Class 91 Electric Locomotive

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Release Version 1.0

1 BACKGROUND 3

1.1 IC225 Overview 3

1.2 Class 91 3

1.1 Technical Specification 3

2 ROLLING STOCK 4

2.1 Intercity Swallow Class 91 4

2.2 Intercity Swallow Mk4 Standard (TSOE) 4

2.3 Intercity Swallow Mk4 Standard (TSO) 4

2.4 Intercity Swallow Mk4 Standard (TSOD) 5

2.5 Intercity Swallow Mk4 Restaurant (RSB) 5

2.6 Intercity Swallow Mk4 First (FOD) 5

2.7 Intercity Swallow Mk4 First (FO) 6

2.8 Intercity Swallow Mk4 Guard (DVT) 6

3 DRIVING THE CLASS 91 7

3.1 Class 91 Main Cab Controls 7

3.2 Class 91 Slab Cab Controls 8

3.3 Mk4 DVT Cab Controls 9

4 SCENARIOS 10

4.1 Simple & Expert Controls Tutorial: Class 91 10

4.2 [91]On Time Alteration 10

4.3 [91]Troublesome Trip to Stevenage 10

5 ACKNOWLEDGEMENTS 11

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1 Background

1.1 IC225 Overview

The InterCity 225 is an electric high speed train, comprising a Class 91 electric locomotive, nine Mark 4 coaches and a Driving Van Trailer. The Class 91 locomotives were built by BREL at Crewe works as a spin-off from the Advanced Passenger Train project, which was abandoned during the 1980s, whilst the coaching stock was built by GEC-Alsthom in Birmingham — again borrowing heavily from the Advanced Passenger Train. The trains were designed to operate at up to 140 mph, but are limited to 125 mph due to a lack of appropriate infrastructure. They are used exclusively on the East Coast Mainline operating services from London King's Cross to Leeds, Edinburgh Waverley, Glasgow Central, Skipton, Bradford Forster Square, Newark North Gate, York and Newcastle.

1.2 Class 91

The Class 91 is a 140 mph, 6,480 hp electric locomotives ordered as a component of the East Coast Main Line modernisation and electrification programme of the late 1980s. The Class 91s were given the auxiliary name of InterCity 225 to indicate their envisaged top speed of 225 km/h (140 mph). The other end of the InterCity 225 train set is formed of a Driving Van Trailer, built with a similar body shell to the Class 91 locomotives.

The locomotive body shells are of all-steel construction. Unusually, the motors are body mounted and drive bogie mounted gearboxes via cardan shafts. This reduces the unsprung mass and hence track wear at high speeds. The locomotive also features an under-slung transformer so that the body is relatively empty compared to other electric locomotives. Much of the engineering was derived from the research and operational experience gained during development of the Advanced Passenger Train.

1.1 Technical Specification

TOPS Number	Class 91
Wheel Arrangement	Bo-Bo
Weight	81.5 tonnes
Length	63ft 8in (19.4m)
Electrical System	25kV AC Overhead Pantograph
Power Output	6,480hp (4,830kW)
Maximum Tractive Effort	43,000lb (190kN)
Continuous Tractive Effort	24,000lb (107kN)
Brake Type	Air
Axle load class	RA 7

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2 Rolling Stock

2.1 Intercity Swallow Class 91

2.2 Intercity Swallow Mk4 Standard (TSOE)

2.3 Intercity Swallow Mk4 Standard (TSO)

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2.4 Intercity Swallow Mk4 Standard (TSOD)

2.5 Intercity Swallow Mk4 Restaurant (RSB)

2.6 Intercity Swallow Mk4 First (FOD)

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2.7 Intercity Swallow Mk4 First (FO)

