

# Class 444/450

## Enhancement Pack



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# How to Install

- 1) Locate where you have downloaded this pack and unzip it. Information on how to do this can be found [here](#).
- 2) Go to the location where you have extracted the files from the .zip file.
- 3) Now find the .exe file called 'Class 444-450 Enhancement Pack'. Double-click this file.
- 4) Follow the steps and by the end of the process, the main part of this pack will have installed.
- 5) If you intend to use any of the included scenarios, please ensure you have all of the requirements, as listed on the product page.
- 6) To ensure the cab environment sounds as intended in this pack, please make sure that 'EFX' is ticked within your in-game Audio settings.

# Keyboard Controls

Non-standard keyboard controls are listed below:

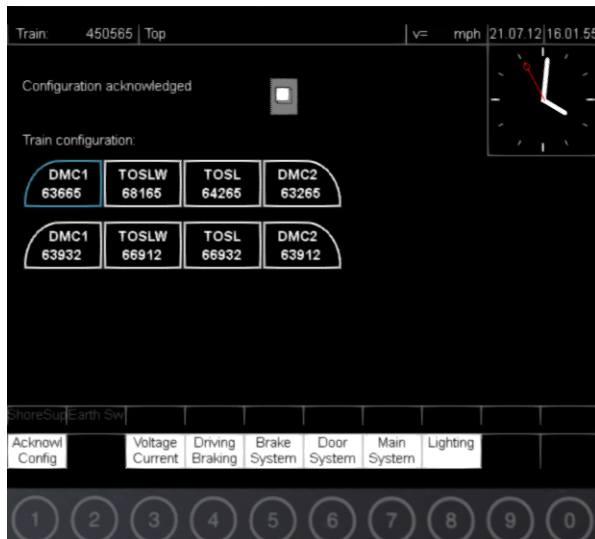
Shift+U -	Battery off button
U -	Battery on button
I -	Cab equipment light switch CLOCKWISE
Shift+I -	Cab equipment light switch ANTI-CLOCKWISE
L -	Cab light ON/OFF
E -	Deadman's pedal (DVD reset)
F7 -	Destination display DOWN
F8 -	Destination display UP
Y -	Driver reminder appliance (DRA) ON/OFF
C -	Driver to guard signal
Ctrl+D -	Driver vigilance device (DVD) ON/OFF
H -	Headlight switch CLOCKWISE
Shift+H -	Headlight switch ANTI-CLOCKWISE
O -	HSCB switch ON
Shift+O -	HSCB switch OFF
I -	Instrument lights switch ON/OFF
Shift+W -	Master key IN/OUT
K -	Tail lights switch ON/OFF
Shift+0 -	TMS key 0
Ctrl+1 to 9 -	TMS key 1 to 9
Ctrl+Page Down -	TMS scroll DOWN
Ctrl+Page Up -	TMS scroll UP
Shift+Q -	TPWS Mk4 AWS button
V -	Wiper switch CLOCKWISE
Shift+V -	Wiper switch ANTI-CLOCKWISE

# Features

## Train Management System (TMS)

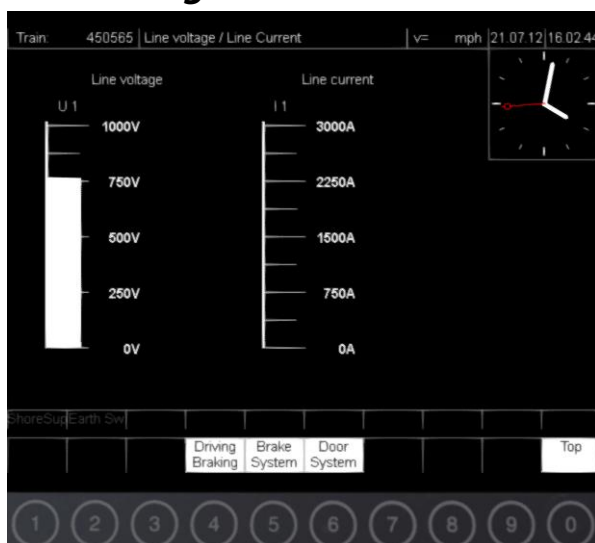
The TMS screen to the top-right of the driver provides information on many aspects of the unit. On all screens, above keys 0 to 9 are a list of screens or actions that can be accessed by pressing their corresponding key on the TMS.

