भारत सरकार – रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226 011
EPBX (0522) 2451200
Fax (0522) 2458500

Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226 011
DID (0522) 2450115
DID (0522) 2465310

No. :- TM/RGM/SRGM
सख्या :- टीएम/आरजीएम/एसआरजीएम

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	:	स्विच रेल ग्राइंडिंग मशीन आरजीआई-20 (लोरम) की अनुरक्षण अनुसूची पुस्तिका का संशोधन-01
Sub	:	Revision-01 of Maintenance Schedule Manual of Switch Rail Grinding Machine RGI-20 (Loram)
संदर्भ	:	मेसर्स वीआईपीएल का पत्र क्रमांक 2023-24/ आरजीएम-आईआर20/आरडीएसओ/006 दिनांक 15.02.2024.
Ref.	:	M/S VIPL letter No. 2023-24/ RGM-IR20/RDSO/006 dated 15.02.2024.

ओईएम मैनुअल, भारतीय रेलवे रेल पथ मशीन मैनुअल - 2019 एवं 'मैसर्स वंदना इंटरनेशनल प्राइवेट लिमिटेड से प्राप्त सुझाव/टिप्पणी के आधार पर, स्विच रेल ग्राइंडिंग मशीन आरजीआई-20 (लोरम) की अनुरक्षण अनुसूची पुस्तिका का संशोधन-01 का मसौदा तैयार कर पत्र सख्या :- टीएम/आरजीएम/एसआरजीएम दि. 10.11.2023 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 मेसर्स वीआईपीएल एवं एनसीआर रेलवे से प्राप्त टिप्पणी के अनुसार अब स्विच रेल ग्राइंडिंग मशीन आरजीआई-20 (लोरम) की अनुरक्षण अनुसूची पुस्तिका का संशोधन-01 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/फैक्स/ पत्राचार द्वारा अधोहस्ताक्षरी को अवगत करायें ।

Based on received suggestion/comment from “M/s Vandana International Private Limite”, Indian Railways Track Machine Manual-2019 and OEM manual, Draft of Revision-01 of Maintenance Schedule Manual of Switch Rail Grinding Machine RGI-20 (Loram) had been prepared and circulated vide letter no. TM/RGM/SRGM dated 10.11.2023 for 15 days for seeking comments/suggestions.

Now, Revision-01 of Maintenance Schedule Manual of Switch Rail Grinding Machine RGI-20 (Loram) has been finalized as per the comments received from M/s VIPL and NCR Railway. 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/fax/post.

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

JAINENDRA KUMAR SINGH
Digitally signed by JAINENDRA KUMAR SINGH
Date: 2024.02.27 11:57:43 +05'30'

