IC Bus® Electric CE Series

Operation and Maintenance Manual

IC Bus, LLC

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IMPORTANT

The information, specifications, and illustrations contained in this manual are based on data that was current at the time of publication. IC Bus, LLC reserves the right to make changes and/or improvements at any time without notification, liability, or without applying those changes or improvements to vehicles previously manufactured and/or sold.

NOTICE

Be advised that this motor vehicle may be equipped with computer / recording devices. Their function is to allow an authorized individual to download data or information relating to the operation or performance of this vehicle.

The stored data or information may be neither downloaded nor retrieved except by the vehicle's registered owner, or, in the alternative, by another individual or entity authorized by the registered owner (e.g., IC Bus® dealer) who may need this data or information to properly service or diagnose this vehicle for repair or following an accident.

Any access to this information without the owner's consent may be in violation of law and may subject that person or entity to criminal penalties.

CALIFORNIA
Proposition 65 Warning

WARNING Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel

Battery posts, terminals and other related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Wash hands after handling.

IMPORTANT

It is important that the applicable vehicle identification number (VIN), engine serial number and or component feature codes are recorded. These numbers are required to obtain pertinent information for this vehicle or engine.

VEHICLE IDENTIFICATION NUMBER (VIN)

ENGINE

Feature Code:	Serial Number:

FRONT AXLE

Feature Code:	Serial Number:

REAR AXLE

Feature Code:	Serial Number:

TRANSMISSION

Feature Code:	Serial Number:

CUSTOMER ASSISTANCE CENTER
1-800-44-TRUCK (1-800-448-7825)

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Summary of Changes

Section	Description	Revision
All	Initial Release	1
All	Warnings and Cautions Content Updates	2
Section 4	Instrumentation: Updated content to Warning Indicators, Instrument Panel Gauge Cluster, Integral Digital Display	
Section 10	Climate Controls: Updates to Auxiliary Heater content	
Section 11	Operation: Updates to Driving an Electric Vehicle content	
Section 13	Roadside Emergencies: Updates to Towing Instruction Content	
Section 16	Maintenance Intervals and Specifications: Updates to Dana Drive Motor and Cabling Intervals content	
Section 4	Instrumentation: Updated illustrations and edited content for clarity	3
Section 12	Charging High-Voltage Batteries: Updated charging process	
Section 13	Roadside Emergencies: Added fuse panel layouts for Power Distribution Modules (PDMs)	
Section 16	Maintenance Intervals: Updated Intervals for cooling systems and drive motor.	
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Section 1 – Introduction

Section 2 – High Voltage Overview

Section 3 – Vehicle Inspection Guide

Section 4 – Instrumentation

Section 5 – Driver Controls

Section 6 – Lights

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Section 8 – Seating and Safety Restraints

Section 9 – Wheelchair Instructions and Information

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SECTION 1 — INTRODUCTION

Preface

All IC Bus® buses are engineered and manufactured to provide economical and trouble-free service. It is the owner's responsibility to make sure the bus receives proper care and maintenance.

Making modifications to various parts, components and systems of your bus can adversely affect the quality and reliability of your vehicle. IC Bus® does not recommend making modifications to this bus.

This manual provides information needed to understand the operation of your bus and its safety features. It also contains information necessary for the proper operation and maintenance of various bus body and chassis systems.

Do not operate this bus until you are completely familiar with the contents of this manual. Keep this manual in your bus for reference. If you sell the bus, make sure this manual stays with it.

Optional Features. This manual describes many optional features that may not be installed in this vehicle.

Cautions / Warnings / Notes

Cautions, Warnings and Notes are included throughout this manual.

CAUTION

Cautions advise you of the proper care to be taken to prevent damage to your vehicle or property.

WARNING

Warnings advise you of hazards, the consequences, and what to do to prevent them, not only to prevent damage to your vehicle or property, but to help prevent situations and occurrences that could result in personal injury or death.

NOTE: Notes indicate an operation, procedure or instruction that is important for correct service.

Vehicle Identification

It is important that you record the Vehicle Identification Number (VIN), Component Code Numbers, and Serial Numbers. Use these numbers to obtain parts and information for your bus.

NOTE: The following illustration represents a typical VIN tag. The actual VIN tag may vary.

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Assistance Guide

IC Bus® believes that every customer is entitled to the best service, both from the product itself and from the firm who sells and services that product.

If for any reason, you do not feel you are receiving these services for the operation of your vehicle or the sales transaction, return to your selling dealer to correct these matters. If the matter is not resolved at that time:

- Contact a member of management at the Dealership to discuss the details of the difficulty. In most cases a problem can be resolved to your satisfaction by the owner or manager.

When parts are required, always provide the Component Code Number, vehicle model and Vehicle Identification Number. Ask your salesperson to assist you in obtaining this information.

For more information not given in this manual, or if you require services of trained service personnel, we urge you to contact a nearby IC Bus® or International® dealer or phone 1-800-44-TRUCK (87825) for assistance.

Component Code Numbers

Code numbers are the basis for identifying the components used on your IC Bus® bus. They are used by sales personnel to order the bus, by manufacturing to build it, and by parts to service the bus. Many items in this manual are identified by codes.

Code numbers are a combination of numbers and / or letters. These codes are listed on the Vehicle Line Set Ticket which is sometimes called the Vehicle Specification Card or Code Sheet.

Line Set Ticket

Each vehicle has a Line Set Ticket (Code Sheet) which lists the identification code numbers of components used to build the vehicle.

A copy of the Line Set Ticket is included in the literature provided with the vehicle. When replacement parts are required, use this copy to positively identify vehicle components to make sure you get the correct parts.

Vehicle Storage Instructions

When a vehicle is not used for an extended period of time, precautions must be taken to prevent deterioration of vehicle components. Vehicles that are out of service for extended periods of time can experience corrosion and other undesirable effects. Drive vehicle monthly to exercise the brakes, driveline and steering.

NOTE: Losses occurring to a unit while it is in storage will not be considered for warranty reimbursement.

General Storage Requirements

To ensure optimal operations, please adhere to the following storage and operational recommendations:

- Maintain state of charge (SOC) between 40% and approximately 90% to maintain battery life during extended storage periods.
- Charge the vehicle to 100% SOC at minimum every three (3) months.
- Recommend storage at ambient temperatures of less than 95°F (34°C).
- Avoid storage at ambient temperatures greater than 122°F (50°C).
- Temporary energy losses may result following long periods of storage without operation of the vehicle. Self-discharge rate will increase when stored at higher ambient temperatures.

Storage Duration – One Month or Less

1. Wash vehicles as necessary. Always wash vehicles that have been exposed to road salt.

NOTE: When vehicles are stored outside, particularly in coastal areas (salt water and high humidity atmosphere) or other areas of corrosive environment, paint and bright metal may require frequent washing and waxing to prevent deterioration. Determining washing frequency is the customer's responsibility.

NOTE: For vehicles exposed to ultraviolet rays of the sun, apply a coating of Bon-Ami® soap, or similar product, to the inside surfaces of the windshield and windows, to shade the interior and prevent fading of the interior trim.

NOTE: Washing Instructions - Wash the vehicle with warm water and mild soap, then wipe wet surfaces with a chamois or soft cloth. DO NOT use hot water or strong soaps or detergents. DO NOT wash the vehicle in direct sun, or when the sheet metal is hot to the touch. This will streak the finish. DO NOT wipe dirt off dry surfaces, as this will scratch the finish.

2. Inspect painted surfaces; touch up all exposed primed or raw metal areas to prevent rust.

3. Apply a thick coat of wax to prevent discoloration from the elements; wax all chrome and stainless steel metal parts.
4. Check the coolant in all three cooling systems for proper level and adequate freeze protection. -20°F (-29°C) is standard for medium duty models and bus chassis. -40°F (-40°C) is standard for heavy duty models.
5. Drain air brake reservoirs and close the drain cocks.
6. Check state-of-charge in 12V batteries and recharge if open circuit voltage is below 12.6 volts.
7. While the vehicle is not in use, it is recommended that the vehicle is kept it plugged in, so it is fully charged for the next use. While plugged in, the bus will maintain the high-voltage batteries at the optimal temperature for charging and to maximize battery life cycle. Avoid completely draining the bus's high-voltage batteries, the bus's control system requires some power to operate and initiate charging. Additionally, discharging the batteries to below 10% is not recommended. Discharging to 0% may permanently damage the batteries.

