

B.R.33003/264
August 1969

BRITISH RAILWAYS



DIESEL MULTIPLE UNIT TRAINS
WITH 'RED TRIANGLE' COUPLING
CODE AND TORQUE CONVERTER
TRANSMISSION

PART 2

DRIVING INSTRUCTIONS
INCLUDING PREPARATION AND
DISPOSAL DUTIES

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FULL PREPARATION DUTIES FOR MULTIPLE UNIT DIESEL TRAINS WITH 'RED TRIANGLE' COUPLING SYMBOLS AND TORQUE CONVERTER TRANSMISSION

When commencing duty each Driver must have in his possession and retain throughout his turn:-

- (a) A control circuit, Yale type, key.
 - (b) An A.W.S. change end key, where applicable.
 - (c) A door key.
 - (d) An internal door key.
1. Open the driving compartment door at the leading end, enter, deposit personal belongings and then:-
 - (a) Check that the handbrake is on.
 - (b) Check that the detonator case is sealed.
 - (c) Check that the track circuit operating clips are in position.
 - (d) Check that the hand fire extinguishers are in position.
 - (e) Check the route indicator, reset and illuminate as required.
 - (f) Check the destination indicator, reset and illuminate as required.
 - (g) Check the passenger control valve (where fitted) is in the operating position.
 - (h) Check that a brake handle and reversing handle are available in the receptacle, but DO NOT fit them to the controls at this stage.
 2. Close the control circuit switch with the Yale type key.
 3. Leave the leading driving compartment and commence external preparation, checking for obvious defects whilst walking round the train. Check also that no cables or pipes are attached.
LOCK THE INTERNAL AND EXTERNAL DOORS OF ALL DRIVING COMPARTMENTS BEHIND THE LEADING VEHICLE AFTER CARRYING OUT THE RELEVANT PREPARATION DUTIES.
 4. Proceed to the first engine on the left hand (Driver's) side of the train then:-
 - (a) Check the fuel level in the adjacent tank.
 - (b) Check the fire alarm system by pressing the test button.
 - (c) Check that the over-riding switch is in the ON position.
 - (d) Start the engine and make a check whilst doing so that no fuel, water, air or exhaust leakages occur.
 5. Repeat 4. for the next engine on the same side of the train.
 6. Proceed to the first intermediate driving compartment (or rear driving compartment when there are no intermediate ones) and then:-
 - (a) Check that the handbrake is OFF.
 - (b) Check that the detonator case is sealed.
 - (c) Check that the hand fire extinguishers are in position.

- (d) Check that the route indicator and destination indicator are both blank unless it is a rear driving compartment, in which case only the destination indicator must be set and illuminated as necessary.
- (e) Check that the passenger control valve (where fitted) is in the operating position.
- (f) Check that the air pressure is increasing.
- (g) Check that the brake handle and reversing handle are not fitted to the controls.
- (h) Check that the A.W.S. switch is in the OFF position.

ON TRAINS OF 8 CARS

- 7. Proceed to the second intermediate driving compartment and repeat 6.
- 8. Proceed to the next engine on the same side of the train and repeat 4 then proceed to the last engine on the same side and repeat 4.

ON TRAINS OF 12 CARS

- 9. Proceed to the third and fourth intermediate driving compartments and repeat 6.
- 10. Proceed to the next engine on the same side of the train and repeat 4, then proceed to the last engine on the same side and repeat 4.

ON TRAINS OF 8 AND 12 CARS

- 11. Proceed to the rear driving compartment, enter and then:-
 - (a) Check that the handbrake is OFF.
 - (b) Check that the detonator case is sealed.
 - (c) Check that the track circuit operating clips are in position.
 - (d) Check that the hand fire extinguishers are in position.
 - (e) Check that the route indicator is set blank and the destination indicator is set and illuminated as necessary.
 - (f) Check that the passenger communication valve (where fitted) is in the operating position.
 - (g) Check that the air pressure is increasing.
 - (h) Check that the brake handle and reversing handle are NOT fitted to the controls.
 - (i) Check that the A.W.S. switch is in the OFF position.
- 12. Leave the rear driving compartment and pass round the end of the train. Repeat 4, in turn, for each engine on the train, until the front end is reached.
- 13. Enter the leading driving compartment and then:-
 - (a) Stop all engines when the air pressure is 80 p.s.i. or above.
 - (b) Fit the reversing handle and brake handle into their respective positions.
 - (c) Select a direction of travel and check that the final drive indicator lights illuminate.
 - (d) Re-start all engines from the driving compartment and check that the indicator lights illuminate.
 - (e) Move the A.W.S. switch to the ON position, then depress and release the reset button.

