
NOVABUS



Operator's Manual

***Durham Region Transit
N8884390 - LB11
December 2017***

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SECTION 0

GENERAL INFORMATION

DIESEL FUEL

**WARNING**

**THIS VEHICLE OPERATES ONLY ON ULTRA LOW-SULFUR DIESEL FUEL.
DO NOT REFUEL THIS VEHICLE WITH ANY OTHER TYPE OF FUEL.**

CERTIFICATION LABEL - BUS WEIGHT RATING

A certification label is installed in all Nova Bus models. This label certifies compliance with all Canadian Motor Vehicle Safety Standards (CMVSS) and all Federal Motor Vehicle Safety Standards (FMVSS). The label lists the date the vehicle was manufactured, the Gross Axle Weight Rating (GAWR), the Gross Vehicle Weight Rating (GVWR), the tire size and the model and serial numbers. The label is mounted on the left side of the operator's compartment. Another label listing the vehicle model and serial number is mounted on the chassis. Please refer to the *Maintenance manual* for additional details.

Gross Vehicle Weight Rating (GVWR)

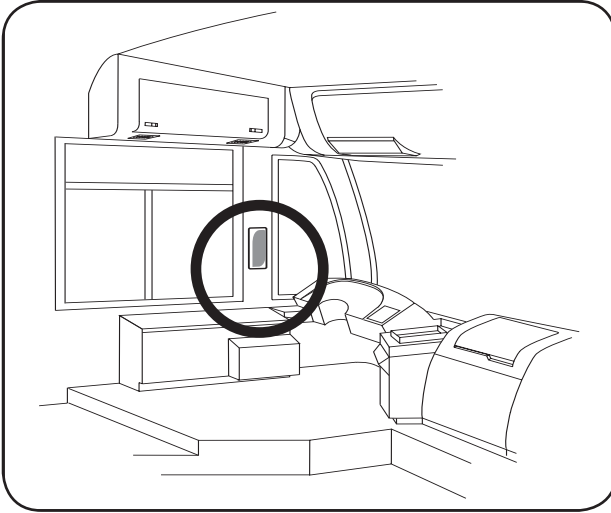
The GVWR indicates the loaded weight capacity of the vehicle. **NEVER** load a vehicle in excess of the GVWR.

Gross Axle Weight Rating (GAWR)

The GAWR specifies the load-carrying capacity of a single axle system as measured at the tire-ground interfaces. **NEVER** load a vehicle in excess of its GAWR. The certification label shows the capacity of the front and rear axles.

MANUFACTURED BY: Nova Bus, A DIVISION OF VOLVO GROUP CANADA INC. DATE: _____		FRT/AV.: _____	
FABRIQUÉ PAR: Nova Bus, UNE DIVISION DE GROUPE VOLVO CANADA INC.		RR/ARR.: _____	
GVWR / PNBV: _____ KG _____ LBS V.I.N./N.I.V.: _____		COLD INFL. PRESS PRESS. DE GONFL. À FROID	
TYPE OF VEHICLE/TYPE DE VÉHICULE: _____		EC	
SEATING CAPACITY/NOMBRE DÉSIGNÉ DE PLACES ASSISSES: _____		FRT/AV.: _____ KPA	
GAWR/PNBE	TIRE/PNEU-DIMENSION-RIM/JANTE	PSI/LPC	
FRT/AV.: _____ KG	TIRES/PNEUS: _____	FRT/AV.: _____	KPA
_____ LBS	RIMS/JANTES: _____	FRT/AV.: _____	PSI/LPC
RR/ARR.: _____ KG	TIRES/PNEUS: _____	RR/ARR.: _____	KPA
_____ LBS	RIMS/JANTES: _____	RR/ARR.: _____	PSI/LPC
CARGO-CARRYING CAPACITY/CAPACITÉ DE CHARGEMENT			



**CAUTION**

The components of this vehicle are designed to provide satisfactory service only if the vehicle is not loaded in excess of either the specified Gross Vehicle Weight Rating (GVWR) or the specified maximum Front and Rear Gross Axle Weight Ratings (GAWR).

MAXIMUM GROSS FRONT AND REAR AXLE WEIGHTS

The weight of the passengers must be properly distributed over the front and rear axles. The Certification Label specifies the maximum weight that the front axle (Front GAWR) and rear axle (Rear GAWR) can carry.

The GAWR represents the maximum loaded weight of the vehicle and takes into consideration the engine, transmission, suspension, braking and tire capabilities.

Make sure that the passenger load is distributed as evenly as possible on both sides of the vehicle.

The following table indicates the gross weight and capacity calculations for this LFS vehicle:

CAPACITY AND WEIGHT CALCULATIONS (KG)							
	LEFT FRONT	RIGHT FRONT	FRONT AXLE	LEFT REAR	RIGHT REAR	REAR AXLE	TOTAL (KG)
Curb Weight	1839	1839	3678	4657	4751	9408	13087
Payload Seated (35+1)	332	332	663	990	796	1786	2449
Seated Load Weight	2171	2171	4342	5647	5547	11194	15536
Payload Standees (31)	606	606	1212	497	401	898	2109
GVWR (66+1) Total Passengers	2777	2777	5554	6143	5948	12092	17645
Maximum Corner Load Limited by	3400	3400	Rim rating	6150	6150	Tire rating	
GAWR	Bridgestone R192 @ 120 psi - Single Mount		6800	Bridgestone R192 @ 120 psi - Dual Mount		12300	19100

TIRES



WARNING

To prevent injury and/or damage to the vehicle, call for expert tire service assistance in the event of a flat tire.

To determine if a tire still contains air under pressure, stand to the side and check whether the tire appears normal. If necessary, compare it with another tire on the vehicle. For dual rear wheels, look between the tires. When in doubt regarding the condition of a tire, stay away from the tire and wheel and call for assistance to dismount and replace the defective tire.

Never reinflate a tire that has been running flat or significantly under-inflated without first having the tire dismounted and inspected for damage by qualified personnel. When inflating a tire, stand as far away as possible. Never add air to tires without using an accurate pressure gauge. Be careful not to exceed the maximum pressure specified on the tire by the manufacturer.

Note that mounting and dismounting the vehicle's tires requires proper tools, safety equipment and specialized training. Improper servicing techniques may result in serious injury and/or damage to the vehicle's components. Vehicle tires and wheels should be serviced by qualified personnel with proper equipment.



CAUTION

An underinflated tire will overheat and wear out prematurely.

The factory-installed tires meet the Certification Label specifications and are selected to provide optimum tire performance under normal operating conditions. When inflated to the recommended pressures, they perform optimally at all loads up to, and including, the full rated load at all normal driving speeds.

TIRE TRACTION

A decrease in driving, cornering, and braking traction occurs when the road surface is covered with water, snow, ice, or gravel. Driving practices and vehicle speed should be adjusted to the road conditions.

When driving on wet or slushy roads, a thin layer of water may form between the tires and the road surface. This phenomenon, known as hydroplaning, results in total or partial loss of traction and adversely affects vehicle control and braking. To prevent loss of control, the following precautions should be taken:

1. Slow down when it is raining or snowing.
2. Slow down if the road is wet and/or has puddles.
3. Keep tires properly inflated.

It is the responsibility of the operating company to make sure that all specifications are maintained within allowable limits, so as never to exceed the maximum weights shown on the Certification Label.

Since the GVWR and GAWR take into account the capability of the tires installed when the vehicle was manufactured, the tires must be replaced with tires of the same capability.

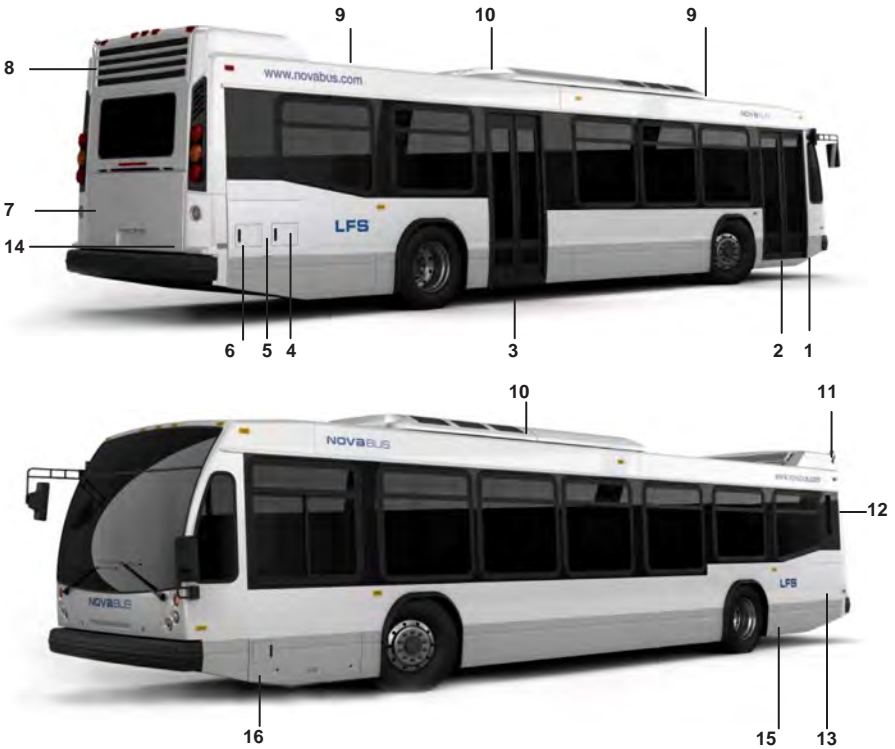


WARNING

To prevent serious injury or damage to vehicle components, tires must be the correct load rating and size as well as properly inflated.

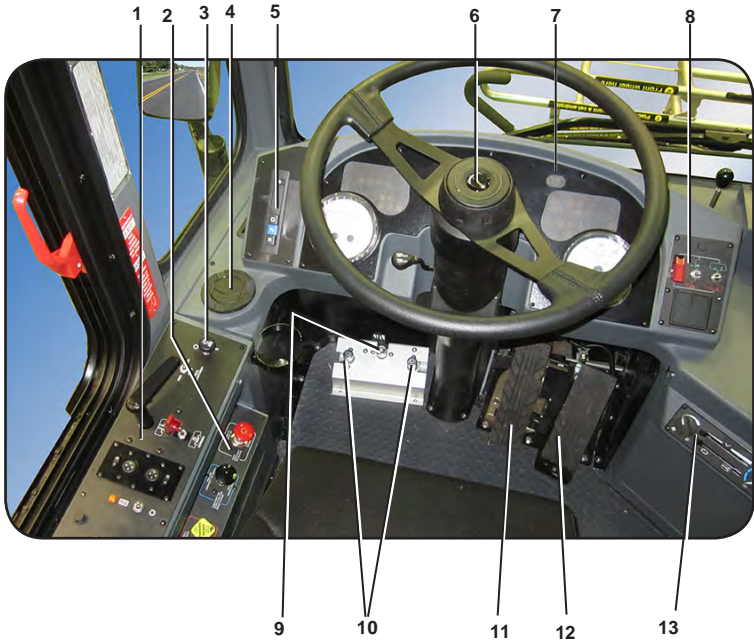
EXTERIOR VIEWS

The following illustrations show all access doors and exterior compartments.



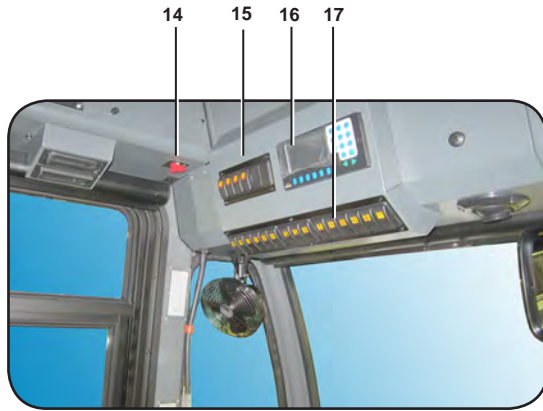
- | | |
|---|---|
| 1. Air Intake | 9. Escape Hatches |
| 2. Front Door | 10. Roof Unit |
| 3. Rear Door | 11. Exhaust |
| 4. Fuel Tank Filler Door | 12. Engine Air Intake Grille |
| 5. Air Dryer Access Door | 13. Side Engine Access Door |
| 6. Diesel Exhaust Fluid Access Door (DEF) | 14. Jump Starting Connection (24-V) |
| 7. Engine Access Door | 15. Battery Compartment |
| 8. Radiator Access Door | 16. Windshield Washer Fluid Access Door |

OPERATOR'S CONTROLS

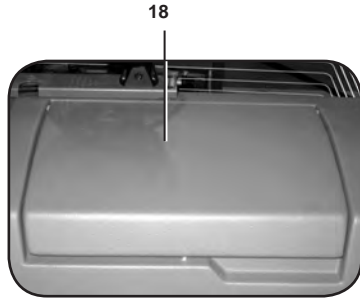


The above illustrates the layout of the operator's control panels.

