1.75″ DIA. × 2.0″ TANDEM MASTER CYLINDER

Air/hydraulic models

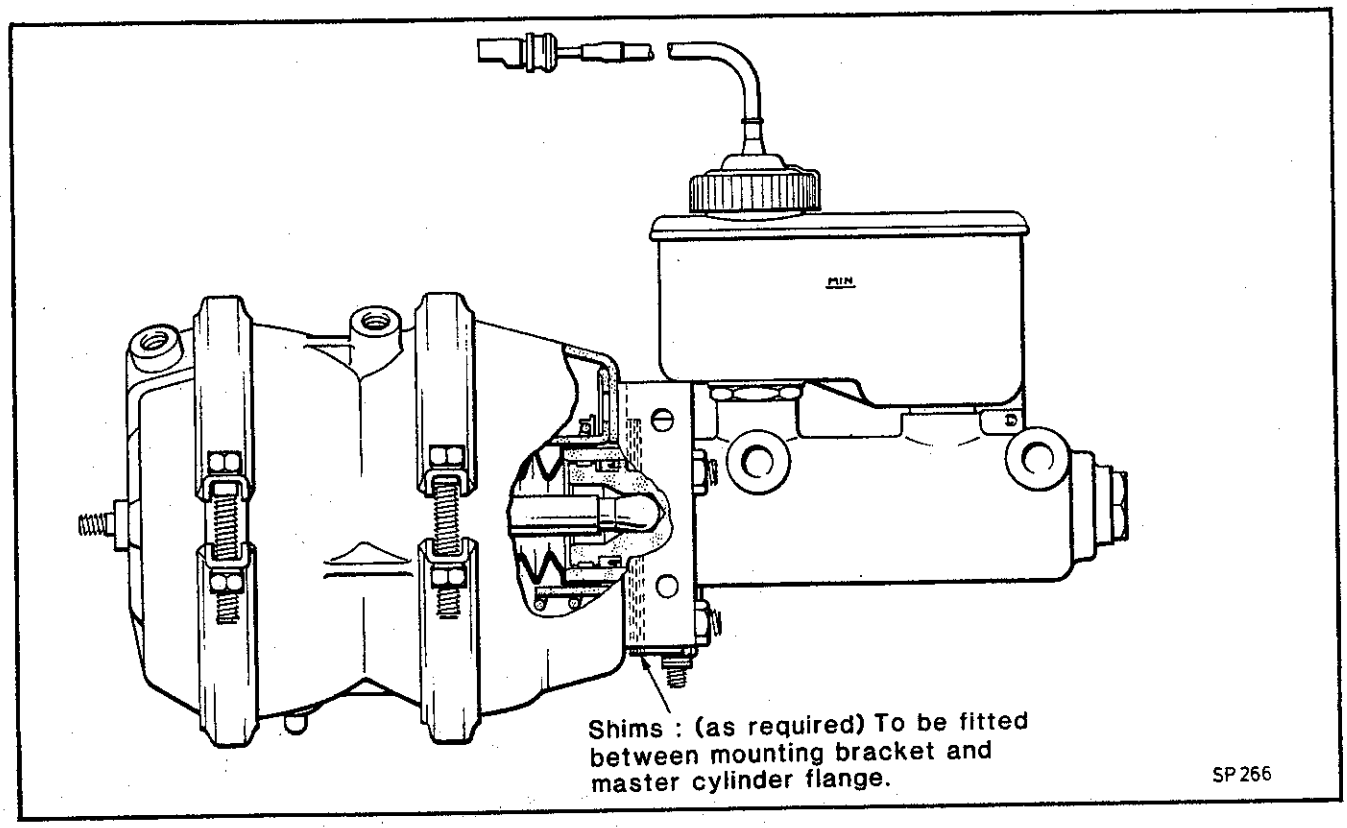


Fig. 1 *Assembly of Tandem Actuator and Master Cylinder.*

TO REMOVE

Apply handbrake, immobilise vehicle and chock wheels.

Clean the assembly thoroughly whilst still mounted on the vehicle.

Disconnect the low level warning switch wires from the filler cap.

Disconnect hydraulic pipes, drain reservoir and seal all open ends.

Release the three nuts holding master cylinder to actuator. Withdraw master cylinder. Replace the three nuts finger tight only to retain actuator and shims to centre bracket.

DISMANTLING

Clamp the mounting flange of the master cylinder body into the soft jaws of a vice with the unit in an upright position.