- (f) Move the brake handle to the OFF position and with the power control handle depressed, check that 21 in. Hg can be obtained on the brake pipe gauge and 28 in. Hg can be obtained on the release pipe gauge.
14. With the brake valve handle in the OFF position, release the power controller handle. Check that the brake pipe vacuum is destroyed by the Driver's safety device.
 15. With the brake valve handle in the OFF position, move it to the ON position. Check that the brake pipe vacuum is destroyed.
 16. Return the brake valve handle to the OFF position in order that the Guard may carry out the vacuum brake test.

**DRIVER'S DUTIES WHEN TAKING TO A TRAIN STABLED
IN TRAFFIC AND WHERE THE AIR PRESSURE
IS OVER 75 p.s.i.**

The following duties must be carried out when a driver takes over a train in traffic which has been left unmanned for a period and in which the air pressure is 75 p.s.i. or above.

1. Open the Driving compartment door at the leading end, enter, deposit personal belongings and then:-
 - (a) Check that the handbrake is ON.
 - (b) Check the outstanding entries in the Repair Book.
 - (c) Check that the detonator case is sealed.
 - (d) Check that the track circuit operating clips are in position.
 - (e) Start the engines from the driving compartment panel. (See page 12).
 - (f) Check the route indicator, reset and illuminate as required.
 - (g) Check the destination indicator, reset and illuminate as required.
2. Leave the driving compartment, proceed to the opposite end of the train, entering all intermediate driving compartments en route and check that the handbrakes are off.

LOCK THE INTERNAL AND EXTERNAL DOORS OF ALL DRIVING COMPARTMENTS BEHIND THE LEADING VEHICLE.

3. In the rear driving compartment only:-
 - (a) Check that the handbrake is OFF.
 - (b) Check that the route indicator is set to blank and the destination indicator is set and illuminated as necessary.
4. Return to the leading driving compartment and then:-
 - (a) Fit the brake handle and place the Driver's brake valve in the OFF position.
 - (b) Move the brake valve handle to the OFF position and with the power control handle depressed check that 21 in. Hg can be obtained on the brake pipe gauge and 28 in. Hg can be obtained on the release pipe gauge.
5. With the brake valve handle in the OFF position, release the power controller handle. Check that the brake pipe vacuum is destroyed by the Driver's safety device.

6. With the brake valve handle in the OFF position, move it to the ON position. Check that the brake pipe vacuum is destroyed.
7. Return the brake valve handle to the OFF position and leave it there in order that the Guard may carry out the vacuum brake test.

NOTES ON PREPARATION AND ENGINE STARTING

4-car multiple unit Diesel sets carry a vacuum brake handle and a reversing handle, in a receptacle, in each driving compartment. 2-car sets carry a brake handle and a reversing handle in one driving compartment. These should not be fitted to the controls during preparation, until at least 80 p.s.i. of air pressure has been raised in the main reservoir and the engines have been stopped. (See 13 (a) and (b) above).

Whenever a train is diagrammed to be prepared for service, the preparation duties, as specified on pages 9 to 11 must be carried out.

Engine starting during preparation (see page 9, item 4(d))

The engines of multiple unit Diesel trains must be started locally during preparation. After carrying out items 1, 2, 3 and 4 (a) to (d) the first engine may be started as follows:-

1. Depress the excess fuel button, then pull the fuel injection pump manual control handle to the "Full fuel" position and hold it there.
2. Press the engine "Local start" button and release it immediately the engine fires. If the engine does not fire within 5 seconds, release the button and pause 10 seconds before making a further attempt. If the engine does not start after three successive attempts, investigate the cause in accordance with the instructions on page 21.
3. Immediately the engine starts, return the fuel injector pump governor manual control slowly to the "Engine Idling" position, taking 3-5 seconds to do so.
4. When satisfied that the engine is running correctly and that there are no obvious defects or leakages, pass to the next engine as shown on page 9.