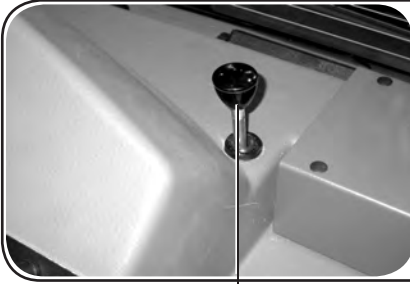
1. Side Control Panel
2. Pneumatic Control Panel
3. Wiper, Windshield Washer Control
4. Adjustable Swivel Air Vent
5. Transmission Pushbutton Shift Selector
6. Horn
7. Instrument Panel
8. Kneeling and Ramp Switch Panel
9. High/Low Headlight Beam Foot Switch
10. Directional Turn Signals
11. Brake Pedal
12. Accelerator Pedal
13. Front Ventilation Control Panel



STORAGE
COMPARTMENT
RELEASE



- 14. Interlock Override Switch
- 15. Electronic Escape Hatch Switches
- 16. Destination Sign Control Panel
- 17. Overhead Control Panel
- 18. Storage Compartment
- 19. Fire Extinguisher (provided, but not installed as shown)



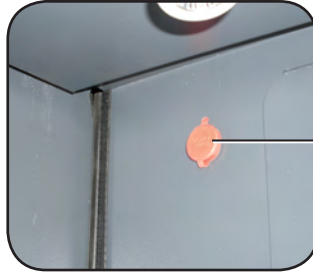
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21



22



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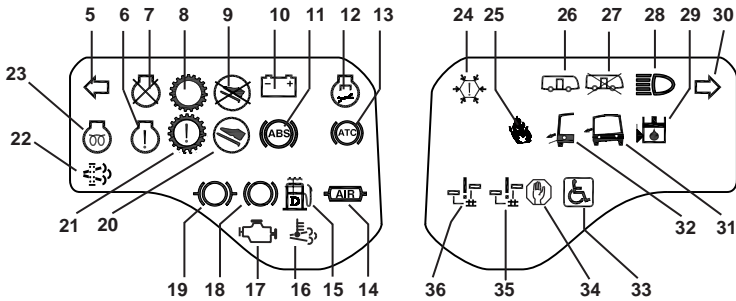
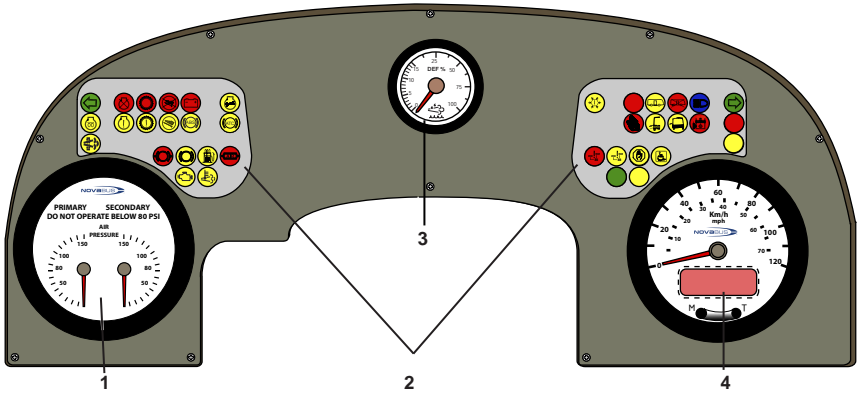


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- 20. Operator's Foot Vent Handle
- 21. Exterior Vent Trap
- 22. Front Dashboard Fan
- 23. 12 Volt Plug
- 24. Operator's Door Open and Close Switch

SECTION 1

INSTRUMENT PANEL



- | | |
|---------------------------------------|--------------------------------------|
| 1. Air Pressure Gauge | 20. Retarder ON |
| 2. LED Tell-Tale Panels | 21. Minor Transmission Problem |
| 3. DEF (Diesel Exhaust Fluid) Gauge | 22. Regeneration Light |
| 4. Speedometer | 23. Wait-to-Start |
| 5. Left Turn Signal | 24. A/C Malfunction |
| 6. Check Engine | 25. Fire |
| 7. Stop Engine | 26. Rear Door Open |
| 8. Major Transmission Problem | 27. Rear Door Alarm |
| 9. Retarder OFF | 28. High Beam |
| 10. Alternator Problem | 29. Low Hydraulic Oil |
| 11. ABS System | 30. Right Turn Signal |
| 12. Engine Maintenance | 31. Kneeling |
| 13. ATC (Traction Control) | 32. Ramp Deployed |
| 14. Low Air | 33. Stop Requested (Wheelchair Area) |
| 15. Water-in-Fuel | 34. Stop Requested |
| 16. HEST (High Exhaust System Temp) | 35. Multiplex Failure - Minor |
| 17. MIL (Malfunction Indicator Light) | 36. Multiplex Failure - Major |
| 18. Brake Lights | |
| 19. Parking Brake | |

AIR PRESSURE GAUGE AND AIR PRESSURE

Correct vehicle air pressure is very important. In addition to the pneumatic brake and suspension systems, several other systems depend on correct air pressure for their operation.

A dual needle gauge indicates the pressure in the pneumatic system. The left part of the gauge indicates the primary system pressure and the right part, the secondary system pressure.



NOTE

It is also possible to have the message display center display the air pressure in the system. See the section entitled speedometer in this section for more information:

If the air pressure is too low while the vehicle is in operation, the low air tell-tale lights up and an alarm sounds.

If this occurs, move the vehicle to a safe location as soon as possible, apply the parking brake and run the engine at fast idle until the correct operating pressure is reached. Air pressure must be at least 80 psi (552 kPa).



NOTE

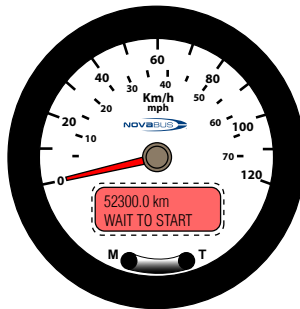
NEVER operate the vehicle with air pressure below 80 psi (552 kPa), as this will reduce brake effectiveness and increase stopping distance.

SPEEDOMETER (MASTER GAUGE)

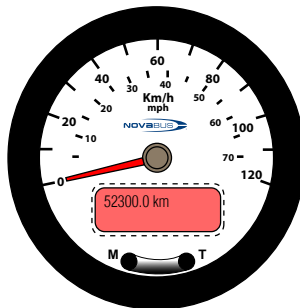
The speedometer, or *Master Gauge*, is located on the INSTRUMENT PANEL and indicates the speed of the vehicle, as well as other important operating and maintenance information through a MESSAGE DISPLAY CENTER. The message display is a graphical, backlit, LCD that displays information to the vehicle operator. Among the messages available to the operator is a *trip odometer with average fuel consumption* and the *air pressure status of the pneumatic system*.

DISPLAYING PARAMETERS

At start-up, the INSTRUMENT PANEL will go through a self-test for tell-tales and gauges. Once the self-test is complete, the MESSAGE DISPLAY CENTER will indicate the distance travelled on the upper line and the WAIT-TO-START message on the lower line. The WAIT-TO-START message disappears after five seconds.

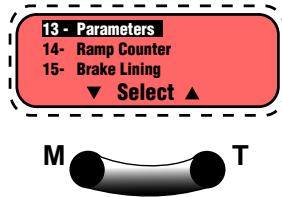


START UP



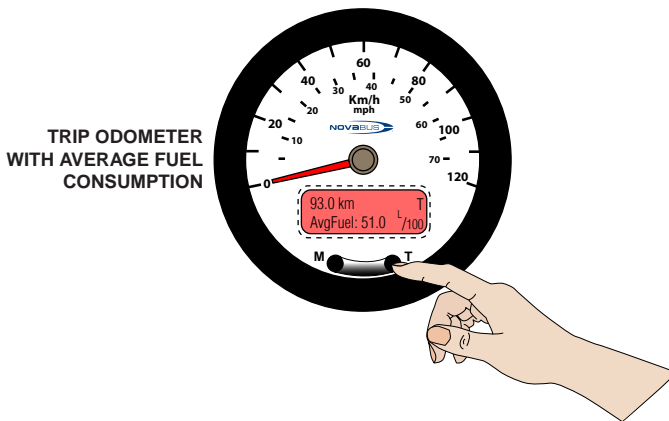
DISTANCE
TRAVELLED

1. Press the **M** button for approximately six seconds.
2. In the menu list that appears, scroll to, and select item # 13 – **PARAMETERS** by pressing the **M** or **T** buttons separately, representing the up (**T**) and down arrows (**M**), to move the highlight through the list. The item selected will be highlighted in **reverse video**.
3. To access the sub-menu for this item, press the **M** and **T** buttons simultaneously.
4. In the **PARAMETERS** sub-menu, use the **M** and **T** buttons to scroll up or down through the list until the required information is indicated and the following screen appears.



To display the *trip odometer with average fuel consumption*:

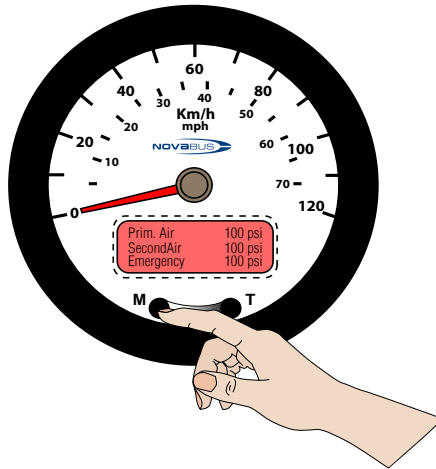
1. Press the **T** button for several seconds.
2. The *trip odometer with average fuel consumption* will be displayed.
3. Press the **T** button to return to the main screen.
4. When viewing the *trip odometer with average fuel consumption* screen, holding the **T** button for more than five seconds will reset the values to zero.



NOVA BUS

To display the *air pressure*:

1. Press the **M** button to scroll down to the *air pressure* parameters.
2. The *air pressure status for the primary, secondary, emergency reservoirs, as well as the rear primary air pressure (articulated vehicles ONLY)* will be displayed.
3. Press the **T** button to return to the main screen.
4. Inactivity on the buttons will revert the screen to the previous screen.



Within item # 13 – **READ PARAMETERS**, it is possible to display various parameters received by the *Master Gauge*. The following table illustrates a list of these parameters available to the operator. Certain optional gauge devices, if installed in the instrument panel, are also able to display some of the following parameters.

PARAMETER	TEXT DISPLAYED	DESIGNATION
1	Eng RPM	Engine Speed
2	Boost Pr	Boost Pressure
3	Eng Load	Engine Load
4	Req. Torque	Torque Request
5	Trans T	Transmission Temperature
6	Coolant T	Engine Coolant Temperature
7	Oil Press	Oil Pressure
8	Prim. Air	Primary Air Pressure
9	SecondAir	Secondary Air Pressure
10	Emergency	Emergency Air Pressure
11	Serv Brake	Service Brake Air Pressure
12	Prim. RAir	Rear Primary Air Pressure*
13	Fuel Lev	Fuel Level
14	Inst Fuel	Instantaneous Fuel Consumption
15	Avg Fuel	Average Fuel consumption
16	Hrs	Engine Hours
17	Dimmer	Dimmer potentiometer
18	Speed	Vehicle Speed
19	Gear	Gear Selected
20	24V Batt	24 Volts Battery Voltage
21	12V Batt	12V Battery Voltage
22	DEF level	DEF level
23	TransOILvl	Transmission Oil Level

*

This applies only to the articulated vehicle.

DIESEL EXHAUST FLUID (DEF) GAUGE

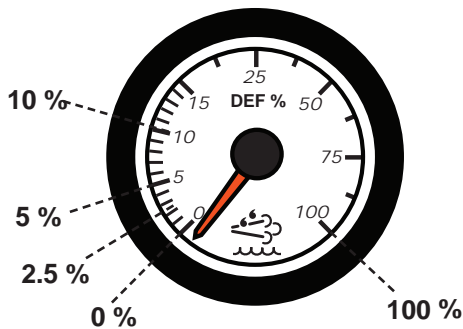
A diesel exhaust fluid (DEF) gauge is installed on the dashboard of all vehicles equipped with a selective catalytic reduction (SCR) system. The DEF is a highly purified solution of urea and water, which is injected into the exhaust gases and considerably reduces the nitrogen oxide emissions of the vehicle.



NOTE

The injection of DEF into the SCR system is performed automatically. It is, however, the responsibility of the operator to verify that the level of DEF is sufficient while the vehicle is in service.

The gauge indicates the level of DEF as a percentage of the maximum capacity of the DEF reservoir. The percentage is indicated by a needle. A warning light at the bottom of the gauge, and the circumference of the gauge illuminating in amber, warn the operator that the level of DEF in the reservoir is low. Different stages of warning exist for the DEF system. Whenever the level indicated by the gauge:



- Is 10% and above, there is sufficient DEF in the system and the circumference of the gauge does not illuminate, nor does the icon.
- At a level of less than 10%, but above 5%, the circumference of the DEF gauge and the icon fully illuminate.
- At a level of less than 5%, but above 2.5%, the circumference of the DEF gauge and the icon illuminate by flashing.
- At a level of less than 2.5%, but above 0%, the circumference of the DEF gauge and the icon continue to flash. In addition, the engine will reduce its output by 25% and the **CHECK ENGINE LED** in the instrument cluster will illuminate in a solid amber light.

