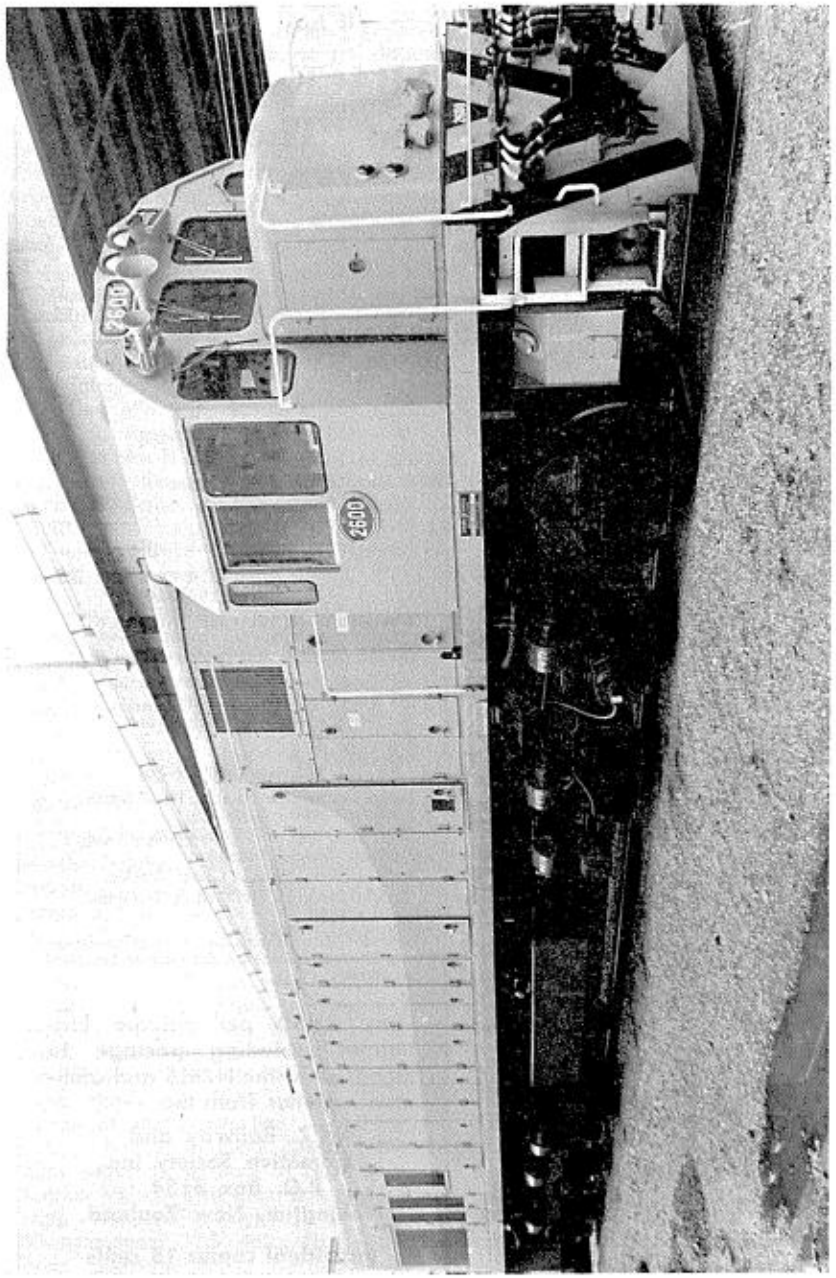


Photograph: N.Z. Railways Publicity

Another view of "Dx" 2600, first of the 15 2,750 h.p. Co-Co type diesel-electric locomotives, all of which entered service in November 1972. They are General Electric U26C models, products of Erie, Pennsylvania.

THE "DX" CLASS LOCOMOTIVES ENTER SERVICE

THE first General Electric diesel locomotives ever acquired by New Zealand Railways, and the most powerful machines ever used on N.Z.R. tracks, entered service in November. Following a decision of the Government Railways Industrial Tribunal disallowing the enginemen's claim for rates of pay based on the horsepower under their control, but granting drivers of the new "Dx" class locomotives a special allowance of 15 cents an hour, crew training and running-in on light duties began first at Auckland's Westfield depot and shortly afterwards at Te Rapa, Taumarunui, Palmerston North, and Wellington. "Dx" 2614 arrived at the Wellington depot on 9 November.

