

*Leyland
National
Bus*



**Operating
instruction
manual
for
drivers**

Department of
the Capital Territory
Transport Section

Introduction

The purpose of this book is to provide basic operating information to all drivers.

Instruments and controls and their functions are described in detail with particular reference to warning indicators and precautions. All drivers connected with the operation of the vehicle should familiarise themselves with these controls.

If, after studying this information, you are still not sure of the procedures, please ask your Depot Supervisor or an Instructor for further instructions.

The illustrations contained in this text are arranged to indicate, as near as practicable, the actual manner in which these instruments and controls are mounted.

This manual has been prepared for your information. Be sure you read and study it.

General data

<i>Overall length</i>	35 ft (10.67 m)
<i>Overall width</i>	8 ft 2 in (2.49 m)
<i>Overall height</i>	11 ft (3.35 m)
<i>Weight</i>	8½ tons (8.64 tonnes)
<i>Turning circle</i>	55 ft (16.76 m)
<i>Rear-end out swing</i>	24 ft (7.32 m)
<i>Fuel tank</i>	50 gal (227.3 litres)
<i>Engine-type</i>	Leyland horizontal underfloor turbo- charged diesel—180 bhp
<i>Gear-box</i>	Semi-automatic four speed and reverse Fully automatic four speed and reverse
<i>Rear axle</i>	Spiral level
<i>Steering gear</i>	Power-assisted rack and pinion
<i>Brakes</i>	Air operated with spring applied parking brake Front braking system is independent of the rear service and parking brake system.
<i>Suspension</i>	Self-levelling air system

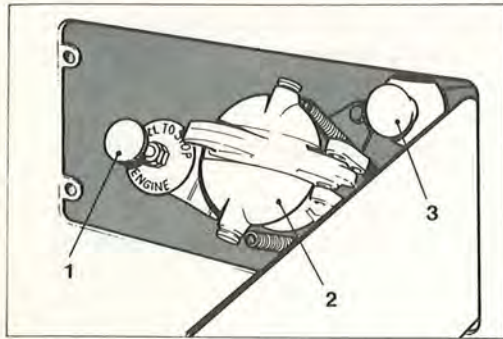
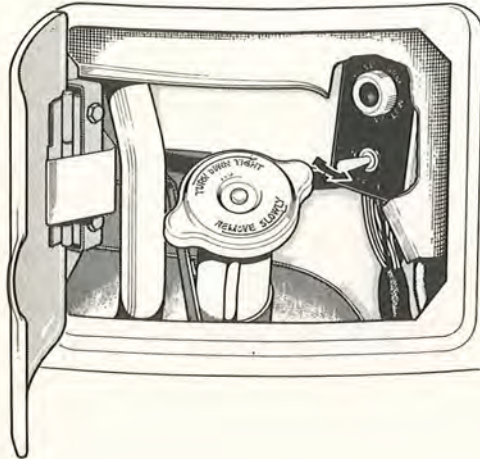


Fig. 1 Location of engine oil filler cap, dipstick and engine stop control

- 1. Engine stop control
- 2. Oil filler cap
- 3. Dipstick

Fig. 2 Location of coolant level indicator and filler cap



Do's

1. Always allow air pressure to build up to maximum (approximately 110lb/sq in, 758.4 kilopascals) before moving off.
2. Always make use of warning light test button before moving off.
3. Always carry out pre-drive checks. The following pre-drive checks should always be carried out before going into service:
 - ▷ Fuel tank contents adequate.
 - ▷ Check the following:
 - Horns
 - Wipers and washers
 - All lighting—including step lights when doors are open
 - Driving mirror positioned
 - Driving seat position.
 - ▷ Depress warning light test button, check that appropriate warning lights are illuminated.
 - ▷ Check engine oil Fig. 1.
 - ▷ Check water level Fig. 2.
 - ▷ Stop lights.
 - ▷ Turn indicator lights—right and left hand.
4. Always take immediate action if a warning light comes on. Remember **red** warning lights mean stop immediately.

5. Always allow the vehicle to stop completely before engaging a gear of opposite direction, that is forward to reverse or vice-versa.

Driving seat adjustment

The driving seat and position adjustment controls are shown in Fig. 3.

Total vertical adjustment is 5 in (12.7 cm).

