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1898 - CENTENNIAL OF THE FIRST PRODUCTION DIESEL ENGINE - 1998

1948 - 50TH ANNIVERSARY OF THE FIRST PRODUCTION DIESEL LOCOMOTIVE BUILT IN CANADA - 1998

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FRONT COVER: CPR 4054 was a CPA16-4 built by Canadian Locomotive Company of Kingston (construction number 2682) and was outshopped on August 23, 1952. It was wrecked in southern B.C. on January 16, 1967 and was scrapped in October, 1969. C.P. photo

BELOW: Train 645, the "Shad Flyer", consisting of diesel-electric car 15837 and an ancient wooden passenger car, arrives at St. Lambert on May 9, 1950, en route to Montreal from Nicolet and Sorel. Photo by Lorne Perry

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The Centennial of the Diesel Engine

By Fred F. Angus

This year marks the 100th anniversary of the first successful operation of the diesel engine, now almost universally used on the railways of much of the world. Although its application to locomotives did not start much before the 1920s, and full scale dieselization did not come until after World War II, the diesel engine itself, at first in a stationary form, dates to 1898, when these engines first went into commercial production and use.

The nineteenth century was a time of great innovation in industrial development, science and engineering. Many of today's wonders were actually invented before 1900, although, in many cases, they were not put into practical operation until considerably later. One of the last major inventions of the nineteenth century was first exhibited to the public exactly one hundred years ago and, unlike many inventions, was actually put into commercial production within a few months. That invention, successfully introduced in 1898, was the diesel engine.

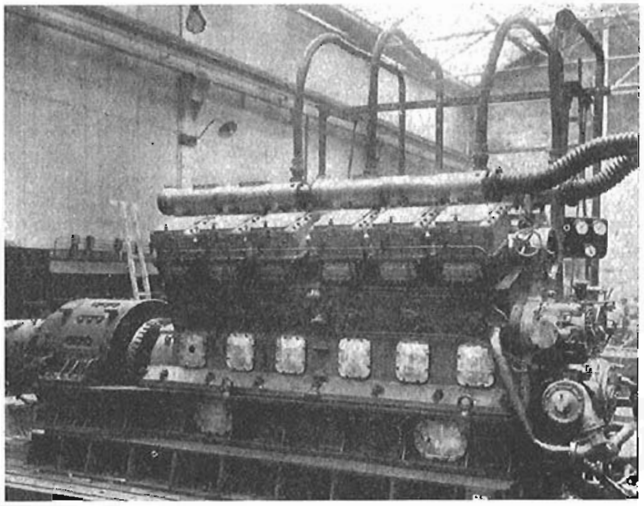
The inventor of the diesel engine was, not surprisingly, Rudolf Diesel (1858-1913). He was a German engineer, born in Paris France on March 18, 1858. Educated at the Munich Polytechnic school, he worked for a time in Paris before returning to Munich in 1893. About this time he conceived the new idea of an internal-combustion engine in which ignition would take place by the heat of compression, rather than an external spark. He patented this idea in 1892, and after his return to Germany worked at the Krupp and Augsburg engineering plants where he refined his theory and built the first operating diesel engine. This 25 horsepower four-stroke machine was completed in 1897 and first placed on display at the Munich exhibition in 1898. The same year the patent and sales rights to the diesel engine for the United States and Canada were purchased for 1,000,000 gold marks (then about $200,000) by Adolphus Busch (1839-1913) the beer baron of St. Louis Mo. Busch formed the Diesel Motor Company of America (soon changed to the American Diesel Engine Company), and before the year 1898 was out, the company had built the first commercially successful diesel engine in the world. The principle of the diesel engine held great promise for stationary power plants, marine engines and even, if certain basic problems could be solved, for railway locomotives. It is, of course, the latter application with which we are concerned here.

In 1899, Rudolf Diesel formed a company in Germany for the construction of diesel engines, which were initially built at Augsburg. In 1900 he attended an engineering congress in Paris where he explained the operating cycle of the new engine. Although the diesel engine showed promise from the start, its full exploitation did not come in Rudolf Diesel's lifetime. He spent the first decade of the twentieth century improving his machine, seeking to market it in many countries and, in 1912, he wrote a book called "The Genesis of Diesel Motors". On September 29, 1913 he sailed for England on the cross-channel ferry from Antwerp to Harwich. He never reached his destination. During that night he fell overboard and was drowned. It was never established whether his death was due to accident, suicide or murder. This was less than a year before the outbreak of World War I, and it is possible that he could have been pushed overboard by secret agents trying to prevent details of the diesel engine falling into the hands of the British. We will, almost certainly, never know the answer.

The basic principles of the diesel engine are actually quite simple. The official definition of a diesel engine is "An internal combustion engine so constructed that the air supplied for combustion is compressed within the engine cylinder to the point where its temperature is sufficient to ignite the injected fuel spontaneously". The typical diesel engine, as originally designed, works on the four-stroke principle, the four strokes being as follows: 1. A suction stroke, during which air is drawn into the cylinder. 2. A compression stroke where the air is compressed to about 500 to 600 lbs per square inch. During this stroke the air is heated by the compression and, near the end of this stroke and the beginning of the next, the fuel is injected under pressure in the form of a fine spray. The heat of the compressed air ignites the fuel which then burns at approximately constant pressure which then produces, 3. A power stroke during which the force produced by the burning fuel pushes on the piston, theoretically at constant pressure, and does useful work. Finally, 4. The exhaust stroke, when the burned products of combustion are expelled from the cylinder. The cycle then repeats. The two-stroke diesel has ports in the sides of the cylinder and relies on "scavenging" air to force the exhaust gasses from the cylinder. This method produces more power for a given size engine, since the exhaust from one power stroke is being expelled as the air for the next one is entering, hence every other stroke produces power compared to one in four with the four-stroke engine. If the air is forced in under pressure, instead of being drawn in from the atmosphere, more air can be compressed in the cylinder and so more fuel burned per stroke. This is known as supercharging, and allows more power to be delivered by an engine. All these principles were known during Rudolf Diesel's lifetime but have, of course, been refined and improved upon since. However the basic principles remain the same.

The advantages of diesel over gasoline engines are twofold. Firstly, there is no separate ignition system, so making the equipment simpler. Also, the thermal efficiency is greater, being about 36% for a diesel as against about 25% for a gasoline engine. This compares to 20% for steam turbines and only 12% for conventional steam engines. Thus we see that the thermal efficiency of a diesel engine is three times that of a comparable steam engine. It is no wonder that the diesel took over from steam on the railways, the wonder is, in retrospect, why it took so long!

It was soon found that the diesel engine works at its best efficiency when running at full speed. This is quite unlike the requirements of railway operation where high power is required at slow speeds for starting heavy trains. This high starting power is available in steam locomotives by admitting steam during much of the power cycle during starting; it is not as efficient since steam is exhausted while still under pressure (hence the "puffs" so beloved of steam enthusiasts), but it gets the job done, and when the train is up to speed the cutoff can be varied to make more economical use of the steam. No such cut-off feature is available with diesels, so it was realized that if they were to be successful on railways some means of variable transmission of power would have to be developed. Here two parallel ideas came together and provided the answer. Since the mid 19th century the idea of an electric locomotive had been getting more and more practical and, by 1900, successful electric locomotives were in regular use. A



One of the first successful large oil-electric locomotive engines in Canada was this 1330 horsepower, 12 cylinder unit, one of two used in CN's pioneer locomotive 9000 in 1928.
Canadian Railway and Marine World, January 1929.

logical extension of the idea was for the locomotive to carry its own generating plant and so do away with the need for overhead wires, third rails and other means of power transmission. In 1899 a steam powered electric locomotive was built but was not very successful. The diesel engine, with its higher efficiency, held great promise for the motive power for such an on-board generator and the idea of the diesel-electric locomotive was born. Although there were, and still are, diesel-mechanical locomotives, these tend to be smaller units, and the diesel-electric principle is used for all large modern diesel-powered locomotives.

A Canadian diesel-hauled long distance passenger train in the 1920s! CNR 9000 hauling the second section of the "International Limited" on August 26, 1929. *Canadian Railway and Marine World, September 1929.*

In this article it is not proposed to give a history of the diesel-electric locomotive. Suffice it to say that before 1920 a few experimental units had been built and the basic principles proved to be sound. In Canada, the CNR had ordered diesel-electric self-propelled cars in the 1920s, and its famous locomotive 9000 was built before the end of the decade. CPR had one diesel switcher (number 7000) in 1937, and in the United States diesels were powering high-speed passenger trains in the 1930s. One of the first, the "Pioneer Zephyr" went into service on the Chicago Burlington & Quincy in 1934 and served until 1959. Recently it has been completely restored to its original appearance and is now in the Museum of Science and Industry in Chicago. Our own Canadian Railway Museum has CNR 77 (formerly 7700), built in 1929, CNR self-propelled car 15824 of 1926 as well as CPR 7000 and 7077 (to be featured in the next article). These historic artifacts chronicle the development of the technology that was to revolutionize railway operation.

By 1940 the diesel-electric locomotive had proved itself and was well on the way to replacing steam on the world's non-electrified railways. There were two reasons why this took twenty more years to accomplish. Firstly, the railways had a tremendous capital investment in steam locomotives and the vast infrastructure needed to make them run; it would take years to raise the necessary capital to replace all this with the new diesel technology, even though the end result would be far more efficient operation. The second reason for the delay was World War II which broke out in 1939. Clearly during a major war was not a suitable time to rebuild most of the motive power of the railways. However when the war ended in 1945 dieselization began in real earnest. The last steam locomotives for a Canadian railway were delivered in 1949, by which time diesels were already taking over many runs. By 1960 the process was essentially complete and the steam locomotives were gone. A few remain in museums, tourist trains and special applications but, by and large, on lines that are not electrified, the diesel reigns supreme.

Some nostalgic railway enthusiasts mourn the passing of steam, but the salient facts are there to see. With the higher efficiency of the diesel, and far less labour, maintenance and operating costs, it is not going too far to say that the diesel saved the railways. It is difficult to see how the railways could have competed against water, air and road transport if they still relied on steam locomotives, assuming that the other means of transport had developed as they did. It is very likely that the cost of maintaining full steam facilities would have forced most railways out of business.

Since the 1960s the "first generation" diesels, that replaced steam, have themselves been largely replaced by "second generation" and later developments. The newest diesel-electric locomotives contain features undreamed of even fifty years ago, and the end is not in sight. Unless some radically new technology appears, or large-scale electrification takes place, both unlikely to happen in North America in the foreseeable future, the diesel-electric locomotive is likely to be around for a very long time to come. Rudolf Diesel would be surprised and gratified to see what has become of his invention that started it all, exactly one hundred years ago.

November 1, 1941

FIRST CHOICE *OF THE RAILROADS TODAY!*

THE streamliner pictured here is more than "the locomotive of tomorrow." It is the No. 1 locomotive of *today*.

Authority for this statement is the fact that American railroads, for the past four years, have bought more GM locomotives than locomotives of any other kind.

And in this achievement you see a typical example of the progressive benefits that General Motors enterprise makes possible.

The Diesel engine that drives these swift and thrifty locomotives was born of General Motors research in internal combustion engines. And from our practical experience in manufacturing motors, generators, frames, bodies and hundreds of other parts—came the processes by which all such units are now made and assembled into complete locomotives in the largest self-contained locomotive factory in the world.

But equally important as the job of developing these locomotives, is the job they themselves have done in actual operation on the railroads. Many people know their record in passenger service. But railroad men can tell you also how more than 600 General Motors switchers have accelerated freight handling and pared down costs in railroad yards—that a new high-powered freight locomotive is beginning to extend these advantages to main-line freight operation.

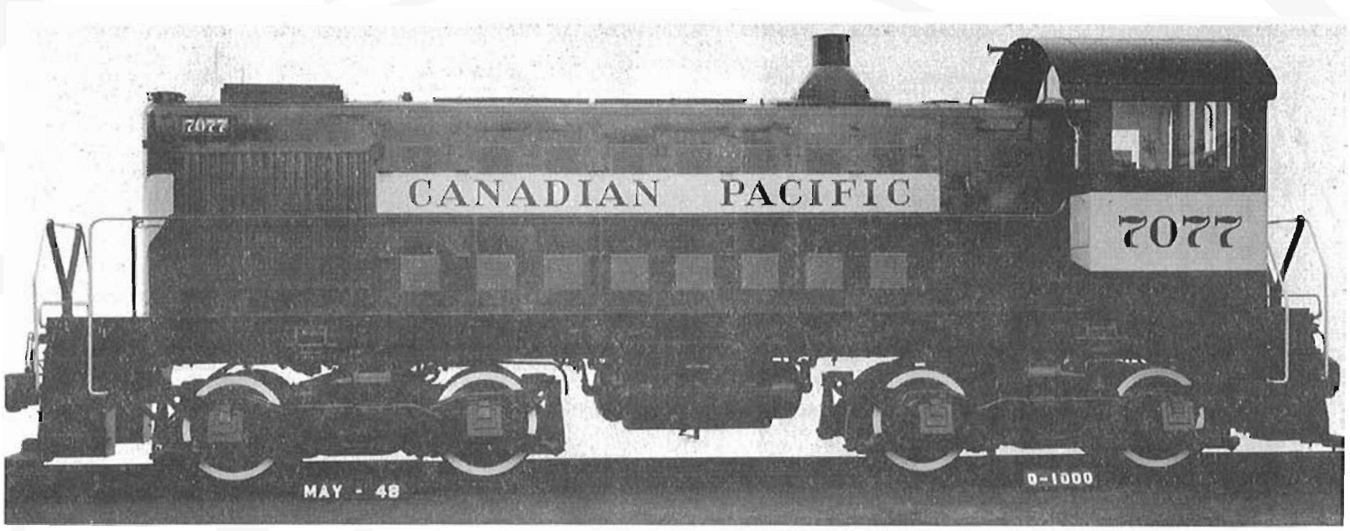
And you can thank the alertness of railroad management for putting this new equipment to work at a record rate—to better still further the service of the finest railroads in the world.

