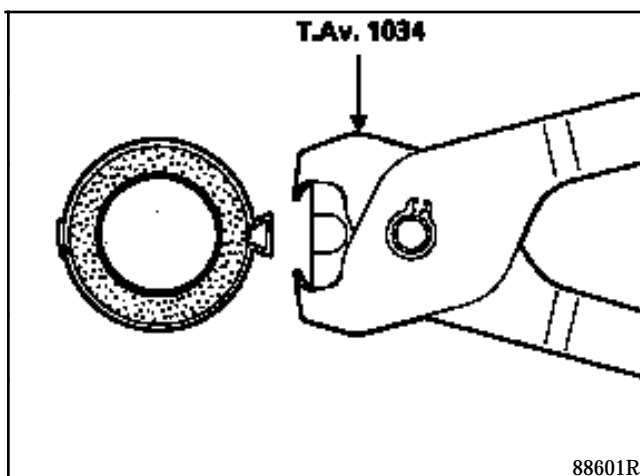
Insert a blunt rod with a rounded end between the gaiter and the shaft in order to expel the air inside the seal.

Extend or shorten the seal until it reaches a length of $A = 153 \pm 1 \text{ mm}$ (dimension between the end of the gaiter and the machined face of the largest part of the yoke).



In this position, remove the rod and fit the retaining clip.

Tighten it with tool T. Av. 1034.

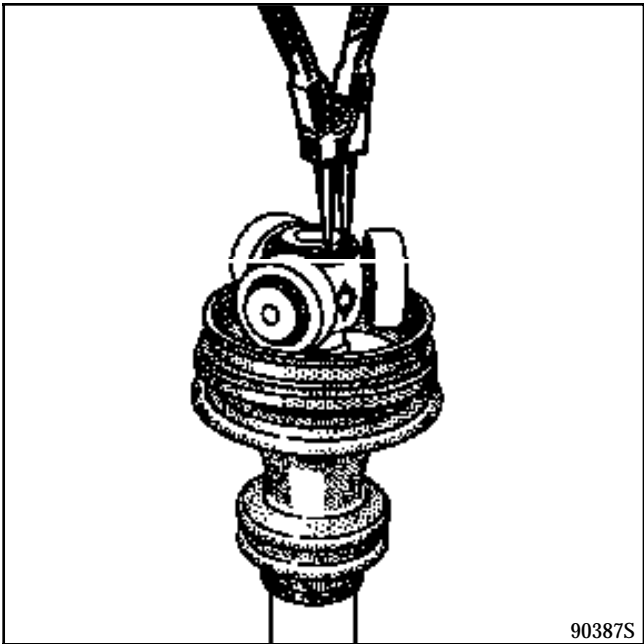


SPECIAL TOOLING REQUIRED	
T.Av. 944	Mandrel for fitting bearing onto shaft

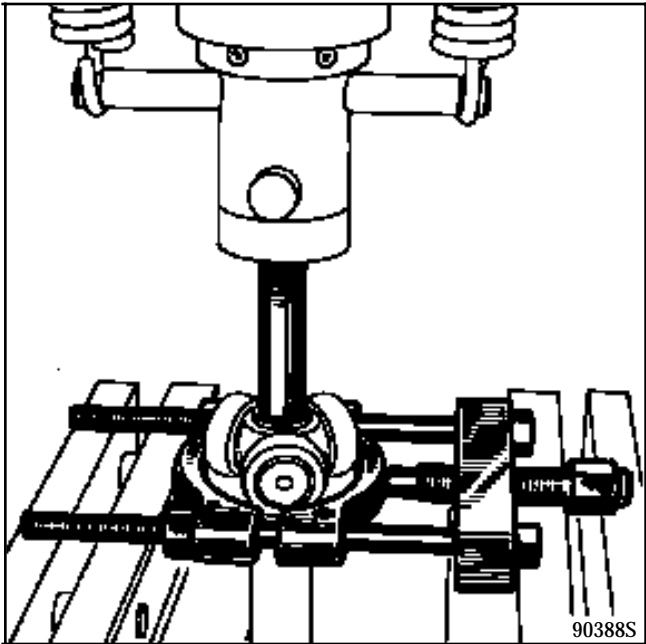
REMOVAL

Never use thinners to clean these components.

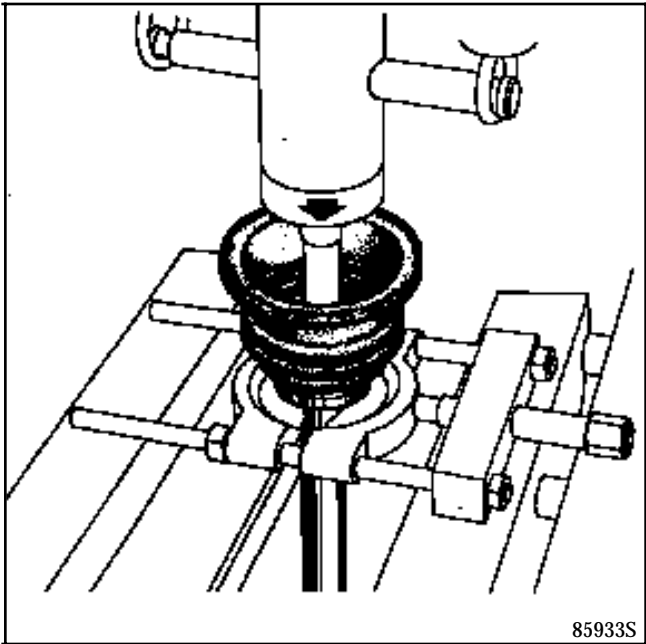
Depending on the assembly, remove the circlips



With a press, extract the triaxe component by using a FACOM U53T type extractor tool.



