

Class 325

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 325 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, make sure you have the requirements installed, 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.

Liveries

Royal Mail - RM1



Royal Mail Revised - RM2



Keyboard Controls

Non-standard keyboard controls are listed below:

Ctrl+P -	AC select button
L -	Cab light ON/OFF
Ctrl+O -	DC select button
E -	Deadman's pedal (DVD reset)
R -	Door close button
Ctrl+R -	Door operation toggle
U -	Door release buttons (left)
O -	Door release buttons (right)
Ctrl+D -	Driver vigilance device (DVD) ON/OFF
H -	Headlight switch CLOCKWISE
Shift+H -	Headlight switch ANTI-CLOCKWISE
Shift+W -	Master key IN/OUT
Shift+P -	Pantograph down button
P -	Pantograph up/reset button
K -	Tail lights switch ON/OFF
Ctrl+Numpad Enter -	Visual aids ON/OFF
V -	Wiper switch CLOCKWISE
Shift+V -	Wiper switch ANTI-CLOCKWISE

Features

Driver Only Operation (DOO)

Whilst in reality, the payload roller shutter doors are opened and closed by the platform/terminal staff, we have still included the option for you, the driver, to control them. Please see below for what the relevant procedure is and how to change the type of operation whilst in-game:

Driver Only Operation (DOO)

- 1) Open the doors by pressing **T+U** (left-hand side) or **T+O** (right-hand side). Alternatively, you can click the corresponding red buttons in the cab.
- 2) If at a platform, wait for the 'Platform Duties Complete' message to appear in the top-right corner and press **R** to close the doors. If not at a platform, press **R** whenever you wish.
- 3) Once the door interlock light illuminates, you may depart.

Staff Operation

- 1) Open the doors by pressing **T**.
- 2) Doors will be closed by the platform/terminal staff once loading has finished.
- 3) Once the door interlock light illuminates, you may depart.

How to Change Operation

This can be changed in-game by pressing **Ctrl+R** which will produce a visual message in the top-right hand corner of the screen to let you know which option you have selected.

Adhesion

Adhesion between a train's wheels and the rails plays a big part in allowing a train to accelerate or brake. Too little of it and the train will slip or slide. There are a myriad of factors that control the level of adhesion and we have attempted to simulate the most important of these to give a varied and realistic driving experience:

Season

Adhesion is generally good in dry conditions during summer and spring. Slightly decreased adhesion during winter to take account of the increased amount of moisture and possible ice on the rails due to cooler temperatures. Much decreased adhesion during autumn due to leaf mulch.

Weather

Adhesion decreases in wet weather, especially so when rain first starts falling before it has had a chance to clean the railhead. If rain is light, it will take longer for the railhead to be cleaned whereas heavy rain will clean it quicker, resulting in adhesion recovering sooner.

When using the drizzle weather pattern in our Sky & Weather Enhancement Pack, adhesion is particularly poor as the rain hasn't enough force to clean the railhead but still makes it sufficiently wet to worsen adhesion.

Time of Day

Adhesion will decrease somewhat after dusk as the air cools and dew is more likely to form on the railhead. This persists throughout the night until around an hour after sunrise when higher temperatures or the sun dry it out. In our simulation, this factor is reduced during summer to account for warmer temperatures, which on average result in less dew.

Tunnels

When adhesion is poor due to external factors such as weather or season, adhesion will generally improve upon entering a tunnel, which is not as susceptible to these factors. When adhesion is good during dry weather and outside of autumn, adhesion may decrease a little upon entering a tunnel due to their damp nature.

Wheelslip

Wheelslip protection aids the driver when powering or braking during times of poor adhesion.

When wheelslip is encountered during acceleration, a two-stage process takes place:

- 1) The motors can be heard rising rapidly in pitch and power quickly falls to control the slip.
- 2) The motors revert to their normal pitch and power returns to the notch selected on the power handle.

As a driver, you must assess which power notch is most suitable for the conditions and balance the occurrence of wheelslip with the maximum possible rate of acceleration.

Wheelslide

When wheelslide is encountered during braking, a two-stage process takes place:

- 1) Brake pressure is automatically reduced to try and control the slide.
- 2) Once the slide stops, brake pressure is returned to the notch selected on the brake handle. If wheelslide reoccurs, the process starts again.

As a driver, you must resist the temptation to reduce the brake yourself as the wheelslip protection will offer the best braking performance.

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.

Neutral Section Functionality

The class 325 will react to the neutral sections available on the WCML Over Shap route and any other route which recreates neutral sections in the same manner. On top of this, they will also function when our own markers and signage are placed in a scenario, which are available in the 'AP/Common' object set filter folder.

