

BR. 33003/61
October, 1958

**PARK ROYAL VEHICLES TYPE
RAILBUS.
NOS. 79970—79974.**

www.railcar.co.uk

GENERAL DESCRIPTION

Single Unit Railbus with driving compartments at each end.
Single Engine only.

TECHNICAL DATA

Type	1A.
Weight in running order ...	15 tons.
Wheel base	19ft. 8½ins.
Wheel diameter	3ft. 0ins.
Width overall	9ft. 3ins.
Length overall	43ft. 4ins.
Height overall	11ft. 10ins.
Minimum curve negotiable ...	3 chains.
Maximum speed at maximum governed engine revs.:	

	<i>1st speed</i>	<i>2nd speed</i>	<i>3rd speed</i>	<i>4th speed</i>
Gear box ratios:	14 m.p.h.	25 m.p.h.	38 m.p.h.	55 m.p.h.
	<i>1st gear</i>	<i>2nd gear</i>	<i>3rd gear</i>	<i>4th gear</i>
	4.28:1	2.43:1	1.59:1	1:1

Fuel capacity (engine) ...	73 gallons
Lubricating oil sump capacity	6½ engine
Cooling water capacity ...	12.5 gallons
Control system	Electro pneumatic
Brake system	Air pressure and lever type hand brake
Warning horn	Compressed air operated

ENGINE: B.U.T.

6 cylinder 11.3 litre horizontal oil engine	A.E.C. type A200 AC, 150 b.h.p. at 1800 r.p.m.
Compression ratio	16 to 1
Bore	130 mm. = 5.12 inch
Stroke	142 mm. = 5.5907 inch
Firing order	1, 5, 3, 6, 2, 4.
Rotation	Clockwise facing free end of engine
Fuel injector type	C.A.V. B.D.L.L. 150S.
Fuel injector nozzle holder ...	C.A.V. NLA102S.
Fuel injector lifting pressure	175 atmospheres 2570 lbs. sq. in.
Fuel pump type	C.A.V. Monobloc type NL6F/90/60. GLWB1/199/900.

TRANSMISSION

Type	Fluid coupling S.C.G. type R.14 gearbox, 4 speed epicyclic. (Electro-pneumatic operated. Unit No. 79970 fitted with C.A.V. type automatic gear change device.
Reversing arrangement ...	Axially sliding dog clutch between bevel gears incorporated in final drive gearbox.
Final drive gear ratio ...	3.36:1.

AUXILIARIES

Battery	Nickel cadmium alkaline type NIFE LR.20. 18 cells 24 volts 200 amp. hours.
Alternator	C.A.V. type A.C.8 belt driven from the input end of gearbox.

Rectifier for Alternator	...	C.A.V. germanium type RUG4.
Lighting	24 volt
Starter motor	C.A.V.
Compressor	Clayton Dewandre twin—type PCGA 31-16. Belt driven from input end of gearbox.
Railbus heating equipment		Smith's combustion heater
Fuel tank for car heating	10½ gallon capacity.
Windscreen wiper	Pneumatic type.
Demister	Hot air from passenger heating with fan boost.
Speedometer	Smith belt-driven electric generator on output side of gearbox.

DRIVER'S CONTROLS

1. Electrical control switch (Yale type with removable key).
2. Throttle handle (engine speed) incorporating the deadman's device.
3. Gear-change selector handle (Units Nos. 79971—79974). Automatic gear change handle marked NEUTRAL-DRIVE (Unit No. 79970).
4. Reversing lever (detachable).
5. Engine "Start" button.
6. Engine "Stop" button.
7. Engine indicator lights.
8. Air pressure/Final drive direction indicator lights.
9. Engine tachometer/Change speed indicator.
10. Dual horn control.
11. Speedometer.
12. Air pressure Duplex gauge.
13. Low air pressure indicator light.
14. Driver's brake valve (handle detachable).
15. Marker light switches and indicator.
16. Windscreen wiper valve.
17. Instrument panel light switches.
18. Route indicator light switch.
19. Destination indicator light switch.
20. Buzzer and push button.
21. Handbrake-lever type.
22. Driver's cab light switch.
23. Car heater switch and indicator panel. No. 1 end only.
24. Deadman's hold over button on R/H cantrail.
25. Car light control.
26. Fire alarm bell.
27. Demister fan switch.
28. Left- and right-hand door control buttons.
29. "Door Open" indicator light.
30. Retractable steps—pull knobs.

