

**DIRECTOR GENERAL BORDER ROADS**  
**GENERAL MAINTENANCE INSTRUCTION NO. 176**

**ON**

**CONCRETE MIXER SAYAJI 200 / 280 (1017 Cu ft)**

**GENERAL**

(a) **Instruction for installation and operation**

- (i) The mixer should be on true horizontal plane.
- (ii) The power drive , roller chains and jockey pulley mechanism should be checked for lubrications.
- (iii) Oil level in engine sump and fuel in fuel tanks should be checked.
- (iv) To ensure free movement of the entire mechanism, few turns by hand to the engine should be given in decompress or layer lift position.
- (v) To raise power loader, push the lever hard for relieving the brake and engaging the clutch. To lower the loader slightly relieve the brake to control the descent of the loader.

**Note** " The loader should never be lowered too fast as the wire ropes may over run the drums, the loader may be damaged by hitting against the ground and the wire rope may even snap."

- (vi) Check the clearance between the loader operating clutch cone and the recess in the chain wheel.

**DIRECTION** - (b) **Clearance should be 1 mm when the clutch lever is in off position**

- (vii) The brake lining must be in contact with the brake drum when the lever is in off position.
- (viii) Bleed the fuel system by unscrewing the vent screw on fuel pump. Fuel will start flowing out. In case it does not start flowing fly wheel by minimum quarter revolution be rotated. Allow the fuel to fuel to flow till all the air in the system is removed.

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(c) Field workshop

To Check the record of maintenance and lubrication in the log books of the equipment during its inspection and repair for complying with these instructions. Field workshop will advise user units, if any discrepancy is noticed.

Details of Instructions

Maintenance and operational instructions are as per appendix 'A'

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**AIM**

This instructions lays down the details of maintenance of Concrete Mixer Sayaji 200 / 280 litres (1017 Cu ft) and is intended to guide the user units to maintain / operate the equipment to achieve maximum life.

**Introduction**

- (1) This instruction lays down the details of periodic as well as preventive maintenance.
- (2) All the tasks indicated are to be understood thoroughly by the operating crew and supervisory Categories. These tasks will be carried out without any laxity. Even a minor lapse on these maintenance jobs will lead to premature failure of the equipment.

**Applicability**

This instruction is applicable to Sayaji 280 / 200 litres Concrete Mixer fitted with Kirloskar air cooled 5 H.P. Diesel Engine.

**Action by**

- (a) **Project / Task Force**

To instruct and check up the units under command for compliance of the instructions.

- (b) **User Units**

(i) All units holding the equipment to study instructions carefully and will carry out maintenance and lubrication accordingly. Record of maintenance tasks should be kept in the log book under signature of operator and supervisor. Timely checking on compliance of supervising officer.

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- (ii) Follow operational instructions at all times during utilisation.
- (ix) Lift the decompressed lever and rotate the handle till the fly wheel attains a good speed and release the decompressor lever of cylinder.
- (x) During the first 50 hours the engine should not be overloaded even for a short duration.
- (ix) press the external fuel pump rack operating lever towards the fuel pump and hold it till the engine comes to a halt when required to stop.
- (xii) At the end of the operation the Drum and bucket should be cleaned.

Note- Decompressor lever should never be used for stopping the engine.

### Maintenance Instruction

#### DAILY

1. Check lubricating oil and top up if required.
2. Check the level of the fuel tank and fill the fuel tank at the end of day's works.
3. Lubricate roller chains and the jockey pulley mechanism.
4. The loader hopper is cleaned thoroughly at the day's closing.
5. Fill up all grease nipples with good quality grease with grease gun twice during the day.
6. Grease the important parts such as mixing drum teeth, bevel pinion twice or thrice daily.
7. Inspect the various parts and check that none of the nuts and bolts are loose.
8. Clean wash to the mixing drum and loading hopper.

#### 50 Hours Maintenance

Apart from the above following task should be carried out :-

- (a) Clean the air cleaner element by lightly tapping it on wooden block.
- (b) After initial run of 50 hours tighten all external nuts and bolts, especially the cylinder head.

Note- Engine Running in period is first 50 hours the engine should be on  $\frac{1}{2}$  load during this period.

- (c) Change engine oil and clean ----- sump and filter element on completion of first fifty hours and subsequently at every 250 hours.

### 250 Hours Maintenance

Repeat daily and fifty hourly maintenance.

