

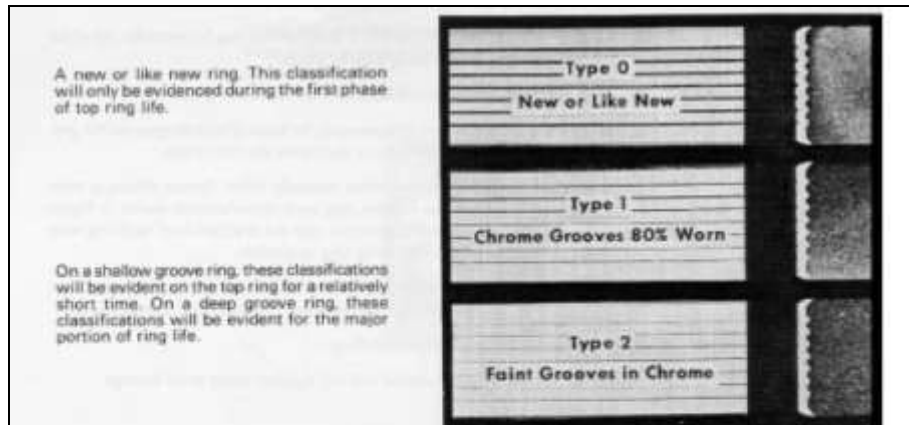
Engine:

Is an amalgamation of acceptable 16-567D1 components.

- Consisting of remanufactured 645 power assemblies.
 - Utilizing a mixture of cylinder head designs ranging from EMD Casting designation Circle 2 through Diamond 5. This mixing of casting technologies is NOT uncommon for this locomotive configuration.
 - Serial number records are:

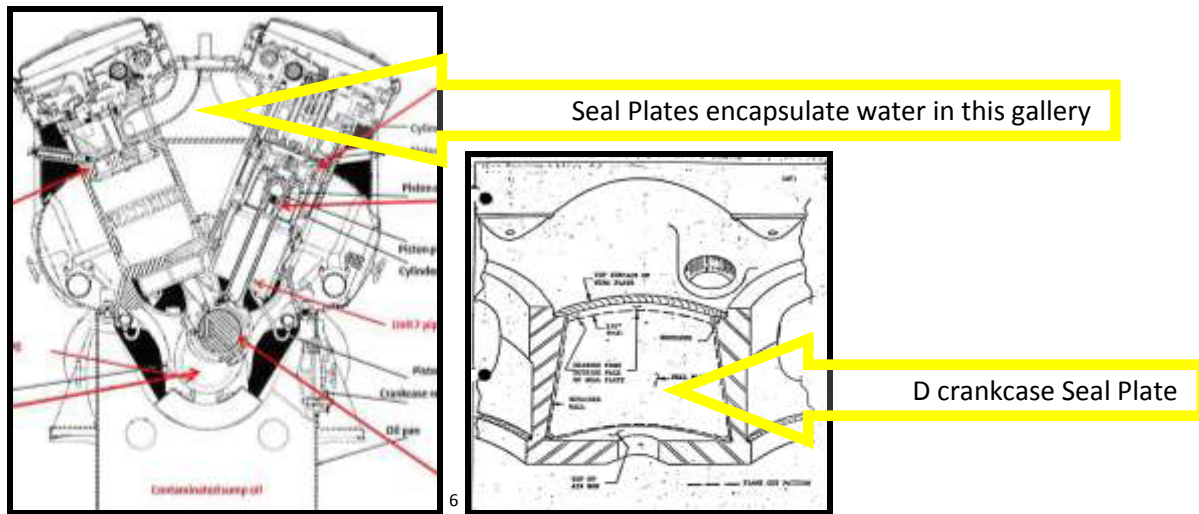
Pos	PA SN	Cylinder head casting ID	Pos	PA SN	Cylinder head casting ID
1	Not legible	D4	9	72 M 2895	D3
2	65 B 1506	D5	10	89 L 1062	D5
3	Not legible	D5	11	71 H 1712	C6
4	68 H 709	C2	12	72 G 3264	D3
5	75 A 1076	D3	13	71 C 7214	C3
6	78 L 1935	D3	14	72 F 3031	D3
7	72 L 1299	D3	15	79 K 3528	D4
8	77 D 4221	D3	16	77 D 2166	D3

- Piston Ring condition meets Type 1, max side ring clearance observed was .013 inches.



- Model D engine crankcase.
 - This crankcase utilizes what is known as “Seal Plates” located between cylinder head seat forgings. These are used to contain water in the crankcases exhaust deck manifold. This is an obsolete technology eliminated by EMD in subsequent designs. While it is adequate for this application, it is limited to engines operating at 2000 THP and lower.

