Class 700/707/717 Enhancement Pack

Contents

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 700-707-717 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

Class 700

Thameslink:

with old Thameslink logo - *TL1*

with revised Thameslink logo - *TL2*

Class 707

South West Trains:

with South West Trains logo- *SWT*

with South Western Railways logo- *Ex-SWT (SWR)*

without logo - *Ex-SWT*

South Eastern - *SE*

Class 717

Great Northern - *GN*

Please note, this does not include a realistic cab, but uses the Class 700 cab instead. For this reason, we recommend it is only used as AI, but it is still driveable if you wish.

Keyboard Controls

Non-standard keyboard controls are listed below:

Ctrl+Z -	Battery off button
Z -	Battery on button
L -	Cab light (main) switch ON/OFF
Shift+L -	Cab light (spot) switch ON/OFF
E -	Deadman's pedal (DVD reset)
N -	Depot horn
F7 -	Destination display DOWN
F8 -	Destination display UP
R -	Door close button
U -	Door release buttons (left)
O -	Door release buttons (right)
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
Shift+W -	Master key IN/OUT
F -	Passenger alarm unit (PAU) override button
Ctrl+R -	Passenger door operation toggle GO/GO (SDO)/DOO/DOO (SDO)
Shift+P -	Power supply switch OFF
P -	Power supply switch ON
X -	Sanding button
Ctrl+O -	Saloon lights ON/OFF
Ctrl+Numpad Enter -	Visual aids ON/OFF
V -	Wiper switch CLOCKWISE
Shift+V -	Wiper switch ANTI-CLOCKWISE

Features

Traction Physics

Great care has been taken to try and accurately simulate the acceleration characteristics of this train. The main two differences are whether you are in AC (overhead wires) or DC (third rail) power mode.

On AC, acceleration is very brisk and constant to around 22 mph, where it then begins to tail off. 100 mph can be reached with ease.

On DC, initial acceleration is still good at around 80% of the rate of AC and stays constant once again until around 22 mph, where it then begins to tail off.

Also of note on DC, 12 car 700/1s take even longer to accelerate so as restrict their draw on the third rail power network.

Brakes

Friction Brake

Conventional friction braking is blended in below 7 mph or if the driver reminder appliance (DRA) is on. Unlike other trains, it is not used instead of the dynamic brake during wheelslide or an emergency brake application.

Dynamic Brake

When the friction brake is not being used as described above, dynamic braking uses the traction motors to slow the train.

Holding Brake

A holding brake is provided to prevent an uncontrolled rollaway whilst the train is at a stand. The holding brake applies a friction brake application of approximately 1 bar when the train is at a stand. The power brake controller must also not be in a power notch. The holding brake is released as soon as traction power is applied.

Emergency Brake

An emergency brake application is approximately 10% stronger than 'Full Service' and occurs in the following circumstances:

- Moving the power brake controller to the 'E' position
- Pressing the emergency brake plunger
- Failure to acknowledge an AWS warning or Driver Vigilance Device (DVD)
- Moving the master key to 'Off'

- Moving the reverser to ‘Neutral’ above 6 mph
- Pressing the door release buttons above 6 mph

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 at times of poor adhesion.

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

1) The sanding button illuminates. Assuming you are above 5 mph, sand can be applied by pressing this button for as long as it remains illuminated.
2) The motors can be heard rising rapidly in pitch and power reduces to control the slip.
3) Once grip is regained, power is reapplied at the notch selected on the power brake controller.

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 multi-stage process takes place:

1) The sanding button illuminates and sand is automatically applied.
2) Brake force is automatically reduced to try and control the slide.
3) Once the slide stops, brake force is returned to the notch selected on the power brake controller. 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.

Dual Voltage Functionality

Follow the instructions below to change the power source from AC (overhead wires) to DC (third rail) and vice versa. This is not applicable to Class 707s which operate on DC only.

AC to DC

1) Ensure the reverser is in 'Neutral'.
2) Move the power supply switch to 'Off'. It will illuminate to show that power has been lost.
3) Move the power mode switch to 'DC'. It will start flashing. Wait until it solidly illuminates.
4) Move the power supply switch to 'On'. It will start flashing. On the Class 717, the third rail shoes will lower. On the Class 700, the shoes are fixed in the lowered position.
5) When the power supply switch stops flashing, you have successfully changed power mode. The power mode switch will extinguish once you start moving.

