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TW/HM/SBCM/Pl.III

Date : 20-03-2019

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विषय SBCM (FRM-80) मशीन की अनुसंधान अनुसूची पुस्तिका (पुनरीक्षण 1) एवं निरीक्षण जाँच सूची (पुनरीक्षण-1)।

Sub: Maintenance schedule manual (Rev-1) and Inspection check list (Rev-1) for SBCM (FRM-80).

SBCM (FRM-80) मशीन की अनुसंधान अनुसूची पुस्तिका (पुनरीक्षण 1) एवं निरीक्षण जाँच सूची (पुनरीक्षण-1) तैयार की गई हैं। निम्नलिखित प्रती, आपके सूचनाार्थ तथा मशीन के कार्यवाहियों को फोल्ड में कम कर रहे हैं। के मार्गदर्शन हेतु संलग्न है। यद्यपि उपरोक्त पुनरीक्षण बनाते समय सभी आवश्यकतों को ध्यान में रखा गया है, फिर भी यदि कोई त्रुटि हो तो, कृपया अपने सुझावों/टिप्पणियों को सुधार हेतु ई-मेल/फैक्स/पत्राचार द्वारा अधीनस्थों को भेजें।

Maintenance schedule manual (Rev-1) and Inspection check list (Rev-1) for Shoulder Ballast Cleaning Machine (FRM-80) have been prepared. 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 revisions of the above said list, the discrepancy noticed, if any, may be brought to the knowledge of the undersigned for further improvement by e-mail/fax/post.

DA: As above

Copy to:

1. Executive Director/Track(MC), Railway Board, New Delhi-110001
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(होम प्रकाश)
निदेशक रेलपथ मशीन-III

(होम प्रकाश)
निदेशक रेलपथ मशीन-III



भारत सरकार
रेल मंत्रालय

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

शोल्डर बैलास्ट क्लीनिंग मशीन (एफ.आर.एम-80)
की अनुरक्षण अनुसूची पुस्तिका

**MAINTENANCE SCHEDULE MANUAL (Rev.-1) FOR
SHOULDER BALLAST CLEANING MACHINE (FRM-80)**

रिपोर्ट संख्या: टी.एम.-79 संशोधन-1

Report No.TM -79 (Revision- 1)

मार्च-2019

March-2019

अनुसंधान अभिकल्प और मानक संगठन

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RESEARCH DESIGNS & STANDARDS ORGANISATION

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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 & Rayanapadu 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.

This maintenance schedule manual (Rev.-1) for Shoulder Ballast Cleaning Machine (FRM-80) has been prepared on the basis of Maintenance instruction given by OEM and suggestions received from different railways. The suggestion and feedback from field has been taken and incorporated in this maintenance schedules (Rev.-1). Suggestion/instruction given by OEM time to time also followed in addition to this manual. 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 part 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.

March-2019

(Om Prakash)
Director/Track Machine-III
RDSO/Lucknow-226011

EXPLANTORY NOTES

While preparing text of schedules for maintenance (Rev.1) of Shoulder Ballast Cleaning Machine (FRM-80) 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 (Rev.1) for Shoulder Ballast Cleaning Machine (FRM-80)

S. N	Schedule	Periodicity	Duration	Location
1.	Schedule I	Daily/ before working and 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 IOH	2000 Engine hrs.	45 days	In Zonal Workshop
7.	Schedule VII POH	6000 Engine hrs.	1 st POH-90 days, 2 nd POH-105 days	CPOH Workshop

Note:- The entire maintenance schedule includes all previous maintenance schedules.

