NEW FLYER

KING COUNTY DEPARTMENT OF TRANSPORTATION

OPERATOR'S GUIDE

DIESEL/ELECTRIC 60FT. LOW FLOOR TRANSIT BUS

This operator's guide is effective for only those coaches with the following Identification Numbers:

SR1316

Vehicle Identification Number	Unit Number
5FYH7YU039C036316	6001
5FYH7YU059C036317	6002
5FYH7YU079C036318	6003
5FYH7YU099C036319	6004
5FYH7YU059C036320	6005
5FYH7YU079C036321	6006
5FYH7YU099C036322	6007
5FYH7YU009C036323	6008
5FYH7YU029C036324	6009
5FYH7YU049C036325	6010
5FYH7YU069C036326	6011

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SR1316 continued

Vehicle Identification Number	Unit Number
5FYH7YU089C036327	6012
5FYH7YU0X9C036328	6013
5FYH7YU019C036329	6014
5FYH7YU089C036330	6015
5FYH7YU0X9C036331	6016
5FYH7YU019C036332	6017
5FYH7YU039C036333	6018
5FYH7YU059C036334	6019

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The information contained in this manual is updated periodically. While great care is taken in compiling the information contained in this manual, New Flyer Industries Canada ULC cannot assume liability for losses of any nature arising from any errors and/or omissions.
The information and specifications contained throughout this manual are up to date at the time of publication. New Flyer Industries Canada ULC reserves the right to change the content of this manual at anytime without notice.

Printed in Canada

☞ **NOTE:**

The National Highway Traffic Safety Administration (NHTSA) has requested that the following statement be provided for your information.

If the property believes that its vehicle has a defect which could cause a crash or could cause injury or death, inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying New Flyer Industries Canada ULC.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you and New Flyer Industries Canada ULC.

To contact NHTSA either call the Auto Safety Hotline toll-free at 1-888-327-4236 (or 366-0123 in the Washington, DC area) or write to: NHTSA, U.S. Department of Transportation, Washington, DC 20590. Other information about motor vehicle safety can be obtained from the Hotline.

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1. INTRODUCTION

This manual describes the operating features and safety equipment of the New Flyer Transit Vehicle. All personnel involved in the operation of the vehicle should be acquainted with this manual and should familiarize themselves with the vehicle before providing any public service. Knowing the contents of this manual and following its recommendations will help to assure safe and trouble-free operation.

It is not the intention or responsibility of this manual to give instruction in the use of common sense, basic skills and rules of driving; therefore, it is assumed that you, the operator, are fully qualified to operate a public transit vehicle.

This manual and any other supplied should be considered a permanent part of the vehicle and remain with the vehicle at all times. The information and specifications throughout this manual are up to date at time of publication. New Flyer reserves the right to change the content of this manual at any time without notice. Any malfunction which interferes with the safe operation of the vehicle should be reported immediately to the appropriate service personnel.

☞ **NOTE:**
New Flyer urges you the driver to read this publication carefully, as well as the following manual which is readily available from the manufacturer.

- *Cummins* ISL Owner's Manual
- *Allison* Electric Drive Systems Operator's Manual

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Hybrid Operating Principles

This vehicle is powered by the E^P System, a parallel hybrid that blends both mechanical and electrical power paths to drive the vehicle. The system consists of a diesel engine, Drive Unit, Energy Storage System (ESS), Dual Power Inverter Module (DPIM), and electronic controls.

The diesel engine is conventionally mounted and coupled to the drive unit. The drive unit is an arrangement of three planetary gearsets, two clutches, and two motor/generators that work together with an electronic control unit to provide two continuously variable operating ranges.

The vehicle is driven by torque from the diesel engine which is blended with inputs from the electric motors. The motors supply the initial propulsion force required to accelerate the vehicle from a standstill; the diesel engine primarily propels the vehicle at cruising speeds.

The energy storage system consists of roof-mounted storage batteries and the DPIM unit. The AC energy provided by the motor/generators is converted to DC energy by the DPIM unit and stored in the batteries. The DPIM unit also converts the stored DC energy back to AC in order to drive the motor/generators when required.

During vehicle deceleration, the electric motors in the drive unit can be driven by the weight of the vehicle, through the driveline, to create electrical energy. This process, known as “regenerative braking”, also slows the vehicle by imposing a drag on the driveline.

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VEHICLE SPECIFICATIONS

VEHICLE TYPE	
Model	*New Flyer* DE60LFA transit bus
Customer	King County Department of Transportation - SR1316
Build Year	2009
ENGINE & FUEL	
Engine	*Cummins* ISL07
Horsepower	330 HP - 1100 ft-lb.
Fuel	Ultra low sulfur diesel
Usable Fuel Capacity	125 U.S. gallons (473 liters)
HYBRID DRIVE SYSTEM	
Drive Unit	*Allison* E^V Drive™
	Maximum output speed 3300 RPM
	Maximum output torque during propulsion 4000 ft-lb.
	Maximum regenerative torque during braking 2200 ft-lb.
Energy Storage System (ESS)	*Allison* nickel-metal hydride battery pack (roof-mounted)
Dual Power Inverter Module (DPIM)	*Allison* hybrid inverter (roof-mounted)
DIMENSIONS	
Length (over bumpers)	60.7 ft. (18.5 m)
Width	8.5 ft. (2.6 m)
Height	11.0 ft. (3.35 m)
Wheelbase (front to center)	19.0 ft. (5.8 m)
Wheelbase (center to rear)	25.3 ft. (7.7 m)
Wheelbase (front to rear)	44.3 ft. (13.5 m)
Turning Radius	42.5 ft. (12.9 m)
Vehicle Weight (approx.)	49,225 lbs. (22,555 kg)
Gross Vehicle Weight Rating (GVWR)	66,790 lbs. (30,290 km)

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AXLES & SUSPENSION	
Front Axle	*MAN* V8 65L
Front Gross Axle Weight Rating (GAWR)	14,780 lbs. (6,700 kg)
Center Axle	*MAN* HONG-1100
Center Gross Axle Weight Rating (GAWR)	24,250 lbs. (11,000 kg)
Rear Axle	*MAN* HP-1352-B (5.44:1)
Rear Gross Axle Weight Rating (GAWR)	27,760 lbs. (12,590 kg)
Suspension	Air springs & shock absorbers
WHEELS & TIRES	
Tires	*Firestone* 305/70R22.5
Rim Mounting	10 bolt hub piloted
Maximum Load	Single Tires - 7,390 lbs. @ 120psi Dual Tires - 6,940 lbs. @ 120 psi
ARTICULATED JOINT	
Hydraulically Controlled Mechanism	*ATG* Artic-O-Mat Limbo II 350
Maximum Pivot Angle	49°
DESTINATION & ROUTE SIGNS	
Front Destination	*Luminator* electronic
Side Destination	*Luminator* electronic, 1 curbside
Side Route	*Luminator* electronic, 1 curbside & 1 streetside
Rear Route	*Luminator* electronic
LIGHTING	
Interior	*Pretoria* 24V LED
HVAC SYSTEM	
HVAC Unit	1 *Thermo King* R-5E front rooftop heater/evaporator unit
	1 *Thermo King* R5 CHP front rooftop condenser unit
	1 *Thermo King* R5 rear rooftop heater/evaporator unit

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Auxiliary Heaters	1 *Mobile Climate Control* defroster unit
	Thermo 230 auxiliary coolant heater
	2 *Whisper* center heaters
	2 *Mobile Climate Control* rear section floor heaters
	1 *Mobile Climate Control* center exit door floor heater
SEATING	
Driver's	*USSC* Q91
Passenger	USSC
Seating Capacity	48
Wheelchair Stations	2 (seats fold up & lock)
BRAKE SYSTEM	
Mechanical Components	Internal expanded S-cam type
	Automatic slack adjusters
Service Brake	Full air operated
	Meritor Wabco ABS & ATC controlled
Parking Brake	Spring applied, air released
Emergency Brake	Spring brake applied
	Brake treadle modulated to control
WINDOWS	
General	*Stormtite* flush-mount, tip-in, with black anodized frame
	44% grey laminated glass
Emergency Escape	2 streetside & 6 curbside windows
Driver's Window	Front sliding sash only, interior & exterior handle
	75% green tint

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DOORS	
Entrance	*Vapor* medium slide glide
Center & Rear Exit	*Vapor* wide slide glide
	Exit door drive enabled, acoustic sensor controlled
Controls	Front & rear door control push buttons
	Entrance door manual control valve
ACCESSIBILITY FEATURES	
Wheelchair Ramp	New Flyer hydraulically-operated, located at entrance door
Kneeling	Full front suspension
	Curbside center suspension
	Curbside rear suspension
SAFETY FEATURES	
Emergency Escape Exits	2 streetside & 6 curbside windows
	2 roof hatches
Fire Extinguisher	5 lb. ABC rating located on curbside luggage rack
Safety Triangles	Located on curbside luggage rack
Emergency Air Release Control Valve	Entrance & exit doors
Fire Suppression System	*Amerex*
Accelerator & Brake Interlocks	Refer to “Interlock System” in the Safety Information section of this manual for interlock information
Video Surveillance System	*Apollo Video Technology*, RoadRunner 8-channel digital videor recorder with 7 cameras
Sensitive Edges	Exit doors
MULTIPLEXING SYSTEM	
Vansco Multiplex System VMM J1939 Network	VMM 2820 Modules VMM 1210 Modules Pocket Gateway Module

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Vehicle Identification

The New Flyer vehicle identification plate is located in the driver's area of the vehicle interior. The plate lists the Gross Vehicle Weight Ratings (GVWR), the Vehicle Identification Number (VIN) and the Gross Axle Weight Ratings (GAWR) for all axles.

Warnings & Cautions

Two types of headings are used in this guide to attract your attention. These notations will be highlighted with the icons below.

WARNING:

Used when an operating procedure or practice, if not correctly followed, could result in personal injury or loss of life.

CAUTION:

Used when an operating procedure or practice, if not strictly observed, could result in damage to or destruction of equipment.

Contacting New Flyer

If additional information is required, contact the Customer Service Department of:

New Flyer Industries Canada ULC
25 DeBaets Street
Winnipeg, Manitoba
Canada
R2J 4G5
tel: (204) 934-4874
fax: (204) 224-0248

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2. SAFETY INFORMATION

Safety Procedures

Do not drive the vehicle if:

- Indicators, instruments or gauges show that a major vehicle operating system is malfunctioning.
- Exhaust fumes seep into the passenger compartment.
- Beneath the vehicle, puddles of engine oil, hydraulic fluid, or coolant have formed.
- Seating stanchions and grab rails are loose or damaged.
- Driving mirrors are broken, missing or cannot be properly adjusted.
- Any exterior or interior light is broken, discoloured, or malfunctioning.

Report the occurrence of any of the above to maintenance personnel so the vehicle can be serviced before beginning revenue service.

- Do not operate the vehicle without fastening the seat-belt.
- Make sure obstructions do not block or interfere with your safe range of driving and operating vision.
- Have any debris or garbage removed from the passenger area and the doors. This is important to eliminate any foot obstructions that could cause tripping or falling.
- Make sure all exterior and interior access doors and panels are securely shut and latched.
- Do not smoke around the fuel storage areas, the fuel filling area or during refueling. Do not smoke in areas where fuel, hydraulic fluid, drive unit oil or any other flammable fluid has leaked.

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Safety Equipment

A hand-held fire extinguisher is located on the curbside luggage rack. Use the extinguisher only after the vehicle is in a safe location, and all passengers are evacuated. Use only if there is no risk to your personal safety.

Safety triangles are located on the curbside luggage rack. Position these triangles at the front and rear of the vehicle to warn other drivers during emergency situations.

☞ **NOTE:**
Consult your transit authority for specific instances during which these safety triangles should be used.

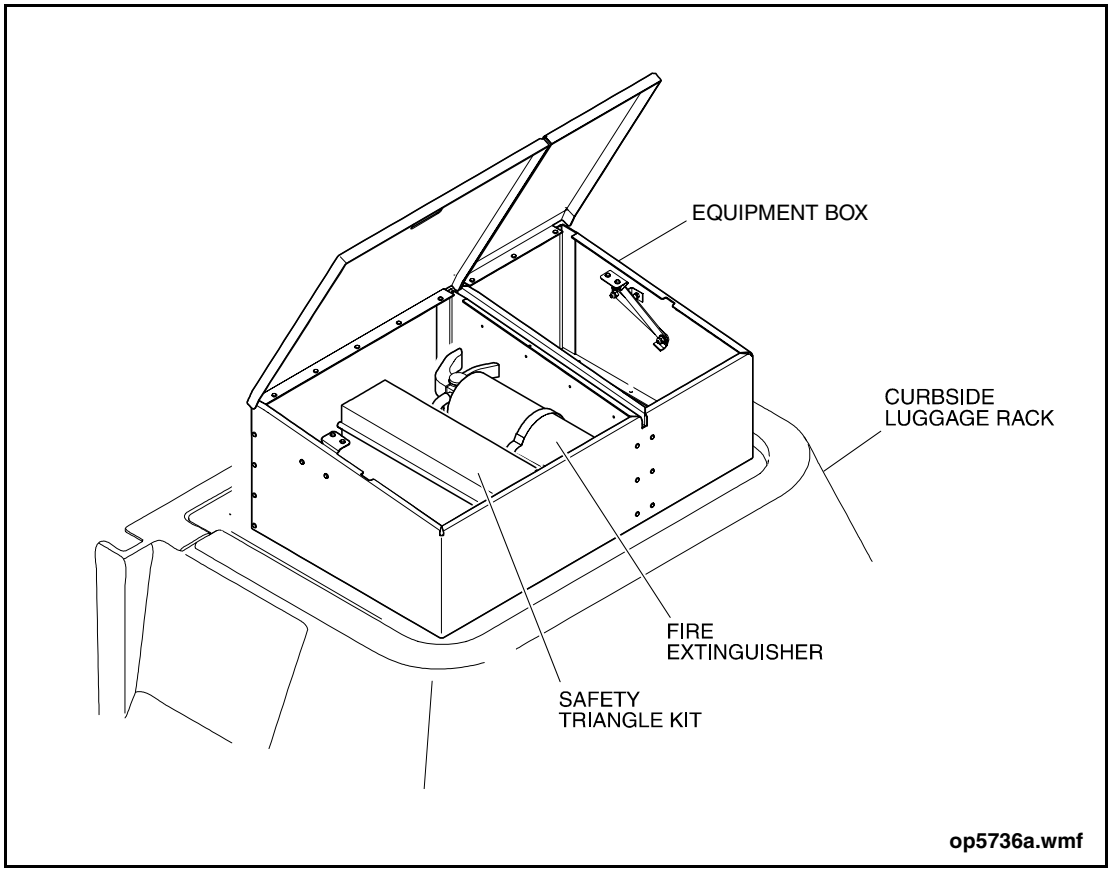

Figure 1: Safety Equipment Box

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Escape Exits

Side Windows

Six streetside and two curbside windows function as emergency exits and are identified by decals on the window panels.

To operate the emergency window, pull the red handle down and hold. Push out on the bottom of the window frame. The window will open on hinges at the top of the frame. To close, release the handle and slam window shut.

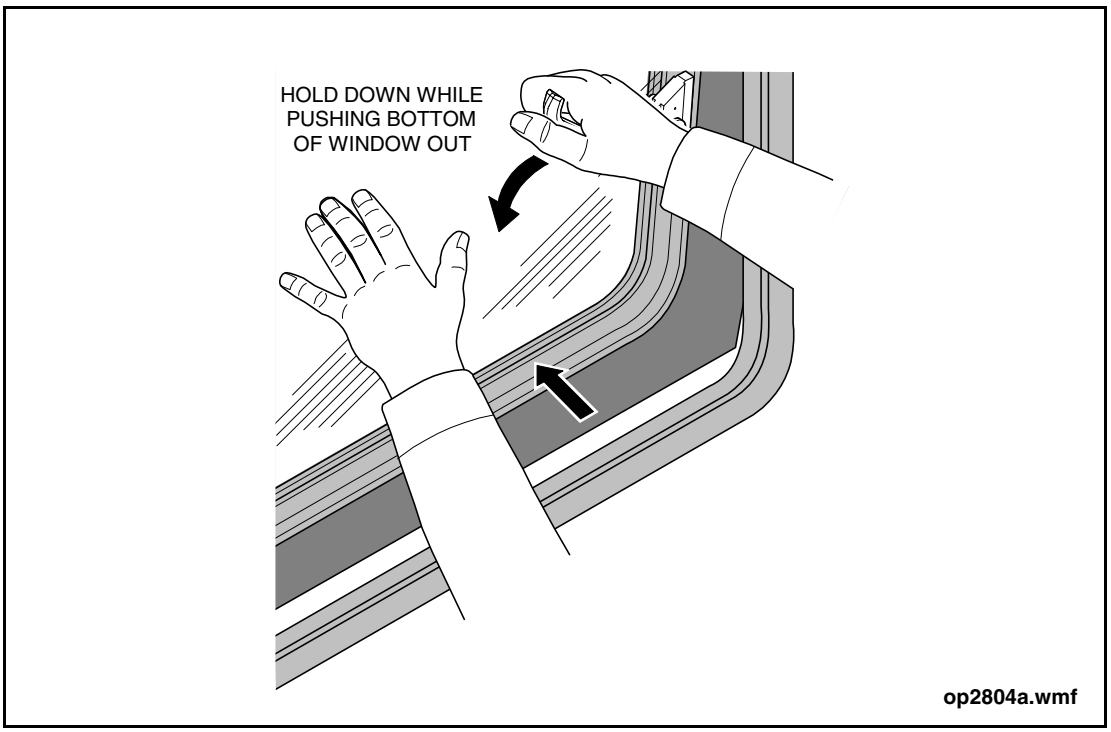

Figure 2: Window Emergency Handle

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Roof Hatches

Two roof hatches are usable for ventilation and/or as emergency exits.

For Ventilation

Open the hatch to the desired position by holding the handles and exerting outward pressure toward the end being opened. To close the vent, grasp the handles and pull the hatch downward.

The most effective hatch positions for ventilation are:

- Front hatch - forward end open.
- Rear hatch - rear end open or fully open.

This allows fresh air to enter the front vehicle hatches while warmed, stale air escapes through the rear vehicle hatch.

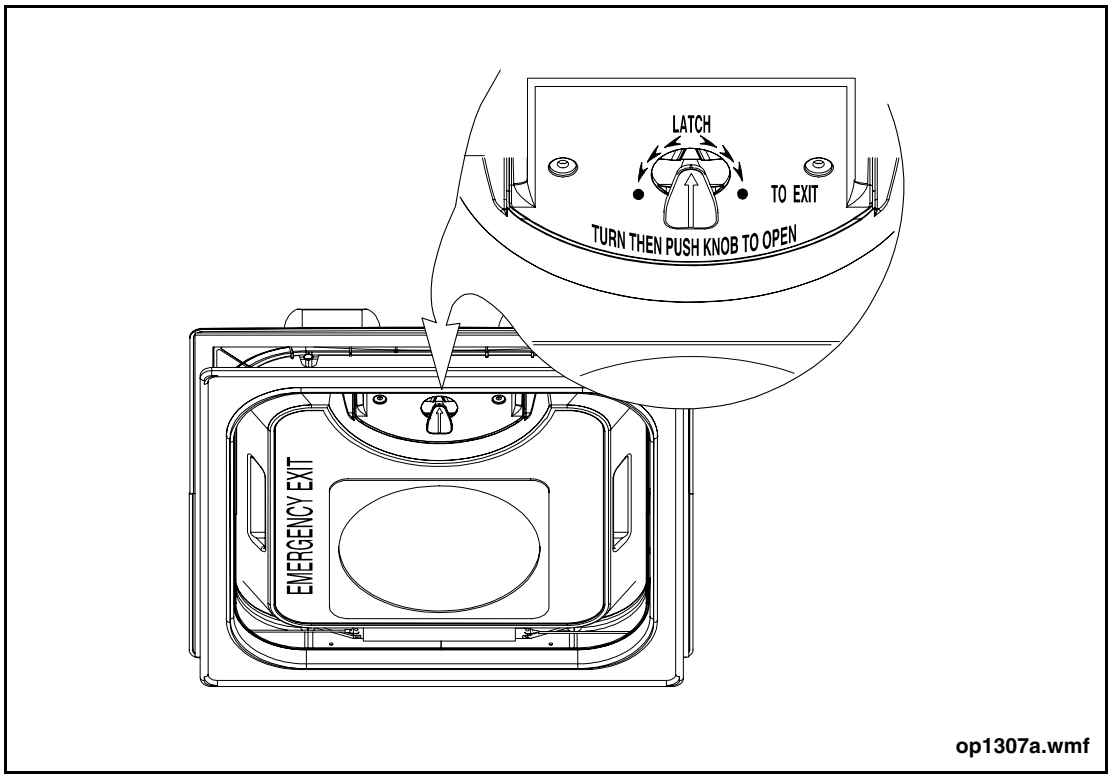

Figure 3: Roof Hatch

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For Emergency Exit

1. Push the hatch up to the full OPEN venting position.
2. Turn the release latch knob 90° left or right to unlock.
3. Push the handle outward so the hatch swings open on the fixed hinge.
4. To close, return the hatch to its full OPEN position. Line up and push the separated hinge halves together.
5. Push up on the hatch to ensure proper engagement. Pull the hatch downwards to close.

