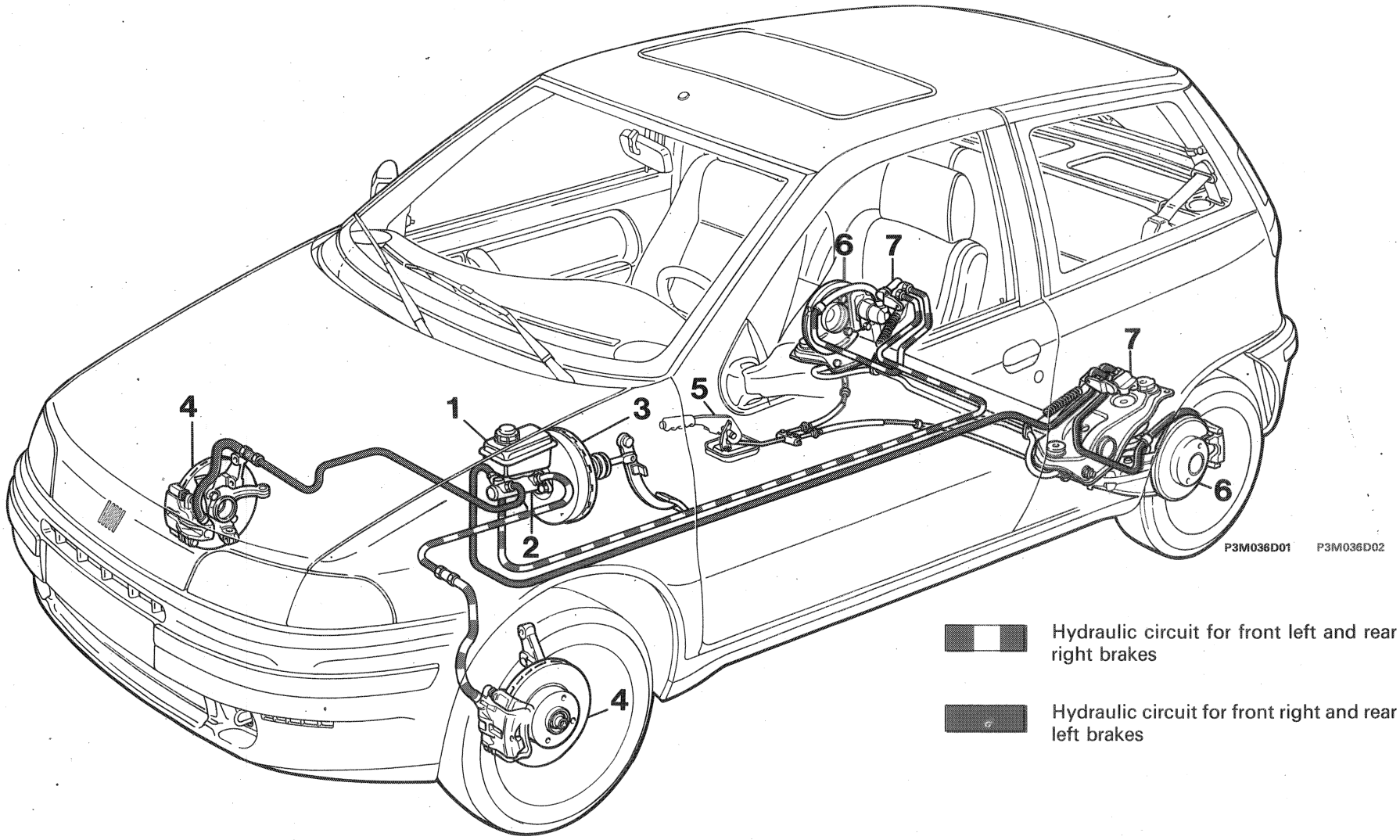
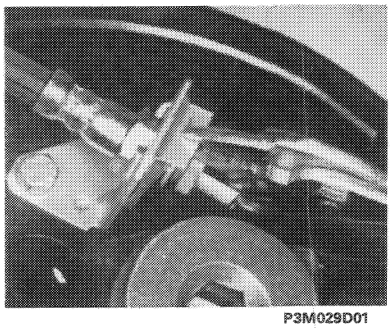
DIAGRAM OF HYDRAULIC BRAKE CIRCUIT AND MECHANICAL HANDBRAKE LINKAGE

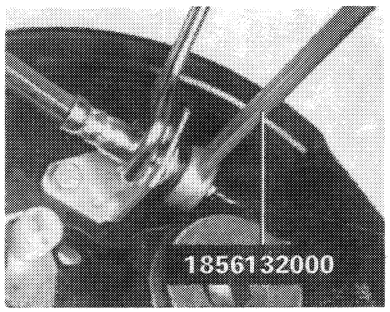


1. Brake fluid reservoir
2. Master cylinder for front and rear wheel brake circuit
3. Vacuum servo unit
4. Front disc brakes
5. Handbrake lever
6. Rear drum brakes
7. Load proportioning valves for rear wheels

DISMANTLING-FITTING DISC BRAKES



P3M029D01



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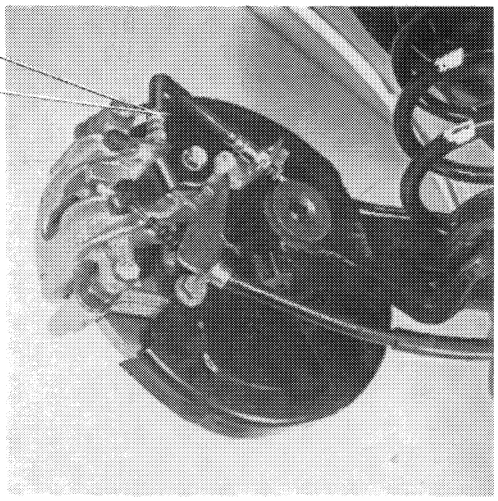
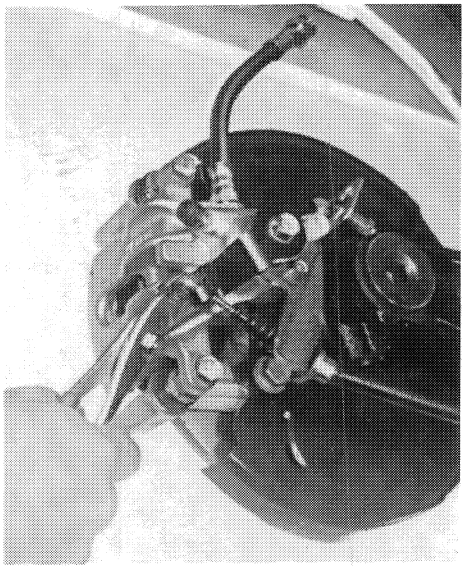