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S. N.	ITEM	SCH.I Daily	SCH.II 50HRS.	SCH.III 100HRS.	SCH.IV 200HRS.	SCH.V 1000HRS.	SCH.VI 2000HRS.	SCH.VII 6000HRS.
1. ENGINE MODEL NO. TBD 234 V 12 (GREAVES)/Cummins 1710 L								
1.1	Visual Check the leakage from fuel pump, injectors, fuel supply and Return pipes and do needful.	√	√	X	X	X	X	X
1.2	Clean the engine and premises	√	√	X	X	X	X	X
1.3	Visual check the fuel level in the diesel fuel tanks.	√	√	X	X	X	X	X
1.4	Check engine lube oil level, top up if required.	√	√	X	X	X	X	X
1.5	Open and clean dust collector/pan.	√	√	X	X	X	X	X
1.6	Visual check the tension and condition of V-belt and do needful.	√	√	X	X	X	X	X
1.7	Visual check the air cleaner chocking indicator. If indicator is red, the outer filter is to be cleaned by dry air.	√	√	X	X	X	X	X
1.8	Check the level of coolant in radiator and top up, if required.	√	√	X	X	X	X	X
1.9	Check leakage of lube oil, if any.	√	√	X	X	X	X	X
1.10	Check water level on water tank.	√	√	X	X	X	X	X
1.11	Check and prevent water leakage, if any.	√	√	X	X	X	X	X
1.12	Check all indicative gauges for proper functioning.	√	√	X	X	X	X	X
1.13	Check the battery charging system.	√	√	X	X	X	X	X
1.14	Record the maximum engine temperature during the day's work.	√	√	X	X	X	X	X
1.15	Check engine oil pressure on load after two hours working- (a) at idle rpm (min. 1.5 kg/sq.cm). (b) On rated rpm (min. 2.5 kg/sq.cm).	√	√	X	X	X	X	X
1.16	Drain water/sediment from fuel water separator	x	√	√	√	√	√	√
1.17	Clean the fins of engine radiator with air pressure.	x	√	√	√	√	√	√
1.18	Check battery terminal and connection for tightness.	x	√	√	√	√	√	√
1.19	Apply petroleum jelly on battery terminal.	x	√	√	√	√	√	√
1.20	Check specific gravity of battery electrolyte if applicable. [Minimum specific gravity = 1.24].	x	√	√	√	√	√	√
1.21	Examine the mounting bolt of the engine.	x	x	√	√	√	√	√
1.22	Check engine hose clamps and replace if required.	x	x	√	√	√	√	√
1.23	Inspect cooling coil for leakage and clean for removing the inside carbon.	x	x	√	√	√	√	√
1.24	Inspect the fuel water separator for proper functioning.	x	x	√	√	√	√	√

S. N.	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.
1.25	Clean outer air cleaner element. (Cleaned after every 200 hrs or on dirt indication)	x	x	√	√	√	√	√
1.26	Check fuel tank breather and clean if required.	x	x	x	√	√	√	√
1.27	Lubricate the accelerating mechanism with lube oil.	x	x	x	√	√	√	√
1.28	Check proper concentration of additive of radiator water.	x	x	x	√	√	√	√
1.29	Check the tension pulley of water pump for free movement and damage, if any.	x	x	x	√	√	√	√
1.30	Clean alternator and check connections.	x	x	x	√	√	√	√
1.31	Change engine oil.	x	√*	x	x	√	√	√
1.32	Change lube oil filter, by pass filter and HSD fuel filter.	x	√*	x	x	√	√	√
1.33	Clean the crank case breather element.	x	√*	x	x	√	√	√
1.34	Replace the outer and inner engine air cleaner element.	x	x	√**	x	√	√	√
1.35	Check high-pressure fuel pipe and clamps.	x	x	x	x	√	√	√
1.36	Clean the diesel tank with lint free cloth.	x	x	x	x	√	√	√
1.37	Test engine temperature safety device and lube oil safety device.	x	x	x	x	√	√	√
1.38	Change the batteries on condition basis.	x	x	x	x	√	√	√
1.39	Check engine compression.	x	x	x	x	√	√	√
1.40	Check the exhaust manifolds and silencers.	x	x	x	x	√	√	√
1.41	Check tappet clearances and adjust if required.	x	x	x	x	√	√	√
1.42	Overhaul the air compressor, If required.	x	x	x	x	√	√	√
1.43	Replace minor repair kit for air compressor.	x	x	x	x	√	√	√
1.44	Check anti vibration mounting pads of the engine and change, if required.	x	x	x	x	√	√	√
1.45	Overhaul self-starter and alternator.	x	x	x	x	x	√	√
1.46	Overhaul the engine, if there is lack of compression on low lube oil pressure otherwise de- carbonize the engine.	x	x	x	x	x	√	√
1.47	Calibrate the fuel injector.	x	x	x	x	x	√	√
1.48	Calibrate the fuel injection pump/PT pump.	x	x	x	x	x	√	√
1.49	Check turbocharger impeller and turbine wheels. Check radial and end clearances & do needful.	x	x	x	x	x	√	√
1.50	Check engine timing and do needful.	x	x	x	x	x	√	x
*Done after every 250/300 Engine hours ** Done after every 500 Engine hours								

