EMD MAINTENANCE INSTRUCTION

SCHEDULED MAINTENANCE PROGRAM — GP-30

INTRODUCTION

Maintenance Instruction 1715 comprises average recommendations which we believe will insure satisfactory locomotive operation and economical maintenance cost where average load factors and average climatic conditions are encountered.

The recommendations assume that the following conditions will apply:

1. All work scheduled will be done in a workmanlike manner, which assumes that the proper tools, facilities and supervision will be available.

2. Fuel oil used should meet the specifications of Maintenance Instruction 1750.

3. Lubricating oil MUST be qualified for use in D3 engines.

4. Lubricating oil filters should be changed in accordance with Item 5, at one (1) month or 15,000 mile intervals, and filters must be of quality equal to original equipment.

5. Lubricating oil should be changed in accordance with Item 12, at four (4) months or 60,000 mile intervals.

ELECTRO-MOTIVE DIVISION
GENERAL MOTORS CORPORATION • LA GRANGE, ILLINOIS, U. S. A.
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MECHANICAL AND ELECTRICAL MAINTENANCE SCHEDULE

ONE MONTH OR 15,000 MILES	REMARKS
1. ANALYZE LUBE OIL SAMPLE	Condemning limits minimum Ph 4.0 or a total base number of no less than 0.10.
2. CHECK LEVEL OF OIL IN OIL BATH AIR FILTER	
a. Air compressor	M.I. 1110
3. CHECK BATTERY WATER LEVEL AND GRAVITY	
4. CLEAN TURBOCHARGER OIL FILTERS	
a. Turbo supply	Use fixture 8315844
b. Soak back pump	Use fixture 8315754
5. LUBE OIL FILTER — 7-ELEMENT	EMD Approved type elements.
a. Change filter elements	
b. Clean lube oil strainer	
THREE MONTHS OR 45,000 MILES	
6. CHANGE OR CLEAN FUEL FILTER ELEMENTS	
a. Michiana fuel filter - change	
b. Suction - clean	
c. Engine mounted - change	
8. INSPECT ENGINE	Engine Maintenance Manual
a. Crankcase	
b. Pistons and piston rings	
c. Cylinder liners	
d. Cylinder head engine mechanism with engine idling and at operating temperature	
9. CHECK COOLING WATER INHIBITOR	Engine Maintenance Manual
10. DRAIN CONDENSATE FROM FUEL TANK	More frequently in rapid temperature changes.

THREE MONTHS OR 45,000 MILES	REMARKS
11. TRACTION MOTOR BRUSHES	Experience with individual operations will dictate the frequency of this item. Brush life will vary from three (3) to six (6) months, depending on the type of service and operating conditions. M.I. 3900
FOUR MONTHS OR 60,000 MILES	
12. CHANGE ENGINE LUBE OIL	Engine Maintenance Manual
a. Clean oil suction screen b. Clean scavenging oil screens c. Clean oil pan d. Change filter elements e. Clean filter housing f. Clean and inspect oil filter relief valves	Performance of the lube oils qualified for use in turbocharged engines has been such that "Lube Oil" change period should be four months or 60,000 miles maximum. However, the condemning limit for oxidation of qualified oils is a minimum Ph of 4.0 or a total base number of no less than 0.10.
SIX MONTHS OR 90,000 MILES	
13. OIL BATH AIR FILTER -- CLEAN FILTER BOWL AND CHANGE OIL	
a. Air compressor	M.I. 1110
14. MAIN GENERATOR BRUSHES	Experience with individual operations will dictate the frequency of this item. Brush life will vary from six (6) to nine (9) months, depending on the type of service and operating conditions. M.I.3302
ONE YEAR OR 180,000 MILES	
15. VISUALLY INSPECT FOR LEAKS	Locomotive Operating Manual
a. Cooling system b. Fuel piping and connections c. Lube oil piping and connections	
16. REMOVE AND CLEAN ROTONAMIC FILTERS	
a. Clean filter housing	

ONE YEAR OR 180,000 MILES	REMARKS
17. REPLACE BRUSHES	
a. Auxiliary generator - (replace complete set)	M.I. 3701
b. Alternator slip ring brushes	M.I. 3306
18. CHECK CALIBRATION AND OPERATION OF PROTECTION AND SAFETY SWITCHES	
a. High temperature	M.I. 5511
b. Low oil pressure	Engine Maintenance Manual
c. High oil suction	Engine Maintenance Manual
d. No voltage	M.I. 5323
e. Overspeed trip	Engine Maintenance Manual
f. Ground relay	M.I. 5384
g. Wheel slip relay	M.I. 5353
h. Engine protector	
19. WASH OUT BATTERY BOXES AND GREASE TERMINALS	
20. CLEAN DYNAMIC BRAKE GRIDS	Use clean dry air.
21. ELECTRICAL CABINETS	M.I.'s 5300, 5373, 5398, 5380, 5427, 5428, 5375, 5364, 5374
a. Visually inspect contact tips of all contactors and replace where required	
22. CHECK OPERATION OF VOLTAGE REGULATOR	Must be at operating temperature. M.I. 4510
23. CHECK OPERATION OF DYNAMIC BRAKE REGULATOR	M.I. 4508
24. CHECK LOW VOLTAGE SYSTEMS FOR GROUNDS	
25. RENEW GOVERNOR DIAPHRAGM	Engine Maintenance Manual
TWO YEARS OR 360,000 MILES	
26. UNIT EXCHANGE TURBOCHARGER	Engine Maintenance Manual
27. LUBE OIL COOLER	
a. Check temperature differential between lube oil and cooling water into engine.	Clean oil cooler if required.

