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LOCOMOTIVES

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Classes 150 – 156 Second Generation DMUs

The UK's Number One Modern Traction Partwork

Modern LOCOMOTIVES ILLUSTRATED

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Above: In the days of Wessex Trains, a company owned by National Express, maroon pictogram-liveried Class 150 No. 150241 The Tarka Belle leads Class 153 No. 153305 painted in Heart of Wessex red, past Gunstone Mill, near Crediton on 8 June 2005 forming the 09.51 Barnstaple to Exmouth service. CJM

Cover: Displaying the latest Arriva Trains Wales two-tone turquoise livery, with white Arriva Trains branding, Class 150/2 No. 150236 calls at Taff's Well, with train 2E36, the 13.38 Merthyr Tydfil to Bridgend via Cardiff service on 6 June 2013. CJM

MLI Issue – No. 212 The Class 35 'Hymek'

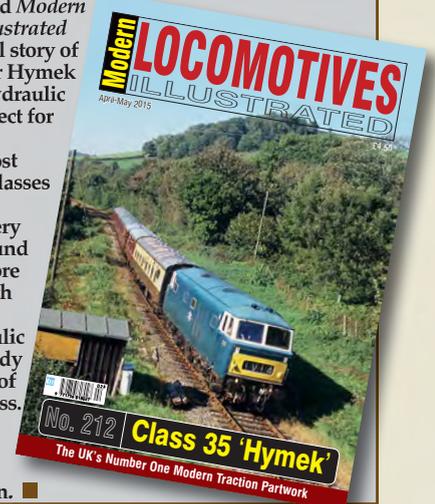
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Class 150-156 2nd Generation DMUs

During the early 1980s, the then British Railways Board (BRB) came to terms with the fact that in just a few years some 95% of their fleet of first generation DMU stock would need total replacement. While refurbishment of some of the older first generation vehicles was a help, replacement with new design stock was the only answer.

No off-the-shelf train design was immediately available and the BRB sought two builders to produce two prototype trains each, these orders went to BREL and Metro-Cammell. BREL used an existing EMU vehicle design altered for diesel operation, while Metro-Cammell designed a totally new product. The trains from both builders were produced to a strict design specification issued by the BR DM&EE department.

The urgency for introducing new trains was such, that by the time the Metro-Cammell trains were delivered, the BRB had already placed a production order with BREL York to build a squadron fleet of Class 150 two-car units.

The new stock was an immediate success with operators and passengers, and quickly several follow-on orders were placed, some going to BREL for further '150' design stock, while the private builders of Leyland and Metro-Cammell were awarded new build contracts for what became the Class 155 and 156 fleets.

Changes in service demand quickly saw the new BR Provincial sector requiring single-car stock and thus the majority of Leyland Class 155s were rebuilt as single-car Class 153s.

The original BR second generation DMUs soon became the property of private lease businesses and operated by the new privatised railway from the mid-1990s. Privatisation led to some major upgrade work, with much improved interiors.

The future of the UK rural and secondary lines looks set to continue to be a DMU-based operation, until electrification plans materialise in some areas. However, new stock will soon be required!

Colin J. Marsden
Editor

Contents

BREL Class 150 'Sprinter'	4	Leyland Class 153	52
Class 150 Technical and Cab	10	Class 153 Technical and Cab	54
Class 154 Technical	13	Class 153 Fleet List	63
Class 150 Drawing	14	Metro Cammell Class 156	64
Class 154	30	Class 156 Technical and Cab	66
Class 950	31	Class 156 Drawings	67
Class 150 Fleet List	32	Class 156 Fleet List	78
Metro Cammell Class 151	34		
Class 151 Drawing	35	Visit our new Modern Locomotives Illustrated website at www.modernlocomotives.co.uk for all the latest information about MLI and on line ordering.	
Class 151 Technical and Cab	36		
Class 151 Fleet List	38		
Leyland Class 155	40		
Class 155 Technical and Cab	42		
Class 155 Drawing	43		
Class 155 Fleet List	50		



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BREL Class 150 'Sprinter'

The story of the second generation of UK Diesel Multiple Unit (DMU) power, starts with the signing of contracts between the British Railways Board (BRB) and two manufacturers in March 1983 for two pairs of prototype three-car sets, with the aim of developing, one or both into a new standard UK multiple unit train.

The builders selected were Metro-Cammell of Washwood Heath, Birmingham and the 'in house' British Rail Engineering Ltd (BREL). Two three-car sets were ordered from each supplier, against a strict design specification set out by the DM&EE department. The plan was for the products to be evaluated before squadron ordering of different styles/formations was authorised. The products from Metro-Cammell became the Class 151. While those from BREL became the Class 150. The Class 151s are covered in the next chapter.

The BREL design was largely based on the previously established Mk 3 vehicle design. After authorisation, it was surprising at first to see the constructional contract placed with the BREL York workshop, a site more usually associated with electric multiple unit and hauled stock construction. However, York was selected, over Derby Litchurch Lane as it was already tooled for Mk3 style EMU production.

York completed its first three-car prototype Class 150 some three months ahead of schedule, with No. 150001 handed over to the then BR Provincial Sector in a ceremony on 8 June 1984.

The two Class 150 sets each comprised of three-vehicles, they were gangwayed only within each set, this permitted an improved front end design compared to the previous BREL Class 210 design. However, as time proved this was not a good feature, as between set access was needed for robust revenue protection and trolley-based catering. This subsequently led to the largest production batch of Class 150s incorporating end gangways.

The two original Class 150s were very much development trains, each was fitted with a different power package for evaluation.

All vehicles were powered, with a full width driving cab fitted in the outer end of each three-car set. Control equipment allowed for up to four units to operate in multiple, using new auto couplers incorporating physical, pneumatic and electrical connections.

The maximum design speed was 75mph (121km/h).

Body construction used a steel frame of rails and pillars, welded together onto which a light gauge steel skin was attached. The roof was formed of corrugated mild steel, of a common style to a Mk3 loco-hauled coach. The body structure was designed to withstand a 150 tonne compression loading at coupler height, thus meeting the UIC end-load requirements for the period. The structural design was produced with a 30 year fatigue life.

Passenger travelling requirements, largely dictated by market research, sought a quieter travelling environment than on first generation stock, therefore sound insulation was important, with an 'anti-drumming' compound applied as a spray within the body structure to reduce interior noise, this was supplemented by fibreglass thermal and acoustic insulation within the bodyside, floor and roof. The new bogie design also reduced the level of track noise transmitted to the passenger area.

The first of the build, No. 150001 was fitted with one Cummins NT855 R5 engine, rated at 285hp (213kW), driving a Voith 211 hydraulic transmission, Gmeinder final drive assemblies were provided (this later became the standard traction package). One traction package was fitted to each coach.

The second unit of the build, No. 150002 was fitted originally with Rolls-Royce Eagle C6 280HR engines, rated at 280hp (209kW). These drove a Self Changing Gears (SCG) R500 automatic gearbox. The final drive assemblies, mounted on one bogie of each car, were also supplied by SCG.

The bogies used under the design were a development of the successful BT13 family, with secondary suspension using air-bags, these incorporated a self-levelling valve for maintaining a standard floor height. Air operated tread brakes used composition blocks, rather than disc brakes.

Fully automatic Bergische Stahl Industrie (BSI) couplers were fitted instead of the Tightlock design at the outer ends, this enabled units to be coupled/uncoupled without the need of shunting staff. Within sets, vehicles were connected by semi-permanent bar couplers.

Passenger accommodation was similar to that provided on the then recently built Class 455 EMUs for the Southern Region. Each vehicle had two bi-parting sliding doors on

each side at the one and two third positions. The doors were under the overall control of the guard (conductor) but locally operated by passenger push-buttons. Double-glazed windows were fitted with tinted glass to reduce glare.

Saloon heating used waste engine heat, the heaters were mounted under seats, with air distribution by electric fans. This system was supplemented by an oil-fired water heater. Carriage ventilators were incorporated in the roof, and air circulation was aided by base-hinged, passenger-operated twin-hopper windows.

Saloon lighting was by un-diffused fluorescent tubes, longitudinally placed. Seating saloons were segregated from door vestibules by draught screens incorporating a toughened glass upper panel. A small lockable parcels or mail area was located in one driving car of each set, when not needed, passenger seating using tip-up seats was provided.

On the two prototype trains, two different seating styles were installed. No. 150001 had bus-type seating with a mix of unidirectional and facing, providing seats for 252, the crush-loading capacity was estimated at 617! The middle vehicle of set No. 150002 originally incorporated a new BR 'inner-suburban' seating style, which was not favoured by passengers in a market research study.

The original Class 150 concept design was deliberately flexible to accept a wide range of different interiors, ranging from inward facing bench seats to InterCity 'luxury' accommodation, the ratio of seats to standees could be varied to suit individual operating requirements. A modular toilet compartment was installed in one vehicle of each unit.

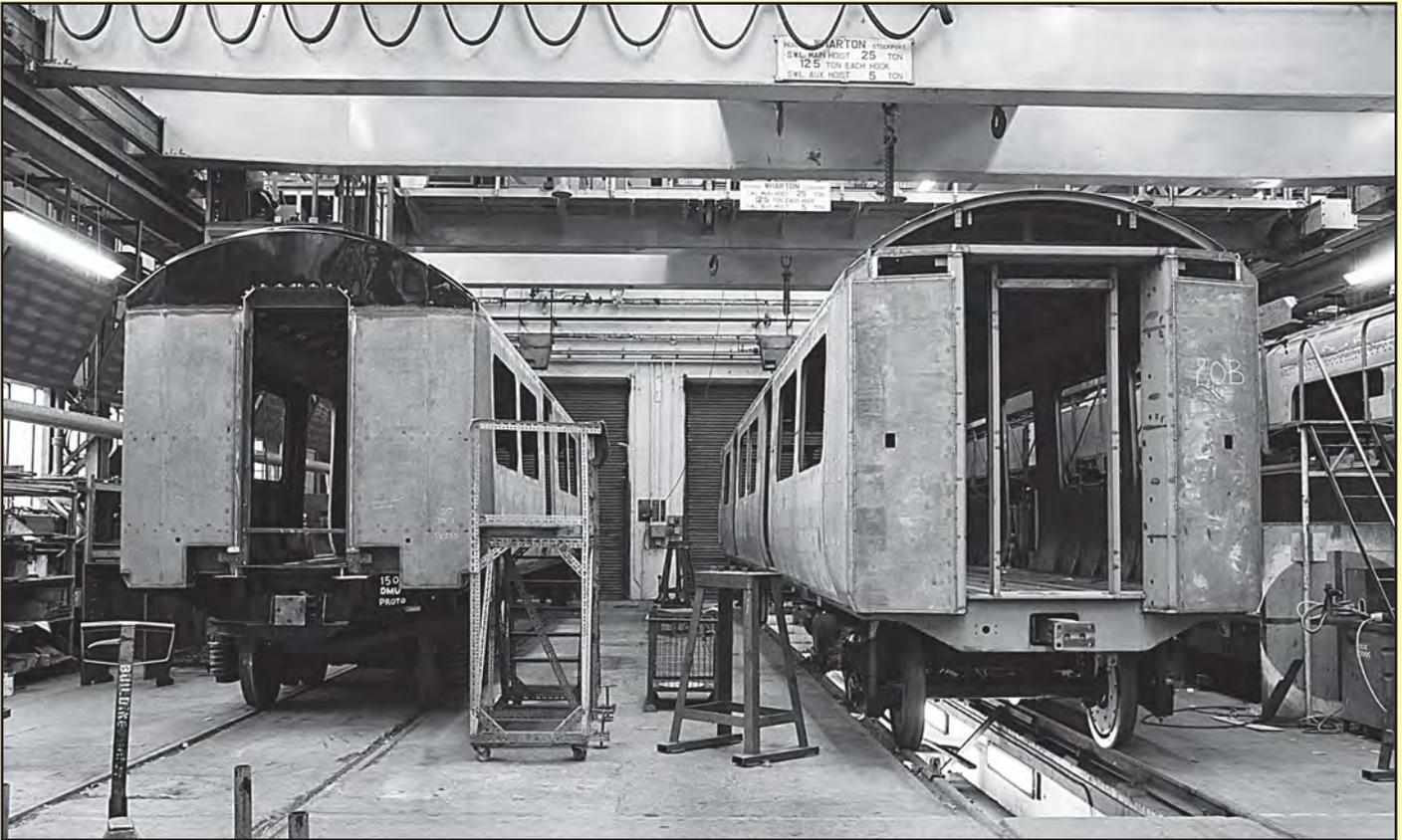
At design stage, it was envisaged that the basic concept could be modified for all future UK local and medium distance travel needs as well as fulfilling a potential export market, offered through the BR/BREL 'Transmark' banner.

The layout of the driving cab was based on the full-width design with a left side position. The power controller or throttle was positioned on the right side and the brake controller stalk (as it was originally on the first two sets) on the left side. Dials and switch gear was provided on an inclined panel and on the flat of the desk. The cab compartment had no external doors, with a central 'push-through' vestibule door feeding a transverse walkway with hinged side doors, this did occupy valuable seating space, and at the official '150' launch, the then BR Provincial Director John Edmonds told the press that the BRB were to seek Trade Union agreement to adopt a new front of vehicle design with seats going right up to the front windows on the outside for subsequent builds - however this did not materialise!

The prototype Class 150 sets were allocated ⇨



Left: After the two prototype three-car Class 150/0 sets had been tested at Derby and given certification to operate the sets started a tour around the main areas in England, Scotland and Wales where the new design was to be deployed to gauge both staff and passenger reaction. On 21 January 1986, set No. 150001 awaits departure from Inverness with the 10.32 stopping service to Aberdeen. This was part of a two-month trial period of working in Scotland, which saw the set used on most DMU routes. CJM



to Derby Etches Park depot and operated extensive trials on services between Derby and Matlock. They soon became known as 'Sprinters' due to their high acceleration rates away from station or signal stops and thus a 'Sprinter' logo was developed and applied to the original paint scheme. Livery for the prototype units used Provincial Sector two-tone blue, white and light grey.

In November 1984, prior to any worthwhile feedback from the operation of the prototype sets was available, authorisation was granted by Government to the BRB to order a further 50 'Sprinter' sets, these were to be classified as Class 150/1 and would be two-car units and be supplied by BREL, thus signalling the end for the Metro Cammell design. The order was valued at £25 million and assembly was again awarded to BREL York. Except for a modified livery, the original structural design was closely followed. Units were gangwayed only within sets and they did away with the expensive sliding door for the cab vestibule and used a hinged slam design. Construction commenced immediately with deliveries between October

Above: The first of the Class 150/2 vehicles No. 52201, seen on the left next to a Class 318 EMU vehicle, poses for the camera at BREL York Works on 5 February 1986. The two shells are seen in the main fabrication shop before cleaning and painting. This Class 150 vehicle was then shipped to the RTC Derby for structural testing before being returned to York for completion. CJM

Right: Soon after delivery, both the Class 150 sets were deployed on the Derby to Matlock branch line, a self contained route and one on which if a failure or problem occurred the train could easily be recovered. The second of the build, No. 150002 is seen at Derby station on 4 April 1985 awaiting to depart to Matlock with an afternoon service. In the early days, sets were often pulled from service or had guests of the BRB travelling on board, looking at the new generation of rural and medium distance rail travel. CJM

1985 and March 1986 to Derby Etches Park depot.

By January 1986, 37 of the new 'Sprinter' sets had replaced most of the first generation DMMUs in the East Midlands, this was some three months earlier than originally planned. As projected by railway commentators, there was no 'phasing-in' period with old and new sets working together due to the inability to couple sets together. All 50 Class 150/1s entered service together, taking over services throughout the Midlands, North and mid-Wales from the May 1986 timetable change. However, due to the speed of delivery and impressive reliability levels, enough of the fleet were available to enable the first generation DMMUs to be replaced or transferred to other areas from January 1986.

In terms of work, the 37 'Sprinter' sets took over all services on the Lincoln to Nottingham/Birmingham/Crewe, Leicester to Birmingham and Derby to Matlock routes. Some of the class also operated to Grantham and Peterborough. March 1986 saw an official launch of '150/1s' using the Cambrian lines in mid-Wales.

By this time the BRB had become very pleased with the Class 150 design, by then the Class 151 Metro-Cammell prototype had failed to meet expectations and had already been sidelined by the BRB. Therefore, by late 1985 agreement was reached between Government and the BRB to order a further fleet of two-car 'Sprinter' sets, these were classified as Class 150/2 and incorporated a re-design of the front end housing end gangways, enabling staff and passengers to have full train access, this considerably improved revenue protection and allowed for the provision of on-train catering on longer-distance routes.

Design work to allow the front end modification required major structural re-engineering, providing a front end more in style with the final two batches of Southern Region Class 455s and the Class 317s working on the Midland Region. The driving cab had to be totally redesigned to occupy just one third of the vehicle width. This was very restricting in terms of equipment provision and personal space for the driver. At the same time, the slam-style cab vestibule doors were →





replaced by a single leaf sliding door, this was also to be available for passenger access on multiple formed trains. A glazed door from the transverse gangway led into the passenger saloon. The passenger environment was much in keeping with the earlier design with just a few refinements made to meet customer and operator requirements. The door screens were of a modified design.

As the design incorporated major structural changes, a prototype body shell was fabricated at BREL York in January / February 1986 and sent to the Engineering Development Unit (EDU) at the Railway Technical Centre, Derby for structural testing. This was later returned to York and included in the first complete set, carrying the running number 150201 emerging from BREL York on 20 September 1986.

The unit was transferred directly to the EDU at Derby for type test approval and soon entered passenger traffic.

It is interesting to record that the first batch of Class 150/2 deliveries emerged without full yellow ends, having a light grey front end, with

just yellow applied to the central gangway door, this was soon replaced with the standard full yellow warning end.

A total of 85 two-car Class 150/2s were built, allocated to virtually all areas of the railway, apart from the Southern Region, to replace first generation DMMU stock. These sets were well accepted by both staff and the travelling public and have performed extremely well ever since.

As part of the testing procedure for the original design, set No. 150002 was the subject of a number of trial and test fittings, this included air conditioning trials during the design phase for equipment to be installed on the then proposed Class 158 fleet. The air conditioning modification saw modules fitted to coach roofs. After all design work had been completed, set No. 150002 was modified back to standard form, losing its Rolls Royce engines in favour of the standard Cummins design. During the sets period as a development unit, it was reclassified as Class 154 and carried both numbers 154001 and 154002 at various times,

often being reduced to a two-car set.

Over the ensuing 30 years, the '150' fleets have seen considerable change. The original two prototype sets were modified as three-car 'standard' sets and operated originally in the West Midlands, this continued through privatisation working for Central Trains and subsequently London Midland. In more recent times the pair were transferred to First Great Western at Reading depot to operate on the Reading to Basingstoke route, before one set had a period of working in the West Country in summer 2014.

The Class 150/1 sets have also seen much change, soon after introduction, a number were modified to operate as three-car units, with sets formed of a Class 150/1 with a Class 150/2 vehicle coupled between, originally these retained their 150/1 numbers, these were mainly short-term reformations. Later a number of temporary reformations took place for Centro, later Central Trains and then London Midland use. This modification was again done by the insertion of a single Class 150/2 →

Above: Another area which saw extensive use of the prototype Class 150s was on the valley lines radiating from Cardiff, where considerable pressure was placed on the BRB to introduce new stock to replace worn out first generation DMMUs. For three weeks in July 1985, set No. 150001 was allocated to Cardiff Canton and operated over all the valley lines. On 5 February 1985 the set is seen at Merthyr with an additional service to Cardiff. During this period, in addition to carrying normal passengers, decision makers, MPs and senior railway officers were found on many services. CJM

Left: On 25 August 1985, the pioneer '150' No. 150001 awaits departure from one of the north bays at Edinburgh Waverley with a service bound for Perth, during the period of regular passenger operation. For its workings in the Scottish low-lands the set was based at Edinburgh Haymarket, a depot later to become the main base for 'Sprinter' stock in the area. In this view, the sets DMS is nearest the camera. www.colour-rail.com



Right Top: When not in use for demonstration or testing purposes, the two prototype '150s' were used on regular services based at Derby. On 10 July 1986, set No. 150001 departs from Ambergate station with the 17.48 Derby to Matlock service. CJM



Right Middle: The first railtours operated by a 'Sprinter' were six return trips between Derby and Wirksworth operated by Hertfordshire Railtours on 27 May 1985, when set No. 150002 powered the Wirksworth Phoenix services. One of the services is seen awaiting departure from Wirksworth. www.colour-rail.com / K Fairey



vehicle between Class 150/1 cars, allowing full access through each three-car unit. These sets were numbered in the 150/0 series. Today, they have all returned to two-car formation and are operated by London Midland, First Great Western and Northern Rail.

The Class 150/2 sets, all of which have seen major refurbishment since original introduction, now sport very different interiors, using the 2+2 low-density seating with different seat designs. In 2015, sets are operated by Northern Rail, Arriva Trains Wales, and First Great Western.

A diverse selection of liveries have been carried by the '150' fleet. After the standard 'Sprinter' colours, came privatisation from 1996 and the transfer of ownership of the fleet to either Porterbrook and Angel Trains leasing. By 2015, some 38 different livery schemes have been recorded on the design, many of which are shown in the pictorial pages of this edition of *MLI*.

Towards the end of the Class 150 build, two extra Class 150/1 style vehicles were hand-built at BREL York to provide special bodyshells for a new Track Assessment Train, later classified as Class 950 and numbered 950001. This twin-set, based at Derby and now operated by Network Rail, traverses the UK network on track inspection duties. It is largely based on a Class 150/1 but has a number of structural modifications. One vehicle is basically a Class 150/1 while the other is a mobile laboratory with different design windows and doors. ■

Carrying a rather attractive 'Sprinter-Link' headboard, which was seen attached to a number of regional demonstration runs, set No. 150001 poses for the camera at Rhymney on 6 July 1985, while demonstrating the train to local council officials, user groups and the general public. CJM





Above: Following the November 1984 order for the follow-on Class 150/1 stock delivery was rapid. In this view taken on 27 September 1985, set No. 150106 is seen in York Works Yard as a complete structure but prior to fitting out. No handrails are fitted, the cab doors are not fitted and the battery box is open. This set was delivered to Derby shed a month later.
Colin Burnham



Left: Throughout the period April 1985 to November 1987 the yards at BREL York Works were peppered with Class 150 stock being built and made ready for handover. This rapid delivery schedule saw no less than 270 vehicles delivered in around 130 weeks equating to around one complete set per week. On 5 February 1986, set No. 150141 awaits transfer to Derby in BREL York Works hand-over yard.
CJM





Above: When the first tranche of the second Class 150 follow-on order for 85 Class 150/2s they emerged in a revised 'Sprinter' livery with a dark blue upper body and grey lower separated by a light blue and white band with the 'Sprinter' legend on the bodyside. The outer ends were the subject of some debate as they were grey body colour except for the center gangway door which was warning yellow. This was subsequently changed to give a full yellow end. Set No. 150230 is seen as the rear unit of the 14.04 Liverpool Lime Street to Scarborough service at Marsden on 19 March 1987. **CJM**



Right Middle: The first of the Class 150/2 sets to be handed over to the Provincial Sector was No. 150202 at the end of January 1987 and allocated to Neville Hill. However, the set was used for type test approval work and demonstration purposes. On 21 March 1987 the set in company with another Class 150/2 and a Class 144 are seen displayed in the bay platforms at York station as part of an engineering conference held in the city. **CJM**

Left: The Derby Etches Park allocated Class 150/1s soon found deployment on the Cambrian route from Shrewsbury to Aberystwyth and Pwllheli. To operate on this route Radio Electronic Token Block (RETB) equipment had to be installed. On 26 March 1990 sets Nos. 150120 and 150109 pass Sutton Bridge Junction, Shrewsbury forming the 09.20 Birmingham New Street to Aberystwyth. **CJM**



Right Below: Prior to full yellow ends being applied, Class 150/2 No. 150224 clearly showing the Provincial Trains 'Sprinter' livery, heads another two-car set entering Leeds City station with a service bound for Scarborough during 1987. www.dieselimagegallery.com / **Jim Binnie**

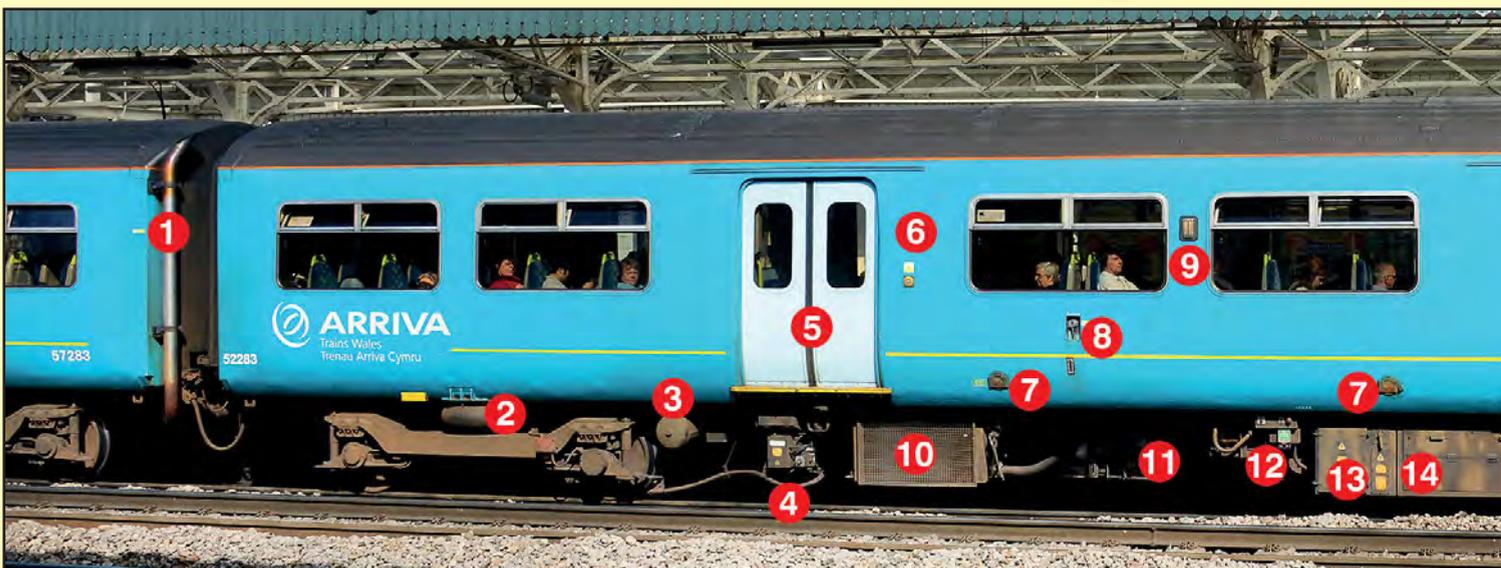
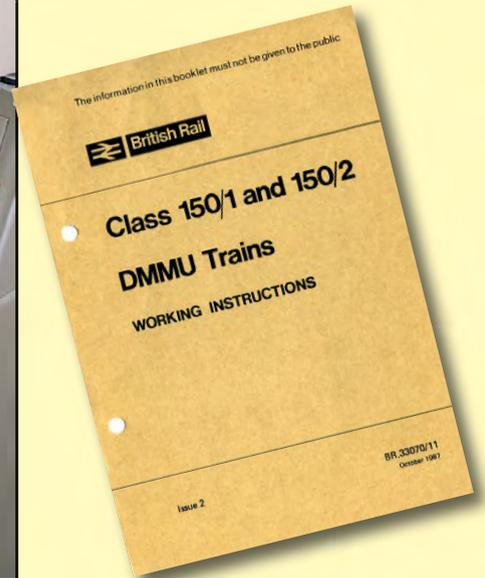