UNIT No. 79970

GENERAL INFORMATION AND DRIVING INSTRUCTIONS

All control devices, e.g. automatic gear control handle, throttle handle (engine speed), reversing lever, etc., are operated by electric pneumatic (E.P.) valves, therefore DO NOT USE FORCE WHEN MOVING THE CONTROL LEVERS OR HANDLES.

The electrical control system operates from either end of the railbus.

Any failure of the control air pressure system resulting in a severe drop in pressure will shut down the engine and return the gears to neutral.

Loss of engine oil pressure will extinguish the engine indicator light and stop the engine.

The throttle handle is also the Deadman's device and, if it is allowed to spring up, the engine will drop to idling speed and after about 5 to 7 seconds delay the air brake will be applied. To re-set the Deadman's device the throttle handle must be moved back past the idling position before the handle can be depressed.

The automatic gear handle and the reversing lever are mechanically interlocked. The automatic gear handle is locked in the neutral position and cannot be moved until the reversing lever is moved to the FORWARD or REVERSE position.

The reversing lever cannot be moved unless the automatic gear handle is in NEUTRAL.

SPECIAL NOTE

DO NOT MOVE THE AUTOMATIC GEAR HANDLE FROM THE NEUTRAL POSITION UNTIL READY TO START THE RAILBUS.

DRIVER'S DAILY DUTIES WHEN IN SERVICE

At Commencement of Turn:

1. Obtain the satchel containing the control switch key, reversing lever, air brake handle and carriage keys.
2. Check that:
 - (a) the detonator cases are intact.
 - (b) the handbrake is ON in the leading driving compartment.
 - (c) the handbrake is OFF in the trailing driving compartment.

NOTE—Operation of Hand Brake Lever

To apply handbrake, pull handbrake lever to rear **without** depressing the ratchet button, push handbrake lever forward to end of travel and repeat until no further rearward movement is possible.

To release handbrake. Pull handbrake lever to rear to release pressure on ratchet, depress ratchet button on top of lever, then push lever forward against end of travel.

3. LOCK DOOR OF TRAILING DRIVING COMPARTMENT.

At Convenient Time during Turn:

1. Make a short inspection of the railbus and check that the apparatus is generally in good working condition. Check fuel tank level. Report all known defects at end of turn.

STARTING THE ENGINE

1. Turn the control switch key to the ON position. Place A.T.C. key (where fitted) to the ON position.
2. Check that the automatic gear handle is locked in the NEUTRAL position, i.e., reversing lever removed from controller, and that the handbrake is on.
3. **If at least 75 lbs. sq. in. air pressure is available in the system and the engine is warm it may be started from the driving compartment.**

The procedure is as follows:

- (a) Place the reversing lever in position and move it FORWARD or REVERSE to obtain control of the equipment in the driving compartment.
- (b) Depress the throttle handle to engage the Deadman's device, then move it to 1st or 2nd throttle position.
- (c) Press "START" button and release immediately the indicator light shows that engine has started. When the engine has started return throttle handle to IDLING position.
- (d) Check that the FORWARD or REVERSE air indicator light has illuminated indicating that the final drive has engaged. If not, with the engine running at IDLING speed place the reversing lever to the opposite direction of travel — pause — and then re-select desired direction of travel. when the FORWARD indicator light is illuminated in the leading driving compartment the REVERSE light will be showing in the opposite compartment.

Note: If the engine does not start, i.e., the indicator light does not light within approximately three seconds, release "START" button for not less than 10 seconds to allow engine to come to rest before pressing the button again.

If the engine refuses to start, check that the engine isolating switch is in the "ON" position. Check fuel tank contents gauge for fuel content and ensure that fuel cock is open. Then start engine locally as shown in item 4 (c)—(e). STOP the engine, proceed to driving compartment and start in the normal manner.

4. If 75 lbs. sq. in. is not available in the system, or the engine is cold it must be started from the side of the railbus. The procedure is as follows:

In Driving Compartment

- (a) Check that the electrical control switch key is in the "ON" position.
- (b) Check that the automatic gear handle is locked in the "NEUTRAL" position and the reversing lever removed from the controller, and that the handbrake is "ON."

At side of railbus

- (c) Pull the fuel injector pump hand throttle control to "FULL OPEN" position and hold it there.
- (d) Press the "start" button which is located on a small panel beside the engine and release it immediately the engine starts.
- (e) Release the fuel injection pump hand throttle control gradually until the engine runs at idling speed—do not race the engine.