P3M029D03

Dismantling-fitting hose



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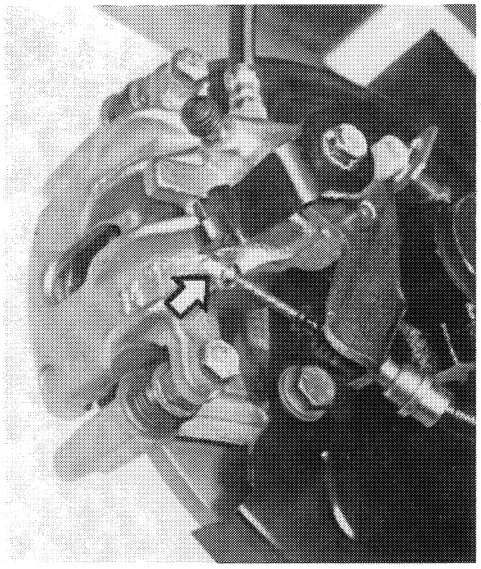
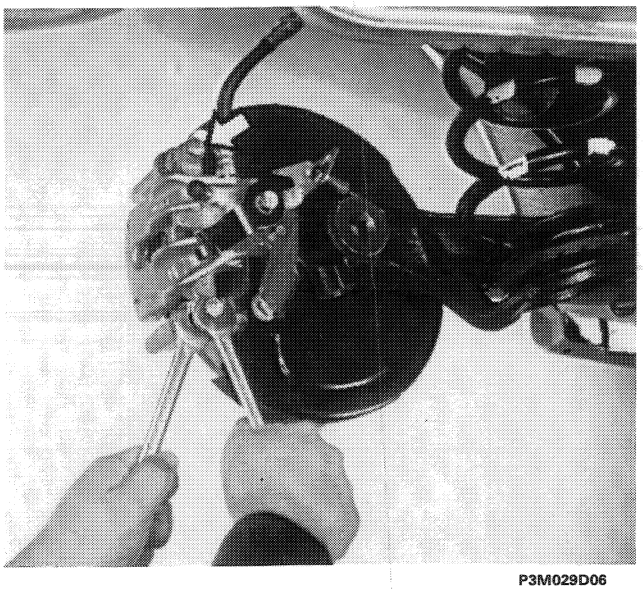


P3M029D05

Dismantling - refitting handbrake cable on brake caliper



P3M029D06

Dismantling - refitting brake caliper

The bolts securing the caliper case are self-locking and must be renewed whenever they are unscrewed or slackened.

Bleed the hydraulic system

NOTE *After replacing the brake calipers, adjust the handbrake*

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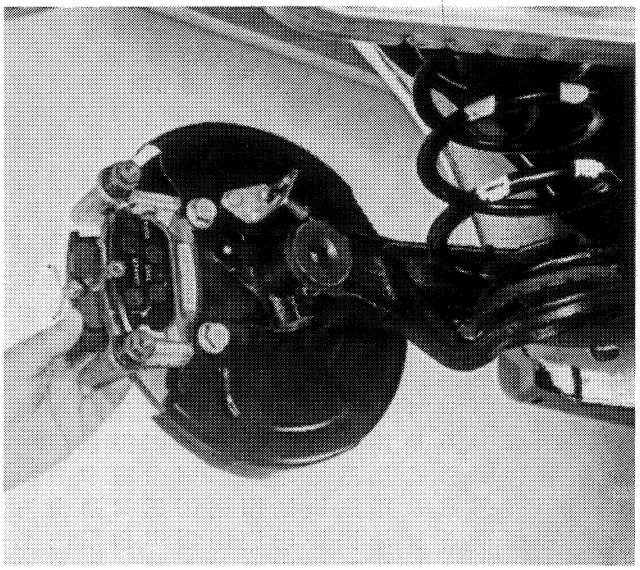
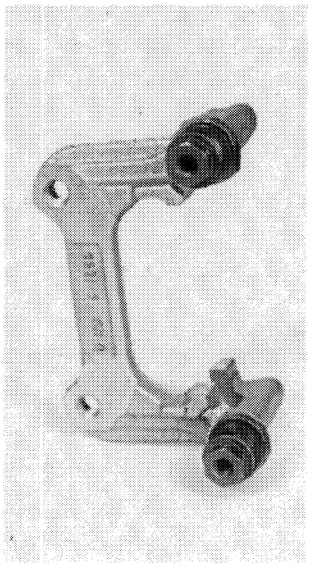


P3M030D01

Dismantling-fitting brake pads

NOTE *Before fitting the new brake pads, reinsert the caliper piston fully by turning it clockwise using tool 18566133000.*
Also adjust the handbrake.

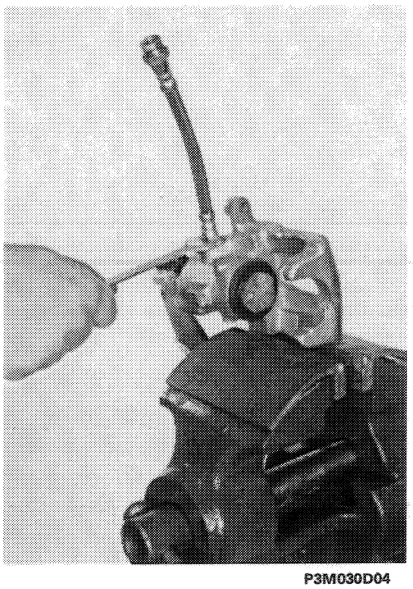
P3M030D02



P3M030D03

Dismantling - refitting caliper mounting bracket

Before refitting the caliper mounting bracket, check the rubber gaiters for damage and renew them if necessary.



