


Built:	EMD JT42CWR
Classification:	66
Wheel Arrangement:	CC
Engine:	12N-710G3B-EC : 2.462 kW 3.300 HP at 904 rpm
Power At Rail:	2.240 kW (3.000 HP)
Trucks:	HTCR-E
Wheel Diameter:	1,067 m.
Sanding Equipment:	8 x 42,5 litre body mounted sand boxes 50 kg per box
Maximum Speed:	120 kmh
Maximum Tractive Effort:	467 kN
Continuous Tractive Effort:	296 kN
Length:	21,35 m.
Width:	2,64 m.
Height:	3,91 m.
Brake Force:	68.000 kg.
Fuel Capacity:	6.550 lit.

# Class 66 series





































JT42CWR

Diesel locomotive



Series:	Class 66
Build:	EMD 1998 - ..
Top speed:	120 km/h
Gauge:	1435 mm
UIC axles:	Co'Co'
Length:	21.35 m
Width:	2.64 m
Height:	3.90 m
Weight:	127 t
Power output:	2385 kW
Tractive effort:	260 kN
Source:	<a href="https://en.wikipedia.org">en.wikipedia.org</a>

## Career

 ACTS 66	 ECR France 66	 MRCE 66	 Veolia CB 66
 AR 66	 ECR France 77	 OHE 66	
 CB Rail 66	 Eichholz 266	 R4C 66	
 CL T66	 ENR 66	 Railtraxx 66	
 CRB 66	 ERS 66	 RheinCargo 66	
 CTB 66	 FPL 66	 RR T66	
 CTD 66	 HGK 66	 RRF 66	
 DBSDE 247	 HHPI 29	 RTB 66	
 DBSNL 266	 HUSA 66	 RTS 66	
 DBSRP 66	 ITL 266	 SNCF 66	
 DLC 66	 LWB 266	 Transport 66	



Class 66/0

Diesel locomotive



Series:	Class 66
Build:	EMD
Top speed:	120 km/h
Gauge:	1435 mm
UIC axles:	Co'Co'
Width:	2.64 m
Height:	3.90 m
Weight:	127 t
Power output:	2385 kW
Tractive effort:	260 kN
Source:	<a href="https://en.wikipedia.org">en.wikipedia.org</a>
Numbering:	66001-66250

## Career

-  DBSUK 66/0
-  EWS 66/0



Class 66/3

Diesel locomotive



Series:	Class 66
Build:	EMD

# HISTORY OF THE CLASS 66s

## by ADRIAN BOOTH

It was the spring of 1998 when the magnificent Class 66 locomotives began to arrive in the UK, initially supplied to the order of EWS, although the type now has also found favour with Freightliner, GB Railfreight, and other European operators. There are now no less than 327 Class 66's in traffic in the UK, the type offering a new level of reliability and now working the majority of trainload freight duties on all but a handful of routes. With their stylish design and colourful liveries, the Class 66's have found fairly universal favour with railway enthusiasts, and are also very popular with their train crews (once initial teething problems with cab noise were rectified).

The Class 66 owes its existence to EWS. When this company was formed in the mid-1990's (after the purchase of Rail Express Systems, and the three BR trainload freight companies - Mainline, Loadhaul and Transrail) it sought to address the chronic availability problems of the aging fleet of locomotives that it inherited. EWS was aware that General Motors in Chicago (GM) had already supplied fifteen Class 59 locomotives to three operators in the UK and, for example, this type had proved immensely efficient and popular working stone trains between Somerset quarries and west London. EWS contacted GM (who therefore already had a suitable body design for the UK market) with a view to updating the popular Class 59 with the latest technology. The end result was an EWS order for no less than 250 new locomotives, designated Class 66, involving an outlay of some £375M, the biggest investment ever in one order for locomotives.

GM built all 250 of the locomotives at their works at Ontario, in south east Canada. To start with, just 66001 and 66002 were built, the frames being laid on 18th May 1997. On 23rd March 1998 number 66001 was officially handed over to the EWS Chairman at Ontario. It was then taken to Albany, New Jersey where, on 31st March 1998, it was loaded on board a ship for its voyage to Immingham. Upon arrival there it was towed by 56018 to the nearby TMD for inspection, with a ceremonial unveiling to the press on 20th April 1998. That night it moved to Toton TMD (hailed by 60016) for further inspection and staff training. Four days later it was displayed in Chester, then being taken on 27th April 1998 to the Railway Technical Centre at Derby for two weeks of tests. It was then sent back to Toton TMD and, on 21 May 1998, it made its first journey on Railtrack under its own power, undertaking brake tests between Toton and Chesterfield. It hauled its first train on 27th May 1998.

GM completed delivery of the order for Class 66's in an amazing timescale. The first, the aforementioned 66001, in a striking maroon and gold livery, was docked at Immingham (the only one to arrive there) on 18th April 1998, whilst the last eleven docked at Newport in South Wales on 18th June 2000, a highly impressive total delivery time of exactly 26 months for 250 locomotives. By comparison, BREL took 7½ years to deliver just 105 Class 56's, whilst the one hundred Class 60's took some four years to emerge from Brush. The Class 66's were quickly tested and all were initially allocated to Toton Depot before being set to work.

The Class 66 locomotives are of the Co-Co type with a cab at each end. Rated for 75mph operation, each has a GM 12N-710G3B-EC two-stroke engine, rated at 3,200hp at 900rpm. This is coupled to a GM AR8/CA6 main alternator, which powers six GM D43TR traction motors - one on each axle - developing a maximum tractive effort of 90,000lbf, and a continuous tractive effort of 57,000lbf, with a maximum speed of 75mph. This makes the Class 66 less powerful than a Class 60 locomotive, although it is a stronger performer than classes 47, 56, 57 and 58. The Class 66 locomotives can carry 6,550 litres of diesel fuel, giving them a range of upward of 1,200 miles between refuellings. A ready-to-run Class 66 weighs-in at 126 tonnes, and this means they have a route availability rating of 7. The Freightliner Class 66/5 locomotives are as per Class 66, with the exception that their maximum tractive effort is 105,080lbf (continuous rating 66,630lbf) and their maximum speed is a reduced 65mph.

When new, all 250 EWS Class 66s were allocated to Toton, although this was little more than a paper code to satisfy the TOPS computer, and each 66 could appear nationwide. However, in November 2000 EWS split its locomotives into regional pools and the Class 66s were allocated to six depots, Cardiff, Eastleigh, Immingham, Motherwell, Thornaby, and Toton. In reality they will still appear as and when they are needed, but the depot allocations helps in maintenance planning and the intention was that each locomotive would visit its home depot at least once every three months.

Such was the impact of the Class 66 that container operator Freightliner quickly got in on the act, initially ordering five of the type (designated Class 66/5) from GM, with 66501 docked at Newport on 17th July 1999. Subsequent orders have raised the Freightliner Class 66/5 total to 54 locomotives (numbered 66501-54) - all being painted in Freightliner's striking turquoise and yellow livery - whilst a further order was for six Class 66/6 locomotives that had a different gear ratio that made them suitable for heavier trainload work. These locomotives (numbered 66601-06) arrived at Newport Docks on 11th November 2000. A further order saw the delivery of numbers 66607-12. In addition to the initial container traffic, Freightliner subsequently won the contracts to work other traffic flows and, for example, 66/5s can now be seen on coal traffic and 66/6s on tanker trains.

In April 2000 GB Railfreight placed an order for locomotives with the same gearing as the Class 66/6s, with their fleet designated Class 66/7 and numbered 66701-12. Their livery is all-over blue with yellow ends, and the number and GBRf on the sides in yellow.

To complete the story, the success of the 66s attracted the interest of, initially, two European operators. A German operator ordered two locomotives to work traffic from Cologne to the Netherlands. These (numbered 9901-02) were painted red with a white band and arrow on the bodyside, and received approval for German operation in September 2000. The second operator was Swedish, and also ordered two locomotives - classified T66 and numbered 713 and 714. They were painted in lime green livery, and were delivered to Sweden in August 2000. The class is expected to thrive in Europe and GM stated that it hoped to sell between forty and fifty Class 66s in Europe during 2002. Indeed, examples can now also be found in Belgium, Holland and Norway.

Acknowledgement: this article is based upon a feature, written by Pip Dunn, which appeared early in 2001 in RAIL 401. [The accompanying tables of loco data](#) originally appeared in RAIL 401 and are copyright of RAIL. When contacted, Pip readily agreed to his material and loco tables being utilised on this web-site, and he and RAIL are sincerely thanked.

From Wikipedia, the free encyclopedia

The **Electro-Motive Diesel** (EMD) **Class 66** (or **JT42CWR**) is a series of **Co-Co** six axle **diesel locomotives** built by EMD for the European heavy freight market. Originally designed for use in **Great Britain** as the **Class 66**, a development of the **Class 59**, they have since been adapted and certified for use in other European countries.<sup>[3]</sup> Outside Europe, 40 locomotives have been sold to Egyptian Railways for passenger operation.<sup>[4]</sup>

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  - 1.2 Mainland Europe
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## [edit]

## [edit]

The *EMD Class 66*<sup>[5]</sup> was originally designed by General Motors-Electro Motive Division for use in the UK as the *British Rail Class 66*, 250 were sold to EWS, with further orders coming from Freightliner (UK) and other railway operators.

[\[edit\]](#)

Over 100 locomotives of this type have been purchased for operations in Europe, including 60 operated by [Euro Cargo Rail](#) a wholly owned subsidiary of English, Welsh and Scottish Railway (since 1st Jan 2009 named [DB Schenker rail \(UK\) Ltd.](#)). The ECR locomotives are equipped with train protection systems for France, Germany and Belgium but cannot operate in Great Britain. They have cab air conditioning and carry a fridge and microwave oven in one cab. They are registered in France as Class 77.

[edit]

The class has undergone various updates; other than the lower geared class 66/6 version produced for Freightliner, most of the updates have been in relation to conforming to the ever increasing specifications for exhaust particulate emissions.



Despite being popular with rail operators, especially due to its high reliability, the class has not been universally successful: one recurring problem, both in operation in the UK and mainland Europe, has been the issue of driver comfort. In particular, noise levels (including noise from the cab horn), vibration, and excessive cab-temperatures in hot weather have brought serious complaints. In particular, the cab is not isolated from the main frame causing engine noise to be the dominant background noise,<sup>[13]</sup> notwithstanding the implications for safety (audibility of warning signals etc.), and the potential for hearing damage in the long term, the conditions

EMD Class 66	
<span></span>	
<div> <div></div> <div>HGK DE 64 at Godorf Hafen open day.</div> </div>	
Power type	Diesel-electric
Builder	<span>Electro-Motive Diesel</span>
Model	EMD JT42CWRM
Build date	1998 to date
Total produced	651+(7) <sup><span>[</span>1<span>]</span></sup>
UIC classification	Co'Co'
Gauge	1,435 <span> </span> mm (4 <span> </span> ft 8 <span> </span> <sup>1</sup> <span>⁄</span> <sub>2</sub> <span> </span> in)
Bogies	HTCR-E
Length	21.35 <span> </span> m (70 <span> </span> ft 1 <span> </span> in)
Width	2.64 <span> </span> m (8 <span> </span> ft 8 <span> </span> in)
Height	3.9 <span> </span> m (12 <span> </span> ft 10 <span> </span> in)
Locomotive weight	126.9 <span> </span> t (124.9 long tons; 139.9 short tons)
Fuel type	Diesel
Fuel capacity	6,400 <span> </span> l (1,400 imp gal; 1,700 US gal)
Engine type	<span>EMD 12N-710G3B-T2</span> , 2,420 <span> </span> kW
Alternator	Main: General Motors AR8PHEH Aux.: General Motors CA6B
Traction motors	General Motors D43TR Axle Hung (6x)
Cylinders	12
Top speed	120 <span> </span> km/h (75 <span> </span> mph) Except Freightliner 66/6 105 <span> </span> km/h (65 <span> </span> mph)
Power output	2,420 <span> </span> kW (3,250 <span> </span> hp) (total) 2,268 <span> </span> kW (3,041 <span> </span> hp) (traction)
Tractive effort	Starting: 409 <span> </span> kN (92,000 <span> </span> lb <sub>f</sub> ) except Freightliner 66/6: 467 <span> </span> kN (105,000 <span> </span> lb <sub>f</sub> ) Continuous: 260 <span> </span> kN (58,000 <span> </span> lb <sub>f</sub> ) @ 25.6 <span> </span> km/h (15.9 <span> </span> mph) except for Freightliner 66/6: 296 <span> </span> kN (67,000 <span> </span> lb <sub>f</sub> ) @ 22.5 <span> </span> km/h (14.0 <span> </span> mph)
Locomotive brakes	Air
Nicknames	'Sheds', 'Ying-yings' (UK) 'Klaas 66' (NL) <sup><span>[</span>2<span>]</span></sup>
Locale	Europe, Egypt



CD66 of CargoNet  
The air conditioning unit is visible above the cab.

drivers face led to threats of industrial action in the UK in 2007,<sup>[14]</sup> and an agreement for increased pay for drivers using this type of locomotive<sup>[15]</sup> (in Norway). By modifying using noise absorbing materials EMD succeeded in meeting TSI Noise Certification standards in 2008.<sup>[16]</sup> Tests on retrofitted cooling systems and improved seating have been carried out on some UK locomotives.<sup>[17][18]</sup>

## ETCS Equipment

[\[edit\]](#)

A number of locomotives operating in the Netherlands and Germany have been equipped with [ETCS](#), principally to allow them to work on the ETCS equipped [Betuweroute](#), comprising the ETCS Level 1 "Havenspoorlijn" in the Rotterdam harbour area and the ETCS Level 2 "A15" route linking Rotterdam to the German border.<sup>[*citation needed*][note 1]</sup>

## Operators

[\[edit\]](#)

Certification ([homologation](#)) is needed for each country of operation. The locos were initially given a temporary certificate for use in France,<sup>[19]</sup> full certification for use in France came in 2009<sup>[20]</sup> (they had previously operated in France on some routes), Romanian certification came in 2007<sup>[21]</sup>

The class are also certified for operation in Germany, The Netherlands, Luxembourg, Belgium, Sweden, Norway, Poland and Denmark.