### Top



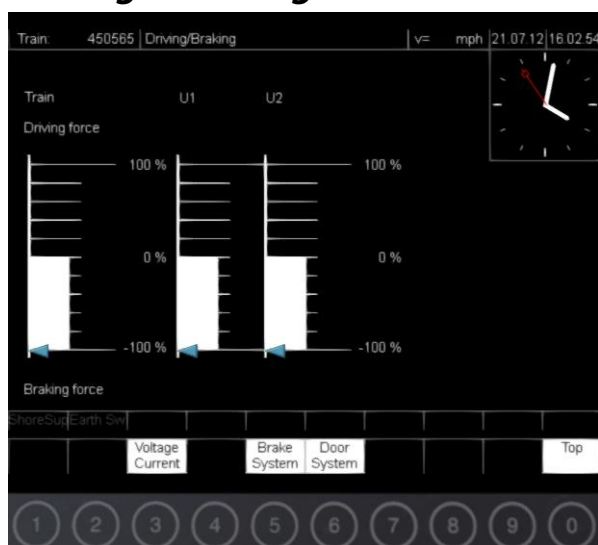
After booting, this is the first screen you see. It displays your train configuration and whether you have acknowledged it. To acknowledge the train configuration, press the **1** key on the TMS, or **Ctrl+1** on the keyboard.

### Line Voltage / Line Current



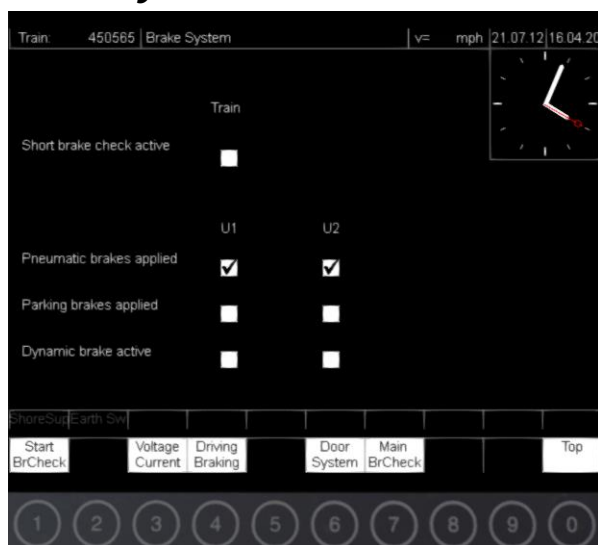
On this screen, you can see the line voltage being received and the line current produced by the train.

## Driving / Braking



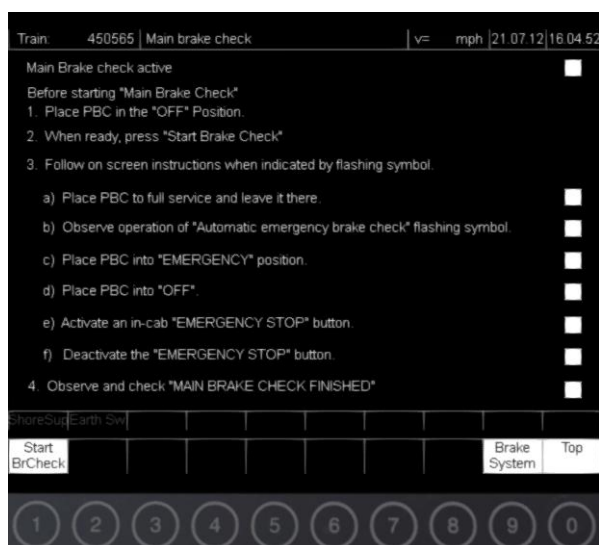
On this screen, you can view the state and level of braking or traction power currently applied. U1, U2 & U3 represent each individual unit in a formation. For example, an 8 car formation is shown above so only U1 & U2 are listed as there are only 2 units in the formation. The blue triangle indicates the position of the power brake controller.

