

**DIRECTORATE GENERAL BORDER ROADS**  
**GENERAL MAINTENANCE INSTRUCTION NO – 198**

**ON**

**LAKSHMIROLLER BEARING STONE CRUSHURES WITH GRANULATORS**

**1. INTRODUCTION**

Portable stone crusher 406 mm x 254 mm (16"x10" ) manufactured by lakshmi Engineering works New Delhi – 110044 M/s fitted with roller bearing double toggle plates,6/10 TPH capacity having granulator conversion kit (16" x16" ) and mounted on pneumatic wheel sturdy chassis with rotary screen of 3' x10' size powered with simpson p6 (I) water cooled diesel engine along with cold starting device has been newly inducted in the Border Road Organisation.

Regular servicing and preventive maintenance are essential to prolong the life of equipment ensure timely repairs, to arrest defects from developing into majors ones, to optimize operation minimize breakdown and downtime losses.

**2. AIM**

To enumerate the details of periodic and preventive maintenance and lubrication of LAKSHMI ROLLER BEARING STONE CRUSHER WITH GRANULATOR.

**3. ACTION BY**

(a) USER UNITS : To carry out periodic and inspection regular servicing and preventive maintenance task as laid down.

(b) FIELD WORKSHOP (GREF) : To check the record of "Maintenance and lubrication" in the log book of equipment during its inspection and repairs if carried as per maintenance and lubrication schedules given in this instruction.

(c) MOBILE MAINTENANCE TEAM : To carry out maintenance and preventive maintenance as per schedule laid down and Commander TF/OC WKSP be apprised about short coming.

**4. DETAILS**

This instruction covers the following:-

(a) Recommended lubrication chart do and do not – Appx 'A'

(b) Periodical maintenance schedule and technical specification Data –Appx 'B'

**5. Please ack receipt**

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**DO AND DONOT**

Do clean the machine every day after day's work

Do pay particular periodic attention to lubrication

Do use only approved grade of lubricating grease

(1 OC SERVOGEM EP 2 Grease or equivalent)

Do check all bolts and nuts tight at an interval of four hours

Do give particular attention to the tightness of swing Jaw bolt and conversion-packing plate bolts in the cases of granulator.

Do operate the plant on perfect level and the machine in perfect plumb line.

Do consult operation and maintenance guide when in doubt.

Do keep the direction of rotation of the crusher (marks on it )

Do not adjust the discharge gap when the machine is in operation

Do not feed strictly any foreign materials like iron particles, wood etc.

Do not operate the machine at low RPM

Do not use any soap base grease.

Do not operate on pneumatic wheels.

**FREQUENCY OF OIL/FILTER CHANGES**  
**INDICATING EQUIVALENT OILS BY IOC LTD**

| S.No  | Assy   | Capacity<br>in ltrs | Periodicity of changes in<br>Hrs/Run            |   | Ambient temp  | IOC  | Remarks |
|---|--|---------------------|---|---|---|--|---------|
|   |  |                     | Oil   | Filter  |   |  |         |
| 1.  | LAKSHMI STONE<br>CRUSHER WITH<br>GRANULATOR<br>ENGINE P6 (I) | 15.5                | 1 <sup>st</sup> change 25<br><br>Thereafter 200 | 1 <sup>st</sup> change<br>25<br>Thereafter<br>200 | 0 <sup>0</sup> to 30 <sup>0</sup> F<br><br>30 <sup>0</sup> to 80 <sup>0</sup> F<br><br>Over 80 <sup>0</sup> F | Servo Pride-10<br><br>Servo Pride-20<br>Or<br>20W-40<br>Servo Pride-30<br>Or<br>20W-40 |         |
| 2.  | Greasing point   | -                   | 48 hrs  | -   | -   | (IOC SERVO GEM EP 2<br>Grease or equivalent )  |         |
| 4.  | Fuel filter  |                     |   |   |   | Do not clean filter insert   |         |
|   | (a) 1 <sup>st</sup> Stage                                    | 1.1<br>0.5          | 500 Hrs<br>500 Hrs                              |   |   |  |         |
|   | (b) 2 <sup>nd</sup> Stage                                    | 1.1<br>0.5          | 1000 Hrs<br>750 Hrs                             |   |   |  |         |
| Note:- Lubricating oils should meet the requirement of the U.S Ordinance Specifications<br>MTL-L- 46152 or MTL-L- 2104C. The lubricating oils<br>Use in all the Simpson Diesel Engines<br>For should have a minimum viscosity Index of 80 |  |                     |   |   |   |  |         |

