



MAINTENANCE INSTRUCTION M.I. 1981

Service Department
ELECTRO-MOTIVE DIVISION
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SCHEDULED MAINTENANCE PROGRAM COMMUTER TYPE LOCOMOTIVES PASSENGER MODELS EQUIPPED WITH 710 SERIES DIESEL ENGINES AND AC TRACTION COMPONENTS

DE/DM30 AC LOCOMOTIVE 3RD RAIL

The maintenance schedule as outlined in this instruction is considered preliminary, and is offered for planning purposes only. As written, this document reflects current GMLG product objectives and design philosophy for the first of new series of commuter-type passenger locomotive models. The product development cycle is incomplete, with engineering work on various configurations still in progress. The content of this M.I. reflects design information available as of February 2002. Final designs could differ from expectations.

NOTICE

This Maintenance Instruction is intended to serve as a guide when establishing maintenance schedules to meet the particular requirements of individual operations and planned economic life of the locomotive. It provides average recommendations which should ensure satisfactory locomotive operation and economical maintenance costs where average load factors and climatic conditions are encountered. The scheduled inspection and maintenance items defined herein are specific to GMLG passenger locomotives as a general class of motive power, and to commuter-type locomotives as a unique sub-set of that fleet. On those locomotives equipped with AC traction, the passenger car power demand is supplied by the locomotive prime mover engine and a dedicated HEP inverter system. A separate HEP engine/generator system is not required. This Maintenance Instruction reflects that design distinction. For planning purposes, EMD has established the following overhaul interval recommendations for intracity commuter locomotives. These overhaul interval recommendations are based on which ever event occurs first: time, mileage, or megawatt hours.

Intracity Commuter Passenger Locomotives Equipped With Prime Mover Engine:

* 12-710 Series: 6 years / 1,000,000 miles / 17,000 MWHRs.

* 16-710 Series: 6 years / 1,000,000 miles / 23,000 MWHRs.

NOTE

Mileage and MWHR values referenced above are defined by EM2000 Archive Data as accumulated by the locomotive control computer system.

Passenger car HEP demand supplied by the locomotive is included in the accumulated MWHR values stated above. As always, when specific operating conditions severely impact locomotive performance and/or reliability, maintenance and overhaul schedules must be adjusted accordingly.

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1.0 INTRODUCTION

The maintenance recommendations contained in this maintenance instruction are based on the following:

1. Fuel oil will meet the specifications of Maintenance Instruction 1750.

NOTE

Fuel filter integrity can be checked periodically by measuring pressure differential at the rack mounted filter gauge. Wayside fuel filtration should be recognized as an important consideration in meeting the specifications of M.I.1750. Locomotive re-fueling at remote-site locations by transient fuel vendors must also consider provisions for wayside or pre-delivery filtration.

2. Lubricants will meet the specifications of Maintenance Instructions 1752 – Lubricating Oil for Domestic Engines, and 1756 – Lubricant Specifications, with levels properly maintained for engine and gear cases.

NOTE

Periodic engine oil samples should be taken to monitor the suitability of the oil for continued use. Oil should be changed at the intervals specified in this M.I. or when laboratory analysis indicates fresh oil is required. Evaluation of engine and oil condition should dictate when more frequent oil changes are required. The type of service, selection of oil, quality of filter elements, and condition of engine will influence the frequency of oil change. Lube oil filter tank pressure can be checked periodically as a means to monitor filter condition.

3. Lubricating oil filters shall be of a quality equal to original equipment and shall be changed at the intervals specified in this Maintenance Instruction.
4. Engine coolant will meet the specifications in Maintenance Instruction 1748 and will be maintained to proper levels.

NOTE

Periodic engine coolant samples can be taken to ensure that the quality of the solution is maintained. The specific concentrations of corrosion inhibitor in the coolant should be monitored and, as a general rule, coolant solution should be changed at least annually.

5. Government mandated inspections are specifically not included in this Maintenance Instruction.

NOTE

Development of a comprehensive inspection and maintenance plan, including AAR and FRA inspections, and unique owner/operator requirements, is the responsibility of the customer.

6. Maintenance requirements and service procedures for Customer specified locomotive options and equipment shall be provided separate from this document.

NOTE

Service information on specialty items will generally be provided by the original manufacturer and reflect their recommendations. Distribution of such information will be through GMLG at time of locomotive delivery.

