DIESEL DEMONSTATORS IN CANADA.

Canadian Transportation

Steam Railway, Electric Railway, Automotive, Air and Marine—Harbours, Waterways and Shipbuilding.

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TORONTO, CANADA, MARCH, 1947.

PRINCIPAL CONTENTS.

Diesel Power for P.E.I. Lines of C.N.R.

To carry out its decision to replace steam locomotives by Diesel-electric locomotives on Prince Edward Island, the Canadian National Rys. management has placed orders for 20 Diesels, 18 of which will be 75-ton machines and the other two 44-ton ones.

RECENT announcement by N. R. Walton, C.B.E., Executive Vice President, Canadian National Rys., is to the effect that the C.N.R. has placed the largest order given to date in Canada for Diesel locomotives, which will be used to replace existing steam locomotives on C.N.R. lines on Prince Edward Island. Eighteen of the new locomotives will be built by Canadian Locomotive Co., and two by Canadian General Electric Co. During the depression, Mr. Walton explained, no locomotives were built, and, in the years which followed, only large and powerful steam locomotives, capable of hauling long and heavy trains, were constructed. The result is that today the C.N.R. needs light locomotives to meet the requirements of a number of branch lines where it will be necessary to replace economically present units as they become obsolete. Assistance in solution of this problem will be furnished through utilization of the existing steam locomotives now on P.E.I. lines, after the Diesel-electric machines replace them.

One thing which influenced the management to replace steam power by Diesel-electrics on the island has been the water problem, occasioned by the difficulty of securing a sufficient water supply for steam locomotives. Another consideration is that large amounts of coal for the steam locomotives must be ferried across to the island, using ferry space which would otherwise be available for other important freight; the necessity of transporting the coal has caused delay in the movement of such other freight. The management calculates that the change-over to Diesel power on the P.E.I. lines will effect a 25% economy annually.

The eighteen locomotives for Prince Edward Island lines are being built by Canadian Locomotive Co., Kingston, Ont., through an arrangement entered into among Baldwin Locomotive Works, Philadelphia, Pa.; Whitcomb Locomotive Co., Rochelle, Ill., and Canadian Locomotive Co., Ltd. Both Baldwin Locomotive Works and Whitcomb Locomotive Co. are represented in Canada by Baldwin Locomotive Works of Canada, Ltd., Toronto. Particulars of the Diesel-electric locomotives which are being built at Kingston, supplied by Baldwin Locomotive while length between the coupler pulling faces is 40 ft. 6 in. Width over cab and width over all are 10 ft. Height over all, from rail to top of cab, is 14 ft.

Locomotives of this type are powered by a Sterling Engine Co. "Viking" model VDS-8 turbo-supercharged Diesel engine, this engine being an eight-cylinder one, with cylinders 8 in. bore and 9 in. stroke, and with nominal rating of 650 h.p. at 1,200 r.p.m. This engine operates a Westinghouse railway type generator which supplies current to four Westinghouse railway type, single reduction, traction motors, with gear ratio of 16:71. The single station electro-magnetic control provides parallel and parallel shunt field control of traction motors, with pneumatic throttle operation, and the equipment is arranged for multiple unit operation. The maximum tractive effort, without sand, and at 25% adhesion, is 37,500 lb.; the maximum, with sand, and at 30% adhesion, is 45,000 lb. The maximum permissible speed is 50 h.p. Each locomotive is equipped with a Gardner-Denver air-cooled, two-stage, three-cylinder compressor, with displacement of 142 cu. ft. per minute, and the air brakes are the Westinghouse straight and automatic schedule 14-EL.

The two locomotives to be built by Canadian General Electric Co. will be 44-ton machines, 25 ft. long, 10 ft. wide and 14 ft. high. These two units, like the 75-ton ones, will be fitted with 400 gall. Diesel oil tanks, sufficient for 400 miles of operation.

To heat the passenger trains in the winter, each locomotive will have an auxiliary tender with automatic oil-fired boilers. Two of these auxiliary units will be constructed. Only two of the present nineteen water stations on the island will be retained, viz., those at Charlottetown and Borden. Three oil refueling stations will be established, viz., one each at Charlottetown, Borden and Summerside; the Summerside station will serve as an emergency one only. The present repair shop at Charlottetown, with minor changes, will serve as a maintenance and repair shop for the Diesel locomotives.