S. N.	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.
1.51	Replace V-belts on condition basis.	x	x	x	x	x	√	√
1.52	Check the air compressor. Overhaul if necessary.	x	x	x	x	x	√	√
1.53	Check the engine damper wheel for dynamic balance.	x	x	x	x	x	x	√
1.54	Check crank shaft and cam shaft end play.	x	x	x	x	x	x	√
1.55	Overhaul the air compressor.	x	x	x	x	x	x	√
1.56	Change air inlet hoses.	x	x	x	x	x	x	√
1.57	Change all the high pressure fuel pipes, pipe clamp, flexible fuel hoses and rubber hoses.	x	x	x	x	x	x	√
1.58	Overhaul turbocharger.	x	x	x	x	x	x	√
1.59	Check the exhaust manifold for any defect and clean the same.	x	x	x	x	x	x	√
1.60	Change shut down valve.	x	x	x	x	x	x	√
1.61	Change anti vibration mounting pads of the engine.	x	x	x	x	x	x	√
1.62	Check the condition of self-starter, alternator and replace if required.	x	x	x	x	x	x	√
1.63	Replace all the V- belts.	x	x	x	x	x	x	√
1.64	Change cooling coil.	x	x	x	x	x	x	√
1.65	Overhaul or replace the engine.	x	x	x	x	x	x	√
Note: Final decision for maintenance of engine may be followed as per OEM guide lines of engine manual. Maintenance of engine shall be exercise as per advice by OEM time to time.								

S. N.	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. HYDRAULIC								
2.1	Check oil level in Hydraulic oil reservoir and top up if required.	√	√	x	x	x	x	x
2.2	Clean the slots to the joints of hydraulic cylinders.	√	√	x	x	x	x	x
2.3	Check hydraulic oil level in auxiliary (emergency) tank and top up if required.	√	√	x	x	x	x	x
2.4	Record the maximum temperature of hydraulic oil during the day's work.	√	√	x	x	x	x	x
2.5	Visual check filters chocking indication if provided.	√	√	x	x	x	x	x
2.6	Check oil level in vibration screen drum.	√	√	x	x	x	x	x
2.7	Check leakage in hydraulic circuit and do needful.	√	√	x	x	x	x	x
2.8	Check for any rubbing of hoses & loose clamping etc. and correct it.	√	√	x	x	x	x	x
2.9	Check the filter indicator of suction filters.	√	√	x	x	x	x	x
2.10	Clean and lubricate piston rods, bolts, and joints of hydraulic cylinders.	x	√	√	√	√	√	√
2.11	Clean the fins of hydraulic oil cooler with air pressure.	x	√	√	√	√	√	√
2.12	Clean the breather filter of the hydraulic oil tank.	x	√*	√*	√*	√*	√*	√*
2.13	Change the hydraulic filter of the Screen drive.	x	x	√**	√**	√**	√**	√**
2.14	Change the filters of axle gear box clutch.	x	x	√**	√**	√**	√**	√**
2.15	Replace suction filters.	x	x	√**	√**	√**	√**	√**
2.16	Check all pressure settings.	x	x	√	√	√	√	√
2.17	Replace return filter.	x	x	x	√	√	√	√
2.18	Check and clean breathing filter of hydraulic tank.	x	x	x	√	√	√	√
2.19	Check the sleeper scraper and lubricate the chain bearing.	x	x	x	√	√	√	√
2.20	Check the condition and position of the hydraulic hoses and replace, if required.	x	x	x	x	√	√	√
2.21	Change hydraulic oil after cleaning the tank, if required.	x	x	x	x	√	√	√
2.22	Clean the hydraulic oil with the help of hydraulic porta filter.	x	x	x	x	√	√	√
2.23	Change the hydraulic pumps, valves and motors on need basis.	x	x	x	x	x	x	√
2.24	Replace all the hydraulic hoses along-with clamps.	x	x	x	x	x	x	√
2.25	Check all hydraulic cylinders, change if necessary.	x	x	x	x	x	x	√
2.26	Check and clean hydraulic oil cooler internally and externally.	x	x	x	x	x	x	√
2.27	Clean the hydraulic oil tank. Paint the surface of tank with approved quality of paint and fill new oil.	x	x	x	x	x	x	√
*Done after every 250 Engine hours ** Done after every 500 Engine hours								

