Class 142 Diesel Multiple Unit 2.0

AP

Contents

AP

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 142 DMU Pack 2.0'. 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 relevant payware add-on packs listed on the product page installed so the scenarios function as intended.
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

Technical Information

Manufacturer	BREL & Leyland
Years built	1985 - 1987
Number built	96 (142001 – 142096)
Formation	DMS + DMSL (2 car)
Engine	1985 to 1993-1996: Leyland TL11 1993-1996 onwards: Cummins LTA10-R
Transmission	1985 to 1988-1991: Self-Changing Gearbox (SCG) RRE5 1988-1991 onwards: Hydraulic Voith T211r
Maximum speed	75 mph (120km/h)
Coupling type	BSI
Length	15.12 m (per car)
Height	3.86 m
Width	2.8 m
Weight	49.5 tonnes

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Liveries

Provincial:

North East destinations – *Provincial 1 (NE)*

North East destinations & new doors – *Provincial 1 (NE) (ND)*

North West destinations – *Provincial 1 (NW)*

North West destinations & new doors – *Provincial 1 (NW) (ND)*

Cab side logo & North East destinations – *Provincial 2 (NE)*

Cab side logo, North East destinations & new doors – *Provincial 2 (NE) (ND)*

Cab side logo & North West destinations – *Provincial 2 (NW)*

Cab side logo, North West destinations & new doors – *Provincial 2 (NW) (ND)*

Network NorthWest logo – *Provincial (NNW)*

Network NorthWest logo & new doors – *Provincial (NNW) (ND)*

GMPTE:

    Original – *GMPTE*

    Orange cant rail & GSM-R – *GMPTE (LSL)*

Chocolate & Cream (Skipper):

    Great Western destinations – *CC1 (GW)*

    North East destinations – *CC1 (NE)*

    North East destinations & new doors – *CC1 (NE) (ND)*

    North West destinations – *CC1 (NW)*

    North West destinations & new doors – *CC1 (NW) (ND)*

    Orange cant rail & North East destinations – *CC2 (NE)*

    Orange cant rail, North East destinations & new doors – *CC2 (NE) (ND)*

    Orange cant rail & North West destinations – *CC2 (NW)*

Regional Railways (GMPTE):

      Original doors – *RR (GMPTE)*

      New doors – *RR (GMPTE) (ND)*

      No logo – *Ex-RR (GMPTE)*

      First North Western logo - *Ex-RR (GMPTE) (FNW)*

      No logo & GSM-R – *Ex-RR (GMPTE) (LSL)*

Regional Railways (Merseyrail):

      Original doors – *RR (MR)*

      New doors – *RR (MR) (ND)*

      No logo – *Ex-RR (MR)*

      First North Western logo - *Ex-RR (MR) (FNW)*

Regional Railways (Tyne & Wear):

     Original doors – *RR (TW)*

     New doors – *RR (TW) (ND)*

     Northern Spirit destinations – *RR (TW) (NS)*

     Arriva logo - *Ex-RR (TW) (ATN)*

Regional Railways:

    North East destinations – *RR (NE)*

    North East destinations & new doors – *RR (NE) (ND)*

    North West destinations – *RR (NW)*

    North West destinations & new doors – *RR (NW) (ND)*

    Northern Spirit destinations – *RR (NS)*

    No logo – *Ex-RR*

    First North Western logo – *Ex-RR (FNW)*

    Arriva logo – *Ex-RR (ATN)*

    Valley Lines logo – *Ex-RR (VL)*

Northern Spirit:

    Northern Spirit logo – *NS*

    Northern Spirit & Nexus logo – *NS (Nexus)*

    Ex-Northern Spirit logo – *Ex-NS*

    Arriva logo – *Ex-NS (ATN)*

Arriva Trains Northern:

  Arriva logo – *ATN*

  No logo – *Ex-ATN*

  Northern Rail logo – *Ex-ATN (NR)*

First North Western:

     First North Western logo – *FNW*

     No logo – *Ex-FNW*

     Northern Rail logo – *Ex-FNW (NR)*

     First Great Western logo – *Ex-FNW (FGW) 1*

     First Great Western logo & pink doors – *Ex-FNW (FGW) 2*

Merseyrail:

Merseyrail logo – *MR*

Merseyrail & First North Western logos – *MR (FNW)*

Merseyrail & Northern Rail logos – *MR (NR)*

AP

Northern Rail:

    Northern Rail logo – *NR1*

    Northern Rail (Serco/Abellio) logo – *NR2*

    Northern Rail (Serco/Abellio) logo & GSM-R – *NR2 (GSMR)*

    No logo – *Ex-NR*

Northern Rail Blue – *NR Blue*

AP

Valley Lines:

      Valley Lines logo – *VL*

      No logo – *Ex-VL*

      Arriva logo – *Ex-VL (ATW)*

      No logo & First North Western destinations – *Ex-VL (FNW)*

Arriva Trains Wales:

Arriva Trains Wales logo – *ATW1*

Arriva Trains Wales logo & new LED lights – *ATW1 (NL)*

Revised Arriva Trains Wales logo – *ATW2*

Revised Arriva Trains Wales logo & GSM-R – *ATW2 (GSMR)*

Revised Arriva Train Wales logo & DB logo – *ATW2 (DB)*

No logo – *Ex-ATW*

Ex-Arriva Trains Wales (Transport for Wales) – *Ex-ATW (TfW)*

Cab Guide

Desk

1 - Brake handle (release/1/2/full service/emergency)
2 - Opening side window
3 - Heated screen switch (off/on)
4 - Signal buzzer button
5 - Windscreen wiper switch (off/slow/fast)
6 - Cab light switch (off/on)
7 - Destination light switch (off/on)
8 - Instrument lights switch (off/on)
9 - Headlight switch (off/tails/markers/night) (+day if GSM-R)
10 - Driver Reminder Appliance (DRA)
11 - Fan (off/slow/fast)

12 - Blind
13 - Main res. & brake cylinder gauge
14 - Speedometer
15 - AWS sunflower
16 - Couple button
17 - Uncouple button
18 - Engine stop button
19 - Engine start button
20 - Compressor speed up switch (off/on)
21 - Hold gear switch (off/on) (SCG only)
22 - Sander button
23 - Power handle
24 - GSM-R or NRN radio

AP

Left of Driver's Seat

25 - Reverser (off/forward/neutral/reverse)
26 - Master key (off/on)

Keyboard Controls

Non-standard keyboard controls are listed below:

Shift+B -	Bounce Factor INCREASE
Ctrl+B -	Bounce Factor DECREASE
L -	Cab light switch ON/OFF
Shift+C -	Clag Factor INCREASE
Ctrl+C -	Clag Factor DECREASE
F7 -	Destination blind UP
F8 -	Destination blind DOWN
M -	Destination light switch ON/OFF
Y -	Driver reminder appliance (DRA) ON/OFF
C -	Driver to guard buzzer
Z -	Engine start button
Ctrl+Z -	Engine stop button
H -	Headlight switch CLOCKWISE
Shift+H -	Headlight switch ANTI-CLOCKWISE
F -	Hold gear switch ON/OFF
Shift+Ctrl+H -	Horn Factor UP
Ctrl+H -	Horn Factor DOWN
I -	Instrument lights switch ON/OFF
Shift+W -	Master key IN/OUT
O -	Saloon lights ON
Shift+O -	Saloon lights OFF
Ctrl+Numpad Enter -	Visual aids ON/OFF
V -	Wiper switch CLOCKWISE
Shift+V -	Wiper switch ANTI-CLOCKWISE

Features

Cab Variants

A number of cab variants are provided which are appropriately used depending on your chosen livery.

Beige with NRN or GSM-R

Blue with NRN or GSM-R

Passenger View

2 main variants of passenger view are included. The first with 'as-built' bus seats and the second with newer 'Chapman' seats. On top of this, 8 different seat moquettes are provided, which are automatically applied to their relevant livery/liveries.

BR Provincial

Northern Spirit

First North Western

Merseyrail

First Great Western

Northern Rail

Valley Lines (Chapman)

Arriva Trains Wales (Chapman)

Transmissions & Engines
Self-Changing Gearbox (SCG) RRE5 Transmission

When built, class 142s were fitted with a self-changing gearbox. The logic was very similar to a 1st generation DMU where the engine revs up through four gears before the train reaches its maximum speed. The only difference being that the gear changes occur automatically rather than manually. Please see below for a table of what gear you can expect to be in depending on speed:

Speed (mph)	Gear
0-14	1st
14-24	2nd
24-41	3rd
41-75	4th

When changing gear, the engine automatically revs down resulting in loss of power, the gear changes, and within around 3 seconds, the engine revs back up and power is restored.

With every increase in gear, there is a reduction in the torque of the engine. As a result, when climbing hills, it is possible the gearbox will keep changing up and down between two gears if the higher gear does not provide sufficient torque to allow acceleration. This makes for a rather jolty ride and can impede progress as a result of the engine revving down for 3 seconds every time the gear change occurs.

If this occurs, turn the 'Hold Gear' switch on whilst you are in the lower gear and this will prevent the gearbox changing to the higher gear. Once, the gradient has eased, you must remember to turn the 'Hold Gear' switch off to allow you to change gear again and accelerate. Please note too that the 'Hold Gear' switch only prevents an upward gear change.

