

Technical Service Bulletin Number
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TSB160126



Technical Service Bulletin

Subject

Turbocharger Compressor Side Engine Oil Leak

Warranty Statement

The information in this document has no effect on present warranty coverage or repair practices, nor does it authorize TRP or Campaign actions.

Contents

Product Affected

- ISL G CM2180 (**Only** engines equipped with closed crankcase ventilation)

Issue

Engine oil leak from turbocharger compressor housing is being misdiagnosed as turbocharger oil seal malfunction.

Symptom:

- Engine oil leaks from rear of turbocharger compressor housing.

Root Cause:

- Engine oil suspended in closed crankcase ventilation blowby gas is centrifugally separated by turbocharger. Turbocharger is **not** equipped with a seal between compressor housing and bearing housing.

Verification

Identify oil leak class, then proceed to Resolution Section.

- Class 1 Oil Leak: Wetness on surface. See Figure 1 below.
- Class 2 Oil Leak: Drops form, but do **not** fall to ground. See Figure 2 below.
- Class 3 Oil Leak: Drops are falling to ground. See Figure 3 below.

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Figure 1, Class 1 Oil Leak.

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Figure 2, Class 2 Oil Leak.

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Figure 3, Class 3 Oil Leak.

Resolution

- The turbocharger compressor wheel, closed crankcase ventilation system, and engine are capable of managing a light amount of engine oil and a light deposit of engine oil will cause no harm to the engine.
- Sealing the turbocharger compressor to the turbocharger bearing housing corrects customer complaint of engine oil leak and prevents incorrect replacement of turbocharger.
- Sealant application requires turbocharger removal, partial disassembly, and thorough cleaning of turbocharger compressor housing to bearing housing joint.

Oil Leak Class

Engine oil leak from turbocharger compressor housing requires specific action depending on oil leak class (1, 2, or 3). See specific instruction by oil leak class below.

Class 1 Oil Leak Resolution:

- Steam clean turbocharger on-engine. See ISL G CM2180 Service Manual, Bulletin 4021649. [Refer to Procedure 000-009](#) in Section 0.
- Add leak detection dye, Part Number 3376891. See ISL G CM2180 Service Manual, Bulletin 4021649. [Refer to Procedure 014-024](#) in Section 14.
- Monitor for engine oil leaks.
 - Any follow-up inspection **must** use leak test kit, Part Number 2892320, and follow Test step of ISL G CM2180 Service Manual, Bulletin 4021649. [Refer to Procedure 014-024](#) in Section 14.
 - If engine oil leak or deposit is reoccurring, apply sealant. See Service Instructions section for application instructions.

Class 2 and 3 Oil Leak Resolution:

- Steam clean turbocharger on-engine before removing turbocharger. See ISL G CM2180 Service Manual, Bulletin 4021649. [Refer to Procedure 000-009](#) in Section 0.
- Remove turbocharger. See ISL G CM2180 Service Manual, Bulletin 4021649. [Refer to Procedure 010-033](#) in Section 10.
- Apply sealant. See Service Parts Availability and Service Instructions section below for application instructions.

Service Parts Availability

Service parts are available. See Table 1 for part numbers.

Table 1, Service Parts						
Preference	Part Description	Size	Type	Existing Part Number	Quantity	Required Applicator Tool

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Preference	Part Description	Size	Type	Existing Part Number	Quantity	Required Applicator Tool
1	Loctite® 5900 (or equivalent)	50 ML	Syringe	None	1	None
		300 ML	Tube	5298961	1	Standard caulking gun
2	Permatex® the Right Stuff® Gasket Maker	5 oz and 10.1 oz (142 and 298 g)	Cartridge	None	1	Permatex® short caulk gun, Part Number 800368
		3 oz and 7.5 oz (85 and 212 g)	Aerosol Can		1	None

Service Instructions

Turbocharger Removal

- Remove turbocharger. See ISL G CM2180 Service Manual, Bulletin 4021649. [Refer to Procedure 010-033](#) in Section 10.

Turbocharger Compressor Housing Removal

- Place turbocharger compressor inlet on a clean flat surface.
- Scribe a mark on turbocharger compressor housing, retaining ring, and bearing housing to aid alignment during assembly. See Figure 4 below.
- Be careful **not** to remove mark during cleaning.



Figure 4, Scribing Mark on Turbocharger Compressor Housing.

⚠ WARNING ⚠

To reduce the possibility of personal injury, wear goggles and protective clothing.

