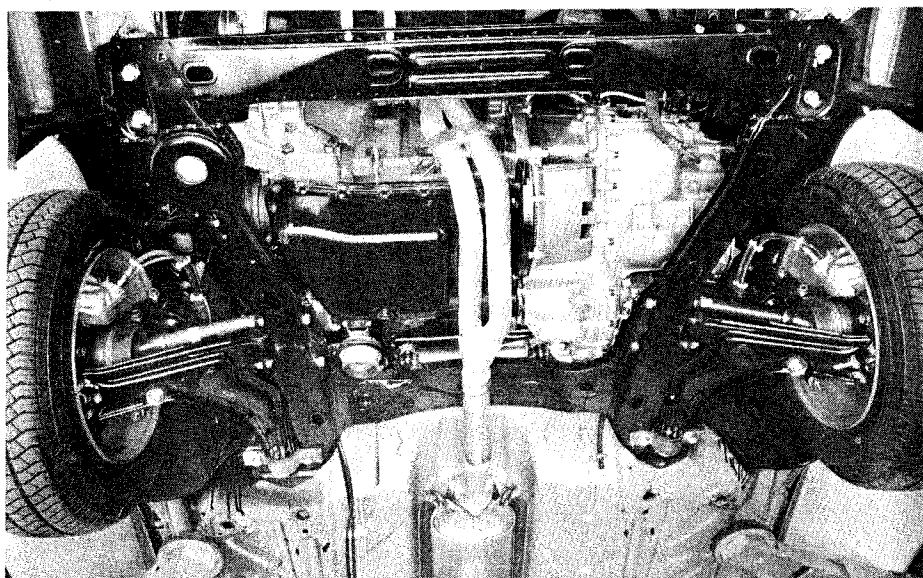
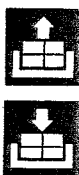
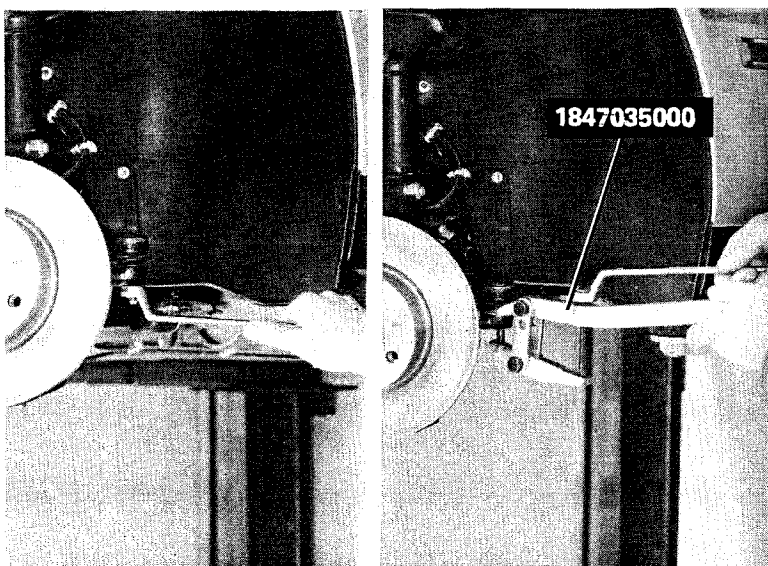
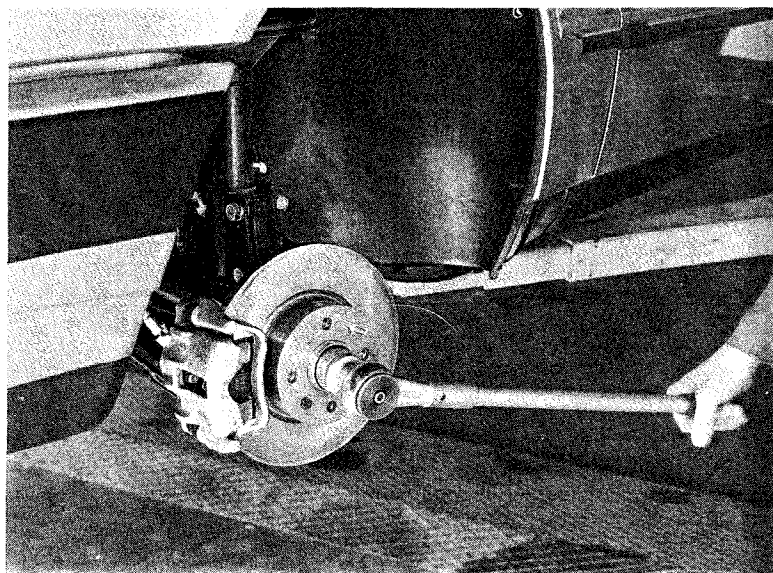


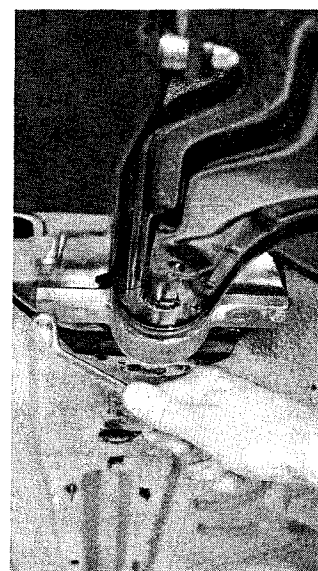
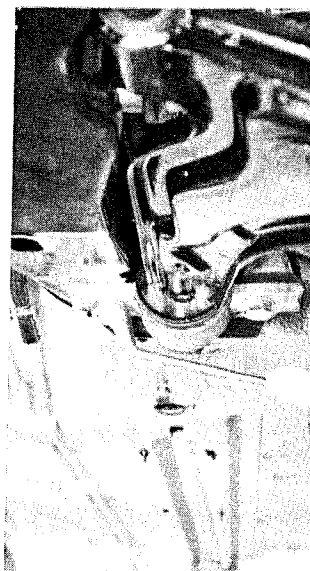
	page
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- Front hub	6
- Coil spring and shock absorber assembly	8
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**Front suspension unit****REMOVING-REFITTING**

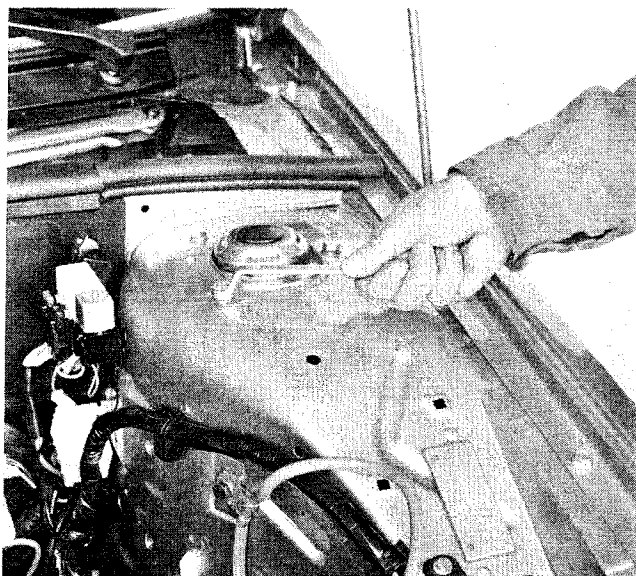
To remove and refit the front suspension, after having positioned the vehicle on a lift and having removed the front wheels, proceed as illustrated below.

**Removing nuts securing constant velocity joints****Removing track rod end ball joint**





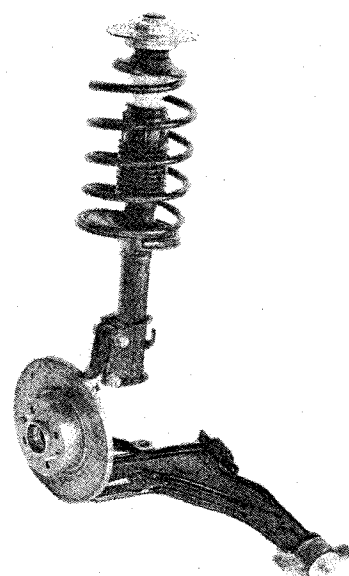
Removing track control arm from suspension/power unit sub-frame (rear part)



Removing shock absorber assembly from turret with removal of suspension unit



*The mounting block securing the shock absorber assembly to the body shell differs depending on whether the car is fitted with variable pitch mechanical steering or power assisted steering. Therefore, if replacing it, be careful to fit the correct type since if this is not done it would bring about a variation in the clearance angle.*



Front left suspension unit



### 44.

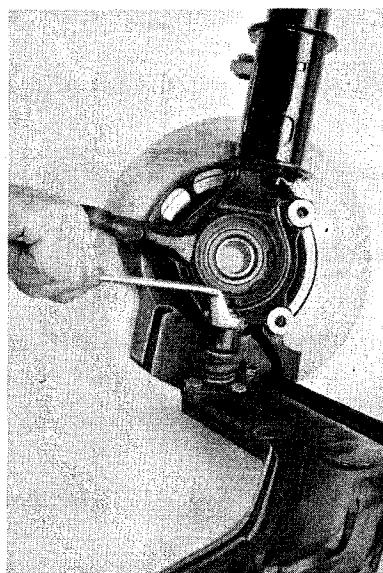
DESCRIPTION	Thread size	Tightening torques
		daNm

#### FRONT SUSPENSION

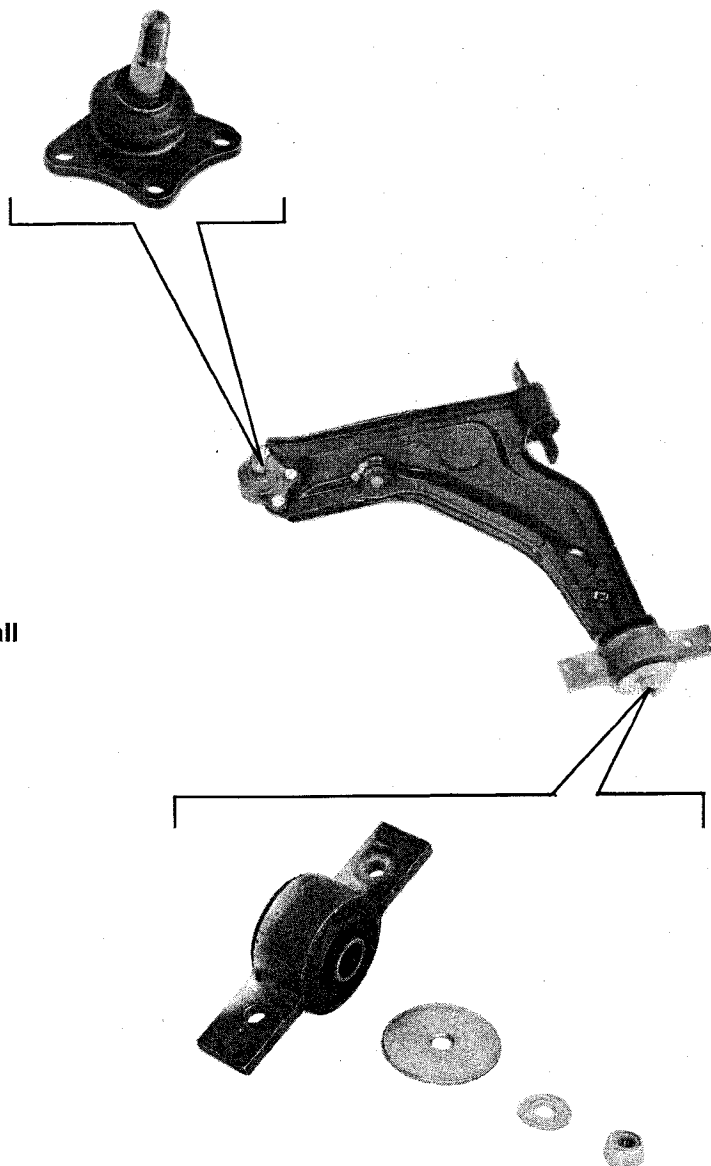
Nut for securing front wheel hubs to stub axle	M 24 x 1,5	36
Studs for securing front wheels to hub	M 12 x 1,25	8,8
Self-locking nut for securing rear flexible bush to track control arm	M 10 x 1,25	5,8
Bolt for securing rear flexible bush to sub-frame	M 6 x 1	0,6
Bolt securing rear flexible bush and sub-frame to body shell	M 10 x 1,25	4,5
Bolt securing track control arm to sub-frame, front flexible bush side	M 10 x 1,25	3
Bolt securing ball joint to track control arm	M 8 x 1,25	3
Self-locking nut for securing ball joint to stub axle	M 12 x 1,25	7,8
Bolt securing shock absorber/damper to MacPherson strut (stub axle)	M 12 x 1,25	10
Self-locking nut for securing shock absorber/damper to flexible mounting block	M 14 x 1,5	9
Bolt for securing flexible mounting block to body shell	M 8 x 1,25	1,4
Self-locking nut for attaching stabilizer bar to small connecting rod	M 10 x 1,25	5
Self-locking nut for attaching small connecting rod on stabilizer bar to track control arm	M 8 x 1,25	0,7
Bolt for securing stabilizer bar fastening bracket to body shell	M 8 x 1,25	1,2

#### REAR SUSPENSION

Nut for securing rear wheel hubs to stub axle	M 24 x 1,5	32
Studs for securing rear wheels to hub	M 12 x 1,25	8,8

**REMOVING-REFITTING**

**Removing-refitting track control arm from/to MacPherson strut**



**Removing-refitting flexible mounting and ball joint**

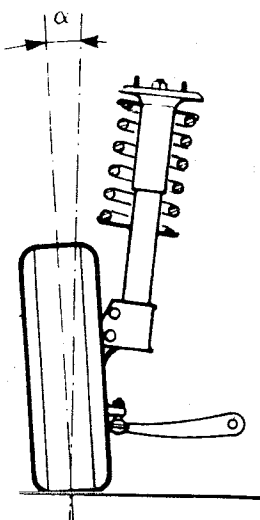
### 44.

#### REAR WHEEL GEOMETRY

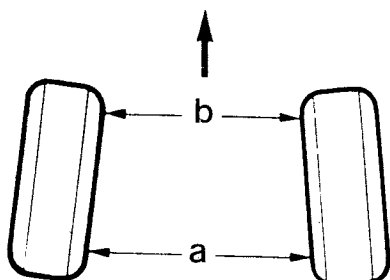
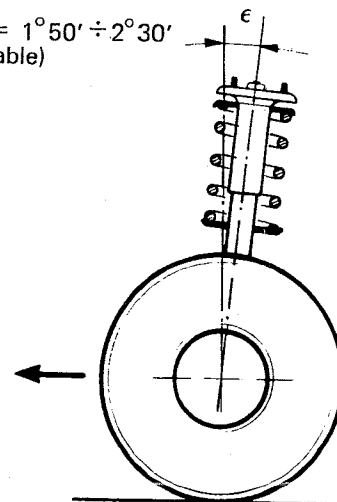
The wheel geometry must be checked after the following checks have been carried out:

- tyre inflation pressure;
- the eccentricity and squareness of the wheel rims must not exceed 3 mm;
- wheel bearing end float.

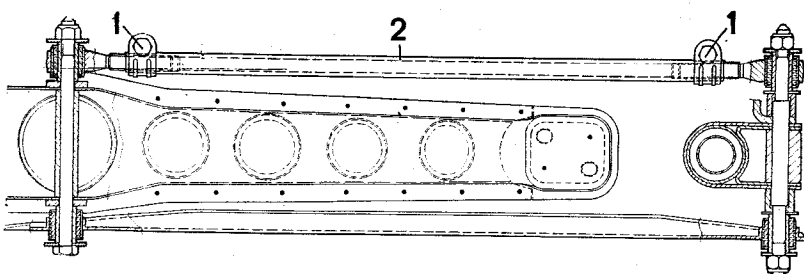
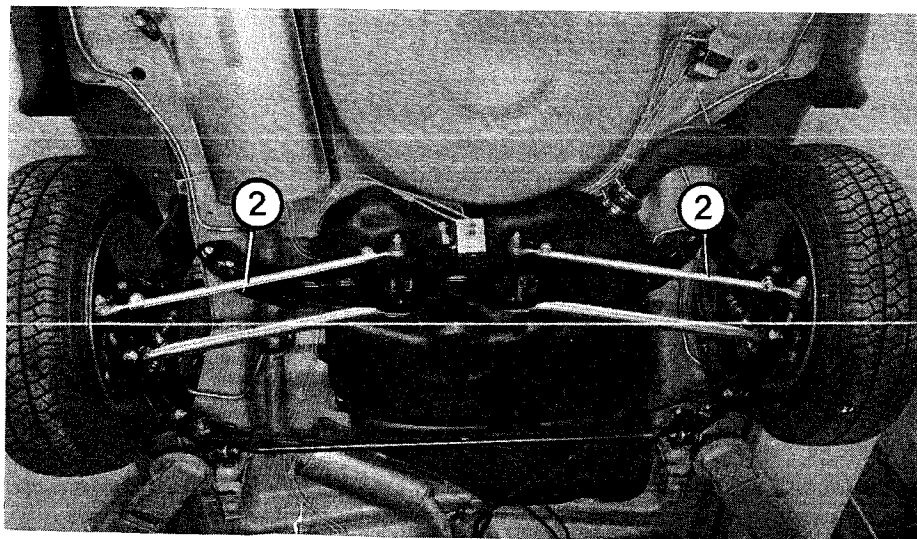
camber  $\alpha = -40' \div 0'$   
(not adjustable)



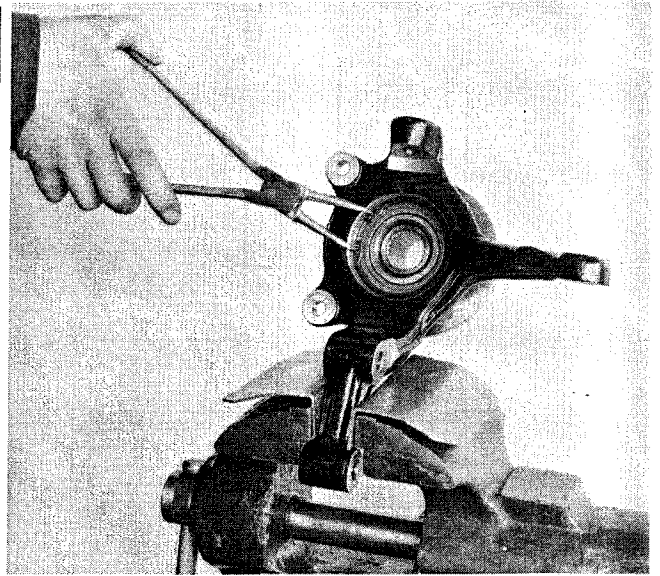
castor  $\epsilon = 1^\circ 50' \div 2^\circ 30'$   
(not adjustable)



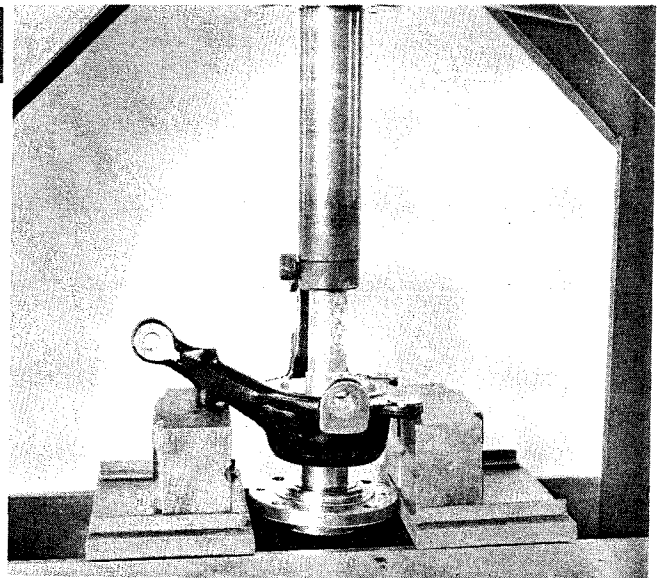
toe-in  $a - b = 1 \div 4$  mm



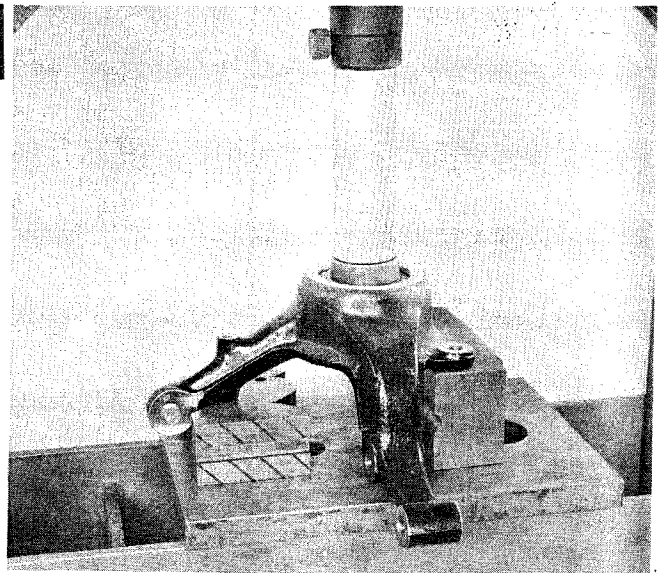
If, when checking the toe-in, different values from the ones given are obtained, loosen nut (1) and rotate rod (2) until the desired effect is obtained. The correct toe-in must be achieved by adjusting both wheel rods.



