



भारतीय रेल (रेल मंत्रालय)
डीजल रेल इंजन कारखाना
वाराणसी-२२१००४, भारत
INDIAN RAILWAYS (MINISTRY OF RAILWAYS)
DIESEL LOCOMOTIVE WORKS
VARANASI-221004, INDIA



No. DLW.m.ES.262

Dated: 19.07.10

DESIGN BULLETIN

1. **Design bulletin no.** DB/01/2010/04
2. **Subject -** Inadequate water head generated by water pumps fitted with indigenous make impellers on G4 Engines, resulting in improper cooling & failures of power assembly no. 7.
3. **Background -** Shop reporting about Power assembly No. 7 failures. (Reference – Dy.CME(Engine)'s letter No. E/EMD/Engine Quality dated 29.03.2010 & 03.04.2010)
4. **Objective -** Investigation into the causes of less water inlet pressure (delivery head from the water pump) into the engine and suggesting measures for rectification / corrective action.
5. **Details of study / Investigation -**

As per EMD design (EDPS-588) the water-in pressure at 900 RPM should not be less than 52.5 psi with discharge as 900GPM. While investigating into the causes of power assembly no. 7 failures (refer Design Bulletin No. DB/01/2010/01), the water in pressure in many engines was found lower than the specified range (around 32 psi) . Though, the power assembly no. 7 cooling was improved by opening up the syphon cover at location 7 by around 2 inches, the basic cause of inadequate water head generated by the water pumps needed investigation & resolution.

The water pump impeller (KASPIAN make) was sectioned and examined with respect to vane angles, cleanliness of water passages/throat area, quality of casting and various critical dimensions. Following deficiencies have been noticed:-

- i) Vane spacing found irregular/uneven.
- ii) Surfaces of water passage found very rough
- iii) Weight of impeller found more by half kg as compared to EMD make impellers.

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Further, audit at manufacturer's end has revealed that the pattern used by the firm was not proper and the firm has been using green sand moulding process , which is bound to generate rough surfaces.


6. Corrective action -

- (a) Pattern to be inspected by DLW before the vendor starts production/casting.
- (b) Casting process to be defined as 'CO2 core shell moulding' in the drawing of impeller.

7. Drg./Spec/Test Plan /QP modified – Water pump Impeller drawing No. 8248248
(Pt. No. 16122008)

8. Implementation - Design , Material Control , Inspection

9. Circulation - CME(P) , CQAM , CME(M)
Dy CME(Engine), Dy.CQAM, Dy.CPM(MC)/Project
SSE(SAS), SSE(RI),SSE(E-III),SSE(ET)
SSE(Design)/Engine


19/07/2010
(S.K.Singh)
Dy.CDE (Engine)