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भारत सरकार
रेल मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

यूनोमैटिक टाई टैम्पिंग मशीन (08-16)
के लिए
अनुरक्षण अनुसूची

MAINTENANCE SCHEDULE MANUAL
FOR
UNOMATIC TIE TAMPING MACHINE (08-16)

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PREFACE

Maintenance of On-Track Machine is a challenging task before the Indian Railways. Presently, about 419 On-Track Machines are working over railways. Maintenance of these machines is being done by zonal railways with the assistance of local trade available, CPOH / Allahabad and RDSO / Lucknow. With their 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. It has, therefore, become imperative to have a uniform maintenance standard throughout the Indian Railways. Maintenance Schedule Manuals for Continuous Action Tamping Machine (09-CSM), Points and Crossing Tamping Machine (UNIMAT), Ballast Cleaning Machine (RM-80), Shoulder Ballast Cleaning Machine (FRM-80) and provisional Maintenance Schedule Manuals of Dynamic Track Stabilizer (DGS-62N), Ballast Regulating Machine (BRM), Points and Crossings Changing Machine (T-28), Plasser Quick Relaying System (PQRS), Multi Purpose Tamping machine, Track relaying Train (P811S) and Tie Tamping Machine (DUO) have been issued by RDSO. The preparation of Maintenance Schedule Manuals for Tie Tamping Machine (UNO) is an effort in the same direction.

While preparing these schedules recommendation of the Original Equipment Manufacturer (OEM) and experience of the zonal railways have been taken into account. Variations in operating conditions in different regions may make it necessary to introduce examination of certain items which have not been prescribed herein or to carry out maintenance at somewhat differing periodicity. The Railways in all such cases should bring this to the notice of the Track Machines & Monitoring Directorate of RDSO for any modifications to the schedule giving full details. Whenever, any scheduled examination, except trip (break down) examination is carried out, all the items of the lower schedules should also be attended to.

While every care has been taken to make the Maintenance Schedule Manuals 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 Maintenance Schedules Manual for Unomatic Tie Tamping machine (08-16), 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) Record the maximum engine temperature of the day's work.
- ii) Check the engine oil level and top up if required.
- iii) Check water level in radiator.
- iv) Check and rectify the water leaks.
- v) Check the air cleaner element indicator.
- vi) Check the tension and condition of V-belts and correct it if required.
- vii) Drain the sediments from the fuel tank.
- viii) Drain the air tanks after the day's work.
- ix) Drain the water separator before starting the work.
- x) Record the engine oil pressure of the day.
 - a) at idle
 - b) on load after two hours of working.
- xi) Clean the engine and premises.
- xii) Check the charging of batteries.
- xiii) Check the fuel level.
- xiv) Check the leakage from fuel line.

2. MACHINE GENERAL:

- i) Check and top up the hydraulic oil tank, if required.
- ii) Check the level of tanks for lubrication of guide columns and top up with hydraulic oil, if required.
- iii) Lubricate eye and fork end of every squeezing cylinder with grease.
- iv) Change the worn out tamping tools.
- vi) Check the tightness and infringement of tamping tools with one another.
- vii) Check locking device of all units.
- viii) Lubricate all the lining roller pins with grease.
- ix) Check leakages from hydraulic hose connections.
- x) Check for any air leakage from the system.
- xi) Check the air brake pressure.
- xii) Check for any unusual sound from machine.
- xiii) Record the maximum hydraulic temperature of the day's work.
- xiv) Observe the leakage from all gear boxes.
- xv) Check the level of tank for lubrication of tamping arm and main bearings.
- xvi) Check the level of main gear box.
- xvii) Lubricate the vibration shaft bearing with grease.
- xviii) Check the tightness of cardan shaft bolts.
- xix) ~~xxx~~ Check the brake application.

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SCHEDULE - II

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

1. ENGINE:

- i) Check the water manifolds and hose pipes for any leakage.
- ii) Lubricate the radiator fan shaft with grease.
- iii) Check battery terminals and connection for tightness.
- iv) Clean the air filter (outer).
- v) Check the specific gravity of batteries.

