RIVET GAMES

Train Simulator Classic

Suburban Glasgow Northwest

Airdrie Extension

1 Route Information

1.1 History

Formed in 1960 as an amalgamation of various railways in the Glasgow area, the current North Clyde Line runs from Edinburgh Waverley to Helensburgh Central, with branches to Springburn, Balloch and Milngavie. Originally home to the venerable Class 303, or "blue trains", the current iteration of the route showcases a wide variety of stock, including many specials - often steam hauled - heading for the West Highland Line.

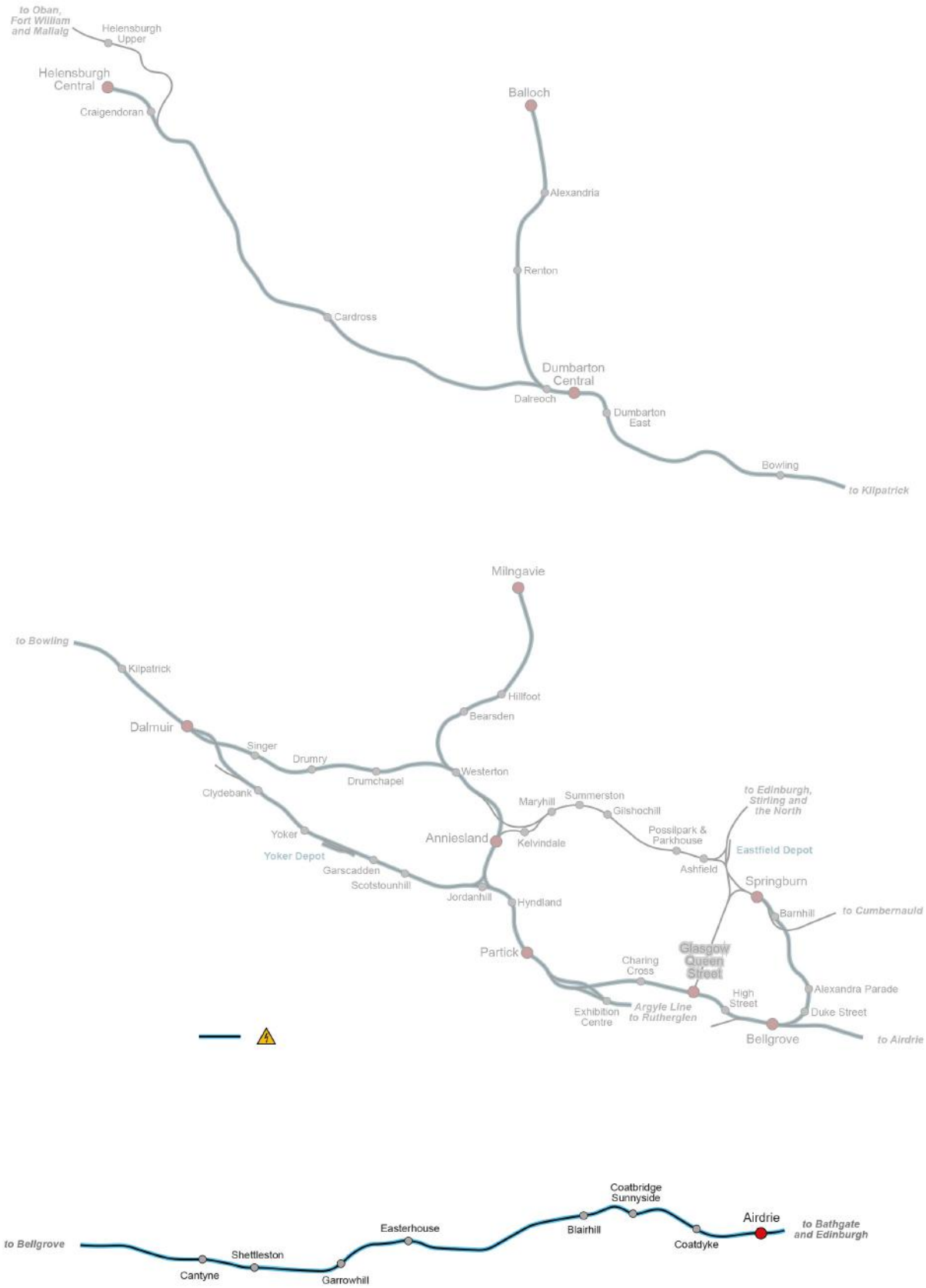
West of Glasgow, the line splits, with one route taking a northerly course through the Glasgow suburbs of Anniesland and Knightswood, before merging with the southerly line in the Clydebank district of Dalmuir. The southerly course passes through the traditional industrial heartland of the Clyde Valley. After Clydebank the route becomes distinctly rural, before ending in the foothills of the Highlands at Helensburgh.

