RUSTON

20 DL
OIL ENGINED
NARROW GAUGE LOCOMOTIVES

SPECIFICATION

TYPE Narrow Gauge Surface Locomotive.

GAUGES 1′ 6″ to 3′ 6″ (457 m/m to 1067 m/m).

WEIGHT 2¾ and 3¼ tons (2800 kgs. and 3300 kgs.).

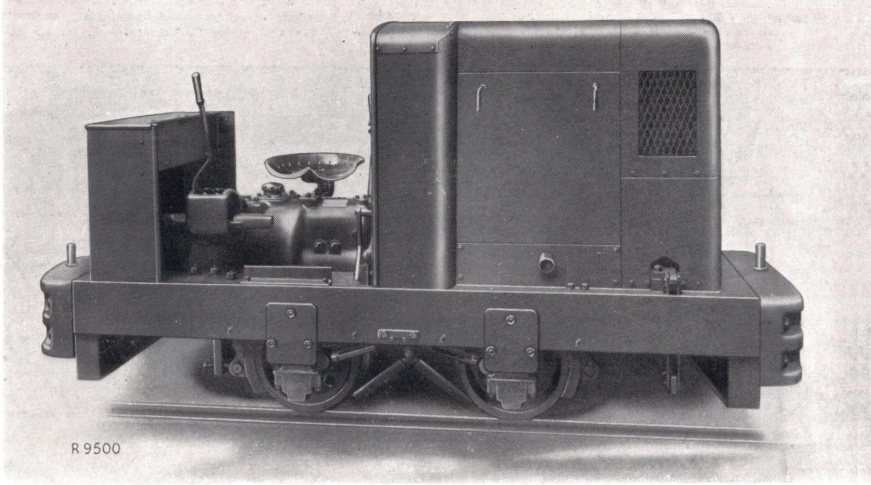
No. of SPEEDS Three forward and three reverse.

CHASSIS AND CAB

The locomotive frame is of welded steel construction The wheels are solid steel stampings pressed on to the axles ; axle boxes are of the plain dust proof type, with bronze bearings each provided with an oil sump and pad. Laminated steel springs are carried in forged steel hangers, brackets and pins. Sanding gear is arranged for sanding all four wheels. Two wheel brakes are fitted as standard, but four wheel brakes can be arranged at extra charge. The brake shoes are of cast iron and the brake action is compensated so that equal load is imposed on each wheel ; they are operated by a hand lever with pawl and ratchet quadrant.

The buffer beams are of the multi-slot type, to give various draw heights.

The drive from the gearbox is by means of short roller chains which are adjusted by radius rods. This type of drive obviates the possibility of "snatch" and is particularly advantageous when short radius curves have to be negotiated.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The locomotive can be fitted with a canopy or a cab, at an extra charge. The canopy may be of the single or double roof type ; the cab is of the enclosed type, open on one side or alternatively, open on two sides but closed front and rear; either type of cab is fitted with safety glass windows.

Steel bonnet and side panels are provided ; the side panels being easily removable for inspection.

ENGINE

Ruston Mark 2VSHL two cylinder, four cycle compression ignition oil engine developing 20 b.h.p. at 1200 r.p.m. Heavy duty cast iron monobloc housing, renewable wet type liners, and separate cylinder head. Forged steel crankshaft supported in steel bushed white metal lined main bearings ; forged steel connecting rods with white metal lined L.E. Bearing and phosphor bronze small end bush ; aluminium alloy pistons with floating gudgeon pins.

Pressure lubrication is provided to all parts except the piston and gudgeon pin, which are splash lubricated. Oil bath type air filter. A flexible coupling of the hermatic disc type is fitted between the engine and gearbox.

GEARBOX

The gearbox is of the constant mesh type giving three speeds in both forward and reverse directions. Gear changing is effected simply by the movement of a single lever—there are no foot controls. Each gear has its own separate clutch and when the change speed lever is moved, one clutch is disengaged and another engaged. Reversing is carried out by operating a small lever placed conveniently at the left hand side of the driver.