ELECTRO-MOTIVE CORPORATION • Subsidiary of General Motors, La Grange, Illinois

This full-page coloured advertisement for the Electro Motive division of General Motors appeared on November 1, 1941, barely five weeks before the United States entered World War II. It refers to the diesel as "the No. 1 locomotive of today".

The Fiftieth Anniversary of the First Production Diesel Locomotive Built in Canada

By Fred F. Angus



A builder's photo of 7077 taken in May, 1948. Photo courtesy of Canadian Pacific Corporate Archives

On June 14, 1948, the Canadian Pacific Railway took delivery of a new diesel-electric switcher locomotive. The CPR had been using diesel switchers for five years, and had bought an experimental unit, No. 7000, as early as 1937. This unit was built by National Steel Car in Hamilton and had an engine built by Harland and Wolff of Belfast (the same firm that built the famous ocean liner "Titanic"). Canadian National had a longer history of diesel development; they had an experimental main line locomotive in 1929. However the locomotive delivered in 1948, CPR number 7077, had great significance; it is considered to be the first production diesel-electric locomotive to be built in Canada, and the beginning of a new era. Before we consider the significance of this event, let us digress a bit and think of what it was like in 1948.

Some of us can well remember 1948, often it does not seem all that long ago. Yet when one considers all the changes that have occurred since then, one quickly realizes that it is indeed half a century ago. Just consider the following. In 1948 much of the British Empire was still intact and was ruled by King George VI. World War II was a recent memory, and the state of Israel had just been born. Harry Truman was President of the United States, and at home, W.L. MacKenzie King was just concluding his final term of office as Canada's longest-serving Prime Minister. Newfoundland was still a separate country, and margarine was illegal in Canada. There was no television in Canada, and one could hear such favourite shows as "Fibber McGee and Molly", "The Shadow", and "Amos and Andy" on network radio. Songs like "Manana", "Nature Boy", and "Buttons and Bows" poured endlessly from millions of radios, but there was not yet any Rock 'N Roll. A first-class letter could be mailed anywhere in Canada and the U.S.A. for four cents, and the local rate was three cents. Street car tickets in Montreal were 6 1/4 cents (four for a quarter), but students could get seven rides for a quarter. Railway fares averaged about three cents a mile, but special excursion rates were lower; it was possible to buy a return coach ticket from Montreal to Vancouver for under $50. Ocean liners still offered regular service from Canada to England, a trip that took about a week, and service to many other countries was also provided.

In 1948, Canadian National Railways had about 25,000 miles of track, while Canadian Pacific's mileage was about 17,000. Both systems had large numbers of branch lines, most with passenger service. Most of the locomotives on Canada's major railways were steam; in fact the last steam locomotives for a Canadian railway had not yet been built. A large number of passenger cars were of wooden construction, some being built well before 1900. More than two dozen Canadian cities still had street cars, although at least three of them would lose their trams before the year was out. In Montreal, then the largest city in Canada, about 1000 street cars still polished the rails.

Many people in 1948 could clearly remember the 1800s, and some born as far back as the early 1880s were still working regularly for the railways. Among pensioners there were some whose lifespans went back to the pioneer days of railroading in Canada. In fact the last survivor of the driving of the CPR's Last Spike at Craigellachie died in 1948.

There were many railway enthusiasts then, but there was a tendency to take for granted scenes that one would pay dearly to see today. Quite a few railway photos were taken in those days, for the wartime film shortages were over, but most were in black and white. Colour film existed, and some, especially Kodachrome, was of good quality. But it was expensive, and so slow (the typical speed was A.S.A. 10) that it could only be used in bright sunlight or with expensive blue flashbulbs.

Yes, 1948 was indeed a long time ago, and the railways have changed as much or more than the rest of the world. As we shall see, 1948 was the year when the biggest change to Canadian Railways, total dieselization, got underway.

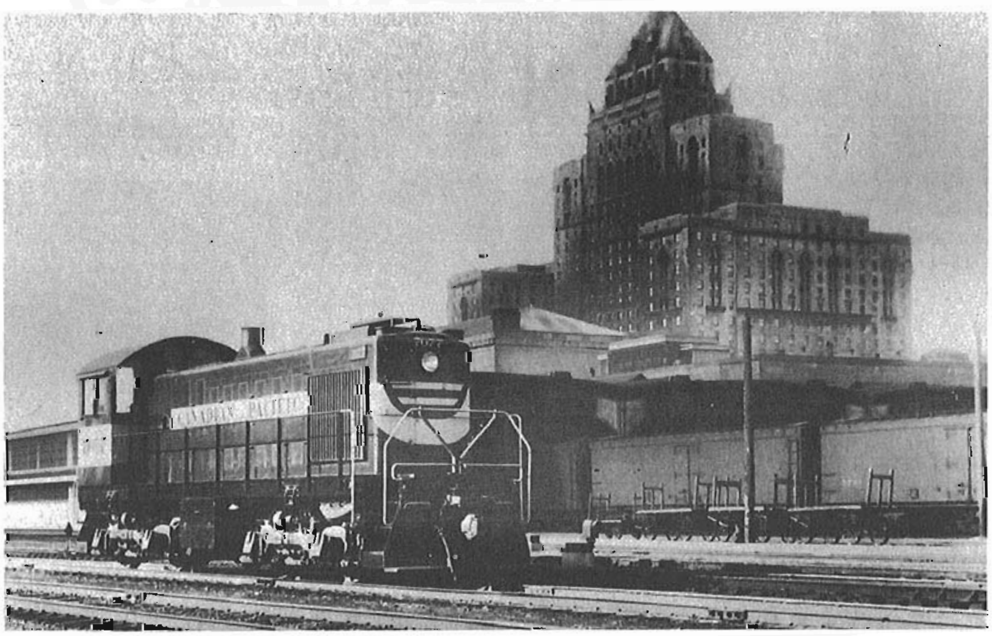
For at least ten years before 1948 it had been obvious to the railway managements that the diesel-electric locomotive was the locomotive of the future and it would eventually replace steam. The technology had proved itself and all that was required was to make the huge investment needed to convert. During World War II both major railways in Canada obtained diesels; these were mostly switchers built in the United States, and they worked hard making up trains for the very heavy wartime traffic. Many of these early units survived for years after the war, and a few are still around. After 1945 dieselization began on a much larger scale and main line units were ordered. By 1948 it had been decided to dieselize the railways completely, and the last orders for steam locomotives were placed that year for delivery early in 1949. The next step would be to build diesel locomotives on a production basis in Canada, something which had not been done before.

One factor that was considered concerns an event which is almost forgotten today. Starting in 1947, and continuing until 1950, Canada had a foreign-exchange crisis as the country's reserves of foreign currency, especially U.S. dollars, fell to a dangerous low. Individuals were only allowed to buy $150 U.S. per year, as a major effort was made to conserve the dwindling foreign reserves. Obviously purchasing locomotives in the U.S. would have a serious effect on the currency situation, so this was another reason for building them in Canada, a factor that was much advertised at the time.

Late in 1947 both CP and CN placed orders for diesel-electric locomotives. Both Montreal Locomotive Works in Montreal and Canadian Locomotive Company in Kingston received orders, but the first to be completed was the first of twenty S-2 switchers for the CPR, numbers 7076 to 7095. The Montreal Locomotive works, a subsidiary of American Locomotive Company in the U.S.A., teamed with General Electric in the construction of diesel-electric equipment. This continued a tradition, dating back to 1924, in which ALCO and GE had cooperated in building diesel-electrics.

At the Canadian International Trade Fair in Toronto in June, 1948, CP 7077 was one of the major exhibits.
Canadian Pacific photo.

The sequence of numbers of these twenty locomotives is quite confusing. The last unit of the previous order (which in fact was not delivered until October, 1948) was 7075. The number 7076 was assigned to the first of a group of Baldwin-design locomotives to be built by CLC. This order was cancelled, so the number 7076 was vacant. In the meantime the numbers 7077 to 7096 were assigned to the twenty MLW units, but only 7077 had been delivered by the time the CLC order was cancelled. Accordingly the numbers of the yet-unbuilt MLW units were changed, and what was to have been 7078 was delivered as 7076. Continuing this reassignment of numbers, what would have been 7079 to 7096 became 7078 to 7095. Therefore the twenty units went into service as 7076 to 7095, but the first two numbers were reversed, so 7077 was the first one and 7076 was the second. As it turned out 7077 was the only one of the group which went into service bearing the number which it had been originally assigned. To make matters even more confusing, the builder's number of 7077 was 76429, a number assigned to ALCO, while those of the other nineteen were 75852 to 75870; these numbers were from a block assigned to MLW and were lower than the builder's number of 7077, even though they were built later.



Immediately after being delivered to the CPR, 7077 went into service in the Toronto terminals. This photo shows it at Toronto Union Station very early in its career, with CP's Royal York Hotel in the background. The Toronto skyline has certainly changed in the last fifty years.
General Electric photo, courtesy of Ray Corley

7077 was actually jointly built by ALCO and MLW, being partially equipped by ALCO in Schnectady and completed by MLW in Montreal. Nevertheless, when it was completed in May, 1948 it was hailed as "the first production diesel locomotive built in Canada", and has always been considered as such. Immediately upon completion it was sent to the

With its "Canadian Pacific" script paint job somewhat faded, 7077 poses at the Canadian Railway Museum on "Diesel Day" 1995. The unit has since been repainted. Canadian Railway Museum photo.

Canadian International Trade Fair which was held from May 31 to June 12, 1948 at the Exhibition grounds in Toronto. Two days after the fair closed, June 14, number 7077 was delivered to the CPR and went into service. The next unit in the series, No. 7076, was not delivered until November 19, and the others followed from then until the last one, 7095, on March 25, 1949. This was the same month in which the CPR took delivery of its last steam locomotive, number 5935, from the same builder.

Once in service, 7077 had an uneventful career. For years it was assigned to the Toronto terminals doing the unglamorous but important job of switching and moving equipment in the Toronto area. In later days it moved to other places, but always stayed in the east, mostly in Ontario. Its final assignment was in North Bay where it served until 1984. For years its historical significance had been appreciated, and it was earmarked for possible preservation by the CRHA's Diesel Acquisition Recommendation Committee as early as 1967. When it became apparent that its days of service were numbered, the CRHA considered whether a request should be made for it to CP Rail. At that time there was another contender, the demotored hulk of former Canadian Pacific E-8 number 1800 or 1802 (then numbered 1898 and 1899), which were in Calgary. In the end there was no contest; 7077 won hands down, and a formal request was made to CP that it be donated to the CRHA. In August, 1984 it was officially retired, and CP Rail very kindly donated it to the CRHA and moved it to the Canadian Railway Museum at Delson / St. Constant.

In its last days of service, 7077 sported the "Action Red" CP Rail paint scheme, with multimark. This photo was taken at the Canadian Railway Museum.

Since then, 7077 has been repainted, and is one of the more historic exhibits at the Museum - the first of a line, and continuing, line of Canadian-built diesel-electric locomotives. It is indeed fitting that we commemorate the golden anniversary of this historic locomotive.

The following articles pertaining to the first MLW diesel-electric locomotives appeared in "Canadian Transportation" in 1948. They are reprinted here as they originally appeared, together with significant illustrations and advertisements from the same year.

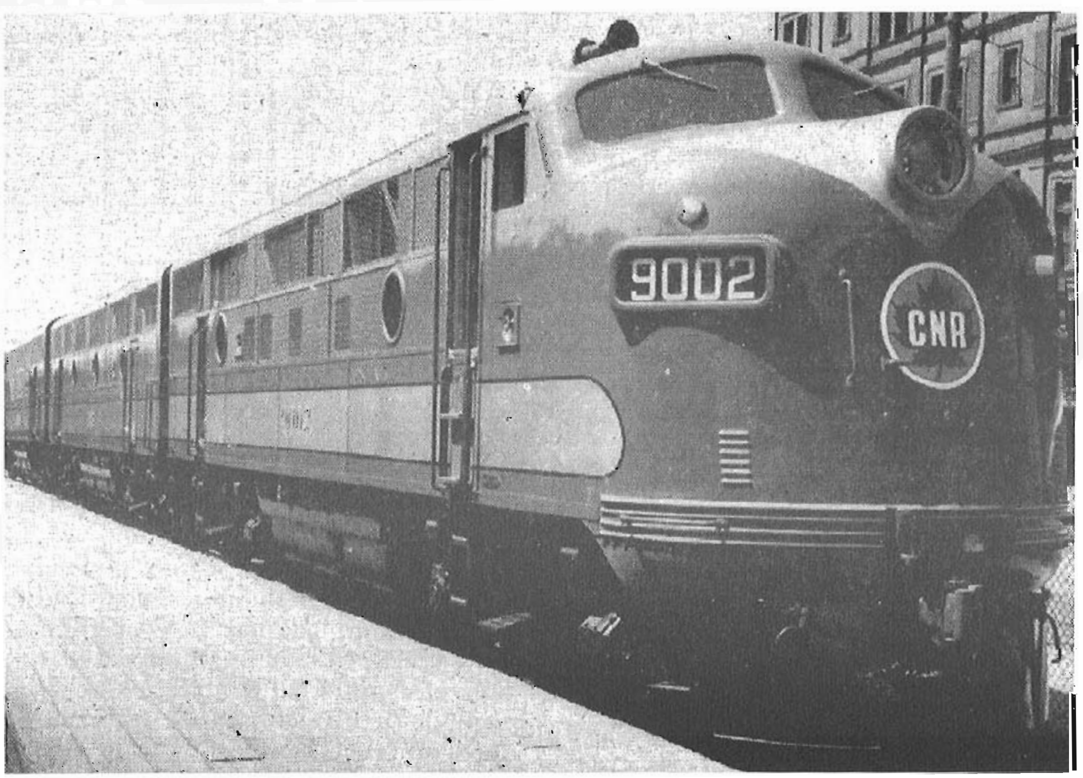
Montreal Locomotive Works, Ltd. Canadian General Electric Co., Ltd.