Total fore and aft adjustment is also 5 in (12.7 cm).

The seat will swivel through 90° Back-rest adjustment is made by movement of control 3.

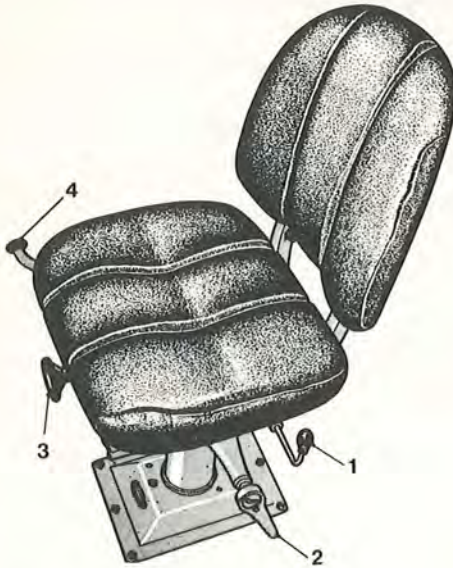


Fig. 3 Driver's seat adjustment controls

1. Swivel control lever
2. Vertical adjustment lever (ratchet type)
3. Back rest adjuster
4. Fore and aft adjuster

Controls-Instruments-Warning lights- Warning buzzers

All Leyland National buses have a common instrument and control layout. A layout of instruments and controls is shown in Fig. 5.

Controls on steering column

Direction indicators (21)

The direction indicator control is used in the conventional manner by moving towards the direction of the steering wheel rotation. The control is self-cancelling when the wheel returns to straight ahead position.

Note

The brightness of the indicators is automatically reduced when side lights are switched on. This minimises glare to other road users.

Horn (21)

Push in the direction indicator control towards the steering column to sound horn.

Headlamp beam (21)

Lift direction indicator control towards steering wheel rim to flash head lamps. The control will return by spring loading to dipped beam position.

Push away from steering wheel for main beam. The control will stay in this position until pulled back.

Hazard warning switch (31)

To warn of obstruction risk or other danger all six direction indicators may be switched on together by pulling this switch.

Controls on side panel

Start/stop switch (30)

This key-operated switch has four positions:

OFF = Key in fore and aft position

AUX = First position clockwise; vehicle electrical supply switched on

START = Second position clockwise. Starter motor energised

STOP = First position, anti-clockwise. Engine stopped.

Pay as you enter light switch (29)

Press black button to switch on PAYE lights. Press red to switch off.

Destination panel light switch (28)

Press black button to switch on destination lights. Press red to switch off.

Saloon light switch (26-27)

Press black button to switch on fluorescent lights. Press red to switch off.

Fog lamp switch (25)

Fog lamps not fitted.

Head and side lamp switch (24)

Rotate to appropriate position—OFF—SIDE or HEAD.

Windscreen wiper/wash (23)

Rotate to S/WIPE for slow wipe.

Rotate to F/WIPE for fast wipe.

Rotate to WASH for fast wipe and wash.

Parking brake control (22)

This control has two positions: ON which is towards the driver and OFF which is away from the driver. Once moved to ON position the knob must be depressed before the lever can be moved to OFF position.

The control may be used for emergency braking by moving gradually

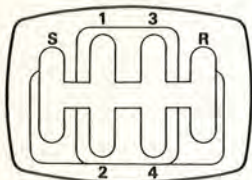


Fig. 4 Gear selector gate positions—
semi-automatic gearbox

Safety features

towards the ON position; the braking effort will be proportional to lever movement.

Gear selector (20)—semi-automatic gearbox

This control is an electric switch which selects, but does not directly engage gears. Gate positions are shown in Fig. 4.

1. To prevent inadvertent selection, first and reverse positions can be reached only by lifting the lever to overcome a raised shoulder.
2. Gate position 'S' must be selected before the engine can be started.
3. A baulking plate prevents a direct down change from top to second gear.

Controls on instrument panel (Fig. 5)

Rear door controls (19)

Press black button to open rear doors. Press red to close.

Note

1. At road speeds above 3 mph (5 km/h) the rear doors cannot be opened by these buttons.
2. The accelerator pedal is inoperative whenever the rear doors are open.