The gear and clutch unit is coupled direct to the engine and is constantly revolving with the engine whether in gear or not, thus, when changing gear there is no inertia to overcome or stationary gears to set in motion. The gears are of hardened steel ; the revolving shafts run in ball and roller bearings. Lubrication is entirely automatic. The complete unit is totally enclosed and inspection covers are provided.

EQUIPMENT

The engine is arranged for hand starting. Radiator cooling is provided for the engine and the system is thermostatically controlled. The fuel tank capacity is 6½ galls. (29.5 litres). A tool box is fitted and a complete set of tools and spares is included.

Electric lighting and an electric horn can be supplied as an extra if required. Cab and inspection lamps may also be fitted if electric lighting is fitted.

HAULAGE CAPACITIES 20DL 2¾ TONS MODEL

Gross Weight behind Loco based on Adhesion of 540 lb. (245 kg.) per ton (1016 kg.) & Rolling Resistance of 22 lb. (10 kg.) per ton (1016 kg.)

Gear	Speed Range	Tractive Effort	Drawbar Pull	Load hauled on straight track *							
				Nil	0.5%	1%	1.25%	2%	3.33%	4%	5%
				Level	1 in 200	1 in 100	1 in 80	1 in 50	1 in 30	1 in 25	1 in 20
Bottom	**1.25—2.75** M.P.H. 2.0—4.4 Km.P.H.	**1485** lb. 675 Kg	**1425** lb. 648 Kg	**64** tons 65000 Kg	**42** tons 42700 Kg	**30** tons 30500 Kg	**27** tons 27400 Kg	**19** tons 19300 Kg	**12** tons 12200 Kg	**10** tons 10200 Kg	**8** tons 8100 Kg
Middle	**2.4—5.25** M.P.H. 3.85—8.4 Km.P.H.	**1184** lb. 537 Kg	**1124** lb. 510 Kg	**51** tons 51800 Kg	**33** tons 33500 Kg	**24** tons 24400 Kg	**21** tons 21300 Kg	**15** tons 15200 Kg	**9** tons 9150 Kg	**8** tons 8100 Kg	**6** tons 6100 Kg
Top	**4. —8.75** M.P.H. 6.4—14.1 Km.P.H.	**710** lb. 321 Kg	**650** lb. 294 Kg	**29** tons 29500 Kg	**18** tons 18300 Kg	**13** tons 13200 Kg	**11** tons 11200 Kg	**8** tons 8100 Kg	**4.5** tons 4550 Kg	**3.5** tons 3550 Kg	**2.5**tons 2550 Kg

Engine speed 550 r.p.m. to 1200 r.p.m.

