Class 86 Electric Locomotive

1 BACKGROUND ................................................................. 2
  1.1 Class 86 Origins ............................................................. 2
  1.2 Class 86 Operation .......................................................... 2
  1.3 Technical Specification .................................................... 3

2 THE CLASS 86 ELECTRIC LOCOMOTIVE .................................. 4
  2.1 Freightliner 'Green' ......................................................... 4
  2.2 Freightliner 'Powerhaul' .................................................... 4
  2.3 Rail Express Systems ....................................................... 5
  2.4 Railfreight Grey .............................................................. 5
  2.5 British Rail Blue .............................................................. 5

3 ROLLING STOCK ................................................................ 6
  3.1 Mk2A First Corridor .......................................................... 6
  3.2 Mk2A Second Open ........................................................... 6
  3.3 Mk2A Brake Second Open .................................................. 6
  3.4 FSA Container Bogie 'Outer' Wagon .................................... 7
  3.5 FTA Container Bogie 'Inner' Wagon ..................................... 7

4 SCENARIOS ..................................................................... 8
  4.1 Free Roam: Northbounder .................................................. 8
  4.2 Free Roam: Borderline ........................................................ 8
  4.3 The Clansman ................................................................ 8
  4.4 To the Loop ................................................................... 8
  4.5 A Chill Wind .................................................................. 8

5 LOCOMOTIVE NUMBERING .................................................. 9
  5.1 Sector Logo Chart ............................................................ 9
  5.2 Depot Plaque Chart .......................................................... 9
  5.3 British Rail Blue Headcodes .............................................. 9

6 CREDITS ........................................................................ 10
1 Background

1.1 Class 86 Origins
The British Rail Class 86 was the standard electric locomotive built during the 1960s, developed as a result of testing with the earlier Classes 81, 82, 83, 84 and 85. One hundred of these locomotives were built from 1965-1966 by either English Electric at Vulcan Foundry, Newton-le-Willows, or British Rail (BR) at their Doncaster works.

The class was built to haul trains on the then newly electrified West Coast Main Line, from London Euston, to Birmingham, Crewe, Manchester Piccadilly, Liverpool and later Preston and Glasgow. They helped to replace steam locomotives, which were finally withdrawn by BR in 1968.

Original British Rail classification, the locomotive was given the designation AL6 (6th design of AC Locomotive), and numbered E3101-E3200. In 1968, this was changed to Class 86, when BR introduced the TOPS classification system. In the early years the locomotives became notorious for track damage, being fitted with axle-hung traction motors, in place of the bogie-frame-mounted motors of the earlier designs. This additional unsprung mass was causing damage at high speeds. In 1969 number E3173, was fitted with experimental helical 'flexicoil' springs which can be seen on present day versions. Trials proved successful and the modification was applied to the whole fleet.

Locomotives were progressively renumbered into the 86204-86261 series. At the same time three locomotives were converted into 5000 bhp test-bed locomotives for development of the Class 87, initially numbered nos. 86201-86203, and quickly renumbered 86101-86103. These locomotives are capable of 110 mph running. The most obvious visual difference between the classes is that the Class 86 has a windscreen with three windows whereas the Class 87 only has two; likewise Class 86 was fitted with headcode boxes (later plated over) while Class 87 was built without them.

1.2 Class 86 Operation
Throughout the 1970s, the class saw use on both express passenger and freight services. Locomotives in the 860xx series (or Class 86/0) were used mainly on freight, whilst the higher-speed 861xx (or Class 86/1) and 862xx series (or Class 86/2) tended to be used primarily for passenger trains.

In 1974, demand for electric locomotives grew due to the extension of electrification north from Preston to Carlisle and Glasgow. From 1978 onwards, BR started to name some of their Class 86 fleet, many of them after cities or counties along the lines that they worked.

In the early 1980s, electrification from London Liverpool Street to Cambridge, Harwich, Ipswich and Norwich saw the class employed on passenger trains to these towns. Accordingly, some Class 86/0 locomotives converted to Class 86/3 with modified wheels, to allow them to operate at higher speeds. In addition, many of the freightliner trains to Felixstowe were also hauled as far as Ipswich by Class 86 locomotives working in multiple. By the end of the 1980s, the need for a standard fleet saw all remaining Class 86/0 and Class 86/3 locomotives fitted with improved
suspension and converted to Class 86/4. These locomotives were now inter-operable with Class 86/2, and thus gave greater operational flexibility.

A later development saw Class 86/2 and 86/4 locomotives fitted with Time Division Multiplex equipment to enabled them to operate push-pull passenger trains, avoiding the need to run the locomotive round a train at terminus station. The 86/4s were already fitted with an older multiple-working system and this was gradually phased out as TDM was fitted across the fleet.

In the late-1980s and early-1990s, the majority of the Class 86/4 subclass were dedicated to freight traffic. As a result, they had their electric train heating isolated, and their maximum speed reduced to 75 mph. These locomotives were reclassified as Class 86/6, and were renumbered by adding 200 to their number. Eight Class 86/2 locomotives were also dedicated to freight work, and were reclassified as Class 86/5, being renumbered into the range 86501-508. However, the InterCity sector of BR decided that it wanted these locomotives back, so they were soon renumbered back as Class 86/2 locomotives.