In Driving Compartment

- (f) When the air pressure has built up to 75 lbs. per sq. in. STOP engine, then place the reversing lever into position in the controller and proceed to re-start as in Item 3 (a)—(d).

Note: If engine does not start within approximately three seconds, release "START" button for not less than 10 seconds to allow engine to come to rest before pressing button again. A separate "STOP" and "START" button is also situated on

the opposite side of frame to the engine for emergency use or servicing purposes only.

WITH THE ENGINE RUNNING

- (a) Place the air brake handle in position and move it to "RELEASE" position. Check that there is 100 lbs. per sq. in. on the reservoir side of the gauge.
- (b) Check the air brake application (brake pressure is 80 lbs. sq. in.)
- (c) Release the throttle handle. Check that it returns to the Deadman's position and that after 5 to 7 seconds delay the brakes are applied.
- (d) Check that the air pressure has again built up to approximately 95 lbs. per sq. in.
- (e) Check operation of both doors in conjunction with the indicator light.
- (f) Apply the air brake, check operation of the retractable steps by operating the "PULL KNOBS", then take off the hand-brake in the driving compartment.

STARTING THE RAILBUS

- (a) Ensure that there is adequate air in the reservoir side.
- (b) Obtain control of the Deadman's device and hold the throttle handle in the "IDLING" position.
- (c) Check that the retractable steps control knobs are in the correct position, then partially release the air brake.
- (d) WITH THE ENGINE IDLING move the automatic gear handle to "DRIVE" position.
- (e) Release the air brake fully by placing brake handle in OFF position. The railbus should not be moved with the brakes dragging.
- (f) After a pause of NOT LESS THAN TWO SECONDS from the moment of placing the automatic gear handle to "DRIVE" position, open the throttle notch by notch; the railbus will commence to move. As the speed increases, the gear changes are made automatically and this is indicated on the engine speed indicator (tachometer).

Note: Never stand for more than a few seconds with the automatic gear handle in "DRIVE" position. If the brake fails to release, return the gear handle to NEUTRAL. Then check the operation of the air brake before again selecting "DRIVE" position.

COASTING

A free wheel is fitted on the output shaft between the fluid flywheel and the gearbox. When the maximum running speed required is obtained, to allow the railbus to coast:

1. Return the throttle handle to "IDLING" position.
2. Leave the automatic gear handle in "DRIVE" position.

Re-opening the throttle:

If it is necessary to re-open the throttle, move the throttle handle throughout its range notch by notch.

STOPPING THE RAILBUS

1. Return the throttle handle to "IDLING" and hold in that position.

2. Apply the air brake as required.
3. When almost at a stand return the automatic gear handle to "NEUTRAL."

Note: If the railbus speed has been reduced, e.g. due to a signal check, and if the signal is placed into the clear position before the bus is brought to a stand, release the air brake and then follow the procedure described under "Coasting, Re-opening the throttle," above.

CHANGING ENDS

1. Put the air brake ON. Release the throttle handle and allow the Deadman's device to operate.
2. STOP the engine.
3. Remove the reversing lever. Place the air brake handle to the "OFF" position and remove handle.
4. Place control switch in the "OFF" position and remove key.
5. Lock driving compartment doors and remove keys.
6. Proceed to the other end of the railbus and place handles and lever into their appropriate positions. Place control switch in "ON" position.
7. Place reversing lever in "FORWARD" or "REVERSE" as required.
8. Proceed to re-start the engines as shown under "STARTING THE ENGINE" item 3 (b)—(d), when at least 75 lbs. sq. in. air pressure is available.

REVERSING THE RAILBUS

If it is necessary to reverse the railbus without changing ends, when it has been brought to a stand, check that the automatic gear handle has been placed into the "NEUTRAL" position, then:

1. With the engine IDLING move the reversing lever to "REVERSE". Check that the direction indicator light is illuminated indicating that the final drive has correctly engaged. If not, with the engine still IDLING place the reversing lever to the opposite direction of travel—pause—and then re-select "REVERSE."
2. Proceed as in "Starting the railbus" items (c)—(f).

DO NOT ATTEMPT TO REVERSE WHEN THE RAILBUS IS MOVING.

STOPPING THE ENGINE

1. Return the throttle handle to "IDLING" position, then release to Deadman's position.
2. Check that the air brake is "ON."
3. Press engine "STOP" button and hold in that position until engine has stopped (engine light is extinguished).
4. Place the reversing lever into the "NEUTRAL" position.
5. Apply the handbrake.

