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Woodhead Electric Railway in Blue

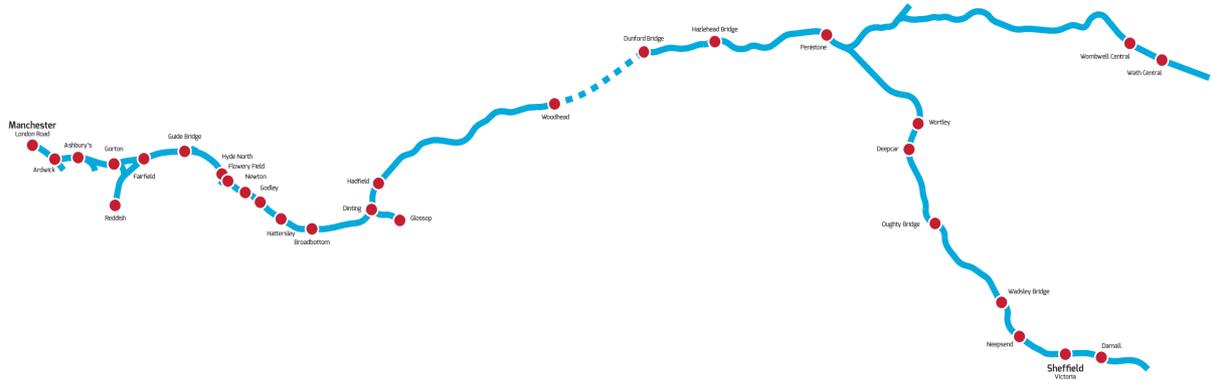
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GAMES



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1 Route Information

1.1 Route Map



1.2 Route Features

- Manchester London Road/Piccadilly
- Reddish Electric Depot
- Rotherwood Exchange Sidings

2 Rolling Stock

2.1 BR Class 08 – BR Blue



2.2 BR Class 76-bX – BR Blue



2.3 BR Class 506 – BR Blue, BR Blue & Grey

- BR Blue – MOBS, DTOS & TOS
- BR Blue Weathered – MOBS, DTOS & TOS
- BR Blue & Grey – MOBS, DTOS & TOS
- BR Blue & Grey Weathered – MOBS, DTOS & TOS



2.4 HAA MGR Wagon



2.5 Ex-LNER HOP 21t Coal Hopper



2.6 MCV 16t Mineral Wagon



2.7 Ex-LNER Toad E Brake Van



2.8 BR Mk1 Coaches – BR Blue & Grey

- Mk1 Brake First
- Mk1 Guard
- Mk1 Brake Second Corridor
- Mk1 First Corridor
- Mk1 Mini Buffet
- Mk1 Second Corridor
- Mk1 BR Tourist Second Open