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

I-	मुख्य अभियन्ता (ट्रैक मशीन)	Chief Engineer (Track Machines)
1.0	मध्य रेलवे, सीएसटी, मुम्बई- 400 001	Central Railway, CST, Mumbai - 400 001.
2.0	पूर्व रेलवे, फैयरली प्लेस, कोलकाता 700001	Eastern Railway, Fairlie Place, Kolkata-700 001.
3.0	उत्तर रेलवे, बड़ौदा हाउस, नयी दिल्ली - 110 001	Northern Railway, Baroda House, New Delhi -110 001.
4.0	उत्तर पूर्व रेलवे, गोरखपुर-273012	North Eastern Railway, Gorakhpur-273 012.
5.0	उत्तर पूर्व सीमान्त रेलवे, मालीगांव, गुवाहाटी - 781011	Northeast Frontier Railway, Maligaon, Guwahati -781 011.
6.0	दक्षिण रेलवे, पार्क टाउन, चेन्नई-600003	Southern Railway, Park Town, Chennai - 600 003.
7.0	दक्षिण मध्य रेलवे, रेल निलयम, सिकन्दराबाद - 500 371	South Central Railway, Rail Nilayam, Secunderabad -500 371.
8.0	दक्षिण पूर्व रेलवे, गार्डन रीच, कोलकाता -700 043	South Eastern Railway, Garden Reach, Kolkata - 700043
9.0	पश्चिम रेलवे, चर्चगेट, मुम्बई 400 020	Western Railway, Churchgate, Mumbai - 400 020
10.0	उत्तर पश्चिम रेलवे, जयपुर-302001	North Western Railway, Jaipur-302 001.
11.0	पूर्व मध्य रेलवे, हाजीपुर-844 101	East Central Railway, Hazipur-844 101
12.0	दक्षिण पश्चिम रेलवे, हुबली - 580023	South Western Railway, Hubli-580 023
13.0	उत्तर मध्य रेलवे, प्रयागराज 211001	North Central Railway, Prayagraj -211 001
14.0	पूर्व तटीय रेलवे, भुवनेश्वर 751 001	East Coast Railway, Bhubaneshwar-751 001
15.0	पश्चिम मध्य रेलवे, जबलपुर - 482001	West Central Railway, Jabalpur-482 001
16.0	दक्षिण पूर्व मध्य रेलवे, बिलासपुर-495004	South East Central Railway, Bilaspur-495 004
II-	**मुख्य कार्यशाला प्रबन्धक (ट्रैक मशीन)**	**Chief Workshop Manager (Track Machines)**
1.0	सी.पी.ओ.एच. कार्यशाला, पो० धूमनगंज, प्रयागराज-211011	CPOH Workshop, PO. Dhoomanganj, Prayagraj -211011
2.0	सी.पी.ओ.एच. कार्यशाला, दक्षिण मध्य रेलवे, रायनापाडु विजयवाडा, जिला कृष्णा, आन्ध्रप्रदेश-521241	CPOH Workshop,South Central Railway, Rayanapadu, Vijaywada, Dist.-Krishna, Andhra Pradesh-521241
3.0	सी.पी.ओ.एच. कार्यशाला, पूर्व रेलवे, भूतबागान रेलवे कॉलोनी, कंचरापारा, पी.एस- बिजपुर पो०- कचरापारा, पश्चिम बंगाल - 743145	CPOH Workshop, Eastern Railway, Bhutbagan Railway Colony, Kanchrapara, P.S.- Bizpur, P.O. - Kanchrapara, West Bengal - 743145
4.0	मुख्य अभियन्ता, सी.पी.ओ.एच. कार्यशाला, पश्चिम रेलवे, मंडल रेल प्रबंधक कार्यालय, चामुंडा माता मंदिर के पास, मरोड़ा रोड, पो०- सैजपुर बोधा, अहमदाबाद- 382345	Chief Engineer. C.P.O.H, Western Railway, Divisional Office, Near Chamunda Mata Mandir, Naroda Road, P.O. –Saijpur Bogha, Ahmedabad-382345
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

स्विच रेल ग्राइंडिंग मशीन आरजीआई-20 (लोरम) की अनुरक्षण अनुसूची पुस्तिका

Maintenance Schedule Manual of Switch Rail Grinding Machine RGI-20 (Loram)

रिपोर्ट संख्या टीएम – 259 Rev. -1

Report No.TM – 259 Rev. -1

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 Switch Rail Grinding Machine RGI-20 (Loram) Revision-1 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 manual of Switch Rail Grinding Machine RGI-20 (Loram) Revision-1, 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 Switch Rail Grinding Machine RGI-20 (Loram) Revision-1

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

Note: *Maintenance Schedule Manual for SRGM (RGI-20) is taken as mentioned in IRTMM-2019. Any modification in this schedule will be done in future after gaining some experience in regard to maintenance of this machine*.

