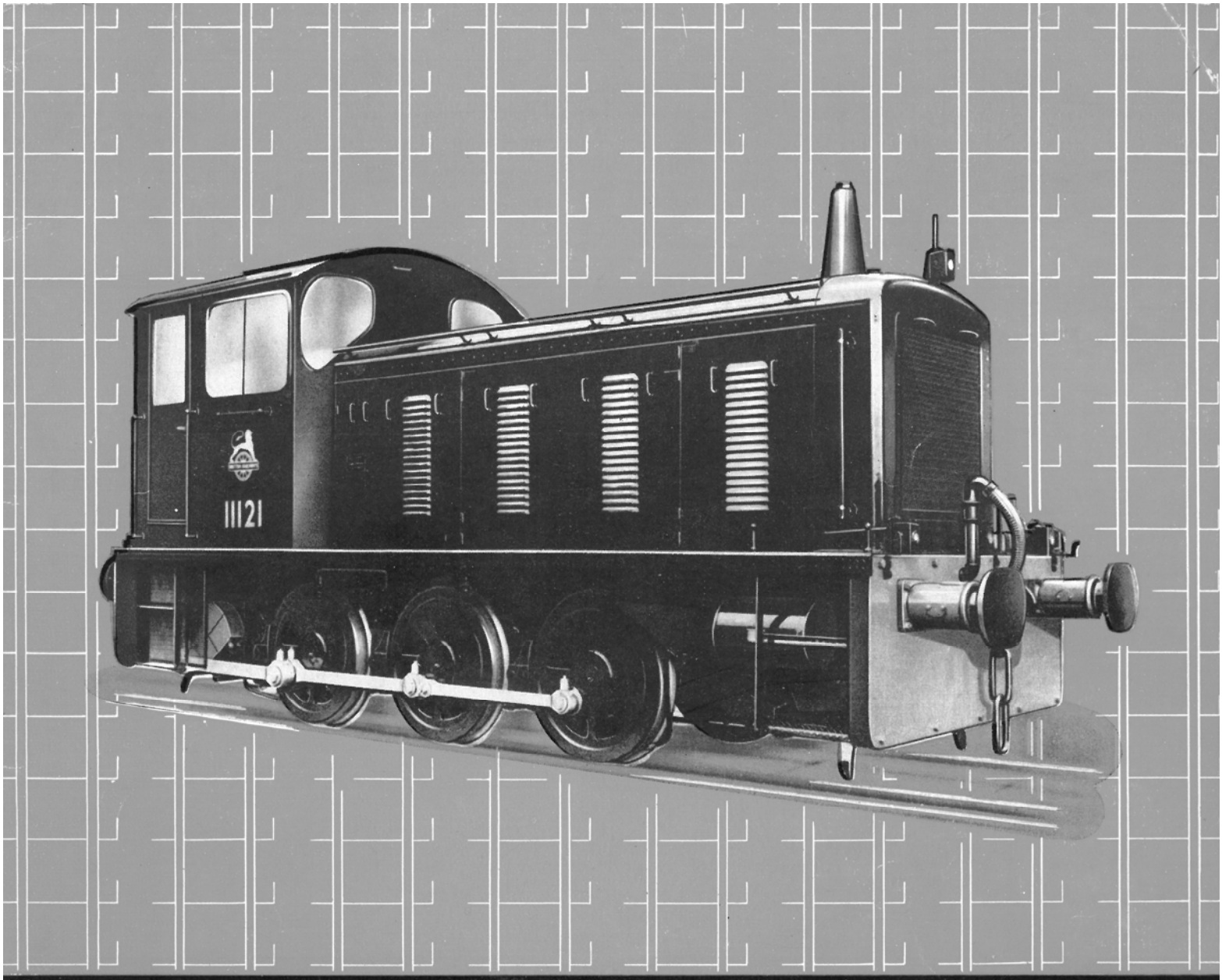

Drewry Diesel Mechanical Locomotives

THE DREWRY CAR COMPANY LIMITED

CITY WALL HOUSE
LONDON E.C.2.,
Telephone: MONarch 0671

129/139. FINSBURY PAVEMENT
ENGLAND
Telegrams: INNEAL, PHONE, LONDON

Scan of printed Manufacturers Catalogue that was purchased from the second hand book stall "Lens Station Emporium" on Loughborough Great Central Station in the 1990's
Original publication was printed on 430mm X 270mm folded sheets but these scans are for A4 sheets

THE DREWRY CAR COMPANY LTD.

DIESEL MECHANICAL LOCOMOTIVES AND RAILCARS.

TELEPHONE:
MONARCH 0671.

TELEGRAMS:
INNEAL, PHONE, LONDON.

CODES USED: BENTLEY'S, A.B.C., LIEBER'S, WESTERN UNION & ENGINEERING TELEGRAPH CODE.

City Wall House,
129/139, Finsbury Pavement,
London, E.C.2.

YOUR REF. _____

OUR REF. JF/BC.

13th May, 1957.

E. Hammond Esq.,
52, Amherst Cresent,
Hove 4.
Sussex.

Dear Sir,

We have much pleasure in enclosing herewith a copy of our catalogue covering Diesel Mechanical Shunting Locomotives as requested in your letter of 9th May. We have no current catalogue dealing with Railcars but enclose also a reprint about Railcars.

Please accept these with our compliments.

Yours faithfully,
THE DREWRY CAR COMPANY LIMITED.
T. A. Farmer

Enc. Catalogue and Reprint.

Separate covering letter that was inserted inside the catalogue.

Inside of front cover was blank

THE DREWRY CAR COMPANY LTD.

CITY WALL HOUSE,
FINSBURY PAVEMENT,
LONDON, E.C.2.

Chairman
Brigadier W. H. CROSLAND, C.B.E., D.S.O., T.D., D.L., J.P.

Managing Director
W. J. WAKLEY.

Directors
C. R. H. CROSLAND.
L. G. H. FARMER.
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P. N. TARLETON.

Telephone: MONarch 0671
Telegrams: INNEAL, PHONE, LONDON

Publication No. 1956.

Scan of printed Manufacturers Catalogue that was purchased from second hand book stall, GCR Loughborough Station in the 1990's. Finding this influenced Jim McGeown's desire to produce 0 gauge, Connoisseur Models, Drewry shunter kits. Page 3 if printed double sided on A4 sheets

New Zealand Government Railways.

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Page 4 if printed double sided on A4 sheets

FOREWORD

THE Drewry Car Company Limited was founded on the 27th November, 1906, and this Catalogue is, therefore, published after fifty years of specialised experience in the development of internal combustion rail traction.

During this period much progress has been made and the Company's activities have covered a very wide range of development which embraces not only locomotives but also railcars, which are the subject of a separate publication.

The earliest application of the internal combustion engine to rail traction was the light inspection trolley then fitted with a single cylinder air cooled petrol engine, in the production of which the Company was among the early pioneers.

From this early beginning there followed the development of heavier railway maintenance vehicles fitted with multi-cylinder water cooled petrol engines in parallel with the development of petrol engined locomotives.

As horse powers increased the problem of a suitable transmission, in which the frequent change of ratio under heavy load and gradient condition to be encountered in railway service, involved much research and experimentation, until locomotives and railcars were eventually produced in the process of steady development in each stage of which reliability in service had been attained by close attention to detail and a careful study of operating conditions.

In this connection the Company gratefully acknowledges the help and co-operation they have received from their many old friends among Railway Officials and Industrial users of their Locomotives and Railcars without which, development that must be based on experience in service, would not have been possible.

The Locomotives referred to, and illustrated, in this Catalogue represent current standard designs resulting from this long experience during which Diesel engines have replaced petrol engines and in which friction clutches and layshaft gearboxes have been superseded by hydraulic couplings and epicyclic transmissions.

Development, however, continues to proceed to meet the demand for Diesel Mechanical Locomotives of yet higher horse power and in the production of a combination of hydraulic torque converter in conjunction with automatic mechanical transmission.

In presenting this Catalogue, the Company has endeavoured to provide technical information covering design and development, which, it is hoped, will be of assistance to those contemplating the introduction of dieselization or the further use of Diesel Locomotives.

East Greenwich Works, South Eastern Gas Board.

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Page 6 if printed double sided on A4 sheets

FIFTY YEARS OF DIESEL RAIL TRACTION

THE reliability and economical operation of Diesel Rail Traction equipment is now appreciated by all the major railways of the world, though this state of affairs has not come about without hard work and continuous development on the part of the pioneers of this equipment. Our foreword tells briefly of the history of the pioneering activities of the Company and the stages of development which have led up to the present design of Drewry Locomotives and which will be dealt with in the following pages.

The object of this catalogue is to provide information regarding leading features, range and capacity as well as brief operating instructions, intended to be of value not only to actual users but also to prospective customers.

Representative photographs showing the layout of the power unit and transmission with the superstructure removed, typical cab interiors showing the arrangement of the controls and a series of illustrations of completed locomotives, together with line diagrams and particulars giving leading dimensions, tables of speeds and tractive efforts available in each gear and load haulage capacities are included.

A questionnaire is provided towards the end of the catalogue (on a detachable sheet), which may be completed and returned to us with enquiries for locomotives.

The section dealing with operating instructions is intended as a handy and convenient reference for the guidance and instruction of drivers and workshop personnel, and is, of course, supplementary to the comprehensive general operating and maintenance handbook which accompanies each delivery of locomotives.

GENERAL DESCRIPTION

MECHANICAL PARTS

The design of the main frame and running gear conforms with standard steam locomotive practice, comprising plate frames, buffer beams and stretcher plates, all being riveted construction. Coupling and side rods are steel forgings machined all over and materials used throughout are in accordance with modern locomotive practice and to British Standard Specification.