Recent announcement by H. M. Turner, President, Canadian General Electric Co., Ltd., and Sir Frederick Carson, Executive Vice President, Montreal Locomotive Works, Ltd., is that the two companies have joined forces to produce, in Canada, Diesel-electric locomotives for operation on railways in Canada and for export. Montreal Locomotive Works, Ltd. will build the locomotives, while Canadian General Electric Co., Ltd., will supply the electrical equipment; the locomotives will be built and sold from the Montreal plant of Montreal Locomotive Works, Ltd. The first locomotive to be produced under this arrangement will be a 1,000 h.p. unit, which will be exhibited at the Canadian International Trade Fair in Toronto, May 31-June 12, and then delivered to the Canadian Pacific Ry. as the first unit in the C.P.R. order for 20 Diesel-electric switching locomotives placed with Montreal Locomotive Works, Ltd., as recorded in Canadian Transportation for March, page 126.

This joining of forces in Canada follows the pattern established by the affiliated companies of the two firms in the United States. The American Locomotive Co. and General Electric Co. have constituted a team in the production of Diesel-electric locomotives since 1924, in which year they produced the first successful locomotive of the type, a 300-h.p. switching locomotive which continues to operate in the service of the Central Railroad of New Jersey. It is expected that, eventually, Montreal Locomotive Works, Ltd., and Canadian General Electric Co., Ltd., will produce in Canada the complete line of seven Alco-GE models of road and switching Diesel-electric locomotives which are now in widespread use on many Class 1 railways in the U. S. At present the two Canadian companies are producing 1,000 h.p. switchers, which are in great demand by Canadian railways. Tooling at the plants of both companies is well under way for the production of Diesel-electric locomotives, which will be in addition to already-established lines. The production of Diesel-electric locomotives by Montreal Locomotive Works, Ltd., will not interfere with that company's steam locomotive construction work nor with its interest in steam locomotives. The company is now building three different types of steam locomotives for the Canadian Pacific; it recently completed an order for 20 locomotives for Egypt, and has orders on its books for Portuguese East Africa, Newfoundland and India.

The electrical parts of the Diesel-electric locomotives will be produced by Canadian General Electric Co., Ltd., at its Peterborough, Ont., plant, and Mr. Turner stated that the company has plans for the acquisition of new factory space, to free the facilities at Peterborough for the planned production of the locomotives electrical equipment. Mr. Turner and Sir Frederick emphasize that the Diesel-electric locomotives will be built to the greatest possible extent from Canadian materials and it is predicted that eventually more than 90% of the equipment going into the locomotives will be of Canadian origin.

Canadian Transportation, May 1948. page 291.



While the CPR had the distinction of ordering the first Canadian production diesels, the CNR purchased what were claimed to be the first road diesels ordered for service in Canada. They were built by General Motors, Electro-Motive Division in LaGrange, Illinois, and were reported as two 4500 horsepower locomotives. Actually they were six locomotives, four "A" units and two "B" units, of 1500 horsepower each. They were numbered 9000-9005, and were delivered in the summer of 1948.

Canadian Transportation, August 1948.

Two Great Companies

Join Forces to Build Diesel-Electric Locomotives in Canada...

Montreal Locomotive Works Limited and Canadian General Electric Company Limited announce a policy of cooperation in the building and servicing of diesel-electric locomotives in Canada.

Thus the engineering and production staffs of the largest manufacturer of locomotives in Canada and the largest manufacturer of electrical products in Canada will team up, using Canadian labor and materials insofar as possible, to produce this newest and most successful form of railway motive power.

The immediate benefit to Canadian railroads will be faster delivery of new equipment and better all round service facilities. Tooling up at the plants of both Companies is well underway and while initial production will be devoted to the popular 1000 hp switchers, it is expected that eventually MLW-CGE will build a complete line.

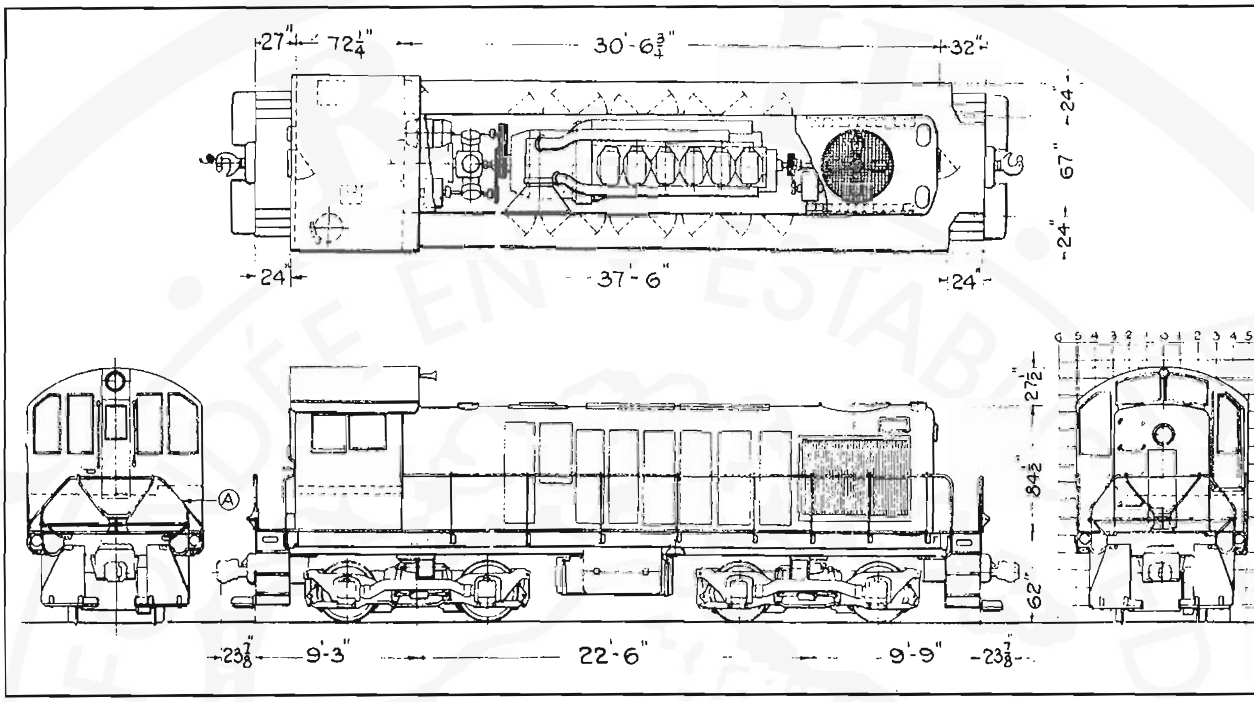
The move for a joint effort on the part of these two prominent Canadian firms follows the pattern established by their respective affiliated companies in the United States. American Locomotive Company and General Electric Company have been a team in the production of diesel-electric locomotives since 1924 and are currently supplying nearly 40% of all orders for this type of motive power to American railroads.

The first locomotive to be produced by the new Canadian coalition will be exhibited at the Canadian International Trade Fair in Toronto and then delivered to the Canadian Pacific Railway as a unit of the first MLW-CGE order.

MONTREAL LOCOMOTIVE WORKS
LIMITED

CANADIAN GENERAL ELECTRIC
COMPANY, LIMITED

48-BKM-1



The locomotive in plan and elevation

Canadian Built Diesel-Electric Switcher

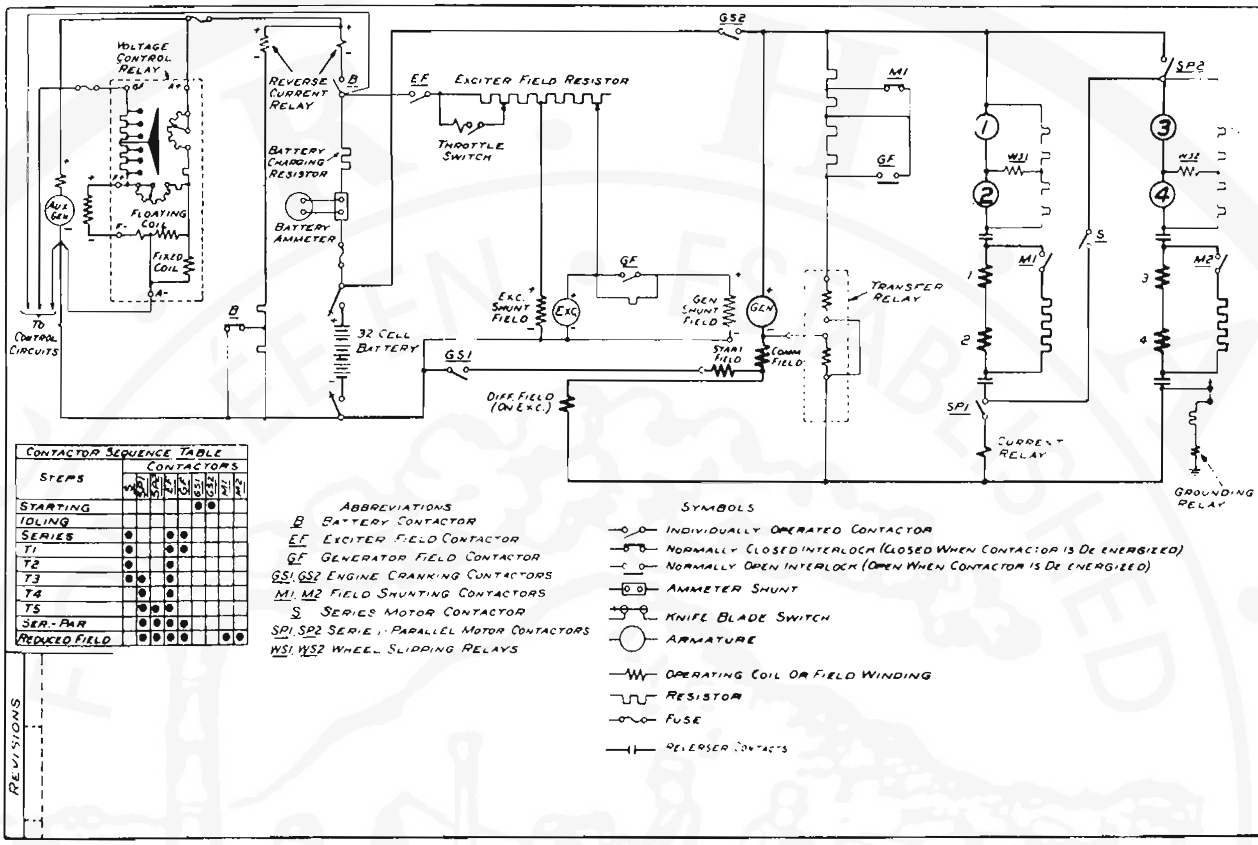
Montreal Locomotive Works, Ltd, in co-operation with Canadian General Electric Co. Ltd., has turned out the first of twenty 1,000 b.h.p. Diesel-electric locomotives ordered by the Canadian Pacific; it is being exhibited at the Canadian International Trade Fair, in Toronto, prior to delivery to the C.P.R.

Particulars were given in Canadian Transportation for May, on page 291, of the joining of forces by Montreal Locomotive Works, Ltd., and Canadian General Electric Co., Ltd., for the production of Diesel-electric locomotives in Canada, and it was noted that the first of 20 Diesel-electric switching locomotives ordered by Canadian Pacific Ry. was due for early completion and for exhibition at the Canadian International Trade Fair, Toronto, May 31 - June 12. This locomotive has been completed and sent to the Canadian National Exhibition grounds in Toronto, where the fair is being held. It is described in the following.

The Montreal Locomotive Works, Ltd. - Canadian General Electric Co., Ltd., coalition follows a pattern established by the affiliated companies of the two firms in the United States. In that country, American Locomotive Co. and General Electric Co. have constituted a team in production of Diesel-electric locomotives since 1924, when, as noted in our preceding article, they produced the first successful Diesel-electric locomotive, a 300 h.p. switching unit still in railway service. The expectation is that eventually the Canadian firms will produce the complete line of seven American Locomotive Co. - General Electric Co. models of Diesel-electric locomotives, for road and switching service, which are now in successful operation on many railways in the United States.

The 1,000 h.p. switching locomotives, of the type ordered by the Canadian Pacific, are of the model being first produced by Montreal Locomotive Works, Ltd., and Canadian General Electric Co. Ltd. A locomotive of this type is equipped with one six-cylinder, supercharged Diesel engine developing 1,000 b.h.p., and the main generator is directly connected to the engine and supported from it, which ensures perfect alignment between the generator armature and the engine crankshaft, independent of any deflections caused by weaving of the locomotive frame. The locomotive is equipped with four traction motors suitable for operation at speeds corresponding to locomotive speed of up to 60 m.p.h. The locomotive is carried on two 4-wheel trucks, all wheels being driving wheels. Weight on drivers and total locomotive weight is 230,000 lb., truck wheelbase is 8 ft. and locomotive wheelbase is 30 ft. 6 in. The extreme height of the locomotive is 14 ft. 6 in., and the extreme width, 10 ft., and the length inside coupler knuckles is 45 ft. 5 3/4 in. The starting tractive effort at 30% adhesion is 69,000 lb., and the locomotive is capable of operation around curves with radius as short as 50 ft. Supply capacities are as follows: Fuel oil, 635 gall.; lubricating oil, 80 gall.; engine cooling water, 240 gall.; sand, 27 cu. ft.

Underframe - Locomotives of this type have underframe of built-up welded steel construction. There are vestibule type steps at each of the four corners, and the steel floor plates are securely -fastened to the underframe. The plates on the walkway along the outside of the hood are of safety tread pattern. Front and rear bumpers of steel plate are securely fastened to the underframe, and push-pole pockets are provided. Swivel couplers of the A.A,R. standard automatic type E, top operated, with 11 in. face and with 6 x 8 in. semi-long shank, are applied at each end



The Type P Control Equipment Diagram

of the locomotive, and the uncoupling levers at each end are arranged to operate independently from either side. Friction draft gear is applied at each end. The coupler yokes are of cast steel, with carrier iron integral with the yoke. The draft gear pockets, of cast steel, with integral striking plates, are securely fastened to the underframe.

