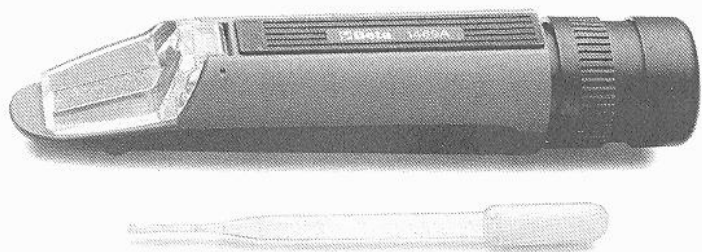
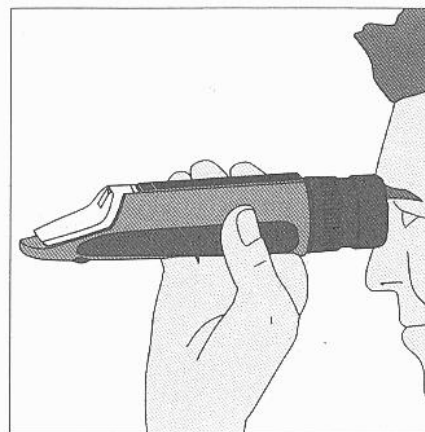




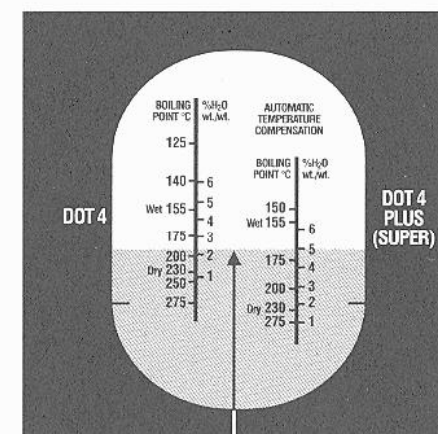
Mod. 1469A



- I ISTRUZIONI PER L'USO
- GB INSTRUCTIONS FOR USE
- F MODE D'EMPLOI
- D GEBRAUCHSANWEISUNG
- E INSTRUCCIONES

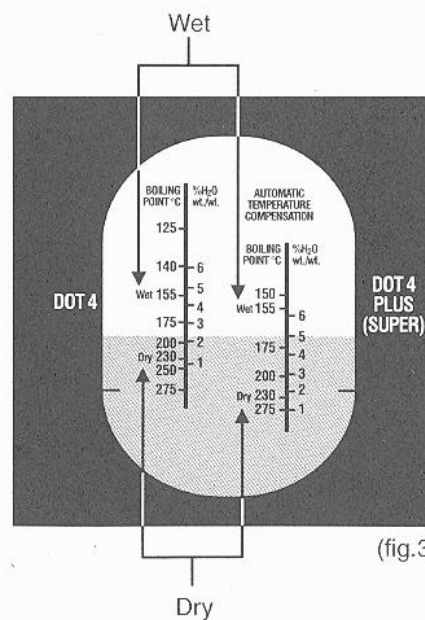


(fig.1)



(fig.2)

Linea di lettura
Reading



(fig.3)

1.0 Introduction

Beta's brake fluid tester means a user-friendly, quick, safe way of checking both the humidity content and the boiling point of brake fluid. This tool is based upon temperature compensation, gives accurate readings about glycol brake fluid DOT 4 at a room temperature ranging from 15 °C (60 °F) to 32 °C (90 °F).

The brake fluid tester shall not be used to test mineral oil or silicone fluids.

It measures the boiling point and the percentage of water in brake fluid DOT 4 Standard and DOT 4 Super, sometimes called "DOT 4 Plus". Brake fluid is hygroscopic or hydrophilic; it steadily absorbs water while the vehicle is running. Water in the system results in the following:

- a lower boiling point;
- increased viscosity, mainly at low temperatures;
- increased corrosivity.

The brake fluid available in the braking system can reach the boiling point if it is subjected to extreme conditions, like a long descent, towing a vehicle, or if a pad/shoe is jammed against the disk/drum. When brake fluid reaches the boiling point, steam is produced, resulting in an air-like effect. The pedal travel gets longer, without providing the pressure needed to slow and/or stop the vehicle. Brake fluid with a high water content is connected with higher density; in addition, water makes fluid more corrosive. Replacing brake fluid when the water content exceeds acceptable levels will result in enhanced safety and a longer life of the braking system, especially in modern systems complete with the ABS.

2.0 Measuring scale

The tool is provided with 2 distinct graduated scales for brake fluid DOT 4 Standard and DOT 4 Super (DOT 4 Plus) (Fig. 2). Both scales allow the boiling point (°C) and the water content in the tested fluid to be read.

To convert Celsius degrees into Fahrenheit degrees, multiply by 9, divide by 5 and add 32 degrees (e.g. 20 °C = (20x9 = 180), (180/5 = 36), (36+32 = 68), 68 °F).