Front door controls (18)

Press black button to open front doors. Press red to close.

Cab light switch (2)

Press black button to switch on driver's cab light. Press red to switch off.

Warning light test button (1)

Press and hold to check non-self testing warning lights:

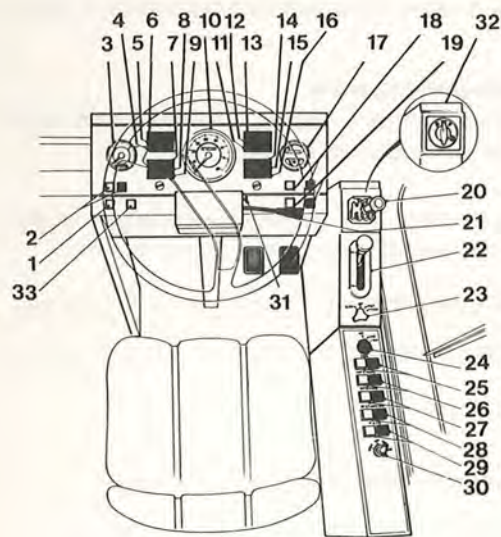


Fig. 5 Layout of controls and instruments

1. Warning light test button
2. Cab light switch
3. Tachometer
4. Emergency door warning light
5. Coolant warning light
6. Direction indicator monitor
7. Spare light
8. Charge warning light
9. Spare light
10. Speedometer
11. Rear door warning light
12. Low air pressure warning light
13. Direction indicator monitor
14. Low oil pressure warning light
15. Handbrake warning light
16. Main beam warning light
17. Dual air gauge
18. Front door controls
19. Rear door controls
20. Gear selector—semi-automatic
21. Direction indicator/horn/headlamp beam control
22. Parking brake control
23. Windscreen wipe/wash control
24. Head and sidelamp control
25. Fog lamp switch
26. Saloon light switch
27. Saloon light switch
28. Destination board light switch
29. PAYE light switch
30. Start/Stop switch
31. Hazard warning switch
32. Gear selector—fully-automatic
33. Cold start button

1. Air
2. Coolant
3. Emergency door (not fitted)

The low air pressure warning buzzer is also checked when this button is depressed.

Note Start/stop switch must be at 'AUX' position to use this button.

Cold start button (33)

Press and hold to switch on engine cold start equipment. See 'Starting the engine' for starting procedure.

Instruments ***Speedometer*** (10)

This is an electrically operated instrument indicating road speed in mph or km/h. A total mileage recorder is also incorporated.

Tachometer (3)

Not fitted.

Dual air gauge (17)

The upper section of this gauge 'Air 1' indicates the air pressure in the front brake reservoir.

The lower section 'Air 2' indicates the air pressure in the rear service and parking brake reservoir.

Note The auxiliary air reservoir which supplies auxiliary services, air suspension, gear change (semi-automatic), accelerator, windscreen wiper/washer, entrance and exit doors is not provided with an air gauge. Insufficient pressure is indicated by the warning light 'Air' and by a buzzer.

Warning lights***Direction indicator monitor*** (6 and 13)

Symbol The appropriate light flashes simultaneously with the external lamps.

Note

If a bulb failure occurs on either of the external lamps, the appropriate monitor light will show steady rather than flashing light.

Coolant (5)

This light flashes if the engine coolant level is low and is permanently lit if the coolant temperature is high. If the light comes on during normal running, the vehicle must be stopped and the fault rectified before proceeding.

Emergency door (4)

Not fitted.

Charge

This light is illuminated when the alternator is not charging. It is, therefore, illuminated when the start/stop is at 'AUX' position and the engine is not running. A fault is indicated if the light comes on when the engine is running.

Air (12)

This light is illuminated when insufficient air pressure is available in either of the three independent systems. If the light comes on during normal running the vehicle must be stopped and the fault reported to the workshop supervisor.

Rear door (11)

This light is illuminated whenever the rear (exit) door is not fully closed.

Oil (14)

This light is illuminated whenever engine oil-pressure is below safe limits. It is, therefore, illuminated whenever the start/stop switch is at 'AUX' position and the engine is not running. A fault is indicated if the light is on when the engine is running.

Handbrake (15)

This light is illuminated when the parking brake control is on.

