

**DIRECTORATE GENERAL BORDER ROADS**  
**GENERAL MAINTENANCE INSTRUCTION NO 197**

**ON**

**SPEED CRAFT DIESEL ROAD ROLLER**

**MODEL DRR/10 CAPACITY 8/10 TONNES**

**1. Introduction**

Regular servicing and Preventive maintenance are essential to prolongs the life of the Eqpt, ensure timely repairs to arrest defects from developing into majors ones, to work eqpt efficiently at all time, minimize breakdown and downtime losses.

**2. AIM**

To enumerate the details of Periodic and Preventive maintenance and lubrication of SPEEDCRAFT ROAD ROLLER.

**3. ACTION BY**

(a) USER UNIT: - To carry out periodic inspection, regular Servicing and preventive maintenance task as laid down.

(b) FIELD WKSP (GREF):-

(1) To check the record of "Maintenance and lubrication" in the log book of eqpt during its inspection and repairs if carried as per Maintenance task as laid down.

(c) MOBILE MAINTENANCE TEAM :-

To ensure preventive Maintenance is carried out and report accordingly to OC Field Wksp for necessary action.

**4. DETAILS**

This instruction covers the following:-

(a) Technical Specification/ DATA Recommended Lubrication Chart

(b) Periodical Maintenance Schedule.

5. Please ack receipt.

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SE (E&M) SG  
Director (Tech)  
For Dir Gen Border Roads

Dated : \_\_\_\_ Sep 1994

**TECHNICAL SPECIFICATIO/DATA**  
**SPEED CRAFT ROAD ROLLER**  
**MODEL DRR/10**

|     |                                        |                         |                      |
|-----|----------------------------------------|-------------------------|----------------------|
| 1.  | Unblasted weight                       | :                       | 8000 kg              |
| 2.  | Water ballasted weight                 | :                       | 9000 kg              |
| 3.  | Sand ballasted weight                  | :                       | 10000 kg             |
| 4.  | Engine                                 | :                       | SIMPSON P-4 (I)      |
| 5.  | Overall length                         | :                       | 4880 mm              |
| 6.  | Rolling width                          | :                       | 1810 mm              |
| 7.  | Overall height                         | :                       | 2860 mm              |
| 8.  | Width of rear rolls                    | :                       | 535 mm               |
| 9.  | Width of front rolls                   | :                       | 940 mm               |
| 10. | Diameter of rear rolls                 | :                       | 1370 mm              |
| 11. | Diameter of front rolls                | :                       | 1030 mm              |
| 12. | Line pressure                          | Front wheel             | Rear wheel           |
|     | Minimum                                | 27.6 Kg/cm              | 47.5 Kg/cm           |
|     | Maximum                                | 41.1 Kg/cm              | 61.7 Kg/cm           |
| 13. | Overlap of rolls                       | :                       | 100 mm               |
| 14. | Wheel base                             | :                       | 2800 mm              |
| 15. | Turning radius                         | :                       | 2935 mm              |
| 16. | No. of speeds                          | 4 forward and 4 reverse |                      |
| 17. | Speed                                  | 1.95 to 900 km/hr       |                      |
| 18. | Gradient                               | 1 in 5 (20 % )          |                      |
| 19. | Fuel tank capacity                     | :                       | 150 ltrs             |
| 20. | Water tank capacity                    | :                       | 225 ltrs             |
| 21. | Permissible variation                  | :                       | +5%, -5%             |
| 22. | <b><u>P4 Engine Technical Data</u></b> |                         |                      |
|     | Bore                                   | :                       | 88.9 mm              |
|     | Stroke                                 | :                       | 127 mm               |
|     | No of cylinders                        | :                       | 4                    |
|     | Swept volume                           | :                       | 3.14 ltrs            |
|     | Firing order                           | :                       | 1-3-4-2              |
|     | Compression ratio                      | :                       | 16.5 : 1             |
|     | Inlet valve open                       | :                       | 13 <sup>0</sup> BTDC |
|     | Valve lift                             | :                       | 9.14 mm              |
|     | Valve Seat angle                       | :                       | 45 <sup>0</sup>      |
|     | Spill timing                           | :                       | 29 <sup>0</sup> BTDC |
|     | Valve clearance int & Exhaust          | :                       | 0.25 mm Hot          |