- At 0%, the circumference of the DEF gauge and the icon on the gauge continue to flash. In addition, the **ENGINE STOP LED** in the instrument cluster will illuminate in a solid red light. Also, at this point the vehicle's speed logic will activate, which limits the vehicle to a speed of not more than 5 mph (7.5 km/h) and an engine rpm reduction to 1,100 rpm. The engine will continue its output reduction of 25%.

It is important to note that even though the vehicle's speed logic is activated, the 5 mph (7.5 km/h) limit will **NOT** occur unless the vehicle is shutdown and restarted. If the bus is running a route and runs out of DEF, *as long as the operator does not shut down the vehicle*, the engine will continue its output reduction of 25%, with the appropriate warning displays.

However, if the operator does shut down the vehicle when the DEF tank is empty, upon restarting the engine, the vehicle will be limited to 5 mph (7.5 km/h). Whenever the DEF tank level is 0 %, loss of DEF line priming is active. The system will try to re-prime the DEF line, and if re-priming fails twice, then the vehicle's speed limit logic will apply.

TELL-TALES

This vehicle is equipped with alarm and signal systems designed to indicate various conditions using tell-tale lights and/or buzzers.



STOP ENGINE TELL-TALE LIGHT (RED)

This light illuminates only when the **ELECTRONIC CONTROL MODULE (ECM)** detects a *serious* problem with the engine. A code associated with the detected problem is stored in the ECM memory. When the two lights are illuminated, it is the operator's responsibility to pull over to the side of the road as soon as possible, to avoid potential engine damage.

When alerted to any of these conditions, you must move the vehicle safely out of traffic and, if necessary, shut it down until the problem is corrected. *The operator is responsible for pulling over to the side of the road as soon as possible to avoid engine damage.*



CHECK ENGINE TELL-TALE LIGHT (AMBER)

This light illuminates to indicate a problem with the engine. The engine should be checked for possible abnormal conditions before proceeding. A code has been logged into the electronic memory for troubleshooting purposes. The vehicle should be watched closely for further indication(s) of trouble, and if necessary, taken out of service to correct the problem(s). Your maintenance personnel can refer to the engine manual supplied by Nova Bus for troubleshooting procedures.



WATER-IN-FUEL (AMBER)

This light illuminates when the sensor installed at the bottom of the fuel filters detects a high level of water in the fuel. When the WIF tell-tale illuminates, the operator must notify the maintenance personnel as soon as possible. The WIF tell-tale will extinguish when the water has been drained and the WIF sensor is covered with fuel.



ENGINE MAINTENANCE

A feature of the Cummins electronic engine includes a maintenance monitor controlled by the **ELECTRONIC CONTROL MODULE (ECM)**. When the tell-tale flashes, this feature indicates to the driver that maintenance on the engine is required.

**MAJOR TRANSMISSION PROBLEM (RED)-STOP SYSTEM**

Whenever a major transmission problem is detected, this tell-tale will illuminate.

The **STOP SYSTEM** tell-tale will light up when a major drive system fault has occurred. The Operator has only 30 seconds to move the vehicle to a safe location before the system **SHUTS DOWN**. Check diagnostic codes. *It is the responsibility of the operator to stop as quickly as possible on the side of the road, in order to avoid damaging the engine.*

**CHECK TRANSMISSION (AMBER SOLID)**

The **CHECK SYSTEM** tell-tale will illuminate and remain steady to alert the operator that a drive system fault has occurred. The vehicle should be returned immediately for service. Check diagnostic codes.

**SYSTEM OVERTEMP (AMBER FLASHING)**

The **SYSTEM OVERTEMP** tell-tale (flashing) warns that a drive system component has reached a thermal limit. Performance is reduced and the propulsion system may become disabled. Check diagnostic codes.

**ALTERNATOR NOT CHARGING**

This tell-tale will light up to warn the driver that the alternator is not charging. If this occurs, turn off all electrical components (except lights required for night driving, headlights, running lights). If necessary, move the bus to a safe stopping point if the alternator is not charging.

**CAUTION**

NEVER operate a vehicle if the alternator is not charging.

NETWORK FAIL

Indicates to the driver that a problem in the multiplex network system has occurred. If the light illuminates, move the bus off the road as soon as possible. Stop the vehicle and turn the master control switch to the **STOP** position.



ABS BRAKE (ANTI-LOCK BRAKING SYSTEM)

Anti-lock braking (ABS) is standard equipment.

The Bendix ABS is an electronic system that monitors and controls wheel speed during braking. The system works with standard air brake systems.

ABS monitors wheel speeds at all times and controls braking during wheel lock situations. The system improves vehicle stability and control by reducing wheel lock during braking.

The tell-tale will light when the system detects a problem. Normal operation of the brake system will not be affected. Maintenance personnel should be notified, in order to correct any existing problem.



REGENERATION TELL-TALE

This tell-tale light is normally **OFF**. Regeneration (cleaning) of the **DIESEL PARTICULATE FILTER (DPF)** takes place automatically during normal service of the vehicle.

When the tell-tale lights up **ON-SOLID**, this indicates that the vehicle can complete its usual operational shift. Changing the duty cycle during its shift may return the tell-tale to its normal **OFF** position. If not, the vehicle should return to its maintenance facility at the end of the shift for assistance with regeneration.

When the tell-tale shows **ON-FLASHING**, this increases the urgency of conducting an assisted regeneration. Again, changing the duty cycle during the shift may return the tell-tale to its normal **OFF** position.

When the tell-tale shows **ON-FLASHING**, in conjunction with the **CHECK ENGINE LAMP**, the vehicle must undergo a stationary regeneration. **DO NOT RETURN THE VEHICLE TO SERVICE UNTIL THIS SITUATION HAS BEEN CORRECTED BY SERVICE TECHNICIANS.**

Once assisted or stationary regenerations have been performed, the tell-tale will resume its **OFF** status.

See the Maintenance Manual for additional service information.



MALFUNCTION INDICATOR LIGHT

This LED illuminates whenever a fault is detected in the diesel exhaust fluid (DEF) system, the catalytic reduction system (CRS) or the diesel particulate filter (DPF). This situation should not be considered as an emergency and the vehicle can be safely driven, however, the problem should be corrected as quickly as possible.



NOTE

If this tell-tale illuminates while the engine is running and does not extinguish, even after recycling the bus power, the tell-tale can be reset by starting and turning off the engine three times, the engine must remain inactive for more than 40 seconds between cycles.

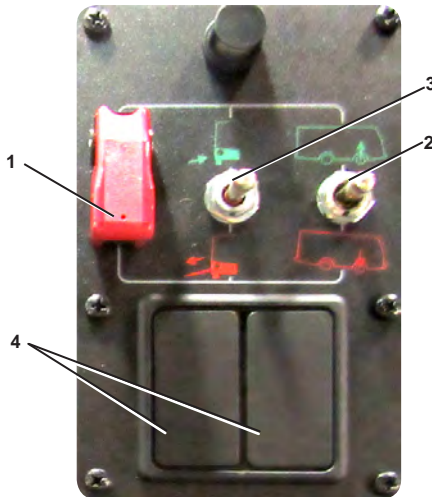


HIGH EXHAUST SYSTEM TEMPERATURE

The High Exhaust System Temperature (HEST) lamp signal controls an indicator lamp or LED to notify the operator that the exhaust system is, or is about to increase above normal temperature levels for the current engine operating condition. The increased temperature can be from residual heat from a previous operating condition, or from an active regeneration of the diesel particulate filter.

The HEST LED will extinguish when the exhaust temperature returns to normal working level. During the time that the LED is illuminated, it is recommended to avoid, where possible, low hanging structures, such as trees, garage equipment, overhanging structures of buildings, etc.

KNEELING AND RAMP CONTROL PANEL



NOTE

Parking brake must be in the ON position and transmission set to neutral (N).

1. KNEELING AND RAMP MASTER SWITCH

This switch is protected by a red cover and is used to deactivate the ramp and the kneeling system.

2. FRONT KNEELING SWITCH

- Before boarding or discharging passengers via the front door, set the kneeling and ramp **MASTER SWITCH** (item 1) in the **UP** position and activate (down position) the front **KNEELING SWITCH** (item 2) to release air from the pneumatic front suspension. The front of the vehicle will lower between 4 and 5 inches (10 and 13 cm) to facilitate boarding. While the front is being lowered, an alarm sounds and a light flashes on the outside of the front door. The light continues to flash until the front of the vehicle is fully lowered. Also, a tell-tale will light up to indicate that the operation is in progress.
- To raise the vehicle, set the **KNEELING SWITCH** (item 2) in the **UP** position. Once the vehicle reaches the minimum operating height, control of the brakes and accelerator is returned to the operator. **After operation, the switch cover of the kneeling and ramp MASTER SWITCH (item 1) must be in the DOWN position to prevent accidental deployment of the kneeling.**

**NOTE**

This mechanism must only be used when:

- The vehicle stops at the bus stop;
- The front door cannot be aligned with the curb;
- The vehicle cannot be aligned parallel to the curb;
- There is no curb at the bus stop.

**NOTE**

When kneeling is selected, the accelerator and brake interlock operates in the same way as when the back doors are open. Thus, the vehicle must be completely stopped for the mechanism to function.

**WARNING**

Do not activate the **KNEELING SWITCH** when the vehicle is in motion. Before lowering the vehicle, make sure that people outside are standing clear to prevent possible injuries to their legs and feet. Never lower the vehicle onto a sidewalk or snowbank. The wheelchair access ramp must be stowed **BEFORE** using the front kneeling. To prevent falls and injuries, do not raise the vehicle until all passengers have taken their places.

3. WHEELCHAIR ACCESS RAMP SWITCH

Some conditions must be met before the access ramp can be deployed.

- The **MASTER CONTROL** switch must be in the **RUN** or **LIGHTS** position.
- The front door must be **OPEN**.
- Kneeling may be active or inactive.
- The transmission selector is set to **NEUTRAL**.
- Parking brake must be in the **ON** position.

To deploy the ramp

- Set the **WHEELCHAIR RAMP SWITCH** in the **DOWN** position and hold it there until the ramp is fully deployed.
- An alarm will sound and a tell-tale will light up to indicate that the operation is in progress.
- A light on the outside of the vehicle will flash to warn people waiting outside.
- Check deployment of the ramp in the front door area.

To stow the ramp

- Activate the **WHEELCHAIR RAMP SWITCH** in the **UP** position, until the alarm stops and the tell-tale extinguishes.
- Check retraction of the ramp in the front door area.

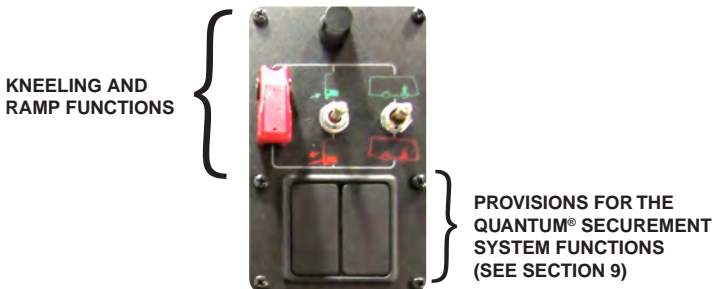
4. PROVISION FOR QUANTUM® SECUREMENT SWITCHES

Provisions, **ONLY**, are provided for the Quantum® wheelchair securement system.



NOTE

The lower portion of the **KNEELING AND RAMP CONTROL PANEL** contains provisions for the switches for the Quantum® wheelchair securement system (see below), when installed. Please refer to section 9 in this manual for additional information. Also, refer to the manufacturer's instructional manuals for further information.



MANUAL RAMP OPERATION



WARNING

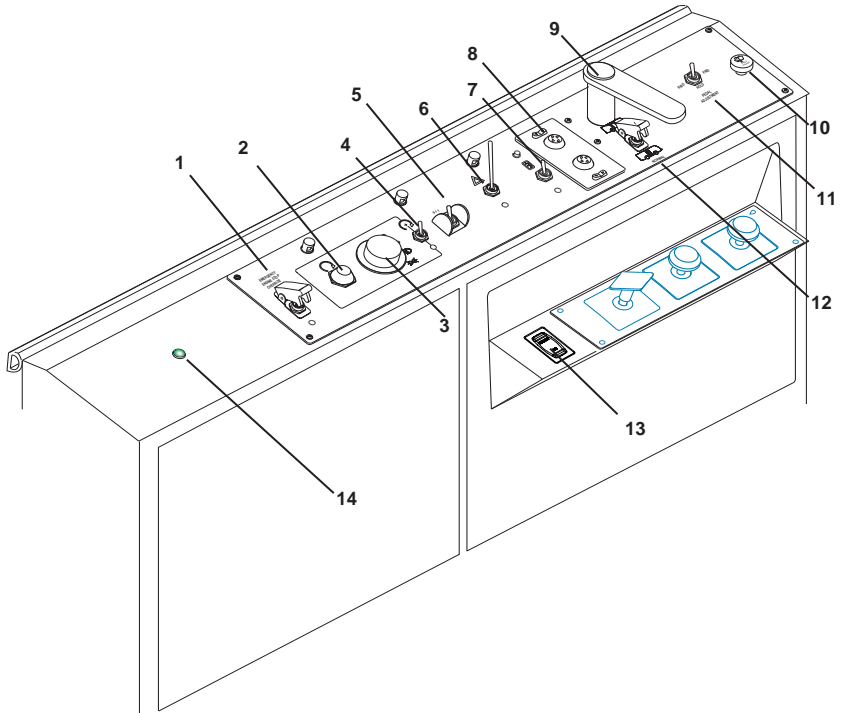
Before using the manual procedure, make sure that both kneeling and ramp switches are not active.

