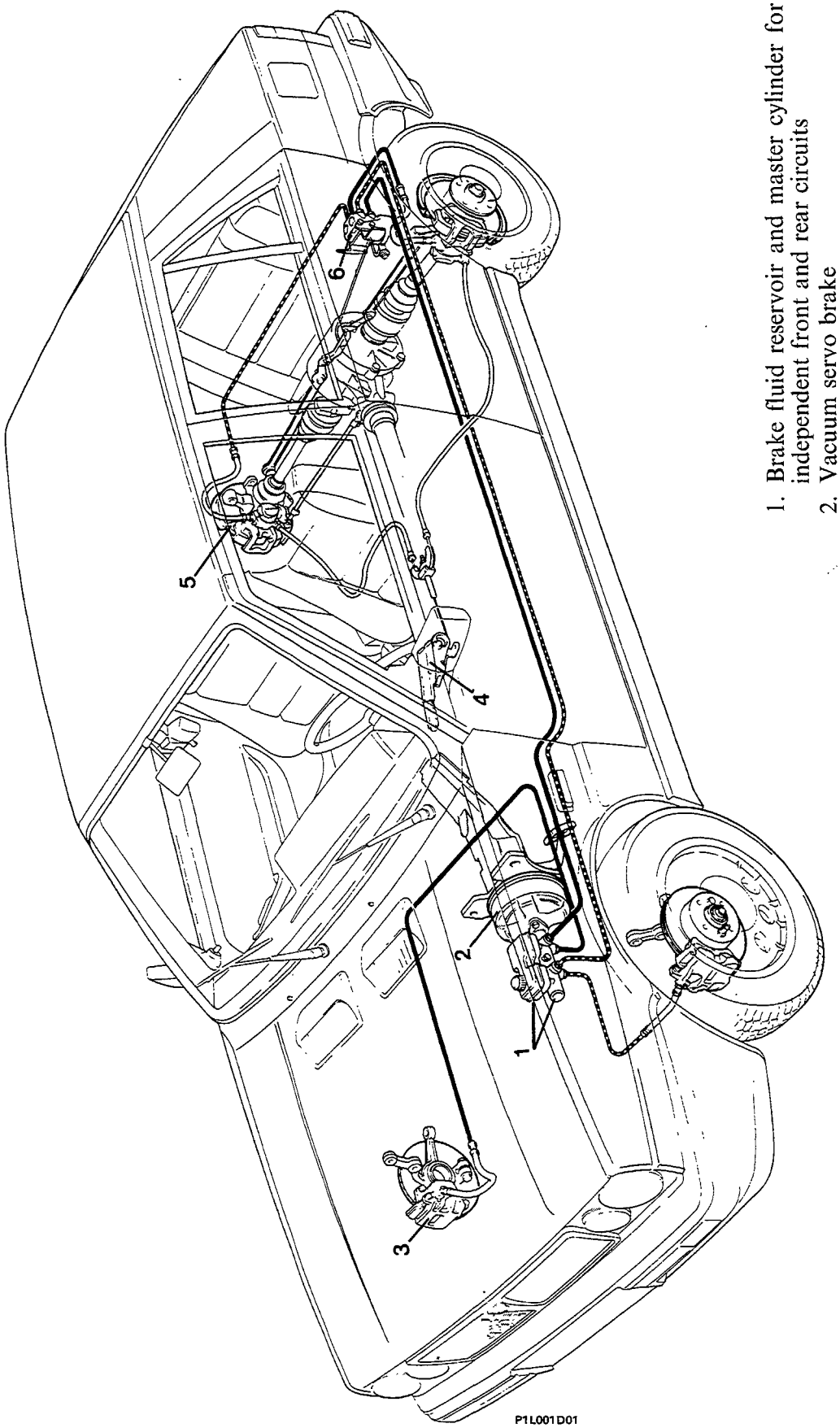
page

DIAGRAM SHOWING HYDRAULIC OPERATION AND MECHANICAL HANDBRAKE FOR THE DELTA 4WD



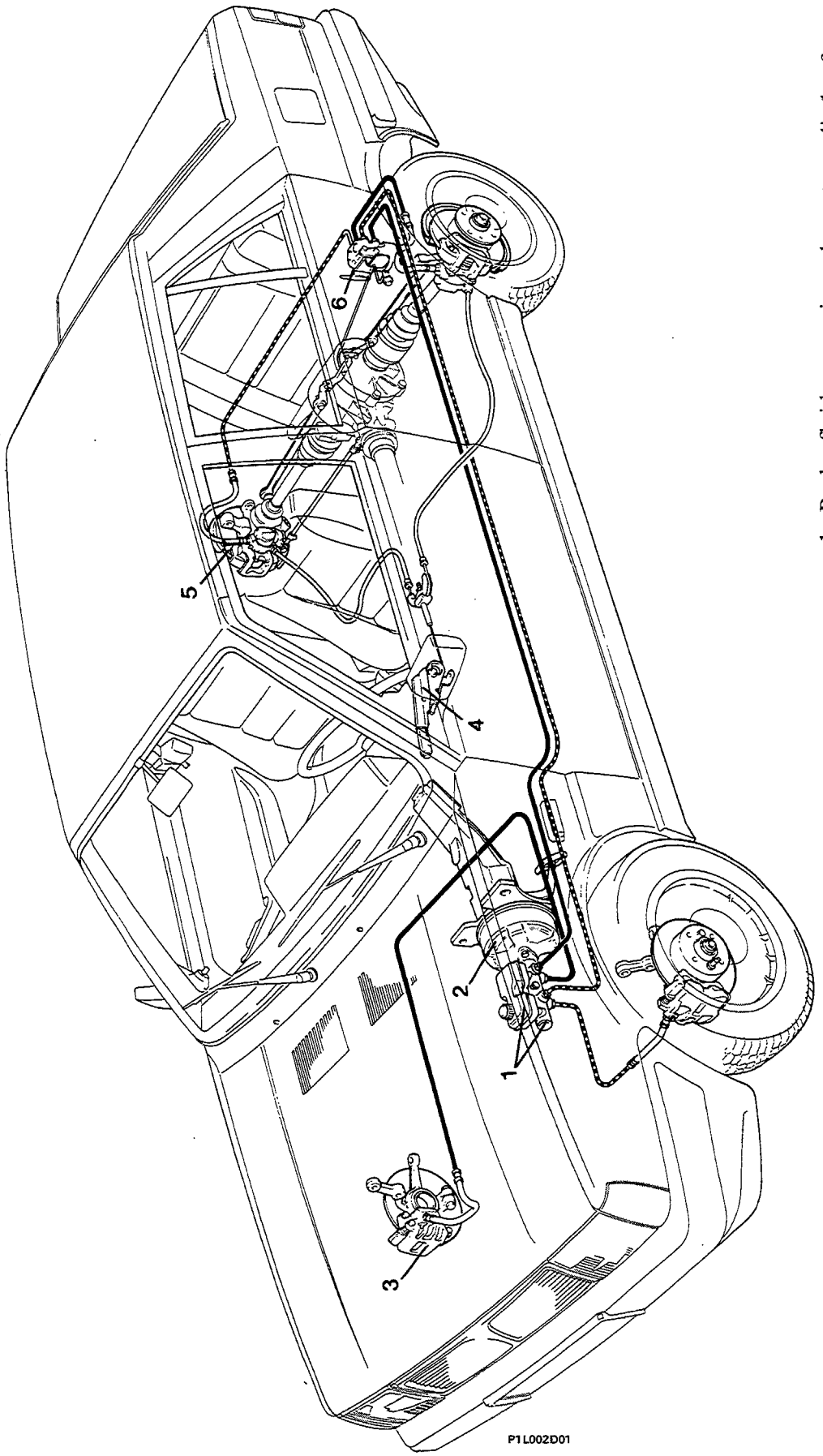
1. Brake fluid reservoir and master cylinder for independent front and rear circuits
2. Vacuum servo brake
3. Front disc brakes
4. Handbrake lever
5. Rear disc brakes
6. Load proportioning valve for rear brakes hydraulic circuit

Hydraulic circuit for right front and left rear brakes

Hydraulic circuit for left front and right rear brakes

33.

DIAGRAM SHOWING HYDRAULIC OPERATION AND MECHANICAL HANDBRAKE FOR PRISMA 4WD



1. Brake fluid reservoir and master cylinder for independent front and rear circuits
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4. Handbrake lever
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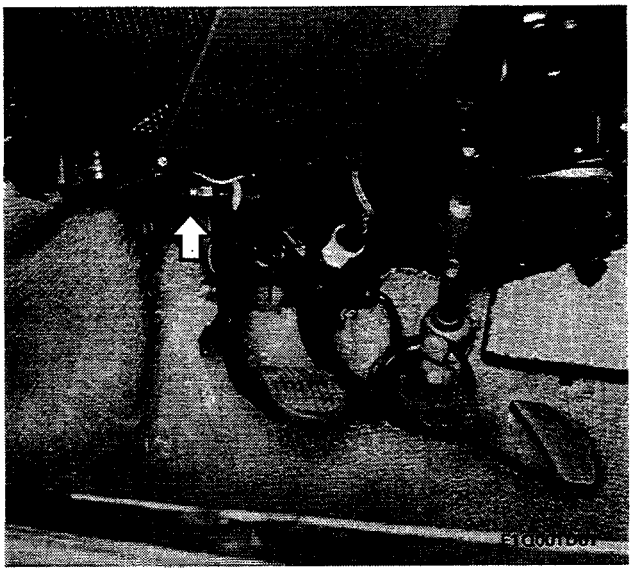
▬ Hydraulic circuit for right front and left rear brakes

▬ ▬ Hydraulic circuit for left front and right rear brakes

PEDAL

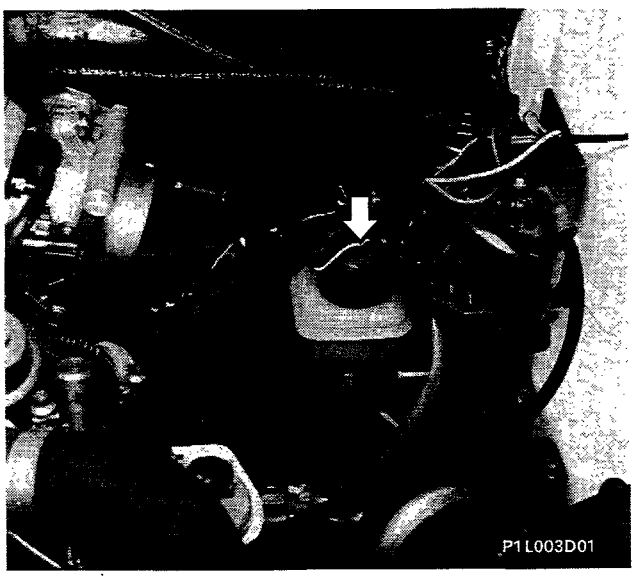


Removing-refitting brake pedal

In order to remove the brake pedal the nut shown by the arrow has to be undone after having previously removed the clutch cable and the pedal.
Remove the pedal mounting pin and release the brake pedal from the servo brake push rod.

the parts concerned with grease before fitting.