Trucks—The two 4-wheel "Alco" swivel type trucks carry the traction motors. The truck frames are of three-piece type, of cast steel. The center member, with center plate and bolster cast integral, is supported through a parallel arrangement of coil and Semi-eliptic springs on the cast steel sideframes, which have integral journal boxes. The trucks are arranged for application of a motor to each axle, and spring nose suspension is employed, with suitable wear plates. The motors are blown through the center plate and the hollow bolster. The design and construction are such that the wheel and axle assembly is removable, with or without the motor. The male cast steel center plate is securely fastened to the underframe. The center plates are fitted with high carbon steel side and bottom liners, with the horizontal liner of the truck center plate removable for shimming. The center plates are oil-lubricated, and dust guards are applied. The truck side bearing sliding surfaces are of steel, with truck safety lock and swivelling limit device applied at the side bearings. The axles are of forged open hearth steel, with collars, and journels are seven inches in diameter and 14 in. long. An axle end thrust arrangement is provided in the journal box. The 40 in. wheels are of rolled steel, with 2 1/2 in. rims. The truck springs are of open hearth steel, tempered in oil.

Cab and Hood - The superstructure is substantially built of steel plates, thoroughly braced and secured to the underframe, and the operating cab is of the single end type, with a low hood covering the power equipment. The section of the hood over the engine-generator set is removable. The radiators and fan are located at the forward end of the hood, with the control equipment adjacent to the cab. There are steel doors at each side at the forward end, and between the cab and hood, to provide for inspection of all parts. Hatches are located over the Diesel engine, to permit removal of a piston, liner or cylinder head. The radiator fan opening is screened. Louvres afford adequate ventilation for the engine, generator, traction motor blowers and control apparatus.

The roof, back and sides of the cab are wood lined, and the steel doors of the cab are provided with suitable weather seals. The back section of the inside windows is of sliding type, with steel sash, while other windows are of the fixed type, with rubber seals. All side windows are glazed with safety glass. Four window wipers are installed, at front and back on both sides of the cab. The cab floor is of seasoned hardwood.

The control stand in the cab is conveniently located at the right side, and carries battery ammeter, slip indicator, lubricating and fuel oil pressure gauges, engine water thermometer, air brake gauges, engine throttle lever, brake valve, and motor controller with reversing lever. Also, in boxes on the control stand are push buttons for controlling all lights (including both headlights), engine starting, fuel pump and control. Other control devices, including those for bell, horn, sander, fuel oil safety cut-out and engine stop, are in locations convenient to the operator's position. A cushioned swivel seat with back rest is fitted at the right side of the cab, and a box type seat with hinged cushioned seat is provided at the left side; this box seat is suitable for holding small tools. Arm rests are provided, and seats and arm rests are upholstered. Also, the cab contains a clothes locker. A fire extinguisher is carried in the cab. A motor-blown cab heater is connected with the engine water system, with control convenient to the operator's position. Other cab equipment includes fuse holder, fuse tester, fuse puller, flag holder and two inspection card holders.

The Diesel engine employed to power a locomotive of this type is built by American Locomotive Co. Diesel Engine Division, Auburn, N.Y., and is a four cycle, single acting, vertical unit, with air cylinders cast en bloc and with mechanical type fuel injection. The normal engine rating at sea level is 1,000 b.h.p., with normal running speed of 740 rp.m. and idling speed of 250 r.p.m. The cylinders are 12 1/2 in. in diameter, with 13 in. stroke. The cylinder block is of cast iron, and cylinder liners of special close grained cast iron are employed. The head for each cylinder, of cast iron, is cast separately, and two exhaust valves, two intake valves and one injection nozzle are located symmetrically in each head. All valve operating gear is totally enclosed and pressure lubricated.

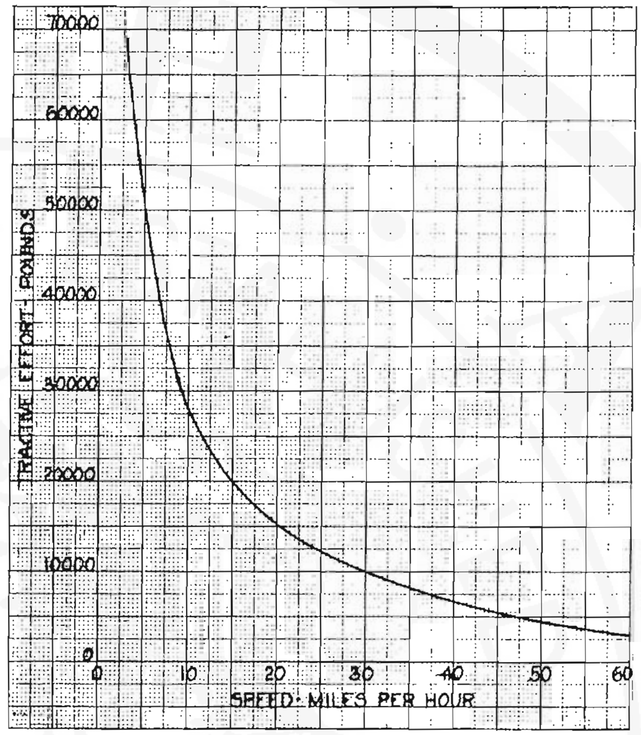
The engine base is of cast iron, and the generator frame is bolted to a flange on the engine base. Detachable covers on each side of the engine base give free access to running parts. A crankcase breather is provided, as is also a blowout safety device.

The crankshaft is a substantial seven-bearing one, bedded in the base. The pistons are of the trunk type, with cast iron rings, and the connecting rods are of forged steel.

The fuel injection system includes an individual injection pump unit for each cylinder, mounted on the engine, together with an electrically-driven transfer pump, for supplying fuel oil from the tank to the injection pump unit. The lubrication system is a full pressure one, supplied by a direct-driven gear type pump. The lubricating oil reservoir in the engine base is of 65 gall. capacity. The system includes a lubricating oil low pressure trip. The governor is of the Woodward-Hydraulic centrifugal variable speed type, and intermediate engine speeds are controlled by the operator's throttle lever, which sets the governor position. An overspeed safety trip, operating independently of the governor, is provided.

For the cooling of engine water and lubricating oil, standard sectional radiators with unit mountings are provided, with all-brazed construction. Radiator shutters are applied, and are operated by means of a lever in the cab. A mechanically-driven radiator fan affords positive cooling. Water is circulated by a centrifugal pump on one side of the engine, and oil is circulated to the radiators by the lubricating oil pressure pump.

The engine is equipped with the Buchi turbo-charging system. The engine auxiliary equipment includes motometer, lubricating oil pressure gauge and air filters for the engine air intake.



The Speed - Tractive Effort Curve of the Locomotive

Accessories - The tanks for fuel and water with which the locomotive is equipped are of welded steel plate construction. The fuel tank, located under the cab, is complete with vent pipe, sump, draining provision, cleaning holes and glass gauge. The filling pipe, with cap, is at the end platform. A safety cut-out valve at the tank is operative from the cab and also from the ground. As stated, the fuel tank capacity is 635 gall. The water tank for the engine cooling system is located above the engine and radiators, and is complete with filling connection, overflow line, vent pipe, and gauge indication to the cab. The water system is arranged for complete drainage at one connection. The capacity of the cooling water tank is 50 gall.

The sand boxes are located inside the hood, and are filled from the roof; as stated above, they provide total capacity of 27 cu. ft. Four traps, of the pneumatic type, are arranged to supply sand ahead of the leading driving wheels for either direction of operation.

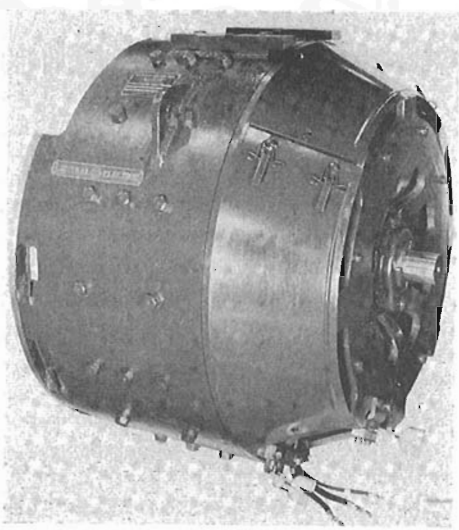
The batteries, of 32 cells, for lights, Diesel engine starting and control, are installed in two substantially-built battery boxes of welded construction, located below the cab frame, between the trucks; the boxes are fitted with insulators and drainage holes for cleaning, and are painted. The battery disconnecting switch is operated from the cab.

The lighting circuits are connected across the 32-cell batteries with the lighting control centralized at the operator's position. A dome light is mounted in the roof of the cab, and the control stand is fitted with indirect lighting. There are four lights in the hood, over the engine, and one in the control equipment section. An extension light cord is provided, suitable for connection to any socket. There is a headlight at each end of the locomotive, these being of the submerged type, with 12 in. metallic reflectors. Each headlight is equipped with 250 watt bulb, with suitable dimining control. Numeral boxes, with electric lighting, are installed at each side of the hood.

By way of warning devices, the locomotive is fitted with an air-operated horn, and with a locomotive bell, 12 in. size, with pneumatic ringer.

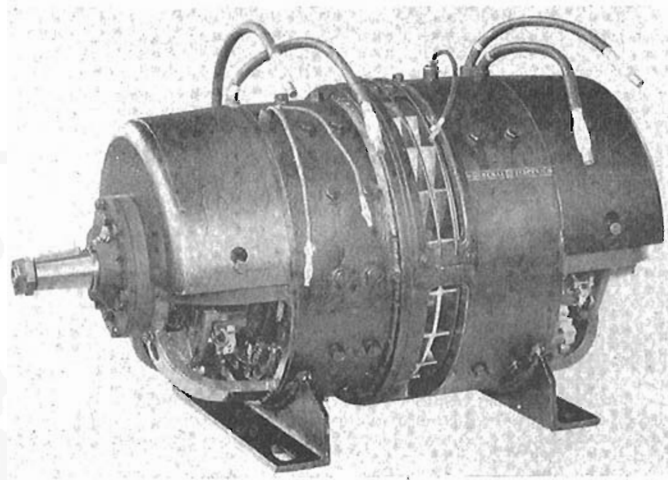
Wherever consistent with proper design, auxiliaries are mechanically driven by use of continuous V belts, applied with a slack adjusting arrangement. Safety guards are provided at all necessary points. Fuel oil filters are the standard duplex type, and a filter for the lubricating oil is located near the Diesel engine. The cab doors are equipped with locks, and all hinges, locks, handles and fastenings on all doors are of ample strength and approved design. Small U-shaped gutters are arranged over the cab side windows.

In the finish of the locomotive, Duco finish is applied on the exterior of the cab, hood and underframe, while the balance of the exterior is painted with black engine finish. The cab interior is painted, with the lining of the roof, and of the walls down to the window sills, in a natural varnish finish. All, steps, handrails and safety appliances are in accordance with U.S. Interstate Commerce Commission regulations.



Front (Commutator End) Oblique Left Side View of Main Generator.

Supplies - Special equipment is supplied as follows:- Foundation brakes by American Locomotive Co.; brake shoes by American Brake Shoe Co.; hand brake by Ajax Hand Brake Co.; air compressor, type 3-CD, and horn, type A-1, by Westinghouse Air Brake Co.; pneumatic bell ringer by Transportation Devices Co.; V belts by the Daytom Rubber Mfg. Co.; radiators by Young Radiator Co.; radiator shutters by Kysor Heater Co.; headlights by Pyle National Co., and traction motor blower by B.F. Sturtevant Co. Other specialties include Nugent lubricating oil filter, Pyrene fire extinguisher, Hayes Air Push window wipers and Graham White sander traps.



The General Electric Direct Current Exciter-Auxiliary Generator Set, Model GMG-139-A2. The auxiliary generator end is at the left.

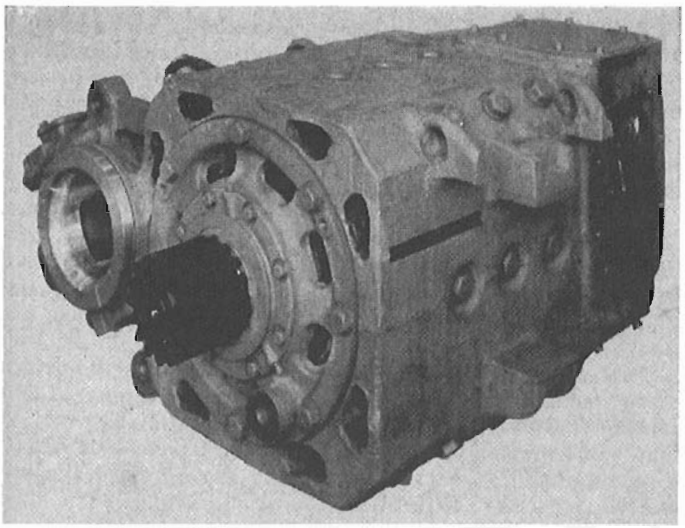
Electrical Equipment

As was indicated in introductory paragraphs, the electrical equipment for Diesel-electric locomotives of this type is furnished by Canadian General Electric Co., Ltd., and the chief items are a type P control equipment, a model GT-553-A main generator, a model GMG-139-A2 exciter-auxiliary generator set, four model GE-731 traction motors, and a radiator fan and right angle drive with model GA-14 fan gear box.

Generator - The model GT-553-A main generator, furnishing power to the traction motors, is, as stated in the foregoing, connected directly to the Diesel engine and supported therefrom, to maintain correct alignment at all times. A single self-aligning roller bearing is used on the outboard end of the generator armature shaft. The generator is so constructed that all important parts are interchangeable. The generator continuous rating is 1,350 amp. The main generator is shown in one of the accompanying illustrations.

Exciter-Auxiliary, Generator Set - The model GMG-139-A2 exciter-auxiliary generator set (with the auxiliary generator having voltage of 75 and continuous rating of 65 amp.) consists of an exciter and an auxiliary generator on the one shaft, belt driven from the engine. This two-part unit is shown in an accompanying illustration. The split pole exciter, which excites the main generator, has a special magnetic circuit which maintains the generator horsepower constant throughout the normal speed range of the locomotive. The auxiliary generator supplies power for the control circuits and for the electrically-operated auxiliaries, and for charging the battery. Its voltage is constant throughout the entire speed range of the Diesel engine.