STABLING THE RAILBUS

After stopping the engine by the method shown above:

1. Check that the hand brake is applied.
2. Place air brake valve to "OFF" position and remove the handle.
3. Remove reversing lever. Place control switch in "OFF" position and remove key.
4. Shut off compartment heater if in use.
5. Remove A.T.C. key (where fitted).

6. Lock the driving compartment doors.
7. Return the satchel containing the brake handle, reversing lever, control switch key, A.T.C. key (where fitted) and door keys to the Running Foreman or other responsible person on duty.

TRAIN HEATING

Heating is by means of hot air suitably directed into the passenger compartment of the vehicle. The operation of the heater is automatic apart from switching on and operating the heat control.

To operate the heater, turn heater switch in a clockwise direction to "FULL HEAT" position. This supplies current to the glow plug (an element) and the glow plug light on the Indicator Panel should be illuminated. If this fails, return switch to "OFF" position and do not attempt to re-start. After a period of 45 seconds the air fan light will be illuminated on the indicator panel denoting that the heater fan and fuel pumps are working. In approximately 3½ minutes the Glow Plug indicator light will be automatically extinguished. If the oil fails to ignite in the above period the fan and fuel pump is automatically switched off, and it is then necessary to return the control switch to "OFF" and re-start. Not more than three attempts should be made to start the apparatus.

If the switch is in the Full Heat position and the heater cuts "OUT", the indicator light will be extinguished. Return the switch to "OFF", then attempt to re-start the heater as described above.

To admit cold air to the vehicle, turn the switch in an anti-clockwise direction past the "OFF" position to "COLD."

FAULTS IN TRAFFIC

If engine stops while the railbus is running, stop the railbus, place gears into "NEUTRAL", then attempt to re-start by depressing the appropriate local "START" button, not more than three times. If this fails to re-start the engine, if possible lock the final drive in "NEUTRAL" and turn engine isolation switch to "OFF". Railbus will then require towing to terminal point.

To Lock Final Drive in Neutral

Stop the engine, then remove floor trap in body and withdraw the "Neutral" lock, turn it a quarter turn and allow it to go right home. Proceed to the driving compartment and move the reversing lever slowly from "Forward" to "Reverse" and back several times, to ensure that the "Neutral" lock is entered fully into the slot. Check that the main propeller shaft to the final drive concerned can be rotated by hand.

Note: If no air pressure is available, the final drive cannot be operated to allow the lock to be engaged in "NEUTRAL".

ASSISTING DISABLED RAILBUS

In an emergency, a disabled railbus may be assisted by another diesel railbus or car or by a locomotive coupled by means of the special towing hook on the vehicle. The towing hook and the bumpers are attached to the body of the vehicle. GREAT CARE must be taken in carrying out any emergency movement, and a speed of 15 m.p.h. must not be exceeded.

FAILURE OF CONTROL EQUIPMENT

Driving Controls

Leading Driving Compartment

Remove control switch key, reversing lever and brake handle and then proceed to the opposite driving compartment and endeavour to gain control. Then act in accordance with the Appendix Instruction for the "Working of Diesel Mechanical Cars—Driving Apparatus Disabled."

COMPRESSED AIR SYSTEM—UNLOADER VALVE

In the event of an unloader valve defect, remove the blank nut from dummy stud adjacent to the unloader valve and fit on to the escape connection of the valve after unscrewing protection cap.

FIRE PRECAUTIONS

In the event of a fire, which will be normally indicated by the fire warning bells ringing if fire is adjacent to the engine, bring the railbus to a stand as laid down in Rule No. 188. When the railbus has been brought to a stand take a hand-operated fire extinguisher from the driving compartment and inspect the engine.

After ensuring that the fire has been extinguished, the small metal tab on the front of the fire alarm control box should be pulled off. This will uncover a switch which should be operated to stop the alarm bell, extinguish the warning light and render it impossible to re-start the engine. After this has been done, the final drive gears must be set and locked in the NEUTRAL position if possible. A speed of 15 m.p.h. must not be exceeded to the point where the railbus can be taken out of traffic. (See instructions under "Assisting Disabled Railbus" and "Towing.")

The alarm isolating switch referred to does not cut out the re-setting thermostat and should this operate through a recurrence of fire on the engine or fluid flywheel, the alarm bells will ring and the warning light will be lit. In this event the fire will not be extinguished automatically. It is essential, therefore, for the remaining hand-operated fire-fighting equipment to be used as a matter of the utmost urgency after the railbus has been stopped.