INDEX

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

S.N.	DESCRIPTION
1.	**ENGINE** (Cummins QST30 GR5, 900 KW, 480VAC/60 Hz)
1.1.	Inspect the engine alternator belt for Wear, Cracking, Flat spots, Stretching, Foreign contaminants on the belt, Tears, Abrasion, and Any missing ribs. Replace the main engine alternator belt, if necessary.
1.2.	Check for fuel tank level sight gauge cracks, leakage, and clarity. Clean or replace as Needed.
1.3.	Check the main engine coolant level on the coolant sight gauge.
1.4.	Inspect the engine oil levels. Fill as necessary.
1.5.	Inspect the engine area for leaks, spills, fuel odors, loose components or damaged parts.
1.6.	Walk around the machine and look for any abnormalities.
2.	**MECHANICAL**
2.1.	To remove the grind dust.
2.2.	Visual inspection of bogies and wheels.
2.3.	Check hand brake application.
2.4.	Check water level of water tank.
2.5.	Check tie spray and ditch spray.
2.6.	Check water leakage.
2.7.	Check Filter purging operation.
2.8.	Check Dust auguring after closing the work.
2.9.	Check dust blower (fan) switch (ON/ OFF) & inspect complete dust collection system in each grind car.
3.	**GRINDING UNIT**
3.1.	Clean and inspect the grease fittings for wear or damage. Replace any damaged or worn fittings as necessary.
3.2.	Inspect the motor top mounting bolts for tightness, damage, and wear. Replace any worn mounting bolts or tighten as necessary. The motor mounting bolts secure the grind motor to the grind module top/bottom plates.
3.3.	Inspect the grind motor grease fitting for leaks or breakage safety wires. Replace if necessary.
3.4.	Locate and inspect the derail pedal pins on the front/rear/left/ right of the buggies.
3.5.	Visually inspect the buggy up rotary limit switches.
3.6.	To inspect the grind motor bearing, free spinning for vibration & abnormal sound.
3.7.	Look for buggy hydraulic fluid leaks near the fittings and tighten any loose connections as necessary.
3.8.	Inspect the buggy hoses for blistering, brittleness, cracks, or any fraying to the fire-sleeve.
3.9.	Inspect the O-ring and backup ring. Replace if necessary.
3.10.	Check the tank temperature and sight glass.
3.11.	Tighten any fittings that are leaking. If the leak persists, replace the O-ring.

S.N.	DESCRIPTION
3.12.	Check UP/ DN mechanism of grinding modules.
3.13.	Check stone if required to replace and record stone life/need basis.
3.14.	Check up for Grind Car Modules/Buggy/Carriage nuts and bolts.
4.	**HYDROSTATIC SYSTEM FOR TRACTION**
4.1.	Inspect the Front and Rear Gear box level and check if any leak
4.2.	Check for leakages in the pipeline of HST system.
5.	**HYDRAULIC SYSTEM FOR GRIND SYSTEM**
5.1.	Check the hydraulic fluid level in the tank using the sight glass. Fill as necessary.
5.2.	Inspect the hydraulic system.
5.3.	Check & record maximum hydraulic oil temperature of the day during working.
5.4.	Check the hydraulic system in the control car, engine room and grind car for wear and damage.
5.5.	Check the hydraulic cooler fins and motor for any leakages.
6.	**PNEUMATIC**
6.1.	Check the air compressor oil level.
6.2.	Inspect the air compressor for any air or oil leaks.
6.3.	Inspect the air horn tank pressure regulator setting. The pressure should be 6.2 bar (90 psi).
6.4.	Check Automatic/independent brake application system.
6.5.	Inspect all pneumatic hoses for any leakages.
6.6.	Visually inspect all the brake shoes on both sides of the bogie. Replace the brake shoes if any worn, cracked, missing, or damaged.
6.7.	Check all type of brake application.
6.8.	Observe UD 50 control panel for any errors.
7.	**ELECTRICAL**
7.1.	Check all lamp lenses and reflectors for damage. Replace if necessary.
7.2.	Check lighting system (head lights, tail, working lights & flasher light).
7.3.	Visual check for cable connection between Grind Car to Camp car.
7.4.	Check Hot Rail Warning Lights and Siren.
8.	**BOGIE AND UNDERFRAME**
8.1.	Clean off any dirt or oil mixed deposits not removed by the air wand.
8.2.	Check that all accessible parts of the bogie frame, traction motors, and brake components are clean and free of damage or defects.
8.3.	Visually inspect the bogie frame, bolster, and supporting structure for any visible damage, cracks, and deformity.
8.4.	Visually inspect the connections to the frame or coach body for damage, cracks, loose bolt connections, cables and hoses, and side bearer pad thickness.
8.5.	Ensure all coil springs are not broken.

S.N.	DESCRIPTION
8.6.	Inspect all hose couplers for any damage.
8.7.	Inspect the under frame of the machine for loose, detached, corroded or damaged Parts for the following areas: 1. Brake and running gear. 2. Bogie frame, springs, and bolster (including bolster mountings). 3. Horn guide clips. 4. Body-to-bogie bond connections. 5. Body-to-bogie flexible hoses. Check for kinked hoses. 6. Couplers 7. Hook and buffer welded joints. 8. Stone storage box mountings. 9. Under frame tanks and mountings. 10. Diesel generator mountings. 11. Grind buggies and mountings. 12. Cab mounting pads and bolts.
8.8.	Inspect the grooved tread, if one is visible.
8.9.	Inspect the wheel tread for flat spots.

