

1. Fluid reservoir
2. Filler cap and level switch
3. Reservoir seals
4. Baffle plates
5. Secondary piston stop pin
6. Master cylinder body
7. Circlip
8. Primary piston

9. Primary piston spring and cup
10. Primary piston seal and washer
11. Primary piston seal
12. Secondary piston
13. Secondary piston spring and cup
14. Secondary piston seal and washer
15. Secondary piston seal

Refurbishing an RV8 brake master cylinder

As the hydraulic fluid in the brake master cylinder looked like old engine oil, Paul Ireland felt it looked as if the fluid had not been changed since his RV8 was built. So he decided to rebuild the master cylinder and the wheel cylinders. The master cylinder proved to be challenging because, not helped by an error in the RV8 repair manual – hence the reason for this note. The master cylinder repair kit – part number **GRK01093** – can be obtained from Past Parts at Bury St Edmunds or Brown & Gammons at Baldock.

The RV8 has a dual brake circuit, the primary piston (see picture) feeds the rear brakes, the secondary the front brakes. Both circuits are independent and will continue to

work even if the other fails. The repair manual describes its operation as “Pressure from the servo forces the primary piston up its bore against the primary spring. The stronger primary spring overcomes the weaker secondary spring and causes the secondary piston to move simultaneously. Initial movement takes the seals beyond the supply ports from the reservoir. Further piston movement directs fluid pressure into the two separate hydraulic circuits.”

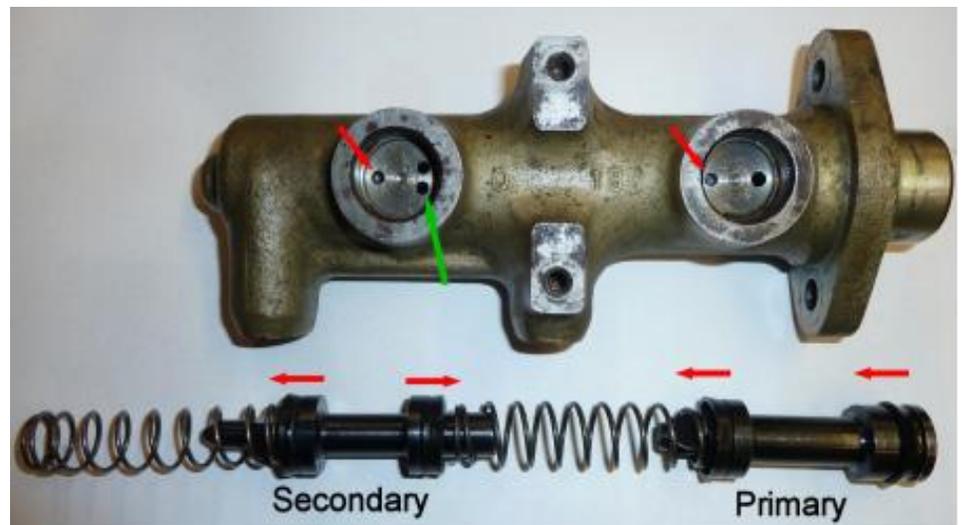
Removing the master cylinder is relatively straight forward.

- I found it easier to firstly remove the fluid reservoir (1) first – it’s held on by two screws but be careful not to splash brake fluid over the paint.
- There is insufficient space to fit a box key or socket onto the two nuts holding the master cylinder to servo. The inner one is accessible with an open ended spanner, the outer is not. I have a small ring spanner with a very thin surround; you can also use a “bent” open ended spanner.
- Once the nuts are removed, the master cylinder has a rubber seal pressed into the servo, this can make the master cylinder stiff to remove.

Dismantling the master cylinder is easy:

- Remove the two seals for the reservoir.
- Pull off the end cap to reveal the circlip holding the primary piston in place.
- To remove the secondary piston, press it in using a bar and remove the pin (not shown) from the hole (marked with the green arrow) using pointed nose pliers.

When cleaning, give particular attention to the two small holes shown with the red arrows to ensure they are clear. These allow fluid into the circuits allowing them to be bled.