ENGINES

For locomotive duty it is essential to select an engine of robust design governed to develop its rated output at a moderate speed preferably within the range of 1200 to 1500 r.p.m. and, in this connection, it will be appreciated that the torque-speed characteristic of the engine governs the size and ratios of the transmission. Economical production is dependent upon standardisation and on this account we have selected and recommend the Gardner LW and L3 type engines for locomotives of 107 h.p. to 204 h.p., the 8L3 type being the largest Gardner engine available. Above this horse-power we recommend the Paxman engine, and although our locomotives are designed to accommodate these engines we are always prepared to consider other specified makes of engines, subject to the torque-speed characteristics being suitable.

TRANSMISSION

The successful performance of a Diesel locomotive depends upon the ability of the transmission to stand up to the heavy loads imposed upon it by buffing, and drawbar shocks, and upon the ease with which it can be controlled.

It is in this connection that our long experience of over 50 years of development work enables us to offer a combination of hydraulic mechanical transmission which has been proved in service to be able satisfactorily to deal with all these severe requirements. This claim is supported by the receipt of continual repeat orders for Drewry locomotives for service both at home and abroad, the magnitude of which will be appreciated by a reference to the list of users appearing on page 13. Our policy in the development

of locomotive transmissions has been based on the knowledge that we must be able to meet individual preferences and, in consequence, we are able to offer the choice of epicyclic change speed gearboxes in conjunction with either hydraulic couplings or hydraulic torque converters.

In the former case, manual or automatic control is available, while in the latter case only automatic control is desirable.

In considering these alternative transmissions it will be convenient to regard the epicyclic change speed gearbox as a mechanical torque converter in which increase in torque is obtained by means of gearing in a series of steps over the range available between low and high ratio.

In the case of the hydraulic converter, although the output torque curve is continuous, the useful efficiency range is very limited, necessitating the employment of a cooling radiator for the converter fluid. Since the load to be hauled behind a locomotive varies over a wide range, the power to weight ratio is not consistent and, consequently, it is essential to employ some form of mechanical reduction gearing behind the hydraulic torque converter so as to ensure that the latter is called upon to operate only within the limits of its best efficiency and for this purpose the epicyclic gear is an ideal application due to its high efficiency and its adaptability for automatic control of ratio.

Reverting to the mechanical torque converter, it is our practice to employ this in conjunction with a traction type hydraulic coupling, the advantages of which, compared with friction clutches, are now well known. The mechanical converter, which comprises multi-ratio epicyclic gearing of the constant mesh type in which the brake bands are air operated, lends itself equally well to either manual or automatic control, which may be centrifugally or electro-pneumatically operated.

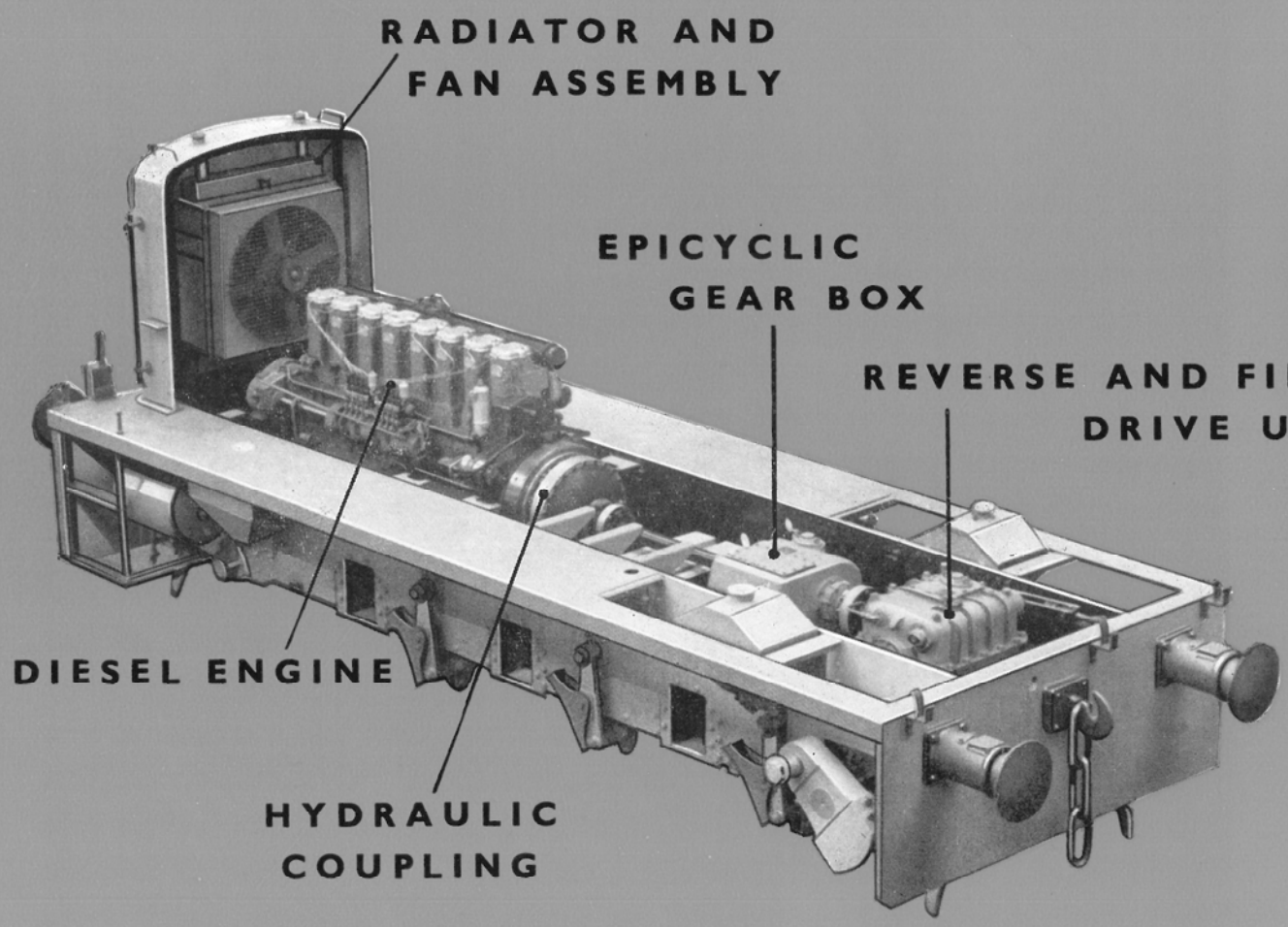
This transmission possesses the advantage of the highest known overall efficiency and is capable of a high rate of acceleration, particularly when operating in the lower range of ratios and can thus provide that degree of " punch " which is essential in a locomotive when employed on " fly " shunting operations. At the same time, it is able to " inch " wagons with great precision by virtue of the inclusion of the hydraulic coupling, which eliminates all risk of engine stalling. It must, however, be admitted that it does not provide a continuous output torque over its complete range of speed

and that, although changes in ratio are practically instantaneous, some degree of break in the output curve is unavoidable.

In the case of the hydraulic torque converter in conjunction with the epicyclic reduction gear which may provide two or three stages of reduction depending upon the particular operating conditions, a higher starting torque is made available. Due to the characteristic of the converter, maximum horsepower is available at the output shaft of the converter throughout its speed range irrespective of the ratio for the time being of the mechanical reduction gear behind it.

POWER UNIT LAYOUT

The illustration below shows the typical layout of a locomotive frame with radiator and power unit portion installed before erection of superstructure.



LAYOUT OF ENGINE AND TRANSMISSION

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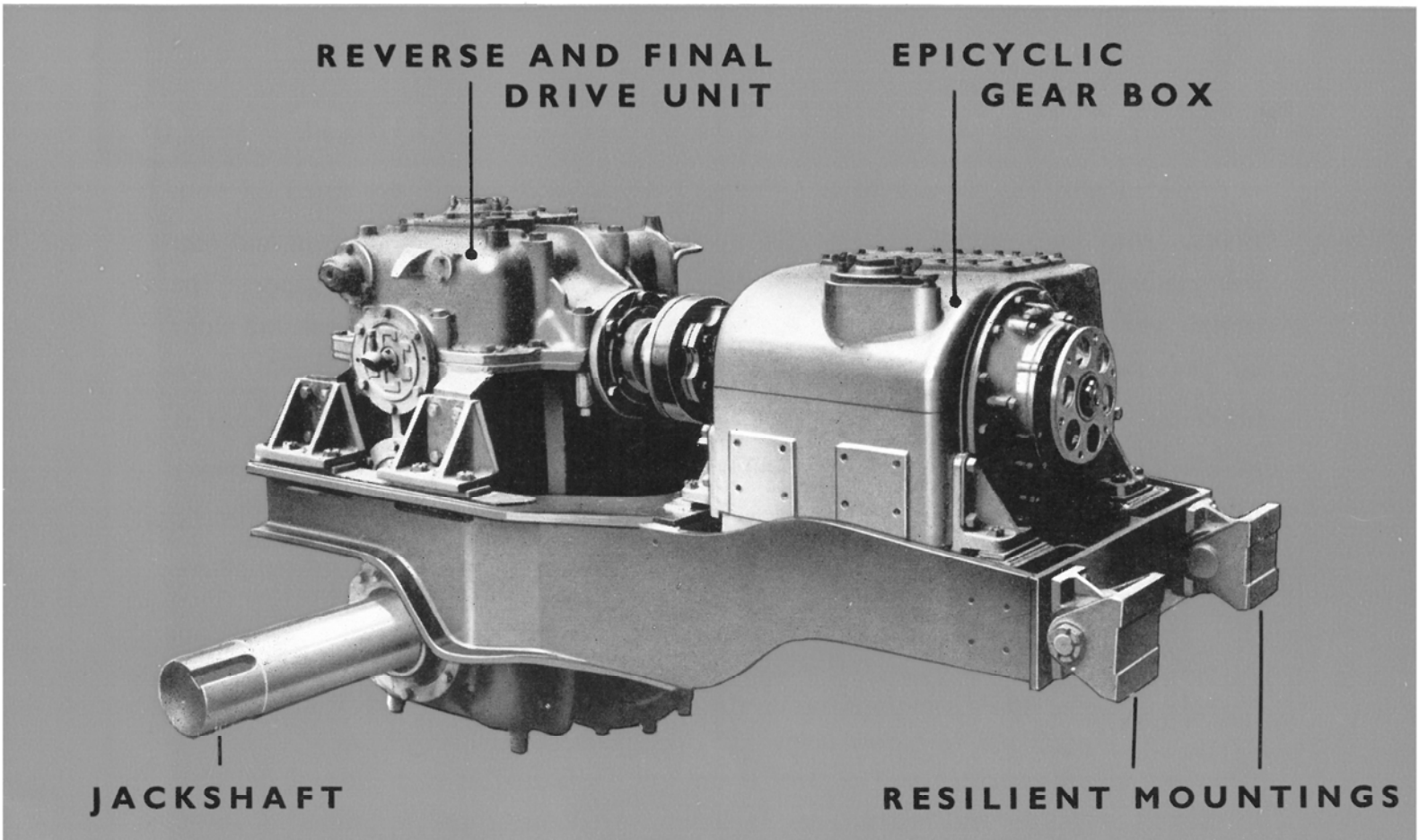
Page 10 if printed double sided on A4 sheets

