

Backgrounder

Fall 2012

VIA Rail Canada's F40 Fleet



PROJECT

Refurbishment of VIA Rail's fleet of 53 EMD F40 diesel-electric locomotives

OBJECTIVE

Improve the performance of the locomotives and increase their lifespan for another 15 to 20 years, at less than one third the cost of buying new equipment.

BUDGET: \$100 million

DESCRIPTION

Under this rebuilding program, CAD Railway Industries stripped the locomotives down to the shells and fully renewed the steel car bodies.

The components of each system – such as the diesel engine, main alternators, trucks, couplers and compressors – were thoroughly inspected, tested and rebuilt.

Major improvement: the addition of a separate diesel engine

The new F40s have been equipped with a new group including an engine and a generator, which were custom designed for VIA Rail. This group is responsible for powering the head-end power (HEP) required to light and heat or air condition the trains they pull.

Previously, the electricity for the whole train consist was powered by a generator that was connected to the locomotive engine. The engine had to continue running even when the trains were stationary. This new group not only reduces fuel consumption and emissions, it also decreases main engine noise.

The separate HEP gen-set also gives the rebuilt F40s greater traction power, enabling them to use the full 3,000 horsepower needed to pull 12 cars. This means that VIA Rail is

able to reduce the number of units used on its longest and heaviest trains, such as the Montréal-Halifax *Ocean* and the Toronto-Vancouver *Canadian*.

The F40s released from these services were reassigned to the additional frequencies VIA Rail is adding to its Quebec-Windsor Corridor route, therefore eliminating the need to purchase additional locomotives.

Environmental benefits: (1) A layover heating system and an automatic engine start/stop system (AESS) have been added to each F40, enabling both diesel engines on each unit to be shut down when sitting for long periods in terminals and yards, providing major fuel, emissions and noise reductions.

(2) New systems were installed to meet today's environmental and safety standards. VIA Rail expects a reduction of greenhouse gas (GHG) emissions of up to 13%, which is in addition to a company-wide GHG reduction of 16% since 1990.

(3) Approximately 120 tons of steel from the basic structure and key components of each unit were fully recycled for another 15 to 20 years of productive service.

Fuel Savings: The better-than-new F40 fleet will produce fuel savings of more than five million liters per year and reduce maintenance costs by 15% annually.

In combination with the 21 General Electric Genesis (designated P42) locomotives acquired in 2001, the rebuilt F40s give VIA Rail one of the most reliable and fuel-efficient locomotive fleets of any passenger rail operator in North America.

VIA RAIL CANADA F40 TECHNICAL SPECIFICATIONS

| | |
|-----------------------------|--|
| Model: | F40PH-2 |
| Builder: | General Motors Electro-Motive Division |
| Prime mover: | 16-645E3C |
| Cylinders: | V16 |
| Power output: | 3,000 hp (2.2 MW) |
| Head end power: | 500 kW |
| Continuous tractive effort: | 19,958 kg (44,000 lb) |
| Wheel arrangement: | B + B (four axles) |
| Track gauge: | 1,435 mm (4 feet 8½ inches) |
| Weight: | 117,936 kg (260,000 lb) |
| Top speed: | 153 km/h (95 mph) |
| Built: | London, Ontario, November 1986-July 1989 |
| Rebuilt: | Lachine, Quebec, December 2007-December 2012 |
| Total active fleet: | 53 |

IMPROVEMENTS

| Description | Benefit |
|---|---|
| <ul style="list-style-type: none"> Cleaner burning engine Automatic engine stop/start system Fuel heating HEP diesel generator Layover heating | Fuel saving |
| <ul style="list-style-type: none"> Odometer De-misting air to windshield Electronic fuel monitoring Low speed system (max. 10 miles/hour) | Improved operation |
| <ul style="list-style-type: none"> All new copper air piping All new receptacles and switches All new relays (70% less due to microprocessor) All new wiring | Improved reliability |
| <ul style="list-style-type: none"> Emergency horn Higher intensity headlight (Xenon) added Improved event recorder with crash hardened memory New forward camera with digital video recorder | Improved safety and security |
| <ul style="list-style-type: none"> Removal of corrosion and anti corrosion | Locomotive life protection applied |
| <ul style="list-style-type: none"> Cooling fan sequencing Independent dynamic braking Microprocessor controls LED indicator lights Electronic braking system | Lower maintenance |
| <ul style="list-style-type: none"> Electronic engine governor | Operation efficiency |
| <ul style="list-style-type: none"> Automatic horn sequencing Cab air-conditioning Ergonomic improvements in cab Improved cab heating and ventilation Improved third (jump) seat added Microwave oven added Anti-glare shield on windshield added | Operator comfort and convenience |
| <ul style="list-style-type: none"> New paint scheme | VIA Rail image |