



Mis-Build Investigation Notice

MIN #: 12124

Date: NOVEMBER 2012

Subject: Gear Train Inspection for Certain Vehicles with MaxxForce® 15 Engines

BUILD DATES: 7 December 2011 to 2 April 2012

DESCRIPTION: This MIN applies **ONLY** to PayStar®, 9900 Premium Conventional, and ProStar®, flagged with MIN # 12124. All other vehicles built during this period have either been repaired prior to shipment or determined to not require this gear train inspection.

The purpose of this MIN is to correct potential misassembly of the fixed idler gear support and the adjustable idler gear support, which may cause damage to the dowel pilot holes in the front plate, and may result in gears off location and with incorrect backlash. This misassembly can also result in the idler support fasteners loosening, leading to gear train failures. This MIN also includes inspection for possible omission of the camshaft thrust plate and verification of final cam gear timing upon reassembly.

Application: MaxxForce® 15

PARTS INFORMATION:

Table 1 **Parts Information**

Part Number	Description	Quantity
Parts Below to Be Replaced in All Cases		
1668921C1	Gasket, Oil Fill Pipe	1
3007189C2	Seal, Crankshaft Front	1
7078458C1	Ring, O (for fuel pump gear cover plate)	1
1891607C1	Ring, O (water pump inlet)	1
1891608C1	Ring, O (water pump outlet)	1
3005414C1	Gasket, Water Pump (to aluminum front cover)	1
7078707C1	Gasket, Front Cover Plate (aluminum front cover to steel front plate)	1

	Parts Below to Be Replaced if Missing	
3007032C1	Plate, Bearing Thrust (camshaft thrust plate)	1
Part Number	Description	Quantity
	Parts Below to Be Replaced if Damaged	
3013526C91	Stud Assembly (for cam gear cover)	2
3007165C1	Gasket, Oil Pan	1
7078705C1	Gasket, Front Cover Plate (cam gear cover to aluminum front cover)	1
	Parts Below to Be Replaced/Used if Front Plate is Damaged	
7078854C92	Plate Assembly, Front Cover (steel front plate)	1
3007034C1	O-Ring (camshaft seal plate, axial)	1
3007036C1	O-Ring (camshaft seal plate, radial)	1
3008882C1	Seal, Ring Air Compressor	1
1882675C1	Ring, O (HP fuel pump)	1
3007147C1	Gasket, Adapter to Crankcase (steel front plate to crankcase)	1
	Loc-tite 243 (or equivalent)	1
	3M 72 or Permatex-- All-Purpose Spray Adhesives	1

TOOLING INFORMATION:

Table 2 Tooling Information

Part Number	Description	Quantity
12-183-01	Front / rear crankshaft seal installation tool kit (See Note near step 27 for optional tool, if not available)	1

SERVICE PROCEDURE

WARNING! Park vehicle on hard flat surface, turn the engine off, set the parking brake, and block the wheels to prevent the vehicle from moving in both directions. Failure to do so may result in property damage, personal injury, and / or death.

WARNING! If the vehicle must be raised, do not work under the vehicle supported only by jacks. Jacks can slip or fall over, potentially resulting in property damage, personal injury, and / or death.

WARNING! Always wear safe eye protection when performing vehicle maintenance. Failure to do so may result in serious eye injury.

WARNING! Keep flames or sparks away from vehicle and do not smoke while servicing the vehicle's batteries. Batteries expel explosive gases. Failure to do so may result in property damage, personal injury, and / or death.

WARNING! Remove the ground cable from the negative terminal of the battery box before disconnecting any electrical components. Always connect the ground cable last. Failure to do so may result in property damage, personal injury, and / or death.

