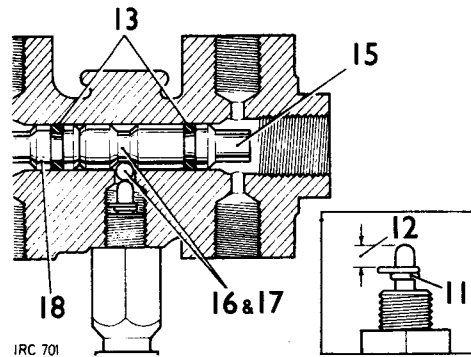


- 13 Fit new shuttle valve seals.
- 14 Coat the seals with Girling brake lubricant or clean brake fluid.
- 15 Fit the longer shuttle valve, slotted end last, to the end plug end of the housing bore.
- 16 Position the shuttle valve to align the groove for the plunger ball with the drilling for the ball.
- 17 Fit the ball and switch unit. Torque loading 17,28 kgf. cm (15 lbf. in.).
- 18 Fit the shorter shuttle valve, slotted end last, to the pipe connector end of the housing bore.
- 19 Reverse instructions 4 and 5, using new sealing washers. Torque 2,2 kgf. m (16 lbf. ft.).
- 20 Fit the switch assembly. 70.15.36.



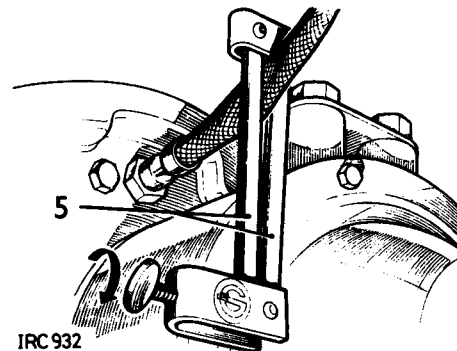
- 6 With clamps fitted on the two front and one rear hose the pedal action should be perfect with no indication of 'sponginess'. If under these circumstances a spongy pedal is apparent, a new or overhauled master cylinder assembly must be fitted and bled and the test repeated.
- 7 If perfect pedal action is obtained with the three hose clamps in position, remove the rear clamp and if the pedal is spongy, the air must be in the rear cylinders. However, if the pedal action is good, remove first one then the other of the two front clamps, repeating the test until the air is located.

Wheel cylinder—servicing

- 8 For wheel cylinder servicing only the appropriate hose need be clamped. This keeps the loss of fluid to a minimum and after the service is satisfactorily completed, only the affected parts require bleeding.

Brake bleeding procedure

- 9 Slacken off the brake shoe adjusters on each wheel to minimise wheel cylinder volume.
- 10 Attach a bleed tube to the bleed nipple farthest from the master cylinder. Submerge the tube free end in brake fluid in a transparent container.
- 11 Slacken the bleed nipple a half-turn.



- 12 Push down the brake pedal through the full stroke; follow with three short rapid strokes then allow the pedal to fully return.
Pause for four or five seconds before commencing the next pedal stroke.

NOTE: On dual braking systems only, do not use full pedal travel as this may decentralise the shuttle valve plunger in the brake failure switch. Operate the pedal slowly. If during the bleeding procedure the plunger operates the switch and the warning light is on, the bleedscrew must be closed and the bleedscrew at the other end of the car opened (if bleeding the front brakes, open a bleedscrew on a rear brake and vice versa).

A steady pressure must then be applied to the pedal until the light goes out, when the pressure must be released immediately and the bleedscrew closed. Otherwise the piston will move too far in the opposite direction and require resetting again.

- 13 Repeat the procedure until fluid discharged from the bleed tube is free of air, then tighten the bleed nipple during a pedal downstroke.

- 14 Repeat the procedure on the remaining wheels, commencing and continuing at the next wheel farthest from the master cylinder.

- 15 Adjust the brakes. 70.25.03.

- 16 If the system is fitted with servo assistance:

Hold foot pressure on the brake pedal and start the engine. If the vacuum system is functioning correctly, the pedal will move towards the board. If no movement is felt, the vacuum system is not operating.