S. N.	ITEM	SCH.I Daily	SCH.II 50HRS.	SCH.III 100 HRS	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS.	SCH.VII 6000HRS.
3. MECHANICAL								
3.1	Visual check braking system.	√	√	x	x	x	x	x
3.2	Visual check securing screws, scraper rubber of the excavation belt	√	√	x	x	x	x	x
3.3	Visual check fastening and wear in chains.	√	√	x	x	x	x	x
3.4	Visual check the ballast distribution chutes.	√	√	x	x	x	x	x
3.5	Visual check working of the belts, tension and operativeness of the scrapers of conveyor belts, look out for damages.	√	√	x	x	x	x	x
3.6	Check wear of sieve fastening elements and ballast guides.	√	√	x	x	x	x	x
3.7	Screening mesh should be checked In order to have proper size of ballast.	√	√	x	x	x	x	x
3.8	Lubricate sliding parts, top up lubricators for swivel ring lubrication of axle bogies.	√	√	x	x	x	x	x
3.9	Check and lubricate chain tension roller.	√	√	x	x	x	x	x
3.10	Check proper locking of all units.	√	√	x	x	x	x	x
3.11	Check lubrication system of excavating chain, main conveyor and excavating conveyor. .	√	√	x	x	x	x	x
3.12	Check the safety screw, scraper fingers and safety bolts of the excavating chain.	√	√	x	x	x	x	x
3.13	Check for wear and check the wearing strips of chain guide.	√	√	x	x	x	x	x
3.14	Covering cap: - Check for wear. - Visual check fastenings telescope movement scraper. - Clean the telescope/sliding strip.	√	√	x	x	x	x	x
3.15	Check anti collision device of waste conveyors unit and cutting chain.	√	√	x	x	x	x	x
3.16	Check the functioning of emergency backup system.	x	√	√	√	√	√	√
3.17	Check brake linkage and lubricate the pivots and gear teeth of hand brake with grease.	x	√	√	√	√	√	√
3.18	Lubricate screen guide plates with grease.	x	√	√	√	√	√	√
3.19	Check guide rollers of conveyor belts.	x	√	√	√	√	√	√
3.20	Lubricate the chain guide of excavating chain.	x	√	√	√	√	√	√
3.21	Check the tension of excavating conveyor chain and adjust if required.	x	√	√	√	√	√	√

S. N.	ITEM	SCH.I Daily	SCH.II 50HRS.	SCH.III 100 HRS	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS.	SCH.VII 6000HRS.
3.22	Lubricate bearing for main and distributing conveyor chain and adjust the tension if required.	x	√	√	√	√	√	√
3.23	Check, clean & lubricate tensioning piston rod, joints/clevis.	x	√	√	√	√	√	√
3.24	Check wear on ballast distribution chutes.	x	√	√	√	√	√	√
3.25	Inspect wear plates of chain trough.	x	√	√	√	√	√	√
3.26	Top up the bottle for lubrication of king pin pivot.	x	√	√	√	√	√	√
3.27	Clean excavating conveyor sliding frame for any restriction.	x	√	√	√	√	√	√
3.28	Grease plough pivots broom units and sliding planes of cutter unit.	x	√	√	√	√	√	√
3.29	Check rubber bearing fitted under screen meshes and change if broken.	x	√	√	√	√	√	√
3.30	Lubricate the cutting chain and excavating conveyor bearing.	x	√	√	√	√	√	√
3.31	Check the condition of brake shoes, replace if required.	x	√	√	√	√	√	√
3.32	Check oil level of all gear boxes and fill up-to the mark, If required.	x	x	√	√	√	√	√
3.33	Check condition of broom.	x	x	√	√	√	√	√
3.34	Check all the idler rollers of distribution and discharge conveyor for free rotation.	x	x	√	√	√	√	√
3.35	Check guide rollers and bushes of cutter chain.	x	x	√	√	√	√	√
3.36	Check the condition of torque arm rubber.	x	x	√	√	√	√	√
3.37	Check for wear and lubricate suspension of sleeper scraper.	x	√*	√*	√*	√*	√*	√*
3.38	Clean and lubricate the guide columns.	x	√*	√*	√*	√*	√*	√*
3.39	Clean and lubricate hand brake links.	x	√*	√*	√*	√*	√*	√*
3.40	Check the excavation chain sprocket and change if required.	x	x	x	√	√	√	√
3.41	Repair ballast screens.	x	x	x	√	√	√	√
3.42	Check the clutch pressure and adjust if required.	x	x	x	√	√	√	√
3.43	Clean and lubricate sliding surfaces and bolts of torque supports with oil.	x	x	x	x	√	√	√
3.44	Change oil in screen drive drum and replace filter element.	x	x	x	x	√	√	√
3.45	Check the functioning of pressure switch of axle clutch and adjust if required.	x	x	x	x	√	√	√
3.46	Check shock absorber for proper functioning and do needful.	x	x	x	x	√	√	√
3.47	Check universal joints for play and replace if required.	x	x	x	x	√	√	√
3.48	Overhaul the complete plough.	x	x	x	x	√	√	√
*Done after every 250 Engine hours								