Class 150 Technical and Cab



Left: Class 150/1 driving cab. 1: Cab air fan, 2: TPWS system, 3: Lamp for illuminating notice board, 4: Radio telephone handset, 5: Driver-guard and public address telephone, 6: Drivers reminder appliance, 7: Emergency bypass switch, 8: Cab air vent, 9: Left side door open buttons, 10: Gearbox fault unit warning light, 11: Gearbox fault train warning light, 12: Engine stop button, 13: Engine start button, 14: Windscreen wiper control valve, 15: Brake controller, 16: Horn valve, 17: AWS re-set button, 18: Cab radio, 19: Main reservoir and brake pipe pressure gauge, 20: Speedometer, 21: AWS indicator and alarm, 22: Marker light switch, 23: Instrument light switch, 24: Demister switch, 25: Destination indicator light switch, 26: Tail light switch, 27: Headlight switch, 28: Spare, 29: Compressor speed up switch, 30: Hold gear switch. 31: Right side door open buttons, 32: Sander button, 33: Driver-guard signal button, 34: Spare, 35: Couple button, 36: Uncouple button (below hinged flap), 37: Power controller/throttle, 38: Master key socket, 39: Master switch forward, neutral, reverse), 40: Drivers safety device peddle. CJM

Below: Class 150/1 and 150/2 working instructions manual. CJM Collection

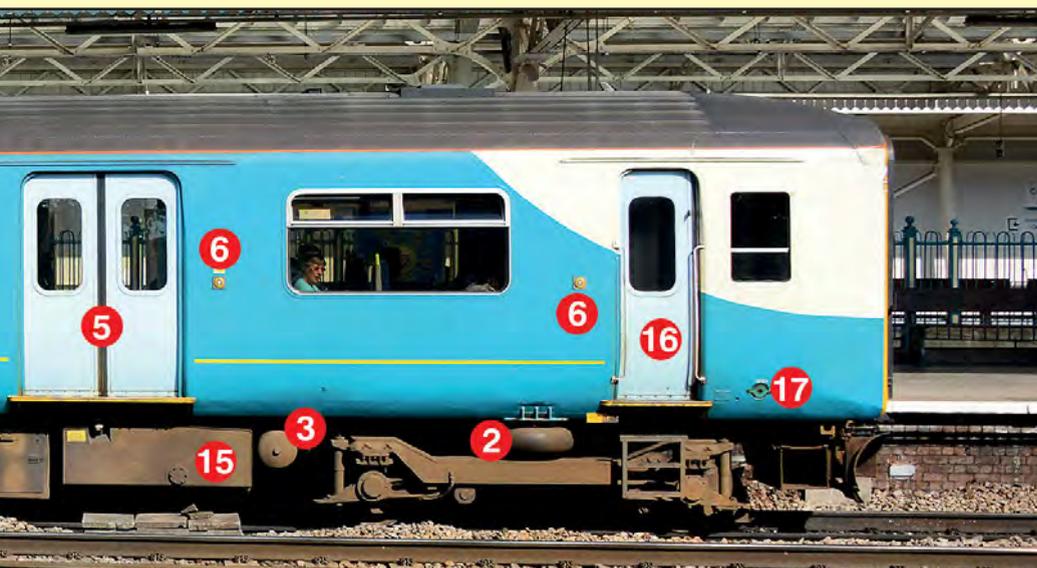


Right: Class 150/2 driving cab. 2: TPWS equipment, 3: Notice board light, 4: Radio telephone handset, 5: Driver-guard and public address telephone, 6: Drivers reminder appliance, 7: Emergency bypass switch, 8: Cab air vent, 10: Gearbox fault unit warning light, 11: Gearbox fault train warning light, 12: Engine stop button, 13: Engine start button, 14: Windscreen wiper control valve, 15: Brake controller, 16: Horn valve, 17: AWS re-set button, 18: Cab radio, 19: Main reservoir and brake pipe pressure gauge, 20: Speedometer, 22: Marker light switch, 23: Instrument light switch, 24: Screen demister switch, 25: Destination indicator light switch, 26: Tail light switch, 27: Headlight switch, 28: Spare, 29: Compressor speed up switch, 30: Hold gear switch, 32: Sander button, 33: Driver-guard signal button, 35: Couple button, 36: Uncouple button (below hinged flap), 37: Power controller/throttle, 38: Master key socket, 39: Master switch (forward, neutral, reverse), 40: Drivers safety device peddle. 41: Supply change-over switch. Cabs on Class 150/2 sets are in the process of modernisation. **CJM**



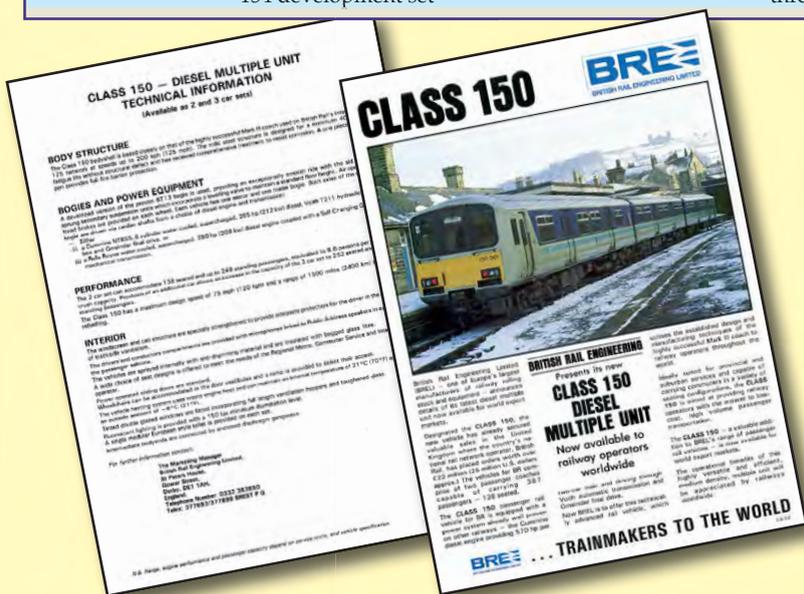
Right Below: Class 150/2 driving cab showing non-driving side, showing auto-announcer unit (above) and OTMR drivers interface unit (orange) below. **CJM**

Below: Class 150/2 equipment positions. 1: Exhaust stack, 2: Air suspension bag, 3: Air reservoir, 4: Sander system with gearbox behind, 5: Bi-parting passenger doors. 6: Passenger door open button, 7: Emergency door release valve, 8: Coolant filler port, 9: Door release/hazard warning light, 10: Radiator, 11: Engine, 12: Local engine controls, 13: Battery isolating switch, 14: Battery box, 15: Fuel tank, 16: Single leaf sliding door to cross vestibule (cab door), 17: Manual door release valve. **CJM**



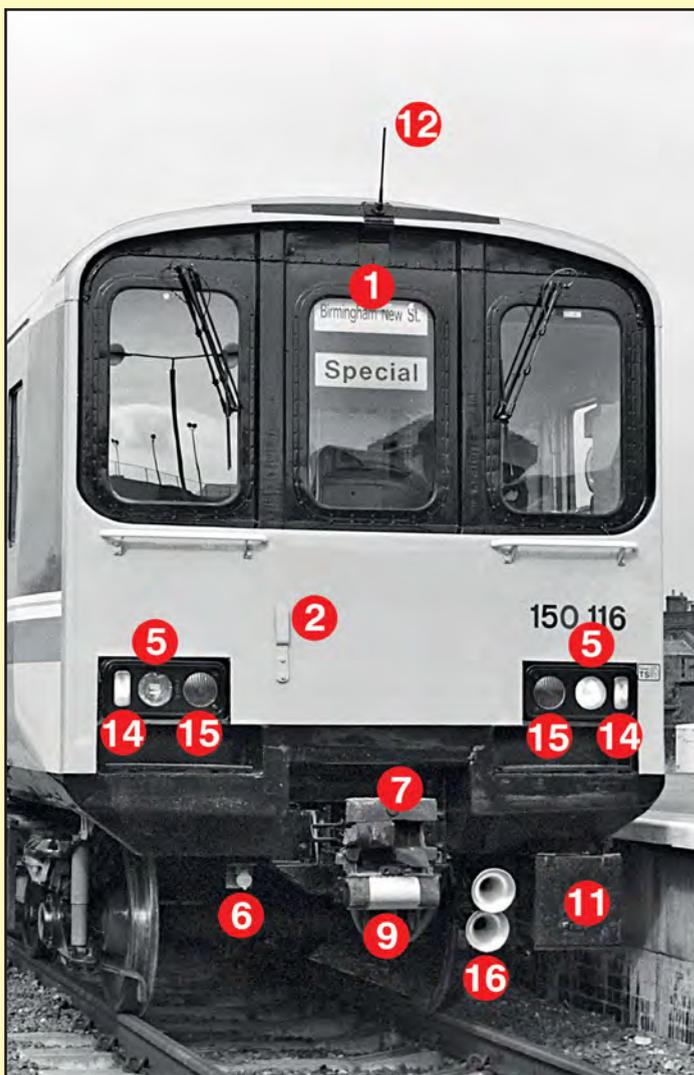
Class 150 Technical Description

Class:	150/0	150/1 (2-car)	150/1 (3-car)	150/2
Number range:	150001-150002	150101-150150	150003-150019	150201-150285
Introduced:	1984	1985-1986	Original - 1985-86 As 3-car - 1995-2011	1986-87
Built by:	BREL York	BREL York	BREL York	BREL York
Formation:	DMSL+MS+DMS	DMSL+DMS	DMSL+DMS(L)+DMS	DMSL+DMS
Vehicle numbers:	DMSL - 55200-55201 MS - 55400-55401 DMS - 55300-55301	DMSL - 52101-52150 DMS - 57101-57150 -	DMSL - 52103-52119 DMS(L) - 522xx, 572xx DMS - 57103-57119	DMSL - 52201-52285 DMS - 57201-57285 -
Vehicle lengths:	DMSL - 65ft 9¾ in (20.06m) MS - 66ft 2½ in (20.18m) DMSL - 65ft 9¾ in (20.06m)	DMSL - 65ft 9¾ in (20.06m) DMSL - 65ft 9¾ in (20.06m)	DMSL - 65ft 9¾ in (20.06m) DMSL - 65ft 9¾ in (20.06m)	DMSL - 65ft 9¾ in (20.06m) DMSL - 65ft 9¾ in (20.06m)
Height:	12ft 4½ in (3.77m)	12ft 4½ in (3.77m)	12ft 4½ in (3.77m)	12ft 4½ in (3.77m)
Width:	9ft 3¾ in (2.82m)	9ft 3¾ in (2.82m)	9ft 3¾ in (2.82m)	9ft 3¾ in (2.82m)
Seating:	As built: Total - 239/252S DMSL - 76S MS - 55400 - 84S - 55401 - 97S DMS - 79S 2015: Total - 233S DMSL - 72S MS - 92S DMS - 69S (plus 6 tip-up)	As built: 138S DMSL - 68S DMS - 70S Post privatisation: Total - 129-148S DMSL - 59-72S DMS - 70-76S	Total - 211 or 212S DMSL - 71S DMS(L) - 70/71S DMS - 70S	As built: Total - 149S DMSL - 73S DMS - 76S Post privatisation: Total - 116-142S DMSL - 60-71S DMS - 56-71S
Internal layout:	2+3	2+3	2+3	2+3 or 2+2
Gangway:	Within set	Within set	Within set	Throughout
Toilets:	DMSL - 1	DMSL - 1	DMSL - 1	DMSL - 1
Weight:	Total - 99.3 tonnes DMSL - 35.4 tonnes MS - 34.1 tonnes DMS - 29.8 tonnes	Total - 76.4 tonnes DMSL - 38.3 tonnes DMS - 38.1 tonnes	Total - 114.5-114.7 tonnes DMSL - 38.3 tonnes DMS(L) - 38.1/38.3 tonnes DMS - 38.1 tonnes	Total - 74 tonnes DMSL - 37.5 tonnes DMS - 36.5 tonnes
Brake type:	Air EP	Air EP	Air EP	Air EP
Bogie type:	Powered - BX8P Trailer - BX8T	Powered - BP38 Trailer - BT38	Powered - BP38 Trailer - BT38	Powered - BP38 Trailer - BT38
Power unit:	As built - 150001 1 x Cummins NT855R4 of 285hp (213 kW) per vehicle As built - 150002 1 x Rolls Royce 'Eagle' C6 280HR of 280hp per vehicle 2015 - 1 x Cummins NT855R5 of 285hp (213 kW) per vehicle	1 x Cummins NT855R5 of 285hp (213 kW) per vehicle	1 x Cummins NT855R5 of 285hp (213 kW) per vehicle	1 x Cummins NT855R5 of 285hp (213 kW) per vehicle
Transmission:	Hydraulic	Hydraulic	Hydraulic	Hydraulic
Transmission type:	Voith T211r	Voith T211r	Voith T211r	Voith T211r
Horsepower:	150001 - 855hp (639kW) 150002 - 840hp (633kW)	570hp (426kW)	855hp (639kW)	570hp (426kW)
Max speed:	75mph (121km/h)	75mph (121km/h)	75mph (121km/h)	75mph (121km/h)
Coupling type:	Outer - BSI Between cars - Bar	BSI	BSI	BSI
Multiple restriction:	Class 14x, 15x, 170, 172	Class 14x, 15x, 170, 172	Class 14x, 15x, 170, 172	Class 14x, 15x, 170, 172
Door type:	Bi-parting sliding (cab door - sliding)	Bi-parting sliding (cab door - slam)	Bi-parting sliding (cab door - slam, slide on 150/2 car)	Bi-parting sliding (cab door slide)
Body structure:	Steel	Steel	Steel	Steel
Owner Privatisation:	Angel Trains	Angel Trains	Angel Trains	Angel Trains
Operator 2015:	First Great Western	London Midland, First Great Western, Northern Rail	(Used in West Midlands)	Northern Rail, London Midland, First Great Western, Arriva Trains Wales
Notes:	Original prototype sets 150002 operated as Class 154 development set		Now disbanded. A number of Class 150 sets were reformed as three-car units at various times	



Right: Class 150 front end layouts. 1: Destination indicator, 2: Lamp bracket, 3: Front gangway door, 4: Combined LED marker/tail light, 5: Headlight, 6: Emergency air supply, 7: BSI coupling, 8: Jumper socket, 9: Electrical connection box, 10: Obstacle deflector plate, 11: Emergency coupling adaptor box, 12: Radio aerial, 13: Forward facing camera (CCTV), 14: Marker light, 15: Tail light, 16: Air warning horns. All: CJM

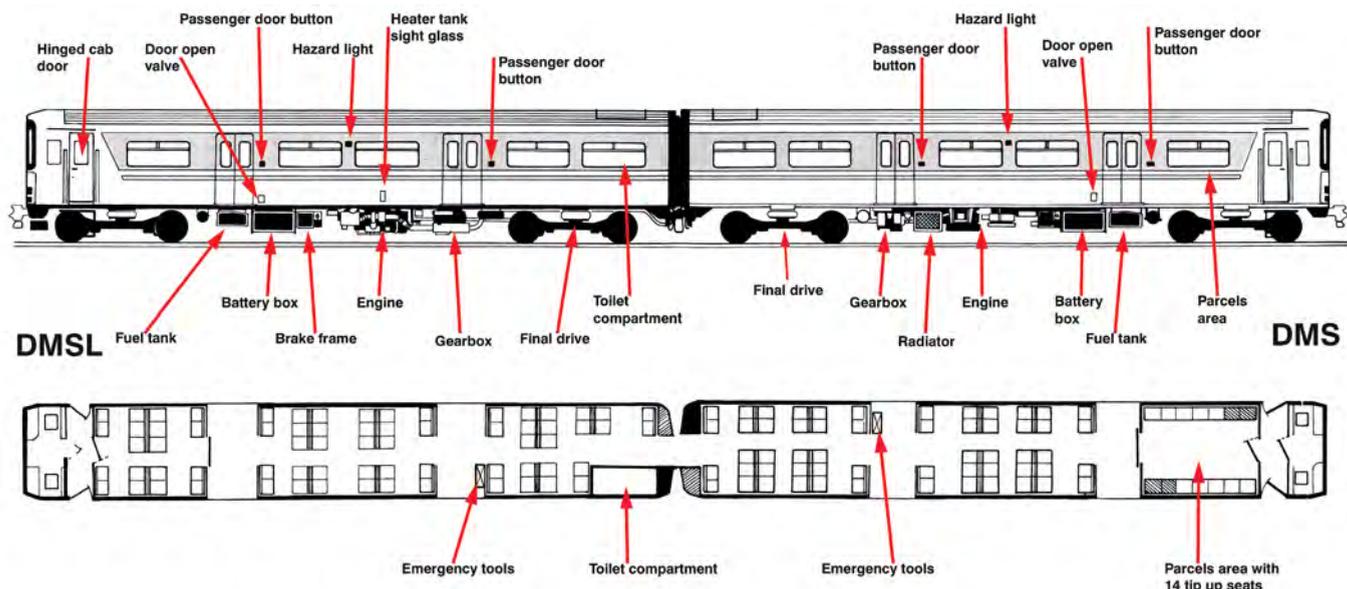
Left: When the two original Class 150/0 prototype sets emerged from BREL York and were delivered to Derby, the BREL publicity team produced a sort of sales brochure which was sent to virtually all railway operators in Europe offering the 'Sprinter' design. Sadly the only taker of a similar design was Northern Ireland Railways who ordered nine Class 450 'Castle' class sets. All of which have now been withdrawn and most have been broken up. CJM Collection



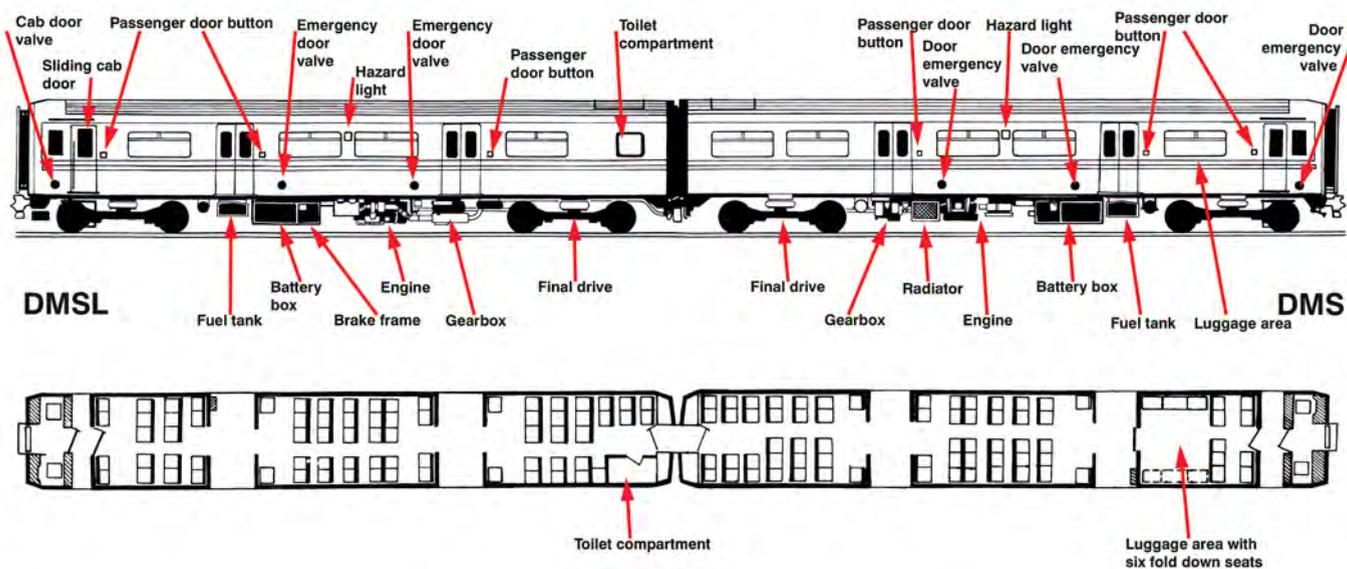
Class 154 Technical Description

Class:	154
Number range:	154001 also carried number 154002
Former number:	150002
Introduced:	Originally 1984, modified as Class 154 1987
Built by:	Originally: BREL York, Modified: EDU, RTC Derby
Formation:	DMSL+MS+DMS
Vehicle numbers:	DMSL - 55201 MS - 55401 DMS - 55301
Vehicle length:	DMSL, DMS - 65ft 9¼in (20.06m) MS - 66ft 2½in (20.18m)
Height:	12ft 4½in (3.77m)
Width:	9ft 3¼in (2.82m)
Seating:	Total: 2155 DMSL 58S, MS - 97S, DMS - 60S
Internal layout:	2+2 / 2+3
Gangway:	Within set
Toilets:	DMSL - 1
Weight:	Total - 110.2 tonnes DMSL - 37.9 tonnes MS - 34.4 tonnes DMS - 37.9 tonnes
Brake type:	Air EP
Bogie type:	Powered - BX8P, Trailer - BX8T
Power unit:	DMSL and DMS 1 x Cummins NT855R5 of 285hp (212.5kW) MS 1 x Rolls Royce 'Eagle' C6 305R of 350hp (261kW)
Transmission:	Hydraulic
Transmission type:	Voith T211r
Horsepower (total):	920hp (686kW)
Max speed:	90mph (140km/h)
Coupling type:	Outer end - BSI, Inner - bar
Multiple restriction:	Class 14x, 15x
Door type:	Bi-parting sliding (cab door - slam)
Special features:	DMSL / DMS fitted with air conditioning
Body structure:	Steel
Notes:	Original prototype 'Sprinter' returned to 150002 Used as Class 154 as development vehicle for Class 158 equipments

Class 150/1



Class 150/2



Viewed from its DMSL end, Derby-allocated set No. 150116 traverses the four track section near Balby, Doncaster soon after passing Hexthorpe Junction on 10 May 1991 forming an all-stations Sheffield to Doncaster service. Today, this set is operated by Northern Rail allocated to Newton Heath depot in Manchester. CJM





Above: The original Provincial livery using a wide light blue upper body band, with a darker blue lower stripe, was only applied to the 50 members of Class 150/1. It looked smart, wore well and during market research scored well with the travelling public. However, when the later dark upper body colour emerged on the later Class 150/2 sets this was a major visual improvement. On 24 April 1989, set No. 150115 pulls away from its Wakefield Westgate station stop with an all stations service from Derby to Leeds. **CJM**



Right Middle: The Midlands to North Wales Coast through services were soon taken over by Class 150s, frequently operating in pairs to meet passenger demand. A double-unit formation, led by set No. 150133 departs from Abergele on 13 June 1987 forming the 11.50 Llandudno to Nottingham service. This set continued to operate after privatisation for the northern franchises and is now operated by Northern Rail. Between February 2007 and March 2008 the set was loaned to Silverlink to cover a unit shortage and was named Northern Star. **John Whiteley**



Right Bottom: Another early route to see 'Sprinterisation' was the Hope Valley line linking Sheffield with Manchester, replacing ancient first generation DMMUs and some loco-hauled stock. On 15 May 1988, set No. 150115 departs from Grindleford station with a service bound for Manchester Piccadilly. **John Whiteley**



Above: After the Class 150/2s entered service, one of the first areas to operate the sets was Cardiff on the Valley lines. Showing the revised '150/2' livery, set No. 150275 arrives at Taffs Well on 6 April 1992 with the 14.34 Merthyr to Cardiff service. In the distance, the line branching off to the right served Nantgarw coking plant. **CJM**



Left: From their introduction for many years the Class 150/2s were common operating over the Standedge route between Leeds and Manchester. Today, most services are in the hands of First TransPennine Express Class 185s. On 28 April 1987, set No. 150210 passes Midge Hill near Mossley forming the 15.39 Leeds to Manchester Piccadilly service. **John Whiteley**

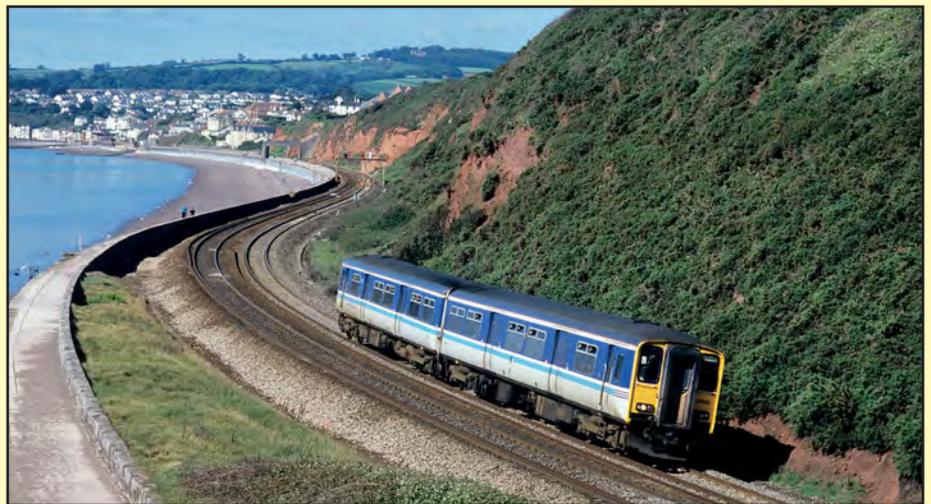
Below: In 1989 under the sectorisation of BR a trading title Network North West was derived for services in the North West of England. A handful of Class 150/2s were repainted into a NNW livery before Regional Railways was formed and new liveries were introduced. Repainting of Class 150/2s was undertaken at Doncaster Works, where set No. 150201 is posed after release from the paint shop in April 1989. **CJM**





Above: Network North West set No. 150207 is seen on the outskirts of Llandudno on 29 May 1993, coupled to a Regional Railways 'Express' liveried Class 158 running as an empty stock train. John Whiteley

Right: Upon the formation of Regional Railways in the 1980s a careful refinement of the 'Sprinter' livery was devised which saw only a minor change, mainly around the cab-sides. Regional Railways liveried set No. 150242 approaches Dawlish Warren on 20 June 1997 forming the 08.56 Paignton to Exeter service. CJM