BRAKES

Bleed 70.25.02

General

- 1 Observe strict cleanliness precautions to prevent foreign matter from entering the hydraulic system.
- 2 Use only new supplies of the recommended brake hydraulic fluid (see 09—Lubricants and Fluids).
- 3 Keep the fluid reservoir 'topped up' during bleeding.
- 4 Where the complete hydraulic system is to be refilled, it is advantageous to first charge the system, to each bleed point in turn, before attempting to expel all air from the system.

Isolating local air pockets

- 5 Use of Girling Brake Service Hose Clamp considerably facilitates the location of air in the system, therefore saving time by locating the hydraulic fault, and saving fluid when servicing the wheel cylinders.

Providing the brake hose is in reasonable condition, damage cannot be caused using the hose clamp, but the use of other tools to clamp the hoses is not recommended as damage may be caused internally to the hose without it being noticed externally.

BRAKES

Adjust

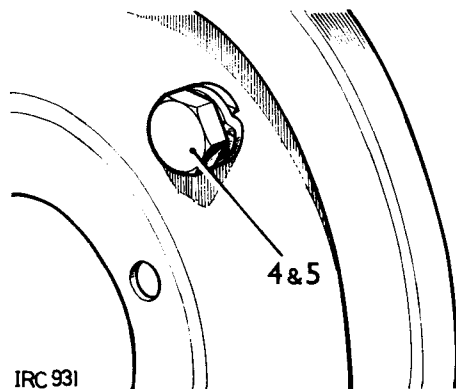
70.25.03

General

Two adjusters are provided on each road wheel on 109 models and one adjuster on each wheel on 88 models.

Adjusting procedure

- 1 Apply the transmission brake.
- 2 Raise the applicable wheel.
- 3 Ensure that the wheel is free to rotate, back-off the adjuster(s) as necessary.
- 4 Turn the adjuster(s) until the brake shoe(s) contact(s) the wheel drum.
- 5 Back-off two serrations on the adjuster(s).
- 6 Lower the wheel.



IRC 931

MASTER CYLINDER, Non-servo systems

Remove and refit

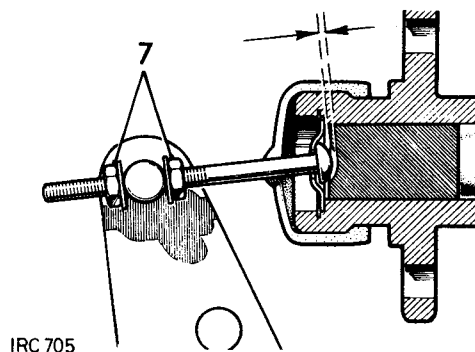
70.30.01

Removing

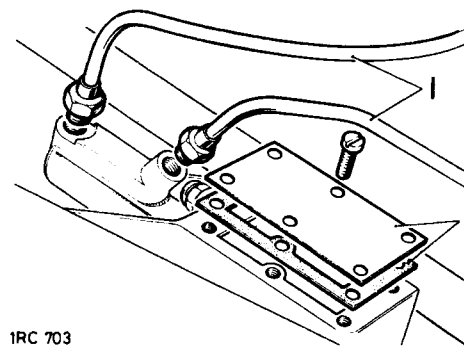
- 1 Disconnect the inlet and outlet pipes from the brake master cylinder.
- 2 Remove the top cover and gasket from the brake pedal bracket.
- 3 Remove the nut and plain washer securing the master cylinder push rod to the brake pedal trunnion.
- 4 Remove the fixings and withdraw the master cylinder from the brake pedal bracket.

Refitting

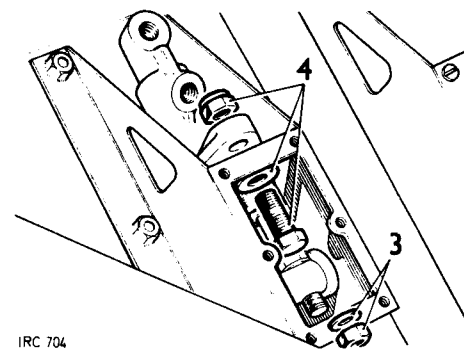
- 5 Reverse 3 and 4, loosely securing the push rod to the trunnion.
- 6 Adjust the push rod, by rotating, to obtain 1,5 mm (0.062 in.) free play between the push rod and the master cylinder piston.
- 7 Tighten the locknuts.
- 8 Reverse instructions 1 and 2.
- 9 Bleed the brake system. 70.25.02.



