

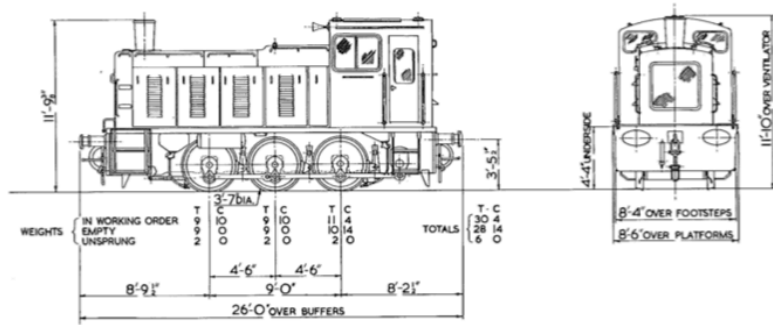
# NON-STANDARD DIESEL SHUNTERS OF BRITISH RAILWAYS

## PART I

*[Drewry, Swindon, Hunslet & Hudswell-Clarke]*



Rodger Bradley



ENGINE.	MAKE & TYPE No. OF CYLS. & CYCLE. MAX. CONT. RATED OUTPUT.	GARDNER 8 L.3. 8 CYLS. 4 STROKE. 204 H.P. AT 1200 R. P.M.	TYPE FOR LOCO. FOR TRAIN	AIR. VACUUM.
TRANSMISSION.	ENGINE TO GEARBOX. GEARBOX. FINAL DRIVE.	FLUIDRIVE TYPE 23 HYD. COUPLING. WILSON - DREWRY C.A.5.R.7. S.C.G. Co. TYPE R. F. II.	BRAKE FORCE. { % OF LOCO. WEIGHT. IN WORKING ORDER.	70%.
PERFORMANCE.	MAX. TRACTIVE EFFORT. CONT. TRACTIVE EFFORT.	15300 LB. AT 22-6% ADHESION 15300 LB. AT 3-75 M.P.H.	SPEED. CURVE.	28.5 M.P.H. 2 CHAINS.
			TANK CAPACITY. FUEL.	300 GALLS.

200 H.P. B.R. O-6-O DIESEL MECHANICAL SHUNTING LOCOMOTIVE. CLASS O3

British Railways standard diesel shunter was the English Electric designed 0-6-0, with almost any number of variations of the 'K' series engine of 1930s vintage. This was developed from the 1930s designs used on the LMS, and was the mainstay of goods, and train marshalling yard operations - it seemed almost forever.

However, in 1962 there were no fewer than 666 diesel shunting locomotives in operation on BR, of either 0-4-0 or 0-6-0 wheel arrangement and powered by engines of less than 350 hp. These "non-standard" types performed a variety of the most mundane tasks, and their earliest appearance was from a pre-nationalisation order to the Hunslet Engine Co. of Leeds, also by the LMS. Following the end of the Second World War, many more were ordered from various makers.

By the early 1980s there were only a handful left in service, mainly of the Class O3 0-6-0s built at Swindon, together with samples from Andrew Barclay, Ruston & Hornsby, Hunslet, Drewry Car Co., Hudswell-Clarke, etc. Amongst this grand total of 666, a number, 24, were allocated to various service departments, ranging from S&TE to the Dinsdale Rail Welding Depot and Broad Clyst sleeper works, amongst others. During BR days, a motley collection of some 11 different designs were in service, carrying out shunting and many other light duties at yards the length and breadth of the country. Although some of the designs dated from the 1930s, the majority were constructed after 1948.

Although I have referred to the smaller shunters operated by BR as 'non-standard', this may not be the best description, since with the arrival of the BR/Swindon Class O3 0-6-0 some degree of standardisation arrived. This was especially true for the shunters with 204 hp diesel engines. A major distinguishing feature of the smaller shunters was that almost all were fitted with either mechanical or hydraulic transmissions, unlike the standard 350hp shunters, which were fitted with electric transmission.