2.8 Intercity Swallow Mk4 Guard (DVT)

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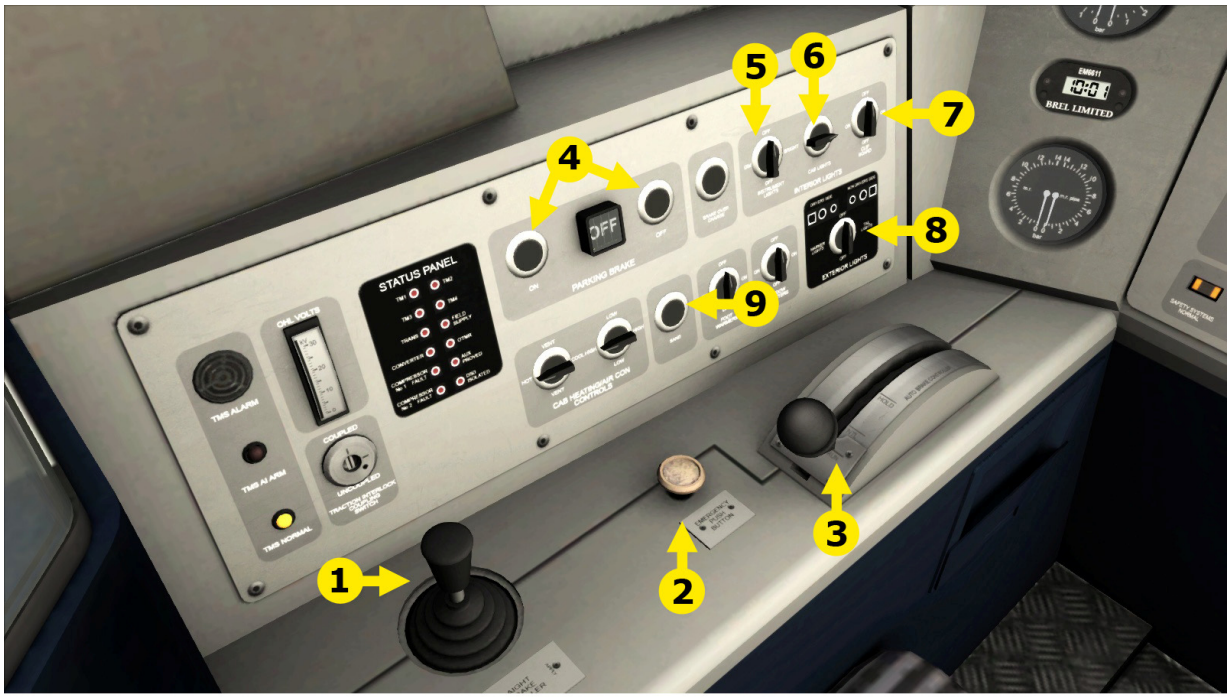
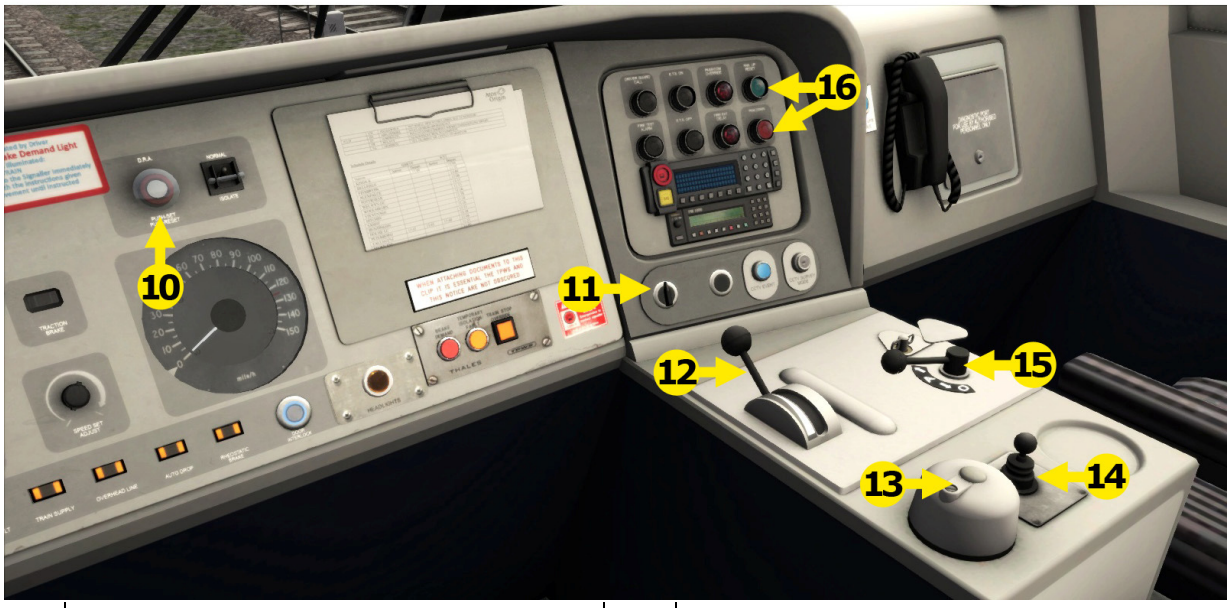
3 Driving the Class 91

