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GROUP:  
**ENGINE**

**IMPORTANT SERVICE  
INFORMATION FOR:**

- ✓ SERVICE MANAGER
- ✓ SERVICE ADVISOR
- ✓ TECHNICIAN
- ✓ PARTS DEPARTMENT
- ✓ WARRANTY PERSONNEL

## **OIL IN THE INTAKE – TURBOCHARGER INSPECTION**

### **AFFECTED VEHICLES**

- 2011-2015MY Isuzu N-Series  
Equipped with 5.2L (4HK1), 3.0L (4JJ1) Diesel Engine and Diesel Particulate Filter (DPF)

***This bulletin supersedes IB09-J-002C. Please discard previous bulletin IB09-J-002C.***

### **INFORMATION**

An 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.

The purpose of the closed PCV system is to keep harmful blowby gas from entering the atmosphere. Unfortunately, blowby gas production and air intake demands do not always match which allows some oil vapor from the crankcase to enter the intake system. As a result, this condition may lead to the incorrect diagnosis. **Oil in the intake system is common for a closed PCV system and is not a good indication for turbocharger failure.**

The oil seal inside the Isuzu turbocharger is a dynamic seal (not a rubber seal). Air pressure (i.e., 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 oil bypassing, 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.**

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.

NOTE: Turbocharger replacement requires Isuzu pre-authorization, contact your DSPM **BEFORE** replacing a turbocharger.

## INSPECTION INFORMATION

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.*

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

- **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.

- 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.

- 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).

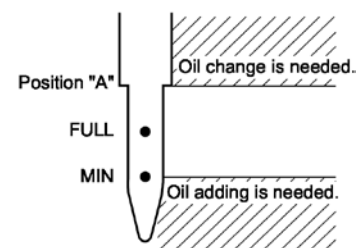
- Replace poor quality or diluted engine oil as part of vehicle maintenance. If diluted, find the source of dilution and correct.

- **PCV System (4HK1 engine only)** – Inspect the PCV hose and the PCV oil separator for obstruction or blockage. A blocked PCV hose will lead to increased engine crankcase pressure and could cause a turbocharger oil leak. Please reference service bulletin – “SB12-J-004 Air Cleaner Oil Intrusion Prevention – Bracket and Clip” for additional information.

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

- **Noise** – Listen for high-pitched noises which can indicate air or gas leaks. An air leak can cause unstable intake pressure by allowing oil to leak through the turbocharger’s dynamic seal.

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



## EXTERNAL VISUAL AND MECHANICAL INSPECTION

Any failures found during these inspections should be repaired as 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 deteriorated turbocharger housings, external oil or coolant leakage and for obvious heat distortion.

