

FRONT SUSPENSION

The front suspension comprises coil springs and anti-roll bars.

The hydraulic shock absorbers are double acting and have integral bump stop and out stop.

Early arrangement : Spring types

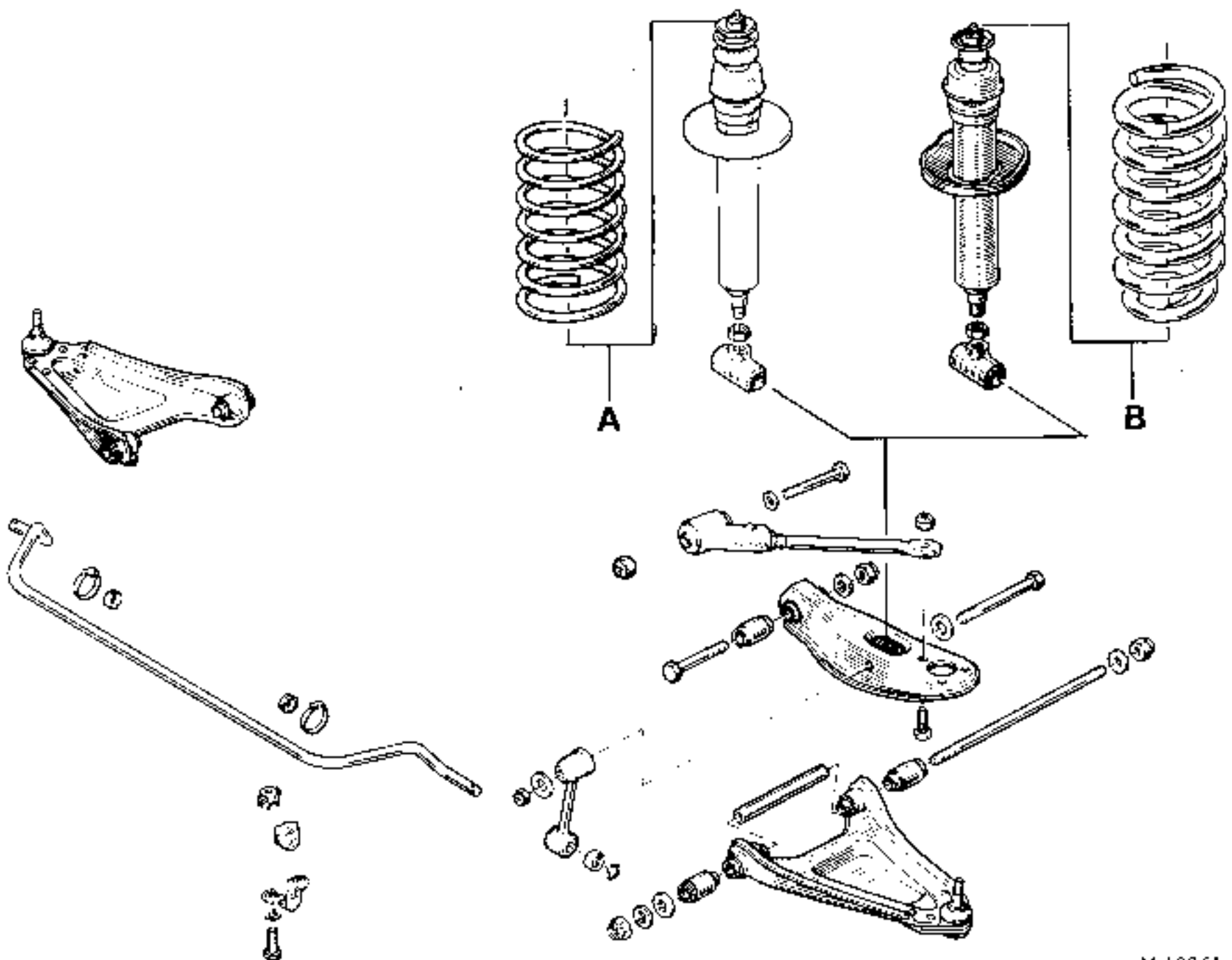
A parallel (up to January 1985)

B with a tighter lower coil (from February 1985 to December 1987)

identification colours Red for Diesel

Yellow for Petrol-Carburettor

Green for Petrol injection

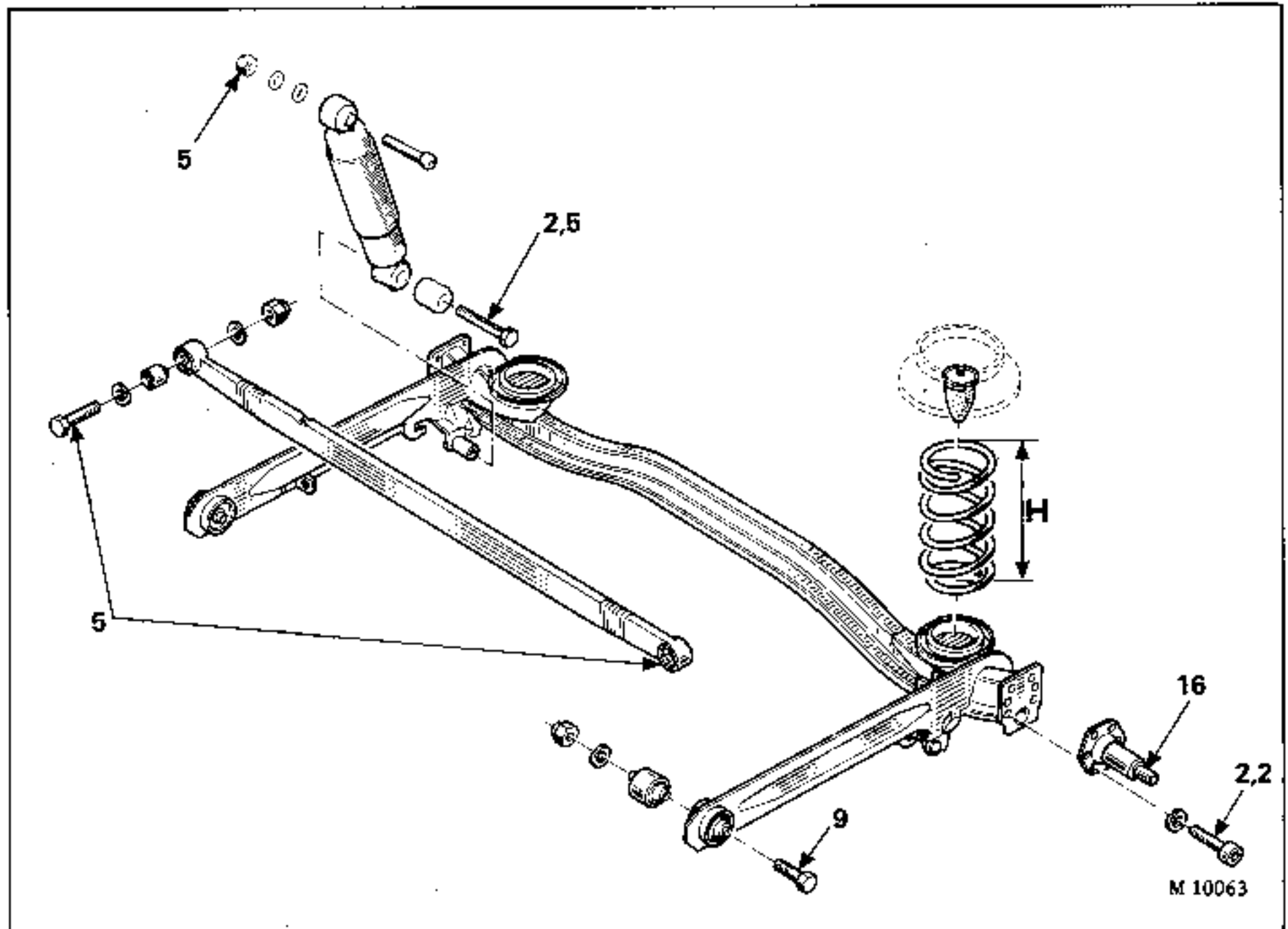


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EXPLODED VIEW OF REAR AXLE AND TIGHTENING TORQUES (in daN.m)

The rear suspension comprises coil springs and a transverse guide bar.

The double acting hydraulic shock absorbers have integral bump stops and out stops.



- There are 2 types of spring :
- Colour code Red and White Height when not under load H = 390 mm
fitted to : - LPG version : on LH and RH sides
- Ambulance version : on LH side only
 - Colour code Blue Height when not under load H = 350 mm
for all other models

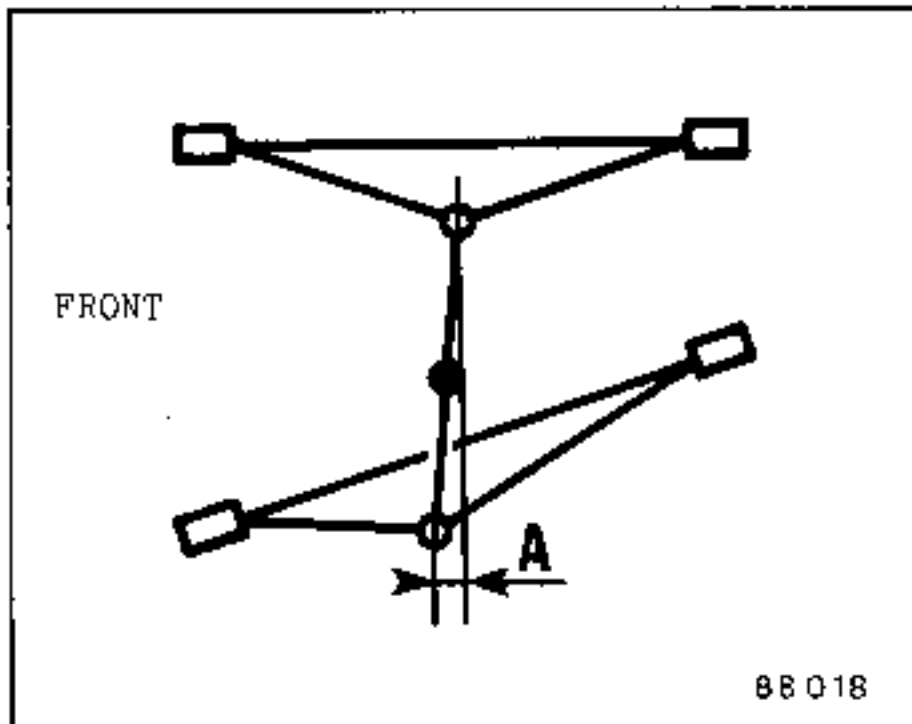
Since January 1988 the ESPACE has been equipped with a special type front axle, the function of which is to reduce :

- the "nose down" effect when the brakes are violently applied,
- the "nose up" effect when the vehicle accelerates.

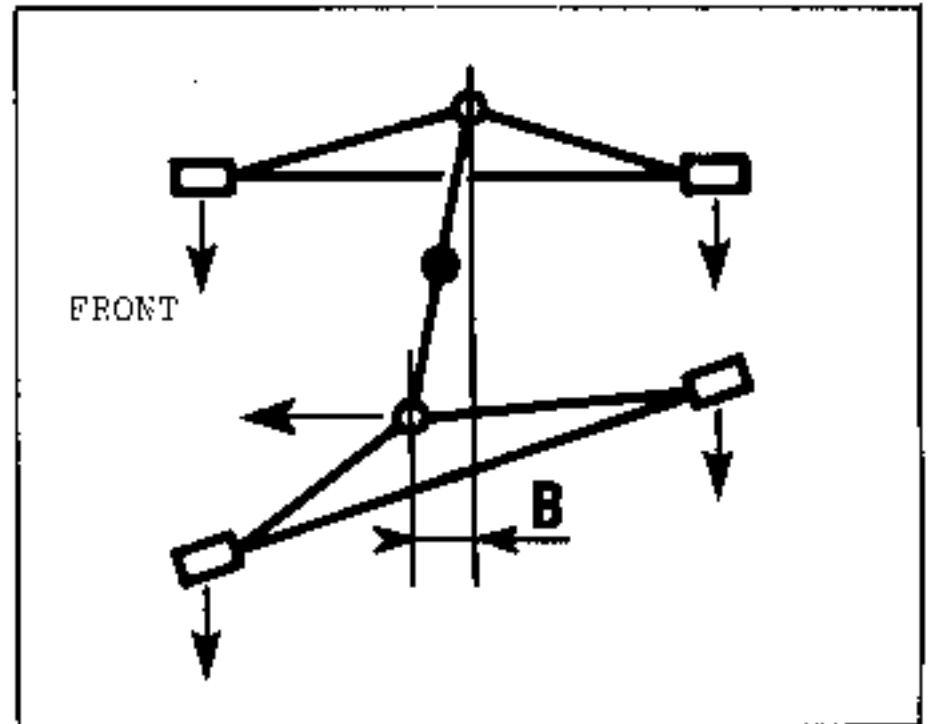
This system is known as the "anti-plunge" system.

Resistance to the "nose down" effect

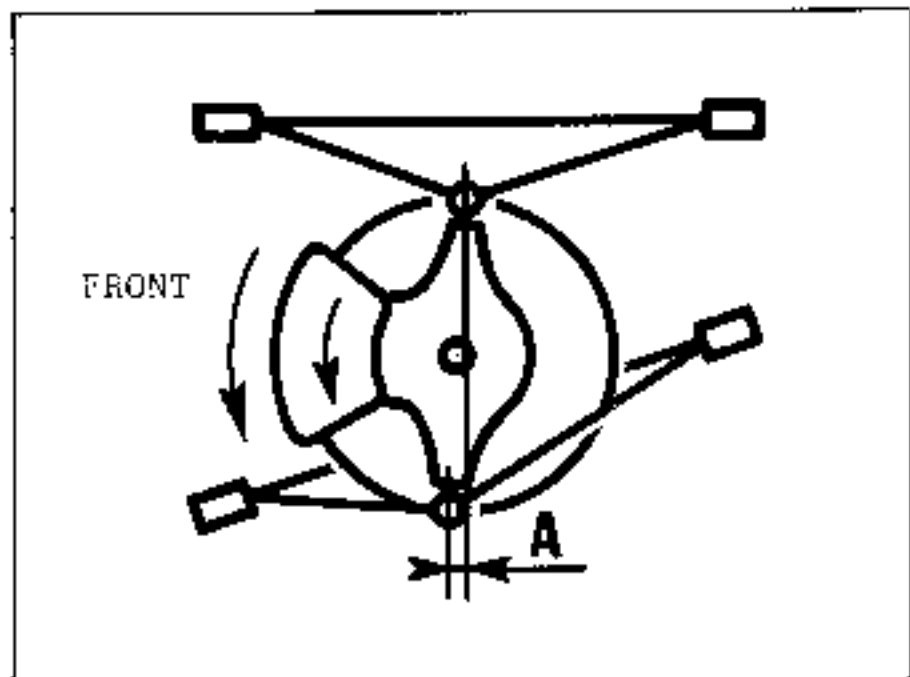
- The lower suspension arm is tilted forwards.



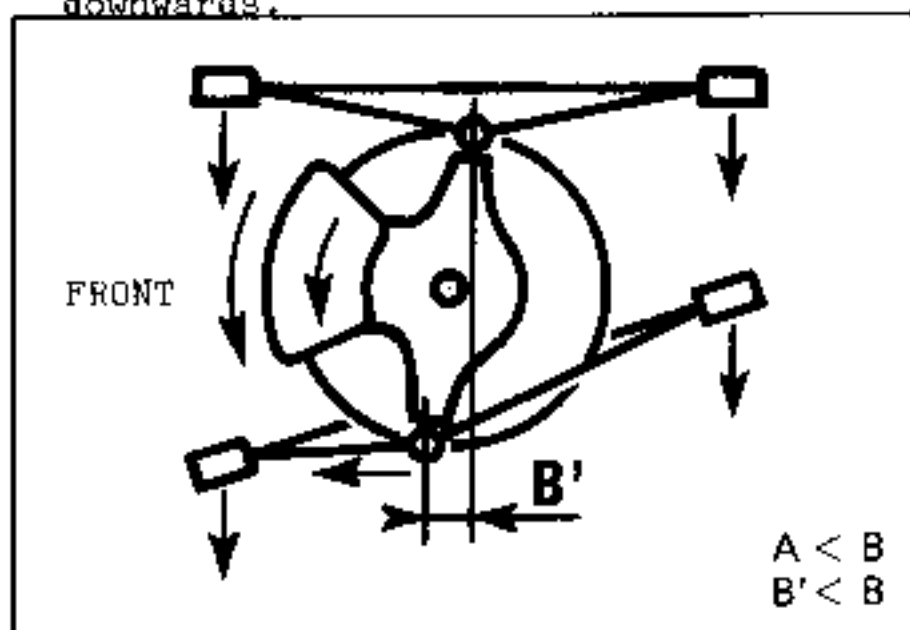
- The lower suspension arm ball joint moves forward when the front end of the bodywork moves down.



- When the brakes are applied, the stub axle assembly is subjected to an appreciable force tending to turn it in the same direction as the wheel.

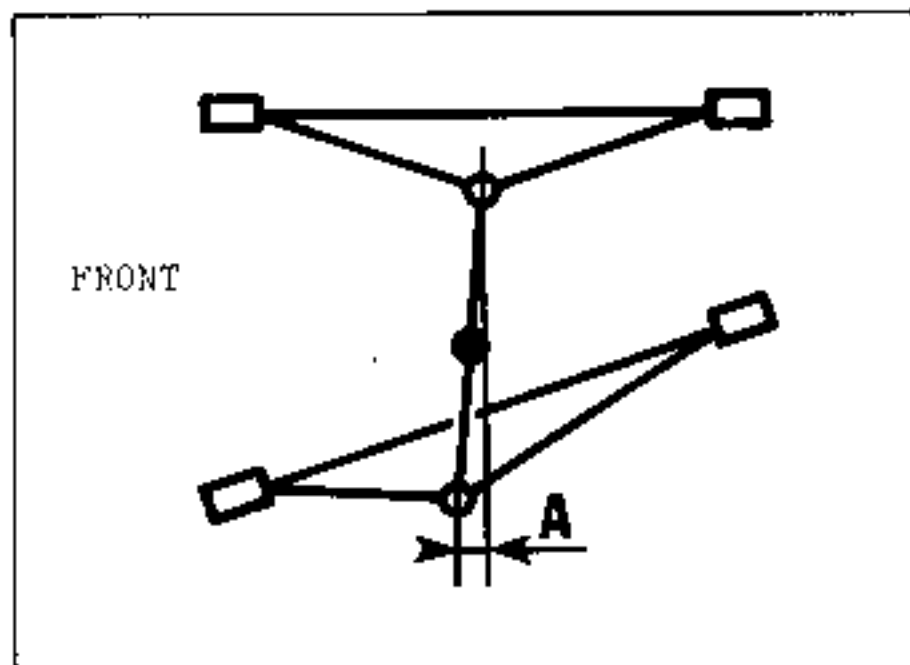


- The stub axle carrier opposes the forward movement of the lower ball joint and therefore limits the tendency of the front end of the vehicle to move downwards.

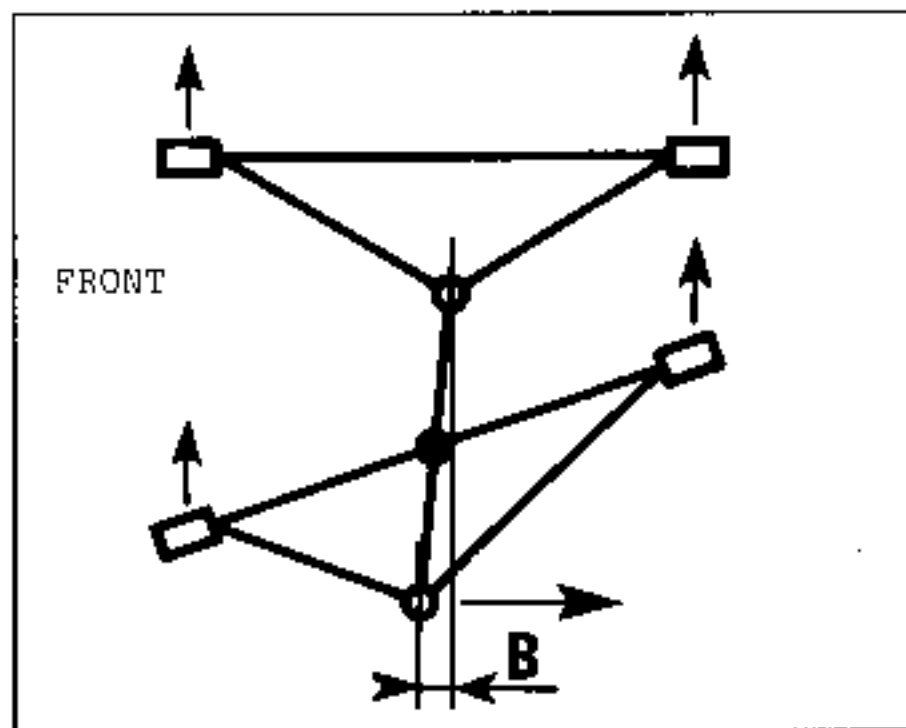


Resistance to "nose up" movement

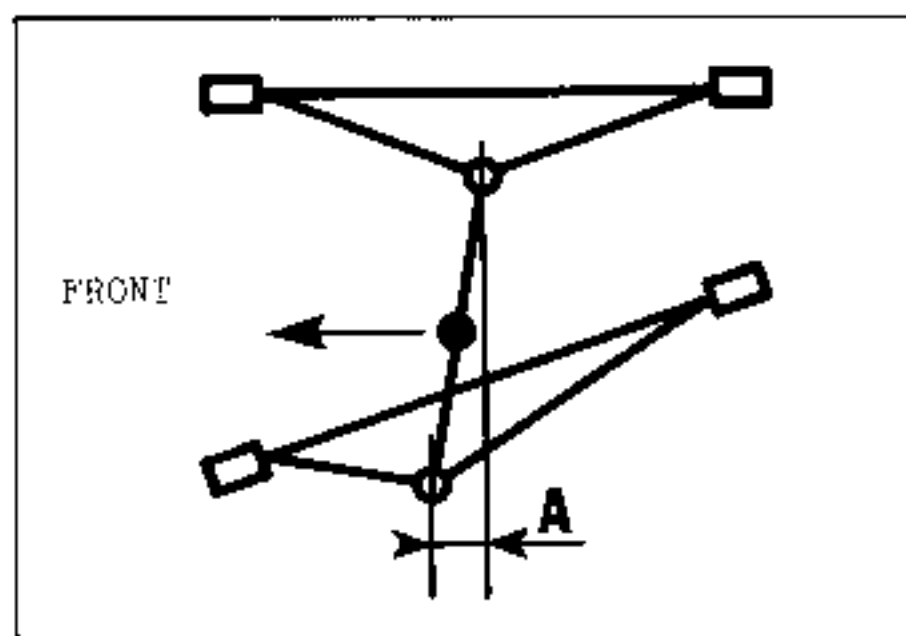
- The lower suspension arm is tilted forwards.



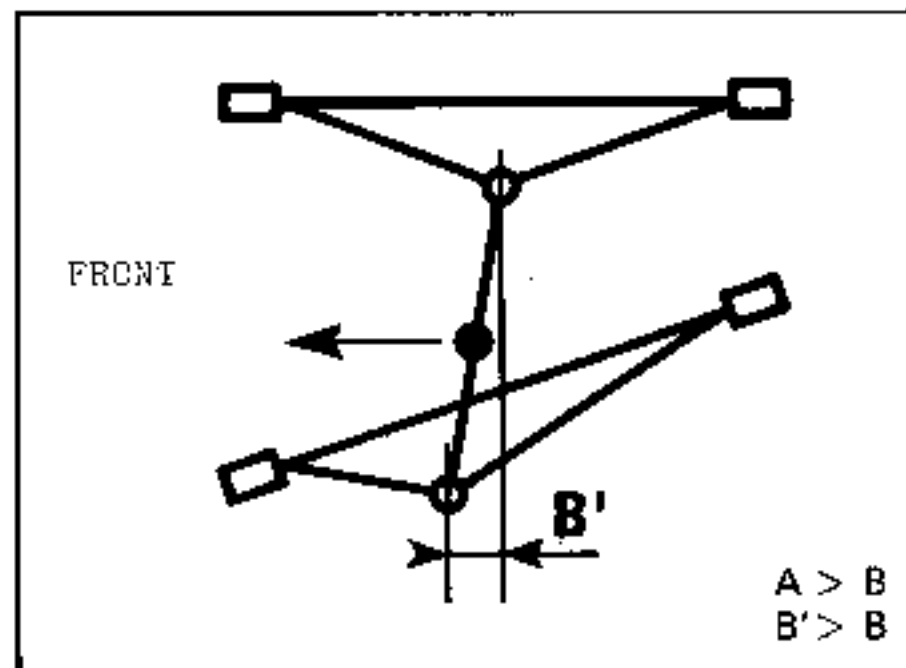
- The lower suspension arm ball joint moves back when the bodywork takes a "nose up" attitude.

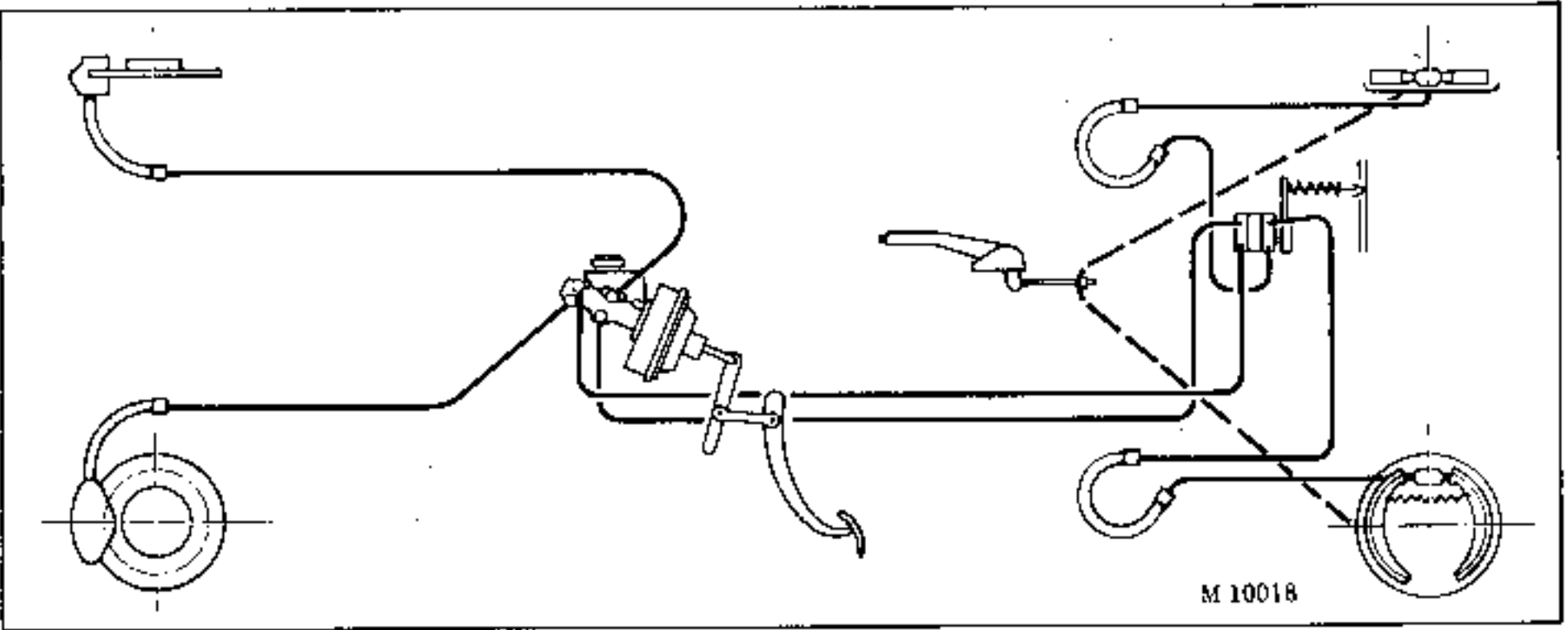


- As the vehicle accelerates the wheel pulls the stub axle carrier forwards.



- The stub axle carrier opposes the tendency for the lower ball joint to move rearwards and therefore limits the "nose up" effect.



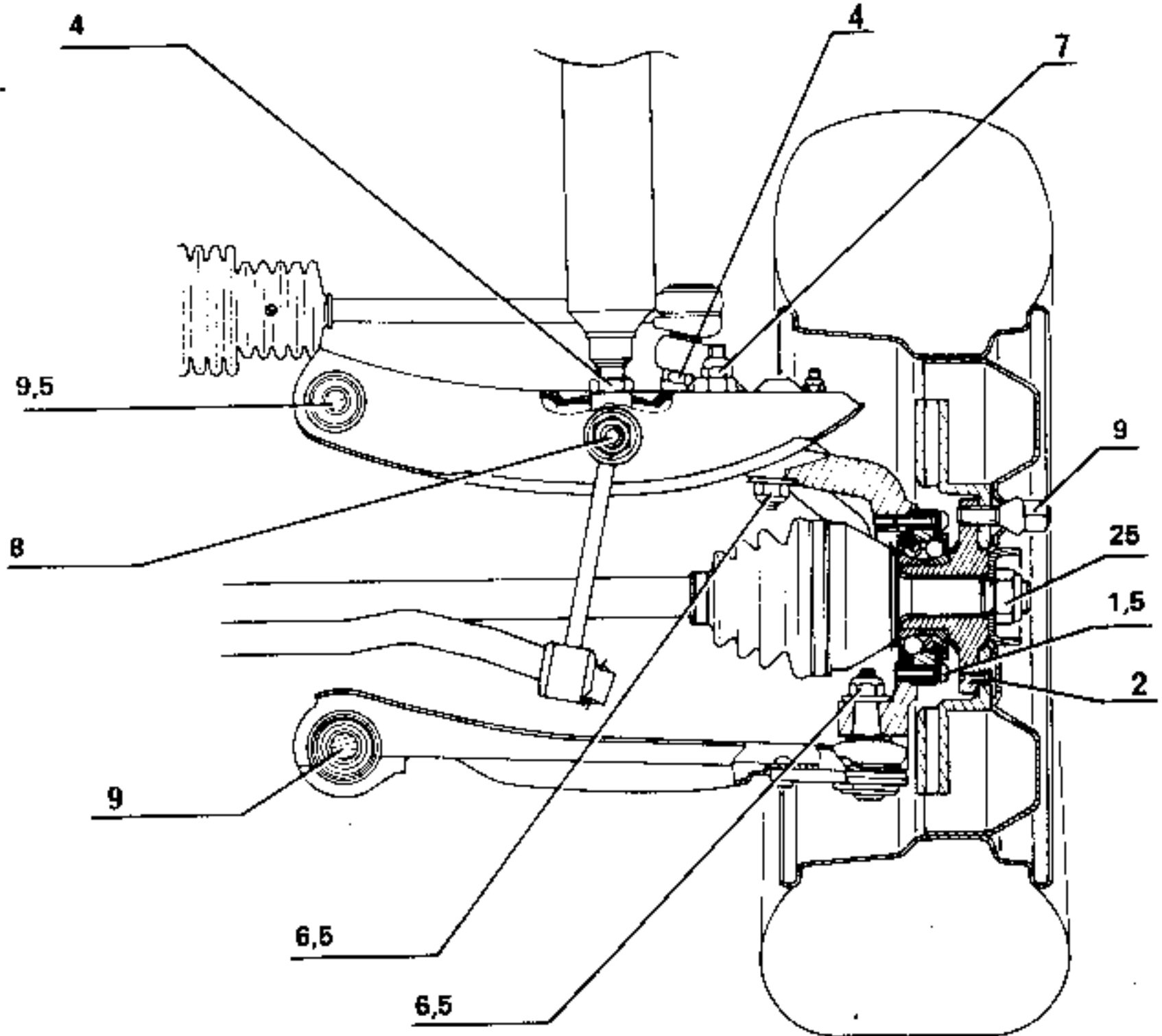


Front brakes	Arrangement (mm)			Rear brakes
	1st	2nd		
Wheel cylinder diameter	54	54	*	Diameter of wheel cylinders 22 mm
Disc diameter	238	259	*	Drum diameter 228.6 mm
Disc thickness	20	21	*	Maximum diameter of drums after reworking 229.6 mm
Minimum thickness of disc	18	19	*	Width of brake linings 40 mm
Minimum thickness of pads	9	10	*	Thickness of linings including shoe 7 mm
Maximum disc run-out	0.07	0.07		Minimum thickness of linings including shoe 2.5 mm
Brake servo diameter (inches)	8"			
Diameter of brake servo with integral master cylinder (ins)		9"	*	

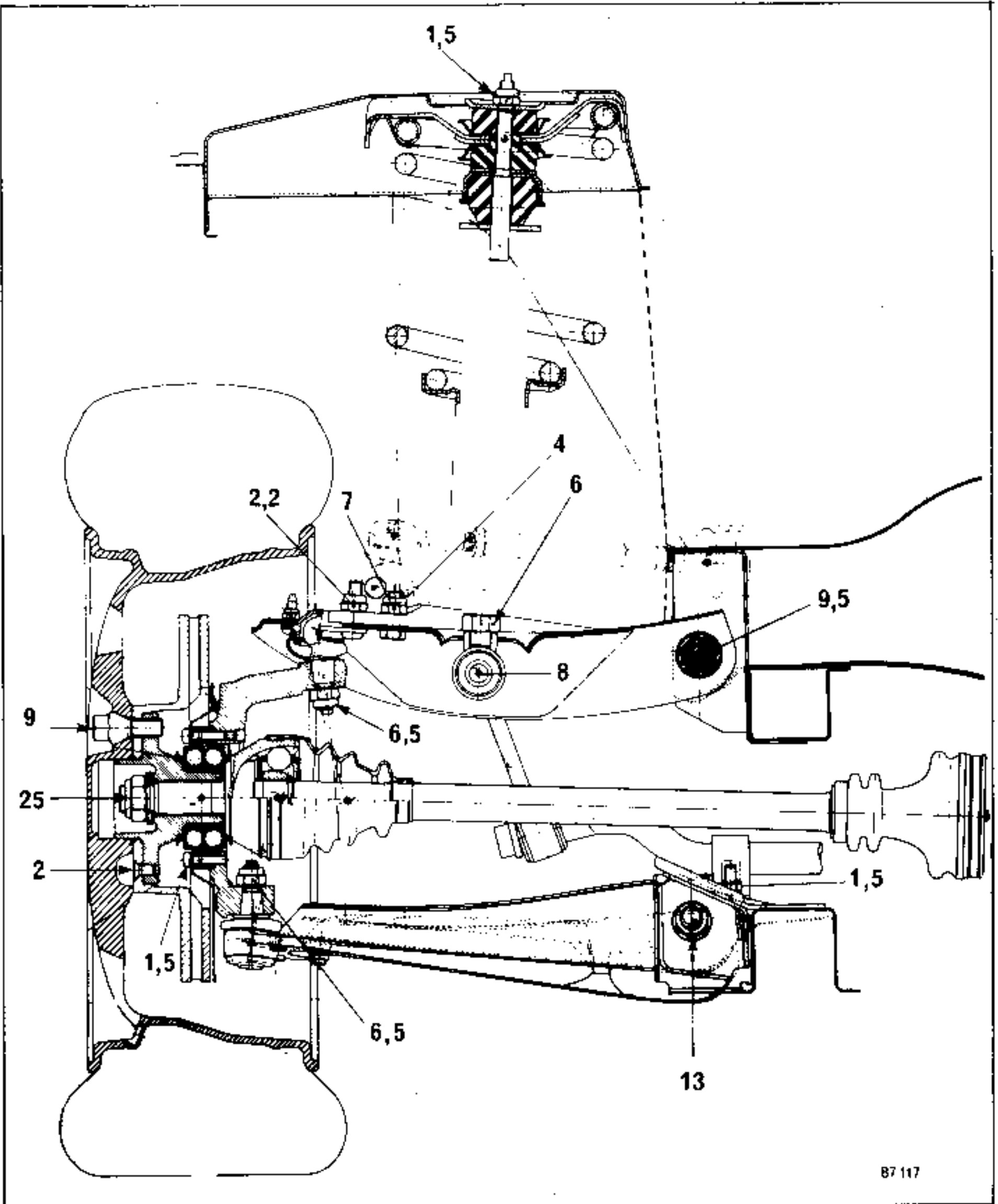
*The introduction of these various changes was spread out over a period of time and differed depending on the model.

	PETROL		DIESEL
	Left-hand drive	Right-hand drive	
APPLICATION FROM SEPTEMBER 1986 ONWARDS			
259 mm diameter front disc with UNSTRENGTHENED caliper bracket	T022234 (J112)	T022237	
New control with a 9" diameter servo	T022234 (J112)	-	
APPLICATION FROM JANUARY 1987 ONWARDS			
259 mm diameter front disc with STRENGTHENED caliper bracket	T026366 (J112) T000452 (J117)	T026369 (J112) -	T012278 (J115) T000494 (S115)
New control with a 9" diameter servo	T000452 (J117)	-	

1st Arrangement fitted up to December 1987



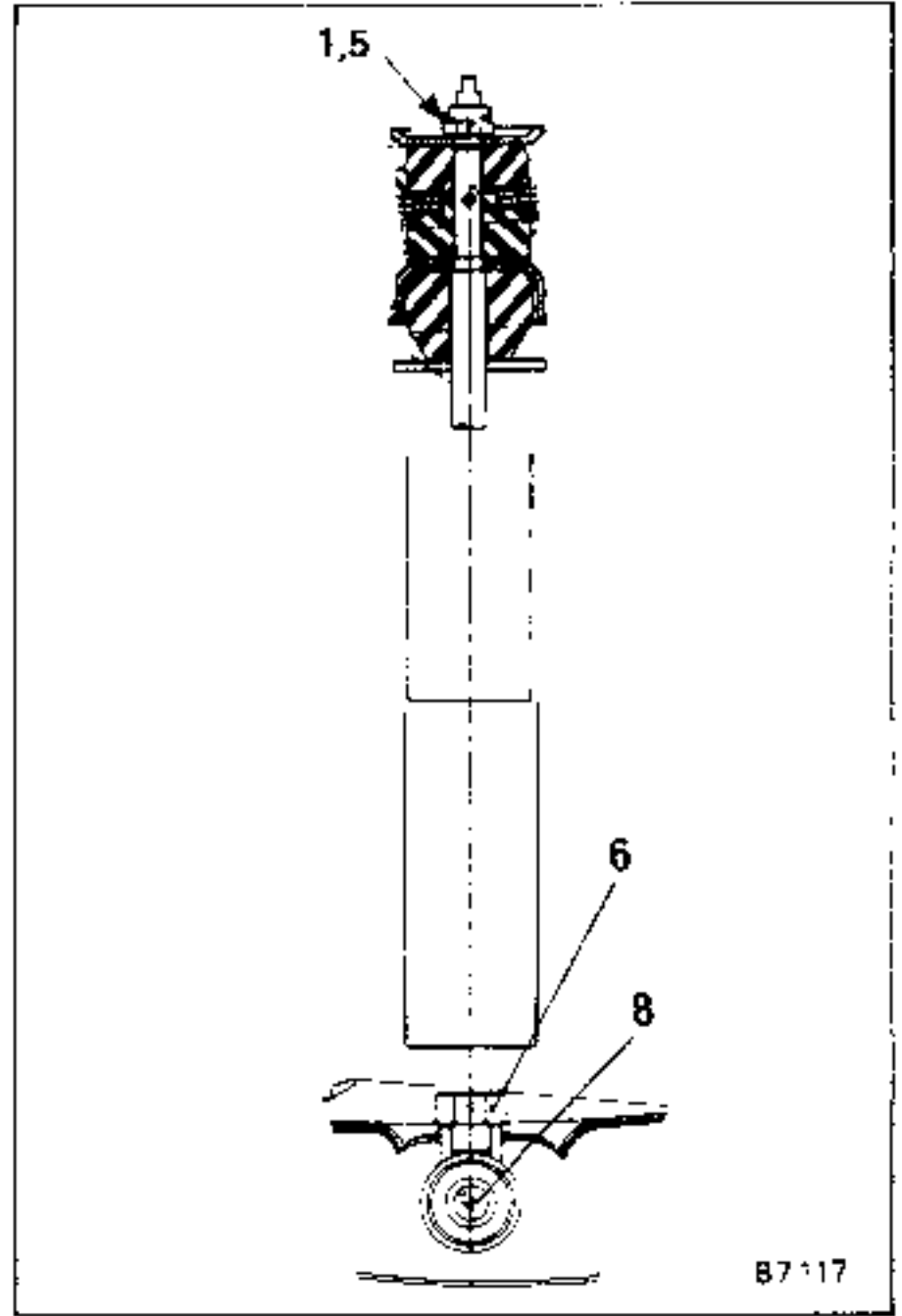
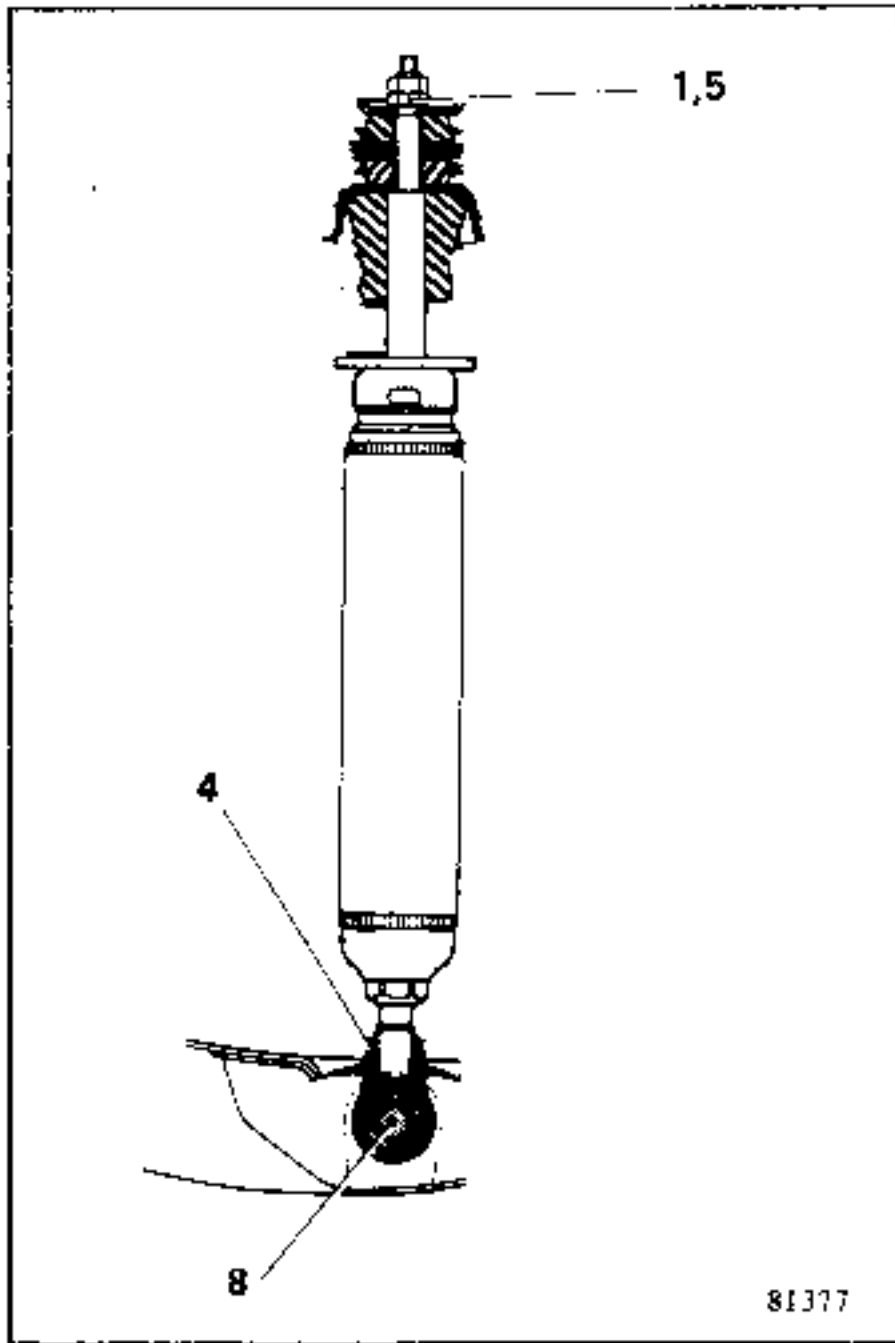
2nd Arrangement from January 1988 onwards



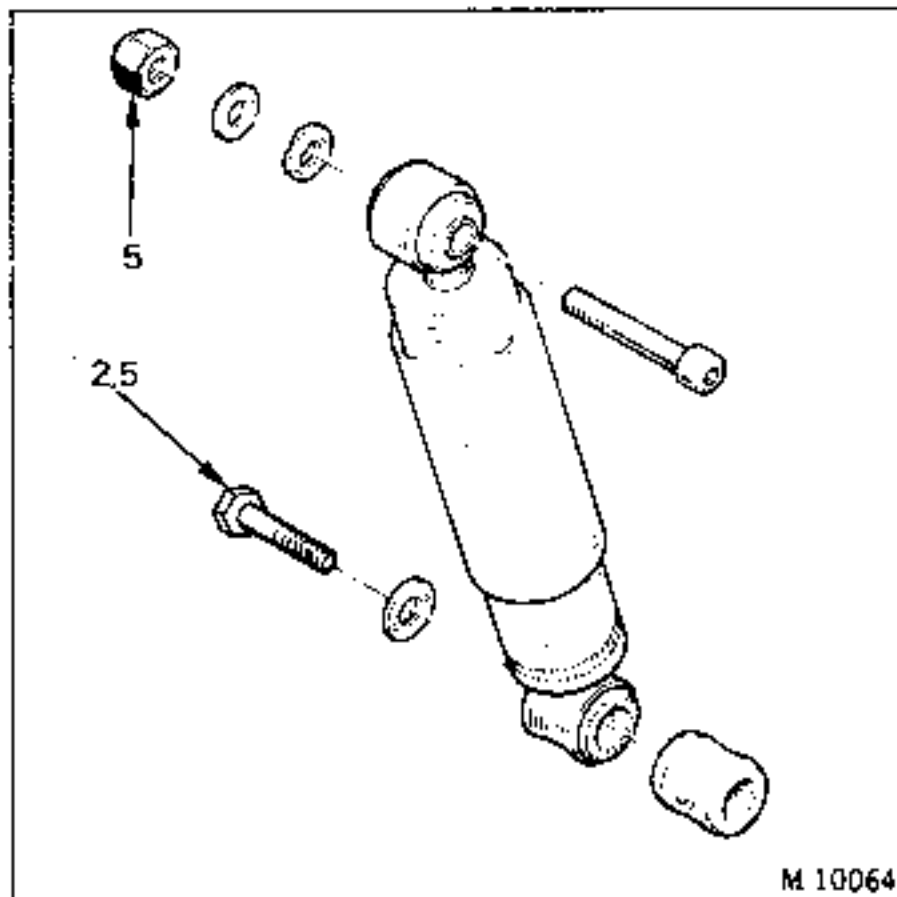
FRONT SUSPENSION

1st Arrangement (Up to December 1987)

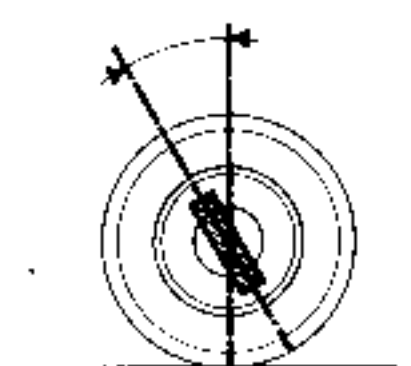
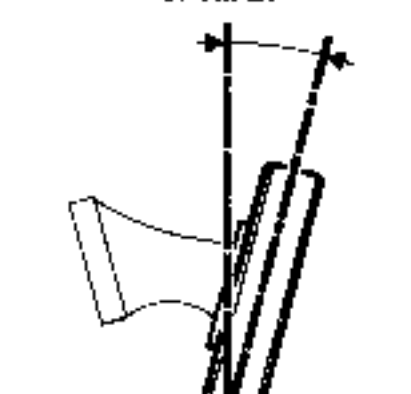

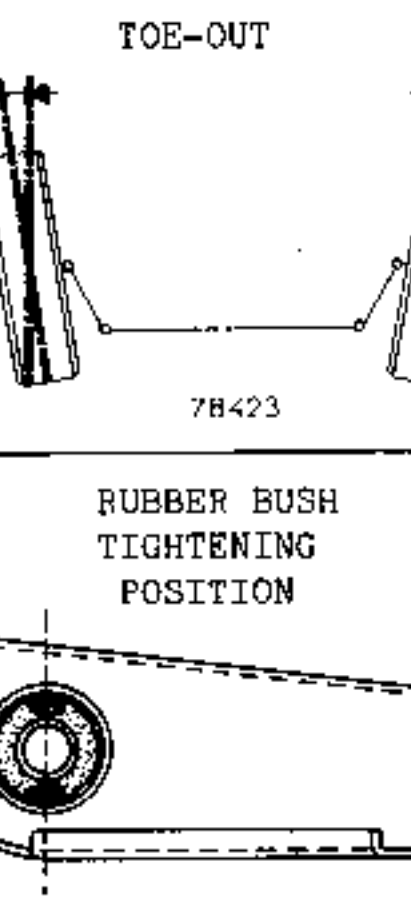
2nd Arrangement (From January 1988 onwards)

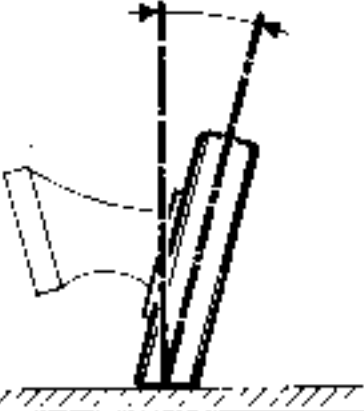
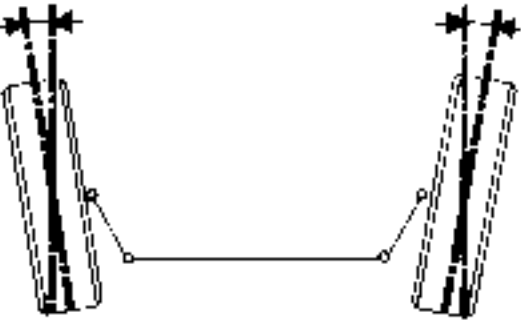
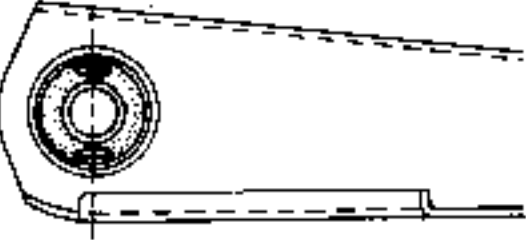


REAR SUSPENSION



	DIMENSIONS	TIGHTENING TORQUES
Bleed screws		0.6 to 0.8
Hoses on front calipers	M 10 x 100	1.3
Hoses on rear suspension arms	M 10 x 100	1.3
Rear wheel cylinder supply	M 10 x 100	1.3
Master cylinder outlets	M 10 x 100 or	1.3
	M 12 x 100	
Compensator inlets	M 10 x 100 or	1.3
	M 12 x 100	
Compensator outlets	M 10 x 100 or	1.3
	M 12 x 100	

ANGLE	VALUE	POSITION of FRONT AXLE	ADJUSTMENT
<p>CAMBER</p> 	<p>$3^{\circ}25' \pm 20'$</p> <p>maximum difference between RH and LH side 1°</p>	<p>UNLADEN</p>	<p>ADJUSTABLE at tie-rods</p> <p>1 turn = 15'</p>
<p>STEERING AXIS INCLINATION</p> 	<p>$0^{\circ}20' \pm 30'$</p> <p>maximum difference between RH and LH side 1°</p>	<p>UNLADEN</p>	<p>NON ADJUSTABLE</p>
<p>TOE-OUT</p>  <p>7B423</p>	<p>Across both wheels (toe-out)</p> <p>$0^{\circ}20' \pm 10'$</p> <p>(2mm \pm 1)</p>	<p>UNLADEN</p>	<p>Adjusted by turning the steering link sleeves</p> <p>1 turn = 30' (3mm)</p>
<p>RUBBER BUSH TIGHTENING POSITION</p> 		<p>UNLADEN</p>	

ANGLE	VALUE	POSITION	ADJUSTMENT
<p>CAMBER</p> 	<p>$0^{\circ} \pm 30$</p>	<p>UNLADEN</p>	<p>NON ADJUSTABLE</p>
<p>TOE-IN</p>  <p>78423</p>	<p>(toe-in)</p> <p>- 1 to - 4 mm or -10' to -40'</p>	<p>UNLADEN</p>	<p>NON ADJUSTABLE</p>
<p>RUBBER BUSH TIGHTENING POSITION</p>  <p>81603</p>		<p>UNLADEN</p>	

Type	Quantity	Unit concerned
Elf-Multi	5 g Coat	Lips on seals Threads on wheel bolts
Hatmo	Coat	Pivot points Lower hinge pin bearings Splines and bushes on steering column
Molkote BR2	24 cms Coat	Steering box Drive shaft splines at gearbox end
CAF 4/60 THIXO	1 to 2 drops	Drive shaft pin hole
Molykote 33 Medium	Coat	Anti roll bar bearings
Loctite "FRENBLOC"	1 to 2 drops	Threads on axial ball joint
Self-vulcanising plugs in kit combi. A	77 01 413 243	The repairing of Tubeless tyres
Loctite "SCELBLOC"	5 to 6 drops	Stub axle on drive shaft
Oil SAE 80W	Coat	Stub axle

BRAKE FLUID CHANGE PERIODS

Present day brake fluids are subject to slight deterioration during the first few months of use as a result of taking up a slight amount of water. From then on the water content stabilises.