7. Maintenance Instructions for Third Rail Cabinet are provided separately. Reference publication - Maintenance Instruction 3700 - Long Island 3rd Rail System Siemens VT63/Y0316.27.
8. Maintenance Instructions for the Traction Coverter Cabinet are provided separately. Reference publication – Traction Converter Cabinet DE/DM30AC Operators Instructions.
9. Maintenance Instructions for the Wheel Mounted Brake Disc with keyed plug centering are provided separately. Reference Publication NYAB – U-CM00.26-en Overhaul Instructions.
10. Maintenance Instructions for the Block Brake Units are provided separately – Reference Document - Overhaul Instructions NYAB U-BE00.23-EN.
11. Maintenance Instructions for the Truck are provided separately in M.I. 1550. This includes DM30AC truck mounted Third Rail Power collection system.
12. Maintenance Instruction for CCB Brake equipment are provided separately. Reference CCB Brake equipment maintenance manual KNORR IP-162C / PL-1466.
13. Publications, as referenced in abbreviation examples listed below, will be followed for inspections, tightening, and maintenance procedures.

LOM	means Locomotive Operator's Manual
LSM	means Locomotive Service Manual
EMM	means Engine Maintenance Manual
M.I.	means Maintenance Instruction
FRA	means Federal Railway Administration standards - Ref: Title 49 CFR-Transportation (parts 200 -399)
AAR	means Association of American Railroads Manual of Standards and Recommended Practices.
PC	means Parts Catalogue
VP	means Vendor Publication
EMDEC	Electro-Motive Diesel Engine Control (EMDEC) Operating and Troubleshooting Guide.
CCB MM	New York Airbrake Maintenance Manual for L.I.R.R. IP-162C / PL-1466

2.0 DAILY

2.1 LOCOMOTIVE CAB

- Check operation of Integrated Cab Electronics. Verify screen displays and Automatic Train Control signals. LSM, LOM
- Monitor computer display panel messages. LSM
- Check for stored annunciator messages. Repair as required. LSM
- Check operation of horn, bell, alerter, cab signal, and speed control equipment. Check windshield wiper blades and replace as required. LOM, LSM
- Check operation of headlights, strobe lights, ditch lights, marker/class/number lights, gauge lights, and all exterior and interior lights. LOM, LSM
- Check operation of electronic air brake system. LOM, CCB
- Verify Siemens display and diagnostics. LSM
- Power test locomotive: Check loading in both forward and reverse positions. LOM

2.2 LOCOMOTIVE HOSTLER STAND (where used)

- Check functional operation of hostler control stand. LOM
- Verify operation of horn, bell, headlights, gauge lights, and interior lights. LOM
- Verify operation of electronic air brake system. LOM
- Verify engine loading in forward and reverse positions. LOM

2.3 ENGINE

- With engine idling: Check engine room for fuel, oil, or water leaks, unusual noises, or smoke. Also check other locomotive support systems (exciter alternator, main alternator, traction motor blowers, air compressor, and cooling fans) for unusual noises. LOM, LSM, EMM
- Check engine oil level LOM
- Check cooling system water level. LOM

2.4 LOCOMOTIVE EQUIPMENT

- Check operation of air driers and drain condensate. LSM, M.I. 1097
- Check air compressor oil level. LOM
- Check condition of trucks, wheels, and axles. Inspect coil springs for cracks or damage LOM, LSM, FRA, AAR
- Inspect condition of running gear, TM gear cases, brake rigging, shock absorbers, and yaw dampers LSM
- Check axle traction rods and other truck mounted equipment for loose or broken bolts. Replace bolts and/or retorque as required LSM
- Check disc brakes and tread brakes for proper application and release. Adjust as required. LOM, LSM
- Inspect disc brake pads and tread brake shoes for wear or damage. Renew pads and or shoes as required. LOM, LSM
- Inspect draft gear. LSM, FRA, AAR
- Visually inspect MU, communication, and HEP receptacles. Check jumper cables for damage to insulation or plugs. LSM, FRA, AAR

3.0 EVERY 45 DAYS

3.1 LOCOMOTIVE CAB AND CONTROL SYSTEMS

- Check functional operation of Automatic Train Control system. Repair/reset as necessary. LOM, LSM
- Check functional operation of Integrated Cab Electronics (ICE) system. Monitor Fault Archive and reset. LOM, LSM
- Perform Air Brake test on the ICE. CCB
- Replace HVAC filter. VP

