FRONT BRAKES VACUUM/HYDRAULIC 2 x 50 PIN SLIDER CALIPER

Description:
The caliper assembly is mounted to the stub axle with four special high grade bolts and is composed of three main parts:

(i) THE MOUNTING BRACKET (2), into which is screwed two slide pins (11) and (16).

(ii) THE BRIDGE (1), which is mounted to the slide pins.

(iii) THE PISTON HOUSING (3), which is fixed to the bridge by four cap head screws.

The mounting bracket straddles the brake disc and locates the two friction pads (8).

The bridge is fitted with a pressed fit metal slide pin bush (17) for the larger ø slide pin and retains a protective rubber boot (18) with its boot seat (19). For the smaller ø slide pin a rubber slide pin bush (12) is fitted internally with a plastic sleeve (13).

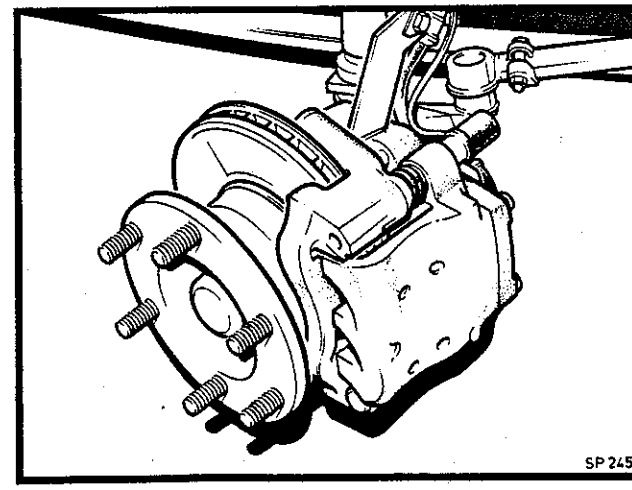
The piston housing contains two piston bores interconnected by fluid passages. Into each bore is fitted a steel piston (4). The rubber wiper seal (6) is retained in each bore mouth by its retainer (7). Fitted further into each bore is a fluid seal (5).

Note that the fluid seal is square in section and the seal groove is tapered.

When the piston is fitted the seal is compressed to the groove shape, as shown in figure 2. The friction pads are composed of steel backing plates to which the friction material is integrally moulded and bonded.

The pads are located in the mounting bracket (2) recesses and retained by two pad steady springs (9) and the caliper bridge (1).

SERVICE KITS
(a) Pin & Bush Kit (Wheel Set)
(b) Seal Repair Kit (Wheel Set)
(c) Replacement friction pads (Axle Set)
(d) Boot Kit (Wheel Set)



2 x 50 PIN SLIDER CALIPER

Operation:

When the brake pedal is depressed hydraulic pressure passes via the brake pipes to the brake hoses and enters the caliper piston housing (3), then through an internal drilling to the other cylinder bore. Hydraulic pressure causes the pistons (4) to move against the inner friction pad (8) which in turn reacts with the brake disc (23). When sufficient force occurs the piston housing/bridge moves away from the disc and the bridge fingers apply a load to the outer friction pad which then reacts against the brake disc, thus causing the clamping action of both friction pads to the brake disc. As the pistons move out, the fluid seals flex as shown in figure 1. When the brake pedal is released, the pressure drops to zero, the seals adopt their original shape and retract the pistons, figure 2. Friction pad wear is compensated automatically with re-positioning of the bridge on the slide pins, and "follow up" travel on the pistons.