If the automatic extinguishing apparatus has operated, avoid inhaling a concentration of the gas which has a faint smell, and avoid touching the liquid with the skin or clothes.

As the gas is heavier than air, the concentration will be at low levels near the ground.

See General Instructions and Notices in Appendix to the Operating Instructions, and in the Miscellaneous Instructions, regarding First-Aid treatment to a person contaminated by the fire extinguishing medium in the automatic appliance.

WARNING HORNS

When sounding the horn, to comply with Rule 127 and the Appendix Instructions, operate the lever in such a manner as to give the 2-tone sound that these horns are designed to emit. This is of the utmost importance, and if the horn is defective it must be reported immediately.

TOWING

The hook on the end of the railbus will accept a British Railways standard screw coupling, but due to no buffers being fitted, the bus can only be towed and at a maximum speed of 15 m.p.h. When slowing down or stopping, extra care is necessary to avoid damage to the towed end of the bus from impact with the towing vehicle or locomotive.

The final drive must be isolated if at all possible before railbus is towed.

DRIVERS IN COURSE OF TRAINING

Drivers in course of training are only allowed to operate the controls and brake on passenger trains under the direct supervision of the instructor.

UNITS Nos. 79971—79974

GENERAL INFORMATION AND DRIVING INSTRUCTIONS

All control devices, e.g. gears, throttle handle (engine speed), reversing lever, etc., are operated by electric pneumatic (E.P.) valves, therefore **DO NOT USE FORCE WHEN MOVING THE CONTROL LEVERS OR HANDLES.**

The electrical control system operates from either end of the railbus.

Any failure of the control air pressure system resulting in a severe drop in pressure will shut down the engine and return the gears to neutral.

Loss of engine oil pressure will extinguish the engine indicator light and stop the engine.

The throttle handle is also the Deadmans device and, if it is allowed to spring up, the engine will drop to Idling speed and after about 5 to 7 seconds delay the air brake will be applied. To re-set the Deadman's device the throttle handle must be moved back past the Idling position before the handle can be depressed.

The gear selector handle and the reversing lever are mechanically interlocked. The gear selector handle and the reversing lever are mechanically interlocked. The gear selector handle is locked in the **NEUTRAL** position and cannot be moved until the reversing lever is moved to the **FORWARD** or **REVERSE** position.

The reversing lever cannot be moved unless the gear selector lever is in **NEUTRAL**.

SPECIAL NOTE

DO NOT MOVE THE GEAR SELECTOR HANDLE FROM THE NEUTRAL POSITION UNTIL READY TO START THE RAILBUS, EXCEPT WHEN "TOGGLING UP" THE GEARBOX BRAKE BANDS (See Instruction, Page 3, item 2).

DRIVER'S DAILY DUTIES WHEN IN SERVICE

At Commencement of Turn

1. Obtain the satchel containing the control switch key, reversing lever, air brake handle and carriage keys.
2. Check that:
 - (a) the detonator cases are intact.
 - (b) the handbrake is **ON** in the leading driving compartment.
 - (c) the handbrake is **OFF** in the trailing driving compartment.

Note: Operation of Hand Brake Lever:

To apply handbrake, pull handbrake lever to rear **without** depressing the ratchet button, push handbrake lever forward to end of travel and repeat until no further rearward movement is possible.

To release handbrake, pull handbrake lever to rear of release pressure on ratchet, depress ratchet button on top of lever, then push lever forward against end of travel.

3. LOCK DOOR OF TRAILING DRIVING COMPARTMENT.

At Convenient Time during Turn

1. Make a short inspection of the railbus and check that the apparatus is generally in good working condition. Check fuel tank level.
 - *2. "Toggle up" the gearbox brake bands as follows:
 - (a) Check that full air pressure is available.
 - (b) STOP the engine.
 - (c) Hold the Deadman's device in the RUNNING position.
 - (d) Place the reversing lever into the FORWARD position.
 - (e) Move the gear selector handle to engage 1st, 2nd and 3rd gears (not 4th) about six times, pausing in each gear position to allow the brake bands to engage fully.
 - (f) Return the gear selector handle to NEUTRAL.
 - (g) Re-start the engine.
- Report all known defects at end of turn.**

STARTING THE ENGINE:

1. Turn the control switch key to the ON position. Place A.T.C. key (when fitted) to the ON position.
2. Check that the gear selector handle is locked in the NEUTRAL position, i.e., reversing lever removed from controller, and that the handbrake is on.
3. **If at least 75 lbs. sq. in. air pressure is available in the system and the engine is warm it may be started from the driving compartment.**