Storage Duration–Over One Month

1. Make sure all tires are inflated properly, and reconnect 12V batteries.
2. Check all vehicle fluid levels and fill as required.
3. Turn OFF heater and / or air conditioner and any other accessories; shut off the headlights. Park the vehicle and turn off the operational readiness.
4. Perform the procedure for **Storage Duration - One Month or Less**, if returning the vehicle to storage.

NOTE: After every 30 additional days of storage, perform Items 1 through 7.

Storage Facilities

1. Whenever possible, store vehicles indoors, protected from sunlight, in a dry, well-ventilated area. If indoor storage is not available, select storage lots to eliminate conditions that cause deterioration.
2. Park away from transformers and / or electrical motors, because when the protective wax in tire compound cracks, ozone in the air attacks the exposed areas.
3. Park away from trees, high weeds and / or grass to prevent damage from tree or weed sap, and to minimize bird and insect stains.
4. Park away from railroad tracks, paint shops, smoky industrial areas, and locations of possible road splash contact.
5. If a vehicle is parked on an incline, install wheel chocks.
6. If storing the bus long-term and if the bus will not be plugged into a charging station, it is recommended to store with the high-voltage batteries at a state of charge (SOC) between 20% and 80%.

7. Charge or operate vehicle monthly to ensure minimum 20% SOC in high-voltage batteries.

Reporting Safety Defects

U.S. Registered Vehicles

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying IC Bus.

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, your dealer, or IC Bus.

To contact NHTSA, you may either call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to http://www.safercar.gov; or write to: Administrator, NHTSA, 400 Seventh Street, SW. Washington, DC 20590. You can also obtain other information about your motor vehicle safety from www.safercar.gov.

Canadian Registered Vehicles

If you believe that your vehicle has a defect which could cause injury or death, to the operator, passengers or persons outside the vehicle, immediately inform Transport Canada in addition to notifying IC Bus®.

To contact Transport Canada, Defect Investigations and Recalls you may call 800-333-0510 or write to: Transport Canada, ASFAD, Place de Ville Tower C, 330 Sparks Street, Ottawa Ontario, K1A 0N5.

Safety Recalls and Authorized Field Changes

Safety Recalls and Authorized Field Changes are two campaigns that are used to notify owners of modifications that may involve their vehicle. If you receive such notification, PLEASE FOLLOW ALL INSTRUCTIONS PROVIDED IN THE CUSTOMER LETTER. If your vehicle is part of a Safety Recall campaign, the recall service procedure must be completed to ensure safe operation of your vehicle. As a vehicle owner, you must provide IC Bus® dealers with address corrections and changes to ensure that you receive all notifications. Please verify that your IC Bus® dealer has your correct address. Dealers also have a record of any outstanding campaigns that affect your vehicle.

Emission Control Systems

HD-OBD

Heavy-Duty On-Board Diagnostics (HD-OBD) is a U.S. Government mandated standard for all 2013 and later Class 4 and above vehicles with a Gross Vehicle Weight Rating (GVWR) of 14,001 pounds or more. The HD-OBD system monitors the vehicle systems.

The HD-OBD system operates similarly to previous power train control systems by storing fault codes and turning ON the MIL. If the problem that caused the fault goes away, the code will clear and the MIL will go out after certain operating conditions have been met. This may take several times operating the vehicle.

Supplemental Federal Emission Control System Warranty

The United States Environmental Protection Agency adopted new heavy-duty Greenhouse Gas (GHG) vehicle regulations on 15 September 2011. This vehicle may be certified to the GHG regulations. For certified vehicles, additional GHG emissions control system warranty covers certain vehicle components.

This Supplemental GHG Federal Emission Control System Warranty coverage for these vehicle components will be managed according to current Federal Emission Control System Warranty process. The GHG emission control system warranty applies to the below listed vehicle components such that they meet the following two conditions:

1. The vehicle and / or GHG emission control system component is designed, built, and equipped so it conforms at the time of sale to the ultimate purchaser with the requirements of the GHG regulations and such component is an emission control and appears on the GHG vehicle emission certification label.
2. The vehicle and / or GHG emission control system component is free from defects in materials and workmanship that cause the vehicle to fail to conform to the GHG requirements during the applicable supplemental warranty period.

GHG Emission Control System Warranty Period

The GHG emission control system warranty period begins on the date the new GHG certified vehicle is delivered to you. The period of coverage is the greater of the base mechanical warranty or:

- Five (5) years or 50,000 miles, whichever comes first, for spark-ignition and light heavy-duty diesel vehicles with GVWR below 19,500 pounds.
- Five (5) years or 100,000 miles, whichever comes first, for medium and heavy heavy-duty vehicles with GVWR equal to or greater than 19,500 pounds.
- Two (2) years or 24,000 miles, whichever comes first, for tires.

Additional Components Covered

Applies to all certified models:

The GHG emission-related warranty covers the following components such that they meet the two conditions listed above:

1. Hybrid system components (where applicable)
2. Components whose failure would increase a vehicle's evaporative emissions (for vehicles subject to evaporative emission standards)
3. Tires

Applies only to certified vehicles equipped with innovative technologies

The GHG emission-related warranty covers components certified as innovative technologies which are part of the certified emission controls. Please contact your authorized IC Bus® or International® Dealer for further information.

Supplemental Federal Emission Control System Maintenance, Repair, And Replacement

Your vehicle may comply with the Greenhouse Gas (GHG) regulations adopted by the Environmental Protection Agency on 15 September 2011. As owner or operator of a GHG compliant vehicle, your vehicle and GHG emissions control system components should be properly maintained in good working order.

Repair and replacement of GHG emission control system components should be done to original vehicle manufacturers' specifications to ensure proper function of the vehicle. Tire replacement should be to tires with GHG emission performance as good, or better, than tires originally equipped on the vehicle. Consult with the tire manufacturer for tire specifications.

The United States Environmental Protection Agency allows limited modification of your vehicle and its GHG emission control system components. Please refer to applicable regulations for allowable and prohibited modifications.

First Responder Information

An Emergency Responder Guide for this vehicle can be accessed in the National Fire Protection Association website: https://www.nfpa.org.

SECTION 2 — HIGH VOLTAGE OVERVIEW

Introduction

WARNING

To prevent personal injury and / or death, NEVER TOUCH OR ATTEMPT TO SERVICE HIGH-VOLTAGE COMPONENTS OR CABLES. High Voltage cables are ORANGE in color and / or ORANGE with STRIPE, components are labeled with decals denoting a high voltage symbol (triangle with lightning bolt). Service of any high-voltage components / cables should only be performed by trained Certified Service Personnel.

This section discusses an brief overview of the IC Bus® Electric CE Series high voltage components and important safety information.

High-Voltage Safety Labels

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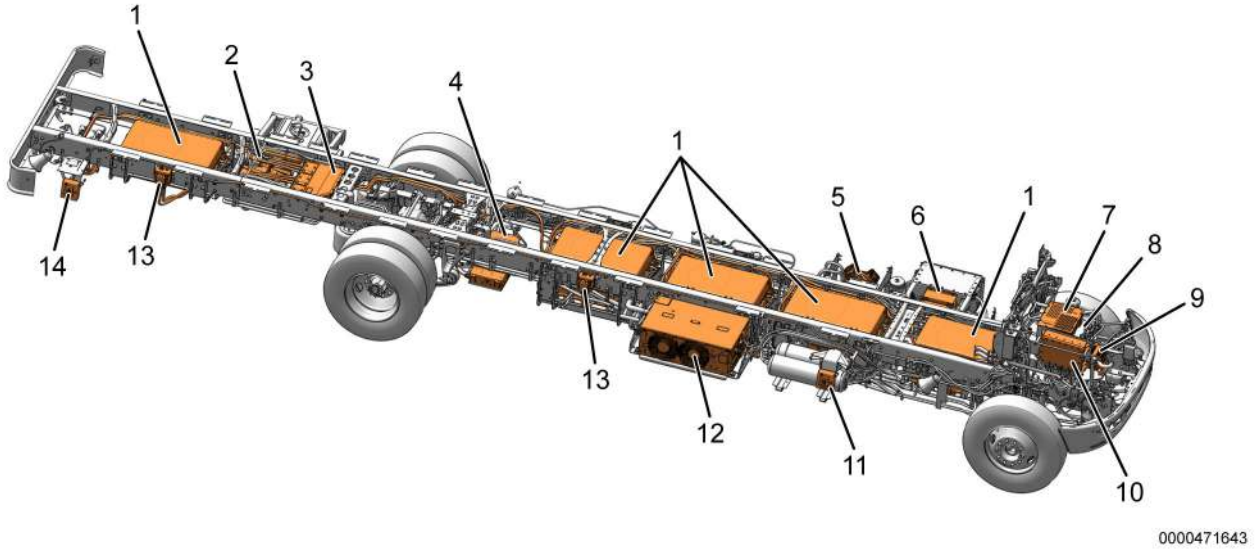
High-Voltage Label Examples

