



TECHNICAL BULLETIN

PYROMETER AND GAUGE ERROR AND HOW EFFECTIVE ARE DEVICES THAT MONITOR A GAUGE TO COOL A TURBO?

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QUESTIONS: HOW ACCURATE IS A EGT GAUGE? Can monitoring this gauge allow a device to automatically run my engine until my turbo is properly cooled?

ANSWER: Diesel Turbo Lifesaver works by timing out how long you engine runs to cool the turbo. Remember, time is time and it never varies. In contrast, the assumption that gauge / thermocouple systems are very accurate is totally incorrect. Please read the QUOTE from the manufacturer's installation instructions of a popular gauge, the Westach 2DC2-30SS:

QUOTE:

"! IMPORTANT !

This system is factory calibrated at 75 deg. F. The indicator measures the temperature difference between the hot end (PROBE) and the pin terminals on the other end of the thermocouple (COLD JUNCTION).

For COLD JUNCTION temperature of 75 deg. the indicator will read the true temperature of the PROBE end of the thermocouple.

For COLD JUNCTION temperatures HIGHER than 75 deg. the indicator will read one deg. LOW for each deg. above 75 deg.

For COLD JUNCTION temperatures LOWER than 75 deg. the indicator will read one degree HIGH for each deg. below 75 deg.

This thermocouple "error" is a normal characteristic of self powered thermocouple systems. If possible, locate the thermocouple COLD JUNCTION connection to patch cable away from heat (or extreme cold) to minimize thermal "error".

When the COLD JUNCTION is 100 deg. and the system is calibrated at 75 deg. that means the COLD JUNCTION is 25 deg. high and the indicator will read 25 deg. low."

UNQUOTE

WHAT THIS MEANS TO YOU:

In examining the 3rd and 6th paragraphs of the quote, one can readily see the following scenario happening: Underhood temperatures can easily reach 225 deg. F. or more when the vehicle is working. For this examination, we will use 225 deg. as the underhood temperature. Thermocouple's COLD JUNCTION is 150 deg. higher than calibration temperature of 75 deg. Therefore gauge reading is 150 deg LOW! Safe turbo shut off temperature is between 250 and 300 deg. F. The vehicle has a device installed in it that monitors the gauge and is set to shut off at 275 deg. Engine shuts off. Is the turbo safe? NO WAY! The "error" in the pyrometer has allowed the engine to shut off when the turbo is at 425 degrees!

Why buy such a system to cool your turbo when it shuts it off hot? All it is giving you is a FALSE sense of security. There is absolutely NO WAY you can compensate for this thermal "error" because the error is NEVER constant! To make matters worse, the gauge reads both HIGH or LOW depending on if you are colder or hotter than calibration temperature!

It does not matter if you have a digital or analog (needle type) gauge, it is clear from the above quote that gauge is only giving you an approximate reading of temperature. Therefore, ANY device that attempts to monitor the temperature of the turbo to determine engine shut off time is ineffective by design. That is why Diesel Turbo Lifesaver is a timing device rather than a thermocouple monitoring device. It allows you to set enough time, regardless of conditions to properly cool your turbo.

DIESEL TURBO LIFESAVER™ is manufactured by:

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NOTE: We have the original Westach document on file in our office. The Westach form number is 177-96V dated 4/96, revised 3/00.