



**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**

**MAINTENANCE SCHEDULES
FOR
TRACK RELAYING TRAIN
(TRT)**

REPORT NO. TM-104

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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 and draft maintenance schedule of FRM-85-F have been issued by RDSO.

Provisional maintenance schedule manual of Track Relaying Train (TRT) was earlier issued vide letter no. TM/HM/15 dated 23-09-2003. Maintenance schedule manual of TRT 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 schedule for Track Relaying Train (TRT), 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 or reconditioned part. Fit new or overhauled or 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
(DAILY)
DURATION - ONE HOUR

I. MAIN MACHINE:

1. Check the lube oil pressure on load after two hrs. working.
2. Check the engine oil level.
3. Check coolant level in radiator.
4. Check hydraulic oil level.
5. Check fuel level at the end of day's work.
6. Check oil level in air compressor.
7. Drain water from air receiver on handling car.
8. Drain water from air receiver on power car.
9. Grease bearings on old sleeper pick up shafts (to be done after two blocks).
10. Inspect the old sleeper pick up mechanism.
11. Inspect the sleeper drop area.
12. Inspect linkage on pump control.
13. Check the air cleaner indicator.
14. Check the cooling air zone.
15. Check the lower part of the oil bath air cleaner of backup engine for correct oil level and freedom from dirt. Replace oil, if sludge has formed.
16. Check the tightness of all nuts and bolts of fast wearing parts.
17. Check the sled chain for proper tension.
18. Lubricate the sled chain with lube oil.
19. Lubricate the N.T. rubber pad.

II. GANTRY :

1. Check the lube oil pressure of engine on load.
2. Check the condition and tension of V- belts of engine.
3. Check coolant level in radiator.
4. Check engine oil level.
5. Check fuel level.
6. Check hydraulic oil level.
7. Check pick up frame level, if required adjust with turn-buckles.
8. Check brakes application of gantry (after every block).
9. Check tightness of nuts and bolts.
10. Lubricate the gantry wheel with grease (to be done after every block).

III. CLIP APPLICATOR:

1. Check lube oil level.
2. Check fuel level.
3. Check tension of V-belts
4. Check battery connections.

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

I. MAIN MACHINE:

1. Check electrolyte level and gravity of batteries and top up the electrolyte if required.
2. Grease clutch and drive shaft universals (engine to hydraulic oil pump drive gear box).
3. Grease old sleepers pick up mechanism.
4. Grease new sleepers drop mechanism.
5. Grease magazine rollers.
6. Grease dynamic plow.
7. Grease conveyor shaft bearings.
8. Lubricate conveyor chain with oil.
9. Lubricate conveyor drive chain with oil.
10. Lubricate other points as per requirement.
11. Check conveyor chains for looseness and cracks.
12. Check conveyor drive chains.
13. Inspect rubber pads on sleeper conveyor chains and replace as per requirement.
14. Check oil in all gearboxes and fill up to required level.
15. Grease all cardan shafts.
16. Check rollers of the sled.
17. Check sprocket and chains of sled.
18. Check condition of fingers of pick up unit.

II. GANTRY:

1. Clean the battery terminals and apply petroleum jelly.
2. Check electrolyte level and gravity of batteries and top up the electrolyte if required.
3. Grease the clutch.
4. Grease intermediate gear bearing and gantry wheel bearing.
5. Check all functions of sleeper gripper.
6. Lubricate cardan shafts with grease.
7. Check condition of sprocket and chain and apply grease.
8. Adjust the brakes and check brake oil level.

III. CLIP APPLICATOR:

1. Check the condition and tension of V-belts.
2. Check electrolyte level and gravity of batteries and top up the electrolyte if required.
3. Check battery terminal connections.
4. Clean air cleaner.
5. Check driving chain for tightness.

SCHEDULE-III
AFTER 100 HOURS OF ENGINE RUNNING)
DURATION – ONE DAY

I. MAIN MACHINE:

1. Check all belts for wear and tension. Replace as per requirement.
2. Clean air filters outer elements.
3. Clean dust collector.
4. Lubricate drive shaft and universal joint with grease.
5. Check operation of emergency / traction stop switch.
6. Lubricate all thread in and thread out rollers with grease.
7. Lubricate linkage on pump control with grease.
8. Lubricate track laying frame stabilizer arms with grease.
9. Check hydraulic system for leakage.
10. Check water hoses of engine and replace if required.