Heading east, the line passes through the districts of Shettleston and Barlanark in the east end of Glasgow, before reaching the suburb of Easterhouse and arriving in Coatbridge. It then climbs steadily to Airdrie, the traditional eastern terminus of the North Clyde Line. The original link from Airdrie continues on to Bathgate, having been reopened in 2010, allowing trains to continue on to Edinburgh Waverley.

1.2 Route Features

- Approx. 45 miles of route network + 9 miles of Airdrie extension
- Class 66 Diesel Locomotive
- Class 67 Diesel Locomotive
- Route fully configured for Quick Drive
- 11 Career scenarios (6 from the original route, 5 from the extension)
- 43 Stations + 8 Stations on the Airdrie extension
- Extensive scenery
- Detailed catenary

1.3 Route Map



2 Signals

2.1 Main Signal Head Aspects

Colour light signals are used for controlling running movements. They display aspects by means of red, yellow and green coloured lights.

Signal Aspect	Description	Instruction to Driver
Red light	Danger	Stop.
Single yellow light	Caution	Proceed: be prepared to stop at the next signal.
Double yellow lights	Preliminary caution	Proceed: be prepared to find the next signal displaying one yellow light.
One flashing yellow light	Preliminary caution for a diverging route	Proceed: Be prepared to find the next signal displaying one yellow light with feather junction indicator for diverging route(s).
Double flashing yellow lights	Indication of diverging route ahead of the next but one signal	Proceed: Be prepared to find the next signal displaying one flashing yellow light.
Green light	Clear	Proceed: The next signal is displaying a proceed aspect.

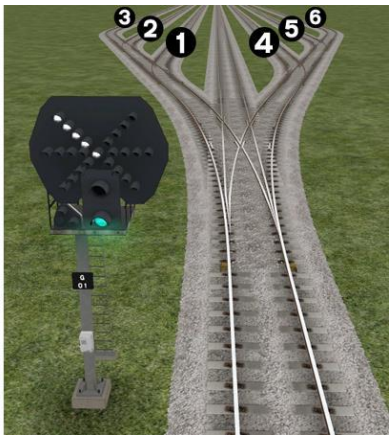
2.2 Theatre Type Signals

A Theatre alphanumeric route indicator indicates the route to be taken using numbers or letters (or a combination of numbers and letters).

A Theatre indicator is often used to show the arrival platform number for a service.

2.3 Feather Type Signals

A Feather junction indicator indicates a diverging route to be taken by the angle at which a line of five white lights is displayed. (Position 1 shown)



Feather Indication	Instruction to Driver
No Feather Indication	Obey main aspect, straight-ahead route is set
Position 1 indication	Obey main aspect, expect divergence to left
Position 2 indication	Obey main aspect, expect divergence to left more extreme than that for position 1
Position 3 indication	Obey main aspect, expect divergence to left more extreme than that for position 2
Position 4 indication	Obey main aspect, expect divergence to right
Position 5 indication	Obey main aspect, expect divergence to right more extreme than that for position 4
Position 6 indication	Obey main aspect, expect divergence to right more extreme than that for position 5

2.4 Ground Signals and Position Light Signals

Ground Signals and Position Light Signals (PLS) display their aspects by means of the position and colour of lights. Ground Signals are always illuminated and can have miniature theatre indicators attached whereas PLS only illuminate to allow a train to pass in to an occupied section of line and are mounted as an addition to a main signal head.

Signal Aspect	Description	Instruction to Driver
Two red lights	Danger	Stop.
No aspect (where associated with a main aspect)		Obey main aspect.
Two white lights	Caution	The line ahead may be occupied. Proceed cautiously towards the next stop signal, stop board or buffer stops. Be prepared to stop short of any obstruction. The associated main aspect (where provided) may be passed at danger

2.5 Entering an Occupied Section of Track

During a scenario your train may be scheduled to enter a platform or section of track that is already occupied by another train or rolling stock. In this situation you should stop at the red signal protecting this section of track as normal. Once your train has stopped press the TAB key on your keyboard to request permission from the signalling centre to enter the occupied section of track. When your train movement is approved the signal will illuminate the two white lights on the position light signal if it has one.

