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No. :- TM/RGM/RMM
सख्या :- टीएम/आरजीएम/आरएमएम

Date : 02.2024
दिनांक : 02.2024

I- मुख्य अभियंता (ट्रैक मशीन) सभी क्षेत्रीय रेलवे — Chief Engineer (Track Machines) All Zonal Railways
II- मुख्य अभियंता (सी.पी.ओ.एच. कार्यशाला) अहमदाबाद — Chief Engineer (CPOH Workshop), Ahmedabad
III- मुख्य कार्यशाला प्रबन्धक (ट्रैक मशीन) सी.पी.ओ.एच. कार्यशाला प्रयागराज, रायनापाडु, कंचरापारा — Chief Workshop Manager (Track Machines) CPOH Workshop, Prayagraj, Rayanapadu, Kachrapara
IV- प्रधानाचार्य भा.रे.रे.प.म.प्र.के. पीपलगांव प्रयागराज - 211011 — Principal IRTMTC, PipalGaon, Prayagraj -211011

Detailed addresses are enclosed herewith.

विषय : रेल मिलिंग मशीन (लिन्सिंगर) की अनुरक्षण अनुसूची पुस्तिका।

Sub : Maintenance Schedule Manual of Rail Milling Machine (Linsinger).

रेल मिलिंग मशीन (लिन्सिंगर) की अनुरक्षण अनुसूची पुस्तिका की मसौदा एवं अनंतिम क्रमशः पत्र सं टीएम/आरजीएम/आरएमएम दिनांक 29.08.2023 द्वारा 30 दिनो के लिये और टीएम/आरजीएम/आरएमएम दिनांक 09.10.2023 द्वारा 15 दिनो के लिये सभी क्षेत्रिय रेलवे, सी.पी.ओ.एच. कार्यशालाओं एवं भा.रे.रे.प.म.प्र.के. प्रयागराज को टिप्पणी हेतु जारी किया गया था जिसके उपरांत अभी तक कोई टिप्पणी प्राप्त नही हुई है। अब रेल मिलिंग मशीन (लिन्सिंगर) की अनुरक्षण अनुसूची पुस्तिका अंतिम रूप मे तैयार की गई है जिसकी प्रति आपके सूचनार्थ तथा मशीन के कर्मचारियों, जो फील्ड में कार्य कर रहे है के मार्ग दर्शन हेतु संलग्न है। यद्यपि उपरोक्त सूची बनाते समय सभी सावधानियाँ बरती गई है, फिर भी यदि कोई त्रुटि हो तो, कृपया अपने सुझावों/ टिप्पणियों को ईमेल / पत्राचार द्वारा अधोहस्ताक्षरी को अवगत करायें ।

Draft and Provisional Maintenance Schedule Manual of Rail Milling Machine (Linsinger) was circulated to all zonal railways, CPOHs and IRTMTC/PRYJ vide letter no. TM/RGM/RMM dated 29.08.2023 for 30 days and vide letter no. TM/RGM/RMM dated 09.10.2023 for 15 days respectively, for seeking comments/suggestions. But, no suggestions/comments were received. Now, Maintenance Schedule Manual of Rail Milling Machine (LINSINGER) has been finalized. A copy of the same is enclosed herewith for your information and guidance of the machine staff working in the field. However, every care has been taken during preparation of the above said list, discrepancy noticed, if any, may be brought to the knowledge of the undersigned for further improvement, by email/post.

Email address: hmtmmrdso@gmail.com
DA: As above

JAINENDRA KUMAR SINGH
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जैनेन्द्र कुमार सिंह
(Jainendra Kumar Singh)
निदेशक/ ट्रैक मशीन
(Director/Track Machine)

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III-	**प्रधानाचार्य भा. रे.रे. प. म.प्र.के. पीपलगांव प्रयागराज - 211011**	**Principal, IRTMTC,PipalGaon, Prayagraj - 211011**

Government of India - Ministry of Railways

Research Designs and Standards Organisation

भारत सरकार रेल मंत्रालय

GOVERNMENT OF INDIA MINISTRY OF RAILWAYS

रेल मिलिंग मशीन (लिन्सिंगर) की अनुरक्षण अनुसूची पुस्तिका

Maintenance Schedule Manual of Rail Milling Machine (LINSINGER)

रिपोर्ट संख्या टीएम – 276

Report No.TM – 276

फरवरी – 2024

February – 2024

इंफ्रास्ट्रक्चर निदेशालय (रेलपथ मशीन एंव मानीटरिंग)

अनुसंधान अभिकल्प और मानक संगठन, लखनऊ–226011

DIRECTORATE OF INFRASTRUCTURE (TRACK MACHINE & MONITORING)

RESEARCH DESIGNS & STANDARDS ORGANISATION, LUCKNOW-226011

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, Kanchrapara & 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 Manual of Rail Milling Machine (LINSINGER) has been prepared on the basis of maintenance instructions given by OEM manual and Indian Railways Track Machine Manual-2019. The manual is prepared for those items which is required for day to day maintenance. Apart from these instructions 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 part where as required in addition to manual depending on discretion of machine in charge. Some time machine modified/altered 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 terms and conditions 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.