Removing-refitting bearing circlip



Removing hub from steering knuckle



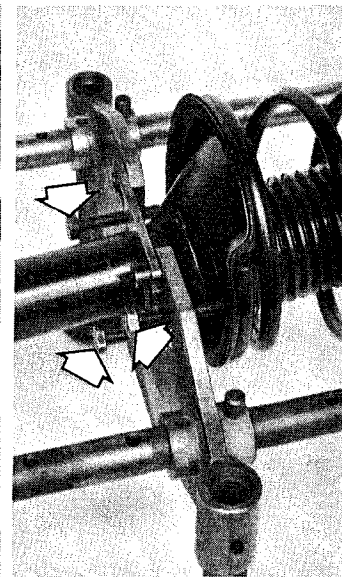
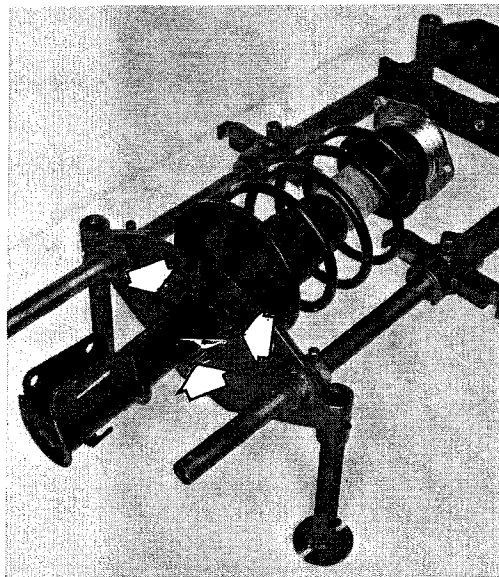
Removing bearing from steering knuckle

44.

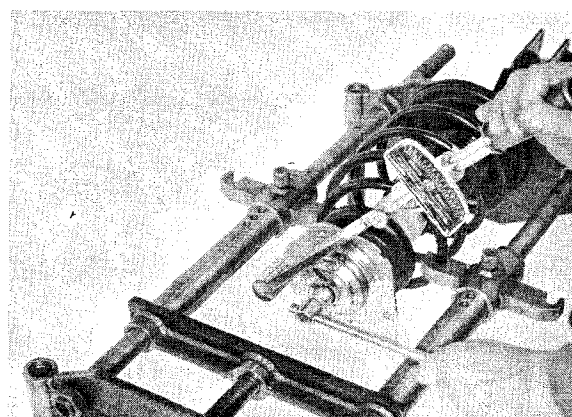
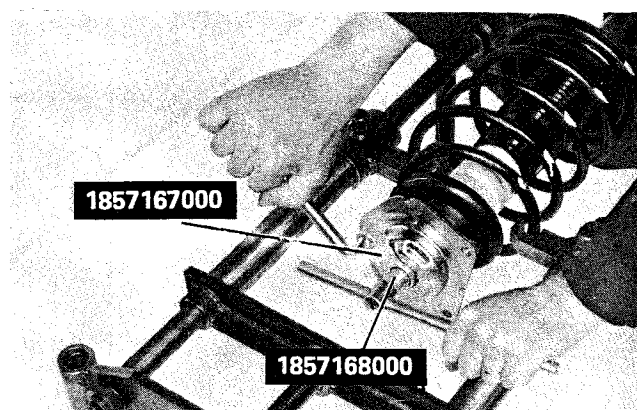
Faults	Causes	Remedies
The level of the car does not go down to normal (only with car unladen)	Height adjuster minimum pressure setting too high	Replace height adjuster
Noise when operating with car unladen	Height adjuster minimum pressure setting too low	Replace height adjuster
The car swings about when in operation	Dampers defective	Replace dampers
Noise when operating and faulty behaviour of suspension	Accumulators defective	Replace accumulators
After staying in one place for a prolonged period, level of car falls to that of compression buffers	Non-return valve in height adjuster faulty Damper leaking Load proportioning valve faulty	Replace height adjuster Replace damper Replace load proportioning valve

### Adjusting support plate adjustment screws

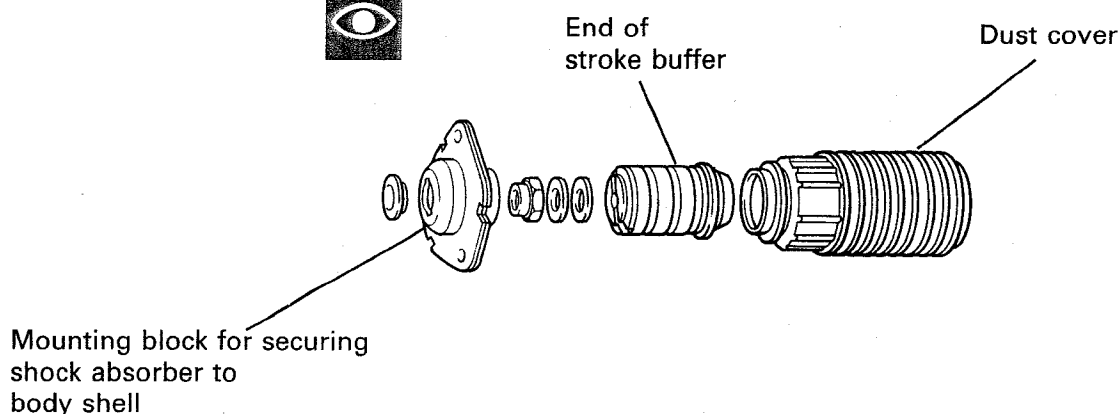
**NOTE:** Before compressing the spring, ensure that the assembly is in the position shown in the diagram and the shock absorber stem is perpendicular to the support plate. This can be achieved by regulating the adjustment screws shown by the arrows.



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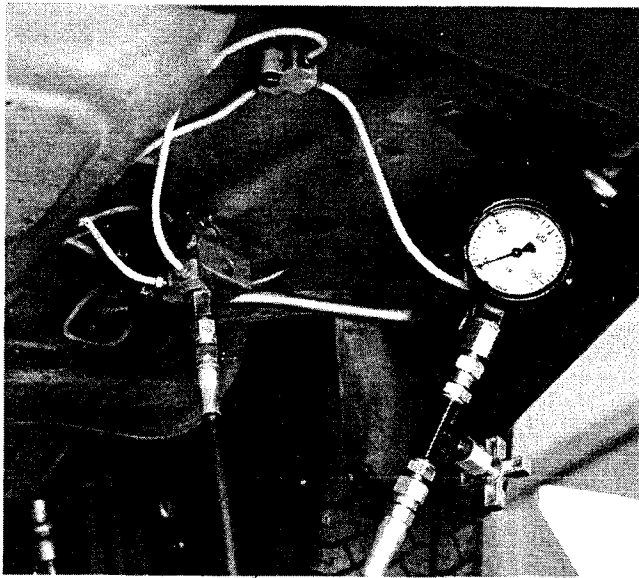
### Removing-refitting nut securing shock absorber stem and tightening to torque



### Shock absorber upper fixing components

Check that there are no defects in the components which might adversely affect their efficiency.

44.



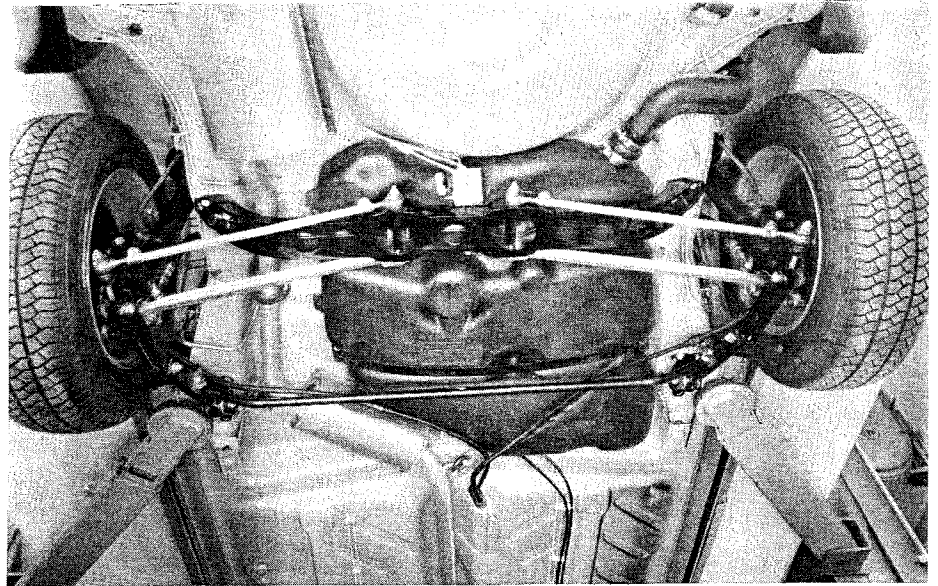
Connect a pressure gauge with a scale going up to 25 bar (included in kit 1896506000) to the delivery pipe to the dampers.

Cut off one of the accumulators (by disconnecting the delivery pipe and plug both it and its housing on the accumulator with plugs included in kit 1896506000). Raise the car off the ground and start up the engine. Then move the height adjustment lever to the upwards adjustment position until the pressure builds up to over 25 bar.

Slowly loosen the bleed screw on the load proportioning valve and note the reading on the pressure gauge.

The pressure should go down slowly between 25 and 17 bar (the pressure at which the accumulators are filled) and then very quickly from 17 to 0 bar.

If this is not the case, the accumulator must be replaced.



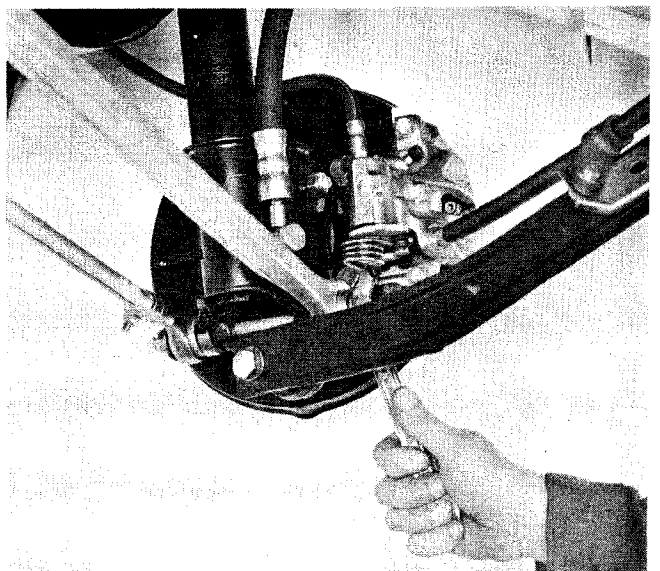
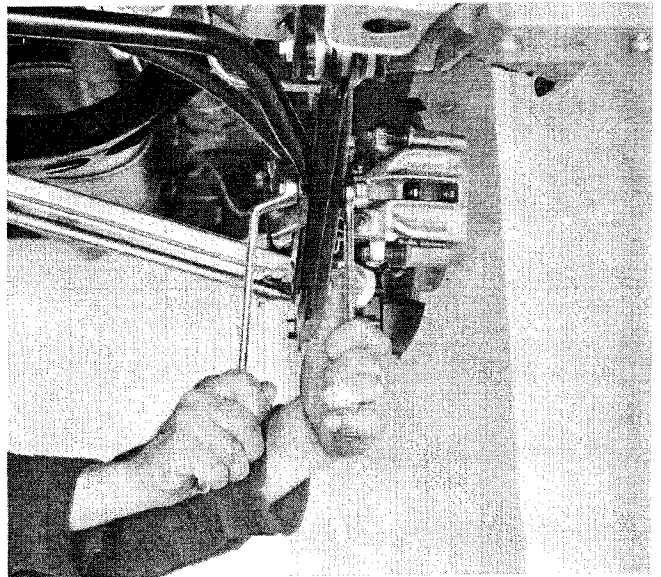
**View of rear suspension unit fitted on vehicle**

#### REMOVING-REFITTING



To remove and refit the rear suspension, after having positioned the vehicle on a lift and having removed the rear wheels, proceed as illustrated below.

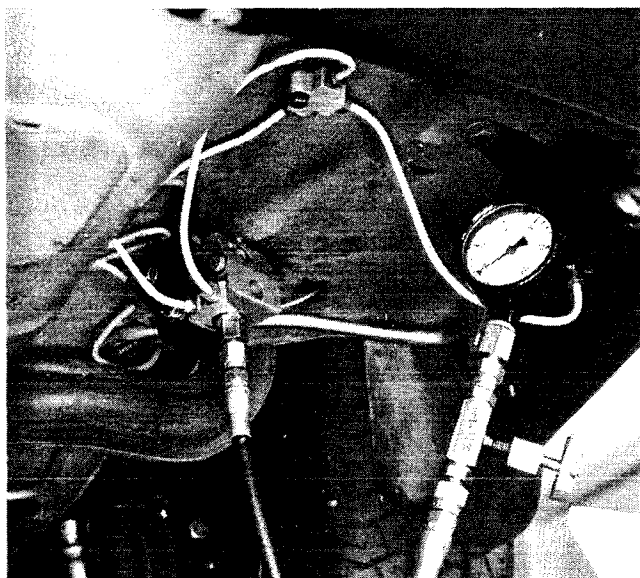
**Removing stabilizer bar and handbrake cable retaining bracket from longitudinal rod**



**Removing brake caliper from MacPherson strut**



### 44.



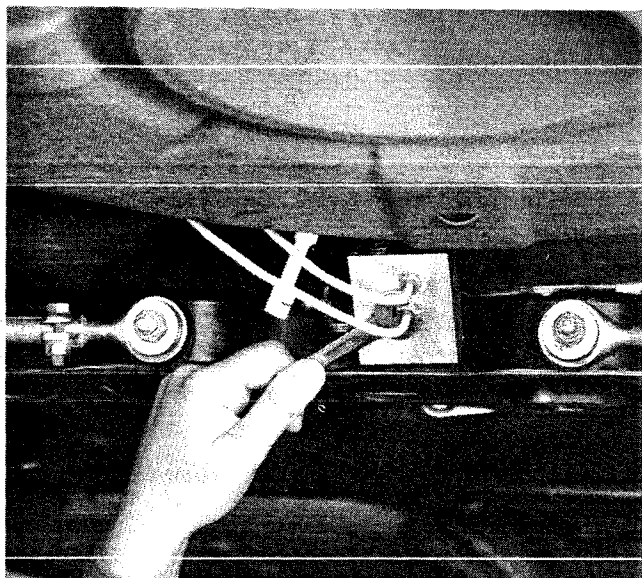
#### CHECKING UPWARDS ADJUSTMENT AND MEASURING MAXIMUM PRESSURE

Connect a pressure gauge with a scale going up to 160 bar (included in kit 1896506000) to the delivery pipe to the dampers. Start up the engine, move the height adjuster lever to the upwards position. In this position the dampers should extend to their full limit.

Continue the test until the pressure builds up to the point where the safety valve opens. At this point the pressure gauge should read  $95 \pm 5$  bar.

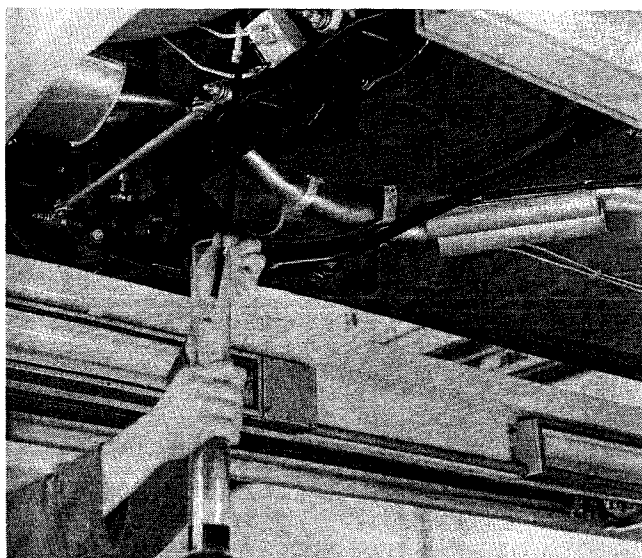
If this is not the case, check the flow of the pump under pressure.

If this flow rate proves to be correct, replace the height adjuster.

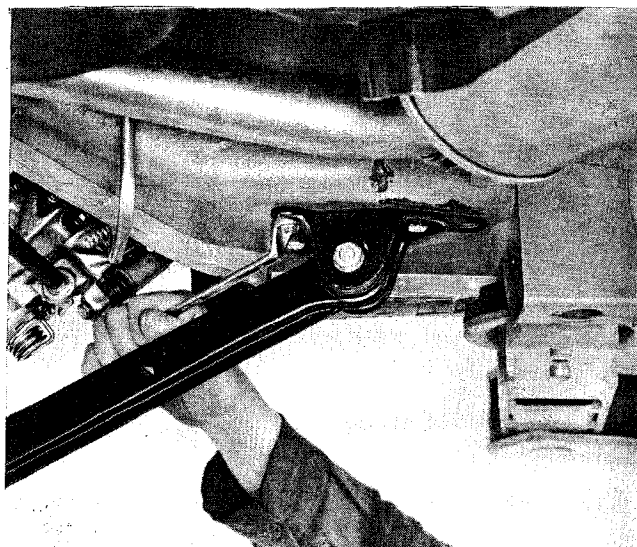


#### CHECKING THE FLOW RATE OF THE PUMP UNDER PRESSURE

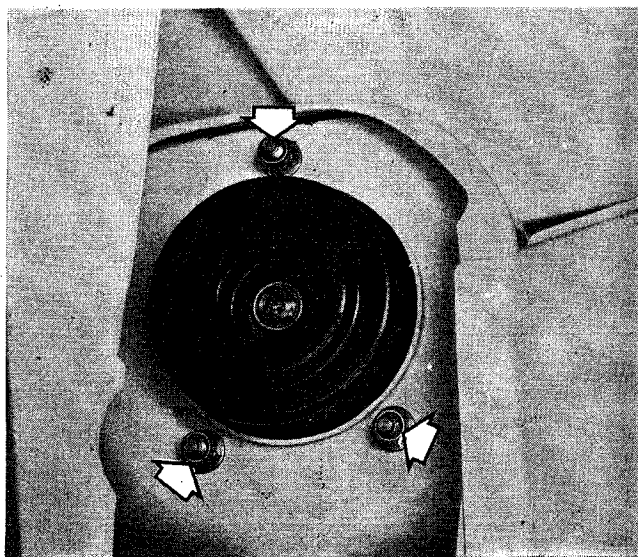
Move the height adjuster lever to the neutral position and disconnect the return pipe to the reservoir from the height adjuster.



Connect a pipe (included in kit 1896506000) start up the engine up to 2000/min, move the height adjuster lever to the upwards adjustment position and check the flow rate of the pump under pressure. The value of the flow rate should be 1,3 l/min (for engines 2000 i.e. and 2000 i.e. turbo), and 1 l/min for engine 2850 cc. If this is not the case replace the pump.