BRAKE FLUID RESERVOIR



Checking insufficient brake fluid level warning device

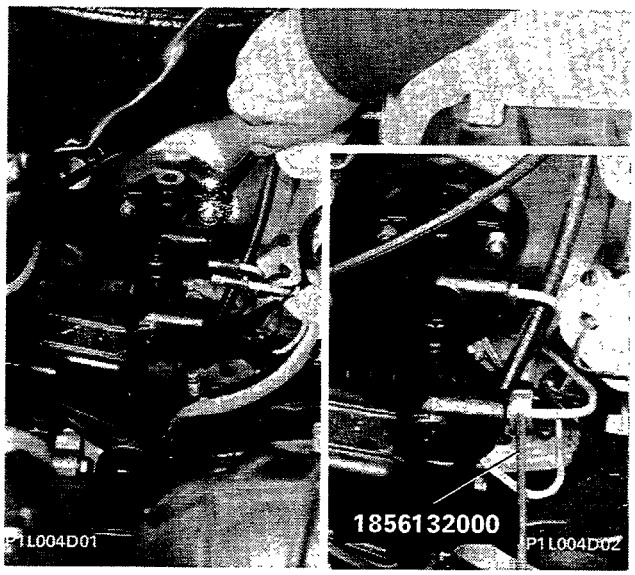
NOTE *Periodically check the operation of the warning device by pressing on the top of the brake fluid reservoir cover (as shown by the arrow); with the ignition switch in the "ON" position the warning light should come on.*

Removing-refitting reservoir from master cylinder

In order to gain access to the reservoir the power assisted steering fluid reservoir and the coil assembly have to be removed.

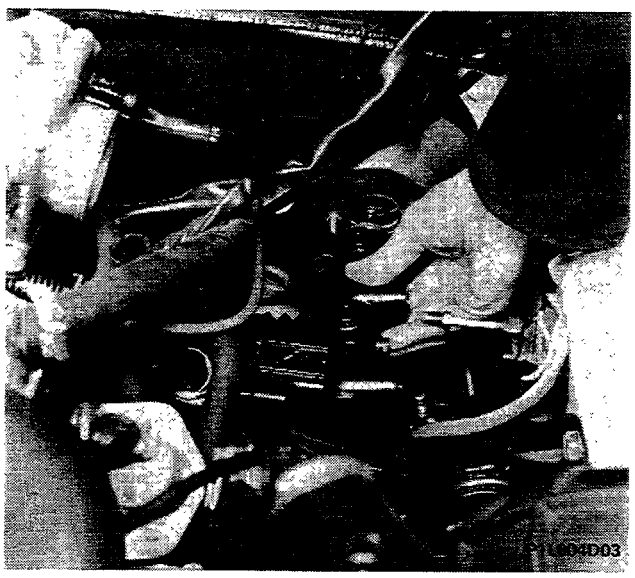
Before removing the reservoir drain the brake fluid.

Bleeding hydraulic system.



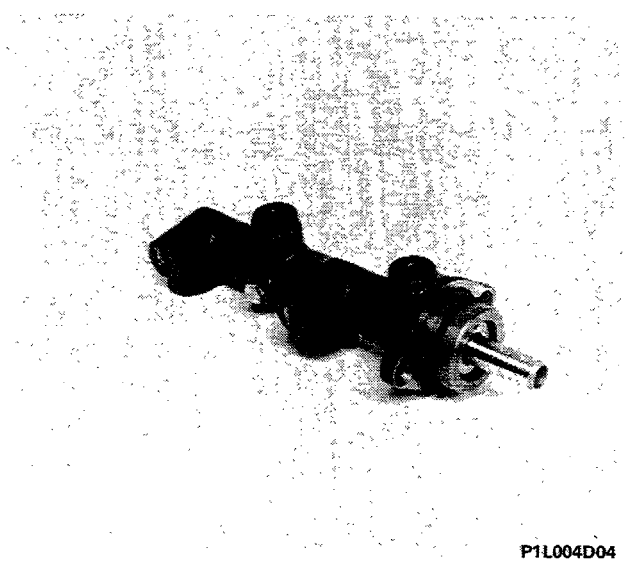
MASTER CYLINDER

Removing-refitting brake pipes and master cylinder

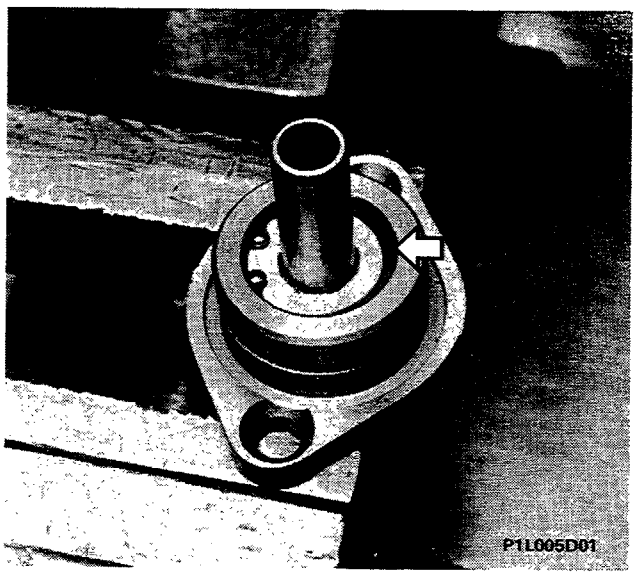


Removing-refitting master cylinder

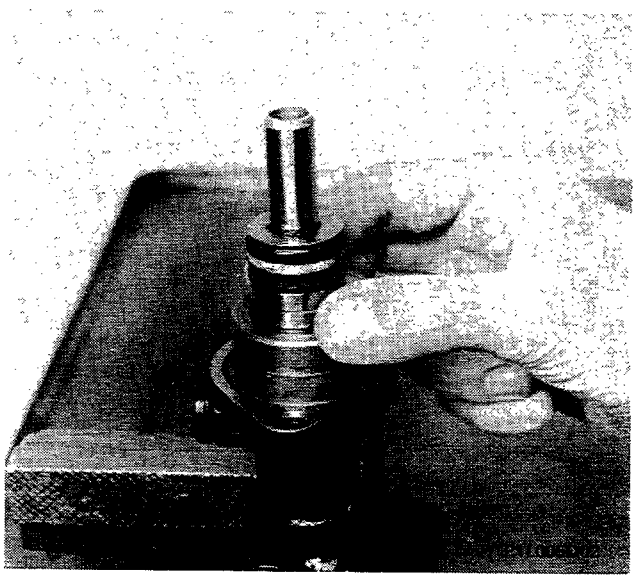
Bleeding braking system



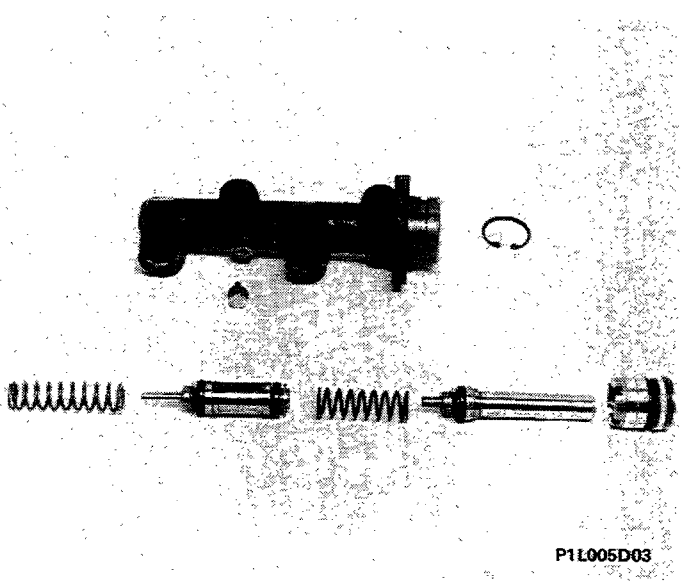
Master cylinder assembly removed from vehicle



Removing-refitting master cylinder internal assembly circlip

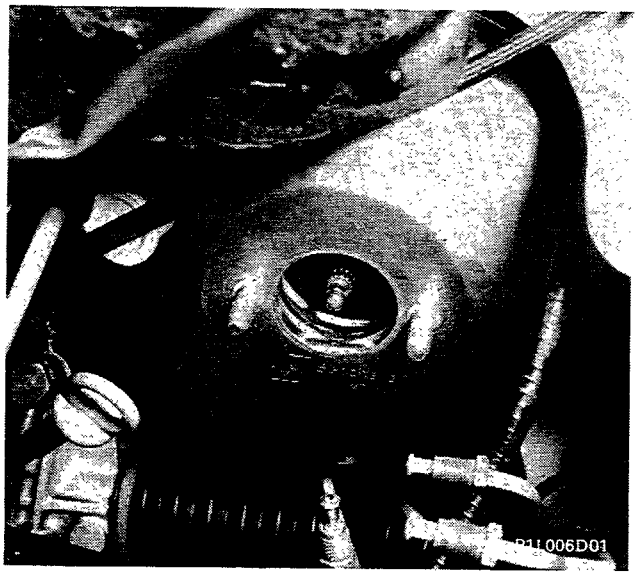


Removing-refitting master cylinder internal assembly



Master cylinder assembly components

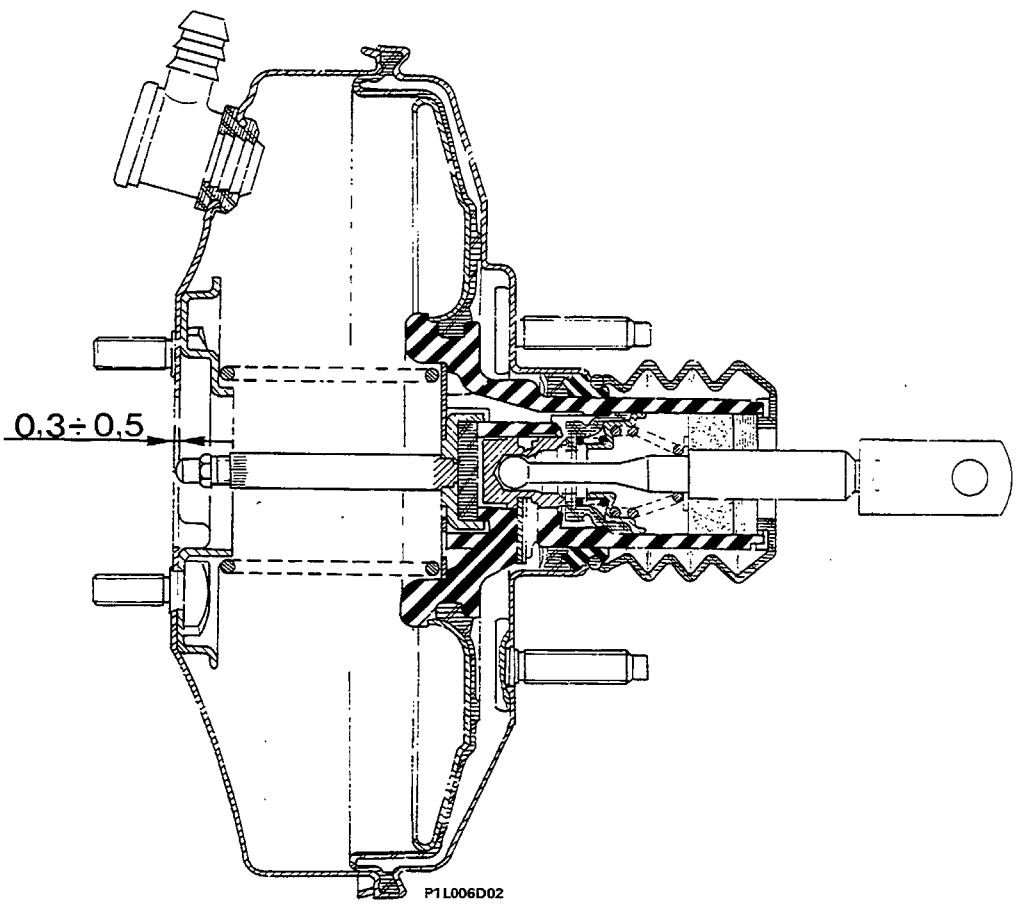
When overhauling, always replace the seals; if any traces of abrasion or seizing are noticed on the master cylinder casing the assembly must be replaced.



