27mm DIA.TANDEM BRAKE MASTER CYLINDER

(Vacuum/hydraulic models)

Description:

A cast iron cylinder accommodates two pistons in tandem which have a captive separating spring between them. The reservoir is a translucent plastic moulding, screwed to the cylinder body. The reservoir is partitioned by an internal vertical baffle to ensure an independent fluid supply to each half of the tandem system, and is provided with a fluid level sensor which is also used as a filler cap.

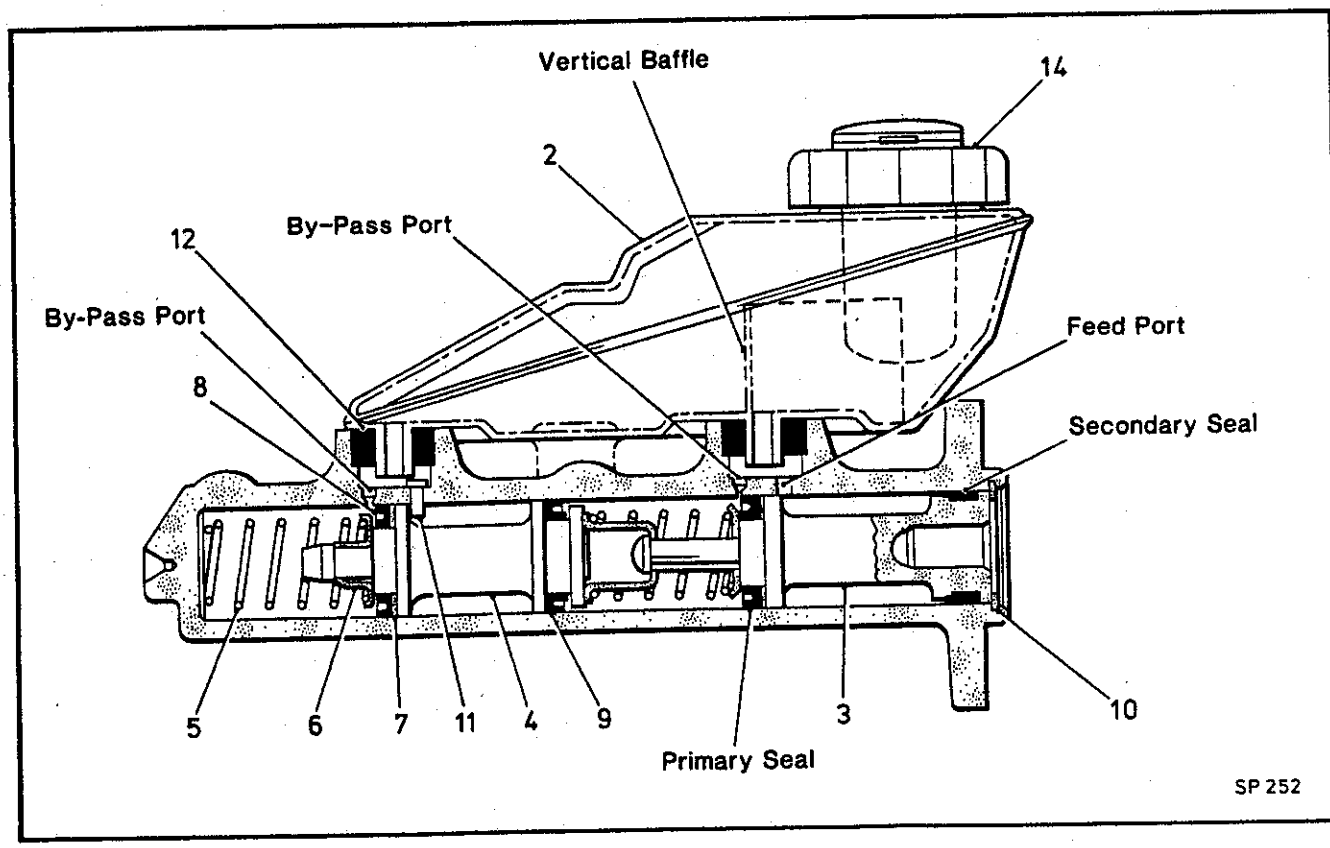
NOTE:- SERVICE KITS

(a) Master Cylinder Repair Kit
(b) Replacement fluid level sensor
(c) Replacement Master Cylinder

Operation:

