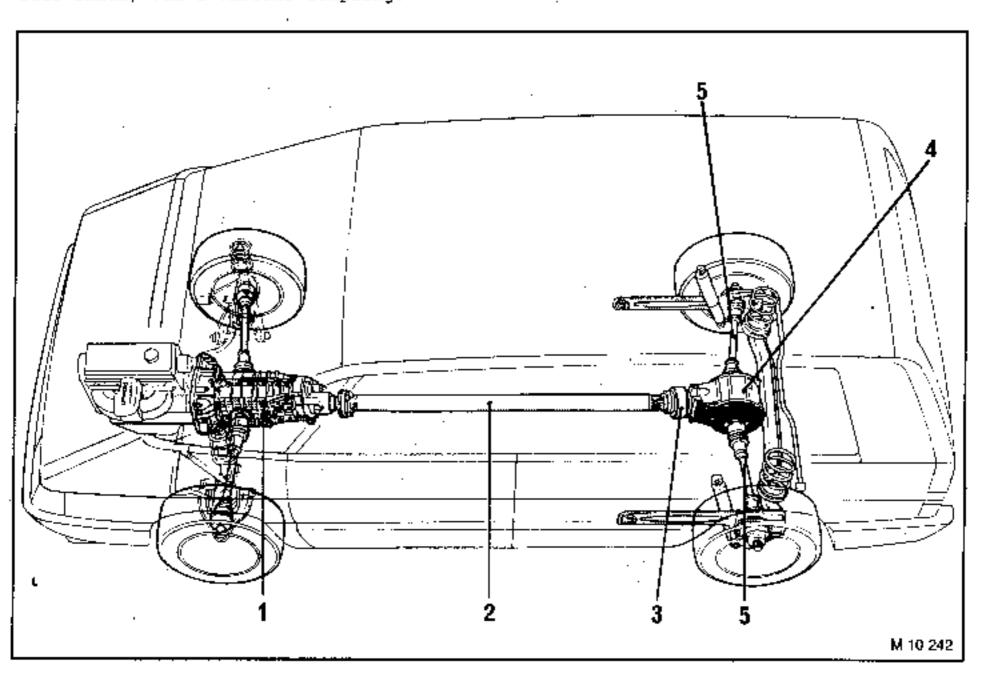
The RENAULT ESPACE QUADRA vehicles are equipped with a permanently engaged integral transmission system incorporating automatic torque distribution between the front and rear axles, via a viscous coupling.



DESCRIPTION

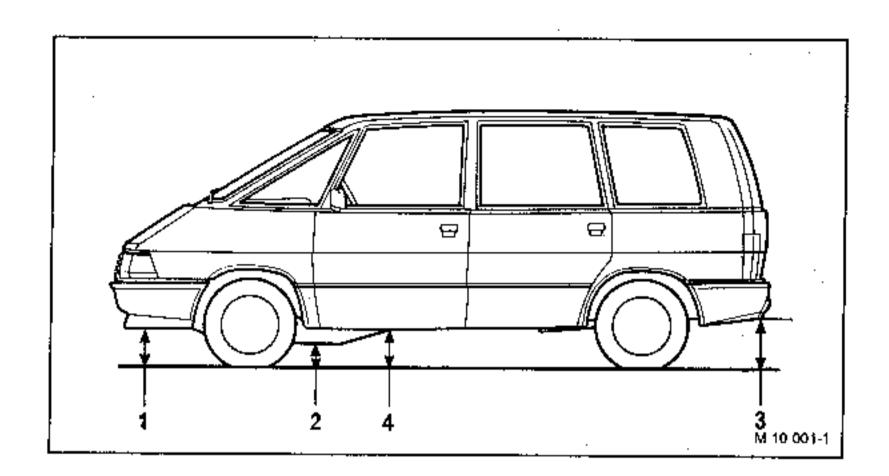
The drive to the front wheels remains conventional through a type NG7 gearbox final drive unit (1).

The longitudinal transmission shaft (2) which is made from wound fibre (carbon and glass) and epoxy resin, is PERMANENTLY coupled to the gearbox secondary shaft and therefore can turn at maximum engine speed.

A viscous coupling (3) is mounted just in front of the type OT2 rear axle (4).

The fully suspended rear final drive unit drives the rear wheels through two drive shafts (5) each of which have two constant velocity joints.

All the transmission system components are aligned ; engine, gearbox, shaft, viscous, coupling and rear final drive unit.



		Under side member		Ground clearance
. ·	Under spoiler (1) (m)	Front (2) (m)	Rear (3) (m)	Under exhaust (4) (m)
Kerb weight	0,250	0.180	0,430	0,165
Fully loaded	0,210	0,135	0,365	0,120

All the other dimensions are identical to those on the other versions.

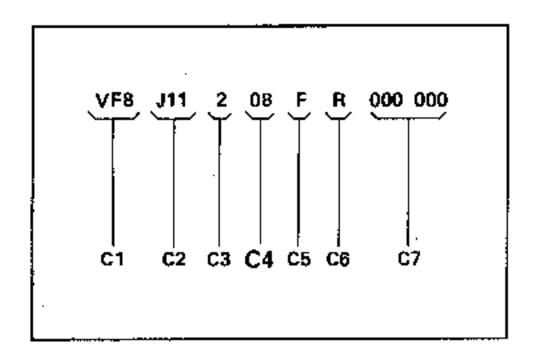
Engine	_	Gearbox
Trind Time	_	vear nox

Vehicle type	Engine	Cuboc cap. (cm³)	Bore (mm)	Stroke (mm)	Comp.	Gearbox
J 116	J7FI 760	1995	88	82	· 10	NG7 - 05
J117	J7T 770	2165	88	89	9,2	NG7 - 05

The Engine - Gearbox assembly is tilted, rearwards, to an angle of 0°30'. This means that the vehicle has a special lower front cross member, a protective casing under the engine, between the cross member and the sump and a dished section in the front left hand side member (to prevent it fouling the alternator.

SPECIAL FEATURE

The vehicle is identified on the manufacturer's number plate, at the position C4. Gearbox type 08.



TOWING THE VEHICLE Integral transmission system

The design of the vehicle (the fact that all 4 wheels are permanently driven, without it being possible to uncouple them) means that the speed of the front wheels can never be very different from that of the rear wheels: IF IT IS, THERE IS A RISK OF IRREPARABLE DAMAGE TO THE VISCOUS COUPLING.

This is why, WHENEVER THE VEHICLE IS MOVED IN AN EMERGENCY, IT MUST EITHER :

- BE PLACED ON A PLATFORM TRUCK (none of the 4 wheels moving),
- OR MUST BE TOWED ON ALL 4 WHEELS (if the regulations of the country concerned permit such an operation).

IT IS FORBIDDEN TO TOW THE VEHICLE :

- WITH THE REAR AXLE RAISED FROM THE GROUND.
- WITH THE FRONT AXLE RAISED FROM THE GROUND.

WARNING :

If, for exceptional reasons, one cannot avoid towing the vehicle with the front wheels raised. IT IS ESSENTIAL FIRST TO REMOVE THE LONGITUDINAL TRANSMISSION SHAFT (SEE SECTION 29).

TYPE NG7 GEARBOX :

SAE 80 W

2.4 litres

SAE 75 W (cold countries)

TYPE OT2 REAR FINAL DRIVE UNIT :

SAE 80 W

1.2 litres

SAE 75 W (cold countries)

GEARBOX SHAFT OUTPUT SPLINES :

MOLYKOTE "BR2"

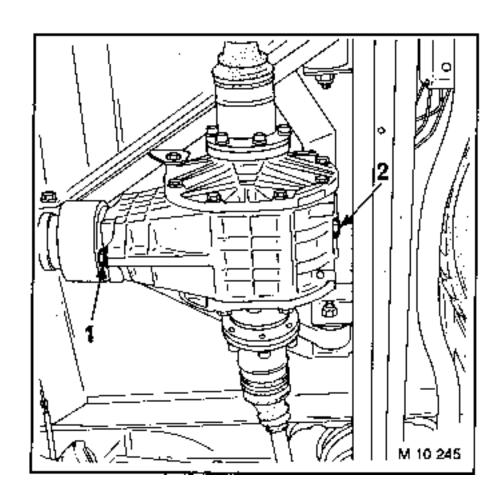
DRAINING - REFILLING Rear final drive unit

The first oil change is to be carried out at between 600 and 2000 miles (1000 and 3000 km) and following that every 30 000 miles (50 000 km).

DRAINING : plug 1 (the final drive unit is to be warm)

FILLING : plug 2

Measure out 1.2 litres of oil and fill the unit through plug 2.



SPECIAL TOOLS Special equipment

TESTING THE VEHICLE ON ROLLING ROAD TYPE TEST BEDS

For the moment, the only test bed authorised for this vehicle is the MAHA type IW2 - 4 wheel drive unit.

If the test bed to be used has not been designed and officially approved for testing vehicles equipped with integral permanent 4 wheel drive transmissions, it is ESSENTIAL to remove the longitudinal transmission shaft before proceeding with the tests.

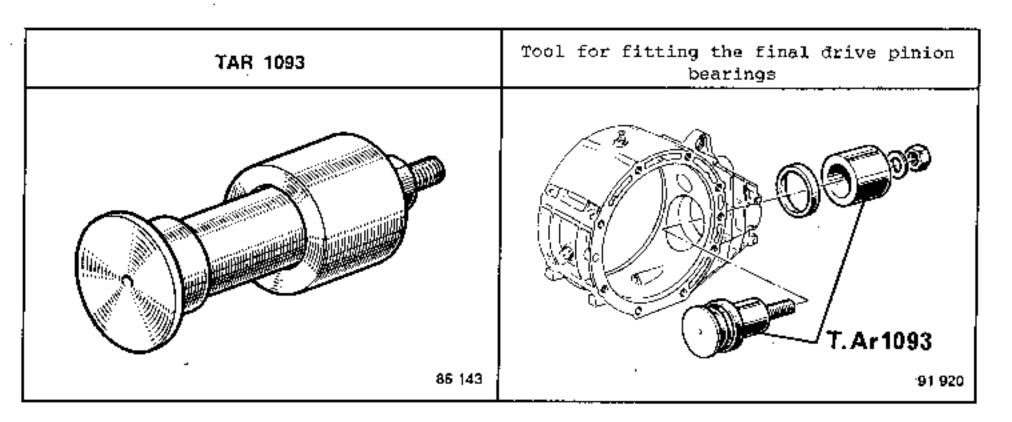
If this shaft is not removed before the test :

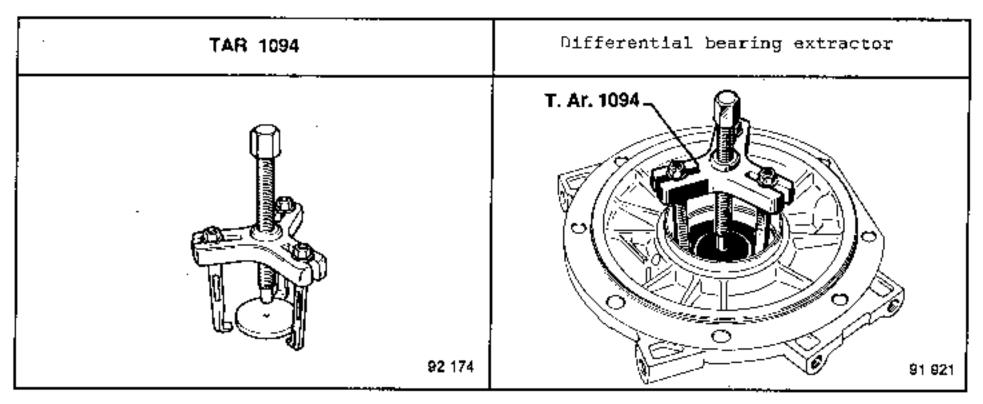
- THE VEHICLE WILL BE PROJECTED OFF THE TEST BED
- THE VISCOUS COUPLING WILL BE IRREPARABLY DAMAGED.

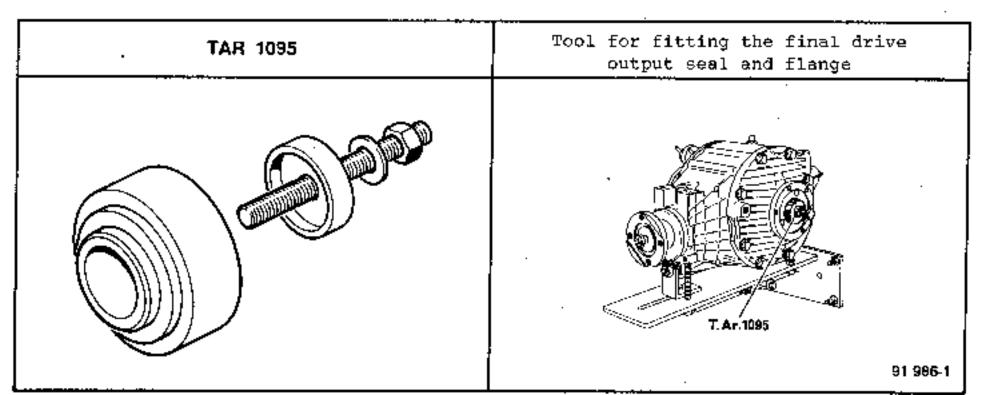
REMOVING THE LONGITUDINAL TRANSMISSION SHAFT

See section 29.

REAR FINAL DRIVE - VISCOUS COUPLING

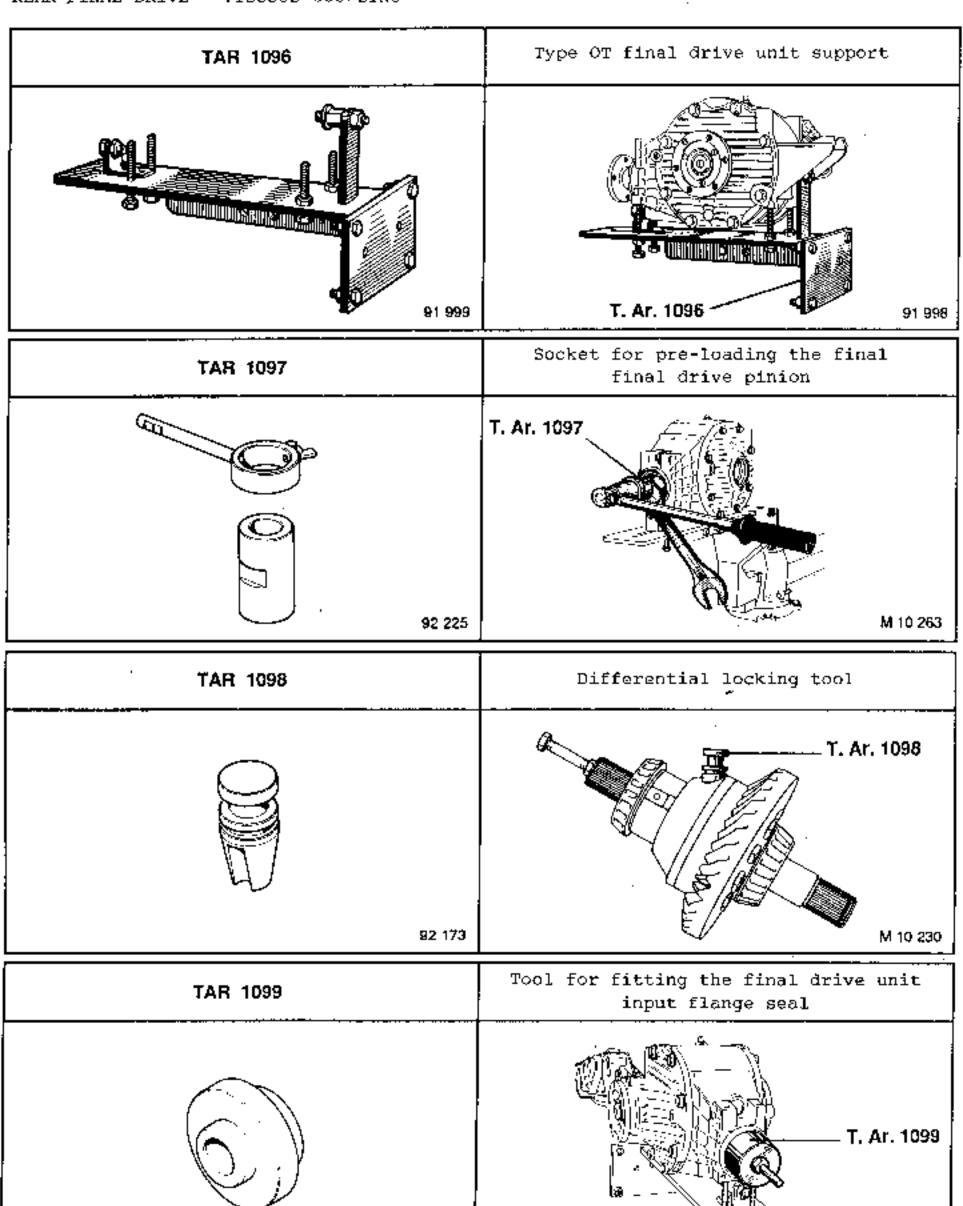






91 995-1

REAR FINAL DRIVE - VISCOUS COUPGING



92 226

REMOVING - REFITTING

The engine is removed from the front of the vehicle, as on a conventional version.

SPECIAL FEATURES

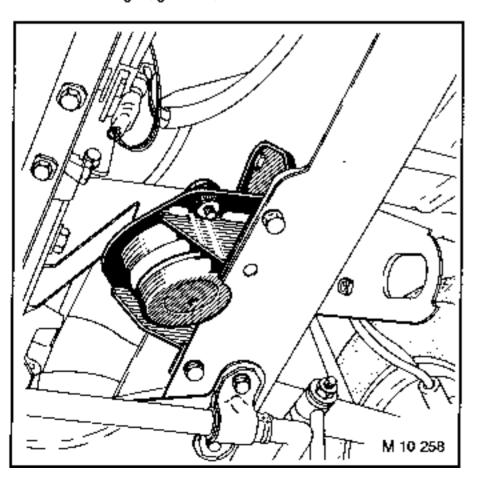
ESPACE QUADRA vehicles are fitted with a sump protector and two special engine mountings.

Removing

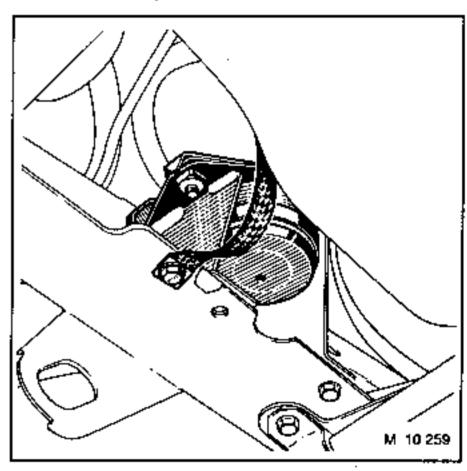
Carry out the same operations as on a conventional version with a fuel injection engine plus the following operations:

Remove :

- the sump protector which is secured to the lower cross member (3 nuts and bolts) and the side members (2 nuts and bolts),
- the bolts securing the left hand engine mounting (green).



- the earthing braid (on the right hand side),
- the bolts securing the right hand engine mounting (orange).



Refitting



Ensure that the engine mounting identification codes are correctly followed.

COMPLETE ENGINE AND LOWER ENGINE COMPONENTS Engine - Gearbox

REMOVING - REFITTING

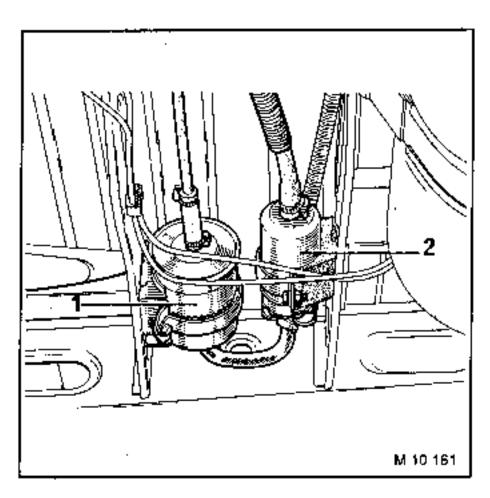
The engine - gearbox assembly is removed from the front of the vehicle as on a conventional version.

SPECIAL FEATURES

For this operation one must first remove the longitudinal transmission shaft (see section 29).

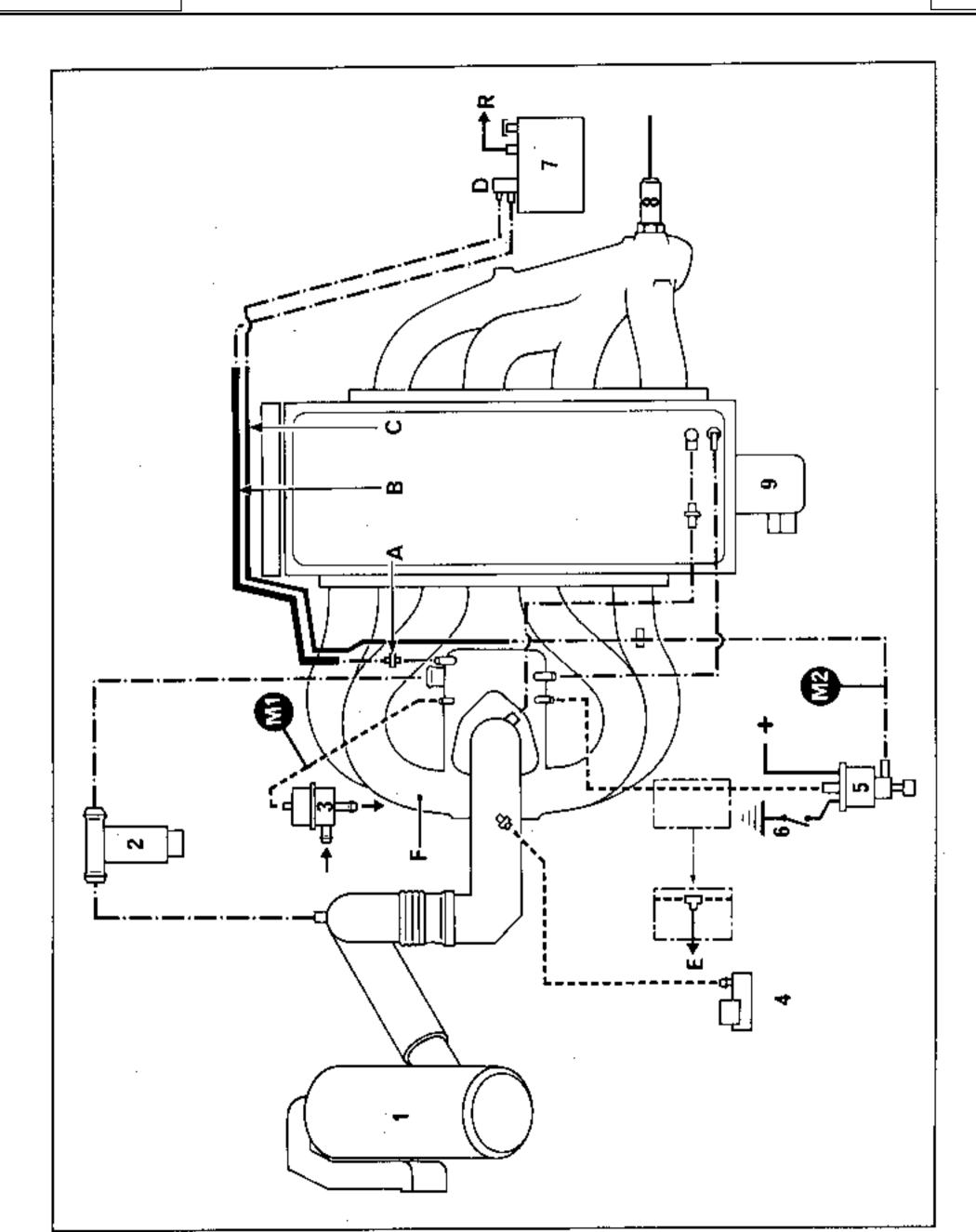
```
The fuel filter is either :
- over the tank (lst model),
- on the right hand side member (2nd model).
```

Removing the pump, which is on a plate on the right hand side above the fuel tank, involves first removing the fuel tank (see section 19).