(Jainendra Kumar Singh)
Director/Track Machine-VI
RDSO/Lucknow-226011

February - 2024

EXPLANATORY NOTES

While preparing Maintenance Schedule of Rail Milling Machine (Linsinger), 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, And 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 of Rail Milling Machine (LINSINGER)

S.N.	Schedule	Periodicity	Duration	Location
1.	Schedule I	Daily/ before working & running	08 hour.	In the track Machine Siding
2.	Schedule II	50 Engine hrs.	10 hours.	-do-
3.	Schedule III	250 Engine hrs.	12 hours.	-do-
4.	Schedule IV	1000 Engine hrs.	03 days	-do-
5.	Schedule V	3000 Engine hrs.	10 days	In CPOH Workshop
6.	Schedule VI	6000 Engine hrs.	20 days	In CPOH Workshop
7.	Schedule VII	15000 or 60 months which ever is earlier	1st POH- 45 days, 2nd POH- 60 days	In CPOH Workshop

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SCHEDULE -- I
(TO BE DONE DAILY)
DURATION 08 HOURS

S.N.	DESCRIPTION
1.	**ENGINE (Caterpillar C32 T2, 895 KW at 1800 RPM)**
1.1.	Clean the exterior.
1.2.	Check engine oil level.
1.3.	Check coolant level and top up if required.
1.4.	Check air cleaner restriction clean/change air cleaner element if required.
1.5.	Drain water from water separator & fuel filter.
2.	**AUXILIARY DIESEL ENGINE (Deutz TCD 2013 l04-2V, 100 KW @1500 RPM)**
2.1.	Check engine oil level.
2.2.	Check coolant level and top up if required.
2.3.	Check suction air filter.
3.	**MECHANICAL**
3.1.	Clean and check the exterior of transmission system.
3.2.	Check the gear box hoses for any leakages.
3.3.	Check function of rail brush.
3.4.	Check rail brush and exchange if necessary.
3.5.	Check function, clearance and completeness control of rail brush locks.
4.	**CHIP/DUST SECTION**
4.1.	Check function of chip blowers.
4.2.	Check filter of the grinding dust extraction and exchange if necessary.
4.3.	Check filter of the chip extraction and exchange if necessary.
4.4.	Check metal suction hoses to the processing units and exchange if necessary.
4.5.	Check grinding dust box sealing.
4.6.	Check grinding dust box sealing.
4.7.	Check and clean grinding dust box flap seal.
5.	**GRINDING UNIT**
5.1.	Check and clean of guiding of guiding cover.
5.2.	Check free movement and lubricate of grinding unit telescopic cover.
5.3.	Clean grinding unit inside cover.
5.4.	Check for function, play and wear of toggle clamps (guard door lock).
5.5.	Check completeness, flexibility and clean of grinding unit cable guide.
5.6.	Check for wear (weld, crack) of suction shoe.
5.7.	Clean suction shoe inside.
5.8.	Check completeness, flexibility and fastening of metal suction hoses.
5.9.	Check wear & function of curtain.
6.	**MILLING UNIT**
6.1.	Control contamination on notches and clean of seat of cutter head.
6.2.	Check free movement of vertical copying column guide.
6.3.	Check function of toggle clamp.
7.	**CONVEYOR BELT**
7.1.	Check conveyor belt function.
7.2.	Check damage and wear of conveyor belt.
7.3.	Clean dust and chip accumulation of conveyor belt.