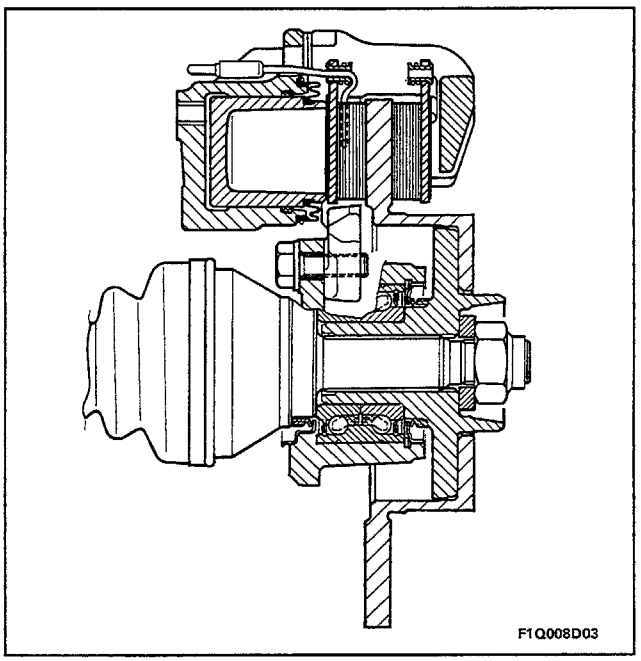
SERVO BRAKE

Servo brake fitted on vehicle

NOTE *The servo brake is adjusted using the adjustment screw at the end of the rod. In the rest position the end of the adjustment screw should be recessed in relation to the plane of the front cover by 0.3 - 0.5 mm.*

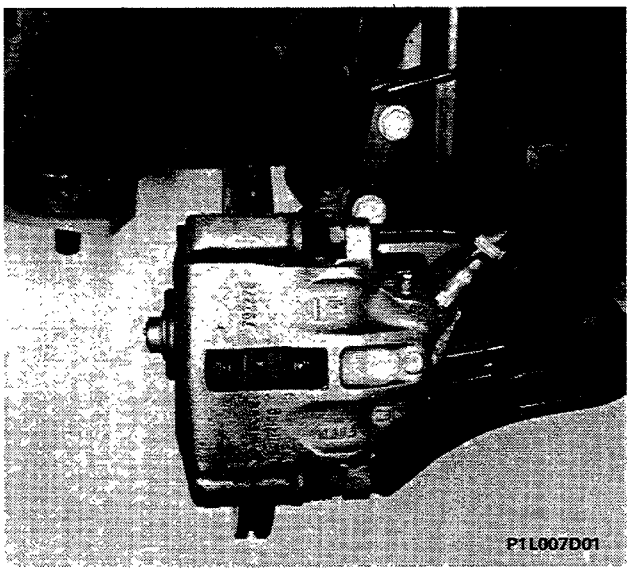


Longitudinal section of servo brake

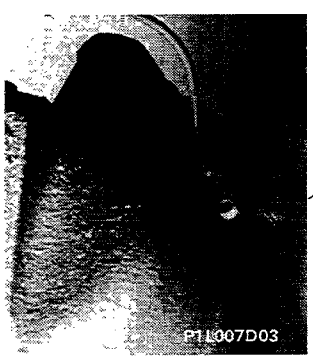


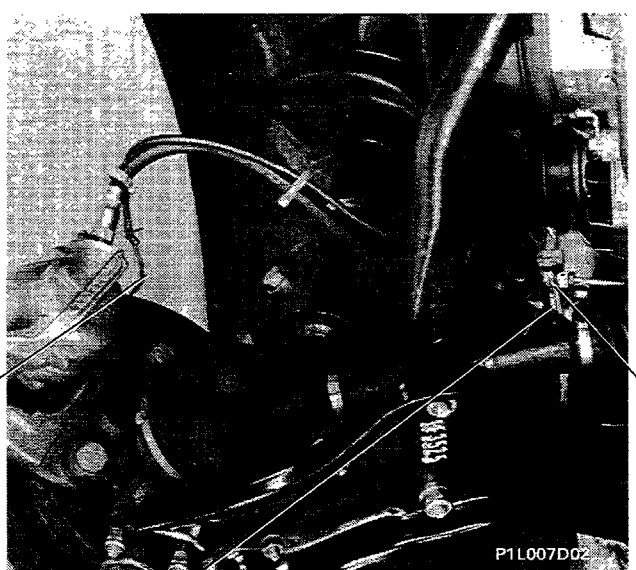
Cross section of front brake caliper and wheel hub

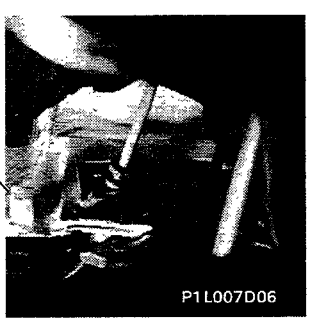
REMOVING-REFITTING



Front brake assembly fitted on vehicle

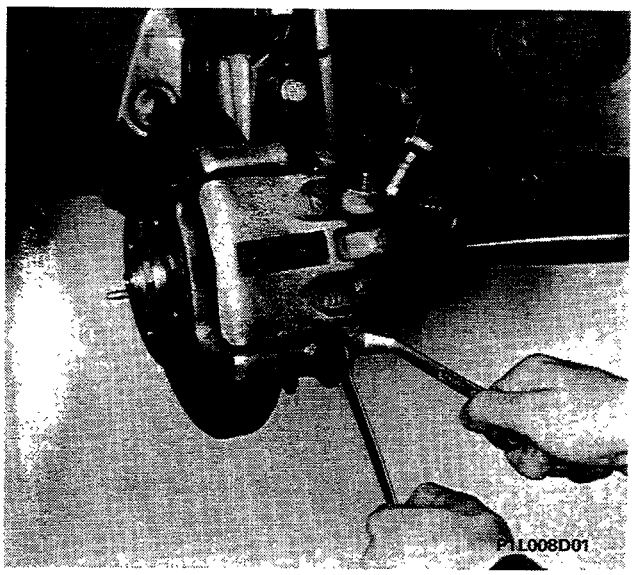






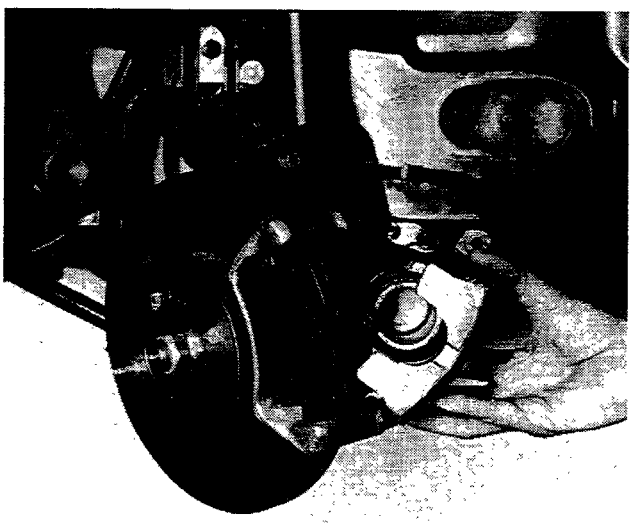
Removing-refitting flexible pipe and electrical connection from brake pad

33.

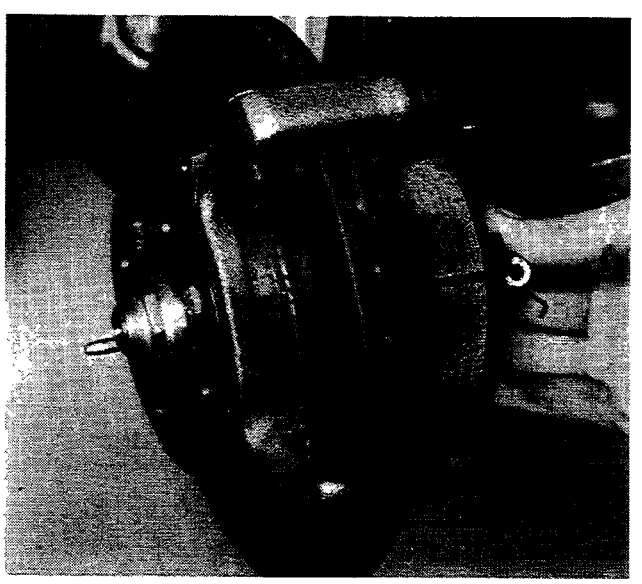


Removing-refitting brake caliper self-locking bolts

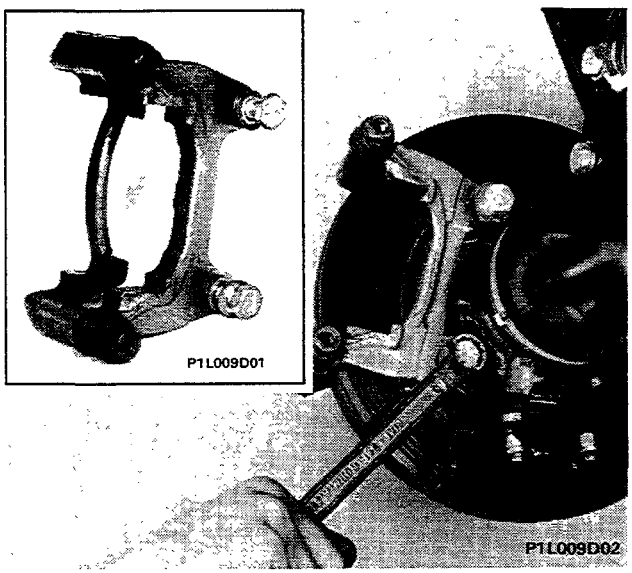
The bolts fixing the brake caliper are self-locking and must always be replaced each time they are loosened or undone.