- Remove turbocharger compressor housing retaining ring using circlip pliers, Part Number 3575186. See Figure 5 below.
- If circlip is seized in groove, gently tap one end with leather hammer and drift.

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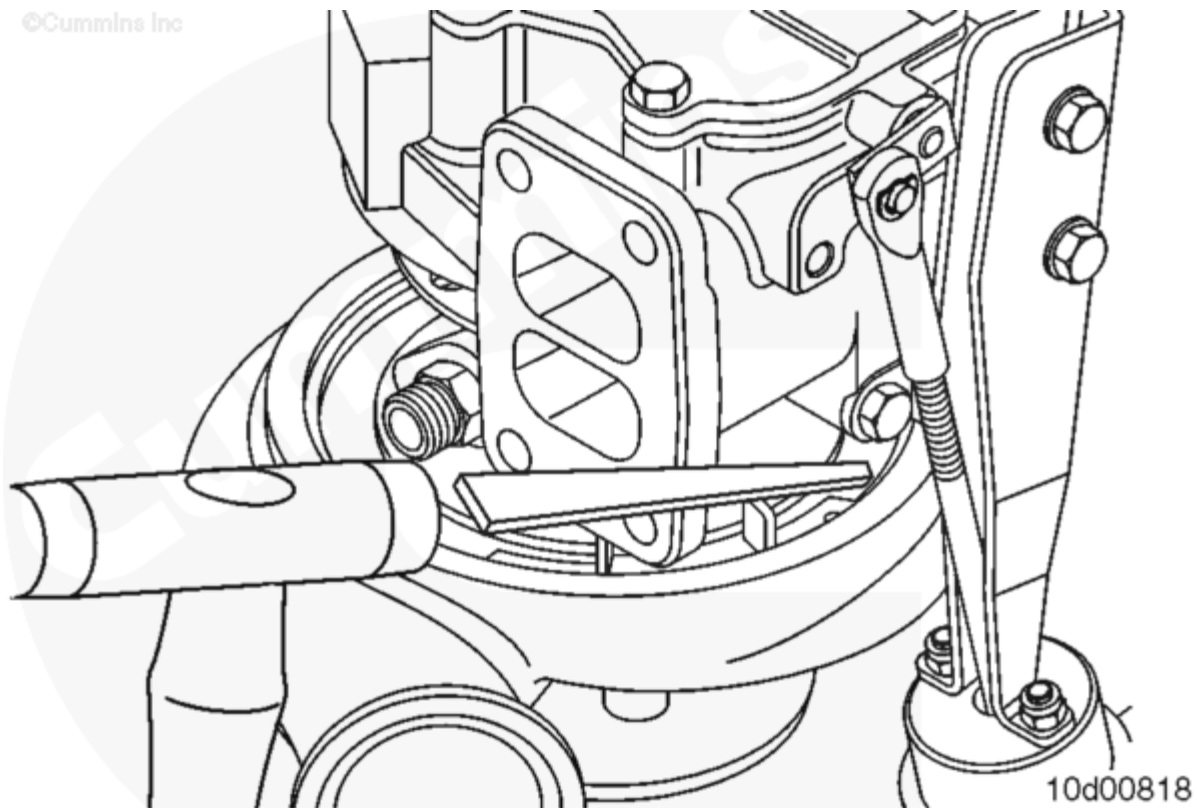


Figure 5, Removal of Retaining Ring.

⚠ CAUTION ⚠

Use care when separating bearing housing from compressor housing. Compressor blades can be damaged when compressor housing is removed.

⚠ CAUTION ⚠

Some compressor housings are pinned to bearing housing. Use care to not bend locating pin during disassembly.

- Secure turbine housing flange in a vice or fixture that will **not** damage sealing surface of flange, or verify turbocharger is stable on a work bench.
- Use a soft hammer to tap turbocharger compressor housing off bearing housing. See Figure 6 below.