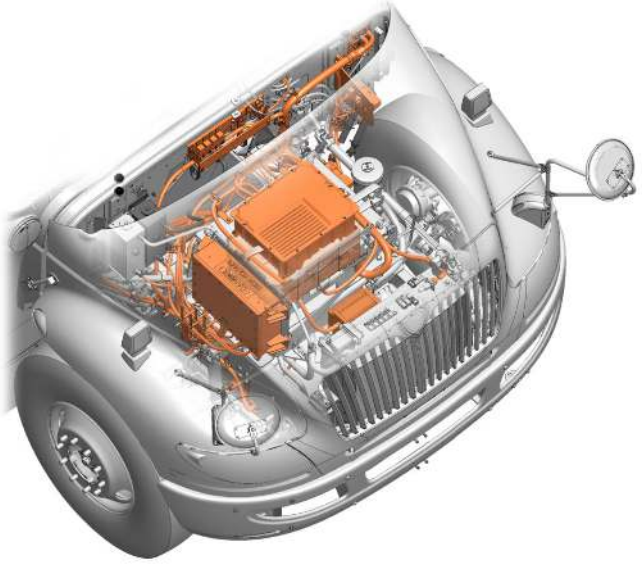
Various high-voltage components are installed throughout the entire vehicle. A triangle with a lightning bolt is used to identify high-voltage components. The lightning triangle can be single or part of a combination. Also any vehicle components that are Orange in color and / or ORANGE with STRIPE identify high-voltage components.

High Voltage Components



High-Voltage System Component Overview

1. High-voltage battery pack (up to five total, dependent on vehicle options)
2. Drive motor
3. Traction Power Inverter Module (TPIM)
4. S-box and High-Voltage Distribution Module (HVDM)
5. High-voltage air compressor
6. DCDC converters (DCDC) and 12V batteries
7. 2-in-1 inverter
8. On-Board Charger (OBC) (2) (under Item 7)
9. High-voltage power steering pump (located behind front cooling system)
10. High-Voltage Distribution Unit (HVDU)
11. Charge port front (AC & DC) and Onboard Charging Interface (OCI) module
12. Battery Thermal Management System (BTMS)
13. Manual Service Disconnect (MSD) (2 pictured). Up to four other MSDs are not pictured.
14. Charge port rear (AC & DC) and Onboard Charging Interface (OCI) Module



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Under the hood, the IC Bus® Electric CE Series has several high-voltage modules. The cabling for these modules can be distinguished by its ORANGE and / or ORANGE with STRIPES coloring. The components themselves have high-voltage labels..

The IC Bus® Electric CE Series may be equipped with up to five high-voltage battery stacks. The front four stacks can contain two vertically stacked high-voltage battery packs. The rearmost stack (if equipped) is always a single battery. The high-voltage batteries are located under the bus cabin between the frame rails. Four battery locations are between the axles and one is located behind the drive motor. The rearmost two battery stacks are optional.

In the Event of Roadside Emergency

WARNING

To prevent personal injury and / or death, NEVER ATTEMPT TO ASSESS OR INVESTIGATE ANY VEHICLE DAMAGE INVOLVING A HIGH VOLTAGE VEHICLE in an emergency situation. Only certified personnel (first responders or trained service personnel) should interact with a compromised vehicle.

In the event of an emergency situation such as an accident, always adhere to the following:

- If possible, safely pull the vehicle to the roadside and engage hazard lights.
- Safely evacuate passengers / personnel from the vehicle through clearly accessible emergency exits to an area of safe distance of at least 200–300 feet from the vehicle.
- Contact local authorities / first responders. Inform first responders that incident is involving a high-voltage vehicle.
- If possible, set up roadside emergency triangles
- Contact dispatcher / district personnel informing of the emergency.

SECTION 3 — VEHICLE INSPECTION GUIDE

Introduction

A pre-trip inspection, in accordance with Commercial Driver's License (CDL) regulations, the Department of Transportation (DOT) and state regulations, is absolutely necessary before you can begin the first route of the day. The routine can vary from bus to bus, but it is essential to have a routine and follow it. The following inspections may include checks that are in addition to the CDL requirements. If the pre-trip inspection reveals a problem, report it to the service department or a qualified technician so that it can be repaired before operating the vehicle.

After returning from your daily routes, you must complete a written inspection report in accordance with CDL regulations. Report any faults that you find, or any problems that occurred during your trip, to the service department so that they can be repaired before the next trip.

NOTE: Make sure your bus is in proper operating condition to keep the passengers safe.

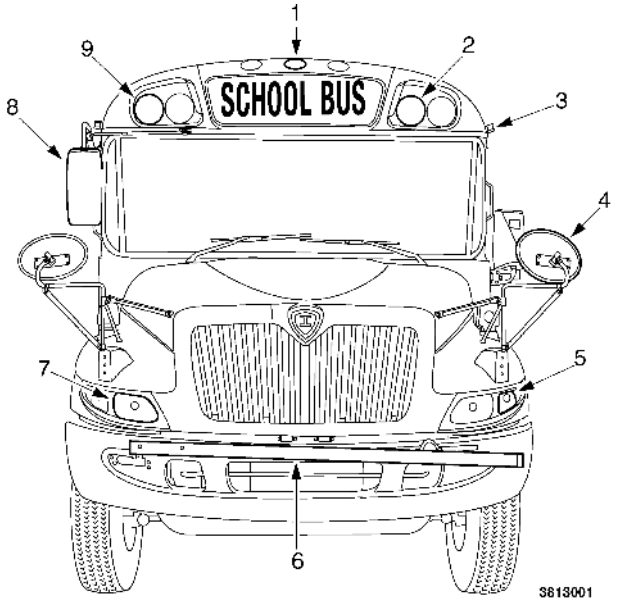
NOTE: The driver's window cannot be unlocked from the outside.

NOTE: If the buzzers do not activate with the ignition turned ON and the emergency exits open, have the vehicle repaired before placing the vehicle in service.

NOTE: Make sure that every emergency exit door and release bar is not blocked.

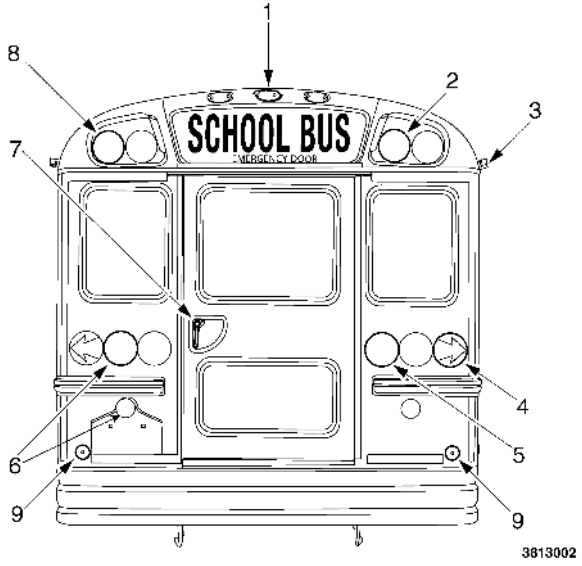
NOTE: The following illustrations are for reference only and may slightly differ from the actual vehicle.