Removing longitudinal rod from body shell



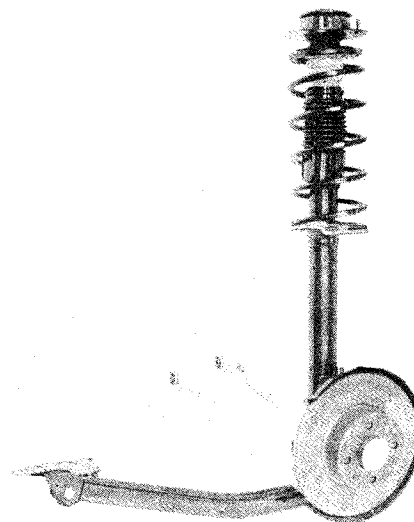
Removing shock absorber unit from turret with removal of suspension unit



*Support the suspension on a hydraulic jack.*

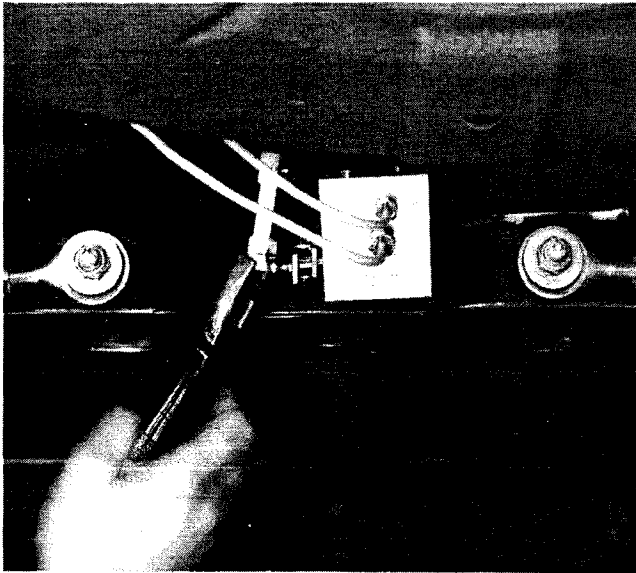
### Rear left suspension unit

**NOTE:** When refitting the rear suspension it is sufficient merely to suitably reverse the order of the operations for its removal.

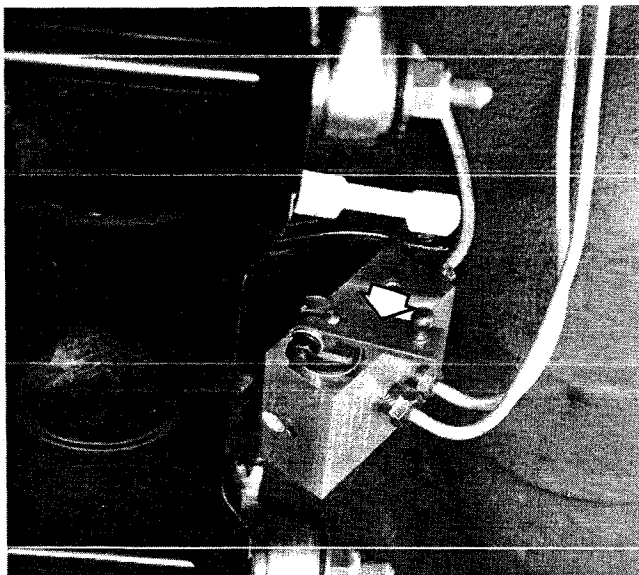


*When refitting the suspension, the bolts and nuts for securing the various components must be tightened to the recommended torque with the vehicle horizontal and with three people on board (2 on the front seats and 1 on the rear seat) + 30 kg of luggage (1 person = 70 kg).*

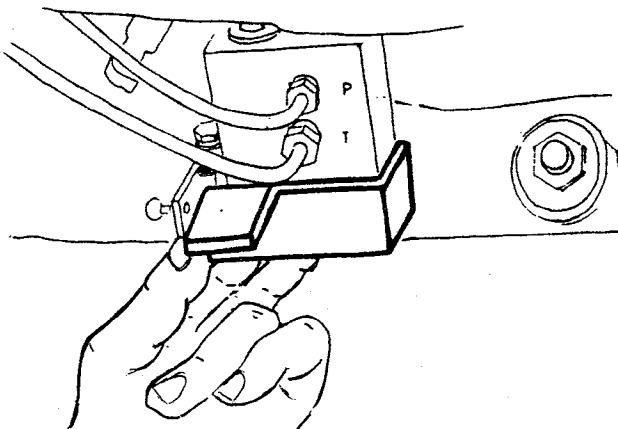
44.



- disconnect the small connecting rod from the height adjuster lever.



If the car is too high or too low, rotate the height adjuster lever upwards or downwards until the car reaches the prescribed height. Then move the height adjuster lever back to the neutral position, which can be recognized because when the lever gets close to this position, it is drawn into it.

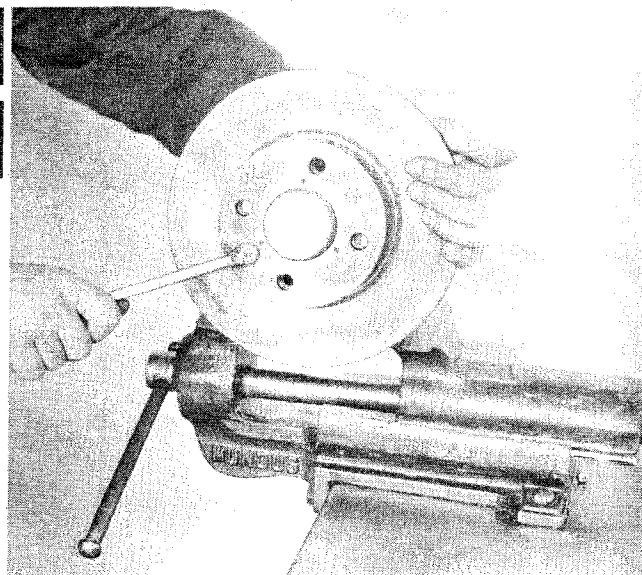


Fit the special tool which is included in kit 1896506000 and which ensures that the lever and the axis of the height adjuster are correctly positioned in relation to each other.

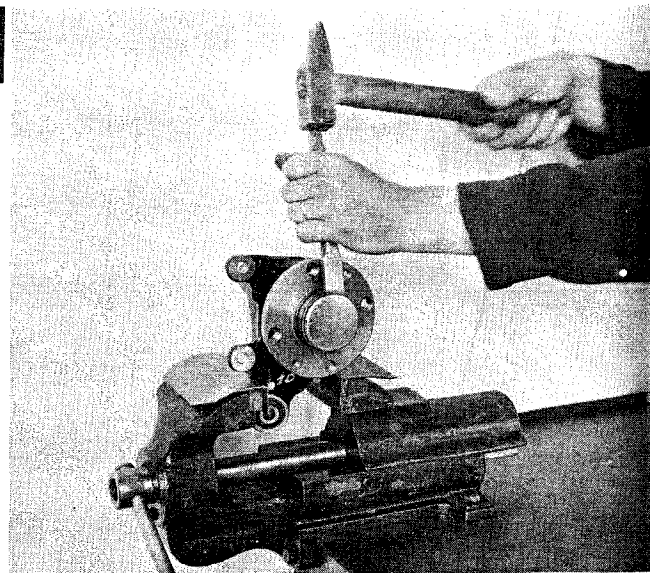
Re-connect the small connecting rod to the height adjuster lever, without moving the latter.

Tighten the bolt securing the connector to the righthand transverse rod and remove the tool.

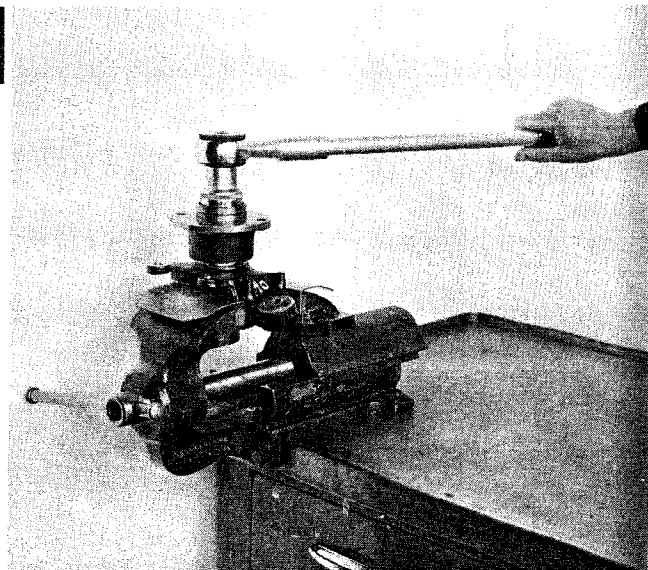
Removing-refitting brake disc from/to stub axle



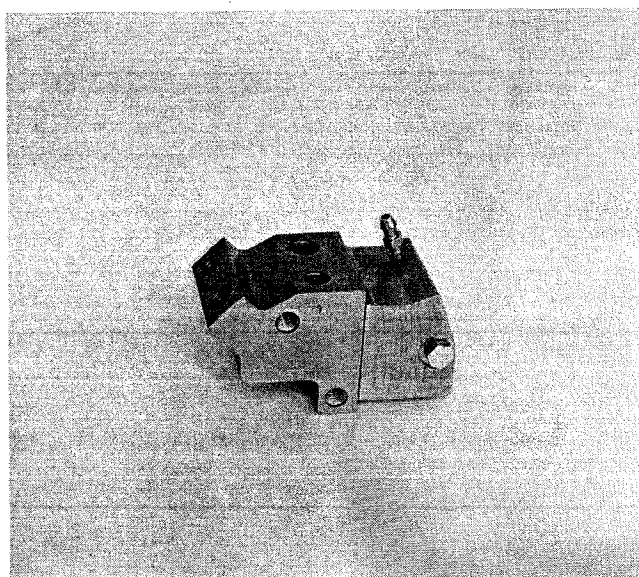
Removing hub cap



Removing wheel hub from stub axle

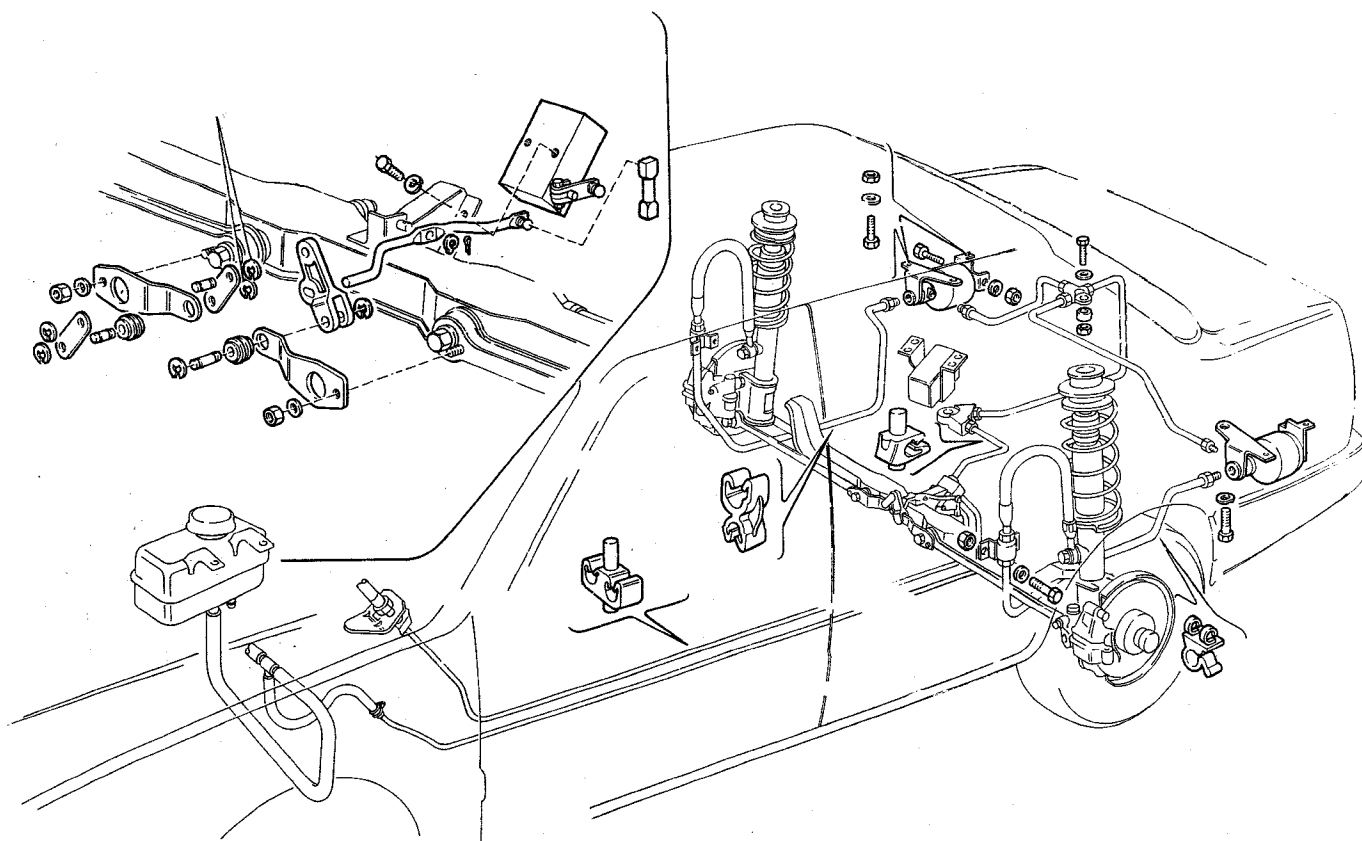


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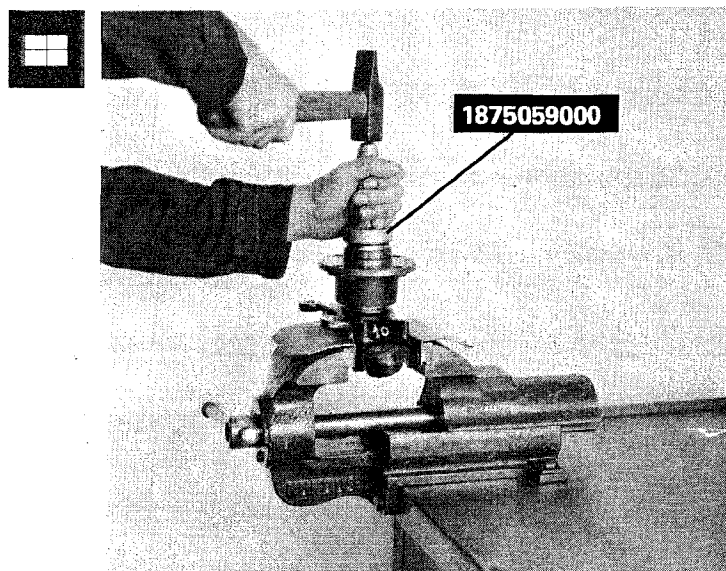
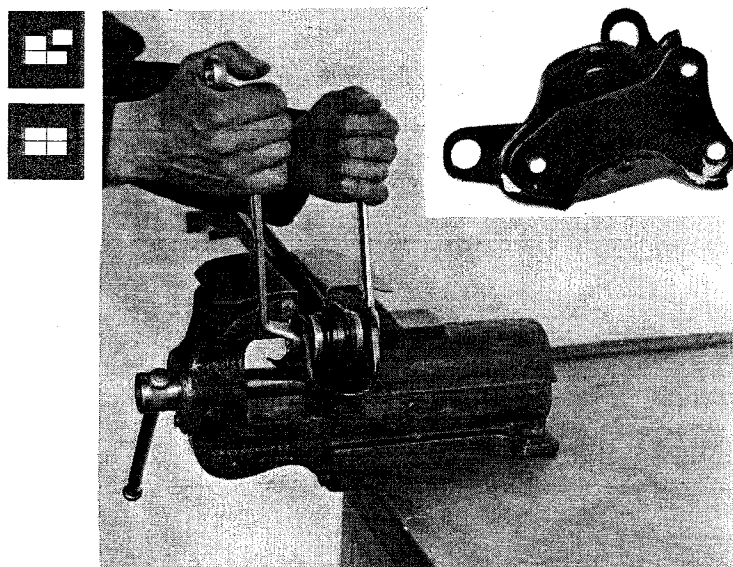
View of the load proportioning valve unit

Self-levelling rear suspension components supplied as spares



**Fitting hub cap**

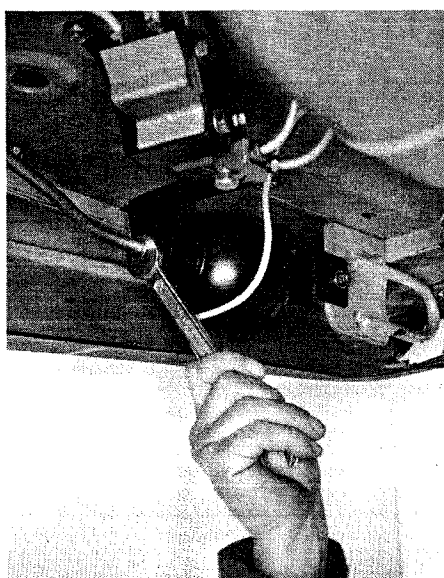
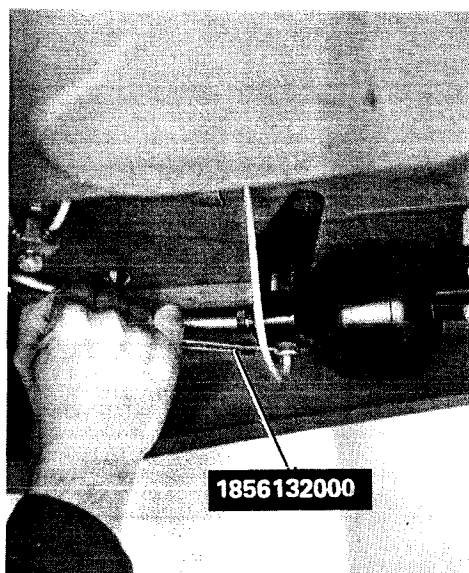
**NOTE:** Before fitting, smear some TUTELA MR3 grease along the edge of the hub cap.

**LONGITUDINAL ROD****View of the longitudinal rod unit**

**Removing-refitting bracket for securing longitudinal rod to body shell**



44.



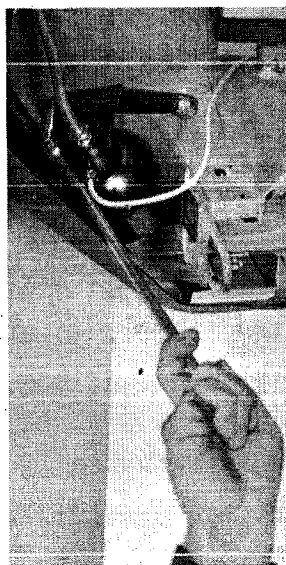
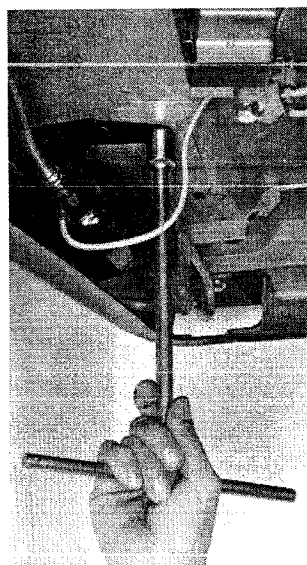
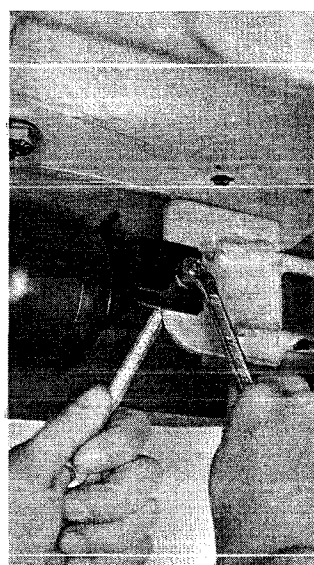
**HYDRAULIC  
ACCUMULATORS**



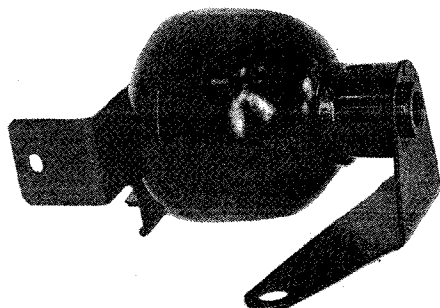
**Removing-refitting self-level-  
ling system pipes**



*Before unscrewing  
the pipe unions,  
bleed off the pres-  
sure in the self-lev-  
elling system via the  
bleed screw on the  
load proportioning  
valve.*

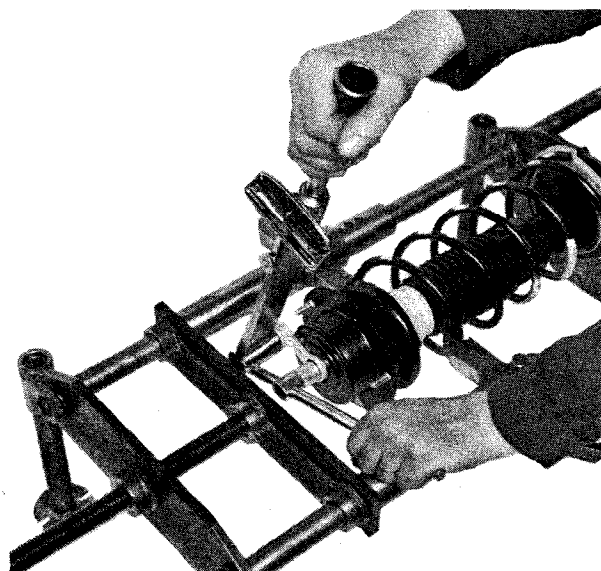


**Removing-refitting hydraulic  
accumulator**



**View of a hydraulic accumulator unit**

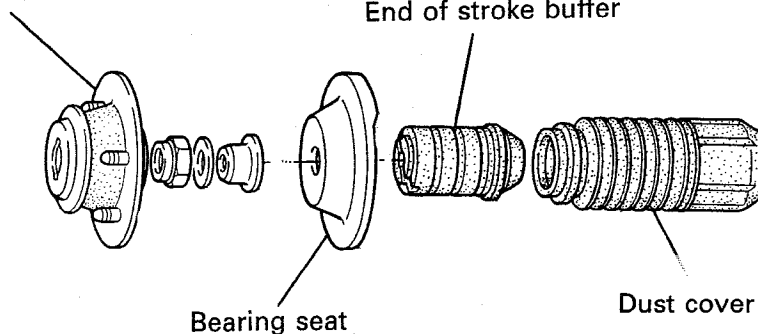
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Refitting nut securing shock absorber stem and tightening to torque

Mounting block securing shock absorber assembly to body shell

End of stroke buffer



Bearing seat

Dust cover

### Shock absorber upper fixing components

Check that there are no defects in the components which might adversely affect their efficiency.