The procedure is as follows:

- (a) Place the reversing lever in position and move it FORWARD or REVERSE to obtain control of equipment in the driving compartment.
- (b) Depress the throttle handle to engage the Deadman's device, then move it to 1st or 2nd throttle position.
- (c) Press "START" button and release immediately the indicator light shows that engine has started.
When the engine has started return throttle handle to Idling position.
- (d) Check that the FORWARD or REVERSE air indicator light has illuminated indicating that the final drive has engaged. If not, with the engine running at IDLING speed place the reversing lever to the opposite direction of travel — pause — and then re-select desired direction of travel. When the FORWARD indicator light is illuminated in the leading driving compartment the REVERSE light will be showing in the opposite compartment.

Note: If the engine does not start, i.e., the indicator light does not light within approximately three seconds, release "START" button for not less than 10 seconds to allow engine to come to rest before pressing the button again.

If the engine refuses to start, check that the engine isolating switch is in the "ON" position. Check fuel tank contents gauge for fuel content and ensure that fuel cock is open. Then start engine locally as shown in item 4 (c)—(e). STOP the engine, proceed to driving compartment and start in the normal manner.

STARTING THE ENGINE (contd.)

4. If 75 lbs. sq. in. is not available in the system, or the engine is cold it must be started from the side of the railbus. The procedure is as follows:

In Driving Compartment

- Check that the electrical control switch key is in the "ON" position.
- Check that the gear selector handle is locked in the NEUTRAL position and the reversing lever removed from the controller, and that the handbrake is ON.

At side of railbus

- Pull the fuel injector pump hand throttle control to "FULL OPEN" position and hold it there.
- Press the "Start" button which is located on a small panel beside the engine and release it immediately the engine starts.
- Release the fuel injection pump hand throttle control gradually until the engine runs at idling speed—**do not race the engine.**

In Driving Compartment

- When the air pressure has built up to 75 lbs. per sq. in. STOP engine, then place the reversing lever into position in the controller and proceed to re-start as in Item 3 (a)—(d).

Note: If engine does not start within approximately three seconds, release "Start" button for not less than 10 seconds to allow engine to come to rest before pressing button again. A separate "STOP" and "START" button is also situated on the opposite side of frame to the engine for emergency use or servicing purposes only.

WITH THE ENGINE RUNNING

- Place the air brake handle in position and move it to Release position. Check that there is 100 lbs. per sq. in. on the reservoir side of the gauge.
- Check the air brake application (Brake pressure is 80 lbs. sq. in.)
- Release the throttle handle. Check that it returns to the Deadman's position and that after 5 to 7 seconds delay the brakes are applied.
- Check that the air pressure has again built up to approximately 95 lbs. per sq. in.
- Check operation of both doors in conjunction with the indicator light.
- Apply the air brake check operation of the retractable steps by operating the "Pull-Knobs", then take off the handbrake in the driving compartment.

STARTING THE RAILBUS

- Ensure that there is adequate air in the reservoir side.
- Obtain control of the Deadman's device and hold the throttle handle in the Idling position.

STARTING THE ENGINE (contd.)

- (c) Check that the retractable steps control knobs are in the correct position, then partially release the air brake.
- (d) WITH THE ENGINE IDLING move the gear selector handle to first gear position. (Do not pause in any other gear position.)
- (e) Release the air brake fully by placing brake handle in OFF position. The railbus should not be moved with the brakes dragging.
- (f) After a pause of NOT LESS THAN TWO SECONDS from the moment of selecting first gear, open the throttle notch by notch; the railbus will commence to move. As the speed increases, change gear as indicated on the engine speed indicator (tachometer).

Note: Never stand for more than a few seconds with first gear selected. If the brake fails to release, return the gear selector handle to NEUTRAL. Then check the operation of the air brake before again selecting first gear.

GEAR CHANGING

(a) Changing up

When the Engine Speed Indicator shows "Change up";

1. Return the throttle handle to IDLING position.
2. Allow the engine speed indicator needle to fall to a position midway between "Change up" and "Change down".
3. Select the next highest gear.
4. PAUSE FOR TWO SECONDS, then re-open the throttle notch by notch.
5. Change gear progressively in the same manner until top gear is engaged.

Note: DO NOT MOVE THE GEAR SELECTOR HANDLE UNTIL THE ACTUAL GEAR CHANGE IS TO BE MADE.

