TANDEM ACTUATOR

Description

The tandem actuator converts the energy of compressed air into the displacement necessary to operate the hydraulic master cylinder and thus the brakes.

The actuator comprises two air pressure cylinders, each connected to one of the systems controlled by the dual brake valve. In the event of excessive loss of air pressure or failure in one of the air systems, the remaining system will continue to control the brakes on all wheels, but at a lower pressure, so that the vehicle can be brought safely to a halt.

The actuator consists of a centre body assembly clamped between two cylinders each containing a piston. The piston rod, which is biased towards the brakes released position by a return spring, passes through the centre of one piston and abuts the centre of the other. The rounded end of the piston rod enters the hydraulic master cylinder which is bolted to the actuator. Each cylinder has an air connection and a breather port. Wire mesh filter elements are fitted in the breather ports to prevent dirt from entering the cylinders.

Operation

When compressed air from the brake valve enters the unit through the air connections, the pressure built up on one side of each piston moves the piston and piston rods towards the hydraulic master cylinder which applies the brakes. The higher the air pressure, delivered by the brake valve, the greater the braking effort produced by the actuator. Conversely, the lower the air pressure, the less the retarding force. When all air pressure is released from the unit by the brake valve, the pistons and rod are moved by the return spring to the brakes-released position.

During normal operation, both pistons act on the piston rod to apply the brakes.

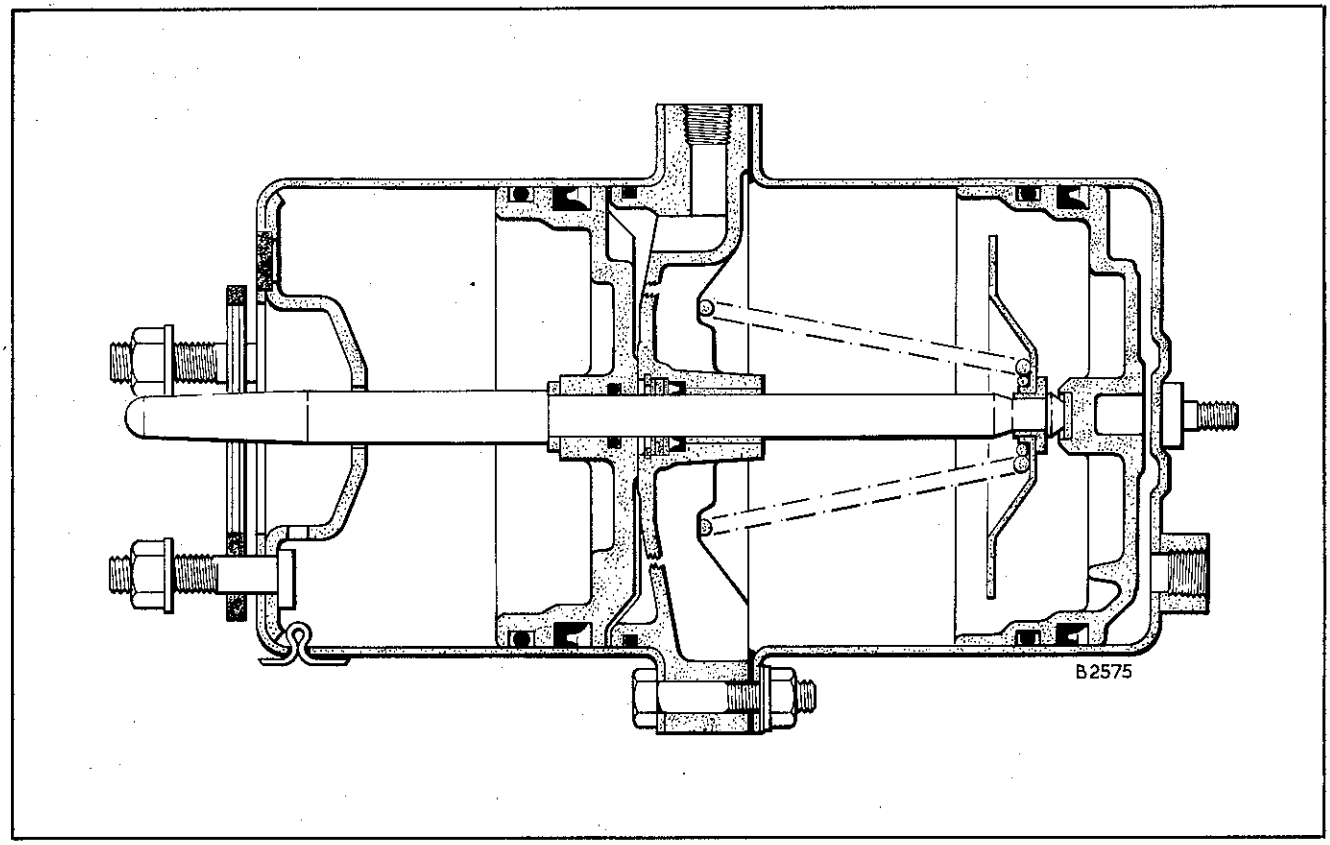

Fig. 1 *Tandem actuator - sectional view*

Maintenance

Check the mounting brackets and nuts for security.