As of 1 Jan 2009, certification for use in the Czech Republic and the Slovak Republic is pending.

Additionally they have been sold to, and are operated in [Egypt](#) by the [Egyptian National Railways](#).



Freightliner PL EMD JT42CWRM #66001 at the station in [Ruhland](#) Germany (May 2008)

Owner	Operator	Countries	Designation	Total	Comments
<a href="#">Angel Trains</a> (250) <a href="#">Beacon Rail</a> (15) <a href="#">Halifax Assets finance Ltd.</a> (33) <a href="#">HSBC Rail UK Ltd.</a> (85) <a href="#">Porterbrook</a> (60) <a href="#">Lloyds TSB</a> (4) <sup>[22]</sup>	<a href="#">Colas Rail</a> <a href="#">DB Schenker</a> <a href="#">DRS</a> <a href="#">Fastline</a> <a href="#">GB Railfreight</a> <a href="#">Freightliner UK</a>	<a href="#">Great Britain</a>	<a href="#">British Rail Class 66</a>	450+	<i>Main article: <a href="#">British Rail Class 66</a></i>  60 EWS locomotives lent from EWS stock to EWSi subsidiary <a href="#">Euro Cargo Rail</a> . <sup>[23]</sup> 5 units exported to Poland for Freightliner Poland. <sup>[22]</sup>
<a href="#">Angel Trains</a>	<a href="#">Euro Cargo Rail</a> (ECR) <sup>[23]</sup>	<a href="#">France</a>	<a href="#">Class 66</a> <a href="#">Class 77</a>	120	60 loaned from parent company EWSi 60 further locomotives during 2009 designated <a href="#">Class 77</a>
	<a href="#">Freightliner PL</a> (FPL) <sup>[24]</sup>	<a href="#">Poland</a>	<a href="#">Class 66</a> <sup>[25]</sup>	7 <sup>[26]</sup>	Part of Freightliner Group Ltd.
<a href="#">CB Rail</a> <sup>[27]</sup> <i>formerly</i> <a href="#">Porterbrook</a>	<a href="#">Rail4Chem</a> Benelux (R4CB)	<a href="#">Benelux</a> ( <a href="#">Belgium</a> , <a href="#">Netherlands</a> & <a href="#">Luxembourg</a> )		26	
	<a href="#">Heavy Haul Power International</a> (HHPI)	<a href="#">Germany</a>			
	<a href="#">Dillen et Le Jeune Cargo Railway</a> (DLC)	<a href="#">Belgium</a>			
	<a href="#">Häfen und Güterverkehr Köln</a> (HGK)	<a href="#">Germany</a>	<a href="#">Class 266</a>		
	<a href="#">ERS Railways</a> (ERSR)	<a href="#">Netherlands</a>			
	<a href="#">Railion Nederland</a> (RN)	<a href="#">Netherlands</a>			
<a href="#">Deutsche Leasing</a> <sup>[27]</sup>	<a href="#">Rail4Chem</a> Benelux (R4CB)	<a href="#">Benelux</a> ( <a href="#">Belgium</a> , <a href="#">Netherlands</a> & <a href="#">Luxembourg</a> )		1	
<a href="#">Egyptian National Railways</a> (ENR)		<a href="#">Egypt</a> <sup>[4][28]</sup>	2120 <sup>[29]</sup>	40 <sup>[28]</sup>	First non-European customer, for passenger use.
<a href="#">GM/Opel</a> leasing <sup>[27]</sup>	<a href="#">Häfen und Güterverkehr Köln</a> (HGK)	<a href="#">Germany</a>	<a href="#">Class 266</a>	2	
<a href="#">GM/GMAC</a> leasing <sup>[27]</sup>	<a href="#">Heavy Haul Power International</a> (HHPI)	<a href="#">Germany</a>		1	
<a href="#">HSBC Rail</a> <sup>[27]</sup>	<a href="#">TGOJ Trafik</a> (TGOJ) <sup>[30]</sup>	<a href="#">Sweden</a>	T66 713 <sup>[31]</sup>	1 <sup>[31]</sup>	Leased to <a href="#">Ikea</a> rail AB, 1 unit modified for use in Denmark
	<a href="#">CFL Cargo DK</a> <sup>[32]</sup>	<a href="#">Denmark</a>	T66K 714 "Krudthornt"	1	Transferred to CFL Cargo DK in Padborg in 2010
	<a href="#">CargoNet</a> (CN)	<a href="#">Norway</a>	<a href="#">CD66</a> <sup>[33]</sup>	6 <sup>[34]</sup>	Problems with driver cabin conditions ( <a href="#">see above</a> ) Named Di9 as per Di series in procurement documents, <sup>[35]</sup> in practice also called <b>CD 66</b> To be replaced by <a href="#">Vossloh Euro 4000</a> on



	Häfen und Güterverkehr Köln (HGK)	Germany	Class 266	5	the Nordland Line <sup><span>[</span><i>citation needed</i><span>]</span></sup>
ERS Railways (ERSR)	Netherlands		5		
KBC lease group <sup><span>[</span>27<span>]</span></sup>	Dillen et Le Jeune Cargo Railway (DLC)	Belgium		4	
MRCE <sup><span>[</span>27<span>]</span></sup>	Dillen et Le Jeune Cargo Railway (DLC)	Belgium		~5	
	ERS Railways (ERSR)	Netherlands		~6	
	Häfen und Güterverkehr Köln (HGK)	Germany	Class 266	~2	
	Afzet Container Transport System (ACTS)	Netherlands		1	
	Dortmunder Eisenbahn (DE)	Germany		1	
	Veolia Cargo / Connex (VC)	Netherlands & France		1	
	Trainsport AG (TS)	Belgium		1	
	Rail4Chem (R4C)	Germany		1	
	NedTrain			1	
Setrag		Gabon		2	Units shipped July 2011. <sup><span>[</span>36<span>]</span></sup>





## See also

[edit]

- Voith Maxima, GE PowerHaul and Vossloh Euro 4000, competitors
- IE 201 Class, GM 710 engined locomotive for Irish railways

## References

[edit]

- ↑ "Class 66 :: Electro-Motive Diesel JT42CWRM". *class66.railfan.nl*. Rogier Immers. Retrieved 9 July 2011.
- ↑ *Klass 66* : a play on the English word "class" and the Dutch boys' name "Klaas" and the word SantaKlaus (dutch:'Sinterklaas'). The nickname came about because the first engine delivered to the Netherlands (HGK DE61) was painted red, a colour normally associated with Santa.<sup>[*citation needed*]</sup>
- ↑ JT42CWRM Fact Sheet 
- ↑  ***<sup>a</sup> <sup>b</sup>*** "Commissioning of Egyptian JT42CWRM begins". *Railway Gazette International*. 2009-05-20.
- ↑ In 2005 General Motors sold its locomotive manufacturing division (EMD), the organisation is now named Electro Motive Diesel or EMD
- ↑ Class 66 (subsection 'History') railfan.nl
- ↑ Andrew Roden (September 2008). "EMD plans new route for Class 66" . *findarticles.com* (International Railway Journal).
- ↑ "EMD to produce passenger demonstrator loco" , *www.railwaygazette.com* (Railway Gazette International), 4 October 2011, "Meanwhile, EMD confirms that it has dropped plans for the 66EU, which was to have been an updated version of its popular Class 66 freight locomotive specifically adapted for the Continental European market"
- ↑ The individual bogies are articulated rather than having two bogies connected with a Beugnot lever or equivalent
- ↑ The effect of locomotive steering steering bogies on wheel and railwear, Swenson, C.A.; Scott, R.T. Railroad Conference, 1996. (via ieeexplore.ieee.org)
- ↑ Effect of self-steering locomotive trucks in improving adhesion oncurved tracks, Ahmadian, M.; Wei Huang, Railroad Conference, 2000. (via ieeexplore.ieee.org)
- ↑ EMD Class 66 Product information sheet from EMD 
- ↑ Rail Safety & Standards board: The implications of the physical agents directive (noise): summary 
- ↑ "Boycott threat over 'dirty' locos" . *news.bbc.co.uk* (BBC News). 30 April 2007.
- ↑ Agreement between the NLF and CargoNet (norwegian)
- ↑ Electro-Motive Diesel, Inc. (EMD) Updated Class 66 European Locomotive is First to Achieve TSI Noise Certification in Europe
- ↑ "Positive moves on Class 66 cabs" . *www.aslef.org*. ASLEF. 21 Mar 2007.
- ↑ "Update on SQUASH" . *www.aslef.org.uk*. ASLEF.
- ↑ Various modifications were required, including some additional to the fitment of the local train safety systems (see Details of Class 66 modifications made for working in France (esg-railconsultancy.co.uk)
- ↑ (EMD) Announces French Homologation Has Been Achieved For the Euro Cargo Rail Class 66 Locomotives
- ↑ Electro-Motive Diesels (EMD) certifies its Class 66 (JT42CWRM) locomotive in Romania
- ↑  ***<sup>a</sup> <sup>b</sup>*** AbRail Rail Databases - Diesel Locomotives  *www.abrail.co.uk*
- ↑  ***<sup>a</sup> <sup>b</sup>*** ECR locomotives railfaneurope.net
- ↑ Freightliner PL Freightliner.co.uk
- ↑ 23 February 2007 ANGEL TRAINS ENTERS THE POLISH RAIL FREIGHT MARKET
- ↑ Angel Trains presentation (via mtgsa.pl)
- ↑  ***<sup>a</sup> <sup>b</sup> <sup>c</sup> <sup>d</sup> <sup>e</sup> <sup>f</sup> <sup>g</sup>*** The Definitive Fleet List of Euro Class 66 locos - giving works numbers, running numbers, names, operators and international IDs. (up to November 2007) therailwaycentre.com
- ↑  ***<sup>a</sup> <sup>b</sup>*** "Electro-Motive Diesel, Inc (EMD) Rolls Out The New JT42CWRM for Egyptian National Railways (ENR)" . Electro-Motive Diesel.
- ↑ ENR locomotives and shunters  *railfaneurope.net*
- ↑ TGOJ Trafik. (Locomotive listing on sub-page) (swedish)
- ↑  ***<sup>a</sup> <sup>b</sup>*** TGOJ locomotives Railfaneurope.net
- ↑ [1]
- ↑ CargoNet diesellokomotiv type CD66
- ↑ Norwegian rolling stock database page (with images)
- ↑ Årlig møte med ledelsen i CargoNet AS TILSYNSRAPPORT (annual audit report) CargoNet 2002 

Notes

[\[edit\]](#)




1.

