

BULLETIN NUMBER:

IB09-J-002C

ISSUE DATE:

APRIL 2013

GROUP:

ENGINE

Turbocharger Inspection

AFFECTED VEHICLES

2007 - 2010 Chevrolet or GMC W3500/W4500/W5500

2007 - 2014 Isuzu NPR/NPRHD/NQR/NRR

2013 Isuzu NPR

SERVICE INFORMATION

AFFECTED VEHICLES

- 2007-2014MY Isuzu N-Series
- 2007-2010MY GMC and Chevrolet W-Series
- 2007-2009MY Isuzu F-Series
- 2007-2009MY GMC and Chevrolet T and C-Series

Equipped with Diesel Particulate Filter (DPF)

This bulletin supersedes IB09-J-002B. This bulletin is being revised to update Model Years. Please discard previous bulletin IB09-J-002B.

INFORMATION

Investigation of returned turbochargers has identified a common occurrence of turbochargers being replaced for internal oil leaks. Results show that there is no fault with the turbocharger. The perceived oil leak actually may be a normal characteristic of the closed positive crankcase ventilation (PCV) system or some other unidentified condition. In order to better service the customer and reduce the replacement of undamaged turbochargers, Isuzu has provided the following inspection information in order to aid the technician in properly diagnosing turbochargers. Turbochargers passing the internal inspections provided should NOT be replaced. Remember, turbocharger replacement requires Isuzu authorization, contact your DSPM BEFORE replacing a turbocharger.

Check the following items as part of normal turbocharger diagnosis.

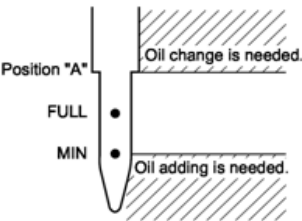
IMPORTANT: If any of these conditions are found, the Turbocharger most likely is OK and should NOT be replaced,

• Air filter – Should be clean without restriction. A restricted air filter can create a vacuum condition on the intake system which may draw excessive oil through the closed PCV system. Check the Filter Minder Gauge for evidence of excessive inlet restriction has been recorded, if equipped.



- o If the air filter is restricted, replace the air filter as part of vehicle maintenance.

• Oil Level – Should not be exceeding the “MAX” level. A high or overfilled oil level will result in high crankcase pressure forcing excessive oil through the closed PCV system into the air intake. For certain vehicles equipped with 4HK1 (5.2L) engines, check to be sure the following bulletin has been completed for accurate level checking: SB09-J-006 Oil Related Misdiagnosis - Engine Oil Dipstick Calibration Incorrect.



- o Adjust the oil level to the correct level as part of vehicle maintenance.

• Oil Condition – Check the oil quality for deterioration (lack of maintenance) or dilution (fuel in the oil). Poor oil quality can lead to aeration of the oil. Aerated oil will increase crankcase pressure forcing excessive oil through the closed PCV system into the air intake. Check for signs of aeration (milky color).



- o Replace poor quality or diluted engine oil and part of maintenance. If diluted, find the source of dilution and correct.

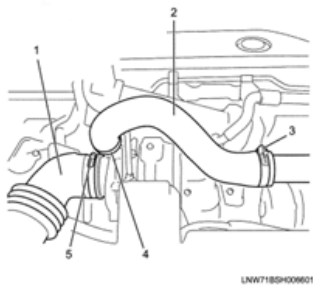
• PCV system (6HK1 engine only) -
Inspect PCV hose and PCV oil separator
for obstruction or blockage. A blocked
PCV hose will lead to increase engine
crankcase pressure and could cause a
turbocharger oil leak.

- o Place the PCV filter as part of
maintenance.



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for obstruction or blockage. A blocked
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turbocharger oil leak.

- o Clean or replace any damaged or
plugged hoses as part of maintenance.



• Noise – Listen for high-pitched noises.
High-pitched noise can indicate air or gas
leaks. An air leak can cause unstable intake
pressures allowing oil to leak through the
turbocharger’s dynamic seal.

- o Locate, repair or replace any loose
or damaged hoses (Metal, plastic or
rubber) or clamps.

A TURBOCHARGER FAILURE CAUSED BY ONE OF THESE ITEMS IS NOT A WARRANTABLE REPAIR.