Entrance Door, Emergency Release Control Valve

The door emergency exit control valve is located behind a breakable window in the door mechanism access cover. In an emergency, break the window to access the control valve knob. Rotate the knob 90° and push the doors open. As the doors open they activate the header, stepwell and curb lights.

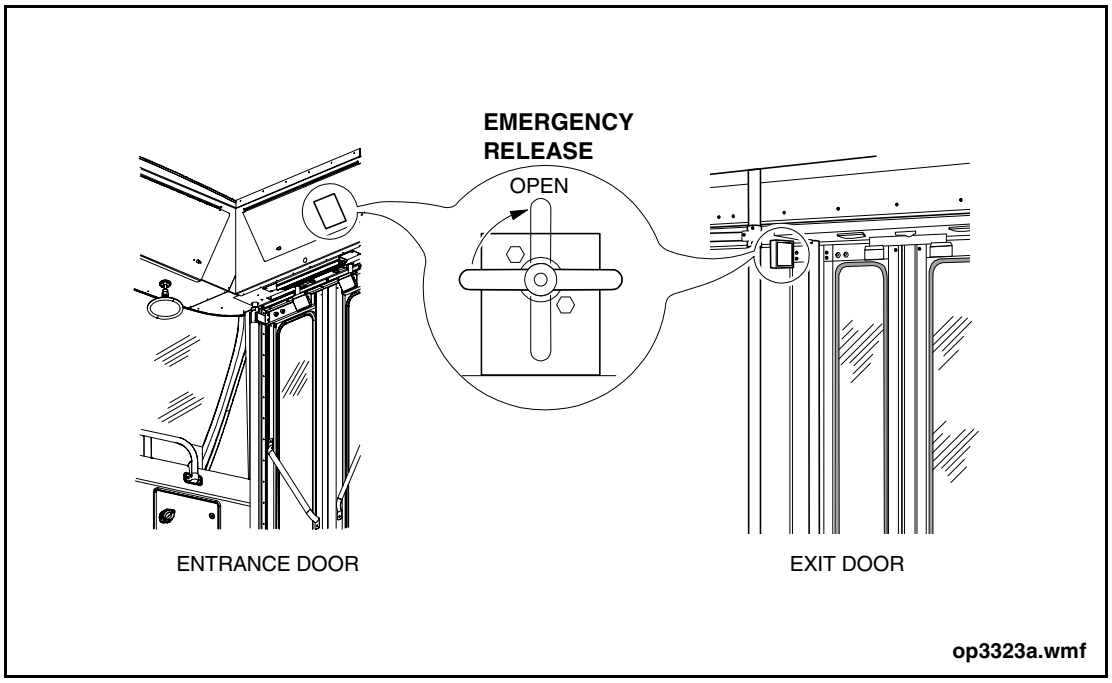

Figure 4: Passenger Door Emergency Release

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Exit Door, Emergency Release Control Valve

The exit door has an emergency exit control valve. It is located to the left of the exit door header, behind a breakable window. In an emergency, break the window to access the control valve knob. Rotate the control valve knob 90° and push the doors open. As the doors open they activate the header, stepwell and curb lights, the interlocks and the Rear Door Open indicator.

Exit Door Sensitive Edges

Mounted to the leading edges of the exit door panels are rubber seals that are sensitive to pressure. If, while closing the doors, they strike an object or passenger, a signal from the sensitive edges sounds an alarm and prompts the doors to fully reopen. Once they fully open the doors will again close.

☞ **NOTE:**
The Interlock System prevents the vehicle from moving until the exit doors are fully closed.

Interlock System

Interlocks disable the accelerator and apply the rear brakes. The interlocks function only when the Master Run switch is in DAY-RUN or NIGHT-RUN position, the Door Master switch is in the ON position, the vehicle speed is below 2 mph, and any of the following conditions occur:

- Exit doors are open or enabled.
- Exit doors emergency valves are activated.
- Vehicle is kneeling.
- Wheelchair ramp is not stowed.
- Maximum joint angle is exceeded while reversing.
- Parking brake is applied.
- Hill holder switch is activated.
- Loss of air pressure at exit doors.

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The Interlock System is intended to protect passengers from an inadvertent vehicle movement and to protect the articulating joint from component damage. Located behind the front destination sign access door are the Door Master and Joint toggle switches. Use these switches to disable the system for maintenance purposes or in an emergency.

☞ **NOTE:**
The brake treadle must be momentarily depressed to release the interlocks.

Fire Suppression System

The vehicle is equipped with a Fire Suppression System. The system protects the passengers and vehicle against fire. If a fire is detected in the engine compartment a dry chemical extinguishing agent is discharged to suppress the fire. A driver's control panel is located on the destination sign closeout panel.

Refer to the Fire Suppression System Section of this manual for a description of these components and the system operation.

☞ **NOTE:**
An alarm sounds and the engine shuts down when the Fire Suppression System is activated.

Video Surveillance System

A video surveillance system records events as they occur on the vehicle. The system consists of a digital video recorder, seven cameras, and two microphones. The video recorder is located in the electronic equipment enclosure. The cameras are located throughout the interior of the vehicle. The DVR power relay is activated when the Master Run switch is set to either the DAY-RUN, NIGHT-RUN or NIGHT-PARK position.

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3. TO ENTER THE VEHICLE

1. Locate the front door open switch compartment on the curbside of the vehicle, near the front wheel.
2. Open the access door and move the switch to open the door.

If the entrance door does not open, exhaust air from the entrance door cylinder as follows:

1. Slide the front portion of the driver's window back to gain access to the door manual control valve.
2. Reach over the side console to the valve handle and turn it to the OPEN position.
3. Open the door manually by pushing on the door panels outside edges.

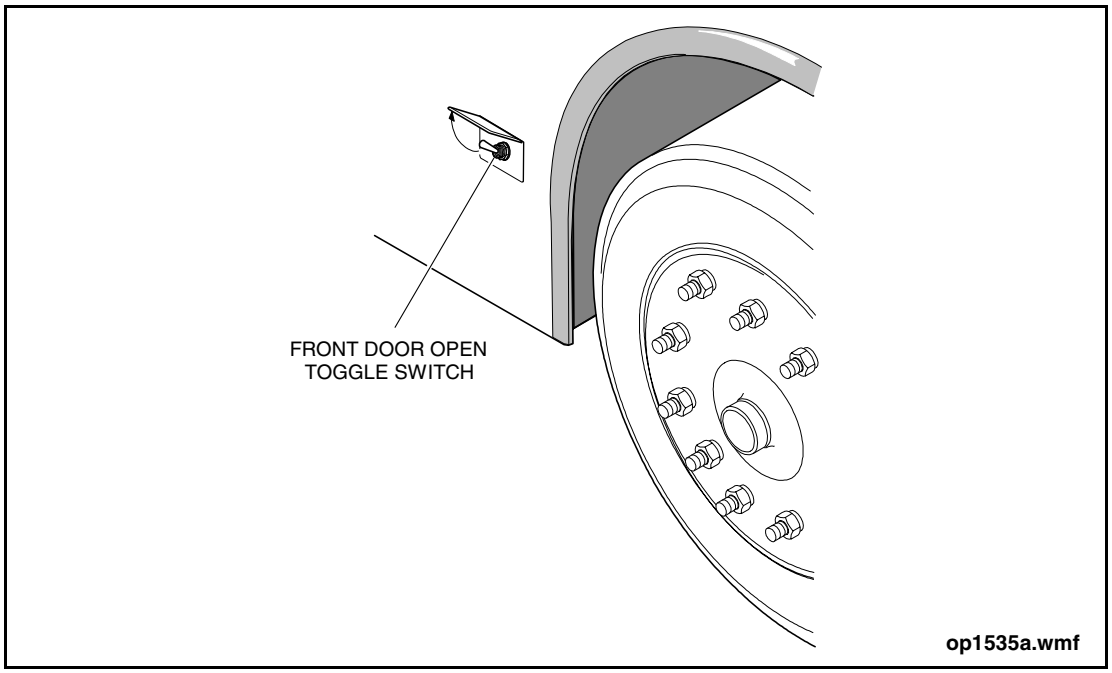

Figure 5: Entering the Vehicle

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4. DRIVER'S CHECK LIST

Check the following before putting the vehicle into transit service. Any problems discovered should be brought to the attention of the service personnel.

Exterior

General

- Battery Disconnect switch is in the ON position.
- Engine Run switch in engine compartment is in the FRONT position.
- Check for any fluid puddles under the vehicle.
- Check all exterior panels for any visible damage.
- Check the air intake grille and the exhaust tailpipe for any blockage.
- Bumpers are securely mounted and no damage is evident.
- Bike rack is securely mounted and functions properly.
- Check artic joint bellows for cuts, tears or other damage

Access Doors

- Visually inspect door panels for any evidence of damage.
- Check that the access doors unlatch and open easily. Ensure gas struts function properly and maintain door in opened position (where applicable).
- Inspect door panel interior rubber bumpers condition or whether missing.
- All access doors must be closed and securely latched (where applicable) prior to operating vehicle.

Windows

- Check that all windows are closed.
- Ensure window glass is clean and no visible evidence of cracks or other damage.
- Inspect condition of window frames and seals for any damage.

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Mirrors

- Inspect condition of mirror housing, glass, and mounting brackets
- Check that mirror head can be easily rotated for adjustment (where applicable).

Lights

- Ensure all lights are clean and not obstructed in any way.
- Check that lights are securely mounted with no missing attaching hardware.
- Inspect lenses for cracks or other damage.

Tires

- Check tire air pressure and ensure it is within the manufacturer's recommended range.
- Inspect tire tread for abnormal wear, cuts, separation, missing tread, or any other visible defects.
- Inspect tire sidewalls for bulges, cuts, gouges, abrasions, or any other visible defects.

Wheels

- Check for any missing or loose wheel nuts.
- Closely inspect condition of wheel studs if any wheel nuts were found to be loose or missing.
- Visually inspect wheel for any evidence of dents, cracks, deformation, or other damage.
- Inspect wheel surface for pitting or excessive corrosion.

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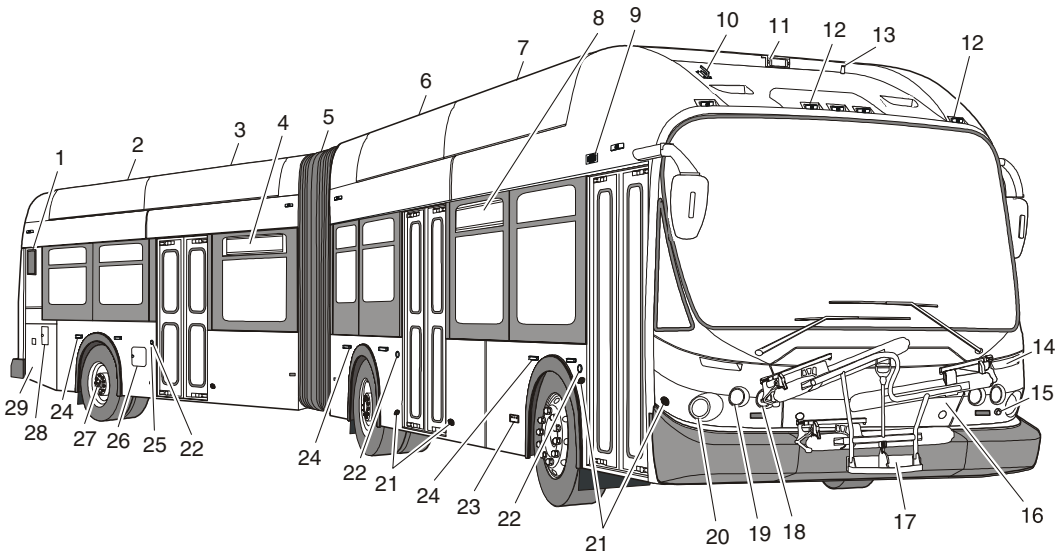

1. Engine Air Intake Grille
2. DPIM & Hydraulic Cooling Unit
3. HVAC Evaporator Unit
4. Side/Rear Route Sign
5. Bellows Assembly
6. Hybrid Battery Pack/Cooler
7. HVAC Evaporator/Condenser Unit
8. Side/Front Destination Sign
9. Exterior Speaker
10. Radio Antenna
11. Traffic Signal Emitter
12. Clearance Marker Lights
13. Antenna Mount
14. Driver's Lower Vent
15. Tow Connector
16. Defroster/Wiper Access Door
17. Bike Rack
18. Headlight, High Beam
19. Headlight, Low Beam
20. Front Turn Light
21. Curb Lights
22. Kneeling/Ramp Warning Light
23. Front Door Open Switch
24. Side Turn Light
25. Kneeling Beeper
26. Fuel Filler Access Door
27. Hubodometer
28. Battery Cutoff Switch Access Door
29. Battery Access Door

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Figure 6: Front Exterior View

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Interior

General

- Ensure farebox is securely mounted and operates properly.
- Check all interior panels for any visible damage.
- Ensure front and side destination signs are securely mounted.
- Roller blinds are securely mounted and function properly.
- Check that roof hatches open in all ventilation positions and close properly.
- Ensure that roof hatches function properly in the emergency release position.
- Visually inspect condition of passenger signal system and verify operation.
- Ensure door controller moves freely through all operating positions and doors open/close accordingly.
- Door Master switch is in the ON position.
- Check that all driver's seat adjustments function properly and maintain position.
- Inspect condition of driver's seat-belt and ensure that it functions properly.
- Inspect condition of wheelchair restraint system and ensure that all mechanisms function properly.
- Check steering wheel operation with engine running. Steering should operate smoothly without binding or erratic movement.
- Check steering wheel tilt/telescope lever functions properly.
- Ensure that the wheelchair ramp functions properly and that the alarm sounds when stowing or deploying the wheelchair ramp.

Fire Suppression System

- Ensure the safety pin on the Manual Actuator switch is securely installed.
- Ensure all indicators on the fire suppression control panel illuminate after pressing the Push to Test button.

Access Doors

- Visually inspect interior door panels for any evidence of damage.
- Check that the access doors unlatch and open easily. Ensure gas struts function properly and maintain door in opened position (where applicable).
- Check for any missing or damaged rubber bumpers on the inside of the door panel.
- All access doors must be closed and securely latched (where applicable) prior to operating vehicle.

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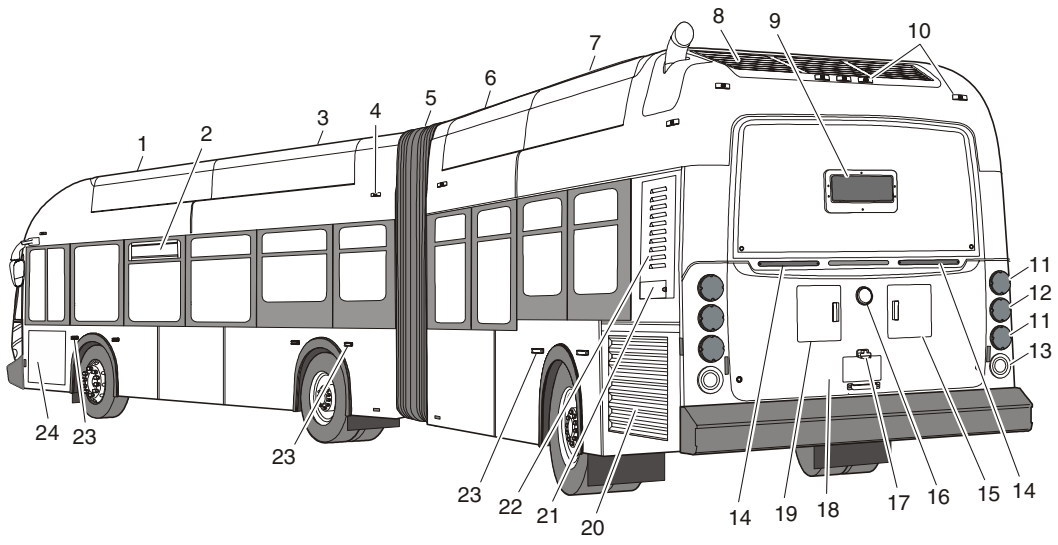

1. HVAC Evaporator/Condenser Unit
2. Side/Front Route Sign
3. Hybrid Battery Pack/Cooler
4. Side Marker Light
5. Bellows Assembly
6. HVAC Evaporator Unit
7. DPIM & Hydraulic Cooling Unit
8. HVAC Condenser Grille
9. Rear Destination Sign
10. Rear Clearance Marker Light
11. Stop/Tail Light
12. Turn Signal Light
13. Backup Light
14. Center Stop Light
15. Drive Unit Dipstick Access Door
16. Strobe Light
17. License Plate Light
18. Engine Access Door
19. Engine Dipstick Access Door
20. Radiator Access Door
21. Surge Tank Access Door
22. Muffler Access Door
23. Side Turn Light
24. Side Console Access Door

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Figure 7: Rear Exterior View

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Seats

- Ensure seats are clean and there is no evidence of cuts, tears, or other damage.
- Ensure seats are securely mounted to seat rail and floor (where applicable).

Floor

- Check overall condition of flooring for cleanliness.
- Inspect flooring for any evidence of excessive wear, cuts, or other damage.
- Inspect edges of flooring and nosing for evidence of lifting or separation.
- Ensure the wheelchair ramp is fully stowed flush with the flooring surface and does not provide a tripping hazard.

Windows

- Check that windows are clean and undamaged.
- Check operation of emergency release mechanism on all windows so equipped. Ensure windows release from the frame and open fully outward for emergency egress.
- Check operation of all windows equipped with slider or tilt openings. Windows should slide or tilt easily and not be loose in the frame.

Mirrors

- Check condition of mirror glass for cracks or other damage.
- Ensure mirrors are securely mounted and maintain their adjusted position.
- Ensure mirrors offer a clear view and are not obstructed.

Passenger Doors

- Check that doors open/close properly.
- Check door panels for dents, deformation or other damage.
- Inspect door panel glass for cleanliness and ensure glass is not cracked or otherwise damaged.
- Inspect door edges and seals for condition and proper sealing.

Modesty Panels/Barriers

- Inspect condition of panels for sharp edges, cracks, or any other damage.
- Ensure panels are securely mounted to stanchions and vehicle structure.

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Stanchions & Grab Rails

- Inspect for bent or cracked tubing, rails, or any other damage.
- Ensure that all stanchions and grab rails are securely mounted.
- Inspect for any sharp edges.
- Inspect for any missing attaching hardware.
- Inspect condition and secure mounting of grab straps (where applicable).

Lights

- Ensure all lights are clean and not obstructed in any way.
- Check that lights are securely mounted with no missing attaching hardware.
- Inspect lenses for cracks or other damage.

Indicator Lights

☞ **NOTE:**
From this point on, items on the driver's check list require activating the vehicle's Multiplexing System and starting the engine. Turning the Master Run switch on the side console to DAY-RUN or NIGHT-RUN activates the Multiplexing System. Wait for the system to activate before starting the engine. Refer to the Vehicle Operation Section of this manual for details on engine starting.

- The Stop Request indicator illuminates when the passenger signal system is activated.
- The W/C Stop Request indicator illuminates when the wheelchair passenger signal system is activated.
- The Parking Brake indicator illuminates when the parking brake is applied.
- The Stop indicator illuminates when the brakes are applied.
- The Turn indicator illuminates and flashes when the turn signal switch is activated or the Hazard switch is turned on.
- The Rear Door Open indicator illuminates when the exit door is open.
- The High Beam indicator illuminates when the high beam headlights are on.
- The Kneel indicator illuminates when the kneeling system is activated.
- The No Gen and Stop Engine indicators illuminate momentarily, then extinguish.
- The remaining indicators relate to vehicle operation concerns and should be checked by service personnel.

