

BRITISH RAILWAYS



DRIVER'S MANUAL

DRIVING INSTRUCTIONS.
DIESEL MULTIPLE UNIT TRAINS
WITH MECHANICAL TRANSMISSION
EXCEPTING CLASS 126 (WHITE CIRCLE) CARS

This booklet supersedes all
previous issues

BR.33056/2
ISSUE 4

DRIVING INSTRUCTIONS FOR DIESEL MULTIPLE UNIT TRAINS WITH MECHANICAL TRANSMISSION, EXCEPTING CLASS 126 (WHITE CIRCLE) CARS.

1. DRIVING CONTROLS

1.1 The power controls consist of:-

1.1.1 A control circuit key position. A control circuit key must be inserted into this position and then turned before the controls can be energised.

1.1.2 A reversing handle. A reversing handle must be inserted into the NEUTRAL position at the base of the gear selector. When moved to FORWARD or REVERSE, the gear selector handle can be moved away from the NEUTRAL position into the four gear-ratio positions. The AIR and AXLE and ENGINE indicators cannot be illuminated unless the reversing handle is moved away from the NEUTRAL position.

1.1.3 A power controller. This consists of a handle which must be depressed before the brake can be released. The handle can only be depressed when at the IDLING position. When the handle is depressed, the engine speed can be increased by moving it to the FULL POWER position. If the pressure on the handle is released when at a power position, it will rise due to spring pressure. It cannot be depressed again until the handle is moved to the IDLING position. Vacuum in the brake pipe will be destroyed 5-7 seconds after the release of the power controller handle.

1.1.4 A gear selector. This consists of a handle which has five positions i.e. NEUTRAL, 1, 2, 3 and 4. Gear ratios and neutral gear are directly selected by moving the handle to these positions.

1.1.5 A brake valve. This is marked OFF, LAP and ON. The handle of this valve can be detached when moved to the LAP position. Likewise it is refitted again with the brake valve still in this position. When the handle is at the OFF position, and the engines are running, a brake pipe vacuum of 21in. Hg can be maintained. The vacuum is destroyed by moving the brake

valve handle to the ON position. If a partial reduction in vacuum is required, the brake valve handle should be moved to ON, until the required figure is obtained and then moved back to LAP. The vacuum can then be held at any desired figure between 0 and 21in. Hg.

2. INSTRUMENTS AND INDICATORS

2.1 A Duplex vacuum gauge. The left hand scale of this gauge indicates the Brake Pipe vacuum and will normally read approximately 21in. Hg when running. The right hand scale indicates the vacuum in the release reservoir and will normally read 28–30in Hg.

2.2 A speedometer. This is scaled from 0 to 90 mph, but the train speed must not exceed 70 mph.

2.3 An engine tachometer. This is scaled from 0–1900 rpm and indicates the speed of either of the engines of the leading power car. A switch is operated in order to connect the tachometer to either the No.1 or No.2 engine. In addition to indicating the engine speeds, the tachometer face has two positions marked CHANGE UP and CHANGE DOWN and these are used to indicate when a change of gear ratio should be made.

2.4 AIR and AXLE lights. These are situated to the left of the windscreen. Six lights are provided vertically and each represents a power car within the train formation. The lights become illuminated provided:—

The air pressure in the main reservoir exceeds 60 psi.

Both final drive gearboxes of the appropriate power car are correctly engaged.

The reversing handle is moved to FORWARD or REVERSE.

2.5 If the train has less than six power cars, the unused lights remain extinguished.

2.6 Engine indicator lights. These lights are provided in two vertical columns. Those to the left of the AIR and AXLE lights represent the left hand engines of the train and those to the right represent the right hand engines of the train. One indicator light is therefore provided for each engine on the train, up to a maximum of 12. The lights become illuminated when their associated engines are started.

- 2.7 A control circuit light. This light becomes illuminated when a control supply is available to operate the equipment, i.e. when the control circuit key is turned and the associated train control fuses are intact.

3. TO MOVE THE TRAIN

With the train prepared and the engines running in accordance with the instructions in BR 33056/9.

- 3.1 Release the parking brake. Await the guard's buzzer code, applying the brake in LAP and keep the power controller handle depressed.

- 3.2 When the guard's signal is received and has been acknowledged.

- 3.2.1 With the engines idling, move the gear selector to FIRST GEAR without pausing in other gears.

- 3.2.2 Move the brake valve to OFF and check that 21in Hg. is registered on the brake pipe gauge.

- 3.2.3 Move the power controller to FULL POWER smoothly, according to the rail conditions and permanent speed restrictions through crossings, etc.

- 3.2.4 Observe the driving tachometer. When this indicates CHANGE UP:—

- 3.2.4.1 Move the power controller handle to IDLING and pause for 4 seconds in order to allow the tachometer to indicate the lower end of the yellow band.

- 3.2.4.2 Select second gear.

- 3.2.4.3 Pause for 2 seconds, then move the power controller handle back to FULL POWER smoothly and according to speed restrictions.

- 3.2.5 When the driving tachometer again indicates CHANGE UP, repeat 3.2.4.1, select third gear and repeat 3.2.4.3. Repeat the procedure again for changing into fourth gear.