<sup>^</sup>

Bombardier "EBICab2000" ETCS. Includes ATB-EG specific transmission module (STM) for conventional Dutch lines and the PZB STM for Germany. In addition, a separate "Memor" unit is installed for Belgian operation.<sup>[*citation needed*]</sup>

External links

[\[edit\]](#)

- JT42CWRM , information at EM Diesels
- Dutch railfan page on Class 66  *(in English)*
- Nothing stops a Class 66: article from RAIL #492  Detailed description of class, including internal layout. via *pigeonsnest.co.uk*



Wikimedia Commons has media related to: ***Class 66 (locomotive)***

<span>v</span> <span>•</span> <span>d</span> <span>•</span> <span>e</span>	<b>Limited Production and Export Locomotives built by <span>GM-EMD</span></b>	<span>[show]</span>
<span>v</span> <span>•</span> <span>d</span> <span>•</span> <span>e</span>	<b>Classes of German diesel locomotives</b>	<span>[show]</span>
<span>v</span> <span>•</span> <span>d</span> <span>•</span> <span>e</span>	<b>Swedish rolling stock</b>	<span>[show]</span>
<span>v</span> <span>•</span> <span>d</span> <span>•</span> <span>e</span>	<b>Norwegian rolling stock</b>	<span>[show]</span>

Categories:

Diesel locomotives of Germany

EMD locomotives

Co-Co locomotives

Diesel locomotives of Egypt

Railway locomotives introduced in 1998

Diesel locomotives of Great Britain

CargoNet locomotives

Diesel locomotives of Norway

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# Class 66



**Freight Operator/s**

**Freightliner Heavy Haul, Freightliner, GB Railfreight**

<b>Vehicle Qty</b>	44 (FHH x 33, FL x 6, GBRF x 5)
<b>Consist</b>	Locomotive
<b>Traction Type or Power Supply Type</b>	GM 12 710 G33B EC2-stroke diesel engine, driving alternator and DC Traction Motors
<b>Max Speed</b>	75 mph

These Canadian-built General Motors locomotives have become the UK's standard heavy freight traction. This is a long-established design, first supplied to the UK as Class 59 in 1985, later being updated for the EWS order of 250 locomotives supplied from 1998, and still gaining new orders. The design is also popular with "open access" freight operators in Europe, thanks to its reputation for reliability. The Class 66 features a General Motors 12N-710G3B-EC two-stroke engine, delivering 2385 kW (3,200 hp). A 6,550 litre fuel tank gives a range of 1,200 miles. The Porterbrook fleet includes 12 Class 66/6 which use a 83/15 gear ratio instead of the standard 81/20, offering a better "heavy haul" performance, but reducing the maximum speed to 65 mph. Reliability is the Class 66's great asset, with miles per casualty figures often around 250,000, which is orders of magnitude better than the older locomotives they replaced.

# CANADIAN RAILWAY OBSERVATIONS

## **How the Canadian-built EMD Class 66 completely changed the face of British railfreight By Thomas Blampied and Dave Kirwin - (January 2010)**

### **They Came, They Saw, They Conquered**

In 1996, as part of the privatisation of British Rail (BR), the different BR freight sectors were sold off to various bidders. The vast majority of the sectors were purchased by Wiscorsin Central (WC) and merged under the branding of English, Welsh and Scottish Railway (EWS). One of the first issues that EWS needed to address was the ageing motive power (about 900 locomotives) they had inherited. Most BR freight diesels were wearing out and many were approaching their 40<sup>th</sup> birthday. Add to this the fact that there were nine different types of locomotive for the crews to learn and the varied maintenance each type required meant that this was a pressing problem. WC was confronted with two choices: either refurbish existing locomotives, gaining a few more years of running; or order new, more powerful and reliable locomotives that would run for decades. They decided to order new locomotives to reinvigorate rail freight (at that time it made up a measly 6% of the UK freight market).

Before privatisation, the last new locomotives on BR were the 100-strong fleet of class 60 heavy freight diesels, rated at just over 2400hp. However these diesels, less than a decade old, were already starting to show reliability problems and their top speed of 60 mph was too slow.

Inspiration for EWS's new locomotives came from the North American-built class 59s, a joint project between Foster-Yeoman and the British Railways Board during the mid 1980s. At the time, no British-built locomotive was powerful enough for Foster-Yeoman's heavy stone trains. A "super" locomotive was built, combining the restricted British loading gauge with the reliable power of GM diesels. Along with the GM class 59s, Foster-Yeoman had also imported a SW1001 switcher to work at their Merehead Quarry, the switcher being much more powerful than British shunters.

The loading gauge in Britain is much more restricted than in North America, making any locomotive design more challenging. Using the class 59 design as a starting point was ideal because the loading gauge problem was already solved. WC already had a history of purchasing EMD locomotives so the builder seemed the ideal candidate for the contract. The proposed design was very similar to the 59s, but with improvements such as a microprocessor control system, a similar power unit to the SD70 (although only 12 cylinder) and radial steering bogies - ideal for reducing rail wear that can occur on the tight curves of the network.

Stunning the railway world, EWS placed an order for 250 of these new locomotives, at a cost of £375 million (about \$750 million CAD) in mid-1996. The locomotives were to be known as class 66 (locomotives in the UK are grouped into classes to simplify the computerised classification system).

The first arrived on British soil (No. 66001) in April 1998. 66001 was essentially the demonstrator. Once in the UK, 66001 was tested at Toton depot and at the Engineering Research Centre at Derby. 66002 was initially sent to the Transportation Technology Centre in Pueblo, Colorado for extensive testing; especially the radial steering bogie system. With the first two locomotives passing all tests, more 66s began arriving in the UK every month.

The first Canadian connection to the class 66s is the most obvious. EMD built all of the new locomotives at their plant in London, Ontario – with power plants from LaGrange. Due the huge size of the order, some manufacturing was outsourced to various local businesses (such as cab construction), but the assembly and extensive testing took place at EMD London. Testing for the 66s was more complicated than most locomotives as each locomotive had two cabs, meaning that two sets of controls needed to be tested. Perhaps most appropriately for use in the UK, each locomotive was tested to be sure it was fully waterproof!

As each batch of locomotives passed the rigorous EMD testing programme, they were shipped east in convoys on the Goderich and Exeter and Canadian National (CN) to Halifax, Montreal or Toronto for shipping across the Atlantic on one of Jumbo Shipping's vessels. Apart from 66001, which arrived at Immingham Port in Lincolnshire, all 66s were unloaded at Newport Docks in Wales.

EMD technicians were sent to the UK in case of any problems, but improvements in reliability and maintenance were immediately apparent as more 66s entered service. EWS locomotive reliability shot up to over 90% with the new 66s compared to 60%-70% with the old BR diesels.

Freightliner, the only large part of BR rail freight not purchased by EWS, had its own problems with ageing motive power. It initially opted to refurbish 12 of the best class 47s by replacing the ageing Brush diesel-electric engines with new GM ones, these 12 locomotives were re-classified as class 57s. However, this project was delayed and once the EWS 66s began running, Freightliner was very impressed and ordered five 66s, built to slightly different specifications for their needs. So successful were the initial five that the Freightliner 66 fleet is now over 100 units.

By now, the UK railfreight market was steadily growing as more and more operators entered the market. First Group (known in Canada for purchasing Laidlaw, now called First Student Canada), ordered class 66s for their Great Britain Rail Freight (First GBRF) operations. Direct Rail Services (DRS) ordered 66s for its new intermodal business.

The second Canadian connection was the 2001 acquisition of Wisconsin Central by (CN). EWS was a British company, funded by WC. Since WC was now part of CN, the company now had "Canadian" money behind it. Various North American railway ideas have been tried, such as running longer trains with multiple locomotives. In Britain, a long freight is 30-40 wagons long! Because most sidings in the UK are quite short, the practice of longer trains is still not commonplace.

A decade after the initial order, class 66s could be found all over the network. So successful is this design that most older freight locomotives have been stored or scrapped. Nearly the entire fleet of 100 British-built class 60s, less than ten years old, were stored as the 66 could do most of their work. Class 31 and 33 locomotives have disappeared virtually altogether and the once popular workhorses 37s and 47s are now rare. Such homogeneity on the network has understandably annoyed rail enthusiasts, but for operators the class 66 has been invaluable.

In the last few years, more new operators have begun to look at the class 66. Jarvis FastLine ordered 5 class 66s for their coal traffic operations. Late in 2008, CN sold EWS to DB Schenker, meaning that the UK's largest rail freight company is now German! To date, only one 66 has been repainted into the Deutsche Bahn red. In 2009, Advenza Freight acquired four class 66s that were superfluous to DRS.

Today, the class 66 fleet in the UK totals around 450 locomotives, divided into various sub-classes. The basic design does not change. The class 66 is just over 70' long and weighs about 130 tonnes. The subclasses use the basic 66 design with various modifications (such as headlights, gearing and top speed) to better suit the customer. The sub-classes are:

66/0 – 66001-66250:

The original batch ordered by EWS. This initial design has a top speed of 75 mph and 3000 hp.

66/3 – 66301-66305:

Ordered by Jarvis FastLine for hauling coal.

66/4 – 66411-66434:

Ordered by DRS for their intermodal business. They are also sometimes found on nuclear flask transport trains.

66/5 – 66501-66599:

Ordered by Freightliner, mostly for their intermodal business.

66/6 – 66601-66625:

Ordered by Freightliner. A low-g geared model with a slower top speed (65 mph), used for very heavy loads such as aggregate.

66/7 – 66701-66732:

Ordered by GBRF for their intermodal and coal businesses. These locomotives can also be seen on maintenance trains on the London Underground.

66/8 – 66841-66844:

Acquired from DRS by Advenza Freight for their scrap metal and gypsum trains. Numbering began in the 840's because 801-804 had already taken in the computer system by other stock. In October 2009, Advenza was dissolved and the 66s returned to the leasing company. Two of these units have now been leased by Colas, a company which picked up much of the traffic affected by the demise of Advenza. The other two have been taken by GBRF.

66/9 – 66951-66957:

The latest 66s ordered by Freightliner. These are low-emissions locomotives.

Several class 66/5s currently operate in Poland for the Freightliner subsidiary Freightliner PL. Several 66/0s have been modified to allow them to run in France for the DB Schenker subsidiary Euro Cargo Rail. To date, the only 66 disposal has been 66521, a write-off after the horrific Great Heck accident in 2001.

Like in North America, operators sometimes lease locomotives to each other when traffic is heavy. First GBRF has leased former DRS 66s and DRS has leased locomotives from Freightliner in the past.

The class 66s can be found in virtually every corner of Great Britain on freights, inspection trains, works trains, nuclear flask trains, the occasional passenger charter, rescuing failed passenger trains and the ever-popular Rail Head Treatment Trains (leaf removal).

Clearly, the locomotives from London, Ontario have had a huge impact in the UK, all over Europe and now even Africa! However, competition is on the horizon as Freightliner have started taking delivery of an order of 30 new locomotives from GE in the United States (these locomotives are now known as class 70). This is GE's first entry into the UK diesel market. With a more ergonomic cab and built-in air conditioning (a complaint on the 66s which do not have any), the class 70 may prove to be attractive to



the industry. Clearly the sheer number of class 66s means they will be seen on the rails for decades to come, but their monopoly may not be as secure as it once was.

#### Sources and Further Reading:

- Anglia-GEN (<http://finance.groups.yahoo.com/group/anglia-gen/>)
- “Class 66 – The First Decade”, *The Railway Magazine*, June 2008
- “EWS – The First Ten Years (Part 1)”, *The Railway Magazine*, May 2006
- “EWS – The First Ten Years (Part 2)”, *The Railway Magazine*, June 2006
- “Freightliner – Ten Years in the Private Sector”, *The Railway Magazine*, July 2006
- “The Class 66 Story”, CineRail DVD
- Wikipedia
- <http://www.thejunction.org.uk/cl66.html>

#### Photos:

##### Photos by Thomas Blampied:



The class 66 pioneer, number 66001, was delivered to EWS in 1998. A further 249 locomotives were delivered to the company, completing the first order. Here, 66001 is seen at Cambridge with an intermodal service on 8 June 2006. Note how the EWS livery is similar to that of Wisconsin Central.





One of the more interesting jobs for the class 66s are the annual Rail Head Treatment Trains (RHTTs). From October through December, RHTTs run all over the UK blasting the rails with an oil-coated sand to improve traction and prevent falling leaves from causing problems. EWS 66s 66043 and 66070 are seen on train number 3S81 at Cambridge on 13 November 2008.