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Electrical Control Systems

- The Master Run switch controls the electrical circuits. Refer to the Instrumentation & Controls Section of this manual for more information.
- Service compartment light switches activate service lights in the rear electrical panel, the engine compartment and the engine compartment fuse box.
- Hazard lights function with the Master Run switch in any position.
- Horn sounds when horn button on steering wheel pressed.
- Rear brake lights illuminate when the brake pedal is applied.
- Destination/route sign circuits function with the Master Run switch in DAY-RUN, NIGHT-RUN or NIGHT-PARK positions.
- All side console control switches function.
- Passenger signal and chime circuits function.
- Accelerator treadle accelerates the engine.
- Drive Unit Selector switch functions.
- Backup lights illuminate when the drive unit is switched to reverse.
- HVAC System functions when the engine is running.
- Speedometer functions when the vehicle is moving.
- Windshield washers spray washer fluid onto windshield.
- Wipers operate (on wet windshield) without streaks, scraping or noisy operation.

Air Control Systems

- Normal vehicle operation pressure ranges from 105 to 125 psi (724 to 862 kPa).
- Low Air indicator illuminates and an alarm sounds if the air system pressure drops below 75 psi (517 kPa).
- Entrance and exit doors open and close smoothly.
- Brake treadle application slows and stops the vehicle smoothly.
- Parking brake valve application holds the vehicle stationary when level or on a 20% maximum incline grade when on dry concrete.
- Door manual control valve, located below the side console, shuts off the air supply to the entrance door mechanism. When in the OFF position, the doors can be pushed open.
- Splash guards clear the ground (vehicle on level surface) with the air system pressure at or above 105 psi (724 kPa).
- Compressor cuts in when the air system pressure drops to approximately 105 psi (724 kPa) and shuts off at approximately 120 to 125 psi (827 to 862 kPa).

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5. DRIVER'S AREA

The driver's area includes the first eight feet of interior space measured from the front windshield.

This section describes the controls and components within the driver's area. A brief outline of the functions and operating procedures of each accompanies the description.

Driver's Window

Front Portion

Pull the sash handle back to open the front portion of the window. Push the handle forward to close.

Mirrors

There are seven mirrors located throughout the vehicle interior: an aisle mirror, an upper right mirror, a front stepwell mirror, an overhead convex mirror, two rear step area mirrors and a bike rack mirror.

Aisle Mirror

This rectangular mirror located above the windshield is used for viewing the vehicle's interior.

Upper Right Mirror

Located to the right of the aisle mirror, the upper right mirror is used to view the rear step area mirror.

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Stepwell Mirror

The stepwell mirror is mounted on the ceiling above the entrance door and provides a view of the entrance area.

Overhead Convex Mirror

This mirror is located on the entrance door access panel. Adjust this mirror to provide a view of the entrance and the curb outside. This will provide the operator with a view to check for any obstructions when kneeling a vehicle or when closing the door.

Exit Door Area Mirrors

There are two exit door area mirrors; one is located at the center exit door and the other is located at the rear exit door. The mirror provides a view of the exit door area.

Bike Rack Mirror

This mirror is located to the left of the aisle mirror. Adjust this mirror to provide a view of the bike rack.

Roller Blinds

There are two roller blinds in the driver's area; one for the front windshield and the other for the driver's window. The blinds can be extended or retracted by either pushing or pulling on their handles.

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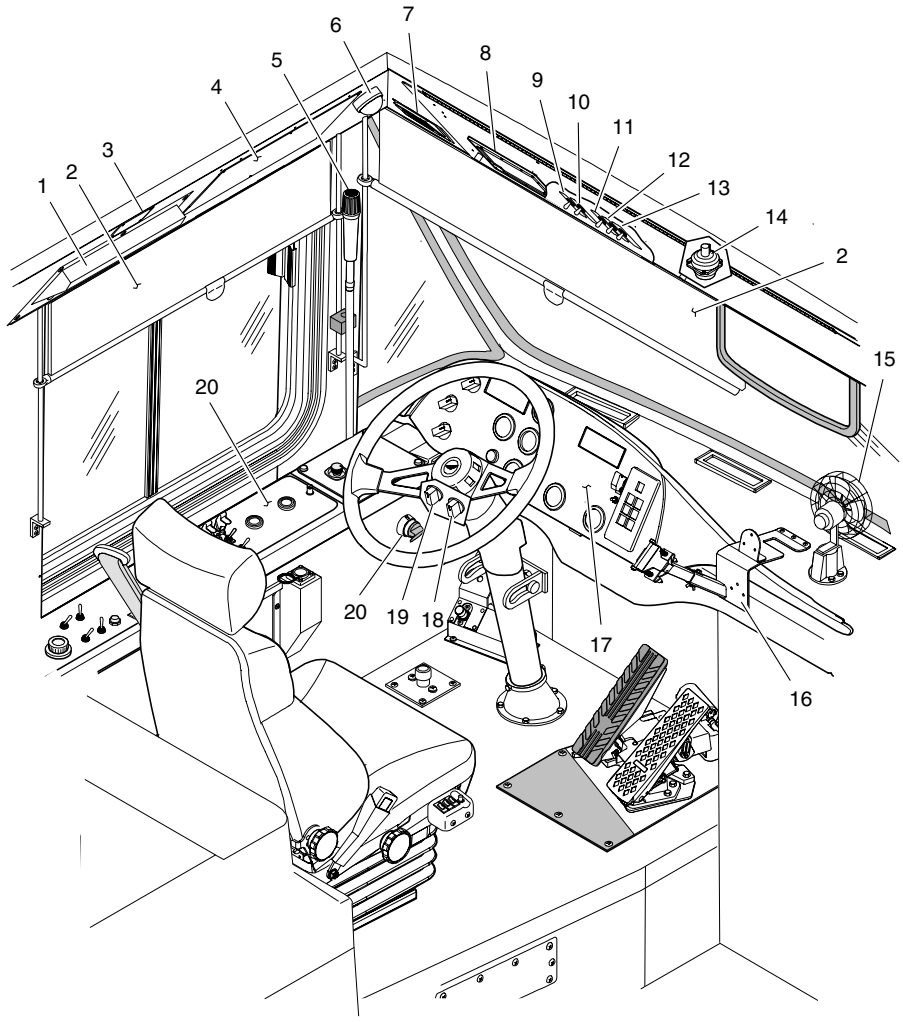

1. Driver's Booster Fan
2. Roller Blind
3. HVAC Control Panel
4. Driver's Locker
5. Gooseneck Microphone
6. Surveillance Camera
7. Fire Suppression Monitor Panel
8. Destination Sign Controller
9. Door Master Switch
10. Joint Override Switch
11. ABS Blink Code Switch
12. Auxiliary Heater Switch
13. Exhaust Filter Switch
14. Farebox Light
15. Dash Fan
16. Transfer Cutter
17. Instrument Panel
18. Foot Heat Control
19. Driver's Vent Control
20. Door Manual Control Valve

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Figure 8: Driver's Area

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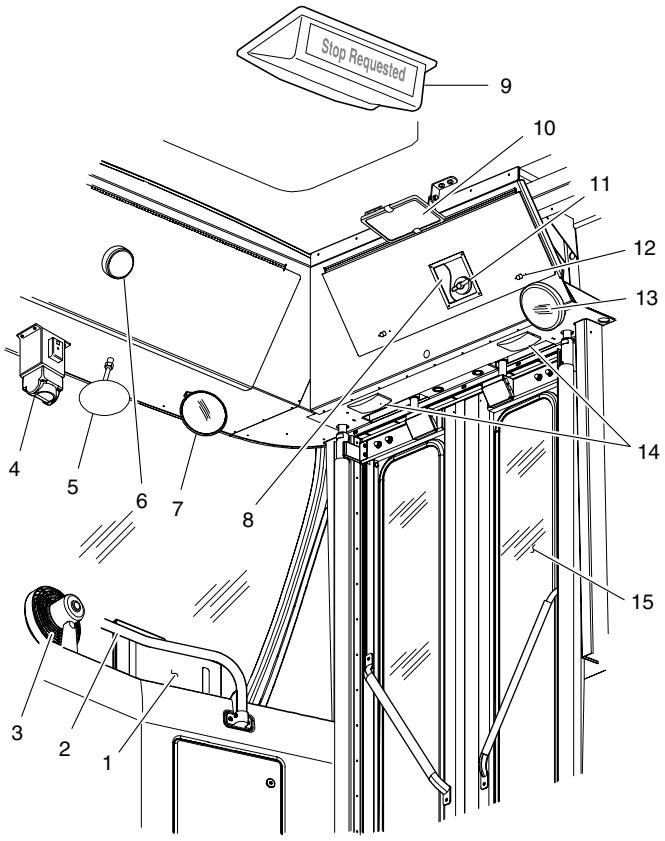
Radio Box

The radio box, mounted on the streetside wheelhousing, contains the vehicle's communications equipment. A lockable latch can prevent unauthorized access and keep the contents secure.

Driver's Locker

Located above the driver's window, the driver's locker is for storing personal belongings.



1. Route Card Holder
2. Farebox Stanchion
3. Dash Fan
4. Surveillance Camera (forward facing)
5. Bike Rack Mirror
6. Surveillance Camera (with microphone)
7. Upper Right Mirror
8. Breakable Cover
9. Stop Request Sign
10. Overhead Convex Mirror
11. Door Emergency Air Release Valve
12. Access Door Latch
13. Stepwell Mirror
14. Doorway Header Lights
15. Entrance Door

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Figure 9: Front Entrance View

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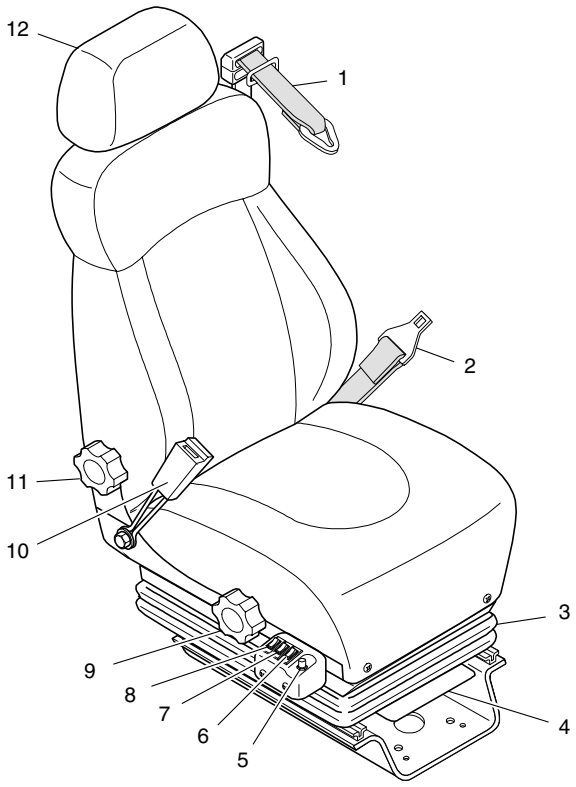
Driver's Seat

The USSC Q91 driver's seat is an adjustable air suspension seat consisting of a steel frame base and back panel and molded foam cushions. The seat-belt retracts to holders beside the seat cushion.

Eight controls adjust the positioning of the seat, seat cushions, and shoulder belt loop guide to suit the needs of the individual. Make position adjustments to provide for the best driving visibility and control.



1. Shoulder Belt
2. Lap Belt
3. Bellows
4. Fore/Aft Locking Device
5. Fore/Aft Adjustment Button
6. Bottom Lumbar Adjustment
7. Middle Lumbar Adjustment
8. Top Lumbar Adjustment
9. Seat Tilt Control
10. Seat-Belt Clip
11. Backrest Adjustment
12. Adjustable Headrest

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Figure 10: Driver's Seat

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Lumbar Adjustment

Three rocker switches on the right side of the seat adjust the top, middle and bottom lumbar. The rocker switches admit or release air pressure to three air bags in the seat back. When making adjustments, momentarily hold the switches in position to allow time for air movement.

Height Adjustment

The knob on the front left corner of the seat adjusts the height. Turn the knob counter-clockwise to raise the seat and clockwise to lower it. Pull the knob out to dump air pressure and reset to the previous adjustment by pushing the knob in.

Tilt Adjustment

Adjust the seat's fore and aft tilt with the large control knobs on the side of the seat. Turn the knob clockwise to tilt forward and counter-clockwise to tilt rearward.

Fore & Aft Track Adjustment

The fore and aft track adjustment has nine position settings. Push the button located in front of the lumbar adjustment switches to unlock and slide the seat to the desired position. Release the button and move slightly fore or aft to set lock. Raising the slide handle below the bellows at the front of the seat will release the slides and allow the seat to move forward or backward.

Back Recline Adjustment

Adjust the backrest to the desired recline position by turning the control knobs located at the bottom of the backrest.

Suspension Lockout/Limiter Control

Located on the left rear of the seat is a three-position lever to control seat suspension movement. The outward position allows full seat suspension movement; the middle position limits the suspension and the inward position locks the suspension.

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Steering Wheel & Horn

Steering Wheel

WARNING:

DO NOT make adjustments to the tilt steering while the vehicle is in motion.

CAUTION:

DO NOT turn the steering wheel if the engine is not operating except in emergency situations.

CAUTION:

DO NOT OPERATE THE VEHICLE if any of the following conditions exist:

- **Binding or resistance in the steering wheel operation (with the vehicle in motion).**
- **Unusual noises related to steering.**
- **Steering wheel vibration.**
- **Looseness, binding or resistance in the tilt/telescopic mechanism.**

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A hydraulic powered steering system turns the front wheels when moving the steering wheel left or right (the engine must be operating to power the system). The tilt/telescopic steering column offers a range of positions for the steering wheel. A lever on the left of the column controls both tilt and telescopic functions. Push to telescope and pull to tilt.

A lever at the steering column to instrument panel attachment point allows additional tilt adjustment of the steering column. To adjust, operate the lever to loosen the pinch bolt and move the steering column to the desired position. Lock column in position with adjusting lever.

Horn

The horn button, located in the center of the steering wheel, operates the dual horn.

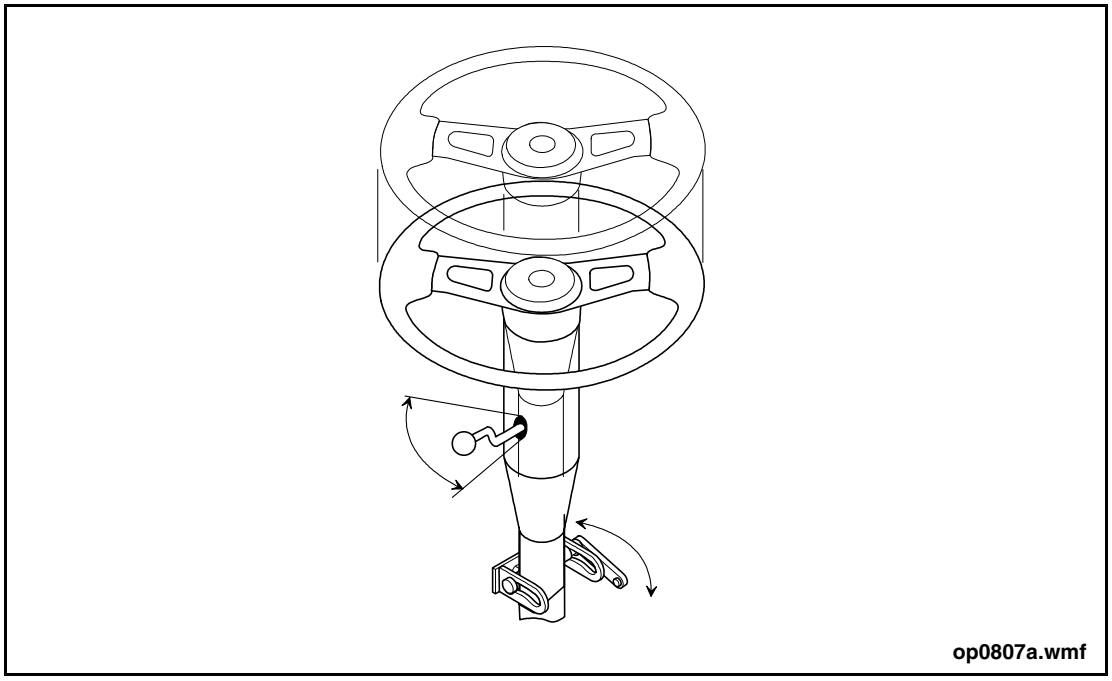

Figure 11: Steering Wheel Adjustment

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Public Address System

The Public Address System (P.A.) allows the communication of messages to the public both inside and outside the vehicle. Components of the system include:

- A gooseneck microphone located on the left front window pillar.
- Eight interior speakers located above the side windows.
- An exterior speaker located above the entrance door.
- A driver's speaker located above the driver.
- A Speaker Select toggle switch on the side console.

☞ **NOTE:**
Consult your Transit Authority for information on operation of this system.

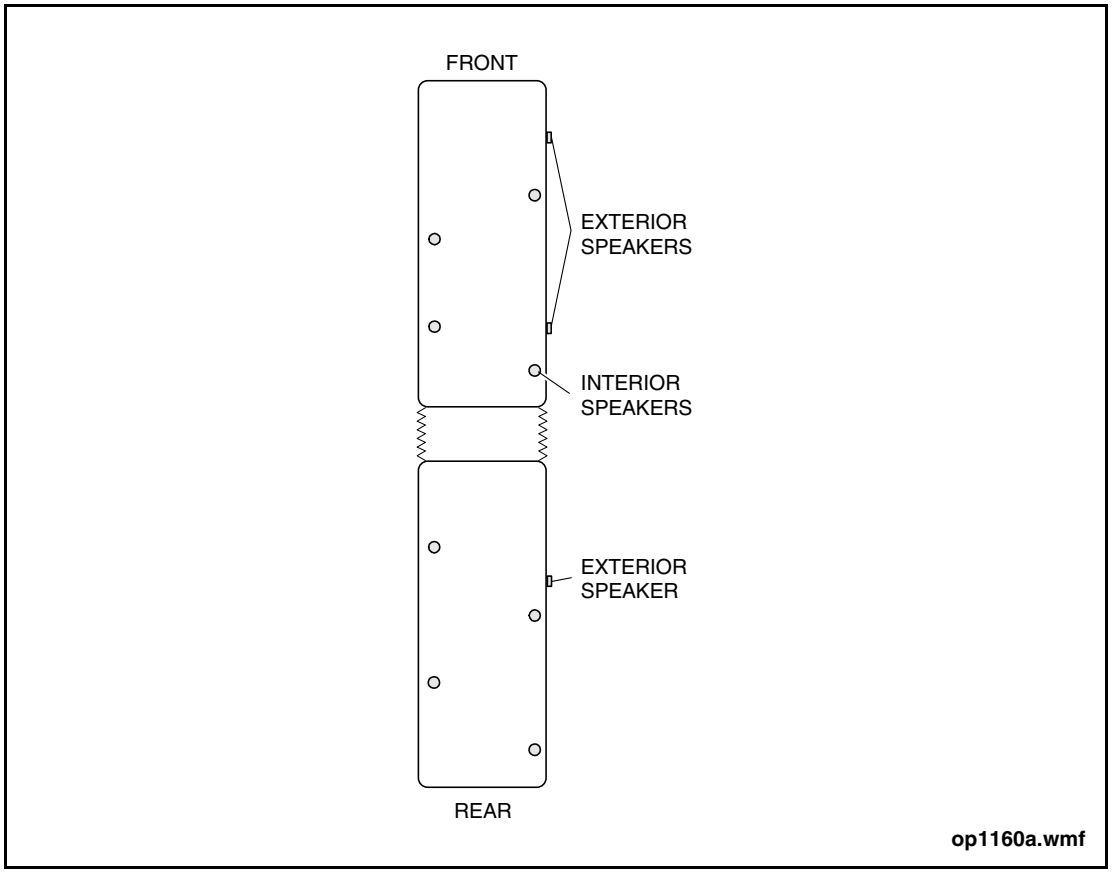

Figure 12: P.A. System Layout

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Destination/Route Signs

☞ **NOTE:**
The following information provides basic introductory information on ODK and Luminator Destination Sign System operation. Your transit authority management establishes policies about system operation and should be consulted before its use. Manuals are available from Luminator which provide more information about the Operator's Display Keyboard and the Luminator Destination Sign System.

System Description

The vehicle's destination/route signs are controlled by an Operator's Display Keyboard (ODK) located in the panel of the front destination sign access door. The ODK functions to control and verify the destination/route sign message display.

