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Brake Master Cylinder with Air Control Valve

Daimler Sovereign, Jaguar Mk 1 0, 4.2, 420 & 420G.
 Jaguar E type 4.2 series 1 & 2. 5.3 V12 series 3
 Rover 3500 & 3500S.

Dismantling

Remove assembly from vehicle. Seal brake pipe ends and exposed cylinder ports. Grip cylinder in a soft jawed vice with air valve uppermost. Extract five screws, remove plastic cover also rubber diaphragm and support. Extract two screws, remove housing and gasket.

Reposition cylinder with mounting flange uppermost, remove rubber boot. Compress return spring, remove spiral clip, retainer and spring. Depress piston and hold, using circlip pliers extract circlip. Do not damage surface finish of piston. Withdraw piston complete with bearings, seals, spring and retainers. Remove inlet and outlet port fittings, extract trap valve and spring. Release cylinder body, tip out lever from end of bore. Insert a blunt screwdriver into outlet port and push out valve piston, finally extract by hand. Remove ,O' ring and seal. Strip main piston assembly, removing bearings and secondary seal. Prise off plastic spring retainer from piston nose, remove main seal and piston washer.

Examination

Carefully inspect components for faults and wear. A replacement cylinder will be required where the bore, after cleaning, shows signs of corrosion or scoring. If metal parts are in perfect condition be prepared to fit new rubber components which are available in a repair kit. Check that all ports and drillings in cylinder body are clear.

Reassembly

Scrupulous cleanliness is essential, keep hands free of grease and dirt. Lubricate cylinder bore and rubber components with clean brake fluid. Insert metal lever into bore to locate correctly into recess. Assemble parts onto piston as illustrated, then insert into bore. Do not bend back lip of main seal or damage bearing ,O' ring seal during insertion. Refit circlip to retain piston assembly then stroke piston to ensure correct operation. Position spring and retainer over exposed part of piston, depress spring and fit spiral circlip. Smear inside of rubber boot with Rubberlube Grease, slide pushrod through boot into end of piston. Locate rim of boot into body groove. Insert trap valve, refit both adaptors and tighten to 45Nm (33lbf.ft).

Reposition cylinder body in vice so mounting face of air valve is uppermost. Ensure face is clean and undamaged. Fit a new ,O' ring and seal onto the air valve piston as illustrated, insert into bore taking care not to bend back lip of seal. Place a new gasket and the air valve housing onto mounting face, secure with two screws and washers to a torque of 19Nm (14lbf.ft). Fit diaphragm onto diaphragm support, place support stem into valve piston. Place valve cover over diaphragm, ensure bosses align with slots in diaphragm. Insert the screws and tighten evenly, do not overtighten.

Finally, visually inspect cylinder to ensure correct assembly before refitting to vehicle.

Fitting Instructions for Type 7 Remote Servo & Tandem Master Cylinder

Jaguar E Type Mk. I, II, III Servos used with 4212-556PT3P (C26767) Master Cylinder

General fitting instructions

To ensure correct installation of the remote vacuum service unit, thoroughly read and adhere to the fitting instructions prior to carrying out any work on the vehicle.

Introduction

The vacuum servo unit is incorporated into the hydraulic braking system, remote from the master cylinder, as an intermediate stage operating between the master cylinder and the brake assemblies. The two main parts of the servo unit consist of the vacuum servo mechanism and the hydraulic slave cylinder assembly. These component parts are bolted together so that the slave cylinder is in line with, and is operated directly, by the servo push rod.

The servo unit is designed to give no assistance with very light brake application. In the absence of servo assistance due

to a loss of vacuum, an unrestricted passage for the fluid will exist. The brakes can still be applied, therefore, by the normal action of the pedal on the brake master cylinder, but this would demand heavier foot pressure to achieve the same degree of braking as with servo assistance. When this servo unit is used to replace a different servo, or is installed on a vehicle previously without a servo, the following recommendations must be observed.

Important:

Fitting a brake servo unit will not make faulty brakes reliable. Any fault in the vehicle braking system **must** be rectified.