IRC 705



IRC 703



IRC 704

MASTER CYLINDER, Servo Systems

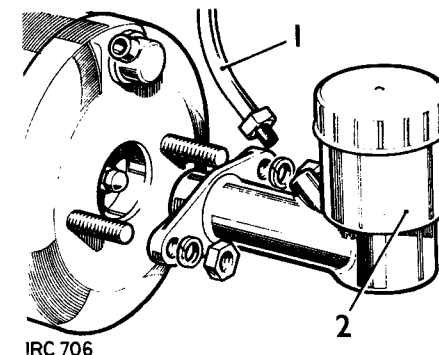
Remove and refit

70.30.01

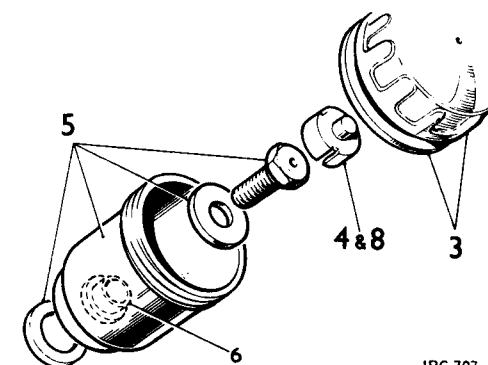
- 1 Disconnect the outlet pipe from the brake master cylinder.
- 2 Remove the fixings and withdraw the master cylinder complete with reservoir.
- 3 Remove the filler cap and filter, where fitted, from the reservoir and drain all the fluid.
- 4 Using long-nosed pliers, withdraw the plastic cover from the reservoir adaptor bolt.
- 5 Remove the adaptor bolt and withdraw the plain washer, reservoir body, and seal.
- 6 DO NOT attempt to remove the distance piece from the base of the reservoir.

Refitting

- 7 Smear the seal for the reservoir base with Castrol-Girling rubber grease and place it in position.
- 8 Locate the fluid reservoir in position on the master cylinder, and secure with the plain washer and adaptor bolt. Tighten the adaptor bolt to a torque figure of 2,8 to 3,5 kgf. m. (20 to 25 lbf. ft.).
- 9 Reverse instructions 3 and 4.
- 10 Reverse 1 and 2; master cylinder fixings torque load is 2,2 to 2,6 kgf. m. (16 to 19 lbf. ft.).
- 11 Bleed the brake hydraulic system. 70.25.02.



IRC 706



IRC 707

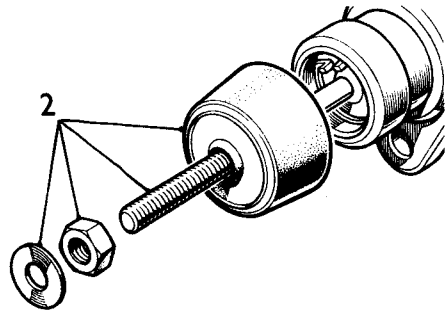
MASTER CYLINDER, Non-servo systems

Overhaul

70.30.02

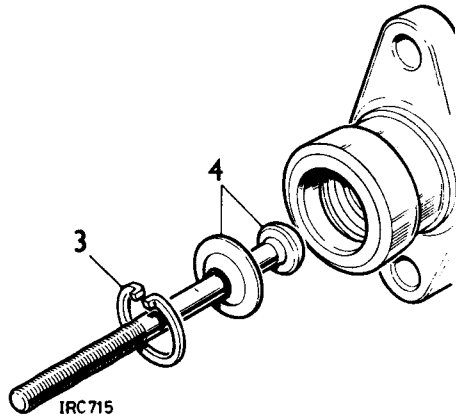
Dismantling

- 1 Remove the master cylinder. 70.30.01
- 2 Remove the plain washer, nut and rubber cover from the push rod.



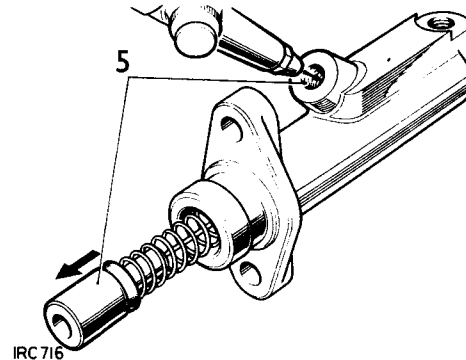
IRC 714

- 3 Remove the circlip.
- 4 Withdraw the push rod and retaining washer.