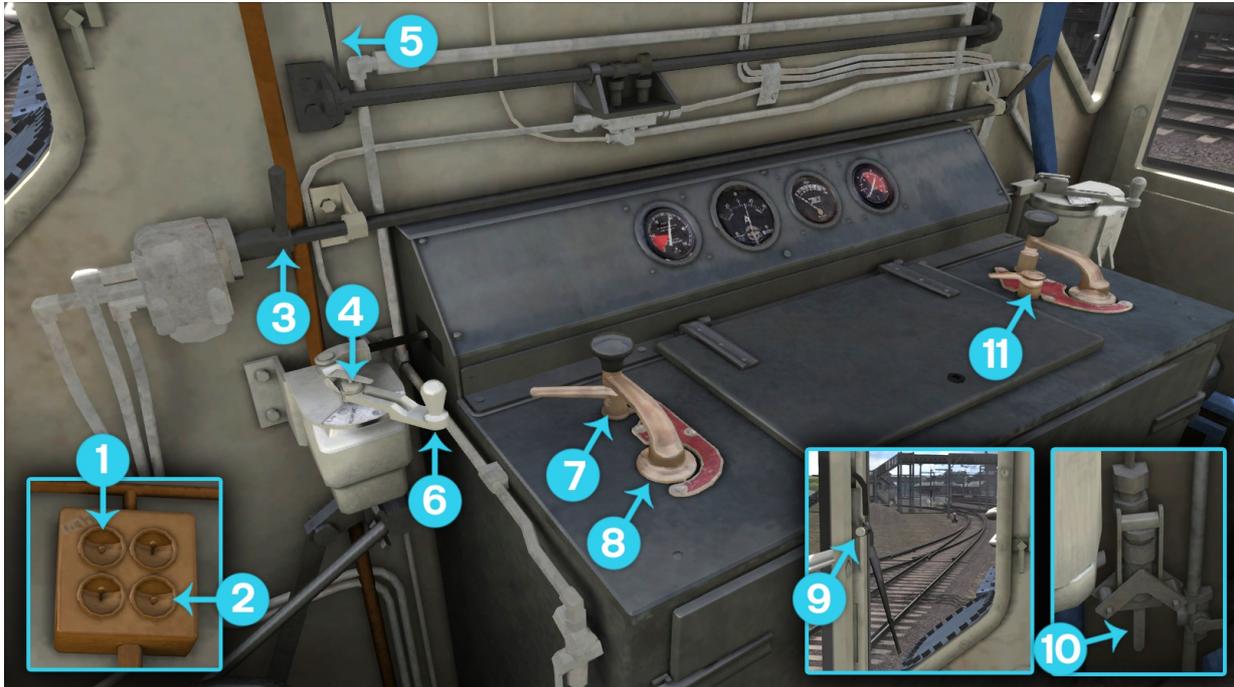


2.9 GUV Blue Express Parcels & GUV Blue Newspapers



3 Driving the BR Class 08

3.1 Cab Controls



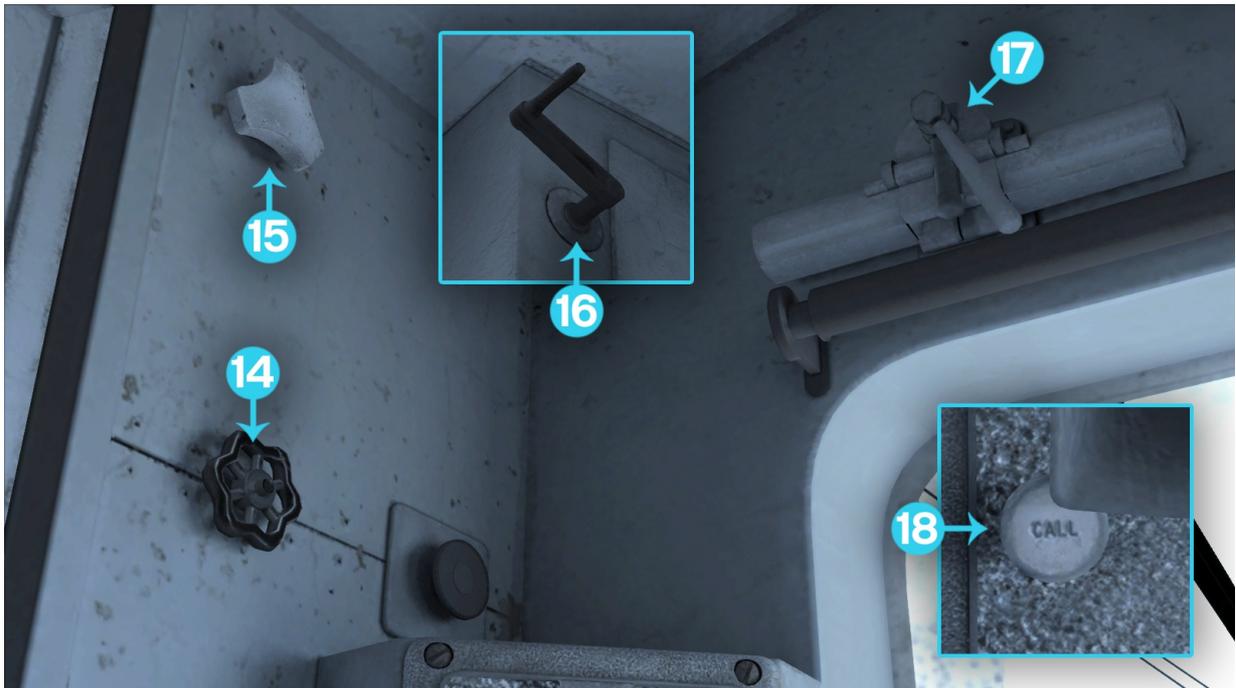
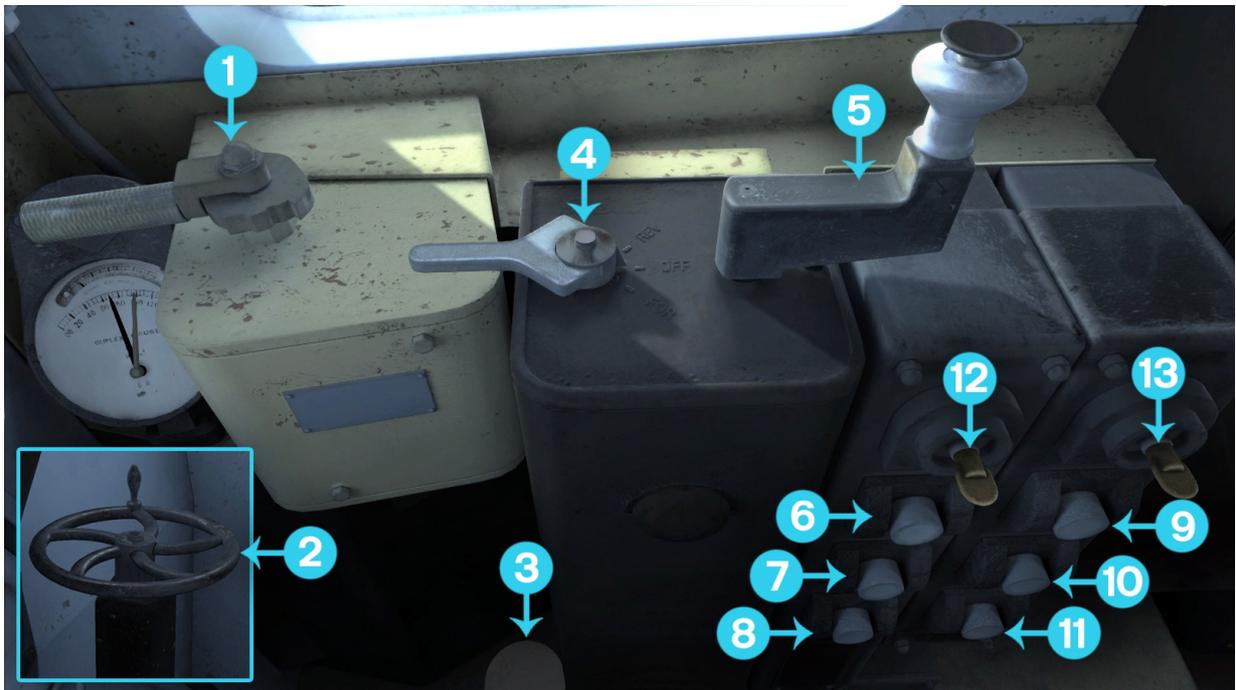
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|------------------------------|---------------------------------------|
| 1 Headlights (H / Shift+H) | 7 Reverser (W / S) |
| 2 Cab Light (L) | 8 Power Handle (A / D) |
| 3 Loco Brake ([/]) | 9 Wipers (V) |
| 4 Exhauster Speed-up (P) | 10 Air Release Valve (Ctrl+I) |
| 5 Sander (X) | 11 Engine On / Off (Z) |
| 6 Train Brake (; / ') | 12 Brake Mode (Page Up / Page Down) |