1 - Fuel filter

2 - Fuel pump



EMISSION CONTROL SYSTEM Anti-evaporation circuit

- 1 Air filter
- 2 Idling speed control valve
- 3 Fuel pressure regulator
- 4 Fuel pressure sensor
- 5 Solenoid valve that bleeds the fuel vapour absorber
- 6 Electronic computer
- 7 Fuel vapour absorber (canister)
- 8 · Oxygen or Lambda sensor
- 9 Ignition distributor
- A 2 mm Ø jet : colour white
- B Fuel vapour canister bleed pipe (distributor cenister)
- C Fuel vapour canister bleed control pipe (canister - solenoid valve)
- D · Fuel vapour canister valve
- F Inlet distributor
- R · To fuel tank

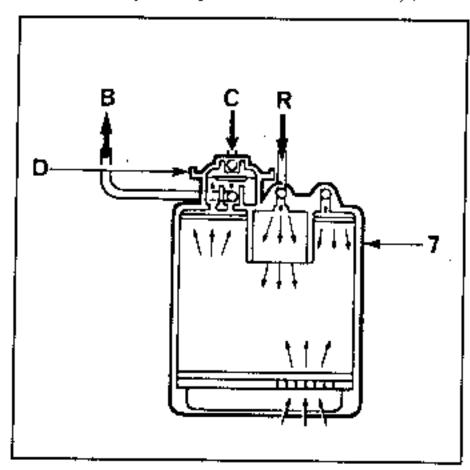
J117 ESPACE vehicles are equipped with a circuit to absorb fuel vapour accumulating in the tank:

- . The circuit consists of a fuel vapour absorption canister connected to the tank by a pipe (R).
- The fuel vapour absorption canister contains active carbon and carries a valve (D) connected directly to the inlet distributor controlled by the injection computer (6) via a solenoid valve (5) and pipe (C). The fuel vapour absorption canister is bled through pipe (B). There is a 2 mm Ø jet in this pipe (A). It is white in colour.

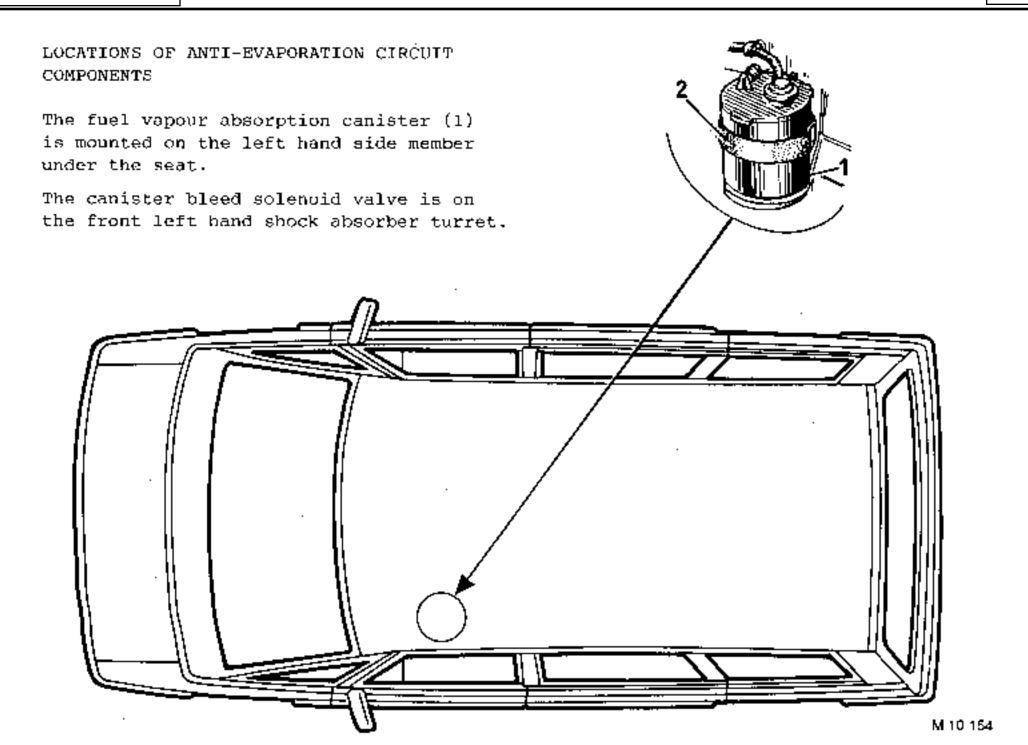
PRINCIPLE OF OPERATION

- . When the engine is stopped : The fuel vapours are collected in the absorption canister.
- . When the engine is running at idling speed :

No bleed signal is passed to the solenoid valve (5) (the injection computer (6) having not passed the command).



When the engine is running at speeds other than idling speed:
Under certain conditions, when the engine is warm, the injection computer (6), operates the solenoid valve (5), electrically, to open the pneumatic circuit (C) between the inlet distributor (5) and the fuel vapour absorption canister (7), to bleed the vapour from the canister.



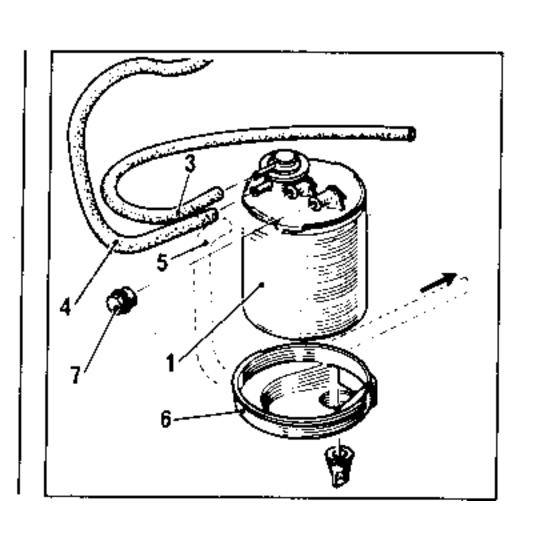
REMOVING - REFITTING THE FUEL VAPOUR ABSORPTION CANISTER

Disconnect the pipes from the top of the canister.

Remove the securing strap (2) and take out the canister from under the vehicle.

- 1 Fuel vapour absorption canister
- 2 Securing strap (left hand drawing)
- 3 · To solenoid valve
- 4 To inlet distributor
- 5 To fuel tank
- 6 Support
- 7 Plug

When refitting, ensure that the pipes are correctly reconnected.



REPLACING

The repair methods are illustrated by diagrams that show, immediately, the points at which the work is to be carried out.

To avoid these becoming excessively complicated, symbols have been used to show the operations in detail.

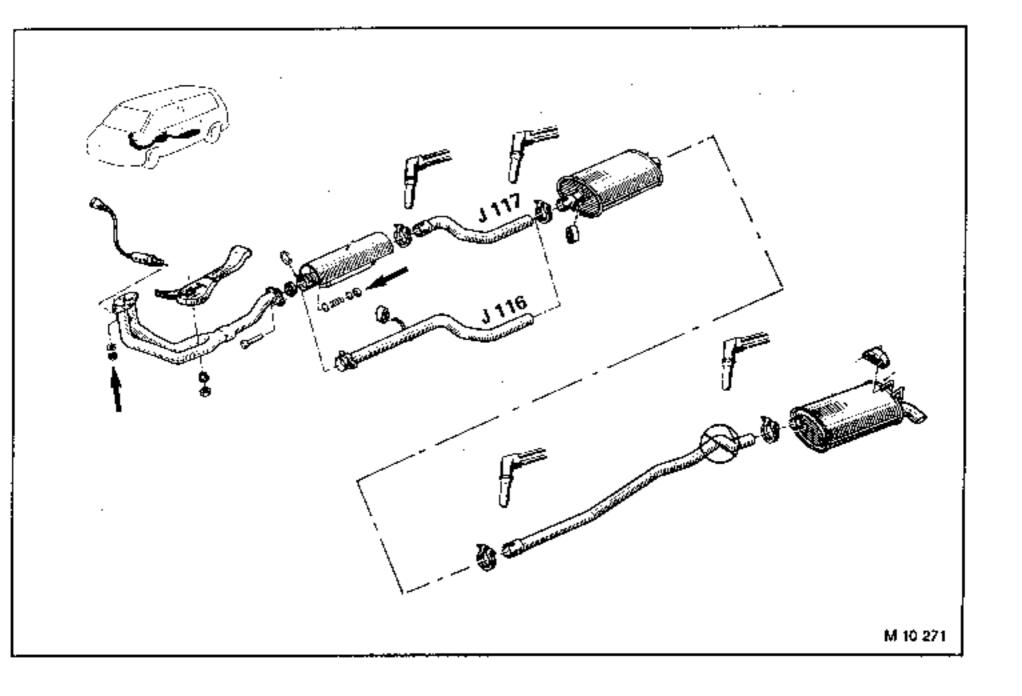
Unscrew, entirely, for dismantling.

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

Cut, with a flame torch only :
 clamp,

- outer tube of the double section.

J 116 - J 117 models



EXHAUST The exhaust system

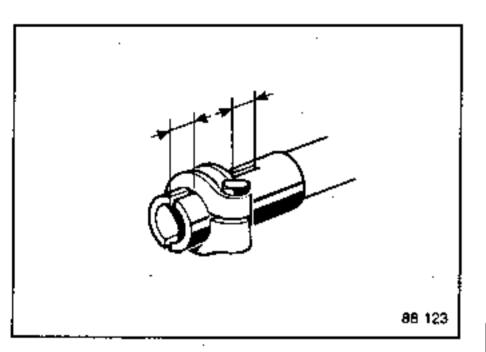
REPLACING



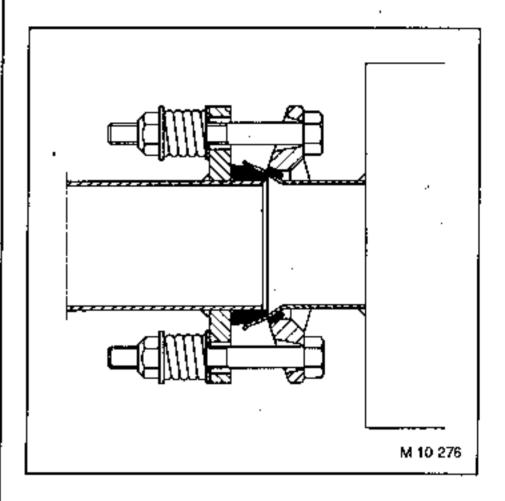
It is essential to coat the inner and outer end of the pipes with mastic (ref. 77 01 421 161).

To align, correctly, the exhaust system and correctly tighten the clamps:

- Tighten the various joints, one after the other, starting at the exhaust manifold and finishing at the silencer.
- Position the clamps so that their clamping surfaces pull down on the split ends of the pipes and their gaps are between the two slots in the pipe.



- Ensure that the clamp bolts are tightened to the correct torque: bolts diameter 8 mm: 2 daN.m, to avoid distorting the pipes and the clamps as this could cause leakage. Correctly tighten the clamps with springs, thermo-plastic seals and exhaust seals on them.



ESSENTIAL: Replace the thermo-plastic seal every time the joint is dismantled and tighten the nuts until the springs are coil bound (do not loosen them after tightening).

REMOVING - REFITTING

- Place the vehicle on a lift.

Before lifting the vehicle :

- Disconnect the battery.
- Remove any fuel still remaining in the tank with a pump.

Raise the vehicle.

Remove the hose clip from the filler pipe.

Disconnect the pipe from its connection neck (T).

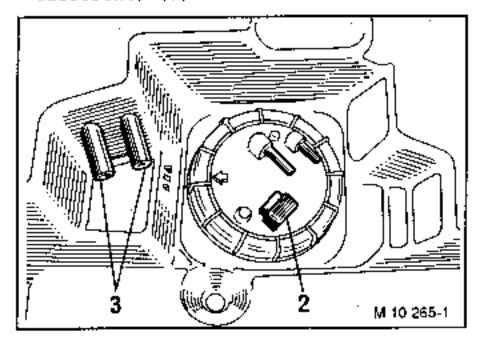


Place a support of the DESVIL V 710 type under the tank, avoiding taking the load under the fuel tank sender unit well.

Remove the 2 outer bolts that secure the tank retaining straps.

Slightly lower the tank, then disconnect :

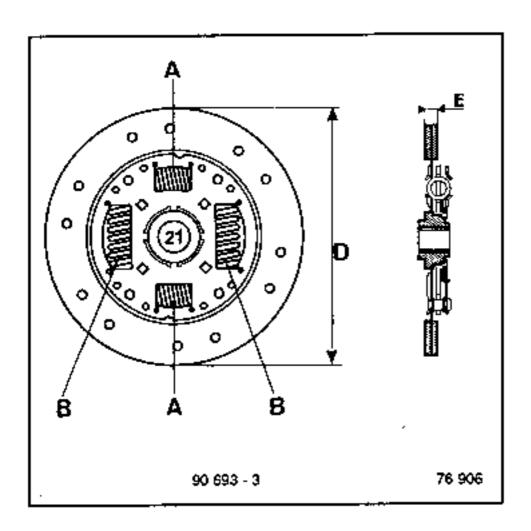
- the electrical supply wire from the sender unit (2),
- the various hoses, taking care to mark the degassing and vent pipes (their calibrated output points on the tank are different) (3).



REFITTING

Carry out these operations in reverse order.

HOWEVER when refitting the tank to the vehicle, ensure that the supply and return pipes are not trapped between the body shell and the tank.



21 splines

 $E = 6.8 \, \text{mm}$

 $D = 215 \, mm$

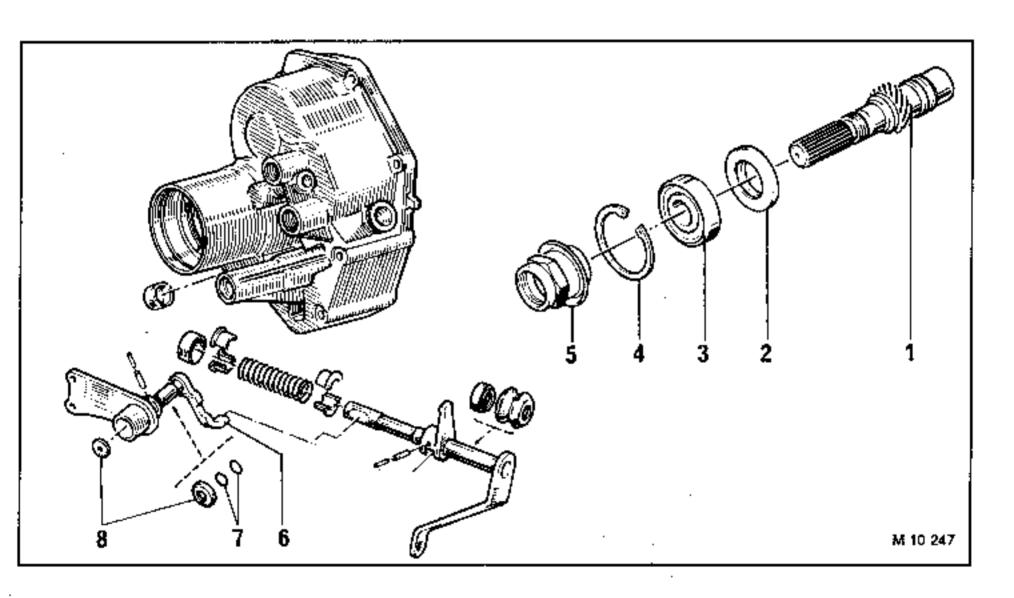
8 springs in pairs : 1 inside the other

A : Red - Blue

B : Light green - Dark green

Gear	rbox		Gearbox ratios					Front final drive	1000	eed er rpm km/h	Speed- ometer drive
Туре	Ref	10	2*	3°	4*	5°	Reverse	C.wheel pinion	49	5*	
NOT		11/45	17/37	22/31	33/34	36/31	11/39	9/34	20.54	24.44	640
NG7	005	0,244	0,459	0,709	0,97	1,16	0,28	0,264	28,51	34,11	6/19

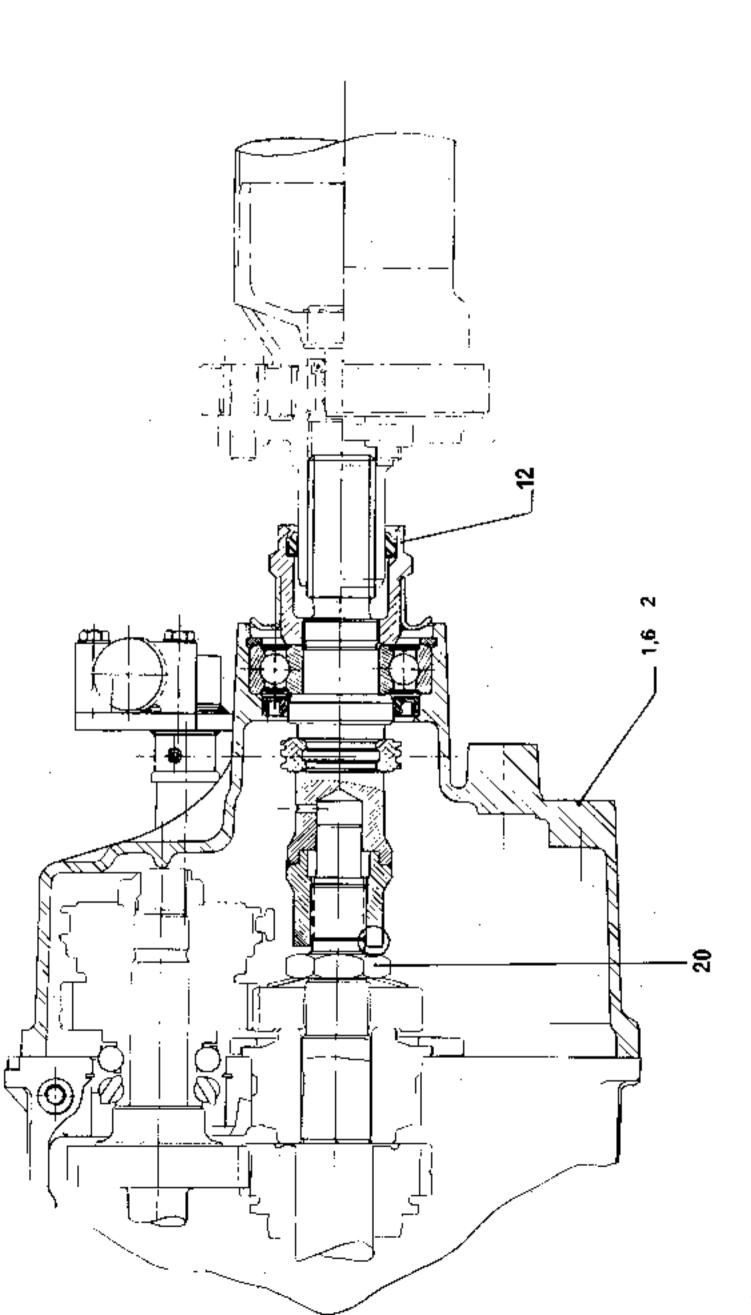
SPECIAL FEATURES (ESPACE version) when compared with K 48 vehicles



- · Special gearbox output
- Special speedometer drive ratio
- Final drive ratio 9 x 34
- No lock engagement system

- 1 Output shaft
- 2 Lip seal
- 3 Bearing
- 4 Circlip
- 5 Sealed end fitting
- 6 Selector lever
- 7 0 ring
- 8 Lever sleeve ball joint cover support

For operations not covered in this section, see section 21 of MR 291 (K 48 4x4) and workshop manual BV NG.



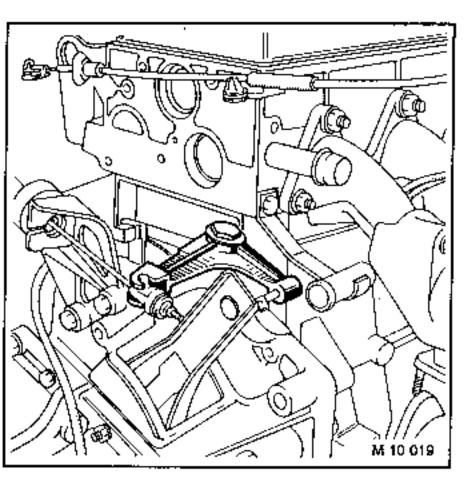
REMOVING - REFITTING .

REMOVING

Place the vehicle on a lift.

Disconnect the battery.

Remove the clutch control swivel lever.



From under the vehicle :

Drain the gearbox.

Remove :

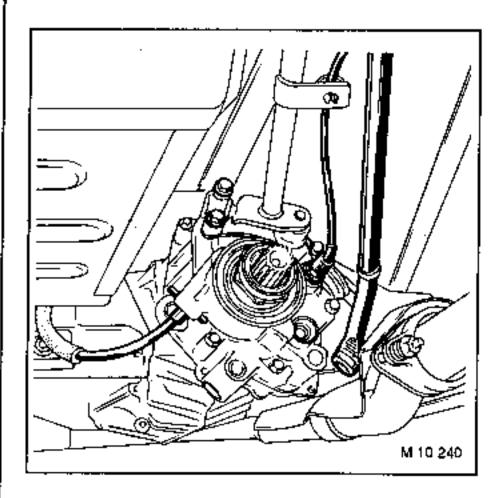
- the longitudinal transmission shaft,
- the exhaust pivot clip,
- the bolts round the gearbox.

Place a DESVIL type stand under the box.

Remove :

- the flywheel protection panel,
- the gearbox mountings,
- the TDC sensor,
- the starter support bolts,
- the gear shift controls,
- the speedometer drive cable.

Disconnect the front drive shafts.



Chock the front end of the engine.

Remove the gearbox rearwards.

REFITTING

Carry out the removing operations in reverse.

Precautions :

It is essential to fit a new exhaust pipe seal and a new thermoplastic seal.

Top up the gearbox oil level.

Working on the 5th speed gear assembly, on the vehicle

REMOVING - REFITTING

ESSENTIAL SPECIAL TOOLS			
	Set of spring pin punches 5th speed hub extractor		

	RQUES (in daN.m).
Primary shaft nut13 Secondary shaft nut20 Output shaft nut12 Rear housing bolts 1.6-2	ut20 ,,,,,, 12

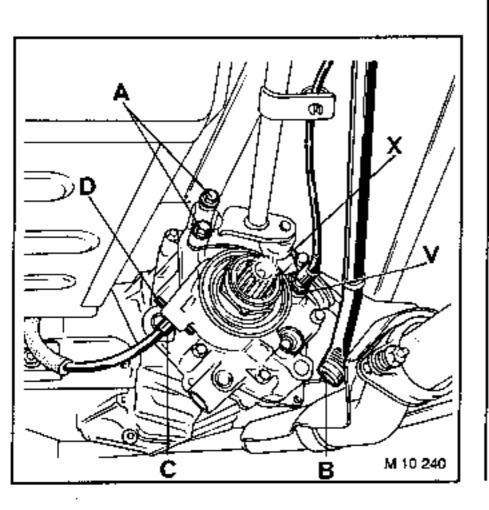
REMOVING

Drain the gearbox.

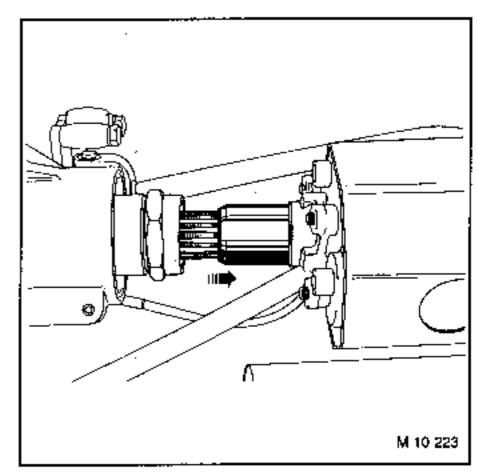
Remove :

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

Disconnect: The speedometer drive cable (C) after first removing the spring pin (D).

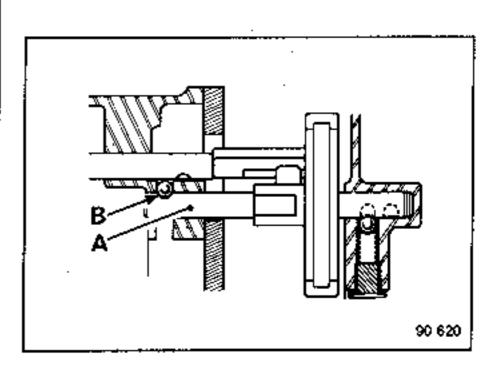


Disconnect the longitudinal transmission shaft.



Select 3rd speed to lock the 5th speed fork.

NOTE: it is essential not to remove the 5th speed shift fork shaft (A) as its locking ball (B) could fall into the gearbox.

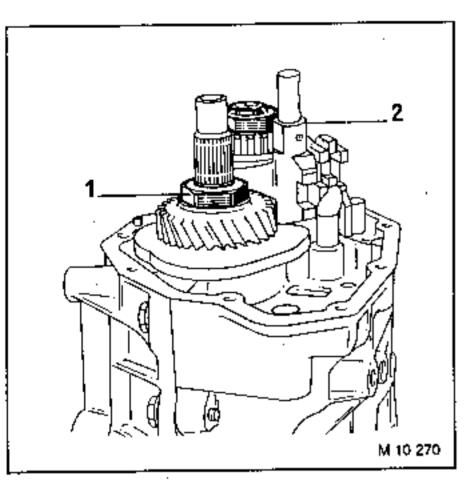


REMOVING (continued)

Remove the bolts from the rear housing.

Remove the housing.

Return the gearbox to neutral them select 5th and 2nd.



