

**New dimensions
in motive power
from Electro-Motive**

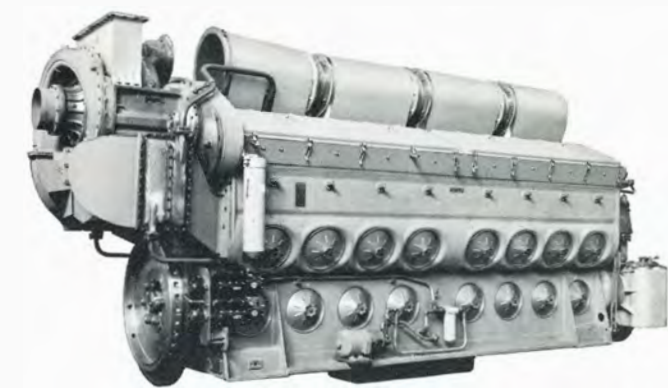


**Nine new locomotives
engineered for today's
greater demands . . .**

powered by General Motors new 645 Diesel engine

The new General Motors 645 Diesel engine, backbone of a whole new line of Electro-Motive locomotives, represents the most significant step ahead in prime mover development since the GM 567 series engine.

The 645 engine brings new dimensions to railroad economy—more horsepower with a lower specific fuel consumption.



This new engine (8, 12, 16 and 20 cylinders) will produce horsepower ratings of 1000, 1500, 2000, 3000, and 3600.

Electro-Motive engineers put nearly three years of intensive research and development into the new prime mover.

It represents a new power plateau, providing a solid base for future horsepower increases.

Electro-Motive brings a totally new, balanced power system with greater unit capacity—advancements in electrical transmission and control—new operational efficiency.

From the home of the Diesel locomotive at LaGrange comes a whole new fleet of motive power for America's railroads . . . nine new models, engineered to meet today's demands and tomorrow's needs in every type of service.

Electro-Motive's new Six-Forty-Five Fleet brings with it new dimensions in unit capability, horsepower, maintenance reduction and operating economy.

And, it's the most tested and proved fleet of new locomotives in motive power history! For over two years the new 645 engine, heart of the new line, and every major component have stood up to the rigorous demands of laboratory and road testing.

In fact, for the first time in railroad history, ten prototype locomotives have been tested and proved in every kind of operating condition. Before commercial production begins, these ten units will cover over 100,000 miles of roadbed.

New dimensions in electrical transmission

Along with the development of a new prime mover, EMD engineers experimented with a more efficient method of converting shaft horsepower to electrical energy. The result of their long-range project—the AR-10 alternator—replaces the conventional dc generator. Over two years of road testing has proved out the new designs in this ac-dc transmission.

The AR-10 features solid state silicon rectifiers in place of commutators and

brushes. The result is more electrical output from a smaller unit. Plus more reliable operation and less maintenance.

Matched with the AR-10 alternator is a new traction motor—the D-77. This new motor represents the first application of a