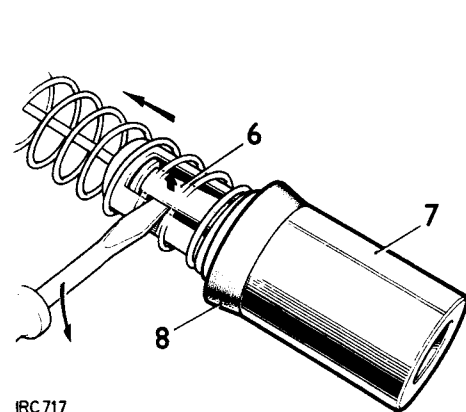
IRC 715

- 5 Withdraw the piston assembly from the master cylinder. If necessary, apply a low air pressure to the outlet port to expel the piston.



IRC 716

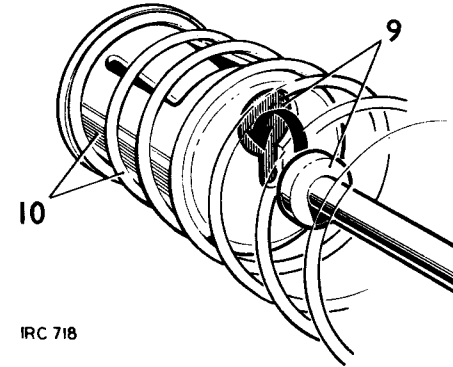
- 6 Prise the locking prong of the spring retainer clear of the piston shoulder.
- 7 Withdraw the piston.
- 8 Remove the piston seal.



IRC 717

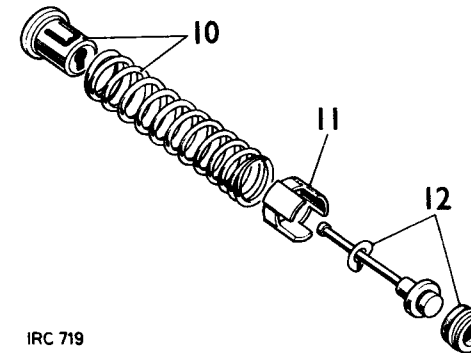
(Non-servo Systems)

- 9 Compress the spring and position the valve stem to align with the larger hole in the spring retainer.
- 10 Withdraw the spring and retainer.



IRC 718

- 11 Slide the valve spring over the valve stem.
- 12 Remove the spring washer and valve seal from the stem.



IRC 719

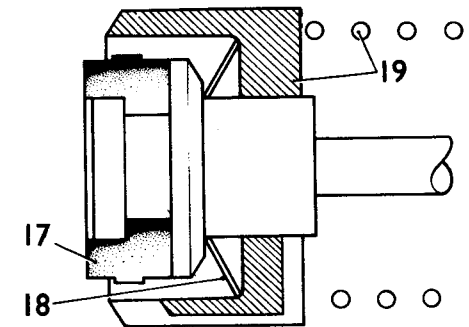
Inspecting

- 13 Clean all components in Girling cleaning fluid and allow to dry.
- 14 Examine the cylinder bore and piston, ensure that they are smooth to the touch with no corrosion, score marks or ridges. If there is any doubt, renew the master cylinder.
- 15 The seals should be replaced with new components. These items are included in the master cylinder overhaul kit.

Assembling

- 16 Smear the seals with Castrol-Girling rubber grease and the remaining internal items with Castrol-Girling Brake and Clutch Fluid.
- 17 Fit the valve seal, flat side first, to the end of the valve stem.
- 18 Place the spring washer, domed side first, over the small end of the valve stem.
- 19 Fit the valve spacer, legs first, and the coil spring.

continued

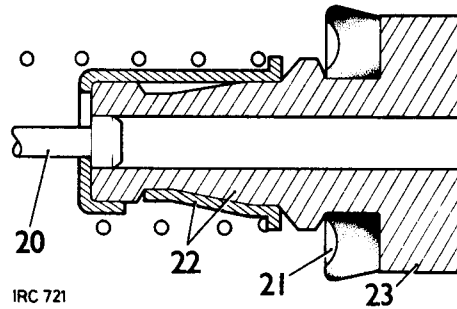


IRC 720

- 20 Insert the retainer into the spring and compress until the stem passes through the keyhole and is engaged in the centre.