S.N.	DESCRIPTION
7.4.	Check sliding conveyor belt function.
7.5.	Clean gap seals between conveyor belt and baffles of conveyor belt.
7.6.	Check guide roller for ease of movement of conveyor belt extendable.
7.7.	Clean dust accumulation of conveyor belt extendable.
7.8.	Clean and lubricate of c rail and rollers of conveyor belt extendable.
7.9.	Check function and free movement lock of conveyor belt extendable.
7.10.	Check free movement and completeness of cable guide of conveyor belt extendable.
7.11.	Clean cable guide of conveyor belt extendable.
8.	**External and internal chain hoist for cutter heads and grinding discs**
8.1.	Check external and internal chain hoist for cutter heads and grinding discs function.
8.2.	Check for damage manual crane control.
8.3.	Check for completeness and deformation of chain hoist hook.
8.4.	Check for deformation of chain hoist arm.
8.5.	Freedom of movement, check clearance (bolt bearing preloaded) and lubricate of chain hoist bearing.
8.6.	Freedom of movement, completeness control and clean of linear guide.
8.7.	Check function of locks.
8.8.	Check visually chain hoist hook for grinding wheels and cutter heads.
8.9.	Check tightness, completeness and strength of External and internal chain hoist for cutter heads and grinding discs.
9.	**COPY SHOE**
9.1.	Check wear of HM sliding plate and exchange if necessary.
9.2.	Check wear of copy shoe sensing tip.
9.3.	Check wear sliding block and exchange if necessary.
9.4.	Check free movement and lubricate of sliding bracket bearing.
10.	**HYDRAULIC**
10.1.	Check oil level and top up if required.
10.2.	Check the hoses for any leakages.
10.3.	Check & record maximum hydraulic oil temperature of the day during working.
10.4.	Inspect all hydraulic hoses for wear and damages.
10.5.	Inspect all hoses for kinks, twists, or rubbing. Look for signs of leakage that may indicate a loose fitting.
10.6.	Visually Check for damage pressure sensor.
10.7.	Check acoustically for damage.
11.	**PNEUMATIC**
11.1.	Inspect the air compressor for any air or oil leaks.
11.2.	Inspect the Pneumatic pressure regulator setting.
11.3.	Check automatic/independent brake application system.
11.4.	Inspect all pneumatic hoses for any leakages.
11.5.	Visually inspect all the brake shoes. Replace the brake shoes if any worn, cracked, missing, or damaged.
11.6.	Check all type of brake application (Direct, Indirect, Emergency and Parking).
11.7.	Drain condensate water from all air reservoirs.
11.8.	Check all Driver's operating valves.

S.N.	DESCRIPTION
11.9.	Check all pressure setting as per operation manual. (Main reservoir pressure 6.8kg/sq. cm to 7.5 kg/sq. cm, brake pipe pressure 5 kg/sq. cm, brake cylinder pressure 2.5kg/sq. cm to 3kg/sq. cm.)
12.	**ELECTRICAL**
12.1.	Check charging of batteries and its voltage.
12.2.	Check all lamp lenses and reflectors for damage. replace if necessary.
12.3.	Calibrate sensor heads of rail profile measurement system (RPMS).
12.4.	Check lighting system (head lights, tail, working lights & flasher light).
13.	**UNDER FRAME**
13.1.	**UNDER FRAME**
13.1.1.	Visually examine center pivot mounting bolts and attend if needed.
13.1.2.	Check condition of head stock/sole bar.
13.1.3.	Visually examine the shock absorbers for damages.
13.1.4.	Visually inspect center pivot cover.
13.1.5.	Visually examine and attend safety loops of bolster.
13.2.	**BRAKE RIGGING & BRAKE SYSTEM**
13.2.1.	Check and attend brake shoe head and key & replace if necessary.
13.2.2.	Visually inspect brake hangers, brake gear pins and cotters/split pins and replace if necessary.
13.3.	**BOGIE FRAME & SUSPENSION**
13.3.1.	Visually examine the condition of bogie frame and welded locations.
13.3.2.	Visual inspection of damping/suspension.
13.4.	**BUFFING GEAR**
13.4.1.	Visually examine buffer plungers for damages/ drooping /stroke length.
13.4.2.	Examine buffer mounting bolts and attend if necessary.
13.4.3.	Examine visually buffer casing for cracks/damages & height.
13.5.	**RUNNING GEAR AND WHEELS**
13.5.1.	Examine visually axle box for grease oozing out, warm box if any.
13.5.2.	Visually inspect axle box covers.
13.5.3.	Examine visually axle box for grease oozing out, warm box if any.

SCHEDULE - II
(TO BE DONE AFTER 50 HOURS OF ENGINE RUNNING)
DURATION- 10 HOURS
(TO BE DONE IN ADDITION TO SCHEDULE-I)