See over for Haulage Capacities of 20DL 3¼ ton Model

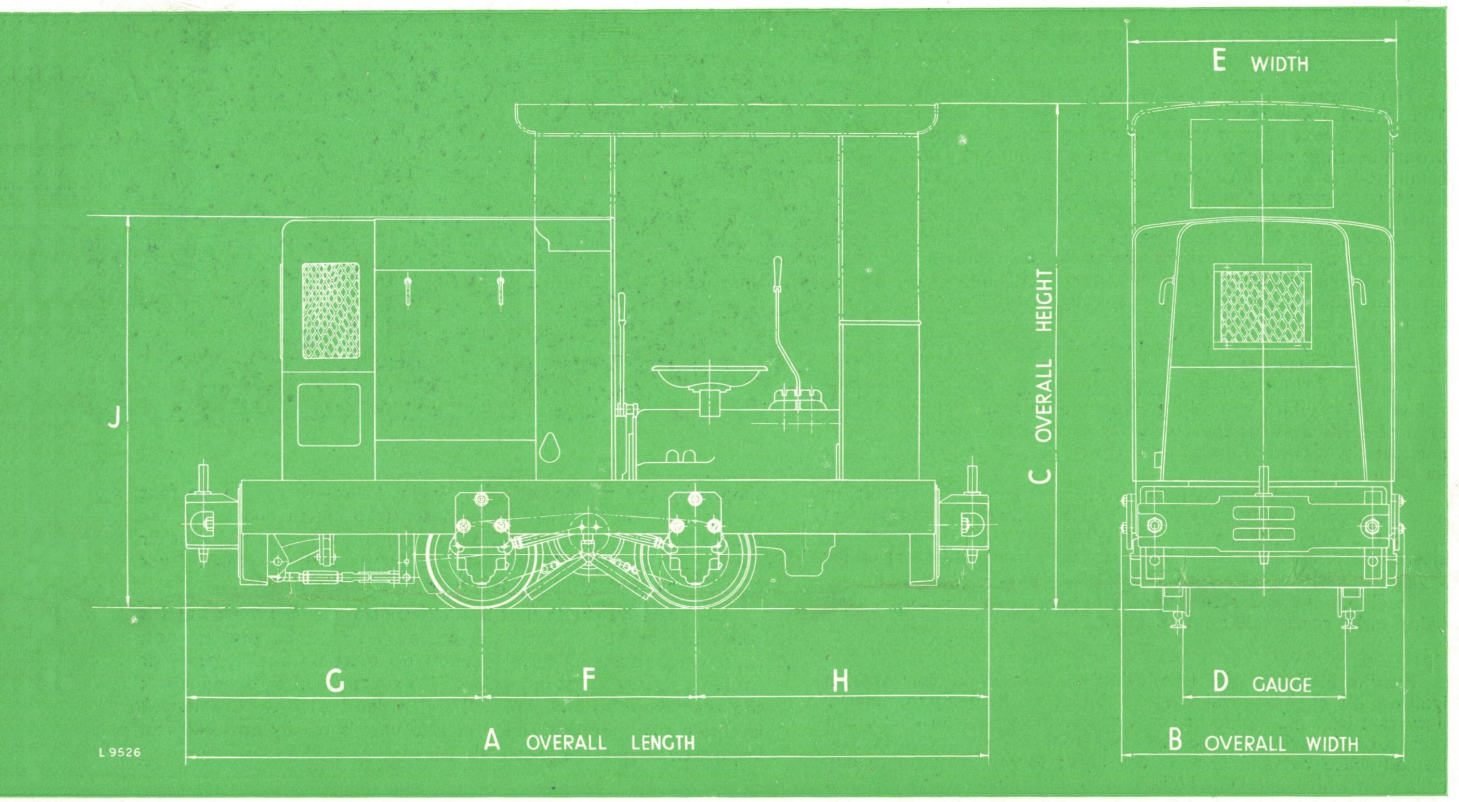
Publication 8974 (Revised)

HAULAGE CAPACITIES 20DL 3¼ TONS MODEL

Gear	Speed Range	Tractive Effort	Drawbar Pull	Load hauled on straight track *							
				Nil	0.5%	1%	1.25%	2%	3.33%	4%	5%
				Level	1 in 200	1 in 100	1 in 80	1 in 50	1 in 30	1 in 25	1 in 20
Bottom	**1.25—2.75** M.P.H. 2.0—4.4 Km.P.H.	**1750** lb. 790 Kg	**1678** lb. 758 Kg	**76** tons 77300 Kg	**49** tons 49800 Kg	**36** tons 36600 Kg	**32** tons 32500 Kg	**24** tons 24400 Kg	**15** tons 15200 Kg	**12** tons 12200 Kg	**10** tons 10200 Kg
Middle	**2.4—5.25** M.P.H. 3.85—8.4 Km.P.H.	**1184** lb. 537 Kg	**1112** lb. 505 Kg	**50** tons 50800 Kg	**32** tons 32500 Kg	**23** tons 23400 Kg	**20** tons 20300 Kg	**14** tons 14200 Kg	**9** tons 9150 Kg	**7** tons 7100 Kg	**5.5** tons 5600 Kg
Top	**4. —8.75** M.P.H. 6.4—14.1 Km.P.H.	**710** lb. 321 Kg	**638** lb. 289 Kg	**29** tons 29500 Kg	**18** tons 18300 Kg	**13** tons 13200 Kg	**11** tons 11200 Kg	**7** tons 7100 Kg	**4** tons 4050 Kg	**3** tons 3050 Kg	**2** tons 2050 Kg

Engine speed 550 r.p.m. to 1200 r.p.m.