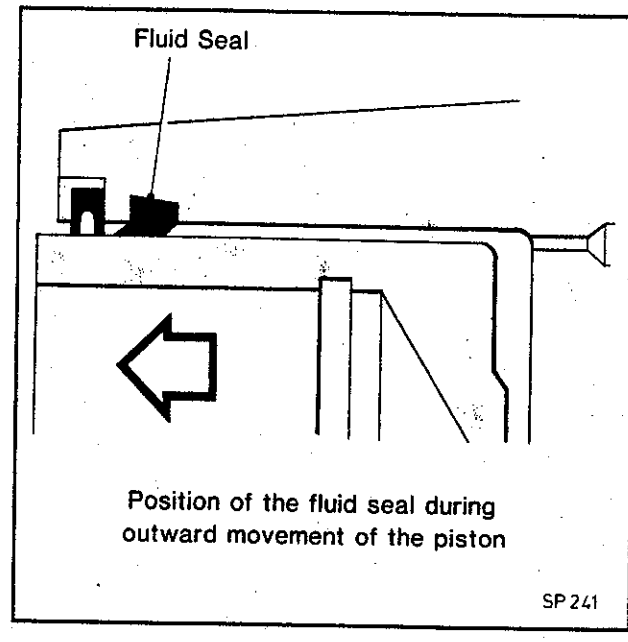


Fig. 1

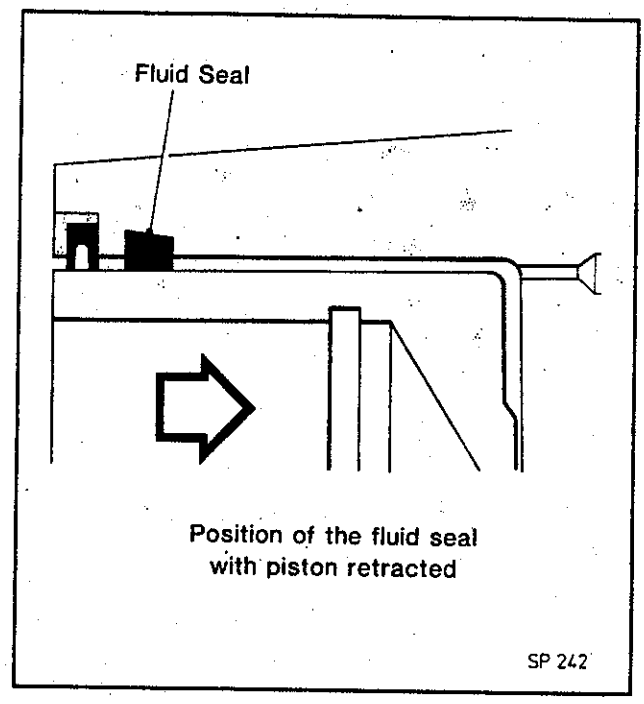


Fig. 2

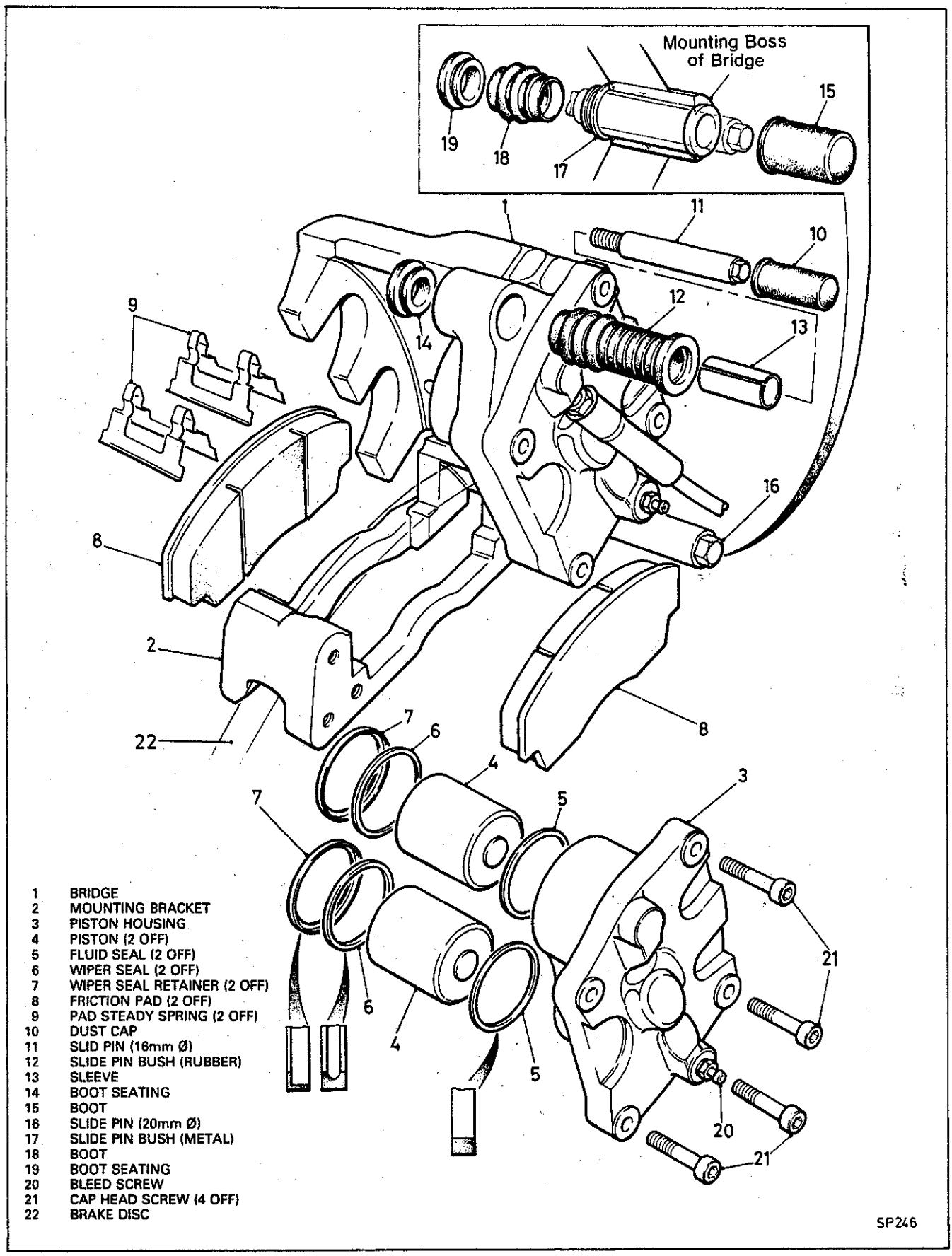


Fig. 3 *Exploded view of 2 x 50 pin slider caliper assembly*

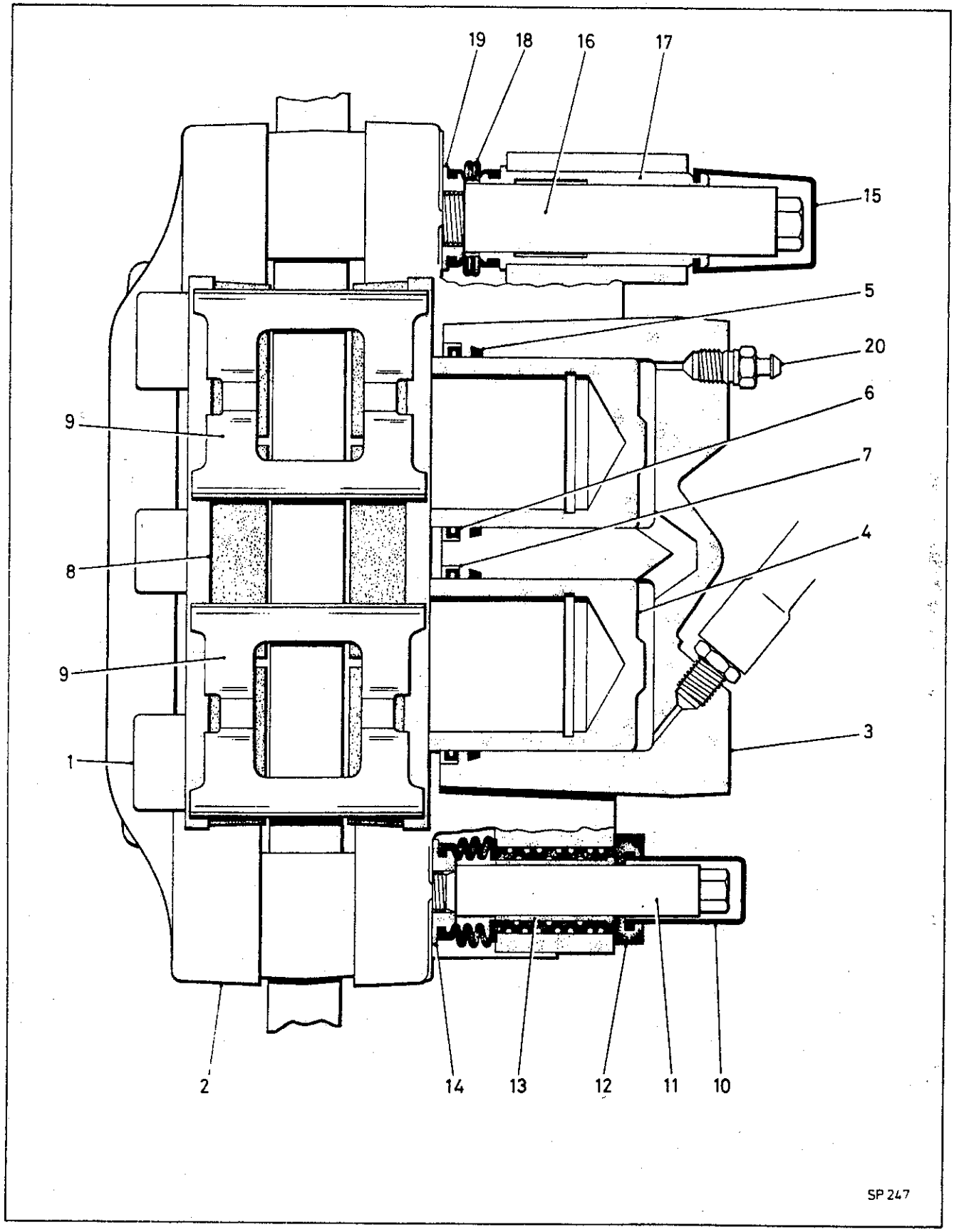


Fig. 3a *Section through caliper*
Note: Reference numbers to be used in conjuction with Fig. 3

Friction pad relplacement:

To ensure balanced braking it is important to replace the friction pads in complete axle sets.

Apply the handbrake, jack up and support the front of the vehicle.

Remove the front road wheels.

Thoroughly clean outer surfaces of caliper body using methylated spirit prior to pad removal. A wire brush can be used to remove excessive road dirt.

Friction pad wear can be directly viewed through the gap between the mounting bracket (2) and the bridge (1) when the road wheel is removed.
With a blunt screwdriver carefully prise plastic dust cap (10) out of rubber slide pin bush (12), this will expose the head of the 16mm ø slide pin (11). With a 13mm