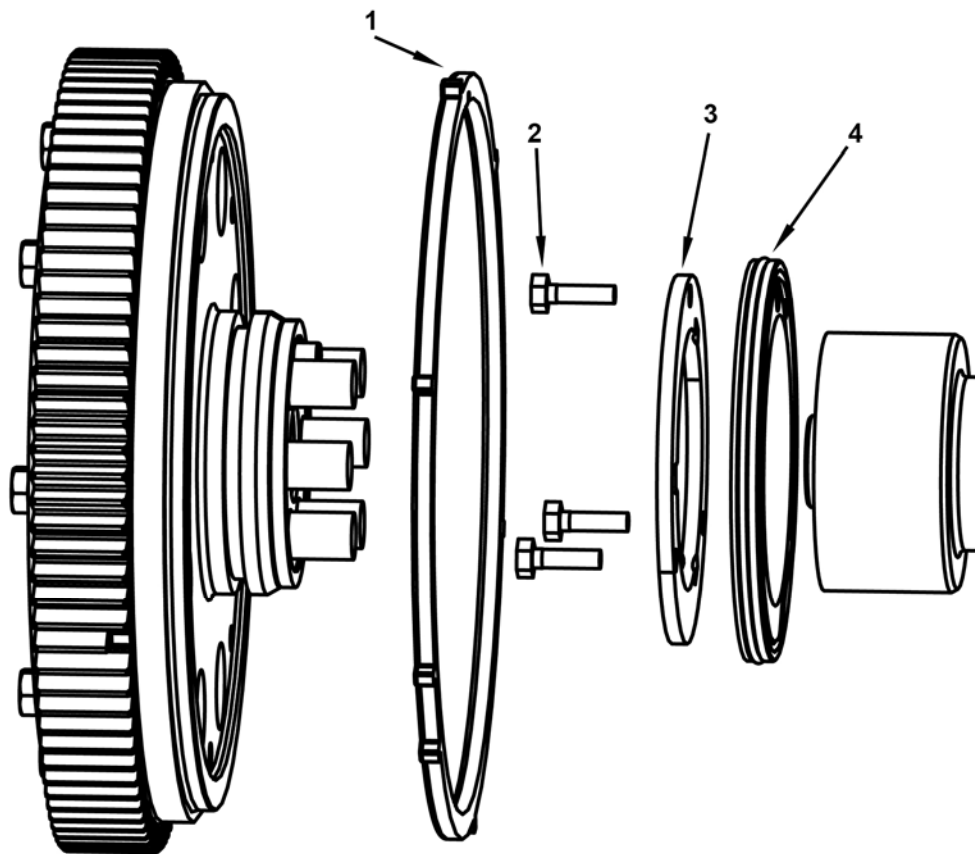


Figure 1 Camshaft Thrust Plate Assembly

1. Timing gear
2. Bolt (3)
3. Thrust plate
4. Camshaft seal plate

1. Bring truck into shop and park on flat surface.
2. Shift transmission to Park or Neutral, set parking brake, and block wheels.
3. Unlatch and open hood.
4. Remove cooling package.
5. Remove crankshaft front seal. Refer to EGES-510, Front Seal Removal.

NOTE: Mild cavitation in the aluminum Front Cover may be seen and is due to normal wear.

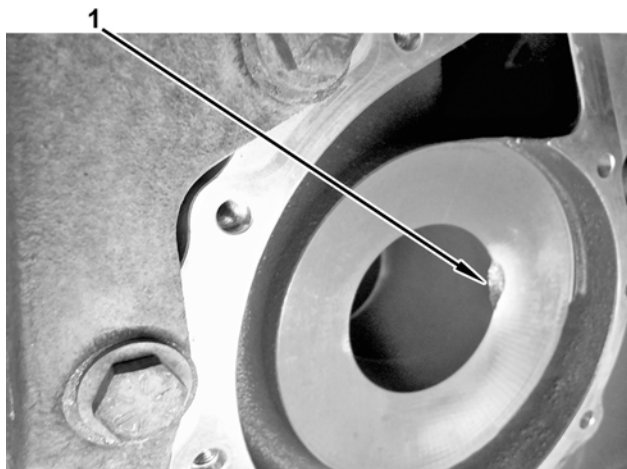


Figure 2 Mild Cavitation in Front Cover

1. Mild cavitation in Front Cover
6. Consider mild cavitation in aluminum Front Cover (water pump area) as normal wear. This is not an indication that cover needs to be replaced (Figure 2, item 1).
7. Remove front cover. Refer to EGES-510, Front Cover Removal.

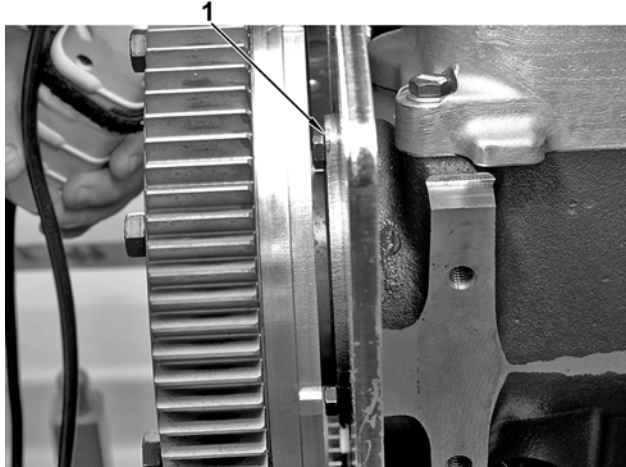


Figure 3 Camshaft Thrust Plate

1. Thrust plate present

8. Confirm presence of camshaft thrust plate (Figure 3, Item 1).
9. If thrust plate is missing, remove cam gear and install thrust plate. Refer to EGES-510, Camshaft Gear, Removal.
10. Pin flywheel at #1 TDC (cam gear timing mark at 12 o'clock) with tool ZTSE6108. Refer to EGES-510, Timing Gears and Supports, Installation.