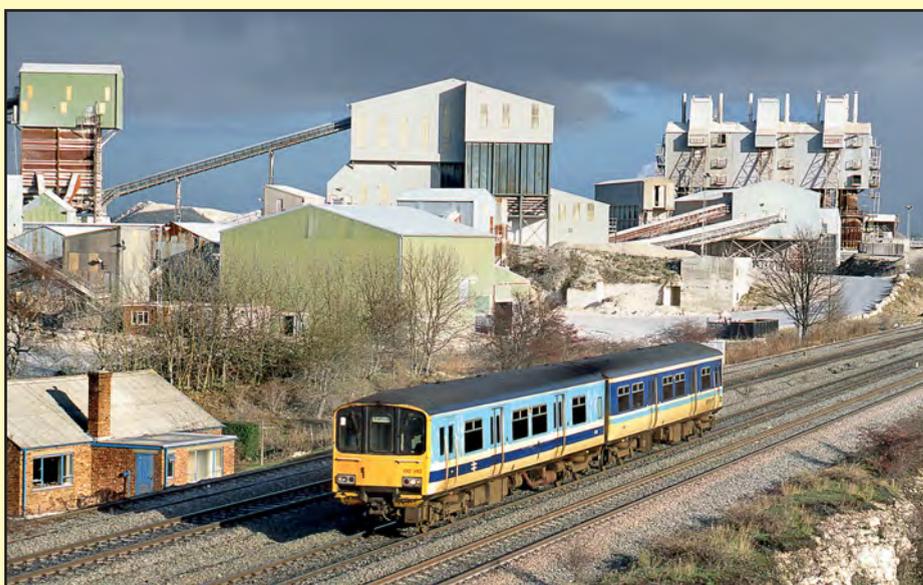


Below: The main livery variation on the Regional Railways Class 150s was the application of white and blue stripes below the cab side windows and the Regional Railways legend. On 18 March 1997, No. 150236 passes East Usk Junction forming the 11.30 Bristol Temple Meads to Cardiff service. CJM





Above: With a standard obstacle deflector plate fitted, Class 150/2 No. 150234 departs from Torquay station on 5 October 2002 forming the 14.14 Exeter Central to Paignton service. Also by this time the original glazed panel in the front door had been plated over. CJM



Left: If needed for maintenance purposes it was quite easy for cars from different sub-classes to be coupled together. Here Class 150/1 DMSL No. 52140 from set No. 150140 is coupled to a DMS from a Class 150/2, clearly showing the different liveries. The two-car hybrid set passes Melton Ross on 20 November 1991 forming a Cleethorpes to Sheffield service. John Whiteley

Below: In the Birmingham Centro area, passenger growth saw the need to have three-car sets, this was done by forming a Class 150/2 car within a Class 150/0 set. Set No. 150130 departs empty stock from Hereford on 14 September 1992 after arriving with the 11.30 service from Birmingham New Street. CJM





Above: West Midlands Passenger Transport Executive took over the governance of the Birmingham area local rail services in the 1990s and launched the Centro brand. This saw a huge investment into all forms of public transport in the West Midlands, new services, improved stock and stations and above all a new brand Centro. Centro adopted a livery theme based on Regional Railways but used green as the predominant colour. The first set to sport the new colours, Class 150/1 No. 150116 is seen on display to the rail media at Birmingham Snow Hill on 8 October 1990. **CJM**



Right Middle: On 7 January 1992 a new Greater Manchester Passenger Transport Executive (GMPT) livery was unveiled at Manchester Piccadilly when Class 150/1 No. 150133 was shown off in its new colours of stone grey and brown, off-set by a red and white mid-height body band. The front ends were also altered with the three window frames picked out in white. The set is seen during its roll out at Manchester Piccadilly. **CJM**



Right Below: Five Class 150/2 sets were painted in the yellow and grey off-set by a black and silver mid-height band of Merseyrail, reflecting the support of Mersey Travel to local services in the Liverpool area. These sets operated in a common pool and could be found operating on any Regional Railways North West duty. Set No. 150207 is seen in the bay platform at Stockport on 5 October 1993. **CJM**



MARSTON VALE

Above: Under privatisation eight Class 150/1s were leased to National Express for use on its North London operation, known as Silverlink Railways. Sets were repainted in the mauve, green and white house colours as shown on set No. 150128 at Bletchley. Many sets were named, the inset picture shows the cast plate Marston Vale as fitted to set No. 150129. Silverlink '150's operated on the Gospel Oak to Barking and Bedford to Bletchley lines. CJM

Left: From privatisation ScotRail operated 18 Class 150s on Fife Circle services and to Dundee and Carnoustie, as well as cross Edinburgh and trains to Bathgate, Stirling, Dunblane and Perth. From May 2005 all units were transferred to Arriva Trains Wales. All sets were repainted in ScotRail livery as displayed on No. 150285 with a Cowdenbeath to Edinburgh Waverley service at Dalmeny on 11 October 2004.

www.dieselimagegallery.com/ / Jim Binnie



Under 1997 privatisation, Birmingham-based local operations operated under the Centro banner were grouped together with a much larger organisation Central Trains owned by National Express. This business continued to operate services for ten years until a new franchise map was drawn up in 2007 when with a lot of route changes, Central Trains became London Midland. Central Trains adopted a green, blue, yellow and white livery, as shown on three-car set No. 150017 at Tyseley on 15 March 2006. Brian Morrison





Above: Post privatisation, the Arriva Trains-operated Cardiff Valley lines Class 150s started to appear in a rather bizarre livery with one coach painted red and the other green, onto which pictogram branding of Welsh scenes were applied. Viewed from its red DMS vehicle set No. 150280 is seen at Pontypridd on 25 June 2002. **CJM**

Right: Of course the Welsh-allocated Class 150s operated some services out of Wales and thus the Valley Lines colours could be found in other areas. On 25 May 2005, set No. 150282 crosses into Devon at Whiteball with Cardiff Central to Exeter service. **CJM**



Below: First North Western was a privatised operator based in the North West and owned by First Group. In 1997 they operated 27 Class 150s which were repainted in blue and gold livery with First North Western branding. Set No. 150223 is seen at Exeter during a period on loan to the West Country in late 2002. **CJM**





Left Top: The present North Western local services are operated by Northern Rail, owned by a joint Serco/Abellio partnership. The franchise was awarded in 2004 and with extensions will operate until February 2016. A total of 30 Class 150/0 sets are in operation. These display Northern blue and mauve livery. On 13 July 2013 the 16.20 Manchester Victoria to Blackpool North pulls away from Buckshaw Parkway (North of Chorley), formed of set No. 150119. Robert France



Left Middle: In addition to the Class 150/1 sets, Northern Rail also operates a fleet of 30 corridor fitted Class 150/2 sets, allocated to Newton Heath depot in Manchester. During the evening of 8 October 2013, set No. 150220 is seen under the roof of Liverpool Lime Street station with a service bound for Wigan. Antony Christie



Below and Inset: Several of the Northern Rail Class 150/2 sets, together with members of Classes 156 and 158 sport route advertising and location pictograms. Some railway traditionalists frown upon such applications, but in the main these are tastefully done and add a little colour and difference to our railway which could otherwise be a little mundane. In the view below we see set No. 150228 at Knottingley on 22 April 2014 working train 2F18, the 13.16 to Leeds. This set has 'Outdoors' pictograms advertising 'Adrenalin Activities', 'Scenic Countryside', 'Coastal Towns', 'Walking', 'Dales', and 'Village Life'. Details of the between door branding is shown in the inset. Both: CJM



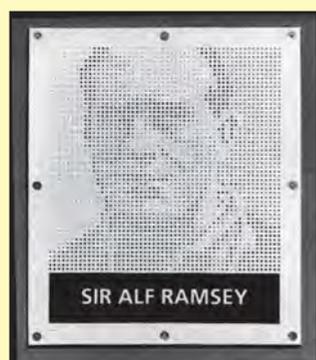


Above: In the mid-2000s when new stock was being delivered in some areas and other 'modern' stock was being cascaded, a number of unusual liveries were recorded in various parts of the country. With the ScotRail Class 150s moving to Arriva Trains Wales, a few of the Arriva services to the far west found ScotRail-liveried sets working the duties allowing a ScotRail train to be recorded passing Dawlish. On 19 June 2005, Arriva Trains Wales set No. 150252 and ScotRail set No. 150256 pull away from Dawlish station with the 09.00 Cardiff to Penzance. CJM

Below: Although built at BREL York Works, this site did not carry out any classified repair work, this was left to either Derby Litchurch Lane or Crewe Works. By 1992 a number of sets were receiving classified overhaul and in this view vehicle 52138 from set 150138 is seen totally stripped down in the Derby paintshop awaiting an application of two-pack spray Regional Railways coloured paint. CJM



Above and Right: The privatisation of the Anglia area saw the Anglia franchise won by GB Railways, who operated the service from March 1997 until 2004. They inherited a number of Class 150s for branch line use and repainted these in Anglia turquoise and white livery, as shown on set No. 150227 at Norwich. Several of the Anglia '150s' were named, using brushed aluminium plates of people associated with the area, selected by members of the public. The plate Sir Alf Ramsey was attached to the set shown above. www.colour-rail.com / CJM





The West Cornwall Experience



Above: The Wessex trains franchise operated West Country local services from October 2001 to March 2006 and was owned by National Express. The company launched a major Class 150 upgrade programme, which saw new 2+2 seating installed in their 25 Class 150/2 sets together with a stunning maroon and pictogram livery, with most sets having different localised branding. A naming policy was also adopted using stick-on type plates, again twinning units with specific routes or locations. Here we see the first set painted in the new colours, No. 150244 The West Cornwall Experience crosses Cockwood Harbour on 14 September 2002 forming the 13.54 Exmouth to Plymouth service. **Inset:** Close up of the stick-on nameplate. **Both:** CJM



Left Middle: The Wessex Trains '150' fleet was maintained by either Cardiff Canton or Exeter depots and operational performance was excellent with few on line problems reported. The sets could be found working throughout Devon and Cornwall as well as in Somerset, Dorset, Wiltshire and the Bristol, Cardiff and Gloucester areas. On 26 July 2004, set No. 150247 leads No. 150243 into Lostwithiel station with the 10.08 Penzance to Cardiff. **CJM**

Left Below: After March 2006, Wessex Trains was absorbed into a new Greater Western Franchise operated by First Group which joined together First Great Western Thames Valley and Wessex trains. The red Wessex sets were not immediately repainted, but soon had the Wessex Trains name removed from the cab sides, as shown in this view of set No. 150232 departing from Liskeard with the 14.52 Newquay to Gunnislake on 17 April 2007. The line ahead of the train diverging to the left is the line to Looe via Coombe Junction. Note the special short arm semaphore stop signal on the gantry on the end of the up platform **CJM**

Right Top: Arriva Trains Wales was formed in December 2003 following franchise changes and is responsible for train services broadly within Wales. Today it is governed by the Welsh Assembly Government. 36 Class 150/2s are currently on the books based at Cardiff Canton. Original repaints saw Arriva turquoise applied as the dominant colour, offset by a cream arc over the cab corners. This livery is displayed on set No. 150229 arriving at Radyr on 6 June 2013 with the 10.52 service from Aberdare to Barry Island, one of the Cardiff cross-city services. **CJM**



Right Middle: As sets have received recent refurbishment and improved interiors, a new Arriva Trains Wales two-tone turquoise livery, complete with bilingual branding has been adopted which looks very smart on these sets. With its DMSL vehicle leading, set No. 150236 pulls into Radyr station on 19 June 2014 with service 2T28, the 13.36 Cardiff Central to Treherbert. When originally delivered, this set was one of the Leeds Neville Hill allocation. **CJM**



Below: Throughout 2014, new-liveried Arriva Trains Wales Class 150/2 No. 150213 has carried branding to its livery celebrating ten years of service to the people of Wales, with 12 roundels applied neatly on the body side at window height and an extra row of lettering under the Arriva Trains Wales name. Set No. 150213 arrives at Pontypridd station on 19 June 2014 with the 15.22 Aberdare to Barry Island service. **CJM**





Left: The repainting and re-branding of the former Wessex Class 150s into the new FGW Local Lines colours was carried out by Pullman Rail at workshops located at Cardiff Canton depot. At the same time new seats and modernised interiors were also fitted. The first vehicle of the project to be completed from set No. 150247 is seen inside the Pullman Rail facility on 5 November 2007. CJM

Below: The application of the First Group Local Lines colours was a complex and costly affair, all the wording on the lower panels were applied in transfer form and positioning had to be very accurate to produce the desired effect. The livery looked smart when first applied, but soon became dirty. After a few years the decision was taken that future repaints would use just an all-over dark blue with First Great Western branding. Local Lines-liveried No. 150232 departs from Dawlish Warren station on 28 March 2011 with the 17.45 Exeter Central to Paignton. CJM



Left: After the expanded Greater Western franchise was awarded in March 2006, a new local-lines First livery was devised, using the traditional First style with names of places, people and attractions as part of the swirl pattern. On 8 June 2007, No. 150244 departs from Starcross with the 17.19 Paignton to Exmouth. **CJM**

Right Top: By the time the transferred in Class 150/1 sets were scheduled for repainting the FGW Local Lines livery had been changed to plain dark blue with the First Great Western legend mid way along the bodyside. To meet the Disabilities Discrimination Act a contrasting door colour was retained, as were full yellow warning ends and obstacle deflector plate. On 13 June 2014, set No. 150120 approaches Dawlish station with service 2F13, the 08.23 Paignton to Exmouth. This was one of the units FGW obtained from Silverlink/Transport for London following the introduction of Class 172 stock on the Gospel Oak to Barking route. **CJM**



Right Middle: A couple of later Class 150/2 arrivals with First Great Western Nos. 150202 and 150216 were repainted into the all-over blue livery style, as displayed on set No. 150216 at Newton Abbot on 18 April 2012. Like most sets in recent times this unit sports the revised Group Standard light cluster with a combined LED marker/tail light. **Antony Christie**



Below: This interesting near broadside view at Claverton near Bath, shows the two styles of First Great Western local lines colours applied to the Class 150 fleet. The Class 150/1 leading No. 150106 shows the all blue style, with pink passenger doors and blue staff cab doors. The Class 150/2 on the rear shows the complicated original local lines style with names of places, people and attractions. Again pink passenger doors and train coloured staff doors are provided. Both sets show the DMSL vehicle on the right. **Mark V. Pike**





Left Middle: From 2008, FGW re-marshalled two Class 150/1 sets as three-car units by inserting a Class 150/2 vehicle in the middle of the formation. The two 150/2 cars could not operate as a pair, as neither had a toilet compartment, these became 'spare' after their companion vehicles were written off in accidents. Originally sets No. 150121 and 150127 operated with the extra middle vehicle (numbered as 150921/927), but to level out maintenance requirements a reform took place in September/October 2014 when sets 150121/127 reverted to two-car sets and the 'spare' coaches were inserted into sets 150125/126, which were renumbered to 150925/926 indicating to the operating department these were three-car formations. Usually these sets operate on the Cardiff-Taunton route, but do escape to other lines from time to time. On 25 October 2014, set No. 150925 is seen near Cogload Junction, Taunton with a Taunton to Bristol/Cardiff service.
Antony Christie

Left Bottom: What a difference a different moquette and floor covering can give to a vehicle. This is the 2+3 high-back interior of First Great Western Class 150/1 set. **CJM**

Below: Four of the FGW Class 150 sets currently carry stick-on nameplates, all reflecting partnerships. The two 'plates' below show The Tarka Line The First 25 Years 1989-2014 name applied in November 2014 as applied to set No. 150261 and Devon & Cornwall Rail Partnership as applied to No. 150129. Both: **CJM**



Left Top: The two original Class 150/0 prototype sets Nos. 150001 and 150002 operated for many years with the Centro fleet, Central Trains and London Midland from Tyseley. However more recently the pair were transferred to First Great Western at Reading and used on the busy Reading to Basingstoke corridor. In the summer of 2014 to ease overcrowding in the west, set No. 150002 was loaned to Exeter and usually operated on the Exeter-Taunton-Cardiff route, however, some trips were recorded on Exeter branch line services to Exmouth, Paignton and Barnstaple. The first time a Class 150/0 ever operated west of Exeter was on 29 July 2014 when set No. 150002 worked a Paignton service, the return 17.49 Paignton to Exmouth is seen along the Dawlish sea front. CJM



Right Top: Under the Wessex Trains banner, some major refurbishment of the Class 150/2 sets was undertaken including the replacement of the 2+3 seating with 2+2 thus making the sets more acceptable to the travelling public, and providing an interior style more in keeping with a train than a bus. This was the pink and grey moquette adopted by Wessex. Note the angled grab poles by the door pockets, finished in Wessex colours, tables and open tube fluorescent lighting. The vehicle illustrated is from set No. 150244. CJM



Right Middle: The same interior style as above but now under First Great Western operations, FGW moquette has been applied, walls have been finished in light blue and gondola covers fitted to the train length lighting. The tables have also been revised and new light grey lino installed on the floors. Set No. 150233 is illustrated. CJM

Below: The older style 2+3 seating has been retained on the First Great Western Class 150/1 sets and this view shows the area directly behind the cab vestibule with a mix of 2+2 and 2+3 seats. Note the closed circuit television camera (CCTV) on the ceiling to the right of the end door and the pull down light-sticks on the left bulkhead wall. In keeping with FGWs blue and pink colours the grab handles have been finished in pink. CJM





Class 154

Above: Of the two original BREL Class 150 prototypes, set No. 150002 fitted with Rolls Royce engines, was in terms of reliability poor when compared with the Cummins NT855R5 engines of the first unit. Eventually, the set was sidelined at Derby and was selected as a testbed for the proposed Class 158 Express or main line DMU stock. Major work was undertaken at the Engineering Development Unit which resulted in the set being re-gearred for 90 mph (144km/h) running and fitted with Cummins engines with Voith transmissions. The interior was also modified to reflect that of the proposed '158'. At one time, the middle vehicle was fitted with a Class 151 style twin disc 'hot-shift' transmission which operated well once the control system was adjusted. To distinguish this unit it was reclassified as Class 154 and allocated the number 154002, but on some occasions the set was recorded running as set No. 154001. After tests were complete, the set was returned to standard Class 150 configuration and reverted to its original number. The set remains identifiable to the present day by having air conditioning pods on the saloon roofs. Today the Class 154 operates for First Great Western as set No. 150002 at Reading depot. In this view the set is seen passing Peartree, south of Derby with a Derby to Birmingham passenger service on 23 May 1989. **CJM**

Left Middle: While much of the Class 154 running was for development work, the set did operate a number of passenger services from Derby to Birmingham or over the Matlock branch. As a two-car set with the MS removed, No. 154001 is seen at Matlock on 17 April 1987 with a Derby service. www.colour-rail.com

Left Bottom: While undergoing road testing at speeds of up to 90mph (144 km/h) the set, running as No. 154002 passes Loughborough station on the southbound main line on 8 August 1991. Records show that on this day the set operated to Cricklewood. www.colour-rail.com



Class 950

Right Top: In 1987, two special 'Sprinter' vehicle body shells were constructed at BREL York Works, based on the Class 150/1 design but with very different body structure. The set was formed of vehicles 999600 and 999601. The bodyside of 999600 had three single width glazed windows on the drivers side followed by a pair of hinged equipment doors another single window and a toilet window. On the non-driving side one pair of passenger bi-parting doors were provided at the inner end. On car No. 999601 the drivers side had four single window positions, a double hinged equipment door a further single window and a toilet window. On this vehicles non driving side two pairs of bi-parting passenger type doors were provided. Painted in its original blue/grey colours with a red bodyside stripe the set is seen at Glasgow Queen Street on 22 March 1994 with vehicle 999600 nearest the camera. When first built official records refer to the Track Recording Unit (TRU) as set No. 180001, but this was soon dropped. Today the set is Class 950 No. 950001. CJM



Right Middle: Originally operated by the M&EE department, upon privatisation the TRU was taken over by Railtrack and repainted in their blue and green livery. The set remained based at Derby and travelled the length and breadth of the UK several times each year. In this view the set is seen stabled at Sheffield on 14 June 2003 with car 999600 nearest the camera with one passenger door. www.dieselimagegallery.com / Stan Withers



Below: Today, set No. 950001 is painted in Network Rail yellow livery, is based at Derby RTC and traverses the network on a timetabled basis. On 6 October 2013 the set passes Dawlish en route to Derby from Penzance via St Ives. Vehicle No. 999600 is nearest the camera. CJM



Class 150 Fleet List

Class 150/0									
Set No.	Vehicle Numbers			Date	First	Present	Present	Notes	
	DMSL	MS	DMS	Delivered	Depot	Owner	Operator		
150001	55200	55400	55300	Nov-84	DY	ANG	FGW	Original prototype set	
150002	55201	55401	55301	Feb-85	DY	ANG	FGW	Prototype set, renumbered 154001/002 01/87-03/92	
Class 150/0 Hybrid 3-car sets with Class 150/2 intermediate vehicle									
Set No.	Vehicle Numbers				First	Notes			
	DMSL	DMS	DMS		Allocation				
150003	52103		57103		TS	Reverted to 2-car set 150103			
150004	52104		57104		TS	Reverted to 2-car set 150104			
150005	52105		57105		TS	Reverted to 2-car set 150105			
150006	52106		57106		TS	Reverted to 2-car set 150106			
150007	52107		57107		TS	Reverted to 2-car set 150107			
150008	52108		57108		TS	Reverted to 2-car set 150108			
150009	52109		57109		TS	Reverted to 2-car set 150109			
150010	52110	57226	57110		TS	Reverted to 2-car set 150110			
150011	52111	57206	57111		TS	Reverted to 2-car set 150111			
150012	52112	52204	57112		TS	Reverted to 2-car set 150112			
150013	52113	52226	57113		TS	Reverted to 2-car set 150113			
150014	52114	57204	57114		TS	Reverted to 2-car set 150114			
150015	52115	52206	57115		TS	Reverted to 2-car set 150115			
150016	52116	57212	57116		TS	Reverted to 2-car set 150116			
150017	52117	57209	57117		TS	Reverted to 2-car set 150117			
150018	52118	52220	57118		TS	Reverted to 2-car set 150118			
150019	52119	57220	57119		TS	Reverted to 2-car set 150119			
Class 150/1									
Set No.	Vehicle Numbers		New	First	Name	Present	Present	Notes	
	DMSL	DMS		Depot		Owner	Operator		
150101	52101	57101	Oct-85	DY		PTR	FGW		
150102	52102	57102	Oct-85	DY		PTR	FGW		
150103	52103	57103	Oct-85	DY		ANG	NR		
150104	52104	57104	Oct-85	DY		PTR	FGW		
150105	52105	57105	Oct-85	DY		ANG	LM		
150106	52106	57106	Oct-85	DY		PTR	FGW		
150107	52107	57107	Oct-85	DY		ANG	LM		
150108	52108	57108	Oct-85	DY		PTR	FGW		
150109	52109	57109	Oct-85	DY		ANG	LM		
150110	52110	57110	Oct-85	DY		ANG	NR		
150111	52111	57111	Oct-85	DY		ANG	NR		
150112	52112	57112	Oct-85	DY		ANG	NR		
150113	52113	57113	Oct-85	DY		ANG	NR		
150114	52114	57114	Oct-85	DY		ANG	NR		
150115	52115	57115	Oct-85	DY		ANG	NR		
150116	52116	57116	Oct-85	DY		ANG	NR		
150117	52117	57117	Oct-85	DY		ANG	NR		
150118	52118	57118	Dec-85	DY		ANG	NR		
150119	52119	57119	Dec-85	DY		ANG	NR		
150120	52120	57120	Dec-85	DY	<i>Gospel Oak-Barking 2000 - 7/04-3/10</i>	PTR	FGW		
150121	52121	57121	Dec-85	DY	<i>Willesden Eight - 12/05-6/07</i> <i>Silver Service - 6/07-11/07</i>	PTR	FGW	Reformed as 150921 back to 2-car 09/14	
150122	52122	57122	Dec-85	DY	<i>RSC Express - 29/9/98 only</i>	PTR	FGW		
150123	52123	57123	Dec-85	DY	<i>Richard Crane - 4/06-5/08</i> <i>Willesden TMD - 5/08-3/10</i> <i>Bletchley Seven 04/10-07/10</i>	PTR	FGW		
150124	52124	57124	Dec-85	DY		PTR	FGW		
150125	52125	57125	Dec-85	DY	<i>The Heart of Wessex Line - 02/12</i>	PTR	FGW		
150126	52126	57126	Dec-85	DY		PTR	FGW		
150127	52127	57127	Dec-85	DY		PTR	FGW	Reformed as 150927 back to 2-car 09/14	
150128	52128	57128	Dec-85	DY	<i>Bedford-Banberg 30 - 09/07-06/10</i>	PTR	FGW		
150129	52129	57129	Dec-85	DY	<i>Marston Vale - 8/00-4/10</i> <i>Devon & Cornwall Rail Partnership - 4/10/11</i>	PTR	FGW		
150130	52130	57130	Jan-86	DY	<i>Sevenside Community Rail Partnership - 17/10/11</i>	PTR	FGW		
150131	52131	57131	Jan-86	DY	<i>Leslie Crabbe - 8/00-3/10</i>	PTR	FGW		
150132	52132	57132	Jan-86	DY		ANG	NR		
150133	52133	57133	Jan-86	DY	<i>Northern Star - 2/07-3/08</i>	ANG	NR		
150134	52134	57134	Jan-86	DY		ANG	NR		
150135	52135	57135	Jan-86	DY		ANG	NR		
150136	52136	57136	Jan-86	DY		ANG	NR		
150137	52137	57137	Feb-86	DY		ANG	NR		
150138	52138	57138	Feb-86	DY		ANG	NR		
150139	52139	57139	Feb-86	DY		ANG	NR		
150140	52140	57140	Feb-86	DY		ANG	NR		
150141	52141	57141	Feb-86	DY		ANG	NR		
150142	52142	57142	Feb-86	DY		ANG	NR		
150143	52143	57143	Feb-86	DY		ANG	NR		
150144	52144	57144	Feb-86	DY		ANG	NR		
150145	52145	57145	Feb-86	DY		ANG	NR		
150146	52146	57146	Feb-86	DY		ANG	NR		
150147	52147	57147	Mar-86	DY		ANG	NR		
150148	52148	57148	Mar-86	DY		ANG	NR		
150149	52149	57149	Mar-86	DY		ANG	NR		
150150	52150	57150	Mar-86	DY		ANG	NR		
150921	52121	57212	57121	C2008	Reverted back to 150/1 09/14	PTR	FGW	Set 150121 plus car 57212 from 150/2	
150925	52125	57209	57125	Oct-14		PTR	FGW	Set 150125 plus car 57209 from 150/2	
150926	52126	57212	57126	Oct-14		PTR	FGW	Set 150126 plus car 57212 from 150/2	
150927	52127	57209	57127	C2008	Reverted back to 150/1 09/14	PTR	FGW	Set 150127 plus car 57209 from 150/2	
Class 150/2									
Set No.	Vehicle Numbers		Date	First	Name	Present	Present	Notes	
	DMSL	DMS		Delivered	Depot	Owner	Operator		
150201	52201	57201	May-87	NH		ANG	NR		
150202	52202	57202	Jan-87	NL		ANG	FGW		

