NEW FLYER

DRAFT

KING COUNTY DEPARTMENT OF TRANSPORTATION

OPERATOR'S GUIDE

XCELSIOR® TROLLEY 40FT. TRANSIT BUS

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

SR1800/1864

Vehicle Identification Number	Unit Number
5FYE8FJ02EC044863	4300
5FYE8FJ04EC044864	4301

Revision Index

Property: King County Department of Transportation

SR1800/1864

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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.

Table of Contents

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 booklet 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 any manuals which are readily available from their respective manufacturer.

Electric Drive System

This vehicle is powered by a Vossloh Kiepe electric drive system. The system consists of a roof-mounted current collector system which draws power from overhead lines. The collected current is processed in the roof-mounted traction inverter and converted from DC to AC. This converted current is provided to a heavy-duty 3 phase AC traction motor which is coupled to a driveshaft and a rear drive axle.

The vehicle incorporates ABS and regenerative braking, automatic traction control, and automatic roll-back protection. Additional features include an electric dewirement detection system, and a battery powered energy storage system (ESS), which provides power for limited driving when overhead line power is not available.

During vehicle deceleration and braking, the traction motor is converted into a generator and produces electrical energy. This energy is returned to the overhead lines for use by other vehicles on the electrical grid. The induced electrical load causes inertia in the vehicle's driveline and produces an effect similar to a standard retarder. The electrical energy produced by the regenerative process will be dissipated through the brake resistor as heat if the overhead line is unable to accept the load.

Vehicle Patent Information

This New Flyer product and its components, and methods of manufacturing thereof, may be protected by one or more of the following patents, design registrations and patent applications. In addition, such products, components, and/or methods may be protected by one or more patent and design applications which may have not been published as of the date of this manual, in the United States, Canada, and elsewhere. Please direct all inquiries to our Corporate Offices. For a current listing of applicable patents, please refer to our Legal Notice at our corporate website, http://www.newflyer.com.

New Flyer Products	Patents, Patent Applications, Design Registrations & Design Applications
Xcelsior® Bus[1]	U.S.: 6,343,908; 6,397,965; 6,416,094; 6,556,899; 6,611,739; 6,681,174; 6,695,366; 8,109,551; 8,548,669; D637520; D639712; D660761; D678818; D680670; D687593; D692360; published applications 2012/0161469; 2013/0181679 Canada: 2,317,237; 2,455,153; 2,652,352; 2,794,822; 2,825,732; design registrations 129599; 132413; 132414; 132415; 132416; 132417; 133389; 133391; 133392; 133598; 133599; 133600; 133645; 133646; 133647; 133648; 133649; 133650; 133651; 136,266; 139456; 139757
MiDi® Bus[1]	U.S.: 6,343,908; 6,556,899; 6,611,739; 6,681,174; 6,556,899; 6,611,739; 6,681,174; 8,548,669 Canada: 2,306,413; 2,689,744
Invero® Bus[1]	U.S.: 6,257,652; 6,340,202; 6,343,908; 6,375,249; 6,397,965; 6,416,094; 6,416,116; 6,556,899; 6,611,739; 6,681,174; 6,695,366; 6,726,271; 8,548,669 Canada: 2,297,618; 2,297,623; 2,297,625; 2,297,719; 2,306,413; 2,317,237; 2,455,153
High Floor Bus[1]	U.S.: 6,343,908; 6,397,965; 6,416,094; 6,556,899; 6,611,739; 6,681,174; 6,695,366; 8,548,669 Canada: 2,317,237; 2,455,153
Low Floor Bus[1]	U.S.: 6,343,908; 6,397,965; 6,416,094; 6,556,899; 6,611,739; 6,681,174; 6,695,366; 8,548,669 Canada: 2,317,237; 2,455,153

New Flyer Products	Patents, Patent Applications, Design Registrations & Design Applications
Electric Bus	U.S.: published application 2013/0181679 Canada: 2,794,822
Passenger Ramps	U.S.: 6,343,908 Canada: 2,306,413
Energy Absorbing Bumpers	U.S.: 6,416,094; 6,695,366 Canada: 2,455,153
Engine Mounts	U.S.: 6,397,965 Canada: 2,317,237
New Flyer Connect™ Products & Services	U.S.: 6,556,899; 6,611,739; 6,681,174; 6,556,899; 6,611,739; 6,681,174; 8,548,669 Canada: 2,689,744
Note 1: Not all buses have features covered by all patents. Contact Legal@newflyer.com for further information.	

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.

Danger, Warning, Caution & Note

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

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

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

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

☞NOTE:

Used to provide additional information that requires special attention by the operator.

Contacting New Flyer

If additional information is required, contact the Publications Department of:

New Flyer Industries Canada ULC
76-630 Kernaghan Ave.
Winnipeg, Manitoba
Canada
R2C 5G1
tel: (204) 982-8437
fax: (204) 667-5769

VEHICLE SPECIFICATIONS

VEHICLE TYPE	
Model	New Flyer XT40 transit bus
Customer	King County Metro - SR1800/1864
Build Year	2014
ELECTRIC DRIVE SYSTEM	
Traction Motor	*Vossloh Kiepe*
	Type - force-ventilated 3-phase asynchronous motor
Current Collector (roof-mounted)	*Vossloh Kiepe OSA 501*
Electronic Control Units (roof-mounted)	*Vossloh Kiepe* Front Roof Auxiliary Container (RAC 101)
	Vossloh Kiepe Front Roof Traction Container (RTC 101)
Brake Resistor Unit (roof-mounted)	*Vossloh Kiepe*
Energy Storage System (ESS)	*Vossloh Kiepe* battery pack located in the traction motor compartment
DIMENSIONS	
Length (over bumpers)	41 ft. (12.5 m)
Width	8.5 ft. (2.6 m)
Height	11.7 ft. (3.6 m)
Wheelbase	23.6 ft. (7.2 m)
Approach/Departure Angle	9°
Vehicle Weight (approx.)	31,210 lbs. (14,157 kg)
Gross Vehicle Weight Rating (GVWR)	43,660 lbs. (19,805 kg)
AXLES & SUSPENSION	
Front Axle	*MAN* VOK-07-F
Front Gross Axle Weight Rating (GAWR)	15,000 lbs. (6,805 kg)
Front Axle Ride Height	4" (102 mm)
Suspension Air Springs	*Firestone*

Suspension Shock Absorbers	*Koni*
Rear Axle	*MAN* HY-1350-F (5.67:1)
Rear Gross Axle Weight Rating	28,660 lbs. (13,000 kg)
Rear Axle Ride Height	3.8" (97 mm)
Suspension Air Springs	*Firestone*
Suspension Shock Absorbers	*Koni*
Driveshaft	*Prop Shaft Supply* 1710 with crosstooth flanges
STEERING	
Steering Gear	*R.H. Sheppard* M110 with remote miter box
Oil Flow	3.6 gal/min
Pressure Relief	1,850 psi
Steering Column	*Douglas Autotec* double tilt 9204 Series
Power Steering Reservoir	2.3 usable gallon steel tank with sight glass and return filter
Power Steering Pump (Electric motor Driven)	*Luk* 21 cc/rev, 19 L/min, 2175 psi (150 Bar) relief pressure, CW
Power Steering Motor	*Parker* 24 V, 3 phase, brushless servo motor with DC Drive/ Controller
WHEELS & TIRES	
Tires	*Firestone*
Tire Size	305/70R22.5
Inflation Pressure	120 psi
Rim Mounting	10 Bolt hub piloted
Wheels	Steel
Maximum Load (single tire)	7,390 lbs. @ 120 psi
Maximum Load (dual tires)	6,940 lbs. @ 120 psi
BRAKE SYSTEM	
Brakes, Mechanical (front)	*Knorr-Bremse* SN7000 air-actuated sliding caliper disc brakes
Brakes, Mechanical (rear)	*Knorr-Bremse* SN7000 air-actuated sliding caliper disc brakes

Wear Sensor (front)	End of life wear sensors in brake pads
Wear Sensor (rear)	End of life wear sensors in brake pads
Service Brake Chamber (front)	*MGM*
Service Brake Chamber (rear)	*MGM*
Antilock Braking System (ABS)	*Meritor Wabco* ABS on all wheels
Automatic Traction Control (ATC)	*Meritor Wabco* ATC on rear wheels
Parking Brake Application	Spring brake chamber applied with push/pull control valve located on side console
Parking Brake Release	Spring brake chamber released with application of air from push/pull control valve located on side console
Emergency Brake Application	Spring brake chamber applied with loss of reservoir pressure, modulated with brake treadle application
HVAC SYSTEM	
HVAC Unit	*Thermo King* TE15EH-M1 rear electric unit
Defroster	*Mobile Climate Control 9kw electric*
Floor Mounted Heaters	*Mobile Climate Control* 6kw/3kw electric in passenger area (4)
Driver's Booster Fan	*Mobile Climate Control* ducted blower
COOLING SYSTEM	
Traction Motor Fan	*Vossloh Kiepe*
AIR SYSTEM	
Compressor	*Powerex* scroll compressor
Air Dryer	*Graham White QBA-15 air dryer*
Batteries (4)	*Odyssey Extreme Battery*
Battery Type	Maintenance-free Absorbed Glass Mat (AGM)
Battery Group Size	31
Battery Charge Voltage	29.0 ± 0.3 Volts
EXTERIOR LIGHTING	
Headlights	Integrated unit with 12 Volt LED low beam, H11 incandescent high beam & amber LED turn lights

Exterior Stop/Tail Lights	12 Volt LED
Side Turn/Marker Lights	12 Volt LED
Clearance Lights	12 Volt LED
INTERIOR LIGHTING	
Aisle Lights	*TCB* 24 Volt LED lights with dimmable Gen 3 clever boards
INSTRUMENTATION	
Instrument Panel	*Parker-Vansco* electronic
	User programmable inputs, outputs, gauges, telltales & LCD display
	2 Controller Area Network (CAN) ports for J1939 chassis/ drivetrain networks
	USB device port for communicating with a PC
Overhead Recess Panel	Destination sign controller
	Driver's booster fan switch
	Propulsion system emergency shutoff
	Front roof hatch switches
	HVAC control panel
	Fire Suppression display panel & manual actuator
MULTIPLEXING SYSTEM	
Multiplexing Module (VMM) System with J1939 Network Communication	*Parker-Vansco* VMM 1615 modules (6)
Instrument Panel	*Parker-Vansco* electronic
AVA/AVL SYSTEM	
Driver/Vehicle Monitoring System	*New Flyer* Connect™ system
DESTINATION & ROUTE SIGNS	
Sign Control	*Luminator* Operator Display Keyboard (ODK 4)
Front Destination	*Luminator* SMT series
Side Destination	*Luminator* SMT series

Street-Side Destination	*Luminator* SMT series
Rear Route	*Luminator* SMT series
DOORS	
Entrance Door	*Vapor* Electric slide glide
Limit Switches	Inductive proximity switches
Exit Door	*Vapor Electric slide glide*
Exit Door Opening Size	Wide
Limit Switches	Inductive proximity switches
Driver's Door Control	Push-button door controller located on the side console
Passenger Door Control	Exit door driver operated
WINDOWS	
General	*Arow Global*, top tip-in
Mounting	Frame
Frame	Black anodized aluminum
Glazing	Laminated glass
Tinting	Grey, 44% light transmittance
Driver's Window	Two piece slider with interior & exterior handles
Glazing	Laminated glass
Tinting	Green, 72% light transmittance
Emergency Escape	2 curbside & 4 streetside identified with labels
SEATING	
Driver's	*USSC* Q91
Passenger	*4ONE* Aries
Passenger Seating Quantity	36
Wheelchair Stations	2 (seats fold up & lock)
FLOOR & SUBFLOOR	
Subfloor	Plywood

Flooring	*Altro* Flooring
Sealant	*Altro*
SAFETY FEATURES	
High Voltage Isolation	Entrance and exit doors, grab handles, grab rails, stanchions, wheelchair ramp, and bike rack
Propulsion System Emergency Shutoff	Push button switch located on driver's overhead panel
Emergency Escape Exits	2 curbside windows identified with labels
	4 streetside windows identified with labels
	2 roof hatches, front motorized
Fire Extinguisher	5 lb ABC rating
Fire Extinguisher Location	Curbside luggage rack, in equipment box
Safety Triangles Location	Curbside luggage rack, in equipment box
Entrance Door Emergency Release	Rotary valve located in baseplate above entrance door
Exit Door Emergency Release	Rotary valve located behind breakable cover, forward of exit door
Accelerator & Brake Interlocks	Entrance or exit door is open
	Exit door emergency release is actuated
	Vehicle is kneeling
	Wheelchair ramp is not stowed
	Parking brake is applied
	Loss of air pressure at exit door
	Hill holder switch is activated
	Rollback protection is active
Sensitive Edges	Exit door panels
Fire Suppression System	*Amerex* Safety Net (AVSN) System
Camera System	*Roadrunner* system with 8 cameras

ACCESSIBILITY FEATURES	
Wheelchair Ramp	*Lift-U* LU11 24V electronically operated, located at entrance door
Wheelchair Ramp Width	Flip-out stainless steel 32"
Wheelchair Ramp Slope Ratio	1:6
Wheelchair Ramp Max. Load Capacity	950 lbs. (430 kg.)
Kneeling	Front suspension, rapid recovery

2. EMERGENCY INFORMATION

Vehicle Evacuation & Shutdown

In the event of an emergency, follow the evacuation and shutdown procedure in the sequence shown:

1. Pull the vehicle over to a safe location.
2. Apply the parking brake
3. Open the front and rear passenger doors.
4. Shutdown the vehicle by either:
   a. Setting the Master Run switch to the STANDBY position.
   b. Pressing the Propulsion System Emergency Shutoff switch, located on the driver's overhead panel.

⚠ WARNING

DO NOT allow the passengers to exit the vehicle if the "Hot Coach" message is displayed on the instrument panel and the warning buzzer is sounding. Ensure that the overhead poles have been lowered and stowed in the hooks before allowing passengers to disembark.

5. Direct all passengers to a safe area, away from the vehicle.
6. Alert the transit authority of the emergency.
7. Retrieve the Emergency Responder Guide and exit the vehicle.

⚠ WARNING

Assess the situation to determine whether it is safe to approach the rear curbside area of the vehicle before proceeding with the following steps.

8. Approach the rear curbside area of the vehicle and open the Battery Disconnect access door.

9. Shut off all 12/24 VDC electrical power to the vehicle by setting the Battery Disconnect switch to the OFF position. See “Figure 1: Battery Disconnect Switch” on page 14.
10. Wait for emergency response personnel to arrive and assist them by providing details of the emergency and handing over the Emergency Responder Guide.

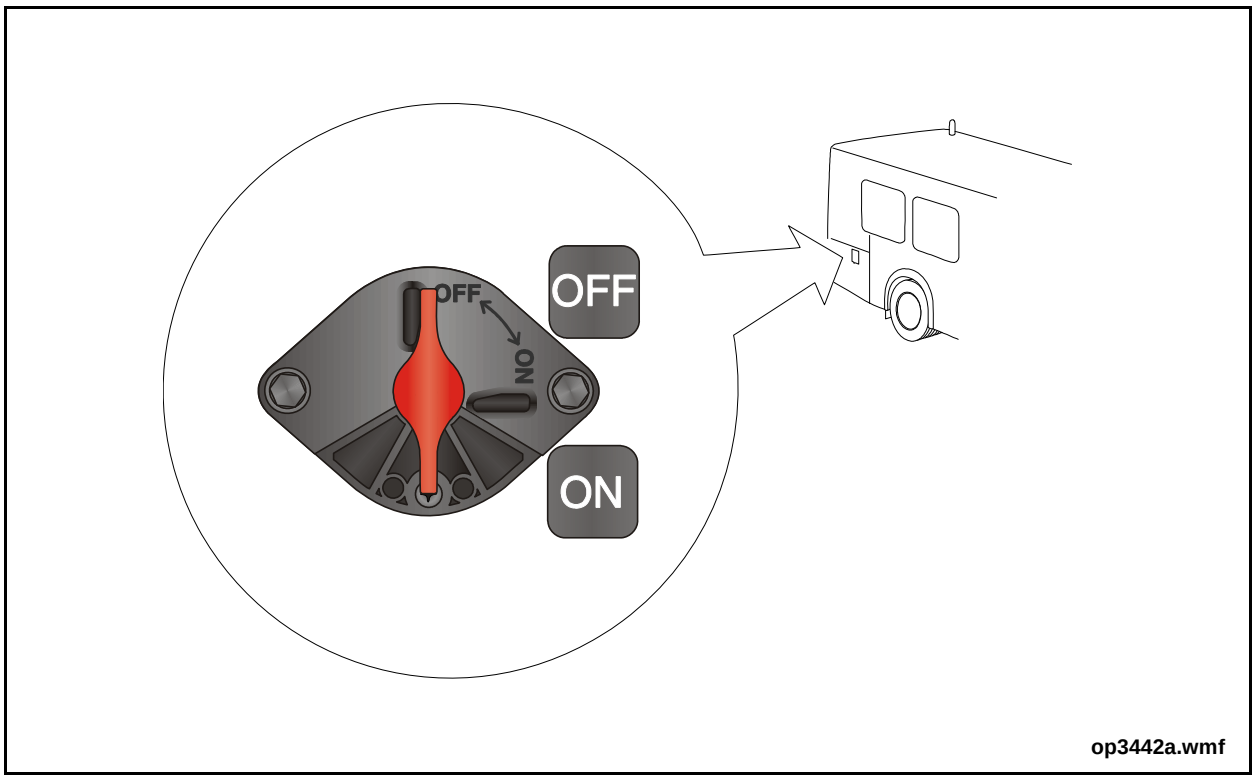

Figure 1: Battery Disconnect Switch

Propulsion System Emergency Shutoff

The Emergency Shutoff switch, located on the driver's overhead panel, controls power to all high-voltage systems on the vehicle including the Propulsion System. See "Figure 2: Propulsion System Emergency Shutoff" on page 15. Pushing down on the switch disables all power to the vehicle's electric propulsion system. This means there will be no power to the traction motor, regenerative braking system, HVAC system, air compressor, charging system, and the Energy Storage System (ESS).

Activate the Emergency Shutoff switch only in an emergency situation, such as uncontrolled acceleration of the vehicle. Use caution bringing the vehicle to a stop as the regenerative braking system will be disabled. The emergency shutoff does not operate the vehicle brakes and does not assist in stopping the vehicle.

☞NOTE:

Pressing the emergency shutoff switch locks it into a maintained position. Reset the switch by rotating the knob 1/4 turn counter-clockwise to allow the switch to return to the raised operating position.

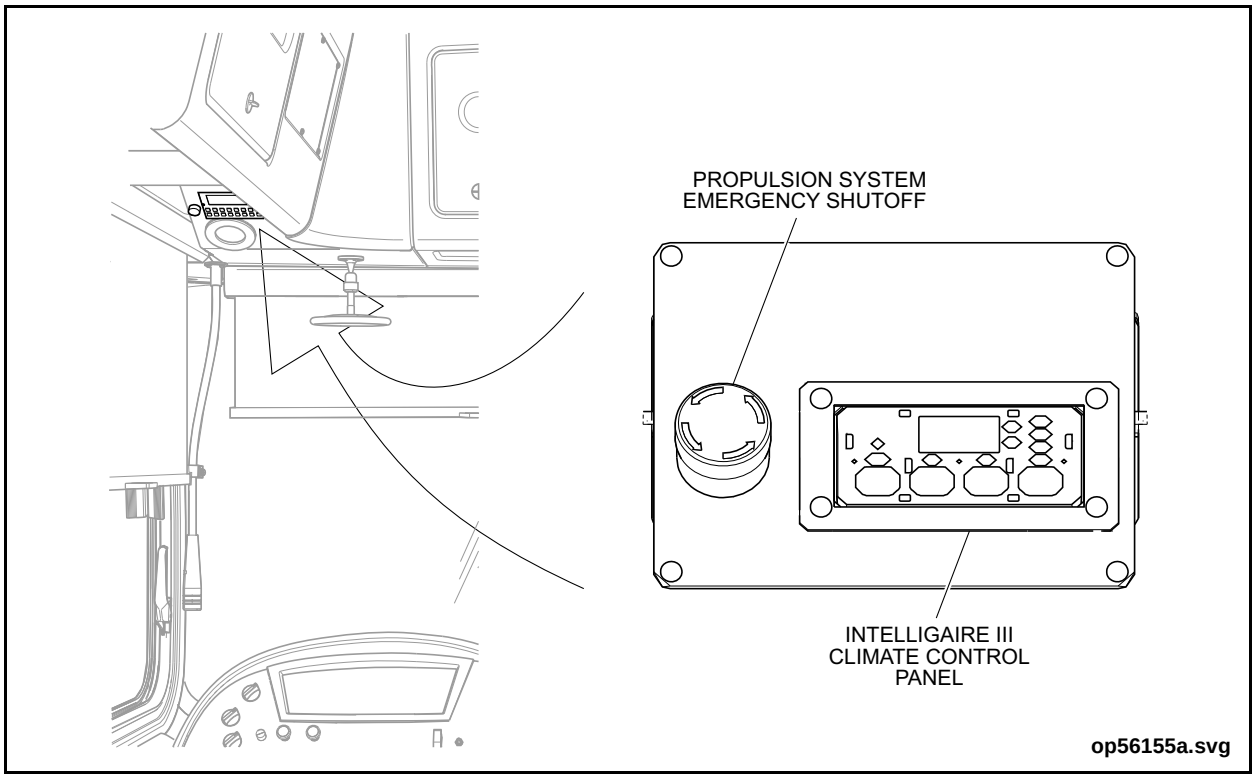

Figure 2: Propulsion System Emergency Shutoff

Escape Exits

Side Windows

The windows which function as emergency exits are identified by labels.

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. See “Figure 3: Window Emergency Handle” on page 16.

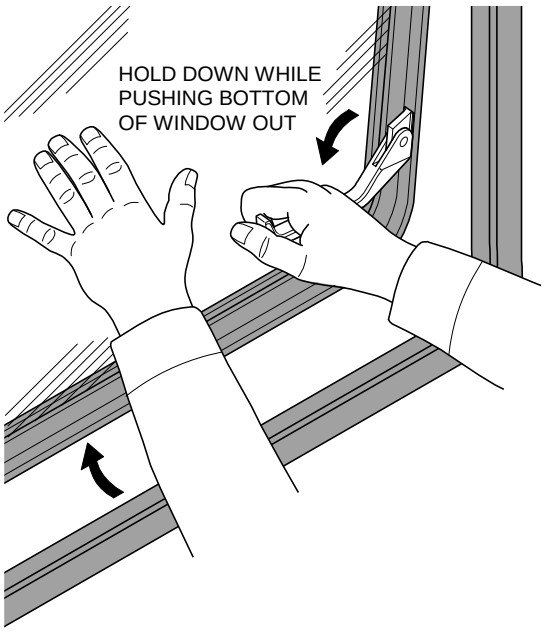

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Figure 3: Window Emergency Handle

Roof Hatches

Both roof hatches function as emergency exits and are identified by decals on the hatch panel. Proceed as follows to operate the emergency exit: See “Figure 4: Roof Hatch Emergency Exit” on page 17.

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. Turn the latch knob to the latched position.
5. Push up on the hatch to ensure proper engagement. Pull the hatch downwards to close.