3.0 Tool cleaning

The brake fluid tester should be cleaned perfectly after being used; any fluid residue on the measuring prism might result in faulty readings and cause the tool to be damaged. To clean the tool correctly, take the following steps: turn the plastic cover protecting the sample backwards, to uncover the prism. Clean both the prism and the lower part of the cover with water and dry both with a clean, soft cloth, being careful not to scratch any surfaces; then take the cover back to position.

4.0 Taking samples of fluid

WARNING: Read this section carefully before taking any samples of fluid and follow the instructions below. Proceed with extreme caution when testing brake fluid; contact with brake fluid may cause irritation or severe skin and eye lesions. It is recommended that protective glasses and gloves should always be worn when working with any fluid available in the vehicle. In addition, brake fluid is corrosive in contact with any painted parts; therefore, extreme caution should be exercised to prevent damage or lesions. Use one of the plastic pipettes the tool is supplied with; take a sample of brake fluid from either the brake fluid reservoir or the front and/or rear cylinders. Before starting the test, make sure that the pipette is free from any previously taken sample of fluid. Lift the cover of the sample and let 2 or 3 drops of the fluid taken for the test fall onto the prism; replace the cover immediately and take the reading.

5.0 Readings

Beta's brake fluid tester is provided with eye protection, which can be used in two different positions: whenever any glasses are being worn, the guard should recede and be turned clockwise, so that it can be locked in position; if no glasses are being worn, the guard should be spread by turning it anticlockwise and pulling it out. To take accurate readings, hold the tool perpendicular to a source of light and look in the eyepiece (Fig. 1). To enhance the image, just rotate the eyepiece.

Both the boiling point and the water content are read where the luminous and dark blue portions meet on the scale (Fig. 2). To enhance the contrast between the two portions, just tilt the tool, keeping it turned to the source of light. Failure to provide a clear contrast between the two areas may depend on the following:

- the prism and/or the sample of brake fluid were not adequately clean and dry before the test;
- brake fluid is lacking on the prism;
- brake fluid is excessively dark and/or contains suspended particles; this state means that brake fluid should be replaced and that both the system and its gaskets should be inspected.

6.0 Dry and wet boiling points

The Society of Automotive Engineers (SAE), the Department of Transport (DOT) and the International Organization for Standardization (ISO) have established the specifications about the dry and wet boiling points for fluids. On the scale such readings are marked "Dry" and "Wet" (Fig. 3). The dry and wet boiling points for the classes of brake fluid are as follows:

Brake fluid	Dry boiling point	Wet boiling point
DOT 4	230 °C / 440 °F	156 °C / 311 °F

The readings about the boiling point on the scale of the tool should be referred to when judging the state of brake fluid. New brake fluid should meet the specifications about the "Dry" boiling point. As time goes by and the vehicle is used, brake fluid in the system will get close to the "Wet" boiling point.

7.0 Tool calibration

The brake fluid tester is so calibrated during production as to suit brake fluid DOT 4 Standard; as a rule, it does not require to be further calibrated. To check the tool, use OEM brake fluid taken from a new, unopened package. Use only OEM brake fluid to calibrate the tool, if need be. Scale DOT 4 can be adjusted with Volkswagen or Castrol brake fluid DOT 4; such fluids should give readings of about 265 °C on scale DOT 4. To check calibration, make sure that the temperature of the tool ranges between 18 °C and 22 °C (between 65 °F and 75 °F). Apply a few drops of OEM brake fluid to the prism and immediately close the sample. If the reading differs from the expected one, the position can be adjusted between light and dark, by removing the rubber cap from the bottom of the tool, putting an offset hexagon key wrench (1.5 mm) into the calibration adjusting screw and rotating it in the right direction, until it is aligned as required. After the tool has been calibrated, the rubber cap should be replaced; **failure to replace the rubber cap may cause the optical equipment to be contaminated.**

8.0 When should brake fluid be replaced?

Many car manufacturers recommend that brake fluid should be checked every 12 months, while others recommend that it should be checked every 24 months. The quantity of humidity absorbed by brake fluid depends on several factors, including the type of brake fluid, air humidity, the type of tubes used for the system, the state of the gaskets and mileage. An up to 1-year-old vehicle usually absorbs 1% humidity; a 2-year-old vehicle has a 2-3% water content in brake fluid; a 2% water content causes the boiling point of brake fluid DOT 4 to fall to approximately 45 °C (113 °F).

Type of brake fluid	State	Water content	Boiling point (°C / °F)
DOT 4	OK	<2%	>210°C / 410°F
	Close to replacement	2% : 3%	187°C / 369°F : 210°C / 410°F
	Replace	>3%	<187°C / 369°F
DOT 4 Super	OK	<2%	>212°C / 414°F
	Close to replacement	2% : 3%	190°C / 374°F : 212°C / 414°F
	Replace	>3%	<190°C / 374°F

The way the vehicle is driven should usually have an impact on the frequency of brake fluid replacement. If the vehicle is used to tow any other vehicle, is driven in mountain areas, or if the system is complete with the ABS, brake fluid should be replaced when the water content accounts for 2%. Brake fluid should be replaced whenever the water content exceeds 3%. **Beta Utensili S.p.A.** reserves the right to modify the product, with a view to enhancing it and for any sound and/or sales-related reasons, without giving notice thereof or modifying any previously sold items.