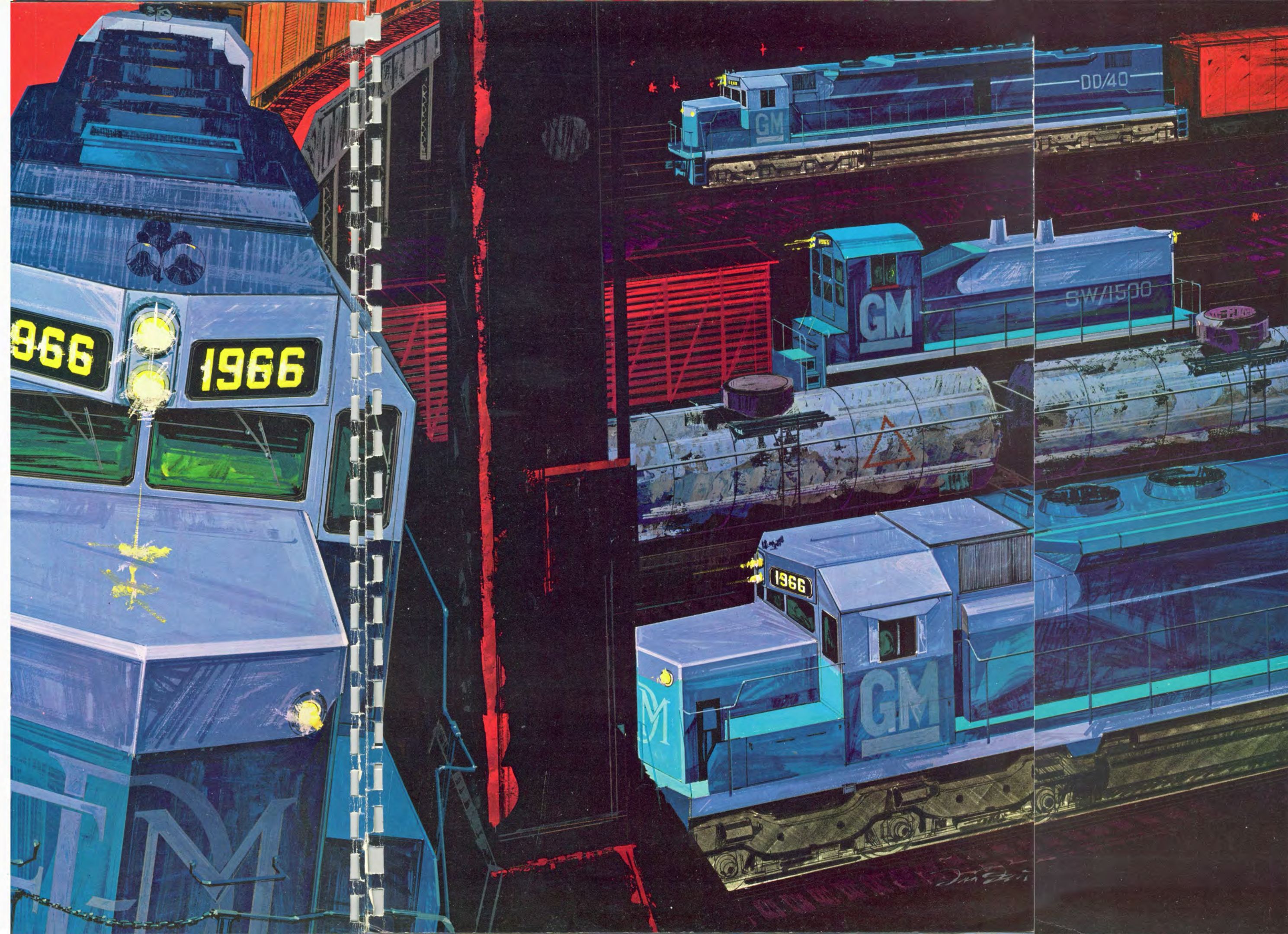
Prototype locomotives with EMD test car

revolutionary insulation material—Kapton—in large traction motors. Because of its high dielectric strength, this material can be applied in extremely thin film form, allowing 18% more copper in the armature coil. The result is a cooler running motor with longer life and increased capacity for current overloads.

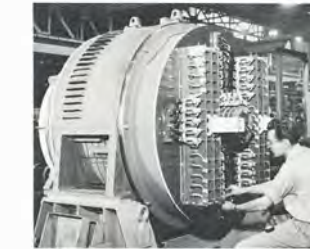
Like other major components of the new line, the D-77 motor has undergone extensive field testing.

New dimensions in electrical control

The use of solid state components in electrical control systems increases reliability



while decreasing maintenance. New control apparatus includes: a new throttle system for smoother train starting and instantaneous response; a silicon controlled rectifier excitation system for more precise main generator excitation and a new dynamic brake regulating control system, permitting closer tolerances.



AR-10 alternator

New dimensions in locomotives selection

The nine new models of the Six-Forty-Five Fleet bring unprecedented flexibility in tailoring power to operating needs. Here they are:

The GP series—two new four-axle, four motor locomotives designed for both heavy duty and high speed freight service. The 3000 hp GP-40, with turbo-charged 645 engine, features the AR-10 alternator. The GP-38, rated at 2000 hp, utilizes the conventional dc transmission.



D-77 traction motor assembly

The SD series—four new six-axle, six motor locomotives designed for heavy

Continued

drag/high speed freight service and, with the SDP-40, equipped with a steam generator to handle passenger operations. Heading this series is the SD-45, a 3600 hp locomotive utilizing the AR-10 alternator and featuring a 20 cylinder model of the turbo-charged 645 engine. Next come the SD-40 and SDP-40, rated a 3000 hp and containing the AR-10 alternator. The SD-38, 2000 hp normally aspirated 645 engine with conventional dc generator rounds out the series.