150203	52203	57203	May-87	NH		ANG	NR	
150204	52204	57204	Feb-87	NL		ANG	NR	Previously disbanded to form 3-car 150/0s
150205	52205	57205	May-87	NH		ANG	NR	
150206	52206	57206	Mar-87	NL		ANG	NR	Previously disbanded to form 3-car 150/0s
150207	52207	57207	May-87	NH		ANG	NR	
150208	52208	57208	Mar-87	NL		PTR	ATW	
150209	52209	57209	May-87	NH		-	-	Car 52209 withdrawn 04/89 cut V Berry 05/89
150210	52210	57210	Mar-87	NL		ANG	NR	
150211	52211	57211	May-87	NH		ANG	NR	
150212	52212	57212	May-87	NL		-	-	Car 52212 withdrawn 04/89 cut V Berry 05/89
150213	52213	57213	Apr-87	NH	Lord Nelson - 22/7/94	PTR	ATW	
150214	52214	57214	May-87	NL		ANG	NR	
150215	52215	57215	May-87	NH		ANG	NR	
150216	52216	57216	May-87	NL		ANG	FGW	
150217	52217	57217	May-87	NH	Oliver Cromwell - 19/8/94	PTR	ATW	
150218	52218	57218	Jan-87	NL		ANG	NR	
150219	52219	57219	May-87	NH		PTR	FGW	
150220	52220	57220	Jan-87	NL		ANG	NR	Previously disbanded to form 3-car 150/0s
150221	52221	57221	May-87	NH		PTR	FGW	
150222	52222	57222	Jan-87	NL		ANG	NR	
150223	52223	57223	May-87	NH		ANG	NR	
150224	52224	57224	Feb-87	NL		ANG	NR	
150225	52225	57225	May-87	NH		ANG	NR	
150226	52226	57226	Feb-87	NL		ANG	NR	Previously disbanded to form 3-car 150/0s
150227	52227	57227	May-87	NH	Sir Alf Ramsey - 26/8/94	PTR	ATW	
150228	52228	57228	Feb-87	NL		PTR	NR	
150229	52229	57229	May-87	NH	George Borrow - 4/10/94	PTR	ATW	
150230	52230	57230	Feb-87	NL	The Tamar Kingfisher - 5/03-6/07	PTR	ATW	
150231	52231	57231	May-87	NH	King Edmund - 9/9/94	PTR	ATW	
150232	52232	57232	Feb-87	NL	The Coastal Connection - 19/11/03-6/08	PTR	FGW	
150233	52233	57233	May-87	NH	The Lady Margaret of Looe Valley - 29/10/03 - 6/08	PTR	FGW	
150234	52234	57234	Feb-87	NL	The National Trust - 10/4/03-3/08	PTR	FGW	
150235	52235	57235	Mar-87	NH	Cardinal Wolsey - 20/9/94	PTR	ATW	
150236	52236	57236	Mar-87	NL		PTR	ATW	
150237	52237	57237	May-87	NH	Hereward The Wake - 16/9/94	PTR	ATW	
150238	52238	57238	Mar-87	NL	Exeter Explorer - 21/7/03-6/08	PTR	FGW	
150239	52239	57239	Mar-87	NH		PTR	FGW	
150240	52240	57240	Mar-87	NL		PTR	ATW	
150241	52241	57241	May-87	NH	The Tarka Belle - 28/10/02-6/08	PTR	ATW	
150242	52242	57242	Mar-87	NL		PTR	ATW	
150243	52243	57243	May-87	NH	The Filton Partnership - 2/7/04-5/08	PTR	FGW	
150244	52244	57244	Apr-87	NL	The West Cornwall Experience 16/9/02-7/08	PTR	FGW	
150245	52245	57245	Apr-87	NH		PTR	ATW	
150246	52246	57246	Apr-87	NL		PTR	FGW	
150247	52247	57247	Apr-87	NH		PTR	FGW	
150248	52248	57248	Apr-87	NL	The Great Gardens of Cornwall - 24/3/03-10/08	PTR	FGW	
150249	52249	57249	Apr-87	NH	J Charles Lang - 2/3/08-9/09	PTR	FGW	
150250	52250	57250	Apr-87	NL		PTR	ATW	
150251	52251	57251	May-87	NH		PTR	ATW	
150252	52252	57252	Apr-87	NL		PTR	ATW	
150253	52253	57253	May-87	NH	The Exmouth Avoset - 19/5/03-8/07	PTR	ATW	
150254	52254	57254	May-87	NL		PTR	ATW	
150255	52255	57255	Apr-87	HA	Henry Blogg - 8/7/94	PTR	ATW	
150256	52256	57256	May-87	NL		PTR	ATW	
150257	52257	57257	May-87	HA	Queen Boadicea - 15/7/94	PTR	ATW	
150258	52258	57258	May-87	NL		PTR	ATW	
150259	52259	57259	May-87	HA		PTR	ATW	
150260	52260	57260	May-87	NL		PTR	ATW	
150261	52261	57261	Jun-87	CF	The Riviera Flyer - 12/5/03-11/07 The Tarka Line The First 20 Years 1989-2014 11/14	PTR	FGW	
150262	52262	57262	May-87	NL		PTR	ATW	
150263	52263	57263	Jun-87	CF	The Castles of Cornwall - 1/9/03-11/08	PTR	FGW	
150264	52264	57264	Jun-87	NL		PTR	ATW	
150265	52265	57265	Jun-87	CF	The Falmouth Flyer - 22/3/03-2/09	PTR	FGW	
150266	52266	57266	Jun-87	CF	The Whitley Wonder - 24/2/03-11/07	PTR	FGW	
150267	52267	57267	Jun-87	CF		PTR	ATW	
150268	52268	57268	Jun-87	CF	Benny Rothman-The Manchester Rambler - 21/4/07-1/10	PTR	NR	
150269	52269	57269	Jun-87	CF		PTR	NR	
150270	52270	57270	Jun-87	CF		PTR	NR	
150271	52271	57271	Jun-87	CF		PTR	NR	
150272	52272	57272	Jul-87	CF		PTR	NR	
150273	52273	57273	Jul-87	CF	Driver John Axon GC - 9/2/07-C2011	PTR	NR	
150274	52274	57274	Jul-87	CF		PTR	NR	
150275	52275	57275	Aug-87	CF		PTR	NR	
150276	52276	57276	Jul-87	CF		PTR	NR	
150277	52277	57277	Jul-87	CF		PTR	NR	
150278	52278	57278	Jul-87	CF		PTR	ATW	
150279	52279	57279	Aug-87	CF		PTR	ATW	
150280	52280	57280	Sep-87	CF	University of Glamorgan - 25/6/02-C2012	PTR	ATW	
150281	52281	57281	Sep-87	CF		PTR	ATW	
150282	52282	57282	Oct-87	CF		PTR	ATW	
150283	52283	57283	Oct-87	HA		PTR	ATW	
150284	52284	57284	Oct-87	HA		PTR	ATW	
150285	52285	57285	Oct-87	HA	Edinburgh Bathgate 1986-1996 - 25/3/96	PTR	ATW	

Key
ANG: Angel Trains, ATW: Arriva Trains Wales, CF: Cardiff, DY: Derby, FGW: First Great Western, HA: Haymarket, LM: London Midland, NH: Newton Heath, NL: Neville Hill, NR: Northern Rail, PTR: Porterbrook, TS: Tyseley,



Metro Cammell Class 151



The two three-car Class 151 prototype sets were ordered from Metro-Cammell by the BRB as an alternative but comparable design to the two BREL prototype sets Nos. 150001 and 150002 at the start of the second generation DMU project to replace old and worn out stock from branch and rural lines.

Only the two prototype three-car units were

built these were assembled in the Washwood Heath, Birmingham factory of Metro-Cammell and emerged during the spring and summer of 1985. After initial 'on works' testing, the pair were transferred to the RTC Derby and eventually allocated to Derby Etches Park depot, alongside the BREL pair.

The Class 151 vehicles were produced in aluminium, much in keeping with the factories

London Underground stock production. The '151' had a full width driving cab and seating in open saloons similar to the Class 150 style. Passenger access was by two pairs of bi-parting sliding doors on each side of each vehicle. The driving cab had its own manual sliding door with rubber seals which was later a constant source of problems. Seating was a mix of directional and group layouts, using the 2+2 and 2+3 style.

Each vehicle was equipped with one Cummins NT855 R5 285hp (213kW) underfloor-mounted engine with a twin-disk transmission and Gmeinder final drive. The design had a maximum speed of 75mph (121km/h). The designs light weight aluminium construction allowed good acceleration but on indifferent track gave a lively ride.

The full width driving cab was designed under very strict guidelines from the BRB design team, in terms of equipment position, style and labelling. At the time the BRB were to produce a standardised cab environment as part of a joint agreement between the BRB and trade unions. The Class 151s used the new generation 'stalk' electronic brake controller rather than a semi-rotary handle, later adopted as standard.

When launched, a number of media at the event, MLIs Editor being one, compared the exterior front end appearance of the design →



Left Middle: A small number of railway press were invited to visit the Metro-Cammell works to inspect the first Class 151 in December 1984 when this illustration was recorded. At this time the set was undergoing static tests and early certification.

CJM

Left Below: In keeping with the Class 150, the Class 151 sets when not involved in type test or demonstration work were allocated to Derby Etches Park depot and used on a limited basis on the Derby to Matlock and Derby to Birmingham passenger services. Technical issues frequently saw the sets enter service in the morning but fail during the day and a changeover between sets was made. In 1988, set No. 151002 is seen at Derby station with a service from Matlock.

www.colour-rail.com



Left: The two Metro-Cammell prototype Class 151 units were on completion at Washwood Heath, taken under their own power to the Engineering Development Unit at the Railway Technical Centre, Derby for assessment and commissioning. No. 151002 is seen outside the test facility on 10 June 1985 soon after arrival from Washwood Heath. CJM

Right: Much of the ride testing and proving of the engines and transmission systems for the Class 151 pair were undertaken on the BR Research Mickleover test track, where this early view of set No. 151001 was recorded on 15 March 1985. During the test track operation dozens of technical adjustments were made before dynamic running on the main line could be allowed. CJM



with that of the Tyne and Wear Metro stock, built by Metro-Cammell, several years prior.

The gearboxes installed on the Class 151s were problematic from an early stage with frequent rough shifts causing shocks throughout the train, these problems were never fully resolved and were very noticeable on the first day in traffic when compared with the Class 150.

While in most areas the Class 151s were of similar style to the Class 150s, these sets had some unusual features, this included a hydraulically driven alternator and cooling fans. The main cooling system and its radiators being mounted in a roof 'pod' in the centre of each vehicle.

Bogies were also another source of major concerns, these were of a non-standard Metro-Cammell design and problems in this area eventually quickened the speed of storage and eventual withdrawal of the design in 1989 after just four years in part time service.

In 1987 a plan was put forward to modify the Class 151s and fit standard Class 150 style bogies. However, a technical appraisal found this would be too expensive and impractical.

By the time the comparison results between the prototype 150 and 151 trains was available, the Government had already ordered the production batch of Class 150s, much

like the haste of placing orders under the Modernisation Plan of the mid-1950s.

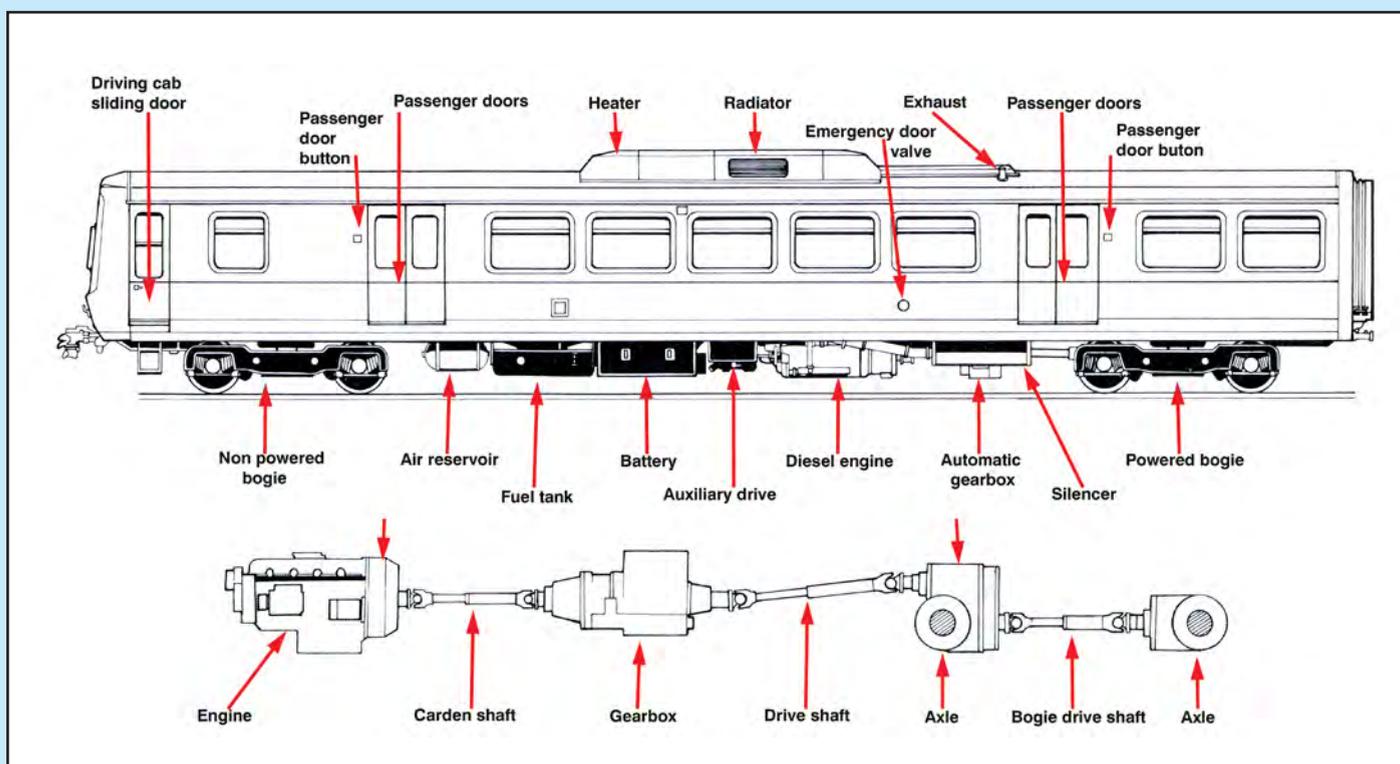
After it was deemed that the Class 151s had no future use, they were withdrawn and offered back to their builders, however this was turned down and the pair were stored by the BRB, firstly at Derby and then to provide space for the expanding 'Sprinter' fleet the pair were hauled to and stored at Llandudno Junction carriage sheds.

Eventually the pair were sold to Railtest (later to become Serco Railtest). It was then proposed to rebuild the pair into self powered track test units. However, due to the levels of work involved, especially with aluminium bodies compounded by the need to totally replace the traction equipment, cooler system, bogies and electrics, this could not be justified and the pair were finally withdrawn and offered for scrap. However, while in the ownership of Railtest and while being assessed

for future use, the pair were moved back to the Railway Technical Centre, Derby.

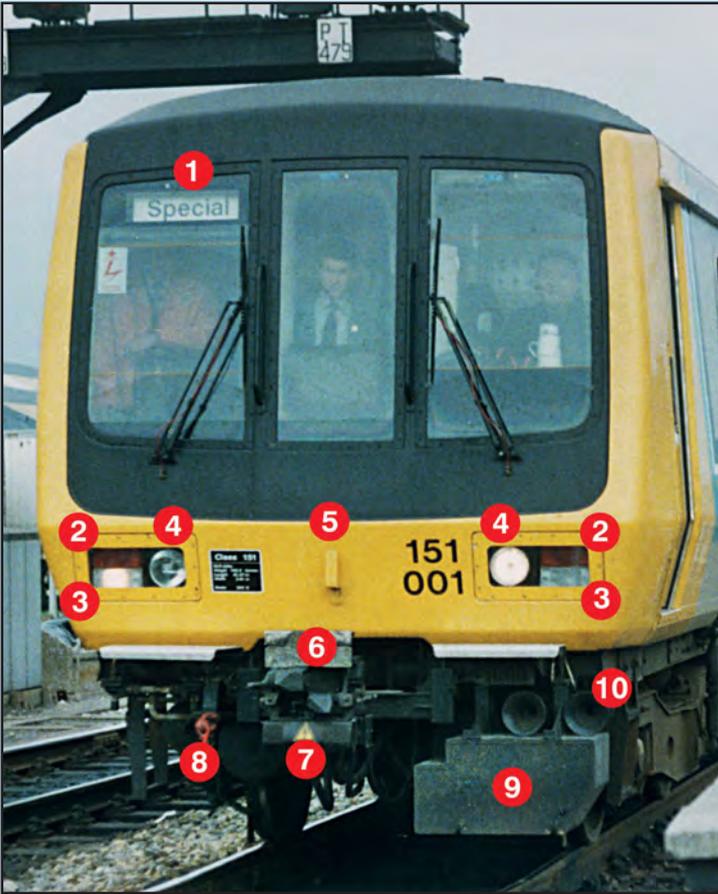
In late 1999 the pair were offered for sale and many expected the scrap man to make the best offer. However, in March 2000, the pair were purchased by a fledgling company Endeavour Rail, who proposed to refurbish them as passenger sets and offer them for 'spot hire' to any TOC who had a DMU shortage. This refurbishment would have seen standard Class 150 equipment installed. With this proposition in mind, both sets were transferred to Waterman Railways LNWR works at Crewe. Sadly, again the overhaul work was abandoned as 'too costly and technically challenging'.

The pair, now dumped in the open air at Crewe, soon became in a poor external and technical state and were eventually sold for scrap being broken up on site in 2004. A sad end for a fascinating design. ■





Class 151 Technical and Cab



Left: The front end of the Class 151 was a totally unique design, based on the strict BRB specification, but with a number of refinements and tweaks introduced by Metro Cammell. Main items of equipment are. 1: Route or destination indicator (manual roll type), 2: Red tail light, 3: White marker light, 4: Headlight, 5: Lamp bracket, 6: BSI coupling, 7: Electrical connection box, 8: Emergency air supply socket, 9: Emergency coupling adaptor in box, 10: Air warning horns. CJM

Below: On 25 June 1987, set No. 151001 pauses on the freight lines adjacent to Derby station while returning empty stock from the Mickleover test track to Derby RTC after test runs had been carried out with a modified micro-processor control of the gearbox. Gear specialists David Brown were involved with these tests and followed a number of serious issues with gear shift on the sets. CJM



Technical Description

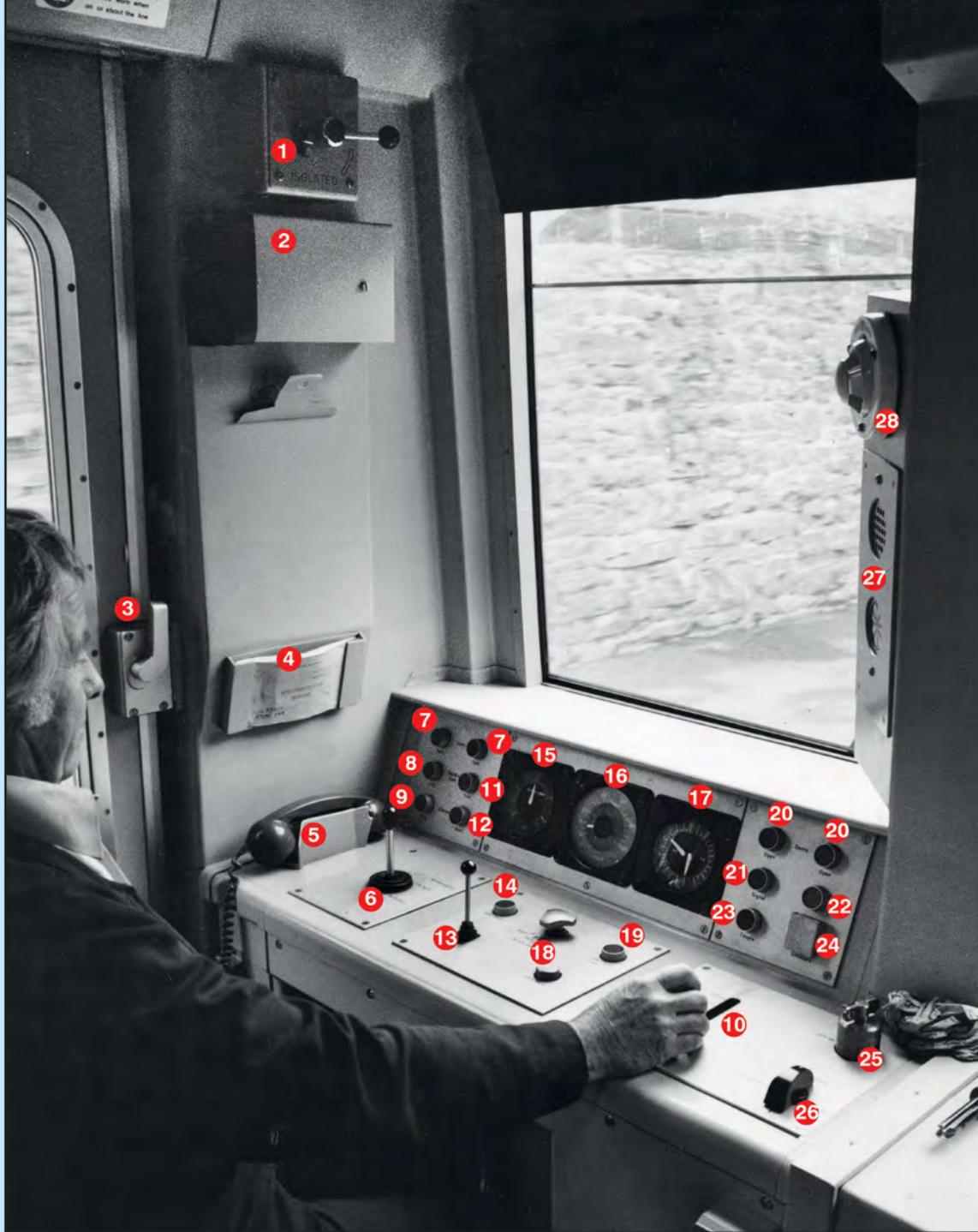
Number range:	151001-151002§	Weight:	Total - 96.9 tonnes
Introduced:	1984-1985		DMSL - 32.4 tonnes
Built by:	Metro-Cammell, Birmingham		MS - 32.1 tonnes
Formation:	DMSL+MS+DMS		DMS - 32.4 tonnes
Vehicle numbers:	DMSL - 55202-55203	Brake type:	Air EP
	MS - 55402-55403	Bogie type:	Metro-Cammell
	DMS - 55302-55303	Power unit:	1 Cummins NT855R5 of 285hp (213kW) per vehicle
Vehicle length:	DMS, DMSL - 65ft 6½in (19.98m)	Transmission:	Hydro-Mechanical
	MS - 64ft 3½in (19.60m)	Transmission type:	Hot-shift
Height:	12ft 9¼in (3.85m)	Horsepower (total):	855hp (639kW)
Width:	9ft 2½in (2.81m)	Max speed:	75mph (121km/h)
Seating:	Total - 2325	Coupling type:	BSI
	DMSL - 805, MS - 845, DMS - 685	Multiple restriction:	Class 14x, 15x
Internal layout:	2+2	Door type:	Double leaf sliding
Gangway:	Within set only	Special features:	-
Toilets:	DMSL - 1	Body structure:	Aluminium/steel
		Notes	§ Also numbered 151003-151004 for a short period

Right: Class 151 driving cab layout.

- 1: AWS isolation switch, 2: Notice board light, 3: Manual handle for cab door, 4: Drivers fault/defect book, 5: Cab to cab and public address telephone handset, 6: Brake controller stalk, 7: Left side door open buttons, 8: Gearbox fault light unit, 9: Engine stop button, 10: Power controller/throttle, 11: Gearbox fault light train, 12: Engine start button, 13: Horn valve, 14: Gear hold button, 15: Brake pipe pressure gauge, 16: Speedometer, 17: Main reservoir pressure and brake cylinder pressure gauge, 18: AWS reset button, 19: Compressor speed up button, 20: Right side door release buttons, 21: Signal button (cab-cab), 22: Spare, 23: Couple button, 24: Uncouple button (under hinged flap), 25: Master key socket, 26: Master switch, forward, neutral, reverse, 27: AWS indicator and alarm, 28: Cab air vent.

J. R. Dungate

Below: By 1987 the performance of the Class 151s was such that limited main line passenger running could be undertaken without the constant presence of a technical inspector to sort out on line problems. At this time, in addition to the Derby to Matlock route, sets were trusted to operate on the Derby to Crewe and Derby to Birmingham routes. On 14 November 1987, set No. 151002 stops at Water Orton with a Derby to Birmingham New Street service. One major restricting factor to Class 151 operations was that only Derby-based driver's, guard's and fitting staff were trained on their operation. John Tuffs





Above: Externally the Class 151 was left in raw aluminium, with painted yellow ends and a two-tone blue and white body side band. The raw aluminium extended to the roof and roof pod. The underframe was finished in black. These were some of the first units to have a contrasting colour or livery difference on the passenger doors, which omitted the mid-height banding. On 28 June 1988, set No. 151004 (renumbered from 151002) arrives at Stoke-on-Trent with the 14.38 Crewe to Derby service. www.colour-rail.com / John E. Henderson



Left Middle: On 25 September 1985, set No. 151001 ventured a long way from home, when it was exhibited at Old Oak Common depot open day. It was parked outside the factory alongside new Mk3 sleeping stock and Mk2 passenger vehicles. This was one of the few times the '151' ventured onto the Western Region. www.colour-rail.com



Left Below: After both the Class 150 and 151 Prototype sets were given the green light for main line normal speed operation, a number of special nighttime paths were organised between Derby and London St Pancras for mileage accumulation and high speed dynamic testing to be undertaken. Some of these test runs were undertaken alone, others in pairs and some with a Class 150 and a 151 working together. This view in early 1986 shows Class 151 No. 151001 and Class 150001 under the great Barlow roof at London St Pancras. This picture is in the position of where the Eurostar platforms are today. Ken Brunt

Class 151 Fleet List

Set No.	Vehicle Numbers			New	First Allocation	Withdrawn	Disposal	Notes
	DMSL	MS	DMS					
151001	55202	55402	55302	Feb-85	DY	OCT-90	Cut Crewe 2004	Renumbered as 151003 02/88
151002	55203	55403	55303	Jun-85	DY	OCT-90	Cut Crewe 2004	Renumbered as 151004 02/88



Above: The Class 151s were allocated to Derby Etches Park depot, where on 22 April 1988 set No. 151003 (the original 151001) receives attention to its engine and final drive. **CJM**



Left: Although not a daily operation, the most likely place to find a Class 151 in passenger service was on the Matlock branch. On 24 June 1986, set No. 151001 pauses at Matlock Bath. www.colour-rail.com

Below: With the original Matlock Bath station buildings as a backdrop, set No. 151002 stops for a brief call on 11 July 1986 forming the 18.23 Matlock to Derby. **CJM**





Leyland Class 155



As part of the British Rail DMU replacement project, a fleet of 42 two-car 'Super Sprinter' sets were ordered from British Leyland at Workington to be classified as Class 155. These sets followed the previous collaboration between BR and the Leyland bus industry in marrying National bus components in terms of body sections with a rail underframe. In many respects these were the main line or express version of the BR/Leyland 'Pacer' Class 142 stock. The sets were delivered in 1987-1988. Of the 42 original sets delivered, only seven now remain in service, the other 35 were converted to single-car Class 153s in 1991-1992.