(b) Changing Down

When the Engine Speed Indicator shows "Change down":

1. Return the throttle handle to IDLING position.
2. Immediately select the next lower gear.
3. Pause for TWO SECONDS, then re-open the throttle notch by notch.

Note: DO NOT MOVE THE GEAR SELECTOR HANDLE UNTIL THE ACTUAL GEAR CHANGE IS TO BE MADE.

COASTING

A free wheel is fitted on the output shaft between the fluid flywheel and the gearbox. When the maximum running speed required is obtained, to allow the train to coast:

1. Return the throttle handle to IDLING position.
2. Place the gear selector handle into the fourth gear position.

Re-opening the throttle:

If it is necessary to re-open the throttle, place the gear selector handle into the appropriate gear position, then pause for TWO SECONDS before re-opening the throttle handle notch by notch.

Note: The correct speeds are as follows:

- 1st gear 0 — 14 m.p.h.
- 2nd gear 14 — 25 m.p.h.
- 3rd gear 25 — 38 m.p.h.
- 4th gear over 38 m.p.h.

STOPPING THE RAILBUS

1. Return the throttle handle to IDLING and hold in that position.
2. Apply the air brake as required.
3. When almost at a stand return the gear selector handle to NEUTRAL without pausing in any other gear. If in 4th gear the lever should be moved direct to NEUTRAL.

Note: If the railbus speed has been reduced, e.g., due to a signal check, and if the signal is placed into the clear position before the railbus is brought to a stand, release the air brake and then follow the procedure described under "Coasting, Re-opening the throttle", above.

CHANGING ENDS

1. Put the air brake ON. Release the throttle handle and allow the Deadman's device to operate.
2. STOP the engine.
3. Remove the reversing lever. Place the air brake handle to the OFF position and remove handle.
4. Place control switch in the OFF position and remove key.
5. Remove A.T.C. key (where fitted).
6. Lock driving compartment door and remove key.
7. Proceed to the other end of the railbus and place handles and lever into their appropriate positions. Place control switch in ON position.
8. Place A.T.C. key (where fitted) in position.
9. Place reversing lever in FORWARD or REVERSE as required.
10. Proceed to restart the engines as shown under "STARTING THE ENGINE" item 3 (b)—(d), when at least 75 lbs. sq. in. air pressure is available.

REVERSING THE RAILBUS

If it is necessary to reverse the railbus without changing ends, when it has been brought to a stand, check that the gear selector handle has been placed into the NEUTRAL position, then:

1. With the engine idling move the reversing lever to REVERSE. Check that the direction indicator light is illuminated indicating that the final drive has correctly engaged. If not, with the engine still IDLING place the reversing lever to the opposite direction of travel — pause — and then re-select REVERSE.
2. Proceed as for "Starting the Railbus," items (c)—(f).

DO NOT ATTEMPT TO REVERSE WHEN THE RAILBUS IS MOVING.

STOPPING THE ENGINE:

1. Return the throttle handle to Idling position, then release to Deadman's position.
2. Check that the air brake is ON.
3. Press engine "Stop" button and hold in that position until engine has stopped (engine light is extinguished).
4. Place the reversing lever into the NEUTRAL position.

STOPPING THE ENGINE (contd.)

5. Apply the handbrake.

STABLING THE RAILBUS

After stopping the engine by the method shown above:

1. Check that the hand brake is applied.
2. Place air brake valve to OFF position and remove the handle.
3. Remove reversing lever. Place control switch in OFF position and remove key.
4. Remove A.T.C. key (where fitted).
5. Shut off compartment heater if in use.
6. Lock the driving compartment doors.
7. Return the satchel containing the brake handle, reversing lever, control switch key, A.T.C. key (where fitted), and door keys to the Running Foreman or other responsible person on duty.

TRAIN HEATING

Heating is by means of hot air suitably directed into the passenger compartment of the vehicle. The operation of the heater is automatic apart from switching on and operating the heat control.

To operate the heater, turn heater switch in a clockwise direction to FULL HEAT position. This supplies current to the glow plug (an element) and the glow plug light on the Indicator Panel should be illuminated. If this fails, return switch to OFF position and do not attempt to re-start. After a period of 45 seconds the air fan light will be illuminated on the indicator panel denoting that the heater fan and fuel pumps are working. In approximately 3½ minutes the Glow Plug indicator light will be automatically extinguished. If the oil fails to ignite in the above period the fan and fuel pump is automatically switched off, and it is then necessary to return the control switch to Off and re-start. Not more than three attempts should be made to start the apparatus.

