



**GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS**

# **MAINTENANCE SCHEDULE MANUAL OF MULTIPURPOSE TRACK TAMPING MACHINE (UNIMAT COMPACT - M)**



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**RESEARCH DESIGNS & STANDARDS ORGANISATION  
LUCKNOW- 226 011**

## **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, Rayanapadu, Kachrapara & Ahmedabad 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 of multipurpose track tamping machine (Unimat compact - M), Rev.01 has been prepared on the basis of maintenance instruction given by OEM. The manual is prepared for those items which is required day to day maintenance. Apart from these instruction if any part of machine fails/breakdown that shall be attended immediately by the railway. The oiling and greasing shall be done of every moving parts where as required in addition to manual depending on discretion of machine in charge. Some time machine modified/alterd on the basis of experience or OEM suggestion that shall be also undertaken in the maintenance practice. If the Engine of machine is under AMC then instruction/maintenance schedule of repairing/alteration of Engine may be followed as per term and condition of this manual.

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 may be sent to the undersigned for future improvement.

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Feb. -2021

## EXPLANATORY NOTES

While preparing Maintenance Schedule of Multipurpose Track Tamping Machine (Unimat Compact - M), Rev.- 01, 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.

### MAINTENANCE SCHEDULE MANUAL FOR MULTIPURPOSE TRACK TAMPING MACHINE (UNIMAT COMPACT - M)

S.N.	Schedule	Periodicity	Duration	Location
1.	Schedule I	Daily/ before working & running	One hour.	In the Track Machine Siding
2.	Schedule II	50 Engine hrs.	Two hrs.	-do-
3.	Schedule III	100 Engine hrs.	One day	-do-
4.	Schedule IV	200 Engine hrs.	Two days	-do-
5.	Schedule V	1000 Engine hrs.	7 days	In Satellite Depot/Zonal Workshop
6.	Schedule VI	2000 Engine hrs.	30 days	In Zonal Workshop
7.	Schedule VII	8000/6000 Engine hrs.	1st POH- 60 days, 2nd POH- 75 days	In CPOH Workshop

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Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
<b>1.</b>	<b>Engine CUMMINS NTA 855L-BC 339 BHP@2100 RPM</b>							
1.1	Check level of lube oil and top up if necessary.	√	X	X	X	X	X	X
1.2	Check and top up coolant/water in radiator.	√	X	X	X	X	X	X
1.3	Check the tension and condition of all V-belts.	√	X	X	X	X	X	X
1.4	Check and prevent leakage from fuel system, lube oil system and cooling system.	√	X	X	X	X	X	X
1.5	Check lubes oil pressure. Rated a) At idle RPM b) At rated RPM c) On load at rated RPM Actual 1 to 2 kg/cm <sup>2</sup> 3 to 7 kg/cm <sup>2</sup> 4 kg/cm <sup>2</sup>	√	X	X	X	X	X	X
1.6	Check air cleaner chocking indication & clean as required.	√	X	X	X	X	X	X
1.7	Check fuel level and fill up the tank as per requirements.	√	X	X	X	X	X	X
1.8	Check the battery charging system.	√	X	X	X	X	X	X
1.9	Record the maximum engine temperature of the day.	√	X	X	X	X	X	X
1.10	Clean the engine and premises.	√	X	X	X	X	X	X
1.11	Check outer air cleaner and clean it as necessary with 2.5 bar dry air.	X	√	X	X	X	X	X
1.12	Check all water houses for any leakages.	X	√	X	X	X	X	X
1.13	Drain water / sediments from HSD oil tank.	X	√	X	X	X	X	X
1.14	Check electrolyte level and gravity (1240) of batteries.	X	√	X	X	X	X	X
1.15	Check whether the safety circuit of engine is functioning properly or not.	X	X	√	X	X	X	X
1.16	Check the battery connection and terminals and lubricate with petroleum jelly.	X	X	√	X	X	X	X
1.17	Check the functioning of water separator.	X	X	√	X	X	X	X
1.18	Check the functioning of air unloader.	X	X	√	X	X	X	X
1.19	Replace the engine oil.	X	X	√*	X	X	X	X
1.20	Replace the lube oil filters.	X	X	√*	X	X	X	X
1.21	Replace the lube oil by pass filter.	X	X	√*	X	X	X	X
1.22	Clean the engine breather filters.	X	X	√*	X	X	X	X
1.23	Replace the fuel filter element.	X	X	√*	X	X	X	X
1.24	Clean the screen filter element of fuel pump.	X	X	X	√	X	X	X
1.25	Clean the radiator fins by blowing air from opposite side.	X	X	X	√	X	X	X
1.26	Check the radiator hoses and replace if found damaged.	X	X	X	√	X	X	X
1.27	Replace the outer and inner engine air cleaner element.	X	X	X	X	√	X	X
* Every 300 ERH								

Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
1.28	Overhaul the air compressor.	X	X	X	X	√	X	X
1.29	Clean the cooling coil.	X	X	X	X	√	X	X
1.30	Clean the crank case air breather.	X	X	X	X	√	X	X
1.31	Overhaul the self starter.	X	X	X	X	√	X	X
1.32	Overhaul the alternators.	X	X	X	X	√	X	X
1.33	Check the bearing and shaft of radiator fan drive and change if required.	X	X	X	X	√	X	X
1.34	Check and adjust the engine timing and tapped clearance.	X	X	X	X	√	X	X
1.35	Clean the HSD oil tank.	X	X	X	X	√	X	X
1.36	Check and clean the air reservoir.	X	X	X	X	√	X	X
1.37	Recharge/replace the batteries.	X	X	X	X	X	√	X
1.38	Overhaul the engine, if required.	X	X	X	X	X	√	X
1.39	Overhaul the injectors.	X	X	X	X	X	√	X
1.40	Overhaul the fuel injection pump.	X	X	X	X	X	√	X
1.41	Overhaul the air compressor.	X	X	X	X	X	√	X
1.42	Overhaul the self starter.	X	X	X	X	X	√	X
1.43	Overhaul the alternator I & II.	X	X	X	X	X	√	X
1.44	Overhaul water pump.	X	X	X	X	X	√	X
1.45	Check the engine mounting pads.	X	X	X	X	X	√	X
1.46	Change water hoses if required.	X	X	X	X	X	√	X
1.47	Check engine damper for dynamic balance.	X	X	X	X	X	√	X
1.48	Check the RPM of engine radiator fan. Take corrective measures if required.	X	X	X	X	X	√	X
1.49	Overhaul /Replace the engine.	X	X	X	X	X	X	√
1.50	Overhaul the injectors.	X	X	X	X	X	X	√
1.51	Overhaul the fuel injection pump.	X	X	X	X	X	X	√
1.52	Overhaul the air compressor.	X	X	X	X	X	X	√
1.53	Overhaul the self starter.	X	X	X	X	X	X	√
1.54	Overhaul the alternators.	X	X	X	X	X	X	√
1.55	Overhaul the radiator fan drive assembly.	X	X	X	X	X	X	√
1.56	Clean the engine radiator internally & externally.	X	X	X	X	X	X	√
1.57	Replace the engine mounting pads.	X	X	X	X	X	X	√

Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
1.58	Replace the water hoses.	X	X	X	X	X	X	√
1.59	Overhaul the water pump.	X	X	X	X	X	X	√
1.60	Replace the engine air cleaner element, all engine filters and silencer muffler.	X	X	X	X	X	X	√
1.61	Inspect the engine damper for dynamic balance.	X	X	X	X	X	X	√
1.62	Check the RPM of engine radiator fan.	X	X	X	X	X	X	√
1.63	Clean the diesel tank.	X	X	X	X	X	X	√
1.64	Check the engine safety circuits.	X	X	X	X	X	X	√
<b>2.</b>	<b>HYDRAULIC</b>							
2.1	Check hydraulic oil level in hydraulic tank.	√	X	X	X	X	X	X
2.2	Record the maximum hydraulic temperature of the day's work.	√	X	X	X	X	X	X
2.3	Check and top up oil in tank for tamping unit arm bearing and guide columns.	√	X	X	X	X	X	X
2.4	Greasing and oiling tamping unit sliding bushes. (35 mm, 55 mm & 65mm)	√	X	X	X	X	X	X
2.5	Check the hydraulic. hoses and prevent the leakage, if observed.	√	X	X	X	X	X	X
2.6	Check all hydraulic hoses and valves for any leakage	√	X	X	X	X	X	X
2.7	Check any rubbing of hydraulic hoses.	√	X	X	X	X	X	X
2.8	Visually check filter choking indication.	√	X	X	X	X	X	X
2.9	Visually check, clean and lubricate all hydraulic cylinders clavis joint.	X	√	X	X	X	X	X
2.10	Replace ZF filter.	X	X	√*	X	X	X	X
2.11	Replace all suction line filters.	X	X	√**	X	X	X	X
2.12	Replace all return line filters.	X	X	X	√	X	X	X
2.13	Replace servo and proportional filter.	X	X	X	√	X	X	X
2.14	Perform chemical testing of hyd, oil If found O.K. then clean it with porta filter of 10μ and reuse it.	X	X	X	X	√	X	X
2.15	Clean the hydraulic tank and breather filter.	X	X	X	X	√	X	X
2.16	Check the hydraulic pumps for rated delivery on the test bench and replace if it is less than the demand of circuit.	X	X	X	X	X	√	X
2.17	Check the hydraulic motors for rated torque and replace, if required.	X	X	X	X	X	√	X
2.18	Check the directional valves for leakage on the test bench, under rated pressure and replace, if required.	X	X	X	X	X	√	X
2.19	Replace the seals of all hydraulic cylinders along with gland bushes /piston and hone the cylinder barrel, if required.	X	X	X	X	X	√	X
* Every 300 ERH ** Every 500ERH								

Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
2.20	Clean the hydraulic reservoir, paint with approved quality of paint and fill new oil.	X	X	X	X	X	√	X
2.21	Recharge the accumulators.	X	X	X	X	X	√	X
2.22	Overhaul all pressure controls and replace their kits, if required.	X	X	X	X	X	√	X
2.23	Clean the hydraulic oil cooler and repair, if required.	X	X	X	X	X	√	X
2.24	Replace the hydraulic hoses on condition basis.	X	X	X	X	X	√	X
2.25	Replace all hydraulic pumps.	X	X	X	X	X	X	√
2.26	Replace all hydraulic motors.	X	X	X	X	X	X	√
2.27	Replace the hydraulic cylinders on condition basis.	X	X	X	X	X	X	√
2.28	Replace all hydraulic hoses.	X	X	X	X	X	X	√
2.29	Replace all hydraulic filters.	X	X	X	X	X	X	√
2.30	Clean the hydraulic tank.	X	X	X	X	X	X	√
2.31	Replace the hydraulic oil in hydraulic tank.	X	X	X	X	X	X	√
2.32	Clean hydraulic oil cooler.	X	X	X	X	X	X	√
2.33	Check the hydraulic accumulator and recharge it.	X	X	X	X	X	X	√
2.34	Replace the direct acting and pilot operated directional valve on condition basis.	X	X	X	X	X	X	√
2.35	Replace servo, proportional valve and logic valves on condition basis.	X	X	X	X	X	X	√
2.36	Replace all the pressure control valves/ unloader/relief/ and safety valves on condition basis.	X	X	X	X	X	X	√
2.37	Replace all the stop cock and flow control valves on condition basis.	X	X	X	X	X	X	√
2.38	Flush the complete hydraulic system.	X	X	X	X	X	X	√
<b>3.</b>	<b>PNEUMATIC</b>							
3.1	Check the function of air unloader, water separator for proper function.	√	X	X	X	X	X	X
3.2	Check all the pneumatic hoses for rubbing and leakages.	√	X	X	X	X	X	X
3.3	Check all the pneumatic cylinders for proper function.	√	X	X	X	X	X	X
3.4	Check the brake efficiency.	√	X	X	X	X	X	X
3.5	Check air brake pressure ( 3.8 bar on lock position of brake valve)	√	X	X	X	X	X	X
3.6	Check the level of the air oiler and fill as per requirement.	√	X	X	X	X	X	X
3.7	Check air brake application and parking brake application.	√	X	X	X	X	X	X
3.8	Drain the air reservoirs after day's work.	√	X	X	X	X	X	X
3.9	Replace the oil of air oiler with hyd. oil if found dirty otherwise top up.	X	√	X	X	X	X	X
3.10	Lubricate all the mounting pins of pneumatics cylinders.	X	√	X	X	X	X	X
3.11	Check the all brake shoes conditions and adjust the clearance gap.	X	√	X	X	X	X	X



Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
3.12	Clean cooling coils.	X	X	X	X	X	√	X
3.13	Overhaul/ Replace air unloader.	X	X	X	X	X	√	X
3.14	Overhaul water separator and air oiler.	X	X	X	X	X	√	X
3.15	Change damaged and choked pneumatic pipes if required.	X	X	X	X	X	√	X
3.16	Overhaul all pneumatic valves and change the unserviceable valves.	X	X	X	X	X	√	X
3.17	Change the seals of all pneumatic cylinders on condition basis.	X	X	X	X	X	√	X
3.18	Change the seals of pneumatic brake cylinders.	X	X	X	X	X	√	X
3.19	Clean the cooling coil.	X	X	X	X	X	X	√
3.20	Replace air unloaded.	X	X	X	X	X	X	√
3.21	Test air tanks for rated pressure.	X	X	X	X	X	X	√
3.22	Replace water separator and air oiler.	X	X	X	X	X	X	√
3.23	Change all pneumatic hoses.	X	X	X	X	X	X	√
3.24	Change all pneumatic valves.	X	X	X	X	X	X	√
3.25	Change all pneumatic cylinders on condition basis.	X	X	X	X	X	X	√
3.26	Overhaul the brake cylinders.	X	X	X	X	X	X	√
3.27	Change all the brake shoes.	X	X	X	X	X	X	√
<b>4.</b>	<b>MECHANICAL</b>							
4.1	Check all the locking devices.	√	X	X	X	X	X	X
4.2	Check all gear boxes for any leakages.	√	X	X	X	X	X	X
4.3	Check oil level of distribution gear box. (For machine no. up-to 2002)	√	X	X	X	X	X	X
4.4	Check the tightness of cardan shaft bolts.	√	X	X	X	X	X	X
4.5	Check the complete machine for any unusual sound and rectify the problem before block working.	√	X	X	X	X	X	X
4.6	Check and top up oil level of bottles for lubrication of guide columns.	√	X	X	X	X	X	X
4.7	Change the worn out tamping tools.	√	X	X	X	X	X	X
4.8	Clean the tamping banks.	√	X	X	X	X	X	X
4.9	Check all functions of the machine before block working.	√	X	X	X	X	X	X
4.10	Check the bolts of distributor of tamping unit	√	X	X	X	X	X	X
4.11	Check brake shoes & hand brake for efficient working.	√	X	X	X	X	X	X
4.12	Grease the tamping unit bearings and pins after every 2.0 hrs. Working.	√	X	X	X	X	X	X
4.13	Check lifting & lining units.	√	X	X	X	X	X	X

Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
4.14	Check Tamping unit up/down cylinder for any defects.	√	X	X	X	X	X	X
4.15	Check cabin and axle support cylinders for leakages/damages.	√	X	X	X	X	X	X
4.16	Check oil of level ZF gear box at 1200 RPM. Top up if required.	X	√	X	X	X	X	X
4.17	Grease the pivot of tamping tool adjusting cylinder.	X	√	X	X	X	X	X
4.18	Check the oil level in pump drive gear box and top up if required.	X	√	X	X	X	X	X
4.19	Lubricate the bearing of rear feeler rollers by lube oil.	X	√	X	X	X	X	X
4.20	Lubricate the guide bushes of front, middle and rear feeler rod by lube oil.	X	√	X	X	X	X	X
4.21	Clean the chord displacement assembly and grease it.	X	√	X	X	X	X	X
4.22	Check the oil level of axle gear boxes and top up if required.	X	√	X	X	X	X	X
4.23	Check the oil level of drive intermediate shaft of powered bogie and top up if required.	X	√	X	X	X	X	X
4.24	Grease the axle gear box flange cover of powered bogie.	X	√	X	X	X	X	X
4.25	Lubricate the fixing hinges of tamping cylinders with grease.	X	√	X	X	X	X	X
4.26	Clean and lubricate the guide plates of tamping cylinders with lube oil.	X	√	X	X	X	X	X
4.27	Lubricate the horizontal lifting hook guide of lifting and lining unit with grease.	X	√	X	X	X	X	X
4.28	Lubricate the bearing of lining rollers of lifting and lining unit with grease.	X	√	X	X	X	X	X
4.29	Lubricate the vertical lifting hook guide of lifting and lining unit with grease.	X	√	X	X	X	X	X
4.30	Lubricate the longitudinal guide of lifting and lining unit with grease.	X	√	X	X	X	X	X
4.31	Clean and lubricate the guide rod of middle feeler with lube oil.	X	√	X	X	X	X	X
4.32	Check the tension of leveling chord wire.	X	X	√	X	X	X	X
4.33	Check the condition of lining fork and replace if found damaged.	X	X	√	X	X	X	X
4.34	Check the condition of leveling and lining transducer chord wires and replace if found damaged.	X	X	√	X	X	X	X
4.35	Check the condition of brake shoes and replace if required.	X	X	√	X	X	X	X
4.36	Adjust the gap between wheel and brake shoes.	X	X	√	X	X	X	X
4.37	Check the operation of limit switch for brake shoes.	X	X	√	X	X	X	X
4.38	Replace the oil of axle gear boxes.	X	X	X	√	X	X	X