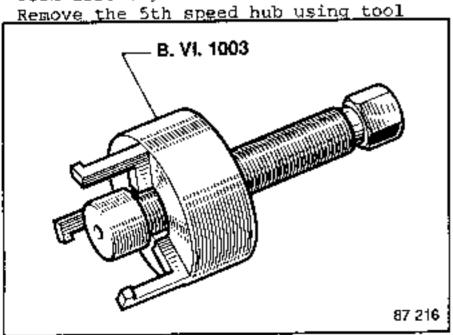
Loosen nut (10) with a 36 mm long series socket.

Loosen the primary shaft nut (2).

Return the gearbox to neutral then reselect 3rd.

Remove the pin from the 5th speed fork using punch B.Vi.31-01.

Remove the 5th speed sliding gear and fork assembly.



B.Vi.1003.

Place the claws of the extractor under the spacer plate and extract the 5th speed fixed goar together with the plate.

REFITTING

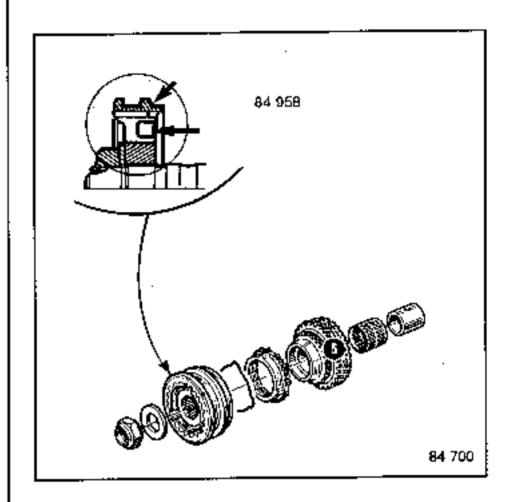
Special features :

- On the secondary shaft :

Ensure that the fixed gear is the correct way round and bond it in place with Loctite FRENBLOC.

- On the primary shaft :

Bond the hub in place with Loctite FRENBLOC after ensuring that the assembly is fitted the right way round.



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

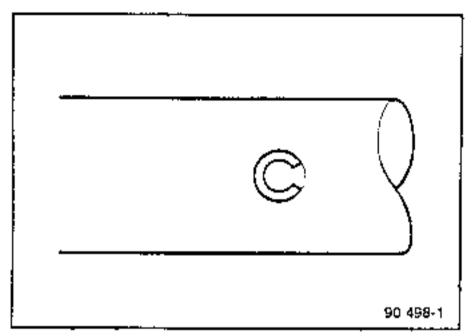
Refit :

- The 5th speed synchroniser, hub-sliding gear and fork assembly,
- the washers.

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

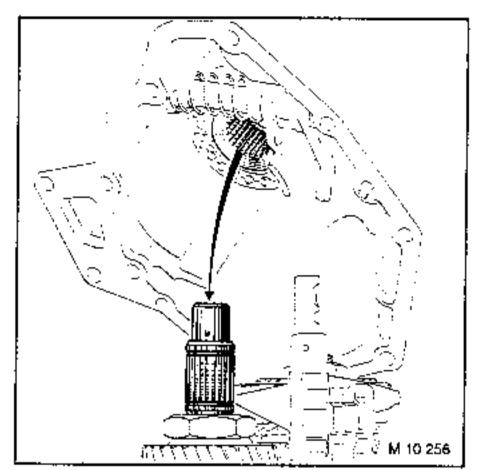
REFITTING (continued)

Pin the fork in place (B.Vi.31-01) with the slit in the pin parallel with the shaft.



Fit the housing cover gasket dry.

Select 3rd and place the housing in position, fitting the selector lever into the dog on the 3rd speed shift fork shaft.



Fit the rear housing.



Tighten the bolts to torque.

Refit the 5th speed locking ball assembly after coating its plug with CAF 4/60 THIXO compound.

Select out of 3rd speed.

Check that all the gears select freely.

Reconnect all the controls.

Refit the longitudinal transmission shaft.

Top up the oil level in the box.

DISMANTLING - REASSEMBLY

	ESSENTIAL SPECIAL TOOLS
B. VI. 31-01	Set of punches for spring pins
B. VI. 747	Fork for removing and refitting the selector spring
Mot. 658	Ring for fitting the seal
	50 mm open ended spanner

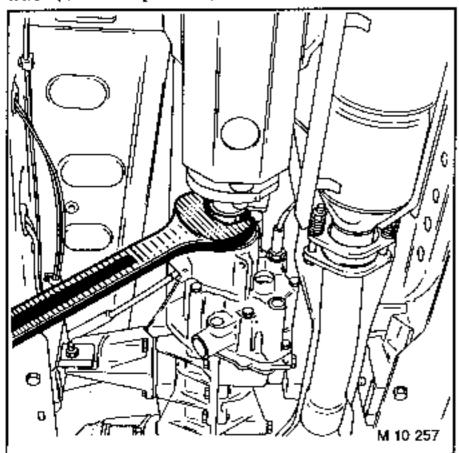
TIGHTENING TORQUES	(in daN.m)
Longitudinal transmission	n bolt 6
Nut	12
Housing bolts	1,6- 2,8

REMOVING



Precaution to be taken

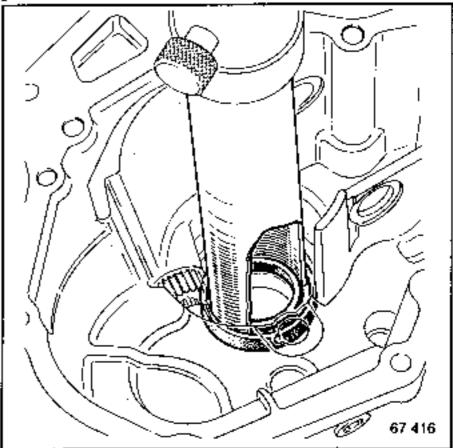
Before removing the longitudinal transmission shaft, loosen the gearbox output nut (50 mm spanner).



Remove :

- the longitudinal transmission shaft,
- the 5th speed housing,
- the output shaft, on a press,
- the bearing circlip.

Extract the bearing and the seal on the press.



Remove the pin from the lever sleeve - cover support - ball joint assembly (8) and remove the sleeve.

Take out the selector lever (6) together with its 0 rings (7).

Extract the speedometer drive pinion shaft.

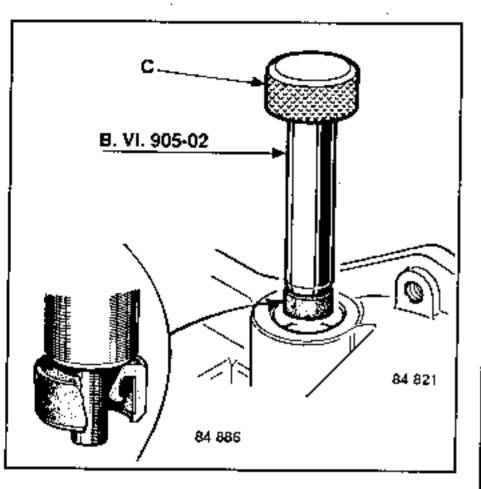
 The speedometer drive pinion must be replaced by a new one each time it is removed.

REASSEMBLY

Special features

Oil the lip seal (7) and refit it using tool Mot.658.

The speedometer drive shaft seal is replaced using tool B.Vi.905-02.

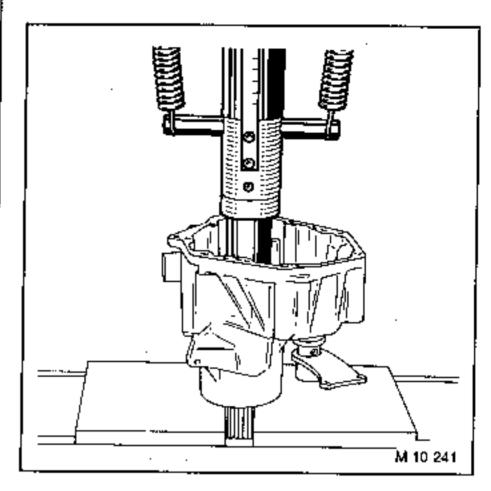


Ensure that the gear clips correctly into place.

Insert the bearing, on the press, taking the load on its outer track ring.

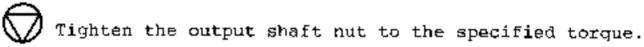
Fit the circlip (9).

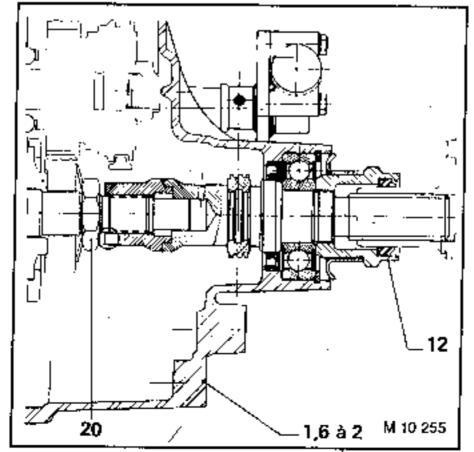
Push in the shaft, on the press, taking the load under the bearing inner track ring.



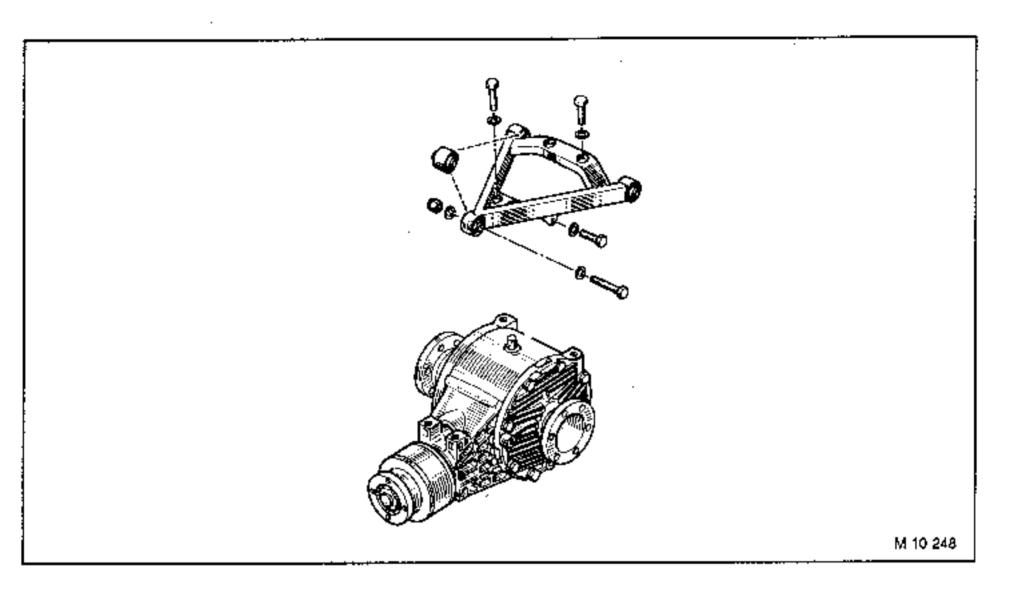
Check that the speedometer drive pinion turns freely.

Ensure that the pins are fitted the correct way round.



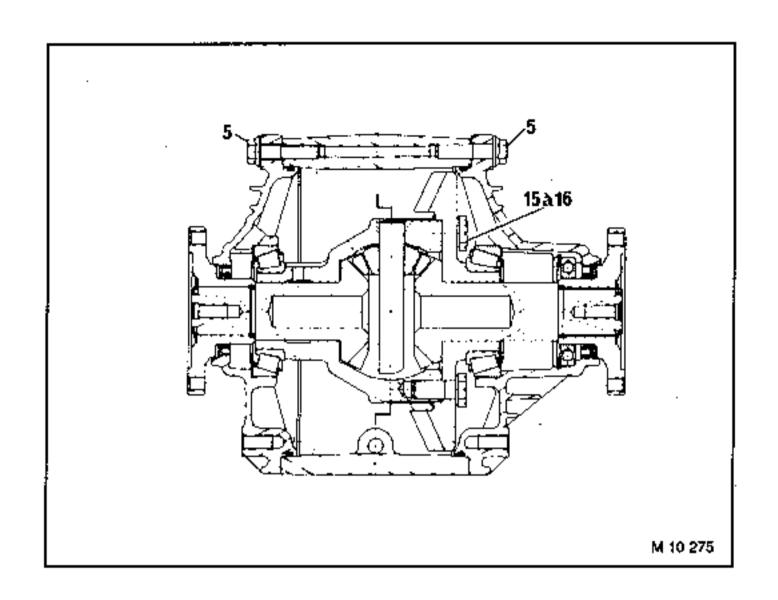


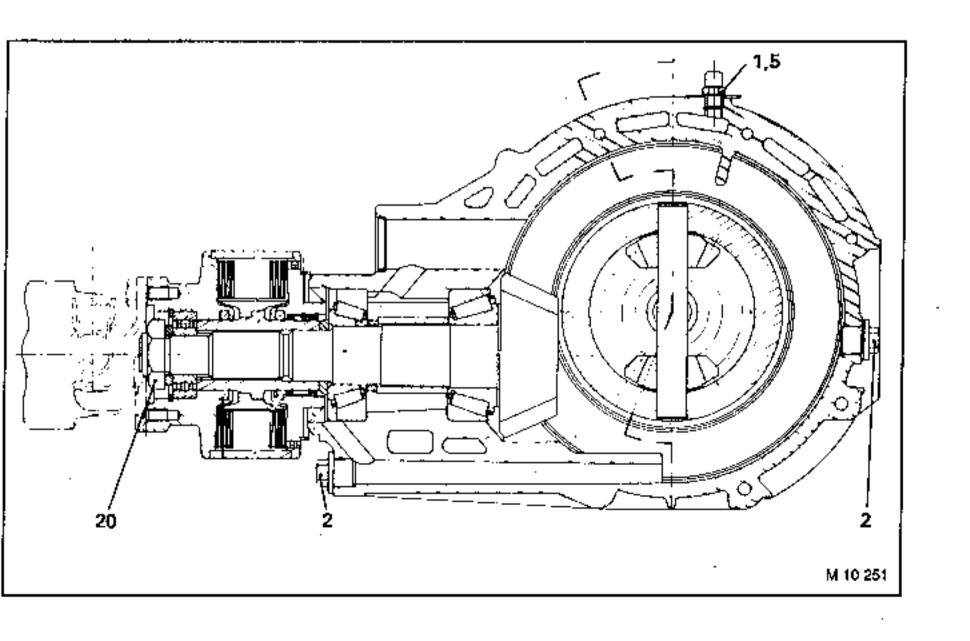
The unit is mounted on a metal sub-frame secured to the chassis by 3 flexible bushes.



Identification

Туре	Index	Crown wheel and pinion
OT 2	010	9/34 - 0,264





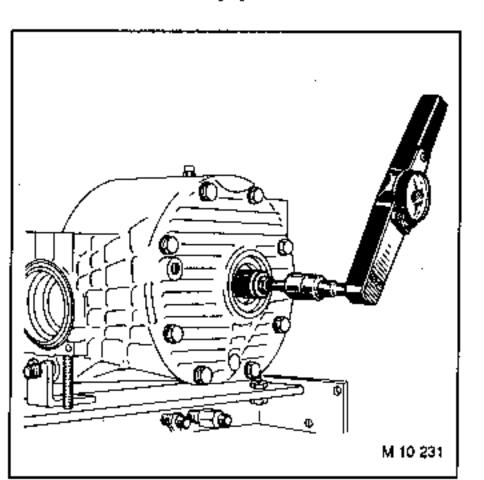
Oil SAE 80 W (SAE 75 W for cold climates) : 1.2 litres

Consumables

PACK SIZES - PART NUMBERS

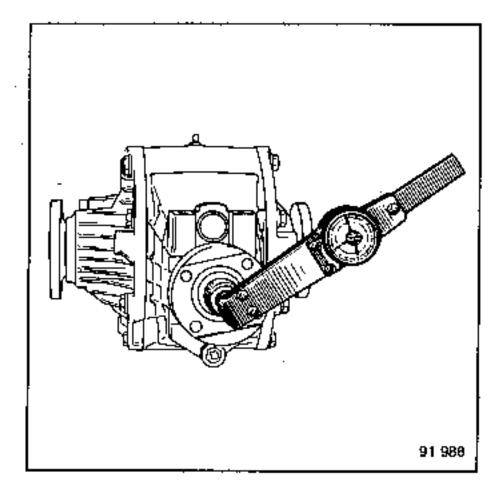
DESCRIPTION	PACK SIZE	N° M.P.R.	
• GREASE No. 20	1 g sachet	77 01 032 832	Sun wheel splines .Viscous coupling splines
- CAF 4/60 THIXO	100 g tube	77 01 404 452	Flange bolts that enter the unit housing.
• LOCTITE FRENBLOC (locking and sealing resin)	24 cc bottle	77 01 394 071	 crown wheel bolts. bolts securing rear drive shafts to final drive unit. bolts securing longitudinal transmission shaft to viscous coupling.

Differential bearing preload.



Re-used bearings	New bearings	
Free, without play	5 to 7 N.m	

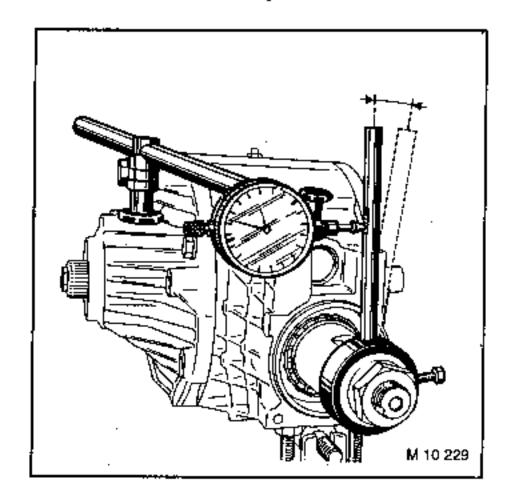
Final drive pinion bearing preload.



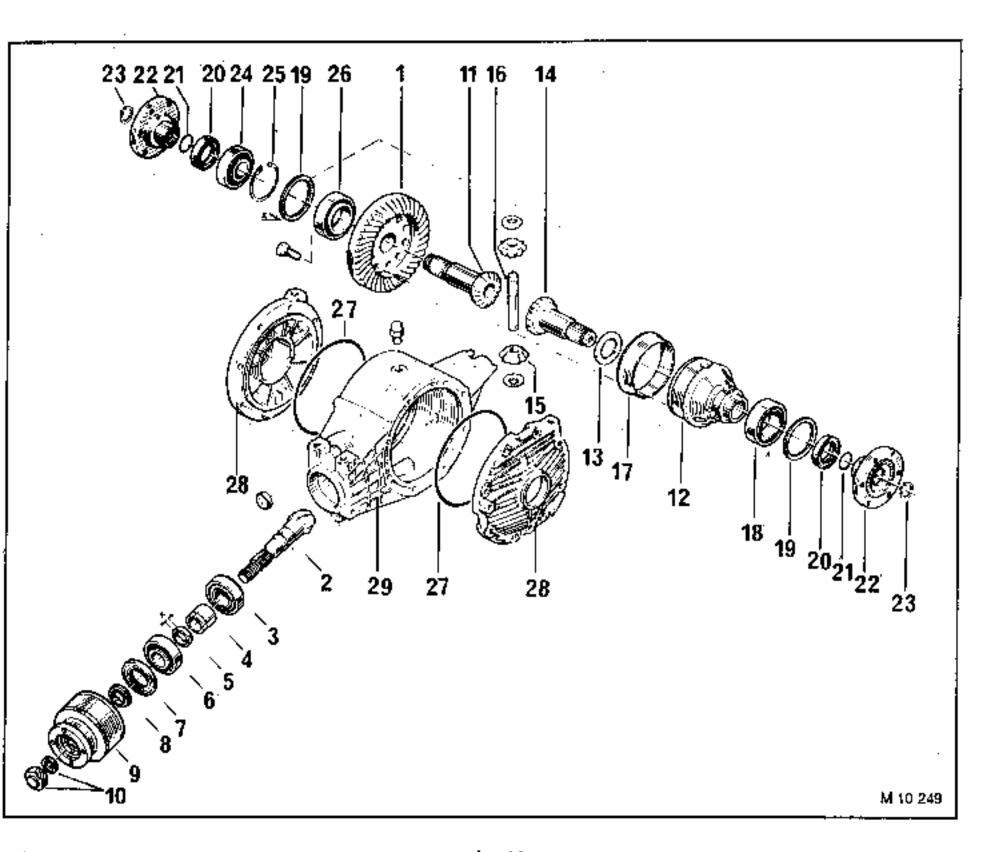
Re-used bearings	New bearings		
Free, without play	1.2 to 2.5 N.m		

The pinion depth cannot be adjusted.

Crown wheel and pinion backlash



The backlash, measured at the input flange (at a radius of 106 mm) should be between 0.60 mm and 0.90 mm.



- Crown wheel
- Pinion
- 3 Taper roller bearings
- 4 Spacer
- .- Preload adjusting spacer
- 6 Taper roller bearing
- 7 · Lip seal
- 8 Spacer
- 9 - Viscous coupling
- 10 - Washer - Nut
- 11 - Right hand sun wheel
- 12 - Differential housing
- 13 Shim washer

14

- Left hand sun wheel
- 15 Planet wheel.

- 16 Planet wheel shaft
- 17
- 18 Taper roller bearings
- 19 Shim washer
- 20 · Lip seal
- 21 - Oring
- 22
- Drive shaft flange
- 23 Circlip
- 24 Ball bearing
- 25 Circlip
- 26 Taper roller bearing
- 27 Flange O ring
- 28 Flange
- 29 Unit housing

REMOVING - REFITTING

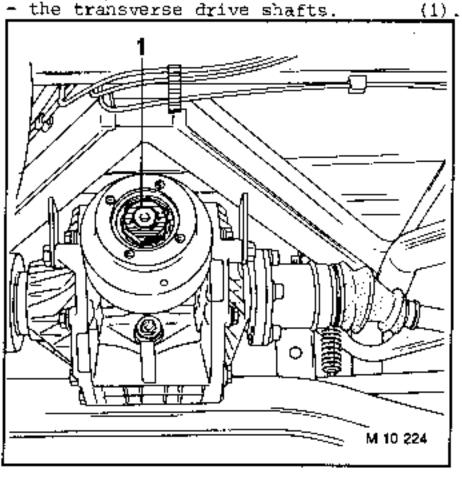
TIGHTENING TORQUE (in dan.m)	
Transmission shaft to flange bolts Transmission shaft to viscous	6
coupling securing bolts Bolts fixing final drive to support Bolts securing final drive to body	

REMOVING

Drain the final drive unit.

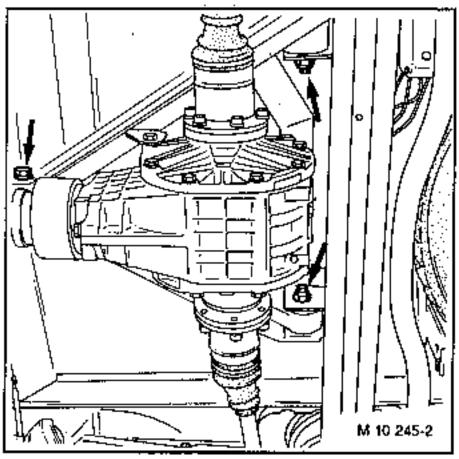
Disconnect:

the longitudinal transmission shaft.
 If the final drive unit is to be over-hauled, loosen the viscous coupling nut



Place a DESVIL V710 or SEF 6050 stand under the unit.

Remove the 3 bolts which secure the support to the body.



Lower the assembly formed by the support and the final drive unit.

Separate the final drive unit from its support (6 bolts).

REFITTING

Special points:



Tighten the nuts and bolts to the specified torques.

Fill the final drive unit with oil.

REAR FINAL DRIVE UNIT Complete Final Drive Unit (Overhaul)

	ESSENTIAL SPECIAL TOOLS
T. Ar. 1096 Rou. 604-01 T. Ar. 1099 T. Ar. 1095	Type OT unit support Type X 2 hub retainer Tool for fitting the unit input flange seal Tool for fitting the drive shaft output seal and flange
T. Ar. 1094 T. Ar. 1093	Differential bearing extractor Tool for fitting the final drive pinion bearings
T. Ar. 1140 Emb. 717	36mm socket Bearing fitting tool
T. Ar. 1097 T. Ar. 1098	Pinion preload tightening socket Tool for tightening the differential

1.18	
TIGHTENING TORQUES (in	daN.m)
Pignon nut Crown wheel bolts F.D. unit flange securing bolts Breather Filler and drain plugs	20 12 ⁻ 14 5 1,5

	CONSUMABLES
	Gearbox oil: EP 60 B For oiling all the parts and lip seals
	before reassembly
	Loctite FRENBLOC locking compound
	- Crown wheel bolts
	- Longitudinal transmission and
	transverse drive shaft bolts
	Grease No. 20
}	- Sun-wheel splines
į	- Viscous coupling splines

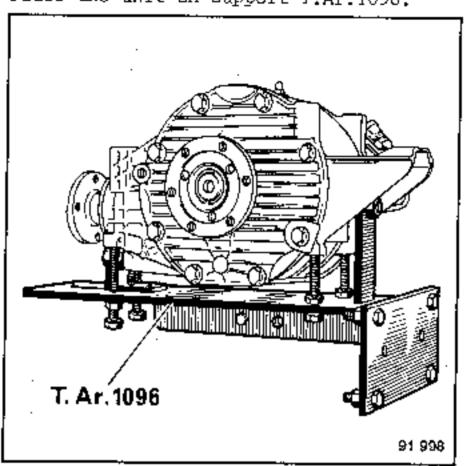
PARTS WHICH MUST BE SYSTEMATICALLY REPLACED BY NEW ONES EACH TIME THEY ARE REMOVED

- Bolts securing crown wheel to differential housing.
- Lip seals.
- 'O' ring seals.
- Viscous coupling securing nut.
 - Differential bearings.
 - Final drive pinion bearings.