Unscrew the filler cap assembly, pull out the deflector and with a socket spanner remove the self locking counter nut.

Remove the screw and washer which attach the reservoir to a lug on the master cylinder body. Remove the reservoir.

Lever the seal from out of its seat in the body and unscrew and remove the adaptor together with the two 'O' rings.

The tipping value is now visible but do not remove at this stage.

Using a length of rod or bar, either wood or metal with an end rounded and smooth, push the primary piston down into the cylinder about ¼" and lift out the tipping value and its spring.

Remove the pressure on the primary piston and remove it, the return spring, seal, back-up ring and the split support rings.

Using the length of rod or bar, push the secondary

piston about ¼" into the cylinder and remove the piston stop pin and washer using round nosed pliers.

Remove the master cylinder from the vice and lightly tap the open end on a wooden surface to remove the secondary piston, return spring,

INSPECTION

Take each part in turn and thoroughly clean and inspect.

If the part is fit for further service, replace it in its correct position.

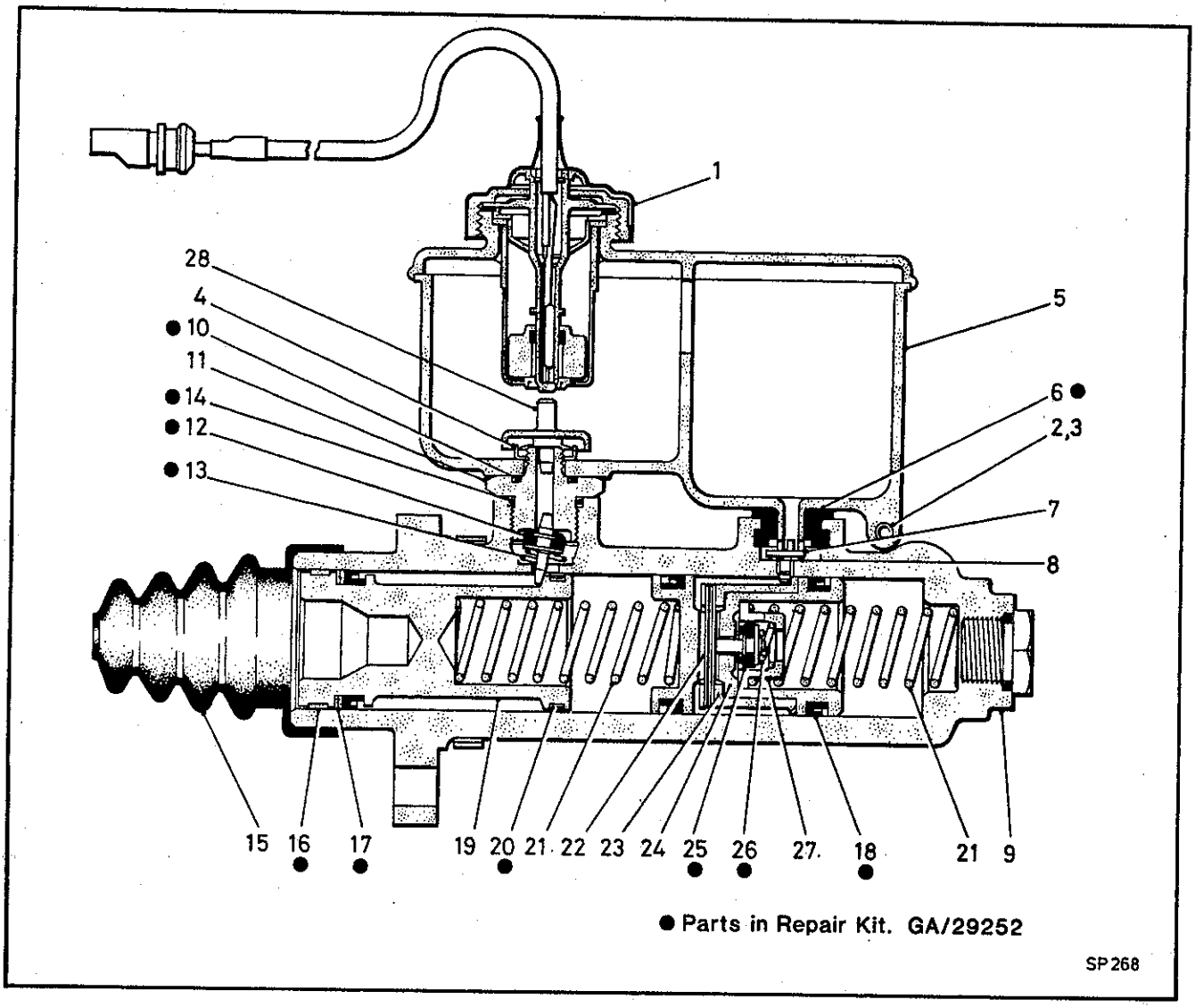


Fig. 2 *Section Through Master Cylinder*

spring retaining cup, centre valve assembly, centre valve spring, sliding sleeves, tension pin and seals.

