



**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**

**MAINTENANCE SCHEDULES
FOR
SHOULDER BALLAST CLEANING MACHINE
(FRM – 85F)**

REPORT NO. TM-125

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PREFACE

Maintenance of On-Track Machine is a challenging task. Presently a large numbers of On Track Machines are working over different zonal railways. Maintenance of these machines is being done by zonal railways with the assistance of local trade available, zonal track machine workshops, CPOH / Allahabad and RDSO/ Lucknow. With experience over the years, the railway engineers have developed adequate expertise in the maintenance of these machines. However, in absence of approved maintenance instructions, different maintenance practices have come into vogue. Therefore, it has become imperative to have a uniform maintenance standard throughout the Indian Railways. Maintenance schedule manuals for of Continuous Tamping Machine (CSM 09-32), Ballast Cleaning Machine (RM-80), Shoulder Ballast Cleaning Machine (FRM-80), Points and Crossing Tamping Machine (UNIMAT), Tamping Express (09-3X), Unomatic machine (UNO), Duomatic machine (DUO), Ballast Regulating Machine (BRM), Dynamic Track Stabilizer (DGS-62N), Multipurpose Tamping Machine (MP), Plasser Quick Relaying System (PQRS), Points and Crossings Changing Machine (T-28), Track relaying train (P811S), UTV (Phooltas) have been issued by RDSO. Provisional maintenance schedule manual of Shoulder Ballast Cleaning Machine (FRM-85F) have been earlier issued vide letter no. TM/HM/15 dated 01-4-08. Maintenance schedule manual of Shoulder Ballast Cleaning machine (FRM-85F) has been prepared after necessary amendment in provisional manual on the basis of experience and suggestions received from railways.

While preparing these schedules, recommendation of Original Equipment Manufacturers (OEM) and experience of the Zonal Railways have been taken into account. Variation in operating condition in different regions may make it necessary to introduced examination of certain items which have not been prescribed herein or to carryout maintenance at somewhat differing periodicity. The Railway in all such cases should bring this to the notice of Track Machine and Monitoring Directorate of RDSO for any modification to the schedule giving full details. Whenever any scheduled examination except trip (Breakdown) examination is carried out, all the items of lower schedules should also be attended to.

While every care has been taken to make the maintenance schedules quite exhaustive, there is always scope for further improvement. Suggestions from the railways in this regard will be welcome and should be sent to the undersigned.

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EXPLANATORY NOTES

While preparing text of schedules for maintenance of Shoulder Ballast Cleaning Machine (FRM-85F), the terms used and their meanings are explained below:

- CHECK - Ensure a specific condition does or does not exist.
- INSPECT - Look for damage and defects including breakage, distortion, cracks, corrosion and wear, Check for leaks, security and that all items are completed.
- CHANGE - Fit new or overhauled or reconditioned part in place of old parts and missing parts.
- OVERHAUL - Dismantle, examine, recondition or renew parts as necessary against given specifications, reassemble, inspect and test.

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Schedule -- I
To be done daily
(Duration – One and half hrs)

1. ENGINE

1. Check the level of coolant in radiator and top up, if required.
2. Check level of the lube oil and top up, if required.
3. Check fuel level and top up, if required.
4. Check for any fuel leakage from the fuel pump, injectors, fuel supply, and return pipes.
5. Check engine oil pressure after warming up-
 - (a) at idle speed (min. 1.5 kg/sq.cm)
 - (b) on rated speed (min. 2.5 kg/sq.cm).
6. Check & correct the tension of alternator V-belt.
7. Check the vacuum indicators for dry type air filter.
8. Record the maximum engine temperature of the day.
9. Clean engine and its premises.
10. Check battery-charging system.
11. Drain water from air reservoir after day's work.
12. Check leakage of lube oil, if any.
13. Check and prevent water leakage, if any.
14. Check all indicative gauges for proper functioning.
15. Check oil level of generator engine.
16. Drain all drip cups.
17. Check the air cleaner and clean if required.
18. Check the function of generator engine.
19. Check the oil level and top up both main gear boxes, if required.

2. MACHINE GENERAL:

1. Check hydraulic oil level in tank and top up if required
2. Check oil level in vibration screen drum.
3. Check proper locking of all units.
4. Check the function and condition of conveyor belt, belt tension, scrapers of conveyors and look out for damages.
5. Check anti collision device of waste conveyor and cutting unit.

6. Screening mesh should be checked In order to have proper size of ballast.
7. Check for any unusual sound from machine.
8. Check lubrication system of excavating chain, main conveyer and excavating conveyer.
9. Check the safety screw, scraper fingers and safety bolts of the excavating chain.
10. Check brake parts of idling bogie and powered bogie.
11. Check for any air leakage.
12. Check leakage in hydraulic circuit and do needful.
13. Record the max. hydraulic oil temperature of the day.
14. Check for proper axle clutch pressure.
15. Check for any rubbing of hoses and loose clamping etc.
16. Check the filter indicators of axle gear box clutch.
17. Check the filter indicator of suction filters.
18. Clean the slots next to the joint of the hydraulic cylinders.