Figure 4 Adjustable Idler Gear

1. Adjustable idler gear

11. Remove adjustable idler gear (Figure 4, Item 1).



Figure 5 Adjustable Idler Gear Support

1. Adjustable idler gear support

12. Remove adjustable idler support (Figure 5, Item 1).

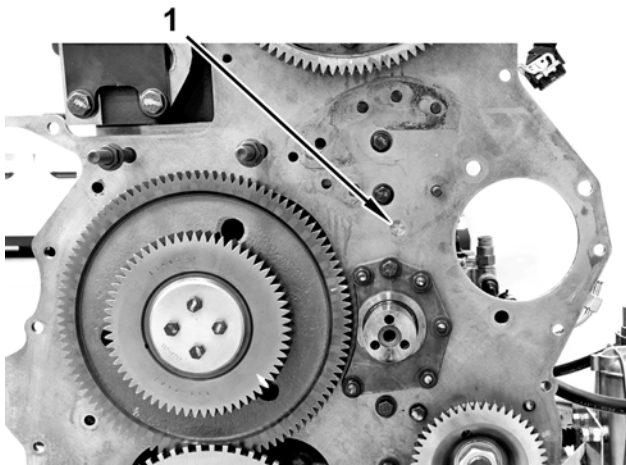


Figure 6 Adjustable Idler Pilot Hole

1. Adjustable idler pilot hole

13. Inspect adjustable idler pilot hole (Figure 6, Item 1).

NOTE: Adjustable idler pilot dowel may not have been started in hole before tightening fasteners, causing slight metal shearing and displacement, and adjustable idler off-location.

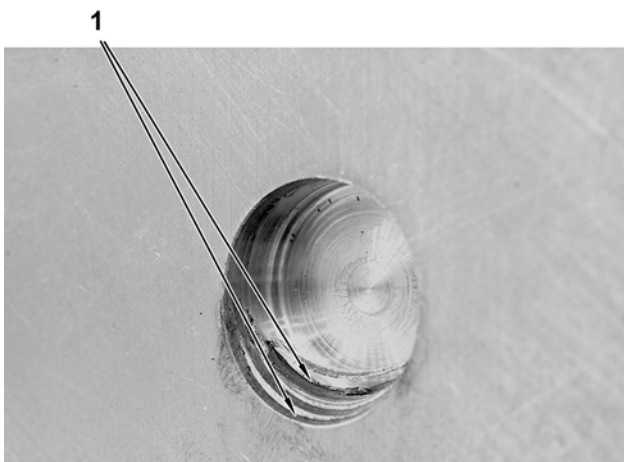


Figure 7 Adjustable Idler Pilot Hole

1. Metal shearing and displacement

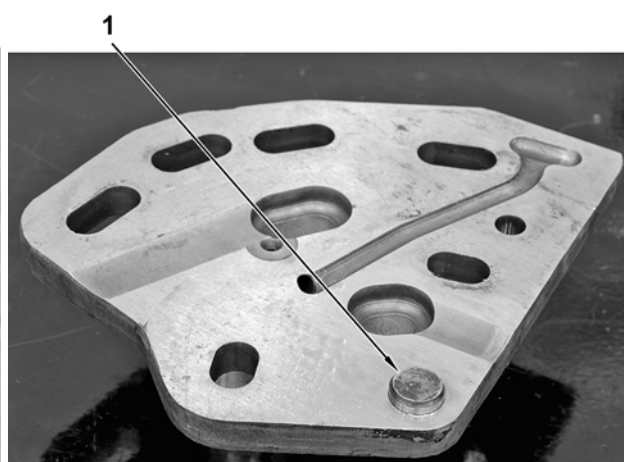


Figure 8 Adjustable Idler Support

1. Pilot dowel

14. Inspect front plate for damage in adjustable idler pivot dowel hole. Damage will be evidenced by metal distorted or sheared around edge of hole, resulting in an enlarged and out-of-round condition and loss of exact position control for pilot (Figure 7, Item 1 and Figure 8, Item 1).



