



**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**

**MAINTENANCE SCHEDULE MANUAL
FOR
WORKSITE TAMPING MACHINE (PLASSER MAKE)**

REPORT NO.TM - 130

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PREFACE

Maintenance of On-Track Machines is a challenging task. 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. Final maintenance schedule manuals of CSM (09-32), BCM (RM-80), FRM-80, Unimat, Duomatic machine (DUO), Unomatic machine (UNO), Ballast Regulating Machine (BRM 66-4), Tamping Express (09-3X), Dynamic Track Stabilizer (DGS 62N), Multi purpose track tamping machine (Unimat Compact--M), Plasser's Quick Relaying System (PQRS), T-28, Track Relaying Train (TRT), Phooltas make UTV, FRM-85-F have been issued by RDSO.

Provisional maintenance schedule manual of Worksite Tamping Machine (Plasser make) was earlier issued vide letter no. TM/HM/15 dated 29-05-03. Maintenance schedule manual of Worksite Tamping Machine (Plasser make) have been prepared after necessary amendment in provisional manual on the basis of experience and suggestions received from railways.

It is hoped that this manual will be quite useful for the staff maintaining the machines in field.

While every care have 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 may be sent to the undersigned.

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EXPLANATORY NOTES

While preparing text of Maintenance Schedules Manual for Work Site Tamping machine (Plasser make), 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 - Remove old parts by substituting a new or overhauled/reconditioned part. Fit new or overhauled / reconditioned part in place of missing part.

- 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 HOUR**

1. ENGINE:

- i) Check the engine oil level and top up if required.
- ii) Check coolant level in radiator
- iii) Check and prevent water leakage, if any.
- iv) Check the air cleaner element indicator. If indicator is red, the outer filter is to be cleaned.
- v) Check the tension and condition of V-belts and correct it if required.
- vi) Drain the air tanks after the day's work.
- vii) Drain the water separator before starting the engine.
- viii) Record the maximum engine temperature of the day's work.
- ix) Check the engine oil pressure at:
 - a) Idle
 - b) On load after two hrs. working
- x) Clean the engine and premises.
- xi) Check the unusual vibrations from machine.

2. MACHINE GENERAL:

- i) Check and top up the oil reservoir for lubrication of vibration shaft main bearing.
- ii) Drain the water separator before starting the engine.
- iii) Check and top up the oil reservoir for lubrication of tamping arm bearing
- iv) Check the oil level of wick lubricator for lubrication of guide columns and top up with hydraulic oil, if required.
- v) Check the locking and unlocking of tamping units.
- vi) Check the worn out tamping tools (limit 20% on area basis), and change if required.
- vii) Check the tightness and infringement of tamping tools with one another.
- viii) Check locking of lifting/lining units.
- ix) Lubricate all the lining roller pins with grease.
- x) Apply lube oil on bush bearings of feeler rods of shadow board trolley.
- xi) Check the hydraulic hoses for leakage and replace, if required.
- xii) Top up the air oiler with hydraulic oil.
- xiii) Check and top up the hydraulic oil tank. If required.
- xiv) Check and prevent for any air leakage from the system, if any.
- xv) Check the air brake pressure (3.8 bars on locking condition).
- xvi) Check the brake application.
- xvii) Check for any unusual sound from machine.
- xviii) Record the maximum hydraulic temperature of the day's work.
- xix) Observe the leakage from all gear boxes
- xx) Greasing of connecting rod bearing, vibration shaft, eye and fork end of squeezing cylinders is to be done after two hours of working.
- xxi) Clean the dust pan.

SCHEDULE - II

(TO BE DONE AFTER 50 HOURS OF ENGINE RUNNING) DURATION- TWO HOURS

1. ENGINE:

- i) Check the leakage from fuel line.
- ii) Check the engine oil pressure on load after two hours of working.
- iii) Lubricate the radiator fan shaft with grease.