S.N.	DESCRIPTION
1.	**ENGINE (Caterpillar C32 T2, 895 kW at 1800 RPM)**
1.1.	Drain sediments from fuel tank.
1.2.	Clean pre-cleaner dust Pan.
1.3.	Visual inspection for leak of transmission gear box.
1.4.	Check of oil level of transmission gear box.
1.5.	Visual inspection of compressed air brake lines.
2.	**MECHANICAL**
2.1.	Check exterior for oil leakage.
2.2.	Check oil level and top up with correct grade oil up to high mark.
2.3.	Check wheels for any flat surfaces/tyre.
2.4.	Check torque arm pin and locking.
2.5.	Lubricate torque arm pins and spherical bushes.
2.6.	Check the inlet and outlet port connections of transmission gear box.
2.7.	Check the all gear box oil level and top up if required.
2.8.	Inspect cardan shaft.
2.9.	Clean and grease cardan shaft UJ and slip joint.
2.10.	Refill lubricate of central lubrication.
2.11.	Cleaning bucket elevator.
2.12.	Check free movement of rail brush vertical slide.
2.13.	Clean linear guide of rail brush.
2.14.	Function check visually & acoustically of roof and superstructure.
2.15.	Function checks ventilation motor of ventilation engine room.
2.16.	Check and clean perforated sheet of ventilation engine room.
2.17.	Exchange of copy shoe lubrication felt if necessary.
2.18.	Check function and fill lubricating container of copy shoe sliding plate lubrication.
3.	**CHIP/DUST SECTION**
3.1.	Check tightness of chip/dust suction pipe line.
4.	**GRINDING UNIT**
4.1.	Check wear of scraper pillar guide.
4.2.	Check grinding unit doors protective cover.
4.3.	Check visually linear guides.
5.	**MILLING UNIT**
5.1.	Check wear of scraper pillar guide.
5.2.	Check wear plate of suction shoe and exchange when worn out.
5.3.	Check completeness, flexibility and clean of milling unit cable guide.
5.4.	Check play, wear and lubricate of doors protective cover hinges.
5.5.	Check free movement, wear and corrosion of linear guides.
5.6.	Check scanning block of CFC (copy finger check) and replace if necessary.
6.	**MOBILE RAIL MEASURING DEVICE**
6.1.	Check and Clean entire measuring system.

S.N.	DESCRIPTION
6.2.	Clean, check free movement and wear of track roller of mobile rail measuring device.
6.3.	Clean rails and guides horizontal & vertical of mobile rail measuring device.
6.4.	Clean longitudinal & cross section sensors of mobile rail measuring device.
6.5.	CONVEYOR BELT
6.6.	Check conveyor belt tension.
7.	**HYDRAULIC**
7.1.	Check strength of hydraulic cylinder and screw connection.
7.2.	Check for abrasion, age and leaks of hydraulic hoses.
7.3.	Check tightness of hydraulic cylinder and screw connection tightness.
8.	**PNEUMATIC**
8.1.	Check air strainers. Check for operation of all valves and adjust if required.
8.2.	Check & clean air filter element (Built in air compressor).
8.3.	Grease/clean air brake calipers.
9.	**ELECTRICAL**
9.1.	Check all battery terminals. Remove, clean and reinstall as necessary.
9.2.	Check electrolyte level, specific gravity of battery & record. Clean & tighten battery terminals & leads.
9.3.	Inspect & clean alternator of engine & tighten electrical connections.
9.4.	Check Function and ease of rotation of cross clearance transducer.
10.	**UNDER FRAME**
10.1.	**BRAKE RIGGING & BRAKE SYSTEM**
10.1.1.	Visually examine brake beams breakages/damages.
10.1.2.	Check brake gear and adjust so that the piston stroke is within the limit.
10.1.3.	Examine and attend brake levers.
10.1.4.	Visually inspect for damage on brake pipe, replace if required.
10.1.5.	Check and attend brake beam safety wire rope /safety straps.
10.1.6.	Check and replace worn brake blocks.
10.1.7.	Visually check for hand brake chain rope, sprocket & floating lever and attend if needed.
10.1.8.	Check of MU washer and attend if needed.
10.1.9.	Check for cutoff angle cock and leakage, attend if needed.
10.2.	**BOGIE FRAME & SUSPENSION**
10.2.1.	Examine bolster safety straps/loops for damage / broken suspension system /missing.
10.3.	**DRAW GEAR**
10.3.1.	Examine draw hook, draw bars, rubber pads for damages.
10.3.2.	Examine visually draft key locking pins.
10.3.3.	Check and replace damage/missing split pins.
10.3.4.	Check condition of the CBC coupling and its components and lubricate as required.
10.3.5.	Check condition of the side buffers and its components and lubricate as required.
10.4.	**RUNNING GEAR AND WHEELS**
10.4.1.	Inspect wheel tread for shattered rim, spread rim, shelled tread, thermal cracks, heat checks.

