

# **175 DMDS**

**ALSTOM**

Service Weight 49.75 tonnes

Length 23.713 m

Width 2.73 m

Seats 64s

Max. Speed 100 mph

# **Class 175/1**

**ALSTOM**

Service Weight 146.761 tonnes

Length 70.45 m

Width 2.73 m

Seats 206s

Max. Speed 100 mph





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# British Rail Class 175

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The **Class 175 *Coradia*** is a type of **diesel multiple unit** passenger train used in the United Kingdom. The fleet of 27 sets were built from 1999 to 2001 by **Alstom** at **Washwood Heath** in **Birmingham**. They are part of the **Coradia** family of trains along with the **Class 180**. They are the basis of **Arriva Trains Wales**'s express fleet, but cannot operate on all lines (including those fitted with **ETCS**).

The entire fleet is owned by the **rolling stock operating company** **Angel Trains**. They were originally leased to **First North Western**, but the fleet has since been transferred to Arriva Trains Wales. For a brief period, units were also sub-leased to **TransPennine Express**.

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## Description

In September 1997, North West Trains placed an order with Alstom for 27 train-sets. The original order was for eleven two-carriage units with a top speed of 100 mph, seven three-carriage units with a top speed of 100 mph and nine three-carriage units with a top speed of 125 mph. This was reconfigured to eleven two-carriage and sixteen three-carriage units all with a top speed of 100 mph, worth £78 million,<sup>[4]</sup> built to allow for the replacement of elderly **Class 101** 'heritage' DMUs and locomotive-hauled trains to **Bangor** and **Holyhead**. As they were constructed, the old **locomotive sheds** at Chester were replaced with a purpose-built facility in order to service the Class 175 units.<sup>[2]</sup> Units were tested at low speed at the **Severn Valley Railway** before further testing and driver training at the **Old Dalby Test Track** from November 1999.<sup>[5]</sup> The first unit entered service on 20 June 2000.<sup>[4]</sup>

### British Rail Class 175 Coradia



175011 operating an Arriva Trains Wales service at Newport in 2009.



Standard Class interior of 175115 at Llandudno in 2009.

<b>In service</b>	2000–
<b>Manufacturer</b>	<b>Alstom</b> <sup>[1]</sup>
<b>Built at</b>	Washwood Heath, <b>Birmingham</b> <sup>[2]</sup>
<b>Family name</b>	<b>Coradia</b> <sup>[1]</sup>
<b>Constructed</b>	1999–2001 <sup>[1]</sup>
<b>Number built</b>	27 trainsets <sup>[1]</sup>
<b>Number in service</b>	27 trainsets
<b>Formation</b>	175/0: 2 cars per train set (DMSL–DMSL) <div>175/1: 3 cars per train set (DMSL–MSL–DMSL)<sup>[1]</sup></div>
<b>Capacity</b>	134 or 206 per trainset <sup>[1]</sup>
<b>Operator</b>	<i>current:</i> <div><b>Arriva Trains Wales</b></div> <div><i>previously:</i><div><b>First North Western</b>,</div><div><b>TransPennine Express</b></div></div>
<b>Depot(s)</b>	Chester

#### Specifications

<b>Car body construction</b>	Steel <sup>[1]</sup>
<b>Car length</b>	Driving end vehicles 23.71 <span> </span> m (77 <span> </span> ft 9 <span> </span> in) <div>Centre cars 23.03<span> </span>m (75<span> </span>ft 7<span> </span>in)<sup>[1]</sup></div>
<b>Width</b>	2.73 <span> </span> m (8 <span> </span> ft 11 <span> </span> in) <sup>[1]</sup>
<b>Doors</b>	Swing plug at vehicle ends <sup>[1]</sup>
<b>Articulated sections</b>	Flexible diaphragm within unit only <sup>[1]</sup>
<b>Maximum speed</b>	100 <span> </span> mph (160 <span> </span> km/h) <sup>[1]</sup>
<b>Weight</b>	97.85 <span> </span> t (96.30 <b>long tons</b> ; 107.86 <b>short tons</b> ) or 144.14 <span> </span> t (141.86