2. MACHINE GENERAL:

- i) Check the oil level of power shift gear box and top up ,if required.
- ii) Check the oil level of distribution gear box and top up if required
- iii) Check the oil level of hydraulic working drive reduction gear box and top up if required.
- iv) Check the oil level of axle gear boxes and top up if required.
- v) Check the oil level of drive intermediate shaft and top up if required
- vi) Lubricate axle gear box flange cover with grease.
- vii) Lubricate the tamping unit frame guide bushes with grease.
- viii) Lubricate the lifting unit with grease.
- ix) Clean and lubricate the thrust plate of front and rear feeler with grease.
- x) Lubricate the guide bushing of front, middle and rear feeler with engine oil.
- xi) Lubricate the pivot of middle feeler with grease.
- xii) Lubricate all other moving parts except above with oil or grease.
- xiii) Check and clean the oiler and fill up with the new hydraulic oil.
- xiv) Lubricate all ball and socket joints.
- xv) Check pneumatic cylinders for air leakage.
- xvi) Check all lights for proper functioning.
- xvii) Check the bolts of cover plate of squeezing cylinders for tightness.
- xviii) Check the tightness of tamping cylinders holding bracket bolts.
- xix) Lubricate all other moving parts except above with oil or grease.

SCHEDULE – III

**(TO BE DONE AFTER 100 HOURS OF ENGINE RUNNING)
DURATION- ONE DAY**

1. ENGINE:

- i) Check high water temperature safety device.
- ii) Check low lube oil pressure safety device.
- iii) Clean outer air cleaner element by pressurized air.
- iv) Check the throttle control linkage.
- v) Examine the mounting bolts of the engine.
- vi) Check the battery terminals and connections for tightness.
- vii) Check specific gravity of battery electrolyte

2. MACHINE GENERAL:

- i) Inspect the water separator for proper functioning.
- ii) Lubricate all the cardan shafts with grease.
- iii) Inspect the bolts of cardan shafts for tightness.
- iv) Lubricate the tamping unit lateral adjusting cylinder with grease.
- v) Check universal joints for play and replace if required.
- vi) Grease the air brake linkage.
- vii) Examine the fire extinguisher.
- viii) Lubricate the bogie turning king pin pivot with grease.

SCHEDULE-IV

(TO BE DONE AFTER 200,400,600 and 800 HOURS OF ENGINE RUNNING)
DURATION-TWO DAYS

1. ENGINE:

- i) Change the engine oil.
- ii) Change lube oil filter element.
- iii) Change fuel filter element.
- iv) Check air cleaner indicator and condition of air cleaner element.
- v) Lubricate all the engine pulleys with grease.
- vi) Replace the super lube oil by- pass filter element.
- vii) Clean crank case breather.
- viii) Check for hub drive pulley and water pump.

Note : Item no. i, ii and iii will be done after 300 engine hrs.

2. MACHINE GENERAL:

- i) Lubricate the torque arm pivot of powered bogie with grease.
- ii) Check the condition of brake shoes.
- iii) Lubricate the brake linkages of powered bogie with grease.
- iv) Lubricate the hand brake gear of idle bogie with grease.
- v) Replace the hydraulic oil of reservoir for lubrication of vibration shaft main bearing.
- vi) Lubricate the pre load cylinder of front tightening, lining and measuring trolley with grease
- vii) Lubricate the lifting cylinder of lining and measuring trolley with grease.
- viii) Replace the servo filter element.
- ix) Replace the proportional valve filter element.
- x) Replace the return line filter element.
- xi) Replace the filter element of power shift gear box.
- xii) Change the air dryer cartridge.
- xiii) Change the oil of hydraulic working drive reduction box.
- xiv) Change the oil of power shift gear box.
- xv) Change the oil of axle gear boxes.
- xvi) Change the oil of drive intermediate shaft.
- xvii) Change the oil of distribution gear box.

Note: Item no. xi to xvi will be done after 500 engine hrs.

