Class 220 ‘Voyager’

Release Version 1.0

1 Background

1.1 Class 220 Voyager

The Class 220 Voyager is a class of diesel-electric high-speed multiple-unit trains built in Belgium by Bombardier Transportation in 2000 and 2001.They were introduced in 2001 to replace the 30-year-old InterCity 125 and Class 47 fleets operating on the Cross Country Route, initially for Virgin Trains and since 2007 by CrossCountry.

All coaches are equipped with a Cummins QSK19 diesel engine which originally produced 750hp (560kW) at 1800rpm. These power a generator which supplies current to motors driving two axles per coach, with one axle per bogie powered. The engines were down-rated to produce 700hp (522kW) during 2007.

Voyagers have both air and rheostatic brakes. They are fitted with Dellner couplers, like the Class 222, operated by East Midlands Trains, and the Class 390 Pendolino electric trains used by Virgin West Coast, meaning they can be coupled in rescue/recovery mode (air brake only) in the event of a failure.

The Class 220s can also be easily assisted by Dellner fitted Class 57s (Thunderbirds) in the event of a failure. By use of adaptive couplings a failed 220 can also be assisted by any air braked locomotive such as a Class 37, 47 or 66 or even an HST. The units can work in multiple with Class 221 units but not Class 222 units as the electrical connections of the Class 222 units are incompatible with the Class 220.

The Class 220s have B5005 bogies, which are distinctive as they are of inside-frame design and so the axles are supported by bearings behind the wheels, meaning the outside face of the wheel is visible.

The Class 220s operate in four-coach sets with a carriage mass of between 45 and 48 tonnes and a total train weight of 185.6 tonnes, a top speed of 125 mph (200 km/h) and a maximum range of approximately 1,350 miles (2,170 km) between refuelling stops. Their route availability is very good being RA 2 - in part due to the lightweight bogie design.

All Voyagers are maintained at the dedicated Central Rivers TMD near Burton-on-Trent.

1.2 Design & Specification

Builder	Bombardier Transportation
Unit Weight	185.6t
Vehicle Length	23.85m (driving cars) or 22.82m (intermediate cars)
Vehicle Width	2.73m
Number Built	34 trainsets
Vehicle Power	Originally 750hp. Reduced to 700hp in 2007
Top Speed	125mph
Brake Types	Air and Rheostatic
Transmission	Diesel Electric

2 Rolling Stock

DMSL (Coach F)

MSRMB (Coach D)

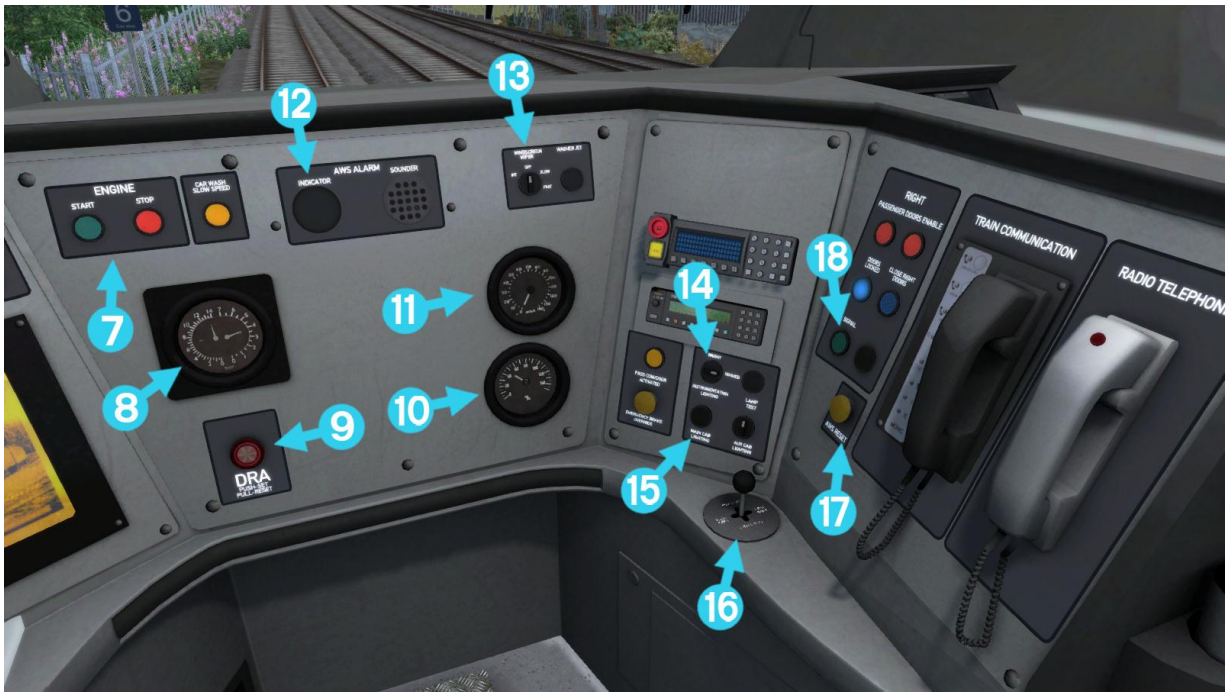
MSL (Coach C)