Figure 9 Fixed Idler Gear

1. Fixed idler gear

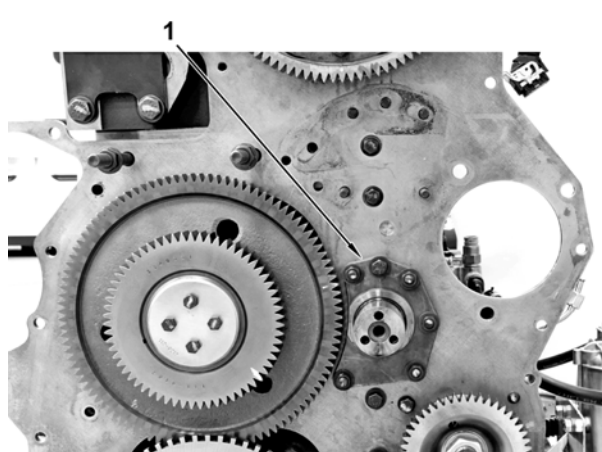


Figure 10 Fixed Idler Support

1. Fixed idler gear removed

15. Remove fixed idler gear and fixed idler support (Figure 9, Item 1 and Figure 10, Item 1).

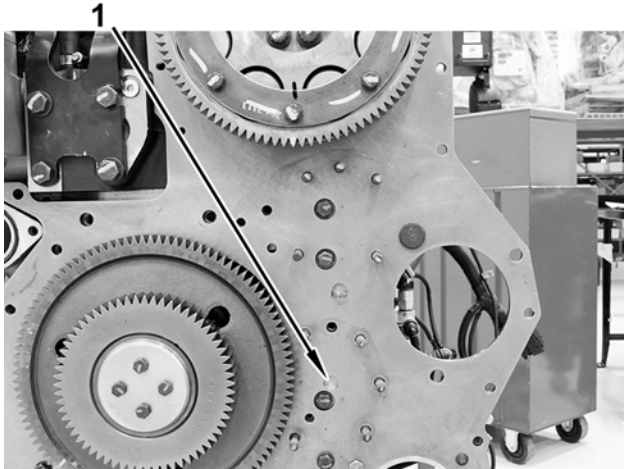


Figure 11 Fixed Idler Pilot Hole

1. Fixed idler pilot hole

16. Inspect fixed idler pilot hole (Figure 11, Item 1).

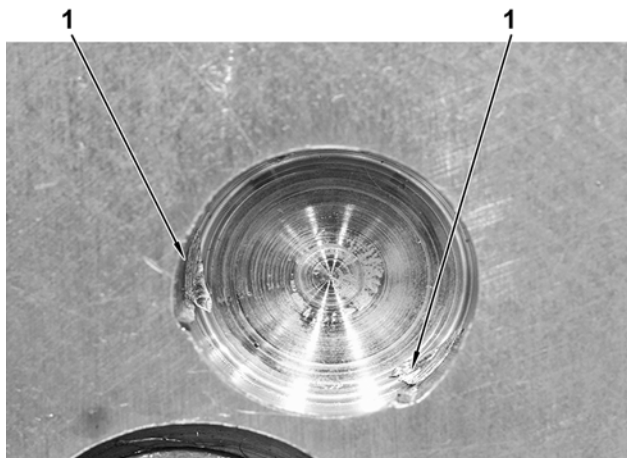


Figure 12 Fixed Idler Pilot Hole

1. Severe metal shearing and displacement

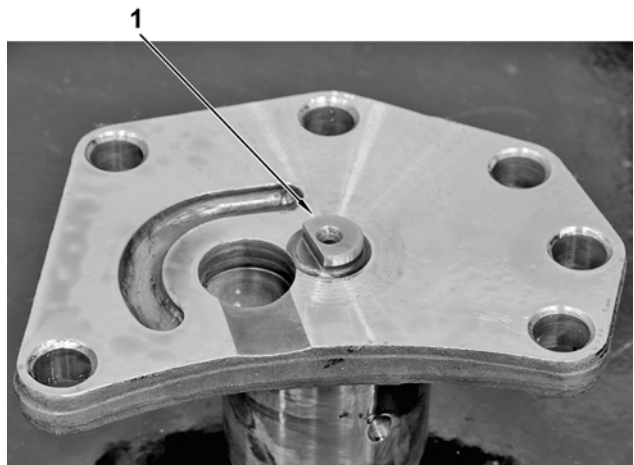


Figure 13 Fixed Idler Pilot

1. D-shaped fixed idler pilot

NOTE: Fixed idler pilot shaft may not have been started in hole before tightening fasteners, causing severe metal shearing and displacement, and fixed idler off-location.

