So You're A Pro?

AN ARTICLE
BY
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A customer of mine is a well read Veteran of not only The Nam but 30 years of high power AM broadcasting. I am proud to call him my friend. He flies his POW flag proudly and is surely one of the most learned guys that I know in the field of AM radio on any topic. If he lacks in any field it would be Diesel Engine operation and repair.

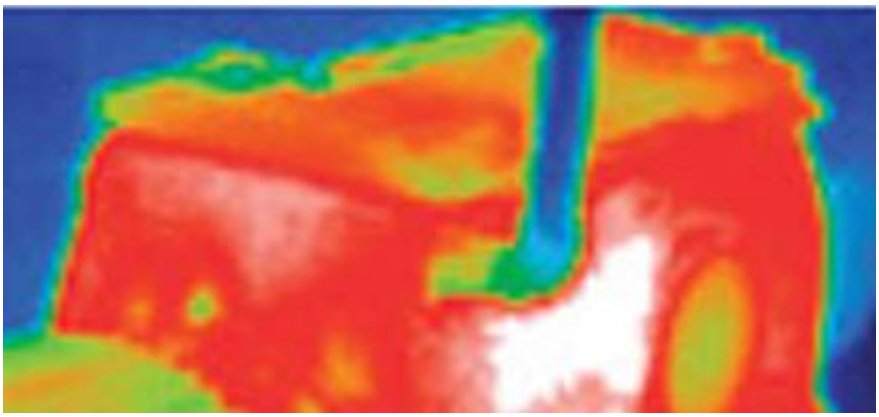
In Some areas of my range of work, one of the first questions asked of you is "Where you from?" This is an important question to them mostly because if you came to work on something for them and you came from more than 75 miles away, this qualifies you to be an Expert, or a Professional in the claimed field of pending work. While this seems like an overly simple standard, it does make you wonder a bit about the people that are sent out to fix something for you and why didn't you just fix it "your own self" as these folks say.

I was assisting my very learned friend with some phasor and transmitter issues and when we were done, he sheepishly asked "Do you have a few more minutes to look at my generator?" I said of course I do so off to the generator building we went. This is a 50kW AM plant with full facilities so the AC mains service is a split 277/480 with a master dropping transformer for the low voltage loads at 120/208. The transmitters, heating, air conditioning, and lighting are all 277/480. The genset is 350kW, Diesel lives in its own building. The installation is nice with my favorite Islatrol surge arrestors and other smaller units.

My friend explains to me that the local rep for his generator has been out to look at the machine six times for excessive smoke. I am pretty good with engines in all forms from LPG to Diesel and I had to wonder what constitutes "excessive smoke"? My friend said "watch this". I was trying to watch the engine frame while it cranked while watching the exhaust output through the window. While the engine rolled over the typical six or seven revolutions to give the electronic timing a clue where the pistons are, the first cylinder hit with a violent, frame shaking off to the races at full throttle belch right up to 1800 RPM. This is not what a newish Tier 3 engine is supposed to do. This thing hit the fuel rail like a run away train and the governor caught it and held the RPM at the required 1800 revolutions, all the while fogging for Mosquitoes through what should have been a three to four second ramp up to 1800.

The entire 10 second ordeal was frightening. This engine start was more like a 2MW on a cold day with a bad block heater. I hit the shut down command and with wide eyes asked him about 50 questions that the Technicians who were from a shop over 75 miles away should have asked.

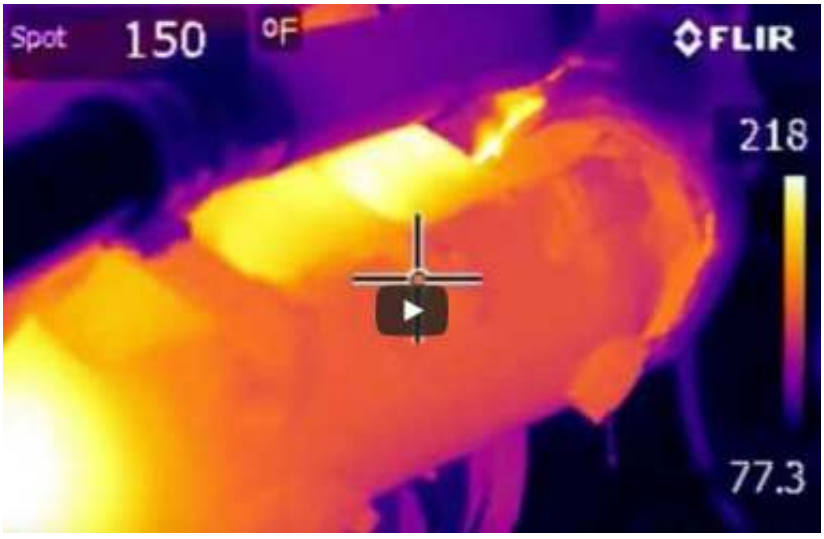
The first question was when did this circus start and ended with does it do this every time? Neither answer was good. I asked him to wait while I went out to the truck and got my Thermal Infrared Camera. I installed the heat shield on the wide angle lens and against my better judgment, we started this thing gain. My friend said that the last Tech said just run it with a load and when it blows the carbon out, the smoking will stop. I asked him to start this run away train again and I started watching the cylinder heads and exhaust manifolds with the camera. Fortunately this was an in line engine format so I could see pretty much everything that I needed to with the camera without having to pan around or miss something. Right away the temperatures started to appear and cylinders three and four were rising way faster than the other four cylinders. While three and four had the same heat curves along with their exhaust port piping, the other four cylinders were nearly cold and their temperatures were what I called extremely low. I recorded about a few quick images of the heat rise and still against my better judgment, stayed in the room until the machine reached full jacket temperatures of around 185F.



The two hot cylinders lead the pack with head and jacket temperatures that exceeded 290F and the exhaust ports were 600F higher than the other four pistons and ports.

The machine reached a point where the smoke billowing out of the exhaust pipe was too think to see through and the engine block parts had thermally stabilized. With the engine shaking violently, I shut the thing down. My friend explained that they had done a load bank and full run up and declared the machine fully operational and that he had nothing to worry about. I told him that cylinders three and four had broken injectors and they were not metering the fuel. Those two injectors were not only idling the engine, they were making all of the horsepower and the sensors, injector pump and injectors needed to all come out for testing or replacement.

My friend said that even though the machine was not new or under warranty that the local rep had no interest in coming out again. I cautioned him that repeated running of the engine, especially under load WILL result in a catastrophic failure of the armature and engine bearings.



He agreed with me and since he had not previously seen any Infrared work done by the Technicians.

The service folks were from more than 75 miles from his location. They were considered the experts. Three operational hours later, the crank shaft and two pistons blew out of the side of the engine.

When you hire trades to come in and work for you, there is no substitute for local knowledge and recommendations. You just have to be sure that the only qualifying factor is better than "They's from more than 75 mile from hyear"

Common sense is not an app that you download.

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