The two-carriage units are numbered 175001-011, and the three-carriage units 175101-116. Carriages are labelled as coaches A- B- C, with two-car units having no coach B. Each train has provision for two disabled passengers in coach A, and storage for two bicycles in coach C.<sup>[6]</sup>

Early reliability problems meant that some services were operated by old rolling stock at short notice.<sup>[7]</sup> <sup>[8]</sup> Remedial work included improving brakes and bogies,<sup>[9]</sup> and the reliability of the units is now greatly improved.<sup>[10]</sup>

## Automated announcement system

Class 175 *Coradias* are fitted with a passenger information system,<sup>[11]</sup> which consists of onboard **LED display** and audio announcements of train destinations and arrivals. However, problems with its operation led to its not being used by Arriva Trains Wales (ATW) when it acquired the trains; not using it meant that the LED destination displays on the front and rear of the train were not illuminated. The system was reprogrammed in 2007 for new routes, which included Welsh spellings on the information screens, as well as the implementation of a chime, signalling the start of an announcement to passengers.

## Operations

The entire Class 175 fleet was operated by **First North Western** from their introduction in 2000 until October 2003, when **franchise** changes led to **North Wales Coast Line** services being transferred to **Wales & Borders**; as a result most of the fleet was then used by Wales & Borders: First North Western's branding was removed from all the units, but the livery remained largely the same.<sup>[11]</sup>

The fleet was transferred to Wales & Borders' successor Arriva Trains Wales in 2004, with some being sub-leased to **First Transpennine Express**, who took over First North Western's long-distance routes. First Transpennine took delivery of new **Class 185 Pennine** units in 2006, and the sub-leased Class 175s returned to ATW. The units have been based at the Chester depot throughout, and they have been operated in **Wales**, **North-West England** and the **West Midlands**.

## North West and West Midlands

From their introduction in 2000,<sup>[12]</sup> **First North Western** (FNW) operated the Class 175s until 2003, when the fleet was transferred to Arriva Trains Wales.

The units were used on various services:

- **Birmingham New Street/Crewe** to **Holyhead**
- **Manchester Airport** to Blackpool/Cumbria
- **Manchester Piccadilly** and **Llandudno** via **Warrington Bank Quay** (three-car set). Due to interworked diagrams between the Chester-Warrington-Manchester and Chester-Altrincham-Manchester line the latter also saw a morning peak train booked to be a class 175, while the former also saw class 150s on some services which started or terminated at Chester.

In 2003, the trains transferred to the **Wales & Borders** franchise and subsequently ATW. However, under a contractual agreement, 11 units were leased back daily from ATW to FNW and then later to **First TransPennine Express** for use on the Manchester Airport to Blackpool and Cumbria services until mid-December 2006, when that contract expired. They also continued to work the First North Western morning peak service between **Chester** and Manchester Piccadilly via **Altrincham** until December 2004.

## Wales

The entire Class 175 *Coradia* fleet was transferred to ATW when it took over responsibility for the **North Wales Coast Line** in 2004. The fleet is based at Chester Depot.

Since fully taking over the fleet ATW now uses Class 175s on **Cardiff Central** to **Manchester** and **Holyhead** service. Some South Wales bound services continue beyond Cardiff to

<b>Prime mover (s)</b>	long tons; 158.89 short tons) per trainset <sup>[1]</sup>
<b>Power output</b>	One per car, <b>Cummins N14 diesel</b> <sup>[1]</sup>
<b>Transmission</b>	450 hp (340 kW) <sup>[1]</sup>
	<b>Voith T211 hydraulic transmission</b>
	<b>ZF final drive</b> <sup>[1]</sup>
	2 axles driven per car
<b>Braking system(s)</b>	Friction/ <b>Hydrodynamic retarder</b> <sup>[1]</sup>
<b>Safety system (s)</b>	<b>AWS</b> , <b>TPWS</b>
<b>Coupling system</b>	<b>Scharfenberg</b> <sup>[3]</sup>
<b>Track gauge</b>	1,435 mm (4 ft 8 1⁄2 in) <b>standard gauge</b>





**Maesteg**, **Carmarthen** and **Milford Haven**. They also continue to operate in the North West on **Llandudno** to Manchester Piccadilly services and the three trains daily extend to Manchester Airport. Since the installation of **ERTMS** signalling on the Cambrian Coast in 2008, the Class 175s are not used on services to Aberystwyth and Pwllheli because they lack the correct equipment. These services are operated with **Class 158 Express Sprinter** units.