17. Damage will be evidenced by metal distorted or sheared around the edge of the hole, resulting in an enlarged and out-of-round condition and loss of exact position control for the pilot (Figure 12, Item 1 and Figure 13, Item 1).

18. If any front plate pilot or pivot hole damage is found, replace front plate.

NOTE: The cam gear may have to be moved slightly from its original position to allow idler gear engagement. When reassembling the adjustable idler gear, the marked tooth on cam gear should be aligned with mark on front cover within $\pm\frac{1}{2}$ tooth. If the alignment error would be about the same in either direction depending on alternate tooth engagement, choose the position with the cam gear slightly counterclockwise.

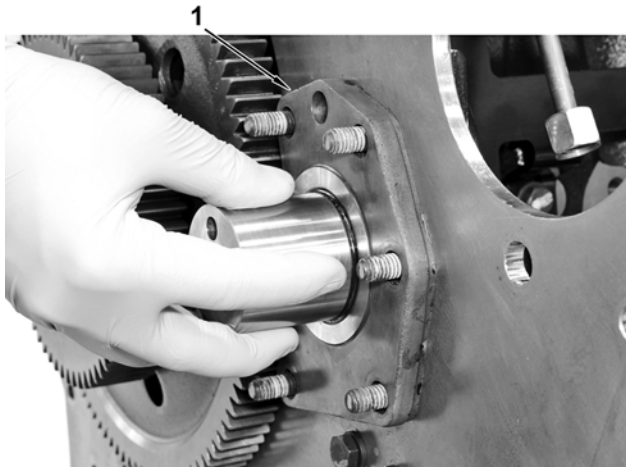


Figure 14 Fixed Idler Support Reassembled

1. Fixed idler support

19. Reinstall fixed idler support (Figure 14, Item1).

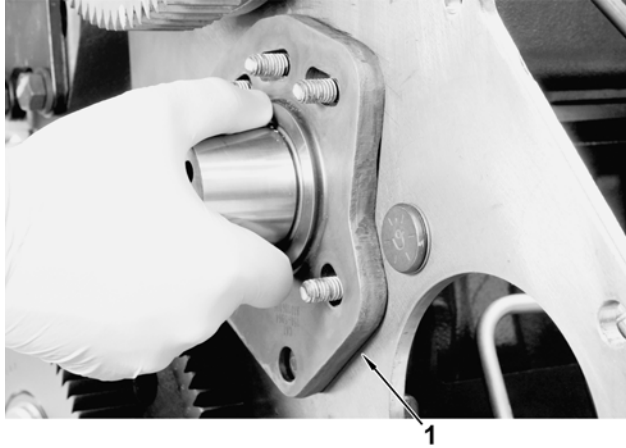


Figure 15 Adjustable Idler Gear Support

1. Adjustable idler gear support seated
20. Reinstall adjustable idler gear support. Carefully work dowel pivot pin into pilot hole until idler support is flat against front plate. Make sure idler gear support is held flat against front plate as nuts / bolts are tightened. Torque nuts and bolt to 40 ft-lb (54 N·m) (Figure 15, Item 1).