**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.                                                                                                                                                                                                                                                                                   | SPEED CRAFT<br>DIESEL FOAD<br>ROLLER<br>Engine P4 (I) | 15                  | 1 <sup>st</sup> change 25<br>Thereafter 200 | 1 <sup>st</sup> change<br>25<br>Thereafter<br>200 | 0 <sup>o</sup> to 30 <sup>o</sup> F<br><br>30 <sup>o</sup> to 80 <sup>o</sup> F<br><br>Over 80 <sup>o</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.                                                                                                                                                                                                                                                                                   | Gear box                                              | -                   | 1000                                        | -                                                 | Below 33.5 <sup>o</sup> c<br>Above 33.5 <sup>o</sup> c                                                        | HP-90<br>HP-140                                                                        |         |
| 3.                                                                                                                                                                                                                                                                                   | Greasing point                                        | -                   | -                                           | -                                                 | -                                                                                                             | Servo grease WB<br>Or<br>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                         |                                                   |                                                                                                               |                                                                                        |         |
| <p>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</p> |                                                       |                     |                                             |                                                   |                                                                                                               |                                                                                        |         |

## PERIODICAL MAINTENANCE SCHEDULE

### **1. AFTER EVERY 8 HOURS WORKING**

#### (a) CHECK:

- (1). Top up engine sump with oil of recommended upto the top mark on to dipstick. (See Appx 'A')
- (2). Top up oil in air filter upto the maximum level mark using new engine oil.
- (3). Top up radiator with clean soft water. Use AFC under sub zero temp and very cold climate or in every the radiator should be drained at the end of each working day.
- (4). Check oil pressure gauge. Minimum oil pressure should not be less than 2.81 kg/cm<sup>2</sup> at normal working speed. Wksp be informed when the oil pressure is low.

#### (b) GREASE / OIL.

- (1). Fill oil in the oil cups behind the Driver's seat for the final drive pinions on each side of the Gear box.
- (2). Inject grease into the both the rear roll bearings.
- (3). Open the foot-plate window and force-feed grease into the nipples for clutch shaft bearing and also the clutch slide and operating fork.
- (4). Pour oil into the oil-holes and force-feed grease to the tail-piece nipple.
- (5). Grease turn-on pins front and rear on fore-carriage
- (6). Grease front wheel bearings.
- (7). Grease yoke-pin of steering through grease cup on top of steering head.
- (7). Top up oil cups on steering worm-gear cover.
- (8). Grease fan and water pump bearings of the engine.
- (9). Clean the dust from all working pins and pivots on all controls and operating rods and lubricate using oil-can Investigate all unusual knocks and noises and ensure that the engine is running smoothly.
- (10). Check and tighten all loose nuts ad bolts.

### **2. AFTER FIRST 25 HOURS RUNNING**

- (a) Drain the engine sump-oil and refill with clean oil of recommended grade. (As per Appx 'A')

### **3. AFTER EVERY 50 HOURS RUNNING**

#### (a) CHECK

- (1). Top up battery with distilled water up to 6mm above.
- (2). Top up gear-oil in the change speed gear box upto top up mark on the dipstick.
- (3) Remove the oil in the Air filter clean the element base etc, with paraffin. Refill with clean oil upto mark shown.

#### (b) GREASE/OIL

- (1). Pour oil in one of the holes in clutch casing and clutch driver.
- (2). Grease steering worm bearing on 2 points. Grease brake shaft after taking off to foot plate window.