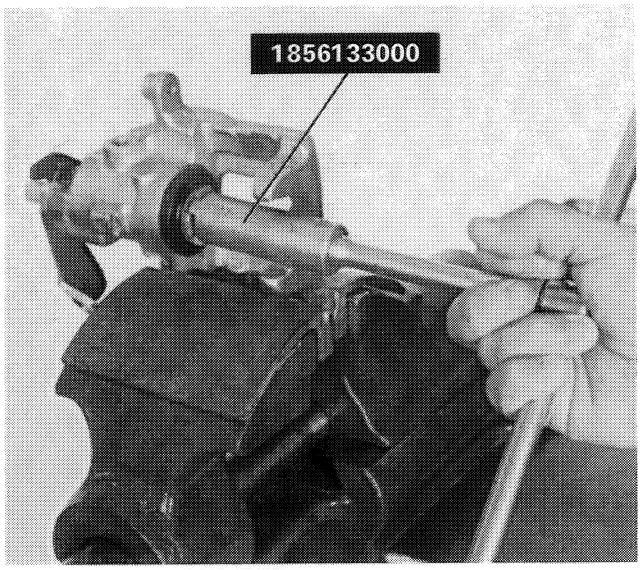
P3M030D04

P3M030D05

BRAKE CALIPER

Dismantling - refitting hose and bleed screw

NOTE *The hose must not be swollen or cracked, otherwise it will need to be renewed. It is advisable to renew both hoses.*



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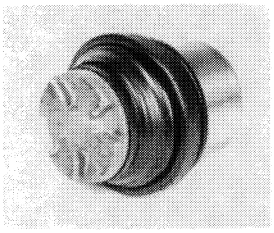
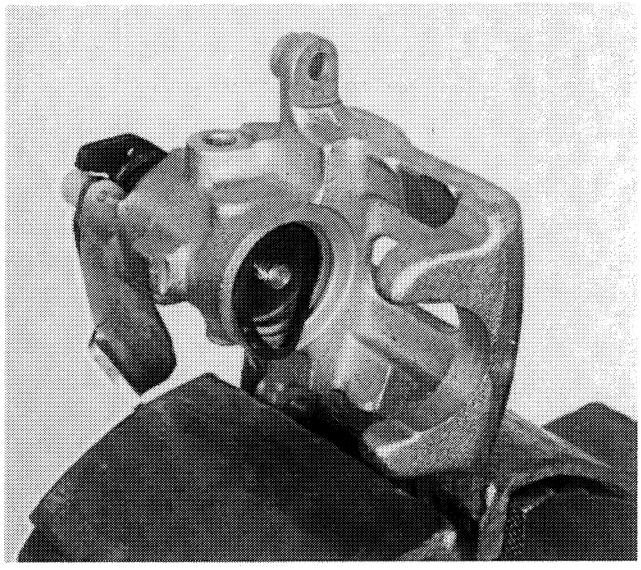


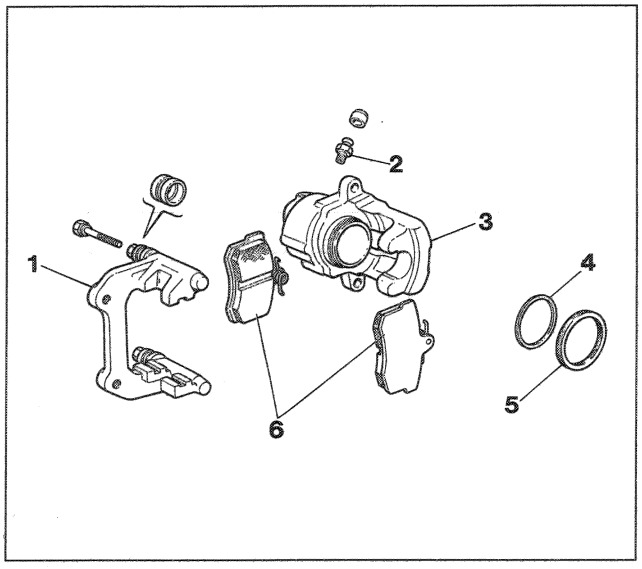
P3M031D02

Dismantling piston and dust excluder



P3M031D03

Dismantling seal



Checking components of the caliper assembly

The piston and caliper case must not show signs of friction or seizure, otherwise the caliper complete with piston will need to be renewed.
The dust excluder and seal will always need to be renewed; also ensure that the bleed screw is not blocked.

To wash the metal parts, use a solution of hot water with FIAT LDC detergent.

1. Caliper bracket
2. Bleed screw
3. Caliper case
4. Seal
5. Dust excluder
6. Brake pads

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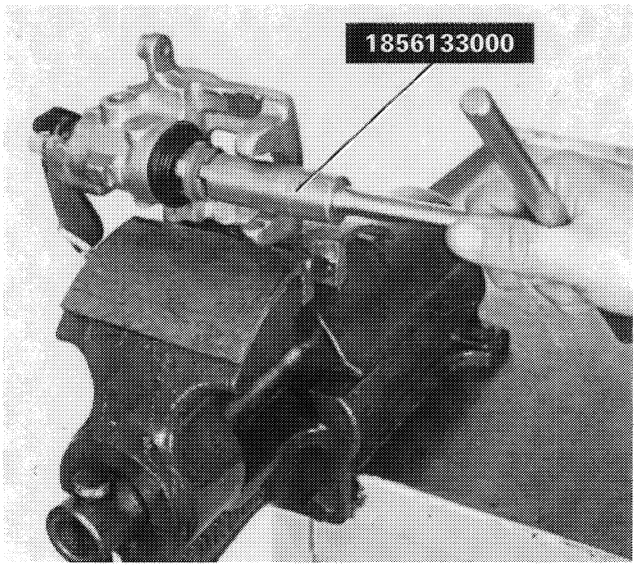
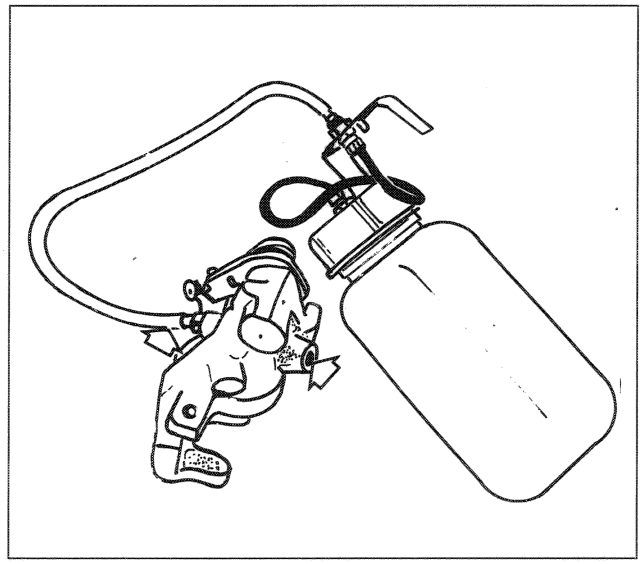


P3M032D01

Refitting piston in caliper case

Before fitting the piston in the caliper case, place the dust excluder on the rear end of the piston.