SCHEDULE III
(TO BE DONE AFTER 250 HOURS OF ENGINE RUNNING)
DURATION- ONE DAY
(TO BE DONE IN ADDITION TO SCHEDULE-I &II)

S.N.	DESCRIPTION
1.	**ENGINE (Caterpillar C32 T2, 895 kW at 1800 RPM)**
1.1.	Clean transmission gear box cooler.
1.2.	Check Engine oil level and change if necessary.
1.3.	Change Oil filter (as needed).
1.4.	Check coolant level.
1.5.	Clean air filter and change if necessary.
1.6.	Check tapered roller bearing fan wheel.
1.7.	Check intake line combustion air.
1.8.	Inspection engine belts.
1.9.	Inspection engine Hoses/Clamps.
1.10.	Change engine oil.
1.11.	Change engine full flow oil filter.
1.12.	Change engine by- pass filter.
1.13.	Clean fuel tank filling breather.
1.14.	Change fuel filter element.
1.15.	Clean crankcase breather.
1.16.	Check air inlet piping.
1.17.	Check coolant inhibitor. Add coolant concentrate, if required.
1.18.	Check belts, adjust if required.
2.	**AUXILIARY DIESEL ENGINE (Deutz TCD 2013 l04-2V, 100 KW @1500 RPM)**
2.1.	Exchange lubricating oil.
2.2.	Exchange oil filter.
2.3.	Check coolant (additive concentration)
2.4.	Check engine monitoring & warning system
2.5.	Exchange fuel pre filter
2.6.	Exchange v-belt.
3.	**MECHANICAL**
3.1.	Check & lubricate Roller wear, zero play and ease of suspension locking.
3.2.	Check & lubricate column guide for zero play and ease of suspension locking.
3.3.	Lubricate bucket elevator chain.
3.4.	Lubricate linear guide of rail brush.
3.5.	Lubricate linear guide of External and internal chain hoist for cutter heads and grinding discs.
3.6.	Linear guide lubricate of tool swivel device.
4.	**CHIP/DUST SECTION**
4.1.	Lubricate flange bearing of screw conveyor for chips.
5.	**GRINDING UNIT**
5.1.	Lubricate Y-spindle bearing, lifting cylinder & grinding wheel magazine.
6.	**MILLING UNIT**
6.1.	Lubricate Y-spindle bearing.
6.2.	Lubricate CFC (copy finger check) bearing.

S.N.	DESCRIPTION
6.3.	Check function of CFC (copy finger check).
6.4.	**MOBILE RAIL MEASURING DEVICE**
6.5.	Lubricate of linear guide locking and swivel joint of mobile rail measuring device.
6.6.	Check pneumatic cylinder and tightness and function mobile rail measuring device.
6.7.	Check and clean of locks for function mobile rail measuring device.
7.	**CONVEYOR BELT**
7.1.	Check rotary drive tightness of conveyor belt extendable.
7.2.	Lubricate roller bearing of conveyor belt extendable.
7.3.	Lubricate chain of conveyor belt extendable.
8.	**COPY SHOE**
8.1.	Check freedom of movement and play of coping finger bearing.
8.2.	Lubricate of coping finger bearing.
8.3.	Lubricate of height copying lever bearing.
9.	**HYDRAULIC**
9.1.	Inspect the fuel filters for leakages.
9.2.	Inspect hydraulic system for any leakage.
9.3.	Check of accuracy of manometer.
9.4.	Check visually for damage electric indicator filter.
10.	**PNEUMATIC**
10.1.	Check pipe line leakages and tighten pipe fittings if required.
10.2.	Check function of air brake calipers loose movements.
11.	**ELECTRICAL**
11.1.	Visually inspect all electrical wiring and components for loose connections.
12.	**UNDER FRAME**
12.1.	**UNDER FRAME**
12.1.1.	Examine trough floor, turn under and other frame members from underneath for corrosion.
12.2.	**BRAKE RIGGING & BRAKE SYSTEM**
12.2.1.	Check and attend brake block adjuster.
12.3.	**BOGIE FRAME & SUSPENSION**
12.3.1.	Visually examine the condition of suspension system (Coil spring) for any damage/loose/ breakage.
12.4.	**DRAW GEAR**
12.4.1.	Check condition of draw beam and locating pins on it.
12.5.	**RUNNING GEAR AND WHEELS**
12.5.1.	Visually examine wheel tyre profile and thickness of tyre and check with tyre profile gauge if they appear to be near condemning limit.
12.5.2.	Check with wheel distance gauge for loose or tight wheels.

S.N.	DESCRIPTION
	TO BE DONE AFTER 500 HOURS OF ENGINE RUNNING (In addition to above)
1.	**MECHANICAL**
1.1.	Check all joint bolts for any slackness.
1.2.	Inspect all gear boxes for any defect externally.
1.3.	Check Clutch main motor and pump train generator.
2.	**HYDRAULIC**
2.1.	Drain 50 ml oil and check for metal particles indicating any abnormal wear.
2.2.	First Hydraulic oil change.
3.	**UNDER FRAME**
3.1.	**BOGIE FRAME & SUSPENSION**
3.1.1.	Examine condition of the wearing plates.
3.1.2.	Examine corrosion of sole bar and other under frame members with torch light or inspection lamp.
3.1.3.	Visually examine the cabin and axle support cylinders for leakages /damages.
3.1.4.	Visual inspection of pivot bearing.
3.2.	**DRAW GEAR**
3.2.1.	Ensure that wear on screw coupling shackle pins, trunion pins, shackle/link holes and draw hook holes should not exceed 3mm.
3.3.	**BUFFING GEAR**
3.3.1.	Ensure the length is within 584-635 mm.
3.3.2.	Inspect buffer plunger false plate for wear and profile.