CE Bus Front View



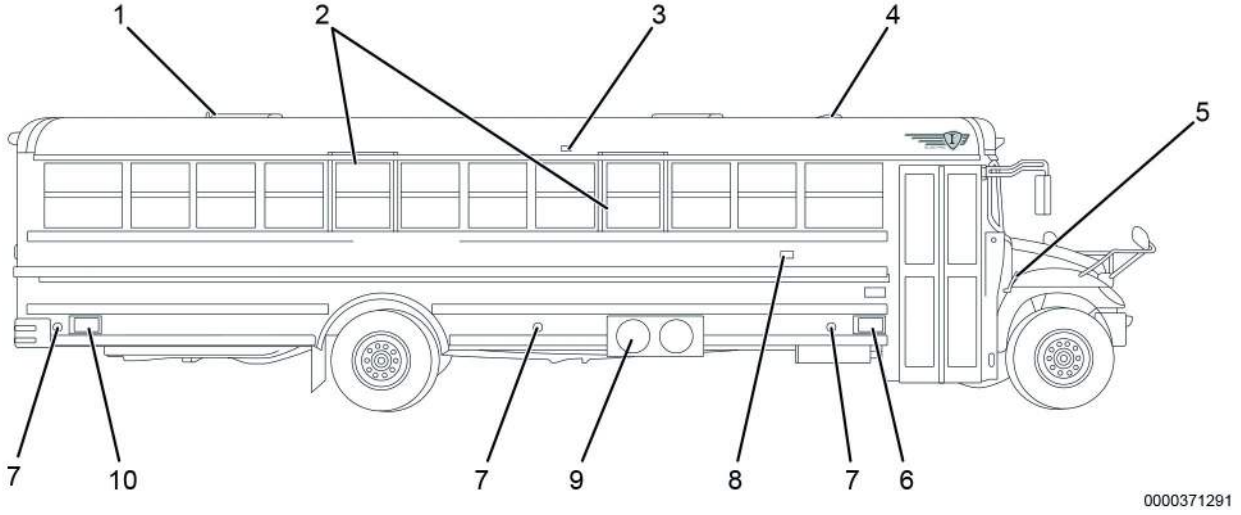
1. Identification lamp
2. AMBER warning light
3. Clearance lamp
4. Cross view mirror
5. Turn signal
6. Crossing gate
7. Headlight
8. Rearview mirror
9. RED warning light

CE Bus Rear View



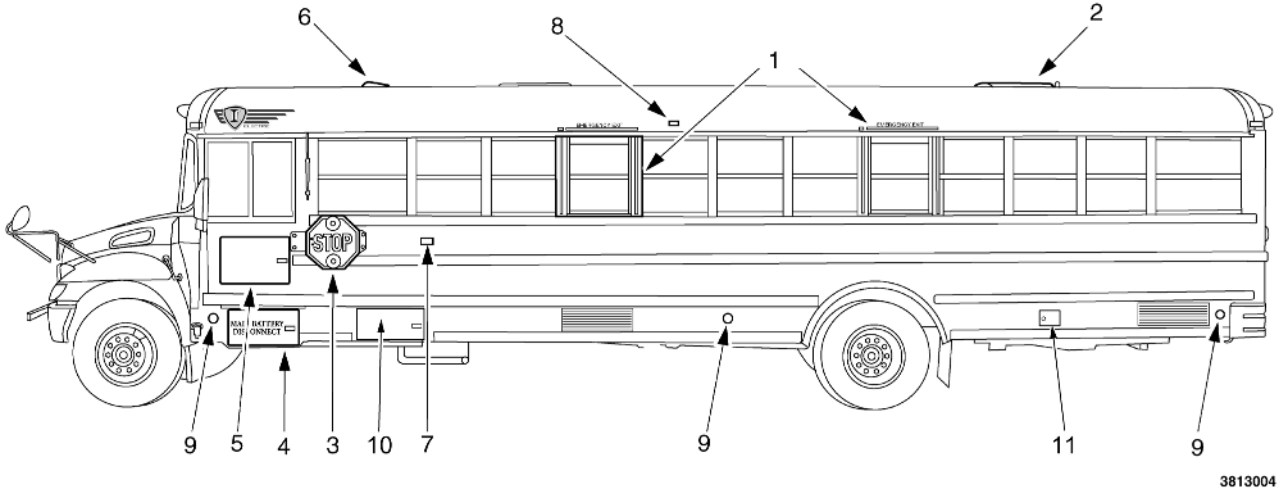
1. Identification lamp
2. AMBER warning light
3. Clearance lamp
4. Turn signal (with or without arrows)
5. Backup light
6. Stop lights / tail light
7. Emergency door handle
8. RED warning light
9. Reflex reflector

CE Bus Right-Side View



1. Emergency roof vent / hatch
2. Emergency exit window
3. Intermediate side marker lamp
4. Static vent
5. Hood latch
6. Charge port door
7. Reflex reflector
8. Side mounted turn signal lamp
9. High-voltage Battery Thermal Management System (BTMS)
10. Rear charge port door (optional)

CE Bus Left-Side View



1. Emergency exit window
2. Emergency roof vent / hatch
3. Stop arm
4. 12V battery compartment
5. 12V electrical compartment access panel
6. Static vent
7. Side mounted turn signal lamp
8. Intermediate side marker lamp
9. Reflex reflector
10. Auxiliary heater
11. Fuel door (for auxiliary heater)

Inspection Check Lists

Exterior Checks

WARNING

To prevent personal injury and / or death, or damage to property, turn off operational readiness and set the parking brake anytime you leave the vehicle.

Location	Description
Walk-Around Inspection	Look and listen for leaks and puddles as you walk up to the bus. Check for vandalism and loose items under the vehicle. Review the results of the previous post-trip inspection with your supervisor or previous driver. Check all previously noted items to make sure that all requested repairs have been made.
Leaks	Check for signs of fluid leaks. Check for signs of drips on the ground under the vehicle.
Outside Mirrors	Make sure the outside view is not obstructed. Check the cross-view and rearview mirrors for cleanliness. Make sure the mirrors are intact and properly adjusted.
12V Battery	**WARNING** **To prevent personal injury and / or death, or damage to property, keep lighted tobacco, flames, sparks or other ignition sources away from the batteries. Gas from the battery cells is flammable and can ignite and / or explode. This is particularly true when jumper cables are being used.** Check the batteries for loose wires or corrosion at the terminals to prevent possible battery or starting failure.

Location	Description
Lights and Reflectors	Turn ON the exterior lamp check system to make sure all exterior lights are working. For operation of the system see **Lights** section. Check the operation of the AMBER warning lights, RED warning lights, and hazard warning lights. If your bus has an exterior strobe light, test it as well. Inspect all reflectors, headlights, turn signals, and emergency flashers. Make certain they are clean, firmly attached, and without cracks or breaks.
Wheels and Tires	**WARNING** **To prevent personal injury and / or death, or damage to property, if wheels or tires must be changed, obtain expert tire service help. Mounting and dismounting of tires should only be performed by qualified personnel using necessary safety procedures and equipment.** Inspect all wheels and tires for any obvious defects, damage, or excessive tread wear. Check tires for the proper inflation. Check wheel or rim nuts for tightness and wear. If equipped with front oil type wheel bearings, check for proper oil level.
Rear Axle and Wheel Bearings	Check for obvious leaking on outside or inside of wheel. Inspect axle flanges and wheel seals for leaks and loose mounting hardware, or broken items. Check lube level, if equipped with sight glass.

Front / Rear Suspension

WARNING

To prevent personal injury and / or death, or damage to property, do not operate vehicle if there is a loss of steering or suspension, which could result in a loss of vehicle control.

Location	Description
Springs	Look for missing, broken or shifted leaves, or leaves that are in contact or nearly in contact with the tire, wheel, brake drum, brake chamber, frame or body.
Spring Mounts	Check the spring hangers, bolts, bushings, axle mounting U-bolts and nuts for cracks, breaks, wear, damage, tightness, and missing hardware. For proper torque, refer to the torque charts in the **Maintenance Intervals and Specifications** section.
Shock Absorbers	Check for cracks, leaks, and missing or broken mounting bolts or bushings.