DMFL (Coach A)

3 Driving the Class 220 Voyager

3.1 Cab Controls

1 Clipboard Light
2 Emergency Brake
3 Master Key
4 Reverser Control
5 Headlight Control
6 Brake and Throttle Control



7	Engine Start/Stop Buttons
8	Air Brake Gauge
9	DRA (Driver's Reminder Appliance)
10	Brake Percentage Gauge
11	Speedometer (MPH)
12	AWS Sunflower
13	Windscreen Wipers
14	Instrument Lights
15	Cab Light Switch
16	Horn
17	AWS Reset
18	Guard Buzzer

3.2 Locomotive Keyboard Controls

Key Equivalent	Action
D A	Decrease or Increase combined throttle and brake.
S W	Move reverser control Forward or Backward.

3.3 General Keyboard Controls

Key	Action
T	**Load/unload** passengers or freight.
H	**Lights.** Repeatedly pressing will cycle through headlight states where appropriate.
V	**Windscreen wipers**. Press once to switch on and again to switch off.
Z	**(Expert) Engine stop/start**. By default engines will already be running at the start of a scenario. Press this button to stop and then again to restart the engine.
Q	**(Expert) Alerter.** The Alerter is a system used on some trains to ensure that the driver has seen a signal. If the alert sounds (a black/yellow striped symbol is shown on the Driver's display), this must be acknowledged by pressing the Alerter button or the emergency brakes will be applied.
X	**(Expert) Sander**. Causes sand to be laid on the rails next to the wheels to assist with adhesion. Press and hold to activate sander, let go to stop.
Space	**Horn.** Sound the horn's low tone.
B	**Horn.** Sound the horn's high tone.
Shift Ctrl C	**Couple manually.**

4 Scenarios

For driving tutorials, please visit the Academy from the main TS2015 menu screen*

4.1 [220] Back on the Rails

Time to get back on the rails. This Class 220 Voyager service developed a fault on an earlier run. It is your job to refuel and run the express passenger service from Exeter St Davids down to Dawlish.

Duration: 25mins
Difficulty: Medium

4.2 [220] Troublesome Voyager

Take charge of this Class 220 Voyager from Exeter St Davids to Newton Abbot. Be prepared to stop for signals as you will be following a delayed HST from London Paddington. To make things better, a film crew and celebrity will be on board filming a documentary!

Duration: 30mins
Difficulty: Hard

4.3 [220] Voyager of the Rails

Time to take on the busy Riviera Line. With weather forecasts reporting that today could be the hottest day of the year, the public are out in force. Expect busy lines.

Duration: 40mins
Difficulty: Easy

5 Acknowledgements

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- The Beta Testing Team
- The QA Department