If the switch is in the Full Heat position and the heater cuts OUT, the indicator light will be extinguished. Return the switch to OFF, then attempt to re-start the heater as described above.

To admit cold air to the vehicle, turn the switch in an anti-clockwise direction past the OFF position to COLD.

FAULTS IN TRAFFIC

If engine stops while the railbus is running, stop the railbus, place gears into NEUTRAL, then attempt to re-start by depressing the appropriate local "Start" button, not more than three times. If this fails to re-start the engine, if possible lock the final drive in NEUTRAL and turn engine isolation switch to OFF. Railbus will then require towing to terminal point.

To Lock Final Drive in Neutral

Stop the engine, then remove floor trap in body and withdraw the "Neutral" lock, turn it a quarter turn and allow it to go right home. Proceed to the driving compartment and move the reversing lever slowly from Forward to Reverse and back several times, to ensure that the "Neutral" lock is entered fully into the slot. Check that the main propeller shaft to the final drive concerned can be rotated by hand.

Note: If no air pressure is available, the final drive cannot be operated to allow the lock to be engaged in NEUTRAL.

STOPPING THE ENGINE (contd.)

ASSISTING DISABLED RAILBUS

In an emergency, a disabled railbus may be assisted by another diesel railbus or car or by a locomotive coupled by means of the special towing hook on the vehicle. The towing hook and the bumpers are attached to the body of the vehicle. **GREAT CARE** must be taken in carrying out any emergency movement, and a speed of 15 m.p.h. must not be exceeded.

FAILURE OF CONTROL EQUIPMENT

Driving Controls

Leading Driving Compartment

Remove control switch key, reversing lever and brake handle and then proceed to the opposite driving compartment and endeavour to gain control. Then act in accordance with the Appendix Instruction for the "Working of Diesel Mechanical Cars—Driving Apparatus Disabled."

COMPRESSED AIR SYSTEM — UNLOADER VALVE

In the event of an unloader valve defect, remove the blank nut from dummy stud adjacent to the unloader valve and fit it on to the escape connection of the valve after unscrewing protection cap.

FIRE PRECAUTIONS

In the event of a fire, which will be normally indicated by the fire warning bells ringing if fire is adjacent to the engine, bring the railbus to a stand as laid down in Rule No. 188. When the railbus has been brought to a stand take a hand-operated fire extinguisher from the driving compartment and inspect the engine.

After ensuring that the fire has been extinguished, the small metal tabe on the front of the fire alarm control box should be pulled off. This will uncover a switch which should be operated to stop the alarm bell, extinguish the warning light and render it impossible to restart the engine. After this has been done, the final drive gears must be set and locked in the **NEUTRAL** position if possible. **A speed of 15 m.p.h.** must not be exceeded to the point where the railbus can be taken out of traffic. (See instructions under "Assisting Railbus and Towing".)

The alarm isolating switch referred to does not cut out the re-setting thermostat and should this operate through a recurrence of fire or fluid flywheel, the alarm bells will ring and the warning light will be lit. In this event the fire will not be extinguished automatically. It is essential, therefore, for the remaining hand-operated fire-fighting equipment to be used as a matter of the utmost urgency after the railbus has been stopped.

If the automatic extinguishing apparatus has operated, avoid inhaling a concentration of the gas which has a faint smell, and avoid touching the liquid with the skin or clothes.

As the gas is heavier than air, the concentration will be at low levels near the ground.

See General Instructions and Notices in Appendix to the Operating Instructions, and in the Miscellaneous Instructions, regarding First-Aid treatment to a person contaminated by the fire extinguishing medium used in the automatic appliance.

WARNING HORNS

When sounding the horn, to comply with Rule 127 and the Appendix Instructions, operate the lever in such a manner as to give the 2-tone sound that these horns are designed to emit. This is of the utmost importance, and if the horn is defective, it must be reported immediately.

TOWING

The hook on the end of the railbus will accept a British Railways standard screw coupling, but due to no buffers being fitted, the bus can only be towed and at a **maximum speed of 15 m.p.h.** When slowing down or stopping, extra care is necessary to avoid damage to the towed end of the bus from impact with the towing vehicle or locomotive.

The final drive must be isolated if at all possible before railbus is towed.

DRIVERS IN COURSE OF TRAINING

Drivers in course of training are only allowed to operate the controls and brake on passenger trains under the direct supervision of the instructor.

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