Destination sign message codes are entered into the system data processor using the keypad switches on the front panel of the ODK. The codes translate into message writing data preprogrammed into the system's memory. The message writing data then controls the signs to display the selected information.

The system data processor begins sending and updating message writing data for the ODK to display when the system is powered-up. Turning the Master Run switch from STOP-ENGINE to DAY-RUN or NIGHT-RUN will power-up the system. Boot and application code versions momentarily display when power is applied to the ODK, followed by a brief system initialization message. The last message entered before power shutdown then displays on the ODK.

Powering-down occurs when the Master Run switch is turned to STOP-ENGINE. Upon powering-down, front and side destination signs will blank immediately or after a preset delay.

Operating the ODK

Basic operation of the Sign System involves presetting transit authority message codes into the sign system using the ODK. The message codes correlate to preprogrammed destination names, public relations messages, and route numbers unique to each transit authority. If required, multiple sets of message codes may be entered to allow for a quick and complete sign change while in route. Key function and code entry instructions are described in the two sections that follow.

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ODK Keypad Switches

The ODK contains 28 keypad switches. Certain keypad switches, or groups, may not function if they are not needed for coded entry procedures. Switches that are not enabled either have no effect when pressed, or indicate that particular function is not available. Keypad switch functions are as follows:

- P/R - press to enable public relations message code entry.
- ROUTE - press to enable route number entry. Route number entry may be either coded or be the actual route number for display.
- DEST A, DEST B - press the appropriate key (A or B) to enable destination message code entry and/or message display change.
- 0-9 Group - key switches are for sequential entering of message codes. These keys function only after a destination (DEST A, DEST B) or enabled public relations (P/R) switch is pressed.
- A-F Group - key switches are for sequential entering of message codes that contain letters and numbers. Normally these keys will only enable if they are part of an existing message code.
- ENTER - press to activate the selected message during code entry and during operation.
- MENU - press to access advanced programming options. Consult your transit authority before use.
- SELECT - press to select additional characters G-Z when entering message code(s).
- MESSAGE TEXT - key switch is not currently in use.

☞ **NOTE:**
Code entry sequences must be followed to set-up destination sign messages. A "beep" sounds and a visual read-out appears on the ODK display when pressing any enabled keypad switch.

Code Entry

When powering-up the sign system it will display the messages entered previously. If continuing on the same route, re-entering new codes may not be required.

To enter a new set of message codes:

1. Consult the transit authority code list for the code that corresponds to your route.
2. Press the switch DEST A, DEST B, P/R, or ROUTE for the message code you are about to enter.

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3. For each code press the corresponding switches in the 0 though 9 and/or A through F groupings one at a time and in proper sequence.

☞ **NOTE:**
If the message code contains letter(s) G-Z, press the SELECT key for access.

4. Press the ENTER key switch and allow the ODK to display the actual message.
5. Repeat steps 1 to 4 for each code required for the route.

To change from one preset message to another for a turn-around or while in route press the appropriate DEST A or DEST B switch.

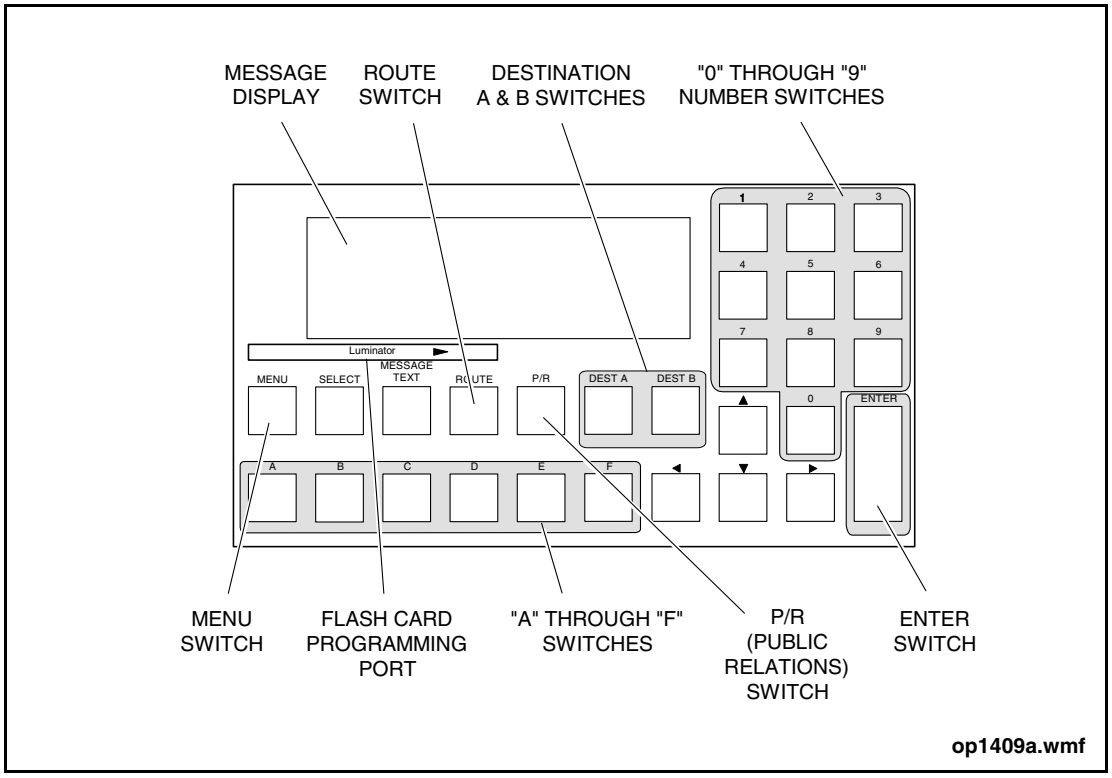

Figure 13: Operator's Display Keyboard (ODK)

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6. EXIT DOOR AREA

The center & rear exit door areas include the following components:

- A slide glide style door that is air-opened and air-closed
- An acoustic sensor door operating system
- An exit door emergency release valve
- A green LED exit door enabled light
- Stop Request buttons on stanchion

Placing the door controller in positions #3, #4, or #5, will enable the exit door which will be indicated by the illumination of the green overhead light. The disembarking passenger is required to place their arm beneath the accoustic sensor to interrupt the sensor beam, which will cause the door to open. The door header lights will illuminate as soon as the exit door is enabled and will remain illuminated for five seconds after the door closes.

In the event of an emergency situation with an inoperable door, the emergency release valve located in the upper left corner can be operated to release air pressure from holding the door closed. Refer to the "Safety Information" section of this manual for emergency release valve operating instructions.

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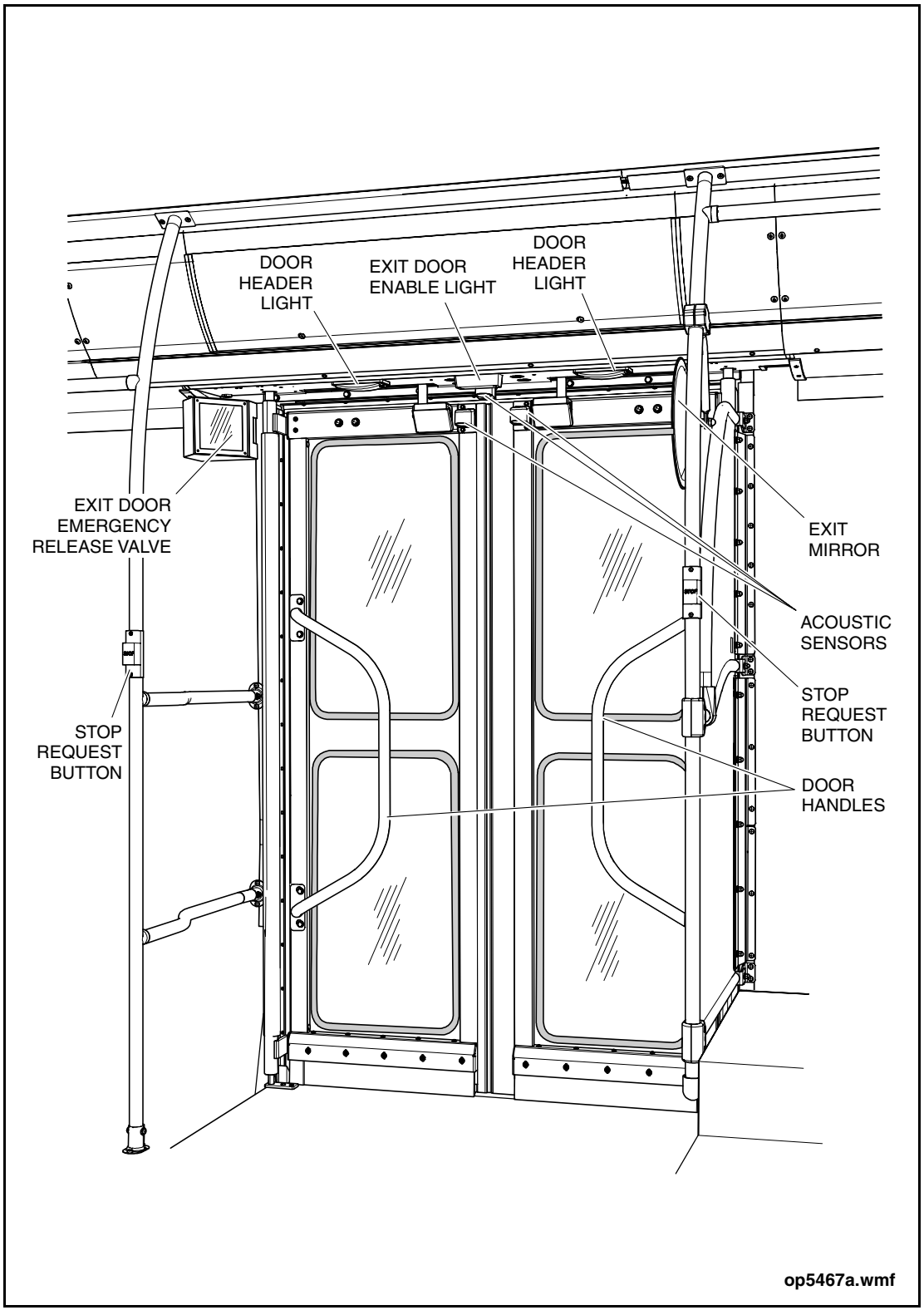

Figure 14: Exit Door Area

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7. INSTRUMENTATION & CONTROLS

Instrument Panel

Turn Indicators (Green)

WARNING:

If turn signal indicators do not operate as described, DO NOT OPERATE THE VEHICLE.

The turn indicators, symbolized by directional arrows, flash on either side of the instrument panel when the right-hand or left-hand floor-mounted turn signal switch is pressed.

When the Hazard switch is activated, both turn indicators flash together. Failure of these lights to flash normally indicates that the flasher module is not functioning.

No Gen Indicator (Red)

CAUTION:

If the no gen indicator remains illuminated while the engine is operating, DO NOT OPERATE THE VEHICLE.

The no gen indicator, symbolized by a battery, illuminates when the alternator is not charging. The no gen indicator illuminates when the Master Run switch is in the DAY-RUN or NIGHT-RUN position and the engine is not operating. The no gen indicator turns off once the engine is operating.

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Low Oil Indicator (Red)

CAUTION:

If the low oil alarm continues and the indicator remains illuminated, DO NOT OPERATE THE VEHICLE.

The Low Oil indicator illuminates if the engine oil pressure is too low for proper engine lubrication. The Low Oil indicator is accompanied by a warning buzzer.

Before starting the engine, positioning the Master Run switch to DAY-RUN or NIGHT-RUN illuminates the Low Oil indicator and sounds its alarm. This occurs momentarily and is a normal electrical system test.

☞ **NOTE:**
If this indicator remains illuminated, the Engine Protection System engages to initiate an automatic engine shutdown sequence.

Low Coolant Indicator (Amber)

The Low Coolant indicator illuminates if too little coolant is in the engine to maintain normal engine operating temperature.

☞ **NOTE:**
The surge tank of this vehicle is equipped with two coolant level sensors. If the coolant level drops sufficiently to activate the second, or lower, sensor, the Engine Protection System engages to initiate an automatic engine shutdown sequence.

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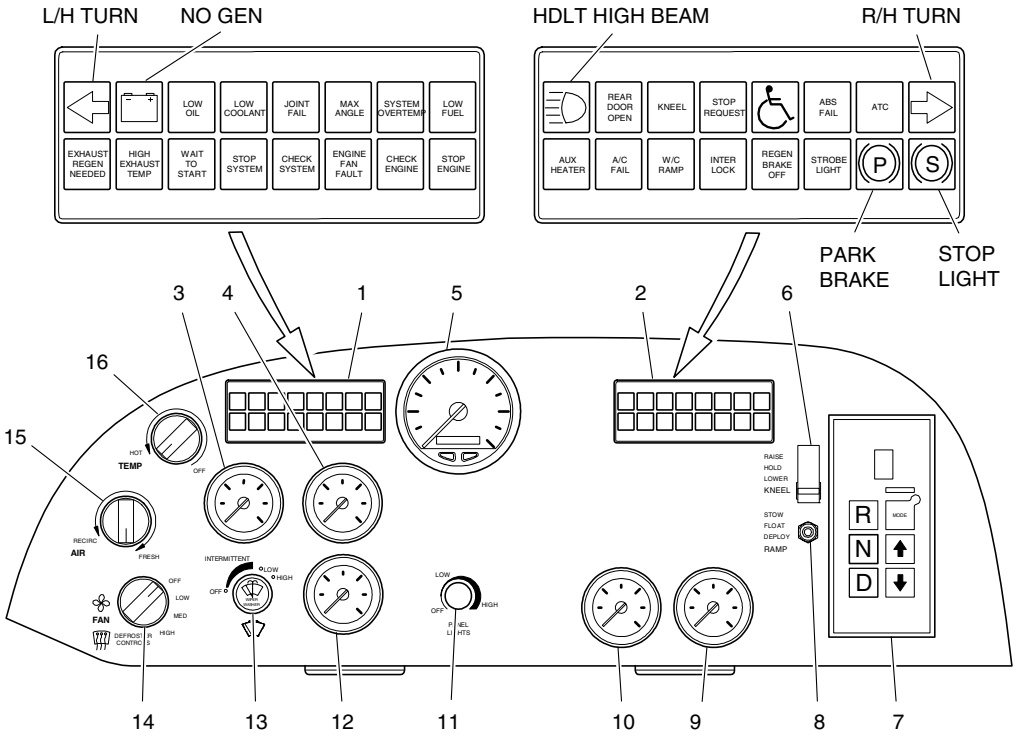

1. Left Indicator Strip
2. Right Indicator Strip
3. Front Air Pressure Gauge
4. Center Air Pressure Gauge
5. Speedometer With Odometer
6. Kneel Switch
7. Drive Unit Shift Selector
8. Ramp Switch
9. Fuel Gauge
10. Auxiliary Air Gauge
11. Panel Lights Dimmer Switch
12. Rear Air Pressure Gauge
13. Wiper/Washer Control
14. Defroster Fan Control
15. Defroster Air Recirculation Control
16. Defroster Temperature Control

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Figure 15: Instrument Panel

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Joint Fail Indicator (Red)

The Joint Fail indicator illuminates and flashes if the articulating joint electronic controller detects a system fault.

Max Angle Indicator (Red)

The Maximum Angle indicator illuminates if the articulation joint reaches its maximum left or right turning angle during forward or reverse operation. An alarm accompanies indicator activation.

☞ **NOTE:**
In reverse the interlocks apply to stop the vehicle if motion continues beyond the maximum angle. Driving forward will release the interlocks.

System Overtemp Indicator (Red)

The System Overtemp Indicator illuminates if the oil in the Drive System or Dual Power Inverter Module (DPIM) exceeds the maximum rated operating temperature. Immediately move the vehicle to a safe area and shut down the system.

Low Fuel Indicator (Amber)

The Low Fuel indicator illuminates when the level of diesel fuel in the tanks has reached the minimum level for reliable vehicle operation.

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Exhaust Regen Needed Indicator (Amber)

This indicator will either illuminate steady or flash and may illuminate in combination with the Check Engine indicator to indicate the various stages of soot buildup in the muffler particulate filter. Refer to the following chart for a description of various conditions and actions required when this indicator illuminates.

EXHAUST REGEN NEEDED INDICATOR FUNCTION

DPF SOOT LEVEL	EXHAUST REGEN NEEDED INDICATOR	CHECK ENGINE INDICATOR	STOP ENGINE INDICATOR	ENGINE DERATE	PROCEDURE
1 (Low to Medium)	On	Off	Off	None	Increase vehicle duty cycle to allow mobile active regeneration, or perform stationary regeneration
2 (Medium to High)	Flashing	Off	Off	None	Increase vehicle duty cycle to allow mobile active regeneration, or perform stationary regeneration
3 (High)	Flashing	On	Off	Derate (Note 1)	Notify service personnel. Perform stationary regeneration (Note 3)
4 (Severe)	Off	Off	On	Severe Derate (Note 2)	Stop engine at earliest opportunity & notify service personnel (Note 4)

Note 1: Moderate derate of engine torque.
Note 2: Servere derate or engine speed.
Note 3: Mobile active regeneration will be disabled during the stationary regeneration process.
Note 4: Stationary regeneration will be disabled.

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High Exhaust Temp Indicator (Amber)

WARNING:

If the High Exhaust Temp indicator on the instrument panel illuminates, ensure the exhaust outlet is not located where it could cause damage to persons or any materials which could melt or explode, and that nothing is within 2 feet of the outlet. Ensure no combustible materials are within 5 feet of the outlet. Exhaust outlet temperatures can reach 1500°F (800°C) when this indicator illuminates.

The High Exhaust Temp indicator illuminates when the muffler thermocouple detects a temperature higher than normal operating conditions. Notify service personnel when this occurs.

Wait to Start Indicator (Amber)

The Wait to Start indicator illuminates before engine start-up with the Master Run switch in the DAY-RUN or NIGHT-RUN position. The indicator will remain illuminated for up to 30 seconds while the intake air heater system operates.

☞ **NOTE:**
The intake air heater system will only operate when the sum of the coolant and air inlet temperature is less than 77°F (25°C).

Stop System Indicator (Red)

The Stop System Indicator illuminates if a major fault or unsafe operating condition is detected in the Electric Drive System, immediately move the vehicle to a safe area and shut down the system.

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Check System Indicator (Amber)

CAUTION:

If the Check System indicator illuminates for more than 30 seconds, remove the vehicle from traffic to a safe location, shut the engine down and apply the parking brake.

The Check System indicator illuminates if a non-critical fault is detected in the Electric Drive System.

Engine Fan Fault (Amber)

The Engine Fan Fault indicator illuminates if a low hydraulic fluid level is detected or fan speed is high with cold engine temperature. The indicator flashes if a fault is detected in the temperature sending unit in the hydraulic cooling system. Notify maintenance personnel if this indicator illuminates.

Check Engine Indicator (Amber)

CAUTION:

If the Check Engine indicator remains illuminated after engine start-up, advise service personnel. Avoid extended periods of operation with this indicator illuminated

The Check Engine indicator illuminates if the engine requires service. The indicator is controlled by the engine's ECM, which monitors engine sensor output. The indicator will illuminate if sensor output signals fall outside of a predetermined range.

Stop Engine Indicator (Red)

The Stop Engine indicator illuminates if an engine operating condition occurs that will result in damage to the engine. The indicator is controlled by the engine's ECM. When the indicator illuminates a buzzer will sound and the system will initiate an engine shutdown sequence.

As an operation check, the Stop Engine indicator should remain illuminated momentarily when the engine is started.

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☞ **NOTE:**
If this indicator remains illuminated, the engine will continue running for 30 seconds. Use this interval to drive out of traffic to a safe area.

High Beam Indicator (Blue)

The high beam indicator, symbolized by a headlight, illuminates when the vehicle headlights are in the high beam mode of operation. Pressing the dimmer switch returns the headlights to normal low beam operation.

Rear Door Open Indicator (Red)

The Rear Door Open indicator illuminates when the Rear Door Control switch is activated and the exit door opens.

Kneel Indicator (Amber)

The Kneel indicator illuminates when the suspension is in the kneeling mode and is lowering the vehicle to the curb.

Stop Request Indicator (Red)

The Stop Request indicator illuminates when the passenger signal system has been activated.

W/C Stop Request Indicator (Amber)

The Wheelchair Stop Request indicator illuminates when the wheelchair passenger signal system has been activated.