REVERSE AND FINAL DRIVE UNIT

A spiral bevel reversing gear is employed with straight tooth reduction gearing to the jack-shaft final drive. All running gear is case hardened and ground and pressure lubricated. This gear casing is a heavy steel casting and is jackshaft mounted.

TRANSMISSION SHAFTS

Layrub resilient couplings and transmission shafts are employed between engine and gearbox and between gearbox and reverse unit, and the torque reaction members are also fitted with resilient mountings, thus making maximum possible provision for absorbing buffing and drawbar shocks.



TRANSMISSION SUB-FRAME AND TORQUE RE-ACTION MEMBER

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Page 11 if printed double sided on A4 sheets

AUXILIARIES

Westinghouse straight air brake is standard equipment, but continuous air brake or vacuum brake equipment may be fitted as required. Air compressors or exhausters are engine driven.

ELECTRICAL EQUIPMENT

Electric lighting and starting equipment is fitted, including head, tail and cab lights.

RADIATORS

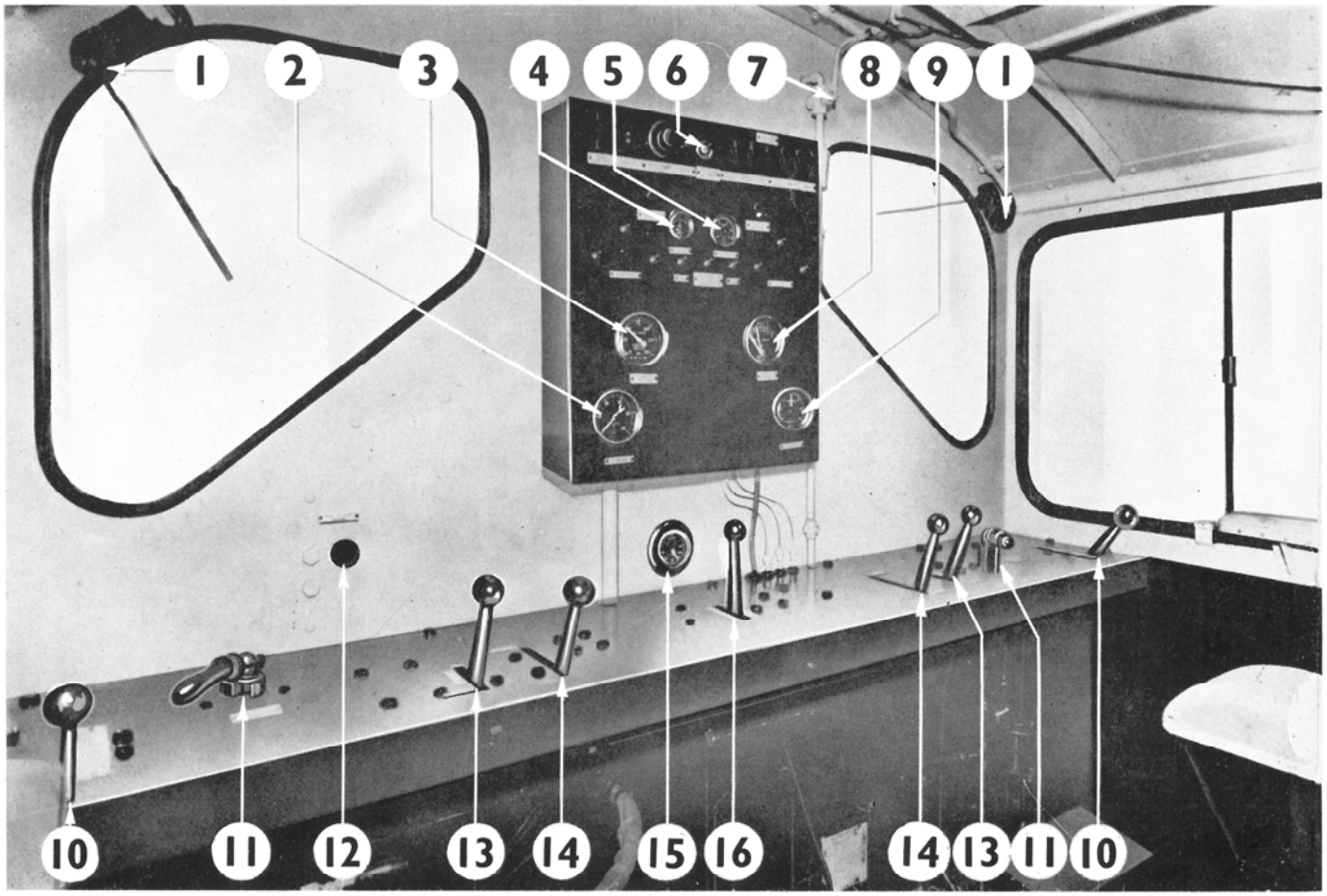
Vertical radiators embodying oil-cooling sections are fitted, cooling being assisted by engine-driven fan.

CAB

The cab is the totally enclosed type, constructed of steel plates and angles bolted or welded together and stiffened where necessary. A door fitted with a drop window is provided each side and in addition, for the convenience of the driver, a sliding window is provided adjacent to each door. For safety precautions locks are fitted on both doors. Maximum visibility is provided by means of large windows in front and rear cab plates, each window being fitted with a power operated screen wiper. The centre section of the roof is detachable to facilitate maintenance and the floor is constructed of hard wood boards in sections for easy removal. An upholstered driver's seat and arm rest is fitted on each side and a large tool box is positioned at the rear. Handrails and footsteps are fitted each side. A large capacity cab heater operating off the engine cooling water system and equipped with an electric air circulating fan is fitted as standard supply for locomotives operating in the temperate zones.

CONTROLS

These are all air-operated and control levers are duplicated at each side of the cab. All necessary gauges and instruments, including speedometer and revolution counter, are mounted on an instrument board on the front cab plate.



ARRANGEMENT OF CONTROLS

1. Screen Wipers
2. Engine Oil Pressure Gauge
3. Gear Box Air Pressure Gauge
4. Ammeter
5. Tachometer
6. Engine Starter Switch
7. Whistle Valve
8. Brake Air Pressure Gauge
9. Speedometer
10. Change Speed Lever
11. Straight Air Brake Lever
12. Engine Stop Control
13. Engine Speed Control Lever
14. Reverse Lever
15. Fuel Tank Gauge
16. Sanding Lever

It will be noted that Items 10, 11, 13 and 14 are duplicated on each side of the Control Desk.

SPECIAL CONTROL EQUIPMENT WHEN REQUIRED

Continuous Vacuum Brake or Automatic Air Brake equipment with associated gauges can be provided, the controls for which would be duplicated.

SAFETY DEVICES

Provision is made for the automatic safeguarding of engine and transmission against lubricating oil and air pressure failure.

WORKS CAPACITY

Locomotive Assembly Shop

Under an agreement which has been operating for a number of years with the Vulcan Foundry Limited and Robert Stephenson & Hawthorns Ltd. capacity is available for the manufacture of mechanical parts for Drewry locomotives at the Newton-le-Willows, Darlington and Newcastle works.

The high reputation enjoyed by this group of locomotive manufacturers is well known throughout the world and the advantages of this association will at once be appreciated.

Not only is ample capacity available under the most modern methods of production but there is also the fullest co-operation in matters of design based on over a century of steam locomotive practice and experience.

Darlington Works

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SOME OF THE USERS OF

DREWRY DIESEL MECHANICAL LOCOMOTIVES

Admiralty.
Argentine National Railways.
Auckland Farmers Freezing Co. (New Zealand).
Australian Iron & Steel Co.
British Railways.
British Guiana Railways.
Calcutta Electric Supply Corporation.
Central Electricity Authority.
City of Liverpool.
Colonial Sugar Refining Co. Ltd. (Queensland).
East African Railways & Harbours.
Esso Petroleum Co. Ltd.
Hyderabad State Electricity Department.
Kalamia Sugar Millers Ltd. (Australia).
Kempthorne Prosser & Co. Ltd. (New Zealand).
Ministry of Supply.
Ministry of Works.
Mount Lyell Mining & Railway Co. (Tasmania).
Mount Isa Mines Ltd. (Queensland).
Nagpur Government Power Station.
New Zealand Forest Products.
New Zealand Government Railways.
New Zealand Refrigerating Co. Ltd.
Northern Aluminium Co. Ltd.
North Eastern Gas Board.
North Western Gas Board.
Norwegian State Railways.
Ohai Railway Board (New Zealand).
Portuguese State Railways.
Pretoria Portland Cement Co. Ltd.
Queensland Railways.
Rea Ltd. (Liverpool).
Shell Petroleum Co. Ltd.
Shell-Mex & B.P. Ltd.
South Eastern Gas Board.
State Electricity Commission (Victoria).
Sudan Government.
Tanganyika Government Railways.
Tasmanian Government Railways.
Taylor Bros. Ltd.
Union Cold Storage Co. Ltd. (Argentine).
United Glass Bottle Manufacturers Ltd.
Western Australia Electricity Commission.
Whakatane Paper Mills Ltd. (New Zealand).
Whites (S.A.) Portland Cement Co. Ltd.
William Cory & Son, Ltd.
Zululand Sugar Millers & Planters Ltd.