Prior to nationalisation, the Hunslet Engine Co. of Leeds supplied the first sample of these small diesel-mechanical shunters, delivered to the LMS in 1932. This locomotive with a 150 hp M.A.N. engine was No. 7051 in LMS lists, but intriguingly it was re-acquired by the makers in 1945 and was available for hire until 1960, when it was sold to the Middleton Railway Preservation Society. During the mid-1930s seven more of these small diesel-mechanical shunters were delivered, built by; Drewry Car Co., Hudswell Clarke and Harland & Wolffe. Following the lead given by the LMS, the GWR also took some interest in this type of shunter and purchased a 70hp 0-4-0 type from another Leeds maker, John Fowler & Co. The other two 'big four' railway companies - the LNER and the Southern - did not make any move in the use of small diesel shunting types until after the Second World War.



The classic BR Class 03 Drewry shunter, carrying number D2282 from new, together with the more common narrow exhaust stack. Standard BR unlined green and the final style of numerals and crest, with black underframe and red buffer beams when new this Frank was a striking design

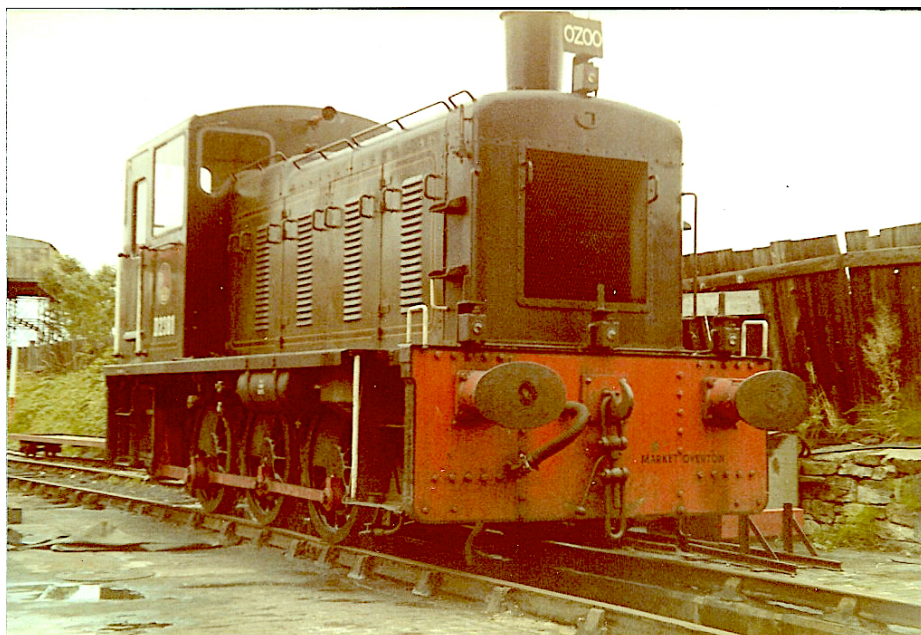
*(c) Rodger P. Bradley Collection*

## Drewry Car Co. & BR/Swindon 0-6-0 Locomotives

In 1947 though the LNER placed what turned out to be the most significant order with the Drewry Car Co. of Stafford, for a six-wheeled shunter powered by a Gardner type 8L3 204hp engine, matched with a Wilson-Drewry mechanical transmission. The final drive to the wheels was by means of a jackshaft, flycrank and outside coupling rods.

The reason for the significance of this particular order lies in the fact that despite the prototype's arrival on the Eastern Region in 1948, this arrangement was applied to by far the majority of British Railways' small diesel shunters. This first locomotive was for departmental use only, carrying number DS1173, but laid the foundations of the most numerous design of its type used on BR.