To extend or retract the ramp, grab the strap (circled) and pull the ramp either out or in.

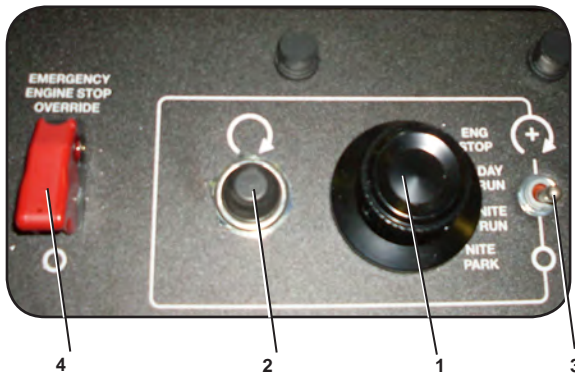


SECTION 2

OPERATOR'S CONTROL PANEL



1. Emergency Engine Stop Override Switch
2. Engine Start Switch
3. Master Control Switch
4. Fast Idle Switch
5. 9-1-1 Emergency Switch
6. Hazard Flasher Switch
7. Rear-View Mirror Defrost Switch
8. Exterior Rear-View Mirror Switches
9. Door Control Switch
10. Windshield Wipers Control Knob
11. Pedal Adjustment Switch
12. Rear Door Switch
13. Instrument Panel Dimmer Switch
14. Seon Diagnostic Indicator/Alarm Switch



1. MASTER CONTROL SWITCH

This switch has four positions. Selection is made by turning the knob to align the triangle with the desired position.

ENG STOP position

- The engine is shut down and the **BATTERY DISCONNECT SWITCH** normally turns **OFF** automatically after 40 minutes. However, this parameter can be modified by the client (between 30 seconds to 75 minutes).
- The electrical system can be turned back **ON** after a few seconds (4 to 5 sec.) when hazard flashers are turned **ON**.

DAY RUN position

- All electrical circuits are energized except for the clearance lights, marker lights and exterior lighting.

NITE RUN position

- All electrical circuits are energized.
- This position is used at night. Exterior lighting is energized.

NITE PARK position

The engine is shut down. Only the following circuits are energized:

- Position and clearance lights;
- Brake lights;
- Hazard emergency flashers;
- Interior lighting (depending on configuration).



NOTE

This position is used when the vehicle is parked at the end of the line, when visibility is reduced, or in overcast weather. The engine must be stopped in this position.



2. ENGINE START BUTTON

A. STARTING PROCEDURE

- Before pressing the start button, make sure:
 - The parking brake is applied.
 - The **MASTER CONTROL SWITCH** is in the **RUN** or **LIGHTS** position.
 - The **WAIT TO START** tell-tale has extinguished.
 - The **MIL TELL-TALE** has extinguished.
- Press and maintain the start button until the vehicle starts.



CAUTION

Do not start the engine when the WAIT TO START tell-tale is ILLUMINATED. This procedure allows the required time for the primary fuel pump to build up the necessary pressure in the fuel system, to pre-heat the air intake chamber, and for the engine's ECU to check all engine components, systems and sub-systems. In cold weather, the waiting time may reach 25 seconds. The MIL tell-tale may take longer than other tell-tales to extinguish. Do NOT start the vehicle if this tell-tale is still illuminated. If the engine is started before the preheating cycle is completed, the preheating process will be cancelled.

- If the engine does not start after several attempts, do the following:
 - Turn the **MASTER CONTROL SWITCH** to **STOP**.
 - Turn **OFF** as many electrical circuits as possible (heaters, defrosters, transfer box, dome lights, destination signs, flashers, etc.).
 - Wait two minutes and repeat the engine starting procedure.



CAUTION

The engine must have adequate oil pressure within 15 seconds after starting. If the CHECK ENGINE tell-tale has not extinguished within 15 seconds, shut off the engine immediately to avoid engine damage.

**NOTE**

The **LOW AIR** tell-tale lights up and the buzzer sounds if the air pressure falls below 80 psi (552 kPa). The low air tell-tale system remains active once the engine is running until engine oil pressure reaches 3 psi (21 kPa) and air pressure reaches 80 psi (552 kPa).

**CAUTION**

Do not engage the starter for more than 15 seconds at a time.

**NOTE**

Idle the engine 3 to 5 minutes before operating with a load. This can be performed with or without the **FAST IDLE** switch on.

B. ENGINE SHUTDOWN PROCEDURE

- Turn the **MASTER CONTROL SWITCH** to the **STOP** position.

If the hazard warning switch, or the optional 9-1-1 switch, is not activated within a period of approximately 40 minutes (or the time determined by your organization), after an engine shutdown, the vehicle will go into a sleep mode and the **BATTERY DISCONNECT SWITCH** will be automatically deactivated.

**CAUTION**

Allow the engine to idle 3 to 5 minutes before shutting it off after a full-load operation. This allows adequate cool down of pistons, cylinders, bearings, and turbocharger components.

**WARNING**

Avoid breathing exhaust gases as they contain carbon monoxide, a naturally colorless, odorless substance. Carbon monoxide is a dangerous gas which can cause unconsciousness or even death.

If exhaust fumes enter the vehicle, find the cause as soon as possible and have it corrected.

The exhaust system must be inspected by a competent mechanic:

- Each time the oil is changed;
- Whenever there is a change in the sound of the exhaust system;
- Whenever the exhaust system or vehicle is damaged.

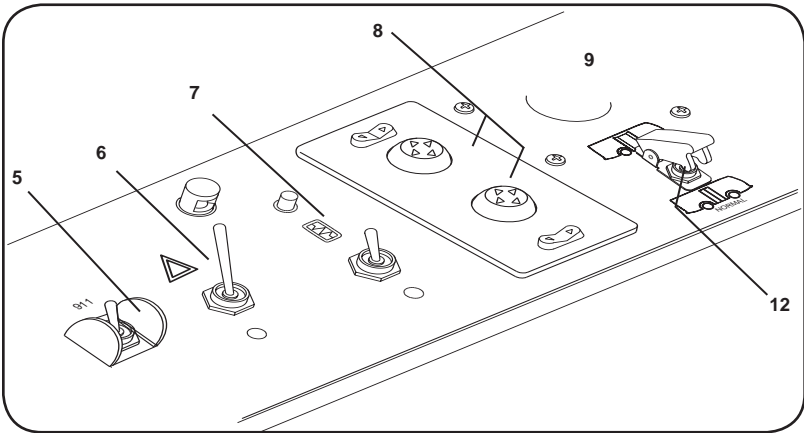
To ensure proper operation of a vehicle's ventilation system, keep the air intake grille clear of snow, leaves or other obstructions at all times.

Never run the engine in confined areas such as garages more than is needed to move the vehicle in or out. **WHEN THE ENGINE IS RUNNING IN CONFINED AREAS, THE USE OF PROPER VENTING SYSTEMS IS RECOMMENDED.** When a vehicle is stopped in an unconfined area with the engine running for more than a short time, **TURN ON THE HEATING/AIR SYSTEM TO FORCE AIR OUT OF THE VEHICLE.**

DO NOT PERFORM A STATIONARY REGENERATION OF THE CPF (CUMMINS PARTICULATE FILTER) EXHAUST SYSTEM INSIDE A BUILDING, OR IN AN AREA THAT HAS A CANOPY OR SIMILAR STRUCTURE.
SEE THE CUMMINS MANUALS PROVIDED WITH THIS VEHICLE.

3. FAST IDLE SWITCH

- This switch is used during engine warm-up.
- High idle depends on transmission gear, and is operative only when the transmission is in neutral and the parking brake is ON.
- *This function is disabled when the parking brake is disengaged.*



4. EMERGENCY ENGINE STOP OVERRIDE SWITCH

- A flashing **STOP SYSTEM** dash indicator lamp signals to the operator an imminent engine shutdown. The shutdown time can be extended by thirty seconds by actuating the vehicle's **EMERGENCY ENGINE STOP OVERRIDE**.

9 1 1 5. 9-1-1 EMERGENCY SWITCH

- Activate by pushing this switch up.
When this switch is **ACTIVATED**, front, side and rear destination signs immediately display an emergency message.

6. HAZARD FLASHER SWITCH

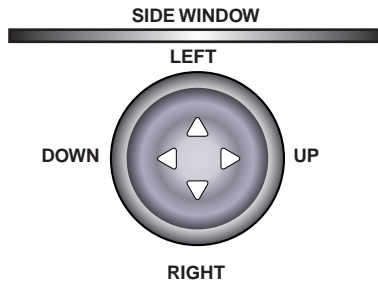
- When the switch is in the **UP** position, all flashers are operative. Flashers operate regardless of the position of the **MASTER CONTROL SWITCH**.

**7. REAR-VIEW MIRROR DEFROSTER SWITCH**

- To operate the defroster, place the switch in the **UP** position. The tell-tale lights up. The defroster and tell-tale shut off automatically after 10 minutes.

8. EXTERIOR REAR-VIEW MIRROR SWITCHES

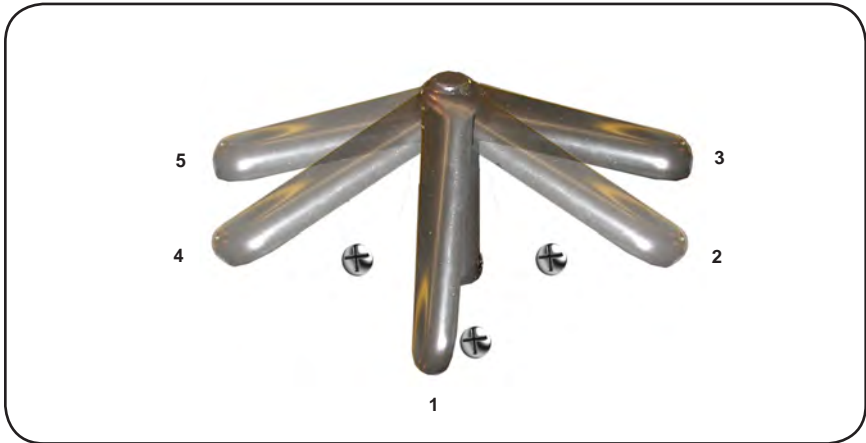
- These switches are used to adjust the left and right rear-view mirrors from inside the vehicle. The top and bottom parts of the mirrors are adjusted separately.



DOOR CONTROL SWITCH

The operator must have knowledge of the purpose and function of the various door controls to safely and successfully operate the doors:

- Door Master Switch Page 3-2
- Door Control Valve Page 5-1
- Emergency Door Valve Page 8-6



9. DOOR CONTROL SWITCH (FIVE-POSITION)

1. Neutral

Doors are closed.

2. One notch to the right of neutral

To open the front door only.

3. Two notches to the right of neutral

To open the front door and authorize the rear door.

4. One notch to the left of neutral

To authorize the rear door only.

5. Two notches to the left of neutral

To authorize the rear door and the front door.



10. WIPER CONTROL KNOB

The windshield wipers are controlled by a knob on the driver's control panel. The knob has four positions; **STOP**, **INT**, **SLOW** and **FAST**. In Intermittent mode, the cycle speed can be adjusted by turning the knob.

To activate the windshield washer system, push on the knob. For a short spray, push and release. For a constant spray, push and hold the button until the surface is sufficiently covered with fluid.

11. PEDAL ADJUSTMENT SWITCH

This is a momentary switch with three positions: **RWD** (rearward), **FWD** (forward) and **HOLD** (default position). In **RWD** mode the accelerator and brake pedals move towards the operator. In **FWD** mode the accelerator and brake pedals move away from the operator. The switch must be held in either **RWD** or **FWD** mode until the desired pedal position is obtained. The switch returns to the **HOLD** position when inactive. The following two conditions must be met for the switch to be functional:

- *Transmission in neutral*
- *Parking brake applied*

12. REAR DOOR SWITCH

This switch has three positions: **NORMAL**, **LOCK** and **OPEN**.



NORMAL position

The rear door will open when the door control lever is activated.



LOCK position

The rear door will not open, even if the door control lever is activated.



NOTE

In this position, the service brakes and accelerator are not locked and the bus can be driven.



OPEN position

The door will open instantly without activation of the motion sensor. The brakes and accelerator are blocked as soon as the door starts to open.



NOTE

In an emergency, a switch on the console above the operator allows instant overriding of the brake and accelerator locking system.



13. DIMMER SWITCH

- Pressing the upper or lower part of this switch increases or decreases the brightness of the lighting on the **DRIVER'S CONTROL PANEL** and the **INSTRUMENT PANEL**. The button is operative when the **MASTER CONTROL SWITCH** is set to **LIGHTS** or **ACCESSORIES**.