## Brake System



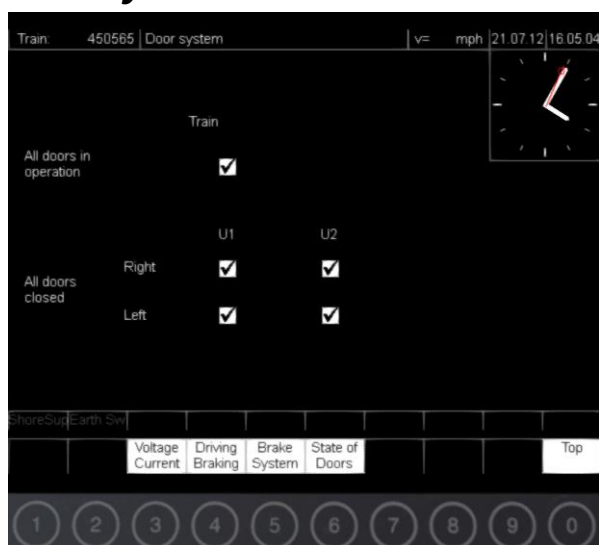
On this screen, you can carry out a short brake check and view the state of the pneumatic (air), parking & dynamic brakes. To carry out a short brake check, the **1** key on the TMS. For this to work, the doors must be closed, reverser in 'Forward' and power brake controller in 'Off'. Whilst in progress, the tick box will flash. When complete, it will return to a blank white box.

## Main Brake Check



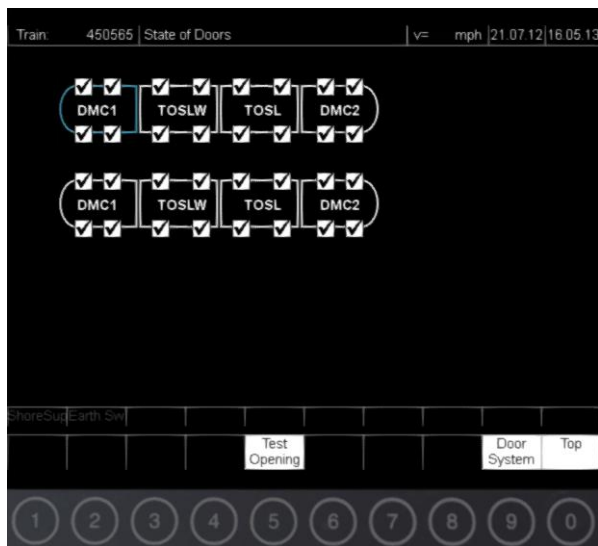
On this screen, you can carry out a main brake check. To do this, press the **1** key on the TMS. For this to work, the doors must be closed, reverser in 'Forward' and power brake controller in 'Off'. As stated on the screen, you must follow the relevant instruction when indicated by the flashing tick box.

## Door System



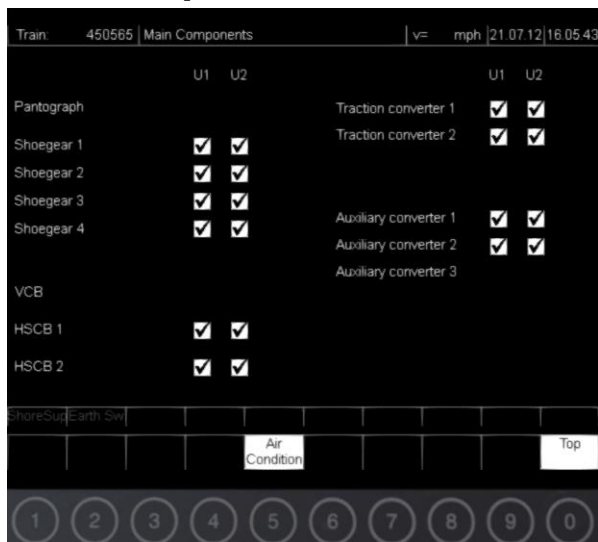
On this screen, you can see the general state of the doors.

## State of Doors



On this screen, you can see the state of each individual door in your formation.

## Main Components



On this screen, you can see the state of each shoe gear, HSCB, traction converter & auxiliary converter.