DC to AC

1) Ensure the reverser is in 'Neutral'.
2) Move the power supply switch to 'Off'. It will illuminate to show that power has been lost.
3) Move the power mode switch to 'AC'. It will start flashing. Wait until it solidly illuminates.
4) Move the power supply switch to 'On'. It will start flashing and the pantograph will raise.
5) When the power supply switch stops flashing, you have successfully changed power mode. The power mode switch will extinguish once you start moving.

Neutral Section Functionality

This train 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.

When passing through a neutral section, the power supply switch will illuminate to indicate loss of overhead and traction power. When overhead power returns, the power supply switch will flash for a short time and traction power will be available again.

Driver Only & Selective Door Operation (DOO/SDO)

Full door control is featured in this pack to simulate 'DOO'. 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).
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.

Guard Operation (GO)

1) Open the doors by pressing **T+U** (left-hand side) or **T+O** (right-hand side).
2) Doors will be closed by the guard once passengers have finished boarding/alighting.
3) Once the door interlock light illuminates, the guard will give two signal beeps which you must acknowledge by also giving two signal beeps. This can be carried out by pressing **C** twice.

Selective Door Operation (SDO)

A simple form of selective door operation is also available in this pack where the doors will only open on coaches that are next to a platform. This uses the core system in Train Simulator to assert this so is reliant on the platforms on your chosen route having been laid correctly.

How to Change Operation

The four operations (**GO**/**GO (SDO)**/**DOO**/**DOO (SDO)**) can be cycled through by pressing **Ctrl+R**. A visual message in the top-right hand corner of the screen will confirm which option you have selected.

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 'DMOCA' vehicle if you wish to change it.

Player Changeable Destination Display

The destination display on the front of the train can be changed during a scenario by pressing either the F7 or F8 keys. Please see below for a list of the available destinations and their relevant code if you wish to use them via the unit's number on an AI service:

Thameslink

a - Blank	s - Gravesend	K - Rainham
b - Ashford International	t - Haywards Heath	L - Redhill
c - Baldock	u - Hertford North	M - Rochester
d - Bedford	v - Hitchin	N - Royston
e - Brighton	w - Horsham	O - Sevenoaks
f - Cambridge	x - Huntingdon	P - St Neots
g - Cambridge North	y - Kentish Town	Q - St Pancras International
h - City Thameslink	z - Kings Lynn	R - St Albans City
i - Crawley	A - Letchworth Garden City	S - Stevenage
j - Dartford	B - Littlehampton	T - Sutton
k - East Croydon	C - London Blackfriars	U - Three Bridges
l - East Grinstead	D - London Bridge	V - Welwyn Garden City
m - Elephant and Castle	E - London Kings Cross	W - West Hampstead Thameslink
n - Ely	F - London Victoria	X - Wimbledon
o - Farringdon	G - Luton	Y - Not in Service
p - Finsbury Park	H - Maidstone East	Z - Check Station Screens
q - Gatwick Airport	I - Orpington	
r - Gillingham	J - Peterborough	

Great Northern

a - Blank	h - Hitchin	o - Royston
b - Alexandra Palace	i - Huntingdon	p - St Neots
c - Baldock	j - Kings Cross	q - Stevenage
d - Drayton Park	k - Letchworth Garden City	r - Watton-at-Stone
e - Finsbury Park	l - Moorgate	s - Welwyn Garden City
f - Gordon Hill	m - Peterborough	t - Not in Service
g - Hertford North	n - Potters Bar	