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 (**Cummins QST30 GR5, 900 KW, 480VAC/60 Hz**)**
1.1.	Visually check the fuel tank level sensor and cabling for any damage or possible failure.
1.2.	Check dust indicators & clean primary air filters of engine and generator.
1.3.	Clean the engine air filters.
1.4.	Inspect actuator rod eyes.
1.5.	To drain water from the fuel tank.
1.6.	Inspect Fire Detection System.
2.	**MECHANICAL**
2.1.	To clean the dust fan wheel and housing.
2.2.	Clean the dust housing baffle, inlet plenum, and frame interior.
2.3.	Visually inspect the drawbars for wear, damage on structures and/or paint. Replace any worn drawbars as necessary.
2.4.	To Clean the RPMS lens.
2.5.	Check brake shoes for wear/damage & replace if required.
2.6.	Lubricate all ball & socket pivot joints and bush bearing of feeler rod by oil.
2.7.	Check draw bar pins & lubricate if required.
2.8.	Clean the Water Strainer, Tie Sprays, and Ditch Sprays.
2.9.	Clean Water Pump Strainer Basket.
2.10.	Check Water pump &Strainer.
2.11.	Grease module pivot bushing.
3.	**GRINDING UNIT**
3.1.	Grease the Modules pivot, vertical slide tube, module slide, buggy vertical slide tube and spark door pivot
3.2.	Grease Module Vertical Slide Tubes and tilting pivot pin.
3.3.	Calibrate the Grind Module Tilt Angle.
3.4.	Lubricate limit switches and cylinder pins.
3.5.	Grease module pivot bushing.
4.	**HYDRAULIC SYSTEM FOR GRIND SYSTEM**
4.1.	Inspect all buggies hydraulic hoses for wear and damages.
5.	**PNEUMATIC**
5.1.	Check the oil level through the sight glass and replenish any lost oil.
5.2.	Clean the Air/oil cooler.
5.3.	Check air brake system linkage and lubricant if required.
5.4.	Check level/function of air oiler.
5.5.	Blow out Air Compressor.
5.6.	Grease air compressor motor.

S.N.	DESCRIPTION
6.	**ELECTRICAL**
6.1.	Check all battery terminals. Remove, clean and reinstall as necessary.
6.2.	Check charging of batteries, Specific gravity and its voltage.
6.3.	Check electrolyte level, specific gravity of battery & record. Clean & tighten battery terminals & leads.
6.4.	Inspect & clean alternator of engine & tighten electrical connection.
6.5.	Inspect cable & coupling between Grind Car to Camp car.
7.	**BOGIE AND UNDERFRAME**
7.1.	Inspect all flanges attached to both hydraulic and HST cooler.
7.2.	Inspect the tank air breather filter for damage or leaks on the HST tank.
	TO BE DONE AFTER 100 HOURS OF ENGINE RUNNING (In addition to above)
1.	**BOGIE AND UNDERFRAME**
1.1.	Inspect the wheel for signs of spalling or shelling which has metal expelled from the tread.
1.2.	Inspect the wheel for signs of tread buildup.
1.3.	Check all fasteners for tightness around the entire cooler and both fan guards. Replace any missing fasteners.
1.4.	Re-tighten any loose fasteners and replace any damage fastener
1.5.	Replace any cables and hoses with rub marks larger than 1 centimeter (0.40 in.).
1.6.	Grease the bearings at each end of the auger.
1.7.	Grease Drive gear box Torque arm