2. MACHINE GENERAL:

- i) Check the condition of brake shoes
- ii) Check the oil level of all gear boxes and top up if required.
- iii) Lubricate the axle gear box flange cover with grease.
- iv) Lubricate the guide bushing of front and rear feeler with engine oil.
- v) Grease all cadan shaft.
- vi) Grease flange of driving axle.
- vii) Lubricate all link rods, pivots and rocker bearing of all assemblies.
- viii) Grease lifting/lining unit assembly.
- ix) Check the tightness of 55mm and 35mm pin.
- x) Check bolts/welding of holding brackets of tamping units.
- xi) Check nuts and bolts of suspension block of tamping units.
- xii) Check/clean air breather of tamping units and gear boxes.
- xiii) Lubricate the feeler rods with grease.
- xiv) Clean and lubricate the guide rods of lining trolley with engine oil.
- xv) Lubricate all other moving parts except above with oil or grease.
- xvi) Check and clean the air oiler and fill up with new hydraulic oil.
- xvii) Check air leakage from pneumatic system.
- xviii) Check all lights for proper functioning.
- xix) Check the bolts of cover plate of squeezing cylinders for tightness.

SCHEDULE – III

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

1. ENGINE :

- i) Check limit switch for proper functioning.
- ii) Clean outer air cleaner element by pressurized air
- iii) Check engine safety devices.
- iv) Check and do oiling and greasing of hand brake.

2. MACHINE GENERAL:

- i) Inspect the hydraulic pumps for any abnormal sound.
- ii) Inspect the hydraulic motor for any abnormal sound.
- iii) Inspect the water separator for proper functioning.
- iv) Lubricate the tamping unit lateral adjusting cylinder guide rod with grease.
- v) Examine the expiry date of the fire extinguisher.
- vi) Check tightness of tamping unit lifting/lowering cylinder piston rod.
- vii) Inspect main gear box cover through inspection window.
- viii) Check hydraulic system pressure.
- ix) Check vibration pressure.
- x) Check squeezing pressure.

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SCHEDULE-IV

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

1. ENGINE:

- i) Check the engine cylinder head bolts.
- ii) Change fuel filter element.
- iii) Lubricate all the engine pulleys with grease.
- iv) Clean engine and premises.
- v) Change the lube oil filter.
- vi) Replace the super by pass filter.
- vii) Change the lube oil
- viii) Change V belts.
- ix) Change air cleaner elements.

Note: i) Item no. (ii),(v),(vi) and (vii) will be done after 300 engine hrs.
ii) Item no. (ix) will be done after 500 engine hrs.

2. MACHINE GENERAL:

- i) Replace the hydraulic oil of reservoir for lubrication of vibration shaft main bearing.
- ii) Lubricate the pre load cylinder of front tightening, lining and measuring trolley with grease.
- iii) Lubricate the lifting cylinder of lining and measuring trolley with grease.
- iv) Replace the proportional valve filter element.
- v) Replace the return line filter element.
- vi) Change the oil of distributor gear box.
- vii) Change the oil of drive intermediate shaft and main gear box.
- viii) Change the oil of six speed gear box.
- ix) Change the oil of reversing gear box.
- x) Change the oil of axle gear boxes.
- xi) Change suction filter.

Note: Item no. (vi),(viii),(ix),(x) and (xi) will be done after 500 engine hrs.

SCHEDULE-V

(10H) - *overhaul*

(TO BE DONE AFTER 1000,3000,5000 HOURS OF ENGINE RUNNING)

DURATION- 7 DAYS

1. ENGINE:

- i) Overhaul both the alternator.
- ii) Overhaul the self starter.
- iii) Overhaul the injectors.
- iv) Overhaul the fuel injection pump.
- v) Check the RPM of engine radiator fan.
- vi) Clean the diesel tank.
- vii) Clean the cooling coil.
- viii) Replace the batteries on condition basis.
- ix) Replace water hoses on condition basis
- x) Examine the mounting bolts of the engine.

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 fil 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.
- 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 the missing or defective lights.
- xviii) Calibrate the sensing trolleys.
- xix) Strengthen the machine frame where cracks have been developed.
- xx) Test the machine on track for all functions.
- xxi) Replace the brake shoes.

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

1. ENGINE:

- i) Top overhaul the engine, if required.
- ii) Replace all the water hoses.
- iii) Overhaul the water separator and air oiler.
- iv) Overhaul the air unloader.
- v) Clean the engine radiator.