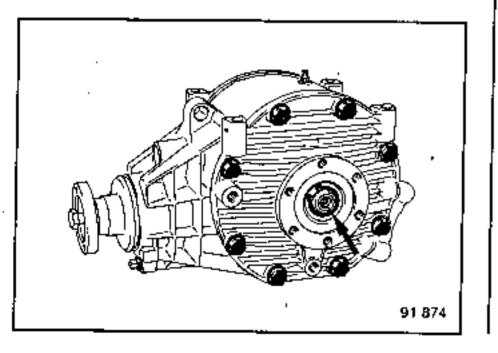
REAR FINAL DRIVE UNIT Complete Final Drive Unit (Overhaul)

Remove the final drive unit from the vehicle.

Place the unit on support T.Ar.1096.



Remove the securing circlips from the drive shaft flanges.



equivalent, remove the drive shaft flances, placing protector Rou.15-01 between the extractor and the end of the

91 874-1

-Rou. 15-01

Using extractor FACON 032-120, or an

shaft.

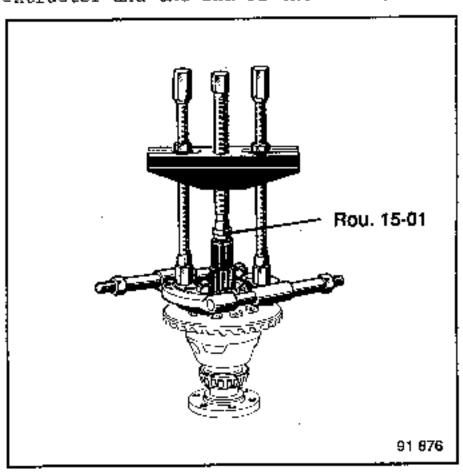
REAR FINAL DRIVE UNIT Complete Final Drive Unit (Overhaul)

DISMANTLING

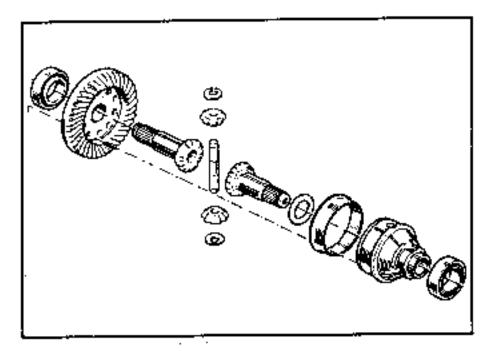
Remove the right hand final drive unit flange.

Take out the differential.

Using an extractor type FACOM U53G + U53E or an equivalent, extract the bearings, placing protector Rou. 15-01 between the extractor and the end of the shaft.



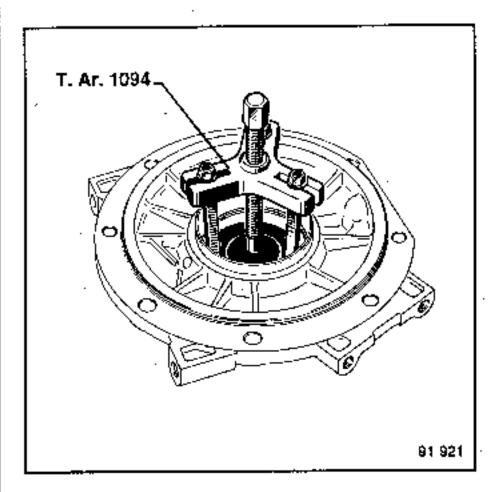
Remove the bolts which secure the crown wheel to the differential housing (these bolts cannot be reused).



Remove the planet wheel shaft retaining ring.

Separate the various parts.

Remove the bearing track rings from the differential unit flanges, using tool T.Ar. 1094.



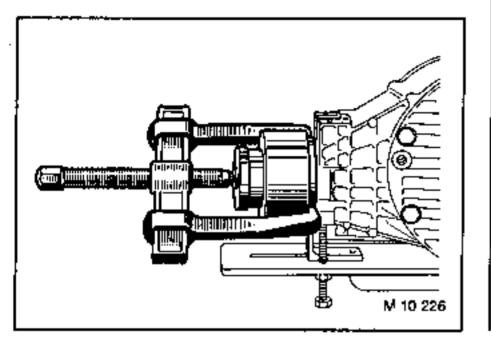
Retrieve the shims which are behind the bearing track rings and identify where they come from.

REAR FINAL DRIVE UNIT Complete Final Drive Unit (Overhaul)

DISMANTLING (continued)

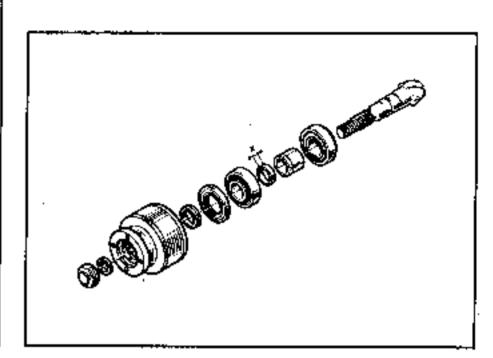
Removing the final drive pinion

Using an extractor type FACOM U32-120 or an equivalent, extract the viscous coupling.

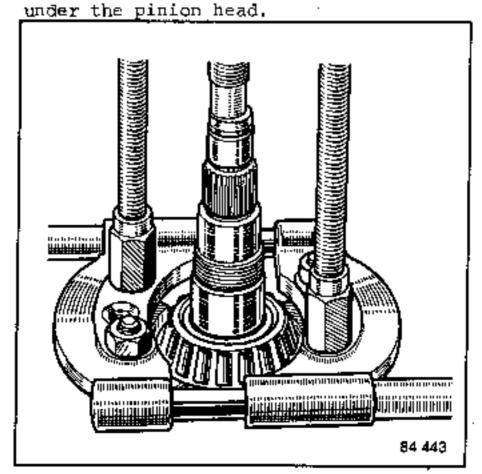


Knock out the final drive pinion with a bronze drift.

Remove the lip seal and the bearing.



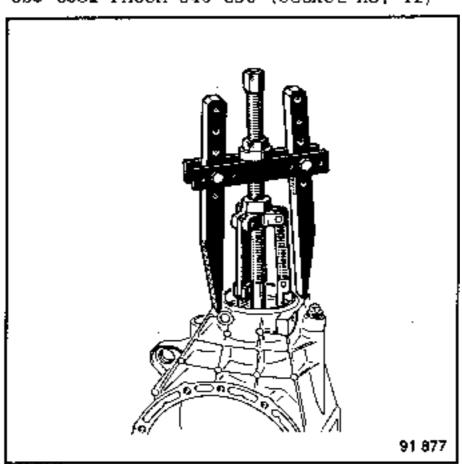
Using a tool type FACOM U53G + U53E or an equivalent, extract the bearing from



DISMANTLING (continued)

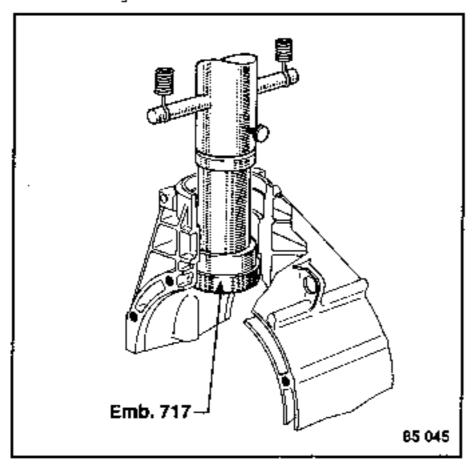
Remove the final drive pinion bearing track rings.

Use tool FACOM U40-U50 (socket no. 12)



Final Drive Pinion Bearing Track Ring:

Support the unit housing on a press and using tool Emb. 717, remove the bearing track ring.



Checking the Parts:

Check the condition:

- of the gear teeth,
- of the lip seal locating areas on the viscous coupling and the drive shaft flanges.

REAR FINAL DRIVE UNIT Complete Final Drive Unit (Overhaul)

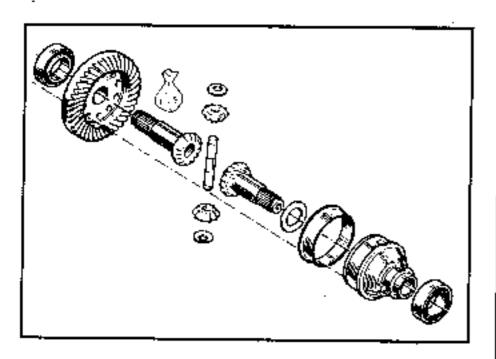
REASSEMBLY - ADJUSTMENTS

Reassembling the Differential

Special points:

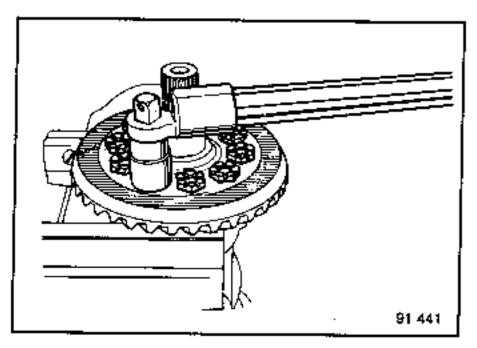
Oil all the parts before reassembly.

The bearing on the crown wheel side is wider than that on the differential housing side.



Secure the crown-wheel to the housing, using new bolts.

Tighten the bolts to the specified torque.

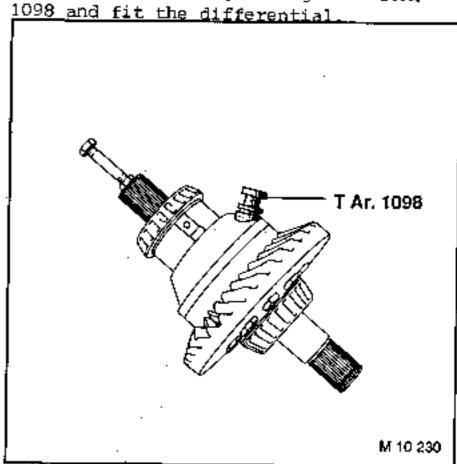


There is nothing special about refitting the bearing outer track rings. However, ensure that the shims removed during dismantling are refitted in the correct position.

NOTE: If the ball-race on the right hand flange has been replaced, the securing circlip must be correctly aligned with the oil hole to ensure that the bearing is correctly lubricated. ADJUSTING THE DIFFERENTIAL BEARING PRE-LOAD

Fit the left hand flange to the final drive unit housing.

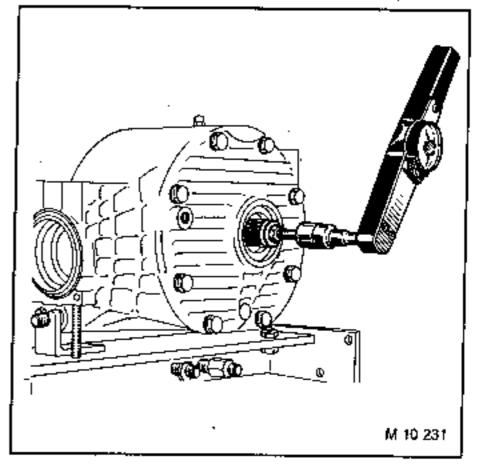
Fit differential tightening tool T.A.



Fit the right hand flange.

Tighten the flange securing bolts to the specified torque.

Measure the preload with a precision torque wrench (e.g. FACOM R250 and adaptors R232, J232) together with an M10x50 bolt screwed into the left hand sun-wheel.



REASSEMBLY - ADJUSTING THE DIFFERENTIAL BEARING PRELOAD (continued)

You may be faced with one of two cases:

- . If new bearings are fitted:
 - The differential must rotate under a load of between 3.5 and 5 N.m. This is the load required to keep the differential rotating.
- . If the original bearings are refitted:

The differential must rotate freely, but without play.

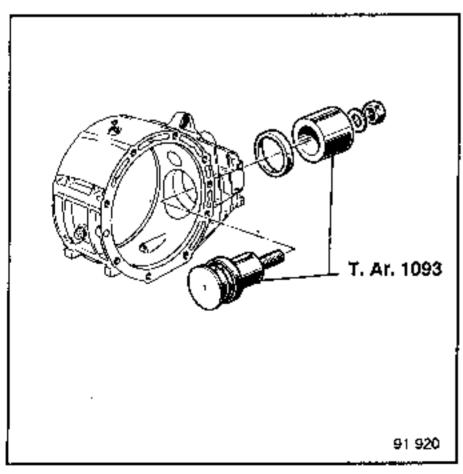
The preload is adjusted by altering the thickness of the shim packs which are behind the differential bearing track rings. One increases the preload by increasing the thickness of these shims and vice versa.

After adjustment, remove the right hand flange and the differential.

REFITTING THE FINAL DRIVE PINION

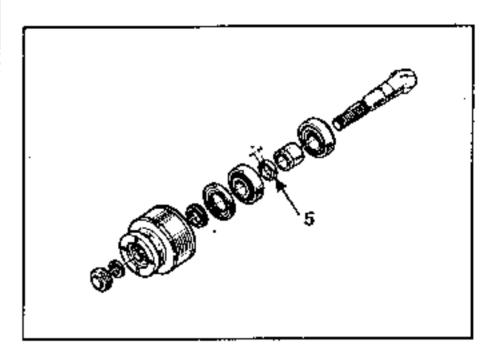
Fit the bearing under its head, using a press and a tube with an inside diameter of 36mm.

Fit the bearing track rings using tool T.Ar.1093.



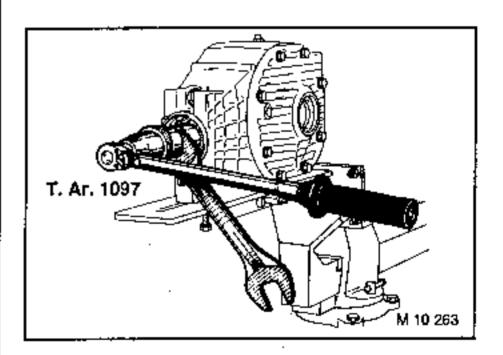
NOTE: The thinnest of the track rings is fitted on the same side as the viscous coupling.

Fit the spacer and the preload adjusting shim (5) taken out when the pinion was dismantled.



Place the assembly in the unit housing, without the differential.

Fit the outer track ring, the socket (T.Ar.1097) and tighten the nut to a torque of 20 daN.m whilst retaining the socket with a 36mm open-ended spanner.



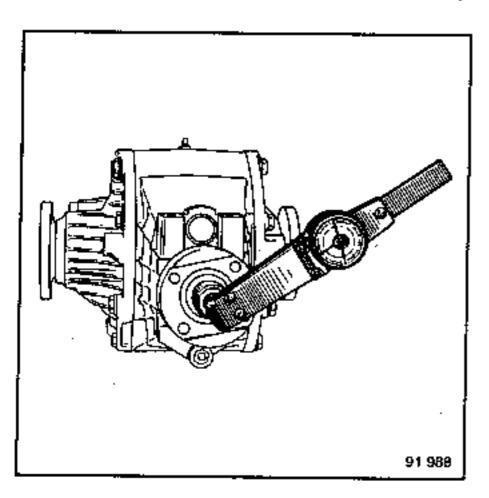
ADJUSTING THE FINAL DRIVE PINION BEARING PRELOAD

Turn the pinion through a number of turns.

Using a precision torque wrench and tool T.Ar.1140, measure the torque required to rotate it.

REAR FINAL DRIVE UNIT Complete Final Drive Unit (Overhaul)

REASSEMBLY - ADJUSTING THE FINAL DRIVE PINION BEARING PRELOAD (continued)



You may be faced with one of two cases:

- . If New Bearings have been Fitted

 The final drive pinion should rotate
 at a torque of between 1.2 N.m and
 2.5 N.m.
- . If the original bearings have been refitted

The final drive pinion should rotate without play (at a torque of between 0 and 1.2 N.m).

If the adjustment is not correct, increase or reduce the thickness of the spacer (5). By increasing the thickness of the spacer one reduces the preload and vice versa.

Spacers are available in thicknesses of 6.60mm to 7.12mm in increments of 0.06mm.

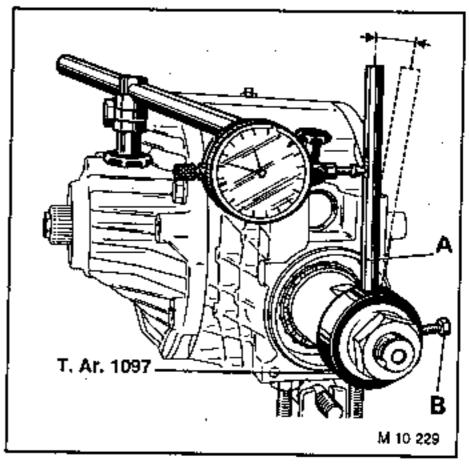
Leave the socket (T.Ar.1097) in position for the adjustment of the crown-wheel and pinion backlash.

ADJUSTING THE CROWN-WHEEL AND PINION BACKLASH

This operation is to be carried out after adjusting the differential and final drive pinion bearing preloads.

Fit:

- the differential,
- the right hand flange,
- the dial indicator support, using one of the flange securing bolts.



Tool (A) fits into socket (T.Ar.1097) and is retained by bolt (B). The dial indicator pointer is to be set on zero (at a point 106mm from the centre of the pinion).

Measure the backlash by gently rocking the nut.

Rotate the final drive pinion, take a number of backlash readings and obtain the average.

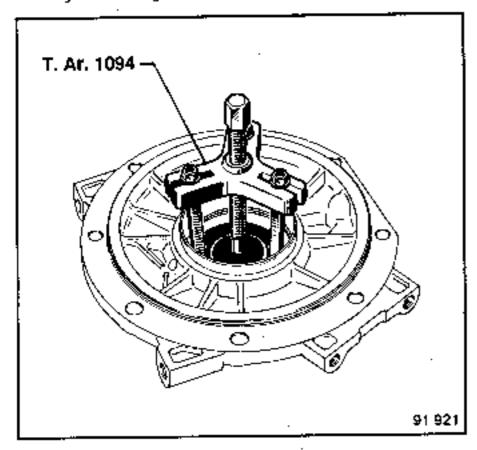
The backlash should be between 0.6 and 0.9 mm.

If the backlash is not correct, remove the right hand and left hand flanges.

REAR FINAL DRIVE UNIT Complete Final Drive Unit (Overhaul)

ADJUSTING THE CROWN-WHEEL AND PINION BACKLASH (continued)

Remove the bearing track rings from the flanges using tool T.Ar.1094.

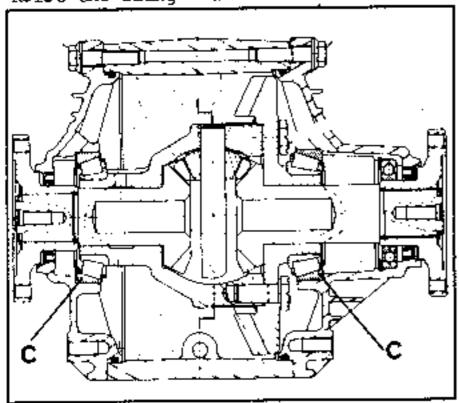


Take out the shims (C) from behind the track rings.

To reduce the backlash, reduce the thickness of the shim pack on the opposite side to the crown-wheel and take them over to the crown-wheel side (to maintain the same bearing preload).

To increase the backlash, carry out this operation in reverse. A change of 0.02mm in the thickness of the shims will vary the backlash by approximately 0.1mm.

Refit the flanges & recheck the backlash.

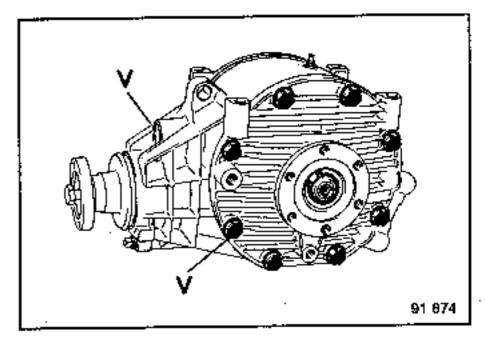


REASSEMBLY

The 2 bolts (V) on the right hand flange, which go right through the thickness of the housing, are to be coated with CAF 4/60 THIXO compound.

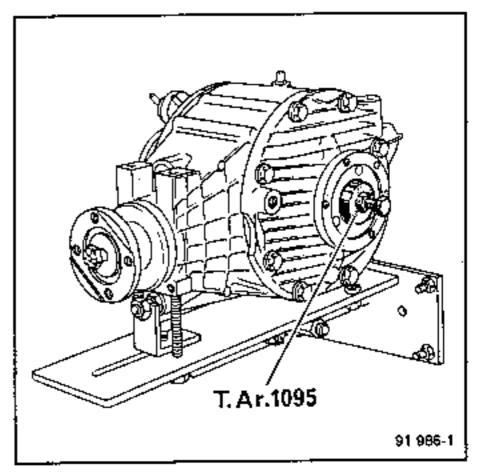


Tighten the bolts to the specified torque.



Ensure that the 'O' rings are in position on the sun-wheel.

Refit the lip seals and the transverse drive shaft flanges, using tool T.Ar.1095.



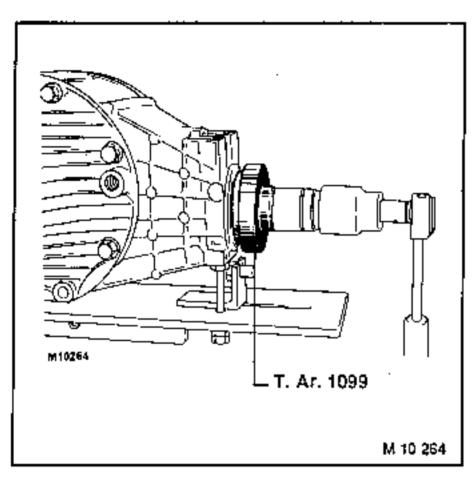
Check that the circlips are correctly positioned in the sun-wheel grooves.

FITTING THE VISCOUS COUPLING

Fit a tool (T.Ar.604-1) to each drive shaft flange.

Remove the socket (T.Ar.1097).

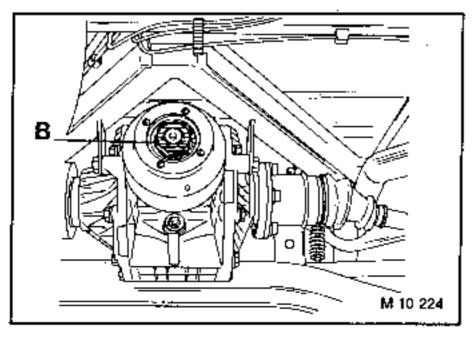
Using tool (T.Ar.1099), fit the seal.



- Grease the splines on the viscous coupling.
- Fit the viscous coupling to the final drive pinion splines.
- Fit the washer and a new nut (B).



Tighten the nut to 20 daN.m.



Lock the nut.

ESSENTIAL SPECIAL TOOLS

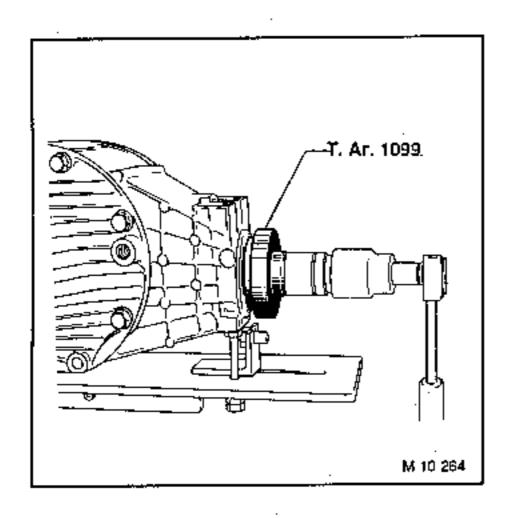
T.Ar. 1099 Tool for fitting the final drive unit input flange seal

REMOVING

Remove the viscous coupling with the extractor (see relevant section) and the spacer.

