

BRITISH RAILWAYS



DRIVER'S MANUAL

DRIVER'S INSTRUCTIONS

**DIESEL MULTIPLE UNIT TRAINS
WITH MECHANICAL TRANSMISSION
AND 'BLUE SQUARE' COUPLING CODE**

1. TO MOVE THE TRAIN

- 1.1. Release the handbrake and await the guard's buzzer code, applying the brake in LAP and keeping the power controller handle depressed.
- 1.2. When the guard's signal is received and has been acknowledged.
 - 1.2.1. With the engines idling, move the gear selector to FIRST GEAR without pausing in other gears.
 - 1.2.2. Move the brake valve to OFF and check that 21 in. Hg. is registered on the brake pipe gauge.
 - 1.2.3. Move the power controller to FULL POWER smoothly, according to the rail conditions and permanent speed restrictions through crossings, etc.
 - 1.2.4. Observe the driving tachometer. When this indicates CHANGE UP:—
 - 1.2.4.1. Move the power controller handle to IDLING and pause for 4 seconds.
 - 1.2.4.2. Select second gear.
 - 1.2.4.3. Pause for 2 seconds, then move the power controller handle back to FULL POWER smoothly and according to speed restrictions.
 - 1.2.5. When the driving tachometer indicates CHANGE UP, repeat 1.2.4.1., select third gear and repeat 1.2.4.3. Repeat the procedure again for changing into fourth gear.
- 1.3. When the train is running in fourth gear the required speed should be maintained by moving the power controller as necessary. If the required speed of the train can be maintained without the use of engine power, fourth gear must be selected and the power controller 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 m.p.h. or above, the gear selector should remain in fourth gear and the power controller should be moved to a power position as necessary.
- 1.4. When power is required after coasting and the speed is less than 41 m.p.h., the correct gear must be selected and after a pause of 2 seconds, the power controller 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
16-27	2nd
28-41	3rd
42-70	4th

- 1.5. 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 a proportionate reduction in engine speed as will be seen by the driving tachometer. If the speed falls to 41 m.p.h. a CHANGE DOWN indication will be given. When this occurs proceed as follows:—
 - 1.5.1. Return the power controller to the IDLING position.
 - 1.5.2. Without pausing, select the next lower gear.
 - 1.5.3. Pause for 2 seconds and then move the power controller handle smoothly back to the FULL POWER position.

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.

If the gradient is of sufficient severity, the driving tachometer will again indicate **CHANGE DOWN** when the speed falls to 27 m.p.h., with full power being applied. When these circumstances occur, the procedure in 1.5.1. to 1.5.3. above must be repeated. The procedure must be repeated again if the driving tachometer gives a further **CHANGE DOWN** indication, which will occur if the speed falls to 15 m.p.h. with full power being applied.

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.

2. BRAKING

2.1. The brakes of D.M.U. trains are of a "quick release" type, in which a high vacuum reservoir on each vehicle assists the exhausters to release the brakes. A duplex vacuum gauge is provided. The left hand scale of this gauge indicates the brake pipe vacuum and the right hand side indicates the release vacuum. The brake valve is provided with a detachable handle which can only be fitted and removed in the LAP position. After fitting, the handle can be moved between the OFF and ON positions.

2.2. To stop the train:

2.2.1. Return the power controller to **IDLING** and keep it depressed.

2.2.2. 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.

2.2.3. When the speed of the train has dropped to between 10 and 15 m.p.h. move the gear selector to **NEUTRAL**.

2.2.4. After coming to a stand keep the brake applied in **LAP** as necessary.

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 1.4.

3. CHANGING ENDS

3.1. With the brakes applied, select the next direction of travel and check that the final drive indicators extinguish and then re-illuminate.

3.2. Turn the control circuit switch key to **OFF** and remove it.

3.3. Remove the automatic brake valve handle and reversing handle and place them in the receptacle on 3 and 4 car units.

3.4. Set the destination indicator and illuminate it as necessary.

3.5. Set the route indicator to a blank aspect.

3.6. Move the A.W.S. change end switch to **OFF**.

3.7. Lock the internal and offside doors.

3.8. Switch off all cab lights.

3.9. Leave the driving compartment, locking the door and proceed **IMMEDIATELY** to the opposite end of the train.

THE ENGINES MUST BE STOPPED AND THE MODIFICATIONS TO RULE 126 SHOWN ON PAGE 39 OF THE GENERAL APPENDIX MUST BE CARRIED OUT, IF IT IS NOT INTENDED TO PROCEED IMMEDIATELY TO THE OPPOSITE END OF THE TRAIN.

UNDER NO CIRCUMSTANCES IS IT PERMISSIBLE TO LEAVE THE IMMEDIATE VICINITY OF A TRAIN, IN WHICH THE ENGINES ARE RUNNING UNLESS THERE IS ANOTHER COMPETENT PERSON IN ATTENDANCE.

- 3.10. At the opposite end of the train, in the driving compartment:
 - 3.10.1. Set the destination indicator and illuminate it as necessary.
 - 3.10.2. Set the route indicator and illuminate it.
 - 3.10.3. Fit the brake handle and reversing handle to the controls and select the direction of travel.
 - 3.10.4. Fit the control circuit switch key and turn it to ON.
 - 3.10.5. Move the A.W.S. switch to ON and press the reset button.
 - 3.10.6. If the engines have been stopped, re-start them from the driving compartment as described in the Preparation Instructions.

4. REVERSING

- 4.1. When it is necessary to reverse a train without changing ends proceed as follows:—
 - 4.1.1. With the engines idling and the brake applied, move the reversing handle to the REVERSE position.
 - 4.1.2. Check that the final drive indicator lights become momentarily extinguished and then re-illuminate.
 - 4.1.3. When receiving the signal to move.
 - 4.1.3.1. With the engines idling and the power control handle depressed, move the gear selector to FIRST GEAR without pausing in any other gears.
 - 4.1.3.2. Move the brake valve handle to the RELEASE position and check that 21 in. Hg. is registered on the brake pipe gauge.
 - 4.1.3.3. Move the power controller to a position sufficient to move the train at the required speed.
 - 4.1.4. When receiving the STOP signal, move the power controller to IDLING, apply the brake and select NEUTRAL gear.
DO NOT MOVE THE REVERSING HANDLE WHEN THE TRAIN IS IN MOTION.

5. STOPPING THE ENGINES

- 5.1. With the power controller at IDLING, the driver's safety device applying the brakes and the control circuit switch at ON.
 - 5.1.1. Press the engine stop button until all engine lights are extinguished.
 - 5.1.2. Apply the hand brake and turn the control circuit switch key to OFF.

6. 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:—

- 6.1. With the train stopped fully apply the brakes.
- 6.2. Obtain full air pressure.
- 6.3. Stop the engines.
- 6.4. Depress the power controller handle.
- 6.5. 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.
- 6.6. Restart the engines when necessary and proceed normally.