ABS Fail Indicator (Amber)

The ABS Fail indicator illuminates if the ABS System requires service. The indicator illuminates momentarily at engine start-up as part of a system check. It also displays blink codes during system diagnostics. Refer to the Vehicle Operation Section of this manual for more information.

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ATC Indicator (Amber)

The ATC indicator illuminates when the Automatic Traction Control System is operating to limit drive wheel spin on slippery surfaces.

Aux Heater Indicator (Amber)

The Auxiliary Heater indicator illuminates when the engine coolant heater functions. It starts automatically in cold conditions to heat the engine coolant to operating temperature.

☞ **NOTE:**
The engine coolant heater operates only when the Master Run switch is in either the DAY-RUN or NIGHT-RUN position.

A/C Fail Indicator (Red)

The A/C Fail indicator illuminates if the HVAC unit malfunctions.

W/C Ramp Indicator (Red)

The Wheelchair Ramp indicator illuminates to indicate operation of the wheelchair ramp.

Interlock Indicator (Red)

The Interlock indicator illuminates when the interlocks apply. This is a safety system that disengages the accelerator and applies the rear brakes during operation of the exit doors, the kneeling system or the wheelchair ramp.

Regen Brake Off Indicator (Red)

The Regen Brake Off indicator illuminates to indicate that the regen braking switch on the side console is in the OFF position and that power is disconnected from the auxiliary braking system.

Strobe Light Indicator

The Strobe Light indicator illuminates when the strobe light switch on the side console is in the ON position.

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Parking Brake Indicator (Red)

The parking brake indicator, symbolized by a circled letter P, illuminates when the parking brake control valve is applied. Activating the parking brake illuminates the stop lights indicator and all red stop lamps.

Stop Lights Indicator (Red)

WARNING:

If the stop lights indicator does not operate as described, DO NOT OPERATE THE VEHICLE.

The stop lights indicator, symbolized by a circled letter S, illuminates each time the service brake or parking brake control valve is applied. If under these circumstances the indicator does not illuminate, then any or all rear stop lights are malfunctioning.

Air Pressure Gauges

Individual analog air pressure gauges are used to monitor the vehicle's front, center, and rear air brake systems. An LED indicator at the bottom of the gauge illuminates and a warning buzzer sounds if air pressure drops below 75 psi (517 kPa). If air pressure exceeds the normal operating range, the LED indicator will flash. Normal operating pressure range is 105 to 125 psi (724 to 862 kPa).

Speedometer/Odometer

This gauge indicates the vehicle's forward speed and displays the distance travelled.

The digital display can be used as a standard odometer or as a trip odometer with trip-1 and trip-2 functions. It can also be set to display operating hours. The mode and set buttons below the display are used to select the desired function.

The speedometer will initialize as soon as the Master Run switch is set to the DAY-RUN or NIGHT-RUN position. During this self-test process all gauges will sweep to zero points, the speedometer display panel will display all alphanumeric segments, and all indicators on the left-hand and right-hand indicator strip will illuminate momentarily.

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Kneel Switch

CAUTION:

When placed in the RAISE position the Kneel toggle switch will latch and continue to raise the vehicle until full ride height is reached at which point the raising action will automatically stop. In order to interrupt the raising operation during its cycle, the toggle switch must be set to the HOLD position.

This three-position momentary switch is used to operate the vehicle's kneeling system. The kneeling system lowers the front and curbside rear of the vehicle approximately 3 to 4 inches by exhausting air from both front suspension and the curbside center and rear air springs. Boarding the vehicle becomes easier, particularly for small children and the handicapped.

LOWER

This position lowers the vehicle, activating the interlocks, the audible alarm and the exterior warning lights. The instrument panel Kneel indicator also illuminates.

☞ **NOTE:**
The Kneel toggle switch is a momentary spring loaded switch that will operate in the LOWER position only as long as pressure on the switch is maintained.

RAISE

This position raises the vehicle automatically to its full ride height. Once the vehicle has reached normal ride height, the interlocks will release (with doors closed), the alarm will silence and the exterior warning light and Kneel indicator will both extinguish.

☞ **NOTE:**
Closing the switch guard locks the switch in the RAISE position.

HOLD

During the kneeling cycle, this position stops kneeling operations, silences the alarms and extinguishes the exterior warning lights. The Kneel indicator and the interlocks remain activated.

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Drive Unit Shift Selector

CAUTION:

Be sure to bring the vehicle to a full stop before shifting from drive [D] to reverse [R] or vice versa.

The Drive Unit shift selector is located on the right hand side of the instrument panel. The shift selector module has five push-button switches and a red LED display. Three switches control the reverse [R], neutral [N] and drive [D] selections. The other switches are MODE, UP arrow and DOWN arrow. Their functions are as follows:

- The UP and DOWN arrows initiate the drive unit diagnostics system when pressed simultaneously. Press them once for diagnostics and twice for oil level readings.

☞ **NOTE:**
A back-up alarm activates when reverse [R] is selected.

Ramp Switch

CAUTION:

The Ramp toggle switch is a momentary type. If pressure is removed, the switch returns to the center FLOAT position and operation ceases.

This is a three-position switch that controls the wheelchair ramp.

DEPLOY

This position activates the ramp from the closed position to the open position.

FLOAT

This position shuts off power to the pump, allowing the ramp to free-fall to either the open or the closed position. Upon cycle completion this becomes an off position.

STOW

This position is used to move the ramp from the open to the closed position.

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Refer to the Wheelchair System Section of this manual for operating procedures.

☞ **NOTE:**
Notify service personnel if the gauge consistently registers pressure levels outside of the normal range.

Water Temperature Gauge

The water temperature gauge indicates engine coolant temperature. The hot engine indicators in the gauge and on the instrument panel indicator will illuminate if the engine overheats. An alarm will sound and the engine protection system will initiate an automatic shutdown sequence

Auxiliary Air Gauge

The auxiliary air gauge indicates air pressure of the front accessories tank.

Panel Lights Dimmer Switch

The Panel Lights Dimmer switch controls the brightness of the instrument and the side console panel lighting. Rotating the dimmer knob clockwise increases the brightness and counter-clockwise decreases the brightness of the panel lights.

Wiper/Washer Control

The wiper control switch operates the left-hand and right-hand wiper motors. The intermittent position allows turning of the control knob to vary the delay of the wiper sweep in times of light rain. In the low or high position the wipers operate at fixed speeds. Pushing down on the knob operates the windshield washer pump to spray fluid onto the windshield.

☞ **NOTE:**
The windshield washer bottle filler is located near the streetside headlight.

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Driver’s Climate Controls

Defroster Fan Control

The defroster Fan knob on the instrument panel controls the speed of the driver's heater/defroster fan. Turning the knob from the extreme left (OFF position) to the right provides infinitely variable fan speeds settings.

Defroster Air Recirculation Control

The Air knob on the instrument panel controls the amount of fresh air circulated through the driver’s heater/defroster system. This knob can be set to recirculate all or a portion of air entering the heater compartment and admit a corresponding amount of fresh air.

Defroster Temperature Control

The Temp knob on the instrument panel controls the temperature of the air blowing from the defroster. Turn the knob from left to right to decrease temperature and from right to left to increase temperature.

Driver’s Vent

Located at the left front of the vehicle, the vent allows outside air in during forward motion. It is a hand operated vent that is controlled by a knob located forward and left of the steering column. To open the vent, rotate the knob clockwise and rotate counter-clockwise to close.

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Driver's Foot Heat

This control knob is located below the instrument panel and left of the steering column. It regulates air from the defroster to the foot control area. Rotate the knob to adjust the air flow to the foot area.

☞ **NOTE:**
Use the Temperature control knob on the instrument panel to set the foot heat air temperature.

Driver's Booster Fan

Located above the side window, the driver's booster fan draws air from the vehicle's streetside air duct. A knob on the assembly provides variable fan speed control and a movable flap directs the air flow.

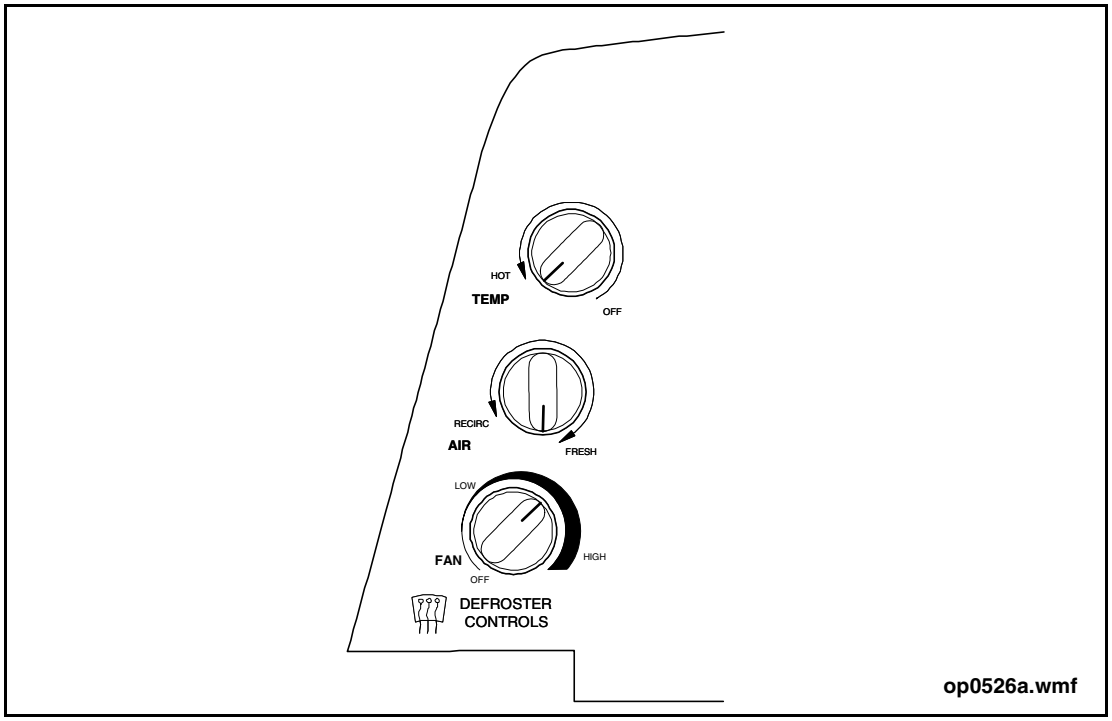

Figure 16: Driver's Area Climate Controls

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Side Console Switch Panel

Fan Speed Switch

The Fan Speed toggle switch controls the main heater blower fan speed. Position switch to either HIGH or LOW for desired speed.

Dash Fan Switches

The RH and LH Dash Fan toggle switches control the dash fans. To run a fan, reposition a switch from OFF to either HIGH or LOW for a desired speed.

Driver's Light Control Knob

The Driver's Light knob controls the light above the driver's area. Turning the knob from the extreme right [OFF] to high [H] illuminates the light. Setting the knob to a position between high [H] and low [L] adjusts the light's brightness.

Hill Holder Switch

The Hill Holder switch is a momentary toggle switch that operates the vehicle's brakes. Positioning and holding the switch to ON applies the brakes. Release the switch when the drive unit torque can move the vehicle in the desired direction. Use the switch to prevent unexpected motion when starting on a hill.

Four-Way Hazard Lights Switch

The Hazard Lights toggle switch has an ON and OFF position. When the switch is ON, the instrument panel turn indicators and the exterior turn signal lights flash.

When the switch is OFF, the exterior signal lights function only as turn signals. The exterior signal lights and instrument panel turn indicators flash when the left or right turn signal foot-switch is pushed and held.

Activate the four-way hazard lights when the transit vehicle is stopped or parked in an area and may block traffic or present a possible hazard to following or approaching vehicles. Also use the four-way hazard lights when the vehicle is being towed.

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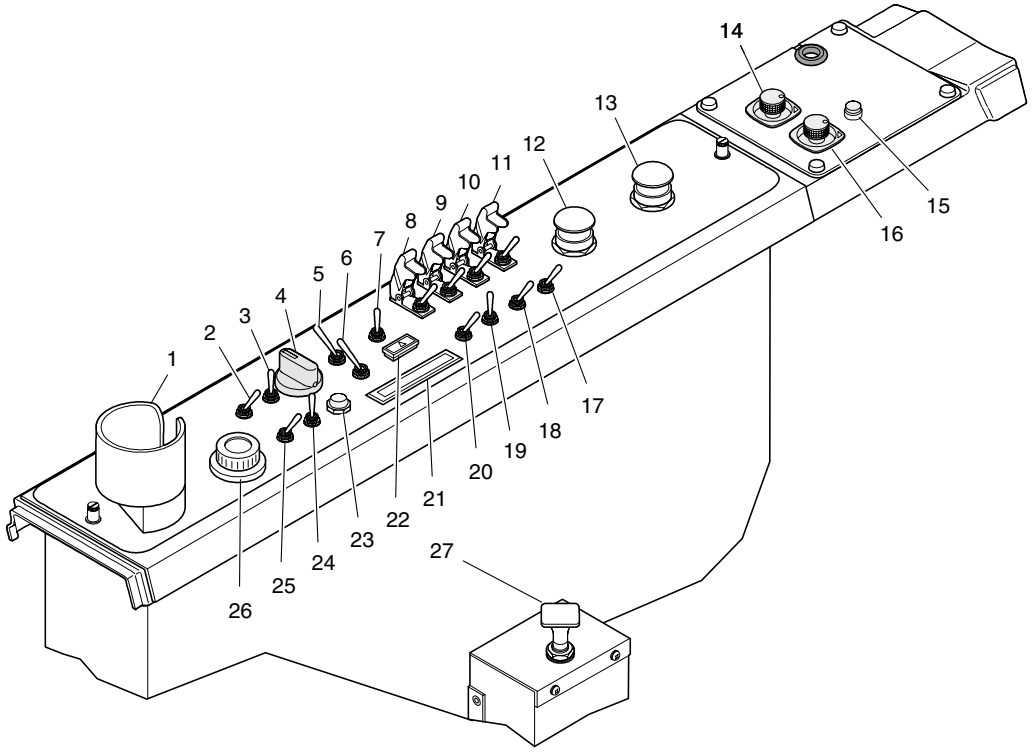

1. Cup Holder
2. Fan Control Switch
3. LH Dash Fan Switch
4. Driver's Light Knob
5. Hill Holder Switch
6. Four-Way Hazard Lights Switch
7. Pedal Adjustment Switch
8. Strobe Light Switch
9. Regen Brake Switch
10. Idle Speed Switch
11. Stop Engine Override Switch
12. Rear Door Control Switch
13. Front Door Control Switch
14. LH Remote Mirror Controller
15. Mirror Heater Button
16. RH Remote Mirror Controller
17. Stop Request Switch
18. Speaker Select Switch
19. Aisle Lights Switch
20. Farebox Light
21. Recessed Handle
22. Hazard Lights Switch Indicator
23. Start Push Button
24. RH Dash Fan Switch
25. Climate Control Switch
26. Master Run Switch
27. Parking Brake Control Valve

op04186a.wmf

Figure 17: Side Console Panel

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Pedal Adjustment Switch

The Pedal Adjustment switch controls the position of the brake and accelerator pedals. The FWD position moves the pedal assembly forward, the RWD position moves the assembly back and the HOLD position will maintain the desired adjustment.

☞ **NOTE:**
The Pedal Adjustment switch is not functional unless the parking brake is applied.

Strobe Light Switch

The Strobe Light switch is a guarded toggle switch. Lifting the guard and setting the switch to the ON position activates the strobe light mounted on the rear panel of the vehicle.

☞ **NOTE:**
Consult your local transit authority for policy on operating the strobe light.

Regen Braking Switch

The Regen Braking toggle switch is a guarded switch located on the side console and controls power to the auxiliary braking system. Lifting the guard and positioning the switch to ON enables the system. The OFF position disables the system and illuminates the Regen Brake OFF indicator on the instrument panel.

☞ **NOTE:**
Consult your transit authority for specific operating conditions during which the Regen switch should be used.

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Idle Speed Switch

CAUTION:

Excessive engine idling is not recommended by the engine manufacturer. Operate engine at fast idle speed if idling for periods longer than 10 minutes. Consult your local transit authority for operating policy.

The Idle Speed toggle switch activates the preset fast idle to increase the engine RPM to maintain optimum engine operating temperature during periods of extended idling. Activating the fast idle following a cold engine start also allows quicker engine warm-up.

☞ **NOTE:**
The FAST position on the Idle Speed switch only operates if the engine is running, the drive unit shift selector is in the neutral [N] position and the parking brake is applied.

Stop Engine Override Switch

WARNING:

Apply the Stop Engine Override switch only for emergencies, such as moving the vehicle from traffic to a safe stopping area. The override interval is 30 seconds.

The Stop Engine Override toggle switch is used to override the engine shutdown system in an emergency. Refer to the Vehicle Operation Section of this manual for more information

Rear Door Control

The exit door control is a push switch that controls the exit door. Push the switch once to open the door. Push the switch a second time to close the door.

Front Door Control

The entrance door control is a push switch that controls the entrance door. Push the switch once to open the door. Push the switch a second time to close the door.

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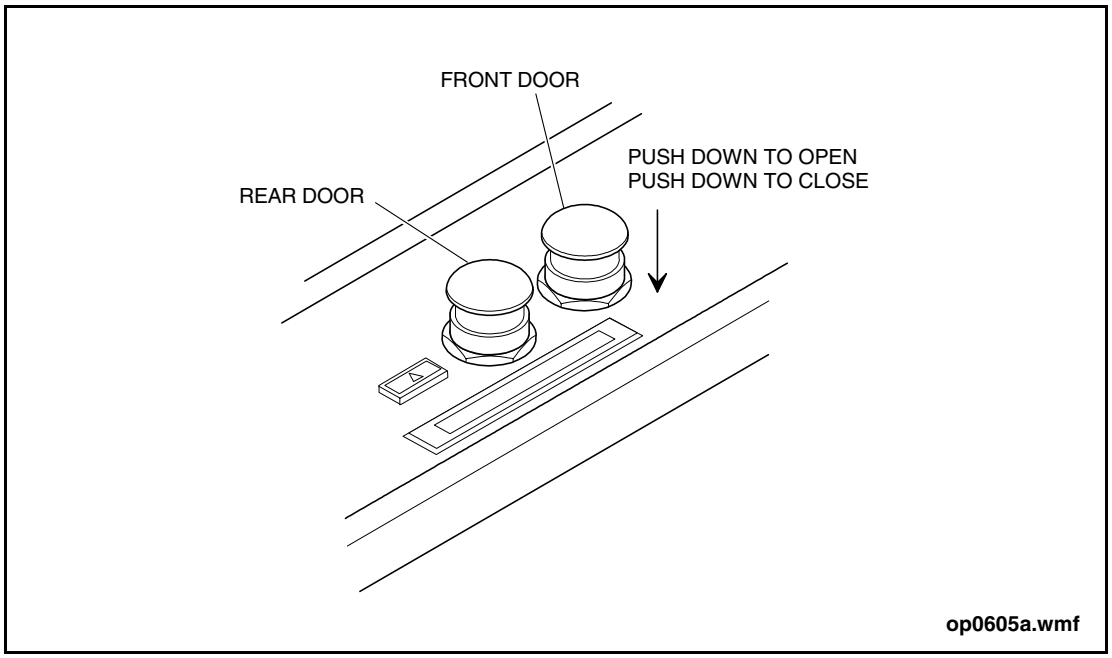

Figure 18: Door Controllers

Mirror Heater Button

This push-button powers the heater elements behind the right and left exterior mirrors. The button illuminates to confirm heater element operation.

Remote Mirror Controllers

The remote mirror controllers control the left and right remote mirror assemblies. Use the four directional tilt function of the dial to move the mirror into the desired position.

Stop Request Switch

The Stop Request toggle switch controls the stop request indicators of the passenger signal system. Setting the switch to the OFF position deactivates the stop request sign, the instrument panel indicator, and the chime.

Speaker Select Switch

The Speaker Select switch controls operation of the exterior speaker. In the INTERIOR position only the speakers inside the vehicle are activated. Use the BOTH position to activate the exterior speaker also.

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Aisle Lights Switch

The following table displays the lights that will be illuminated based on the positions of the Aisle Lights switch and Master Run switch.

