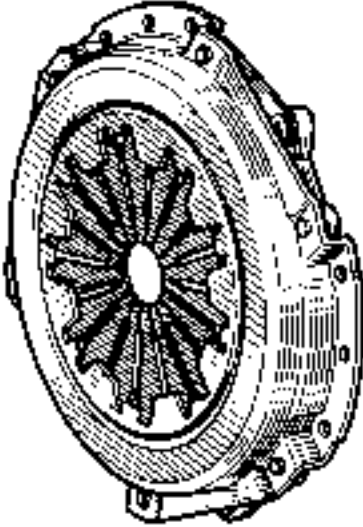
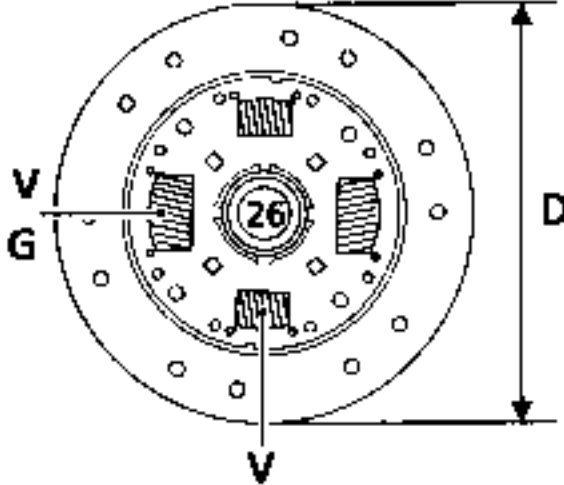

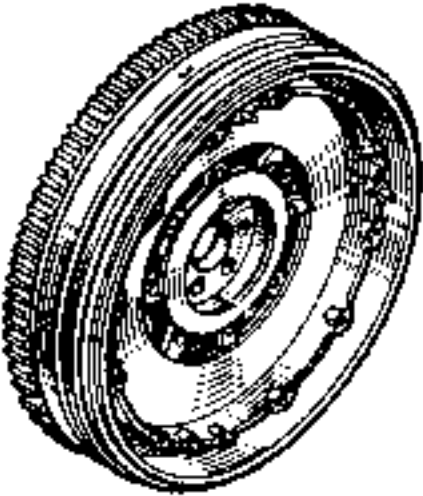
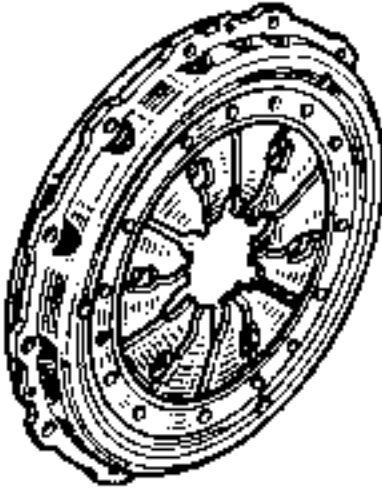
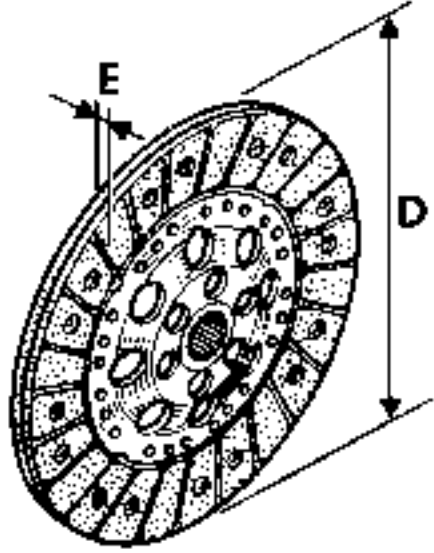


VEHICLE TYPE	ENGINE TYPE	MECHANISM	DISC
JE0A 05	F3R	 <p>85873S</p> <p><b>215 DBRN 4400</b></p>	<p>26 splines      V = Green D = 215 mm    G = Grey E = 7.5 mm</p>  <p>90693-2M</p>  <p>94990R*</p>

VEHICLE TYPE	ENGINE TYPE	FLYWHEEL	MECHANISM	DISC
JE0E 05	G8T TURBO	 <p>PRD2009</p>	 <p>PRD2011</p> <p><b>B-023-003-08</b></p>	<p>21 splines</p>  <p>PRD2013</p> <p>D = 215 mm E = 8 mm</p>

NOTE: ENGINE WITH DUAL DAMPER FLYWHEEL

**F ENGINE**

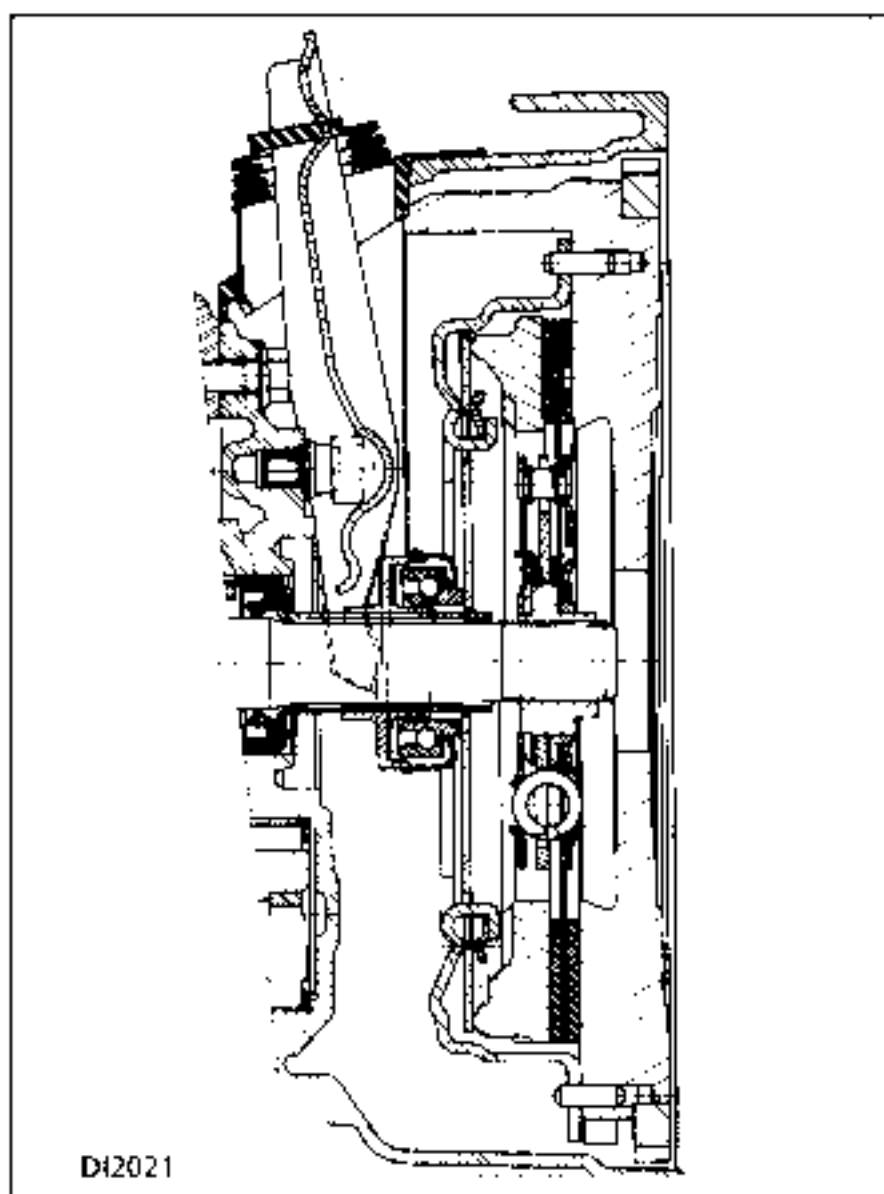
Single disc, cable controlled disc, operating dry.

Clutch plate with diaphragm.

Clutch disc with resilient hub.

Self-centring guided ball bearing type thrust pad  
**in constant contact.**

Automatic wear take-up.



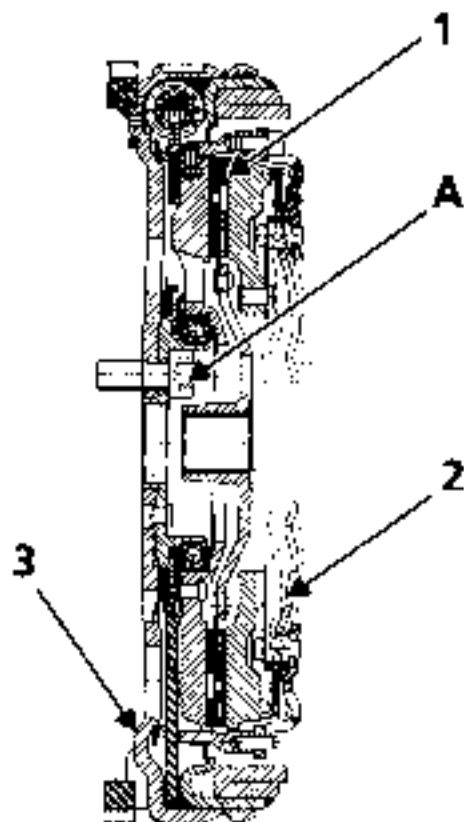
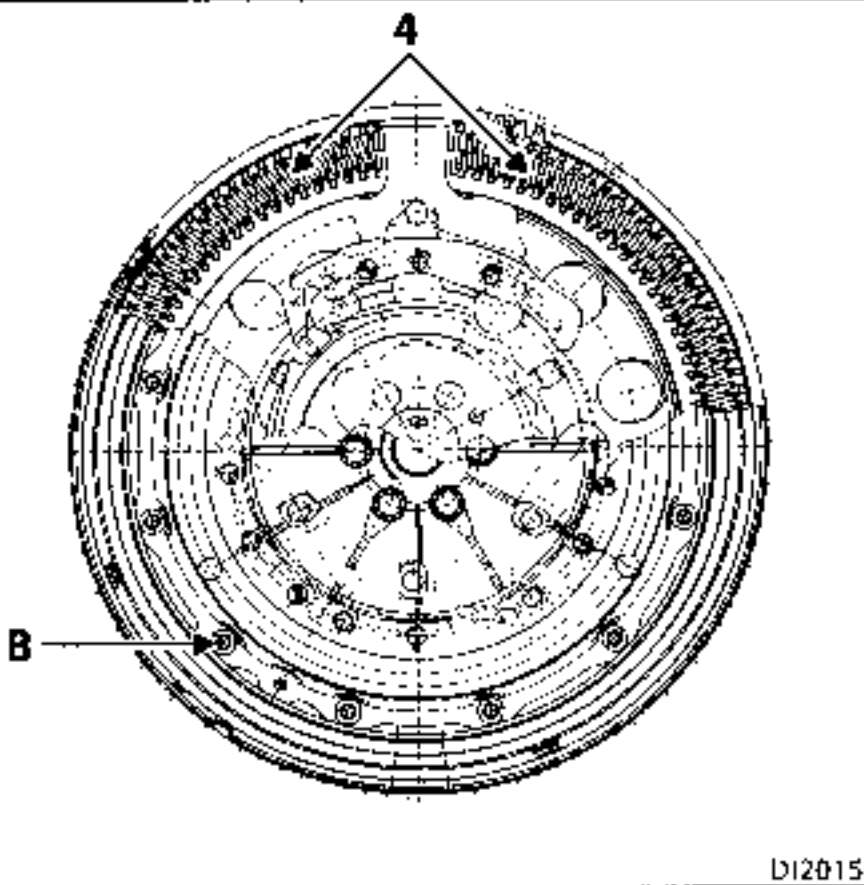
**G ENGINE**

The flywheel is an assembly of two flywheels, connected by circular springs (4). This arrangement allows the first flywheel (connected to the crankshaft) to rotate by  $80^\circ$  with respect to the second flywheel (to which the clutch mechanism is mounted).

The components in the assembly cannot be separated.

The mechanism and thrust pad are conventional.

- 1 Friction plate
- 2 Mechanism
- 3 Dual flywheel
- 4 Springs between flywheels
- A Dual flywheel bolt
- B Mechanism bolt



## F ENGINE

Type	Packaging	Part Number	Component
MOLYKOTE BR2	1 kg tin	77 01 421 145	Right hand sunwheel splines Fork pivot Thrust pad guide Fork pads
RHODORSEAL 5661	100 g tube	77 01 404 452	Ends of driveshaft roll pins
LOCTITE 518	24 ml syringe	77 01 421 162	Housing assembly faces


## G ENGINE

Type	Packaging	Part Number	Component
MOLYKOTE BR2	1 kg tin	77 01 421 145	Fork pivot Thrust pad guide Fork pads
LOCTITE FRENBLOC	24 cc bottle	77 01 394 071	Clutch centring ring

## REPLACEMENT

This operation is carried out when the gearbox has been separated from the engine.

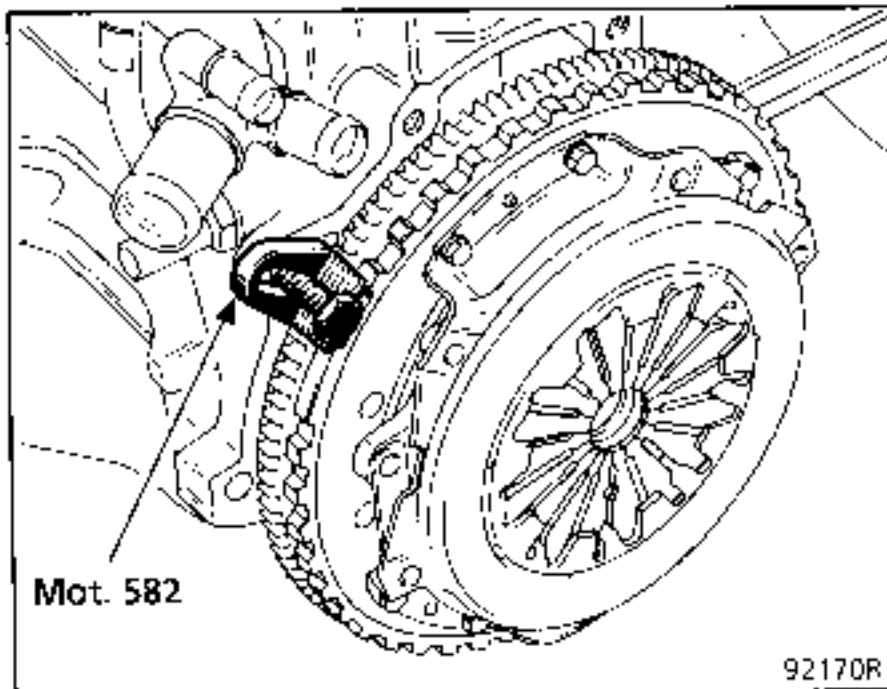
SPECIAL TOOLING REQUIRED	
Mot. 582	Locking tool

TIGHTENING TORQUES (in daN.m)	
Mechanism mounting bolt	2.2

## REMOVAL

Fit the locking tool **Mot. 582**.

Remove the mounting bolts from the mechanism and remove the mechanism together with the clutch disc.



Visually check:

- the flywheel is not scratched,
- the flywheel is not worn,
- the starter motor ring gear is in good condition,
- the crankshaft lip seal is in good condition.

Replace any faulty parts and clean the clutch shaft splines.

## REFITTING

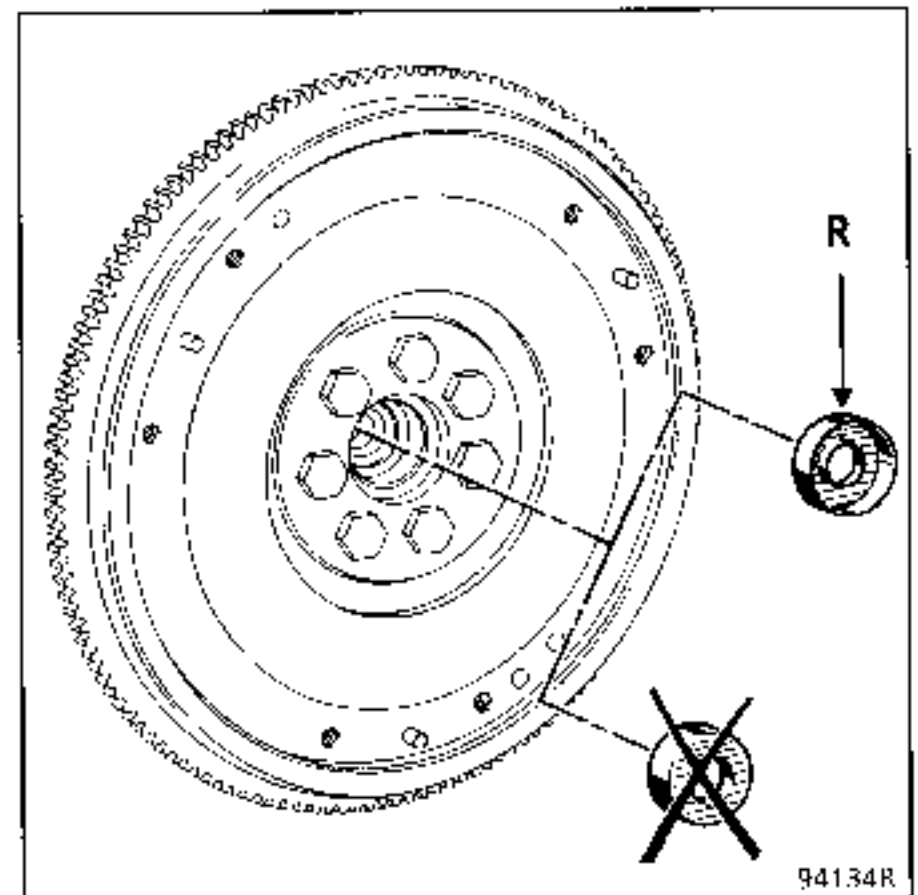
The clutch kits contain a ring (dummy bearing) which is used to centre the disc.

Degrease the crankshaft bore in which the ring (R) is to be fitted.

Coat the outside of the ring with **Loctite Frenbloc**.

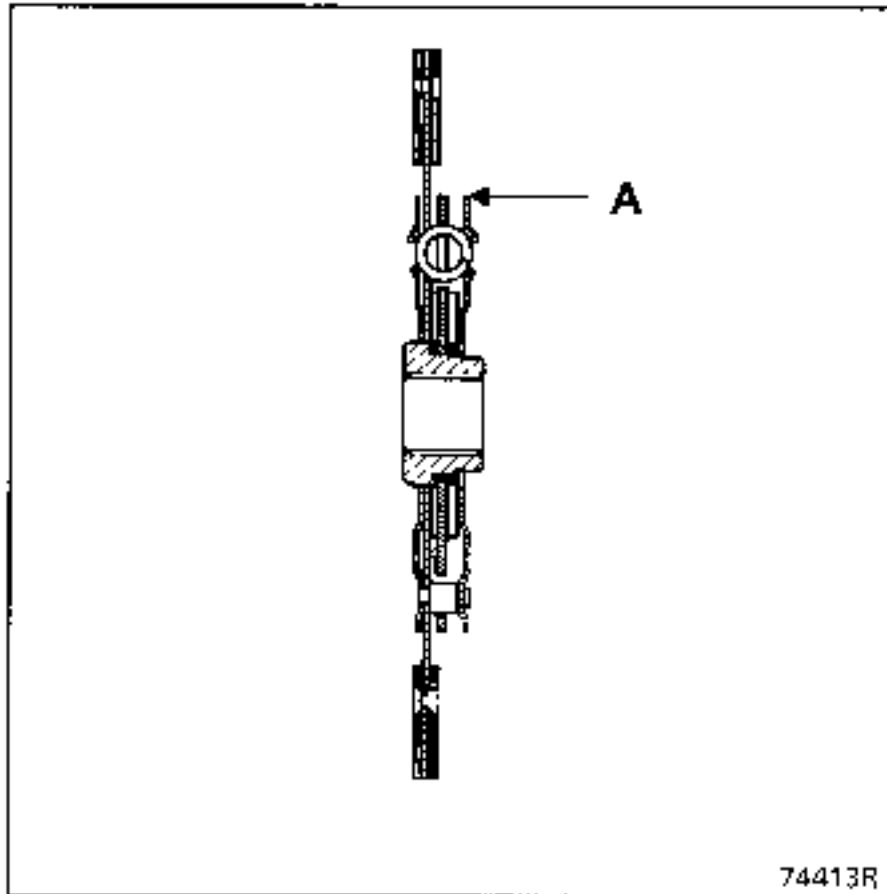
Using a tube of exterior diameter **38 mm**, fit the ring into the crankshaft bore as far as it will go.

Ensure this ring is fitted the correct way round and is correctly positioned.

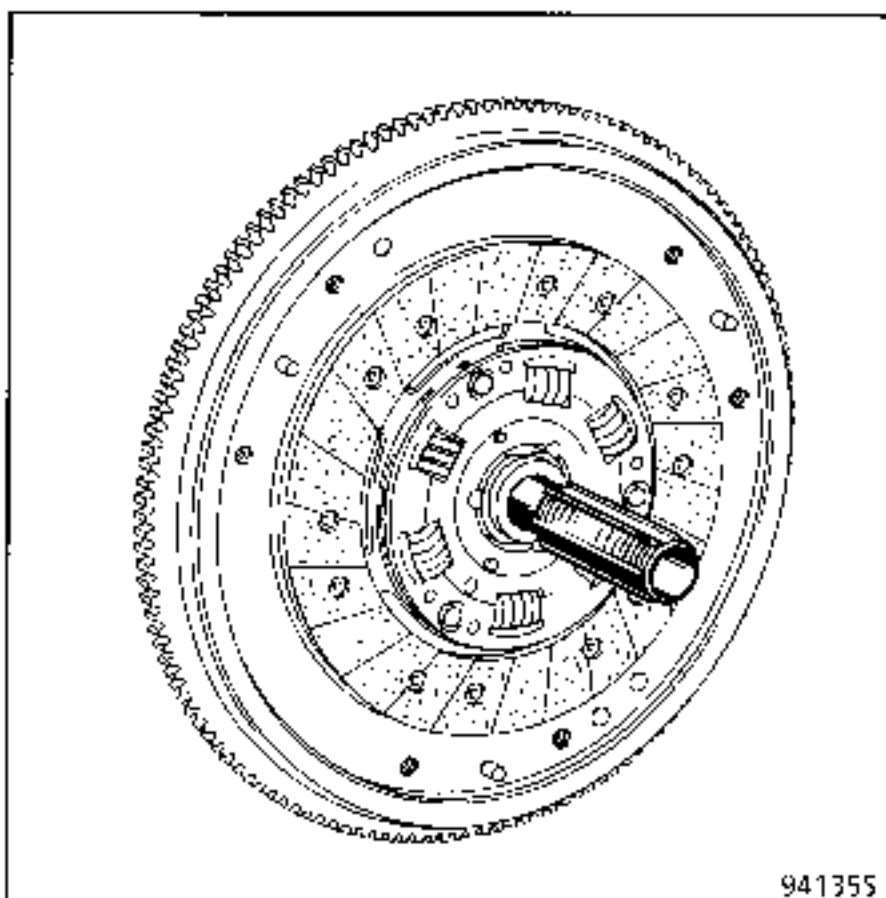


**IMPORTANT:** the clutch disc hubs are now nickel coated and do not require lubrication (risk of contamination).

Fit the disc into position: offset (A) on the hub at gearbox end.



Use the plastic centring device in the kit to fit the disc.



Fit the mechanism.

Using a star pattern, gradually tighten then torque tighten the mechanism mounting bolts.

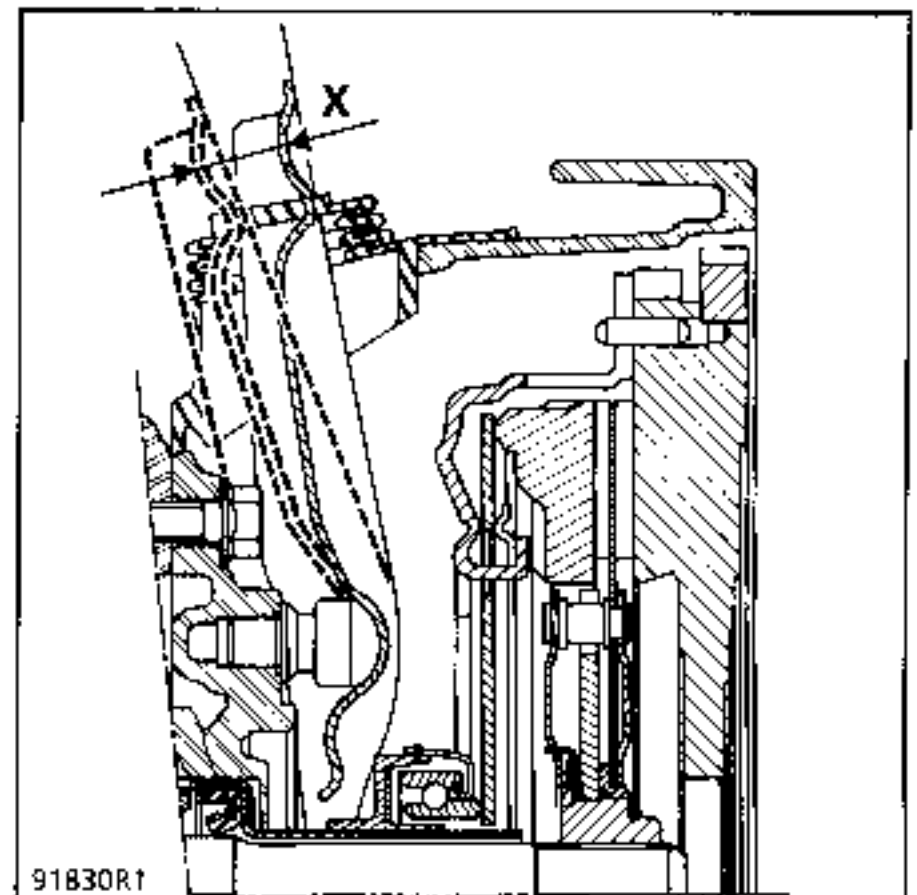
Remove the locking tool Mot. 582.

Coat the thrust pad bore, the guide tube, the fork pads and the pivot with **MOLYKOTE BR2**.

After refitting the gearbox, reset the toothed segment and check the automatic take-up system operates correctly.

Check the fork travel . It should be :

$$X = 26 \text{ to } 28 \text{ mm}$$



**REPLACEMENT**

This operation is carried out when the gearbox has been separated from the engine.

**SPECIAL TOOLING REQUIRED**

Mot.	582	Locking tool
------	-----	--------------

**TIGHTENING TORQUES (in daN.m)**

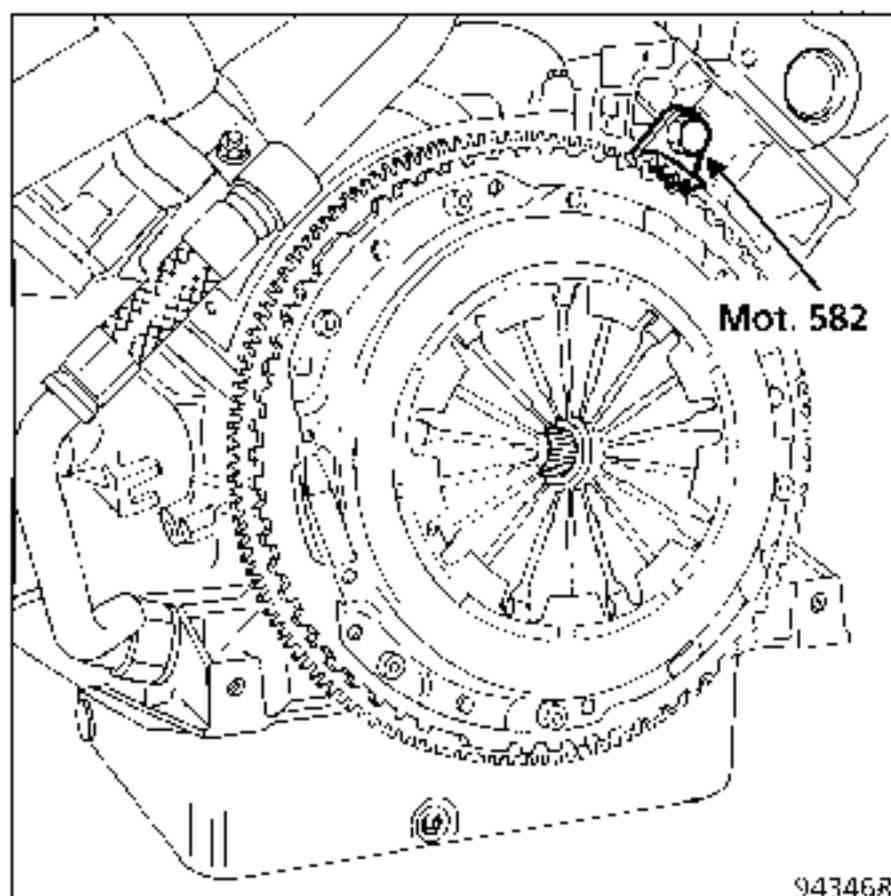
Mechanism mounting bolt	1
-------------------------	---

**REMOVAL**

Fit the locking tool **Mot. 582**.

Remove the mounting bolts from the mechanism and remove the mechanism together with the clutch disc.

Check and replace any faulty parts.

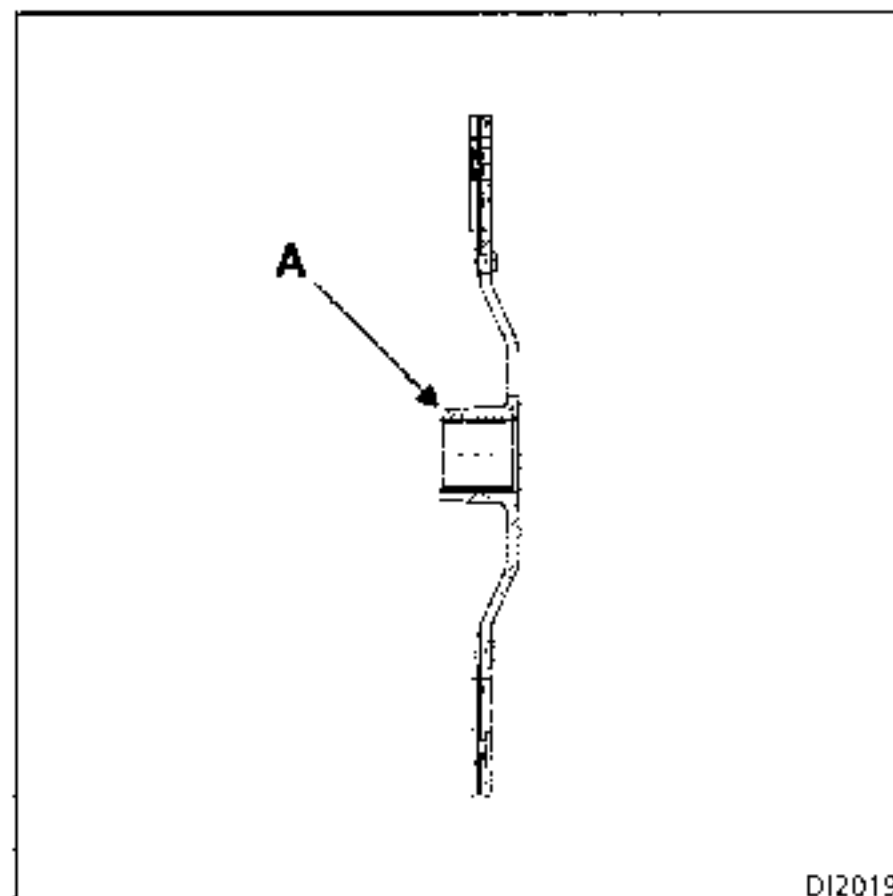
**REFITTING**

**Precautions to be taken when repairing the clutch:**

Clean the clutch shaft splines and refit the assembly, **without lubricant**.

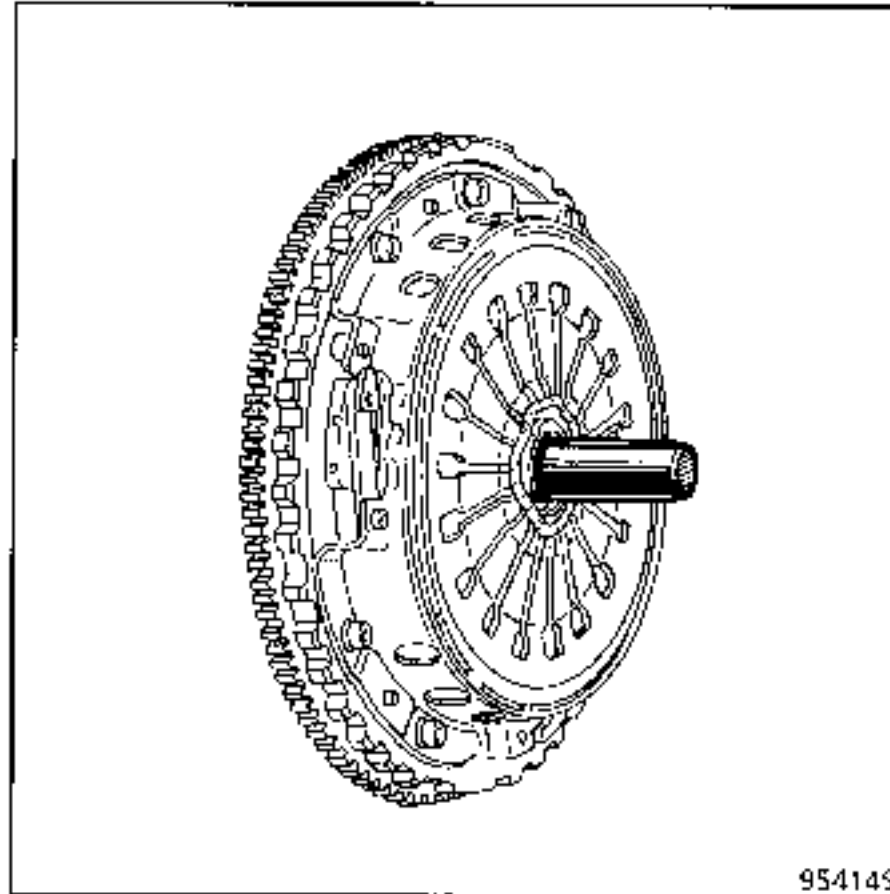
Degrease the friction faces of the flywheel and the mechanism.

Fit the **disc** into position (offset **(A)** of the hub should be at the flywheel end).



**CENTRING**

Use the plastic centring device in the kit.



Using a star pattern, gradually tighten then torque tighten the mechanism mounting bolts.

Remove the locking tool **Mot. 582**

Coat the following components with **MOLYKOTE BR2** :

- the guide tube,
- the fork pads.

Position the thrust pad on the gearbox guide tube and the fork pads in their locations on the thrust pad.



## REPLACEMENT

This operation is carried out when the gearbox has been separated from the engine.

## REMOVAL

Remove:

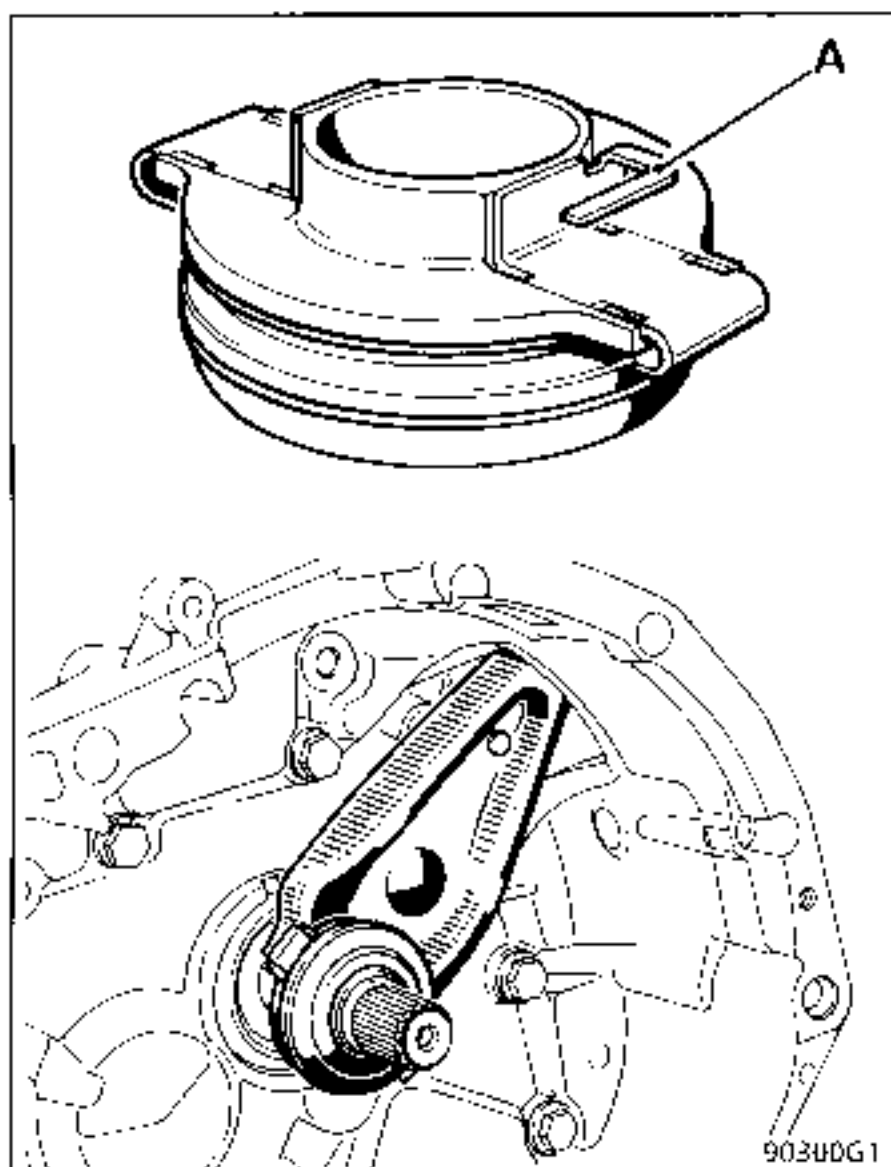
- the thrust pad by tilting the fork,
- the rubber protector and pull the fork to the interior of the clutch bellhousing.

## REFITTING

Coat the walls of the guide tube and the fork pads using **MOLYKOTE BR2**.

Position the fork and refit the rubber protector.

Fit the thrust pad on the guide tube, locating lug (A) in the fork.



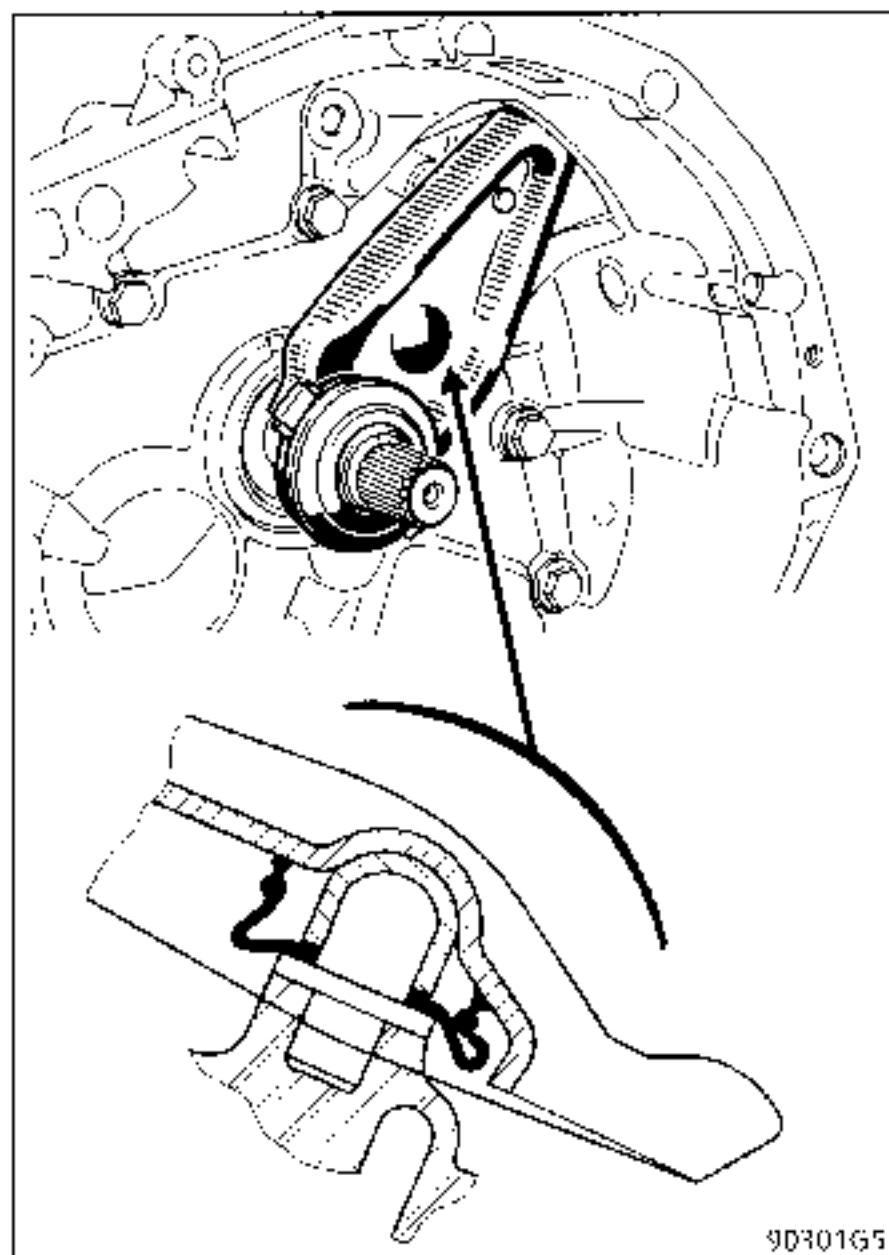
Ensure the assembly slides correctly.

**NOTE :** when carrying out operations which do not require the gearbox to be removed or after replacing the gearbox, DO NOT lift the fork as this may release it from the lug (A) on the thrust pad.

## EVOLUTION

The JC gearbox has a lubricating gaiter for the clutch fork.

Fill this gaiter with **MOLYKOTE BR2** before refitting the fork.



## REPLACEMENT

This operation is carried out when the gearbox has been separated from the engine and the clutch removed.

## SPECIAL TOOLING REQUIRED

Mot. 582	Locking tool
----------	--------------

## TIGHTENING TORQUES (in daN.m)



Flywheel bolt	6
---------------	---

## REMOVAL

Fit the locking tool **Mot. 582**.

Slacken the flywheel mounting bolts (these may not be re-used).

Remove the flywheel and the locking tool **Mot. 582**.

The friction face of the flywheel may not be re-ground.

Renew the flywheel if it has been damaged or is worn.

## REFITTING

On the crankshaft, clean the flywheel mounting bolt threads using a dry cloth.

Degrease the bearing face of the flywheel on the crankshaft.

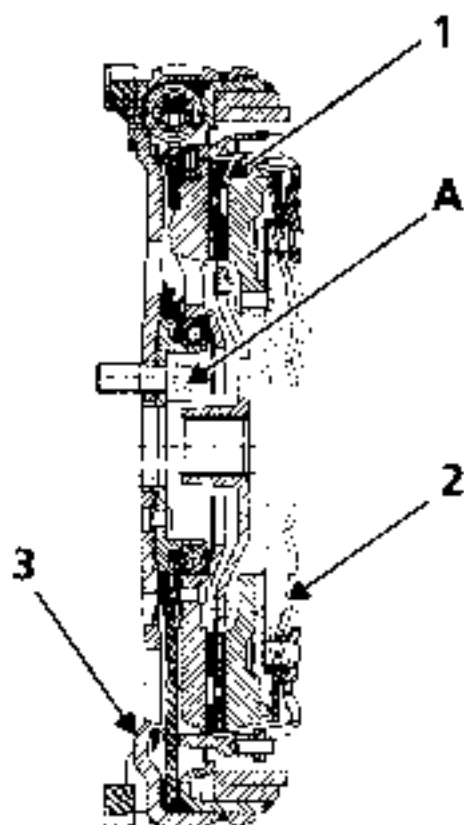
Fit the flywheel, bonding it using **Loctite AUTOFORM**.

Coat the new bolts with **Loctite FRENETANCH** and hand tighten them as far as possible.

Fit the locking tool **Mot. 582**.

Tighten the bolts to a torque of **6 daN.m**.

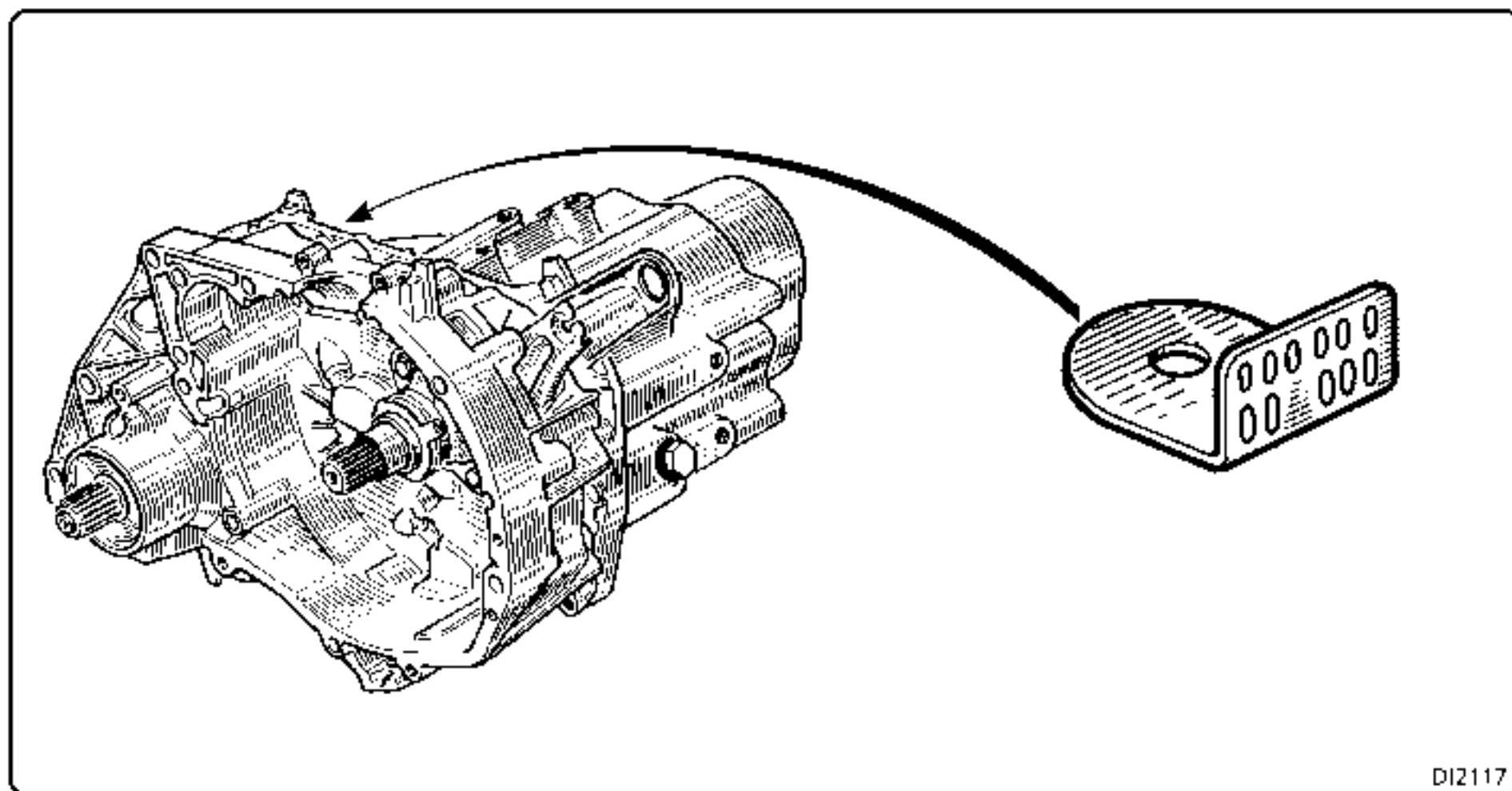
Remove the locking tool **Mot. 582**.



DI2016

JE0A 05 vehicles with F3R engines are fitted with the JC5 type manual gearbox.

Workshop Repair Manual "B.V. JC" deals with the complete overhaul of this component.



DI2117

An identification plate on the clutch bellhousing shows:

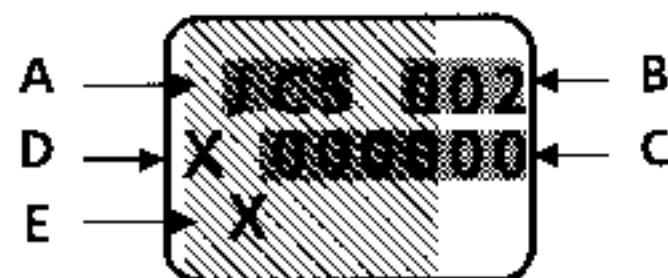
At A : the gearbox type

At B : the gearbox suffix

At C : the fabrication number

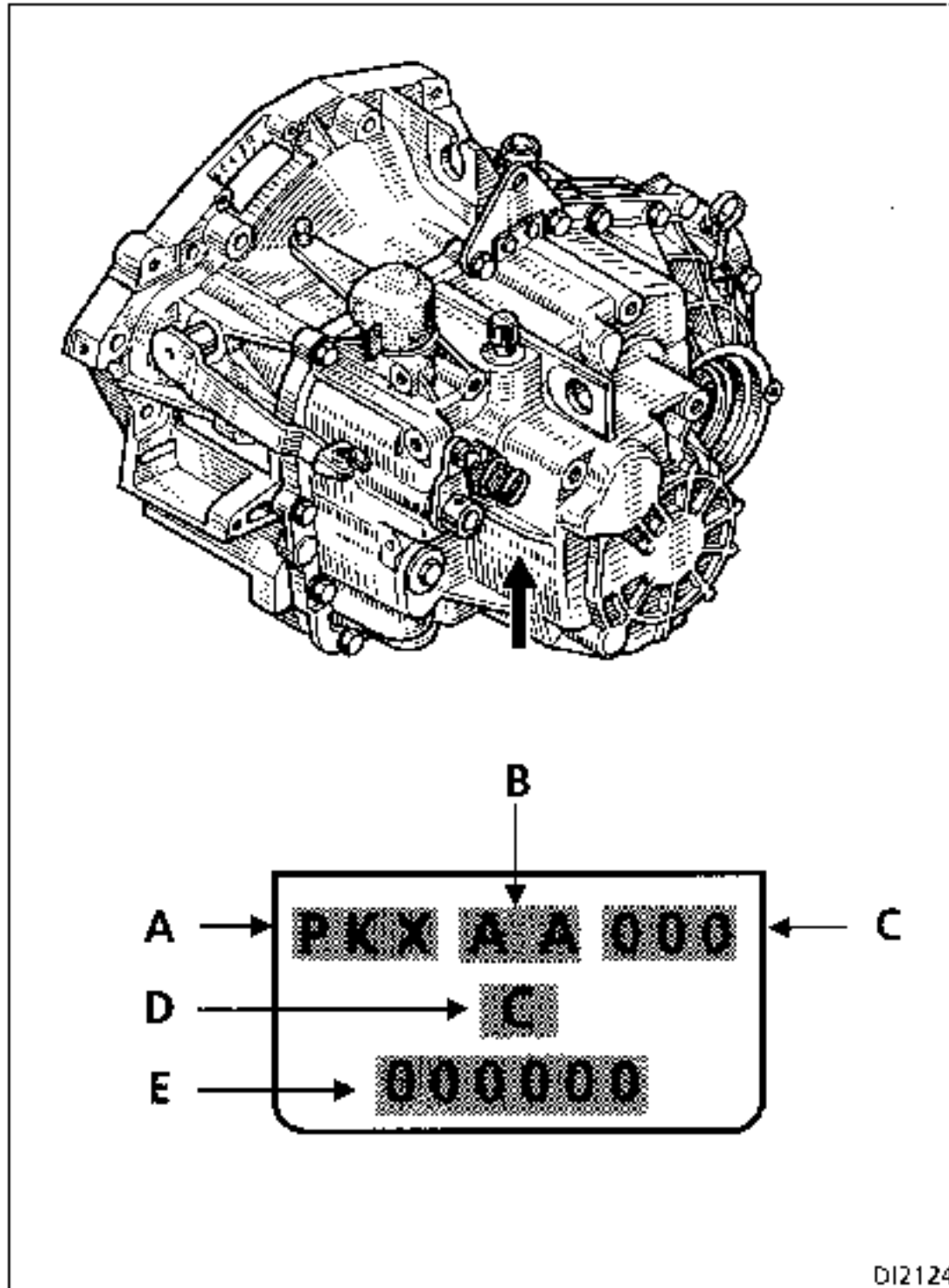
At D : the factory of manufacture

At E : the type of engine assembled with the gearbox



90 775

JE0E 05 vehicles with **G8T turbo** engines are fitted with the **PK1** type manual gearbox.



A marking on the gearbox housing shows:

At **A** : the gearbox type

At **B** : the type approval number

At **C** : the gearbox suffix

At **D** : the factory of manufacture

At **E** : the fabrication number

Suffix	Vehicle	Final drive ratio	Speedo gear	1st	2nd	3rd	4th	5th	Reverse
--------	---------	-------------------	-------------	-----	-----	-----	-----	-----	---------

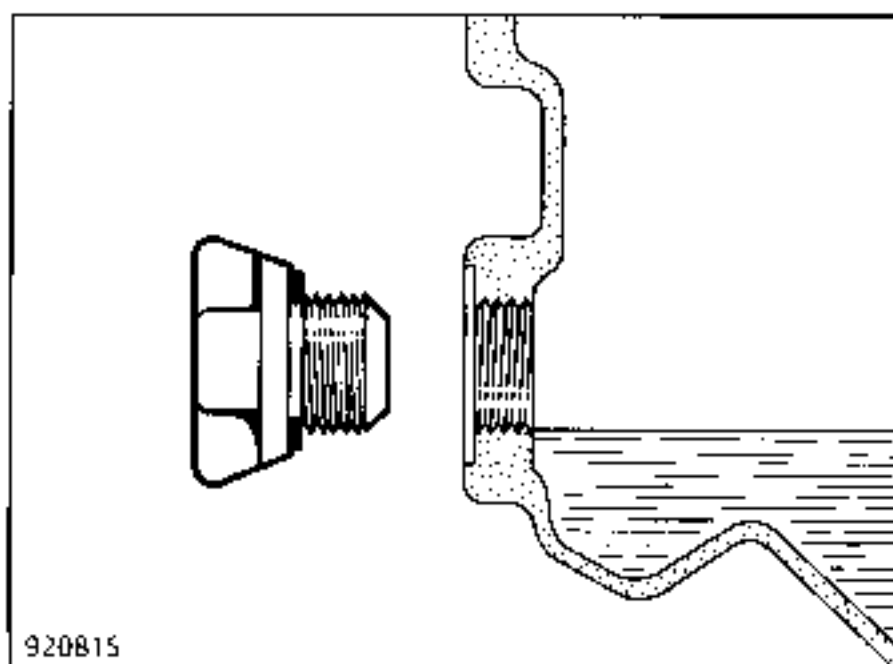
JC5									
026	JE0 A05	$\frac{15}{61}$	$\frac{18}{22}$	$\frac{11}{41}$	$\frac{21}{43}$	$\frac{28}{37}$	$\frac{35}{34}$	$\frac{39}{31}$	$\frac{11}{39}$ 26
PK1									
026	JE0 E05	$\frac{21}{80}$	$\frac{19}{24}$	$\frac{11}{43}$	$\frac{19}{42}$	$\frac{31}{43}$	$\frac{41}{40}$	$\frac{39}{35}$	$\frac{11}{29}$ 40

**CAPACITY (in litres)**

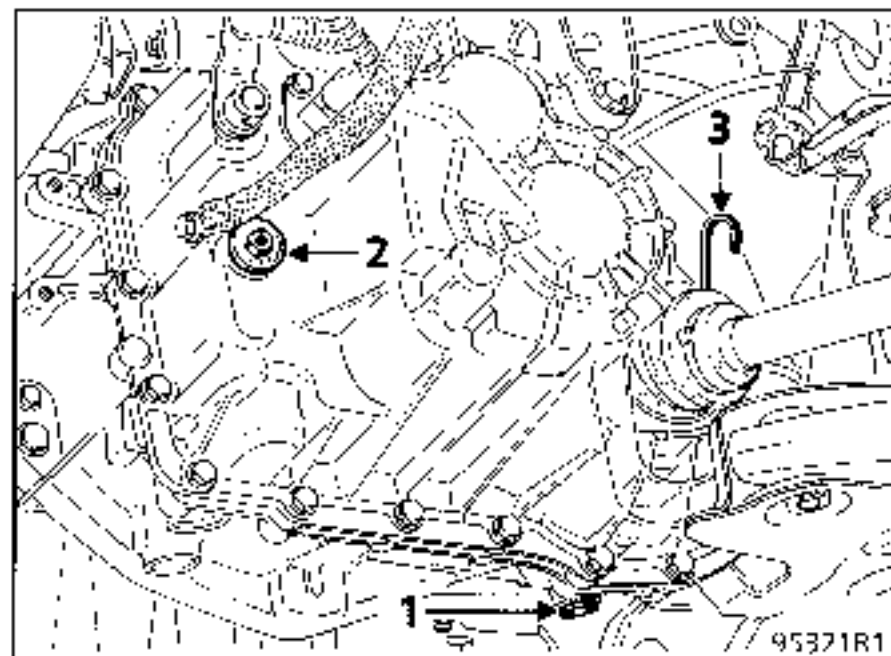
JC5	3.1
PK1	2.1 (min. mark) 2.6 (max. mark)

**VISCOSITY GRADE****TRANSELF TRX 75 W80W**

Part Number: 77 11 143 534 (5 litre can)

**JC5**

Fill up to the level of the aperture.

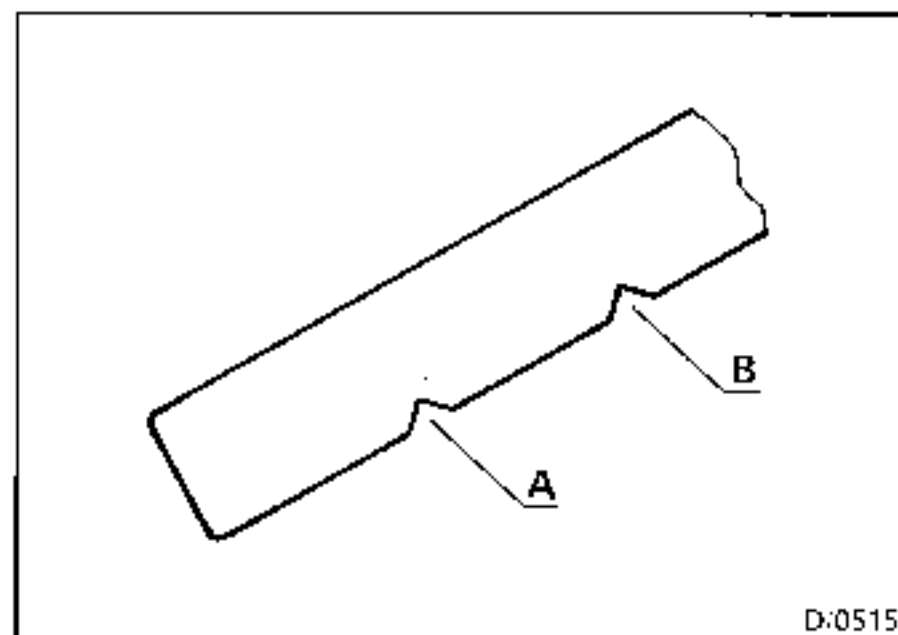
**PK1**

- 1 Drain plug
- 2 Filling plug
- 3 Dipstick

The level is measured using dipstick (C). To check the level, the front left hand wheel must be removed. The oil may then also be drained and the recommended volume filled.

**IMPORTANT:** the filling plug (2) should not be used to check the level by overflow. The angle of the gearbox changes, depending on which vehicle the gearbox is fitted to.

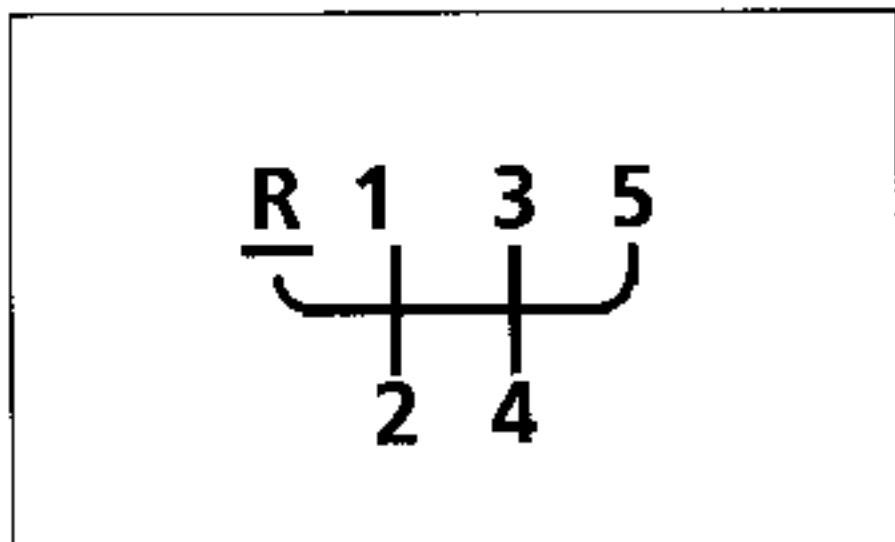
Note : See Technical Note for new method.



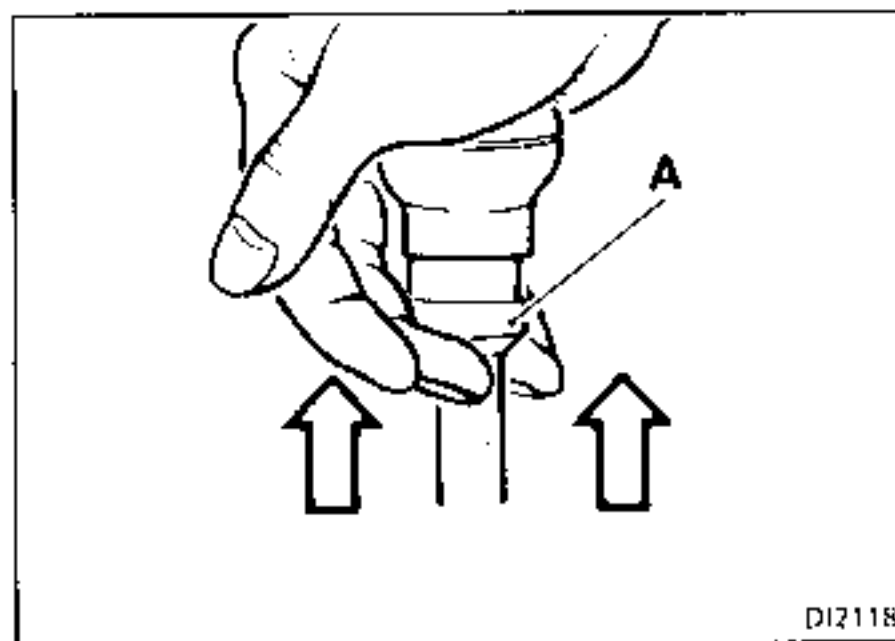
- A Minimum mark
- B Maximum mark

## GEAR LAYOUT

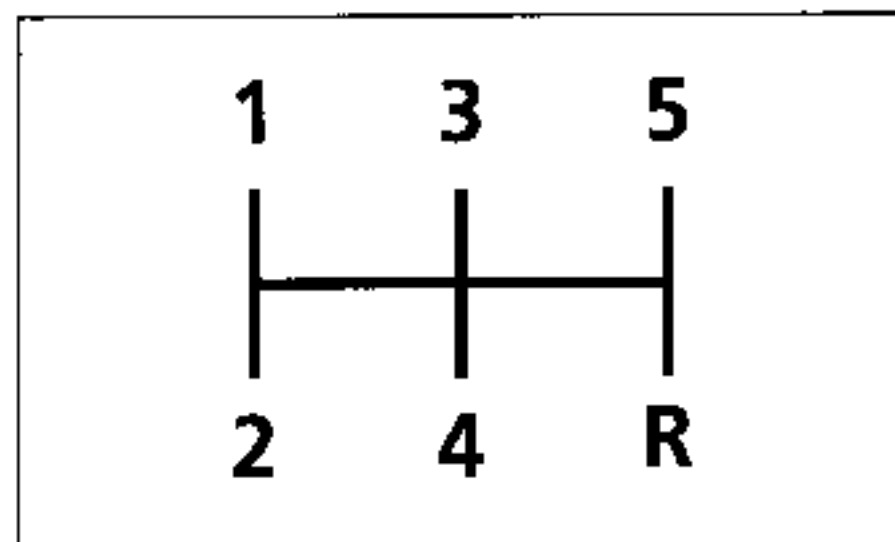
### JC5



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



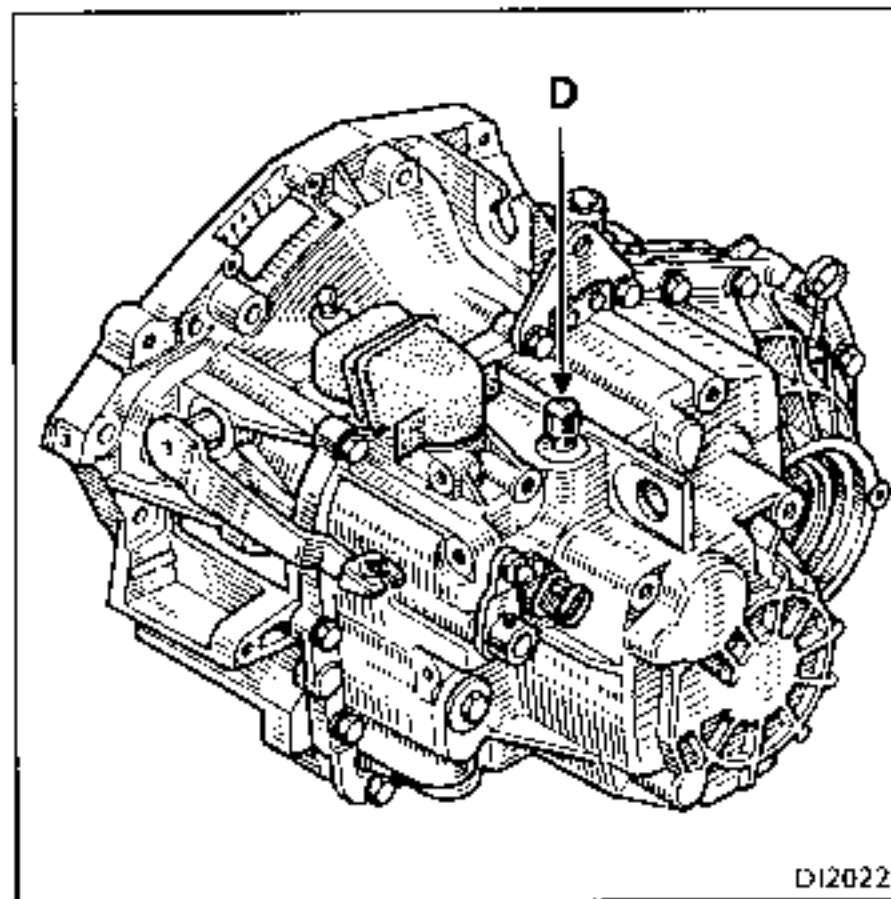
### PK1



To engage reverse gear, return to neutral then engage reverse as for a normal gear.