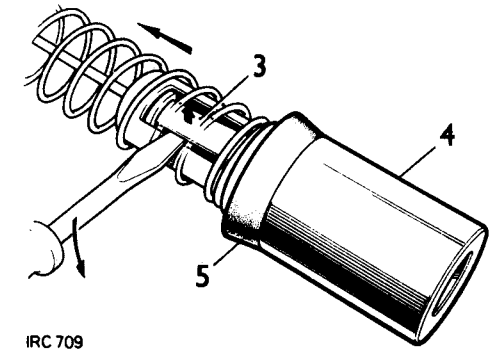
(Non-Servo Systems)

- 21 Fit the seal, large diameter last, to the piston.
- 22 Insert the piston into the spring retainer and engage the locking prong.
- 23 Smear the piston with Castrol-Girling rubber grease and insert the assembly, valve end first, into the cylinder.
- 24 Fit the push rod, retaining washer and circlip.
- 25 Smear liberally the inside of the dust cover with Castrol-Girling rubber grease and fit the cover over the push rod and cylinder.
- 26 Fit the locknut and washer to the push rod.
- 27 Refit the master cylinder. 70.30.01.



IRC 721

- 3 Prise the locking prong of the spring retainer clear of the piston shoulder.
- 4 Withdraw the piston.
- 5 Remove the piston seal.
- 6 Compress the spring and position the valve stem to align with the larger hole in the spring retainer.



IRC 709

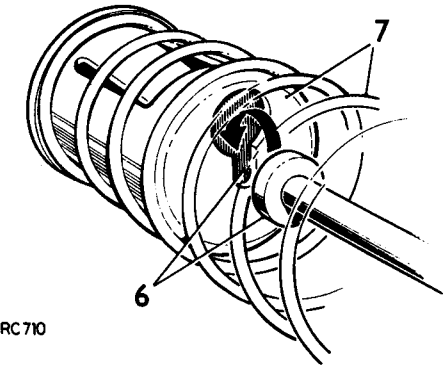
DATA

Master cylinder bore size:

- 88 models
- 109 models

19,05 mm (0.750 in.) diameter
25,4 mm (1.0 in.) diameter.

- 7 Withdraw the spring and retainer.
- 8 Slide the valve spacer over the valve stem.
- 9 Remove the spring washer and valve seal from the stem.



IRC 710

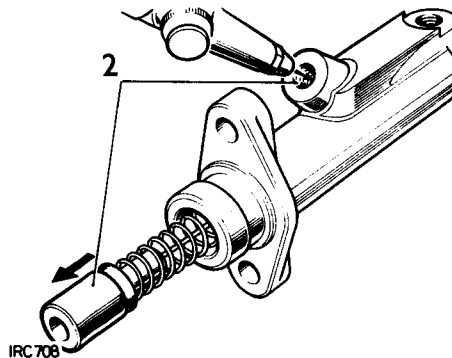
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MASTER CYLINDER, Servo systems

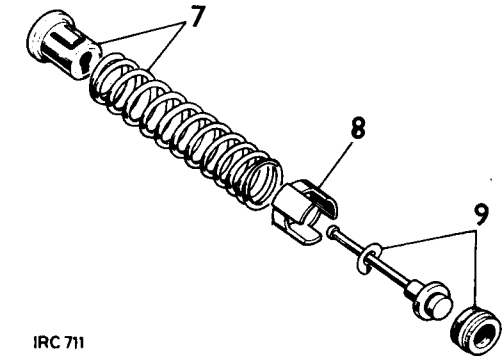
Overhaul 70.30.02

Dismantling

- 1 Remove the master cylinder. 70.30.01.
- 2 Withdraw the piston assembly from the master cylinder. If necessary, apply a low air pressure to the outlet port to expel the piston.



IRC 708



IRC 711

Inspecting

- 10 Clean all components in Girling cleaning fluid and allow to dry.
- 11 Examine the cylinder bore and piston. Ensure that they are smooth to the touch with no corrosion, score marks or ridges. If there is any doubt, fit new replacements.
- 12 The seals should be replaced with new components. These items are included in the master cylinder overhaul kit.

