ELECTRO-MOTIVE

MAINTENANCE INSTRUCTION

M.I. 1705
*Rev. B

NEW EXPORT LOCOMOTIVE DEPROCESSING, INSPECTION, AND TIGHTENING PROGRAM

INTRODUCTION

Overseas shipment of locomotives requires precautionary measures to protect them against possible damage from corrosion or other causes. This instruction covers the steps taken to protect locomotives at the factory, and what should be done to deprocess the unit and prepare it for service. However, this instruction should only be used as a general guide.

Prior to placing a new locomotive in service, it is important that certain equipment inspections be made. After limited service (approximately one month) it is essential that an additional inspection be made and equipment tightened to proper torque values. Such attention will have a definite bearing on continued successful operation.

This publication outlines the procedures and inspections that should be performed with accurate records kept of initial inspection and tightening. Since it covers locomotives having varying equipment, certain items listed may not be applicable.

INSTRUCTION REFERENCES

In the instructions, abbreviations are used to reference publications that contain information related to maintenance. The following examples are provided to aid in understanding the abbreviations used.

LSM	means Locomotive Service Manual
EMM	means Engine Maintenance Manual
M.I.	means Maintenance Instruction

BEFORE SERVICE DEPROCESSING

The entire locomotive is covered with a waterproof bag and mattress which is held down by a batten assembly. The entire batten assembly, waterproof bag, and mattress must be carefully removed.

TRUCKS AND TRACTION MOTORS

1. TRACTION MOTOR AIR DUCT	Remove plywood and/or tape covering duct. If ducts were shipped loose, remove covers and apply.
2. UPPER TRACTION MOTOR INSPECTION OPENING	Open inspection cover and remove the two bags of desiccant.

*This bulletin is revised and supersedes previous issues of this number. Areas of change are indicated by vertical bars in the margins.

MECHANICAL (CONT'D)

5. COOLING SYSTEM

a. Check inhibitor	M.I. 1748.
b. Fans and shutters	Press buttons to check operation. Check for blown fuses.
c. Piping	Check for leaks at piping, radiators, and aftercooler (if applicable).
d. Radiator header screens	Remove and clean. Refer to M.I. 549 and M.I. 550.

6. FUEL SYSTEM

a. Suction strainer	Clean suction strainer. LSM.
b. Filters	Change fuel filters. LSM.

7. LUBE OIL SYSTEM

a. Lube oil	Check for dilution or contamination.
b. Lube oil filters	Change filters. Clean the filter housing. LSM.
c. Lube oil strainer housing	Clean the suction screens.

8. AIR COMPRESSOR OR COMPRESSOR EXHAUSTER	Tighten cylinder head and cylinder to crankcase bolts. M.I. 1100, 1144.
9. TRUCK AND WHEELS	Make visual inspection of frame, bolster, wear plates, liners, springs, spring seats, snubbers, brake rigging, rubber bolster springs, and shock absorber mounting bolts.

ELECTRICAL

1. ROTATING EQUIPMENT	Perform checks listed under ROTATING EQUIPMENT in "Before Service Inspection And Tightening." Also inspect for flashover damage.
2. DEVICES AND SYSTEMS	Perform checks listed under DEVICES AND SYSTEMS in "Before Service Inspection And Tightening."

TRUCKS AND TRACTION MOTORS (CONT'D)

3. TRACTION MOTOR AIR OUTLETS	Remove the tape covering the outlets.
4. BOLSTER CENTER BEARING	Remove plywood covering. Add oil, if necessary. LSM. Check to be certain center bearing dust guard is in place and not damaged.
5. BRAKE CYLINDER VENTS	Remove tape over vents.
6. TRACTION MOTOR LEADS	Remove wooden protective box and tape.
7. TRACTION MOTOR AIR INLETS ON UNDERFRAME	Remove covering and tape.
8. SANDER LINES	Disconnected from carbody; remove seal over connections.
9. JOURNAL BOX SPEED RECORDER HEAD	Remove tape seal.
10. BRAKE CYLINDER PIPING	Remove seals where piping was disconnected.
11. TRACTION MOTORS	Remove fibreen paper and rope wrapped around traction motors. Replace brushes and remove the wrap placed between the brush holder and the commutator. **NOTE** This is necessary when the traction motors are removed and shipped separately.

ENGINE

12. COOLING SYSTEM	No action is necessary to remove the factory applied protective coating. Engine water pipes are not sealed or plugged so no removal action is necessary.
13. LUBE OIL SYSTEM	Treated at factory with preservative oil, Tectyl No. 823EM. No remover is needed.
a. Top deck	All parts are coated with the same preservative oil as lube oil system. No remover is needed.
b. Air box	Treated with the same preservative oil as lube oil system, no remover is needed. Remove desiccant bags, if present.
c. Oil pan	Remove desiccant bags, if present.
14. FUEL OIL SYSTEM	Pumps and injectors have adequate protection. No remover is needed.
15. EXHAUST OUTLET(S)	May or may not be covered. Remove any covering.

ENGINE (CONT'D)

16. GOVERNOR	Remove barrier paper wrapping and two bags of desiccant hung behind and from the bottom of the governor.
17. EQUIPMENT RACK	Remove tape and desiccant bags from switches.
18. CRANKCASE PROTECTOR AND TEST VALVES	Remove desiccant bags and tape.

GENERATOR

19. UNPAINTED STEEL SURFACES	Coated with MIL-C 16173 Grade 4, or equivalent. Remove by using turpentine or paint thinner.
20. BRUSHES	The brushes are raised and a piece of wrap is placed between them and the collector ring or commutator. Remove the wrap.

ELECTRICAL CABINET

21. CABINET INTERIOR	Remove the five to ten 1-lb. bags of desiccant that are placed at the lower corners of the high voltage cabinet.