175113 rounds the bend into **Deganwy** with a service from **Llandudno**.

Fourteen Class 175 *Coradia* units are in operation on daily **Welsh Marches Line** services to South Wales from Manchester and Holyhead, while ten are in operation on the North Wales Inter-Urban services between Manchester/Crewe and Chester/North Wales. One Sunday-only service sees the unit travel from Holyhead to Birmingham New Street via Stafford.

They have been cleared by Network Rail to operate the lines from Cardiff Central to Maesteg,<sup>[13]</sup> Cheltenham,<sup>[14]</sup> and Ebbw Vale.<sup>[15]</sup>

### Accidents and Incidents

On 16 January 2010, 175103 operating the 08:30 service from **Manchester Piccadilly** to **Milford Haven** struck two cars at **Moreton-on-Lugg** crossing between **Hereford** and **Leominster**.<sup>[16]</sup> The front seat passenger in one of the cars was fatally injured, although there were no casualties on the train, which did not derail. The signaller had raised the barriers in error when the train was approaching the crossing,<sup>[17]</sup> and he was arrested on suspicion of manslaughter in July 2010.<sup>[18][19]</sup>

The same service collided with a trailer on the Morfa Main level crossing on 31 January 2011. No-one was injured, but the unit involved, 175108, received nearly £82,000 worth of damage due to striking the trailer at 75 miles per hour (121 km/h). The farmer in charge of the trailer was sentenced to a 36-week suspended jail sentence and was ordered to carry out 200 hours of community work.<sup>[20][21]</sup>

On 19 December 2011, 175002 collided with a lorry at the Llanboidy level crossing near **Whitland**.<sup>[22]</sup> The train was operating the 09:10 service from Milford Haven to Manchester Piccadilly. The driver of the lorry has been arrested on suspicion of endangering safety.<sup>[23]</sup>

Class 175 units have caught fire in 2004 at **Preston** (175008), 2009 at **Prestatyn** and 2011 at Manchester Piccadilly.<sup>[24][25][26]</sup>

### Fleet details

Class	Operator	No. built	Year built	Cars per set	Unit nos.
<b>Class 175/0</b>	Arriva Trains Wales	11	1999–2001	2	175001 – 175011
<b>Class 175/1</b>		16	1999–2001	3	175101 – 175116

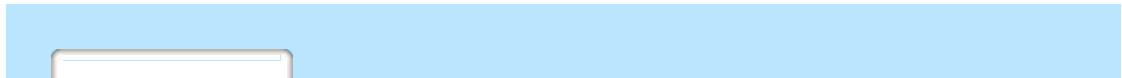
### Named units

Some of the class have received names:

- 175003 - *Eisteddfod Genedlaethol Cymru*<sup>[27]</sup>
- 175004 - *Mencap* - *Pengwern College*<sup>[28]</sup>
- 175006 - *Brondyffryn Trust*<sup>[29]</sup>
- 175008 - *Valhalla Blackpool Pleasure Beach*<sup>[30]</sup>
- 175103 - *Mum*<sup>[28]</sup>
- 175107 - *Coronation St. Rovers Return*<sup>[31]</sup>
- 175111 - *Brief Encounter*<sup>[29]</sup>
- 175112 - *South Lakes Wild Animal Park* - *Sumatran Tiger*<sup>[32]</sup>
- 175114 - *Manchester 2002* - *Commonwealth Cruiser*<sup>[31]</sup>
- 175116 - *Peter V. L. Jones, Community Rail Officer Conwy Valley Line*<sup>[33]</sup>

All except for *Eisteddfod Genedlaethol Cymru* were named by First North Western. The nameplates have now all been removed as the fleet now wears standard Arriva colours.<sup>[34]</sup>