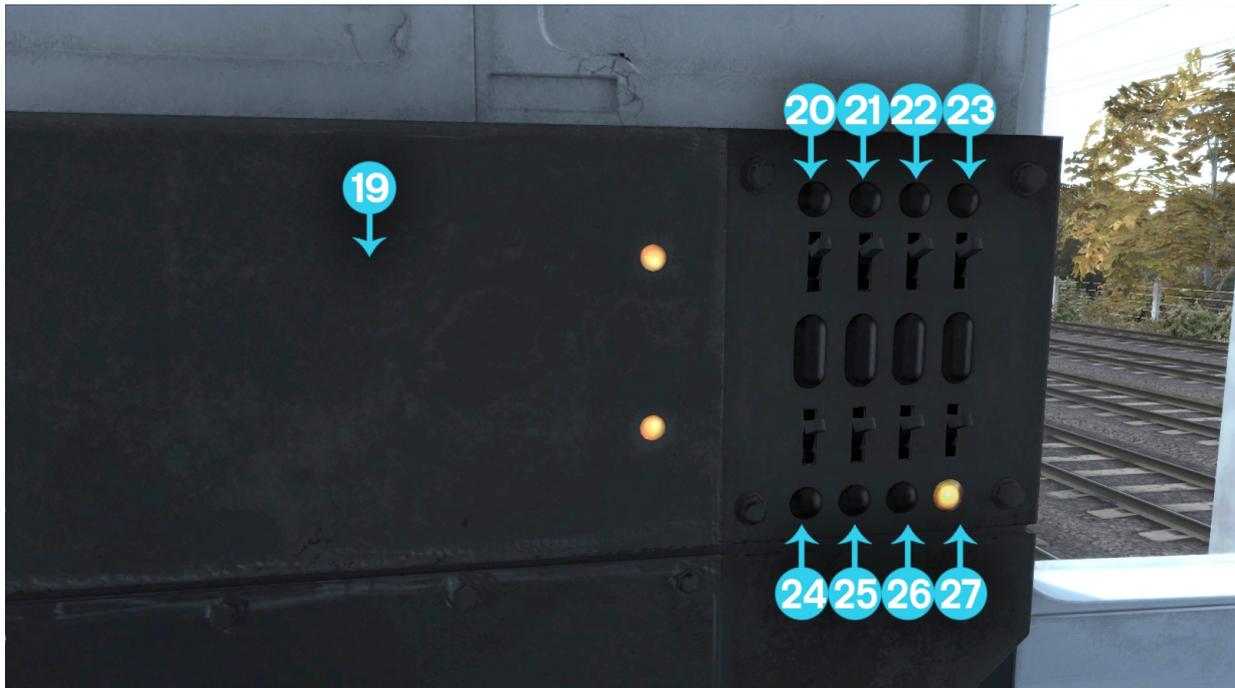
3.2 Driving Notes

- Max Speed 15mph
- Brake Modes
 - Unfitted or light engine with vac bag off dummy coupling.
 - Unfitted, light engine or unbraked shunting.
 - Wagons with vacuum brake and no D.A. valves.
 - Wagons with vacuum brake and D.A. valves.
 - Passenger coaching stock with vacuum brake and D.A. valves.