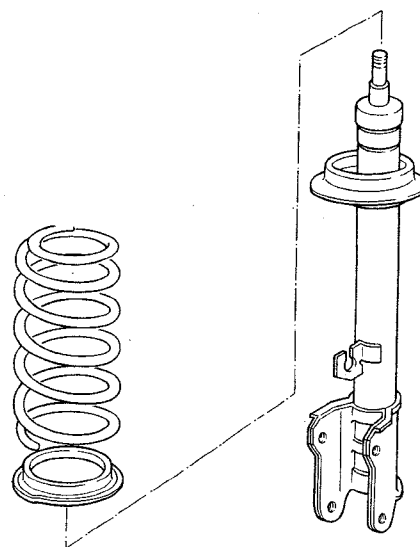
### Shock absorber

If any faults are found which are attributable to the shock absorber, it must always be replaced as a complete unit.

### Coil spring

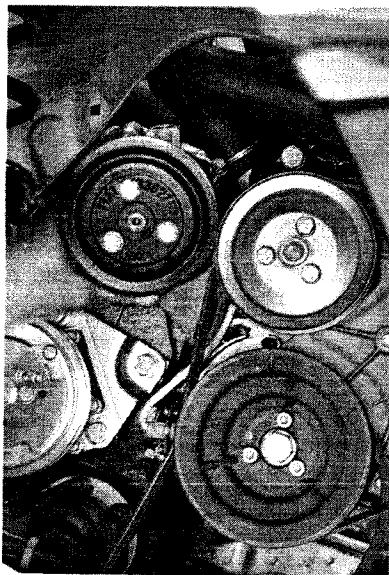
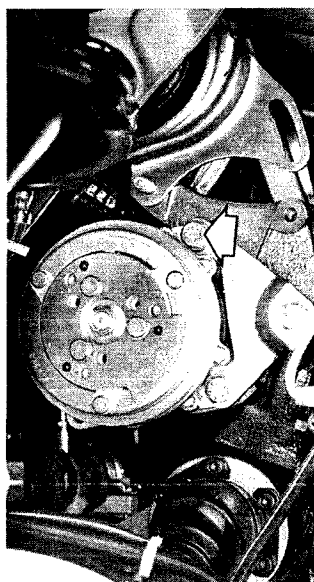
Make sure that it is not cracked or distorted in such a way as might adversely affect its efficiency.

**NOTE:** The coil springs are sub-divided into two categories, identifiable by a yellow or green paint stripe on the central coil. Springs of the same category must be fitted.





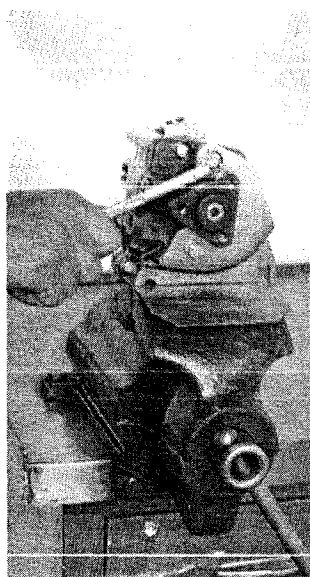
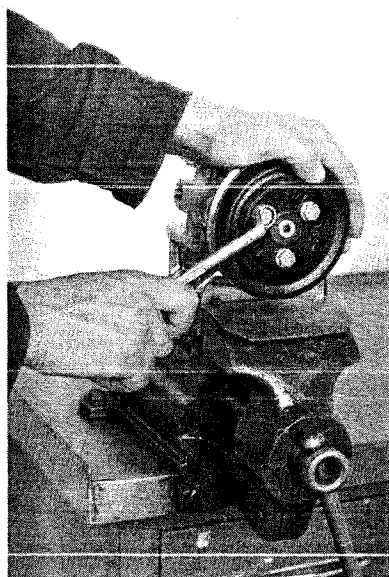
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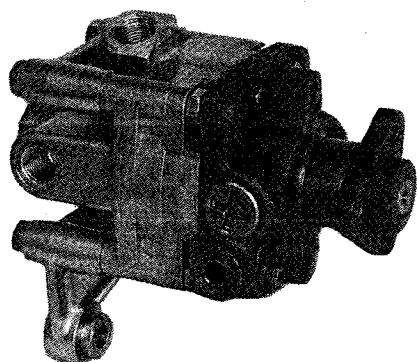
### Removing-refitting pump from/to vehicle



*In order to be able to get the pump out the air conditioning compressor needs to be removed (if one is fitted) by loosening the securing bolt shown by the arrow.*

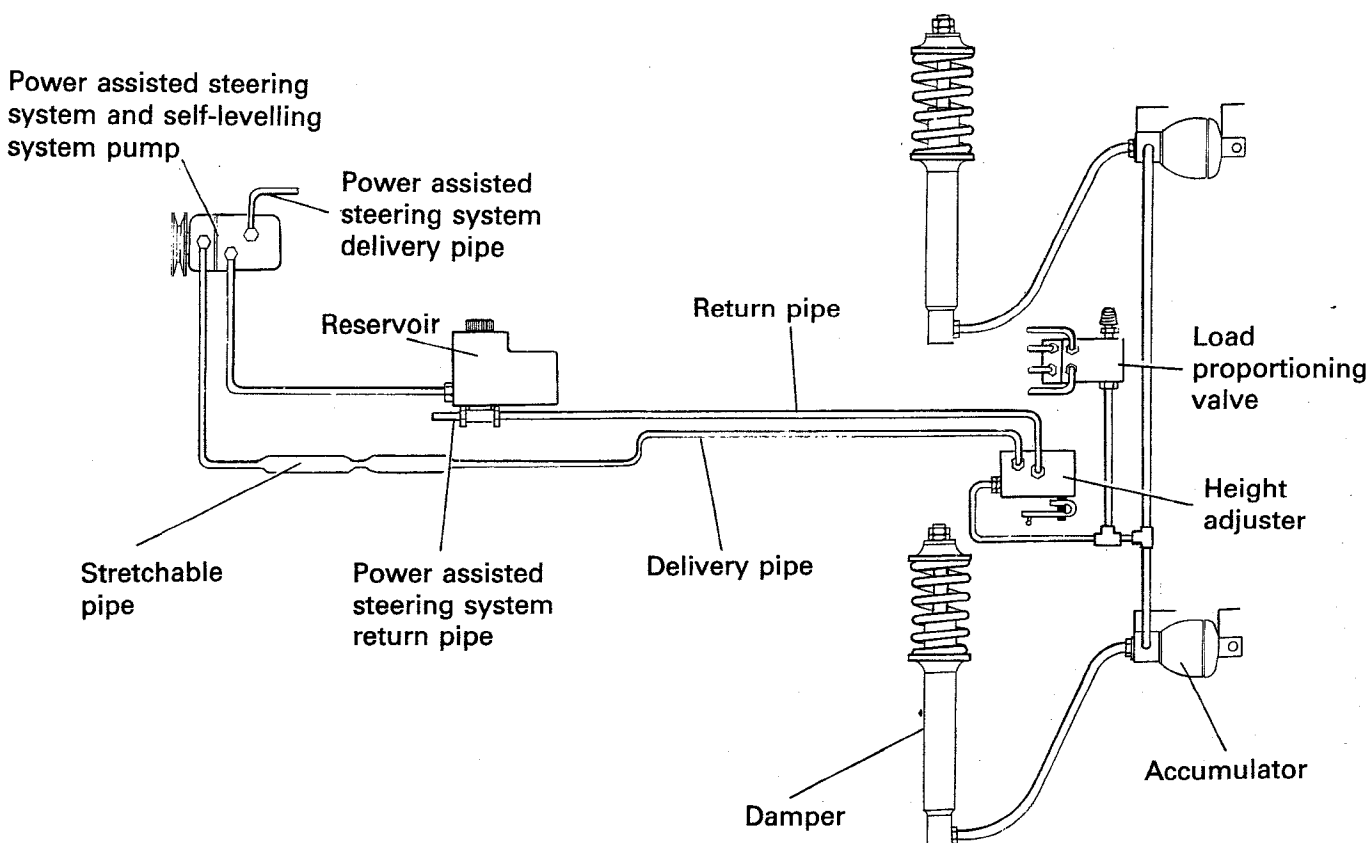


### Removing-refitting pump drive pulley and relevant securing bracket



View of the pump unit

### HYDRAULIC CIRCUIT



### How the system works

The purpose of the self-levelling system is to keep the attitude of the rear of the car constant, under all loading conditions, at a pre-fixed horizontal value.

This confers the following advantages:

- possibility of always taking advantage of the full stroke of the dampers;
- makes it better to drive the car;
- headlamps always adjusted to the right height;
- improved operating comfort.

The height adjusting system consists of 3 main elements:

1. Hydraulic dampers and accumulator
2. Hydraulic system (pump and reservoir)
3. Control device (height adjuster and operating linkages)

In a vehicle fitted with self-levelling rear suspension, the dampers act partly as load-bearing units, that is to say the weight of the rear part of the car is supported not only by the steel springs but also by the dampers themselves.

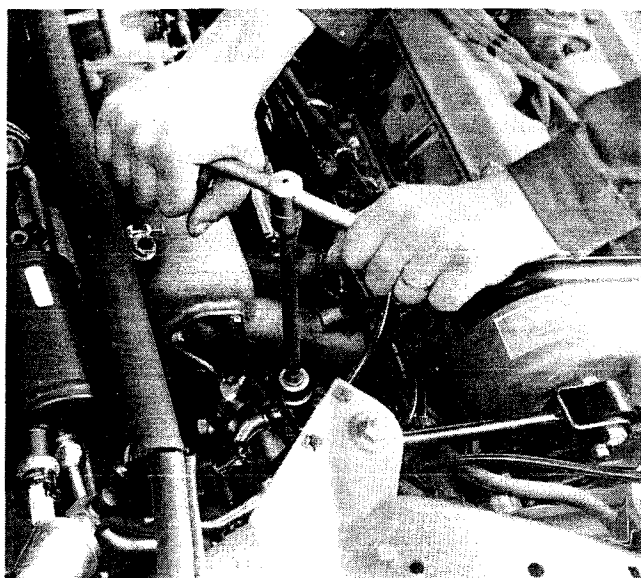
These dampers differ from conventional ones in that they are completely filled with oil and connected via pipes to the accumulators which are filled with nitrogen.

As well as adjusting the height of the car off the ground, they also perform the traditional function of dampers or shock absorbers in a conventional suspension system.

The pump, which has two stages and which is driven by the engine, sends oil from the reservoir under pressure via one circuit to the self-levelling system and via another circuit to the power assisted steering.

The oil needed for adjusting the car's height is sent from the pump through the stretchable section of the delivery pipe to the height adjuster. The stretchable section of pipe deadens the noise produced by the action of the pump.

44.

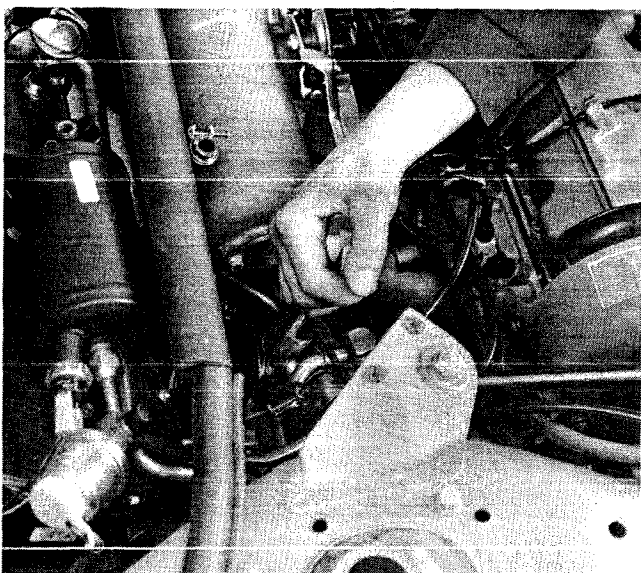


POWER ASSISTED STEERING SYSTEM AND  
SELF-LEVELLING SYSTEM OIL PUMP



REMOVING-REFITTING

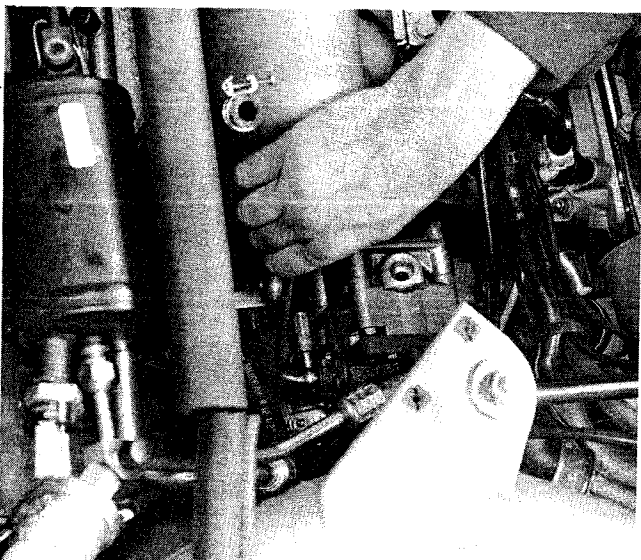
Removing-refitting return pipe to reservoir



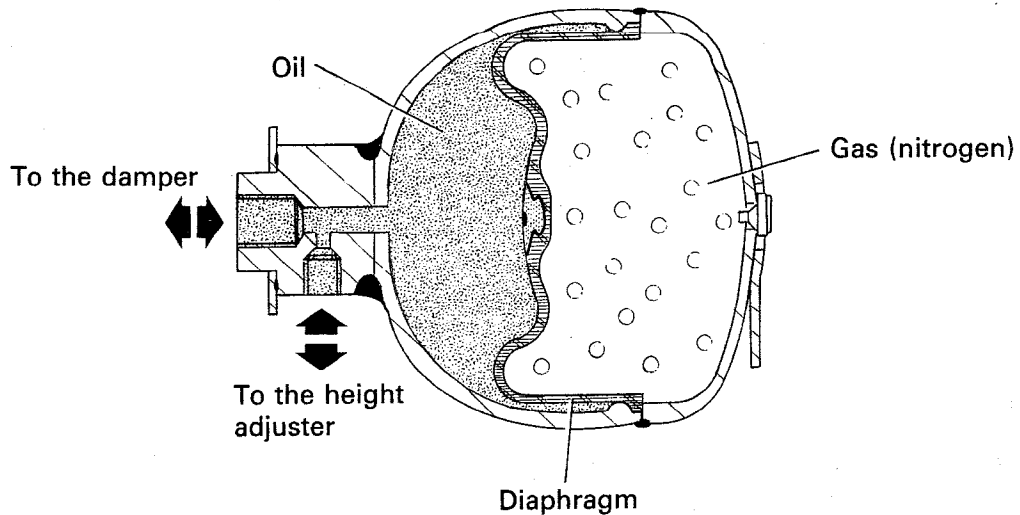
Removing-refitting delivery pipe to power as-  
sisted steering system



*Before carrying out this operation re-  
move oil from power steering - self-  
levelling system reservoir and collect  
in suitable containers.*



Removing-refitting delivery pipe to self-level-  
ling system



### HEIGHT ADJUSTER

#### How it works

The height adjuster has the function of keeping the car body at a pre-arranged optimum height above the road surface.

The distance between rear axle and bodywork is transmitted to the height adjuster by means of a special linkage.

If the distance between rear axle and bodywork is less than the prescribed value, the height adjuster lever moves into the upwards adjustment position as a result of which oil flows into the dampers.

If on the other hand the distance is greater than the prescribed value, the lever is lowered into the downwards adjustment position and oil drains off from the dampers until the prescribed suspension level is reached.

The height adjuster is designed for pressurized systems with low flow rates.

In addition to its suspension adjusting function, the height adjuster also has an overpressure valve and a minimum pressure valve.

The upwards adjustment function is brought about by the opening of a ball valve.

Both functions are controlled by cams.

The functions of the height adjuster can be summarized as follows:

#### Neutral position

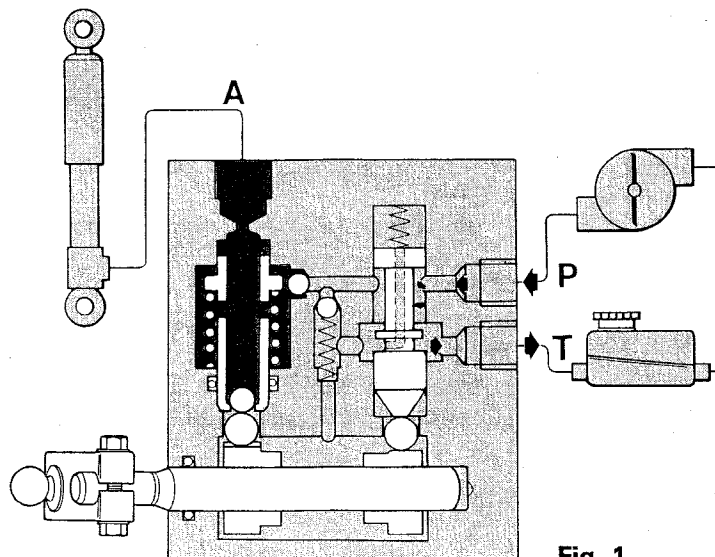


Fig. 1

## 44.

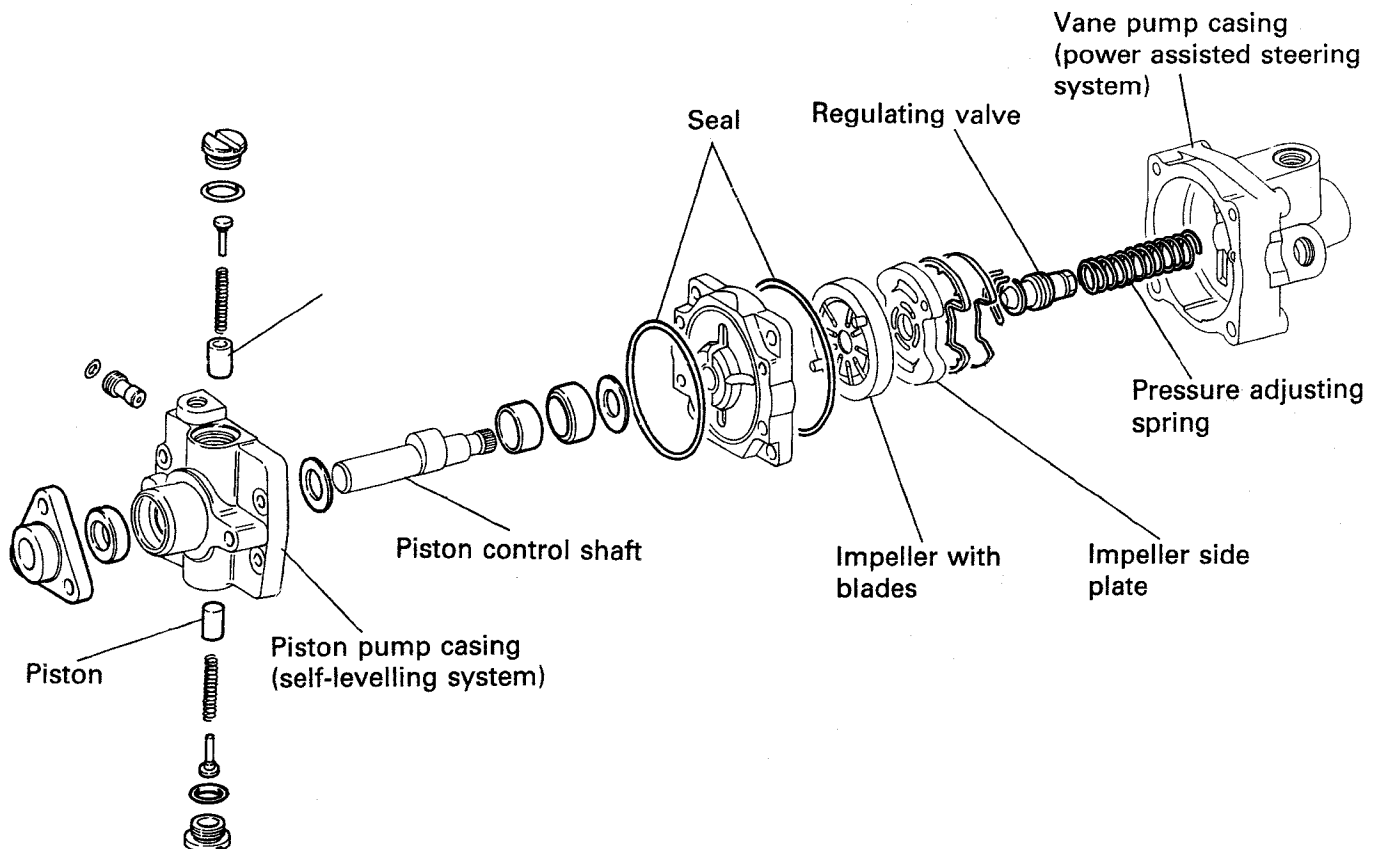
### OIL PUMP

#### How it works

The oil pump for operating the self-levelling system is of the volumetric type with pistons, and is driven directly by the engine.