The Leyland 'Super Sprinter' Class 155s were formed of two 23 metre vehicles, each fitted with a Cummins NT855-R5 285hp (213kW) engine coupled to a Voith transmission, driving the inner bogie.

In terms of construction, the Class 155s were similar to the Class 14x 'Pacers', with several bus body pre-formed sections riveted together, with the lightweight body attached to a welded floor assembly. The interior using the low-density 2+2 style, while pleasing to the eye, was not accepted well by the travelling public, with seats low down to the window height.

A toilet compartment was fitted in one

vehicle, with a luggage and catering trolley space in the same position on the other vehicle.

Soon after introduction, major troubles emerged. The Class 155s were the first DMUs to incorporate single sliding-plug doors, which when closed gave a smooth bodyside appearance. Regrettably these doors did not operate well, with several cases reported of doors opening while trains were in motion. This quickly led to the entire fleet being taken out of service for a short time while modifications were carried out.

In the Cardiff area Class 156s were drafted in to take over some duties, while in some areas first generation stock was returned to front line use.

Once fully operational the fleet did not operate for long before the requirement arose for replacement of rural lines stock emerged, this led the BRB to look at either buying new single car trains or to convert recently introduced stock into single car trains. At first consideration was given to rebuilding some Class 156s into new generation 'bubble' cars, but eventually the entire Regional Railways operated Class 155 fleet was authorised for rebuilding into single-cars, replacing Class 121 and 122 first generation stock. The rebuild also gave Regional Railways greater flexibility with the ability to operate anything from a single

car to a 10-car train.

When originally built, the final seven Class 155s were funded by West Yorkshire Passenger Transport Executive (WYPTE) for Leeds area 'Metro' services, these were not converted to single vehicles, although at the time the BRB tried to obtain these vehicles for the conversion project.

As Class 155s, the sets were deployed in the West Country, Wales and longer distance Midland area services, based at Cardiff Canton depot.

They were delivered in Regional Railways 'Sprinter' livery of beige and two-tone blue with full yellow warning ends. The first of the build sported a traditional Leyland logo on the front end below the non-driving window.

In terms of the driving cab, the Class 155s followed the standard 'Sprinter' style, with switch and control gear in much the same places as on other 15x builds.

The seven WYPTE units have always been allocated to Leeds Neville Hill depot and today operate services on the Calder Valley Line, the Harrogate Line, and between Leeds and York.

When delivered these sets were painted in a deep red and cream West Yorkshire PTE livery. Today, following refurbishment and upgrade, they sport Northern Rail 'pictogram livery' but still with Metro branding. ■



Above: After No. 155301 was collected from the Workington plant of Leyland it travelled south via Sellafield and Carnforth to reach the West Coast Main Line and then to Crewe and via Stoke to Derby. Once at Derby the set was admitted to the Engineering Development Unit at the Railway Technical Centre for type test and commissioning work. This image was recorded a couple of days after arrival with the traditional EDU red flags indicating not to be moved. Soon after this image was taken the set commenced dynamic testing on the Midland Main Line to Cricklewood before taking up its allocation at Cardiff Canton depot. **CJM**

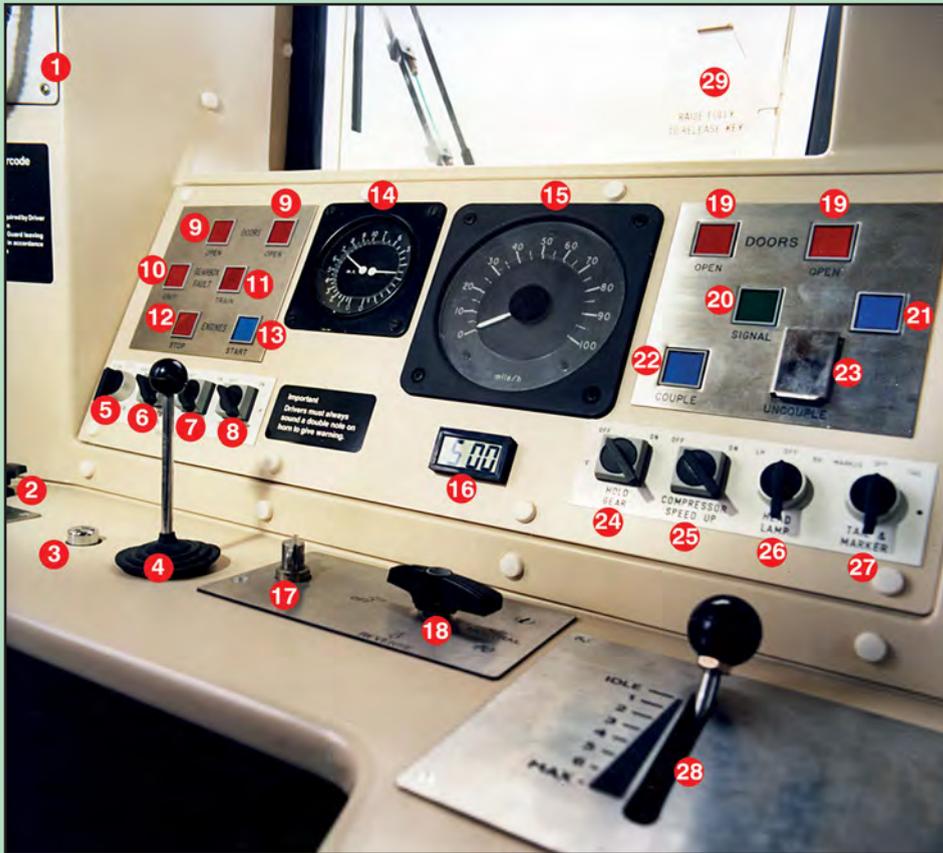
Left Top: On the day of hand-over from Leyland Bus in Workington to the BR Provincial business sector set No. 155301 poses in the works yard awaiting the BR driver and staff to arrive. Note the traditional Leyland name below the non-driving front window. **CJM**



Right: Class 155 front end equipment positions. 1: Destination indicator, 2: Lamp bracket, 3: Front gangway door, 4: White marker light, 5: Headlight, 6: Red tail light, 7: BSI automatic coupling, 8: Air warning horns, 9: Obstacle deflector plate, 10: Electrical connection box, 11: Emergency jumper socket. Front end of West Yorkshire PTE (Northern Rail) Class 155/3 No. 155346. **CJM**



Class 155 Technical and Cab

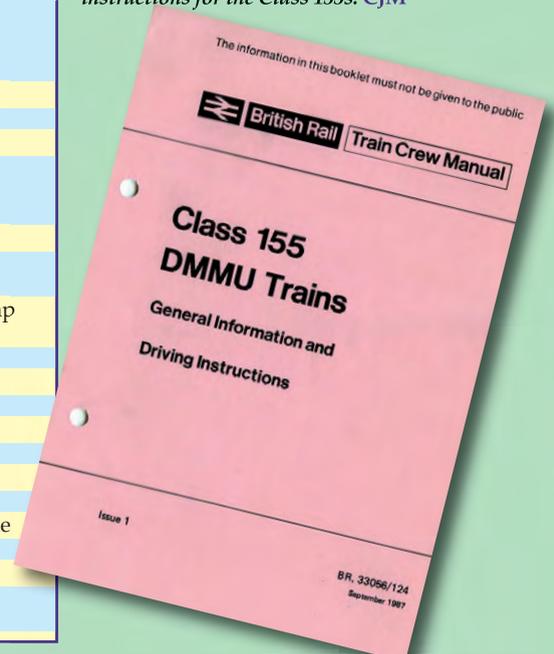


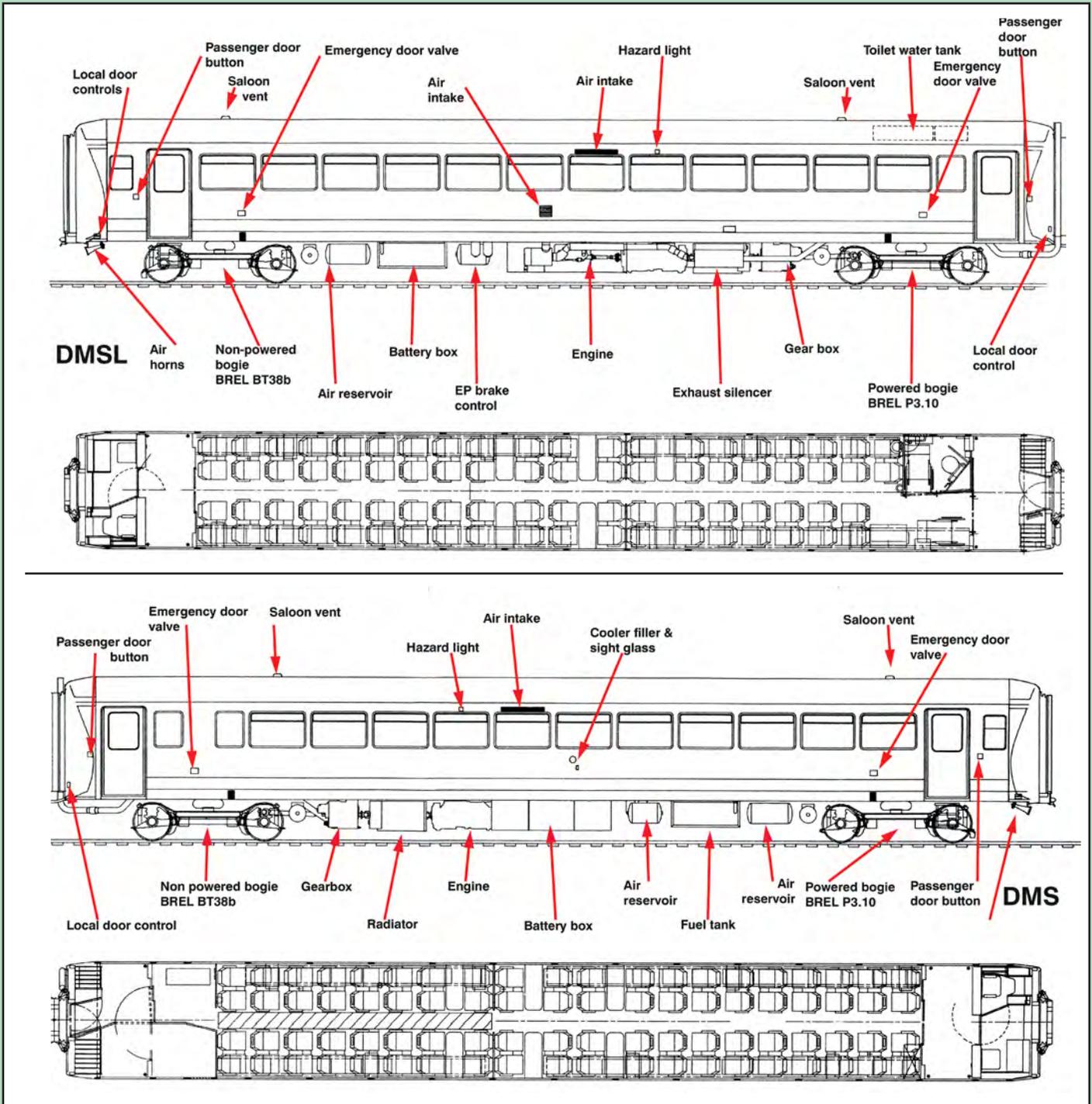
Left: Class 155 driving cab. Main equipment items: 1: Cab to cab and public address telephone and call buttons, 2: Windscreen wiper controller, 3: AWS reset button, 4: Horn valve, 5: Cab heater fan control, 6: Windscreen heater switch, 7: Cab light switch, 8: Instrument light switch, 9: Left side doors open, 10: Gearbox fault unit, 11: Gearbox fault train, 12: Engine stop button, 13: Engine start button, 14: Main reservoir and brake cylinder pressure gauge, 15: Speedometer, 16: Clock, 17: Master key socket, 18: Master switch, 19: Right side door open buttons, 20: Signal button, 21: Spare, 22: Couple button, 23: Uncouple button (under flap), 24: Hold gear switch, 25: Compressor speed up switch, 26: Headlight switch, 27: Marker/tail light switch, 28: Power controller/throttle, 29: Emergency brake bypass switch. Cab illustrated from set No. 155302. CJM

Technical Description

Class:	155/0	155/3
Number range:	155301-155335	155341-155347
Introduced:	1987-1988	1988
Built by:	Leyland Bus, Workington	Leyland Bus, Workington
Formation:	DMSL+DMS	DMSL+DMS
Vehicle numbers:	DMSL - 52301-52335 DMS - 57301-57335	DMSL - 52341-52347 DMS - 57341-57347
Vehicle length:	76ft 5in (23.29m)	76ft 5in (23.29m)
Height:	12ft 3¾ in (3.75m)	12ft 3¾ in (3.75m)
Width:	8ft 10in (2.69m)	8ft 10in (2.69m)
Seating:	Total - 161S DMSL - 81S DMS - 80S	As built: Total - 160S DMSL - 80S DMS - 80S 2015: Total 156S DMSL - 76S DMS - 80S
Internal layout:	2+2	2+2
Gangway:	Throughout	Throughout
Toilets:	DMSL - 1	DMSL - 1
Weight:	Total - 78 tonnes DMSL - 39 tonnes DMS - 39 tonnes	Total - 77.8 tonnes DMSL - 39.2 tonnes DMS - 38.6 tonnes
Brake type:	Air EP	Air EP
Bogie type:	Powered - BREL P3-10 Trailer - BREL BT38	Powered - BREL P3-10 Trailer - BREL BT38
Power unit:	1 x Cummins NT855R5 of 285hp (213kW) per vehicle	1 x Cummins NT855R5 of 285hp (213 kW) per vehicle
Transmission:	Hydraulic	Hydraulic
Transmission type:	Voith T211r	Voith T211r
Horsepower (total):	570hp (426kW)	570hp (426kW)
Max speed:	75mph (121km/h)	75mph (121km/h)
Coupling type:	BSI	BSI
Multiple restriction:	Class 14s, 15x	Class 14x, 15x, 170, 172 series
Door type:	Single-leaf sliding plug	Single-leaf sliding plug
Body structure:	Aluminium alloy on steel frame	Aluminium alloy on steel frame
Owner privatisation:	-	Porterbrook
Operator 2015:	-	Northern Rail
Notes:	35 sets rebuilt to 70 single cars of Class 153	

Below: British Rail Train Crew Manual BR33056/124 covering general and driving instructions for the Class 155s. CJM





Right: Original Class 155 passenger saloon, showing the well spaced 2+2 seating layout, using low back and cushion seats, causing a large number of complaints that the seats were too low for people to enjoy the view from the window. The problem with the height of the seats against the body window openings was governed by the use of bus body parts. The seating was mainly of the airline style with two groups of four seats around tables. The airline seats had fold down tables, with a cut out for a drink. These were later changed to a solid table after people placed too small a drinks container in the cut out causing it to fall through on their lap or floor. As these were deemed as Sprinter Express or longer distance trains carpets were fitted. The vehicle shown is from set No. 155303. **CJM**



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Left Top: Class 155 testing on the Western Region, organised by the DM&EE commenced on 4 August 1987 with one round trip per day from Bristol Bath Road to Didcot and return, departing from Bristol at 10.34. On the second day of testing the pioneer set, complete with its Leyland logo under the non-driving front window, heads into Didcot on the up relief tracks. The two lines on the right served the now closed and demolished Didcot power station, which at the time could see anything up to 12 trains every day. **CJM**



Left Middle: After many teething problems, some including doors flying open when trains were in motion, the Class 155s settled down to give a good availability from Cardiff Canton with figures of between 70-85% being recorded in 1990-91. On 9 April 1991, set No. 155312 passes Severn Tunnel Junction forming the 13.05 Brighton to Cardiff service. In February/March 1992 this set was rebuilt as Class 153s Nos. 153312 and 153362. **CJM**

Below: When in traffic as Class 155s from Cardiff Canton, they were deployed on services radiating from Cardiff to Portsmouth, Brighton, Birmingham, Shrewsbury and the Mid-Wales routes as well as services to the West Country including Paignton, Plymouth and Penzance. On 11 July 1991, set No. 155321 departs from Westbury with a Sussex coast to Bristol/Cardiff duty. **John Whiteley**





Above: Passing the wonderful semaphore signal gantry at Sutton Bridge Junction, Shrewsbury on 26 March 1990, 'Super Sprinter' No. 155330 forms the 08.21 Manchester Piccadilly to Cardiff service. This Class 155 remained in service until summer 1992 before being called to the Hunslet-Barclay works at Kilmarnock for conversion to Class 153s **CJM**

Below: When the Class 155s were introduced on Cardiff to West Country services, it was a culture change in travelling comfort for passengers, who had been used to travelling on first generation DMMU stock, or a few remaining loco-hauled services mainly using Mk1 stock. On 2 June 1989, set No. 155310 passes Aller Junction, west of Newton Abbot with the 08.05 Cardiff to Penzance semi-fast service. **CJM**





Above: When the final seven Class 155s emerged from Leyland, Workington, they were funded by West Yorkshire Passenger Transport Executive and painted in their red and cream livery. Allocated to Leeds Neville Hill the sets were used on longer-distance duties in the Leeds area. In addition to the BR double arrow logo, these sets sported the Metro train branding. Set No. 155341 is illustrated at the Procor Works at Horbury on 25 May 1996 while awaiting refurbishment and a classified overhaul. **CJM**



Left Middle: With its Driving Motor Standard Lavatory (DMSL) vehicle leading, set No. 155346 forming an evening Leeds to Bradford and Manchester service departs from Bradford Interchange station on 13 July 1989. **John Whiteley**



Left Below: On 30 May 1990, West Yorkshire PTE-liveried No. 155341 forms an evening Manchester Piccadilly to Bradford and Leeds service. The train is seen approaching Bradford Interchange station at Mill Lane Junction. **John Whiteley**



Above and Left: Today the remaining Class 155s are painted in pictogram branded Northern livery promoting Leeds, Bradford and Huddersfield. On 22 April 2014, set No. 155346 stands in the bay platform at Selby forming the 15.43 Selby to Huddersfield. On the left are details of the bodyside pictogram. Both: **CJM**

Below: Class 155/3 No. 155347 pulls out of Winterbutlee Tunnel, Walsden on 14 February 2007, forming the 11.08 Leeds to Manchester Victoria train. **Mark Bearton**



Class 155 Fleet List

Class 155/0							
Set No.	Vehicle Numbers		New	First Allocation	Reformed as Class 153	Class 153 Numbers	Notes
	DMSL	DMS					
155301	52301	57301	Jun-87	CF	Sep-91	153301, 153351	
155302	52302	57302	Jul-87	CF	Oct-91	153302, 153352	
155303	52303	57303	Sep-87	CF	Jan-92	153303, 153353	
155304	52304	57304	Oct-87	CF	Jun-91*	153304, 153354	*153304 not modified until January 92
155305	52305	57305	Oct-87	CF	Nov-91	153305, 153355	
155306	52306	57306	Oct-87	CF	Oct-92	153306, 153356	
155307	52307	57307	Nov-87	CF	Feb-92	153307, 153357	
155308	52308	57308	Nov-87	CF	Oct-91	153308, 153358	
155309	52309	57309	Nov-87	CF	Sep-91	153309, 153359	
155310	52310	57310	Dec-87	CF	Nov-91	153310, 153360	
155311	52311	57311	Jan-88	CF	Aug-91	153311, 153361	
155312	52312	57312	Jun-88	CF	Feb-92	153312, 153362	
155313	52313	57313	Jan-88	CF	Aug-92	153313, 153363	
155314	52314	57314	Feb-88	CF	Jul-91	153314, 153364	
155315	52315	57315	Feb-88	CF	Nov-92	153315, 153365	
155316	52316	57316	Feb-88	CF	Aug-92	153316, 153366	
155317	52317	57317	Feb-88	CF	Jul-91	153317, 153367	
155318	52318	57318	Feb-88	CF	Dec-91	153318, 153368	
155319	52319	57319	Feb-88	CF	Oct-91	153319, 153369	
155320	52320	57320	Feb-88	CF	Jul-92	153320, 153370	
155321	52321	57321	Feb-88	CF	Mar-92	153321, 153371	
155322	52322	57322	Mar-88	CF	Mar-92	153322, 153372	
155323	52323	57323	Mar-88	CF	Nov-91*	153323, 153373	*153373 not modified until January 92
155324	52324	57324	Mar-88	CF	Jul-92	153324, 153374	
155325	52325	57325	Mar-88	CF	Mar-92*	153325, 153375	*153325 not modified until June 92
155326	52326	57326	Mar-88	CF	Mar-92	153326, 153376	
155327	52327	57327	Apr-88	CF	May-92	153327, 153377	
155328	52328	57328	Apr-88	CF	Apr-92	153328, 153378	
155329	52329	57329	Apr-88	CF	Feb-92	153329, 153379	
155330	52330	57330	Apr-88	CF	Sep-92	153330, 153380	
155331	52331	57331	Apr-88	CF	Aug-91*	153331, 153381	*153331 not modified until November 91
155332	52332	57332	May-88	CF	Nov-91*	153332, 153382	*153332 not modified until January 92
155333	52333	57333	Jul-88	CF	Oct-92	153333, 153383	
155334	52334	57334	Jun-88	CF	May-92	153334, 153384	
155335	52335	57335	Jul-88	CF	Sep-92	153335, 153385	

Class 155/3						
Set No.	Vehicle Numbers		New	First Allocation	Present Owner	Present Operator
	DMSL	DMS				
155341	52341	57341	Jul-88	NL	Porterbrook	Northern Rail
155342	52342	57342	Aug-88	NL	Porterbrook	Northern Rail
155343	52343	57343	Sep-88	NL	Porterbrook	Northern Rail
155344	52344	57344	Sep-88	NL	Porterbrook	Northern Rail
155345	52345	57345	Sep-88	NL	Porterbrook	Northern Rail
155346	52346	57346	Sep-88	NL	Porterbrook	Northern Rail
155347	52347	57347	Sep-88	NL	Porterbrook	Northern Rail

With the Westbury White Horse in the background. Class 155 No. 155328 approaches Fairwood Junction on 7 March 1991 with the 14.40 Bristol Temple Meads to Weymouth service. Following withdrawal of the Class 155s from Cardiff, the Bristol to Weymouth route was taken over by Class 150 stock, later some services were operated by Class 153s and in 2015 Class 150s are the rostered motive power. CJM



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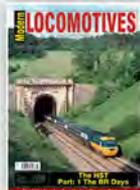
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Leyland Class 153



Above: Regional Railways held a major press event at the Hunslet-Barclay works in Kilmarnock on 18 July 1991, when the press were invited to see the major conversion operation under way and then travel on the first released pair of Class 153s Nos. 153317 and 153367 (the original Class 155 No. 155317) for a special demonstration run from the Hunslet-Barclay Works to Carlisle via Ayr. In this view we see vehicle No. 153317 inside the main shop at Kilmarnock just before departure. **CJM**

Soon after the Leyland Bus based Class 155 two-car sets emerged, the BRB saw the need to replace its first generation DMMU fleet of Class 121 and 122 single 'bubble' railcars used on branch and lightly used lines. Greater all round flexibility could also be seen in having a fleet of 70 single cars, enabling trains to be formed of any length depending on demand.

Thus the then Regional Railways management went out to tender to convert the entire fleet of 35 Regional Railways Class 155s into single vehicles. The conversion contract was won by Kilmarnock-based Hunslet-Barclay, who undertook the complex re-working in 1991-1992.

The most difficult part of this contract was to build a new driving cab into the original vestibule or inner end of each coach. The space was very limited, the original door pocket could not be moved and the resulting cab, which extends slightly into the original door space, together with the end door position and non-driving seat, are to say the least 'compact'. Indeed some of the more portly driver's have difficulty in getting into the cab. To install the required desk layout, some ingenious thinking had to be made and in one of the rare cases, the cabs at both end of the train are of a slightly different layout.

During the rebuild, the original Class 155 cab layout was replaced with new switch equipment, with some items such as the master key socket and reverser switch being positioned to the cab side in the new cab end. Space restrictions also saw the Group Standard light cluster at the new end positioned slightly higher up the body

than would have been liked to provide the necessary space, while the windscreen wiper control had to be installed from the top rather than the bottom of the window. The drop light side window was also much smaller and difficult to lean out.

Internally the DMSL vehicles retained most of their original layout, however the DMS vehicles had to be fitted with a toilet compartment. Seating is in the 2+2 style with the majority being of the airline type with only a limited number of facing seats around fixed tables.

The maximum speed of the Class 153s is 75 mph (121 km/h) which is quite surprising for the low brake efficiency of a single vehicle. However, the speed suited the workings for which the class were introduced.

The new generation 'Bubble' cars were fitted with BSI auto-couplers and fully compatible with Class 142, 143, 144, 150, 156, 158 and 170 stock.

Conversion of vehicles saw two numeric groups formed. With sets numbered 153301-153335 and 153351-153385. The first group being the original 52301-52335 batch and the second being the original 57301-57335 series, which after conversion were renumbered to 57351-385 to maintain uniformity with set numbers.

In the lead up to privatisation the Class 153s were allocated between Porterbrook and Angel Trains and post 1996 saw deployment with many rural operators.

In 2015 a small fleet is operated by Arriva Trains Wales (eight vehicles), these are used on rural lines, such as between Shrewsbury and Swansea and on local stopping services

from Crewe to Shrewsbury via Nantwich and on the Cardiff Bay shuttle service.

Central Trains, now London Midland, operate eight vehicles on lines in the West Midlands such as between Coventry and Nuneaton and on the Marston Vale Line between Bedford and Bletchley.

East Midlands Trains has an allocation of 17 Class 153s allocated to Nottingham Eastcroft and deployed on routes such as Nottingham to Worksop, Nottingham to Matlock and Skegness, Leicester to Lincoln, Peterborough to Lincoln, Doncaster to Cleethorpes, and the Derby to Crewe route. All East Midlands Trains Class 153s carry Stagecoach blue 'local' livery.

First Great Western, who inherited the Wessex Trains fleet when the Greater Western Franchise was formed, operate a fleet of 14 vehicles, these are operated from Exeter depot and work services in Devon, Cornwall and the Bristol-Cardiff area, as well as on the Swindon to Southampton via Melksham corridor.