II. GANTRY:

1. Clean air filter.
2. Check the tension of V-belts.
3. Check oil level of drive gearbox and fill up to required level.
4. Check water hoses of engine, replace if required.
5. Check lock pins of all bridges and gantry rails of all BRH's.

III. CLIP APPLICATOR:

1. Check condition of V-belts.
2. Clean engine and premises.

SCHEDULE-IV
(TO BE DONE AFTER 200 HOURS OF ENGINE RUNNING)
DURATION – TWO DAYS

I MAIN MACHINE:

1. Replace engine oil.
2. Change lube oil filters.
3. Change fuel filters.
4. Check oil level of reduction gear box and fill up to required level.
5. Check oil level of disconnect gear box and fill up to required level.
6. Check oil level of conveyor gear box and fill up to required level.
7. Check oil level of hydraulic pump drive gear box and fill up to required level.
8. Check oil level of all axle gear boxes and fill up to required level.
9. Check oil level of planetary gear box and fill up to required level.
10. Check oil level of shifter gear box and fill up to required level.
11. Check condition of rail alignment rollers.
12. Recondition vibration plate of dynamic plow.
13. Recondition wear plate of side plow.
14. Recondition skids.
15. Check electrical connections and cables of all remotes for damage.
16. Reconditioning finger boxes and engine weld-T.
17. Replace air cleaner outer element.
18. Replace all hydraulic filters.
19. Replace oil of drive gear box.
20. Replace oil of reduction gear box.
21. Replace oil of conveyor gear box.
22. Replace oil of disconnect gear box .
23. Replace oil of hydraulic pump drive gear box.
24. Replace oil of shifter gear box.

(Note : Item no. 17to 24 will be done after 500 engine hrs. Maintenance time 4hrs)

II GANTRY:

1. Replace engine oil.
2. Replace oil filter.
3. Replace fuel filter.
4. Replace air filter.
5. Check all belts for tension and wear. Replace as per requirement.
6. Check oil level of hydraulic pump drive gearbox and fill up to required level.
7. Check gantry for any wear and tear.
8. Replace air filter outer element.
9. Replace oil of drive gearbox.

Note : Item no. 9 will be done after 500 engine hrs. Maintenance time 1hrs)

III CLIP APPLICATOR:

2. Replace engine oil.
3. Replace lube oil filter.
4. Replace fuel filter.
5. Check battery connection and apply petroleum jelly on terminals.
6. Replace air cleaner outer element.
7. Clean radiator by pressurized air from opposite side.

(Note : Item no. 4 to 6 will be done after 500 engine hrs. Maintenance time 1hrs)

SCHEDULE-V
(TO BE DONE AFTER 1000 HOURS OF ENGINE RUNNING)
DURATION - SEVEN DAYS

I. MAIN MACHINE:

1. Reset tappet clearance.
2. Attend turbocharger if required.
3. Clean engine radiator.
4. Clean hydraulic tank.
5. Replace hydraulic oil.
6. Clean diesel tank.
7. Overhaul sled.
8. Replace pin bearing and bushes of all thread in and thread out rollers.
9. Inspect part for replacement limits as given in Annexure-II and replace if required.
10. Check condition of all hydraulic hoses and replace as per requirement.
11. Check hydraulic system for any leakage.
12. Check electrical system for proper functioning.
13. Check auto functioning of relays, limit switches etc.

II. GANTRY:

1. Reset tappet clearance.
2. Check exhaust vent for leakage.
3. Attend turbocharger if required.
4. Clean engine radiator.
5. Check rope and replace if strands found broken forming bird cage or any core failure noticed.
6. Check drive chains for any developing cracks or excess wear at links, replace if required.
7. Check bearing, pins and gear teeth for excessive wear and do needful.