Do not carry out further dismantling at this stage, but lay out all the parts in order for inspection.

If a part is unserviceable and a replacement part is in the repair kit, place the new part in its correct position.

If a part is unserviceable and is not in the repair kit, it will be necessary to replace the complete unit.

Check the filler cap assembly for damage, then connect the terminals to a suitable battery with a

bulb in the circuit. Hold the assembly in a vertical position with the cap uppermost. In this position; which simulates a low fluid level condition, the bulb should light up. Gently raise the float, simulating normal fluid level and the bulb should go out.

Check the reservoir body for signs of damage, particularly at the seal areas and the seam.

Discard and replace the tipping value and its spring.

Ensure that the piston stop pin is in good condition.

Discard and replace the primary piston seal, spiral back-up ring and split support rings.

Thoroughly clean the grooves of the primary piston.

Lubricate a new seal and spiral back-up ring with clean brake fluid.

Working from the end opposite to where the seal is fitted, 'SCREW' the back-up ring into position in the seal groove. With the open end of the seal facing rearwards, carefully work the seal along the piston until it drops in its groove.

Fit in position in their appropriate grooves the split support rings. Note that the plain ring fits in the groove nearest the seal.

Check the primary piston return spring for coil contact and distortion.

From the secondary piston, carefully remove and discard both seals. Remove the spring retaining cup and discard both the centre value and its spring.

Check that the sliding sleeves move freely within the groove in the piston and that the piston stop pin has not damaged the flange face.

Thorougly clean the secondary piston, especially the grooves. Lubricate the two new seals with clean brake fluid. Take one seal and with the open lip end rearwards, carefully ease it into its groove in the piston. Turn the piston round and repeat this operation with the second seal. (Properly installed, the open ends of the seals should face outwards).

Fit the new centre valve into the piston and carefully press in the spring retaining cup and new spring. The flanges of the nylon sliding sleeves should be held away from the shoulder of the piston by the action of the spring in a correct assembly.

Check the secondary piston return spring for coil contact and distortion.

Check the bore of the master cylinder body, this must be free from scratches, score marks and corrosion. Do not attempt to rectify a damaged bore, order a new unit if any doubt exists. Inspect the threads of the primary and secondary ports and lightly coat the length of the bore with new brake fluid and prepare for re-assembly.

RE-ASSEMBLY

Clamp the mounting flange of the master cylinder in the soft jaws of a vice with the unit in an upright position.

Place the secondary piston return spring inside the secondary piston.