In 2009, EWS was purchased by the German operator DB Schenker. To date, only one class 66 has been painted into the DB livery, number 66152. 66152 is seen at Peterborough on 7 February 2009.





The old and the new. 47370 sits at Ipswich waiting to be taken to the scrap yard, while 66532 is tested before its next assignment. The 40-year-old class 47s once numbered over 500 units, but the reliability of the class 66s has made most of them obsolete. Both locomotives were seen at Ipswich on 16 May 2009. 47370 was sent to the scrap heap less than two weeks after the photo was taken.



First GBRF's original livery still graces 66713, named "Forest City" in honour of the city that built it: London, Ontario. The locomotive was named by Anne Marie de Cicco, mayoress of London. The locomotive was seen at Peterborough on 31 May 2008.





First GBRF were awarded the maintenance contract to assist Metronet in maintaining the London Underground. 66721 sports the First GBRF livery used on the locomotives initially ordered for the Metronet contract. Since then, any First GBRF 66 can be seen on underground maintenance trains. This 66 is far from London, on a ballast train at Ely on 23 August 2009.



With relatively short freights being the norm in the UK, a triple-header is a rare sight. Here, 66725, 66719 and 66723, all in various First GBRF liveries are seen with an intermodal service at Ely on 11 October 2008.





66726 (in the latest First GBRF livery) pulls an intermodal service through Ely, UK on 30 May 2009.



One of the latest companies to use the class 66 in the UK is the now-defunct Advenza Freight. They acquired three used locomotives from DRS in May 2009. The locomotives, part of the new class 66/8 subclass, worked for Advenza until October 2009 when the company ceased to operate. 66841 is seen on train number 4L72, the West Burton to Tilbury fly-ash train as it passes through Cambridge on 3 June 2009.





One of Freightliner's latest locomotives, from the class 66/9 subclass is seen at Ipswich on 16 May 2009. This subclass are low-emissions locomotives with an extra door, visible part-way down the side of the locomotive.



Two generations of Freightliner-liveried class 66 sit at the Freightliner stabling point at Ipswich on 16 May 2009. Note the different subclasses (66/9 next to 66/5) and the different types of headlights.



**ELECTRO MOTIVE**

Electro-Motive  
9301 W. 55th Street  
P.O. Box 10381  
LaGrange, Illinois 60525

ASM PT. NO. 40124165

Manufactured in: ☒ Canada  
☐ U.S.A.  
☐ Mexico

Assembled in: ☒ Canada  
☐ U.S.A.  
☐ Mexico

Model : JT42CWR-T1  
Serial : 20068922-009  
Date : 03-2008

Electro-Motive Canada  
P.O. Box 5160  
London, Ontario N6A 4N5

**Class**

**66**

**A**

**Weight tonnes**

**127**

**Brake force tonnes**

**68**

**ETH index**

**0**

**RA**

**7**

**Max speed mph**

**75**

T0646640A

Thomas Blampied

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No doubt where this locomotive was built. Freightliner class 66 number 66956 proudly displays the manufacturer's label beside the cab door.





One of the 66/4 subclass, this unidentified 66 in DRS livery sits on the freight avoiding line at York on 13 June 2006.



Class 66s make for an interesting sight in Canada too. The units are shipped by rail to either Halifax, Toronto or Montreal to be sent across the Ocean. Here, one of Jarvis Fastline's class 66s, number 66303, is seen en route to Toronto Harbour as it passes the VIA Rail TMC on 7 August 2008. 66303 was joined by 66s bound for France and Belgium.



Photos by Dave Kirwin:



Bearing a striking resemblance to the class 66, 59201 is in fact a class 59. This photo demonstrates how similar the two types of locomotive are from the outside. The 66 is, however, more powerful and about 15 years newer.



DRS 66405 carries the livery of Malcolm logistics, in recognition of the contract between the two companies for freight haulage.





DRS 66411 carries the very popular "Stobart Rail" livery to recognise the haulage contract between DRS and the road hauler Eddie Stobart. Keeping with the tradition of Eddie Stobart trucks being named, 66411 has been named "Eddie the Engine".



Freightliner's 66522 carries the hybrid Freightliner/Shanks livery in recognition of the contract between Freightliner and Shanks Waste Management.





GBRf named 66705 'Golden Jubilee' on 20 June 2002 to mark the 50th anniversary of the Queen's accession to the throne. The loco has a distinctive Union Flag on its side.



Following the demise of Advenza Freight, two of their class 66/8 locomotives were acquired by Colas Rail (the company having taken over most of Advenza's work). Here 66841 is seen at the Eastleigh works having just been repainted into the Colas livery.

# Captions

## **Captions to photos of the liveries that we could not find in our own collections:**

A photo of the unique Freightliner Bardon Aggregate livery, by Colin J. Marsden:

<http://cjm.fotopic.net/p40321647.html> 66623

A photo of the unique GBRF Medite livery, by Colin J. Marsden:

<http://cjm.fotopic.net/p44975719.html> 66709

A photo of one of the EWS (now DB Schenker) class 66 locomotives certified to work in France. Note the slightly different livery and additional safety lettering. Photo by Paul Bigland:

<http://paulbigland.fotopic.net/p35835895.html>

A photo of the competition for the class 66. This is a photo of 70001, the first GE diesel in the UK, by Geoff Tibble.

<http://geoffsangliaphotos.fotopic.net/p62479166.html>



# The Euro '66s'

**New  
Euro Cargo Rail  
Added**

**The Definitive Fleet List of Euro  
Class 66 locos - giving works  
numbers, running numbers,  
names operators and  
international IDs**



Updated to 24 November 2007

**TheRailwayCentre.Com**  
Photography, Design and Publishing

# Euro '66s' *THE definitive list*

GM/EMCC Works No.	Date Built	Owner	Operator	Identity	Notes
998101-01	08/99	GM/Opal Leasing	Häfen und Güterverkehr Köln (HGK)	DE61	Also carried No. 9902 EBA No. EBA 00L13C 002
999101-02	08/99	GM/Opal Leasing	Häfen und Güterverkehr Köln (HGK)	DE62	Also carried No. 9901 EBA No. EBA 00L13C 001
20008212-01	07/00	HSBC Rail	Trafikaktiebolaget Grängesbergs-Oxelösunds Järnväg, Sweden (TGOJ)	T66-713	Lease to Ikea Rail AB
20008212-02	07/00	HSBC Rail	Trafikaktiebolaget Grängesbergs-Oxelösunds Järnväg, Sweden (TGOJ) Trafikaktiebolaget Grängesbergs-Oxelösunds Järnväg, Sweden (TGOJ)	T66-714 T66K-714	Named: <i>Kruthornet</i> Lease to Ikea Rail AB Modified for Denmark Named: <i>Kruthornet</i> Lease to Ikea Rail AB
20008254-01	07/01	Porterbrook Leasing Porterbrook Leasing CB Rail	ShortLines, Rotterdam (31/01/02) Rail4Chem, Benelux (11/10/04) Rail4Chem, Benelux	PB01 PB01 PB01	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 003
20008254-02	07/01	Porterbrook Leasing Porterbrook Leasing  Porterbrook Leasing CB Rail	ShortLines, Rotterdam (01/02) Azfet Container Transport System (ACTS), (09/04 only) Rail4Chem, Benelux (11/10/04) Rail4Chem, Benelux	PB02 PB02 PB02 PB02	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 004
20008254-03	07/01	GM/GMAC Leasing  CB Rail	Heavy Haul Power International (22/02/02) Heavy Haul Power International	29001 29001	Named: <i>Robert J G Savage</i> Sold to CB Rail 02/05 Named: <i>Robert J G Savage</i> EBA No. EBA 00L13C 005 Tested 02/06 in Romania
20008254-04	08/01	GM/GMAC Leasing  CB Rail	Heavy Haul Power International (28/03/02) ShortLines, Rotterdam (03-04/03) Heavy Haul Power International	29002 29002	Named: <i>Hans Cermak</i>  Sold to CB Rail 02/05 Named: <i>Hans Cermak</i> EBA No. EBA 00L13C 006
20008254-05	09/01	Porterbrook Leasing CB Rail	Dillen & Le Jeune Cargo Rly (02/02/02) Dillen & Le Jeune Cargo Rly	PB03 PB03	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 007
20008254-06	09/01	Porterbrook Leasing  CB Rail	Häfen und Güterverkehr Köln (HGK) (03/06/02) Häfen und Güterverkehr Köln (HGK)	PB04 then DE63 DE63	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 008
20008254-07	09/01	Porterbrook Leasing CB Rail CB Rail	Rail4Chem, Essen (25/05/02) Rail4Chem, Essen Rail4Chem, Benelux (03/01/06)	PB05 PB05 PB05	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 009
20008254-08	09/01	Porterbrook Leasing  CB Rail	Häfen und Güterverkehr Köln (HGK) (12/07/02) Häfen und Güterverkehr Köln (HGK)	PB06 then DE64 DE64	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 010
20008254-09	09/01	Porterbrook Leasing CB Rail	European Rail Shuttle Rly (02/09/02) European Rail Shuttle Railways	PB07 then 6601 6601	Sold to CB Rail 16/11/04 Named: <i>Blue Arrow</i> EBA No. EBA 00L13C 011
20008254-10	09/01	Porterbrook Leasing CB Rail	European Rail Shuttle Rly (28/09/02) European Rail Shuttle Railways	PB08 then 6602 6602	Sold to CB Rail 16/11/04 Named: <i>Blue Bullet</i> EBA No. EBA 00L13C 012
20008254-11	02/02	Porterbrook Leasing CB Rail	European Rail Shuttle Rly (30/09/02) European Rail Shuttle Railways	PB09 then 6603 6603	Sold to CB Rail 16/11/04 Named: <i>Blue Catapult</i> EBA No. EBA 00L13C 013
20008254-12	02/02	Porterbrook Leasing CB Rail	European Rail Shuttle Rly (02/09/02) European Rail Shuttle Railways	PB10 then 6604 6604	Sold to CB Rail 16/11/04 Named: <i>Blue Dart</i> EBA No. EBA 00L13C 014
20008254-13	03/02	GM/GMAC Leasing	Heavy Haul Power International Hire to Rail4Chem 03-04/03 Heavy Haul Power International	29003 29003	Named: <i>Rhoda Painter</i> EBA No. EBA 00L13C 015 Named: <i>Rhoda Painter</i>
20018352-01	11/02	HSBC Rail	CargoNet, Norway	66 401	Also had No. Di9-01
20018352-02	11/02	HSBC Rail	CargoNet, Norway	66 402	Also had No. Di9-02
20018352-03	11/02	HSBC Rail	CargoNet, Norway	66 403	Also had No. Di9-03
20018352-04	11/02	HSBC Rail	CargoNet, Norway	66 404	Also had No. Di9-04
20018352-05	11/02	HSBC Rail	CargoNet, Norway	66 405	Also had No. Di9-05
20018352-06	11/02	HSBC Rail	CargoNet, Norway	66 406	Also had No. Di9-06
20018360-01	05/02	Porterbrook Leasing CB Rail	European Rail Shuttle Rly (05/11/02) European Rail Shuttle Railways	PB11 then 6605 6605	Sold to CB Rail 16/11/04 Named: <i>Blue Escabalar</i> EBA No. EBA 00L13C 016



