



TECH TIP

TT-17-015 TURBOCHARGER REPLACEMENT GUIDELINES

GROUP: 0-GENERAL

DATE: 10-3-2017

REFERENCE: HMM-170951-J1

SUBJECT VEHICLES: 05MY-18MY Conventional Trucks equipped with a J05 or J08 engine.

Note: This tech tip is provided as technical information and is not authorization for a warrantable repair.

OVERVIEW:

Turbochargers have been misdiagnosed as being faulty for different reasons including, but not limited to the following:

- Oil leaks, oil residue, oil saturation, oil consumption
- MIL Lamp Illuminated
- Noise
- Low power

It is important to follow the guidelines set forth within the Engine Workshop Manual, **Model Year > Engine > Turbo charger** and this Technical Tip prior to replacement of the turbocharger. Also reference Technical Tip **#15-026** for diagnosis of DTC P0299 and or P226C when an exhaust restriction may be present.



OIL CONSUMPTION AND/OR OIL IN THE CAC PIPING:

The images below represent a normal condition with some oil in the CAC piping



The following images represent heavy oil saturation.
This is not usually caused by a faulty turbocharger and further inspection is required.



It is normal to find some engine oil at the turbocharger outlet, within the CAC (charge air cooler) piping, or inside of the CAC. Seeing oil in these areas is not a cause for concern unless the amount of oil is grossly excessive. If excessive amounts of oil are found, do not suspect a faulty turbo without first inspecting the following:

- The engine air filter is not restricted (verify that the filter minder has not triggered, and remove the air filter to inspect its condition).
- The CCV (closed crankcase ventilator) system is operating properly and not restricted.

*From the 2011 to current model year, a filter was added to the CCV system to control the amount of engine vapor suspended in the crankcase. This filter has a maintenance interval of 60,000 miles (100,000km) or every 12 months, whichever occurs first.

- Engine oil level and condition. Excessive fuel dilution of the engine oil should be considered. Reduced viscosity of the engine oil can result in more oil in the CAC pipes.
- Intercooler hoses. Inspect for loose hoses or leaks. Oil leaking from an intercooler hose is not indicative of a failed turbocharger.
- Engine misfire. Improper engine performance due to a misfire can lead to turbo misdiagnosis. Inspect the fuel injectors –i.e. injection quantity, correction balance, misfire, or knocking. These items, as well as low engine compression can cause the turbo shaft to shudder during operation resulting in excessive oil carryover from the turbocharger. Do not replace the turbo for this condition.



If no issues are identified with the above items and excessive amounts of oil are present within the CAC piping, careful inspection of the turbocharger is necessary before condemning it. Unless the presence of liquid oil is confirmed in combination with a mechanical failure of the turbocharger, the turbocharger should NOT be replaced. Follow the inspection guidelines set forth within the Engine Workshop Manual relevant to the model year vehicle you are inspecting. Also reference the Turbo Inspection section, below.

OTHER CONCERNS

Rotary Electric Actuator (REA) Failure with inactive or active DTC's (2005-2010 MY Only)

A turbocharger REA failure is generally associated with either a P0045 or U1123 DTC. In some cases the codes may be intermittent as noted by inactive codes, and in other cases the codes may remain Active. In either case, a proper diagnosis is required. VNT tests and checks of electrical circuits and connections should be conducted per the procedures of the Hino Workshop Manuals prior to a turbocharger being replaced. In most cases, either of the trouble codes, stated above, are the result of an intermittent or active REA failure condition.

Noise Complaints

Abnormal noise from the turbo may be a result of an exhaust leak, exhaust restriction, or leak in the intake system. Inspect these items for issues before replacement of the turbo for a noise concern. Perform the Turbo Inspection procedure, below if no leaks or restrictions are found in the intake or exhaust system.

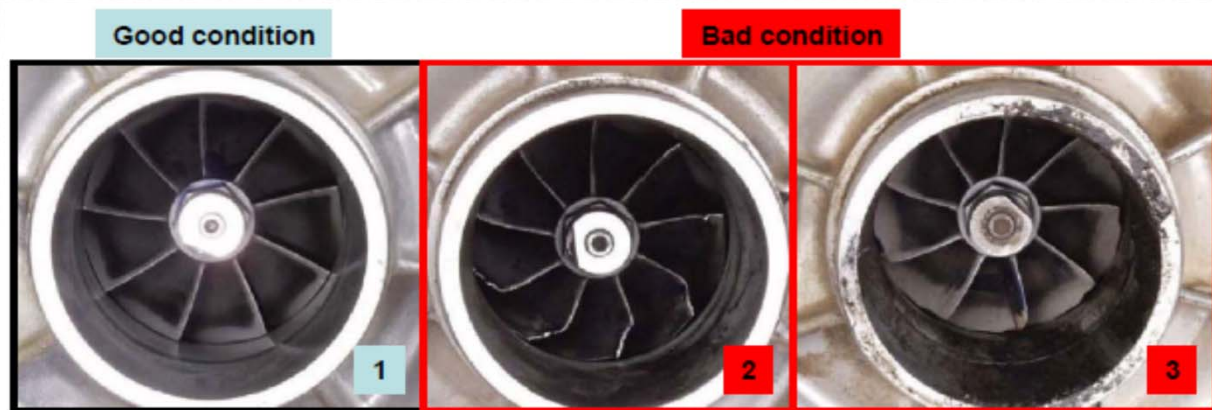
Poor Performance / Low Power

In these cases where performance is low and no obvious fault lies with the turbocharger, the low power may be due to improper fuel delivery, a restriction or leak in the intake or exhaust systems, or worn engine components (low compression). If an issue with the turbo is suspected, perform the Turbo Inspection procedure, below. If neither wheel rubs on the housing, the blades are not damaged, and the shaft spins freely, there is no reason to replace the turbocharger.



TURBO INSPECTION:

Compressor Wheel Inspection



- **Good condition (1)** - The compressor blades are clean and straight. There are no large gaps between the compressor housing and the wheel. No visible damage to blades.
- **Bad condition (2)** - The compressor wheel has bent and/or broken blades. This turbocharger should be replaced.
- **Bad condition (3)** - The compressor wheel blades have signs of erosion from dirt entering the intake air system. The blades are rounded off and there is dirt accumulation in the compressor inlet. This turbocharger should be replaced and the cause should be corrected. This is caused by dirt intrusion and is not a warrantable failure.

Turbo Shaft Inspection

If the visual appearance of the compressor wheel is ok, the turbocharger shaft should be inspected for binding or excessive play. Some amount of play in the turbo shaft is normal. Follow the inspection guidelines set forth within the Engine Workshop Manual relevant to the model year vehicle you are inspecting, Turbocharger Inspection section. The turbo shaft should spin freely by hand. The turbo shaft should not bind while rotating it by hand and lightly side loading it simultaneously. The compressor wheel should also not contact the sides of the housing. If the shaft is binding or has excessive play, the turbocharger should be replaced. If no issues are found with these items, it is **highly unlikely** that a defect with the turbocharger rotating assembly is present.