It is flanged to the power assisted steering system pump.

There is only one oil supply for both these two pumps, since the same oil is used both for the power assisted steering system and the self-levelling system.



#### Power assisted steering and self-levelling system pump components



Before carrying out any maintenance operations on the system, it is necessary to bleed off the minimum pressure (either via the bleed screw on the load proportioning valve or by a pipe loosening operation).

It is important to remember however that bleeding the system must be done with the utmost care.

### Downwards adjustment position

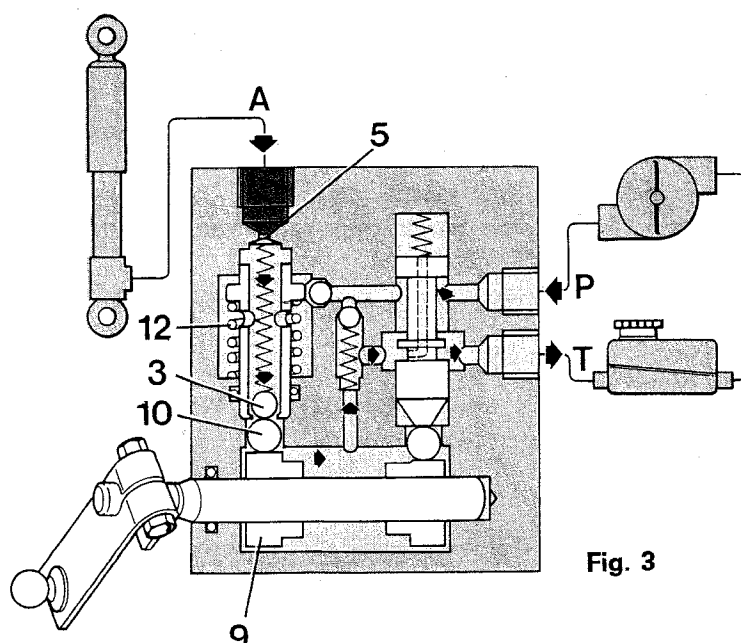


Fig. 3

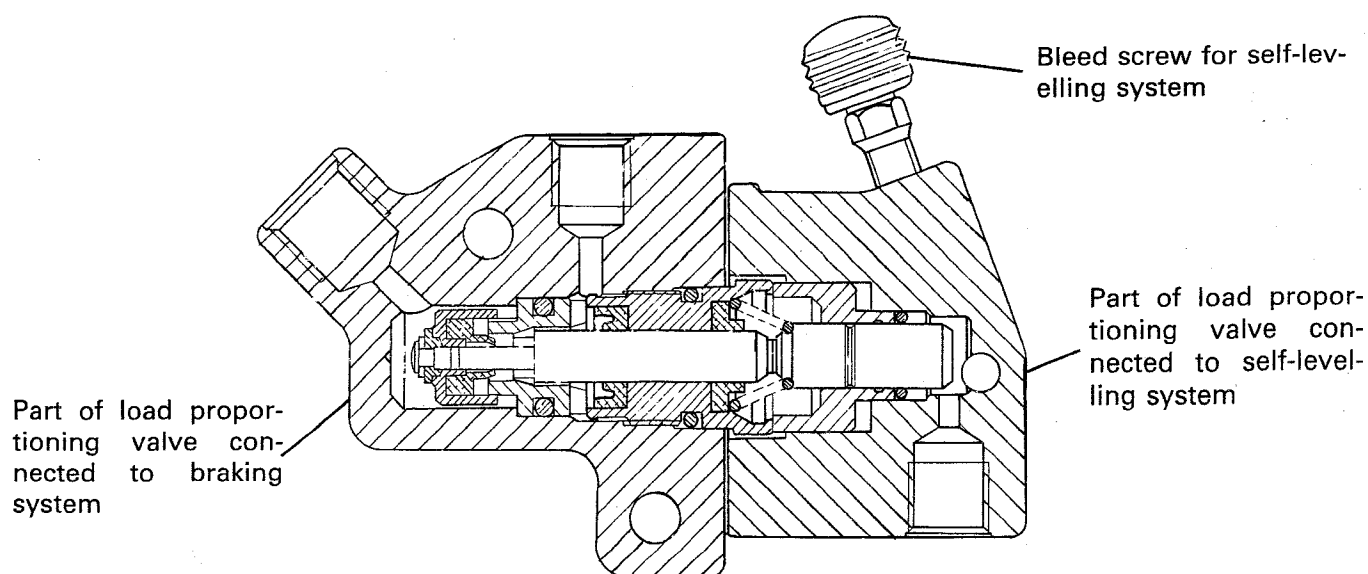
### LOAD PROPORTIONING VALVE

#### How it works

The type of load proportioning valve fitted on cars which have self-levelling rear suspension differs from the type fitted on cars which have conventional rear suspension in having a different operating system. In the conventional type of load proportioning valve the adjusting signal is supplied by a small bar which converts the variation in attitude of the car into a variation in the force applied to the load proportioning valve.

In cars which have self-levelling rear suspension the load proportioning signal is supplied by the oil pressure in the dampers.

The load proportioning valve in fact consists of two interconnected parts: one of which is connected to the braking system and the other to the self-levelling system.



Cross section of load proportioning valve

### 44.

When the height adjuster is in the neutral position (fig. 1) the dampers which are connected to the height adjuster via outlet "A" are cut off from the oil circuit, and oil flows into the height adjuster through "P" and flows out again through "T" from where it returns to the reservoir.

When the camshaft is rotated anti-clockwise (upwards adjustment), as can be seen from fig. 2, the cam (6) pushes a ball (7) which in turn pushes a control piston (2) upwards thus closing outlet "T". The oil therefore flows from "P" through a non-return valve (4), when the pressure of the oil itself exceeds that existing inside the dampers, arriving at outlet "A" which is constricted by a nozzle (5).

Consequently the car body is raised until it reaches the prescribed level.

Valve (3) remains closed.

If the pressure builds up to a point where it is greater than that at which a safety valve (8) is calibrated, then this safety valve opens and oil under pressure flows out from the height adjuster via outlet "T".

In this way the various parts of the system are protected from possible overloads.

#### Upwards adjustment position

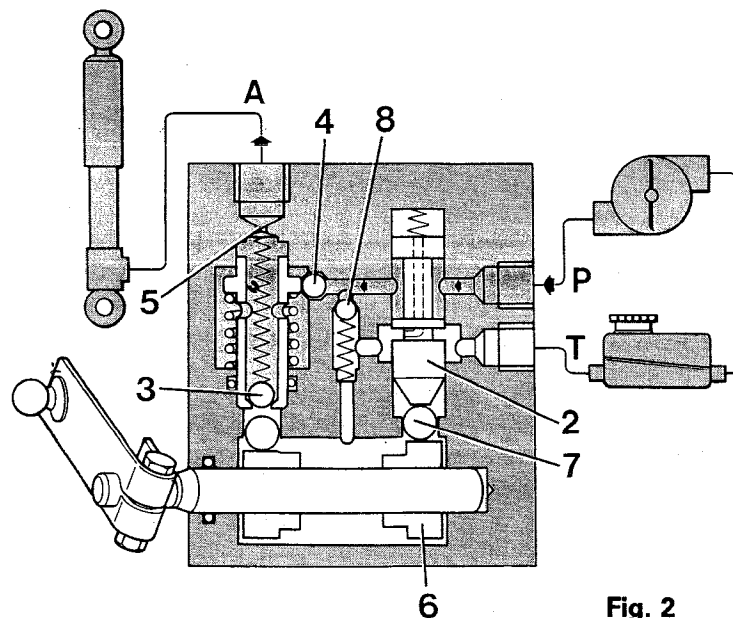


Fig. 2

**If on the other hand the camshaft is rotated clockwise (downwards adjustment position), as can be seen from fig. 3, the section of the passage way for oil through piston (2) is increased.**

Cam (9) pushes ball (10) upwards thus opening valve (3) and oil can therefore flow from "A" through the piston and out via "T".

When the level of the car body has been lowered to the prescribed value, the camshaft once again returns to the neutral position and valve (3) closes again.

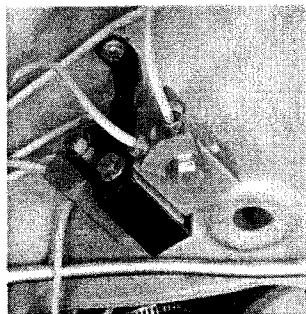
The time for both upwards and downwards adjustment to take place is linked to the diameter of the nozzles (5).

The minimum pressure valve ensures that a minimum pressure is maintained in the hydro-pneumatic suspension. It is responsible for supplying the system with sufficient oil, so that there is always a sufficient amount in the extension phase of the dampers.

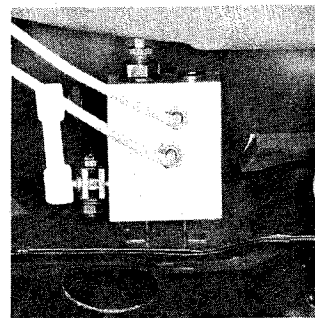
It also ensures that the system is not completely drained when the car is raised on a jack.

When the pressure in the system drops to a certain minimum level, spring (12) causes valve (3) to close and stay closed.

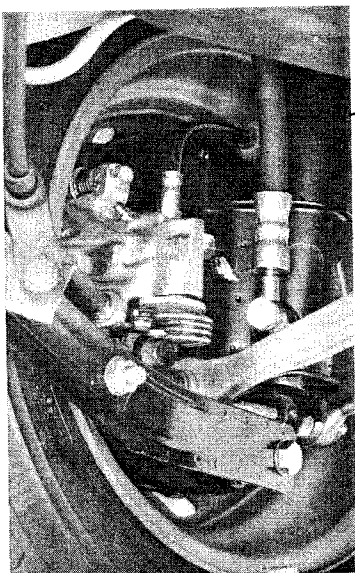
**LOCATION OF THE VARIOUS SELF-LEVELLING REAR SUSPENSION COMPONENTS ON THE VEHICLE**



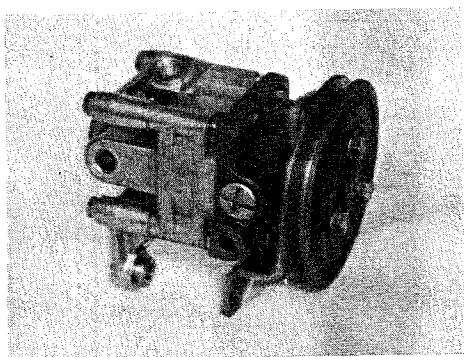
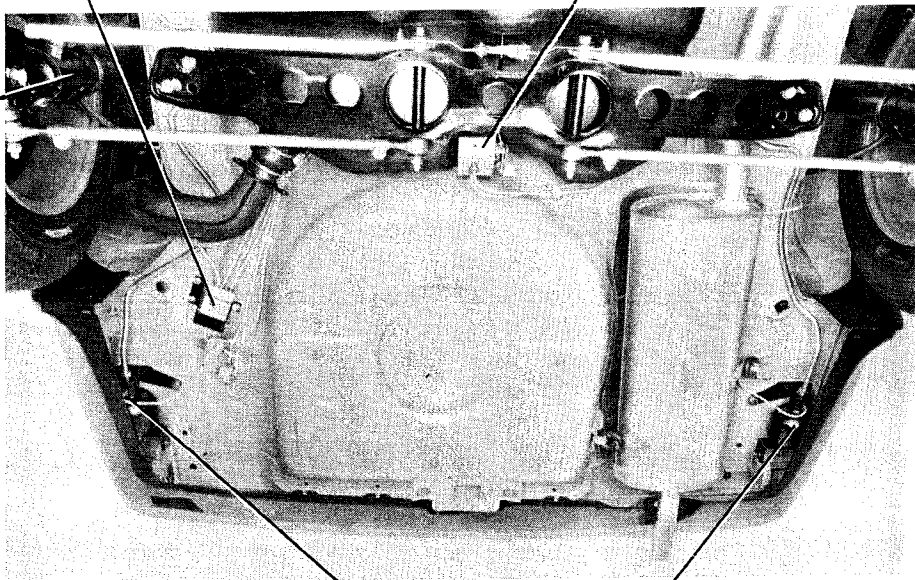
Load proportioning valve



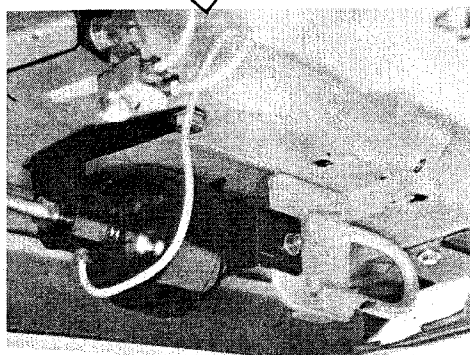
Height adjuster



Dampers



Oil pump  
(in the engine compartment)



Hydraulic accumulators



### 44.

From the height adjuster, the oil passes - via a connecting pipe to the dampers.

The return pipes then bring the oil back again to the reservoir.

The height adjuster is fixed to the bodywork at the centre of the rear axle.

The adjusting lever is connected to the rear axle by a linkage so that the distance between the rear axle and the bodywork is constantly fed to the height adjuster.

In the upwards adjustment position the height adjuster sends oil to the dampers until the prescribed value for the distance between bodywork and rear axle is achieved.

If the distance between bodywork and rear axle is more than that prescribed, the lever assumes the downwards adjustment position as a result of which oil is made to drain away from the dampers.

When the height adjuster is in either the neutral position or in the downwards adjustment position unpressurized oil is made to flow back to the reservoir.

Only when the adjusting lever is in the upwards adjustment position is oil sent to the dampers thereby raising the rear of the car.

To protect the system from possible overloads, the height adjuster has an auxiliary safety valve, which, if the pressure in the dampers becomes too high, opens to allow oil to flow back into the reservoir, even though the system is in the upwards adjustment position.

In order to make sure that when the car is unladen there is a sufficient amount of oil in the accumulator for stretching purposes and to make sure that the shock absorbing action of the dampers is completely independent of the position of the height adjuster, the height adjuster itself has a minimum pressure valve built into it which prevents the pressure falling below a certain level.

The pressure in the dampers, which is dependent on the load which the car is carrying, is conveyed via the relevant pipes to the load proportioning valve which adjusts the braking force to take account of whatever load the car happens to be carrying at the time.

If it is necessary to carry out maintenance work on the self levelling suspension system the pressure in the dampers should be bled off using the bleed screw on the load proportioning valve.

### DAMPERS

#### How they work

The dampers have a dual function: on the one hand they raise and lower the rear of the car, and on the other they help to damp oscillations.

From a mechanical point of view their construction basically corresponds to that of a conventional damper.

When oil is forced into the internal of the damper through the connecting mechanism in the double bottom, the stem extends upwards. If on the other hand oil is allowed to flow out from the damper then the stem recedes downwards.

The movement of the stem causes a flow of oil through the internal cylinder of the damper, so as to produce a normal hydraulic damping effect.

In order to get rid of the heat generated in the damper, the space between the inner and outer cylinder is filled with oil. There is a stop inside the cylinder to limit the extension stroke, and a buffer to limit the compression stroke.

### HYDRAULIC ACCUMULATORS

#### How they work

Fluctuations in the volume of oil displaced by the stems in the course of their stroke in and out of the dampers are compensated for by similar fluctuations in the accumulators.

The accumulators, which are used a flexible hydro-pneumatic elements, have a positive effect on the entire suspension system.

The accumulators consist of two housings welded together.

Inside the accumulator is divided into two chambers by a flexible diaphragm: one chamber for oil and the other for gas.

The oil chamber is linked by a connector to a damper and to the height adjuster.

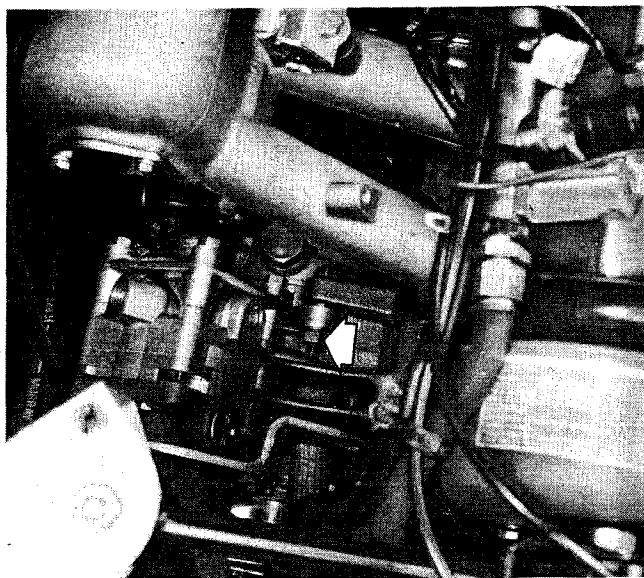
The gas chamber is filled with nitrogen at a pressure of 17 bar.

The hole through which the gas is inserted is sealed off with a welded plug.

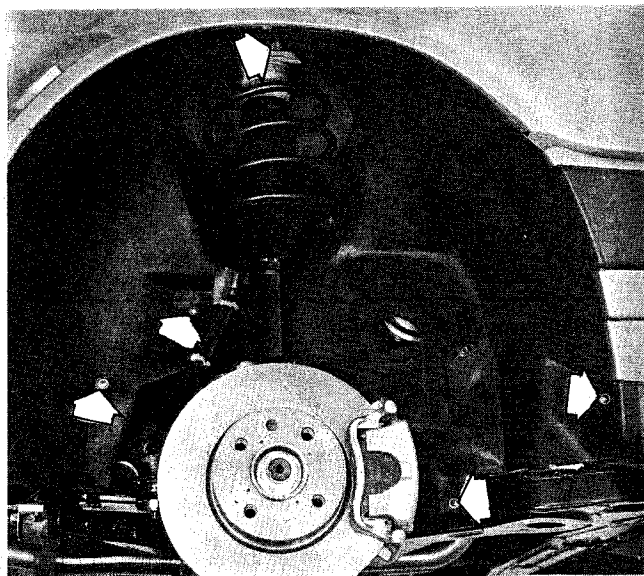
In the compression phase, the oil flows from the dampers to the accumulators where it compresses the nitrogen.

In the extension phase, the compressed nitrogen pushes the oil back into the dampers.