GM/EMCC Works No.	Date Built	Owner	Operator	Identity	Notes
20018360-02	06/02	Porterbrook Leasing Porterbrook Leasing CB Rail	Dillen & Le Jeune Cargo Rly (09/12/02) Dillen & Le Jeune Cargo Railways Dillen & Le Jeune Cargo Railways	PB12 PB12 PB12	Hire to ACTS 12/02 Sold to CB Rail 16/11/04 Hire to ERS 08-10/05 EBA No. EBA 00L13C 017
20018360-03	06/02	Porterbrook Leasing	Häfen und Güterverkehr Köln (HGK) (28/11/02)	PB13 then DE65	Sold to CB Rail 16/11/04
20018360-04	07/02	CB Rail	Häfen und Güterverkehr Köln (HGK)	DE65	EBA No. EBA 00L13C 065 Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 018
		CB Rail	Dillen & Le Jeune Cargo Rly (03/01/06)	PB13	
		Porterbrook Leasing	Dillen & Le Jeune Cargo Rly (09/12/02)	PB14	
20018360-05	07/02	CB Rail	Dillen & Le Jeune Cargo Railway	PB14	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 019
		Porterbrook Leasing	Häfen und Güterverkehr Köln (HGK) (10/12/02)	PB15 then DE66	
		CB Rail	Häfen und Güterverkehr Köln (HGK)	DE66	
20018360-06	07/02	CB Rail	Dillen & Le Jeune Cargo Rly (03/01/06)	PB15	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 067
		Porterbrook Leasing	Häfen und Güterverkehr Köln (HGK) (20/12/02)	PB16 then DE67	
		CB Rail	Häfen und Güterverkehr Köln (HGK)	DE67	
20018360-07	07/02	CB Rail	European Rail Shuttle (07/12/05)	6613	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 021
		Porterbrook Leasing	ShortLines, Rotterdam (09/01/03)	PB17	
		Porterbrook Leasing	Rail4Chem, Benelux (11/10/04)	PB17	
20018360-08	04/03	CB Rail	Rail4Chem, Benelux	PB17 r/n to PB017	Spot hire Spot hire Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 022
		Porterbrook Leasing	European Rail Shuttle 08/03	PB18	
		Porterbrook Leasing	ShortLines, Rotterdam (09/03)	PB18	
20018360-09	04/02	Porterbrook Leasing	Dillen & Le Jeune Cargo Rly (05/12/03)	PB18	Spot hire Spot hire Spot hire Spot hire Sold to CB Rail 16/11/04 Hire to RailReLease 01/03/05 (sub lease) EBA No. EBA 00L13C 023
		Porterbrook Leasing	Dillen & Le Jeune Cargo Railway	PB18	
		Porterbrook Leasing	Heavy Haul Power International (08/03)	PB19	
20018360-10	03/02	Porterbrook Leasing	ShortLines, Rotterdam (09/03)	PB19	Spot hire Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 024
		Porterbrook Leasing	European Rail Shuttle (09/03)	PB19	
		Porterbrook Leasing	Dillen & Le Jeune Cargo Rly (10/03)	PB19	
20028453-01	03/03	CB Rail	Dillen & Le Jeune Cargo Railway	PB19	Originally No. DE168 EBA No. EBA 00L13C 668
		CB Rail	Eichholz Verkehr & Logistik (01/03/05)	PB19	
		CB Rail	Dillen & Le Jeune Cargo Rly (07/12/05)	PB19	
20028453-02	03/03	Porterbrook Leasing	European Rail Shuttle (08/03)	PB20	Originally No. DE169 EBA No. EBA 00L13C 669
		Porterbrook Leasing	Dillen & Le Jeune Cargo Rly (07/12/03)	PB20	
		Porterbrook Leasing	Dillen & Le Jeune Cargo Railway	PB20	
20028453-03	04/03	HSBC Rail	Häfen und Güterverkehr Köln (HGK) (04/09/03)	DE668	Originally No. DE170 EBA No. EBA 00L13C 670
20028453-04	04/03	HSBC Rail	Häfen und Güterverkehr Köln (HGK) (04/09/03)	DE669	Originally No. DE171 EBA No. EBA 00L13C 671
20028453-05	04/03	HSBC Rail	Häfen und Güterverkehr Köln (HGK) (04/09/03)	DE670	Originally No. DE172 EBA No. EBA 00L13C 672
20038513-01	08/03	HSBC Rail	Häfen und Güterverkehr Köln (HGK) (04/09/03)	DE671	Originally No. DE173 EBA No. EBA 00L13C 673
20038513-02	08/03	HSBC Rail	Häfen und Güterverkehr Köln (HGK) (04/09/03)	DE672	Originally No. DE174 EBA No. EBA 00L13C 674
20038513-03	08/03	HSBC Rail	European Rail Shuttle (ERS) (24/12/03)	6606	EBA No. EBA 00L13C 025
20038513-04	08/03	HSBC Rail	European Rail Shuttle (ERS) (19/12/03)	6607	EBA No. EBA 00L13C 026
20038513-05	08/03	HSBC Rail	European Rail Shuttle (ERS) (19/12/03)	6608	EBA No. EBA 00L13C 027
20038513-06	08/03	HSBC Rail	European Rail Shuttle (ERS) (19/12/03)	6609	EBA No. EBA 00L13C 028
20038513-07	08/03	HSBC Rail	European Rail Shuttle (ERS) (24/12/03)	6610	EBA No. EBA 00L13C 029 Named: 10 Years ERS 1994-2004
20038513-08	03/04	GM/EMD	European Rail Shuttle (ERS) (24/12/03)	6611	Sold to MRCU Also No. MRCE 513-6 EBA No. EBA 00L13C 033
		Mitsui Rail Capital Europe	Spot hire loco	ER6	
		Mitsui Rail Capital Europe	Dillen & Le Jeune Cargo Railway (DLC) (04/02/05)	ER6	
20038513-09	03/04	Mitsui Rail Capital Europe	Dillen & Le Jeune Cargo Railway (DLC) (renumber 12/05)	DE6301	Sold to MRCU Also No. MRCE 513-7 EBA No. EBA 00L13C 034
		Mitsui Rail Capital Europe	Spot hire loco	ER7	
		Mitsui Rail Capital Europe	Dillen & Le Jeune Cargo Railway (DLC) (18/01/05)	ER7	
20038513-10	03/04	Mitsui Rail Capital Europe	Dillen & Le Jeune Cargo Railway (DLC) (renumber 12/05)	DE6302	Sold to MRCU Also No. MRCE 513-8 Spot hire Spot hire
		GM/EMD	Spot hire loco	ER8	
		Mitsui Rail Capital Europe	Mitteldeutsche Eisenbahn GmbH (11/04)	398	
20038513-11	03/04	Mitsui Rail Capital Europe	Rail4Chem, Benelux (03/12/04)	ER8	EBA No. EBA 00L13C 035
		Mitsui Rail Capital Europe	Häfen und Güterverkehr Köln (HGK) (06/02/05)	DE54	
		Mitsui Rail Capital Europe	European Rail Shuttle (ERS) (21/06/05)	6612	

GM/EMCC Works No.	Date Built	Owner	Operator	Identity	Notes
20038513-09	03/04	GM/EMD Mitsui Rail Capital Europe	Spot hire loco Azfet Container Transport System (ACTS) Lease (12/11/04) European Rail Shuttle (ERS) (25/05/06) Rail4Chem, Benelux (25/08/06) European Rail Shuttle (ERS) (30/09/06) Off lease	ER9 ER9 MRCE 513-9 MRCE 513-9 MRCE 513-9 MRCE 513-9 MRCE 513-9	Sold to MRCU Also No. MRCE 513-9 r/n 12/05  EBA No. EBA 00L13C 036 Painted ACTS livery Collision damage Arnhem 21/11/06
20038513-10	03/04	GM/EMD Mitsui Rail Capital Mitsui Rail Capital  Mitsui Rail Capital Europe	Spot hire loco Rail4Chem, Benelux (08/02/05) Azfet Container Transport System (ACTS) (03/03/05)  Dillen & Le Jeune Cargo Railway (DLC) (20/05/05)	ER10 ER10 ER10  DE6303	Sold to MRCU Also No. MRCE 513-10   EBA No. EBA 00L13C 037
20038545-01	11/03	GM/EMD Deutsche Leasing	Spot hire loco Rail4Chem, Benelux (21/07/04)	EC1 66 020	Sold to Deutsche Lease EBA No. EBA 00L13C 030
20038545-02	11/03	GM/EMD CB Rail	Spot hire loco Railion, Nederland (26/08/04)	EC2 RN 266 452-2	Sold to CB Rail 16/11/04 EBA No. EBA 00L13C 031
20038545-03	11/03	GM/EMD CB Rail	Spot hire loco Railion, Nederland (26/08/04)	EC3 RN 266 453-0	Sold to CB Rail EBA No. EBA 00L13C 032
20038561-01	11/04	GM/EMD Mitsui Rail Capital Europe	Spot hire loco Häfen und Güterverkehr Köln (HGK) (30/03/05)	EM1 DE673	Sold to MRCU Also No. MRCE 561-01 EBA No. EBA 00L13C 038
20038561-02	11/04	GM/EMD Mitsui Rail Capital Europe	Spot hire loco Häfen und Güterverkehr Köln (HGK) (30/03/05)	EM2 DE674	Sold to MRCU Also No. MRCE 561-02 EBA No. EBA 00L13C 039
20038561-03	11/04	GM/EMD Mitsui Rail Capital  Mitsui Rail Capital Europe	Spot hire loco OstHavelländische Eisenbahn (OHE) (12/04/05 - 31/05/05) European Rail Shuttle (ERS) (15/06/05)	EM3 MRCE 561-03  6611	Sold to MRCU Spot hire  EBA No. EBA 00L13C 040
20038561-04	11/04	GM/EMD Mitsui Rail Capital  Mitsui Rail Capital Mitsui Rail Capital Europe	Spot hire loco Dillen & Le Jeune Cargo Railway (DLC) (07/06/05) Rail4Chem, Benelux Dillen & Le Jeune Cargo Railway (DLC) (08/09/05)	EM4 DE6304  DE6304 DE6304	Sold to MRCU Also No. MRCE 561-04  Sub lease from DLC EBA No. EBA 00L13C 041
20038561-05	11/04	GM/EMD Mitsui Rail Capital  Mitsui Rail Capital Europe	Spot hire loco Häfen und Güterverkehr Köln (HGK) (03/07/05) Connex Cargo/Veolia Transport  Hire to RegioBahn, Bitterfeld, Berlin (Connex) (16/07/05) Hire to Dortmunder Eisenbahn/ Veolia Cargo / Connex) (19/05/06)	EM5 MRCE 561-05  MRCE 561-05  MRCE 561-05 MRCE 561-05	Sold to MRCU Spot hire    EBA No. EBA 00L13C 042
20048653-01	01/06	Mitsui Rail Capital Europe	Veolia Transport (09/01/07)	MRCE 8653-01	(EMCC No. JT1) EBA No. EBA 05D21K 001
20048653-02	01/06	Mitsui Rail Capital Europe	Tested in Switzerland 02-06-2006 At NedTrain Tilburg 14/2/06-04/12/06 European Rail Shuttle (ERS) (04/12/06)	MRCE 653-02 6615	(EMCC No. JT2) EBA No. EBA 05D21K 002 Named: <i>Kayden</i>
20048653-03	01/06	Mitsui Rail Capital Europe	At NedTrain Tilburg 14/2/06-05/12/06 European Rail Shuttle (ERS) (05/12/06)	MRCE 653-03 6614	(EMCC No. JT3) EBA No. EBA 05D21K 003 Named: <i>Lauryn</i>
20048653-04	01/06	Mitsui Rail Capital Europe	ETCS test loco, used on Betuweroute  Azfet Container Transport System (ACTS) (06/07)	MRCE 653-04  MRCE 653-04	(EMCC No. JT4) EBA No. EBA 05D21K 004
20048653-05	01/06	Mitsui Rail Capital Europe	Rurtalbahn, Germany, hire to Häfen und Güterverkehr Köln (HGK) (19-10-06 - 30/04/07) Trainsport AG (Belgium) (30/04/07)	MRCE 653-05 DE55  MRCE 653-05	(EMCC No. JT5) EBA No. EBA 05D21K 005
20048653-06	02/06	Mitsui Rail Capital Europe	At NedTrain Tilburg 13/4/06-06/12/06 European Rail Shuttle (ERS) (12/06)	MRCE 653-06 6616	(EMCC No. JT6) EBA No. EBA 05D21K 006
20048653-07	02/06	Mitsui Rail Capital Europe	At NedTrain Tilburg 13/4/06-07/12/06 European Rail Shuttle (ERS) (12/06)	MRCE 653-07 6617	(EMCC No. JT7) EBA No. EBA 05D21K 007

