

Comparing Different Types of Brake Fluid

Composition

There are four main types of brake fluid available on the market today:

- DOT 3
- DOT 4
- DOT 5
- DOT 5.1

DOT 3, DOT 4 and DOT 5.1 are glycol-based fluids. Glycol-based fluids are **hygroscopic**, meaning they absorb water over time. As moisture gets into the brake system, the boiling point of glycol-based fluid lowers.

DOT 5 is a silicone-based fluid. Silicone-based fluid is **hydrophobic**, meaning it repels water. Moisture introduced into a brake system with DOT 5 fluid does not mix with the brake fluid. This causes the moisture to freeze or boil and can lead to brake fade.

Glycol and silicone-based fluids are **NOT** compatible. **Do not mix these fluids.** Only use DOT 5 in a completely dry system or in a vehicle that already has DOT 5 in the system. DOT 3, DOT 4 and DOT 5.1 are all interchangeable.

Boiling Points

Boiling points are the most critical aspect of brake fluid to keep an eye on. As moisture enters the brake system, the boiling point of the brake fluid lowers.

As you drive your car and apply your brakes, your brake system heats up, including your brake fluid. If your fluid heats up to the point of boiling, the fluid vaporizes and air bubbles form in your brake lines. This leads to brake fade or a loss of pedal completely.

There are two types of boiling points:

- Dry Boiling Point
- Wet Boiling Point

Dry boiling point is the boiling point of brake fluid measured with **zero percent** water by volume. Wet boiling point is the boiling point of brake fluid measured with **3.7 percent** moisture by volume.

Testing your brake fluid for moisture content on a regular basis is important.

You can find the minimum boiling point specifications in the table below. Be aware that as the moisture content of the fluid increases, the boiling point decreases.

Boiling Point	DOT 3	DOT 4	DOT 5	DOT 5.1
Dry Boiling Point	401 °F (205 °C)	446 °F (230 °C)	500 °F (260 °C)	500 °F (260 °C)
Wet Boiling Point	284 °F (140 °C)	311 °F (155 °C)	356 °F (180 °C)	356 °F (180 °C)

Color

New glycol-based fluid (DOT 3, DOT 4, DOT 5.1) is a translucent yellow color. In fact, it almost looks clear when you pour it out of the bottle.

Fresh DOT 5 brake fluid is a purple color. This allows you to easily distinguish between glycol-based and silicone-based brake fluid.

Over time, the color of your brake fluid darkens. Rubber components in your hydraulic system break down over time. These rubber components break down because of:

- 1.) Moisture in your brake system
- 2.) General wear and tear of using your brakes

Brown or black brake fluid is a key indicator that your brake fluid needs replacing.

Corrosion Prevention

Moisture in the hydraulic system can cause the metal parts of the hydraulic system to rust. This includes the master cylinder, the wheel cylinder and ABS components. Over time, this can cause a leak in your hydraulic system.

Brake fluid includes additives in it to prevent corrosion. However, over time, those additives break down.

When to Change Your Brake Fluid

Many manufacturers specify when to change brake fluid in the vehicle's service manual. Some manufacturers recommend changing brake fluid every two years or 24-thousand miles.

If the service manual does not include this information, make sure to check your brake fluid once a year. Check the color of the fluid as well as the moisture content.

[See our tech bulletin on testing your brake fluid for more information.](#)

What to Put in Your Car

The simple answer is to put whatever fluid it says on the cap of your master cylinder reservoir. For older models that do not have this information written on the cap, use DOT 3.

In a pinch, remember glycol-based fluids are interchangeable. You can mix DOT 3, DOT 4 and DOT 5.1 and it won't affect the performance of your vehicle. **DO NOT** mix silicone-based fluid (DOT 5) with glycol based fluid. **They are not compatible.**