Removing-refitting brake caliper

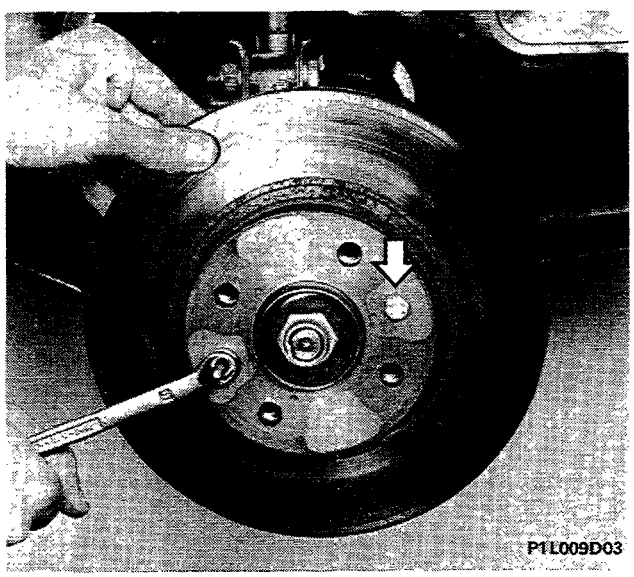


Removing-refitting brake pads

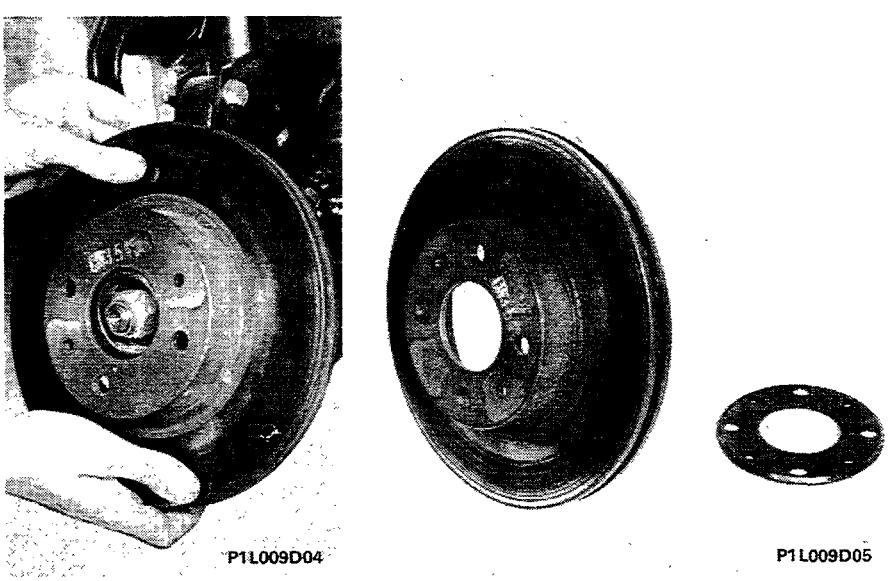


Removing-refitting caliper support bracket

Before refitting the caliper support bracket, check that the rubber boots are intact; if they are not, they must be replaced.

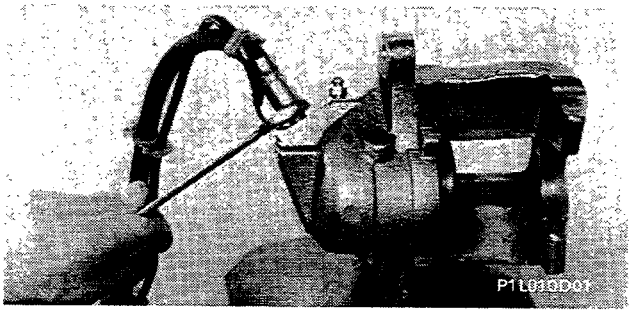


Removing-refitting brake disc fixing bolts

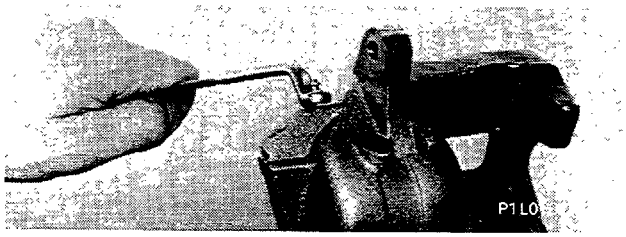


Removing-refitting brake disc

When refitting, remove any possible traces of rust to ensure that the disc is perfectly perpendicular in relation to the hub.

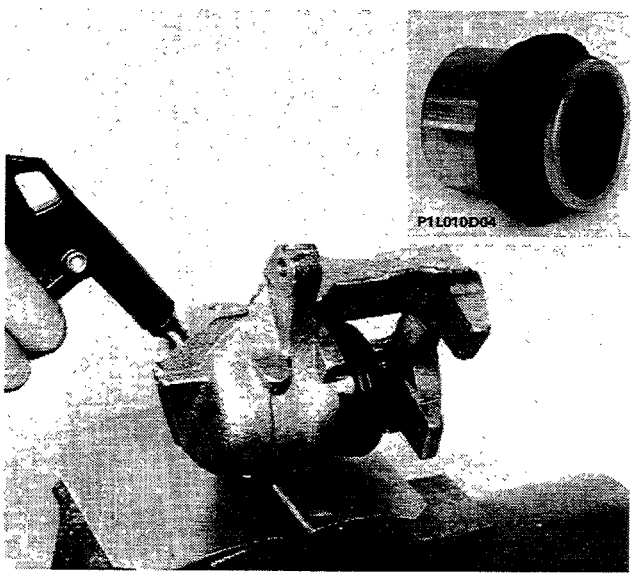


BRAKE CALIPER



Removing-refitting flexible pipe union and bleed screw

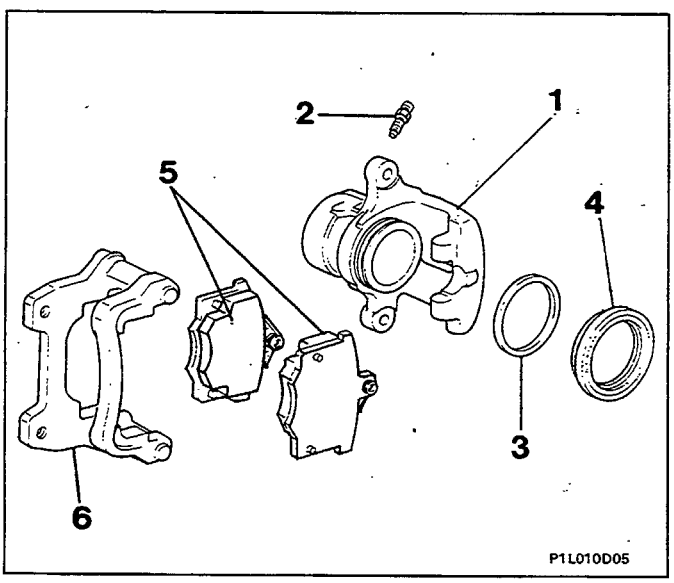
NOTE *The flexible pipe should not show any signs of bulges or cracks or else it must be replaced.*
It is advisable to replace both pipes.



Removing piston and protective boot and checking caliper assembly components

The piston casing is removed by directing a jet of compressed air into the brake fluid inlet opening.
The piston and the caliper casing should not show any signs of abrasion or seizing; if they do, the entire caliper must be replaced.
The protective boot and the seal must be replaced each time also making sure that the bleed screw is not obstructed.

A solution of warm water and FIAT LDC detergent should be used to wash the metal components.



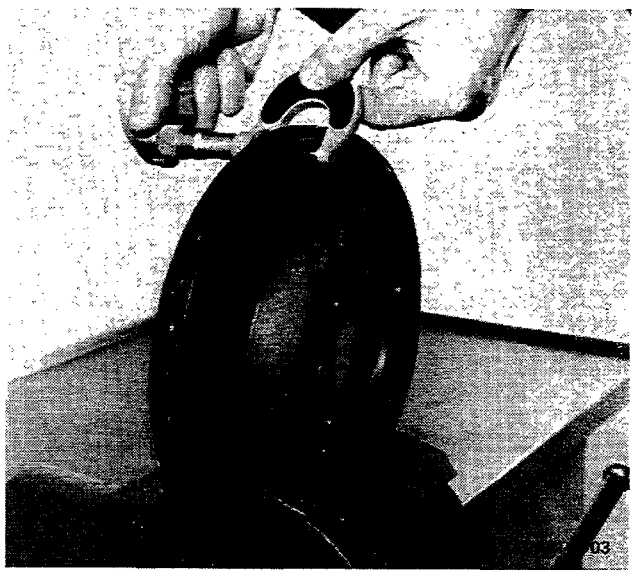
Exploded view of brake caliper

1. Caliper casing
2. Bleed screw
3. Seal
4. Protective boot
5. Brake pads
6. Caliper support bracket

Fitting seal and piston on caliper casing

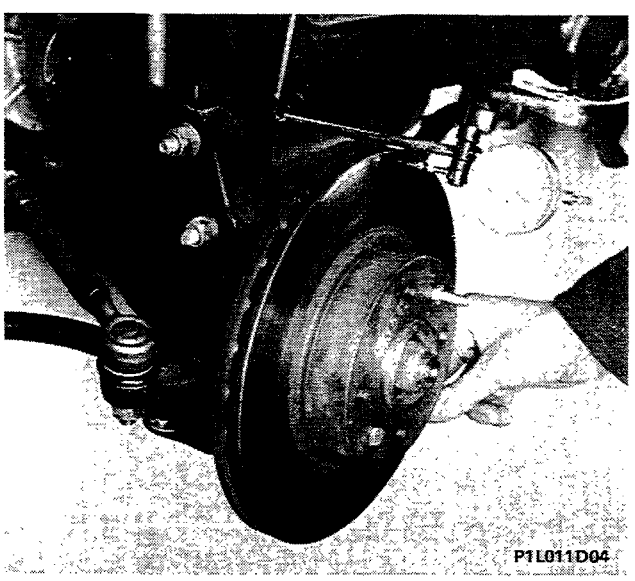
the parts concerned with brake fluid before fitting.

BRAKE DISCS



Checking and measuring disc

The minimum allowable thickness for brake discs due to wear is 10.8 mm for the Prisma 4WD and 18.2 mm for the Delta 4WD; if the brake disc measures less than this then it must be replaced.
In the case of deterioraiton or deep grooves, the surfaces of the brake disc should be refaced using a grinder; when the operation is completed the thickness of the brake disc should not be less than 11.3 mm for the Prisma 4WD and 18.55 for the Delta 4WD.



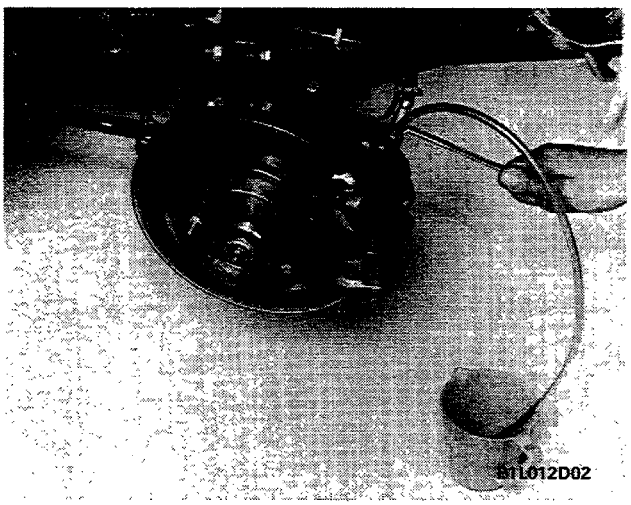
Checking run out of brake disc

If the brake pads have to be replaced, it is advisable to check that the disc is no more than 0.15 mm off centre.
This is measured 2 mm from the external diameter of the disc.