## Interior Lighting



On this screen, you can control and view the state of the interior lighting. To control the saloon or emergency lighting, ensure the grey cursor is on the desired type of lighting by pressing the **Up Arrow** or **Down Arrow** key on the TMS. You can then turn it on by pressing the **1** key on the TMS or off by pressing the **2** key on the TMS.

## Exterior Lighting



On this screen, you can see the state of the exterior lighting.



## **Gradients**

By default in Train Simulator Classic, only gradients of 1 in 185 or steeper have a gravitational effect on a train and this is only suitably realistic on gradients of approximately 1 in 125 or steeper. This means on gradients shallower than 1 in 125, the train does not experience the gravitational forces upon it than it should.

With this information in hand, we have managed to get rid of this limitation by making the train invisibly power or brake itself to simulate the effect that gravity has where Train Simulator Classic by default doesn't do so. This is all invisible to you as the player so you won't suddenly find the power or brake handles moving without your say so, but it does mean you have to drive to the gradients of the route a lot more than before, just like a real driver, especially on mainline routes where gradients rarely reach the severity where Train Simulator Classic has them behave realistically. You will also now find that if trying to recreate real timetabled runs, your timings will much more closely match reality.

## **Train Protection and Warning System (TPWS) Mk4**

TPWS Mk4 has been simulated to the greatest extent currently possible within the simulator.

### ***Self-test***

When moving the reverser away from off, TPWS & AWS will perform a self-test. All lights on the unit will illuminate and you must reset the AWS warning by pressing **Q**. You will then receive audible confirmation that TPWS & AWS are operational.

### ***AWS***

If the AWS is not reset in time (except during the self-test), the emergency brakes will apply and the AWS button on the TPWS unit will flash. Once you have come to a stop, press the AWS button to acknowledge it, then press it again to reset the system and you will be able to obtain power.

## **Uncoupling Procedure**

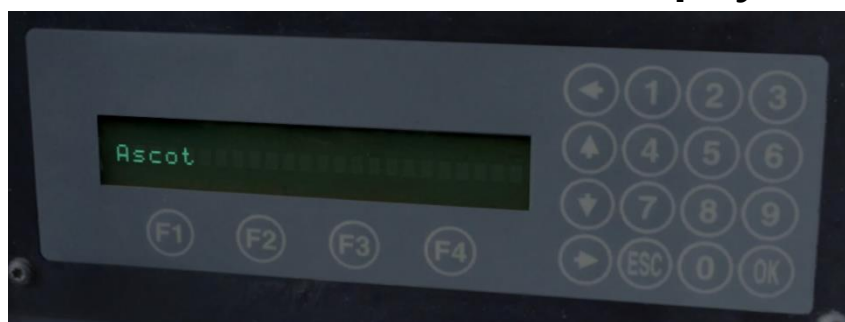
Please see below for how to uncouple from another class 444 or 450:

- 1) Ensure you are in the cab of the vehicle you are uncoupling from and wish to stay in after uncoupling.
- 2) Ensure the master key is 'On' and move the reverser to 'Neutral'. The cab will not be 'live' as you are still coupled to another unit.
- 3) Uncouple using the F3 or F4 HUD.
- 4) Press the 'Uncouple' button on the cab desk. This will 'liven' up the cab.

## **Automatic Unit Numbering**

When placing a unit in the scenario editor or using one in Quick Drive, all vehicles will automatically be given correct unit and coach numbers, instead of you having to select each vehicle and changing their number manually so they match. The unit number is controlled via the DMC1 coach if you wish to change it.