4 Driving the BR Class 506

4.1 Cab Controls





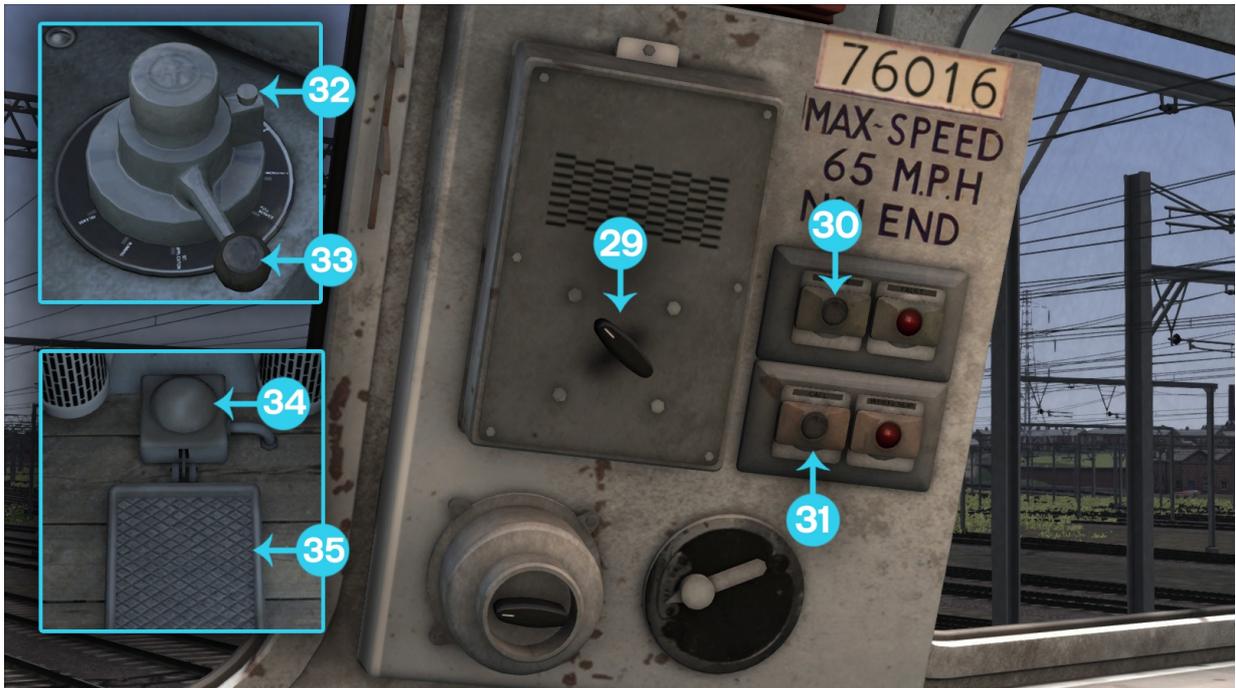
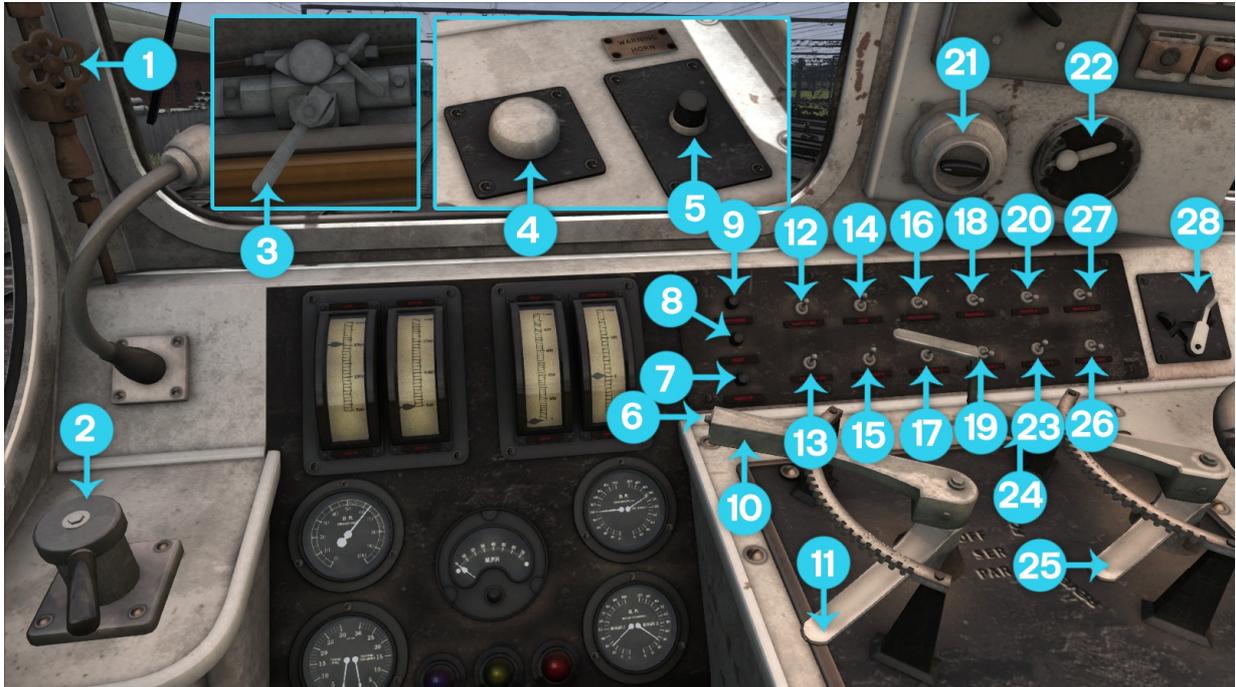
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|--------------------------------------|---|
| 1 Train Brake (; / ') | 15 Wiper Switch (V) |
| 2 Handbrake (/) | 16 Destination Roller (mouse only) |
| 3 Horn (Space) | 17 Manual Wiper control (mouse only) |
| 4 Reverser (W / S) | 18 Driver/Guard Buzzer (C) |
| 5 Power Handle (A / D) | 19 Fuse Cupboard (mouse only) |
| 6 Pantograph Down (Ctrl+P) | 20 Marker Light Top Left (mouse only) |
| 7 Pantograph Up (P) | 21 Marker Light Top Right (mouse only) |
| 8 Overload Reset (R) | 22 Destination Light (mouse only) |
| 9 Passenger Heat Trip (mouse only) | 23 Cab Light (L) |
| 10 Crew Heat Trip (mouse only) | 24 Marker Light Bottom Left (mouse only) |
| 11 Crew Heat Set (mouse only) | 25 Marker Light Bottom Right (mouse only) |
| 12 Control Key Switch (mouse only) | 26 Tail Light (mouse only) |
| 13 Train Line Key (mouse only) | 27 Instrument Lights (mouse only) |
| 14 Wiper Reducing Valve (mouse only) | |