2.6 Repeater Signals and Primary Route Indicators

Standard banner repeater signals indicate whether the signal ahead is displaying a proceed aspect or is at danger. Modern fibre optic banner repeating signals, as shown above, consist of a rectangular unlit black background displaying a white circle with a black bar.

Repeater signals are intended to provide a driver with advance information of a signal that may be obscured on approach. A train does not need to stop at a repeater signal, only at the related signal if it is at danger.

Signal Display	Instruction to Driver
Horizontal arm	Be prepared to find the next signal at danger
White arm at an upper quadrant angle of 45°	Next signal is exhibiting a proceed aspect

3 Speed Signs

3.1 Permissible Speed Indicators

These signs display the permissible speed in miles per hour applicable to the section of line beyond the sign up to the commencement of any subsequent permissible speed section.

Remember to wait for the complete length of your train to pass these signs before accelerating if the permissible line speed is increasing. If the permissible line speed is decreasing then you must reduce your speed before passing these signs.

If there is an arrow provided in conjunction with the main sign then the permissible speed only applies to the diverting line indicated by the arrow.

3.2 Permissible Speed Warning Indicators

These signs provide advance warning of a reduction in permissible speed ahead. Permanent AWS Ramps (Automatic Warning System) are often installed in conjunction with these signs. In these cases the driver must cancel the AWS warning when triggered on approach to these signs. See safety systems section of this manual.

If there is an arrow provided in conjunction with the sign then the permissible speed warning only applies to the diverting line indicated by the arrow.

4 Safety Systems

4.1 AWS (Automatic Warning System)

AWS is provided to give train drivers in-cab warnings on the approach to signals, reductions in permissible speed and temporary/emergency speed restrictions, and to apply the brakes in the event that a driver does not acknowledge cautionary warnings given by the system.

As a train approaches a signal or track sign, it passes over AWS track equipment (magnets) which are fixed to the sleepers between the running rails. The magnets are sensed by a receiver mounted under the leading end of the train.

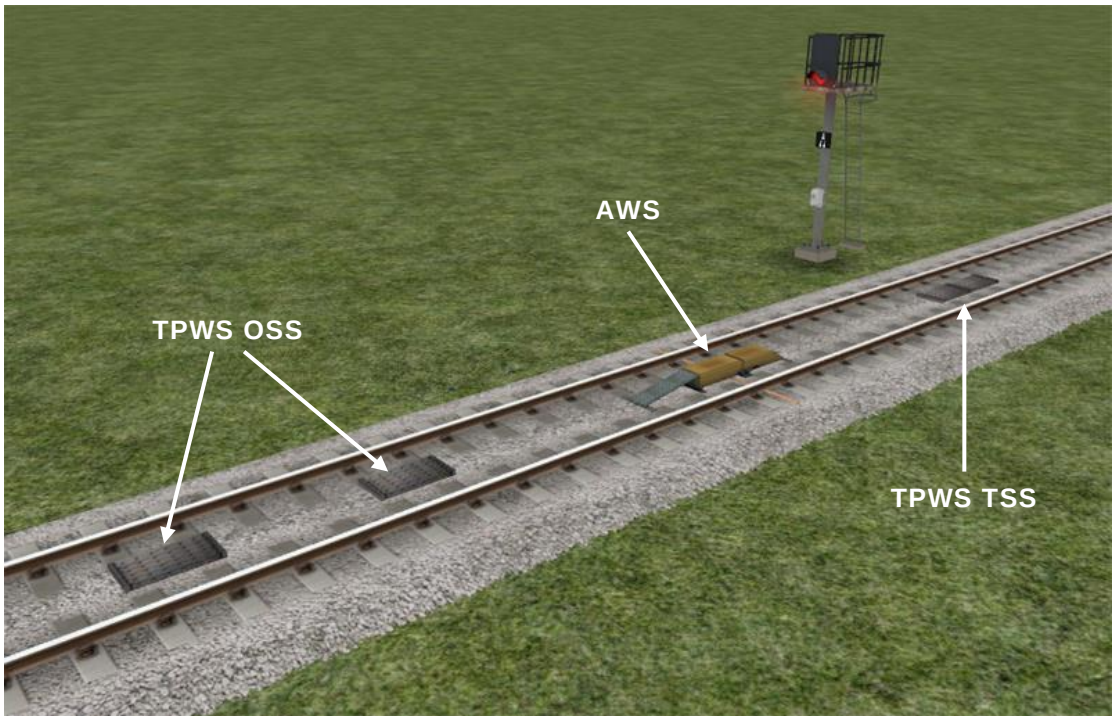
If the signal ahead is displaying a clear aspect (green), a bell (or an electronic ping) sounds in the driver's cab, and the AWS Sunflower indicator displays "all black". No action in respect of the AWS is required of the driver.

