

# LASER<sup>®</sup>

## Brake Fluid Boiling Point Tester

### Instructions



- Identifies the boiling point of any brake fluid sample.
- Powered from the vehicles own battery.
- Clear accurate digital read out.
- Sampling syringe and glass sampling container included.

## Brake Fluid Analyser – Boil Test

The Laser 6802 Brake Fluid Analyser is designed to test the boiling point of the brake fluid in the vehicle very quickly and with digital accuracy. It works on all grades of brake fluid, shows clearly the temperature the brake fluid has boiled at, and recommends whether the brake fluid in the vehicle should be replaced or not.

### Why test brake fluid?

Brake fluid is designed to have a high boiling point, to withstand the high temperatures generated during braking. Non-silicone-based brake fluids have one major drawback – due to its chemical composition the fluid absorbs moisture. This can be moisture from the air (via the vent hole in the master cylinder cap) or via the rubber brake hoses. As the level of moisture in the brake fluid increases, the boiling point gets lower, and the fluid cannot safely perform its vital function. This increases the risk of 'brake fade'; under heavy braking conditions, such as towing, or on steep, downhill, winding roads or stop-start braking at high speeds. Brake fade is when (with its reduced boiling point due to the increased moisture level), the brake fluid boils and turns to vapour. Then the brake pedal feels spongy, with dangerously reduced braking action, or in extreme brake fade the brake pedal goes straight to the floor with no braking action.

## Components

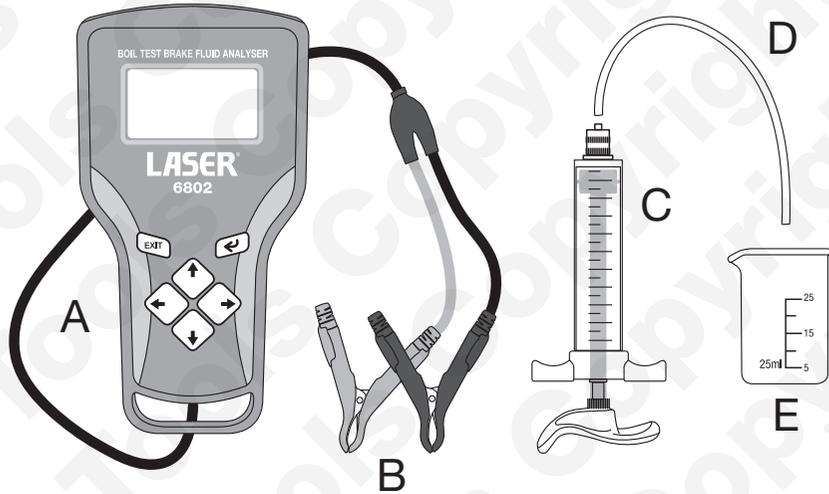


Fig 1

| Code | Description                |
|------|----------------------------|
| A    | 6802 Brake Fluid Analyser  |
| B    | Battery Connectors         |
| C    | Syringe                    |
| D    | PU tube (150mm)            |
| E    | Brake Fluid test container |

## Controls



Fig 2

| Code | Description         |
|------|---------------------|
| 1    | LCD Display         |
| 2    | ENTER key           |
| 3    | EXIT key            |
| 4    | Arrow (Select) keys |
| 5    | Tester Probe        |
| 6    | Metal stand         |

## Instructions

1. Refer to Figure 2: pull back the metal stand (6) and set up the instrument on a flat, level and secure workplace, within reach of the vehicle battery, or another suitable 12V power source.
2. Refer to Figure 1: fit the clear polyurethane tube (D) to the syringe (C). Using the syringe, remove approximately 25ml of brake fluid from the vehicle's brake fluid reservoir, then evacuate this fluid into the supplied brake fluid test container (E). Note: *recommended volume of brake fluid to be tested is 20-25ml.*

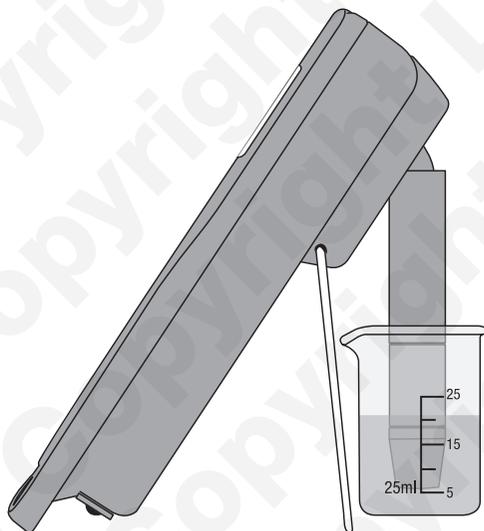


Fig 3

3. Refer to Figure 3: place test container under the instrument, and place the tester probe (5) into the brake fluid. Note: *take care with the tester probe, do not drop or knock, which may damage sensor and ceramic components.*
4. Start test: connect battery clips to vehicle battery or a 12V power source, RED to POSITIVE, BLACK to NEGATIVE (ground).