**14. SEON DIAGNOSTIC INDICATOR/ALARM SWITCH**

- Pressing the alarm button of the diagnostic indicator/alarm switch causes an alarm event to be recorded by the digital video recorder (DVR). The indicator ring shows the DVR status:

NO GREEN LIGHT

No power to the DVR/Ignition not on

FLASHING GREEN LIGHT

DVR powered, but not recording

SOLID GREEN LIGHT

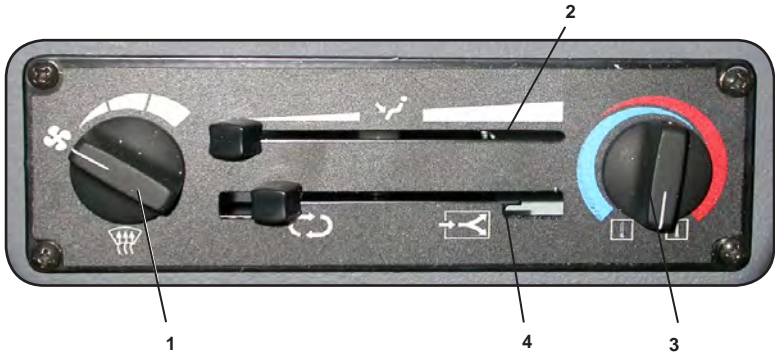
DVR powered and recording

SPEAKERS AND PUBLIC ADDRESS SYSTEM

To operate the speakers, activate the microphone switch and speak naturally into the microphone. The switch and volume control are accessible through the ITS system installed by the transit authority.



FRONT VENTILATION CONTROL PANEL

**1- FAN SWITCH (4 POSITIONS)**

Turning this switch clockwise increases the front fan speed.

**2- OPERATOR'S AIR DIRECTION CONTROL**

Sliding the control to the right increases the flow of air to the operator's feet. When the control is completely open, 50% of the air is directed to the feet and 50% to the windshield.

**3- OPERATOR'S TEMPERATURE CONTROL**

Turning the control clockwise increases the amount of heat from the ventilation system.

**4- EXTERIOR/INTERIOR AIR INTAKE CONTROL**

Sliding the control to the right increases the amount of outside air being circulated.

SECTION 3

OVERHEAD LEFT CONSOLE

BRAKE INTERLOCK

The brake interlock is used when the vehicle kneels, or the ramp is deployed. When those systems are activated, the interlock system is designed to apply air pressure to the rear brakes. When the interlock system is in operation, the **BRAKE LIGHT** tell-tale lights up. To release the brake interlock, the service brake must be applied, the doors must be closed, the vehicle must be at operating height and the ramp must be retracted.

**CAUTION**

When preparing to stop the vehicle, at a bus stop or red light, for example, the service (foot) brake MUST be used to stop the vehicle. When leaving the vehicle unattended, ensure that the PARKING BRAKE is applied. See section 5 in this manual.

ACCELERATOR INTERLOCK

The engine remains at idle during accelerator interlock. As soon as the ramp is retracted and front kneeling is deactivated, the accelerator is unlocked and the brakes are released.

**NOTE**

If the accelerator is pressed before the ramp is retracted and/or kneeling is deactivated, the engine remains at idle. To return to normal operation, release the accelerator completely and press it down again.

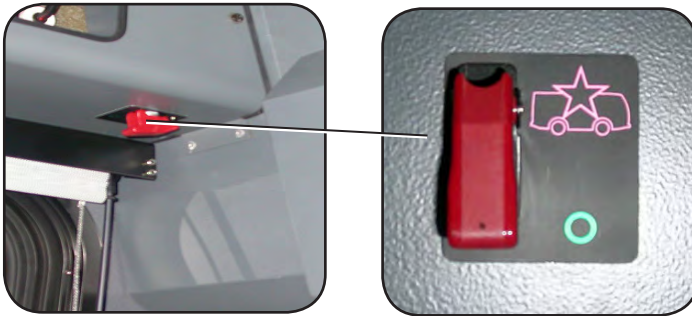
DOOR MASTER SWITCH (INTERLOCK OVERRIDE)

- This switch is located on the underside of the **OVERHEAD LEFT CONSOLE**.
- To unlock the brakes when the vehicle must be moved to a point of safety with the rear door locked open, open the red cover and pull the switch.
- This system sounds an alarm. The system must be re-armed to stop the alarm.
- Kneeling will automatically take its initial position.

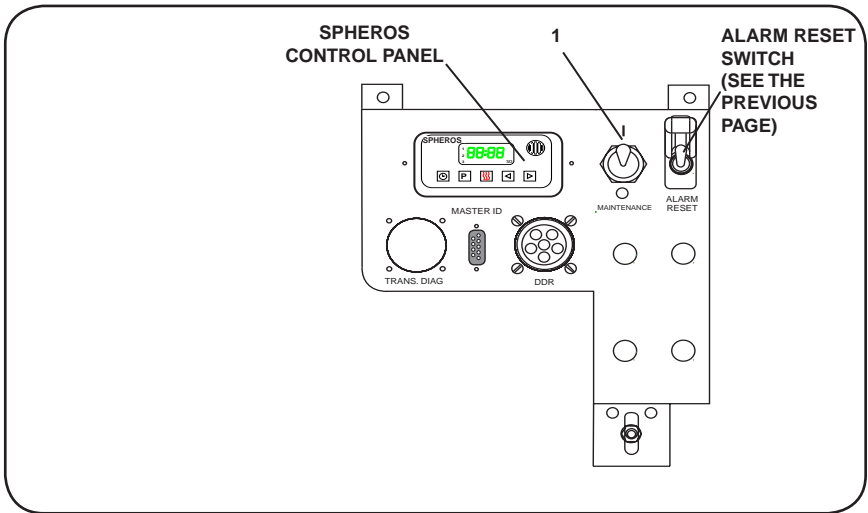


NOTE

To reset the override system and stop the alarm, activate the momentary switch (Alarm Reset) with the red safety cap in the **OVERHEAD LEFT CONSOLE**. (See the following page for illustration).



INSIDE THE OVERHEAD LEFT CONSOLE



1. ELECTRICAL DIAGNOSTIC SWITCH

This two-position switch is used to activate the electrical diagnostic feature on the speedometer. This switch should be activated when maintenance is being performed on the vehicle. This switch lights up the illustrated amber tell-tale on the dashboard to indicate to other personnel that the vehicle should not be started without verification.

SPHEROS HEATER

GENERAL

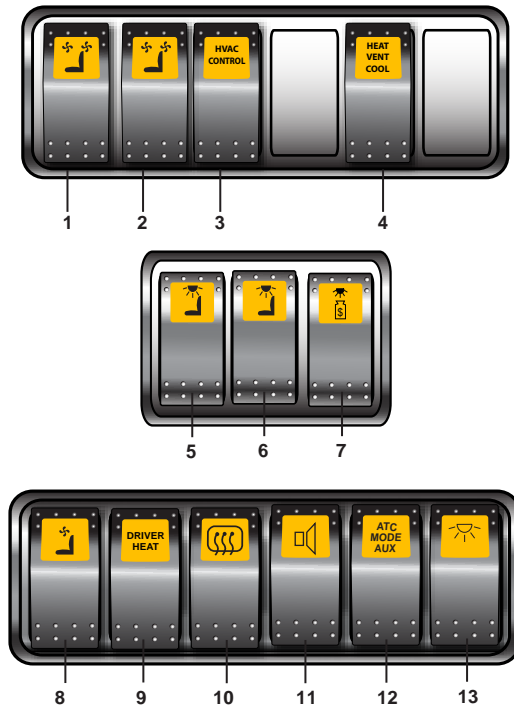
The Spheros (formerly *Webasto*) System supplies heat to the vehicle's normal heating system without starting the engine. The Spheros controller panel is located in the Overhead Left Console.

OPERATION

For detailed information on how to use the control panel, refer to the Spheros operator's manual.

SECTION 4

OVERHEAD SWITCH PANEL



1. Left-hand Operator's Upper Mounted Fan Switch
2. Right-hand Operator's Middle Dash Mounted Fan Switch
3. HVAC Control Switch
4. Heat, Vent, Cool Control Mode Switch
5. Transfer Light Switch
6. Operator's Light Switch
7. Fare Box Light Switch
8. Operator's Booster Fan Switch
9. Driver Heat Switch
10. Front Door Heating Switch
11. Speaker Switch
12. Auxiliary Traction Control Switch
13. Dome Lights Switch

**1. UPPER LEFT-HAND MOUNTED FAN SWITCH**

- This switch is used to activate the upper left-hand fan in the operator's environment. This switch has three positions: **OFF**, **LOW** and **HIGH**.

**2. DASH MOUNTED FAN SWITCH**

- The dash mounted fan is controlled by the fan switch. The fan can be adjusted to direct the air flow as desired. The switch has three speed positions: **OFF**, **LOW** and **HIGH**.

**3. HVAC CONTROL SWITCH**

- This switch has two positions: **ON** and **OFF**. This is the **MASTER** switch that activates or deactivates the HVAC system.

**4. HEAT, VENT, COOL CONTROL MODE SWITCH**

- This is a three-position switch to activate the HVAC system into its **HEAT**, **VENT** or **COOL** modes, provided that the **HVAC CONTROL SWITCH** (item 3) is in the **ON** (activated) position. In the **HEAT** position, heating is activated when the thermostat detects a cool temperature. In the **VENT** position, normal fresh air ventilation is operational. In the **COOL** position, air conditioning is activated when the thermostat detects a warm temperature.

**5. TRANSFER LIGHT SWITCH**

This switch has two positions - **ON** or **OFF**. When the switch is activated, the light above the central dashboard lights up the fare box area.



6. OPERATOR'S LIGHT SWITCH

This switch has two positions and is used to illuminate the operator's compartment. The **MASTER CONTROL SWITCH** must be in the **RUN** or **LIGHTS** position.



7. FARE BOX LIGHT SWITCH

This switch has three positions:

NORMAL

- The light illuminates every time the command is given to open the front door, provided the **MASTER CONTROL SWITCH** is in the **LIGHTS** or **ACCESSORIES** position.

ON

- The light is always illuminated, regardless of the position of the door controls.

OFF

- No lights are illuminated.



8. OPERATOR'S BOOSTER FAN SWITCH

This switch has three positions: **LOW**, **HIGH**, and **OFF**, and controls ventilation in the operator's compartment.

- A fan in the console over the window on the operator's left moves the air.
- Two adjustable air vents can be used to direct air towards the operator.
- The operator's window is defrosted and defogged by means of vertical slots under the window.



9. DRIVER HEAT SWITCH

This two-position switch turns **ON** or **OFF** the warm airflow into the panel-mounted radiator behind the operator's seat, to heat the operator's compartment.



10. FRONT DOOR HEATER SWITCH

This two-position switch activates the heater blower at the front door.



11. SPEAKER SWITCH

This switch has three positions that control the P.A. system:

BOTH

- The P.A. system is active and operates the outside and inside speakers.

IN

- The P.A. system is active and operates the inside speakers.

OUT

- The P.A. system is active and operates the outside speakers.

ATC
MODE
AUX.

12. AUXILIARY TRACTION CONTROL SWITCH

The ATC switch is momentary, press once to activate, press once to deactivate.

- Traction Control is an electronic system that monitors and controls wheel speed during acceleration. This switch adds a **DEEP SNOW AND MUD** setting that supplements the standard system by allowing additional wheel slip. The amount of additional slip allows the wheels to work through loose mud and snow to gain traction.
- Under normal operating conditions with the ATC switch deactivated, the ATC tell-tale light in the instrument panel will flash during wheel slip. The tell-tale light will stop flashing once wheel slip has stopped.
- When the ATC switch is activated, the tell-tale light will flash continuously regardless of wheel slip. This mode allows additional wheel slip to work through loose mud and snow to gain traction. To deactivate the **DEEP SNOW AND MUD** setting, press the ATC switch once and the tell-tale light will stop flashing.
- Activation of the ATC switch, when not required, will decrease acceleration performance of the vehicle in normal slippery conditions.
- The **DEEP SNOW AND MUD** setting is deactivated when the engine is turned **OFF**.

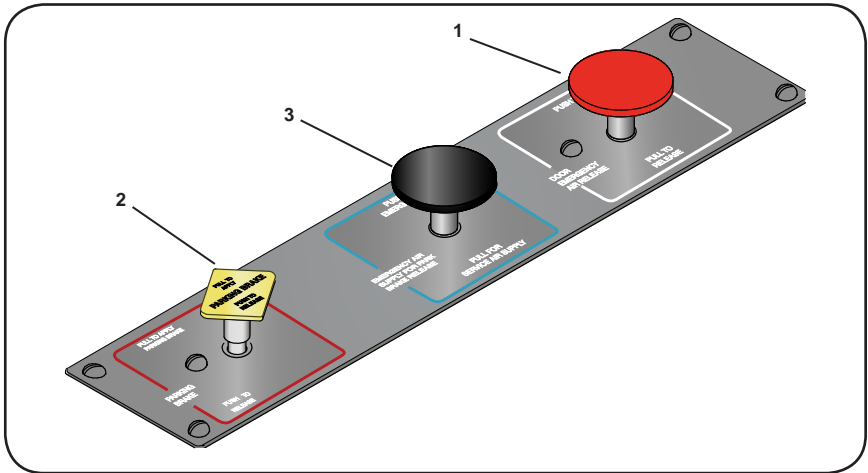
**13. DOME LIGHTS SWITCH**

This switch has three positions: **RUN**, **ROAD** and **OPEN**.