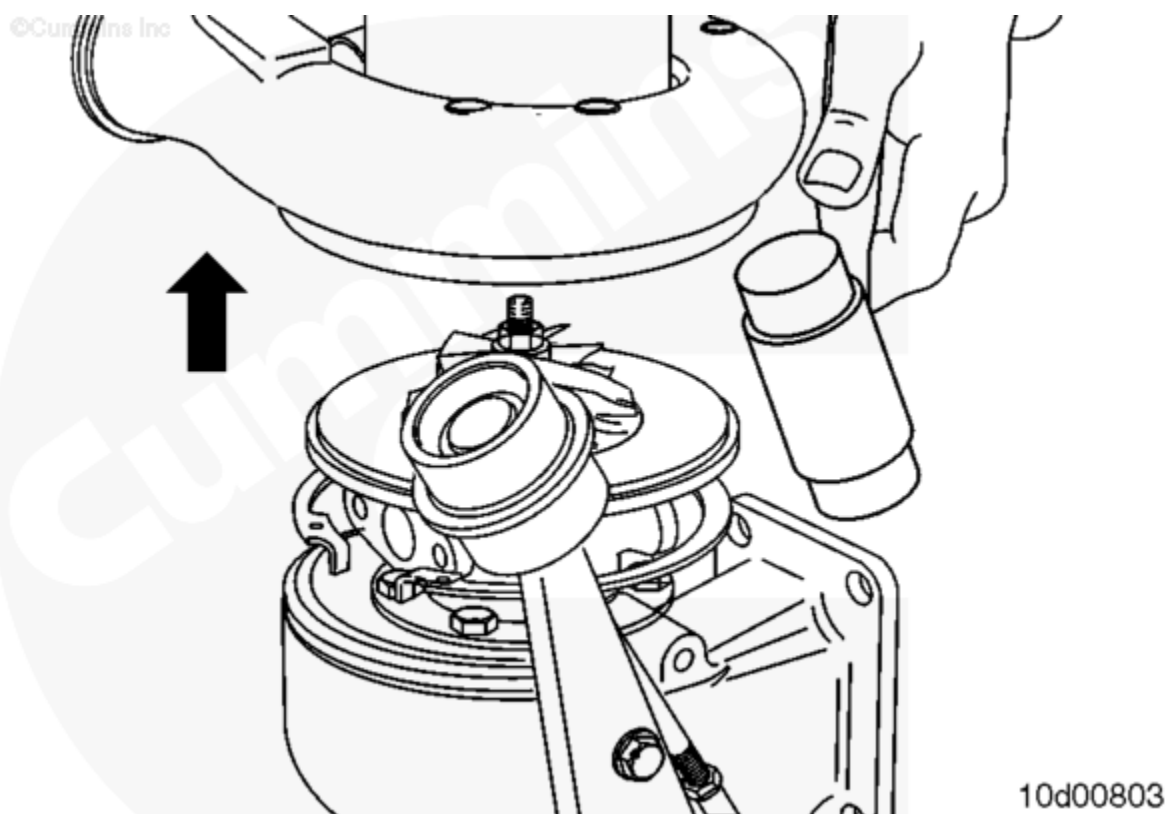


Figure 6, Removal of Turbocharger Compressor Housing from Turbocharger Bearing Housing.

Turbocharger Compressor Housing Cleaning

WARNING

When using solvents, acids, or alkaline materials for cleaning, follow the manufacturer's recommendations for use. Wear goggles and protective clothing to reduce the possibility of personal injury.

- Clean inside edge of turbocharger compressor housing with a pick and contact cleaner.
- Surface **must** be clean for effective silicone bonding.
- Edge **must** be free of any oil, dirt, or contact cleaner residue after completion of this step.
- Clean turbocharger diffuser plate in same manner as turbocharger compressor housing. Surface **must** be free of any oil, dirt, or contact cleaner residue.

Sealant Application to Turbocharger Compressor Housing

- Apply a bead of sealant to turbocharger compressor housing as shown below in Figure 7. Use Loctite® 5900 silicone, Part Number 5298961, or equivalent. Permatex® The Right Stuff® Gasket Maker one minute sealant is also acceptable.
- Smooth bead of sealant using finger or applicable tool. Wipe away excess sealant. Too much sealant can lead to excess sealant propagating into turbocharger compressor and downstream sensors. See Figure 8 below.
- No cure time or wait period is needed.

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Figure 7, Bead of Sealant Applied Around Turbocharger Compressor Housing.

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Figure 8, Smoothed Bead of Sealant.

Turbocharger Compressor Housing Installation

CAUTION

Use care when installing the bearing/turbine housing onto compressor housing. Compressor blades can be damaged when compressor housing is installed.

CAUTION

Some compressor housings are pinned to bearing housing. Use care to not bend locating pin during assembly.

- Verify turbocharger compressor housing is stable on a work bench with air inlet facing downward.
- Place retaining ring onto turbocharger bearing housing with tabs pointed inward, away from turbocharger compressor housing.
- Align scribe marks on housings and retaining ring that were created during disassembly or locate assembly onto locating pin, if equipped.
- Install assembly onto turbocharger compressor housing. See Figure 9 below.