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** (Cummins QST30 GR5, 900 KW, 480VAC/60 Hz)
1.1.	Replace the engine oil/lube oil (quantity 155 L).
1.2.	To clean a ditch sprayer.
1.3.	Inspect the condition of the flexible wire-way conduit between the generator and the electrical enclosure.
1.4.	To inspect the hose reel.
1.5.	Clean/replace a faulty tie spray nozzle.
1.6.	Examine all mounting fasteners and bolt for any wear, damage, or loosening. Check all battery terminals. Remove, clean and reinstall as necessary.
1.7.	Inspect the air intake piping from the filters to the engine for any damaged or loose connections.
1.8.	Inspect exhaust piping for damage, loose connections, and missing or broken clamps.
1.9.	Inspect the engine and generator platforms for any indication of fluid leakage.
1.10.	Inspect all hose and pipe connections for leaks. If defects are found, shut down and lockout the affected engine. Drain the fuel tank, if necessary, to make repairs.
1.11.	Inspect the radiator fins, fans, and motors for any signs of damage. Check for cracks, loose rivets, and bent or loose fan blades. Ensure the fan is tightly secure.
1.12.	Replace the engine fuel/water separator filter:
1.13.	Inspect the intake piping for wear points and damage to piping, loose clamps, and punctures. Replace as necessary to prevent the air system leaking.
1.14.	Replace the engine oil filters.
1.15.	Replace main engine new coolant filters.
2.	**GENSET ENGINE – CAMP CAR (POWEROL BY MAHINDRA)**
2.1.	Oil Change (CH4 15W40) – (first change in 15 days/100 Hrs.) then after every 3 months/300 Hrs.
2.2.	Change Lube Oil Filter - (first change in 15 days/100 Hrs.) then after every 3 months/300 Hrs.
2.3.	Change Oil In Air Cleaner (Oil Bath Type) - (first change in 15 days/100 Hrs.) then after every 3 months/300 Hrs.
2.4.	Change Primary Fuel filter - after every 3 months/300 Hrs.
3.	**MECHANICAL**
3.1.	Check expiry date of Fire Extinguisher.
3.2.	Inspect the gasket and spring tension on cap.
3.3.	Inspect fan blades for cleanliness and free of cracks.

S.N.	DESCRIPTION
3.4.	Inspect fins for dust accumulation.
3.5.	Inspect the pulleys. The grooves should have no sharp edges or chips.
3.6.	Check that the pressurization blowers are working and there are no unusual noises.
3.7.	To grease the main engine radiator fan motor.
4.	**GRINDING UNIT**
4.1.	Inspect the dust hopper and blower motor areas for any accumulation of grind dust.
4.2.	Inspect dust system welds for cracks or breaks.
4.3.	Check that the ducting is properly bolted/clamped and mounting brackets and dampeners are in good condition.
4.4.	Inspect for excessive vibration while the dust blower motors are running.
4.5.	Inspect filter doors for proper sealing.
4.6.	Clean for water tank strainer.
5.	**HYDRAULIC SYSTEM FOR GRIND SYSTEM**
5.1.	Inspect all hoses for kinks, twists, or rubbing. Look for signs of leakage that may indicate a loose fitting.
5.2.	Inspect the sight glass for cracks.
5.3.	Inspect for signs of leaks.
5.4.	Check gauges and filter restriction indicators on the hydraulic filter assemblies. • Red = Requires Action • Yellow = Report to Supervisor or Crew Chief • Green = Requires No Action
5.5.	Inspect for signs of leakage in the hydraulic system.
6.	**PNEUMATIC**
6.1.	Adjust brake pressure, if required.
6.2.	Adjust unloader valve pressure, if required.
7.	**ELECTRICAL**
7.1.	Visually inspect all electrical wiring and components for indications of heat damage or loose connections.
7.2.	Inspect common bus cables for wear.
7.3.	Inspect inside the lockers for cleanliness. Clean as necessary.
7.4.	Replace any damaged or missing bonds/braids/straps as necessary.
7.5.	Inspect and close the enclosure.
7.6.	Inspect all lights for any damage or malfunctions, replace if required.
7.7.	Replace any defective lamps, outlets, and switches.