Main beam (16)

This light is illuminated when the head lamps are on main beam.

Warning buzzers

Two warning buzzers are located on the front junction board in the driving compartment.

The buzzer gives warning of low air pressure.

Low air pressure could be on either of the three systems. If both air gauges register normal pressure approximately 110 lb/sq ft (109, 213 kilopascals) the fault will be in the auxiliary system. Report the fault to the workshop supervisor.

The other buzzer gives warning of excessively high water temperature. Report fault to workshop supervisor.

Other controls**Windscreen demist**

A rotary control (Fig. 6) raises or lowers a flap along the top edge of the windscreen, and thus controls air flow over the screen.

This is the *only* manual control connected with the heating and ventilation system. The operation of the ventilation system is summarised later in this manual.

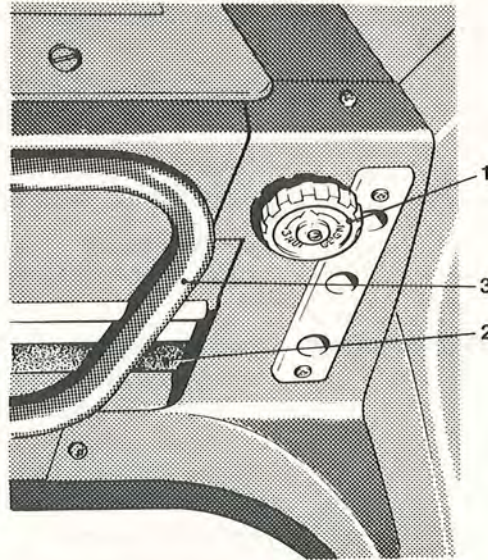


Fig. 6 Windscreen demist control

- 1. Control knob
- 2. Air flap
- 3. Sun visor support

Starting the engine

To prevent damage to the starter pinion a lockout system ensures that once the engine has started and the start key has been released, the starter cannot be re-engaged until the engine stops.

Therefore, to energise the starter, the following must prevail:

- ▷ All engine access doors fully closed
- ▷ Gear selector in gate position 'S'
- ▷ Engine stopped.

Procedure

1. Ensure that gear selector is in gate position 'S'.
2. Ensure that parking brake is applied.
3. Consult the following table and if required use the cold starting device as detailed.

Cold starting device table

<i>Surrounding temperature</i>	<i>'Thermostart' (Cold start)</i>
Over 5° Celsius (41°F)	Not required
5° Celsius (41°F) to 0° Celsius (32°F)	Required
Below 0° Celsius (32° F)	Required

4. Depress cold start button only, for fifteen seconds.
 5. Keeping the cold start button depressed, operate the starter until the engine is running.
 6. Release the starter switch immediately the engine is self-sustaining and the cold start button immediately the engine responds to the accelerator.
- ▷ *Caution*—The 'thermostart' (cold start) may be damaged if continuously energised for more than twenty-five seconds.
7. If a false start occurs, wait a few seconds then repeat the cycle.

If the engine does not start readily a fault is indicated, that is, cold start equipment not used when needed, wrongly used or defective, fuel supply defective, batteries discharged causing sluggish rotation.

When the engine has started, check that the oil pressure and charge warning lights are promptly extinguished. Check also that the air pressure rises steadily to approximately 110 lb/sq in (758.4 kilopascals) and that the warning buzzer cuts out at approximately 60 lb/sq in (413.7 kilopascals).

Don'ts

1. Don't select a gear until the low air pressure warning buzzer has cut out. This applies in particular to vehicles with semi-automatic gear box to avoid the possibility of band slippage. It also applies to fully automatic vehicles since the parking brakes will not be fully released until this point is reached.
2. Don't drive the vehicle until the suspension is fully inflated. The suspension may settle overnight but will be quickly restored to normal height when the engine is running.
3. Don't abuse the easy steering by rapidly applying full lock when moving slowly or when stationary. This practice will quickly 'scrub' tyres.
4. Don't 'rev' a cold engine. Drive off normally with moderate use of accelerator.
5. Don't coast in neutral; the types of gear box fitted may be damaged by over-speeding of gears.