The gearboxes are fitted with BORG-WARNER synchronisers.

**IMPORTANT:** the breather valve (D) MAY NOT be removed to fill the gearbox with oil.



**JC5 (F3R )**

TYPE	PACKAGING	PART NUMBER	COMPONENT
<b>MOLYKOTE BR2</b>	1 kg tin	77 01 421 145	Right hand sunwheel splines Fork pivot Thrust pad guide Fork pads
<b>Loctite 518</b>	24 ml syringe	77 01 421 162	Housing assembly faces
<b>RHODORSEAL 5661</b>	100 g tube	77 01 404 452	Threaded plugs and switches Locking ball plugs Ends of driveshaft roll pins
<b>LOCTITE FRENBLOC</b> (locking and sealing resin)	24 cc bottle	77 01 394 071	Primary and secondary shaft nuts 5th gear hub and fixed gear Differential lock drive

**PK1 (G8T turbo)**

TYPE	PACKAGING	PART NUMBER	COMPONENT
<b>MOLYKOTE BR2</b>	1 kg tin	77 01 421 145	Thrust pad guide Fork pads
<b>LOCTITE FRENBLOC</b>	24 cc bottle	77 01 394 071	Brake caliper bolts

## Parts to be systematically replaced

**When they have been removed:**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>- lip seals,</li> <li>- O rings,</li> <li>- thrust pad guide tubes (except PK1),</li> </ul> | <ul style="list-style-type: none"> <li>- secondary shaft and differential nuts,</li> <li>speedo gear and shaft,</li> <li>- speedo crown wheel,</li> <li>- roll pins,</li> <li>- bushes under pinions,</li> </ul> |
|--|--|



SPECIAL TOOLING REQUIRED	
T.Av. 476	Ball joint extractor
B.Vi. 31-01	Set of punches
EQUIPMENT REQUIRED	
Impact ball joint extractor	
Strut type engine support	
Component jack	
2 post lift safety pads	

TIGHTENING TORQUES (in daN.m)		
Drain plug	2.2	
Brake caliper bolt	3.5	
Driveshaft gaiter bolt	2.4	
Lower ball joint nut	6.5	
Shock absorber base bolt M16 X 200	20	
Engine tie bar bolt	5.5	
Clutch protective plate bolt	2.4	
Bolts on edge of gearbox and starter	5	
Front left suspended mounting nut on side member	7	
Suspended mounting bolt on gearbox	6	
Rear centre mounting bolt	5.5	
Gearbox filling plug	0.17	
Wheel bolts	10	

## REMOVAL

Put the vehicle on a 2 post lift.

Disconnect the battery.

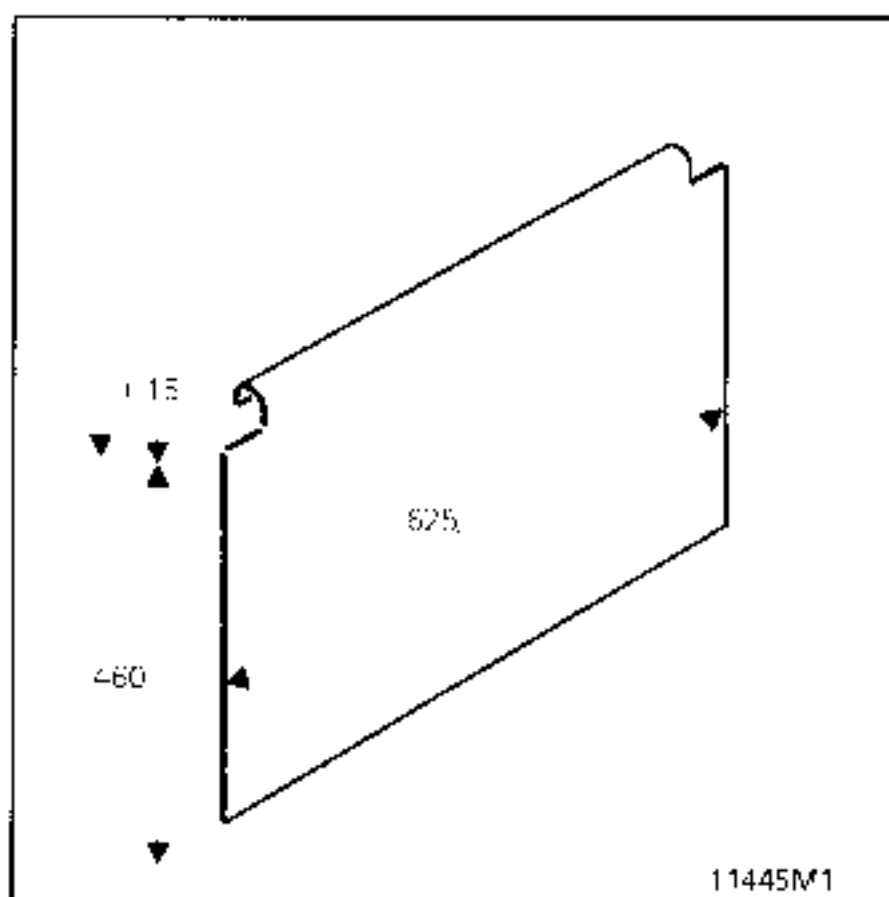
Remove the front wheels.

Drain the gearbox.

Refit the drain plug with a new seal.

CONSUMABLES
Loctite FRENBLOC :
Brake caliper mounting bolt
RHODORSEAL 5661 :
Ends of driveshaft roll pins

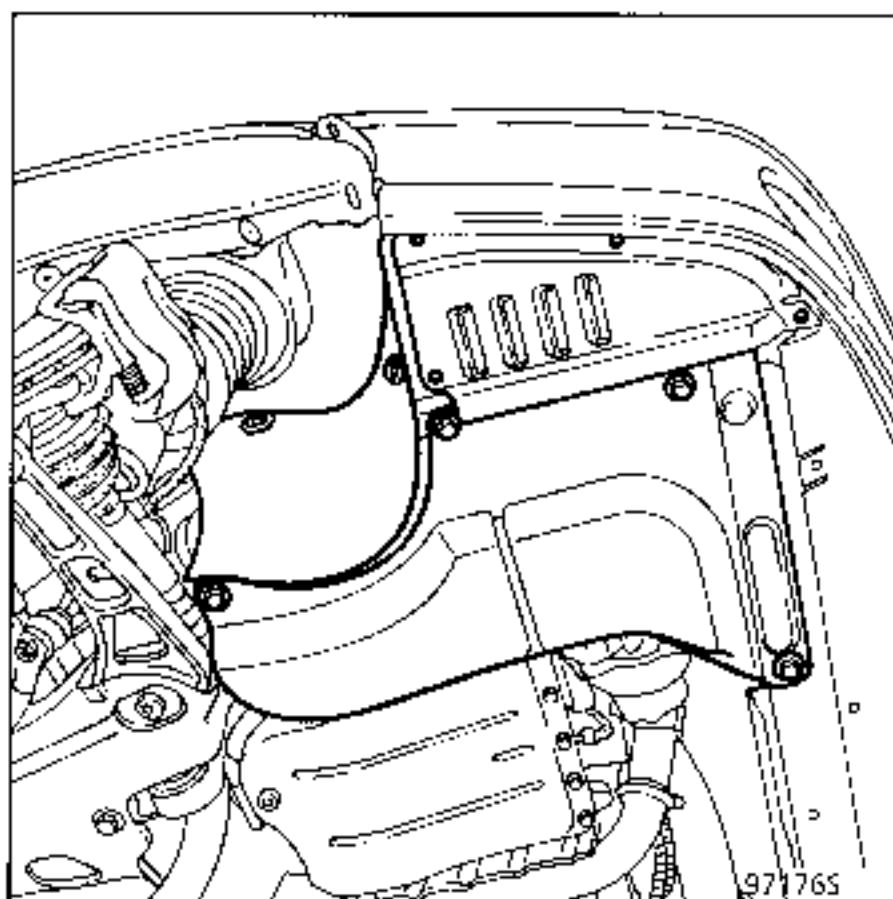
Fit the locally made radiator protection tool (**THIS MUST BE DONE**):



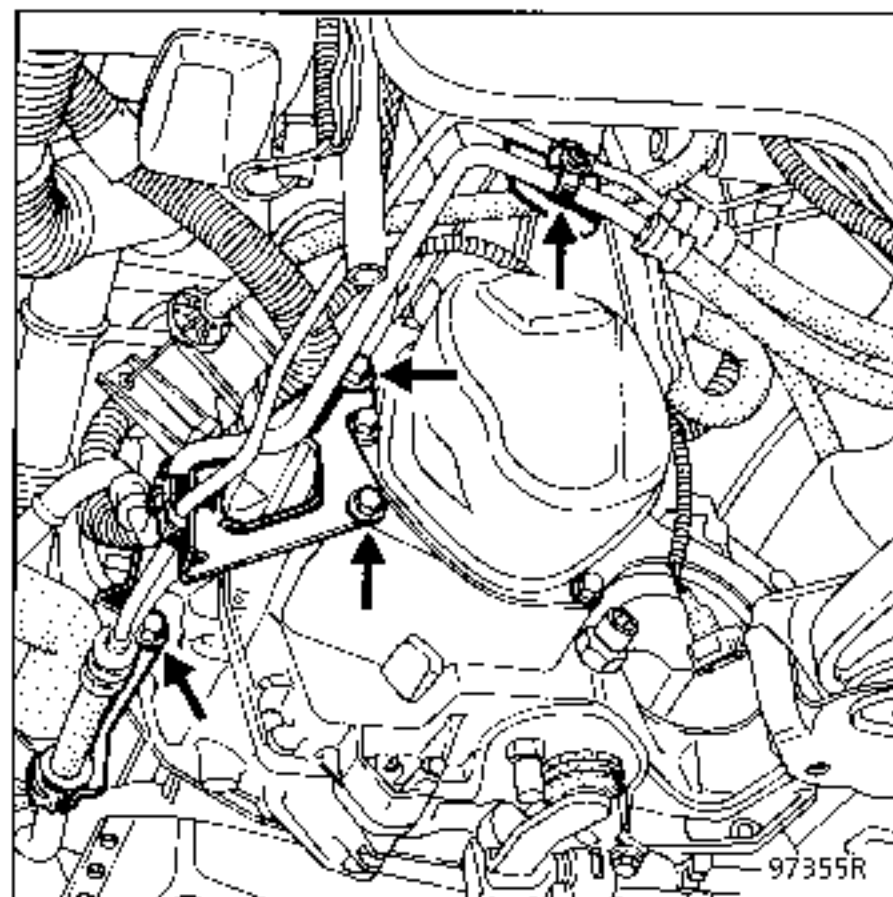
**Materials:** Aluminium or steel sheet with a folded over top edge to hook onto the upper corner of the radiator.

Remove:

- the engine undertrays,
- the front wheels,
- the left and right hand front protector at the ends of the wheel arches,
- the wheel arch protectors.



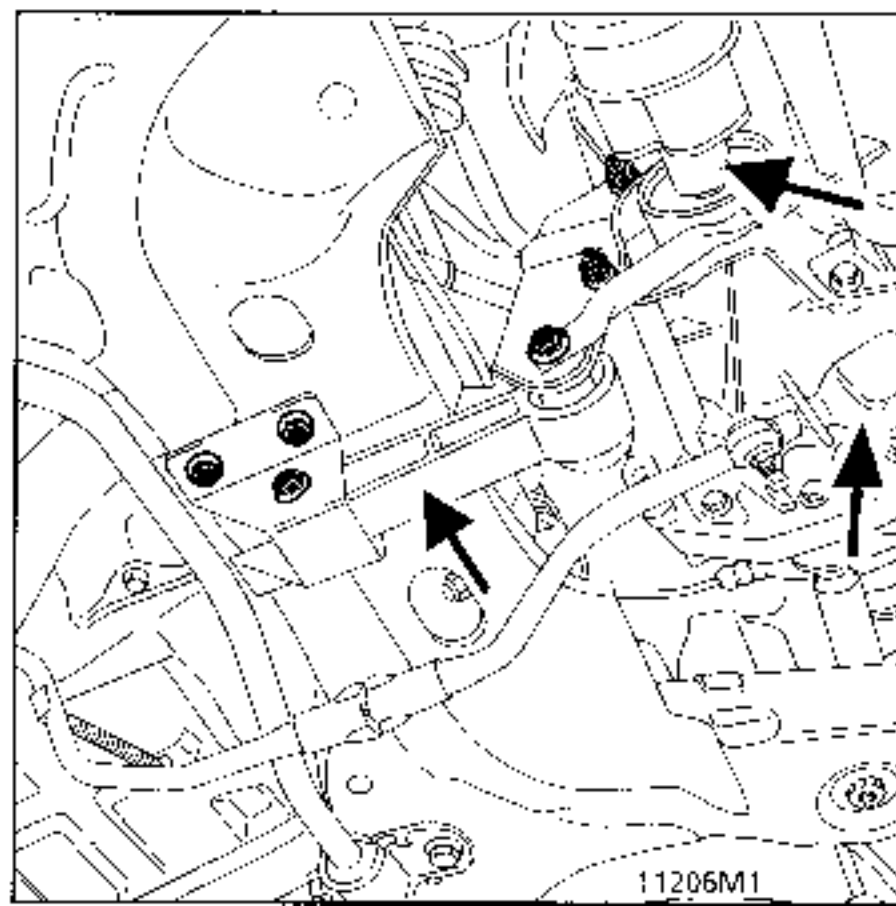
Remove the mounting flanges for the power assisted steering hoses on the engine.

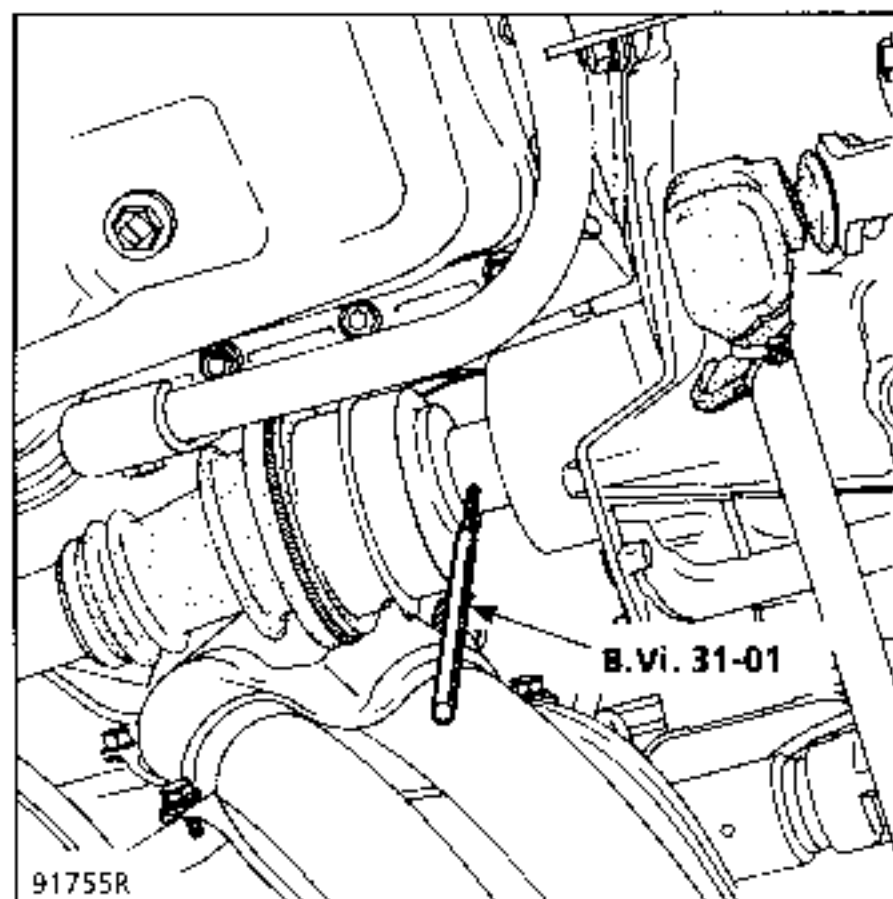
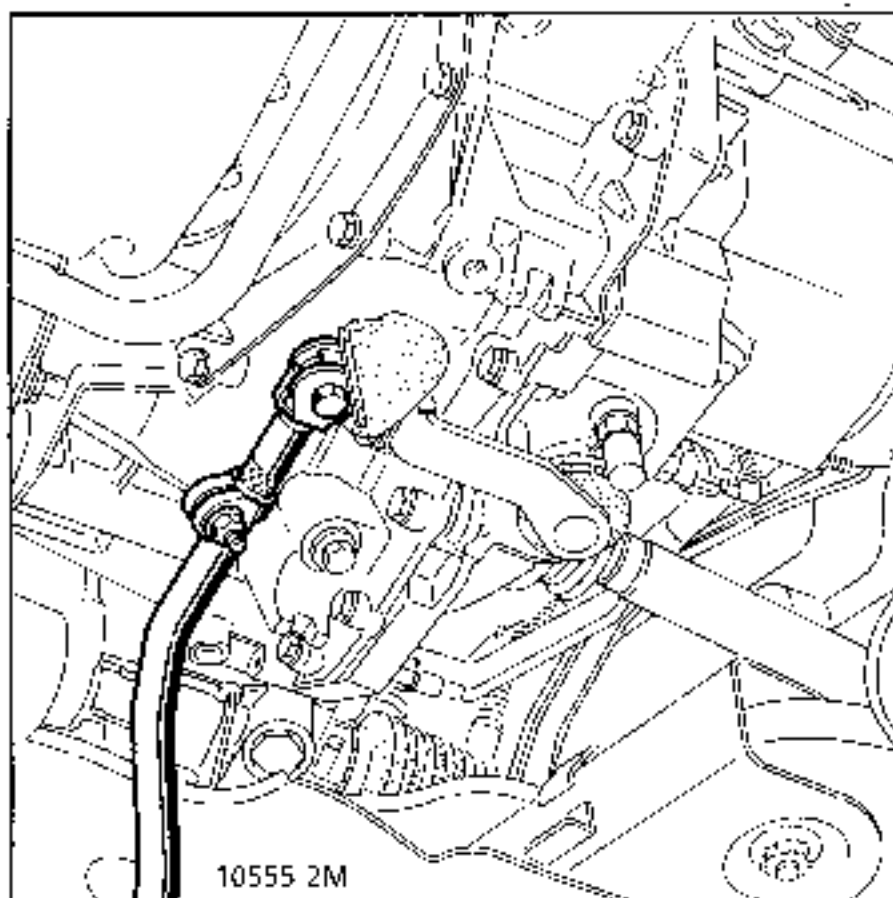


Remove the mounting bolt for the gearbox earth strap.

Remove:

- the engine tie bar,
- the gear control (move the gaiter to one side),
- the right hand driveshaft roll pin,
- the wiring retaining clip on the gearbox.





Disconnect:

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

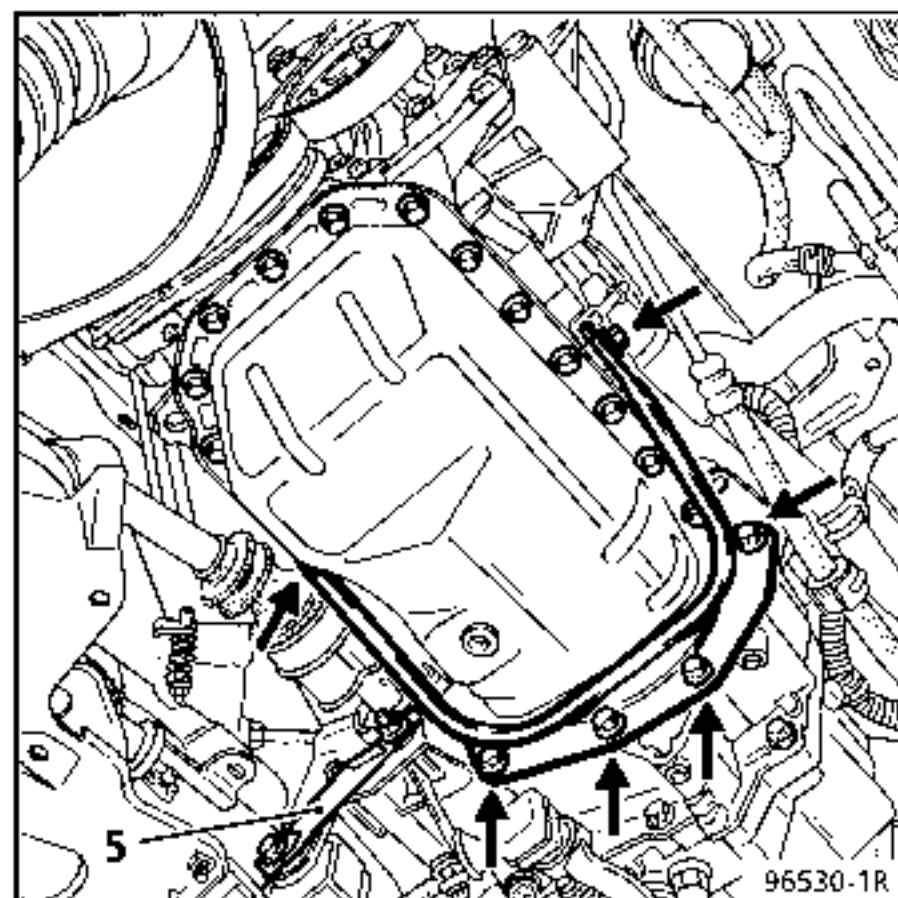
Remove:

- the exhaust outlet pipe,
- the starter motor (see section 16 - starter motor).

*Under the vehicle:*

Release the engine - gearbox tie rod:

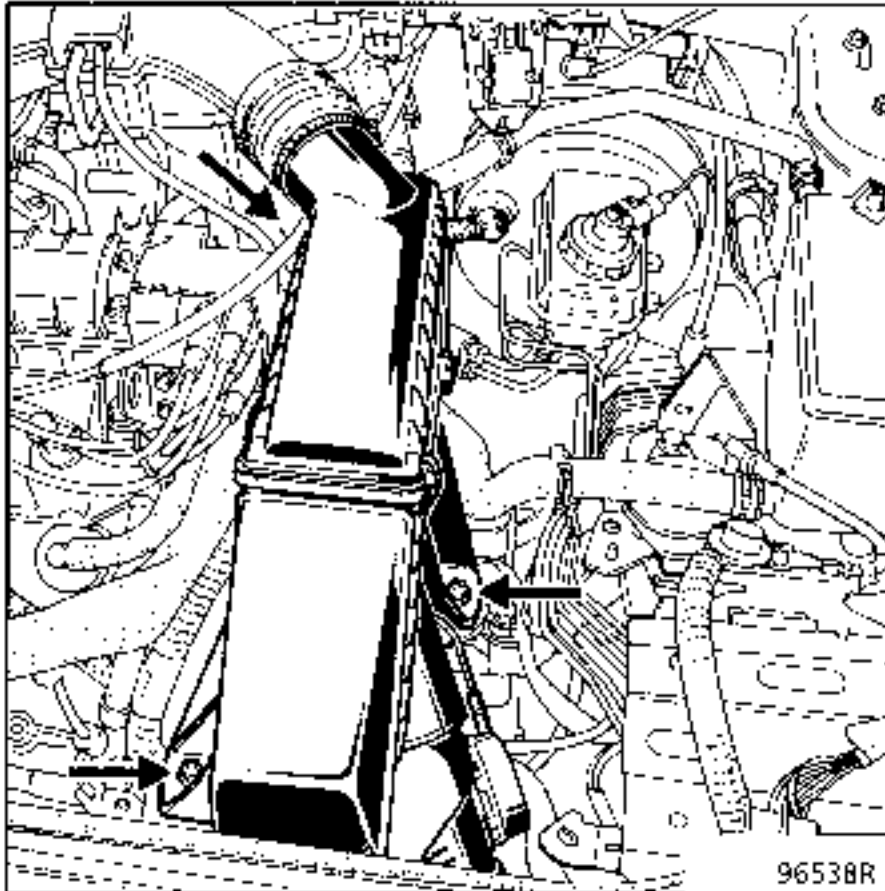
- Slacken the bolts in the engine block.
- Remove the bolts from the clutch protective plate.



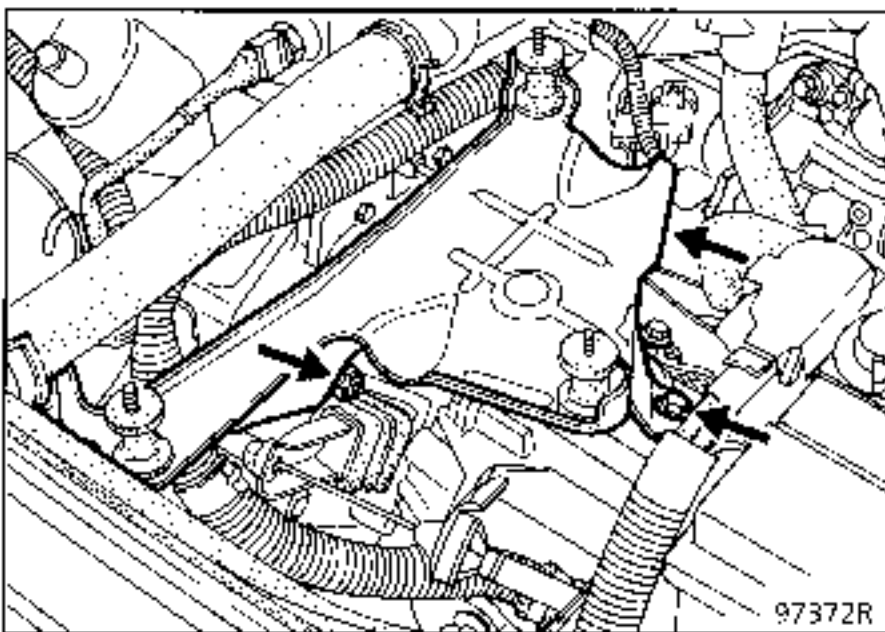
*In the engine compartment:*

Remove:

- the air filter,
- the earth strap at the gearbox end,



- the air filter mounting,

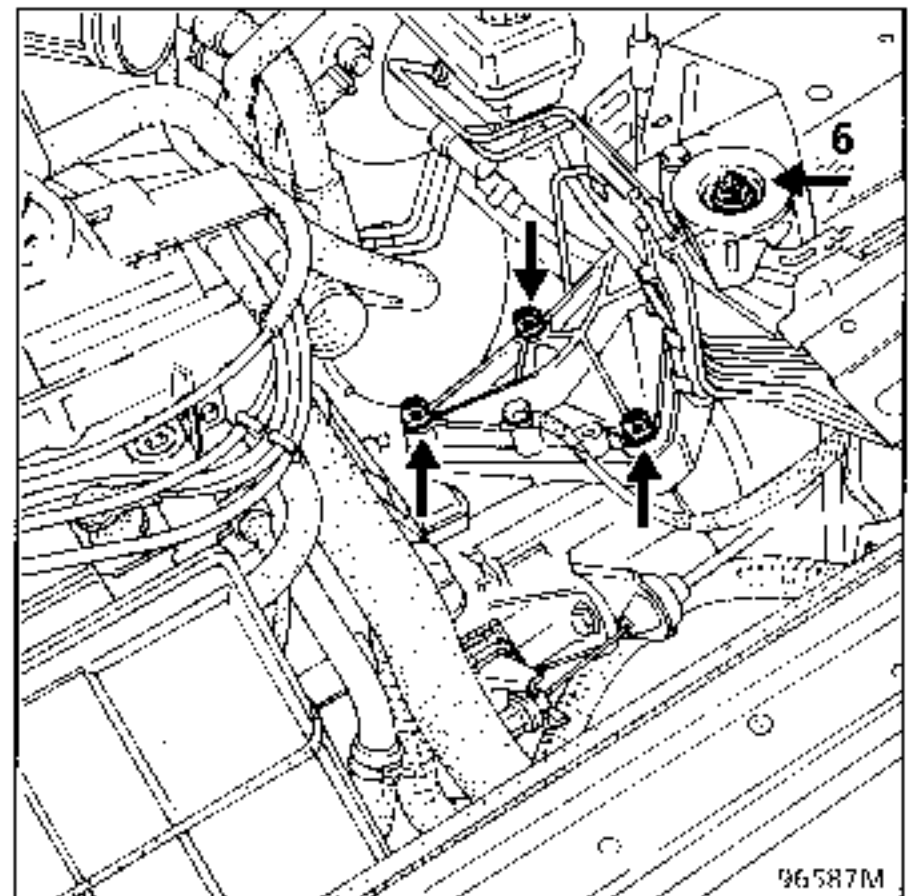


- the TDC sensor,
- the clutch cable,
- the upper bolts from the edge of the gearbox and the starter motor.

Take the weight of the engine by fitting a strut or component jack under the engine block.

Remove the 3 bolts marked in the diagram on the gearbox mounting (do not remove the upper nut marked (6)).

Tilt the engine and transmission assembly slightly while lifting the vehicle (or lowering the support if it has a progressive system).

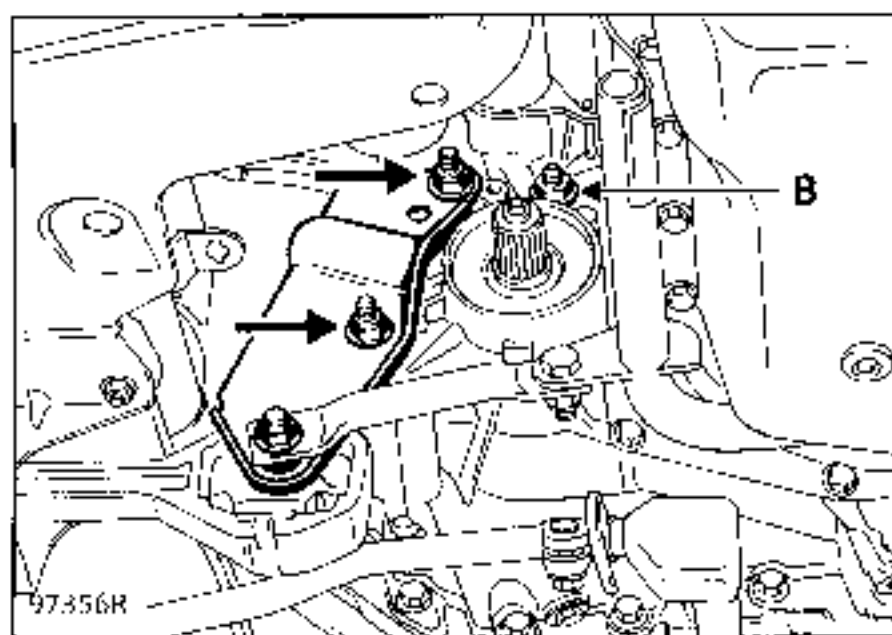
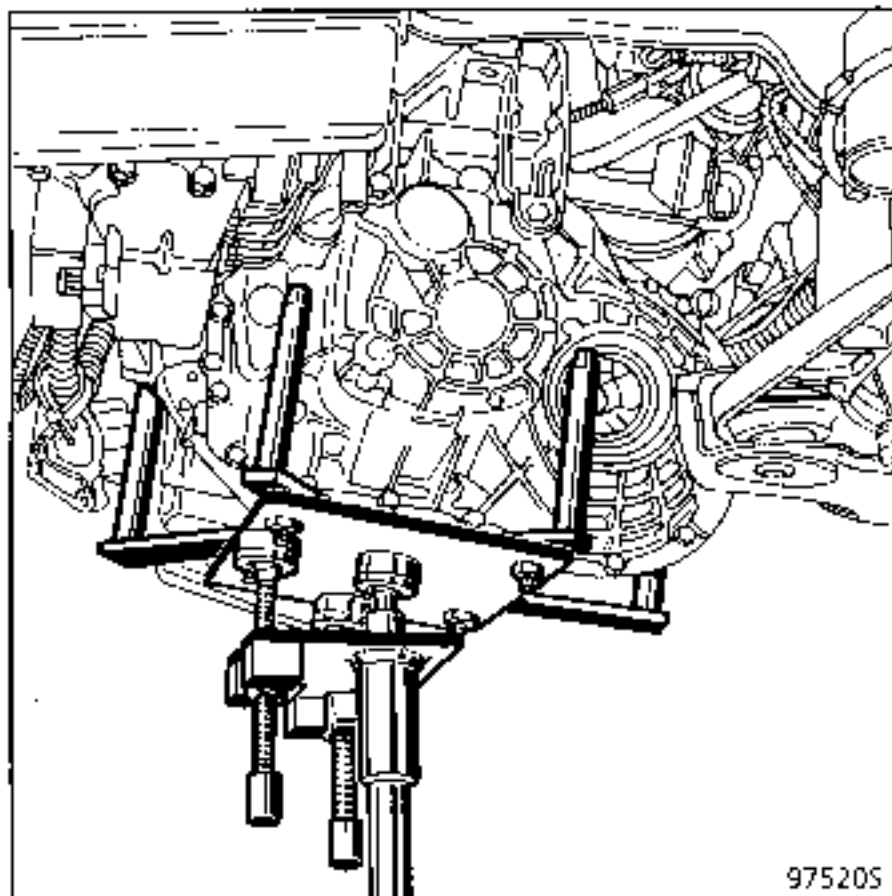


***Under the vehicle:***

Remove nut (B).

Fit the component jack under the gearbox.

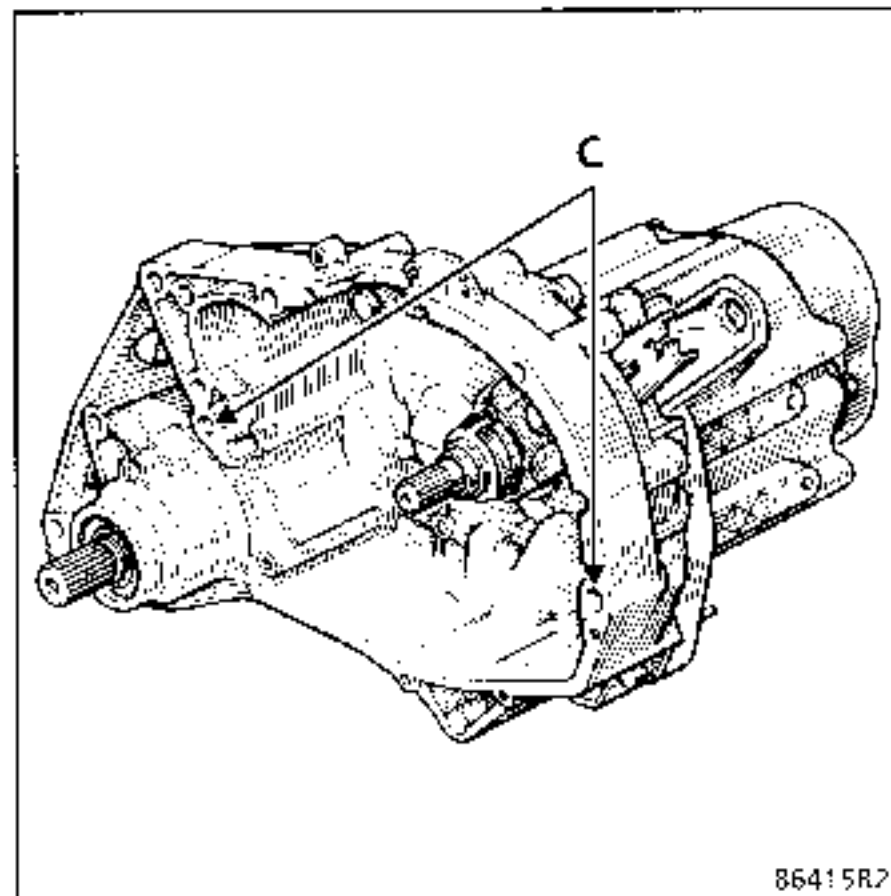
Lift the gearbox gently using the component jack and remove the two mounting bolts from the centre rear mounting. Move this as far back as possible.



Separate the gearbox from the engine and lower it using the component jack, moving the engine mounting if necessary.

**REFITTING (Special notes)**

Ensure the engine - gearbox centring rings are present at (C).

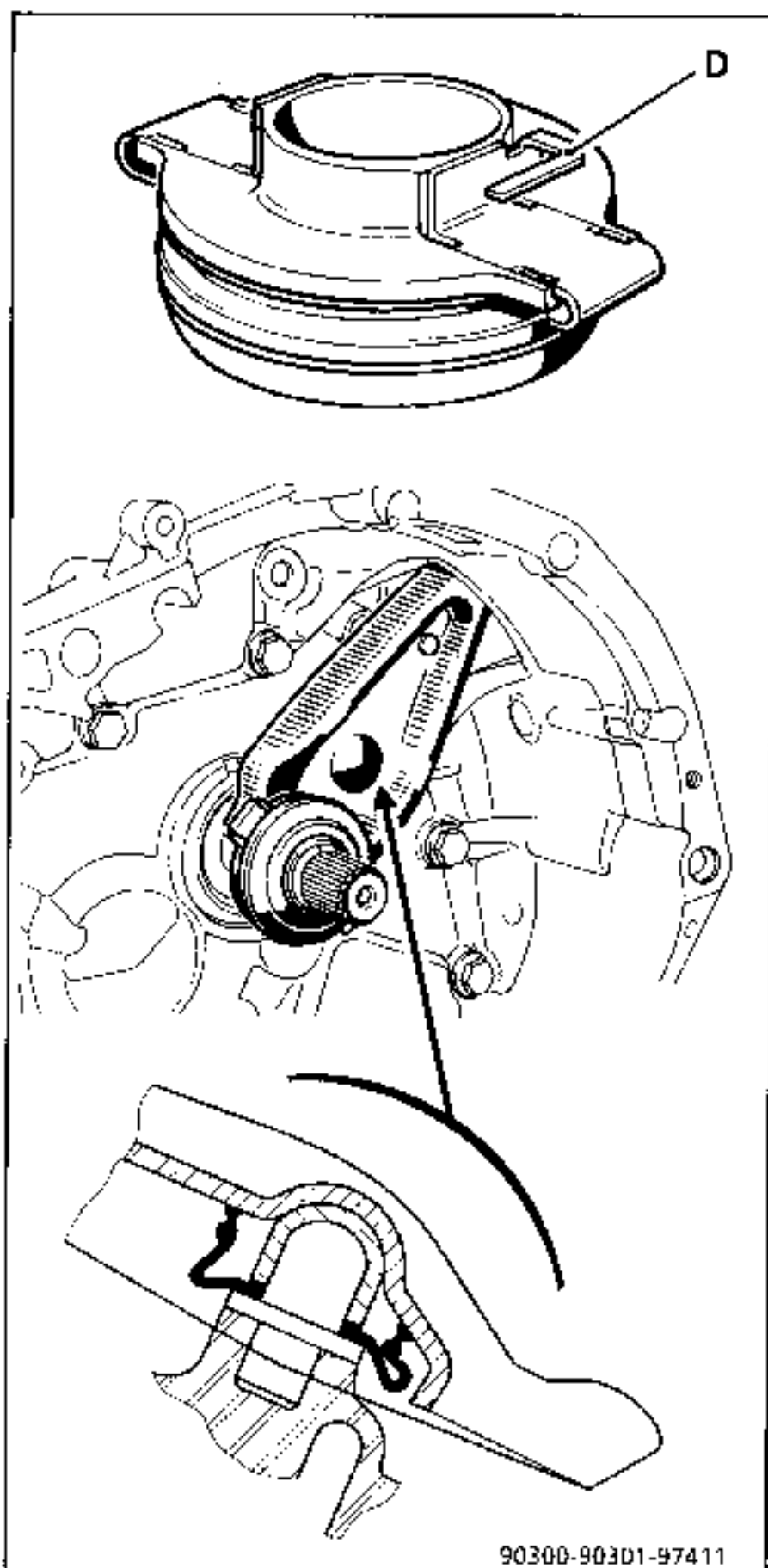


**IMPORTANT:** do not lubricate the clutch shaft splines - they are nickel coated.

Coat the splines of the right hand sunwheel with **MOLYKOTE BR2**.

Check the position of the thrust pad - lug (D) should be engaged in the fork.

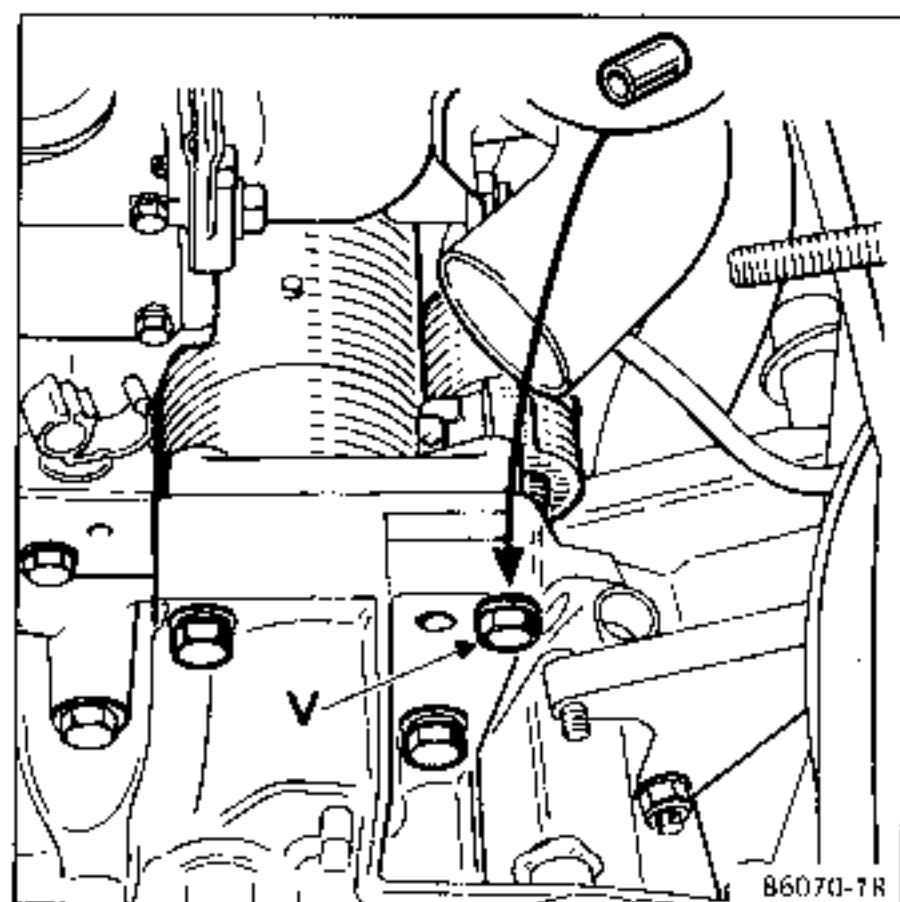
**Evolution :** a gaiter containing grease is fitted behind the clutch fork.



Fit the gearbox.

Ensure the centring rings are correctly fitted in their location at the engine end.

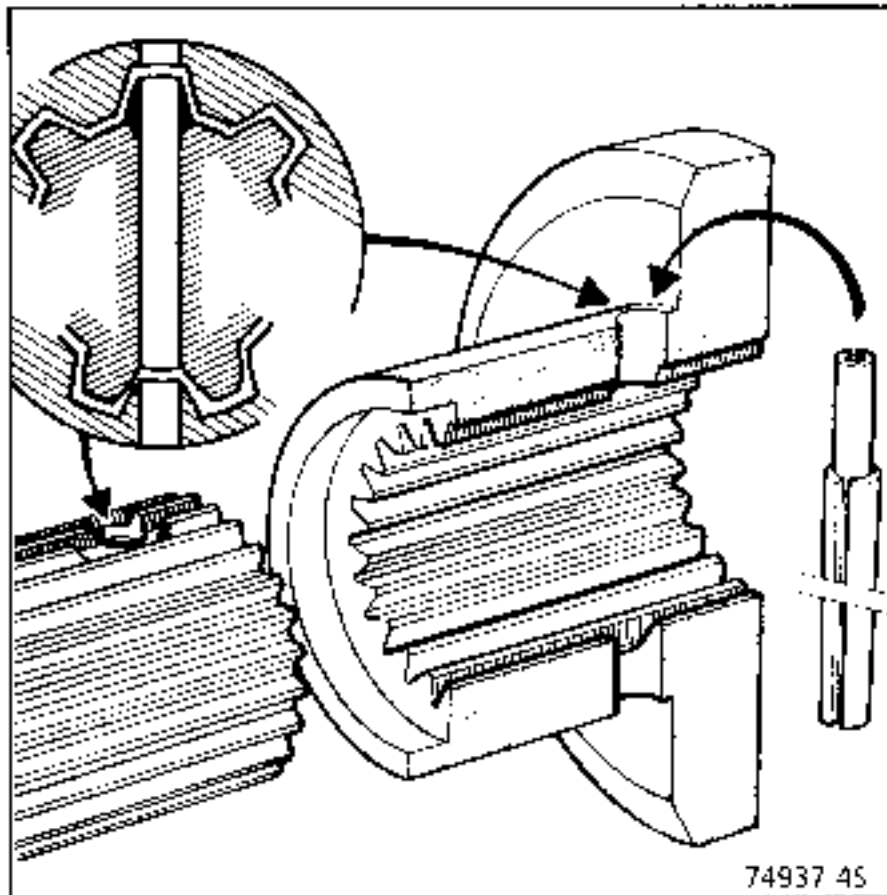
**IMPORTANT:** ensure bolt (V) and the starter motor centring dowel are correctly located.



Use the component jack to reposition the engine and transmission assembly so the front left hand engine mounting may be refitted.

Position the driveshaft in relation to the sunwheel.

Pivot the stub axle carrier and fit the driveshaft into the sunwheel using the angled pin B. Vi. 31-01 to align the holes.

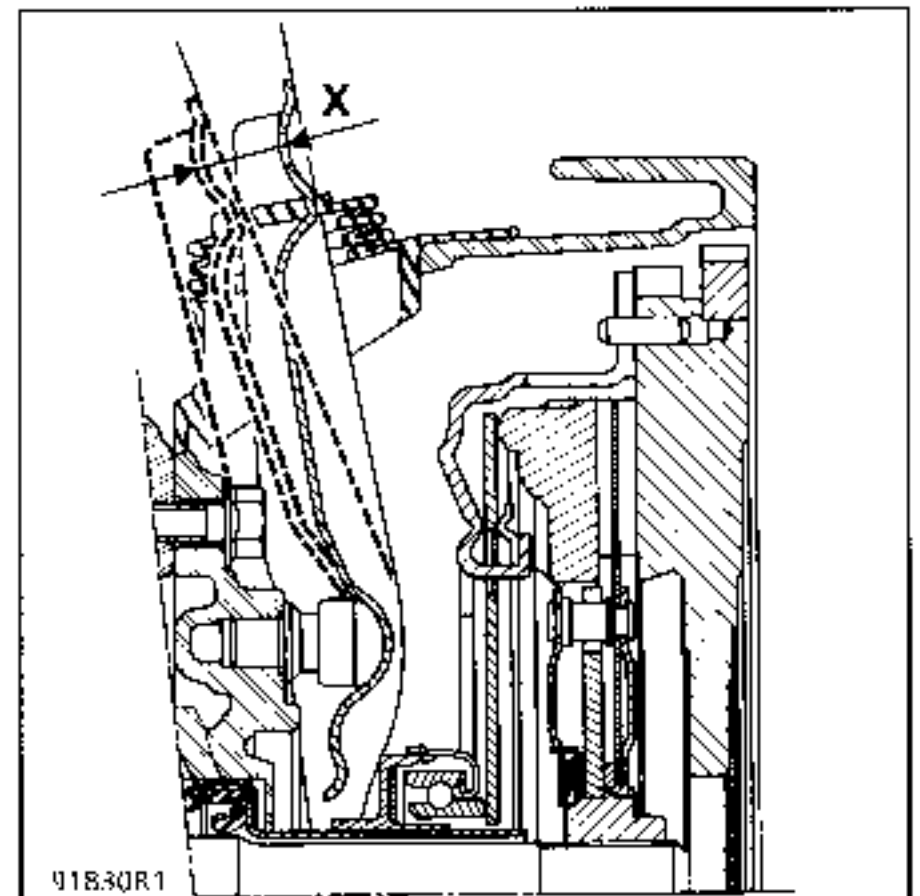


An input chamfer on the sunwheel makes fitting the new roll pins easier.

Seal the ends of the pins with **RHODORSEAL 5661**.

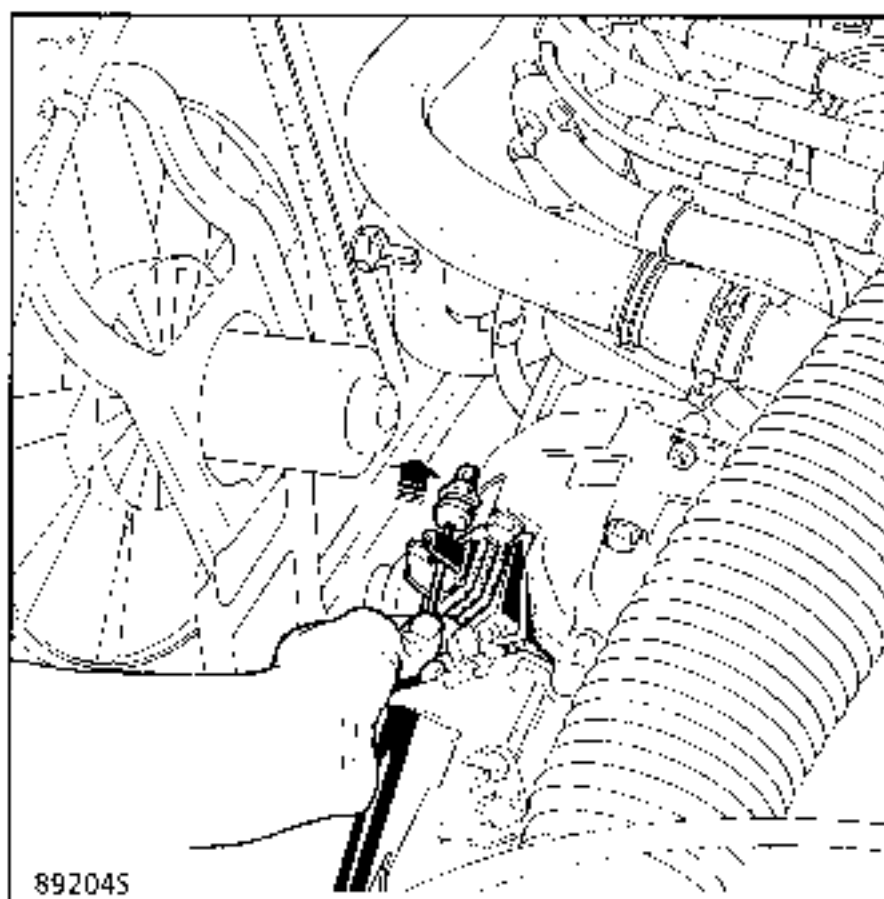
After refitting the engine and gearbox assembly to the vehicle, check the fork travel. It should be:

$$X = 26 \text{ to } 28 \text{ mm}$$



Pull the cable at the clutch fork on the gearbox.

There should be a minimum of 3 cm "slack".



These checks ensure the automatic wear take-up system is operating correctly.

Replace the mounting bolts for the brake caliper and tighten them to the correct torque.

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




Tighten all nuts and bolts to the correct torque

Fill the gearbox with oil.



SPECIAL TOOLING REQUIRED	
T.Av. 476	Ball joint extractor
EQUIPMENT REQUIRED	
Impact ball joint extractor	
Strut type engine support	
Component jack	
2 post lift safety pads	

TIGHTENING TORQUES (in daN.m)	
Drain plug	2.2
Driveshaft gaiter bolt	2.4
Shock absorber base bolt	20
Clutch protective plate bolt	2.4
Bolts at edge of gearbox and starter	5
Nut on edge of gearbox	5
Gearbox mounting bolt on gearbox	6
Left hand lower suspended mounting bolt	11.5
Track rod end nut	4
Lower ball joint nut	6.5
Wheel bolts	10
Engine tie bar bolt	12 to 18
Suspended mounting bolt on gearbox	5.5 to 6.5
Upper rubber mounting pad nut for suspended mounting on front left hand side member	5.5 to 8
Lower rubber mounting pad nut for suspended mounting on front left hand side member	10 to 12.5
Mounting pad bolt on front left side member	6 to 8

## INGREDIENTS

## MOLYKOTE BR2 :

Right hand sunwheel splines and outer bearing cage of relay bearing.

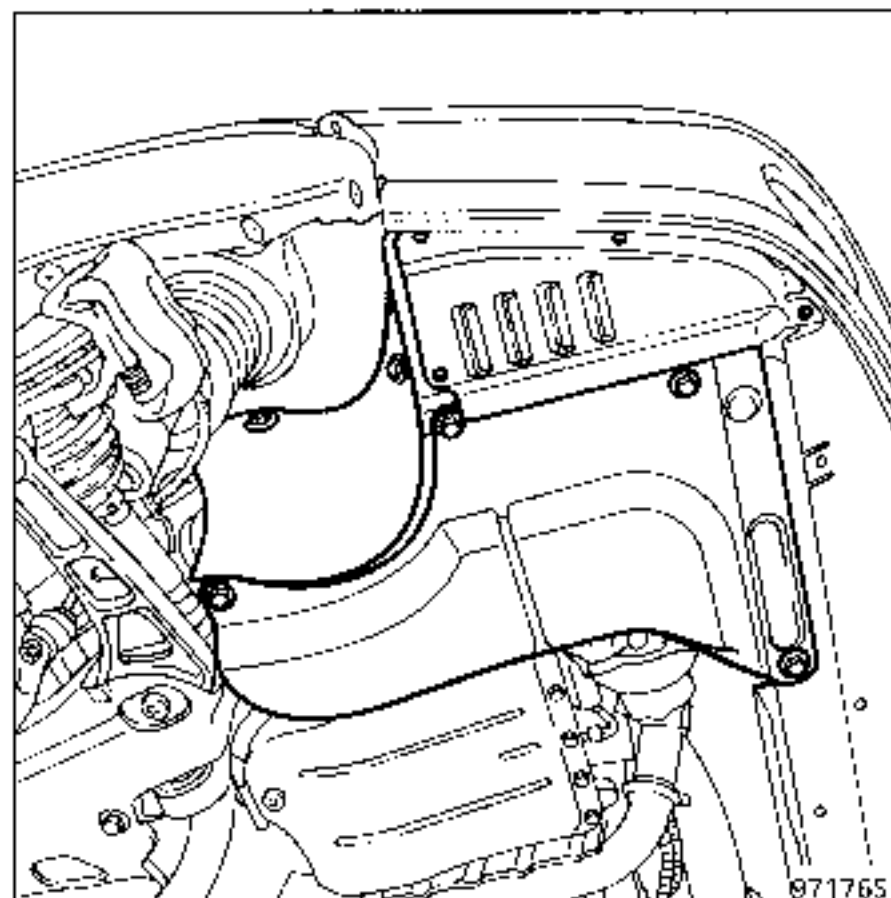
## REMOVAL

Put the vehicle on a 2 post lift fitted with FOG safety pads.

Disconnect and remove the battery.

Remove:

- the front wheels,
- the engine undertrays,
- the front left hand wheel arch protector.



Drain the gearbox.

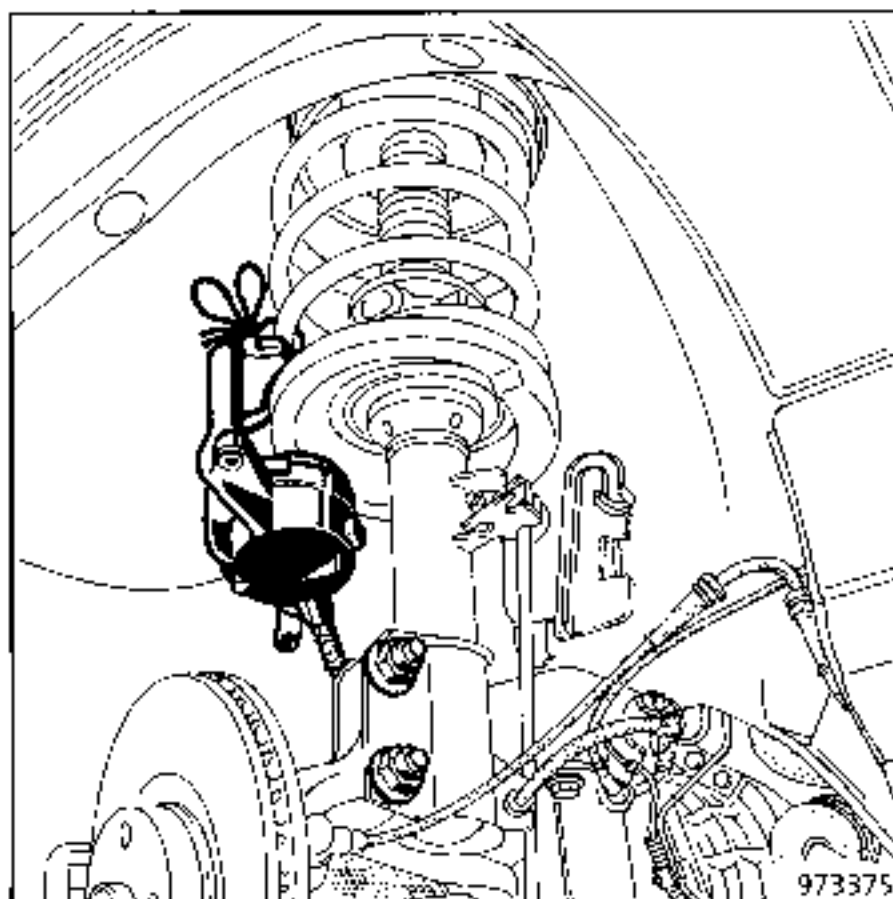
Refit the drain plug with a new seal.

### REMOVING THE DRIVESHAFTS:

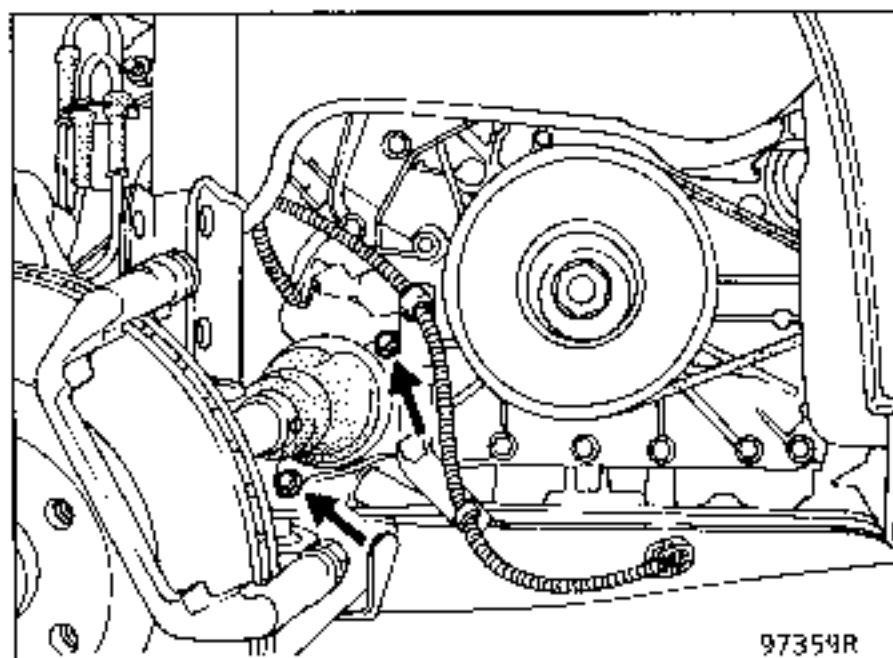
#### Right hand side of the vehicle

Remove:

- the front right hand brake caliper, attaching it to the suspension spring to protect the pipe,



- the two mounting bolts for the transmission flange on the inner gaiter,

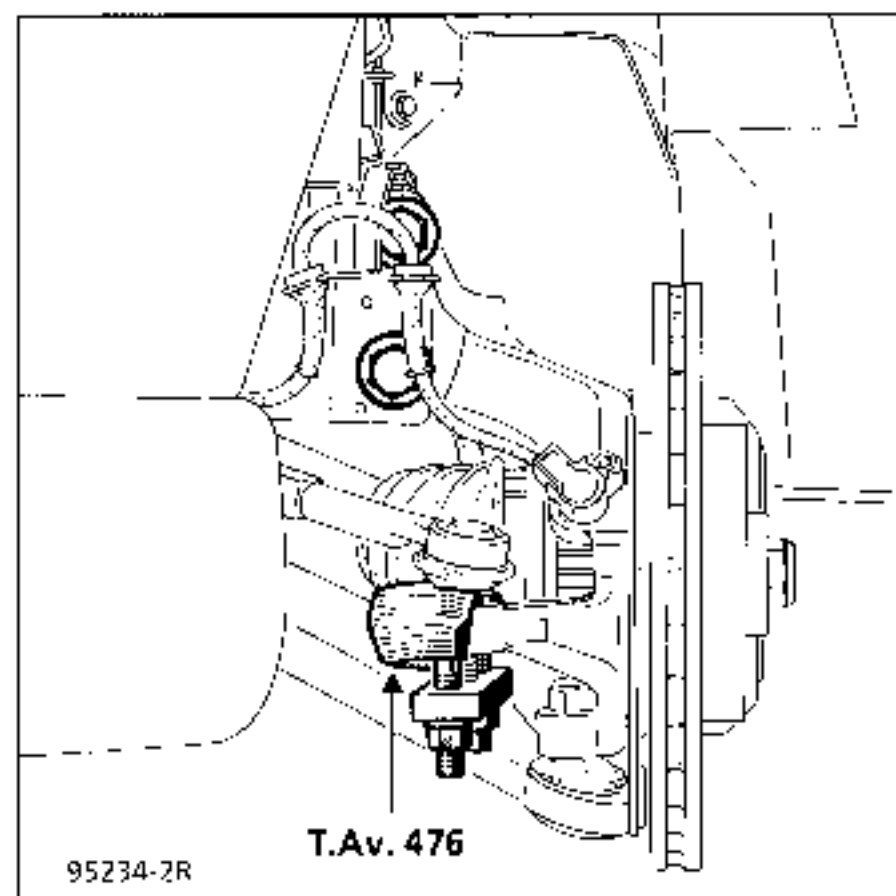


- the track rod end using tool T. Av. 476.

Release the brake pad wear warning light wire.