3.2 ENGINE

- Check lube oil filter tank pressure. Replace filter elements if tank pressure so indicates. LSM

- Inspect Air Compressor for oil level and operation LSM
- Gather oil sample for spectra analysis. LSM

3.3 LOCOMOTIVE EQUIPMENT

- Check battery electrolyte level and specific gravity. LSM
- Inspect interior and exterior lights and replace if required. LSM
- Visually inspect humidity indicator. A blue color indicates dryer is functioning properly. Lavender, white, yellow or brown color indicates possible dryer damage, and further dryer inspection required. Verify dryer goes through a complete cycle every 2 minutes and 10 seconds, 48 seconds regeneration, 17 seconds repressurization for each side. M.I. 1097

3.4 TRUCKS

- Check vertical and lateral shock absorbers and yaw dampers for leaking fluid. Check condition of mounting. LSM
- Check traction rod bushings and rubber secondary spring supports for rubber-to-metal bond failure, cracks and deformation. LSM
- Check condition of wheels. Check for wear, sharp flanges, shelling, cracks and flat spots. Check rim surface for pitting, crushing or build up of cracks. LSM
FRA
- Inspect tread brake and disc brake units for wear and operation. LSM
- Check functional operation of sanding system. Inspect sand boxes, magnet valves, pipes, hoses, and seals. Repair or replace components as required. LSM

3.5 DM THIRD RAIL RUNNING GEAR

- Inspect and operate Proximity Probes utilizing EM2000 self test accesible through the ice screen.. LSM
- Clean shoe beams and inspect insulating boots LSM

for wear and replace as required.

- Inspect contact shoe for wear and gauge accordingly. LSM

4.0 EVERY 92 DAYS

4.1 LOCOMOTIVE CAB

- Test functional operation of Integrated Cab Electronics (ICE). LOM, LSM
 - Verify screen display of all menu driven features
 - Perform/review system diagnostics on display screen.
- Test functional operation of electronic air brake system. LOM, LSM, CCB
 - Perform system diagnostics through ICE display screen. Correct any system failures.
- Check locomotive computer. LOM, LSM
 - Verify correct Date, Time, and Unit Number from EM2000 display. Reset information as required.
 - Monitor computer display panel messages.
 - Perform all locomotive self-test functions.
 - Check for stored annunciator messages.
 - Repair as Required.
- Download archive and running totals as required. LSM

4.2 CAB AND CONTROL SYSTEMS

- Test functional operation of automatic train control system. Repair/reset as necessary. LOM, LSM, VP
- Test functional operation of Integrated Cab Electronics. Verify screen display of all menu driven features. Perform system diagnostics on display screen. LOM, LSM
- Monitor computer display panel messages. LOM, LSM
- Check for stored annunciator messages. Perform checks or maintenance indicated by messages. Qualify fault indicating devices and systems. LOM, LSM

- Perform EM2000 blended brake functional qualification test with locomotive at standstill. Complete multi-stage test sequence to verify wheel slip/slide detection capability. LOM, LSM

4.3 AIR GAUGES (where used)

- Test all air gauges for accuracy. LOM, LSM

4.4 ENGINE (Running) With engine idling and at operating temperature

- Inspect lines, connections, and equipment for leaks: fuel, oil, water, air, exhaust gas. EMM
- Inspect cylinder head mechanisms for proper rocker arm and valve bridge operation. EMM
- Perform load test. If tests indicate horsepower is out of specification, correct as necessary. LSM, EMM, EMDEC

4.5 ENGINE (Stopped)

- Renew all seven primary lube oil filter elements. Use elements equal to original equipment. Remove lube oil soakback filter assembly. Disassemble, clean and inspect. Renew filter element. Remove turbocharger lube oil filter assembly. Disassemble, clean and inspect. Renew filter assembly. EMM, LSM
- Check soak back oil system and turbocharger oil system for proper operation. EMM
- Renew primary fuel filter elements and engine mounted fuel filter elements. Use elements equal to original equipment. EMM, LSM
- Clean or renew fuel suction strainer element. LSM
- Renew fiberglass element engine air filters. LSM
- Inspect eductor tube for carbon deposits. Clean if necessary. EMM
- Visually inspect crankcase and air box for leaks and condition of power assemblies. Clean airbox drains if necessary. EMM
- Check cooling system inhibitor concentration. M.I. 1748
- Check engine protector. Test low water shut down function. EMM, LSM, EMDEC
- Check EMDEC active and inactive fault codes. EMDEC