FGW commenced a refurbishment plan from 2007, which saw vehicles externally reliveried in the 'Local Lines' or 'location' livery. Internal upgrade was also undertaken including work in the toilet area, where new flooring and wall coverings were applied, and a revised toilet and sink module fitted. Seating was replaced with Richmond high-back seats trimmed in First Great Western moquette. Some earlier modernised vehicles sported Chapman seats.

Over the years some interesting formations have been seen with '153' vehicles replacing one vehicle of a 'Sprinter' set. In recent





Above: The most difficult part of the Class 155-153 conversion contract was the formation of the new cab in the former vestibule end. This was a challenging operation and resulted in a very small cab area, limited space required the light clusters to be fitted higher up the body work than usual, while the drivers windscreen wiper had to have its motor above the cab front window, pushing the destination blind onto the non-driving side. Class 153 No. 153314 is seen in advance stages of conversion with the bodywork rubbed down for repainting. **CJM**

years Class 150/2 car No. 52221 (set 150221) received fire damage and while this was repaired 'bubble' No. 153369 was formed with remaining car 57221, the temporary formation running as No. 153399. Soon after 150221 reverted to its booked formation, No. 153369 was paired with one vehicle of Central Trains-liveried set No. 150202, which was again numbered as 153399.

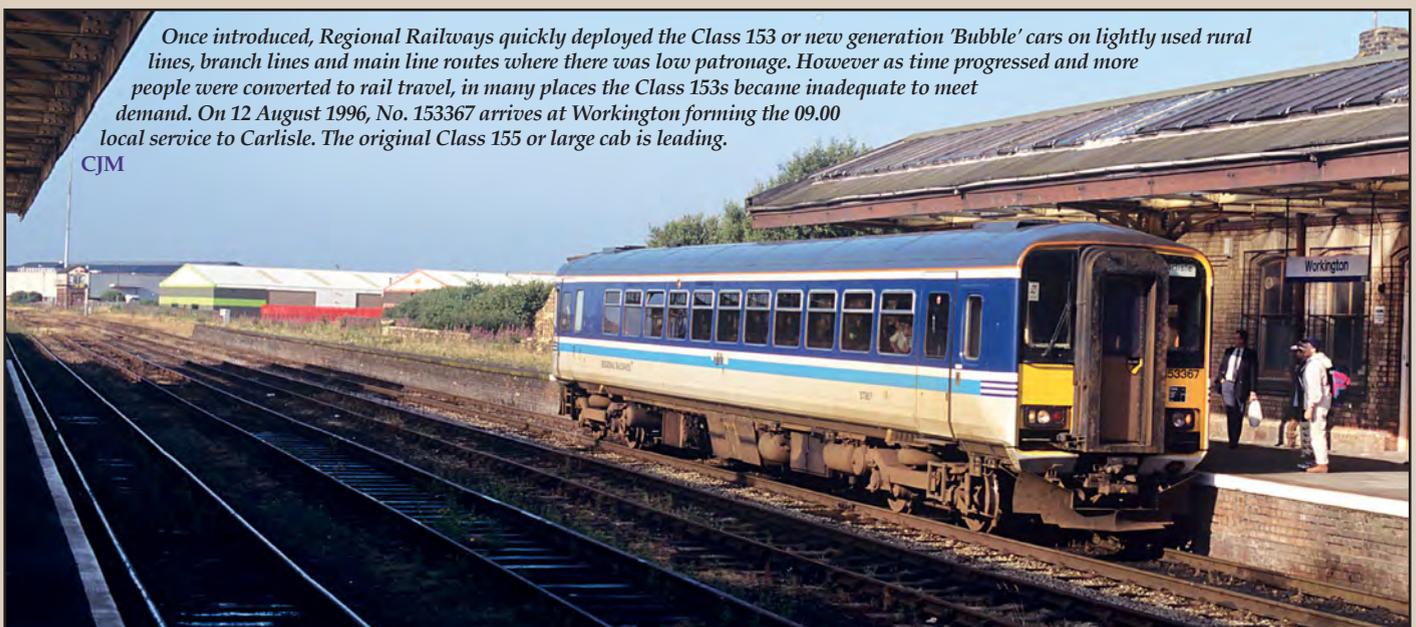
When the present Northern Rail franchise was launched in December 2004, it took on the fleets previously operated by Arriva Trains Northern, the fleet is deployed on local services around Manchester, and on Lancaster to Barrow-in-Furness/Carlisle and Preston to Ormskirk services. They are also used on local services around Leeds, Doncaster,

and Sheffield, including the Cleethorpes to Barton-on-Humber 'shuttle' services.

Today, all vehicles have been repainted into Northern Rail livery.

Another area which uses single car Class 153s is Anglia, where a small fleet of five vehicles is allocated to Norwich Crown Point for local rural services, this includes Ipswich to Cambridge, Peterborough, Felixstowe and Lowestoft, as well as on lines radiating from Norwich.

Anglia sets have carried a number of different liveries since the days of regional railways, with ONE Railway, National Express and most recently Abellio Greater Anglia base white/ red applied with Greater Anglia branding. ■



Once introduced, Regional Railways quickly deployed the Class 153 or new generation 'Bubble' cars on lightly used rural lines, branch lines and main line routes where there was low patronage. However as time progressed and more people were converted to rail travel, in many places the Class 153s became inadequate to meet demand. On 12 August 1996, No. 153367 arrives at Workington forming the 09.00 local service to Carlisle. The original Class 155 or large cab is leading. **CJM**

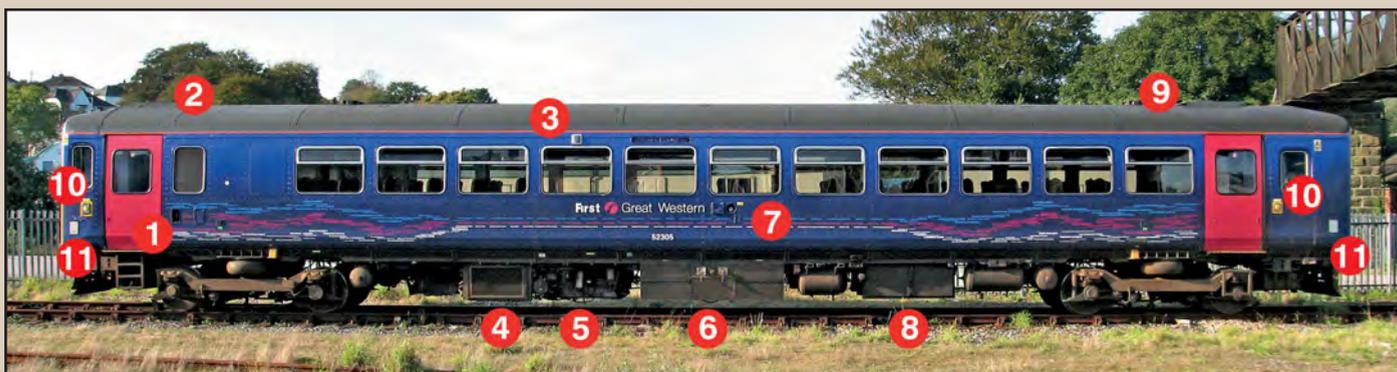


Technical and Driving Cabs



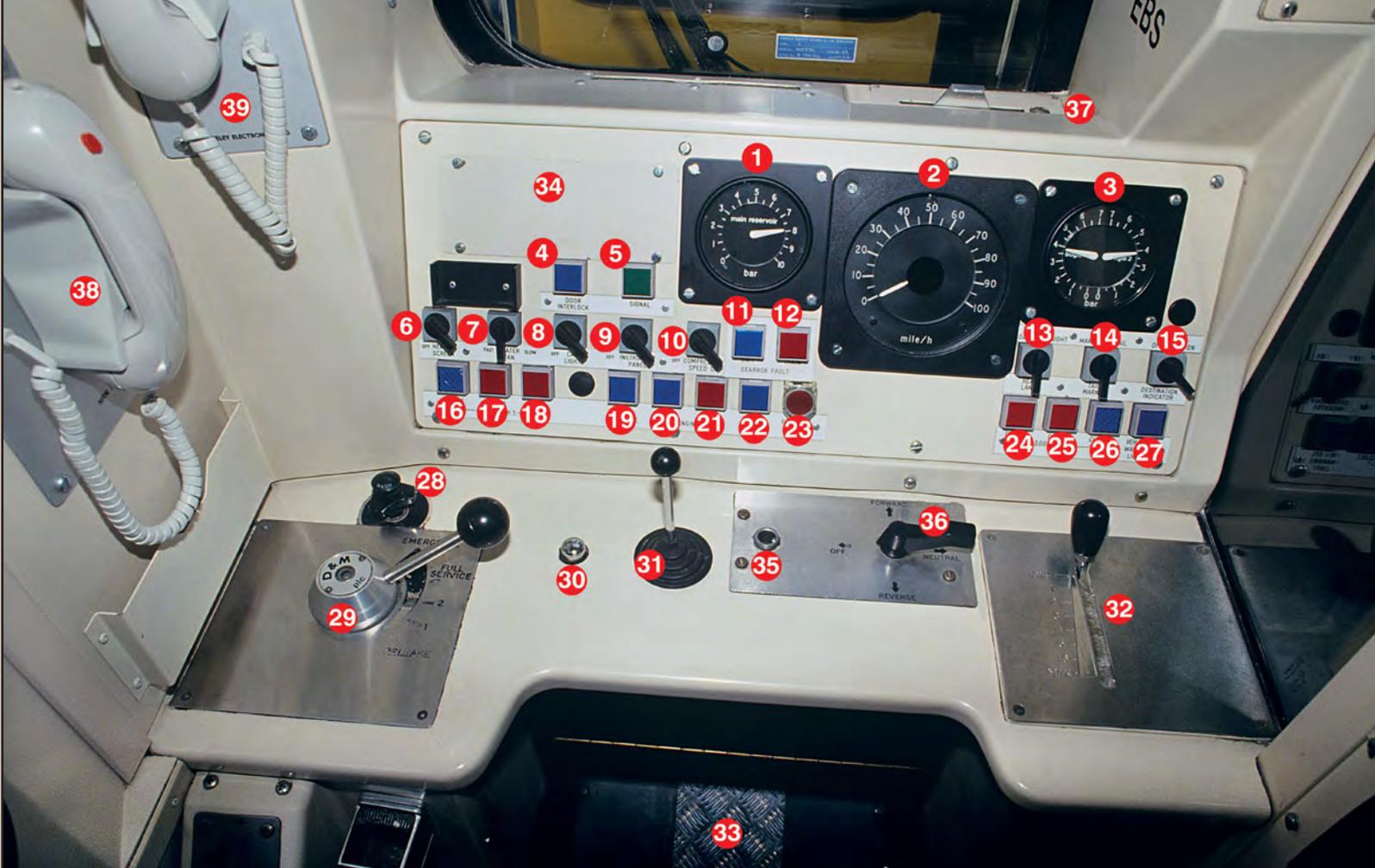
Above: Class 153 front end layout. The 'new' or small cab end is shown on the left. The cab on the right has received subsequent modification in terms of valance, marker lights and obstacle deflector plate. 1: Gangway door, 2: Lamp bracket, 3: Joint LED red tail and white marker light, 4: Headlight, 5: Warning horns, 6: BSI coupling, 7: Electrical connection box, 8: Obstacle deflector plate, 9: Emergency jumper cable, 10: Destination indicator, 11: Marker light, 12: Tail light, 13: Emergency air supply, 14: Emergency coupling air supply. Both: CJM

Below: Class 153 equipment positions. 1: Toilet water filler, 2: Roof aerial, 3: Door open/hazard light, 4: Radiator, 5: Engine, 6: Battery box, 7: Cooler water filler port, 8: Fuel tank, 9: Roof aerial, 10: Door open button, 11: Crew control for local door. CJM

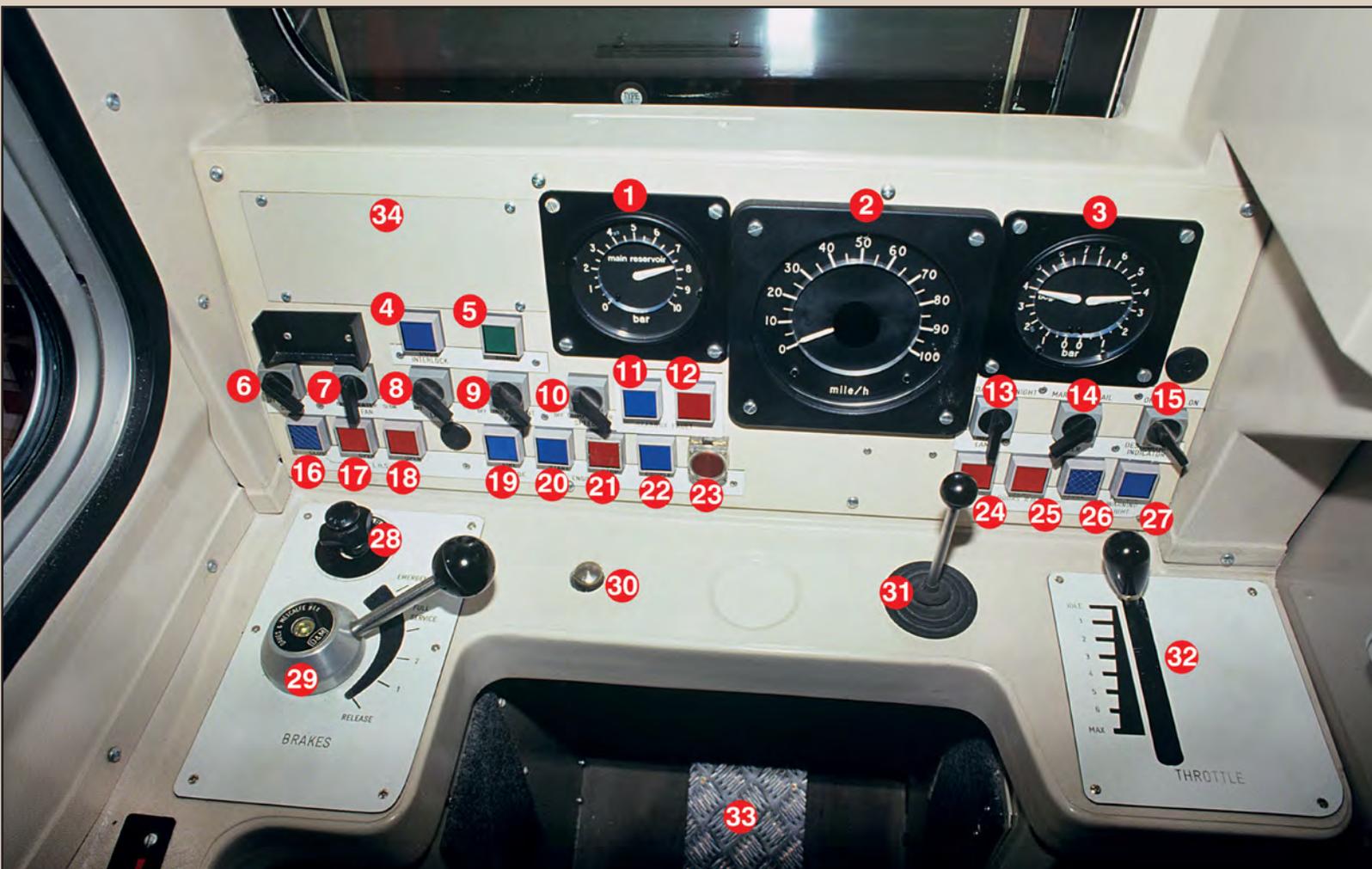


Technical Description

Number range:	153301-153385	Bogie type:	Powered - BREL P3-10 Trailer - BREL BT38
Introduced:	As Class 153 - 1991-1992 Originally as Class 155 2-car sets - 1987-1988	Power unit:	1 x Cummins NT855R5
Original build:	Leyland Bus, Workington	Transmission:	Hydraulic
Rebuilt by:	Hunslet-Barclay, Kilmarnock	Transmission type:	Voith T211r
Formation:	DMSL	Horsepower (total):	285hp (213kW)
Vehicle numbers:	52301-52335, 57351-57385	Max speed:	75mph (121km/h)
Vehicle length:	76ft 5in (23.29m)	Coupling type:	BSI
Height:	12ft 3 ³ / ₈ in (3.75m)	Multiple restriction:	Class 14x, 15x, 17x series
Width:	8ft 10in (2.69m)	Door type:	Single-leaf sliding plug
Seating:	As built: 72S plus 3 tip-up 2015: 66-73S depending on operator	Body structure:	Aluminium alloy on steel frame
Internal layout:	2+2	Owner:	Post Privatisation: Angel Trains, Porterbrook
Gangway:	Throughout	Operator:	2015: Northern Rail, East Midlands Trains, Arriva Trains Wales, Greater Anglia, London Midland, First Great Western
Toilets:	1	Notes:	Rebuilt from 35 Class 155 twin sets
Weight:	41.2 tonnes		
Brake type:	Air EP		



Above and Below: Class 153 driving cab layout, the illustration above is the original or standard cab and the view below is the new or small cab. 1: Main reservoir pipe gauge, 2: Speedometer, 3: Brake cylinder pressure gauge, 4: Door interlock light, 5: Signal button (cab-cab), 6: Heated screen switch, 7: Cab heat fan switch (fast-slow), 8: Cab light switch, 9: Instrument light switch, 10: Compressor speed up switch, 11: Gearbox fault light unit, 12: Gearbox fault light train, 13: Headlight switch (day-off-night), 14: Tail/marker light switch, 15: Destination indicator switch, 16: Left side door close button, 17/18: Left side door open buttons, 19: Fire release override button, 20: Engine start button, 21: Engine stop button, 22: Couple button, 23: Uncouple button (under hinged cover), 24/25: Right side door open buttons, 26: Right side door close button, 27: Vehicle systems warning light, 28: Windscreen wiper valve, 29: Brake controller, 30: AWS re-set button, 31: Horn valve, 32: Power controller/throttle, 33: Drivers Safety Device (DSD) peddle, 34: Position for radio, 35: Master key switch, 36: Master switch, forward, neutral, reverse, 37: Emergency bypass switch, 38: Telephone handset, 39: Cab-cab and public address handset. CJM





Above: In some areas such as the West Country when the Class 153s were introduced they would frequently appear working longer distance services coupled together, basically operating as a Class 155. At first glance this looks like a Class 155 formed train, but actually it is single cars No. 153332 and 153305 operating together as the 08.55 Exmouth to Paignton passing Dawlish Warren on 20 February 1993. **CJM**

Below: Displaying the neat Regional Railways livery and with its big cab nearest the camera, Class 153 No. 153384 passes Wratby Junction, Barnetby on 29 August 1992 with a local service bound for Cleethorpes. **John Whiteley**





Above: A number of striking liveries emerged on Class 153s under the Wales and West and Wessex franchise ownership. Being supportive of the partnerships and community railways, new vinyl-based liveries were applied at Cardiff Canton depot. From March 2001 Class 153s Nos. 153302/308/374/377/380/382 emerged in an all black livery with the Great Scenic Railways of Devon and Cornwall branding and a pictogram on the bodywork at the toilet end. This was supported by the Plymouth-based Devon and Cornwall Rail Partnership. Set No. 153374 is illustrated at Canton on 16 May 2001. **CJM**



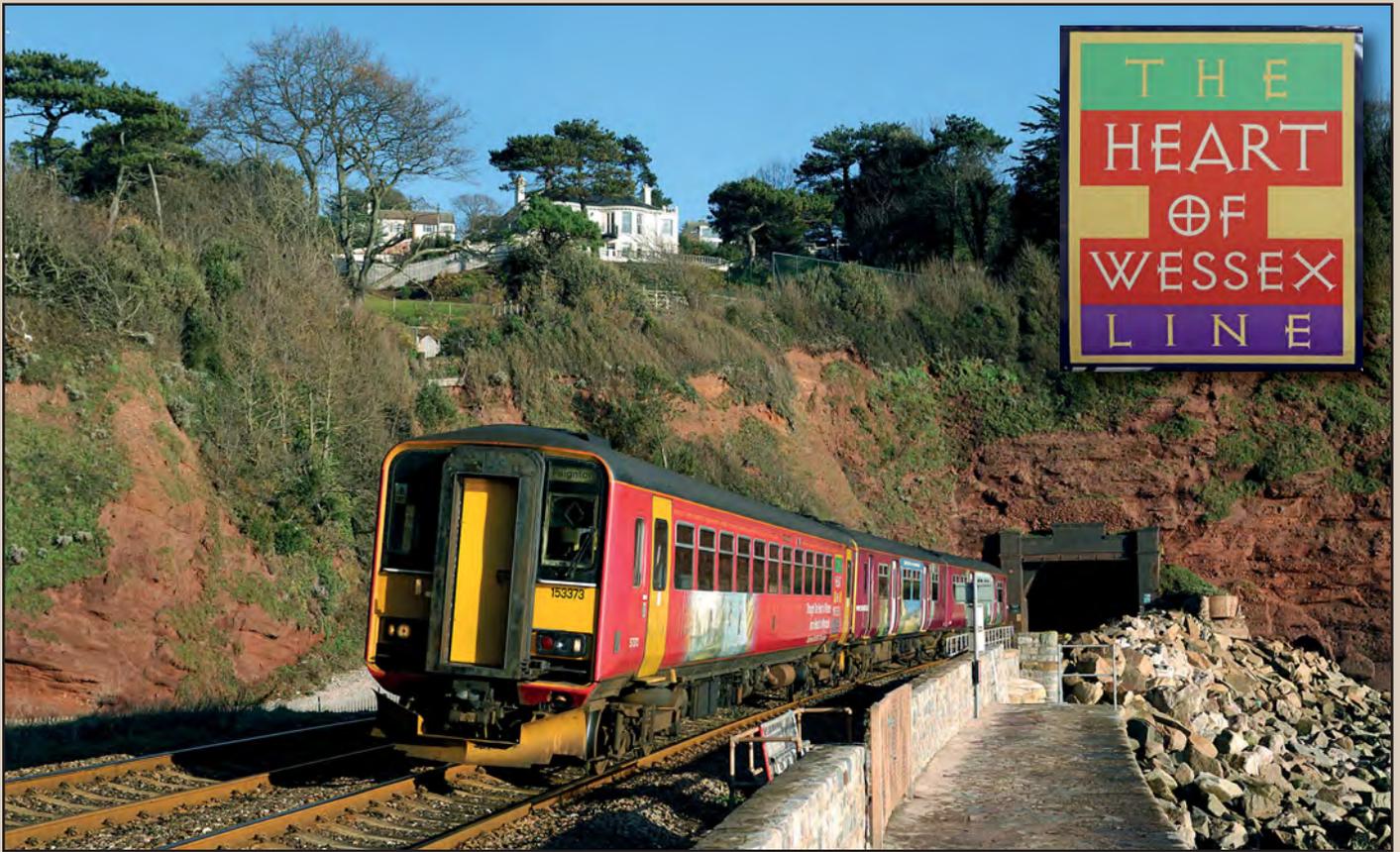
Right Middle: A handful of Class 153s were also painted and vinyl'd in Heart of Wales orange livery with words from Dylan Thomas on the bodyside. These sets were usually kept on Welsh services but from time to time turned up in places such as Plymouth and Weymouth. Set No. 153353 is seen from its small cab at Exeter depot. **CJM**



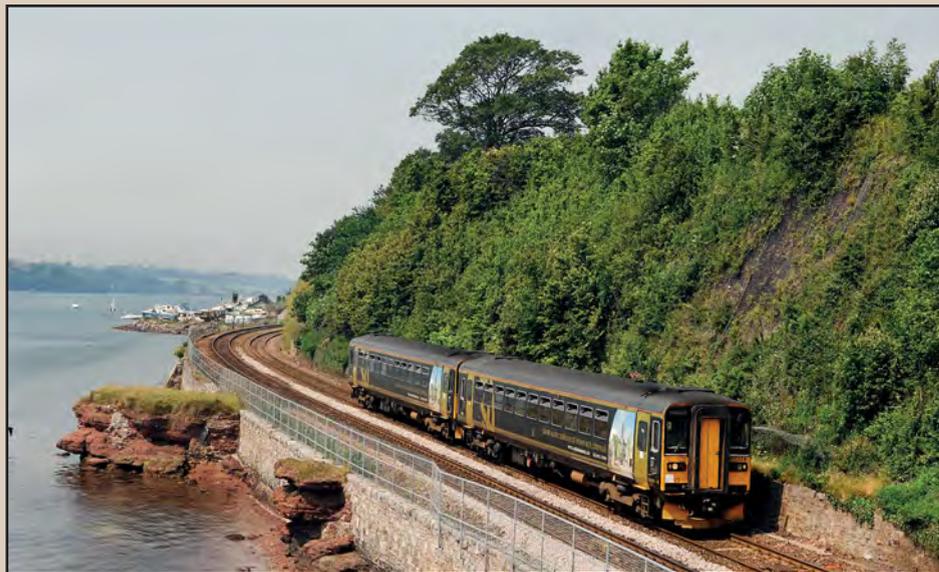
Right Lower: The heart of Wessex line from Bristol to Weymouth was supported by a dark pink livery with Through the Heart of Wessex branding, again using a pictogram but this time on the lower body panel and a large route logo over the toilet bodywork. Set No. 153355 is illustrated. **CJM**

Below Left and Below Right: Under the Wessex Trains banner in 2005, two Class 153s (153329 and 153369) were painted in mid blue and carried branding, pictograms and names in support of the St Ives branch and the Looe Valley line. The illustrations below show the branding and set No. 153329 for the St Erth-St Ives sponsorship. Both: **CJM**





Above: One of the problems of applying route branding is that sets will stray from their painted area. When Wales & West and Wessex applied the 153s with route branding, it was agreed that the sets would operate as a common pool and work in 'other' areas. Here on 19 December 2005, Heart of Wessex set No. 153373 leads Class 150/2 No. 150219 out of Parsons Tunnel, Teignmouth working the 11.29 Exeter St Davids to Paignton. The inset shows the detailed Heart of Wessex branding. Both: **CJM**



Left Middle: Trying to imitate a Class 155, a pair of Class 153s, Nos. 153374 and 153382 approach Shaldon Bridge, Teignmouth with the 11.24 Paignton to Exmouth on 1 July 2006. Both vehicles are painted in the Devon & Cornwall Rail Partnership black and gold colours. **CJM**



Left Below: Under privatisation, the Birmingham area Class 153s became operated by Central Trains and their mid-green livery with yellow passenger doors was applied. A pair of unbranded Central Trains 'Bubble' cars Nos. 153383 and 153376 are recorded on the Midland Main Line at Barrow-on-Soar, south of Loughborough on 27 February 2008 with a southbound stopping service bound for Peterborough. **CJM**



Above: Under privatisation the First North Western franchise operated a small number of '153s', later some of these were transferred to Arriva Trains Wales, and some interim liveries such as this of ENW blue and gold with Arriva branding emerged. No. 153310 is seen at Cardiff on 5 November 2007. **CJM**