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

I MAIN MACHINE:

1. Overhaul / Replace the engine on condition basis.
2. Calibrate fuel Injectors.
3. Overhaul Injector pump.
4. Check exhaust vent for leakage.
5. Replace outer and inner air cleaner element.
6. Check the cam disc shoe.
7. Replace water hoses.
8. Recondition dynamic plow.

II GANTRY:

- 1 Replace oil of pump drive gearboxes.
- 2 Inspect gantry for any wear and tear.

III CLIP APPLICATOR:

1. Reset tappet clearance.
2. Replace V- belts.
3. Replace air cleaner element.

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

I. MAIN MACHINE:

1. Replace all engine filters.
2. Replace lube oil
3. Replace side plates and guide plates of dynamic plow.
4. Replace conveyor chains.
5. Replace all drive chains/sprockets.
6. Replace rope wires, D-shakles and fittings.
7. Replace old sleeper pick up finger assembly.
8. Replace conveyor chain drive channel.
9. Replace sled.
10. Replace pump control assembly with linkages.
11. Overhaul all the gear boxes.
12. Replace all solenoid and hand operated valves.
13. Replace all cables of remotes, relay and limit switches.
14. Recondition all the bogie wheels.
15. Replace axle bearing.
16. Replace clamp no.3, 4, 6 and 7.
17. Replace shaft of conveyor chain if found deformed.
18. Replace cross bearing of all cardan shafts.

II GANTRY

1. Replace bearings of pulleys, intermediate gear, toothed wheel and other bearings.

PRECAUTION DURING MAINTENANCE WORK

A. CLEANING OF OIL TANKS:

1. While doing the cleaning of oil tanks, cloth or other lint containing material must not be used.
2. For cleaning of oil tank, scrub the inside surfaces of the tanks with the help of kerosene oil and scrubbing brush.
3. Rinse out the tank using the clean kerosene oil.
4. Remove all the remaining kerosene oil using the pressurized air.
5. Allow tank to dry before refilling the oil.
6. If old oil found fit in chemical testing, the same can be used only after using a filtration unit of three micron.

B. GREASING OF THE COMPONENTS:

1. For greasing of bearings of old sleeper pick up mechanism, three shots of grease gun per nipple are sufficient during daily maintenance.
2. Three shots of grease gun per nipple are sufficient for greasing of all components except gantry rail wheels where two shots are sufficient during schedule-II.

C. Multi-grade engine oil must not be used in any circumstances.

ANNEXURE-I

WEAR LIMITS FOR REPLACEMENT OF COMPONENTS

A. UNIT – GANTRY CRANE:

S. No.	Main Section	Sub-section	Part No.	Limits
1.	Drive train 0-2010624-0-07	Toothed wheel (drive)	6947. 113.000.00	Replace when tooth flange becomes 4 mm thick.
		Disc brake caliper	L425107	Replace when disc brake pads become approx. 1.5 mm thick.
		Chain (ASA-80)	L426082	Replace when elongation of pin-bushing contact area is excessive and prevents proper meshing of the chain and sprocket.
2.	Mobile platform	Friction strip (between frame and jaws)	0-1302484- 0-01	Replace when top of strip reaches bolts head.
		Friction block (between frame and gantry legs)	0-1404-22-0-01	Replace when top of block reaches bolts head.
3.	Rope and pulley	Wire rope		Replace: i) if 6 wires found broken in one rope lay and 3 in 1 strand in one rope lay. ii) if wear of outside individual wire at least $\frac{1}{3}^{\text{rd}}$ the original diameter. iii) if reduction of nominal dia. of more than one mm. iv) if necking down of the rope which would indicate core failure.
		Pulley	0-1301941-0-01	Replace when wire rope pulley groove clearance is less than 1 mm.