Dual Voltage Functionality

Follow the instructions below to change the power source from AC (overhead wires) to DC (third rail) and vice versa.

AC to DC

- 1) Ensure the reverser is in 'Neutral'.
- 2) Press the 'Pan Down' button by pressing **Shift+P**.
- 3) Press the 'DC System Select' button by pressing **Ctrl+O**.
- 4) Press the 'Pan Up/Reset' button by pressing **P**.
- 5) If the line light is illuminated, you have successfully changed to DC.

DC to AC

- 1) Ensure the reverser is in 'Neutral'.
- 2) Press the 'AC System Select' button by pressing **Ctrl+P**.
- 3) Press the 'Pan Up/Reset' button by pressing **P**.
- 4) If the line light is illuminated, you have successfully changed to AC.

Bodyside Interlock Lights

Over the years, there has been a degree of mystery surrounding the blue bodyside lights on these units which are often seen illuminated on the move. After consulting official documentation and online sources, the consensus appears to be that these are interlock lights for the doors, which illuminate if a door on the relevant vehicle has not been securely latched closed. When these units were pressed into service however, it was agreed that all containers within the train would be secured with webbing straps whilst in transit. Therefore, it was no longer considered a safety issue if the doors were not securely closed and as a result, these lights have been ignored by rail staff ever since. So much so, there is even an entry in the Rule Book to this effect.

To simulate this, the blue bodyside interlock lights will remain lit on some vehicles once the doors are closed. Each vehicle has been given a 50/50 chance of whether they will stay lit or not and this is recalculated every time the doors are closed.

Arcing Pantograph



Special attention has been given to simulating arcing between the pantograph and overhead wire.

From one hour after sunrise to one hour after sunset on a dry day, there is only light arcing.

From one hour after sunset to one hour after sunrise, there is moderate arcing to simulate the moisture that tends to build up on the overhead wire once night falls. There is also moderate arcing when raining at any time of day.

During the winter, from one hour after sunset to one hour after sunrise, there is heavy arcing to simulate ice/frost that tends to build up on the overhead wire once night falls. There is also heavy arcing when snowing at any time of day during the winter.

Finally, arcing becomes more frequent as you gain speed.

When arcing, you will visually see it on the pantograph which illuminates the area around it to a varying degree with each arc. Please note that the illumination of the surrounding area will only occur after sunset and before sunrise. This is to avoid the unrealistic appearance of projected light in broad daylight.

You will also audibly hear it if the arcing is moderate or heavy.

Variable Power & Brake Performance

Any train driver will tell you that especially on older stock, braking and power performance can vary quite noticeably from unit to unit, despite being within the same class. We have simulated this variance by randomly allocating a 'Brake Factor' & 'Power Factor' every time you drive a unit in the simulator. This factor can reduce or increase performance by a maximum of 8% either way. There is no way of finding out what factor your unit has been allocated except for assessing its 'feel' when powering or braking; just like a real driver!

Variable Traction Motor Volume

Class 325s are known for their loud traction motors but in reality, some were louder than others. To simulate this, we have implemented a random 'Motor Factor' to each motor bogie which ranges from 1 to 6; 1 being the quietest and 6 being the loudest. This can not be changed by the player.

Dead Variant

When working on unelectrified lines or due to unreliability, these units have often been hauled by a locomotive. Dedicated 'Dead' variants are provided for this purpose and are available in the scenario editor with a '(Dead)' suffix in the 'Rolling Stock' section. The key features of this variant are:

- Correct unpowered physics
- Correct unpowered sounds. Only 'run' sounds are audible.
- Bodyside indicator lights, headlights and tail lights are off
- A tail lamp can be attached to a DPV by adding **;TL=1** to the DPV vehicle number.

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 PMV vehicle if you wish to change it.

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:

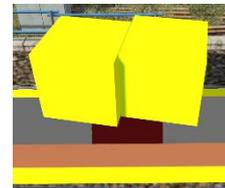
- 1) In the scenario editor, go to the location at which you would like the AI train's horn to sound, and press **Spacebar** 3 times. The track will now display a certain colour which represent its speed limit.

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

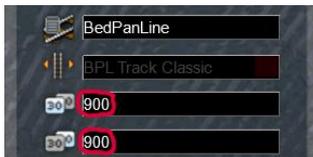


- 3) Hover your mouse over the piece of track where you like the AI horn to sound. A yellow border will appear around the track when it is selected.