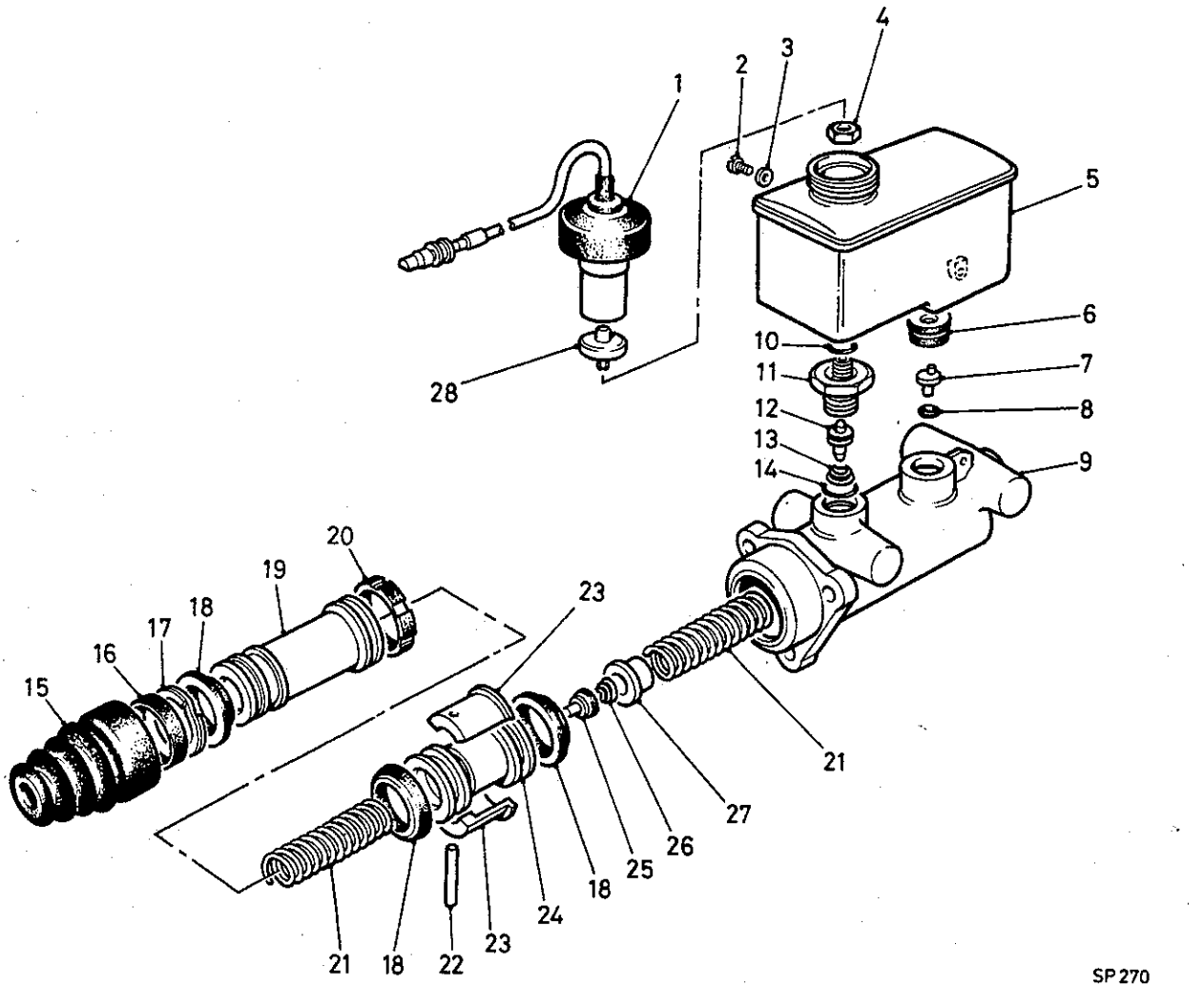
Offer the secondary piston assembly to the master cylinder bore until the lip of the first seal is resting inside the lead-in chamfer of the bore. Check all around the lip of the seal to ensure that it has fully entered without curling back, then slowly push the piston down the bore in one continuous movement.

Using the rod or bar with the smooth rounded end, push the piston down the bore until it bottoms then press in the piston stop pin and its washer. Gently release the pressure on the piston.

Place the primary piston return spring inside the primary piston.

Offer the primary piston assembly to the master cylinder bore until it just enters the lead-in chamfer of the bore. Hold the two ends of the slotted split support ring together and feed the piston in until the lip of the seal is resting inside the lead-in chamfer. Check all around the lip of the seal to ensure that it has fully entered without curling back. Hold the two ends of the plain split support ring together and push the piston fully into the bore.

Using the smooth, rounded end rod or bar, push



1 FILLER CAP	8 WASHER	15 BOOT	22 TENSION PIN
2 SCREW	9 M'CYLINDER BODY	16 SPLIT SUPPT. RING-PLAIN	23 SLIDING SLEEVE (2 OFF)
3 WASHER	10 'O' RINGS	17 SPIRAL BACK-UP RING	24 SECONDARY PISTON
4 COUNTER NUT	11 ADAPTOR	18 PISTON SEAL (3 OFF)	25 CENTRE VALVE
5 RESERVOIR	12 TIPPING VALVE	19 PRIMARY PISTON	26 SPRING – CENTRE VALVE
6 SEAL	13 SPRING-TIPPING VALVE	20 SPLIT SUPPT. RING-SLOTTED	27 SPRING RETAINING CUP
7 PISTON STOP PIN	14 'O' RING	21 RETURN SPRING (2 OFF)	28 DEFLECTOR

Fig. 3 *Exploded view of Master Cylinder*

the piston down the bore for at least ¼" from the end then fit the tipping valve and its spring. Gently release the pressure on the piston.

