# MASTER CYLINDER
# (As fitted to vacuum hydraulic models)

## INTRODUCTION

The Girling ASAS type master cylinder is designed to operate split line hydraulic systems. It consists of a body which contains two independent cylinders thus ensuring that a failure in one half of the system will not affect the other i.e. full braking will be available on one axle.

Referring to Fig. 1 the secondary plunger operates the front brakes and the primary plunger operates the rear brakes.

The fluid reservoir is a single container which is divided internally to supply independently the primary and secondary cylinders.

## OPERATION

**Brakes off** (Fig. 1)
The hydraulic fluid is free to move unrestricted between the dual line system and the separate reservoirs in the supply tank.

**Brakes Applied** (Fig. 2)
When the footbrake is applied the output rod of the servo moves the primary plunger along its bore. The pressure created acts in conjunction with the increased pressure of the compressed intermediate spring on the secondary plunger and overcomes the stronger secondary spring.

Initial movement of both plungers seal off the recuperation ports in chambers A and C so that the pressure created in these chambers is directed to the two halves of the system.

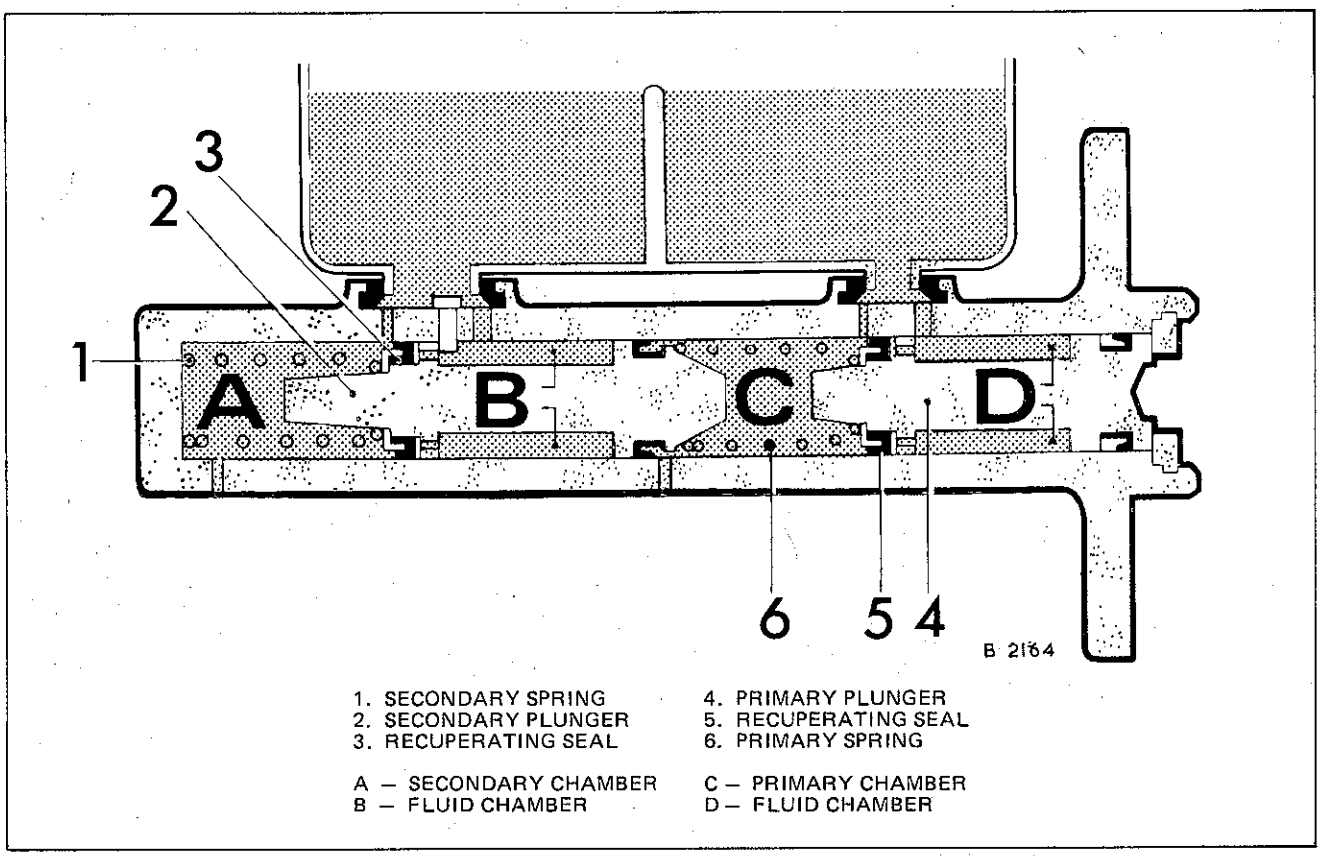



**Fig. 1** *Master cylinder — Brakes off*

The fluid in chambers B and D remains unaffected and is free to pass between the separate chambers and respective reservoirs before and during brake application.

**Brakes Released**
The plungers, aided by their return springs are retracted faster than the fluid and this creates a vacuum between the fluid in chambers 'A' and 'C'

## OVERHAUL

**To Remove**
The master cylinder is retained to the servo unit by means of studs and nuts.

Wipe the unit clean particularly around the reservoir filler and the outlet unions. Remove filler cap.

