Class 31 Enhancement Pack

AP

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 31 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 freely available extra stock pack and 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.

AP

Liveries

BR Blue (with domino marker lights) - *BR Blue 1 AP*

BR Blue (with newer style marker lights) - *BR Blue 2 AP*

BR Blue White Stripe - *BR Blue WS AP*

BR Railfreight Red Stripe - *BR Railfreight Red AP*

BR Railfreight - *BR Railfreight AP*

BR Trainload (Coal, Construction & Petroleum) - *BR Trainload AP*

BR Departmental Grey - *BR Dep Grey AP*

BR Civil Engineers - *BR Civil Eng AP*

InterCity Mainline - *IC AP*

InterCity Swallow - *ICS AP*

Regional Railways - *RR AP*

Mainline - *Mainline AP*

EWS - *EWS AP*

Fragonset Railways - *Fragonset AP*

Wessex Trains:

     with Wessex Trains/Fragonset logos - *WT AP*

     without Wessex Trains/Fragonset logos - *Ex-WT AP*

Network Rail - *NR AP*

DCR Green - *DCR AP*

Keyboard Controls

Non-standard keyboard controls are listed below:

L -	Cab light ON/OFF
Shift+C -	Clag Factor INCREASE
Ctrl+C -	Clag Factor DECREASE
Shift+E -	Electric Train Supply (ETS) ON/OFF
Z -	Engine start button
Ctrl+Z -	Engine stop button
H -	Headlight ON/OFF
J -	Marker lights ON/OFF
Shift+M -	Motor Factor INCREASE
Ctrl+M -	Motor Factor DECREASE
K -	Tail lights ON/OFF
Ctrl+T -	Thrash Mode ON/OFF
Ctrl+Numpad Enter -	Visual aids ON/OFF
V -	Windscreen wiper ON/FASTER
Shift+V -	Windscreen wiper OFF/SLOWER

Features

Traction Physics

Great care has been taken to simulate the traction physics of this locomotive. When recording the sounds used in this pack, we also recorded the speedometer and ammeter and this information has been translated accordingly into Train Simulator. In the past, locomotives of this type have been plagued by a limitation where at speed, the amount of power being applied was not proportional to the power handle and as a result, you could happily maintain a high speed with not much power applied. Using our custom scripting, we bypass this limitation and ensure performance matches the real thing as closely as possible.

On top of this, field diverts have been implemented at the correct speeds of 29mph, 41mph & 55mph. Field diverts allow the locomotive to maximise its acceleration as it gains speed. When these take place, the engine note changes, the turbocharger briefly rises before falling back to normal and the exhaust thickens. This is all in response to the load being increased on the engine.

Class 31s are renowned for their sluggish performance when supplying Electric Train Supply (ETS). We have implemented this performance decrease which is calculated by taking the length of the train and estimating its ETS load accordingly. For example, the locomotive will have less power available for traction with an 8 coach rake compared to a 4 coach rake. At its maximum load, equivalent to 16 20m coaches, ETS will use a quarter of available power. ETS can be turned on and off by pressing **Shift+E**. This should only be done on locomotives numbered 314xx as these are the only ones fitted with ETS.

Westinghouse Brake Handle

This locomotive is fitted with a dual-brake Westinghouse brake handle which has the following positions:

Release (0%) - This is a sprung load position and is used to overcharge the brakes which isn't simulated.

Running (15%) - Brakes are fully released and the brake pipe pressure will read 5 bar.

1st Application (30%) - Minimum possible brake force. This equates to around 25% brake force. The brake pipe pressure will read 4.5 bar.

Service (30% to 70%) - Brake pipe pressure can be changed as desired between 3.35 & 4.5 bar.

Full Service (70%) - Maximum possible brake force. The brake pipe pressure will read 3.35 bar.

Emergency (100%) - Maximum possible brake force applied quicker compared to Full Service. The brake pipe pressure will read 0 bar.

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 Protection

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

1) Power is automatically reduced and the wheelslip indication light illuminates in the cab.
2) Once the wheelslip stops, power is reapplied to the selected power handle setting and the wheelslip indication light extinguishes. If wheelslip reoccurs, the process starts again.

As a driver, you must assess which power setting is most suitable for the conditions and balance the occurrence of wheelslip with the maximum possible rate of acceleration. This locomotive has a low power to weight ratio and applies power at a slow rate so wheelslip is generally less likely compared to other locomotives.

Variable Power Performance

Any train driver will tell you that especially on older locomotives, power performance can vary quite noticeably from locomotive to locomotive, despite being within the same class. We have simulated this variance by randomly allocating a 'Power Factor' every time you drive a locomotive in the simulator. This factor can reduce or increase performance by a maximum of 10% either way. There is no way of finding out what factor your locomotive has been allocated except for assessing its 'feel' when powering; just like a real driver!

Variable Traction Motor Volume

Much like described above in relation to exhaust, locomotives tend to vary in how loud their traction motors are. To simulate this, we have implemented a random 'motor' factor to each locomotive which ranges from 1 to 6; 1 being barely audible and 6 being very prominent. This can also be controlled on the player locomotive by using **Shift+M** and **Ctrl+M**.