BRAKE PADS

Checking brake pads

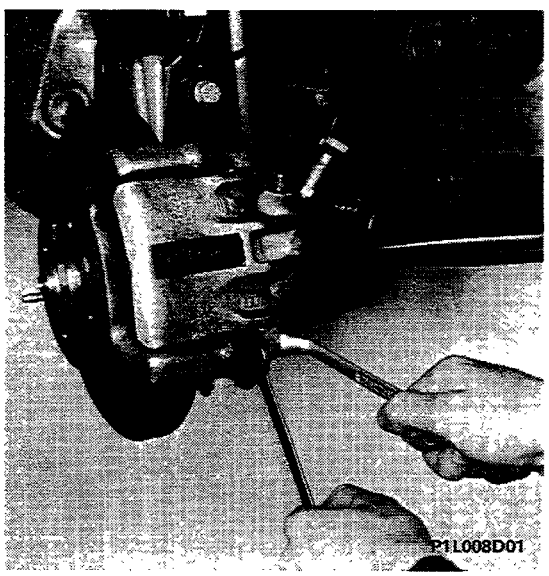
The brake pads must be replaced when the thickness of the lining is less than 1.5 mm.
Check that the same type of pads are fitted on each pair of wheels.



BLEEDING

It is not advisable to reuse the brake fluid collected. The reservoir should be topped up with new brake fluid.

REPLACING BRAKE PADS

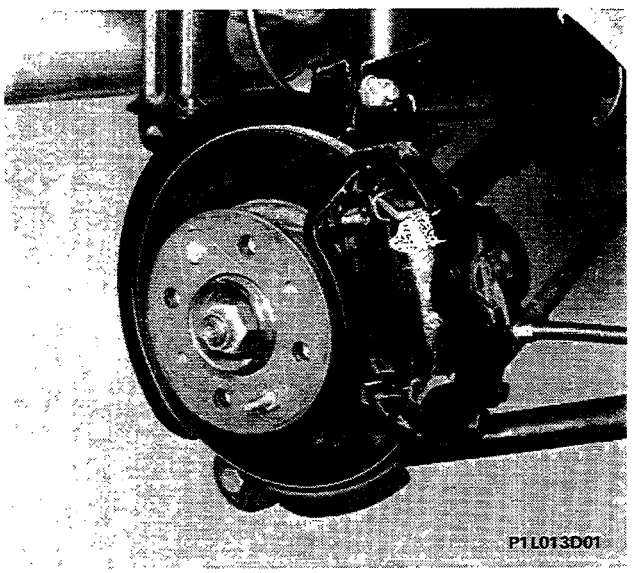


If only the brake pads are being replaced, the flexible pipe does not have to be removed.

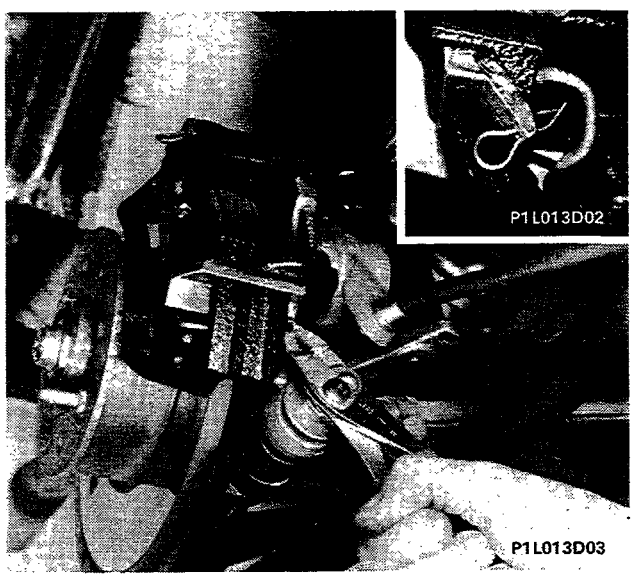
The bolts fixing the caliper casing are self-locking and must always be replaced each time they are loosened or undone.

Bleeding hydraulic system.

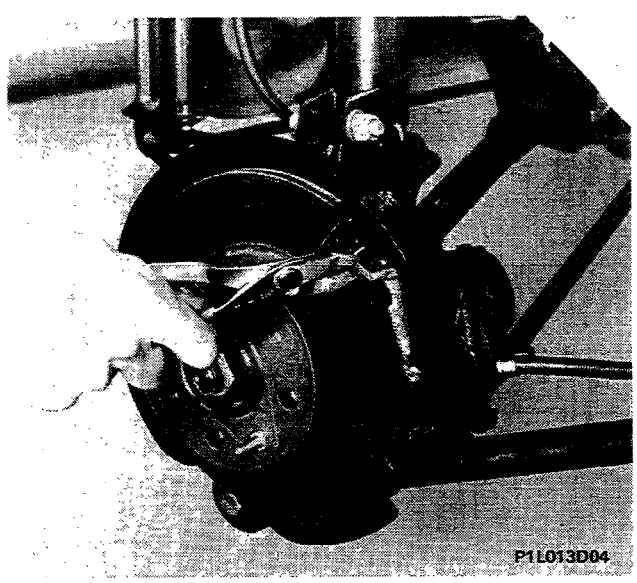
REMOVING-REFITTING



Rear brake assembly fitted on vehicle

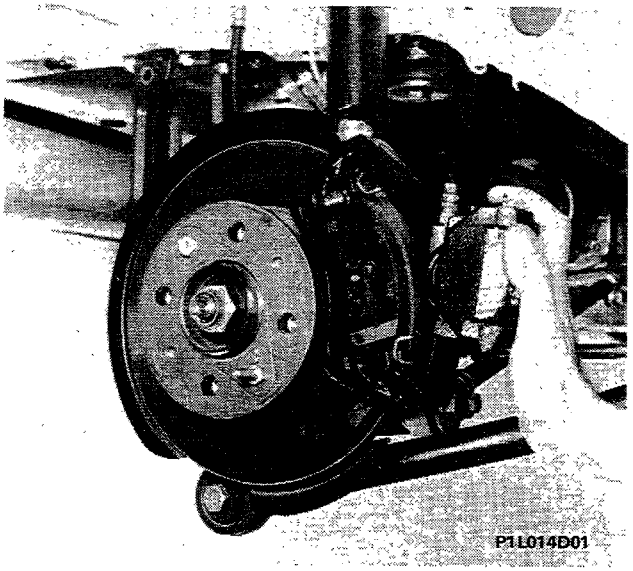


Removing-refitting sliding pad split pins

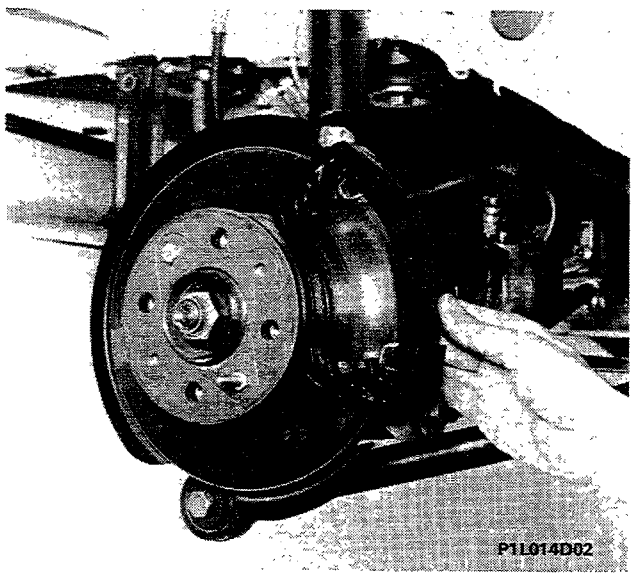


Removing-refitting sliding pads

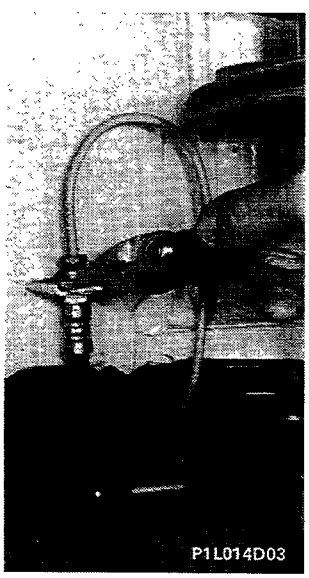
33.

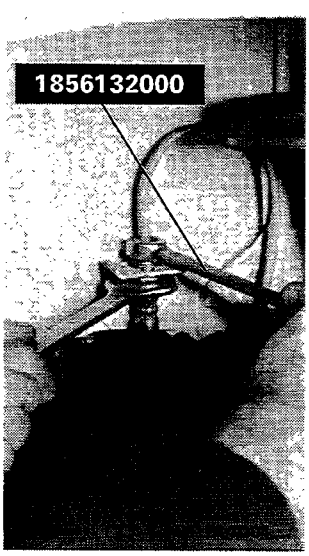


Removing-refitting brake caliper from support bracket



Removing-refitting brake pads



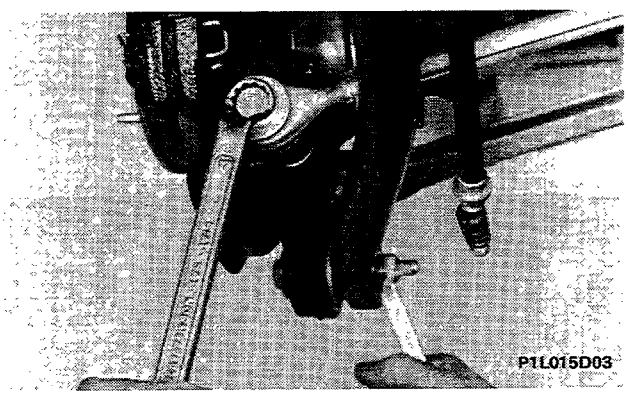


Removing-refitting flexible pipe

If only the brake pads are being replaced then the flexible pipe does not have to be removed.

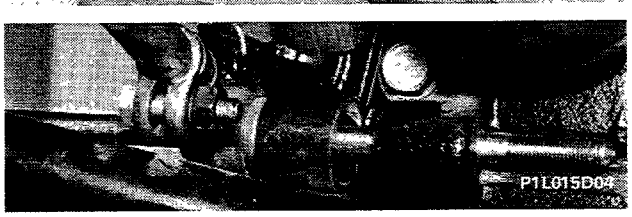
Removing-refitting brake caliper

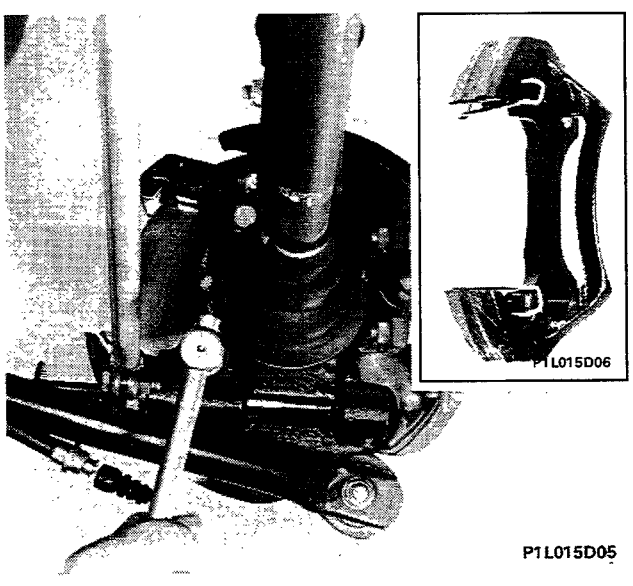
Before proceding to remove-refit the brake caliper, the handbrake cable has to be released from the actual caliper.