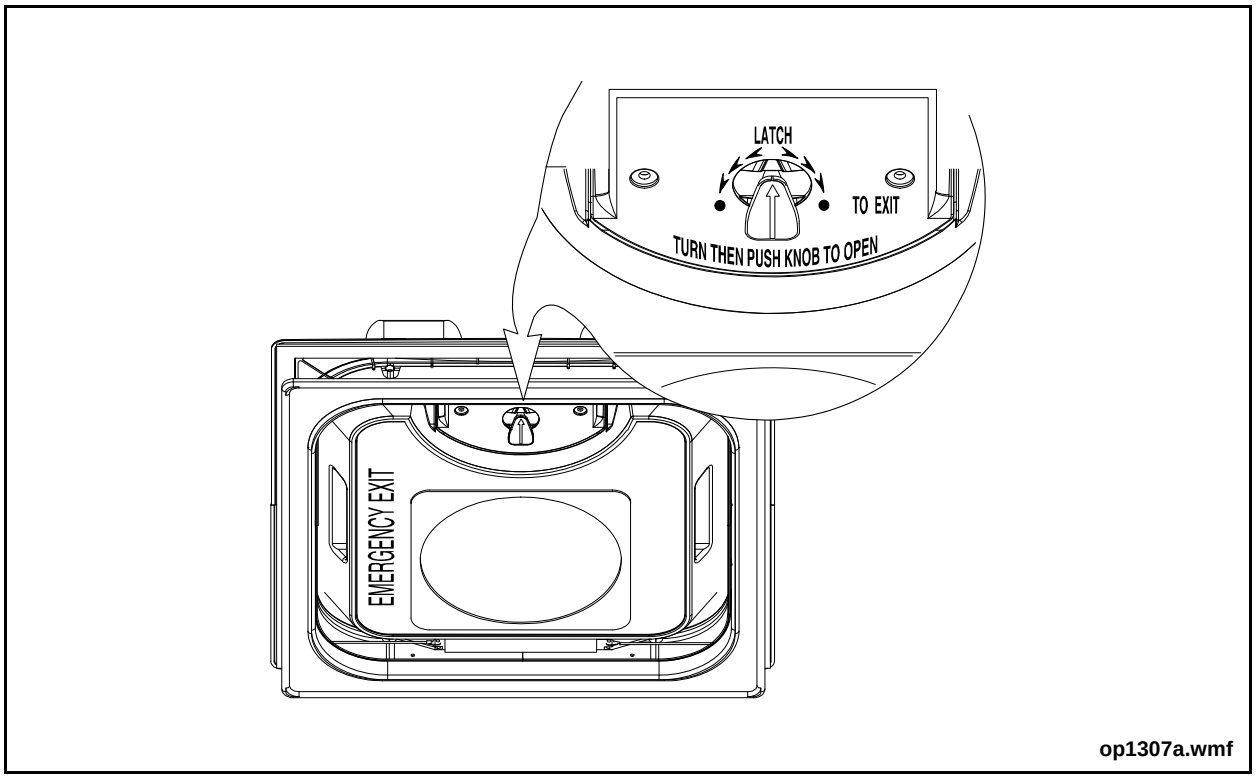


Figure 4: Roof Hatch Emergency Exit

Emergency Release Control Valve - Entrance Door

The entrance door emergency release control valve is located behind a breakable window in the door mechanism access cover. In an emergency, break the glass to access the control valve knob. Rotate the knob 90° counter-clockwise to release air pressure from door operator, then push the doors open. As the doors open they activate the header and curb lights. See “Figure 5: Entrance Door Emergency Release Control Valve” on page 18.

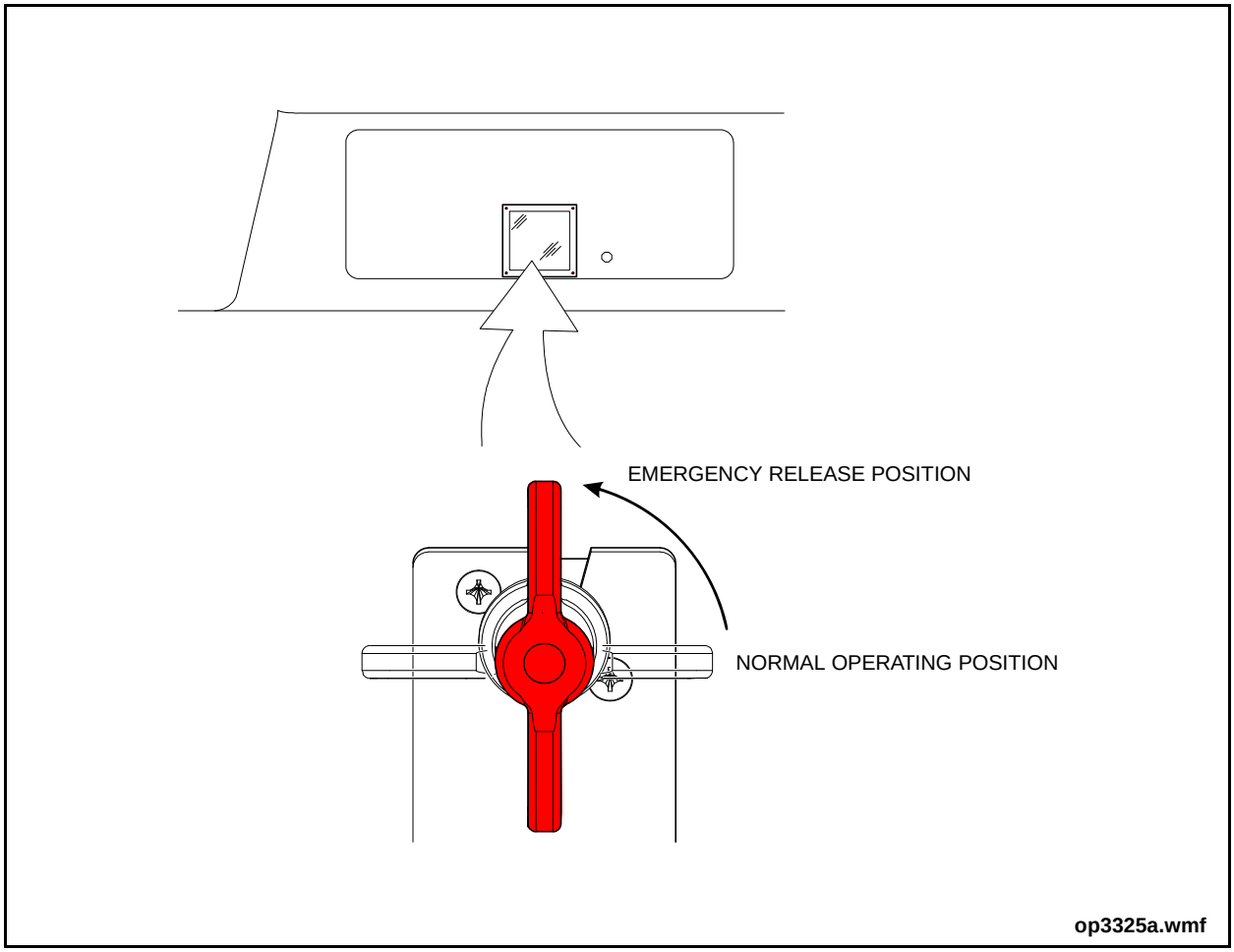


Figure 5: Entrance Door Emergency Release Control Valve

Emergency Release Control Valve - Exit Door

The exit door emergency exit control valve is located to the left of the exit door header, behind a breakable window. In an emergency, break the glass to access the control valve knob. Rotate the control valve knob 90° counter-clockwise to release air pressure from the door operator, then push the doors open. As the doors open they activate the header and curb lights, the brake interlocks, and the Rear Door Open indicator. See “Figure 6: Exit Door Emergency Release Control Valve” on page 19.

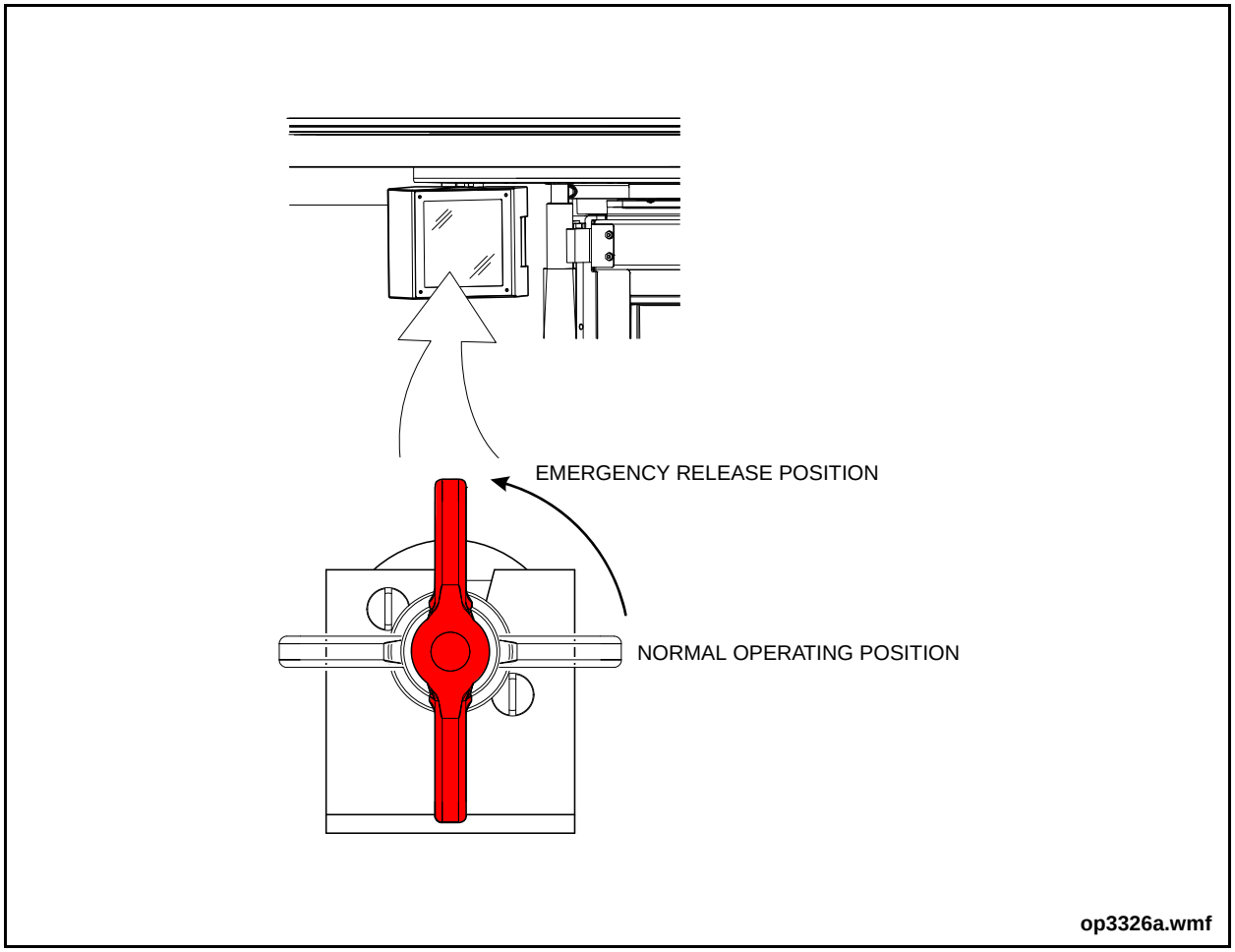


Figure 6: Exit Door Emergency Release Control Valve

3. SAFETY INFORMATION

Hot Coach Condition

WARNING

In a hot coach condition the chassis has a hazardous voltage potential to ground.

A hot coach condition occurs when an insulator fails and the vehicle structure has a hazardous electrical potential to ground. If this occurs the hot coach indicator on the instrument panel will illuminate and a buzzer on the instrument panel will sound. Make sure passengers do not step off the vehicle and nobody touches the vehicle from outside the vehicle until the poles are lowered from the overhead power line.

Stop the vehicle, apply the parking brake and lower the poles using the Current Collector switch on the side console. Check to ensure that the poles are lowered correctly.

WARNING

When jumping out of the vehicle DO NOT touch the vehicle and the ground or any exterior surface at the same time.

DO NOT access the rooftop of the vehicle. Rooftop-mounted components may be hot and high voltage potentials exist.

If the poles do not lower when the Poles switch is operated, jump out of the vehicle, without touching the vehicle, and manually lock the poles into the hooks using the rope. Allow passengers to exit the vehicle only after poles are properly stowed in the hooks. After all passengers have left the vehicle, move the vehicle to a safe location using ESS mode or have it towed. Call your transit authority for assistance.

High Voltage Isolation

This vehicle is designed to isolate occupants of the vehicle from high voltage risk in the event of a “hot coach condition”. The areas of the vehicle that could provide a path to ground from the vehicle chassis or body have been isolated. These components include the entrance and exit doors, grab handles, grab rails, stanchions, wheelchair ramp, and bike rack.

Safety Features & Equipment

Warning Buzzer

A warning buzzer is located behind the mode selector on the instrument panel. It is controlled by the hot coach detector and by the central control unit. The buzzer operates under the following conditions:

Hot Coach or Fail Light Condition

The buzzer will emit a steady tone if the red “FAIL” lamp is illuminated, a hot coach condition has occurred or the vehicle is passing through a zero voltage section of overhead line.

Check Light Condition

A 1/4 second tone followed by 1/4 second pause, a half second tone, 1/4 second pause and 1/4 second tone repeated every 1 1/2 seconds indicate illumination of the amber CHECK LIGHT.

Dewirement Condition

Continuously repeating 1/4 second tones separated by 1/4 second pauses indicate dewirement of the poles.

Shutdown Interlock Condition

Two 1/4 second tones separated by a 1/4 second pause repeated every 1 1/4 seconds indicate that the vehicle will not shut down when the Master Run switch is set to the STANDBY position due to the poles not being correctly stored or attached to the overhead line. If this occurs, correctly store the poles or attach them to the overhead line.

Communication Fault Condition

The buzzer will emit a single 1/4 second tone every 2 seconds to indicate communication failure between the Vossloh Kiepe and New Flyer Systems. See “Figure 7: Buzzer Tone Pulse Width Chart” on page 22.

A separate buzzer, also located behind the instrument panel, is controlled by the Speedometer Control Unit (SCU) and is associated with the following vehicle functions:

- Door Master switch
- Rear Door Emergency switch
- Rear door sensitive edges
- Low air pressure indication
- Stop lamps fault
- Auxiliary system fault
- Stop System indicator active

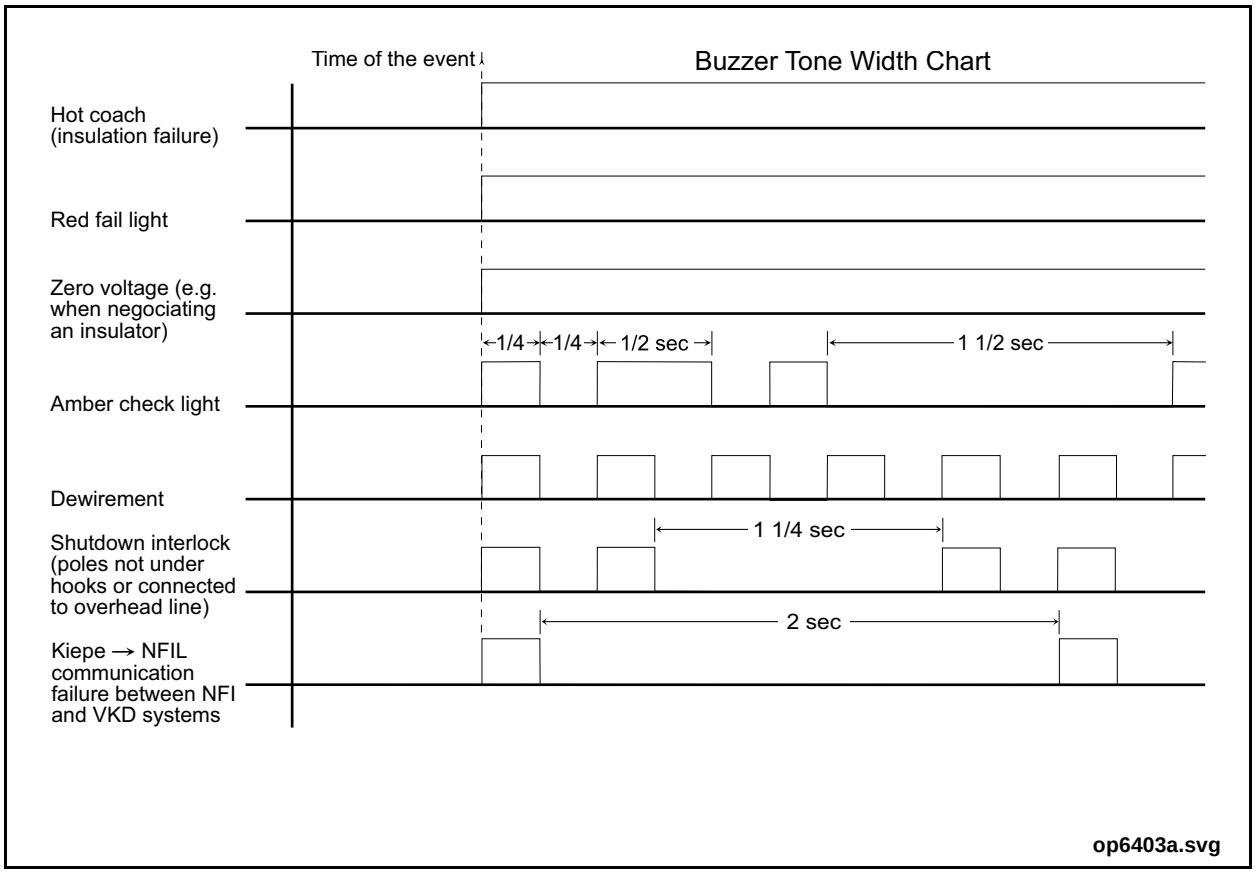


Figure 7: Buzzer Tone Pulse Width Chart

Safety Procedures

Do not drive the vehicle if:

- Indicators, instruments or gauges show that a major vehicle operating system is malfunctioning.
- The hot coach indicator on the instrument panel remains illuminated.
- Poles, ropes or trolley heads are damaged.
- Ropes are not inside the rope guide above the rear window.
- Any roof compartment door or exterior access door is open.
- Liquid spillage of the batteries has occurred.
- Rope reel does not free-wheel easily.
- Beneath the vehicle, puddles of rear axle fluid, power steering fluid, or traction motor oil 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, discolored, 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 in areas where hydraulic fluid, traction motor oil or any other flammable fluid has leaked.

Safety Equipment

The following safety equipment is supplied with this vehicle:

- Hand-held fire extinguisher - 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. See “Figure 8: Safety Equipment” on page 24.
- Safety triangles - Position the triangles at the front and rear of the vehicle to warn other drivers during emergency situations.

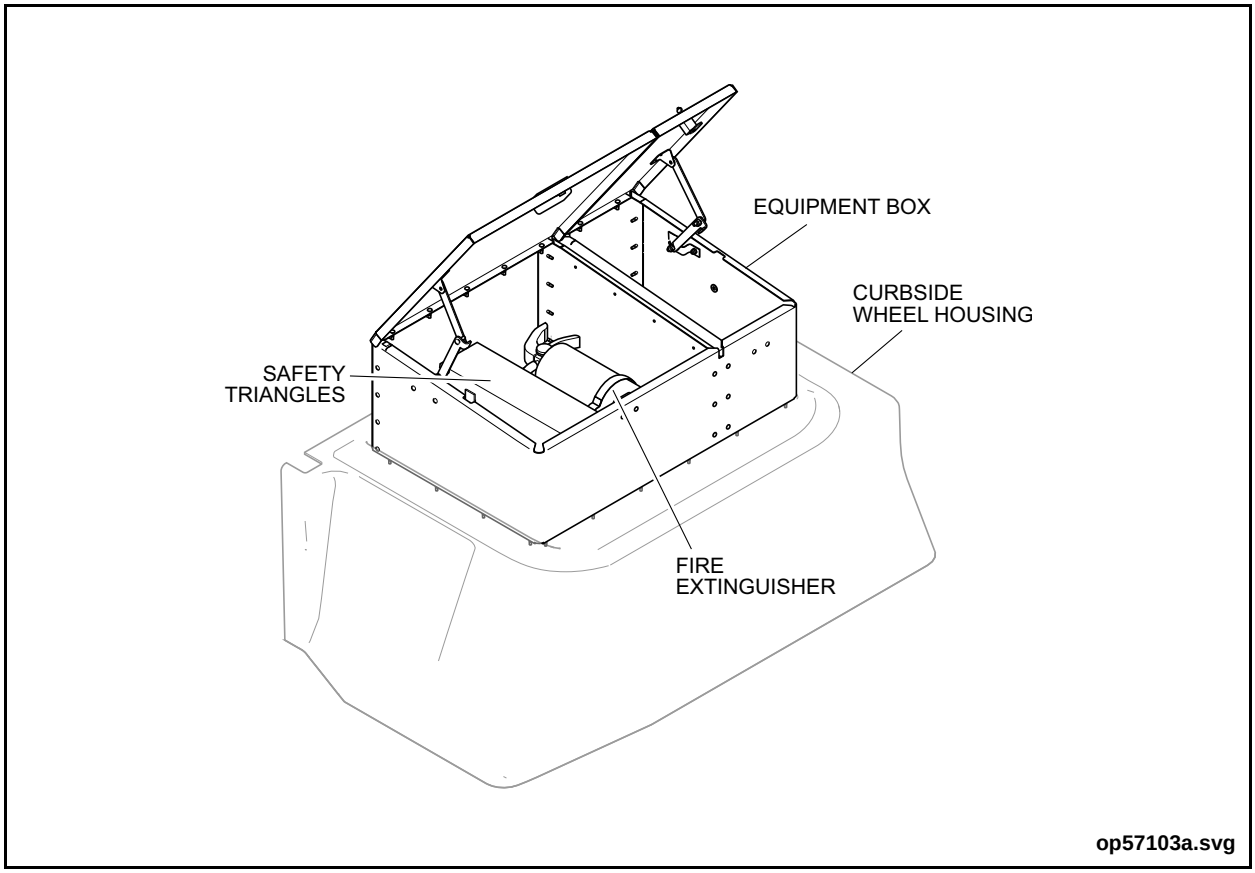


Figure 8: Safety Equipment

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 traction motor compartment, 12/24 VDC battery compartment, or rooftop propulsion system, an alarm will sound. The extinguishing agent will discharge through a nozzle, located in the 12/24 VDC battery compartment, to suppress the fire.

The Fire Suppression System components that are located in the driver's area include the Manual Actuator switch and alarm panel. Refer to "10.FIRE SUPPRESSION SYSTEM" on page 91 in this manual for a description of these components and the system operation.

☞NOTE:

An alarm sounds and the vehicle powers down when the Fire Suppression System is activated.

Exit Door Sensitive Edges

Pressure sensitive rubber seals are mounted to the leading edges of the exit door panels. If they encounter an object or passenger during door closure, an alarm sounds and the doors fully reopen. The doors will again close once they have fully reopened.

☞NOTE:

The Interlock System prevents the vehicle from moving until the exit doors have fully closed.

Obstruction Detection System

Acoustic sensors are mounted at the top of each door panel and in the center of the exit door header. These sensors enhance the sensitive edge function when the door is closing. They monitor the door pathway while the door is open to prevent premature closing. If they detect an object or passenger during door closure, the doors fully reopen. The doors will again close once they have fully reopened and the object or passenger has cleared the doorway.

☞NOTE:

The Interlock System prevents the vehicle from moving until the exit doors have fully closed.

Interlock System

Interlocks disable the accelerator and apply the 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 (except where noted), and any of the following conditions occur:

- Entrance or exit doors are open or enabled.
- Exit door emergency valve is actuated (regardless of vehicle speed).
- Vehicle is kneeling.
- Wheelchair ramp is not stowed.
- Parking brake is applied.
- Loss of air pressure at exit door.
- Hill Holder switch is activated.
- Roll back protection is active.

The Interlock System is intended to protect passengers from inadvertent vehicle movement. The Door Master switch can be used to disable the system for maintenance purposes or in an emergency. Refer to “Door Master Switch” on page 76 in this manual for further information on switch operation.

☞NOTE:

The brake treadle drops slightly when the interlock system applies. When the interlocks apply, the Multiplexing System logs the application pressure in the brake lines. To release the interlocks, the operator must apply pressure to the brake treadle to “push through” the interlock application, exceeding the logged pressure by 10 psi. When released, the treadle will return with the operator’s foot to its normal position.

Video Surveillance System

A Video Surveillance System records events as they occur on the vehicle. The system consists of a digital video recorder, five interior cameras, and three exterior cameras. The video recorder is located in the electronic equipment enclosure. Power is provided to the DVR when the Master Run switch is set to either the DAY-RUN or NIGHT-RUN position.

4. TO ENTER THE VEHICLE

1. Locate the front door open switch compartment below the curbside headlight.
2. Open the access door and operate the switch to open the door. See “Figure 9: To Enter the Vehicle” on page 27.
3. If the entrance door does not open, exhaust air from the entrance door cylinder as follows:
   a. Slide the front portion of the driver’s window back to gain access to the door manual control valve, located below the side console.
   b. Reach over the side console to the valve handle and turn it to the OPEN position.
   c. Open the door manually by pushing on the outer edges of the door panels.