The first of the numerous Drewry locomotives were ordered by eastern Region in 1950. These were taken onto stock as replacements for ex-GER steam tram locomotives used on the Wisbech & Upwell tramway. The basic design, although following that of the solitary DS1173 differed in a number of aspects. The most noticeable of these was the fitting of deep side valances, 'cow catchers' to the front and rear buffer beams. Less noticeable but more importantly perhaps, was the provision of an engine speed governor limiting the track speed to 12 mph. A further order for six more of these 204hp shunters in 1951 did not have these features, but the Drewry design then began to resemble its later, more familiar appearance. These locomotives were delivered in 1953 and put to work on shunting duties at Harwich (Parkestone Quay) and in the northeast at West Hartlepool.



Resting at "Steamtown" in 1979, D2381 was one of the later batch of Drewry type shunters, built at BR's Swindon and Doncaster Works. The steam style exhaust was a characteristic of a number of these 0-6-0 shunters, whilst the lined green livery was an equally unusual feature.

*(c) Rodger P. Bradley Collection*

<b>Builders</b>	Drewry Car Co.; Vulcan Foundry; Robert Stephenson & Hawthorns	BR Swindon and Doncaster
<b>No. Series</b>	D2200-2340 (Originally 11100-3/5-15/11121-35/49-60, 11212-29)	D2000-2199, D2372-99 (Originally allocated 11187-209, but not carried)
<b>Wheel arrangement</b>	0-6-0	0-6-0
<b>Length over buffers</b>	26ft 0ins	26ft 0ins
<b>Overall width</b>	8ft 6ins	8ft 6ins
<b>Overall height</b>	12ft 2 3/8 ins	12ft 2 7/16 ins
<b>Wheelbase</b>	9ft 0ins	9ft 0ins
<b>Wheel diameter</b>	D2200-29 – 3ft 3ins D2230-2340 – 3ft 6ins	3ft 7ins
<b>Weight (w.o.)</b>	32tons 4 cwt	30tons 16cwt
<b>Max tractive effort</b>	15,650 lbs	15,650 lbs
<b>Braking equipment</b>	Air for locomotive, vacuum for train	Air for locomotive, vacuum for train
<b>Diesel engine</b>	Gardner 8L3, 204 bhp 8-cylinders, 4-stroke. Cylinders 5 1/2 ins x 7 1/4 ins Piston speed 1,200 rpm	Gardner 8L3, 204 bhp 8-cylinders, 4-stroke. Cylinders 5 1/2 ins x 7 1/4 ins Piston speed 1,200 rpm
<b>Transmission</b>	Vulcan-Sinclair fluid coupling to Wilson CA5 gearbox	Vulcan-Sinclair fluid coupling to Wilson CA5 gearbox
<b>Final drive</b>	Self-change Wiseman type RF11 spiral bevel and reverse, jackshaft	Self-change Wiseman type RF11 spiral bevel and reverse, jackshaft

**NOTES:** \* Later in their working life a number of the BR/Swindon locomotives were fitted with air-brake equipment to work air-braked trains. TOPS codes were 03 for the BR shunters and 04 for the Drewry locomotives. None of the Class 04 received or carried TOPS numbers and only 123 of the 03 class were allocated a new number in the range 03004 - 03399. Two of these, 03370 and 03371 were formerly Departmental locomotives 91 and 92.

Further orders placed with Drewry between 1951 and 1958 brought the total in service to 141, with good old DS1173 from 1948 still in Departmental stock. Even with the later deliveries of the Drewry design there were a number of differences between successive batches. The common equipment throughout was the Gardner 8L3B engine, Wilson type CA5 epicyclic gearbox and Wiseman F11 final drive unit, connected through the frames via jackshaft and flycranks to the coupled wheels. The first 30 locomotives had 3ft 3ins diameter wheels on a wheelbase of exactly 9ft 0ins, although this dimension remained the same, later batches saw an increase in wheel diameter to 3ft 6ins. An increase in front and rear overhangs brought the overall length up from 22ft 6 1/2ins to 26ft 0ins. Modifications to the cab included the fitting of larger side and front windows, the latter being shaped to follow the outline of the upper corners of the engine casing. Shunters carrying BR numbers D2200 to D2241 were constructed by the Vulcan Foundry at Newton-Le-Willows, with Robert Stephenson & Hawthorns of Newcastle supplying numbers D2242 to D2340.