Engine starting when the main reservoir pressure is 75 p.s.i. or over

With the handbrake on:-

1. Close the control circuit switch with the Yale type key.
2. Fit the reversing handle and select a direction of travel.
3. Check the final drive indicator lights. If any do not illuminate, move the reversing handle to the opposite direction of travel. If the indicator light does not illuminate after two further reversals, check the final drives of the affected car.
4. With the direction of travel selected and the final drive indicator lights illuminated—
 - (a) Depress the power controller handle and move it to the full power position.
 - (b) Press ONE of the engine start buttons until the appropriate engine indicator lights illuminate.

(c) Press the other engine start button until the other engines are started.

DO NOT PRESS BOTH ENGINE START BUTTONS AT ONCE.

5. Move the A.W.S. switch to the ON position then depress and release the reset button.

If an engine does not fire within 5 seconds, release the button and pause 10 seconds before making a further attempt. If the engine does not fire after three successive attempts, investigate the cause in accordance with the instructions on page 22.

6. Return the power controller handle to the IDLING position when the engines have fired.

TO MOVE THE TRAIN

1. Release the handbrake and await the Guard's buzzer code, applying the brake in LAP as necessary and keeping the power controller handle depressed.
2. When receiving the Guard's signal:-
 - (a) With the engines IDLING, move the gear selector to the "D" (Drive) position.
 - (b) Move the brake valve handle to the OFF position and note that 21in. of vacuum is registered on the brake pipe gauge.
 - (c) Move the power controller handle to the FULL POWER position smoothly, according to the rail conditions and permanent speed restrictions through crossings etc.
 - (d) The train will then accelerate as required and the power controller should be used as necessary in order to maintain the required road speed.

NOTE : During acceleration the speed of the engines will drop to idling when a road speed of 46 m.p.h. is reached. This is to enable a smooth transition from hydraulic drive to direct drive in the torque converters. When the direct drive clutch in each torque converter is engaged, the engine speed will rise automatically to a value corresponding with the power controller position.

3. If a period of coasting is to be performed, i.e. when the speed of the train can be maintained without the use of engine power, the "D" position of the gear selector must be used and the power controller must be placed in the IDLING position. When power is again required after coasting, the power controller should be used as necessary in order to maintain road speed.

BRAKING

The brakes of D.M.U. cars 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 high 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 ON and OFF positions.

TO STOP THE TRAIN

1. Return the power controller to the idling position and keep it depressed.
2. Apply the brake by moving the brake valve handle towards the ON position and then return it to the LAP position when the required vacuum has been destroyed in the brake pipe. Do not make brake applications by moving the handle alternately between the OFF and ON positions.
3. When the speed of the train has dropped to between 10 and 15 m.p.h. move the gear selector to the NEUTRAL position.
4. After coming to a stand keep the brake applied in LAP as necessary.

CHANGING ENDS

1. With the brakes applied, remove the brake valve handle and reversing handle and place them in the receptacle.
2. Turn the control circuit key to OFF and remove it.
3. Place the A.W.S. switch in the OFF position.
4. Set the destination indicator and illuminate it as necessary.
5. Set the route indicator to a blank aspect.
6. Lock the internal and offside doors.
7. Switch off all cab lights.
8. 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. (See page 15 under "Stopping the Engines.")

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.

9. Upon arriving at the opposite end of the train, unlock the driving compartment door, enter and proceed as per items (1) to (4) on page 12 or as per items (1) to (6) on pages 12 and 13 if the engines have stopped.

REVERSING

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

1. With the engines idling and the brake applied move the reversing handle to the REVERSE position.
2. Note that the final drive indicator lights become momentarily extinguished and then re-illuminate.
3. When receiving a signal to move:-
 - (a) With the engines idling and the power controller handle depressed, move the gear selector to the "D" position.