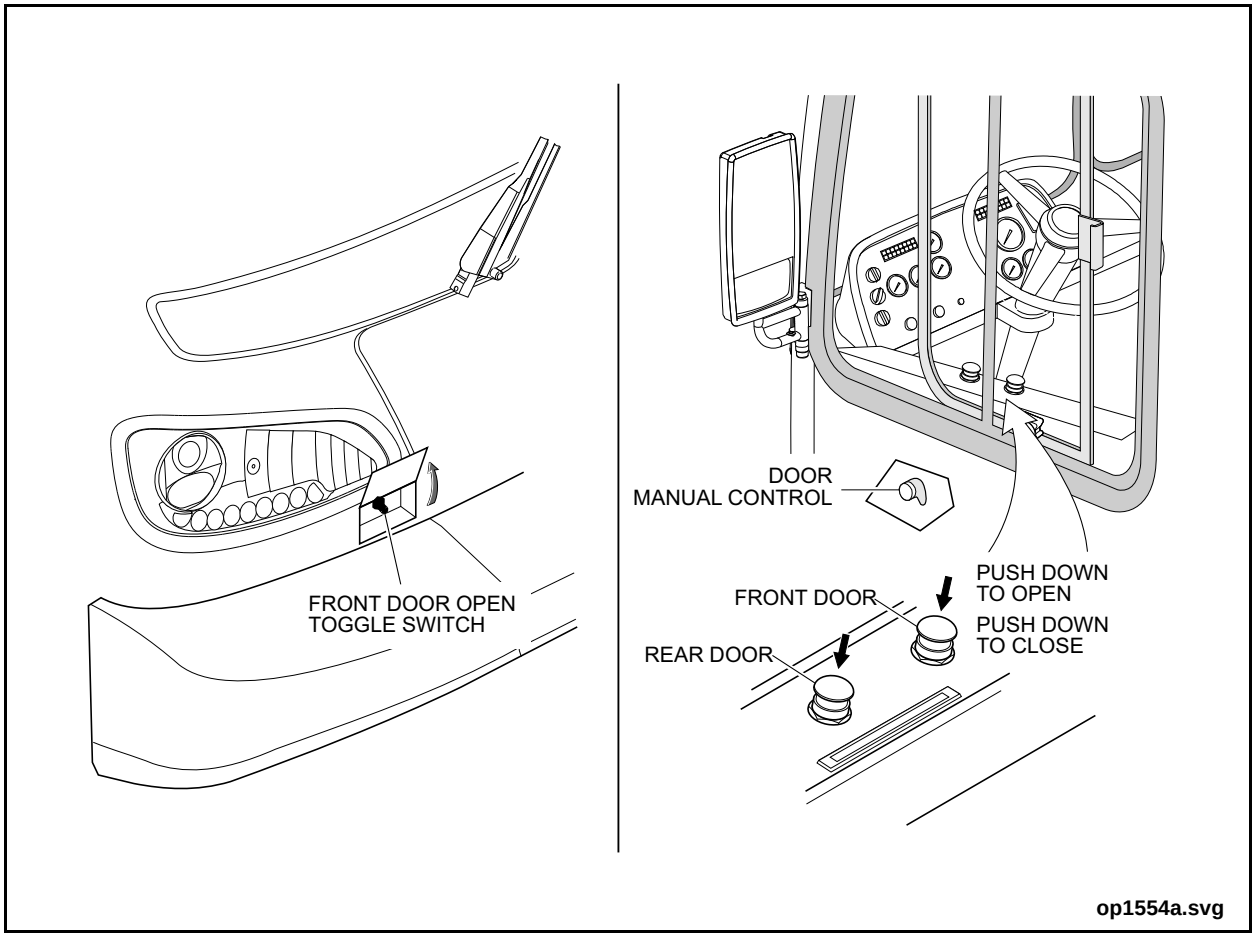


Figure 9: To Enter the Vehicle

5. 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

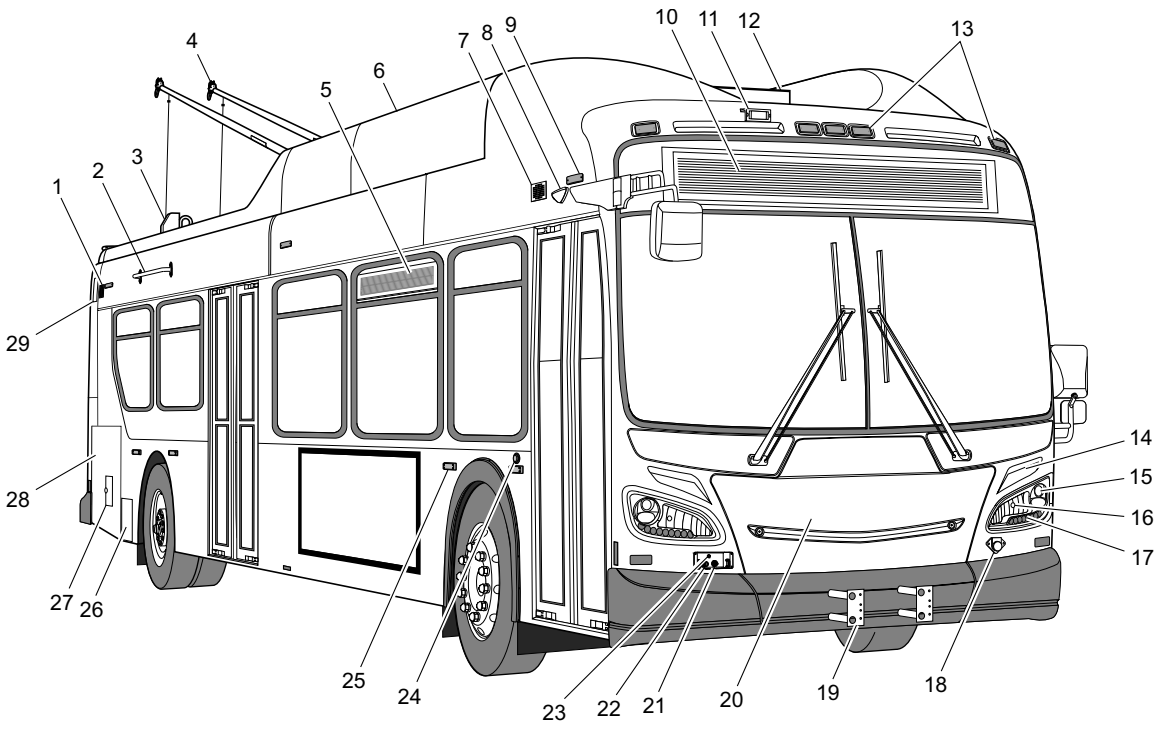
- Battery Disconnect is in the ON position.
- Check for any fluid puddles under the vehicle.
- Check all exterior panels for any visible damage.
- Bumpers are securely mounted and no damage is evident.
- Check the traction motor fan air inlet for any blockage.
- Trolley poles, ropes and contact shoes are undamaged.
- Ropes are inside the rope guide above the rear window.
- Rooftop access doors are securely closed.
- Both trolley rope reels inside the rear ESS compartment freewheel easily, and the ropes are not stuck. This can be done by carefully pulling each rope individually.

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.



1. Traction Motor Air Intake Grille
2. Roof Access Ladder Hook Rail
3. Pole Hooks
4. Pole Contact Shoes
5. Side Destination Sign
6. Rooftop Propulsion System Enclosure
7. Exterior Speaker
8. Exterior Camera
9. Side Marker Light
10. Front Destination Sign
11. Traffic Signal Emitter
12. Propulsion System Braking Resistor
13. Clearance Marker Lights
14. Driver's Lower Vent
15. Headlight, Low Beam
16. Headlight, High Beam
17. Front Turn Light
18. Towing Electrical Connector
19. Bike Rack Mount
20. Defroster/Wiper Access Door
21. Towing Air Connector
22. Supply Air Connector
23. Entrance Door Switch
24. Kneeling/Ramp Warning Light
25. Side Turn Light
26. Fusebox Access Door
27. Battery Cutoff Switch Access Door
28. Battery Access Door
29. HVAC Air Intake Grille

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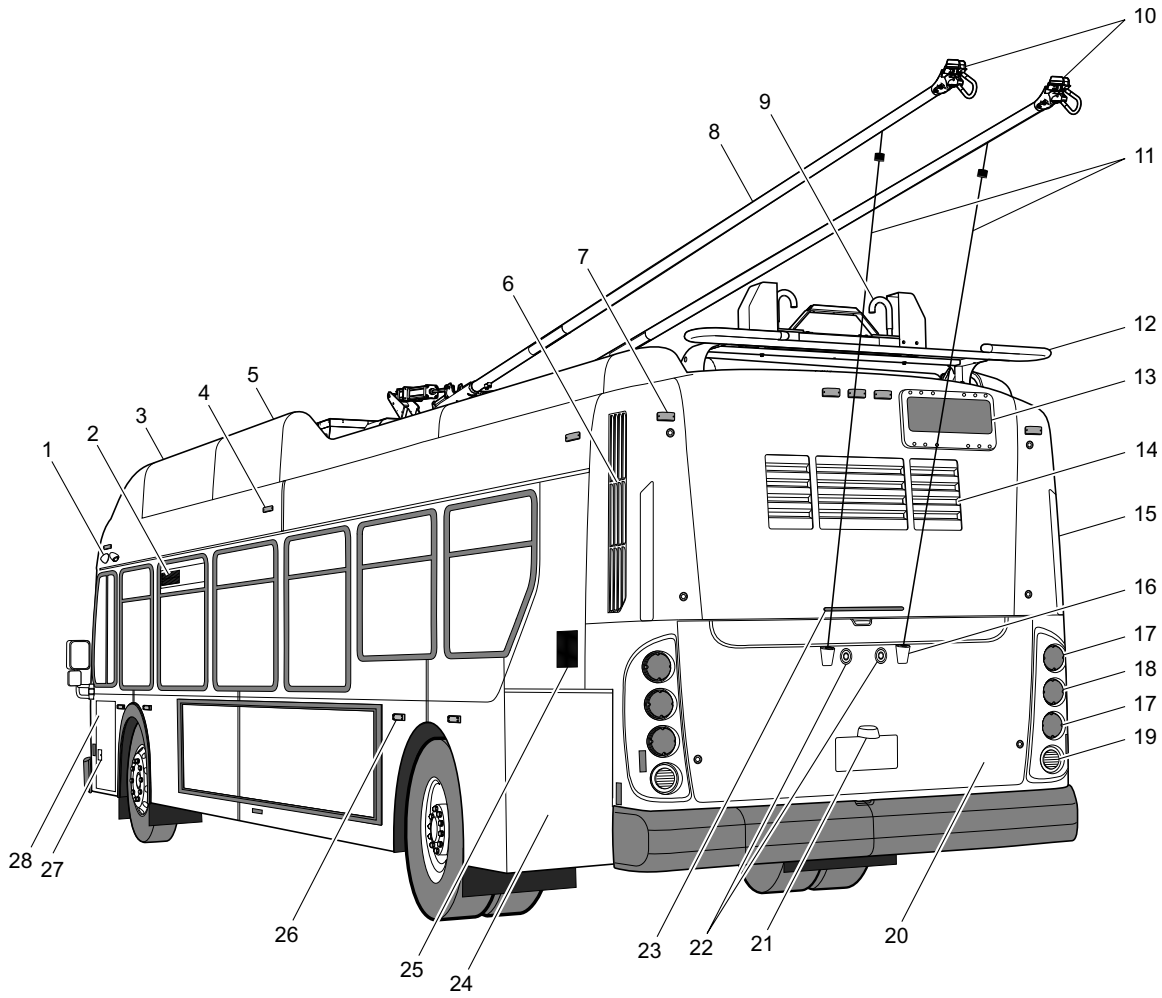
Figure 10: Front Exterior View



1. Exterior Camera
2. Streetside Destination Sign
3. Front Propulsion System Enclosure
4. Side Marker Light
5. Rear Propulsion System Enclosure
6. Streetside Service Access Door
7. Clearance Marker Lights
8. Current Collector Poles
9. Pole Hooks
10. Collector Shoe Assembly
11. Pole Ropes
12. Rope Guide
13. Rear Route Sign
14. HVAC Unit Access Door
15. Curbside Service Access Door
16. Retriever Reel Rope Guide
17. Stop/Tail Light
18. Turn Signal Light
19. Backup Light
20. Propulsion System Access Door
21. License Plate Light
22. Retriever Reel Air Release Push Buttons
23. Center Stop Light
24. Service Access Door
25. ESS Air Intake Grille
26. Side Turn Light
27. Side Console Access Door
28. Windshield Washer Filler

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Figure 11: Rear Exterior View

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.

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.
- Sunvisors and/or 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 front and rear door control push buttons function properly.
- 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 propulsion system powered up. 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 properly.

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.

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 and latch securely upon closing.
- Check operation of all windows equipped with slider or tilt openings. Windows should slide or tilt easily, not be loose in the frame and latch securely upon closing.

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.

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 vehicle. 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 vehicle. Refer to "11.VEHICLE OPERATION" on page 95 *in this manual for details on vehicle 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 System indicators illuminate momentarily, then extinguish.
- The remaining indicators relate to vehicle operation concerns and should be checked by service personnel.

Electrical Control Systems

- The Master Run switch controls the electrical circuits. Refer to "9.INSTRUMENTATION & CONTROLS" on page 56 in this manual for more information.
- Light switches, located inside the service compartments, activate the compartment lights.
- Windshield washers spray washer fluid onto windshield.
- Wipers operate (on wet windshield) without streaks, scraping or noisy operation.
- 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 stop request signal and chime circuits function.
- Accelerator treadle accelerates the vehicle.
- Mode Selector switch functions in forward and reverse driving directions.
- Backup lights illuminate when the transmission is shifted to reverse.
- HVAC System functions when the vehicle is powered up.
- Speedometer functions when the vehicle is moving.

Air Control Systems

- Normal vehicle operation pressure ranges from 120 to 131 psi (827 to 903 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 120 psi (827 kPa).
- Compressor cuts in when the air system pressure drops to approximately 120 psi (827 kPa) and shuts off at approximately 131 psi (903 kPa).

6. 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. See "Figure 12: Driver's Front Area" on page 36. See "Figure 13: Driver's Side Area" on page 37.

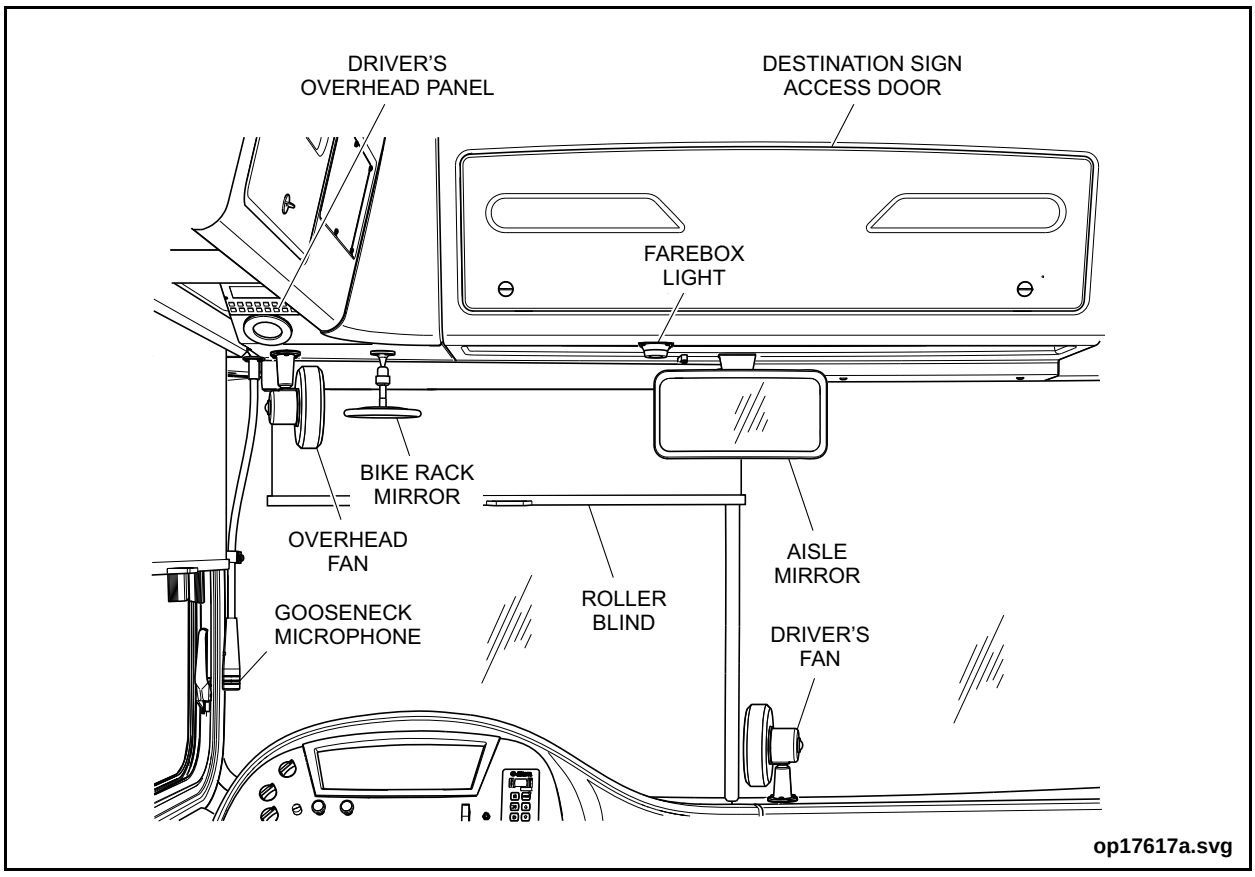


Figure 12: Driver's Front Area

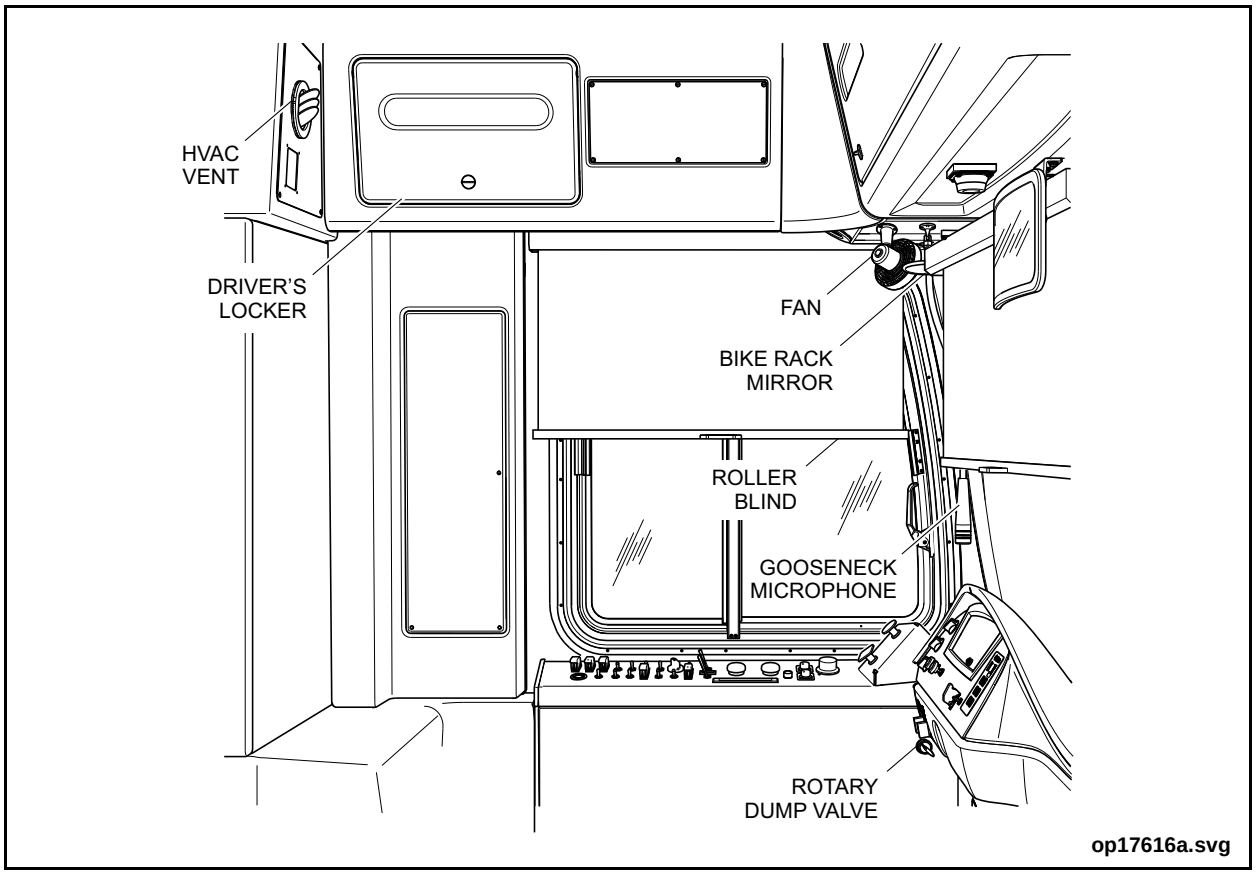


Figure 13: Driver's Side Area

Driver's Window

Front Portion

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

Aft Portion

Pinch the sash handle to release the lock. Pull the handle forward (keeping handle pinched) to open the rear portion of the window.

Push the handle rearward, pinch and release to close and lock the aft sash.

Mirrors

The vehicle is equipped with the following mirrors:

Aisle Mirror

The aisle mirror is located under the front destination sign closeout. Its convex glass surface provides a wide view of the entrance door and passenger area.

Upper Right Mirror

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

Exit Door Area Mirror

The exit door area mirror is located on a stanchion at the exit door. It provides a view of the exit door area when looking through the upper right mirror from the driver's seat.

Bike Rack Mirror

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

View Behind Driver's Mirror

Located above the entrance door, this mirror provides a view behind the driver's seat.

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.

Electronic Equipment Enclosure

The electronic equipment enclosure is located on the streetside wheelhousing and is used for storing the vehicle communication and monitoring equipment. The lockable access door provides security for the stored contents and the slide-out trays provide easy access for servicing the electronic equipment.

Driver's Locker

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

Driver's Overhead Panel

The driver's overhead panel is a recessed panel located above the driver that contains the the following components: See "Figure 14: Driver's Overhead Panel" on page 41.

- Destination sign controller - Refer to "Destination/Route Signs" on page 47 in this manual for information on the operation of the destination sign controller.
- Fire suppression display panel and manual actuator - Refer to "10.FIRE SUPPRESSION SYSTEM" on page 91 in this manual for a description of the fire suppression components and the system operation.
- HVAC control panel - Refer to "Driver's Climate Controls" on page 74 in this manual for information on the HVAC control panel.
- Propulsion System emergency shutoff push button. Refer to "Propulsion System Emergency Shutoff" on page 15 in this manual for information on this push button.
- Driver's Booster Fan switch. Refer to "Driver's Climate Controls" on page 74 in this manual for information on this switch.
- Front Roof Hatch switches.