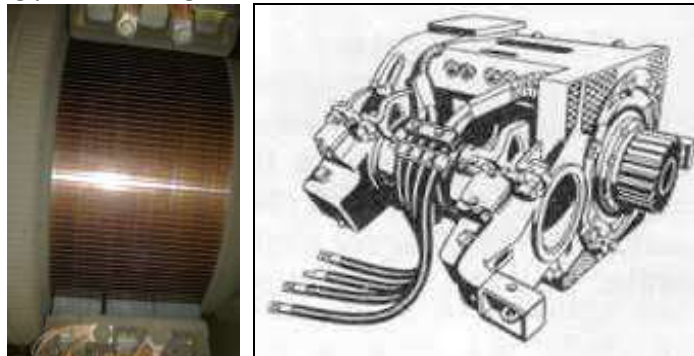
⁵ As established by EMD OEM requirements.



- Normally aspirated roots blown combustion air supply.
- Lube oil capacity – 200 US gallons.
- Fuel capacity – 900 US gallons.

Electrical Rotating:

- EMD Model D12 traction generator / D14 companion alternator.
 - Generator measured at better than ten Meg on a 500 volt scale and was found to be dielectrically sound.
- 14KW auxiliary generator.
- Traction motor model D57.
 - Potentially rewound as D77 however no documented or visual evidence existed to confirm this, nor did any electrical test affirm it incontrovertibly, it is suspected because this would have been a common occurrence when this locomotive was rebuilt in 1973. However at its present HP and electrical control configuration a D77 would not provide superior performance measures beyond the D57 design.
 - Commutator filming pattern is in good condition.



⁶ Reprinted from EMD Engineering Specification for Factory Rebuild # 2132.

- Each TM was measured at better than ten Meg on a 500 volt scale and found to be dielectrically sound.
- Cooling fans – 10 blade AC (four – split cooling design, two forward and to rear).
- Traction motor blower – AC.

Air Brake:

- AAR defined 26RL system.
 - Locomotive Air Brake system features have evolved over time, what is commonly considered to be present age technology is 26L air brakes operated by 30CDW controlling valve or electronic air brake systems. In effect all air brake systems provide the same end result (e.g. mechanical braking effort). Making this system unique is its RL model designation. Its distinguishing factor is; 26RL equipment provides a minimum service reduction position with a predetermined initial reduction in brake-pipe pressure, after which further reductions are initiated and controlled by the locomotives operator. In effect this distinguishing factor is commercially irrelevant and roughly equivalent to whether one wishes to use the “Resume Speed Feature” on automotive cruise control or would rather depress a gas pedal to increase a vehicles speed. This is essentially a matter of preference that ought to be known to the operator but is not detrimental if it is not known.
- Air compressor - Gardener Denver model WBO.

Structure – Drawbar – Running Gear:

- Structure exhibits typical wear and tear defects largely cosmetic in nature.
- Does not strictly qualify to self-aligning coupler requirements (further discussed below) but does include welded stop wedges acceptable to many Class 1 Railroads for movement.
- EMD two axle swing hanger GP truck design.
- Clasp Brakes.
- 62:15 gear ratio.
- Wheel report:

Pos.	Flange Height	Flange Thickness	Rim Thickness	Tread Wear	Wheel Diameter
L1	0-19	0-0	48	0	38
L2	0-19	0-0	50	0	40
L3	0-20	0-0	45	0	36
L4	0-20	0-0	48	0	38

Pos.	Flange Height	Flange thickness	Rim Thickness	Tread Wear	Wheel Diameter
R1	0-19	0-0	48	0	38
R2	0-19	0-0	50	0	40
R3	0-20	0-0	45	0	36
R4	0-20	0-0	48	0	38

- Side Bear Clearances:

RPS Lube Oil analysis:

Spectrographic analysis identified presence of water in the oil, however no indication of an internal water leak was readily identified in the engine during RPS’s inspection. Probability would suggest it is due to condensation having occurred while in a humid climate and lack of use at that time. This is not considered abnormal.