3.1 Class 91 Main Cab Controls





1	Locomotive Brake ([&])	10	DRA (K)
2	Emergency Brake (Backspace)	11	Wipers (V)
3	Train Brake (; & ')	12	Throttle (A & S)
4	Parking Brake (/)	13	AWS & Vigilance Device Reset (Q)
5	Instrument Light (I)	14	Horn (Spacebar & B)
6	Cab Light (L)	15	Direction Control (W & S)
7	Clip Light (CTRL+L)	16	Pantograph Up/Down (P)
8	Headlights (H & Shift+H)	-	Cruise Control (Y & C)
9	Sander (X)	-	Guards Buzzer (U)

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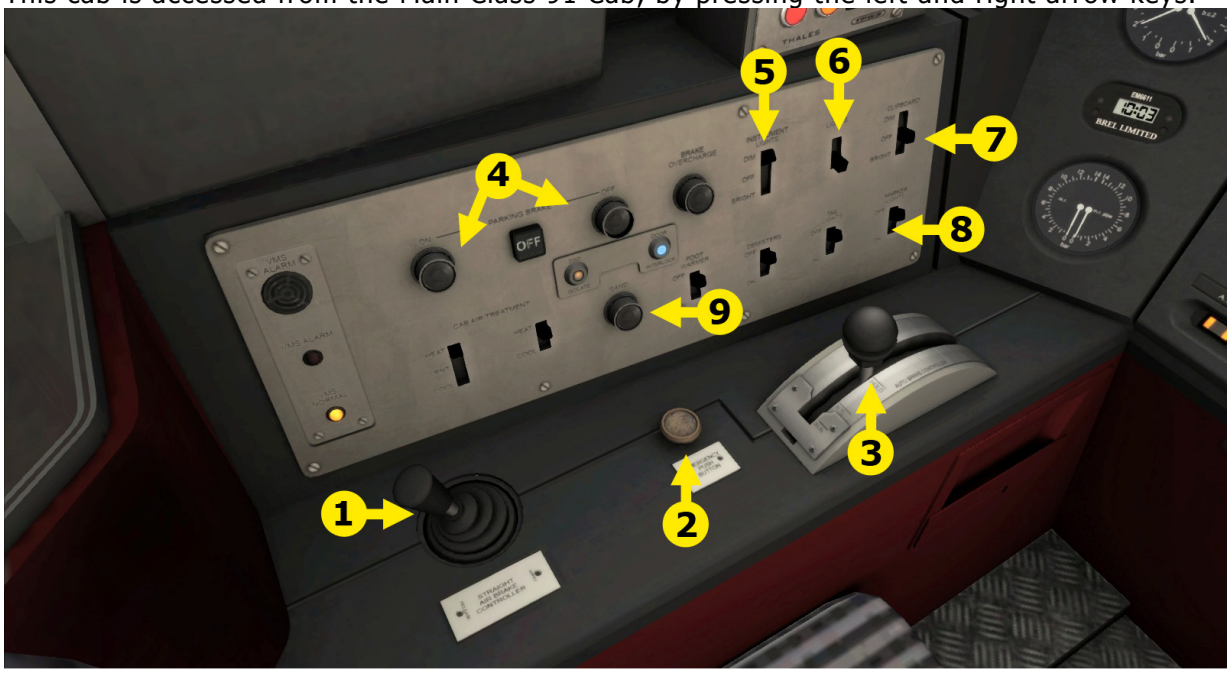
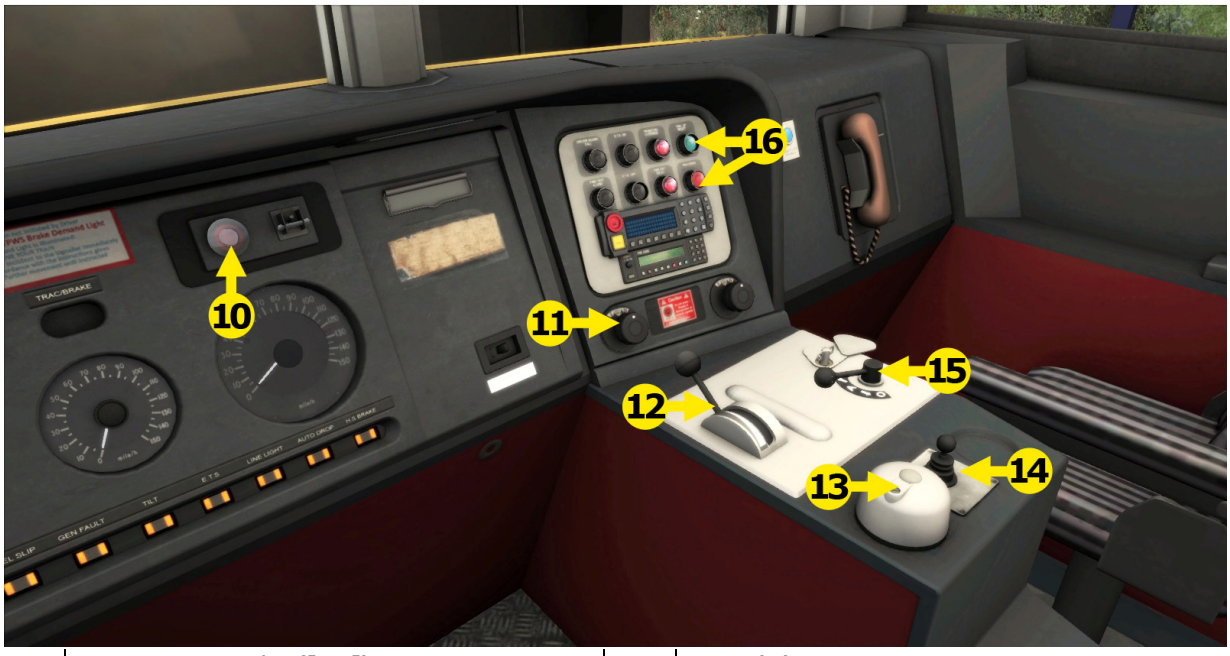
3.2 Class 91 Slab Cab Controls

This cab is accessed from the Main Class 91 Cab, by pressing the left and right arrow keys.





1	Locomotive Brake ([&])	10	DRA (K)
2	Emergency Brake (Backspace)	11	Wipers (V)
3	Train Brake (; & ')	12	Throttle (A & S)
4	Parking Brake (/)	13	AWS & Vigilance Device Reset (Q)
5	Instrument Light (I)	14	Horn (Spacebar & B)
6	Cab Light (SHIFT+L)	15	Direction Control* (W & S)
7	Clip Light (SHIFT+CTRL+L)	16	Pantograph Up/Down (P)
8	Headlights (H & Shift+H)	-	Cruise Control (Y & C)
9	Sander (X)	-	Guards Buzzer (U)

*Note - If using the HUD display in the 'Slab Cab', the Direction Control is reversed.