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4.39	Replace the oil of drive intermediate shaft of powered bogie.	X	X	X	√	X	X	X
4.40	Lubricate the cross bearing of cardan shaft between axle 2 –axle 1 of powered bogie with grease.	X	X	X	√	X	X	X
4.41	Lubricate the brake linkage of powered bogie with grease.	X	X	X	√	X	X	X
4.42	Lubricate the brake lever pivot with grease.	X	X	X	√	X	X	X
4.43	Lubricate the brake linkage of brake mechanism with lube oil.	X	X	X	√	X	X	X
4.44	Replace the hyd. oil of tank for vibration shaft main bearing.	X	X	X	√	X	X	X
4.45	Lubricate the rocker bearing of pre load and lifting cylinder of middle feeler rod with oil.	X	X	X	√	X	X	X
4.46	Replace the filter element for servo valve.	X	X	X	√	X	X	X
4.47	Replace the filter element for proportional valve.	X	X	X	√	X	X	X
4.48	Check the filter indicator of return line filter and replace the filter on condition basis.	X	X	X	√	X	X	X
4.49	Check the filter indicator of suction line filter and replace the filter on condition basis.	X	X	X	√	X	X	X
4.50	Check the calibration of X-level.	X	X	X	√	X	X	X
4.51	Check the calibration of lining.	X	X	X	√	X	X	X
4.52	Check the calibration of tamping unit depth.	X	X	X	√	X	X	X
4.53	Recondition the jaw of lifting hooks.	X	X	X	√	X	X	X
4.54	Lubricate the king pin pivot of powered bogie with grease.	X	X	X	X	√	X	X
4.55	Replace the grease of hand brake gear.	X	X	X	X	√	X	X
4.56	Check the bearing of all axles and grease them.	X	X	X	X	√	X	X
4.57	Check Maggie spring and replace if found damaged.	X	X	X	X	√	X	X
4.58	Check bearing of trolley wheels and grease them.	X	X	X	X	√	X	X
4.59	Check the condition and play of tamping units and replace/ overhaul ,if required.	X	X	X	X	√	X	X
4.60	Overhaul/ Replace the tamping units if required.	X	X	X	X	√	X	X
4.61	Overhaul/Replace the lifting units.	X	X	X	X	√	X	X
4.62	Check the function of all assemblies after IOH.	X	X	X	X	X	√	X
4.63	Calibrate the sensing equipments.	X	X	X	X	X	√	X
4.64	Test the machine for one week near the workshop, before it is put for work in regular section.	X	X	X	X	X	√	X
4.65	Overhaul the trollies and wheels of all the feeler rollers.	X	X	X	X	X	√	X
4.66	Strengthen the machine frame, where cracks have developed.	X	X	X	X	X	√	X

Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
4.67	Check the wheels for tyre defects, reprofile or replace, if required.	x	x	x	x	x	√	x
4.68	Check all gear boxes and repair, if required.	x	x	x	x	x	√	x
4.69	Replace the brake shoes.	x	x	x	x	x	√	x
4.70	Check with wheel distance gauge for loose or tight wheels.	x	x	x	x	x	√	x
4.71	Repair/replace all wheels, axles bearing housings and bearings.	x	x	x	x	x	√	x
4.72	Overhaul/Replace the tamping units.	x	x	x	x	x	x	√
4.73	Overhaul/ Replace the lifting units.	x	x	x	x	x	x	√
4.74	Overhaul the trollies, wheels & feeler rollers.	x	x	x	x	x	x	√
4.75	Strengthen machine frame where cracks have developed.	x	x	x	x	x	x	√
4.76	Check the wheels for tyre defects, reprofile or change the assembly, if required.	x	x	x	x	x	x	√
4.77	Check the axle bearings and grease them.	x	x	x	x	x	x	√
4.78	Axles may be replaced if the bearings are loose on the journal.	x	x	x	x	x	x	√
4.79	Complete machine to be painted as per approved paint scheme.	x	x	x	x	x	x	√
4.80	Overhaul the driving and idling bogies and replace the defective parts.	x	x	x	x	x	x	√
<b>5.</b>	<b>UNDER FRAME</b>							
<b>5.1</b>	<b>Under frame</b>							
5.1.1	Visually examine center pivot mounting bolts and attend if needed.	√	√	√	√	x	x	x
5.1.2	Check condition of head stock/sole bar.	√	√	√	√	√	√	√
5.1.3	Examine trough floor, turn under and other frame members from underneath for corrosion.	x	√*	x	x	√	√	√
5.1.4	Visually inspect center pivot cover	√	√	√	√	√	√	√
5.1.5	Visually examine and attend safety loops of bolster.	√	√	√	√	√	√	√
5.1.6	Thoroughly examine the centre pivot mounting bolts and replace, if needed.	x	x	x	x	√	√	√
<b>5.2</b>	<b>Brake rigging &amp; Brake System</b>							
5.2.1	Check and attend brake shoe head and key & replace if necessary.	√	√	√	√	√	√	√
5.2.2	Visually examine brake beams breakages/damages.	x	√	√	√	√	√	√
5.2.3	Visually inspect brake hangers, brake gear pins and cotters/split pins and replace if necessary.	√	√	√	√	√	√	√
5.2.4	Check brake gear and adjust so that the piston stroke is within the limit.	x	√	√	√	√	√	√
	* To be done after every 250 hrs							

Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
5.2.5	Visually inspect damaged/missing brake gear bushes, lever hanger pins replace if necessary.	x	x	x	x	√	√	√
5.2.6	Examine and attend brake levers.	x	√	√	√	√	√	√
5.2.7	Visually inspect for damage on brake pipe, replace if required	x	√	√	√	√	√	√
5.2.8	Check and attend brake beam safety wire rope/safety straps.	x	√	√	√	√	√	√
5.2.9	Visually check for hand brake chain rope, sprocket & floating lever and attend if needed.	x	√	√	√	√	√	√
5.2.10	Check of MU washer and attend if needed.	x	√	√	√	√	√	√
5.2.11	Check for cutoff angle cock and leakage, attend if needed.	x	√	√	√	√	√	√
5.2.12	Check and attend brake block adjuster.	x	√*	x	x	√	√	√
5.2.13	Check/Replace all types Torque arm plates, pins & bushes.	x	x	x	x	x	√	√
5.2.14	Check/Replace all Maggie flex washer, Maggie/Rubber springs/ Damper rubber.	x	x	x	x	x	√	√
5.2.15	Replace all brake reversal springs.	x	x	x	x	x	√	√
5.2.16	Repair/Replace all brake drum seals, cylinders & brake linkage rods.	x	x	x	x	x	√	√
<b>5.3</b>	<b>Bogie Frame &amp; Suspension</b>							
5.3.1	Visually examine the condition of bogie frame and welded locations.	x	√	√	√	√	√	√
5.3.2	Examine bolster safety straps/loops for damage/broken suspension system /missing	x	√	√	√	√	√	√
5.3.3	Visually examine the condition of suspension system (Coil spring) for any damage/loose/breakage.	x	√*	x	x	√	√	√
5.3.4	Examine condition of the wearing plates.	x	x	√**	x	√	√	√
5.3.5	Examine corrosion of sole bar and other under frame members with torchlight or inspection lamp.	x	x	√**	x	√	√	√
5.3.6	Visually examine the cabin and axle support cylinders for leakages/damages.	x	x	√**	x	√	√	√
<b>5.4</b>	<b>Draw Gear</b>							
5.4.1	Examine draw hook, draw bars, rubber pads for damages.	x	√	√	√	√	√	√
5.4.2	Examine visually draft key locking pins.	x	√	√	√	√	√	√
5.4.3	Check and replace damage/missing split pins.	x	√	√	√	√	√	√
5.4.4	Check condition of the CBC coupling and its components and replace as required	x	√	√	√	√	√	√
5.4.5	Check condition of draw beam and locating pins on it.	x	x	√	√	√	√	√
5.4.6	Ensure that wear on screw coupling shackle pins, trunion pins, shackle/link holes and draw hook holes should not exceed 3 mm	x	x	√**	x	√	√	√
	* To be done after every 250 hrs ** To be done after every 500 hrs							

Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
5.4.7	Remove the scale, rust, work hardened layers and surface cracks if any, by light grinding/filing	x	x	x	x	x	√	√
5.4.8	Use dye-penetration test for checking surface cracks in case of doubts	x	x	x	x	x	√	√
5.4.9	Inspect the draw hook for deformations & cracks. The neck, its pin hole, and the slot are vulnerable locations	x	x	x	x	x	√	√
<b>5.5</b>	<b>Buffing Gear</b>							
5.5.1	Visually examine buffer plungers for damages/ drooping /stroke length.	√	√	√	√	√	√	√
5.5.2	Examine buffer mounting bolts and attend if necessary.	√	√	√	√	√	√	√
5.5.3	Ensure the length is within 584-635 mm	x	x	√**	x	√	√	√
5.5.4	Inspect buffer plunger false plate for wear and profile.	x	x	√**	x	√	√	√
5.5.5	Check the draw bar for dimensional distortions and damaged threads.	x	x	x	x	x	√	√
5.5.6	Check the castle nuts for damaged threads, worn nut faces visually. Replace castle nuts if needed.	x	x	x	x	x	√	√
5.5.7	Test all draw bars by magna-glow equipment for surface cracks.	x	x	x	x	x	√	√
5.5.8	Load test draw bar (Stc. 60.61) at 39.5 t and those of (IS 5517 Gr. 35Mn6Mo3) at 60t. There should not be any permanent deformations.	x	x	x	x	x	√	√
5.5.9	Examine visually buffer casing for cracks/damages & height.	√	√	√	√	√	√	√
<b>5.6</b>	<b>Running Gear and Wheels</b>							
5.6.1	Examine visually axle box for grease oozing out, warm box if any	√	√	√	√	√	√	√
5.6.2	Visually inspect axle box covers.	√	√	√	√	√	√	√
5.6.3	Inspect wheel tread for shattered rim, spread rim, shelled tread, thermal cracks, heat checks	x	√	√	√	√	√	√
5.6.4	Visually examine wheel tyre profile and thickness of tyre and check with tyre profile gauge if they appear to be near condemning limit	x	x	√	√	√	√	√
5.6.5	Check with wheel distance gauge for loose or tight wheels.	x	x	√**	x	√	√	√
5.6.6	Repair/replace all wheels, axles bearing housings and bearings.	x	x	x	x	x	√	√
5.6.7	Fill all axles bearing housing with grease.	x	x	x	x	√	√	√
5.6.8	Repair/replace all gear boxes, seals & driving shaft assemblies.	x	x	x	x	x	√	√
<b>6.</b>	<b>ELECTRICAL</b>							
6.1	Check all lights, flashers, horns and gauges for proper function.	√	x	x	x	x	x	x
6.2	Check battery charging and battery voltage.	√	x	x	x	x	x	x
6.3	Check the mounting of alternators and self starters.	√	x	x	x	x	x	x
6.4	Check all the cables for any defect.	√	x	x	x	x	x	x
6.5	Check the solenoid socket connections.	x	x	√	x	x	x	x
	** To be done after every 500 hrs							