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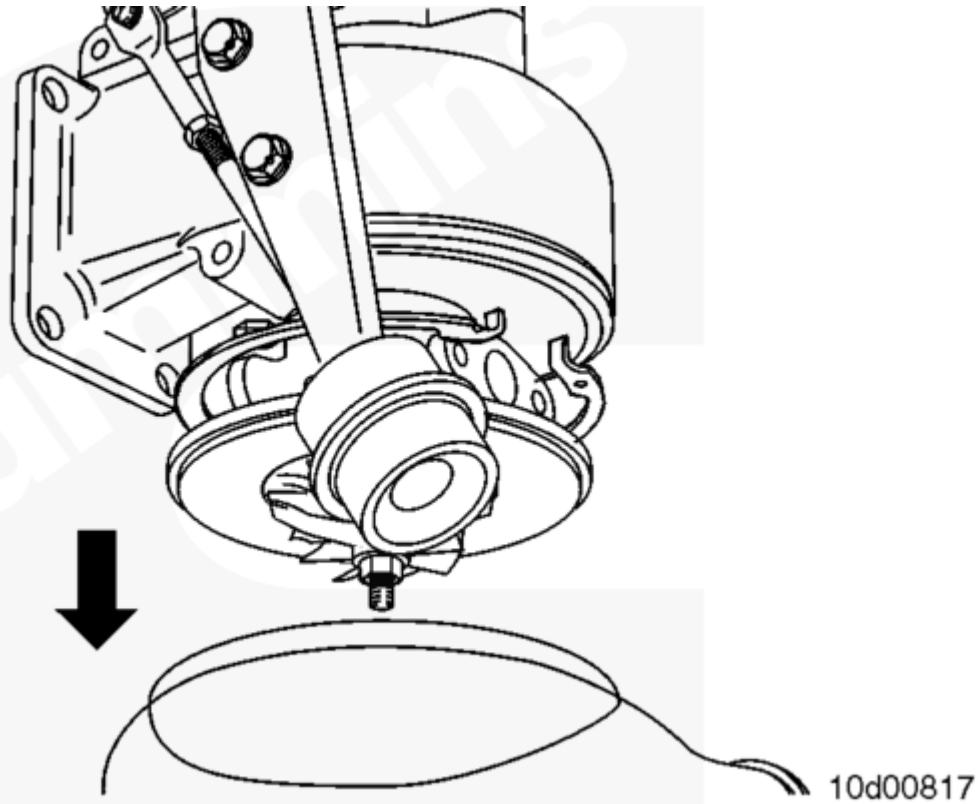


Figure 9, Turbocharger Compressor Housing Installation.

⚠ WARNING ⚠

To reduce possibility of personal injury, wear goggles and protective clothing.

- Use circlip pliers, Part Number 3575186, to install retaining ring. See Figure 10 below.

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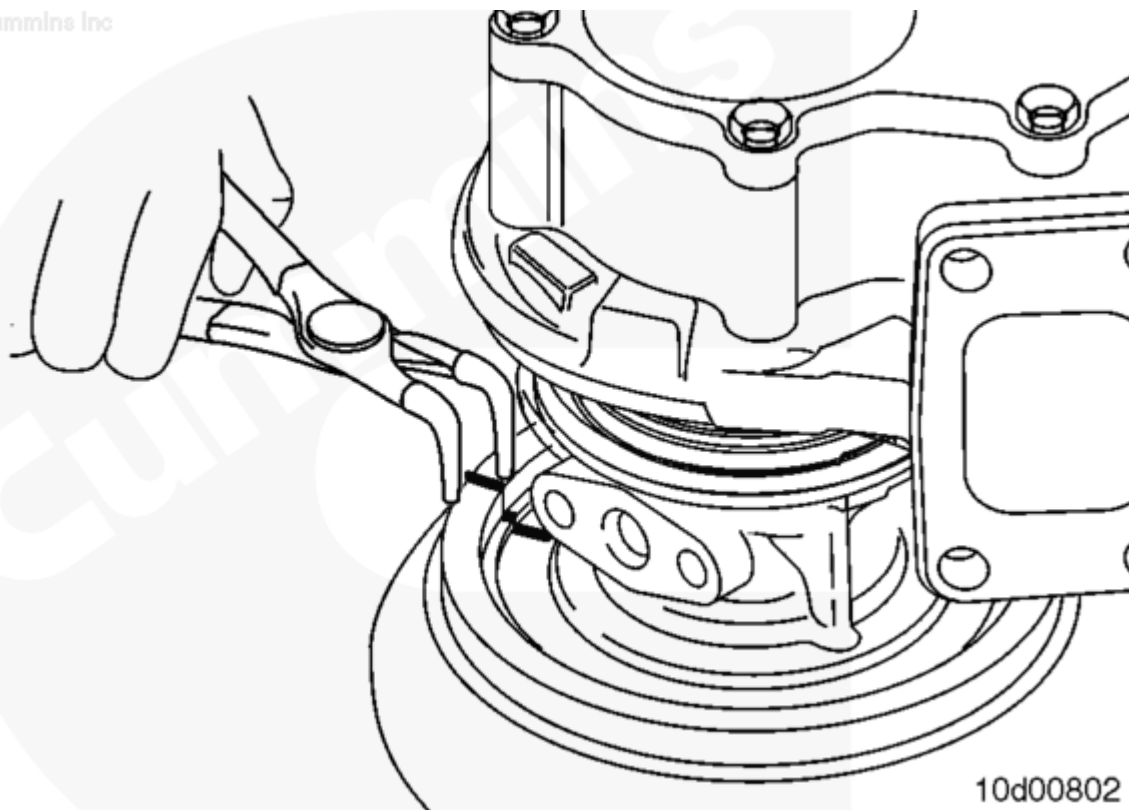


