

RESPONSE TO MARUBENI-IRAN REQUEST FOR ADDITIONAL INFORMATION

1. The diesel engines used in the 7FDL16 Dash 8 locomotives are essentially the same design as the 7FDL12 Dash 7 units. Both are four stroke cycle with 45° V cylinder arrangements. Both utilize a 9 inch bore and 10-1/2 inch stroke with the same 12.7 to 1 compression ratio and run at the same maximum speed of 1050 RPM. Cylinder assemblies, pistons, rods, fuel injection equipment, bearings, sectionalized camshafts, sectionalized intake and exhaust manifolds, are virtually identical except for the larger quantity required for the larger engine. The governor is the same except for certain electrical features.

Major differences are in the size of the turbocharger, main frame, crankshaft, and oil pan, which are again a similar design but necessarily larger in size.

2. From the spare parts point of view, the overall cost per megawatt of the 7FDL16 vs. the 7FDL12 is essentially the same, as the output per cylinder is essentially the same if measured in megawatt hours of work.

The component overhaul schedule for the 7FDL16 Dash 8 is 26,000 megawatt hours for most components; this roughly approximates 1 million motoring miles on most railroads. The schedule for the 12 cylinder engine is 19,500 megawatt hours, which is exactly 3/4 of the 7FDL16 as 3/4 is the same proportion as 12/16. The overhaul time period varies among railroads, but usually ranges from 5-7 years for either 12 or 16 cylinder engines depending on the type of service.

TABLE 1. COMPONENT OVERHAUL SCHEDULE (BY COMPONENT).

COMPONENT	OVERHAUL or QUALIFY*	MANUAL REFERENCE
DIESEL ENGINE:		
BONDED DRIVE	26,000 MWHrs (Replace)	MI-91102
CAMSHAFTS	26,000 MWHrs (Qualify)	MI-91200
CAMSHAFT BEARINGS	26,000 MWHrs (Qualify)	MI-91200
CAMSHAFT DRIVE GEARS	26,000 MWHrs (Qualify)	MI-91200
CONNECTING ROD BEARINGS	26,000 MWHrs (Replace)	MI-93502
CRANKSHAFT	26,000 MWHrs (Inspect)	MI-91100
CRANK SPLIT DRIVE GEAR	26,000 MWHrs (Qualify)	MI-91100
CROSS HEADS and GUIDES	26,000 MWHrs (Qualify)	MI-93200
CYLINDERS COMPLETE	26,000 MWHrs (Overhaul)	MI-93105
ENGINE GOVERNOR	26,000 MWHrs (Overhaul)	MI-97000, MI-97005
EXHAUST MANIFOLD	26,000 MWHrs (Qualify)	MI-95210
FUEL INJECTION PUMPS	26,000 MWHrs (Overhaul)	MI-93342, MI-93340
FUEL BOOSTER PUMP and MOTOR	26,000 MWHrs (Overhaul)	MI-98200, MI-98201
FUEL REGULATOR	26,000 MWHrs (Overhaul)	SMI-90010
FUEL RELIEF VALVE	26,000 MWHrs (Overhaul)	SMI-90010
GOVERNOR DRIVE GEAR BOX	26,000 MWHrs (Qualify)	MI-96010
HI-PRESSURE FUEL LINES	52,000 MWHrs** (Replace)	MI-93299
INTERCOOLER	26,000 MWHrs (Overhaul)	MI-95100
LOW-PRESSURE FUEL HOSE	26,000 MWHrs (Replace)	
LUBE OIL COOLER	26,000 MWHrs (Overhaul)	MI-15701
LUBE OIL and WATER PUMP DRIVE GEARS	26,000 MWHrs (Qualify)	MI-91102
LUBE OIL PUMP	26,000 MWHrs (Overhaul)	MI-92300

* Megawatt Hours are listed for GE 16-Cylinder Engine; use ~~19,500~~ MWHrs for GE 12-Cylinder Engine.