SCHEDULE-V
(IOH)
(TO BE DONE AFTER 1000,3000,5000 HOURS OF ENGINE RUNNING)
DURATION- 7 DAYS

1. ENGINE:

- i) Change worn out water hoses.
- ii) Check coolant for PH value (8.5-10.0).
- iii) Overhaul the self starter.
- iv) Overhaul both the alternator.
- v) Overhaul the injectors.
- vi) Overhaul the fuel injection pump
- vii) Replace the rocker cover gaskets.
- viii) Clean the engine radiator externally.
- ix) Replace the outer and inner engine air cleaner element.
- x) Check the condition and tightness of V-belt for radiator fan.
- xi) Clean the diesel tank.
- xii) Clean the cooling coil.
- xiii) Replace the batteries on condition basis.
- xiv) Check the water pump idler and fan hub idler pulley.
- xv) Replace minor repair kit for air compressor.

2. MACHINE GENERAL:

- i) Send the hydraulic oil for chemical testing.
- ii) Clean the hydraulic oil tank.
- iii) Clean the hydraulic oil through 10 μ if found OK in chemical testing otherwise fill new oil.
- iv) Check the bearings of all the axles and lubricate with grease.
- v) Check the condition of meggi springs and replace them if required.
- vi) Recondition the worn out wheels of all trolleys, if required.
- vii) Check bearing of trolley wheels and lubricate them with grease.
- viii) Clean and check the air reservoir for rated air pressure.
- ix) Overhaul/ Replace the tamping units, if required.
- x) Overhaul/Replace the lifting units, if required.
- xi) Replace the hydraulic hoses, which are damaged.
- xii) Replace the seals of leaking hydraulic cylinders, If any.
- xiii) Overhaul all the transducers.
- xiv) Replace the defective transducer fork.
- xv) Thoroughly clean all the panel boxes with pressurized air.
- xvi) Check the wire connections in panel boxes.
- xvii) Replace defective or missing lights.
- xviii) Calibrate the sensing trolleys for level.
- xix) Strengthen the machine frame where cracks have been developed.
- xx) Replace the brake shoes.
- xxi) Check backlash of axle drive pinion. Attend if necessary.
- xxii) Change lubricant of hand brake gear.
- xxiii) Test the machine on track for all functions.

SCHEDULE-VI
(IOH)
(TO BE DONE AFTER 2000 AND 4000 HOURS OF ENGINE RUNNING)
DURATION - 45 DAYS

1. ENGINE:

- i) Overhaul the engine, if there is lack of compression on low lube oil pressure otherwise de- carbonize the engine
- ii) Overhaul the air compressor.
- iii) Check the bearing and shaft of radiator fan drive. If found O.K. then lubricate it with grease.
- iv) Replace all the water hoses
- v) Overhaul the water separator and air oiler
- vi) Overhaul the air unloader
- vii) Check turbocharger compressor and turbine wheels. Check radial and end clearances.
- viii) Check crank shaft end clearance.
- ix) Check the vibration damper for dynamic balance.
- x) Replace fuel pump screen filter.

2. MACHINE GENERAL:

- i) Replace the seal of brake cylinders.
- ii) Inspect functioning of limit switches.
- iii) Clean and repair the hydraulic oil cooler, if it is blocked more than 20% or badly leaking.
- iv) Check the hydraulic motors for rated delivery and replace if required.
- v) Replace the damaged and chocked pneumatic pipes.
- vi) Overhaul all the pneumatic valves and change unserviceable ones.
- vii) Replace the seals of all pneumatic cylinders.
- viii) Check the machine wheels for tyre defects. Reprofile or replace if required.
- ix) Replace the defective switches and potentiometer.
- x) Overhaul all the transducers.
- xi) Replace the cartridge of air dryer.
- xii) Calibrate the machine on track for all functions.