- (i) Drain the sump, flush out and refill with new oil. Clean the lub oil strainer.
- (ii) Check cylinder head joints for leakage and tightened nuts and keys. Tightening torque should be kept as 5.5 Kg m or 40 lbs feet.
- (iii) Clean the air cleaner.
- (iv) Clean the carbon deposits from the exhaust silencer.
- (v) Make sure that the vent hole in fuel tank filler cap is clear.
- (vi) Fill new lubricating oil filter element and joint ring.
- (vii) Check clearance between the loader operating clutch cone and the recess in the chain wheel.
- (viii) Check the brake on the loader winding drum when the lever is in off position the brake lining must be in contact with the brake drum.

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- (ix) Clean the whole unit, lubricate and fill all grease nipples with grease gun.

500 Hours Maintenance

Carry out all above maintenance jobs described above :-

- (a) Change the fuel filter element.
- (b) Clean operating cable, inspect and give a coat of grease.
- (c) Open injectors, test spray and replace nozzles if required. Adjust pressure to 200 Kg / Cm<sup>2</sup>.

- (d) Adjust tappet clearance as-

In-let valve clearance - 00.18 mm	}	In cold
Exhaust valve clearance - 00.20 mm		

1000 Hours Maintenance

- (i) Remove cylinder head, de-carbonize piston top and insides of inlet and exhaust valves parts.
- (ii) Examine and grind the inlet valves and exhaust valves seating's.
- (iii) Withdraw the pistons carefully clean out oil return holes. Examine cylinder bore.
- (iv) Clean button filler in the fuel pump delivery pipe union at the injector end.

2000 Hours Maintenance

- (1) Wash out lubricating system.
- (2) Thoroughly clear the fuel tank and remove the sludge.
- (3) Examine large end bearings and replace if clearance is excessive.

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## Desert Precautions

In order to meet with the harmful effects of desert conditions following extra maintenance jobs will be carried out.

### 1. Oil filter and oil strainer

Clean and change oil filter and oil strainer at the minimum half the normal periodicity. Units should be provided filters at liberal seals as " Maint. Spares."

### 2. Sump

(i) Enforce cleaning sump minimum once a year, as well as before and after exercise indirect.

(ii) Provision should be made to manufacture sump gaskets well in advance before opening sumps immediate replacement otherwise dust / sand will get into engine block / components.

### 3. Oil Gallery

Pressure cleaning of oil gallery to be included as a yearly maintenance task by field workshop.

### 4. Oil pump

Clean oil pump oil strainer and sump minimum once a year.

### 5. Lubricants gets Dirty frequently

(a) Needs to reduce periodicity of oil change to minimum half or even earlier, if oil is found dirty.

(b) Clean air cleaner (Oil Bath Type) and change its oil as and when oil is changed.

(c) " Adequate Pool " of engines to be maintained for replacement.

Note - " Items marked will be attended to by the maintaining field workshop".

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6. Fuel tank (and its strainer) and Cap

Always use strainer while filling fuel tank. Replace or repair punctured strainer promptly.

7. Fuel filter

(a) clean fuel filter and its element minimum at half the normal periodicities.

(b) Change fuel filters for slightest damage. For that, provide fuel filter cartridge (elements) to drivers or operators as part of their vehicle kit list.

(c) Enforce replacement of fuel filters at half of the normal periodicity or even earlier also before and after every exercise in desert.

8. Fuel Pump

(a) Provision of fuel filter repair Kits as well as inlet and outlet valve at liberal scale for field repairs should be made.

(b) Put wet cloth on the fuel line to over come vapour lock.

9. Air Cleaner

(a) Clean paper filter element at half the normal periodicity due to excessive dusty conditions.

(b) Change Air cleaner oil minimum at half the normal periodicity.

10. Battery (When ever applicable)

(i) Never used drinking or saline water to top up battery.

(ii) Provide "Distilled Water bottle" with each veh / eqpt as part of its equipment kit list, to top up battery daily and during long drive.

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(iii) Clean and smear Mineral Jelly lightly before every long drive, otherwise treat it as weekly maint task.

(iv) The specific gravity need to be corrected to normal temperature and pressure to evaluate actual condition of battery charge electrician must be aquanted with the same.

(v) Ensure battery terminal are not worn and leads are tightly fitted on posts, field workshops to build up warn at battery posts by molten lead and make positive post thicker and paint / mark it '+' for case of identification of drivers / operator.