Therefore before fitting the new servo unit, ensure the braking system is in good working order.

Note:

A. When changing brake parts the need for absolute cleanliness is essential. Therefore ensure that hands are free of grease and dirt. Always use a fluff-free cloth or paper towelling for cleaning purposes.

B. Ensure a sufficient quantity of DOT 4 brake and clutch fluid is available for bleeding the braking system and topping up the reservoir. Where possible, brake fluid should always be stored and dispensed from the original container. Care must be taken to prevent both dirt entry and contamination, especially in the mouth area of the master cylinder reservoir.

Fitting Hydraulic piping (Fig. 1)

With all relevant connection points clean and free from ingress of foreign matter, using the new Bundy piping:

- Connect up the feed pipe from the brake master cylinder to the servo slave cylinder inlet port.
- Connect up the supply pipe from the servo slave cylinder primary outlet to the front brakes.
- Connect up the supply pipe from the servo slave cylinder secondary outlet to the rear brakes.

When bending brake pipes to shape, **great care must be taken to avoid kinking.** The best way to obtain a good curve is to bend the pipes smoothly round a mandrel of suitable diameter.

Using existing clips on the vehicle, ensure pipes are properly secured and cannot chafe or foul other components. Where a long length of piping is fitted, e.g. from one side of the vehicle to the other via the bulkhead, secure the pipes to the bulkhead to avoid unnecessary vibration.

Addendum to above

It should be noted that front or rear brakes may be connected connected to the secondary outlet. The final piping arrangement can only be decided with due regard to the type of car and the minimum brake performance requirements demanded by international legislation.

Fitting the Fluid Reservoir Feed Pipes

- Connect the brake master cylinder fluid feed pipe to the first reservoir.
- Connect the servo slave cylinder fluid feed pipe to the second reservoir.

Note:

Brake fluid is injurious to paintwork, therefore when removing the servo unit from the vehicle, care should be taken to ensure that no fluid is spilt onto the painted surface of the bodywork. Should fluid spillage occur, wash off immediately with copious amounts of cold water.

Where the hydraulic piping, needs to be shortened, it will be necessary to use a Bundy flaring tool to reform the pipe end. **No attempt should be made to cut and reflare existing brake pipes in situ as problems could arise with contamination through ingress of foreign matter such as swarf etc.**

In a convenient position, preferably at the highest point in the vacuum hose run, an in-line non-return valve is advisable on high performance vehicles.

Cut the hose and connect up the two sections to the valve unit and secure with hose clips.

Ensure that when fitted, the arrow on the non-return valve is pointing towards the servo.

(See Fig.2)

Important: to protect the servo unit and non-return valve from fuel contamination, it is recommended that a „U“ trap be formed in the vacuum hose route.

It is essential the vacuum hose inclines downwards from the servo and that the ‚U‘ trap is formed below the level of the servo and the in-line non-return valve where fitted.

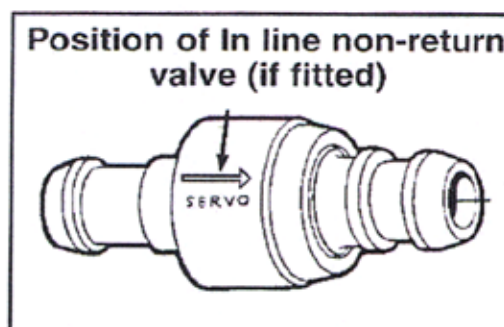


Fig. 2

Bleeding and testing the system

- 1 Using **new DOT 4 brake and clutch fluid**, or fluid as recommended by the vehicle manufacturer (conforming to SAE J1703 specification) bleed the braking system in accordance with the appropriate vehicle manufacturer's workshop manual. With the system properly bled, firm resistance should be felt at the brake pedal. If difficulty is experienced in achieving a **,good bleed'**, then the bleeding process will be assisted by ,cracking open' the brake pipe tube nut at the servo outlet connection whilst depressing the brake pedal. Surround this connection with clean ,fluff free' cloth to capture escaping brake fluid. When the pedal is fully depressed, re-tighten the tube nut. Repeat several times if necessary. When complete, top up the fluid reservoir to the correct level.
- 2 Start engine & apply brakes several times. Whilst an assistant depresses the brake pedal, re-check for fluid leaks at all connections. Road test the vehicle and check again for leaks.