* The loads given in the tables on this and the previous page are the maximum which can be hauled with the engine in good condition at normal temperatures and altitudes and upon straight tracks. Rail curves should be as large as possible to reduce flange wear and to maintain loads and speeds. Although the loco will negotiate a short curve of 15 feet (4600 m/m) radius when necessary we advise curves for normal working to be at least 22 feet (6700 m/m) radius under good conditions.



DIMENSIONS

Gauge D	A	B	C	E	F	G	H	J
1′ 6″ to 1′ 7¾″ 457 m/m to 502 m/m	9′ 10½″ 3010 m/m	4′ 1¼″ 1251 m/m	6′ 6″ 1981 m/m	3′ 3½″ 1003 m/m	2′ 6½″ 775 m/m	3′ 8″ 1118 m/m	3′ 8″ 1118 m/m	5′ 0¾″ 1543 m/m
1′ 8″ to 1′ 10½″ 508 m/m to 571 m/m	9′ 10½″ 3010 m/m	4′ 1¼″ 1251 m/m	6′ 4″ 1930 m/m	3′ 3½″ 1003 m/m	2′ 7½″ 800 m/m	3′ 7½″ 1105 m/m	3′ 7½″ 1105 m/m	4′ 10¾″ 1492 m/m
1′ 10¾″ to 2′ 0½″ 578 m/m to 622 m/m	9′ 10½″ 3010 m/m	3′ 5¼″ 1048 m/m	6′ 4″ 1930 m/m	3′ 3½″ 1003 m/m	2′ 7½″ 800 m/m	3′ 7½″ 1105 m/m	3′ 7½″ 1105 m/m	4′ 10¾″ 1492 m/m
2′ 1″ to 2′ 6″ 635 m/m to 762 m/m	9′ 10½″ 3010 m/m	4′ 1¼″ 1251 m/m	6′ 4″ 1930 m/m	3′ 3½″ 1003 m/m	2′ 7½″ 800 m/m	3′ 7½″ 1105 m/m	3′ 7½″ 1105 m/m	4′ 10¾″ 1492 m/m
2′ 6½″ to 3′ 0″ 775 m/m to 914 m/m	9′ 10½″ 3010 m/m	4′ 8″ 1422 m/m	6′ 4″ 1930 m/m	3′ 3½″ 1003 m/m	2′ 7½″ 800 m/m	3′ 7½″ 1105 m/m	3′ 7½″ 1105 m/m	4′ 10¾″ 1492 m/m
3′ 1″ to 3′ 6″ 940 m/m to 1067 m/m	9′ 10½″ 3010 m/m	5′ 1¼″ 1556 m/m	6′ 4″ 1930 m/m	3′ 3½″ 1003 m/m	2′ 7½″ 800 m/m	3′ 7½″ 1105 m/m	3′ 7½″ 1105 m/m	4′ 10¾″ 1492 m/m

Separate leaflets covering other Ruston oil engined Narrow-gauge Locos will be sent on request.

Buffer Beams are adjustable. The following heights of Drawgear are available :—6⅝″ (168 m/m), 9⅛″ (232 m/m), 9¾″ (248 m/m), 11⅝″ (295 m/m), 12¼″ (311 m/m), 14⅛″ (359 m/m), 14¾″ (375 m/m), 17¼″ (438 m/m), from top of rail to centre line of Drawgear.

Illustrations, Specifications, Weights and Dimensions must not be taken as binding until confirmed by us, alterations being found necessary from time to time. Any variation from our standard specification may involve increase in price and delay in delivery

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Telephone : Lincoln 645 Telegrams : Ruston, Lincoln

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