Take out the worn seal with a screwdriver oil the outside and inside of the new seal and place it on tool (T.Ar.1099).

Insert the seal using the nut and a spacer.





level.

Grease the viscous coupling splines Tighten the assembly to torque. Top up the differential unit oil

REAR FINAL DRIVE UNIT Transverse Drive Shaft Output Flange Seal

REPLACING

ESSENTIAL SPECIAL TOOLS

T.Ar. 1095 Tool for fitting the transverse drive shaft output flange seal

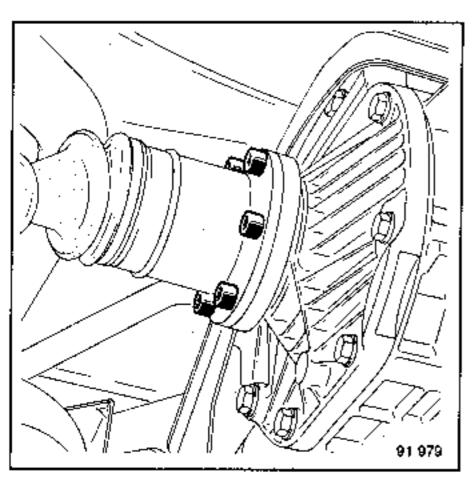
6

TIGHTENING TORQUES (in dan.m)

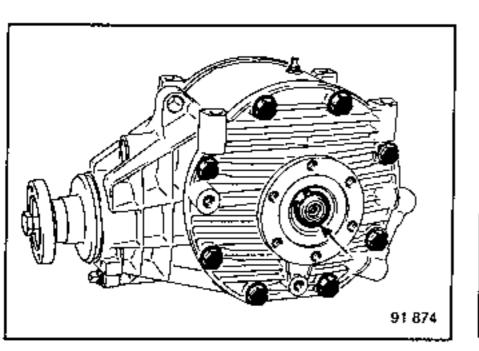
Drive shaft securing bolts

Drain the final drive unit.

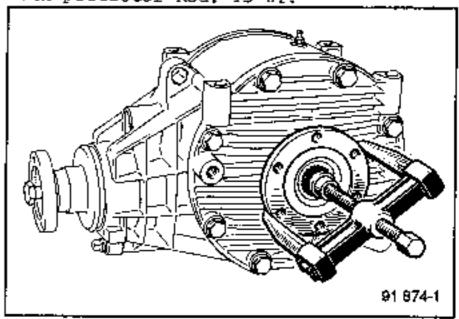
Disconnect the drive shaft on the side concerned.



Remove the sun-wheel circlip.



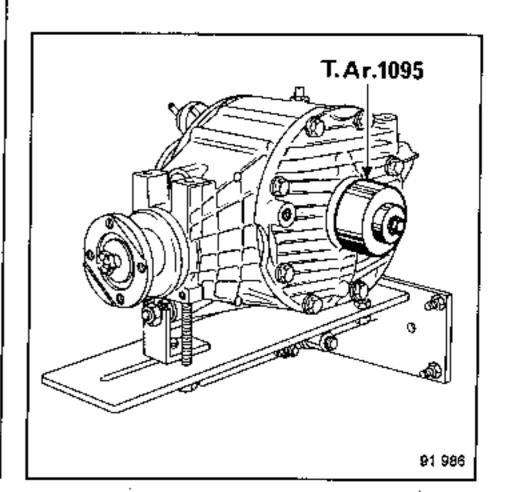
Using an extractor FACOM U32-120 or an equivalent, remove the drive shaft flance, protecting the end of the shaft with protector Rou. 15-01.



Take out the seal with a screwdriver.

REFITTING

The new lip seal is fitted using tool T.Ar.1095 to position it correctly.



REAR FINAL DRIVE UNIT Transverse Drive Shaft Output Flange Seal

REPLACING (continued)

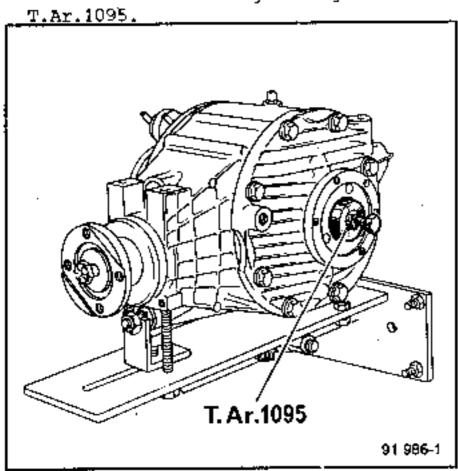
NOTE: The outside diameters of the left hand and right hand lip seals are different.

right hand side : Ø 64mm
left hand side : Ø 62mm

Check that the 'O' ring is in position on the sun-wheel.

Refit:

- the drive shaft flange using tool



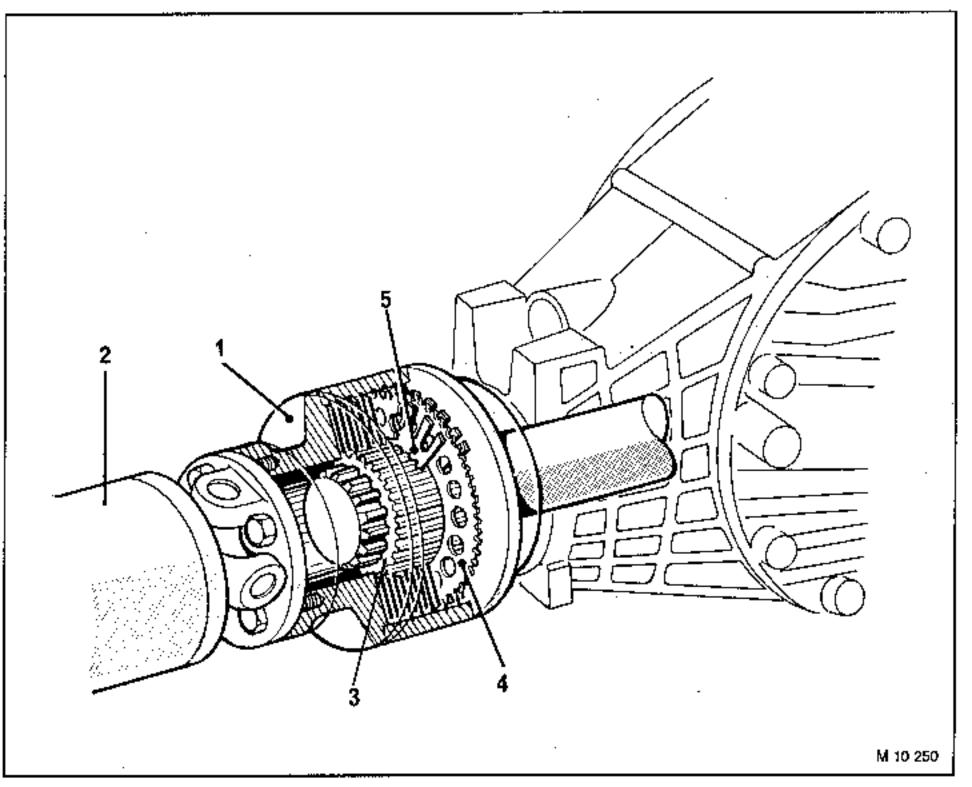
- _ the circlip,
- _ the drive shaft.



Tighten the bolts to the specified torque.

Refill the final drive unit with oil.

DESCRIPTION



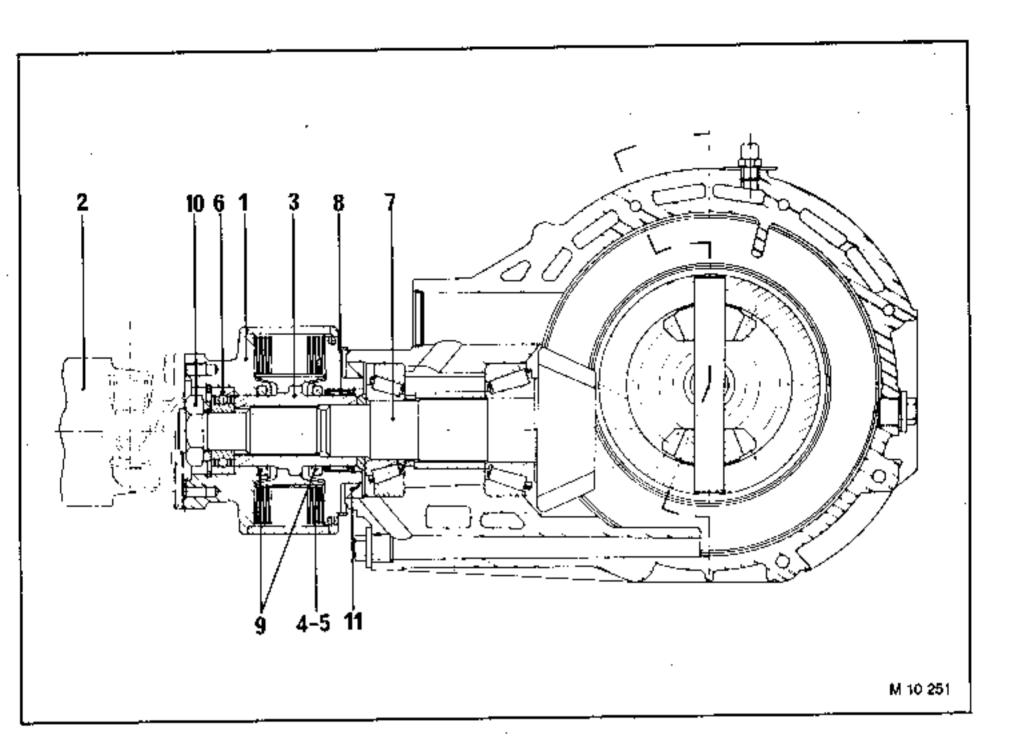
This consists:

- . of an OUTER HOUSING (1) connected to the longitudinal transmission shaft (2).
- . of an INTERNAL DISC CARRIER (3) connected to the final drive pinion.
- . of 2 SERIES OF DISCS:
 - one series of DISCS (4) secured to the outer housing (by external splines),
 - another series of DISCS (5) secured to the disc carrier (by internal splines).

The discs of these 2 series alternate with one another and are split and pierced to set up turbulent flow between them.

. of SILICON OIL occupying the volume between the outer housing and the inner disc carrier and surrounding the discs. A bubble of air is left in the assembly when it is filled with oil.

It is not possible to TOP UP THE OIL in this unit.



. 2 BEARINGS:

- a SEALED BALL RACE (6) mounted at the front, between the outer housing (1) and the final drive pinion shaft (7).
- a NEEDLE RACE (8) lubricated by the oil in the final drive unit, is mounted at the rear end between the outer housing (1) and the inner disc carrier (3)
- . 2 INTERNAL SEALS (9) which are resistant both to high pressure and high temperature.

METHOD OF SECURING TO THE FINAL DRIVE PINION SHAFT

THE CRIMPED NUT (10) secures this assembly to the final drive pinion shaft (7). Its tightening torque defines the preload in the taper roller bearings.

A SEAL (11) seals the final drive unit (it runs on the outer housing).

REAR FINAL DRIVE UNIT Viscous Coupling

PRINCIPLE OF OPERATION

If there is a difference between the speeds at which the wheels on the front and rear axles are turning, that is to say if THE ADHERENCE AT ONE OR MORE OF THE WHEELS FALLS (for example, drive wheels slipping on starting, loss of adherence caused by road conditions, sand, gravel, ice, snow etc ...), the VISCOUS COUPLING AUTOMATICALLY TRANSFERS SOME OF THE DRIVE TORQUE TO THE AXLE ON WHICH THE GROUND ADHESION IS BEST, as follows:

THE DIFFERENCE IN THE SPEED BETWEEN THE TWO SERIES OF DISCS (one of which being connected to the front axle and the other connected to the rear axle) causes the SILICON oil to WARM UP and therefore to EXPAND.

The consequences of this are:

- 1) AN INCREASE in the transfer of shear forces through the fluid, which tends to equalize the rotating speeds, and this TRANSFERS some of the TORQUE TO THE AXLE ON WHICH THE ADHESION IS BEST.
- 2) A tendency to BRING THE DISCS CLOSER TO ONE ANOTHER to further accentuate the above phenomenon.

When the speeds at which the discs are turning TEND TO APPROACH ONE ANOTHER, THE HEATING EFFECT AND EXPANSION of the oil IS REDUCED, and this returns the viscous coupling to its normal condition if the adherence at the wheels on the two axles becomes more uniform, that is to say if the rotational speeds come closer to one another. THE VISCOUS COUPLING therefore carries out the function of DISTRIBUTING THE TORQUE between the 2 axles.

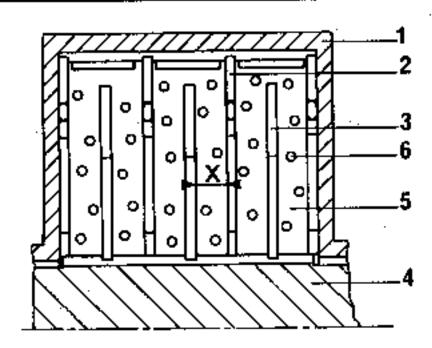
THE CRITICAL MODE

If there is a CONSIDERABLE DIFFERENCE BETWEEN THE SPEEDS OF THE TWO AXLES (in the extreme case, for example, of a wheel on one of the axles becoming bogged down), lasting over a prolonged period (more than a few seconds), the silicon oil expands to a considerable extent, the trapped volume of air will be compressed, and this will cause an INCREASE IN THE INTERNAL PRESSURE (which can reach 120 bars). This forces the discs against one another in the same way as on a clutch, and the viscous coupling will LOCK.

With the discs forced against one another, the shear forces in the oil will fall and with it its temperature. This means that the unit will progressively return to the normal condition if the wheel adherence becomes uniform.

This system has 2 advantages:

- . It passes a VERY HIGH TORQUE (up to 90%) to the WHEELS ON WHICH THERE IS ADDRESION.
- . It momentarily protects the VISCOUS COUPLING by limiting the extent to which the oil temperature can rise.



VISCOUS COUPLING WHEN NOT OPERATING



2 : DISCS

3 : DISCS

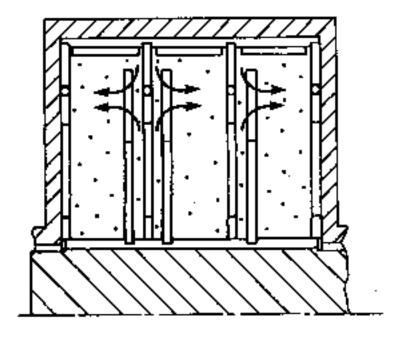
4 : INNER DISC CARRIER

5 : SILICON OIL

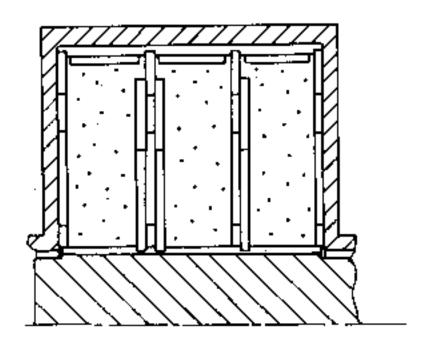
6 : AIR BUBBLES

X : initial clearance between

the discs



NORMAL OPERATION



CRITICAL MODE: DISCS FORCED AGAINST EACH OTHER

M 10 252

REMOVING - REFITTING

ESSENTIAL SPECIAL TOOLS

T. Ar. 1140 35mm socket

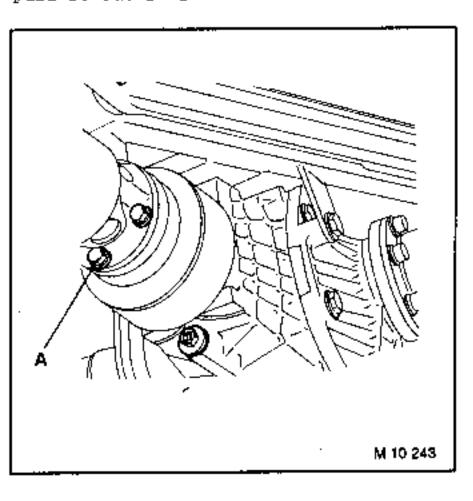
Special Features:

The viscous coupling cannot be repaired. The only operation which can be carried out on it is the replacement of the front ball race.

REMOVING

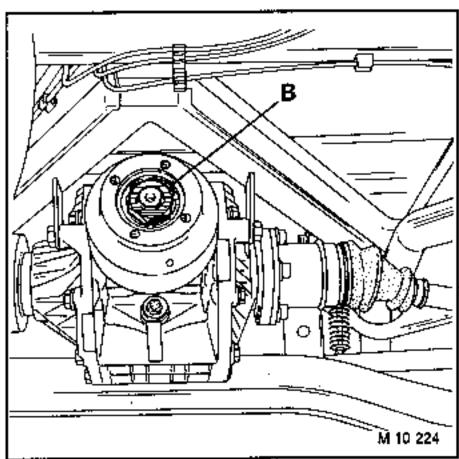
Drain the final drive unit.

Remove the 4 bolts (A) which secure the longitudinal transmission shaft and pull it out rearwards.

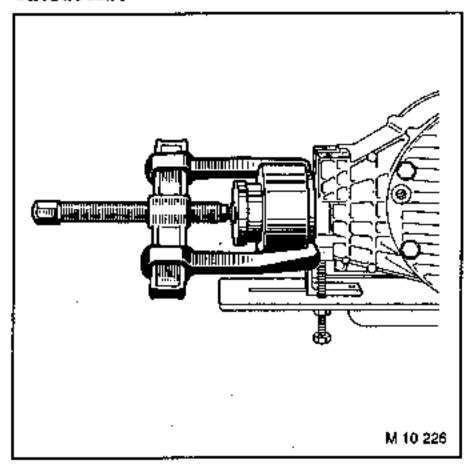


Remove:

- the dust seal (B),
- the viscous coupling securing nut, using tool T.Ar.1140.



Take off the viscous coupling with the extractor.



REFITTING

Carry out the removing operation in reverse.



Grease the seal and tighten the nut (to 20 daN.m).

Coat the securing bolts on the viscous coupling with Loctite FRENBLOC locking compound and tighten them to the specified torque.

Fill the final drive unit with oil.

REPLACING THE BALL RACE

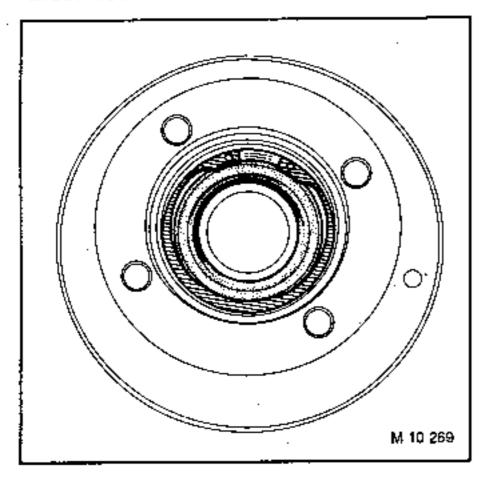
ESSENTIAL SPECIAL TOOLS

Inertia Extractor

Remove the viscous coupling.

Remove the circlip.

Remove the bearing, using the inertia extractor.



Push in the new bearing on the press, taking the load on the outside diameter through a socket.

Refit the circlip and the viscous coupling.

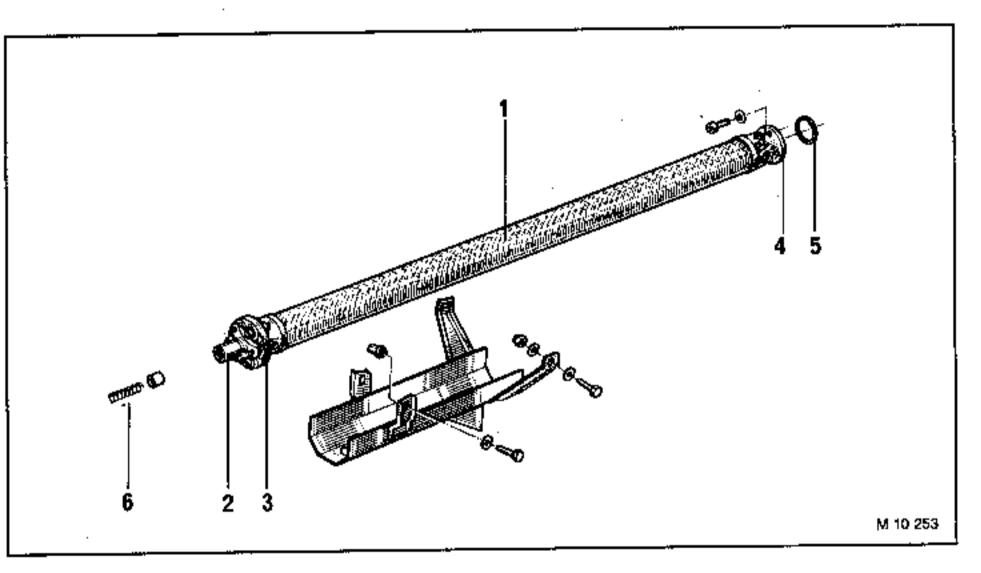
FRONT TRANSVERSE DRIVE SHAFTS

These are identical to those of the conventional ESPACE.

REAR TRANSVERSE DRIVE SHAFTS

The left and right hand drive shafts are identical. They each comprise 2 identical constant velocity joints of the GI 72, 3 roller type.

LONGITUDINAL TRANSMISSION SHAFT

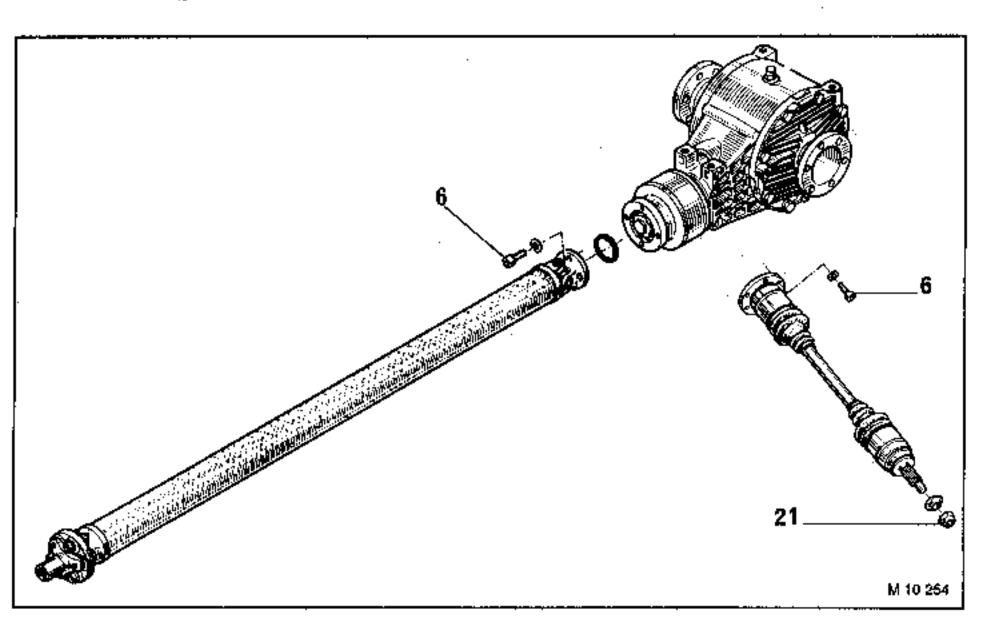


This consists of:

- A HOLLOW SHAFT (length = 1.6m) (1) made from a composite material consisting of wound fibre strands (75% carbon fibre and 25% glass fibre) impregnated with EPOXY resin; it weighs 0.8 kg.
- . A SPLINED FEMALE END (2) at the front connected to the output shaft by a flexible coupling (3). This end fitting is greased and can slide lengthwise on the gearbox output shaft.
 - A spring (6) is placed between the gearbox output shaft and the end fitting (2) to absorb vibration. (This is only on the early models).
- . A UNIVERSAL JOINT (4), at the rear end, secured to the viscous coupling by 4 bolts. There is a seal (5) between it and the viscous coupling.

This assembly, which is balanced during manufacture, weighs 3.3 kg.