MISCELLANEOUS

22. AIR COMPRESSOR OR COMPRESSOR EXHAUSTER	Remove tape covering air compressor.
23. LOAD REGULATOR	Remove paper and tape covering load regulator.
24. BATTERIES	
a. Leads	Battery positive and negative leads are disconnected and taped at battery end only. Remove tape and reconnect.
b. Battery terminals	Coated with a white petroleum jelly. No remover is needed.
c. Dry charged batteries	Vent caps sealed - sealer must be removed.

BEFORE SERVICE INSPECTION AND TIGHTENING

MECHANICAL

1. ENGINE

a. Air Box b. Oil pan	Pre-lube before starting engine. Bar over during pre-lube inspection. LSM. If fluid discharge is observed from any cylinder, find the cause and make necessary repairs prior to starting the engine. EMM.
c. Check racks	Move injector control lever to check for freedom of movement and without binding of injectors.
d. Lubricating oil	Fill to proper level with approved oil. M.I. 1761. Before starting, make certain that lube oil strainer housing is filled. Recheck oil level with engine running.
e. Governor	Check oil level. Add as required. Refer to EMM and M.I. 1764.
f. Top deck	Inspect for loose parts and foreign material. With engine running at idle, check for proper lubrication and for fuel leaks.
g. Air box drain	Check for air discharge.

2. COOLING SYSTEM

Fill cooling system. Use EMD approved water treatment. M.I. 1748. Check shutter and fan operation after engine is running. Refer to LSM.

3. AIR COMPRESSOR OR COMPRESSOR EXHAUSTER

Check oil level, M.I. 1100, 1144. Add as required, M.I. 1756. Check operation for cut in and cut out after engine is running.

4. SPEED RECORDER

Check oil level. Add as required. Refer to Manufacturer's bulletin.

5. TRUCKS

a. Traction motor support bearings	Check oil level. M.I. 3900, 3904. Add as required, M.I. 1756.
b. Armature bearings - Oil type	Add six ounces of oil to each bearing per specifications in M.I. 1756.
c. Gear case	Check grease level, M.I. 3900, 3904. Add as required, M.I. 1756.
d. Journal boxes	Check oil level, M.I. 1552. Add as required, M.I. 1756.
e. Brakes	Check air and hand brake operation. Observe that brakes apply and release properly, and that there are no air leaks.
f. Sand	Check that sand is applied to rail in proper amount at proper location, relative to position of reverser handle. LSM.

MECHANICAL (CONT'D)

6. SPEED INCREASER	Check oil level. See that fan is free to operate. M.I. 1207.
7. BLOWERS	Check air discharge from traction motor vents and discharge through main generator into engine room.
8. GENERATOR PIT DRAIN ASPIRATOR	Check for obstructions and proper air flow.

ELECTRICAL

9. ROTATING EQUIPMENT	Inspect collector rings, commutators, and brushes. Replace broken or chipped brushes using same grade and type as removed.
a. Main Generator	
b. Traction motors	
c. Auxiliary generator	
d. Dynamic brake blower motor	
10. DEVICES AND SYSTEMS	
a. Contactors, relays, and switches	Check wiring connections for tightness and check for proper operation.
b. Terminal boards, resistors, and rheostats	Check connections for tightness.
c. Fuses (main electrical cabinet)	Test and install fuses.
d. Fuses (main generator and radiator cooling fan)	Check fuse indicating pins.
e. Control system qualification	Perform qualification checks. Perform forward and reverse movement check in single and multiple unit operation.
11. BATTERIES	Check battery leads. Check electrolyte level and specific gravity. Add water as necessary.
12. AUXILIARY GENERATOR	Check auxiliary generator voltage. If necessary, perform adjustment in run 8 with equipment at operating temperature.
13. ALARM AND SAFETY DEVICES	
a. All annunciator lights	Test for correct operation.
b. Governor shutdown (low oil pressure)	
c. Hot engine	

ELECTRICAL (CONT'D)

d. No power (auxiliary AC)

e. Overspeed trip

f. High voltage ground/fault

g. Engine protector

h. Turbocharger auxiliary pump (if applicable)

14. INERTIAL AIR FILTER DUST BIN MOTOR	Check for correct rotation.
15. TRACTION MOTOR BLOWER — MOTOR DRIVEN	Check for correct rotation and operation.

AFTER SERVICE INSPECTION AND TIGHTENING

Perform All Operations Listed After Approximately One Month Of Service

MECHANICAL

1. ENGINE BOLT AND NUT TIGHTNESS CHECK

Check that the following nuts and bolts are tightened to the correct torque values as specified in the EMM.

a. Cylinder liner water inlet line nuts and bolts.

b. Exhaust manifold flange bolts

c. Cylinder head crab nuts — Except those engine equipped with plate-type crabs.

d. Head frame to crankcase bolts

e. Turbocharger to airduct bolts, aftercooler to airduct bolts, and air duct to crankcase bolts (if applicable)

f. Engine mounting bolts.

g. All nuts and bolts at both ends of engine and all piping connections.

2. ENGINE INSPECTION

a. Air box — Bar engine over and make visual inspection. If fluid discharge is observed from any cylinder, find the cause and make the necessary repairs. EMM.

b. Oil pan

c. Top deck

3. ENGINE CONTROLS AND ADJUSTMENTS

Check settings. Refer to Engine Maintenance Manual for correct settings.

a. Injector timing

b. Injector rack setting

c. Engine speed

d. Lash adjusters

e. Pilot valve setting — Readjust pilot valve setting if engine speed adjustment is changed.

4. EQUIPMENT RACK

Check tightness of all bolts, nuts, and connections on equipment rack.

MECHANICAL (CONT'D)

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