



Technical Service Bulletin

Technical Service Bulletin: TSB170124	Released Date: 07-Dec-2017
Fuel Pump Timing Correction to Reduce Engine Noise	

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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

- ISX15 CM2350 X101
- X15 CM2350 X114B
- X15 CM2350 X116B

Issue

Symptom:

- Gear train impact noise that is most noticeable at or around 1500 rpm and worsens as load increases.
- Gear train impact noise occurs at half-engine-order (once every 2 crankshaft revolutions), similar to a fuel knock and has been described as sounding like a “freight train” or “helicopter”.

Root Cause:

- Incorrect fuel pump timing. This problem is **not** related to the timing of the fuel pump gear to the fuel pump. The fuel pump gear is keyed or indexed to the pump cam and is **always** in a fixed position with respect to the internal timing of the fuel pump. When the fuel pump is installed to the engine, it is possible to time the fuel pump incorrectly with respect to the crankshaft position and thereby worsen engine noise.

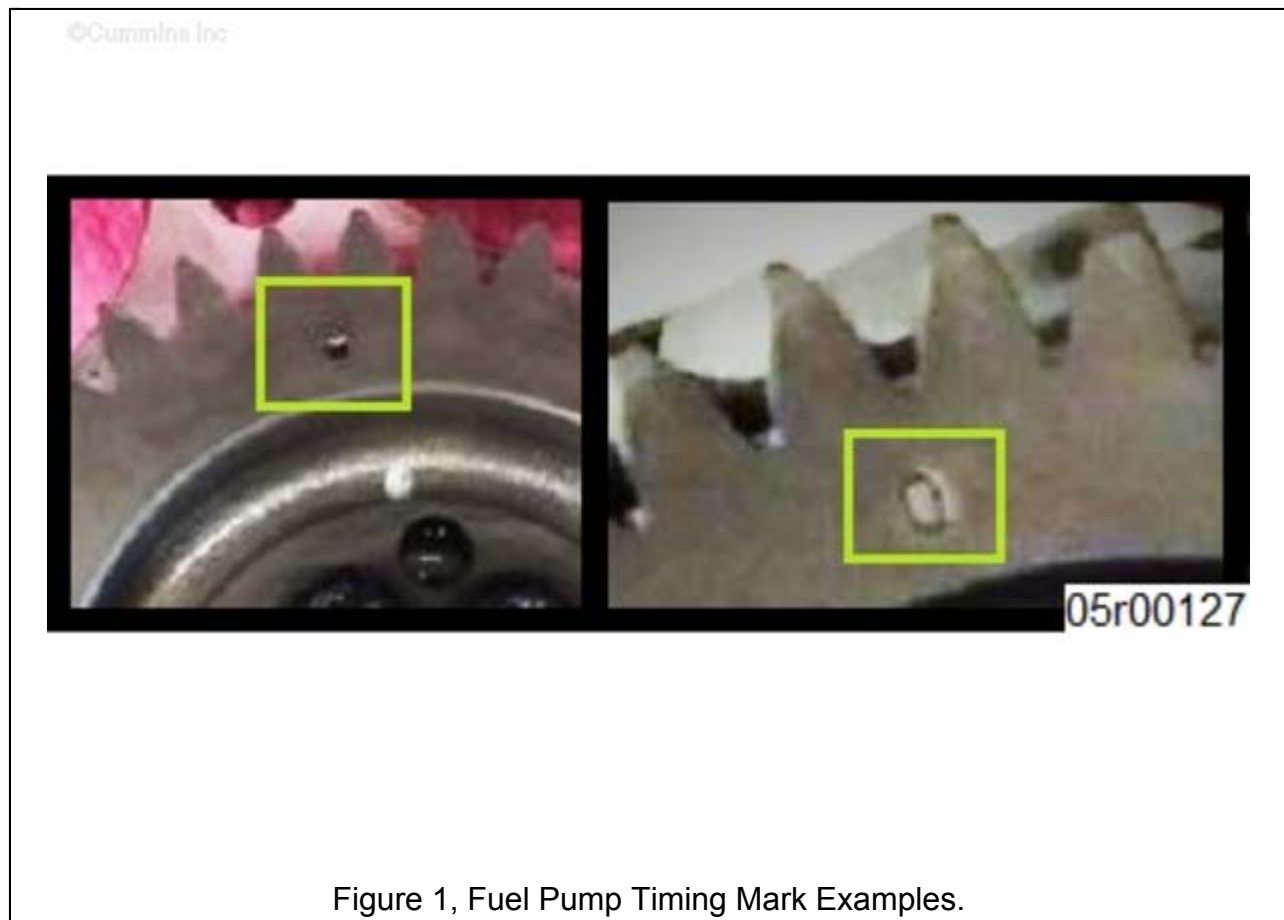
Verification

- Confirm gear train impact noise that sounds like a “freight train” or “helicopter”.
- Confirming that an engine noise complaint is caused by improper fuel pump timing and not due to another issue is **not** possible without removing the fuel pump and inspecting for its timing. No inspection or performance tests are available to confirm fuel pump timing is the cause of an engine noise complaint prior to fuel pump removal. See Resolution Section below.

Resolution

The following steps outline how to remove and install the fuel pump so the fuel pump is timed correctly with the engine. Performing the steps below will help reduce engine noise.

- Pin crankshaft. See corresponding Service Manual. Reference Procedure 001-088 in Section 1.
- Remove high pressure fuel pump. See corresponding Service Manual. Reference Procedure 005-116 in Section 5.
- Clean front face of fuel pump gear of excess oil.
- Locate fuel pump timing mark stamped on front face of fuel pump gear. Fuel pump timing mark is either a “0” or “•” See Figure 1 below.