S. N.	ITEM	SCH.I Daily	SCH.II 50HRS.	SCH.III 100 HRS	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS.	SCH.VII 6000HRS.
3.49	Replace the worn out broom sticks, if required.	x	x	x	x	√	√	√
3.50	Replace all conveyor belts on condition basis and overhaul the driving stations.	x	x	x	x	√	√	√
3.51	Repair/recoup the missing and defective hand tools.	x	x	x	x	√	√	√
3.52	Check wear of brake shoes.	x	x	x	x	√	√	√
3.53	Check condition of trough plates and replace if required.	x	x	x	x	√	√	√
3.54	Replace excavating belts, supports pipes, chains and acrylic strip of excavating units.	x	x	x	x	√	√	√
3.55	Replace main conveyor support pipes, chains and acrylic strip.	x	x	x	x	√	√	√
3.56	Check the wheels for tyre defects and re profile or replace, if required.	x	x	x	x	x	x	√
3.57	Change the rear frame, chute box and wing frame of screening unit.	x	x	x	x	x	x	√
3.58	Check the bogie pivot for wear and attend as necessary.	x	x	x	x	x	x	√
3.59	Change the scraper pads and skirt rubbers of all conveyors.	x	x	x	x	x	x	√
3.60	Check all the stopcocks and flow control valves and change if required.	x	x	x	x	x	x	√
3.61	Check shock absorber and replace/repair as necessary.	x	x	x	x	x	x	√
3.62	Replace bearing of cutting chain drive gearbox, if required.	x	x	x	x	x	x	√
3.63	Change all the brake shoes on need basis.	x	x	x	x	x	x	√
3.64	Check the axle bearing and grease them. Change if required.	x	x	x	x	x	x	√
3.65	Strengthen the machine frame where cracks have developed.	x	x	x	x	x	x	√
3.66	Repair/replace screen frame.	x	x	x	x	x	x	√
3.67	Replace bearing of excavating unit.	x	x	x	x	x	x	√
3.68	Overhaul the bogies.	x	x	x	x	x	x	√
3.69	Overhaul the cutting unit.	x	x	x	x	x	x	√
3.70	Replace distributing conveyors and waste conveyor.	x	x	x	x	x	x	√

S. N.	ITEM	SCH.I Daily	SCH.II 50HRS.	SCH.III 100 HRS	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS.	SCH.VII 6000HRS.
4. POWER TRANSMISSION AND GEAR BOX								
4.1	Check the oil leakage from all gear boxes and do the needful.	√	√	x	x	x	x	x
4.2	Check axle gear box suspension, as well as torque converter bearings.	√	√	x	x	x	x	x
4.3	Check the filter of axle gear box.	√	√	x	x	x	x	x
4.4	Check cutter chain gear box bolts.	√	√	x	x	x	x	x
4.5	Check oil level in axle gear box.	√	√	x	x	x	x	x
4.6	Check the filter indicators of axle gear box clutch.	√	√	x	x	x	x	x
4.7	Check for proper axle clutch pressure.	√	√	x	x	x	x	x
4.8	Lubricate axle gearbox flange cover of driving bogie with grease.	x	√	√	√	√	√	√
4.9	Check the oil level of excavating and waste conveyor belt gear box.	x	√	√	√	√	√	√
4.10	Check tightness of cardon shaft bolts.	x	x	√	√	√	√	√
4.11	Check oil level in main gear box.	x	x	√	√	√	√	√
4.12	Check reduction Gear box of cutter chain.	x	x	√	√	√	√	√
4.13	Check reduction gear box of main conveyor.	x	x	√	√	√	√	√
4.14	Check Intermediate shaft bearing.	x	x	√	√	√	√	√
4.15	Clean and grease the prime mover cardan shafts.	x	√*	√*	√*	√*	√*	√*
4.16	Check piston ring and bush of axle pinion shafts.	x	√*	√*	√*	√*	√*	√*
4.17	Change oil in the main gear boxes, axle gear boxes and waste conveyor gear box.	x	x	x	√	√	√	√
4.18	Lubricate the axle bearings of the bogies with grease.	x	x	x	x	√	√	√
4.19	Ultrasonic examination of axle shall be between 40,000 to 45,000 kms of running or three years, whichever is earlier.	x	x	x	x	X	√	√
4.20	Change mounting pad of all gear boxes.	x	x	x	x	x	x	√
*Done after every 250 Engine hours								