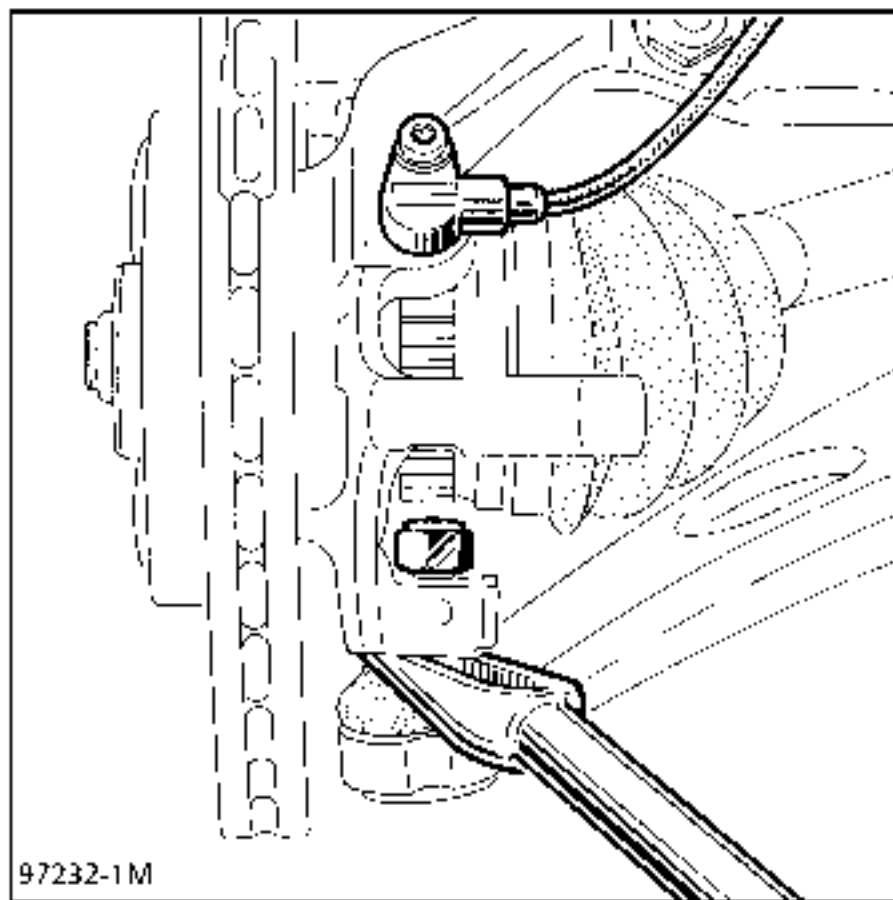
Disconnect the ABS target sensor.

Remove the shock absorber base mounting bolts.

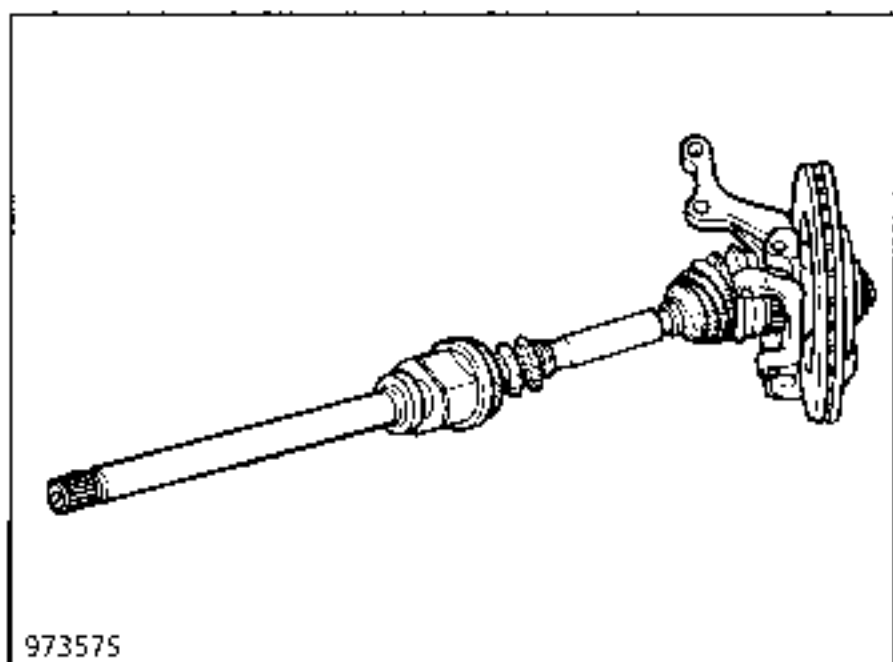


Remove the wheel sensor if the vehicle is fitted with ABS.

Slacken the nut on the lower ball joint as far as possible and release the joint using an impact ball joint extractor.



Remove the hub assembled with the driveshaft.

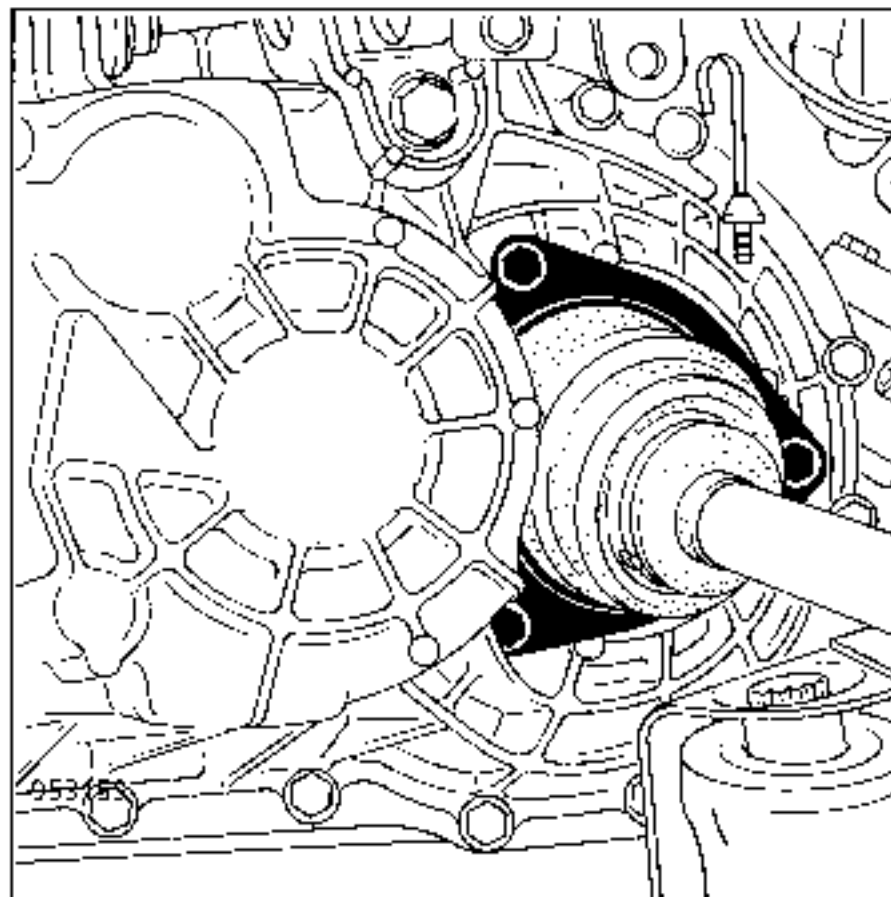


Take care to protect the gaiters.

### Left hand side of the vehicle

Remove:

- the brake caliper,
- the three driveshaft gaiter mounting bolts.

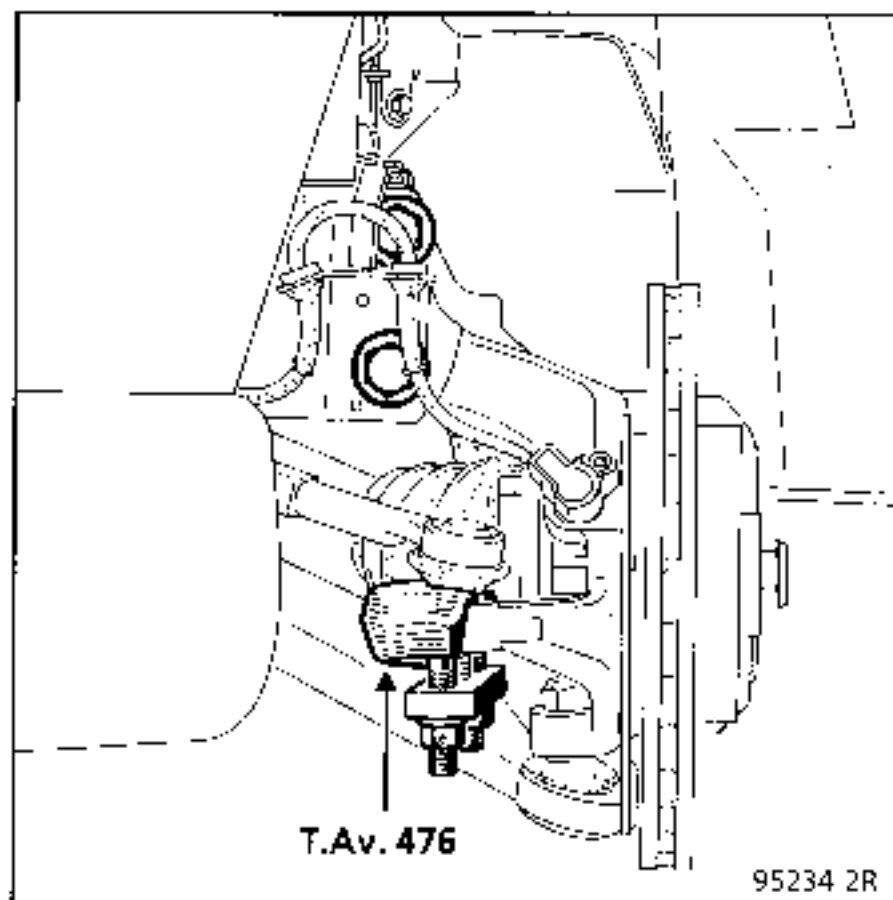


- the track rod end using tool  
T. Av. 476.

Release the brake pad wear warning light wire.

Disconnect the ABS target sensor.

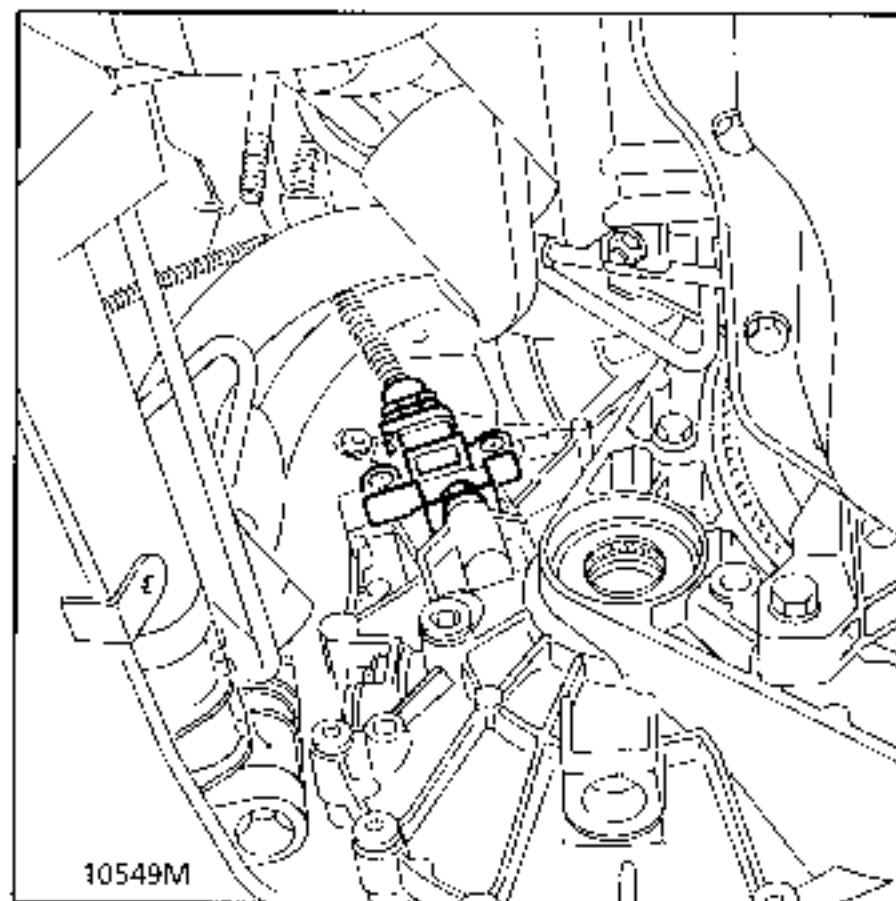
Remove the shock absorber base mounting bolts.



Release the lower ball joint and the track rod end.  
Remove the stub axle - disc - driveshaft assembly.

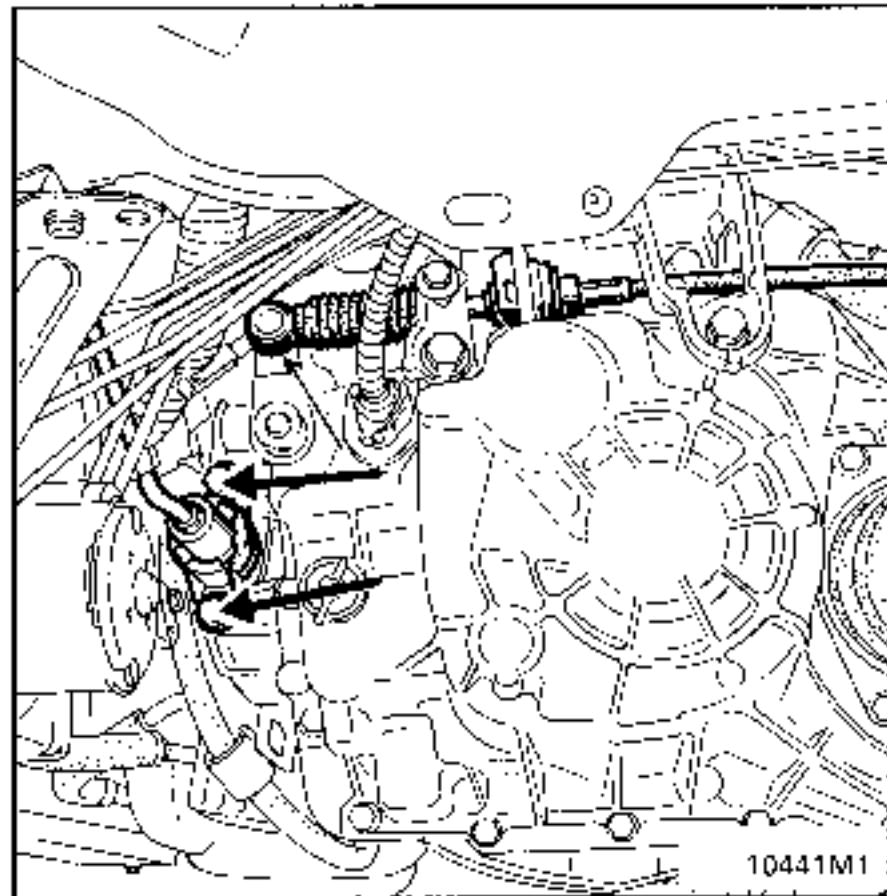
Disconnect the earth strap from the gearbox.

Disconnect the speedo sensor from the rear of  
the gearbox.

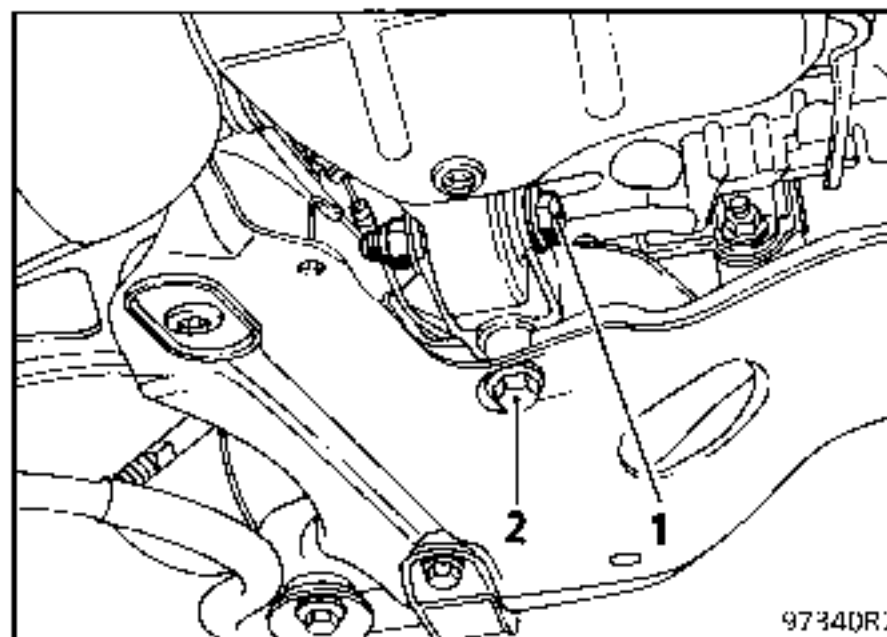


Unclip and partially release the gear selection cable.

Separate the clutch slave cylinder from the gear-box (2 bolts).



Remove the engine tie bar bolt (1) and slacken bolt (2).

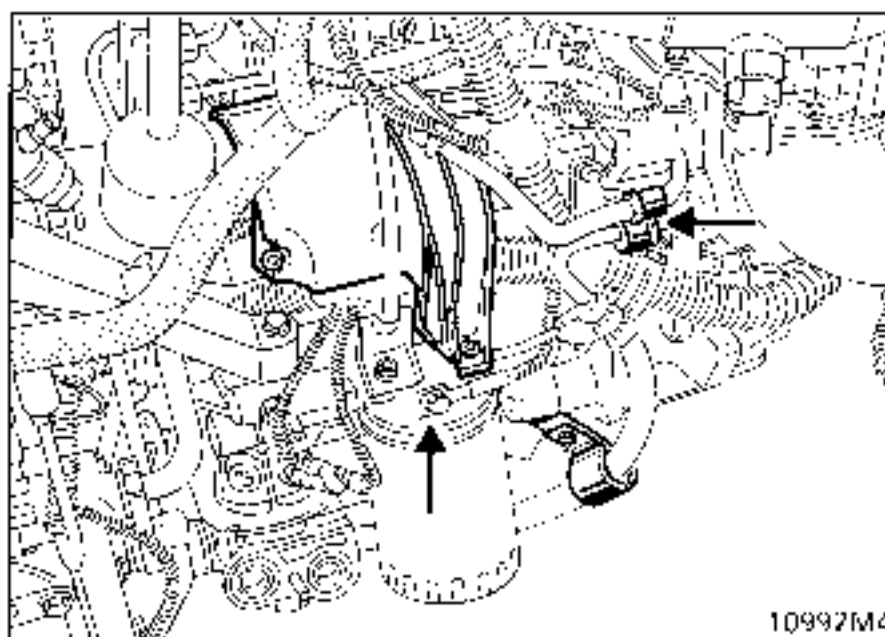


Remove the reversing lights switch wiring and the clip.

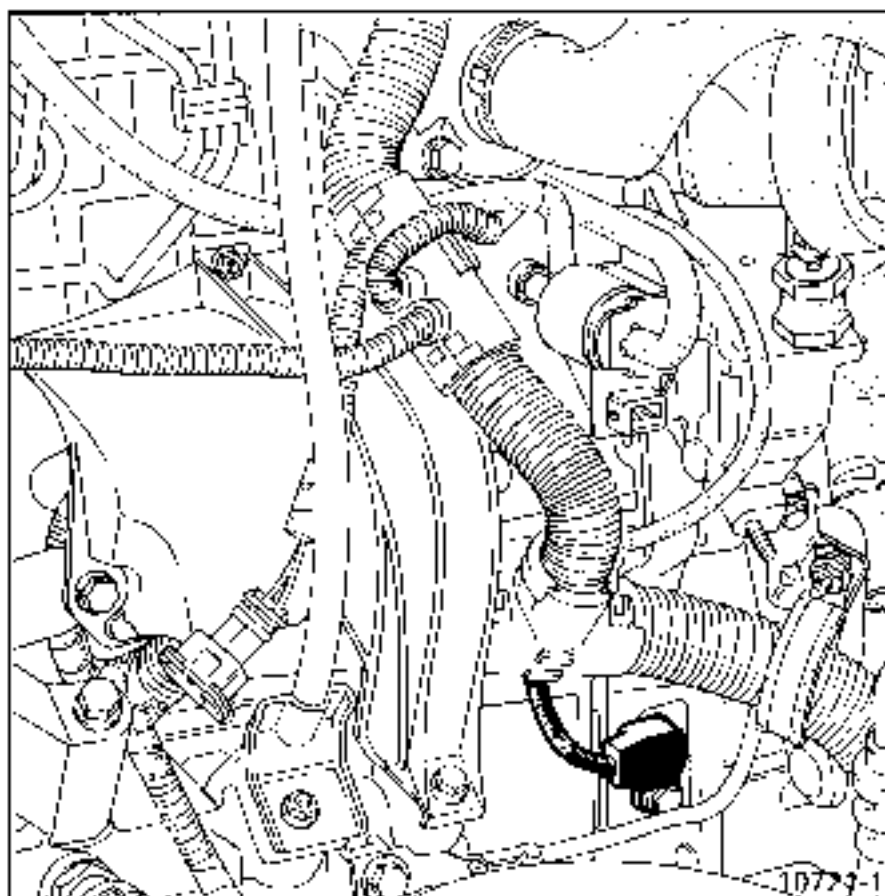
*From below the vehicle:*

Remove the engine earth wire (next to the oil filter mounting).

Slacken but leave connected the mounting bolt for the power assisted steering pipes. Release the power assisted steering pipes from these brackets.



Remove the speed sensor from the starter ring gear to make reaching the starter bolts easier.

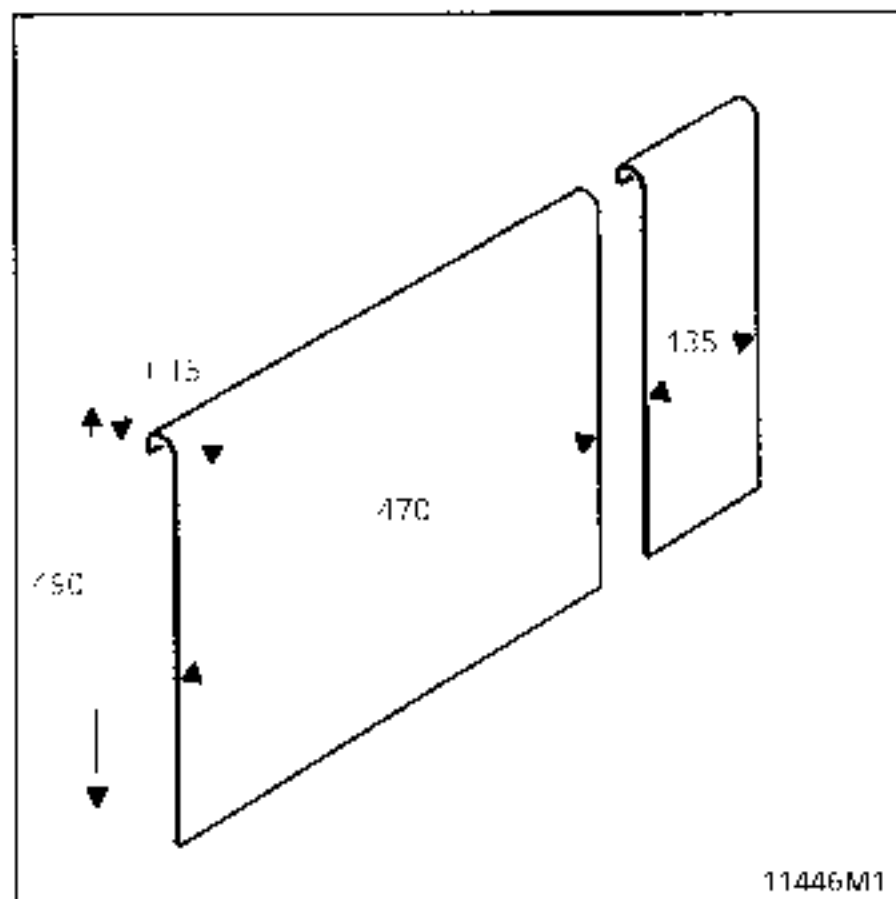


Remove the starter motor protective plate.

**From above the vehicle:**

Release the radiator oil exchanger without disconnecting it. Attach it to the engine.

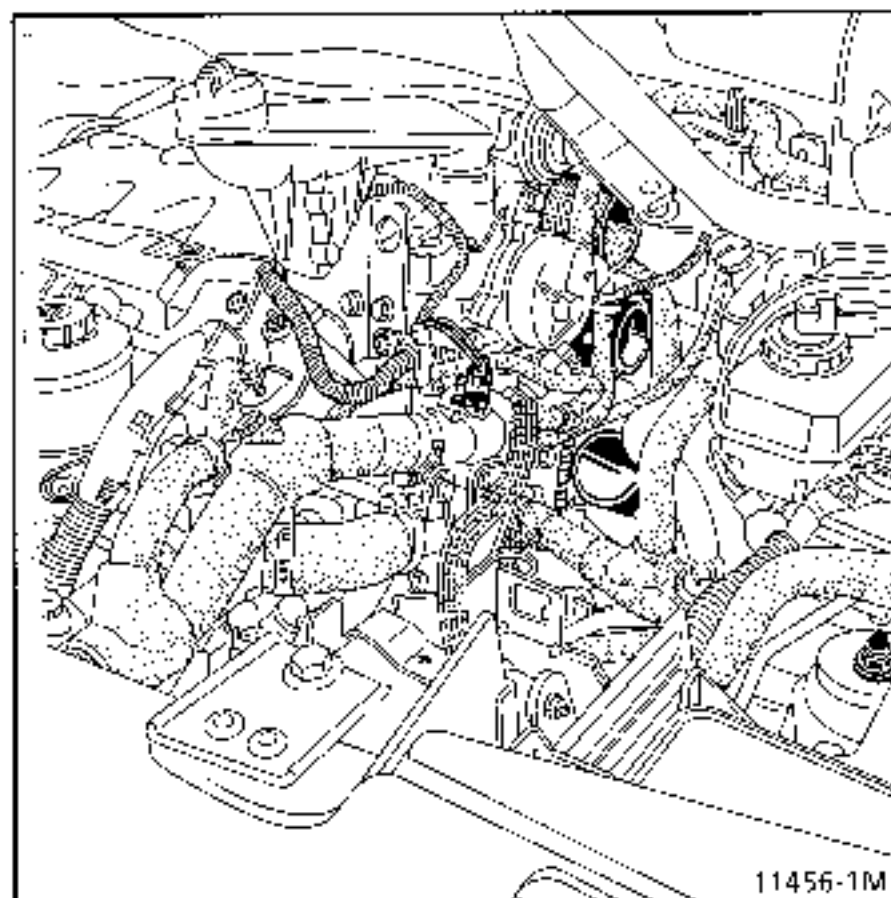
The radiator must be protected using a locally made tool as described below.



Remove:

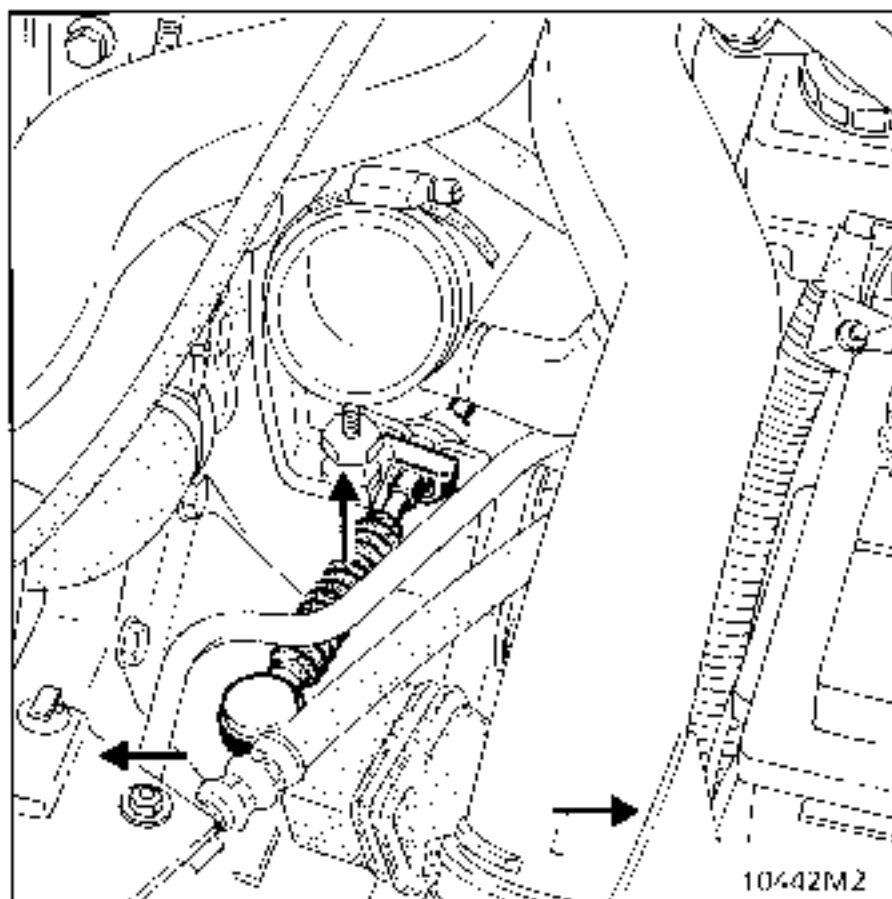
- the air filter,
- the air duct between the air filter and the turbocharger,
- the air filter mounting,
- the rigid pipe between the exchanger and the inlet manifold to make reaching the bolts at the edge of the gearbox easier.

Disconnect the air pipe between the turbocharger and the exchanger.

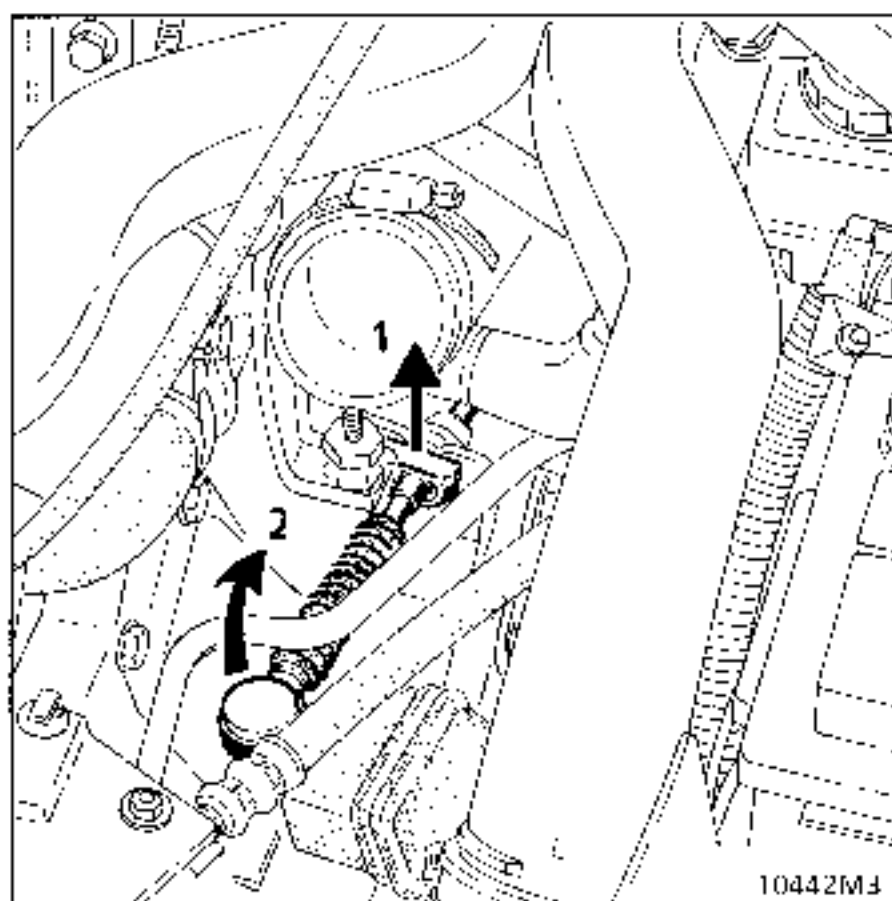


Remove the three mountings for the air filter support.

Remove the mounting bolts for the PAS pipes at the edge of the gearbox (behind the device).



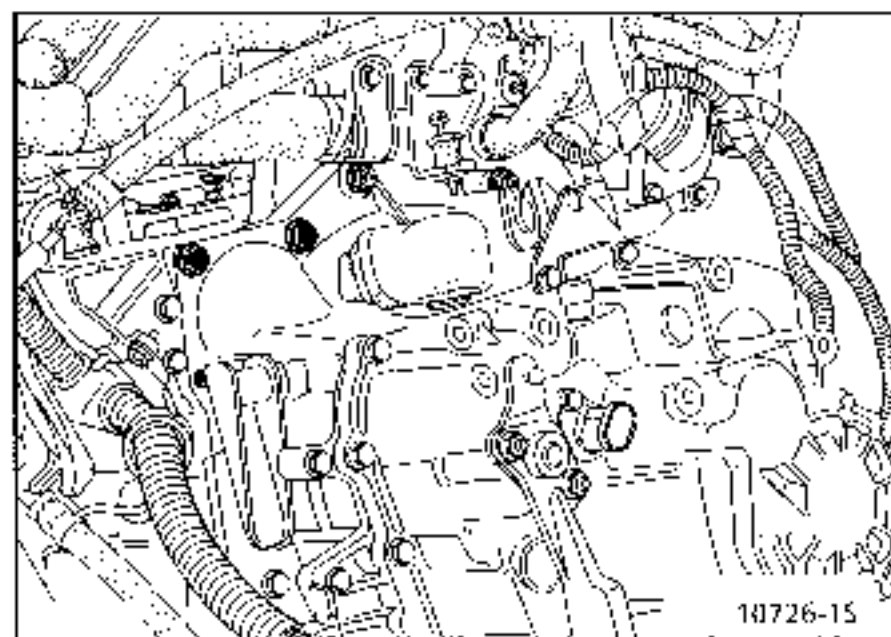
Unclip the gearbox control cable and release the ball joint from the cable.



Pass the control above the coolant pipe to avoid twisting it when removing it from the gearbox.

*From below on the left hand side:*

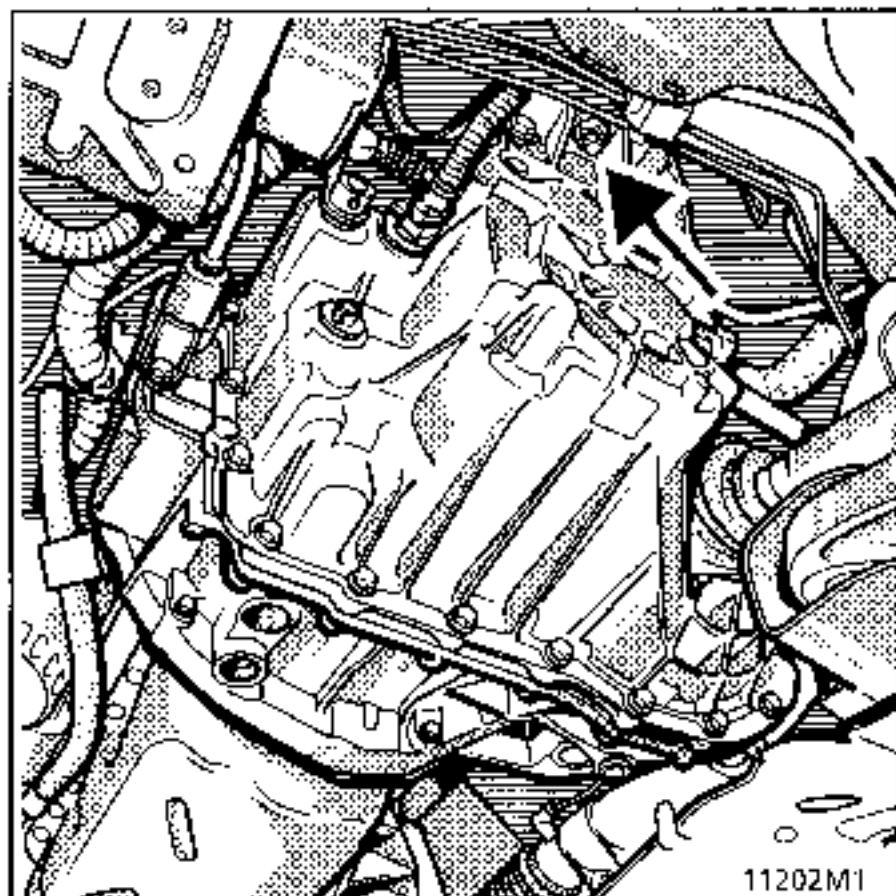
Remove the bolts at the edge of the gearbox and the starter motor from above or from the side (socket + extensions).



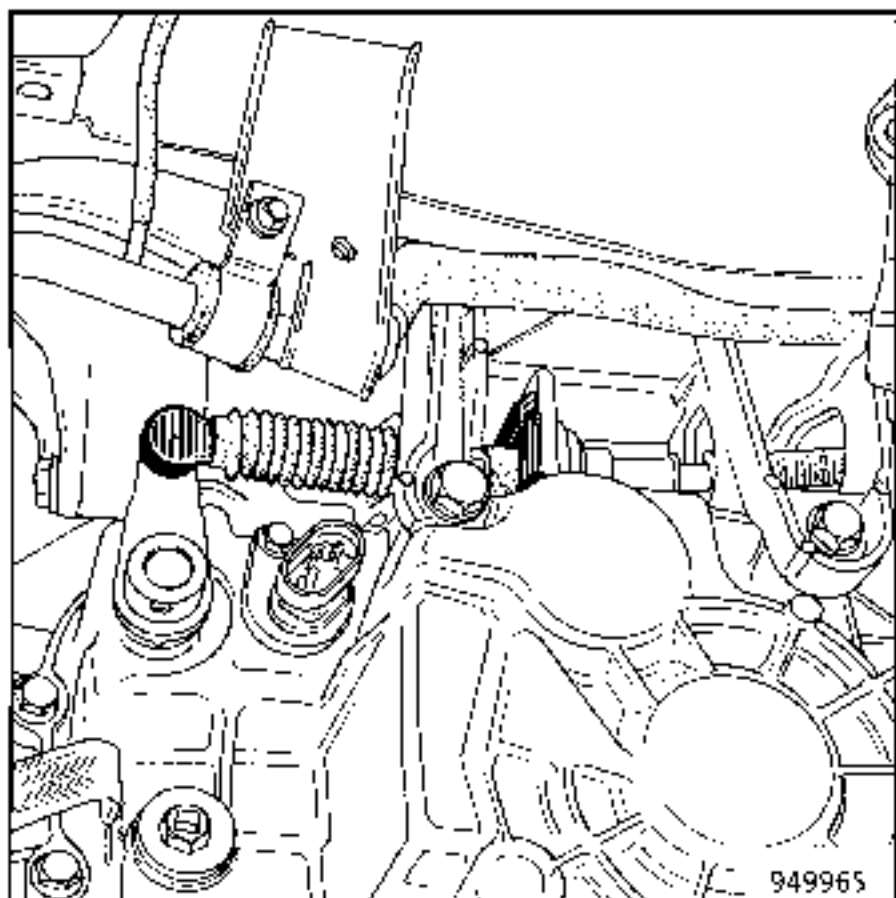
Take the weight of the engine using an axle stand with a rubber pad under the sump.



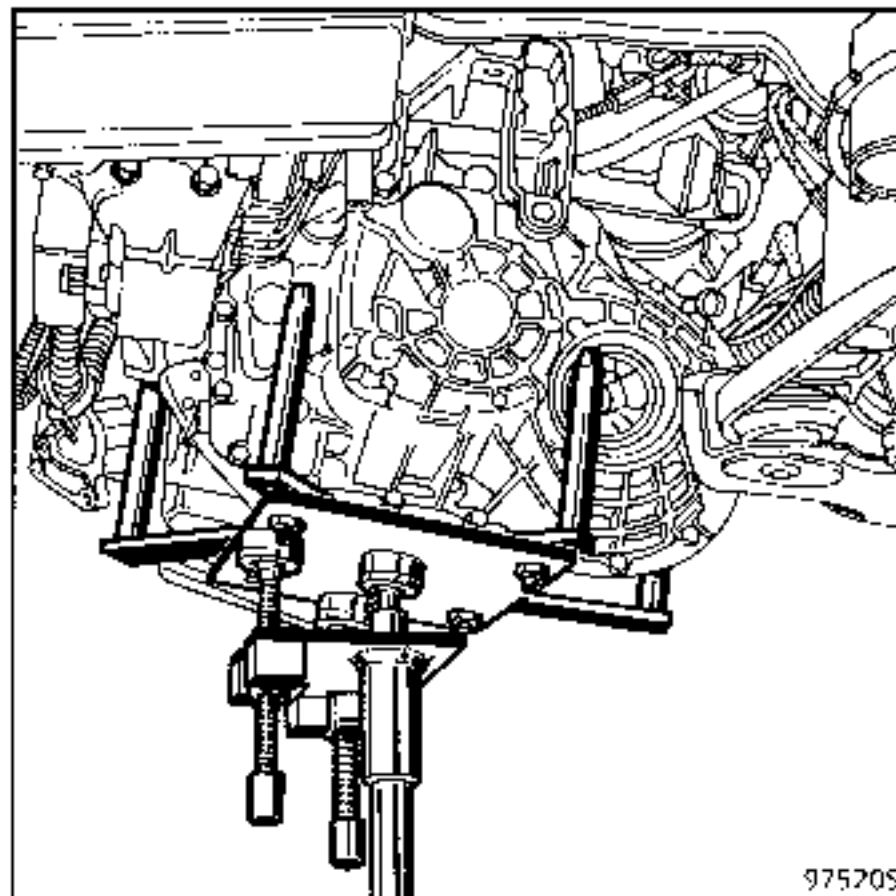
Remove the mounting bolt for the suspended mounting on its mounting pad.



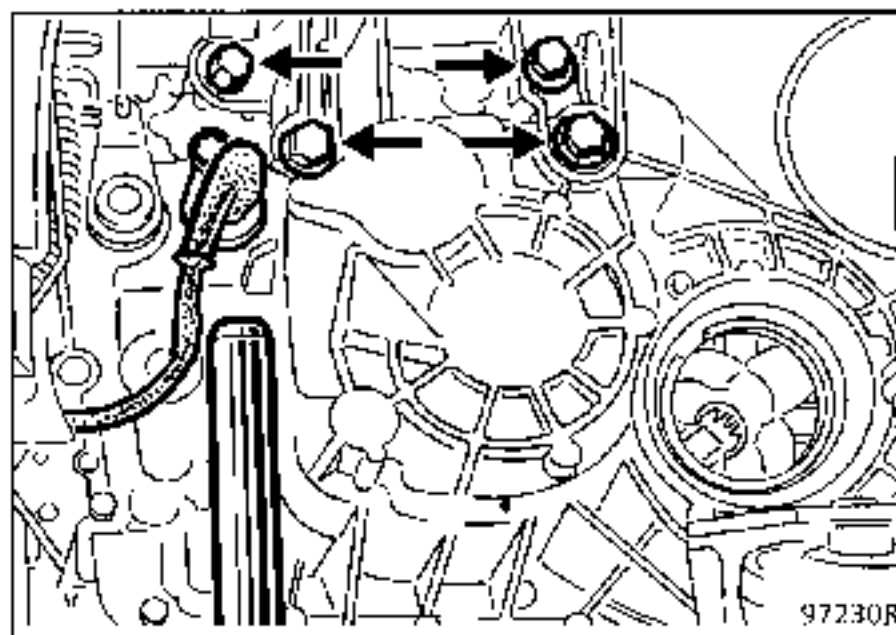
Unclip and remove the gear selection control.



Fit the component jack into position.



Slightly lower the engine and transmission assembly to make removing the left hand gearbox mounting easier (4 bolts).



Remove the remaining bolts from the edge of the gearbox.

**NOTE:**

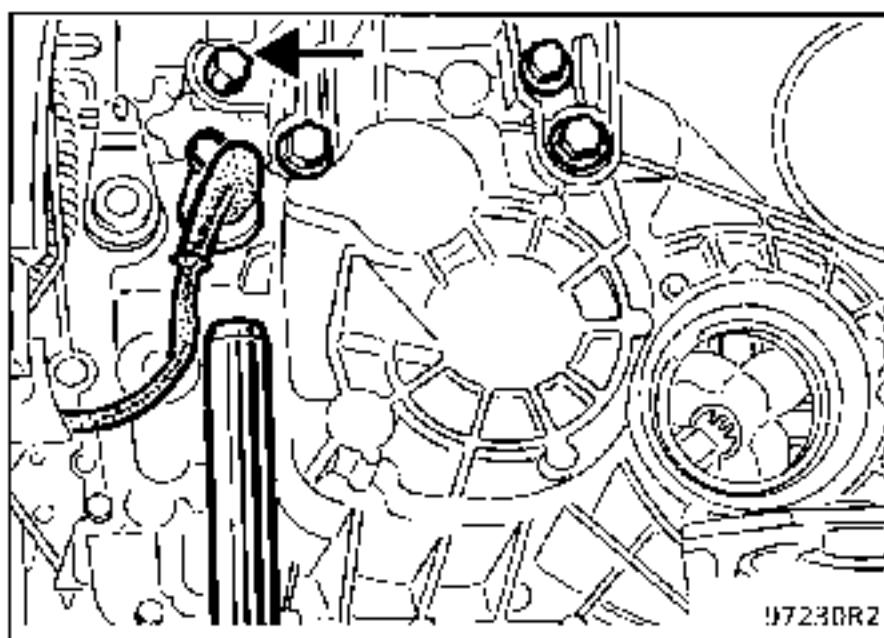
All the bolts are of the same length.

Remove the gearbox (two persons will be required).

**REFITTING**

Ensure the gearbox centring dowels are present.

First fit and tighten the tapered bolt for the left hand engine and transmission mounting.



Lubricate the edge of the gaiter/bearing for the right hand driveshaft to avoid it sticking the next time it is removed.

Ensure the gear control cable sleeve is correctly clipped to the left hand air filter mounting.

(Important - if this is not correct there is a risk of noise while driving)

SPECIAL TOOLING REQUIRED	
B.Vi. 22-01	Extractor body
B.Vi. 28-01	Bearing extractor with jaws
B.Vi. 31-01	Set of punches for removing and fitting 5 mm diameter roll pins
B.Vi. 1000	5th gear fixed gear extractor
B.Vi. 1170	5th gear hub extractor
B.Vi. 1007	Jaws for tool B. Vi. 28-01
B.Vi. 1175	5th gear fixed gear mounting bolt

## TIGHTENING TORQUES (in daN.m)



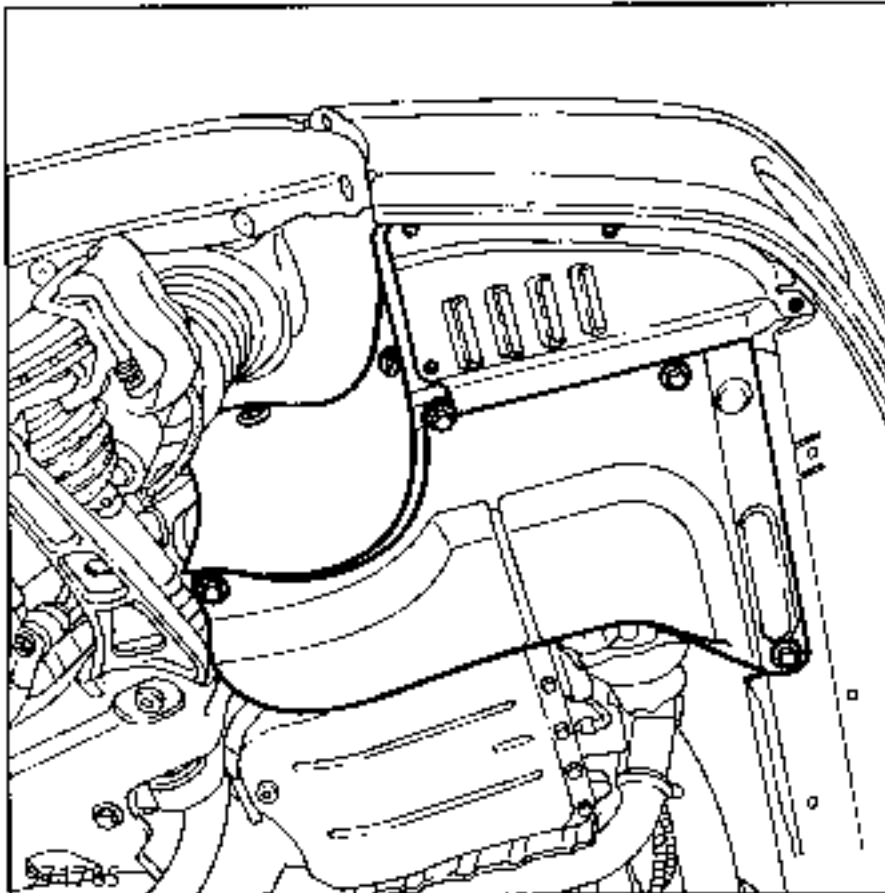
Primary shaft nut	13.5
Secondary shaft bolt	8

## REMOVAL

Put the vehicle on a 2 post lift.

Remove the front left hand wheel.

Remove the wheel arch protector.



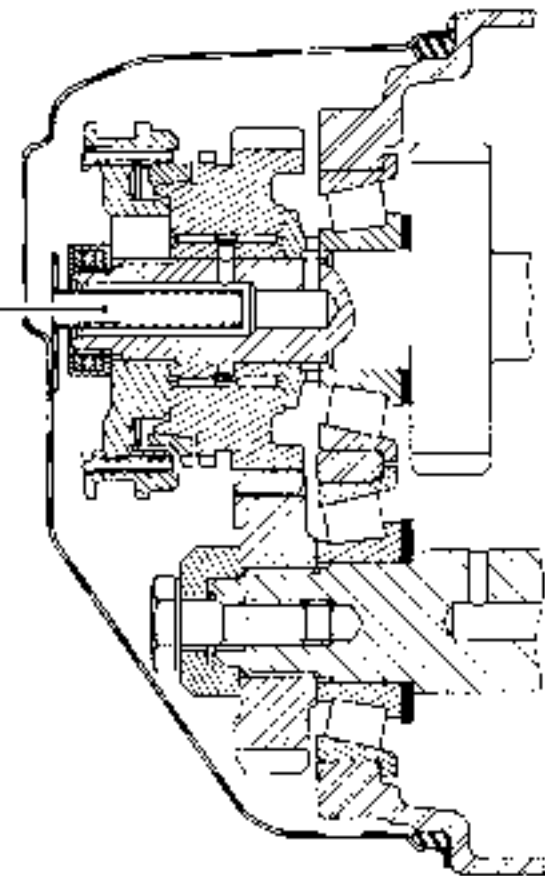
Remove the oil collector under the gear box and drain the gearbox.

The rear housing must be removed in the horizontal axis of the gearbox, as it has a lubrication channel (A) which fits into the primary shaft.

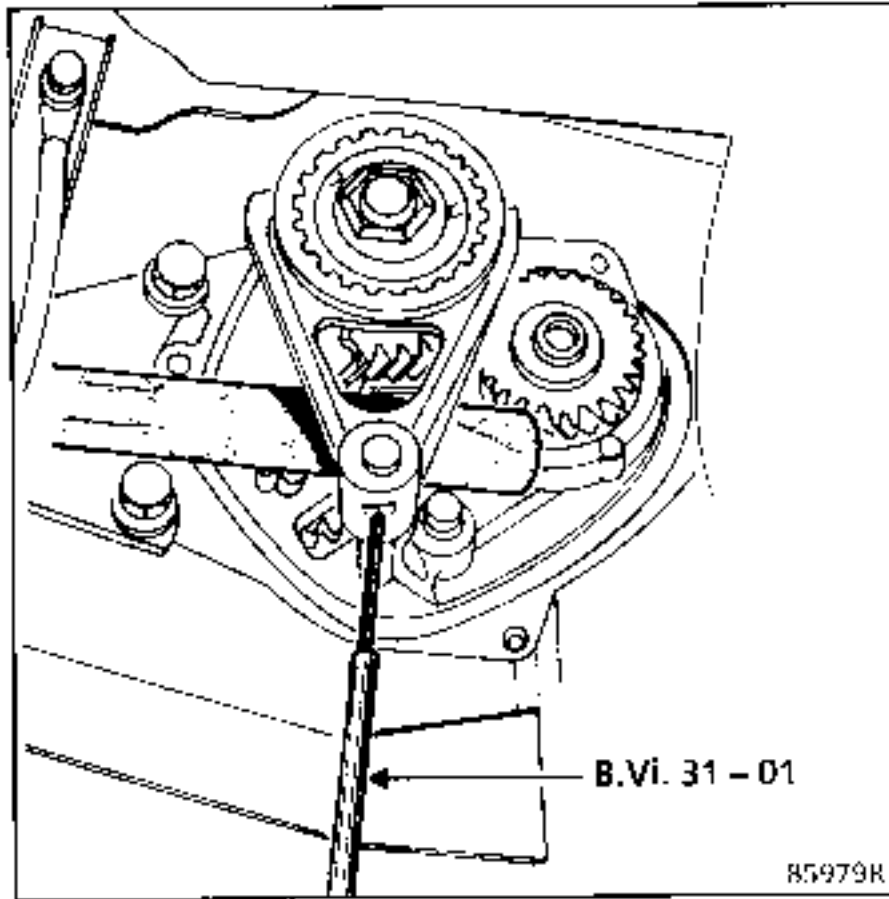
JC5

A

93259R

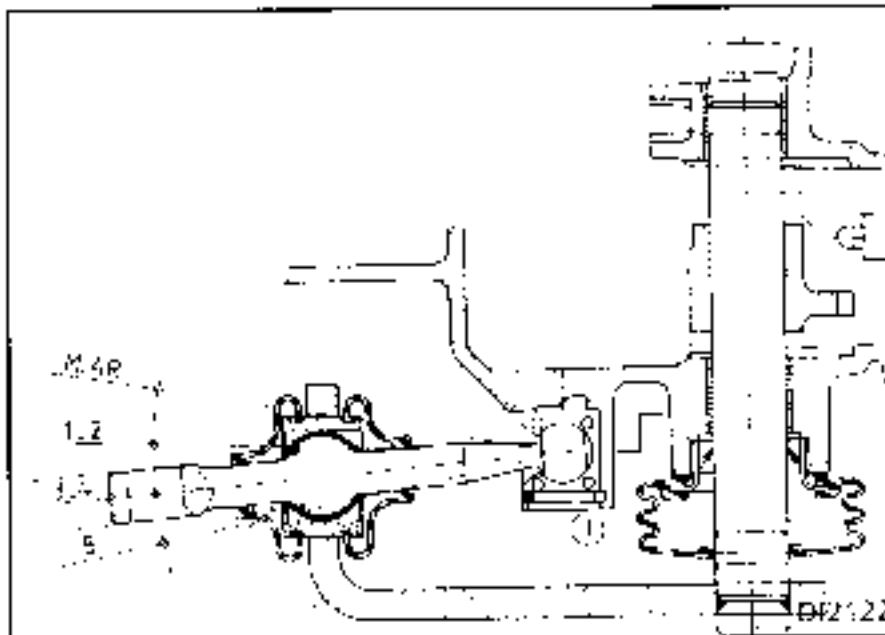


Fit a wooden block between the 5th gear fork and the drive pinion to take the weight; then remove the fork roll pin using tool B.Vi. 31-01.

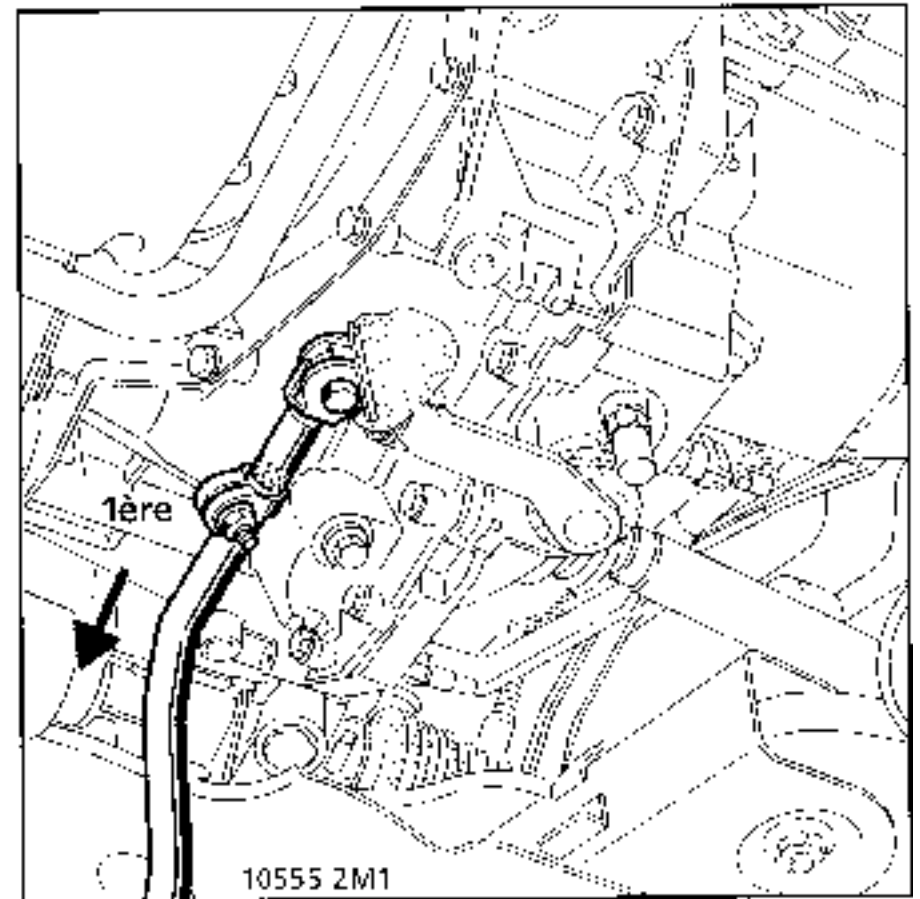


#### NOTE

Do not pull the 5th gear fork shaft outwards as the locking mechanism may move and prevent the fork being refitted; for safety reasons, engage a gear (3rd or 4th) when removing and refitting the pin.



Engage 5th gear by sliding the fork on its shaft and selecting 1st gear at the gear lever.



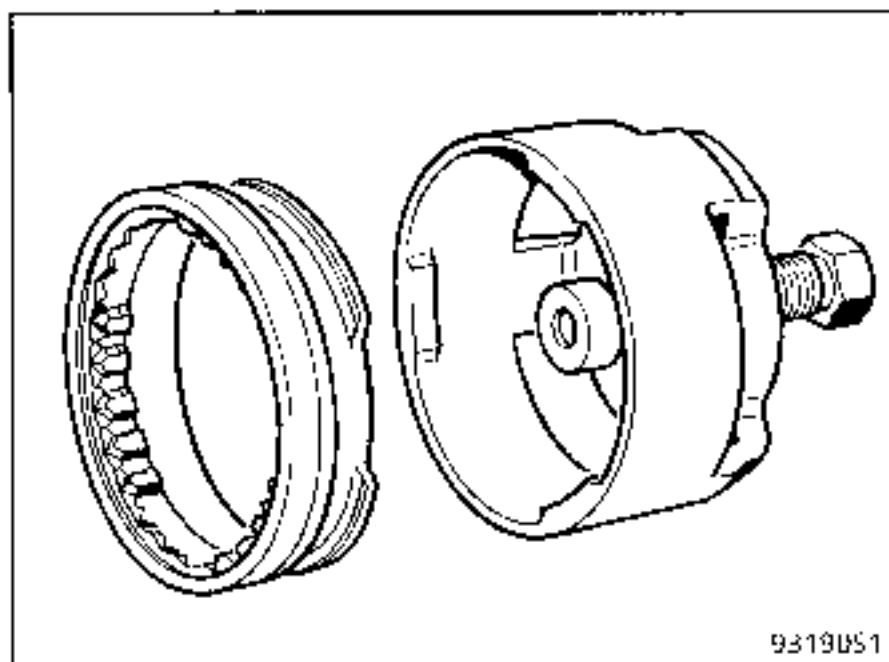
Slacken and remove the primary shaft nut and the secondary shaft bolt.

Return the gearbox to neutral.

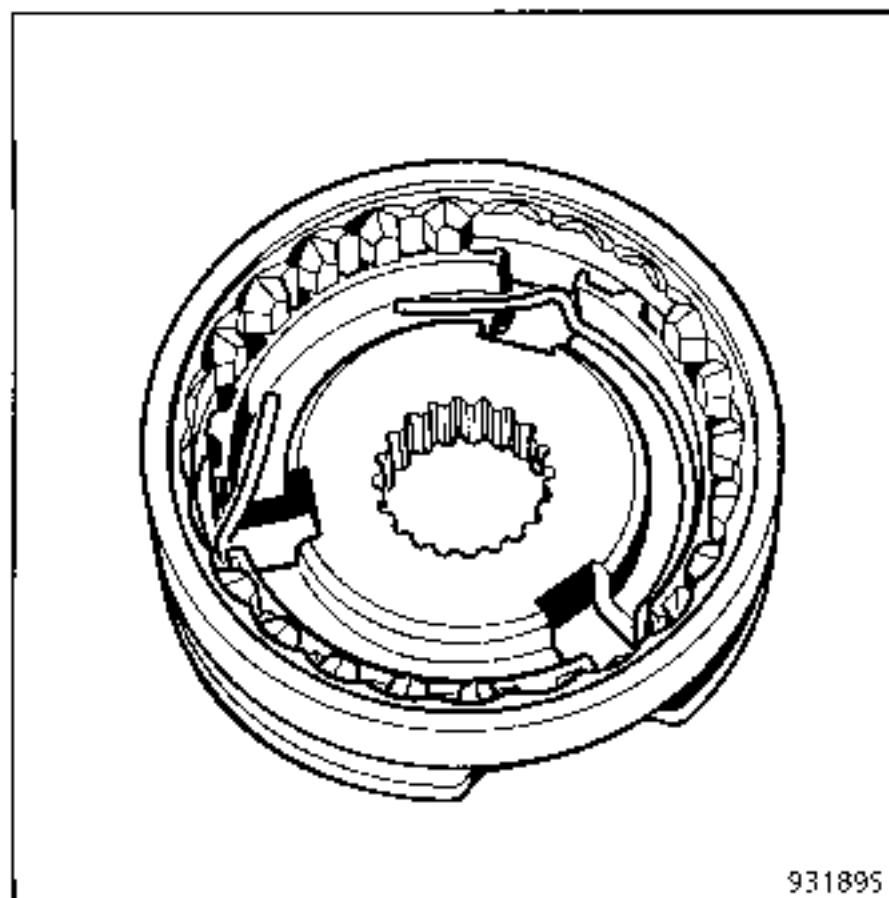
**On the primary shaft:**

Remove the 5th gear fork and the sliding gear.

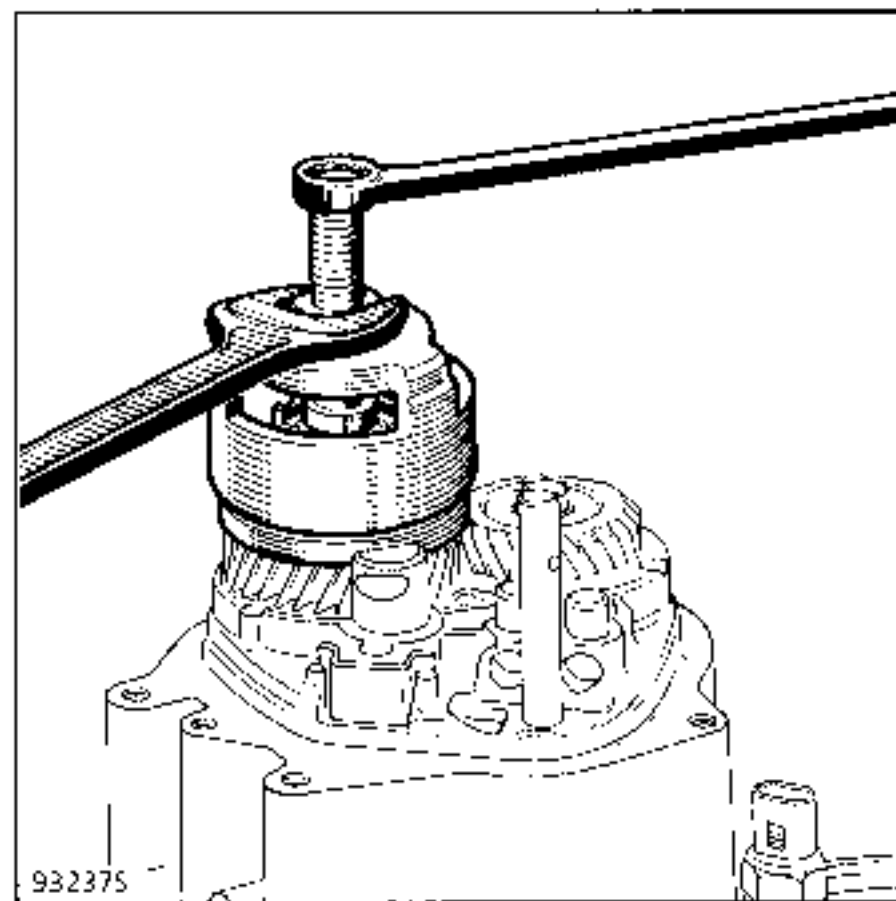
Remove the synchro hub using tool B.Vi. 1170.



