S.R. Diesel-Mechanical Shunter

BEFORE nationalisation, the Southern Railway initiated the building of several diesel locomotives, one type of which was to have mechanical transmission. The original designs were drawn up under the aegis of Mr. O. V. S. Bulleid, then Chief Mechanical Engineer. The first to be put into service is the 500-b.h.p. diesel-mechanical unit, No. 11001, which was designed for heavy yard shunting and short-distance transfer and trip working.

Construction of the mechanical portion was undertaken at Ashford Works, and there the engine and transmission were sent for erection. In full working order the locomotive weight is 49½ tons, and the length over buffers 33 ft. 3 in. The 4 ft. 6 in.-dia. B.F.B.-type box-section wheels, are spread over a wheelbase of 12 ft. 6 in., and this is short enough for 4-chain curves to be negotiated at slow speed. The tyre fastening is of the plain double-lip type as used on Southern Region 4-6-2 and 0-6-0 steam locomotives with box-section wheels. The plate

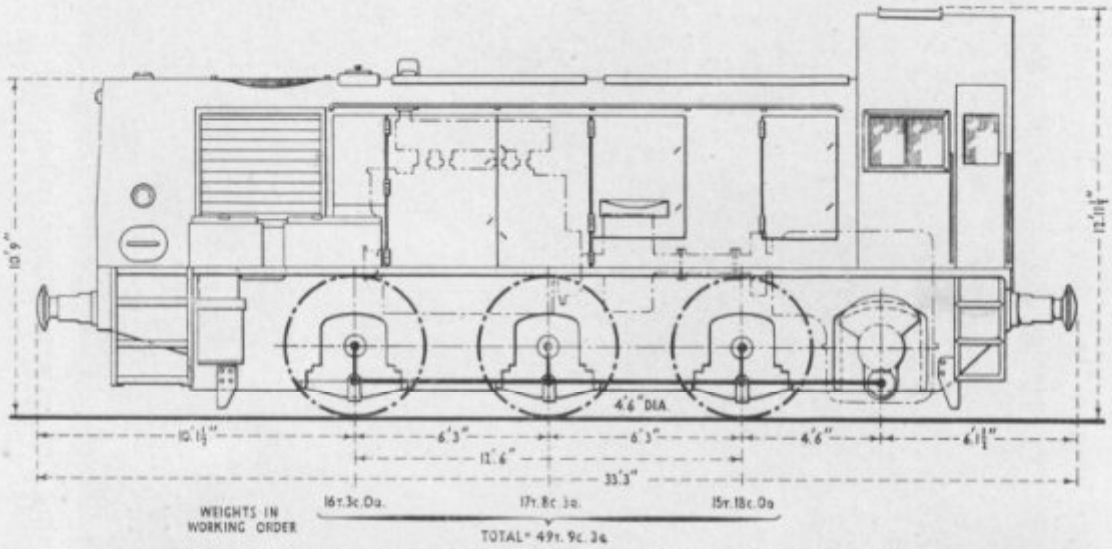
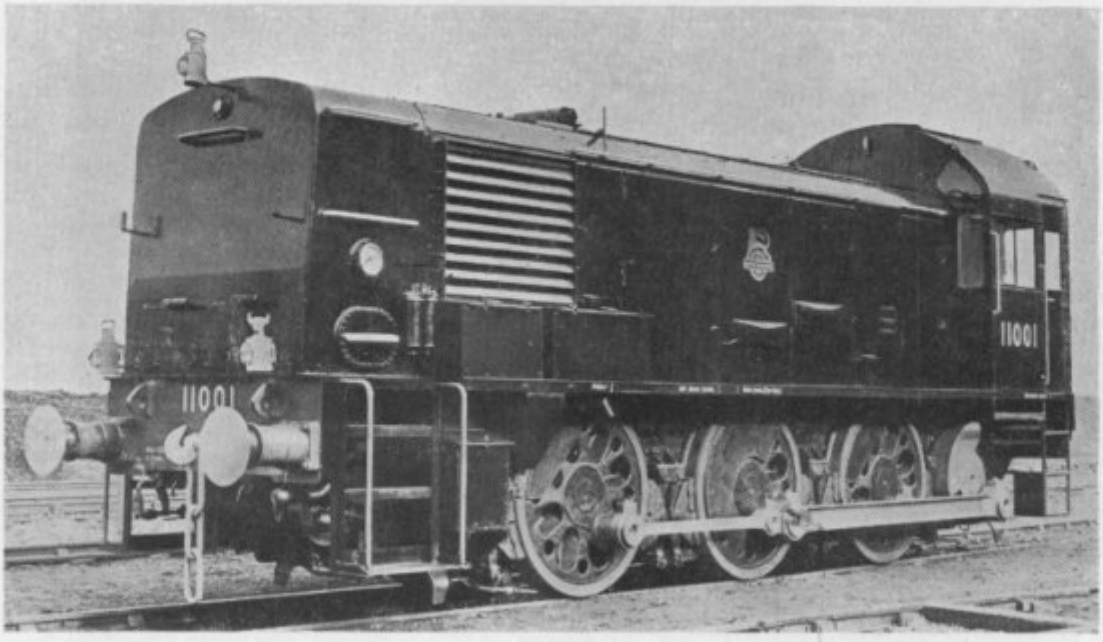


Diagram showing principal weights and dimensions



New diesel-mechanical shunting locomotive for the Southern Region of British Railways

S.R. Diesel-Mechanical Shunter

frames are inside the wheels and the axles run in S.K.F. split-type roller bearings supported by underhung laminated springs. Braking is on the Westinghouse straight air system, but no piping or equipment is provided for operating train brakes.

Power is provided by a 12-cylinder V-type oil engine of the Paxman RPH class set to give a top output of 500 b.h.p. at 1,250 r.p.m. Cylinder bore and stroke are 7 in. and 7¾ in. respectively, and the cylinder banks are at an included angle of 60 deg. From the engine, drive is taken through a scoop-controlled fluid coupling. For coasting, the engine is disconnected from the gearbox, and this operation withdraws the scoop tube in the coupling and reduces engine speed to idling.

Torque from the fluid coupling is taken to a three-speed gearbox equipped with an extra set of gears to give, in effect, a six-speed gearbox. This gives track speeds at top engine speeds of 5, 9 and 15 m.p.h. in the low set of gears; and 12, 21 and 36 m.p.h. in the top range. Corresponding rail tractive efforts are: 33,500, 18,500, 11,500, 13,900, 7,900 and 4,600 lb., bottom gear effort being equivalent to a factor of adhesion of 3.3 to 1 in full condition, and to about 3.15 to 1 with empty fuel tanks. Final drive is by reduction gears on the jackshaft, and through flycranks and rods to the wheels.

On the driving deck in the cab are a throttle lever, gear-change lever, forward-and-reverse lever, and self-lapping driver's air-brake handle; these are duplicated to permit of either-side driving, but the transmission-range lever is fitted in the centre of the desk. A deadman treadle is located at each side of the cab, with a delay period long enough for the driver to move from one to the other. The instrument panel is on the front weather-board.

Forward of the engine is an auxiliary gearbox, shaft-driven, and from this goes a drive to the radiator fan, and others to the Westinghouse compressor, water circulating pump, and two dynamos. Engine circulating water and lubricating oil are cooled in two banks of Serck radiators, one on each side of the bonnet, and fitted with louvre shutters. Air from the compressor set serves the brakes, either-way sanding, and the controls. Two separate electric circuits are installed in the locomotive, each with its own bank of accumulator cells, one for engine starting and the other for lighting and small miscellaneous services.