As this slight deterioration takes place at the beginning of its operating life, the braking system is designed to suit the specifications of the deteriorated fluid so that THE FLUID DOES NOT REQUIRE SYSTEMATIC PERIODIC REPLACEMENT.

Furthermore, the design of our braking systems, in particular our disc brakes (hollow pistons that transmit a very small amount of heat, a small amount of fluid in the cylinder, sliding calipers that avoid the necessity for keeping a reserve of fluid in the least well cooled part of the wheel) has permitted us to reduce the risk of vapour lock to an absolute minimum, even when the brakes are used intensively (in mountain regions).

Consequently, the characteristics of brake fluid change very little after a few months and, as we have said, the product does not require systematic changing. However, all the brake fluid must be replaced if extensive work is carried out on the system such as replacing a caliper or a wheel cylinder or, obviously, a complete overhaul of the system.

Topping up the fluid level :

Wear on the brake pads and linings causes a gradual fall of the level of the brake fluid in the reservoir. It is unnecessary to top up this fall because the correct level will be re-established when the pads are changed. Obviously, however, it must not be allowed to fall below the minimum level mark.

Officially approved brake fluids :

Mixing two incompatible brake fluids in the same system can cause a serious risk of leakage following, mainly, an attack on the seals. To avoid this risk, it is essential only to use brake fluids that have been checked and officially approved by our laboratories and which conform to Standard SAE J 1703 and DOT 3 or DOT 4.

Parts that must automatically be replaced whenever removed

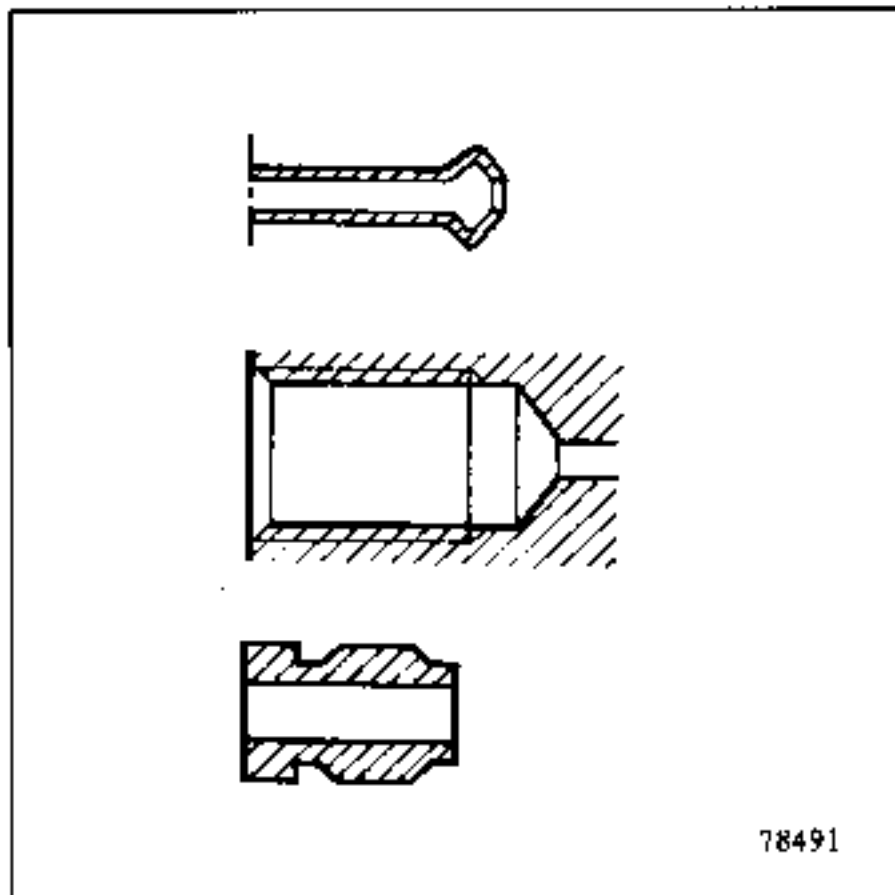
- Axial ball joint locking plate.
- Wheel balancing weight securing hooks.
- Hub bearings.
- Girling caliper guide bolts.

The pipes between the master cylinder, the front calipers, the pressure limiting valve and the rear wheel cylinders have unions on them the threads of which are METRIC.

Consequently, it is important only to use the parts that appear on the Spare Parts Catalogue for this vehicle.

Identification of the parts:

- The SHAPE of the end of steel or copper PIPES
- The SHAPE of the TAPPINGS in the wheel cylinders.
- The colour of the UNIONS which are either GREEN or BLACK : 11 mm or 12 mm hexagon.



The effect of the various geometry angles on the road-holding of the vehicle and on tyre wear .

CAMBER

It is the comparison between the left-hand and right-hand angles which is important. A difference of more than one degree from one side to the other causes the vehicle to pull to one side. This movement has to be corrected at the steering wheel and this causes abnormal tyre wear.

CASTOR

Once again it is the comparison between the left-hand and right-hand angles which is important. A difference of more than one degree also causes the vehicle to pull to one side, correction at the steering wheel and consequent unnecessary wear on the tyres.

The characteristic of this defect is a pull towards the side on which the angle is smallest when the vehicle is being driven at constant speed.

STEERING BOX HEIGHT

This setting affects the change in the toe-in/out as the suspension components move.

Different variations on the toe-in/out between the right-hand and left-hand wheels causes (without the steering wheel changing position):

- pulling to one side during acceleration
- pulling towards the opposite side on over-run, '
- changes in steering heading on bumpy roads.

TOE-IN/OUT

The steering must, absolutely, be centralised before this adjustment is carried out, if an effect on the road-holding is to be avoided.

It is to be noted :

- that an excessive amount of toe-out causes symmetrical wear on the inside edges of both tyres,
- that an excessive amount of toe-in causes symmetrical wear on the outside edge of both tyres.

PRELIMINARY CHECKS

Before checking the axle geometry, the following points are to be checked, and, if necessary, remedied:

- That the tyres on any given axle are the same from the point of view of :
 - . dimensions,
 - . inflation pressures,
 - . degrees of wear.
- Hinge and pivot points :
 - . check the condition of the rubber bushes,
 - . check the play in the ball joints,
 - . check the bearing play.
- The wheel run-out : this must not exceed 1.2 mm (it will be compensated for by the checking equipment).
- That the under body heights are the same (a check on the condition of the suspension).

DETERMINING THE STEERING CENTRE POINT

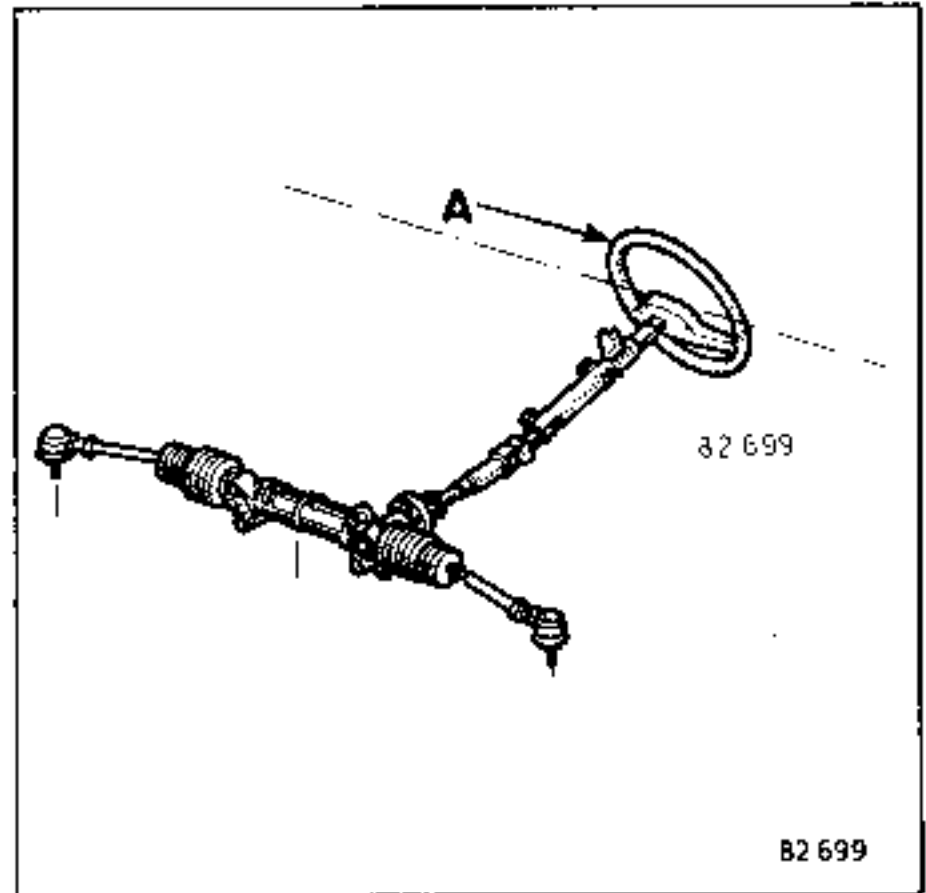
An operation of checking and adjusting the front axle geometry involves centralising the steering to avoid the vehicle pulling to one side or the other.

Turn the steering against its lock stop in one direction.

Make a mark (A) at the top of the steering wheel rim.

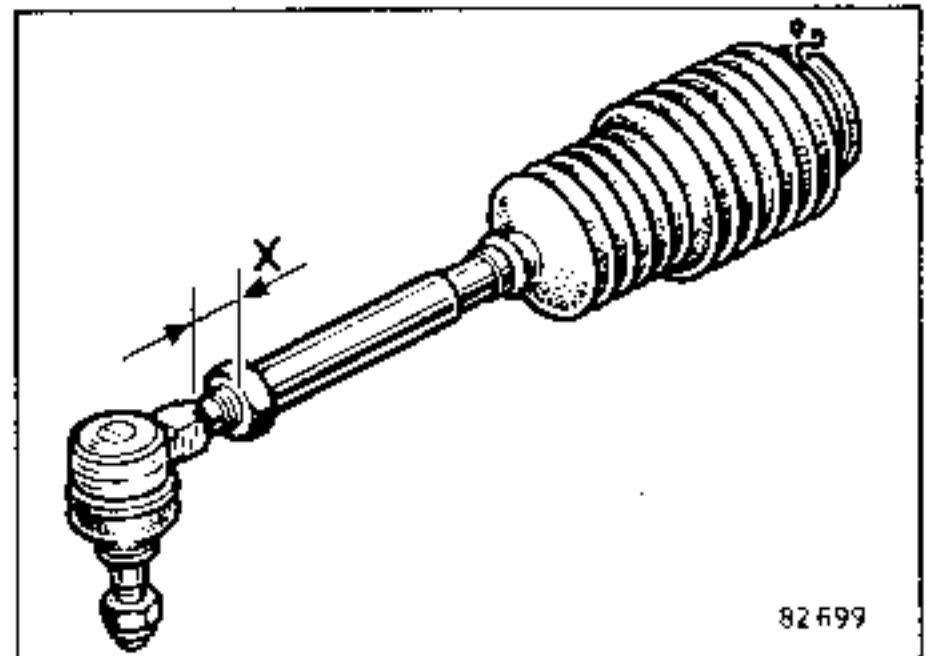
Turn the steering wheel, counting the number of turns and fractions of a turn, to bring the steering against the other lock stop.

Come back by half the number of turns (and fractions of a turn) just noted. The steering will then be in its "centre point".



In this position, fit the geometry checking equipment and continue with the check.

When adjusting the toe-in or out ensure that both lengths X on the steering link ball joint casings are the same.

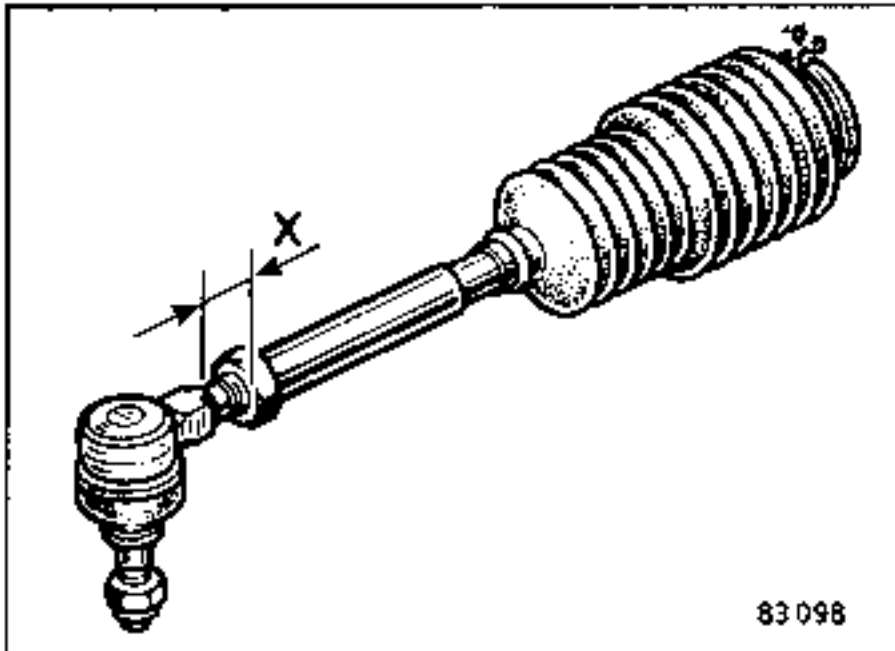


CHRONOLOGICAL ORDER IN WHICH THE OPERATIONS ARE TO BE CARRIED OUT

Because of the geometric design of a front axle, a change in one of the angles (castor, camber, steering axis, toe-in/out and variation) will have greater or lesser effect on the other angles (the castor angle is the one that has most effect).

It is therefore essential to keep to the following order :

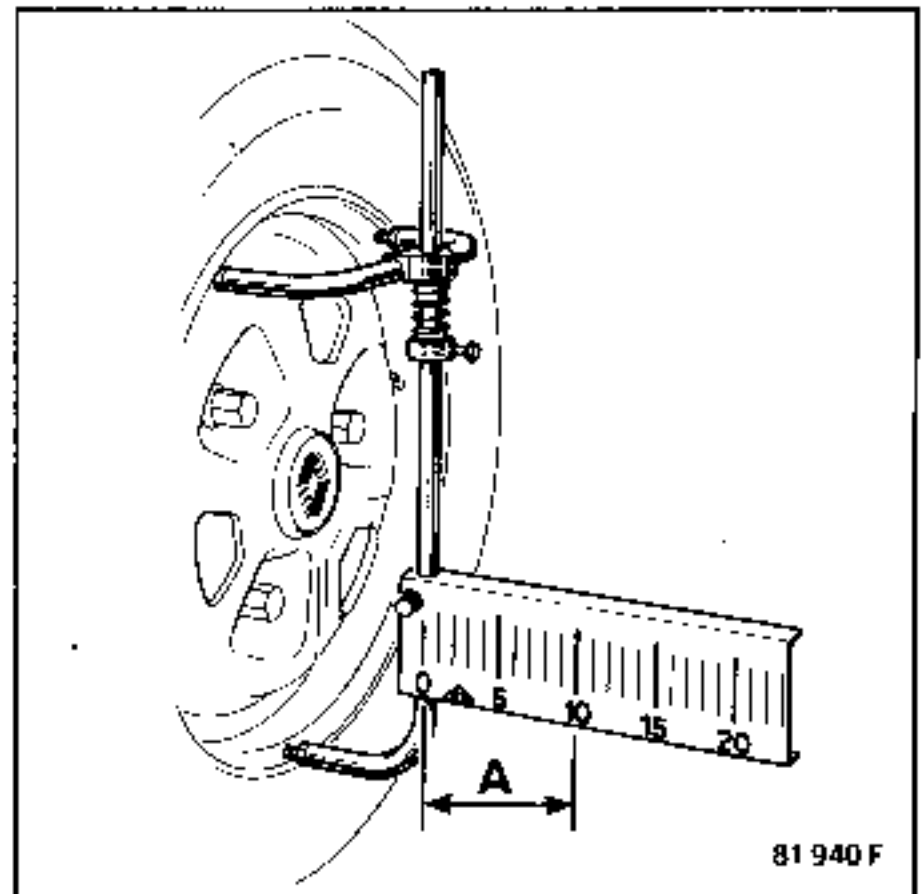
- place the equipment on the vehicle by following its manufacturer's instructions.
- determine the steering centre point (see preceding page) and clamp the steering wheel.
- lift the vehicle from under its bodyshell.
- cancel out the wheel run-out
- lower the vehicle onto swing plates,
- fit the pedal depressor
- "bounce" the suspension to establish the free suspension height,
- check that the length X on the steering



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link ball joint casings are the same,

- note readings A on the equipment scales.



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1 If lengths A are the same :

- dimension A should be equally distributed.

2 If lengths A are not the same :

- note down dimensions A on the right-hand and left-hand sides, subtract them one from the other and distribute half of the result on either side.

Example :

Reading on right-hand side : 16

Reading on left-hand side : 10

$$16 - 10 = 6$$

$$6 : 2 = 3$$

Turn the steering links to even out dimensions A on both sides :

$$A = 13$$

- in this position, zero the swing plates,

- carry out the check in the following order :

- . the castor angle,
- . the steering axis inclination,
- . the camber,
- . the toe-in/out.

This fault-finding sequence covers all types of circuit and braking system component used on our current range.

Notice is only to be taken of those items that apply to the vehicles covered by this Workshop Manual.

The fault-finding sequence is broken down into two distinctly separate parts to facilitate identifying the problem.

- I The effect felt at the pedal
- II The effect on the vehicle behaviour

I EFFECT FELT AT THE PEDAL

DEFECT	POSSIBLE CAUSE
<p>Hard pedal : High pedal pressure required to obtain poor deceleration</p>	<ul style="list-style-type: none"> - Defective servo system - Pads and linings : <ul style="list-style-type: none"> . greasy, . glazed or of the incorrect type, . overheated following a prolonged period with the pedal under constant pressure (descending a long incline). - Piston sticking. - Brake pipe crushed or kinked. - Pads or linings worn : almost no lining left, just before metal to metal contact (loud noise).
<p>Pedal spongy :</p> <p>Note : As the servo assistance ratio on present day vehicles is high, one always has the effect of a spongy pedal. To determine whether the system is defective or perfectly normal, two tests are to be carried out.</p> <ol style="list-style-type: none"> 1. With the vehicle moving Carry out a subjective test on the ratio between the pedal travel and the braking effect obtained. 2. With the vehicle stationary and the engine switched off Carry out an additional test on the brake pedal travel : depress the brake pedal 5 times to empty the braking servo before considering test result valid. 	<ul style="list-style-type: none"> - The presence of air in the system : poorly bled. - Internal leakage in the braking system - Insufficient fluid in the reservoir (external leak in the braking system)

Long pedal travel :

This test is to be carried out with the vehicle stopped and its engine switched off.

Note: The brake pedal will have to be depressed 5 times to empty the braking servo before considering the results of the test as valid.

- Brake shoes incorrectly adjusted.

Drum brakes only :

- Manual adjustment : shoes too far from the surface of the drum

Disc and drum brakes :

- Automatic adjustment : handbrake cable too tight.

Note : The wear in the braking system will be taken up automatically when the pedal is depressed unless the handbrake cable is too tight when the brake is in the released position.

- Excessive asymmetric wear on the pads and linings (at an angle or hollow)
- Excessive master cylinder clearance.
- Fluid boiling or overheated.

Pedal going right down to the floor :

This test is to be carried out with the vehicle stationary and the engine switched off.

Note : The brake pedal will have to be depressed 5 times to empty the brake servo before results of test can be considered as valid.

- Fluid leakage (check the system for leaks)
- Defective seal between the two master cylinder circuits.
- Fluid boiling

II EFFECT APPARENT ON VEHICLE BEHAVIOUR

DEFECT

POSSIBLE CAUSE

Brakes self-engaging

- Apply lead chamfers to linings.
- Linings and pads slightly greasy.
- Replace springs.

Brakes juddering

- Oval drums.
- Run-out in discs.
- Disc thickness not the same all round.
- Abnormal deposit on discs (oxidisation between pad and disc).

<p>Pulling to one side (at the front) when the brakes are applied</p>	<ul style="list-style-type: none"> - Check front suspension, axle and steering. - Piston sticking*. - Tyre defect (wear - inflation). - Pipe crushed or kinked*. <p>*WARNING : On vehicles that have negative offset type front axles, pulling to one side is a result of a defect on the opposite side.</p>
<p>Pulling to one side (at the rear) when the brakes are applied</p>	<ul style="list-style-type: none"> - Brake compensator or pressure limiting valve (adjustment - operation). - Piston sticking. - Shoes incorrectly adjusted. -Manual adjustment: shoe too far from the surface of the drum. Automatic adjustment: handbrake cable too tight. <p>Note : The wear is automatically taken up when the pedal is depressed unless the handbrake cable is excessively tight when in the released position.</p> <ul style="list-style-type: none"> - Return spring.
<p>Brakes overheating</p>	<ul style="list-style-type: none"> - Master cylinder free travel insufficient thus preventing the master cylinder from returning to the released position. - Piston sticking or not returning correctly. - Pipe crushed or kinked. - Handbrake control sticking. - Handbrake control incorrectly adjusted.

ESSENTIAL SPECIAL TOOLS

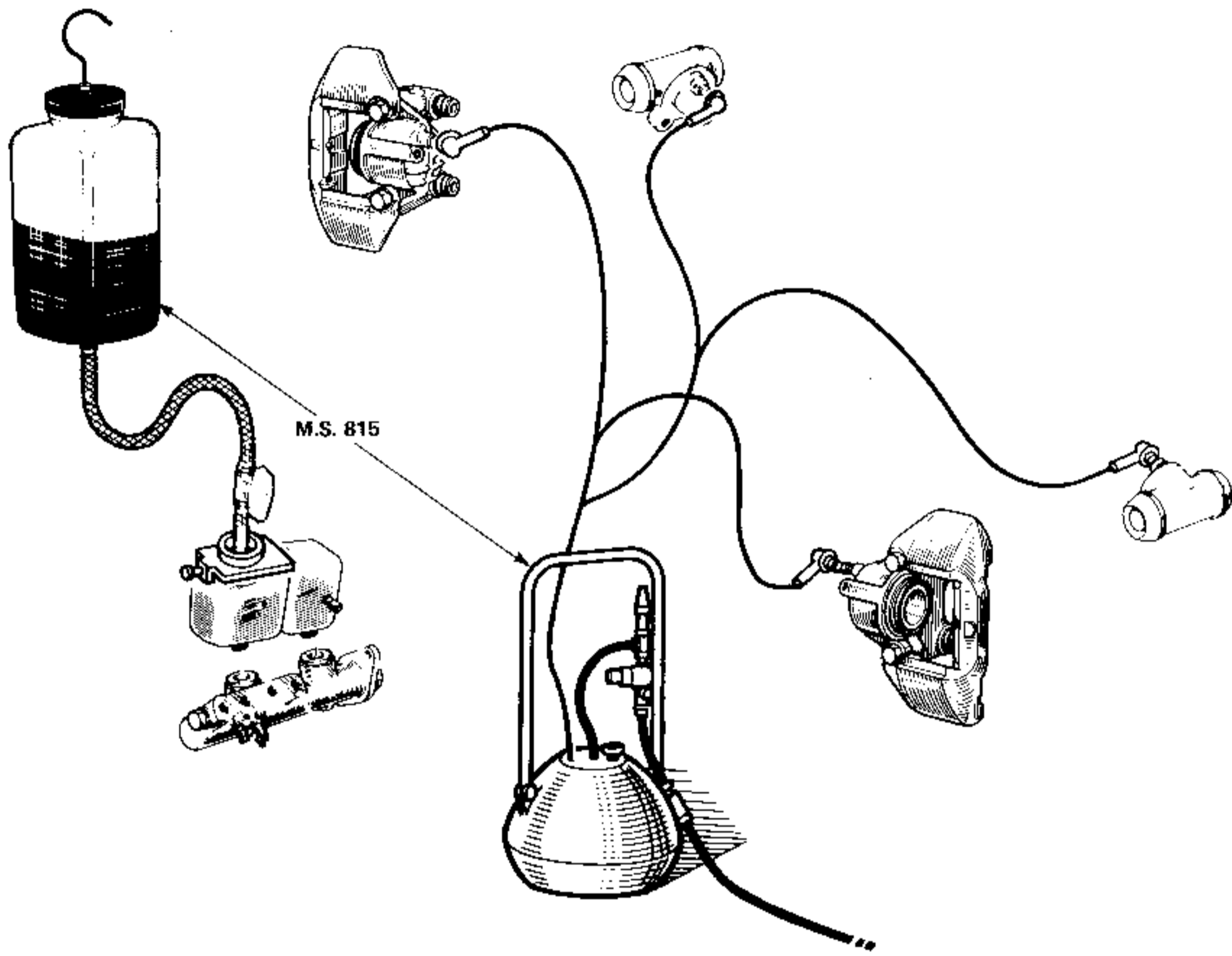
M.S. 815 Brake bleeding unit

When bleeding the braking system of a vehicle equipped with servo brakes, it is important, no matter what the method used, for the servo system not to be operating during the operation.

- The system is bled using equipment M.S.815 on a four column lift with the wheels resting on the floor.
- Connect the pipes on M.S.815 to the bleed screws on the :
 - master cylinder,
 - wheel cylinder
 - compensator or pressure limiting valve.
- Connect the unit to a compressed air source (minimum pressure 5 bars).
- Connect the filling system to the brake fluid reservoir.
- Open the supply and wait until the reservoir is full (both of its parts).
- Open the compressed air valve.

As these vehicles are equipped with "crossed"(X) circuits, proceed as follows :

- Open :
 - the bleed screw on the rear right-hand wheel and allow the fluid to flow for approximately 20 seconds,
 - the bleed screw on the front left-hand wheel and allow the fluid to flow for approximately 20 seconds.
- Take no notice of the air bubbles in the pipes on the bleed equipment.
- Carry out the same operation on the rear left-hand wheel and front right-hand wheel.
- Check that the brake pedal is firm when depressed (press it several times).
- Repeat the bleed operation if necessary.
- Top up the level of the brake fluid in the reservoir after disconnecting the equipment.



ESSENTIAL SPECIAL TOOL

T. Av. 476

Ball joint extractor

TIGHTENING TORQUES (in daN.m)

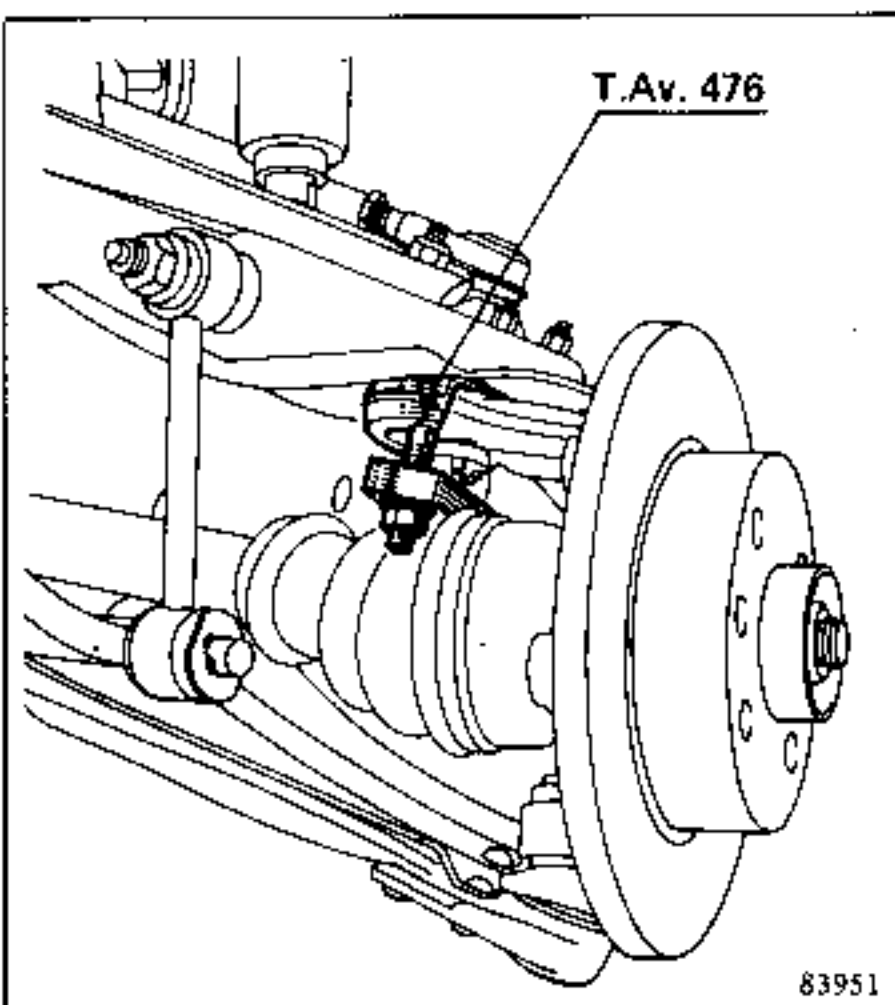
Upper suspension arm hinge pin	9.5
Shock absorber lower securing pin	8
Nut on castor tie rod	7
Nut on upper ball joint	6.5
Wheel bolts	9
Shock absorber lower lock nut	4
Bearing securing nut	1.5

REMOVING

Loosen the lock nut at the bottom of the shock absorber.

Disconnect :

- the castor tie rod at the suspension arm end,
- the upper ball joint using tool T.Av.476.

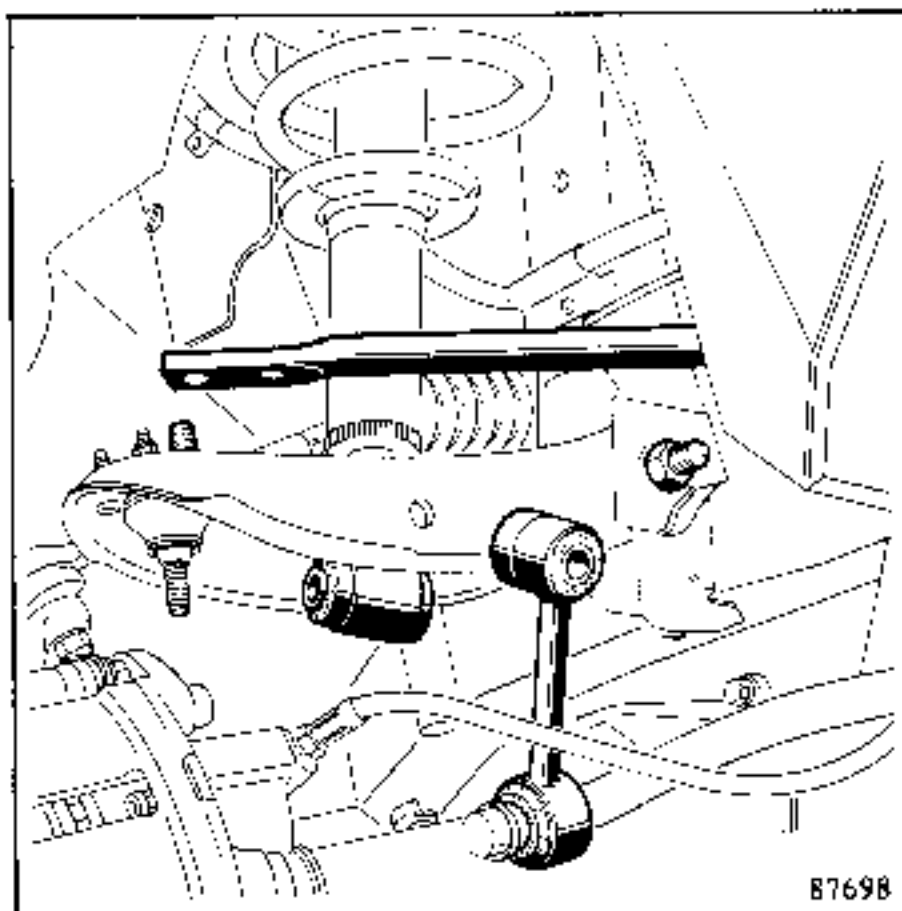


- the anti-roll bar.

Remove :

- the pin from the bottom of the shock absorber,
- the suspension arm hinge pin.

Lift the arm and unscrew the bottom of the shock absorber.



REFITTING

Correctly position the suspension arm and screw on the bottom of the shock absorber.

Refit without tightening them :

- the upper suspension arm hinge pin,
- the shock absorber lower securing pin after coating it with "HATMO" grease,
- the anti-roll bar.

Refit and tighten the following to the specified torques :

- the castor tie rod,
- the nut at the bottom of the shock absorber,
- the upper ball joint.

With the weight of the vehicle resting on its wheels, tighten the following to the specified torque :

- the upper suspension arm hinge pin,
- the pin at the bottom of the shock absorber.

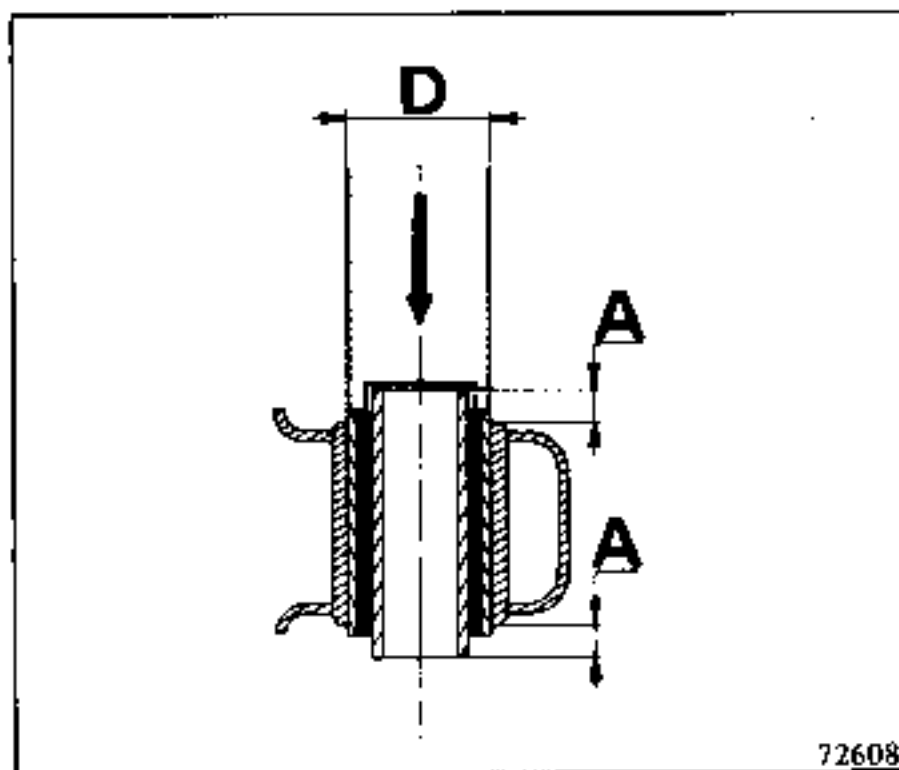
First remove the upper suspension arm :

- Push out the damaged bush on the press using a tube of the following outside diameter :

D	Up to December 1987	From January 1988
	26 mm	34,5 mm

- Fit the new bush on the press and centralise it in the suspension arm.

A	Up to December 1987	From January 1988
	6 mm	7,5 mm



72608

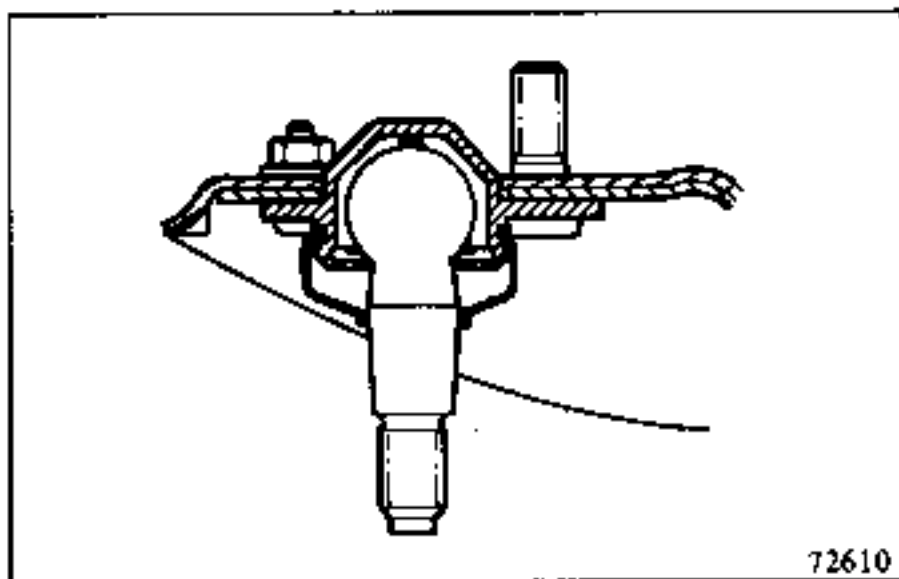
REPLACING THE UPPER SUSPENSION ARM BALL JOINT

REMOVING

Disconnect the upper ball joint using tool T.Av.476.

Removing :

- the nut from the castor tie rod,
- the ball joint securing bolts.



72610

REFITTING

Place the ball joint on the suspension arm.

Reconnect the castor tie rod and the stub axle carrier.

Check and, if necessary, adjust :

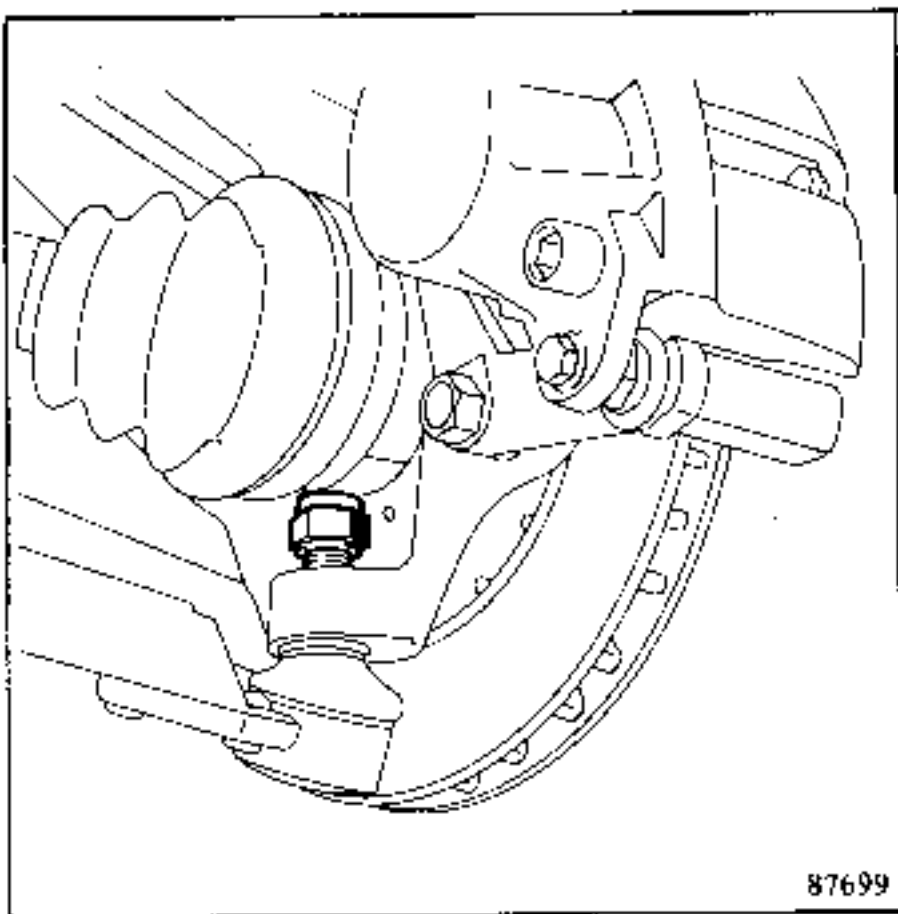
- the castor and camber angles,
- the steering box height,
- the toe-out.

TIGHTENING TORQUES (in daN.m)

Wheel bolts	9
Nut on lower ball joint	6.5
Suspension arm hinge pin	9

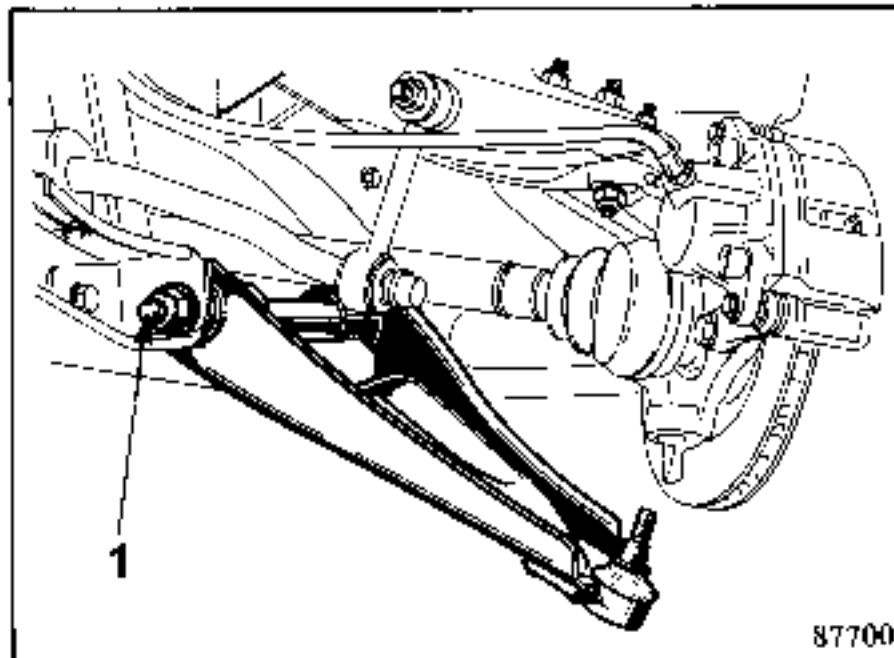
REMOVING

Loosen the ball joint nut and unscrew it until it makes contact with the drive shaft yoke. Then continue to unscrew it to extract the ball joint (the nut itself will act as an extractor and must therefore be replaced when refitting).



Remove :

- the pin (1) in a forward direction,
- the suspension arm.

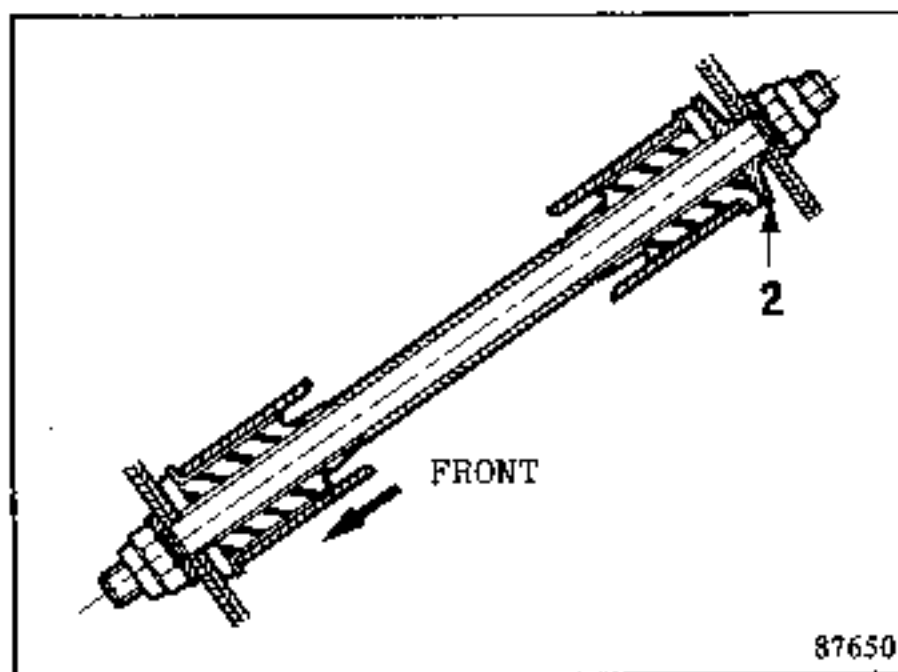


REFITTING

Fit the suspension arm.

Coat the pin with "HATMO" grease.

Ensure that the castor adjusting shim (2) is correctly positioned (at the rear on power steering versions).



Refit the ball joint and tighten it to torque.

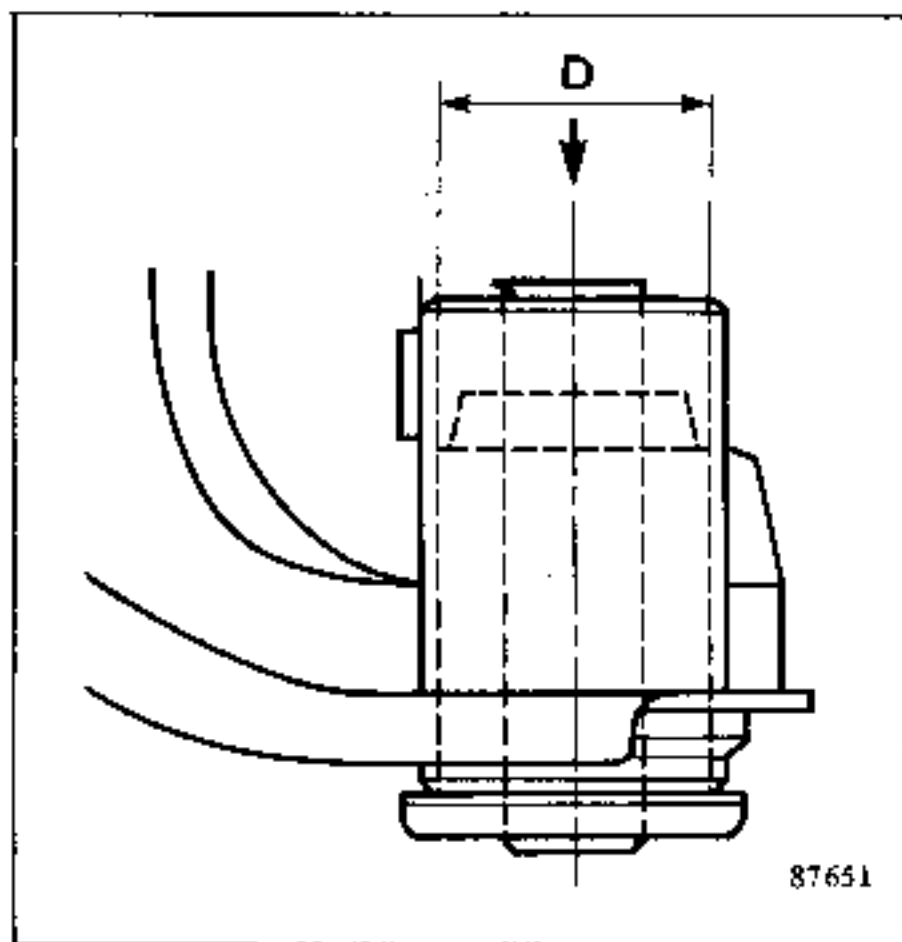
Lower the vehicle onto its wheels and tighten the hinge pin to torque.

To keep the rubber bushes central with reference to the suspension arm centre line, they are to be replaced one at a time.

First remove: The lower suspension arm

- Push out just one of the worn bushes on the press using a tube with an outside diameter :

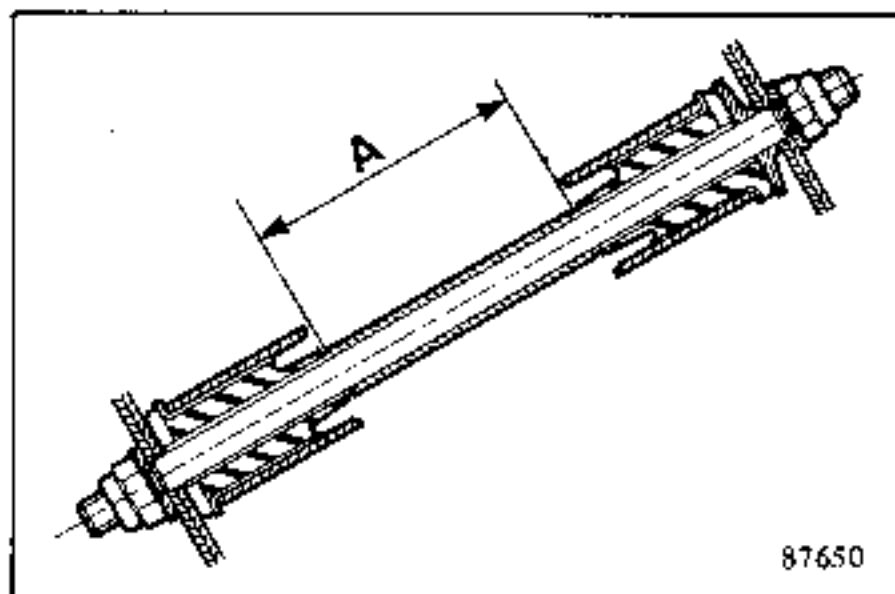
D	Up to December 1987	From January 1988
	31 mm	39,5 mm



- Fit a new rubber bush so as to retain dimension A :

A	Up to December 1987	From January 1988
	181,3 mm	112,6 mm

Note : When the rubber on both bushes is damaged and reference dimension A can therefore not be determined, mark the position of the outer tube on the bush with reference to the suspension arm and fit the new bush in the same position.



Push out the second bush on the press and proceed in the same way to maintain dimension A.

REPLACING THE BALL JOINT ON THE LOWER SUSPENSION ARM

If the rubber bellows is damaged, it is essential to replace the entire ball joint.

This operation involves removing the lower suspension arm.