Powered by a 12-cylinder 4-stroke turbocharged, after-cooled diesel engine (General Electric's model 7FDL12 D3) with a rated output of 2,750 horsepower at 1,050 r.p.m., the "Dx" class locomotive has 2,600 h.p. available for traction, and develops a continuous tractive effort of 46,500 lb at 17 m.p.h. Total locomotive weight ready for service is 96 tons, equally distributed over the six axles, which are arranged in two 3-axle trucks with 35 feet between pivot centres. Wheelbase of each truck is 10ft 5½in. To assist in obtaining an equal weight distribution, the pivot centre at the cab end is located 12 feet back from the headstock, whereas the pivot centre at the other end is only 10ft. 6in. back.

With a length of 55ft. 6in. over headstocks and 58ft. 10½in. over the pulling faces of the knuckle couplers, the "Dx" locomotive is more than 12 feet longer than the 1,425 h.p. "Da" class locomotives of General Motors design that form the backbone of North Island motive power. It is, however, slightly lower and narrower than the "Da", and it is 2ft. 4½in. shorter than the 1,500 h.p. "Df" class of locomotive, 10 of which were supplied by English Electric in 1954 to usher in the era of main-line diesel power in New Zealand. The latter are now in the process of being withdrawn after about 17 or 18 years service.

The progress made in locomotive design over that relatively short period is graphically illustrated by the fact that, within a total weight 12 tons lighter than the "Df", almost double the power has been obtained. Some of the saving of weight of course has been obtained by having just one cab and set of controls, and more so from the simplification of the running gear. Whereas the "Df" had a 2-Co-Co-2 wheel configuration, the "Dx" is a simple Co-Co, meaning two 3-axle trucks with a separate electric motor driving each axle.

On the "Dx", the diesel engine drives a direct-coupled three-phase alternator, the output of which is converted by solid-state bridge-connected rectifier diodes to direct current. The six DC traction motors (model 5GE761 A14) are connected

permanently in parallel across the rectifier, and work on full field over the entire running speed range of the locomotives, which have a design maximum speed of 75 m.p.h. In present-day service, normal maximum running speed is 55 m.p.h., where this is permitted by track conditions. There is no transition or weak-field switching to complicate the circuits, a simplification that leads to lower maintenance requirements.

The motors are nose-suspended and mounted so that all nose suspensions face towards the centre line of the locomotive. The primary suspension comprises dual double coil springs above each axlebox. The secondary suspension between each bolster and bogie frame consists of four multi-rubber sandwich type springs of special design to give a centering action to the bolster. Phenolic pads fore and aft of each bogie centre prevent excessive bogie tilting and weight transfer under high tractive effort conditions. Tilting of the bogies brings one or other of the pads in contact with mating pads on the underframe, so transferring some superstructure weight to the leading end of the bolster to prevent further tilting.

Vertical friction dampers are fitted between the axleboxes and bogie frame on numbers 1, 3, 4 and 6 axles. Two lateral friction dampers are provided between each bolster and bogie frame.

Single shoe brakes are fitted and operated by one Westinghouse type UAH 10" x 8" cylinder for each wheel. Manual slack adjusters are incorporated in the rigging.

Timken "AP" journal bearings (6½" x 12") are provided for the axle bearings and the housing and axlebox horns on the bogie frame are fitted with manganese steel liners.

A gear unit mounted on the rear of the alternator carries and drives the exciter and auxiliary generator. Each of these machines is provided with starter windings and is used to crank the engine for starting. A third output on the gearbox drives the main blower through a shaft fitted with gear-type flexible couplings. The blower supplies traction motors, alternator, and rectifier with cooling air and pressurises the engine compartment, the electrical cabinet, battery box and driving cab.