AISLE LIGHTS SWITCH OPERATION		
AISLE LIGHTS SWITCH POSITION	**MASTER RUN SWITCH POSITION**	**ILLUMINATED LIGHTS**
ON	DAY-RUN	Streetside (1-9) Curbside (1-9)
ON	NIGHT-RUN	Streetside (1-9) Curbside (1-9)
ON	NIGHT-PARK	Streetside (1-9) Curbside (1-9)
PARTIAL*	DAY-RUN	Streetside (1-9) Curbside (1-5)
PARTIAL*	NIGHT-RUN	Streetside (1-9) Curbside (1-5)
PARTIAL*	NIGHT-PARK	Streetside (1-9) Curbside (1-5)
OFF	ANY POSITION	Streetside (None) Curbside (None)
* The front two light panels will only illuminate when the entrance doors are open		

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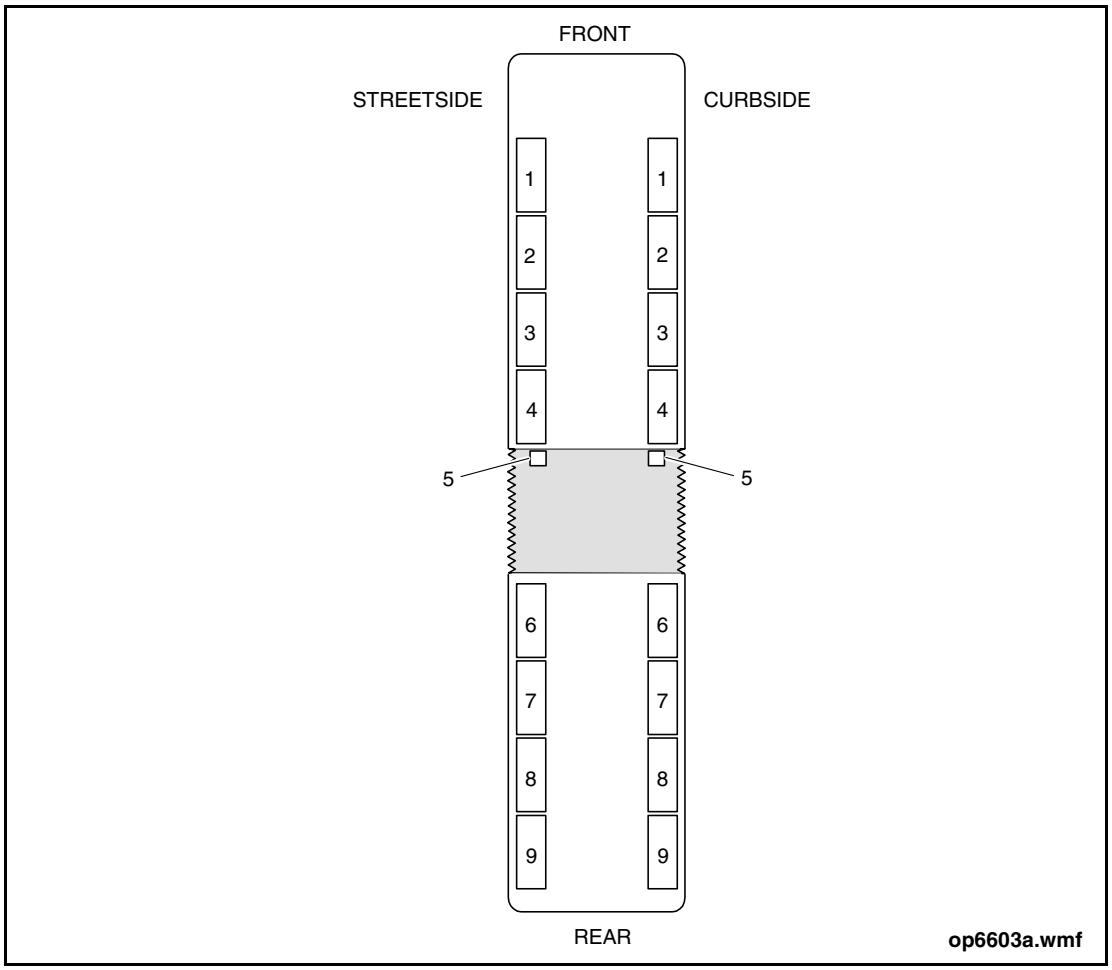

Figure 19: Interior Lighting Panels

Farebox Light Switch

The Farebox Light switch is a two-position switch controlling the light above the farebox. In the NORMAL position the light is only on when the entrance door is open. Use the ON position to illuminate the light when the door is closed.

Hazard Lights Switch Indicator

The Hazard Lights Switch indicator illuminates when the Master Run switch is in the NIGHT-RUN or NIGHT-PARK position. It serves only to highlight the position of the Four-Way Hazard Lights switch.

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Start Push Button

WARNING:

Put the shift selector in neutral [N] and apply the parking brake before starting the engine. If the parking brake indicator does not illuminate, DO NOT OPERATE THE VEHICLE.

This momentary push button on the side console allows the operator to start the engine without leaving the driver's seat.

☞ **NOTE:**
The electronic control system limits engine cranking time to 14 seconds; the starting circuit is then locked out for 60 seconds before engine cranking is allowed to resume.

Climate Control Switch

The Climate Control toggle switch is a two-position toggle switch that controls the HVAC System. In the AUTO position, the system will heat or cool the vehicle interior to maintain a preset temperature. The OFF position disables the system.

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Master Run Switch

The Master Run switch is a 4-position rotary switch. The DAY-RUN, NIGHT-RUN, and NIGHT-PARK positions are used to activate the vehicle Multiplexing System and energize various 12/24V electrical circuits. The STOP-ENGINE position is used to shutdown the engine and de-energize the Multiplexing System and most 12/24V electrical circuits except those associated with safety functions. The Battery Disconnect switch must be set to the OFF position in order to disconnect the remaining 12/24V circuits from the vehicle batteries. The following table provides a list of circuits energized by the various Master Run switch positions:

☞ **NOTE:**
The Multiplexing System is programmed to remain active for 30 minutes after the Master Run Switch is set to the STOP-ENGINE position.

MASTER RUN SWITCH OPERATION

CIRCUIT OR SYSTEM	STOP-ENGINE	DAY-RUN	NIGHT-RUN	NIGHT-PARK
Headlights, high beam			x	
Headlights, low beam (Note 4)		x	x	
Four-way hazard lights	x	x	x	x
Turn lights (Note 3)	x	x	x	x
Stop lights		x	x	
Strobe light		x	x	x
Clearance/marker lights			x	x
Tail lights			x	x
License plate light			x	x
Backup lights & alarm (Note 1)		x	x	
Aisle lights (normal)		x	x	
Aisle lights, on (Note 3)	x	x	x	
Instrument panel illumination			x	x
Instrument panel dimmer			x	x
Driver's lamp (Note 3)	x	x	x	x

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MASTER RUN SWITCH OPERATION				
CIRCUIT OR SYSTEM	STOP-ENGINE	DAY-RUN	NIGHT-RUN	NIGHT-PARK
Service compartment lights (Note 3)	x	x	x	x
Entrance & exit door lights with door open (Note 2)		x	x	x
Instrument panel warning indicators		x	x	
Drive unit shift selector		x	x	
Brake & accelerator interlocks		x	x	
Destination sign operation		x	x	x
Door controller		x	x	x
Horns	x	x	x	x
Regenerative braking (Note 1)		x	x	
Driver's alarm		x	x	
Fire suppression & alarm	x	x	x	x
Parking brake alarm (Note 3)	x			x
Driver's seat/alarm		x	x	
Kneeling operation & alarm		x	x	
Wheelchair ramp & alarm		x	x	x
Passenger signal system		x	x	
Public address system		x	x	
HVAC system (Note 1)		x	x	
Auxiliary heater		x	x	
Wiper control		x	x	
Remote mirrors		x	x	
Heated mirrors		x	x	

Note 1: Engine must be running
Note 2: DAY-RUN also requires W/C ramp deployed
Note 3: Multiplexing system must be active
Note 4: Daytime running lights (DRL) operate at reduced intensity with Master Run switch in DAY-RUN position

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Parking Brake Control Valve

WARNING:

If the air pressure is below 40 psi (276 kPa), the parking brake valve will return to the applied position.

This valve controls the application or the release of the parking brake. Pulling up on the control knob applies the parking brake. Pushing down on the knob releases the parking brake.

Foot Operated Controls

Brake Treadle

The brake treadle, located to the left of the accelerator treadle, controls the application and release of the service brakes. The brake treadle also controls the retarder function. Refer to the Vehicle Operation Section of this manual for specific operating procedures on the retarder.

Brake application is proportional to the amount of treadle movement applied. Pressing the brake treadle illuminates the tail lights and the stop light indicator.

Accelerator Treadle

The accelerator treadle, located to the right of the brake treadle, controls the engine throttle. Acceleration of the engine is proportional to the amount of treadle movement applied.

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Headlight Dimmer Switch

The headlight dimmer switch is a heel-activated click-in switch located adjacent to the side console. Pressing the switch changes the headlight operating mode between either high beam or low beam. The blue high beam indicator on the instrument panel indicates the high beam mode.

Turn Signal Switches

Two bracket-mounted momentary-on switches control the right and left turn signal lights when held depressed. The left or right turn signal indicators on the instrument panel illuminate when the respective floor switch is activated.

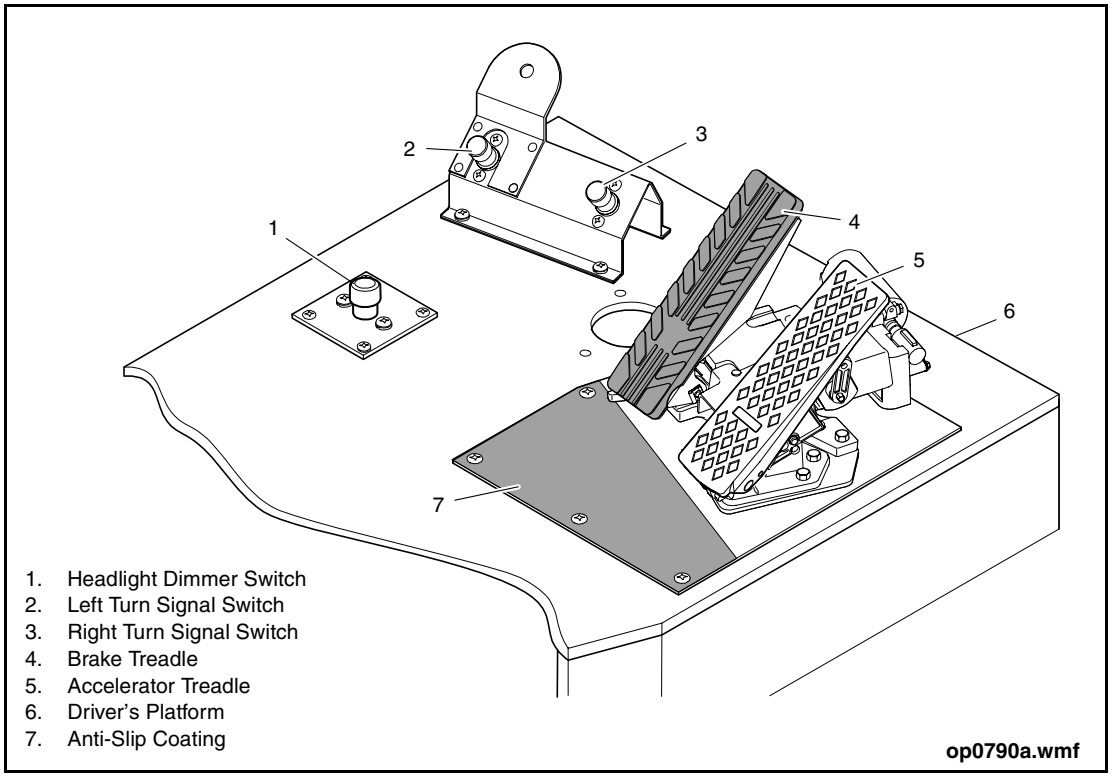

Figure 20: Driver's Foot Controls

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Miscellaneous Controls

ABS Switch

The ABS switch, located in the destination sign compartment, is used by service personnel to troubleshoot the ABS System. Pulling the switch to BLINK CODE and releasing activates the blink code diagnostic capabilities. The blink code sequence displays on the instrument panel ABS Fail indicator.

HVAC Control Panel

An HVAC unit control panel is installed above the driver's window. The unit is equipped with four keys and an LED display. The keys allow the operator to raise or lower the vehicle temperature set points for up to three separate climate-controlled zones on the vehicle. An RS-232 diagnostic access port allows service technicians to load software upgrades or perform vehicle diagnostics with the use of a personal computer.

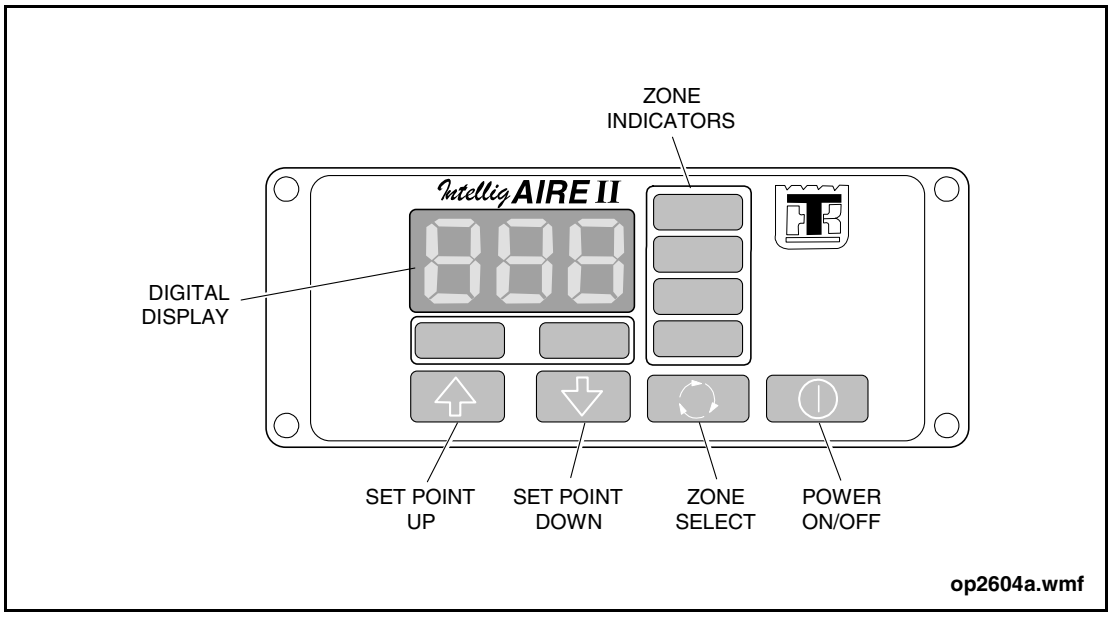

Figure 21: HVAC Control Panel

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Door Master Switch

WARNING:

Greater attention to passenger safety must be given whenever operating the vehicle with the Door Master switch in the OFF position, as this position disables several safety features and will allow the following conditions to occur:

- **Vehicle can be moved with exit door open (brake interlocks disabled).**
- **Drive unit can be shifted without foot on brake treadle.**
- **Drive unit can be shifted and vehicle moved with wheelchair ramp deployed.**
- **Exit doors can be opened at any speed by using the emergency release control valve.**

The Door Master toggle switch, located in the destination sign compartment, controls power to the brake interlocks and exit door. When the switch is in the ON position, the entrance and exit doors are fully functional. In this mode, opening the exit door, kneeling the vehicle or operating the wheelchair ramp engages the interlocks. Engaging the interlocks applies the rear brakes and deactivates the accelerator.

When the switch is In the OFF position, the brake interlocks are released (interlocks will not engage). The entrance door remains fully functional and the exit door does not function. A warning buzzer sounds and the Rear Door Open indicator illuminates on the instrument panel. In this mode, the exit door only opens if the emergency release control valve is activated.

The control valve is located behind the breakable window to the left of the exit door.

Door Manual Control Valve

This air control valve is located above the foot-operated controls and on the side of the side console panel. Turning it to the OFF position releases the air controlling the entrance door. This allows manual operation of the door for initial vehicle entry. For normal entrance door operation, position the door manual control valve to ON.

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Auxiliary Heater Switch

The Auxiliary Heater switch controls operation of the auxiliary engine coolant heater. Positioning the switch to ENABLE allows the heater to function in response to heat requirements from either the Defroster Temperature Control switch or the Climate Control switch. Positioning the switch to DISABLE will inhibit operation of the auxiliary engine coolant heater.

Joint Override Switch

The Joint Override toggle switch is located behind the destination sign access door. It is a two position momentary switch that controls artic joint electrical system circuits. Pulling the switch down temporarily overrides the interlocks that apply at maximum angle.

Exhaust Filter Switch

The Exhaust Filter switch, located in the front destination sign compartment, is a 3-way toggle switch with NORMAL, INHIBIT and REGEN positions. This switch is used by service personnel as required to regenerate or burn soot off of the muffler filter. This switch should be set to the NORMAL position for everyday vehicle operation and to the INHIBIT position when the vehicle is parked inside for servicing. When the switch is set to the REGEN position by service personnel, the engine speed and exhaust temperature will increase as the muffler filter regenerates. The High Exhaust Temp indicator on the instrument panel will also flash. When the switch is set to the NORMAL position, the muffler filter will automatically regenerate during regular vehicle operation. When the switch is set to the INHIBIT position the regeneration process is disabled.

Signal Control Emitter

A Signal Control Emitter is installed on the front exterior roof of the vehicle. This device is designed to transmit a coded infrared signal when the vehicle is running behind its preprogrammed route schedule. The signal is detected and decoded by traffic controller circuitry at vehicle intersections. The intersection control circuitry can provide a green light signal to the vehicle on a priority basis.

☞ **NOTE:**
Consult your Transit Authority for specific guidelines on Signal Control Emitter activation.

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8. FIRE SUPPRESSION SYSTEM

Description

The Fire Suppression System protects the passengers and vehicle against fire. A dry chemical extinguishing agent discharges through four fixed nozzles in the engine compartment and two nozzles in the muffler compartment to suppress a fire. The major components of the system include:

- Fire suppression control panel - located in the driver's area, to the left of the destination sign access door.
- Manual actuator switch - located below the driver's side console.
- Six heat sensor thermostats - four in engine compartment and two in muffler compartment.
- Six discharge nozzles - four in engine compartment and two in muffler compartment.
- Two extinguishing agent cylinders - located in the overhead light compartment at the rear streetside of the vehicle.

Fire Suppression Control Panel

The control panel is used to inform the operator or service personnel of the fire suppression system status. The LED indicators and audible alarm indicate basic system status. Detailed event text messages are shown on the panel display. The control panel serves as the fire suppression central control and coordinates communication between all modules. Ensure that the "System OK" message is displayed on the panel before operating the vehicle.

The "System Test Confirm" button tests the audible alarm and LED indicator function. This test button is also used to confirm system configuration.

Press and hold the test button for one second to initiate a self-test of the audible alarm and LED indicator lights. This test will take approximately 10 seconds to complete.

Pressing and holding the test button will engage and test all relay operations in addition to testing the audible alarm and LED indicator circuits. Press the Relay Reset button to reset all the relays. Pressing the test button will also display "Vehicle Safety Network, Firmware:, and Configuration:"

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Screen Display Messages

The following table lists the various events that provide a screen display.

SCREEN DISPLAY MESSAGES					
EVENT TYPE	**EVENT CAUSE**	**EVENT RECORD**	**OPERATION DISPLAY**	**LED INDICATION**	**AUDIBLE ALARM**
Trouble	Communications Error	No Response Invalid Response Invalid Module Missing Module Invalid Command Software Error	Trouble Module# Comm	Yellow Trouble Steady	Pulsed
Trouble	Sensor Trouble	Sensor Missing Sensor Wrong Sensor Disables	Trouble Module# Sensor#	Yellow Trouble Steady	Pulsed
Trouble	Over-Temperature Level 1	Variable Overheat Sensor Level 1 Exceeded		Yellow Trouble Steady	Single Pulse
Trouble	Over-Temperature Level 2	Variable Overheat Sensor Level 2 Exceeded		Yellow Trouble Steady	Steady On
Trouble	Discharge	Open Circuit at Actuator	Trouble Module# Discharge	Yellow Trouble Steady	Pulsed
Trouble	Pressure Low	Open Circuit at Pressure Switch Input	Trouble Module# Press. Low	Yellow Trouble Steady	Pulsed
Fire	Fire	Fire	FIRE Module# Sensor#	Red Fire Steady	Steady On
None	System	Various	None	No	No

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Operation

Heat from a fire will close the normally open contacts of one of the heat sensors. This action will short the system's electrical circuit and electrically actuate the solenoid in the agent cylinder. The system can also be manually activated using the manual actuation switch on the driver's side console. The dry chemical extinguishing agent will then be routed to the distributor and released from the discharge nozzles. The control panel in the driver's area will display the current system condition.