S.N.	DESCRIPTION
	TO BE DONE 500 HOURS OF ENGINE RUNNING (In addition to above)
1.	**ENGINE** (Cummins QST30 GR5, 900 KW, 480VAC/60 Hz)
1.1.	Check the fuel tank filling cap, vent valves, and covers for indications of corrosion, damage, or leaks. Replace if required.
1.2.	Replace all primary & Secondary air filters of engine, write installation date on filter and record in maintenance log.
1.3.	Grease Generator Bearing.
2.	**GENSET ENGINE – CAMP CAR (POWEROL BY MAHINDRA)**
2.1.	Change Secondary Fuel filter - after every 6 months/600 Hrs.
2.2.	Change Air Cleaner Element (Oil Bath Type) - after every 6 months/600 Hrs.
3.	**MECHANICAL**
3.1.	Lubricate the Dust Blower motor.
3.2.	Grease articulated joints and draw bars
3.3.	Inspect wheel flange.
3.4.	Grease anti-friction bearings of dust collection system.
3.5.	Grease water pump motors.
4.	**PNEUMATIC**
4.1.	Inspect the air compressor air filter

SCHEDULE IV
(TO BE DONE AFTER 1000 HOURS OF ENGINE RUNNING)
DURATION-02 DAYS
(TO BE DONE IN ADDITION TO SCHEDULE-I, II &III)

S.N.	DESCRIPTION
1.	**ENGINE** (Cummins QST30 GR5, 900 KW, 480VAC/60 Hz)
1.1.	Inspect Generator, Blower, Belts, Check for leaks and Grease all the Bearings.
1.2.	Check / Change worn out water hoses on condition basis.
1.3.	Check / Change bearings and shaft of radiator fan drive on condition basis.
1.4.	Clean the engine radiator.
1.5.	Clean diesel tank. (6 months/1000 hours of engine running which is earlier)
1.6.	Grease anti friction bearing of blower.
1.7.	Check RPM of engine radiator fan.
1.8.	Grease engine fan bearing and pullies where needed. Record in maintenance log.
1.9.	Replace Fuel Tank Breather filters.
1.10.	Check Generator windings and record insulation test meggrening.
2.	**GENSET ENGINE – CAMP CAR (POWEROL BY MAHINDRA)**
2.1.	Change Air Cleaner Element (Outer) – after every 12 months/1200 Hrs.
2.2.	Change coolant - after every 12 months/1200 Hrs.
3.	**MECHANICAL**
3.1.	Lubricate the Dust Blower motor.
3.2.	Grease water pump motors.
3.3.	Replace Dust flame retardant. (6 months/1000 hours of engine running which is earlier)
3.4.	Replace auger gearbox oil.
3.5.	Check / change wornout water hoses on condition basis.
4.	**GRINDING UNIT**
4.1.	Grind Module Tilt calibration
4.2.	Grind module shift calibration
5.	**HYDROSTATIC SYSTEM FOR TRACTION**
5.1.	Gear box secondary axle seal clean and grease two pump with Hi Temp grease
5.2.	Replace primary and secondary air filters. Write installation date on filter and record in maintenance log.
6.	**HYDRAULIC SYSTEM FOR GRIND SYSTEM**
6.1.	Check pressure of all sections for rated settings and adjust if necessary.
6.2.	Check accumulator pre-charge (Gas pressure)
6.3.	Grease the Hydraulic Pump/ Drive Motors.
7.	**PNEUMATIC**
7.1.	Replace compressor lubricant filter. (1000 hrs. of compressor running)
7.2.	Inspect compressor filter, fan and pulley.
7.3.	Grease air compressor motor.

S.N.	DESCRIPTION
8.	**ELECTRICAL**
8.1.	Inspect and clean the all battery terminals, cables and connections of self starter, alternators for proper working.
8.2.	**BOGIE AND UNDERFRAME**
8.3.	To remove/replace the gearbox air breather filter.
	TO BE DONE AFTER 06 MONTH OF ENGINE RUNNING (In addition to above)
1.	**ENGINE** (Cummins QST30 GR5, 900 KW, 480VAC/60 Hz)
1.1.	To remove Primary filter in six month and Secondary 03 Month.
1.2.	To remove and replace the generator air filter assembly.
2.	**HYDROSTATIC SYSTEM FOR TRACTION**
2.1.	Replace hydraulic Pump pressure filters.
2.2.	Hydrostatic tank return filter.
2.3.	Replace Pump drive gear case oil.
2.4.	Replace Drive gear box oil.
3.	**GRINDING UNIT**
3.1.	To grease the grind motor. (180 Grind Hrs or 6 month whichever is earlier)
3.2.	Dust collector filter replacement.
3.3.	To remove and replace the RPMS desiccant plugs. (2000 hrs./annually or as condition based)