### Gallery





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- <sup>^</sup> "The Encyclopaedia of Modern Traction Names - V". TheRailwayCentre.com. Retrieved 17 March 2009.
- <sup>^</sup> <sup>*a b*</sup> "The Encyclopaedia of Modern Traction Names - C". TheRailwayCentre.com. Retrieved 17 March 2009.
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- <sup>^</sup> "The Encyclopaedia of Modern Traction Names - P". TheRailwayCentre.com. Retrieved 17 March 2009.
- <sup>^</sup> "North Wales Coast Line - Notice Board". 22 February 2009. Retrieved 17 March 2009. It is confirmed that the name Eisteddfod Genedlaethol Cymru on 175 003 did not survive the repainting experience. ATW seem to be removing all names as trains are repainted...

## External links

- Testing the Class 175s



Wikimedia Commons has media related to **British Rail Class 175**.

# First North Western launches Class 175

01 Mar 2000

ON FEBRUARY 4 British operator First North Western unveiled the first five of 27 Class 175 diesel multiple-units at their newly-built depot in Chester. Part of Alstom's Coradia family, the trains will enter commercial service in May on routes from Birmingham and Chester to Holyhead and Manchester to Llandudno. Later they will take over FNW's routes from Manchester to Blackpool, and services to Windermere and Barrow-in-Furness. This will allow the company to withdraw its last locomotive-hauled trains and to cascade Class 158 and Class 156 DMUs so that Class 142 railbuses can be taken out of use.

FNW's Class 175 fleet comprises 11 two-car and 16 three-car sets. It is a steel-bodied design able to run at 160 km/h thanks to a 450hp Cummins engine mounted under each car. Some of the 27 sets were to have been fitted with more powerful engines to allow 200 km/h running, but FNW has abandoned this aspiration.

Alstom was required to keep the noise level in the saloon to 71dB at 160 km/h, but test measurements showed that 67dB had been achieved. This reflects use of a resilient floor, one of several interior design innovations that Alstom developed with Jones Garrard. This company also developed the cab exterior and was responsible for other work that included concept design and engineering design.

David Franks, Managing Director of FNW, said that the Class 175 trains were the 'first sign of £100m of investment' in the company's services. The fleet is costing £70m, and the Chester depot £18m.

Alstom has a contract to maintain the Class 175 fleet for 15 years, and initially it must have 24 of the trains available for service. Depot facilities include a fully-enclosed carriage washer supplied by Kärcher of Illingen near Stuttgart in Germany. This can function at -10°C.

Each unit is fitted with a nose-mounted video camera to record lineside events.

- Sister company First Great Western will shortly take delivery from Alstom of a fleet of 14 five-car Class 180 sets which have many common features with the Class 175. FNW and Alstom are awaiting approval from HM Railway Inspectorate for passengers to travel in the leading vehicle of a Class 180 at the maximum speed of 200 km/h. Measures designed to afford passengers protection in the event of a collision include sacrificing about 30% of the end cars to van space, use of crumple zones, and higher braking performance.

Class 175 suppliers

Main contractor Alstom

Diesel engines Cummins

Transmission and final drive Voith

Cooler group Covrad

Brakes Westinghouse

Air-conditioning Soprano

Doors Tebel Technologies

Seats Georg Eknes

Toilets Evac

Gangways Dowty Woodville

Air suspension Paulstra

Interior design Jones Garrard

CAPTION: Right: Two units wait at FNW's new Chester depot between commissioning tests

Below: Interiors were developed for Alstom and FNW by Jones Garrard

Bottom: FNW's blue livery is enhanced with pink and white stripes

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## Class 175 - Arriva Trains Wales



Type	Regional Passenger
Class	175
Manufacturer / Model	Alstom Coradia
Fleet Size	11 x 2-car units and 16 x 3-car units
Year of Build	1999 - 2001
Construction	Steel
Length	DMSL: 23.71 m, MSL: 23.02m
Width	2.73 m
Weight	56.51t DMSL(A), 55.8t MSL, 57.5t DMSL(B).
Transmission	Voith T211re3 and Voith final drive
Traction Motors	N/A
Bogies	ACR (Alstom FBO)
Engines	Cummins N14E-R at 450 hp
Maximum Speed	100 mph
Traction Type	DMU
Couplers	Scharfenberg outer ends. Bars within unit.
Builder	Alstom Birmingham
Brakes	Friction and Retarder
Seating	2+2 facing/unidirectional. 136 seats per 2-car unit
Gangways	Flexible diaphragm. Within unit only