ANNEXURE-II

B. UNIT – MAIN MACHINE

S. No.	Main Section	Sub-section	Part No.	Limits
1.	Side plow	Wear strip	A2357T04	i) When leading corner wear becomes 25 mm, rotate the end. ii) Then rotate wear strip between side plow blades. iii) Replace after rotating.
2.	Sled assembly /roller	Sled roller assembly	B3042YAA	i) When rollers, located under bogie wheels have approx 6 mm difference between their lower edge and the surrounding wheel lower edge, rotate the wheel around. ii) Replace when roller outer diameter becomes 113 mm.
3.	Watch-band sledge assembly	Crawler track	C2516 x 01B	i) Replace when crawler track guide keel becomes 4 mm thick. ii) Replace when wear on top or bottom of track exceeds 3 mm.
		Crawler track pin	C2517Y01	Replace when pin becomes bent.
		Watch-band roller assembly	C2514YAA	i) Replace when roller outer diameter becomes 75 mm. ii) Replace when gap between roller bushing pin becomes more than 3 mm.
4.	New sleeper conveyor	Rubber pads	0-2300202-0-01	Replace when rubber pad becomes 4 mm thick or when torn off.

S. No.	Main Section	Sub-section	Part No.	Limits
5.	Plow and tie layer 02011483 -0-03	Roller (Green)	0-3653000-0-01	Replace when roller outer diameter becomes 89 mm.
		Tie stop pad	B0021Y01	Replace when rubber surface become 6 mm thick or torn .
		Tie drop pad	B0022Y01	Replace when rubber surface becomes 6 mm thick or torn
		Tie centering arm	0-210067-0-03	Recondition the worn tube end
		Damper (finger cylinders)	0-1306257 -0-01	Replace when concrete dust starts to tear the rubber pads.
		Wear strip dynamic plow (bottom leading edge)	A1735T43 B2628Y02	Replace when lower edge becomes 4 mm thick.
		Wear plate (tie layer finger)	0-1306287 -0-01	Replace when plate becomes 6 mm thick.
		Finger guide weldment	0-2201091-1 - 02	Replace when top plate becomes 10 mm thick.
		Roller (green)	0-3653000-0-03	Replace when roller outer dia becomes 77 mm.
		Wear plate (wide tie layer finger)	0-1306287-0-03	Replace when plate becomes 6 mm thick.
		Finger guide weldment (wide tie layer finger)	0-2201091 -1- 03	Replace when top plate becomes 10 mm thick.
6.	Old sleeper pick up D 1911 VAD	Claw weldment (short)	D3954 x AA	Replace when claw length becomes 245 mm.
		Claw weldment (long)	D3954 x AB	Replace when claw length becomes 340 mm.
		Hook weldment (assist finger)	H3363 x AA	Replace when hook length becomes 510 mm.
		Tip (on end of tusk)	0-3032000-0-07	Replace when thinnest part becomes 3 mm thick.

APPROVED LUBRICANTS

1. OILS FOR ENGINES

- i) Shell – Rotella T X 740 – SAE-40
- ii) BP --Vanellus M 40 -- SAE-40
- iii) Castrol – CRB 40 -- SAE-40

2. OILS FOR GEAR BOXES

- i) Shell -- Spirax HD -- 85W140
- ii) BP -- Multigear -- 85W140
- iii) Castrol – Hypoy -- C85-140

3. HYDRAULIC OILS

- i) Shell -- XM0-- SAE15W30
- ii) BP -- Vanellus C3 Extra – SAE15W40

4. GREASES

- i) Shell -- Shell Retinax A
- ii) BP -- Energrease L2
- iii) Cassrol -- Castrol LM Grease

APPROVED FILTERS

1. MAIN HYDRAULIC FILTERS

- i) Pressure Filter - 0 - 3354001-0-02
- ii) Return Filter - L425299

2. GANTRY HYDRAULIC SYSTEM

- i) Suction Filter - L 423794
- ii) Return Filter - L 425299

3. MAIN ENGINE - NTA - 855-C360

- ii) Air Filter Primary - 03610008-0-01
- iii) Air Filter Secondary - 0-3610008-0-02
- iv) Lube oil filter (primary) - B8836P04
- v) Lube oil filter(Secondary) - B 8836P05
- vi) Fuel Filter - B8836P03

4. ENGINE (GANTRY)—6BT5-9C

- i) Air Filter
- ii) Lube Oil Filter - B38980V0
- iii) Fuel Filter (Primary) - B8980Y01
- iv) Fuel Filter (Secondary) - B8980Y02

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