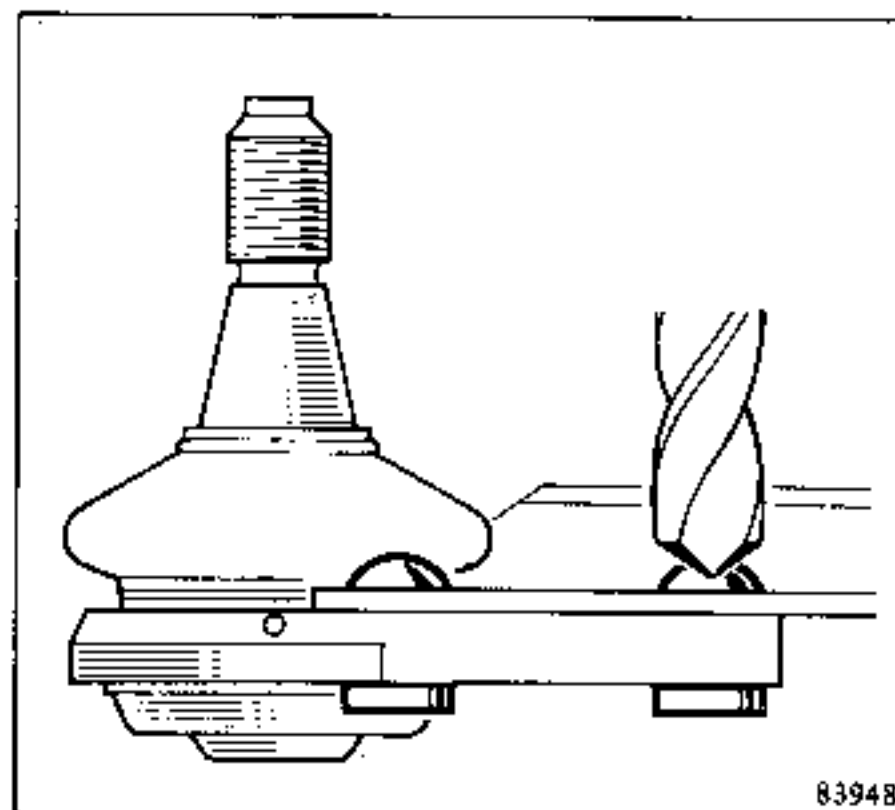
Drill out the heads on the ball joint securing rivets and free the ball joint.

Secure the new ball joint in place with the bolts supplied with it.

Place the bolt heads on the same side as the protective bellows.

Refit the lower suspension arm.

Check and, if necessary, adjust the front axle geometry.



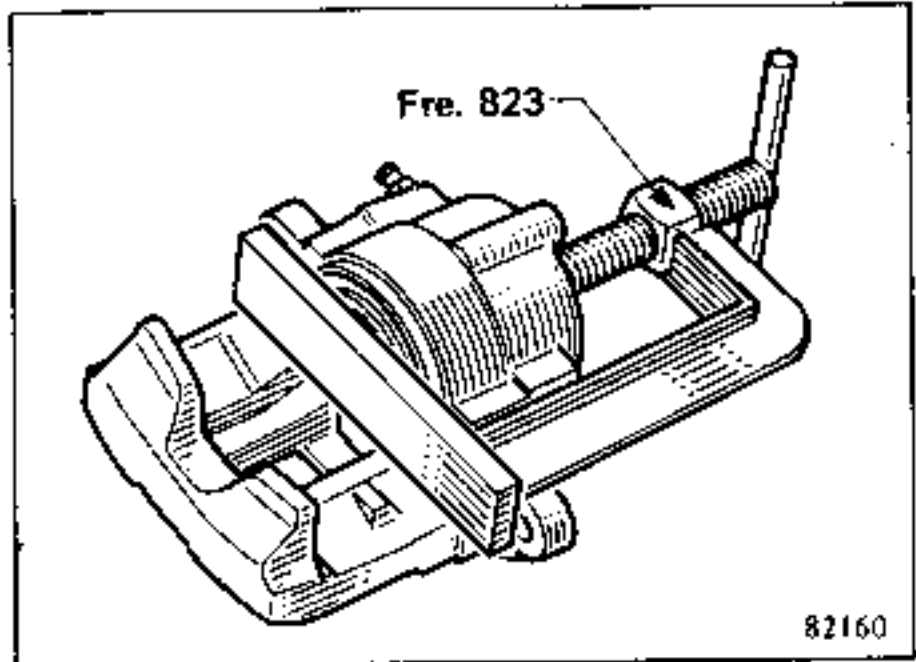
TIGHTENING TORQUES (in daN.m)



Wheel bolts: 4 bolts	9
Brake caliper guide bolts	3,5

ESSENTIAL SPECIAL TOOLS

Fre. 823 Piston pusher

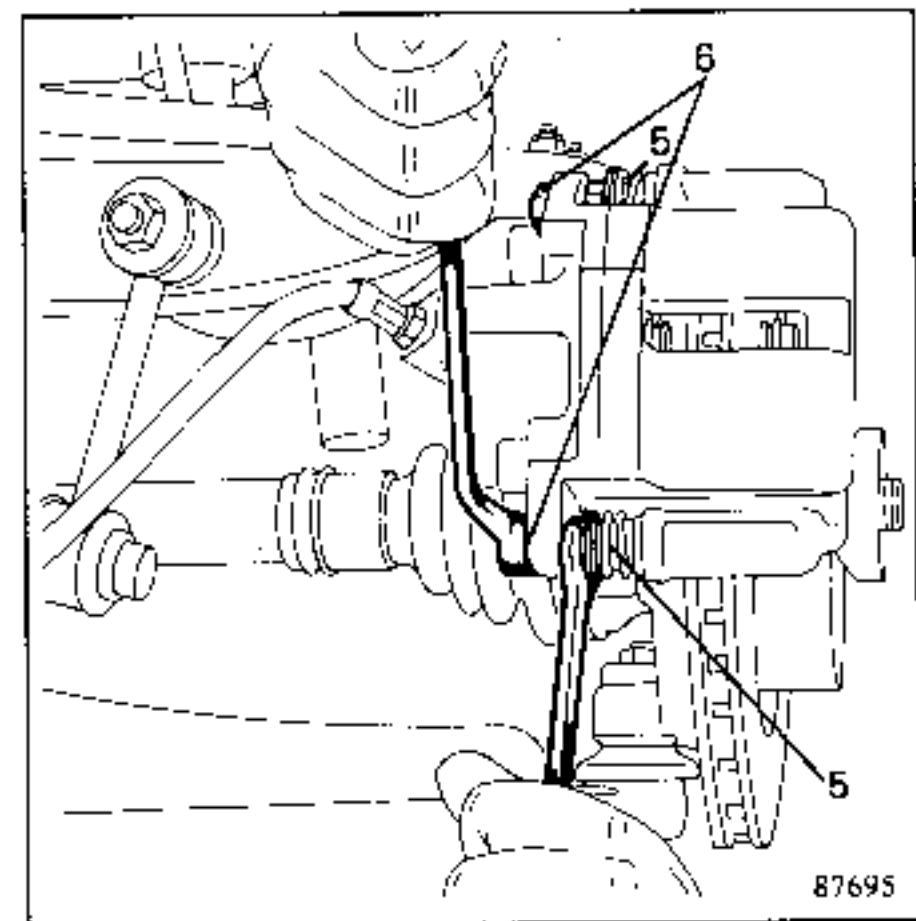


82160

REMOVING

- Disconnect the pad wear warning light wires.
- Push in the piston by sliding the caliper towards the outside, by hand.
- Remove the guide bolts (6) with 2 spanners. Do not clean these bolts.
- Free the sliding caliper.
- Take out the pads.

- Place the new pads in position.
- The pad which has the wear warning light on it is fitted on the inside.
- Fit the caliper and its lower guide bolt (6) coated with Loctite "FRENBLOC".
- Press down the caliper and fit the upper guide bolt after coating it with Loctite "FRENBLOC".
- Tighten the guide bolts to torque, starting with the bottom one.
- Press the brake pedal a few times to bring the pistons into contact with the pads.

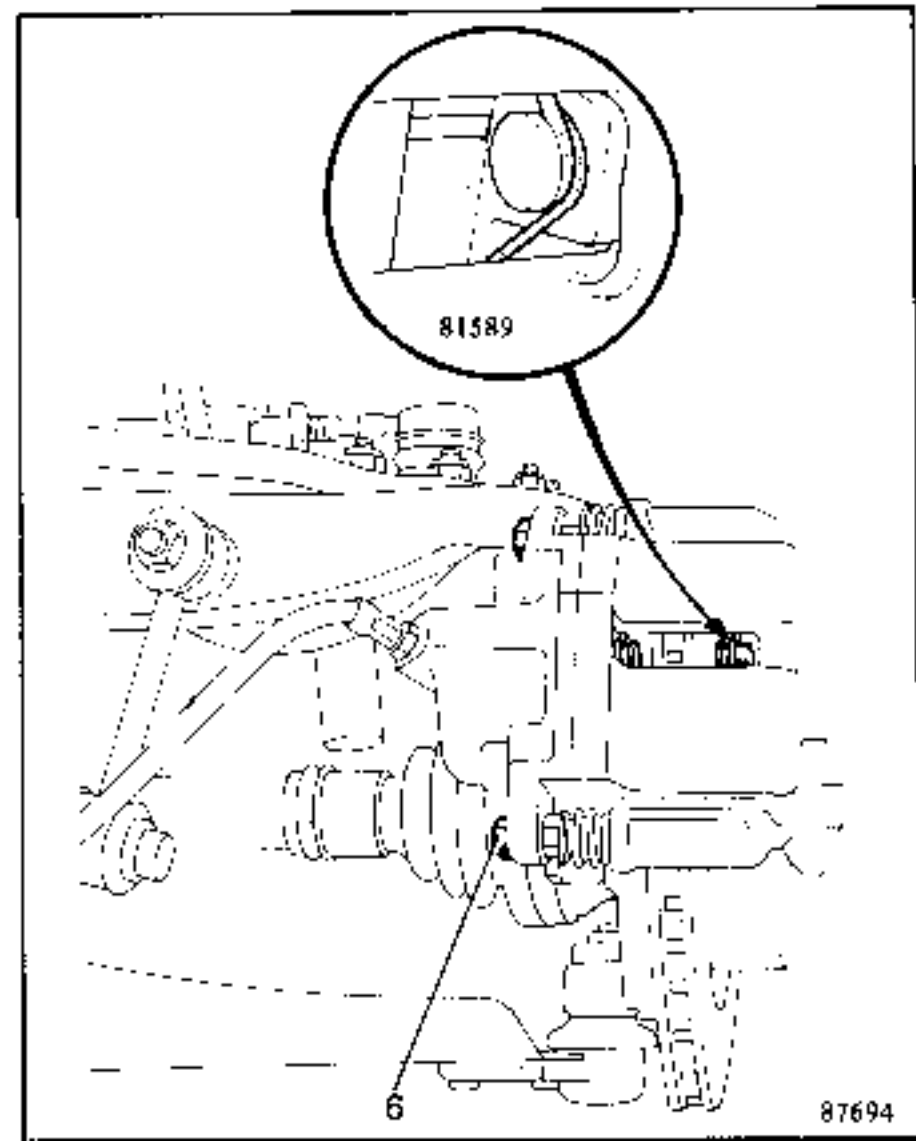


87695


Check that the piston dust cover and its retaining circlip are in good condition and correctly fitted.

REFITTING

Push in the caliper piston using tool Fre.823.



87694

TIGHTENING TORQUES (in danN.m)	
Wheel bolts	9
GIRLING brake caliper guide bolts	3.5

REMOVING

Loosen the brake hose at the wheel cylinder end.

Remove :

- the brake pads - (see corresponding section).

Unscrew the hose from the wheel cylinder (have a container by to catch the fluid).

Check the condition of the hose and replace it if necessary (see section entitled replacing the hose).

REFITTING

Screw the wheel cylinder on to the hose.

Loosen the wheel cylinder bleed screw and wait for fluid to flow from it (check that there is enough fluid in the brake fluid reservoir).

Re-tighten the bleed screw.

Check the condition of the pads and refit them.

The system can only be partially re-bled if the brake fluid reservoir has not emptied during the operation. If it has, carry out a complete bleed operation :

- on the entire braking system.

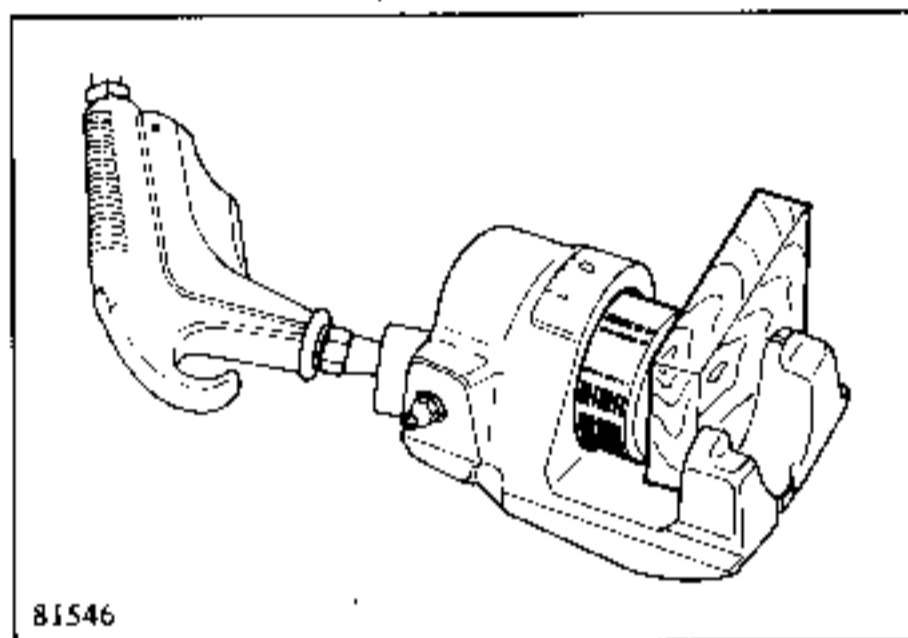
Depress the brake pedal a number of times to bring the pistons into contact with the pads.

OVERHAULING

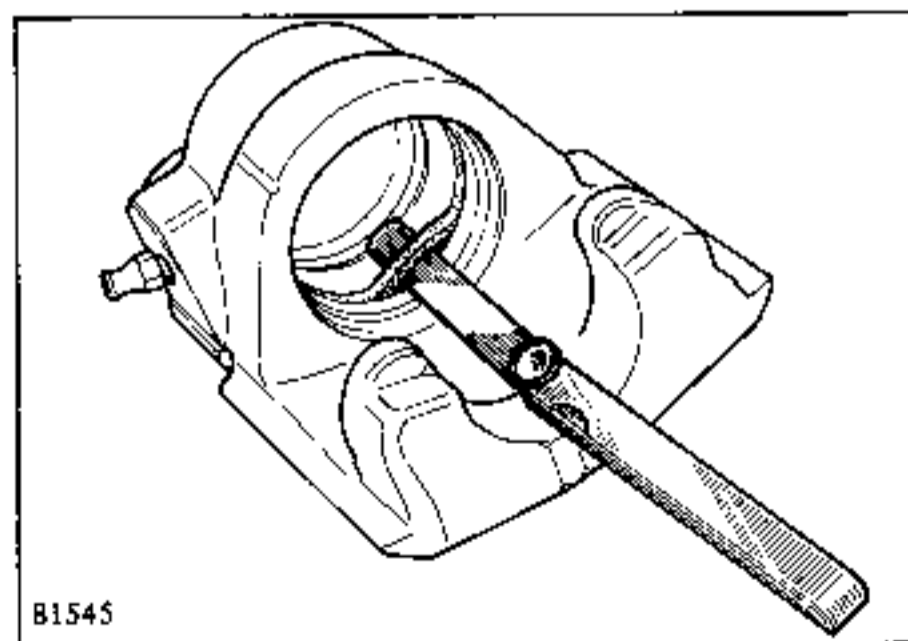
Any scoring in the caliper bore makes it essential to replace the complete caliper.

Remove the brake caliper and take off the rubber dust cover and its retaining ring. Blow out the piston with compressed air, taking care first to place a block of wood between the caliper and the piston so that it is not damaged : even the slightest

impact mark on the piston skirt would render it unusable.




Using a flexible blade with rounded edges (of the feeler gauge type) take out the rectangular section seal from the groove in the caliper.



Clean the parts with methylated spirits.

Replace any defective parts by genuine spares and refit the seal, the piston, the dust cover and its retaining ring.

The brake discs cannot be refaced. If a disc is excessively worn or scored, it must be replaced by a new one.

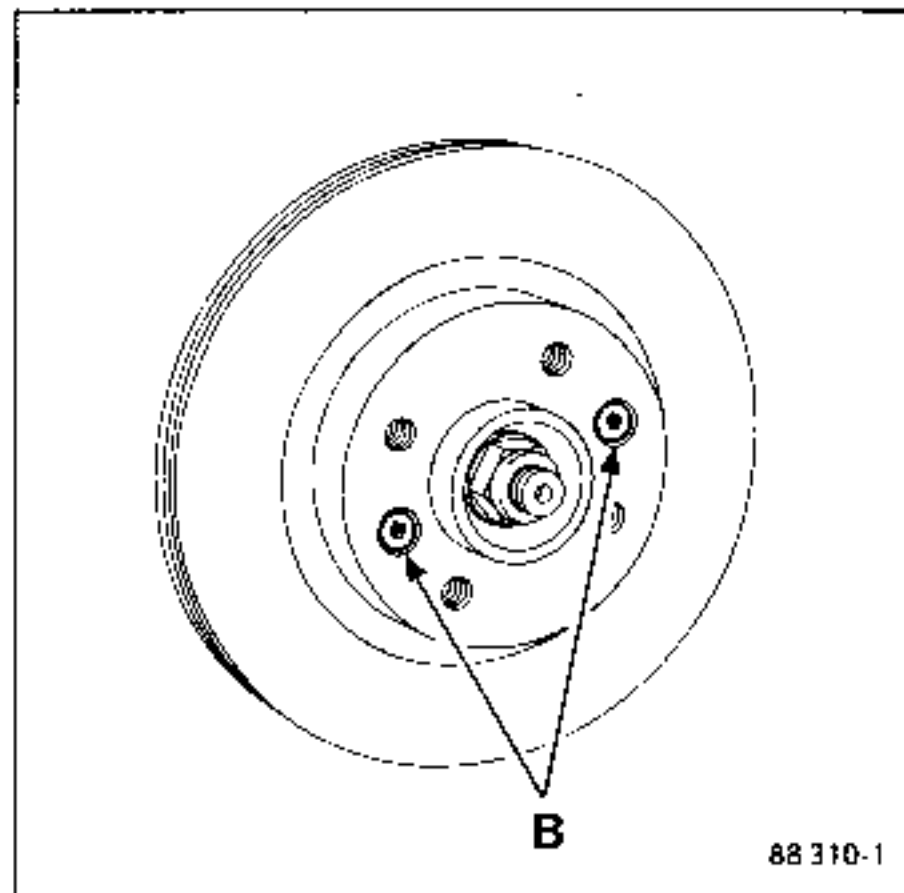
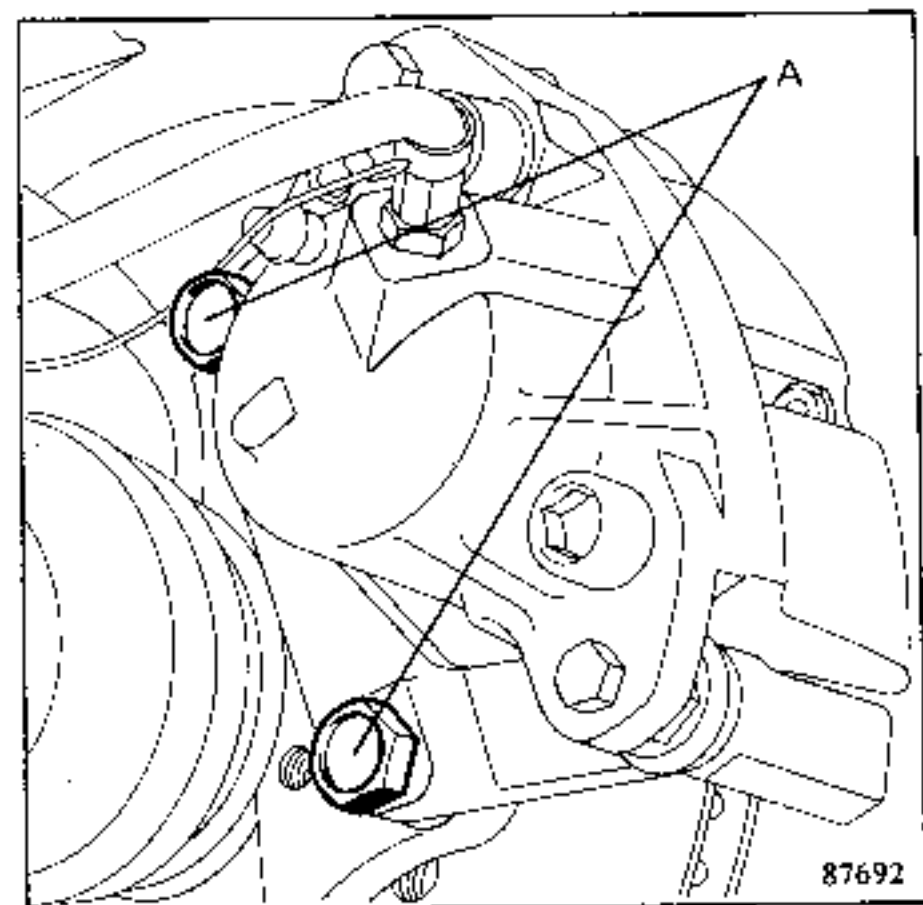
 TIGHTENING TORQUES (in daN.m)	
Wheel bolts	9
Disc locating screws	1,5
Caliper securing bolts	6,5

REMOVING

Remove:

- the two caliper securing bolts (A),
- the two disc securing screws (B) (using a Torx T.40 key (e.g. Facom 89-40),
- the disc.

GIRLING



REFITTING

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

Fit the brake caliper, coating the bolts with Loctite "FRENBLOC" and tighten the bolts to torque.

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

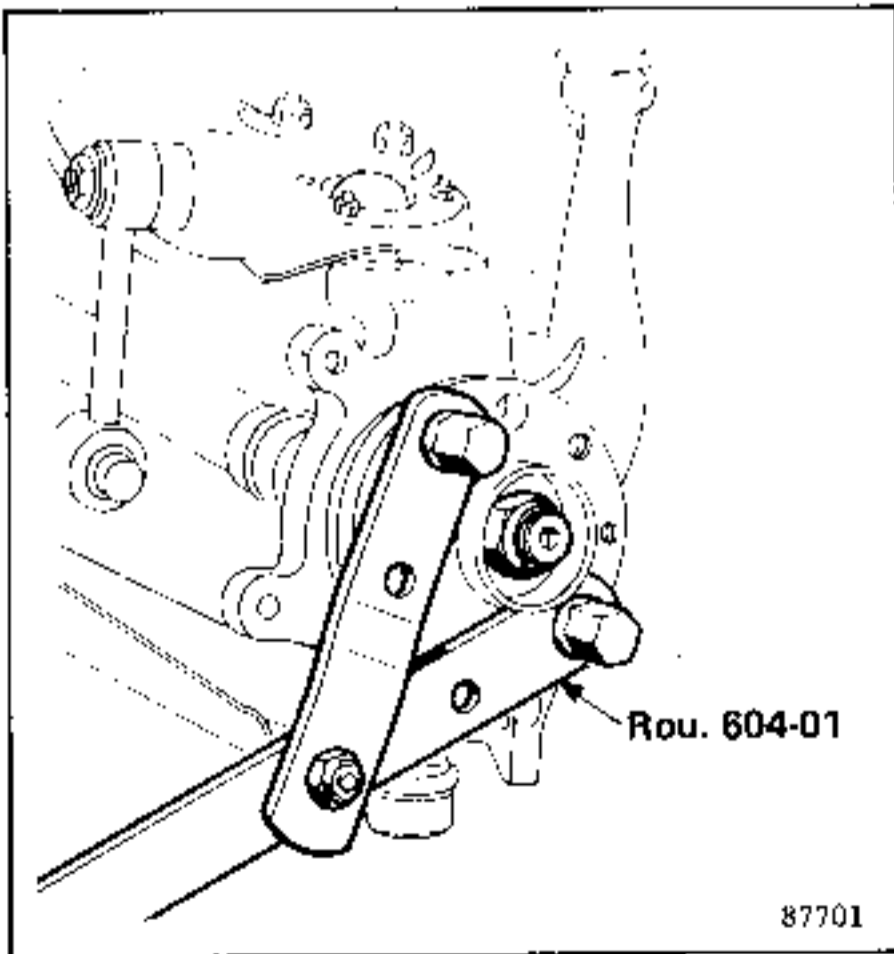
ESSENTIAL SPECIAL TOOLS	
M.S.580	Inertia weight
Rou.15-01	Shaft protector
Rou.604-01	Hub locking tool
T.Av.476	Ball joint extractor
T.Av.1050	Hub extractor

TIGHTENING TORQUES (in daN.m)	
Drive shaft nuts	25
Wheel bolts	9
Caliper securing bolts	10
Bearing securing screws	1,5

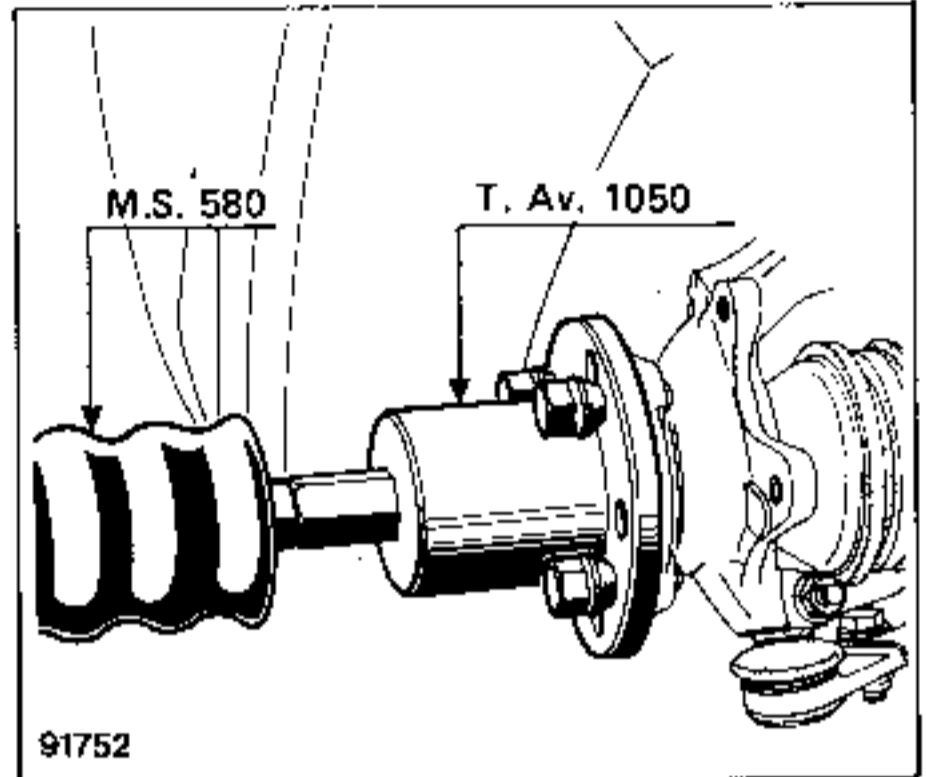
REMOVING

Remove:

- the brake disc (see page 31-7);
- the drive shaft nut, using tool Rou.604-01.

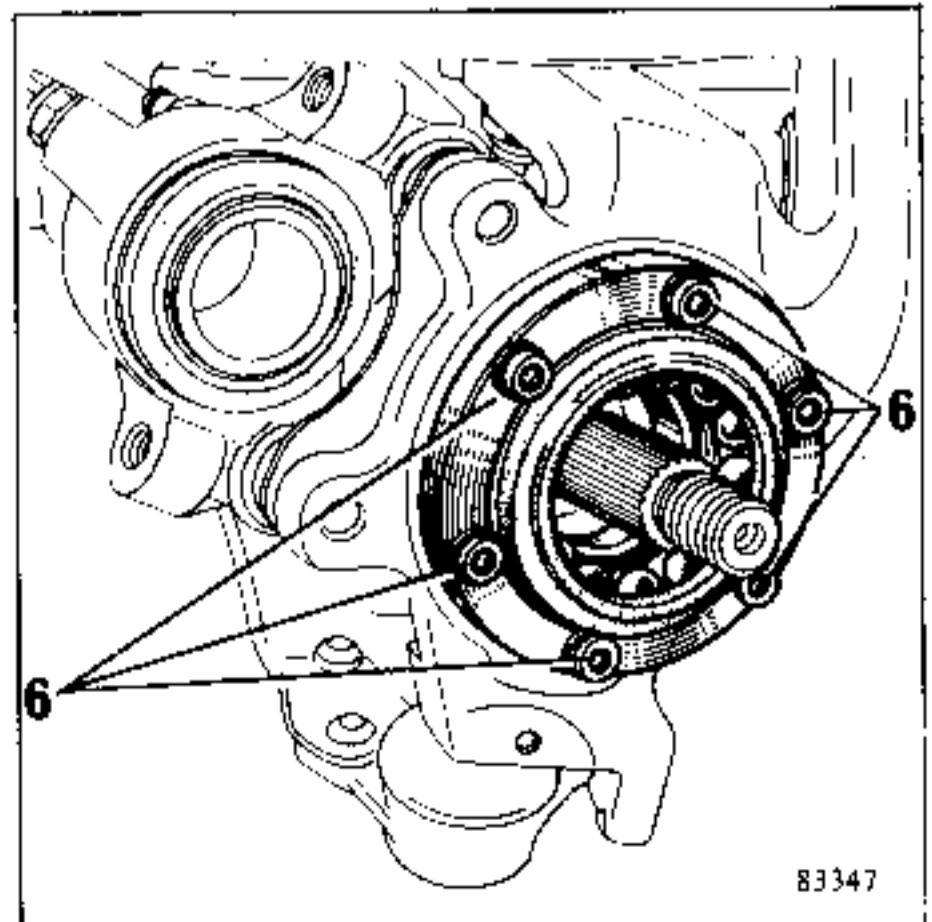


Extract the hub, using tool T.Av.1050 + M.S.580.



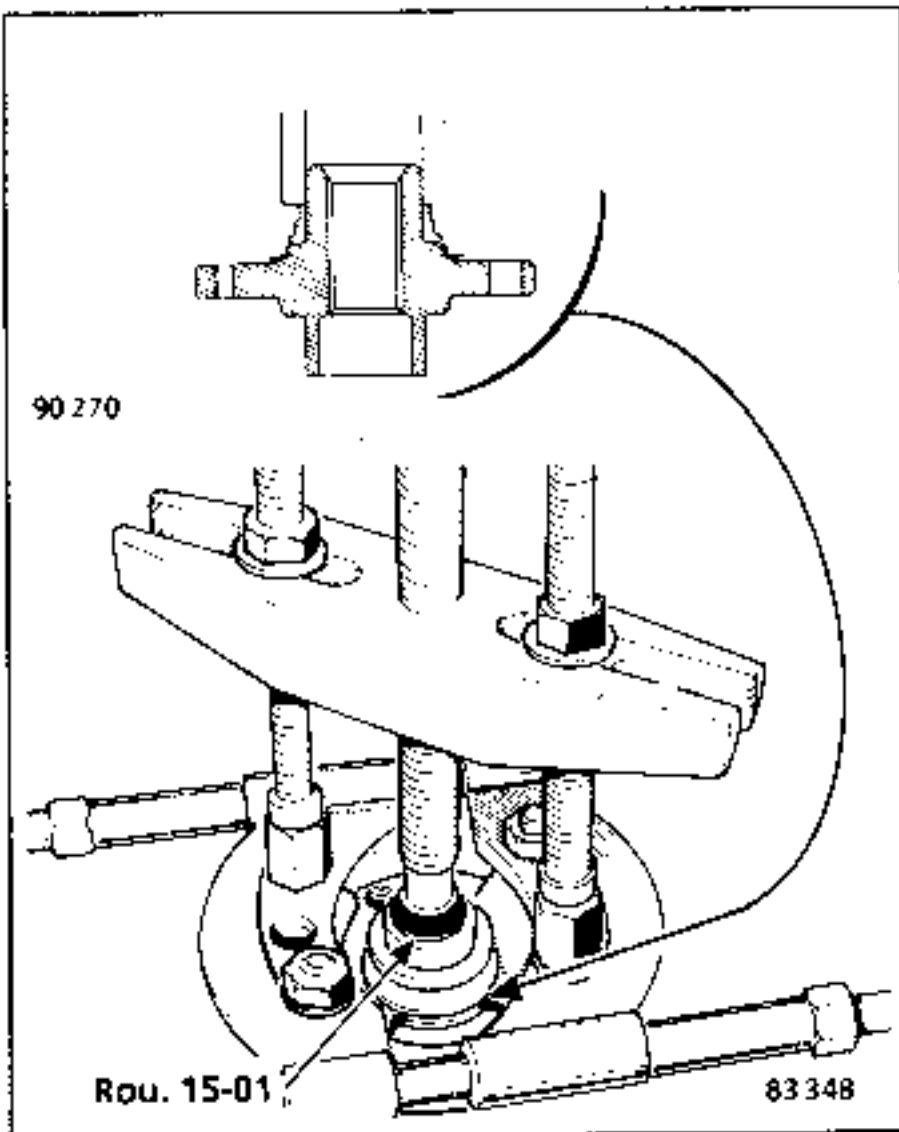
Remove:

- the bearing securing screws (6), using a Torx T30 key (e.g. FACOM RX30 + adaptor or 89-30).



- The bearing and its inner half ring will remain on the drive shaft stub axle.

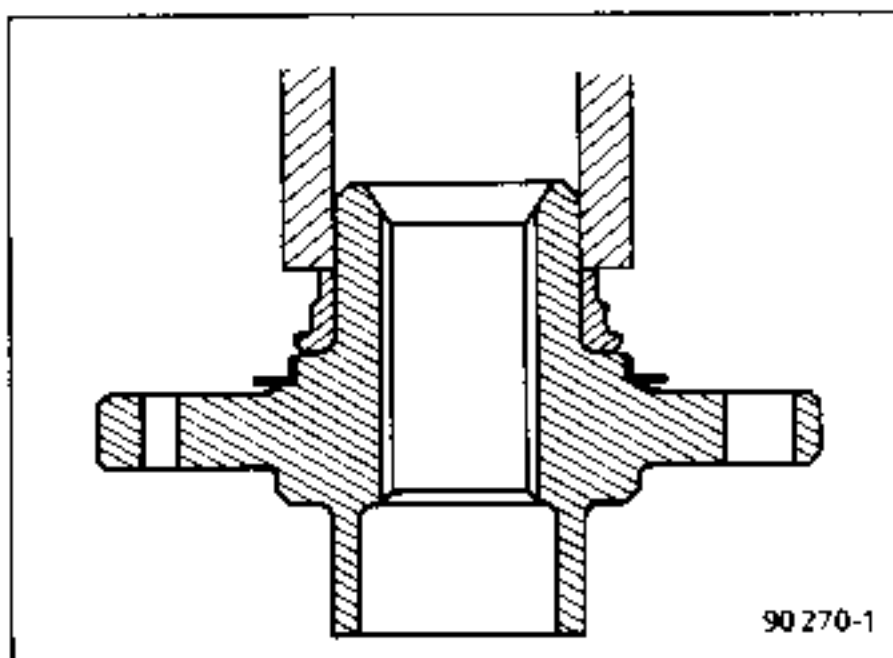
Extract the other bearing half ring from the hub, using an extractor of the FACOM U53G + U53E type and tool Rou.15-01.



REFITTING

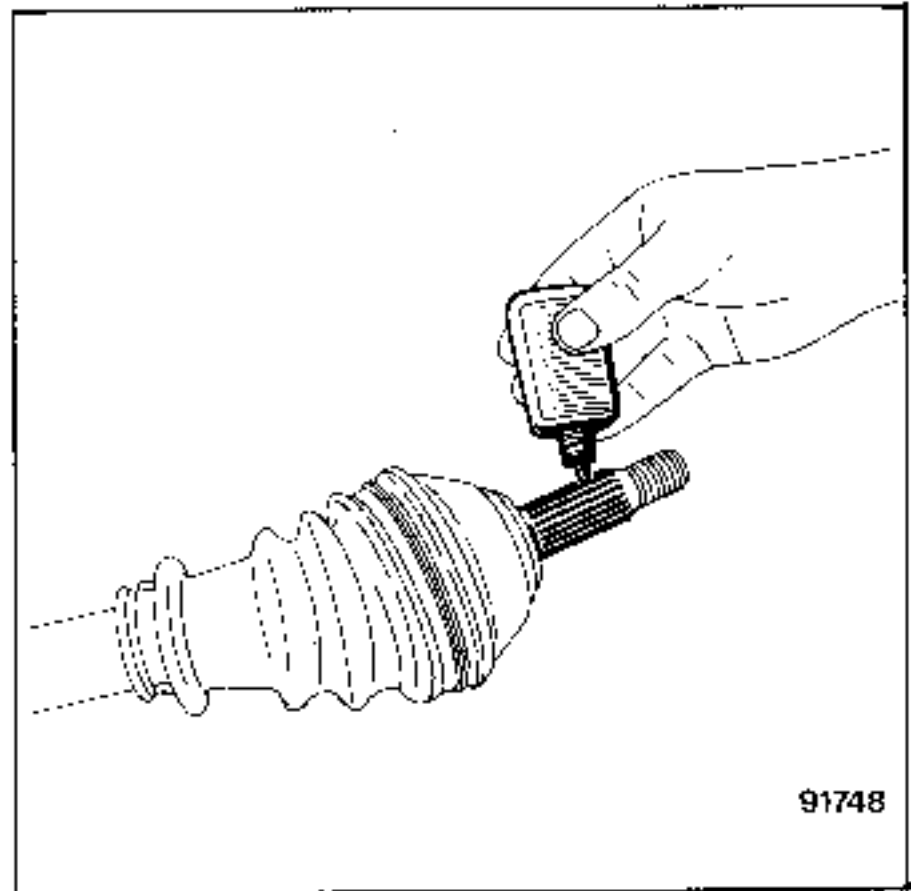
Fit the bearing inner half ring to the drive shaft stub axle and secure the bearing to the stub axle carrier.

Push the other half ring onto the hub, on the press, using a tube with an inside diameter of 41 mm.



Coat the balls, tracks and lips of the seals with ELF multi grease.

Coat the drive shaft stub axle with Loctite "SCELBLOC" compound.



Fit the hub to the drive shaft stub axle (knock it on with a mallet if necessary) until the nut can be screwed on by a few threads.

Fit the hub locking tool Rou.604-01 and tighten the drive shaft nut to the specified torque.

Refit the brake assembly (see corresponding section).

ESSENTIAL SPECIAL TOOLS

- T.Av. 476 Ball joint extractor
 T.Av. 509-01 Front axle retaining spacer
 Rou. 604-01 Hub locking tool

TIGHTENING TORQUES (in daN.m)

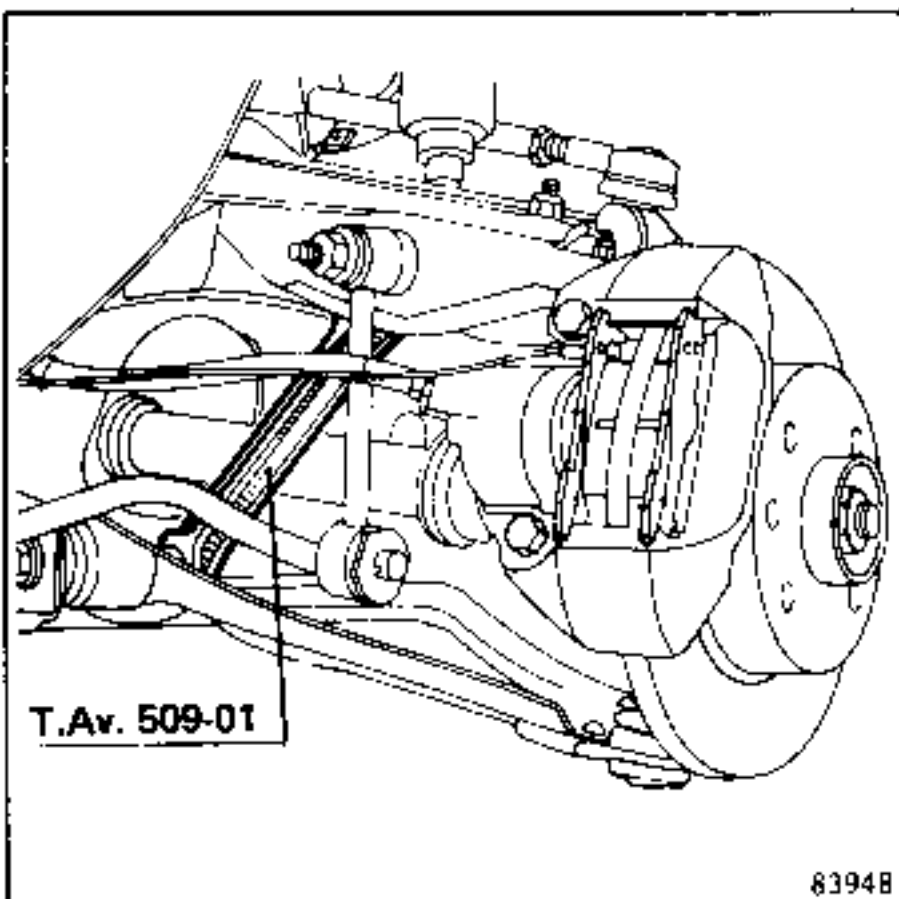
Drive shaft nut	25
Wheel bolts	9
Upper ball joint nuts	6,5
Lower ball joint nuts	6,5
Steering ball joint nuts	4
Brake caliper securing bolts	10
Bearing securing screws	1,5

REMOVING

With the vehicle still resting on its wheels:

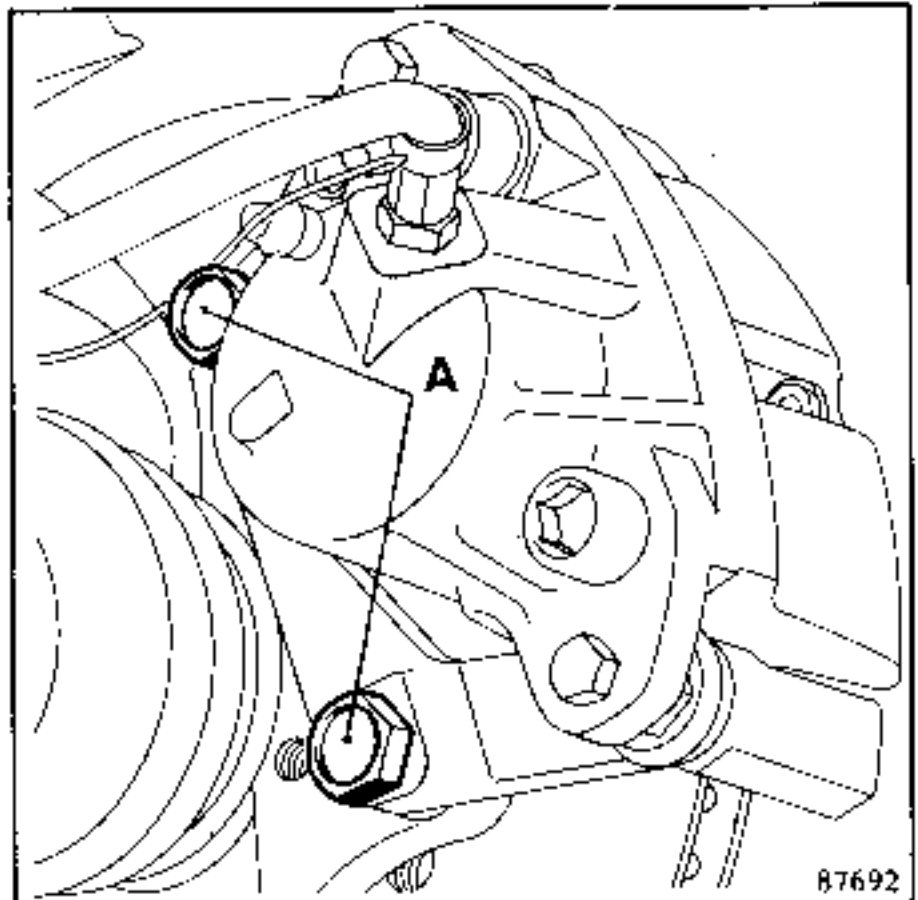
Fit a spacer T.Av. 509-01.

Support the vehicle on a stand, on the side concerned, and remove the wheel.

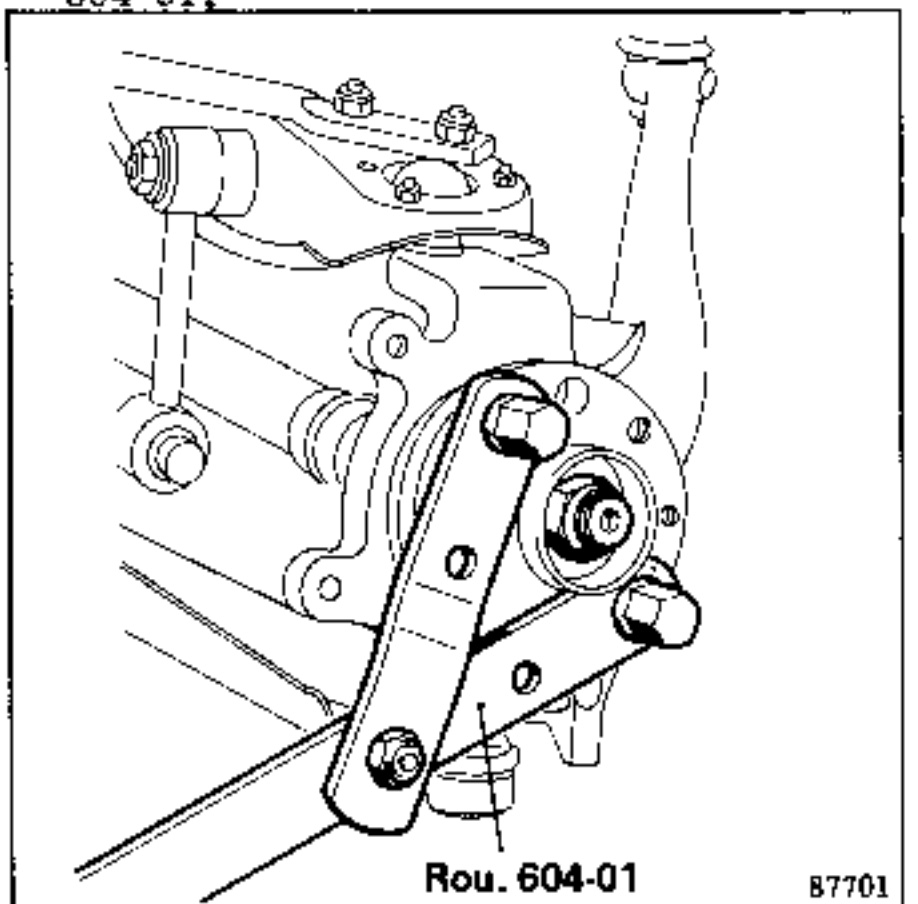


Remove:

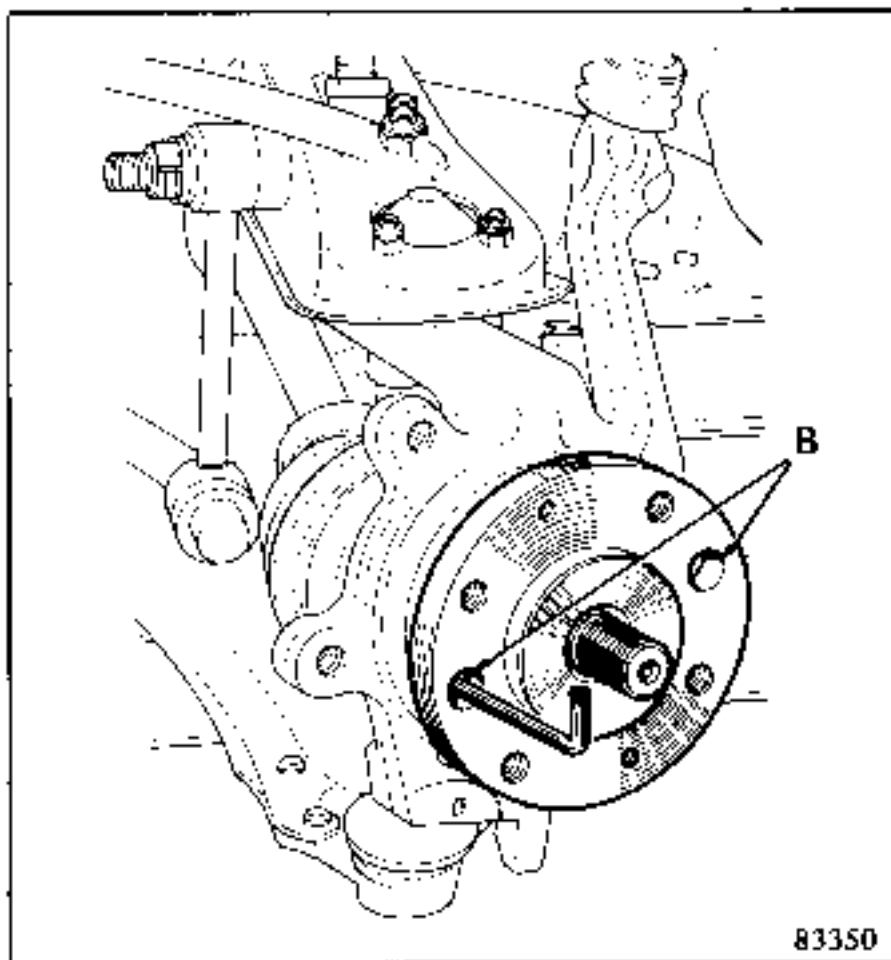
- The brake assembly by taking out the two bolts (A).



- The disc (see the corresponding section).
- The drive shaft nut, using tool Rou. 604-01.



Through the holes (B) in the hub, take out the bearing securing screws, using a Torx T30 (e.g. FACOM RX30 + adaptor or 89-30).



Remove the hub-bearing assembly.

Disconnect the three stub axle carrier ball joints, using tool T.Av.476 and remove the stub axle carrier.

REFITTING

After securing the stub axle carrier by its three ball joints, refit the hub and the brake assembly, taking care to use only parts that are clean and in good condition.

PARALLEL SPRING

ESSENTIAL SPECIAL TOOLS	
Sus. 863	Tool for removing spring and shock absorber

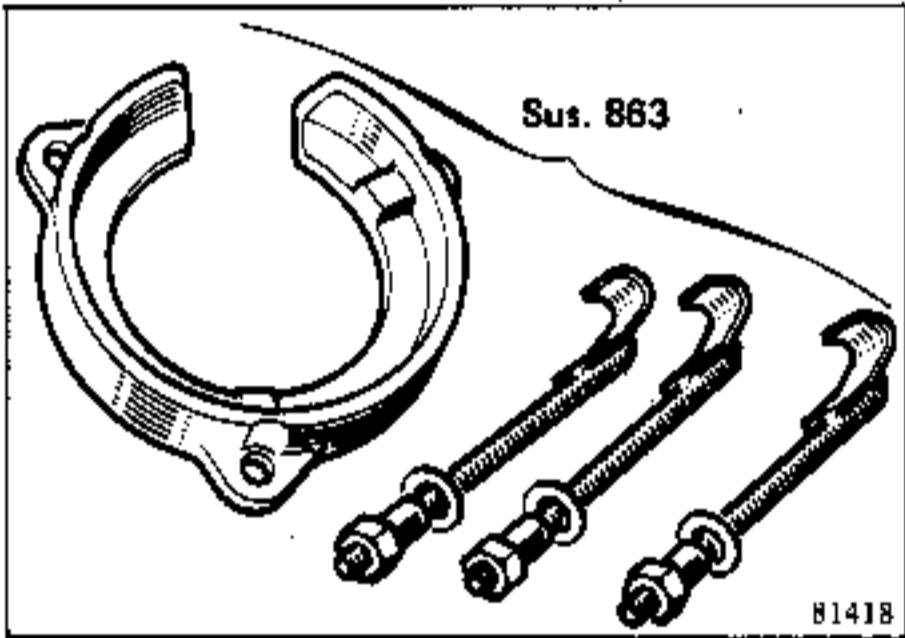
TIGHTENING TORQUES (in daN.m)	
Shock absorber upper securing nut:	2
Shock absorber lower lock nut:	4
Nut on shock absorber lower securing pin:	8
Wheel bolts:	9

- the three claws (after having greased the threads) to the last coil but one at the upper end of the spring,
- the compression pad under the lower spring dish so that the screwed ends of the claws enter the three holes in the pad.