SCHEDULE IV
(TO BE DONE AFTER 1000 HOURS OF ENGINE RUNNING)
DURATION-03 DAYS
(TO BE DONE IN ADDITION TO SCHEDULE-I, II &III)

S.N.	DESCRIPTION
1.	**MECHANICAL**
1.1.	Check roof and superstructures of seals.
1.2.	Check for leak lubrication lines and screw connections of central lubrication.
2.	**HYDRAULIC**
2.1.	Exchange hydraulic fine filter.
2.2.	Exchange hydraulic pressure filter cartridge.
2.3.	Exchange hydraulic pressure filter cartridge small.
2.4.	Exchange hydraulic pressure filter element.
2.5.	Check/adjustment screw on the pressure reducing valve.
3.	**PNEUMATIC**
3.1.	Check and adjust brake hanger linkages.
3.2.	Check brake cylinder movement, tighten mounting bolts.
3.3.	Apply grease on brake cylinder joints.
3.4.	Change air filter element.
	TO BE DONE AFTER 03 MONTH OF ENGINE RUNNING (In addition to above)
1.	**MECHANICAL**
1.1.	Lubricate bucket elevator bearing.
2.	**GRINDING UNIT**
2.1.	Check and grease of threaded spindle.
3.	**MILLING UNIT**
3.1.	Visual inspection/lubrication vertical spindle.
4.	**PNEUMATIC**
4.1.	Clean air brake dust filter.
4.2.	Check for wear, crack of brake pads and change if necessary.
4.3.	Check gap brake pad and brake disc and change if necessary.
4.4.	Grease/clean of air brake calipers.
	TO BE DONE AFTER 03 MONTH OF ENGINE RUNNING (In addition to above)
1.	**ENGINE (Caterpillar C32 T2, 895 kW at 1800 RPM)**
1.1.	Check v- belt tension of the fan.
2.	**MECHANICAL**
2.1.	Function check of rail brush pneumatic cylinder.
2.2.	Screw and connection tightness of rail brush.
2.3.	Check tightness and completeness of roof mounting.
2.4.	Check lifting equipment of External and internal chain hoist for cutter heads and grinding discs.
2.5.	Check for deformation and damage of copy shoe sensing finger.
2.6.	Visual inspection of fire extinguishers.
2.7.	Check visually rails and guides mobile rail measuring device.

S.N.	DESCRIPTION
3.	**CHIP/DUST SECTION**
3.1.	Check tightness and wall thickness of chip container.
3.2.	Clean suction hood.
3.3.	Check tightness of hydraulic cylinder chips removal flap.
3.4.	Check function and tightness of pneumatic cylinder chips guiding flap.
3.5.	Check toggle clamp and gas cylinder of grinding dust box.
3.6.	Check tightness of grinding dust box screw.
3.7.	Lubricate of grinding dust box hinges.
3.8.	Visual inspection and tightness of grinding dust cyclone.
3.9.	Check internal wear in the grinding dust cyclone via cleaning opening.
3.10.	Clean accumulation of grinding dust in the cyclone.
3.11.	Check chip removal flap seal of screw conveyor for chip.
3.12.	Check drive belts screw conveyor for chip.
3.13.	Check tightness hydraulic motor of screw conveyor for chip.
3.14.	Check oil level planetary gear of screw conveyor for chip.
3.15.	Lubricate torque arm of screw conveyor for chip.
3.16.	Check tightness hydraulic cylinder chip of screw conveyor for chip.
4.	**GRINDING UNIT**
4.1.	Check wear and tension v- belt & Pulley.
4.2.	Check tightness of hydraulic cylinder.
5.	**MILLING UNIT**
5.1.	Check wear of belt gear and pulley.
5.2.	Check milling unit belt tension.**
5.3.	Check tightness of hydraulic cylinders and screw connections.
6.	**HYDRAULIC**
6.1.	Check tightness of hydraulic motors.
7.	**PNEUMATIC**
7.1.	Check Pneumatic valve.
7.2.	Check all air brake vent openings.
8.	**ELECTRICAL**
8.1.	Check all level sensors and temp sensor.
8.2.	Check proximity sensor.