**PERIODICAL MAINTENANCE SCHEDULE: LAKSHMI STONE CRUSHER**

**10 HOURS MAINTENANCE TASK**

| S/No   | Items/Assy                              | Maintenance instruction  |
|--|---|--|
| 1  | General                                 | (a) check oil water and diesel for leaks<br>(b) check exhaust smoke<br>(c) check all gauges and meters<br>(d) check all bolts and nuts if loose or deficient<br>(e) clean machine after day's work.                      |
| 2.   | Engine sump                             | Check and top up oil level to the 'MAX' mark on the dip stick more frequently  |
| 3.   | Air cleaner                             | Clean under very dusty condition   |
| 4.   | Fuel tank                               | Drain sediments and water from sediment trap drain plug  |
| 5.   | Cooling system                          | (a) Check water level in radiator and top up.<br>(b) Check the radiator cap is properly tightened<br>(c) Check fan belt tension.   |
| <b>CRUSHER SIDE</b>  |   |  |
| 6.   | Jaw stock bearing                       | Check up grease lubrication  |
| 7.   | Drive pinion brg                        | Bearing lubrication to be checked  |
| 8  | Main drive gear brg                     | Check grease lubrication   |
| 9.   | Rotary screen drive gear and level gear | Check grease lubrication   |
| 10   | Main drive belt                         | Check tension and adjust if loose  |
| 11.  | Belt fastener                           | Check up belt fastener are fitted properly   |
| <b>ELECTRICAL SYSTEM</b>   |   |  |
| 12.  | Battery                                 | (a) Check level of distilled water of low to be topped up.<br>(b) Check up vent holes if blocked make free<br>(c) Check up terminals for cleanness and proper fitting<br>(d) Check up battery position safe with cradle. |
| 13.  | Wiring and connection                   | Check up all tyre pressure with pressure gauge.  |
| <b>48 HOURS MAINTENANCE TASK</b>   |   |  |
| 01.  | <b>CRUSHER SIDE</b>                     |  |
| Grease the following lubrication point (Bharat Petroleum MP-3 Grease or equivalent) Do not use soap base grease. |   |  |
|  |   | (a) Free wheel<br>(b) Main bearing block<br>(c) Pitmen bearing<br>(d) Swing Jaw Pin<br>(e) Drum Pully bearing<br>(f) Screen driving pully bearing<br>(g) Screen hanging brackets.  |

**100 HOURS MAINTENANCE TASK**

|                     |  |   |
|---------------------|--|---|
| 1.                  | General                                      | Carry out 10 & 48 hrs maintenance task  |
| 2.                  | Engine                                       | (a) clean air cleaner under moderately dusty condition.<br>(b) Wipe engine and base plate clean.<br>(c) Check lubricating oil leaks and tight nuts and fitting as necessary |
| 3.                  | Cooling system                               | (a) clean radiator core<br>(b) Grease water pump bearing  |
| <b>CRUSHER SIDE</b> |  |   |
| 4.                  | Main drive bearing<br>Rotary screen bearings | Remove ole grease and fill up cups with new grease.   |
| 5.                  | Rotary screen drive gear and bevel gear      | Clean gears and lubricate   |

**200 HOURS MAINTENANCE TASK**

|     |                   |   |
|-----|-------------------|---|
| 1.  | General           | Carry out 10, 48, 100 hrs maintenance task.   |
| 2.  | Engine            | Clean crank case breather element   |
| 3.  | Inlet and Exhaust | Check valve clearance and adjust if necessary<br>(clearance valve to rocker 0.015" or 0.28 mm ) hot |
| 4.  | Oil filter        | Clean filter element  |
| 5.  | Fuel filter       | Clean fuel filter   |
| 6.  | Radiator          | Drain water, flush with washing soda and refill with clean water                                    |
| 7.  | Injector          | Check injector spray and clean if necessary   |
| 8.  | Fuel Injection    | Oil level to be checked if low to be topped up.   |
| 9.  | Blower            | Check blower belt tension   |
| 10. | Dynamo            | Lubricate dynamo bearing with few drops of engine oil.  |