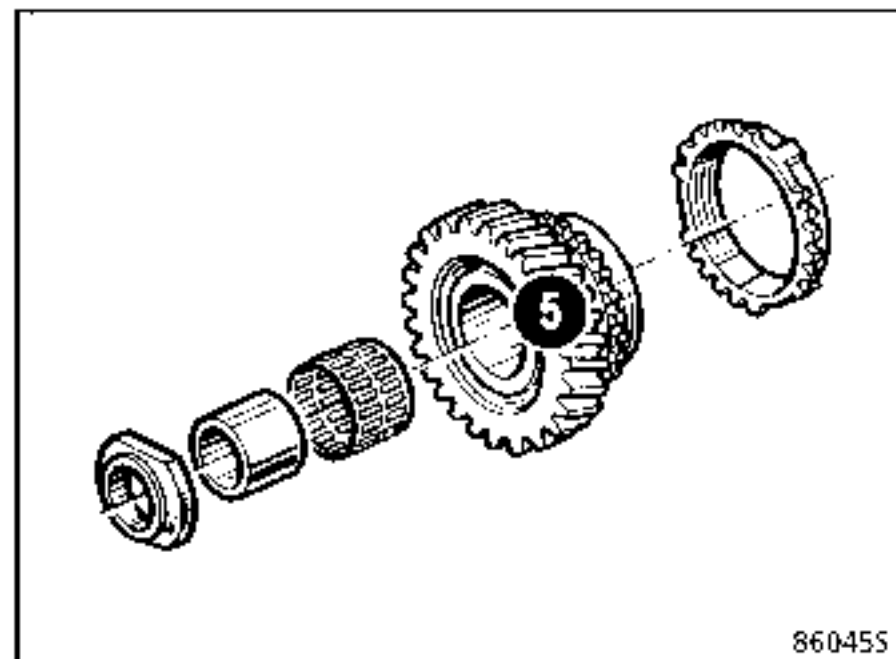
Fit the sliding gear of tool B.Vi. 1170 as if to engage 5th gear and turn it so that the splines on the sliding gear and the hub are opposite each other.



Fit the bell shaped section of the tool on the sliding gear and turn it to the stop, then remove the hub.

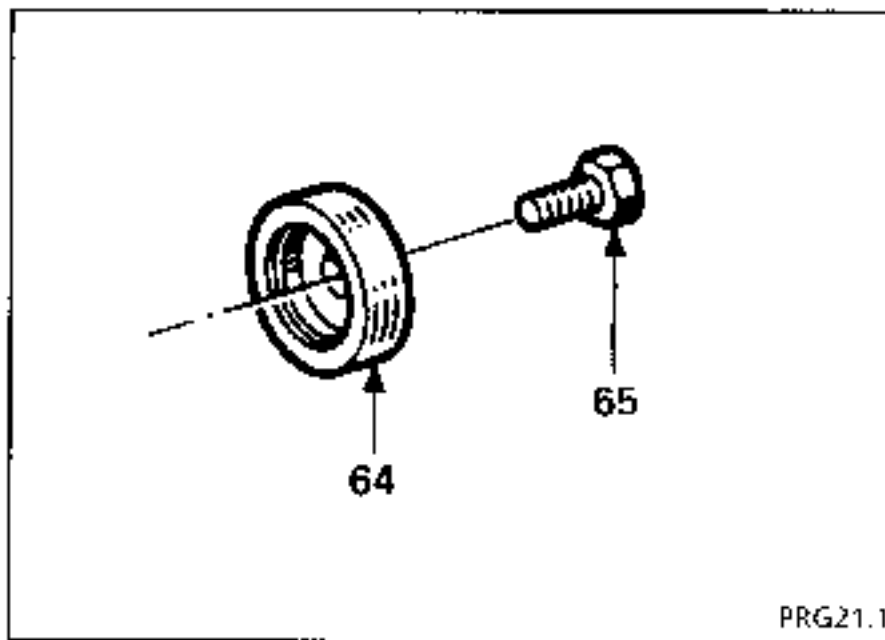


Remove the 5th gear assembly.



*On the secondary shaft:*

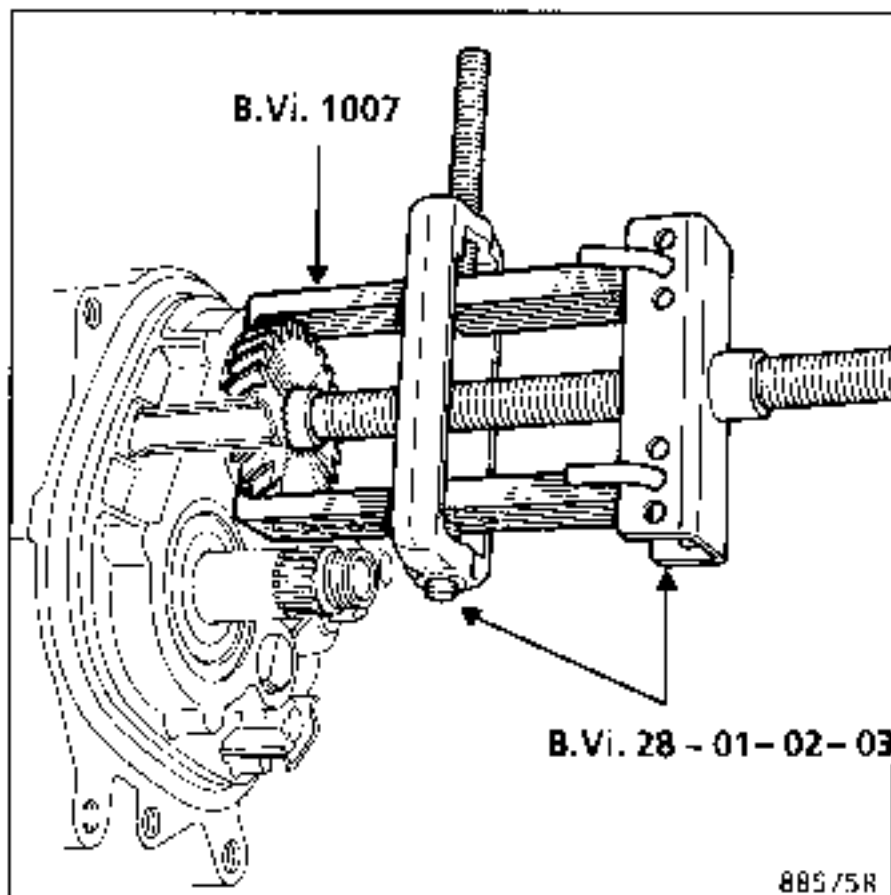
Remove the shouldered washer (64).



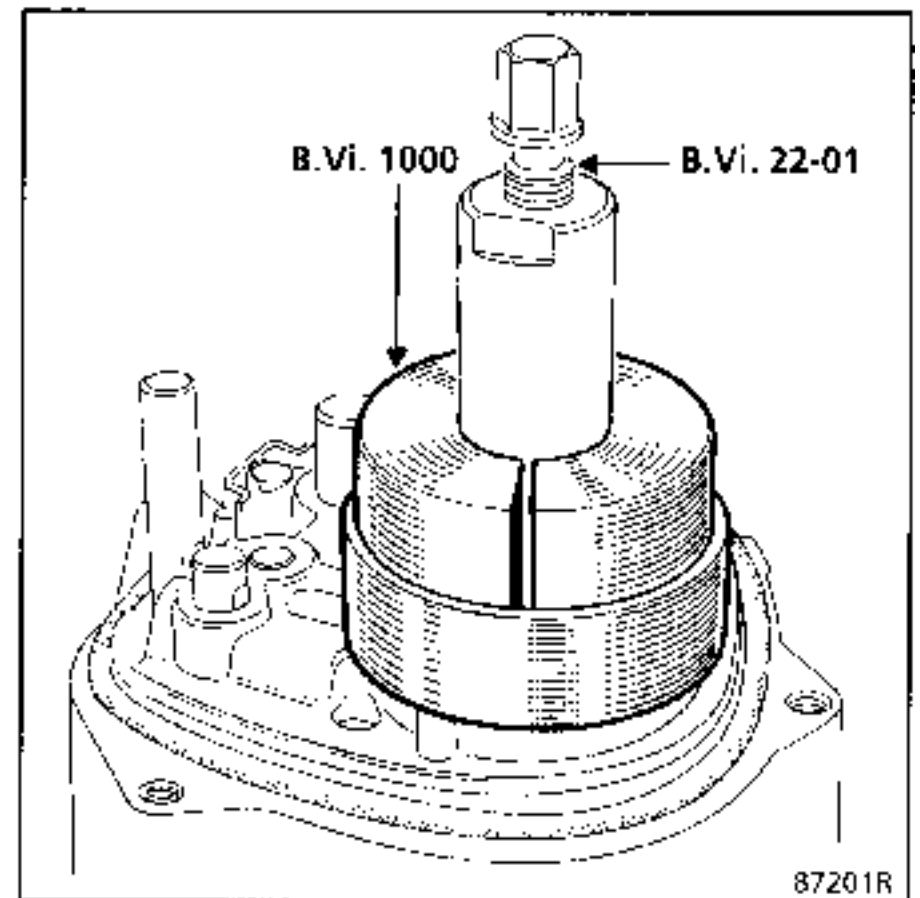
Remove the 5th gear fixed gear.

Two possibilities:

1. Using tool B.Vi. 28-01 with jaws B.Vi. 1007.



2. Using tools B.Vi. 22-01 and B.Vi. 1000.

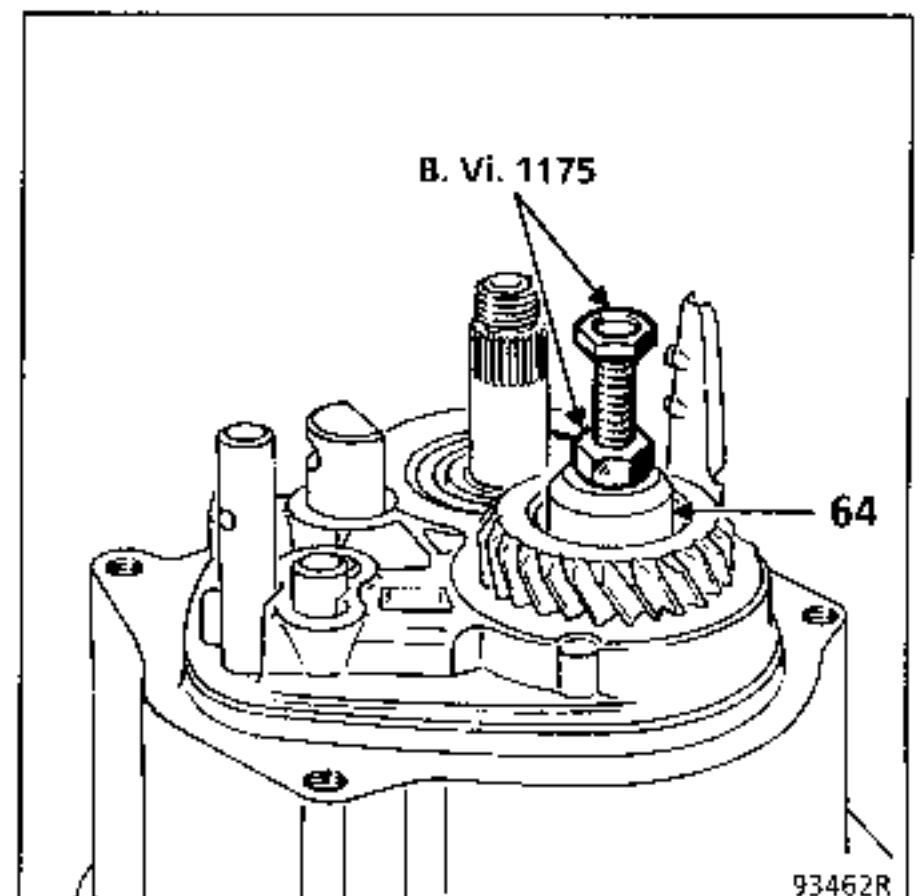


## REFITTING

*On the secondary shaft:*

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

Fit it into position using tool B.Vi. 1175 and the shouldered washer (64).



Remove tool B.Vi. 1175.

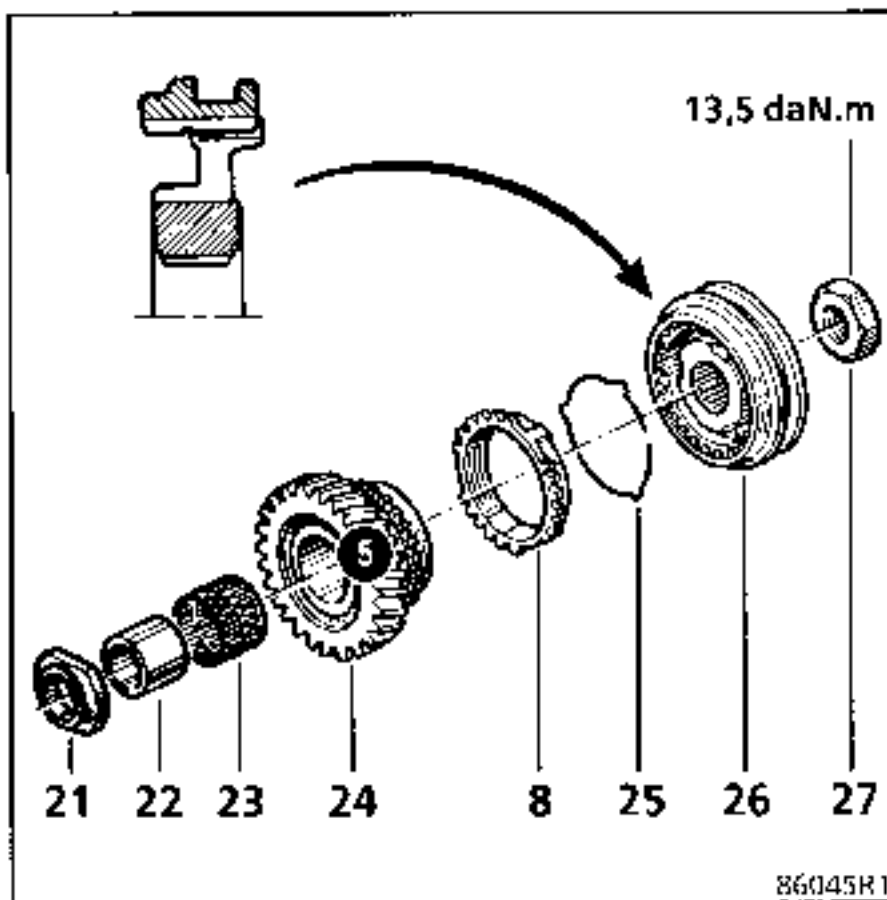
**On the primary shaft:**

Refit in the order (21) (shoulder opposite bearing) (22), (23), (24) and (8).

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

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

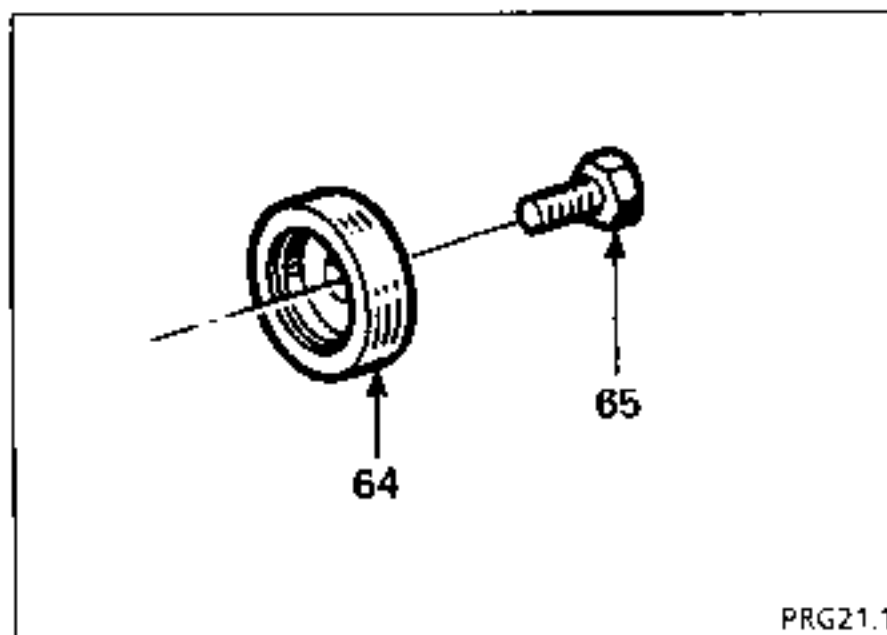
Position the bosses on the synchro ring in the lugs on the hub.



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

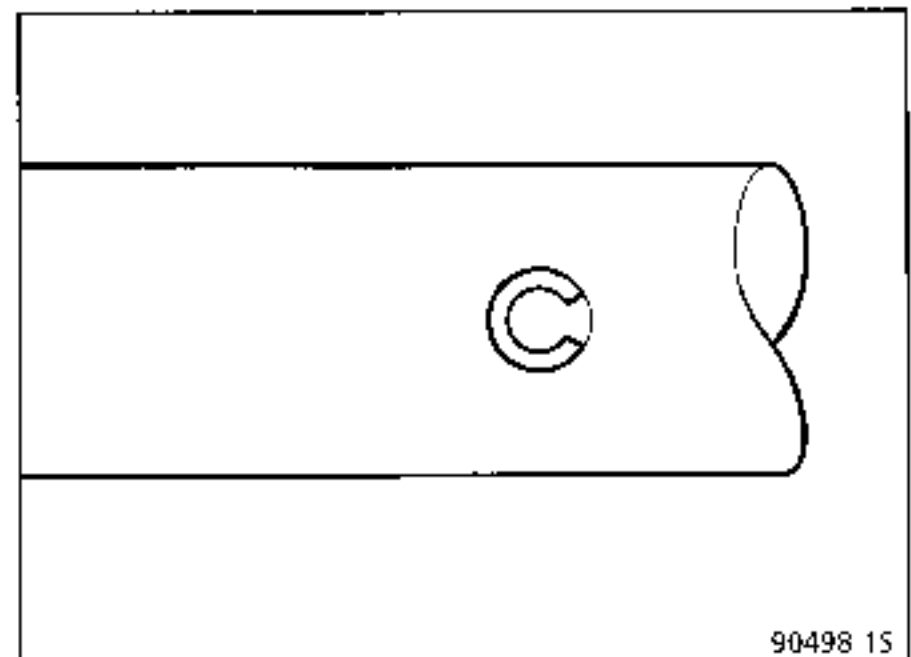
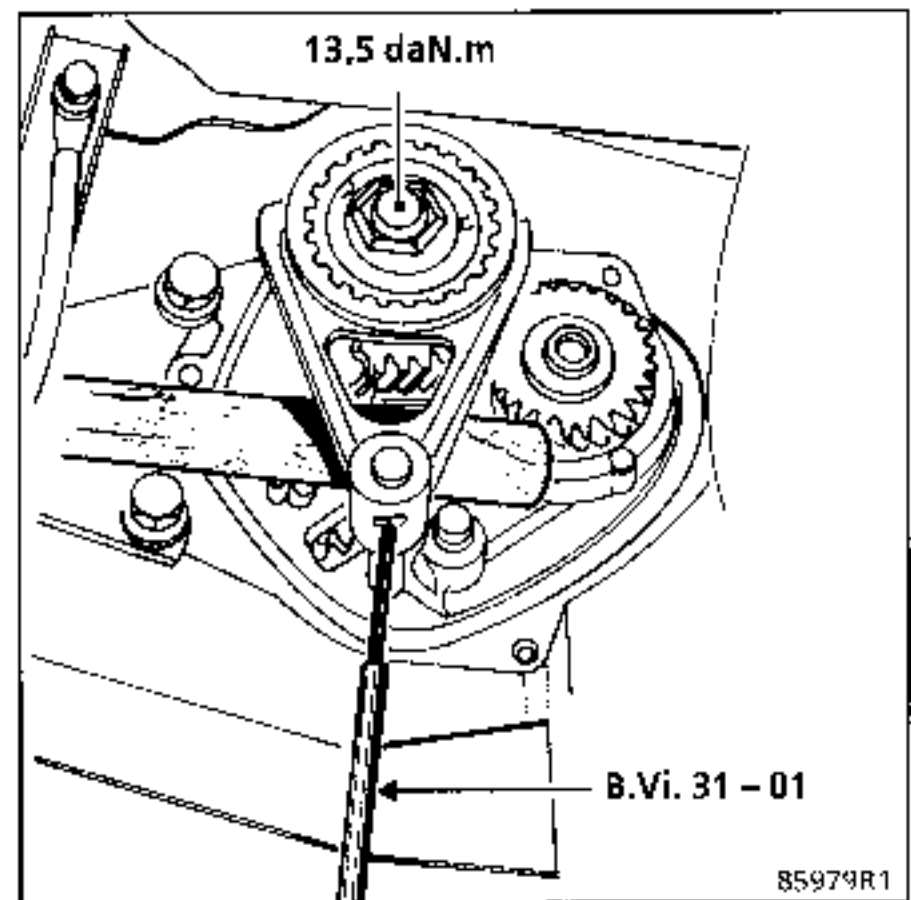
**On the secondary shaft:**

Fit the shouldered washer (64).

**Apply 3 drops of Loctite FRENBLOC :**

- to the nut (27) on the primary shaft and torque tighten to **13.5 daN.m**,
- to the bolt (65) and torque tighten to **8 daN.m**.

Fit a wooden block between the 5th gear fork and the drive pinion to take the weight and refit a new roll pin to the 5th gear fork using tool **B.Vi. 31-01**, ensuring it is correctly positioned - the slot should be in line with the shafts.



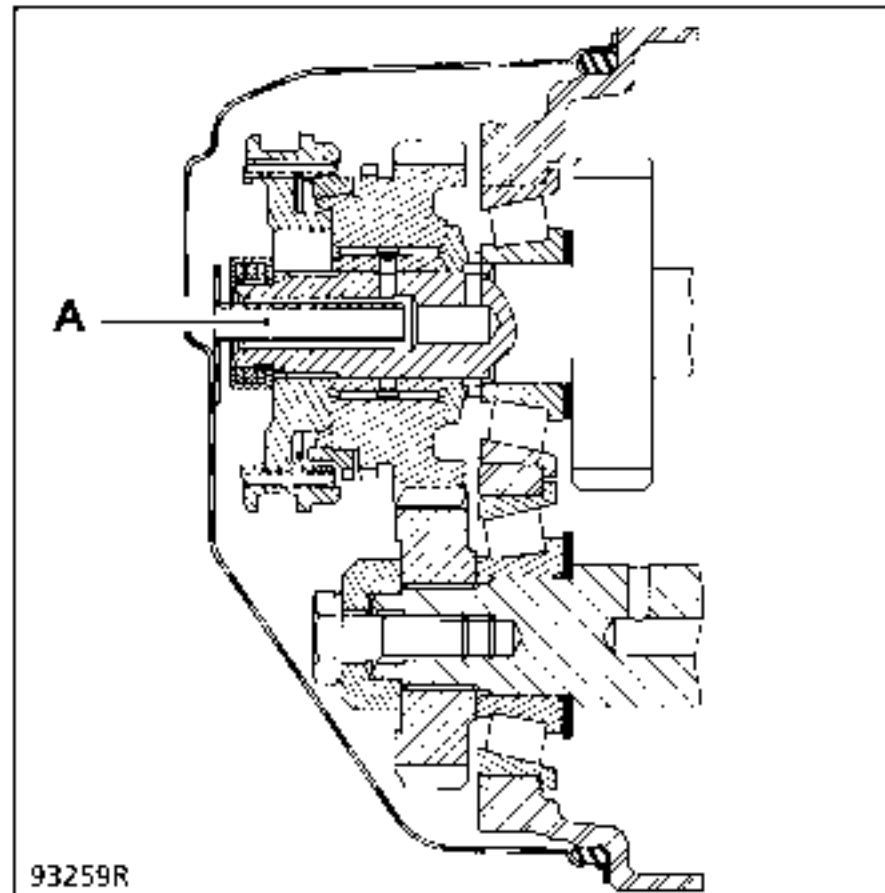
90498 15

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

If there is a fault, check that reverse gear is not engaged.

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

Fit the rear housing, inserting the channel (A) into the primary shaft.



Fill the gearbox with oil.

Refit the oil collector.

Check the rear housing is sealed when the engine is running.



## SPECIAL TOOLING REQUIRED

Emb. 880	Roll pin extractor.
Emb.1163	Tool for fitting the thrust pad guide tube.

## TIGHTENING TORQUES (in daN.m)



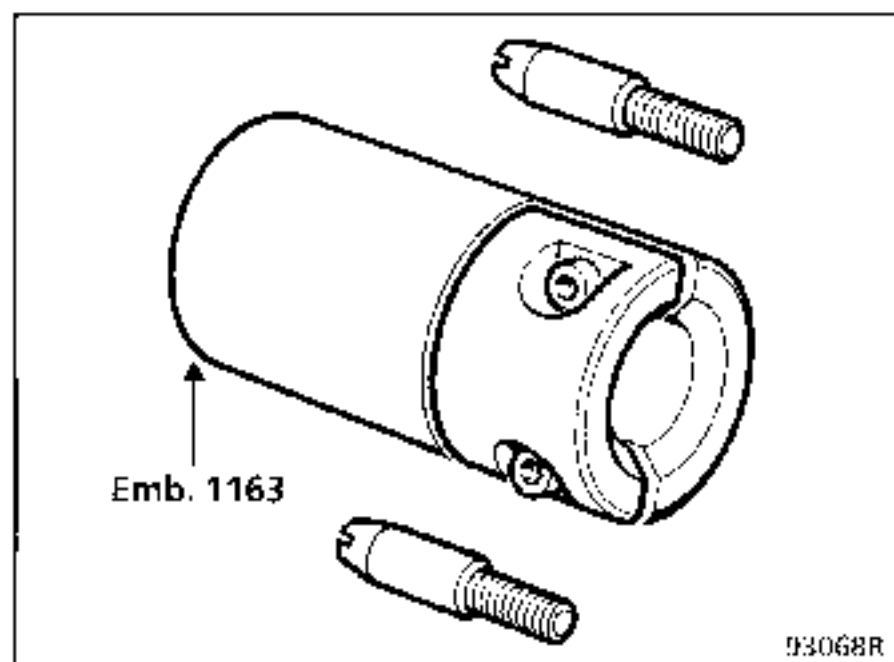
Guide tube bolt

2.4

## JC5 GEARBOX

The clutch shaft lip seal (primary shaft) is supplied from the Parts Department assembled on the thrust pad guide tube.

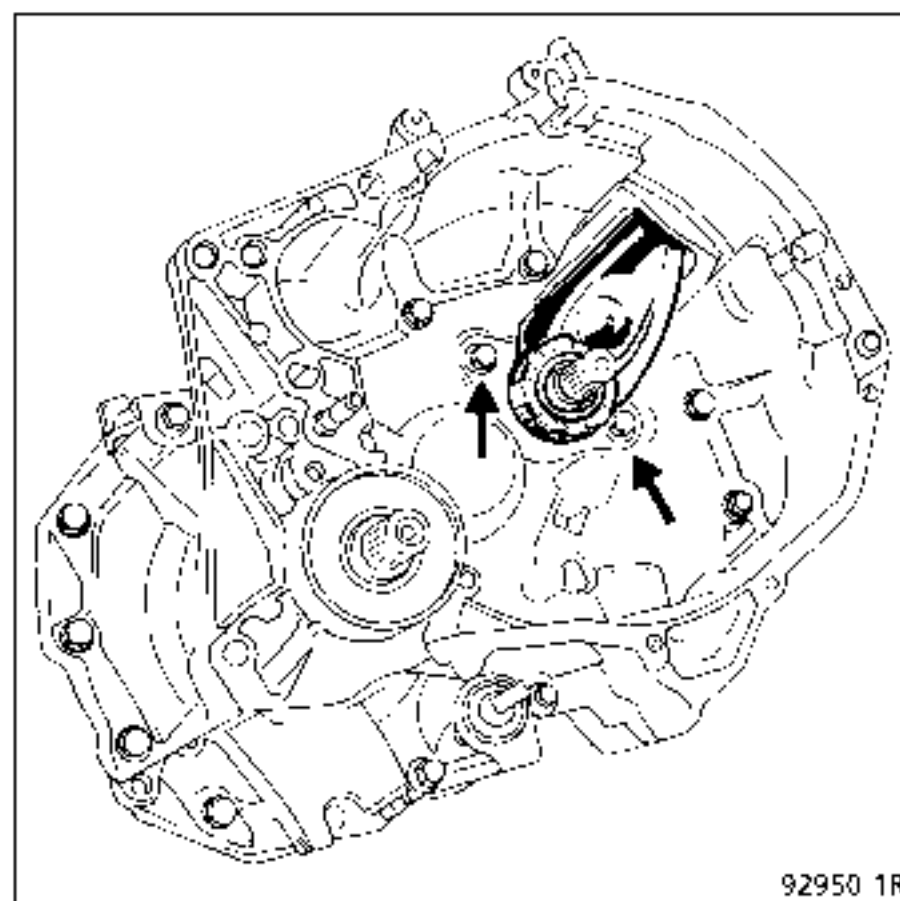
The replacement operation does not require the mechanism housing to be separated from the clutch bellhousing. Tools **Emb. 880** and **Emb. 1163** are used.



## REMOVAL

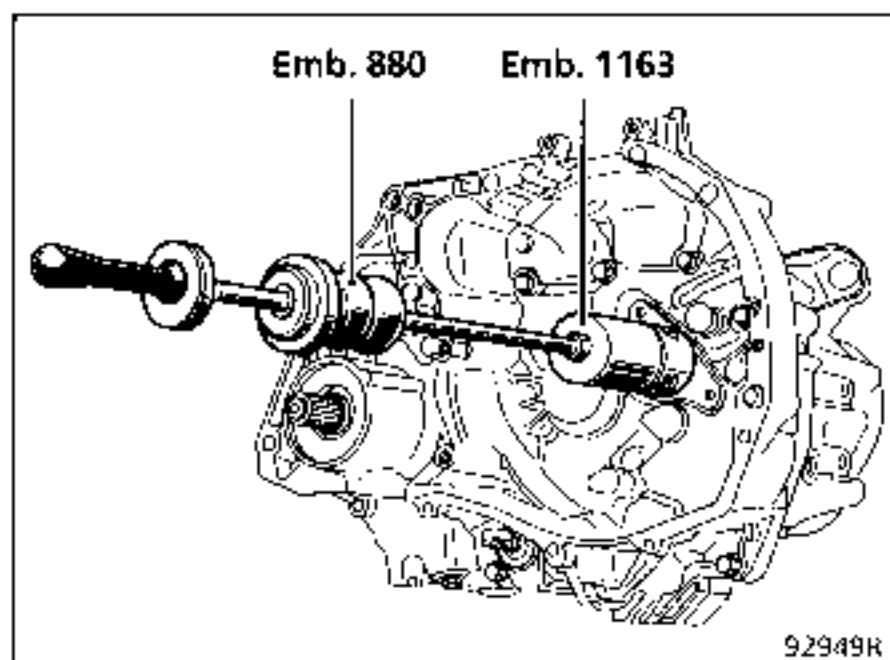
Remove the thrust pad and the fork from inside the housing.

Remove the two guide tube mounting bolts.

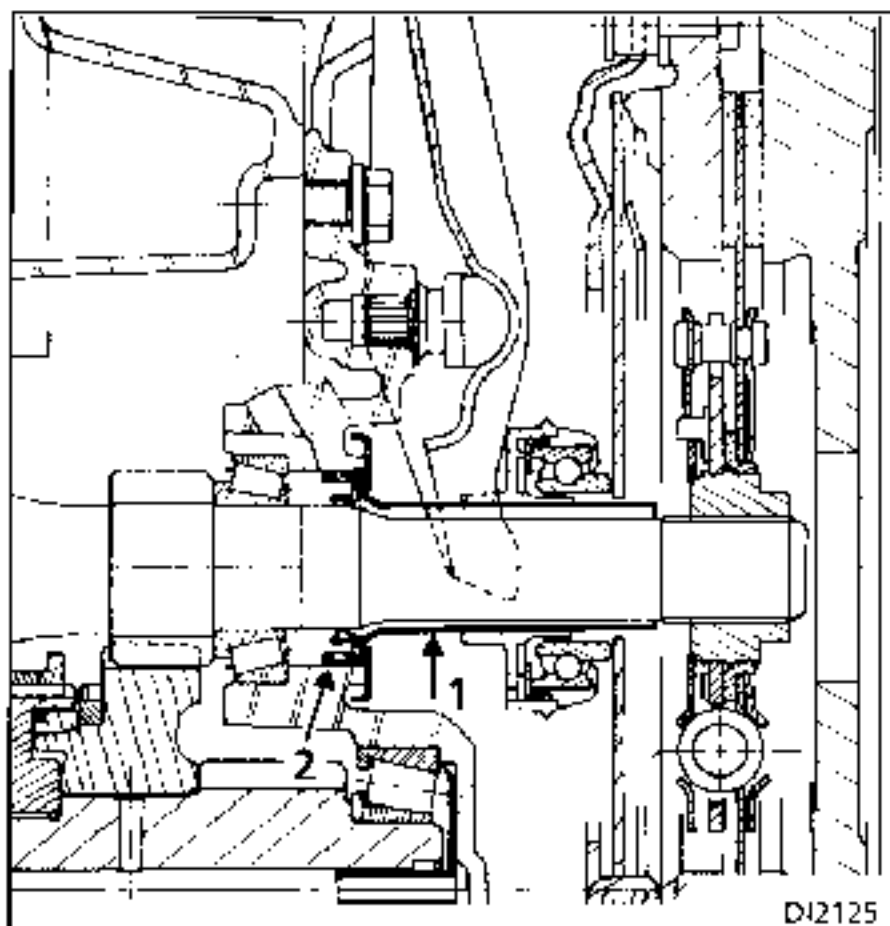


Fit tool **Emb. 1163** to the guide tube and tighten it.

Screw tool **Emb. 880** onto this assembly and extract the guide tube (1).



Remove the lip seal (2) from the clutch bellhousing using two screwdrivers, taking care not to mark the housing bore.



## REFITTING

Fit the guide tube and lip seal assembly with the protector into tool **Emb. 1163**.

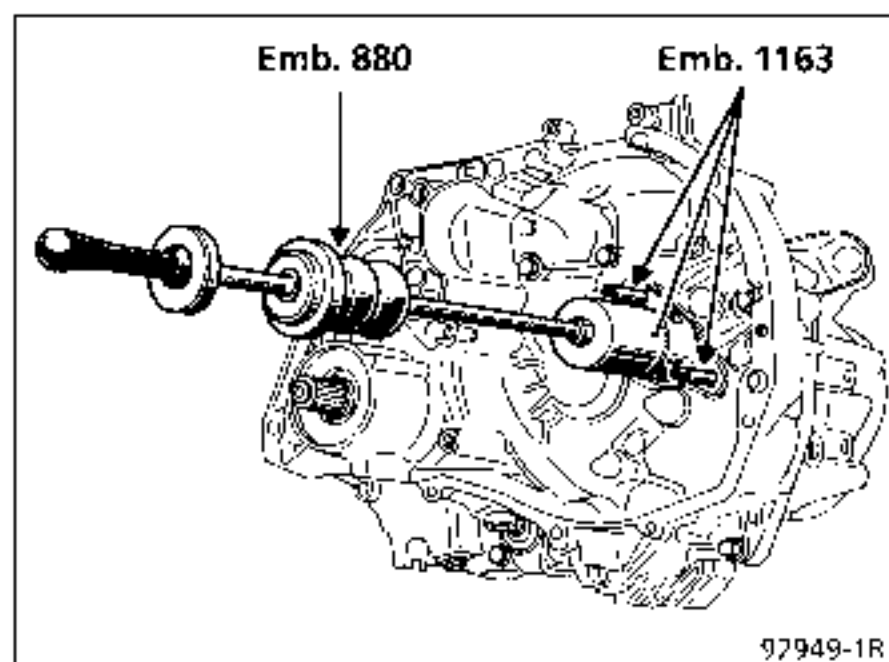
Check that the guide tube plate is correctly positioned against the tool and tighten it slightly.

Fit the two studs **Emb. 1163** in place of the two thrust pad guide mounting bolts.

Lubricate the external part of the seal and the seal bearing face on the shaft.

Cover the clutch shaft splines to prevent them damaging the lip seal.

Fit the seal into place, ensuring the tool remains perpendicular to the housing during the operation.



Remove the protector and the tool.

Check that the plate is correctly positioned against the housing and that there is no interference between the guide tube and the shaft.

Fit the two mounting bolts and tighten them to a torque of **2.4 daN.m**.

**NOTE :** on the guide tube from the Parts Department, the lip seal is offset to move its bearing face on the primary shaft.

**REPLACEMENT****1st case:**

Only the speedo gear or the shaft is damaged.

**REMOVAL**

The gearbox does not need to be completely dismantled.

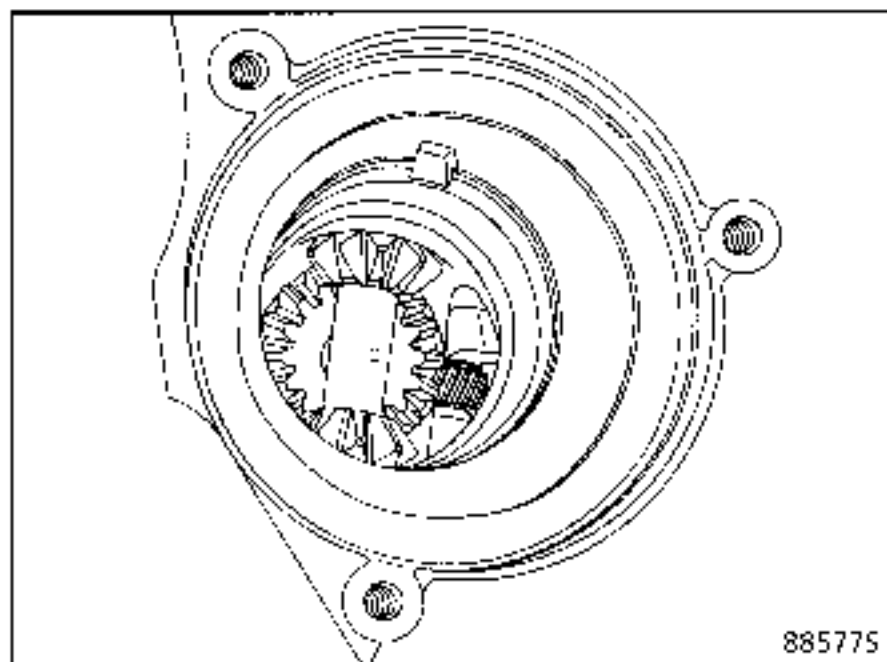
Release the left hand driveshaft.

Remove the sunwheel spider.

Turn the differential by hand so the speedo gear can be reached.

Release the shaft, pulling vertically using long nose pliers.

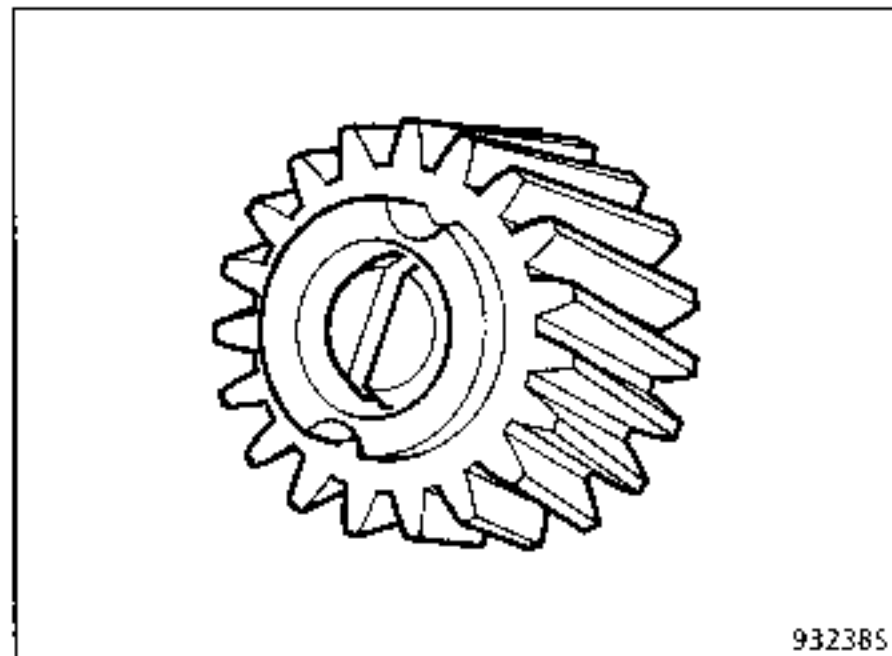
Use these pliers to remove the gear from its location.



**NOTE :** the gear and the shaft **MUST BE RENEWED** after each removal.

**REFITTING**

Fit the gear, ensuring it is fitted the correct way round.



Ensure it is correctly clipped in.

Refit the sunwheel spider.

**2nd case:**

The gear and the speedo crownwheel are damaged.

The gearbox must be removed and the final drive dismantled.

## SPECIAL TOOLING REQUIRED

B.Vi. 31-01	Set of punches
B.Vi. 945	Mandrel for fitting differential seal (protector A)
B.Vi. 1058	Mandrel for fitting differential seal

## TIGHTENING TORQUES (in daN.m)



Shock absorber base mounting bolts	M 16 X 200	20
Wheel bolts		10

## INGREDIENTS

## Loctite FRENBLOC :

Brake caliper mounting bolt

## RHODORSEAL 5661 :

Ends of driveshaft roll pins

## MOLYKOTE BR2 :

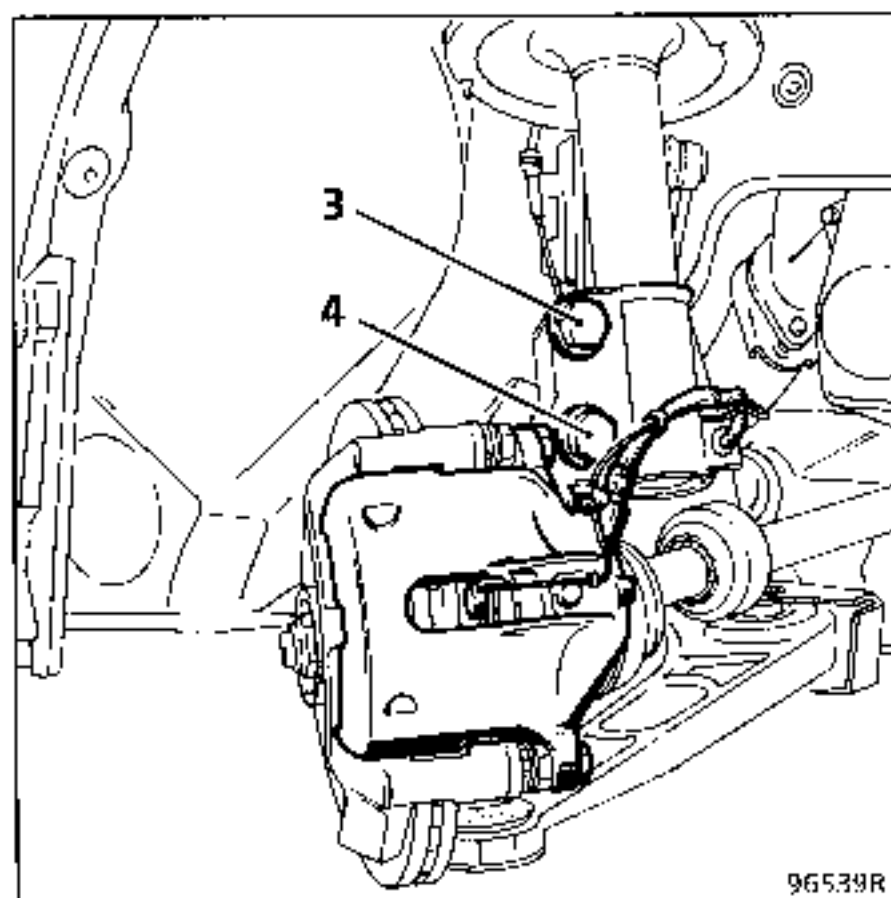
Right hand sunwheel splines

## REMOVAL

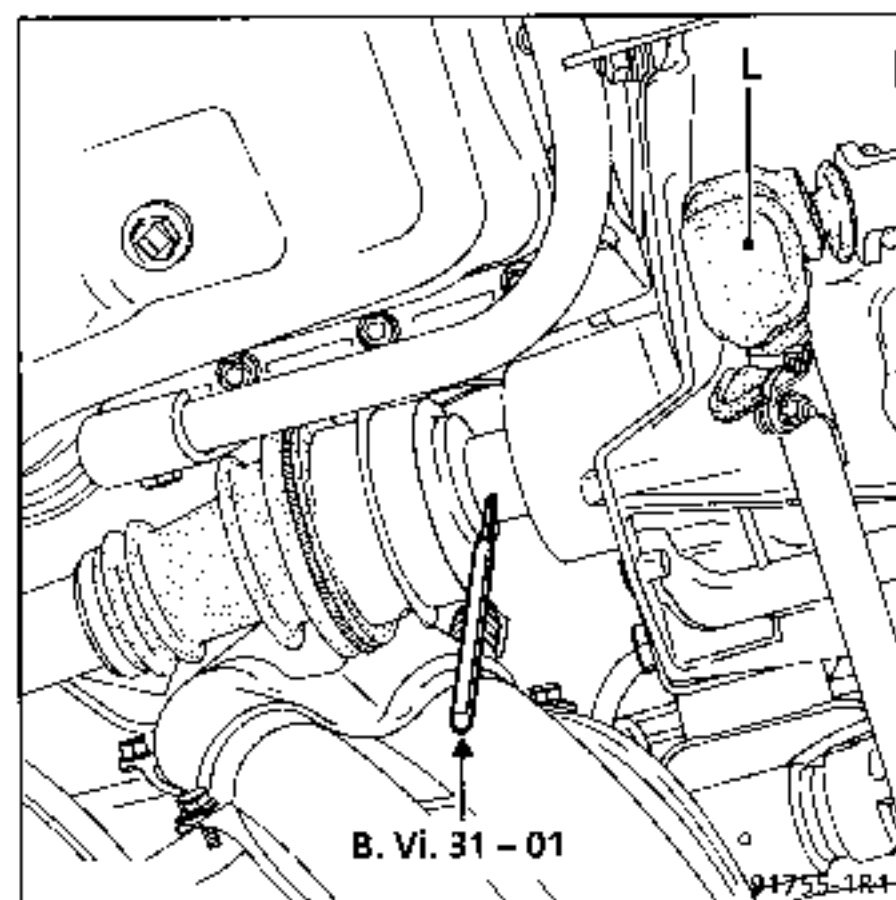
Remove the oil collector if fitted and drain the gearbox.

Remove:

- the front right hand wheel,
- the upper bolts (3) and (4) from the base of the shock absorber,
- the ABS sensor if the vehicle is fitted with ABS.



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



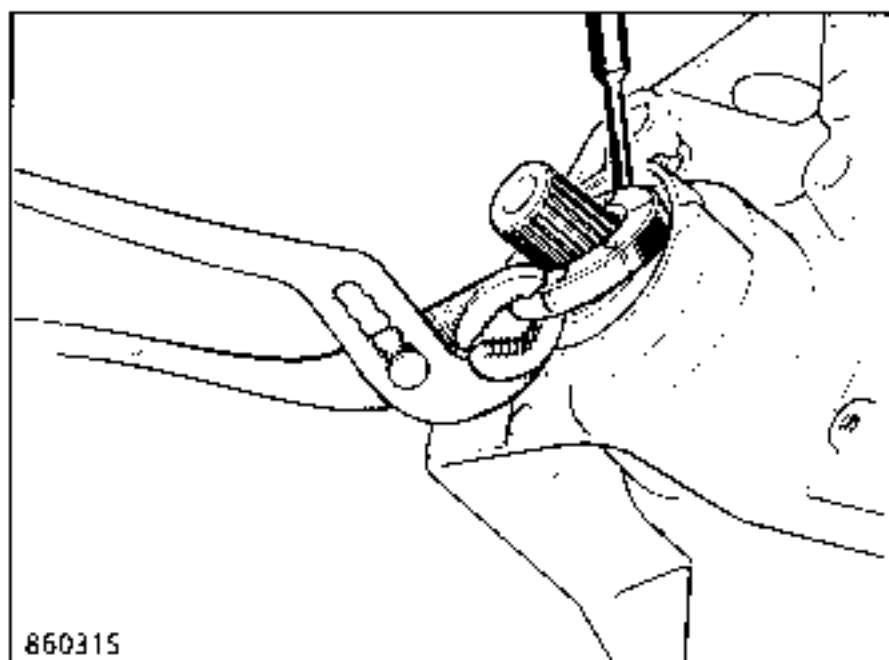
Tilt the stub axle carrier and release the driveshaft (take care not to damage the gaiters during this operation) (see section 29).

**REPLACING THE SEAL**

Remove the sunwheel O ring.

Tap the lip seal on the bottom using a roll pin punch and a small mallet to tilt it in its location.

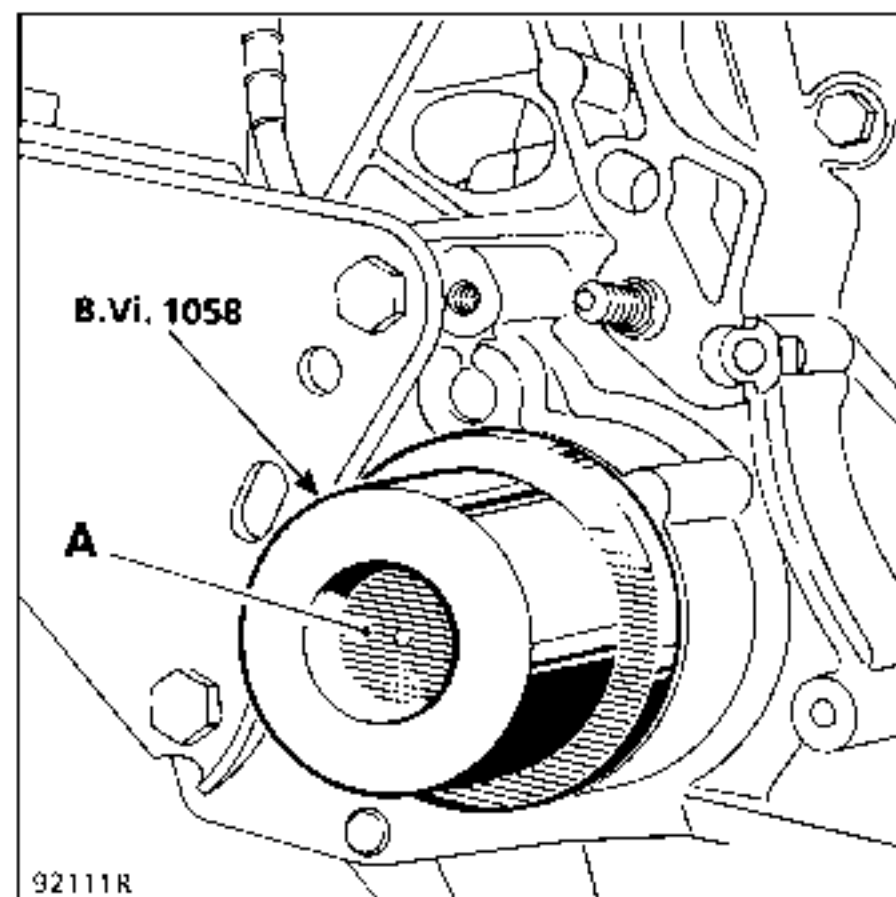
Once the seal has been released, remove it using pliers, taking care to avoid damaging the splines of the sunwheel.



The seal is refitted using tool **B.Vi. 1058** and protector (A) of tool **B.Vi. 945**.

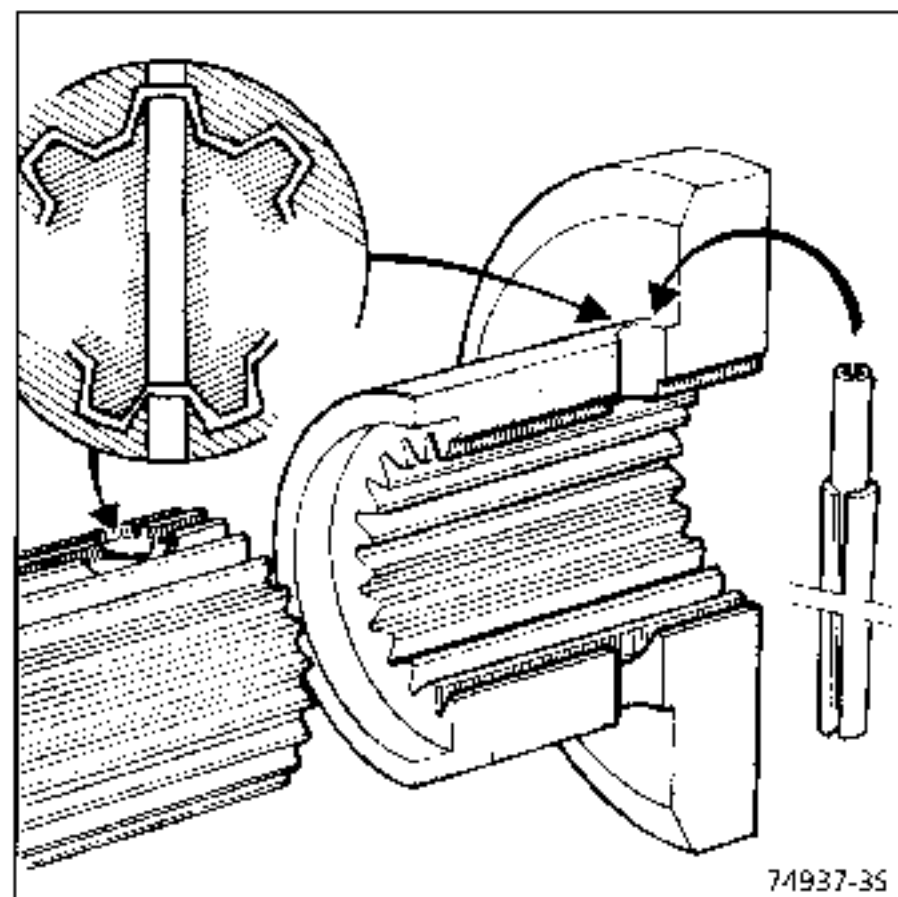
Lubricate the protector before fitting it to the splined part of the sunwheel.

Fit the lip seal then the O ring and coat the splines with **MOLYKOTE BR2**.



Position the driveshaft in relation to the sunwheel.

Pivot the stub axle carrier, inserting the driveshaft into the sunwheel. To do this, use tool **B.Vi. 31-01** to align the holes.



Fit the new roll pins and seal the ends using **RHODORSEAL 5661**.

Tighten the nuts and bolts to the recommended torques.

Fill the gearbox with oil.

**DRIVING**

The automatic transmission is lubricated under pressure, which only happens if the engine is running.

Consequently, at the risk of causing serious damage, the following recommendations should be observed:

- Never drive with the ignition off (down a hill for example), this practice is extremely dangerous.
- Never push the vehicle (example to reach a petrol station, unless the precautions specified in the "Towing" section are observed).

The vehicle is also only driven if the engine is running. The engine on a vehicle with automatic transmission cannot be started by pushing the vehicle.

**TOWING**

In all cases it is preferable to tow the vehicle on a flat bed trailer or with the front wheels lifted.

If this is impossible, the vehicle may be towed in exceptional circumstances at a speed less than 25 mph (40 km/h) for a maximum distance of 130 miles (50 km) (lever in N).

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**Identification**

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Vehicle	AT type	Engine	Converter	Step down	Differential ratio	Speedo drive
JE0 D	AD8 013	Z7X 775	250 Z	74/87	21/73	24/20

The transmission computer is identified using the XR25.

Connect it to the vehicle's diagnostic socket.

Set the ISO selector to position S8. Ignition on.

Use the latest cassette (from cassette n° 14).

Enter the AT code: **D 1 4**

Enter **G 7 0 \***

Display:

	E	E	5
			7
		7	0

The **Part Number** is repeated once

X	X	X	X
X	X	X	
	X	X	X

**IMPORTANT:** # 94, used for A4.1 no longer gives information which may be used for A4.2.

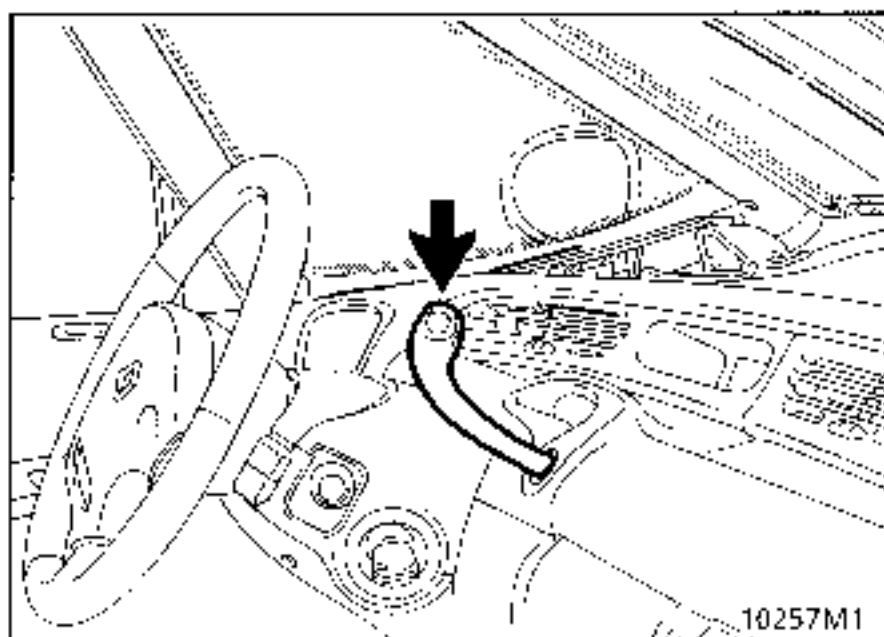
GEAR RATIOS		1st	2nd	3rd	4th	Reverse
Gear reduction		2.71	1.55	1	0.68	2.11
JEO D	Speed in km/h for 1000 rpm with 1.92 m tyres	10.67	18.67	28.96	42.68	13.72

## Gear change thresholds

VEHICLE	AT TYPE	Accelerator 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
JEO D	AD8 013	PL	18		46		71		65		42		10	
		PF	56	61	98	109	163	182	116	151	69	85	26	44
		RC	61		109		182		156		97	99	50	

The values given in the table are theoretical average values for gear change speeds in Km/h.  
**Tolerance = ± 10 %.**

- PL** : no load - accelerator pedal not depressed.  
**PF** : full load - accelerator pedal fully depressed.  
**RC** : Kickdown(change to a lower gear).  
**A** : gear change thresholds offset in "economy" position.  
**B** : gear change thresholds offset in "sport" position.





DESCRIPTION	COMPONENT CONCERNED
<b>MOLYKOTE BR2</b> grease	Transmission relay shaft splines Converter centring device
<b>Loctite FRENLOC</b>	Brake caliper mounting bolt Converter mounting bolt on metal plate

---

## Parts to be systematically replaced

---

Parts to renew when they are removed:

- self-locking nuts,
- copper seals,
- rubber seals.

---

## Oil

---

The **ADB** automatic transmission uses **two grades of oil** and has **two oil levels**.

### MECHANISM

**ELF RENAULTMATIC D2** (D20104)

Otherwise use:

**MOBIL ATF 220D** (D20104 or D21412)  
**TEXAMATIC 4011**

### FINAL DRIVE

Name: **TRANSELF**  
**TRX 75 W 80 W**

Standard: **API GL5**  
**MILL 2105 C or D**

The mechanism should be drained every **40 000 miles (60 000 km )**(the strainer is no longer replaced in this operation).

The oil level should be checked every **6 000 miles (10 000 km)** if there is a slight oil leak.

The final drive is **not drained**; it is filled with oil for life.

Only the level should be checked if there is a slight leak.

#### CAPACITY IN LITRES

	Mechanism	Final drive
Total volume	5.7	1.5
Volume after draining	4	–

**IMPORTANT :** If the automatic transmission is to be replaced, the final drive must be filled and the level must be checked for the mechanism (the mechanism is supplied ready filled by the Parts Department).

**SPECIAL TOOLING REQUIRED**

B. Vi. 1213	AT drain spanner
M.S. 1019-10	XR25 test kit

**DRAINING**

**FINAL DRIVE**

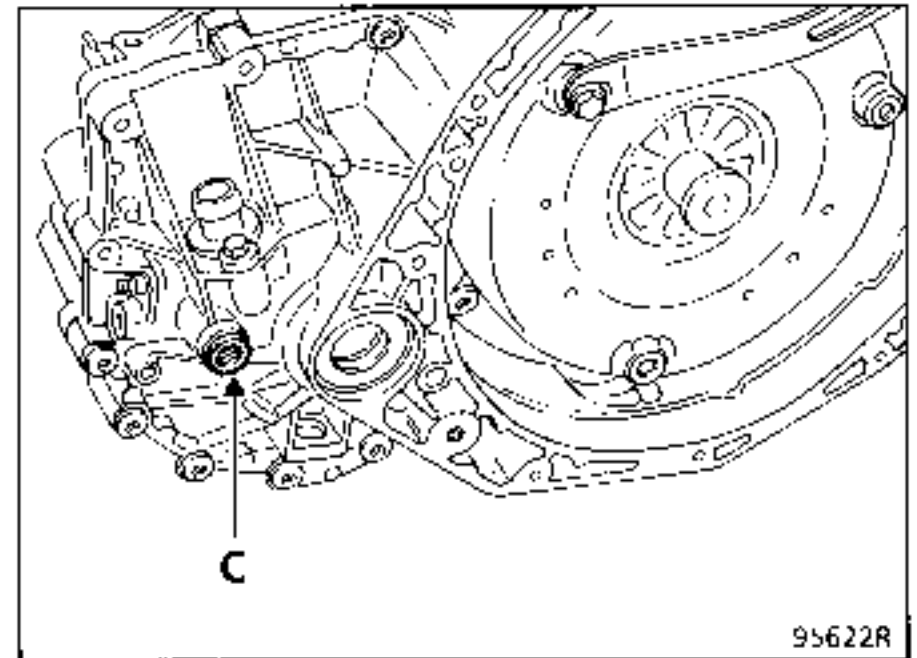
The final drive is not drained - it is filled for life.

If, however, it must be drained, remove plug (2).

**MECHANISM**

The mechanism is drained by removing plug (1) with the triangular marking (B. Vi. 1213).

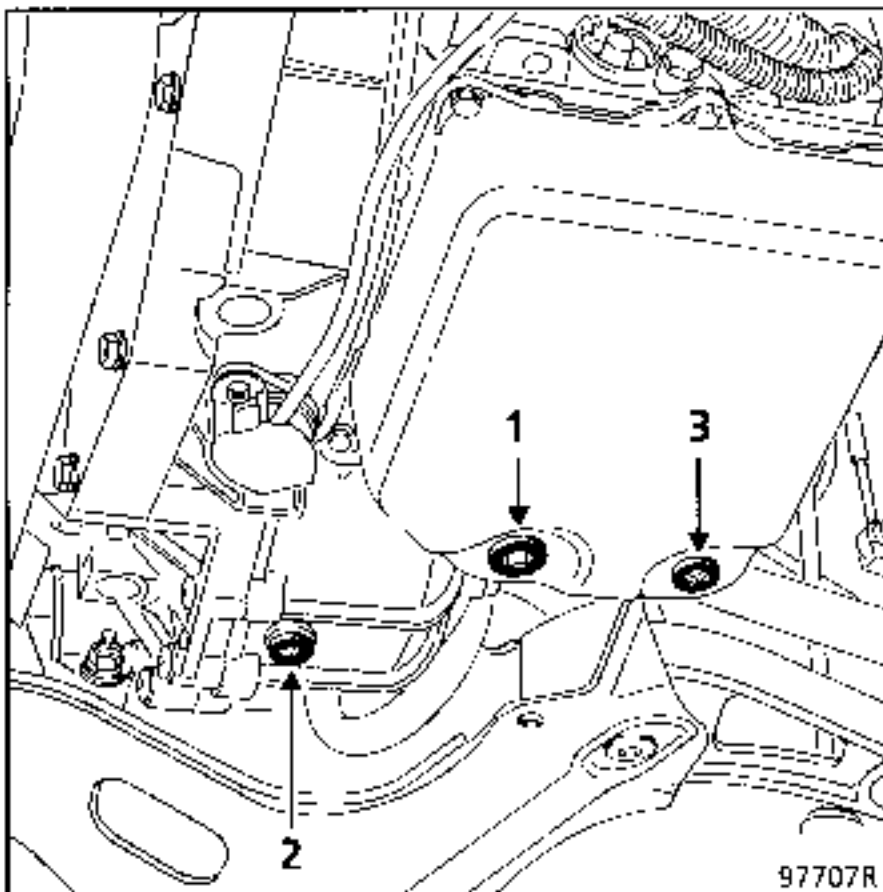
Plug (3) is for filling to the correct level (square marking).



95622R

**MECHANISM**

Filling is carried out after removing plug (E).