## User Controllable Destination Display



The external destination display has been made controllable by pressing **F7** or **F8**. Also, as shown above, the display in the cab now shows the current destination displayed. Finally, the destination can be set via the unit's number in the scenario editor by adding **;D=x** to the end of the DMC1's number. Please see below for a list of the available destinations and the relevant number you need to insert in place of 'x':

1 - Aldershot	26 - Hounslow via Richmond	51 - Shepperton
2 - Alton	27 - London Waterloo	52 - Southampton Central
3 - Ascot	28 - London Waterloo Fast Service	53 - Southampton Central Fast Service
4 - Ascot via Aldershot	29 - London Waterloo Stopping Service	54 - Southampton Central Stopping Service
5 - Basingstoke	30 - London Waterloo via Basingstoke	55 - Staines
6 - Basingstoke Stopping Service	31 - London Waterloo via Brentford	56 - Staines via Hounslow
7 - Bournemouth	32 - London Waterloo via Hounslow	57 - Surbiton
8 - Bournemouth Fast Service	33 - London Waterloo via Richmond	58 - Virginia Water
9 - Bournemouth Stopping Service	34 - London Waterloo via Surbiton	59 - Wareham
10 - Branksome	35 - London Waterloo via Winchester	60 - Weybridge
11 - Brighton	36 - Lymington Pier	61 - Weybridge via Hounslow
12 - Brockenhurst	37 - Poole	62 - Weymouth
13 - Clapham Junction	38 - Poole Fast Service	63 - Weymouth Fast Service
14 - Dorking	39 - Poole Stopping Service	64 - Weymouth Stopping Service
15 - Eastleigh	40 - Portsmouth Harbour	65 - Winchester
16 - Fareham	41 - Portsmouth Harbour Fast Service	66 - Windsor & Eton Riverside
17 - Farnborough	42 - Portsmouth Harbour Stopping Service	67 - Woking
18 - Farnham	43 - Portsmouth Harbour via Basingstoke	68 - South West Trains
19 - Fratton	44 - Portsmouth & Southsea	69 - Sorry, Not in Service
20 - Fratton Stopping Service	45 - Portsmouth & Southsea Fast Service	70 - Empty to Depot
21 - Guildford	46 - Portsmouth & Southsea Stopping Service	71 - Special
22 - Guildford via Aldershot	47 - Portsmouth & Southsea via Basingstoke	72 - Chessington South
23 - Haslemere	48 - Reading	73 - Brockenhurst Stopping Service
24 - Havant	49 - Richmond	74 - Epsom
25 - Hounslow via Brentford	50 - Richmond via Hounslow	

## Global System for Mobile Communication-Railway (GSM-R)



Beginning in 2013 and completed by 2016, Global System for Mobile Communication - Railway, more commonly known as GSM-R, replaced the existing National Radio Network (NRN) & Cab Secure Radio (CSR) systems. This communication system and its accompanying unit has been simulated to the best of our ability within the simulator. Please see below for how to register & deregister your train:

### **Registering**

- 1) Move the reverser away from 'Off' or hold down either the 'Registration' or 'Accept' button for 5 seconds. The GSM-R unit will begin a boot up sequence.
- 2) When 'GSM-R GB' appears, the unit has successfully booted.
- 3) Press the 'Registration' button in the top right-hand corner.
- 4) Using the numerical keys, insert your 4-character train reporting number (headcode), followed by the signal number you are standing at in a 3-digit format. For example, signal WH84 would require you to enter '084'. If you wish to delete a character, press the 'x' button.
- 5) Press the '✓' button.
- 6) Registration will take a moment. Once it has completed, you will hear a double beep and the train reporting number will appear in the top right-hand corner of the display.



## ***Deregistering - Method 1***

If you are closing down the driving desk, use this method.

- 1) Move the reverser to 'Off'.
- 2) Deregistration will automatically begin and you will be given the opportunity for a short moment to retain the registration by pressing the '✓' button. Simply do nothing if you would like to continue with the deregistration.
- 3) Deregistration will take a moment. Once it has completed, the train reporting number will no longer be displayed.

## ***Deregistering - Method 2***

If you wish to keep the driving desk active after deregistering, use this method.

- 1) Press the 'Registration' button in the top right-hand corner.
- 2) A prompt will appear on the unit saying 'Confirm deregister?'.
- 3) Press the '✓' button.

Deregistration will take a moment. Once it has completed, the train reporting number will no longer be displayed.

## **Depot Preparation Procedure**

Class 444s/450s are rarely 'cut out' so a 'cold start' is not offered in this pack. When a unit is prepared for service though, there is a certain procedure that must be followed and we have simulated that.