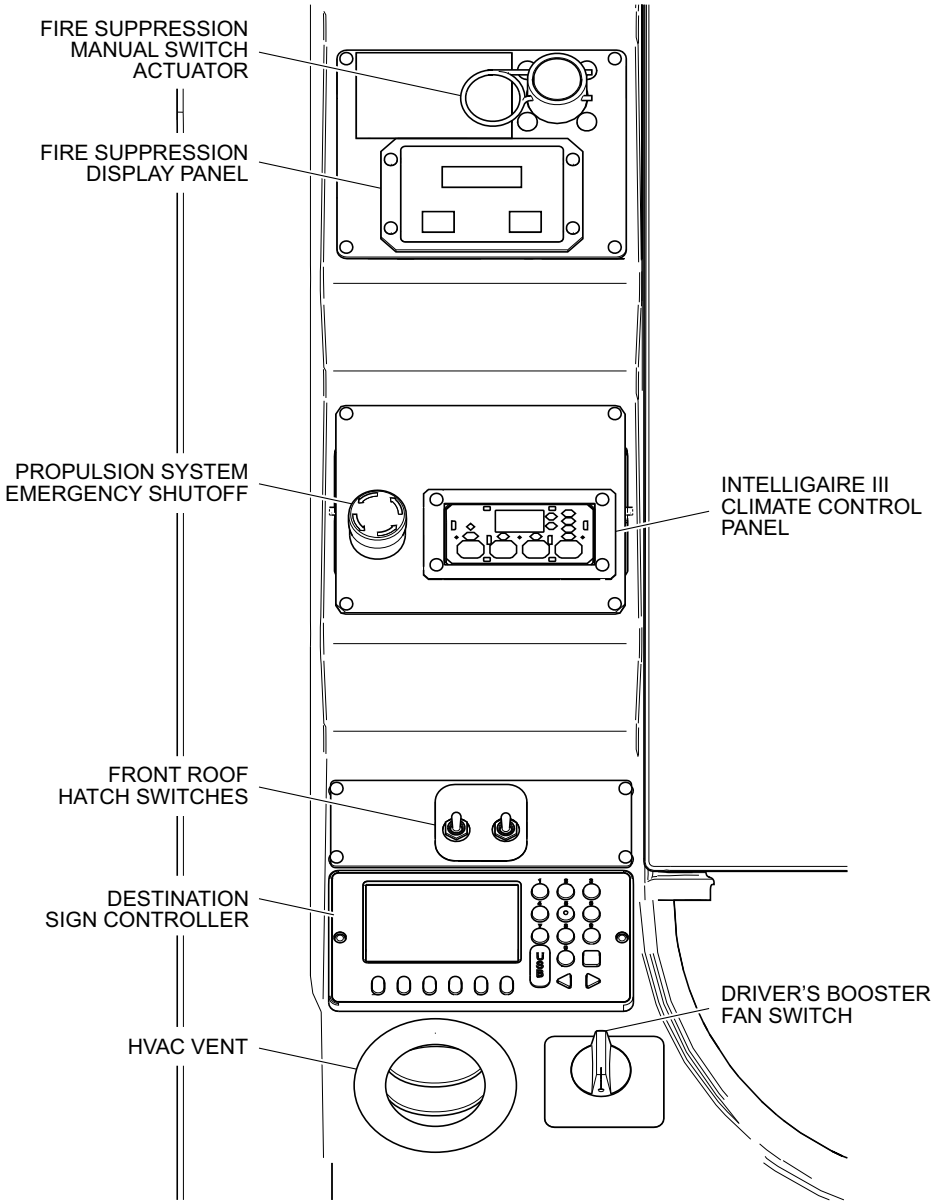
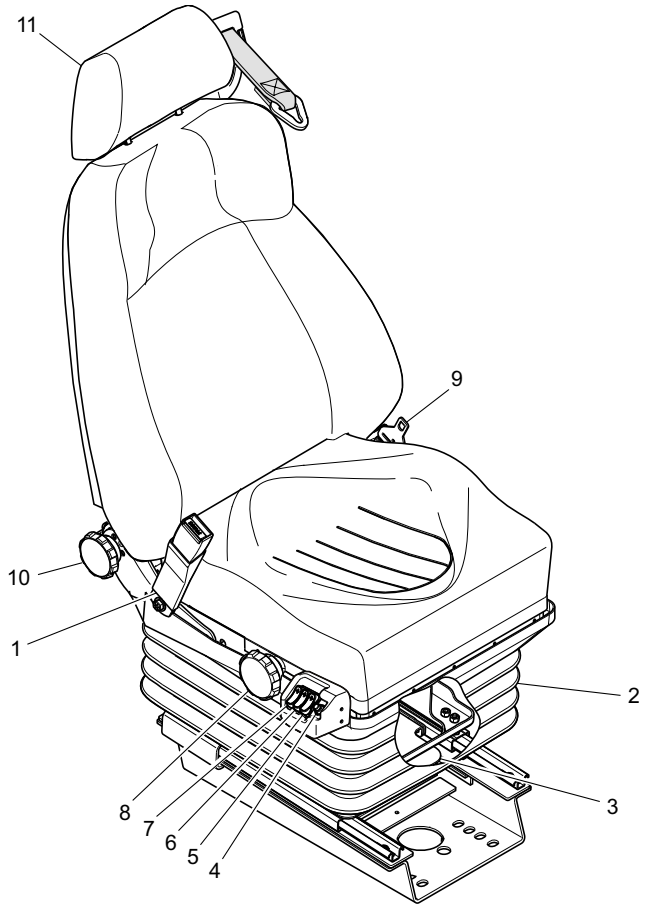


Figure 14: Driver's Overhead Panel

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. See "Figure 15: Driver's Seat" on page 42.

Nine 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. Seat-Belt Receptacle
2. Bellows
3. Fore/Aft Locking Device
4. Fore/Aft Adjustment Button
5. Bottom Lumbar Adjustment
6. Middle Lumbar Adjustment
7. Top Lumbar Adjustment
8. Seat Tilt Control
9. Seat-Belt
10. Back Rest Adjustment
11. Adjustable Headrest

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Figure 15: Driver's Seat

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.

Shoulder Belt Loop Guide

The upper adjustment knob on the right side of the backrest is used to adjust the belt loop guide. Turn the knob clockwise to raise the guide or counter-clockwise to lower it.

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.

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 vehicle 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.**

A hydraulic powered steering system turns the front wheels when moving the steering wheel left or right (the vehicle 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. See "Figure 16: Steering Wheel Adjustment" on page 45.

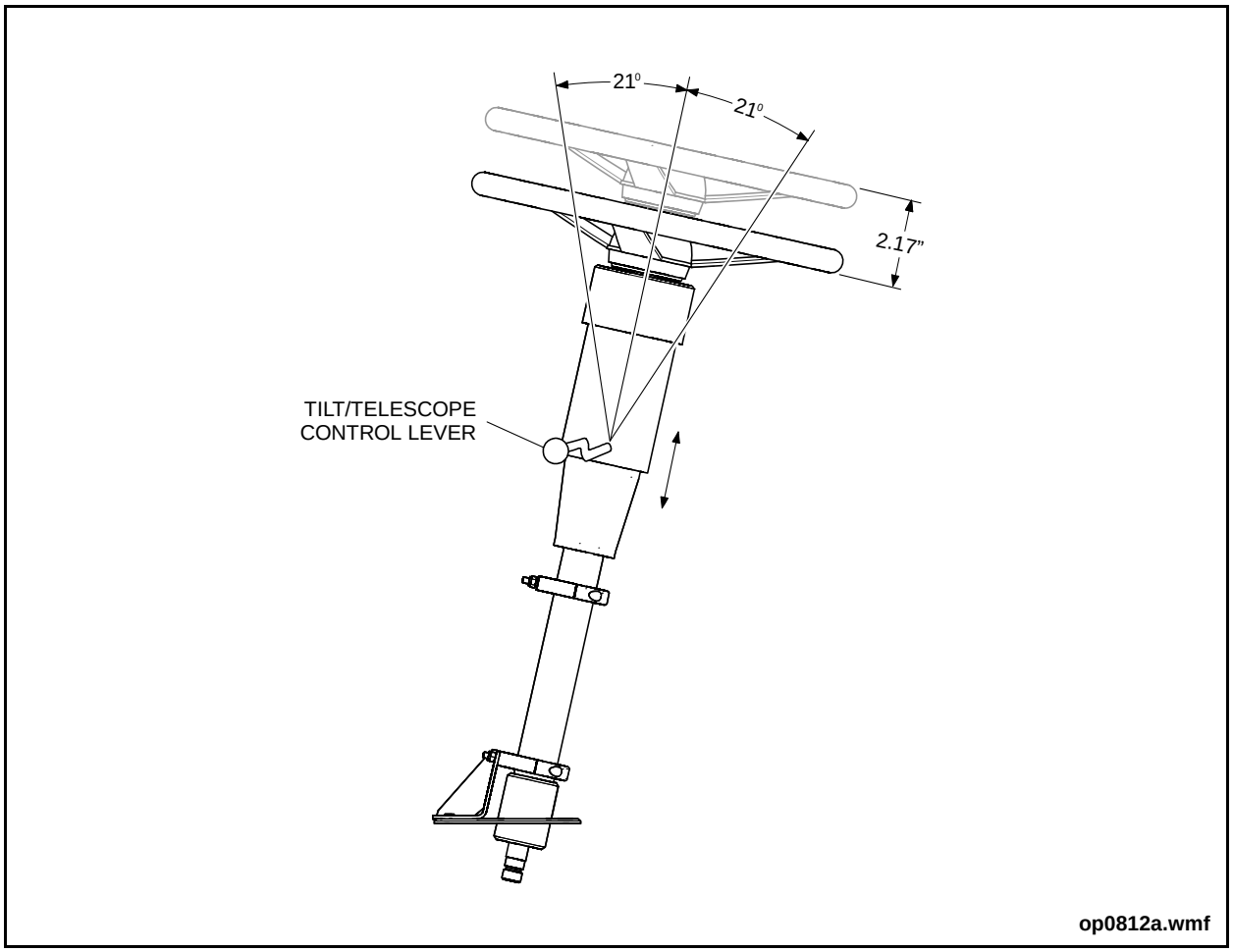


Figure 16: Steering Wheel Adjustment

Horn

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

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: See "Figure 17: P.A. System Layout" on page 46.

- A goose neck microphone located at the left windshield pillar.
- Six interior speakers located above the side windows.
- An exterior speaker located above the entrance door.
- A speaker select switch on the side console switch panel.

To use the system first position the Speaker Select toggle switch on the side console to operate the desired speakers, then speak into the microphone.

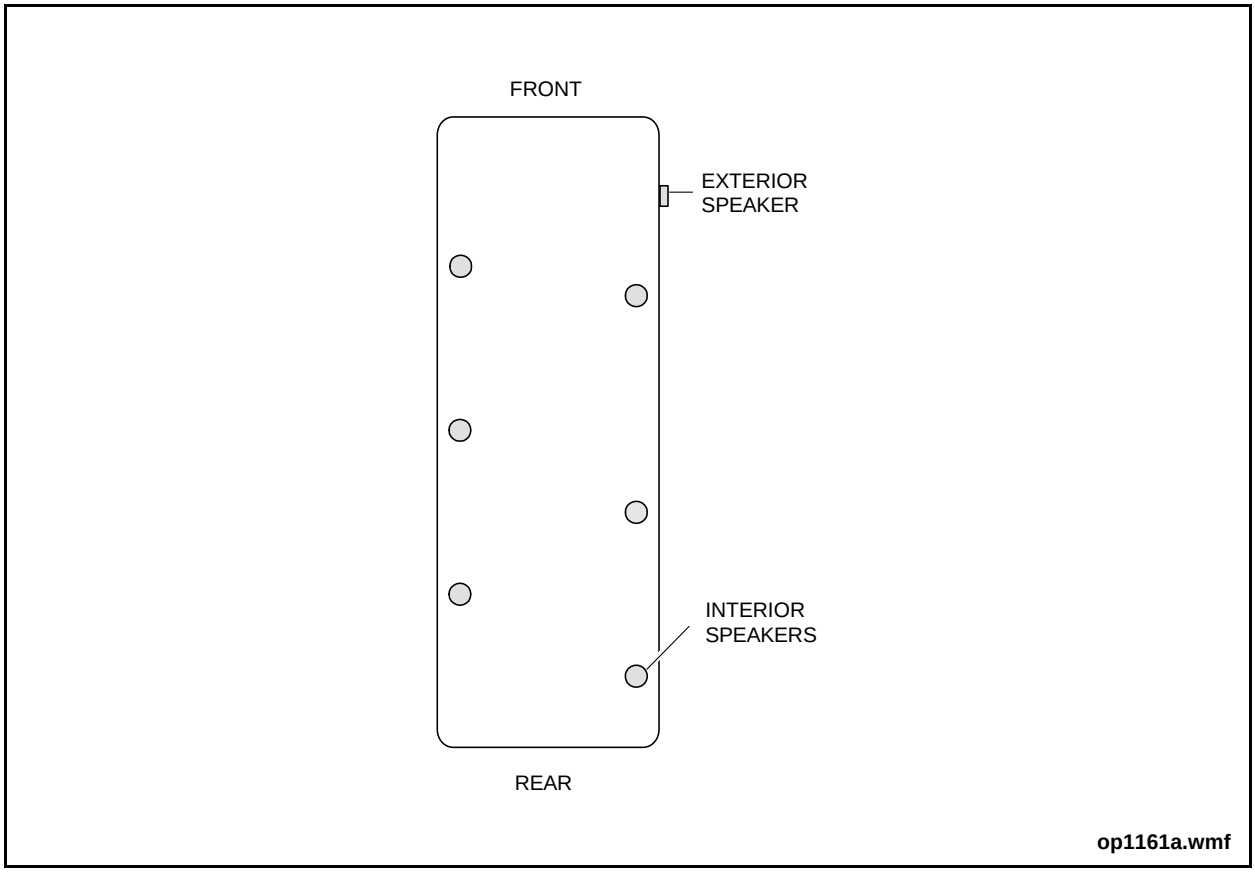


Figure 17: P.A. System Layout

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 (ODK4) located in the driver's overhead panel. The ODK consists of a liquid crystal display (LCD) display screen with six soft keys, six corresponding hard keys, keypad with numbered (0-9) switches, enter key, and left/right arrow keys.

The sign system is controlled through programmed instructions stored in ODK memory through its liquid crystal display (LCD) touchscreen and keypad. Messages displayed on the vehicle signs can also be displayed on the ODK touchscreen.

☞NOTE:

The touch sensitive soft keys labeled on the LCD touchscreen will vary per the menu being displayed and are functionally identical to the blue hard keys located directly beneath them and can be used interchangeably.

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 STANDBY 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 STANDBY. Upon powering-down, front and side destination signs will blank immediately or after a preset delay.

Operating the ODK4

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 basic operation instructions are described in the two sections that follow.

ODK4 Operating Keys

Six soft keys are located on the bottom of the LCD display screen. The function of these softkeys is identical to the corresponding hard keys located directly below the display screen. The soft keys and hard keys can be used interchangeably. The keys function as follows:

- MENU - used to access advanced programming (some may require a password).
- RUN - used to enter run number. This function is determined by transit authority programming.
- ROUTE - used to enter route number. This function is determined by transit authority programming.
- P/R - used to enable public relations message code entry. This switch may be disabled if public relation messages are not available.
- ROUTE - press to enable route number entry. Route number entry may be either coded or be the actual route number for display.
- DEST A and DEST B - used to enable respective destination message code entry for message display change. These switches are permanently enabled.

All destination and public relations (P/R) messages can be set an viewed from the ODK. See "Figure 18: Operator's Display Keyboard (ODK)" on page 49.

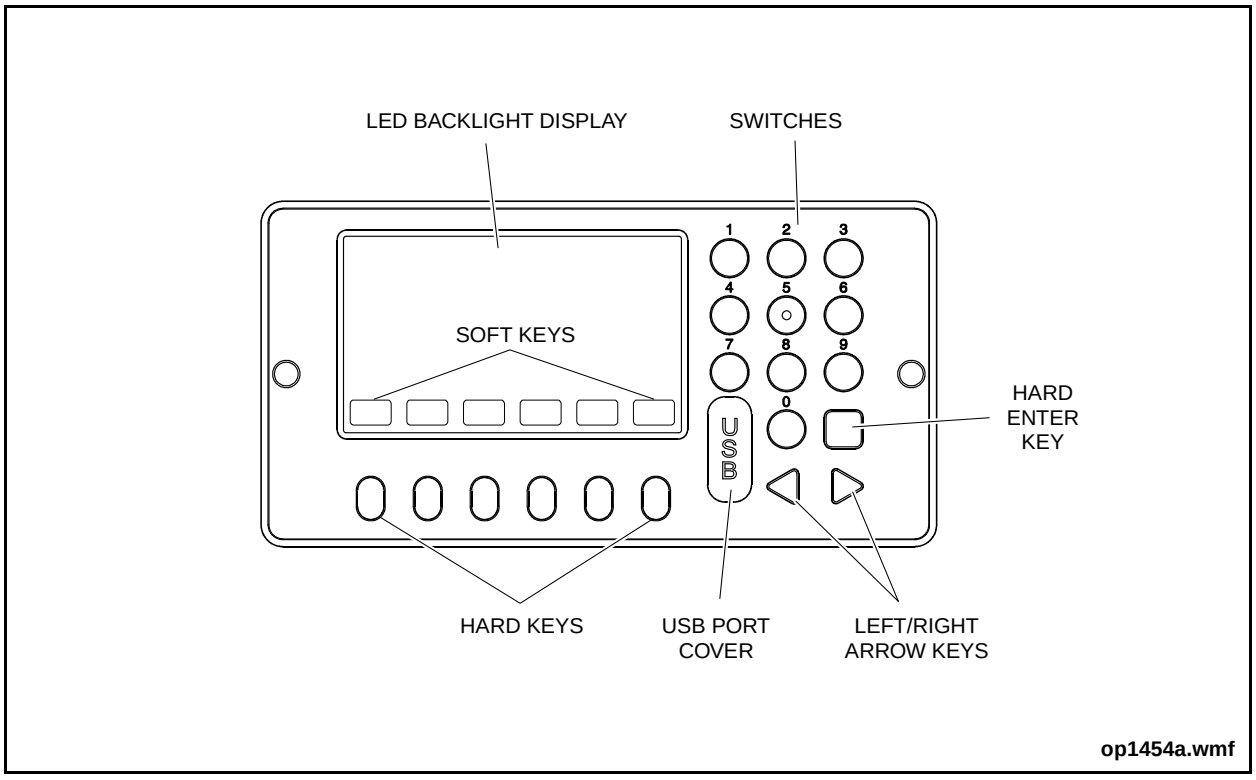


Figure 18: Operator's Display Keyboard (ODK)

Basic Operating Procedures

Basic operating procedures are as follows:

- Set RUN number - press the RUN key on the default screen. Enter the run number via the ODK number pad and then press ENTER. The message "RUN button not used" will appear if the manual entry feature has been disabled.

☞NOTE:

To change a RUN number, use the left/right arrow keys to highlight a number and then press CLEAR (or press DEL to delete an entire string).

- Set ROUTE number - press the ROUTE key on the default screen. Use the ODK keypad to enter a route number or left/right arrow keys to highlight a letter, then press SELCT to select it. After entering the route number, press the hard ENTER key. The route number just entered will be displayed on the ODK as well as on the route signs. This route number will persist when you go from DEST A to DEST B without having to re-enter it.

☞NOTE:

To change a ROUTE number, use the right arrow key to move the square cursor to the end of the string and then use the left arrow key to move cursor back to the left to erase existing numbers (you cannot simply overwrite them).

- Set Public Relations (P/R) message - press the P/R key on the default screen. Enter the P/R message code number via the ODK number pad and press ENTER. The P/R code number will display on the ODK display screen and the route signs approximately 5 seconds after it is entered.

☞NOTE:

To change a P/R code number (or clear the message altogether) use the left/ right arrow keys to highlight a number and press CLEAR to erase it (or press DEL to delete an entire string) then press ENTER.

- Set Destination A or B message - press the DestA key on the default screen to set the DestA message. Enter the destination code number via the OKD number pad and press the hard ENTER key. The destination code number will display on the ODK display screen and the route signs approximately 5 seconds after it is entered. Setting Destination B is performed in the same manner as setting Destination A.

☞NOTE:

To change a destination number, use the right arrow key to move the square cursor to the end of the string and then use the left arrow key to move cursor back to the left to erase existing numbers (you cannot simply overwrite them).

- Set Display Brightness Level - press MENU on the default screen to access menu options. From the MENU screen press the PREF key. From the PREF screen press the BRGHT key. From the BRGHT screen touch the brightness level bar at the top of the screen or use the left/right arrow keys to set the brightness level, then press OK.

☞NOTE:

To return the display to the original factor default brightness level press the DFLTS key from the PREF screen, then press YES

- Set Aisle Light Dimming Level - press MENU on the default screen to access menu options. From the MENU screen press the DIMNG key. From the DIMNG screen touch the dimming level bar at the top of the screen or use the keypad left/right arrow keys to set the dimming level, then press OK.

Driver/Vehicle Monitoring System

The New Flyer Connect™ Driver/Vehicle Monitoring System measures and records vehicle operating parameters and location in real time. The system consists of:

- A Main Board Unit (MBU) located in the electronic equipment enclosure.
- A GPS/Data Modem Unit mounted on the ceiling of the vehicle, above the driver.
- A Driver Maneuver Awareness System (DMAS) display mounted on the instrument panel.

The Driver/Vehicle Monitoring System is connected to the vehicle's J1939 networks. Information from these networks is monitored and transmitted, in real time, to allow transit authorities to monitor driver performance and vehicle condition.

The Main Board Unit contains a 3-axis accelerometer to monitor hard acceleration and braking and fast turning. The Driver Maneuver Awareness System (DMAS) is an LED bar graph display that provides the driver with feedback on these parameters and warns when accepted values are being exceeded. Refer to "9.INSTRUMENTATION & CONTROLS" on page 56 in this manual for more information on the DMAS Display.

7. ENTRANCE DOOR AREA

The entrance door area includes the following components: See “Figure 19: Entrance Door Area” on page 53.

- A slide glide style door that is air-opened and air-closed.
- An entrance door emergency release valve.
- An entrance door header light.

Pushing the front door control push button will open the entrance door.

When the Master Run switch is in DAY-RUN, the door header lights will illuminate when the entrance door is open and the wheelchair ramp is deployed. In NIGHT-RUN or NIGHT-PARK the door header lights will illuminate when the entrance doors are opened.

Boarding passengers can use the door mounted handles to assist in entering the vehicle.

In the event of an emergency situation with an inoperable door, the emergency release valve located behind the mechanism access door, can be operated to release air pressure from holding the door closed. Refer to “2.EMERGENCY INFORMATION” on page 13 in this manual for emergency release valve operating instructions.

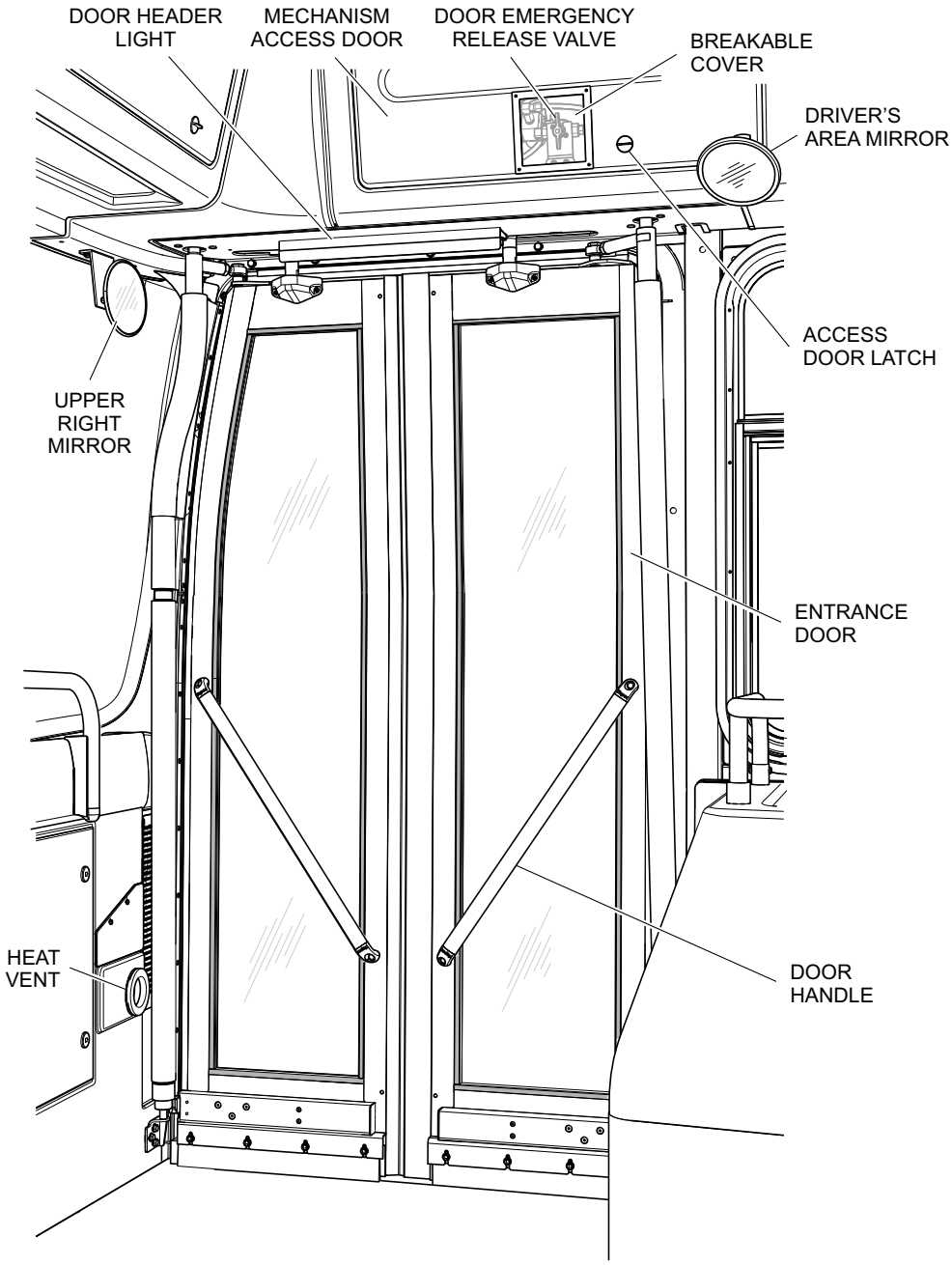


Figure 19: Entrance Door Area

8. EXIT DOOR AREA

The exit door area includes the following components: See “Figure 20: Exit Door Area” on page 55.