Motors - The model GE-731 traction motor is a four-pole, direct current, commutating pole type, designed and insulated for operation with full or shunted field from the engine-driven generator. Two views of one of the motors are given herewith. The motors are supported in the trucks by the axle bearings and the spring nose suspension from the truck frame. The axle suspension bearings are of the



View of the General Electric Type GE-731 Traction Motor. The locomotive employs four of these motors. Above is seen the suspension side and pinion end of one of the motors, and below right the axle side and commutator end.

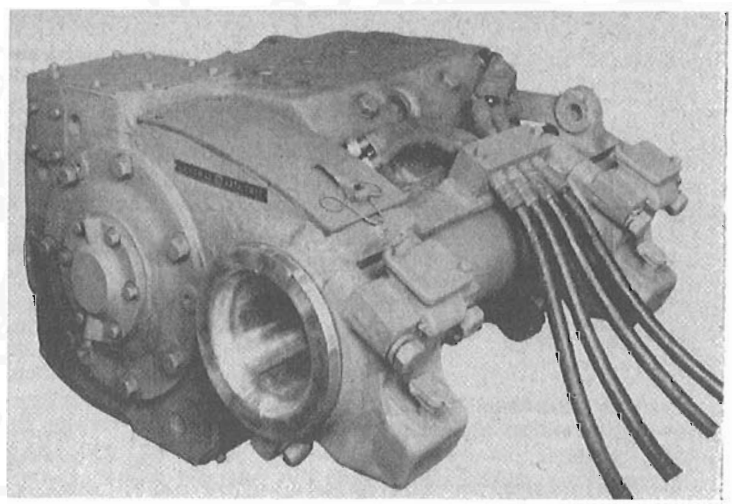
sleeve type and are lubricated by oil which is fed to them by means of wool waste. The motor armature shaft is unusually rigid, and can be removed without disturbing the windings of the commutator. The stiffness of this shaft assures accurate gear tooth alignment and long life for the gear and pinion. The completed armature is dynamically balanced before assembly in the frame. The field coils are hot drawn, i.e., they are mounted in place and heated by passing current through the coil, then drawn up tight, ensuring tightness. The motor frame is an integral steel casting, provided with large openings for inspecting the brushes. The roller bearing on the pinion end is 130 mm. in diameter, and at the commutator end, 90 mm. The shaft diameter through the pinion end bearing is 5.125 in.

Radiator Fan and Drive - The single radiator fan, of 45 in. diameter, is both driven and supported by a right angle drive gear box. The fan is located in the hood roof, and provides sufficient air flow at all locomotive speeds, with low power input to the gear box shaft, which is belt-driven from the engine. The fan is a four-blade one, and at 1,000 r.p.m. delivers air, for radiator cooling, for the maximum engine output. It is built of cast aluminum alloy, heat treated, with a steel insert in the hub, and is carefully balanced, to operate without vibration. The model GA-14 gear box is a malleable iron integral casting, and is ribbed, to ensure rigidity. The gearing is of the spiral bevel type, case hardened, mated and lapped in pairs, for quiet running. The gear ratio is unity. Full lubrication is provided by dip and splash from the gear box, and provision is made for convenient filling and for checking of the oil level.

Control Equipment - The type P, single end, single unit control equipment, with mechanically driven auxiliaries, as applied to locomotives of this type, includes electro-pneumatically operated traction motor reverser and line contactors, with the remaining contactors operated magnetically. The engine power is regulated by the throttle lever on the control stand at the operator's position. Initial movement of the throttle closes contacts to operate the main motor and field circuit contactors.

The traction motors are arranged to operate in series and series-parallel, and in the latter connection are also operated with shunted fields. The motor shaft connections are changed automatically from series to series-parallel, and from series-parallel full field to series-parallel shunt field. The connections are controlled by a relay, whereby transfers are obtained not only at rated engine speed but over the entire operating range of engine speeds. This same relay also drops out the field-hunting contactors when the locomotive speed is reduced below the predetermined range for shunt field operation.

Generator protection is obtained by a current relay, with an indicating light giving visible warning when the locomotive is operated below the proper speed range with the motors in the series-parallel connection. Wheel slipping relays actuate a buzzer which warns the operator when any pair of wheels slips.



A master controller is employed to select the motor combination, and for controlling the direction of movement; it has an operating handle with three forward, one off and three reverse positions. The handle is normally placed in either the full forward or full reverse position before opening the throttle, so that the motor connections are then automatically changed from series to series-parallel, and the field shunting contactors operated at the proper locomotive speeds without any attention on the part of the operator. The handle can be placed in the first forward or reverse position, and thus maintain the series motor connection.

A multi-button switch at the operator's station controls the fuel pump, engine starting and the lighting circuits.

Canadian Transportation, June 1948, pages 293-297.

The World's Most Popular *Diesel*

More Alco-GE diesel-electric switching locomotives are in service on the North American Continent than any other make. Now manufactured in Canada by the Montreal Locomotive Works, Ltd. and Canadian General Electric Co., Ltd., this 1,000-hp switcher is the highly-versatile model which performs equally well in freight transfer runs as well as in general yard switching.

Here are the reasons why this great locomotive has proved itself to cost-conscious railroads and industries during two decades of tough service:

High availability—96% and up. You refuel an MLW-GE diesel-electric only once or twice a week. Servicing expense is low. The interval between overhauls is long.

Fast starting—A diesel-electric is ready for work almost immediately! Quick push-button starting.

Fuel economy—The diesel-electric does more work per dollar of fuel cost.

Cleanliness — A diesel-electric gives off no smoke, no dangerous exhaust gases. This is important if you operate in a smoke-conscious community.

Safety—No dangerous sparks or hot ashes to cause fire. No steam to obstruct the engineman's view during the switching operation.

Low maintenance—There is no boiler, no firebox to maintain. Heavy reciprocating parts are eliminated. No fire cleaning or ash-handling expense. No trips to the water tower.

Less track maintenance — The smooth torque and short wheelbase of the diesel-electric makes it easier on track.

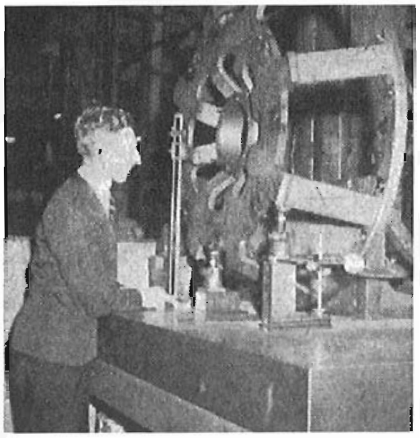
Made in Canada — Conserves foreign exchange and gives all the other benefits of domestic production.

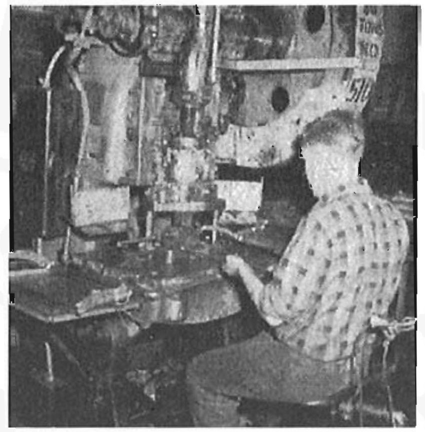
Alco GE is . . . MLW GE *in Canada*

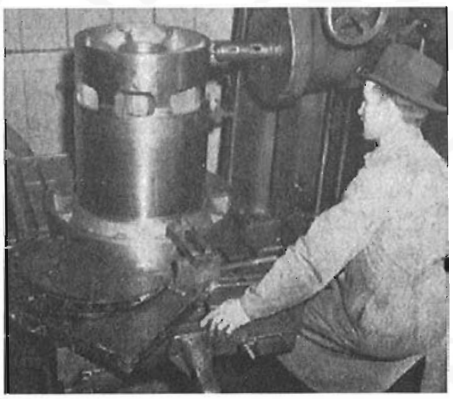
MONTREAL LOCOMOTIVE WORKS
LIMITED

CANADIAN GENERAL ELECTRIC
COMPANY LIMITED

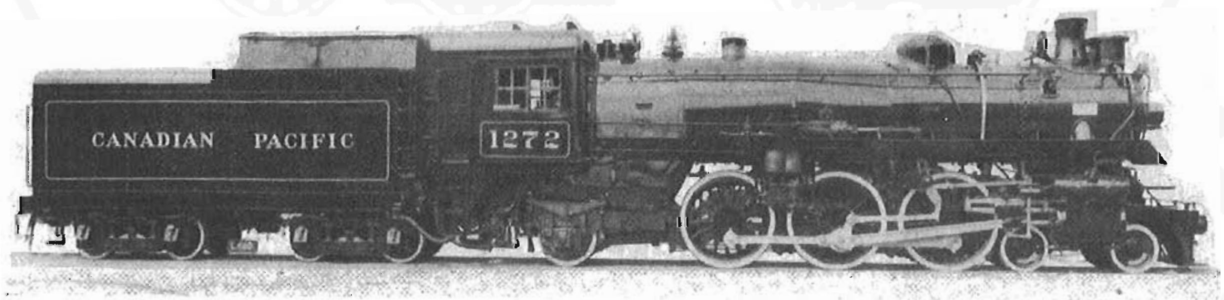
48-BKM-5







Operations in the Manufacture of the Electric Equipment for the Locomotive at the Canadian General Electric Co. plant in Peterborough, Ont. The operations depicted are: Top Left, Inspection, generator frame head; Top Right, Flattening leads of motor armature coils, Above Left, Milling keyway in generator spider, Above Right, Building generator commutator.



Even as the diesels were arriving, steam was making its last stand. This advertisement for CLC in Kingston, depicting CPR 1272, appeared in "Canadian Transportation" for November, 1948. It was one of the last of a long line of ads for new Canadian steam.

Straight Pipes — What a Racket!

By Lorne C. Perry

CNR Motor Train 645 is just coming off the Sorel Subdivision at St.Lambert, QC, in 1950. Unit 15837 hauls a single trailer for added passenger accommodation.
Photo by Lorne C. Perry

Branch lines have always been inherently expensive. They required continual, if minimal, maintenance, and called for a basic passenger and freight train service that used up staff, locomotives and fuel quite out of proportion to revenue. But without them, the main lines were not fed with traffic. A dilemma.

Back in the 1920s CNR began experimenting with self-propelled cars that had the potential of replacing passenger trains on many light traffic routes. They were primitive when compared to today's diesel-electric units, but once the experimental period was over, they performed with a satisfactory level of reliability and with a welcomed drastic reduction in cost from the 1930s right through to the fifties.

The Shad Flyer

I got to know one such unit in the late 40s when it was assigned to trains 645-646 between Montreal and Nicolet, Quebec, by way of St.Lambert, and Sorel. My home was in St.Lambert and westbound 645 was often a convenient train for the 20-minute trip into Central Station. On the summer schedule the time was 9:04 a.m. Eastern Daylight Time, an hour later than railroad official time.

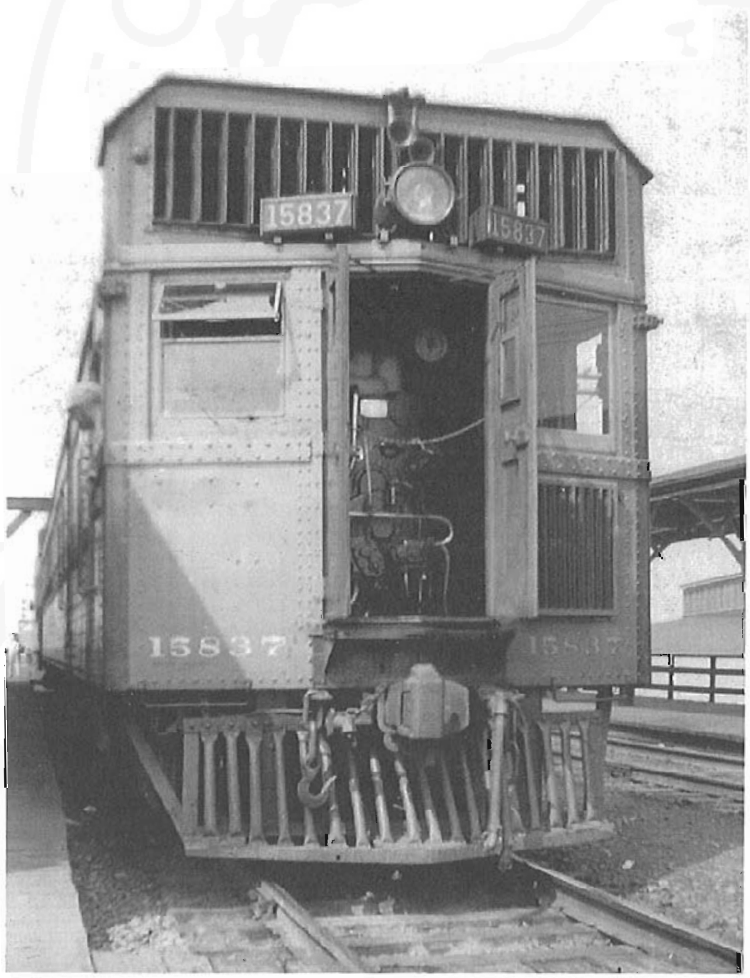
It was also a useful train for people along the south shore of the St.Lawrence River wishing to spend

MONTREAL-SOREL-NICOLET-DES ORMEAUX-TROIS RIVIERES.