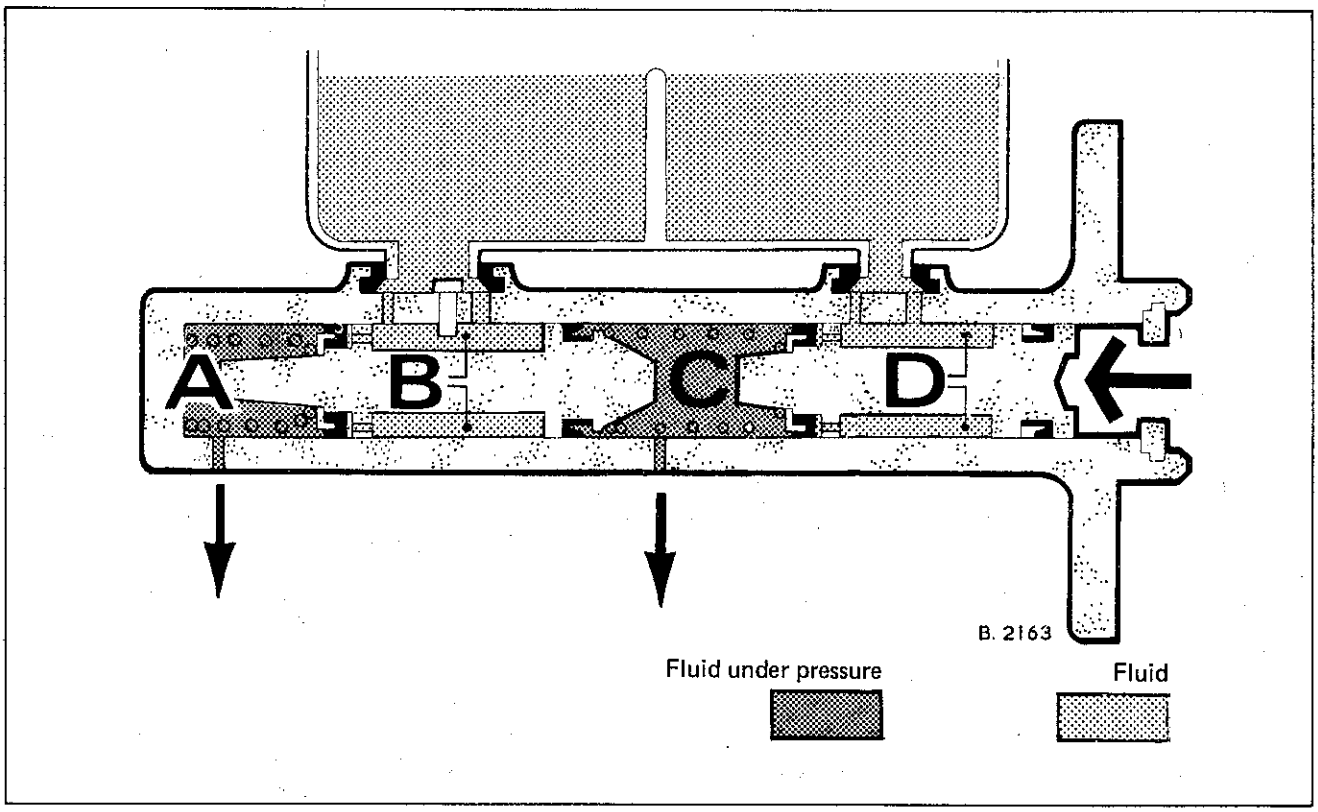



**Fig. 2** *Operation — Brakes Applied*

and the recuperating seals. The seals momentarily collapse allowing fluid in chambers 'B' and 'D' to flow through the recuperating holes in the plungers into chambers 'A' and 'C'.

**Hydraulic Failure**
Figs. 3 and 4 illustrate the operation of the cylinder should a failure occur in the primary or secondary systems respectively.

Disconnect the primary and secondary system feed pipes and allow fluid from master cylinder and reservoir to drain off.

Remove the stud nuts retaining the cylinders to the servo and withdraw the cylinder from the studs.