GM/EMCC Works No.	Date Built	Owner	Operator	Identity	Notes
20048653-08	02/06	Mitsui Rail Capital Europe	Rail4Chem, Benelux (07/11/06)	MRCE 653-08	(EMCC No. JT8) EBA No. EBA 05D21K 008 Named: <i>Wessel</i>
20048653-09	02/06	Mitsui Rail Capital Europe	At NedTrain, Tilburg 11/06 - 03/07 Dillen & Le Jeune Cargo Railway (DLC) (02/03/07)	MRCE 653-09	(EMCC No. JT9) EBA No. EBA 05D21K 009
20048653-10	02/06	Mitsui Rail Capital Europe	Dillen & Le Jeune Cargo Railway (DLC) NedTrain, Tilburg, ETMS cab signal testing For lease to Veolia Transport, NL	DE6305 MRCE 653-10	(EMCC No. JT10) EBA No. EBA 05D21K 010
20058725-01	11/06	To be confirmed	EMCC Demonstrator Railion Freight	EMCC No. EU01 EU01	Delivered in Green livery
20058725-02	11/06	Angel Trains	Freightliner Poland	66001 92 51 365 0 000-4	EMDD No. EU02
20058725-03	11/06	Angel Trains	Freightliner Poland	66002 92 51 365 0 001-2	EMDD No. EU03
20058725-04	11/06	Angel Trains	Freightliner Poland, at Nedtrains, Tilburg	66003 92 51 365 0 002-0	EMDD No. EU04
20058725-05	11/06	Angel Trains	Freightliner Poland, at Nedtrains, Tilburg	66004 92 51 365 0 003-8	EMDD No. EU05
20058725-06	11/06	CB Rail	Rail4Chem	CB1000 92 80 1266 105-6	EMDD No. EU06
20058725-07	11/06	CB Rail	Rail4Chem	CB1001 92 80 1266 106-4	EMDD No. EU07
20058725-08	11/06	KBC Lease	Dillen & Le Jeune Cargo Railway (DLC)	DE6306 92 80 1266 101-5	EMDD No. EU08
20058725-09	11/06	KBC Lease	Dillen & Le Jeune Cargo Railway (DLC)	DE6307 92 80 1266 102-3	EMDD No. EU09
20058725-10	11/06	KBC Lease	Dillen & Le Jeune Cargo Railway (DLC)	DE6308 92 80 1266 103-1	EMDD No. EU10
20058725-11	11/06	KBC Lease	Dillen & Le Jeune Cargo Railway (DLC)	DE6309 92 80 1266 104-9	EMDD No. EU11
20058725-12	11/06	Angel Trains	Freightliner Poland	66005 92 51 365 0 004-6	EMDD No. EU12
20058725-13	11/06	Angel Trains	Freightliner Poland	66006 92 51 365 0 005-3	EMDD No. EU13
20058725-14	11/06	Angel Trains	Freightliner Poland	66007 92 51 365 0 006-1	EMDD No. EU14
20068864-01	09/07	To be confirmed	EWS-Euro Cargo Rail	77001 (EWS01)	At London plant
20068864-02	09/07	To be confirmed	EWS-Euro Cargo Rail	77002 (EWS02)	At London plant
20068864-03	09/07	To be confirmed	EWS-Euro Cargo Rail	77003 (EWS03)	Delivered 11/07
20068864-04	09/07	To be confirmed	EWS-Euro Cargo Rail	77004 (EWS04)	Delivered 11/07
20068864-05	09/07	To be confirmed	EWS-Euro Cargo Rail	77005 (EWS05)	Delivered 11/07
20068864-06	10/07	To be confirmed	EWS-Euro Cargo Rail	77006 (EWS06)	At London plant
20068864-07	10/07	To be confirmed	EWS-Euro Cargo Rail	77007 (EWS07)	
20068864-08	10/07	To be confirmed	EWS-Euro Cargo Rail	77008 (EWS08)	
20068864-09	10/07	To be confirmed	EWS-Euro Cargo Rail	77009 (EWS09)	
20068864-10	On order	To be confirmed	EWS-Euro Cargo Rail	77010 (EWS10)	
20068864-11	On order	To be confirmed	EWS-Euro Cargo Rail	77011 (EWS11)	
20068864-12	On order	To be confirmed	EWS-Euro Cargo Rail	77012 (EWS12)	
20068864-13	On order	To be confirmed	EWS-Euro Cargo Rail	77013 (EWS13)	
20068864-14	On order	To be confirmed	EWS-Euro Cargo Rail	77014 (EWS14)	
20068864-15	On order	To be confirmed	EWS-Euro Cargo Rail	77015 (EWS15)	
20068864-16	On order	To be confirmed	EWS-Euro Cargo Rail	77016 (EWS16)	
20068864-17	On order	To be confirmed	EWS-Euro Cargo Rail	77017 (EWS17)	
20068864-18	On order	To be confirmed	EWS-Euro Cargo Rail	77018 (EWS18)	
20068864-19	On order	To be confirmed	EWS-Euro Cargo Rail	77019 (EWS19)	
20068864-20	On order	To be confirmed	EWS-Euro Cargo Rail	77020 (EWS20)	
20068864-21	On order	To be confirmed	EWS-Euro Cargo Rail	77021 (EWS21)	
20068864-22	On order	To be confirmed	EWS-Euro Cargo Rail	77022 (EWS22)	
20068864-23	On order	To be confirmed	EWS-Euro Cargo Rail	77023 (EWS23)	
20068864-24	On order	To be confirmed	EWS-Euro Cargo Rail	77024 (EWS24)	
20068864-25	On order	To be confirmed	EWS-Euro Cargo Rail	77025 (EWS25)	
20068864-26	On order	To be confirmed	EWS-Euro Cargo Rail	77026 (EWS26)	
20068864-27	On order	To be confirmed	EWS-Euro Cargo Rail	77027 (EWS27)	
20068864-28	On order	To be confirmed	EWS-Euro Cargo Rail	77028 (EWS28)	



GM/EMCC Works No.	Date Built	Owner	Operator	Identity	Notes
20068864-29	On order	To be confirmed	EWS-Euro Cargo Rail	77029 (EWS29)	
20068864-30	On order	To be confirmed	EWS-Euro Cargo Rail	77030 (EWS30)	
20068864-31	On order	To be confirmed	EWS-Euro Cargo Rail	77031 (EWS31)	
20068864-32	On order	To be confirmed	EWS-Euro Cargo Rail	77032 (EWS32)	
20068864-33	On order	To be confirmed	EWS-Euro Cargo Rail	77033 (EWS33)	
20068864-34	On order	To be confirmed	EWS-Euro Cargo Rail	77034 (EWS34)	
20068864-35	On order	To be confirmed	EWS-Euro Cargo Rail	77035 (EWS35)	
20068864-36	On order	To be confirmed	EWS-Euro Cargo Rail	77036 (EWS36)	
20068864-37	On order	To be confirmed	EWS-Euro Cargo Rail	77037 (EWS37)	
20068864-38	On order	To be confirmed	EWS-Euro Cargo Rail	77038 (EWS38)	
20068864-39	On order	To be confirmed	EWS-Euro Cargo Rail	77039 (EWS49)	
20068864-40	On order	To be confirmed	EWS-Euro Cargo Rail	77040 (EWS40)	
20068864-41	On order	To be confirmed	EWS-Euro Cargo Rail	77041 (EWS41)	
20068864-42	On order	To be confirmed	EWS-Euro Cargo Rail	77042 (EWS42)	
20068864-43	On order	To be confirmed	EWS-Euro Cargo Rail	77043 (EWS43)	
20068864-44	On order	To be confirmed	EWS-Euro Cargo Rail	77044 (EWS44)	
20068864-45	On order	To be confirmed	EWS-Euro Cargo Rail	77045 (EWS45)	
20068864-46	On order	To be confirmed	EWS-Euro Cargo Rail	77046 (EWS46)	
20068864-47	On order	To be confirmed	EWS-Euro Cargo Rail	77047 (EWS47)	
20068864-48	On order	To be confirmed	EWS-Euro Cargo Rail	77048 (EWS48)	
20068864-49	On order	To be confirmed	EWS-Euro Cargo Rail	77049 (EWS49)	
20068864-50	On order	To be confirmed	EWS-Euro Cargo Rail	77050 (EWS50)	
20068864-51	On order	To be confirmed	EWS-Euro Cargo Rail	77051 (EWS51)	
20068864-52	On order	To be confirmed	EWS-Euro Cargo Rail	77052 (EWS52)	
20068864-53	On order	To be confirmed	EWS-Euro Cargo Rail	77053 (EWS53)	
20068864-54	On order	To be confirmed	EWS-Euro Cargo Rail	77054 (EWS54)	
20068864-55	On order	To be confirmed	EWS-Euro Cargo Rail	77055 (EWS55)	
20068864-56	On order	To be confirmed	EWS-Euro Cargo Rail	77056 (EWS56)	
20068864-57	On order	To be confirmed	EWS-Euro Cargo Rail	77057 (EWS57)	
20068864-58	On order	To be confirmed	EWS-Euro Cargo Rail	77058 (EWS58)	
20068864-59	On order	To be confirmed	EWS-Euro Cargo Rail	77059 (EWS59)	
20068864-60	On order	To be confirmed	EWS-Euro Cargo Rail	77060 (EWS60)	

**Below:** HSBC-owned Euro Class 66 No. ERS6607, delivered to European Shuttle Rail on 19 December 2003. This loco was built to order number 20038513. The loco is seen passing Amersfoort on 28 September 2005 with a container train bound for Rotterdam. **Ron Cover**







**Above:** MRCE 653-08 approaches Lage Zwaluwe near Breda in Holland on 14 June 2007 with a northbound container train. This loco is presently operating for Rail4Chem.



**Right Middle:** EU12, painted in Freightliner Poland livery stands at the EMDD plant on 12 March 2007.



**Right Bottom:** MRCE 653-08 approaches Lage Zwaluwe near Breda in Holland on 14 June 2007 with a northbound container train. This loco is presently operating for Rail4Chem.

**All: Colin J. Marsden**





**Above:** PB02, painted in Rail 4 Chem livery passes Tilburg on 20 November 2006 powering an eastbound intermodal service. This loco has been operating in Mainland Europe since January 2002.

**Front Cover:** MRCE 8653-01 passes Lage Zwaluwe near Breda in Holland on 14 June 2007 with a southbound container train. Note the air conditioning unit on the cab roof.

**Below:** In DLC grey-livery, No. PB12 power a Rotterdam-bound intermodal freight past Gilze Rijen on 21 November 2006. **All: Colin J. Marsden**





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## Nothing stops a Class 66: article from RAIL #492

972k of images. Sorry dialup users!

Cargonet in Norway has six Class 66s - leased through HSBC. This is 66406 taking fuel and highlights the extreme weather these locomotives have to endure in Scandinavia.

### On a mission... *Nothing stops a '66'*

The Class 66 has become the preferred workhorse for much of the UK railfreight industry since it first landed on these shores six years ago, and is now making inroads on the Continent too.

RODNEY POLACEK and BOZIDAR SIMONOVIC, of General Motors' Electro-Motive Division, tell you everything you ever wanted to know about its development and design.

Cargonet in Norway has six Class 66s - leased through HSBC. This is 66406 taking fuel and highlights the extreme weather these locomotives have to endure in Scandinavia. (BY VINI SVARD)





In 1996 Wisconsin Central Railway Co. acquired the former British Rail freight companies and created English Welsh & Scottish Railway (EWS). EWS inherited around 1,000 locomotives with a high age and low productivity.

Immediate investment in traction was needed by the acquisition agreement and also dictated by the demand for increased productivity.

EWS contacted all UK and US locomotive builders looking for the freight locomotive that could become its new standard. It gave the US builders a slight preference because of their established record of locomotive performance and predictable maintenance cost over the life of the product, but its major selection criteria were price, delivery and product performance.

General Motors Electro-Motive Division (GM-EMD) had 15 Class 59s operating successfully in the UK for more than ten years. EWS decided the '59' could be used as a platform for the development of its new locomotive and entered negotiations with GM-EMD for the supply of 250 locomotives with dual cabs and traction power of no less than 3,000hp (2,237kW).

The initial customer requirements were very simple. The new locomotive had to:

- Meet UK certification requirements;
- Have the lowest possible price and shortest delivery;
- Have lower fuel consumption than Class 59;
- Have newer technologies where justified;
- Have the largest possible fuel tank.

In response to those requirements GM-EMD proposed the following concept using the '59' platform:

- Reuse the Class 59 underframe and cabs with minimal changes in order to shorten the time for UK certification of the new model.
- Replace the 16-cylinder 645 engine with the current 12-cylinder 710 engine of nearly the same power. This would reduce fuel consumption and weight that could be used to provide additional fuel capacity.
- Replace the AR11 traction alternator (4,000hp) with a smaller AR6 (3,300hp) alternator. This better matches the engine and would contribute towards the fuel tank weight and reduction of fuel consumption.
- Replace the '59' rigid HTC bogies with the EMD HTCR radial bogie. This technology would allow EWS to negotiate lower track

- Replace the analogue electronics control system of the '59' with the standard GM-EMD control computer EM2000 and the digital diesel engine controller EMDEC. This would further improve fuel efficiency, and also improve other locomotive performance measures like exhaust emissions, wheelslip control, reliability and maintainability.