In 1955 the Drewry Car Co. received an order for 23 power equipments, including engine and transmission, but with the mechanical parts to be built by BR at Swindon Works. This was the start of the delivery of the 228 locomotives later to become Class 03, built between 1957 and 1962. No less than 146 were outshopped from Swindon, including two for service stock, sporting numbers 91 and 92, delivered in 1958. The remaining 82 shunters in this class were supplied from BR's Doncaster Works.

Differences in appearance between the Drewry and BR versions of this shunter included the fitting of a steam engine style chimney at the leading end of the engine casing, fitted on the majority of BR built locomotives, along with alterations to the cab roof profile. The earliest BR built shunters were provided with the same style of exhaust as the Drewry design - tapering to a narrow outlet from a wide base. It may have been due to the ever present sense of individuality on the GWR and BR Western Region that a steam type chimney was substituted - although not even Swindon managed a copper cap on this one !! The wheels on the Swindon built variety were 3ft 7ins, an 1 inch more than the Drewry version, with an all up weight of 30 tons 16 cwt, compared with the 32 tons 4 cwt of the latter.

Before the advent of the BR Modernisation & Re-Equipment programme of 1955, all locomotives were allocated all figure running numbers, which in the case of the small diesel shunters meant a block between 11100 and 11719. The Drewry locomotives carried numbers between 11100-11160 and 11212-11229 Later becoming D2200-41 and D2242-59), whilst the BR built 0-6-0s were numbered 11187-11209 (D2000-22). In addition they were painted a rather drab livery of all black. However, to relieve the monotony some details were picked out in other colours, including buffer beams/stocks in red, steam



Captured at Bo'Ness on the Bo'Ness & Kinneil Railway in the 1990s, by then Class 03 073 in its final 'Rail Blue' livery, this was one of the Drewry built 0-6-0s, with the 'Flowerpot' chimney.

(c) Rodger P. Bradley Collection

## Hunslet & Hudswell-Clarke Locomotives

The Hunslet Engine Co. of Leeds, although a pioneer of diesel traction for shunting locomotives, did not provide any examples for service with BR until 1955, when three 150hp 0-4-0s were delivered. This new design again made use of a Gardner engine, but this time; the six-cylinder 6L3 type was used. The mechanical transmission consisted of the Hunslet patent four-speed gearbox and final jackshaft drive to the 3ft 4ins coupled wheels. Weighing a mere 22 tons 9 cwt, a maximum tractive effort of 10,800 lbs was available.



Hunslet 0-4-0 D2951 - with a distinctive small "D" prefix - was one of the three 153hp shunters ordered from the Leeds based company in 1955. Minus its final drive gearbox, flycranks and coupling rod, this example looks fairly sorry for itself. Worth noting too, is the lack of any serif to the letter D, the crest is of 1956 vintage, but the absence of hazard stripes suggest the date is between 1957 and 1961. © *Lens of Sutton*

As with the first Drewry locomotives, deep side valances and 'cow catchers' were fitted to these 0-4-0s, numbered (originally) 11500-2. The full width cab, with a flattish roof had three large windows in the spectacle plate, allowing good visibility over the engine casing. The upper sides of the bonnet were angled inwards, but unlike the Drewry designs there was no prominent exhaust.

Subsequently, orders to Hunslet were for 0-6-0 types, with the 204hp Gardner engine, destined for the eastern, North Eastern and Scottish regions. Some 69 were completed between 1955 and 1961. The first of these 0-6-0s were numbered 11136-43 and 11161-76, with the same 3ft 4ins diameter wheels as the earlier 0-4-0 design. The final series however, had the wheel size increased to 3ft 9ins, weight was up from 30 to 32 tons, with the maximum tractive effort growing from 14,500 to 17,400 lbs.

The Hunslet patent four-speed gearbox was retained, along with the full width cab, but no side valances this time, although very deep front and rear buffer beams were a characteristic feature. Modifications to the cab windows to further improve visibility included a long horizontal pane over the four vertical panes in the cab side panel.