A/F socket unscrew and withdraw pin approximately 25mm. **It is recommended that this pin is not extracted from its bush for friction pad replacement,** as some difficulty or damage could result when refitting this pin without the use of an assembly bullet supplied in the Service Kit, See Fig. 6.

Pivot caliper bridge (1) about the upper slide pin (16) and support safely in the open position. This will allow access to the friction pads (8) and pad steady springs (9). Remove the friction pads.

Inspection of parts:

When refitting or replacing the friction pads, thoroughly clean the pad recesses and the exposed part of the pistons. Use clean Lockheed Universal brake fluid or methlyated spirit with a lint free clean cloth.

Carefully examine the surface finish of the pistons, provided that they are undamaged and not corroded they need not be replaced.

Examine caliper slide pin protective rubber boot (18) and rubber bush (12) these need not be replaced unless damaged.

Lightly smear the friction pad recesses with Lockheed Disc Brake lubricant.

Check the brake disc for cracks, scoring, or a rust deposit giving the surface a black appearance. Such faults if severe render the disc inefficient, therefore renew where there is any doubt. A rust build up on the outside edge of the disc sufficient to prevent correct seating of new friction pads may be carefully removed with a smooth file.

Re-assembly:

Carefully press each piston back into the caliper bore using a suitable piston clamp. During this operation brake fluid will be displaced. To prevent the reservoir overflowing open the bleed screw with a spanner, attach a bleed tube and allow surplus fluid to run into a glass jar.

When the pistons are fully back retighten bleed screw.

Check the bearing edges of the new pads for blemishes. High spots on the steel pressure plates may be carefully removed with a smooth file.

Lightly smear the back and front edges of the friction pad pressure plates with Lockheed Disc Brake Lubricant carefully avoiding the friction material.