CLOSED PCV SYSTEM DEFINITION

The purpose of the closed PCV system is to remove harmful gases from the crankcase before damage occurs and combine them with the engine’s normal incoming air charge preventing these harmful gases from entering the atmosphere. Unfortunately, blowby gas production and air intake demands do not always match allowing some oil vapor from the crankcase to enter the intake system, including the turbocharger. As a result, this condition may lead to the incorrect diagnosis. **Oil in the intake system is common for a closed PCV system .**

The oil seal inside the Isuzu turbocharger is a dynamic seal. Air pressure (boost pressure) on the compressor side and exhaust pressure on the turbine side keep the lubricating oil inside the turbocharger center housing. A reduction in pressure on either side of the center housing will allow oil to pass into either the intake or the exhaust side on the turbocharger. In order to correct the oil bypassing the seal, the source of the pressure reduction must be located and corrected. **The most common causes of this condition are a restricted air filter, incorrect engine oil and/or loose intake hose clamps or excessive crankcase pressure .**

Be sure that air filter maintenance and oil changes are performed per the Owner’s Manual. Inspect these items before continuing into diagnosis. These inspections can save you and your customer time and money.

ELECTRICAL INSPECTION

Using IDSS check for the following turbocharger related DTCs: P003A, P0045 (SB08-J-001) P0234, P0237, P0238, and P0299. If any of these DTCs are present, follow the diagnostic information in the appropriate service manual to correct the condition.

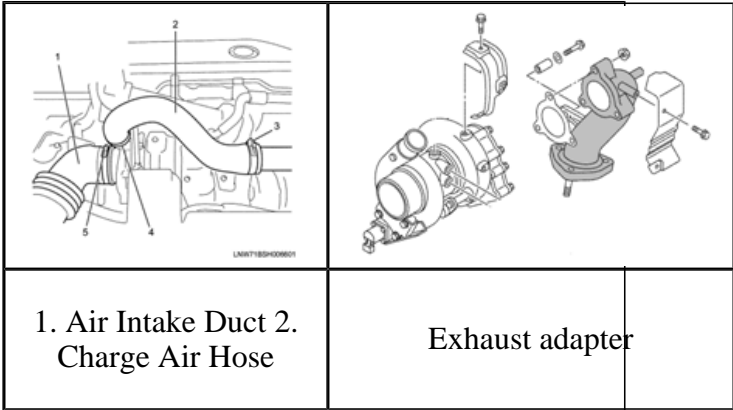
EXTERNAL VISUAL AND MECHANICAL INSPECTION

Any failures found during these inspections should be repaired per the current published Service Manual.

- Listen for unusual mechanical noise and watch for vibration.
- General Installation - Inspect for missing or loose nuts, bolts, clamps, washers, loose or damaged intake and exhaust manifolds and their duct clamps, damaged or restricted oil supply and drain lines, cracked or deteriorating turbocharger housings, external oil or coolant leakage and for obvious heat distortion.

INTERNAL VISUAL INSPECTION

Remove the air intake duct, charge air hose and exhaust adapter from the compressor. Using an inspection light, inspect the compressor and turbine wheels for evidence of foreign object damage. If one or both of the wheels are damaged, a foreign object(s) probably entered through the intake or exhaust system. Identify the origin of the foreign object. Foreign objects usually come from human error or deteriorated engine/intake systems. Repair the source for the foreign object and replace the turbocharger assembly. If NO damage is found, inspect the radial and axial shaft play.

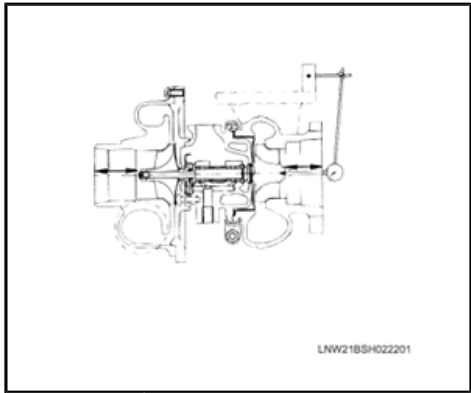


INTERNAL RADIAL AND AXIAL INSPECTION

Perform the following radial and axial play inspections. Refer to the Turbocharger section in the appropriate service manual for detailed procedures. If measured play is within specification, there is no mechanical problem with the turbocharger, there are no turbocharger-related DTCs, and the turbocharger spins freely by hand, then it SHOULD NOT be replaced. Review the list of external visual and mechanical inspections for other potential issues.

Wheel shaft axial play

Spin turbo shaft several times by hand before taking the measurement. Be sure the shaft spins freely. This will remove some excess oil from the bearings which should provide a more accurate measurement. Use a dial gauge to measure the wheel axial shaft play when a force of 12 N (2.6 lb) is alternately applied to both sides of the compressor wheel.




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Axle play	Maximum limit mm (in)
4HK1	0.09 (0.0035)
6HK1	0.09 (0.0035)

Wheel shaft and bearing radial play

Use a dial gauge to measure the clearance between the wheel shaft and the bearing. For proper measurement push up and pull down on the turbine and compressor wheels at the same time. Moving only one side or cocking of the shaft can lead to a smaller inaccurate measurement.



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Clearance	Maximum limit mm (in)
4HK1	0.17 (0.0067)
6HK1	0.14 (0.0055)