Figure 10, Installation of Retaining Ring.

△ CAUTION △

Use care to not damage bearing housing with drift.

- Lightly tap ends of retaining ring with a hammer and drift to make sure retaining ring is properly located in groove. See Figure 11 below.

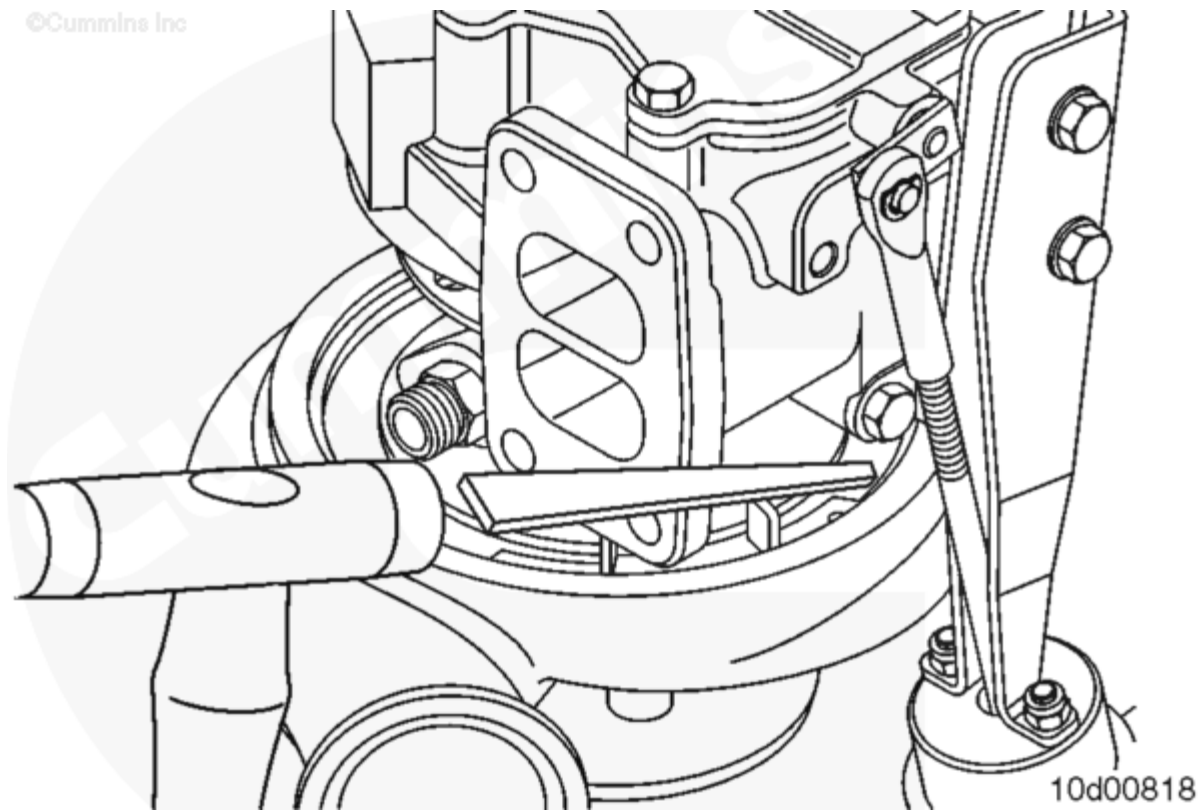


Figure 11, Verifying Retaining Ring is Properly Seated.

