SB-10058920-9183

Technical Service Bulletin Number
TSB150130

Technical Service Bulletin

Subject

Intake Valve Chordal Failures

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

Issue

Under severe operating conditions, acidic corrosion and thermal stresses induced in the intake valve can initiate fatigue cracking which, over time, can propagate until a portion of the intake valve separates from the valve head and enters the cylinder. This type of valve failure is commonly known as a chordal failure. Once failed, performance of the engine is compromised and progressive damage to the piston, cylinder liner, cylinder head and turbocharger can occur. Typical complaints following intake valve chordal failures include but are not limited to check engine light, low engine power, cylinder misfire, “popping” noise from the air intake manifold, excessive engine noise, and engine shut down and no start conditions.

Product Affected

- ISX15 CM570
- ISX15 CM870
- ISX15 CM871
- ISX15 CM871 E
- ISX15 CM2250
- ISX15 CM2250 SN
- ISX15 CM2350 X101

- QSX15 CM570

Verification/Confirmation

NOTE: Intake valve chordal failures are only one possible cause of the symptoms discussed in this document. The repair facility has the responsibility to follow normal troubleshooting procedures and determine root cause. Chordal failure of the intake valve can only be reliably determined by borescope inspection or removal of the cylinder head.

CAUTION

Reference Prevention of Turbocharger Damage After Engine Mechanical Issue, Bulletin 4326040, to prevent subsequent engine damage from occurring following repair of a valve failure.

A chordal failure of an intake valve is characterized by a piece or pieces of valve head missing from an intake valve. Refer to Figure 1 and Figure 2 below. Visual inspection of turbocharger and exhaust plumbing may reveal the presence of metal debris or, in instances of turbocharger failures, foreign object damage may be observed.

Fault Codes that may be present following chordal failure of an intake valve include:

- Fault Code 1898 - VGT Actuator Controller - Out of Calibration
- Fault Code 2387 - VGT Actuator Driver Circuit (Motor) - Mechanical System Not Responding or Out of Adjustment
- Fault Code 1654, 1655, 1656, 1657, 1658, 1659 – Engine Misfire – Condition Exists

Figure 1: Broken Intake Valve in Cylinder Head

02r00008

Figure 2: Broken Intake Valve Showing Radial/Chordal Fracture

Resolution

Intake valve, Part Number 3685996, has been released to address chordal failures and commonize intake valve part numbers across all ISX and QSX cylinder heads. The intake valve is manufactured from premium materials and improves robustness against acidic corrosion and thermal fatigue that are primary contributors to chordal failures. The intake valve seat remains unchanged.

Service Parts Availability

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

Table 1, Cylinder Head and Intake Valve Part Numbers		
Part Description	**Obsolete Part Number**	**New Part Number**
Cylinder Head	3688761	4386009
Cylinder Head	3104450	4386011
Cylinder Head	4962732	4331387
Intake Valve	4965868	3685996

Part Structure

The new intake valve is now structured into all ISX and QSX cylinder heads.

Part Inventory Action

Use existing part number inventory before using the new part number.

Production Status

Implemented for production. See Table 2.

Table 2, Production Information			
Part Number	**ESN First**	**Build Date***	**Plant**
4386009	79832078	18-Apr-2015	Jamestown Engine Plant
4386011	79844115	5-May-2015	Jamestown Engine Plant
4331387	79764260	06-Aug-2014	Jamestown Engine Plant
*Engine build date can be found on the engine dataplate.			

Document History

Date	Details
2015-7-29	Module Created

Last Modified: 03-Aug-2015