Right: On franchise changes in 2007, London Midland was formed from parts of the old Central Trains operation. LM currently has a fleet of eight Class 153s, No. 153356 is seen at Nuneaton on 6 May 2012. **Nathan Williamson**



Below: The diverse number of liveries carried is shown in this view of a Northern Rail train forming a Carlisle to Leeds service soon after departing from Ribbleshead on 19 March 2005. The lead '153' No. 153357 is in Arriva Trains colours while the Class 156 on the rear retains Northern Spirit colours from the 1997-2000 period. **John Whiteley**





Above: Today, East Midlands Trains operates a fleet of 17 Class 153s based at Nottingham Eastcroft for branch and rural line operations. All are painted in Stagecoach red, blue and orange livery. Viewed from its original cab end No. 153384 is seen at Doncaster on 23 April 2014. **CJM**



Left and Below: Northern Rail, owned by Serco-Abellio, has a fleet of 18 Class 153s, all painted in their blue, mauve and grey house colours. The fleet is based at Leeds Neville Hill depot and operate on the Manchester-Liverpool, Colne-Blackpool, Preston-Ormskirk, Leeds-Knottingley and Cumbrian Coast routes. Vehicles are also attached to other services to provide extra accommodation. In the view left, No. 153363 is seen in the bay at Preston on 16 July 2014 with an Ormskirk service, while in the view below No. 153330 departs from Doncaster on 23 April 2014 with the 08.19 Scunthorpe to Lincoln Central duty. Both: **CJM**





Above: Arriva Trains Wales, another operator with a number of rural routes, operates a fleet of eight Class 153s allocated to Cardiff. Sporting the older Arriva trains Wales colours, No. 153303 awaits departure from Cardiff Queen Street to Cardiff Bay on 6 June 2013 with the shuttle service to 'The Bay'. **CJM**

Right and Below: Originally GB Railways, then National Express and now Abellio Greater Anglia have operated '153s' on Anglian rural services since the start of privatisation. A number of different liveries have been carried. In the view right, light grey/blue National Express-liveried No. 153306 leads an original GB Railways Anglia green and white liveried vehicle. Today, Abellio Greater Anglia operate five vehicles, based at Norwich Crown Point depot. All are refurbished and now sport Abellio Greater Anglia white livery off-set by orange doors. Three of the five vehicles retain their brushed aluminium nameplates of famous Anglia people. Below, we see No. 153309 departing from Norwich. **Jamie Squibbs / CJM**





Above: Currently First Great Western operate a fleet of 14 Class 153s based at Exeter. These work on branch lines from Exeter to Barnstaple, Exmouth and Paignton as well as to Bristol on Wiltshire services, the Weymouth line and on Cornish branch lines. In addition to operating on their own, the '153s' work to strengthen Class 143 and 150 formations to three vehicles at busy times. On 27 June 2011 two FGW Class 153s led by No. 153305 approach Aller divergence, Newton Abbot with a morning Bristol to Penzance service. **Antony Christie**

Below: In an attempt to reduce body corrosion due to water ingress behind the bodyside transfers, some FGW Class 153s have been repainted into all blue livery with First Great Western branding, still retaining pink passenger doors. No. 153369, showing this livery, departs from Newton Abbot on 25 April 2014 with the 15.59 shuttle service to Paignton. **Antony Christie**



Class 153 Fleet List

Set No.	Vehicle Number	New	First Allocation	Name	Owner	Operator	Notes
153301	52301	Sep-91	HT		ANG	NR	
153302	52302	Oct-91	CF		ANG	EMT	
153303	52303	Feb-92	CF		ANG	ATW	
153304	52304	Jan-92	TS		ANG	NR	
153305	52305	Nov-91	CF		ANG	FGW	
153306	52306	Oct-92	TS	<i>Edith Cavell - 11/11/94</i>	PTR	AGA	
153307	52307	Feb-92	TS		ANG	NR	
153308	52308	Sep-91	CF		ANG	EMT	
153309	52309	Sep-91	TS	<i>Gerard Fiennes - 11/10/94</i>	PTR	AGA	
153310	52310	Nov-91	NH		PTR	EMT	
153311	52311	Aug-91	TS	<i>John Constable - 25/11/94</i>	PTR	EMT	
153312	52312	Mar-92	CF		ANG	ATW	
153313	52313	Aug-92	NH		PTR	EMT	
153314	52314	Jul-91	TS	<i>Delia Smith - 4/5/95</i>	PTR	AGA	
153315	52315	Dec-92	TS		ANG	NR	
153316	52316	Aug-92	NH	<i>John 'Longitude' Harrison - 26/4/14</i>	PTR	NR	
153317	52317	Jul-91	HT		ANG	NR	
153318	52318	Dec-91	LA		ANG	FGW	
153319	52319	Oct-91	HT		ANG	EMT	
153320	52320	Jul-92	TS		PTR	ATW	
153321	52321	Mar-92	TS		PTR	EMT	
153322	52322	Apr-92	TS	<i>Benjamin Britten - 2/12/94</i>	PTR	AGA	
153323	52323	Nov-91	TS		PTR	ATW	
153324	52324	Jul-92	NH		PTR	NR	
153325	52325	Jun-92	NC		PTR	FGW	
153326	52326	Apr-92	TS	<i>Ted Ellis - 9/12/94</i>	PTR	EMT	
153327	52327	May-92	LA		ANG	ATW	
153328	52328	Apr-92	TS		ANG	NR	
153329	52329	Feb-92	TS	<i>The St. Ives Bay Belle - 4/12/05-5/08</i>	ANG	FGW	
153330	52330	Sep-92	NH		PTR	NR	
153331	52331	Nov-91	HT		ANG	NR	
153332	52332	Jan-92	NH		ANG	NR	
153333	52333	Nov-92	TS		PTR	FGW	
153334	52334	May-92	TS		PTR	LM	
153335	52335	Oct-92	TS	<i>Michael Palin - 19/9/97-10/07</i>	PTR	AGA	
153351	57351 (x 57301)	Sep-91	HT		ANG	NR	
153352	57352 (x 57302)	Oct-91	HT		ANG	NR	
153353	57353 (x 57303)	Jan-92	CF		ANG	ATW	
153354	57354 (x 57304)	Jun-91	NH		PTR	LM	
153355	57355 (x 57305)	Nov-91	LA		ANG	EMT	
153356	57356 (x 57306)	Nov-92	TS		PTR	LM	
153357	57357 (x 57307)	Feb-92	TS		ANG	EMT	
153358	57358 (x 57308)	Oct-91	HT		PTR	NR	
153359	57359 (x 57309)	Sep-91	NH		PTR	NR	
153360	57360 (x 57310)	Nov-91	NH		PTR	NR	
153361	57361 (x 57311)	Aug-91	NH		ANG	FGW	
153362	57362 (x 57312)	Feb-92	LA	<i>Dylan Thomas 1914-1953 - 2/9/03-8/07</i>	ANG	ATW	
153363	57363 (x 57313)	Aug-92	NH		PTR	NR	
153364	57364 (x 57314)	Jul-91	TS		PTR	LM	
153365	57365 (x 57315)	Nov-92	TS		PTR	LM	
153366	57366 (x 57316)	Aug-92	TS		PTR	LM	
153367	57367 (x 57317)	Jul-91	NH		PTR	ATW	
153368	57368 (x 57318)	Dec-91	CF		ANG	FGW	
153369	57369 (x 57319)	Oct-91	NH	<i>The Looe Valley Explorer - 20/12/05-05/08</i>	ANG	FGW	
153370	57370 (x 57320)	Sep-92	LA		ANG	FGW	
153371	57371 (x 57321)	Mar-92	TS		PTR	LM	
153372	57372 (x 57322)	Mar-92	CF		ANG	FGW	
153373	57373 (x 57323)	Jan-92	CF		ANG	FGW	
153374	57374 (x 57324)	Jul-92	LA		ANG	EMT	
153375	57375 (x 57325)	Mar-92	TS		PTR	LM	
153376	57376 (x 57326)	Mar-92	TS	<i>X24 Expeditious - 10/4/14</i>	PTR	EMT	
153377	57377 (x 57327)	May-92	LA		ANG	FGW	
153378	57378 (x 57328)	Apr-92	TS		ANG	NR	
153379	57379 (x 57329)	Feb-92	TS		PTR	EMT	
153380	57380 (x 57330)	Sep-92	LA		ANG	FGW	
153381	57381 (x 57331)	Aug-91	TS		PTR	EMT	
153382	57382 (x 57332)	Nov-91	LA		ANG	FGW	
153383	57383 (x 57333)	Oct-92	NC		PTR	EMT	
153384	57384 (x 57334)	Jun-92	TS		PTR	EMT	
153385	57385 (x 57335)	Sep-92	TS		PTR	EMT	

Key: AGA-Abellio Greater Anglia, ANG-Angel Trains, ATW-Arriva Trains Wales, CF-Cardiff, EMT-East Midland Trains, FGW-First Great Western, HT-Heaton, LA-Laira, LM-London Midland, NC-Norwich, NH-Newton Heath, NR-Northern Rail, PTR-Porterbrook, TS-Tyseley.



Left & Right: In 1994-95 Anglia named seven Class 153s after famous Anglia people with names selected by members of the public. The brushed aluminium plates, including a portrait from Nos. 153322 and 153314 are shown. **CJM**



Above & Below: Wessex Trains stick-on style transfer nameplates **The Looe Valley Explorer** (153369) and **The St. Ives Bay Belle** (153329). Both: **CJM**





Metro-Cammell Class 156



Above: Deemed by many as the pinnacle of 'Super Sprinter' design are the 114 Metro-Cammell-built Class 156s, these two-car sets were designed for longer-distance operations, have a 2+2 interior layout with exterior doors at each end feeding a transverse walkway, more in keeping with main line stock. On 9 April 1991, set No. 156401 passes Magor in South Wales forming the 14.00 Birmingham New Street to Cardiff service. **CJM**

The second of the 'Super Sprinter' builds were the Class 156 of which 114 were built between 1987-1989 by Metro-Cammell of Washwood Heath, Birmingham.

The Class 156 was ordered by the BR Provincial Sector to replace first generation and loco hauled services and used a traditional bodysell design formed in steel, a one third width driving cab and the standard 'Sprinter' style interior layout. Each two-car set was formed of a DMS and DMSL vehicle, only one vehicle housed a toilet. Sets were numbered in the series 156401-156514.

Traction power was provided by the 'standard' Sprinter engine, the six-cylinder Cummins NT855-R5 coupled to a Voith T211r transmission using a Gmeinder final drive, although these were 'main line' sets, they had a top speed of 75 mph (121 km/h).

Structurally, the Class 156s were very different from the earlier Class 150 design, apart from using a long body-design, they had a single-leaf sliding door at both ends of each coach, feeding a transverse vestibule. As with the Class 155s, this was agreed as the planned use was on longer distance runs with few intermediate stops. Doors were opened/closed by passengers under the overall control of the guard (Conductor).

The then Provincial Sector of BR ordered 100 units and these emerged painted in the Provincial beige, two-tone blue and white with full yellow cab ends. Subsequently many repaints have taken place, a number of which are illustrated in the following pages.

The final 14 Class 156 units, Nos. 156501-514, were officially ordered by Strathclyde Passenger Transport Executive (SPTE), and were originally finished in an orange and black livery. In years to come this was replaced by a return of one of the traditional

railway liveries of the 1950s - carmine and cream.

Paperwork exists at the Public Records Office, Kew, of a plan in 1991 to convert between 20 and 40 Class 156s into single vehicles identified as Class 152. However, following an engineering review it was identified that the required work would be too expensive and technically very difficult. Eventually the plan was dropped in favour of a similar plan to modify the Class 155s as single car Class 153s.

An early working of special note in Class 156 history came in summer 1989, when in connection with celebrations marking the 150th anniversary of Dutch railways, BR sent an example of its latest rolling stock to be exhibited in Utrecht. The item selected was Class 156 No. 156502 fresh from the build shop painted in Strathclyde PTE orange and black. The set was exported on 16 June 1989 after being driven under its own power from the RTC Derby. The trip across the Channel was on the train ferry from Dover Western Docks to Dunkirk, from where it was driven under its own power to Utrecht.

On introduction, early sets were destined for Scotland where they replaced loco-hauled stock on many of the northern longer routes. Sets also went to East Anglia for cross-country operations.

In Scotland, a massive number of complaints were made, this included issues with overcrowding, poor leg and luggage space and limited toilet facilities (one per train).

From introduction through privatisation, when the sets became the property of Angel Trains and Porterbrook Leasing, the fleet have mainly continued to operate in the same

areas, today the main operator being First ScotRail with 48 sets in operation.

A number of Scottish allocated Class 156s were fitted with Radio Electronic Token Block (RETB) equipment allowing operation over the single lines of the West Highland Line.

In Scotland a number of new liveries have been seen, with several versions of First ScotRail colours more recently culminating in the application of the blue 'Saltire' livery based on the national flag of St Andrew. Strathclyde sets Nos. 156501-514, were the first to be painted in these colours.

East Anglia has always been associated with the Class 156 fleet, with many allocation changes since their first introduction. Today the nine sets are allocated to Norwich Crown Point depot and can be found operating on the branch line network radiating from Norwich and Ipswich as well as on the Marks Tey to Sudbury branch and the longer distance services between Ipswich and Cambridge/Peterborough.

Operated by Abellio Greater Anglia, this is the first operator to see sets modified to meet full disability standards, with a large disabled access toilet installed in the DMSL vehicle. This has seen some structural changes to the vehicle with some windows plated over, in the area behind the driving cab, these are visible in the illustrations.

Following privatisation, both First North Western and Northern Spirit, later Arriva Trains Northern, operated Class 156s. These sets were later taken over by the larger re-let Northern Rail franchise. After a number of re-allocations and exchanges with other operators, by 2015 Northern Rail operated a fleet of 42 sets allocated to either Allerton (Liverpool) or Heaton (Newcastle) depots. The Class 156s fleet is largely centered on the →



North-West and North-East, and are not frequently seen in areas such as Yorkshire and Humberside.

Under the Northern Rail banner three new liveries were launched. Set No. 156451 was re-painted in a light mauve and white scheme. This was followed by Nos. 156425 /460/464 also painted in a mauve and white colour but using the reverse layout to No. 156451. The final and adopted Northern Rail livery, is a

mauve and blue scheme, which on some sets includes a pictogram on the bodyside.

The original Central Trains franchise was allocated a small number of Class 156s, these were originally painted in the old Regional Railways colours, with a Central Trains name line. Later Central Trains green was applied, at the time the operator had 20 sets for longer distance services.

Fleet changes between franchise operators

later saw nine '156s' transferred to the Anglia area in 2005, in exchange for Class 150 sets. In subsequent franchise changes the Central Trains routes are now part of the much larger East Midlands Trains franchise and in 2015 operates a fleet of 15 Class 156s allocated to Nottingham Eastcroft depot. The sets are deployed on medium-distance duties and sport the East Midlands Trains / Stagecoach blue livery scheme. ■

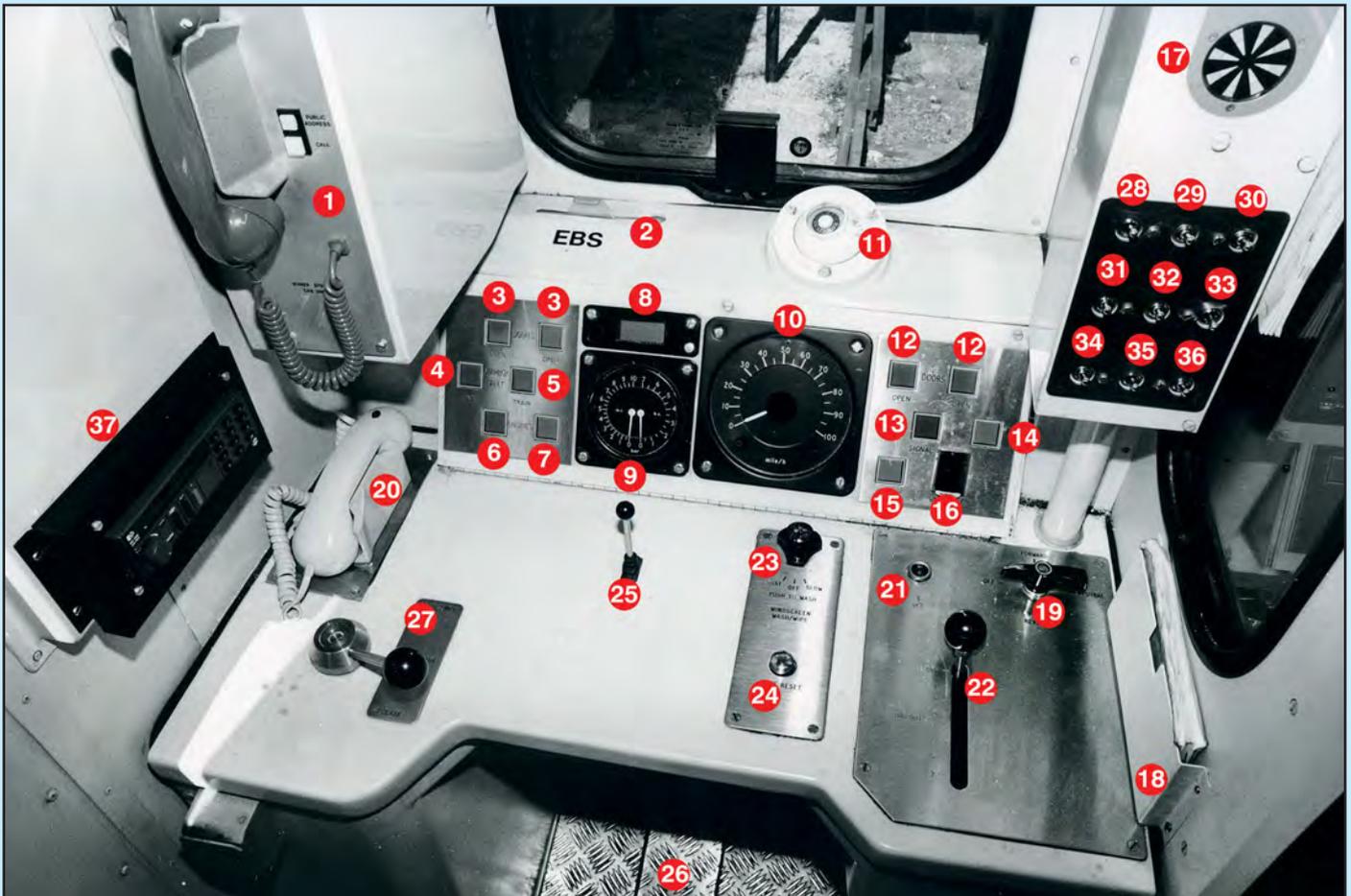
Above: As Metro-Cammell were unable to assemble the Class 156 body sections, three engineering firms were contracted to supply the body shells, Procor of Wakefield 118, W H Davis 60 and Standard Wagon 50. No noticeable detail differences exist between the fabrications. This was the view in the Procor erecting shop on 25 April 1989 and shows shell No. 112 under fabrication, which records show was inserted in set No. 156456. CJM

Below: Soon after introduction the Norwich-allocated sets were turning in high daily mileages operating on the east west cross-country services. On 17 February 1989, set No. 156412 passes Langley Mill with the 08.14 Blackpool North to Cambridge service. CJM





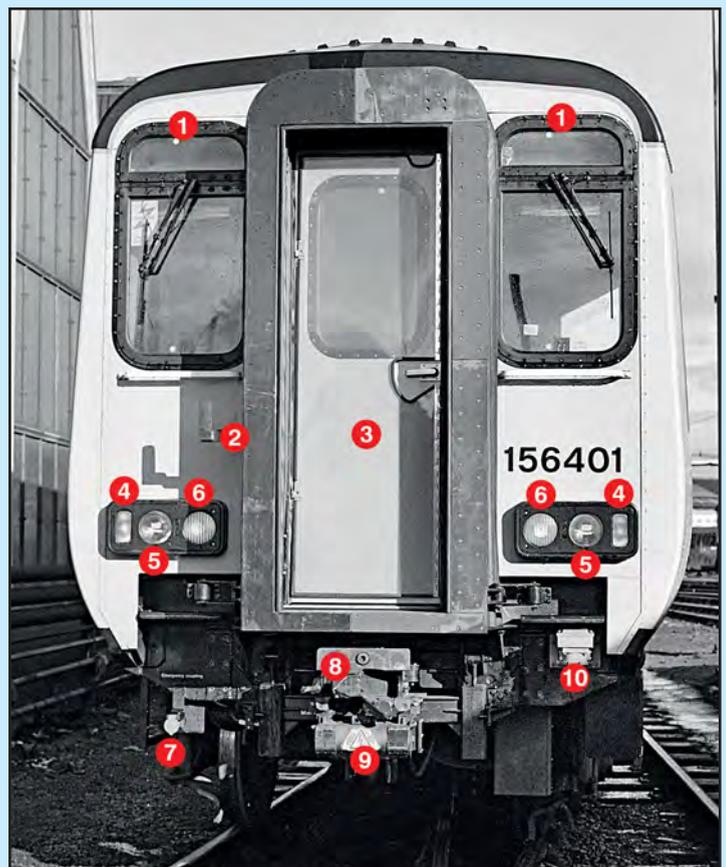
Class 156 Technical and Cab



Technical Description

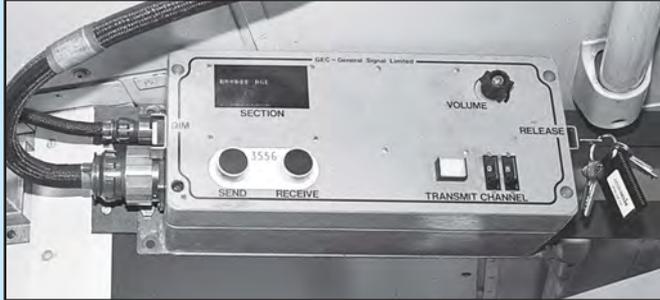
Number range:	156401-156514
Introduced:	1987-1989
Built by:	Metro-Cammell, Birmingham
	Bodies from: Procor (118), W H Davis (60) and Standard Wagon (50)
Formation:	DMSL+DMS
Vehicle numbers:	DMSL - 52401-52514 DMS - 57401-57514
Vehicle length:	75ft 6in (23.03m)
Height:	12ft 6in (3.81m)
Width:	8ft 11in (2.73m)
Seating:	As built - Total - 150S (plus 12 tip up) DMSL - 74S (plus 4 tip up) DMS - 76S (plus 8 tip up) Post Privatisation - Total - 134-152S* DMSL - 62-74S DMS - 72-78S
Internal layout:	2+2
Gangway:	Throughout
Toilets:	DMSL - 1
Weight:	Total - 74.7 tonnes DMSL - 38.6 tonnes, DMS - 36.1 tonnes
Brake type:	Air EP
Bogie type:	Powered - BREL P3-10, Trailer - BREL BT38
Power unit:	1 x Cummins NT855R5 of 285hp (213kW) per vehicle
Transmission:	Hydraulic
Transmission type:	Voith T211r
Horsepower (total):	570hp (426kW)
Max speed:	75mph (121km/h)
Coupling type:	BSI
Multiple restriction:	Class 14x, 15x, 170, 172 series
Door type:	Single-leaf sliding
Body structure:	Steel
Owner:	Post Privatisation: Porterbrook, Angel Trains
Operator:	2015: East Midlands Trains, Greater Anglia, Northern Rail, First ScotRail
* Dependent on operator	

Below: Class 156 front end layout. 1: Destination indicator, 2: Lamp bracket, 3: Gangway door, 4: White marker light, 5: Headlight, 6: Red tail light, 7: Emergency air supply, 8: BSI coupling, 9: Electrical connection box, 10: Jumper socket. CJM

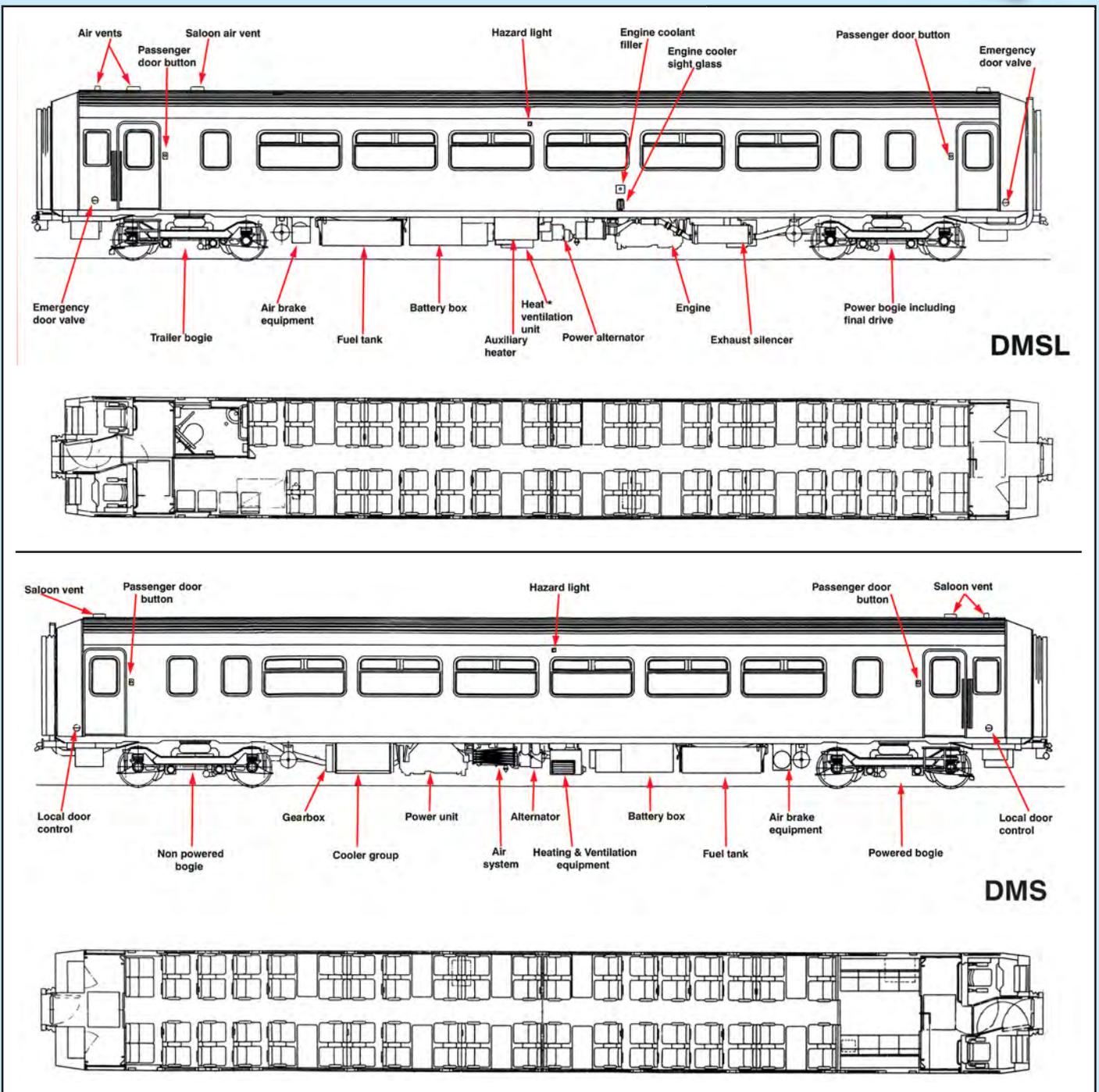
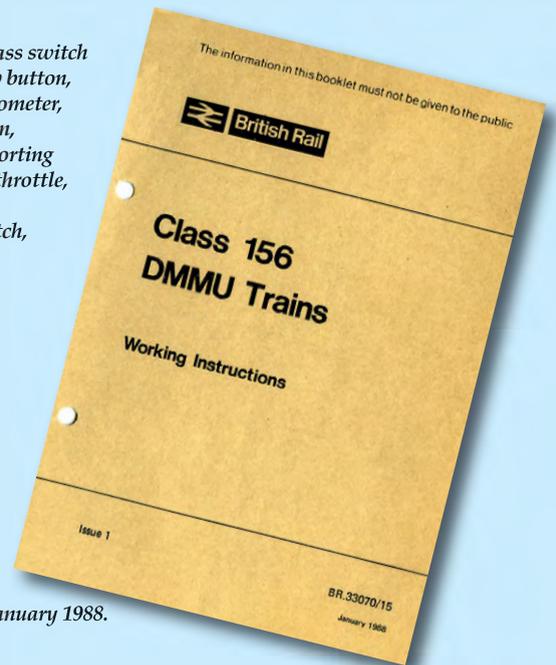