The DD series—an eight-axle eight motor unit powered by two 16 cylinder turbo-charged 645 engines and rated at 6000 hp. The DD-40A is the largest of the new line, and the largest single locomotive on the rails today.



Solid state control

The SW series—two new switching locomotives, the 1500 hp SW-1500 and the 1000 hp SW-1000. Both models contain the conventional dc generator and normally aspirated 645 engine.

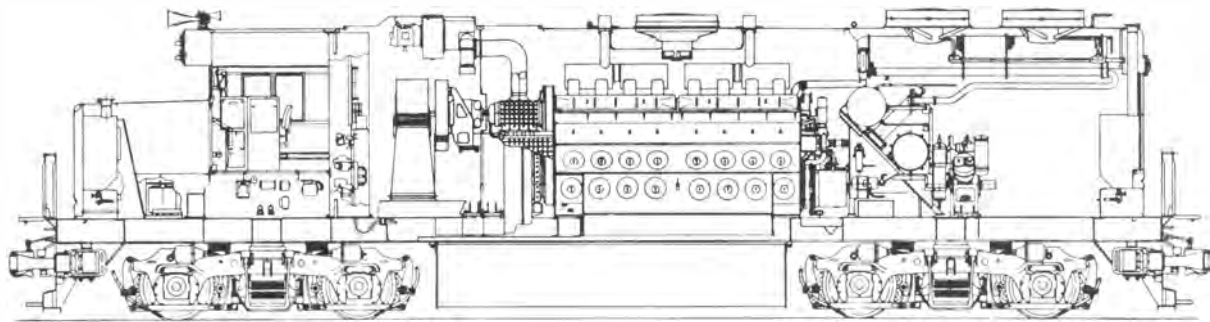
New economic factors in unit reduction

The new EMD locomotives bring not only reduced maintenance and lower fuel consumption, they also bring new dimensions in unit reduction. For example, four of the 40 series locomotives can do the work of five GP-30s. The comparison is even more dramatic with older model locomotives. In this case, each GP-40 or SD-40 can replace two 1500 hp locomotives. Or, two SD-45's will do the work of five 1500 hp units in high speed operation.



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GENERAL MOTORS - LA GRANGE, ILLINOIS
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 In Canada: General Motors Diesel Limited, London, Ontario

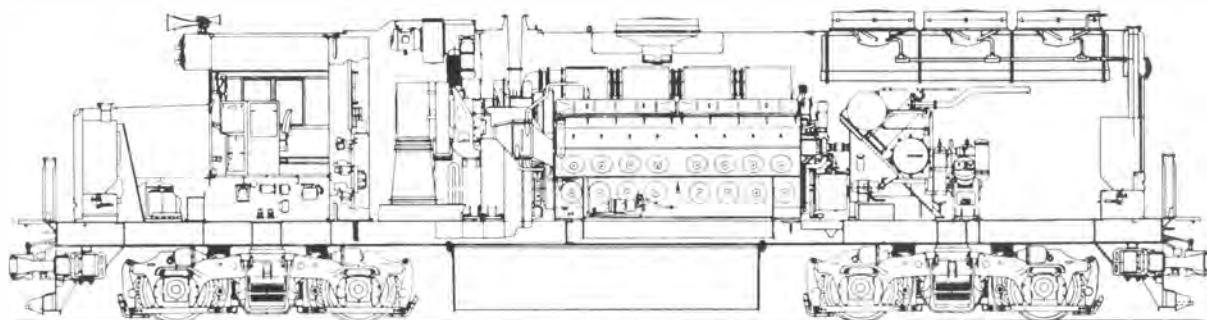




GP-38

Horsepower.....2000
 Axles.....4
 Motors.....4
 Distance between
 coupler pulling faces.....59' 2"
 Distance (bolster center).....34' 0"
 Truck wheelbase.....9' 0"
 Height.....15' 2½"