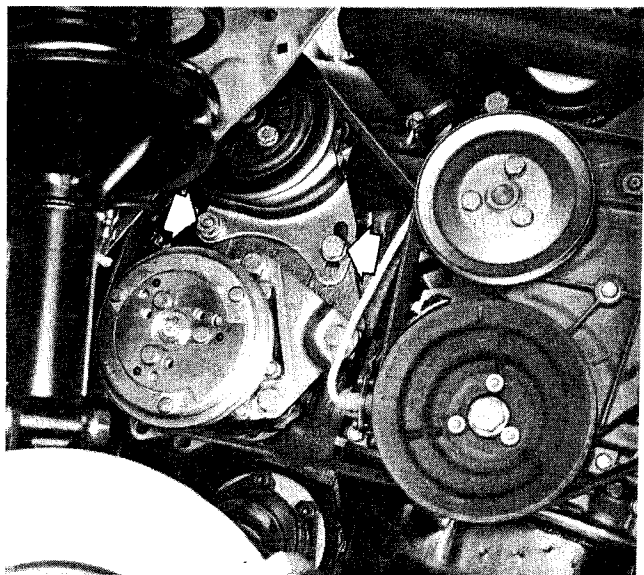
Removing-refitting pump (upper securing bolt)



Removing-refitting supplementary righthand wheel arch

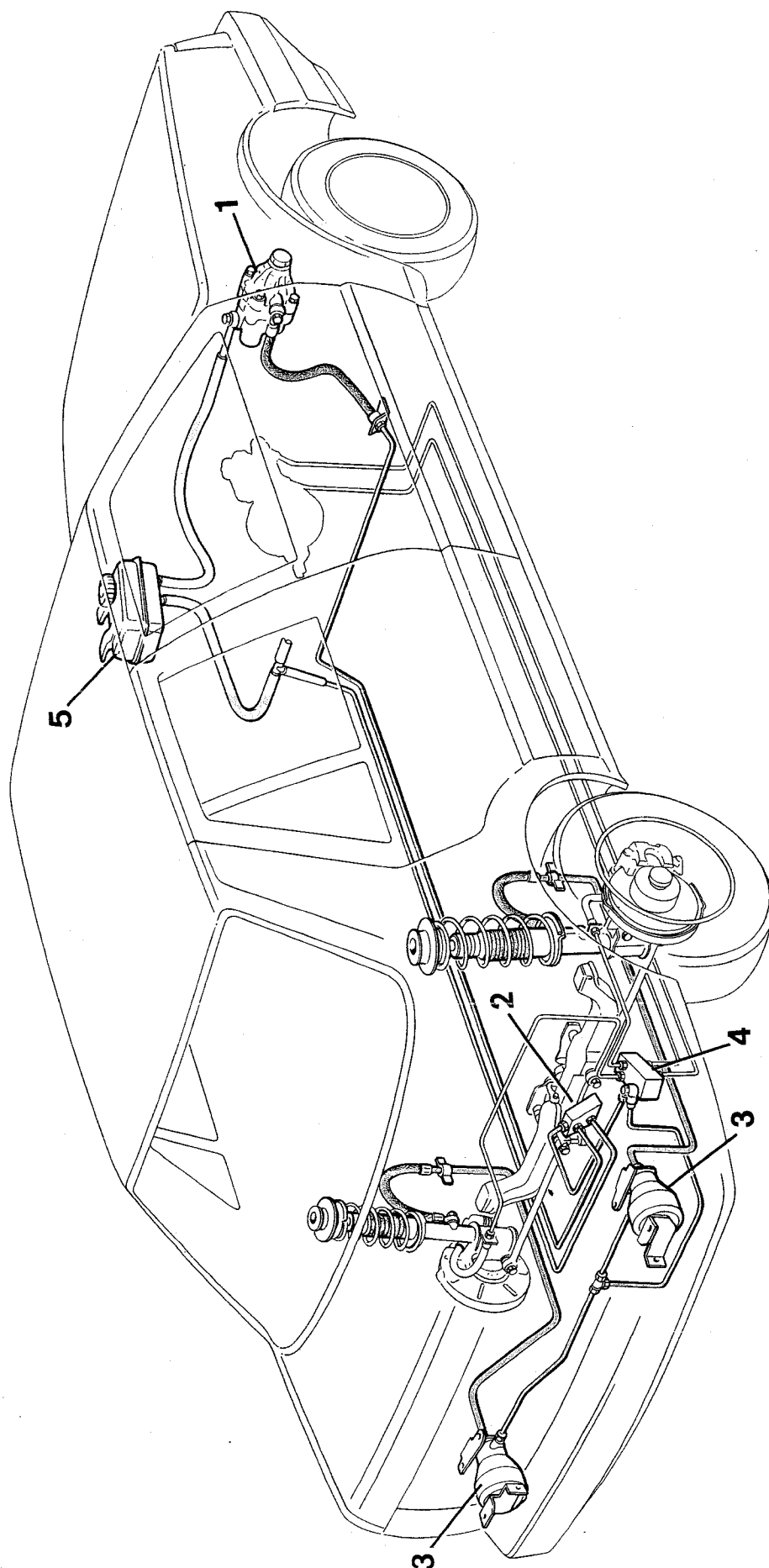


Removing-refitting pump (lower securing bolts) and drive belt



44.

OPERATING LAYOUT FOR SELF-LEVELLING REAR SUSPENSION SYSTEM



1. Power assisted steering system and self-levelling system pump
2. Height adjuster
3. Hydraulic accumulators
4. Load proportioning valve
5. Reservoir

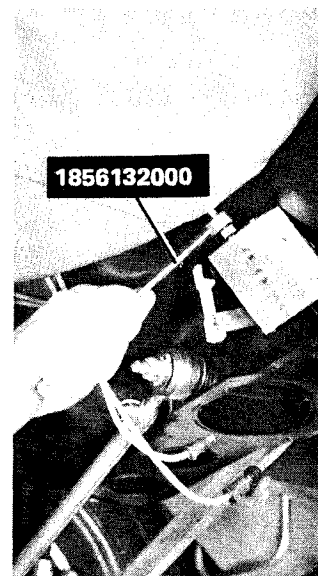
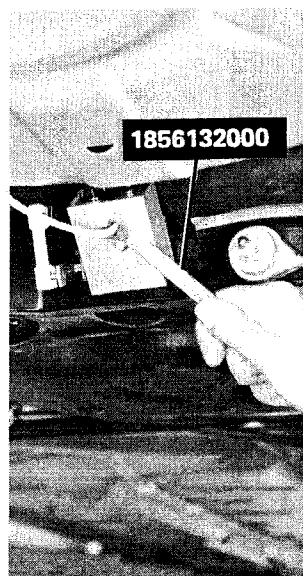
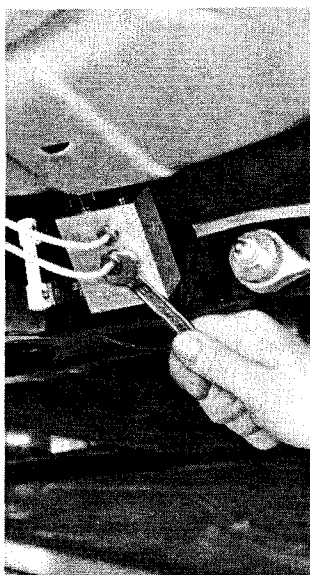
Delivery circuit

Return circuit

# HEIGHT ADJUSTER



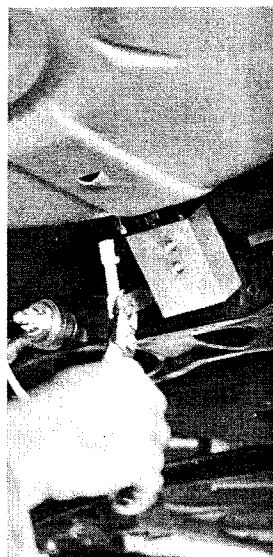
Before unscrewing the pipe unions, bleed off the pressure in the self-levelling system via the bleed screw on the load proportioning valve.



## Removing-refitting pipes for self-levelling system



The unions connecting the various pipes to the height adjuster measure 11 mm and 13 mm respectively; use spanner 1856132000 for the former and an ordinary spanner for the 13 mm unions, taking great care not to damage the unions.



## Removing-refitting height adjuster



When refitting check the height of the car on the rear axle as described on page 35.

## View of the height adjuster unit

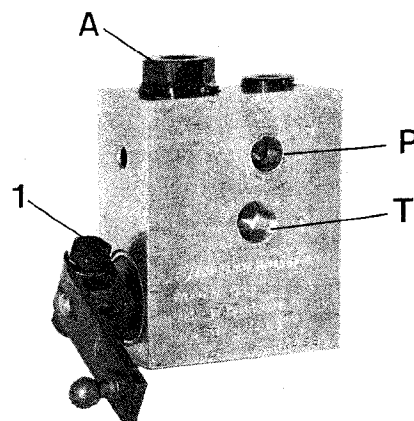


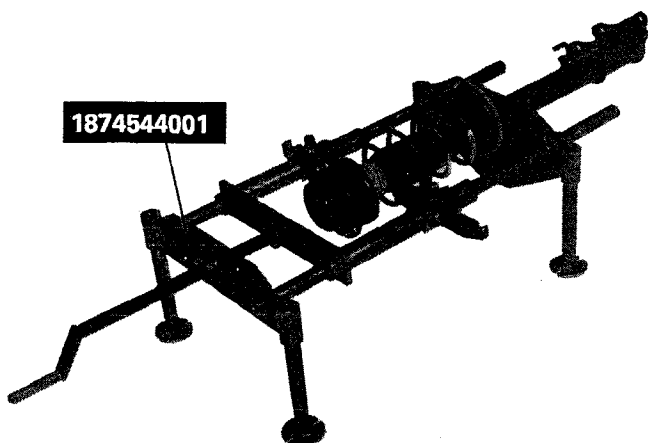
**NOTE:** The inlets and outlets for the pipes are identified by letters stamped on the height adjuster casing, which are as follows:

- A = for the delivery pipe to the dampers
- B = for oil intake from the pump
- T = for return pipe to the reservoir



Under no circumstances when making adjustments to the height adjuster interfere with the bolt marked 1, or the system will be put out of service.

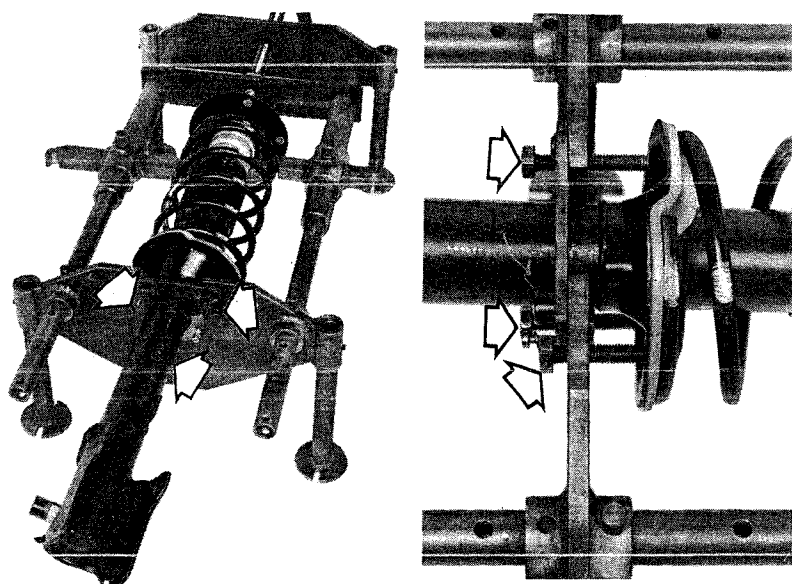




COIL SPRING AND SHOCK ABSORBER ASSEMBLY

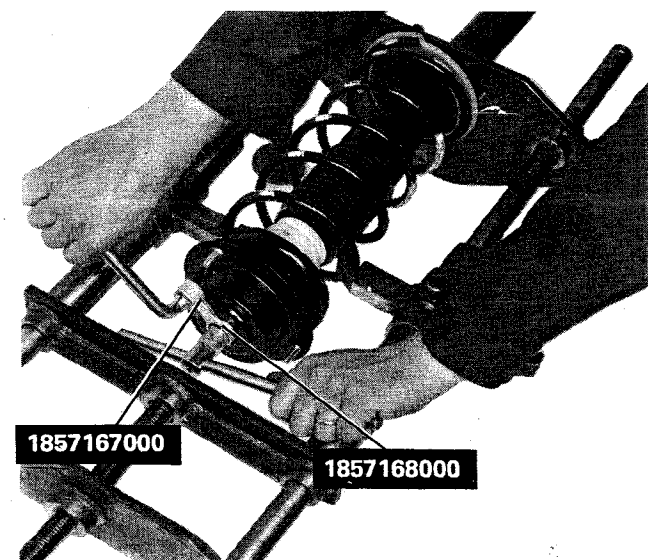


Removing-refitting coil spring and shock absorber assembly



Adjusting support plate adjustment screws

**NOTE:** Before compressing the spring, ensure that the assembly is in the position shown in the diagram and the shock absorber stem is perpendicular to the support plate. This can be achieved by regulating the adjustment screws shown by the arrows.



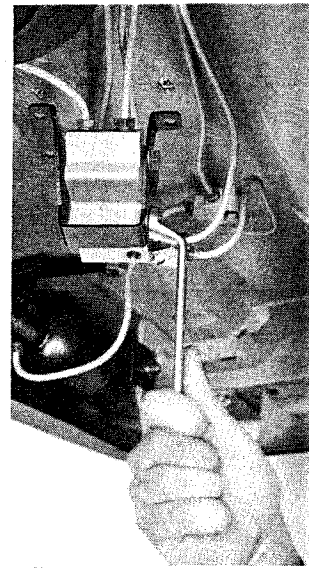
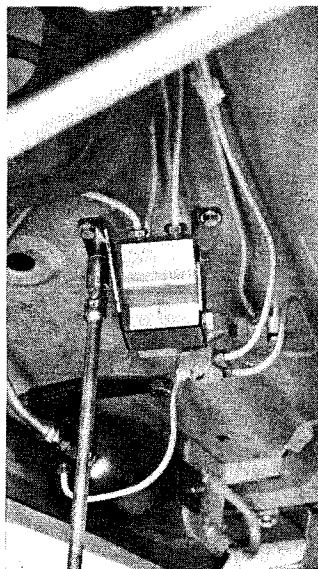
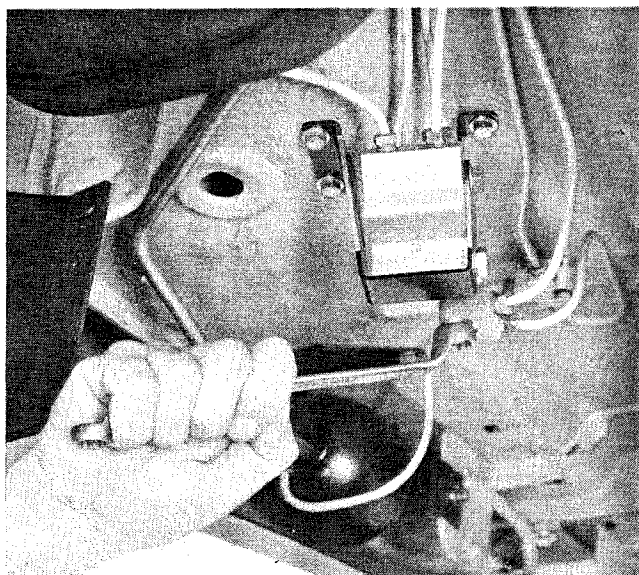
Removing nut securing shock absorber stem

### LOAD PROPORTIONING VALVE

#### Removing-refitting self-levelling system pipes from/to load proportioning valve



*Before unscrewing the pipe unions, bleed off the pressure in the self-levelling system via the bleed screw on the load proportioning valve.*



#### Removing-refitting load proportioning valve securing bracket

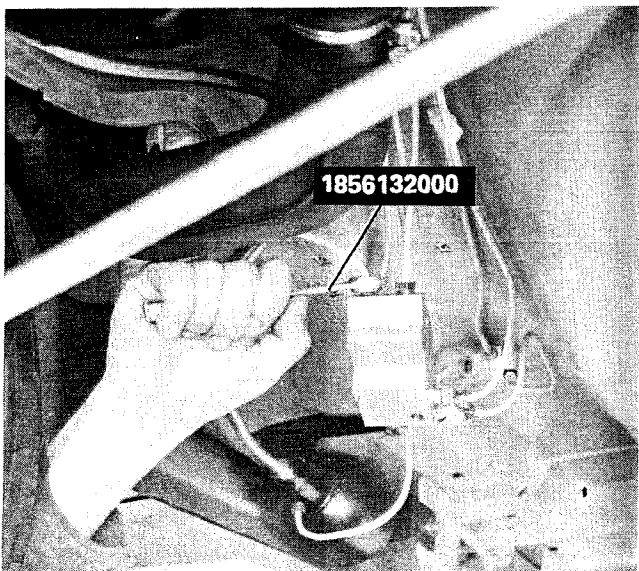
#### Removing-refitting load proportioning valve itself



*The unions connecting the various pipes to the load proportioning valve measure 11 mm and 13 mm respectively; use spanner 1856132000 for the former and an ordinary spanner for the 13 mm unions, taking great care not to damage the unions.*

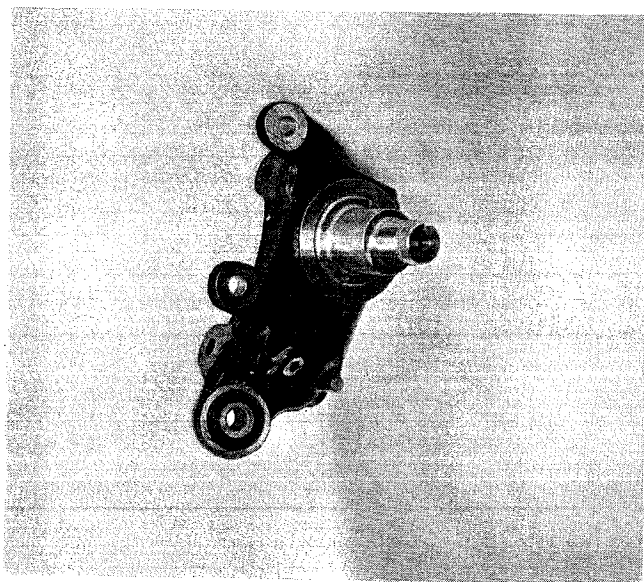


*Bleed braking system*



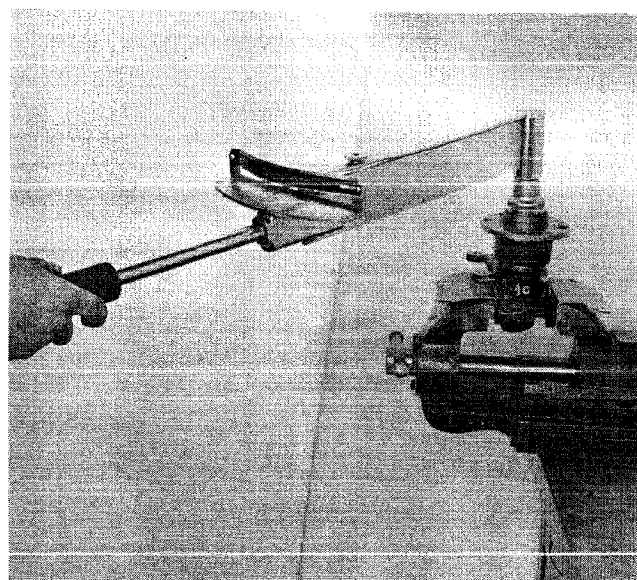


### 44.



**STUB AXLE**

The stub axle should not show any signs of cracks, distortions or wear, or it must be replaced.

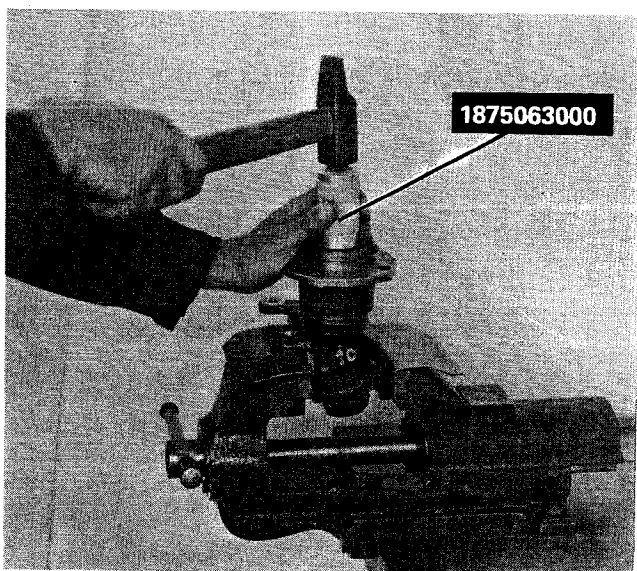


82 08N

**Fitting wheel hub retaining nut and tightening to torque**



*Whenever the hub nut is removed, it must be replaced with a new one.*



**Staking hub nut**



**FILLING UP THE SYSTEM AND CHECKING THE OIL LEVEL**

**NOTE:** *Filling up the system and checking the oil level should be done with the vehicle in running order (ie carrying spare wheel etc) but with no one inside it.*

Fill the reservoir up with oil to the MAX. mark. Then start up the engine and finish filling with oil until the level is between the MIN and MAX marks on the reservoir.