- (b) Move the brake valve handle to the OFF position and note that 21 in. Hg is registered on the brake pipe gauge.
 - (c) Move the power controller to a position sufficient to move the train at the required speed.
4. When receiving a stop signal, move the power controller to the IDLING position, apply the brake and select NEUTRAL gear.
- DO NOT MOVE THE REVERSING HANDLE WHEN THE TRAIN IS IN MOTION.**

STOPPING THE ENGINES

1. With the power controller handle in the idling position and the Driver's safety device applying the brakes:-
- (a) Press the engine stop button until all engines stop.
 - (b) Apply the handbrake and open the control circuit switch.

DISPOSAL DUTIES FOR DIESEL MULTIPLE UNIT TRAINS WITH 'RED TRIANGLE' COUPLING SYMBOLS AND TORQUE CONVERTER TRANSMISSION

STABLING

When a train is to be stabled in a position from which the next move must be in the opposite direction proceed as follows:-

1. Apply the handbrake.
2. Switch off the driving compartment heater if in use.
3. Move the reversing handle to the REVERSE position.
4. Press the engine stop button until all engines stop.
5. Open the control circuit switch by means of the Yale type key when all of the final drive gearboxes have reversed.
6. Remove the reversing handle and brake valve handle and place them in the receptacle.
7. Place the A.W.S. switch in the OFF position.
8. Report all known defects in the repair book.
9. Switch off the driving compartment lights.
10. LEAVE THE DRIVING COMPARTMENT WITH THE INTERNAL AND EXTERNAL DOORS LOCKED.

When a train is to be stabled and the direction of the next move is not known, omit (3) above.

TRAIN HEATING (SMITH'S HEATERS)

The heating of multiple unit trains is normally under the control of the Guard. When working empty trains in which pre-heating of the stock is not required the driving compartment may be heated by operating the heaters of the leading power car. Two heater control panels are provided in the driving compartment from which either or both of the heaters may be operated. To operate either heater proceed as follows:-

1. Turn the heater starting switch to the STARTING POSITION. This should illuminate the GLOWPLUG light. If this light does not illuminate, the system is faulty and the switch must be returned

to the OFF position. After a period of 45 seconds, the AIR FAN light will become illuminated. After a period of 3½ minutes the GLOWPLUG light will be extinguished. If the fuel does not ignite when the GLOWPLUG light is illuminated the fan and fuel pump are automatically switched off and the switch must be returned to the OFF position.

NOT MORE THAN THREE ATTEMPTS MUST BE MADE TO START THE HEATING APPARATUS.

2. When the GLOWPLUG light is extinguished and the AIR FAN light is illuminated, the switch should be returned to the RUNNING position.

To switch a heater off turn the control switch to the OFF position.

DO NOT OPEN THE BATTERY ISOLATING SWITCH UNTIL THE HEATERS HAVE BEEN STOPPED FOR 5 MINUTES OTHER THAN IN EMERGENCIES.

DISPOSAL OF OIL FOR DIESEL MULTIPLE UNIT TRAINS
WITH 'RED TRIANGLE' COUPLING SYMBOLS
AND TORQUE CONVERTER TRANSMISSION

STABILISING

When a train is to be stabilised in a position from which the next move must be in the opposite direction proceed as follows:-

1. Apply the handbrake.
2. Switch off the driving compartment heater if in use.
3. Move the reversing handle to the REVERSE position.
4. Operate the control switch by means of the 2nd type key when all of the final drive gearboxes have stopped.
5. Remove the reversing handle and take safety handle and place them in the rearcock.
6. Place the A.W.S. switch in the OFF position.
7. Report all known defects in the repair book.
8. Switch off the driving compartment heater.
9. LEAVE THE DRIVING COMPARTMENT WITH THE INTERNAL AND EXTERNAL DOORS LOCKED.

When a train is to be stabilised and the direction of the next move is not known, omit (1) above.

TRAIN HEATING (SMITH'S HEATERS)

The heating of multiple unit trains is normally under the control of the Guard. When working single trains in which the heating of the stock is not required the driving compartment may be heated by operating the heaters of the heating power car. Two heater controls are provided in the driving compartment from which either or both of the heaters may be operated. To operate either heater proceed as follows:-

1. Turn the heater control switch to the STARTING POSITION. This should illuminate the GLOWPLUG light. If this light does not illuminate the system is faulty and the switch must be returned