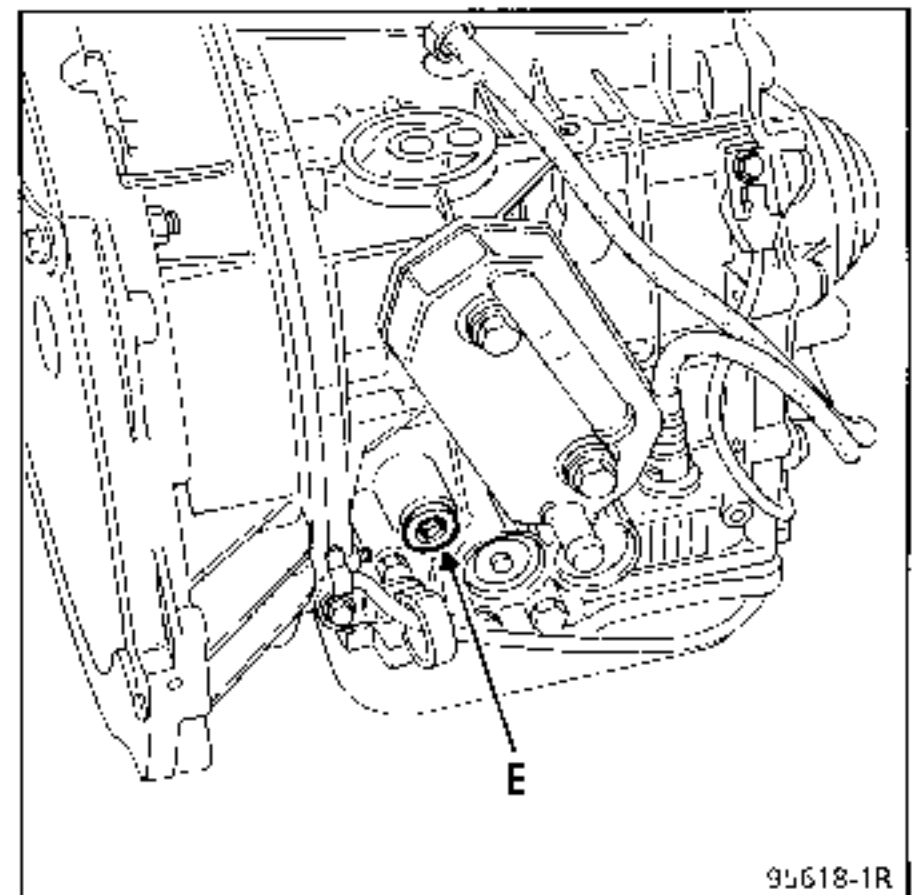


97707R

**FILLING**

**FINAL DRIVE**

Filling and checking the level are carried out after removing plug (C) and injecting 1.5 litres of oil.



95618-1R

Use a funnel fitted with a **15/100** filter, to prevent foreign bodies from entering the transmission.

The level **MUST** be checked using the method described below.

Before doing this:

- if the automatic transmission sump has been removed, add **4** litres of oil (if the oil is just being changed, add **3.5** litres).
- if just the level is being checked, add **0.5** litres of recommended oil.

1. Vehicle on a four post lift, transmission at ambient temperature.
2. Start the engine, selector lever in Park.
3. Connect the **XR 25**, enter **D 1 4** and **# 0 4**
4. Lift the vehicle and let the engine run until it reaches a temperature of **60° C**.
5. When the required temperature has been reached, with the engine running, open the level checking plug (A); allow the excess oil to run out (which must be greater than 0.1 litres) for approximately 20 seconds. Refit the plug.
6. If the volume of oil collected is less than 0.1 litres ( ~ 1 glass), the level is incorrect and the operation must be repeated. In this case, add another 1 litre of recommended oil, allow the transmission to cool and then repeat the operations in sequence.

## MESSAGE FROM THE SERVICE WARNING LIGHT

### Operation with no fault present:

- The warning light extinguishes approximately 3 seconds after starting the engine.

### Fault present:

- The "service" warning light is permanently illuminated (Refer to M.R., T.A. A, DIAG II or the "Fault finding" document).

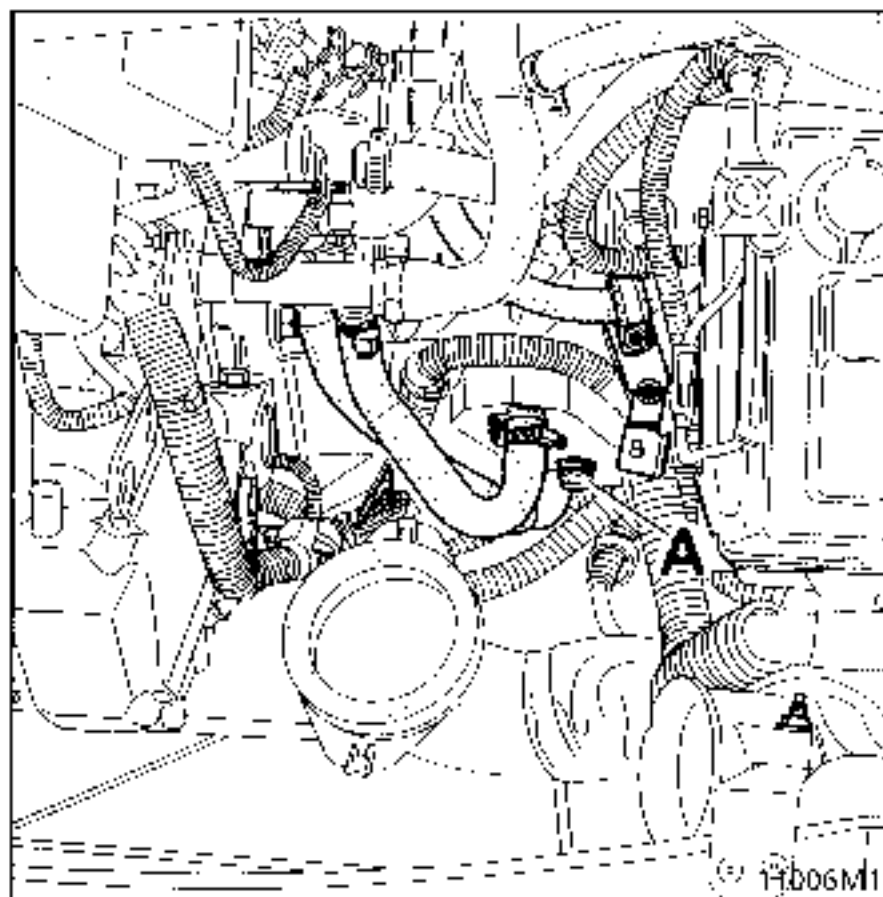
### Oil temperature $< -20^{\circ}\text{C}$ or $> +140^{\circ}\text{C}$

- Vehicle moving or stationary, warning light flashes **approximately once a second**. In this case, reduce the requirement for performance by moderating acceleration.

## REMOVAL - REFITTING

Remove the air filter and the air intake sleeve (access to cooler).

Fit hose clamp pliers to the inlet and outlet pipes on the exchanger and disconnect these pipes.




Remove bolts (A). Take care to catch the oil which will run out.

When refitting, renew the bolt seals.

Top up the oil level as described in the section "Draining - Filling - Levels"

The strainer is used to filter the oil and guarantee that the automatic transmission operates correctly.

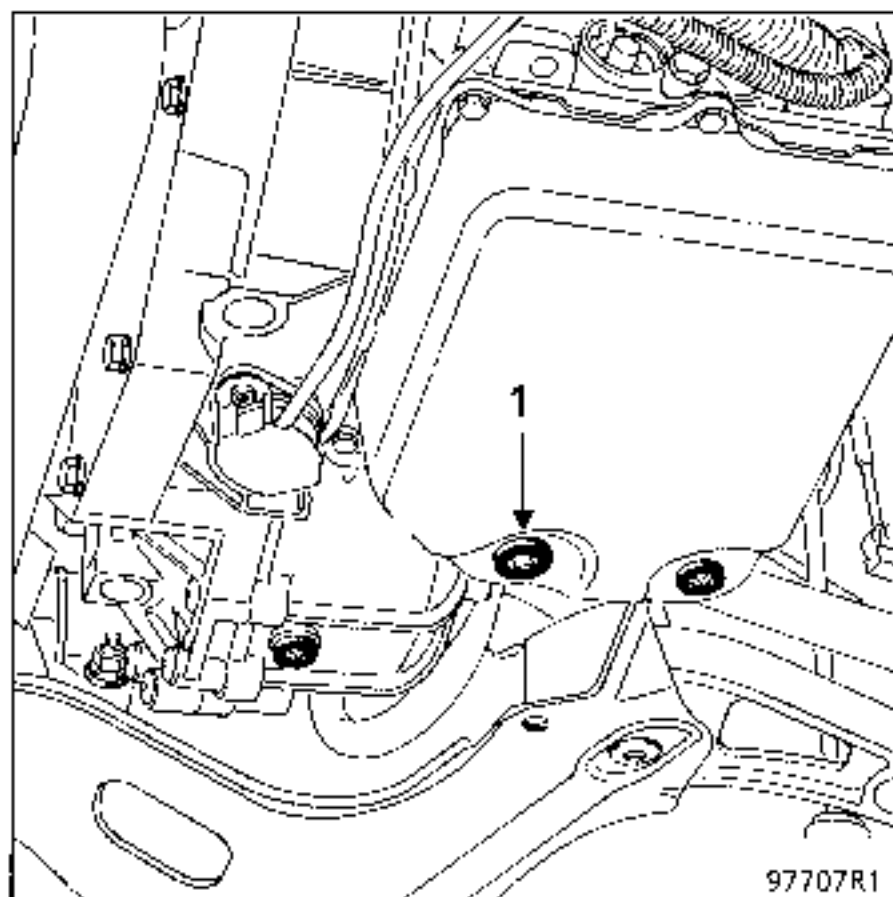
TIGHTENING TORQUES (in daN.m) 	
Strainer mounting bolt	$0.5 + 0.1$ □
Sump mounting bolt	$1 \pm 0.1$

Put the vehicle on a 2 or 4 post lift.

### REMOVAL

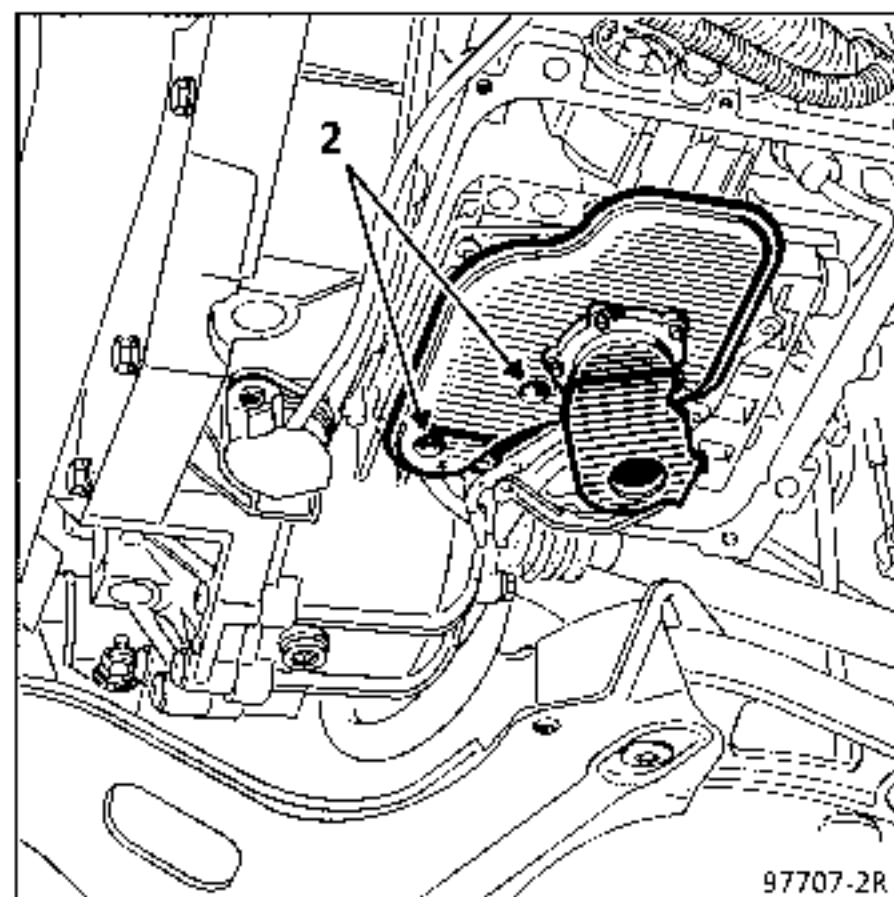
Remove the engine undertray.

Drain the transmission (mechanism section) by removing the plug with the triangular marking (1) (B. Vi. 1213).



Remove:

- the sump,
- the strainer (bolts 2).



Before refitting, clean the sump and the magnet.

Check the condition of the sump seal and the draining and topping up plugs.

### REFITTING

Refitting is the reverse of removal.

Fill the transmission with oil and check the level (see corresponding section).

TIGHTENING TORQUES (in daN.m)

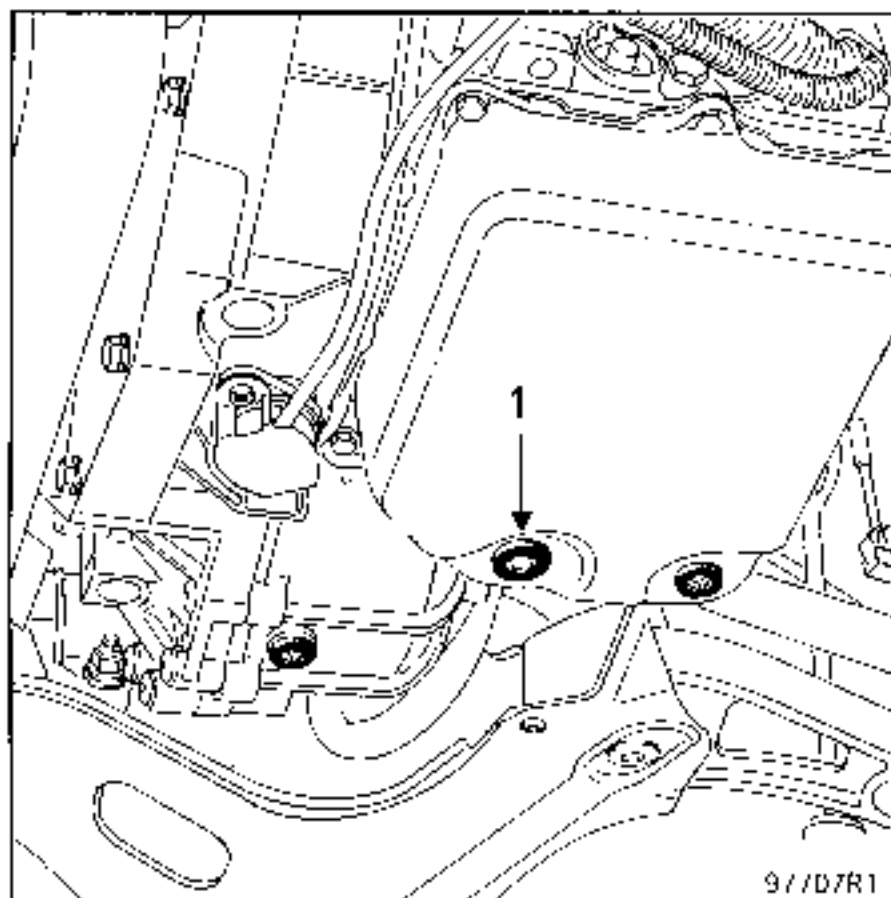


Sump mounting bolt	$1 \pm 0.1$
Strainer mounting bolt	$0.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$
Distributor mounting bolt	$0.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$

REMOVAL

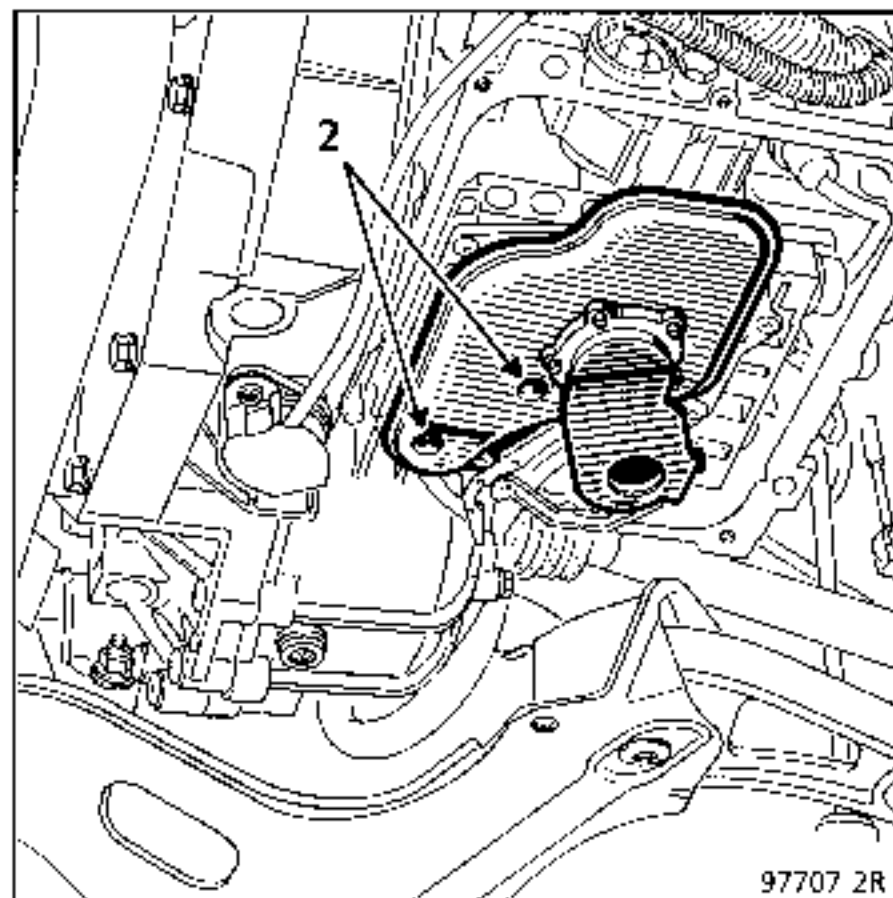
Remove the engine undertray.

Drain the transmission (mechanism section) by removing the plug with the triangular marking (1) (B. Vi. 1213).

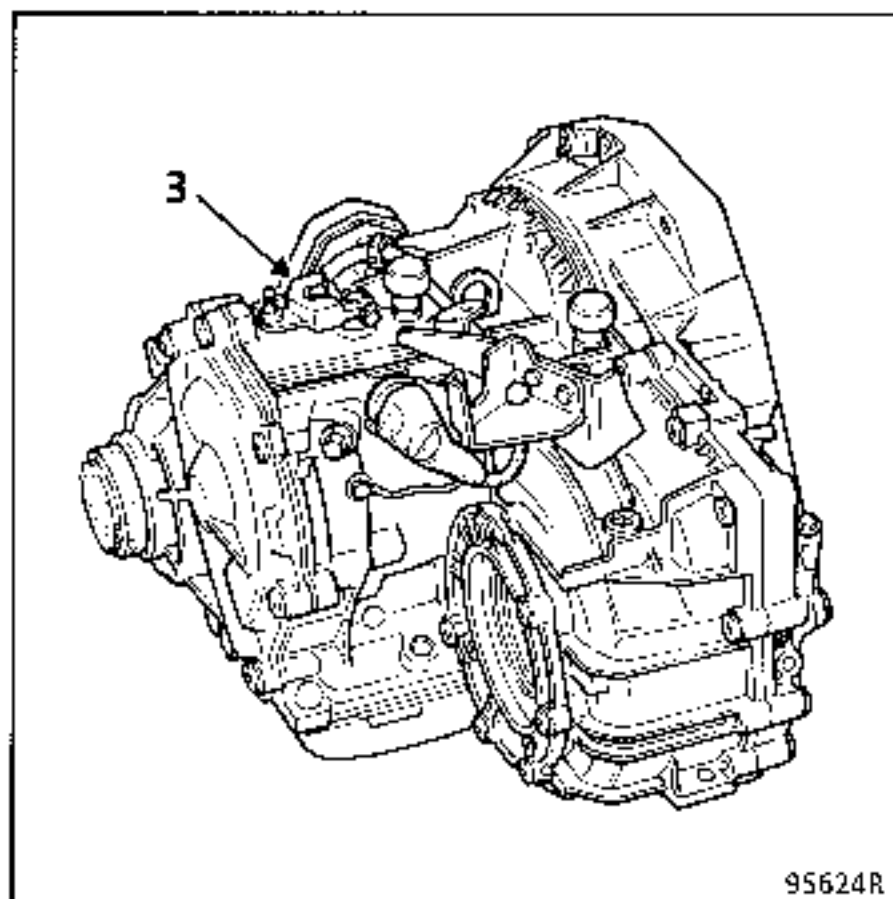


Remove:

- the sump,
- the strainer (bolts 2).

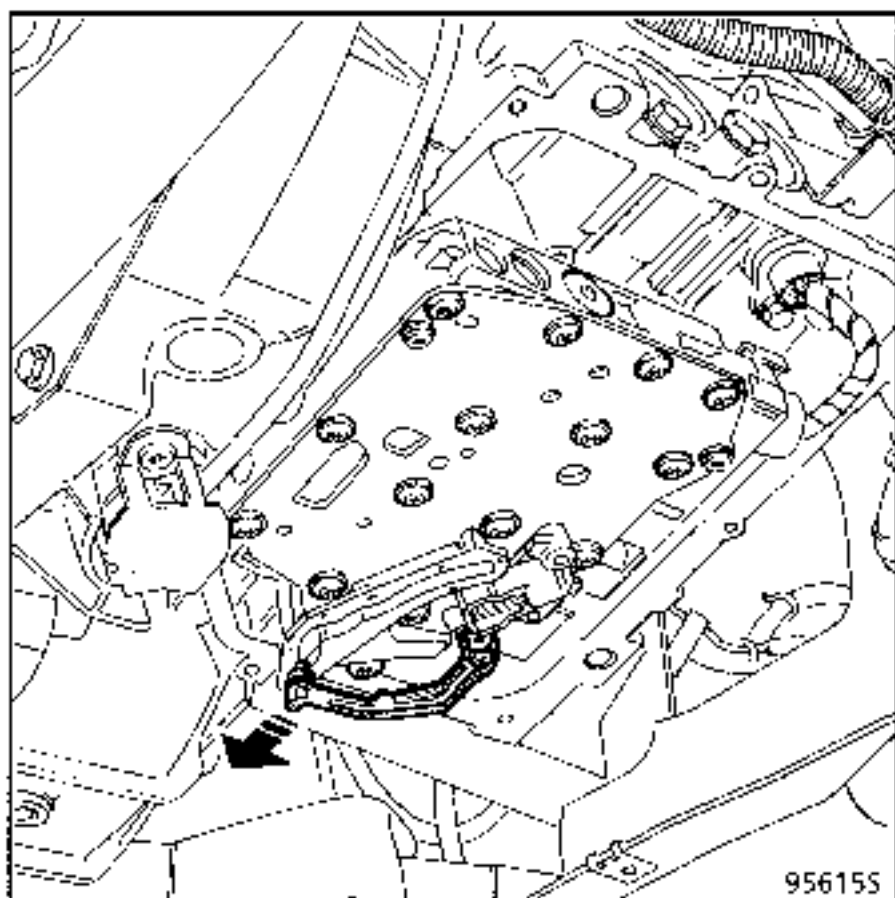


- the selector (3) to allow the lever to move beyond the "Park" position.

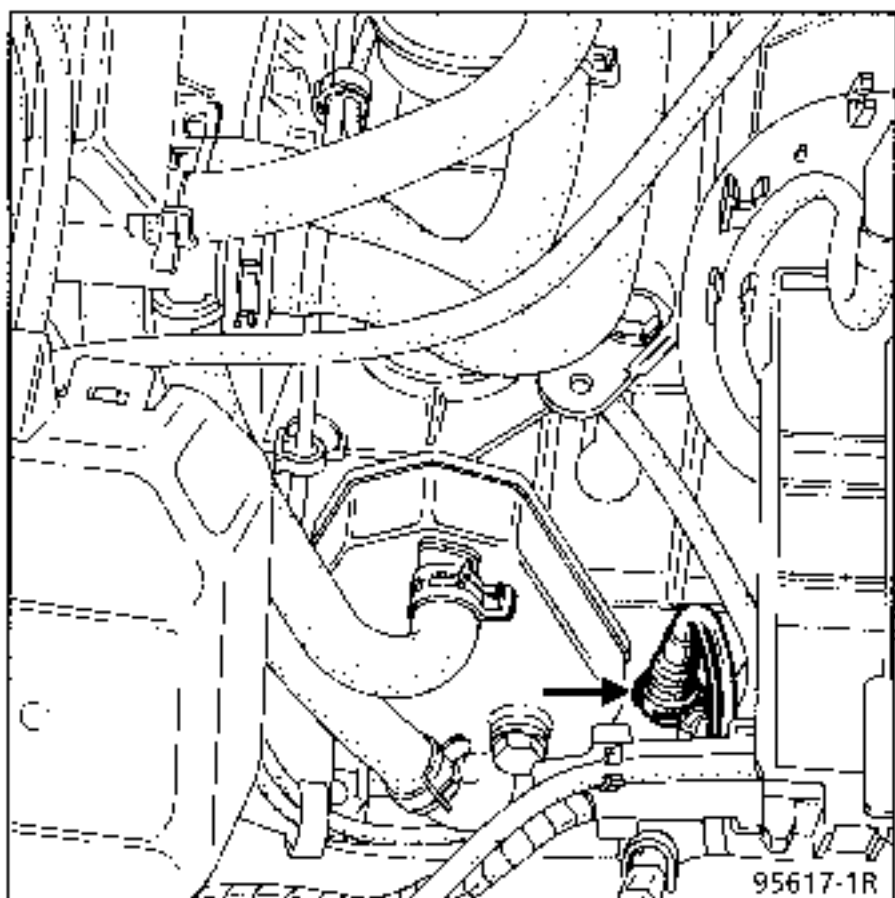




This additional travel is required to release the selector lever from the manual valve.

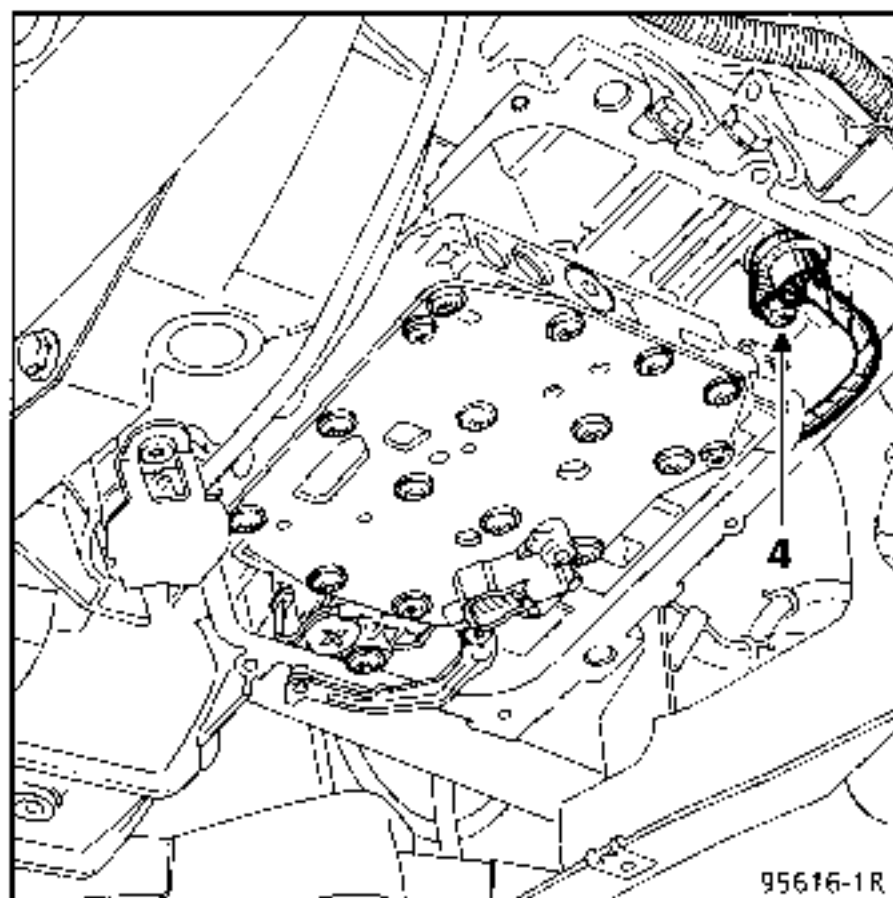


Disconnect the sealed connector cable by pressing on the locking ring.

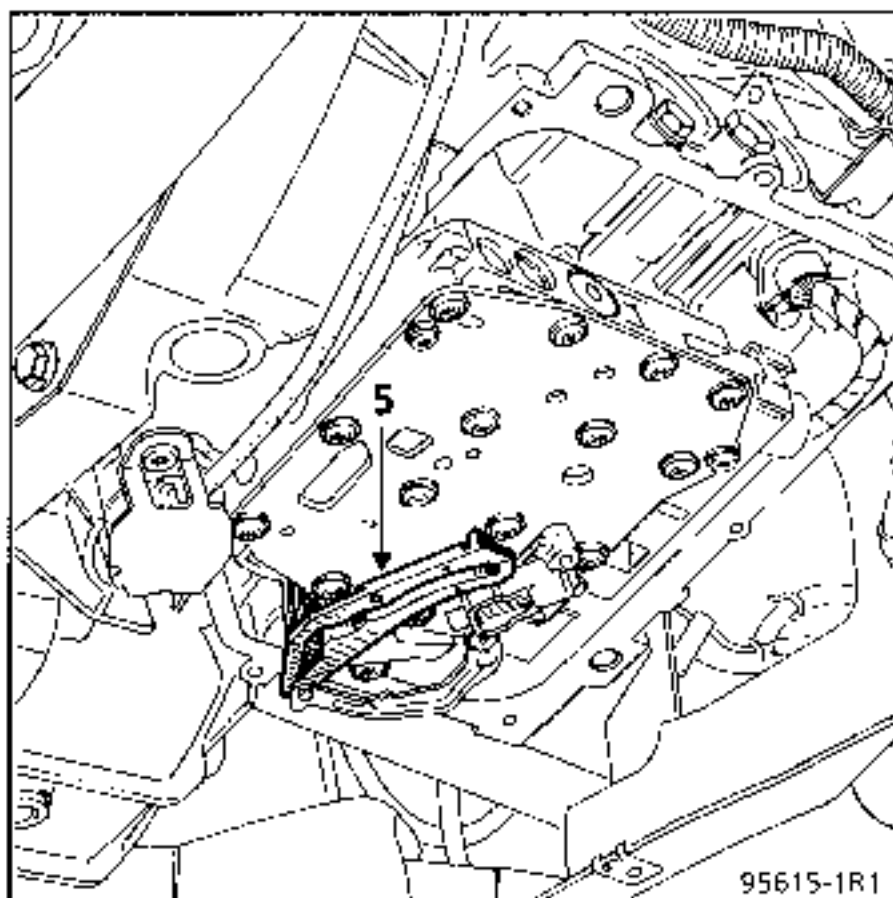


Remove:

- the sealed connector after removing bolt (4).

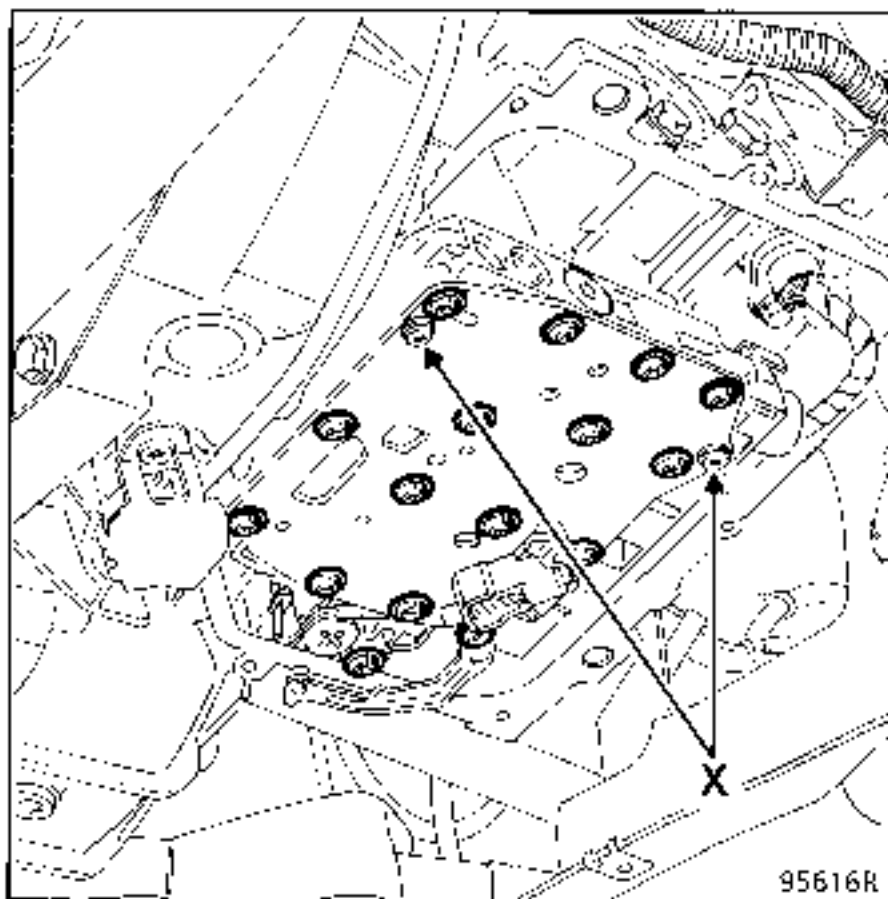


Release the selector from the manual valve (5).



Remove:

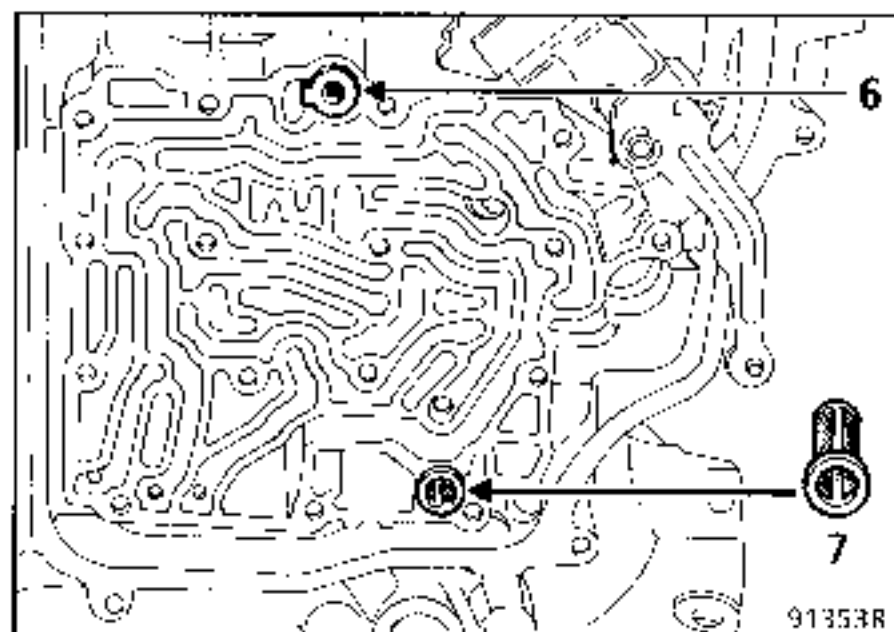
- the 16 hydraulic distributor mounting bolts. Bolts (X) remain in place to secure the cover plate to the distributor,



- the hydraulic distributor after pushing the gear control selector to the stop and releasing the modulating solenoid valve from the housing.

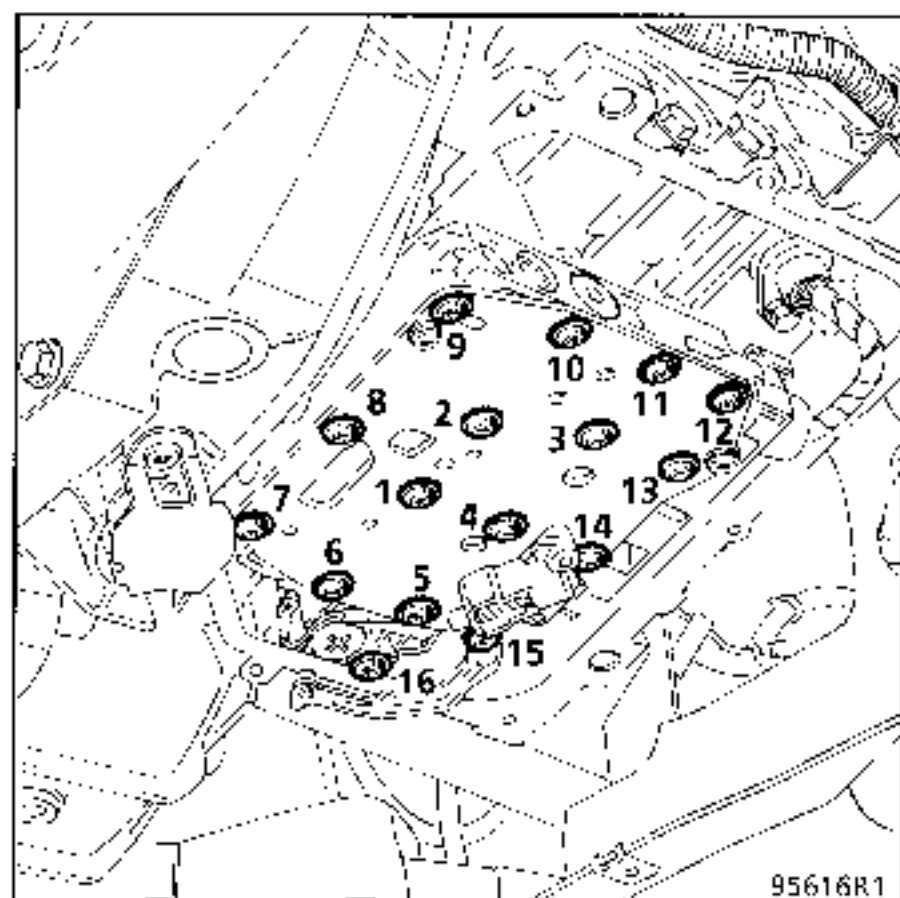
REFITTING

Ensure the supply pipe for F1 (6) and the modulating solenoid valve filter (7) (see NOTE on following page) are present.



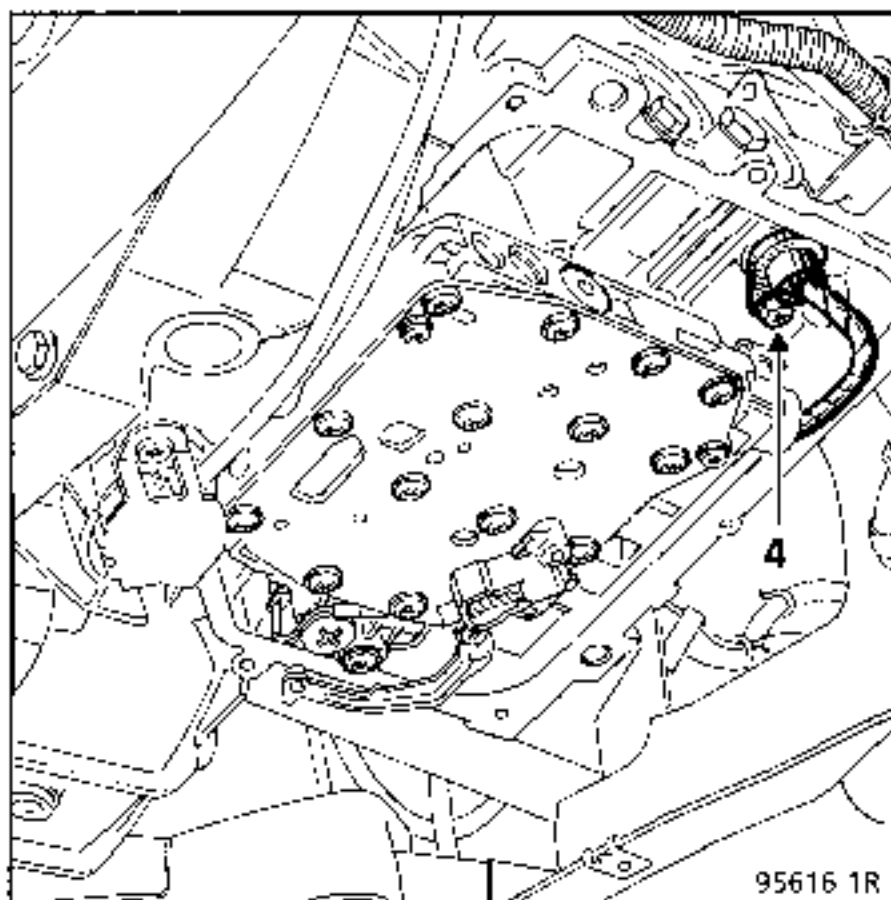
Fit the hydraulic distributor.

Fit the 16 mounting bolts securing the distributor to the housing and torque tighten them to  $0.5 \begin{smallmatrix} 0.1 \\ 0 \end{smallmatrix}$  daN.m in the order shown.



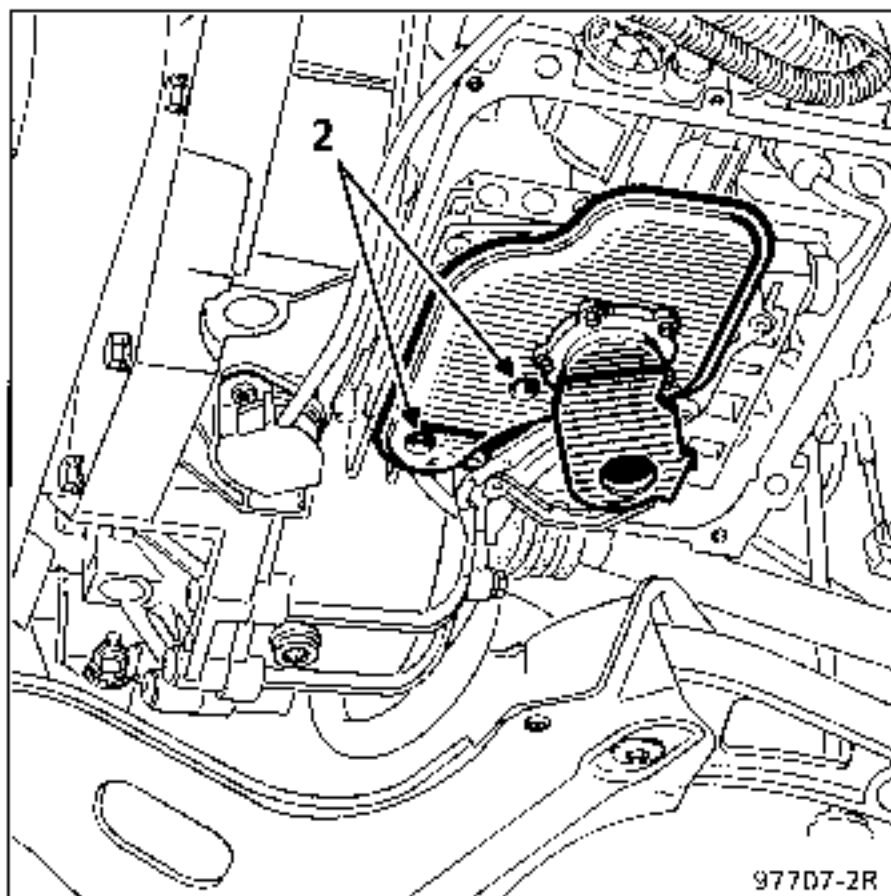
Fit the manual valve selector.

Refit the sealed connector with its O ring and bolt (4).



Fit a new strainer and seal.

Tighten the two mounting bolts (2) to a torque of  $0.5 \begin{smallmatrix} 10.1 \\ 0 \end{smallmatrix} \text{ daN.m}$

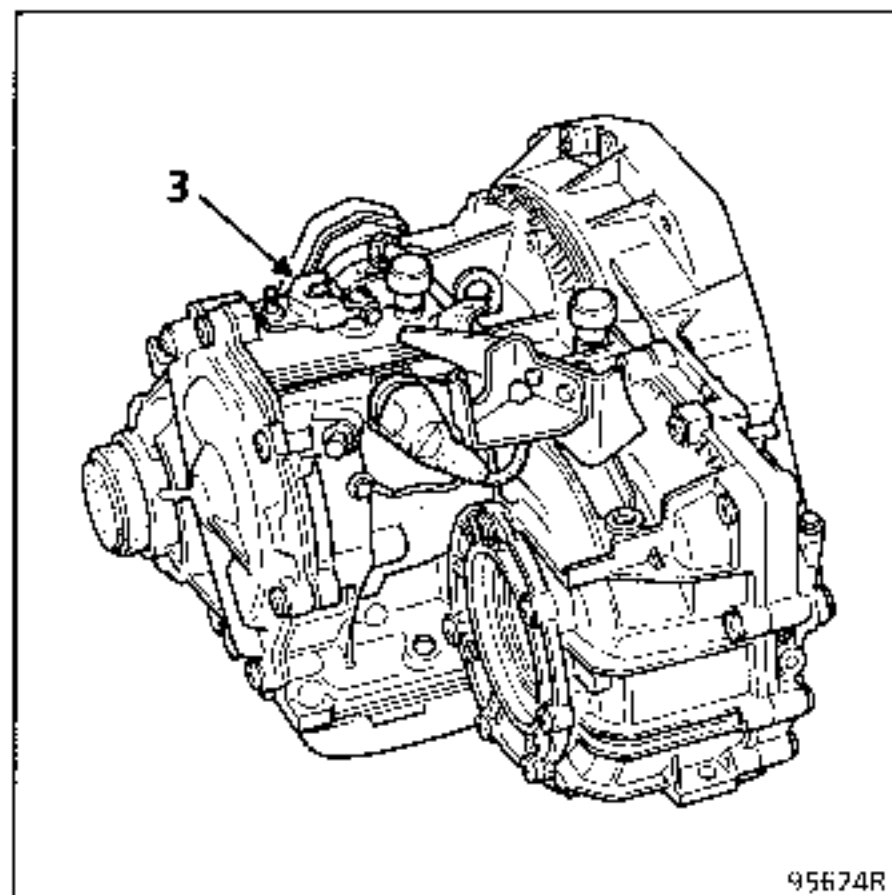


Fit the sump (check the seals are in good condition and the magnet is present).

Tighten the sump mounting bolts to a torque of  $1 \pm 0.1 \text{ daN.m}$

Reconnect the sealed connector.


Refit the gear selector (3).



Fill the transmission with oil and check the level (see corresponding section).

**NOTE :** each time the hydraulic distributor is removed or renewed, renew the filter for the modulating solenoid valve , the strainer and its seal.

The engine and transmission assembly must be removed to allow removal and refit of the automatic transmission.

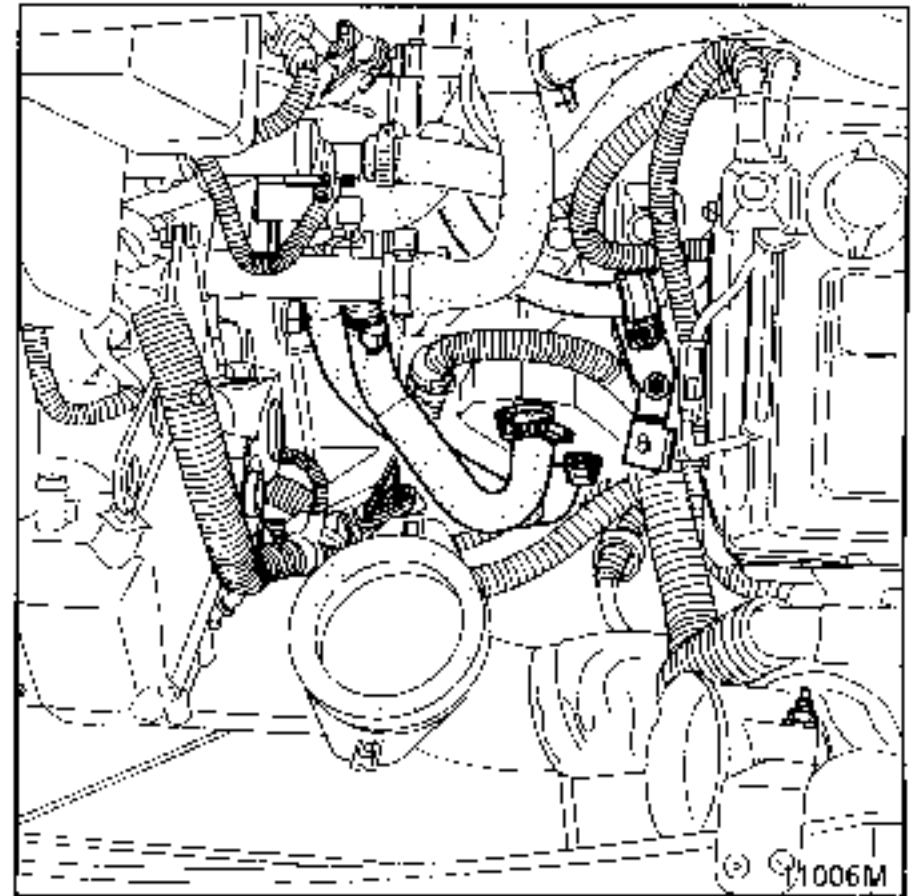
TIGHTENING TORQUES (in daN.m)		
Bolt mounting AT support onto AT	4	
Bolts and nuts mounting AT on engine	4.5	
Stud mounting AT on engine	1	
Starter motor bolt	2.5	
Bolts on protective panel	2	
Bolts mounting converter drive plate on crankshaft	6.5	
Converter mounting bolts on plate	3.5	

### SEPARATING THE ENGINE AND AUTOMATIC TRANSMISSION

Disconnect:

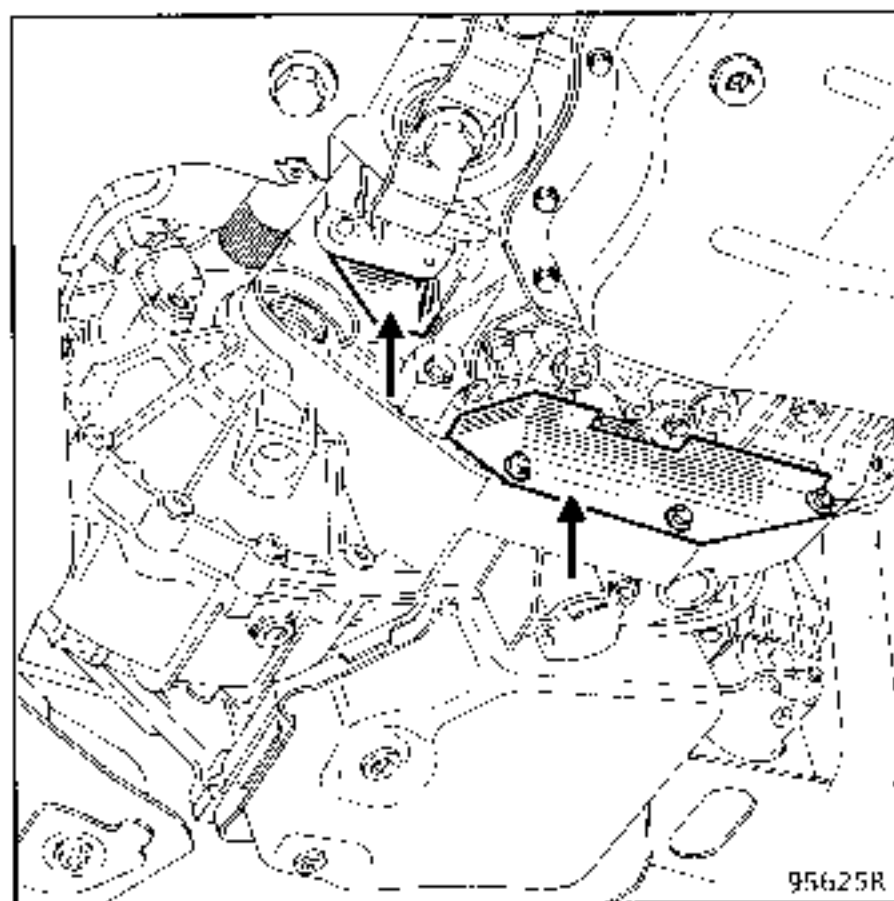
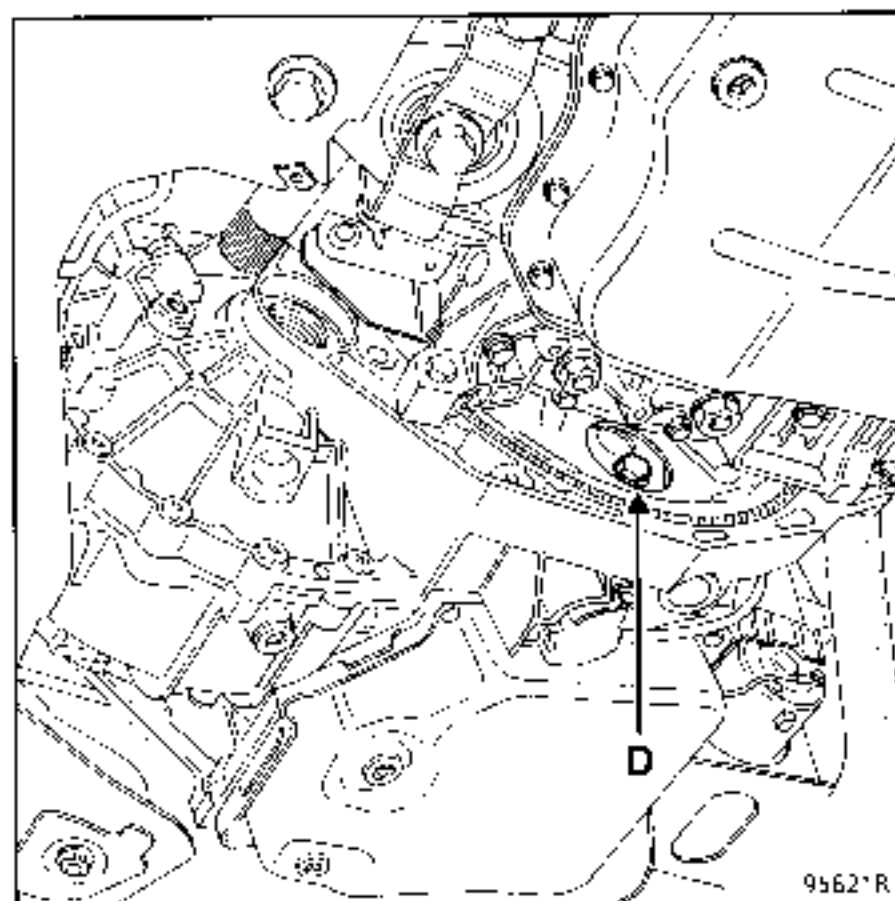
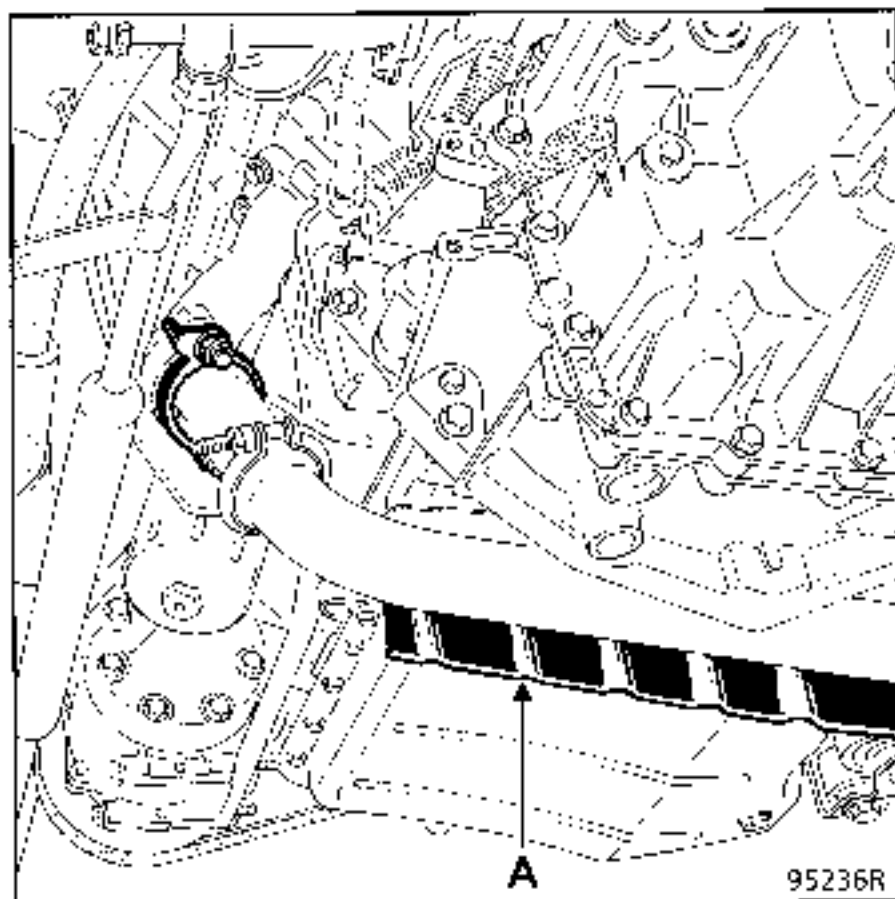
- the speedo plug,
- the two mounting clips for the engine wiring on the front face of the automatic transmission.

Collect the wiring on the engine.  
Disconnect the coolant circuit from the exchanger on the automatic transmission.



Remove:

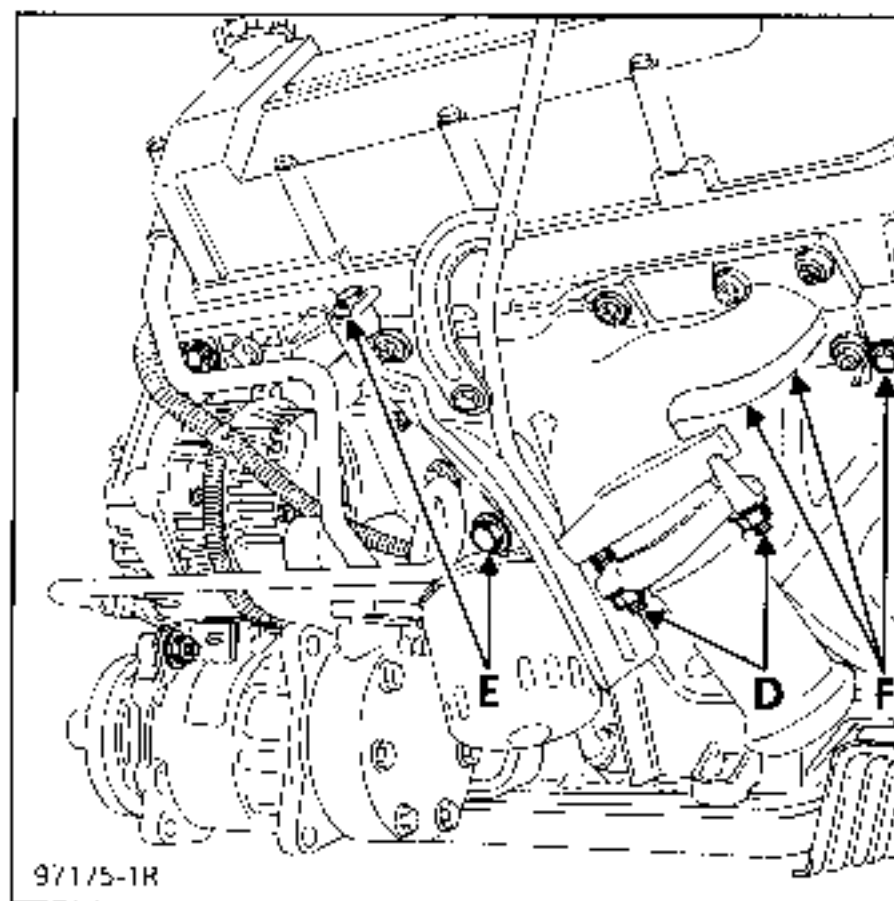
- the exhaust heat shield (1),
- the starter motor ring gear protective plates,
- the 3 mounting bolts for the converter on the drive plate (2).



Remove the starter motor; to do this:

Remove:

- the heat shield which protects the oil filter by removing the 2 bolts (E),
- the starter motor heat shield by slackening the 3 mounting bolts (F),
- the clip which holds the starter cable,
- the starter motor feed and energiser.



Remove the 3 starter motor mounting bolts.

If necessary, cut the plastic clip which holds the wiring.

Release the starter motor.

Retain the protective plate which is located between the starter motor and the converter housing.

With the engine and transmission assembly on its support, release the automatic transmission by approximately 1 cm.

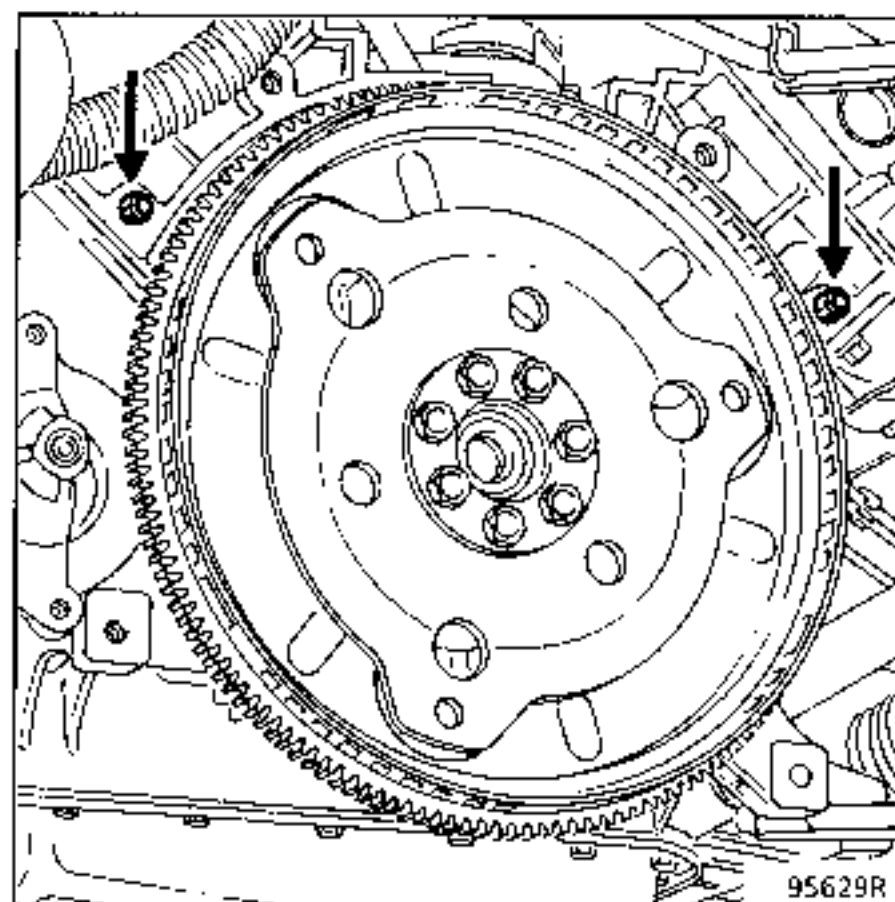
Remove the last mounting bolts for the transmission on the engine.

Separate the transmission from the engine (this operations requires 2 persons) and take care not to knock the output shaft against the flywheel TDC target or the converter.

### REFITTING:

The same precautions as for removal should be observed when bringing the transmission and flywheel together.

Before refitting the automatic transmission to the engine, check the centring dowels are present on the engine block.

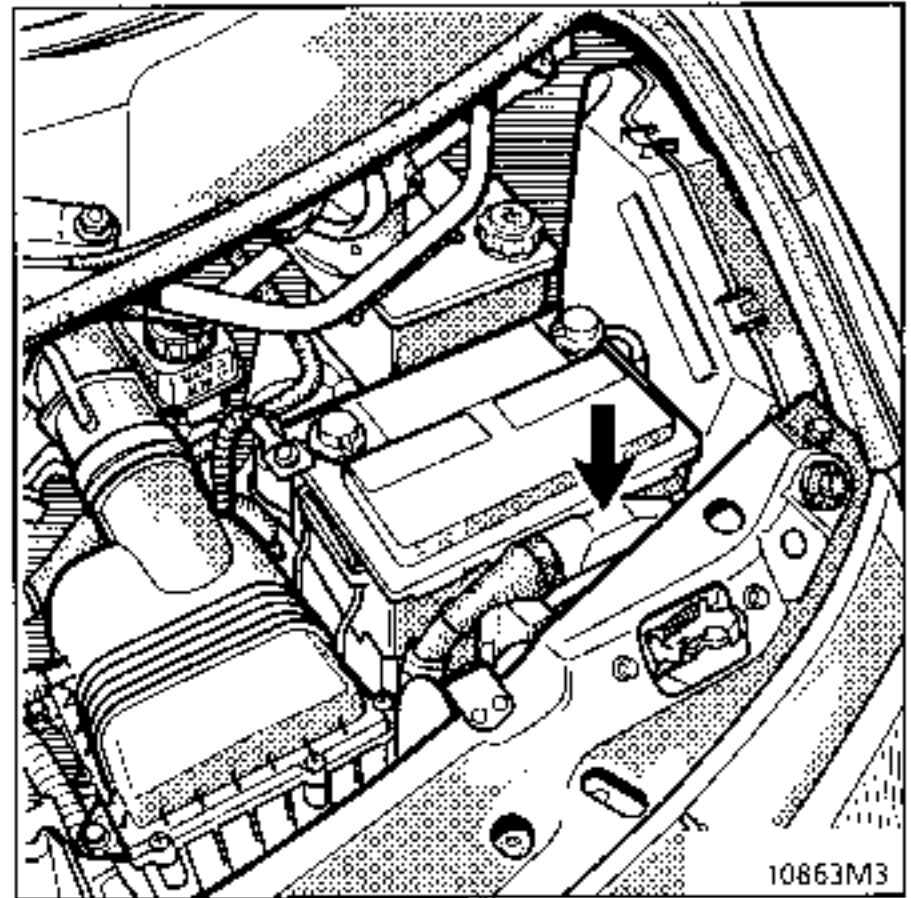


Use **MOLYKOTE BR2** to grease the converter centring device in the crankshaft.