If the signal is displaying a caution or danger aspect (yellow, double yellow or red), a horn sounds in the driver's cab and the display shows "all black". The driver has to acknowledge the warning by pressing the "AWS Acknowledgement" (AWS Reset) push button. When the driver operates the push button, the horn is silenced and the AWS Sunflower changes to a segmented yellow and black circular display. If the driver fails to acknowledge the warning horn within a set time period, the emergency brakes are applied automatically.

Where permanent warning AWS equipment is provided on the approach to reductions in permissible speed, fixed warning boards and speed restrictions, the cab equipment always operates in a manner equivalent to the approach to a signal displaying a caution or stop aspect. The driver receives a warning and has to respond to it accordingly; otherwise the emergency brakes are applied automatically.

4.2 TPWS (Train Protection and Warning System)

The primary purpose of TPWS is to minimise the consequence of a train passing a TPWS fitted signal at danger and a train speeding on approach to a TPWS fitted signal at danger. TPWS track equipment is only active when the signal that they are protecting is displaying a danger aspect (red).



There are two pairs of grids mounted between the running rails. Both pairs consist of an 'arming' and a 'trigger' grid. The first pair, the Overspeed Sensor (OSS), are positioned on approach to the protected signal. The other pair of grids are mounted back to back at the signal location, and these form the Train Stop Sensor (TSS).

The emergency train brakes are automatically applied if a train passes over an active Overspeed Sensor faster than a predetermined speed for that location. The brakes are also applied if a train passes over an active Train Stop Sensor at any speed, as the signal it is protecting must be at danger.

After passing a signal displaying a caution aspect (single yellow) it is advisable to reduce your train speed to anticipate the approach to the next signal. It may be at danger and therefore the TPWS Overspeed Sensor will be active and will trip an emergency stop if your train speed is greater than the predetermined approach speed when you pass over it.

Many platforms with buffer stops are protected by Mini-Overspeed Sensors (usually set with a trigger speed of around 12mph). It is advisable to enter these platforms no faster than 10mph.

Class 66 Diesel Locomotive

5.1 Background

5.1.1 Class 66

When British Rail's freight operations were privatised in 1996, "English, Welsh and Scottish Railway" (EWS) bought a large proportion of British Rail's freight operations. Many of the locomotives that EWS inherited were at the end of their useful life and EWS approached General Motors Electro-Motive Division (EMD), to supply a replacement. EMD offered their JT42CWR model which incorporated General Motors' version of (self-steering) bogies that reduce flange wear, improve adhesion and reduce track load. The locomotive design uses standard EMD components of its era including D43 traction motors. The new JT42CWR locomotives were finally given the Class 66 designation in the British classification system (TOPS). Two hundred and fifty were initially ordered and built in London, Ontario, Canada.

In 1998, Freightliner placed an order for locomotives. They were followed by GB Railfreight, and then Direct Rail Services. More recent orders for additional locomotives have seen the introduction of low-emission variants and other operators such as Colas Rail now utilise a number of locomotives.

The Class 66 design has also been introduced to Continental Europe where it is currently certified for operations in Germany, the Netherlands, Belgium, Luxembourg, Sweden, Norway, Denmark, France, and Poland. They currently operate on routes between Sweden and Denmark and between Germany, Belgium, The Netherlands and Poland.