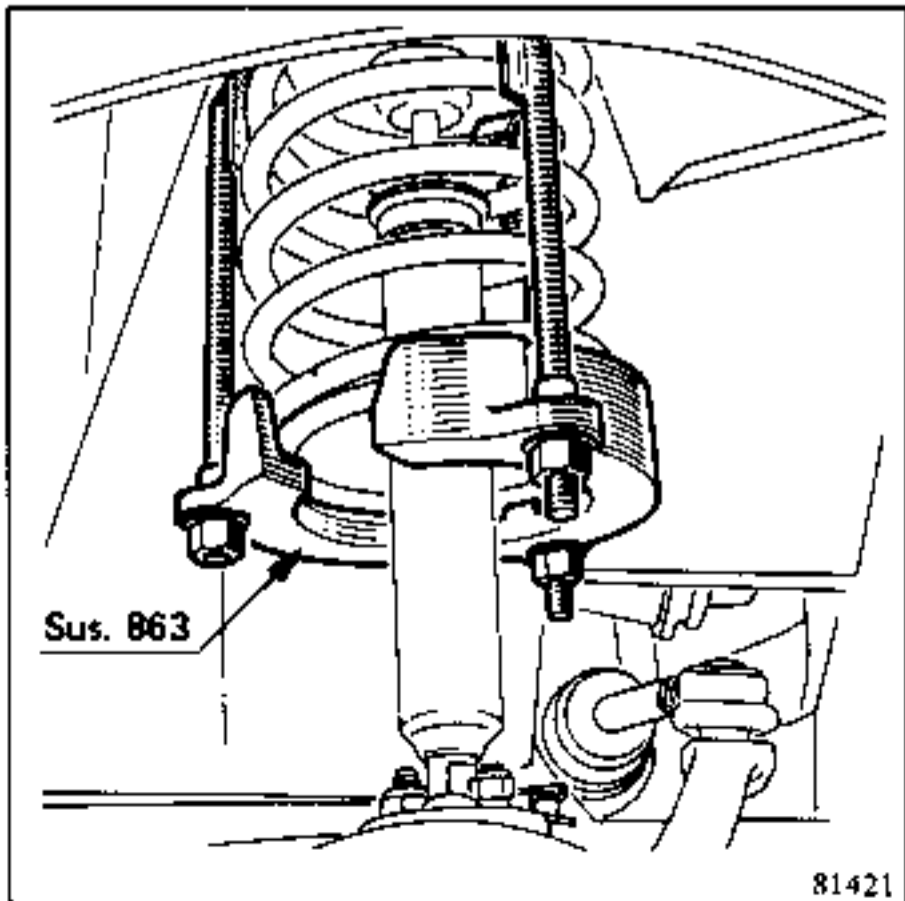
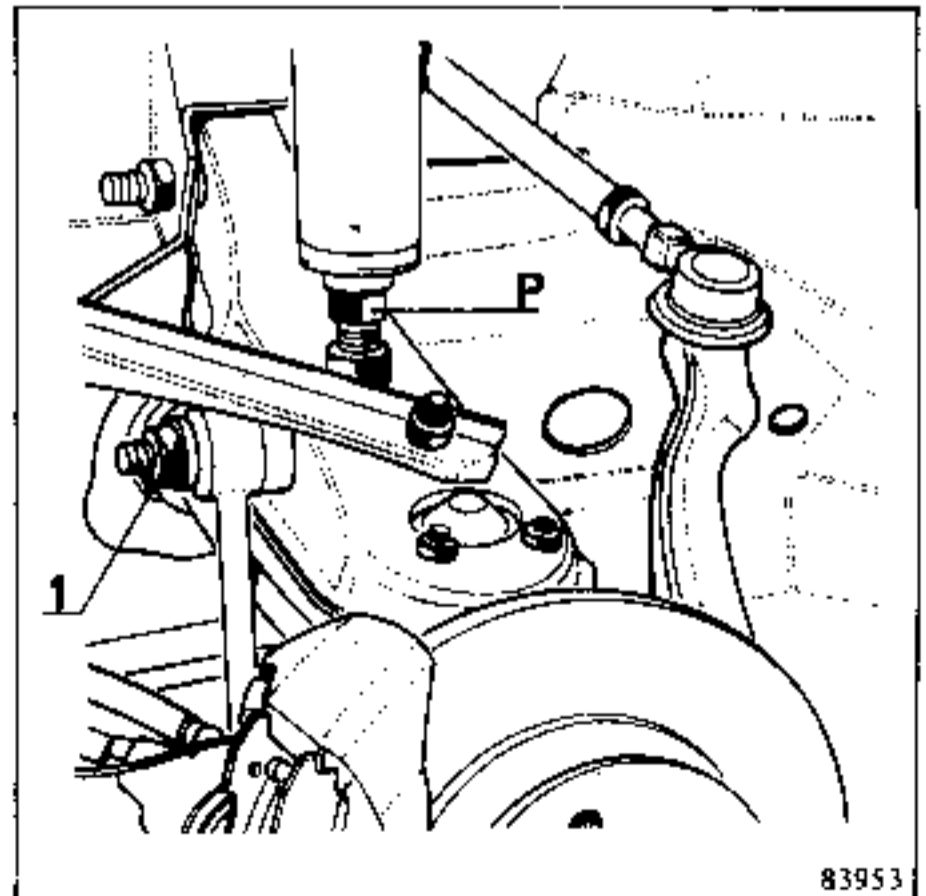
Note:

Place the lead on the compression pad in line with the lower end of the spring. This will determine the position of the 3 claws and facilitate the removing and refitting of the spring and the shock absorber. Run up the nuts on the claws and then lightly tighten them. Bring down the jack under the lower ball joint until the spring comes free from its upper dish. (The spring should be capable of being turned by hand). Loosen the pin (1) at the bottom of the shock absorber, but do not remove it. Disconnect the shock absorber:

- at the top,
- at the bottom: loosen the lock-nut



REMOVING
 Support the front end of the vehicle on stands and remove the wheel. Place a jack under the lower ball joint and raise it until the vehicle body lifts away from the stand. Fit tool Sus.863:



whilst holding the shock absorber with a spanner across point (P). Unscrew the shock absorber and remove the assembly formed by the tool, the spring and the shock absorber.

SPRING WITH TIGETER LOWER COIL

In view of the high forces developed in the spring, it is essential to ensure that the tooling is in perfect condition. Grease its threads before each time it is used.

ESSENTIAL SPECIAL TOOLS

SUS.1039 Tooling for working on the front spring and shock absorber

TIGHTENING TORQUES (in daN.m)

Upper securing nut:	2
Lock-nut at bottom of shock absorber	6
Pin at bottom of shock absorber	8
Wheel bolts	9

Use components A,B,C,D of tool SUS.1039.

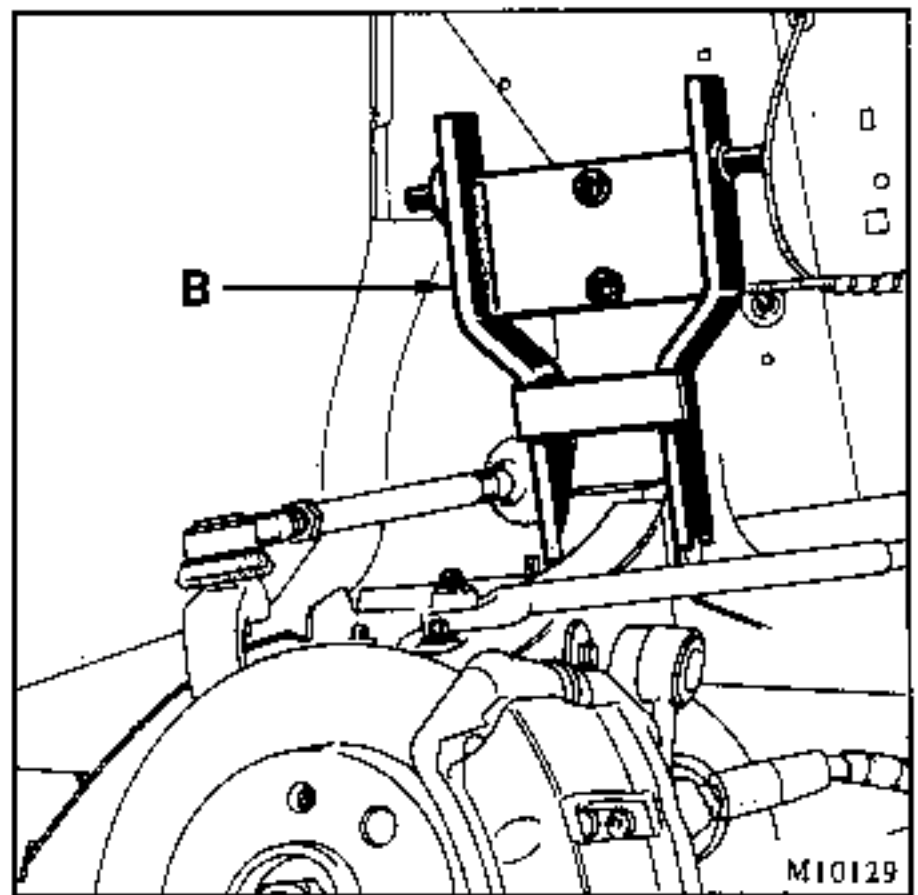
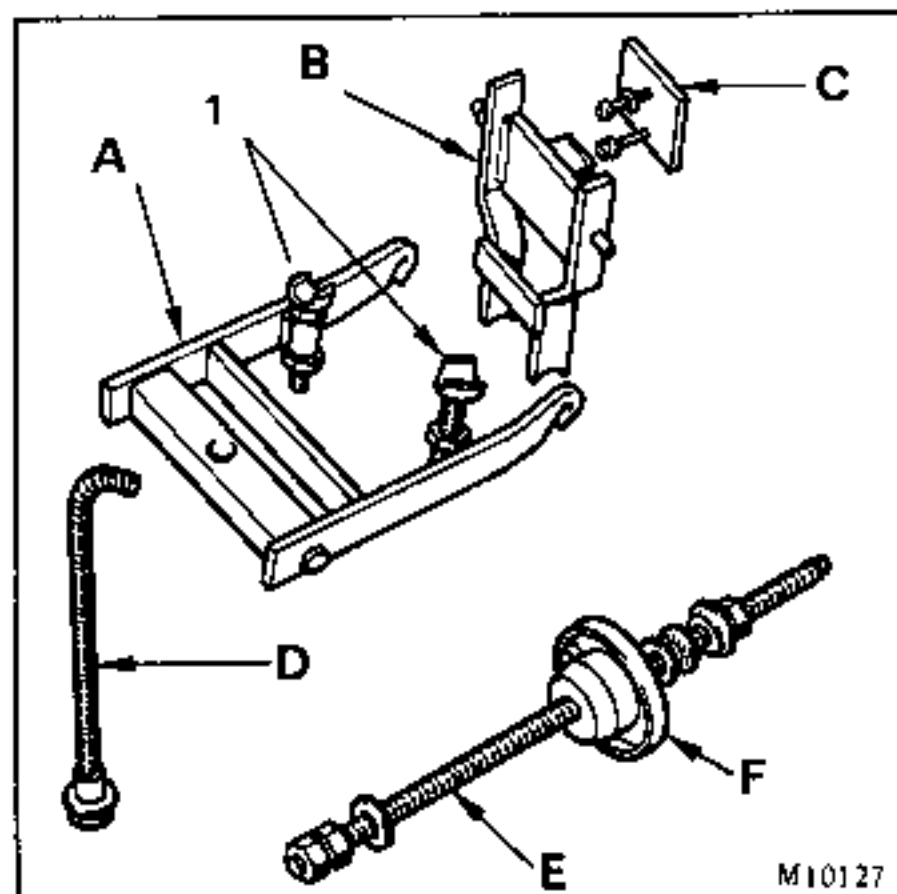
REMOVING:

Support the front end of the vehicle on stands and remove the wheel.

Remove the mud baffle from the wheel-arch.

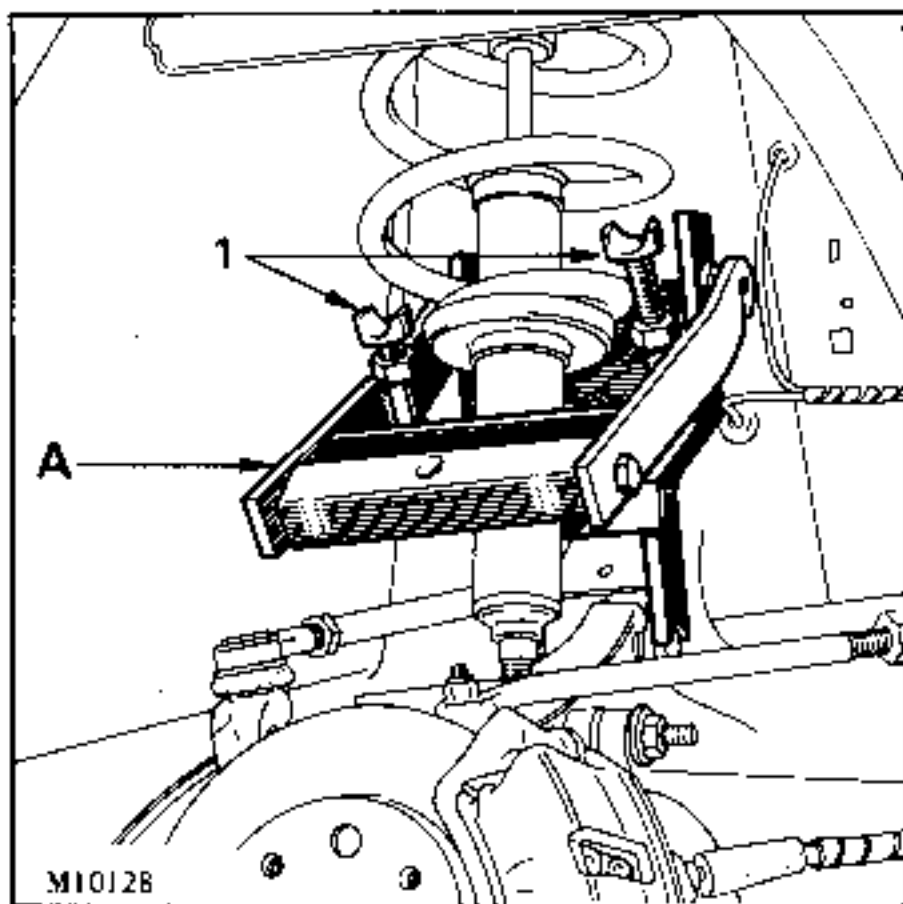
Place a jack under the lower ball joint and fit:

- the securing plate B behind the shock absorber and the back-plate C. Do not tighten them.



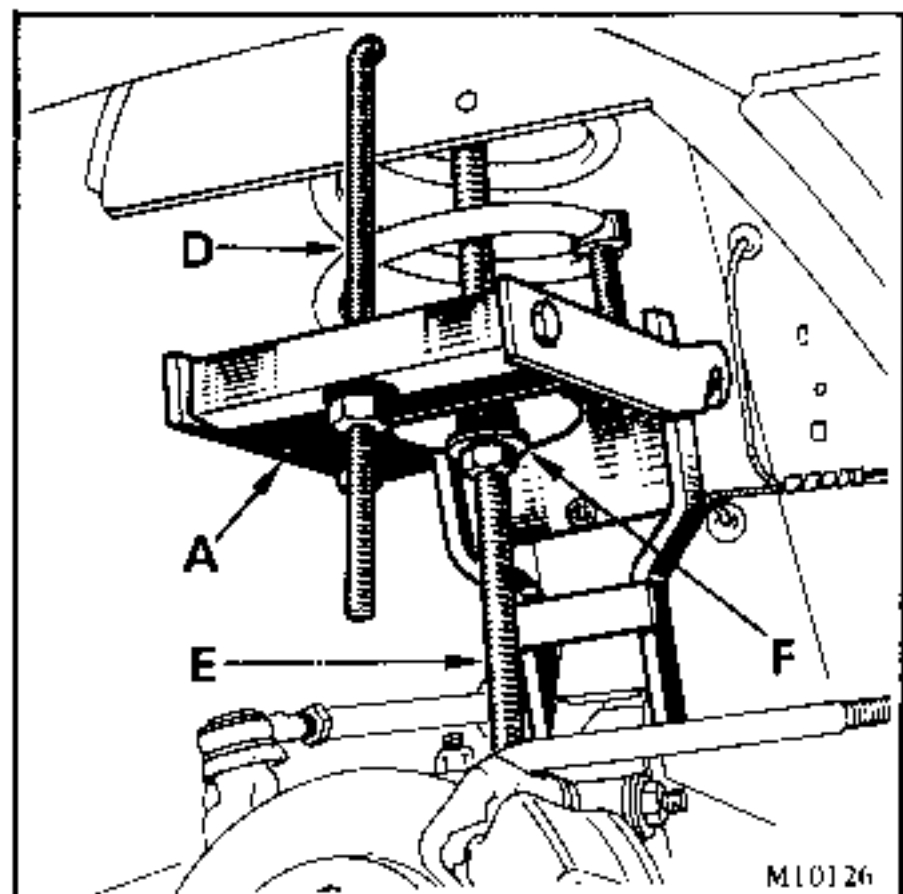
- A: Spring compression pad
 B: Plate for securing to wing flange
 C: Retaining back-plate
 D: Compression tie-bar

- the compression pad A and position the two thrust rods (1) on the spring.

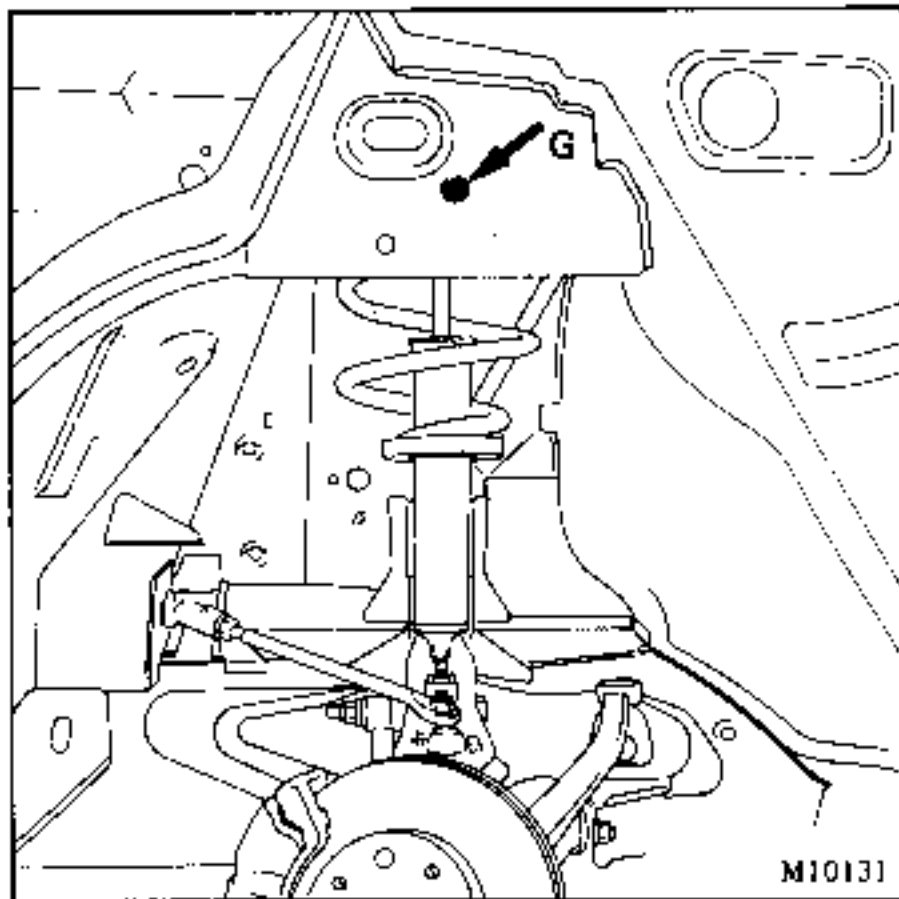


Tighten the assembly B and C whilst centralizing it.

Fit the compression tie rod D.



On vehicles where there is no hole (G) for locating the compression tie rod, a hole will have to be drilled.



It should be in line with the hole already drilled in the shock absorber cap on the centre of the shock absorber piston rod.

Do not hook the compression tie rod into any hole other than the one provided for it.

Tighten the nut on tie rod D to free the shock absorber by a sufficient amount (height of compressed spring approximately 240 mm).

Loosen the upper cups and the locknut at the bottom of the shock absorber.

Disconnect the anti-roll bar from the pin at the bottom of the shock absorber.

Lower the half axle assembly.

Unscrew the shock absorber and remove it.

Precautions to be Taken before Fitting:

Shock absorbers are laid horizontally in the Parts Stores.

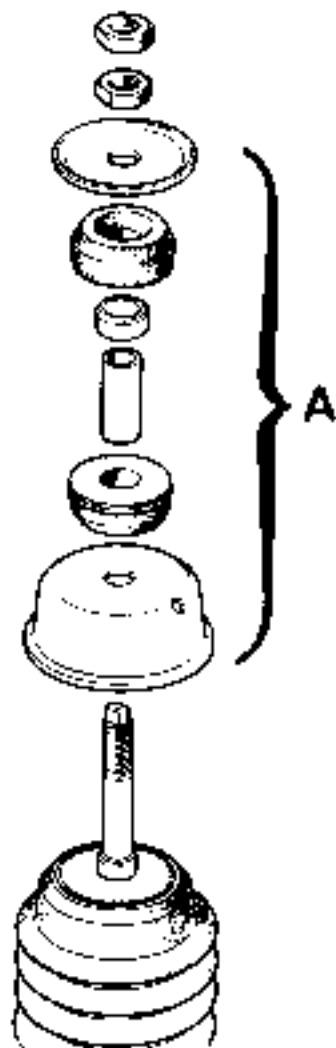
Under these conditions, it is possible for a shock absorber designed to operate vertically, to become unprimed.

Consequently, before fitting it to the vehicle, simply pump it a few times with it held vertically.

REFITTING

Place the assembly formed by the tool, the spring and the shock absorber in the position it was in prior to removal.

Secure the shock absorber at its upper end, ensuring that the cups (A) are the correct way round.



Raise the half axle assembly.

Screw the thread at the bottom of the shock absorber in as far as it will go, then unscrew it by one turn.

Tighten the lock-nut at the bottom of the shock absorber to the specified torque.

Resecure the anti-roll bar.

Loosen the tie rod (D) or tool (S 863) (early arrangement).

Lower the half axle.

Remove:

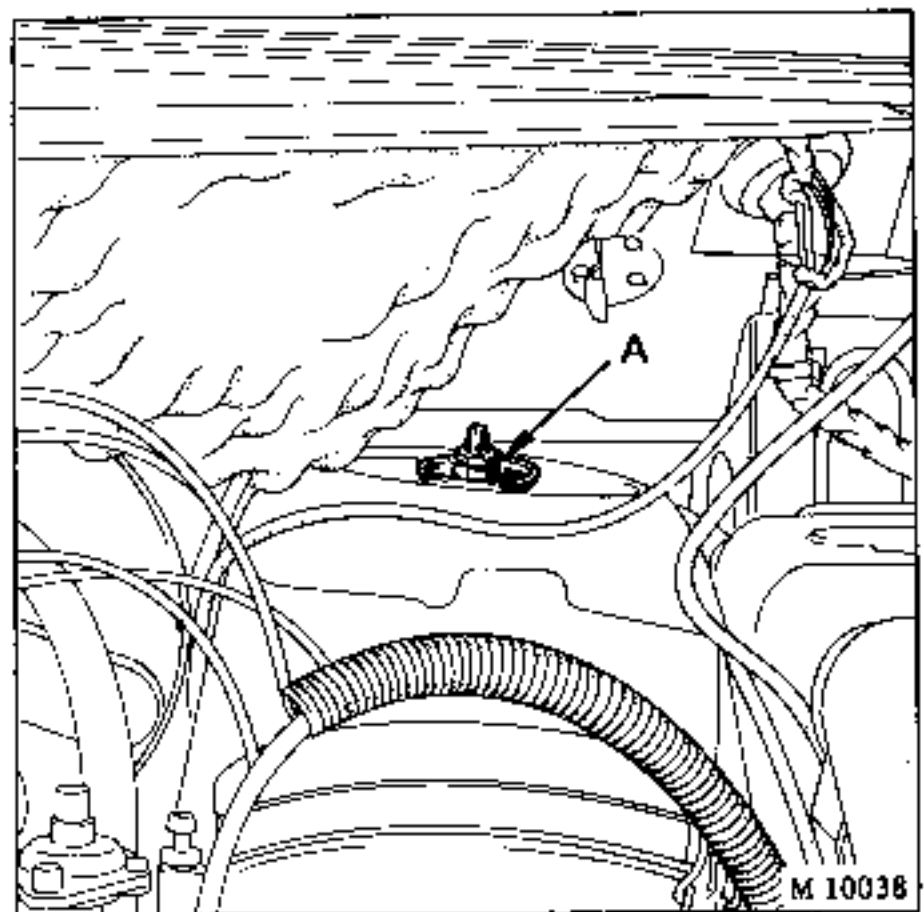
- the compression pad (A),
- the plate (B) and the back-plate (C).

Rivet the mud baffle in place in the wheelarch.

Lower the vehicle onto its wheels and tighten the following to torque:

- the pin at the bottom of the shock absorber,
- the shock absorber upper fastening.

"Bounce" the suspension.



PARALLEL SPRING

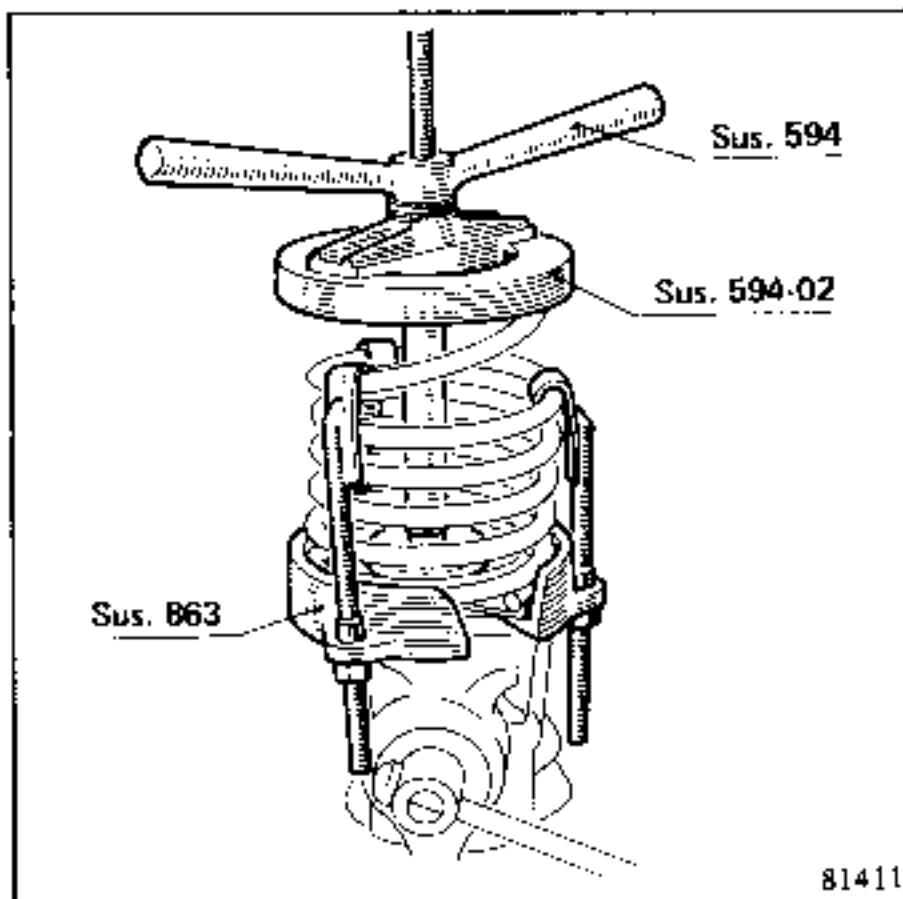
SPECIAL TOOLS	
Sus. 594	Spring compression tool.
Sus. 594-02	Spring centralizing cup.

TIGHTENING TORQUES (in daN.m)	
Shock absorber upper securing nut:	2
Locknut at bottom of shock absorber:	4
Nut on pin at bottom of shock absorber:	8
Wheel bolts:	9

REMOVING

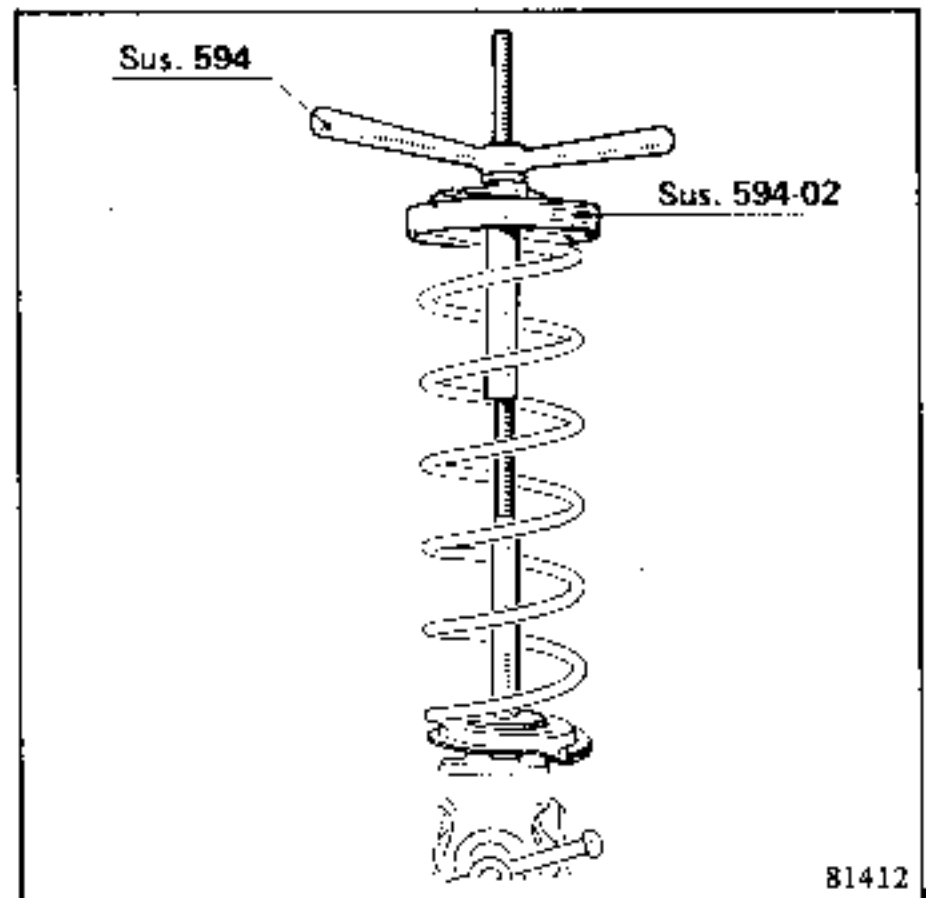
Remove the shock absorber-spring assembly.

To decompress the spring, fit tool Sus. 594 (and its cup Sus.594-02) inside the spring, then screw it in in order to free the tool Sus.863 and remove the compression from the spring.



REFITTING

Compress the spring using tool Sus.594 and its cup Sus.594-02, ensuring it is fitted the correct way round.



Fit tool Sus.863 to the assembly (with its hooks in contact with the last coil but one on the spring).

Remove tool Sus.594 and its cup Sus. 594-02. The spring is thus ready to be fitted to the vehicle.

Refit the spring and the shock absorber. Ensure that the cups are fitted the correct way round.

Note: On refitting, the lower end of the spring should be against the cup and in line with the aperture in the base of tool Sus.863.

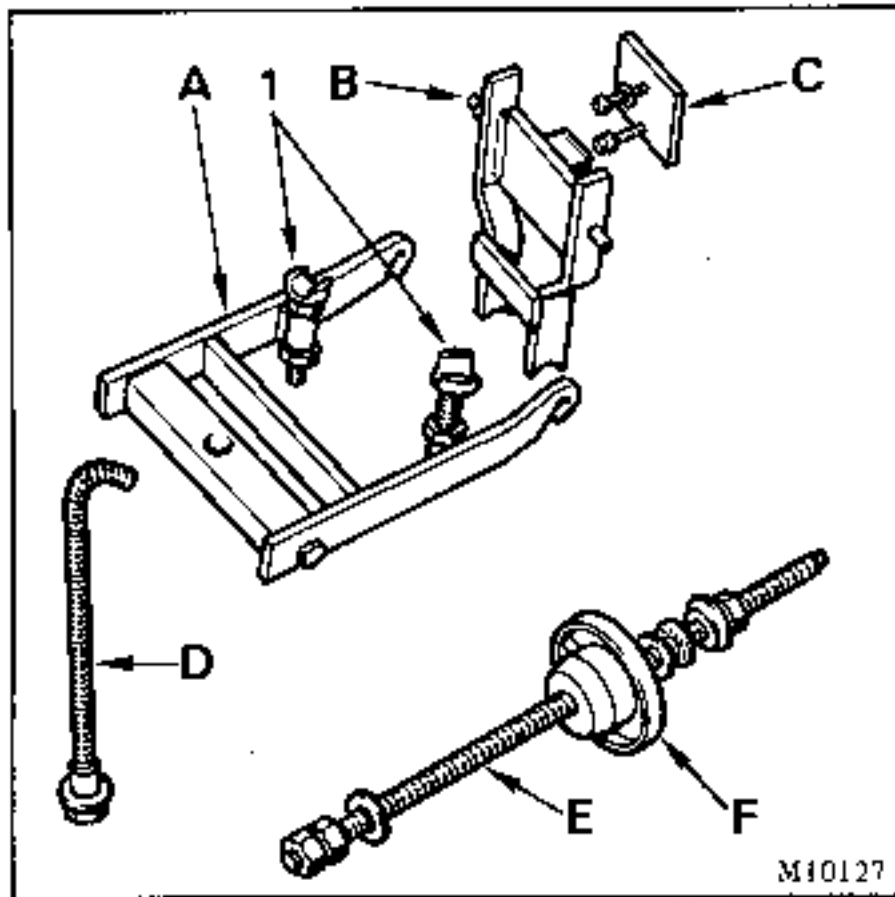
SPRING WITH A TIGHTENED LOWER COIL

In view of the force developed by the spring, it is essential to ensure that the tooling is in perfect condition. Grease the threads before each time it is used.

ESSENTIAL SPECIAL TOOL	
SUS.1039	Tooling for working on the front spring and shock absorber

TIGHTENING TORQUES (in daN.m)	
Upper securing nut	2
Locknut at lower end of shock absorber	6
Pin at lower end of shock absorber	8
Wheel bolts	9

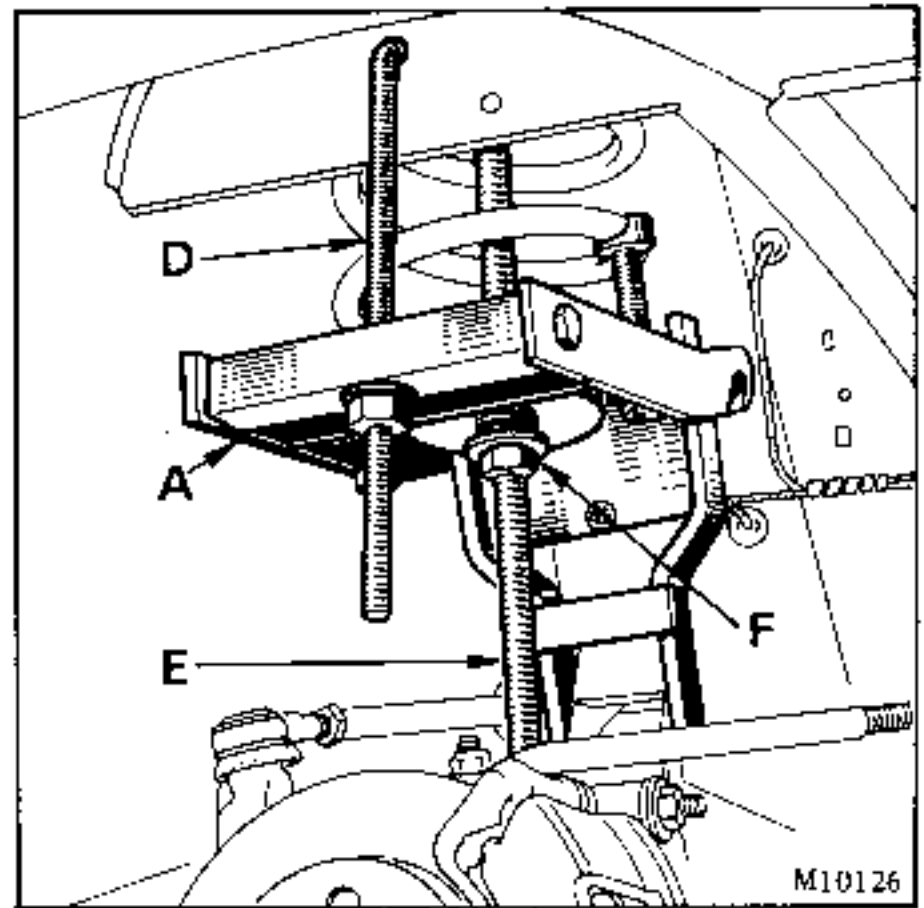
Use components A, B, C, D, E of tool SUS.1039.



- A : Spring compression pad
- B : Plate for securing to wing flange
- C : Retaining back-plate
- D : Compression tie rod
- E : Spring compression rod
- F : Dummy cup

REMOVING:

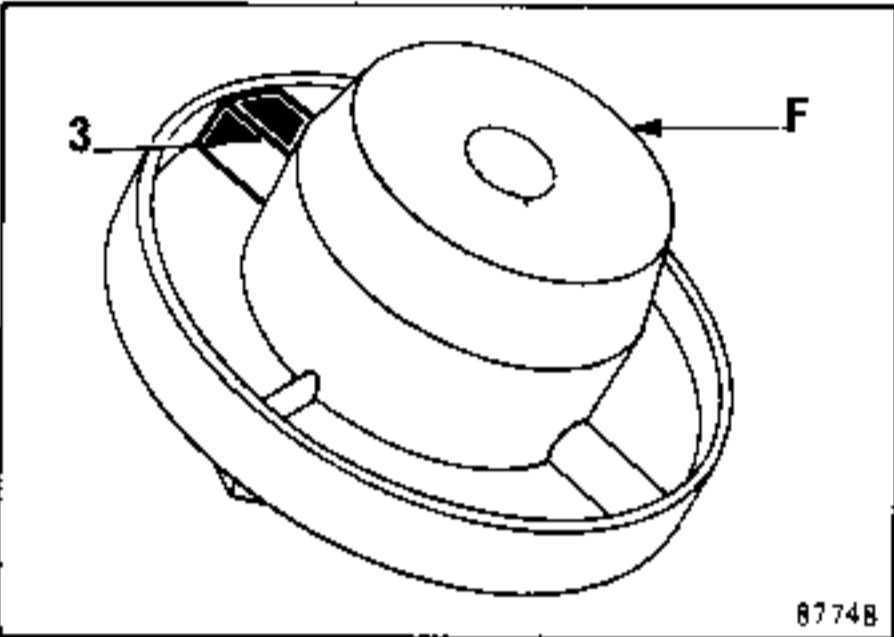
This operation is carried out after first removing the shock absorber.



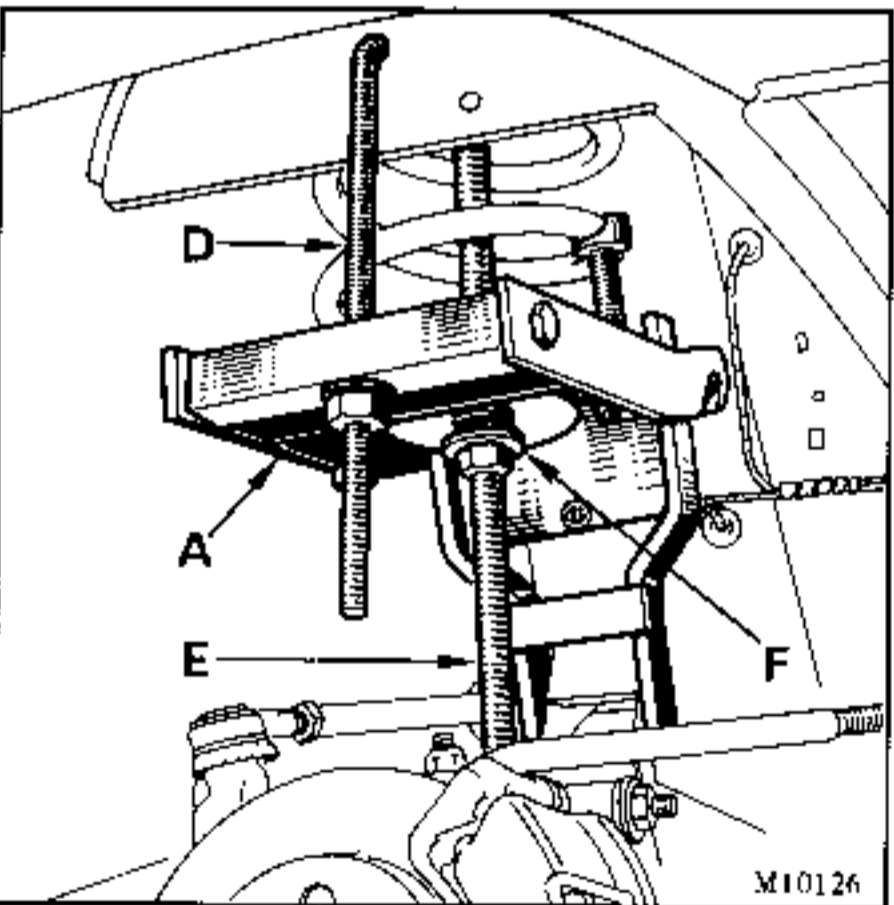
Fit the spring compression rod (E).

Screw on the dummy cup (F).

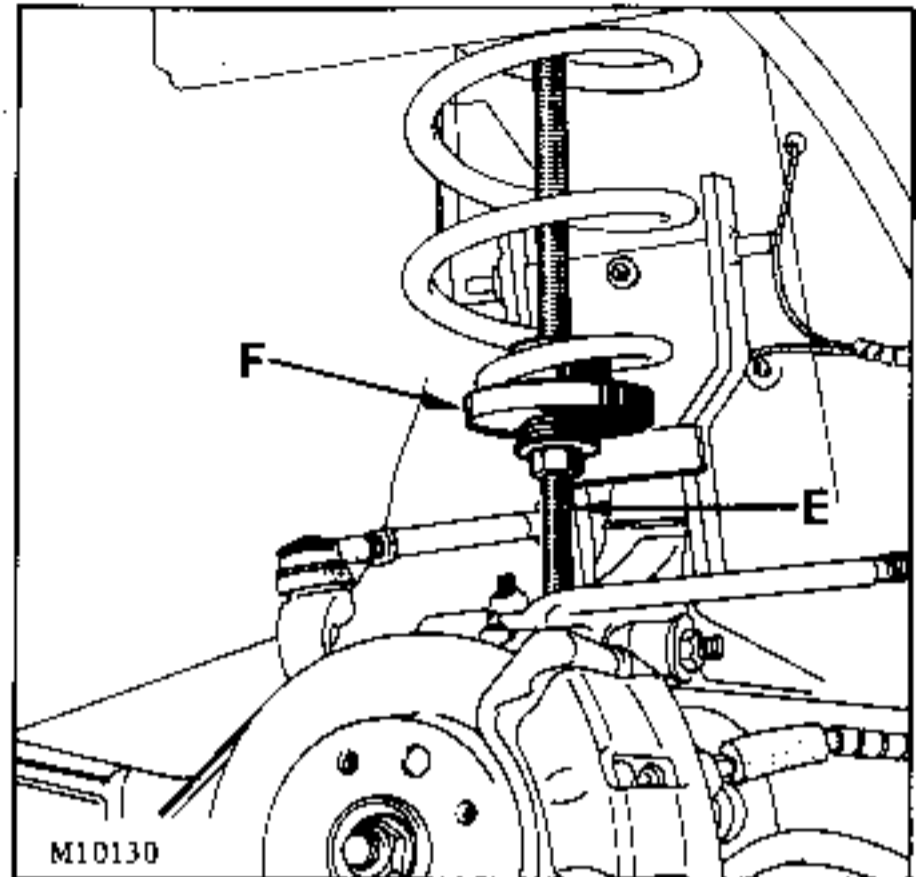
Centralize the compression rod (E) in the location in the bottom of the shock absorber by lifting the half axle. Bring the spring against point (3).



Compress the spring to free the pad A.



- Remove the compression tie-rod (D).
- Remove the pad (A).
- Release the spring pressure.
- Lower the half axle.
- Remove the spring.



REFITTING:

Fit:

- the spring, bringing it into contact with the shock absorber cup.
- the compression rod (E)
- the dummy cup (F) with the spring against it.

Lightly compress the spring.

Lift the half axle to centralize the spring compression rod (E) in the shock absorber lower end support.

Fully compress the spring (240mm).

Fit the compression pad (A) and position the two spring locating rods (1).

Fit the tie-rod (D).

Compress the spring until the dummy cup (F) comes free.

Lower the half axle.

Remove the compression rod (E) from the spring, together with the dummy cup (F).

Fit the shock absorber (see corresponding section).

Grease the bottom of the spring to facilitate fitting it to its pad.

TIGHTENING TORQUES (in daN.m)	
Wheel bolts	9
Bearing securing nut	1,5
Nut securing link to pin	8

REMOVING

On each side, unscrew the nuts:

- which secure the bearings to the side-members,
- on the anti-roll bar links.

Check the condition of the bearings and the bearing bushes.

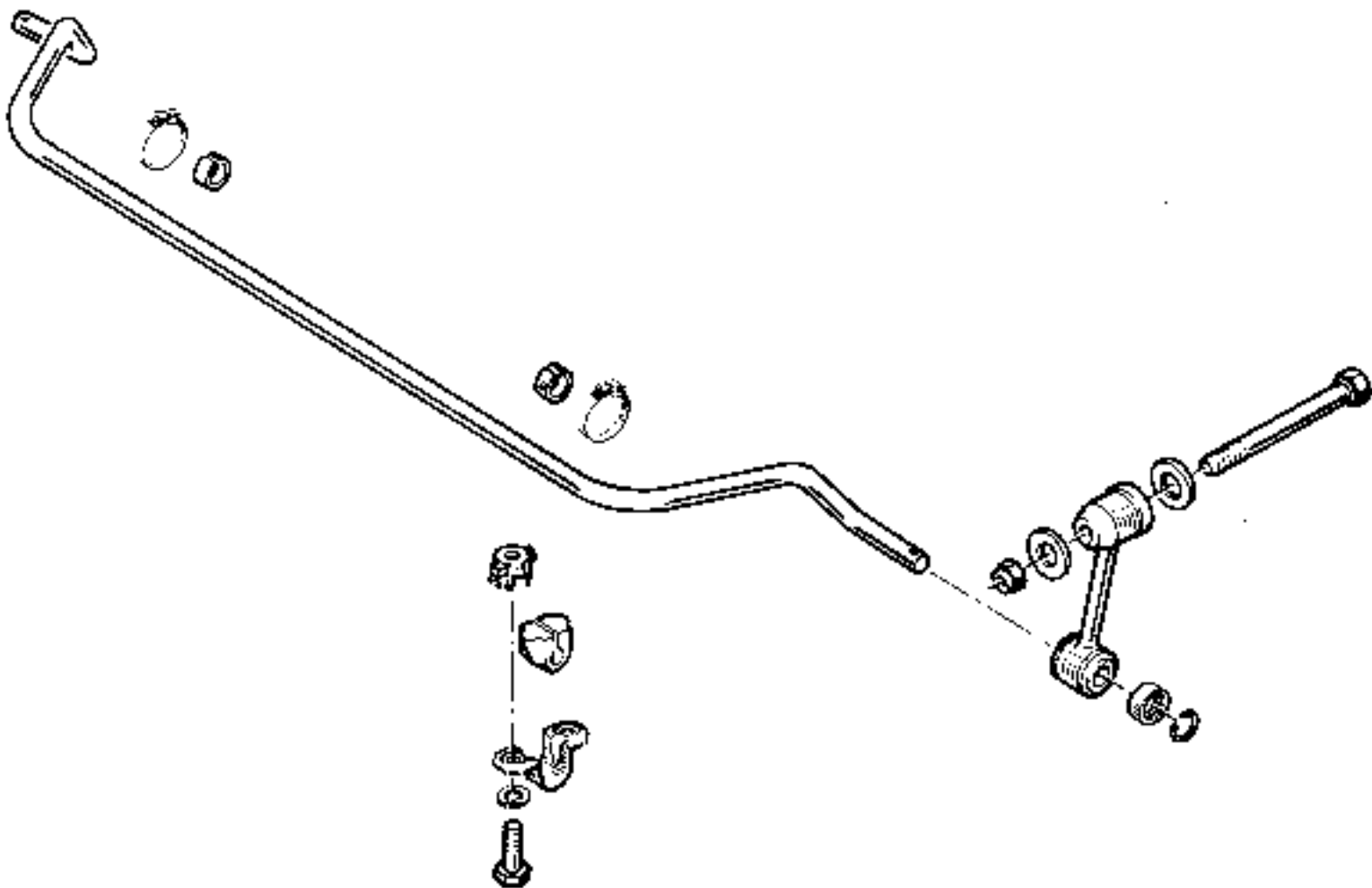
If necessary, separate the link from bar.

REFITTING

Ensure that the parts are fitted in the correct order and the correct way round.

Lower the vehicle onto its wheels and tighten, to torque, the nuts:

- that secure the bearings,
- that secure the links to the shock absorber pins.



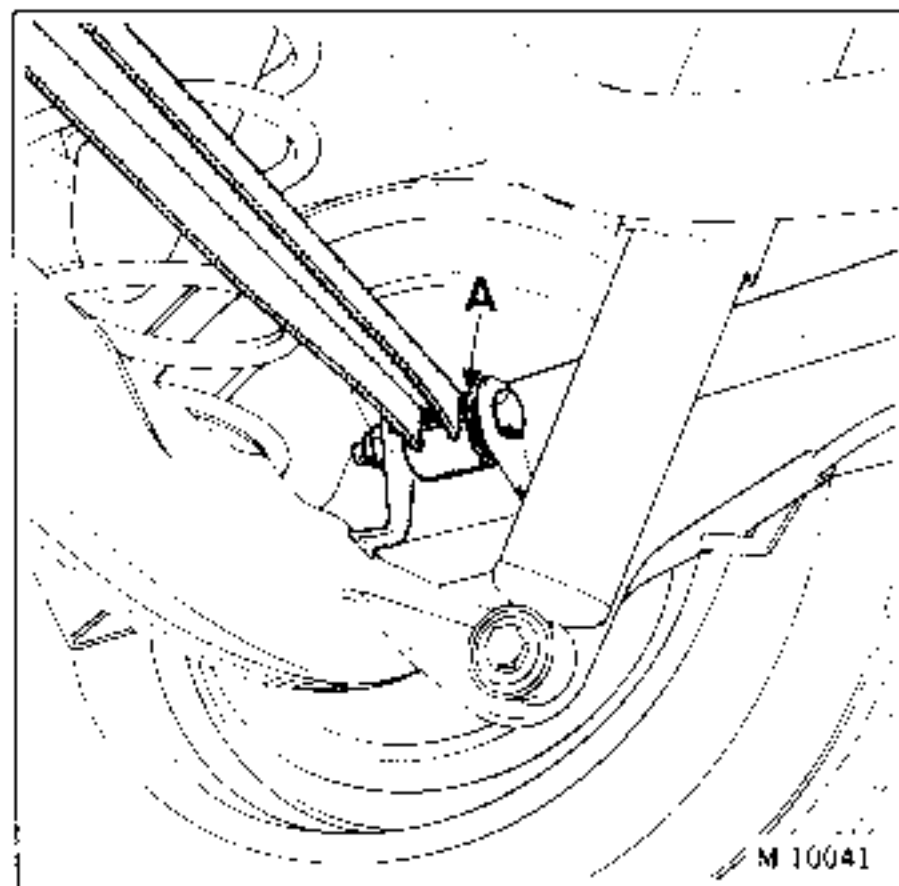
TIGHTENING TORQUES (in daN.m)	
Axle arm securing nut	2,0
Shock absorber lower securing bolt	2,5
Shock absorber upper securing nut	5
Wheel bolt	9
Stub axle nut	16
Transverse guide bar	5

REMOVING:

- Support the rear of the vehicle on stands.
- Remove the rear wheels.
- Remove the brake drums.
- Disconnect the handbrake secondary cables from the levers.
- Disconnect the brake pipes from the axle arms.
- Place a jack under the axle.
- Lightly compress the springs.
- Remove the lower shock absorber fastenings.
- Remove the fastenings securing the rear guide bar to the axle (A). Secure the axle to one of the chassis components.
- Remove the fastenings from the side suspension arms.
- Lower the jack and remove the springs.
- Take out the axle.