The late-1980s also saw the introduction of many new liveries. The class had previously only worn electric blue when built, replaced by the standard BR Blue livery from 1967. The first new livery was introduced by the InterCity sector in 1984 with the unveiling of a new grey and white livery, with a red body side stripe. This was subsequently followed by several variations, culminating in the final InterCity Swallow livery in 1989. The Railfreight sector introduced its new two tone grey livery in 1986, followed by revised Railfreight Distribution livery in 1992. Finally the parcels sector introduced a new red livery in 1990, which was replaced with Rail Express Systems livery in 1993.

1.3 Technical Specification

<table>
<thead>
<tr>
<th>TOPS Number</th>
<th>Class 86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheel Arrangement</td>
<td>Bo-Bo</td>
</tr>
<tr>
<td>Weight</td>
<td>81 tonnes</td>
</tr>
<tr>
<td>Height</td>
<td>12ft 2¼in (3.77m) with pantograph down</td>
</tr>
<tr>
<td>Length</td>
<td>58ft 6in (17.83m)</td>
</tr>
<tr>
<td>Width</td>
<td>8ft 8in (2.68m)</td>
</tr>
<tr>
<td>Electrical System</td>
<td>25kV AC Overhead Pantograph</td>
</tr>
<tr>
<td>Power Output</td>
<td>3,600hp (2,680kW)</td>
</tr>
<tr>
<td>Maximum Tractive Effort</td>
<td>60,000lb (267kN)</td>
</tr>
<tr>
<td>Brake Type</td>
<td>Dual</td>
</tr>
<tr>
<td>Braking Force</td>
<td>66½ tonnes</td>
</tr>
</tbody>
</table>
2 The Class 86 Electric Locomotive

The following locomotives are available this Add On.

2.1 Freightliner 'Green'

Dedicated freight hauling Class 86 Locomotive, limited to 75Mph top speed.

2.2 Freightliner 'Powerhaul'

Dedicated freight hauling Class 86 Locomotive, limited to 75Mph top speed.
2.3 Rail Express Systems

Dedicated freight hauling Class 86 Locomotive, limited to 75Mph top speed.

2.4 Railfreight Grey

2.5 British Rail Blue
3 Rolling Stock

3.1 Mk2A First Corridor

3.2 Mk2A Second Open

3.3 Mk2A Brake Second Open
3.4 FSA Container Bogie 'Outer' Wagon

These wagons come with a selection of container cargo that can be loaded or unloaded. There are six variations per vehicle, named 1a/1b/1c & 2a/2b/2c respectfully.

3.5 FTA Container Bogie 'Inner' Wagon
4 Scenarios

4.1 Free Roam: Northbounder
- Season Summer
- Start Location: Carlisle Kingmoor Yard

4.2 Free Roam: Borderline
- Season Spring
- Start Location: Mossend yard

4.3 The Clansman
You are driving a section of The Clansman service from London Euston to Inverness. Starting at Carlisle you must stop at Motherwell before continuing north.
- Date: 10th August 1987
- Rating: Hard
- Duration: 80 minutes
- Season: Summer
- Start Location: Carlisle Station
- Locomotive: British Rail Blue Class 86

4.4 To the Loop
Take the driving seat for a London-bound Freightliner train. Get to the Abington loop on time so an express passenger service can pass on the main line.
- Date: 2nd February 1996
- Rating: Easy
- Duration: 35 minutes
- Season: Autumn
- Start Location: Mossend Yard
- Locomotive: Freightliner Class 86

4.5 A Chill Wind
Starting at Kingmoor Yard after heavy snowfall you are braving the elements and driving an important freight service up to Lockerbie.
- Date: 20th December 1995
- Rating: Medium
- Duration: 40 minutes
- Season: Winter
- Start Location: Kingmoor Yard
- Locomotive: Railfreight Class 86
5 Locomotive Numbering

Provided with the Class 86 Electric Locomotive Add-on is a selection of Railfreight Sector decorated liveries.

These liveries are accessed via the numbering system provided with RailWorks. To change the number, open the Scenario Editor. Double Click on the Triple Grey Class 86 locomotive and open its property window on the right hand side.

86001Ab >> nnnnSp

nnnn = Class 86 number
S = Freight Sector (see below)
p = Depot Plaque (see below)

5.1 Sector Logo Chart
- A = Petroleum
- B = Metal
- C = General
- D = Distribution
- E = Construction
- F = Coal

5.2 Depot Plaque Chart
- a = Eastfield
- b = Immingham
- c = Southampton
- d = Hither Green
- e = Carlisle Currock
- f = Crewe
- g = Leicester
- H = Motherwell
- i = St Blazey
- j = Knottingley
- k = Eastleigh
- l = Laira
- m = Margam
- n = Ripple Lane
- o = Stewarts Lane
- p = Westbury
- q = Willesden
- r = Buxton
- s = Grangemouth
- t = Saltley
- u = Stratford
- v = Thornaby
- w = Tinsley
- x = Toton

5.3 British Rail Blue Headcodes
To change the Headcode, open the Scenario Editor. Double Click on the BR Blue Class 86 locomotive and open its property window on the right hand side.

1M2386201 >> HHHHnnnnn

HHHH = The 'Headcode' display
nnnnn = Class 86 number

More information on Train Headcodes can be found here:
http://en.wikipedia.org/wiki/Train_reporting_number
http://www.2d53.co.uk/Headcode/headcodeA.htm
http://www.scot-rail.co.uk/page/Headcodes+Explained
http://www.jhowie.force9.co.uk/303tributepage5.htm
6 Credits

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