- 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 button on the exit door stanchion.
- Door operation decals.

Pressing the Rear Door Push Button, opens the exit door. The green overhead light will illuminate when the exit door is open. The disembarking passenger is required to touch the decal to interrupt the acoustic sensor beam, which will cause the door to open. An acoustic sensor obstruction detection system will prevent the door from closing while passenger movement continues through the exit door. The door header lights will illuminate as soon as the exit door is open 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 “3.SAFETY INFORMATION” on page 20 in this manual for emergency release valve operating instructions.

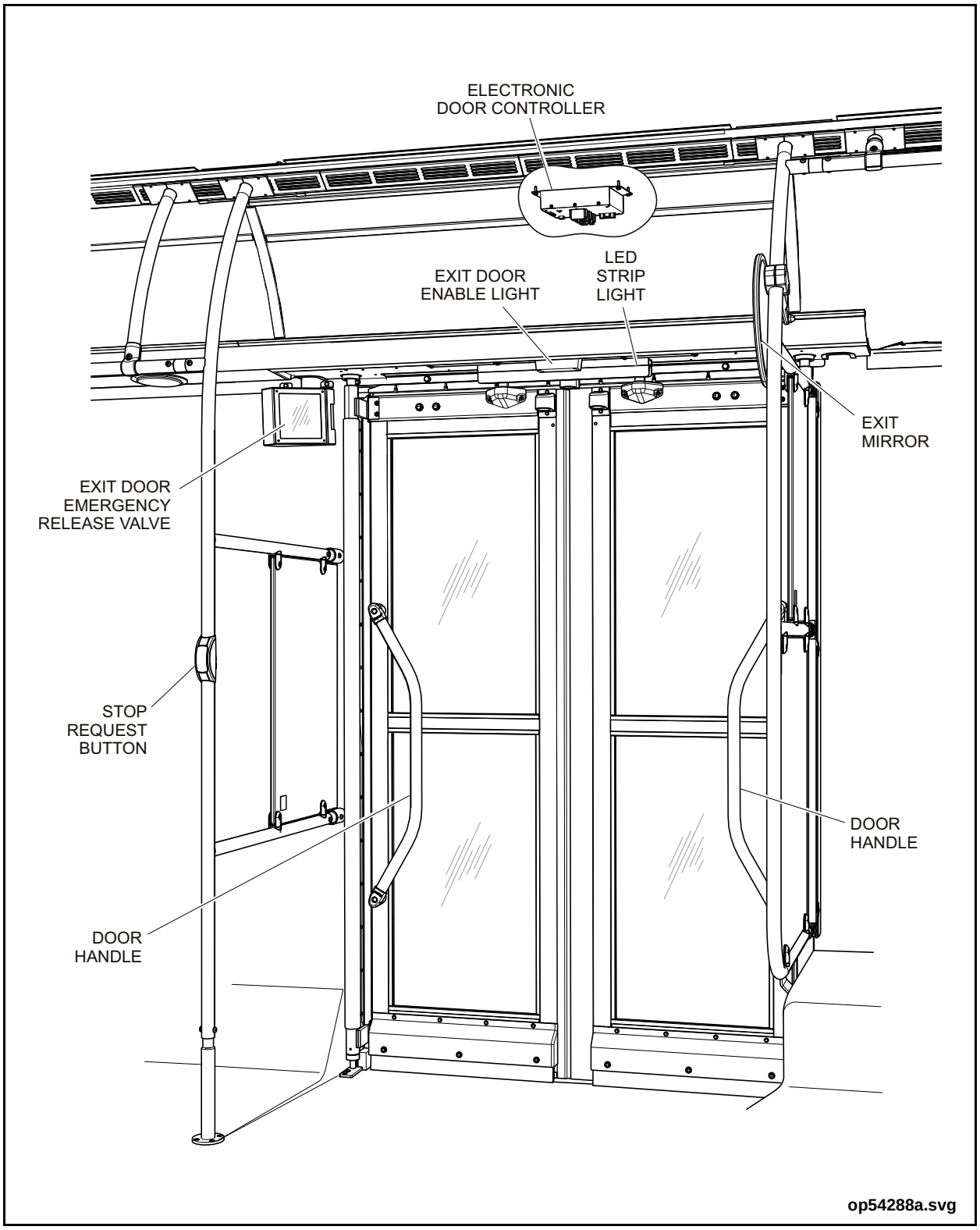
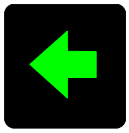


Figure 20: Exit Door Area

9. INSTRUMENTATION & CONTROLS

Instrument Panel

The instrument panel is located directly in front of the driver and provides a visual display of the vehicle operating systems as well as providing controls for the various systems. The instrument panel cluster is a programmable electronic unit with diagnostic capabilities. See “Figure 21: Instrument Panel” on page 57.



Turn Indicators (Green)

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.

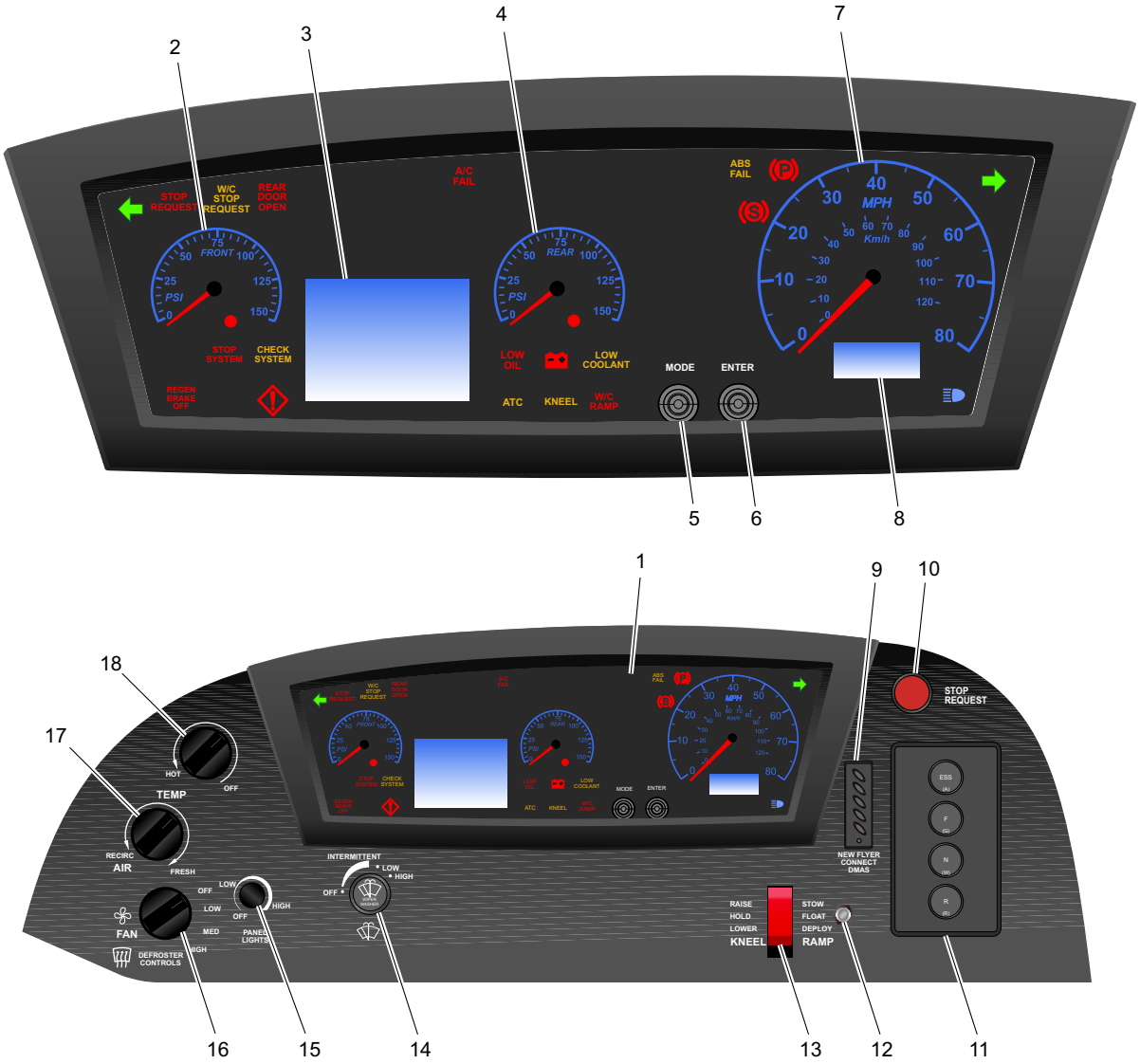
When the Hazard switch is activated, both turn indicators flash together. Failure of these lights to flash normally indicates that the flasher module is not functioning.

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.



1. Instrument Cluster
2. Front Air Pressure Gauge
3. LCD Screen
4. Rear Air Pressure Gauge
5. Mode Button
6. Enter Button
7. Speedometer
8. LCD Odometer
9. New Flyer Connect™ DMAS
10. Stop Request Indicator
11. Mode Selector
12. Ramp Switch
13. Kneel Switch
14. Wiper/Washer Control
15. Panel Lights Dimmer Switch
16. Defroster Fan Control
17. Defroster Air Recirculation Control
18. Defroster Temperature Control

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Figure 21: Instrument Panel

Rear Door Open Indicator (Red)

The Rear Door Open indicator illuminates when the exit door control push button is pressed and the exit door opens.

A/C Fail Indicator (Red)

The A/C Fail indicator illuminates if the heating, ventilating and air conditioning (HVAC) unit malfunctions.

ABS Fail Indicator (Amber)

The ABS Fail indicator illuminates if the ABS System requires service. Vehicle power-up illuminates the indicator momentarily as part of a system check. It is also used during diagnostics to display the blink code. Refer to “11.VEHICLE OPERATION” on page 95 in this manual for further information.

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)

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.

Stop System Indicator (Red)

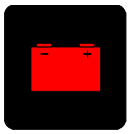
The Stop System indicator illuminates if a major fault or unsafe operating condition is detected in the electric drive system. Immediately move the vehicle to a safe area and shut down the system.

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 vehicle down and apply the parking brake.

The Check System indicator illuminates if a non-critical fault is detected in the Allison electric drive system.



No Gen Indicator (Red)

CAUTION

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

The no gen indicator, symbolized by a battery, illuminates when the 12/24VDC charging system is malfunctioning. The no gen indicator illuminates when the Master Run switch is in the DAY-RUN or NIGHT-RUN position and the electric drive system is not operating. The no gen indicator turns off once the electric drive system is operating.

Regen Brake Off Indicator (Red)

The Regen Brake Off indicator illuminates when the regenerative braking system has been disabled by toggling the Regen Brake switch to the DISABLE position. The Regen Brake switch is located inside the destination sign compartment.

Exclamation Symbol (Red or Amber)

The Exclamation Symbol will illuminate when a text message tell tale appears in the Message Display Screen. The color of the exclamation symbol will change to match the message currently being displayed on the screen.

ATC Indicator (Amber)

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

Kneel Indicator (Amber)

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

☞NOTE:

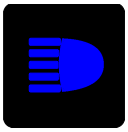
The Kneel toggle switch is located on the instrument panel.

W/C Ramp Indicator (Red)

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

☞NOTE:

The Ramp toggle switch is on the instrument panel.



High Beam Indicator (Blue)

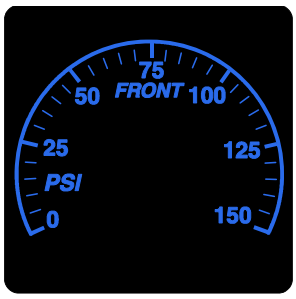
The high beam indicator, symbolized by a lit headlight, illuminates when the vehicle headlights are in the high beam mode of operation. Pressing the dimmer switch returns the headlights to normal low beam operation.

Mode Button

The Mode button is used primarily to navigate between the Message Display Screen and the Odometer/Hourmeter Display Screen and to navigate through the menus and select various options available on the selected screen. The button function is dependent on the length of time it is pressed. Refer to “Message Display Screen” on page 62 and Refer to “Odometer/Hourmeter Display Screen” on page 67 in this manual for information on the operation of this button.

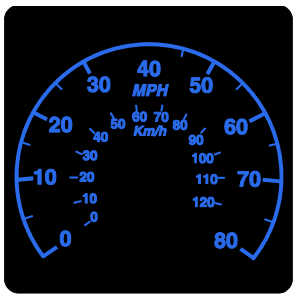
Enter Button

The Enter button is used to navigate through the menus on the Message Display Screen and to switch screen formats on the Functional Readout Screen, The Enter button can also be used to reset the tripmeters on the Odometer Display Screen. The button function is dependent on the length of time it is pressed. Refer to “Message Display Screen” on page 62 and Refer to “Odometer/Hourmeter Display Screen” on page 67 in this manual for information on the operation of this button.



Air Pressure Gauges

Individual analog air pressure gauges are used to monitor the vehicle’s front 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 120 to 131 psi (827 to 903 kPa).



Speedometer

This gauge indicates the vehicle’s forward speed. 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 the gauge will sweep full scale and then return to the zero point.

☞NOTE:

Refer to “Odometer/Hourmeter Display Screen” on page 67 *in this manual for information on the odometer.*

Message Display Screen

The larger of the two LCD screens is located between the air pressure gauges and is used to display text messages to warn the driver of potential problems. The screen will change color, from blue to amber to red, depending on the severity of the warning message.

The message display screen has four separate menus. Navigate through the menus by performing a long press (over 3 seconds) on the ENTER button.

- Function Readout (default screen) - change the readout between bar graph and digital using a short press (1 to 3 seconds) on the ENTER button.
- Active LCD Tell Tale Overview - this screen displays a list of the active tell tale messages.
- IP Software Version - this screen displays the IP software version, configuration file label, and routing table label.
- VMM Query - this screen displays the application and ladder logic version of the VMM multiplexing modules on the vehicle.

☞NOTE:

There are no operator navigable or resettable features in the IP Software Version or VMM Query screens.

Perform a long press (greater than 3 seconds) on the MODE button to navigate between the Message Display Screen and the Odometer/Hourmeter Display Screen. If the Odometer/Hourmeter Display Screen has been selected, then an arrow pointing to it will appear in the lower right-hand corner of the Message Display Screen.

☞NOTE:

There are no operator navigable or resettable features in the IP Software Version or VMM Query screens.

Perform a long press (greater than 3 seconds) on the MODE button to navigate between the Message Display Screen and the Odometer/Hourmeter Display Screen. If the Odometer/Hourmeter Display Screen has been selected, then an arrow pointing to it will appear in the lower right-hand corner of the Message Display Screen.

Function Readout Displays

- ESS BATT - displayed on a bar graph as percentage of charge remaining in the Energy Storage System (ESS). See “Figure 22: Function Readout” on page 63.
- Auxiliary Air Pressure - displayed on bar graph as PSI of air pressure in the auxiliary air tank.

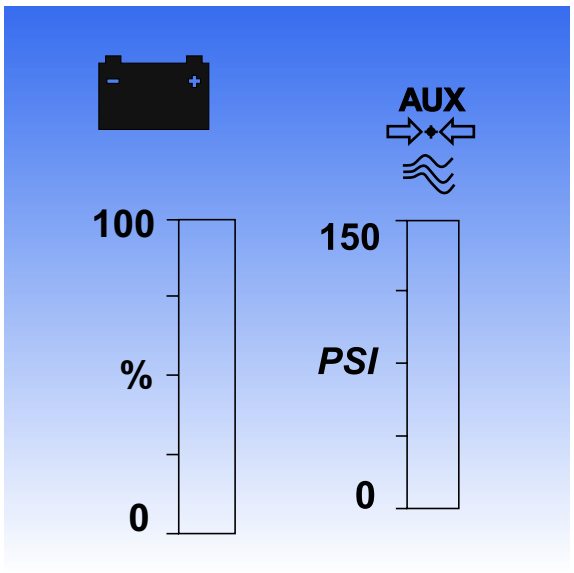


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Figure 22: Function Readout

Text Messages

- RH Headlight Fault (Amber) - The RH Headlight Fault message will appear on the LCD screen to indicate a fault with a low beam headlight. Notify service personnel if this message appears on the screen.
- RH Turn Fault (Amber) - The RH Turn Fault message will appear on the LCD screen to indicate a fault with the right-hand turn light. Notify service personnel if this message appears on the screen.
- LH Headlight Fault (Amber) - The LH Headlight Fault message will appear on the LCD screen to indicate a fault with the low beam headlight. Notify service personnel if this message appears on the screen.
- LH Turn Fault (Amber) - The LH Turn Fault message will appear on the LCD screen to indicate a fault with the left-hand turn light. Notify service personnel if this message appears on the screen.
- Kneel Snsr Fault (Amber) - This message will appear if the kneeling sensors malfunction during the kneeling process.

☞NOTE:

Notify service personnel if this message appears. If the Kneel Snsr Fault message appears, kneeling will continue to function using time-based kneel and raise intervals.

- Interlock Off (Red) - This message will appear on the LCD Screen to indicate the brake interlocks have been disabled with the Door Master switch.
- Door Alarm (Red) - This message appears when the exit door sensitive edge has been activated.
- Front Brake Worn (Amber) - The Front Brakes Worn message will appear on the LCD screen to indicate that the brake disc pads have worn to a limit where service is required. Notify service personnel if this message appears on the screen.
- Rear Brake Worn (Amber) - The Rear Brakes Worn message will appear on the LCD screen to indicate that the brake disc pads have worn to a limit where service is required. Notify service personnel if this message appears on the screen.
- Bike Rack (Amber) - The Bike Rack message will appear on the LCD screen to indicate the bike rack is not securely latched.
- Stop Lamp Fault (Red) - This message will appear on the LCD screen and the buzzer will sound to indicate a fault with a stop lamp circuit. Notify service personnel if this message appears on the screen.
- Tail Lamp Fault (Amber) - This message will appear on the LCD screen to indicate a fault with a tail lamp circuit. Notify service personnel if this message appears on the screen.
- Ext Lamp Fault (Amber) - This message will appear on the LCD screen to indicate a fault with an exterior lamp circuit. Notify service personnel if this message appears on the screen.

- Interlock (Red) - The interlock message appears when the interlock system applies the brake interlocks. The message disappears when the interlock system releases.

☞NOTE:

Refer to “Foot Operated Controls” on page 87 *in this manual for information on the brake treadle and interlock operation.*

- Fire (Red) - This message will appear on the LCD screen and an alarm will sound to indicate that a fire has been detected in the electric propulsion system. Immediately bring the vehicle to a safe stop, power down the system, and evacuate all passengers from the vehicle.
- Poles Up (Amber) - This message will appear on the LCD screen to indicate that the Poles switch on the side console has been placed in the RAISE position and poles are being raised and connected to the overhead lines.
- Poles Down (Amber) - This message will appear on the LCD screen to indicate that the Poles switch on the side console has been placed in the LOWER position and poles are being lowered to the secured position.
- No 700V (Purple) - This message will appear on the LCD screen to indicate a loss of power supply from the overhead lines or the poles are not connected to the overhead lines.
- De-Wired (Amber) - This message will appear on the LCD screen to indicate that a dewirement has occurred on one or more poles have been automatically lowered while the vehicle is being driven. This message will be cancelled when the poles are locked in the hooks or reattached to the overhead lines.

⚠ WARNING

If the Hot Coach message is activated, stop the vehicle and lower the poles by placing the Poles switch, located on the side console, in the LOWER position. Ensure that the passengers do not step off the vehicle and that nobody touches the vehicle from the outside.

- Hot Coach (Red) - This message will appear on the LCD screen to indicate that the vehicle chassis has a hazardous electrical potential to ground.
- Insul Warn (Amber) - This message will appear on the LCD screen to indicate a potential fault with the electrical insulation on the electric propulsion system. Notify service personnel if this message appears.
- Pole Angle Warn (Amber) - This message will appear on the LCD screen to indicate that the poles rotated more than 10° from vehicle centerline, thereby preventing poles from being lowered when using setting the Pole switch to the LOWER position.
- Pole Range Exceed (Amber) - This message will appear on the LCD screen to indicate that the poles have been rotated more than 55° from the vehicle centerline and the possibility of dewirement exists.

- Route Over Ride (Amber) - This message will appear on the LCD screen to indicate that the Route Selector switch, located on the driver's side console, has been activated and will manually override the turn signal mode for triggering the overhead line switch.
- Low ESS Batt (Amber) - This message will appear on the LCD screen to indicate that the state of charge of the battery pack, used in the auxiliary power supply, is below normal operating voltage. Notify service personnel if this message appears.
- Aux Gauge Fault (Amber) - This message will appear on the LCD screen to indicate that the air pressure in the tank used to operate the current collector is below the normal operating range.
- Aux System Fault (Red) - This message will appear on the LCD screen to indicate a fault with one of the components on the accessories side of the electric propulsion system.
- Poles ACTV (Amber) - This message will appear on the LCD screen to indicate that the poles are in process of being either lowered or raised.
- Regen Brake Fail (Red) - This message will appear on the LCD screen to indicate that the regenerative braking
- Low Line VLTG (Purple) - This message will appear on the LCD screen to indicate that the overhead line voltage is below the normal operating range.
- Heat Fail (Amber) - This message will appear on the LCD screen to indicate a fault in the high-voltage main heating system of the vehicle.
- DFRSTR Fail (Amber) - This message will appear on the LCD screen to indicate a fault in the high-voltage driver's defroster.
- HV Inter Lock (Red) - This message will appear on the LCD screen to indicate that the HVAC High-Voltage distribution compartment is open.
- CMRA Fault (Amber) - This message will appear on the LCD screen to indicate a fault in the video surveillance system. Notify service personnel if this message appears.
- Steep Hill (Amber) - This message will appear on the LCD screen to indicate the Steep Hill switch has been activated.

Odometer/Hourmeter Display Screen

The smaller of the two LCD screens is located directly below the speedometer and contains the odometer, two trip odometers and an hour meter. The display screen has four separate menus. Navigate through the menus by performing a quick press (less than 1/2 second) on the MODE button. See “Figure 23: Odometer/Hourmeter Display Screen Options” on page 67.

☞NOTE:

The trip odometers can be reset by navigating to the appropriate screen with the MODE button, and then performing a short press (1 to 3 seconds) on the ENTER button.

Perform a long press (greater than 3 seconds) on the MODE button to navigate between the Message Display Screen and the Odometer/Hourmeter Display Screen.

