Hino With A Surge Issue

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Midrange surge- Hino FDJ7 JO7E engine

Even though our readers mainly work on light vehicles, in this issue I'd like to share with you an issue I had with a Hino.

Some time ago, I recall the earlier Hino JO7C 5-cylinder engine having surging faults related to the Denso inline fuel pump.

Back in the mid 2000's that engine was a popular fitment in the truck fleet of one our biggest clients when I ran our diesel fuel injection shop.

They were certainly a big earner for our small business as we would overhaul around 10 pumps and injector sets a year for 3 years running for just that one client alone. The fault was metal in the fuel metering rack causing it to stick. The metal was from a failing rear bearing of the fuel pump camshaft.

Moving on a few years, the JO7C made a comeback and became the JO7E using an electronic Common Rail Diesel (CRD). This recent surging fault we came across, was on a 2012 Hino FDJ7 with approximately 350,000kms. The job was logged into our DIESEL HELP members online area and the following information was provided by the workshop.

Customer Complaint: Surge under throttle

Fault Codes: None

Fault Description: Once vehicle gets above 72 degrees and the Exhaust Gas Recirculation Valve (EGR) operates, the surge starts to occur. The Injectors have been replaced originally as parts of the surge issue vehicle had excessive smoke and a cylinder cut out revealed injector performance issues. The Diesel particulate Filter (DPF) also had 35 kPa of back pressure. Currently DPF is removed from the vehicle awaiting replacement.

Diagnostics Implemented: Have pressure tested intake system looking for leaks. Operated EGR & VGT via scan tool. Have removed turbo to physically check VGT movement internally. OK.

After 14 days of liaising with our DIESEL HELP member, they found the fault to be within the turbo itself. Yes, as mentioned one of the diagnostics implemented was removal of the turbo for inspection. This unfortunately could have been solved before logging the job had they known how a notchy in a turbo could cause such a problem and what we do to diagnose this. We see this kind of failure regularly, at least 2 to 3 a month but never have I witnessed a midrange surge without a fault code.

Often that failure will throw a fault code, demonstrate a lack performance or drive ok until a code sets the truck into limp home mode because it is over-boosting.

We suspect the sticking in the turbo was not found because the arm had not been completely removed and checked separately whilst driving. The arm is steadied by the electronic actuator.

A tip we in the trade have used for years is to unplug the electronic actuator and disconnect the arm from the actuator to the turbo. Using a strong cable attached to the turbo arm on the turbo side (not the actuator) and operate whilst driving. At the same time, take note of what your boost is doing. Find out the specification if you can, which will certainly help your diagnosis.

It was not until we had access to read the data from another known good Hino, that we could confirm what the boost pressure reading should be.

The turbo produces a low boost of around 5 psi under these conditions. It was also noted during the conversation that the turbo was very noisy. This is often the case if a turbo were to be over-boosting, something we hear way too often from incorrect tuning.

We confirmed this vehicle had not been tuned but found the vehicle was in fact boosting at 12 PSI. That is excessively high for this vehicle at those conditions. Being aware the EGR acts as a wastegate for the turbo, if it was to over-boost, this is where you must be certain to avoid misdiagnosing. Thankfully, we vested more time into the diagnostics rather than replace unnecessary parts.

Another key factor to consider when diagnosing, was this fault would only occur when the engine was warm. It is likely that once temperature increased, the expansion of internal metal components caused the variable turbo fins to stick in the housing.

With the arm disconnected from the actuator, the surge had disappeared. A replacement turbo was ordered from GCG Turbos (www.gcgturbos.com.au)*

If you need assistance or to learn more visit www.dieselhelp.com.au

*** In fact we refer many of our DIESEL HELP members to GCG for their keen pricing and huge range of quality products and services including turbo testing and more.**

GCG TURBOS

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For the second consecutive year, Ryco Filters has been recognised as one of Australia and New Zealand's most innovative companies.

Placing fifth on the 2020 AFR Boss Most Innovative Companies list (manufacturing and consumer goods category) for its ground-breaking Ryco Vehicle Specific component Kits (RVSK), Ryco also made the top three last year for its RCC350 Crankcase filter.

In an industry first, Ryco devised a vehicle specific component kit designed for the dual or single installation of Ryco Fuel Water Separator and Ryco Crankcase assemblies. The convenient kits come supplied with specifically moulded hoses and brackets that are engineered to fit each unique vehicle engine bay.

The RVSK Kits are designed to match the specifications of a wide range of vehicles, including the Ford Ranger, Toyota Landcruiser, Mitsubishi Triton, Nissan Navara and the Toyota Hilux - to name a few.

Vehicle specific kits make the fitting of a crankcase assembly and/or the fuel water separator straight forward for the technician. They are designed in Australia by Ryco to fit most vehicles with dual battery set ups, locally tested at Ryco's dedicated filtration lab (the only one of its type in Australasia) and built with long lasting high-quality components and resists vibration. They also come with an application specific moulded PCV hose, a high quality 3mm laser cut steel electrocoated bracket with rivet nuts and feature quick release fuel fittings.

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The expert judging panel also assesses internal elements such as innovation culture, strategy, resources and process, which demonstrate a sustainable and repeatable approach to innovation.

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