TIGHTENING TORQUES (in dan.m)



CONSUMABLES

Grease for longitudinal transmission shaft splines: MOLYKOTE BR2

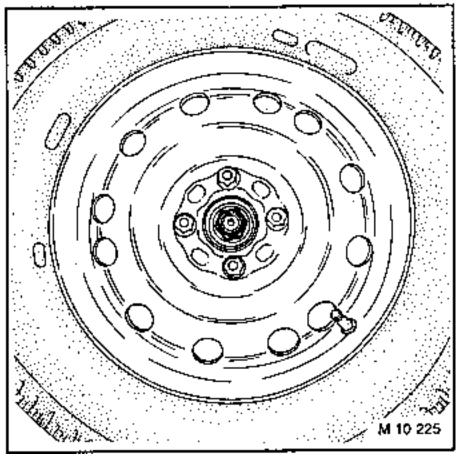
REPLACING

	TIGHTENING TORQUES (in dan.m)	
 	Drive shaft nuts Bolts securing assembly to sun-wheel	21 6

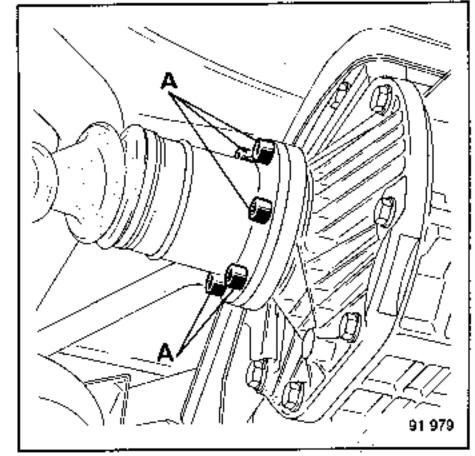
REMOVING

Remove:

- the wheel trim,
- the drive shaft nut.



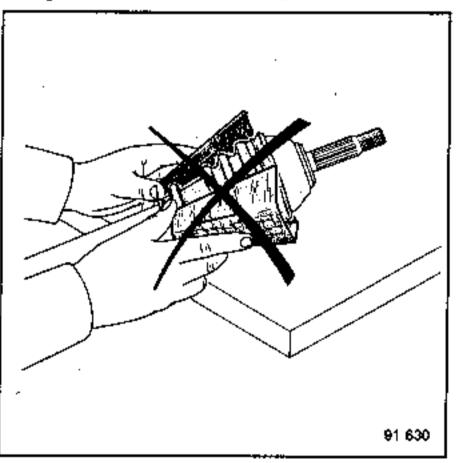
- the six bolts (A) securing the drive shaft to the sun-wheel.



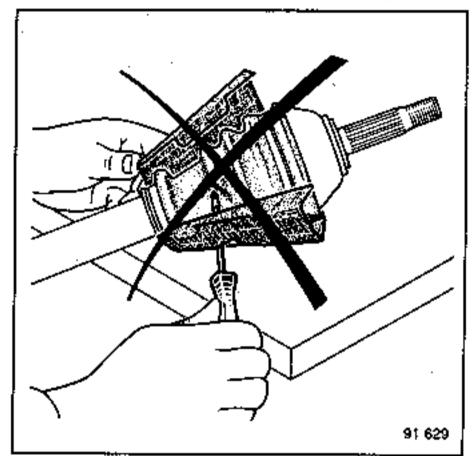
REFITTING

NOTE: From now on the Parts Dept will supply each drive shaft fitted with protectors and provided with fitting instructions. It is essential to follow these to ensure that the reassembly operations are carried out to the HICH-EST STANDARDS. Note that even the slightest impact on the bellows will cause the rubber to fail, in the short or long term, and the shaft to be irreparably damaged.

Do not remove the cardboard protectors from the drive shaft until it has been fully fitted to the vehicle.



Under no circumstances is any form of sharp tool which could damage the bellows to be used during these operations



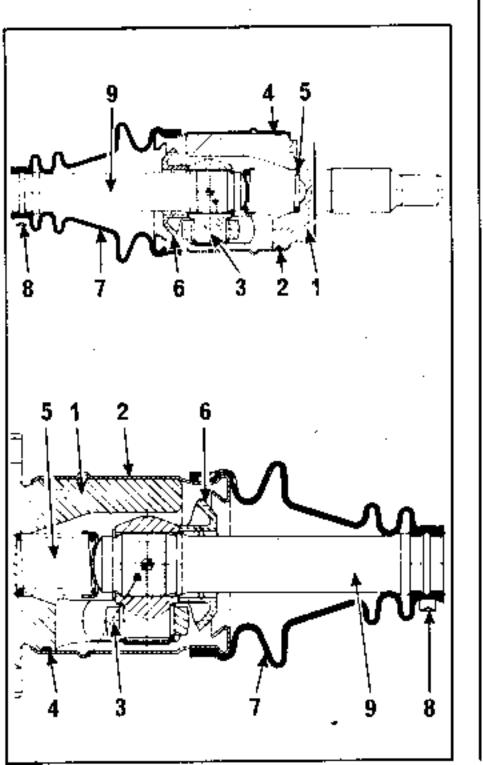
- Insert the drive shaft stub axle into the hub.
- Coat the 6 bolts (A) with Loctite FRENBLOC locking compound.
- Secure the drive shaft to the differential sun-wheel (with bolts A) and tighten them to the specified torque.
- Remove the cardboard protectors.

ESSENTIAL SPECIAL TOOLS

T. Av. 1034 Drive shaft clip crimping pliers

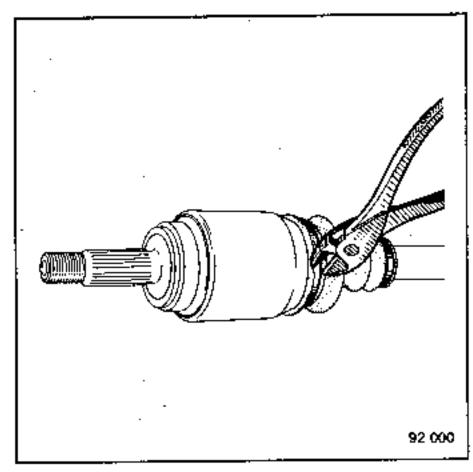
GI - 72

- 1 Yoke housing
- 2 Sheet steel cover
- 3 Spider
- 4 Seal
- 5 Spring
- 6 Stop pad
- 7 Rubber bellows
- 8 Retaining clip
- 9 Drive shaft

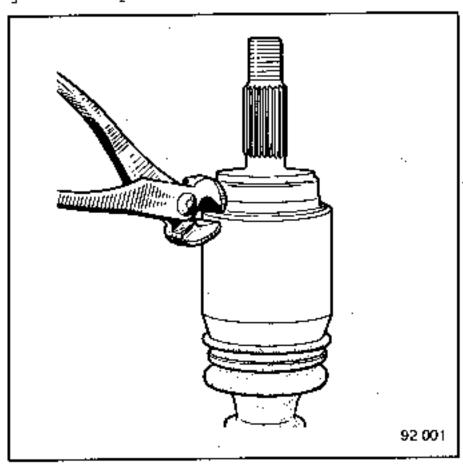


DISMANTLING

Cut the crimped clips.



Uncrimp the sheet steel cover from the yoke, pull it back and remove as much grease as possible from it.

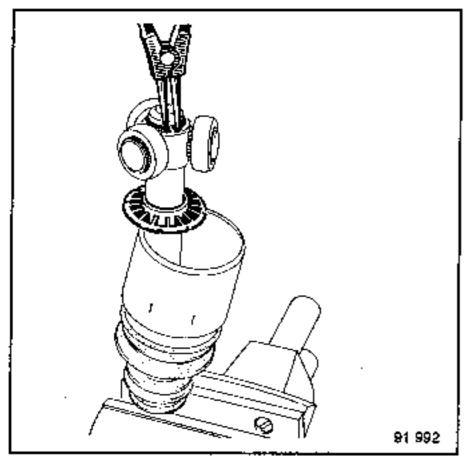


Remove:

- the yoke (3),
- the spring and its locating cup (5).

Never remove the rollers from their respective shafts because the rollers and needle races are matched and must never be intermixed.

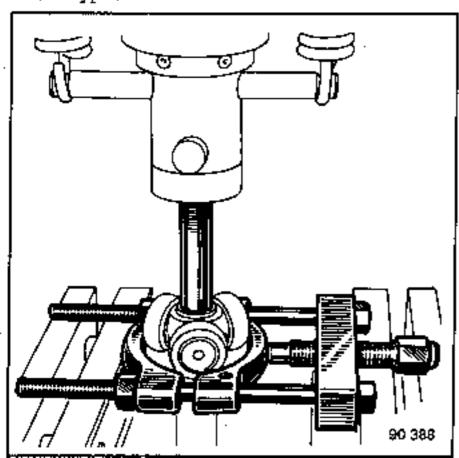
Remove the circlip.



Never clean the component parts with thinners or solvent.

Mark the position of the spider.

Remove the spider, on the press, taking the load on an extractor of the FACOM U53G type.



Remove:

- the stop pad (6),

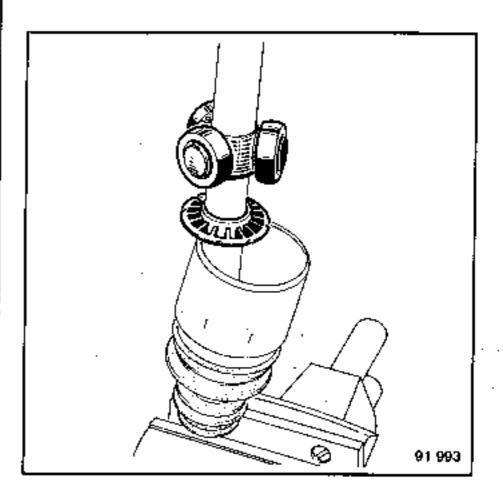
- Joint GI - 72
- the sheet steel cover (2),
- the rubber bellows (7).

REASSEMBLY

Lubricate the drive shaft and fit:

- the two clips round the shaft if they are not of the "open" type.
- the bellows and a new sheet steel cover,
- the stop pad (6).

Reflt the spider to the splined shaft in its original position.

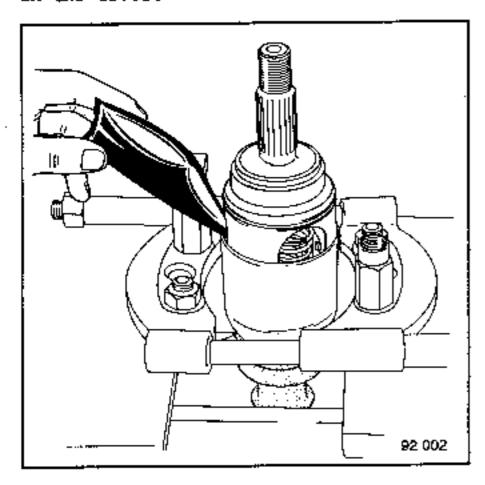


Refit the retaining circlip.

Fit the seal (4) into its groove on the yoke and fit the yoke, the spring and its locating cup into the cover.

Place the premeasured amount of grease into the cover through the apertures in the yoke.

Position a tool of the FACOM U53G type on the cover.

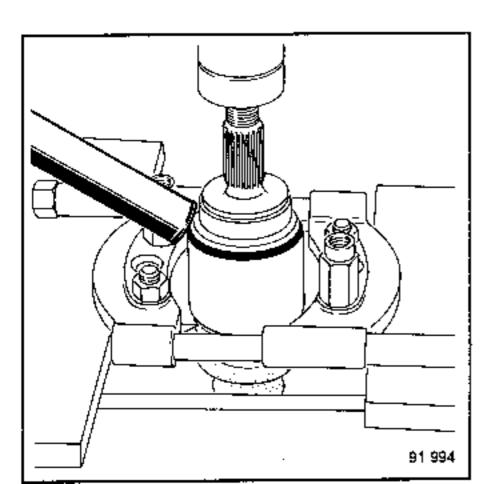


The yoke is inserted on the press.

Push the yoke fully in.

DO NOT ALLOW THE PRESSURE TO RISE.

In this position, crimp the cover onto the yoke.

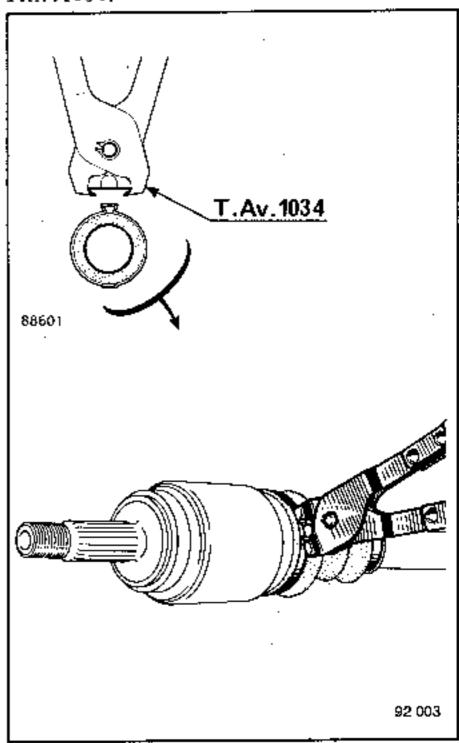


GI - 72

Place the lips of the bellows in the grooves in the drive shaft and in the cover.

Insert a rod with no sharp edges and with a rounded end between the bellows and the shaft to permit the correct volume of air to establish itself inside the joint.

Fit the clips and crimp them with tool T.Av.1034.



ESSENTIAL SPECIAL TOOLS

Heat Shield

TIGHTENING TORQUE (in dan.m)

Transmission shaft bolts _____6

REMOVING.

Place the vehicle on a lift.

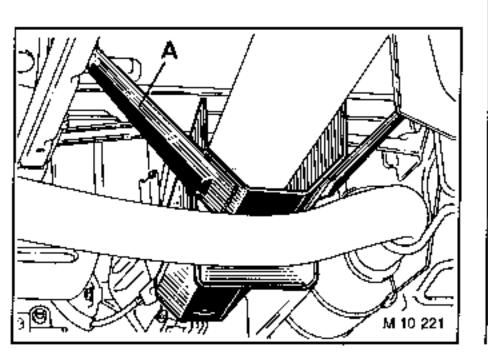
Do not engage a gear and do not apply the handbrake.

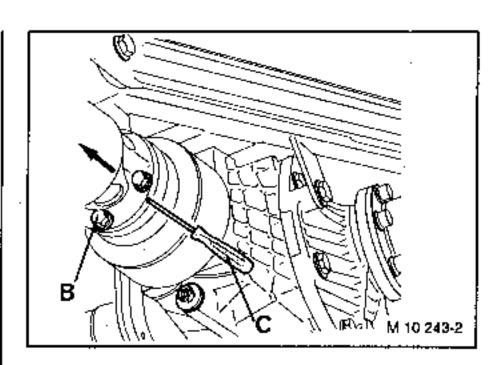


Place the heat shield between the exhaust pipe and the transmission shaft housing to prevent the shaft being damaged by making contact with a hot exhaust pipe.

Loosen the 4 bolts which socure the transmission shaft housing (A) and remove it.

Remove the 4 transmission shaft securing bolts (B).





With a flat screwdriver (C) placed between the universal joint and the viscous coupling, lever the universal joint forwards to free the viscous coupling (to compress the spring (6) between the gearbox output shaft and the splined end on the transmission shaft)*.

Free the transmission shaft by pulling it rearwards.

WARNING: Retrieve the spring (6), when applicable, and ensure it is refitted*.

PRECAUTIONS

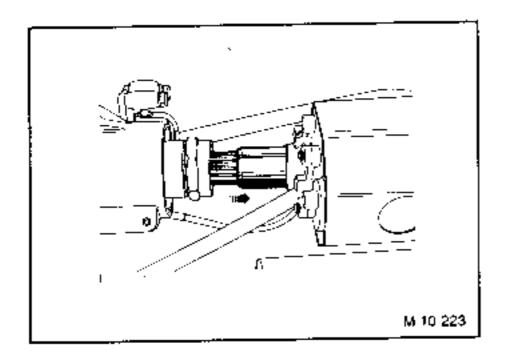
This shaft is made from a composite material which can be damaged by impact or contact with very hot parts.

These operations are only necessary on shafts fitted with a spring (6) (as fitted to the early models only).

REFITTING

Place the scal (C) in the viscous coupling.

Lightly coat the splines at the gearbox end with Molykote BR2 grease.

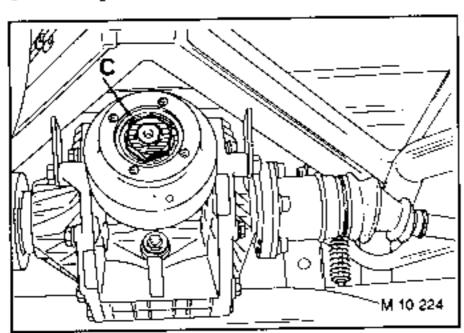


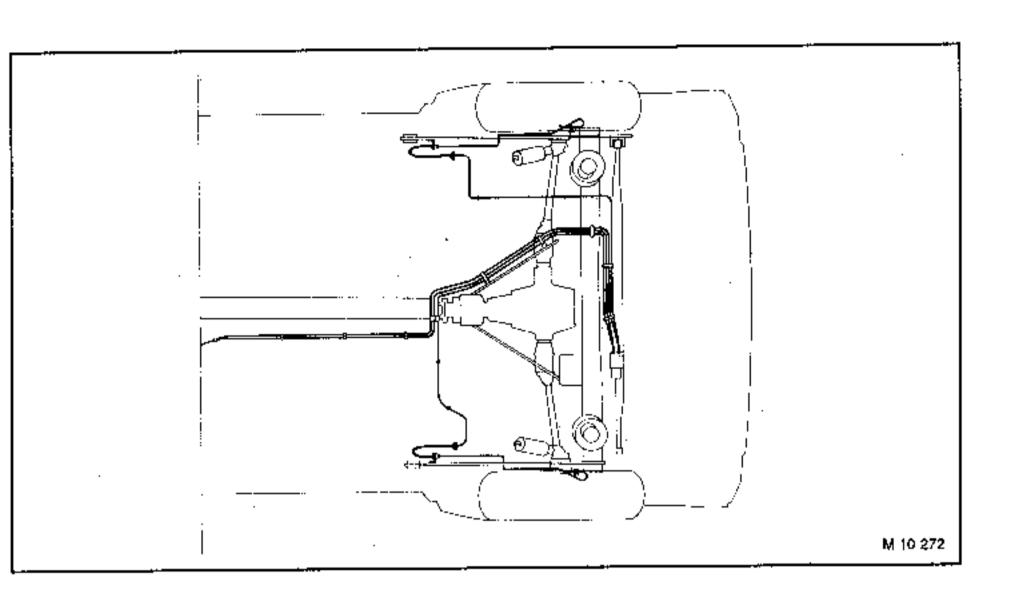
Coat the bolts on the viscous coupling with Loctite FRENBLOC locking compound.

Refit the shaft, pushing it as far forward as it will go to secure it to the viscous coupling. Move the vehicle forwards or backwards to align the securing holes.

Tighten the bolts to the specified torque.

Fit the protective casing*.





Specifications - Dimensions of main braking system components

FRONT BRAKES

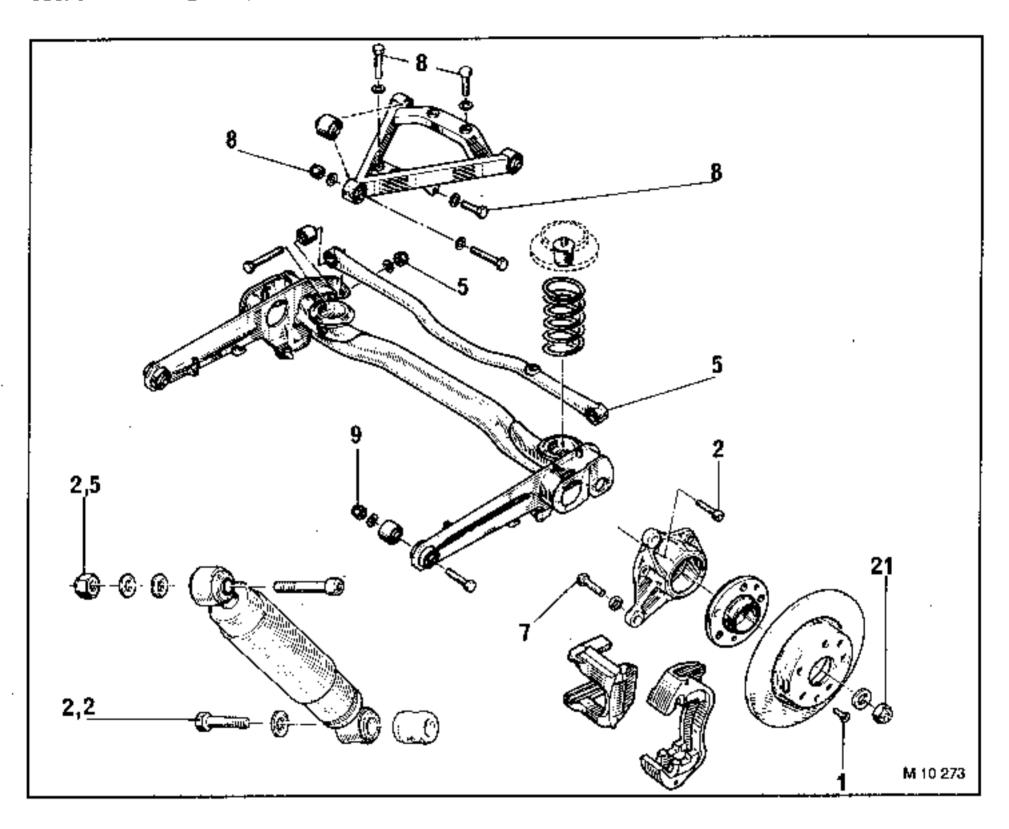
These are identical to those of the conventional ESPACE.

REAR BRAKES

Caliper cylinder diameter	36	\overline{m} m
Disc diameter		$\mathbf{m}\mathbf{m}$
Thickness of discs	10.5	
* Minimum thickness of discs		m
Thickness of pads (including back plate)	14	
Minimum thickness of pads (including back plate)	6	mm
Maximum disc run-out	0.07	mm
Pad grade (depending on version) :		
- with asbestos TEX	XTAR T	269
- without asbestos TEX	XTAR T	424

^{*} The brake discs cannot be refaced. If they are excessively scored or worn they must be replaced by new ones.

TIGHTENING TORQUES (in daN.m)



Consumables

- Transmission shaft splines
- Wheel bolts
- Wheel hubs
- Brake caliper securing bolts
- : HATMO grease .
- : ELF MULTI grease
- : oil SAE BOW
- : Loctite FRENBLOC (2 to 3 drops)

Parts to be replaced by new oneswhenever removed

- Rear hub bearings
- Bearing circlips
- Rear transverse drive shaft self-locking nuts
- Bearing carrier securing bolts
- Self-locking nuts securing axle assembly components

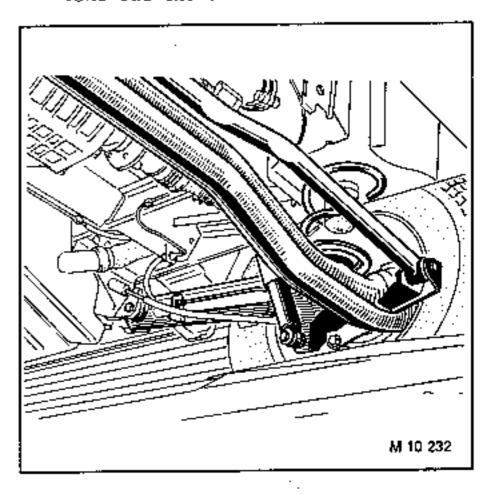
REMOVING - REFITTING

Tightening torques (in daN.m)	
Axle arm securing nuts	9
Guide bar securing nuts	5
Drive shaft/hub securing nuts	21
Shock absorber upper securing bolts	2,5
Shock absorber lower securing bolts	.,2,2
Drive shaft/final drive flange securing	bolts6
Wheel bolts (light alloy wheels)	9
Wheel bolts (pressed steel wheels)	6,5

REMOVING

- Support the rear end of the vehicle on stands.
- Remove the rear wheels.
- Disconnect the hand brake cables at the caliper ends.
- Disconnect the brake pipes at the axle arm ends.
- Remove the drive shafts (see corresponding section).
- Place a jack under the axle assembly.
- Slightly compress the springs.
- Remove the lower fastenings from the shock absorbers.
- Remove the fastening that secures the guide bar to the axle and secure the bar to part of the chassis.
- Remove the side suspension arm fasten+*
 ings.

- Lower the jack and remove the springs.
- Take out the axle.



REFITTING

- Carry out these operations in the reverse order.
- Tighten the fastenings to the specified torques.
- Bleed the braking system and adjust the hand brake (see corresponding sections).
- Check and adjust the brake compensator (see corresponding section).

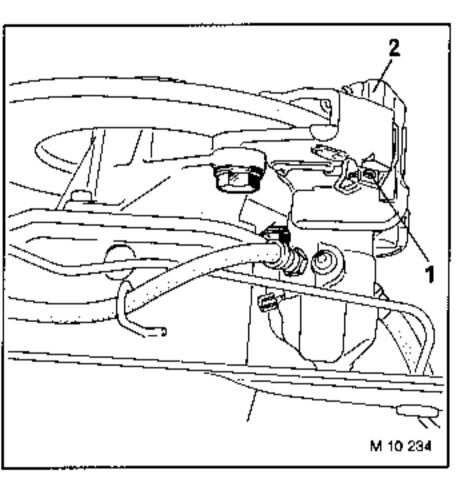
REPLACING

TIGHTENING TORQUES (in dan.m)			
Wheel bolts (light alloy wheels)	9		
Wheel bolts (pressed steel wheels)	6,5		

WARNING: The pads must be fitted with their retaining stops (A) downwards to prevent the pads coming out of their locations when worn.