Schedule II
To be done after 50 engine hours
(Duration – Two hrs.)

1. ENGINE

1. Clean the fins of engine radiator and hydraulic oil cooler with air pressure.
2. Clean battery plugs connections and apply petroleum jelly.
3. Check electrolyte level in batteries and specific gravity.
[minimum specific gravity = 1.24].

2. MACHINE GENERAL:

1. Check brake linkage and lubricate the pivots and gear teeth of hand brake with grease.
2. Check guide rollers of conveyor belts.
3. Lubricate axle gearbox flange cover of driving bogie with grease.
4. Lubricate screen guide plates with grease.
5. Lubricate all cordon shafts with grease.
6. Lubricate bearing for main and distributing conveyor chain and adjust the tension if required.
7. Clean complete machine.
8. Check wear on ballast distribution chutes.
9. Inspect wear plates of chain trough.
10. Top up the bottle for lubrication of king pin pivot.
11. Clean excavating conveyor sliding frame for any restriction.
12. Check the tension of excavating conveyor chain and adjust if required.
13. Grease guide columns, plow pivots broom units and sliding planes of cutter unit.
14. Check rubber bearing fitted under screen meshes and change if broken.
15. Check all working lights and do needful.
16. Check brake shoe clearance and adjust if required.
17. Check oil level of axle gearboxes and top up, if required.
18. Lubricate the chain guide of excavating chain.
19. Check the oil level of excavating and waste conveyor belt gear box.
20. Check oil level of main gearbox.
21. Check tightness of cordon shaft bolts.
22. Lubricate the cutting chain and excavating conveyor bearing.

Schedule III
To be done after 100 engine hours
(Duration – one day)

1. ENGINE

1. Check engine foundation bolts.
2. Check engine clamps and replace if required.
3. Inspect cooling coil for leakage and clean for removing the inside carbon.

2. MACHINE GENERAL

1. Check all the idler rollers of distribution and discharge conveyor for free rotation.
2. Check guide rollers and bushes of cutter chain.
3. Check the functioning of back up system.
4. Check the condition of torque arm rubber.
5. Lubricate all cordon shafts.

Schedule IV
To be done after 200 engine hours
(Duration --Two days)

1. ENGINE

1. Change engine oil.
2. Change lube oil filters.
3. Change fuel filter.
4. Lubricate the accelerating mechanism with lube oil.
5. Check proper concentration of additive of radiator water.
6. Check the tension pulley of water pump for free movement and any damage.
7. Clean alternator and check connections.
8. Clean air cleaner element (outer) with air pressure.
9. Change air cleaner elements (outer).
10. Change generator engine oil.

Note:-- i) Item no.1,2,3, 8 and 10 will be done after 250 engine hrs.
ii) Item no.9 will be done after 500-engine hrs.

2. MACHINE GENERAL

1. Check function of all limits switches.
2. Check the excavation chain sprocket and change if required.
3. Clean breather filter of hydraulic oil tank.
4. Change the filters of axle gear box clutch.
5. Repair ballast screens.
6. Lubricate hand brake gear with grease.
7. Change oil in the axle gear boxes.
8. Change oil in the main gear boxes.
9. Change oil in waste conveyor gear box.
10. Check the clutch pressure and adjust if required.
11. Change hydraulic suction filters.
12. Change hydraulic return filters.
13. Check the sleeper scraper and lubricate the chain bearing.
14. Check and clean the filter of hydraulic tank.
15. Check the main supply cable from generator.

Note:-- i) Item no. 4,7,8,9 and 10 will be done after 250 engine hrs.
ii) Item no. 11 will be done after 500-engine hrs.

Schedule V
To be done after 1000, 3000, 5000 engine hours.
(Duration - 7 days)

1. ENGINE

- 1 Check high-pressure fuel pipe and clamps.
- 2 Clean the diesel tanks.
- 3 Test engine temperature safety device.
- 4 Change batteries, if required.
- 5 Check engine compression.
- 6 Clean turbo charger and check for end and radial play.
- 7 Calibrate the fuel injectors.
- 8 Check the exhaust manifolds and silencers.
- 9 Calibrate the fuel injection pump.
- 10 Check tappet clearances and adjust if required.

Note: All the items will be done in the presence of representative of engine manufacturer.