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East African Railways and Harbours, Kenya.

Norwegian State Railways.

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Queensland Sugar Estates.

British Railways, Eastern Region.

Scan of printed Manufacturers Catalogue that was purchased from a second hand book stall.
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British Railways, North Eastern Region.

East African Railways and Harbours, Tanganyika.

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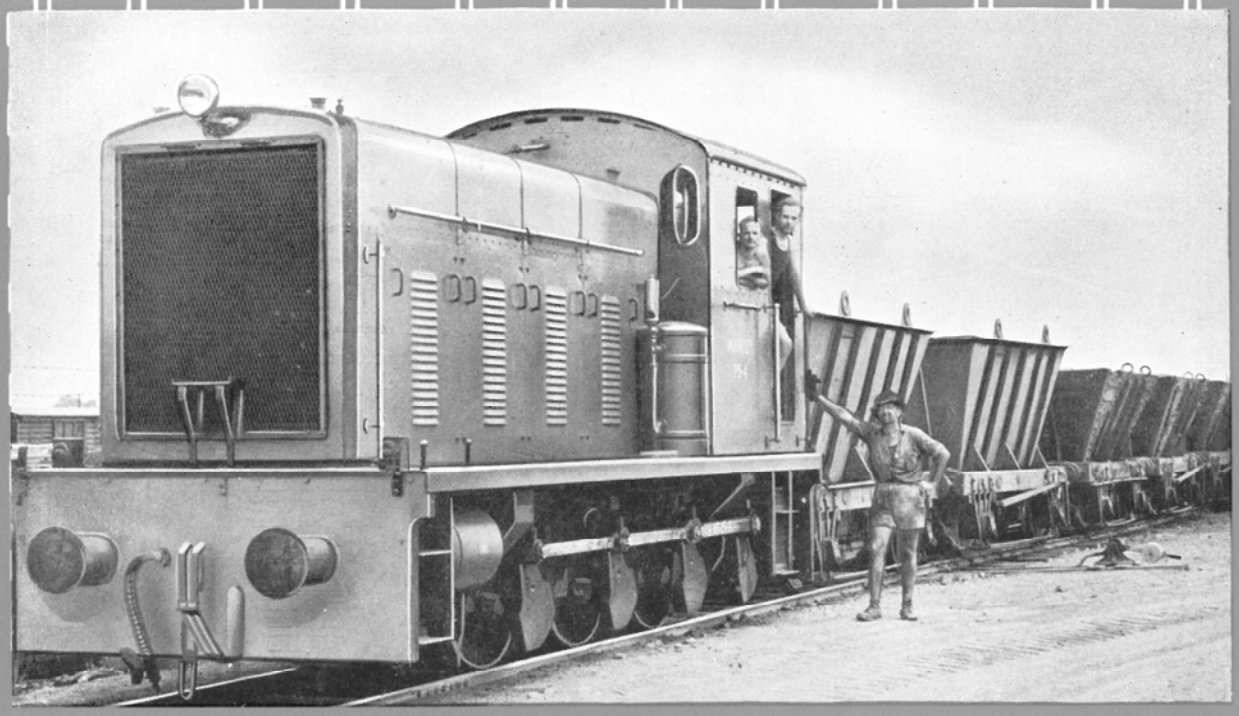

Mount Isa Mines Ltd., Queensland.

Central Electricity Authority.

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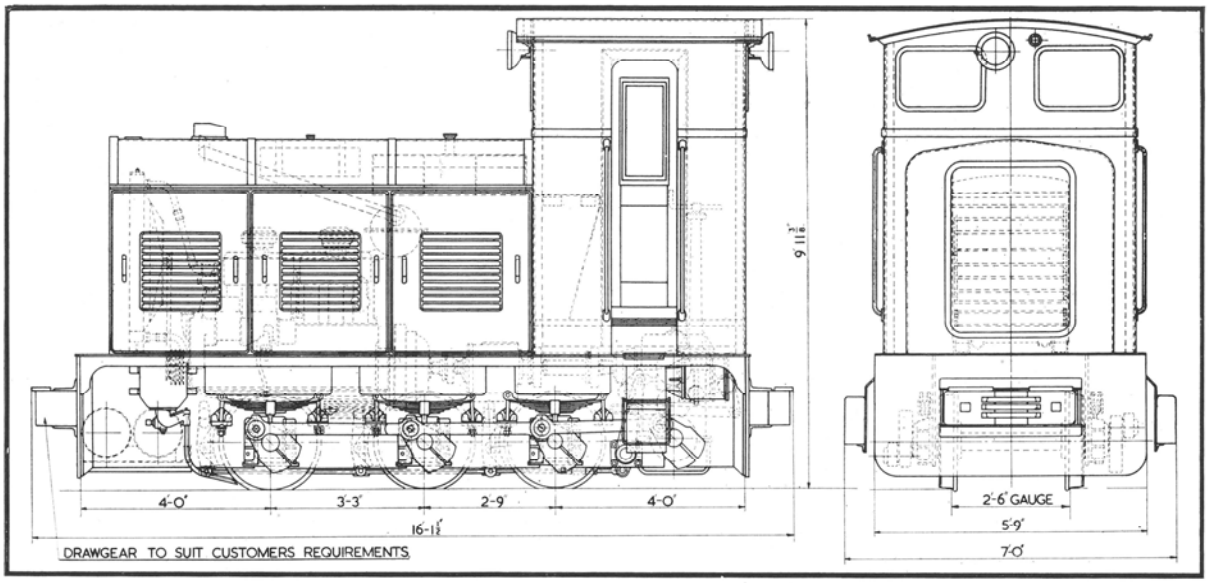
DREWRY 107 H.P. 0-4-0 & 0-6-0 TYPE LOCOMOTIVE



GENERAL PARTICULARS

Gauges	2 ft. 0 in. to 5 ft. 6 in.
Engine	Gardner 6LW 107 B.H.P. at 1700 r.p.m.
Hydraulic Coupling	Rigid traction type.
Transmission	Wilson-Drewry direct air operated epicyclic change speed gearbox. Spiral bevel reverse and final reduction unit, jackshaft mounted.

Wheel diameter :	
For 2 ft. 0 in. to 3 ft. 6 in. gauge	2 ft. 0 in.
For 4 ft. 8½ in. to 5 ft. 6 in. gauge	2 ft. 9 in.
Wheelbase :	
For 0-4-0 type	5 ft. 0 in. to 6 ft. 0 in.
For 0-6-0 type	6 ft. 0 in.
Length over buffer beams	14 ft. 2 in. to 18 ft. 6 in.
Overall width :	
For 2 ft. 0 in. to 3 ft. 6 in. gauge	7 ft. 0 in. to 7 ft. 6 in.
For 4 ft. 8½ in. to 5 ft. 6 in. gauge	7 ft. 6 in. to 10 ft. 0 in.
Overall height :	
For 2 ft. 0 in. to 3 ft. 6 in. gauge	10 ft. 0 in.
For 4 ft. 8½ in. to 5 ft. 6 in. gauge	10 ft. 0 in. to 12 ft. 0 in.
Weight in working order	10½ to 15 tons
Fuel capacity	52 gallons

The above General Particulars cover our Standard Locomotives and are subject to modifications as may be found desirable to meet special requirements or local conditions.

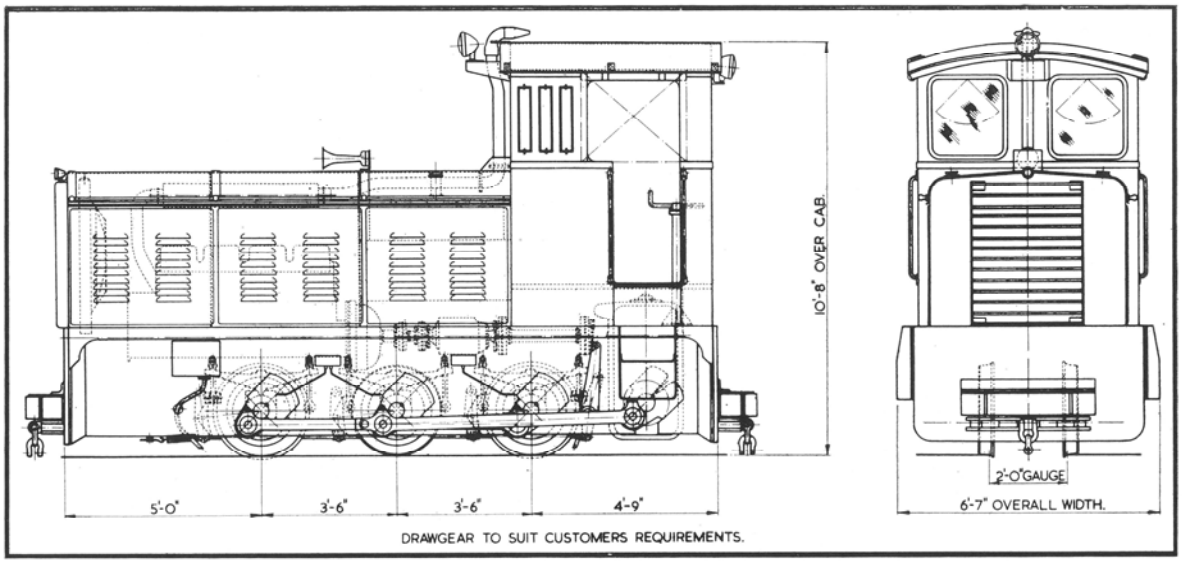
PERFORMANCE

	With 2 ft. 0 in. dia. wheels and 8.41-1 Final Drive Ratio				With 2 ft. 9 in. dia. wheels and 10.5-1 Final Drive Ratio			
Speeds (m.p.h.) Forward & Reverse	3.46	5.82	8.80	14.10	3.81	6.40	9.68	15.50
Tractive Effort (lb.) (75% efficiency)	8700	5170	3420	2135	7900	4700	3110	1940
	Load hauled in tons							
On level tangent track	710	416	270	163	643	377	245	147
Up 1 in 200 ,, ,,	360	208	132	77	326	187	119	69
Up 1 in 100 ,, ,,	238	136	85	47	215	122	76	41
Up 1 in 75 ,, ,,	193	108	67	36	174	97	59	31
Up 1 in 50 ,, ,,	138	76	45	23	124	68	40	19