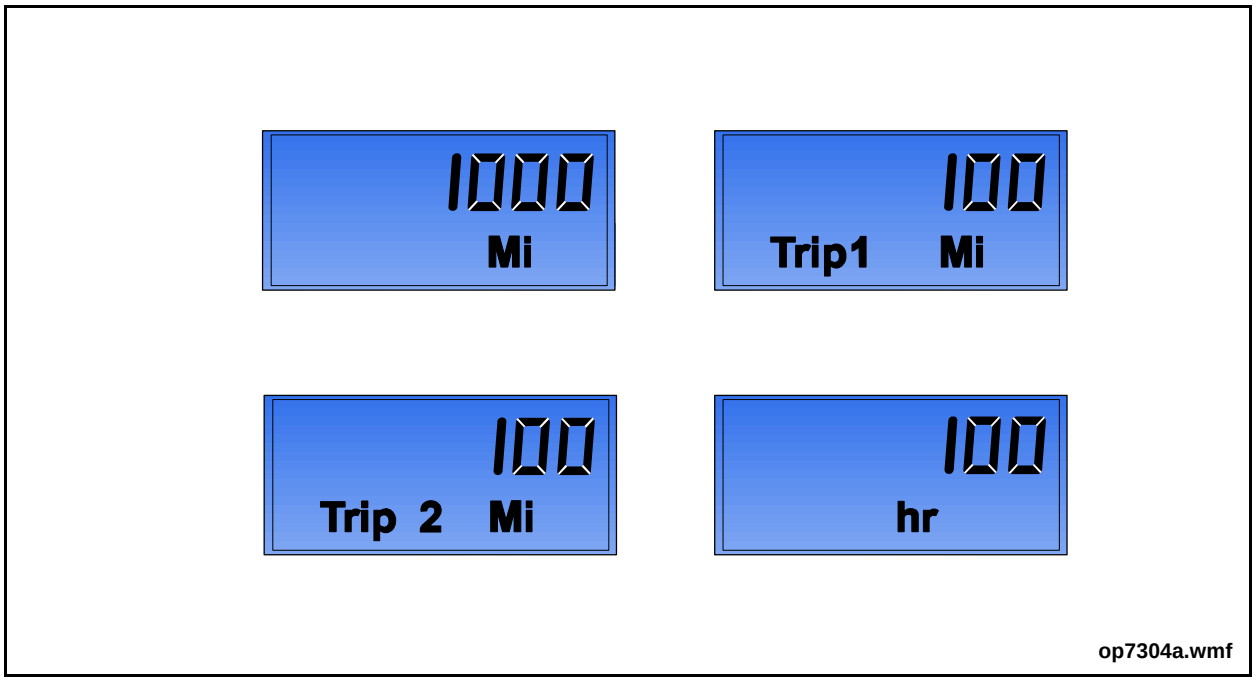


Figure 23: Odometer/Hourmeter Display Screen Options

DMAS Display

The Driver Maneuver Awareness System (DMAS) provides the driver with visual feedback as to whether he/she is operating the vehicle within acceptable driving limits. The display consists of five LED indicators that will illuminate in response to the severity of the driving parameter being exceeded. These driving parameters include acceleration, braking, and turning. See “Figure 24: DMAS Display” on page 68.

The function of the LED indicators is as follows:

- The small round white indicator at the base of the display indicates that a problem exists with the system.
- The blue LED indicates that power is on and the system is functioning properly.
- The green LED indicates vehicle operation within normal limits.
- The amber, orange, and red LED’s indicate the degree to which the vehicle is being operated outside acceptable limits.

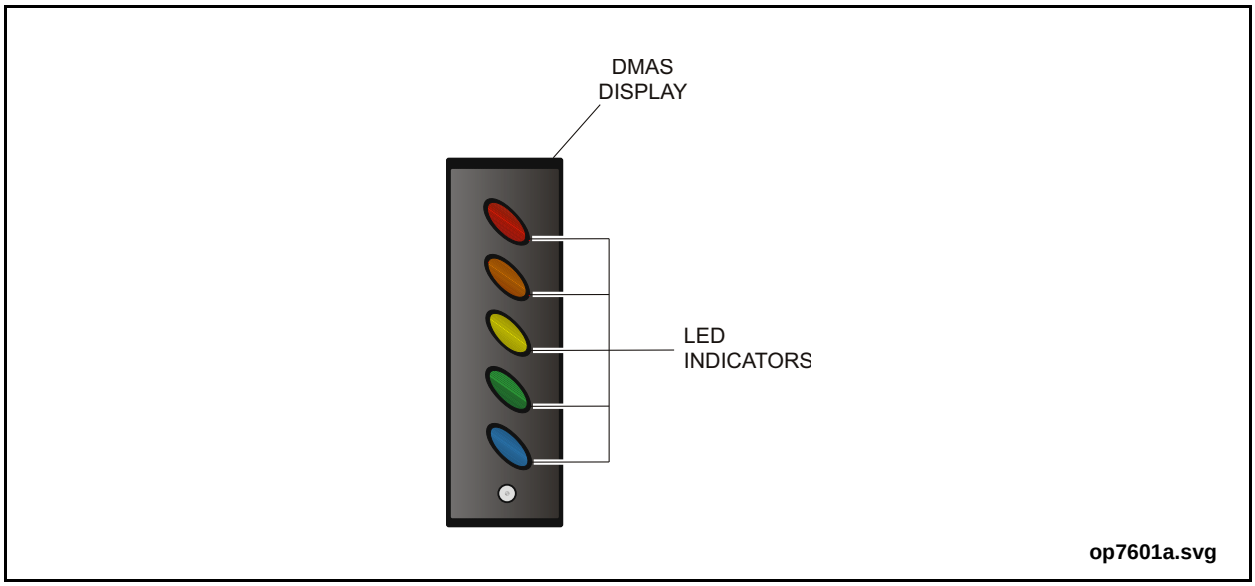


Figure 24: DMAS Display

Mode Selector Operation

The mode selector has four push buttons. Operation is as follows:

ESS Mode (Amber)

Drive with caution, as electrical dewirement is automatically deactivated in ESS mode. Dewirement will only be detected through the maximum height and rope reel speed detector.

Pressing the ESS Mode button will activate the ESS propulsion mode so that the vehicle can be powered by the ESS batteries rather than the overhead line.

☞NOTE:

The ESS system is designed primarily for use in emergencies only. Always use the overhead line mode if overhead line voltage is available. A typical duty cycle in ESS mode is approximately 0.6 miles (1.0 km) on level ground at a speed of 10 mph (15 km/h) or 100 yards (100m) on a 10% incline at a speed of 3 mph (5 km/h). The speed is limited to 10 mph (15 km/h) if the poles are not stowed under the hooks. Drive carefully to avoid uncontrolled movement of the poles. The system is designed for an average of 2 cycles per day with a maximum of 14 cycles per day. Excessive use of the system will reduce the performance and life of the ESS batteries.

ESS-mode can be switched off by pressing the [N] button on the mode selector. ESS mode will be switched off automatically when overhead line voltage is present for a set distance. The accelerator pedal must be fully released before driving is possible after the system has automatically switched off ESS mode.

☞NOTE:

The following systems are not functional in ESS mode:

- *Heating and ventilation system.*
- *Air compressor.*
- *LVPS and ESS battery charger.*
- *Electro-dynamic braking.*

F / Forward (Green)

Top speed is limited to 40 mph (65km/h). Forward mode can only be activated from a standstill with the wheelchair ramp stowed. If driving is not possible (no 700V, doors open, insufficient air pressure or system fault) the direction is preselected and the [F] indicator flashes. If driving is possible, forward direction is selected automatically and the [F] indicator illuminates steady.

☞NOTE:

The accelerator pedal has to be fully released first before driving is possible after the system has switched from direction pre-selected to direction selected.

N / Neutral (White)

Inverter remains switched off and no driving is possible. This position can also used as a reset or to confirm failures by pressing the button for more than 5 seconds. Neutral has to be selected at standstill to enable the wheelchair ramp.

R / Reverse (Red)

⚠ WARNING

DO NOT operate in reverse with poles connected to overhead lines in areas where the possibility of damaging the carbon shoes, poles or overhead lines exists. When reversing, consider that the poles might protrude out of the vehicle's profile. Use extreme caution when reversing. Switch into ESS mode and store poles when driving in reverse in a critical environment.

Top speed in reverse is limited to 3 mph (5 km/h). Reverse mode can only be activated from a standstill with the wheelchair ramp stowed. If driving is not possible (no 700V, doors open, insufficient air pressure or system fault) the direction is preselected and the [R] indicator flashes. If driving is possible, reverse direction is selected automatically and the [R] lamp illuminates steady.

☞NOTE:

The accelerator pedal has to be fully released first before driving is possible after the system has switched from direction pre-selected to direction 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.

☞NOTE:

Refer to “12.WHEELCHAIR SYSTEM” on page 116 *in this manual for operating procedures.*

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 of the vehicle approximately 3 to 4 inches by exhausting air from both front suspension 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 light. 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 light. The Kneel indicator and the interlocks remain activated.

Wiper/Washer Controls

The Wiper Control switch operates the left-hand and right-hand wiper motors. Rotating the control knob through the intermittent range will vary the delay of the wiper sweep for differing rain conditions. 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 in the side console access door.

Panel Lights Dimmer Switch

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

Driver's Climate Controls

See "Figure 25: Driver's Area Climate Controls" on page 74.

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 variable fan speed 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.

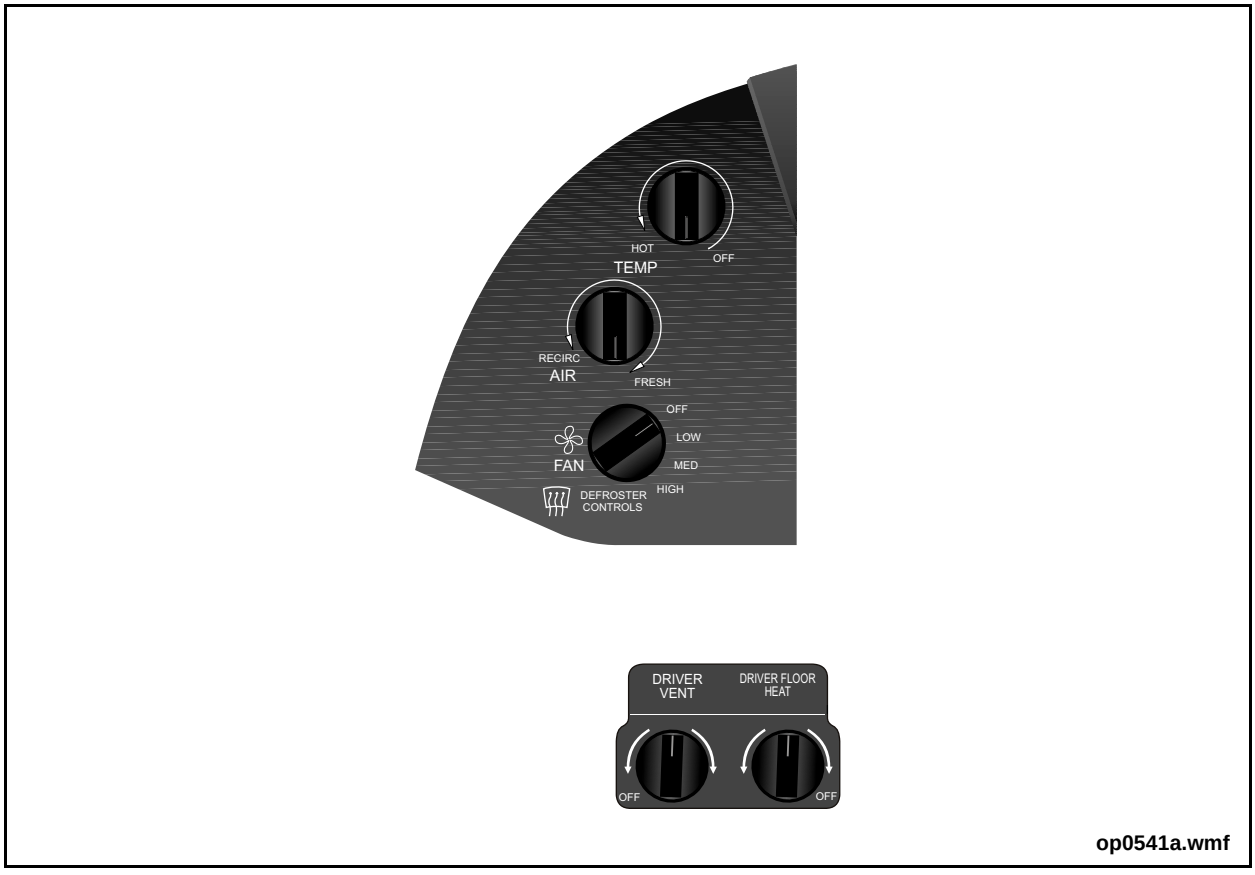


Figure 25: Driver's Area Climate Controls

Defroster Temperature Control

The Temp knob on the instrument panel controls the temperature of the air blowing from the defroster. Turn the knob clockwise from the OFF position to obtain, LOW, MED, & HIGH temperature settings.

Driver's Vent

The vehicle is equipped with a lower vent that allows outside air to enter the vehicle interior during forward motion. The lower vent inlet is located on the left front corner below the windshield. The vent control is located below the instrument panel. Turn the knob clockwise to increase air flow.

Driver's Booster Fan Control

The driver's booster fan control operates the fan speed. Turning the switch clockwise increases fan speed.

Driver's Floor Heat

The driver's floor heat control is located below the instrument panel and controls the defroster/heater outlet to the floor area of the driver's platform. Turn the knob counterclockwise to increase the foot heat setting.

☞NOTE:

Use the Temperature control knob on the instrument panel to set the floor heat air temperature.

Side Console Switch Panel

See “Figure 26: Side Console Panel” on page 77.

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 entrance and/or exit door open (brake interlocks disabled).**
- **Traction motor can be shifted without foot on brake treadle.**
- **Traction motor 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 on the driver’s side console, 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.

Fan Speed Switch

The Fan Speed toggle switch controls the fans of the HVAC system. Position the switch to HIGH or LOW for a desired fan speed.

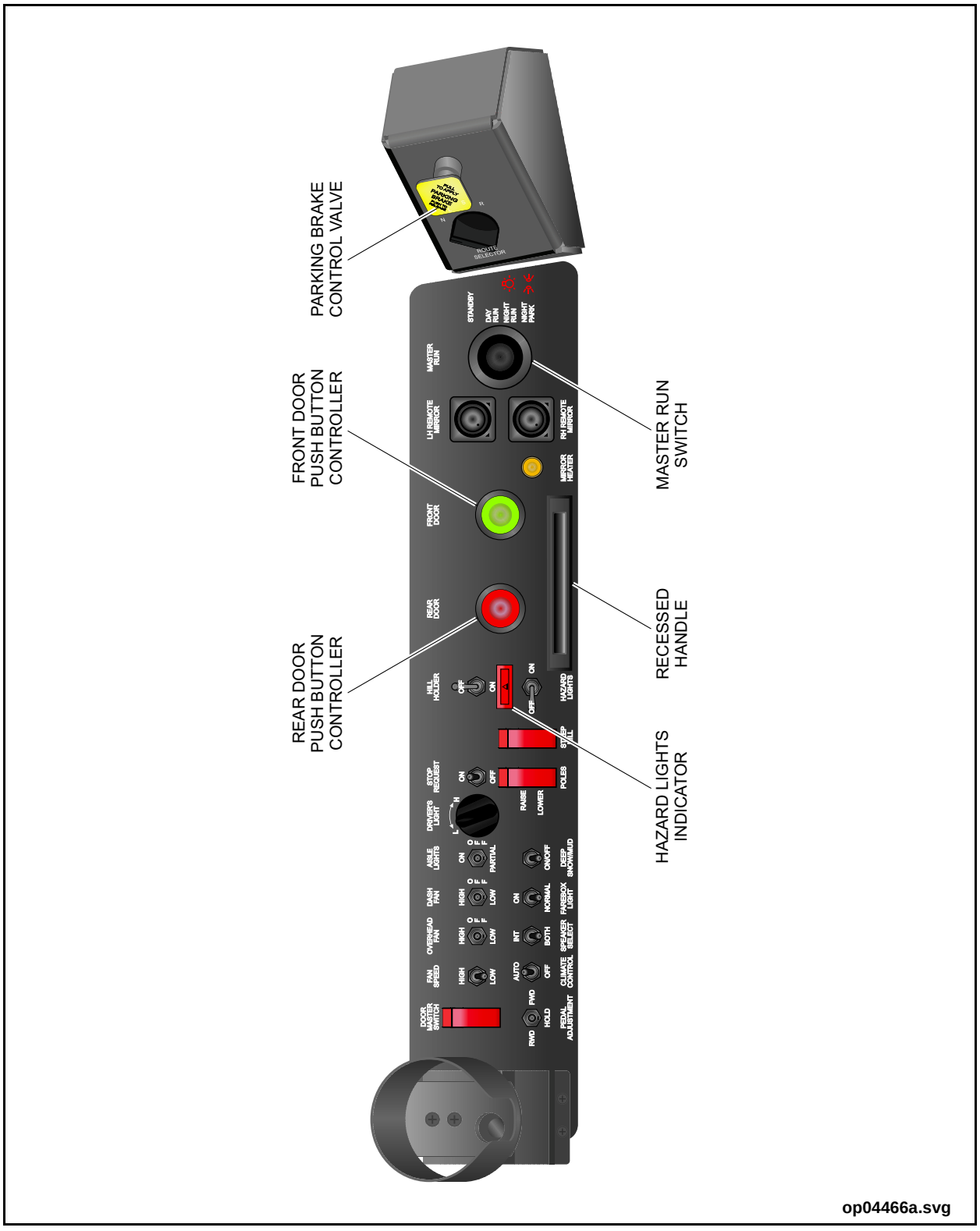


Figure 26: Side Console Panel

Overhead Fan Switch

The Overhead Fan switch is a three-position toggle switch that controls the overhead fan located above the windshield. Position the switch to either the LOW or HIGH position for the desired fan speed. The OFF position deactivates the fan.

Dash Fan Switch

The Dash Fan switch is a three-position toggle switch that controls the lower dash fan. Position the switch to either the LOW or HIGH position for the desired fan speed. The OFF position deactivates the fan.

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. See “Figure 27: Aisle Lights” on page 79.

AISLE LIGHTS SWITCH OPERATION

AISLE LIGHTS SWITCH POSITION	MASTER RUN SWITCH POSITION	ILLUMINATED LIGHTS
ON	DAY-RUN	Streetside (1,3,4,5) Curbside (1,2,4,5)
ON	NIGHT-RUN	Streetside (1,3,4,5) Curbside (1,2,4,5)
ON	NIGHT-PARK[1]	Streetside (None) Curbside (None)
NORMAL	DAY-RUN	Streetside (2,4,5) Curbside (3,4,5)
NORMAL	NIGHT-RUN	Streetside (1,2,3,4,5) Curbside (1,2,3,4,5)
NORMAL	NIGHT-PARK[1]	Streetside (4,5) Curbside (4,5)
OFF	ANY POSITION	Streetside (None) Curbside (None)

Note 1: In NIGHT-PARK, the lighting system will remain active for 30 minutes.

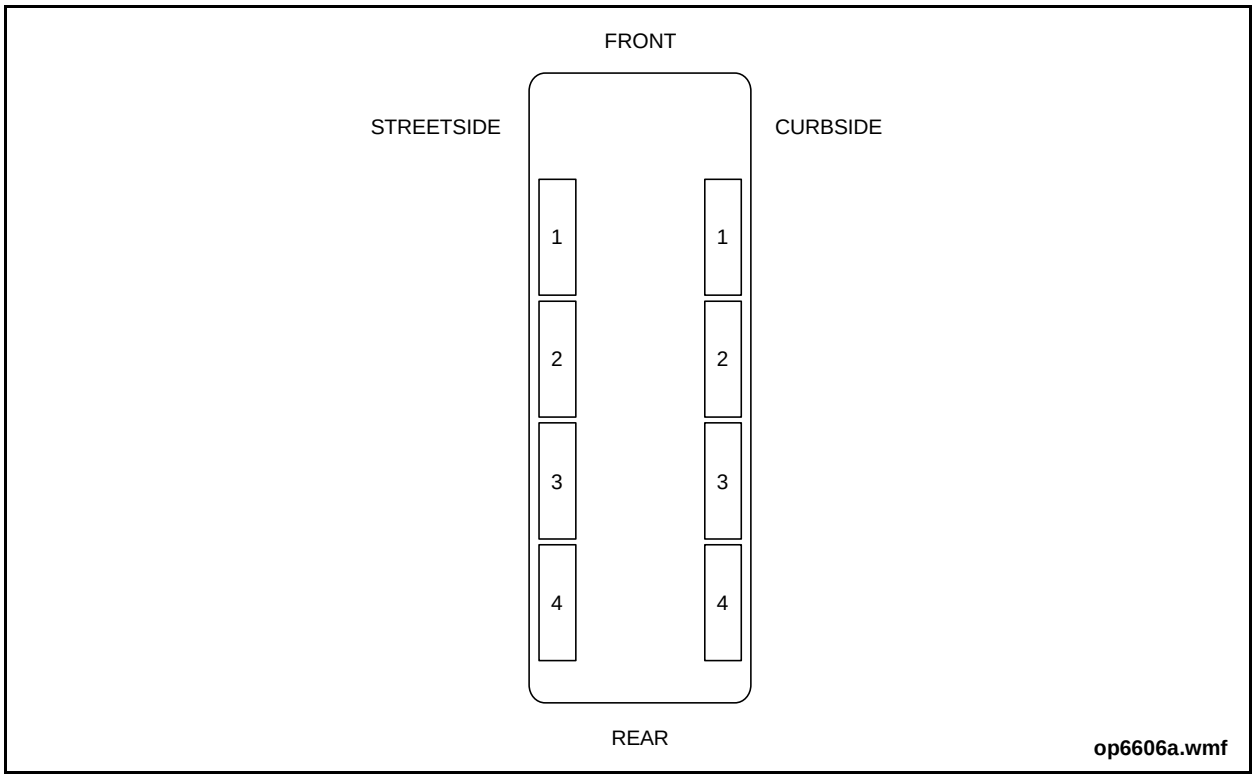


Figure 27: Aisle Lights

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.

Stop Request Switch

The Stop Request toggle switch allows control of the passenger chime. Position to ON to enable chime and OFF to disable chime.

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 vehicle torque can move the vehicle in the desired direction. Use the switch to prevent unexpected motion when starting on a hill.

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

See “Figure 28: Door Control” on page 80.

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.

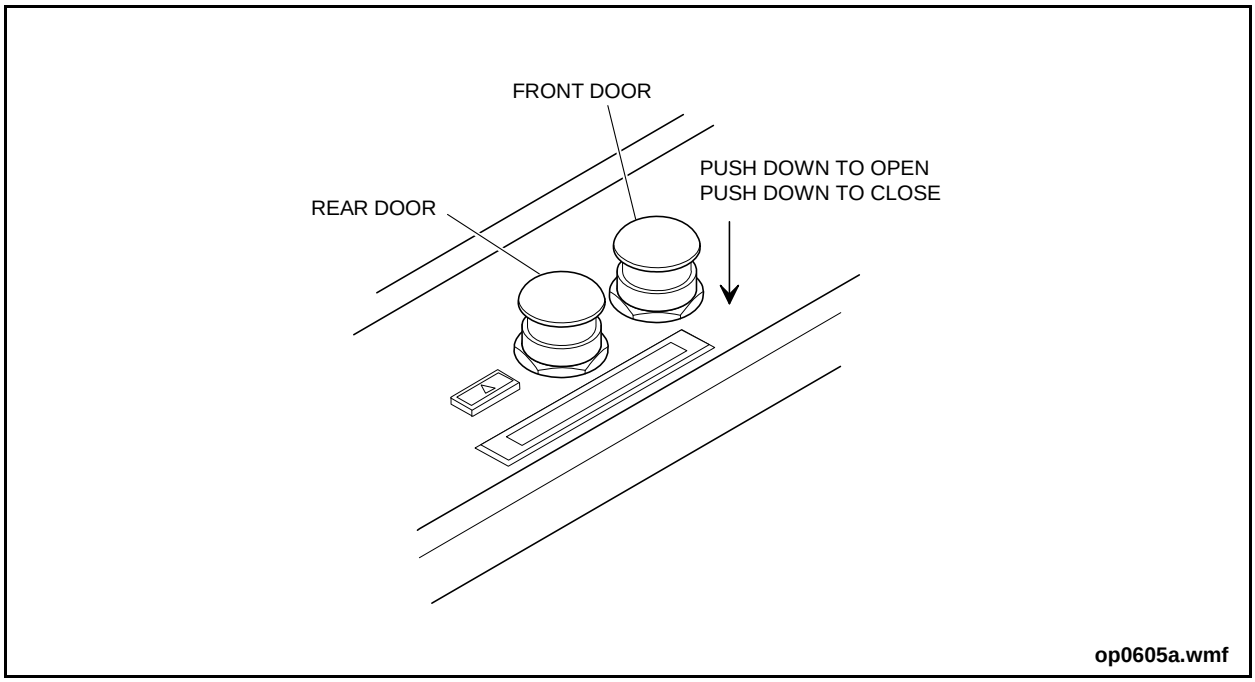


Figure 28: Door Control

LH & RH Remote Mirror Control

The LH & RH Remote Mirror Control allows the operator to adjust the mirrors from the driver's seat, moving the four directions tilt function of the dial to the desired position.

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 STANDBY position is used to shutdown the vehicle electric propulsion 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 STANDBY position.