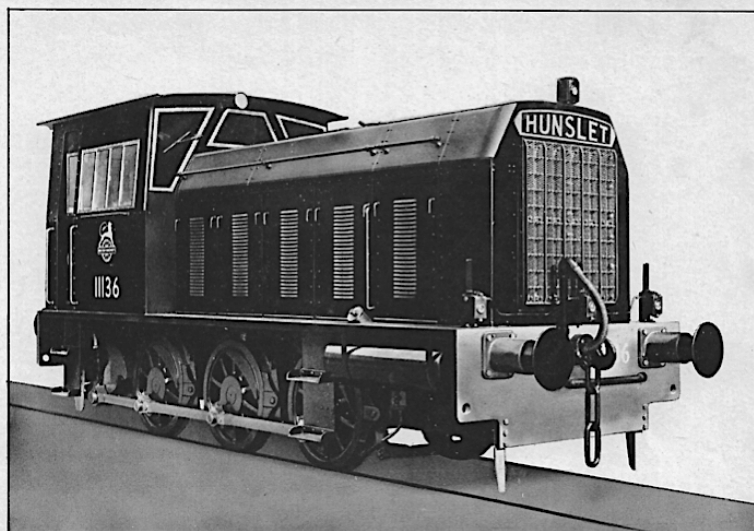
By far the majority of the Hunslet locomotives worked on the Eastern and North Eastern Regions, with some in Scotland and the three 0-4-0s permanently resident at Ipswich. In the early 1960s, two of the 0-6-0s, numbers D2612 and D2615 were transferred to Departmental stock as Nos. 88 and 89. Only one locomotive survived to carry a TOPS number, although D2550-D2618 were listed in 1968 as newly classified 05, D2554 was renumbered 05001 in 1973. This was in fact the third number carried by this locomotive, with the first being '11140' in 1955. It was subsequently transferred to departmental stock in the later 1970s and carried number 97863.

In 1956 and 1961, Hudswell-Clarke - just down the road from the Hunslet Engine Co. in Leeds - supplied 20 shunters in, outwardly at least, two very different styles. The first 10 were numbered 11116-20 and 11144-48, later renumbered D2500-9 and allocated to Birkenhead for use on the dock lines. Although all of the diesel-mechanical shunters could be said to have been built rather like steam locomotives, the first Hudswell-Clarke designs perhaps emphasised that point more than most.

An extract from a Hunslet advertising leaflet, showing the first of their 0-6-0 designs with original numbers and the first British Railway lion and wheel totem.