Insert the new pads into the caliper recesses, fit the pad steady springs (9) to the bridge (1), renew steady springs if corroded or damaged and spread spring ears to ensure correct position for fitting.

Apply special grease from the Service Kit to the inside of the rubber slide pin bush (12).

Carefully lower bridge ensuring rubber slide pin bush (12) is fully compressed against the bridge (1) with boot seating (14) and not damaged on the mounting bracket (2).

Refit slide pin (11) and tighten to the correct torque.

Ensure both boots are fitted to their boot seatings (14) and (19).

Using the blunt screwdriver carefully refit the plastic dust cap (10) over slide pin head and into slide pin bush (12).

Depress the brake pedal firmly several times to locate the friction pads correctly.

Using Lockheed Universal 329s brake fluid restore the level in the brake master cylinder reservoir.

When the operation has been completed, on both caliper assemblies, refit the wheels and road test the vehicle.

Remember that when new friction pads have been fitted they are not "bedded in", avoid unnecessary heavy braking for the first three hundred miles.

Renewing caliper piston seals:

Apply the handbrake, jack up and support the front of the vehicle.

Remove the front road wheels.

As previously described under "friction pad replacement" remove the pads from the caliper. If it is intended to refit the used pads take note of their original positions.

Release the four cap head screws (21) which hold the piston housing (3) to the bridge (1), this will allow removal of the piston housing from the bridge **(do not allow the brake hose to support the weight of the piston housing).**

Fit a suitable piston clamp on to either piston (4) to restrict the exposed piston travel to about 40mm while the other piston (4) is pushed out by the hydraulic fluid. Place a receptacle under the caliper unit to receive any displaced brake fluid.

Fit a suitable hose clamp to prevent brake fluid loss, then remove piston clamp and extract remaining piston by hand.

Piston housing can be removed from the vehicle when released from the brake hose.

If any piston is seized the only satisfactory remedy is renewal of the complete caliper piston housing (3).

The wiper seal can now be removed by inserting a blunt screwdriver between the retainer and the seal to prise the retainer carefully from the mouth of the bore. Taking great care not to damage the seal grooves in the cylinder bore, extract the wiper seal and the fluid seal.

Thoroughly clean the bore, piston and particularly the seal grooves with clean brake fluid or methylated spirit only. If the caliper or pistons are corroded, or the condition of them is not perfect the parts must be renewed.

Coat the new fluid seal with Lockheed Universal brake fluid and ease the seal into the groove in the bore using fingers only, ensuring that it is correctly seated into the groove. The fluid seal groove and the seal are not the same in section, thus when bedded, the seal feels proud to the touch at edge furthest away from the mouth of the bore. (see Fig. 2).

Slacken the bleed screw on the caliper one complete turn and after lightly coating the piston with brake fluid insert it squarely into the bore using the fingers only. Do not tilt the piston during insertion and leave approximately 8mm projecting from the bore mouth.

Coat a new wiper seal with brake fluid and fit it into the new seal retainer. Slide the assembly squarely, seal side first, over the protuding piston and up to the bore mouth. Carefully use a piston clamp to press home the seal retainer and the piston. In a similar sequence deal with the other piston.

Tighten the caliper bleed screw to the correct torque, couple piston housing to brake hose and tighten.

Refit piston housing (3) to the caliper bridge (1) and tighten the four cap head screws (21) to correct torque.

Insert friction pads into the caliper recesses, fit the pad steady springs (9) to the bridge (1) ensure correct position.

Apply the special grease from the Service Kit to the inside of the rubber slide pin bush (12).

Carefully lower bridge ensuring rubber slide pin bush (12) is fully compressed against the bridge (1) with boot seating (14) and not damaged on the mounting bracket (2).

Refit slide pin (11) and tighten to correct torque. Replace dust cap (10) and finally remove the hose clamp and tighten brake hose to correct torque.

Refill the reservoir with Lockheed Universal brake fluid and bleed the system thoroughly. See Section MA190. It is important that the bleed operation is conducted with vacuum assistance to the brake servo unit.

Replenish the fluid level in the reservoir and operate the brake pedal several times to locate the friction pads correctly.