2. MACHINE GENERAL

1. Lubricate the axle bearings of the bogies with grease.
3. Clean and lubricate sliding surfaces and bolts of torque supports with oil.
4. Change oil in screen drive drum and replace filter element.
5. Change hydraulic oil after cleaning the tank.
6. Check shock absorber for proper functioning and do needful.
7. Check universal joints for play and replace if required.
8. Replace all conveyor belts on condition basis and overhaul the driving stations.
9. Overhaul the complete plow.
10. Replace the worn out broom sticks, if required.
11. Repair the missing and defective hand tools.
12. Check foundation bolts of brake cylinders.
13. Check all pressure settings.
14. Check wear of brake shoes.
15. Check condition of trough plates and replace if required.
16. Check condition of hydraulic and pneumatic hoses and replace as required.
17. Check the functioning of pressure switch of axle clutch and adjust if required.
18. Replace the defective lights.
19. Paint the screen area and chain trough.
20. Replace excavating belts, supports pipes, chains and acrylic strip of excavating units.
21. Replace distributing conveyors and waste conveyor.
22. Replace main conveyor support pipes, chains and acrylic strip.
23. Clean the hydraulic oil with the help of hydraulic filtration pump for about one hour.

Schedule VI
(To be done after 2000, 4000 engine hours)
(45 days)

1. ENGINE

1. Engine is to be top overhauled.
2. Check engine timing and do needful.
3. Replace V-belts on condition basis.
4. Overhaul the alternator and starter.
5. Clean turbocharger and do needful.
6. Check anti vibration mountings of the engine and change, if required.

Note: All the items will be done in the presence of the representative of engine manufacturer

2. MACHINE GENERAL

1. Check wheel tyre defects and do needful.

Schedule VII
To be done after 6000 engine hours
(Duration-90 Days)

1. ENGINE

1. Overhaul the emergency generator
2. Overhaul/Replace the engine.
3. Change air inlet hoses.
4. Change all the high pressure fuel pipes, pipe clamp, flexible fuel hoses and rubber hoses.
5. Check the exhaust manifold for any defect and clean the same.
6. Change shut down valve.
7. Replace cooling coil.
8. Change anti-vibration pads.
9. Change engine safety system components.
10. Check the condition of self-starter and replace if required.
11. Check the condition of alternator and replace if required.
12. Replace all the V- belts.
13. Replace all engine filters.

2. MACHINE GENERAL

1. Change the hydraulic pumps, valves and motors.
2. Clean the hydraulic oil tank. Paint the surface of tank with approved quality paint and fill new oil.
3. Change the rear frame, chute box and wing frame of screening unit.
4. Check the bogie pivot for wear and attend as necessary.
5. Change the scraper pads and skirt rubbers of all conveyors.
6. Check all the stopcocks and flow control valves and change if required.
7. Check shock absorber and replace / repair as necessary.
8. Replace defective switches and potentiometers.
9. Repair/replace screen frame.
10. Replace bearing of cutting chain drive gearbox, if required.
11. Replace bearing of excavating unit.
12. Check the wheel tyre profile.
13. Check the brake system.
14. Replace all the hydraulic hoses along-with clamps.
15. Check all hydraulic cylinders, Change if necessary.
16. Check and clean hydraulic oil cooler.
17. Replace air unloader.
18. Test air tank for leakage.
19. Change all the brake shoes.
20. Check the axle bearing and grease them.

21. Change mounting pad of all gearboxes.
22. Overhaul the bogies.
23. Check the calibration of all the indicative instruments and replace the defective ones.
24. Replace all the limit switches on condition basis.
25. Check the LED of all solenoids.
26. Overhaul all the panel boxes.
27. Arrange insulation test of main cables and replace the defective ones.
28. Provide missing thimbles.
29. Replace all the defective PCBs.
30. Strengthen the machine frame where cracks have developed.
31. Flush the complete system.
32. Fill new oil after replacing return line and suction filters.
33. Check the function of all assemblies.
34. Test the machine for one week before it is put for actual working in section on regular basis.
35. Overhaul the cutting unit.
36. Replace excavating belts, supports pipes, chains and acrylic strip of excavating units .
37. Replace distributing conveyors and waste conveyor.
38. Check wheel and axle cracks by ultrasonic testing

General Safety Notes

1. The machine has to be operated to existing Indian Railways rules and regulations.
2. The safety of yourself and other people is most important consideration in the operation and maintenance of the machine.
3. Remember the machine is a working unit, carrying delicate instruments. Therefore the machine should not be driven at excessive speed over bad track or turnouts.
4. Always keep your eyes open for other men working close to the machine.
5. Do not forget to look out for signals, switches and track obstructions.
6. Remember to make sure that all protection equipments and safety devices are in place on the machine and in working order especially when it is being driven from site-to-site.
7. Always, keep the machine clean. Excessive oil or grease on the machine can cause you to slip and fall and is also a potential for fire hazard.
8. Always lock the machine before you leave. Make sure that the machine is protected in accordance with railways regulations.
9. Do not permit un-authorized persons to operate the machine.
10. It is prohibited to use exposed light or fire on or near the machine.
11. Do not tow the machine if the final drive is engaged.

ACKNOWLEDGEMENT

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