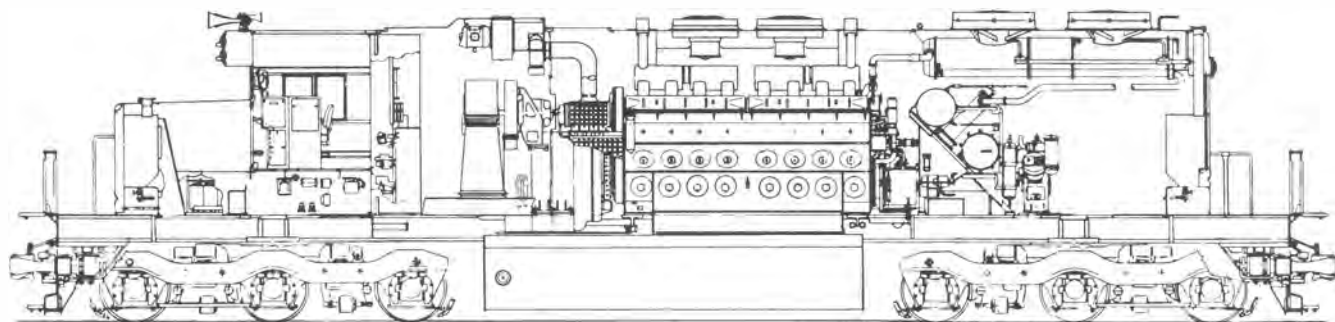
Basic weight.....244,800
 (can be ballasted to
 278,000 ± 2000 lbs)
 Maximum fuel capacity.....3600 gal
 Sand capacity.....56 cu ft
 Non-turbocharged 16-645E engine
 D-32 generator
 D-77 traction motors



GP-40

Horsepower.....3000
 Axles.....4
 Motors.....4
 Distance between
 coupler pulling faces.....59' 2"
 Distance (bolster center).....34' 0"
 Truck wheelbase.....9' 0"
 Height.....15' 2½"

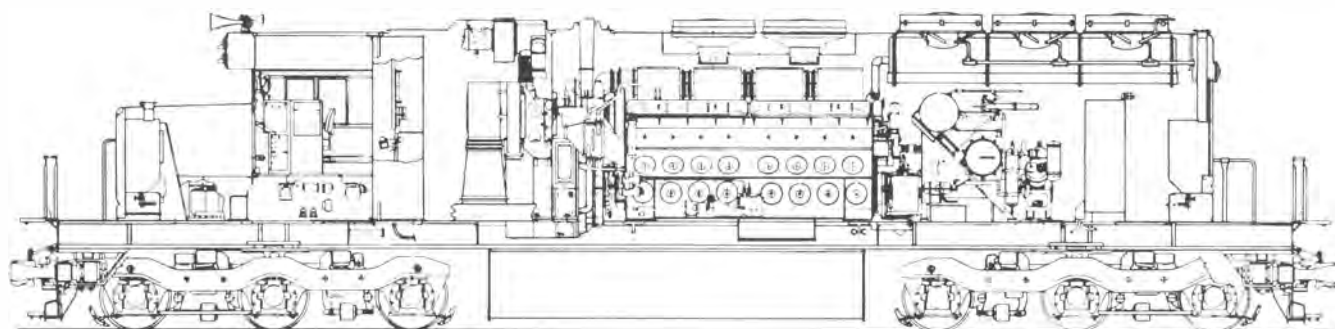
Basic weight.....244,800
 (can be ballasted to
 278,000 ± 2000 lbs)
 Maximum fuel capacity.....3600 gal
 Sand capacity.....56 cu ft
 Turbocharged 16-645E engine
 AR-10 alternator
 D-77 traction motors



SD-38

Horsepower.....2000
 Axles.....6
 Motors.....6
 Distance between
 coupler pulling faces.....65' 8"
 Distance (bolster center).....40' 0"
 Truck wheelbase.....13' 7"
 Height.....15' 5¼"

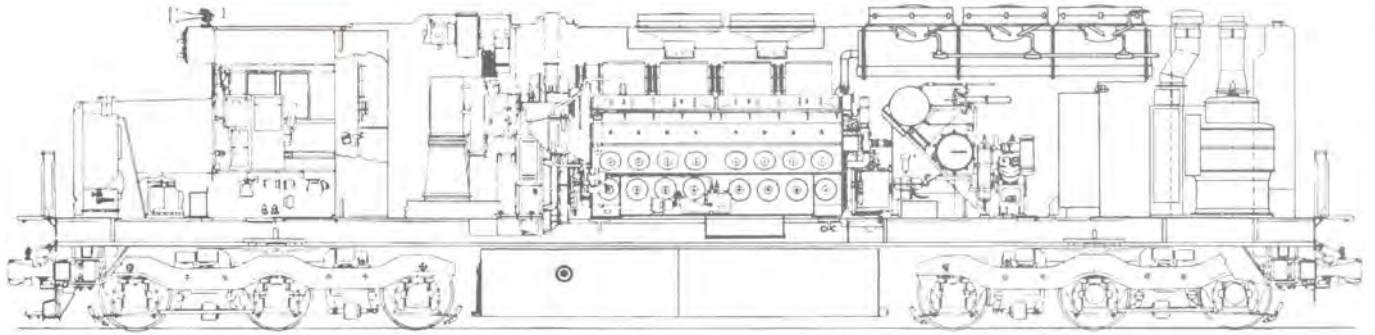
Basic weight.....356,000
 (can be ballasted to
 393,000 ± 3000 lbs)
 Maximum fuel capacity.....4000 gal
 Sand capacity.....56 cu ft
 Non-turbocharged 16-645E engine
 D-32 generator
 D-77 traction motors