Brakes

Location	Description
Drum or Rotor and Brake Linings	Check to see that there are no cracks, dents or holes and no loose or missing bolts. Check to see that the brake linings, where visible, are not worn thin or contaminated by lubricant.
Hoses	Check for secure couplings and for cracked, worn or frayed hoses.
Chamber (Air Brakes Only)	Check to see that the brake chambers are not cracked or dented and that they are securely mounted.
Slack Adjuster (Air Brakes Only)	Check for broken, loose or missing parts: angle between push rod and adjuster arm should be approximately 90 degrees when the brakes are applied.
Air Wet Tank (Air Brakes Only)	Drain water daily.

Under Hood and Fluid Checks

WARNING

To prevent personal injury and / or death, or damage to property, do not touch damaged high-voltage cables and high-voltage components such as the on-board charger, the high-voltage cabin heater, the high-voltage batteries, the power electronics, or the high-voltage A/C compressor; doing so can cause a fatal electric shock.

All high-voltage components of the electrical system are marked with warning stickers. The high-voltage cables are ORANGE in color and / or ORANGE with STRIPE.

- **Do not perform any work on the high-voltage vehicle electrical system, ORANGE / ORANGE with STRIPE high-voltage cables, or any high-voltage components marked with warning stickers.**
- **Never damage, remove or disconnect the ORANGE / ORANGE with STRIPE high-voltage cables from the high-voltage vehicle electrical system.**
- **Do not touch parts of the electrical system that have been damaged, such as following an accident.**
- **Never remove the high-voltage batteries.**

WARNING

To prevent personal injury and / or death, or damage to property, maintain adequate clearance between all parts of all hoses, wires, and lines for cooling system, brake system, power steering system, and electrical system. Heat damage to hoses and wires may cause vehicle malfunction.

WARNING

To prevent personal injury and / or death from hot coolant or steam scalding, use the following procedure to remove the pressure cap from the surge tank:

A. **Allow the system to cool.**

B. **Wrap a thick cloth around pressure cap.**

C. **Partially unscrew pressure cap slowly while firmly holding cap down, then pause to allow pressure to release.**

D. **When system pressure is released, fully unscrew pressure cap while continuing to hold cap down. Slowly release downward pressure from pressure cap.**

E. **Remove cap.**

Location	Description
Coolant	There are three separate cooling circuits on the electric bus. The two surge tanks on the cowl have sight glasses to check coolant level. Make sure the fluid is between the ADD and MAX fluid level range as marked on the reservoir of the Battery Thermal Management System (BTMS). Do not remove the pressure cap until the coolant has cooled; failure to do so may result in personal injury. If additional fluid is necessary, see the Maintenance Intervals and Specifications section of this manual to find the correct fluid type before filling.
Windshield Washer System Fluid	Inspect the fluid level through the plastic reservoir. If additional fluid is necessary, see the **Maintenance Intervals and Specifications** section of this manual to find the correct fluid type before filling.
Power Steering Fluid	Check that the fluid is between the MIN (COLD) and MAX (HOT) marks. If additional fluid is necessary, see the **Maintenance Intervals and Specifications** section of this manual to find the correct fluid type before filling.
Hood and Hood Latches	Close and latch the hood. Check that the hood is securely latched in place with the hood latches.

Interior Visual and Operational Checks

Location	Description
Interior Mirror	Make sure the interior mirror is clean and adjusted to provide a clear view of the entire rear of the bus including the rear windows. To adjust the mirror, loosen the bolts and nuts in the slotted holes. After moving the mirror to the desired position, tighten the bolts and nuts.
Window Operation	Make sure windows are free of dirt, fog, condensation and snow. Make sure the driver and passenger windows can open and close completely.
Key On / Power Up for Electric Vehicle	For starting procedures, reference (Driving an Electric Vehicle, page 117). **NOTE: All remaining checks are to be performed.**
Instrumentation	With operational readiness, check gauges for temperature, charge level of the high-voltage batteries and GREEN icon for the readiness to drive.
Wiper Blades	Look through the windshield to inspect both wipers for signs of wear, damage, or signs of aging on the rubber blades. Check wiper operation.
Passenger Entry	Make sure the door opens and closes completely. Make sure the entry steps are clear, and the treads are secure and are in good condition.
Heater Leaks / Fans	Inspect for interior heater fluid leaks and check fan operation at all heater locations.
Emergency Devices	Sound the horn. Turn on the heater and defroster. Check the windshield wipers and washers for proper operation. Using cross-view mirrors and another person, or the lamp check system, verify that the front and rear exterior directional signal lights are working. Make sure that all interior lights are working properly.

Location	Description
Air Brake Check	Check the air brakes accordingly: 1. Install wheel chocks if necessary. Push in parking brake. 2. Check the air compressor or governor cut-out pressure (approximately 120 psi [827 kPa]). 3. Turn key to ON position. 4. Without brake pedal applied, note air pressure drop for 1 minute. It should be less than 2 psi (14 kPa) per minute. 5. Depress and hold brake pedal making sure there is no more than a 3 psi (21 kPa) per minute pressure drop. 6. Step on and off brake pedal and check for warning indicator and buzzer to come on at about 60 or 70 ± 6 psi (414 or 483 kPa). 7. Step on and off brake and check to make sure the parking brake knobs pop out between 20 to 40 or 45 psi (138 to 310 kPa). 8. Start the bus. See Starting Procedure (Driving an Electric Vehicle, page 117). 9. Put the bus in forward drive and gently pull against service and parking brakes separately to make sure they will hold.
Accelerator Pedal	Start the bus. See Driving an Electric Vehicle(Driving an Electric Vehicle, page 117). Then, check for smooth, non-binding pedal action.
Drive Mode Selector	Start the bus. See Driving an Electric Vehicle (Driving an Electric Vehicle, page 117). Then, check for proper functioning of the drive mode selector. **NOTE: Foot brake pedal must be pressed to shift out of the Neutral (N) position.**

Location	Description
Parking Brake Check	With foot on brake pedal, set the drive mode selector into drive mode. Take your foot off the service brake pedal, and allow the bus to idle forward. If the bus moves forward, the parking brake has malfunctioned. Stop the bus with the service brake and have the vehicle serviced immediately. **NOTE: Foot brake pedal must be pressed to release the parking brake and to shift out of the Park (P) position.**
Backup Alarm Check (If Equipped)	Check for proper operation of the Backup alarm. See Driver Section for Backup alarm operation. **NOTE: Foot brake pedal must be pressed to release the parking brake and to shift out of the Park (P) position.**
Wheelchair Lift System Operational Check (If Equipped)	Inspect the optional wheelchair lift system for proper operation every day. Refer to the lift manufacturer's operator manual for items that should be checked before operation.

Air Conditioning System

Location	Description
Evaporator Filters	Check for cleanliness. A properly maintained filter maximizes air flow and system performance.
Hoses	Check that hoses are secured and protected. Prevents the possibility of refrigerant leaks.
Wiring Harnesses	Check that harnesses are secured and protected. Prevents the possibility of electrical shorts.
Condenser Coil	Check for cleanliness. A properly maintained condenser coil will ensure maximum heat transfer and system performance.
Sight Glass Moisture Indicator	Check color of sight glass: • Deep GREEN = Absence of moisture • YELLOW = Moisture is present **IMMEDIATE SYSTEM SERVICE REQUIRED**