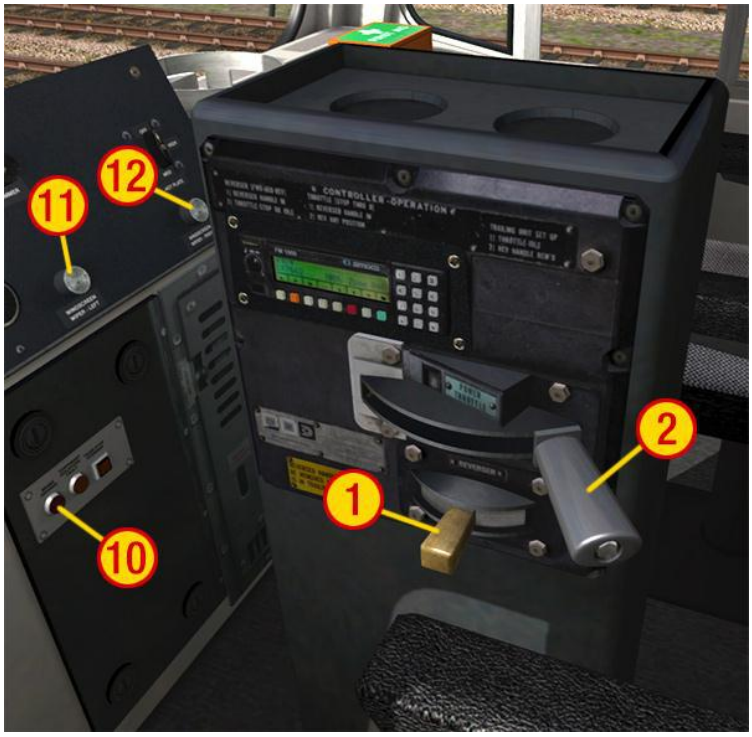
5.1.2 Technical Specification

TOPS Number	Class 66
Wheel Arrangement	Co-Co
Weight	126 tonnes
Height	12ft 10in (3.91m)
Length	70ft ½in (21.34m)
Width	8ft 8¼in (2.65m)
Bogie Wheel Base	13ft 7in (4.14m)
Bogie Pivot Centres	43ft 6in (13.26m)
Wheel Diameter	3ft 6in (1.06m)
Minimum Curvature	4 chains (80.46m)
Engine Type	GM 12N-710G3B-EC
Engine Output	3,300 hp (2,460 kW)
Power at Rails	3,000 hp (2,238 kW)
Maximum Tractive Effort	92,000 lb (409 kN)
Continuous Tractive Effort	58,390 lb (260 kN)
Design Speed	87.5 Mph (141 km/h)
Maximum Permitted Speed	75 Mph (121 km/h)
Brake Type	Air, Westinghouse PBL3
Braking Force	68 tonnes
Traction Alternator	GM EMD AR8
Traction Motors	GM EMD D43TR
Number of Traction Motors	6

2 Locomotive

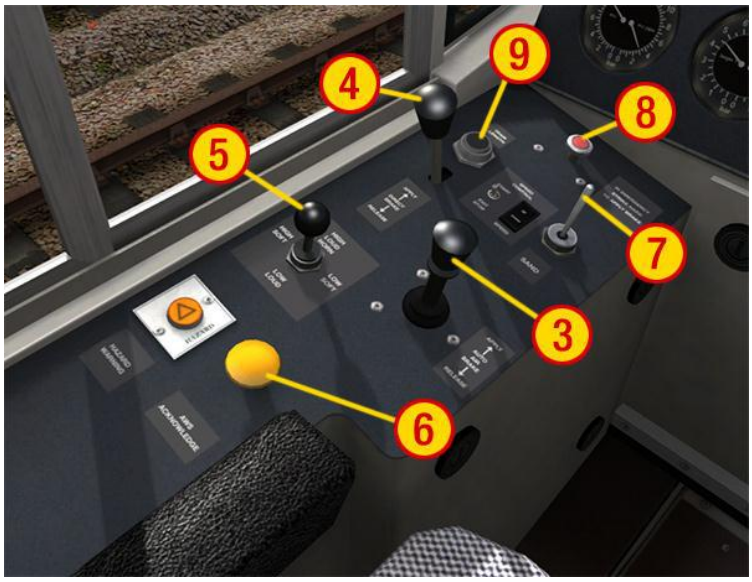
2.1 EWS Class 66 Locomotive

3 Class 66 Cab



1 – Reverser
2 – Throttle
3 – Train Air Brake Lever
4 – Loco Air Brake Lever
5 – Horn Lever
6 – AWS Reset
7 – Sand Lever
8 – Emergency Brake Plunger
9 – Train Length Button
10 – AWS/TPWS Brake Lamp
11 – Left Wiper Switch
12 – Right Wiper Switch