REFITTING:

- Carry out the removing operations in reverse.
 Tighten the fastenings to torque.
 Bleed the braking system.



TIGHTENING TORQUES (in daN.m)

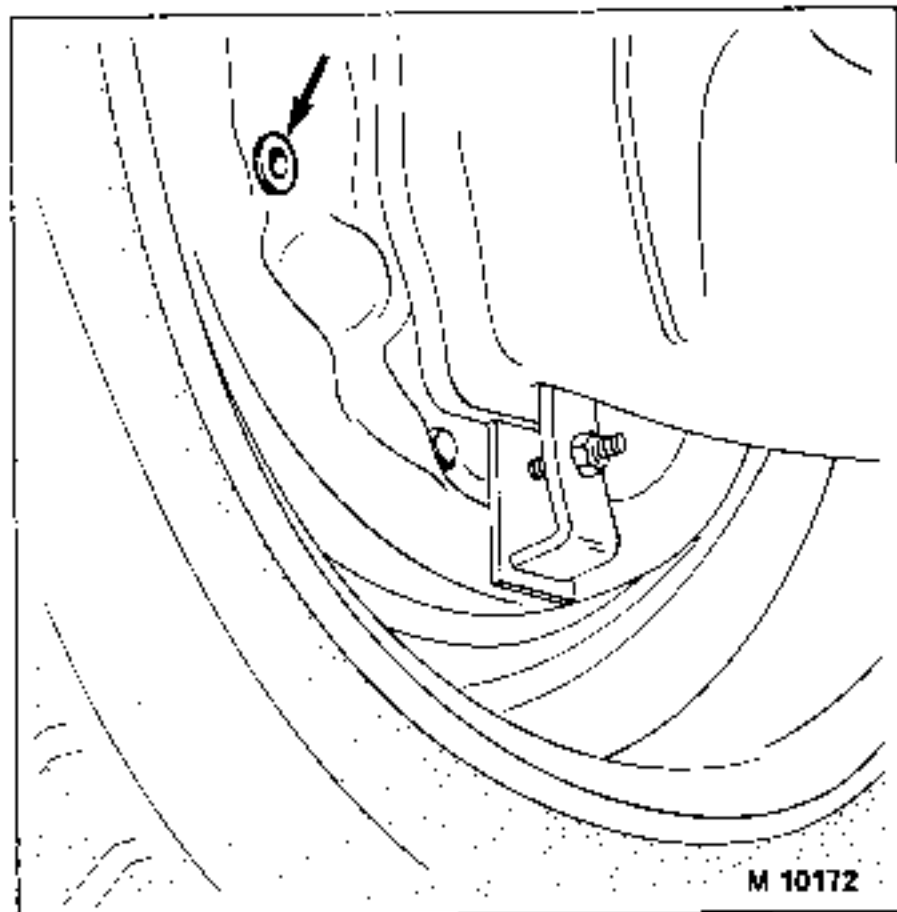


Wheel bolts	9
Drum locating screws	1,5

REMOVING

Release the handbrake and slacken-off the secondary cables to be able to move back the lever.

Remove the plug from the flange to be able to unlock the automatic wear take-up system.



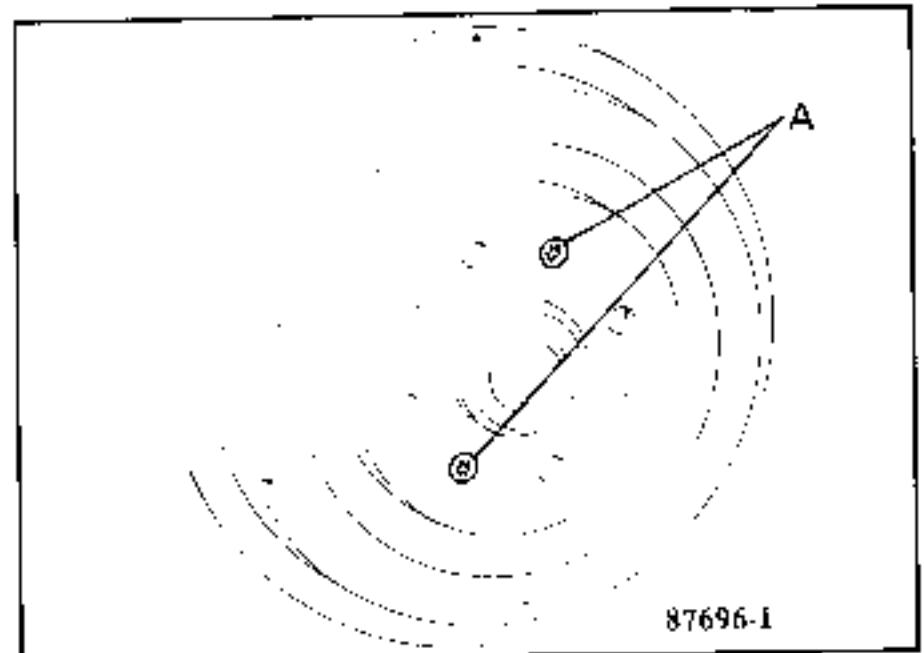
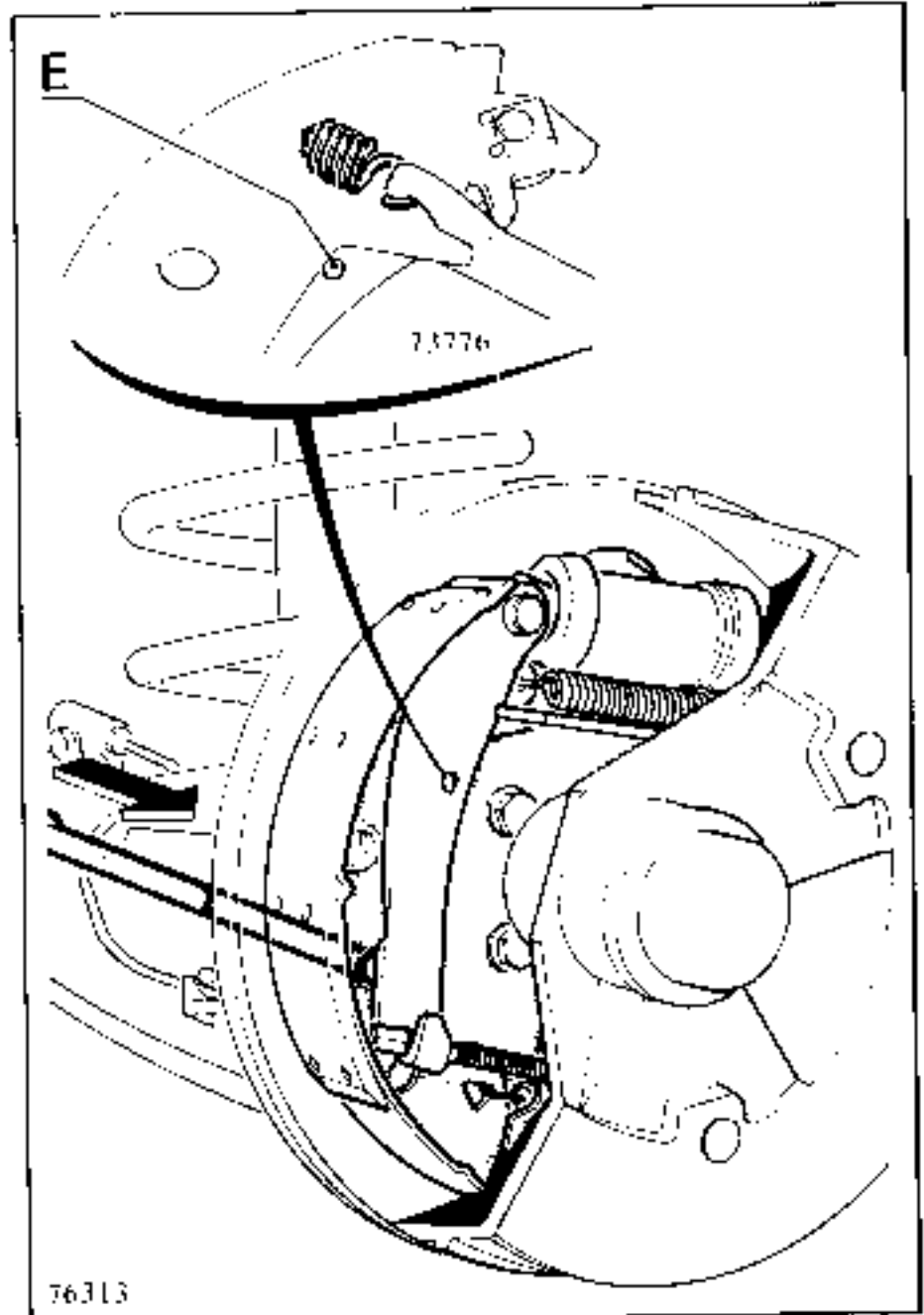
Place a screwdriver against the handbrake lever and push it to free its stud (E) from the brake shoe.

Note: The flange and brake shoe are drilled to provide access to the handbrake lever, which is behind them.

After freeing the stud, assist the lever to release itself by pushing it towards the rear.

Remove:

- the two drum securing screws (A) (male Torx T 30 key (e.g. Facom 89-30),
- the drum.



REFITTING

Fit the drum and secure it with the two screws (A).

Adjust the positions of the shoes by repeatedly depressing the brake pedal.

Adjust the handbrake.

Fit the plug to the flange.

ESSENTIAL TOOLS

Fre.572-01 Grips for brake shoes

TIGHTENING TORQUES



Bleed screws	0,6 - 0,8
Hydraulic union screws	1,3


REMOVING

- Remove the drum, see page 2, and the upper spring (tool Fre.572-01).
- Pull back the brake shoes.
- Unscrew the pipe union and the 2 securing bolts.

REFITTING

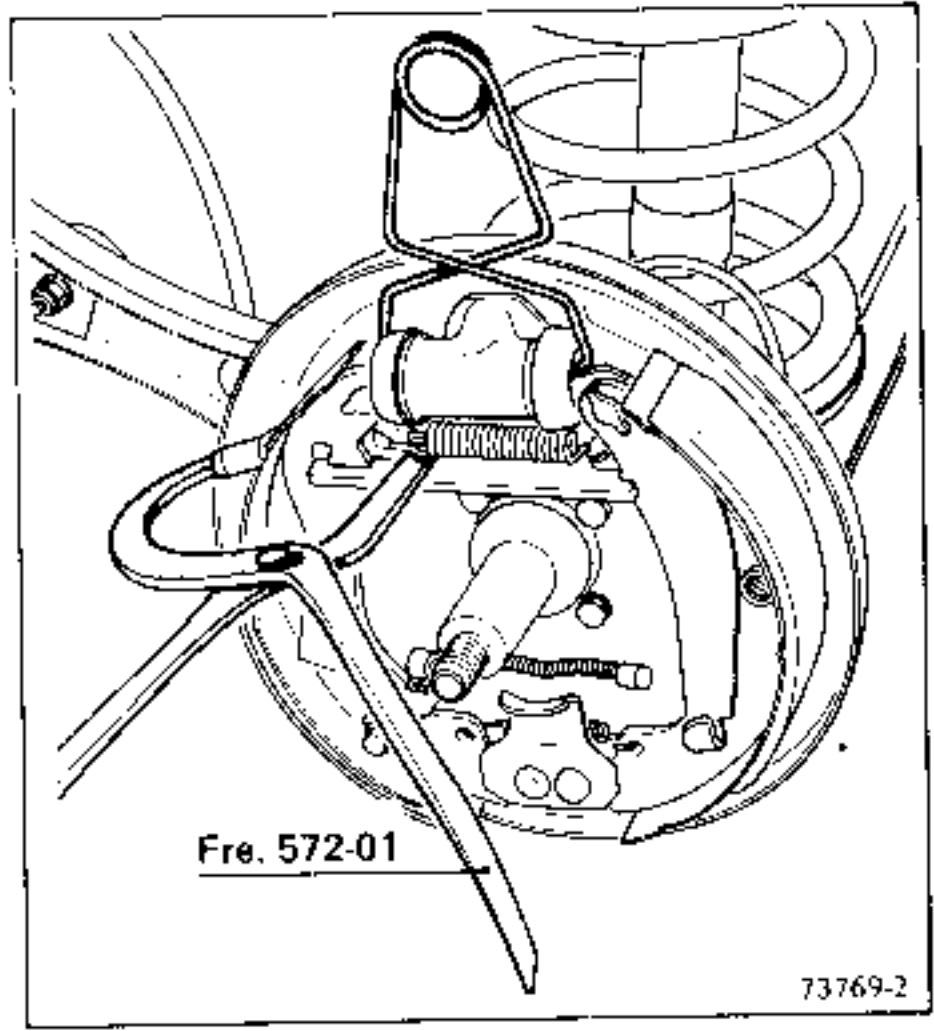
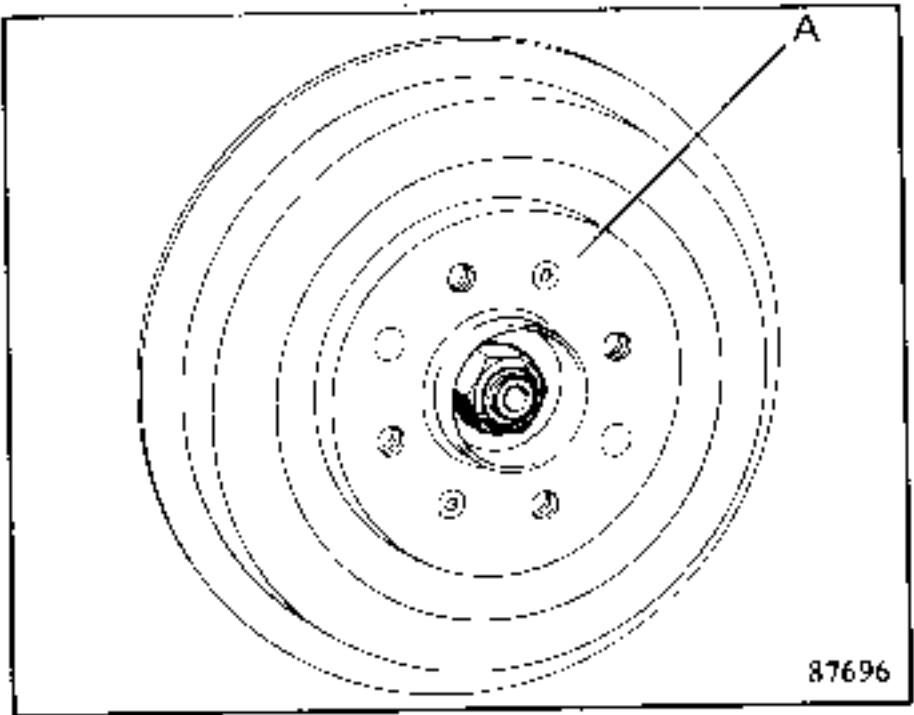
- Check the condition of the shoes. If there are any traces of oil on them, replace them.
- Carry out the removing operations in reverse.
- Bleed the braking system.
- Adjust the positions of the shoes by repeatedly depressing the brake pedal.

ESSENTIAL SPECIAL TOOLS	
Fre. 573-01	Grips for handbrake cable.
Fre. 826	Tool for removing and refitting the brake shoe retaining springs

TIGHTENING TORQUES (in daN.m)	
Wheel bolts	9
Stub axle nut	16

REMOVING

- Remove:
- the hub plug,
 - the hub-drum-nut assembly (A) (see section dealing with the rear brake drum).



Remove the upper return spring, using brake shoe grips.

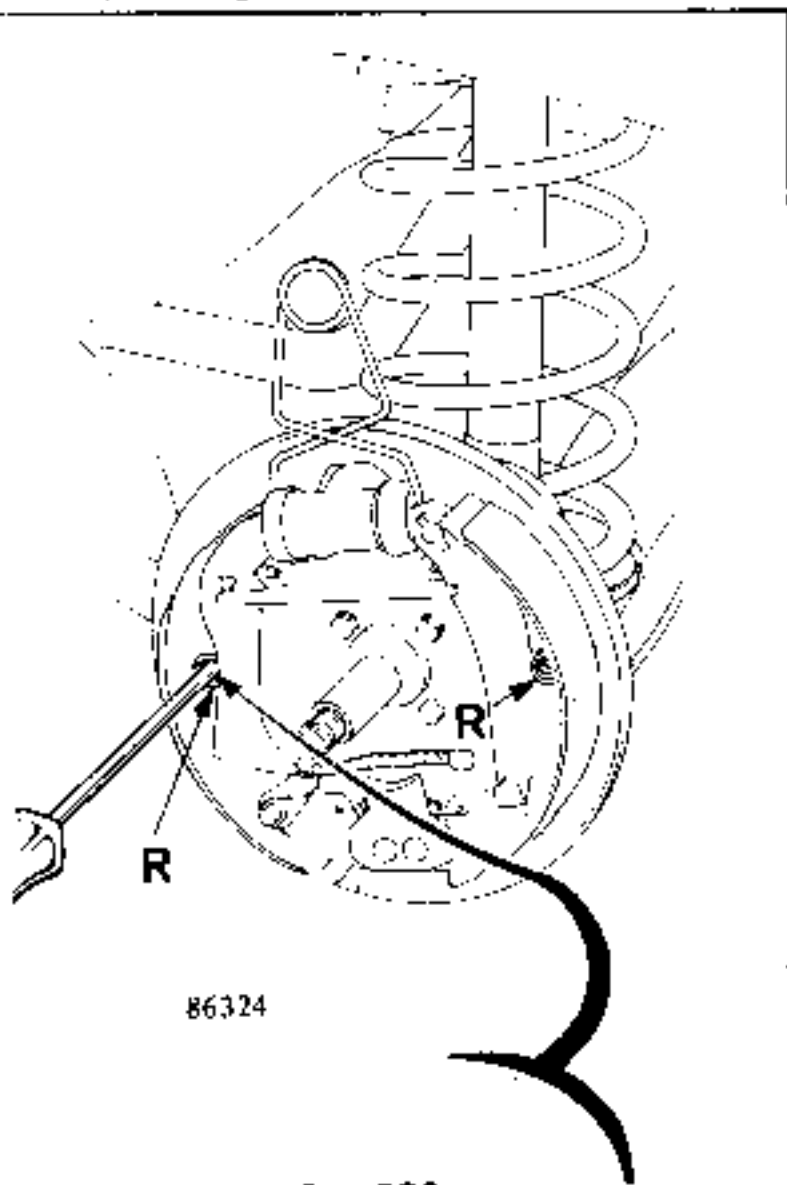
Disconnect the handbrake cable, using tool Fre.573-01.

Both brake drums must always be of the same diameter, therefore reworking one of the drums must be accompanied by a reworking of the other.

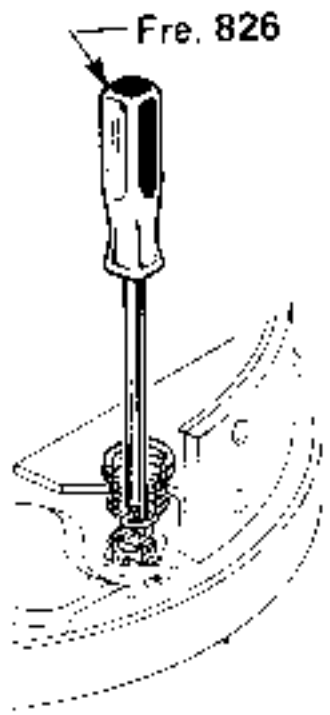
A maximum metal removal of 1mm on diameter is permissible.

Place a clip on the wheel cylinder.

Unhook the two springs (R) which retain the shoes, using tool Fre.826.



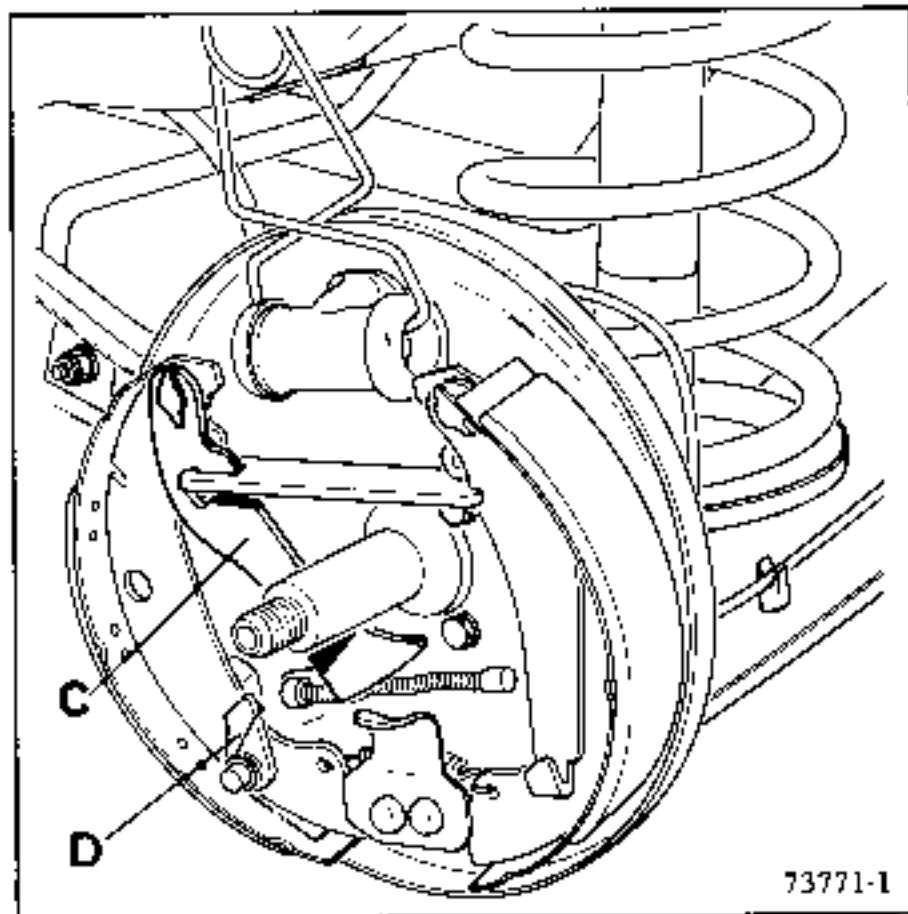
86324



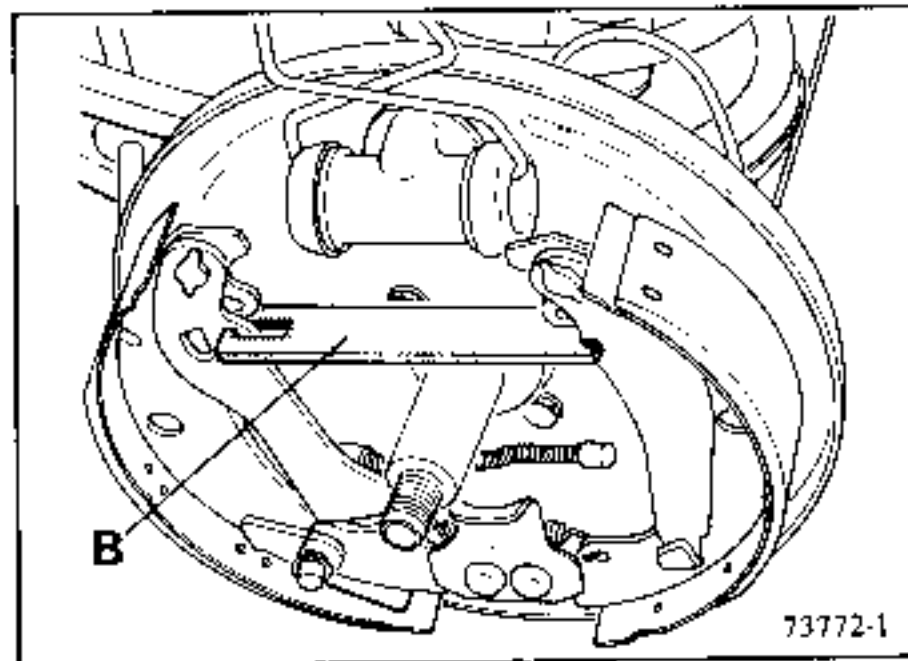
86324-1

Tilt the serrated lever (C) as far as it will go towards the stub axle by pushing down the serrated quadrant (D).

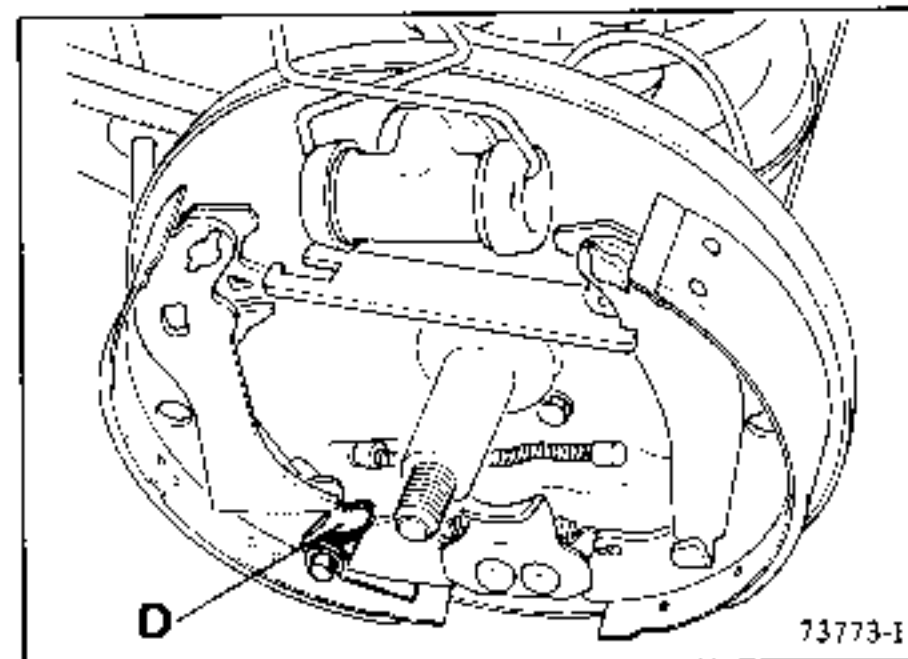
Remove the shoes from the back flange.



Pull the link (B) outwards and take out the leading shoe.



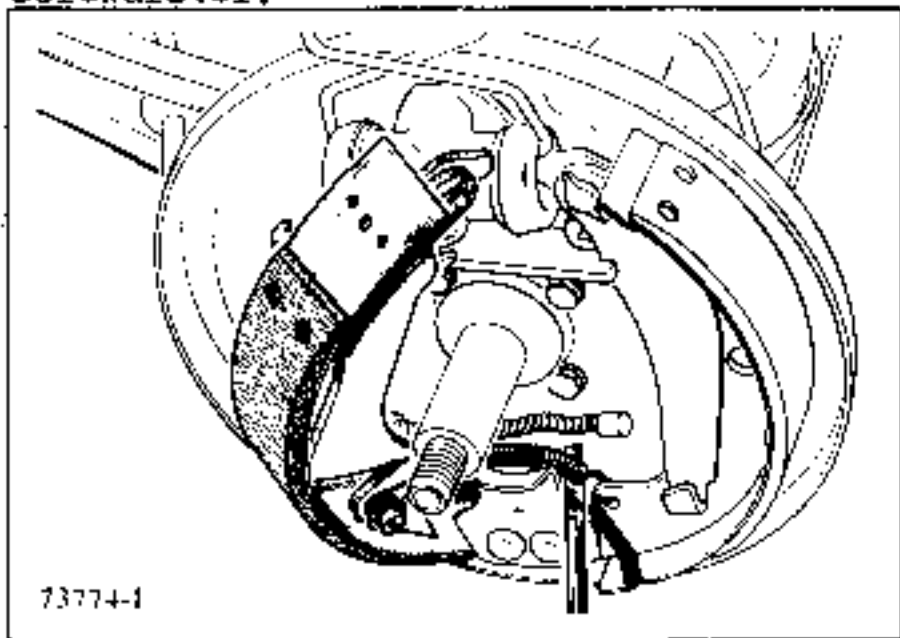
Return the serrated quadrant (D) to its original position.



73773-1

Swing the leading shoe through 90°.

Take out the lower spring with a screwdriver.



Free the leading shoe.

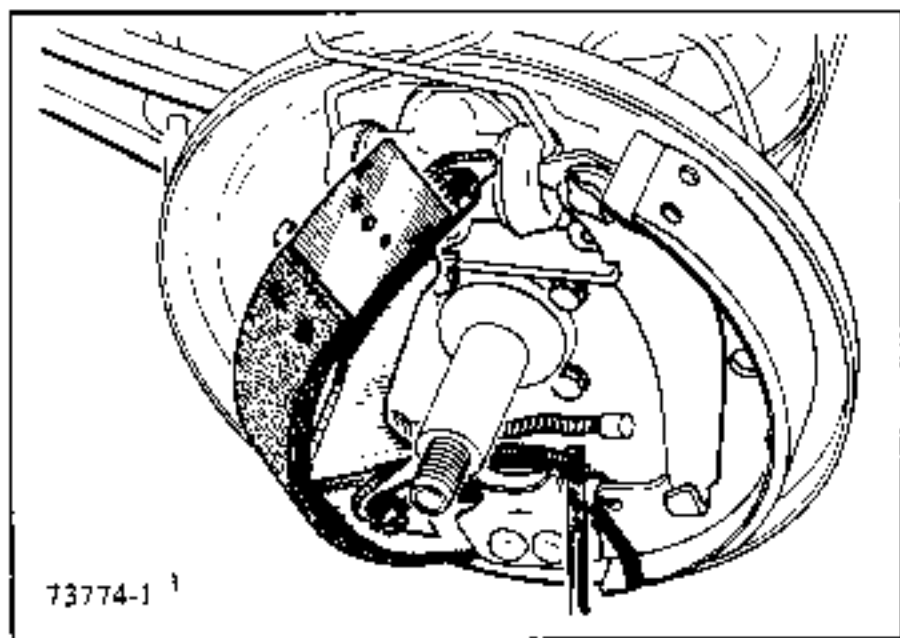
Take out the trailing shoe.

REFITTING

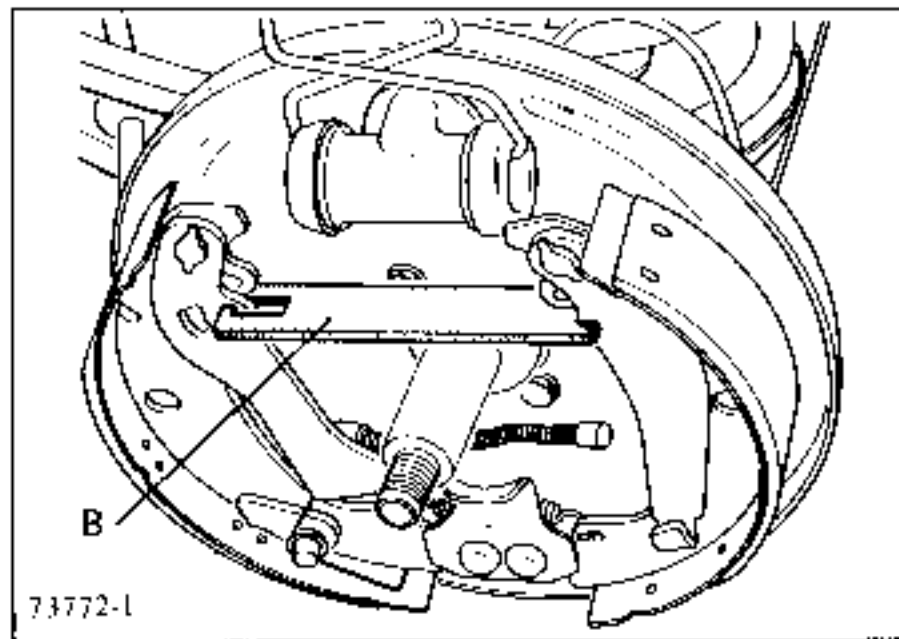
Check the condition of the drums and the hoses.

Hook the lower spring onto the shoes.

Position the shoes on the back flange by swinging the leading shoe through 90°.



Swing the serrated lever as far as it will go towards the stub axle and fit the link (B).



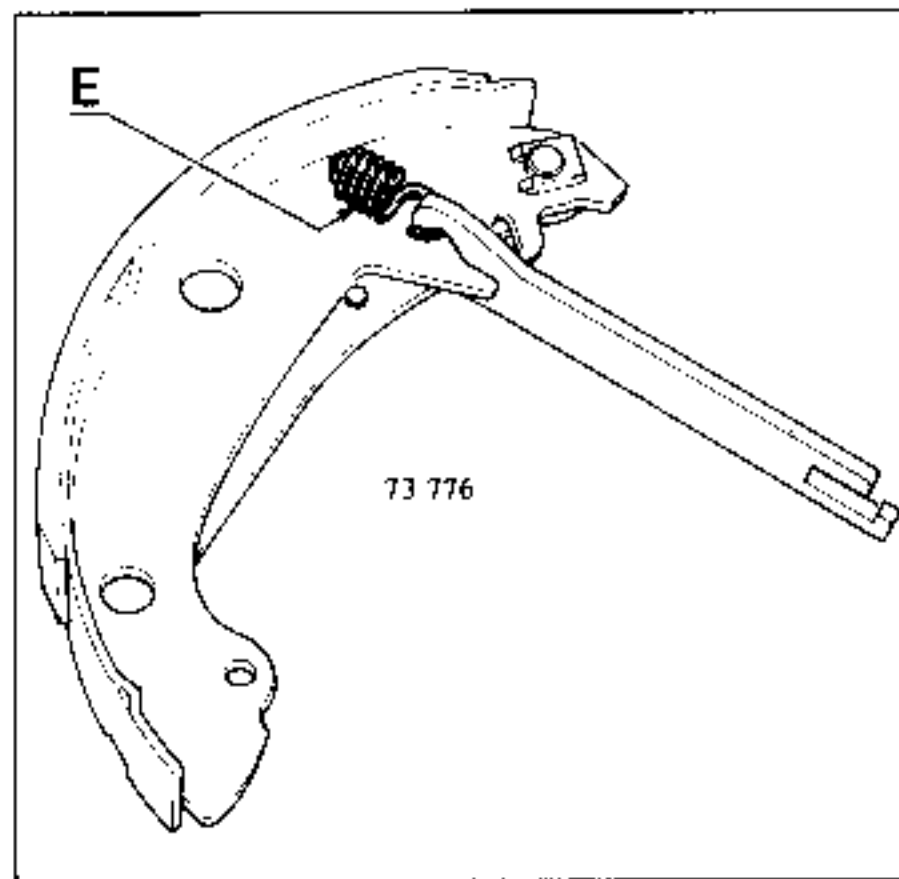
Fit the two brake shoe retaining springs using tool Fre.826.

Connect the upper return spring, using brake shoe grips.

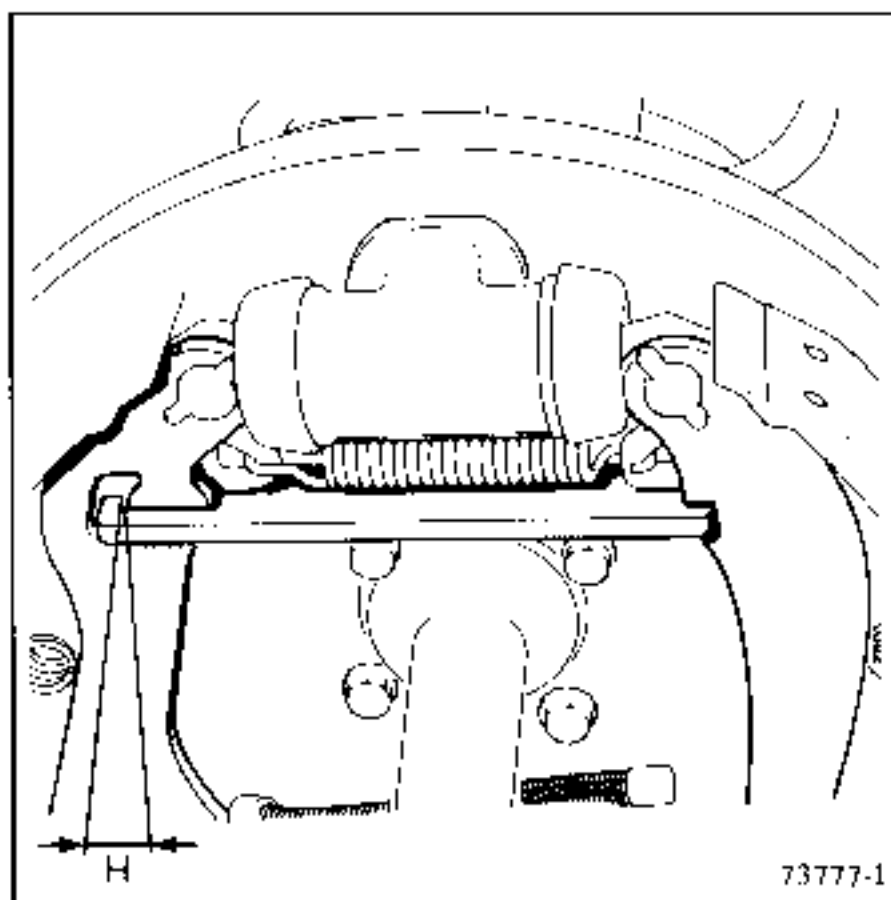
Fit the handbrake cable, using tool Fre.573-01.

ADJUSTING THE AUTOMATIC WEAR TAKE-UP SYSTEM

The adjustment depends on the tension in spring (E) which is hooked between the link and the trailing shoe.



The adjustment consists of measuring dimension H, which should be approximately 1mm, between the link and the leading shoe as shown below (with the handbrake lever against the shoe).



If this dimension (H) is not correct, it is essential to replace the link tensioning spring and the two shoe return springs.

Refit the hub-drum assembly.

Tighten the stub axle nut to the specified torque.

Adjust the positions of the shoes by repeatedly depressing the brake pedal.

Adjust the handbrake.

Refit the plug to the back flange.

This vehicle is fitted with hubs with integral bearings. In case of defect, the entire assembly must be replaced.



TIGHTENING TORQUES (in daN.m)	
Wheel bolts:	9
Stub axle nuts:	16

REMOVING

Remove

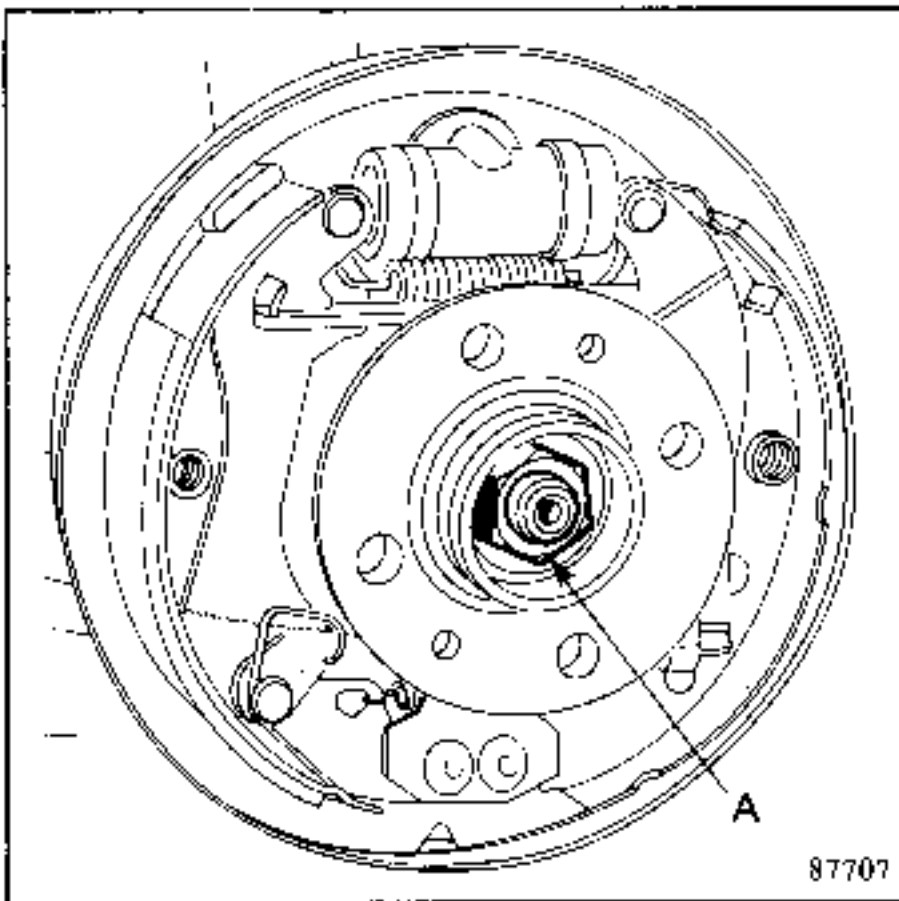
- the hub plug
- the drum (see corresponding section)
- the hub (nut A)

REFITTING

Oil the stub axle with oil SAE 80 W.

Fit:

- the hub, tightening it to torque,
- the drum (see corresponding section),
- the hub plug.

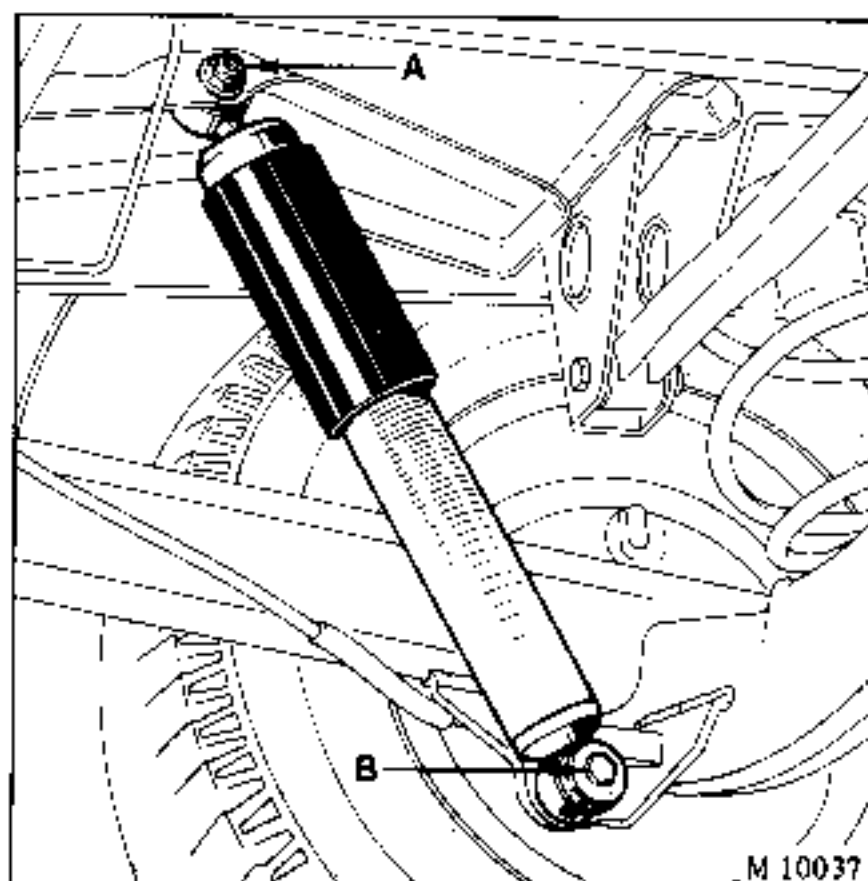




TIGHTENING TORQUES (in daN.m)	
Upper securing nut	5
Lower securing bolt	2,5

REMOVING

Raise the vehicle on a lift with its weight resting on its own wheels.



Unscrew the lower securing bolt B.

Remove the upper pin A.

Remove the shock absorber.

REFITTING

Precautions to be taken before fitting:

The shock absorbers are laid horizontally in the spare parts stores.

Under these conditions, it is possible for shock absorbers which are designed to operate vertically to become unprimed.

Consequently, before fitting such a shock absorber to the vehicle, merely pump it manually a few times with it held in the vertical position.

Fit the shock absorber.

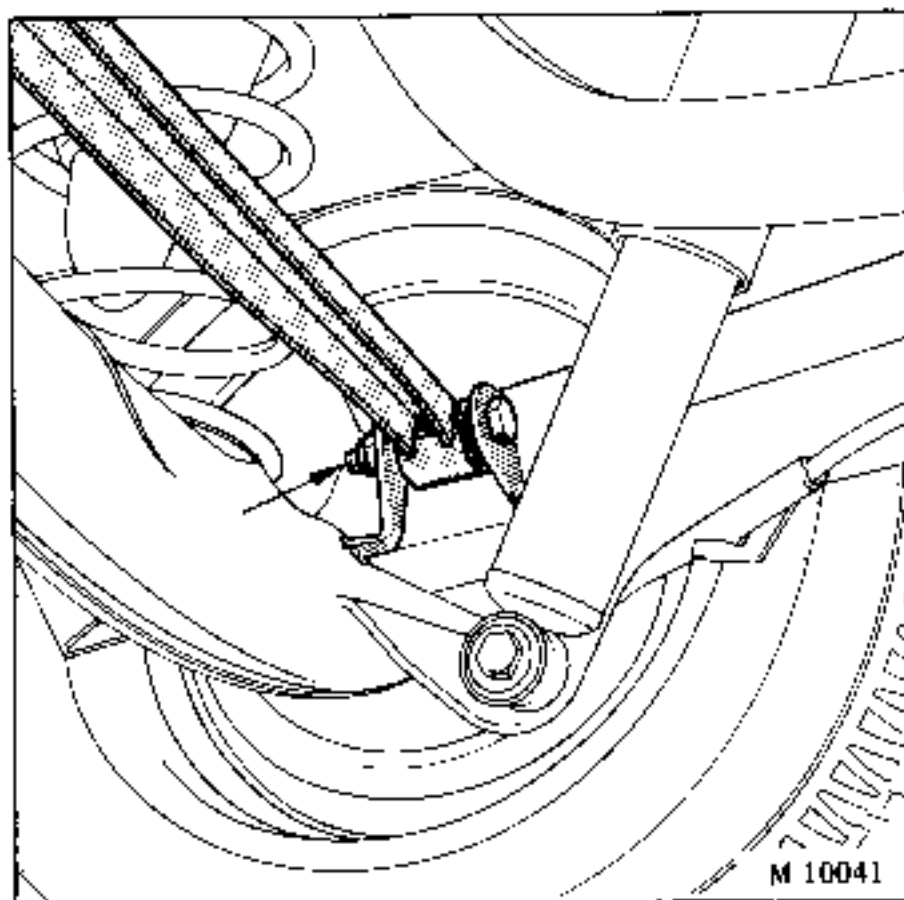
Tighten its fastenings to the specified torque.



TIGHTENING TORQUES (in daN.m)	
Shock absorber lower securing bolt	2,5
Transverse guide bar	5

REMOVING:

- Support the vehicle on stands.
- Slightly lift the rear axle by placing a jack underneath the spring dish.
- Remove the shock absorber lower securing bolts.
- Remove the fastenings which secure the guide bar to the axle.



- Lower the axle until the springs come free from the body.
- Remove the springs.

REFITTING:

Carry out the removing operations in reverse.

Tighten the shock absorber lower fastenings and the guide bar fastenings to the specified torques.



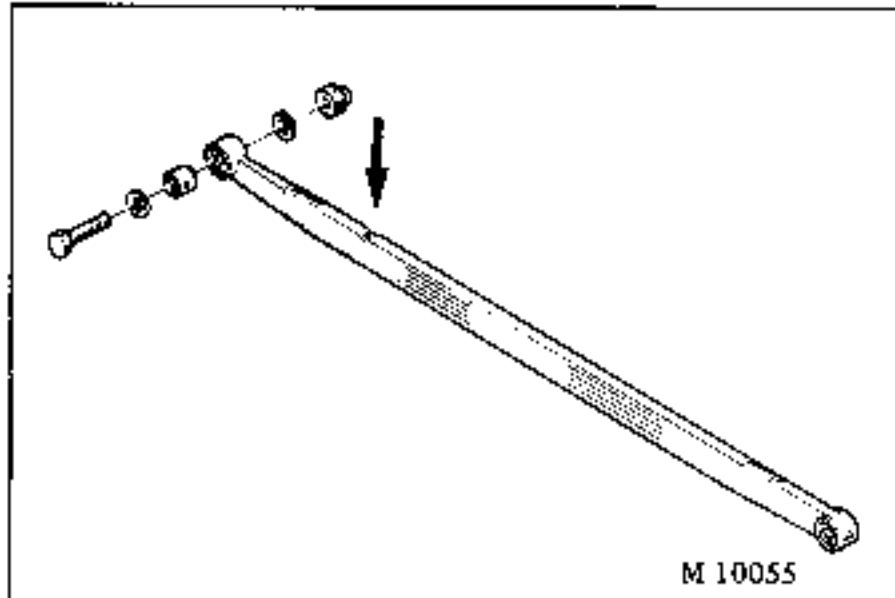
TIGHTENING TORQUES (in daN.m)	
Fastenings to the chassis	5
Fastenings to the axle	5

REMOVING

- Unscrew the compensator nut under the bar.
- Remove the fastenings that secure it to the axle and to the chassis.
- Remove the bar without altering the compensator adjustment.

REFITTING

- Carry out the removing operations in reverse.
- Tighten the fastenings to the specified torques.
- Coat the securing pins with EATMO grease.

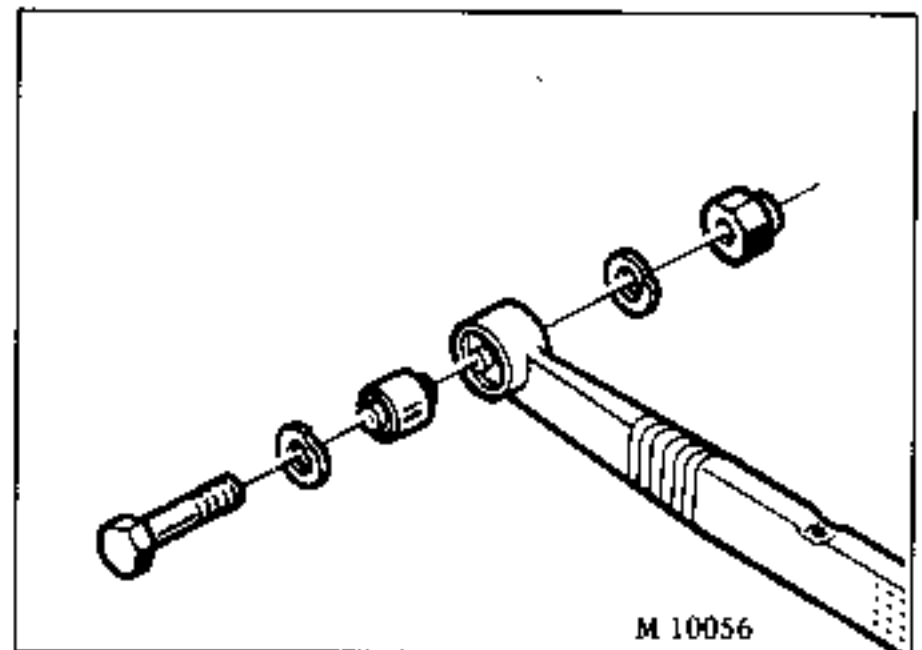


Replacing the Flexible Bushes in the Transverse Guide Bar

Remove the guide bar.

The bushes are replaced on the press.

Coat the securing pins with EATMO grease.