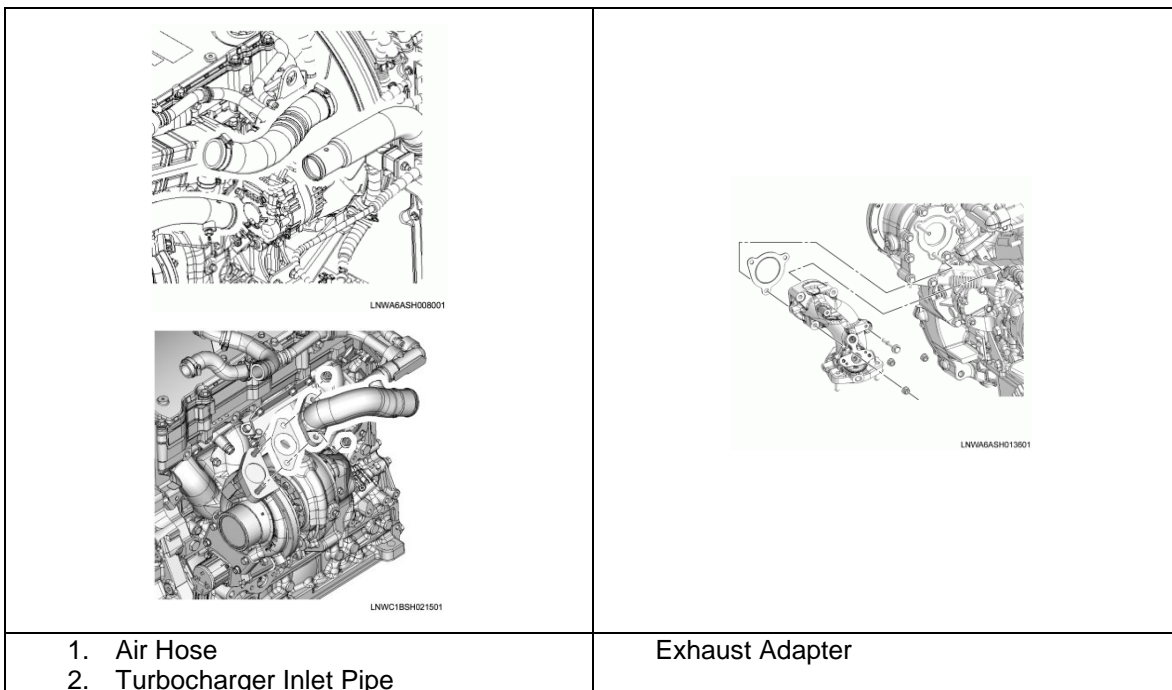
## INTERNAL VISUAL INSPECTION

If a dealer is inspecting a turbo it is normal for the turbo to have what may be deemed “excessive play” in turbo shaft bearing because there is no oil pressure being supplied to the turbo.

Wiggling the turbo shaft with the engine off may lead the technician to feel there is excessive play in the turbo bearings. Some play in the turbo shaft with the engine off is normal. A technician may also notice that if they pull or push on the turbo shaft they can make the turbo blades hit the housing. This is also normal, and would not always lead to a turbo replacement.

The turbo rotates at extremely high speeds. If the bearing did have excessive wear, the turbo blades would hit the housing. If there are no signs of the blades hitting the housing, do not replace the turbo.

Remove the air hose, the turbocharger inlet pipe and the 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) has probably entered through the intake or exhaust system. Be sure to identify the origin of the foreign object, as foreign objects tend to occur 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.



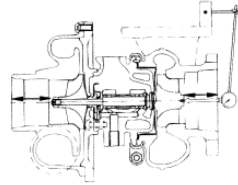
## INTERNAL RADIAL AND AXIAL INSPECTION

Perform the following radial and axial play inspections. Refer to the Turbocharger section in the appropriate service manual. 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

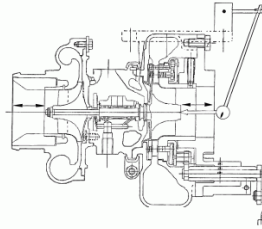
Spin the turbo shaft several times by hand before measuring, and be sure the shaft spins freely. This will remove some excess oil from the bearings which should provide a more accurate measurement. Use a dial gauge to measure the wheel axial shaft play when a force of 12 N (2.6 lb) is alternately applied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

Axial Measurement	Maximum Limit mm (in)
4HK1	0.13 (0.0051)



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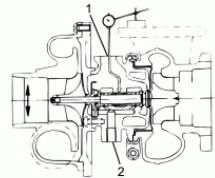
Axial Measurement	Maximum Limit mm (in)
4JJ1	0.09 (0.0035)



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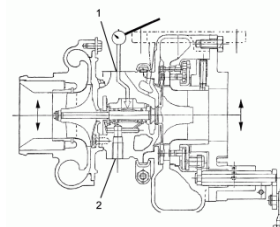
Use a dial gauge to measure the clearance between the wheel shaft and the bearing. For proper measurement, push up and pull down on the turbine and compressor wheels at the same time. Moving only one side or cocking of the shaft can lead to a smaller, inaccurate measurement.

Radial Measurement	Maximum Limit mm (in)
4HK1	0.17 (0.0067)



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Radial Measurement	Maximum Limit mm (in)
4JJ1	0.17 (0.0067)



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