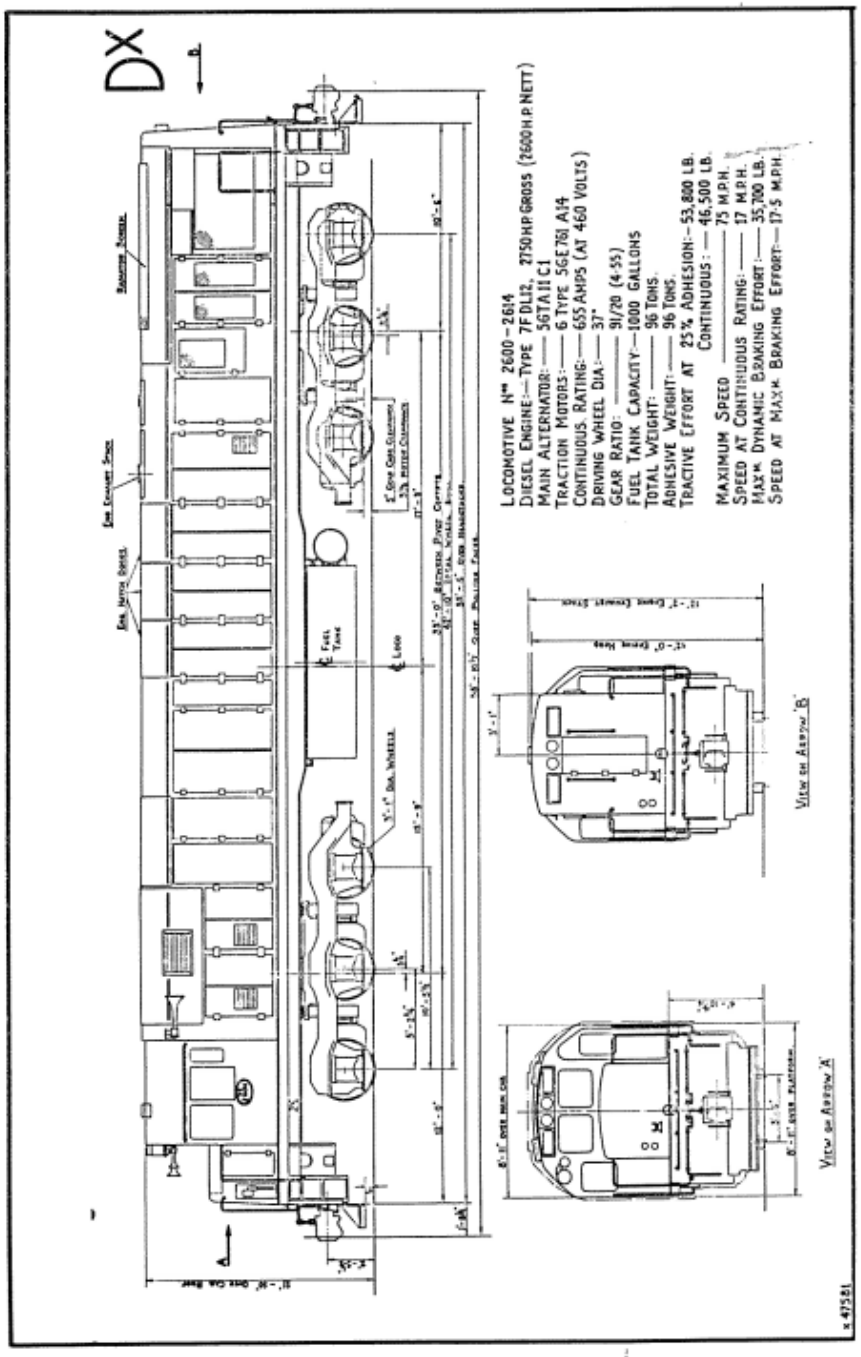
Air entering the blower passes through roof-mounted self-cleaning inertial type filters. A small belt-driven air cleaner exhauster is used to extract the dirt-laden air from the filters. Primary filtration of the engine air is performed by a separate inertial filter system of similar type, and the cleansed air is passed through paper-element secondary filters before entering the turbocharger. Filter cleaning and maintenance is thus reduced to a minimum.