** Megawatt Hours are listed for GE 16-Cylinder Engine; use ~~39,000~~ MWHrs for GE 12-Cylinder Engine.



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TABLE 1 (CONT'D).

COMPONENT	OVERHAUL or QUALIFY*	MANUAL REFERENCE
DIESEL ENGINE (Cont'd):		
LUBE OIL RELIEF VALVE	52,000 MWHrs** (Overhaul)	<div style="font-size: 2em; font-weight: bold; margin-bottom: 10px;">مجدد احوال</div> <div style="font-size: 1.5em; font-weight: bold;">مظروف</div> MI-91100 MI-96300, MI-96202 MI-96202 MI-91100 MI-94313, MI-94317 MI-92200 MI-91101
MAIN BEARINGS	26,000 MWHrs (Replace)	
OVERSPEED GOVERNOR	26,000 MWHrs (Overhaul)	
OVERSPEED LINK	26,000 MWHrs (Overhaul)	
THRUST COLLAR	26,000 MWHrs (Replace)	
TURBOCHARGER	26,000 MWHrs (Overhaul)	
WATER PUMP	26,000 MWHrs (Overhaul)	
VIBRATION DAMPER	52,000 MWHrs** (Replace)	
ROTATING:		
AIR COMPRESSOR MOTOR	8 Years (Qualify)	MI-26000
ALTERNATOR	12 Years (Overhaul)	MI-41502, MI-41508
EQUIPMENT BLOWERS	12 Years (Overhaul)	MI-14260
GRID BLOWER MOTORS	7 Years (Overhaul)	MI-14352
RADIATOR FAN MOTOR	10 Years (Overhaul)	MI-16668
TRACTION MOTOR	750,000 Miles (Overhaul)	MI-31100-011
ELECTRICAL:		
BRAKING and REVERSER SWITCH	15 Years (Overhaul)	MI-66012
CABLING and WIRING	20 Years (Replace)	MI-65314, MI-85005
CONTACTORS and RELAYS	12 Years (Overhaul)	MI-65000, MI-65001, MI-65005, MI-65006 MI-65200

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** Megawatt Hours are listed for GE 16-Cylinder Engine; use 39,000 MWHrs for GE 12-Cylinder Engine.

TABLE 1 (CONT'D).

COMPONENT	OVERHAUL or QUALIFY*	MANUAL REFERENCE
TRUCK:		
AUTOMATIC SLACK ADJUSTER	5 Years (Overhaul)	MI-30270
BOLSTER MOUNTS	10 Years (Replace)	MI-30001-002
LATERAL HYDRAULIC SHOCKS	500,000 Miles (Overhaul)	MI-30001-002 MI-30001-012
TRUCKS	10 Years (Overhaul)	MI-30100, MI-30001-012
VERTICAL HYDRAULIC SHOCKS	500,000 Miles (Overhaul)	MI-30001-002002 MI-30001-012
OTHER:		
AIR COMPRESSOR	8 Years (Overhaul)	MI-25101-001
AIR COMPRESSOR HEADS	5 Years (Overhaul)	MI-25101-001
AXLE ALTERNATOR	8 Years (Overhaul)	MI-30006
INERTIAL AIR FILTERS	4 Years (Clean)	SMI-10002, SMI-10014
RADIATORS, MECHANICAL BOND	10 Years (Qualify)	

* Megawatt Hours are listed for GE 16-Cylinder Engine; use 19,500 MWHrs for GE 12-Cylinder Engine.

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TABLE 2. COMPONENT OVERHAUL SCHEDULE (BY TIME PERIOD).