S. N.	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. ELECTRICAL								
5.1	Check all lights and do needful.	x	√	√	√	√	√	√
5.2	Check function of all limits switches/Proximity switch and do needful.	x	x	x	x	√	√	√
5.3	Replace the defective lights.	x	x	x	x	√	√	√
5.4	Clean and tighten all the earthing cable connections.	x	x	x	x	√	√	√
5.5	Check the LED of all solenoids & replace if required.	x	x	x	x	x	x	√
5.6	Overhaul all the panel boxes.	x	x	x	x	x	x	√
5.7	Replace all the defective PCBs.	x	x	x	x	x	x	√
5.8	Arrange insulation test of main cable/wiring and replace the defective ones.	x	x	x	x	x	x	√
5.9	Replace defective switches and potentiometers, on need basis.	x	x	x	x	x	x	√
5.10	Provide missing thimbles.	x	x	x	x	x	x	√

S. N.	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. PNEUMATIC								
6.1	Check air brake system pressure.	√	√	x	x	x	x	x
6.2	Check for any air leakage.	√	√	x	x	x	x	x
6.3	Drain drip cup of main air piping	√	√	x	x	x	x	x
6.4	Drain air reservoirs/drip cups after the day's work.	√	√	x	x	x	x	x
6.5	Check brake system of all bogies.	√	√	x	x	x	x	x
6.6	Check the functioning of auto drain valve.	x	√*	√*	√*	√*	√*	√*
6.7	Check tightness of foundation bolts of brake cylinders.	x	x	x	x	√	√	√
6.8	Check condition of pneumatic hoses and replace, if required.	x	x	x	x	√	√	√
6.9	Overhaul the air unloader.	x	x	x	x	√	√	√
6.10	Overhaul the water separator and air oiler.	x	x	x	x	√	√	√
6.11	Change the water separator and air oiler.	x	x	x	x	x	x	√
6.12	Replace the air unloader on condition basis.	x	x	x	x	x	x	√
6.13	Replace air unloader.	x	x	x	x	x	x	√
6.14	Check/clean air tank for leakage.	x	x	x	x	x	x	√
6.15	Check/repair the brake linkage.	x	x	x	x	x	x	√
6.16	Replace pneumatic rubber hoses.	x	x	x	x	x	x	√
*Done after every 250 Engine hours								

S. N.	ITEM	SCH.I Daily	SCH.II 50HRS.	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS.	SCH.VII 6000HRS.
7.0 UNDER FRAME								
7.0.1	Visually examine center pivot mounting bolts and attend if needed.	√	√	X	X	X	X	X
7.0.2	Check condition of head stock/sole bar.	√	√	X	X	X	X	X
7.0.3	Examine trough floor, turn under and other frame members from underneath for corrosion.	X	√*	√*	√*	√*	√*	√*
7.0.4	Visually inspect center pivot cover	√	√	√	√	√	√	√
7.0.5	Visually examine center pivot mounting bolts and attend if needed.	√	√	√	√	√	√	√
7.0.6	Visually examine and attend safety loops of bolster.	√	√	√	√	√	√	√
7.0.7	Visually examine the shock absorbers for damages.	√	√	√	√	√	√	√
7.1 Brake rigging & Brake System								
7.1.1	Visually examine brake beams breakages/damages.	√	√	√	√	√	√	√
7.1.2	Check brake gear and adjust so that the piston stroke is within the limit.	√	√	√	√	√	√	√
7.1.3	Check and attend brake shoe head and key & replace if necessary.	√	√	√	√	√	√	√
7.1.4	Visually inspect brake hangers, brake gear pins and cotters/split pins and replace if necessary.	√	√	√	√	√	√	√
7.1.5	Visually inspect damaged/missing brake gear bushes, lever hanger pins replace if necessary.	√	√	√	√	√	√	√
7.1.6	Visually inspect for damage on brake pipe.	√	√	√	√	√	√	√
7.1.7	Check and attend brake beam safety wire rope / safety straps.	√	√	√	√	√	√	√
7.1.8	Check and replace worn brake blocks.	√	√	√	√	√	√	√
7.1.9	Check and attend brake block adjuster	X	X	√	√	√	√	√
7.2 Bogie Frame & Suspension								
7.2.1	Visually examine the condition of bogie frame and welded locations.	√	√	√	√	√	√	√
7.2.2	Inspect axle box safety straps/loops for damage/broken/missing.	√	√	√	√	√	√	√
7.2.3	Examine bolster safety straps/loops for damage/broken/missing	√	√	√	√	√	√	√
7.2.4	Examine condition of the wearing plates.	X	X	√**	√**	√**	√**	√**
7.2.5	Examine corrosion of sole bar and other under frame members with torch light or inspection lamp.	X	X	√**	√**	√**	√**	√**
7.2.6	Visually examine the cabin and axle support cylinders for leakages/damages	√	√	√	√	√	√	√
*Done after every 250 Engine hours ** Done after every 500 Engine hours								