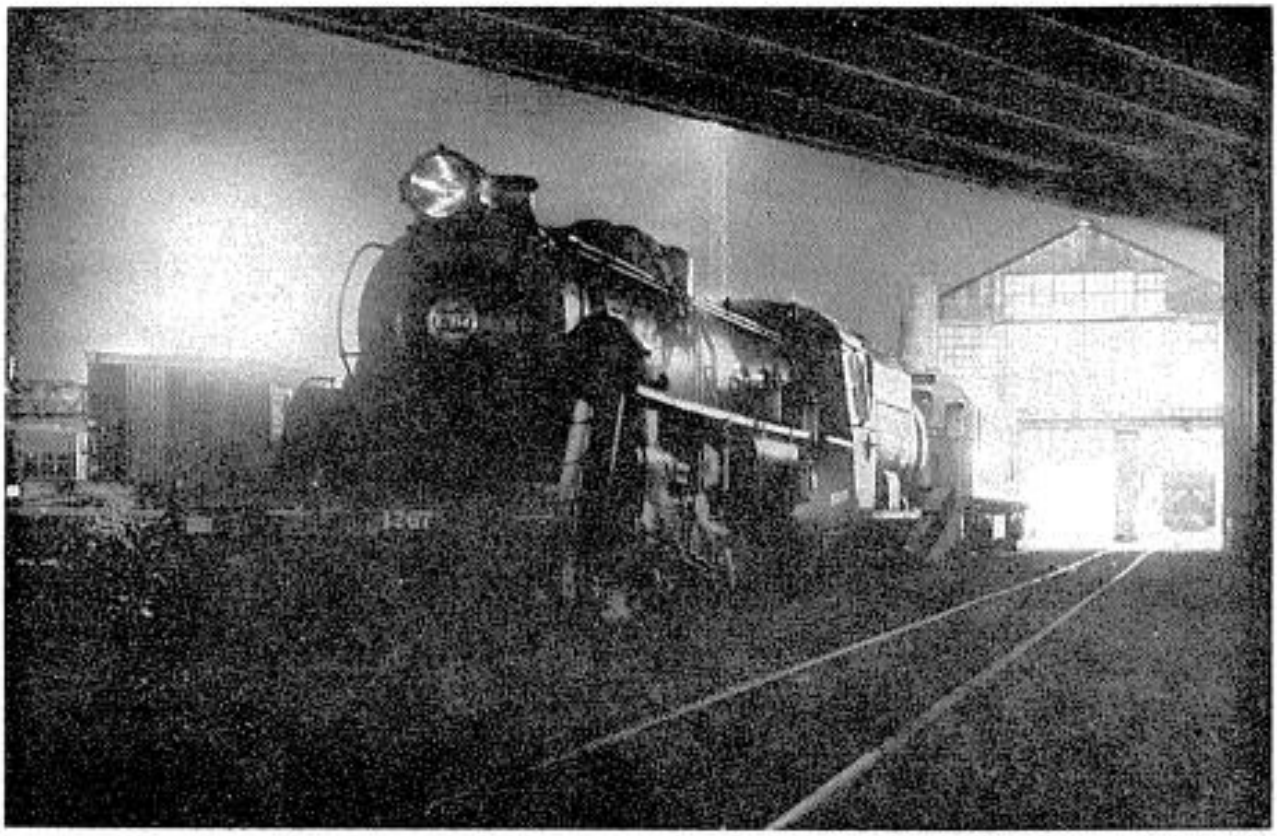
The air brake system provided is the standard Westinghouse type 26L which has now been fitted to 213 of New Zealand Railways' main-line diesel locomotives. Westinghouse type D3 vigilance equipment is fitted and arranged for alternate cancelling by the enginedriver and the locomotive assistant. A powerful dynamic brake is also provided.

An additional control feature is the provision of power-matching equipment so that, when one of the less powerful "Da" class locomotives is coupled in multiple with a "Dx" class, the latter's power output at low speeds is automatically reduced to a level at which it has the same operating speed as the "Da". This arrangement means that both locomotives handle the same load as they would when operated separately.

The low short hood gives both crew members a wide vision forward from their seated positions. Main driving instruments and controls are located to the left and in front of the driver, whose position is on the right-hand side of the cab. Gauges include a brake-pipe flow meter, main and equalising reservoir pressure gauge, brake pipe and cylinder pressure gauge, load meter, and a Vapor Speed Log digital speed indicator. A speed recorder works in conjunction with the indicator. Non-driving instruments are located on a panel above the electrical cabinet on the rear wall of the cab. These include various temperature and pressure gauges.

The main fuel tank slung beneath the underframe has a capacity of 1,000 gallons, more than ample for the through 423-mile run from Wellington to Auckland, where the locomotives will be used on heavy express goods and passenger trains, including the "Silver Star" sleeping-car express. One "Dx" will be expected to take an





Photograph: B. R. Poulsen

Back in May 1972, when "Dx" 2600 was brought to Wellington for staff training purposes, it could be seen in company with "Ja" 1267, which was being prepared for its delivery trip in July to Te Awamutu.

express passenger train up to 570 tons in weight right through between Auckland and Wellington, or an express goods train up to 950 tons, except for a reduction to 700 tons up the 1 in 50 grades against southbound trains from Kakahi to National Park.

In ordinary goods train service, typical ruling loads are 1,700 tons from Auckland to Frankton, where the steepest grades are 1 in 100; 1,000 tons up the 1 in 70 grade southbound from Te Kuiti; and 750 tons from Kakahi up to National Park. From Paekakariki to Pukerua Bay, the load rating is 980 tons in deference to the 1 in 60 gradient, but on some favourable sections, such as Mercer-Frankton and Feilding-Palmerston North, a load of 2,000 tons is permitted. It will be most interesting to see how these new machines acquit themselves in everyday service.

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