This gearbox is applied to Provincial, GMPTE & Chocolate & Cream liveries with the original doors. This excludes the Network NorthWest and orange cant rail livery variants which were recent enough to have had the Voith transmission instead. This also excludes 142050 which was fitted with the Voith transmission from new as a testbed.

Voith T211r Hydraulic Transmission

Owing to unreliability of the original self-changing gearbox, class 142s were gradually fitted with the Voith T211r transmission between 1988 & 1991, as used on class 150s & 156s.

Great care has been taken in recreating the characteristics of this 2-stage hydraulic transmission.

1st Stage - Torque Converter

When accelerating from a standing start, the engine revs up and oil fills the torque converter, which allows acceleration to take place. There is a 2 second or so delay between the engine revving up and the oil filling the converter, which is why these units don't accelerate as soon as power is applied, and is what causes the distinctive, initial surge of rpm before the engine settles. This also explains why you don't get that same initial surge of rpm when powering up from 'Notch 1', instead of 'Off', as the converter is already filled with oil. During this 1st stage, engine rpm is directly controlled via the notch selected on the power handle.

2nd Stage - Fluid Coupling

At 45mph, the oil transfers from the torque converter to the fluid coupling which results in a reduction of engine rpm. During this stage, engine rpm is directly proportional to the speed of the train which means rpm will be the same regardless of which notch is selected on the power handle. All that varies is the load being placed on the engine. As speed increases then, you will gradually hear engine rpm rise in sync.

The unit will stay in this second stage until speed drops below 35mph. At this point, the transmission reverts to the first stage.

Leyland TL11 & Cummins LTA10-R Engines

When built, class 142s were powered by the Leyland TL11 engine. Due to it being discontinued though and spare parts becoming hard to come by as a result, it was gradually replaced between 1993 & 1996 by the Cummins LTA10-R.

From a driver's perspective, the only real difference between the two is the sound and the Cummins being slightly more powerful at 225 hp compared to the 200 hp of the Leyland.

By default in this pack, any livery variant with the newer doors will have the Cummins engine. For livery variants with the original doors, the Leyland engine. This means that for liveries introduced in the early 1990s such as the Regional Railways variants, these will have the interesting and fairly short-lived combination of the Leyland TL11 engine with the Voith T211r transmission.

Tread Brake Simulation

By default in Train Simulator, braking performance is constant throughout the speed range so a full brake application at 70mph will have the same level of retardation than at 10mph. This is a fairly good representation of how disc brakes work but for stock with tread brakes, like the class 142, this is not so realistic.

As a result, this pack has scripted brake force to simulate the relatively poor performance at high speed, and the 'bite' at lower speeds where performance increases quite significantly.

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 10% either way with 'Brake Factor' & 7.5% with 'Power Factor'. 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!

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 (WSP)

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

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

1) Power is automatically reduced and the two gearbox fault lights illuminate in the cab.
2) Once the wheelslip stops, power is reapplied to the notch selected on the power handle and the two gearbox fault lights extinguish. If wheelslip reoccurs, the process starts again.

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 braking during poor adhesion, it is possible that the wheels will lock up and slide. As with wheelslip, the two gearbox fault lights will illuminate but there is no automatic sander or reduction of the brake, so it is up to you to either apply sand or move the brake handle to a lower step in an attempt to control the slide.

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 of 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.

Automatic Unit Numbering

When placing a class 142 unit in the scenario editor or using one in Quick Drive, both the DMS & DMSL 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 DMSL vehicle if you wish to change it. Please note that the destination display on both driving vehicles is also controlled via the DMSL vehicle.

Dynamic Exhaust Effects

Dynamic exhaust effects mean that the exhaust reacts to what the engine is doing. For example, when in notch 7, 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 vehicle varies depending on how well maintained it is, so to represent this in the simulator, a random 'clag' factor is allocated to each vehicle which ranges from 1 to 10; 1 being the cleanest and 10 being the dirtiest. This can also be controlled on the leading player vehicle by using **Shift+C** & **Ctrl+C**.

Horn

Variants

Four horn variations are provided under the guise of 'Horn Factor'. Upon loading a scenario, your vehicle will be randomly allocated one of these horns. If you wish to change it, press **Shift+Ctrl+H** or **Ctrl+H**.

Please see below for a list of where we sourced each horn variant:

1 & **2** - 142036 - East Kent Railway
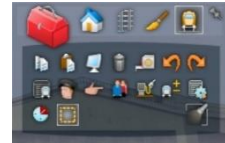**3** & **4** - 141113 - Midland Railway Centre

AI

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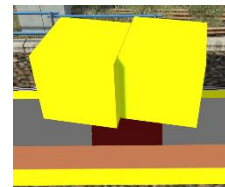
1) In the scenario editor, go to the location at which you would like the AI train's horn to sound, and press **Spacebar** 3 times. The track will now display a certain colour which represent its speed limit.