Refitting is the reverse of removal.

The computer is located between the battery and the left hand headlight.

When it is replaced or the memory is erased, remember to validate full load and no load (see corresponding section).



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## Throttle potentiometer

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A4.2 generation computers use the load information from the injection potentiometer.

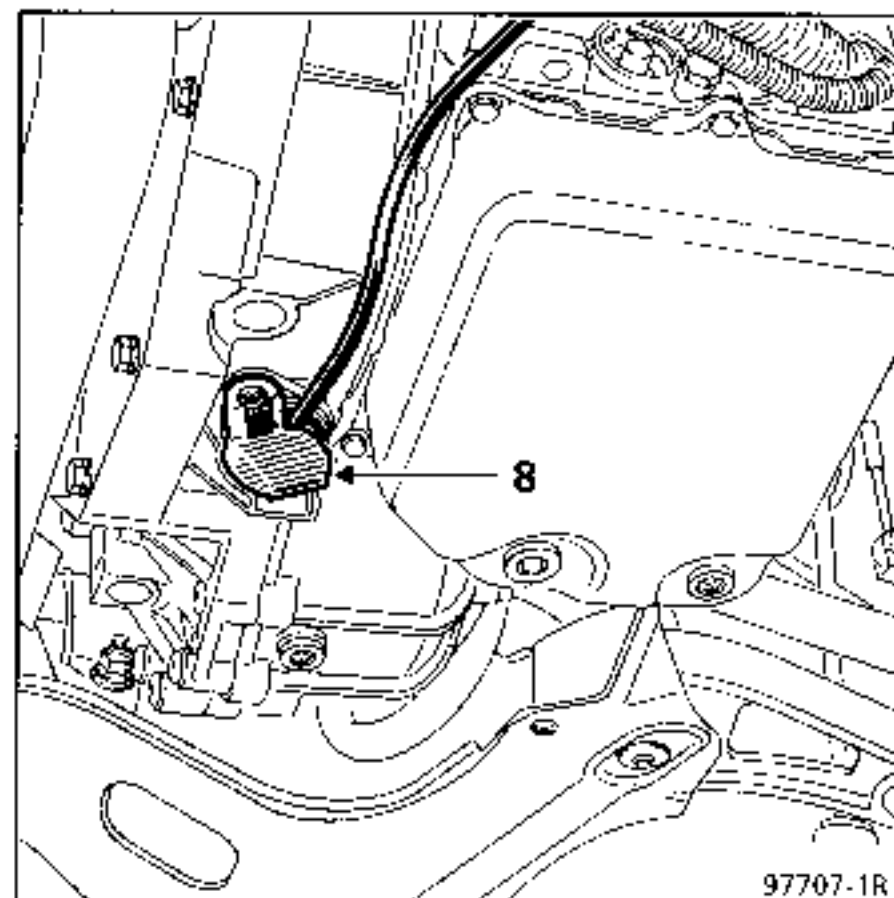
It is mounted on the throttle body by two bolts.

**SPECIAL NOTE:** this potentiometer may not be adjusted. When it is replaced, validate full load and no load to programme its travel into the computer (see corresponding section).

The line pressure sensor is mounted by two bolts on the automatic transmission housing.

It may be reached directly from under the vehicle.

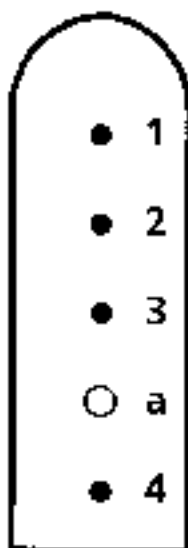
**AFTER ITS REPLACEMENT, REMEMBER TO ERASE THE MEMORY AND VALIDATE FULL LOAD AND NO LOAD** (see corresponding section)



It is connected to the wiring loom by a connector. It may therefore be replaced without cutting the mono-block wiring.

#### ALLOCATION OF TRACKS

Sensor end



a : sensor breather pipe



The multifunction switch is checked using the 55 track connector on the computer, bornier **Sus. 1228** and the following table.

If the tests show a fault, cut the wiring 20 cm from the multifunction switch and check between:

- the cut section and the 55 track connector,
- the cut section and the multifunction switch,

using the tables below and the wiring diagram.

Lever position	Continuity assured	Insulation assured
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

If one of the insulations or one of the continuities is not assured, replace the multifunction switch or the complete wiring.

#### Wire colours

55 track end	Function	Colour
51 46 27 44 52	Information 2 Reversing lights Reversing lights switch Starter motor relay switch Information 1	BE VE or GR VE or GR RG SA

To replace this part, refer to **Technical Note 8075** which deals with the repair of wiring. The part supplied by the Parts Department is of generation A4.1. To fit it to this wiring, cut the wiring on the switch received to adapt the length of the wire to suit the repair.

Ensure the wire joints are staggered.

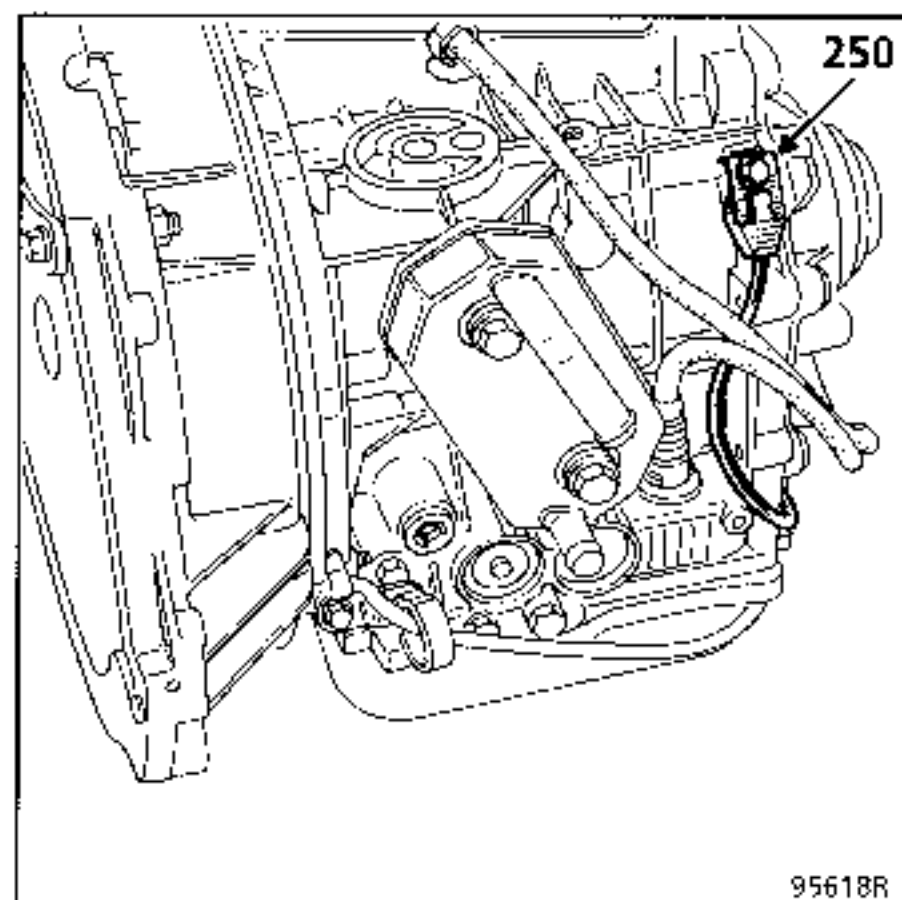
One black wire will remain unused.

The speed sensor is mounted on the automatic transmission housing by a bracket.

To replace this part if necessary, refer to **Technical Note 8075** which deals with the repair of wiring.

The part supplied by the Parts Department is of generation A4.1. To fit it to this wiring, cut the wiring on the sensor received to adapt the length of the wire to suit the repair.

**AFTER ITS REPLACEMENT, REMEMBER TO ERASE THE MEMORY AND VALIDATE FULL LOAD AND NO LOAD** (see corresponding section)



## Solenoid valves

### TIGHTENING TORQUES (in daN.m)



Solenoid valve mounting bolt	$0.9 \pm 0.1$
Distributor plate mounting bolt	$0.5 \pm 0.1$
Distributor mounting bolt	$0.5 \pm 0.1$

The sequence and modulating solenoid valves and the temperature sensor may only be replaced after the hydraulic distributor has been removed (see corresponding section).

Remove:

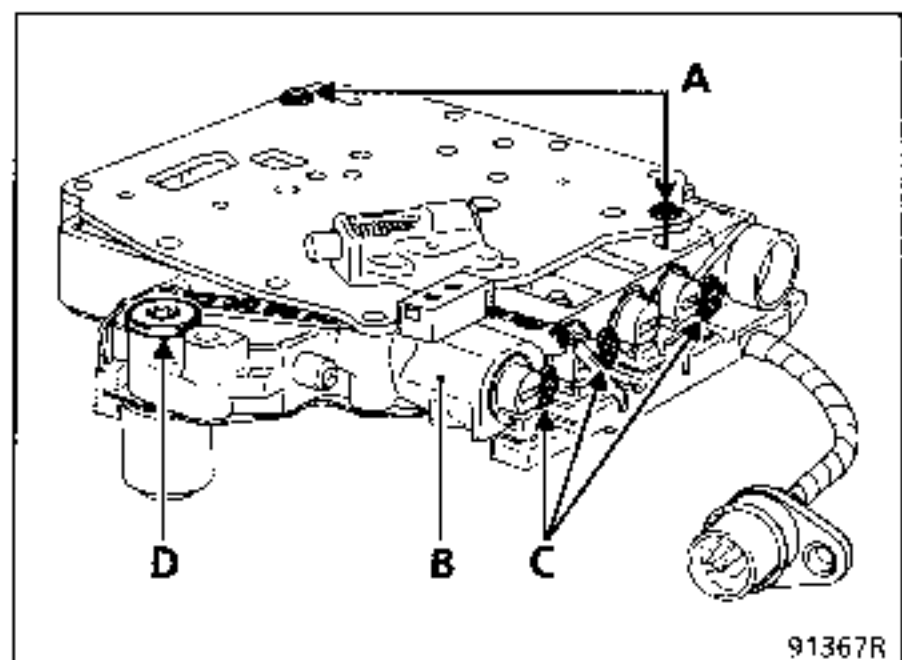
- bolts (A) mounting the cover plate on the distributor (B),
- The mounting bolts for the sequence (C) and modulating (D) solenoid valves.

Release the solenoid valves / sensor assembly from the distributor.

There are no special notes for refitting the assembly. Refitting is the reverse of removal.

**IMPORTANT** : tighten all bolts to the recommended torque.

**NOTE** : each sequence solenoid valve is positioned on its own mounting - do not confuse them.



## 1. ENGINE TORQUE REDUCTION

The reduction of engine torque during changing gear aims to:

- a) improve the smoothness of changing gear,
- b) reduce the theoretical load on the hydraulic components used during the gear change,
- c) reduce stress on the mechanical components.

Torque reduction is achieved by altering the advance point. The torque reduction signal is provided by the A.T. computer to the injection computer: during the complete period of changing gear, the advance point is retarded by 25°.

If there is a fault, refer to "Injection" fault finding, fiche N° 27 (10.NJ) bargraph 5 LH side (torque reduction).

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## Kickdown switch

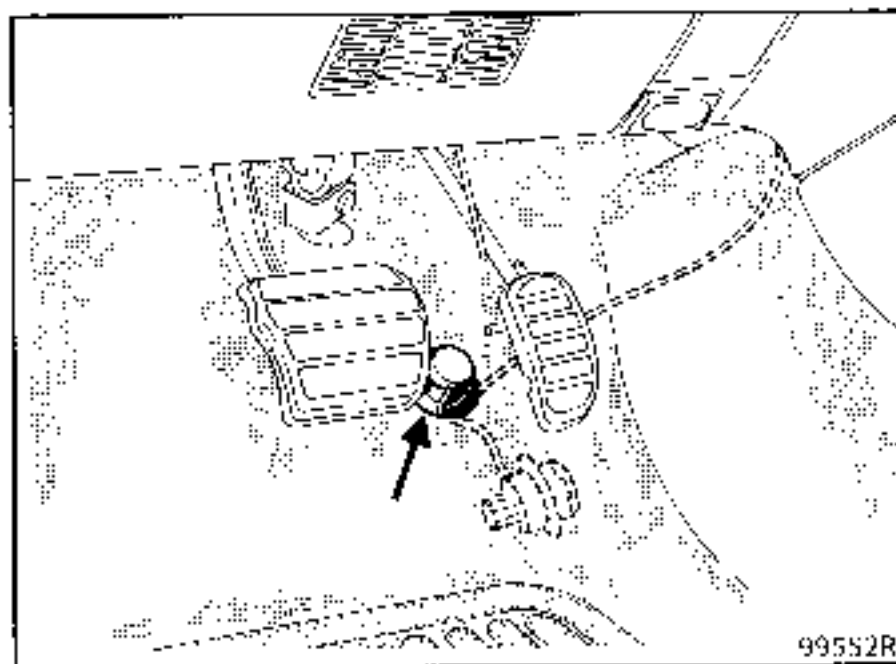
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This informs the computer that the accelerator pedal is beyond the full load position. The driver requires torque so the automatic transmission changes down a gear.

It is located under the accelerator pedal with a connector in the dashboard.

After the full load position there is a point of resistance when the switch closes.

This device is adjusted when the accelerator control is adjusted (see corresponding section).

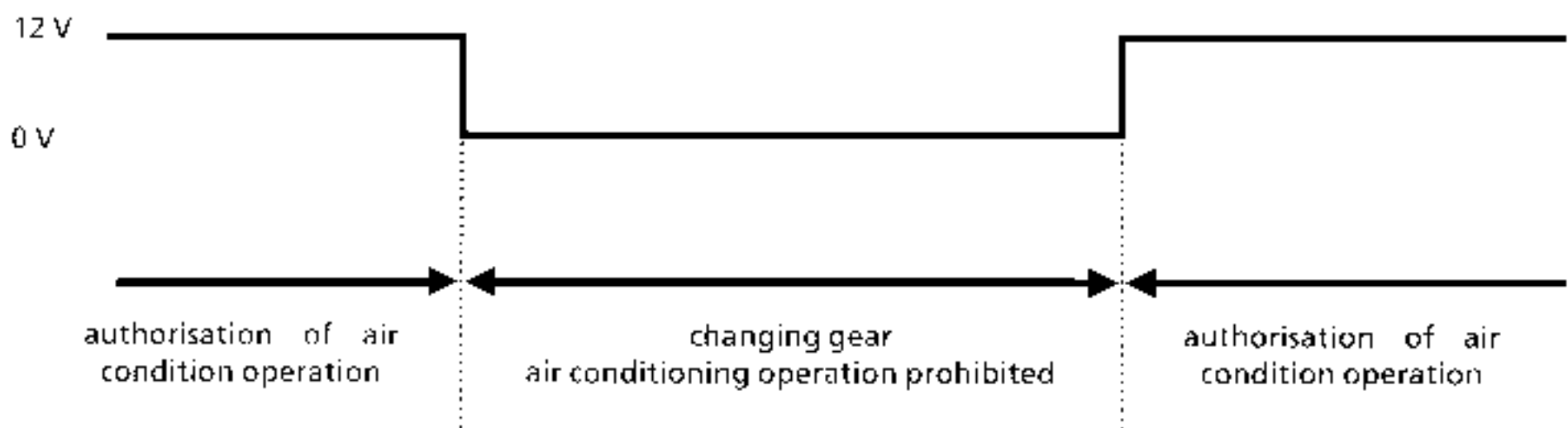


#### 4. INJECTION COMPUTER / AT COMPUTER CONNECTION

Refer to the "Injection" section (diagnostic fiche N° 27).

#### 5. AT COMPUTER / AC COMPUTER CONNECTION

When the gear is changes, for the complete changing period, the AT computer , on track C5 connector I, earths track 20 on the AC computer. This ceases or prevents operation of the compressor clutch, to improve driving comfort.



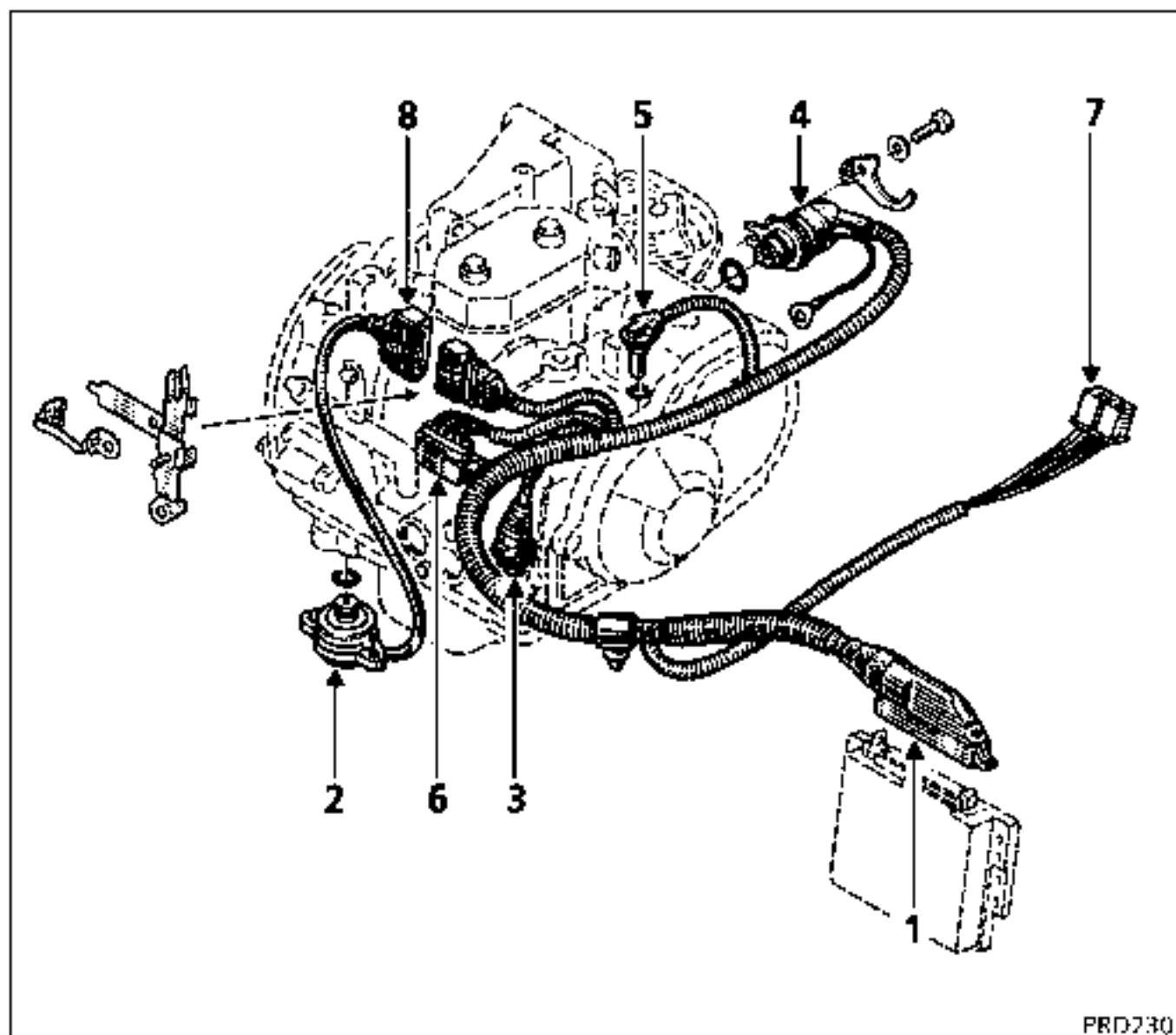
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## Fault finding

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For fault finding on the AD8 automatic transmission, refer to **MR T.A. A**, Fault Finding Aid (Diag) II or the "Fault finding" section.

The A4.2 generation automatic transmission has monoblock wiring.



- 1 55 track automatic transmission computer connector.
- 2 Oil pressure sensor.
- 3 Electro-hydraulic interface (sealed connector).
- 4 Multifunction switch.
- 5 Speed sensor at automatic transmission output (for vehicle speed).
- 6 Connection R22 (engine/ automatic transmission).
- 7 Connection R34 (engine/ dashboard).
- 8 Pressure sensor connector.

For removal - refitting, refer to **NT 8104** and **2462**.

A4.2 computers use the load information from the injection potentiometer.

The potentiometer travel must be programmed and the full load then the no load positions must be programmed.

To do this:

- connect the XR255,
- set the ISO selector to S8,
- turn the ignition on **without starting the engine**,
- **gear selector in position P or N**,

**NOTE :** if these two conditions are not respected, it will be indicated during the procedure.



Enter the code for transmission A4.2

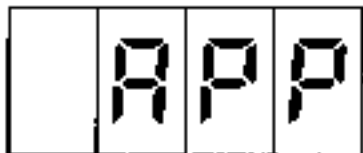
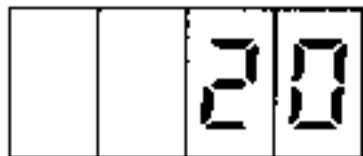
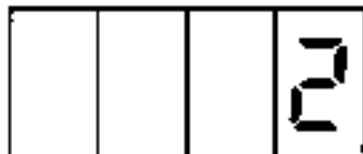
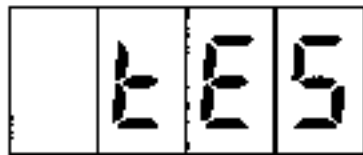
**D 1 4**

Enter

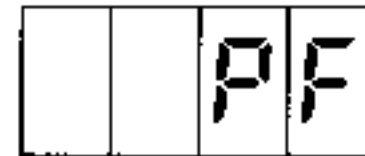
**G 2 0 \***

to start the procedure for programming full load and no load

Display:

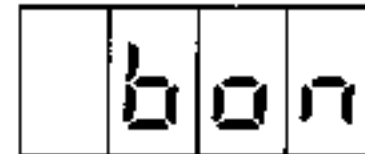


The XR255 requests full load.

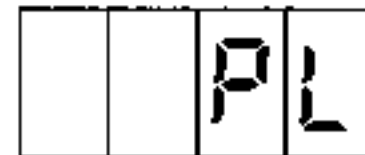


Validate the full load position by pressing the accelerator pedal (beyond the kickdown point of resistance).

Display:

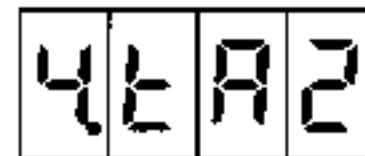
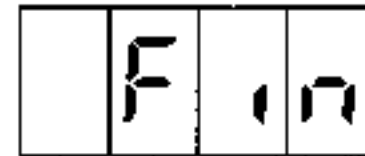
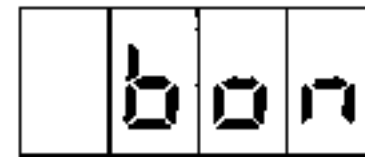


The XR255 requests no load.



Validate the no load position by releasing the accelerator pedal.

Display:



**VERY IMPORTANT :** turn the ignition off then on again. Enter the code for transmission A4.2 to check that validation has been carried out correctly.

Bargraph 10 LH side extinguished = correct.

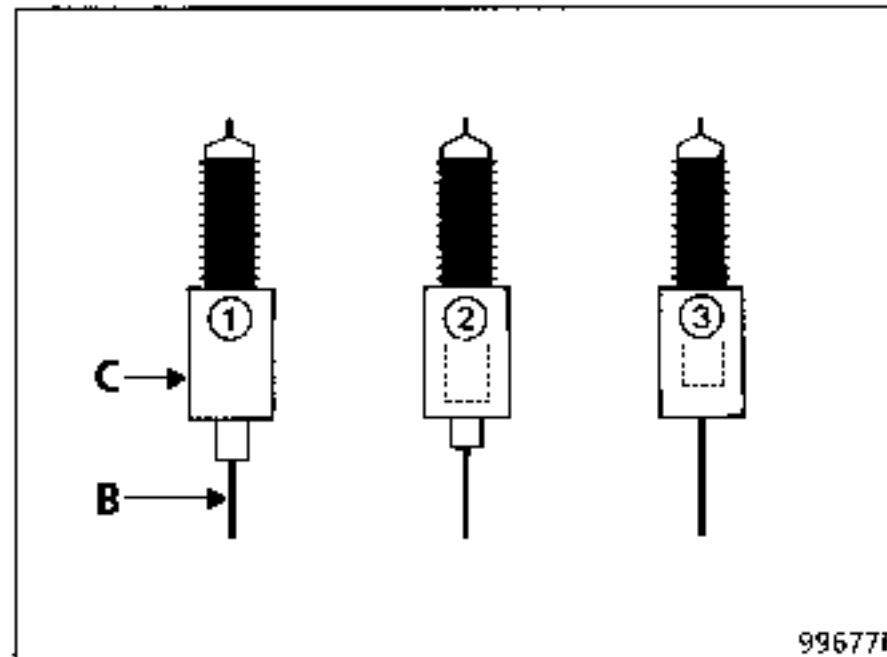
Switch off the ignition and disconnect the XR255.

If bargraph 10 LH side does not extinguish and before starting corresponding fault finding using the fault charts, check the accelerator control is correctly adjusted (see corresponding section).

Check there is no excess carpet between the pedal and the kickdown switch.

Apart from its compensation function (ensures complete acceleration without breaking the clip hooked onto the pedal), this compensator allows the kickdown switch to compress using the compensation travel and thus gives the computer full load information.

**Compensator located above the engine / gearbox connecting face**



- A** Bulkhead.
  - B** Accelerator cable.
  - C** Compensator.
- 1** Rest position.
  - 2** Compensation position (the throttle is fully open but the pedal is not yet at the floor).
  - 3** Maximum position (reached if the adjustment is not correct).

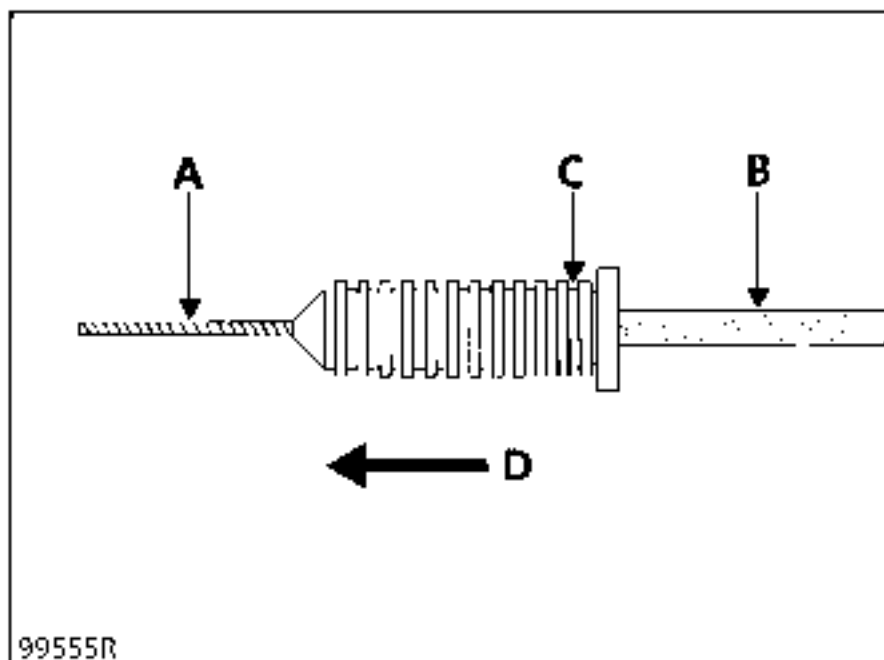
### ADJUSTMENT

After any operation on the accelerator cable, the compensator adjustment must be checked.

#### A - Adjusting the transformed load

1) Set the compensator adjustment pin to the notch specified in the table below.

Steering	A Left	A Right
Position of clip Number of notches	14	12



- A** Cable.
- B** Sleeve.
- C** 1st notch.
- D** - direction.

2) Press the pedal to the floor several times to **tamp the cable**.

Check there is no excess carpet between the pedal and the kickdown switch.

3) Connect the XR25.

4) Turn the ignition on, **without starting the engine, lever in P or N.**

5) Enter fault finding, XR25 selector on S8, enter

**D 1 4**

6) Start the programming command

**G 2 0 \***

Display:

**EE5**

**2**

**20**

**APP**

7) The XR25 requests full load

**PF**

Validate the full load position by pressing the accelerator pedal (beyond the kickdown point of resistance).

Display:

**ban**

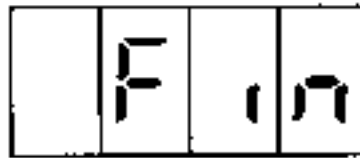
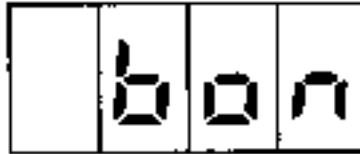


8) The XR255 requests no load



Validate the no load position by releasing the accelerator pedal.

Display:



9) Enter



on the XR255 (the transformed load value is displayed).

10) Press the pedal to the floor, the value read should be  $227 \pm 1$ .

11) Release the pedal, the value read should be  $16 \pm 1$ .

12) Press the pedal to the point of resistance but do not exceed it.

The transformed load value read should be greater than 203.

If the value read is not correct, the adjustment must be altered.

Correction table - "pin movement"

Engine	Transformed load read	Pin movement
Z7X	$163 < XX < 204$ $125 < XX < 163$	+ 1 notch + 2 notches

13) Move the pin by the number of notches specified in the "pin movement" column in the table. The + sign indicates that the pin must be moved towards the cable.

14) Press the pedal several times to settle the cable.

15) Check the adjustment once more by repeating the operations from paragraph A-12.

**NOTE :** after programming, the transformed load values should vary between 16 and 227 (including the kickdown zone). If values are then found which are less than 15, or greater than 228, the full load and no load positions must be programmed once more.

### **B - Checking the compensator travel**

- 1) Press the pedal to the floor.
- 2) Check that the compensator travel is less than or equal to **6 mm**.

If the travel is greater than **6 mm**, there is probably a fault in the cable, it is incorrectly routed or the pin has been positioned too near to the cable.

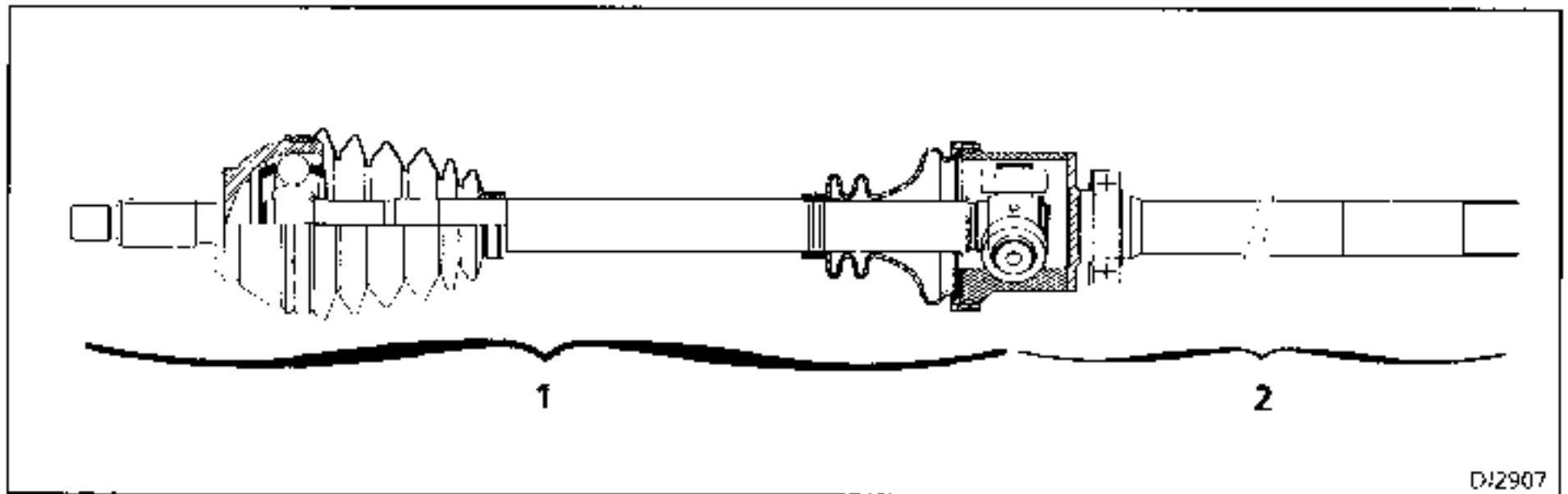
### **C - Optimising the adjustment**

- 1) Move the pin – 1 notch (towards the pedal).
- 2) Note the value of the transformed load at the point of resistance (see paragraph A-12).
- 3) Analysis of results:
  - if the transformed load value is no longer within the tolerance, return to the previous adjustment
  - if the transformed load value is still within the tolerance, repeat the operations from paragraph C-1.

**RIGHT HAND DRIVESHAFT** (Special notes for PK and AD8 transmissions)

This driveshaft has an intermediate bearing and is sold in two sections:

1. The primary section has the exterior joint (GE), the connecting tube and the interior open joint (GI).
2. The secondary section (yoke, relay shaft and its bearing).



For this reason the right hand driveshaft may be completely removed or just the primary section may be removed (the secondary section remains in position and this therefore avoids having to remove the flange and damage the lip seal at the gearbox output). The removal of mechanical components may however mean that the complete assembly must be removed.

Type	Quantity	Component concerned
Loctite SCELBLOC	Coat	Stub axle splines
MOBIL CVI 825	130 gr	Joint RC 490
Black Star	165 gr	Joint RC 491
or	140 gr	AC 2900
MOBIL EXF 57C		

## Allocation of joints on the vehicle

Type of joint	LH driveshaft		RH driveshaft	
	Wheel end	Gearbox end	Wheel end	Gearbox end
RC 490	-	PK1-AD8	-	JC5 small cover
RC 491	-	-	-	PK1-AD8
AC 2900	JC5-PK1-AD8	-	JC5-PK1-AD8	-
G 169	-	JC5	-	-

## REPLACEMENT

### SPECIAL TOOLING REQUIRED

Rou. 604-01	Hub locking tool
T.Av. 476	Ball joint extractor
T.Av. 602	Driveshaft puller
T.Av. 1050-02	Hub extractor
B.Vi. 31-01	Roll pin punch

### TIGHTENING TORQUES (in daN.m)

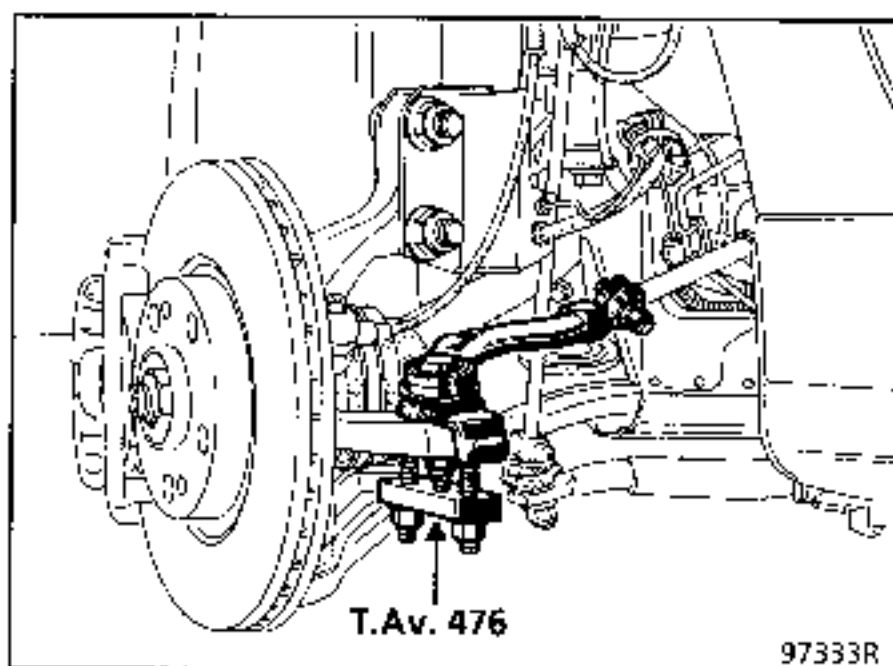


Shock absorber base mounting bolt	20
Driveshaft nut	33
Track rod end	4
Gaiter mounting bolts on gearbox	2.5
Brake caliper guide bolts	3.5
Wheel bolts	10
4 bolts	10
5 bolts	10

## REMOVAL

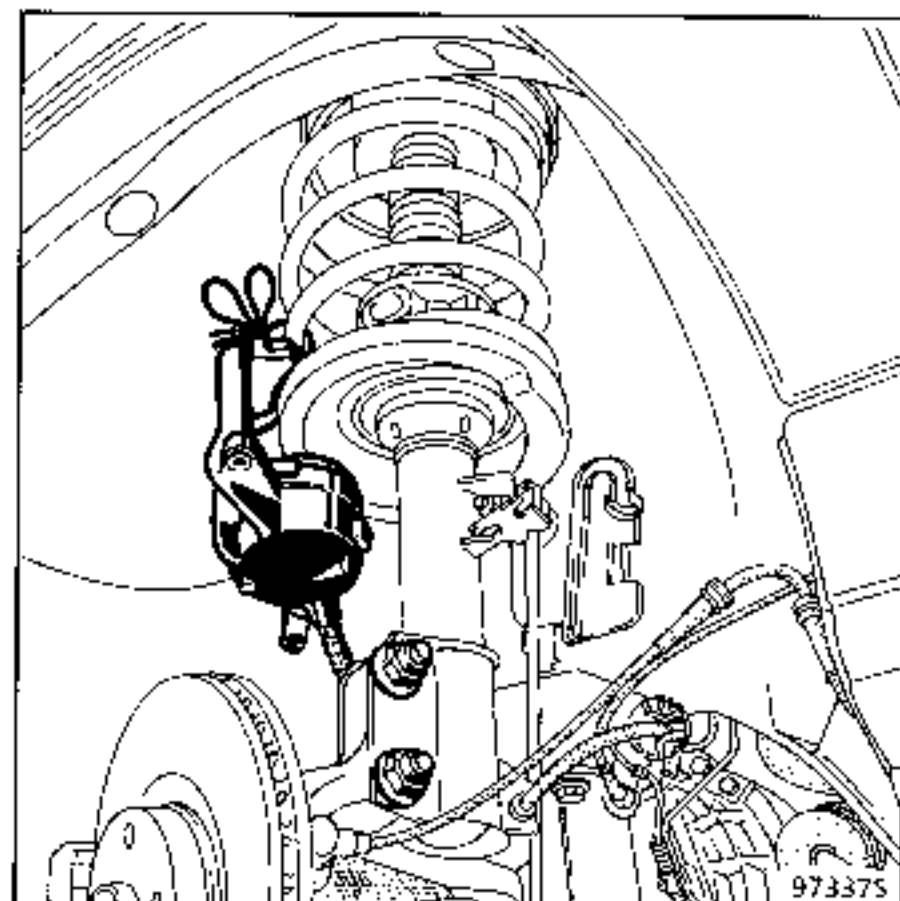
Remove:

- the wheel,
- the track rod end using tool **T.Av. 476**.



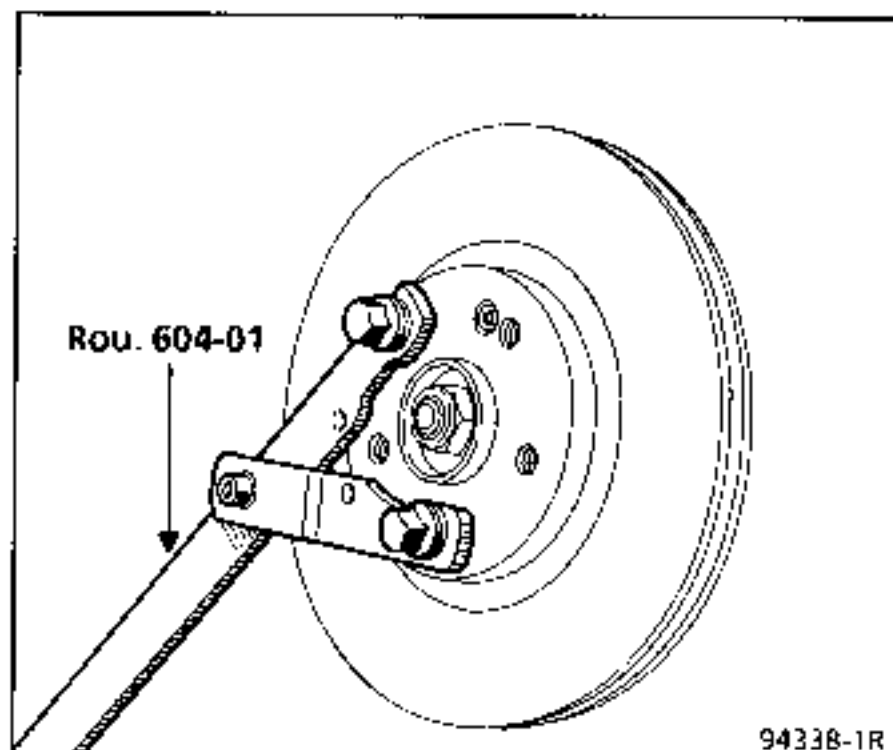
Fit a protector on the driveshaft gaiter.

Remove the brake caliper (suspend it from the chassis or the suspension spring so the brake pipe is not damaged).



Release the ABS wiring (if fitted) from its caliper retaining bolt mountings.

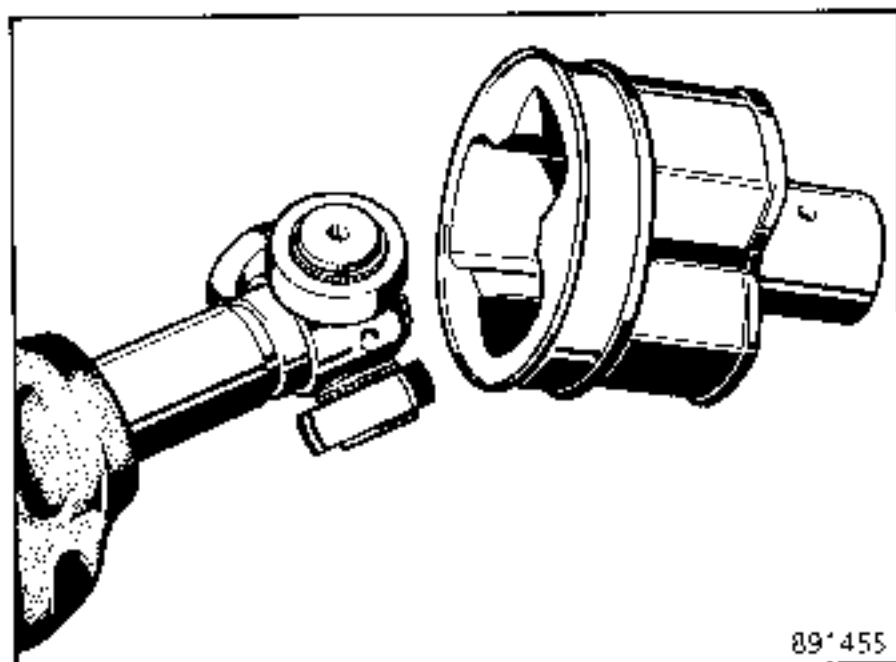
Remove the driveshaft nut using tool **Rou. 604-01**.



*Right hand side:*

**PK - AD gearbox**

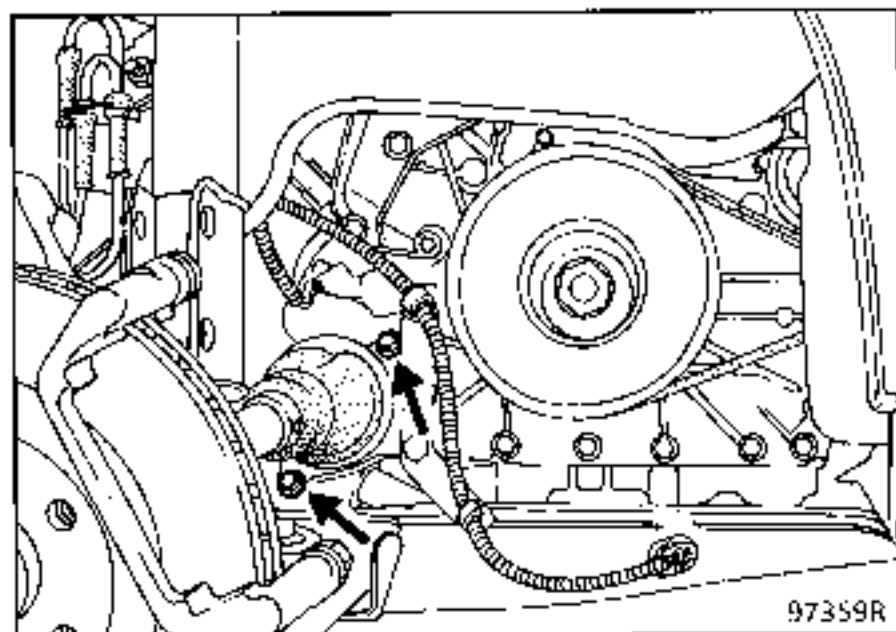
The primary section may be removed alone. In this case, cut the gaiter retaining clip on the yoke and release the driveshaft.



**NOTE :** the yoke has no stop tab and is removed without force.

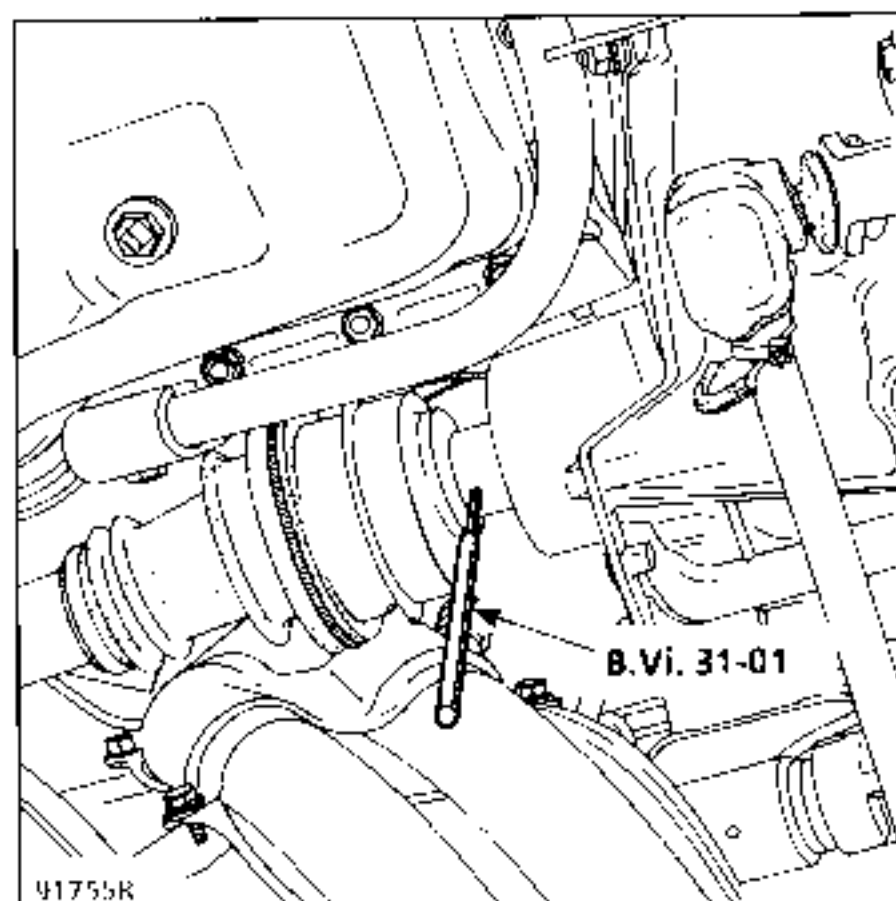
Do not remove the roller cages from their respective trunnions since the cages and rollers are matched and must never be mixed.

If the complete driveshaft is being removed, remove the two mounting bolts on the flange.



**JC gearbox**

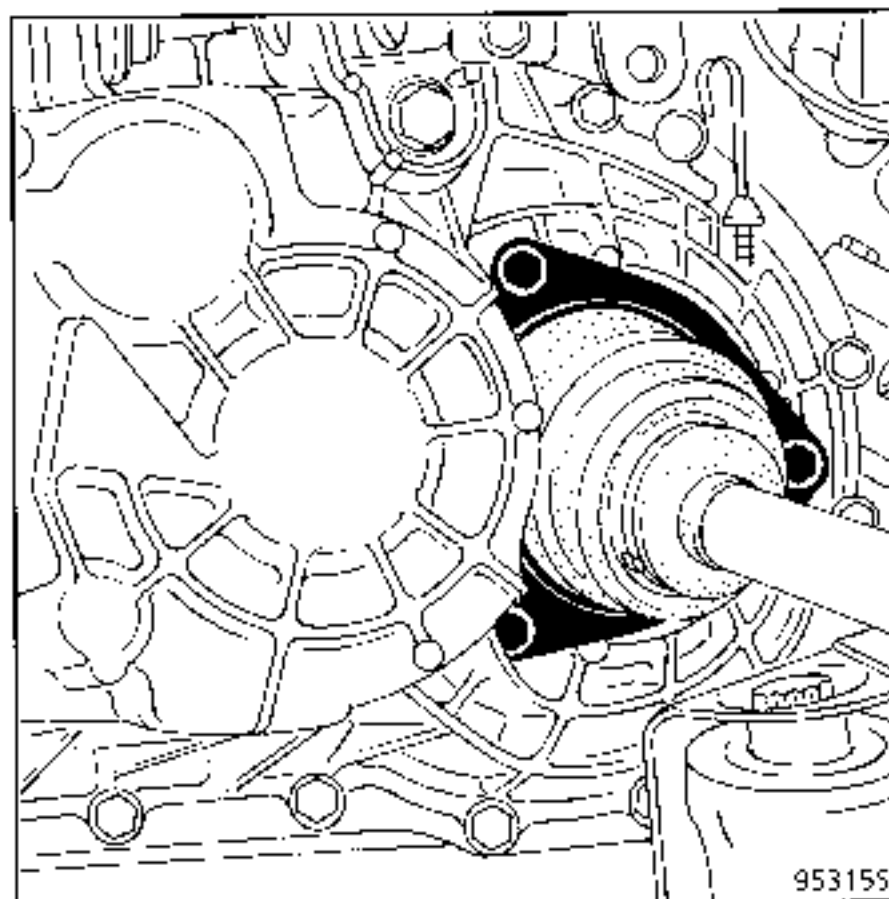
Remove the roll pin using tool B.Vi. 31-01.



*Left hand side:*

Drain the gearbox.

Remove the three mounting bolts for the gaiter on the gearbox.

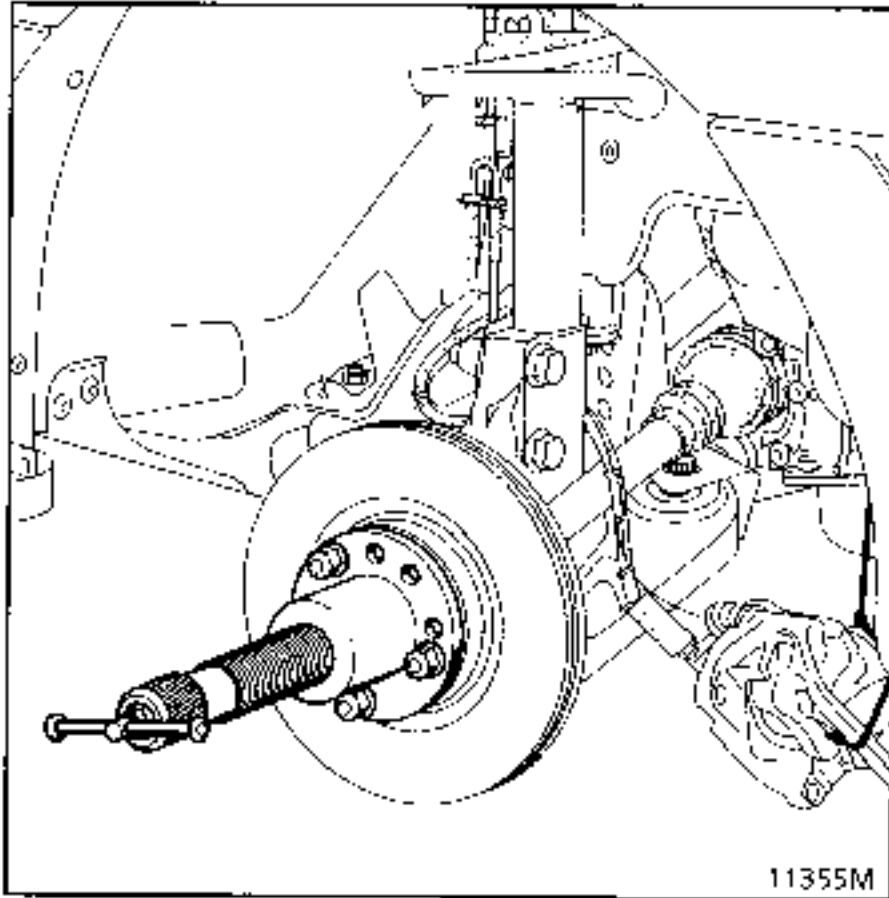


*On both sides:*

Remove the upper shock absorber base mounting bolt.

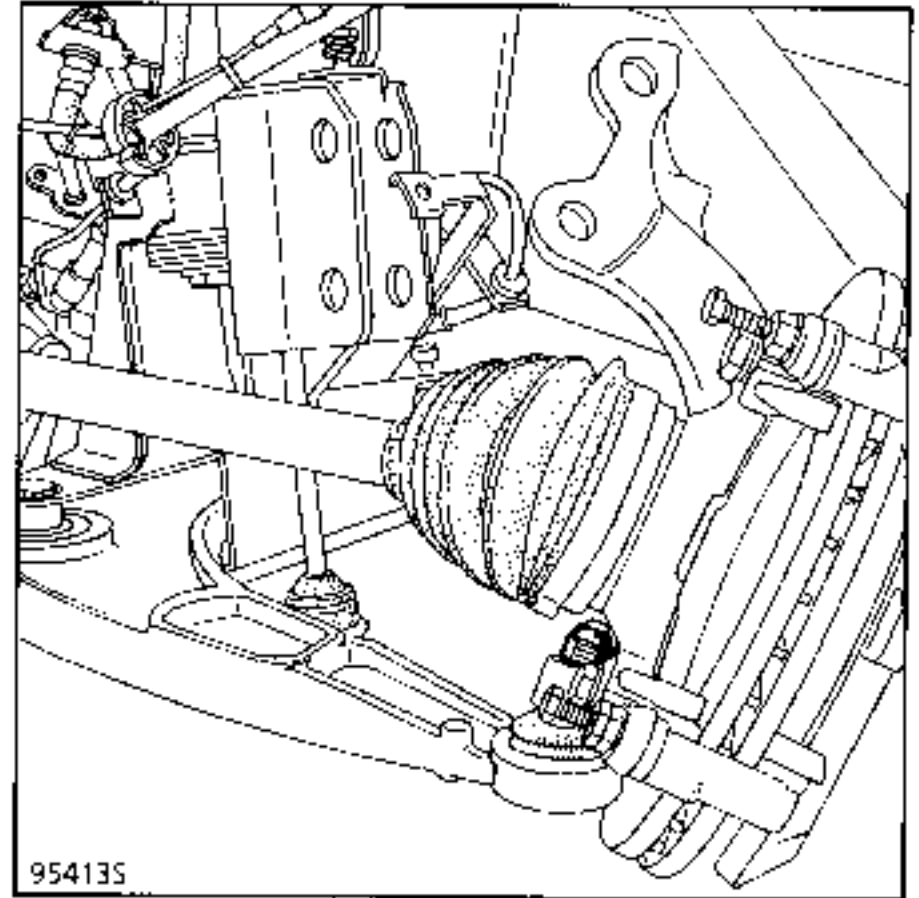
Release but do not remove the lower mounting bolt.

These vehicles are fitted with bonded driveshafts, which will need to be pushed back using tool T.Av. 1050-02.



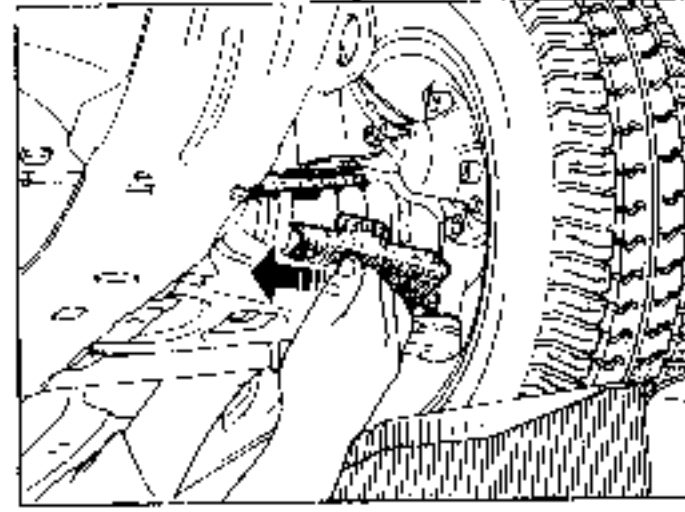
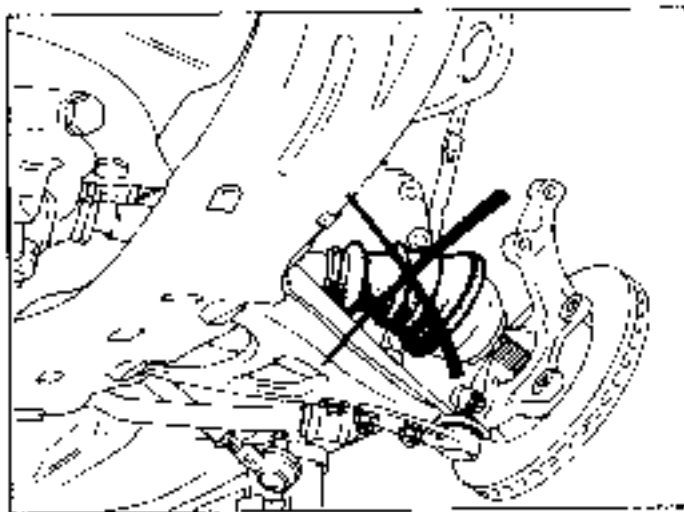
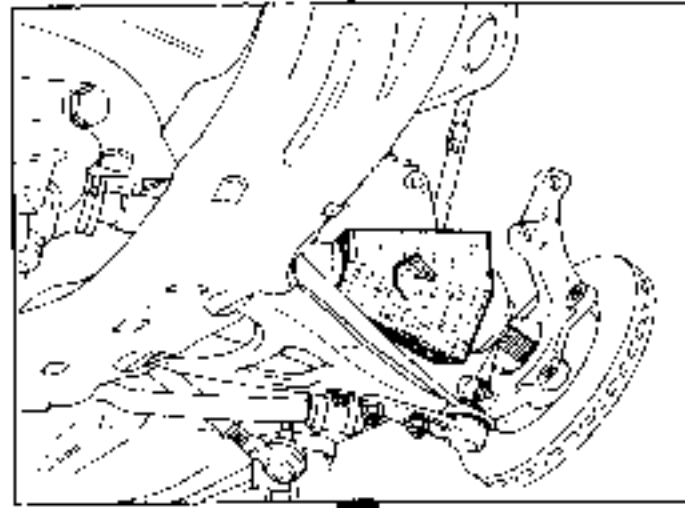
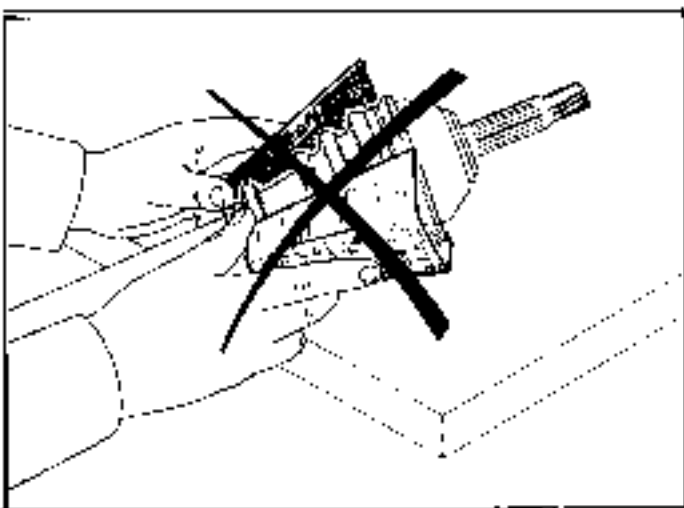
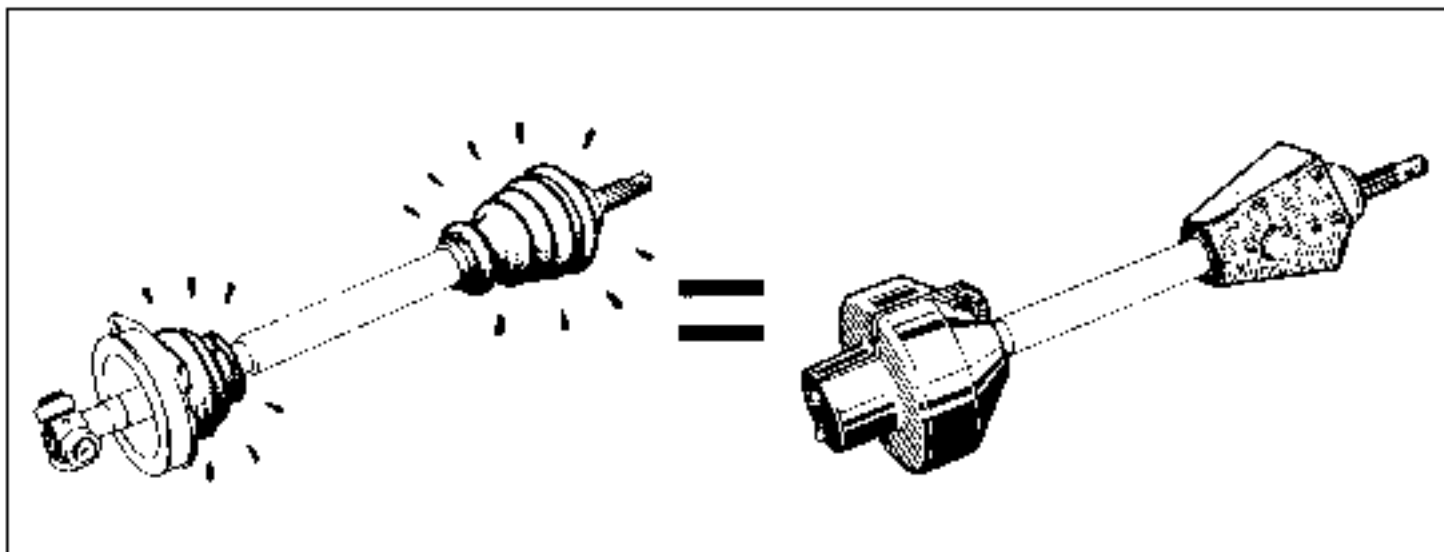
Remove the lower shock absorber base bolt and tilt the stub axle carrier.

Remove the driveshaft stub axle from the hub.



Remove the driveshaft.

## ESSENTIAL ASSEMBLY INSTRUCTIONS

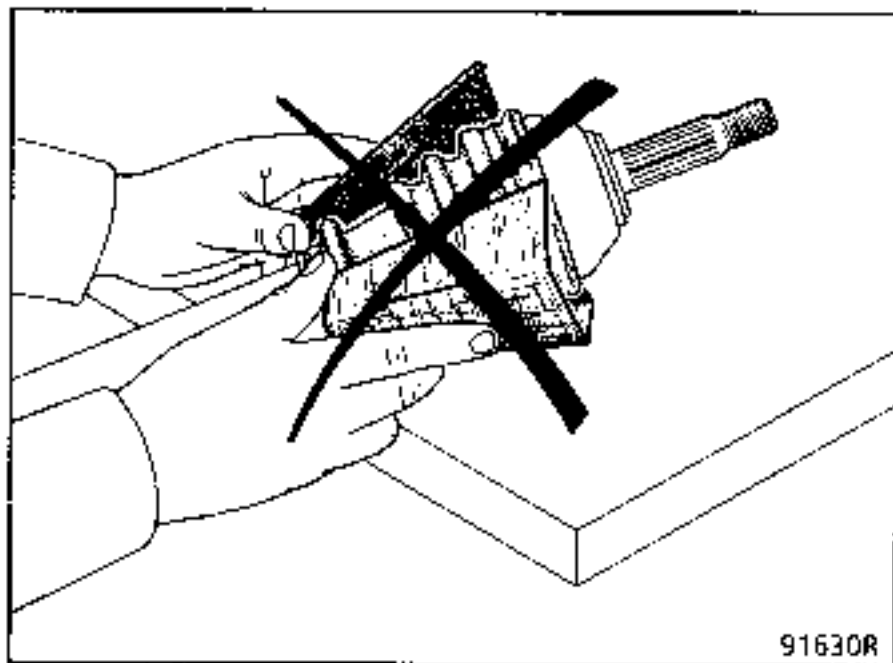




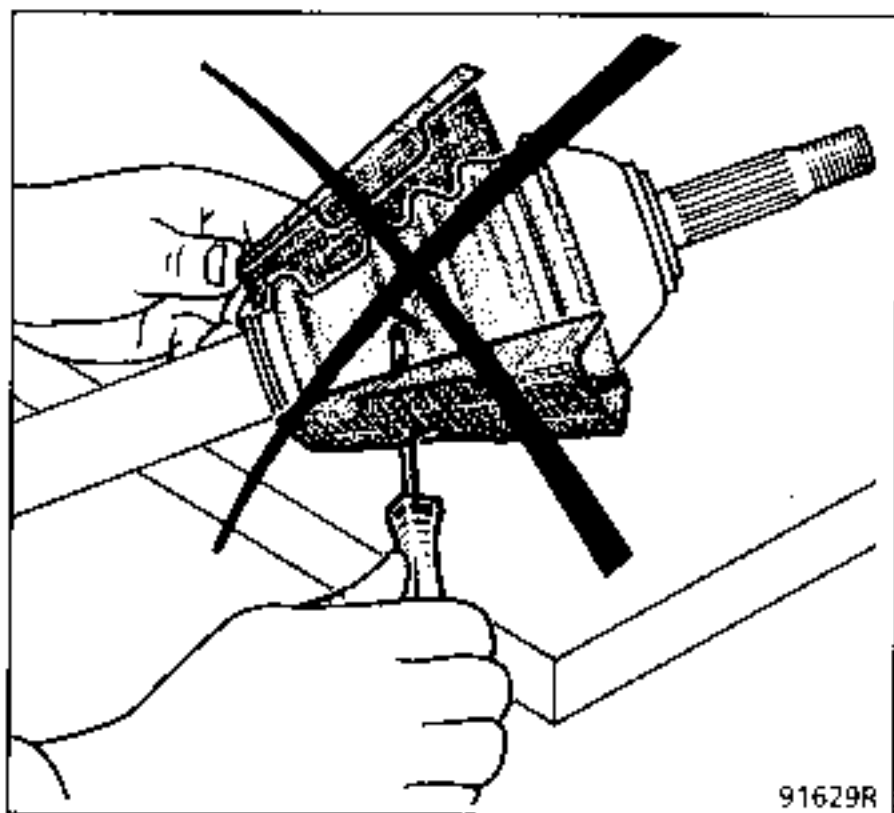
## REPLACEMENT (cont)

### REFITTING

Never remove the cardboard protectors before the end of the operation to refit the driveshaft to the vehicle.