SCHEDULE-V
(TO BE DONE AFTER 3000 HOURS OF ENGINE RUNNING)
DURATION- 10 DAYS
(TO BE DONE IN ADDITION TO SCHEDULE-I, II, III & IV)

S.N.	DESCRIPTION
1.	**ENGINE (Caterpillar C32 T2, 895 kW at 1800 RPM)**
1.1.	Clean fuel tank inside.
1.2.	Clean the exterior.
1.3.	Clean radiator.
1.4.	Check fan hub/idler and water pump/idler.
1.5.	To inspect the hose reel.
1.6.	Check tapered roller bearing fan wheel.
1.7.	Change coolant level.
1.8.	Replace coolant temp. Regulator.
1.9.	Inspect/clean Engine.
1.10.	General check of compressor aggregate.
2.	**AUXILIARY DIESEL ENGINE (Deutz TCD 2013 l04-2V, 100 KW @1500 RPM)**
2.1.	Check crankcase breather valve.
2.2.	Check fuel return line valve.
2.3.	Check battery and cable connectors.
2.4.	Check/exchange v-belt.
2.5.	Check/exchange engine mounting.
2.6.	Check/exchange fastening, hose unions/clip
2.7.	Exchange fuel filter cartridge.
2.8.	Exchange fuel pre- filter.
2.9.	Exchange suction air filter & Dry filter.
3.	**MECHANICAL**
3.1.	Service of fire extinguishers.
3.2.	Check backlash and adjust if required.
3.3.	Clean magnetic plug.
3.4.	Check of inside and outside labeling.
3.5.	Check bearing of drive spindle of grinding unit.
4.	**MILLING UNIT**
4.1.	Check bearing of drive spindle.
5.	**HYDRAULIC**
5.1.	Change hydraulic oil.
5.2.	After oil change check lubrication pump working.
5.3.	Check and fill wheel bearing grease if required
5.4.	Check accumulator pre-charge (Gas pressure).
5.5.	Check oil seals for any leakages. Replace if required.
5.6.	Exchange transmission gear box oil filter.
5.7.	Laboratory test/replace if necessary of hydraulic oil sample from the tank.
5.8.	Check pressure control valve.
5.9.	Check electrical function of the suction flap position control.
5.10.	Check for tightness/adjustment screw on the throttle valves.

S.N.	DESCRIPTION
5.11.	Check function of heating valve.
5.12.	Revision of all hydraulic pumps.
5.13.	Inspection of preload accumulators.
5.14.	**PNEUMATIC**
5.15.	Disassemble, clean and reassemble brake valve and relay valve.
6.	**UNDER FRAME**
6.1.1.	**UNDER FRAME**
6.1.2.	Thoroughly examine the centre pivot mounting bolts and replace, if needed.
6.1.3.	Check mounting screw of under frame equipment.
6.2.	**BRAKE RIGGING & BRAKE SYSTEM**
6.2.1.	Visually inspect damaged/missing brake gear bushes, lever hanger pins replace if necessary.
6.3.	**Bogie Frame & Suspension**
6.3.1.	Grease and inspection of axle bearing.
6.4.	**RUNNING GEAR AND WHEELS**
6.4.1.	Fill all axles bearing housing with grease.
6.4.2.	Fill all axles bearing housing with grease.

SCHEDULE-VI (IOH)
(TO BE DONE AFTER 6000 HOURS OF ENGINE RUNNING)
DURATION 20 DAYS
(TO BE DONE IN ADDITION TO SCHEDULE-I, II, III, IV & V)