Based on this proposal, EWS purchased 250 '66s' through Angel Trains. Negotiations concluded in May 1996. In April 1998, the first '66' was unloaded in the UK at Immingham. Certification was issued in June 1998, and regular delivery started - at Newport - with three in August. It later peaked at 11 a month.

## AC v DC

The issue of AC traction as a potential technology upgrade for the '66' was discussed

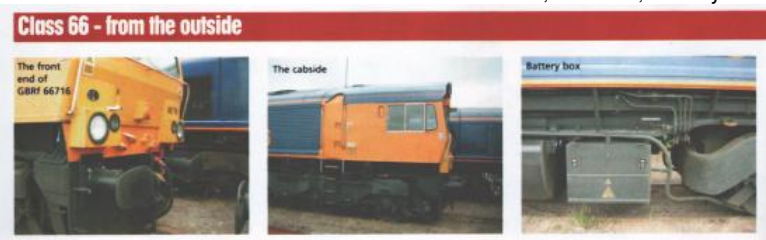
with EWS and was rejected because of the lack of economic benefits.

GM-EMD is one of the few locomotive builders that has wide experience with AC as well as DC. Since 1993 GM-EMD has built over 1,500 locomotives with AC traction for North America and more than 2,000 with DC traction. Our experience is based on the direct comparison of the two variants of our SD70 model locomotive - the SD70M (with DC traction) and SD70MAC (with AC traction). These two variants of the same model are used in two different types of freight operation.

The North American railroads have found economic justification for AC traction by exploiting its higher tractive effort and better adhesion compared with DC. They were able to reduce the number of locomotives on 15,000t coal trains from five DC to three AC.

Unfortunately, this strategy is not available to European operators. Most freight trains are operated with a single locomotive. Heavy Haul Power International in Germany has recently

Class 66 - from the outside: Front end of GBRf 66716, Cabside, Battery box



heavily 600m is not realistic in Germany where signal spacing of 700m is common. Therefore a '66' with AC traction that could ultimately handle trains over 5,000t (which would be over 700m) can be deployed in central Europe only under very special circumstances and would have a very limited market.

Dictated by this infrastructure limitation, AC technology cannot offer any other benefits to a European freight operator except for the reduced maintenance of the motors. This is not enough to justify the current price of AC traction and is exactly the reason why Class 66s are equipped with DC traction motors.

### On the Continent

It was natural that after the great success of the Class 66s in Britain, GM-EMD turned to continental Europe, where privatisation and

and the design must be scrutinised in detail to prove its integrity to the regulatory agencies.

When we decided to seek customers in continental Europe, we had already completed the European type of certification process in conjunction with the acceptance of the '66s' in Britain. GM-EMD certification team had already compiled the majority of required information from the British certification process. Nedtrain Consulting reviewed this information package, compared it with the list of required documents from German EBA, Dutch Railned and Belgian SNCB.

The complete package was then translated into German and French (Railned was able to work with original English documents) and submitted to the three national authorities. We have chosen to seek first the German certification since our first customer (HGK) was in Germany. Railned and SNCB both agreed with this approach and after reviewing German certification added only minor requirements of their own to satisfy local conditions.

### Germany and the Benelux

Based on the British experience with '66' certification, GM-EMD and HGK agreed to collaborate in the certification process. Additionally GM-EMD contracted with Nedtrain Consulting in Utrecht to co-ordinate and manage certification in the three countries.

Certification for the HGK '66' modified for Germany was completed in August 2000, ten months after the two landed in Rotterdam. The original plan called for certification in Germany within six months but the delay was caused mainly by our inexperience with the process, translations and some European infrastructure peculiarities. Locomotive certification is unknown in North America.

The Federal Railway Administration (FRA) regulations and Association of American Railroads (AAR) standards exist but locomotive

and the design must be scrutinised in detail to prove its integrity to the regulatory agencies.

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### Certification in Scandinavia

Certification in Scandinavia proceeded along similar lines as in central Europe. A convinced and determined customer, TGOJ Trafik in Sweden, acquired two '66s' (UK version). TÅG AB in Kristinehamn modified them for Scandinavian conditions (Swedish designation T66). TÅG AB used our certification files and minimal direct technical support from GM-EMD to successfully apply for certifications in Sweden and later in Denmark. The T66 is currently the only diesel locomotive certified to

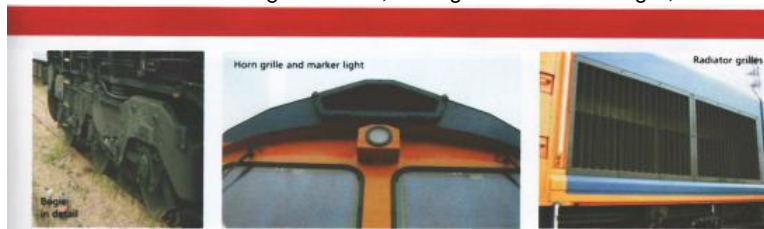
## Class 66 dimensions and performance characteristics

Weight	122t	Length over buffers	21.349m
Maximum axle load	21.5t	Width over body	2.692m
Starting tractive effort	409kN	Height: top of rail to top of body	3.912m
Continuous tractive effort	260kN at 25.6km/h	Fuel capacity	6,450 litres
Rated traction power	3,000hp (2,237kW)	Sand capacity	340 litres
Rated engine power	3,200hp (2,386kW)	Wheel arrangement	Co-Co

Left: EWS placed the biggest order for Class 66s - with 250 locomotives. They work the length and breadth of the country on all manner of duties and have allowed withdrawal of twice as many older and less reliable locomotives. On June 16, 66179 works a Shoburyness-Didcot MoD train past Chalkwell on the c2c commuter route. This train used to be worked by Class 47s and more recently Class 37s.

ANTHONY KAY.

Class 66 - from the outside: Bogie in detail, Horn grille and marker light, Radiator grilles





operate over the Øresund Bridge and tunnel. CargoNet in Norway has leased one of the two TGOJ '66s' to ease its traction shortage. CargoNet, with TAG's assistance, has also obtained a temporary certification from Norwegian authorities based on the existing certification files and the actual certifications in central Europe. The '66' has operated over a year on the demanding Trondheim-Bodo line and has demonstrated the same or better dependability as GM-EMD-powered NSB Di 4, Di 3 and Swedish T44 locomotives.

Based on this performance, CargoNet has ordered six Class 66s (Norwegian designation - Di 9), delivered to Norway in early January. The installation of the Norwegian signalling system and brake system modifications will again be performed in Sweden by TAG.

### Poland, Italy and France

Baltic Rail Co., a subsidiary of Heavy Haul Power International (HHPI), with support from GM-EMD has recently obtained preliminary certification of the '66' in Poland. All required documentation was translated and submitted to the Polish authorities in mid-2002. They have reviewed the documentation and test reports and have concluded that it is sufficient for a temporary (three-year) certification pending the inspection of the Polish safety systems and the radio. One of the HHPI '66s' is in Tilburg for installation of the Polish safety systems and radio in addition to the Indusi system and Mesa 2002 radio.

Certification in Italy is progressing slowly since we don't yet have an Italian customer who can champion this effort. Nedtrain Consulting has recompiled the certification file to match the Italian list of certification requirements. All major test reports have been translated into Italian and submitted to CESIFER.

HHPI is working with SNCF and SNCB on iron ore traffic from Antwerp to a French steel mill. This project will require SNCF certification of the '66'. In preparation for this effort, Nedtrain Consulting has submitted a proposal to GM-EMD to recompile the certification files to match French list of requirements, and HHPI is investigating the actual certification process in France.

### Class 66: the 'walk through'

The '66' has two cabs that are not identical. The electrical control cabinet forms the rear

## "It was natural after the success of the '66' in Britain, GM-EMD turned to continental Europe, where free access created a market for the locomotive"

wall of No. 1 cab, which is made deeper to allow better access for maintenance to the front of the control cabinet. The central door of the control cabinet opens horizontally and forms a convenient working surface for trouble-shooting and monitoring performance. Cabs are connected through a corridor on one side.

The corridor on the other side starts behind No. 2 cab and extends to the 'Generator Partition' bulkhead. This corridor is used only for maintenance. The machine room between the cabs is in three sections: Clean Air Compartment, Engine Room and Cooling System Compartment. The three sections are divided by well-sealed steel bulkheads and doors.

The full body over the engine section is built in three sections. The two end sections that form the cooling and clean air compartments are welded to the underframe but have removable roof sections. The engine section of the body is bolted to the underframe and can be removed for major engine overhauls.

Small engine overhauls, replacements of heads, cylinder liners, pistons and connecting rods are undertaken within the locomotive and four hinged roof hatches are over the engine so the roof does not have to be removed. Maintenance doors are on both side walls of the body for easy access from depot platforms to the equipment rack where lubrication oil and fuel filters are, as well as the fuel pump, lubrication oil cooler and other engine components including the auxiliary electrical cabinet.

The equipment rack is a rigid modular assembly that contains most of the engine support equipment. It also contains most of the piping for this equipment. The rigid construction of the rack reduces the flexing of lubrication oil, fuel, and engine coolant piping and greatly reduces pipe fatigue and leaky joints.

The clean air compartment is the area from which the engine takes its combustion air, and the blowers for generator and front traction motor cooling also take air from there. A self-cleaning inertial air filter mounted on one side of the body provides primary cleaning for the air entering the clean air compartment.

The cooling system is behind the engine and contains radiators, two electrical cooling fans and the mechanical shutter assembly. Fans are below the radiators (on the 'cold side'), which makes them more efficient. Access is on the side. The fans can be easily removed with a forklift truck from the shop platform.

The electrical blower for the rear traction motors is also in the cooling system compartment, but it takes air from the engine room. The generator cooling air is exhausted into the engine room to prevent heat build-up. The No. 2 traction motor blower draws the air from the engine room but that airflow is lower than the generator airflow so the air pressure in the engine room remains always positive, keeping the room clean.

### Structures

Locomotive structures are made predominantly from mild steel for strength and ease of repair. High-strength, impact-resistant steel is used in the draft gear pocket and a few other critical areas. The underframe, a slightly modified version of the '59', is the main structural member of the '66' that provides the rigidity for the whole vehicle. It was designed in 1984 and by 1996 had accumulated about 80 years of service on 15 locomotives in the UK.

As with all other GM-EMD underframes on international locomotives, it is designed with two 'I' beams held together by necessary cross-members. The underframe is designed and tested for a buffer load of 2,936 kN (660,000lb). The underframe does not have a constant cross-section. A wider section ('fish belly') is in the middle of the underframe in order to lower the mounting points for the engine and fit it inside the very restrictive UK clearance.

The underframe is equipped with draft gear pockets that allow steel and rubber composition draft/buffer gears to be easily mounted at the draw hook height of 950mm required by EWS and 1,040mm required by UIC.

Within the underframe, two air chambers are formed for distribution of traction motor cooling air. Bulkheads are in the underframe

Class 66 - inside the cab and body: Cab dashboard, Cab-roof-mounted switches, Q-tron and locomotive computer display

### Class 66 - inside the cab and body



The cab dash for the driver (left) and the cab-roof mounted switches (right)

under the equipment to mate with bulkheads above the deck level. The bottom surface of the underframe in the engine section forms the 'engine pit' where all spilled and leaked fluids are collected to be ducted to the waste fluid retention tank directly underneath.

The cabs are equipped with collision beams sized to accept a distributed load of 300kN without deformation and are under the wind-screens. Cab walls, front and side, as well as the roof are constructed of 3mm (11-gauge) steel sheets with supporting angles and channels that provide good overall collision and projectile penetration protection for the driver. The windcreens meet UIC projectile requirements for locomotive windcreens. The side windows meet US requirements. They can stop a small-calibre bullet (5.58mm) weighing 2.6g fired at 1,053km/h as well as resist penetration of a cinder block weighing 10.9kg at 48.3km/h.

### The diesel engine

The engine of the '66', the 12-710G3B-EC, is the third generation of world-renowned GM-EMD diesel engines.

The 710G series engine was introduced in production in early 1985. It is a medium-speed diesel engine based on the original 567 series of Roots blown engines, introduced in 1938. The second generation, the 645 series including both Roots blown and turbocharged engines, was introduced in 1965. The 710 engine was developed primarily for improved fuel economy with better reliability while providing increased displacement and power.