4.2 Driving Notes

- Headlight combinations can be cycled through using the H / Shift+H keys.

5 Driving the BR Class 76-bX

5.1 Cab Controls



1 Wiper Switch (V)	21 Rheostatic Brake Switch (R / Ctrl+R)
2 Loco Brake ([/])	22 Weight Transfer Switch (mouse only)
3 Manual Wiper Handle (mouse only)	23 Marker No. 4 (Ctrl+3)
4 Deadmans holdover switch (mouse only)	24 Regenerative Brake (, / .)
5 Secondman's Horn (mouse only)	25 Reverser (W / S)
6 Power handle Button (E)	26 Foot Warmer (mouse only)
7 Pantograph Up (P)	27 Cab Heater 2 (mouse only)
8 Overload Reset (loco) (mouse only)	28 Control Key Switch (mouse only)
9 Pantograph Down (Ctrl+P)	29 Clear Call Switch (mouse only)
10 Power Handle (A / D)	30 Overload Reset (multiple locos)(mouse only)
11 Combination Lever (C / Ctrl+C)	31 Call Button (mouse only)
12 Supply Motor Generator (mouse only)	32 M8 Valve Pin (Return)
13 Exciter Motor Generator (mouse only)	33 Train Brake (M8 Valve) (; / ')
14 Cab Light (L)	34 Sander (X)
15 Instrument Lights (I)	35 Deadmans Pedal (mouse only)
16 Window Heater (mouse only)	36 Locomotive Formation (Home / Ctrl+Home)
17 Marker No. 2 (Ctrl+1)	37 Brake Mode (Page Up / Page Down)
18 Marker No. 1 (Ctrl+4)	38 Advanced Mode (B)
19 Marker No. 3 (Ctrl+2)	39 Pantograph Flashing Effect (Ctrl+Shift+Y)
20 Cab Heater 1 (mouse only)	40 Brake Selector (End / Shift+End)

5.2 Starting the Class 76

1. Move Reverser into forward or reverse.
2. Move the Combination Lever into Series.
3. Release Train Brake or Loco Brake
4. Once the brakes are released, move the power handle into notch 1. You will notice the Field Amps and Armature Amps increase on the gauges in front of you. Do not allow the amps to go near 1000 amps as you will overload the loco/locos.
5. Slowly notch up on the power handle until you reach the Full Field notch (displayed as "F.F." on the HUD.
6. Once at Full Field move the Combination Lever into Parallel and reduce the Power Handle into notch 1. After about 1 second, you will hear the loco go from Series to Parallel. You will also see this on the Field and Armature gauges.
7. Slowly notch up on the Power Handle again as before, all the way into the Weak Field notches.