Element	UOM	#	Monitor	Current						Next Oil/Fuel
Si	ppm	--		8						
Ca	ppm	--		4						
Na	ppm	--		0						
Ti	ppm	--		0						
Al	ppm	--		0						
Sn	ppm	--		0						
Fe	ppm	--		21						
P	ppm	--		0						
M	ppm	--		0						
Cu	ppm	--		2777						
Mg	ppm	--		0.8						
Zn	ppm	--		76						
Mo	ppm	--		0.7						
Li	ppm	--		0						
BB	ppm	--		0						
Be	ppm	--		0						
Co	ppm	--		0						
Mn	ppm	--		0						
Ni	ppm	--		0						
S	ppm	--		0						
PC1	Particulate Quantifier Index		In Range							
PC2 Index	NR			0						
FTIR	FTIR Spectroscopy		ASTM D3212							
Water	ABSCM-1	--		46						
SO2	ABSCM-1	--		0.1						
NO2	ABSCM-1	--		0.1						
Sulf	ABSCM-1	--		0.8						
SW	ABSCM-1	--		0.3						
PT-IR Glycol	ABSCM-1	--		0						
PT-IR Water	ABSCM-1	--		0.3						

Acceptance to general BoA lease return language:

- RPS substantiates this locomotive largely meets the return language of the BoA lease agreement with the exception of provision (7) requiring removal of all Lessee installed markings. While the locomotive does exhibit salient defects, in RPS opinion these are normal wear and tear for a locomotive of this age. RPS does not recommend remediation of these defects as they are what is commonly expected on locomotives of this kind.

Acceptable for AAR interchange: Yes.

- Locomotive is not equipped self-aligning couplers as defined by some class 1 RR’s, however it does use equipment acceptable to many Class 1’s. In all probability it would require “dead in train” or “special” movement rather than powered movement.
- The couplers on this locomotive (represented below) essentially⁷ comply with movement requirements established by Norfolk Southern Railroad operating rule LDI 10-11 “Instructions and rules regarding moving units without alignment control draft gear” (attached).

⁷ Final acceptance is determined by a Railroad Inspector who is allowed “judgement” concerning safety and actual compliance, this judgement can differ from individual to individual.



Typical Couplers modified for LDI 10-11 requirements.

Other roads could require application of the coupler (Figure 1) below.

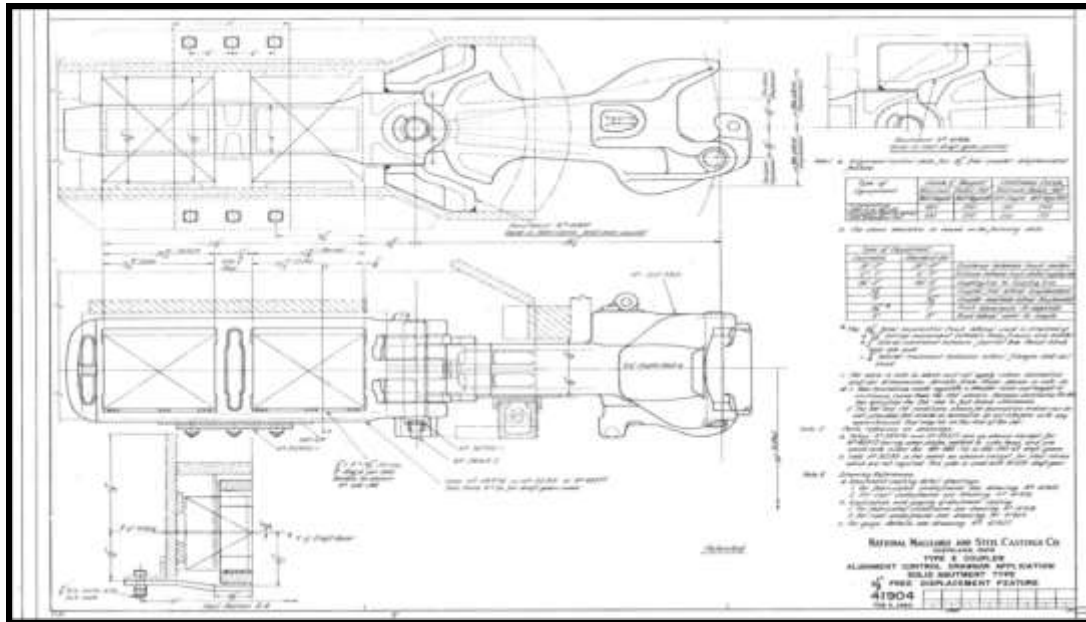


Figure 1

Salient defects:

- 1) Helpers chair missing arm rest and upholstery:



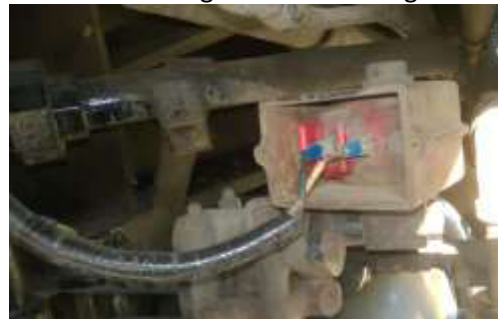
- 2) Left front corner of end sheet has minor strike damage.