Location of new servo unit and brackets

- 1 It is essential that the servo unit is fitted to the body or chassis (**i.e. not to the engine**) thus preventing the brake pipes being subjected to vibration or flexing.
- 2 It is an advantage to locate the servo within the engine compartment wherever possible to safeguard the unit and keep hydraulic pipe runs to a minimum length.

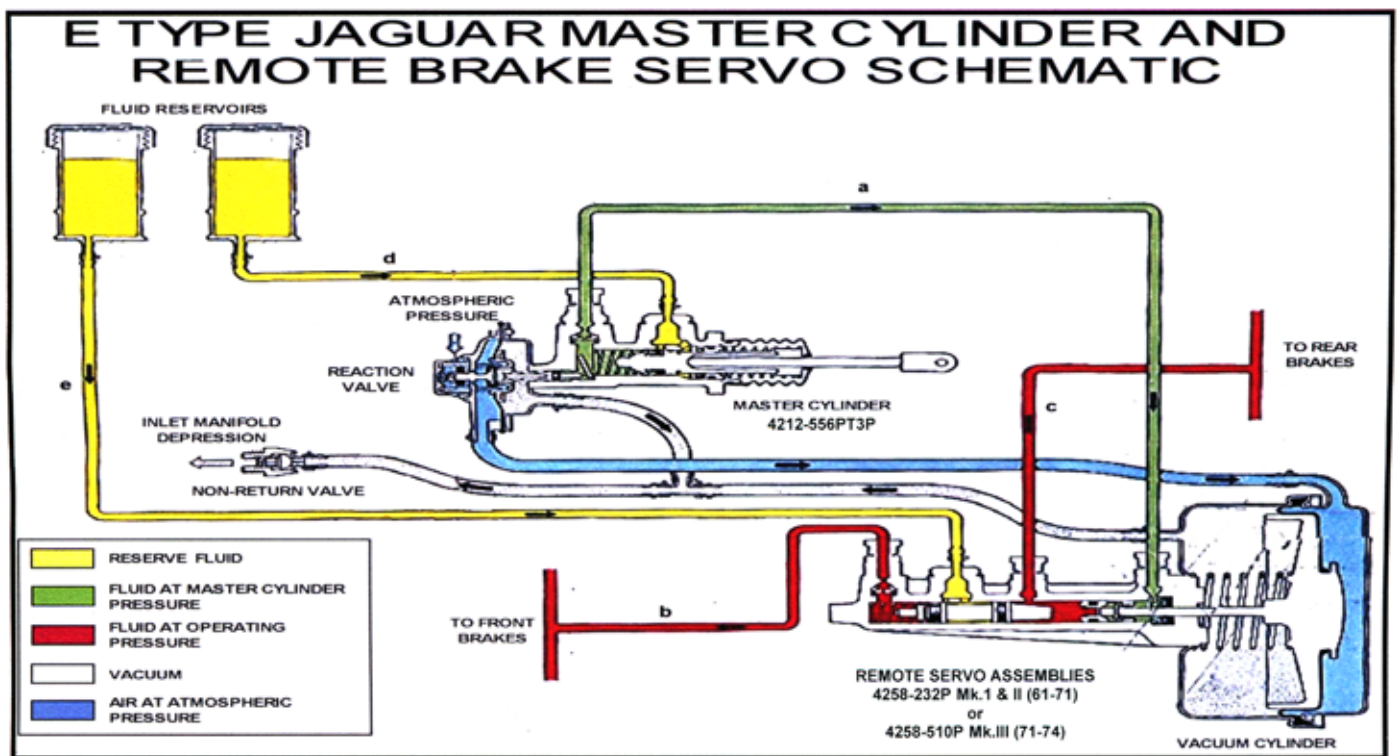


Fig. 1