The above Tractive Efforts are based on a conservative mechanical efficiency of 75% at N.T.P. site conditions, and as these performance figures are obtained with maximum governed speed of the engine a reserve of Tractive Effort is available at maximum torque speed. These performance figures, however, would be reduced when working at an altitude or in tropical temperature as follows :

4% loss for every 1,000 ft. above sea level and 1% loss for every 5° Fah. rise above 60° Fah.

DREWRY 142 H.P. 0-6-0 TYPE LOCOMOTIVE



GENERAL PARTICULARS

Gauges	2 ft. 0 in. to 3 ft. 6 in.
Engine	Gardner 8LW 142 B.H.P. at 1700 r.p.m.
Hydraulic Coupling	Rigid traction type.
Transmission	Wilson-Drewry direct air operated epicyclic change speed gearbox. Spiral bevel reverse and final reduction unit, jackshaft mounted.

Wheel diameter	2 ft. 4 in. to 2 ft. 8 in.
Wheelbase	7 ft. 0 in.
Length over buffer beams	18 ft. 10½ in.
Overall width	6 ft. 7 in.
Overall height	10 ft. 8 in.
Weight in working order	15 to 20 tons
Fuel capacity	100 gallons

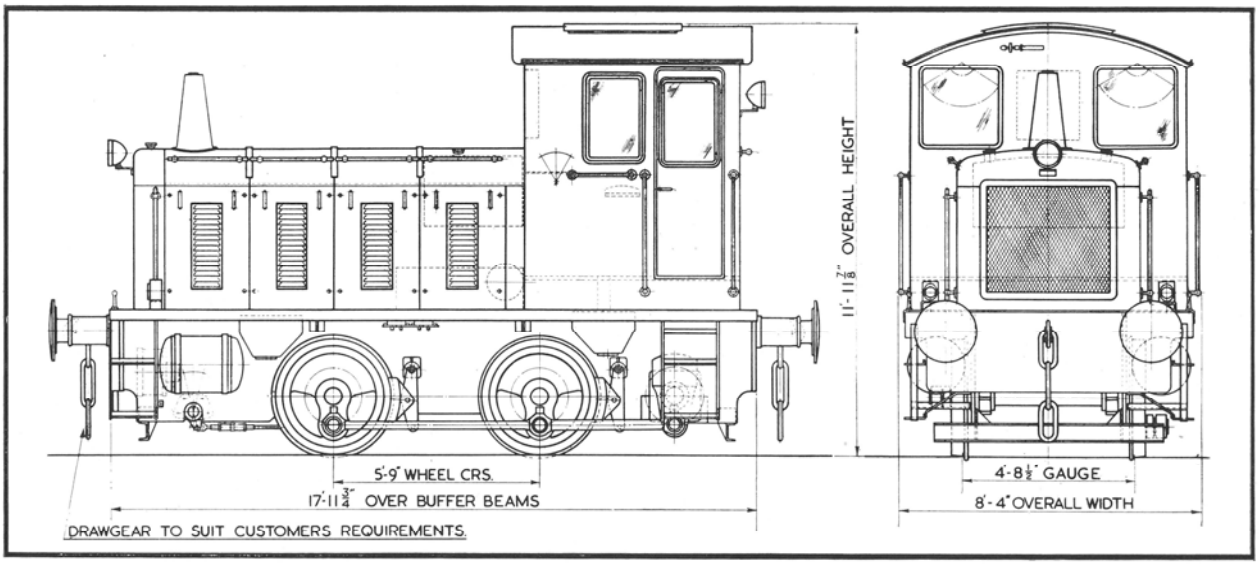
The above General Particulars cover our Standard Locomotives and are subject to modifications as may be found desirable to meet special requirements or local conditions.

PERFORMANCE

	With 2 ft. 4 in. dia. wheels and 8.95 - 1 Final Drive Ratio				With 2 ft. 8 in. dia. wheels and 8.95 - 1 Final Drive Ratio			
Speeds (m.p.h.) Forward & Reverse	3.8	6.4	9.65	15.4	4.33	7.3	11.0	17.6
Tractive Effort (lb.) (75% efficiency)	10500	6230	4130	2590	9220	5460	3620	2260
	Load hauled in tons							
On level tangent track	855	500	324	196	748	435	281	169
Up 1 in 200 ,, ,,	432	248	158	92	377	215	136	77
Up 1 in 100 ,, ,,	285	161	100	55	248	139	85	46
Up 1 in 75 ,, ,,	230	129	79	42	200	110	66	34
Up 1 in 50 ,, ,,	165	90	53	26	142	76	44	20

The above Tractive Efforts are based on a conservative mechanical efficiency of 75% at N.T.P. site conditions, and as these performance figures are obtained with maximum governed speed of the engine a reserve of Tractive Effort is available at maximum torque speed. These performance figures, however, would be reduced when working at an altitude or in tropical temperature as follows :
4% loss for every 1,000 ft. above sea level and 1% loss for every 5° Fah. rise above 60° Fah.

DREWRY 153 H.P. 0-4-0 TYPE LOCOMOTIVE



GENERAL PARTICULARS

Gauges	One metre to 5 ft. 6 in.
Engine	Gardner 6L3 153 B.H.P. at 1200 r.p.m.
Hydraulic Coupling	Rigid traction type.
Transmission	Wilson-Drewry direct air operated epicyclic change speed gearbox. Spiral bevel reverse and final reduction unit, jackshaft mounted.

Wheel diameter	3 ft. 3 in.
Wheelbase	5 ft. 9 in. or 7 ft. 0 in.
Length over buffer beams	18 ft. 0 in. to 18 ft. 9 in.
Overall width :	
For one metre to 4 ft. 8½ in. gauge	8 ft. 0 in. or 8 ft. 6 in.
For 5 ft. 6 in. gauge	9 ft. 0 in.
Overall height	11 ft. 4 in. to 12 ft. 4 in.
Weight in working order	20 to 23½ tons
Fuel capacity	100 gallons

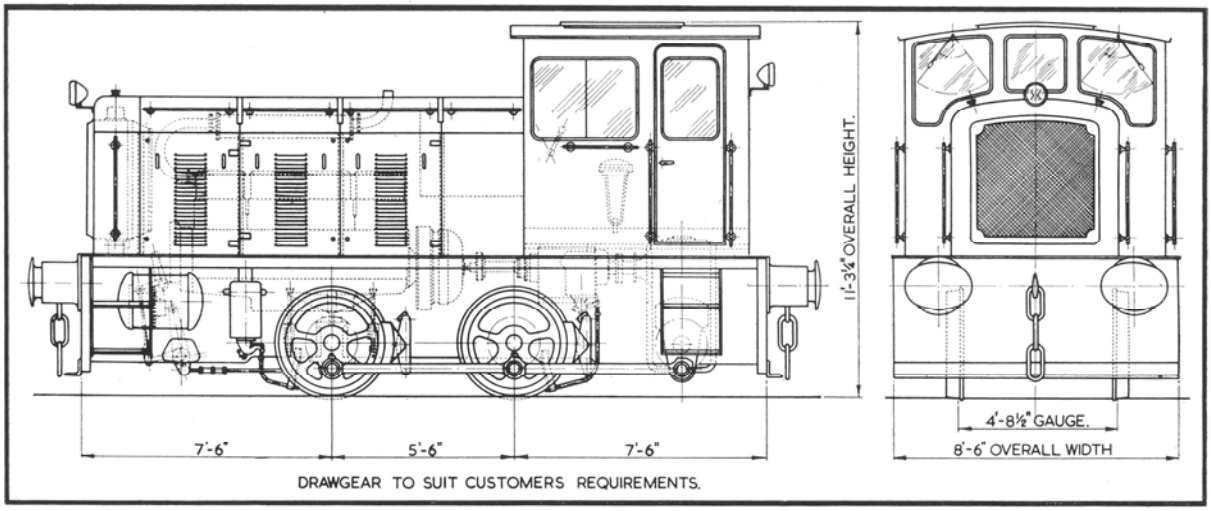
The above General Particulars cover our Standard Locomotives and are subject to modifications as may be found desirable to meet special requirements or local conditions.