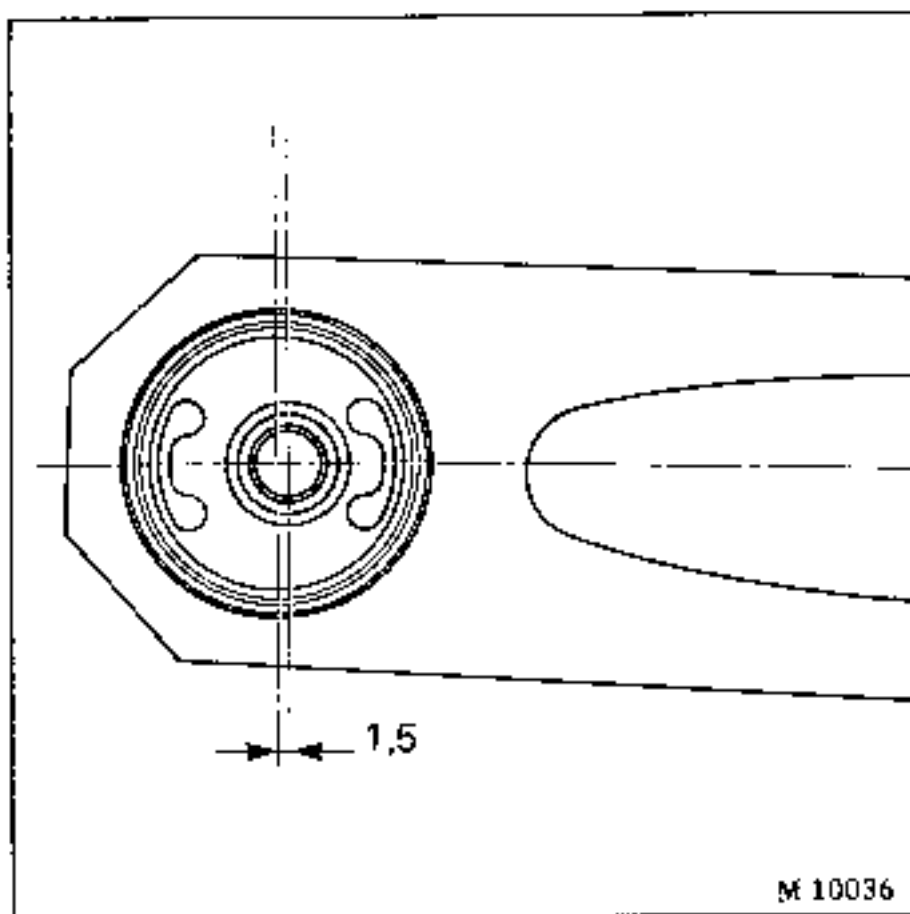


The bushes are replaced on the press, after first removing the rear axle.


PRECAUTION WHEN FITTING A FLEXIBLE BUSH

Fit the flexible bush in the position shown in this drawing.

The pin which secures the suspension arm is offset towards the rear of the vehicle with reference to the centre line of the flexible bush locating bore.



This operation is carried out with the axle still on the vehicle.

TIGHTENING TORQUES (in daN.m)		
Wheel bolts	9	
Hub bolts	16	
Stub axle securing screws	2,2	
Bleed screws	0,6 - 0,8	
Union screws	1,3	

REMOVING

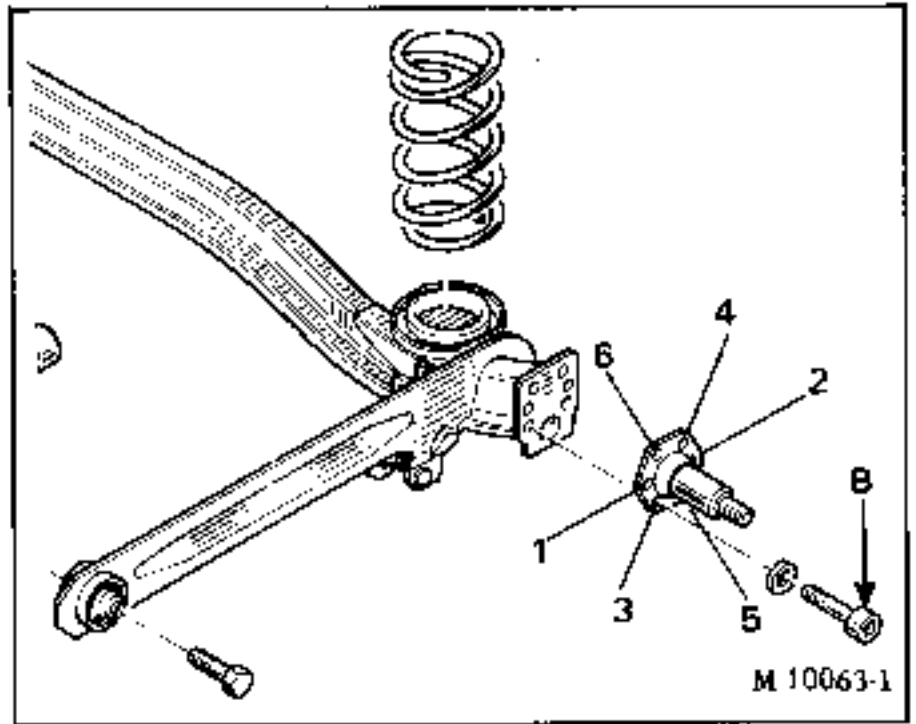
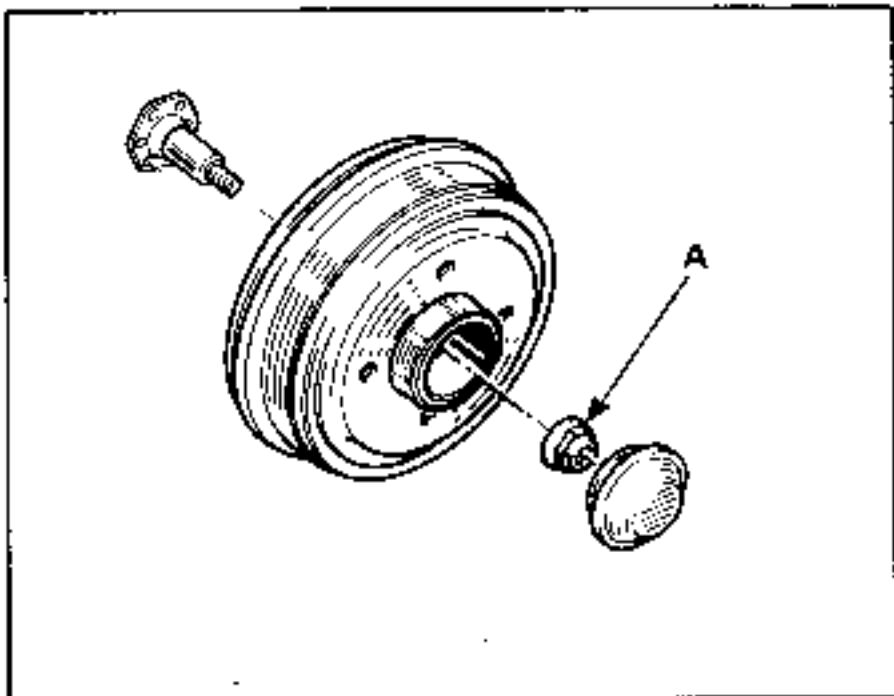
Support the rear of the vehicle on stands.

Remove:

- the hub, drum and nut (A) assembly (see section on brake drums)

Unscrew:

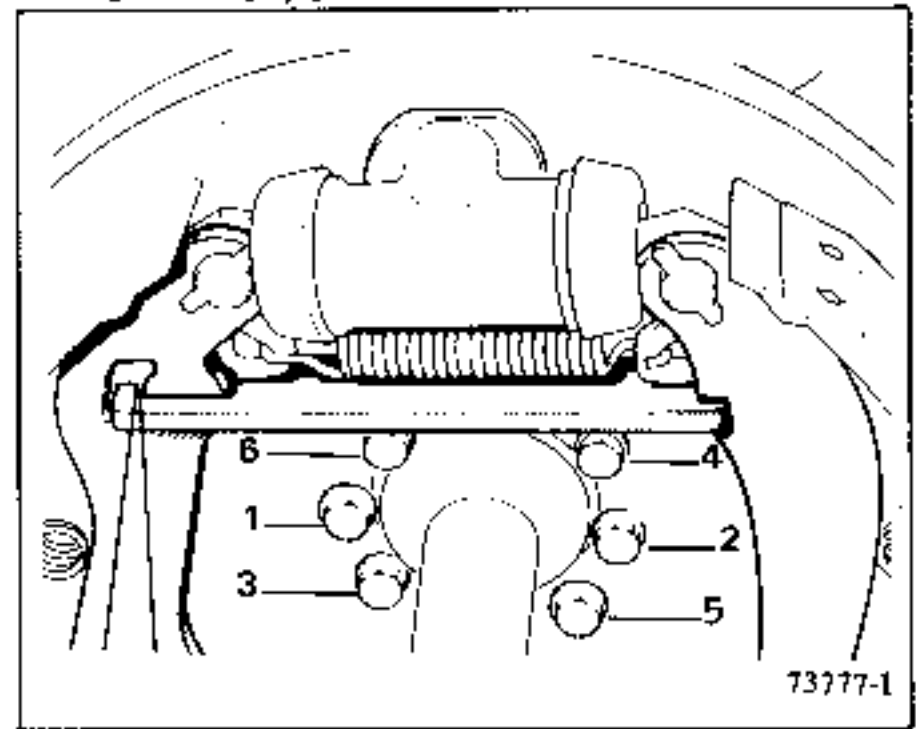
- the hydraulic union. It has an 11mm hexagon.
- the six screws which secure the stub axle flange, which are 6mm Allan screws.



REFITTING

Fit the stub axle, the flange and the six securing screws.

Tighten them in the order 1 2 3 4 5 6 as shown in this illustration (to a torque of 2.2 daN.m).



Note: If the original stub axle securing screws are to be refitted, it is essential to coat them with LOCTITE FRENBLLOC locking compound and to fit new washers. Carry out the removing operations in reverse. Tighten the nut to a torque of 16 daN.m. Bleed the braking system.

WHEELS

The wheel identification marking can take one of two forms:

- an engraved inscription on pressed steel wheels,
- a cast inscription on light alloy wheels.

The inscription provides the main dimensional specifications of the wheel.

It can be either complete:

Example: 5 1/2 J14 4 CH 36

or simplified:

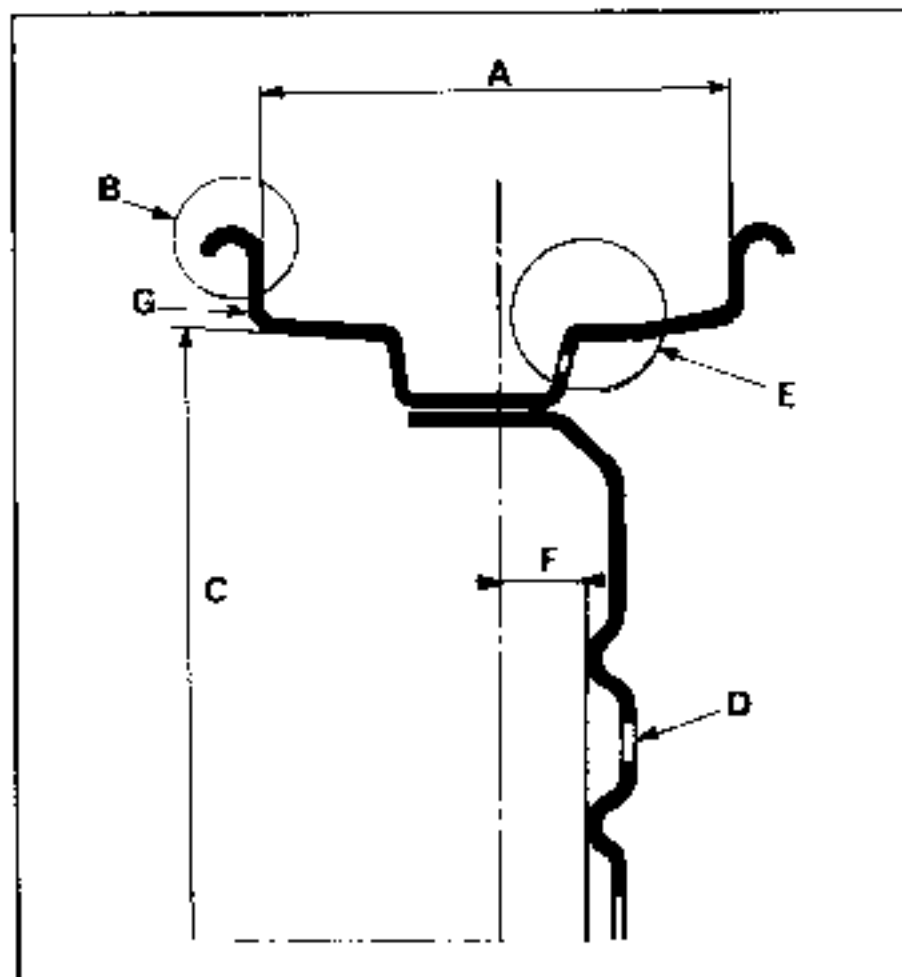
Example: 5 1/2 J14

	A	B	C	D	E	F
Wheel type	Width (in inches)	Rim edge profile	Nominal diameter (in inches) Under tyre bead	Number of holes	Tyre locating profile	Offset in mm
5 1/2 J14 4 CH 36	5 1/2	J	14	4	CH	36

The wheel bolts are on a pitch circle diameter of 100mm.

Maximum permissible run-out: 1.2mm measured at the wheel rim (point G).

Maximum excentricity: 0.8mm measured on the tyre bead locating surface.



TYRES

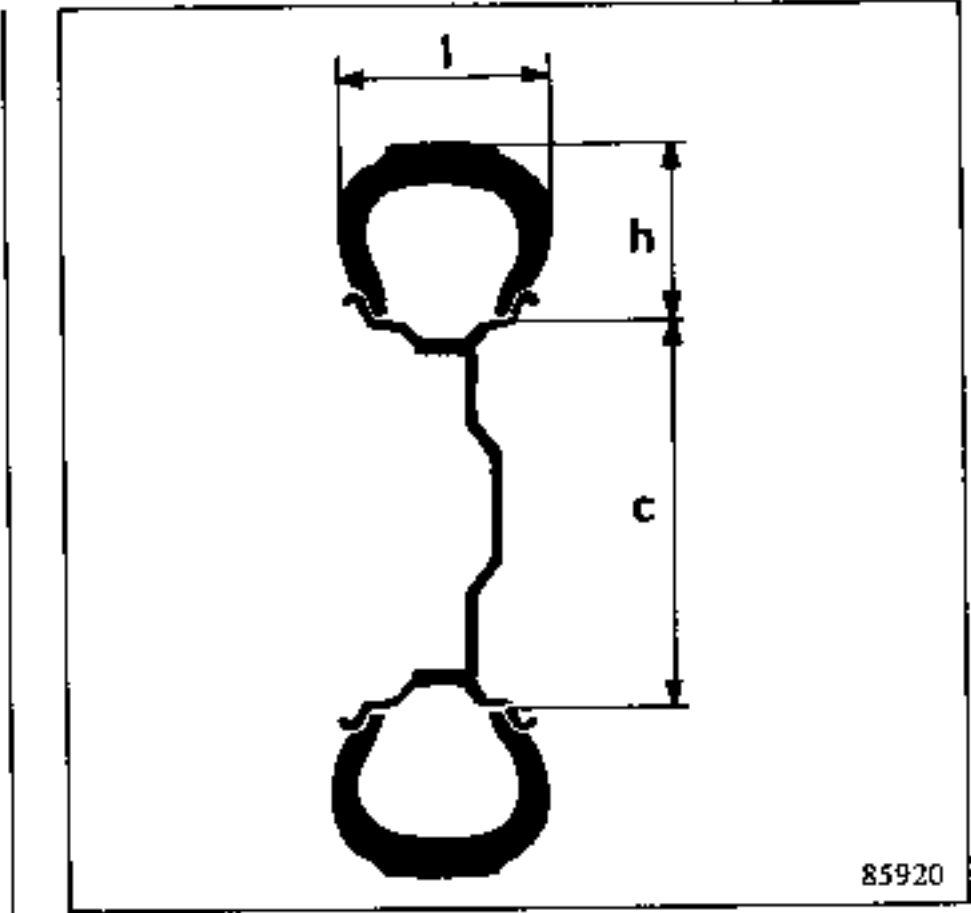
The identification marking for any given tyre type can take one of two forms:

Example : 175/70 S R 13

or 175/70 R 13 80 S

175 / 70 S R 13
① ② ③ ④ ⑤

175 / 70 R 13 80 S
① ② ④ ⑤ ⑥ ③



- ① 175 Width of tyre profile: Expressed in millimetres (or in inches) and measured at the widest point on the tyre.
 $L = 175\text{mm}$

- ② 70 Series, or h/l ratio:

$h/l = 0,8$ (normal)		No inscription
$h/l = 0,7$ (low profile)		70
$h/l = 0,6$ (extra low profile)		60

- ③ S Maximum speed:

Up to 180 km/h		S
Up to 190 km/h		T
Up to 200 km/h		U
Up to 230 km/h		V
More than 230 km/h		Z

- ④ R Type of structure:

Cross ply		No inscription
Radial		R
Bias belted		B

- ⑤ 13 Wheel rim diameter: Expressed in inches or in millimetres
 $C = 13$ inches

- ⑥ 80 Tyre load capacity rating.

Vehicle Type	Year	Wheel	Tyre
. GTS	Up to December 1985	5 1/2 J 13	185 / 70 R 13 H 185 / 70 SR 13
GTS	From January 1986	5 1/2 J 14	185 / 65 R 14 H 195 / 65 R 14 H
TSE	Up to December 1985	6 J 14	
2001 - Turbo DX TXE	From 1987 model	5 1/2 J 14	
GTX - TSE	From January 1986	5 1/2 J 14	

The tyres are of the Tubeless type (with no inner tube).

Their inflation pressures are to be checked when they are cold. The temperature rise caused by driving the vehicle can result in a pressure increase of 0.2 to 0.3 bars.

If the pressures are checked when the tyres are warm, allow for this pressure increase and never deflate them.

Wheel Balancing

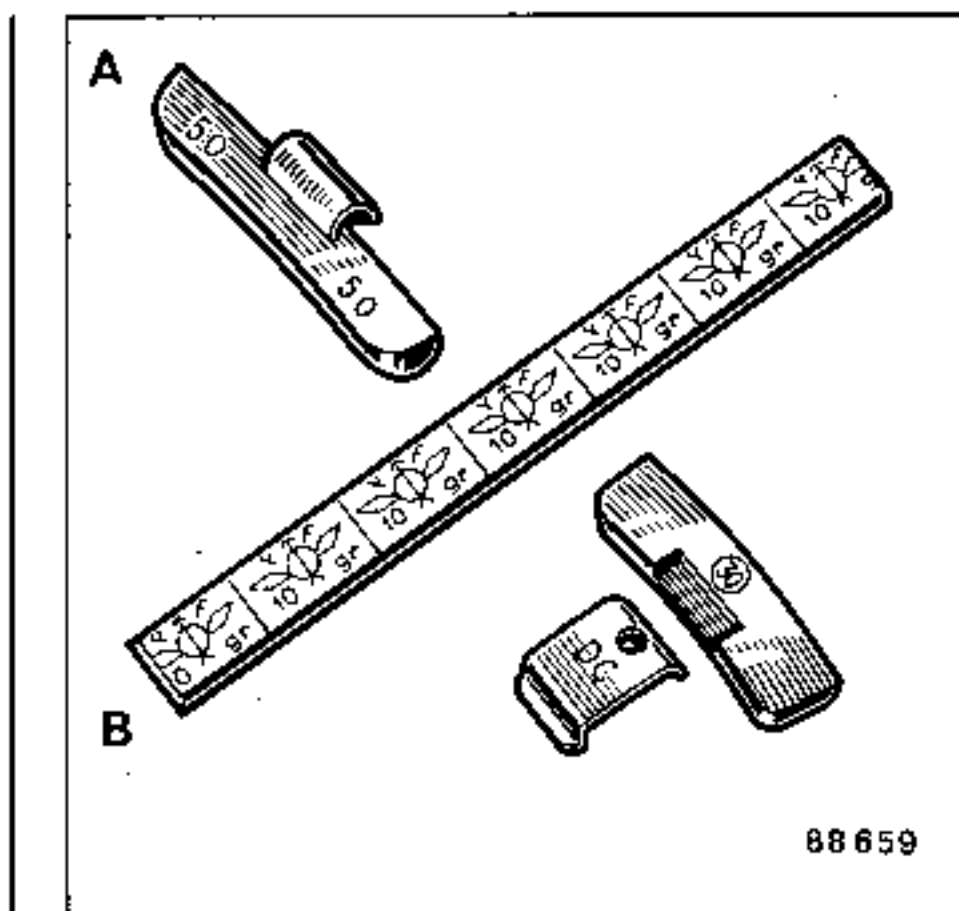
BALANCE WEIGHTS

Use only the balance weights obtainable from the spare parts stores:

- they are secured by hooks to pressed steel wheels (hooks that are part of the actual weight),
- they are secured by hooks (flat hooks) or self-adhesive pads on light alloy wheels.

A Pressed steel wheel

B Light alloy wheel

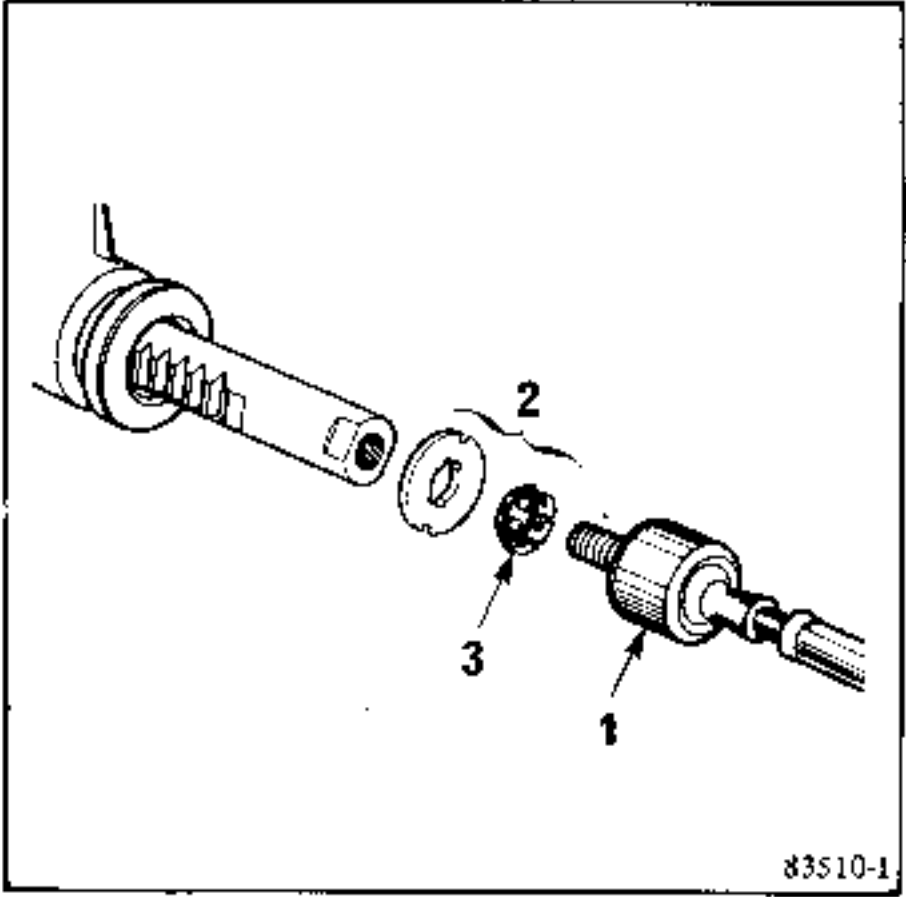
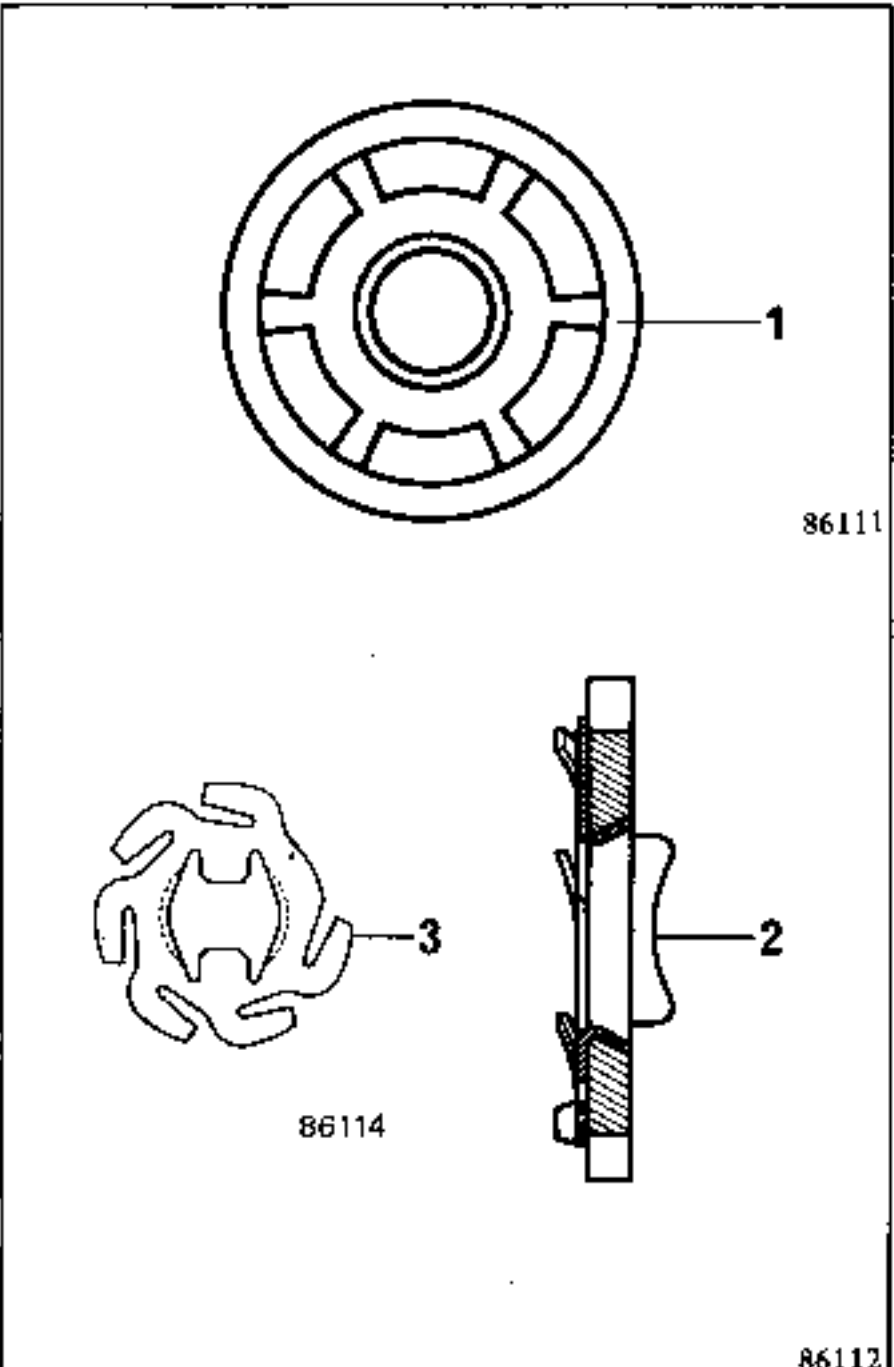


ESSENTIAL SPECIAL TOOLS	
Dir. 812-01 or Dir. 832-01	} Spanners for tightening axial ball joints
T. Av. 476	

TIGHTENING TORQUES (in daN.m)	
Ball joint nut	4
Axial ball joint	5

REMOVING THE BALL JOINT: It is essential to replace the assembly (2). If its serrations are not damaged, the ball joint itself can be refitted.

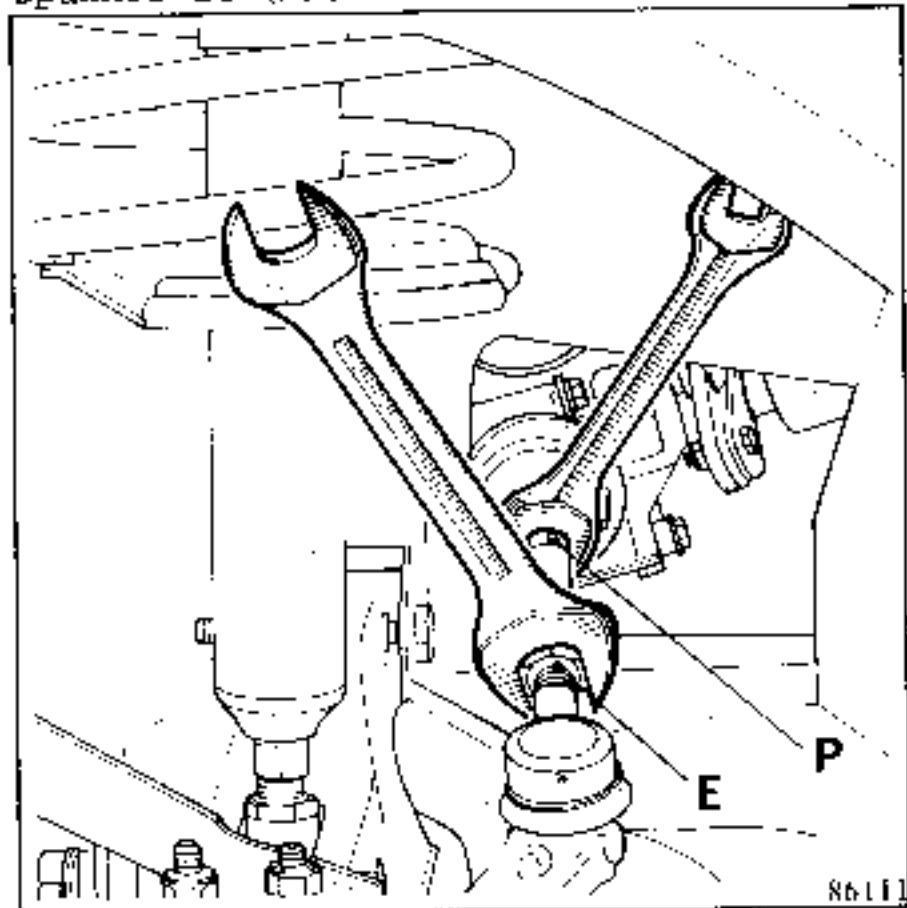
Axial Ball Joint with Flat Locking Washer



83510-1

REMOVING

Loosen the locknut (E) whilst holding the axial ball joint with an open-ended spanner at (P).

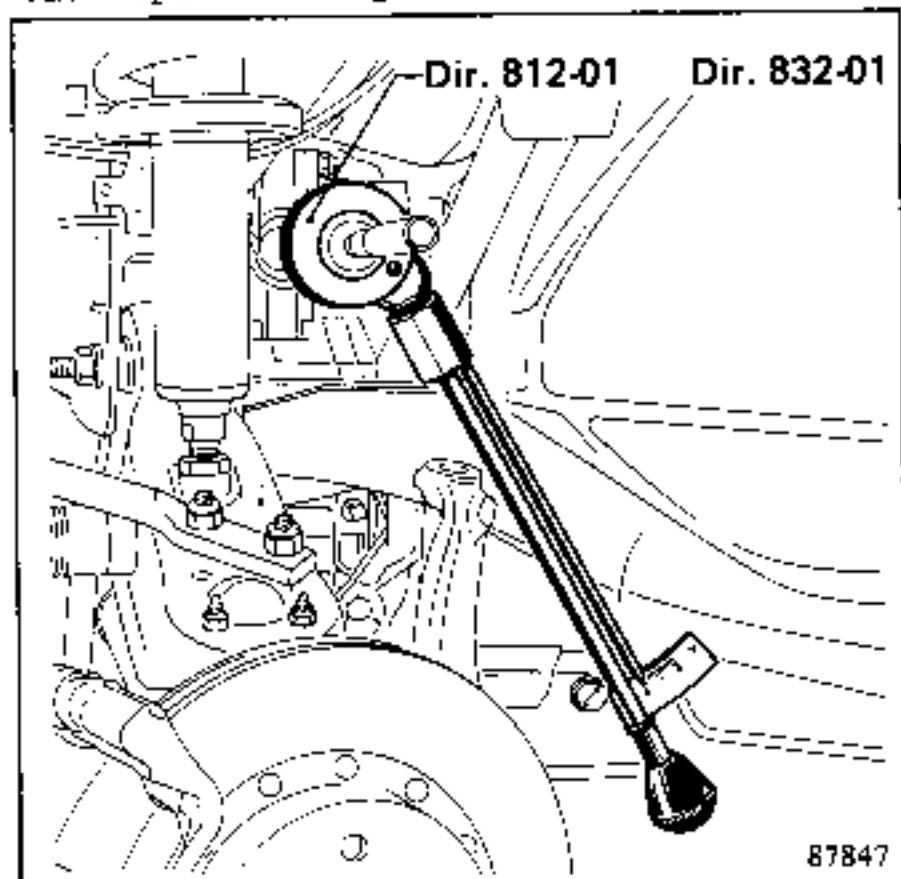


Disconnect the steering ball joint, using tool T.Av.476.

Remove:

- the ball joint casing, counting the number of turns of the thread so that the toe-out can be preadjusted on refitting.
- the rack bellows.

Loosen the axial ball joint using spanner Dir.812-01 or Dir.832-01 and holding the thrust washer (2) with a claw spanner to prevent the rack rotating.

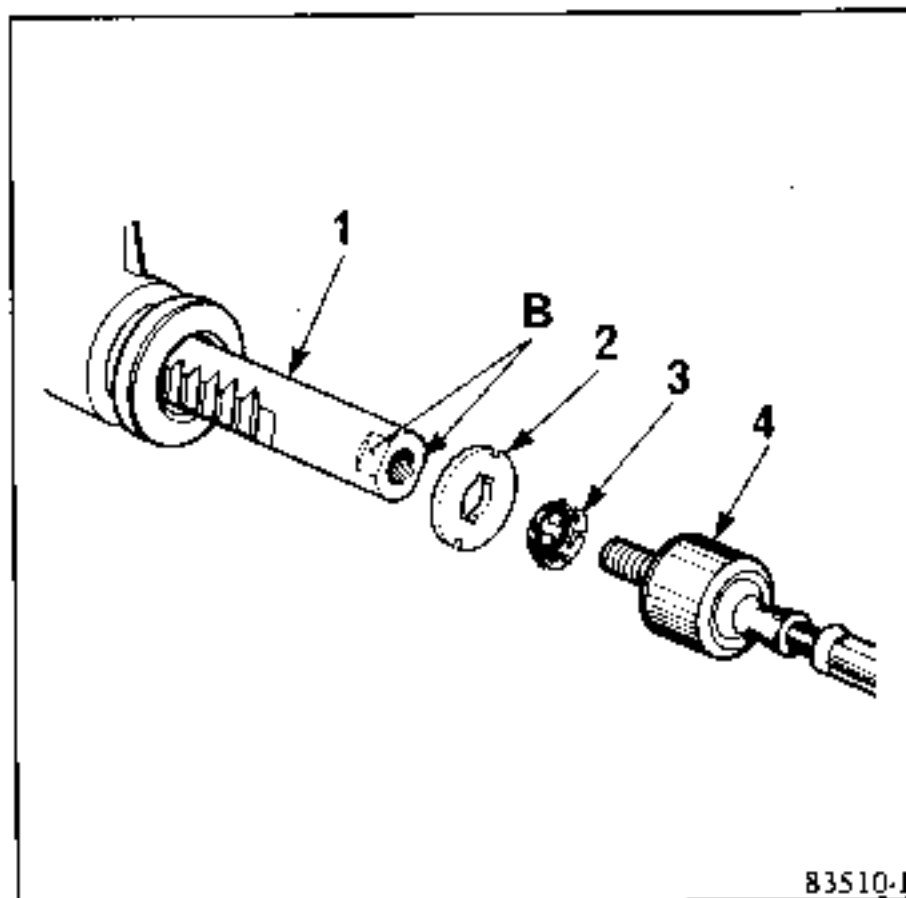


REFITTING

Fit the following to the rack (1):

- the thrust washer (2),
- the locking washer (3),
- the axial ball joint (4) after first coating its thread with Loctite "FRENBLLOC".

Note: Before tightening the ball joint with spanner Dir. 812-01 or Dir. 832-01, check that the two tabs on the washer (2) are, in fact, in line with the flats (B) on the rack.



Refit the bellows and its clip.

Screw the ball joint into the sleeve by the same number of turns as when it was removed.

Reconnect the link to the stub axle carrier.

Check and, if necessary, adjust the toe-out, then tighten the sleeve locknut.

ESSENTIAL SPECIAL TOOLS

Mot. 453-01	Hose clamps
T. Av. 476	Ball joint extractor

TIGHTENING TORQUES (in daN.m)

Steering ball joint nut	4
Axial ball joint	5

REMOVING

With the front of the vehicle supported by stands, remove:

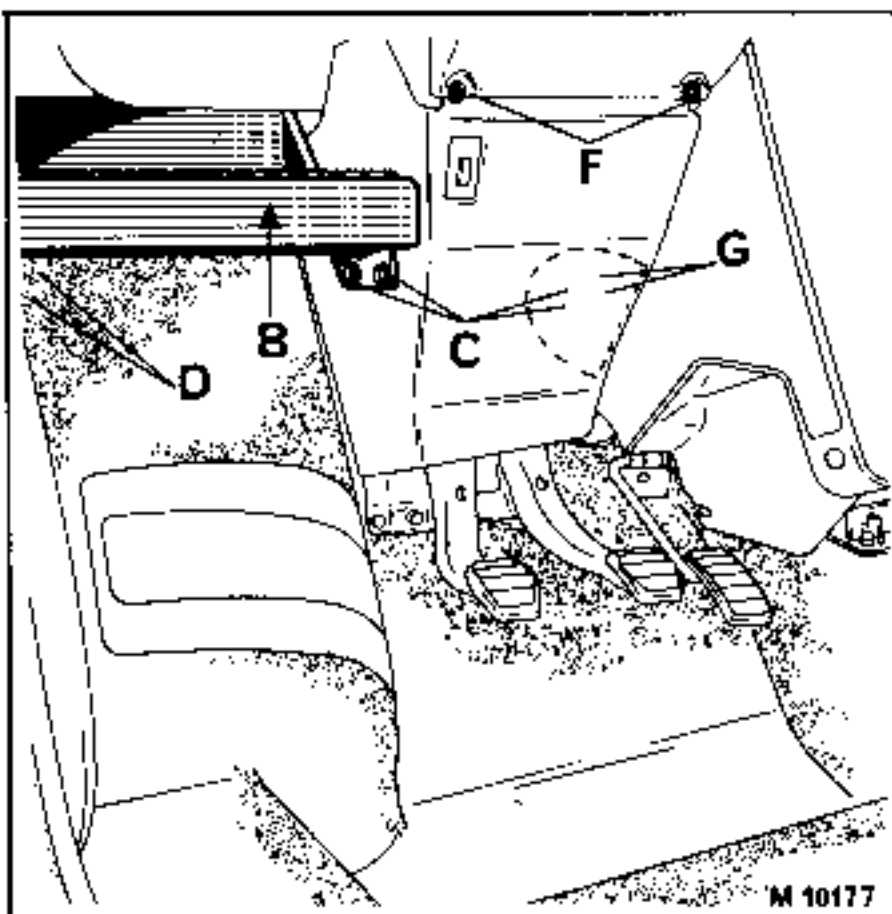
- the steering ball joints on the stub axle carriers, using tool T.AV. 476.

Inside the vehicle:

Remove the parcel shelf (B) by taking out the 4 screws (the 2 marked (D) and the 2 marked (C)).

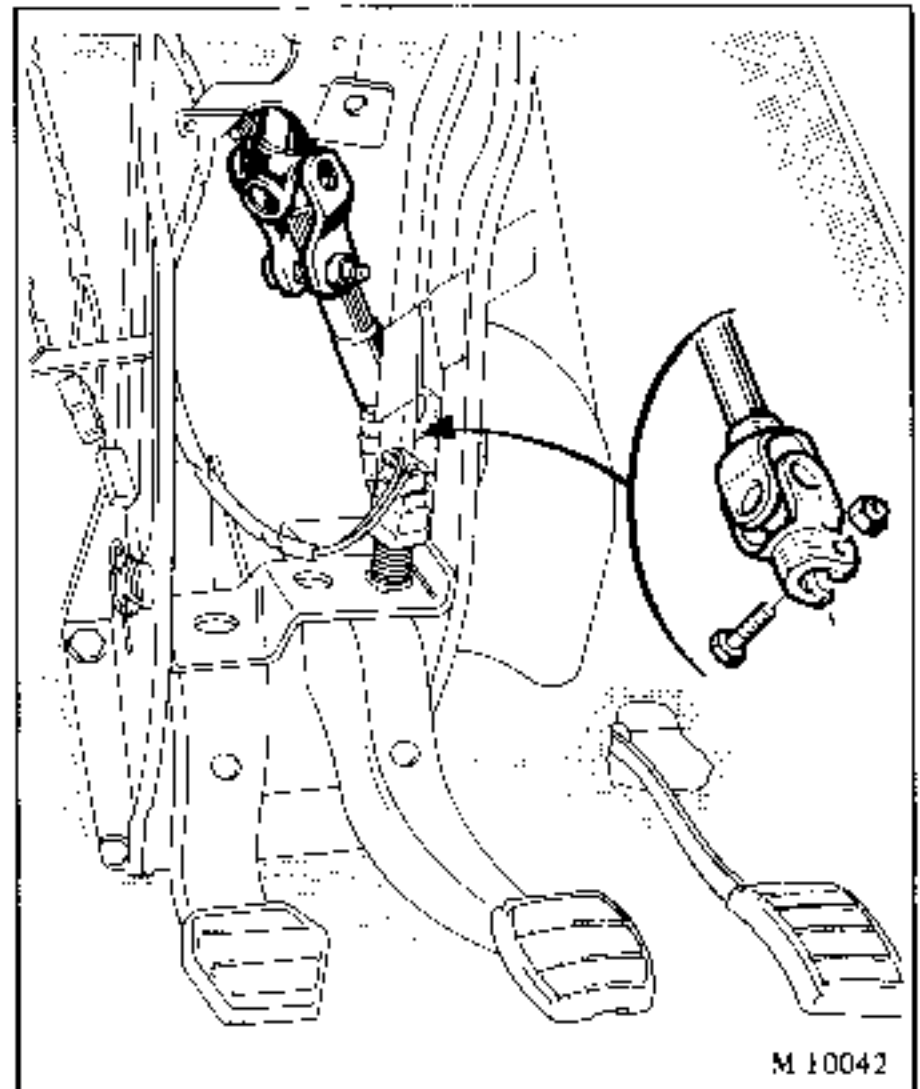
Remove:

- the 2 other screws marked (C),
- the 2 screws marked (F) (using key TR20),
- the bonnet latch control marked (G).



M 10177

Remove the trim from under the steering column and the coupling cover (B). Remove the cotter bolt from the steering universal joint (the universal joint connecting the steering column shaft to the rotary valve). Disconnect the coupling, marking its position with reference to the splines on the rotary valve.



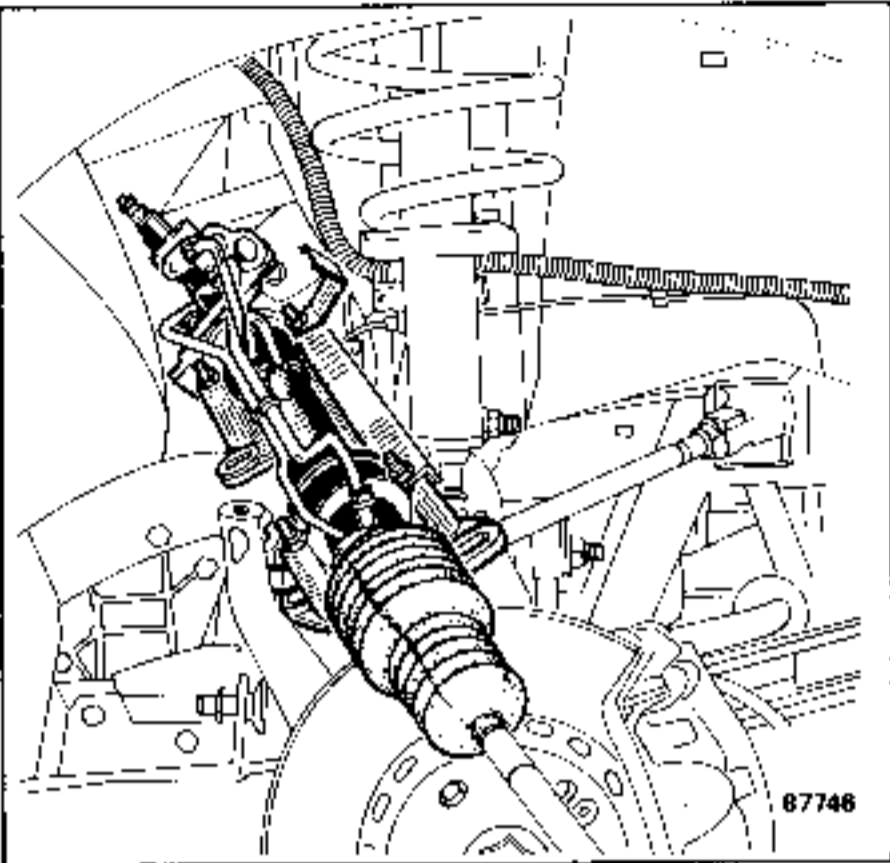
M 10042

In the engine compartment:

Place a clamp Mot. 453-01 on each of the hoses, leaving the oil reservoir.

Remove the pipe support from the rotary valve and disconnect the pipes leading from the reservoir and from the high pressure pump (provide a container to catch the oil remaining in the circuit).

Remove the four fastenings which secure the steering box to the crossmember.

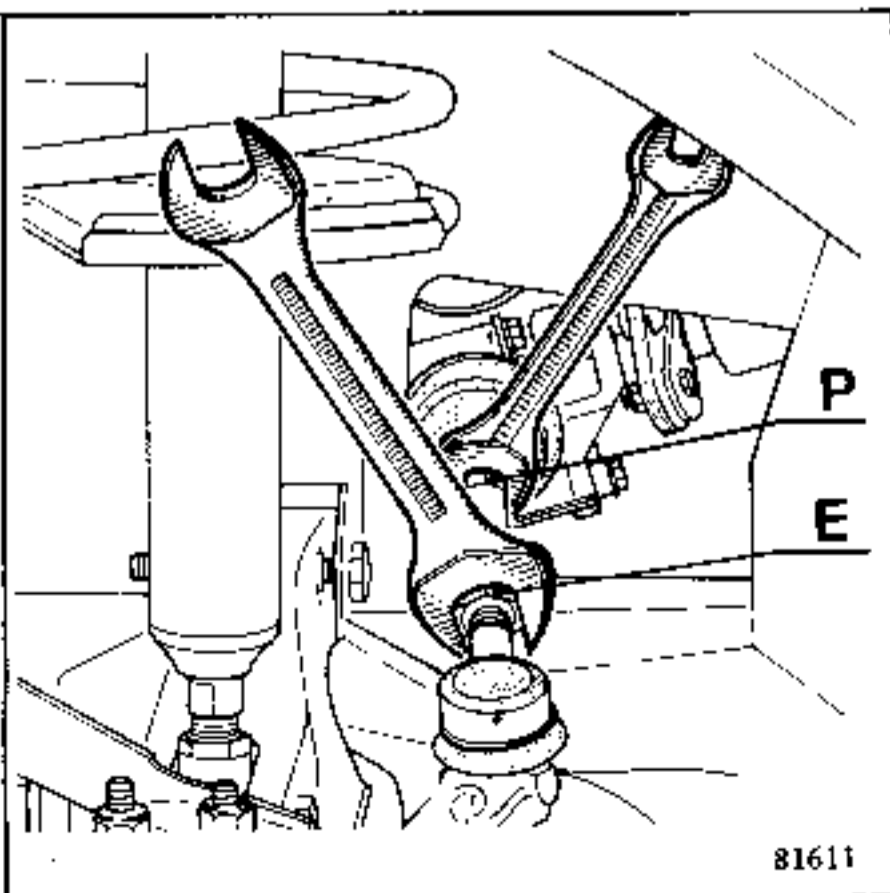


Remove the assembly formed by the steering box and the steering links, through the hole in the RH cowl side. Never unscrew the axial ball joints from the rack unless they have to be replaced.

If the steering box has to be replaced, the ball joint casings at the stub axle carrier ends are to be re-used.

To retrieve them:

- loosen the locknut (E) whilst holding the axial ball joint with an open ended spanner at (P),
- unscrew the ball joint casings, counting the number of threads engaged.



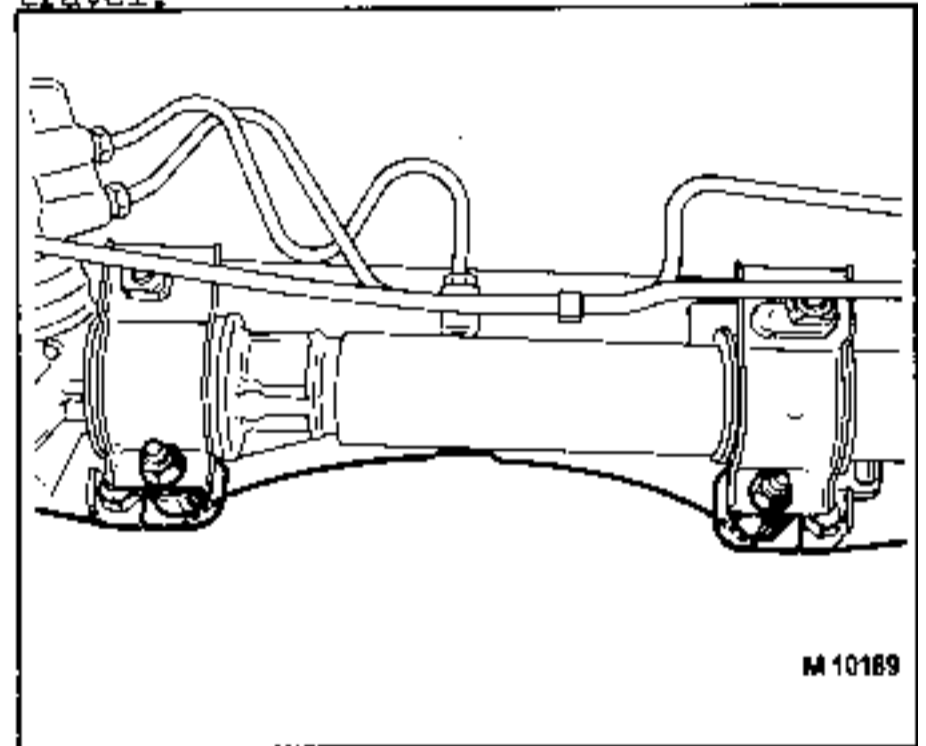
REFITTING

Carry out the removing operations in reverse.

If a new steering box is being fitted, fit the ball joint casings in the positions noted during dismantling.

STEERING RACK HEIGHT

Before tightening the fastenings, the steering box is to be positioned with reference to the crossmember, as shown below, to avoid variation in the toe-out when the suspension moves through its travel.



The bosses (A) must be aligned, symmetrically, with the lower edge of the steering crossmember (B).

REMOVING

Replacing the valve involves removing the steering box (see preceding section).

After removing the box, loosen the 2 bolts which secure the valve in place.

Extract the valve housing, which is a light press fit.