MASTER RUN SWITCH OPERATION				
CIRCUIT OR SYSTEM	**STAND BY**	**DAY-RUN**	**NIGHT-RUN**	**NIGHT-PARK**
Headlights (low beam)		x	x	
Headlights (high beam)			x	
Four-way hazard lights	x	x	x	x
Turn lights (Note 3)	x	x	x	x
Stop lights		x	x	
Clearance/marker lights			x	x
Tail lights			x	x
License plate light			x	x
Backup lights & alarm		x	x	
Aisle lights (normal) (Note 3)	x	x	x	x
Aisle lights (on) (Note 3)	x	x	x	x

MASTER RUN SWITCH OPERATION				
CIRCUIT OR SYSTEM	**STAND BY**	**DAY-RUN**	**NIGHT-RUN**	**NIGHT-PARK**
Instrument panel illumination			x	x
Instrument panel dimmer			x	x
Driver's lamp (Note 3)	x	x	x	x
Service compartment lights (Note 3)	x	x	x	x
Entrance & exit door lights with door open (Note 2)		x	x	x
Instrument panel indicators		x	x	
Mode selector		x	x	
Brake & accelerator interlocks		x	x	
Destination sign operation		x	x	x
Door control push button		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
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	
Wiper control		x	x	
Mirror heat		x	x	x
Remote mirror		x	x	

Note 1: Propulsion System must be running
Note 2: DAY-RUN also requires W/C ramp deployed
Note 3: Multiplexing System must be active

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.

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 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 vehicle is stopped or parked 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.

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.

Steep Hill Switch

The Steep Hill switch is used when approaching a steep uphill grade to demand more power from the Propulsion System to make the climb. Activate the Steep Hill switch at the base of the incline.

Poles Switch

The Poles switch is used to either lower or raise the poles.

- RAISE - A single momentary activation of the switch to the RAISE position will cause the Propulsion System to automatically raise the poles.

☞NOTE:

The poles will not automatically connect to the overhead lines unless positioned at a standstill at a specific location where the overhead lines are equipped with funnels.

- LOWER - Use a single momentary activation of the switch to the LOWER position to lower and secure the poles in the hooks. The poles will automatically stow under the hooks.

☞NOTE:

The poles must not be rotated more than 10° with respect to the vehicle centerline in order for the poles to be lowered.

Deep Snow/Mud Switch

The Deep Snow/Mud switch is a momentary toggle switch used to change the operating mode of the Automatic Traction Control System (ATC). Positioning the switch to ON and releasing, will prompt the system to allow more wheel spin. Repositioning the switch to ON will deactivate this operating mode. Refer to the Vehicle Operation Section of this manual for specific operating instructions on the ATC System.

Farebox Light Switch

The Farebox Light toggle switch controls the light above the farebox. When in the ON position the light illuminates. The OFF position disables the light.

Speaker Select Switch

The Speaker Select toggle switch controls the interior and exterior speakers of the public address (P.A.) system. Position this toggle switch to INTERIOR, or BOTH to direct the P.A. announcement to the desired audience.

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.

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.

Route Selector Switch

The Route Selector switch is used to transmit a signal to the Overhead Lines Routing Switch System. When the Route Selector switch is in the “N“ (normal) position, the vehicle will transmit to the Overhead switch using the left and right turn signals. If the Route Selector switch is positioned to either “L“ (left), “R“ (right), or “S“ (straight) positions, the route selector signal will transmit to the Overhead switch and override the turn signal switch.

Parking Brake Control Valve

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

The parking brake control 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.

Driver’s Light Switch

The Driver’s Light toggle switch is a two-position switch that controls the light above the driver.

Dash Fan Speed Switch

The Dash Fan Speed toggle switch controls the center dash fan. To run the fan, reposition switch from OFF to either HIGH or LOW for desired speed.

Foot Operated Controls

See “Figure 29: Driver’s Foot Controls” on page 88.

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 regenerative braking function. Refer to “11.VEHICLE OPERATION” on page 95 in 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 stop lights and the stop lights indicator.

☞NOTE:

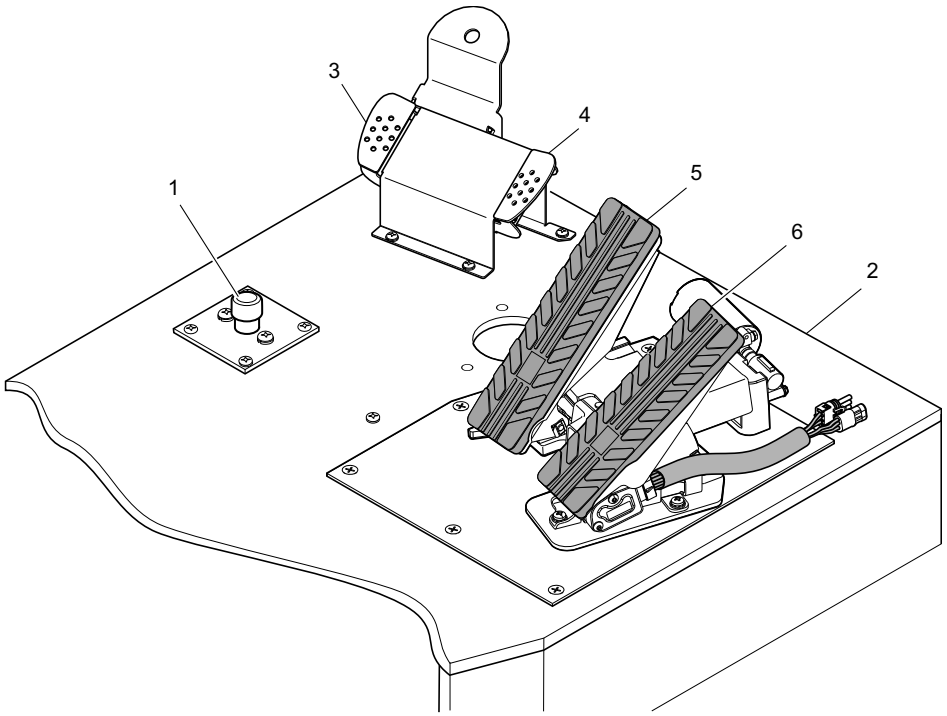
The brake treadle drops slightly when the Interlock System applies. To release the brake interlock system, apply sufficient pressure to the brake treadle to “push through” the interlock application. The interlock message will disappear from the instrument panel LCD screen and the treadle will return with the operator’s foot to its normal position.

Accelerator Treadle

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

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.



1. Headlight Dimmer Switch
2. Driver's Platform
3. Left Turn Signal Switch
4. Right Turn Signal Switch
5. Brake Treadle
6. Accelerator Treadle

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Figure 29: Driver's Foot Controls

Turn Signal Switches

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

The turn signal switches are also used to activate the Overhead Line Route switches. When the vehicle approaches a junction in the overhead lines, the turn signals can be used to activated the Overhead Route switch. Pressing the left or right turn signal switch will be recognized by the Propulsion System switch which, in turn, will transmit a signal to the Overhead Route switch. The Overhead Route switch, located in the overhead line junction, will direct the trolley poles in the selected direction.

Miscellaneous Controls

See “Figure 30: Miscellaneous Switches” on page 89.

Regen Brake Switch

The Regen Brake toggle switch is located inside the front destination sign compartment and controls power to the regenerative braking system. Moving the switch to the DISABLE position will deactivate the regenerative braking system and illuminate the REGEN BRAKE OFF indicator on the instrument panel. The ON position will restore operation of the regenerative braking system.

☞NOTE:

Consult your transit authority for specific operating conditions during which the Regen Brake switch should be used.

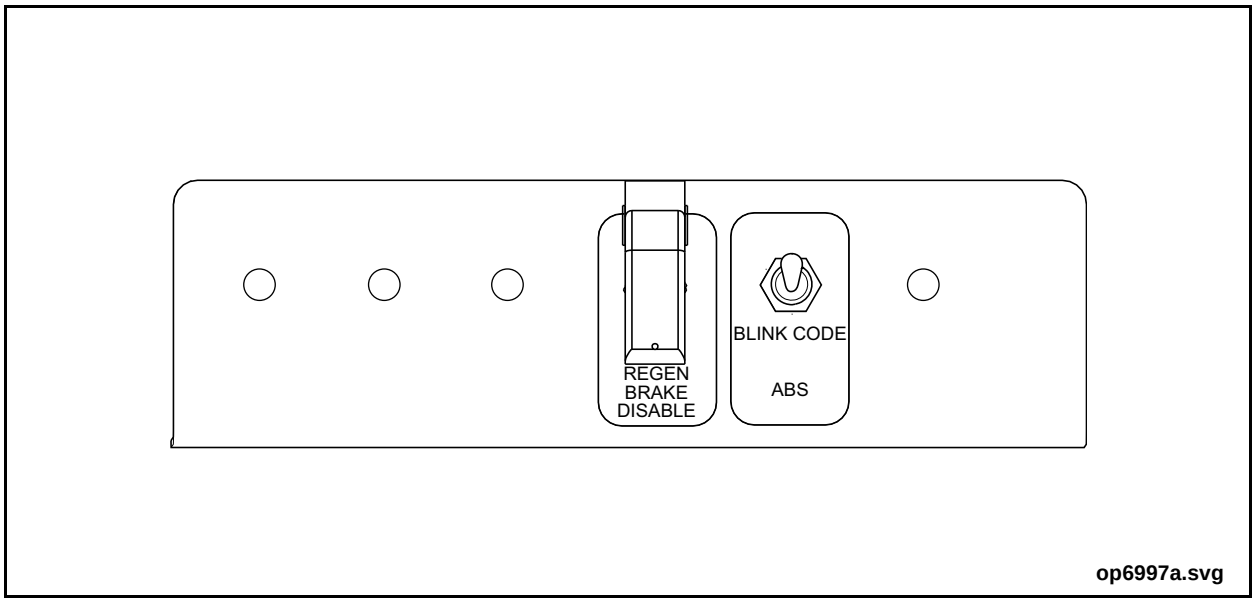


Figure 30: Miscellaneous Switches

ABS Switch

The ABS switch 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.

Entrance Door Manual Control Valve

This air control valve is located beside the driver, just below the side console. 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.

10.FIRE SUPPRESSION SYSTEM

Monitoring and operating the Fire Suppression System effectively requires a basic understanding of the components and the operation of each in the system. The following gives a brief explanation of the components and their function.

Major System Components & Location

- Fire Suppression Control Panel (1) - located in the driver's overhead panel.
- Heat Sensors (4) - one in the 12/24 VDC battery compartment, one in the area of the traction motor, and one in each of the two rooftop Propulsion System containers.
- Discharge Nozzle (1) - in 12/24 VDC battery compartment.
- Extinguishing Agent Cylinders (1) - in the rear streetside corner of the HVAC compartment.
- Manual Actuator Switch (1) - located in the driver's overhead panel.

Description

The Fire Suppression System protects the passengers and vehicle against fire. A halon extinguishing agent discharges through a single fixed nozzle to suppress a fire. Driver's area components include the manual actuator switch and fire suppression control panel.

Manual Actuator Switch

The Manual Actuator switch is located in the driver's overhead panel 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.

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. See “Figure 31: Fire Suppression Control Panel & Manual Actuator Switch” on page 92.

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:”

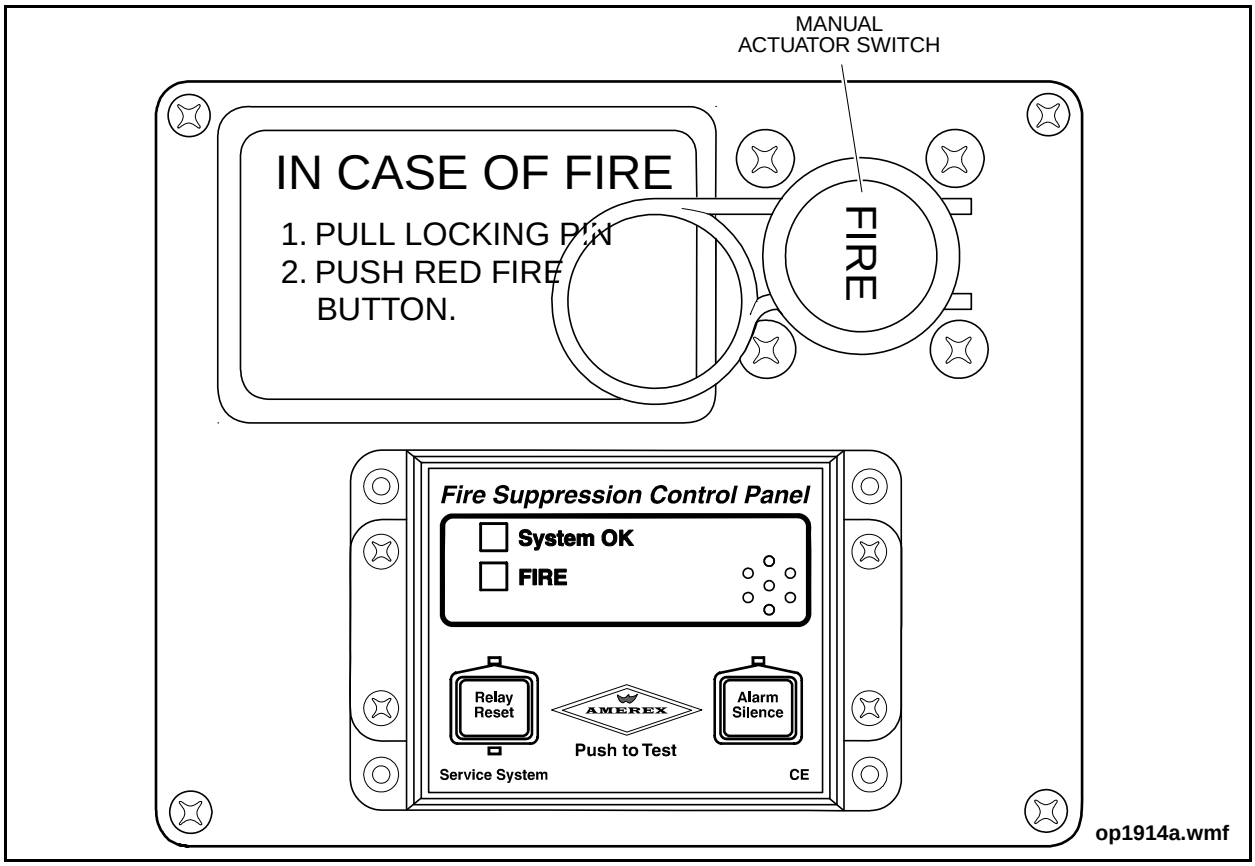


Figure 31: Fire Suppression Control Panel & Manual Actuator Switch

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

SCREEN DISPLAY MESSAGES					
EVENT TYPE	**EVENT CAUSE**	**EVENT RECORD**	**OPERATION DISPLAY**	**LED INDICATION**	**AUDIBLE ALARM**
None	System	Clock Set Configuration Written Configuration Erased Configuration Reset Self-Test Relays Cleared Alarm Silenced Reset (at power-on) User Reset (logo button) Event Log Erased Configuration Mismatch Power Failure Maintenance Schedule Set Maintenance Schedule Reset Maintenance Disabled	None	No	No

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 halon 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 Vehicle Protection System to shut down the Electric Propulsion System. 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.

11.VEHICLE OPERATION

WARNING

ALWAYS shift the vehicle into neutral [N] and apply the parking brake before leaving the driver's seat for any reason. Failure to apply the parking brake does not properly secure the vehicle from inadvertent movement.

DO NOT rely on the Interlock System alone to secure the vehicle.

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 Multiplexing 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.
- Fully kneel the vehicle. Refer to "Kneeling" on page 113 in this manual for kneeling procedure.

Power-Up

WARNING

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

Battery Disconnect Switch

To operate the vehicle the Battery Disconnect switch must be in the ON position. Check the switch by opening the battery disconnect access door at the rear of the vehicle. These connect the vehicle electrical circuits to the battery power. See “Figure 32: Battery Disconnect Switch” on page 96.

☞NOTE:

Refer to “5.DRIVER’S CHECK LIST” on page 28 *in this manual before operating the vehicle.*

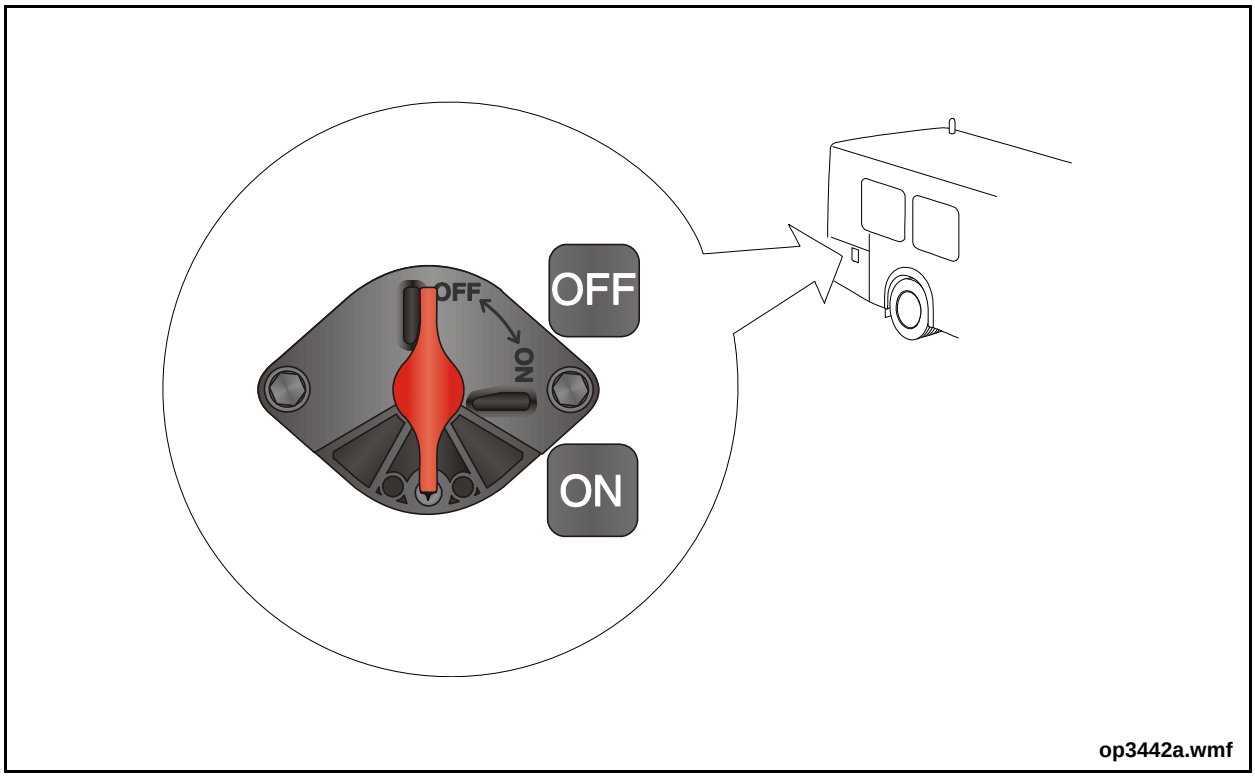


Figure 32: Battery Disconnect Switch

Overhead Power Connection

To operate the vehicle, the overhead 700V DC power must be connected, or ESS mode selected. In normal operation connect the current collector poles to the overhead line. Refer to “Connecting & Stowing the Poles” on page 108 for connecting procedure.

In ESS mode, the vehicle operates off-wire, using energy stored in its Energy Storage System. Refer to “ESS Mode Operation” on page 97 in this manual for the operation of this system.

ESS Mode Operation

To power-up the vehicle in ESS mode, simply set the Master Run switch to DAY-RUN or NIGHT-RUN mode, and press the ESS button on the mode selector at the driver's instrument panel.

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 vehicle shut down, the Multiplexing System responds instantly.

☞NOTE:

The "NO 700" Volt indicator on the instrument panel will illuminate if overhead power is not available.

Operational Checks

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

- The air system pressure is within normal operating range and the suspension is at full height.
- The No Gen indicator is off when the vehicle is operating.
- Mode selector neutral [NN] indicator remains illuminated.
- Parking brake and stop light indicator remain illuminated as long as the parking brake is applied.
- Door control push buttons are operational. This may require resetting the door manual control valve if it was used to gain entry into the vehicle.
- Position the Door Master switch to the OFF position and attempt to open the exit door by using the side console door control push button. 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/air conditioning controls (on dash) are operational.
- Exterior lights operate during exterior light test. To conduct test, ensure vehicle is powered up and parking brake is applied, then press both turn switches simultaneously. All exterior lights will illuminate for two minutes. The lights are extinguished by shifting the mode selector out of neutral [N]. This feature enables one person to test the exterior light system.
- 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.

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 indicator illuminates when air pressure drops below 75 psi to warn of an unsafe air system pressure level. A warning buzzer sounds when the Low Air indicator is activated. DO NOT OPERATE THE VEHICLE until the alarm system is canceled.

The air pressure gauge indicates the air system pressure levels of the air brake system. The air system will maintain pressure levels above the low operating limit of 120 psi (827 kPa) during normal vehicle operation.

Mode Selector

At vehicle power-up, the mode selector neutral [N] button illuminates to indicate that the traction motor is in neutral. This should occur automatically at each vehicle power-up.

No Gen

When illuminated, the no gen indicator signals that the 12/24VDC System is NOT charging. The indicator remains illuminated until the vehicle is powered-up. If the indicator fails to remain illuminated until the vehicle is powered-up, DO NOT OPERATE THE VEHICLE.

Operator Display Keyboard (ODK) Messages

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

Rear Door Open Indicator

Press the RED rear door control push button to check that the Rear Door Open indicator illuminates when the doors open.

☞NOTE:

Exit doors will open and the interlocks will be engaged. Interlocks are rated up to 15% grade, park brakes are rated at 20% and more.

Pressing the RED rear door control button closes the exit door 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.

Day-Time Operation

When the vehicle is powered-up, check the following:

- The air system pressure is within normal operating range of 120 to 131 psi (827 to 903 kPa) and the suspension is at full height.
- The No Gen indicator is off when the vehicle is powered-up.
- Mode selector neutral [NN] 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 control push button operation.
- The Door Master switch, when placed in the DISABLE position, disables the exit door and inhibits the brake interlocks.

☞NOTE:

Return the Door Master switch to the ON position.

- Aisle lights operation.
- 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 aisle lights can be turned on using the Aisle Lights switch.

Regenerative Braking

Regenerative braking is initiated as soon as the accelerator treadle is released. When the brake pedal is depressed, the regenerative braking is blended with the vehicle service brakes in order to slow the vehicle. During vehicle deceleration the traction motor is driven, through the drive-line, by the weight of the vehicle. Under this condition the motor imposes a load on the driveline, slowing the vehicle as it captures kinetic energy to create electrical energy.

The energy recovered from the moving vehicle by the regenerative braking is stored in the ESS battery pack. Once the battery packs are fully charged, excess energy can be diverted back to the overhead line grid network. If the grid network cannot accept the additional current, then the regenerative braking energy is routed to the braking resistor where it is dissipated as heat.

The regenerative braking system can be disabled by using the Regen Brake Disable switch located inside the destination sign compartment.

☞NOTE:

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

Anti-Lock Braking System

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. The ABS is inactive (no ABS event) whenever wheel deceleration difference remains within programmed limits.

An ABS Indicator on the instrument panel indicates any active faults and is also used by service personnel to retrieve codes.

⚠WARNING

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

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.

☞NOTE:

Under certain operating conditions, the ABS system will override the Regenerative Braking System. Refer to “Regenerative Braking” on page 102 *in this manual for specific operating conditions which apply.*

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 vehicle start-up. Driving the vehicle above 4 mph (6 km/h) should extinguish the indicator. If the indicator remains illuminated, active faults are still present; 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 drive torque to the wheel with better traction. If both drive wheels spin, the system reduces drive torque to improve traction. The ATC indicator on the instrument panel illuminates to confirm system operation.

The ATC system has two modes of operation. The normal mode activates automatically to reduce wheel spin when drive traction is reduced. An illuminated ATC indicator light on the instrument panel confirms system operation. The deep snow/mud operating mode is manually activated by the Deep Snow/Mud switch on the side console. Use this mode when travelling over soft surfaces like snow, mud or gravel where wheel spin is required to provide enough drive traction to move the vehicle.

To activate the deep snow/mud mode, position the switch to ON and release. The ATC operating mode will change to allow more wheel spin as indicated by flashing ATC indicator. To deactivate and return to the normal operating mode, reposition the switch to ON and release. The ATC indicator will stop flashing.

