Keeping “Tabs” On Engine Temperature

By Larry Carley

Heat is an engineôs worst enemy. Heat can damage valve seals as well as many other engine parts, so itôs not surprising that overheating is a common cause of engine failures and warranty claims.

The most common cause of overheating is loss of coolant, often due to a failed radiator or heater hose and/or a leaky radiator. An engine can also overheat if the thermostat sticks shut (a good reason for using a "fail-safe" type of thermostat). But overheating can also occur if the cooling system is not filled properly after installing a rebuilt engine or when changing the coolant (air pockets in the block).

An engine can also run hot if thereôs a blockage in the radiator, the cooling fan or fan clutch fails, thereôs a blockage in the exhaust system, ignition timing is incorrect or the fuel mixture is off. Regardless of what caused the engine to overheat, itôs often hard to prove that overheating resulted in engine damage.

The telltale symptoms of severe overheating may include piston seizure and scuffing, galled valve stems, damaged valve guides, and/or a warped or cracked cylinder head. But these conditions may also be blamed on other factors such as incorrect assembly tolerances or a lack of lubrication.

Your first line of defense in such instances is proof that the engine did indeed overheat (regardless of the cause). A heat tab can provide such proof by indicating a certain temperature was exceeded in operation.

A typical heat tab for a gasoline engine has a center plug that melts out at 250º to 255º F. If the engine has gotten hot enough to melt the heat tab, any damage it suffered is likely not the rebuilderôs fault. Lower temperature heat tabs are also available for other applications such as marine (187º to 192º F) and diesel (225º to 230º F).

Heat tabs, used properly, provide an acceptable defense against unjust warranty claims. The validity of heat tabs as a reliable and proven means for monitoring engine temperature has also held up successfully in court cases involving engine warranty claims.

Heat tabs can be mounted almost anywhere on the engine block or cylinder head. Many rebuilders will install one heat tab on the block and one on each cylinder head in a V6 or V8 engine.

The heat tab should be positioned where it will give a good indication of average head temperature, but away from exhaust ports, manifolds or pipes. The heat tab should also be located in a protected position so it isnôt accidentally damaged or knocked off during engine

installation or normal use. For engine blocks, a good location is in the recess of a freeze plug. For heads, almost any exterior surface not adjacent to the exhaust ports will work.

Traditional heat tabs are small round metal buttons that are attached to the engine with high-temperature, high-strength adhesive. For a secure attachment, the mounting surface on the engine must be clean (no oil, dirt or grease).

Heat indicating labels available through Engine Rebuilders Association (AERA) can also be used to monitor temperature readings. The self-adhesive labels have a series of windows from 180º to 280º F that turn black when the indicated temperature is reached.

One very important point to keep in mind when using heat tabs or labels for warranty protection is to make sure your customer understands why the tab or label is on the engine. They should know that the engine warranty is void if the tab indicates overheating has occurred or if the tab is removed.

For added protection, some rebuilders have been known to hide an additional heat tab in a less obvious location just in case the most visible heat tab has been removed or tampered with.

Using a "personalized" heat tab with your companyôs name or logo on it is also a good way to identify parts youôve rebuilt, and to assure the heat tab on the engine is the same one you installed.

Heat tabs are relatively inexpensive. Metallic heat tabs generally cost less than about 35 cents each, and heat-sensitive labels can be bought for less than 95 cents each. Considering the potential expense of a warranty claim, heat tabs are very cheap insurance.