REMOVING

Disconnect the hand brake cable.



Remove :

- the two pins (1),
- the two keys (2), using a pin punch,
- the caliper,
- the pads.

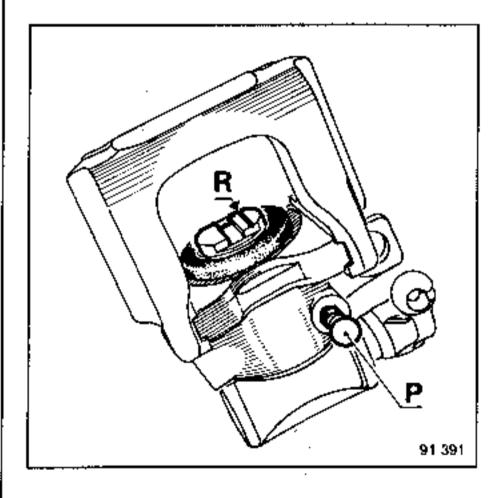
Checking :

Check that the piston dust cover is in good condition and correctly positioned and also check the springs under the pads.

REFITTING

Push in the piston by screwing it in with a square section screwdriver until it no longer moves inwards.

Position the piston so that the line R on its thrust face is on the same side as the bleed screw.



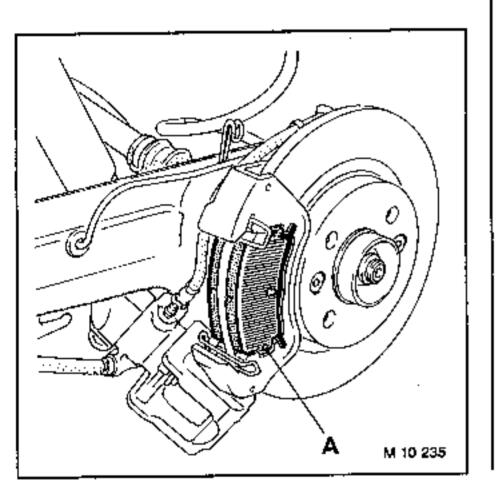
NOTE :

On German, Swiss and Austrian versions, fit only TEXTAR T424 pads (without asbestos).

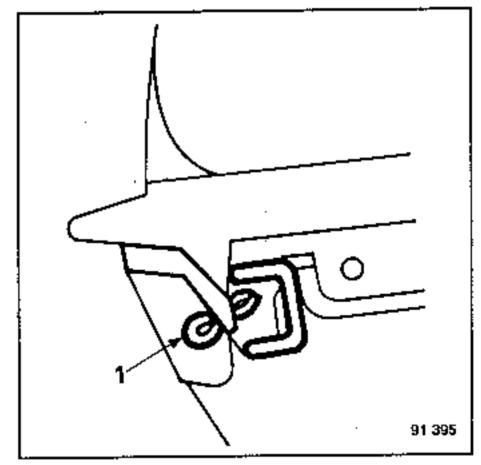
REPLACING (continued)

Fit:

- the new pads on their springs,
- the caliper between the clip spring and the key locating area on the caliper brack-et.



- the first of the keys,
- insert a screwdriver into the second key location and insert the key by pressing down the screwdriver,
- the two pins (1) that retain the keys.



Reconnect the hand brake cables.

Depress the brake pedal several times to bring the piston into contact with the pads.

REMOVING - REFITTING - OVERHAULING



TIGHTENING TORQUES (in daN.m)

Wheel bolts (light alloy wheels) 9
Wheel bolts (pressed steel wheels)6.5

REMOVING

Loosen the brake hose at the caliper cylinder end.

Remove the brake pads (see the corresponding section).

Unscrew the caliper piston from the hose (provide a container to catch the brake fluid).

Check the condition of the hose and replace it if necessary (see description of replacing a hose).

REFITTING

Screw the new caliper cylinder on to the hose.

Loosen the cylinder bleed screw and wait till brake fluid runs from it (check that there is enough brake fluid in the brake fluid reservoir).

Retighten the bleed screw.

Check the condition of the pads. If they are greasy, replace them.

If sufficient fluid has remained in the brake fluid reservoir during the entire operation, partially bleed, or if it has fully emptied, fully bleed:

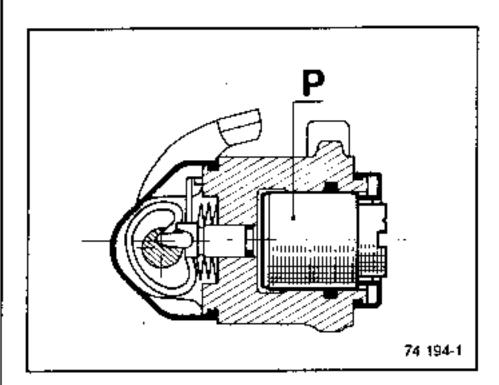
- the braking system.

Depress the broke pedal a number of times to bring the piston into contact with the pads.

OVERHAULING

If the brake caliper bore is even slightly scored, the entire caliper must be replaced. Remove the brake caliper.

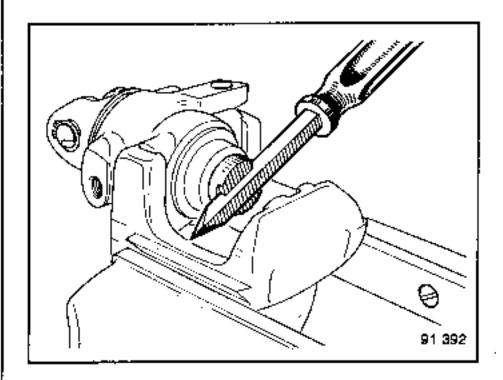
It is forbidden to dismantle the components inside the piston (P).



Crip the caliper in a vice fitted with soft jaws.

Remove the rubber dust cover.

Take out the piston by unscrewing it with a square section screwdriver.

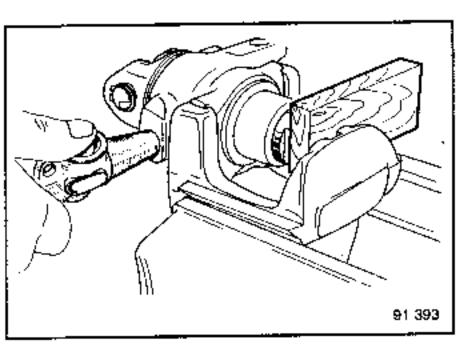


When the piston turns freely, gently blow compressed air into the cylinder taking care nto to eject the piston violently.

Place a wooden block between the caliper and the piston to prevent damage to the piston.

Any impact mark or scoring on the piston would render it unusable.

REMOVING - REFITTING - OVERHAULING (continued)



Remove the seal from its groove using a steel blade with rounded edges.

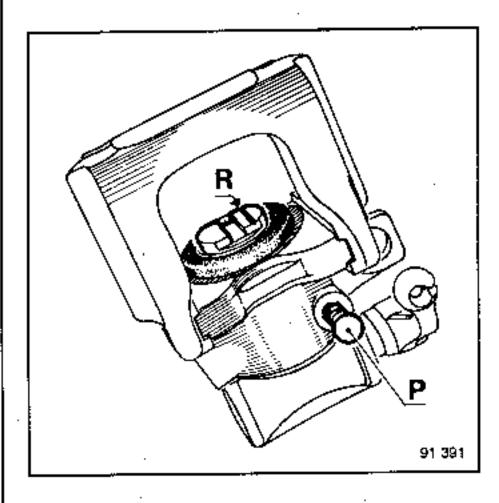
Clean the parts in methylated spirits and reassemble them.

Lubricate the seal and the piston with brake fluid.

Gently push in the piston by hand to avoid damaging the seal.

Finish pushing in the piston by screwing it with a screwdriver until it will enter no further.

Position the piston so that the line (R) marked on its thrust face is on the same side as the bleed screw (P) to permit the effective bleeding of the caliper and allow the pad to locate correctly in the central groove in the piston.



Coat the periphery of the piston with Spagraph grease.

Fit a new protective cap.

ESSENTIAL SPECIAL TOOLS

Fre. 514 Tool for dismantling the hand brake control

DISMANTLING

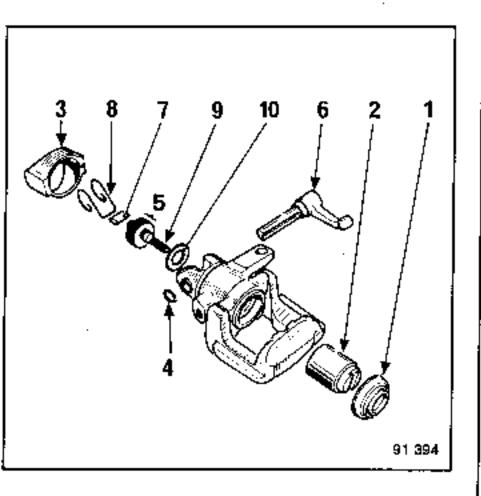
Grip the caliper in a vice equipped with soft jaws, without moving the cylinder from its support.

Remove :

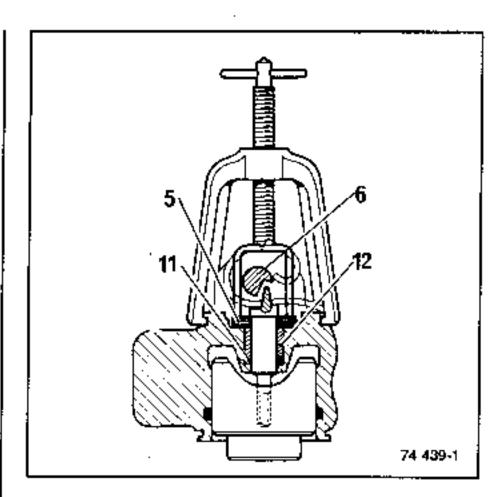
- the sealing cap (1),
- the piston (2), by unscrewing it.

Fold back the dust cover (3) (it is fitted to shaft (6)).

Remove the circlip (4).



Compress the spring washers (5) using tool Fre.514.



Remove :

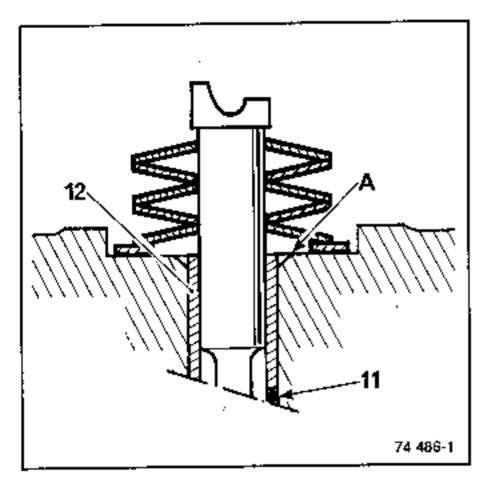
- the shaft (6) together with the dust cover (3), by pulling the lever,
- the plunger (7),
- the spring (8),
- the adjusting screw (9),
- the washer (10),
- the spring washers (5),
- bush (12) using a pin punch,
- the 0 ring (11).

Clean all the parts with methylated spirits.

REASSEMBLY

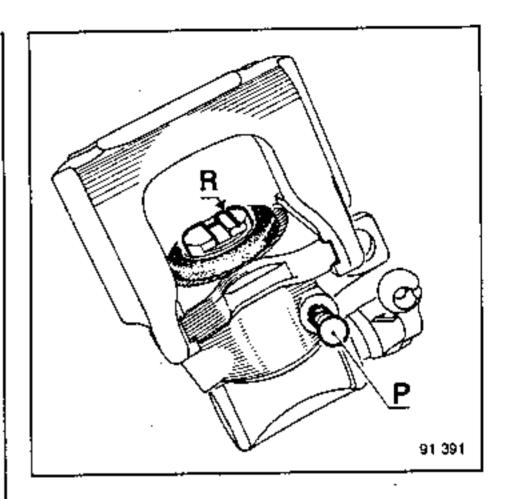
Fit:

- the 0 ring (11),
- the bush (12) until it is flush with face (A), using a tube of the appropriate diameter.



Check that the spring washers are correctly positioned. They must occupy the position shown in this illustration to permit the hand brake lever to return to the "released" position.

From them on, carry out the dismantling operations in reverse.



Position the piston so that line (R) on its thrust face is on the same side as the bleed screw (P).

REMOVING - REFITTING

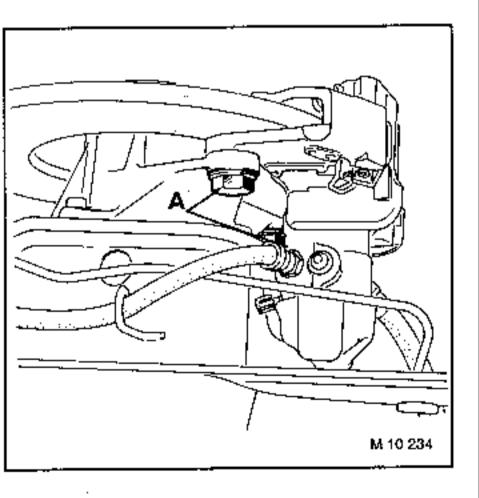
The brake discs cannot be refaced. If they are excessively worn or scored they must be replaced by new ones.

TIGHTENING TORQUES (in dan.m)
Wheel bolts (light alloy wheels) Wheel bolts (pressed steel wheels) Caliper bracket securing bolts Disc securing screws	9 6,5 7 1

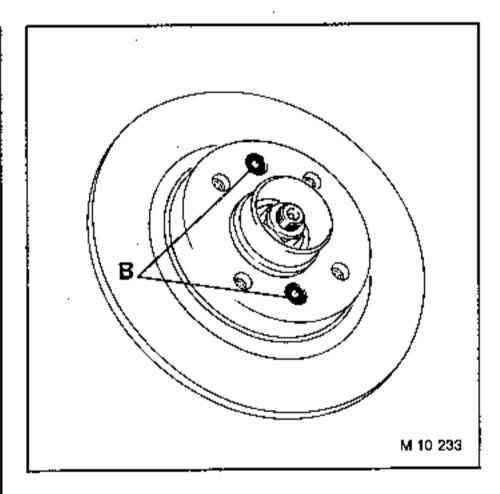
REMOVING

Remove :

- the brake pads (see the corresponding sections),
- the 2 caliper bracket securing bolts
 (A).



- the 2 disc securing screws (B) using a Torx T40 key (eg. : Facom RX 40 + an adaptor or 89-40).



the disc.

REFITTING

Fit the disc to the hub and secure it in place with its two screws (B).

Refit the other components by carrying out the removing operations in reverse order, taking care to coat the bolts (A) on each caliper bracket with Loctite FRENBLOC and to tighten them to the specified torque.

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

REPLACING



ESSENTIAL SPECIAL TOOLS

Rou. 604-01 Hub retainer

Rou. 15-01 Shaft end protector

T. Av. 1050 Hub extractor M. S. 580 Inertia weight

TIGHTENING TORQUES (in daw.m)

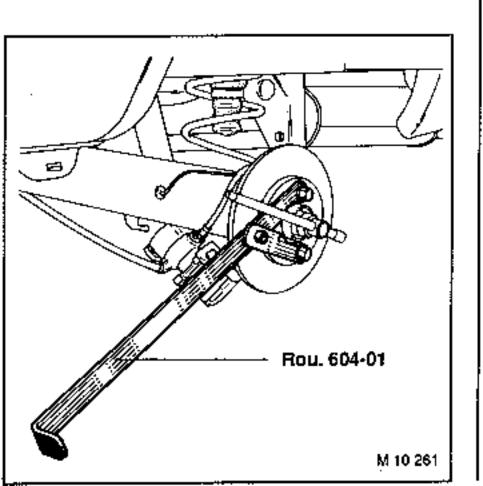
Wheel bolts (pressed steel wheels)...6,5
Wheel bolts (light alloy wheels)9
Disc securing screws1
Caliper bracket securing bolts7
Bearing carrier securing screws2
Drive shaft nut21

Checking the bearing play:
Check, with a dial indicator placed
against the hub, that the end play is between 0 and 0.005 mm.

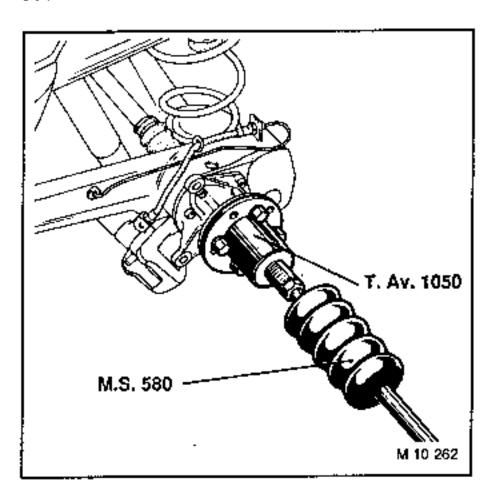
REMOVING

Remove :

- the brake disc.
- the drive shaft nut, using tool Rou.
 604-01.



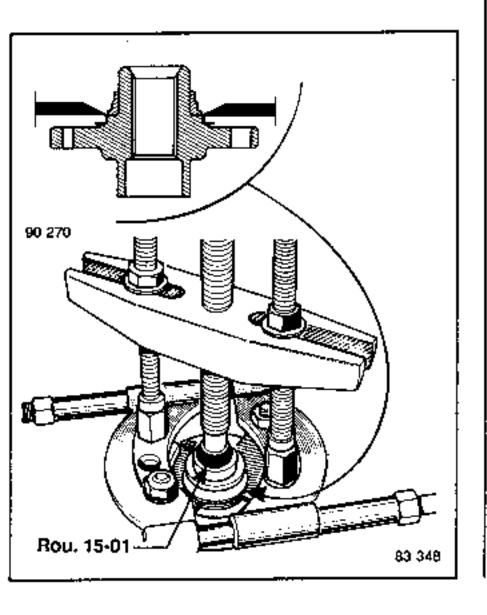
Extract the hub using tool T.Av.1050+M.S. 580.



REPLACING (continued)

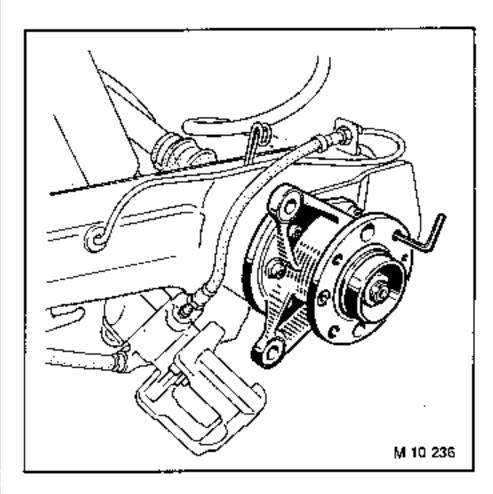
Remove, from the hub :

 the inner track ring using an extractor of the FACOM U53G+U53E type and tool Rou.15-01.



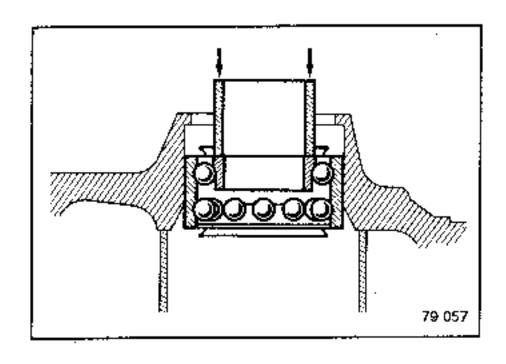
Remove :

 the 6 screws that secure the bearing carrier to the axle arm.



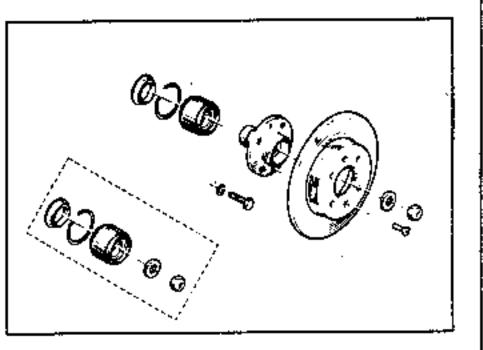
- the circlip.

Extract the outer track ring on the press using one of the inner track rings and leaving the ball cage and the seals in position.

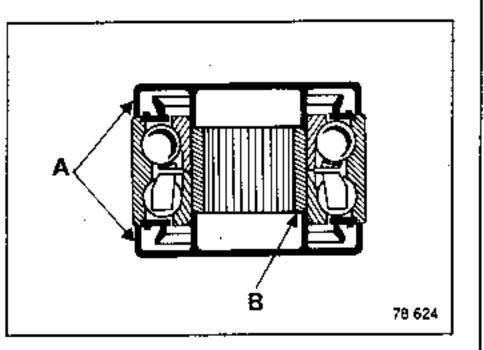


REPLACING (continued)

REFITTING

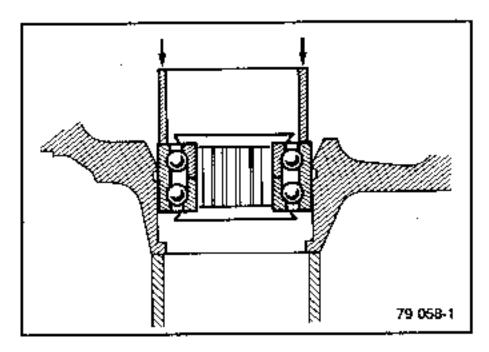


Remove the two plastic protectors (A) from the new bearing.



Fit the bearing, together with its plastic ring (B) into the bearing carrier using a tube with an outside diameter of 71 mm and an inside diameter of 66 mm, taking the load on the outer track ring.

Do not take the load on the inner track ring as the heavy loads required to fit the bearing would damage it.

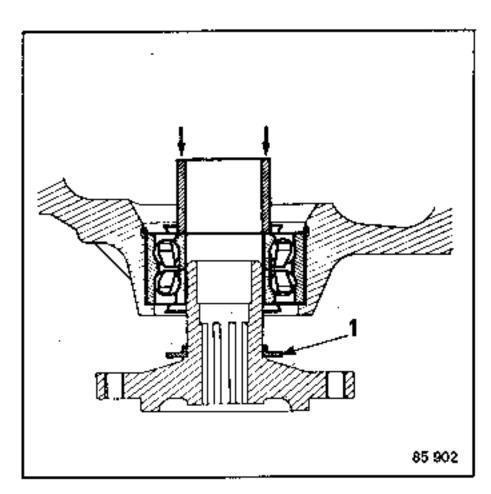


Remove the plastic ring (B).

Fit the new circlip.

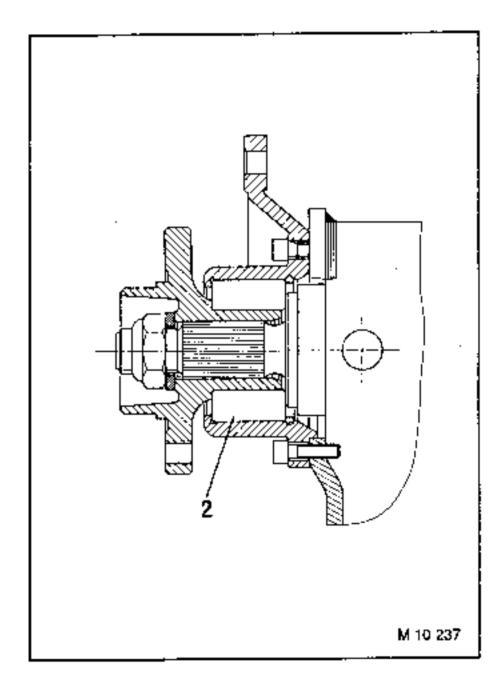
Coat each lip of the seal with ELF Multigrease.

Fit the thrust washer (1) to the hub and fit the assembly using a tube with an outside diameter of 48 mm and an inside diameter of 43 mm, taking the load on the bearing inner track ring.



Refit the bearing carrier to the vehicle by carrying out the removing operations in reverse order and tighten the nuts to the specified torque. REPSACING (continued)

The removing and refitting operations are exactly the same as for when replacing the bearing.



NOTE: As the load required to fit the bearing outer track ring (2) into its bore is very heavy, the entire bearing must be replaced after removing this track ring because the bearing areas are marked during the operation.

REAR SUSPENSION UNITS Suspension arm rubber bushes

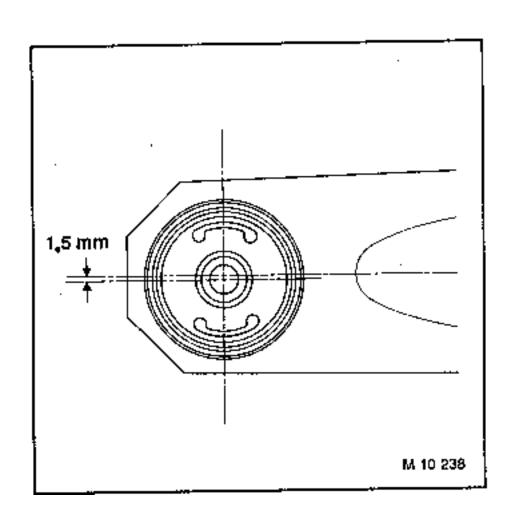
REPLACING

The rubber bushes are replaced, on the press, after removal of the axle from the vehicle, using a tube with an outside diameter of 53 mm.