To carry out this procedure, please follow the instructions below:

- 1) Insert the master key by pressing **Shift+W**.
- 2) Move the reverser to 'Neutral' by pressing **W**.
- 3) Reset the AWS self-test by pressing **Q**.
- 4) Turn the High Speed Circuit Breaker (HSCB) off by pressing **Shift+O**.
- 5) Turn the battery off by pressing **Shift+U**.
- 6) Wait 30 seconds and turn the battery on by pressing **U**.
- 7) Turn the HSCB on by pressing **O**.
- 8) Carry out a 'Main Brake Check' via the TMS.
- 9) If required, turn on the saloon lighting via the TMS.
- 10) Acknowledge your configuration via the TMS.

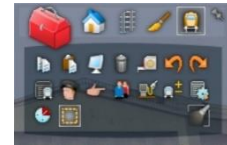
After carrying out this procedure, your unit will be successfully prepared,

## AI Horns

To blow an AI train's horn in a scenario, you must edit the speed limit properties of the section of the track at which you would like the AI train to sound its horn. Please see below for instructions:

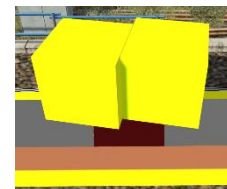
- 1) In the scenario editor, go to the location at which you would like the AI train's horn to sound, and press **Spacebar** 3 times. The track will now display a certain colour which represent its speed limit.

- 2) Go to the top-left-hand fly-out and click the 'Select' icon.

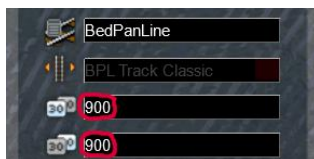


- 3) Hover your mouse over the piece of track where you like the AI horn to sound. A yellow border will appear around the track when it is selected.

- 4) Click and drag the yellow box in either direction until the measurement reading at the bottom of the screen says at least '1.0 metres'.



- 5) Go to the right-hand fly-out and change the two 'Speed Limit' values to '900'.



- 6) Click outside of any menus and the section of track you selected will now say 'Unspecified'. Any AI train which passes over this section of track will now blow its horn.

The manner in which the AI train blows its horn is randomly calculated each time, meaning no horn is ever the same. You may hear a single tone (any post-2007 liveries only), a two tone, a three tone, or now and then, even the infamous 'Ilkley Moor' sequence.

If you wish to be more specific in how and when the horn is sounded, please see the table below for values other than '900' which can be inputted in the speed limit field for different behaviour:

Speed Limit Value	Notes
900	Random number of tones
901	1 tone (low)
902	1 tone (high)
903	2 tone (low/high)
904	2 tone (high/low)
905	3 tone (low/high/low)
906	3 tone (high/low/high)
907	'Ilkley Moor' sequence
921	Same as 900 but 1 in 20 (5%) chance of horn sounding
922	Same as 900 but 1 in 16 (6.3%) chance of horn sounding
923	Same as 900 but 1 in 12 (8.3%) chance of horn sounding
924	Same as 900 but 1 in 8 (12.5%) chance of horn sounding
925	Same as 900 but 1 in 6 (16.6%) chance of horn sounding
926	Same as 900 but 1 in 4 (25%) chance of horn sounding
927	Same as 900 but 1 in 3 (33.3%) chance of horn sounding
928	Same as 900 but 1 in 2 (50%) chance of horn sounding
929	Same as 900 but 1 in 1.33 (75%) chance of horn sounding
930	Same as 900 but intended for use at platform ends*
931	Same as 921 but intended for use at platform ends*
932	Same as 922 but intended for use at platform ends*
933	Same as 923 but intended for use at platform ends*
934	Same as 924 but intended for use at platform ends*
935	Same as 925 but intended for use at platform ends*
936	Same as 926 but intended for use at platform ends*
937	Same as 927 but intended for use at platform ends*
938	Same as 928 but intended for use at platform ends*
939	Same as 929 but intended for use at platform ends*
940	Whistle boards**
950	Tunnels***

\* **Platform ends** - Horn will sound only if train is travelling over 50mph, which at platforms of 12 car length or less, ensures that stopping trains do not sound their horn. Also, the point at which the train sounds its horn randomly varies from 1m to however fast the train is travelling. For example, if a train is passing at 125mph, the maximum possible distance it will sound its horn away from the trigger point is 125m. This simulates the propensity for drivers to sound their horn earlier if they are travelling at speed.