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** (Cummins QST30 GR5, 900 KW, 480VAC/60 Hz)
1.1.	To calibrate the encoder.
1.2.	To clean the engine cooling system.
1.3.	To remove and replace the generator air filter assembly.
1.4.	Check up for Machine Emergency stop & Engine E-stop.
1.5.	Check Tightness of Mounting Bolts.
1.6.	Change the engine mounting pads on condition basis.
1.7.	Check all hoses for crack, cuts etc replace if required.
1.8.	Inspect all rubber cushioning mounts for crack and damages replace if require.
1.9.	Inspect all mounting brackets for cracks or damaged bolt holes.
2.	**GENSET ENGINE – CAMP CAR (POWEROL BY MAHINDRA)**
2.1.	Change Air Cleaner Element (Inner) – after every 36 months/3600 Hrs.
3.	**MECHANICAL**
3.1.	Calibrate sensor heads, Record in maintenance log.
3.2.	Check Water pumps and motors and repair if required.
3.3.	Grease dust blower (fan) motor and shaft.
4.	**GRINDING UNIT**
4.1.	Replace any hoses, if needed.
4.2.	Grind module Ideal AMP calibration.
4.3.	Inspect carriage slide tubes.
5.	**HYDRAULIC SYSTEM FOR GRIND SYSTEM**
5.1.	To drain and clean the Hydraulic tank.
6.	**PNEUMATIC**
6.1.	Replace the air compressor oil filter.
6.2.	Inspect and clean the air compressor cooler.
6.3.	Clean the air compressor oil return line (scavenger line) screen.
6.4.	Inspect the air compressor for any air or oil leaks.
6.5.	Change air filter element
6.6.	Air brake pipe leak test.
6.7.	Air brake supply reservoir and air brake cylinder test.
6.8.	Air main reservoir leak test.
7.	**ELECTRICAL**
7.1.	Calibrate sensor heads of rail profile measurement system (RPMS).
7.2.	Thoroughly clean all panel boxes.
7.3.	Provide missing thimbles.
7.4.	Replace defective switches and potentiometers on condition basis.
7.5.	Replace defective indicative instruments.
7.6.	Replace the missing or defective light.

S.N.	DESCRIPTION
	TO BE DONE AFTER 4000 HOURS OF ENGINE RUNNING (In addition to above)
1.	
1.1.	**PNEUMATIC**
1.2.	Replace the air separator elements.
1.3.	Replace the compressor desiccant dryer cartridges.
1.4.	Replace the compressor desiccant dryer purge valves.
1.5.	Replace the inlet check valve.
1.6.	Change the compressor lubricant.

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** (Cummins QST30 GR5, 900 KW, 480VAC/60 Hz)
1.1.	Check the RPM of Engine radiator fan, if found less than the rated RPM, take corrective measures.
1.2.	Overhaul the air compressor. if required.
1.3.	Clean the engine radiator externally & internally.
1.4.	Replace the outer and inner engine air cleaner element.
1.5.	Clean the cooling coil.
1.6.	Clean the diesel tank with lint free cloth.
1.7.	Clean diesel tank.
2.	**MECHANICAL**
2.1.	Complete inspection of the undercarriage including all wheels, axles and bogies.
2.2.	Turning of wheels/ replacement of wheels as per requirement based on local inspection of the equipment
2.3.	Complete machine may be painted. (As required)
3.	**HYDROSTATIC SYSTEM FOR TRACTION**
3.1.	To replace Drive gear box breather
4.	**GRINDING UNIT**
4.1.	To remove and replace the RPMS desiccant plugs.
4.2.	Replacement of Grind Buggy wheels.
4.3.	Replace hoses of all module and Grind Buggy.
4.4.	Replace all lower module pivot bushings.
5.	**HYDRAULIC SYSTEM FOR GRIND SYSTEM**
5.1.	Replace hydraulic pressure filters.
5.2.	Replace hydraulic return filters and hydraulic tank breathers.
5.3.	Replace all hydraulic hoses.
5.4.	Flush the complete system/ need basis.
6.	**PNEUMATIC**
6.1.	Grease air compressor pump motor.
6.2.	Replace Air Compressor Air/Oil Separator Element.
7.	**ELECTRICAL**
7.1.	Grease air compressor motor.
7.2.	To remove and replace the pressurization air filter.