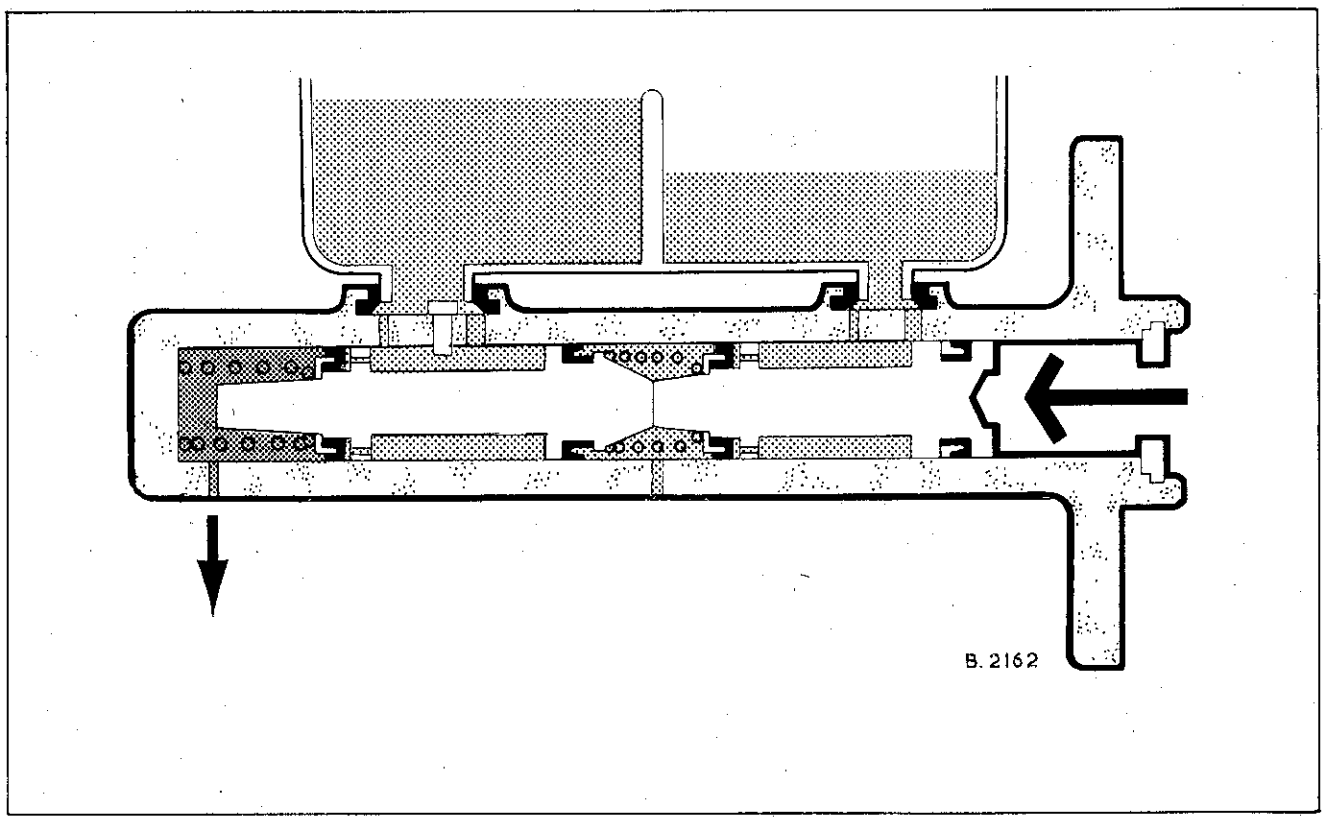



**Fig. 3** *Operation — Failure in Primary*

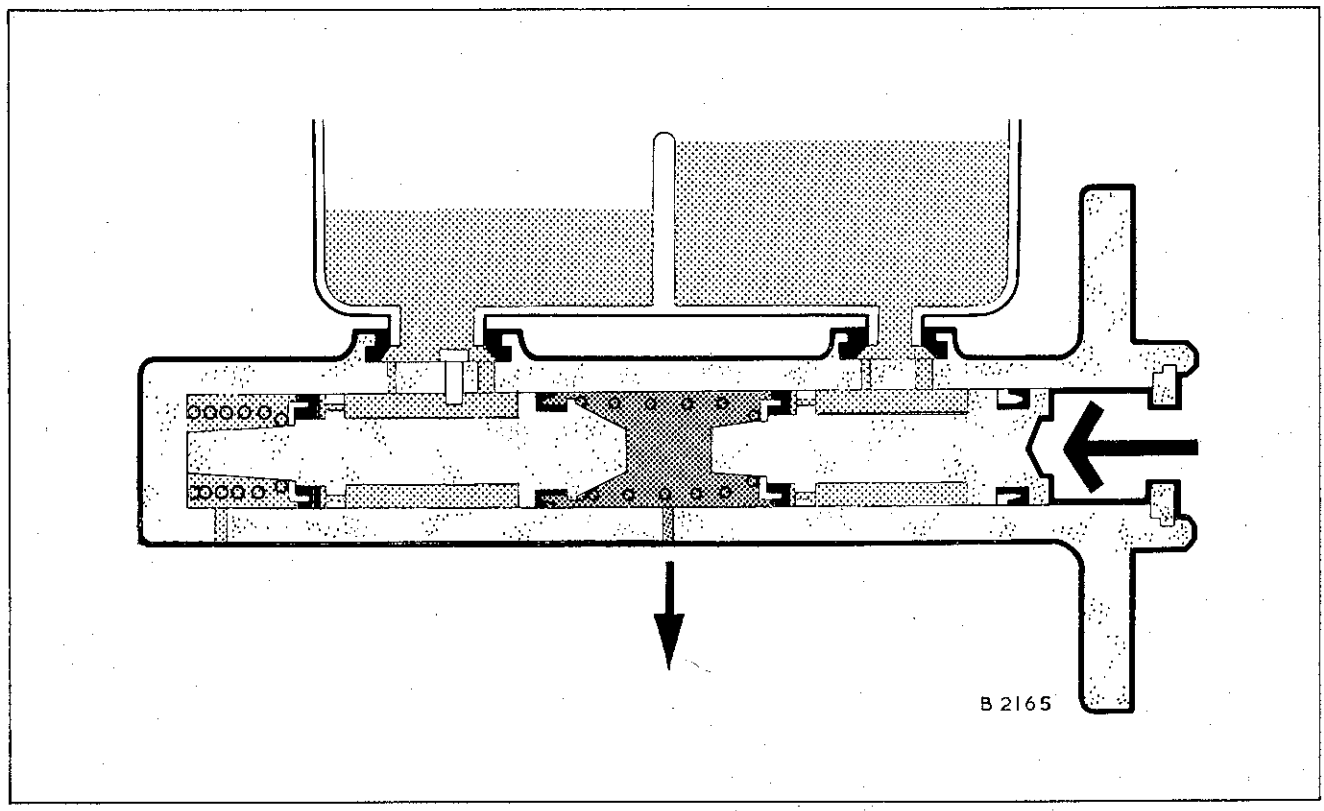



**Fig. 4** *Operation — Failure in Secondary*

**To Dismantle**
Before carrying out the following procedure ensure that cylinder, work area, tools and hands are clean.

Referring to Fig. 5 remove the reservoir (3) by withdrawing the pin retaining clips (6) and pins (8). Pull the reservoir off the cylinder and extract seals (4) and (7).

Push the plunger fully down the cylinder bore and withdraw the secondary plunger stop pin (5).

Remove circlip (13) and withdraw primary plunger assembly (12). Tap the cylinder on a soft surface and remove secondary plunger assembly (10). If necessary lubricate bore with clean fluid to aid removal.

Remove secondary plunger spring (14), seal retainer (15), recuperating seal (16) and washer (17).