(c) *Rodger P. Bradley Collection*

### THE HUNSLET ENGINE CO. LTD *Engineers* LEEDS ENGLAND



	Hunslet Engine Co.	Hudswell-Clarke Ltd.
<b>Builders</b>	Hunslet Engine Co.	Hudswell-Clarke Ltd.
<b>No. Series</b>	D2550-2618 & D2950-2 (originally 11136-43/11161-76 & 11500-2)	D2500-19 (Originally 11116-20/11144-8)
<b>Wheel arrangement</b>	0-6-0 0-4-0 (D2950-2)	0-6-0
<b>Length over buffers</b>	0-4-0: 17ft 4 1/2ins 0-6-0: 22ft 6ins/21ft 10ins	26ft 1 1/2ins
<b>Overall width</b>	8ft 3ins	8ft 6ins
<b>Overall height</b>	0-4-0: 11ft 0 1/2ins 0-6-0: 11ft 0 1/2ins/11ft 11 3/4ins	11ft 0 3/4ins (D2500-9) 12ft 0ins (D2510-9)
<b>Wheelbase</b>	0-4-0: 5ft 6ins 0-6-0: 9ft 0ins	8ft 7ins
<b>Wheel diameter</b>	0-4-0: 3ft 4ins 0-6-0: 3ft 4ins/3ft 9ins	3ft 6ins
<b>Weight (w.o.)</b>	0-4-0: 22 tons 9 cwt 0-6-0: 30 tons/32 tons	36 tons 7 cwt (D2500-9) 34 tons 4 cwt (D2510-9)
<b>Max tractive effort</b>	0-4-0: 10,800 lbs 0-6-0: 17,400/14,500 lbs	16,100 lbs (D2500-9) 17,069 lbs (D2510-9)
<b>Braking equipment</b>	Air for locomotive, vacuum for train	Air for locomotive, vacuum for train *
<b>Diesel engine</b>	0-4-0: Gardner 6L3, 153 bhp, 6 cylinders, four-stroke 0-6-0: Gardner 8L3, 204 bhp, 8 cylinders, four-stroke Cylinders; 5 1/2ins x 7 3/4ins Piston speed; 1200 rpm	Gardner 8L3, 204 bhp, 8 cylinders, four-stroke Cylinders; 5 1/2ins x 7 3/4ins Piston speed; 1200 rpm
<b>Transmission</b>	Mechanical; Hunslet Patent 3 or 4-speed gearbox	SCR Type 5 fluid coupling to SSS "Powerflow" 3-speed or 4-speed (D2510-9) gearbox, incorporating final drive through jackshaft, flycranks and coupling rods.
<b>Final drive</b>	Hunslet Patent 3 or 4-speed gearbox incorporating final jackshaft and fly crank drive to coupled wheels.	Gearbox, incorporating final drive through jackshaft, flycranks and coupling rods.



**NOTES:** No Hudswell-Clarke locomotive survived to be reclassified in 1968. Of the Hunslet designs, only the 0-6-0s were classified as 05 in 1968, including Nos. D2550-2618. TOPS numbers were given to one locomotive, No.D2554, which became 05001 in 1973.

The final ten 0-6-0s from Hudswell-Clarke were delivered to BR in 1961 and were a lighter development of Nos. D2500-9, with the same power unit, but a 4-speed SSS gearbox and final drive. The jackshaft and flycranks were located in what could be described as the more conventional position, at the rear of the engine frame.

The first eight of these were allocated to Barrow on the London Midland Region and worked shunting and docks duties there, throughout their career, whilst one was put to work at Kilburn Parcels Depot in London, from its Willesden base, with the last of the class, No. D2519 was to be found at Crewe.

The upper works featured a much lower engine casing than the earlier design, with a more central cab, having large windows in the front and rear spectacle plates, giving good all round visibility. The Gardner type 8L3 engine was placed in the front, larger portion of the bonnet, with the gearbox and connection to the final drive passing beneath the cab floor.

For power, the Gardner 8L3 engine was again selected, mounted on the mainframes, driving a 3-speed SSS 'Powerflow' gearbox with jackshaft and flycrank drive to the coupled wheels, mounted at the front of the locomotive. The tall engine casing or bonnet, stopped just in front of the leading coupled wheels, with a raised casing on the front footplate, covering the final drive assembly. Perhaps the two features, which gave

the first Hudswell locomotives their steam type 'air', was the neat chimney at the front of the engine casing and the cab. Although the full width cab was an established feature of the design of diesel shunters by this time, a rearward projection from the cab backplate housing some controls, resembled in profile, a tank engine bunker.

In working order, numbers D2500-9 weighed 36 tons 7 cwt and were carried on 3ft 6ins wheels, with a wheelbase of 8ft 7ins, giving a maximum tractive effort of 16,100 lbs. On these engines only air and handbrakes were fitted, consequently they were unable to work vacuum fitted stock, unlike the later design from the same stable, an 0-6-0 type carrying running numbers D2510-9.

