

P38 ABS Brake Bleeding Procedure



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Introduction

Official maintenance schedules call for periodically changing the brake fluid, because it tends to absorb water. Over time, this leads to fluid boiling under hard repeated braking which causes sponginess of the brake pedal and ineffective braking. I experienced this once on my Classic on a long downhill stretch, and it was a scary experience! Brake bleeding is also called for in certain brake system repairs or whenever there is a chance that air or water might have entered the system.

With the advent of the sophisticated ABS system on Range Rovers, bleeding the brake fluid became slightly more complex than it used to be. However, to make it as easy as possible, Donald Fisher has kindly put together the information below, gleaned from the shop manuals and his own experience.

Preliminary Notes of Caution:

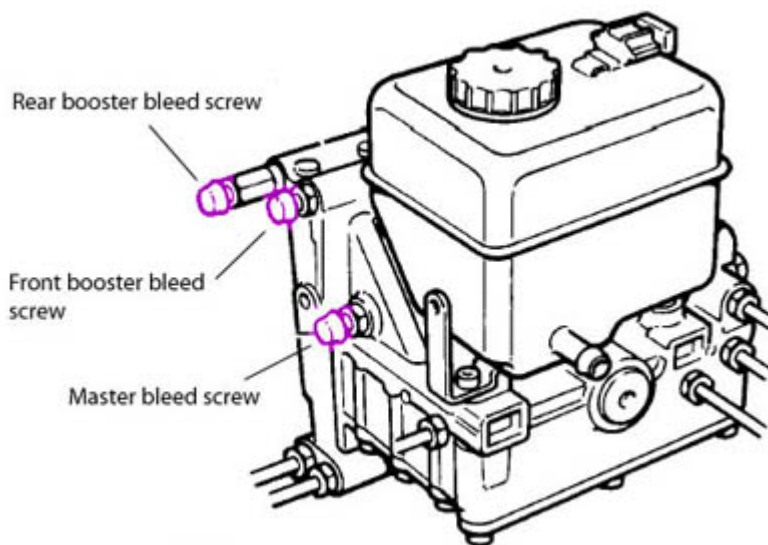
- If required thoroughly clean all bleed screws, caps and connections using **only** clean brake fluid.
- Always ensure that the reservoir fluid remains above **MIN** during this procedure. Check the level after each step or after a few presses of the pedal or opening of a bleed screw.
- **Never** re-use any previously used brake fluid.
- Dispose of used fluid responsibly in suitably marked containers.

Tools

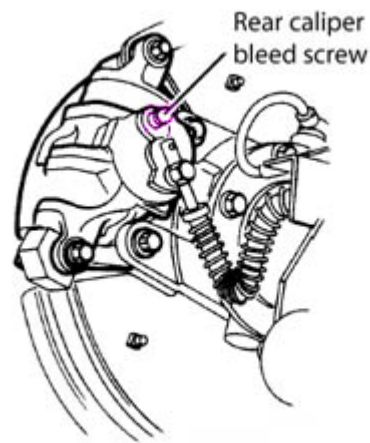
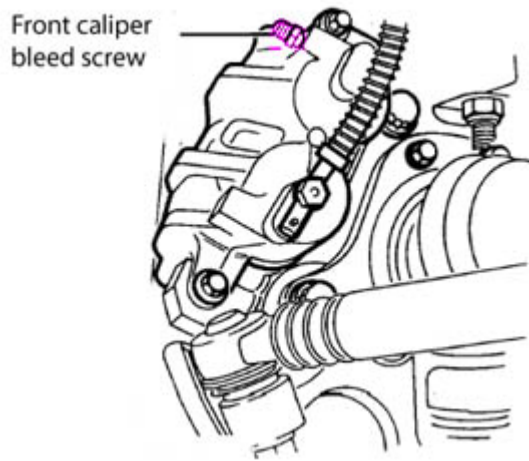
- Spanner to open and close bleed screws
- Clear tube to fit over bleed screw at each stage
- Clean glass bottle to catch brake fluid
- A second person to press (and hold) the brake pedal
- A few small wood blocks (such as 1/2 inch plywood scraps) and some C-clamps are useful for pressing the caliper pistons back in.

Bleed Screw Locations

ABS Booster Unit (from official shop manual)



Caliper Bleed Screws (from official shop manual)



Brake Bleeding Procedure

1. Depressurize the brake system.
2. Fill the fluid reservoir to MAX level.
3. Bleed master cylinder (highlighted in diagram).
Open bleed screw on booster, when fluid appears, close bleed screw.
4. Fit tube to bleed screw
5. Re-open bleed screw, depress pedal slowly and progressively.
6. Close bleed screw. Release brake pedal.
7. Repeat instructions 5 and 6 until fluid coming out of bleed screw is clear and there are no air bubbles visible in the fluid.
8. Open bleed screw again, depress brake pedal completely to floor, close screw
9. Bleed front calipers, beginning with driver's side first:
 - Fit tube to bleed screw.
 - Open bleed screw on caliper.
 - Depress brake pedal slowly and progressively.
 - Close bleed screw at the bottom of each pedal stroke.
 - Release pedal.
10. Repeat instruction 9 until fluid coming out of bleed screw is clear and free from bubbles. (Remember to check the fluid level in the reservoir.)
11. Open bleed screw. Fully depress brake pedal. Close bleed screw.
12. Repeat instructions 9, 10, 11 for passenger side caliper.
13. Bleed front booster unit bleed screw. (shown in diagram)
 - Open bleed screw

- Depress brake pedal fully
- Switch ignition ON so ABS pump starts to run and fluid starts to flow.

14. Allow fluid to flow until clear of air bubbles.

- Switch ignition OFF.
- Close bleed screw.
- Release pedal

15. Repeat steps 13 and 14 for the rear booster unit bleed screw (shown in diagram)

16. Bleed each of rear calipers, starting with drivers side caliper first, then repeating steps 16 to 18 for rear passenger side caliper.

- Open bleed screw
- Depress brake pedal slowly and progressively

17. Switch ignition ON (so pump starts to run) for 4 seconds

- Switch ignition OFF for 4 seconds
- Repeat until fluid is clear of air bubbles.

18. Switch OFF ignition. Close bleed screw. Release pedal.

19. Switch on ignition.

- Wait for ABS pump to stop running.
- Press brake pedal down firmly and fully and then release fully 5 times.

20. With ignition ON, repeat bleed of front calipers as in steps 9 to 12.

- Use only the lower two thirds of pedal travel when bleeding.

21. Repeat step 19.

22. Check and top up fluid level if necessary.

NOTE: If ABS pump makes ticking noises when running during this procedure, then repeat steps 13 to 19. The ABS should not make any ticking noises.

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