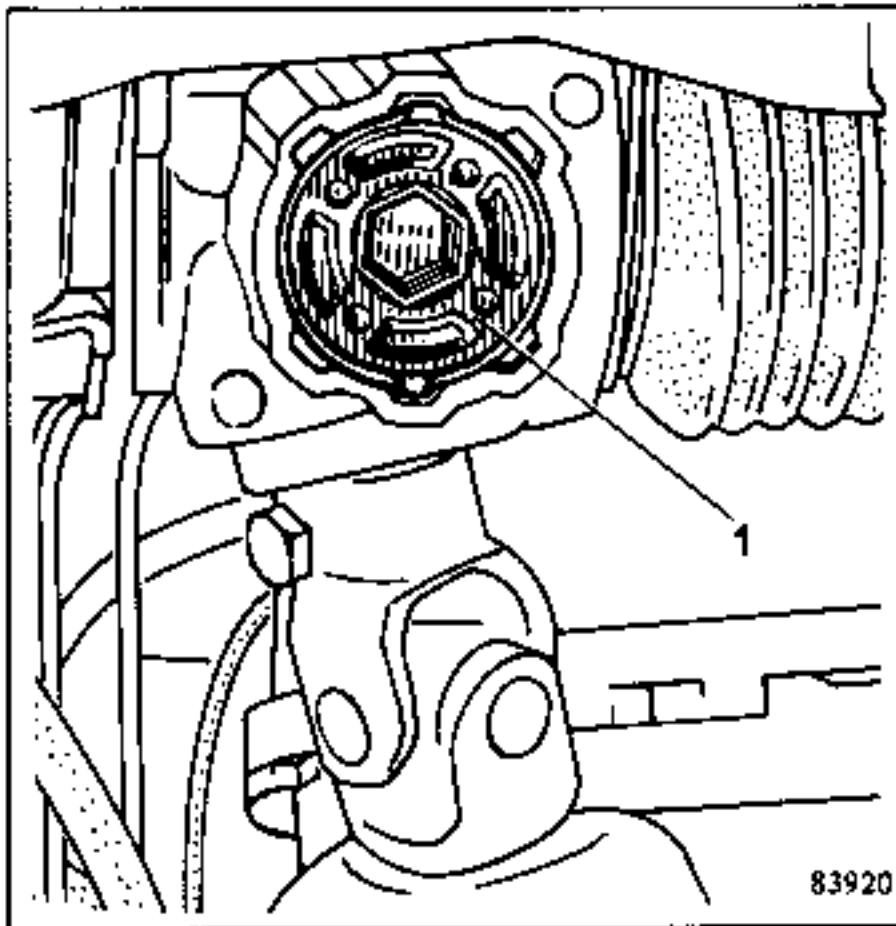
REFITTING

Remove as much grease as possible from the steering box.

Fit a new valve after first having coated the steering pinion and rack with grease grade Molykote BR2.

Reconnect the intermediate steering shaft to the valve and resecure the rubber (3).

Adjust the steering plunger clearance (see next page).



If rattling can be heard from the steering box plunger, before envisaging replacing the entire steering box, it is essential to check that the plunger is correctly adjusted.

This operation can be carried out on the vehicle without moving the steering box.

1) Checking for Rattle

Grasp the rack bar on the same side as the plunger and check the actual play (by pushing it forwards and backwards). If there is play in the assembly and a rattling noise can be heard, this is caused by the plunger rattling.

2) Adjusting on a Vehicle Made Before January 1986

Unlock the adjusting nut (1) by lifting out the peaned areas (A) on the nut collar.

Tighten the adjusting nut by 1/8 turn (1 notch) using a 10mm allen key.

The steering should then be free, but with no stiff points from lock to lock.

Maximum permissible takeup: 2 notches.

Relock the nut by knocking the collar on the nut into two diametrically opposed slots in the housing.

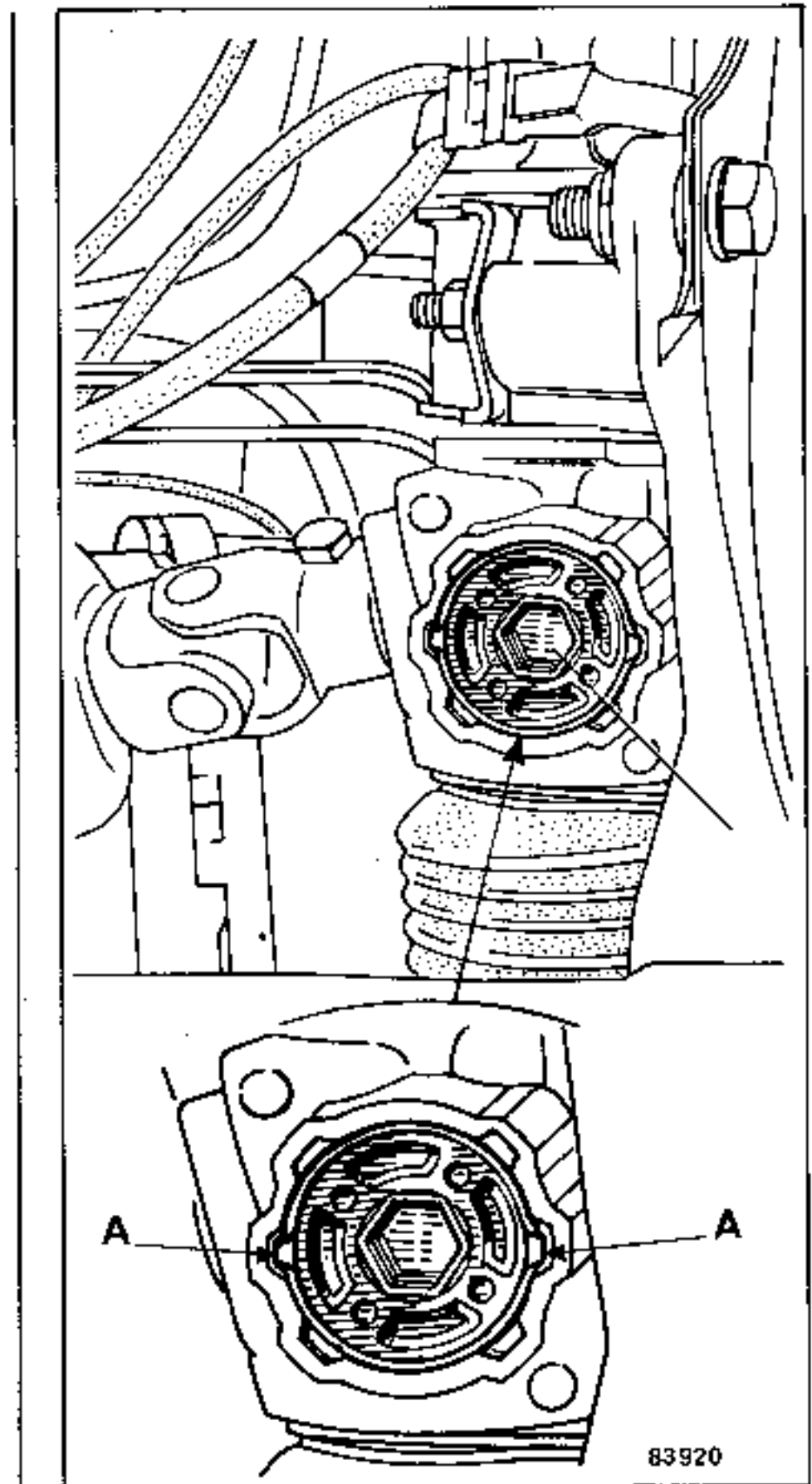
3) Adjusting on a Vehicle Made After January 1986

Unlock the adjusting nut (1) by lifting out the peaned sections (A) on the nut collar.

Tighten the adjusting nut by 2 notches, using a 10mm allen key.

Maximum permissible takeup: 3 notches.

Relock the nut by knocking its collar into two diametrically opposed slots in the housing.



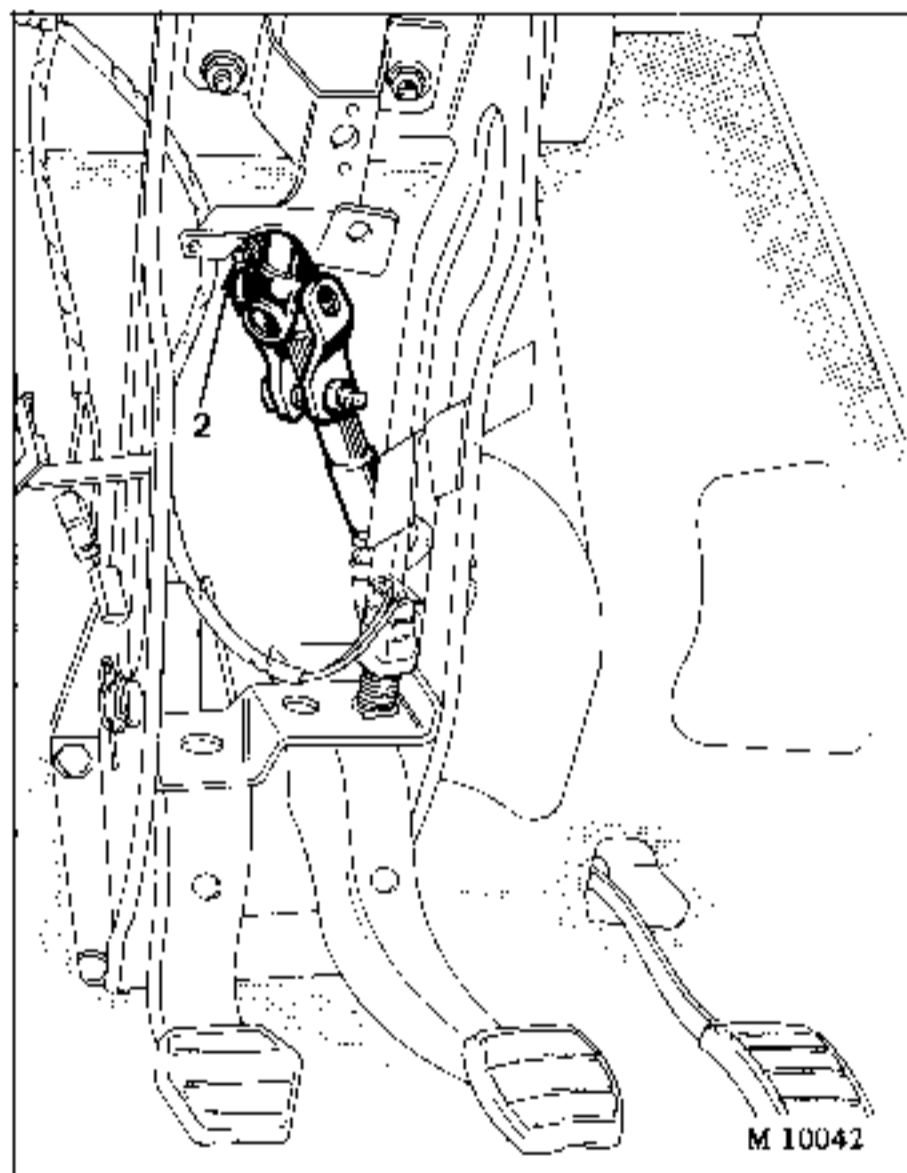
TIGHTENING TORQUE (in daN.m)

Steering wheel bolt	1,5
---------------------	-----

REMOVING

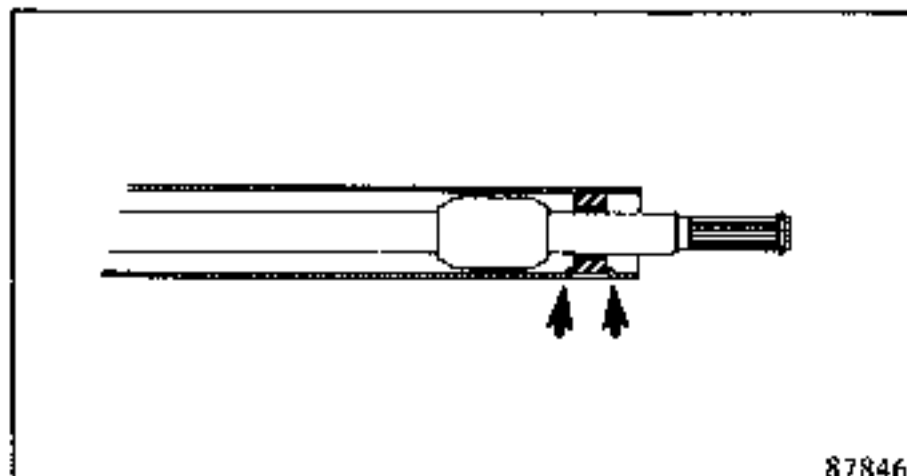
Remove:

- the lower protective casing,
- the cotter bolt (2).



Pull the steering wheel to free the steering column shaft and upper bush (ensure that the steering lock is unlocked).

Knock out the lower bush, using a piece of tube with an outside diameter of 35mm.



REFITTING

Fit the new lower bush, using a piece of tube with an outside diameter of 35mm after having first coated it with grease.

Disconnect the steering wheel from the shaft.

Fit the steering column shaft, engage it in the universal joint, and refit the cotter bolt (2).

Fit the new upper bush, using a piece of tube with an outside diameter of 35mm after having first coated it with grease.

Refit:

- the steering wheel, tightening its securing bolts to torque,
- the lower protective casing.



TIGHTENING TORQUES (in daN.m)

M 10 x 100	1,3
M 12 x 100	1,3
Brake servo securing screws.....	1,3

REMOVING

Drain and remove, by pulling it upwards, the brake fluid reservoir.

Remove the pipes and mark their positions.

Remove the two securing nuts on the brake servo.

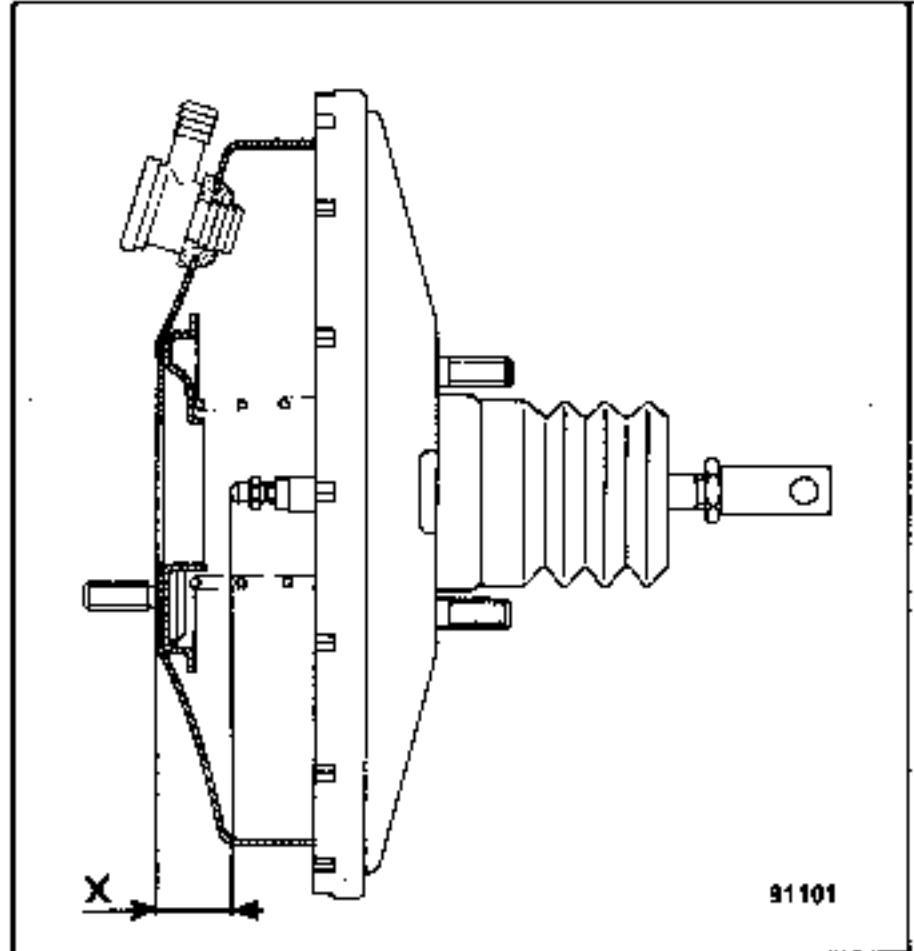
REFITTING

Check the length of the thrust rod X.

Reconnect:

- the pipes in their correct positions.
- the brake fluid reservoir, pressing it down to clip it into position on the master cylinder.

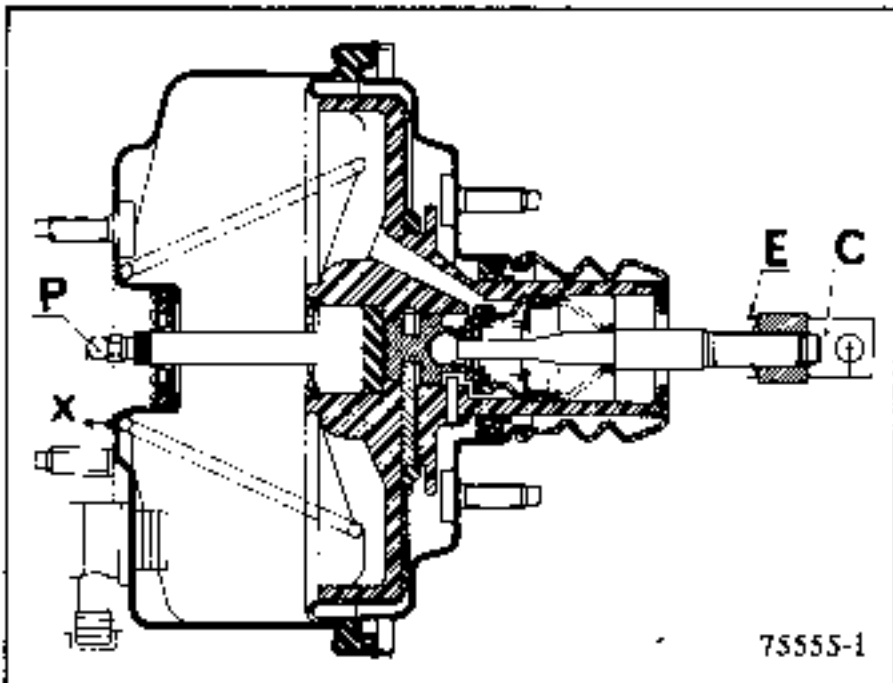
Bleed the braking system.



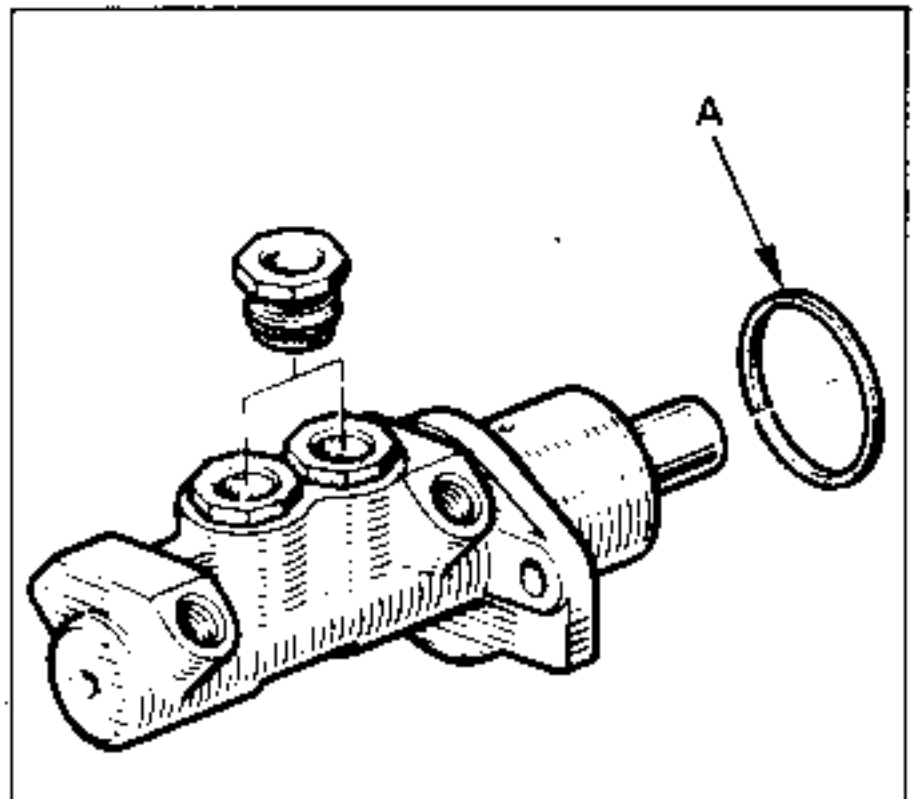
X = 22,3mm

NOTE:

Vehicles of the later type are fitted with master cylinders which are an integral part of the brake servo. The air tightness of the braking servo depends directly on the seal between it and the master cylinder. When carrying out any work, fit a new seal A. Fit the master cylinder, aligning it with the brake servo, so that the thrust rod P enters, correctly, its location in the master cylinder.



X = 9 mm



TIGHTENING TORQUES (in daN.m)

Master cylinder to brake servo	1,3
Brake servo to scuttle	2

The brake servo cannot be repaired. The only operations that can be carried out are on:

- the air filter,
- the non-return valve.

REMOVING THE BRAKE SERVO

- In the engine compartment

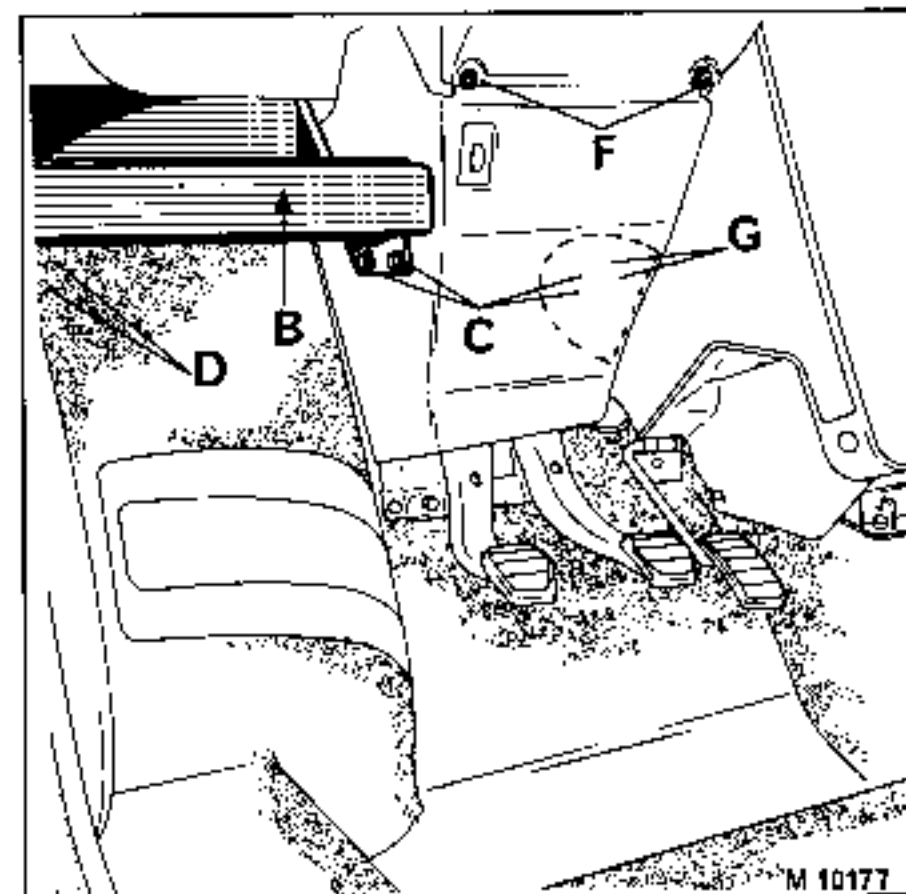
Disconnect the battery.

Remove:

- the carburettor cowl,
- the duct carrying hot air to the carburettor,
- the master cylinder, marking the pipe connections.

Disconnect the vacuum hose from the brake servo.

- Inside the Vehicle



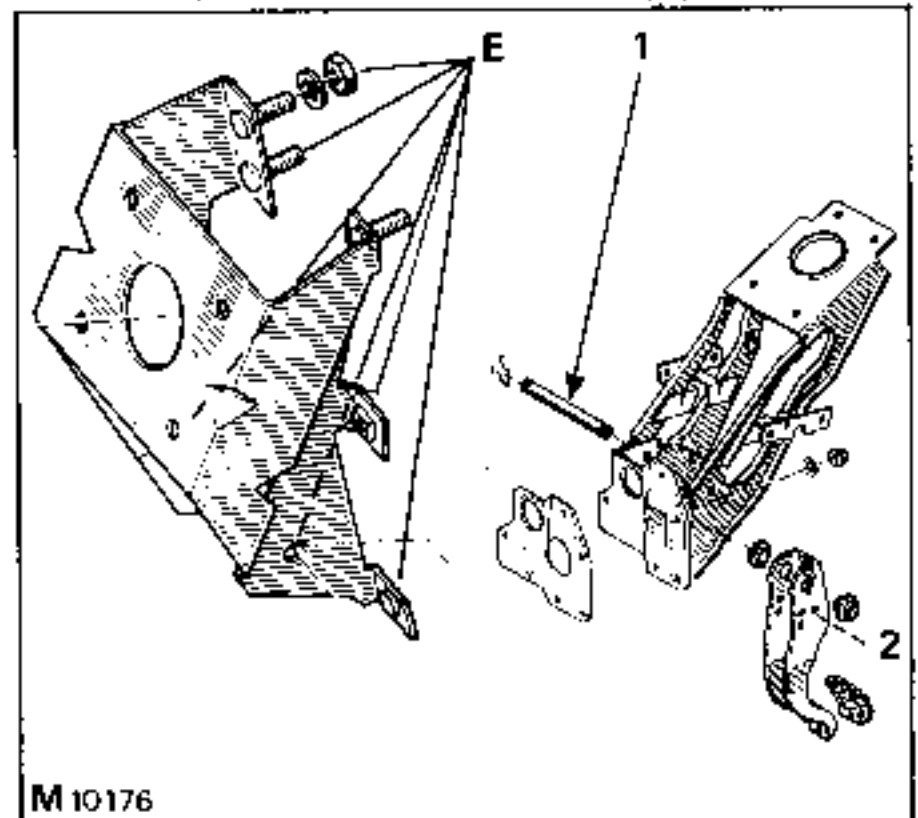
Remove the parcel shelf (B) by taking out the 4 screws (the 2 marked (D) and the 2 marked (C)).

Remove:

- the other 2 screws marked (C),
- the 2 screws marked (F) (using a TORX T20 key),
- the bonnet latch control marked (G),
- the trim from under the steering column.

Remove:

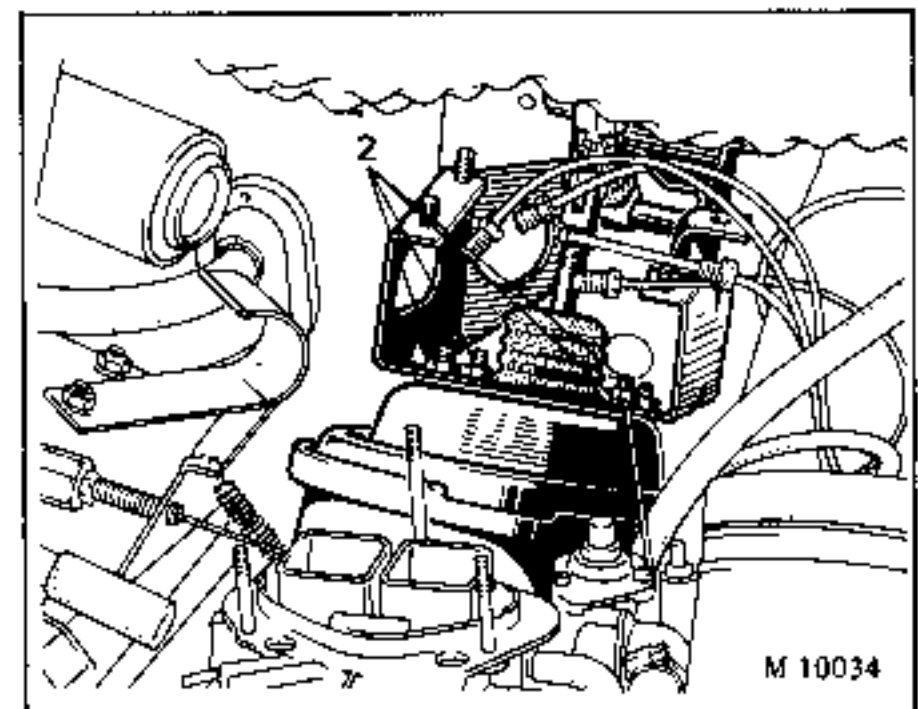
- the brake and clutch pedal shaft item (1),
- the clutch cable and the shaft from the brake thrust rod item (2).



Remove the nuts and bolts (E) which secure the support in place.

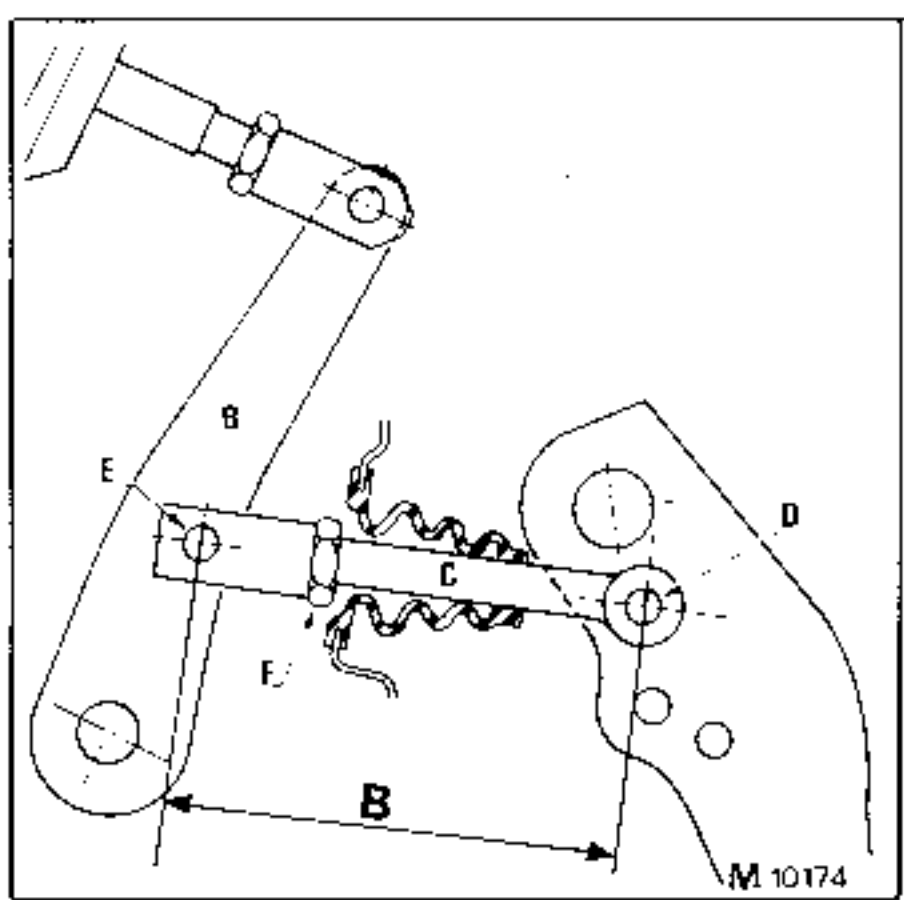
- In the Engine Compartment

Remove the 4 nuts, item (2), to take out the brake servo.



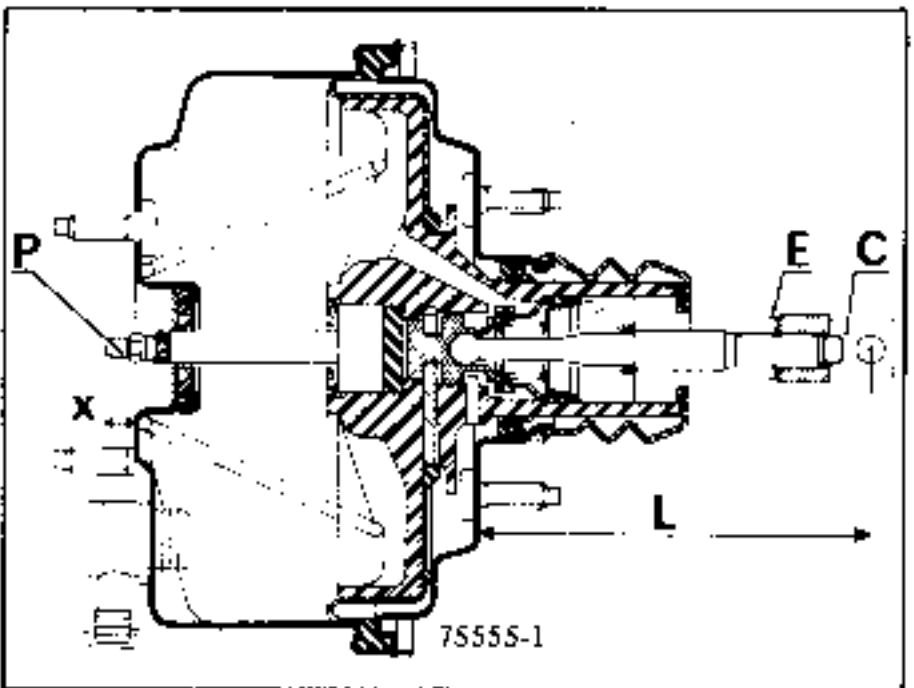
EARLY TYPE

- Adjusting
- Remove the thrust rod.
- Adjust B to $101 \pm 0.5\text{mm}$.



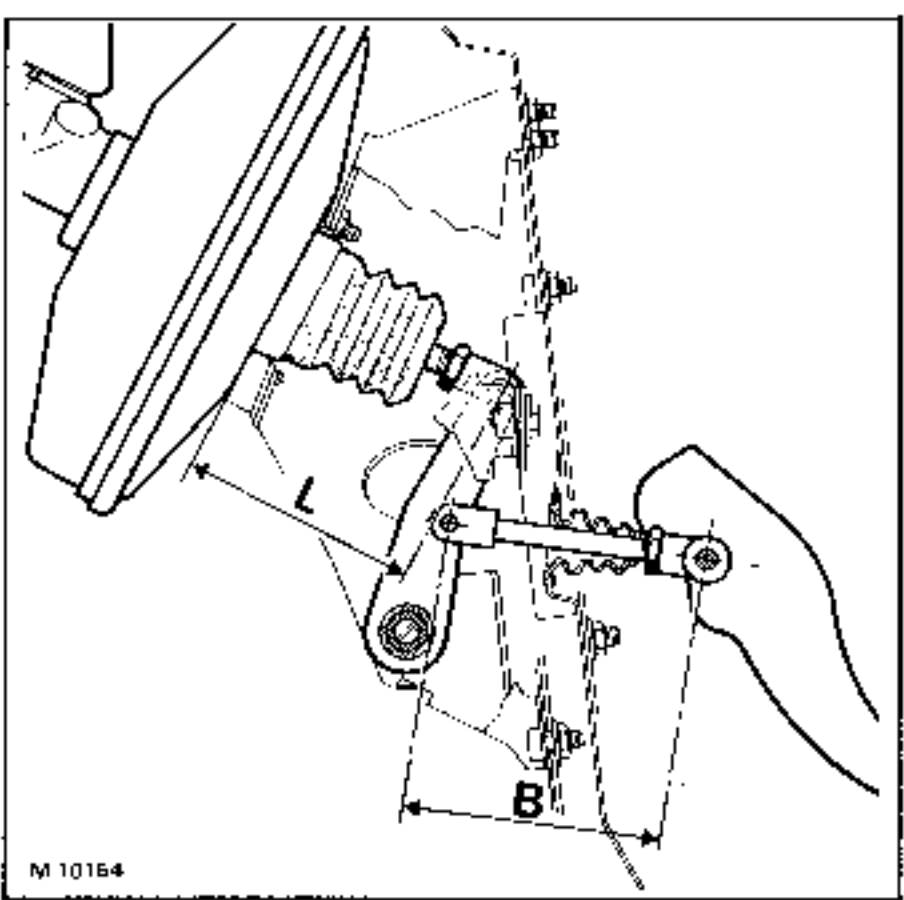
Adjusting the brake servo:

- X = 9 mm which can be adjusted at rod (P)
- L = 110 mm which can be adjusted at rod (C).



LATER TYPE

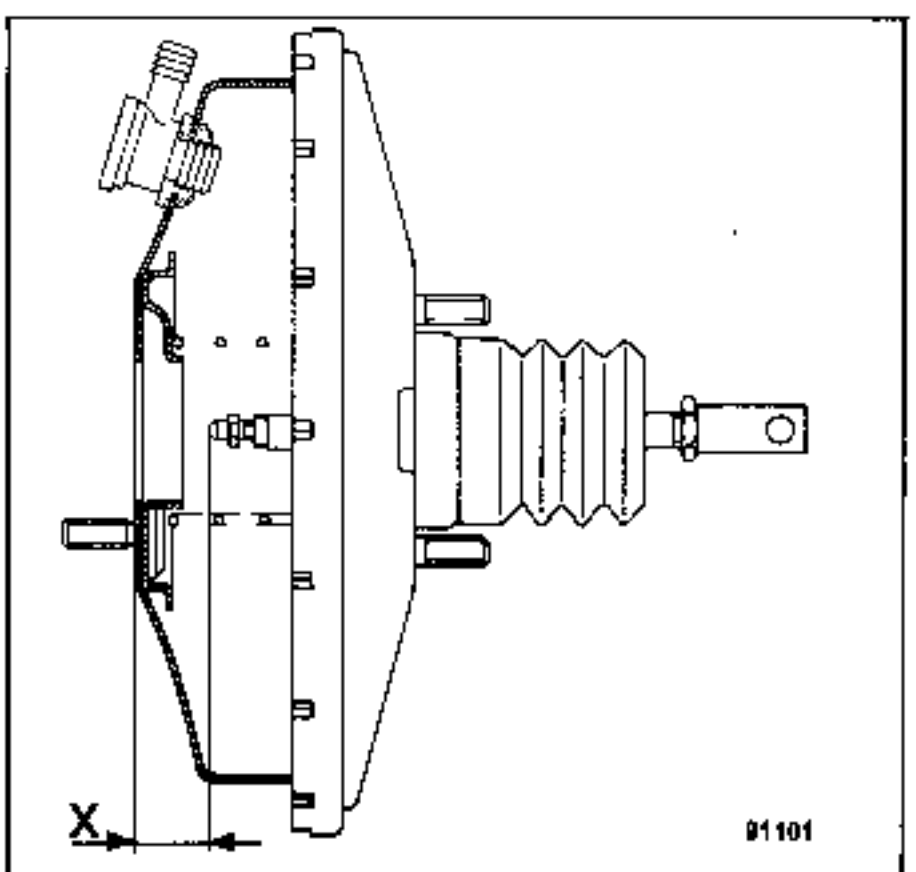
- Adjusting
- Remove the thrust rod.
- Adjust B to $112.5 \pm 0.5\text{mm}$.



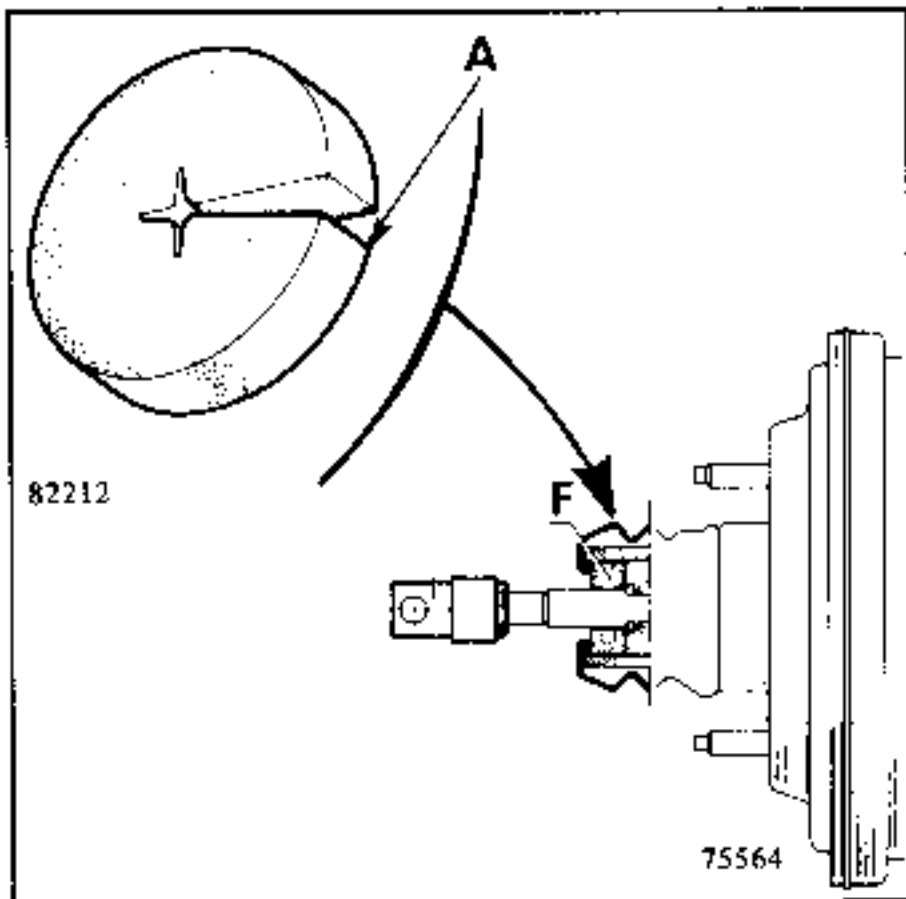
Adjusting the brake servo:

- X = 22,3 mm which cannot be adjusted
- L = 105 mm

The component parts from these two type arrangements are not interchangeable. Those on the later type are identified by a dab of white paint.



REPLACING THE AIR FILTER



To replace the air filter (F), one must remove the brake servo (see section on removing and refitting the brake servo on page 37-2).

The filter is extracted with a metal hook. Cut the new filter at (A) (see illustration) and place it round the rod. Then push it into its location, extending it over the entire bore, to avoid there being any points through which unfiltered air can pass.

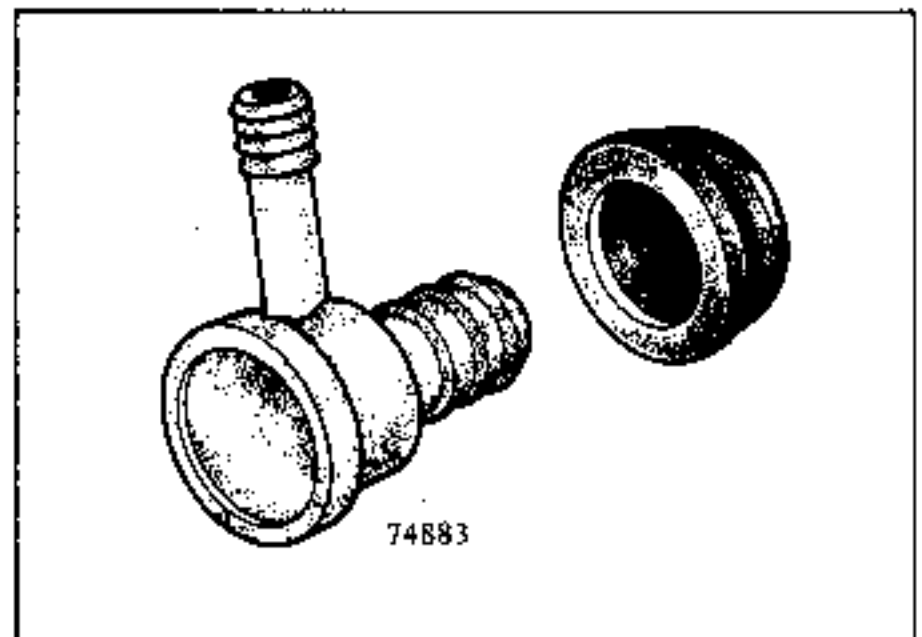
REPLACING THE NON-RETURN VALVE

This operation can be carried out on the vehicle.

REMOVING

Disconnect the vacuum input pipe from the brake servo.

Pull and twist the non-return valve to free it from the rubber seal.



REFITTING

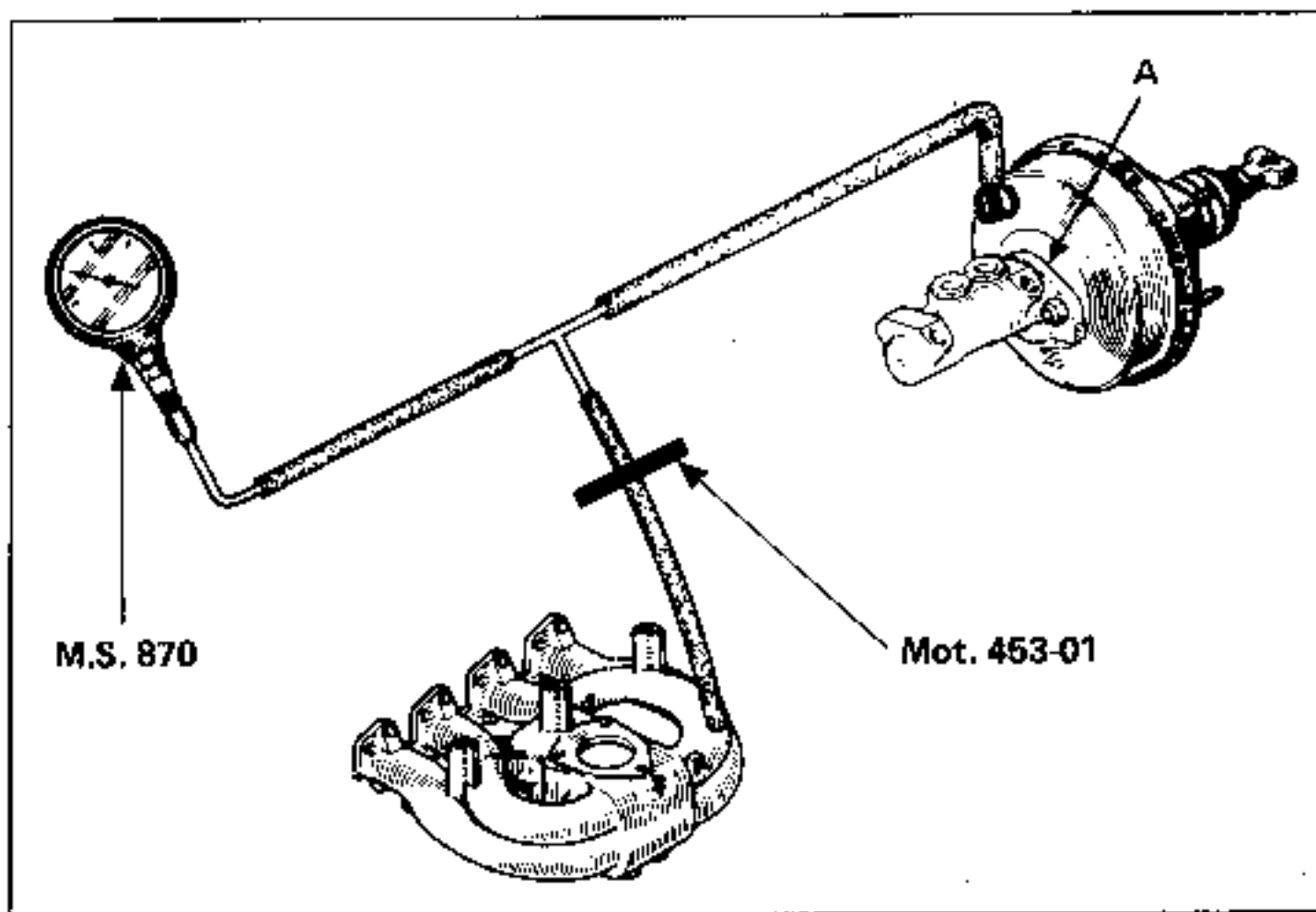
Check the condition of the seal and the non-return valve.

Replace any defective parts.

Refit the assembly.

ESSENTIAL SPECIAL TOOLS	
Mot. 453-01	Hose clamp
M.S. 870	Vacuum gauge

When checking the later type brake servo for leaks, ensure that the seal between it and the master cylinder is effective. If there is a leak at this point, replace the sealing ring (A).



The brake servo is to be checked for leaks on the vehicle with the hydraulic system in operating condition. connect the vacuum gauge MS.870 between the brake servo and the vacuum source (the inlet manifold) with a "T" union and as short a piece of pipe as possible. Run the engine at idling speed for one minute.

Pinch flat the hose (with clamp Mot. 453-01) between the "T" union and the vacuum source.

Stop the engine.


If the vacuum falls by more than 33 mbar (25 mm/Hg) in 15 seconds, there is a leak which could be either:

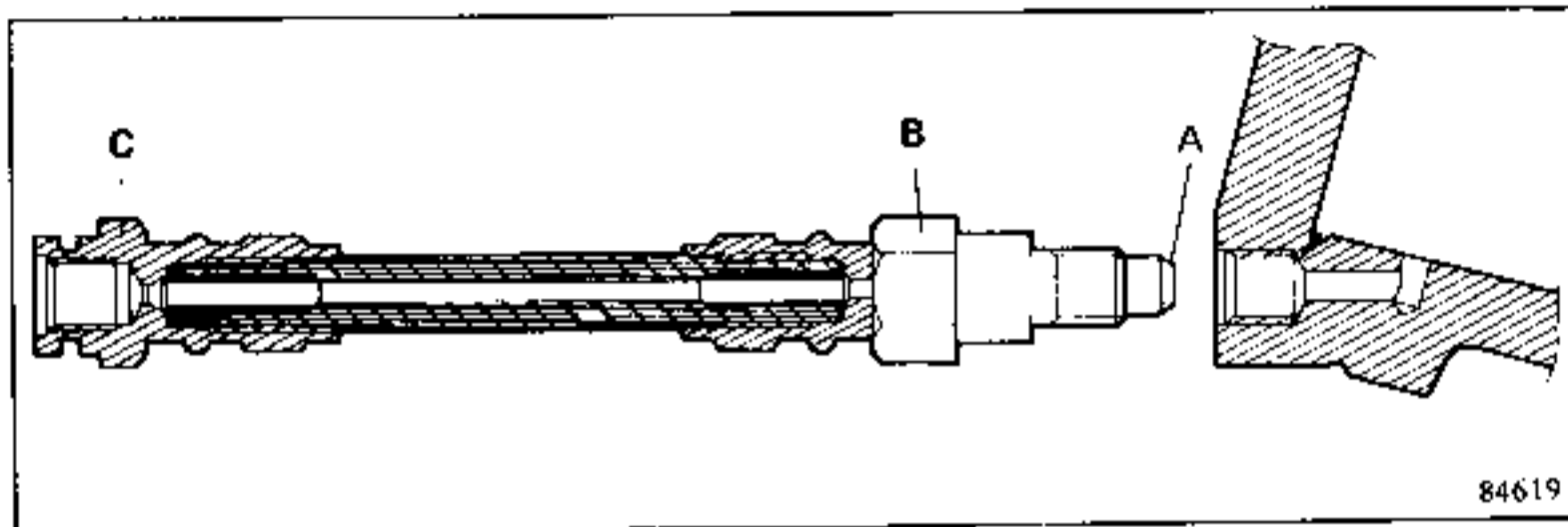
- at the non-return valve (replace it by a new one),
- at the thrust rod diaphragm (in this case replace the brake servo unit).

If the brake servo ceases to operate, the braking system will still work, but the pressure required at the pedal is much higher to obtain a given braking effect than it would be with the servo assistance operating.

These vehicles are fitted with brake hoses which have no copper seals.

The seal is provided by contact, at the bottom of the taper, around the shoulder (A) on the hose.

TIGHTENING TORQUES (in daN.m)	
B - 1,3	
C = 1,3	



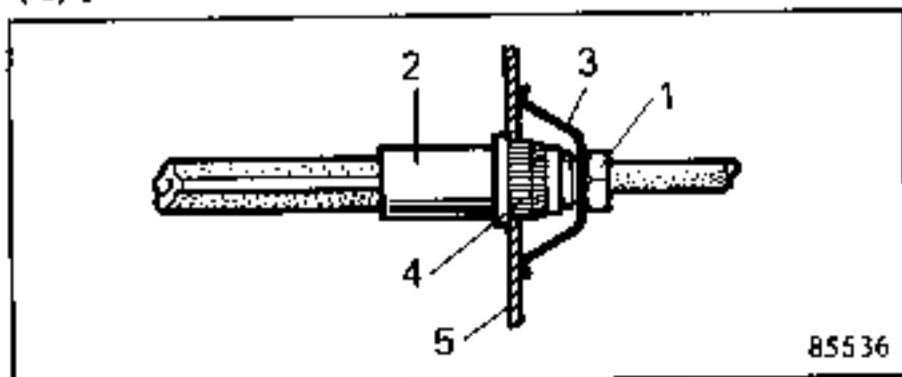
Replacing a Brake Hose

PRECAUTIONS TO BE TAKEN WHEN REMOVING AND REFITTING
A WHEEL CYLINDER OR A BRAKE HOSE

For reasons of safety, to avoid the brake hose being twisted and thus making contact with one of the suspension components, operations must be carried out in the following order:

REMOVING

Unscrew the union (1) which secures the rigid pipe to the hose (2) to the point at which the spring (3) is released, thus releasing the hose from the splines (4).