SD-40

Horsepower.....3000
 Axles.....6
 Motors.....6
 Distance between
 coupler pulling faces.....65' 8"
 Distance (bolster center).....40' 0"
 Truck wheelbase.....13' 7"
 Height.....15' 5¼"

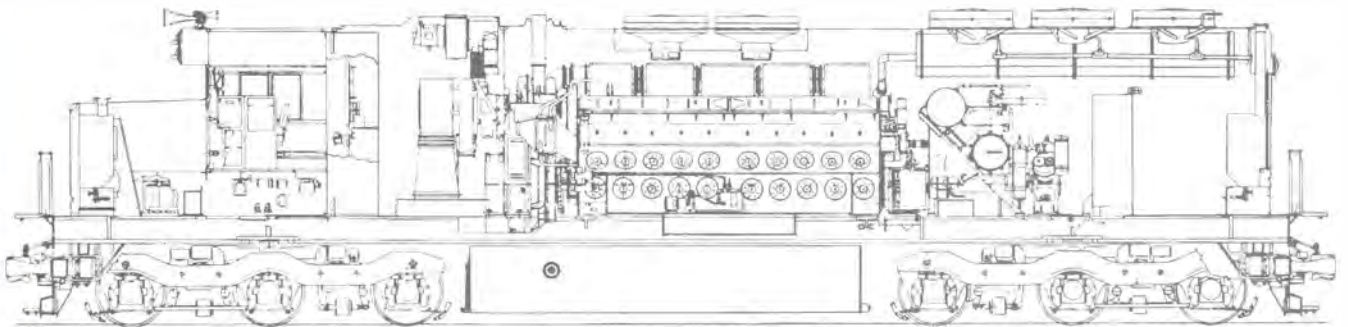
Basic weight.....360,000
 (can be ballasted to
 393,000 ± 3000 lbs)
 Maximum fuel capacity.....4000 gal
 Sand capacity.....56 cu ft
 Turbocharged 16-645E engine
 AR-10 alternator
 D-77 traction motors



SDP-40

Horsepower.....3000
 Axles.....6
 Motors.....6
 Distance between
 coupler pulling faces.....65' 8"
 Distance (bolster center).....40' 0"
 Truck wheelbase.....13' 7"
 Height.....15' 5¼"

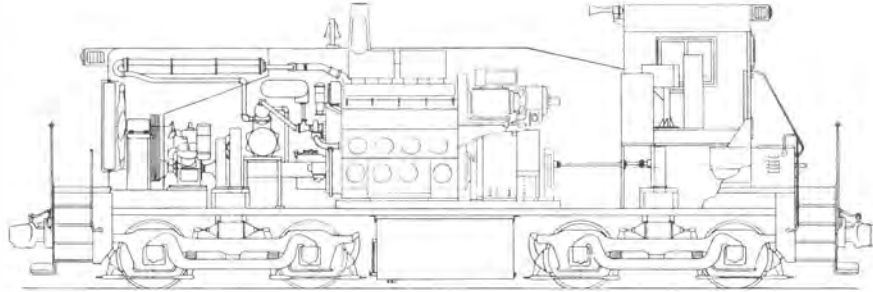
Basic weight.....360,000
 (can be ballasted to
 393,000 ± 3000 lbs)
 Maximum fuel capacity.....4000 gal
 (fuel and water)
 Sand capacity.....56 cu ft
 Turbocharged 16-645E engine
 AR-10 alternator
 D-77 traction motors