- Depending on the Transit Authority's requirements for the lighting sequence, the Dome lights could illuminate, or be extinguished in any of these three switch positions.
- Please consult the lighting sequence for this contract to determine the functionality of this switch.

SECTION 5

PNEUMATIC CONTROL PANEL



1. Main Door Control

2. Parking Brake

3. Emergency Brake Release

MAIN DOOR CONTROL

An air shut-off valve, located to the left of the operator, controls air pressure to the doors. A label underneath the control gives the following instruction:

PUSH TO APPLY
PULL TO RELEASE

The valve must be in the **PUSH TO APPLY** position for the air-operated doors to function. In an emergency, the valve can be placed in the **PULL TO RELEASE** to allow manual opening of the doors.

EMERGENCY MEASURES

The following instructions on the use of the air-shutoff control are **STRICTLY FOR EMERGENCY** use and must **NOT** be used for normal operation of the doors. **NEVER** operate the vehicle with the shut-off valve in the **PULL TO RELEASE** position, except to move it to a point of safety in the case of an emergency.

FRONT DOORS FAIL TO OPEN OR CLOSE

PULL the air shut-off valve to the **RELEASE** position. The doors can then be forced open and closed manually. Before driving on, **PUSH** the shut-off valve to the **APPLY** position for normal operation.

PARKING BRAKE

The parking brake is air-actuated (air released-spring applied). The parking brake control valve is located on the **PNEUMATIC CONTROL PANEL**. To apply the parking brake, **PULL** the control valve knob. To release the parking brake, **PUSH** the control valve knob. A tell-tale lights up when the parking brake is applied.

When system air pressure is low, build up air pressure to at least 80 psi (552 kPa), or more, before **PUSHING** the valve knob to help ensure full parking brake release. Any time the parking brake is not performing satisfactorily (i.e. holding ability on a grade), report condition to service personnel immediately.



CAUTION

The parking brake must be applied before leaving the operator's seat. This will prevent the vehicle from moving unexpectedly, which could result in personal injury, death and/or property damage.

OPERATION

To operate the parking brake, **PULL** the valve knob. This allows the spring brake hold-off pressure to exhaust through the parking control valve and the spring brake to apply.

To release the spring parking brake, **PUSH** on the same control valve knob.

If air pressure in the primary and secondary system reservoirs falls to approximately 80 psi (552 kPa), a buzzer sounds and a tell-tale lights up. At around 60 psi (414 kPa) the parking brake begins to apply automatically. At around 30 psi (207 kPa), the parking brake is completely applied.

EMERGENCY OPERATION

If normal application of the service brakes fails to stop the bus, apply the emergency brake by **PULLING** on the control valve knob. This will produce an abrupt stop and should **ONLY** be used in an emergency.

EMERGENCY PARKING BRAKE RELEASE

If the vehicle must be moved after a complete loss of air pressure in the primary and secondary system, a separate emergency air-supply system is used to release the spring parking brake.

The operator **PUSHES** the emergency release by means of an emergency release valve knob, also located on the **PNEUMATIC CONTROL PANEL**.

Constant pressure must be maintained on the knob to keep the spring brakes released. **PULLING** the knob reapplies the brakes.



WARNING

Use of emergency parking brake release is limited to the emergency air supply tank.

LOSS OF AIR PRESSURE

When air pressure in the system falls below 80 psi (552 kPa), a **LOW-AIR** warning tell-tale lights up and a buzzer sounds. The vehicle should be stopped and the cause of pressure loss corrected before proceeding. However, if the warning devices are ignored and the parking brake reservoir pressure drops below 80 psi (552 kPa), making it unsafe to operate the vehicle, the **EMERGENCY PARKING BRAKES** will apply automatically.

EMERGENCY BRAKE SYSTEM

If there is a loss of pressure in the primary brake system (as indicated by the arrow on the left-hand side of the air pressure gauge on the **INSTRUMENT PANEL**), the front brakes will maintain their full capacity. When pressure loss occurs in the secondary system (as indicated by the arrow on the right-hand side of the air pressure gauge), the primary system (rear brakes) remains operational.

SECTION 6

TRANSMISSION

TRANSMISSION SHIFT SELECTOR

Transmission gear selection is controlled by the electronic range selector located on the left side of the INSTRUMENT PANEL. Shift pad positions are: **DRIVE (D)**, **NEUTRAL (N)**, and **REVERSE (R)**. The three push buttons are designed to illuminate to let the operator know the transmission is ready to operate in the selected range.



NOTE

To minimize possible vehicle damage, never try to rock the vehicle or change direction of travel while the vehicle is moving.

Neutral (N) must always be selected **BEFORE** changing the direction of travel. If a change of forward to reverse travel is attempted above walking speed, the transmission will revert to Neutral. The vehicle must be stopped, the Neutral (N) button pressed again and the desired direction of travel reselected.

TRANSMISSION ELECTRONIC CONTROL UNIT (ECU)

This unit controls the upshifts, downshifts, lockup functions and monitors the system for conditions that could result in damage to the transmission or dangerous vehicle operation.

DRIVE (D)

Select this range for all normal driving conditions. In this range, the vehicle is designed to start in first gear, and as the speed increases, the transmission will automatically upshift. As the vehicle slows down, the transmission will automatically downshift to the correct gear.



NEUTRAL (N)

Shift to Neutral when starting the engine, checking bus accessories, operating the doors or wheelchair lift, and for extended periods of engine idle operation.

REVERSE (R)

Select this range to back the vehicle. When the transmission is in Reverse (R), a back-up alarm will sound.

PARKING THE VEHICLE

Before parking the vehicle or leaving the operator's seat, always place the transmission in NEUTRAL and apply the parking brake.



CAUTION

Whenever leaving the operator's seat, N must be selected on the shift selector and the parking brake applied, so the vehicle will not move if the accelerator is accidentally touched. Always apply the parking brake before stopping the engine to prevent the bus from moving.

DRIVING INSTRUCTIONS

The engine can only be started with Neutral (N) selected. With the vehicle standing still and the brake applied, start and run the engine at low idle. Apply the service brake, release the parking brake and select the desired range. The transmission should engage the desired gear. Release the service brake, press the accelerator and drive away.



NOTE

At temperatures below 5°F (-15°C) start the engine and warm up the transmission in Neutral (N) for approximately 10 to 15 minutes.



WARNING

If one of the tell-tale lights is flashing, report to service personnel as soon as possible.

DRIVING ON ICE OR SNOW

To prevent loss of traction when driving on ice or snow, reduce speed and let the transmission downshift. Select a suitable speed for the conditions. Accelerate and decelerate gradually to prevent loss of traction.



CAUTION

To minimize the risk of personal injury or property damage when the vehicle is stationary, the transmission must be placed in NEUTRAL, so that the vehicle will not move if the accelerator is accidentally touched. Always place the transmission in NEUTRAL before stopping the engine, and apply the parking brake to prevent the vehicle from moving.

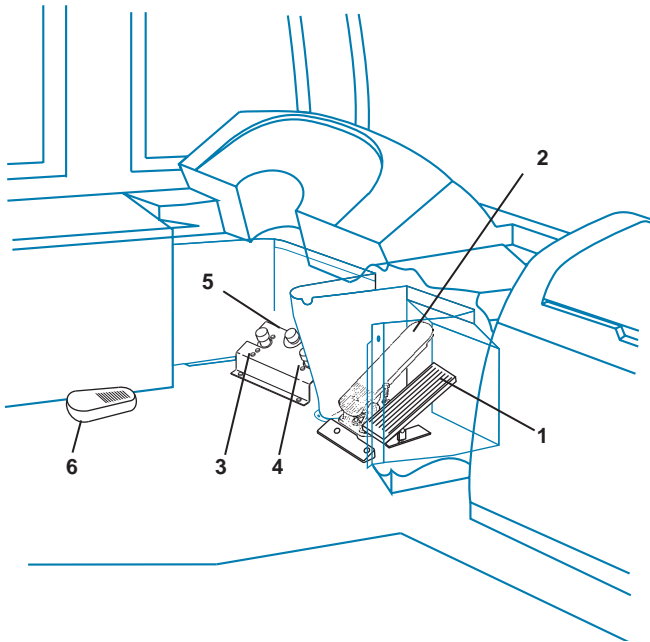
RETARDER OPERATION AND DRIVING DOWNHILL

The retarder is a hydrodynamic brake which functions according to the gear in use and suffers no mechanical wear. Therefore application of the retarder is recommended on lengthy grades or when slowing from high speeds. This saves wear on the service brakes, and in an emergency, the full braking effect (no fading) of the service brakes is available.

Depending on the requested transmission programming, the retarder is engaged either when releasing the throttle pedal, or when pressing the brake pedal. When the retarder is engaged, the **RETARDER ACTIVE** tell-tale illuminates.

SECTION 7

FLOOR CONTROLS



1. Accelerator Pedal
2. Brake Pedal
3. Left-hand Directional Switch
4. Right-hand Directional Switch
5. High/Low Headlight Beam Foot Switch
6. INIT ITS Foot Switch

USE OF SERVICE BRAKES

The service brakes on the vehicle are air-operated and are applied by pressing the brake pedal. The braking force varies with the pressure applied on the brake pedal.

DO NOT PUMP THE BRAKE PEDAL

This practice produces poor braking, wastes air pressure and causes excessive wear on the brake linings and brake assembly. Pumping the brakes does not increase the pressure in the brake lines, but does reduce pressure in the reservoir and lines.



CAUTION

Riding the brake by resting your foot on the pedal when you do not intend to brake can cause overheating, excessive lining wear and possible damage to the brake system.

When the brake pedal is pressed, the **BRAKE LIGHTS** tell-tale on the dashboard illuminates to indicate that the brake lights are functioning. If the tell-tale fails to illuminate when the brakes are applied, the LED is probably burnt out.

AIR PRESSURE IS IMPORTANT

Air pressure must be at least 80 psi (552 kPa) for the air brakes to be fully effective. Check the pressure gauge frequently. If the **LOW AIR** tell-tale lights up and the buzzer sounds while the vehicle is operating, stop immediately and determine the cause of the drop in air pressure. Without air pressure, the brake pedal will not work.



CAUTION

Driving through water deep enough to wet the brakes may adversely affect brake performance. The vehicle may not slow down normally and could pull to the right or left. Applying the brakes lightly will indicate whether they have been affected. To dry wet brakes quickly, apply light pressure while maintaining a safe forward speed with sufficient clearance ahead and to the sides of the vehicle until normal braking has been re-established.

BRAKE LIGHTS

When the brakes are applied, the brake lights, center lights and brake light tell-tale light up.

ABS BRAKE (ANTI-LOCK BRAKING SYSTEM)

Anti-lock braking (ABS) is standard equipment.

Bendix ABS is an electronic system that monitors and controls wheel speed during braking. The system works with standard air brake systems.

ABS monitors wheel speeds at all times and controls braking during wheel lock situations. The system improves vehicle stability and control by reducing wheel lock during braking.

A tell-tale will light when the system detects a problem. Normal operation of the brake system will not be affected. Maintenance personnel should be notified, in order to correct any existing problem.

TRACTION CONTROL

Traction Control is an electronic system that monitors and controls wheel speed during acceleration. The system prevents wheel spinning during acceleration on slippery surfaces.

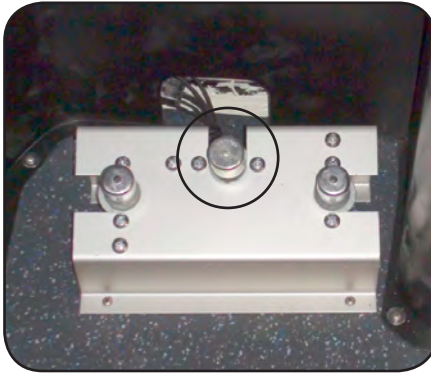
DIRECTIONAL SIGNAL SWITCHES

The directional signal lights are controlled by two foot-operated switches. The right switch controls the right-side signals, and the left switch, the left-side signals. The switches are momentary, so the pedals must be held down to maintain the signal. When the signals are operating, the directional signal tell-tale flashes.



HIGH/LOW HEADLIGHT BEAM FOOT SWITCH

To activate the high or low headlight beams, push the knob, then release. A tell-tale on the instrument panel will light up when the high beams are active. The **MASTER CONTROL SWITCH** must be in the **LIGHTS** position.



INIT ITS FOOT SWITCH

The INIT ITS system provides audible route and stop announcement both inside and outside the vehicle. This system is installed by your transit authority. See your supervisor for additional information on the operation of this system.