Left Top: Class 156 driving cab. 1: Cab-cab telephone and public address system, 2: Emergency by-pass switch (EBS), 3: Left side door release buttons, 4: Gearbox fault - unit, 5: Gearbox fault - train, 6: Engine stop button, 7: Engine start button, 8: Clock, 9: Main reservoir and bogie brake cylinder pressure gauge, 10: Speedometer, 11: Cab ventilator, 12: Right side door release buttons, 13: Signal button, 14: Spare, 15: Couple button, 16: Uncouple button (under hinged flap), 17: AWS indicator with alarm above, 18: Driver's fault reporting book, 19: Master switch, 20: Radio telephone hand set, 21: Master key socket, 22: Power controller/throttle, 23: Windscreen wiper valve, 24: AWS re-set button, 25: Horn valve, 26: Drivers safety device peddle, 27: Brake controller, 28: Fault light dimmer, 29: Instrument light switch, 30: Windscreen demist switch, 31: Destination light switch, 32: Tail light switch, 33: Headlight switch, 34: Marker light switch, 35: Compressor speed up switch, 36: Hold gear switch, 37: Cab radio. CJM

Below: Radio Electronic Token Block (RETB) control box, located above cab door. CJM



Right: Class 156 working instructions, BR33070/15, issued in January 1988. CJM





Above: Mid-way during the construction of the Class 156s painted in Provincial Sector mid blue and grey off-set by a band of light blue and white, the 'Super Sprinter' branding was applied. On 24 April 1999, No. 156482 heads a Leeds to Carlisle service towards Blea Moor under a threatening sky. www.dieselimagegallery.com / Jim Binnie

Right: Builders plate as fitted to DMSL vehicles. Plate from set No. 156401 illustrated. CJM

Below: The second of the build, No. 156402 passes over Clay Cross Junction on 16 May 1989 with a northbound service from Anglia bound for Blackpool North. Set No. 156401 was delivered new to Norwich Crown Point in January 1988 and has remained at the depot ever since. John Whiteley





Above: For many years the Class 156s were the booked power for the scenic Settle & Carlisle line, frequently operating in pairs or with a Class 153. Looking rather grubby and in need of a wash, set No. 156480 stands in one of the south facing bays at Carlisle on 6 September 1991 with an afternoon service bound for Leeds. **CJM**

Below: The stunning scenery of the Settle and Carlisle line allows even a mundane DMU to look picturesque. On 28 May 1994, a Class 156 pair led by set No. 156469 from the Leeds Neville Hill allocation forms a Leeds to Carlisle service captured passing Waitby, just north of Kirkby Stephen. **John Whiteley**





Above: The final 14 Class 156s were outshopped from Metro-Cammell painted in Strathclyde Passenger Transport Executive orange and black livery. These sets were funded by the PTE to operate on Glasgow non-electrified services in an attempt to replace the worst of the first generation DMMU sets. On 21 August 1992, set No. 156507 departs from Glasgow Central with an afternoon service bound for East Kilbride. **CJM**



Left Middle: The orange liveried Strathclyde Class 156s tended to operate in a general pool from Corkerhill depot and could be found operating as far south as Carlisle and even on some occasions on the Carlisle to Newcastle line. On 3 August 1991, set No. 156511 poses in the sun at Carlisle after arriving with a service over the Glasgow & South Western route. **John Whiteley**



Left Below: After ScotRail became the marketing tool for Scottish Railways, sets were branded with the ScotRail flash logo, seen in this view applied behind the leading passenger door and on the front end below the non-driving window. In this view set No. 156507 is seen at Kilmarnock with a lunchtime service bound for Glasgow Central on 22 March 1995. **CJM**



Above: The Strathclyde Passenger Transport Executive changed its corporate identity from orange to carmine and cream colours in 1996, and several sets soon appeared in the new, more traditional colour scheme. No. 156500 arrives at Ayr on 29 August 2002 with the 14.37 Stranraer to Glasgow Central service. **CJM**

Right: Set No. 156504, in Strathclyde PTE carmine and cream livery form the 09.27 Dunblane to Edinburgh Waverley passing Lathallan, near Polmont on 7 November 2005. www.dieselimagegallery.com/ / **Jim Binnie**



Below: During the period of shadow privatisation a number of local livery variations were found. Here Provincial Railways in the North West applied a green mid-height body band in place of blue and removed some of the black from the front end. Set No. 156464 is seen at Preston on 10 March 1997. **CJM**





Above: Under a year before privatisation, Regional Railways commenced a Class 156 refurbishment project using Doncaster Works to carry out the contract. A very neat revised livery emerged of a dark graphite grey upper body panel, beige base with white and two-tone blue stripes below window height. The front end appearance was very much changed with deep black panels around the windows and a yellow band at roof height. Sets Nos. 156404 and 156411 pose for the camera at Skegness during a press trip to inspect the refurbishment work. **CJM**



Left Middle: Upon launch of the First North Western franchise in March 1997, the existing Regional Railways livery, some with green mid-height bands were branded First North Western on the lower body panel. This is shown in this view of set No. 156441 arriving at Stockport on 7 April 2003 with a Blackpool North to Buxton service. **Tom Heavyside**



Left Below: Once the First North Western franchise became established, a new livery was launched, this was a derivative of the First Group 'Barbie' colours applied to both bus and trains. In the main it was a standard livery theme, with the area operators name in the middle of the vehicle, in reality a number of local varieties were to be found. In full First North Western colours, set No. 156427 arrives at Shaw on 2 March 2004 with the 13.58 Rochdale to Kirkby service. This picture was taken just eight months before First lost the North Western Franchise during a major shuffle of franchise areas, with this section of the network becoming the responsibility of Northern Rail. **Tom Heavyside**



Above: One of the more colourful liveries to emerge from privatisation was the turquoise of Northern Spirit, a company owned by MTL who traded from March 1997 until sold to Arriva Trains on 18 February 2000. The livery however remained for many years with just the addition of Arriva branding. Set Nos. 156484 and 156444 form the 14.00 Carlisle to Leeds service crossing Ais Gill viaduct on the scenic Settle & Carlisle line.

www.dieselmagegallery.com / Jim Binnie

Right: Usually snowploughs or obstacle deflector plates were finished in yellow, but some of the Arriva sets emerged with them painted black, as shown on set No. 156470 at Garsdale on 2 September 2002.

www.colour-rail.com / D Ovenden



Below: Some of the inherited Class 156s operated by Arriva Trains Northern were painted in all blue livery (from First North Western days) and just carried Arriva branding on the bodyside. Set No. 156426 shows this livery variation on 20 October 2007 when working train 2N21 the 11.22 Newcastle to Carlisle seen passing Upper Denton.

www.dieselmagegallery.com / Jim Binnie





Left Top: Midlands-based Central Trains were also another major operator of Class 156s on longer distance duties. In the years after the operator was launched trains were repainted in the green house colours, which were actually quite attractive on the body profile of these sets. Under subsequent franchise changes, Central Trains was disbanded, and the '156s' were transferred to East Midlands Trains. On 18 June 2002, set No. 156407 is seen at Lincoln with stock to form the 16.21 to Manchester Airport. **Tom Heavyside**



Left Middle: In 2004 a proposed shuffle of rolling stock was to have seen some of the Midlands-allocated Class 156s move to Scotland and in preparation for this move, which never came about, one or two sets emerged from the paint shop in base white with a purple roof. On 23 April 2004 set No. 156402 passes Stenson Junction, north of Burton on Trent with a Derby to Crewe service. **CJM**



Left Below: East Midlands Trains currently operates a fleet of 15 Class 156s based at Nottingham Eastcroft and used on longer distance EMT services. All sets are painted in Stagecoach blue swirl livery. On 15 May 2014, set No. 156497 passes Stenson Junction, with train 1K99, the 10.42 Derby to Crewe via Stoke-on-Trent. **CJM**

Right: Northern Rail operate a number of DMUs of different classes carrying pictogram branding, this either advertises specific routes, areas, or towns and consists of some of the best vehicle bodyside graphics carried by any trains in the UK. Set No. 156441 William Huskisson MP is seen arriving at Preston on 16 July 2014 with branding for Liverpool and Manchester and the Museum of Science and Industry. The train is forming the 11.04 Liverpool South Parkway to Blackpool North. **CJM**



Above: In the livery transition period, Northern Rail experimented with various schemes. This one based on white with mauve and grey was not adopted but was quite appealing. Set No. 156460 with blue-liveried No. 156455 pass Ais Gill on 4 March 2006 forming the 14.26 Carlisle to Leeds. Bill Atkinson

Right: The adopted Northern Rail livery of mid blue, mauve and grey is quite eye-catching and in the main kept very clean. On 10 October 2013, set No. 156469 stops at Manchester Oxford Road with a service bound for Preston. Antony Christie

Below: Several Northern Rail units carry nameplates, these are of the transfer type applied above window height. The plate from set No. 156420 is shown. CJM





Above: The largest operator of Class 156s is ScotRail with 48 sets on their books in 2015. On 19 March 2001, set No. 156447 is seen carrying the original ScotRail colours at Carlisle, while forming a Stranraer to Newcastle service. Tom Heavyside



Left: In 2015 First ScotRail are in the process of repainting sets in the blue and white Saltire livery, complete with grey contrasting passenger doors. Set No. 156514 is seen at Glasgow Central station on 2 July 2014. CJM

Below: With the merging of Anglia Railways, First Great Eastern and West Anglia on 1 April 2004 came the emergence of One Railway. Their blue and multi-coloured livery was soon applied to most stock, shown here on Class 156 No. 156416 at Ipswich. CJM





Above: By February 2008 the One Anglia trading title was replaced by the National Express title with trains starting to be repainted into National Express corporate grey and white livery, this extended to some Class 156s. It is displayed here on set No. 156419 passing Reedham on 25 July 2008 forming the 09.57 Norwich to Lowestoft. **Lindsay Atkinson**

Below: The National Express white and grey colours, in a similar style to that applied to the operators road coaches, remained until February 2012, during which time only handful of trains were fully repainted into the new colours. On 26 September 2009, the National Express-liveried '156' No. 156419 is seen passing Brantham near Manningtree on the Great Eastern main line forming the 07.47 Harwich Parkeston Quay to Cambridge service. **John Hooson**



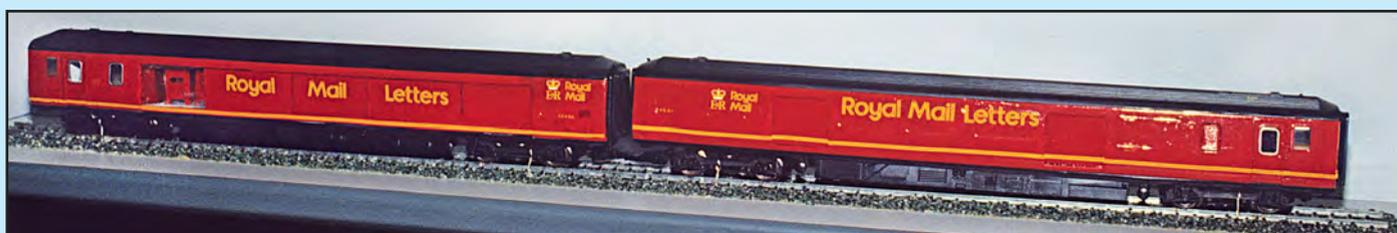
Class 156 Fleet List

Set No.	Vehicle Numbers		New	First Allocation	Name	Present Owner	Present Operator	Notes
	DMSL	DMS						
156401	52401	57401	Nov-87	NC		PTR	EMT	
156402	52402	57402	Jan-88	NC		PTR	AGA	
156403	52403	57403	Jan-88	NC		PTR	EMT	
156404	52404	57404	Feb-88	NC		PTR	EMT	
156405	52405	57405	Mar-88	NC		PTR	EMT	
156406	52406	57406	Mar-88	NC		PTR	EMT	
156407	52407	57407	May-88	NC		PTR	AGA	
156408	52408	57408	May-88	NC		PTR	EMT	
156409	52409	57409	May-88	NC	<i>Cromer Pier Seaside Special - 7/09-C2013</i>	PTR	AGA	
156410	52410	57410	May-88	NC		PTR	EMT	
156411	52411	57411	May-88	NC		PTR	EMT	
156412	52412	57412	May-88	NC		PTR	AGA	
156413	52413	57413	May-88	NC		PTR	EMT	
156414	52414	57414	May-88	NC		PTR	EMT	
156415	52415	57415	May-88	NC		PTR	EMT	
156416	52416	57416	May-88	NC	<i>Saint Edmund - 28/11/06</i>	PTR	AGA	
156417	52417	57417	May-88	NC		PTR	AGA	
156418	52418	57418	Jun-88	NC		PTR	AGA	
156419	52419	57419	Jun-88	NC		PTR	AGA	
156420	52420	57420	Jun-88	CF	<i>La'al Ratty Ravensglass & Eskdale Railway - 5/7/03</i>	PTR	NR	
156421	52421	57421	Jun-88	NC		PTR	NR	
156422	52422	57422	Jun-88	NC		PTR	AGA	
156423	52423	57423	Jun-88	NC		PTR	NR	
156424	52424	57424	Jul-88	NC		PTR	NR	
156425	52425	57425	Jul-88	NC		PTR	NR	
156426	52426	57426	Jul-88	NC		PTR	NR	
156427	52427	57427	Jul-88	NC		PTR	NR	
156428	52428	57428	Jul-88	NC		PTR	NR	
156429	52429	57429	Jul-88	NC		PTR	NR	
156430	52430	57430	Jul-88	CK		ANG	FSR	
156431	52431	57431	Jul-88	CK		ANG	FSR	
156432	52432	57432	Jul-88	CK		ANG	FSR	
156433	52433	57433	Jul-88	CK	<i>The Kilmarnock Edition - 24/9/06-2/09</i>	ANG	FSR	
156434	52434	57434	Aug-88	CK		ANG	FSR	
156435	52435	57435	Aug-88	CK		ANG	FSR	
156436	52436	57436	Aug-88	CK		ANG	FSR	
156437	52437	57437	Aug-88	CK		ANG	FSR	
156438	52438	57438	Sep-88	CF	<i>Timothy Hackworth - 17/3/12</i>	ANG	NR	
156439	52439	57439	Sep-88	CK		ANG	FSR	
156440	52440	57440	Sep-88	NC	<i>George Bradshaw - 8/12</i>	PTR	NR	
156441	52441	57441	Sep-88	NL	<i>William Huskisson MP - 15/9/10</i>	PTR	NR	
156442	52442	57442	Sep-88	CK		ANG	FSR	
156443	52443	57443	Oct-88	NL		ANG	NR	
156444	52444	57444	Oct-88	NL	<i>Councillor Bill Cameron - 26/9/09</i>	ANG	NR	
156445	52445	57445	Oct-88	CF		ANG	FSR	
156446	52446	57446	Oct-88	CF		ANG	FSR	
156447	52447	57447	Oct-88	HA		ANG	FSR	
156448	52448	57448	Nov-88	CF		ANG	NR	
156449	52449	57449	Nov-88	IS	<i>Saint Columba - 6/12/97-6/00</i>	ANG	FSR	
156450	52450	57450	Nov-88	HA		ANG	FSR	
156451	52451	57451	Nov-88	NH		ANG	NR	
156452	52452	57452	Nov-88	CF		PTR	NR	
156453	52453	57453	Nov-88	HA		ANG	FSR	
156454	52454	57454	Nov-88	CF	<i>Whitby Endeavour - 16/10/97-11/99</i>	ANG	NR	
156455	52455	57455	Nov-88	CF		PTR	NR	
156456	52456	57456	Nov-88	NH		ANG	FSR	
156457	52457	57457	Nov-88	NH		ANG	FSR	
156458	52458	57458	Nov-88	CF		ANG	FSR	
156459	52459	57459	Dec-88	NH	<i>Benny Rothman The Manchester Rambler - 04/10</i>	PTR	NR	
156460	52460	57460	Dec-88	NH	<i>Driver John Axon GC - 6/10</i>	PTR	NR	
156461	52461	57461	Dec-88	CF		PTR	NR	
156462	52462	57462	Dec-88	CF		ANG	FSR	
156463	52463	57463	Dec-88	CF		ANG	NR	
156464	52464	57464	Dec-88	CF	<i>Lancashire Dales Rail - 5/10</i>	PTR	NR	
156465	52465	57465	Dec-88	CF	<i>Bonnie Prince Charlie - 19/8/95-8/00</i>	ANG	FSR	
156466	52466	57466	Dec-88	CF	<i>Buxton Festival - 5/6/04 - 30/9/09</i> <i>Gracie Fields - 3/10/09</i>	PTR	NR	
156467	52467	57467	Dec-88	CF		ANG	FSR	
156468	52468	57468	Jan-89	NC		ANG	NR	
156469	52469	57469	Jan-89	NL		ANG	NR	
156470	52470	57470	Jan-89	NC		PTR	EMT	
156471	52471	57471	Jan-89	CF		ANG	NR	
156472	52472	57472	Jan-89	NC		ANG	NR	
156473	52473	57473	Jan-89	NC		PTR	EMT	
156474	52474	57474	Jan-89	IS		ANG	FSR	
156475	52475	57475	Jan-89	NL		ANG	NR	
156476	52476	57476	Jan-89	NL		ANG	FSR	
156477	52477	57477	Feb-89	IS	<i>Highland Festival - 30/3/96-9/00</i>	ANG	FSR	
156478	52478	57478	Feb-89	IS		ANG	FSR	
156479	52479	57479	Feb-89	NL		ANG	NR	
156480	52480	57480	Feb-89	NL		ANG	NR	
156481	52481	57481	Feb-89	NL		ANG	NR	
156482	52482	57482	Feb-89	NL		ANG	NR	
156483	52483	57483	Mar-89	NL		ANG	NR	
156484	52484	57484	Mar-89	NL		ANG	NR	

156485	52485	57485	Mar-89	IS		ANG	FSR
156486	52486	57486	Mar-89	NC		ANG	NR
156487	52487	57487	Mar-89	NL		ANG	NR
156488	52488	57488	Apr-89	NL		ANG	NR
156489	52489	57489	Apr-89	NL		ANG	NR
156490	52490	57490	Apr-89	NL	Captain James Cook Master Mariner - 7/14	ANG	NR
156491	52491	57491	Apr-89	NL		ANG	NR
156492	52492	57492	Apr-89	IS		ANG	FSR
156493	52493	57493	Apr-89	IS		ANG	FSR
156494	52494	57494	Apr-89	IS		ANG	FSR
156495	52495	57495	Apr-89	IS		ANG	FSR
156496	52496	57496	May-89	IS		ANG	FSR
156497	52497	57497	May-89	NL		PTR	EMT
156498	52498	57498	May-89	NL		PTR	EMT
156499	52499	57499	May-89	HA		ANG	FSR
156500	52500	57500	May-89	HA		ANG	FSR
156501	52501	57501	May-89	CK		ANG	FSR
156502	52502	57502	Jun-89	CK		ANG	FSR
156503	52503	57503	Jun-89	CK		ANG	FSR
156504	52504	57504	Jun-89	CK		ANG	FSR
156505	52505	57505	Jun-89	CK		ANG	FSR
156506	52506	57506	Jul-89	CK		ANG	FSR
156507	52507	57507	Jul-89	CK		ANG	FSR
156508	52508	57508	Jul-89	CK		ANG	FSR
156509	52509	57509	Aug-89	CK		ANG	FSR
156510	52510	57510	Aug-89	CK		ANG	FSR
156511	52511	57511	Aug-89	CK		ANG	FSR
156512	52512	57512	Sep-89	CK		ANG	FSR
156513	52513	57513	Sep-89	CK		ANG	FSR
156514	52514	57514	Sep-89	CK		ANG	FSR

Key

AGA: Abellio Greater Anglia, ANG: Angel Trains, CF: Cardiff Canton, CK: Corkerhill, EMT: East Midlands Trains, FSR: First ScotRail, HA: Haymarket, IS: Inverness, NC: Norwich Crown Point, NH: Newton Heath, NL: Neville Hill, NR: Northern Rail, PTR: Porterbrook.



Above: When Royal Mail were seeking expressions of interest in obtaining new rolling stock for its Mail by Rail project, which eventually saw a fleet of Class 325s introduced, it looked at the option put forward to build a fleet of Class 156 style DMUs fitted with roller shutter side doors feeding open storage areas in both vehicles. This model was produced and exhibited at a trade fair, but nothing further happened with the project. **CJM**

Right Middle: As of early 2015 all Class 156s remain in operation, however one or two have been in serious accidents. This is set No. 156490 after it had been involved in a collision with sister unit 156468 at Mallerstang on the Settle and Carlisle line on 31 January 1995. The train was subsequently transported by road to Derby Litchurch Lane Works where a new front end was fabricated and installed. The sets remains in service today with Northern Rail and is now named Captain James Cook Master Mariner. This illustration shows the set at Litchurch Lane Works on 13 March 1995. **CJM**



Right Below: A number of rail operators have used trains as mobile advertising hoardings, and One Railway was no exception, this operator has used several sets for specialist promotions over the years but one of the most distinctive was this applied to set No. 156402 advertising the Chapelfield Shopping Centre in Norwich. It is uncertain what the overall benefits of full train advertising are, as people waiting for a train at a station are too close to even see what is being advertised and for those seeing the train travelling at speed, its passing is too quick to grasp what is being promoted. No. 156402 is seen at Norwich on 22 November 2007. **CJM**

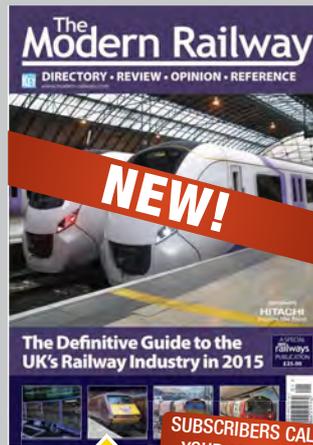


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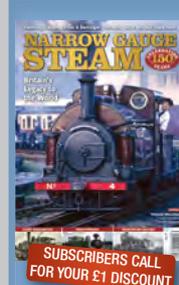
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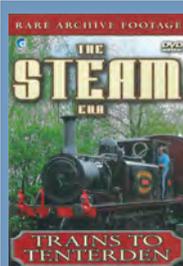


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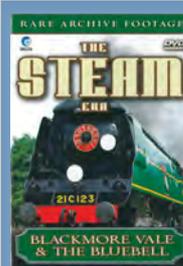


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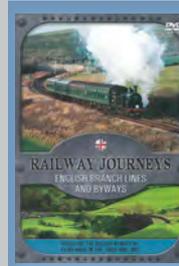


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Above and Left: After Abellio took over the Greater Anglia franchise in February 2012 trains started to emerge in an all-white base livery with Abellio Greater Anglia branding together with orange doors. As part of the franchise the operators were required to install disabled persons facilities on its fleet. On the '156s' this has seen some major structural changes to the DMSL vehicle with some windows plated over when the new toilet compartment is fitted, this is clearly visible in these illustrations of set No. 156416 at Norwich. Both: CJM

Right: Since their original introduction, a number of interior refurbishments and refits have been undertaken, especially in the period of the privatised railway, post 1996, where each operator has wanted to put their mark on the passenger environment. The basic interior of using the 2+2 low-density style with seats in groups of four around tables has largely remained. This view shows an East Midlands Trains layout using Stagecoach red moquette. Brian Morrison



Left: In 2011 during a partnership drive between the rail industry and Norfolk Country Council to promote the Norwich to Sherringham 'Bittern Line' Norwich-based set No. 156417 was given new table tops incorporating a route map of the line. Brian Morrison

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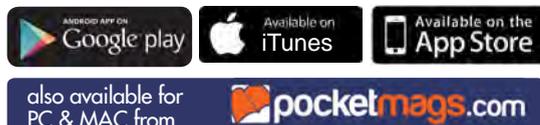
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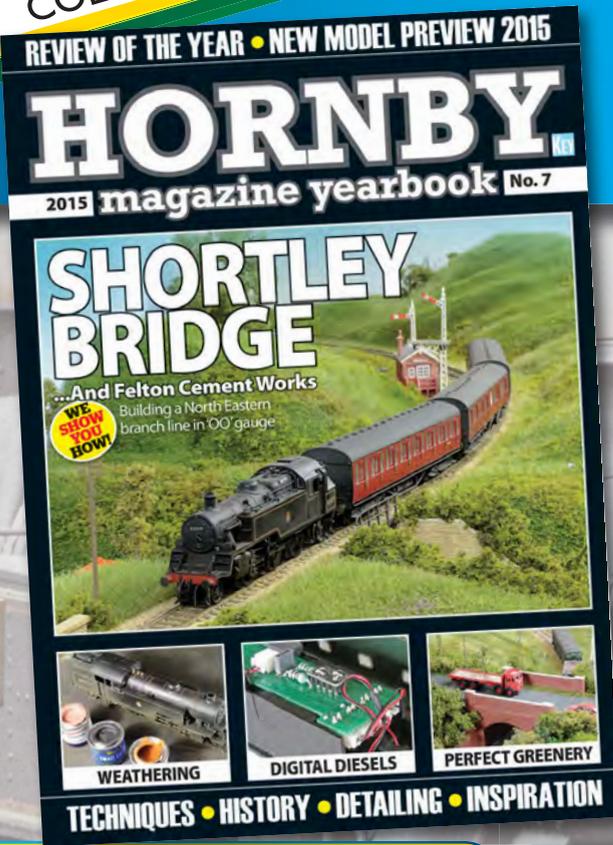
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