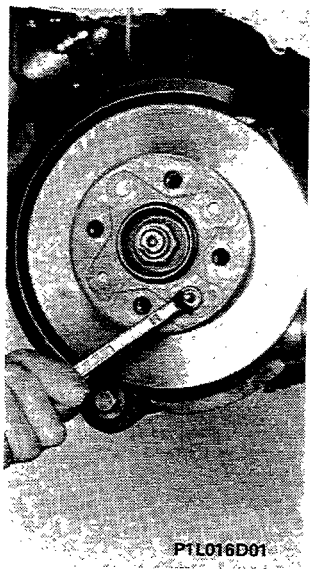
Removing-refitting nut fixing transverse rod

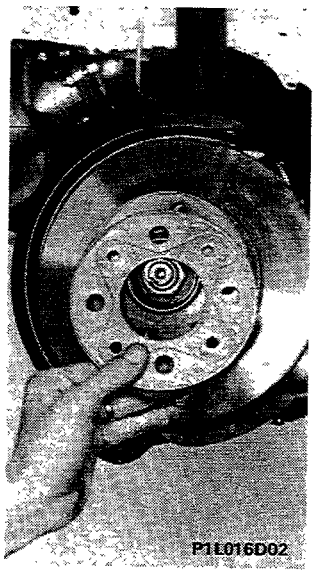
In order to gain access to the caliper support bracket bolts, the nut fixing the transverse rod has to be removed and the rod moved away from the stub axle.

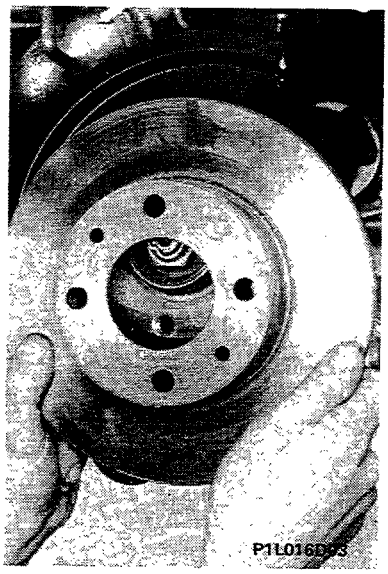




Removing-refitting brake caliper support bracket





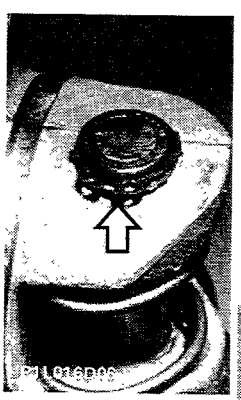


Removing-refitting brake disc from hub

When refitting, remove any possible traces of rust to ensure that the disc is perfectly perpendicular in relation to the hub.

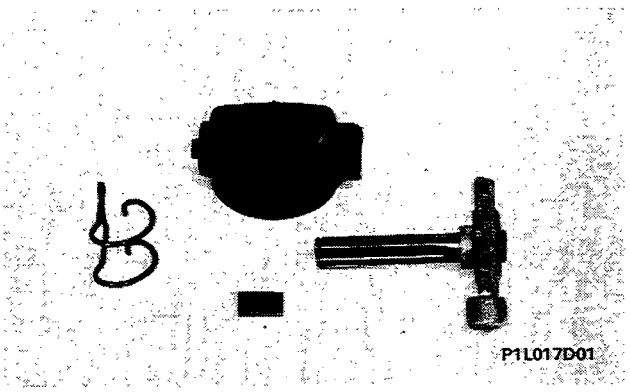
BRAKE CALIPER

Removing-refitting flexible pipe and bleed screw and removing protective boot

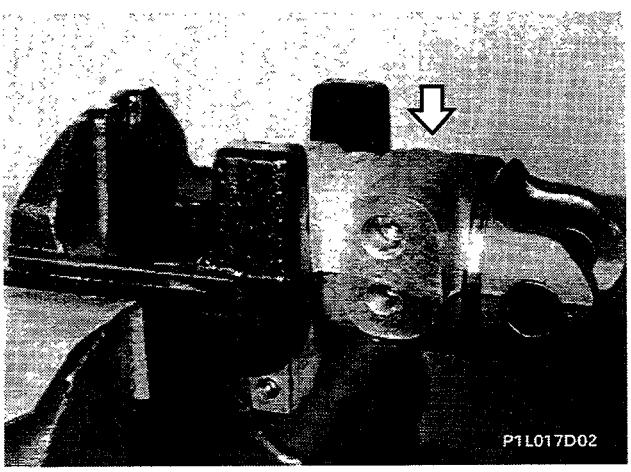


Removing-refitting handbrake control from brake caliper

Before removing the device pin, the circlip shown by the arrow has to be removed.

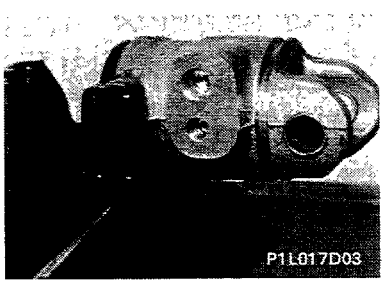


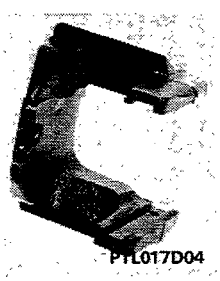
Handbrake components

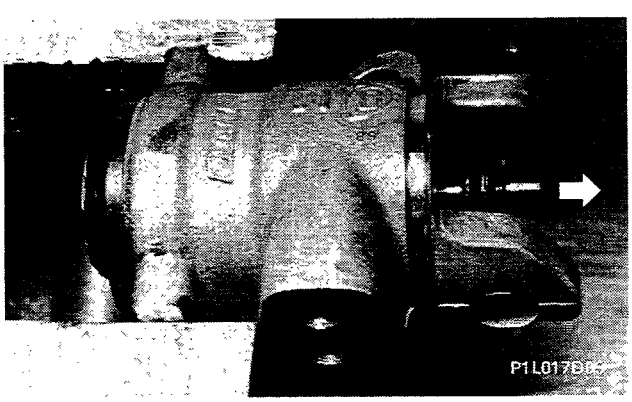


Removing-refitting cylinder support from caliper casing

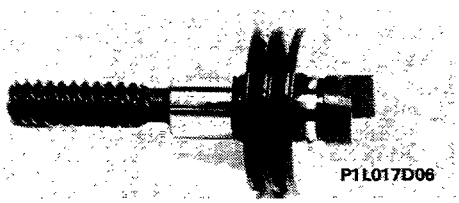
In order to proceed with the removal of the cylinder support from the caliper casing the retaining pin has to be released using a point as illustrated in the diagram.



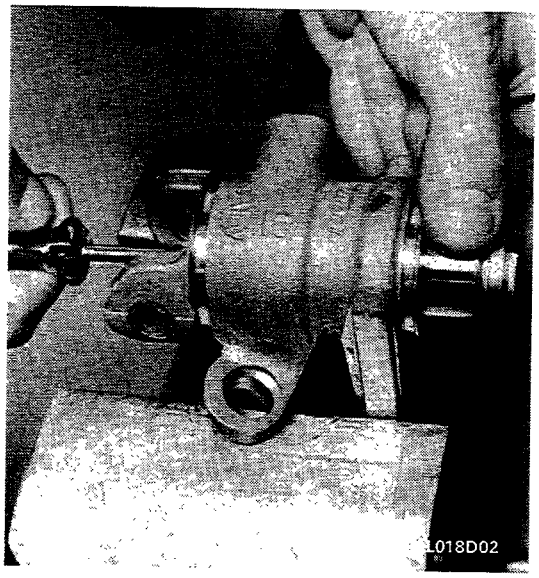




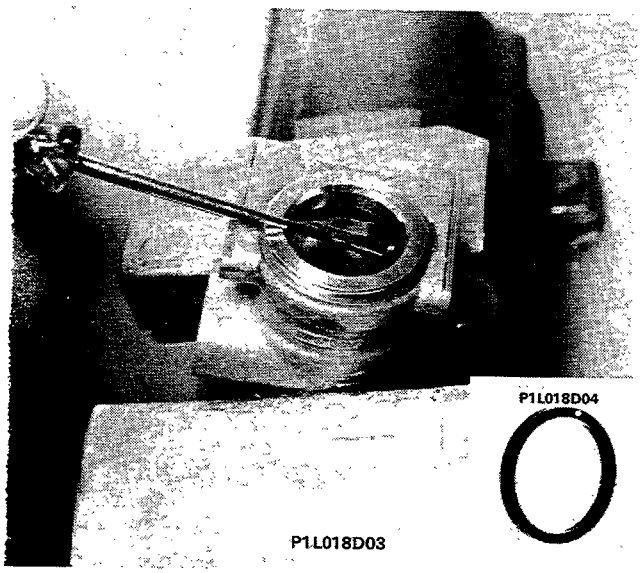
Removing-refitting device adjusting clearance between brake pads and brake disc



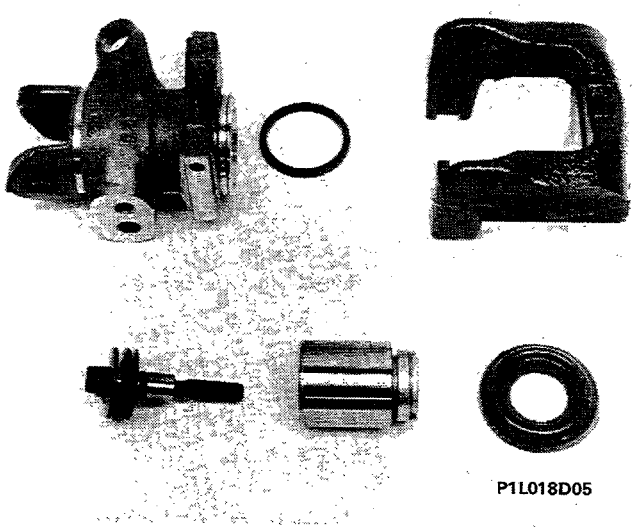
33.



Removing-refitting protective boot and piston



Removing-refitting seal

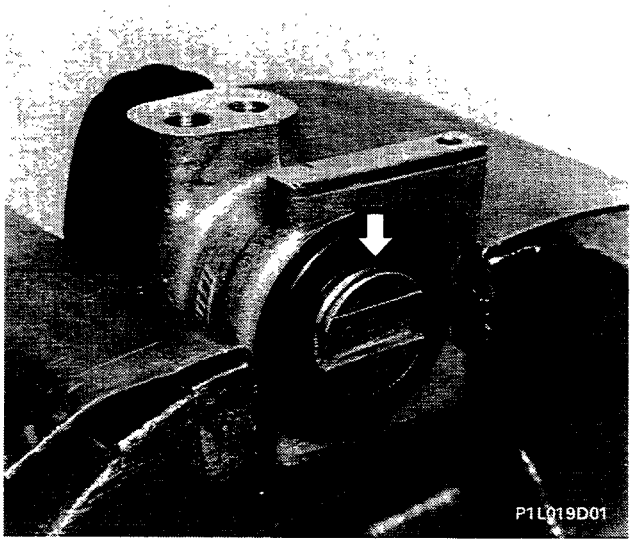


Brake caliper components

Fitting pisnton and dust cover in caliper casing

the parts concerned with brake fluid before fitting.