# NORTH WALES COAST RAILWAY THE TRAINS

Rheilffordd arfordir Gogledd Cymru *Trenau*

## CLASS 175



Last update July 2009

[Trains index](#) | [North Wales Coast Railway home page](#)

Fleet list (A = Arriva standard livery)

175 001 A 50701 79701  
175 002 A 50702 79702  
175 003 A 50703 79703  
175 004 A 50704 79704  
175 005 A 50705 79705  
175 006 A 50706 79706  
175 007 A 50707 79707  
175 008 A 50708 79708  
175 009 A 50709 79709  
175 010 A 50710 79710  
175 011 A 50711 79711

175 101 A 50751 56751 79751  
175 102 A 50752 56752 79752  
175 103 A 50753 56753 79753  
175 104 A 50754 56754 79754  
175 105 A 50755 56755 79755  
175 106 A 50756 56756 79756  
175 107 A 50757 56757 79757  
175 108 A 50758 56758 79758  
175 109 A 50759 56759 79759  
175 110 A 50760 56760 79760  
175 111 A 50761 56761 79761  
175 112 A 50762 56762 79762  
175 113 A 50763 56763 79763  
175 114 A 50764 56764 79764  
175 115 A 50765 56765 79765  
175 116 A 50766 56766 79766

### Technical data

Length: 23.71 m (driving end vehicles), 23.03m (centre cars)  
Width: 2.73 m  
Weight per car:  
Driving car 50xxx (coach A) with disabled toilet 49.01 t  
Centre car 56xxx (coach B) 46.29 t  
Driving car 79xxx (coach C) with bicycle space 48.84 t  
Maximum Speed 100 mph  
Construction: Steel  
Engines: each vehicle has one under-floor Cummins  
N14 diesel of 450 hp at 2100 rpm.  
Transmission:  
Voith T211 and ZF Voith final drive  
Toilets: one per car  
Bogies: Alstom  
Brakes: Friction and dynamic

### The fleet

Class 175 is a diesel-hydraulic railcar train built in 1999 - 2001 by the Alstom plant in Washwood Heath, Birmingham and owned by leasing company Angel Trains. There are two versions, two-car 175/0 and three-car 175/1; the whole fleet is based at Chester depot. The story of their ordering and development is a complex and problematic one: see 'Prehistory' below.



Although the type has suffered form many technical difficulties, many believe that they have the most comfortable passenger accommodation of all the new trains built since Privatisation, especially in terms of legroom. With an idea of offering some kind of 'premier class' (which has never materialised, despite a brief re-invention of the idea by Arriva) the seats at one end of Coach A of the three-car sets are fitted with 'at seat entertainment' sockets and controls, designed to play a random selection of music from a multi-disc CD player aboard, although these have been seldom used and probably no longer work.



Originally built for service with the First North Western company, changes to franchises later meant that although all were leased by Arriva Trains Wales, sub-leasing arrangements from February 2004 meant that Chester depot, had to supply a daily allocation to three different train companies: Arriva Trains Wales, First North Western and Trans Pennine Express.







Picture © Concrete Bob

To this end, the First North Western logos were removed from the vehicles. First Group basic livery was retained, but in 2005 a start was made in applying a new "ghostly" version of Arriva's colour scheme (above), although without branding and logos. Car 50753 of set 175 103, which was out of service due to a derailment, also carried the scheme when displayed at the National Railway Museum in November 2005, but the vinyls were removed soon after. **175 008** and **175 110** were the only ones to carry this livery in traffic, and indeed did carry logos for a short time. It became extinct with the repainting of 175 110 in April 2009.

After delivery of new Class 185 units to Trans Pennine in 2006-7, all 27 175s became wholly dedicated to Arriva Trains Wales and all vehicles were given ATW logos.