**500 HOURS MAINTENANCE TASK**

|                     |                                    |   |
|---------------------|------------------------------------|---|
| 1.                  | General                            | Carry out 10, 48, 100 and 250 hrs maintenance task  |
| 2.                  | Engine                             | (a) De carbonize if engine shows loss of compression or blow by pressure but do not disturb otherwise<br>(b) Adjust tappet clearances<br>(c) Wash engine interior with paraffin or fuel oil.<br>(d) Change oil filter element<br>(e) Clean cooling fins and oil cooler element if necessary |
| <b>CRUSHER SIDE</b> |                                    |   |
| 3.                  | Jaw plate                          | (a) Check serviceability of jaw plates<br>(b) Check Jaw plate adjusting if loose to be tightened  |
| 4.                  | Mounting Bolt                      | Check mounting bolt and tight if loose any.   |
| 5.                  | Main drive belt and belt fasteners | Check serviceability of belts fastener and adjust tension.  |
| 6.                  | <b><u>ELECTRICAL SYSTEM</u></b>    |   |
|                     | (a) Dynamo                         | Replace bearing with fresh grease   |
|                     | (B) Starter motor                  | Lubricate bearing with few drops of oil.  |

### 1500 HOURS MAINTENANCE TASK

- |    |                                       |  |
|----|---------------------------------------|--|
| 1. | General                               | Carry out 10,48,100,250 and 5000 hours maintenance tasks                                       |
| 2. | Engine                                | (a) De carbonize engine<br>(b) Clean all cooling fins and oil cooler element.                  |
| 3. | Blower                                | Examine blower blades and clean.   |
| 4. | Governor                              | Check free working of governor linkage.  |
| 5. | Fuel system                           |  |
|    | (a) fuel tank                         | Remove fuel tank, clean interior and strainers.  |
|    | (b) fuel filter                       | Change fuel filter element   |
|    | (c) Injector                          | (a) Clean injector nozzle or replace with serviced one<br>(b) Check injector pressure setting. |
|    | (d) fuel pump                         | Check fuel pump timing and balancing.  |
| 6. | <u>CRUSHER SIDE</u>                   |  |
|    | (a) Jaw stock bearings                | Dismantle jaw stock and check up for bearings and pack up with fresh grease.                   |
|    | (b) Rotary screen drivepoint bearings | Lubricate with fresh grease  |
|    | (c) All shaft and bearings            | Check all shaft and bearings for serviceability and if necessary replace.                      |
|    | (d) Wheel bearings                    | Grease up all wheel bearings.  |
| 7. | <u>Electrical</u>                     |  |
|    | (a) Starter motor                     | Inspect brush and commutator.  |
|    | (b) Dynamo                            | Clean commutator and change the brush if worn out  |

### 3000 HOURS MAINTENANCE TASK

- |    |         |  |
|----|---------|--|
| 1. | General | Carry out 10 to 1500 hrs maintenance task      |
| 2. | Blower  | Check blower bearings for wear and lubrication |

### 5000 HOURS MAINTENANCE TASK

- |    |         |  |
|----|---------|--|
| 1. | General | Carry out 10 to 3000 hrs maintenance task  |
| 2. | Engine  | (a) check big and main bearings<br>(b) Inspect cam shaft bearing and tappets.<br>(c) Change valve spring |

Note : For grade of lubricant  
Please refer lubrication chart  
Appendix 'A' to this Instruction

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**TECHNICAL SPECIFICATION/ DATA**

**LAKSHMI STONE CRUSHER ALONGWITH GRANULATOR KITS**

1. Model and type of crusher : Portable double toggle jaw crusher
2. Size : 406 mmx254 mm (16"x10" )
3. Maximum/Minimum size of feed (in mm) : 225mm Max size input
4. Discharge setting in mm and corresponding out put : (i) 25mm jaw setting 10 TPH  
(ii)38mm jaw setting 15.5 TPH  
(iii) 50mm jaw setting 21.5 TPH  
(iv) 19mm jaw setting 9 TPH  
(V) 12mm jaw setting 6TPH  
With granulator kit and feed size 100mm
5. Power : Simpson P6 (I) engine 65 HP at 2000 RPM
6. Material
  - (a) Frame : Fabricated mild steel
  - (b) Jaw stock : Fabricated mild steel
  - (c) Sewing Jaw shaft : MS Railway axle
  - (d) Jaw stock crank : Railway axle
  - (e) Jaw plates : Manganese steel
  - (f) Side plates : Mild steel
  - (g) Main plates : Self aligning double new roller type
  - (h)Toggle plates : Mild steel
  - (j) Rotary screen : Fabricated form 5mm MS Plate having size (3'x10' long)
  - (k) Trolley : MS Fabricated
  - (l) Belt guard : Expanded wire mesh
  - (m) Tyres : Reputed make