(Servo systems)

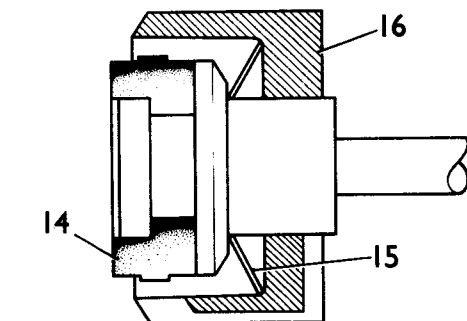
Assembling

- 13 Smear the seals with Castrol-Girling rubber grease and the remaining internal items with Castrol-Girling Brake and Clutch Fluid.
- 14 Fit the valve seal, flat side first, to the end of the valve stem.
- 15 Place the spring washer, domed side first, over the small end of the valve stem.
- 16 Fit the valve spacer, legs first, then the coil spring.
- 17 Insert the retainer into the spring and compress until the stem passes through the keyhole and is engaged in the centre.
- 18 Fit the seal, large diameter last, to the piston.
- 19 Insert the piston into the spring retainer and engage the locking prong.
- 20 Smear the piston with Castrol-Girling rubber grease and insert the assembly, valve end first, into the cylinder.
- 21 Liberally smear Castrol-Girling rubber grease inside the piston end of the master cylinder.
- 22 Refit the master cylinder. 70.30.01.

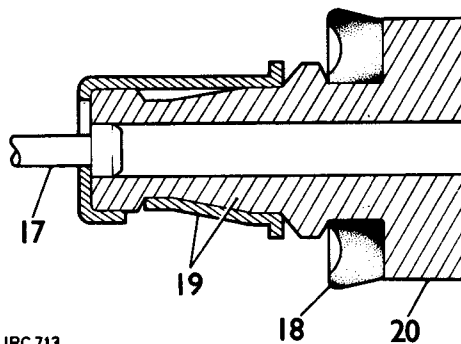
DATA

Master cylinder bore size:

109 models



IRC 712



IRC 713

25,4 mm (1.0 in.) diameter.

MASTER CYLINDER, Dual systems

Remove and refit

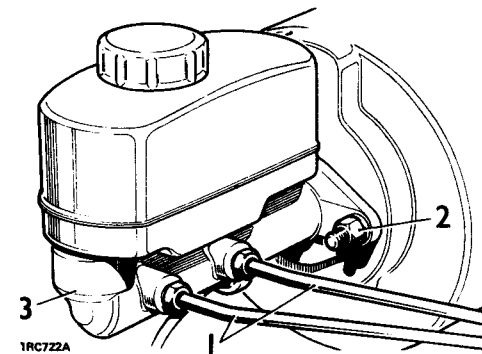
70.30.08

Removing

- 1 Disconnect the brake pipes.
- 2 Remove the fixings at the flange.
- 3 Withdraw the master cylinder and fluid reservoir complete.

Refitting

- 4 Reverse 2 and 3. Torque loading 2,2 to 2,6 kgf. m. (16 to 19 lbf. ft.).
- 5 Connect the brake pipes.
- 6 Bleed the brakes. 70.25.02.