Note: The Train and Loco Brake levers (3&4) are not used when Train Simulator Driving Model is configured for "Simple Mode" under Game Settings. Under this setting the throttle and brakes are controlled together from the Throttle Lever (2)



13 – Passenger/Goods Brake Timing Switch and Indicators
14 – Parking Brake Buttons
15 – Engine Start/Stop Buttons
16 – Main Reservoir Gauge
17 – Bogie Brake Cylinder Gauge
18 – Air Flow Indicator
19 – Brake Pipe Pressure Gauge
20 – Speedometer
21 – Alternator Output Gauge
22 – AWS Indicator

23 – Cab Light Switch
24 – Instrumentation Light Switch
25 – Headlight/Taillight Switch
26 – Headlight/Taillight Proving Panel

3.1 Brake Levers

Both the Train Air Brake and Loco Air Brake levers have three functional positions:

- In the upright position they "Hold" the current brake pressure
- When pulled fully back they gradually "Release" the brakes
- When pushed fully forwards they gradually "Apply" the brakes

The Train Brake lever is centre sprung both in the cabin and on the game HUD and the Loco Brake lever is only sprung forwards for brake application and can be left resting in the "Release" position when required.

When using the Train Brake lever a target brake pressure can be selected as indicated by the outer needle on the Brake Pipe Pressure Gauge. The actual brake pressure will then gradually change to match the selected target as shown by the larger inner needle.

The rate that the brake pressure changes is dictated by the brake timing selection ("Passenger" or "Goods") as selected and indicated on the main console (item 13 shown on the previous page). When in "Goods" brake timing mode the brake pressure changes more slowly.

3.2 Additional Keyboard Controls

L – Toggle Cab Light	SPACE – Horn High
CTRL+L – Toggle Instrument Lights	CTRL+SPACE – Horn High Soft
U - Toggle Train Length Button	B – Horn Low
Y - Toggle Pass/Goods Brake Timing	CTRL+B – Horn Low Soft
V - Toggle Left Wipers Switch	
CTRL+V - Toggle Right Wipers Switch	

4 Acknowledgements

RailSimulator.com gratefully acknowledges the assistance Oovee Ltd. in creating sounds and simulation for this locomotive.

Class 67 Diesel Locomotive

6.1 Background

6.1.1 Class 67

The Class 67 locomotives emerged very quickly after privatisation of the UK railway industry in the mid 90s. The US-based Wisconsin Central who purchased the majority of the UK freight operations from British Rail, quickly established that the locomotive fleets it had acquired were not up to the task of modern freight requirements, with many examples quickly being sent to the scrap pile.

While the newly formed company - English, Welsh & Scottish Railway - had already made a significant order for new motive power in the form of 100 EMD built Class 66 diesel locomotives, these were unsuitable for powering passenger and charter trains due to their lack of electric train supply equipment. In addition, these locomotives were not capable of reaching the desired speeds of up to 125Mph. As a result, EWS soon returned to General Motors for the construction of a new fleet of high speed Bo-Bo locomotives.

General Motors had not produced such a locomotive before, even for its home market, and so a partnership was formed with Alstom to design and construction what was to become the Class 67 locomotives, exclusively for passenger and Royal Mail traffic.

EWS ordered a total of 30 locomotives, all of which were built at the Alstom plant in Valencia and delivered between 1999 and 2000.

Despite being quickly deployed on their intended work, EWS lost the contract to carry mail in 2004, having priced itself out of the market. Since then, the Class has mainly sort spot hire work on charter trains, infrequent freight flows and special duties such as that of hauling the Royal Train around the UK.

Due to the unspecific nature of the Class 67 operations, over the past 11 years they have been in service, it has been possible to spot the locomotives in all corners of the UK.

