The Brake Fluid Tester (ALB1100) - Why Test Brake Fluid?

Everyone knows to change their oil & antifreeze regularly, but what about your brake fluid? Failing to change oil or antifreeze could be costly but it will not kill you. But using old brake fluid could easily lead to all the brakes failing simultaneously under hard braking. It is possibly the most safety critical item in your car but could also be the Silent Killer in Your Car.

In todays automotive aftermarket where competition is tough, the factor which often determines where your customer decides to spend their money is service. Although most mechanics know brake fluid does not last forever, very few customers know this, so it is not something they normally ask to be done. It is your responsibility to advise your customer of needed repairs and maintenance, to extend the life of their vehicle.Your advice on this will be appreciated as it will keep them safe and it will also generate additional revenue for your workshop.

Tell Them or Lose Them

Failure to do a test & advise your customer they need a low cost fluid change can add a substantial cost to the price of a routine brake job later on. Mad customers don't come back and will tell many other potential customers about your bad service and advice or lack of it. If you do not test the fluid and replace old "wet" unsafe fluid, you may also be exposing yourself to litigation in the event of a subsequent accident.These incidents could ruin your business.

Brake Fluids Dirty Little Secret

Brake fluid has to have a wide range of attributes including a high boiling point and low cost and the end result is that most brake fluid is based on Ethylene Glycol with various additives to prevent corrosion etc. Unfortunately, Ethylene Glycol is hygroscopic and gradually absorbs moisture from the air. This slowly lowers its high boiling point until it may be only a little higher than water. This could then cause complete Brake failure under certain driving conditions. This is brake fluids dirty little secret.

Most car drivers have heard of brake fade and are likely to assume that old fluid will lead to this even though they may not know what 'brake fade' actually means. It sounds a gradual process though and not one likely to cause a serious problem.

Unfortunately, brake failure due to old fluid is not usually like this at all

Old fluid will work perfectly well for most normal driving. The brakes get warm after slowing down but the brake fluid remains below its boiling point even when this has been seriously reduced by water absorption. So there are many drivers driving around with very dangerous fluid who are completely unaware of any danger.

The problems for these drivers come when they exceed the limits of their very inadequate fluid. This may happen for a variety of reasons; the teenage son may borrow the car for the evening; or they may tow a caravan or boat; or take a trip through the mountains, or be in heavy stop/go traffic on a hot day etc

The Silent Killer In Your Car

Old brake fluid is not something you can use until you notice a deterioration. With old fluid, one minute you have perfect brakes and the next you have none. Old fluid is literally a death trap into which many people have fallen. The silent killer in your car. We read of drivers 'falling asleep at the wheel' when they apparently drive into the back of another vehicle with no sign of braking or apparently fail to brake for a mountain bend. Some of these fatalities could be the result of old fluid boiling and usually the fluid has drained away even if the investigation is aware of this possibility.

The Solution

The rate at which brake fluid will absorb water and become dangerous depends on many factors: the climate, the amount and type of driving and braking, the design and condition of the braking system and components, where the car is garaged (or not), the type of fluid etc etc. It is therefore wasteful and inadequate to specify fixed intervals for changing the brake fluid just as it would be stupid to change tyres or brake pads once a year.

In the past, measuring the boiling point of brake fluid was a laboratory job and so routine changes was the best that car manufacturers could offer. Now reliable in car testing is possible with the invention and patenting of the Alba Brake Fluid Safety Meter. Now every garage can offer a quick and reliable test which will indicate the actual boiling point of the fluid.

Although the reduction in boiling point is the most serious effect of moisture in the fluid moisture will also cause internal corrosion of the system including steel pistons and ABS modulators, a real & often very expensive problem particularly on ABS systems.

Brakes Work on Friction & Friction Causes Heat

Brake Fluid is designed to have a high biling point. New brake fluid will have a boiling point (with no moisture in it) of around 500degF (260degC). As the fluid absorbs moisture, through the rubber hoses and breather holes in filler caps, this critical temperature reduces. Only 3% moisture absorption in a system can take the fluid below the minimum "wet" boiling point, when the fluid should be changed.

Many vehicles on the road today have fluid in them which is potentially dangerous because it may not be able to withstand the heat generated by heavy braking action without boiling. This applies particularly to vehicles over 3 years old which have been driven many miles in wet or humid conditions and/or have been left outside overnight.

Brakes work by converting the kinetic energy of the moving car into heat which raises the temperature of the braking system. Repeated braking with only short intervals for cooling will steadily raise the temperature. In the dark the disk brakes could be seen glowing red hot .

A Growing Problem

Modern cars tend to be more powerful, more streamlined and there is pressure to reduce the unsprung mass (which include the brakes) to improve comfort and tyre life. The brake hardware itself is getting smaller and lighter and we now have non asbestos brake pads. All of these effects accentuate the temperatures now reached by the fluid particularly if the car is driven hard.