Lubricate the parts concerned with brake fluid before final assembly.



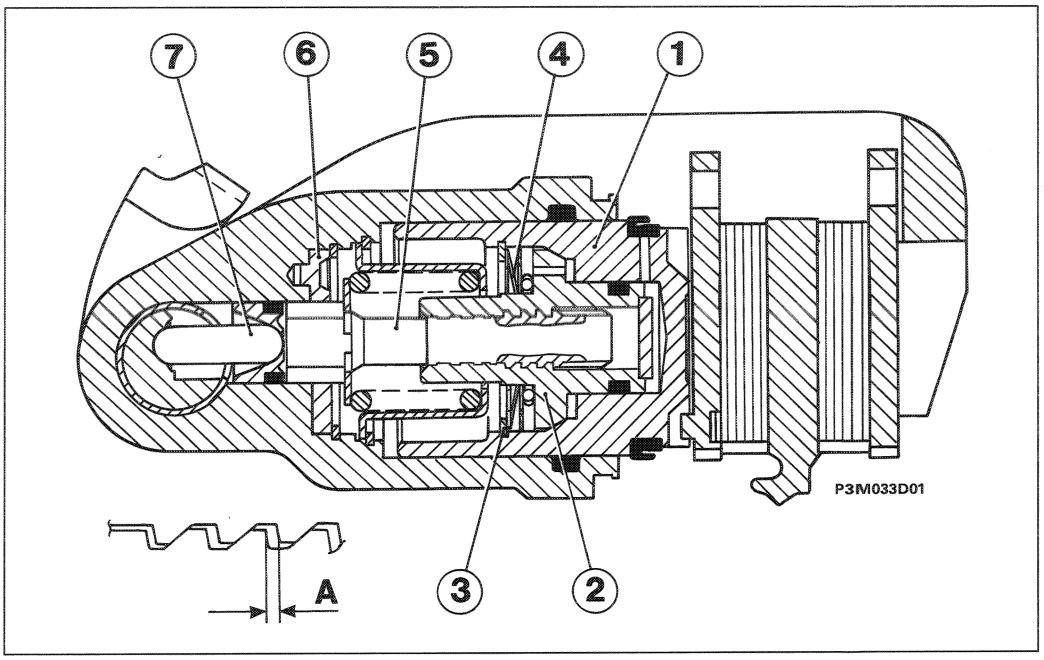
Filling brake caliper

After the brake caliper has been overhauled and before it is refitted to the car, it must be filled in accordance with the following procedure:
- slacken the bleed screw;
- insert the end of a transparent tube in the bleed screw hole;
- using an ordinary container with brake fluid, introduce fluid into the caliper until air bubbles emerge from the threaded hole where the brake hose is connected;
- retighten the bleed screw.

AUTOMATIC REAR BRAKE AND HANDBRAKE ADJUSTER ASSEMBLY

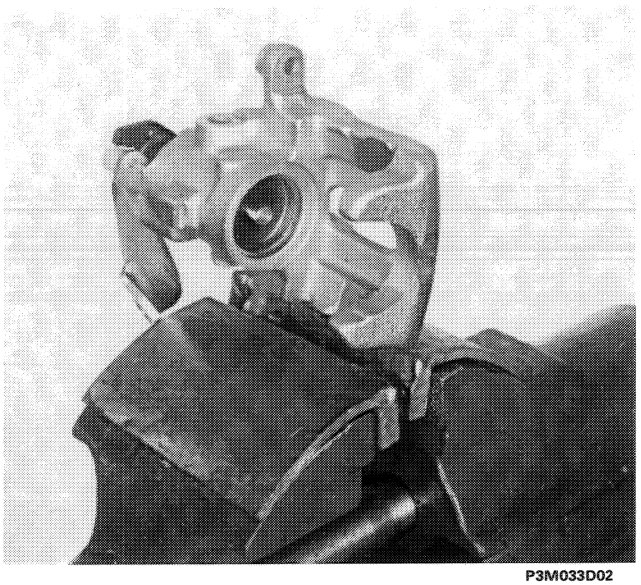
The rear brake caliper piston contains a device for automatically adjusting the distance between the disc and friction linings. This device comprises a nutscrew (2) which turns (only in the direction of advance) on a shaft (5) as a result of the action of a Belleville washer (4), and the shaft (5) on which the nutscrew (2) is screwed. The shaft cannot rotate since it is attached to the brake caliper case by the retainer (6). The shaft and nutscrew connect to each other by means of a four-start thread with a pre-set clearance (A).
During braking, the piston (1), pushed by hydraulic pressure, moves towards the brake pad together with the nutscew (2), since the latter is attached to the piston by the retaining ring (3) and the Belleville washer (4).

If the brake pads are excessively worn, the endfloat (A), even if compensated, cannot by itself absorb the entire travel of the piston (1). The nutscrew (2) then momentarily moves away from its point of contact with the piston (1), but the action of the Belleville washer (4) makes the nutscrew (2) turn on the shaft (5) until it comes into contact with the piston (1).
When the handbrake is operated, the mechanical force is transmitted from the handbrake lever to a rod (7), and then passes through the shaft-nutscrew assembly to reach the piston (1) and from the latter the brake pads.
The nutscrew (2), and so the piston (1) which is joined to it, cannot rotate since the piston comprises a coupling system which during the braking action engages in the brake pad plate.