S. N.	ITEM	SCH.I Daily	SCH.II 50HRS.	SCH.III 100 HRS.	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS.	SCH.VII 6000HRS.
7.3 Draw Gear								
7.3.1	Check and replace damage/missing split pins.	√	√	√	√	√	√	√
7.3.2	Examine draw hook, draw bars, rubber pads for damages.	√	√	√	√	√	√	√
7.3.3	Check condition of the screw coupling/CBC and its components and replace is required	√	√	√	√	√	√	√
7.3.4	Examine visually draft key locking pins.	√	√	√	√	√	√	√
7.3.5	Check condition of draw beam and locating pins on it.	√	√	√	√	√	√	√
7.3.6	Ensure that wear on screw coupling shackle pins, trunion pins, shackle/link holes and draw hook holes should not exceed 3 mm.	X	X	√**	√**	√**	√**	√**
7.3.7	Ensure that wear at any section on draw hook should not exceed 10 mm.	X	X	√**	√**	√**	√**	√**
7.4 Buffing Gear								
7.4.1	Visually examine buffer plungers for damages/drooping/stroke length.	√	√	√	√	√	√	√
7.4.2	Ensure the length is within 584-635 mm.	X	X	√**	√**	√**	√**	√**
7.4.3	Inspect buffer plunger false plate for wear and profile.	X	X	√**	√**	√**	√**	√**
7.4.4	Examine buffer mounting bolts and attend if necessary.	√	√	√	√	√	√	√
7.4.5	Examine visually buffer casing for cracks/damages	√	√	√	√	√	√	√
7.5 Running Gear and Wheels								
7.5.1	Examine visually axle box for grease oozing out, warm box if any	√	√	√	√	√	√	√
7.5.2	Visually examine wheel tyre profile and thickness of tyre and check with tyre profile gauge if they appear to be near condemning limit	√	√	√	√	√	√	√
7.5.3	Visually inspect axle box covers.	√	√	√	√	√	√	√
7.5.4	Check with wheel distance gauge for loose or tight wheels.	X	X	√**	√**	√**	√**	√**
7.5.5	Inspect wheel tread for shattered rim, spread rim, shelled tread, thermal cracks, heat checks	√	√	√	√	√	√	√
*Done after every 250 Engine hours ** Done after every 500 Engine hours								