S.N.	DESCRIPTION
1.	**ENGINE (Caterpillar C32 T2, 895 kW at 1800 RPM)**
1.1.	Check all screw connection of engine mounting pad and tight as per requirement.
1.2.	Inspect Engine.
2.	**AUXILIARY DIESEL ENGINE**
2.1.	Exchange Dry air filter.
2.2.	Exchange V-belts.
2.3.	Exchange coolant.
2.4.	Check/adjust valve clearance.
2.5.	Check/adjust control piston clearance.
2.6.	Check crankcase breather valve.
3.	**MECHANICAL**
3.1.	Clutch main motor generator.
3.2.	Clean fuel tank and diesel sump.
3.3.	**PNEUMATIC**
3.4.	Clean all valves.
3.5.	Reassemble after proper lubrication.
4.	**CHIP/DUST SECTION**
4.1.	Exchange oil planetary gear of screw conveyor for chips.
5.	**UNDER FRAME**
5.1.	**BRAKE RIGGING & BRAKE SYSTEM**
5.1.1.	Check/replace all types torque arm plates, pins & bushes.
5.1.2.	Replace all brake reversal springs.
5.1.3.	Check/replace all Maggie flex washer, Maggie/rubber springs/ damper rubber.
5.1.4.	Repair/replace all brake drum seals, cylinders & brake linkage rods.
5.2.	**DRAW GEAR**
5.2.1.	Remove the scale, rust, work hardened layers and surface cracks if any, by light grinding/filing.
5.2.2.	Inspect the draw hook for deformations & cracks. The neck, its pin hole, and the slot are vulnerable locations.
5.2.3.	Use dye-penetrate test for checking surface cracks in case of doubts.
5.3.	**Buffing Gear**
5.3.1.	Check the draw bar for dimensional distortions and damaged threads.
5.3.2.	Check the castle nuts for damaged threads, worn nut faces visually. Replace castle nuts if needed.
5.3.3.	Test all draw bars by magna-glow equipment for surface cracks.
5.3.4.	Load test draw bar (Stc. 60.61) at 39.5 t and those of (IS 5517 r.35Mn6Mo3) at 60t. There should not be any permanent deformations.
5.4.	**Running Gear and Wheels**
5.4.1.	Repair/replace all wheels, axles bearing housings and bearings.
5.4.2.	Repair/replace all gear boxes, seals & driving shaft assemblies.
5.4.3.	Non destructive test of wheel set & axles.
5.4.4.	**Note:** Ultrasonic testing of axles of machine shall be done between 40,000 to 45,000 kms of running or three years whichever is earlier.

SCHEDULE-VII (POH)
(TO BE DONE AFTER 15000 HOURS OR 60 MONTHS WHICH EVER IS EARLIER OF ENGINE RUNNING)
1 st POH 45 DAYS and 2 nd POH 60 DAYS
(TO BE DONE IN ADDITION TO SCHEDULE-I, II, III, IV,V & VI)

1.	**ENGINE (Caterpillar C32 T2, 895 kW at 1800 RPM)**
1.1.	Overhaul engine.
1.2.	General check of compressor aggregate.
1.3.	General overhaul of compressor aggregate.
2.	**HYDRAULIC**
2.1.	Exchange all hydraulic hoses.
3.	**UNDER FRAME**
3.1.	**Bogie Frame & Suspension**
3.1.1.	General check of bogies.
3.2.	**Running Gear and Wheels**
3.2.1.	Non destructive test of wheel set & axles.
3.2.2.	**Note:** Ultrasonic testing of axles of machine shall be done between 40,000 to 45,000 kms of running or three years whichever is earlier.
3.2.3.	Revision of all hydraulic pumps.

List of Safety Equipment's

Annexure – I

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 nos.
4.	H.S. Tri colour lamps	2 nos.
5.	Chain & Padlock	1 set.
6.	Clamp with Padlock	2 nos.
7.	Jack 20t capacity with traverse.	1 no*.
8.	Crow bars	4 nos.
9.	Wooden blocks off sizes	8 nos.
10.	Gauge cum level	1 no.
11.	Rail thermometer (dial type)	1 no.
12.	Banner flag	2 nos.
13.	Portable Control Phone	1 no
14.	Walkie Talkie	1 set
15.	First Aid Box	1 no each cabin
16.	Skids	2 nos.
17.	Working time table of section where machine working	1 copy
18.	G&SR book with upto date amendment slips	1 copy
19.	4 cell flasher light	1 no.
20.	Petromax /LPG lamps	1 no.
21.	Safety helmets	For each Machine staff
22.	Protective clothing, safety shoes and safety gloves	Foreach Machine staff
23.	Track Machine Manual	1 no.
24.	Accident Manual	1 no.
25.	Fire extinguisher	1 no each cabin
26.	Hooter (manual	2nos
27.	Hydraulic Hand Pump	1 no.
28.	Emergency pneumatic/Hydraulic hose of sizes suiting to different machines (complete with end fittings)	1 no.

Note:-

1. Inspecting official should wear the safety items 22 to 23 while doing the inspection.
2. * Proposal is sent to Railway board vide letter no. TM/HM/1, VOL-2, dt.22/08/2019 for approval of jack, machine wise.

Annexure-II

GENERAL SAFETY NOTES

1. The machine is 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. Do not tow the machine if the final drive is engaged.

ACKNOWLEDGEMENT

Following officer and staff have made their valuable contributions in finalization of the Maintenance schedule manual of Rail Milling Machine (LINSINGER).

RDSO

1	SHRI	RAKESH TIWARI	ARE/HM/TMM
2	SHRI	SURENDRA KUMAR	SSRE/HM/TMM
3	SHRI	PRINCE KUMAR	SSE/TM/RGM
4	SHRI	NEERAJ SINGH	JRE/TM/RGM

RAILWAY

1.	SHRI	SHAHID JAMAL KHAN	SSE/TMC/NCR