SECTION 8

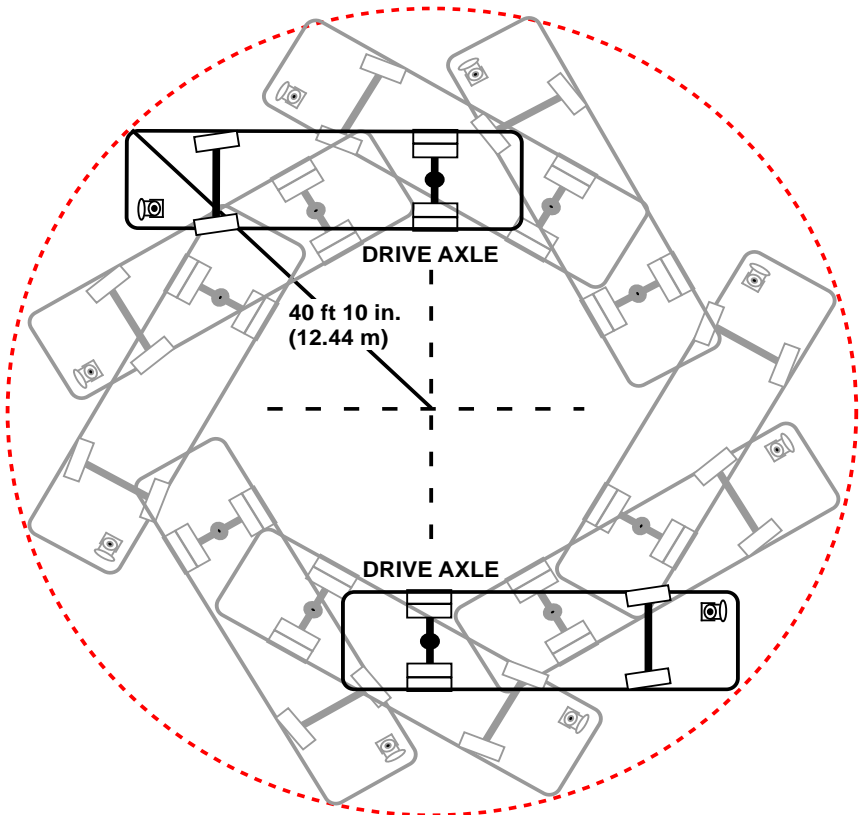
OTHER CONTROLS AND COMPONENTS

POWER STEERING

If power steering fails due to engine stalling or a malfunction, the vehicle can still be steered. However, in this situation move the bus off the road as soon as possible.

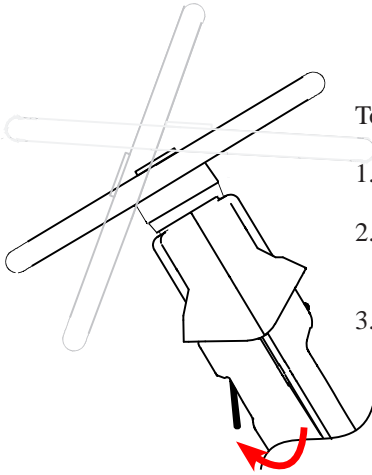
The power steering reservoir is located in the engine compartment and is accessed via the **ENGINE ACCESS DOOR**. In normal operation, the oil level should be visible through the sight glass.

TURNING RADIUS



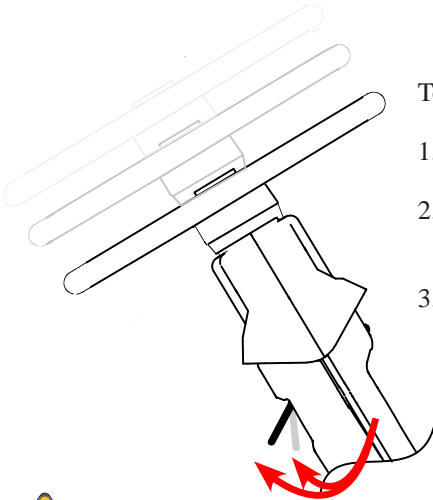
ADJUSTING STEERING WHEEL ANGLE AND HEIGHT

For operator comfort, adjust the steering wheel angle and height to acquire a comfortable driving position.



To adjust angle:

1. Pull the knob up.
2. Place the steering wheel in the desired position.
3. Release the knob.



To adjust height:

1. Push the knob down.
2. Place the steering wheel in the desired position.
3. Release the knob.



NOTE

If the knob does not return to its initial position, the wheel is between positions. Repeat the adjustment instructions above until the knob is correctly positioned.

NOVA BUS

SUNSHADES



To adjust the sunshades to the desired height, simply pull down on the handle at the center of the lower rail.

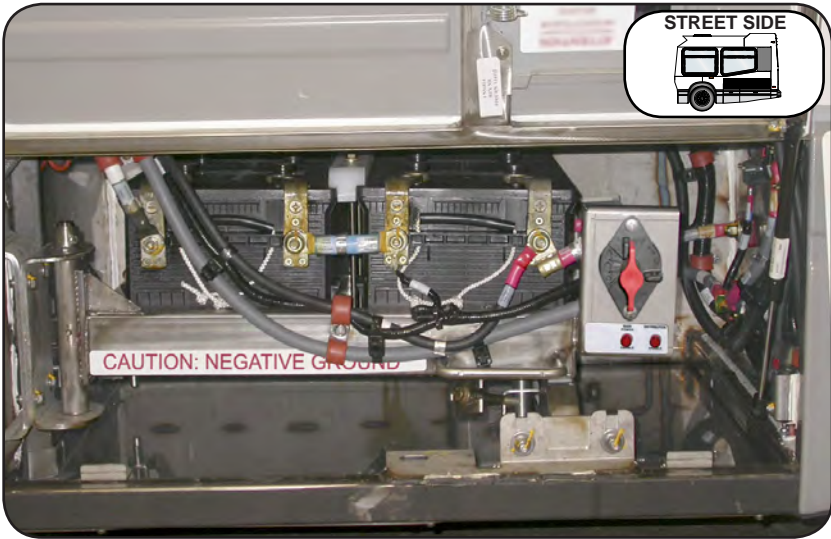


To raise and automatically re-roll the shades, gently push up on the same handle.

OPERATOR'S WINDOW

The operator's side window can be opened for improved air circulation by pulling the lock back, sliding the front pane towards the center and latching it in position.



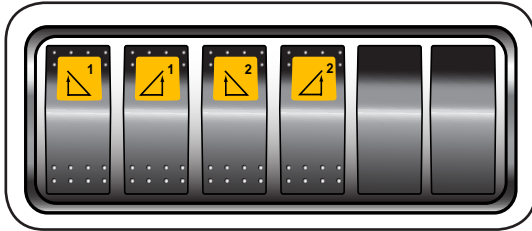
BATTERY DISCONNECT SWITCH

If the batteries must be disconnected from the electrical system (e.g. in case of fire), place the switch in the **OFF** position.

The **BATTERY DISCONNECT SWITCH** can be reached from within the rear street-side battery compartment.



BATTERY DISCONNECT SWITCH

EMERGENCY EQUIPMENT**ROOF EMERGENCY ESCAPE HATCHES****FRONT AND REAR**

The emergency escape hatches, located in the roof, can be opened from inside the vehicle. The front and rear emergency escape hatches can be opened electronically by the operator for ventilation. Four switches are located on the destination sign panel above the driver.

The **FRONT ARROW** switch opens or lifts the hatch toward the front. The **REAR ARROW** switch opens or lifts the hatch toward the rear. Both switches, when pushed at the same time, will open or lift the hatch straight up.

FOR EMERGENCY ESCAPE

1. Turn the handle completely.
2. Push on the hatch.

EMERGENCY ESCAPE VIA SIDE WINDOWS

In an emergency, the side windows that display a sticker, as shown below, can be opened for escape.

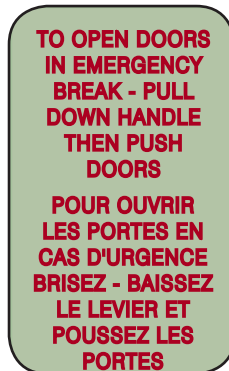
FOR EMERGENCY ESCAPE

1. Pull down the handle.
2. Push the window at the bottom.



EMERGENCY DOOR RELEASE

A special safety door release valve is located close to the front and rear doors behind a plastic window. In case of emergency, break the window using hand pressure and pull the handle to release the doors.



NOVA BUS

FIRE EXTINGUISHER

A fire extinguisher is provided, but not installed as shown.



SECTION 9**SEATS****USSC OPERATOR'S SEAT**

The operator's seat can be adjusted for height, fore and aft, seatback tilt, lumbar support, and seat cushion pitch.

**CAUTION**

DO NOT adjust an operator's seat while the vehicle is moving. The seat could move suddenly and unexpectedly and could cause the operator to lose control of the vehicle.

After adjusting a manually operated seat, push forward and backward on the seat to be sure it will not move and that the seat adjusters have latched. Movement of the seat indicates that at least one latch did not engage. This could increase the chance of injury and/or the amount of injury in an accident. Report condition to service personnel if you find that either seat adjuster does not latch.

SEAT HEIGHT

The air suspension seat has an infinite vertical height adjustment. The height adjusting knob is located on the front left edge of the seat cushion. Rotation increases or decreases the amount of air in the air bag, raising or lowering the seat accordingly. All air can be quickly released by pulling the knob out. Pushing it back in restores air to the system.

SEAT TILT

The seat cushion angle can be adjusted 10 degrees by turning the seat tilt knobs located on the middle sides of the seat cushion. Seat tilt is independent of seat height adjustment. This allows full tilt range at all seat heights.

SEAT BACK RECLINE

The seat back angle can be adjusted from 45 degrees forward to 125 degrees backward. Two seat recline knobs are located on both sides of the seat back where they meet the seat cushion.

LUMBAR SUPPORT

Located on the front edge of the seat are the air lumbar switches. Pushing the switches increases or decreases the amount of lumbar support.

SIDE BOLSTER

Located on the switch box (front right edge of seat) are the side bolster adjustments. Inflation of air bags decreases the space between bolsters for a tighter fit. Deflation allows more room for larger drivers.

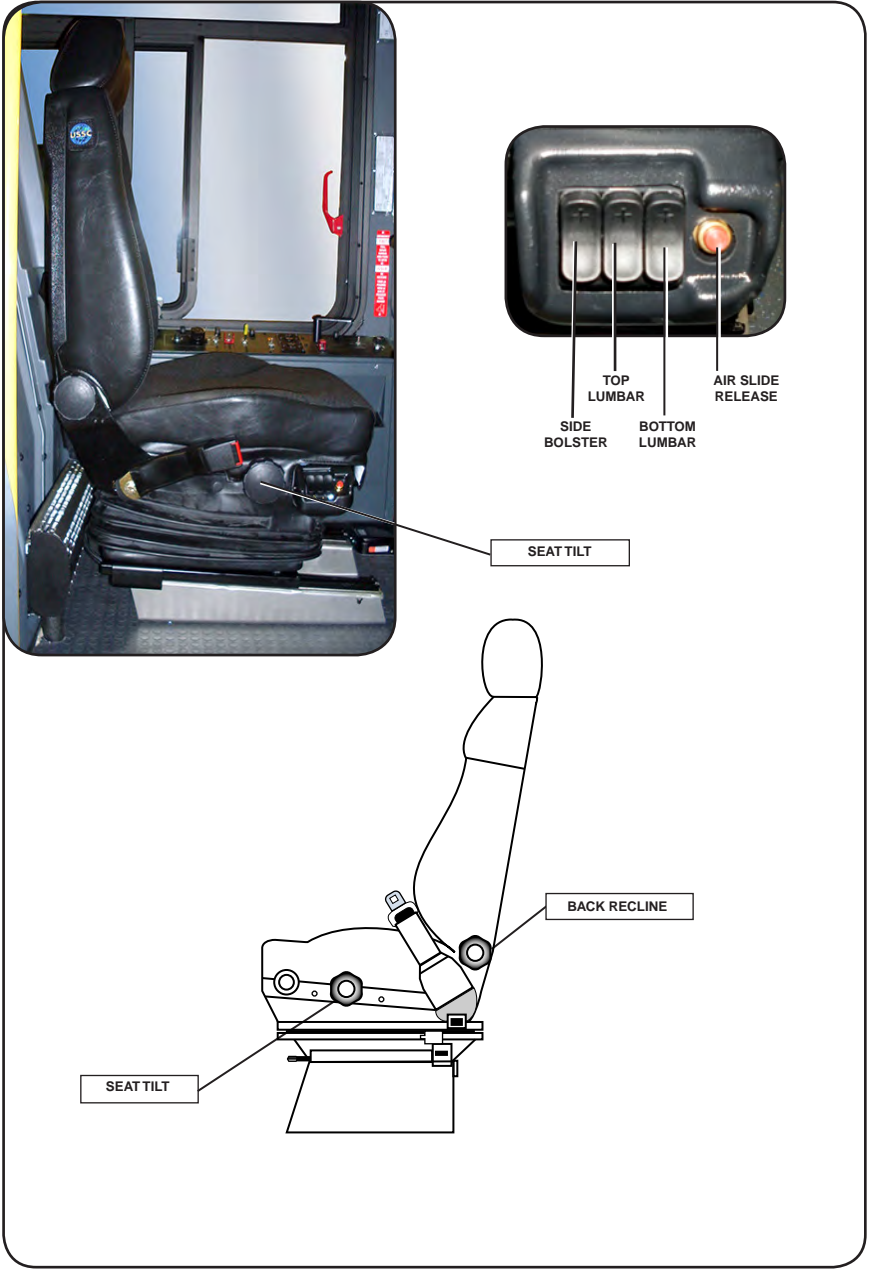
FORE/AFT SLIDE

The entire seat can be adjusted by 11.8 inches front to back. The air slide release button is located on the switch box that controls the lumbar and side bolsters. Press the red button to release the slides, move the seat to desired location and release button. The slides will automatically lock in place.