Check the hydraulic system for leaks before road testing the vehicle.

Remember that when new friction pads have been fitted they are not "bedded in", avoid unnecessary heavy braking for the first three hundred miles.

Slide Pin Maintenance:

Both slide pins (11) and (16) support the bridge caliper assembly (1). The plastic dust cap (10) and rubber boot (15) when removed expose the 13mm A/F pin heads. The lower 16mm Ø pin is **only unscrewed** for friction pad inspection or replacement.

If it is necessary to replace the rubber slide pin bush (12) first withdraw slide pin completely, remove boot seating (14) and split plastic sleeve (13) with care.

This will allow the rubber slide pin bush (12) to be extracted from the bridge (1).

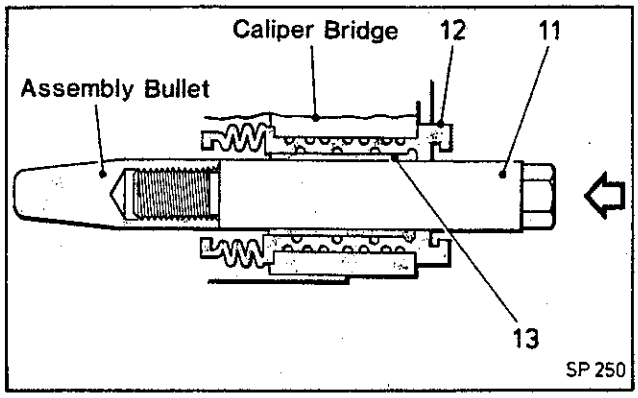


Fig. 4 *Slide pin replacement*

The replacement material for this operation is available in the Service Kit **only grease from this kit should be used for servicing these bushes and slide pins.**

Liberally grease the inside of the new rubber slide pin bush (12) and carefully fit **(gaiter end first)** into bridge hole.

Coat the split plastic sleeve (13) with the special grease and fit into the bush ensuring that the collar of the plastic sleeve is correctly engaged in the bush groove.

Grease and refit slide pin (11) (replace if necessary) with the use of the assembly bullet supplied in the Service Kit (see Fig. 4). This prevents damage or displacement of the split plastic sleeve.

Remove assembly bullet and refit boot seating (14).

If the rubber boot (18) needs replacing slacken the upper 20mm Ø slide pin and withdraw, remove from seating on slide pin bush (17) and boot seating (19).

Reverse procedure for boot replacement and ensure a liberal internal greasing of the new boot and the metal slide pin bush internal recess.

If slide pin shows signs of damage, i.e. indentation, corrosion or wear then renew.