2. MACHINE GENERAL:

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

SCHEDULE-VII

(POH) - → 10 000 hours of engine running

(TO BE DONE AFTER 6000 HOURS OF ENGINE RUNNING)

DURATION-90 DAYS

1. ENGINE:

- i) Overhaul or replace the engine on condition basis.
- ii) Check the engine damper for dynamic balance.
- iii) Overhaul the radiator fan drive assembly.
- iv) Replace the engine mounting pads.
- v) Replace the water separator and air oiler.
- vi) Replace the air unloader.
- vii) Overhaul the fuel injector.
- viii) Overhaul the fuel injection pump.
- ix) Overhaul the self starter.
- x) Overhaul both the alternator.
- xi) Replace all the water hoses.
- xii) Overhaul the water pump.
- xiii) Change engine air cleaner elements.
- xiv) Change all engine filters along with lube oil.
- xv) Clean the diesel tank.
- xvi) Check and clean the cooling coil.

2. MACHINE GENERAL:

- i) Replace all hydraulic pumps
- ii) Replace all the hydraulic motors
- iii) Check and recharge the hydraulic accumulators.
- 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 ones.
- 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.

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- 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) Test the air tank for rated air pressure.
- xiv) Replace all pneumatic valves.
- xv) Replace the pneumatic cylinders on condition basis, which were creating the frequent trouble during work. Otherwise replace seals only.
- xvi) Overhaul the brake cylinders and replace the seals if cylinder is o.k. ✓
- xvii) Overhaul the sensing trolleys.
- xviii) Re-profile all the trolley wheels.
- xix) Replace the axle bearings.
- xx) Overhaul all the gear boxes.
- xxi) Overhaul the cardan shafts.
- xxii) Repair or replace the defective PCB's.
- xxiii) Check the limit switches and replace on condition basis.
- xxiv) Overhaul the pendulums.
- xxv) Overhaul the panel boxes and provide thimbles as required.
- xxvi) Replace the defective switches and indicator lights.
- xxvii) Check and replace the defective LED's of solenoids if required.
- xxviii) Calibrate all the potentiometers for zero correction.
- xxix) Calibrate the machine in all respects.
- xxx) Paint the complete machine with approved quality paint.

IMPORTANT DATA AND INSTRUCTIONS FOR MAINTENANCE OF MACHINE

- i) Working pressure 130-140bar
- ii) Tamping unit vibration pressure 150 bar
- iii) Squeezing pressure 90-135 bar
- iv) Minimum thickness of brake block 13 mm
- v) Minimum clearance between brake block and wheel. 3-5mm
- vi) Stroke of brake cylinder 60 mm Max.
- vii) Fire extinguisher Check the expiry date, seal should be intact and nozzle should be free from obstructions.
- viii) Oil used as damping oil in pendulums silicon oil M200/12500
- ix) Never operate the engine with oil level below low mark or above the high mark.
- x) Keep the oil level as near high mark as possible.
- xi) Check the engine oil level at operative temperature at least after 2 minutes after turning off the engine.
- xii) When greasing and lubricating, remove excessive grease or oil before re-greasing and re-lubrication the machine parts.

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Consumables To Be Used

S.N.	Section	Lubricant	Grade	Frequency
1.	Engine Crank Case	Lube oil	API CF4-15W40	300 Hrs
2.	All gear boxes	Gear oil	C-90	500Hrs
3.	Working system	Hydraulic oil	Hydraulic oil approved by RDSO	6000Hrs
4.	Air oiler	Hydraulic oil	Same as working system	50 hours
5.	Clutch assembly	Brake oil	Brake fluid	----
6.	Axle bearing and all greasing points.	Grease	MP2 or RR3	As per schedules
7.	King pin pivots	Lube oil	API CF4-15W40	-----
8.	Radiator	Coolant	Premixed coolant or prepared coolant additive concentrate	Daily
9.	Vibration shaft main bearing, guide columns and 55 mm pin	Hydraulic oil	Same as working system	Daily
10.	Distributor, six speed and reversing gear box	Gear oil	C-90	500 hours
11.	Main gear box and drive intermediate shaft	Gear oil	C-90	200 hours

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.

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ACKNOWLEDGEMENT

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RAILWAYS

1. Shri R.K. Verma JE-I/TMC/NR

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