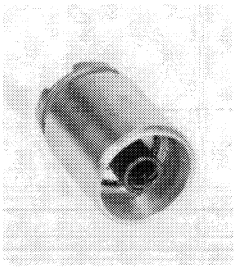


Cross section of rear brake caliper cylinder

1. Piston - 2. Nutscrew - 3. Retaining ring - 4. Belleville washer - 5. Shaft - 6. Retainer - 7. Rod - A. Nutscrew/shaft clearance



P3M033D02



P3M033D03

Components of the automatic rear brake and handbrake adjuster assembly

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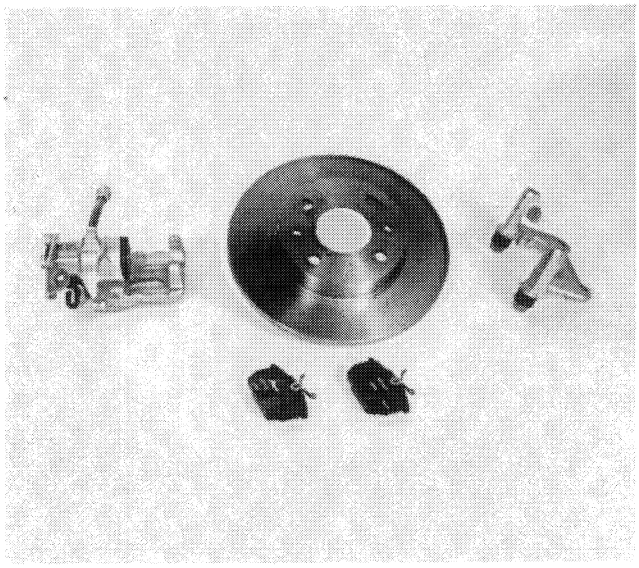
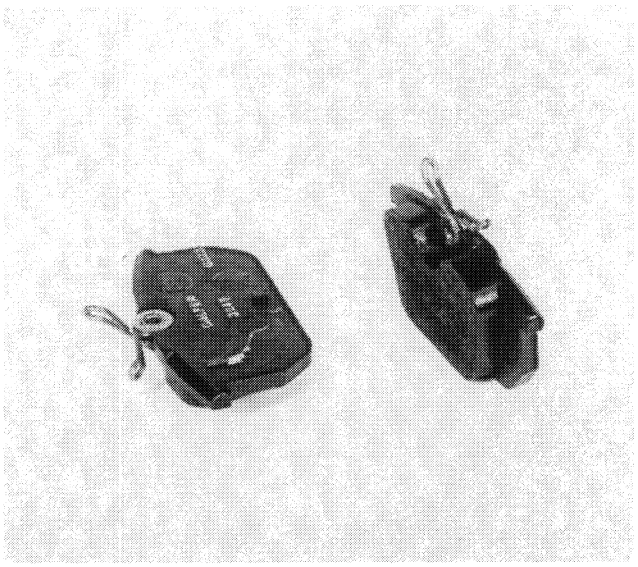


P3M034D01

Components of the braking system

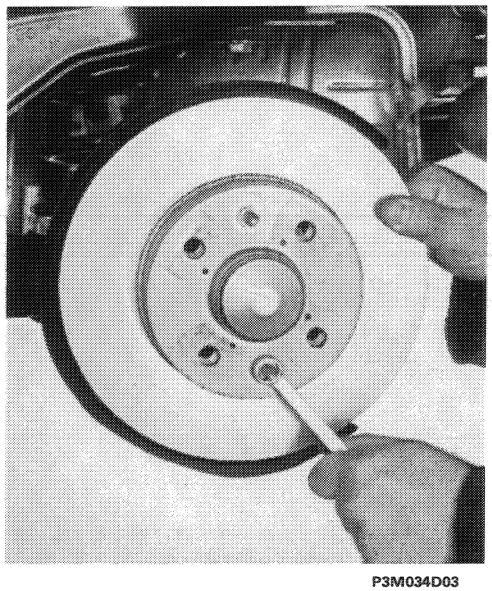


P3M034D02

BRAKE PADS

Checking brake pads

The brake pads must be renewed when the thickness of the friction material is less than 1.5 mm.
Check that matching brake pads are fitted on each pair of wheels.



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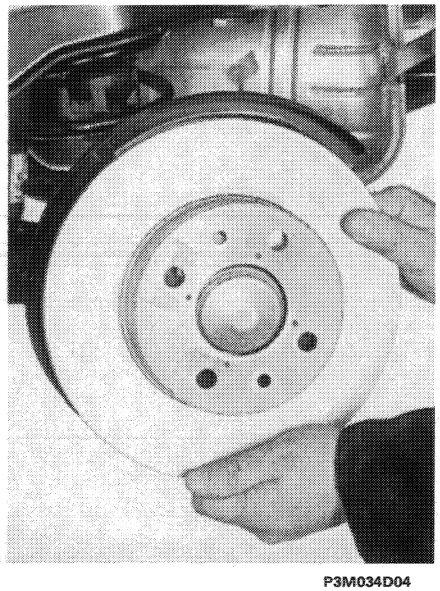
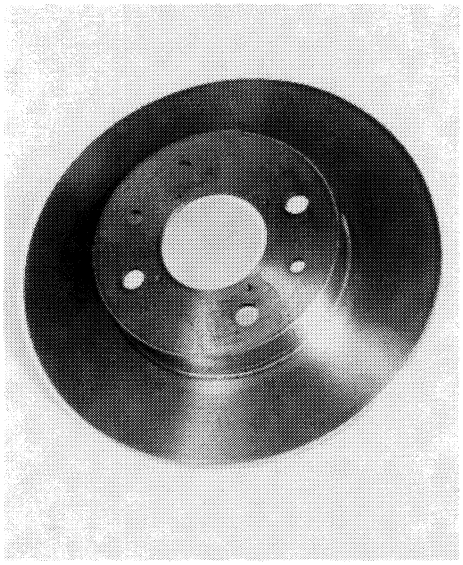