The 710 engine was evolved from its predecessor, the 645, via a 1in longer stroke. Enhanced expansion of the gases and scavenging of the cylinder from the longer stroke, combined with a new high-efficiency turbo-charger and new injectors, have provided the improved fuel economy with only a moderate increase in mechanical loading of engine structural and power assembly components and a significant decrease in thermal loading of critical power assembly components.

The present engine model, 710G3B-EC, has further increased fuel efficiency and power over the original 710G3. It is equipped with computer controlled electronic fuel injection

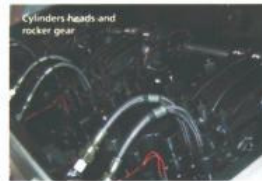
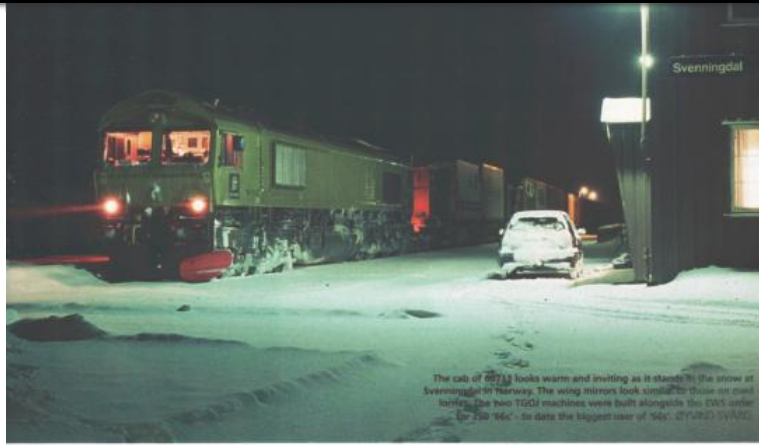
using GM's unit injectors that combine a high-pressure pump and spray nozzle inside the injector. This eliminates high-pressure fuel lines that can leak and cause locomotive fires.

The Model 710G3B Series is a two-stroke cycle, uniflow scavenged, open combustion chamber, poppet valve, 45-degree 'V' diesel engine with overhead camshafts. The 710 designation refers to the displacement per cylinder in cubic inches (11,644 dm<sup>3</sup>). The engine has a single turbocharger mechanically driven in lower throttle notches and is free-wheeling at higher throttle notches.

GM-EMD remains committed to development of the two-stroke diesel engines because of the advantages they offer. Other advantages result from the robust design that is required for operation in North America. The engine requires no preheating and can be started after it has been completely cooled down to 10° C and it does not require pre-lubrication unless it was shut down for more than 48hr.

The engine is protected by a number of functions embedded in the engine control computer and the control system. In addition,

Large pic: The cab of 66713 looks warm and inviting as it stands in the snow at Svenningdal in Norway. The wing mirrors look similar to those on road lorries. The two TGOJ machines were built alongside the EWS order for 250 '66's - to date the biggest user of '66's.  
Small pics: Class 66 - inside the cab and body: Main circuit boards, Rocker gear, Radiator grilles





the coolant pressure is too low (water pump cavitation) and crankcase pressure is too high (engine bearing failure and potential crankcase explosion).

A single, GM-EMD designed turbocharger provides cooled combustion air to both banks of the engine. The turbocharger is mechanically driven and acts as a supercharger at lower engine power levels. At higher power levels with enough energy from the exhaust, the free-wheeling clutch releases the turbocharger from the gear train. The turbine is protected from debris by an inlet screen.

The engine also meets global requirements for fuel efficiency and exhaust emissions.

### Where the 425 '66s' are...

Number	owner	user	Total
66001-250	AT	EWS	250
66401-410	PB	DRS	10
66501-505	PB	FLI	5
66506-525	HSBC	FHH	20
66526-531	PB	FHH	6
66532-537	PB	FLI	6
66538-543	HSBC	FLI	6
66544-553	PB	FHH	10
66554-566	HSBC	FHH	13
66567-577	HSBC	FLI	11
66578-581	tba	tba	4
66601-612	PB	FHH	12
66613-618	HSBC	FHH	6
66619-622	tba	FHH	4
66701-717	HSBC	GBRF	17
66951/952	PB	for FHH	2
PB01/02/17	PB	SL	3
PB03/12/14	PB	DLC	3
PB05	PB	R4C	1
PB07-11	PB	ERS	5
PB18-20	PB	DLC	3
T6671/3/4	HSBC	TGOJ	2
DE61/62	HGK	HGK	2
DE63-67	PB	HGK	5
DE68-72	HSBC	HGK	5
29001-003	GM	HHPI	3
66401-406	HSBC	CN	6
tba	tba	Railion	3
tba	tba	tba	2

#### Key

- AT Angel Trains Rolling Stock Leasing Co.
- CN CargoNet (Norway)
- DLC Dillen & Le Jeune Cargo (Belgium)
- DRS Direct Rail Services (UK)
- ERS European Rail Shuttle (Netherlands)
- EWS English Welsh & Scottish Railway (UK)
- FHH Freightliner Heavy Haul (UK)
- FLI Freightliner Intermodal (UK)
- GBRF GB Railfreight (UK)
- HHPI Heavy Haul Power International (Germany)
- HSBC HSBC Rolling Stock Leasing Co.
- PB Porterbrook Rolling Stock Leasing Co.
- R4C Rail4Chem (BASF Co) (Germany)
- SL Shortlines (Netherlands)
- TGOJ Trafik Grängesberg-Oxelösund Järnvägar (Sweden)
- renumbered from PB04/06/13/15/16
- PB07-11 to be renumbered 6601-05
- understood to be numbered DE68-72, but not confirmed
- ♦ three Class 66s are expected to be ordered by German-based Railion, but deal and leasing company to be decided
- Two Class 66s are at Tilburg works but have yet to be allocated to an operator or a ROSCO
- o 66521 written off in February 2001
- ▲ 66554 a replacement for 66521

### The cooling system

As with most GM-EMD locomotives, the Class 66 has a 'dry' cooling system. The radiators are positioned high in the roof of the locomotive with a large water tank located on the equipment rack below them. When the engine is shut down, the engine coolant completely drains from the radiators into the water tank inside the body to prevent unnecessary heat loss.

The Class 66 has a single-circuit, pressurised cooling system. The pressure relief/fill cap limits the cooling system pressure to 0.483 bar (7 psi). The water coming from the radiators is first passed through the lubrication oil cooler before it enters the pumps. Two water pumps mounted on, and directly driven by, the engine provide the coolant flow for the cylinders, heads, after-cooler and the air compressor. From there the water is returned to the radiators.

The roof-mounted radiators are well protected from debris and minor collisions. The radiators consist of flat copper tubes and fins. The tubes become round sections at both ends, which are then mechanically bonded to heavy steel headers. This construction provides a very robust assembly that can withstand mechanical stresses caused by temperature cycling and vehicle distortions. Our North American experience indicates that these radiators have a life expectancy of over 40 years.

Air-operated shutters are provided behind the air inlet screens and remain closed when the cooling fans are not running. This prevents over-cooling of the engine that can occur during idling and operation in low power.

Two cooling fans with a diameter of 1,220mm (48in) are located horizontally below the radiators, powered by induction motors with two-speed windings and directly controlled by the locomotive computer.

### Electrical traction system

The electrical traction system consists of the AR8/CA6 combined assembly of the auxiliary alternator, traction alternator and traction rectifier in one and six DC traction motors (D43). The traction motors are connected in parallel and have no field weakening.

The AR8/CA6 generator is a single-bearing, compact machine that consists of two mechanically coupled but electrically independent, air-cooled, three-phase alternators mounted on the same shaft. The two alternators are the AR8 traction alternator and the CA6 companion alternator.

The armature of the AR8 has ten groups of 'star' connected windings. Five groups of these windings are connected to the left bank of rectifiers, the other five groups to the right bank. AC power is rectified by these two banks of air-cooled silicon diodes.

The AR8 traction rectifier is made of eight

circuit. Thermal fuses with blow-indicators are provided in series with each diode pair. If any of the diodes shorts during operation of the locomotive, the fuse will open and isolate the short circuit without any effect on the locomotive performance.

The resulting DC current is directly supplied to the DC traction motors. The two rectifier banks contain both traction and steering diodes. With the help of steering diodes, the two rectifier banks can be switched from parallel connection for high-current, low-voltage operation at lower locomotive speeds, to a series connection for low-current, high-voltage operation. This GM-patented solution allows us to use a smaller generator that is not only lighter, but also more efficient. It can still provide maximum current of over 8,000A in parallel mode and the maximum voltage of 1,450V in series mode.

### Radial bogie

GM-EMD developed the high-adhesion radial bogie during the mid and late 1980s. The HTC-R bogie is a radial bogie with high adhesion efficiency and three powered axles. It was introduced in 1992, just in time for an explosive increase of locomotive power and continuous tractive effort brought about by the introduction of AC traction in North America.

Despite the considerable increase in locomotive power and tractive effort, the HTC-R bogie has demonstrated lower rail forces than a two-axle bogie with the same axle load. This

EWS placed the biggest order for Class 66s - with 250 locomotives. They work the length and breadth of the country on all manner of duties and have allowed withdrawal of twice as many older and less reliable locomotives. On June 16, 66179 works a Shoburyness-Didcot MoD train past Chalkwell on the c2c commuter route. This train used to be worked by Class 47s and more recently Class 37s.



The two outboard axles of the HTC-RE bogie are radially adjustable and the middle axle has lateral compliance. When entering a curve, the leading axle of the bogie will adjust radially. Since steering rods connect the leading axle with the trailing axle, the trailing axle is forced to steer in the opposite direction. The middle axle shifts laterally to bring the bogie through the curve with practically no flange contact to the rail. The '66' can negotiate curves with a minimum radius of 80m.

With this new development, GM-EMD can offer a locomotive that has all the advantages both of a six-axle and four-axle machine.

### Computer controls

The analogue computer controls of the '59' were also replaced with the second-generation digital computer EM2000. This was introduced in 1992, and is still the standard control system for most GM locomotives built today.

The control system has built-in sub-system tests and diagnostic aids that simplify repair and maintenance. The computer maintains a fault archive and a record of operating parameters relevant to that particular fault at the time of failure, and in some cases the five seconds preceding the failure. It accumulates operating information, like total mileage, operating hours and total kWh generated. It also accumulates duty cycle information, such as

records and stores for a limited time main operating parameters of the locomotive - like speed, power air brake pressure and horn actuation - but also continuously collects and stores information from the locomotive control computer. That way, the system can be used as an accident recorder as well as an enhanced locomotive health-monitoring device.

The next enhancement of the control system is the real-time health monitoring and warning system INTELITRAIN that is being tested in North America, where the locomotive location and operating parameters are transmitted via cellular phone lines and the internet to the central processing facility in GM-EMD headquarters in La Grange, Illinois. Product specialists can analyse the data and issue early warnings to the operators about potential failures and at the same time provide maintenance and parts replacement recommendations.

In the near future, this service can also be offered in Europe on a trial basis if European operators express enough interest and cell phone service coverage is sufficiently dense along rail lines.

The control system also incorporates GM's patented 'Super Series' wheel slip control that allows the '66' to reliably operate at 28% adhesion under all weather conditions. The 'Super Series' takes the ground speed signal from a ground speed monitoring radar and deter-

generator.

Based on cooling air temperature and traction motor voltage and current, the control system calculates the actual traction motor operating temperature and allows traction motor overload until 1% of traction motor life is consumed in each incident. When this point is reached, the control system will limit the generator current to the rated traction motor temperature until the motors have cooled down and thus prevent overheating, while still allowing considerable overload of traction motors when required. This feature also allows the '66' to operate indefinitely in slow speed control mode, which makes it ideal for loading and unloading of ballast and other aggregates.

One of the '66s' is currently in Tilburg for the retrofit of radio remote-control that will also allow it to perform light shunting duties in the Netherlands and Germany.

The '66' is now a Europe-wide locomotive and set to be for many years. While UK orders are likely to exceed 400, the opportunities for main land Europe would appear almost limitless. ■

*RAIL thanks GB Railfreight, Neil Bennett at Porterbrook and John Swain at General Motors for their help in preparing this feature. It is an edited version of an article that first appeared in Railvolution magazine.*

Porterbrook's PB02 is leased by Shortlines which has slightly enhanced the Union Pacific Harbour Mist grey livery with blue bands. This is one of the few 'base' liveries that GM delivers Class 66s in. It leaves Rotterdam Waalhaven yard on June 17 with a container train.



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