When the brake pedal is depressed the servo output pushrod exerts a force on the primary piston of the master cylinder pushing it down the bore. As the 'captive' primary spring is stronger than the secondary spring the secondary piston also moves down the bore. Pressure is gernerated when the primary seals travel past the by-pass ports. The secondary piston, due to the reverse seal, is pushed by the primary fluid pressure and thereby maintains a similar pressure in the secondary circuit. In the event of serious leakage from the secondary circuit the piston will move to the end of the cylinder bore but the primary circuit will continue to function. Conversely loss of pressure in the primary circuit will cause the primary piston to contact and mechanically operate the secondary piston thus pressurising the secondary circuit. In either instance brake pedal travel will be increased but the remaining circuit will still be capable of operating hydraulically. When the pedal is released the fluid pressure and springs return the pistons, the by-pass ports are once more uncovered and the fluid pressure drops to zero. The open by-pass ports allow fluid movement, compensating for expansion or contraction caused by changes in temperature.

Fig. 1 *Assembly of Ø 27 Tandem Brake Master Cylinder.*



Master Cylinder (Vac./Hyd.)

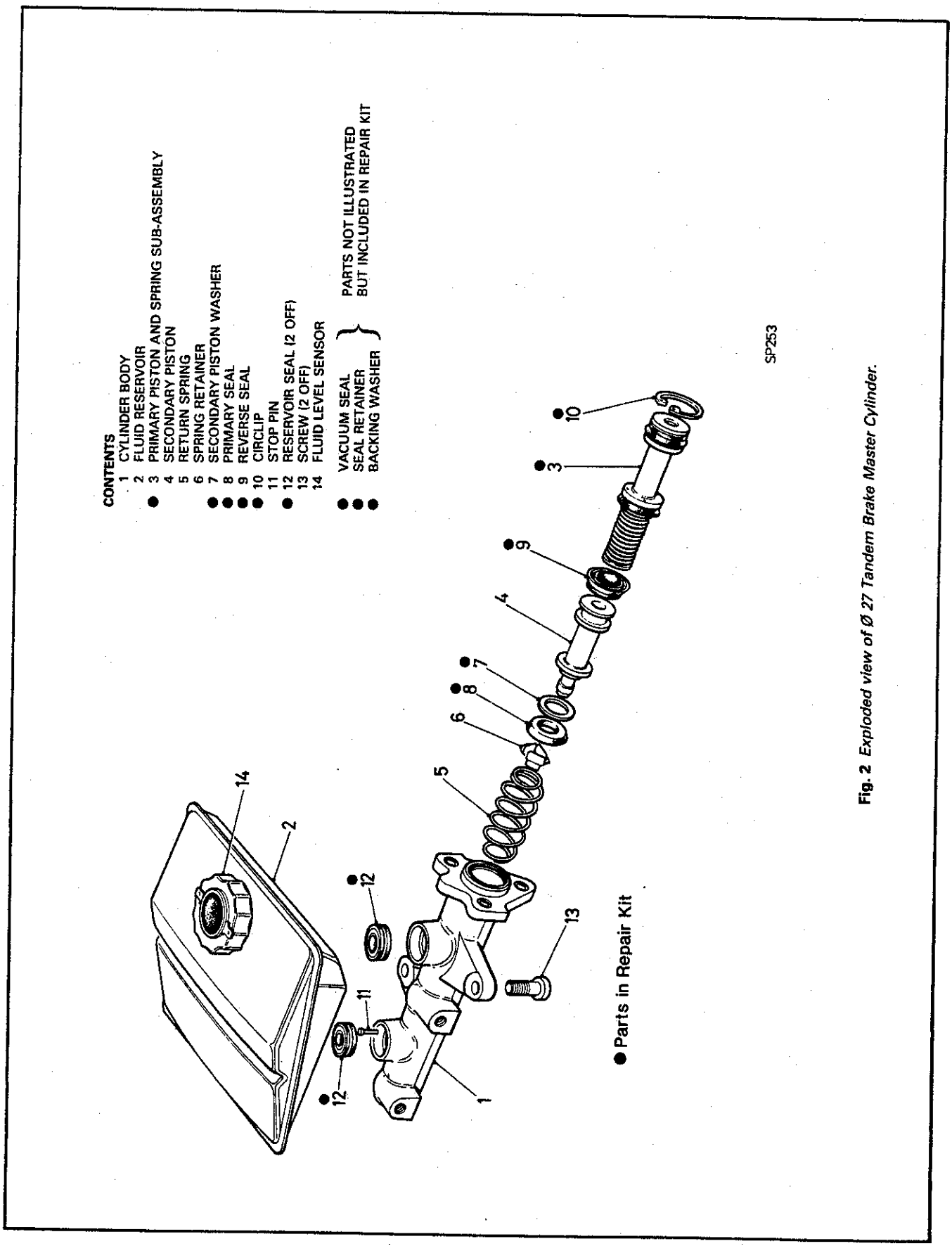


Fig. 2 *Exploded view of Ø 27 Tandem Brake Master Cylinder.*

Dismantling:

Before commencing either overhaul or replacement, operate the brake pedal several times to fully exhaust all residual vacuum from the servo. Never operate the brake pedal with the master cylinder removed, otherwise the vacuum servo internals will be damaged.

Remove the hydraulic pipes from the master cylinder and plug the exposed ports.

Disconnect the wires from the fluid level sensor unit. Unscrew the three nuts and separate the master cylinder from the servo. Drain the reservoir and refit the cap.

If overhaul is undertaken the procedure detailed below must be followed, ensuring that the components do not come into contact with mineral oil (engine oil, grease, etc).

Mount the master cylinder, reservoir uppermost in a soft jawed vice, remove the two screws (13) retaining the reservoir to the cast iron cylinder and remove the reservoir (2).

After removal of the reservoir seal rubbers (12) the secondary piston stop pin (11) can be extracted. If the pin is not free, push the primary piston and spring sub-assembly (3) down the bore with a soft rod which will take the load off the pin.

Hold the primary piston sub-assembly down the bore (off the circlip) and using internal circlip pliers extract circlip from bore mouth and withdraw the primary piston and spring sub-assembly.

To remove the secondary piston (4) and return spring (5), place a clean lint free cloth on the bench and repeatedly tap the open mouth of the bore onto the bench until sufficient of the secondary piston emerges.