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.

National Radio Network (NRN)

A simple representation of the NRN radio is simulated and is operational on pre-GSM-R liveries. To set the NRN zone, please follow the instructions below:

1) Turn the radio on by pressing the button below the volume control on the left-hand side of the console.
2) Enter the three-digit zone number by using the numpad.
3) To confirm this, press the green button below the British Rail arrows symbol. The NRN is now successfully set up.
4) If you see an NRN zone change sign (pictured below), you must change the zone number manually. Do this by simply entering the new three-digit zone number on top of the old one.

NRN zone placement in scenarios

NRN zones cover very large areas so it is entirely possible you will not change areas during a scenario but should you wish to do so, a sign is included in this pack and must be placed by the scenario author.

This sign can be found by selecting 'AP/Common' in the 'Object Set Filter' and browsing for 'AP NRN Sign' in the left-hand 'Track Infrastructure' fly-out. To place it, simply place the marker on the track your train will be passing through, double click the sign, and input the three-digit area number in the right-hand fly-out. Please note that this must be three-digits so zone 65 would be '065'.

AP

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

Please note that GSM-R is only included for liveries that are relevant for operations post-2013.

Destination Roller Blind

The destination roller blind can be changed during a scenario by pressing either **F7** or **F8**.

When changing the destination blind, it will only apply to the unit you are in. If there is another unit in the formation, you will need to move to that unit to change its blind.

Please see below for a list of the available destinations on each livery and their relevant code if you wish to use them via the unit's number on an AI service:

Chocolate & Cream (GW)

0 - Blank	11 - Plymouth	22 - Liskeard
1 - Axminster	12 - Taunton	23 - Looe
2 - Barnstaple	13 - Totnes	24 - Newquay
3 - Dawlish Warren	14 - Depot	25 - Par
4 - Exeter Central	15 - Not in Public Use	26 - Penzance
5 - Exeter St. David's	16 - Special	27 - Plymouth
6 - Exeter St. Thomas	17 - Bere Alston	28 - Saltash
7 - Exmouth	18 - Calstock	29 - St. Erth
8 - Honiton	19 - Falmouth	30 - St. Ives
9 - Newton Abbot	20 - Gunnislake	31 - Truro
10 - Paignton	21 - Lelant Saltings	

AP

Provincial (NW) / Provincial (NNW) / GMPTE / Chocolate & Cream (NW) / Regional Railways (GMPTE) / Regional Railways (Merseyrail) / Regional Railways (NW) / First North Western

0 - Blank	25 - Hunts Cross	50 - Rochdale via Castleton
1 - Alderley Edge	26 - Irlam	51 - Rochdale via Oldham
2 - Altrincham	27 - Kirkby	52 - Rose Hill
3 - Bangor	28 - Knutsford	53 - St. Helens Central
4 - Barrow	29 - Lancaster	54 - Salford Crescent
5 - Bidston	30 - Leeds	55 - Sellafield
6 - Blackburn	31 - Liverpool	56 - Shaw
7 - Blackpool North	32 - Llandudno	57 - Sheffield
8 - Blackpool South	33 - Llandudno Junction	58 - Southport
9 - Blaenau Ffestiniog	34 - Macclesfield	59 - Stalybridge
10 - Bolton	35 - Manchester Airport	60 - Stockport
11 - Buxton	36 - Manchester Oxford Road	61 - Stoke-on-Trent
12 - Carlisle	37 - Manchester Piccadilly	62 - Todmorden
13 - Chester	38 - Manchester Victoria	63 - Wakefield Westgate
14 - Chinley	39 - Manchester via Oldham & Rochdale	64 - Warrington
15 - Clitheroe	40 - Manchester via Rochdale & Oldham	65 - Whitehaven
16 - Colne	41 - Marple	66 - Widnes
17 - Crewe	42 - Millom	67 - Wigan
18 - Disley	43 - Morecambe	68 - Windermere
19 - Ellesmere Port	44 - New Mills	69 - Workington
20 - Greenbank	45 - Newton-le-Willows	70 - Wrexham
21 - Greenfield	46 - Ormskirk	71 - Special
22 - Holyhead	47 - Oxenholme	72 - Not in Public Use
23 - Helsby	48 - Preston	
24 - Huddersfield	49 - Rhyl	

AP

Provincial (NE) / Chocolate & Cream (NE) / Regional Railways (Tyne & Wear) / Regional Railways (NE) / Regional Railways (NS) / Ex-Regional Railways (ATN) / Northern Spirit / Arriva Trains Northern