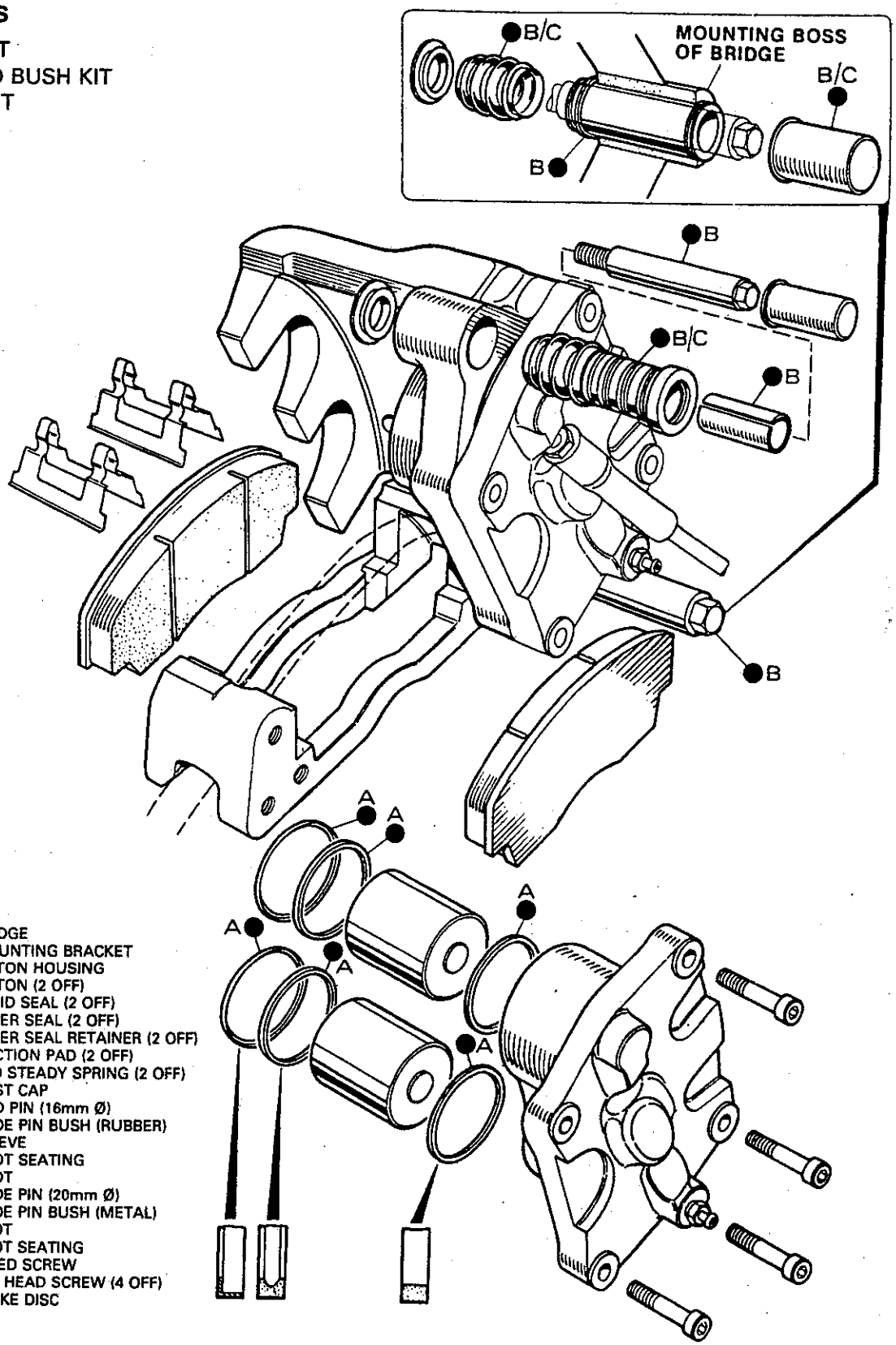
When rubber boot (18) or rubber slide pin bush (12) are to be replaced and the caliper is to remain on the vehicle it is advisable to remove only one slide pin at a time. Thus the other pin supports the weight of the bridge assembly.

Ensure the caliper weight is not supported by the brake hose.

The metal slide pin bush (17) should be replaced if it shows signs of damage, indentation, wear or corrosion, for this operation the caliper bridge assembly (1) will need to be removed from the vehicle. The bush is a press fit into the bridge and will need to be pressed out away from the bush shoulder. **Only a service replacement metal slide pin bush (17)** should be pressed into the bridge ensuring correct alignment and seating of the bush on its shoulder.

REPAIR KITS

A SEAL KIT
B PIN AND BUSH KIT
C BOOT KIT



		1	BRIDGE
		2	MOUNTING BRACKET
		3	PISTON HOUSING
		4	PISTON (2 OFF)
A	●	5	FLUID SEAL (2 OFF)
A	●	6	WIPER SEAL (2 OFF)
A	●	7	WIPER SEAL RETAINER (2 OFF)
		8	FRICTION PAD (2 OFF)
		9	PAD STEADY SPRING (2 OFF)
		10	DUST CAP
B	●	11	SLID PIN (16mm Ø)
B/C	●	12	SLIDE PIN BUSH (RUBBER)
B	●	13	SLEEVE
		14	BOOT SEATING
B/C	●	15	BOOT
B	●	16	SLIDE PIN (20mm Ø)
B	●	17	SLIDE PIN BUSH (METAL)
B/C	●	18	BOOT
		19	BOOT SEATING
		20	BLEED SCREW
		21	CAP HEAD SCREW (4 OFF)
		22	BRAKE DISC

Fig. 5 *Contents of Service Repair Kits*