Repainting began in earnest at the beginning of 2008, the units being sent one at a time to Alstom at Oxley, Wolverhampton for treatment. It was decided that pale-coloured "ghostly" scheme will not be perpetuated, and instead the standard Arriva colours and branding are being applied. The first to be done was 175 008 - which thus gained its third livery - followed by 175 010 (see heading picture). The last to be done, in July 2009, was 175 115.



PICTURE BY TONY MILES

175 008 seems to have a history of 'firsts' - it was also the first to catch fire and spend some months being repaired - as it was the first to receive a name (since removed): it was named *Valhalla* (after the big ride at Blackpool) on 2 November 2000. The name was chosen in a First North Western/Asda competition and was submitted by 11-year-old Adam Cotton. (Earlier public competitions for names seemed to fizzle out.) This name was carried on the white stripe of the FNW livery; later ones done under FNW were a rather tacky vinyl pseudo-nameplate. The only Arriva naming so far, 175 003, had a different style looking more like a real nameplate, but Arriva have removed all the names during repainting their livery.



HOLYHEAD 3 5.00 PICTURE JOHN MURRAY

### Class 180

A similar type of train, but in five-car form and with bigger engines (suitable for 125 mpg running) and more streamlined ends, was built by Alstom as Class 180 for First Great Western: in 2007 it emerged that FGW were returning these to the leasing company, making their future uncertain. Arriva apparently looked at the possibility of taking some, but in the end decided the cost would be too high. In early 2008 it was announced that a small fleet would be used by Hull Trains, and more recently Virgin Trains are reported to have leased two units, and at the end of 2009 three were (remarkably) allocated to Northern Rail for use on local services on the Manchester - Blackpool axis.

Alstom has ceased to build trains in the UK, so it is most unlikely that any more of these 'Coradia 1000' (as Alstom calls them) trains will ever be built.

## Class 175 gallery



## Prehistory

When North West Regional Railways was franchised to the Great Western group in 1997, the package included the introduction of 70 new diesel vehicles to displace the 40-year-old 'heritage' stock still in service and to pioneer a service to London in competition with Virgin, both from the Manchester area and the North Wales coast. Initially it was suggested that some would be 3-car sets capable of 125 mph for the London services, whilst the rest would be a mixture of one-car and two-car sets. GEC Alsthom were soon chosen as the constructor, and the initial thought of single cars was revised to 2- and 3-car 100 mph sets plus 9 three-car 125 mph sets. The artists' impressions above date from 1997, showing the more streamlined front proposed for the faster units. The side view shows a remarkable resemblance to the same builder's earlier Class 156 trains.

After First Group took over in 1998, it became clear that high-speed running to London was out of the question, as Railtrack and Virgin Trains had agreed that Virgin would have exclusive rights to fast trains in return for an investment in the refurbishment of the main line. As a result, the plan was revised again, and what was actually ordered were 16 3-car and 11 2-car sets, all of the same 100 mph design. 125 mph sets were, however, built for Great Western Trains. Meanwhile, GEC Alsthom changed its name to Alstom, apparently to clarify the pronunciation. The original name was the Alsace Thomson-Houston Company. The livery chosen was based on the First Group standard for new buses.

The trains were assembled at Alstom's Washwood Heath plant near Birmingham, once owned by Metro-Cammell. Test runs began in Autumn 1999, and the first train to enter First North Western stock, two car set **175 003**, was delivered to Chester Depot on 23 December 1999, with the others scheduled for delivery during 2000. The new units are referred to by Alstom as their Coradia 1000 series - Coradia being a word said to mean 'Inter City' in Greek.

As of February 2000, five two-car units were in stock at Chester, but running on the main line under an 'Interim' safety certificate only, permitting tests and driver training but not carriage of passengers.

Nine months later, in November 2000, Class 175s were becoming a common sight on North Wales and Mid-Cheshire services, with crew training in progress for the Barrow and Windermere lines, even though at that time only nine of the 27 trains on order had been accepted onto the First North Western fleet. The three-car units in particular were very slow in delivery, only 104 and 105 having been seen in service at the beginning of November 2000. **175 101** remained an instrumented test train, and the first two to be delivered, 001 and 002, still awaited modifications before they could be used. It was 2002 before all were officially accepted by First North Western.