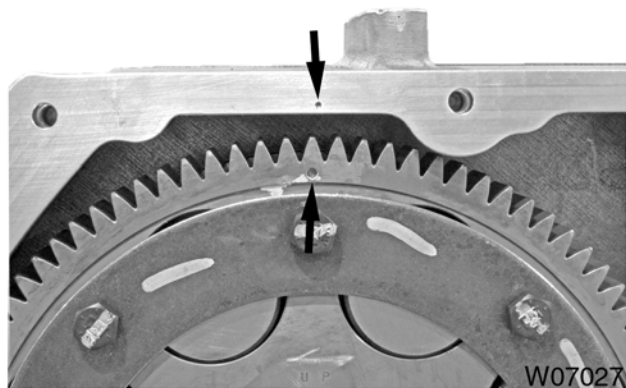


Figure 16 Camshaft Timing Marks

21. Verify camshaft timing mark and front cover marks are aligned (Figure 16).

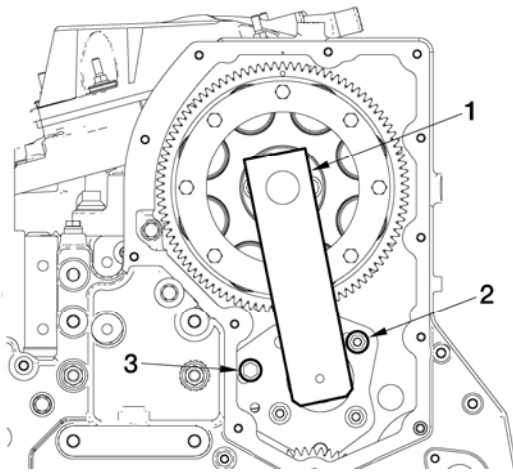


Figure 17 Idler Gear Backlash Adjustment

1. Idler Assembly Adjuster
2. 3/8-16 x 1.5 hex flange locking bolt
3. 3/8-16 hex flange nut

22. Set correct gear backlash with service tool (sets correct idler-to-cam gear center distance) as shown, and torque nuts and bolt to 40 ft-lb (54 N·m) (Figure 17, Items 1, 2, 3). Refer to EGES-510, Timing gear lash, Installation.

Note: When installing fixed and adjustable idler gears, the oil groove in the retaining plate should be toward the gear (part number visible from front).

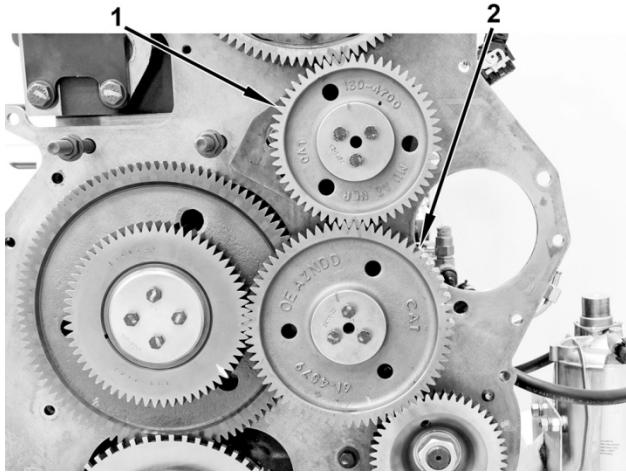


Figure 18 Fixed & Adjustable Idler Gears

1. Adjustable idler gear
2. Fixed idler gear

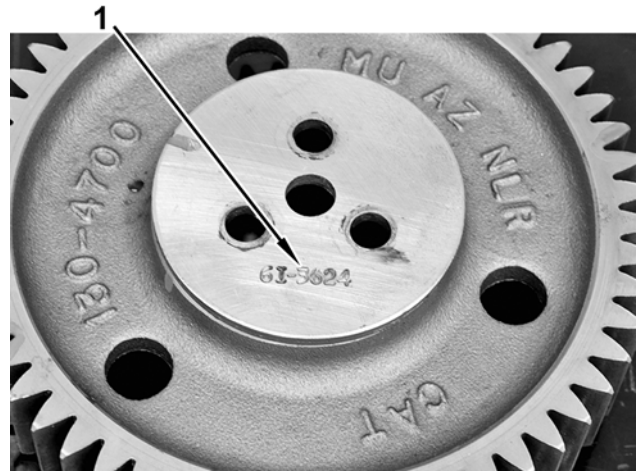


Figure 19 Idler Gear Retaining Plate

1. Idler gear retaining plate (part number visible)

23. Position fixed and adjustable idler gears on supports and install idler gear retaining plates (Figure 18, Items 1 and 2 and Figure 19, Item 1)

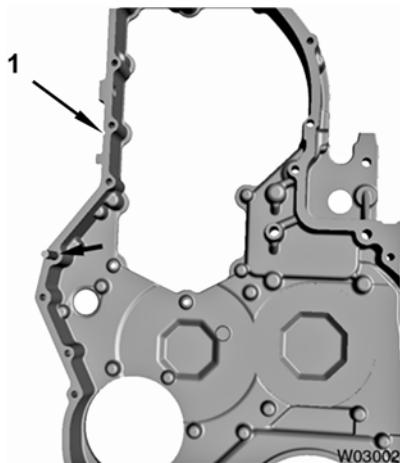


Figure 20 Front Cover

1. Front cover

24. Install front cover. Refer to EGES-510, Front Cover, Installation (Figure 20, Item 1).

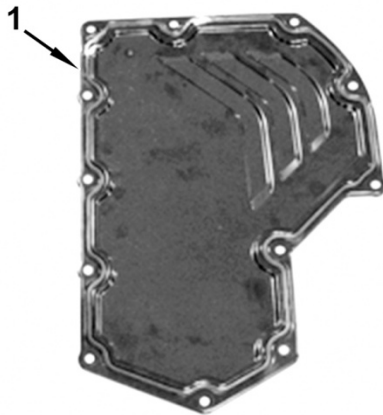


Figure 21 Camshaft Gear Cover Gasket

1. Camshaft gear cover gasket

25. Inspect original cam gear cover seal for leaks or any deformity. It can be reused if it has not been removed or disturbed in the cover groove. If a new seal is installed, go to step 27. If seal is not damaged, no further action is required (Figure 21, Item 1).

