

**DIRECTORATE GENERAL BORDER ROADS**  
**GENERAL MAINTANENCE INSTRUCTION NO. 164**  
**ON**  
**ENGINE BEARINGS NH-220 CUMMINS ENGINES**  
**FITTED WITH D-80-A-8 AND D-80-A-12**  
**CRAWLER TRACTORS**

**INTRODUCTION**

A larger Nos of comprehensive maintenance instructions inspect of vehs / eqpts have been issued from time to time by this HQ to improve the eqpt utilization.

2. It is seen from the premature failure reports submitted by the projects that premature failure of Cummins engines fitted on D80-A8 / A-12 are on extremely higher side. A detailed examination of the effected engines with the association of firms rep was conducted to find out the exact cause pf premature failure. It was revealed that in addition to use of sub-standard spares at the time of overhaul, in most of the cases the poor maintenance and “ Negligency at the part of user units” had also been attributed for the premature failure of Cummins engines.

**ACTION BY :-**

- (a) User Units :- To carry out maintenance as per GMI's issued by this HQ in connection with the manufacturers recommendation.
- (b) Field Workshop ( GREF ) :- To check that proper maintenance is being carried out by the user unit at regular intervals and advise them accordingly.

**DETAILS**

As per Appendix “A” to this Instruction.

## APPENDIS "A' TO HQ DGBR GMI NO. 164

### DETAILS

#### ENGINE BEARINGS NH-220 CUMMINS ENGINES

A technical seminar was held by M/S Kirloskar Cummins at Tezpur which was attended by Commander Case Workshop and representatives of other agencies. One of the main points discussed in the seminar was the premature failure of engines bearings of NH-220 engines fitted on D80-A8 and D80-A-12 dozers.

2. After an exhaustive study of prematurely worn out engine bearings, it has been concluded that bearings failure can be categorized as follows :-

- (a) Scoring or scaring
- (b) Wiping or seizure.
- (c) Fatigue or lining break out

3. The premature failure due to above categories can be mainly due to following reasons:-

- (a) Faulty engine operation
- (b) Inadequate lubrication system
- (c) Inadequate cooling system.

#### FAULTY ENGINE OPERATION

4. Generally operators allow the machine to run ideal for longer periods when dozer is not engaged in work. This is mainly due to the non availability of fully charged batteries with the machines or due to faulty dynamo. At idling engine speeds, formation of effective lubrication film between bearings and journal is not possible. Consequently inadequate cushion of oil exists between the bearing and the shaft. Metal to Metal contact occurs and erosion of bearing material starts. The presence of dirt particles in oil will make it further worse. Long idling also keeps the engine temperature below its requirement. This leads to accumulation of unburnt fuel which finds its way into the lubricating oil, thus reducing the oil viscosity. Inadequate oil viscosity will reduce oil pressure which ultimately leads to generation of excessive heat.

...2/-

4. Rapid bearing wear is also attributed to over heating of engine due to over loading climbing of Dozers on gradients in higher gear, push start of dozer with other dozer etc. It is pointed out that dozers are not designed to negotiate higher for gradients than 40 Degree and they should not be allowed to idle for long in that condition.

### **LUBRICATING SYSTEM**

5. Correct grade of lub oil prescribed by the manufacturer should always be used and correct oil level in the sump should always be maintained. At higher temperature, lub oil will lose its viscosity. Lower lub oil viscosity will reduce the cushioning effect and oil pressure tends to drop.

### **COOLING SYSTEM**

6. Following are recommended for effective cooling of engine -

- (a) Water Pump and fan drive belts must be installed, adjusted and maintained properly to prevent wear and belt slippage.
- (b) Do not use water hose which is clogged , buckled wrinkled or swollen.
- (c) Keep the cooling system completely filled, Re-check water level after the engine reaches its normal operating temperature.
- (d) External areas of radiator and engine surfaces should be free dust, dirt and other harmful accumulations to ensure free heat transfer.
- (e) Ensure that the thermostat function and is not removed.

-- END --