TWO YEARS OR 360,000 MILES	REMARKS
28. CHECK SETTINGS OF RELAYS IN AUTOMATIC TRANSITION CIRCUIT	M.I. 6829, 5497
29. LOAD REGULATOR	
a. Clean commutator and replace brushes	M.I. 4504
30. UNIT EXCHANGE	
a. Filter compartment fan motor b. Fuel pump c. Fuel pump motor	
31. RENEW BRUSHES	
a. Dynamic brake blower motor	M.I. 4104

THREE YEARS OR 540,000 MILES	
32. UNIT EXCHANGE CYLINDER ASSEMBLIES	Engine Maintenance Manual
a. Replace grommets, all-metal gasket, and liner seals b. Renew piston rings c. Clean top deck, and oil pan	Take compression lead readings of all cylinders when reapplied to engine. Maintain records.
33. UNIT EXCHANGE	Engine Maintenance Manual
a. Injectors b. Water pumps c. Aftercooler assemblies	
34. REMOVE BATTERIES, CLEAN AND PAINT BATTERY BOXES	

FOUR YEARS OR 720,000 MILES	
35. UNIT EXCHANGE SOAK BACK PUMP MOTOR	
36. INSTALL NEW THRUST COLLARS AND NEW LOWER MAIN BEARINGS	Engine Maintenance Manual
37. UNIT EXCHANGE TRACTION MOTORS	
38. UNIT EXCHANGE GOVERNOR	Engine Maintenance Manual

SIX YEARS OR 1,080,000 MILES	REMARKS
39. UNIT EXCHANGE a. Auxiliary generator b. Dynamic brake blower motor c. Traction motor blower motors d. Cooling fans	
40. RECONDITION AIR COMPRESSOR ASSEMBLY	M.I. 1110
41. CLEAN AND INSPECT FUEL TANK	
TWELVE YEARS OR 2,160,000 MILES	
42. UNIT EXCHANGE ENGINE ASSEMBLY	
43. UNIT EXCHANGE MAIN GENERATOR AND ALTERNATOR ASSEMBLY	
44. RENEW HIGH VOLTAGE CABLE	It is recognized that this work may not be required at this particular time or mileage. However, shop efficiency may require this operation at time of engine and generator exchange.
45. RENEW LOW VOLTAGE WIRING	It is recognized that this work may not be required at this particular time or mileage. However, shop efficiency may require this operation at time of engine and generator exchange.
46. CLEAN AND RECONDITION ENTIRE CARBODY	

NON-SCHEDULED MECHANICAL AND ELECTRICAL MAINTENANCE

A definite schedule for the items listed below cannot be established due to variation in wheel life and truck overhaul periods. This rework to be performed at wheel change time or when truck is removed for reconditioning.

	REMARKS
1. MAGNAFLUX: a. Pinion gears b. Axle gears c. Axles with inner races removed	M.I. 1518

2. CHECK TRACTION MOTOR ARMATURE BEARINGS	Whenever truck assembly is removed from locomotive, check traction motors for any unusual bearing noise or heat at not less than 1500 RPM. M.I. 3900
3. CLEAN AND RECONDITION HYATT JOURNAL BOXES	M.I. 1552

LUBRICATION SCHEDULE

ONE MONTH OR 15,000 MILES	REMARKS
1. TRACTION MOTOR SUPPORT BEARINGS	Fill to 6-1/2" mark. Capacity 12-1/2 pints.
2. TRACTION MOTOR GEAR CASE	Jet Lube or equivalent. M.I. 3900
3. WATER PUMPS	Fill cup on pumps. M.I. 1752
4. BELL RINGER	
5. SHUTTER LINKAGE	
6. JOURNAL BOX — ROLLER BEARING	Maintain to fill plug level.
THREE MONTHS OR 45,000 MILES	
7. LUBRICATE SPEED RECORDER AND DRIVE CABLE	SAE #10 oil. This item not required for grease lubricated recorders.
8. HAND BRAKE WHEEL	Light oil.
9. BRAKE SLACK ADJUSTER SCREWS	Use graphite grease.
10. LUBRICATE:	
a. Mars headlight	
b. Windshield wiper motors	
c. Door and window hardware	
ONE YEAR OR 180,000 MILES	
11. AIR COMPRESSOR UNLOADER - (ALL METAL TYPE)	Light machine oil. Lubricate parts when valves are inspected and cleaned. M.I. 1110
12. CHANGE OIL IN ENGINE GOVERNOR	M.I. 1752
13. CHANGE OIL IN AIR COMPRESSOR	M.I. 1752

FIVE YEARS OR 900,000 MILES	REMARKS
14. MAIN GENERATOR BEARING	Use Cyprina RA grease - Grade #3.
a. Repack as follows: (1) Remove bearing cover (2) Remove old grease from cover and exposed portions of bearing (3) Inspect exposed portions of bearing for signs of distress, metal chips, etc. (4) Repack bearing solidly with approved grease (5) Repack cover and apply	Capacity (New) — D22 Generator: Bearing 14 oz. Cap 18 oz. Cover 18 oz.