**\*\* Whistle boards** - Intended for use at whistle boards. Pre-2007, trains sounded at least two tones at all times of day. From April 2007, following increasing concerns about noise, drivers were instructed to use only a single low tone and only between the hours of 07:00 & 23:00. This was later changed to between 06:00 & 23:59 in 2016.

To simulate this, any pre-2007 liveries will exhibit pre-2007 behaviour (at least two tones/no time restriction) and any post-2007 liveries will exhibit a hybrid of post-2007 & 2016 behaviour (single low tone/between 06:00 & 23:59 only). The point at which the horn sounds varies randomly from 1m to 40m away from the trigger point.

**\*\*\* Tunnels** - Historically, trains always blew their horn when entering & exiting tunnels to warn potential track workers of their presence. With increased health & safety regulations reducing the presence of track workers in 'live' tunnels, and to allay complaints of increasing noise pollution due to louder modern horns, this requirement was removed on Saturday 6<sup>th</sup> November 2004.

To simulate this, any pre-2004 liveries will sound at least two tones. The point at which the horn sounds varies randomly from 1m to 40m away from the trigger point.

Whilst these tools are primarily intended for use by scenario creators, they can also be used by route editors to 'bake' these features into a route. The platform end, whistle board & tunnel values being of particular use in this respect.

Finally, due to the custom speed limits being of such a short distance, they do not affect AI train performance or appear as the current speed limit on the F3/F4 HUD. Also, assuming the route you are using is configured to only show signed speed limits (the majority do this), custom speed limits will not appear in the part of the F3/F4 HUD which shows forthcoming speed limit changes.



## Bits and Bobs

This section is dedicated to aspects of this pack that don't warrant a dedicated section but are still of note:

- The acceleration and braking physics differ between the Class 444 & 450 as per reality.
- Correct push button functionality for cab light switch.
- Power reduction button reduces power output by 50%.
- Visual alarms outside of cab when AWS or DVD are active.
- Amended cab camera angle.
- In-cab unit and vehicle numbers added.
- The visible driver automatically moves to whichever cab you are in.
- Doors locked button changed to be blue as per reality.
- 1 second delay between train passing over AWS magnet and AWS warning sound occurring. The F3/F4 HUD will show the warning immediately so you must wait 1 second before trying to cancel it.
- The headlights only provide illumination before sunrise and after sunset. This is to avoid the unrealistic appearance of projected light in broad daylight.
- Main headlight texture amended to be more orange
- Colours amended on default South West Trains livery
- Texture sizes reduced to improve performance

# Setting up the Driver's Cab

Please follow these steps to set up the cab so you are ready to move:

- 1) Turn the master key in by pressing **Shift+W**.
- 2) Move the reverser to the 'Neutral' position by pressing **W**.
- 3) Cancel the AWS self-test alarm by pressing **Q**.
- 4) Turn the headlights on by pressing **H**.
- 5) Acknowledge your configuration via the TMS by pressing **Ctrl+1**.
- 6) Set your destination by pressing **F7** or **F8**.
- 7) Turn the Driver Reminder Appliance (DRA) off by pressing **Y**.

You should now be ready to move off.

## Scenarios

### **APC450EP: 2L30 09:54 Basingstoke - Waterloo**

Route = Portsmouth Direct Line - London to Portsmouth

Track covered = Woking - Waterloo

Traction = Ex-South West Trains (SWR) 444021

Year = 2017

Duration = 40 minutes



### **APC450EP: 5F01 05:49 Wimbledon Park Depot - Woking**

Route = Portsmouth Direct Line - London to Portsmouth

Track covered = Wimbledon Park Depot - Woking

Traction = South West Trains 450030, 450119 & 450025

Year = 2017

Duration = 30 minutes



## Credits

**Nicolas Schichan** - Advanced scripting

**Alan Hingston** - Assistance in recording sounds and providing invaluable knowledge on the operation of these units