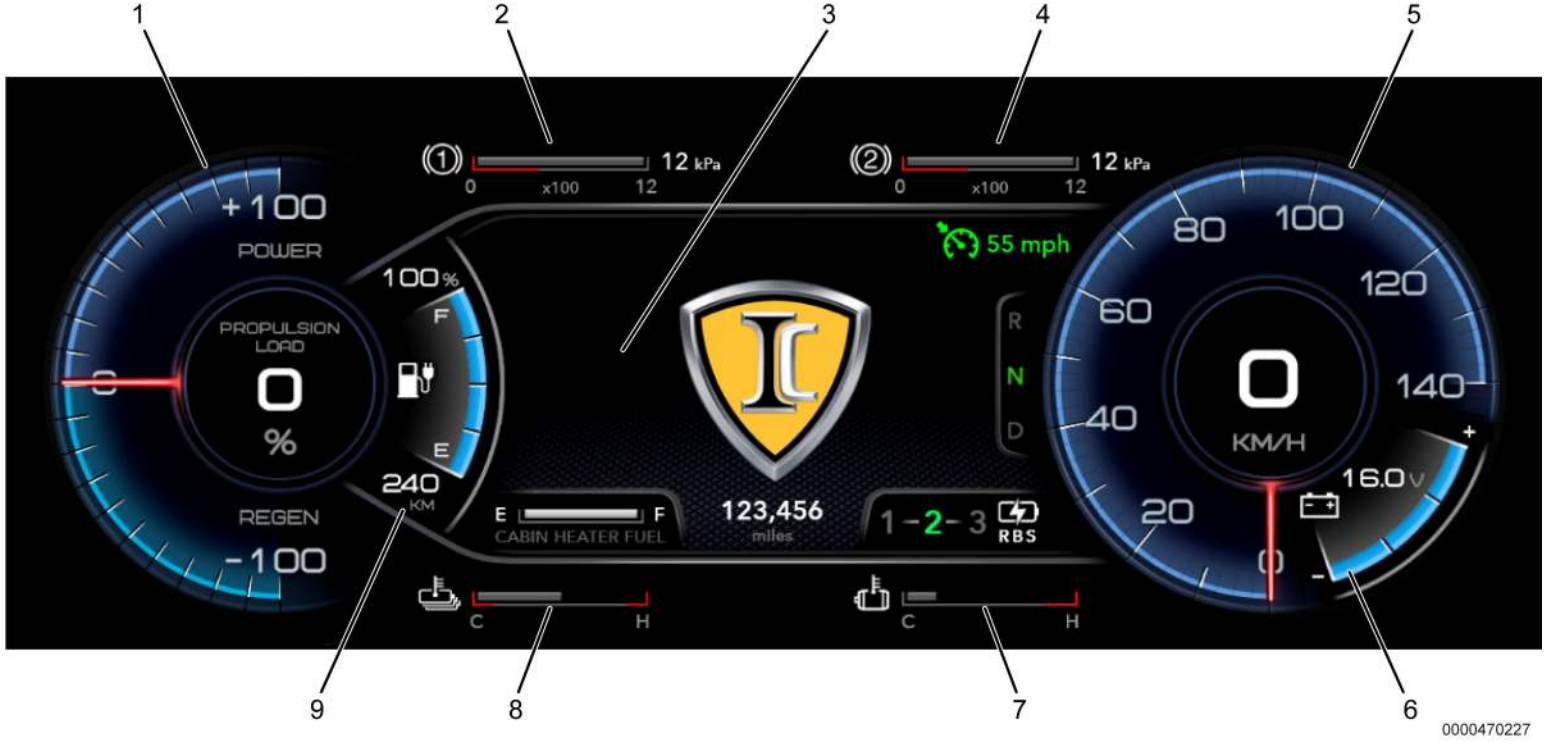
Emergency Exits and Equipment

Location	Description
Roof Hatch	Inspect the roof hatch daily for proper opening, buzzer warning, if supplied, and operating instruction decal attachment. Make sure the emergency hatch is completely closed and secure.
Emergency Exits	Check all emergency exits every day for proper opening, buzzer warning, and operating instruction decal attachment. Check to see that all emergency exit doors can be opened, and that they are firmly closed. Make sure all emergency door release bars are properly secured, and the kickout window handle is properly latched.
Warning Lights, Stop Arm, Crossing Gate, and Entrance Door Check	• Check to see that the AMBER and RED warning lights are operating properly. To check these lights use the Exterior Lamp Check procedure in the **Lights** section of this manual. • Verify the Stop Arm and Crossing Gate are working properly and extend completely • Verify the entrance door is opening and closing properly. • Verify the flasher warning lights and stop arm are working properly with the flasher switches and entrance door operations. Check to see that the AMBER Warning Lights are flashing. When the entrance door is opened, check to see that the AMBER Warning Lights stop flashing and the RED warning lights begin flashing, and Crossing Gate and Stop Arm are extended. Close the entrance door and observe that flasher warning lights turn OFF. There is an optional feature that will automatically turn OFF the pupil warning lights after the bus has started to move.
Emergency Equipment	If equipped / required by state law, check to make sure that the fire extinguisher, reflective triangles, first aid kit, and body fluid clean up kit are in place and secure.

SECTION 4 — INSTRUMENTATION

Instrument Panel Gauge Cluster

This instrument panel gauge cluster displays the crucial operational functions of the vehicle. It includes the instrument gauges, warning indicators, and a digital display with an odometer and other information. There is also a charge level display and an outside temperature display.



Gauges

WARNING

To prevent personal injury and / or death, or damage to property, never operate the vehicle when insufficient air pressure (less than 70 psi [483 kPa]) is indicated for either the primary or secondary air system. The volume of air required to stop the vehicle may be greater than that available. Have the brake system checked and repaired before returning the vehicle to service.

The gauges in the instrument panel gauge cluster help monitor the vehicle while in service. Most gauges have in-gauge warning indicators that turn on if the gauge pointer moves into an out-of-acceptable-range condition. When the ignition switch is turned ON, the gauge indicators will be on. Metric versions of the gauges and speedometer are available as an option.

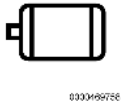
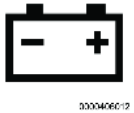
NOTE: If any indicator fails to go out after starting vehicle, stop vehicle and determine cause of the gauge indication that is out of acceptable range.

Item	Name	Description
1	Thrust / Regeneration	Indicates the propulsion in percent of available torque (positive values are thrust; negative values are regeneration).
2	Primary Air Pressure	Provides indication of air pressure available for the primary air brakes in pounds per square inch (psi).
3	Digital Display	Warning Messages and Settings are displayed here. See (Integral Digital Display, page 33).
4	Secondary Air Pressure	Provides indication of air pressure available for the secondary air brakes in pounds per square inch (psi).
5	Speedometer	Speedometer indicates the vehicle speed in miles per hour (mph) and kilometers per hour (km/h).
6	12V Battery Voltage	Indicates the voltage of the 12V battery system when the ignition switch is in the ON position.
7	Propulsion System Temperature	Indicates the approximate temperature of the electric propulsion system
8	High-Voltage Battery Temp	Indicates the approximate temperature of the high-voltage batteries.
9	High-Voltage Battery Charge	Indicates the charge level of the high-voltage batteries and the approximate remaining range.

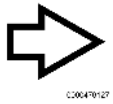
Warning Indicators

The gauge cluster indicators are used to alert the driver of vehicle conditions and functions and may indicate a WARNING or STOP condition. They are turned on by the software in the instrument panel gauge cluster. At ignition, the warning indicators will illuminate for 8 to 10 seconds, as part of the vehicle power-up sequence.

Item	Icon	Description
1		Illuminates YELLOW when the high-voltage battery charge level is 20% or less. Charge the high-voltage batteries as soon as possible.
2		Electronic Stability Control (if equipped) - Illuminates YELLOW with a flashing indicator which represents that the electronic stability control is engaged, while a solid indicator represents a fault in the system.
3		Illuminates YELLOW when the traction control system is turned OFF. It also illuminates momentarily when the traction control system is on and is limiting wheel spin. Blinks on if slippery road conditions may exist. If this happens, adjust your driving accordingly. Refer to the Driving section for more information.
4		Illuminates YELLOW when the Regenerative Braking System (RBS) is not available or limited due to high-voltage battery temperature. If the Regenerative Braking System indicator stays illuminated for an extended amount of time, have the system serviced immediately.

Item	Icon	Description
5		Illuminates YELLOW when a defect has been detected in the vehicle's drive or charging system and will be accompanied by an audible alarm to indicate an alert condition. Limited and adapted driving possible.
6		Flashes GREEN when the left-side turn signal or the hazard lights are turned ON.
7		Illuminates RED when the voltage in the 12V batteries is too low or too high.
8		Brake Failure (English Cluster) Illuminates RED when a failure in the service brake system has occurred. If the Brake Pressure warning indicator illuminates, safely stop the vehicle as soon as possible and seek service immediately.
8		Brake Failure (Metric Cluster) Illuminates RED when a failure in the service brake system has occurred. If the Brake Pressure warning indicator illuminates, safely stop the vehicle as soon as possible and seek service immediately.