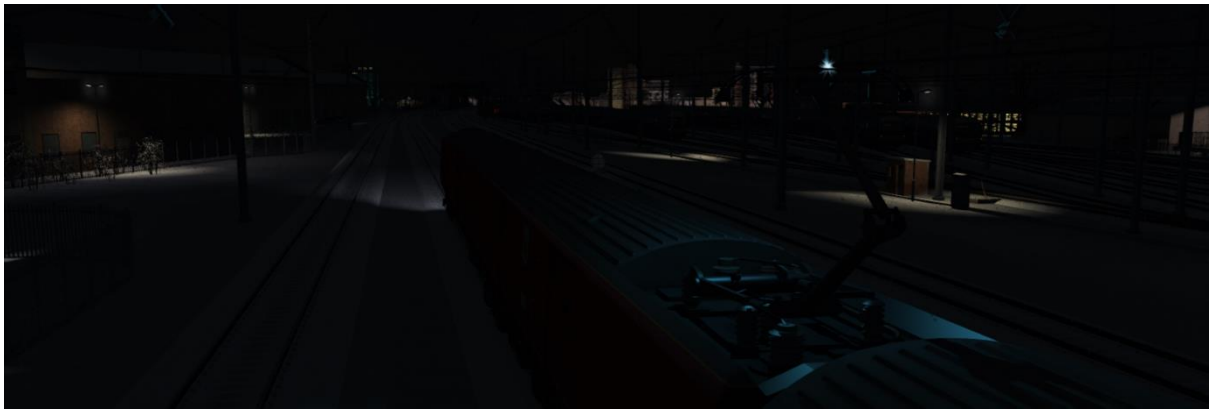
South West Trains / South Western Railway

a - Blank	j - Farnham	s - Twickenham
b - Aldershot	k - Guildford	t - Waterloo
c - Alton	l - Hampton Court	u - Weybridge
d - Ascot	m - Hounslow	v - Wimbledon
e - Brentford	n - Kingston	w - Windsor and Eton Riverside
f - Chessington South	o - Reading	x - Woking
g - Clapham Junction	p - Shepperton	y - Not in Service
h - Dorking	q - Staines	z - Check Station Screens
i - Epsom	r - Strawberry Hill	

South Eastern

a - Blank	**i - Gillingham**	**q - Rochester**
b - Barnehurst	**j - Gravesend**	**r - Sevenoaks**
c - Beckenham Junction	**k - Grove Park**	**s - Sidcup**
d - Blackfriars	**l - Hayes**	**t - Slade Green**
e - Bromley North	**m - Kent House**	**u - Strood**
f - Cannon Street	**n - Lewisham**	**v - Victoria**
g - Charing Cross	**o - London Bridge**	**w - Not in Service**
h - Dartford	**p - Orpington**	**x - Check Station Screens**

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 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.

Cold Start

'Cold Start' means the unit is in the following state when it loads:

- Main reservoir & brake cylinder pressures are 0.
- Battery is off

To prepare a unit from cold, please follow the instructions below:

1) Hold the 'Battery On' button down for a couple of seconds by pressing **Z**.

2) Turn the master key in by pressing **Shift+W**.

3) Acknowledge the AWS self-test by pressing **Q**.

4) Acknowledge the Passenger Alarm Unit self-test by pressing **F**.

5) Depending on which power mode you require (AC or DC), move the power mode switch to the relevant position. Once this switch solidly illuminates, the power mode has been successfully selected.

6) Move the power supply switch to 'On' by pressing **P**. In 'AC' mode, this will start the auxiliary compressors to charge the auxiliary air system so as to allow the pantograph to be raised. To monitor its progress, move the power supply switch to 'On' by pressing **P**. Once sufficient pressure has built up, move the power supply switch to 'On' by pressing **P** and this will raise the pantograph.

7) Once the power supply switch stops flashing, your train is now connected to the relevant power mode. You must now wait for main reservoir pressure to build to 7.2 bar. Once it has done so, you will be able to obtain a brake release.

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

Bits and Bobs

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

- Newly modelled front to represent the Class 717 within the limitations of the original Class 700 model.
- Pantograph monitoring light illuminates pantograph.
- High quality head/marker/tail light textures and accurate light combinations.
- Improved bodyside indicator light visuals.
- Dynamic brake fan visuals added to underframe of motor vehicles.
- Full Length Unit (FLU) & Reduced Length Unit (RLU) stickers added to Class 700 cab.
- Cab window reflections reduced
- Appearance of DMI (driver's screen) improved with the addition of dust and higher contrast
- Brake cylinder gauge amended to look more accurate.
- Brake cylinder gauge needles are now illuminated and visible at night.
- Cab camera position amended so more of the cab desk is visible.
- Additional secondman cab camera position.
- Additional passenger view camera angles on Class 700.
- Saloon lights brightened and colour temperature increased to look cooler.
- First class antimacassars in passenger view improved in appearance
- Improved ceiling lights and passenger information screens in passenger view.
- Correctly notched power brake controller
- Master key will not move if reverser is in 'Forward' or 'Reverse'.
- Power brake controller will not move into a power notch unless the reverser is in 'Forward' or 'Reverse'.
- Reverser will not move if power brake controller is in a power notch.
- Prototypical cab light rocker switch.
- Lights automatically revert to tail lights when master key is moved to 'Off'.