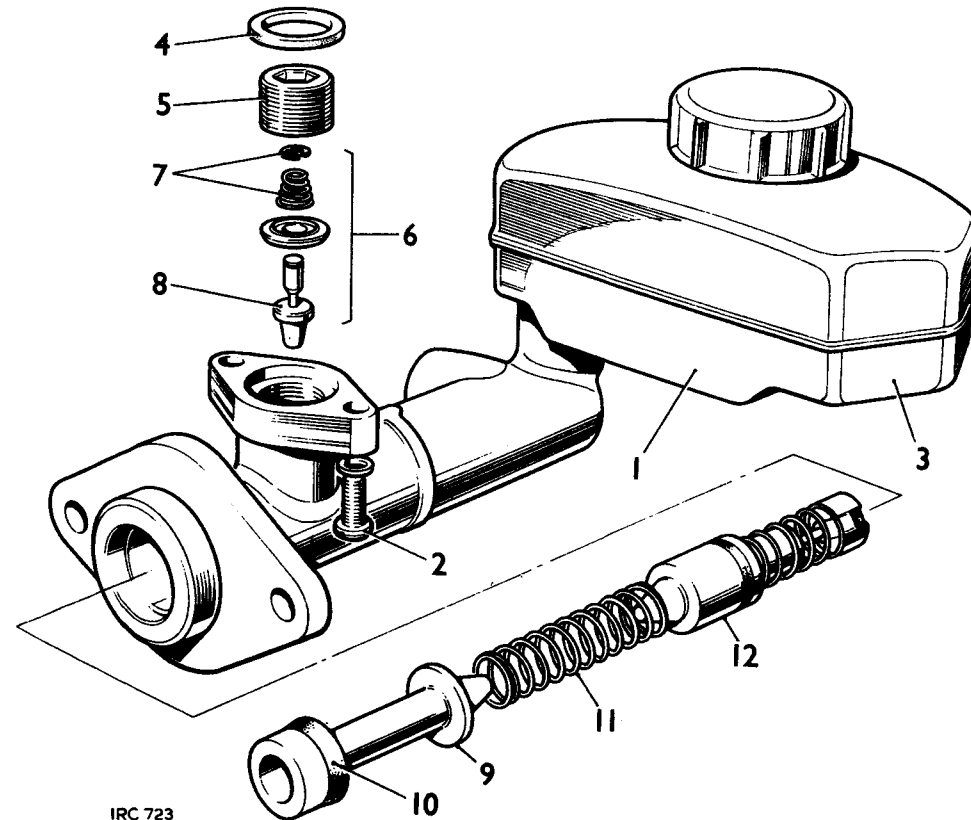
IRC 722A

MASTER CYLINDER, Dual systems**Overhaul****70.30.09****Dismantling**

- 1 Remove the master cylinder and fluid reservoir complete. 70.30.08.
- 2 Remove the reservoir fixing screws.
- 3 Pivot the reservoir front end aside to expose the master cylinder front inlet bore.

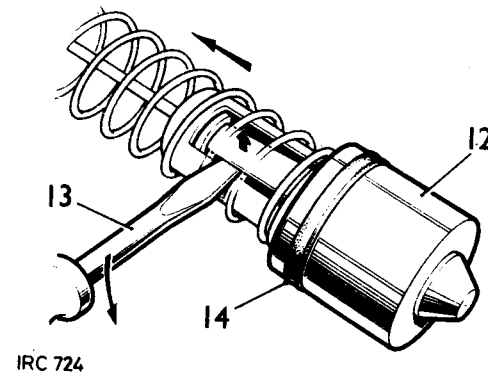
NOTE: Do not attempt to remove completely the reservoir which is retained by an internal fixing at the rear inlet bore.

- 4 Withdraw the oil seal ring.



IRC 723

- 5 Unscrew the tipping valve assembly retainer.
- 6 Lift out the tipping valve assembly.
- 7 Remove the retaining circlip and withdraw the spring.
- 8 Withdraw the tipping valve from the seal plate.
- 9 Withdraw the outer piston.
- 10 Remove and discard the oil seal.
- 11 Withdraw the piston spring.
- 12 Withdraw the inner piston and valve assembly.
- 13 Prise the spring retainer locking prong clear of the piston shoulder and withdraw the piston and spring.
- 14 Remove and discard the oil seal.



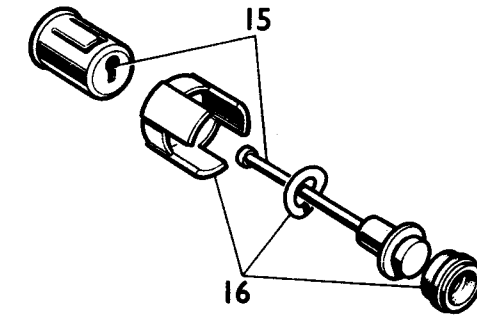
IRC 724

Inspecting

- 17 Clean all components in Girling cleaning fluid and allow to dry.
- 18 Examine the cylinder bore and pistons, ensure that they are smooth to the touch with no corrosion, score marks or ridges. If there is any doubt, fit new replacements.
- 19 The seals should be replaced. These items are included in the master cylinder overhaul kit.

continued

- 15 Position the valve stem to align with the larger hole in the valve retainer. Withdraw the retainer.
- 16 Slide the valve spacer over the valve stem. Remove the wave washer and valve seal from the stem.



IRC 725