Item	Icon	Description
9		Drive Enable Indicator. Illuminates GREEN when the Vehicle is ready to drive.
10		Illuminates BLUE when the high beam head lamps are turned ON.
11		The AMBER Warning Lamp (AWL) illuminates when the vehicle needs to be serviced at the first available opportunity.
12		Illuminates RED when a critical defect has been detected in the Electric Vehicle System and will be accompanied by an audible alarm to indicate an alert condition to the operator. If the Electric Vehicle System Stop Lamp illuminates, immediately pull the vehicle safely off the roadway, turn on the flashers, set the parking brake, place warning devices, turn the key to the OFF position, and remove the charging plug (if connected). The vehicle should not be restarted prior to being serviced.

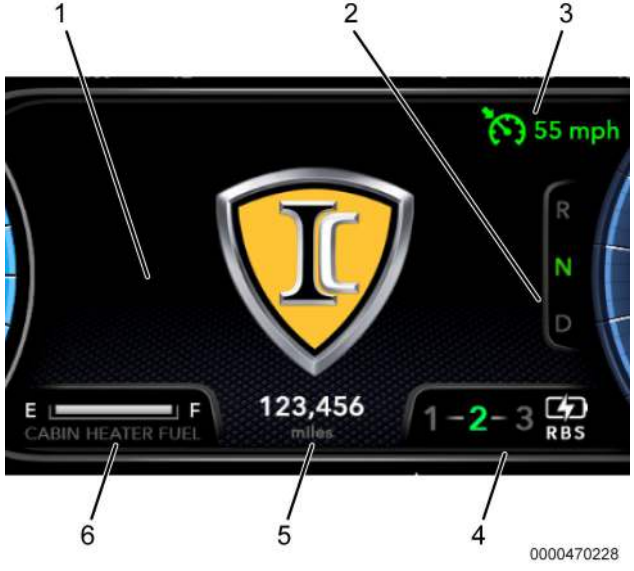
Item	Icon	Description
13		Parking Brake (English Cluster). Illuminates RED when the parking brake is applied. If the brake warning indicator does not illuminate, or if it stays on with the parking brake not engaged, seek service immediately.
13		Parking Brake (Metric Cluster). Illuminates RED when the parking brake is applied. If the brake warning indicator does not illuminate, or if it stays on with the parking brake not engaged, seek service immediately.
14		Optional indicator illuminates RED immediately after ignition is turned on to remind operator to fasten seat belt. This applies to only the driver's seat. Optional Seat Belt Reminder with Seat Belt Monitoring causes initial visual indication, then flashes with audible alarm when ignition is on, parking brake is released, and seat belt is not fastened.
15		Flashes GREEN when the right-side turn signal or the hazard lights are turned ON.

Item	Icon	Description
16		Illuminates YELLOW when an antilock brake system malfunction has been detected. If the ABS indicator stays illuminated or continues to flash, have the system serviced immediately.
17		Illuminates when the RED flasher warning lights are activated.
18		Illuminates when the AMBER warning flasher lights are activated.
19		Illuminates YELLOW when the optional lift door is not securely closed when the key switch is in the ON position.

Item	Icon	Description
20		Illuminates when the emergency exit is not securely closed when the key switch is in the Accessory (ACC) or ON position.
21		Illuminates YELLOW when the steering system could be faulty. Limited and adapted driving possible.
22		Illuminates YELLOW when the drive power is restricted. Typical causes for this condition include the high-voltage batteries not being sufficiently charged or being at its operating temperature limits, such as in very cold outdoor temperatures.

NOTE: If the MIL is illuminated, it is the vehicle owner's responsibility to have the fault repaired or face fines.

Integral Digital Display



Item	Name	Description
1	Settings and Warning Messages	Displays a variety of messages necessary for vehicle monitoring and operation. See Settings and Warning Messages (Settings and Warning Messages, page 34).
2	Drive Mode Indicator	Displays the drive mode (R = Reverse; N = Neutral; D = Drive / Forward)
3	Cruise Control Indicator	Displays the cruise control set speed when cruise control is active.
4	RBS Level Indicator	Displays the Regenerative Braking System (RBS) level.
5	Odometer	Displays the total distance traveled in miles or kilometers.
6	Cabin Heater Fuel Level	Indicates the approximate fuel level in the fuel tanks of the auxiliary heater.

The digital display is located in the center of the gauge cluster. Items can be individually selected.

Settings and Warning Messages

Routine Warnings

These messages inform the driver of vehicle conditions. If the message flashes, it will flash for 3 - 5 seconds, and then will be displayed for an additional 3 - 5 seconds. If more than one message is viewable, the displayed message will be followed by an asterisk (*), indicating multiple messages. To view additional messages, press and release the display control button to proceed to the next message.

The following is a list of the routine Text and Warning messages that can be displayed and is dependent upon the configuration of your vehicle:

Message	Description	Flash
Washer Fluid Low	Indicates Low Washer Fluid Level	Yes
Low Coolant Level	Message is displayed when coolant level is less than or equal to 80%.	Yes
Push Brake To Engage Gear	Message is displayed when an attempt is made to select Drive (D) or Reverse (R) and the brake is not pressed.	Yes

Warnings that Require Service

When either the RED Stop Lamp (RSL) or the AMBER Warning Lamp (AWL) is displayed, a corresponding text warning will be displayed:

Lamp	Text Warning
RED Stop Lamp (RSL)	STOP VEHICLE
AMBER Warning Lamp (AWL)	WARN VEHICLE

These indications typically indicate a condition that requires vehicle service and one or more Diagnostic Trouble Codes (DTCs) will have been logged to aid service technicians in diagnosing the problem.

Gauge Cluster Alarms

WARNING

To prevent personal injury and / or death, or damage to damage to property, when an alarm sounds, stop normal vehicle operation and determine the source of the alarm condition.

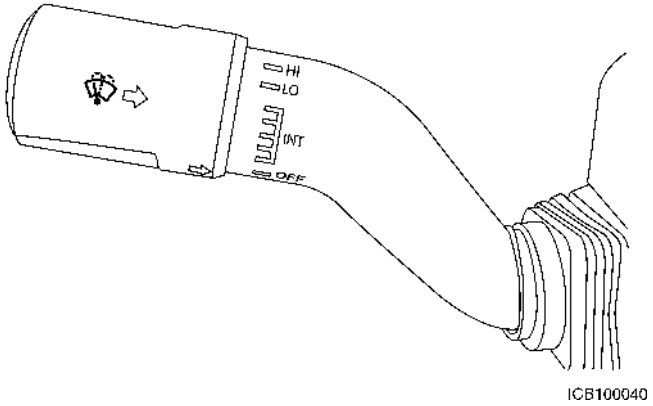
Audible alarms are used in addition to warning indicators and gauges. An audible alarm sounds when a problem exists with one of the vehicle functions. Audible alarms sound when one of the gauges indicates an abnormal condition, or when there is a problem with one of the vehicle systems. When an audible alarm is heard, have the system inspected immediately, and do not operate the bus until the bus is serviced.

Alarm Condition	Audible Alarm Pattern	Additional Comments
Fault in brake system	Repeating single beep	Brake pressure indicator illuminates (Item 4)
Fault in electric drive or charging system	3 long beeps	Electric Vehicle System indicator illuminates (Item 5)
Amber Warning Lamp illuminates (Item 10)	3 long beeps	Indicates the system is requesting the AWL (Item 10)
Electric Vehicle System Stop	Repeating single beep	Indicates the system is requesting the RSL (Item 11)
12V Battery System: Low Voltage Warning	5 beeps	12V Battery Low indicator illuminates (Item 13)

SECTION 5 — DRIVER CONTROLS

Windshield Wiper / Washer System

Wiper Blade Speed



The windshield wiper / washer switch is located on the left-side of the steering column.

Rotate the windshield wiper control to the desired interval, low or high speed position.

The bars are for intermittent wipers. When the wiper control is in the intermittent position, rotate the control upward for faster intervals, and downward for slower intervals.

Windshield Wiper Speed Control

This optional feature forces wipers to slowest intermittent speed when parking brake is set and wipers are left ON for a predetermined time.