- Unscrew the hose from the caliper.
- If necessary, unscrew the caliper.

REFITTING

- Place the caliper on the brake assembly and screw the hose into it.
- Tighten it to a torque of 1.3 daN.m.

With the wheels hanging free in the straight ahead position, place the female end of the hose in the retaining lug (5). (The hose is not to be twisted) and fit the following:

- the spring (3),
- the rigid pipe to the hose, ensuring that the hose does not turn as the arrangement is screwed in place.

Bleed the braking system.

These vehicles are fitted with a brake compensator which is controlled by the load carried by the vehicle. The front braking system and rear braking system pressures are checked on opposite sides of the vehicle.

These twin compensators have two entirely separate bodies which act across the vehicle on one of the front wheels and the opposite rear wheel.

It is essential to check both circuits.

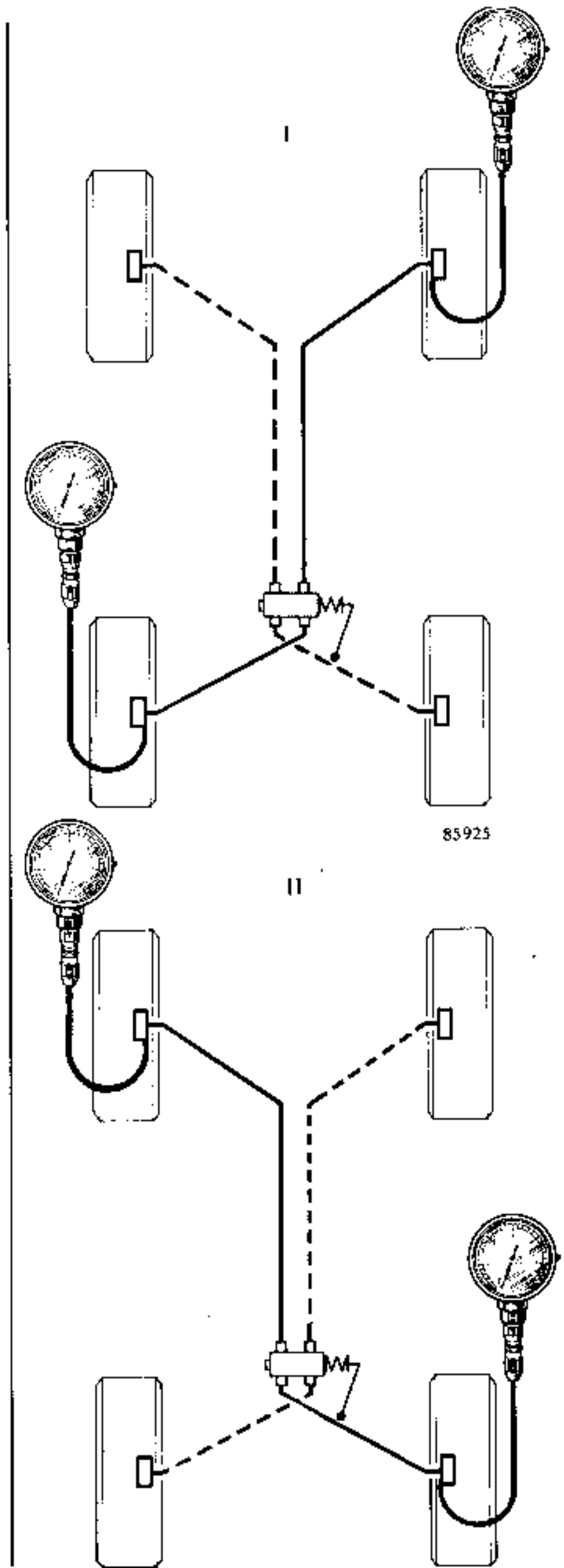
I : front RH/rear LH

II : front LH/rear RH

Load Control Compensator

On a load control compensator, the adjustment permits one to set the rear pressure as a function of the front pressure.

The adjustment acts simultaneously on both bodies, so if the pressure is incorrect on only one of the two bodies, replace the entire compensator.



The compensator cannot be repaired.

REMOVING

Disconnect the pipes.

Unscrew nut A.

Unscrew the two screws on the support.

Separate the compensator from its support.

REFITTING

Carry out the removing operations in reverse order.

The pipes for the front circuit are connected to the lower part of the compensator.

Bleed the braking circuit.

Adjust the compensator (see following section).

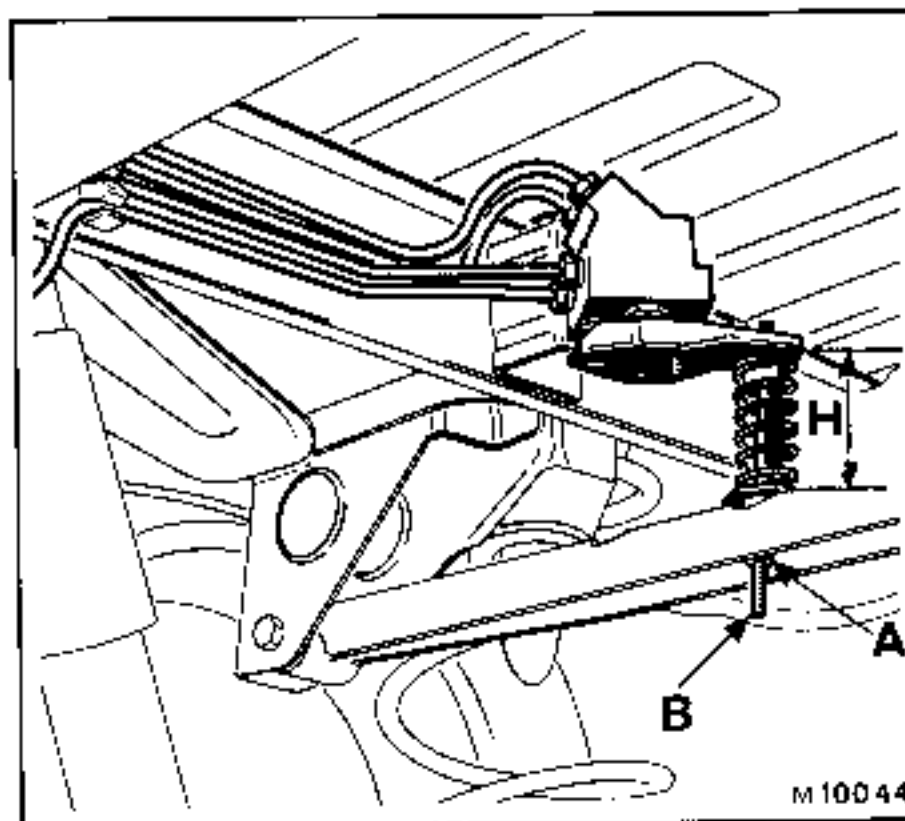
ADJUSTING

Pre-adjusting the Height of the Spring

With the vehicle at kerb weight, and the seats in position (2 front seats + 3 rear seats), with a full fuel tank (or a weight to compensate for any absence of fuel in the tank) and a person sitting in the driving seat, the height of the compensator spring should be:

$$H = 60 \begin{array}{l} + 0 \\ - 1 \end{array} \text{ mm}$$

To obtain this dimension, loosen locknut A and turn the adjusting rod B.



Note: Company Vehicle Version (S112-S115).

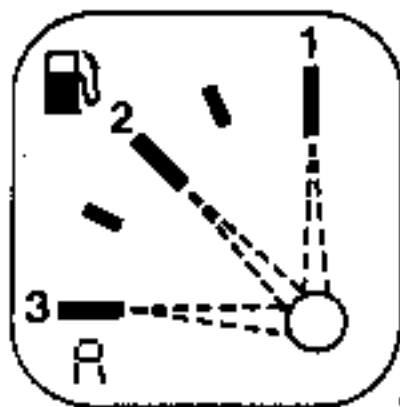
Compensate for the absence of the 3 rear seats by placing 39 kg in the vehicle.

Adjust the pressure in the rear braking system to suit the pressure in the front braking system by turning the adjusting screw (B) after first loosening nut (A).

The rear pressures must be the same to within 3 bars.

With the vehicle at kerb weight and the seats in position (2 front seats + 3 rear seats), the tank full (or with an equivalent weight placed in the vehicle to compensate for the amount of fuel missing, as shown in the chart below), and a person sitting in the driving seat, the height of the brake compensator spring should be:

$$H = 60 \begin{matrix} + 0 \\ - 1 \end{matrix} \text{ mm}$$



91273-2

Position of Gauge Needle	Weight to be placed in the boot to compensate for fuel missing (in Kg)		Test Pressure (in bars)	
	Petrol	Diesel	FRONT	REAR
- 1 full	0	0	40 →	33 + 2 - 3
- 2 1/2 full	22	24,5		
- 3 empty	44	49	80 →	45 + 2 - 3



If the handbrake is incorrectly adjusted and the cable too tight:

- it prevents the automatic brake shoe wear take-up system operating correctly,
- it makes the brake pedal travel too long.

Under no circumstances must the cables be retensioned to attempt to remedy this defect, as the problem will soon arise again.

The handbrake control adjustment is not a way of adjusting for play. It is only to be adjusted when replacing:

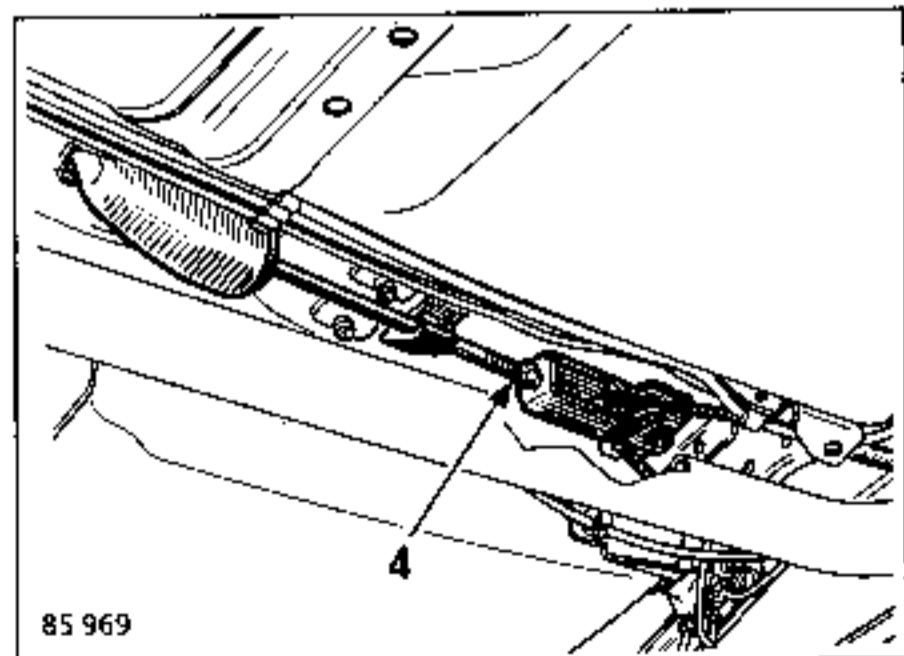
- the brake shoes,
- the cables,
- the control lever.

Any adjustment other than following these operations is therefore forbidden.

I. ADJUSTING DRUM BRAKES

The vehicle is to be lifted on a lift locating under the body:

Loosen the locknut (4) and fully unscrew the central swivel assembly.

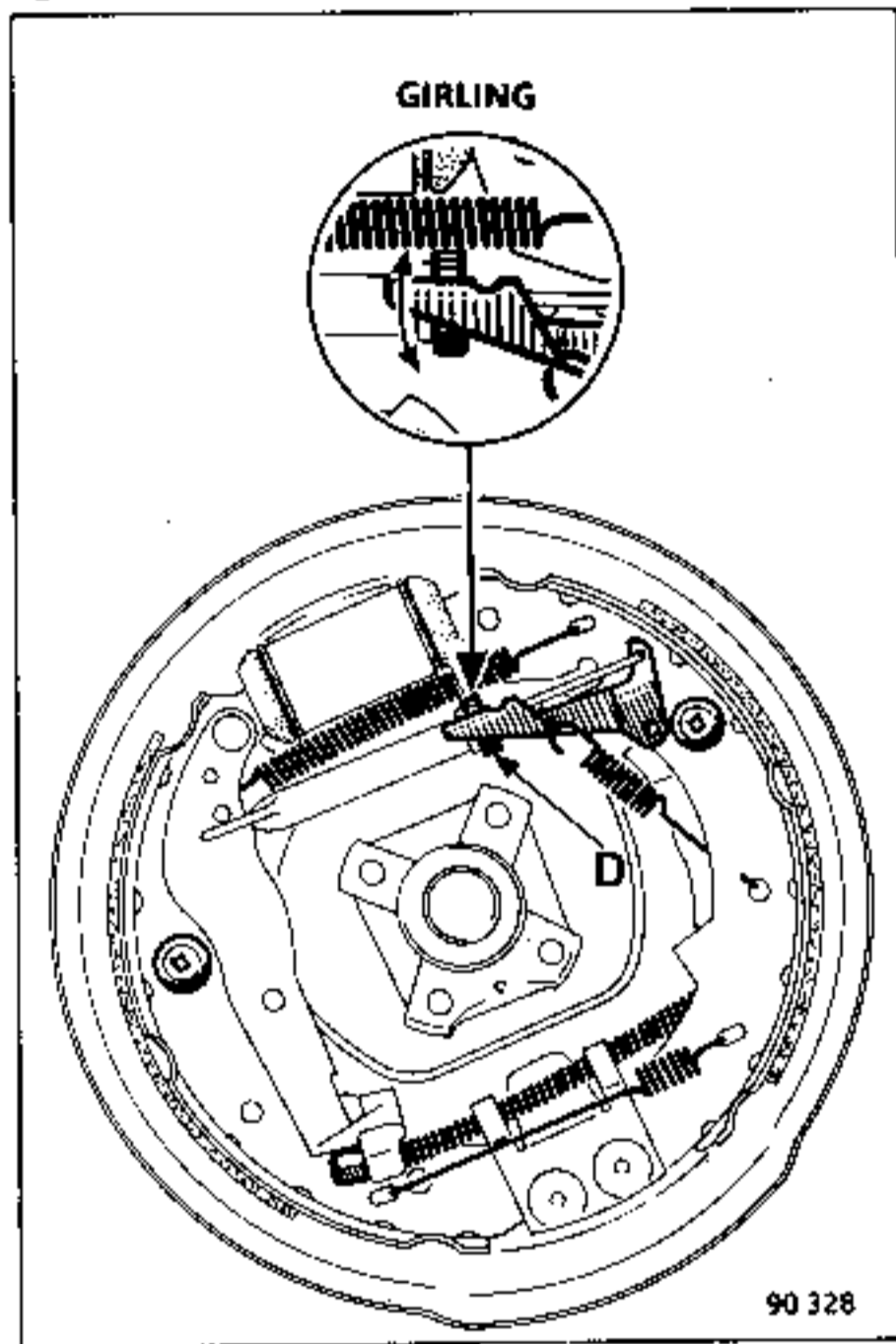


85 969

Remove:

- both rear wheels,
- both drums.

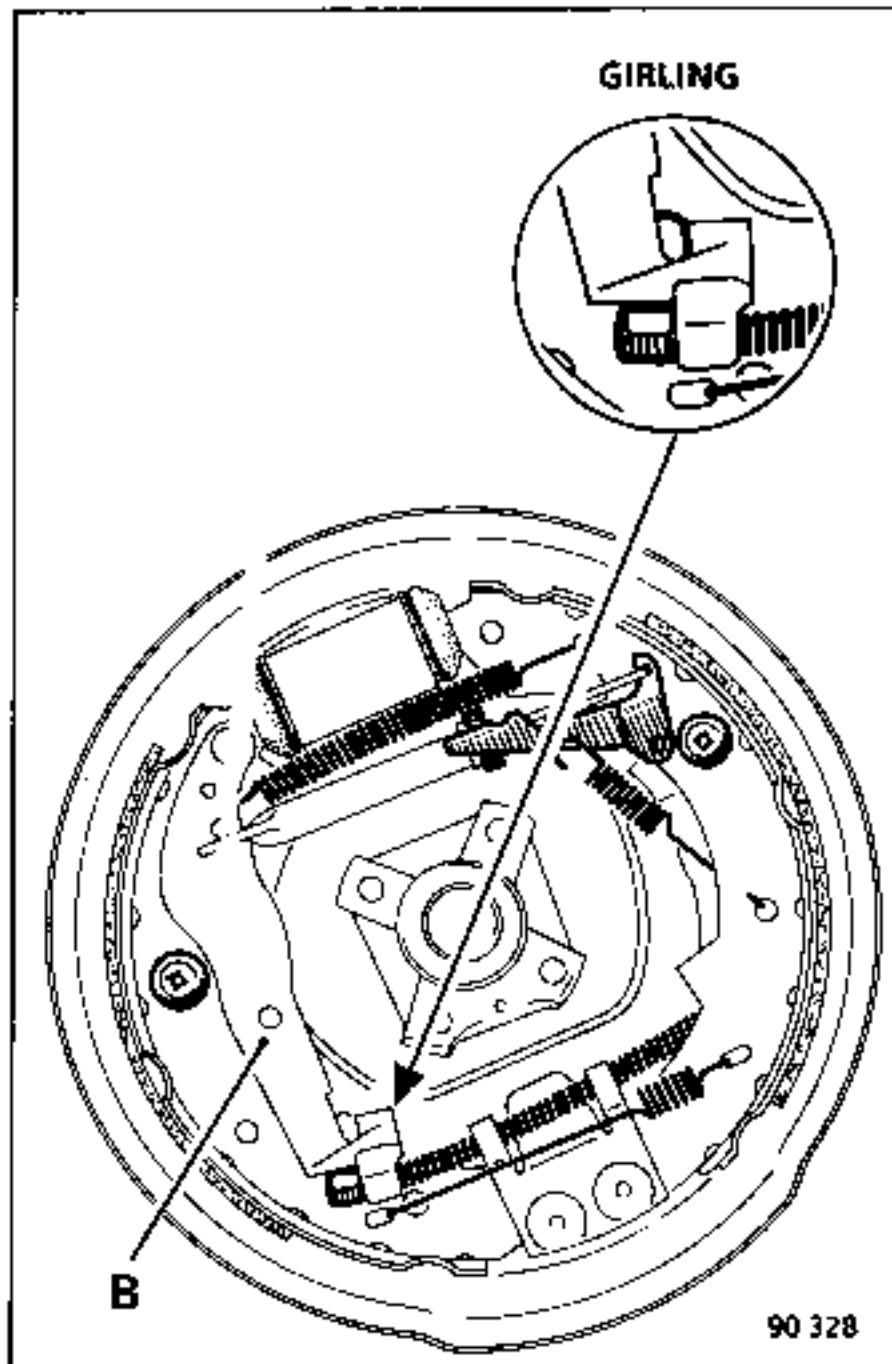
Check the operation of the automatic wear take-up system by turning the serrated quadrant D (ensure that it will turn in both directions), then loosen it by 5 to 6 teeth.



90 328

Ensure:

- that the cables slide freely,
- that the handbrake levers (B) make correct contact with the shoes.



Gradually tension the cables at the centre adjusting point until the levers B lift at between the 1st and 2nd notch on the handbrake lever travel and remain lifted at the 2nd notch.

Tighten the locknut (4).

Refit the drums.

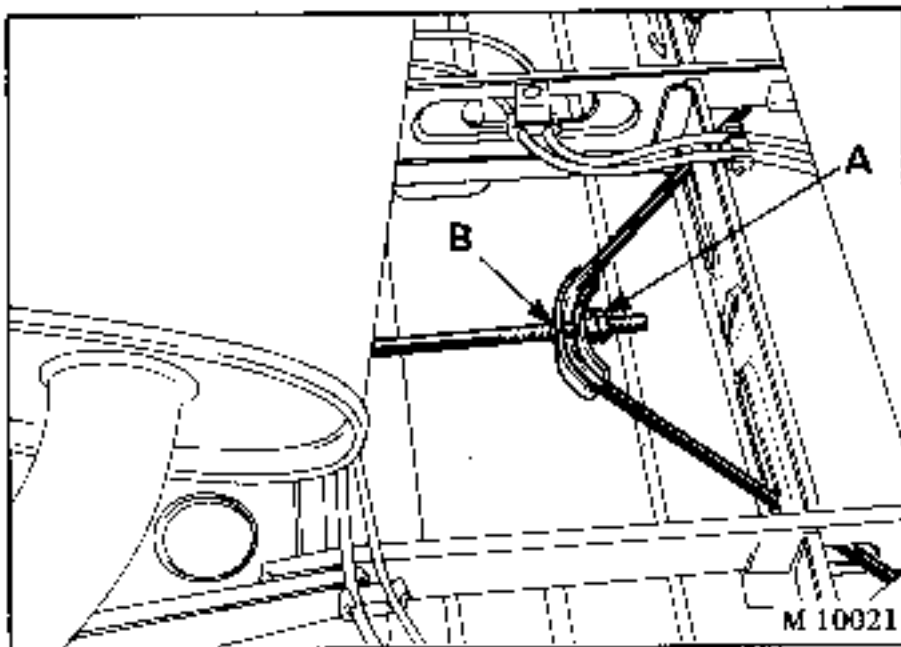
With the vehicle resting on its wheels:

Adjust the positions of the shoes by firmly and gradually depressing the brake pedal a number of times whilst listening for the automatic wear take-up system to operate.

REMOVING

From under the vehicle:

Loosen and remove the nut and the locknut (A).



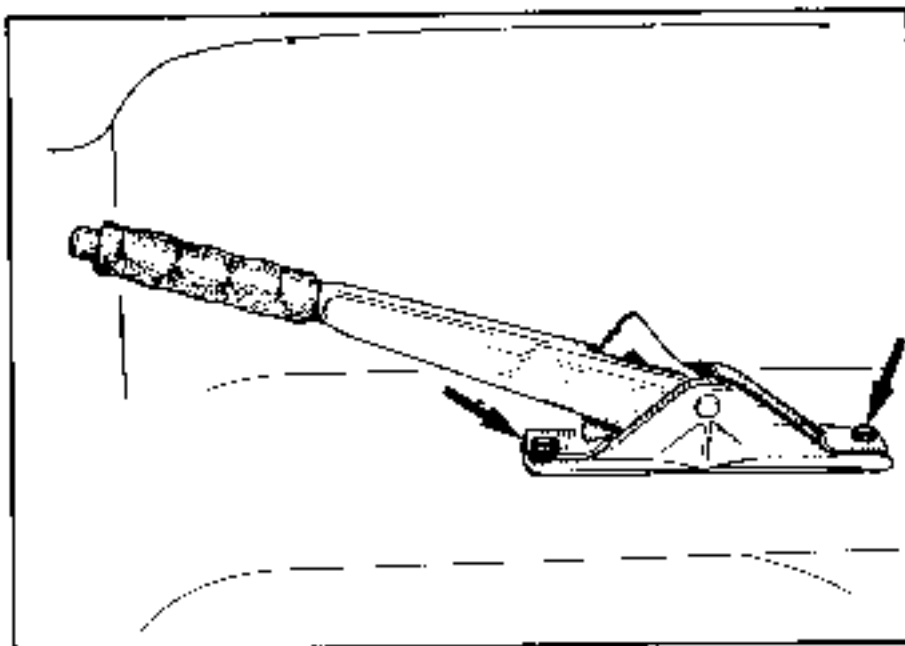
Free the support B.

Inside the vehicle:

Remove:

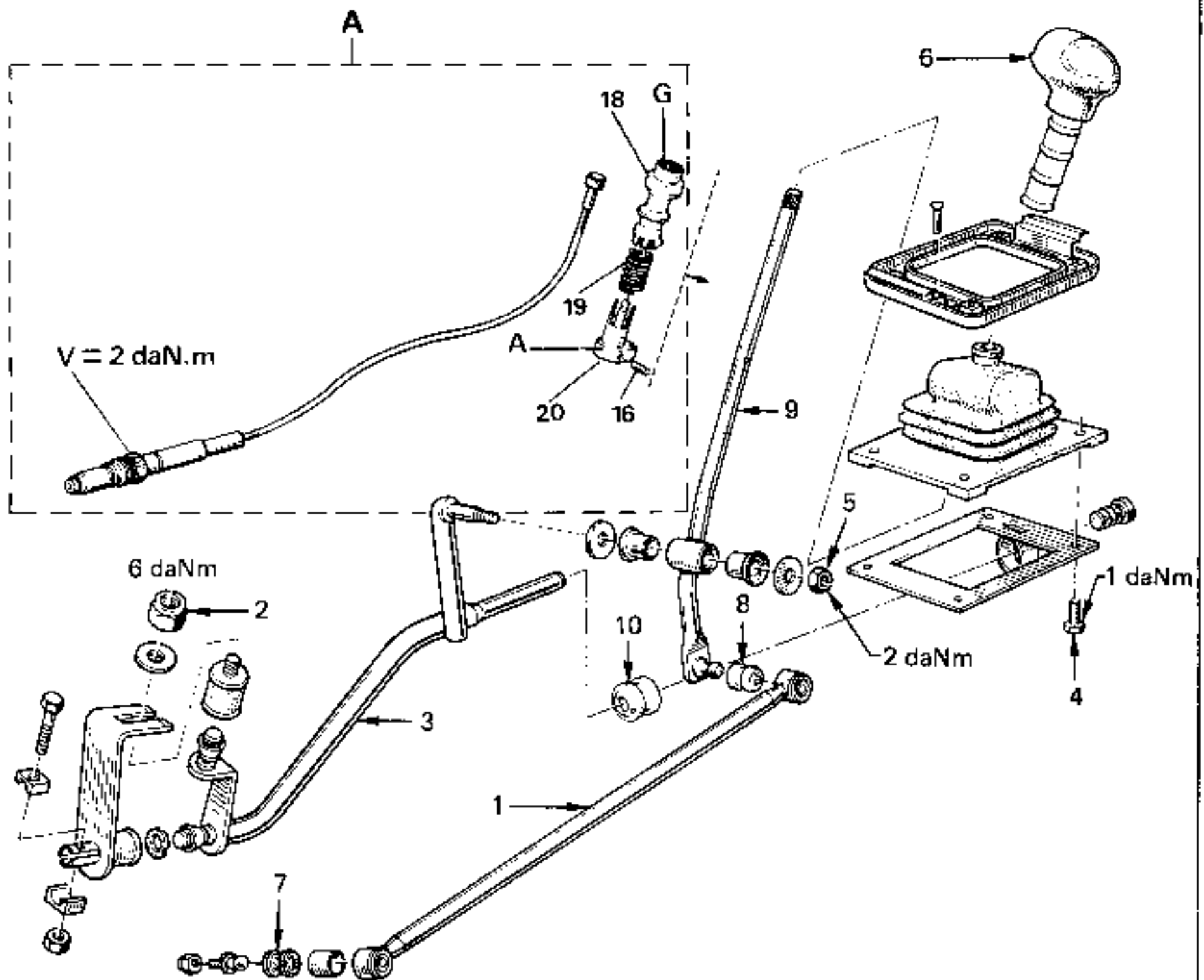
- the 2 screws which secure the assembly to the floor,

Take out the lever-primary rod assembly.



SPECIAL OPERATION WHEN REFITTING

Adjust the lever travel (see the section on adjusting the handbrake control).



M 10050

Arrangement A from 1987 models

REMOVING

- Raise the vehicle on a lift.
- Remove the link 1.
- Unscrew 2 and pull back 3.
- Unscrew V from the 1987 models.
- Unscrew 4 (4 screws).
- Remove the assembly from underneath.
- Pull the boot upwards.
- Unscrew 5.
- Remove 3.
- Remove 6.
- Replace, if necessary, 7, 8 and 10.

REFITTING (special features)

Stick 6 to the lever 9.

Place a little grease inside 7, 8 and 10.

Tighten the nuts to the specified torque.

This type of gear shift control
requires no adjustment.

OPERATION OF PLAY TAKE-UP SYSTEM

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

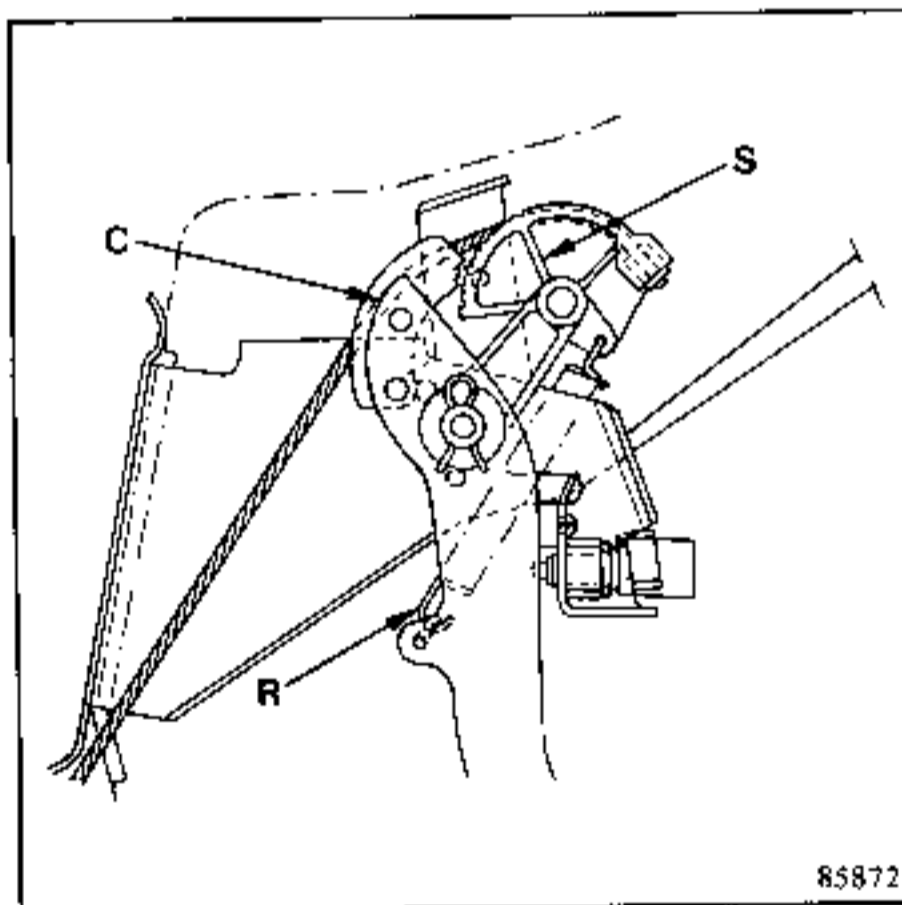
The cable is always under tension, and this therefore pulls the fork and keeps the release bearing in permanent contact with the diaphragm.

The release bearing spring has no effect.

The system is self-adjusting.

CLUTCH RELEASE FUNCTION

When the pedal is depressed, the serrated cam (C) on the pedal engages with the serrations on the play take-up quadrant (S) to stop it pivoting and allow it to apply tension to the cable.



ESSENTIAL SPECIAL TOOLS	
Split bush:)	made locally
Lever:)	

REMOVING

Inside the engine compartment:

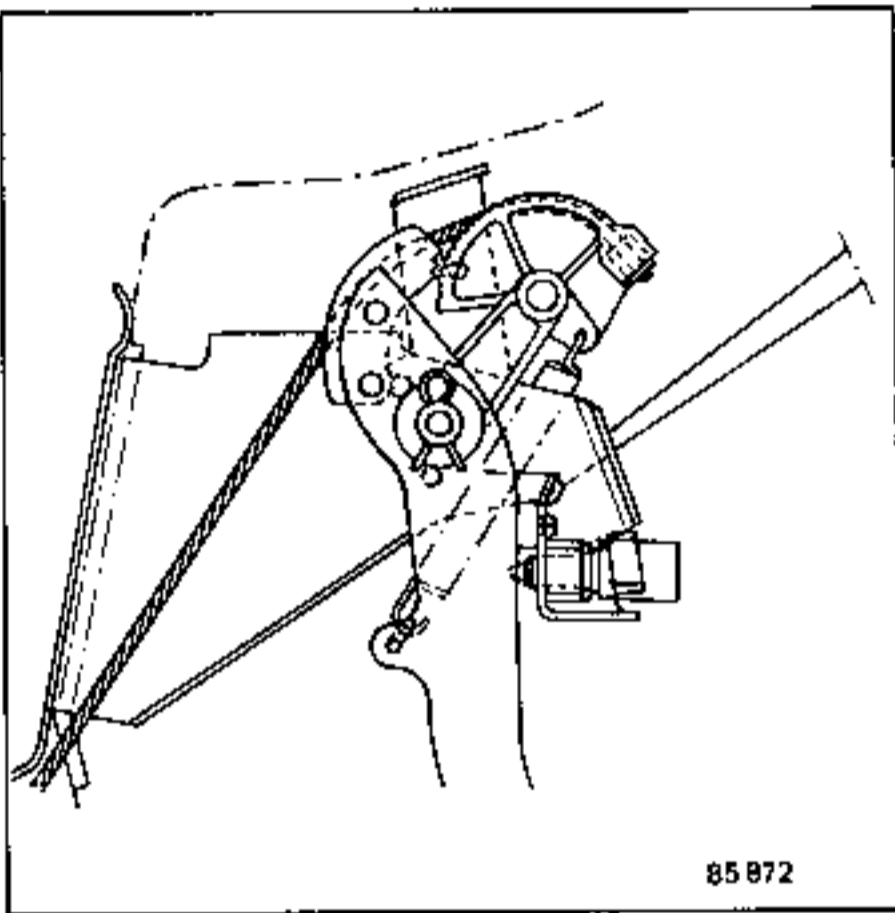
- Unhook the cable from the fork.

Inside the vehicle:

Remove the trim from under the steering column.

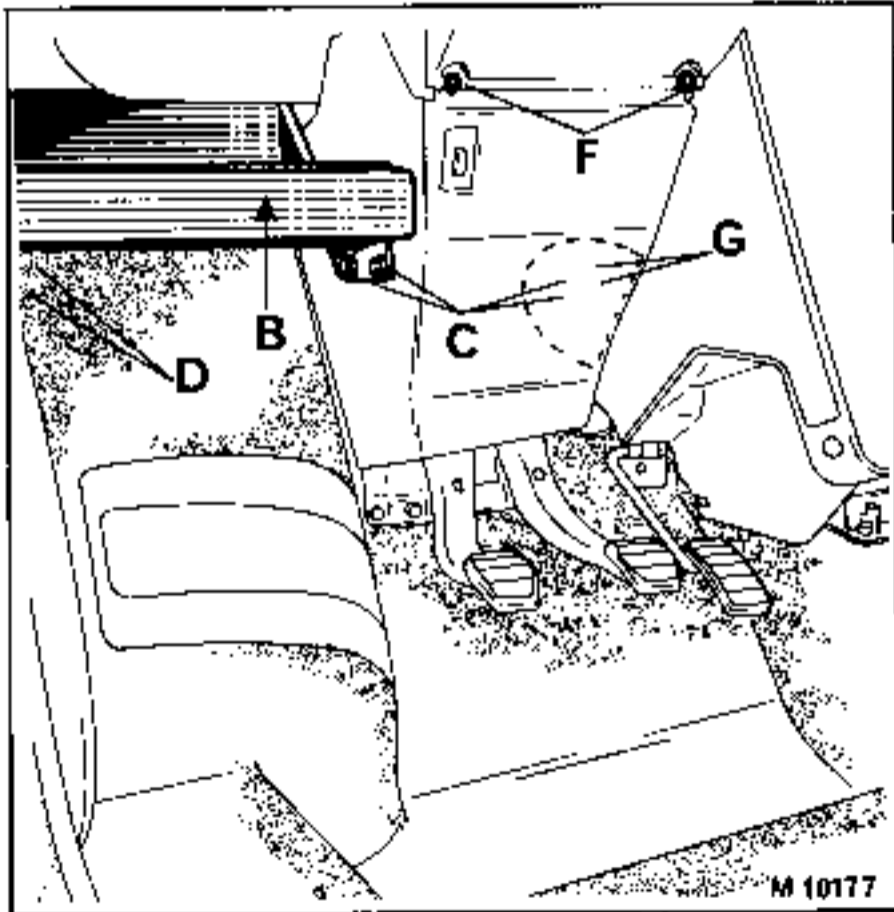
Remove:

- the parcel shelf (B) by taking out the 4 screws, 2 marked (C) and 2 marked (D).
- the other 2 screws marked (C).
- the 2 screws (F) (TORX T20 key).
- the bonnet latch control marked (G).
- the trim from under the steering column.



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Remove the cable cover retainer on the floor by pushing it with a screwdriver, then remove the complete cable through the engine compartment.



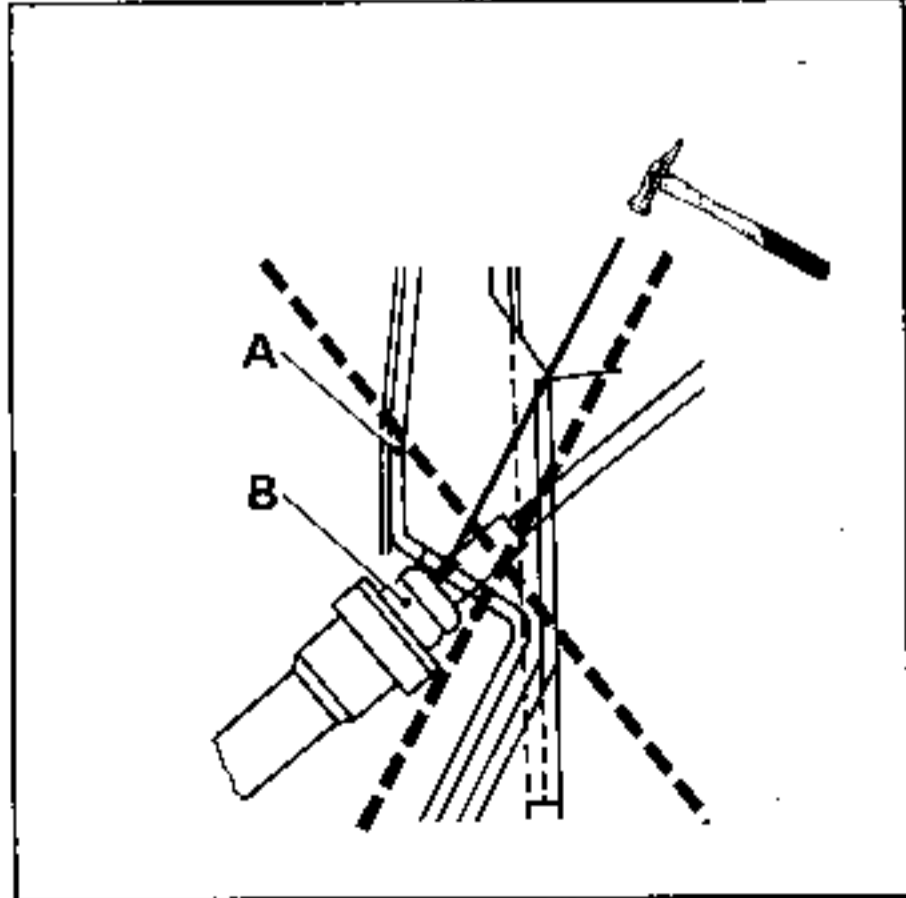
M 10177

Press the clutch pedal.

Hold the cable against the cam (e).

Release the pedal. The cable stop will come out of its location.

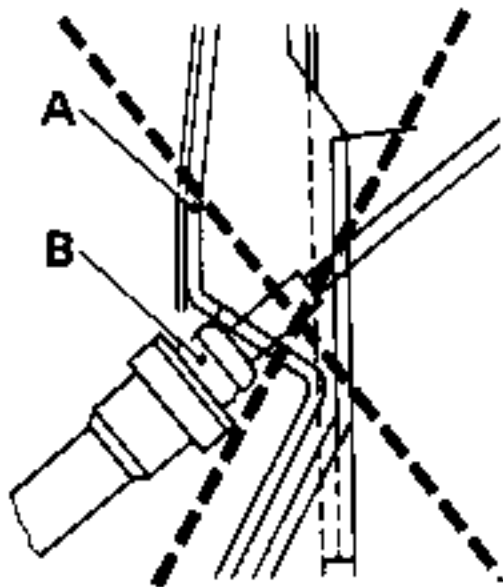
Free the cable from the pedal assembly.



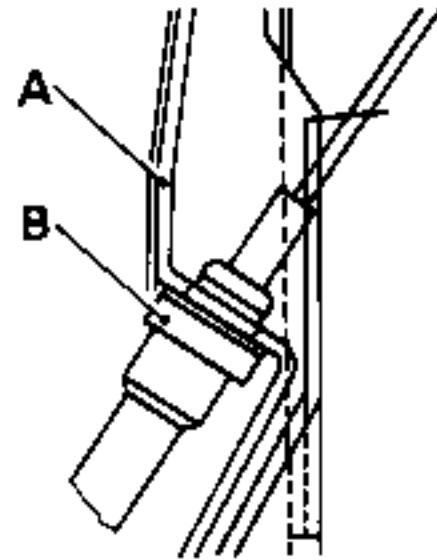
REFITTING

Special features:

If the clutch cable cover end fitting (B) is incorrectly positioned in the pedal assembly support bracket (A), it can cause the cable to break at the pedal end.



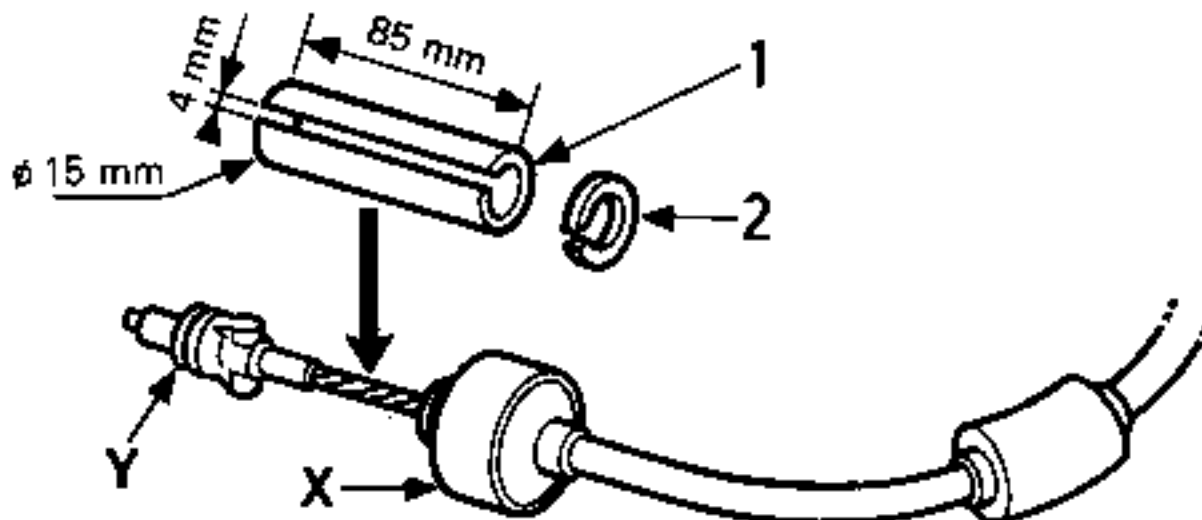
Incorrect position



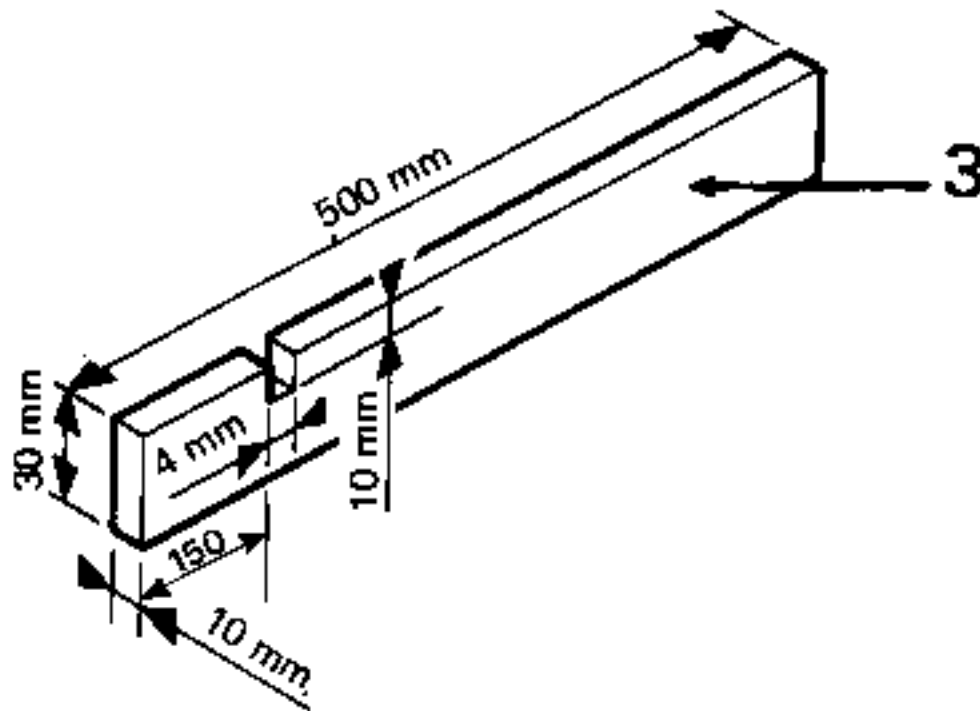
Correct position

To ensure that the assembly is correctly fitted, two tools, 1 and 3, must be used.

- A spacer tube (1) which is to be placed on the cable at the clutch fork end, between the pad (X) and the trunnion (Y).
- Insert a split washer (2) between the pad and the spacer tube to avoid damaging the pad.

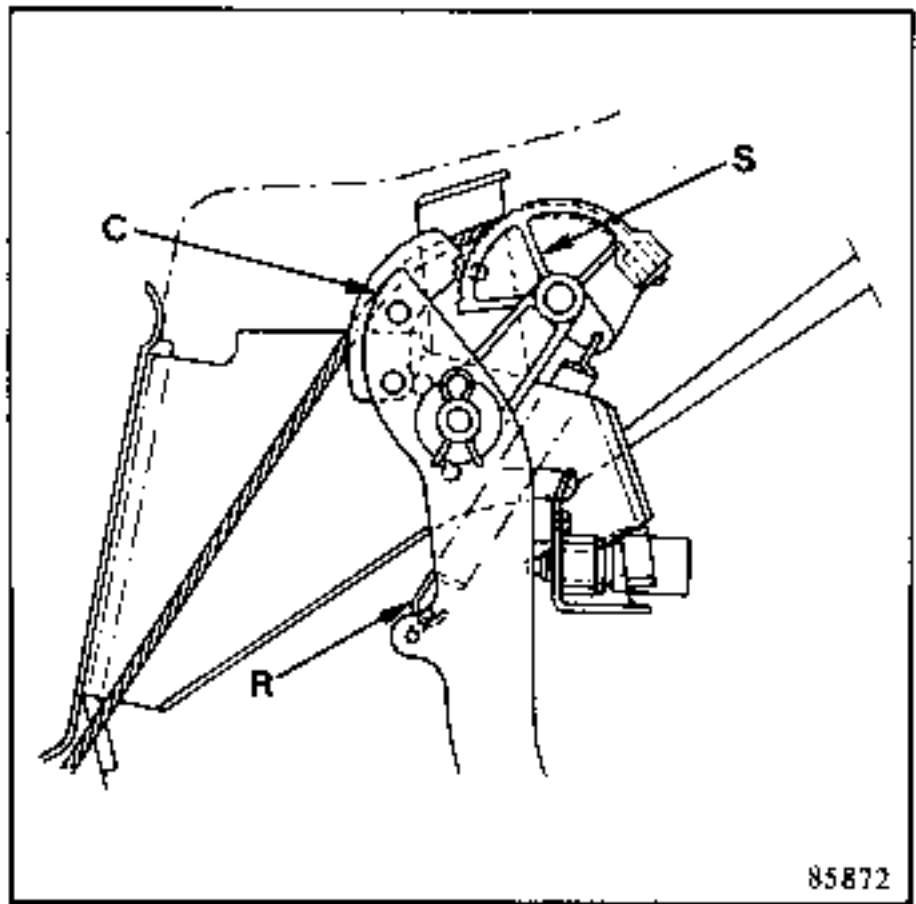
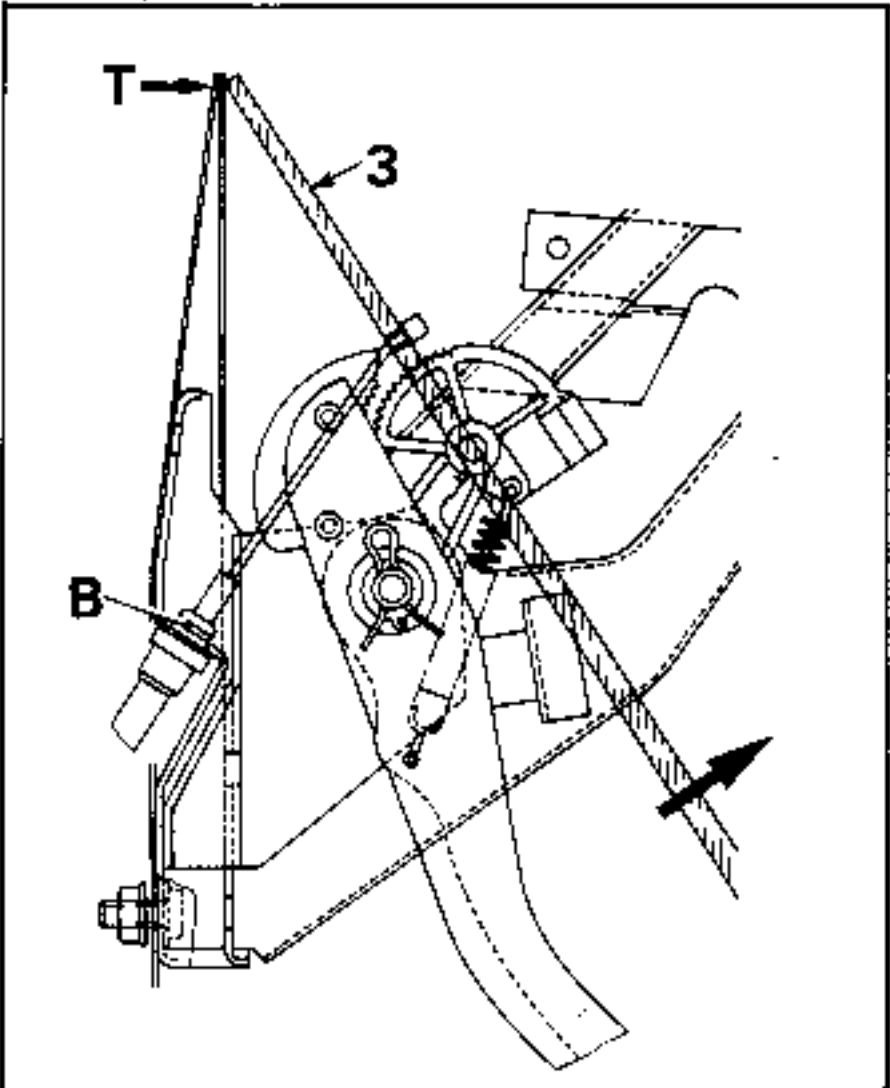


- A lever (3), which enables one to clip the cable cover end stop into the pedal assembly support by pulling on the clutch cable itself.



METHOD OF FITTING

- Pass the cable from the engine compartment through into the interior of the vehicle.
- Place the spacer (1) on the cable without forgetting washer (2).
- Engage the end of the cable in the slot in the tool (3).
- Centralize the cable cover end fitting (B) in the hole in the pedal assembly support (A).
- Bring tool (3) against the scuttle at (T).
- Pull the tool downwards. The cable cover end fitting will clip into the scuttle.
- Check (by using a lamp and a mirror) that the cable cover end fitting (B) is correctly in position.
- Remove the spacer (1) and the lever (3).
- Check that the clutch cable is correctly fitted at the fork end and at the pedal end (5).



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For the other refitting operations:
Carry out the removing operations in reverse.