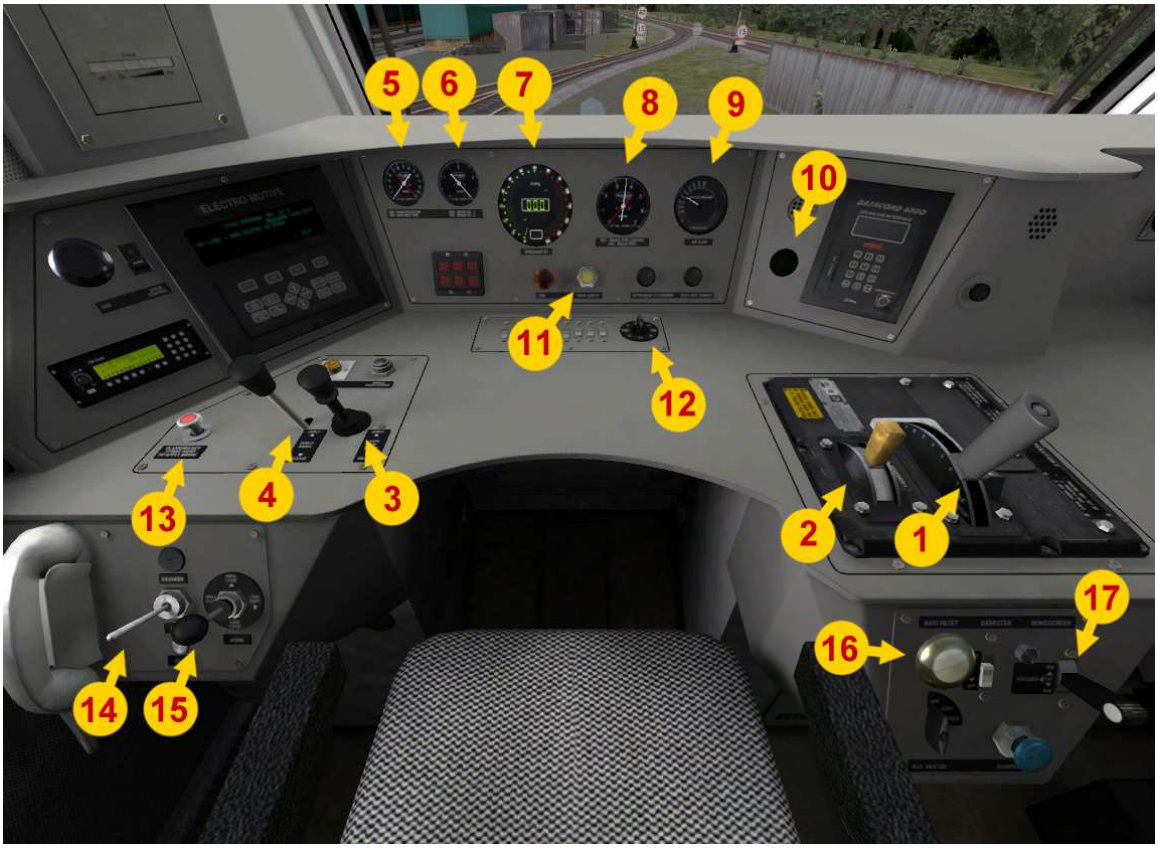
6.1.2 Technical Specification

TOPS Number	Class 67
Wheel Arrangement	Bo-Bo
Weight	90 tonnes
Height	12ft 9in (3.88m)
Length	64ft 7in (19.68m)
Width	8ft 9in (2.66m)
Bogie Wheel Base	9ft 2in (2.79m)
Bogie Pivot Centres	38ft 1in (11.63m)
Wheel Diameter	3ft 2in (0.965m)
Minimum Curvature	3.8chains (75m)
Engine Type	GM 12N-710G3B-EC
Engine Output	3,200hp (2,386kW)
Power at Rails	2,494hp (1,860kW)
Maximum Tractive Effort	31,750lb (141kN)
Continuous Tractive Effort	20,200lb (89.7kN)
Design Speed	140Mph (225km/h)
Maximum Permitted Speed	125Mph (201km/h)
Brake Type	Air, Westinghouse PBL3
Braking Force	78 tonnes (780kN)
Traction Alternator	EMD AR9AC6HEX
Traction Motors	EMD D43FM
Number of Traction Motors	4
Gear Ratio	59:28
Fuel Capacity	1,201 gal (5,460lit)
Oil Capacity	202 gal (920lit)
Total Built	30

