

BR. 33003/60  
October 1958

A.C. TYPE RAILBUS.  
Nos. 79975—79

[www.railcar.co.uk](http://www.railcar.co.uk)

**DRIVER'S INSTRUCTIONS FOR OPERATING  
A.C. TYPE RAILBUS  
NOS. 79975 - 79**

**TECHNICAL DATA**

Type	...	...	...	...	1A
Weight in Running Order	...	...	...	...	11 tons (approx.)
Wheel base	...	...	...	...	19ft. 0ins.
Wheel diameter	...	...	...	...	3ft. 0ins.
Width Overall	...	...	...	...	9ft. 3ins.
Length Overall	...	...	...	...	37ft. 0ins.
Height Overall	...	...	...	...	12ft. 2½ins.
Maximum speed at maximum engine revs.:	—				
1st speed	2nd speed	3rd speed	4th speed		
13 m.p.h.	23 m.p.h.	35 m.p.h.	57.55 m.p.h.		
Gear ratio:					
1st gear	2nd gear	3rd gear	4th gear		
4.28 : 1	2.43 : 1	1.59 : 1	1 : 1		
Fuel capacity	...	...	50 gallons for engine and heater		
Lubricating oil sump capacity	6½ gallons				
Fluid coupling oil capacity	3½ gallons				
Gearbox oil capacity	...	...	2½ gallons		
Final drive oil capacity	...	...	3½ gallons		
Cooling water capacity	...	...	14 gallons (approx.)		
Control system	...	...	Electro-pneumatic		
Brake system	...	...	Compressed air and hand brake		
Warning horn	...	...	Compressed air operated		

**ENGINE**

One 6-cylinder horizontal oil engine	11.3 litre	B.U.T. (A type) A.E.C. 150 h.p. at 1,800 r.p.m.
Compression ratio	...	16 to 1
Bore	...	130 m.m. = 5.12 ins.
Stroke	...	142 m.m. = 5.5907 ins.
Firing order	...	1, 5, 3, 6, 2, 4.
Rotation	...	Clockwise
Fuel injector type	...	C.A.V. B.D.L. L.150.S.
Fuel injector lifting pressure	...	175 atmospheres (2,570 lbs./sq.in.)
Fuel pump type	...	C.A.V. Monobloc

**TRANSMISSION**

Type	...	Fluid coupling 20ins. dia. S.C.G. type R.14 gearbox 4-speed epicyclic. (Electro pneumatic operated).
Final drive reversing arrangement	...	Axially sliding dog clutch between bevel gears.
Final drive gear ratio	...	3.36 : 1

**AUXILIARIES**

Battery	...	NIFE type LR.20, 19 cells, 24 volt. 200 amp./hr.
Generator	...	Stones type 24 volt. Belt driven from input end of gearbox.
Lighting	...	24 volt.
Starter motor	...	CAV or Simms
Compressor	...	Clayton-Dewandre type, belt driven.

Railbus heating equipment ...	Smith's combustion air heater.
Windscreen wipers ... ..	Compressed air operated.
Speedometer ... ..	Smiths (Electrical drive).
Seating capacity ... ..	46

## DRIVER'S CONTROLS

1. Electrical control switch (with Yale type removable key) and indicator light.
2. Throttle handle (engine speed) incorporating the Deadman's device.
3. Change-gear selector handle.
4. Reversing lever (detachable).
5. Engine "Start" button.
6. Engine "Stop" button.
7. Engine indicator light.
8. Final drive direction air indicator lights.
9. Engine Tachometer/Change Speed indicator.
10. Dual horn control.
11. Speedometer.
12. Air pressure gauge (Duplex).
13. Driver's air brake handle.
14. Handbrake.
15. Head light switches.
16. Destination indicator light switch.
17. Panel light switch.
18. Demister switch.
19. Main lighting switch (No. 1 driving compartment).
20. Railbus heater switches (No. 2 driving compartment).
21. Cab lighting switches.
22. Deadman's hold-over button.
23. Door control buttons—open and close, right and left hand doors.
24. Door emergency release—adjacent to doors, inside and outside the bus.
25. Main battery isolating switch—on side of bus.
26. Heater isolating switch—on side of bus.
27. Windscreen wiper control.
28. Retractable steps. Pull knobs.

## GENERAL INFORMATION

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

Any failure of the air pressure system resulting in a severe drop in pressure will shut down the engine to IDLING.

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

The throttle handle is also the Deadman's handle and if it is allowed to spring up the engine will drop down to IDLING speed and after 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 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

handle is in NEUTRAL.

### **SPECIAL NOTE**

DO NOT MOVE THE GEAR SELECTOR HANDLE FROM THE NEUTRAL POSITION UNTIL READY TO START THE RAILBUS EXCEPT WHEN TOGGING UP THE GEARBOX BRAKE BANDS. (SEE INSTRUCTION ON PAGE 3).