- Using a paint marker, draw a line over fuel pump gear timing mark to outer edge of fuel pump gear See Figure 2 below.



- Align a straight edge or ruler between center-line of fuel pump camshaft and center of upper left fuel pump mounting hole. See Figure 3 below.



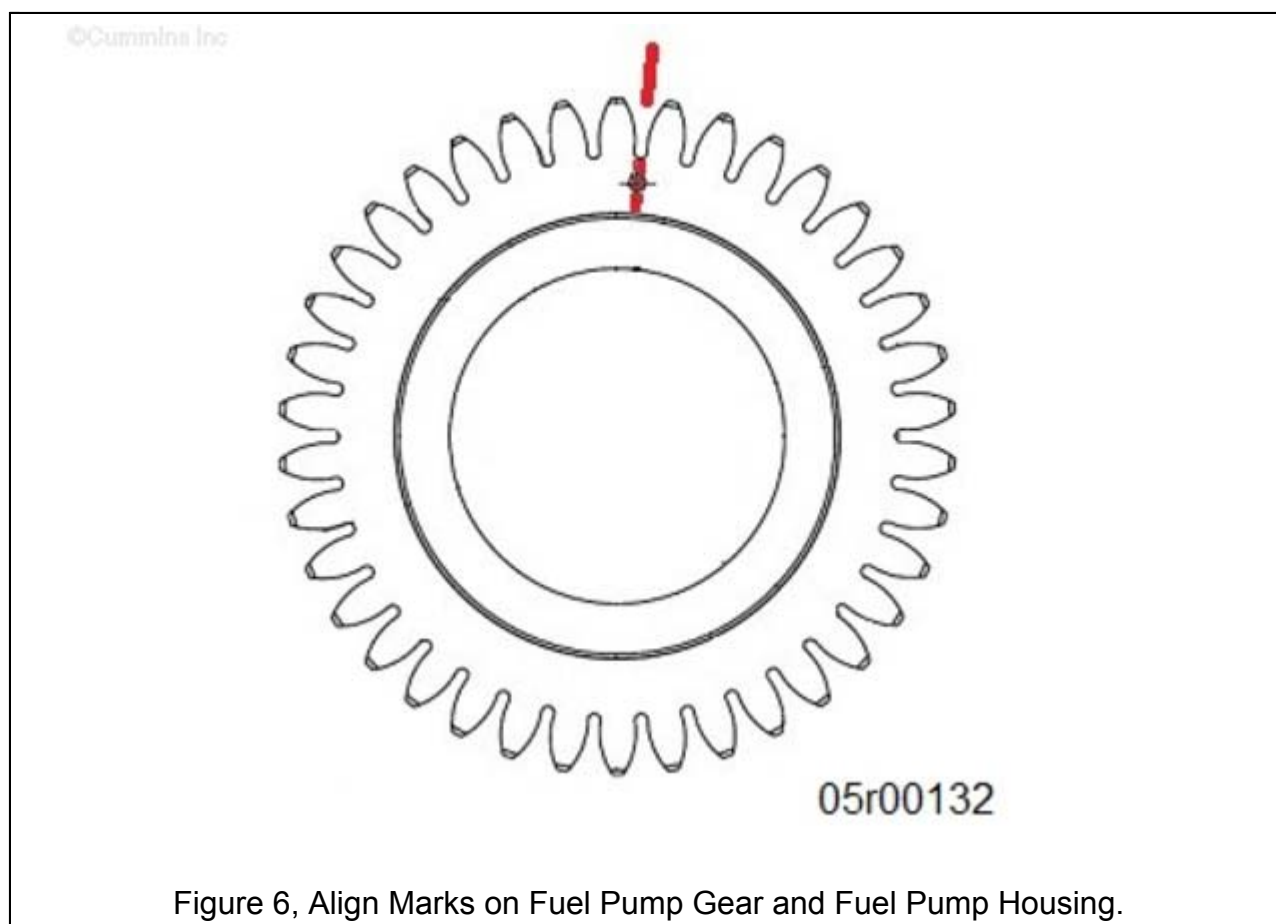
- Mark fuel pump housing (ISX15 CM2350 X101 and X15 CM2350 X114B **only**):
 - Count six complete fuel pump gear teeth **clockwise** from straight edge tool and mark corresponding location on fuel pump housing.
 - Example in Figure 4 below is an approximate location. All marks **must** be made by counting gear teeth and **not** by matching Figure 4.



- Mark fuel pump housing (X15 CM2350 X116B **only**):
 - Count eight complete fuel pump gear teeth **clockwise** from straight edge tool and mark corresponding location on fuel pump housing. See Figure 5 below.
 - Example below in Figure 5 is an approximate location. All marks **must** be made by counting gear teeth and **not** by matching Figure 5.



- Rotate fuel pump gear until painted line over timing mark aligns with mark on fuel pump housing. See Figure 6 below.



- Install fuel pump. See corresponding Service Manual. Reference Procedure 005-116 in Section 5. **Never** rotate pump while meshing fuel pump gear teeth with fuel pump idler gear.
 - While installing fuel pump, align fuel pump housing mounting holes to their corresponding bolt holes in gear housing while fuel pump gear is inserted into gear housing.
 - If fuel pump gear will **not** mesh during insertion into gear housing, do **not** rotate fuel pump more than $\frac{1}{2}$ a tooth spacing to achieve mesh. Rotate fuel pump away from engine if possible.

Production Status

Implemented for production. See Table12.

Table 1, Production Information		
ESN First	Build Date ¹	Plant
80021663	3-November-2017	Jamestown Engine Plant
¹ Engine build date can be found on engine dataplate.		

Document History

Date	Details
2017-11-28	Module Created

Last Modified: 07-Dec-2017