Driving procedure—semi-automatic

▷ *Caution*

- A. In order to avoid slipping and consequent excessive wear of brake bands in the semi-automatic gear box, it is imperative that gears are not selected before the low air pressure warning light and buzzer have ceased to operate. In addition, the spring-applied parking brakes will not be fully released until the light and buzzer have cut out.
- B. Although the gear box is suitable for 'power shifts', that is, gear changes made without removing the foot from the accelerator and without pausing in neutral, this is not recommended.

To obtain maximum life from the gear box and promote passenger comfort the following procedure, which includes a pause in neutral position and adjustment of engine speed by use of the accelerator, is recommended.

To start from rest

1. With the parking brake applied select first gear.
2. Release the brakes and depress the accelerator.
3. When a suitable road speed is reached move the control lever to the neutral position.
4. Release the accelerator at the same time as moving the control lever to neutral, pause to allow the engine speed to correspond with second gear road speed.

5. Move the selector to second gear position and depress the accelerator accordingly.
6. Repeat the procedure until top gear is engaged

Down changes (under load)

Without releasing the accelerator, move the selector to neutral position, pause, then move the selector to the next lower gear. This will enable maximum rpm and torque to be maintained.

Down changes (reducing speed)

Without releasing the accelerator, move the selector to neutral position, pause, then move the selector to the next lower gear; at the same time release the pressure from the accelerator.

Routine maintenance

Daily checks

Checking engine coolant level (refer Fig. 2)

An electrically operated coolant level indicator is provided. The visible part of this unit, together with the radiator filler cap, is accessible after opening a small flap at the right-hand rear corner of the vehicle. A three-position toggle switch and indicator light are mounted on a small panel. The switch positions are marked as follows:

Left of centre—run

The switch is set to this position for normal running.

Centre—test

This position is used to check the efficiency of the warning circuit. If the light flashes in this position the circuit is in working order.

Right of centre—check top up

This position is used to check coolant level. If topping-up is required the light will flash and will cease to do so when the coolant level is corrected.

Normal coolant level check

(Instrument panel and rear indicator lights flashing.)

1. Open access flap and partially release the filler cap to relieve any pressure. Remove the cap and top-up the system to the level of the filler neck.
2. Replace cap and return switch to 'run' position and close access flap.

No lights flashing

1. *Do not* remove filler cap until check has been made.
2. Move indicator switch to 'test' position. If light flashes, the circuit is in working order. If the light does not flash report this fault to the workshop supervisor.
3. Move switch to 'Check top-up' position. If the light flashes, top-up is required.

Checking engine oil level

Ensure that vehicle is on level ground. If the vehicle has been driven up or down an incline immediately before being brought to a rest, allow the engine to idle for a few minutes before checking the oil level. Stop the engine before carrying out the check.

The dipstick is located adjacent to the oil filler cap and both are accessible after opening a small flap incorporated in the engine right-hand access door. See Fig. 1.

The oil level should be maintained at the 'full' mark and should not be allowed to drop below the 'low' mark. Approximately eight pints of oil is required to raise the level from 'low' to 'full'.

Stopping the engine

The Leyland National is equipped with a 'turbo charged' engine. The turbo charger operates at approximately 80 000 revolutions per minute, and the bearings of the turbo charger are lubricated by the engine oil pressure. Should the engine be stopped immediately the vehicle is halted, the turbo charger will 'run on'—consequently the bearings are running without lubrication.

The following instructions, when stopping the engines and parking of these vehicles, *must* be observed:

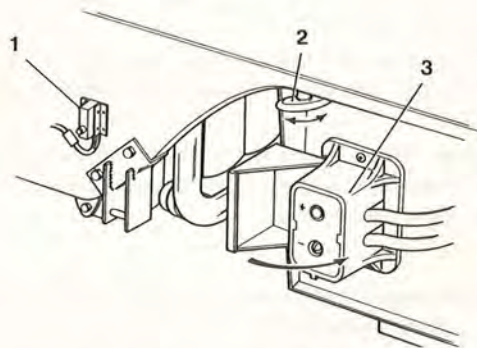


Fig. 7 Location of battery isolation switch and charging socket

1. Access door micro-switch (start inhibit)
2. Isolation switch control
3. Charging socket

1. Ensure that the gear selector is returned to the neutral position before stopping the engine.
2. Before stopping a turbo charged engine allow to idle for not less than three minutes. This allows the turbo charger rotor to slow down whilst there is still oil pressure in the bearings, so reducing the possibility of bearing failure.
3. The engine is stopped by moving the start/stop switch key anti-clockwise to the spring-loaded stop position.