S. N.	ITEM	SCH.I Daily	SCH.II 50HRS.	SCH.III 100 HRS	SCH.IV 200 HRS.	SCH.V 1000 HRS.	SCH.VI 2000HRS.	SCH.VII 6000HRS.
8.0 GENERAL								
8.1	Check all the functions of machine before block working.	√	√	x	x	x	x	x
8.2	Check for any unusual sound from machine.	√	√	x	x	x	x	x
8.3	Check safety items, emergency tools & spares.	√	√	x	x	x	x	x
8.4	Visual inspection for any apparent wheel defects.	x	√	√	√	√	√	√
8.5	Clean complete machine.	x	√	√	√	√	√	√
8.6	Check the expiry of first Aid box.	x	x	√**	√**	√**	√**	√**
8.7	Check the expiry of fire extinguisher, may be done on regular basis.	x	x	√**	√**	√**	√**	√**
8.8	Paint the screen area and chain trough.	x	x	x	x	√	√	√
8.9	Thoroughly clean all panel boxes with pressurized air.	x	x	x	x	x	√	√
8.10	Check the function of all assemblies after IOH.	x	x	x	x	x	√	√
8.11	Calibrate the machine on track for all functions.	x	x	x	x	x	√	√
8.12	Overhaul A.C. unit.	x	x	x	x	x	x	√
8.13	Overhaul the bogies/recondition.	x	x	x	x	x	x	√
8.14	Check the calibration of all the indicative instruments and replace the defective ones.	x	x	x	x	x	x	√
8.15	Flush the complete system.	x	x	x	x	x	x	√
8.16	Complete machine may be painted with approved paint.	x	x	x	x	x	x	√
8.17	Check the function of all assemblies.	x	x	x	x	x	x	√
8.18	Test the machine for one week before it is put for actual working in section on regular basis.	x	x	x	x	x	x	√
**Done after every 500 Engine hours								
Note-During POH, machine supervisor and CPOH Inspecting authority jointly inspect the machine. Any part of machine is to be repaired or replaced; this decision is taken by CPOH Inspecting authority.								

List of Safety Equipments

Sr. No.	Description	Quantity
1.	Red hand signal flags	2 Nos.
2.	Green hand signal flags	1 No.
3.	Tri- colour hand signal lamps/LED torch	2 Nos.
4.	Chain With Padlock	2 Nos.
5.	Fire Extinguisher	One per cabin
6.	Hooter (Manually Controlled)	2 Nos.
7.	Jack 10 t	2 Nos.
8.	Jack 50 t	1 no.
9.	Wooden Blocks	4 Nos.
10.	Crow bars	4 Nos.
11.	Hydraulic hand pump	1 No.
12.	Emergency Pneumatic / Hydraulic hose off size suiting to different machines (complete with end fitting)	As per requirement
13.	Wire rope with close loops at both ends 2 meters and 9 meters long one of each length	As per requirement
14.	Machine Specific Equipment, if any.	As per requirement
15.	Fog signals (detonators) in a tin case	10 Nos.
16.	A copy of working time table of this section where the machine is working	1 No.
17.	G & SR book with up to date amendment slips	1 No.
18.	4 cells flasher light LED lamp cum flasher light (rechargeable)	1 No.
19.	Banner flags	2 Nos.
20.	First aid Box	1 No.
21.	Skids	2 Nos.
22.	Safety Helmet, protection clothing , safety shoes, safety gloves etc.	All machine staff
23.	Walkie talkie with frequency of SM, guard and loco pilots	2 Nos.
24.	Internal communication system walkie talkie and /or head mounting system	-
25.	Track machine manual with up to date correction slip	1 No.
26.	Accident manual	1 No.
27.	Tail Lamp	1 No.

GENERAL SAFETY NOTES

1. The machine has to be operated according to existing Indian Railways rules and regulations.
2. The safety of all machine staffs is most important in the operation and maintenance of the machine.
3. Always alert the men working close to the machine.
4. Do not forget to look out for signals and obstructions on track.
5. 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.
6. Always keep the machine clean. Excessive oil or grease on the machine can make surface slippery and is also potential fire hazard.
7. Always lock the machine before leaving. Make sure that the machine is protected in accordance with Railways regulations.
8. Wherever there is an opportunity while waiting to go out for a job, do some of the smaller maintenance job, such as tightening loose nut & bolts and cleaning the machine.
9. Do not permit unauthorized persons to operate the machine.
10. It is prohibited to use fire on or near the machine.
11. Whenever going to work near cutting chain, operate the emergency push button and ensure latching position.
12. Always wear proper dress, safety shoes and helmet while operation of the machine.

ACKNOWLEDGEMENT

Following officer and staffs have made their valuable contributions in finalization of the Maintenance Schedule Manual (Rev.1) for Shoulder Ballast Cleaning Machine (FRM-80).

RAILWAYS:-

- | | | |
|----|----------------------|-------------|
| 1. | Shri Babu Lal Bairwa | SSE/TMC/NCR |
|----|----------------------|-------------|

RDSO:-

- | | | |
|----|----------------------|---------|
| 1. | Shri MUSLIM AHMAD | ARE/TM |
| 3. | Shri V.P. Srivastava | SSE/TM |
| 2. | Shri Ravi KUMAR | SSRE/TM |