PERFORMANCE

	With 8.47-1 Final Drive Ratio				With 9.82-1 Final Drive Ratio			
Speeds (m.p.h.) Forward & Reverse	3.9	6.9	10.75	16.0	3.4	5.9	9.3	13.8
Tractive Effort (lb.) (75% efficiency)	11020	6230	4000	2690	12640	7290	4630	3110
	Load hauled in tons							
On level tangent track	897	497	311	201	1031	584	362	235
Up 1 in 200 ,, ,,	452	245	148	93	522	291	175	111
Up 1 in 100 ,, ,,	297	157	93	56	344	189	111	67
Up 1 in 75 ,, ,,	240	126	72	41	278	151	88	51
Up 1 in 50 ,, ,,	171	88	47	24	199	105	58	32

The above Tractive Efforts are based on a conservative mechanical efficiency of 75% at N.T.P. site conditions, and as these performance figures are obtained with maximum governed speed of the engine a reserve of Tractive Effort is available at maximum torque speed. These performance figures, however, would be reduced when working at an altitude or in tropical temperature as follows :
4% loss for every 1,000 ft. above sea level and 1% loss for every 5° Fah. rise above 60° Fah.

DREWRY 204 H.P. 0-4-0 TYPE LOCOMOTIVE



GENERAL PARTICULARS

Gauges	4 ft. 8½ in.
Engine	Gardner 8L3. 204 B.H.P. at 1200 r.p.m.
Hydraulic Coupling	Rigid traction type
Transmission	Wilson-Drewry direct air operated epicyclic change speed gear box. Spiral bevel reverse and final reduction unit, jackshaft mounted.

Wheel diameter	3 ft. 3 in. or 3 ft. 6 in.
Wheelbase	5 ft. 6 in.
Length over buffer beams	20 ft. 6 in.
Overall width	8 ft. 6 in.
Overall height	11 ft. 3¼ in.
Weight in working order	30 to 33 tons
Fuel capacity	150 gallons

The above General Particulars cover our Standard Locomotives and are subject to modifications as may be found desirable to meet special requirements or local conditions.

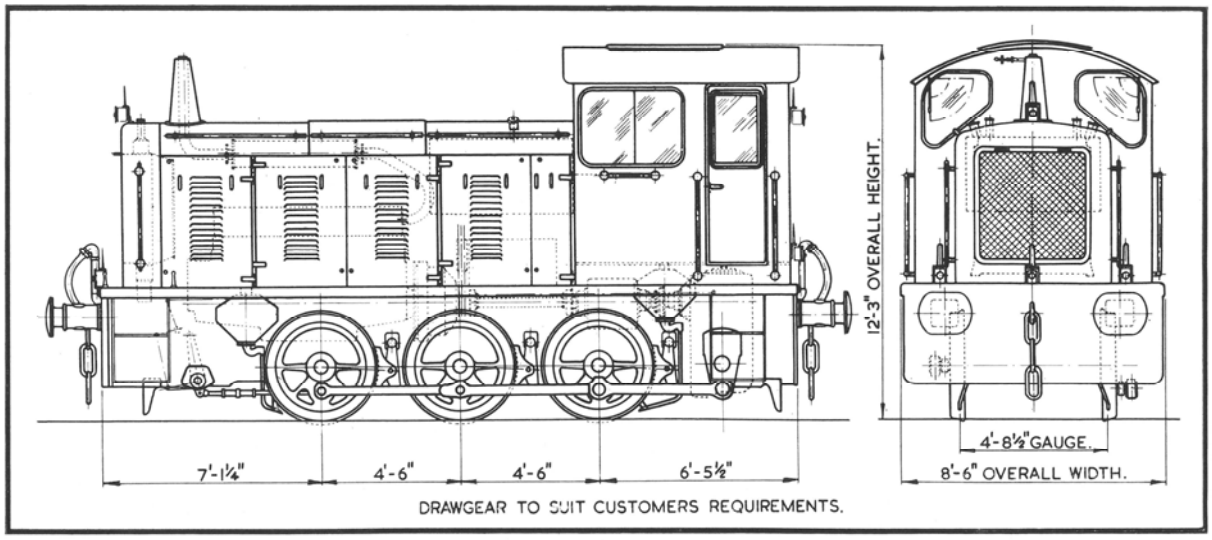
PERFORMANCE

	With 3 ft. 3 in. dia. wheels and 9.82-1 Final Drive Ratio					With 3 ft. 3 in. dia. wheels and 8.47-1 Final Drive Ratio				
Speeds (m.p.h.) Forward & Reverse	3.40	5.90	8.90	13.80	25.80	4.00	6.90	10.30	16.00	30.00
Tractive Effort (lb.) (75% efficiency)	16850	9730	6440	4150	2220	14330	8310	5570	3580	1910
	Load hauled in tons									
On level tangent track	1373	780	506	316	155	1164	663	435	268	129
Up 1 in 200 ,, ,,	695	389	247	149	66	588	328	210	124	52
Up 1 in 100 ,, ,,	460	253	157	91	35	386	212	132	74	27
Up 1 in 75 ,, ,,	372	202	124	69	23	312	168	103	56	19
Up 1 in 50 ,, ,,	267	141	83	43	9	222	117	68	33	—

The above Tractive Efforts are based on a conservative mechanical efficiency of 75% at N.T.P. site conditions, and as these performance figures are obtained with maximum governed speed of the engine a reserve of Tractive Effort is available at maximum torque speed. These performance figures, however, would be reduced when working at an altitude or in tropical temperature as follows :

4% loss for every 1,000 ft. above sea level and 1% loss for every 5° Fah. rise above 60° Fah.

DREWRY 204 H.P. 0-6-0 TYPE LOCOMOTIVE



GENERAL PARTICULARS

Gauges	One metre to 5 ft. 6 in.
Engine	Gardner 8L3. 204 B.H.P. at 1200 r.p.m.
Hydraulic Coupling	Rigid traction type.
Transmission	Wilson-Drewry direct air operated epicyclic change speed gear-box. Spiral bevel reverse and final reduction unit, jackshaft mounted.

Wheel diameter :	
For one metre to 3 ft. 6 in. gauge	3 ft. 3 in.
For 4 ft. 8½ in. to 5 ft. 6in. gauge	3 ft. 6 in.
Wheelbase	9 ft. 0 in.
Length over buffer beams	22 ft. 6½ in.
Overall width :	
For one metre to 4 ft. 8½ in. gauge	8 ft. 6 in.
For 5 ft. 3 in. and 5 ft. 6 in. gauge	9 ft. 0 in.
Overall height	11 ft. 4 in. to 12 ft. 4 in.
Weight in working order	26 to 33 tons
Fuel capacity	225 gallons

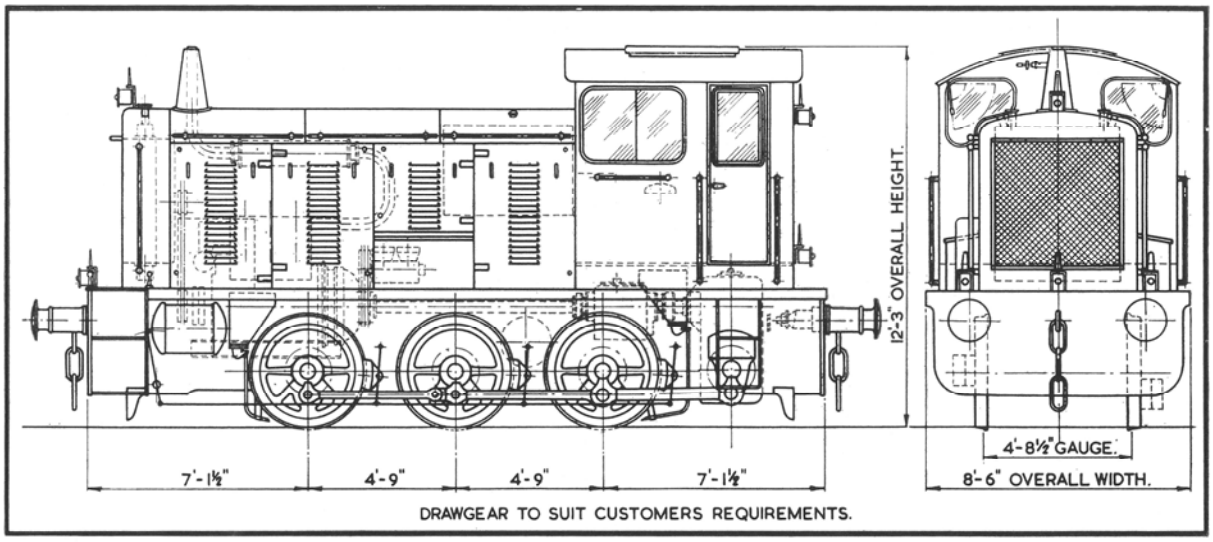
The above General Particulars cover our Standard Locomotives and are subject to modifications as may be found desirable to meet special requirements or local conditions.

PERFORMANCE

	With 3 ft. 6 in. dia. wheels and 12.44-1 Final Drive Ratio					With 3 ft. 6 in. dia. wheels and 9.82-1 Final Drive Ratio				
Speeds (m.p.h.) Forward & Reverse	2.90	5.05	7.58	11.75	22.0	3.66	6.40	9.62	14.9	27.9
Tractive Effort (lb.) (75% efficiency)	19750	11350	7560	4880	2600	15670	8950	5950	3840	2050
	Load hauled in tons									
On level tangent track	1615	915	600	376	187	1175	715	465	290	141
Up 1 in 200 ,, ,,	821	459	296	180	82	645	355	226	135	57
Up 1 in 100 ,, ,,	544	300	190	112	46	425	230	143	82	30
Up 1 in 75 ,, ,,	441	241	150	87	32	344	184	112	62	19
Up 1 in 50 ,, ,,	318	170	103	56	16	246	128	75	38	6

The above Tractive Efforts are based on a conservative mechanical efficiency of 75% at N.T.P. site conditions, and as these performance figures are obtained with maximum governed speed of the engine a reserve of Tractive Effort is available at maximum torque speed. These performance figures, however, would be reduced when working at an altitude or in tropical temperature as follows :
4% loss for every 1,000 ft. above sea level and 1% loss for every 5° Fah. rise above 60° Fah.