Taking care not to damage the plunger, remove seal (19).

**Note** Keep the plunger and its spring together at all times as primary and secondary plunger springs must not be interchanged.

Dismantling the primary plunger is similar to that described for the secondary plunger.

**Inspection and Overhaul**
Thoroughly clean all parts with Girling Cleaning Fluid or new hydraulic fluid.

Carefully examine the cylinder bores and plungers for signs of corrosion, score marks or ridges. If in doubt fit new parts or replacement unit. If parts are satisfactory renew all seals supplied in the service kit.

Repeat this procedure when refitting the primary plunger assembly.

**To Reassemble**
Reassemble the plungers in the reverse order to dismantling using plenty of clean fluid to aid fitment of the new seals. Take care not to damage the seal lips and ensure that the lips of the seals are facing the ends of the plungers as illustrated.

**Note** When refitting the plungers to the cylinder it is essential that the following instructions are observed, to ensure that seals are not damaged.

Clamp the cylinder in a bench vice and coat seals liberally with clean hydraulic fluid.

Offer up the secondary plunger assembly to the cylinder so that its recuperating seal is positioned centrally in the mouth of the bore.

Ensuring that the seal is not trapped, gently introduce the plunger into the bore using a circular rocking motion to ease in the seal. Once the seal is in position slowly push the plunger down the bore in one continuous movement.

Holding the plunger down the bore refit the circlip.

Push both plungers fully down the bore and refit the secondary plunger stop pin.