Sr. No.	ITEM	SCH.I Daily	SCH.II 50HRS	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS	SCH.VII 6000 HRS.
6.6	Inspect the chord wires of all transducers.	X	X	√	X	X	X	X
6.7	Thoroughly clean all panel boxes.	X	X	X	X	X	√	X
6.8	Provide missing thimbles.	X	X	X	X	X	√	X
6.9	Replace defective switches and potentiometers.	X	X	X	X	X	√	X
6.10	Replace defective indicative instruments.	X	X	X	X	X	√	X
6.11	Replace the batteries or as per conditions.	X	X	X	X	X	√	X
6.12	Overhaul the pendulums.	X	X	X	X	X	√	X
6.13	Overhaul all transducers and replace the chord wires.	X	X	X	X	X	√	X
6.14	Replace the missing or defective lights. (working, head, flasher etc)	X	X	X	X	X	√	X
6.15	Calibrate the machine for zero setting in all respect.	X	X	X	X	X	√	X
6.16	Replace the defective PCBs, Relays.	X	X	X	X	X	X	√
6.17	Replace the defective limit switches, Proximately switches, Digital button, voltmeter, hour meter and joysticks switches.	X	X	X	X	X	X	√
6.18	Calibrate all the indicative instruments.	X	X	X	X	X	X	√
6.19	Overhaul the pendulums.	X	X	X	X	X	X	√
6.20	Overhaul all the transducers.	X	X	X	X	X	X	√
6.21	Conduct insulation test of main cables and replace the defective ones.	X	X	X	X	X	X	√
6.22	Overhaul the panel boxes.	X	X	X	X	X	X	√
6.23	Defective switches and indicative lights may be replaced.	X	X	X	X	X	X	√
6.24	Check the LED of all the solenoids.	X	X	X	X	X	X	√
6.25	Check/Replace all defective electrical gauges.							
6.26	Check the calibration of digital potentiometers and replace the defective ones.	X	X	X	X	X	X	√
6.27	Calibrate the machine in all respect.	X	X	X	X	X	X	√

## List of Safety Equipments

S. No.	Description	Quantity
1.	Detonators in a tin case	1 box
2.	H.S. flag red	2 nos.
3.	H.S. flag green	1 no.
4.	H.S. Tri colour lamps/LED torch	2 nos.
5.	Chain & Padlock	1 set
6.	Switch Clamp with Padlock	2 nos.
7.	50 t jack with traverse*	1 no.
8.	20 t jack with traverse*	1 no.
9.	Crow bars	2 nos.
10.	Wooden blocks of different sizes	8 nos.
11.	Rail thermometer (dial type)	1 no.
12.	Banner flag	2 nos.
13.	Walkie Talkie with same frequency of SM, guard and loco pilots	2 nos.
14.	Portable telephone	1 no.
15.	First Aid Box	1 no.
16.	Skids	4 nos.
17.	Working time table of section where machine working	1 copy
18.	G&SR book with up to date amendment slips	1 copy
19.	4 cell flasher light/ LED torch, 6 watt (rechargeable)	1 no.
20.	Safety helmets	For each Machine staff
21.	Protective clothing, safety shoes and safety gloves	For each Machine staff
22.	High visibility warning clothes	For each Machine staff
23.	Track Machine Manual with up to date correction slip	1 no.
24.	Accident Manual	1 no.
25.	Fire extinguisher	1 no.
26.	Hooter (Manual/Remote)	2 nos.
27.	Hydraulic Hand Pump	1 no.
28.	Tail Lamp	1 no.
29.	Emergency pneumatic/Hydraulic hose off sizes (complete with end fittings)	1 set



**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 the maintenance schedule of Multipurpose Track Tamping Machine (Unimat compact - M), Rev.01)

### **RAILWAYS**

- |   |      |                   |             |
|---|------|-------------------|-------------|
| 1 | SHRI | RAM SARAN VERMA   | SSE/TMC/NCR |
| 2 | SHRI | MANOJ KUMAR GUPTA | SSE/TMC/WCR |

### **RDSO**

- |   |      |                        |         |
|---|------|------------------------|---------|
| 1 | SHRI | MUSLIM AHMAD           | ARE/TM  |
| 2 | SHRI | VED PRAKASH SRIVASTAVA | SSE/TM  |
| 3 | SHRI | SURENDRA KUMAR         | SSRE/TM |