SCHEDULE-VII
(POH)
(TO BE DONE AFTER 6000 HOURS OF ENGINE RUNNING)
DURATION-90 DAYS

1. ENGINE:

- i) Overhaul or replace the engine.
- ii) Overhaul the radiator fan drive assembly.
- iii) Replace the engine mounting pads.
- iv) Check the engine damper for dynamic balance
- v) Replace the water separator and air oiler.
- vi) Replace the air unloader

2. MACHINE GENERAL:

- i) Replace all hydraulic pumps
- ii) Check and recharge the hydraulic accumulators
- iii) Replace all the hydraulic motors.
- iv) Replace the hydraulic cylinders on condition basis otherwise replace all the seals.
- v) Replace all the D.C. and pilot operated valves.
- vi) Get calibrated the proportional valve, if possible; otherwise replace it with new one.
- vii) Replace all pressure control valves.
- viii) Check the functioning of all stopcock and flow control valves, if anyone found defective then replace it with new ones.
- ix) Replace all hydraulic hoses along with crimped fittings.
- x) Clean the hydraulic tank. Inside to be painted with approved quality paint.
- xi) Flush the complete hydraulic system.
- xii) Replace all pneumatic hoses.
- xiii) Check and clean the cooling coil.
- xiv) Test the air tank for rated air pressure.
- xv) Replace all pneumatic valves.
- xvi) Replace the pneumatic cylinders on condition basis, which were creating the frequent trouble during work. Otherwise replace seals only.
- xvii) Renew the complete wiring of the machine if existing wiring found more than 40% damaged otherwise replace only the damaged circuits.
- xviii) Overhaul the brake cylinders and replace the seals if cylinder is o.k.
- xix) Overhaul the sensing trolleys.
- xx) Re-profile all the trolley wheels.

- xxi) Replace the axle bearings.
- xxii) Overhaul all the gear boxes.
- xxiii) Overhaul the cardan shafts.
- xxiv) Repair or replace the defective PCB's.
- xxv) Check the limit switches and replace on condition basis.
- xxvi) Overhaul the pendulums.
- xxvii) Overhaul the panel boxes and provide thimbles as required.
- xxviii) Replace the defective switches and indicator lights.
- xxix) Check and replace the defective LED's of solenoids if required.
- xxx) Calibrate all the potentiometers for zero correction.
- xxxi) Check the machine frame for crack and strengthen as necessary
- xxxii) Paint the complete machine with approved quality paint.
- xxxiii) Calibrate the machine in all respects.

Annexure- I

IMPORTANT DATA AND INSTRUCTIONS FOR MAINTENANCE OF MACHINE

1. Working pressure 130-140bar
2. Tamping unit vibration pressure 150 bar
3. Squeezing pressure 90-135 bar
4. Minimum thickness of brake block 13 mm
5. Minimum clearance between brake block and wheel 3-5mm
6. For examination of fire extinguisher check as per instruction of manufacturer (seal should be intact and nozzle should be free from obstructions).
7. Oil used as damping oil in pendulums silicon oil (M200/12500)
8. Never operate the engine with oil level below low mark or above the high mark.
9. Keep the oil level as near high mark as possible.
11. Check the oil level of power shift gear box at 1200RPM
For lower level at 40°C
For upper level at 80°C
12. When greasing and lubricating, remove excessive grease or oil before re-greasing and re-lubrication the machine parts.

GENERAL SAFETY NOTES.

1. The machine has to be operated according to existing Indian Railways Rules & 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 crossing.
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. Make sure that all protection equipment 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 to potential fire hazard.
8. Always lock the machine before you leave. Make sure that the machine is protected in accordance with railway regulations.
9. Whenever you have the opportunity while waiting to get out on a job, do some of the smaller maintenance job, such as tightening loose nuts and bolts and cleaning the machine.
10. Do not permit unauthorized persons to operate the machine.
11. It is prohibited to use fire on or near the machine.
12. When ever going for working on or near the tamping bank area, operate the emergency push button and ensure latching position.
13. Do not tow the machine if the final drive is engaged.

ACKNOWLEDGEMENT

Following officers and staff have made their valuable contributions in finalization of Maintenance Schedule manual for Worksite Tamping Machine (Plasser make).

RAILWAYS

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