SD-45

Horsepower.....3600
 Axles.....6
 Motors.....6
 Distance between
 coupler pulling faces.....65' 8"
 Distance (bolster center).....40' 0"
 Truck wheelbase.....13' 7"
 Height.....15' 5¼"

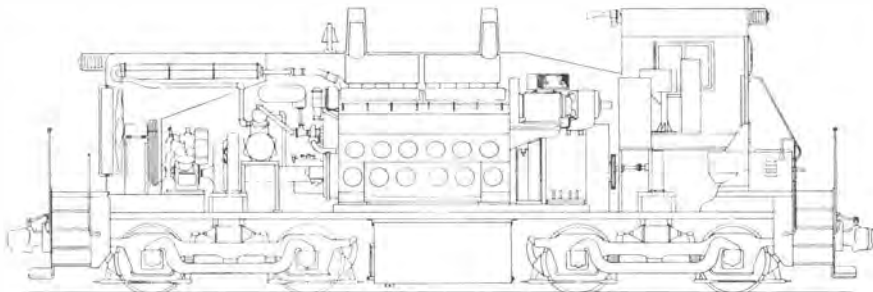
Basic weight.....360,000
 (can be ballasted to
 393,000 ± 3000 lbs)
 Maximum fuel capacity.....4000 gal
 Sand capacity.....56 cu ft
 Turbocharged 20-645E engine
 AR-10 alternator
 D-77 traction motors



SW-1000

Horsepower.....1000
 Axles.....4
 Motors.....4
 Distance between
 coupler pulling faces.....44' 5"
 Distance (bolster center).....22' 0"
 Truck wheelbase.....8' 0"
 Height.....14' 10"

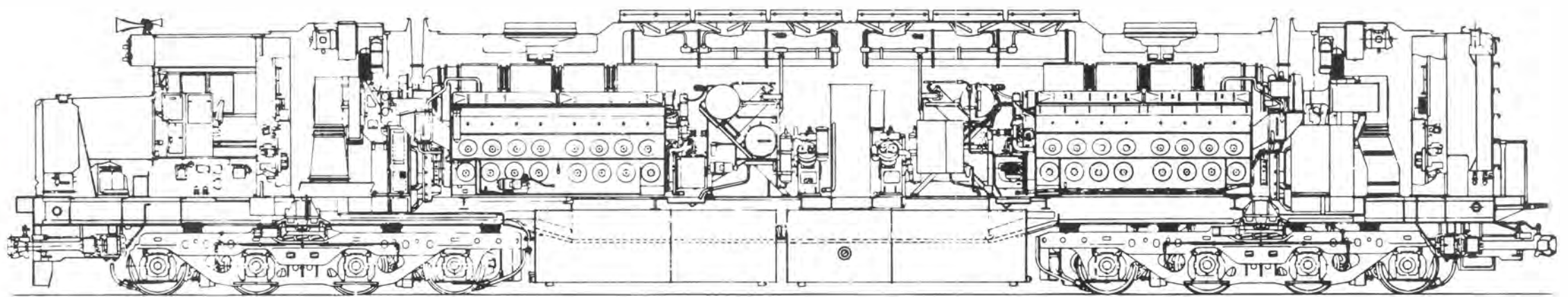
Basic weight.....230,000
 (can be ballasted to
 258,000 ± 2000 lbs)
 Maximum fuel capacity.....1100 gal
 Sand capacity.....22 cu ft
 Non-turbocharged 8-645E engine
 D-25 generator
 D-77 traction motors



SW-1500

Horsepower.....1500
 Axles.....4
 Motors.....4
 Distance between
 coupler pulling faces.....44' 5"
 Distance (bolster center).....22' 0"
 Truck wheelbase.....8' 0"
 Height.....14' 10"

Basic weight.....248,000
 (can be ballasted to
 258,000 ± 2000 lbs)
 Maximum fuel capacity.....1100 gal
 Sand capacity.....22 cu ft
 Non-turbocharged 12-645E engine
 D-32 generator
 D-77 traction motors



DD-40A

Horsepower.....6000
 Axles.....8
 Motors.....8
 Distance between
 coupler pulling faces.....88' 2"
 Distance (bolster center).....55' 0"
 Truck wheelbase.....17' 1½"
 Height.....16' 5¾"

Basic weight.....520,000
 Maximum fuel capacity.....5200 gal
 Sand capacity.....51 cu ft
 2 turbocharged 16-645E engines
 2 AR-10 alternators
 D-77 traction motors

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