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These are 75-ton locomotives, with 0-4-4-0 wheel arrangement. Of standard gauge, they have 36 in. diameter driving wheels, and the total weight of 150,000 lb. is distributed equally between the leading and trailing trucks. The truck wheelbase is 7 ft., and distance between truck centers 19 ft. 10 in. Length over bumpers is 36 ft. 6 in., [illegible] sion, is 37,500 lb.; the maximum, with sand, and at 30% adhesion, is 45,000 lb. The maximum permissible speed is 50 h.p. Each locomotive is equipped with a Gardner-Denver air-cooled, two-stage, three-cylinder compressor, with displacement of 142 cu. ft. per minute, and the air brakes are the Westinghouse straight and automatic schedule 14-EL.

The two locomotives to be built by Canadian General Electric Co. will be 44-ton machines, 35 ft. long, 10 ft. wide and 14 ft. high. These two units, like the 75-ton ones, will be fitted with 400 gall. Diesel oil tanks, sufficient for 400 miles of operation.

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The Canadian National, pioneer in the Canadian development of Diesel power for railway transportation, with the first Diesel-electric locomotive placed in service in 1925, now has 50 Diesel-electric units in switching service in Canada and the United States. In addition, there are 29 Diesel-powered self-propelled cars operating in local services throughout Canada.

(Since the foregoing was written, the C.N.R. has ordered additional Diesel-electric locomotives. See under "Rolling Stock Orders and Deliveries".)

G. T. W. Tests Diesel in Main Line Service

During the first half of December, a General Motors model F-3 Diesel-electric locomotive was operated by the Grand Trunk Western in fast freight service, between Port Huron and Chicago.

AS a part of a development programme to provide faster freight and passenger service, the Grand Trunk Western Rd. began, December 2, test operation of a General Motors F-3 Diesel-electric locomotive between Port Huron, Mich., and Chicago, according to advice from C. A. Skog, Vice President and General Manager. The locomotive was placed in service for a two-week trial period, and was assigned to train 490, a Montreal-Chicago fast freight, on the United States end of its international run.

Diesel-electric locomotives of the type operated are built in units, or cars, of 1,500 h.p. each, which can be operated singly, or in combinations of 2, 3 or 4 units providing 3,000, 4,500 or 6,000 h.p. respectively. A 3-unit assembly was operated in the test runs on the G.T.W. Each locomotive unit is powered by a 16-cylinder, 2-cycle, 1,500 h.p. General Motors Diesel engine. The engine operates a generator, which supplies current to truck-mounted traction motors geared directly to the driving axles. The test locomotive was so designed that, by the simple changing of a set of gears, which can be carried out quickly in almost any railway shop, it is well suited to operate as a heavy duty freight locomotive with top speed of 50 m.p.h., or as a heavy duty passenger locomotive capable of handling long and heavy trains at speeds up to 102 m.p.h. Also, there are five intermediate gear ratios provided between these two extremes. The test locomotive on the G.T.W. was geared for heavy freight service with top speed of 65 m.p.h.

Electric retarding brakes developed by the Electro-Motive Division of General Motors are part of the locomotive equipment. By a simple twist of a small lever, the engineer reverses the traction motors and makes generators out of them. Since generators resist motion, the train's speed can be retarded for curves or other conditions or held at any point on a grade often without applying air brakes.

A considerable saving on brake shoe and wheel wear is made by the retarding brakes, in addition to the speeding of freight movements, because whereas it may take five minutes to release air brakes fully on a mile-long train, the electric brake is released instantly and power can be applied immediately to get the train back up to a high speed after a slowdown for a curve or grade.

Unusual attention has been paid to crew comfort and safety in the design of the locomotive cab. Both engineer and fireman sit in deeply upholstered, leather-covered swivel armchairs, and both have completely unimpeded view of the right of way and approaches. No-draft, rolldown windows provide cooling in hot weather. Hot water heaters keep the cab comfortable in winter, and automatic windshield wipers and defrosters keep the front windows clear in rain or snowstorms. The locomotive is equipped with two powerful air horns designed to be heard four miles. One points forward to warn motorists, and the other to the rear for signalling to the train crew.

Controls are so nearly like those in a steam locomotive that the Diesels are turned over to veteran steam locomotive engineers for operation after only one or two practice trips with an instructor. Control cabs are located at both ends of the locomotive, making it unnecessary to turn it at the end of a run. The engineer merely throws some switches and valves, walks through the locomotive to the other end, sits down, sets switches and valves and is ready to go in the other direction, almost as easily as a streetcar motorman reverses his direction.

The test locomotive operated by the G. T. W. carries 3,600 gallons of fuel oil, which enables it to haul a 100-car freight train over the average railroad between 450 and 500 miles before refueling. It is 151 ft., 4 in. long, 15 ft. high and 10 ft., 7 in. wide, and weighs 350 tons fully loaded with all running supplies.