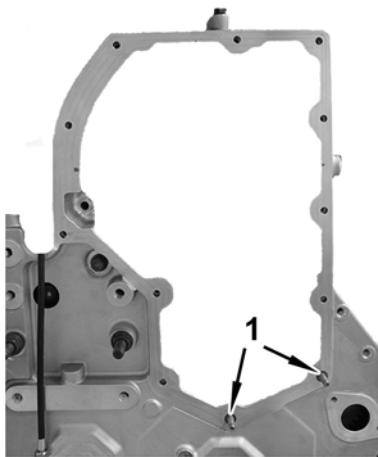


Figure 22 Front Cover Studs

1. Cam cover studs

26. Before installing the cam gear cover, remove the two front cover studs and apply Loctite 243 (only to the threads that engage the aluminum front cover, to prevent the possibility of oil leakage) (Figure 22, Item 1).

27. If replacing gear cover seal, first degrease cover and apply a pressure sensitive adhesive (such as 3M 72 or Permatex All-Purpose Spray Adhesives). Fully press seal into the groove and watch for retention in groove as gear cover is installed.

Note: Use Front / Rear Crankshaft Seal Installation Tool number 12-183-01 to install new 2 piece Front Crankshaft Seal.

CAT 5P-1733 Seal installer locator and CAT 6V-6142 front seal installer (not shown) may be used if above tooling is not available.