PRECAUTIONS WHEN FITTING THE NEW FLEXIBLOC

Take care, when fitting the flexibloc, to position it as shown in this illustration.

The centre of the suspension arm securing pin is offset, in a downward direction, with reference to the centre of the rubber bush locating bore.



REMOVING - REFITTING

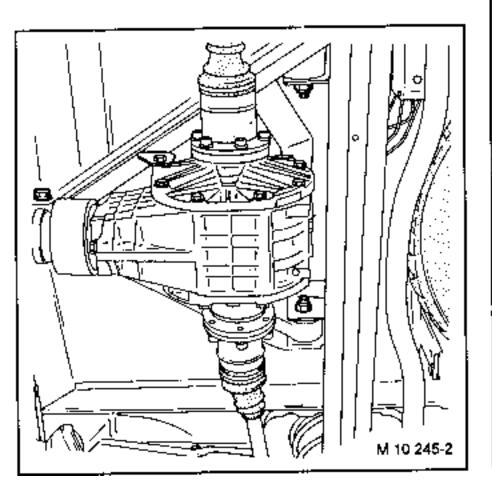
REMOVING

Place the vehicle on a lift.

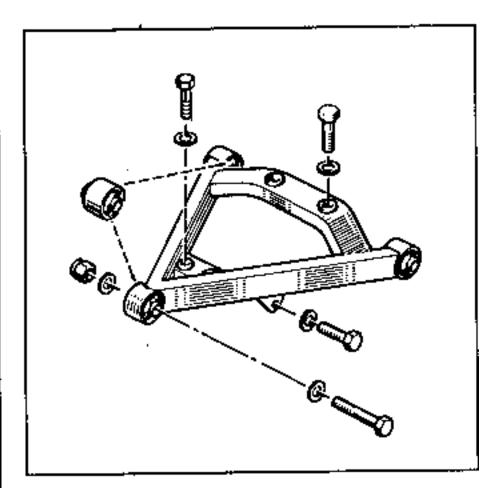
Position a support stand of the DESVII type under the final drive unit.

Remove the 3 bolts securing the support frame.

Lower the final drive/support frame assembly.



Remove the 6 bolts that secure the final drive unit to its support frame.



REFITTING

Carry out the removing operations in reverse.

REAR SUSPENSION UNITS Final drive support frame rubber bushes

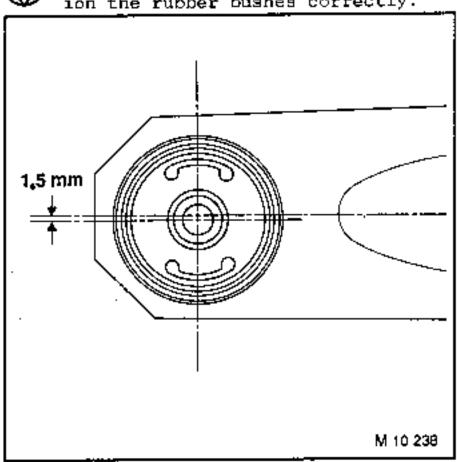
REPLACING THE RUBBER BUSHES ON THE PRESS

Extract the worn rubber bush using a tube with an outside \emptyset of 53 mm.

Fit the new rubber bush using the same tube.



It is absolutely essential to position the rubber bushes correctly.



WHEELS : 5.5 J 14

TYRES: 195/65 R 14 type MXT 4 (no other type)

SPARE WHEEL :

Wheel : 3,50 B 15 Tyre : 125/90 R 15

IMPORTANT :

Following a puncture, it is essential:

- . to use the spare wheel only as a temporary measure and to drive at REDUCED SPEED (50 mph 80 km/h MAX.)
- . to have the punctured tyre repaired or replaced immediately (have it removed for inspection).
- . to have the repaired or new type 195/65 R 14 MXT4 tyre refitted. No other type of tyre is to be used.

Warning: Using any other type of tyre, however briefly, can cause damage to the VISCOUS COUPLING.

INFLATION PRESSURES

Normal	Front	2,0 b.
	Rear	1 . 7 b.
Motorway driving or	Front	2,0 b.
heavy load- ing	Kear	2, 0 0.
Spare wheel		4,2 b.

These vehicles are fitted with a load controlled brake compensator that has two entirely separate bodies each operating one of the rear wheels.

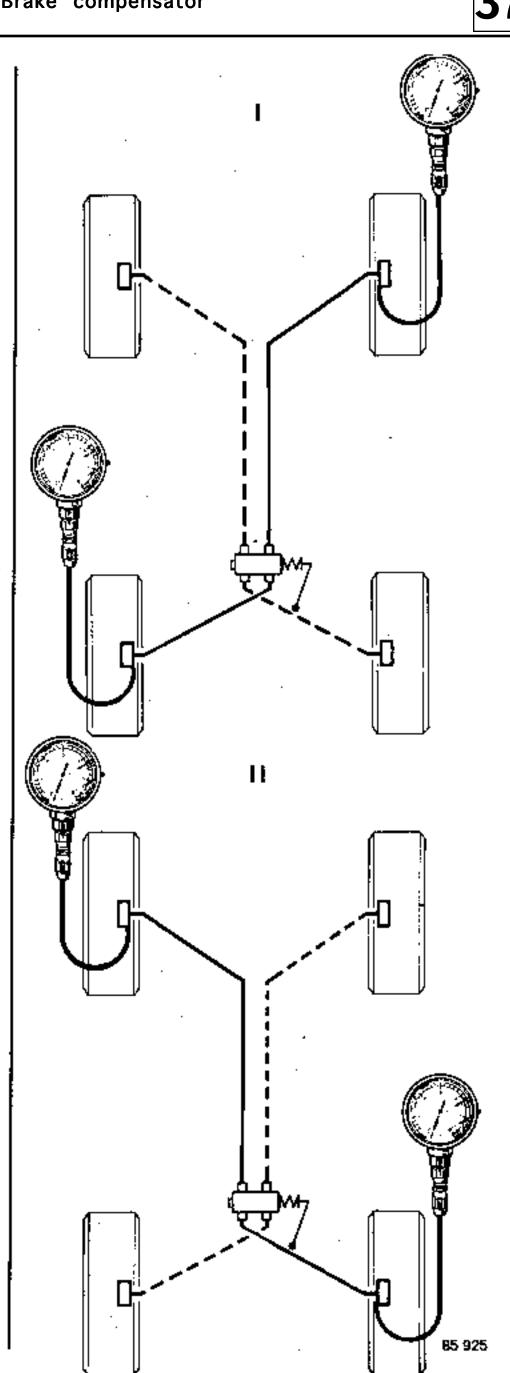
The pressure readings are taken on each crossed circuit by comparing the pressure reading on each of the front wheals with that of the rear wheel on the opposite side.

It is essential to check both circuits :

l : Front right - Rear left

II : Front 1eft - Rear right

The adjustment system permits one to adjust the rear pressure with reference to the front pressure and acts simultaneously on both bodies.



CHECKING - ADJUSTING

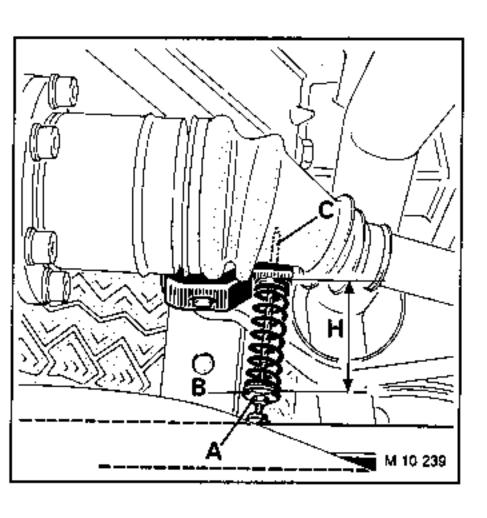
The brake compensator is to be checked and adjusted:

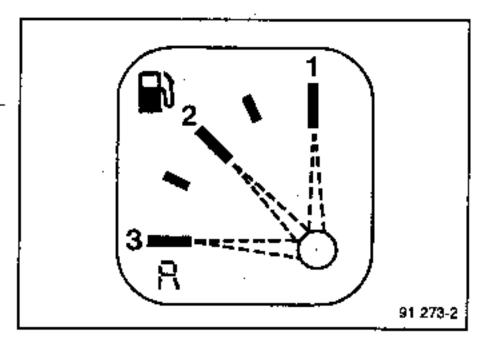
- with the vehicle at its kerb weight, resting on its wheels and with 5 seats fitted
 (2 at the front + 3 at the rear).
- with the tank full (or with the amount of fuel missing compensated for by placing an equivalent load in the vehicle as shown in the chart),
- with a person in the driving seat,
- with the hand brake correctly adjusted (see corresponding section).

The height of the compesnator spring is to be

$$H = 79 + \frac{1}{0} mm$$

To obtain this dimension, loosen nut (A) and turn cup (B) whilst holding rod (C).





Position of gauge needle	Load to be placed in boot to compensate for tank contents (in kg)	
	Fuel	
1 full	. 0	
2 1/2 full	20	
3 empty	40,5	

Adjustment figures

With the vehicle in the condition described above, the pressure readings should be as follows:

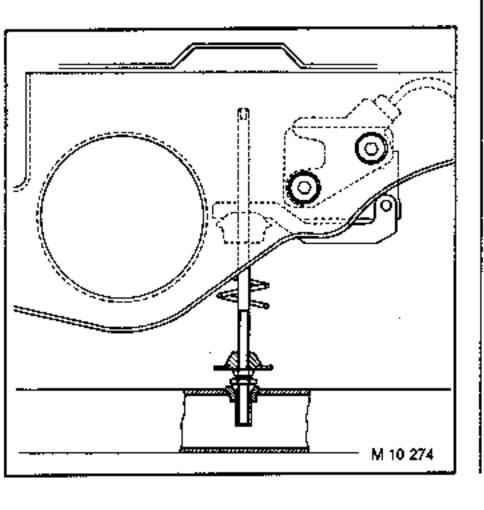
Front brakes	Rear brakes	
40 b.	25 + 0 b	
80 b.	- 37 + 0 b	

The pressure in the rear braking systems can be adjusted, with reference to that of the front braking systems by adjusting cup (B). The rear pressures must be the same to within 3 bars.

REMOVING - REFITTING

REMOVING

- Disconnect the pipes.
- Unscrew the 2 bolts securing the unit to its support.
- Pull the compensator upwards to free the spring and control rod.
- Retrieve the shim from between the compensator and its support.

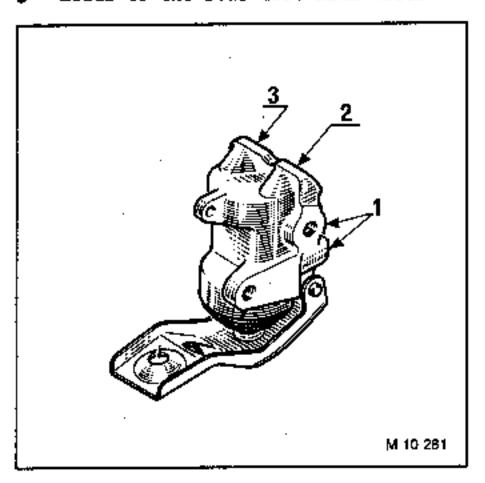


REFITTING

Carry out the removing operations in reverse.

The front braking system pipes are connected to the bottom of the compensator (1).

- 2 Leads to the rear right hand wheel
- 3 Leads to the rear left hand wheel



- Bleed the braking system.
- Check, and if necessary, adjust the pressure (see the corresponding section).

THE BRAKE COMPENSATOR CANNOT BE REPAIRED.



ADJUSTING THE CONTROL

If the hand brake is incorrectly adjusted (cable too tight) :

- The automatic wear take-up system cannot operate correctly.
- The brake pedal travel will be too long.

Under no circumstances is any attempt to be made to remedy this defect by retensioning the cables. The problem will quickly re-appear.

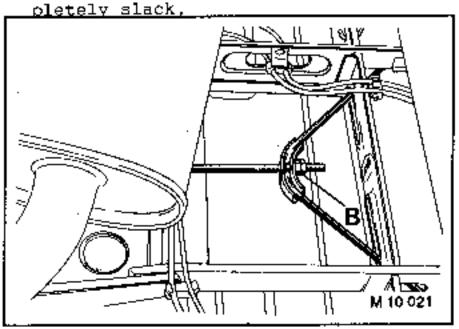
The hand brake system is not designed to take up wear. It must only be adjusted after replacement:

- of the pads,
- of the cables,
- of the hand brake lever.

ADJUSTING

Raise the vehicle on a lift that locates under the body shell :

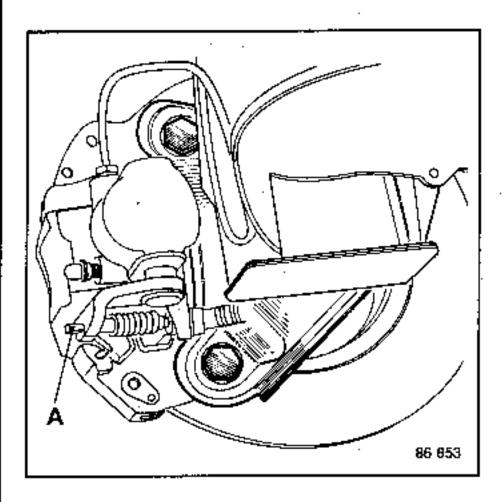
- Loosen the lock nut and nut (B) and unscrew them until the cables are com-



Remove both rear wheels.

Check :

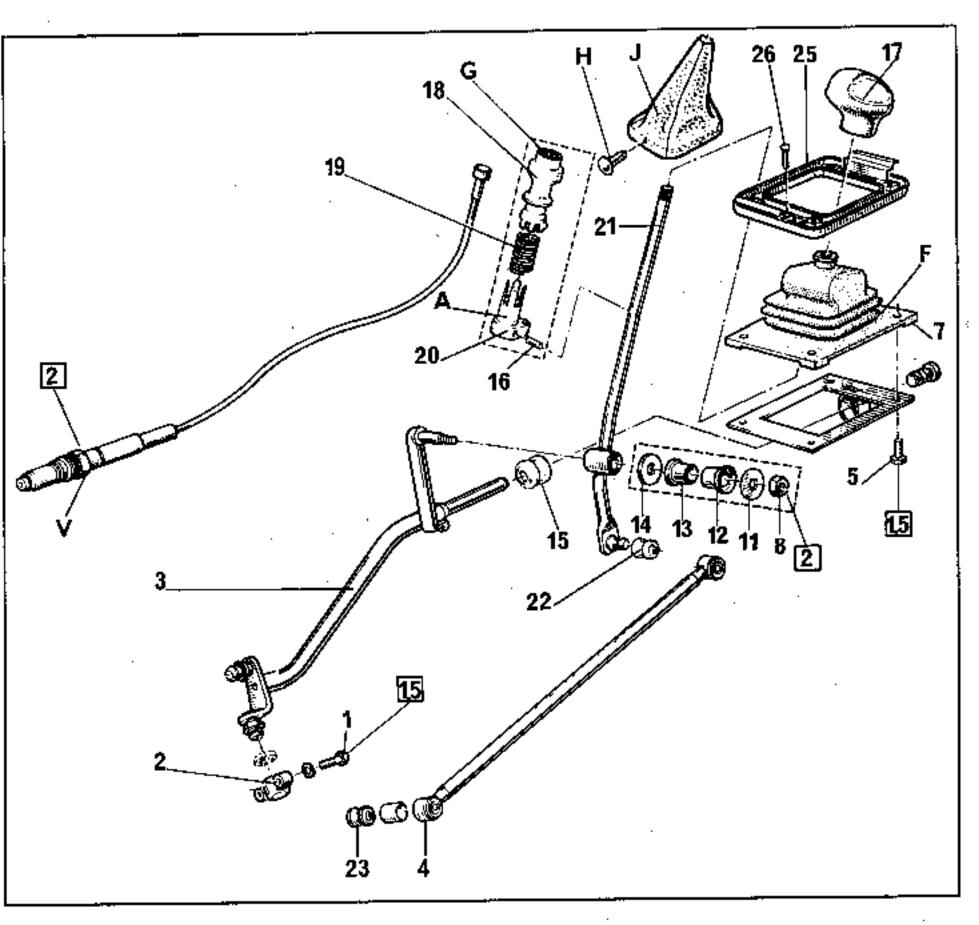
- that the cables slide freely,
- that the caliper hand brake levers move freely and bring them against their stops towards the rear of the vehicle.



Gradually tighten the cables at the central adjustment point to bring the cable ends (A) into contact with the levers, without moving the levers.

Finally adjust the system so that the levers start to move at between the lst and 2nd notch on the hand brake control lever travel and remain lifted away from their stops at the 2nd notch.

Re-tighten the nut and the lock nut (B).



Tightening torques in daN.m

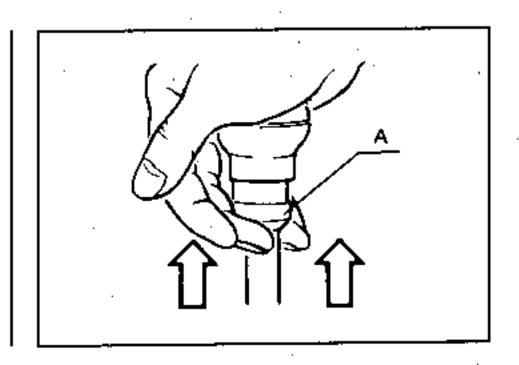
REVERSE POSITIVE LOCK

This system prevents reverse being accidentally "snagged" when quickly selecting from 3rd to 2nd.

Principle of operation :

To select reverse, lift the locking ring (A) and move the shift lever. The ring operates a cable which moves a locking pin on the gearbox rear housing.

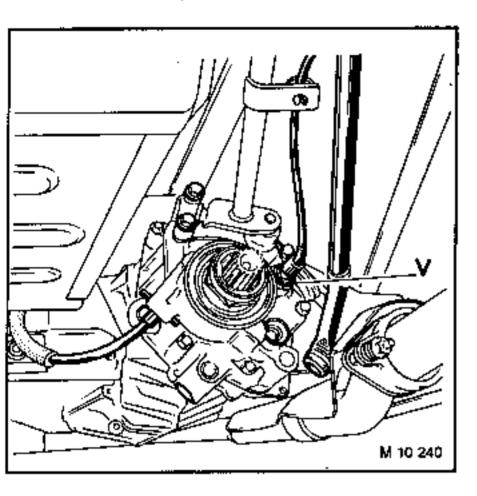
The movement of this locking pin permits reverse gear to be selected.



REMOVING THE LOCK CABLE

It is not necessary to drain the gearbox to do this.

Unscrew and remove the locking system
 (V) from the gearbox.



- Unclip (2 clips H) the boot (J).
- Lift the boot (J) to free the locking ring (G).
- Unclip the cable retainer from the locking ring (G).
- Remove the cable cover from its stop (A).
- Unclip the cable cover from the lever (3).

REFITTING

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

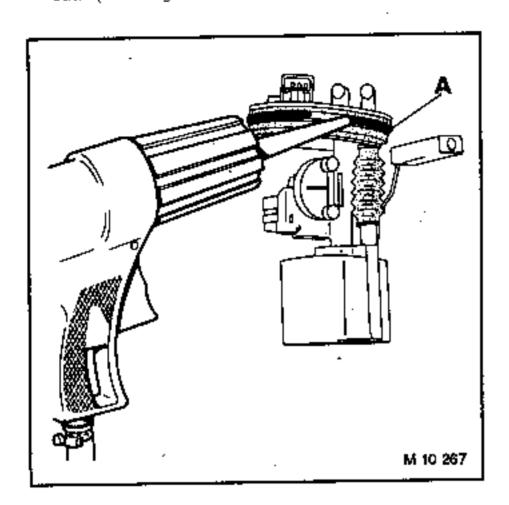
REMOVING THE TWIN BAR SHIFT ASSEMBLY

- Remove, in this order, items (12),(3), (4),(5),(6),(8).
- Retrieve parts (10),(11),(12),(13),(14).
- Take out (15) to (6).
- Unpin (16).
- Remove, in this order, items (17),(24),
 (18),(19),(20),(7).
- Retrieve (21).
- If necessary, replace items (22) and (23).
 - the green bush is fitted at the gearbox end,
 - the natural coloured bush is fitted at the shift lever end.

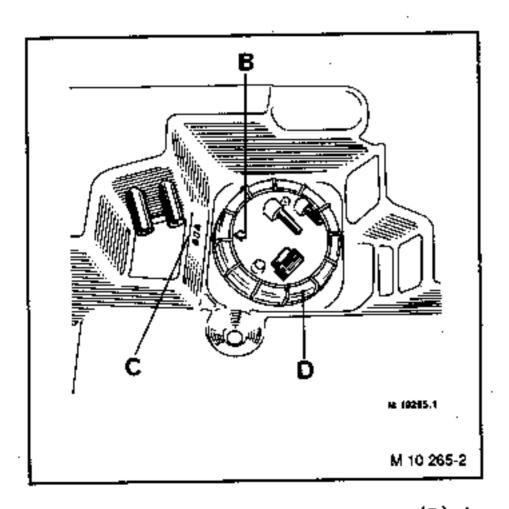
REFITTING (special points)

- Bond (17) to lever (21).
- Apply a small quantity of 33 Medium grease inside (15) (22) and (23) and to the ball joints on bar (3).
- Tighten the nuts to the specified torque.

 Remove all compound remaining on the tank, the gasket and the tank unit.

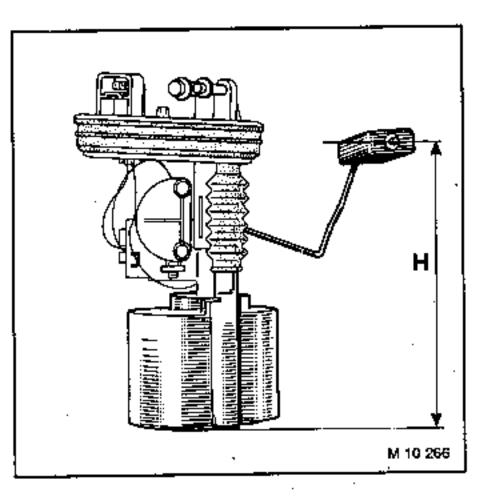


 Extrude a 3 mm Ø fillet (A) of compound round the periphery of the gasket.



- Fit the assembly with the arrow (B) in line with the position mark (C).
- Tighten the nut (D).

TESTING



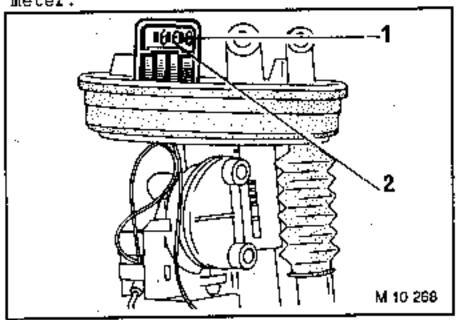
Position the tank unit bowl horizontally.

Measure the dimension H between the locating face and the centre of the float.

WARNING :

DO not apply pressure to the float : allow it to fall under its own weight (otherwise there is a risk of causing internal damage).

Measure the reading between terminal 1 (earth) and 2 (gauge signal) with an ohmmeter.



Instrum- ent read- ing	Height (H) in mm	Resistance across terminals 1 and 2 (Ω)
4/4	189	0 - 7Ω .
3/4	134	48 - 56Ω
1/2	102	83 - 101Ω
1/4	67	128 - 156 Ω
Reserve	47	warning light switches on

INSTRUMENT PANEL INSTRUMENTS Fuel gauge

GENERAL

The gauge tank unit is of the rocker type with a bowl that prevents it becoming unprimed. It is spring mounted to permit the suction pipe to remain as near as possible to the bottom of the tank (the bowl makes contact with the bottom of the tank) with changes in the shape of the plastic tank.

REMOVING

The tank must first be removed from the vehicle (see section 19).

Special points :

WARNING: Do not apply pressure to the float: allow it to fall under its own weight (otherwise internal damage can be caused).

A fillet of jointing compound is applied between the gasket and the tank when the tank unit is refitted.

UNDER NO CIRCUMSTANCES ARE A SCREWDRIVER AND A HAMMER to be used to remove the tank unit as this could damage to the slots in the plastic nut and the tank unit itself.

Remove the plastic nut with a strap spanner or a C spanner.

REFITTING

Required consumable :

- Cartridge of BETASEAL 71 904 HVII - Part no. : 77 012 022 34.

Tool required:

- Gun for 310 ml cartridge.