Check the tightness of the air pipe connections.

Check that the drain pin is free from dirt and obstruction.

At the time stated in the Maintenance Schedule overhaul and renew the seals in the actuator.

Leakage Test

Securely chock the wheels.

Charge the system to governor valve cut-out pressure and stop the engine.

Tape up the drain hole fitted with a split pin in the cylinder adjacent to the hydraulic master cylinder.

Make a maximum application of the brake pedal and hold the application throughout the duration of the test.

Coat the breathers, one in the centre body and the other in the cylinder adjacent to the master cylinder, and the pipe connections with soap solution.

Leakage from the breather ports in excess of a 2 cm (0.79 in) soap bubble in three seconds is not permissible.

No leakage is permissible from the pipe connections or centre body joints or any other part of the unit.

No bubbles from a breather port indicates the piston is seized.

Remove the tape from the drain hole after the test.

To Remove

Note: The tandem actuator can be removed without disturbing the hydraulic master cylinder providing the master cylinder is supported.

Thoroughly clean the pipe connections.

Disconnect the air feed pipes.

Remove the nut and washer securing the actuator to the front mounting bracket.

Disconnect and remove the front mounting bracket.

Suitably support the master cylinder.

Remove the three nuts and washers securing the actuator and master cylinder to the rear mounting bracket.

Withdraw the actuator forward, collect the shims.

To Dismantle

Thoroughly clean the tandem actuator.

Mark the cylinders and centre body to show their correct relationship.

Remove the eight nuts and bolts securing the cylinders to the centre body and separate the parts. Discard the gasket.

Extract the piston fitted into the rear cylinder (the one furthest away from the master cylinder) using air pressure, if necessary.

Remove the breather element from the other cylinder.

Secure the piston rod (return spring upwards) in a soft jawed vice.

With one operator pressing down on the spring end plate, the second operator can release and remove the collets.

Withdraw the spring end plate, spring, centre body, piston and abutment washer.

Remove the piston rod from the vice.

Remove the breather element from the centre body.

Extract the circlip from the centre body and remove the retaining plate, lubricator ring, retaining plate and seal.

Remove all sealing rings from the pistons and body, including the one from the front piston bore.