P3M034D04

BRAKE DISCS

Dismantling - refitting brake disc

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



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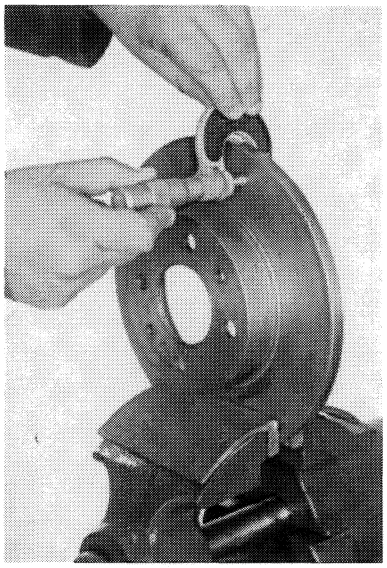
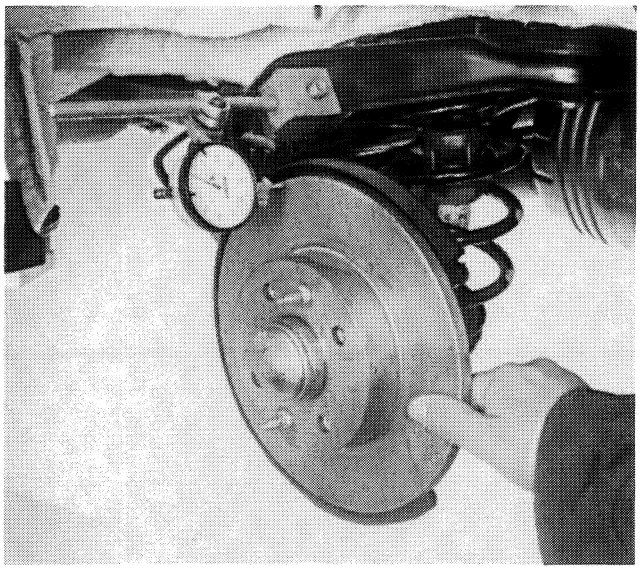


P3M035D02

Checking and measuring disc

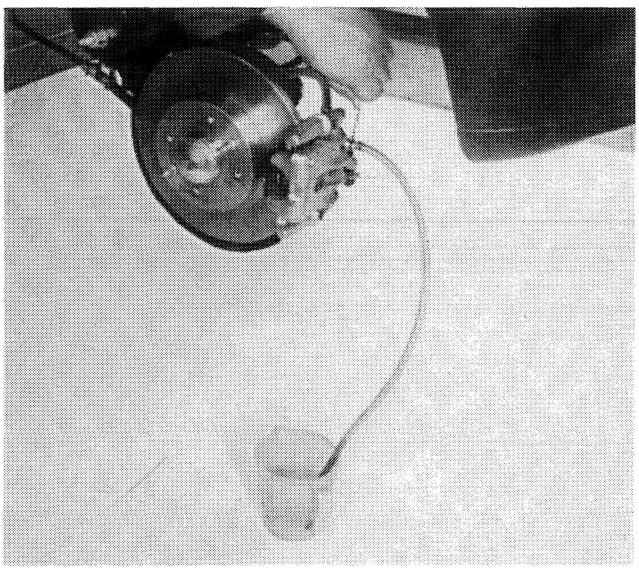
The minimum permissible worn thickness of the brake disc is 9.2 mm; if the thickness is less, the disc must be renewed. If the brake disc is damaged or deeply scored, the surfaces may be skimmed. After machining, the brake disc thickness must not be less than 9.55 mm.



P3M035D03

Checking brake disc run-out in relation to axis of rotation

If only the brake pads need to be renewed, it is advisable to check that the run-out does not exceed 0.15 mm.
This value is measured 2 mm from the disc's outer diameter.



P3M035D04

BLEEDING

The old fluid should not be reused. Top up the level with fresh brake fluid.

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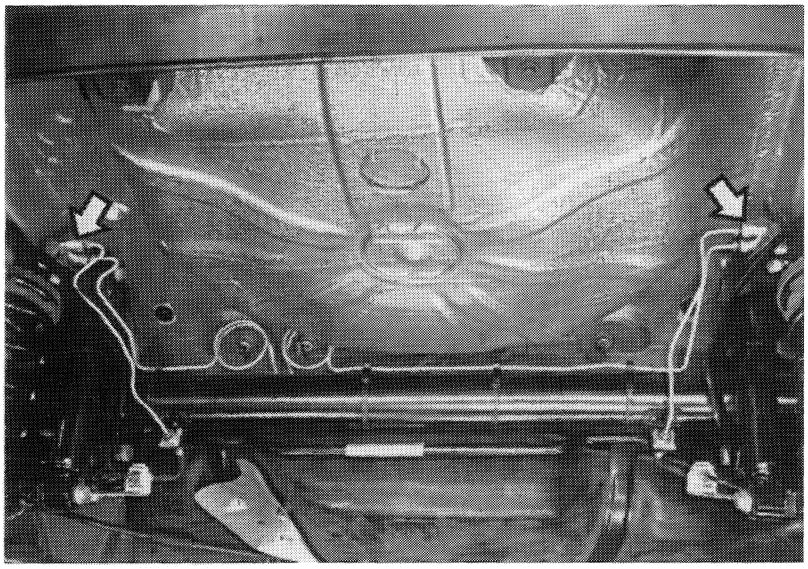
BRAKE PRESSURE REGULATORS FOR REAR WHEELS

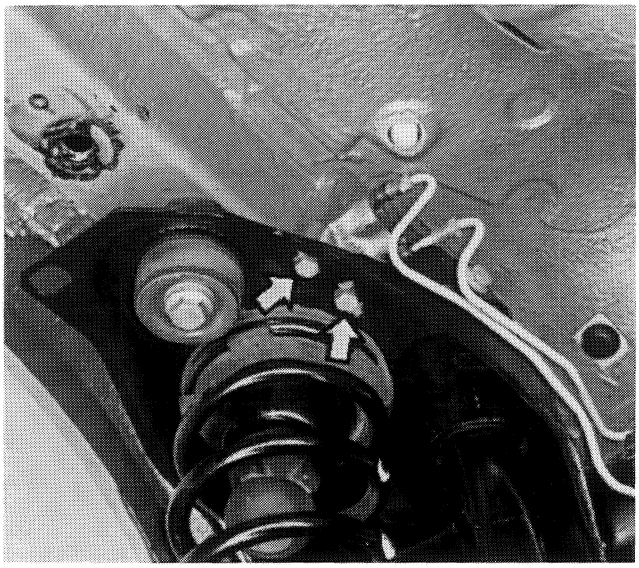


P3M037D01

Location on car of pressure regulators for rear wheels

P3M037D02

Dismantling-fitting brake pipes



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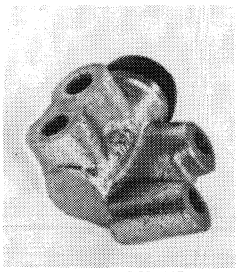