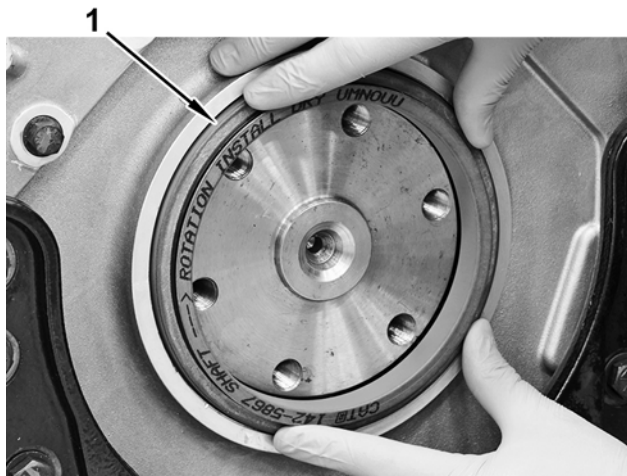


Figure 23 Seal on Crankshaft

1. Seal placed on crankshaft

28. Position seal on crankshaft end (Figure 23, Item 1).

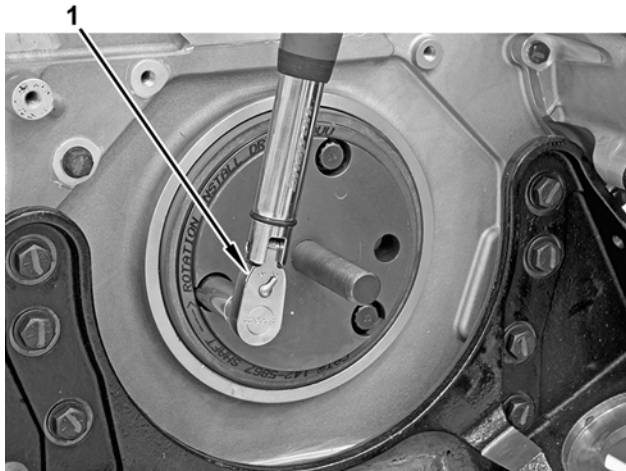


Figure 24 Hub Adapter Installed

1. Torque applied to hub adapter

29. Install hub adapter on crankshaft end and tighten to 15 lb-ft (20 N·m) (Figure 24, Item1).

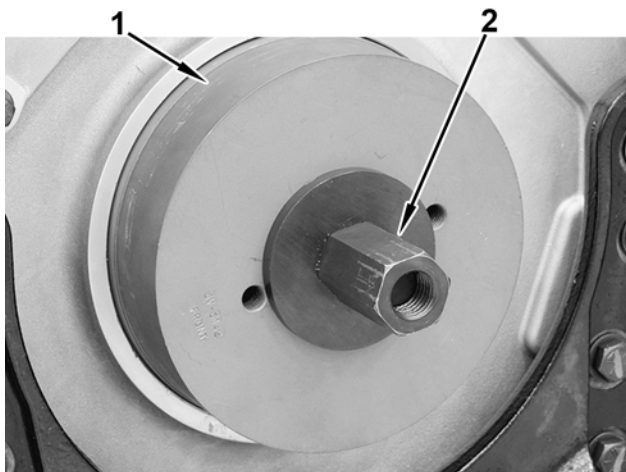


Figure 25 Seal Driver Setup

1. Seal driver installed
2. Driving nut

30. Install seal driver on hub adapter (Figure 25, Items 1 and 2).

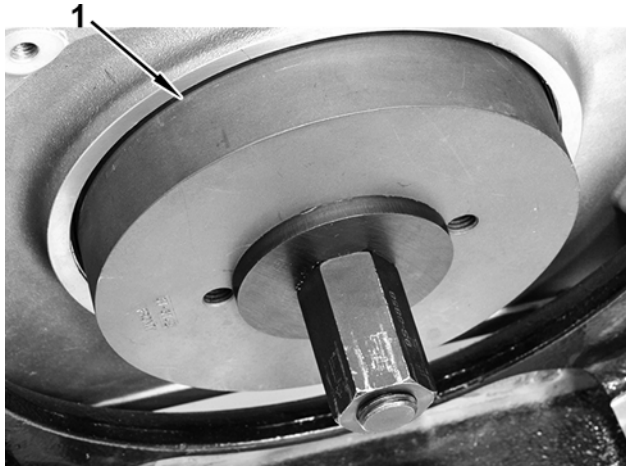


Figure 26 Seal Fully Seated

1. Seal fully seated

31. Tighten driving nut until seal driver bottoms (Figure 26, Item1).

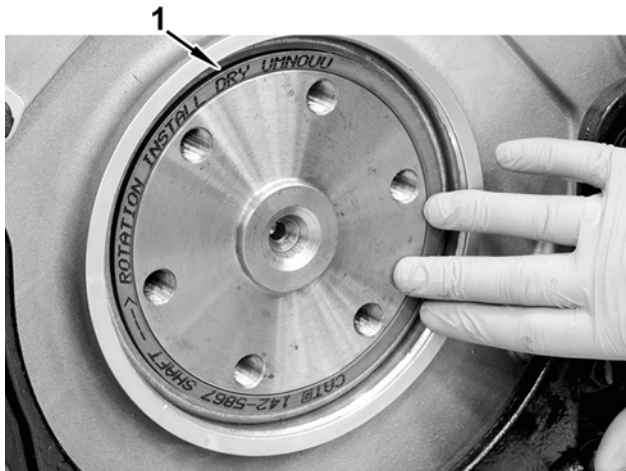


Figure 27 Seal Seated

1. Seal properly seated

32. Remove tools and inspect to ensure seal is properly seated (Figure 27, Item 1).

Labor Information – Operation number must appear on all claims.

Table 3 Labor Information

Operation No.	Description	Time
A40-12124-1	Disassemble, Inspect Gear Train and Reassemble (no replacement of Camshaft Thrust Plate)	13.7
A40-12124-2	Disassemble, Inspect Gear Train, Replace Camshaft Thrust Plate, Reassemble	14.4

WARRANTY CLAIMS:

Warranty claim expense is to be charged to Warranty. Claims are to be submitted in the normal manner, making reference to Mis-Build Investigation Notice G-12124.

It is important that the coding be completed properly to assist in processing the warranty claim. Complete instructions will be found in the Warranty Manual, Section 7.1.8.

As with all claim submissions, items acquired locally must be submitted in the "Other Charges" tab. The cost of any bulk items (such as a bag of cable tie straps, wire, barrel of oil, or tube of silicon) should be prorated for the cost of the individual pieces / amount used during each repair.

To ensure this important improvement is made in a timely manner, all claims for G-12124 activity must be submitted by November 13, 2013 or within the normal warranty period for the vehicle, if after November 13, 2013.

GROUP	NOUN	C	WARR.	TP	PAD
GROUP Enter number G—	NOUN Leave blank	C (CAUSE) Enter either 1, 2, 3. (see below)	WARRANTY (Warranty Code) Enter 40.	TYPE PART Enter P for type part causing failure.	PAD Enter 100
		1. Inspected (No repair required).			
		2. Inspected and repaired.			
		3. Defective part from parts stock.			

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