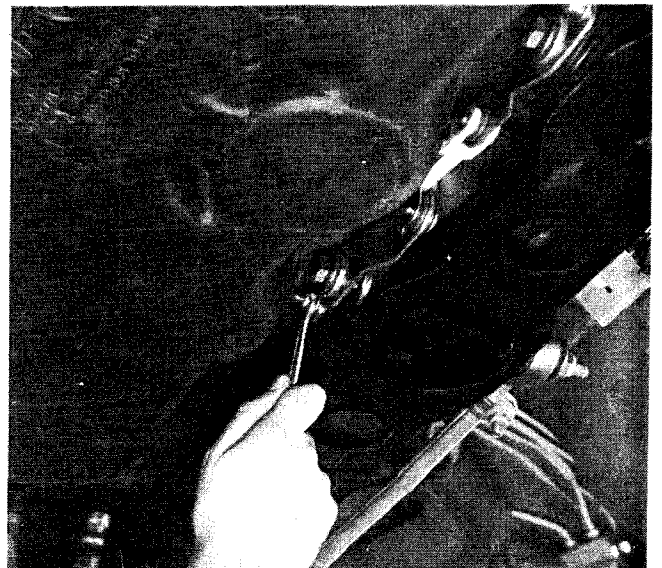
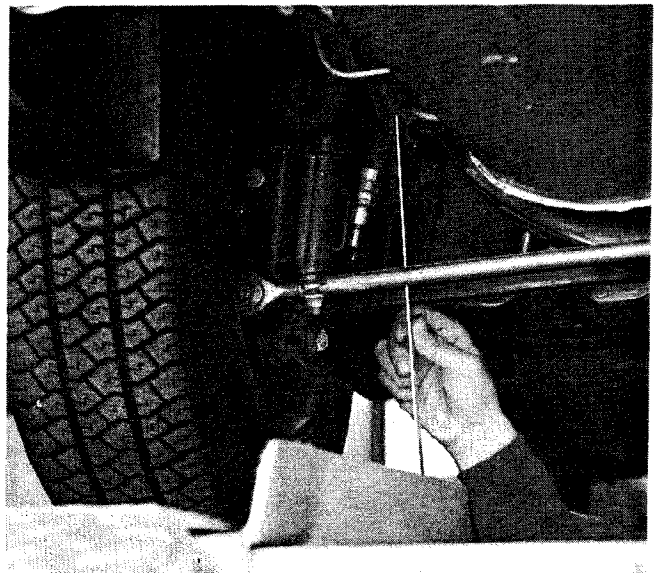
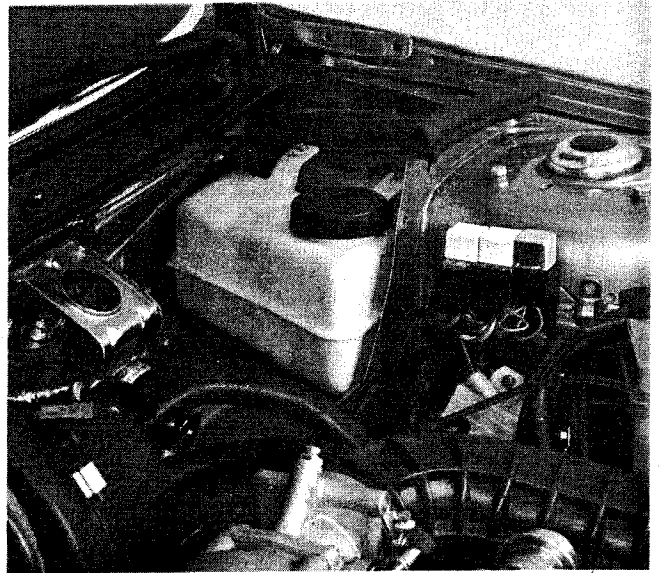
**CHECKING HEIGHT OF CAR ON REAR AXLE AND IF NECESSARY ADJUSTING**

Prepare the car with a load of 145 kg on the rear seats.

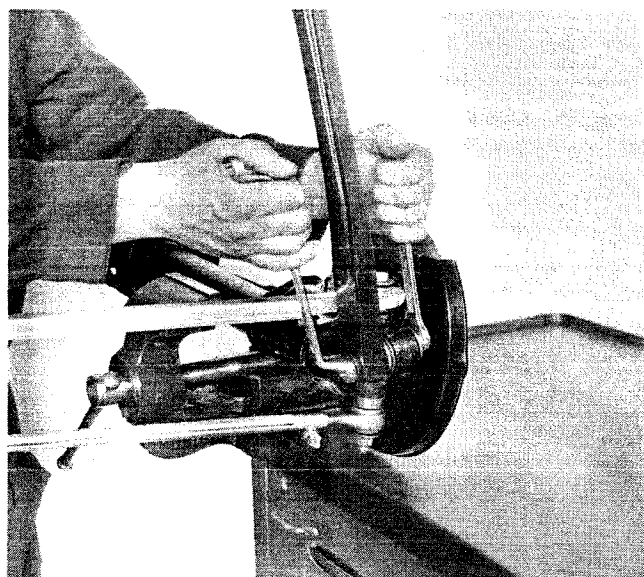
Then start up the engine, wait until the attitude of the car has settled down to a stable level and check that the height off the ground of the rear crossmember bearing surface to the body shell is  $338 \pm 3$  mm.

If this does not prove to be the case, proceed as follows:

- loosen the bolt securing the connector to the righthand transverse rod;

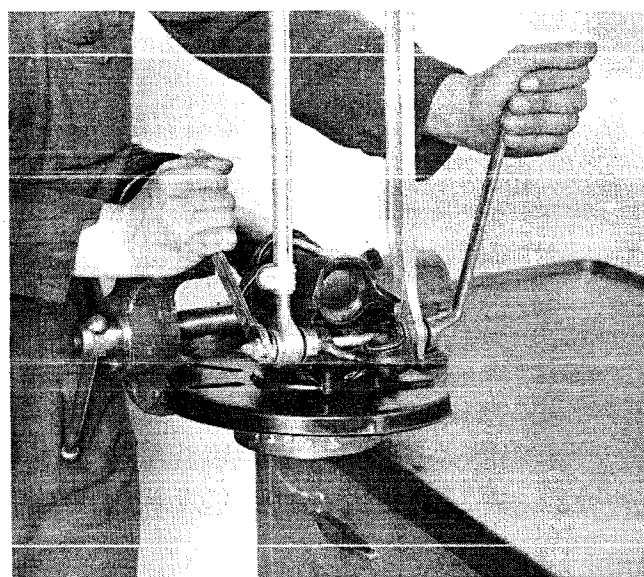


44.

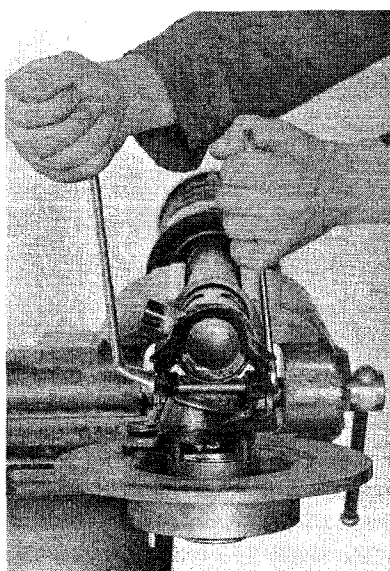
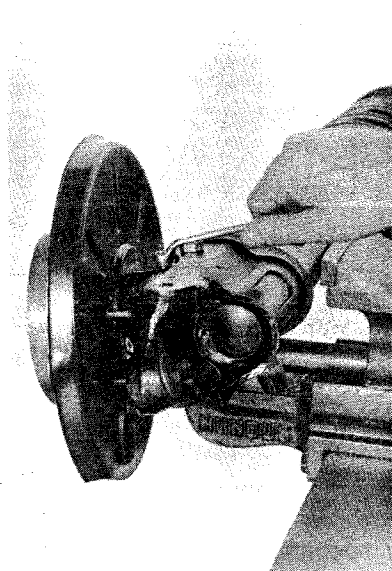


REMOVING-REFITTING

Removing-refitting longitudinal rod from/to stub axle



Removing-refitting transverse rods from/to stub axle



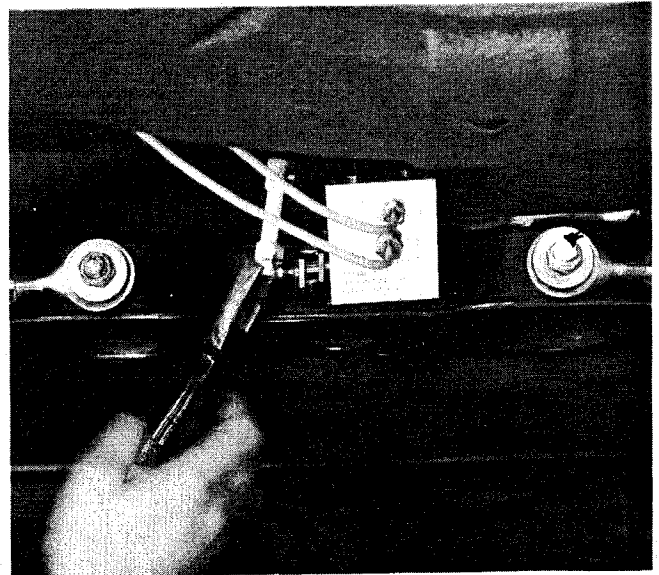
Removing-refitting shield and shock absorber assembly from/to stub axle

**CHECKING THE HEIGHT ADJUSTER AND PUMP**

Checking that the height adjuster and pump are working properly is done by carrying out the following tests:

- a. upwards adjustment, measuring the maximum pressure and the flow of the pump under pressure;
- b. downwards adjustment and measuring the minimum pressure.

**NOTE:** *In order to carry out these tests the car should be prepared with a load of 145 kg on the rear seats and the operations illustrated below carried out.*

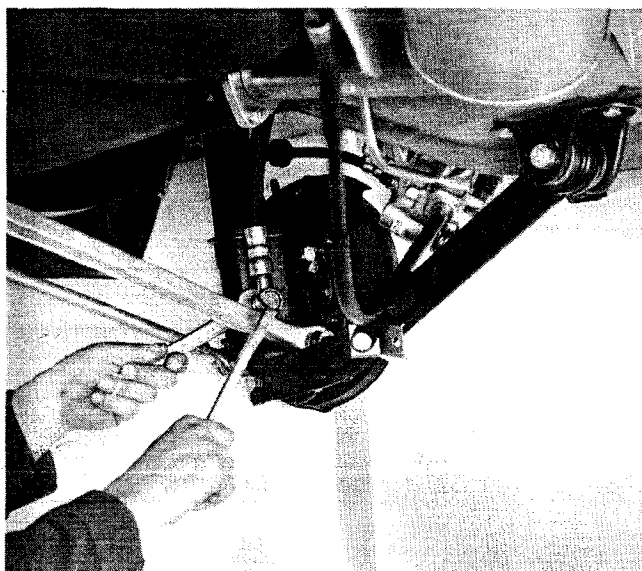


Disconnect the small connecting rod from the height adjuster lever.



Drain off the pressure in the system via the bleed screw on the load proportioning valve.

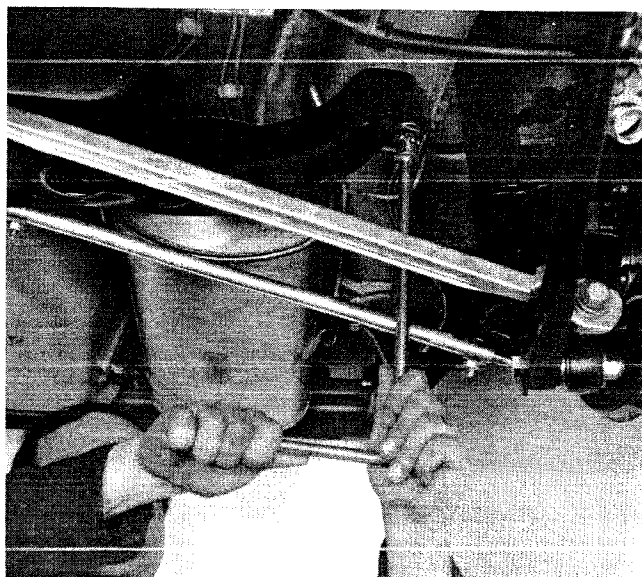
### 44.



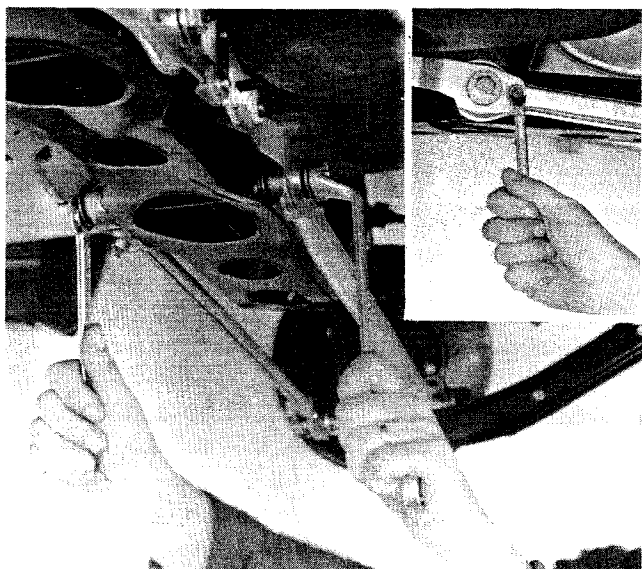
**Removing flexible pipe from shock absorber (only for cars fitted with self-levelling rear suspension)**



*Before unscrewing the flexible pipe union, bleed off the pressure from the self-levelling system by means of the bleed screw on the load proportioning valve.*



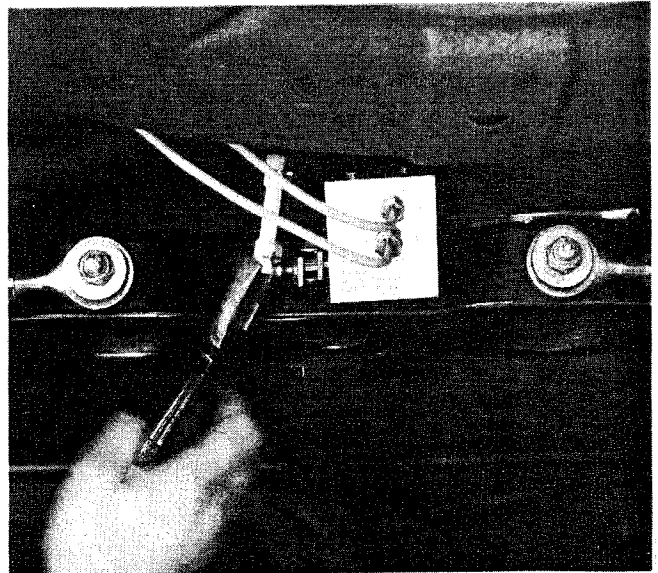
**Removing bolts securing crossmember and lowering crossmember in order to allow the transverse rods to be removed**



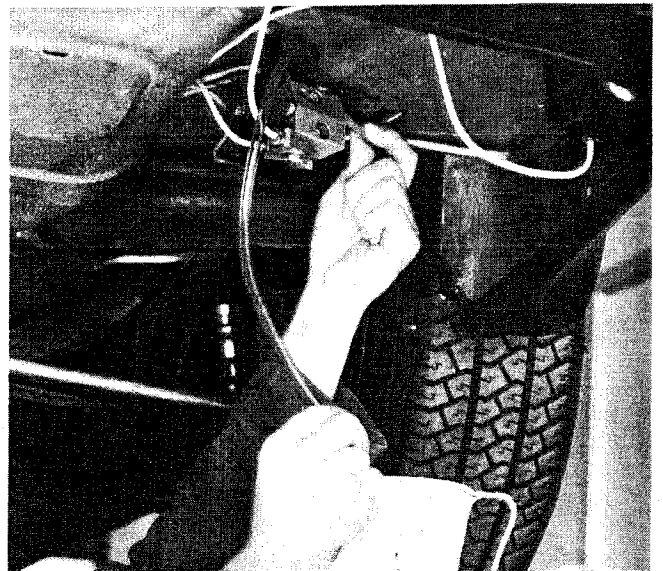
**Removing transverse rods and nut securing connector to front rod**

**CHECKING DOWNWARDS ADJUSTMENT AND MEASURING MINIMUM PRESSURE**

Replace the pressure gauge used in the preceding test with one which has a scale going up to 25 bar (included in kit 1896506000) then start up the engine and move the height adjuster lever to the downwards adjustment position. Under these circumstances the level of the car will fall below normal and the pressure gauge should indicate a minimum pressure of  $24 \pm 2$  bar. If this is not the case replace the height adjuster.

**CHECKING WHETHER THE HYDRAULIC ACCUMULATORS ARE WORKING PROPERLY**

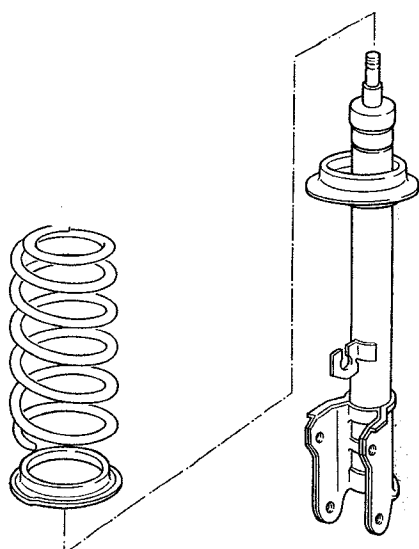
Disconnect the small connecting rod from the height adjustment lever.



Drain off the pressure from the system using the bleed screw on the load proportioning valve.

## Front suspension

44.



### Shock absorber

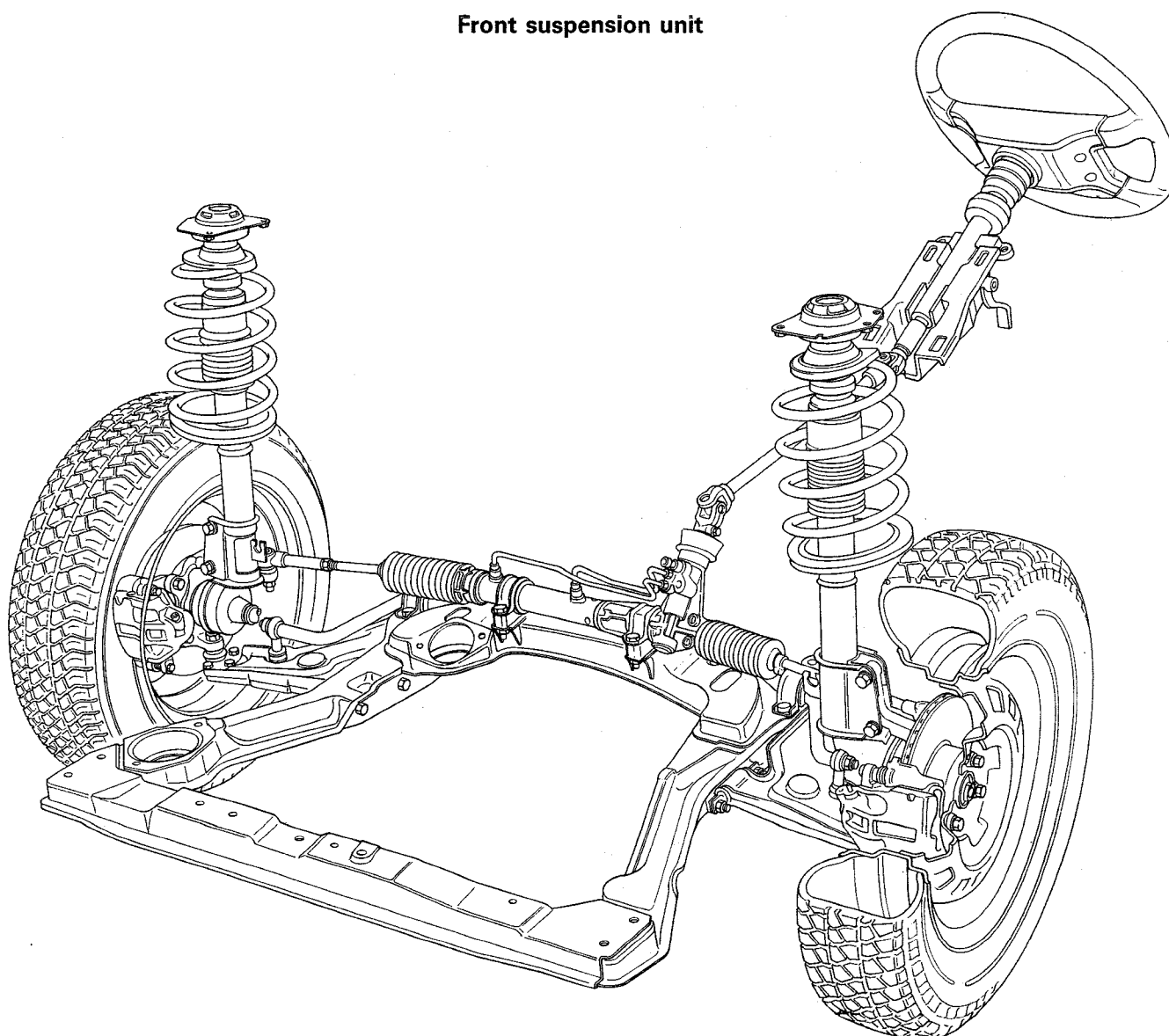
If any faults are found which are attributable to the shock absorber, it must always be replaced as a complete unit.