## Instructions

5. Instrument will switch on and LCD will display as Figure 4A.

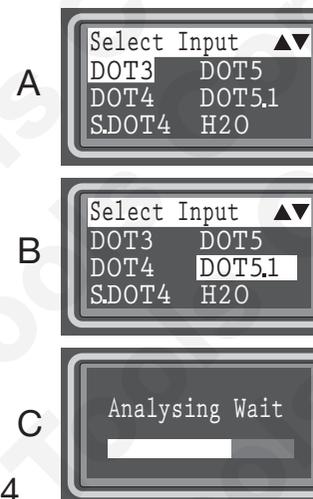


Fig 4

6. Refer to Figure 2: use arrow keys (4) to select grade of brake fluid being tested (DOT 4, DOT5.1, etc). Refer to Figure 4B.
7. When correct grade has been selected, press ENTER key (2) **three times**. Instrument will start test (Figure 4C).
8. When test is completed, the screen will display the standard Dry and Wet boiling points for the grade of brake fluid selected, plus the **results** of the test in degrees Celsius and Fahrenheit. (Refer to Figure 5.)

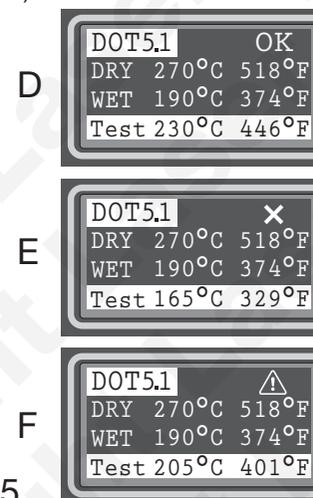


Fig 5

## Test Results

**Note:** Be aware that the tester probe, test container and the fluid in the container will be very hot when test has completed: use appropriate heat resistant gloves to handle.

**Dry Boiling Point** refers to the temperature that brake fluid will boil at when it is new and fresh (unopened container) and no water present in the fluid.

**Wet Boiling Point** refers to the temperature that brake fluid will boil at when the fluid has 3% water by volume (real world conditions, fluid in service). This figure is typically reached after approximately two years of service (most vehicle manufacturers recommend replacing the brake fluid in the system every two years).

Refer to Figure 5: The test result offers a recommendation as to the suitability of the brake fluid in the vehicle's braking system:

Figure 5D: 'OK' symbol is displayed — brake fluid is within the safe range.

Figure 5E: 'X' symbol is displayed — brake fluid is out of range and must be replaced immediately.

Figure 5F: Warning symbol is displayed — brake fluid is going out of range — replacement is recommended.

## To Finish

When the test is completed, before packing away the instrument and accessories, carry out a (H<sub>2</sub>O) test on clean, plain water. Clean the test container before filling with approximately 25ml of water.

Press the EXIT key (3) to reset the instrument, then select **H<sub>2</sub>O** with the arrow keys and carry out test as above.

This will clean the corrosive brake fluid from the tester probe internals and also confirm the accuracy of the device. The result of the H<sub>2</sub>O test should be 100°C (212°F) with a tolerance of ±2%.

Let the tester probe air dry before packing away.

| Brake Fluid Grade | Dry Boiling Point | Wet Boiling Point |
|-------------------|-------------------|-------------------|
| <b>DOT3</b>       | 205 °C / 401 °F   | 140 °C / 284 °F   |
| <b>DOT4</b>       | 230 °C / 446 °F   | 155 °C / 311 °F   |
| <b>Super DOT4</b> | 230 °C / 446 °F   | 155 °C / 311 °F   |
| <b>DOT5</b>       | 260 °C / 500 °F   | 180 °C / 356 °F   |
| <b>DOT5.1</b>     | 270 °C / 518 °F   | 190 °C / 374 °F   |

**Measurement Range: 0°C (32°F) to 330°C (572°F)**

## Precautions

- Wear hand and eye protection when working with brake fluid.
- Do not conduct a boil test if there is less than 20-25ml of brake fluid or water in the test container.
- Be aware that the tester probe, test container and the fluid in the container will be very hot when test has completed: use appropriate heat resistant gloves to handle.
- Do not return the tested brake fluid to the vehicle's brake fluid reservoir; the boil test changes the structure of the fluid and it must be disposed of after the test.
- Dispose of used brake fluid according to local authority guidelines.
- Testing a single sample of brake fluid more than once will yield different results as the structure of the fluid and the moisture level changes. The first result is the only accurate result and reflects the condition of the brake fluid in the vehicle's braking system.
- **Never** mix poly-glycol based brake fluids (DOT3, DOT4, SuperDOT4 and DOT5.1) with a silicone-based brake fluid (DOT5).
- When the test is completed, before packing away the instrument and accessories, carry out a (H<sub>2</sub>O) test on clean, plain water (refer to instructions above).
- Keep instrument and accessories clean and dry, and pack carefully in supplied case.
- Take care with the tester probe, do not drop or knock, which may damage sensor and ceramic components. Take particular care when inserting into packing case.



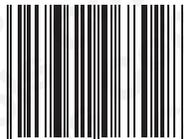
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**Safety First. Be Protected.**



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**Guarantee**



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