■646	138	Ms.	*November 27, 1949.*	■645	137
P M	A M	....	*(Central Station.)*	A M	P M
†550	†750	0	lv. + **Montreal, Que.** ar.	915	900
603	803	1.9	+ .... Bridge Street ▣	907	852
611	811	4.0	+ ... **St. Lambert**	854	839
618	818	6.9	+ ..... Longueuil	845	830
f630	f830	12.5	...... Boucherville	f830	f815
f642	f842	17.7	.... Varennes	f820	f803
659	858	25.2	+ ..... Vercheres	804	747
f709	f908	29.8	...... St. Antoine	f755	f736
720	913	33.4	...... Contrecoeur	747	720
f729	f921	37.9	. St. Roch de Richelieu .	f738	f710
f –	f –	39.8	.... Lisieux	f –	f –
f –	f –	42.5	.... Les Greves	f –	f –
745	f937	47.7	... St. Joseph de Sorel ...	f723	f653
750	940	48.4	arr .... + **Sorel** ...... lve.	720	650
755	943	48.4	lve ...... **Sorel** ...... arr.	715	645
805	955	53.4	.. **Bellevue Junction** ..	703	635
815	1003	58.5	+ ...... Yamaska	652	626
f816	f1004	58.9	..... Yamaska East	f650	f625
f821	f1009	61.3	.... Gerard	f644	f620
830	1017	64.8	+ . St. Francois du Lac ..	636	612
834	1020	65.4	+ ..... Pierreville	633	609
850	1035	72.1	+ ...... La Baie	618	555
910	1053	79.9	+ ... **Nicolet, Que**	†600	538
P M	1107	86.5	+ .... **St. Gregoire**	A M	526
.....	1120	91.3	+ ... **Des Ormeaux**	.....	515
.....	1145	93.1	+ **Trois Rivieres** (Ferry).	.....	†430
.....	A M	....	ARR. }(**Three Rivers**){ LVE.	.....	P M

The time table of the "Shad Flyer", from the Official Guide of April, 1950. The schedule had not changed since November 27, 1949.

A builder's photo of CNR No. 15834, a car similar to 15837, as it appeared new in September 1929. CRHA Archives, CanCar Collection, Photo No. C-3150.



A view into the engine room of 15837. The engineer sat right beside the diesel engine, but on a hot day enjoyed the breeze through the open front doors. Photo by Lorne C. Perry

a full day in Montreal for business, shopping or visiting. It started out at Nicolet, 79.9 miles from Montreal, at 6:15 a.m. EDST, with 21 stations listed either as regularly scheduled or flag (request) stops. Average speed was around 25 m.p.h., a decent speed for branch lines, taking all the stops into account. In the spring the route was infamous for the abundance of shad flies that rose from the marshes along the St.Lawrence Shore. Keep the coach windows closed, and your mouth too!

CNR Unit 15837

The timetable showed a small black square next the train number, indicating it was a Motor Train, with limited baggage accommodation. The motorized unit regularly assigned was CNR 15837. It was really a full-length, lightweight coach with an engine room and cab at one end, plus a smallish baggage compartment and quite a bit of coach seating. An unusual feature for our area was the so-called 3-2 seating arrangement. The aisle was off-center to allow a wider seat on one side. Built by Canadian Car and Foundry of Montreal in1930, the unit was capable of hauling a coach or two, as long as they weren't too heavy. The trailer normally assigned to 645-646 was a 60-foot four-wheel truck coach of rather elderly wooden construction.

The standard paint scheme for such units was CNR coach green with gold lettering, plus a special, high visibility paint treatment on the front end. The overall colour was yellow, but the end doors (normal coach door width but split in two) was painted signal red.

Above the diesel engine was one pipe for each of its six cylinders; all the pipes coming through the roof in a row front to back. Muffler? What's that? Each pipe simply exhausted the red hot gases directly to the air. Well, if you think that didn't make a racket like machine gun fire, you don't know much about those days.

Noise abatement was a very young or nonexistent science, and railways were inherently noisy; some of it for reasons of safety and warning. Unit 15837 had a two-note air horn which could not be sounded at crossings within the community of St.Lambert, but, depending on wind direction, it could often be heard from the platform in St. Lambert as the train followed the St.Lawrence shoreline through Montreal South and Longueuil with their many level crossings.

Some of the noise level of the railways was just thoughtlessness. I don't think it entered anyone's head to try and dampen the sound of the explosions coming from inside 15837. When the throttle was pulled out to maximum, the noise was deaf-

Central Vermont 148 is pictured in 1950 at St.Lambert Station during its brief stop to embark mid-morning commuters for Montreal. Photo by Lorne C. Perry

ening. It was instructive to watch such a performance after dark, such as when the train was leaving St.Lambert and branching onto the Sorel Subdivision. The exhaust was visible as a red and green shaft of flame leaping from each pipe in rapid succession. It was an audiovisual treat.

CV and its doodlebug

In contrast, the other such unit with which I was acquainted, was a much more socially responsible vehicle. Little 148 belonged to the Central Vermont Railway and came into Montreal every day on a route that started in St.Albans, Vermont, and rambled through Highgate Springs, St-Armand, Iberville, St.Johns and St.Lambert. The run, as train 43-44 (143-144 on Sundays) took two and a quarter hours, covering the 64 miles at an average speed of 33 m.p.h.

One forty-eight was built by Brill in the USA in 1927 and had a smaller and much quieter engine than 15837, quiet enough that you could actually hear the whine of the traction motors as it got underway. The unit was shorter than 15837 and was never seen around our way pulling a trailer. Also in coach green, the front end had a special CV treatment; diagonal yellow stripes in an inverted V shape against the basic olive green colour. In the center of each yellow stripe was a narrow gold.stripe, which continued in a horizontal line partway down the side of the unit below the windows.

This little train also served a commuter purpose between St.Lambert and Montreal, augmenting the fleet of trains that paused at St.Lambert Station to pick up and set down passengers. On a typical weekday morning in 1950, St.Lambert folks had a choice of nine trains into Montreal.

Later on, starting in the mid-1950s, CNR tried RDC (Budd Rail Diesel Car) cars on a number of marginal runs, and thus staved off the inevitable abandonment of passenger service for several years. But the two routes described here were never converted to RDC operation. Service was simply discontinued as the automobile took over.

Table I—MONTREAL-ST. JOHNS-ST. ALBANS. Via St. Armand, Que.

144 ◈	44 ☾	Mls.	*September* 25, 1949.	43 ☾	143 ◈	.....
P M	P M	....	(*Eastern time.*)	A M	P M	.....
§7 30	†6 00	0	lve. **Montreal**................(*C. N.*) arr.	11 00	7 00	.....
7 50	6 20	4.0	lve. St. Lambert................ " arr.	10 40	6 40	.....
8 20	6 50	23.2	arr. **St. Johns** .... " lve.	10 10	6 10	.....
§8 21	†6 51	23.2	lve..........+**St. Johns**.....(*C. V.*) arr.	10 09	6 09	.....
8 37	7 07	31.6	..............St. Alexander..............	9 52	5 52	.....
8 49	7 19	38.3	.... Des Rivieres	9 40	5 40	.....
8 56	7 26	40.8	+............ **Stanbridge**	9 34	5 34	.....
9 10	7 40	47.2	+............St. Armand................	9 21	5 21	.....
9 18	7 48	52.0	............Highgate Springs............	9 09	5 09	.....
9 25	7 55	56.1	..............East Swanton..............	9 02	5 02	.....
9 45	8 15	64.3	+............ **St. Albans**	†8 45	§4 45	.....
P M	P M	.....	ARRIVE] [LEAVE	A M	P M	.....

Optional Route via East Alburgh or St. Armand—Tickets to or from stations St. Albans and south destined to or from stations St. Johns and north are to be routed C.V. to St. Johns or the reverse. These tickets will be honored via East Alburgh or St. Armand at the option of the passengers.

The Schedule of the Central Vermont "Doodlebug"; also from the Official Guide of April, 1950.

The Diesel Acquisition Recommendation Committee Report of 1967

By Murray W. Dean et al.

The CRHA was a leader in the preservation of diesel locomotives in Canada. In the first half of the 1960s the Association had already acquired three units for preservation: CPR 7000 (built 1937), CNR 77 (built 1929), and CNR 15824 (built 1926). By 1967 it was apparent that many of the "first generation" diesel locomotives were rapidly nearing the end of their career, and a decision had to be made soon as to whether the CRHA should expand its acquisition activities to include representatives of these locomotives. It should be remembered that 1967 was less than a decade after the end of steam and, to many devoted steam fans, the word "diesel" was almost like a four-letter word! After some debate, the directors of the CRHA decided that diesel acquisition was indeed within its mandate and, on October 30, 1967, established the Diesel Acquisition Recommendation Committee under the chairmanship of the late Murray W. Dean. The committee held five meetings and, on December 20, 1967 it submitted its report, in which it recommended the acquisition of 17 first-generation diesel units. This report was not published generally at the time, but was a true pioneer and has been the basis for most diesel acquisition plans made since then. For various reasons it was not possible to acquire all 17 items, but the basic idea has been followed, and several recommended locomotives were indeed acquired. As part of this issue of Canadian Rail which commemorates the start of diesel production in Canada, and in view of the interesting information that the DARC report contains, we, for the first time, present this historic report exactly as it was prepared more than thirty years ago. The illustrations are nine of those that accompanied the original report.

REPORT OF THE DIESEL ACQUISITION RECOMMENDATION COMMITTEE TO THE BOARD OF DIRECTORS OF THE CANADIAN RAILROAD HISTORICAL ASSOCIATION 20 DECEMBER 1967

FOREWORD

At their meeting of 30 October 1967, the Board of Directors, Canadian Railroad Historical Association, passed the resolution that "a committee be established under the chairmanship of Murray W. Dean, and including one member of the Canadian Railway Museum Commission, to prepare a 'master list' of Canadian-built diesel-electric locomotives recommended for acquisition by the Canadian Railroad Historical Association." The president of the C.R.H.A. subsequently informed the chairman that the choice of committee, including the museum commissioner, was entirely his. The committee was originally composed of four members as follows: Fred.F. Angus (commissioner), William Blevins, Murray W. Dean (Chairman), and Geoffrey D. Southwood. Stanton J. Smaill was added to the committee starting with the third meeting, on 25 November 1967. This report contains a choice of first generation diesel-electric locomotives recommended for preservation by C.R.H.A. the reasons why, and the reasons why others were rejected.

ACKNOWLEDGEMENTS

The committee would like to acknowledge the assistance of Fairbanks-Morse (Canada) Ltd., General Motors Diesel Ltd., and the Montreal Locomotive Works for their assistance in preparing this report. The Railway Association of Canada has also proved very helpful. In addition, Jerry A. Pinkepank's publication "Diesel Spotters Guide" and the use of Clayton F. Jones' hitherto unpublished manuscript "All-time Canadian Diesel Roster" has been greatly appreciated. The Canadian National Railways, Canadian Pacific Railway, and Toronto, Hamilton and Buffalo Railway all co-operated by supplying photographs of their respective locomotives.

INTRODUCTION

The Committee was faced with the problem of selecting the minimum number of locomotives to adequately represent a fleet of approximately 3500. To do this, the Committee proceeded in an elimination process as follows:

1) General policy was decided to be "to select locomotives either representative of Canadian Railways or significant in the development of the diesel in Canada, or both".

2) The railways which were to be represented were selected from a list of 30. (Table 1).

3) The locomotive models available from the various manufacturers were studied and representative types selected. Sixty eight models were available. (Tables 2 to 7).

4) Significant locomotives were noted.

From this point the committee combined the various categories into as few locomotives as possible. It should be noted that if a locomotive is rejected in any of the sub-categories, it can still appear in the final list due to its desirability, in another subcategory. Locomotives are considered only from one point of view in each sub-category.

The diesel-electric equipment already acquired by C.R.H.A. (CN 77, 15824, CP 7000) was heartily endorsed by this committee.

The committee held five meetings as listed in Table 8. At the monthly meeting of the C.R.H.A. held on 8 November 1967 it was announced that our committee existed. As a result, three persons expressed a desire to come to one of the committees meetings to express their views. These persons were: Charles Mallory, Stanton J. Smaill, Grant B. Will. They were invited to attend the next meeting on 11 November 1967. They held views very similar to those of the committee, although Mr. Mallory's knowledge was restricted to the Canadian National. Differences in locomotive selection resulted from a basic difference of philosophy. The committee, as stated in Item one of this introduction, set a policy of selection of locomotives that were either representative of Canadian railways or significant in the development of the diesel in Canada, or both. The three guests, however, tended toward the, albeit interesting, but rather limited production models which appeal to their scarcity more than anything else. Despite lengthy discussion, the committee still felt that its original policy was the more valid of the two. Previous to this meeting, Stanton Smaill had been under consideration as a member of the committee. His desirability as a member was confirmed at this meeting and he was subsequently requested to join, which he did.

Any one of CN's RS-18s has been chosen for preservation. CN 3643 is one such unit. CN photo 53285-1.

CN 4496 ably demonstrates the distinctive profile of a General Motors "Geep", in this case a GP9. Note the dynamic brakes. CN photo 52683-1.

No other persons approached the committee to express views, although many expressed interest in our deliberations. However, the committee decided to withhold final decisions until the report had been released to the Directors of the Association.

ELIMINATION PROCESS

1) Railways to be represented.

The 30 railways considered are listed in Table 1. The following railways were excluded from further consideration due to their relatively small size: a) Alma and Jonquieres Railway Company, b) Arnaud Railway Company, c) Canada and Gulf Terminal Railway, d) Cartier Railway, e) Dominion Atlantic Railway, f) Essex Terminal Railway, g) Grand Falls Central Railway Company Ltd., h) Greater Winnipeg Water District Railway, i) London and Port Stanley Railway, j) Midland Railway of Manitoba, k) Napierville Junction Railway Company, l) Roberval and Saguenay Railway Company, m) Sydney and Louisburg, n) Thurso and Nation Valley, o) Wabush Iron Company.

After much discussion it was decided not to represent the United States subsidiaries of the Canadian National Railways for the following reasons:

a) All locomotives are American-built.

b) All locomotives are equally typical of the CNR with the exception of DWP locomotives. However, this railway also comes under the first stage of elimination i.e. the railway is too small to warrant representation. This discussion removed a) Central Vermont Railway, b) Duluth, Winnipeg, and Pacific Railway, c) Grand Trunk New England Lines, d) Grand Trunk Western Railroad from the possibilities. Further discussion on the British Columbia Hydro and Power Authority and the Toronto, Hamilton, and Buffalo Railway brought the decision that these were also too small to warrant representation on their own merit.

A long discussion ensued concerning acquisition of a locomotive from Newfoundland. Of the three types available (GE 48-ton, GMD G8, GMD NF110), the NF110 being most common by far (47 units) was decided upon. It was felt that a locomotive from this province was highly desirable since a Canadian Railway Museum should, of course, attempt to represent all ten provinces. It was also noted that both the Newfoundland Railway and the CNR in Newfoundland are historically very significant. As well, the locomotives are in great abundance, having more units than some other types that the committee has selected for preservation. Difficulties created by gauge are considered minor when compared to arrangements necessary to obtain other pieces of equipment acquired by CRHA in the past.