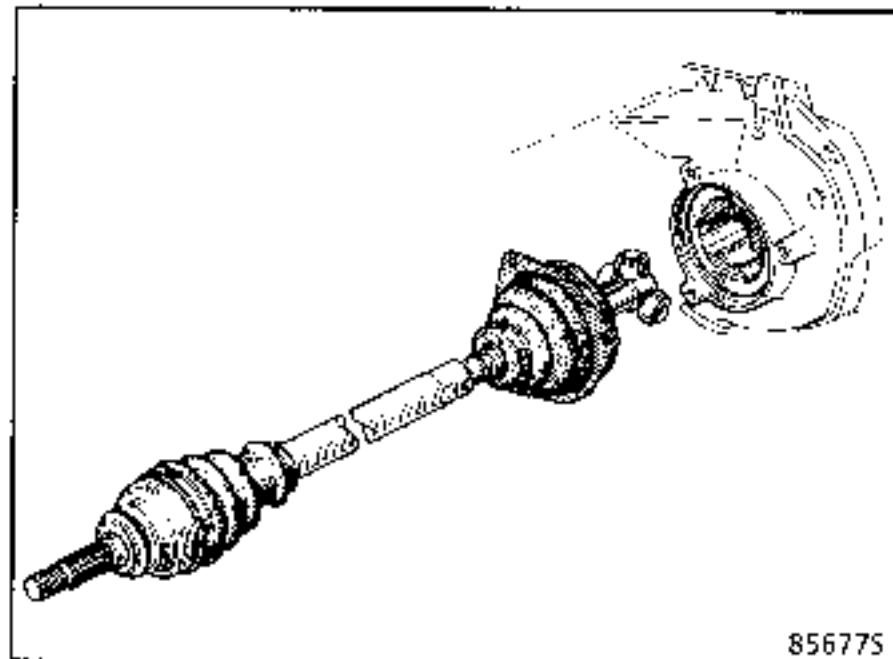


Never use an instrument with a sharp edge which could damage the gaiter.



### Left hand side:

Remove the plastic protector from the gaiter bearing and engage the driveshaft, keeping it as horizontal as possible.

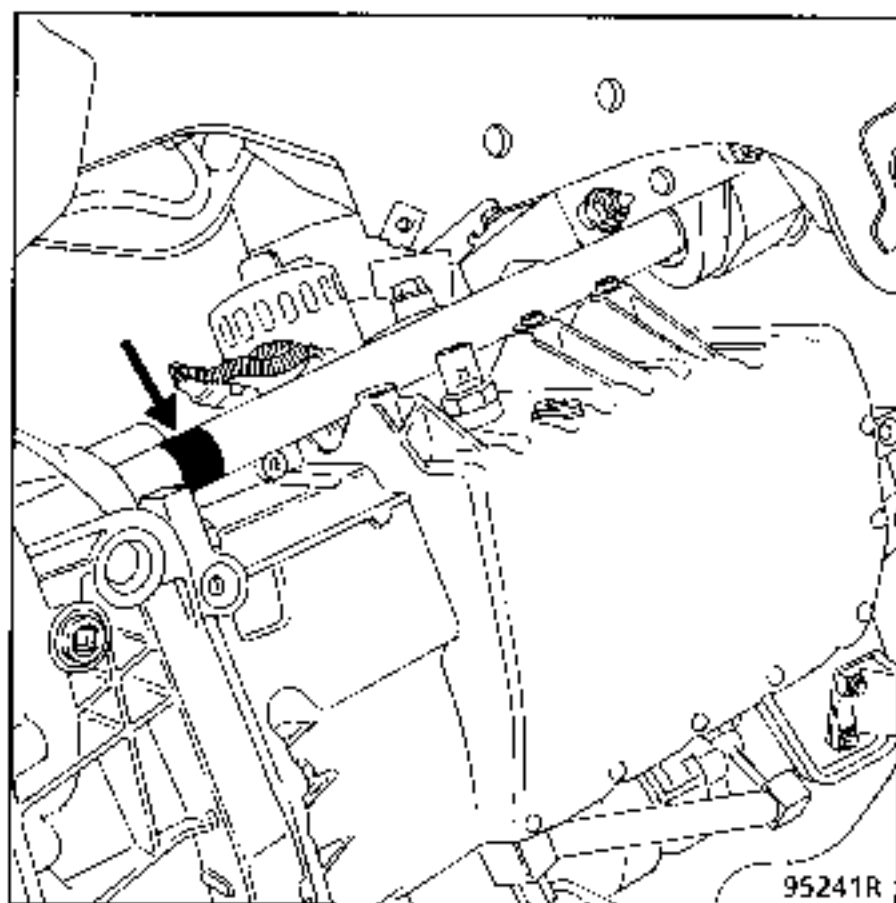


### Right hand side:

#### PK - AD gearbox

Clean the bore of the bearing receiving the roller bearing.

Check the condition of the lip seal face on the relay shaft.



**NOTE** :we recommend that the differential output lip seal is renewed (see corresponding section).

### JC gearbox

With the protector in position, coat the splines of the joint at the gearbox end with **MOLYKOTE BR2**.

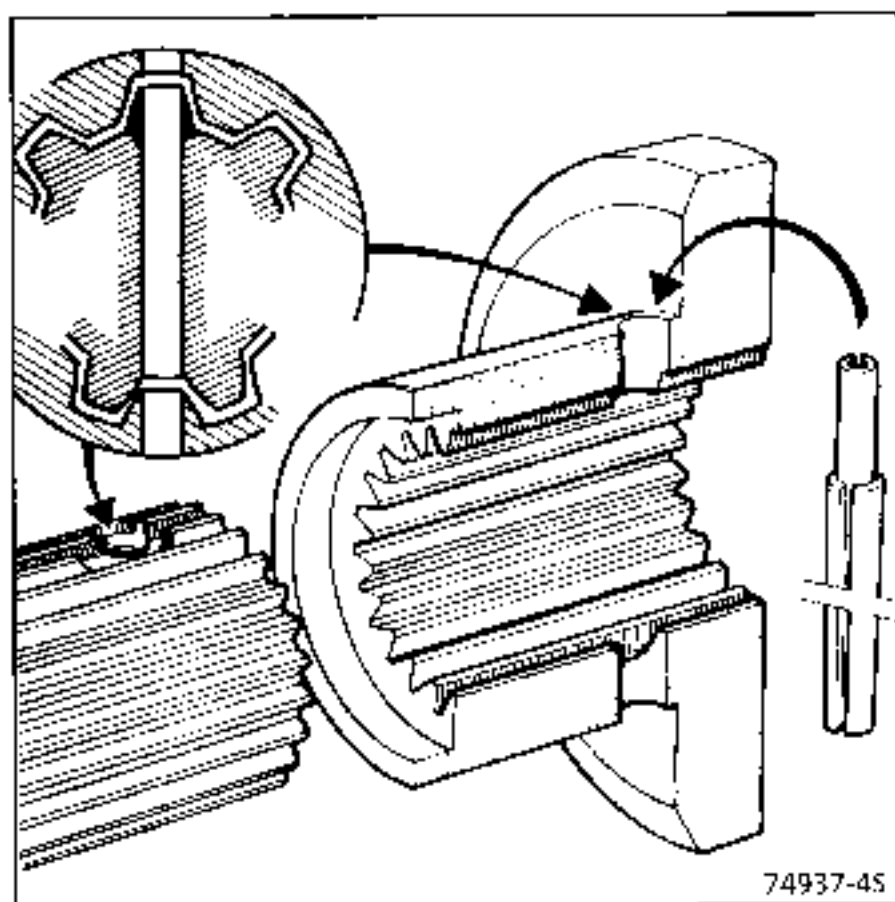
Position the driveshaft in relation to the sunwheel and engage it.

Check its position using the angled pin **B.Vi. 31-01**.

Fit two new roll pins, using tool **B.Vi. 31-01**.

Seal the roll pin holes using **Rhodorseal 5661**

**NOTE :** An inlet chamfer on the sunwheels makes it easier to fit the new roll pins.

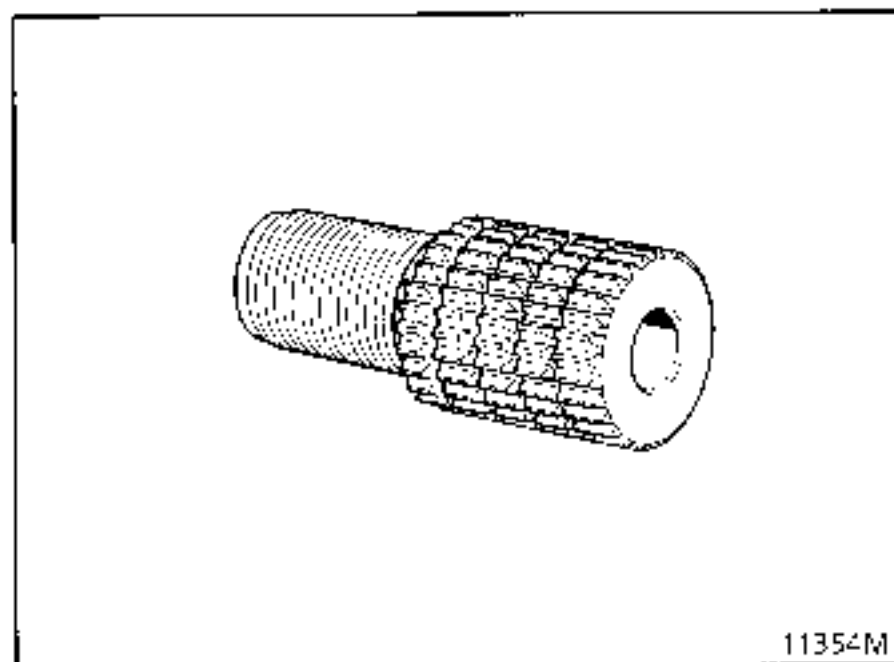


### On both sides:

Coat the ends of the stub axle splines with **LOCTITE SCELBLOC**.

### NOTE:

To make cleaning the splines on the stub axle easier, make a locally made tool as described below using an old driveshaft which has been cut and modified.



Fit the driveshaft into the sunwheel on the final drive then the stub axle into the hub.

It should enter freely until just past the thread for fitting the stub axle nut. If this is difficult, use tool **T.Av. 602**.

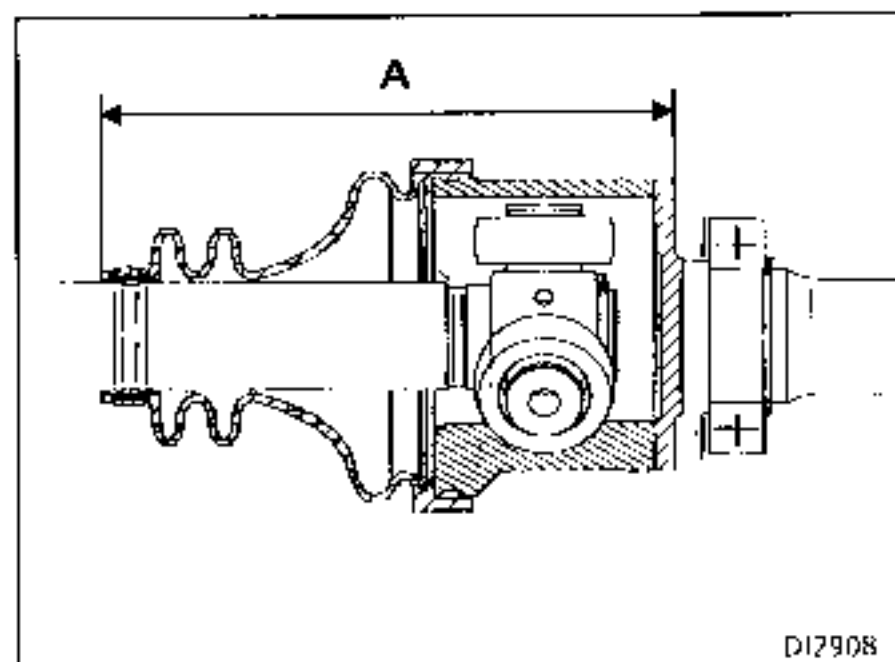
Refitting is then the reverse of removal.

### PRIMARY SECTION OF RIGHT HAND DRIVESHAFT (Special notes)

Spread the grease in the gaiter.

**NOTE :** Ensure that the amount of grease specified in the "Materials" section is used.

Insert a smooth round-edged rod between the gaiter and the driveshaft to correct the amount of air inside the joint.



Expand or shorten the joint to obtain dimension  $A = 156 \pm 1 \text{ mm}$  (dimension measured between the end of the gaiter and the largest diameter machined face of the yoke).

Fit the large clip and crimp it using **OETIKER** pliers, Part Number 1090 (see gaiter at gearbox end - RC 491 joint).

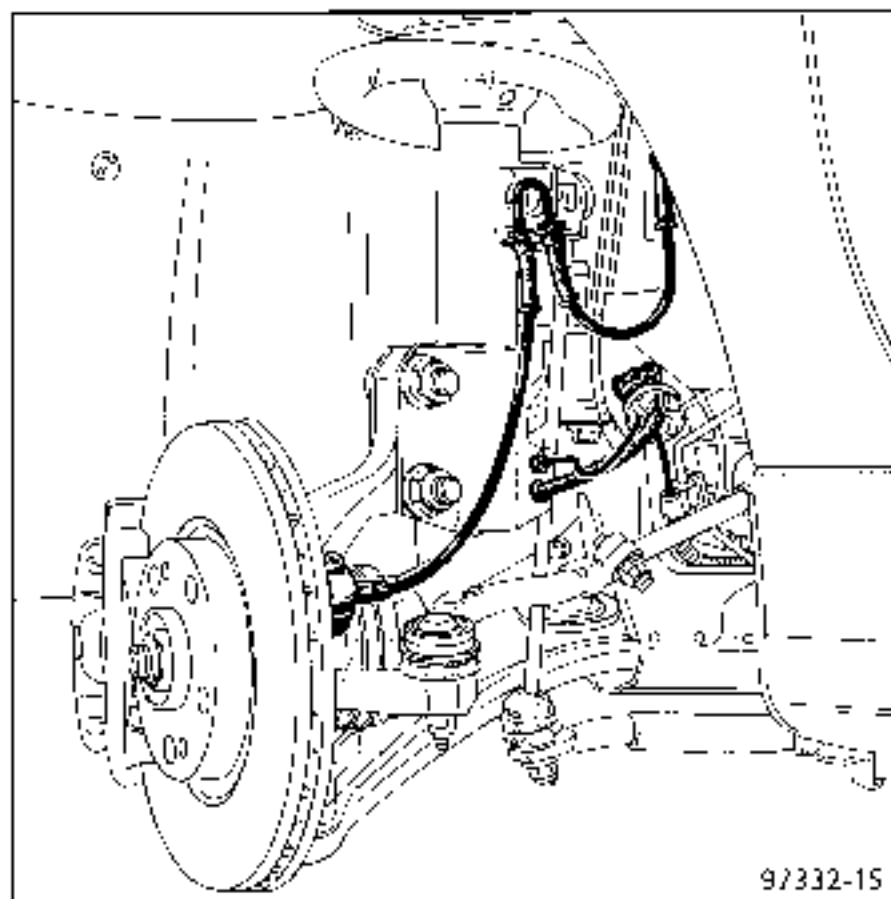
Fit the hub locking tool **Rou. 604-01** and torque tighten the driveshaft nut.

Refit the braking assembly (see corresponding section).



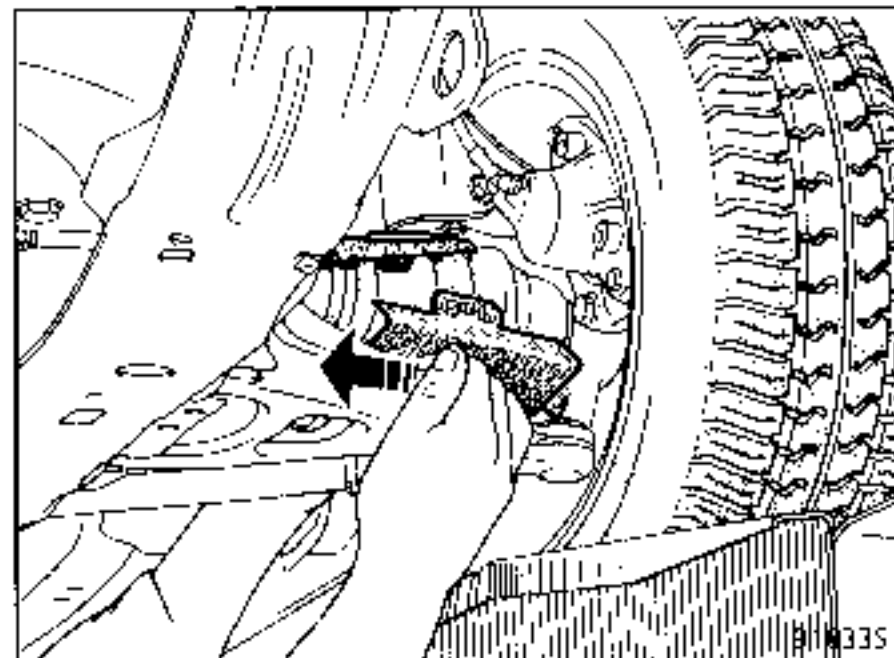
Refitting is then the reverse of removal. Tighten all the nuts to the correct torques.

Ensure the ABS wires and the brake pad wear warning light wire are correctly routed.

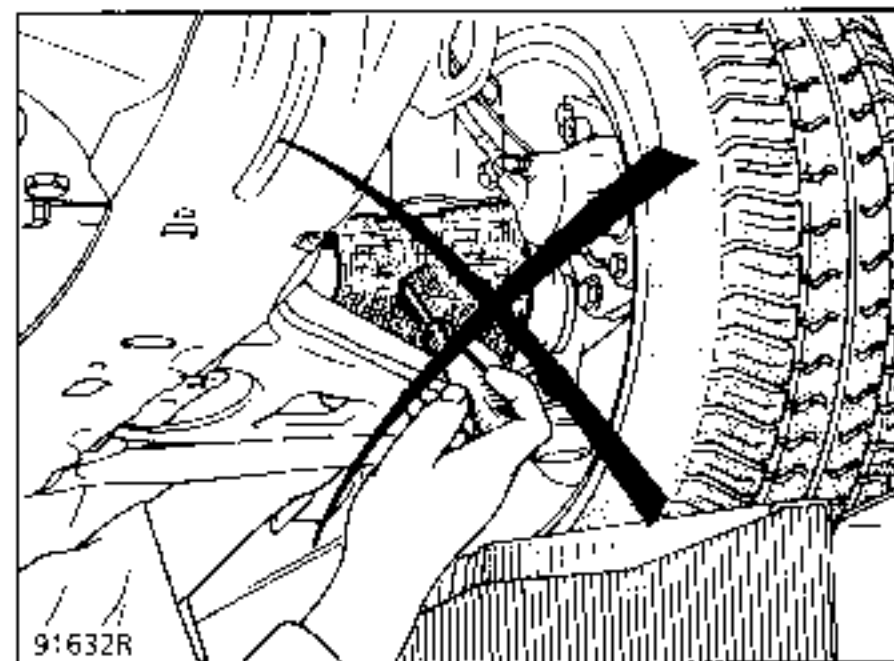


Fill the gearbox with oil or top up the level (depending on case).

With the vehicle on its wheels, remove the cardboard protectors by tearing them as shown in the diagram.



Never use an instrument with a sharp edge which could damage the gaiter.



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

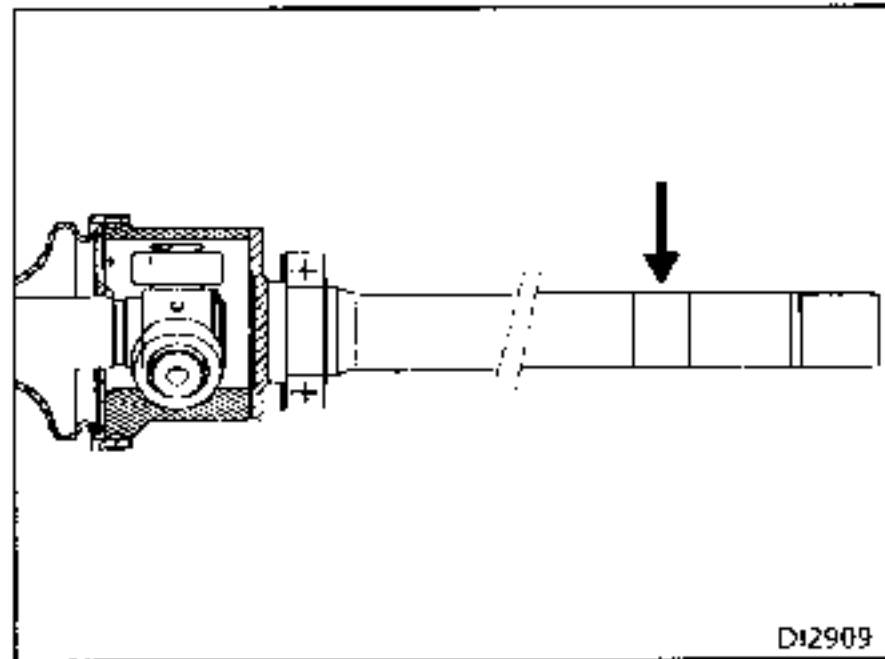
## RELAY SHAFT BEARING ROLLER BEARING

### REPLACEMENT

Remove the complete driveshaft.

Remove the roller bearing on the press, taking the weight on a releasing type extractor tool.

Take care not to scratch the lip seal bearing face on the relay shaft.



### REFITTING

Lubricate the part of the shaft which the roller bearing fits onto.

Fit the new roller bearing onto the shaft then position it against the stop using a tube of interior diameter 35 mm, so that the weight may be taken against the inner bearing ring.

Before refitting the driveshaft, clean and lubricate the bearing bore which will receive the roller bearing.

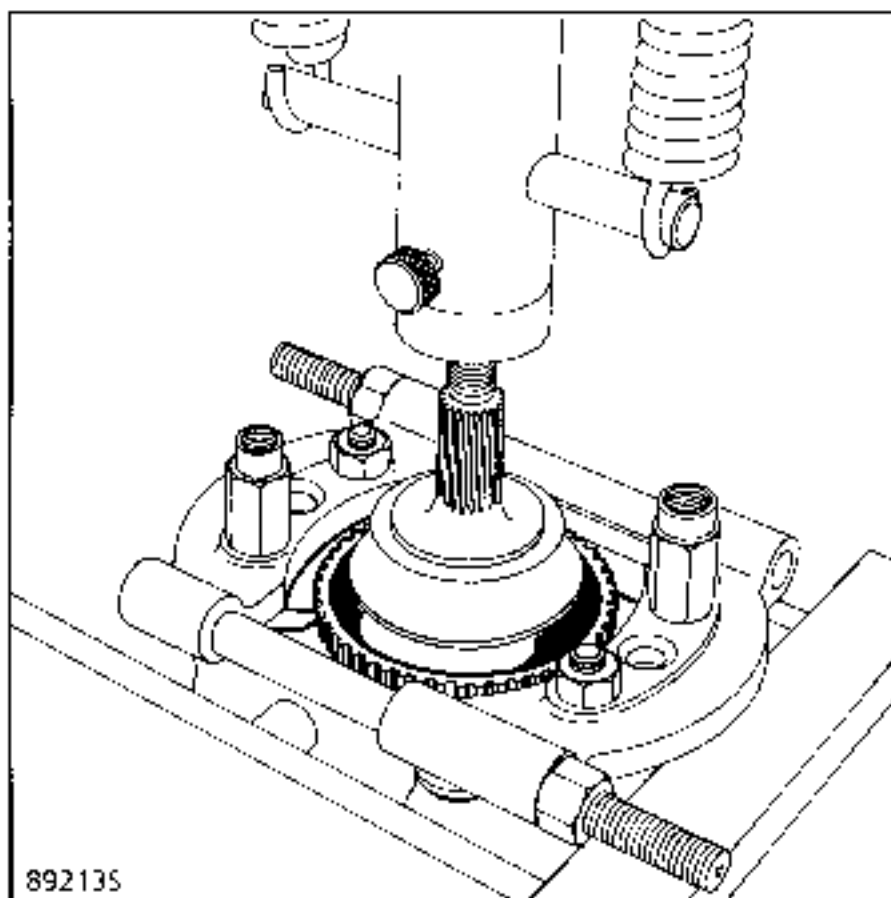
## ABS TARGET

### SPECIAL TOOLING REQUIRED

T.Av. 1239	Mandrel for fitting ABS target
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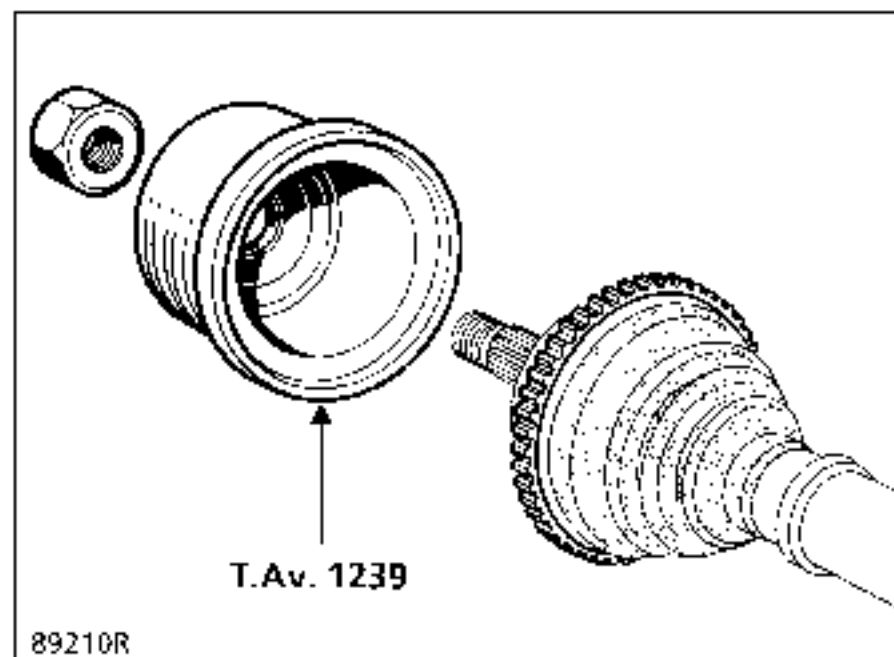
## REMOVAL

Remove the target wheel using the press and an extractor tool.



## REFITTING

Coat the target with **Loctite SCELBOC** and refit it using tool **T.Av. 1239** and the old driveshaft nut.



**NOTE :** the Parts Department supplies machined driveshafts which do not have an ABS target. The old target must therefore be retained to fit to the new driveshaft. The target is however available as a single part.

**SPECIAL TOOLING REQUIRED**

T.Av. 1256

Pliers for crimping OETIKER clips

T.Av. 1168

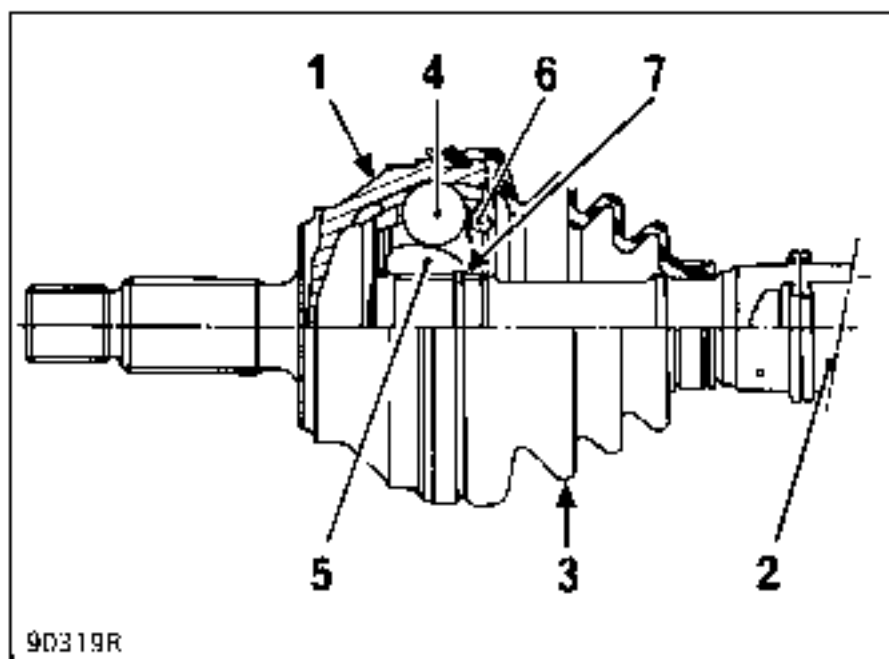
Pliers for CAILLAU click-type clips

A driveshaft may be partially repaired at the wheel end:

- replacing the joint,
- replacing the gaiter.

**SIX BALL WHEEL END JOINT**

- 1 Stub axle bowl
- 2 Driveshaft
- 3 Gaiter
- 4 Balls
- 5 Ball hub
- 6 Ball cage
- 7 Locking ring



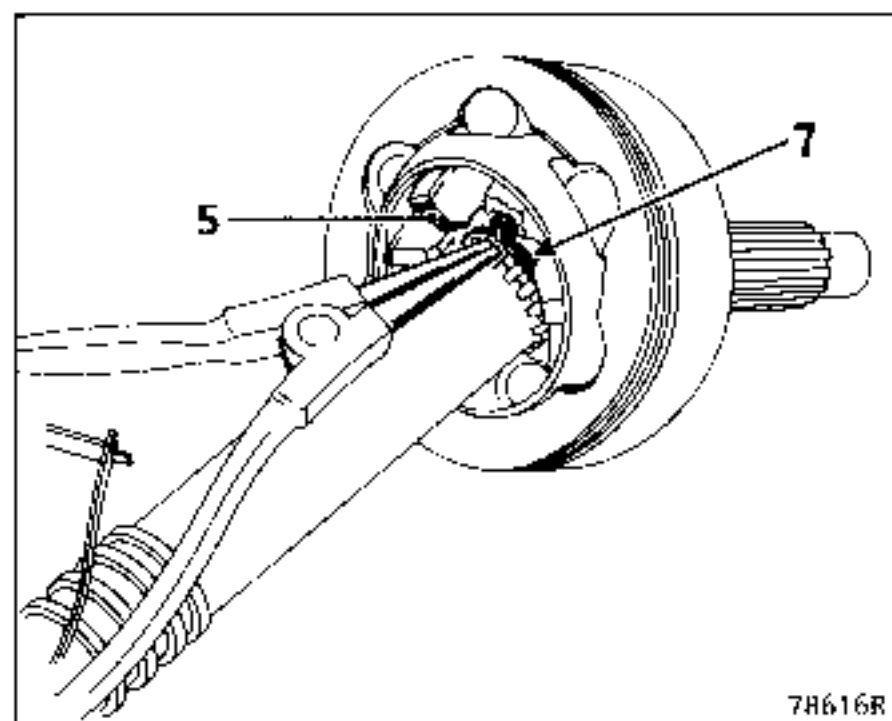
**REMOVAL**

Cut the clips and the gaiter along its length.

Remove as much grease as possible.

Spread the locking ring (7) and at the same time tap the exposed face of the ball hub (5) with a mallet.

Separate the joint from the shaft.

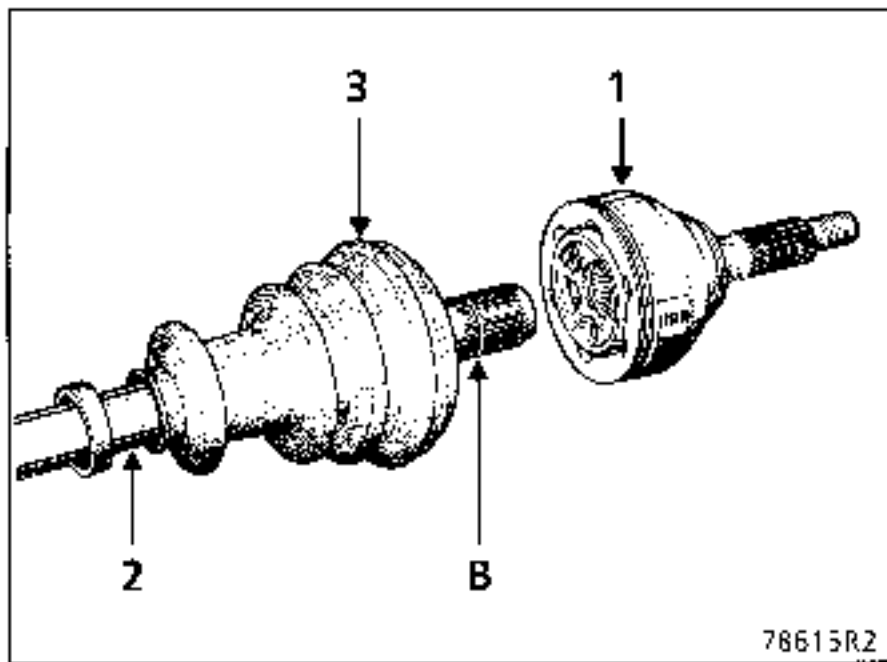


## REFITTING

Fit to the shaft:

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

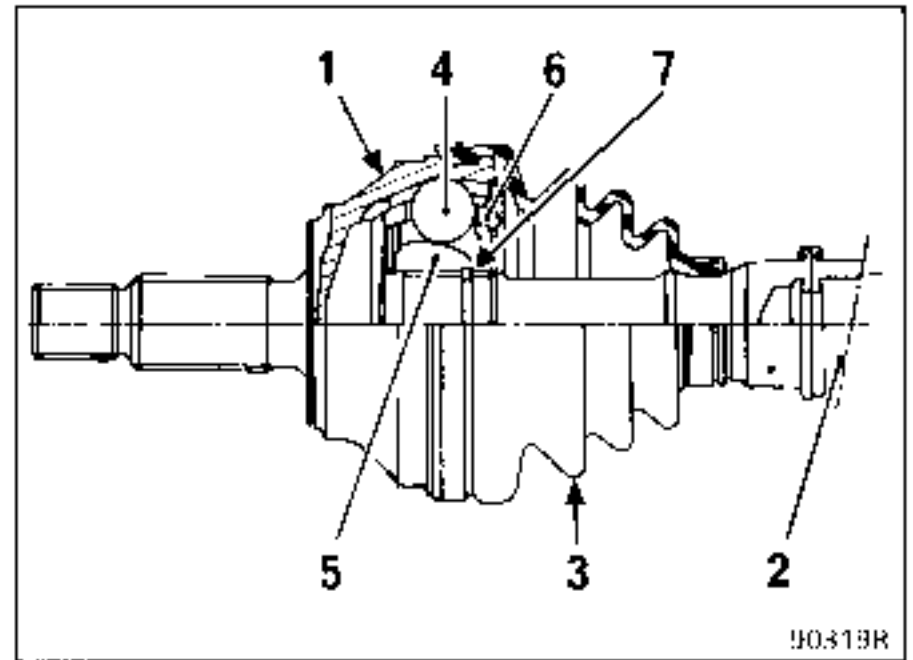
Slide the ball joint (1) complete with the (new) locking ring onto the shaft splines until the locking ring locates in shaft groove (B).



Spread the sachet of grease evenly between the gaiter and the stub axle bowl.

**NOTE :** Ensure that the amount of grease specified in the "Materials" section is used.

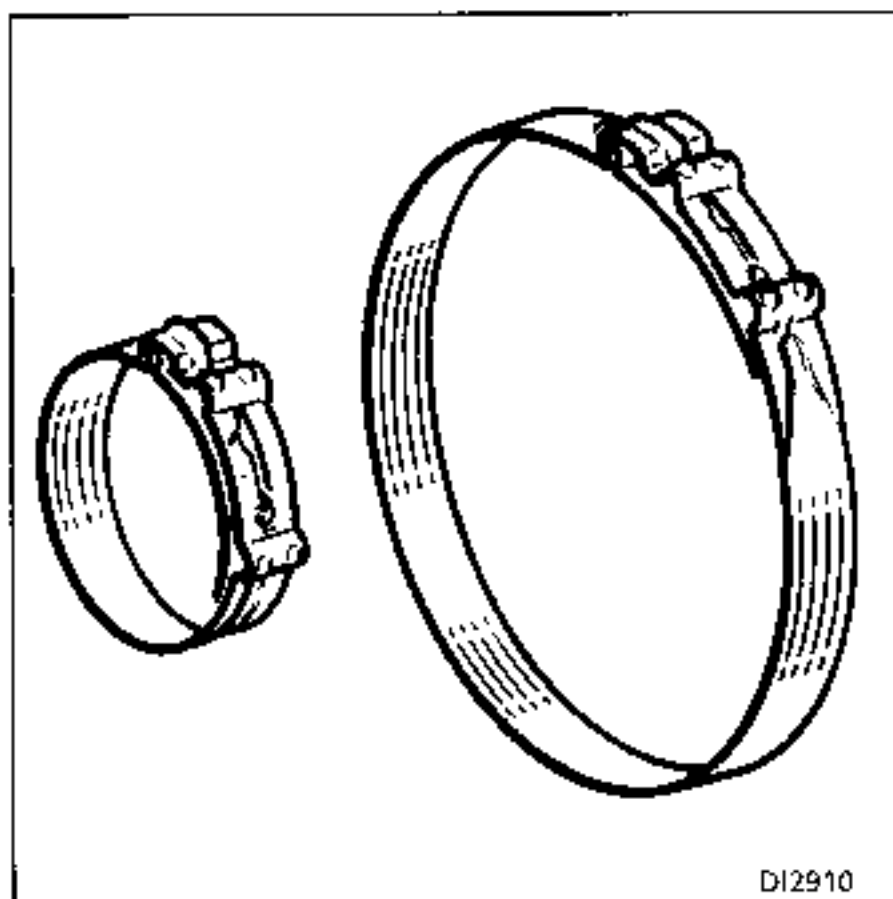
Position the gaiter lips in their grooves on the stub axle bowl (1) and the driveshaft (2).



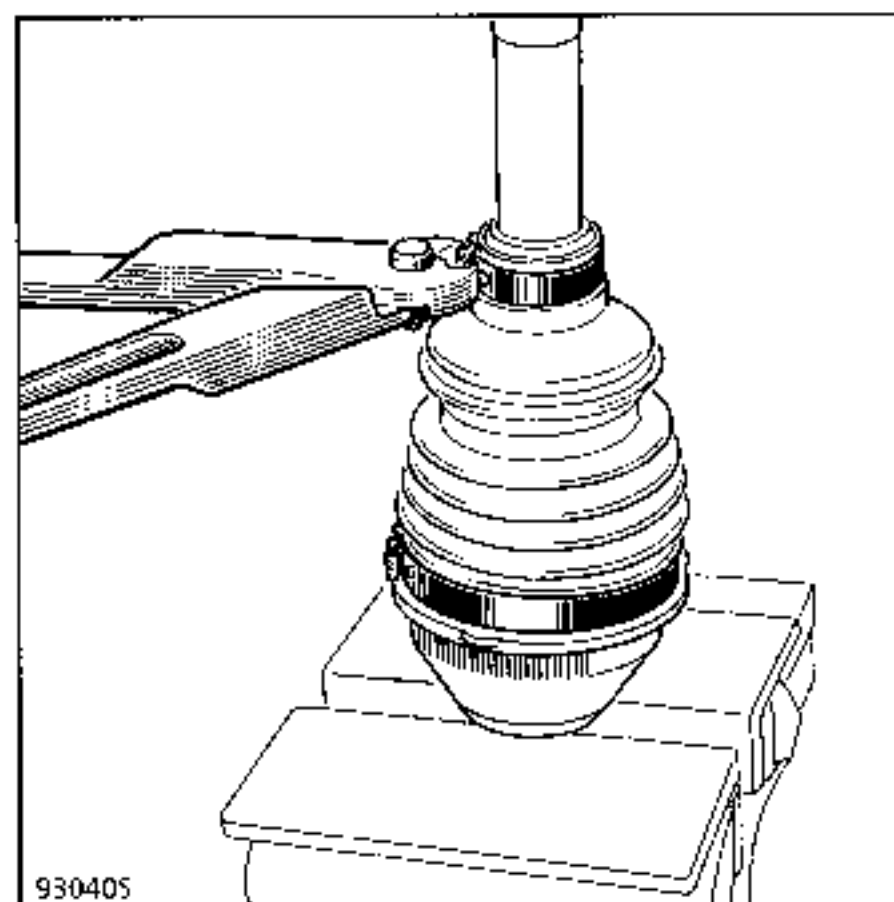
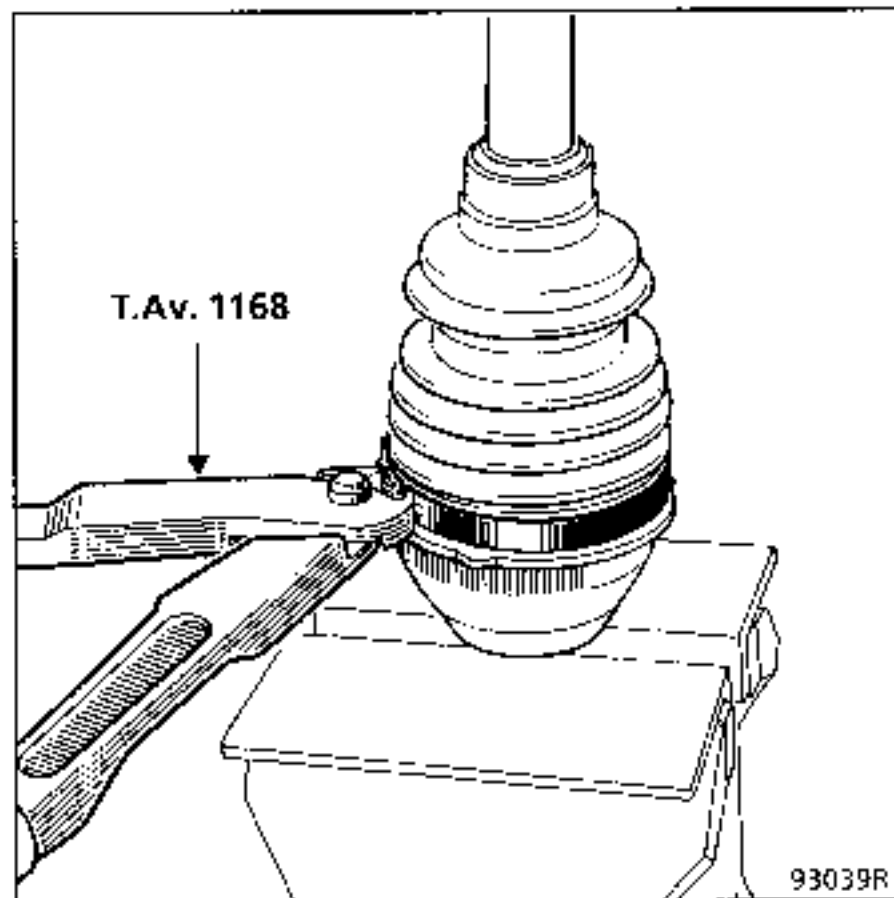
Fit the large clip.

CRIMPING CLIPS

CAILLAU click-type clips



Use pliers T.Av. 1168.

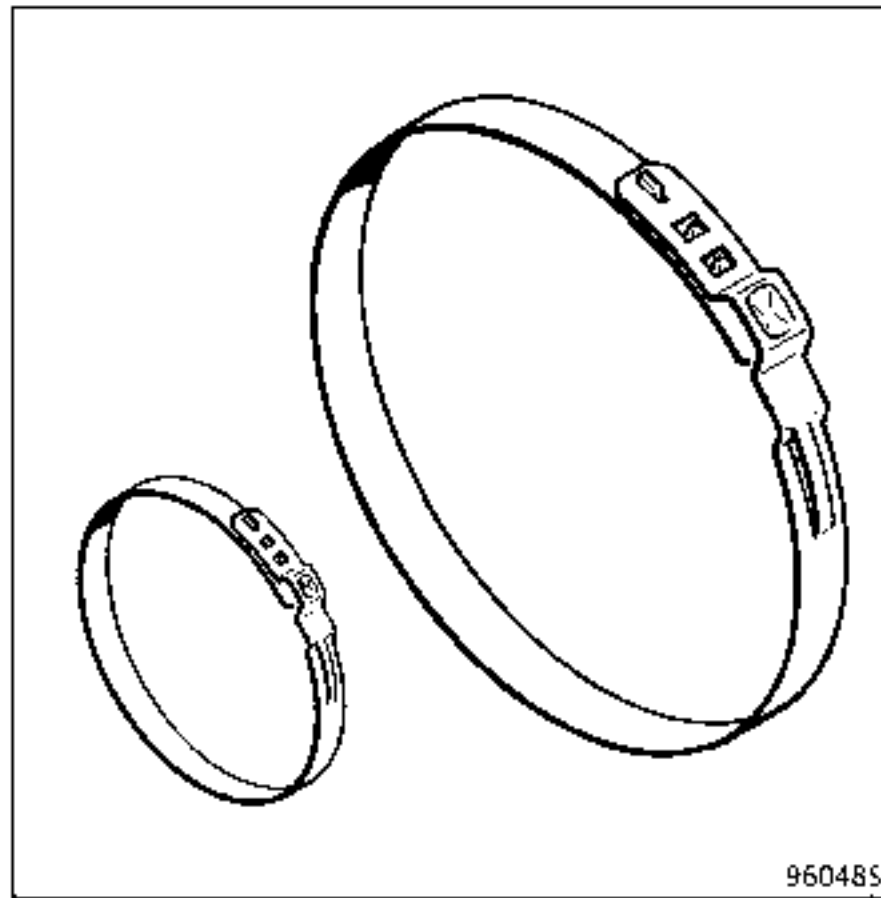


**NOTE :** CAILLAU click-type clips may not be re-used.



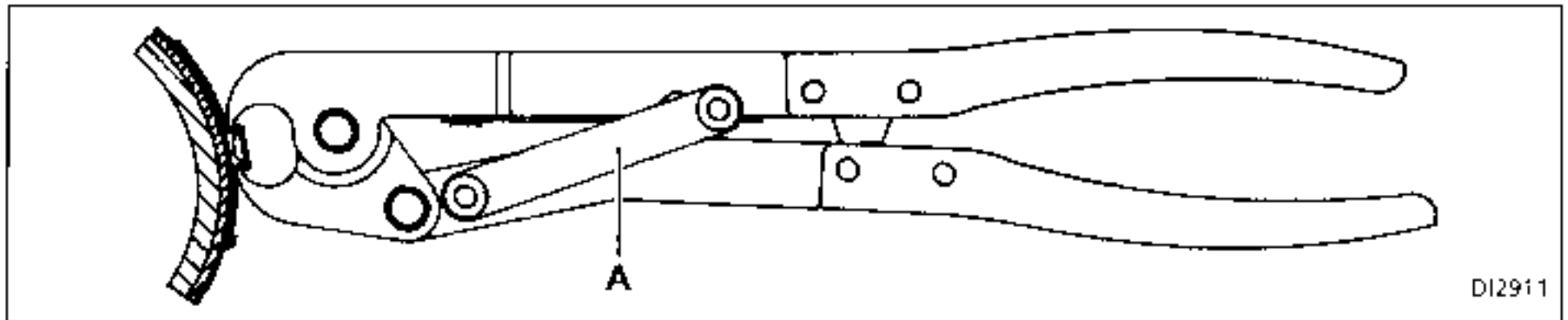
REFITTING (cont)

OETIKER CLIPS



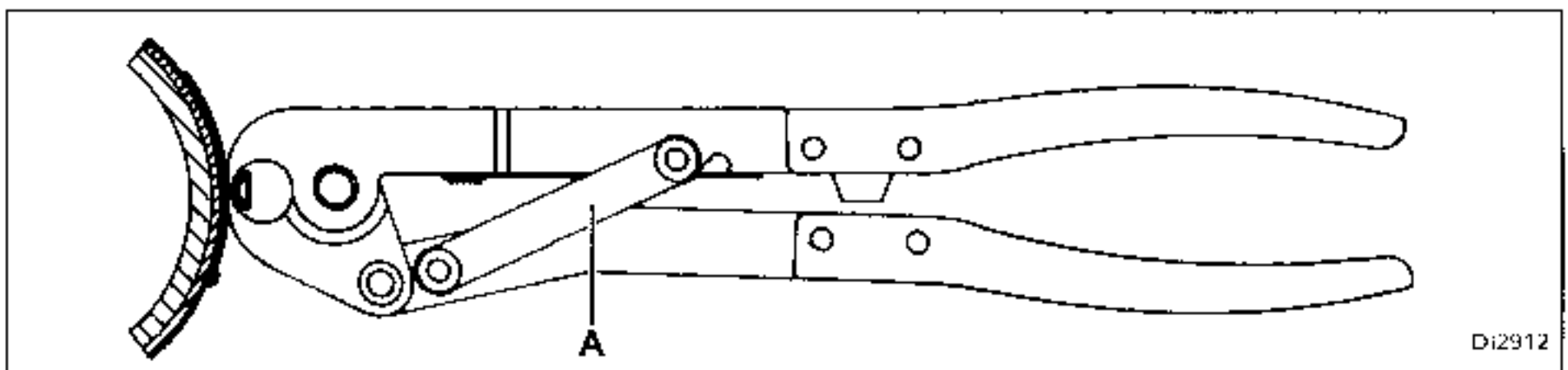
Use pliers T.Av. 1256.

POSITION 1 - Pre-crimping and positioning the clip



Position bar (A) in the lower notch and close the pliers as far as possible. The pre-crimped clip slides onto the gaiter and may then be positioned.

POSITION 2 - Crimping



Position bar (A) in the upper notch and close the pliers as far as possible.

## Joint on right hand driveshaft - PK gearbox

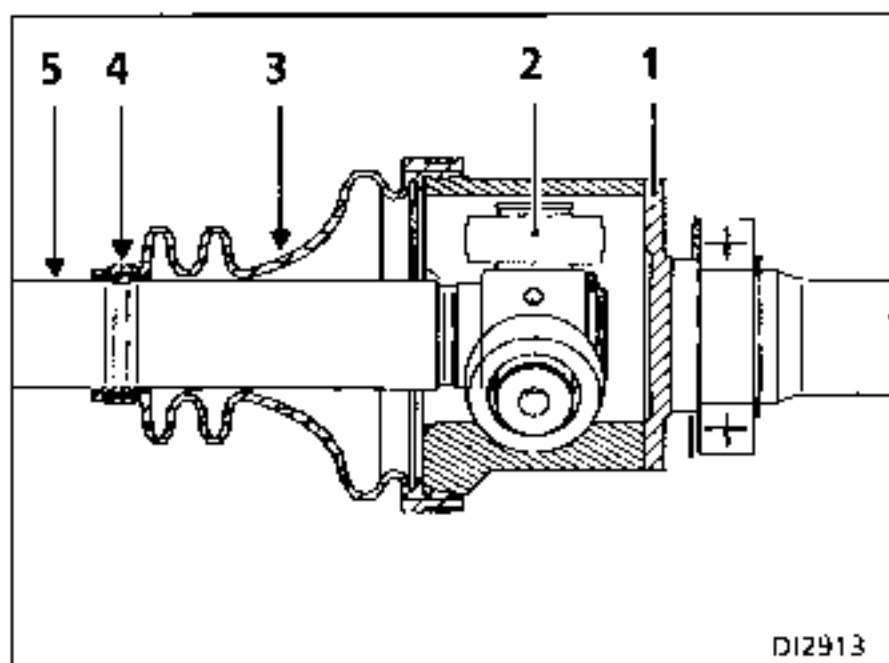
## SPECIAL TOOLING REQUIRED

T.Av. 1034    Pliers for crimping driveshaft clips

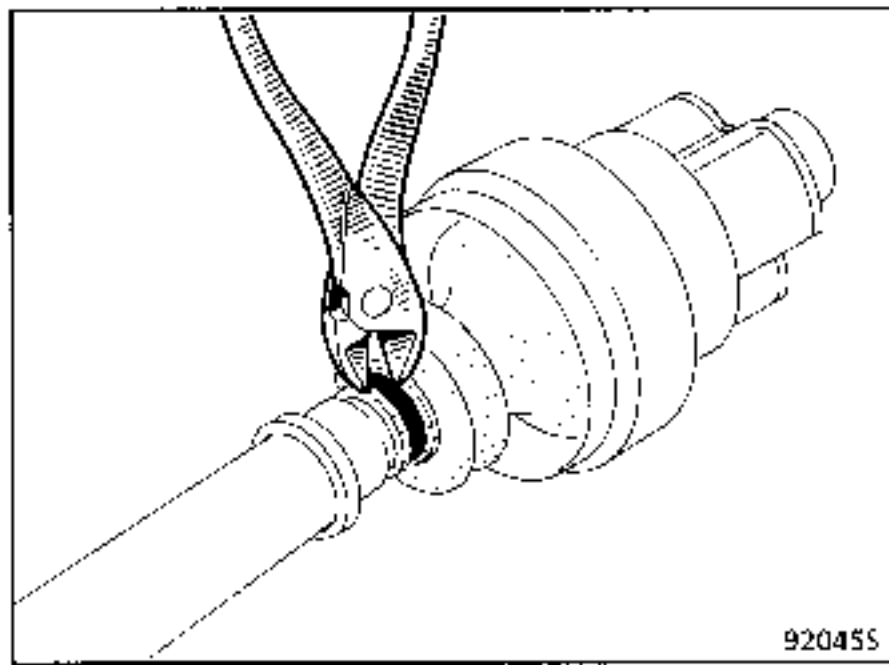
## EQUIPMENT REQUIRED

OETIKER pliers    Part Number 1090

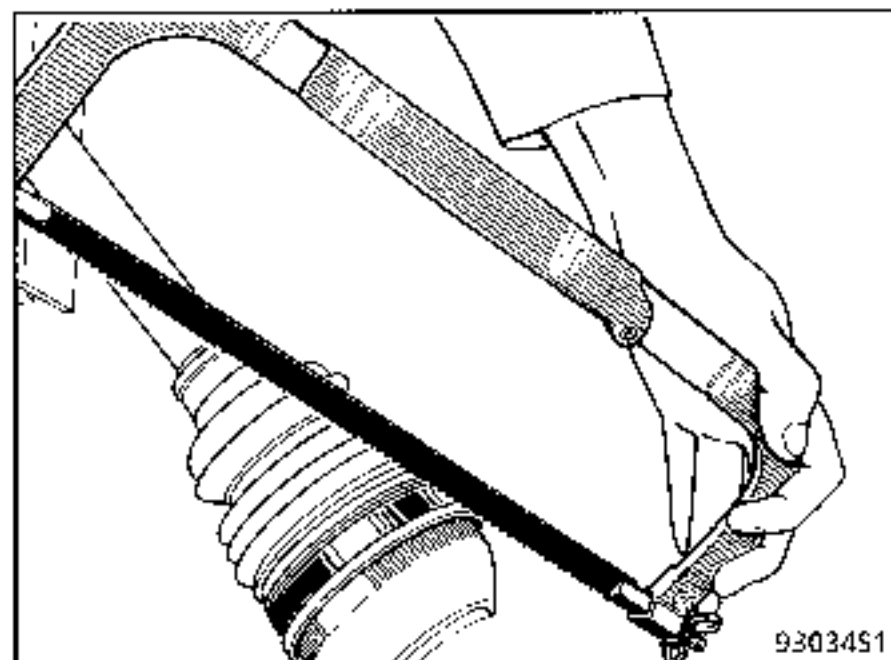
- 1 Yoke
- 2 Spider
- 3 Rubber gaiter
- 4 Retaining clip
- 5 Driveshaft



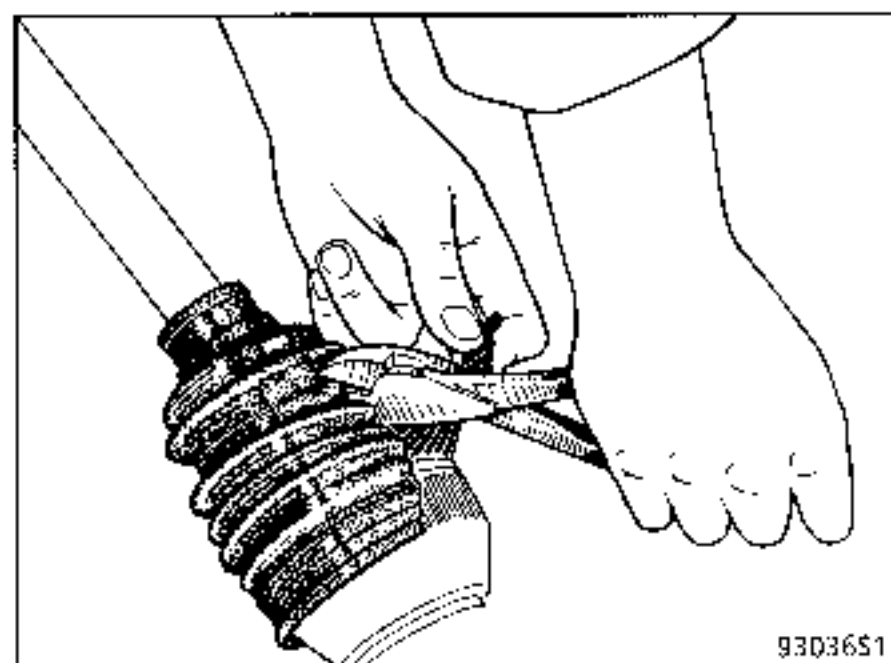
Cut the retaining clip.



Saw the large clip, taking care not to damage the groove on the yoke.

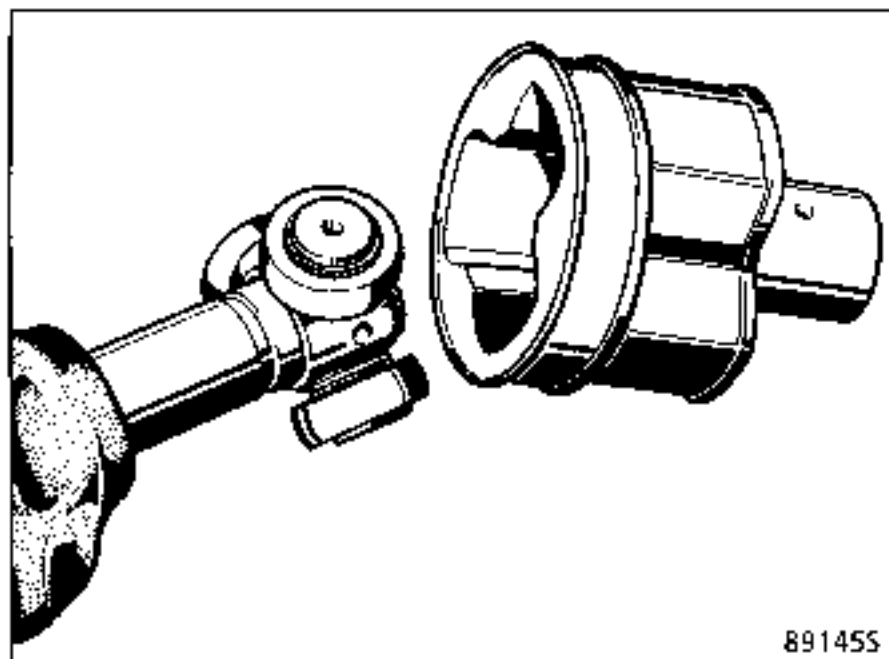


Cut the gaiter.



Remove as much grease as possible.

(Joint on right hand driveshaft)

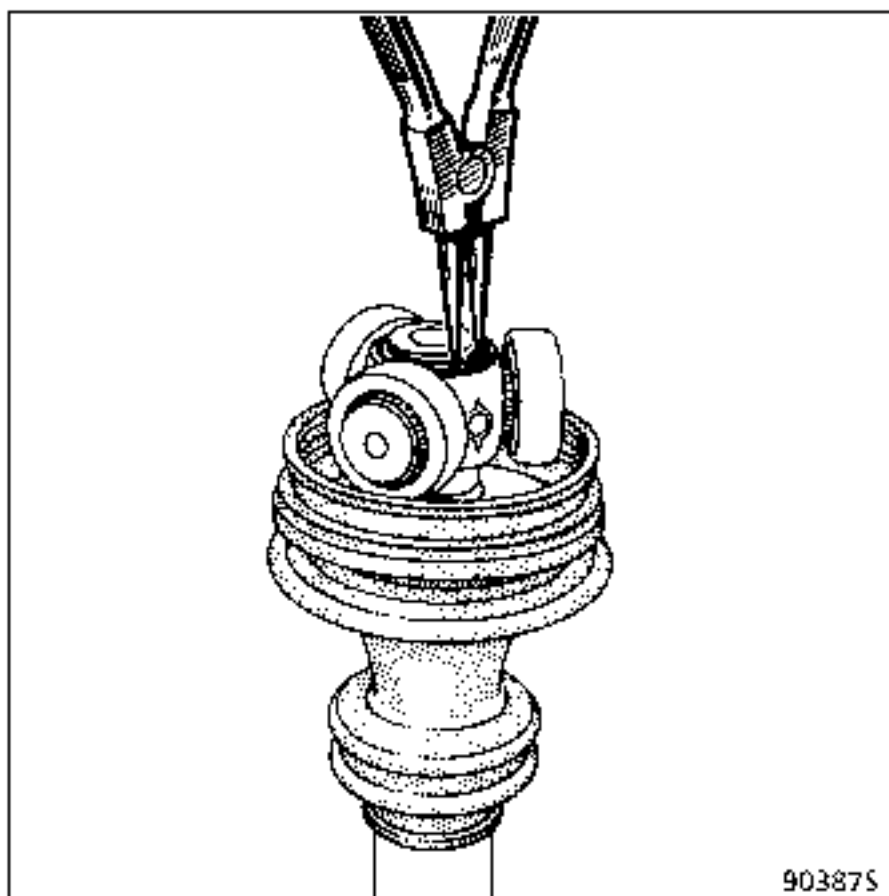


**NOTE :** the yoke is not fitted with a locking plate so it may be removed without force.

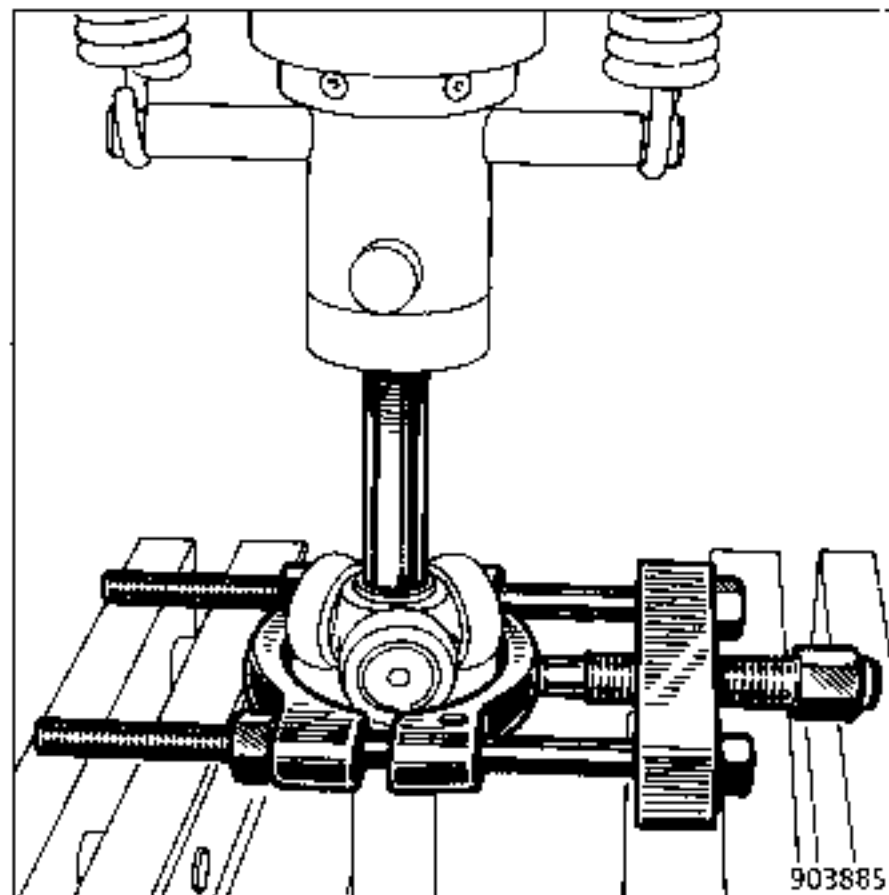
Do not remove the roller cages from their respective trunnions since the cages and rollers are matched and must never be mixed.