SEAT BELT

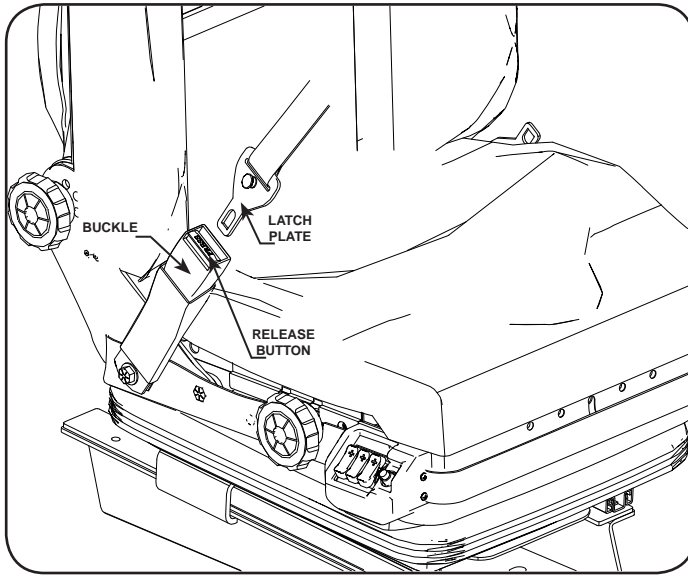
The safety belt latch plate is located on the left-hand side of the seat. The belt is stored in a lower retractor. Pull the belt across the lap to snap into the buckle on the right-hand rear of the seat.

OPERATOR INSTRUCTIONS



USSC Operator's Seat Controls

OPERATOR'S SEAT BELT



SEAT BELT

The seat belt installed has a three-point *lap and diagonal* configuration. This installation allows the operator to use only the lap belt, or the lap belt with the diagonal belt attached. The diagonal belt cannot be used without being attached to the lap belt latch plate. The lap safety belt latch plate is located on the left-hand side of the seat. The belt is stored in a lower retractor. The diagonal safety belt latch plate is also located on the left-hand side of the seat. This belt is held by an upper retainer.

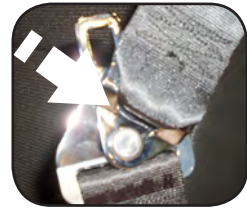
To use the lap belt only, pull the belt across the lap to snap into the buckle on the right-hand rear of the seat. To use the lap belt with the diagonal belt attached, pull the diagonal belt latch toward the lap belt latch plate and clip the small latch of the diagonal belt onto the round pin on the latch plate of the lap belt. Then pull the lap belt across the lap to snap into the buckle on the right-hand rear of the seat.



DIAGONAL SAFETY BELT IN
UPPER RETAINER



PIN ON LAP BELT LATCH
PLATE



DIAGONAL SAFETY BELT LATCH
CONNECTED TO PIN ON LAP
BELT LATCH PLATE

**WARNING**

A snug fit and low lap belt position are essential to minimize the chance of injury in the event of an accident. This spreads the force exerted by the lap belt in a collision over the strong hip bone structure rather than across the soft abdominal area. Never use the lap belt for more than one person at a time. Never wear the belt without fully extending the webbing from a retractor. Never wear a twisted belt or allow it to become damaged by being pinched between the seat's metallic structural parts.

- Regularly inspect the belt, buckle, latch plate, retractor and anchors for damage that could lessen the effectiveness of the restraint system.
- Keep sharp edges and pointed objects away from the belt.
- Replace the belt immediately if cut, weakened, frayed or subjected to collision.
- Check that anchor bolts are tight.
- Replace any questionable parts.
- Keep belts clean and dry. Clean only with mild soap solution and luke-warm water.
- Do not bleach or dye belts since this may severely weaken them.

**WARNING**

Many cleaning products may be toxic or flammable, and improper use may cause personal injury or damage to interior surfaces. When cleaning the interior, do not use volatile cleaning solvents such as acetone, lacquer thinner, enamel reducers, nail polish remover, or other cleaning agents such as laundry soaps, bleaches or reducing agents. Never use carbon tetrachloride, gasoline or naphtha for cleaning purposes.

**NOTE**

Be sure the vehicle is well ventilated before using cleaning agents. Follow the manufacturer's recommendations for use.

SECTION 10

DESTINATION SIGN

DESTINATION SIGN-LUMINATOR

This vehicle is equipped with a destination sign system designed for public transportation buses. In daylight, the large sized numbers and letters are clearly visible and a fluorescent light aids visibility at night.



USING THE DESTINATION SIGN SYSTEM

The destination sign is controlled by a display system above the operator. For detailed information on how to use the system, as well as maintenance instructions, refer to the sign manufacturer's manuals.



SECTION 11**APPENDIX****OPERATOR CHECKLIST****NOTE**

These checks are for information purposes. The operator must perform a safety walk-around inspection according to the Highway Safety Code.

**WARNING**

Inspection, maintenance and repairs must be carried out with care to prevent accidents and the deterioration of vehicle components. If maintenance is incomplete or improperly carried out, operation of the vehicle will be adversely affected and will increase the risk of accident or damage to the bus and equipment. In case of doubt regarding maintenance procedures, request that it be performed by a competent mechanic.

DAILY VEHICLE INSPECTION

In order to extend the life span of the vehicle and to ensure optimal usage, it is recommended to perform the checks listed on the following pages on a daily basis. Inform service personnel of all repairs that you consider necessary.

**NOTE**

The checks referred to under this heading must be performed at least on a daily basis to ensure the safety of the driver and passengers. These checks do not replace the requirements of the regulations governing motor vehicle safety standards. Other checks may be required by the operating company.

**NOTE**

For reasons of security, and to prolong the life span of the vehicle, it is essential to perform all repairs before returning the vehicle to service.

VEHICLE EXTERIOR

1. Ensure that the outside of the bus is clean, pay particular attention to the lights, mirrors and windows.
2. Verify the firm attachment of outside components, such as mirrors and windshield wipers.
3. Check the pressure of the tires. Inspect for damage to the tires and the wheels (no sign of wear or damage, no dents in the rims, no soldering, no mishapen bolt-holes, no rubbing of the wheels on the body). Ensure that all wheel nuts are in place and firmly tight.
4. Verify the condition of the suspension: the vehicle should not sag.
5. Ensure there are no leaks of water, oil, or other fluid by checking the ground under the vehicle.
6. Check that all access doors around the vehicle (engine, radiator, etc.) are closed and locked.
7. Check the condition of the front and rear doors (solidly attached, no broken windows, rubber seals are securely in place and no object interferes with their operation).

EXTERIOR LIGHTING

8. Verify the operation of headlights and running lights.
9. Verify the operation of turn indicators and hazard warning lights.
10. Verify the operation of sidelights and clearance lights.
11. Verify that the brake lights, parking lights and back-up lights function properly.

VEHICLE INTERIOR

- | | |
|---|--------------------------|
| 12. Verify that the warning lights on the control panel light up and that the alarm sounds when the master control switch is in the NORMAL RUN position. | <input type="checkbox"/> |
| 13. Verify that the Diesel Exhaust Fluid (DEF) is above 10%. | <input type="checkbox"/> |
| 14. Verify the operation of the 9 -1 -1 visual warning (optional). | <input type="checkbox"/> |
| 15. Verify the operation of the heater/defroster system in the driver's compartment. Verify the heating/ventilation system in the passengers' compartment. | <input type="checkbox"/> |
| 16. Activate the door lever and verify the operation of the front and rear doors for each position of the lever. Check the effectiveness of the sensitive edges while preventing the opening of the rear door with the tip of the foot. The door must open. | <input type="checkbox"/> |
| 17. Verify the operation of the rear door lever. The doors must open when in the OPEN position. | <input type="checkbox"/> |
| 18. Test the horn to make sure that it works. | <input type="checkbox"/> |
| 19. Check the condition of the windshield wipers and the operation of the windshield wiper system. | <input type="checkbox"/> |
| 20. Make sure a fire extinguisher is installed. Ensure that the extinguisher's pressure is adequate by checking the gauge. | <input type="checkbox"/> |
| 21. Ensure that the emergency exit windows are not open toward the outside. | <input type="checkbox"/> |
| 22. Check that the escape hatches in the roof of the vehicle are securely fixed. | <input type="checkbox"/> |

BRAKE AND AIR PRESSURE VERIFICATION TEST

- | | |
|---|--------------------------|
| 23. Operate the service brake and check its effectiveness. | <input type="checkbox"/> |
| 24. With the engine running, operate the service brake to decrease the air pressure to less than 80 PSI (550 kPa). When the pressure falls below 80 psi (550 kPa), check that the alarm sounds and that the low-pressure tell-tale lights up. Once the pressure rises above 80psi (550kPa) following this test, the alarm should stop and the low pressure tell-tale should extinguish. | <input type="checkbox"/> |
| 25. Check that the air pressure is maintained between 117 and 137 PSI (806 and 945 kpa) when the transmission is in neutral. | <input type="checkbox"/> |
| 26. Release the service brake and verify that the air pressure is maintained at approximately 90 PSI (620 kpa). | <input type="checkbox"/> |

CHECKS AND ADJUSTMENTS BEFORE EACH DEPARTURE

In order to ensure safe driving of the vehicle, it is recommended that the operator performs the following checks and adjustments **BEFORE** each departure.



WARNING

To reduce the risk of personal injury caused by unexpected movement of the vehicle, make sure there is sufficient clearance in front of, and behind the vehicle, before making the following checks. Set the parking brake and firmly apply the service brakes. Do not press the accelerator pedal. Be ready to turn the engine control switch **OFF** if the engine starts.



NOTE

Report all problems to service personnel before driving the vehicle.

BEFORE EACH DEPARTURE

- | | |
|--|--------------------------|
| 1. Adjust the interior mirrors. | <input type="checkbox"/> |
| 2. Adjust the exterior mirrors, in order to just see the sides of the vehicle and to have a good rearward vision. | <input type="checkbox"/> |
| 3. Adjust the operator's seat to ensure a comfortable driving position. Ensure that the seat belt can be attached. Attach the seat belt. | <input type="checkbox"/> |
| 4. Check that the warning lights illuminate when the master control switch is in the RUN position. | <input type="checkbox"/> |
| 5. Verify that the speedometer functions correctly. | <input type="checkbox"/> |
| 6. Start the engine, watch and listen for any sign indicating a problem. | <input type="checkbox"/> |
| 7. Verify the service (foot) brake. Start the engine and try to advance the vehicle with your foot firmly pressing on the brake pedal. | <input type="checkbox"/> |
| 8. Verify the parking brake. Start the engine and try to advance the vehicle with the parking brake firmly applied. | <input type="checkbox"/> |

PERIODIC VERIFICATIONS

All vehicle problems must be brought to the attention of the maintenance personnel as soon as possible concerning the necessity for repair or replacement.



CAUTION

Conscientiously performing these safety checks on a regular basis and promptly correcting any problems will help protect you, your passengers and your vehicle, thus preventing or reducing potential injuries and damage.

Seat belt:

Check webbing, buckle, latch plate, retractor and attaching points for proper operation and for damage.

Windshield wipers and washers:

Check the operation of wipers and the condition and alignment of wiper blades. Check the amount and direction of fluid sprayed by the washer.

Windshield defroster:

Check the performance of the defroster by moving the operator's air direction control (front ventilation control panel) from left to right and noting the amount of air directed against the windshield.

Wheel alignment and balance:

In addition to uneven or abnormal tire wear, the need for wheel alignment servicing may be indicated by a pull to the left or right when driving on a straight and level road. A need for wheel balancing is usually indicated by vibration of the steering wheel or operator's seat at normal highway speeds.

Service brakes:

The driver must be alert to any changes in braking action, such as repeated pulling to one side, unusual sounds when braking or between brake applications, or increased brake pedal travel. Any of these conditions signal the need for brake system inspection and/or maintenance.

Parking brake:

Check parking brake holding ability by parking on a fairly steep grade and restraining the vehicle with the parking brake only.

Lights, buzzers and chime:

Check all instrument lights, tell-tales and buzzers, the chime, all interior lighting, the licence plate light, marker lights, headlights, tail lights, brake lights, directional lights, backup lights, emergency flashers, parking lights and roof-mounted identification lights.

Rear-view mirror and sunshade:

Check that rear-view mirrors and sunshades are properly adjusted.

Doors, windows and escape hatch:

- Check for proper opening, closing and latching.
- Check that the window emergency release handles work and that the windows open, close and latch properly.
- Make sure that all compartment and entry doors are securely closed by trying to reopen them after use.
- Check for missing, broken, or damaged parts that might prevent secure latching.
- Check that escape hatches open easily and close securely.
- Check for broken, scratched, dirty, or damaged window glass that could obscure vision or cause injury.

Fluid leaks:

Check for water, fuel, oil or other fluid leaks by observing the ground under the vehicle after it has been parked for some time.

Exhaust system:

Be alert to any changes in the sound of the exhaust system or the smell of fumes that may signal a leak requiring inspection and/or maintenance.

Steering:

Be alert to any changes in the steering action. A need for inspection or maintenance may be indicated by difficulty in turning the wheel, excessive play or unusual sounds when turning or parking.

Seat adjusters:

Check that seat-adjusters engage securely by pushing forward and backward whenever you adjust your seat.

NOVA BUS Canada certifies that this vehicle complies with the applicable requirements of the industry Canada ICES-002.

** This manual is also available in electronic format (Acrobat).*