General Motors 3-Unit, 4,500 h.p. Diesel-electric Locomotive which Was in Test Operation on the G.T.W. in December.

The locomotive was employed in road service between Port Huron and Chicago, handling fast freight train 490.

Rolling Stock Orders and Deliveries

Algoma Central and Hudson Bay Ry.—It was mentioned in the March issue, page 140, that the Algoma Central and Hudson Bay Ry. Co. had ordered 350 70-ton gondola cars from National Steel Car Corp. Official advice is that these cars, which will be used in the handling of pulpwood, steel and general traffic, will be of steel construction, with wood deck, and of solid bottom type. They will have the following general dimensions:—

Length inside	40 ft. 6¼ in.
Length over pulling faces of couplers	53 ft. 4 in.
Length over striking plates	51 ft. 9 in.
Width inside	9 ft. 6 in.
Width over all	10 ft. 2⅝ in.
Height inside	4 ft. 9 in.
Height from top of rail to top of car	7 ft. 9 in.
Center to center of trucks	40 ft. 6 in.
Truck gauge	4 ft. 8½ in.
Truck wheelbase	5 ft. 8 in.

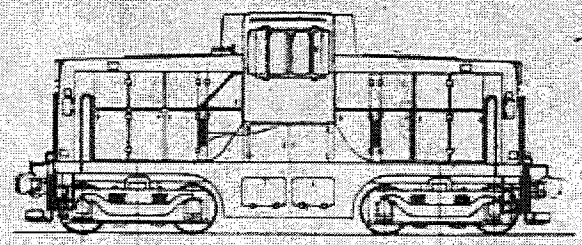
These cars will be equipped with Cardwell Westinghouse NY-11F draft gear, A.A.R. type "E" bottom operating couplers with Standard Railway Equipment Co. safety uncoupling device, Westinghouse AB-10 air brakes and Barber stabilized trucks.

Canadian National Rys.—R. C. Vaughan, C.M.G., Chairman and President, C.N.R. Co., announced in the latter part of March that orders had been placed for the building of 3,700 cars, with earliest possible delivery. He said:—"The addition of these new cars to the Canadian National equipment will help to relieve the present box car shortage in Canada. It will also mean work for thousands of Canadians in various industries across the Dominion, not only in building the cars but in supplying the necessary materials."

A statement by the C.N.R. Publicity Department in regard to the new cars is as follows:—"The cars have been designed by the company's mechanical engineers to meet the diversified requirements of Canadian shippers as well as all specifications and clearances of the Association of American Railroads. They will be constructed by three large car building companies, Canadian Car and Foundry, Montreal, Eastern Car, New Glasgow, N.S., and National Steel Car, Hamilton, Ont.

"Larger than any now in service, the new box cars will have a carrying capacity of fifty tons. In handling certain shipments, they will be able to carry as much as 25% more than present cars of this type. Of all-steel construction, the interiors will be lined with a special wood finish. Inside, they will be 40 feet, six inches long; ten feet, six inches high—half-a-foot higher than any now in service; and nine feet, two inches wide.

"Trucks, brakes and other mechanical parts will all be of the latest design for smooth handling at fast freight speeds. For faster loading and un-



44-Ton Diesel for P.E.I. Lines of C.N.R.

red background, the maple leaf in green and the lettering in white."

Orders placed by the C.N.R. with National Steel Car Corp. in the period February 17-March 18 were for 500 50-ton, steel sheathed, wood lined box and 150 70-ton, steel, covered hopper cars.

Included in the C.N.R. orders are 500 all steel automobile cars to be built by Canadian Car and Foundry Co., Ltd., Montreal. These cars, designed by C.N.R. mechanical engineers to conform with all specifications and clearances of the Association of American Railroads, will be 40 ft. 6 in. long inside, 9 ft. 2 in. wide and 10 ft. 10 in. high. They will be 40-ton cars.

Also, included in the C.N.R. orders are 1,500 50-ton box cars to be built by Canadian Car and Foundry Co., Ltd., and 1,700 50-ton box cars to be built by Eastern Car Co., Ltd.

It was recorded in the March issue that the C.N.R., in connection with its project for the replacement of steam locomotives by Diesel-electric units on Prince Edward Island lines, had ordered eighteen Diesel-electric locomotives, to be built by Canadian Locomotive Co., and two to be built by General Electric Co. The eighteen locomotives to be built by Canadian Locomotive Co. will be 75-ton machines, and the two to be built by General Electric Co., 44-ton ones; brief descriptions of them were given. It was further recorded in that issue that the C.N.R. had ordered eighteen Diesel-electric locomotives from Electro-Motive Division of General Motors Corp., and ten from American Locomotive Co., thus bringing recent orders for Diesel-electric locomotives to a total of forty-eight.