### **DRIVER'S DAILY DUTIES WHEN IN SERVICE**

1. Obtain the satchel containing the control switch key, reversing lever, A.T.C. key (where fitted) 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 compartment.
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 (where 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 into position and move it to 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 the "Start" button and release it immediately the indicator light shows that the 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 required direction of travel.

**NOTE.**—If the engine does not start, i.e. its 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 fuel cock is open. Then start engine locally as shown in item 4 (c-e). STOP the engine, proceed to the driving compartment and start the engine in the normal manner.

4. **If 75 lbs./sq. in. air pressure 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 the driving compartment**

- (a) Check that the electrical control switch key is in the ON position.
- (b) 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.
- (c) **At side of railbus**, pull the fuel injector pump hand throttle control in 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.**
- (f) When the air pressure in the system has built up to 75 lbs./sq. in. STOP the engine, then place the reversing lever into position in the controller and proceed to re-start the engine as shown in Item 3 (a-d).

**NOTE.**—If the engine does not start within approximately three seconds, release "Start" button for not less than 10 seconds to allow the engine to come to rest before pressing the button again.

**WITH THE ENGINE RUNNING**

- (a) Check that the air pressure has built up to approximately 95 to 100 lbs./sq. in. on the reservoir side of the gauge.
- (b) Check the air brake application (brake pressure should show 20 - 85 lbs./sq. in.).
- (c) Release the throttle handle. Check that it springs up to the Deadman's position and that after 5 - 7 seconds' delay the brakes are applied.
- (d) Check operation of both doors by pressing the appropriate control buttons.
- (e) 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**

- (a) Obtain control of the Deadman's device and hold the throttle handle in the IDLING position.
- (b) Check that the retractable step control knobs are in the correct position, then partially release the air brake.
- (c) **WITH THE ENGINE IDLING** move the gear selector handle to first gear position. (Do not pause in any other gear position).



- (d) Release the air brake fully, the railbus should not be moved with the brakes dragging.
- (e) 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 the first gear selected. If the brake fails to release, return the gear selector 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 higher 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.

**N.B.**—**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.

**N.B.**—**DO NOT MOVE THE GEAR SELECTOR HANDLE UNTIL THE ACTUAL GEAR CHANGE IS TO BE MADE.**

## **COASTING**

A free wheel is fitted on the propellor shaft between the fluid fly-wheel 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. 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 then pause for **TWO SECONDS** before re-opening the throttle handle notch by notch.

**NOTE.**—The correct speeds are as follows:—

1st gear	0 - 13 m.p.h.
2nd gear	13 - 23 m.p.h.
3rd gear	23 - 35 m.p.h.
4th gear	over 35 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 handle should be moved direct to NEUTRAL.

**NOTE.**—If the railbus speed has been reduced, e.g. due to a signal check, and 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. Release the throttle handle and allow the Deadman's device to operate.
2. STOP the engines.
3. Remove the reversing lever.
4. Place control switch in the OFF position and remove key.
5. Place the air brake handle into RELEASE position.
6. Remove A.T.C. key (where fitted).
7. Lock driving compartment door and remove key.
8. Proceed to the other end of the railbus and place the reversing lever and the control switch key into their appropriate positions. Place control switch to ON position.
9. Place A.T.C. key (where fitted) in position.
10. Place reversing lever in FORWARD or REVERSE as required.
11. Proceed to re-start the engine 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 the railbus 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 in "Starting the railbus," items (b-e).

**N.B.**—DO NOT ATTEMPT TO REVERSE WHEN THE TRAIN 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 the engine has stopped (engine light 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 handbrake is applied.
2. Remove reversing lever. Place control switch in OFF position and remove key.
3. Remove A.T.C. key (where fitted).
4. Shut off compartment heaters if in use.
5. Lock driving compartment doors.

6. Return the satchel containing the reversing lever, control switch key, A.T.C. key (where fitted) and carriage 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 switch which is situated in No. 2 driving compartment.

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 pump 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 are automatically switched off; 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 shut down the heater, return the switch to the OFF position.

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

## **FAULTS IN TRAFFIC**

If the engine stops, attempt to re-start by depressing the 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 then place the engine isolating switch to OFF. The railbus will then require towing to a terminal point.

### **To Lock Final Drive in Neutral**

Stop the engine, then 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 in 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.

## **FAILURE OF CONTROL EQUIPMENT**

### **Driving Controls**

#### **(a) Leading Driving Compartment**

Remove control switch key, reversing lever, and A.T.C. key (where fitted), then proceed to the rear driving compartment and endeavour to gain control. Then act in accordance with the Appendix Instruction for the "Working of Diesel Mechanical Trains—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, bring the railbus to a stand as laid down in Rule No. 188.

Hand operated fire extinguishers are provided in each driving compartment, also in the luggage compartment.

## **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**

A special towing shackle is provided, but due to no buffers being fitted the railbus can only be towed 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 railbus from impact with the towing vehicle or locomotive.

The final drive must be isolated, if at all possible, before the 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.

[www.railcar.co.uk](http://www.railcar.co.uk)