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** (Cummins QST30 GR5, 900 KW, 480VAC/60 Hz)
1.1.	Overhaul or replace the engine.
1.2.	Overhaul the injectors.
1.3.	Overhaul the fuel injection pump
1.4.	Change engine mounting pads.
1.5.	Change water hoses.
1.6.	Change engine air cleaner elements.
1.7.	Change all engine filters along with lube oil.
1.8.	Check the RPM of Engine radiator fan, if found less than the rated RPM, take corrective measures.
1.9.	Clean the diesel tank.
1.10.	Checks cooling system. It must be clean to work correctly and to eliminate buildup of harmful chemicals.
1.11.	Checks for coolant leaks.
1.12.	Test function of thermostat.
1.13.	Check the thermostat for wear or damage. If the barrel of the thermostat is worn out or fretted, it must be discarded.
1.14.	Check water pump, replace it if required.
1.15.	Inspect turbo charger function. (Look for damaged or cracked compressor or turbine blades)
1.16.	Check the vibration damper for evidence of fluid loss, dents and wobbles etc.
2.	**MECHANICAL**
2.1.	De-scaling of all pipes/ replacement of the same
2.2.	Clean out rust, corrosion and de-scale from water tanks and plumbing circuit.
2.3.	Replace/ overhaul water pump and motors.
2.4.	Change water hoses.
2.5.	Replace/ overhaul blower motors and blower assembly.
2.6.	Replace/ overhaul complete auger system.
2.7.	Strengthen machine frame where cracks have developed.
2.8.	Recondition worn-out wheels of all sensing trollies.
2.9.	Repair/ replace all bushes and bearing of sensing bogies.
2.10.	Pre- inspection of complete machine by Machine supervisor / senior official of Indian Railway to estimate a complete list of parts to be repaired / replaced.
2.11.	Inspect and repair of bogies and machine frame of Grind Car to Camp car.
3.	**GRINDING UNIT**
3.1.	Replace buggy wheels including bearings and shaft.
3.2.	Replace all module guide tube/rod.
3.3.	Check complete buggy frame and repair/ strengthen as required.
3.4.	Replace all bearings and bushes of tilt cylinders and module.

S.N.	DESCRIPTION
3.5.	Calibrate all modules.
3.6.	Overhaul / Replace the buggies, wheels & feeler rollers.
4.	**HYDROSTATIC SYSTEM FOR TRACTION**
4.1.	To drain and clean the HST tank.
4.2.	Complete inspection of the traction system and traction motor / replace if needed
5.	**HYDRAULIC SYSTEM FOR GRIND SYSTEM**
5.1.	Change all Hydraulic pumps and motors on need basis.
5.2.	Replace/overhaul all Hydraulic cylinders on condition basis.
5.3.	Clean the Hydraulic tank, inside to be painted with approved quality of paint.
5.4.	Fill new hydraulic oil after replacing return line and suction filters.
5.5.	Clean Hydraulic oil cooler. If it is blocked more than 20% during service or badly Leaking, then replace it.
5.6.	Change all the valves on condition basis.
5.7.	Change all 'O' rings and oil seals.
6.	**PNEUMATIC**
6.1.	Inspect the main motor and fan electrical connections.
6.2.	Change air filter element
6.3.	Replace water separator and air oiler. Condition basis.
6.4.	Change all pneumatic hoses.
6.5.	Change all pneumatic valves.
6.6.	Overhaul/ Change all pneumatic cylinders on condition basis.
6.7.	Change brake cylinders on condition basis.
6.8.	Change all the brake shoes.
6.9.	Replace cooling coil.
6.10.	Replace air unloader.
6.11.	Clean and test air tanks.
7.	**ELECTRICAL**
7.1.	Replace or repair the defective PCBs. Condition basis
7.2.	Replace the limit switches. Condition basis
7.3.	Overhaul the panel boxes.
7.4.	Defective switches and indicative lights may be replaced.
7.5.	Check the LED of all the solenoids & replace if required
7.6.	Check the calibration of digital potentiometers and replace the defective ones.
7.7.	Reconditioning/ replace batteries.

Annexure – I

List of Safety Equipment's

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 Switch Rail Grinding Machine RGI-20 (Loram) Revision-1.

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

M/S VIPL

1.	SHRI	DINKAR GUPTA	V. P. Operation