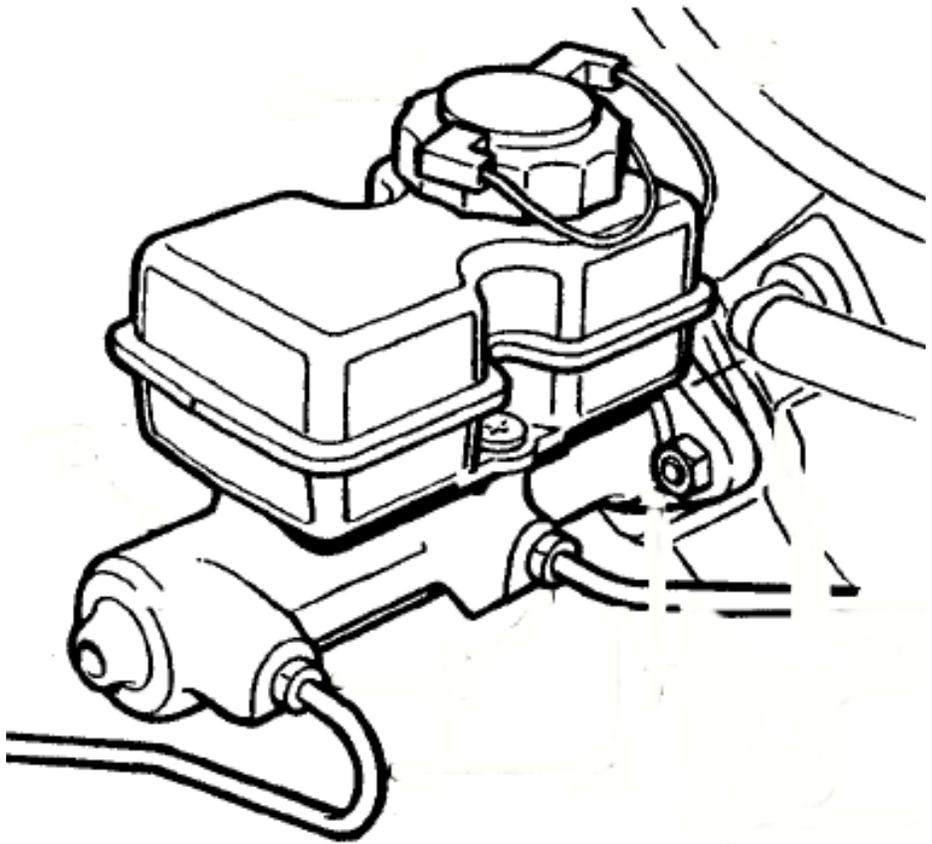
When reassembling the master cylinder;

- Ensure the seals are placed in the direction shown. The rear seal on the secondary piston forms a hydraulic seal with the primary piston allowing the pressure on the brake pedal to be transmitted to the front brakes. The two pairs of seals are interchangeable.
- Ensure the thin steel washers are fitted behind the primary seals (left hand ones in the picture).
- Identify the stronger spring and fit to the secondary piston. (In the picture this is shown fitted to the primary piston as per the manual – this is WRONG).
- Before refitting to the car cover each of the exit holes in turn with your finger. Press in the pistons and you should feel a pressure, release this pressure and recover the hole. Slowly allow the piston to return to its normal position and you should feel a vacuum building which is released once the pistons reach their stops. If the vacuum remains check the seals are clearing the smaller holes.
- Refit the master cylinder to the car. With the new seal fitted, it may be difficult to push back in. Use rubber grease on the outside of the seal and you may have to use the nuts to pull it fully home.
- Fit the reservoir seals to the reservoir and carefully press it into the master cylinder. The cap is to the rear of the car. Again rubber grease helps.

I bled the brakes using a Draper Expert 68714 Vacuum Pump/Brake Bleeding Kit. In principle this is a good idea as you fit it to the bleed nipples and single handed can "suck" the fluid and air through into a collecting pot. Unfortunately, it suffers from one major drawback - when you release the bleed nipples, it sucks air in around the bleed nipple so you cannot tell if the circuit is free of air. I found that by wrapping plumbers PTFE tape around the nipples they sealed sufficiently for this to work.

If you follow the advice in the RV8 Repair Manual and fit the weaker spring to the secondary piston you will be unable to bleed the front brake circuit. There is very little clearance – only 0.2mm - between the seal and the smaller hole which allows fluid to enter the cylinder. With the stronger spring fitted to the primary piston, there is sufficient force to push the secondary piston beyond this hole, preventing any fluid from entering the circuit.

See a copy of the Draper Expert manual:
www.v8register.net/subpages/news120503draper.htm



Draper Expert 68714
 Vacuum Pump/Brake
 Bleeding Kit