The reference mark on the piston (shown by the arrow) should be parallel to the surface of the bleed screw and turned towards it.
If this procedure is not followed it results in the malfunction of the braking system because it is not possible to bleed the system effectively.



AUTOMATIC DEVICE FOR ADJUSTING THE CLEARANCE BETWEEN THE REAR BRAKE PADS AND DISCS AND THE HANDBRAKE

Operation

The rear brake caliper piston contains a device which allows the distance between the brake discs and pads to be adjusted automatically.
This device comprises a spring (3), a self-adjustment female thread screw (4), a bearing (5), a plate (12), a clip (11) and a five-start threaded pin for self-adjustment (6).
In the rest position the position of the self-adjustment device, in relation to the piston (1), is shown in fig. A.
Whilst braking, the piston (1) moves in the cylinder assuming the position illustrated in fig. B, allowing the brake pads to make contact with the disc; the piston travel therefore corresponds to clearance G1 between the bearing (5) and the plate (12) fixed by the clip (11).

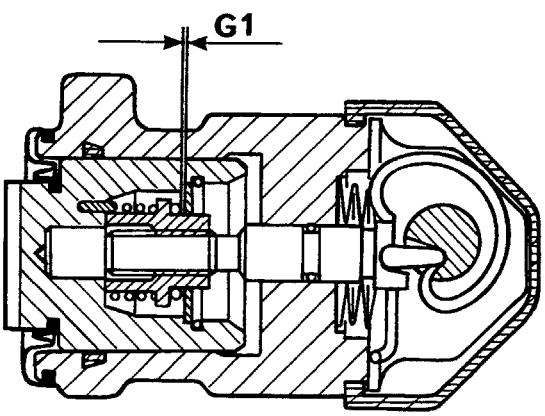


Fig. A

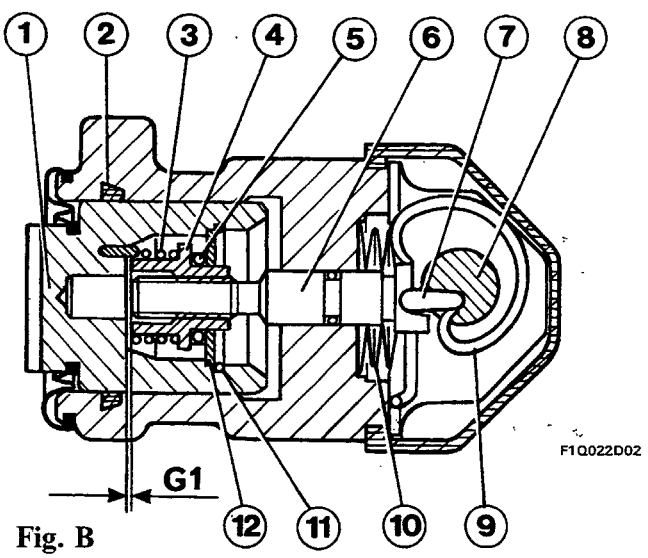


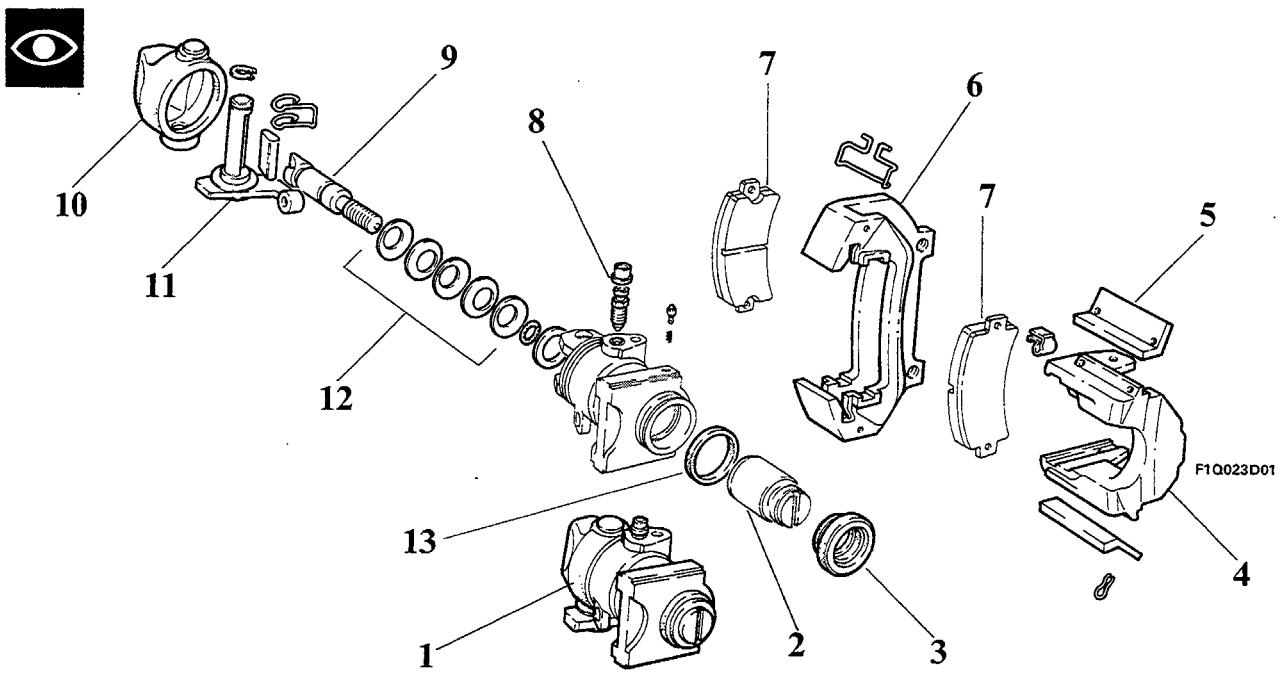
Fig. B

Cross section of rear brake caliper cylinder

1. Piston
2. Piston seal
3. Spring for female thread screw
4. Female thread screw for self-adjustment
5. Ball bearing
6. Pin for self-adjustment
7. Plate for piston with handbrake
8. Plate (7) control lever shaft
9. Spring for shaft (8)
10. Flexible washer
11. Clip
12. Plate

33.

After the sliding of the piston the seal (2) is distorted.
If the distance between the brake pads and the brake disc is greater than clearance G1, because the pads are worn, then the piston moves further into the cylinder forcing the female thread screw (4) to rotate in a clockwise direction on the threaded pin (6) by means of the plate (12).
During this rotation, the spring (3) turns in an anti-clockwise direction on the female thread screw and fixed to the piston at one end it tends to unwind allowing the female thread screw to rotate.
Once the braking action is over, the piston recedes under the action of the seal (2) which resumes its original shape.
However, the return stroke of the piston is always equal to the value of clearance G1 as it will stop when it makes contact with the female thread screw (4) as shown in fig. A.
In its turn the female thread screw cannot recede because in order to do this it would have to rotate in the same direction as the spring (3) is wound but the friction between the spring and the screw is such that the latter remains fixed in position. In this way whatever the wear to the pads, obviously assuming it is within the permissible limits, the exact clearance between the pads and the disc is automatically renewed; the handbrake is also adjusted at the same time since the shaft (8), controlled by the handbrake lever, acts directly on the pin (6) via the plate (7).



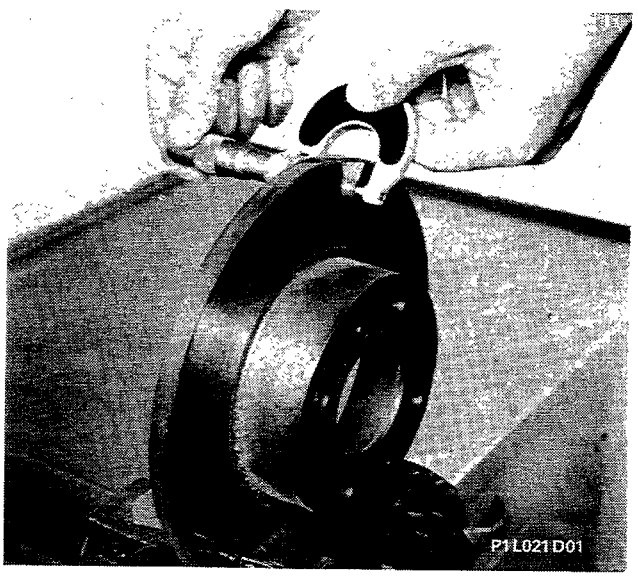
Brake caliper assembly components

1. Caliper casing
2. Piston
3. Dust cover
4. Cylinder mounting
5. Sliding pads
6. Caliper support bracket
7. Brake pads
8. Bleed screw
9. Pin for self-adjustment
10. Protective boot
11. Lever with pin for controlling handbrake
12. Flexible washers
13. Piston seal

NOTE *The piston and the caliper casing should not show any signs of abration or seizing; if this is not the case then the complete caliper must be replaced.*

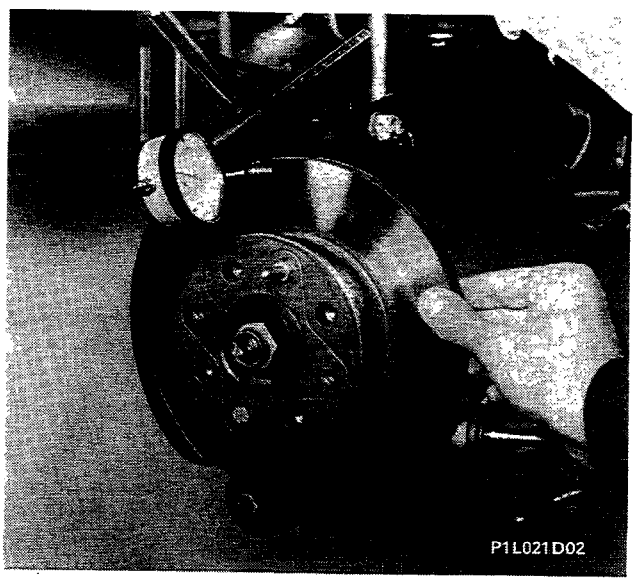
Use a solution of warm water and FIAT LDC detergent to wash the metal components.

BRAKE DISCS



Checking and measuring brake disc

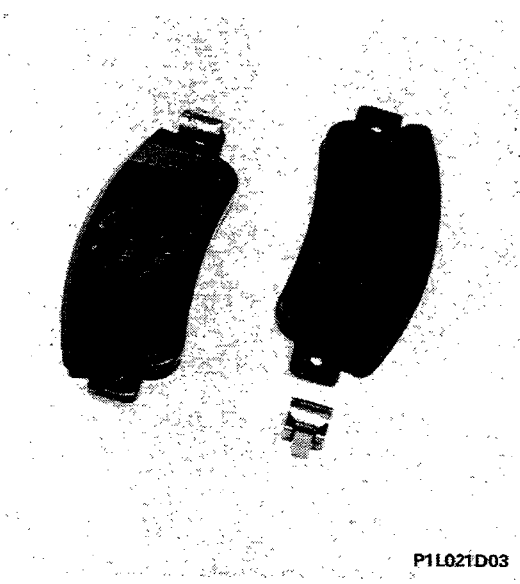
The minimum allowable thickness for brake discs is 9 mm; if it measures less than this, the disc must be replaced.
In the case of wear or deep grooves, the surfaces of the brake disc can be machined. After grinding the brake disc must not be less than 9.7 mm thick.