DREWRY 250 H.P. 0-6-0 TYPE LOCOMOTIVE



GENERAL PARTICULARS

Gauges	One metre to 5 ft. 6 in.
Engine	Paxman 6 R.P.H. II 250 B.H.P. at 1250 r.p.m.
Hydraulic Coupling	Rigid traction type.
Transmission ..	Wilson-Drewry direct air operated epicyclic change speed gearbox. Spiral bevel reverse and final reduction unit, jackshaft mounted.

Wheel diameter	3 ft. 7½ in.
Wheelbase	9 ft. 6 in.
Length over buffer beams	23 ft. 9 in.
Overall width	8 ft. 6 in.
Overall height	12 ft. 3 in.
Weight in working order ..	37 tons
Fuel capacity	300 gallons

The above General Particulars cover our Standard Locomotives and are subject to modifications as may be found desirable to meet special requirements or local conditions.

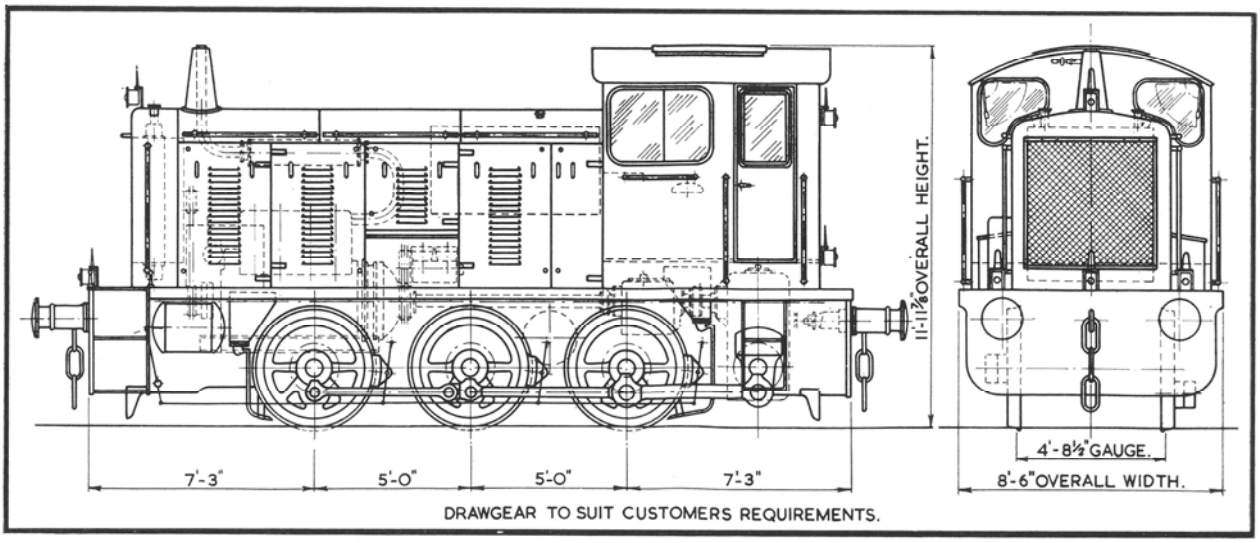
PERFORMANCE

	With 9.82-1 Final Drive Ratio					With 12.44-1 Final Drive Ratio				
Speeds (m.p.h.) Forward & Reverse	3.95	6.90	10.38	16.11	30.10	3.12	5.46	8.2	12.7	23.8
Tractive Effort (lb.) (75% efficiency)	17800	10200	6770	4360	2340	22500	12870	8570	5530	2950
	Load hauled in tons									
On level tangent track	1446	813	527	326	158	1838	1035	777	424	209
Up 1 in 200 ,, ,,	730	402	254	194	64	934	518	332	201	90
Up 1 in 100 ,, ,,	481	259	159	89	31	617	338	212	124	48
Up 1 in 75 ,, ,,	387	206	124	67	18	499	270	167	94	33
Up 1 in 50 ,, ,,	275	142	82	39	4	358	189	113	60	15

The above Tractive Efforts are based on a conservative mechanical efficiency of 75% at N.T.P. site conditions, and as these performance figures are obtained with maximum governed speed of the engine a reserve of Tractive Effort is available at maximum torque speed. These performance figures, however, would be reduced when working at an altitude or in tropical temperature as follows :

4% loss for every 1,000 ft. above sea level and 1% loss for every 5° Fah. rise above 60° Fah.

DREWRY 333 H.P. 0-6-0 TYPE LOCOMOTIVE



GENERAL PARTICULARS

Gauges	One metre to 5 ft. 6 in.
Engine	Paxman 8 R.P.H. II 333 B.H.P. at 1250 r.p.m.
Hydraulic Coupling	Rigid traction type
Transmission	Wilson-Drewry direct air operated epicyclic change speed gearbox. Spiral bevel reverse and final reduction unit, jackshaft mounted.

Wheel diameter	3 ft. 10 in.
Wheelbase	10 ft. 0 in.
Length over buffer beams	24 ft. 6 in.
Overall width	8 ft. 6 in.
Overall height	12 ft. 3 in.
Weight in working order	46 tons
Fuel capacity	400 gallons

The above General Particulars cover our Standard Locomotives and are subject to modifications as may be found desirable to meet special requirements or local conditions.

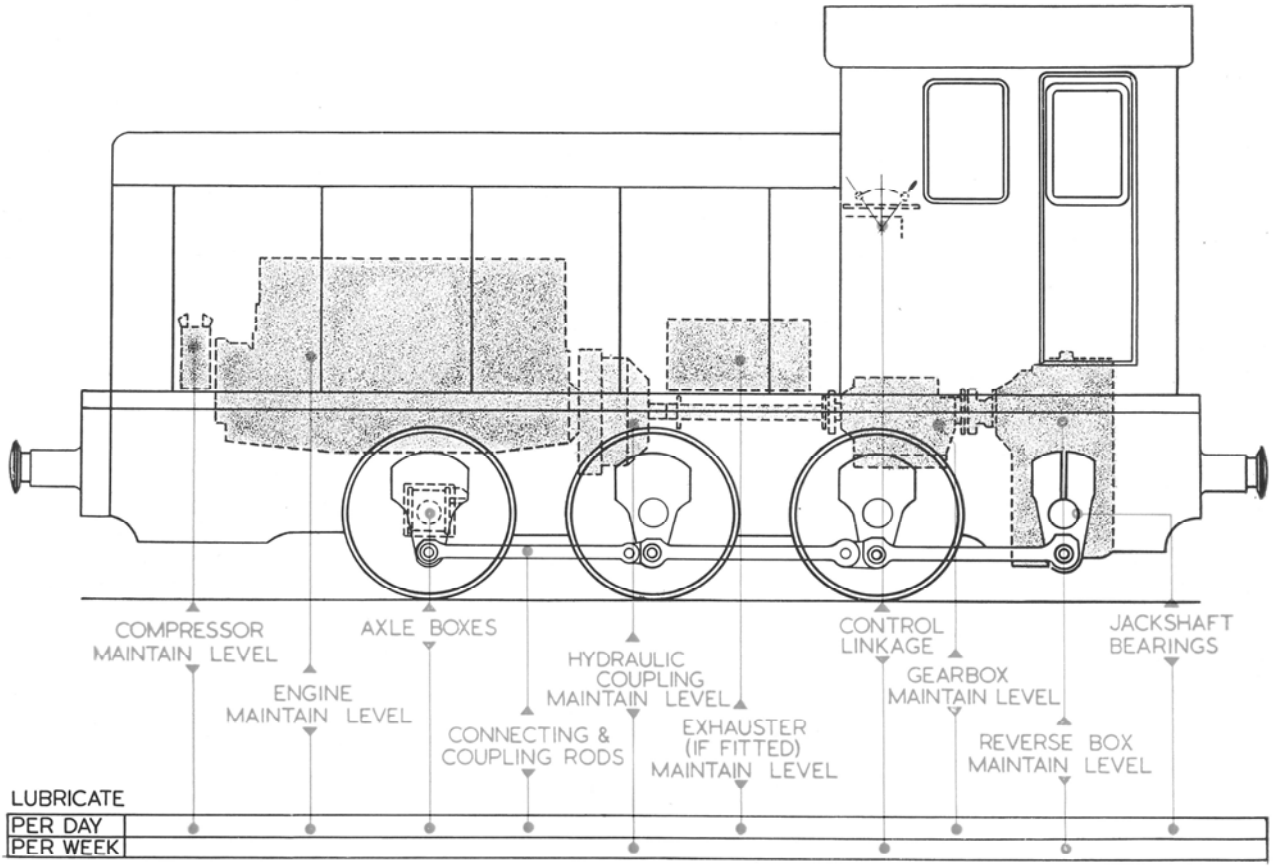
PERFORMANCE

	With 9.82-1 Final Drive Ratio					With 12.44-1 Final Drive Ratio				
Speeds (m.p.h.) Forward & Reverse	4.17	7.29	10.95	17.00	31.8	3.32	5.80	8.72	13.5	25.3
Tractive Effort (lb.) (75% efficiency)	22400	12810	8540	5500	2940	28200	16160	10730	6940	3710
	Load hauled in tons									
On level tangent track	1820	1021	665	412	199	2304	1300	765	532	263
Up 1 in 200 ,, ,,	918	506	322	191	80	1168	651	416	253	114
Up 1 in 100 ,, ,,	606	327	202	114	39	774	424	266	155	62
Up in 1 in 75 ,, ,,	488	259	157	85	24	626	339	209	119	42
Up 1 in 50 ,, ,,	347	178	104	50	5	449	237	142	76	19

The above Tractive Efforts are based on a conservative mechanical efficiency of 75% at N.T.P. site conditions, and as these performance figures are obtained with maximum governed speed of the engine a reserve of Tractive Effort is available at maximum torque speed. These performance figures, however, would be reduced when working at an altitude or in tropical temperature as follows :

4% loss for every 1,000 ft. above sea level and 1% loss for every 5° Fah. rise above 60° Fah.