### Coil spring

Make sure that it is not cracked or distorted in such a way as might adversely affect its efficiency.

**NOTE:** The coil springs are sub-divided into two categories, identifiable by a yellow or green paint stripe on the central coil. Springs of the same category must be fitted.

### Front suspension unit

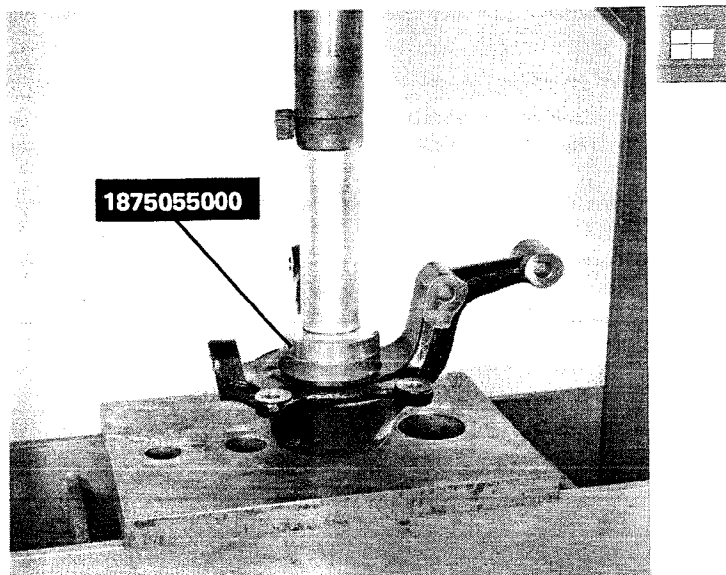


### FAULT DIAGNOSIS FOR THE SELF-LEVELLING SYSTEM

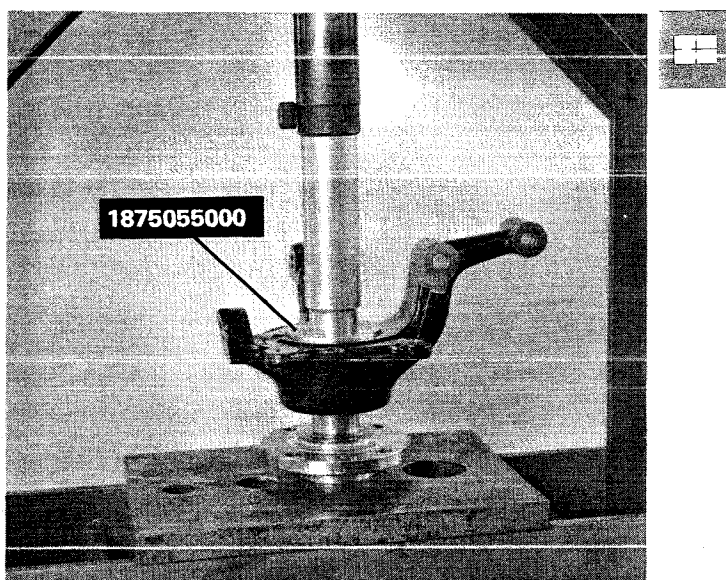
Faults	Causes	Remedies
Height of car wrongly adjusted	Height adjuster control device faulty Height adjuster control device loose Height adjuster control device not properly adjusted	Replace control device Check that device is in right position and tighten it Put control device back in right position
Upwards adjustment not working	Insufficient oil level Insufficient pump pressure Height adjuster control device faulty Height adjuster control device loose Height adjuster control device not properly adjusted Adjustment nozzle in height adjuster obstructed	Check that there are no leaks and top up to right level Check minimum pressure, maximum pressure and flow rate of pump under pressure Replace control device Check that device is in right position and tighten it Put control device back in right position Replace height adjuster
Upwards adjustment not working with car laden	Vehicle overloaded Pressure setting of excess pressure valve too low	Reduce load on rear axle to maximum permissible value Replace height adjuster
Downwards adjustment not working	Height adjuster control device faulty Height adjuster control device loose Height adjuster control device not adjusted properly Adjustment nozzle or circulation inside the height adjuster obstructed	Replace control device Check that device is in right position and tighten it Put control device back in right position Replace height adjuster



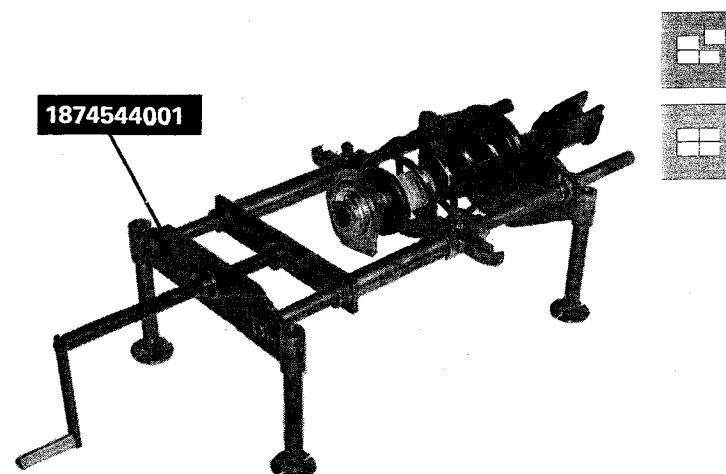
44.



Fitting bearing in steering knuckle on the press



Fitting hub in bearing in steering knuckle



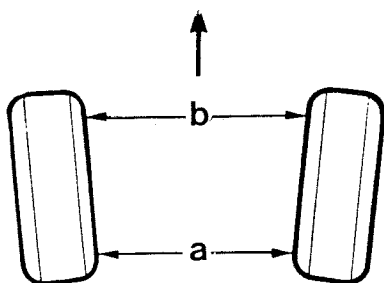
COIL SPRING AND SHOCK ABSORBER ASSEMBLY

Removing-refitting coil spring and shock absorber assembly

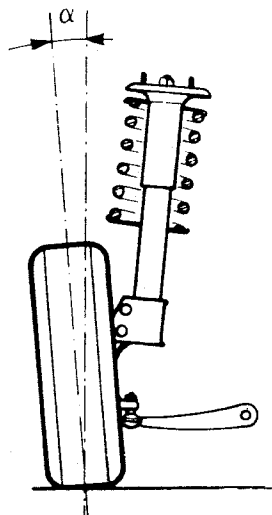
## FRONT WHEEL GEOMETRY

The wheel geometry must be checked after having subjected the components involved to the following checks:

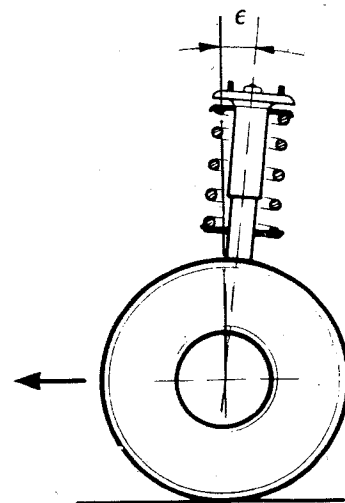
- tyre inflation pressure;
- the eccentricity and squareness of the wheel rims must not be more than 3 mm;
- wheel bearing end float;
- clearance between steering knuckle and suspension arm ball joint;
- steering rod ball joint clearance.



toe-in  $a - b = -1 \div 1 \text{ mm}$

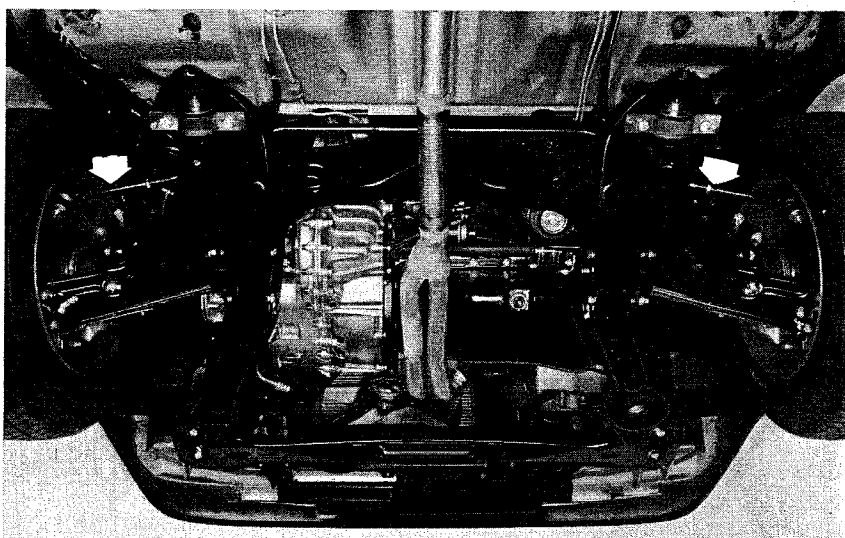


camber  $\alpha = -40' \div 0'$   
(not adjustable)



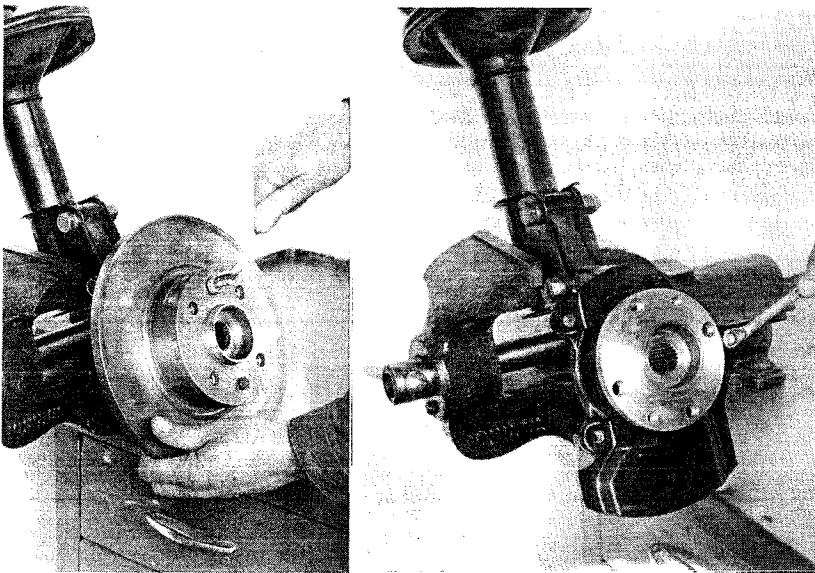
castor  $\epsilon = 1^\circ \div 1^\circ 40' \Delta$   
 $2^\circ 30' \div 3^\circ 10' \star$   
(not adjustable)

- $\Delta$  cars with mechanical steering
- $\star$  cars with power assisted steering

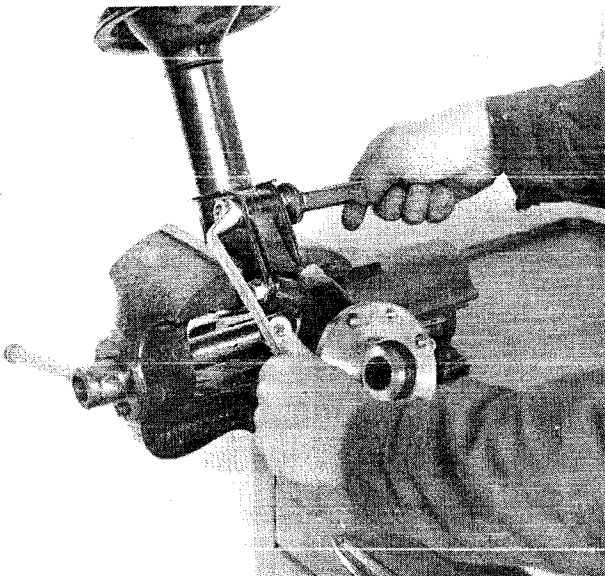


If, when checking the toe-in, different values from the ones given are obtained, adjust the steering box rods after having loosened the fixing nuts

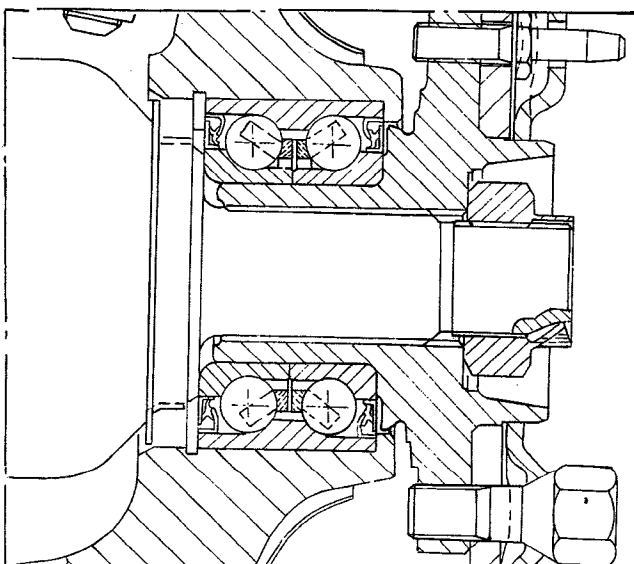
44.



Removing-refitting brake disc and shield



Removing-refitting shock absorber and spring from/to MacPherson strut



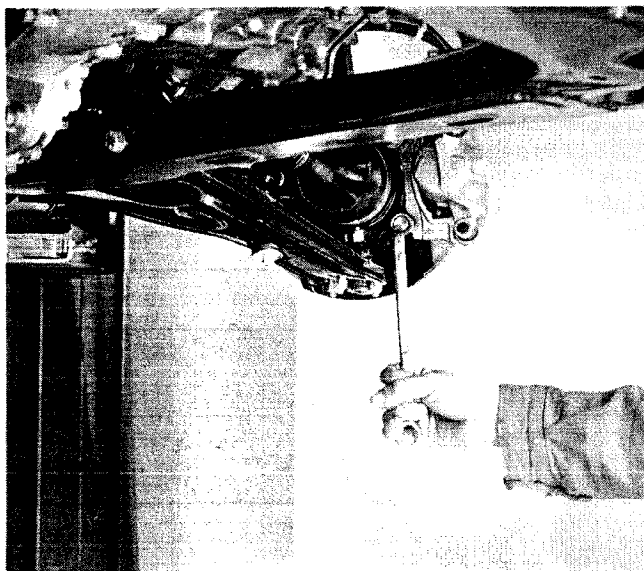
FRONT HUB

Cross section of front hub assembly fitted on vehicle

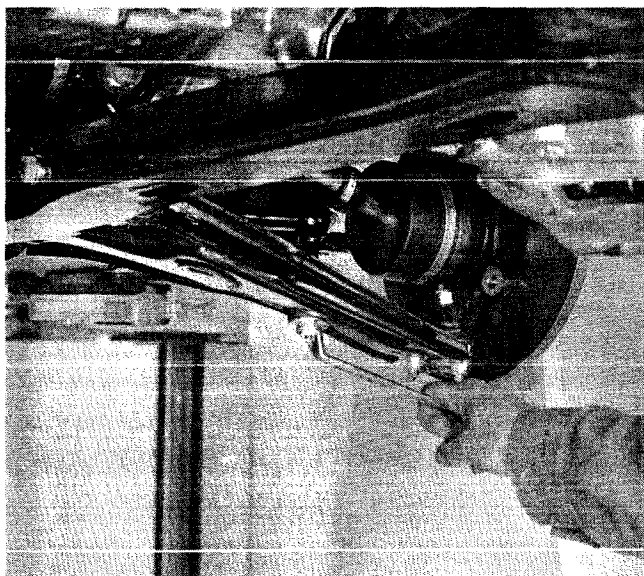
<b>1847035000</b>	Track rod ball joint extractor	<b>1874544031</b>	Pair of parts to be used with 1874544001
<b>1847038000</b>	Extractor for removing ball joint from MacPherson strut	<b>1874544032</b>	Pair of parts to be used with 1874544001
<b>1857167000</b>	(19 mm) spanner for removing nut retaining damper/shock absorber system	<b>1875055000</b>	Tool for inserting front wheel bearing and hub
<b>1857168000</b>	Socket with hexagonal blade for retaining damper/shock absorber stem whilst manipulating nut	<b>1875059000</b>	Drift for fitting rear wheel hub caps
<b>1870296000</b>	Keying tool for removing and refitting flexible bush from/in rear wheel MacPherson strut	<b>1875063000</b>	Tool for staking wheel hub securing nuts
<b>1874544001</b>	Tool for compressing suspension springs	<b>1896506000</b>	Kit for self-levelling rear suspension fault diagnosis
<b>1874544030</b>	Pair of parts to be used with 1874544001	<b>1896506024</b>	* Gauge for checking height adjuster lever position.

\* The gauge forms part of kit 1896506000, but it can also be ordered as a separate item.

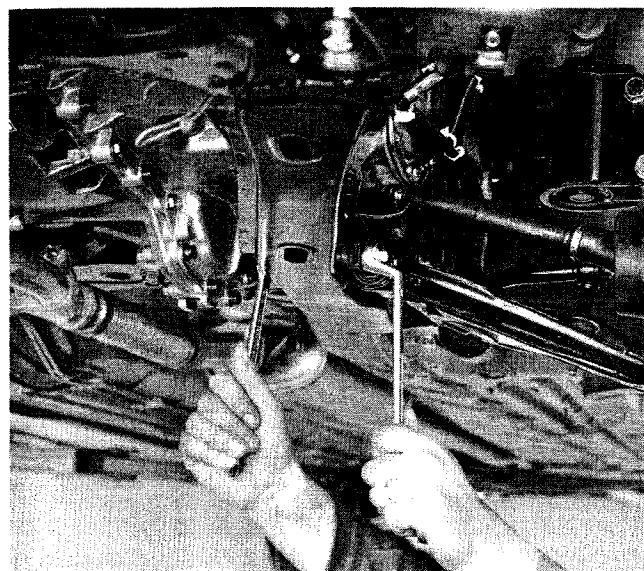
**44.**



**Removing brake caliper from MacPherson strut**



**Removing stabilizer bar from track control arm**



**Removing track control arm from suspension/  
power unit sub-frame (front part)**

DESCRIPTION	Thread size	Tightening torques
		daNm

Bolt for securing shock absorber/damper to MacPherson strut (stub axle)	M 10 x 1,25	5,8
Self-locking nut for securing shock absorber/damper to flexible mounting block	M 14 x 1,5	9
Self-locking nut for securing flexible mounting block to body shell	M 8 x 1,25	1,8
Bolt for securing longitudinal rod for stabilizer bar to MacPherson strut (stub axle)	M 12 x 1,25	10
Bolt for securing stabilizer bar longitudinal rod to mounting for fastening to body shell	M 10 x 1,25	6
Bolt for securing longitudinal rod to stabilizer bar	M 10 x 1,25	6
Bolt for securing longitudinal rod anchoring bracket to body shell	M 10 x 1,25	3,7
Bolt for securing rear crossmember to body shell	M 10 x 1,25	3
Bolt for securing transverse rods and shock absorber/damper to MacPherson strut (stub axle)	M 10 x 1,25	6
Bolt for securing transverse rods to rear crossmember	M 10 x 1,25	6
Bolt for securing front transverse rod adjusting sleeve	M 8 x 1,25	1,5

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