The Silent Killer In Your Car

What about the alternative methods of checking fluid condition?

The key question is not 'how much water is in the fluid' but 'what is the boiling point'. Certainly if you know the amount of water in the fluid, and know which fluid is in the car (type and manufacturer) you can consult a graph and deduce the boiling point. It can be done but it is an indirect way with quite a few unknowns that can & will upset the result. Test strips that change colour may "work" to some degree as will meters that measure conductivity or meters which measure the refractive index. Unfortunately these methods require a sure knowledge of the fluid being tested and can also be easily upset by outside influences like damp storage conditions, low battery voltage, slight variations from batch to batch in the make up of the fluid, additives in the fluid etc.

Such unreliable methods may have to be used if there was no alternative but with the Alba Brake Fluid Safety Meter giving a direct boiling point reading, with a digital readout, it is clear to both the mechanic and the car owner if the fluid is still satisfactory or has fallen below the minimum boiling point specified in DOT and Federal Motor Vehicle Safety Standards again (FMVSS).

A Clear Digital Reading

The Alba Brake Fluid Tester accurately determines the boiling point on the car in less than a minute. Previously this could only be done in a laboratory using special equipment. Now you can prove to your customers when their brake fluid needs changing.

Customers prefer to see an actual boiling point reading, on a digital display, rather than have an opinion based on a colour change on a test strip, or coloured lights on conductivity meters, or trying to adjust your eyeglasses, while squinting into a small eyepiece, to determine where a fuzzy little boundary line crosses tiny scale divisions.

The boiling point shown on the tester and the specification are quite clear and precise. The fluid is either within specification or not, and few customers shown the boiling point of their fluid will refuse a fluid change when you make them aware of the dangers of moisture in their fluid.

All current written standards, including the Society of Automotive Engineers (SAE J1703), ISO4295 and the United States Federal Motor Vehicle Safety Standards (FMVSS 116) say that you must test fluid by the "boiling point" method. They do not state any method for testing by conductivity, capacitance, refractive index, colour strips etc, due to their restrictions, limitations and unreliability of results. Further to this none of the worlds major brake and brake fluid companies will approve anything other than the "boiling point" method. Other methods could give rise to to misleading or even dangerous results, which could result in litigation against the garage or technician in the event of an accident after they have tested the customers fluid with these other types of devices.

The Silent Killer In Your Car

How The Alba Diagnostics Brake Fluid Tester (ALB1100) Works

The tester is inserted into the master cylinder reservoir on the car (or where this is impossible, into a sample of the fluid) and clipped onto the battery. When the button is pressed, a small sample of the fluid is heated up to boiling point where the temperature is recorded by an accurate electronic thermometer and displayed. This display alternates with the specified minimum boiling points so that it is instantly clear if the fluid needs to be changed or is within the specification used during the car manufacturers brake testing trials. The meter can be withdrawn and the display will continue so that it can be shown to the car owner. Disconnecting the battery then resets the meter for use again. There is no additional cost of consumables, nothing to order and stock (other than lots of brake fluid) and the meter is practically maintenance free. (We recommend using the meter in water occasionally to remove any contamination from the heater. Once a year or every 100 uses will be more than adequate).

The test itself is quickly carried out (it is entirely possible to check brake fluid condition whilst a car is being refueled) and the test can then lead to a complete overhaul of the braking system where appropriate. Customers appreciate work which may have a direct impact on their safety and that of their family and friends, so the Tester can also be a way of catching customers who would not otherwise consider using your services. Because it is simple to use, staff engaged for their appearance and manner (rather than their technical knowledge) may be used to win customers from the passing trade.

Tip

Test every car & light commercial truck that comes in. Then tell and show the customer if their fluid is below the SAE/Federal Motor Vehicle Safety Standards. You will find that few drivers will argue with an accurate, digital, scientific safety check. They may argue about colour test strip comparisons or a comparitive chart but not with an accurate digital readout of the fluids actual boiling point. A digital result which you can feel safe & secure will stand up in a court of law, a result which will not ruin your business.

Think of it as a cash register....Which saves your customer money , but makes money for you!

Test every vehicle that comes in, lets say 20/day. About 10 will be below the SAE/FMVSS safety standards and will require a fluid change/flush. But not all your customers will buy the service, but say 4/day do. Your extra sales will be....Extra sales/week Extra sales/year

Each Brake Fluid change/flush

At $39.95 per vehicle $1000 $50,000
At $49.95 per vehicle $1200 $62,000

Add to this any incremental sales, and profit, plus increased customer safety and satisfaction.

There are few tools in your shop today that can pay for themselves this fast, then continue making good money for you, every day.