P3M037D04

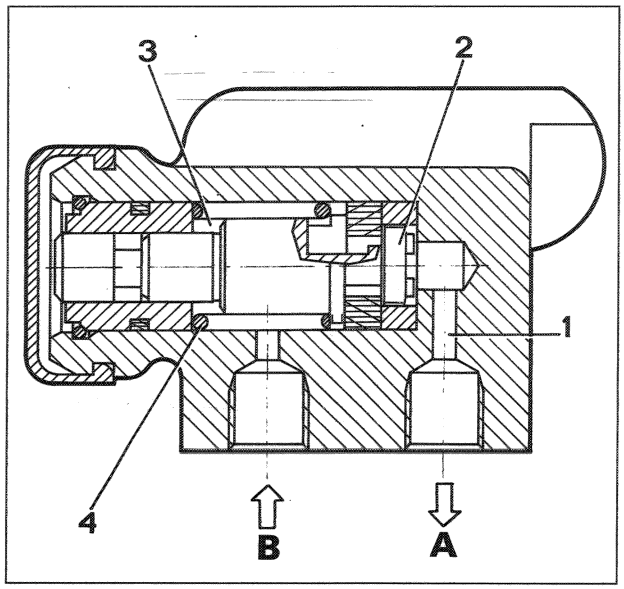
Removing-refitting pressure regulator

Bleed the hydraulic system

33.

Description and operation

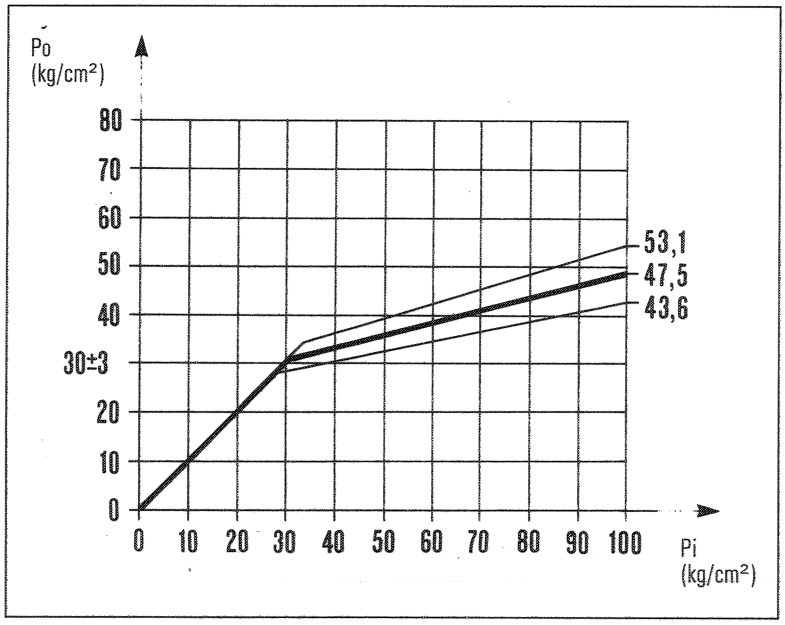
The pressure regulators are fitted on the pipes which connect the master cylinder to the rear wheel cylinders, and their purpose is to prevent the rear wheels from locking during emergency braking when, as a result of braking, the load of the car shifts onto the front axle.
Two pressure regulators are necessary because a cross-type braking system has been adopted.



P3M038D01

Cross section of pressure regulator

A. Brake fluid outlet to rear brakes
B. Brake fluid inlet from pump
1. Outlet chamber
2. Piston
3. Inlet chamber
4. Servo spring



P3M038D02

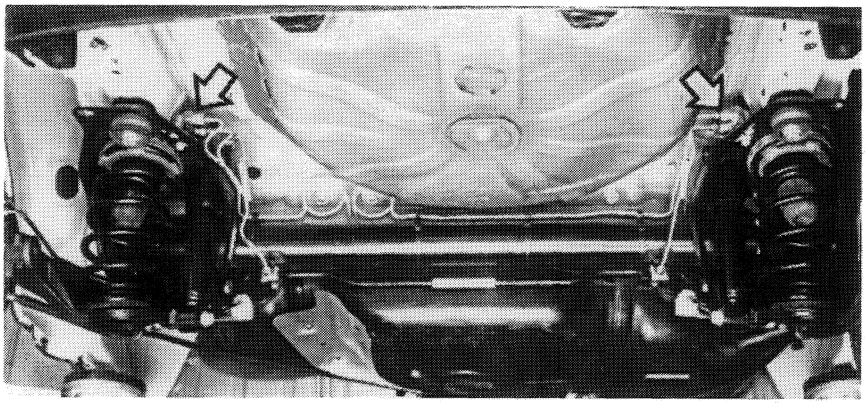
Characteristic curve of the pressure regulator

1. Rest position

The servo spring pushes the piston fully into the cylinder, i.e. against the wall of the outlet chamber.

2. Intervention position

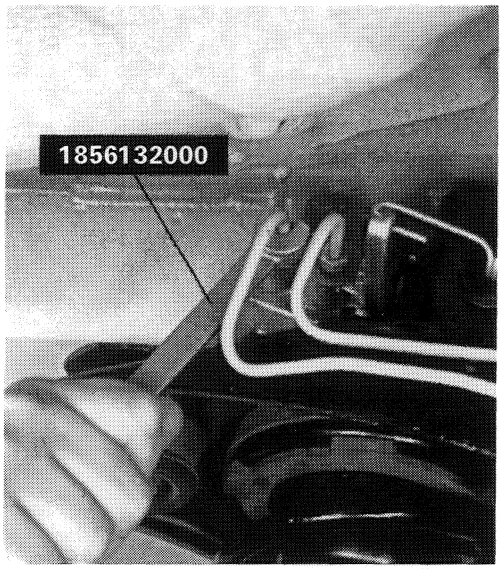
Up to an intervention pressure of 30 kg/cm², the outlet pressure (Po) corresponds to the inlet pressure (Pi).
The increase in the inlet pressure acting on the surfaces of the piston causes the piston to move downwards, overcoming the force of the servo spring.
Under these conditions, there is an increase in volume in the outlet chamber with a resulting decrease in the pressure on the rear circuit, in a ratio of 0.25 per wheel.