It was noted that there are numerous American roads with Canadian trackage and Canadian-built locomotives. Representation of these was rejected since they are basically American railways and utilize motive power that is equally typical of Canadian railways.

This left nine railways as follows:

a) Algoma Central Railway
b) Canadian National Railways
c) Canadian Pacific Railway
d) Northern Alberta Railway
e) Newfoundland Railway - CNR
f) Ontario Northland Railway
g) Pacific Great Eastern Railway Company
h) Quebec, North Shore and Labrador Railway Co.
i) White Pass and Yukon Route

2) Locomotive models from M.L.W. to be represented.

Twenty-five models are shown In Table 2. The S-11, S-12, S-13 and RS-23 are still in production and so have been deemed "Second Generation" diesels and thus not under consideration in this report. The S-1, S-2, S-3, S-4, S-7, S-10 are all switchers that are much the same and so it was decided that one locomotive from any one of these types would be all that is required. Preservation of an RS-1, RS-2, RSC-3, or an RSC-24 was eliminated due to the small number built. The RS-3 and RS-18 were immediately selected for saving due to the large number built. In spite of the large number of RS-10s constructed, this locomotive was omitted due to its extreme exterior similarity to the RS-18. Similarly, the RSC-13 is much like the RS-3, and its need is thus obviated. "A" and "B" units from CLC, GMD, and MLW will be considered together under the heading "A" and "B" units later in this report. Locomotives to be represented from the 25 models of this builder (not including "A" and "B" units) are thus:

a) an early switcher
b) RS-3
c) RS-18

3) Locomotive models from G.M.D. to be represented.

Twenty models are listed In Table 3. The SW1200, GMD1, and GP9 models were immediately accepted for preservation due to the large number built. In addition, the GMD1 is a Canada-only model peculiar to the CNR and NAR. The acquisition of the SW8, SW9, or SW900 would be redundant due to their external similarity to the SW1200. The NW2 was only built by EMD for the American subsidiaries and can thus be eliminated. The GP18 and SW1 did not have large enough production to warrant preservation. The GP7 is much like the GP9 and so is unnecessary. The standard gauge G8 is an export model with only two units in Canada and is thus unrepresentative. The narrow gauge G8 has already been eliminated in the discussion of Newfoundland. Thus three models from GMD (not including "A" and "B" units) are selected.

a) SW1200
b) GMD1
c) GP9

4) Locomotives from C.L.C. to be represented.

This company built 1 switcher, 4 roadswitcher, 2 "A" unit, and 2 "B" unit designs. The switcher had very limited production and is thus unrepresentative. The roadswitchers consist of a 1200 horsepower version, which can be mounted on either B-B or A1A-A1A trucks, a 1600 horsepower version, and a 2400 horsepower version. Brief discussion brought the unanimous decision that representation with one locomotive of 2400 horsepower and one of 1200 horsepower with no preference to truck type would demonstrate this company's road-switcher production adequately.

5) "A" and "B" Unit representation.

C.L.C., G.M.D., and M.L.W. supplied a total of 11 "A" unit models and 9 "B" unit models. Total agreement was quickly reached that there should be one "A" unit from each manufacturer and a single "B" unit which would exactly match one of the "A" units. The MLW unit was quickly chosen as model FA-1, CNR 9400, as this was the first "A" unit built in Canada and consequently rather significant. The CLC unit was equally easy, being model CFA-16-4, CPR 4064, the CLC demonstrator. This model is also the CLC "A" unit in greatest abundance in Canada. The MLW unit does not have a corresponding "B" unit. If a matching "B" unit were selected for the CLC "A", this company would be grossly overrepresented, considering the total number of locomotives built. This left the "B" unit to come from GMD which balanced builder representation quite nicely. The models decided upon from this builder were the FP9A for the "A" unit and the F9B for the "B" unit. The FP9A is the most common of GMD's

This photo shows the choice for a matching "A" and "B" unit from GMD. The units selected are 6542 and 6637 and are identical to 6541 and 6621 shown here. CN photo X50561-2.

CN 1615 is shown here at Granby under its former number 7615. An alternative to 1615 for the Museum is 1617. CN photo X33660.

passenger "A" units and one of its number was the last GMD "A" unit built. As well, the CNR did not have any FP7As, and it was necessary that these two locomotives be CN to balance railway representation. Furthermore, the difference between FP7A and FP9A is externally very slight. The reasons for the F9B are the same as for the "A" unit, as well as the fact that it corresponds to the FP9A.

6) Baldwin locomotive Representation.

Table 5 shows the three models contributed by this builder. The DRS-4-4-10 was chosen not only for its greater production, but also because it is a road locomotive and thus of more interest to the general public.

7) Locomotives from General Electric to be represented.

The 48-ton model was eliminated in the discussion of Newfoundland. Two basic standard gauge models were supplied as shown in Table 6. The 70-ton model was selected purely on a production basis.

8) Budd Company Representation.

The committee decided that the Budd RDC was part of its field of survey, despite the fact that the RDC has direct transmission rather than electric. Thoughts were first cast to the Budd Demonstrator, now owned by CNR. However, the CN has embarked upon a renovation program for their RDCs which is very jolly for passengers, but undesirable from the standpoint of preserving a typical RDC. This left CPR and PGE to consider. The latter does not have many cars, and these are exteriorally different from the standard RDC. This left the CPR. It was decided to obtain a post 1956 car for the following reasons:

a) The majority of CP's fleet is composed of such cars.

b) Some of these cars were built in Canada by Canadian Car and Foundry.

c) The later car is the refined version of the original.

Of the five models built (Table 7), CP only possesses four. It was felt that the car should contain both a baggage and a passenger section, so that all models would be more easily visualized by the public. This narrowed the choice to the RDC-2, and the RDC-3 models. None of CP's RDC-3s are standard, all having had the RPO compartment removed and the baggage section extended. This left the RDC-2 as the final choice.

SIGNIFICANT LOCOMOTIVES

There was complete agreement that the following significant locomotives would be valuable additions to our collection.

a) GMD's first locomotive, TH&B 71, a GP7, outshopped on 11 August 1950.

b) MLW's first diesel-electric locomotive, CP 7077, outshopped 14 June 1948. Although this is the second locomotive of the class, the first of the class did not arrive until November 1948.

c) Either of CLC's demonstrators, CP 4064 and 4065.

d) The first "A" unit built In Canada, CN 9400.

e) The first diesel-electric locomotive to enter the property of the Canadian Railway Museum, CP 8444.

In addition, it was noted that the three locomotives purchased by Canadian National for service on the Montreal and Southern Counties are of a type desired for preservation.

FINAL SELECTION

Table 10 shows the final selection of locomotives. The specific reasons for their desirability follow. The number of the figure showing the particular locomotive corresponds to the number both in Table 9 and the following summary.

1) Any one of CN 26 to 42

Of the 33 GE 70-ton models available, CN owns 17. The others are scattered across Canada in possession of Industry and minor railways, none of which, it is felt, would wish to relinquish a locomotive free of charge. Furthermore, such a CN unit represents Prince Edward Island very well. This part of the overall picture will be covered more fully in the summary.

2) Any one of CN 900 to 946

This locomotive is from Newfoundland. Reasons for acquisition were discussed when the CN-Newfoundland Railway was selected.

3) Any one of CN 1204 to 1397

Such a locomotive represents the SW1200, of which 343 were built by GMD, the majority (182) being purchased by Canadian National.

4) CN 1615 or 1617.

CN 1615 to 1617 are the three locomotives purchased by CN for use on the M&SC. They are CLC model H-12-46 which is one of the models selected as desirable for preservation. #1616 has already been retired and stripped. Of the remaining two, either is equally desirable.

5) Any one of CN 3615 to 3745 or CN 3830 to 3893.

Of the 335 RS-18s built by MLW, 131 went to CN and 72 to CP. CN's large majority indicates representation of this unit to lie there.

6) Any one of CN's GMD GP9s.

Of the 662 GP9s built by GMD, 343 were purchased by CN and 200 by CP. The CN System owns an additional 94 of this model built in the United States. The choice thus went to CN to represent this type. All the GMD locomotives have dynamic brakes as per discussion of TH&B 71.

7) CN 6542.

This is the "A" unit of the "A" and "B" unit set. The last locomotive of the series was chosen since it is the last GMD "A" unit built.

8) CN 6637.

This is CN 6542's matching "B" unit and is the last "B" unit to be built by GMD.

9) CN 9400.

The choice of this locomotive was fully discussed when the FA-1 model was chosen for preservation.

10) CP 4064 (or CP 4065).

CLC'S "A" unit was chosen to be model CFA-16-4, specifically the demonstrator CP 4064. If this locomotive is unavailable, CP 4065 (the second demonstrator) will do, but the former is certainly more desirable.

11) CP 7077.

This is the first MLW diesel-electric locomotive. It will also be our representative of the early switcher.

12) Any one of CP 8000 to 8012.

This locomotive fills the requirement for a Baldwin DRS-4-4-10.

13) CP 8444.

CP purchased 35 RS-3s while CN purchased 41. Since the CN majority is very small it is not an important factor. The significance of CP 8444 has already been noted. In addition, taking

CPR 8444 is shown here on its second trip to the Canadian Railway Museum.
Photo GDS

CP 8012 is an example of a Baldwin road switcher. The committee hopes that the railway will put back the fuel tanks before delivery to the Museum! *CP photo.*

the RS-3 from CP's fleet keeps the balance of locomotives from CN and CP in line.

14) Any one of CP 8901 to 8920.

CLC's 2400 horsepower roadswitcher was most predominant on CP, there being 21 such units, road numbers 8900 to 8920. Of these, CP 8900 was partially built in the United States and partially in Canada, while the remainder are entirely Canadian-built. The committee therefore recommends the aquisition of any one of these latter locomotives.

15) CP 9115.

The discussion of the RDC has so far reached the point where an RDC-2 of post 1956 design has been selected. Of this type on CP, 9115 was the only one assembled in Canada and so has been selected.

16) Any one of NAR 301 to 305.

The choice of this locomotive satisfies the requirement to represent the Northern Alberta Railways and GMD's GMD1 model.

17) TH&B 71.

This locomotive is mentioned under significant locomotives and the committee feels that it is of such significance that it should be preserved despite the fact that it does not belong to a railway that the committee specifically desires to represent, nor is it a model that is specifically desired. However, there is nothing undesirable about representing the Toronto, Hamilton, and Buffalo Railway, being a road of medium size, having approximately 111 miles of track. The GP7 is also a common Canadian model, there being 90 such units in Canada. The committee stresses at this time that the GP7 must not pre-empt the GP9 because of the similarity. Not representing either of CN or CP with a GP9 would be a great mistake due to the large number on these roads. In addition, since the TH&B locomotive does not have dynamic brakes, the GP9 is selected so as to be so equipped to provide more of an external difference.

Algoma Central Railway, Ontario Northland Railway, and Quebec, North Shore and Labrador Railway have not had a locomotive included since all their motive power is identical in type to CN and CP and it would make the overall picture of these latter two look ridiculous if the locomotive type was taken from one of these smaller railways. It is recommended that representation from these three railways wait until the "Second Generation" selection of locomotives.

Pacific Great Eastern's representative has been selected as the RS-18. Their version of this model (which was also selected for CN) has an elongated low-nose and has been chosen to contrast with CN's more standard high-nose RS-18. The model is also PGE's most common. However, since it is PGE's most modern power (three having been purchased in 1966) it is recommended that the railway not be asked for this locomotive at the present time. It thus does not appear in the final list.

Both CN and CP possess hump boosters, the 15 of the former self-built, while CP's 4 came from MLW. These locomotives possess only traction motors with a load of ballast to create extra traction for the hump. Power is obtained from one or more accompanying diesel-electrics. CP's boosters are not typical, being much smaller in number than CN's, and so are not desirable. CN's, on the other hand, were built between 1964 and 1966 and are not likely to be retired for many years. These units are thus designated "Second Generation" and are to be considered for preservation at the same time as other "Second Generation" units.

The committee's research into the motive power of the White Pass and Yukon Route (three foot gauge) is not yet complete. The Committee will submit a report on this railway later in 1968.

SUMMARY

The final choice of locomotives totals 17 units divided amongst the railways and builders as follows:

CN	9	BLW	1
CP	6	Budd	1
NAR	1	CLC	3
THB	1	GE	1
		GMD	7
		MLW	4

The division of the locomotives is approximately proportional to the number on the railways concerned and to the number produced by the builders (Tables 2 to 7). The following is a regional list which shows that all parts of Canada have a motive power representative in the committees selection. When any locomotive or a class has been selected, the first unit of that class is used below to denote that locomotive.

Newfoundland: CN 900.

Prince Edward Island: CN 26.

Nova Scotia and New Brunswick: CN 1600, 3615, 9400, CP 7077, 8444, 9115.

Quebec and Ontario: CN 1204, 3615, GP9, 6542, 6637, 9400, CP 7077, 8444, 9115, TH&B 71.

Manitoba, Saskatchewan, and Alberta: CN 1204, GP9, 6542, 6637, CP 9115, 4064, 7077, 8901, NAR 301.