0 - Blank	30 - Guiseley	60 - Newcastle
1 - Adwick	31 - Halifax	61 - Nunthorpe
2 - Alnmouth	32 - Haltwhistle	62 - Penistone
3 - Ashington	33 - Harrogate	63 - Peterborough
4 - Barnsley	34 - Hartlepool	64 - Pontefract
5 - Barton on Humber	35 - Hebden Bridge	65 - Preston
6 - Berwick	36 - Hexham	66 - Redcar
7 - Beverley	37 - Horsforth	67 - Retford
8 - Bishop Auckland	38 - Huddersfield	68 - Ribblehead
9 - Blackpool	39 - Hull	69 - Saltburn
10 - Bradford	40 - Ilkley	70 - Scarborough
11 - Bridlington	41 - Keighley	71 - Scunthorpe
12 - Brough	42 - Kirkby Stephen	72 - Seaham
13 - Carlisle	43 - Knaresborough	73 - Selby
14 - Castleford	44 - Knottingley	74 - Sheffield
15 - Chathill	45 - Lancaster	75 - Shipley
16 - Chesterfield	46 - Leeds	76 - Skipton
17 - Cleethorpes	47 - Lincoln	77 - Special
18 - Darlington	48 - Liverpool	78 - Stanhope
19 - Depot	49 - Manchester Airport	79 - Stockton
20 - Doncaster	50 - Manchester Oxford Road	80 - Sunderland
21 - Dumfries	51 - Manchester Piccadilly	81 - Wakefield Kirkgate
22 - Durham	52 - Manchester Victoria	82 - Wakefield Westgate
23 - Edinburgh	53 - Marsden	83 - Whitby
24 - Filey	54 - Meadowhall	84 - Whitehaven
25 - Gainsborough Lea Road	55 - Metrocentre	85 - Windermere
26 - Glasgow	56 - Morecambe	86 - Workington
27 - Goole	57 - Micklefield	87 - Worksop
28 - Grimsby Town	58 - Middlesbrough	88 - York
29 - Grosmont	59 - Morpeth	89 - Sorry Not in Service

AP

Northern Rail / Ex-Arriva Trains Northern (NR) / Ex-First North Western (NR)

0 - Blank	34 - Hebden Bridge	68 - Ormskirk
1 - Adwick	35 - Helsby	69 - Preston
2 - Barnsley	36 - Heysham Port	70 - Retford
3 - Barrow	37 - Hexham	71 - Ribblehead
4 - Barton on Humber	38 - Horsforth	72 - Rochdale
5 - Beverley	39 - Huddersfield	73 - Rose Hill
6 - Bishop Auckland	40 - Hull	74 - St Helens Central
7 - Blackburn	41 - Ilkley	75 - Salford Crescent
8 - Blackpool North	42 - Irlam	76 - Saltburn
9 - Blackpool South	43 - Kirkby	77 - Scarborough
10 - Blaenau Ffrestiniog	44 - Kirkby Stephen	78 - Scunthorpe
11 - Bolton	45 - Knaresborough	79 - Selby
12 - Bradford	46 - Knottingley	80 - Sellafield
13 - Bridlington	47 - Lancaster	81 - Sheffield
14 - Burnley Central	48 - Leeds	82 - Skipton
15 - Buxton	49 - Lincoln	83 - Southport
16 - Carlisle	50 - Liverpool Lime St	84 - Stalybridge
17 - Castleford	51 - Liverpool Sth Pway	85 - Stockport
18 - Chathill	52 - Manchester Airport	86 - Sunderland
19 - Chester	53 - Manchester Oxford Road	87 - Todmorden
20 - Chinley	54 - Manchester Piccadilly	88 - Wakefield Kirkgate
21 - Cleethorpes	55 - Manchester Victoria	89 - Wakefield Westgate
22 - Clitheroe	56 - Marple	90 - Warrington
23 - Colne	57 - Marsden	91 - Whitby
24 - Crewe	58 - Marsten	92 - Whitehaven
25 - Darlington	59 - Metro Centre	93 - Wigan North Western
26 - Doncaster	60 - Middlesbrough	94 - Wigan Wallgate
27 - Dumfries	61 - Millom	95 - Workington
28 - Ellesmere Port	62 - Morecambe	96 - Worksop
29 - Goole	63 - Morpeth	97 - York
30 - Halifax	64 - Newcastle	98 - Special
31 - Harrogate	65 - New Mills Central	99 - Not in Public Use
32 - Hartlepool	66 - Nottingham	
33 - Hazel Grove	67 - Nunthorpe	