- Verify turbocharger compressor wheel rotates freely by rotating compressor wheel by hand. See Figure 12 below.

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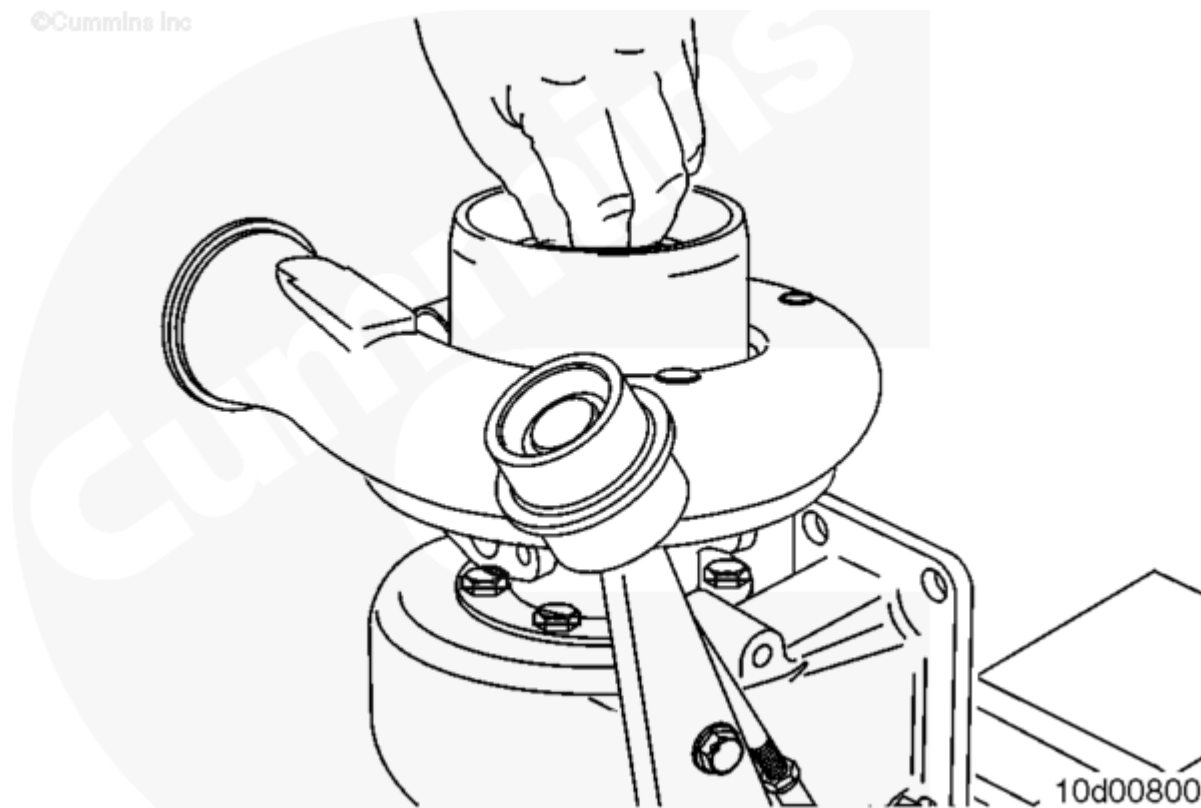


Figure 12, Rotating Turbocharger Compressor Wheel by Hand.

Turbocharger Installation

- Install turbocharger. See ISL G CM2180 Service Manual, Bulletin 4021649. [Refer to Procedure 010-033](#) in Section 10.

Finishing Steps

- Loctite® 5900 is a fast curing formula, no additional cure time is needed.
- Start and operate engine and check for leaks.

Warranty Claim Information

Claimable SRT:

- 10-151 Turbocharger - Remove and Install (Gas Engine) – Applicable Access Code
- 99-999 Miscellaneous - Non-SRT detail
 - 0.5 hrs (turbocharger compressor housing remove and install, cleaning, and sealant application)

Claimable Consumables:

- Quantity 1: Sealant, Part Number 5298961, or equivalent
- Quantity 1: Contact cleaner, Part Number 3824510, or equivalent

Document History

Date	Details
2016-11-18	Module Created

Last Modified: 30-Nov-2016

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