Place a new 'O' ring onto the underside of the adaptor.

Push the primary piston down the bore again for at least ¼" then screw the adaptor fully home and tighten to correct torque. Slowly release the pressure on the piston.

Lubricate the new reservoir to master cylinder seal and ease the seal into the master cylinder body. Using a smooth round bar through its centre, ensure that it is located properly all the way round.

Fit a new 'O' ring into its recess in the adaptor.

Lower the reservoir into position and fit the screw and washer but do not fully tighten.

Fit the self locking 12mm counter nut and tighten to correct torque.

Push the deflector into the top of the adaptor.

Tighten the screw.

Fit the filler cap assembly.

Refit master cylinder to the actuator, retaining previous shims and tighten the three nuts to the correct torque.

Reconnect hydraulic pipes, refill with new brake fluid to correct specification and bleed the hydraulic system.

ASSEMBLY OF NEW UNITS

If either the master cylinder or actuator had been changed, the following procedure should be carried out. (see Fig. 4 and Fig. 1 section M260)

Using the special tool, first release the Allen screws securing the tool plunger and the collar. Position the short legs of the tool on the master cylinder mounting face. Insert the tool plunger until it abuts the primary piston. Tighten Allen screw to lock plunger in position. Slide collar until it abuts shoulder of tool and lock collar with Allen screw.

Attach actuator centre mounting bracket directly onto front cover of actuator (no shims), and torque tighten the three fixings.

Release the Allen screw securing tool plunger.

Place long legs of the special tool onto mounting face of actuator bracket. Position tool plunger until it abuts actuator push-rod. Tighten Allen screw to lock plunger in position.

Measure gap between tool collar and shoulder. The dimension is equal to the thickness of shims required.

Place the required thickness of shims on each actuator stud between mounting bracket and master cylinder flange.

Attach master cylinder and tighten nuts to correct torque.

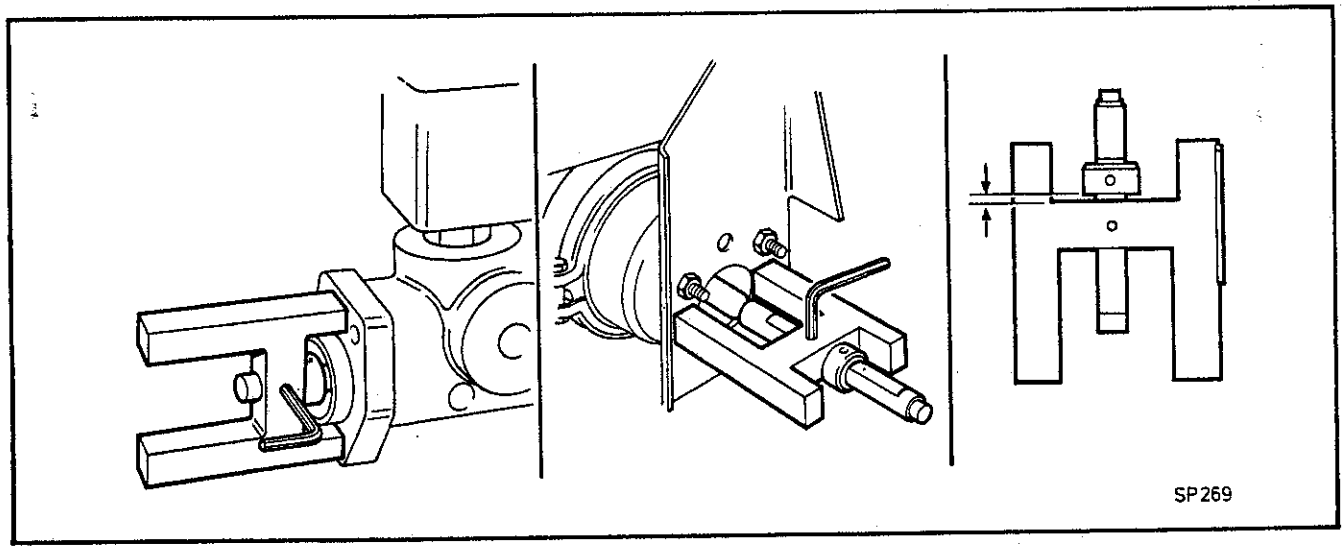


Fig. 4 *Setting Master Cylinder and Actuator*