

BRAKE SYSTEM SERVICE

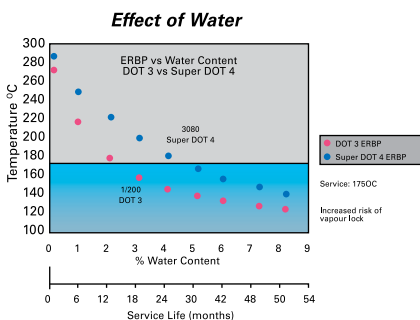
Most vital, yet often overlooked

The brake system of motor vehicles needs to be properly maintained. While many motorists are aware that their brake pads wear over time, many fail to realise that their brake fluid also degrades over time and needs to be regularly changed in accordance with the vehicle manufacturer's recommendations.

Brake system contamination is inevitable due to the imperfect sealing of the system against moisture. Many brake problems can be traced to air or contamination of the hydraulic fluid. Leaks at fittings where lines and hoses connect to the master cylinder, calipers and/or wheel cylinders can allow air to enter the system, as can corrode through brakelines. Air can also appear after moisture gets into the fluid and boils, giving off steam. Two signs of air in the fluid are a noticeable decrease in brake performance and a spongy pedal that quickly and nearly effortlessly goes to the floor as air compresses easier than fluid.

Vehicle manufacturers usually specify the brake fluid performance required, usually reference to a DOT specification. Brake fluid by nature is hygroscopic, (it rapidly absorbs moisture from the air con contact). As little as 3% moisture can decrease fluids performance by 30% and also negate its anti-corrosives. Additionally, standard DOT 3 brake fluid can only absorb up to 7% moisture, after which water droplets and braking problems begin to form.

Anti-lock brake systems (ABS) are especially affected by moisture because they can cycle as many as 20 times per second. Spongy pedal feel is a sign of moisture in the brake fluid. Depending on temperature fluctuations and humidity, a brake system can take on as much as 3% water in as much as eight months. As shown in the graph, the recommended service interval for DOT 3 fluid is every 12 months and for DOT 4 is every 2 years.



| SPECIFIED FLUID | MINIMUM EQUILIBRIUM BOILING POINT | MINIMUM "WET" BOILING POINT |
|-------------------------------|-----------------------------------|-----------------------------|
| DOT 3 | 205° | 140° |
| DOT 3 – AS/NZS 1960.1 Grade 1 | 230° | 140° |
| DOT 4 | 230° | 155° |
| DOT 4 – AS/NZS 1960.1 Grade 3 | 260° | 170° |
| SUPER DOT 4 | 260° | 180° |
| DOT 5 | 260° | 180° |

VALVOLINE Brake Fluids

If you are working on Toyota's make sure that you use the right kind of fluid. Toyota specifies a DOT 3 brake fluid for use in their brake systems. **Valvoline's Heavy Duty DOT 3 Brake Fluid** is suitable for use in Toyota's ABS brake systems and provides a minimum boiling point of 260°C. Consider that the standard minimum boiling point of the Australian/NZ DOT 3 specification is 230°C, and our Super DOT 3 more than meets the task. Valvoline Heavy Duty Brake Fluid has been dyed blue for easy identification.

For other makes and models specifying a DOT 4 fluid, we recommend **Valvoline Performance DOT 4 Brake Fluid** or **Valvoline Disc and Drum Brake Fluid**. These fluids are suitable for car, truck and bus applications where a DOT 4 or SUPER DOT 4 is specified. The low moisture absorption maintains maximum performance even under the most severe braking conditions. Both products offer a minimum boiling point of 270°C.

Valvoline VR1 Fluid is a low water absorption extreme high temperature brake fluid for sustained high speed racing applications for vehicles fitted with drum or disc brakes. The brake fluid is an amber yellow for easy identification and has a high boiling point exceeding 300°C.

| PRODUCT | PRODUCT CODE |
|---|--------------|
| Valvoline Racing Brake Fluid 500ml | 0905.72 |
| Valvoline SynPower Brake Fluid 500ml | 8505 |
| Valvoline Heavy Duty Brake Fluid 500ml | 8508 |
| Valvoline Disc & Drum Brake Fluid 205 Litre | 0904.51 |
| 20 Litre | 0904.56 |
| 2.5 Litre | 0904.88 |