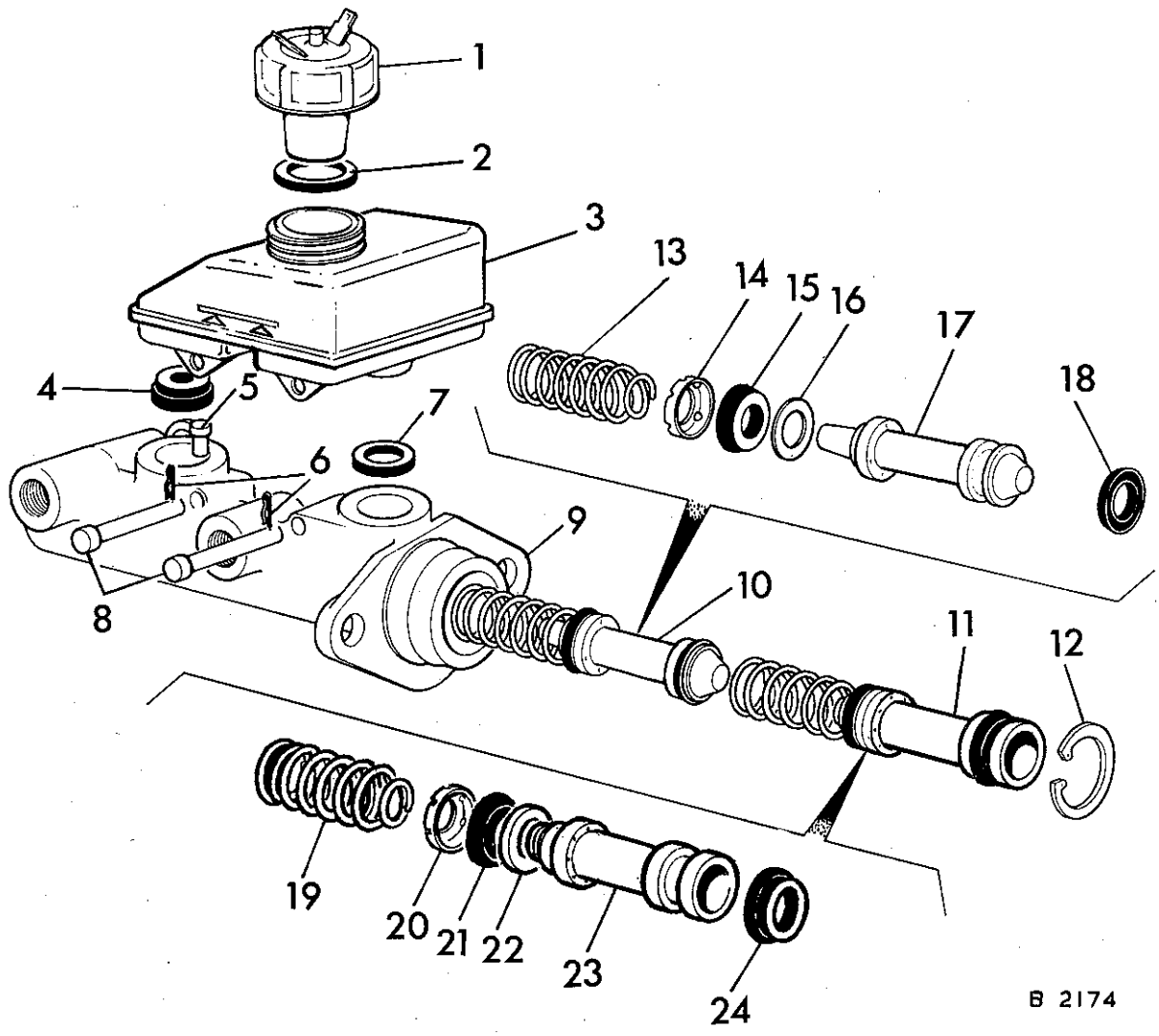
Lubricate new reservoir seals with clean fluid and fit to cylinder. Press reservoir into position and secure with pins and clips.

**To Refit**
Ensure that no dirt enters parts during the refitting procedure.

Check that the seal in the servo is in good condition and correctly positioned.

Refit cylinder to servo and tighten stud nuts securely.

Reconnect outlet pipes, top up reservoir and bleed system.




1. CAP
2. SEAL
3. RESERVOIR
4. SEAL
5. STOP PIN
6. RETAINING CLIP
7. SEAL
8. FIXING PINS
9. CYLINDER
10. SEC. PLUNGER ASSEMBLY
11. PRIM. PLUNGER ASSEMBLY
12. CIRCLIP
13. SEC. SPRING
14. RETAINER
15. RECUPERATING SEAL
16. WASHER
17. SEC. PLUNGER
18. SEAL
19. PRIM. SPRING
20. RETAINER
21. RECUPERATING SEAL
22. WASHER
23. PRIM. PLUNGER
24. SEAL

**Fig. 5** *Master Cylinder Details*