3.3 When the train is running in fourth gear the required speed should be maintained by moving the power controller handle as necessary. If the required speed of the train can be maintained without the use of the engine power, fourth gear must be selected and the power controller handle must be moved to idling. If the period of coasting is to be followed by a period of running under power, this must be resumed with the correct gear ratio selected. If the section requiring power to be used is approached at 41 mph or above, the gear selector should remain in fourth gear and the power controller handle should be moved to a power position as necessary.

3.4 When power is required after coasting and the speed is less than 41 mph the correct gear must be selected and after a pause of 2 seconds, the power controller handle must be moved smoothly towards the FULL POWER position. The correct gears in which to resume powered running after coasting are determined by the road speed at the time of power requirement. These are given in the following table:-

Speed Range in M.P.H.	Gear Ratio
0-15	1st
15-27	2nd
27-41	3rd
41-70	4th

3.5 When the train reaches a sharply rising gradient the full power will probably be required unless the ascent only covers a short distance and the speed of approach is high. If the gradient continues to rise sharply, the speed of the train will be reduced. The reduction in road speed will cause proportionate reduction in engine speed as will be seen by the driving tachometer. If the speed falls to 41 mph a CHANGE DOWN indication will be given. When this occurs proceed as follows:-

3.5.1 Return the power controller handle to the IDLING position.

3.5.2 Without pausing, select the next lower gear.

3.5.3 Pause for 2 seconds and then move the power controller handle smoothly back to the FULL POWER position.

3.6 The selection of the lower gear may enable the train to be worked without further gear changing on the particular gradient, i.e. with the driving tachometer between the CHANGE UP and CHANGE DOWN positions.

3.7 If the gradient is of sufficient severity, the driving tachometer will again indicate CHANGE DOWN when the speed falls to 27 mph with full power being applied. When these circumstances occur, the procedure in 3.5.1 to 3.5.3. above must be repeated. The procedure must be repeated again if the driving tachometer gives a further CHANGE DOWN indication. This will occur if the speed falls to 15 mph with full power being applied.

3.8 When severe gradients are being ascended occasions can arise during which the road speed may remain constant with the tachometer indicating, or almost indicating CHANGE DOWN. On these occasions the next lower gear should be selected and there should be no attempt to remain in a higher gear for the longest possible period.

4. BRAKING

4.1 The brakes of DMU trains are of a "quick release" type, in which a high vacuum reservoir on each vehicle assists the exhausters to release the brakes.

4.2 To stop the train:

4.2.1 Return the power controller handle to IDLING and keep it depressed.

4.2.2 Move the brake valve towards ON. Return it to LAP when the required vacuum has been destroyed in the brake pipe. Do not make a brake application by moving the handle alternately between the OFF and ON positions.

4.2.3 When the speed of the train has dropped to between 10 and 15 mph move the gear selector to NEUTRAL.

4.2.4 After coming to a stand keep the brake applied in LAP.

NOTE: If the train speed has been reduced by braking due to a signal check, permanent way slack etc., and power is again required, the correct gear must be selected before re-applying power as shown in 3.4.

5. REVERSING

5.1 When it is necessary to reverse a train without changing ends proceed as follows:-

5.1.1 With the engines idling and the brake applied in LAP, move the reversing handle to the REVERSE position.

5.1.2 Check that the final drive indicator lights become momentarily extinguished and then re-illuminate.

5.1.3 When receiving the signal to move.

5.1.3.1 With the engines idling and the power controller handle depressed, move the gear selector to FIRST GEAR without pausing in any other gears.

5.1.3.2 Move the brake valve handle to the OFF position and check that 21 in. Hg. is registered on the brake pipe gauge.

5.1.3.3 Move the power controller handle to a position sufficient to move the train at the required speed.

5.1.4 When receiving the STOP signal, move the power controller handle to IDLING, apply the brake and select NEUTRAL gear.

DO NOT MOVE THE REVERSING HANDLE WHEN THE TRAIN IS IN MOTION.

6. STOPPING THE ENGINES

6.1 With the power controller handle at IDLING, the driver's safety device applying the brakes and the control circuit key at ON.

6.1.1 Press the engine stop button until all engine lights are extinguished.

6.1.2 Apply the hand brake and turn the control circuit key to OFF.

7. TOGGLING THE GEARBOX BRAKE BANDS

At a convenient time during the turn of duty, or as soon as possible if slipping gearbox bands are suspected, proceed as follows:-

- 7.1 With the train stopped fully apply the brakes.
- 7.2 Obtain full air pressure.
- 7.3 Stop the engines.
- 7.4 Depress the power controller handle.
- 7.5 With the reversing handle in FORWARD, select 1st 2nd and 3rd gears in turn six times, pausing five seconds in each gear. Return the gear selector to NEUTRAL.
- 7.6 Restart the engines when necessary and proceed normally.

8. RUNNING OF DIESEL ENGINES AND HEATERS IN STATIONS, SIDINGS ETC.

- 8.1 With the exception of situations where side starting would be impossible due to platforms, or dangerous due to conductor rails, or movement of vehicles on adjacent roads, engines must be stopped if the standing time is to exceed 5 minutes.

NOTE: The exceptions do not include situations where some engines are accessible on one side of the train only, because it will then be possible to start the remaining engines from the driving compartment.

- 8.2 Heaters may be left running for 30 minutes after the engines have been stopped.