(3). Check and tighten all bolts, nuts, setscrews, split pins wherever they are fitted (i.e. also in engine, clutch, coupling transmission & fore carriage)

**4. AFTER EVERY 200 HOURS RUNNING**

(a) Drain engine sump oil and fill up to mark on dipstick with recommended grade of oil.

**5. AFTER EVERY 250 HOURS RUNNING**

(a). Clean and Grease the terminals of battery

(b) Grease Dynamo bearings

(c) Grease water pump bearings.

(d) Check tension of V-belt and adjust if necessary. (should be  $\frac{3}{4}$ " or 20mm deflection )

**6. AFTER EVERY 500 HOURS RUNNING**

(a). Remove the cover of the change speed gearbox and check all gears for correct matching specially of the bevel gears.

(b). Clean the strainers for diesel and lubricating oil clean and check atomizers.

**7. AFTER EVERY 1000 HOURS RUNNING**

(a). Remove old oil from change speed gear box and fill up to mark on dipstick with the recommended grade of fresh oil, after flushing . (As per Appx 'A' )

(b). Check fan belt and adjust or change as necessary.

(c). Add a few drops of oil to the dynamo and starter.

(d). Flush out the radiator cooling system.

(e) Check valve spring and tappet clearance of engine adjust if necessary (Tappet clearance 0.25 mm Hot both valves)

**8. AFTER EVERY 2000 HOURS RUNNING**

(a). Remove and clean clutch plate and lining

(b). Replace the lining if worm out.

(c). Clean water and fuel tanks.

**DO AND DO NOT**

**DO**

Do keep the engine clean.

Do pay particular attention to lubrication.

Do use only approved grades of lubricating oil.

Do keep all bolts and nuts tight.

Do eliminate all air from the fuel system and keep all fuel oil unions air tight

Do completely change engine oil in accordance with "Periodical Attention".

Do renew element in lubricating oil filter in accordance with "Periodical Attention".

Do check oil flow to rockers arms and examine the valve springs in accordance with "Periodical Attention".

Do use only filtered fuel oil. Never tip into tank a half empty barrel of fuel oil, the bung which may have been out for weeks.

Do keep check other temperature of the cooling water, It should not be allowed to boil. The best temperature is 170<sup>0</sup>F (77<sup>0</sup>C) but where a pressurized radiator filler cap is fitted, then the coolant temperature should be in the region of 190<sup>0</sup>F (88<sup>0</sup>C)

Do attend immediately to fuel and lubricating oil leaks.

Do check tappet clearance from time to time (0.010 in/0.25 mm) with warm engine  
Do drain radiator if engine is being left idle in frosty weather.  
Do drain cylinder block if engine is being left idle in frosty weather. (drain tap on side of block)  
Do ensure that the pressurized radiator filler cap (where fitted) is removed before draining the cooling system.  
Do close these drain cocks and refill with water before attempting to re-start next morning.  
Do disengage differential lock immediately after use.

### **DO NOT**

Do Not neglect the routine attentions specified in "Periodical Attentions".  
Do not race the engine in neutral.  
Do Not run the engine unless the gauge shows oil pressure  
Do Not unnecessarily interfere with any adjustments.  
Do Not continue to run the engine if the cooling water boils.  
Do Not forget to keep the fan belt adjusted  
Do Not continue to run the engine if black smoke is coming from the exhaust.  
Do Not if the engine stops without apparent reason, fail to make sure first of all that fuel is reaching the fuel pump.  
Do Not omit to wipe the engine over regularly with a clean rag to check for oil or fuel leaks.  
Do Not take the fuel pump to pieces.  
Do Not use cotton waste or any fluffy cloth when cleaning.  
Do Not use any but approved brands of fuel or lubricating oil.  
Do Not use any but approved brands of fuel or lubricating oil.  
Do Not store fuel oil in a galvanized container.  
Do Not subject the engine to continuous overloading.  
Do Not turn off fuel supply to stop the engine, otherwise fuel system have to be air vented