Dynamic Exhaust Effects

Dynamic exhaust effects mean that the exhaust reacts to what the engine is doing. For example, when on full power, the engine will produce more exhaust than it would when idling. Also, when revving up, exhaust thickens before thinning out when rpm settles. Equally, when revving down, exhaust thins. On top of that, when starting up, exhaust rises in sync with the sound of the engine revving up. Finally, in reality, the smokiness of each locomotive varies depending on how well maintained it is, so to represent this in the simulator, a random 'clag' factor is allocated to each locomotive which ranges from 1 to 10; 1 being the cleanest and 10 being the dirtiest. This can also be controlled on the player locomotive by using **Shift+C** & **Ctrl+C**.

Thrash Mode

One issue we face in our enhancement packs is working with cab models that don't feature opening windows or doors to allow the external sound into the cab. To compensate for this, we have introduced a player controllable 'Thrash Mode' which when activated, plays the external sound in the cab as if you have the window open. This can be turned on and off by pressing **Ctrl+T**.

Bits and Bobs

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

- 4-step reverser (Off/Reverse/Engine Only/Forward).

- The reverser must be placed in 'Engine Only' to start the engine.

- Separate engine start & stop keys.

- 'Engine Stopped' indication light provided which illuminates when engine is stopped.

- The power handle will not move when the reverser is in 'Off'.

- When attached to vacuum braked stock, exhausters will be audible outside and in no.2 cab. Also, only one compressor will be active.

- Exhausters and compressor are not operational when the reverser is in 'Off'.

- Variable speed windscreen wipers.

- 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.

- Cab light.

- Cab camera amended to provide a better view of the gauges and an additional second man's view.

- Improved textures on ammeter and speedometer gauges.

- Cab window glass made more transparent.

- An ETS jumper is automatically added to the front of locomotives fitted with ETS (314xx), have ETS isolated (315xx) or through-wired for ETS (316xx).

- Dynamic driver which automatically appears in the cab where the player is or the leading cab of an AI train.

How to Use in the Scenario Editor

How to Place

To place a class 31 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 'RSC' from the drop-down menu.

3) Tick the second & third box beside 'Class31Pack02'.

4) The class 31 liveries should now be visible in the left hand rolling stock fly-out with a prefix of 'Class 31'. All AP enhanced liveries have a suffix of 'AP'.
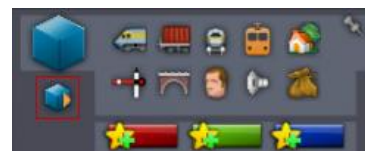
Numbering

When placing a class 31 in the scenario editor, you are able to control a number of visual differences via the number of the locomotive. Please see the table below for information on what you can do on each livery:

High-intensity headlight

To add a high-intensity headlight in the central, lower position, add **;HL=1** to the locomotive number.

To add a high-intensity headlight in the right-hand, centre position, add **;HL=2** to the locomotive number.

Snowplough

To add snowploughs to the locomotive, add **;SP=1** to the locomotive number.

Logos

For some of the liveries, logos can be changed or added by adding the following to the locomotive number:

BR Trainload

To add Coal logos, add **;L=1**.

To add Construction logos, add **;L=2**.

To add Petroleum logos, add **;L=3**.

BR Civil Engineers

To add a BR logo below the number on the cab side, add **;L=1**.

InterCity Swallow

To add Fragonset logos, add **;L=1**.

Network Rail

To add Network Rail logos, add **;L=1**.

DCR Green

To add DCR logos, add **;L=1**.

Depot plaque

On BR Trainload & BR Civil Engineers liveries, a depot plaque can be added by adding the following to the locomotive number:

To add a Bescot depot plaque, add **;DP=1**.

To add a Crewe Diesel depot plaque, add **;DP=2**.

To add a Immingham depot plaque, add **;DP=3**.

To add a Stratford depot plaque, add **;DP=4**.

Scenarios

APC31EP: 1V96 16:57 Brighton - Cardiff Central
Route = South Wales Main Line
Track covered = Bristol Temple Meads - Cardiff Central
Traction = Wessex Trains 31601 & Fragonset 31452
Year = 2004
Duration = 50 minutes

APC31EP: 2C96 22:50 Cardiff Central - Bristol Temple Meads
Route = South Wales Main Line
Track covered = Cardiff Central - Bristol Temple Meads
Traction = InterCity Swallow 31454 & Fragonset 31128
Year = 2004
Duration = 1 hour 10 minutes

APC31EP: 3Q01 23:22 Swansea Landore - Derby R.T.C. (Part 1)
Route = South Wales Main Line
Track covered = Swansea - Pencoed
Traction = Network Rail 31233
Year = 2015
Duration = 45 minutes

APC31EP: 3Q01 23:22 Swansea Landore - Derby R.T.C. (Part 2)
Route = South Wales Main Line
Track covered = Pencoed - Severn Tunnel Junction
Traction = Network Rail 31233
Year = 2015
Duration = 55 minutes

Credits

A1A Locomotives Limited & Nene Valley Railway - Sound recording
Nicolas Schichan - Advanced scripting