5.3 Clear Call System

This system allows the leading loco to control multiple locos to assist up steep inclines. To use this system advanced mode is required (press B key).

1. Select locomotive formation using Home / Ctrl+Home.
2. Turn the Clear Call Switch to increase power from the assisting locomotive/locomotives. Quarter power, half power and full power can be selected.

5.4 Regenerative Braking

Regenerative brakes use the motors to create a braking effect while regenerating electricity and sending it back into the overhead wires.

If you wish to use the regenerative brake between 16 mph and 33 mph and unlikely to be much above 33mph then move the combination lever to series. If speed is likely to be between 33 mph and 55 mph and unlikely to be below 33 mph select parallel. Speed may need to be maintained by the friction brakes until setup.

Please note that regenerative brakes are inoperative if the weight transfer switch is in the on position.

1. With the combination lever set in the required position as stated above, move the regenerative handle to it's first notch. If in parallel it will take around 2 seconds for the parallel connections to be made from series.
2. Once the connections have been made, increase the regenerative brake handle's position until the motor voltmeter reads approximately the line voltage.
3. Move the power handle straight to notch 15 and do not pause in any notch to prevent the resistors heating up. To produce a braking effort move the regenerative brake handle towards back. You should note the motor voltmeter reading increasing, and the armature ammeter reading increasing. The higher the current on the armature and field ammeters the more braking effort is being generated.
4. To increase speed, move the handle towards motoring (forward), to decrease speed move the handle back towards.

5.5 Rheostatic Braking

The locomotive is also fitted with rheostatic brakes, which operate relatively similarly to the regenerative brakes.. These brakes are operative in series only and are effective right down to speeds below 5 mph. They shouldn't really be used above 20mph as the high currents will very quickly burn out the resistors. This brake should only be used in emergencies or poor adhesion conditions. The Rheostatic braking is inoperable if the weight transfer switch is enabled.

To enable rheostatic brakes, first the regenerative brake handle must be in motoring, the combination lever in series, the power handle in off and the weight transfer switch off.

1. The rheostatic brake switch has 4 positions: Off, B1, B2 and B3 which alter the excitation of the motor fields. The higher the excitation the more braking effort. To begin rheostatic braking, move the rheostatic brake switch to the desired excitation setting.
2. Open the power handle and rheostatic braking should commence as indicated by the armature ammeter which should now show a current.
3. To increase braking effort, increase the throttle setting (this decreases the resistance and increases the current) or increase excitation.

5.6 Brake Selector

Brake Selector Switch Setting	Approx. time for brake cylinder pressure to drop below 5psi after brake pipe pressure rises above 70psi.	Approx. time for brake cylinder to reach maximum after brake pipe pressure rises drops below 50 psi.
Air Passenger	15-20 seconds	3-5 seconds
Air Goods	45-60 seconds	20-28 seconds
Vacuum Passenger	5-8 seconds	10 seconds
Vacuum Goods	25-30 seconds	10 seconds

5.7 Locomotive Formations

Locomotive formations can be selected using the “**Home/Ctrl+Home**” key:

- 1 lead locomotive and 0 banking locomotives.
- 2 lead locomotives and 0 banking locomotives.
- 2 lead locomotives and 1 banking locomotive.
- 2 lead locomotives and 2 banking locomotives.
- 1 lead locomotive and 1 banking locomotive.

- 1 lead locomotive and 2 banking locomotives.
- 4 lead locomotives and 0 banking locomotives.

5.8 Faults and Failures

On the Class 76 there are a number of faults and failures which could occur. In standard mode they are simplified or not present.

Overload

Description: Current exceeded safe limits and so power has been cut to protect motors and circuits.