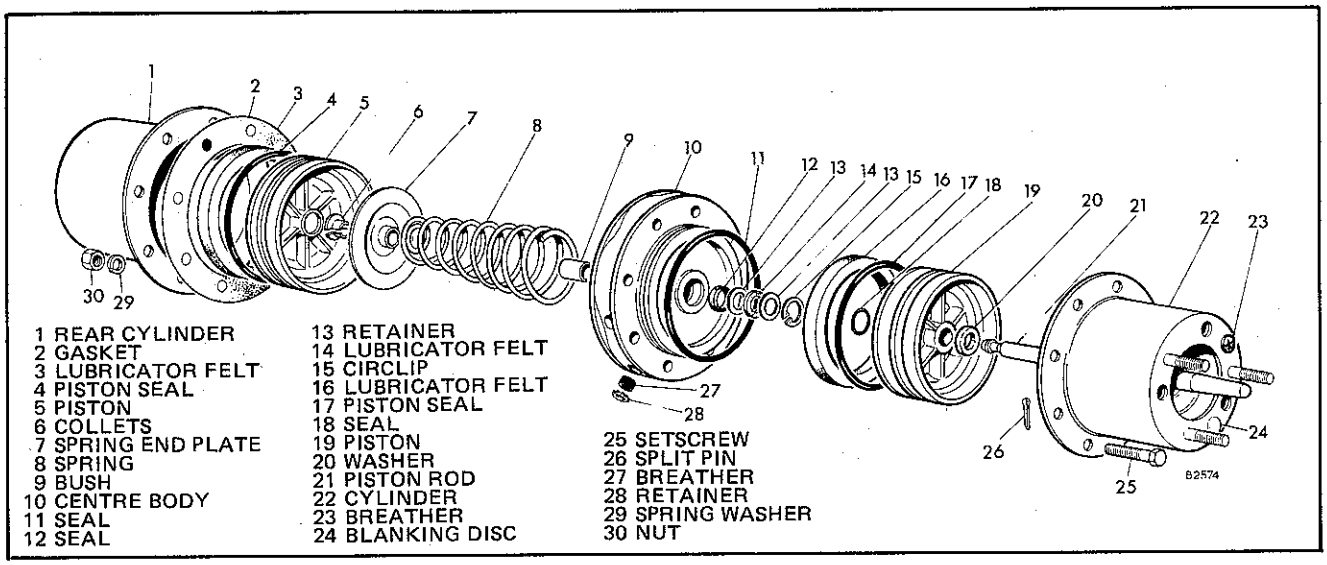

Fig. 2 *Tandem actuator details*

Inspection and Overhaul

Thoroughly clean all parts.

Examine the body and cylinders for cracks, dents, excessive internal scoring or corrosion damage.

Examine the pistons for scores, cracks or other damage.

Check the spring for corrosion or damage.

Examine the push rod and check for buckling and excessive wear where the rod contacts the centre body.

If the centre body bush is worn, giving a sloppy fit to the push rod, fit a new bush. Ream if necessary to give a correct fit.

Renew all rubber parts.

To Re-Assemble

All sliding and load bearing surfaces, sealing rings and springs must be coated with the grease (CDS 156) supplied in the repair kit, or Rocal E1A. Soak the lubricator ring and piston lubricators in C.O. Power cylinder oil (CDS 107) for 30 minutes.

Fit the sealing ring into the bore of the front piston.

Fit the lubricator wick to the groove nearest the open end of the pistons. Ensure the ends abut.

Fit the sealing ring to the pistons with the lips pointing away from the lubricator wick.

Fit the seal into the centre body bore with the lips pointing away from the bush. Fit the seal retaining plate, lubricator ring, retaining plate and circlip.

Position the push rod in a soft jawed vice, collet end upwards.

Assemble on the push rod the abutment washer, the piston, sealing ring upwards, centre body, spring seat upwards.

Position the spring on the centre body, locate the end plate on the spring, bevelled end downwards.

With one operator pressing down on the end plate, the second operator can refit the collets to secure the end plate.

Remove the push rod assembly from the vice, fit the seal into the groove in the centre body.

Fit the piston into the front cylinder, taking care not to damage the seal.

Align the marks made before dismantling and fit the front cylinder and new gasket to the centre body.

Taking care not to damage the seal, insert the piston assembly into the rear cylinder, aligning the marks made prior to dismantling. Fit the bolts through the rear cylinder, centre body and front cylinder, secure with nuts and spring washers.

DESCRIPTION AND MODIFICATIONS

This may seem a little out of place but I have heard about problems with people stealing work and selling it - for example on eBay.

If you're reading this and you bought this manual anywhere then you have been ripped off.

Please contact me via my email mikejamson@hotmail.com Otherwise I can be found on the dodge50 facebook page, if not then get in contact with Greg and he can pass the message on to me.

I have note done this pdf manual for my own personal gain and wish to see the community of 50 series owners benefit from the information here, and I do not want to see the community get taken advantage of and somebody else gain from it unfairly.

The information in pdf format will hopefully allow more of these wonderful trucks to stay on the road by providing information to everybody.

This has been quite a long and involved process to scan the manual and to convert it into a pdf format. I do aplogise as I have used several different scanners and several different computers to do it, so there are no doubt some errors hidden throughout, as well as some editing errors.

I have aimed to balance quality and file size and hope that this balance meets to everybody's approval.

If you see an error please let me know and I will fix it as soon as I can.

Place the breather elements into the recesses in the rear cylinder and centre body. Secure the one in the centre body with the retainer.

Using an air line check that the actuator is operating correctly.

To Refit

Remove the actuator rear bracket, ensuring the master cylinder is adequately supported.

Position the actuator and master cylinder so that the push rod of the actuator is lightly touching the primary plunger of the master cylinder. Measure the distance between the two mounting flanges.

Add 0.75 mm (0.30 in) to this dimension plus the thickness of the rear mounting bracket. Select shims to this total, plus or minus 0.35 mm (0.015 in). When the shims are fitted there must be 0.35-1.15 mm (0.015-0.045 in) clearance between the push rod and primary plunger when the brakes are in the OFF position.

Refit the rear bracket.

Position the actuator on the rear mounting bracket and secure with the front mounting bracket.

Assemble the master cylinder with the shim packs to the actuator, secure with three nuts and washers, torque tightened to Data figure.

Reconnect the air pipes and carry out a leakage test.