**Never use thinners to clean the component parts.**

Remove the circlip (depending on model).



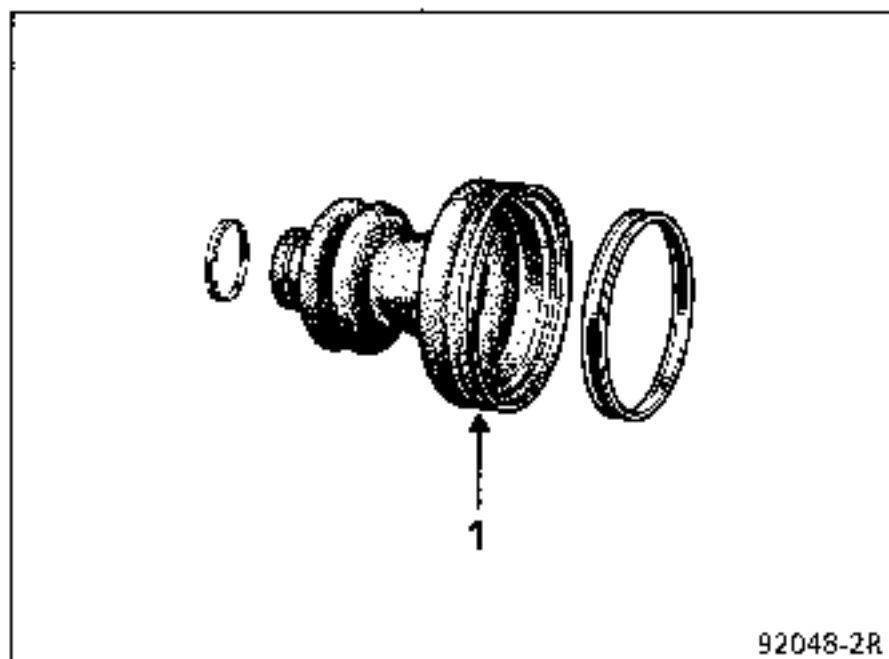
On the press, remove the spider, using a releasing extractor.



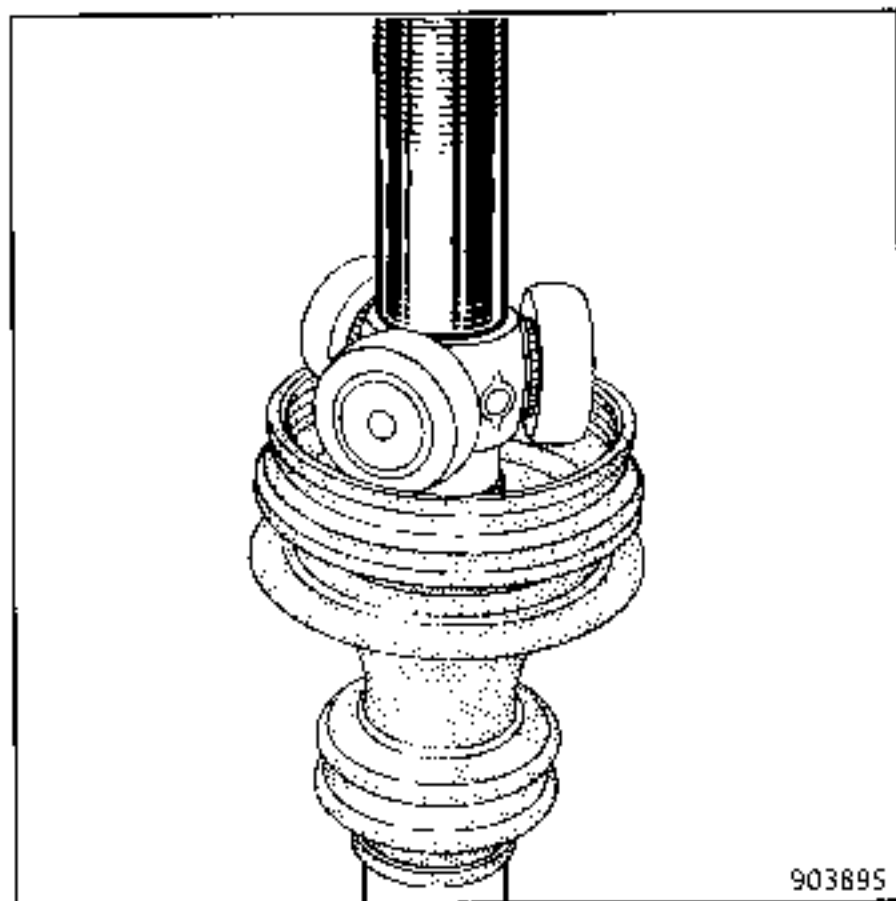
## REFITTING

Lubricate the driveshaft and slide on:

- the two clips around the shaft if they are not of the "open" type,
- the rubber gaiter (1).



Fit the spider onto the splined shaft.



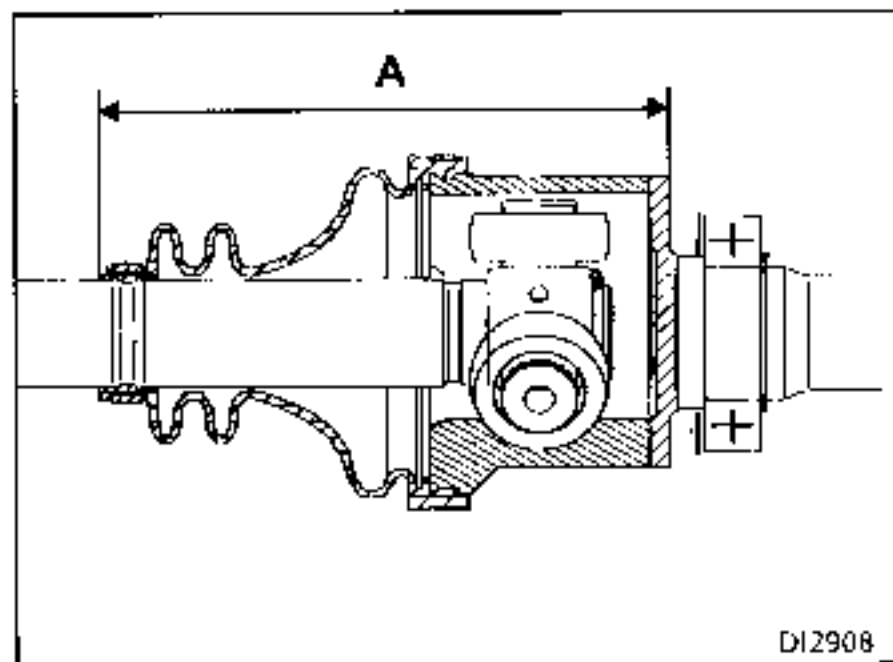
Refit the retaining circlip.

Spread the sachet of grease in the gaiter.

**NOTE :** Ensure that the amount of grease specified in the "Materials" section is used.

Insert a smooth, rounded end rod between the gaiter and the shaft to correct the amount of air inside the joint.

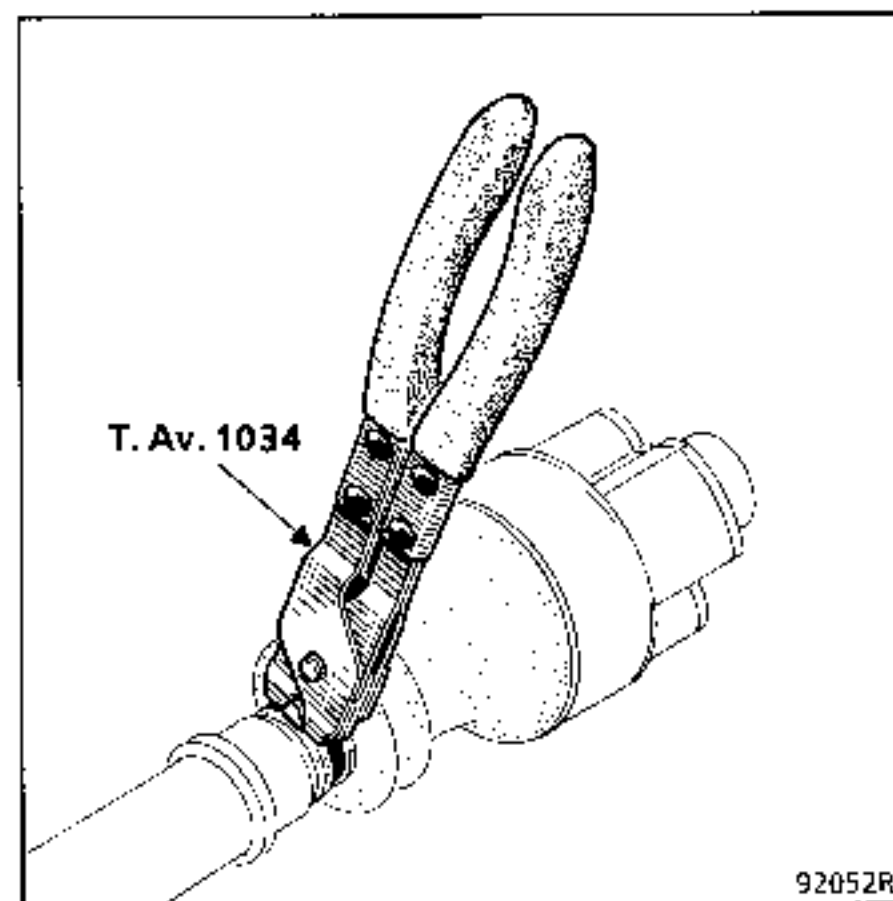
Expand or shorten the joint to obtain dimension  $A = 156 \pm 1 \text{ mm}$  (dimension measured between the end of the gaiter and the largest diameter machined face of the yoke).

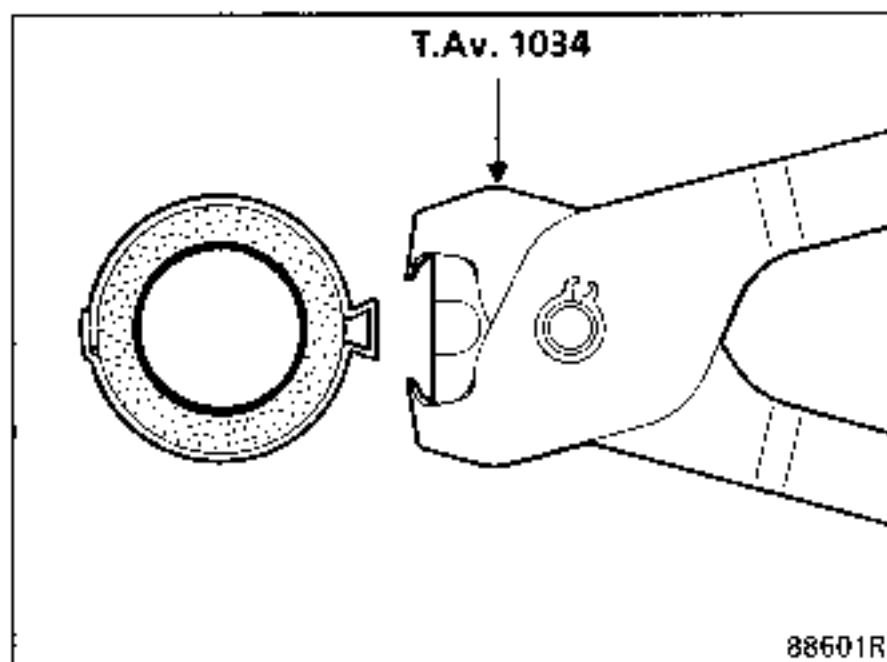


In this position remove the rod.

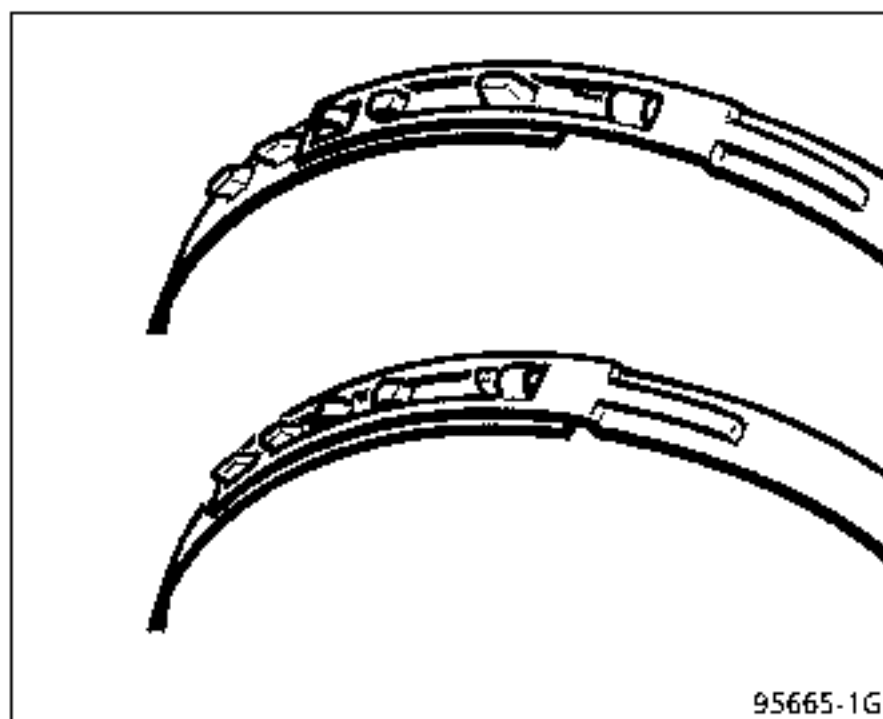
Using tool T.Av. 1034, tighten on the gaiter:

– the small clip,





- the large clip until it clicks, using **OETIKER** pliers, Part Number **1090**.



Contact your After Sales Head Office for details on ordering the **OETIKER** pliers.

1090 manual pliers for fitting OETIKER clips.

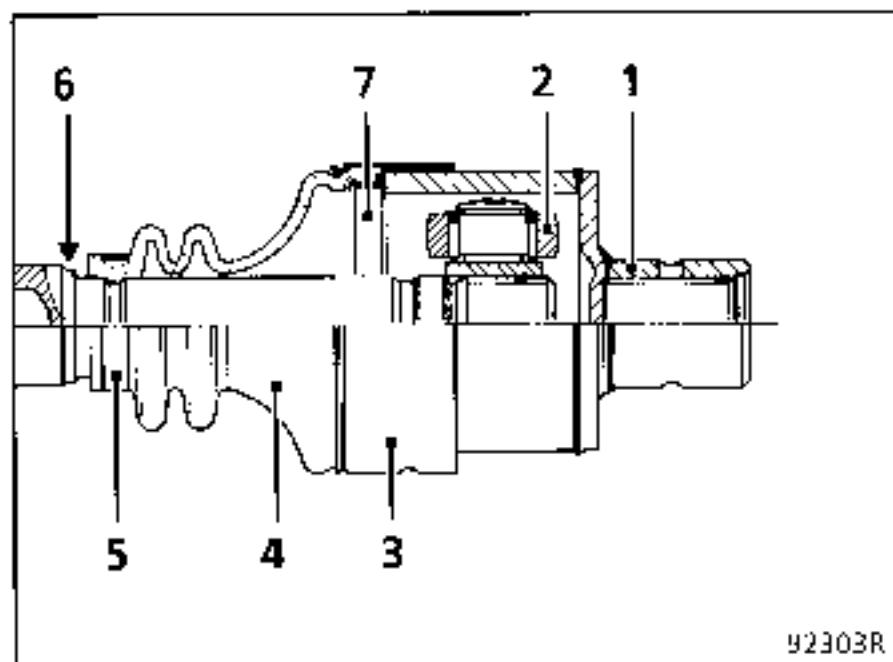
Joint on right hand driveshaft - JC gearbox

**SPECIAL TOOLING REQUIRED**

T.Av. 1034

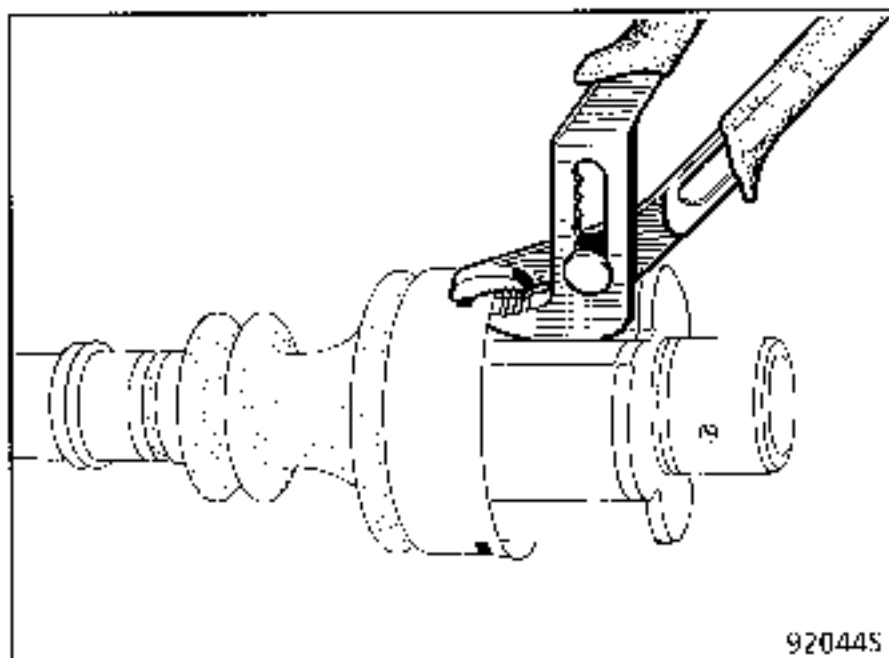
Pliers for crimping driveshaft  
clips

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

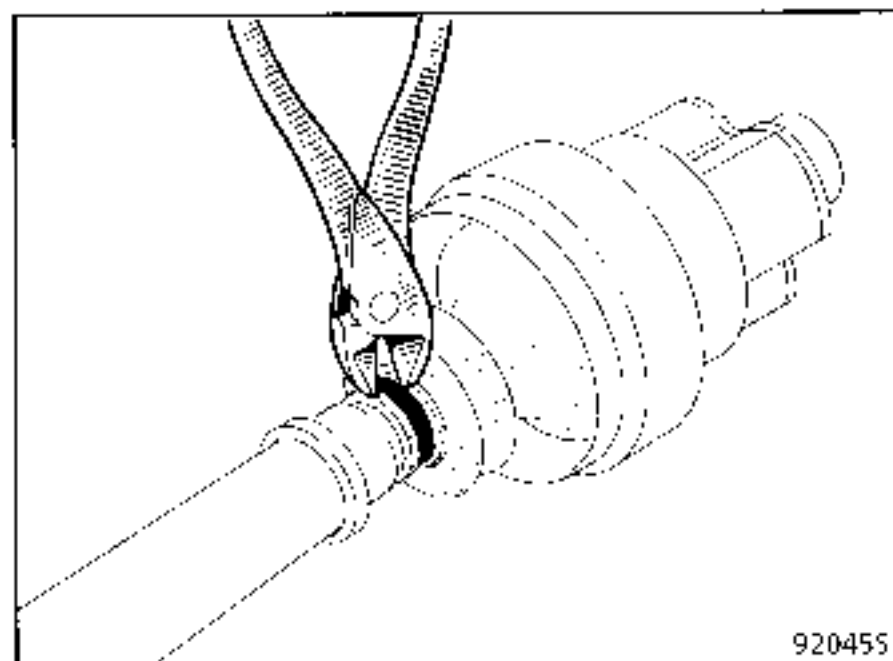


**REMOVAL**

Uncrimp the three points securing the cover using  
pliers.

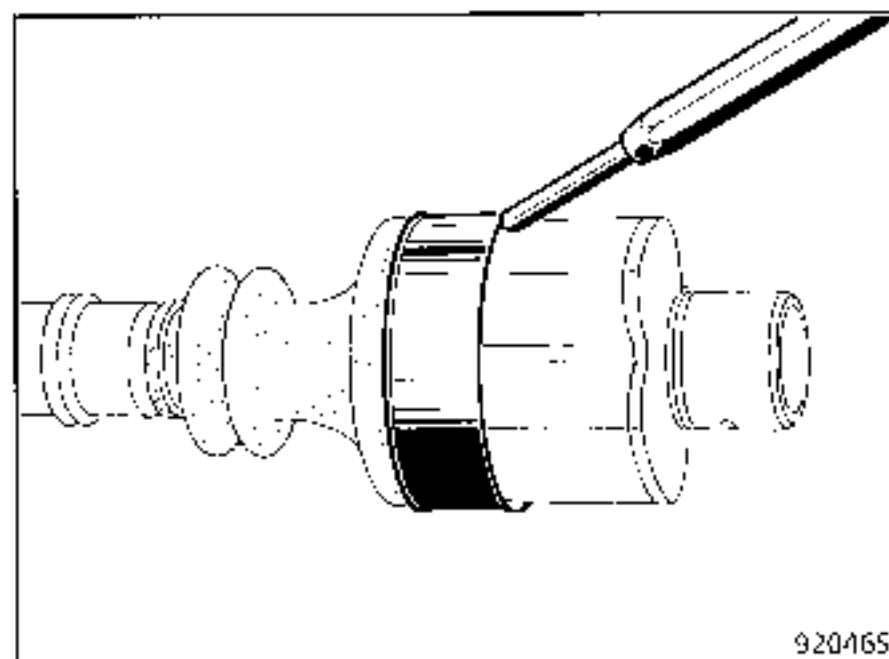


Cut the retaining clip and the gaiter along its  
length.

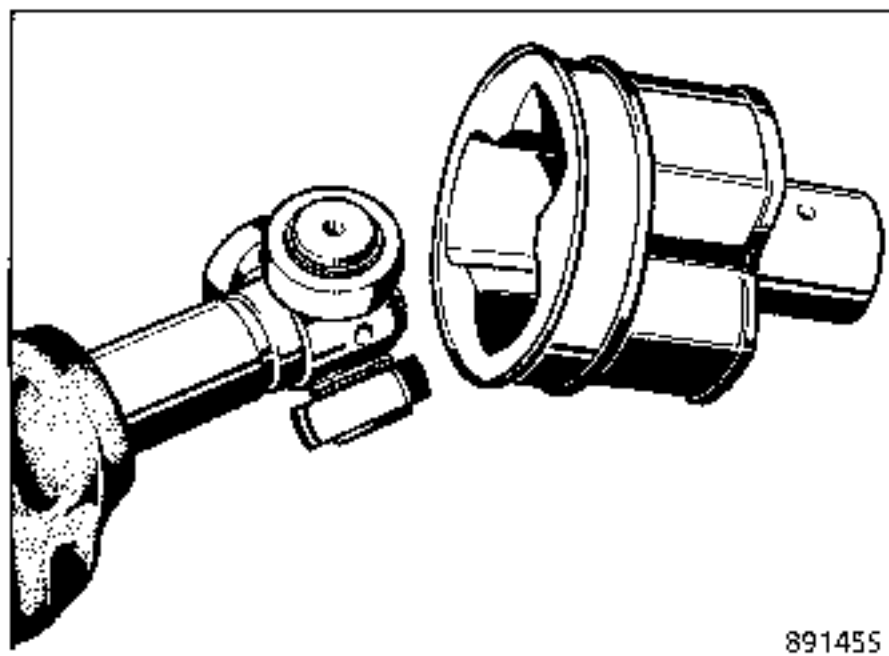


Remove as much grease as possible.

Remove the metal retaining cover.



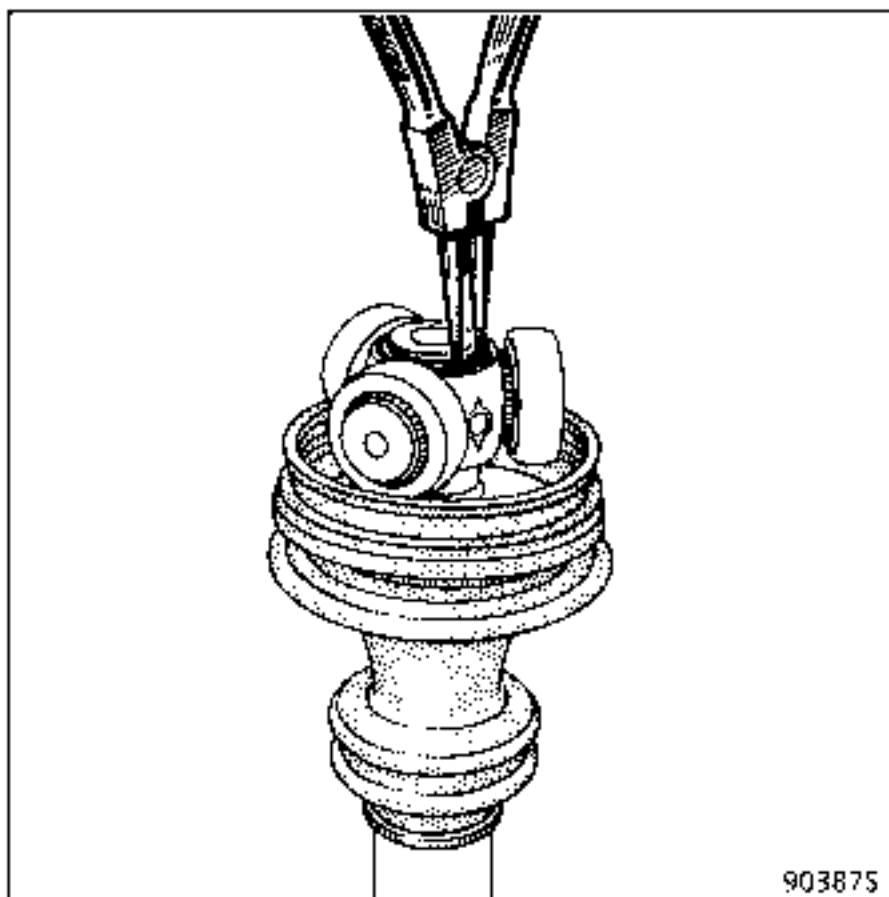
Remove the yoke.



**NOTE :** the yoke is not fitted with a locking plate so it may be removed without force.

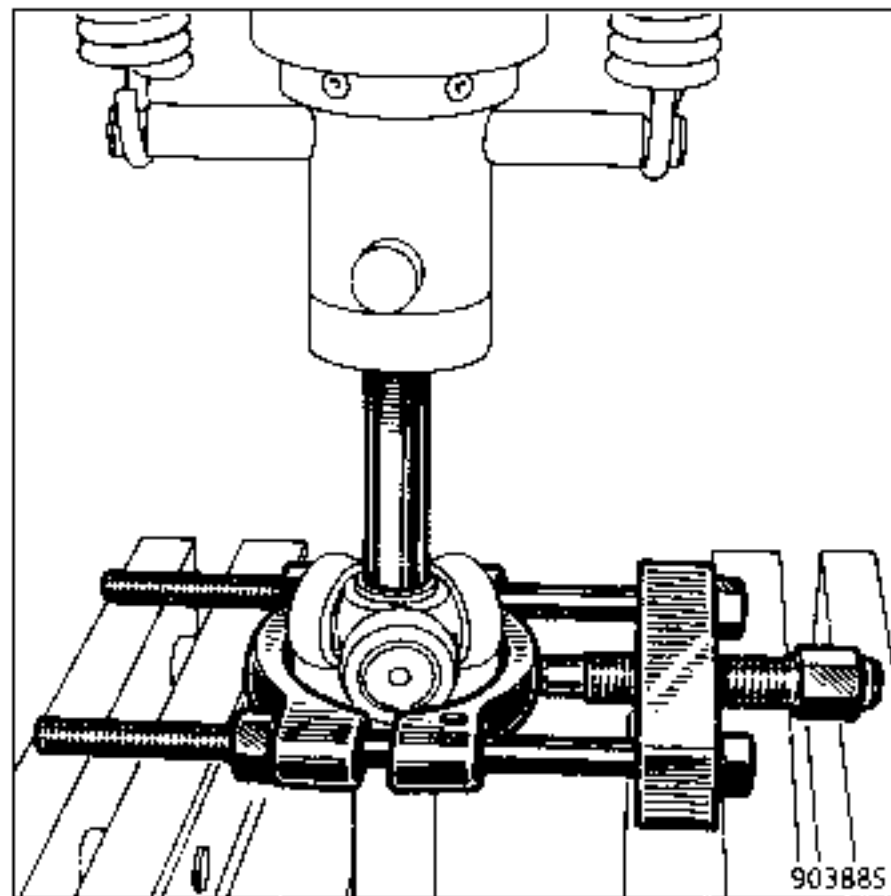
Do not remove the roller cages from their respective trunnions since the cages and rollers are matched and must never be mixed.

Remove the circlip (depending on model).



**Never use thinners to clean the component parts.**

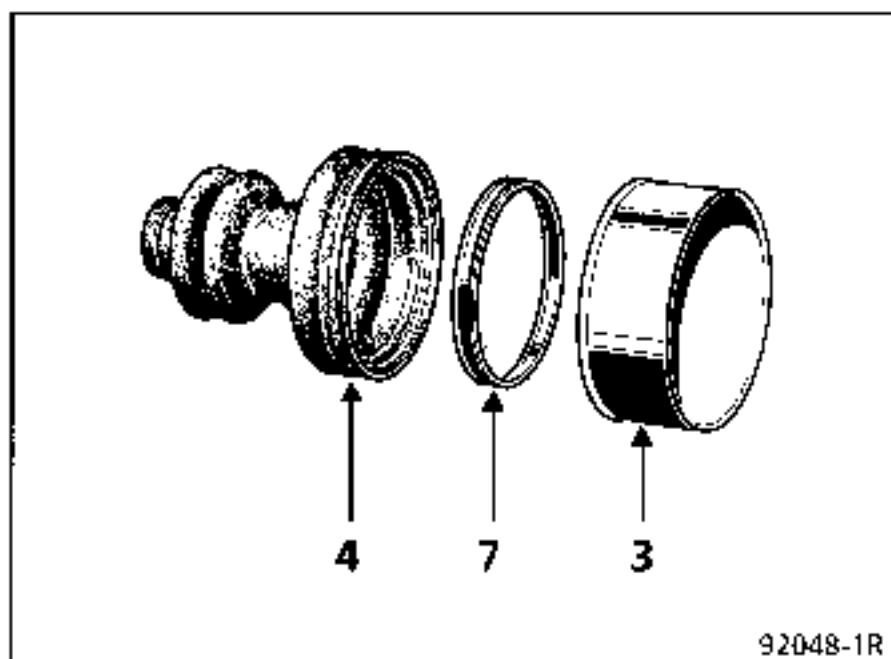
On the press, remove the spider, using a releasing type extractor.



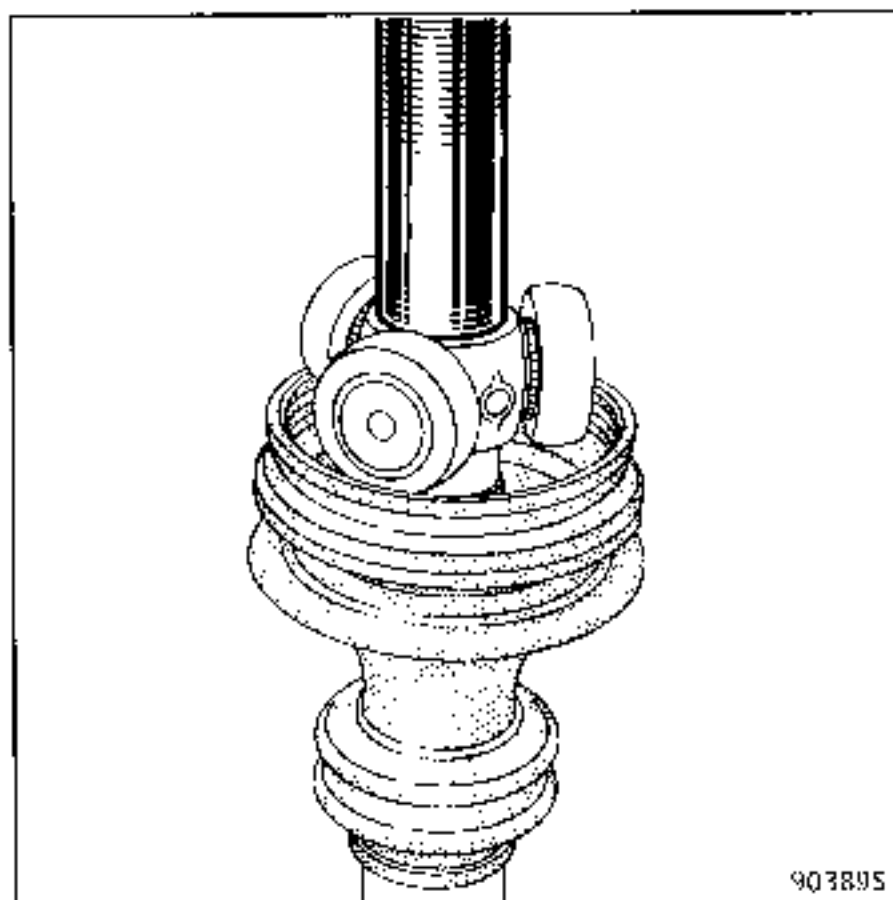
#### REFITTING

Lubricate the driveshaft and slide on:

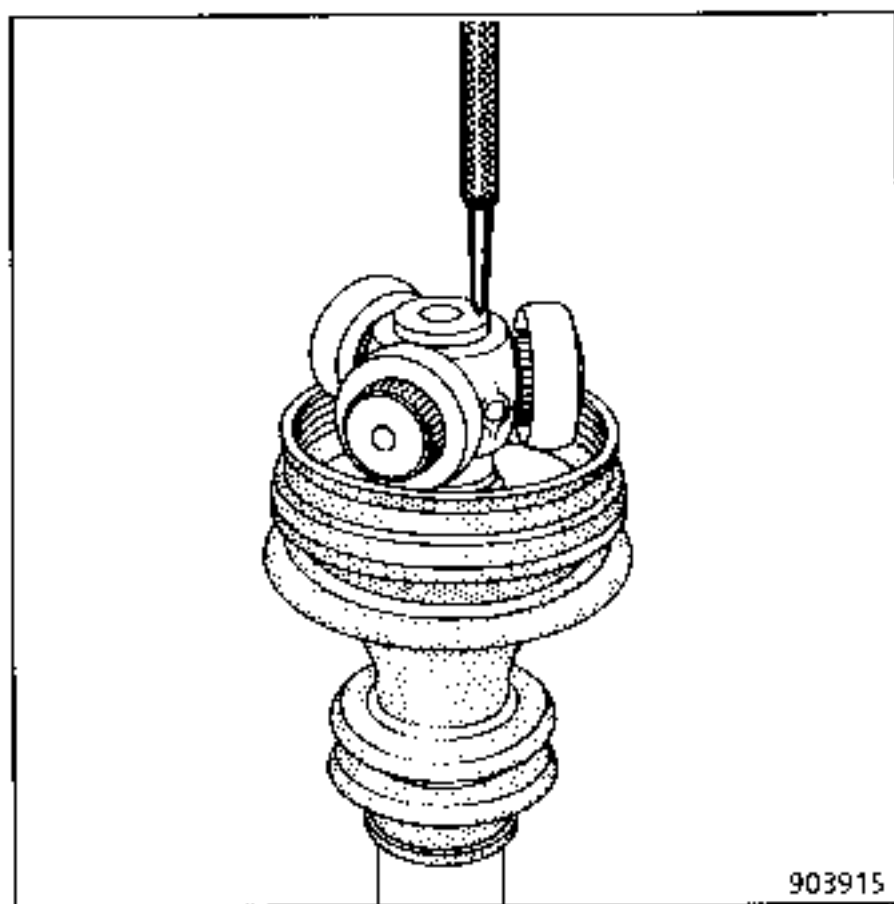
- a new retaining clip,
- the rubber gaiter (4) with metal insert (7) and the metal retaining cover (3).



Fit the spider onto the splined shaft.



Refit the retaining clip or make three crimping points 120° apart, pushing back the metal of the driveshaft splines.



Lubricate the yoke and engage it onto the spider assembly.

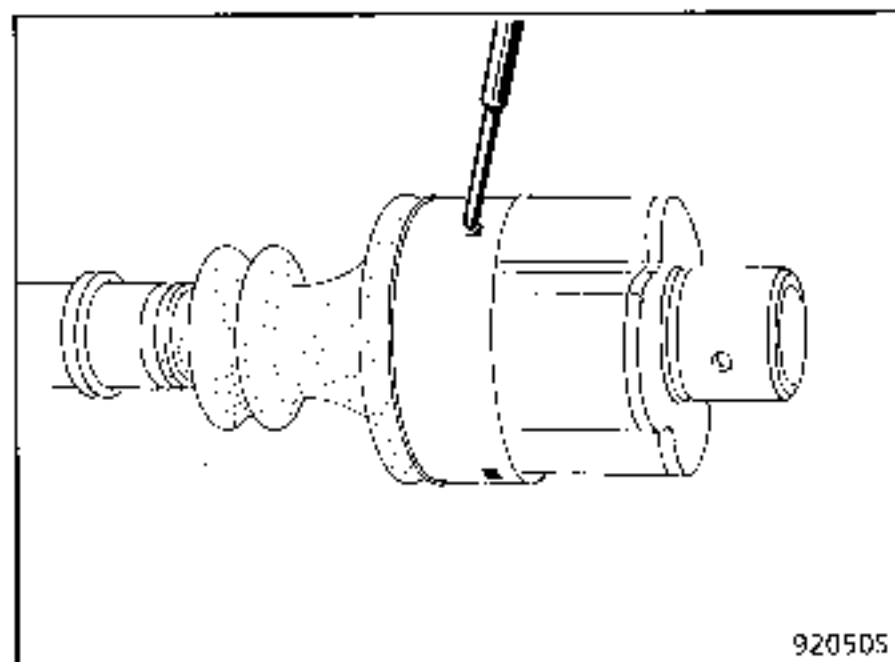
Spread the sachet of grease evenly between the gaiter and the yoke.

**NOTE :** Ensure that the amount of grease specified in the "Materials" section is used.

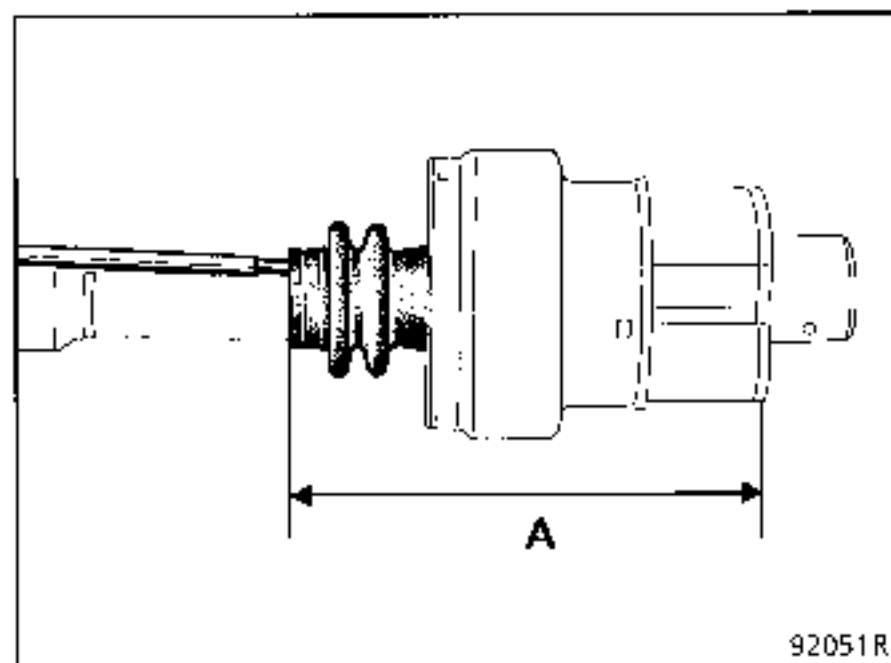
Position:

- the gaiter and its metal insert in the retaining cover,
- the retaining cover by sliding it on until the guide plate is flush with the yoke.

In this position, make three crimping points in the locations provided for this purpose on the guide plate.



Insert a smooth, rounded end rod between the gaiter and the shaft to correct the amount of air inside the joint.

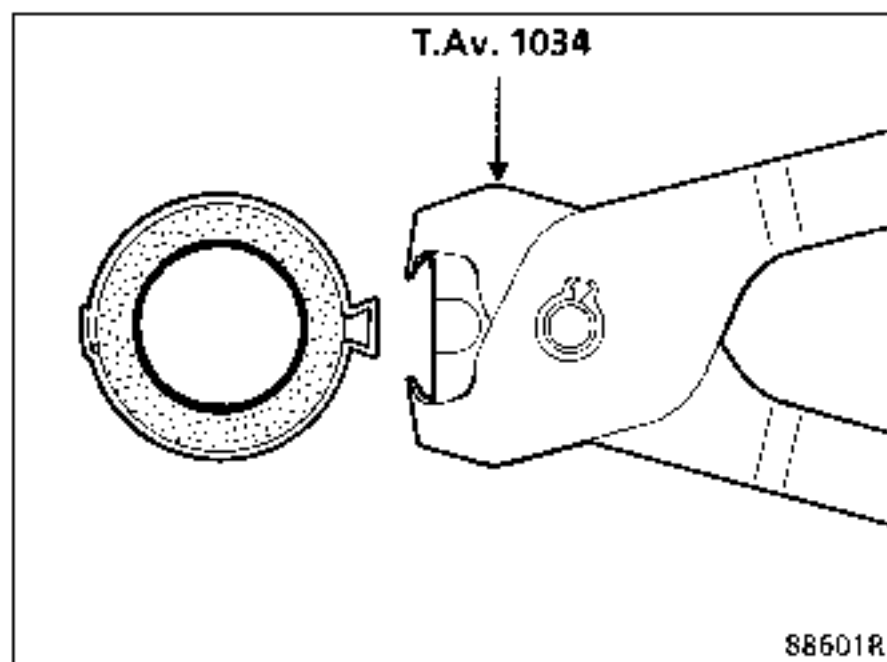
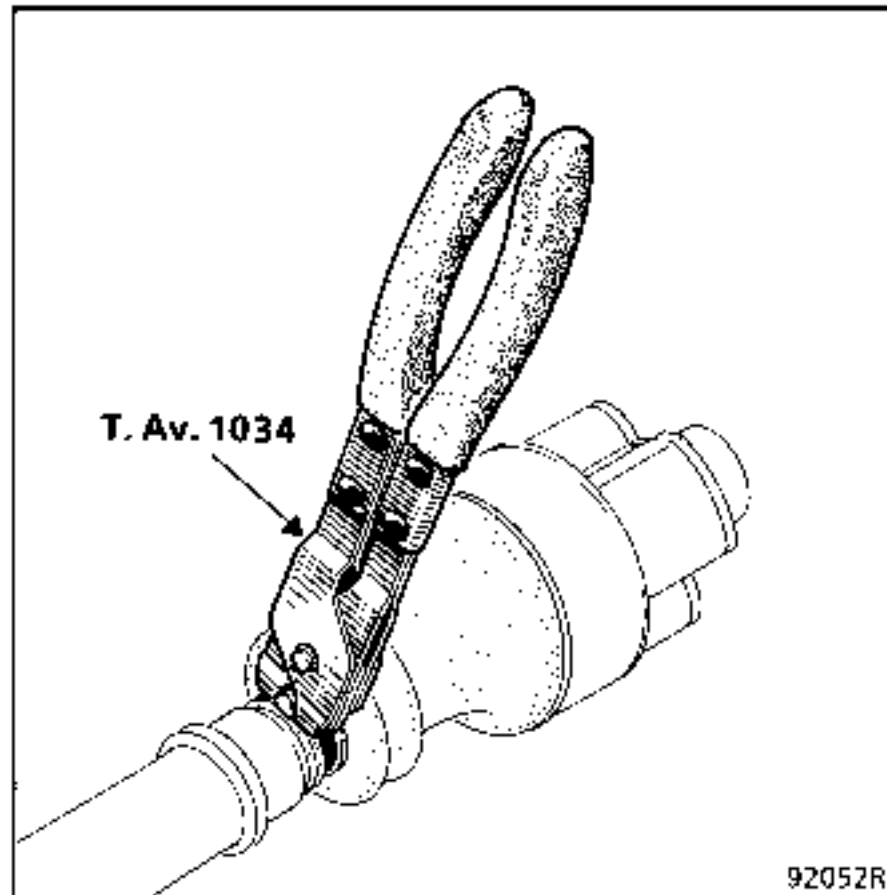


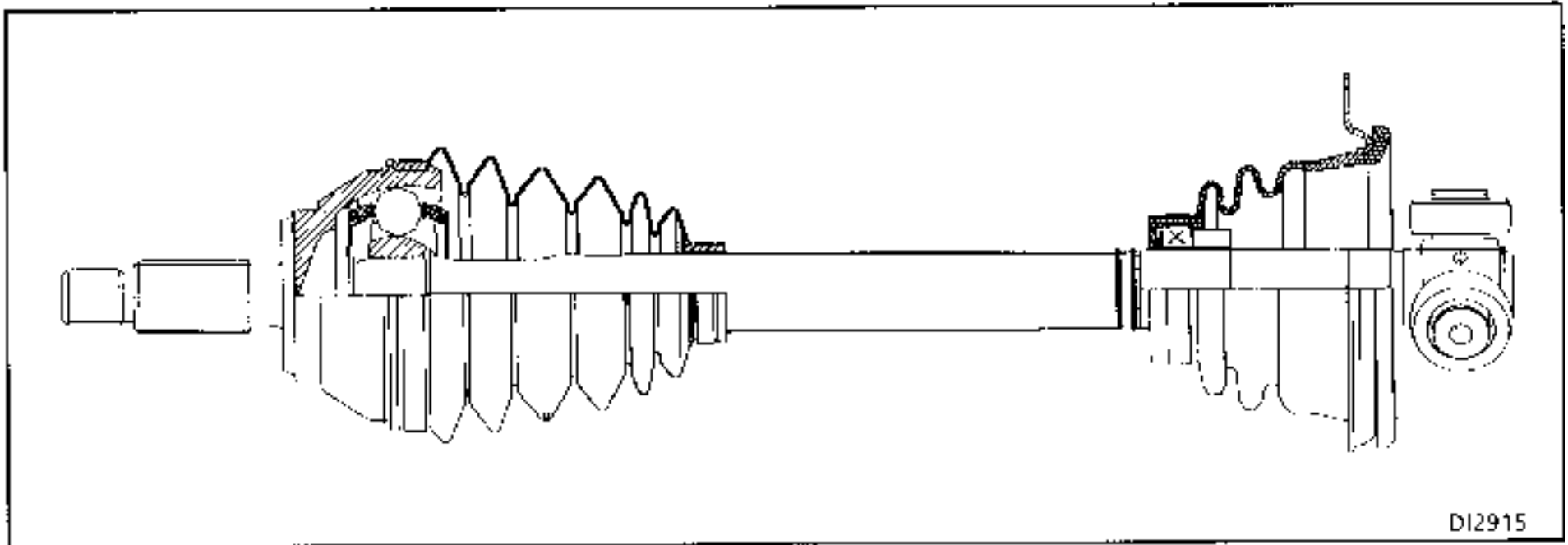
Expand or shorten the joint until dimension **A** =  $156 \pm 1$  mm is obtained (dimension measured between the end of the gaiter and the largest diameter machined face of the yoke).

In this position remove the rod.



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





D12915

Joint on left hand driveshaft - PK and JC gearboxes

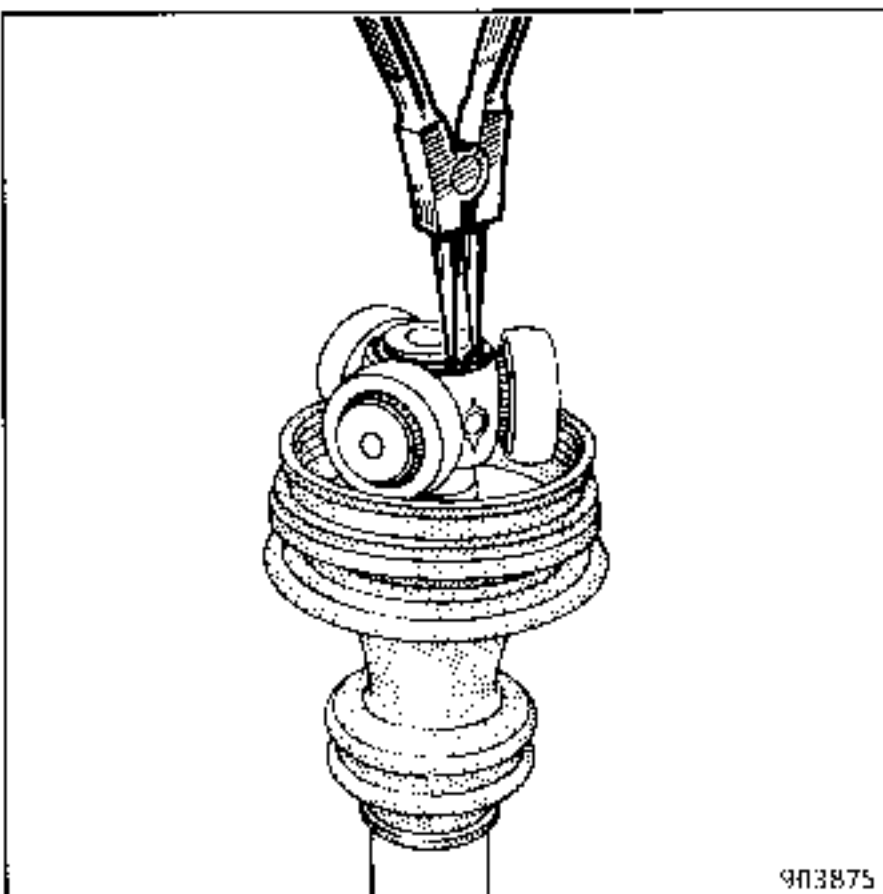
SPECIAL TOOLING REQUIRED	
T.Av. 1244	Mandrel for fitting bearing to shaft (PK gearbox).
T.Av. 944	Mandrel for fitting bearing to shaft (JC gearbox)

## REMOVAL

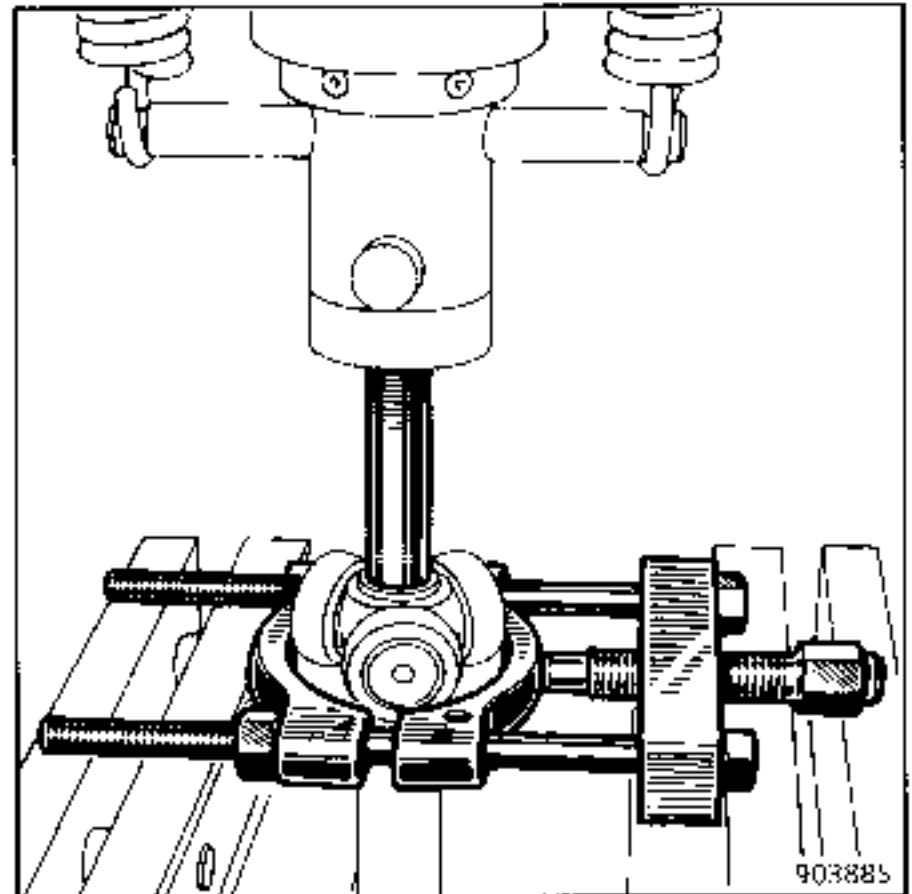
Never use thinners to clean the component parts.

Depending on assembly, remove the circlip.

On the press, remove the spider, using an extractor.

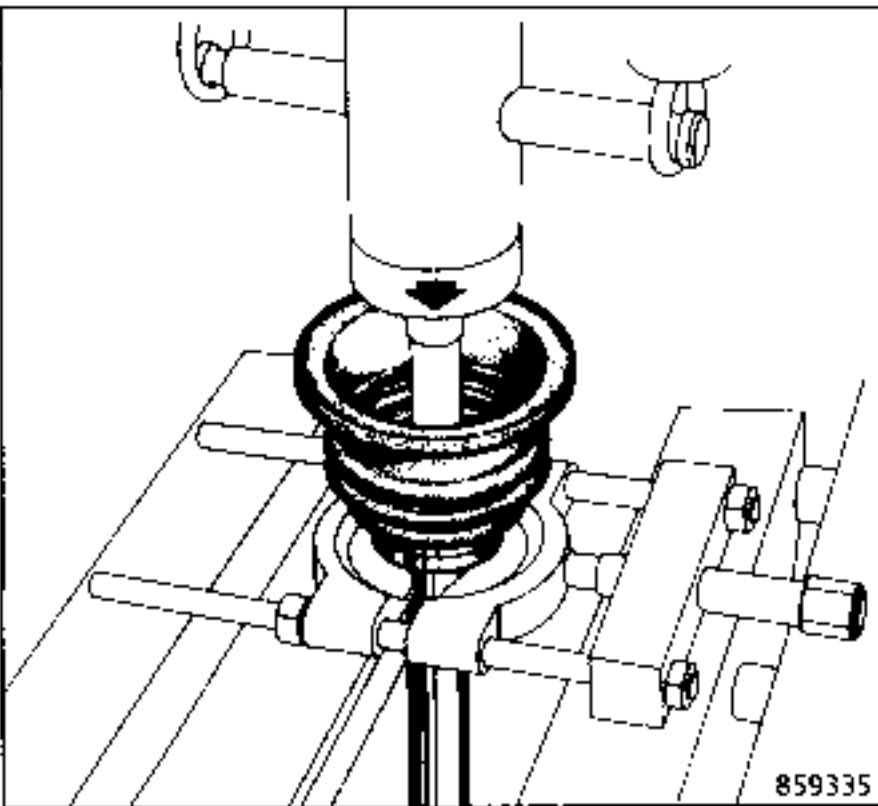


903875



903885

Remove the gaiter and bearing assembly in the same manner as the spider.



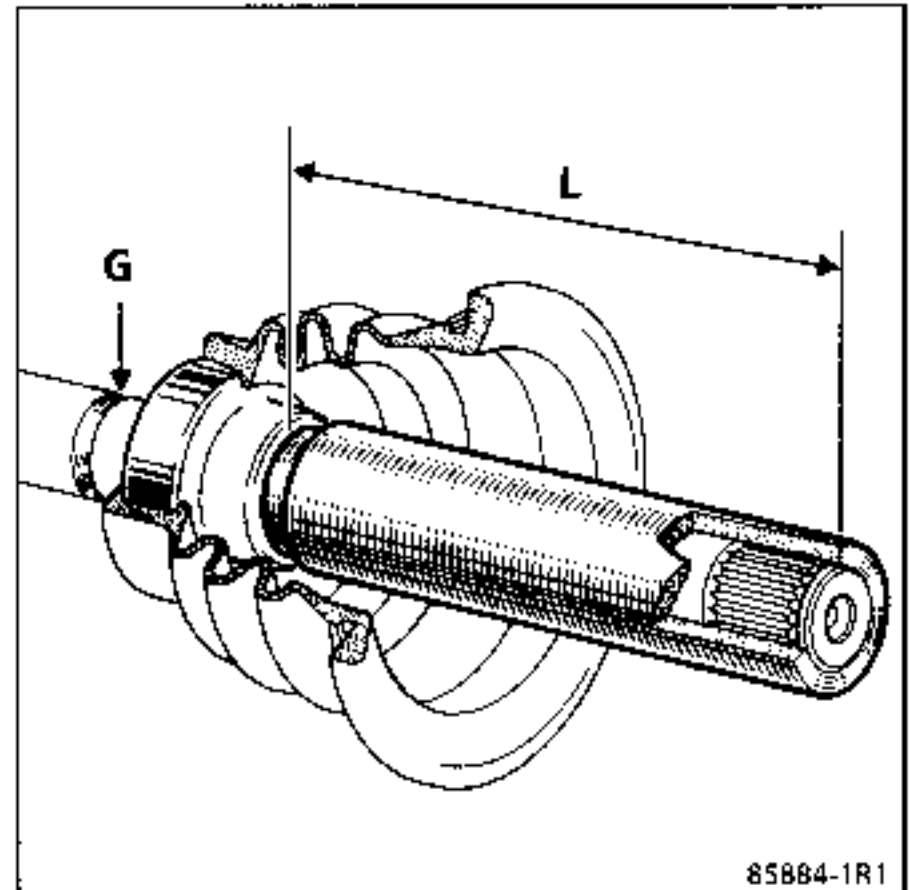
## REFITTING

When in its correct position on the shaft the bearing must be inserted until dimension L is obtained between the rear face of the bearing and the end of the shaft.

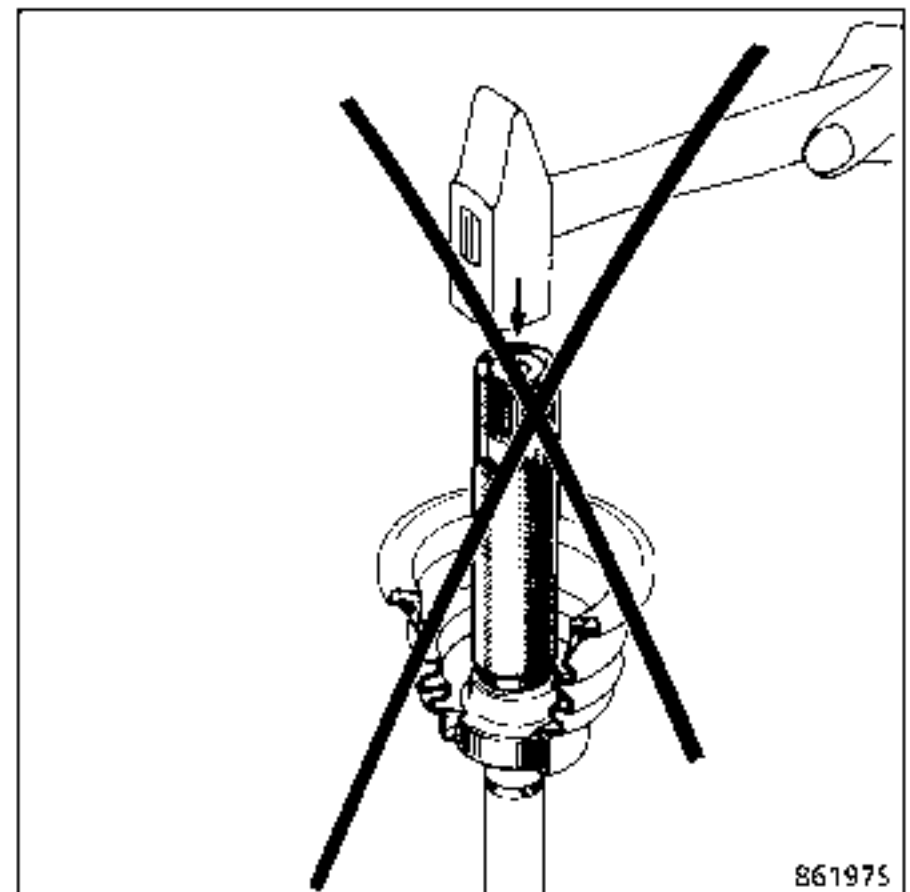
This dimension is obtained using :

- tool T.Av. 1244 :  
L = 99.5 mm  
driveshaft fitted to PK gearbox.
- tool T.Av. 944 :  
L = 123.2 mm  
driveshaft fitted to JC gearbox.

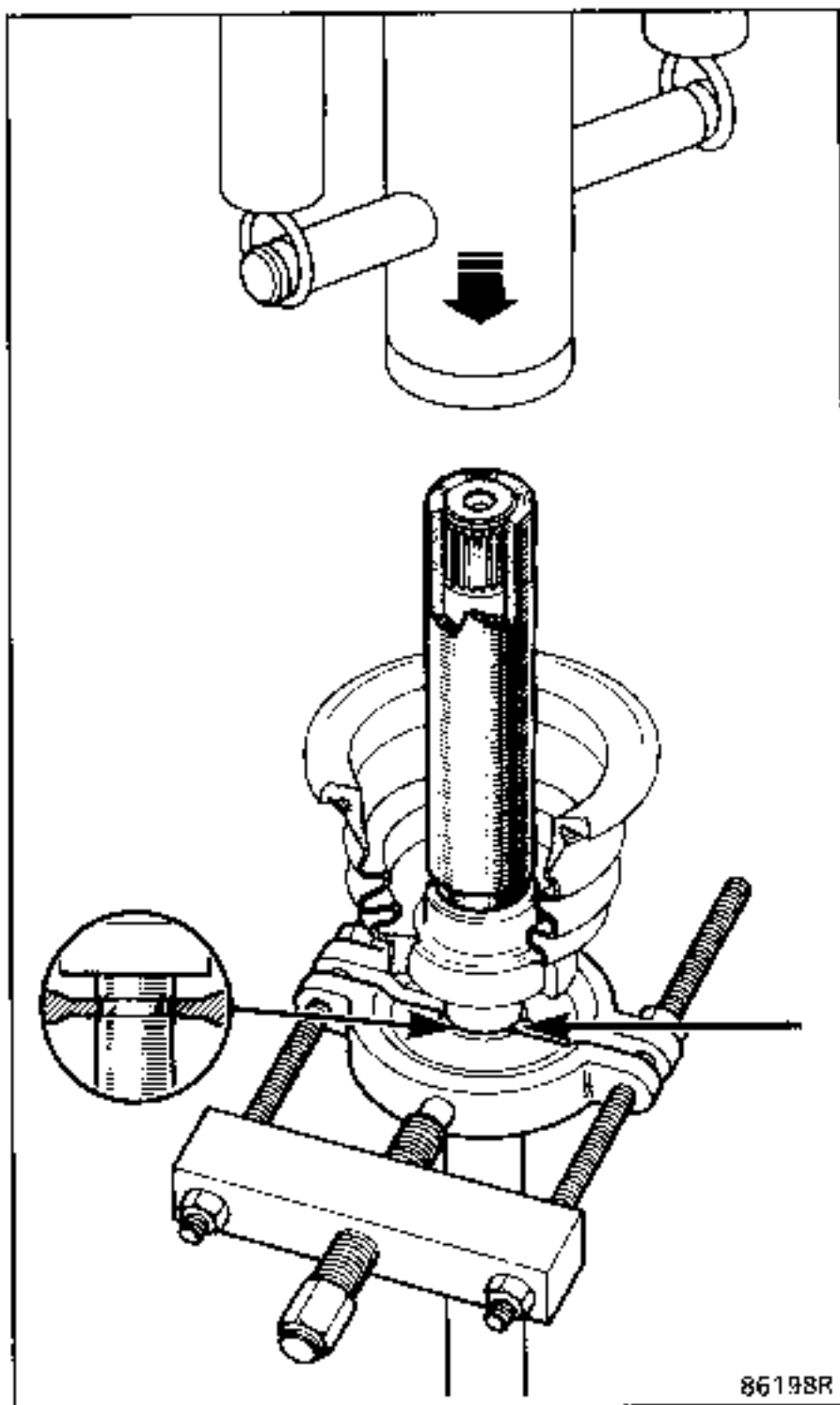
This dimension is obtained using tool T.Av. 1244 or T.Av. 944 when the end of the tool is level with the shaft.



To avoid damage to the bearing which has a lip seal, which could cause a leak, do not use a mallet to fit the bearing, but use the press to allow progressive pressure to be applied.



The driveshaft should be held in the press by groove (G) using an extractor to avoid damaging the wheel end joint.



86198R

Fit the spider onto the splined shaft and refit the retaining circlip (depending on assembly).