- Correct any system faults
- Clear fault codes

4.6 ELECTRICAL EQUIPMENT AND SYSTEMS

- Inspect, check, and test all alarms, automatic controls, and protective devices. LSM, EMM, LOM, VP
- Check traction motor gear case oil level. Add oil as required. LSM
- Check movement and lubricate wheel-axle grounding brushes. Check brush length and check braided shunt. Clean and check parts for wear and damage. LSM
- Renew ICE blower filter element. Use elements equal to original equipment. LSM
- Check condition of traction alternator. Clean rectifier banks and inspection windows.
 - Inspect diode fuses. Replace diodes and fuses as required and record failed diode locations. M.I. 3317-2
 - Inspect commutation capacitors and resistors and generator current transformers. M.I. 3317-2
 - Inspect collector rings and brushes. Renew if necessary. M.I. 3317-1
- Check battery electrolyte level and specific gravity. Wash cell tops and complete battery box. Apply petroleum jelly to terminals. LSM
- Check ground relay action. LSM
- Check low voltage system for grounds. LSM, M.I. 3317-2
- Check functional operation of motor driven traction motor blowers. Check variable speed operation. Check motors and blowers for unusual noises. LSM

4.7 MECHANICAL EQUIPMENT AND SYSTEMS

- Renew main reservoir air filter elements. Use elements equal to original equipment. LSM
- Check operation of main reservoir automatic drain valves. LSM
- Check air compressor oil level LSM
- Check functional operation of HVAC system. LSM, VP

Operate both heating and air conditioning modes regardless of season. Renew condenser inlet filter element. Renew fresh air make-up filter element. Renew return air filter element. Use elements equal to original equipment.

- Inspect main generator pit drain aspirator. Clean if necessary. LSM
- Check vertical and lateral shock absorbers and Yaw Dampers for leakage and proper control. Inspect rod surfaces and check mounting. Replace and/or if damage is evident. LSM and M.I. 1550
- Check traction rod bushings and rubber secondary spring supports for rubber-to-metal bond failure, cracks, and deformation. Check bolt torque. LSM, M.I. 1550
- Inspect brake disc for wear and for signs of cracking or other damage. Check that all bolts are in place. Retorque brake disc mounting bolts. LSM, M.I. 1550
- Inspect brake disc pad holder locking and support equipment. Renew hardware as required. LSM, M.I. 1550
- Inspect brake disc cooling flanges to insure that flanges are free of contamination which might reduce air circulation. LSM, M.I. 1550
- Check condition of wheels. Check for wear, sharp flanges, shelling, cracks, and flat spots. Check rim surface for pitting, crushing, or build-up of cracks. LSM, FRA, AAR
- Check automatic parking brake for proper operation. LOM, LSM, M.I. 1550, VP

4.8 LOCOMOTIVE EQUIPMENT

- Visually inspect dynamic brake grids for damage or foreign material
- Check cables and connections

5.0 SIX MONTHS

5.1 CAB AND CONTROL SYSTEMS

- Check functional operation of emergency fuel cut-off and throttle stop. LOM, LSM
- Check functional operation of MU Engine Stop LOM, LSM

Buttons

- Lubricate throttle and reverser handle pivot points. LSM

5.2 ENGINE

- Perform complete power assembly inspection, including liners, pistons, piston rings, p-pipes, connecting rods, and crankshaft. EMM
- Visually inspect crankcase and oil pan for external leaks. Check for air leaks around aftercooler duct mounting flanges. EMM

5.3 ELECTRICAL EQUIPMENT AND SYSTEMS

- Check electrical cabinet ventilation. LSM
 - Take manometer readings at high voltage cabinet. Take manometer readings at AC cabinet. Take manometer readings at inverter cabinet.