LUBRICATION DIAGRAM



OPERATION NOTES

Whilst there may be isolated cases when drivers will be required to attend to general maintenance, this work is usually the duty of maintenance-shop staff, and a separate and comprehensive manual is provided for this purpose.

Drivers will, therefore, be given instructions by the appropriate authority for the handling of the locomotive and their duties and responsibilities will be determined by those instructions.

It is, however, important that both maintenance staff and drivers should have available for handy reference general information such as this catalogue contains.

The reader will be familiar with the general details of construction of the locomotive and disposition of the engine and transmission units and auxiliaries from the preceding pages of illustrations, and we cannot too strongly stress the importance of cleanliness.

If machinery is kept clean it should follow that development of minor defects such as oil, water, or air-leaks and slack mechanical connections will be observed and corrected before possible serious trouble can arise.

Drivers are provided with a roomy and comfortable cab with good vision in all directions, together with the most simple system of control, and are therefore working under much more favourable conditions than is the case with a steam locomotive.

OPERATION NOTES

(continued)

The layout of the power unit renders all components as accessible as possible for lubrication and examination, and a lubrication diagram is given on page 25. Attention must also be given to topping-up of radiator and battery levels.

An instruction plate giving essential information to be observed in the handling of the locomotive, is fixed in the cab.

A feature of the transmission is the inclusion of the traction-type Hydraulic Coupling in place of the usual friction clutch and it is important for users to understand how this functions.

At idling speed of the engine no useful torque is transmitted, but this rises very steeply as the engine is speeded up, to the extent that full engine torque can be transmitted to the driving wheels of the locomotive at zero speed.

This results in a very even starting torque under heavy load and is ideal for the purpose of " inching " wagons over a weigh-bridge and similar duties.

It will, however, be appreciated that if in any gear the tractive effort demanded to handle the load behind the locomotive is in excess of the tractive effort available, then the coupling will " slip," although the engine will continue to develop its maximum torque output, which will be absorbed by the fluid in the coupling, with consequent overheating if persisted in.

The instruction plate referred to above includes a table of minimum and maximum speeds permissible in each gear. The minimum speeds correspond to the maximum torque speed of the engine, and if this cannot be maintained, the next lower gear must be engaged or, if in low gear, the load behind the locomotive must be reduced.

This procedure will prevent what is termed stalling of the coupling and avoid overheating.

This speed-range table must therefore be strictly observed.

We include in this catalogue tractive-effort speed tables, also tables showing the loads which can be hauled on level track and on varying gradients.

Drivers are instructed that, when the load is in motion, gear changes must be made progressively when changing up or down. This is particularly important when changing from a high gear to a lower gear.

The gear-box provides varying ratios, from an overdrive ratio of 1 to 1.87 in the case of a locomotive fitted with a five-speed gear-box, down to a reduction ratio of approximately 4 to 1 in bottom gear. If, therefore, to go to an extreme, a change was made under load from over speed to bottom gear, very severe " snatch " would take place and the engine would be seriously over-speeded, the whole of the transmission being subjected to heavy reaction loading which could cause serious damage.

On the other hand, it is not necessary always to start in bottom or lowest gear and, with experience, drivers will be able to select a suitable gear in which the load for the time being can be started and accelerated. Provided the load behind the locomotive can be accelerated in a particular gear, then there is no danger of submitting the Hydraulic Coupling to excessive " slip " and consequent risk of overheating.

OPERATION NOTES

(continued)

Gear changing requires no special skill such as is the case with the conventional arrangement of friction clutch and layshaft type of gear-box. The gear is engaged while the locomotive is at rest and while the brake is applied, and the locomotive will move off on releasing the brake and opening the throttle, following which higher or lower gears are engaged depending upon load and speed requirements.

Neutral gear should not be engaged until after the locomotive has been brought to rest.

When negotiating long down-grade sections do not engage neutral gear and " coast " but remain in high gear. This is a precautionary measure designed to ensure that there will be no risk of a low gear being engaged at speed and, moreover, provides the advantage of the " braking " effort of the engine. On no account must the gearbox be used to provide additional braking by engaging a low gear at speed.

The Wilson-Drewry epicyclic gear-box is of the direct air-operated type, in which changes in ratio are obtained by admitting air through a four or five-way control valve to separate operating-cylinders which contract the brake bands of the gear-train required, through toggle mechanism which is provided with an automatic device which takes care of adjustment for wear in the brake linings. Details of the gear-box are fully described in the maintenance manual which includes sectional drawings of all details.

Gear changing is positive and practically instantaneous and is effected merely by moving a control lever from one gear position to another and, as already explained, the Hydraulic Coupling replaces the usual friction clutch in the engine flywheel.

It will be appreciated that it is important to avoid any undue " slip " on the epicyclic brake bands, and on this account the capacity of the operating-cylinders and the operating pressure has been selected to ensure positive grip of the brake bands, with the minimum of " snatch."

Drivers and maintenance staff should therefore check that the automatic adjusting device continues to function satisfactorily and that undue " slip " is not allowed to develop.

Drivers are warned in the instructions referred to that indirect gears should be engaged and disengaged about five times each at the end of every day's run.

Any tendency to " slip " will be easily detected by drivers by a softening of the rate of take-up on engaging a particular gear, and if this occurs he should report to the maintenance staff who should check the adjustment as described in the instruction manual.

Care should be taken to ensure that the correct oil level is maintained (which will generally be a maintenance-staff responsibility), and drivers may safely rely upon the transmission responding to control requirements and load demands. It is, however, only prudent to ensure the satisfactory performance of the locomotive that drivers should be familiar with what takes place following movement of the control levers and thus be in a position to report defects, however unlikely these may be.

Like the gear-box control, the reverse control is air-operated, and a mechanical interlock is provided so that the reverse gear lever can only be moved after neutral gear has

OPERATION NOTES

(continued)

been engaged, but it is most important to remember that the reverse lever must not be moved from one position to the other until the locomotive has been brought to rest.

Change of direction is effected by the movement of a sliding dog-clutch between two bevel wheels, and unless these bevel wheels are at rest the internal teeth of the sliding dog may " ratchet " and fail to engage.

Provided air for control operation is available this dog-clutch will always follow the movement of the reverse control lever.

If, however, the controls are interfered with by some unauthorised person after the driver has shut down the locomotive and when air is not available, the dog-clutch will not follow the movement of the control lever.

Consequently, should the engine later be started up under the above conditions, the sliding dog would begin to move over as air pressure slowly builds up and " ratcheting " could result.

To avoid this possibility a cock is provided which isolates the reverse control valve ; this cock must always be closed by drivers after shutting down the locomotive and it must not be opened until full control pressure is available. The following general advice to drivers should be strictly observed :

Do not attempt to drive the locomotive unless correct pressures are registered on the gauges :

Engine oil pressure.
Control air pressure.
Brake air pressure or vacuum.

If your duty requires you to attend to lubrication, proceed in accordance with lubrication diagram, page 25, and also check contents of fuel tanks as registered on fuel gauge in cab, also check correct adjustment of auxiliary driving belts :

Fan drive.
Compressor and/or exhauster drive.
Dynamo drive.

Do not fail to report at all times any unusual symptom and ensure that it is attended to at once.

Remember that the trouble free operation of the locomotive is dependent upon correct maintenance attention, and the prompt reporting by drivers of any sign of defect.

Maintenance staff are entirely dependent upon drivers' reports, without which suitable action cannot be taken in time to ensure completely satisfactory service of Drewry locomotives or, for that matter, any other piece of machinery.

Drewry locomotives, because of the care taken with the design and the simplicity of the control system, will continue to give satisfactory service in spite of abuse in handling but, ultimately, failure must result, with consequent unnecessarily high cost of maintenance. This is a fact which will be fully appreciated by all concerned in the employment of machinery.

We have therefore endeavoured in these remarks briefly to explain the main features in the design and operation of Drewry locomotives, and it is our sincere hope that this catalogue will be found of service not only to those already operating our locomotives but to prospective customers.

Worrall & Robey Ltd., London, E.C.3.
2/12/56/24175

QUESTIONNAIRE

LOCAL CLIMATIC conditions, i.e. altitude, temperature, and humidity, all affect the performance of compression-ignition type engines, and it is important that the fullest possible data should accompany all enquiries. To enable us, therefore, to determine the size and type of Diesel Locomotive most suitable for any given set of conditions, kindly complete the following Questionnaire and forward to us.

1. Gauge of track.....
2. Weight of rails in use or maximum permitted axle load .....
3. The steepest gradient and length of same .....
4. (a) Maximum load to be hauled on level track .....
   (b) Maximum speed at which this load is to be hauled .....
5. (a) Maximum load to be hauled up steepest gradient .....
   (b) Maximum speed at which this load is to be hauled .....
6. Minimum radius curve .....
7. Minimum radius curve on gradients and whether latter are compensated for curvature .....
8. Particulars of clearance diagram or details limiting height and width of locomotive. .....
9. Type of buffer and drawgear required .....
10. Altitude above sea level .....
11. Minimum and maximum shade temperatures .....
12. Normal and maximum humidity.....

THE DREWRY CAR COMPANY LIMITED

CITY WALL HOUSE · 129-139 FINSBURY PAVEMENT · LONDON E.C.2 · ENGLAND

Telephone: MONarch 0671 - - - Telegrams: INNEAL, PHONE, LONDON

Separate Questionnaire that was inserted inside the catalogue.
Inside of back cover was blank

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Page 32 if printed double sided on A4 sheets