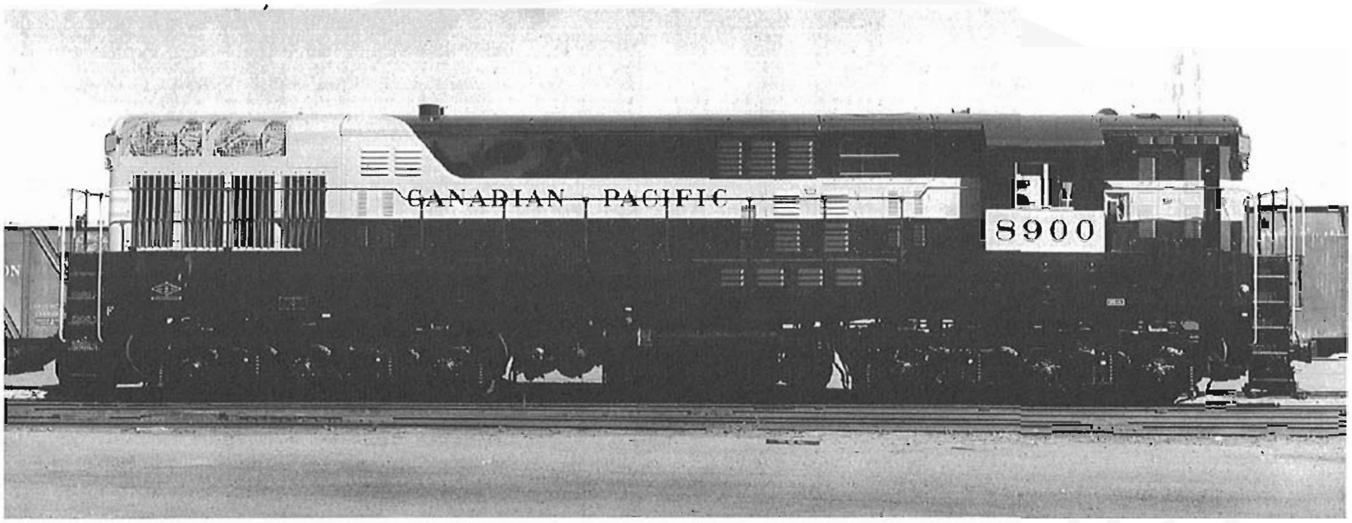
British Columbia: CN 1204, GP9, 6542, 6637, CP 4064, 7077, 8000, 8901, 9115.

RECOMMENDATIONS

The committee recommends that this report be accepted in its entirety by the Board of Directors, Canadian Railroad Historical Association, and that requests for the acquisition of this equipment be filed with the appropriate railways immediately. Delay is extremely dangerous since some of the desired locomotives are fast disappearing, while the fate of others is uncertain. Very few of these locomotives have an assured long life ahead, and it is felt that even these should be requested now, although they will not, of course, be obtained, so that the railway concerned knows that we shall not be running to them every two years with additional requests.

The committee further recommends that its existance be continued for the purpose of supervising both the external and mechanical maintenance of the equipment upon its arrival at the Museum. This jurisdiction would include CN 77, 15824, and CP 7000, but not, of course, the Museum's own shunter #9. The committee feels that the maintenance work would be better looked after in the hands of such a committee since the members have the knowledge, or sufficient interest to obtain the knowledge quickly, to be able to look after, or find someone who can look after the equipment in the manner to which it was previously accustomed. The committee would not have a budget, but would refer all requests for expenditure to the Canadlan Railway Museum Commission or to the C.R.H.A. Board of Directors, whichever said Board sees fit.

This report is respectfully submitted to the Board of Directors, Canadian Railroad Historical Association, by the Diesel Acquisition Recommendation Committee on this twentieth day of December in the year nineteen hundred and sixty-seven. No member of the committee desires to submit a minority report.



CP 8900 is the same as 8901 to 8920 except for the country of building. *CP photo.*

NAR 303 is an example of the GMD1 locomotive.

CP 9115 is identical to CP 9100 shown here. *CP photo B3977-4.*

TABLE 1
RAILWAYS OF CANADA WITH DIESEL-ELECTRIC LOCOMOTIVES

1) Algoma Central Railway
2) Alma and Jonquieres Railway Company
3) Arnaud Railway Company
4) British Columbia Hydro and Power Authority
5) Canada and Gulf Terminal Railway
6) Canadian National Railways
7) Canadian National Narrow Guage System
8) Canadian Pacific Railway
9) Cartier Railway Company
10) Central Vermont Railway
11) Dominion Atlantic Railway
12) Duluth, Winnipeg, and Pacific Railway
13) Essex Terminal Railway
14) Grand Falls Central Railway Company Ltd.
15) Grand Trunk New England Lines
16) Grand Trunk Western Railroad
17) Greater Winnipeg Water District Railway
18) London and Port Stanley Railway Company
19) Midland Railway of Manitoba
20) Napierville Junction Railway Company
21) Northern Alberta Railways
22) Ontario Northland Railway
23) Pacific Great Eastern Railway Company
24) Quebec, North Shore, and Labrador Railway Company
25) Roberval and Sagueny Railway Company
26) Sydney and Louisburg (Cumberland Railway Company)
27) Thurso Nation Valley
28) Toronto, Hamilton, and Buffalo Railway
29) Wabush Iron Company
30) White Pass and Yukon Route

TABLE 2
MONTREAL LOCOMOTIVE WORKS DIESELS OF CANADIAN RAILWAYS

MODEL	PRODUCTION	MODEL	PRODUCTION
S-1	1	RS-10	128
S-2	150	RSC-13	35
S-3	152	RSD-17	1
S-4	121	RS-18	335
S-7	40	RS-23	34
S-10	13	RSC-24	4
S-11	10	FA-1	20
S-12	11	FB-1	20
S-13	53	FA-2, FPA-2	54
RS-1	2	FB-2, FPB-2	27
RS-2	12	FPA-4	36
RS-3	105	FPB-4	14
RSC-3	8		

TABLE 3
GENERAL MOTORS DIESELS OF CANADIAN RAILWAYS

MODEL	PRODUCTION	MODEL	PRODUCTION
NW2	32	E8A	3
SW1	2	F3A	4
SW8	66	F3B	2
SW9	16	F7A	76
SW900	90	F7B	30
SW1200	343	FP7A	35
GMD1	102	FP9A	54
GP7	90	F9B	44
GP9	662	NF110	47
GP18	2	G8 (narrow gau.)	6
		G8 (Std. gau.)	2

TABLE 4
CANADIAN LOCOMOTIVE COMPANY DIESELS OF CANADIAN RAILWAYS

MODEL	PRODUCTION	MODEL	PRODUCTION
H-12-44	30	CFA-16-4	38
H-12-46	30	CFB-16-4	15
H-16-44	57	CPA-16-5	6
H-24-66	22	CPB-16-5	6
DT-2	14		

TABLE 5
BALDWIN DIESELS OF CANADIAN RAILWAYS

MODEL	PRODUCTION
DS-4-4-6	1
DS-4-4-10	11
DRS-4-4-10	13

TABLE 6
GENERAL ELECTRIC DIESELS OF CANADIAN RAILWAYS

MODEL	PRODUCTION
44-ton	10
70-ton	33
48-ton	3

TABLE 7
BUDD COMPANY DIESELS OF CANADIAN RAILWAYS

MODEL	PRODUCTION	MODEL	PRODUCTION
RDC-1	45	RDC-4	9
RDC-2	29	RDC-9	7
RDC-3	17		

TABLE 8
MEETINGS OF THE DIESEL-ELECTRIC ACQUISITION RECOMMENDATION COMMITTEE

1) 04 November 1967
2) 11 November 1967
3) 25 November 1967
4) 02 December 1967
5) 16 December 1967

TABLE 9
DIESEL-ELECTRIC LOCOMOTIVES RECOMMENDED FOR ACQUISITION

1) Any one of CN 26 to 42.
2) Any one of CN 900 to 946.
3) Any one of CN 1204 to 1397.
4) Either of CN 1615 or 1617.
5) Any one of CN 3615 to 3745 or CN 3830 to 3893.
6) Any one of CN's GMD GP9s.
7) CN 6542.
8) CN 6637.
9) CN 9400.
10) CP 4064 (or CP 4065).
11) CP 7077.
12) Any one of CP 8000 to 8012.
13) CP 8444.
14) Any one of CP 8901 to 8920.
15) CP 9115.
16) Any one of NAR 301 to 305.
17) TH&B 71.

Ontario Northland Donates Locomotives

By John Godfrey

ONR 1400 at North Bay (date unknown). Photo by R. Currie, from the collection of Dave Shaw

Any evidence of civilization receded from view to the rear as the small caravan bounced along the uneven surface of a gravel road adjacent to ONT's North Bay, Ontario shop complex. "Are you sure this is the right way?" asked Bernard from behind the wheel of the rented truck. It was.

A little further there appeared around a slight bend the open gates to the Piche & Sons scrap yard, our destination. The small procession pulled-up to the office to find the doors locked. A rumble off in the distance showed that someone was on the site. Since the object of our visit was between us and the far-off growl of heavy machinery, we headed over to our quarry: former ONT RS-3 1306. But what were five refugees from the CRHA's Canadian Railway Museum doing so far from home? Let's go a little further back in time...

Some years ago, the CRHA asked the Ontario Northland Railway about the possibility of securing the donation of one of their older locomotives to the CRM. Geeps were unavailable, came the reply, but there were a couple of F-units that may be of interest. A reconnaissance trip in the spring of 1995 revealed the units to be in a state far beyond the skills of the varied resources the CRM has at its disposal. However, two RS-10s and two RS-3s were present and amazingly intact. They had been stored 'serviceable' pending a sale that never materialized in 1985. Attention turned to acquiring one of each. Lengthy negotiations proved fruitful when it was learned from ONT's head office that they would donate RS-10 1400 and RS-3 1306 to the CRHA.

Getting them to Delson would be relative easy. ONT would interchange the duo to CN, who would move them to Delson. Since the CRM is physically connected to the SL&H, they would move them the final mile to their new home. As part of their ongoing, generous support of the CRHA's museum project, CN would pick-up the tab for the movement. All looked rosy, until the CN's car department had a look at the pair. It had been anticipated to move them coupled to idler cars for braking. Wheel condition hadn't figured into the equation; they were stored 'serviceable', right?

Wrong. The number 3 axle of the 1400 had been badly skidded, and there were defects on all four wheel-sets of the 1306, in addition to other relatively minor defects with both units. ONT was contacted about the possibility of performing the necessary running repairs as part of their donation. Negotiations dragged-on for months. In the end, a change in administration within the ONR, a new Ontario Premier's sharp budgetary axe, and a tenuous labour situation within the railway negated this possibility. Despite all our efforts and concern it looked as if we were going to lose the opportunity to acquire these units.

Serious decisions had to be made by the CRHA. With a game plan in hand, I arranged to meet with ONT's Mike Montag at the North Bay shops in October of 1997. We visited both units, talked at length about various repair possibilities, and examined the surrounding area. I returned to Montreal with a sense that that light at the end of the tunnel was not an approaching train.

ONR 1306, also at North Bay on an unknown date. Photo by R. Currie, from the collection of Dave Shaw

Since the 1306 was being acquired for its contents vs its container, it was decided to move the unit off ONR property to the nearby Piche scrap yard for stripping. The remains would be sold to Piche, the proceeds put towards the re-profiling of the badly skidded #3 axle of 1400, which had become one of 2 extant RS-10s in Canada during the course of this episode (ONT had scrapped the other RS-10 and RS-3 pair during a site clean-up in 1996). And so, on a Friday night in late November, 1997, CRM volunteers Len Thibeault, Bernard Archambault, Alain Bossé, and myself headed north-west through the darkness towards North Bay, to be joined during the night by the fifth member of the party, Dave Barnard.

After an all-too-brief sleep and a big breakfast at the motel's restaurant, we set-out for the scrap yard After a commemorative photo, we divided-up the task at hand. Over the next 8 hours, coupler knuckles, brake shoes, electrical components, and mechanical parts all found their way into the truck. Despite the labour involved in working with hand tools, spirits were high. If one member of the work party was having a hard time liberating a particular item, removal by committee soon had the piece started on its journey to its new home.

Work and family commitments dictated that Dave and I return to Montreal on Saturday. The rest of the crew remained in North Bay to gather up tools and parts, secure the load, and get a decent night's rest; setting out for Delson the following day.

In relatively short order, the next phase of the project was set in motion. ONT moved the 1400 into the shop, made the trucks safe for movement, lubricated the running gear, covered the cab windows, and assisted CN with locating an idler car for the unit's journey. CN carmen from Capreol arrived to install a bypass hose on the unit to enable braking system air to travel 'around' the unit to the idler car to insure the continuity of the brake line of any train it would travel on.

Shortly after the new year, ONT marshalled the unit and its idler into the consist of a freight destined for Rouyn, Quebec, where CN took over. The former government road had decided to move the unit to the Montreal area via Rouyn, Senneterre, and Garneau, a route more in keeping with the 1400's 30 MPH speed restriction than the high-speed Montreal - Toronto line. Mother nature intervened at this point, enveloping much of eastern Ontario and southwestern Quebec in an icy tomb while the unit layed-over in Senneterre. The idler was 'borrowed' to convey material for Hydro Quebec, and two weeks elapsed before a replacement was located. Numerous phone calls later, 1400 rolled into CN Taschereau Yard in Montreal on January 28th.

As the results of Mother Nature's behaviour still had not been completely repaired around Delson / St. Constant, precluding transfer to SL&H on Montreal's South Shore, the unit was interchanged to SL&H at the Parsley interchange between Taschereau and St. Luc yards later that same day. Sufficient repairs in the vicinity of the CRM were completed to enable SL&H to spot former ONT 1400 at the CRM behind Barrington Station on February 11th. Once Mother Nature releases her wintry grip on southern Quebec, former ONT 1400 will be moved into one of the yards, cleaned-up somewhat, and placed in an accessible location on the property for all to see. In time, it is hope to breath new life into the unit, enabling visitors to view the only preserved RS-10 east of Winnipeg in operation.

The acquisition of ONT 1400 and its movement to the CRM would not have been possible without the help of many friends. The CRHA would like to express its gratitude to the following individuals and corporations for their help and support:

Mike Montag and Trevor Prescott - Ontario Northland Railway
Monique Purdon and Gary Johnston - CN Operations
Guilio Capuano - St. Lawrence & Hudson
Stan Smaill, Charles De Jean, Bernard Archambault, Dave Barnard, Len Thibeault, and Alain Bossé - Canadian Railway Museum
Canadian National Railway
Ontario Northland Railway
St. Lawrence & Hudson Railway

BACK COVER: CNR 7615 was assigned to the Montreal and Southern Counties line. This view, taken about 1950, shows it at St. Lambert. What looks like the guard tower of a prison is actually part of a "pen" of a different kind - the Waterman Pen factory. Patterson-George Collection

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