COMPONENT	OVERHAUL or QUALIFY	MANUAL REFERENCE
FOUR YEARS:		
INERTIAL AIR FILTERS	Clean	SMI-10002, SMI-10014 ■
LATERAL HYDRAULIC SHOCKS	Overhaul	MI-30001-002, MI-30001-012 ■
VERTICAL HYDRAULIC SHOCKS	Overhaul	MI-30001-002 MI-30001-012 ■
FIVE YEARS:		
AIR COMPRESSOR HEADS	Overhaul	MI-25101-001
AUTOMATIC SLACK ADJUSTER	Overhaul	MI-30270
750,000 MILES/ OR CLOSEST WHEEL CHANGE:		
TRACTION MOTOR	Overhaul	MI-31100-011
26,000 MWHrs*/ OR FIRST ENGINE OVERHAUL:		
BONDED DRIVE	Replace	MI-91102
CAMSHAFTS	Qualify	MI-91200
CAMSHAFT BEARINGS	Qualify	MI-91200
CAMSHAFT DRIVE GEARS	Qualify	MI-91200
CONNECTING ROD BEARINGS	Replace	MI-93502
CRANKSHAFT	Inspect	MI-91100
CRANK SPLIT DRIVE GEAR	Qualify	MI-91100
CROSS HEADS and GUIDES	Qualify	MI-93200
CYLINDERS COMPLETE	Overhaul	MI-93105
ENGINE GOVERNOR	Overhaul	MI-97000, MI-97005

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TABLE 2 (CONT'D).

COMPONENT	OVERHAUL or QUALIFY	MANUAL REFERENCE
26,000 MWHrs*/ OR FIRST ENGINE OVERHAUL (Cont'd):		
EXHAUST MANIFOLD	Qualify	MI-95210 ■
FUEL INJECTION PUMPS	Overhaul	MI-93342, MI-93340
FUEL BOOSTER PUMP and MOTOR	Overhaul	MI-98200, MI-98201 ■
FUEL REGULATOR	Overhaul	SMI-90010
FUEL RELIEF VALVE	Overhaul	SMI-90010
GOVERNOR GEAR BOX	Qualify	MI-96010
INTERCOOLER	Overhaul	MI-95100 ■
LOW-PRESSURE FUEL HOSE	Replace	
LUBE OIL COOLER	Overhaul	MI-15701
LUBE OIL and WATER PUMP DRIVE GEARS	Qualify	MI-91102
LUBE OIL PUMP	Overhaul	MI-92300
MAIN BEARINGS	Replace	MI-91100
OVERSPEED GOVERNOR	Overhaul	MI-96300, MI-96202
OVERSPEED LINK	Overhaul	MI-96202
THRUST COLLAR	Replace	MI-91100
TURBOCHARGER	Overhaul	MI-94313, MI-94317 ■
WATER PUMP GEAR	Qualify	MI-92200
SEVEN YEARS:		
GRID BLOWERS	Overhaul	MI-14352

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TABLE 2 (CONT'D).

COMPONENT	OVERHAUL or QUALIFY	MANUAL REFERENCE
EIGHT YEARS:		
AIR COMPRESSOR	Overhaul	MI-25101-001
AIR COMPRESSOR MOTOR	Qualify	MI-25101-001
AXLE ALTERNATOR	Overhaul	MI-30006
RADIATORS, MECHANICAL BOND	Qualify	
TEN YEARS:		
BOLSTER MOUNTS	Replace	MI-30001-002
RADIATOR FAN MOTOR	Overhaul	MI-16668
TRUCKS	Overhaul	MI-30100 MI-30001-012
52,000 MWHrs*/ OR SECOND ENGINE OVERHAUL:		
ALL ITEMS LISTED AT FIRST OVERHAUL AND:		
LUBE OIL RELIEF VALVE	Overhaul	
HIGH PRESSURE FUEL LINES	Replace	MI-93299
TORSIONAL/VIBRATION DAMPER	Replace	MI-91101
TWELVE YEARS:		
ALTERNATOR	Overhaul	MI-41502, MI-41506 MI-41508
CONTACTORS AND RELAYS	Overhaul	MI-65000, MI-65001, MI-65005, MI-65006, MI-65200
EQUIPMENT BLOWERS	Overhaul	
FIFTEEN YEARS:		
BRAKING AND REVERSER SWITCH	Overhaul	MI-66012

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