P3M039D01

LOAD PROPORTIONING VALVES FOR REAR WHEELS

Location on car of load proportioning valves for rear wheels



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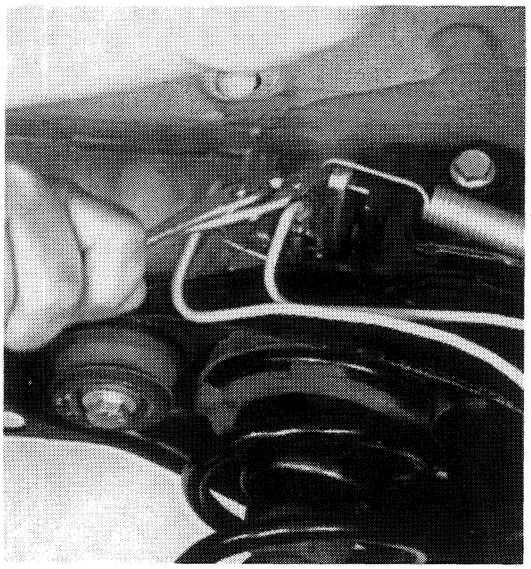
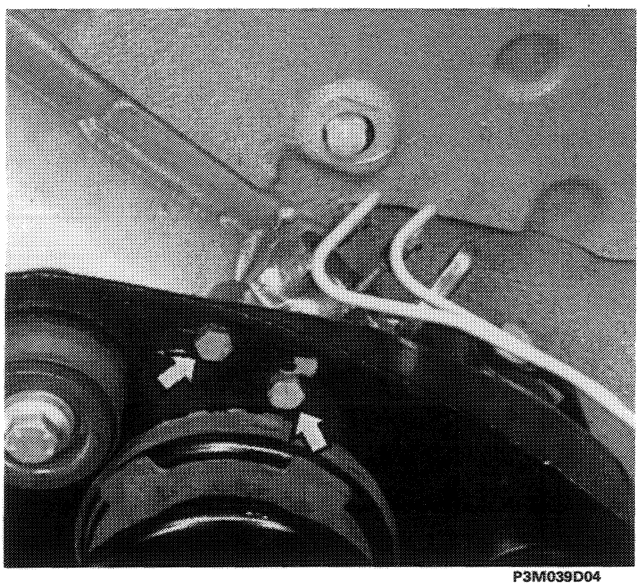


P3M039D03

Dismantling-fitting brake pipes and actuating spring



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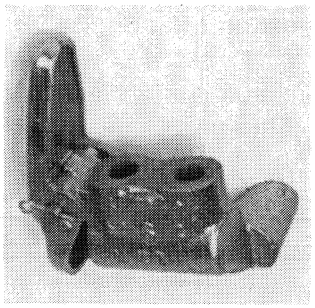
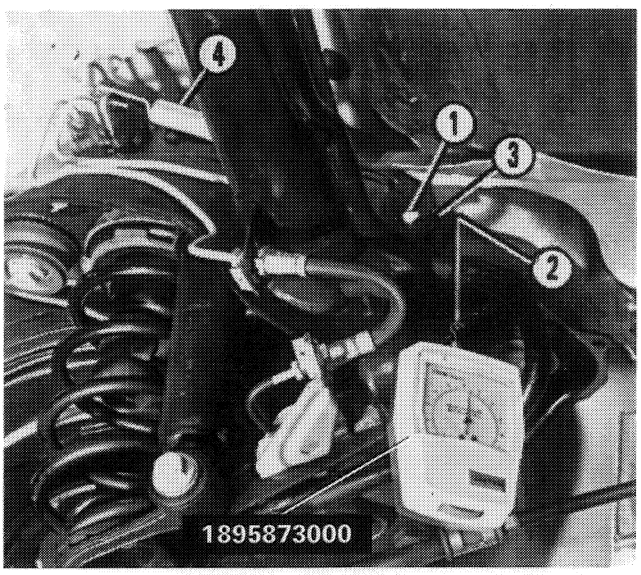


P3M039D05

Removing-refitting load proportioning valve



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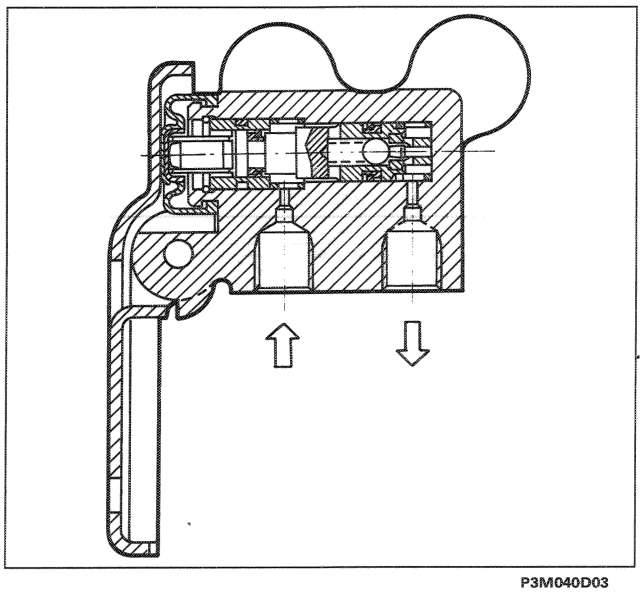
P3M040D03

Adjustment

- Settle down the rear suspension;
- place the car (in running order, in other words with the cooling system filled and the spare wheel and accessories fitted) on a horizontal level with the wheels on the ground;
- load a weight of 130 kg for all engine types into the luggage compartment, preferably over the rear axle;
- undo the bracket fixing bolt (1);
- mount the torque wrench 1895873000 to the eyelet (2) on the bracket;
- apply a load of 5 daN for the 1372 turbo engines and 7 daN for the 1697 TD - 1242 MPI engines with ABS;
- hold the bracket (3) in this position and tighten the bracket fixing bolt (1);
- repeat the adjustment procedure for the other load proportioning valve.

NOTE *If the load proportioning valve is faulty, the entire assembly must be renewed.*

Bleed the braking system

Operation

The load proportioning valve on the rear wheels, mounted on a bracket on the rigid rear axle, differentiates the braking pressure in the rear wheel braking circuit in relation to the pressure in the front wheel circuit in accordance with the load conditions and deceleration of the vehicle.
The pressure variation is caused by the position assumed by the spring (4) connected to the stabilizer bar, which acts on the piston of the load proportioning valve.
The braking system has 2 load proportioning valves, 1 for each rear wheel.

Cross section of load proportioning valve