AP

Ex-First North Western (First Great Western) / Northern Rail Blue

0 - Blank	17 - Brighton	34 - Penzance
1 - Avonmouth	18 - Castle Cary	35 - Plymouth
2 - Barnstaple	19 - Cheltenham Spa	36 - Cardiff
3 - Bristol Parkway	20 - Clifton Down	37 - Portsmouth Harbour
4 - Bristol Temple Meads	21 - Exeter Central	38 - Southampton
5 - Cardiff	22 - Filton	39 - St. Erth
6 - Exmouth	23 - Frome	40 - St. Ives
7 - Exeter St Davids	24 - Gloucester	41 - St. James Park
8 - Falmouth	25 - Gt. Malvern	42 - Swindon
9 - Paignton	26 - Gunnislake	43 - Topsham
10 - Severn Beach	27 - Liskeard	44 - Totnes
11 - Taunton	28 - Looe	45 - Bristol Temple Meads
12 - Truro	29 - Newton Abbot	46 - Warminster
13 - Weston-S-Mare	30 - Newquay	47 - Worcester F. St
14 - Westbury	31 - Newport	48 - Worcester S. Hill
15 - Weymouth	32 - Okehampton	49 - Sorry, Not in Service
16 - Bath Spa	33 - Par	

Arriva Trains Wales / Ex-Regional Railways (Valley Lines)

0 - Blank	19 - Carmarthen	38 - Penarth
1 - Abercynon	20 - Cheltenham	39 - Pontypridd
2 - Aberdare	21 - Chepstow	40 - Pontypridd via City Line
3 - Aberdare via City Line	22 - City Line	41 - Porth
4 - Abergavenny	23 - Coryton	42 - Radyr
5 - Bargoed	24 - Ebbw Vale	43 - Radyr via City Line
6 - Barry Island	25 - Fishguard Harbour	44 - Rhymney
7 - Barry Town	26 - Gloucester	45 - Swansea
8 - Bridgend via Pontyclun	27 - Haverfordwest	46 - Taffs Well
9 - Bridgend via Rhoose	28 - Heath High Level	47 - Taffs Well via City Line
10 - Cadoxton	29 - Heath Low Level	48 - Tenby
11 - Caerphilly	30 - Hereford	49 - Tondu
12 - Cardiff Bay	31 - Maesteg	50 - Treherbert
13 - Cardiff Central	32 - Merthyr Tydfil	51 - Treherbert via City Line
14 - Cardiff Central via City Line	33 - Merthyr Tydfil via City Line	52 - Whitland
15 - Cardiff Central via Pontyclun	34 - Mountain Ash	53 - Ystrad Mynach
16 - Cardiff Central via Queen Street	35 - Newport	54 - Ystrad Rhondda
17 - Cardiff Central via Rhoose	36 - Pembroke	55 - Sorry Not in Service
18 - Cardiff Queen Street	37 - Pembroke Dock	

AP

Dot Matrix Destination Display

Funded by Merseyrail, 142041 to 142049 & 142051 to 142058 were refurbished in the early 2000s. One of the improvements was the fitting of a dot matrix destination display to replace the traditional roller blind and this has been visually simulated in this pack. You will see this display when using the Merseyrail livery or Northern Rail livery with an appropriately numbered unit.

The display can be changed during a scenario by pressing either **F7** or **F8**.

When changing the display, it will only apply to the unit you are in. If there is another unit in the formation, you will need to move to that unit to change its blind.

Please see the next page 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:

0 - Blank	34 - Hebden Bridge	68 - Ormskirk
1 - Adwick	35 - Helsby	69 - Preston
2 - Barnsley	36 - Heysham Port	70 - Retford
3 - Barrow	37 - Hexham	71 - Ribblehead
4 - Barton on Humber	38 - Horsforth	72 - Rochdale
5 - Beverley	39 - Huddersfield	73 - Rose Hill
6 - Bishop Auckland	40 - Hull	74 - St Helens Central
7 - Blackburn	41 - Ilkley	75 - Salford Crescent
8 - Blackpool North	42 - Irlam	76 - Saltburn
9 - Blackpool South	43 - Kirkby	77 - Scarborough
10 - Blaenau Ffrestiniog	44 - Kirkby Stephen	78 - Scunthorpe
11 - Bolton	45 - Knaresborough	79 - Selby
12 - Bradford	46 - Knottingley	80 - Sellafield
13 - Bridlington	47 - Lancaster	81 - Sheffield
14 - Burnley Central	48 - Leeds	82 - Skipton
15 - Buxton	49 - Lincoln	83 - Southport
16 - Carlisle	50 - Liverpool Lime Street	84 - Stalybridge
17 - Castleford	51 - Liverpool South Parkway	85 - Stockport
18 - Chathill	52 - Manchester Airport	86 - Sunderland
19 - Chester	53 - Manchester Oxford Road	87 - Todmorden
20 - Chinley	54 - Manchester Piccadilly	88 - Wakefield Kirkgate
21 - Cleethorpes	55 - Manchester Victoria	89 - Wakefield Westgate
22 - Clitheroe	56 - Marple	90 - Warrington
23 - Colne	57 - Marsden	91 - Whitby
24 - Crewe	58 - Marsten	92 - Whitehaven
25 - Darlington	59 - Metro Centre	93 - Wigan North Western
26 - Doncaster	60 - Middlesbrough	94 - Wigan Wallgate
27 - Dumfries	61 - Millom	95 - Workington
28 - Ellesmere Port	62 - Morecambe	96 - Worksop
29 - Goole	63 - Morpeth	97 - York
30 - Halifax	64 - Newcastle	98 - Special
31 - Harrogate	65 - New Mills Central	99 - Not in Public Use
32 - Hartlepool	66 - Nottingham	
33 - Hazel Grove	67 - Nunthorpe	