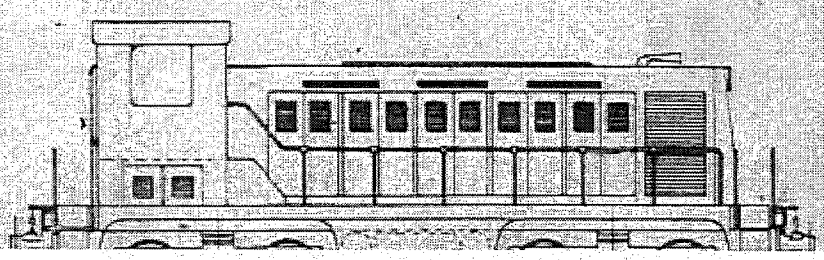
As concerns the locomotives to be built by Canadian Locomotive Co., it was explained that these are to be constructed under the terms of an arrangement entered into by that company with Baldwin Locomotive Works, Ltd., Philadelphia, Pa., and Whitcomb Locomotive Co., Rochelle, Ill. The following information is additional to that presented in the March issue. The locomotives will be built to operate around curves with radius as short as 100 ft. The chasses will be of welded steel construction, with trucks furnished by General Steel Castings Corp. The wheels will be of rolled steel, 36 in. in diameter, with A.A.R. standard journal boxes. The equipment will include a 32-cell, heavy duty battery, for the lighting circuits, engine starting, etc., and a separate belt driven air compressor will be installed.

Outline drawings of the two classes of locomotives appear herewith.

It is worthy of note that the C.N.R., which placed its first Diesel unit in service about 1925, now has 79 Diesel-powered units in operation, viz., 50 switching locomotives and 29 self-propelled cars. The addition of the 48 locomotives recently ordered will bring the total number of Diesel units in service to 127.

In announcing the recent orders for locomotives, D. McKay Ford, Vice President, Purchases and Stores, C.N.R., said in part:—"The purchase of these Diesel locomotives will go a long way to easing the present shortage of motive power on the Canadian National Railway System. They will release existing steam units for other than switching service, and will perform the local work more economically."

The eighteen switching locomotives ordered from the Electro-Motive Division of General Motors Corp. will be of latest type and will include a number of new features. Each will be powered by a 12-cylinder, 2-cycle, 1,000 h.p. Diesel engine, which will drive the main generator, which in turn will furnish



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"Trucks, brakes and other mechanical parts will all be of the latest design for smooth handling at fast freight speeds. For faster loading and unloading, the doors will be larger, seven feet wide by six high. They will be painted in the standard Canadian National Railways freight car red with the monogram and the slogan on the

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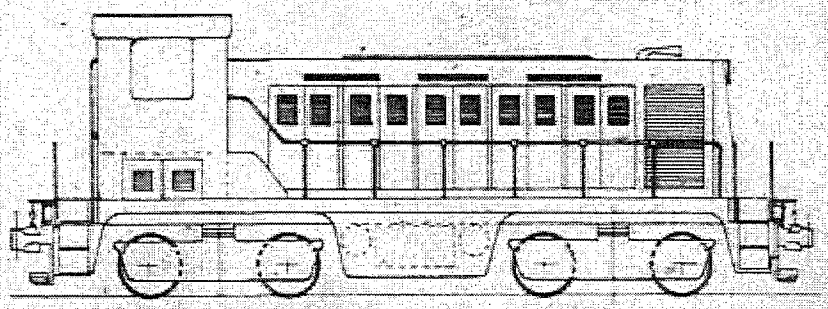

75-ton Diesel for P.E.I. Lines of C.N.R.

MABOU AND GULF RAILWAY.

The Mabou and Gulf Ry. line extends from the Mabou mines to Mabou Harbor, N.S., about five miles. It is graded and partially constructed to a junction with the Inverness Coal and Ry. Co.'s line, about three miles from Mabou Harbor. It handles the output of the Mabou mines and a tug service in Mabou Harbor; no passenger trains are at present operated on the railway. We are advised that it is planned to complete the line between Mabou Harbor and the Inverness Coal and Ry. Co.'s line in 1908. W. P. Deppe, Mabou Mines, is President, and A. A. Mackay, Halifax, N.S., Secretary-Treasurer.

Midway and Vernon Ry.—R. W. Morris, an English civil engineer, arrived in Vernon, B.C., Aug. 28, and made a trip of inspection over the route of this projected railway. It was stated that he would report to a British syndicate which contemplates undertaking the construction of the line. (July,

October 1907