Remove the gaiter and bearing assembly in the same way as the triaxe component.



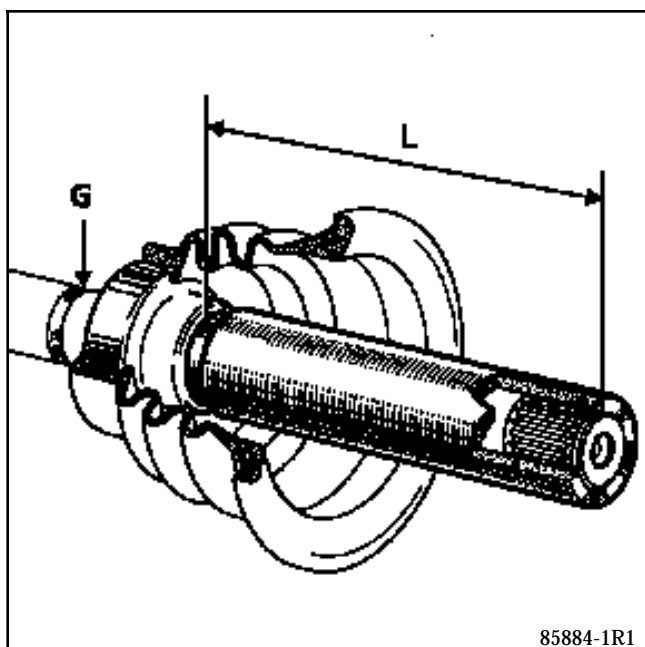
REFITTING

To be in the correct position on the shaft, the bearing must be fitted so as to obtain a dimension L between the front part of the bearing and the end of the shaft.

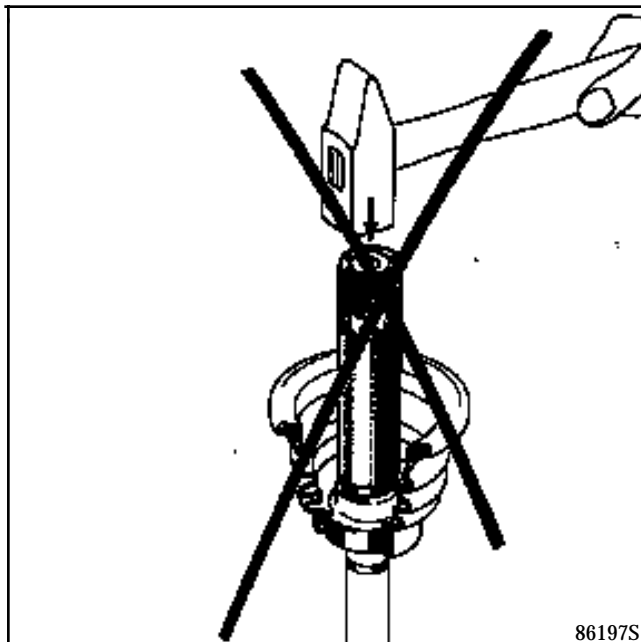
L = 118 ± 0.2 mm (JB1 gearbox)

L = 123.2 ± 0.2 mm (JB3 gearbox)

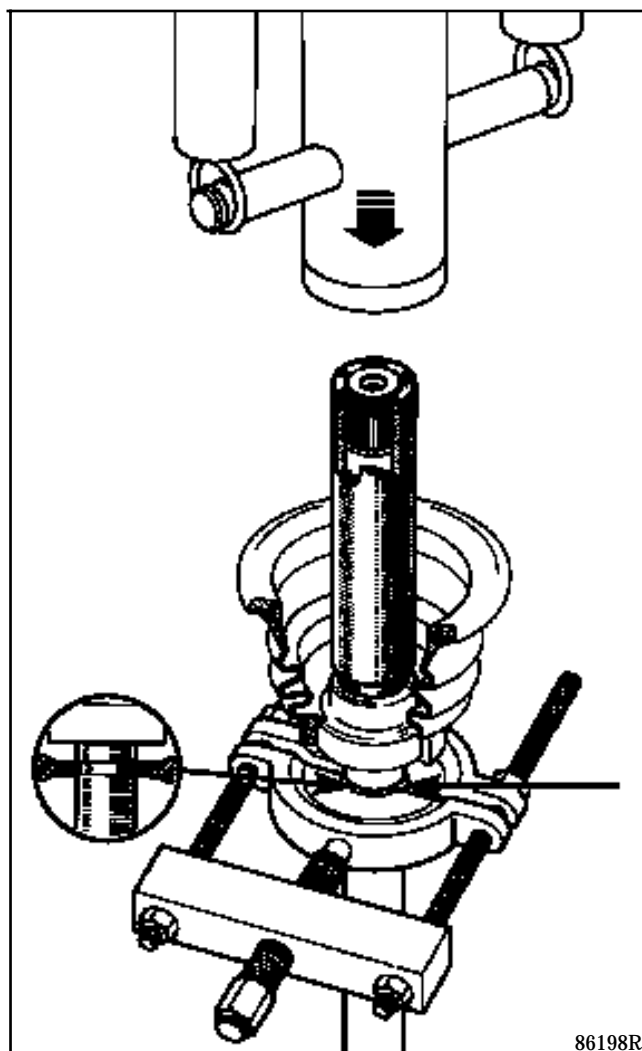
This dimension is obtained using tool T.Av. 944 when its end is level with the shaft.



To avoid damaging the bearing which contains a lip seal, therefore to avoid the risk of leaks, do not fit the bearing using a hammer but instead use a press which provides progressive pressure.



In addition, the driveshaft is held in place on the press by channel (G) with a **FACOM U53T** type tool to avoid damaging the seal on the wheel side.



Fit the triaxe component onto the splined shaft and refit the retaining circlips (depending on assembly).