Bounce Factor

Due to their 2-axle wheel arrangement, which is fixed directly to the chassis rather than a more shock absorbent bogie, class 142s are known for rough riding. We have implemented this characteristic feature in the form of 'Bounce Factor' which ranges to **1** to **5**. Please see below for what we judge each factor to simulate:

1 - Very subtle and representative of very well maintained continuously welded rail

2 - Fairly subtle and representative of typical continuously welded rail

3 - A rougher ride and representative of poorly maintained continuously welded rail

4 - Notably rough ride and representative of jointed track

5 - Very rough ride and probably not representative of any realistic track conditions. Included mostly for fun!

By default, Bounce Factor is set to **2**. To change Bounce Factor in-game, press **Shift+B** to increase or **Ctrl+B** to decrease.

Please note that this is only applicable to internal views and does not change anything externally.

Cold Start

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

- Main reservoir and brake cylinder pressures are 0
- The engine is shut down
- Saloon lights are off

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

1) Insert the master key by pressing **Shift+W**.

2) Move the reverser to 'Neutral' by pressing **S**.

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

4) Start the engine by holding **Z** until the 'Engine Stopped' indicator extinguishes. The exhaust will be whiter and thicker at first but this will clear.

5) You will now need to wait for the compressor to build the air in the main reservoir. You can speed up this process by turning on the 'Compressor Speed Up' switch which increases engine rpm. The compressor is directly linked to the engine so when the engine revs faster, the compressor also does.

6) When the main reservoir reaches 4.5 bar, you have sufficient air to obtain a brake release and get on the move. Ideally though, you want to have between 6.5 & 7.5 bar as if it drops below 4.5 bar, an emergency brake application will occur.

7) If going into passenger service, turn the saloon lights on by pressing the 'Saloon Lights On' button on the back wall.

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

Coupling Procedure

Please see below for how to couple to another unit in a realistic manner:

1) Approach the unit you are going to couple to at caution and come to a stop just short of it.
2) Select 'Notch 1' power and ease up to the unit. As soon as you have coupled, apply 'Step 3' brake and return the power handle to 'Off'.
3) To ensure the coupling is secure, you must perform a 'pull-away' test. To do this, select 'Reverse' on the reverser, 'Step 1' brake and apply 'Notch 1' on the power handle for a few seconds. If you do not move, the coupling has been successful.
4) Hold the 'Couple' button down on the cab desk for 5 seconds. This will connect the two units' air and electrical systems.

Bits and Bobs

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

- As built, only a 'Night' headlight position was available. From the around the time of GSM-R fitment in the mid-2010s, a modification was carried out to supply a 'Day' option too. This is simulated and appears depending on which livery/variant you use.

- The driver to guard buzzer is inactive when the doors are open. This is to prevent the driver incorrectly giving the right away buzzer.

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

- Power cannot be applied if the brake handle is in 'Step 2', 'Step 3' or 'Emergency'.

- If the emergency brake applies, power can only be regained by placing the reverser into 'Neutral', brake handle into 'Emergency' & power handle in 'Off'.

- If the brake handle is placed in 'Step 2', 'Step 3' or 'Emergency' whilst powering, power will be lost and you must return the power handle to 'Off' before being able to regain power.

- 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.

- Saloon lights will only be turned on by default before sunrise or after sunset or if it's raining. Once again, this is to avoid the unrealistic appearance of projected light in bright conditions.

- LED bodyside indicator lights on units with the latest style OHL decal sticker and original/incandescent bodyside indicator lights with earlier styles.

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) Turn the Driver Reminder Appliance (DRA) off by pressing **Y**.

6) If applicable, register the NRN or GSM-R.

You should now be ready to move off. For information on this, please see below.

Driving Guide

The following steps should allow you to drive in a realistic and safe manner:

1) When you receive two buzzes from the guard, return them by pressing **C** twice.

2) Move the reverser to your desired direction of travel by pressing either **W** for forward or **S** for reverse.