☞NOTE:

Shutting down the vehicle will also deactivate the deep snow/mud mode.

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. Power-up the vehicle and check the following:
   a. The low pressure warning devices switch off as the air pressure builds.
   b. If the air pressure gauge reading was below 90 psi (620 kPa), the reading increases back to 90 psi (620 kPa) in less than three minutes.
   c. The air pressure gauge reading levels off at the upper operating range of 131 psi (903 kPa).
3. Release the parking brake.
4. Make multiple light brake treadle applications and check the following:
   a. The air pressure gauge reading stabilizes at the lower operating range of 120 psi (827 kPa) as the air compressor begins its pumping cycle.
   b. After continued multiple light brake treadle applications the low pressure warning devices activate as the air pressure gauge reading falls below 75 psi (517 kPa).
5. Release the brake treadle and reapply the parking brake.
6. Allow the air system to fully recharge.
7. Shut down the vehicle by turning the Master Run switch to STANDBY position, and proceed as follows.
   a. Release the parking brake.
   b. Apply the brake treadle fully, hold and check the following:
      - Upon treadle application the air pressure gauge reading does not drop more than 18 psi (124 kPa).
      - The air pressure does not drop more than 3 psi (20 kPa) per minute.
      - There are no audible air leaks.
   c. Release the brake treadle and apply the parking brake.

8. Power-up the vehicle by turning the Master Run switch to the DAY-RUN position.
   a. Set the Fast Idle switch to FAST to recharge the air system.
   b. Allow the air system to recharge to 131 psi (903 kPa).
   c. Release the parking brake.
9. Move the vehicle slowly and test brake response. Refer to “Moving the Vehicle” on page 106 in this manual before operating the vehicle.

Moving the Vehicle

1. Fasten driver’s seat-belt.
2. Close the doors by using the door control push buttons. The Rear Door Open indicator should be off.
3. Apply the brake treadle and release the parking brake. The parking brake indicator extinguishes.
4. Use the mode selector to select the desired driving mode.
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.

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. See “Figure 33: Parking on an Incline” on page 107.

1. Bring the vehicle to a complete stop using the brake treadle. The stop lights indicator illuminates. Press the neutral [N] button on the mode selector.
2. Apply the parking brake and release the brake treadle. The parking brake indicator illuminates.
3. Open the entrance door by pressing the GREEN door control push button.
4. Turn the Master Run switch to the STANDBY position.
5. Exit the vehicle.
6. Slide the front portion of the driver’s window back to gain access to the door control from outside the vehicle.
7. From outside, close the entrance door by pressing the GREEN entrance door control push button.
8. Close the driver’s window (from outside) by sliding the front portion forward.

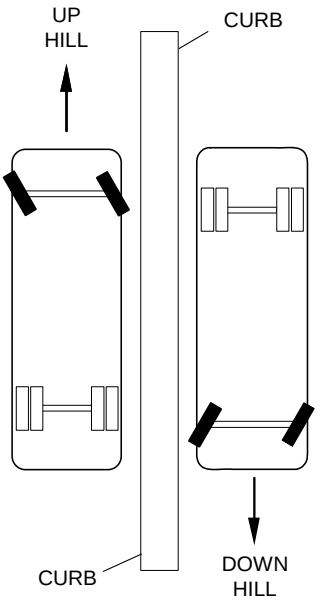


Figure 33: Parking on an Incline

Connecting & Stowing the Poles

Connecting Poles from Stowed Position

NEVER wind the rope around your hand when connecting the poles. Even when the retriever valves are switched off when the vehicle is at a standstill, a fault may cause retriever action leading to severe injury.

ALWAYS connect the negative (curbside) pole first, then the positive (streetside) pole.

If the vehicle is being powered up in a location where overhead wire funnels are present, then it is not necessary to use the ropes to manually unhook and guide the poles to the overhead wires. Activation of the POLES UP switch will automatically raise the current collector poles. The overhead wire funnels will guide the current collector poles to the wires.

1. Apply the parking brake.
2. Select neutral [N] on the Mode Selector.
3. Set the Master Run switch to the STANDBY position.
4. Move to the rear of the vehicle and pull the rope on the negative (curbside) pole to move the pole downward and laterally to release it from the stowage hook.
5. Release the rope carefully to allow the pole to lift the current collector head into contact with the overhead line. If the current collector head does not align with the line, slash it gently against the line to align it.
6. Connect the positive pole using the same method as the negative pole.

Connecting Poles after Dewirement

WARNING

DO NOT use one pole as a lever to release the other pole that may be entangled in the overhead line. DO NOT use the end of one pole to strike and release the other pole as this will cause damage to the equipment.

☞NOTE:

The poles are said to be dewired whenever they have become disconnected from or entangled in the overhead lines, regardless of cause.

1. Release air pressure in the air cylinders using one of the two methods below:
   a. If the poles are not snagged on the overhead lines, pull them down below the height of the hooks (using rope) to release air pressure. The air pressure will automatically bleed out of the cylinders when the pole is lower than the hook.
   b. If the poles are snagged on the overhead lines, hold the rope and press the respective air release button (left button for left pole, right button for right pole) on the EPU rear compartment door to allow the poles to lift and clear the overhead line. Pull the poles down into the hooks.
2. Connect poles to overhead lines. Refer to “Connecting Poles from Stowed Position” on page 108 in this manual for procedure.

Stowing Poles

WARNING

Use extreme caution if using the ropes to lower the collector poles. NEVER attempt to lower the poles if the vehicle is in motion. ALWAYS use the air release switches prior to pulling down the poles. A fault in the retriever system could pull down the poles without warning. Keep hands clear of the rope guide on the rear compartment access door.

WARNING

Ensure all auxiliary systems are switched off by setting the Master Run switch to the STANDBY position before lowering the poles. This will prevent arcing which could damage the overhead line or electrical equipment on the vehicle.

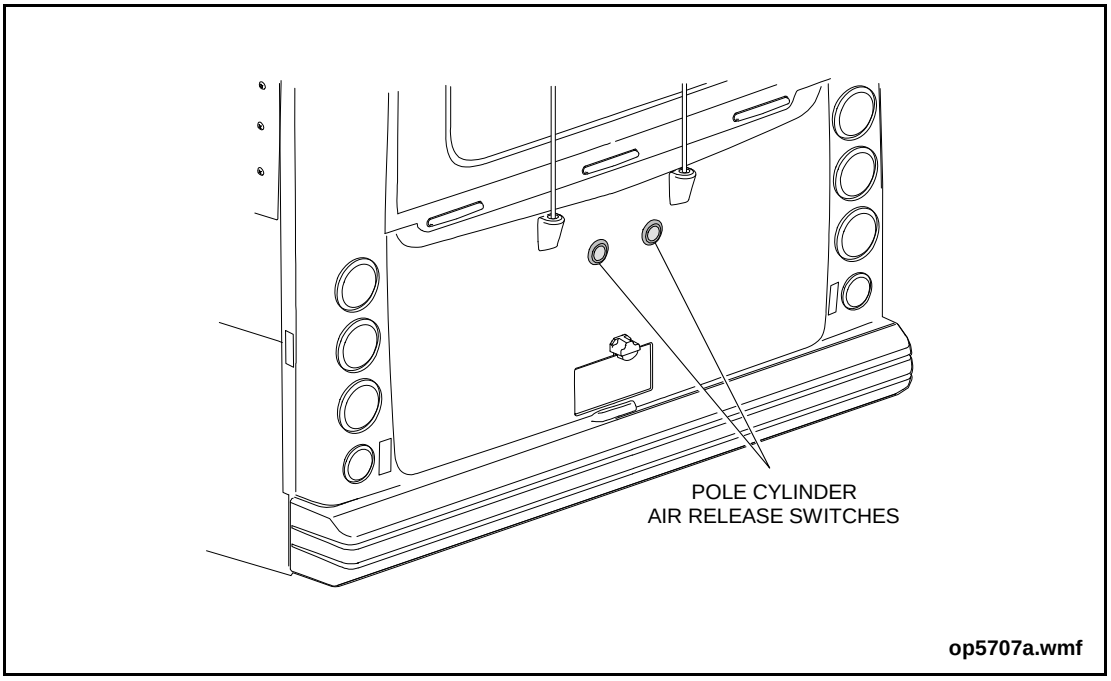


Figure 34: Pole Cylinder Air Release Switches

The following procedure describes lowering and stowing the poles manually in the event the Poles switch is inoperative or in an emergency situation.

1. Apply the parking brake.
2. Select neutral [N] on the Mode Selector.
3. Set the Master Run switch to the STANDBY position.

WARNING

ALWAYS lower the positive (streetside) pole first, then the negative (curbside) pole.

4. Move to the rear of the vehicle and press the air release switch for the positive (street-side) pole. See “Figure 34: Pole Cylinder Air Release Switches” on page 110.
5. Use an insulated pole with hook to pull down the collector pole. Use the hooked end of the pole to grasp the handle on the end of the collector pole.
6. Continue to lower the pole until it is below the level of the storage hook.
7. Move the pole laterally and allow it to slip up into the hook.
8. Press the air release switch for the negative (curbside) pole and repeat steps 5-7 for the negative pole.

Roof Hatch Ventilation

The roof hatches may be used for ventilating the interior when the vehicle is in motion. Open the front roof hatch so that it draws air into the vehicle and open the rear hatch so that it draws air out of the vehicle. Push firmly on the front or rear hatch handle to tilt the roof hatch to the desired position. See “Figure 35: Roof Hatch Ventilation” on page 112.

⚠CAUTION

Close the roof hatches when passing under low overhead restrictions.

☞NOTE:

Close the roof hatches when the HVAC system is in operation or to keep precipitation out.

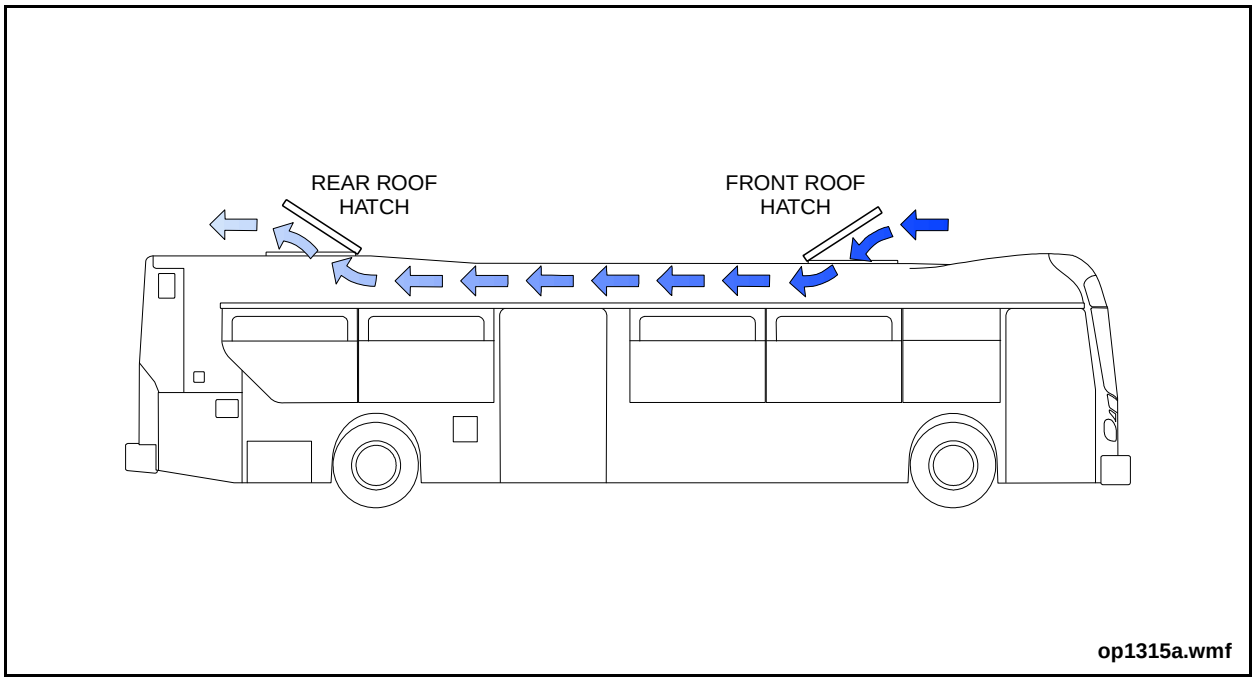


Figure 35: Roof Hatch Ventilation

Jump Start Connection

The jump start connector is a quick connect assembly that ensures a safe and correct electrical connection of an auxiliary power supply to the vehicle battery terminals. Connect an external power supply to supplement or assist the on-board batteries if they have become depleted. One jump start connector is located on the lower face of the fusebox and the other is mounted on a curbside support strut inside the rear compartment.

Fire Suppression System

If a fire activates the Fire Suppression System, it will immediately shut down the Electric Propulsion System. Bring the vehicle to a stop, shut down any electrical systems, set the parking brake and evacuate all passengers from the vehicle. Call transit dispatch for assistance. The vehicle cannot be restarted until the applicable fault is cleared and the system is reset by service personnel.

☞NOTE:

An alarm sounds when the Fire Suppression System activates.

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.

☞NOTE:

The Kneeling sensors must be calibrated at each vehicle start up. To calibrate sensors, fully kneel vehicle once.

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 push button 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.

⚠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 Signal

An amber lamp located beside the entrance door indicates when the kneeling system is in operation. A warning beep also sounds.

Passenger Signal System

This passenger signal system is activated by the following devices:

- Stop request cord
- Exit door stanchion push buttons
- Wheelchair area touch pad

Activating the signal system causes the following to occur:

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

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

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

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

Stop Request Cord

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

Stop Request Button

Two stop request buttons are located on the exit door stanchions. Pressing a button activates the system.

Wheelchair Stop Request Touch Pads

Stop request touch pads are located under each longitudinal hinged seat in the wheelchair stations. Pressing the 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 curb lights. Pressing the door control press button 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.

12.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.

Safety Precautions

Comply with these safety precautions:

- Avoid using ramp on sloped or steeply crowned roadways because it may compromise the safety of ramp users.
- Verify that the vehicle area is clear of obstacles.
- Read and comply with all warning labels and symbols attached to the wheelchair ramp.
- Inspect ramp before use. If unusual noises, movements, or other unsafe conditions are noticed, inform your transit authority.
- Do not operate ramp with a load in excess of 300 kg (660 lbs).
- The platform is intended for ONE wheelchair and its occupant. Do not overload ramp.
- Wheelchair occupants must face forward (in direction of travel) when entering or exiting vehicle. Do not move wheelchair backwards onto ramp.
- Do not place equipment inside the vehicle that may prevent pivoting of the wheelchair. Being able to pivot assures that the wheelchair passenger can safely exit facing outward.
- Wheelchair brakes are less effective if the wheels or ramp are wet. The operator must be extra careful in wet conditions.
- Verify that the wheelchair fits safely on the ramp. The wheelchair cannot extend beyond the side barriers.
- Keep arms, legs and clothing away from moving ramp parts.
- Keep others clear of ramp while operating it.
- Return ramp to stowed position when not in use. Do not leave ramp outside of 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.**

☞NOTE:

The ramp motor is electronically controlled and will automatically shut off prior to the ramp platform reaching the fully deployed or stowed position. The ramp will continue to fall or float, unpowered, until it reaches its fully deployed or stowed position. The DEPLOY/STOW toggle switch may be released once the ramp has travelled pass the mid-point of its travel and the motor shuts off.

Operation

The ramp control toggle switch is located on the instrument panel. The three positions of the switch enable the wheelchair ramp mechanism to perform the following operations: See “Figure 36: Wheelchair Ramp Operation” on page 119.

☞NOTE:

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.

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.

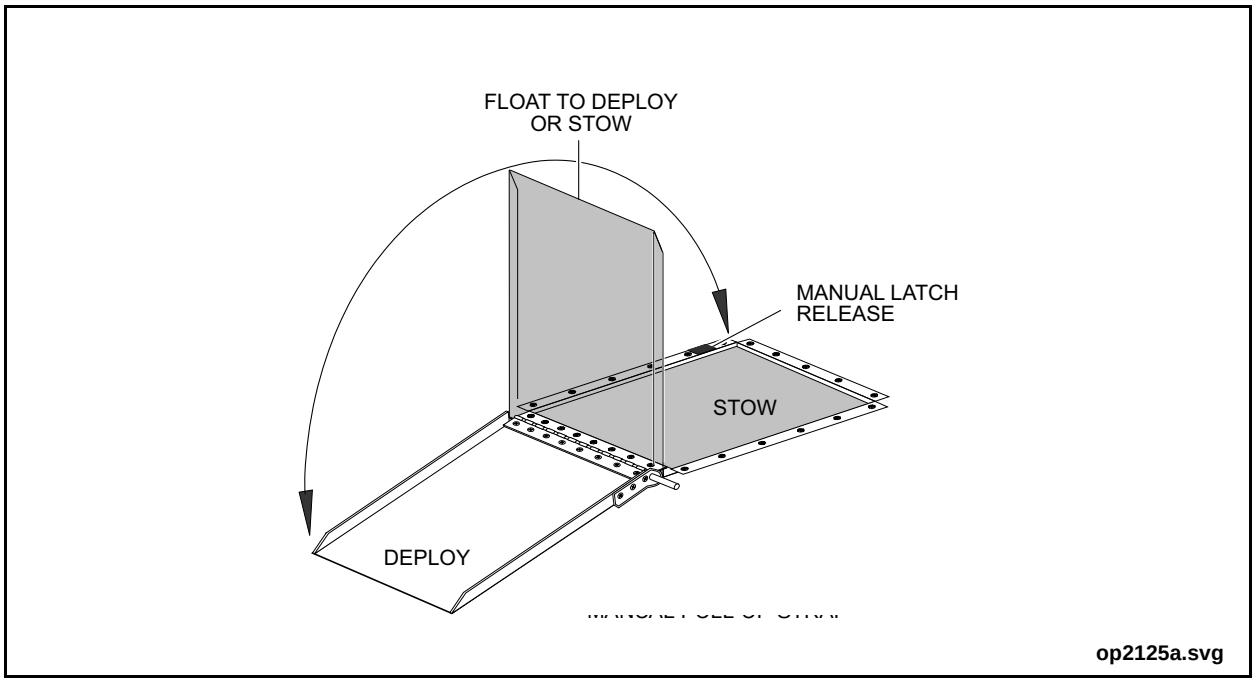


Figure 36: Wheelchair Ramp Operation

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 mode selector in neutral [N].
4. Kneel vehicle if required.

☞NOTE:

Parking brake and stop light indicators on the instrument panel will illuminate.

5. Press the entrance door control push button to open the door.

⚠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.

Raising the Ramp

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 the manual latch release located near the corner of the ramp plate.

Wheelchair Restraint System

The forward seat positions are equipped with a "Q-Pod" 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. See “Figure 37: Wheelchair Restraint System” on page 122.

☞NOTE:

This restraint system includes an automatic belt retraction system. When the retractor release handle is actuated, the operator has 15 seconds to affix the hooks to the wheelchair frame. The belts will tighten automatically when the 15 second interval has elapsed. A light will illuminate and an alarm will also sound for the duration of the 15 second interval.

Operation

Positioning the Wheelchair

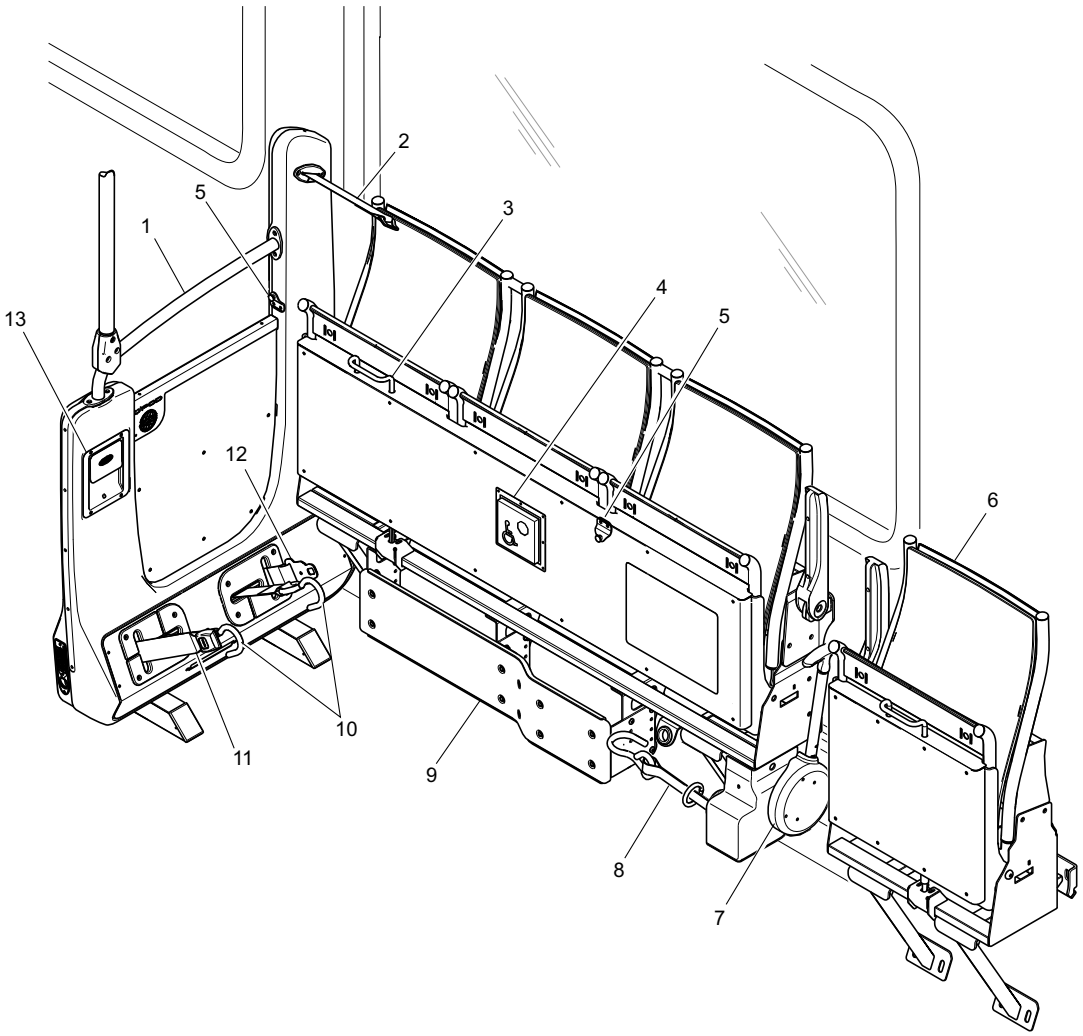
Position the wheelchair in the restraint area as follows:

1. Move the flip-up seat cushions up to the lock position.
2. Extend the lap belt and attach it to the belt hook on the flip-up seat assembly. This will provide access to the belt once the wheelchair has been positioned.
3. Back the wheelchair into the restraint area, facing forward (facing driver's seat).
4. Set the wheelchair brakes.

Rear Wheelchair Restraints

Attach the rear wheelchair restraint belts as follows:

1. Pull the retractor release handle and pull the belt to extend.
2. Attach the belt hook around a solid rear frame member of the wheelchair.
3. Wait for the 15 second delay, belts will retract and tighten automatically.



1. Wheelchair Barrier
2. Shoulder Belt
3. Flip-Up Mechanism Release Handle
4. Stop Request Touch Pad
5. Belt Hook
6. Flip-Up Seat Assembly
7. Front Belt Release Handle
8. Front Wheelchair Restraint Belt
9. Wheelchair Side Restraint
10. Rear Wheelchair Restraint Belts
11. Passenger Belt Clip
12. Lap Belt
13. Rear Belt Release Handle

op16451a.svg

Figure 37: Wheelchair Restraint System

Front Wheelchair Restraints

Attach the front wheelchair restraint belts as follows:

1. Ensure the wheelchair is positioned directly against the side restraint.
2. Extend the belt and attach the hooked end around a solid frame member of the wheelchair.
3. Pull downward on the belt tightening handle until the wheelchair is firmly snugged up against the side restraint.

Passenger Securement

Restraints should not be held away from body by wheelchair components.

Secure wheelchair occupant as follows:

1. Extend both ends of lap belt and connect together at occupant's hip area on aisle side. Do not place belt over armrest.
2. Ensure that belt clips and buckle are securely engaged.

13.NOTES

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