Actuation of the Fire Suppression System will also cause the engine protection system to shut down the engine, ensuring that the fuel flow stops. Bring the vehicle to a safe stop and ensure that all passengers exit the vehicle safely.

During system discharge of the suppressant expect a high noise level and possibly a large cloud of extinguishing chemical.

☞ **NOTE:**
Avoid breathing the dry chemical dust. It will irritate the throat and lungs.

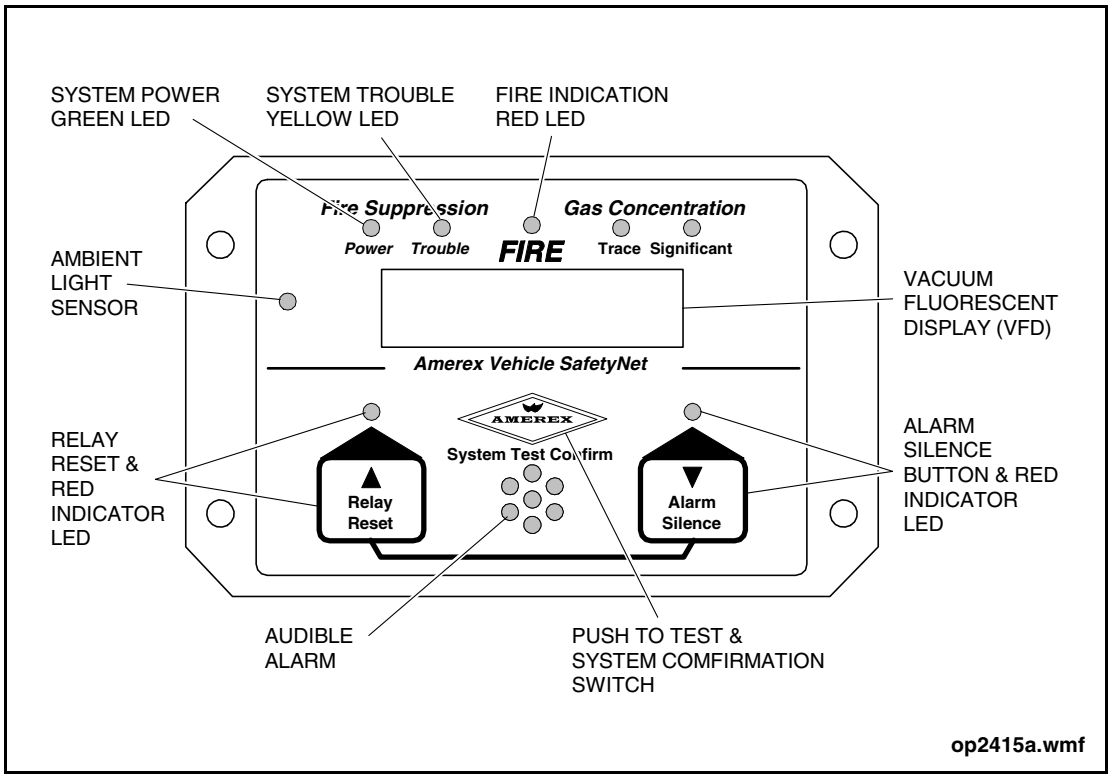

Figure 22: Fire Suppression Control Panel

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Manual Actuator Switch

The Manual Actuator switch is located on the driver's side console and is used to manually initiate the discharge of the extinguishing agent. Pulling a safety pin out and pressing down on the switch initiates the discharge. Check that the safety pin is installed before operating the vehicle.

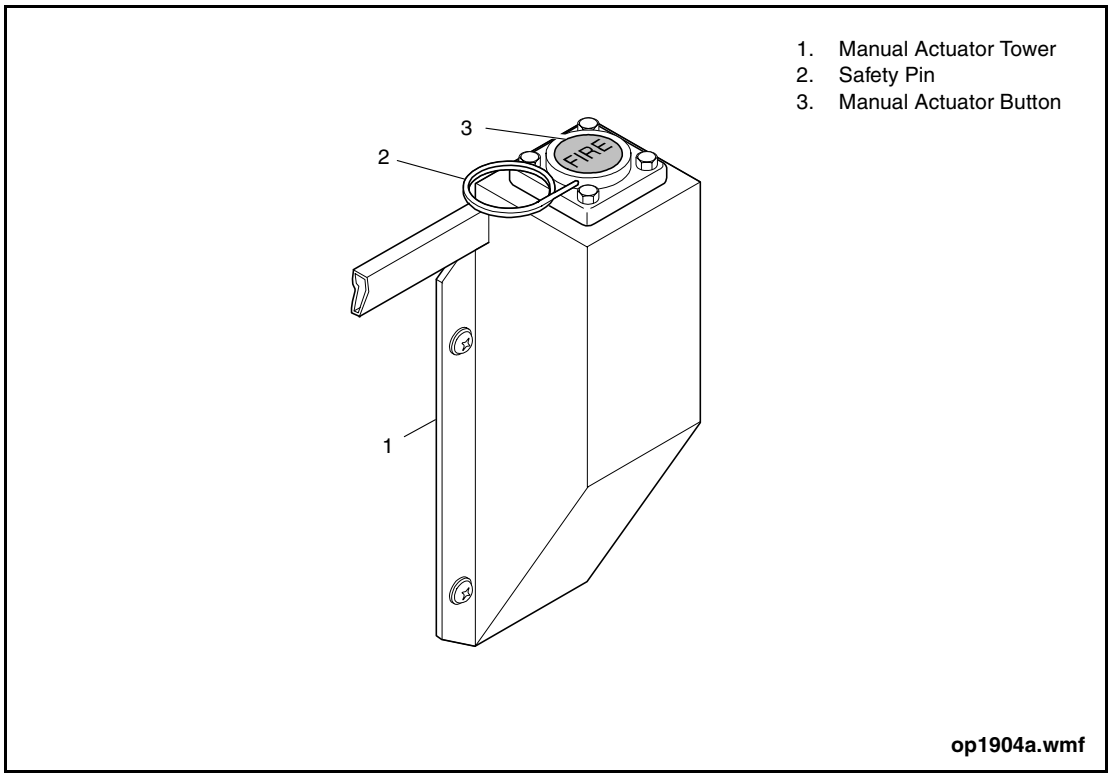

Figure 23: Manual Actuator

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9. VEHICLE OPERATION

Pre-Start Checks & Adjustments

A daily routine inspection of the vehicle should reveal any required repairs or adjustments. These need to be reported to service personnel to maintain the best operating condition of the vehicle. When it is ready for service perform the following steps upon entry.

- Activate the electronic control system by turning the Master Run switch to the DAY-RUN or NIGHT-RUN position.
- Adjust the driver's seat for individual comfort.
- Adjust the tilt/telescopic steering column to suit.
- Adjust all mirrors for unobstructed views.
- Check that the Door Master switch is in the ON position.
- Check horn operation.

Drive Unit Operation

CAUTION:

Be sure to bring the vehicle to a full stop before shifting from drive [D] to reverse [R] or vice versa.

Selection of the automatic Drive Unit operating ranges is by the shift selector module on the instrument panel. There are three operating range selection buttons for reverse, neutral and drive [labeled R, N, D]. The red LED display will show reverse, neutral and drive selections as [R] and [N] and [D]. Operate the Drive Unit using the following procedure:

1. Before starting the engine
   a. Check that the Drive Unit is in neutral [N].
   b. Check that the parking brake is on.
   c. Apply the brake treadle.
2. With the engine running and idling at normal speed, apply firm pressure on the brake treadle and make the desired range selection.

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3. Release parking brake and the brake treadle to proceed.
4. To change direction bring the vehicle to a full stop, apply firm pressure on the brake treadle and make the desired range selection.

☞ **NOTE:**
A back-up alarm activates when reverse [R] is selected.

5. When parking or shutting down the vehicle come to a full stop, apply the parking brake, select neutral [N] and release the brake treadle.

⚠ **WARNING:** ⚠

NEVER leave the driver's seat while the drive unit is in gear.

Regenerative Braking System

Regenerative braking is provided by the diesel engine system and the drive unit system. During vehicle deceleration the engine and drive units are being driven, through the driveline, by the weight of the vehicle. Under this condition the motor/generators in the drive unit create electrical energy and slow the vehicle by imposing a load on the driveline. This process is referred to as "regenerative braking".

The regenerative braking system can be disabled by using the Regen Brake switch located on the side console.

☞ **NOTE:**
Consult your local transit authority for specific operating conditions under which the Regen Brake switch should be used to disable the regenerative braking system.

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Anti-Lock Braking System

WARNING:

Keep stopping distances the same as those for similar non-ABS equipped vehicles.

The Anti-Lock Braking System (ABS) functions to bring the vehicle to a safe, controlled stop during emergency braking situations. Through computer monitoring of wheel speeds the system controls brake pressure to prevent wheel lock-up. If during brake application the ABS system senses imminent wheel lock-up it engages automatically thus increasing vehicle stability and control.

To operate under normal conditions use the standard braking technique. For emergency braking apply firm and constant pressure to the brake treadle. If required the ABS system will activate automatically producing a pulsing sensation to the brake treadle and a hissing sound. These are normal indications of ABS system operation. During emergency braking avoid “pumping” the brakes as this defeats the pulsing action of the ABS system and will increase your stopping distance.

If the ABS on one wheel malfunctions the system will retain normal braking on that wheel. Should the entire ABS system malfunction the system will also retain normal braking. The ABS Fail indicator on the instrument panel will illuminate if a malfunction occurs.

☞ **NOTE:**
After ABS System service the ABS Fail indicator will remain illuminated at engine start-up. Driving the vehicle above 4 mph should extinguish the indicator. If the indicator remains illuminated, contact service personnel.

Automatic Traction Control

The vehicle’s Automatic Traction Control (ATC) System activates automatically to prevent drive wheel spin when accelerating or starting the vehicle from a stand still.

The system uses components of the ABS System to apply the brakes to a drive wheel that loses traction and spins. This transfers the engine torque to the wheel with better traction. If both drive wheels spin, the system reduces engine torque to improve traction. The ATC indicator on the instrument panel illuminates to confirm system operation.

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Starting the Engine

WARNING:

Put the shift selector in neutral [N] and apply the parking brake before starting the engine. If the parking brake indicator does not illuminate, DO NOT OPERATE THE VEHICLE.

To operate the vehicle the Battery Disconnect switches must be in the ON position. Check the switches by opening the battery disconnect access door at the rear of the vehicle. These connect the engine starter and vehicle electrical circuits to the battery power.

☞ **NOTE:**
Refer to the Driver's Check List Section of this manual before operating the vehicle.

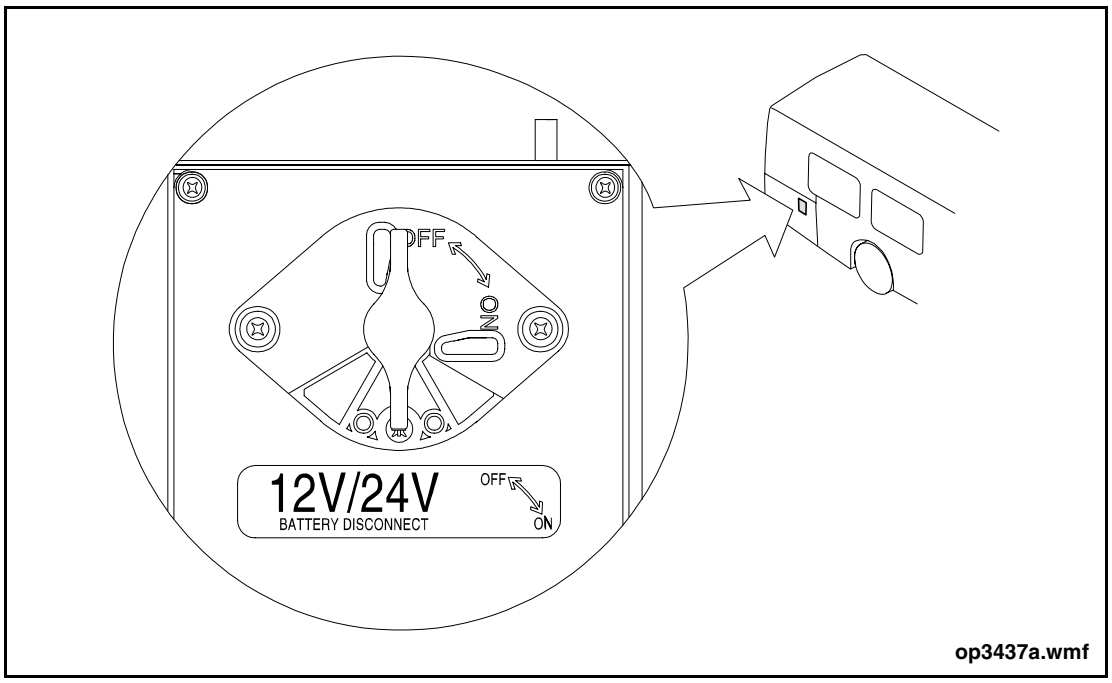

Figure 24: Battery Disconnect Switch

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Master Run Switch

Turn the Master Run switch (on side console) to DAY-RUN or NIGHT-RUN position. This activates the vehicle's Multiplexing System. Illuminated indicator lights and sounding alarms signify an active Multiplexing System.

☞ **NOTE:**
When restarting less than 30 minutes after engine shut down, the Multiplexing System responds instantly.

Start Push Button

WARNING:

Put the shift selector in neutral [N] and apply the parking brake before starting the engine. If the parking brake indicator does not illuminate, DO NOT OPERATE THE VEHICLE.

This momentary Push Button on the side console allows the operator to start the engine without leaving the driver's seat.

☞ **NOTE:**
Allow 3-4 seconds after setting the Master Run switch to the DAY-RUN or NIGHT-RUN positions before pressing the Start Push Button. This brief delay will allow the hybrid system to initiate and enable the starter push button function.

☞ **NOTE:**
The Multiplexing System limits continuous starter operation to 14 seconds; the starter circuit is then disconnected for 60 seconds to allow the starter to cool down.

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Operational Checks

Once the engine is operating the operator should observe the following:

- The air system pressure is between 105 and 125 psi (724 and 862 kPa) and the suspension is at full height. The Air System requires a working pressure of 105 to 120 psi (724 to 827 kPa).
- The No Gen indicator is off when the engine is operating.
- Drive Unit Selector neutral [N] indicator remains illuminated.
- Parking brake and stop light indicator remain illuminated as long as the parking brake is applied.
- Door controller is operational.
- Position the Door Master switch to the OFF position and attempt to open the exit door by using the side console door controller. The exit door should not be operational; the entrance door should remain operational.
- Return the Door Master switch to the ON position.
- Wiper and washer controls are operational.
- Defroster/heater controls (on dash) are operational.
- Exterior lights operate during exterior light test. To conduct test, ensure engine is running and parking brake is applied, then press both turn switches simultaneously. All exterior lights will illuminate for two minutes.
- The destination sign controller is active.

Parking Brake

The parking brake indicator illuminates when the parking brake is applied. If the parking brake indicator is not illuminated, apply the parking brake by pulling up on the parking brake control valve knob. If the parking brake indicator does not illuminate, DO NOT OPERATE THE VEHICLE.

Press the brake treadle before releasing the parking brake. Release the parking brake by pushing down on the control knob. The parking brake indicator extinguishes.

☞ **NOTE:**
Reapply parking brake.

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Stop Lights

The stop lights indicator illuminates when the rear stop lights are on. If the indicator is not illuminated, check for rear stop light failure.

Low Air

The Low Air indicators illuminate to warn of an unsafe air system pressure level. A warning buzzer sounds when a Low Air indicator is activated. DO NOT OPERATE THE VEHICLE until the alarm system is canceled.

The air pressure gauges indicate the air system pressure levels of the air brake system. The air system will maintain pressure levels above the low operating limit of 105 psi (724 kPa) during normal vehicle operation.

Check Engine

The Check Engine indicator on the instrument panel illuminates momentarily before starting. The Check Engine indicator extinguishes before the engine starts. If the Check Engine indicator remains illuminated, DO NOT OPERATE THE VEHICLE.

Shift Selector Display

At engine start-up the shift selector's red display shows [N] to indicate that the drive unit is in neutral. This should occur automatically at each engine start-up.

No Gen

When illuminated, the No Gen indicator signals that the alternator is NOT charging. The indicator remains illuminated until the engine starts. If the indicator fails to remain illuminated until the engine starts, DO NOT OPERATE THE VEHICLE.

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Operator Display Keyboard (ODK) Messages

Check that the destination sign control unit correctly programs electronic destination sign messages.

Rear Door Open Indicator

Move the door controller to position #3, #4 or #5 to check that the Rear Door Open indicator illuminates when the doors open.

☞ **NOTE:**
Exit doors will open and the interlocks will be engaged.

Turning the door controller handle to position #1 closes the entrance and exit doors and extinguishes the Rear Door Open indicator. Check that the exit doors are closed. If the exit doors are not closed and the Rear Door Open indicator is still illuminated, DO NOT OPERATE THE VEHICLE.

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Day-Time Operation

When the engine is operating, check the following:

- The air system pressure is between 105 and 125 psi (724 and 862 kPa) and the suspension is at full height. The air system requires a working pressure of 105 to 120 psi (724 to 827 kPa).
- The No Gen indicator is off when the engine is operating.
- Drive Unit Shift Selector neutral [N] indicator remains illuminated.
- Parking brake and stop light indicator remain illuminated as long as the parking brake is applied.
- Daytime running lights operation.
- Front, side and rear destination/route sign lights.
- Door controller operation.
- The Door Master switch, when placed in the OFF position, disables the exit door and inhibits the brake interlocks.
- Aisle lights operation.
- Return the Door Master switch to the ON position.
- Wiper and washer controls operation.
- Defroster/heater control (on dash) operation.

Night-Time Operation

For night-time operations, ensure the Master Run switch is placed in the NIGHT-RUN position. Check the following in addition to the day-time checks:

- Instrument panel illumination lights.
- Headlight operation (high and low beam).
- Front and rear identification and marker lights.
- Tail lights.
- License plate light.
- Panel lights dimmer changes the brightness of instrumentation backlights and panel text.
- Interior LED lights can be turned on using the Aisle Lights switch.

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Pre-Trip Brake Test

WARNING:

Before driving the vehicle conduct the following test sequence. If the test reveals a fault, advise service personnel and DO NOT OPERATE THE VEHICLE.

Conduct the following test sequence to ensure that the air brake system is functioning properly.

1. Apply the parking brake.
2. Start the engine and check the following:
   a. The low pressure warning devices switch off as the air pressure builds.
   b. If the air pressure gauges were reading below 90 psi (620 kPa), the readings increase back to 90 psi (620 kPa) in less than three minutes.
   c. The readings of the three air pressure gauges level off at 120 to 125 psi (827 to 862 kPa).
3. Release the parking brake.
   a. Make multiple light brake treadle applications and check the following:
      i. The air pressure gauge readings stabilize at 105 psi (724 kPa) as the air compressor begins its pumping cycle.
      ii. After continued multiple light brake treadle applications the low pressure warning devices activate as the air pressure gauge reading falls to 75 psi (517 kPa).
   b. Release the brake treadle and reapply the parking brake.
4. Allow the air system to fully recharge.
5. Stop the engine and proceed as follows.
   a. Release the parking brake.
   b. Apply the brake treadle fully, hold and check the following:
      i. Upon treadle application the air pressure gauge reading does not drop more than 18 psi (124 kPa).

☞ **NOTE:**
Tap the gauges to be sure their needles are not stuck.

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ii. The air pressure on each of the three gauges does not drop more than 3 psi (20 kPa) per minute.

iii. There are no audible air leaks.

c. Release the brake treadle and apply the parking brake.

6. Restart the engine to recharge the air system. When the reading levels off at 120 to 125 psi (827 to 862 kPa) release the parking brake.

7. Move the vehicle slowly and test brake response.

Moving the Vehicle

1. Fasten driver's seat-belt (as required by law).

2. Close the doors by turning the door controller handle to position #1. The Rear Door Open indicator should be off.

3. Apply the brake treadle and release the parking brake. The parking brake indicator extinguishes.

4. Shift the Drive Unit Shift Selector into the desired gear.

☞ **NOTE:**
The neutral [N] indicator extinguishes and the appropriate range letter appears in the display.