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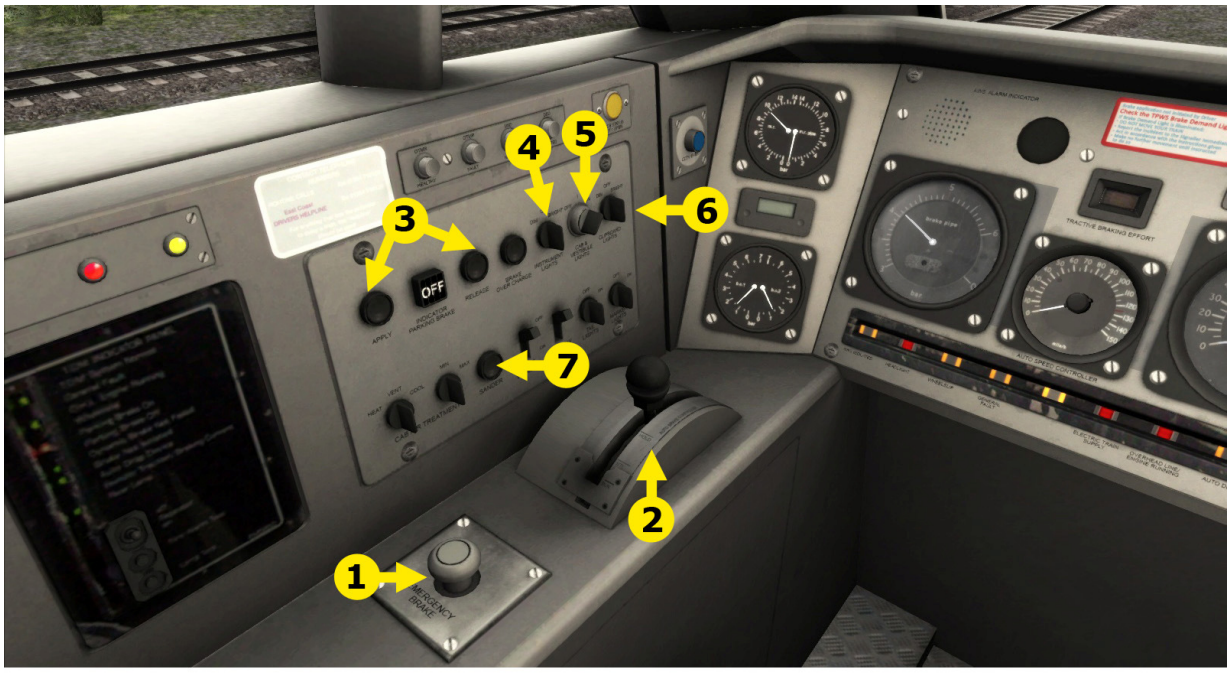
3.3 Mk4 DVT Cab Controls



1	Emergency Brake (Backspace)	10	Wipers (V)
2	Train Brake (; & ')	11	Throttle (A & D)
3	Parking Brake (/)	12	AWS & Vigilance Device Reset (Q)
4	Instrument Light (I)	13	Horn (Spacebar & B)
5	Cab Light (L)	14	Direction Control (W & S)
6	Clip Light (CTRL+L)	15	Pantograph Up/Down (P)
7	Sander (X)	-	Cruise Control (C & Y)
8	DRA (K)	-	Driver/Guard Call (U)
9	Headlights (H & Shift+H)		

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4 Scenarios

4.1 Simple & Expert Controls Tutorial: Class 91

You will learn about operating the class 91 using expert controls. The controls will be explained before you will be instructed to drive the train to King's Cross where you will make a passenger stop. Don't worry, everything will be explained at a comfortable pace.

4.2 [91]On Time Alteration

Drive a Class 91 to Kings Cross, making an out of schedule stop at Stevenage, catering for the passengers of a failed train.

On the way to London, please make an out of schedule stop at Stevenage. Aim to arrive in the Capital at 09:10.

- **Duration 40 minutes**

4.3 [91]Troublesome Trip to Stevenage

Bad weather and a tight timetable conspire to compound this already hectic rush hour commute to Stevenage.

Good evening driver. Today you'll be driving the Class 91 to Stevenage during rush hour. Try and stick to the schedule, but drive carefully due to the adverse weather.

- **Duration 45 minutes**

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5 Acknowledgements

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