- ‘Dipped’ headlights should be used for normal running. ‘Full Beam’ is only required when inspecting the line at night.
- Door interlock light only illuminates below 5 mph.
- Driver Vigilance Device (DVD) sounds every 60 seconds when the reverser is in ‘Forward’ or ‘Reverse’, unless you sound the horn, reset the AWS or move the power brake controller.
- ‘Major Alarm’ button illuminates on cab desk when ‘DVD’ is disabled.
- Variable windscreen wiper frequency.
- Wipers audibly rub against the windscreen when it is not wet.
- Signal button only functions when keyed in and you have door interlock.
- Distinctive air whistle can be heard in the cab and saloon when accelerating or decelerating. This changes in pitch depending on the rate of acceleration/deceleration.
- Different door open alarm on Class 717 compared to Class 700/707.
- Visual alarms outside of cab when AWS or DVD are active.
- The visible driver automatically moves to whichever cab you are in.
- Right-hand ‘head-out’ view located next to the rear driving vehicle bogie. A great spot to listen to the traction motors!
- Class 700s & 717s have two compressors. Only one operates at a time so as to even out wear. The one which operates is decided on a daily basis by the on-board computer system. The only exception to this is when starting from cold where both compressors operate.
- 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 headlight and pantograph light only provide illumination before sunrise and after sunset. This is to avoid the unrealistic appearance of projected light in broad daylight.
- Wipers operate on AI services if it’s raining.

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) Cancel the AWS self-test alarm by pressing **Q**.
3) Acknowledge the Passenger Alarm Unit self-test by pressing **F**.
4) Check that the headlights are set correctly.
5) Set the correct destination by pressing **F7** or **F8**.
6) Turn the Driver Reminder Appliance (DRA) off by pressing **Y**.

You should now be ready to move off.

How to Use in the Scenario Editor

How to Place

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

1) 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.

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

3) Tick the second & third box beside 'Class700Pack01'.

4) The liveries should now be visible in the left-hand rolling stock fly-out. The numbers in brackets are to assist with placing the vehicles in the correct order.

Numbering

When placing in the scenario editor, you are able to control a number of features via the number of the unit. Please note that unless otherwise stated, the only number you need to change is the DMOCA.

Power Mode

By default, the power mode of a unit is set to 'DC'. For the power mode to default to 'AC' add **;P=AC**. On a player service, this must be added to the number of the lead driving vehicle (DMOCA or DMOCB).

Door Mode

By default, the door mode is set to 'Driver Only Operation'. You can change this default by adding **;D=x**:

- Driver Only Operation (Selective Door Opening). x =**1**
- Guard Operation. x = **2**
- Guard Operation (Selective Door Opening). x =**3**

Cold Start

To activate cold start mode on a player train, add **;Cold=1** to the number of the lead driving vehicle.

Example number:

700001h;P=AC;Cold=1

Key:

700001 - Unit number

h - Destination

;P=AC - AC power mode selected by default

;Cold=1 - Cold start

Scenarios

APC700EP: 5K44 14:47 Bellingham Siding - Orpington

Route = Chatham Main Line: London Victoria to Dover & Ramsgate
Track covered = Bellingham Siding - Orpington
Traction = Thameslink 700019
Date = 16th August 2021
Duration = 30 minutes

APC700EP: 9K44 15:32 Orpington - Luton

Route = Chatham Main Line: London Victoria to Dover & Ramsgate
Track covered = Orpington - London Blackfriars
Traction = Thameslink 700019
Date = 16th August 2021
Duration = 50 minutes

APC700EP: 9Y13 08:16 London Blackfriars - Sevenoaks

Route = Chatham Main Line: London Victoria to Dover & Ramsgate
Track covered = London Blackfriars - Swanley
Traction = Thameslink 700006
Date = 8th November 2021
Duration = 50 minutes

Looking for more scenarios? Find more from us at www.trainsimscenarios.com.

Credits

Nicolas Schichan - Advanced scripting

Gü Studios - Modelling of Class 717 front