Symptoms: Loss of power, Line switch light extinguished with power handle open, fault light illuminated

Cause: Current exceeded 950 amps

Remedy: If 1 lead loco, press local reset button, if multiple lead locos press main fault reset button

Resistor High Temperature

Description: Resistors are running hot and care must be taken not to burn them out.

Symptoms: fault light illuminated and isn't extinguishable.

Cause: Excessive current for prolonged time periods.

Remedy: Stop using resistance notches until fault light extinguishes by itself. Do not move combination lever to off otherwise motors blowers (and hence cooling will cease).

Note: Advanced mode Only

Resistor Burn Out

Description: Resistors have run so hot that one or more components has failed.

Symptoms: fault light illuminated, Loss of power, Line switch light extinguished with power handle open, Failure message.

Cause: Excessive current for prolonged time periods.

Remedy: None, locomotive is a complete failure.

Note: Advanced mode Only

Traction Motor High Temperature

Descriptions: Motors are running hot and care must be taken not to burn them out.

Symptoms: fault light illuminated and isn't extinguishable.

Cause: Excessive current for prolonged time periods.

Remedy: reduce and cut power until fault light extinguishes by itself. Do not move combination lever to off otherwise motors blowers (and hence cooling will cease).

Note: Advanced mode Only

Traction motor burn out

Description: Motors have run so hot that the insulation on the armature has melted causing a flashover and the motors to fail.

Symptoms: fault light illuminated, Loss of power, Line switch light extinguished with power handle open, Failure message.

Cause: Excessive current for prolonged time periods.

Remedy: None, locomotive is a complete failure.

Note: Advanced mode Only

Loss of Line Volts

Description: Line voltage has been lost

Symptoms: Voltmeter reading less than 900 volts, loss of traction power.

Cause: Pantograph dropped, Overhead line fault*

Remedy: Check pantograph is raised. Otherwise shut off power and wait for line voltage to return.

Note: overhead line fault can only be caused through scenario scripting.

Large drop in line volts

Description: Line voltage not in usual operating range (1350-1650 volts).

Symptoms: Line Voltmeter reading is not between the bands of between 1350-1650 volts.

Cause: One or more substations have tripped or failed meaning voltage is being provided from a substation some considerable distance away resulting in a voltage drop.

Remedy: Wait for voltage to return to normal and reduce power to reduce load on substation.

Note: Substation line fault can only be caused through scenario scripting.

Air brake traction interlocks.

Description: To prevent damage for occurring, or moving with inoperative brakes power will be cut.

Symptoms: Loss of traction power, Line switch light extinguished with power handle open

Cause: Air brake pipe pressure dropped below 45psi, or main reservoir pressure dropped below 80psi

Remedy: Increase brake pipe pressure above 62psi and/or wait for main reservoir pressure to increase past 95psi.

Deadman's demand.

Description: Deadmans device has activated bring about an emergency application of the air brake.

Symptoms: Loss of traction power, Line switch light extinguished with power handle open, train pipe pressure rapidly dropping.

Cause: Deadmans pedal or holdover button not depressed while reverser in the forward direction, and 6 second delay period exceeded.

Remedy: Move throttle to off, re-depress deadmans pedal and make a full application of the locomotive straight air brake. Once made the demand should cease, the brake released and traction power should return.

5.9 Brake Modes

The brake mode can be changed with the Page Up / Page Down keys:

- Passenger coaching stock with vacuum brake and D.A. valves.
- Wagons with vacuum brake and D.A. valves.
- Wagons with vacuum brake and no D.A. valves.
- Unfitted, light engine or unbraked shunting.
- Unfitted or light engine with vac bag off dummy coupling.

6 Credits

Dovetail Games would like to thank the following people & organisations for their contribution to the development of the Woodhead Electric Railway BR Blue:

Stuart Galbraith

Route Builder

Masterkey Simulations

BR Class 506 Artwork

Ricardo Rivera

BR Class 76 Artwork

Edward Fisk

BR Class 08, 76 & 506 sounds and physics

Dovetail Games Beta Team

Department for Transport