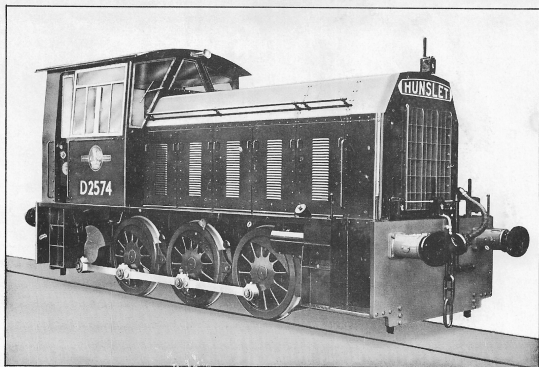
None of the two Hudswell-Clarke designs - there were only 20 locomotives in all - survived even to 1968, to the introduction of the later TOPS classification scheme and a number were sold for use by industry.



A good example of Hudswell-Clarke's early contributions is No. 11147. Ordered from this other major Leeds based builder in 1956, they spent much of their working lives on the dock lines at Birkenhead. In the later 1950s they were renumbered D2500-9, with 11147 carrying D2508. There was something very steam engine looking about these first Hudswell types and none survived to the BR TOPS scheme in 1973. (c) *Lens of Sutton*

Non-Standard Diesel Shunters on BR

THE HUNSLET ENGINE CO. LTD *Engineers* LEEDS ENGLAND



0-6-0 TYPE  
204 H.P. "HUNSLET" DIESEL LOCOMOTIVE

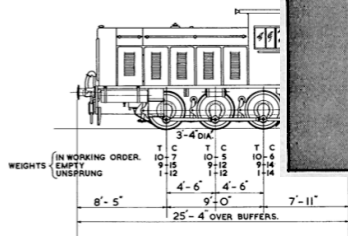
Gauge of Railway	...	4 ft. 8½ in.
Dia. of Coupled Wheels	...	
Wheelbase	...	
Height Overall	...	
Width Overall	...	
Length over Buffer Beams	...	
Maximum Power and Speed of Engine	...	
Speed, 1st Gear	...	
Speed, 2nd Gear	...	
Speed, 3rd Gear	...	
Speed, 4th Gear	...	
Fuel Capacity	...	
Weight in Working Order	...	
Maximum Axle Load	...	
Maximum Tractive Effort 1st Gear	...	
Tractive Effort 2nd Gear	...	
Tractive Effort 3rd Gear	...	
Tractive Effort 4th Gear	...	
Ratio, Adhesive Weight—Tractive Effort	...	
Minimum Radius of Curve Engine will traverse with ease	...	
Weight per yard of Lightest Rail advisable	...	
Load Engine will start and haul in 1st Gear	...	
" " " haul in 2nd Gear	...	
" " " " 3rd Gear	...	
" " " " 4th Gear	...	

Loads hauled are based on 18 lbs./ton Starting Resistance and

426/58

Code Word—SCOTI

One of the later batches from Hunslet, with the new logo and livery applied.



# Non-Standard Diesel Shunters on BR

ENGINE.	MAKE & TYPE.	ARMORER 8-13	TYPE OF LOCOMOTIVE.	CLASS	CLASS O5
	No. OF CYLS. & CYCLE.	4-2			
	MAX. CONT. RATED OUTPUT.	200 H.P.			
TRANSMISSION.	ENGINE TO GEARBOX.	HUNSLET PATENT FRICTION CLUTCH.	BRAKE FORCE.	OF FULL WEIGHT	20.5 TONS
	GEARBOX.	HUNSLET FOUR SPEED.	(IN WORKING ORDER).		
	FINAL DRIVE.	JACKSHAFT & COUPLING RODS.	MAX. PERMITTED SERVICE SPEED.		17.8 M.P.H.
PERFORMANCE.	MAX. TRACTIVE EFFORT.	14,500 LB. AT 21.6% ADHESION.	(WITHOUT GAUGE WIDENING:		1-82 CHAINS.
	CONT. TRACTIVE EFFORT.	14,500 LB. AT 4-48 M.P.H.	MIN. RAD. CURVE:		1-52 CHAINS.
			(AT DEAD SLOW SPEED:		300 GALLS.
			TANK CAPACITY.	FUEL.	

200 H.P. HUNSLET 0-6-0 DIESEL MECHANICAL SHUNTING LOCOMOTIVE.  
CLASS O5