Checking run out of brake disc

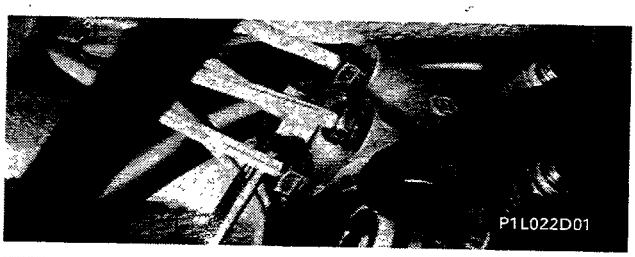
If only the brake pads have to be replaced, it is advisable to check that the disc is no more than 0.15 mm off centre.
This is measured 2 mm from the external diameter of the disc.

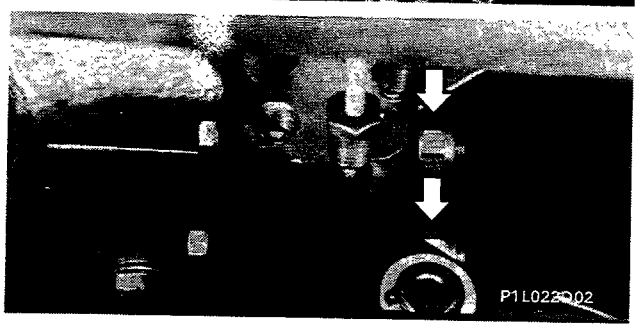
BRAKE PADS



Checking brake pads

The brake pads must be replaced when the thickness of the lining is less than 1.5 mm.
Check that the same type of pads are fitted on each pair of wheels.

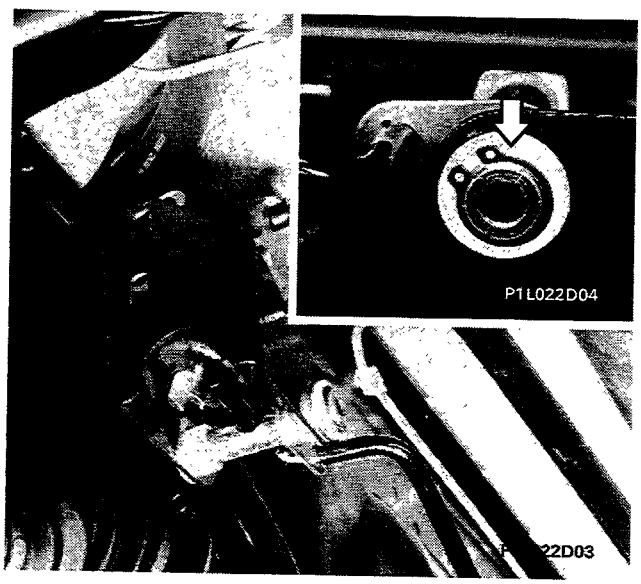




LOAD PROPORTIONING VALVE

Removing-refitting

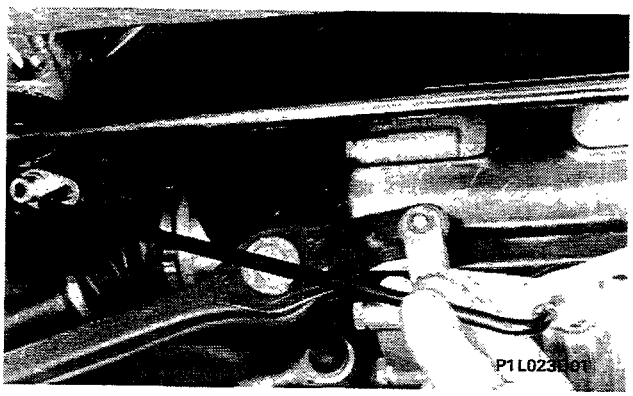
Removing-refitting unions and nuts fixing load proportioning valve to mounting



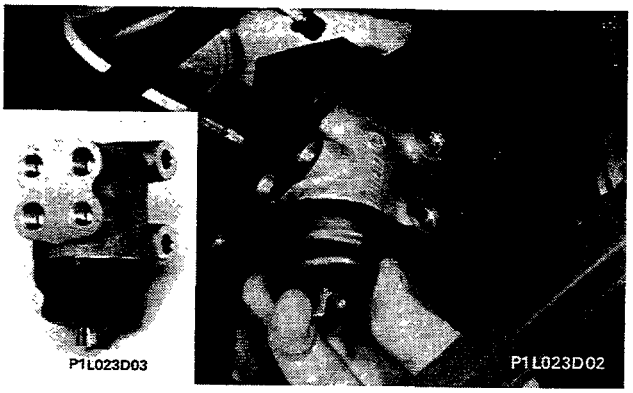
Removing-refitting bar mounting pin from load proportioning valve

In order to remove the bar mounting pin, the circlip shown by the arrow in the diagram has to be removed.

Removing-refitting bar from mounting after having removed circlip



Removing-refitting bar

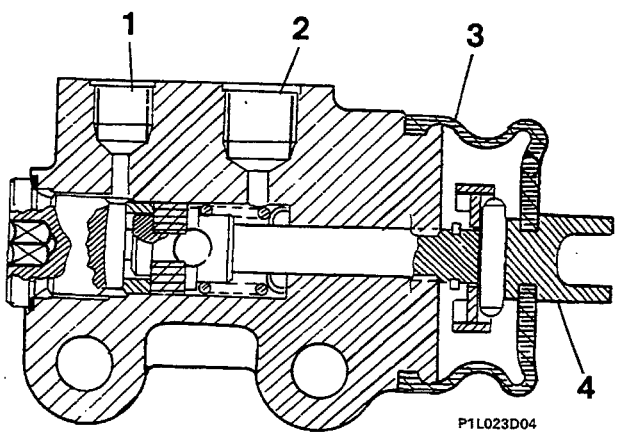


Removing-refitting load proportioning valve

Bleeding hydraulic system

The load proportioning valve for the rear wheels, fixed to the rear suspension transverse rods cross member, differentiates between the pressure in the rear brake circuit and the pressure in the front circuit according to the vehicle load and deceleration conditions.

The variation in pressure is caused by the position which the bar connected to the rear suspension transverse rods which acts on the load proportioning valve piston assumes.



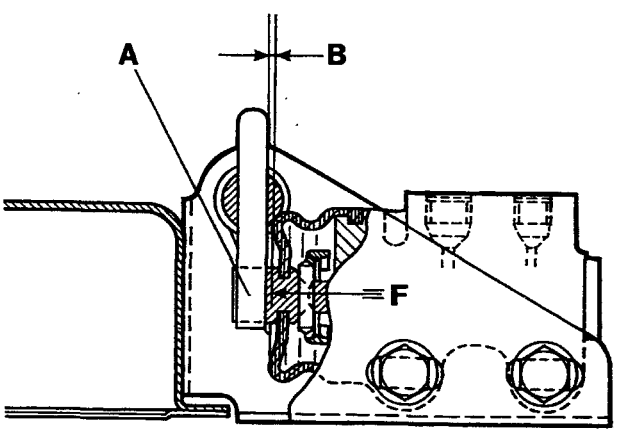
Cross section of load proportioning valve

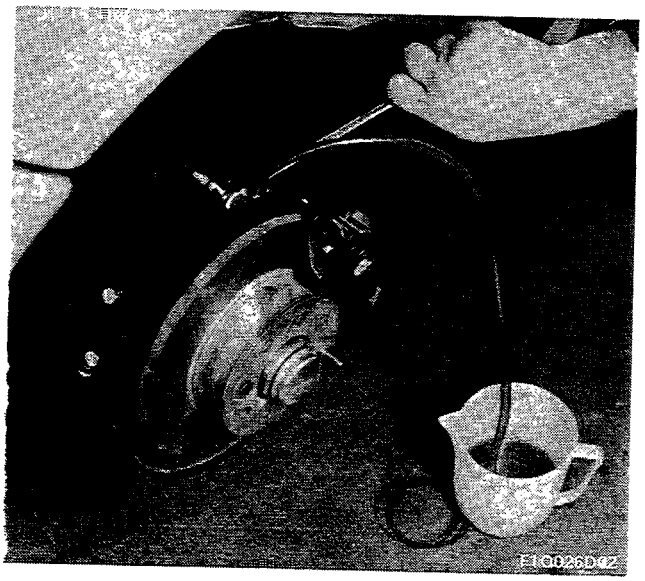
1. Seat for rear brake pipe unions
2. Seat for front brake pipe unions
3. Dust cover
4. Piston

Adjusting load proportioning valve

- Raise the vehicle at the back;
- loosen the load proportioning valve fixing bolts;
- bring point F of the load proportioning valve to distance B from end A of the bar;
- then lock the fixing bolts.

Distance B = 1.1 ± 0.2 mm

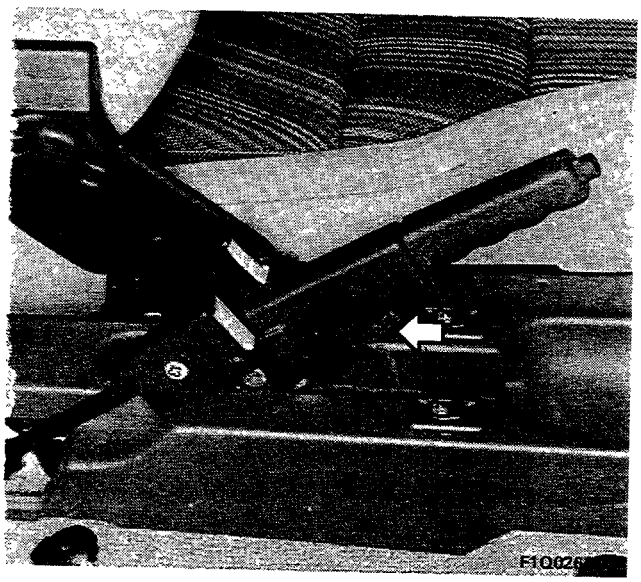




BLEEDING

It is not advisable to reuse the brake fluid collected.
The level should be topped up using new brake fluid.

In order to carry out the bleeding the suspension must be compressed in such a way that the load proportioning valve comes into operation.



HANDBRAKE

Handbrake adjustment

NOTE *After carrying out the adjustment, the handbrake lever should not travel through more than 4 or 5 notches and the wheels should turn freely when it is released.*

Print no.504.787/06

DESCRIPTION	Thread size	Tightening torque
		daNm
Front brake caliper to steering knuckle fixing, bolt	M10 x 1,25	4,8
Front brake disc to hub fixing, bolt	M8 x 1,25	1,2
Front brake disc to hub fixing, bolt	M8 x 1,25	2,3
Load proportioning valve to bracket fixing, bolt	M8 x 1,25	2,5
Unions for tubes with split cone ends for fixing brake pipes to pump and load proportioning valve	M10 x1	1,8
Union for fixing brake pipes to load proportioning valve	M12 x1	1,8
Union for fixing flexible pipe to front brake cylinder	M10 x1	2,3
Union for fixing flexible brake pipe to rear brake cylinder	M10 x 1	1,2
Rear brake caliper to support bracket fixing, bolt	M10 x 1,25	3,6
Brake caliper mounting bracket to stub axle fixing, bolt	M8 x 1,25	2,5
Rear brake disc to hub fixing, bolt	M8 x 1,25	1,2
Rear brake disc to hub fixing, bolt	M8 x 1,25	2,3