Battery isolation switch (master switch)

This switch is located behind the right-hand side access door and is accessible through the individual flap. See Fig. 7.

When actuated the switch completely isolates the batteries thus rendering all electrics inoperative. It is *essential* that this switch be turned off when vehicles are parked within the depot or workshop.

Fueling point

The fuel tank is located midway between the front and rear wheels on the right-hand side.

Checking windscreen washer fluid level

The windscreen washer fluid container is located behind a hinged access door on the interior of the bus immediately below the windscreen. See Fig. 8.

The container should be kept well topped-up at all times

Destination rolls—controls

Access to 'destination rolls' controls is made by raising a panel above the windscreen. A typical layout is shown in Fig. 9. The lever '1' selects

which roller will rotate and the winder '2' when pulled out and rotated will move the appropriate roller.

Heating and ventilation systems

The heating and ventilating system on this vehicle is fully automatic in operation and the only provision for manual control is for the demisting of the windscreen. The heater units are located in the roof-mounted pod at the rear of the vehicle. Air passes down between the inner and the outer roof skin and emerges above all windows. When the doors are open a curtain of warm air is directed over the door aperture.

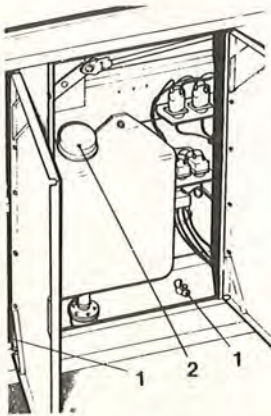


Fig. 8 Location of windscreen washer fluid container

- 1. Fluid container filler cap

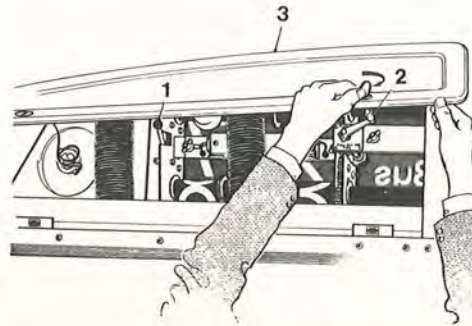


Fig. 9. Destination board controls typical view

- 1. Roller selector lever
- 2. Winder
- 3. Access flap

A summary of system operation is as follows:

Very cold morning—engine started; blowers run when engine coolant temperature is sufficient to actuate engine-mounted thermal switch. motorised water valve opens and motorised air valve moves to the recirculated air position. The controls will remain in this position as long as the saloon sensor, attached to the top of the driver's cab rear screen, requests maximum heat output. Please do not interfere with this sensor under any circumstances.

Cold morning—engine started; blowers running. Water valve opens and air valve moves to 'recirculated air' position. As saloon temperature increases, water valve starts to close to reduce heat output.

Warm morning—engine started; blowers running. If surrounding temperature is above required saloon temperature, then fresh air will be selected and water valve will not open. If temperature drops, then water valve will open and air valve will move to recirculating position until most favourable temperature is attained.

Parking of Leyland National, Kingston—Ainslie depots

All Leyland Nationals operate solely from the Woden depot. The reason for this is that the 'pod' mounted on the roof at the rear of the vehicle does not allow sufficient clearance at the entrances of the Kingston and Ainslie depots.

All cleaning-fueling-maintenance and parking of these vehicles is carried out at the Woden Depot only.

Blue bell light

This light will illuminate when the bell switch is pressed in the saloon. This is an indication to the driver that passengers wish to alight from the bus at the next stopping place.

This light will cancel when the rear door is opened.

The blue light is positioned above the windscreen at the centre of the 'destination roll' flaps.

Parking of Leyland National,
Kingston—Annie depots

All Leyland National depots were closed from the 1st of January 1975. The reason for this was that the Leyland National depots were no longer required for the storage of Leyland National vehicles. The depots were closed as the Leyland National vehicles were no longer required for the storage of Leyland National vehicles.

Green Bell Light