5.4 MECHANICAL EQUIPMENT AND SYSTEMS

- Drain condensate from fuel tank. Drain more frequently during periods of high humidity or rapid temperature change. LSM
- Check retention tank for leaks or overflow discharge. Drain tank as required. LSM

6.0 ONE YEAR

6.1 ENGINE (Running)

- Check engine speeds and overspeed protection limit. Reset EMDEC system if necessary. EMM, LSM
- Check performance of cooling system. Measure engine water in temperature. EMM, LSM
- Perform two-step HEP load test. LSM
 - Step one:* Check HEP inverter output for proper voltage and frequency, and balanced current output in normal operational mode. LSM
 - Step two:* Cut-out HEP inverter and test operation of back-up traction inverter to LSM

provide HEP output. Check for proper frequency and voltage with balanced current in back-up output mode.

- Perform Turbocharger Rundown Test EMM
- Check EUI and injector response time. Correct as required. LSM, EMM, EMDEC
- Check EUI injector calibration code. Reset as required LSM, EMM, EMDEC

6.2 ENGINE (Stopped)

- Remove exhaust manifold inspection plate and inspect screen and trap. If foreign objects are found in trap, remove screen to inspect turbine vanes. EMM
- Remove and clean oil separator element. EMM
- Retorque main lube oil and piston cooling oil pump shaft nut. EMM
- Inspect starting motors. Blow out with dry air and renew brushes in complete sets. Lubricate nose cone bushing. EMM
- Check soak back oil system for proper operation, EMM

6.3 ELECTRICAL EQUIPMENT AND SYSTEMS

- Inspect condition of traction alternator collector rings and reverse polarity. Replace brushes. LSM, M.I. 3317-2
- Check functional operation of motor driven air compressor drive motor. LSM, M.I. 1300
- Check motor and compressor for unusual noises. Check motor insulation and blow out with dry air to minimize dirt accumulation. LSM, M.I. 1300
- Inspect dynamic brake blower motor. LSM, M.I. 4105
- Inspect cooling fan motors LSM, M.I. 4105
- Visually inspect dynamic brake grids, grid shorting contactors, and cables. Renew contactor tips as required. LSM, M.I. 1602
- Check operation of all contactors. Inspect arc chutes and interlock plunger bolts. Renew contactor tips as required. LSM

- Brake contactors
- Transfer switches
- Relays GFA, GFC, GFD, STA, EPC
- Renew electrical cabinet air filters. Change high voltage cabinet filter element. Change AC cabinet filter element. Use elements equal to original equipment. LSM
- Check door seals on all electrical cabinets for damage and leakage. Replace if necessary. Adjust lock keeper, if required. LSM
- Inspect all visible insulation and connections on traction motor leads, carbody boots, and HEP system 480 VAC cables, plugs, receptacles and related wiring. LSM

6.4 MECHANICAL EQUIPMENT AND SYSTEMS

- Clean air compressor air filter housing and renew air filter elements. Do not attempt to clean elements. LSM
- Change air compressor oil and filter. M.I.1756, M.I. 1300
- Replace DL filter elements in electronic air brake system. LSM
- Replace coalescer element. Inspect and check all mounting hardware for tightness. Tighten if needed. M.I. 1097
- Inspect radiator air passages and clean if necessary. Operation in areas and in periods of airborne seeds and leaves can require more frequent cleaning. LSM
- Clean radiator header screens after first year of operation. Condition of screens at this time can provide a basis for future cleaning. The presence of metal chips at first cleaning or after engine parts have been renewed is not an abnormal condition. LSM
- Inspect and test cooling system pressure cap and filler neck. Renew cap or filler neck if defective. LSM
- Check for proper cooling system automatic drain operation. Frequency of this check can be seasonally adjusted. (where used)
- Check proper operation of radiator shutter LSM.

system.

- Add 1/4 oz. of lubricant (transmission fluid) to each cylinder and lubricate linkage.
- Drain engine coolant and refill with new. LSM, M.I. 1748
- Drain condensate from fuel tank. LSM
 - Drain more frequently during periods of high humidity or rapid temperature change
- Verify parking brake operation, repair as required. CCB
- Measure pressure drop across carbody inertial filters. Clean if necessary. LSM
- Measure pressure drop across #2 end inertial filters. Clean if necessary. LSM
- Clean HVAC condenser coils. LSM
- Inspect main generator pit drain aspirator. Clean if necessary. LSM
- Change and Clean 824 Filters LSM