Be prepared for fluid spillage when removing pistons.

With the fingers only, remove the primary and reverse seals (8 & 9), piston washer (7) and spring retainer (6) from the secondary piston only, **taking careful note of their positions, particularly the seals.**

Inspection of parts:

Clean all the parts thoroughly with new **Lockheed Universal 329s brake fluid,** dry with a lint free cloth and carefuly inspect the metal components for faults and wear.

A replacement assembly will always be required where the cylinder bore, after cleaning, shows the slightest sign of corrosion or scoring.

If the metal parts are found not to be in perfect condition, be prepared to fit a new primary piston and spring sub-assembly and rubber seals; these are all included in the master cylinder repair kit.

The fluid feed and by-pass port drillings in the cylinder body must be clear, also the drillings in the head of each piston. Check that the vent hole in the fluid level sensor is clear.

Re-assembley:

Scrupulous cleanliness is essential, therefore ensure that the hands are free of grease and dirt. Before re-assembly the cylinder bore and rubber components should be lubricated with new Locheed Universal 329s brake fluid.

Locate a new piston washer (7) on the head of the secondary piston. Using the fingers only, ease the primary seal (8) over the piston nose, lip last, so that it is seated up to the piston head holding the piston washer in place.

Carefully fit the reverse seal (9), lip last, into the groove on the other end of the piston.

Push the spring retainer (6) onto the secondary piston nose followed by the return spring (5). Insert the return spring, spring retainer and secondary piston assembly into the bore, taking care not to bend back the lip of the leading seal.

Enter the primary piston and spring sub-assembly (3) ensuring that the seal lips are not bent back. Refit the circlip at the cylinder mouth and check that it is correctly seated in the groove.

Push the primary piston fully down the bore until it stops, than insert the stop pin (11) into either one of the two secondary feed port holes.

Position the two reservoir seals (12) into the cylinder body recesses. Ensure that the reservoir is clean and insert the two fluid tubes into the rubber seals. Fit the two reservoir securing screws (13) and tighten to correct torque.

Refit the master cylinder to the servo unit and tighten the three nuts to correct torque.

Reconnect the fluid feed pipes and tighten the tube nuts to correct troque. Refill the reservoir with **Lockheed Universal 329s brake fluid** and bleed the system thoroughly. Replenish the reservoir, reconnect the wires to the fluid level sensor unit and check the hydraulic system for leaks before road testing the vehicle.