5. Release the brake treadle and lightly apply the accelerator treadle to slowly move vehicle from the parking area. The stop lights indicator extinguishes.

6. Check the steering wheel for vibrations, looseness or binding while the vehicle is in motion. If any abnormalities are present, DO NOT OPERATE THE VEHICLE.

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Parking the Vehicle

WARNING:

The parking brake must be applied when parking the vehicle. When parking downhill, be sure the front wheels are turned into the curb; when parking uphill, be sure the front wheels are turned away from the curb.

1. Bring the vehicle to a complete stop using the brake treadle. The stop lights indicator illuminates. Shift the Drive Unit selector into neutral [N].
2. Apply the parking brake and release the brake treadle. The parking brake indicator illuminates.
3. Operate the front door control switch to open the entrance door.
4. Turn the Master Run switch to the STOP-ENGINE position.
5. Exit the vehicle.
6. Manually close the entrance doors.

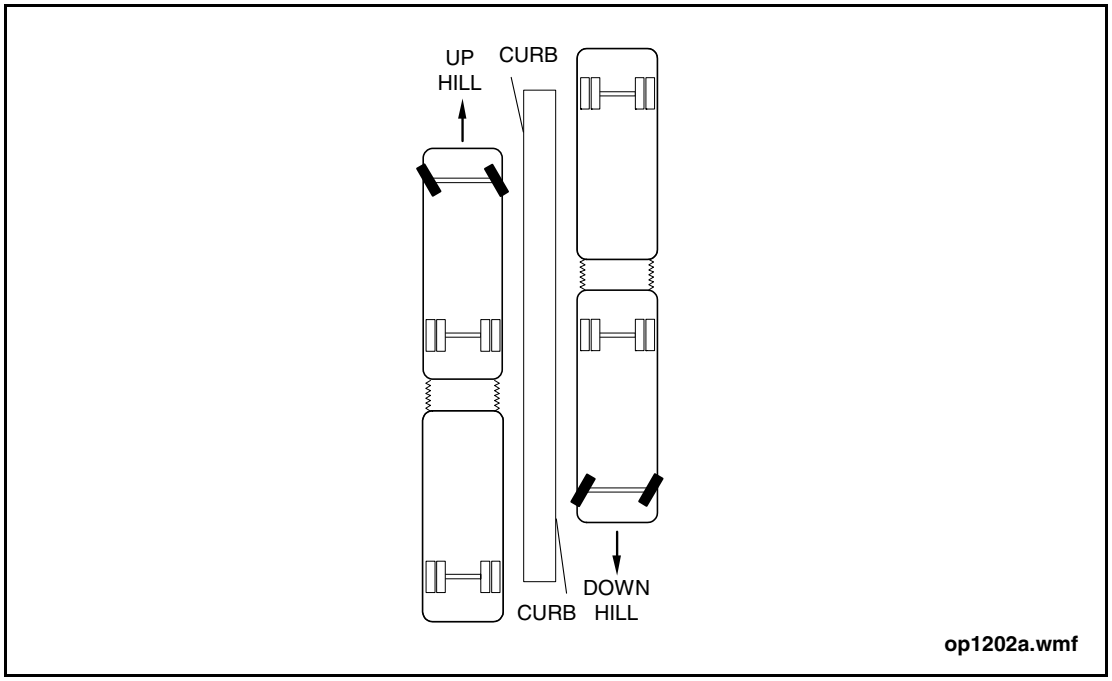

Figure 25: Parking on an Incline

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Operating the Vehicle in Reverse

CAUTION:

Continuing in reverse after disengaging the interlocks, risks damage to the articulating joint.

Reverse operation of the vehicle requires paying special attention to the articulating joint angle. Just as a trailer can reach a “jackknife” position the articulating joint can reach a potentially damaging maximum angle position. To reduce this risk vehicle safety systems limit reverse speed to 3 mph and an alarm warns of articulating joint maximum angle.

Three types of alarms sound as the articulating joint moves closer to its maximum angle. An interrupted alarm sounds as the angle is near the maximum. The interrupted alarm frequency increases upon reaching the maximum angle. If the stops of the articulating joint contact each other, the alarm sound becomes constant.

The interlocks apply upon reaching the articulating joint maximum angle to stop further reverse movement. To release the interlocks and allow movement for correction, use the Joint Override toggle switch behind the destination sign access door. Switch activates provides 20 seconds to correct the maximum angle condition before reapplying the interlocks.

Jump Start Connection

Behind the battery access door is a jump start connector to supply power to the batteries when normal engine starting is not possible. It uses a quick connect assembly to ensure a safe and correct electrical connection to the battery poles.

☞ **NOTE:**
Advise service personnel if starting difficulties occur.

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Engine Protection System

CAUTION:

If engine shutdown occurs, DO NOT attempt an engine restart unless absolutely necessary. Continuing engine operation without fault correction may result in engine damage.

The New Flyer vehicle is equipped with an automatic shut down system to prevent engine damage. If the Stop Engine indicator illuminates, the Engine Protection System initiates a power reduction cycle that lasts 30 seconds. After that time the engine will shut down.

☞ **NOTE:**
Use the 30 seconds to remove the vehicle from traffic. Contact service personnel for further instructions.

Kneeling

The vehicle's kneeling operations are controlled by the Kneel switch on the instrument panel. This switch is used to raise, hold, or lower the vehicle.

Kneeling Procedure

1. Bring the vehicle to a complete stop, put shift selector in neutral, apply the parking brake and press the front door control switch to open the entrance door. Kneeling will not be enabled if the door is closed.

☞ **NOTE:**
Brake and accelerator interlocks engage when the entrance door is open and kneeling is in process.

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WARNING:

Prior to kneeling the vehicle, ensure that boarding passengers stand clear of the vehicle and no obstructions exist.

2. Lift the switch guard and hold the Kneel switch in the LOWER position until the vehicle is completely kneeled. Boarding passengers must stand clear and wait until the vehicle has lowered before entering the vehicle.
3. Set the Kneel switch to the RAISE position and close the switch guard once passengers have safely boarded. The vehicle will raise automatically to its full ride height.

Kneeling Exterior Signal

Amber lamps located beside the entrance and rear exit doors indicate when the kneeling system is in operation. A warning beeper also sounds.

Passenger Signal System

This passenger signal system is activated by the following devices: stop request cord, exit door stanchion button and wheelchair area touch pads. Activating the signal system causes the following to occur:

- Stop request sign illuminates. The sign extinguishes when the system is reset.
- Stop Request indicator illuminates and remains illuminated until the system is reset.
- A chime sounds once when the passenger signal system is used. A different tone sounds if the wheelchair passenger signal system is used.

The system is cancelled (reset) and the lights are extinguished by:

- Opening the entrance door with the door controller.
- Opening the exit door, once enabled with the door controller.
- Pushing the Stop Request switch to CANCEL and releasing.

The stop request sign extinguishes when the entrance or exit doors are fully open.

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Stop Request Cord

Stop request cords are located on either side of the vehicle interior. Pulling a cord activates the system.

Stop Request Button

There are eight stop request buttons located throughout the bus;

- one located on each exit door stanchion
- one on the streetside stanchion located opposite of the rear exit door
- two on the streetside stanchions located opposite of the center exit door
- one located on the curbside luggage rack stanchion

Wheelchair Stop Request Touch Pad

Stop request touch pads are located under each longitudinal hinged seat in the wheelchair stations. Pushing a pad activates the passenger signal system. A chime sounds a different tone to alert of a wheelchair passenger stop request.

Entrance & Exit Door Lights

The entrance and exit doorways are lit by header lights (above the door), step lights and exterior door lights. Pressing the door controller to open a door activates these lights. The lights extinguish as the doors close.

☞ **NOTE:**
The exit door curb lights extinguish after a five second delay.

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10.WHEELCHAIR SYSTEM

The wheelchair system consists of a wheelchair ramp and wheelchair restraint system.

Wheelchair Ramp

The New Flyer vehicle is equipped with a wheelchair ramp system to assist passengers in boarding and exiting the vehicle.

WARNING:

When the ramp is in STOW or DEPLOY, the brake interlocks are activated. The vehicle will not move until the ramp is fully stowed and the switch is in the FLOAT position.

Before this system can be energized, the following conditions must exist:

- **Ensure passenger safety during the wheelchair ramp operations. Monitor the passenger's position during the operation cycle.**
- **Loading or unloading the passengers must be performed in a flat, open area. DO NOT deploy the ramp where trees, telephone poles, fire hydrants, or similar obstacles may jeopardize passenger safety or damage the ramp.**
- **Be familiar with ramp functions and operation before operating the equipment.**
- **DO NOT conduct the 'STOW" operation with a passenger on the lift.**
- **Passengers are to board the ramp only when it's at ground level, and the 'DEPLOY"cycle is complete.**

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⚠ CAUTION: ⚠

Release the switch after the ramp has passed the 90° position. This prevents the oil and pump from overheating.

The switch to control this feature is located on the instrument panel. The three positions of the switch enable the wheelchair ramp mechanism to perform the following operations:

DEPLOY

This position activates the ramp from the closed position to the open position.

FLOAT

This position shuts off power to the pump, allowing the ramp to free-fall to either the open or the closed position. Upon cycle completion, this becomes an off position.

STOW

This position is used to move the ramp from the open to the closed position.

☞ **NOTE:**
When the wheelchair ramp is in motion, an audible alarm sounds, and the exterior lift warning light illuminates and flashes.

Deploying the Ramp

1. Bring the vehicle to a complete stop in a flat, unobstructed area, one to three feet from the curb. Check for obstructions and be certain that there is adequate clearance to deploy the ramp.
2. Apply the parking brake.
3. Place the drive unit shift selector in neutral [N].
4. Kneel vehicle if required.

☞ **NOTE:**
Parking brake and stop light indicators on the instrument panel will illuminate.

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5. Move the door controller to the door open position, (#2, #3 or #5).

CAUTION:

Make sure the area in which the ramp will DEPLOY is clear of people and any obstructions.

6. Move the Ramp toggle switch to DEPLOY.
7. After the ramp has passed the vertical 90° position, release the switch. The ramp continues to lower until it reaches the ground.

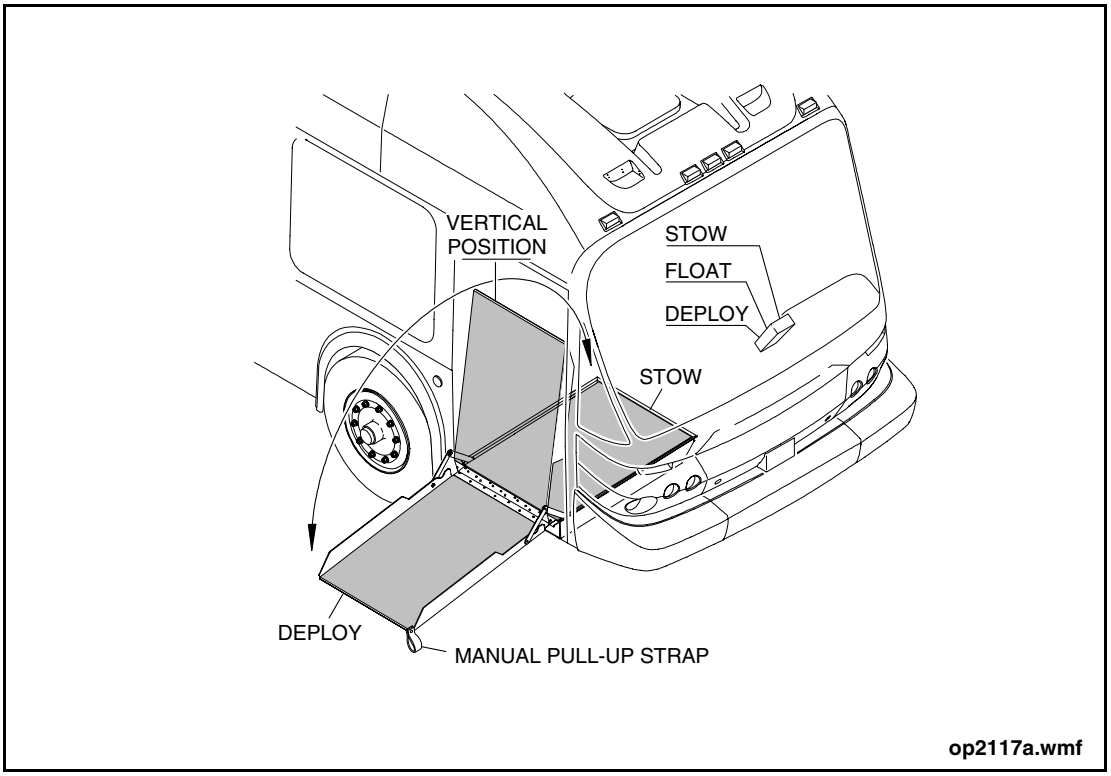

Figure 26: Wheelchair Ramp Operation

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Raising the Ramp

WARNING:

Check for obstructions and be sure that all passengers are at a safe distance. Keep objects and passengers off the lift platform during the STOW operation.

1. Once the passenger has boarded the vehicle safely and is clear of the ramp, move the toggle switch to the STOW position.

   ☞ **NOTE:**
   An audible alarm sounds when the ramp is moving.

2. Raise the vehicle from the kneeling position.
3. Close the entrance door.
4. Disengage the parking brake and proceed to the next stop.

Ramp Emergency Procedures

In case the wheelchair ramp power unit fails, the unit may be hand-operated by using a pull-up strap located on the ramp's corner.

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Wheelchair Restraint System

The forward seat positions are equipped with a Wheelchair Restraint System for security of handicapped passengers. For optimum passenger safety be sure to follow the operating procedures to complete all the necessary restraint system connections.

CAUTION:

The wheelchair wheel-lock is for use on large diameter steel wheels only. Use both rear red belts if not using the wheel-lock.

Operating Procedures

1. Move the flip-up seat cushions up to the lock position.
2. Back the wheelchair into the restraint area, in front of the barrier, facing forward (facing driver's area). Set wheelchair brake.
3. Locate two tie-down belts at the base of the barrier and attach each belt to solid rear frame members of wheelchair as follows:
   a. Pull the tie-down belt release handle located on the face of the barrier.
   b. Attach extended end of each tie-down belt to a solid rear frame member of wheelchair.
   c. Move release handle back into position to take up belt slack.
   d. Check belts to ensure they are secure.
4. Attach the two front tie-down belts to solid front members of the wheelchair as follows:
   a. Press the retractor release button on window side tie down belt and pull belt to extend.
   b. Attach the extended end to a solid front frame member of the wheelchair.
   c. Take up the belt slack by pressing the release button again.
   d. Turn the belt retractor knob until tight.
   e. Remove the aisle tie-down belt from storage.
   f. Attach the stud end securely into the floor anchor.
   g. Press the retractor release button and pull the belt to extend.
   h. Wrap the belt around a solid front frame member of the wheelchair and secure the belt clip into the belt buckle.

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i. Take up the belt slack by pressing the release button again.

j. Turn the belt retractor knob until tight.

5. Secure the passenger by extending the lap belt across to the aisle side clip and fasten. Do not place belt over armrest.
6. Extend window-side shoulder belt and connect to stud on lap belt Ensure that belt clips and buckle are securely engaged.
7. Check the belt locks by pulling on each end to ensure they engage.

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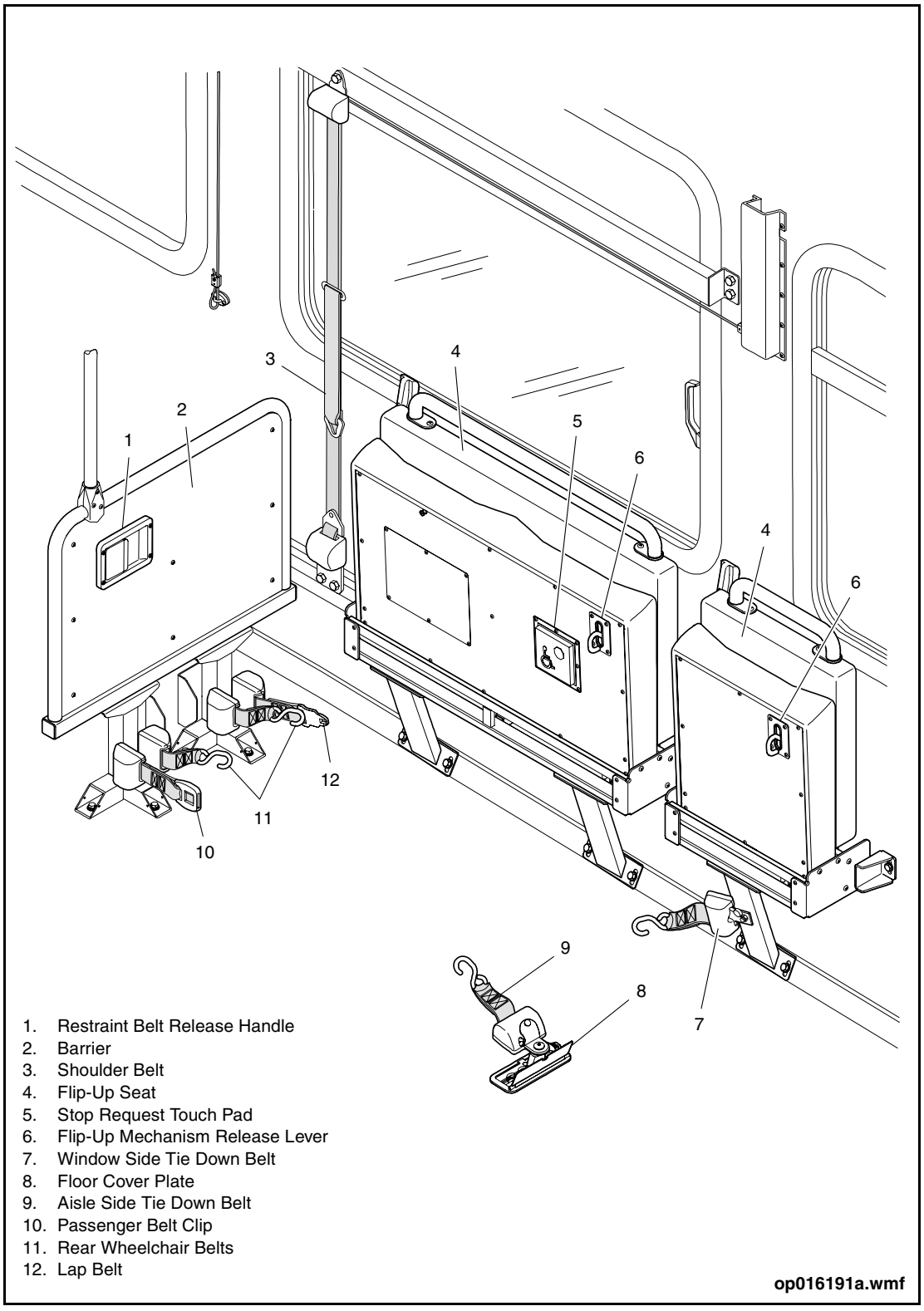

Figure 27: Wheelchair Restraint System

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11.BIKE RACK SYSTEM

WARNING:

Loading or unloading bike from the streetside endangers the passenger. LOAD OR UNLOAD THE BIKE FROM THE CURB-SIDE ONLY.

The bike rack system allows the passenger to load and unload a bike without driver assistance. In the case of children under ten, however, have an adult assist in loading and unloading the bike.

Be sure to load and unload the bike from either the front of the rack or from the curbside.

Loading Operation

CAUTION:

To ensure safe vehicle operation, NEVER load a bike onto the bike rack which will in any way obstruct the headlamps. ALWAYS verify that the headlamps are unobstructed whenever a bike has been loaded onto the bike rack.

1. Remove water bottles, pumps or other loose items from bike prior to loading.
2. Squeeze bike rack handle UP to release latch.
3. Fold down bike rack.
4. Lift bike onto rack, fitting wheels into proper wheel slots.
5. Raise the support arm over the front tire so that the hook rests at the highest point on the front wheel. Bike is now held firmly in place.

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Unloading Operation

1. Unload from curb or from in front of vehicle.
2. Raise support arm off the tire.
3. Lift bike out of wheel slots and set down.
4. If there are no other bikes on the rack, lift it until the rack swings into the lock position against the vehicle.

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12.NOTES

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NEW FLYER

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