- Inspect trucks. LSM, M.I. 1550
- Lubricate door hardware; hinges, latches, and linkages. M.I. 1756
- Change traction motor gear case oil. LSM, M.I. 3911

7.0 TWO YEARS

7.1 ENGINE

- Replace engine crankcase pressure protector and requalify functional operation. Replacement can be EMD Unit Exchange. EMM
- Check temperature differential between lube oil and cooling water into engine. Perform during scheduled load test. Clean oil cooler if necessary. LSM, M.I.927, M.I. 928

7.2 MECHANICAL EQUIPMENT AND SYSTEMS

- Renew thermostatic valve element of fuel oil preheater. LSM

- Renew cooling system pressure cap. LSM
- Inspect vertical and lateral truck shock absorbers and Yaw dampers. Replace as necessary. LSM, M.I. 1550
- Apply grease to traction motor roller support bearings. M. I. 3912

8.0 THREE YEARS

8.1 ENGINE

- Install new upper & lower connecting rod bearings. EMM
- Install new lower main bearings. EMM
- Inspect pendulum damper. Check for free movement of counterweights. EMM
- Inspect and qualify piston cooling tubes. EMM
- Check exhaust valve timing. EMM
- Check rocker arms, rocker arm bushings, and cam followers. EMM
- Renew valve bridge and lash adjuster assemblies. EMM
- Renew injectors. EMM
- Renew top deck cover seals and check latches. EMM
- Renew water pumps EMM
- Inspect EMDEC engine mounted components and wire harness for damage. Repair as required. EMM
- Replace all EMDEC system transducers. EMM
- Renew starter motors. EMM

8.2 MECHANICAL EQUIPMENT AND SYSTEMS

- Renew HVAC system. LSM, VP
- Recondition air compressor valves. Inspect compressor and related piping for leaks. Repair as required. M.I. 1300
- Renew auxiliary generator drive coupling. M.I. 1753.
- Replace fuel pump and motor assembly. EMM
- Renew flexible coupling seals in cooling and lube oil piping. LSM
- Renew shutter air cylinder piston, piston rod, LSM

- and cylinder seals. Air test after seal renewal.
- Renew shutter magnet valves. LSM
- Renew sander magnet valves LSM

- Renew main reservoir drain valves. LSM
- Remove primary lube oil filter bypass valve. M.I. 926
Clean, inspect, and test.
- Inspect secondary yaw dampers. Replace as LSM, M.I. 1550
necessary.

8.3 ELECTRICAL EQUIPMENT AND SYSTEMS

- Inspect traction inverter/HEP cabinet. Clean M.I. 3700
cooling fins on phase modules. Check all cable
and wiring connections.
- Inspect HEP transformer, chopper reactors and M.I. 3700
line filter reactor. Clean cooling fins on
transformer. Check all cable and wiring
connections.
- Renew inverter cabinet blower motor assembly. LSM
- Renew inverter cut-out switch motor module LSM
assembly.
- Renew radiator cooling fan assemblies. LSM
- Renew dynamic brake blower assembly. LSM
- Renew Inertial Filter Blower Motor. LSM
- Renew Electronics Blower Motor. LSM
- Renew exciter alternator M.I. 1753, M.I. 3707
- Renew #1 truck TM blower motor assembly. LSM
- Renew #2 truck TM blower motor assembly. LSM
- Renew ICE blower motor assembly. LSM

9.0 SIX YEARS

9.1 ENGINE

- Drain lubricating oil. Replace with fresh charge LSM, EMM, M.I. 1752
of oil after overhaul work is completed.
- Renew power assemblies. Apply new heads, EMM
liners, pistons, and rings. Apply new head seat

rings. Apply new lower liner inserts. Apply new rocker arms and rocker arm bushings. Apply new valve bridges and lash adjusters. Apply new camshaft bearings.

- Install new upper and lower connecting rod bearings EMM
- Visually inspect and requalify crankshaft. Install new upper and lower main bearings. Install new thrust collars. EMM
- Visually inspect and requalify all components of the front and rear gear trains. EMM
- Renew crankshaft damping device. Replace with new or reconditioned pendulum-type damper. LSM
- Renew turbocharger. EMM.
- Replace turbo lube pump motor. LSM
- Renew aftercooler cores. EMM
- Inspect exhaust manifold sections. Renew base gaskets. Renew expansion joints. EMM
- Renew EMDEC fuel injection system components. Replace EMDEC computer modules. Replace engine mounted wiring harnesses. EMM
- Renew or recondition oil pumps EMM
- Remove oil pressure relief valve; clean, inspect, and test.