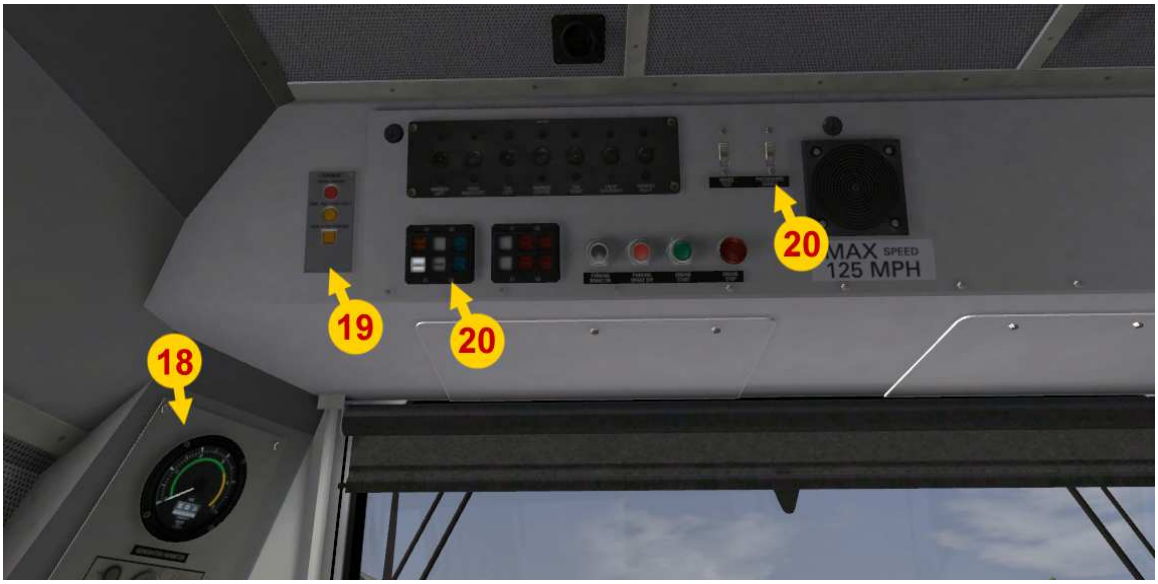
6.2 The Class 67 Diesel Locomotive

6.2.1 EWS Maroon

6.3 Class 67 Cab



1. Power Handle
2. Reverser
3. Train Brake Handle
4. Locomotive Brake Handle
5. Main Reservoir Gauges
6. Brake Cylinder Gauges
7. Speedometer & LCD/LED Readout
8. Train Brake Pipe Gauges
9. Air Flow Gauge
10. AWS Sunflower
11. Train Length Button
12. Head/Taillight Selector
13. Emergency Plunger
14. Sander Paddle
15. Horn Paddle
16. AWS Acknowledge Button
17. Windscreen Wiper Paddle
18. Ammeter Gauge
19. TPWS Panel
20. Locomotive Mode Selector



6.4 Rolling Stock

6.4.1 PCA 2-Axle Barrel Cement Tank Wagon

Cement is a useful and a highly sought after. Having been transported in aging Presflo wagons for many years, the Associated Portland Cement Manufacturers (later Blue Circle Cement) decided to upgrade its fleet with conventional tank wagons. These were found unsatisfactory in operation until the depressed barrel design was introduced in 1969. Using gravity to assist the air pressure discharge equipment, the design became very successful and many other cement companies have adopted the vehicles since.

6.4.2 Mk3 SLEP Sleeper Coach & Mk2E TFO and BFO in Caledonian Sleeper Livery

Sleeper Either class (SLE) and Sleeper Either class with Pantry (SLEP) are railway sleeping cars used in the UK.

A total of 208 vehicles were built at Derby by British Rail between 1982–1984 to the Mark 3A profile. They were introduced to replace an ageing fleet of Mk 1 sleeping cars dated from the late 1950s.

As of 2006, the only mainline operators of these type of carriages are First Great Western on the Night Riviera and First ScotRail on the Caledonian Sleeper. With the decline of overnight sleeper services in the UK shortly after their introduction at the end of the 1980s, many of the carriages later were moved to heritage railways to provide sleeping accommodation for heritage staff and volunteers.

These coaches were withdrawn from service in October 2019.

7 Other Information

This document is provided as a guide to Rivet Games' Suburban Glasgow Northwest Airdrie Extension add-on route for Train Simulator, a product provided for entertainment purposes.

There is more information on this route at http://www.rivet-games.com

If you do notice errors in this document, please let us know at support@rivet-games.com

Please give feedback on the Rivet Games forums: forums.rivet-games.com, as well as leave a review on the Steam store to help others decide whether they would enjoy this route.

8 Acknowledgements

This route was conceived and developed by Iain Mackay. Rivet Games provided additional assets and assistance in order to make it available commercially.