- 3) Left Front truck brake cylinder hose cracked.



- 5) 818 air filter magnet valve missing cover.



- 4) Rear pilot sheet has strike damage.



6) Fuel tank sight glass missing sight tube.



9) FPC relay missing cover.



7) Flex conduit for axle generator damaged.



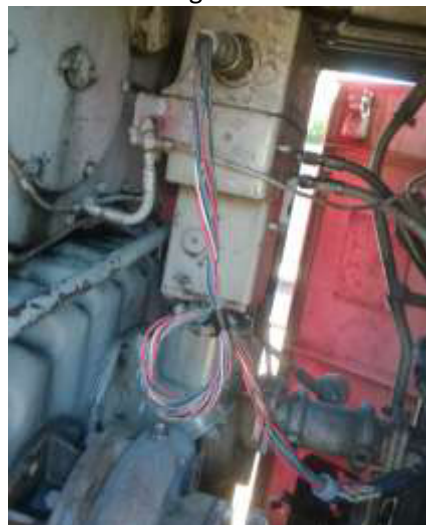
10) Right rear visor Missing.



8) Helper's side strip heater missing cover.



11) Governor wiring not in conduit.



12) Water leak, left bank water pump.



Of greater importance beyond what is reported is what is not reported. Unless noted otherwise the locomotive complies or perform satisfactorily to the following requirements:

General inspection

- With engine running check for air, fuel, water and exhaust leaks.
- Perform RPS air brake leak and function tests and FRA departure safety test.
- Inspect cab weather stripping and cab equipment for defects.
- Inspect engine base bolts and dowels for secure conditions.
- Inspect handbrake operation.
- Inspect engine top deck for fuel or water leaks, excessive oiling from camshaft bearing blocks and potential crab bolt spherical seat wear (seen by bubbling crab bolts).
- Inspect high voltage and AC cabinet door seals and latches ...ensure correct operation, locking and sealing functions.
- Verify correct operation of cooling fan and blower(s).
- Check for correct operations of all emergency fuel cut off switches.
- Check that all access panels, doors, covers and hatches to electrical equipment and cabinets are in place and have proper warning labels
- Check sanders, forward, reverse and emergency functions for correct operations.
- Check function of all cab equipment (wipers, lights, etc) for correct operations.

Lube oil system

- Note lube oil governor pressure is correct (no less than 60 PSI) during throttle 8 operations after unit is properly warm (min 120 degree water temperature).

Fuel system

- Check pressure differential at rack mounted gauge for bypassing during TH 8 Load.

Truck and running gear

Check gear case lubricant level.

Inspect journal box oil level.

Inspect all gear cases and seals for obvious leaks or damaged conditions.

Inspect condition of trucks for signs of wear and ancillary damages.

Inspect condition of pedestal liners for worn conditions ...measure all where wear exceeds 3/8 of an inch per side.

Cooling system

Observe rust inhibitor is present in the sight glass.

Inspect radiators through shutters to note clean vs. dirty and damaged conditions.

Inspect condition of water tank pressure cap, look for signs of boiled out water residue

Air brake system

Check all automatic drain valves for correct operations.

Perform departure test, ensure no leaks exist.

Generator / Inertial room

Check condition of locomotive generator pit.

Note cleanliness of engine air filters.

Verify brush length, document if worn beyond 25%.

Engine

Inspect exhaust manifold base gaskets for failed condition.

Inspect top deck covers and latches, ensure tight and correct operations.

Inspect engine exterior for signs of water and oil leaks or weeps (a leak is a streak originating from the engine where its deposits travel to the engine base at the underframe, a weep is an emission of fluids that creates a streak but ends before the base of the engine).

Batteries

Inspect for battery box cleanliness and signs of caked materials.

Low voltage electrical

Inspect for low voltage grounds ...when grounds exist open circuit breakers to determine which circuit the ground is in, do not find the source of the ground.

High voltage system

Check correct operations and setting of Ground Relay.

HV Electrical cabinet

Inspect the general cleanliness of the HVC cabinet interior.

Visually inspect a sampling (no less than three) of contactor tips for burnt or worn conditions.

Carbody and underframe

Inspect condition of couplers and coupler carriers for visual signs of cracking or excessive wear.

Identify any excessively rusted metal surfaces.

Verify correct operation of all cab lights.

Verify correct operation of all window wiper motors.

Lube Oil analysis:

No significant issues were identified through the customer's oil analyses.