9.2 ELECTRICAL EQUIPMENT AND SYSTEMS

- Remove rectifier assemblies from generator air box. Remove fuses and thoroughly wash heat sink and diodes. CAUTION: Never use a caustic cleaner solution. M.I. 3317-2
- Remove main generator bearing cover. Inspect for grease contamination, excessive wear and overheating. Apply new grease. M.I. 3317-1
- Check operation of all AC fan/blower motor contactors. Inspect interlocks and fuses. LSM
 - Renew cooling fan contactor.
 - Renew dynamic brake contactors.
 - Renew TM blower motor contactors.

- Renew inverter cabinet blower motor contactors.
- Renew air compressor drive motor contactors. LSM, M.I. 5364-B
- Renew ICE Train Situation Indicator screens. LSM

9.3 MECHANICAL EQUIPMENT AND SYSTEMS

- Recondition air compressor. M.I. 1300
- Renew turbocharger-to-filter air duct. LSM
- Clean main reservoir system and recondition valves. LSM
- Renew soak back motor pump assembly.

10.0 TWELVE YEARS

10.1 ELECTRICAL EQUIPMENT AND SYSTEMS

- Renew traction motors. Replacement should be EMD Unit Exchange or equivalent. Refer to non-scheduled maintenance portion of this M. I. M.I. 1550, M.I. 3911
- Renew main generator bearing. M.I. 3317-1

10.2 ENGINE SKID

- Inspect skid for fatigue cracks and defects. LSM
- Replace isolation mounts LSM

11.0 EIGHTEEN YEARS

11.1 ENGINE

- Renew engine.

11.2 ELECTRICAL EQUIPMENT AND SYSTEMS

- Renew main traction alternator and companion alternator.

12.0 NON-SCHEDULED MAINTENANCE

A definite time schedule for items listed below cannot be established due to variations in wear and component life related to operating conditions.

12.1 HIGH VOLTAGE CABLING

Renew.

12.2 LOW VOLTAGE WIRING

Renew.

12.3 TRUCK ASSEMBLIES

The EMD 2-axle, high-speed, passenger locomotive truck has been designed to achieve a one-million mile service life. With attendant improvements in wheel wear and wheel life, the maintenance cycle of this truck is expected to coincide with two wheel change intervals. Actual overhaul frequency of the truck assembly needs to be consistent with service life and the scheduled maintenance of other locomotive components as reflected in this M.I.

- At overhaul, inspect, test, and repair or replace the following items as necessary; frame, wear plates, springs, spring seats, snubbers, brake rigging, rubber secondary springs, and sander guides. LSM, M.I. 1550 M.I. 3911, M.I. 3912 as applicable.

(The following work should be performed at each wheel truing event, or when trucks are removed for reconditioning.)

- Inspect all primary and secondary dampers. Replace as necessary. LSM, M.I. 1550
- Renew vertical truck shock absorbers LSM, M.I. 1550
- Requalify pinion. Replace at fourth wheel change. M.I. 1518, M.I. 1550, M.I. 3911
- Requalify bull gear. M.I. 1518
- Requalify axle M.I. 1518
- Inspect grounding brushes. Replace as required. M.I. 1550

12.4 TRACTION MOTOR

- Reference M.I. 3911

The following work should be performed at each wheel change event, or when truck assembly is removed for reconditioning.

12.4.1 TRACTION MOTOR SUSPENSION BEARINGS

- Re-grease. M.I. 3912
- Renew roller bearing assemblies at second wheel change. M.I. 3912

12.4.2 JOURNAL BEARINGS

- Renew at wheel change-out M.I. 1553

12.5 BRAKE RIGGING

- Reference Document LSM,
M.I. 1550,

12.6 GROUNDING CABLES

- Replace truck grounding cables with new cables. M.I. 1550

These EMD Maintenance Plans, detailed Maintenance Steps and Experienced Estimates of Time required to perform maintenance on EMD products is confidential between EMD and its Customers. These estimates are based on assumptions about the Locomotive Duty Cycle, Train Operation and actual Maintenance performed.

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