- 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 6th 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:

- Visual cab improvements including high resolution button/switch labels, new illuminated button/gauge visuals, new TPWS unit visuals, correct power/brake controller markings and numerous other minor improvements.
- Functioning master key
- Working in-cab clock to the left of the speedometer
- 4-step reverser (off/forward/neutral/reverse).
- Reverser and power brake controller re-animated for more realistic motion
- DVD isolation light to the top-left of the driver, as well as 'Safety System Isolated' indicator on the desk.
- Functioning brake hold button which applies the equivalent of step 1 brake.
- Amended cab camera angle
- A special 'bogie cam' is available if you switch to the right-hand 'head-out' view (**Shift+2 THEN Right Arrow**).
- Slow & fast wiper speeds.
- Wipers operate on AI services if it's raining
- Visual alarms outside of cab when AWS or DVD are active.
- The visible driver automatically moves to whichever cab you are in.
- Compressor momentarily rises in pitch when taking power; just like the real thing
- 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.
- Unrealistic aerofoils removed from pantograph
- The headlights only provide illumination before sunrise and after sunset. This is to avoid the unrealistic appearance of projected light in broad daylight.
- High quality headlight/marker light & tail light visuals, including LED variant on 325007.
- Nameplates for 325002, 325006 & 325008.
- 7 overhead line warning sticker variations

How to Use in the Scenario Editor

How to place

To place in the scenario editor, please follow the instructions below:

- 7) In the left-hand rolling stock fly-out, click the object set filter which looks like a blue box with an orange arrow to the right of it.



- 8) Go to the right-hand fly-out which should have appeared. Select 'RSC' from the drop-down menu.



- 9) Tick the second & third box beside 'Class325Pack01'.



- 10) The liveries should now be visible in the left-hand rolling stock fly-out.



Formation

DPV(A) + PMV + TAV + DPV(B)

Numbering

When placing in the scenario editor, you are able to control a number of features via the number of the unit.

Tail Light

Add a tail light to a DPV(A) or DPV(B) vehicle by adding **;TL=1** to the relevant DPV vehicle.

Logo

To change the logo displayed on Royal Mail 1 livery, add **;L=x** to the PMV number.

- x = 1** - Royal Mail (English crown) & ABB logo
- x = 2** - Royal Mail (Scottish crown) & ABB logo
- x = 3** - Royal Mail (English crown)
- x = 4** - Royal Mail (Scottish crown)
- x = 0** - Unbranded (also useable on Royal Mail 2 livery)

Overhead Line Warning Stickers

There are seven different types of overhead line warning stickers represented. Add **;OHL=x** to the PMV number for your desired option.

- x = 1** - old style (behind glass) - x1 front
- x = 2** - old style - x1 front (left)
- x = 3** - new style - x1 front (left)
- x = 4** - new style - x2 front (left & right)
- x = 5** - new style - x1 front (right)
- x = 6** - new style (behind glass) - x1 front (right)
- x = 0** - no stickers

LED Lights

For LED headlight, marker lights & tail lights, add **;LED=1** to the PMV number.

Nameplate

If you wish to hide the nameplate on 325002, 325006 or 325008, add **;NP=0** to the PMV number.

Reversing Motor Whine

When changing direction, the motors will make a distinctive high pitch whining sound that slowly fades away over time. After one reversal, this sound activates automatically but to enable it at the start of a scenario, add **;RW=1** to the PMV number. This is mostly intended to be used when a scenario starts at a terminus.

Example PMV Number

325007;L=1;OHL=6;LED=1

Key:

325007 - Unit number

;L=1 - Royal Mail (English crown) & ABB logo

;OHL=6 - Overhead line warning sticker (new style, behind glass, x1 front (right))

;LED=1 - LED lights

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 **S**.
- 3) Cancel the AWS self-test alarm by pressing **Q**.
- 4) Turn the tail lights off by pressing **K**.
- 5) Turn the marker light and headlight on by pressing **H**.

You should now be ready to move off.

Scenarios

APC325EP: 1M19 19:47 Doncaster RMT - Willesden PRDC

Route = ECML London - Peterborough
Track covered = Peterborough - King's Cross Freight Jn
Traction = Royal Mail 325008
Year = 2003
Duration = 50 minutes



APC325EP: 1M80 21:47 Low Fell RMT - Willesden PRDC

Route = ECML London - Peterborough
Track covered = Hitchin - King's Cross
Traction = Royal Mail 325007
Year = 2013
Duration = 65 minutes



APC325EP: 1S04 16:01 Willesden PRDC - Edinburgh

Route = ECML London - Peterborough
Track covered = King's Cross Freight Jn - Peterborough
Traction = Royal Mail 325006, 325009 & 325013
Year = 2000
Duration = 70 minutes



Credits

Nicolas Schichan - Advanced scripting

Lewis Clowes - Texturing

Thameslink - Assistance in recording sounds