3) Move the brake handle to step 1 by pressing **;**.

4) Move the power handle to notch 3 by pressing **A** and let the engine rev up. After a couple of seconds, move the brake handle to the release position which will ensure you depart without rolling back.

5) From then on, apply further power as you see fit.

6) When returning the power handle to off, make sure to hold it in notch 1 for a second or two beforehand. This is to let the power die off before removing it.

7) To brake the train, you may make applications and releases by moving the handle between step 1 and full service. It is recommended you only use full service as a last resort so as to ensure you always have more brake force available if required.

8) Just before coming to a stop, aim to have the brakes in step 1 so as to provide a smooth stop.
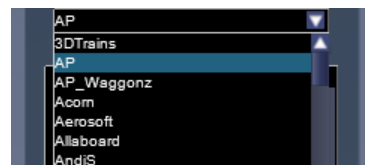
How to Use in the Scenario Editor

How to place

To place a class 142 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.
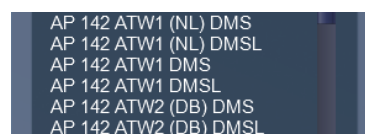
8) Go to the right-hand fly-out which should have appeared. Select 'AP' from the drop-down menu.

9) Tick the second & third box beside 'Class142Pack01'.

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

Formation

DMS + DMSL

Numbering

When placing in the scenario editor, you are able to control a number of features via the number of the DMSL vehicle. Please note that unless otherwise stated, you need only change the DMSL number to apply to the whole unit. The DMS number is simply a placeholder.

Cold start

To activate cold start mode on a player train, add **;Cold=1** to the vehicle the driver icon is placed on. This can be either the DMS or DMSL.

NRN

To have the NRN radio already active when a scenario starts, add **;NRN=x** to the DMSL vehicle number. x = 3-digit NRN zone number.

GSM-R

To restrict the train reporting number and signal number that the player can use to register with on the GSM-R, add **;GSMR=1A22084** to the DMSL vehicle number. In this example, '1A22' is the train reporting number and '084' is the signal number.

Leyland TL11 Engine & Voith T211r Transmission

If you would like to apply the Leyland TL11 engine & Voith T211r transmission combination to a unit, add **;TL11=1** to the DMSL vehicle number.

Cummins LTA10-R Engine & Voith T211r Transmission

If you would like to apply the Cummins LTA10-R engine & Voith T211r transmission combination to a unit with original doors, add **;Cummins=1** to the DMSL vehicle number.

Example number

142002;D=10;Cold=1;GSMR=1A22084;TL11=1

Key:

142002 - Unit number

;D=10 - Destination

;Cold=1 - Cold start

;GSMR=1A22084 - Restricted GSM-R settings. '1A22' is the train reporting number and '084' is the signal number.

;TL11=1 - Leyland TL11 engine with Voith T211r transmission

Scenarios

APC142: 2E89 15:57 Southport - Leeds

Route = Huddersfield Line - Manchester to Leeds
Track covered = Manchester Victoria - Leeds
Traction = Ex-Northern Rail 142035 & 142042
Date = 19th May 2014
Duration = 1 hour 25 minutes

APC142: 2H41 07:18 Manchester Victoria - Greenfield/
2J42 08:03 Greenfield - Manchester Victoria

Route = Huddersfield Line - Manchester to Leeds
Track covered = Manchester Victoria - Diggle Jn & Return
Traction = GMPTE 142008
Date = 27th October 1988
Duration = 1 hour 15 minutes

APC142: 2M05 11:32 Huddersfield - Manchester Victoria

Route = Huddersfield Line - Manchester to Leeds
Track covered = Huddersfield - Manchester Victoria
Traction = Merseyrail 142046
Date = 25th February 2005
Duration = 50 minutes

APC142: 1H35 08:01 Holyhead - Manchester Piccadilly

Route = North Wales Coast Line (TfW)
Track covered = Holyhead - Chester
Traction = Regional Railways (GMPTE) 142002 & Regional Railways 158752
Date = 9th June 1995
Duration = 1 hour 55 minutes

APC142: 1K70 16:18 Chester - Crewe/1D78 16:45 Crewe - Chester

Route = North Wales Coast Line (TfW)
Track covered = Chester - Crewe - Chester
Traction = Regional Railways (Merseyrail) 142052
Date = 8th January 1999
Duration = 55 minutes

APC142: 2D64 07:31 Llandudno - Holyhead

Route = North Wales Coast Line (TfW)
Track covered = Llandudno - Llandudno Junction - Holyhead
Traction = Provincial 142066
Date = 10th August 1989
Duration = 1 hour 15 minutes

AP

Credits

Nicolas Schichan - Scripting

East Kent Railway - Assistance in recording sounds

AP