Windshield Washer

WARNING

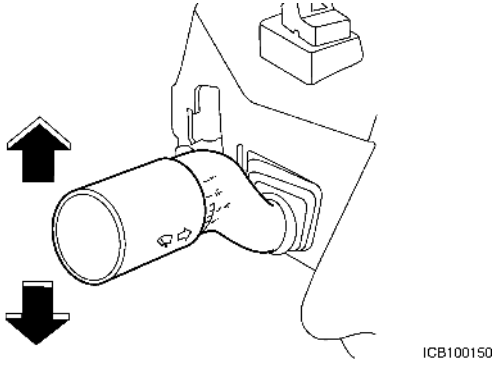
To prevent personal injury and / or death, or damage to property, do not use the washers in freezing weather without first warming the windshield with the defrosters; otherwise, the washer solution may freeze on the windshield and obscure your vision, which could cause an accident.

WARNING

To prevent personal injury and / or death, or damage to property, do not use radiator coolant or antifreeze in the windshield washer reservoir. Radiator coolant in the washer reservoir can severely reduce visibility when sprayed on the windshield.

Push the control on the end of the stalk inward to activate the washer function. Push and hold for a longer wash cycle. Using the windshield washer function activates the wipers. The wipers automatically cycle to clear the windshield and stop automatically after a 5-second cycle.

Turn Signal



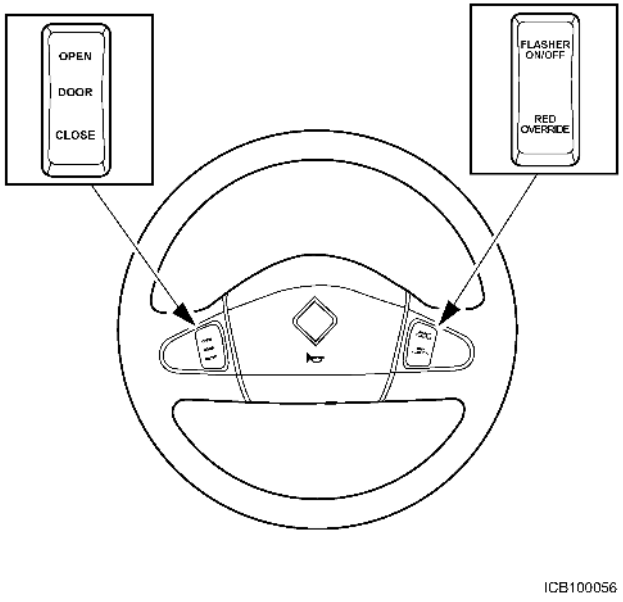
The turn signal switch is located on the left-side of the steering column and is part of the multifunction switch. Move the lever up or down to signal the turning direction. After the turn has been completed, the turn signal automatically cancels.

For additional information about the Turn Signal Multifunction Switch refer to the **Lights** section.

Steering Wheel and Column

Steering Wheel Controls

NOTE: The location for the entry door and warning flasher switches is the steering wheel, and the left-side / right-side console switch panel.

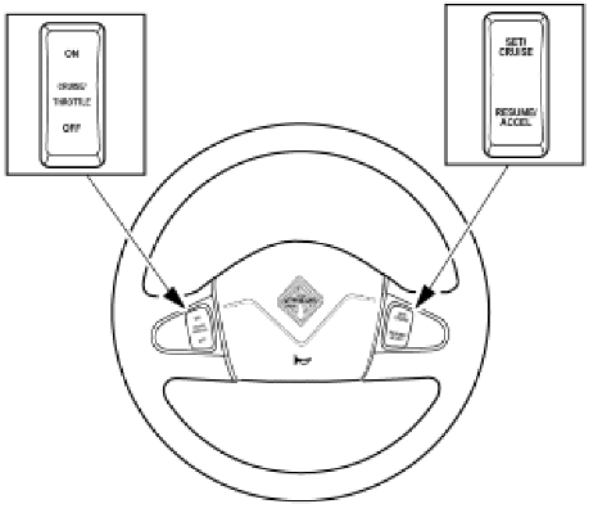


OPEN / CLOSE DOOR button is located on the steering wheel in the left-side button position.

FLASHERS ON / OFF and RED OVERRIDE button is located on the steering wheel in the right-side button position.

For the uses of these buttons see the **Passenger Control** section.

Steering Wheel Controls



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For the correct use of the cruise control switches in this location, refer to the cruise control procedure later in this section.

Horn

The horn is a standard electric automotive type and is located in the center of the steering wheel. Push down the horn button to operate it.

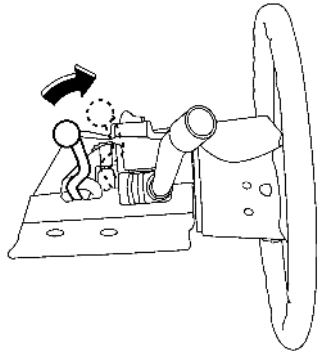
Adjustable Tilt or Tilt / Telescoping Steering Column

WARNING

To prevent personal injury and / or death, or damage to property, do not adjust the steering column while the vehicle is moving. It could suddenly or unexpectedly move, causing the driver to lose control of vehicle.

CAUTION

To prevent property / vehicle and / or component damage, do not lubricate the tilting mechanism.



ICB100042

The optional adjustable tilt steering column allows you to pull the tilt steering control toward you and move the steering wheel up or down. Hold the control while adjusting the wheel to the desired position. Release the tilt steering control to lock the column in position.

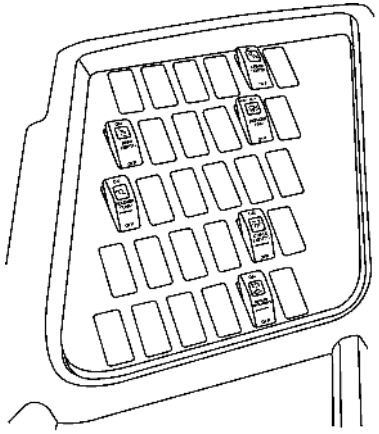
Left-Side Console Switch Panel

Rocker Switches and Their Functions

NOTE: Due to differences in state and local requirements and customer preferences, the location and arrangements of the controls and switches on the console switch panels may be different than those illustrated. Some switch positions may be empty, while other rows may have only one switch. Switches are installed in the same location unless precluded by state regulations. Before reading this section of the manual, sit in driver's seat and become familiar with the location of the controls and switches in this bus.

NOTE: Your bus may not be equipped with all switches listed.

The left-side console switch panel contains the controls for bus heaters and defrosters, destination sign, and other standard and optional bus body controls.



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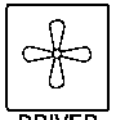
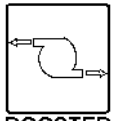
DRIVER HEATER / DEFROST: Turns heater / defrost blower motor to HI / LO / OFF.



BOOSTER PUMP: Turns ON / OFF coolant pump in heating system.



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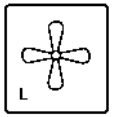
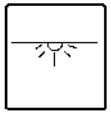
HEATED MIRROR: Turns heating element behind outside mirror glass ON / OFF.

LEFT FAN: Turns HI / LO / OFF driver's defog fan above windshield.



DRIVER DOME: Turns ON / OFF driver side lights.

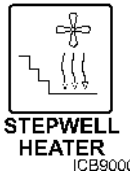
DOME LIGHTS: Turns ON / OFF interior side lights.



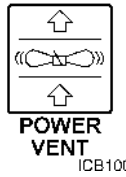
NOISE SUPP: Disconnects power to all noise generating devices.

LIFT SWITCH: Turns wheelchair lift power ON or OFF.

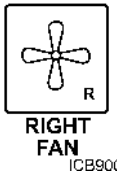
STEPWELL HEATER: Turns the Stepwell Heater ON / OFF.



POWER VENT: Turns ON / OFF power to exhaust vent.



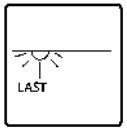
RIGHT FAN: Turns right-side front windshield defog fan HI / LO / OFF.



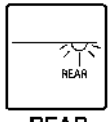
DESTINATION: Turns ON / OFF illumination for destination window.

STROBE LIGHT: Turns ON / OFF top strobe light.

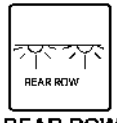
LAST DOME: Turns ON / OFF last dome light.



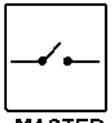
REAR DOME: Turns ON / OFF rear half dome lights.



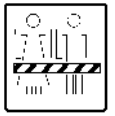
REAR ROW DOME: Turns ON / OFF rear row lights.



MASTER FLASHER:
Turns ON / OFF system power for the warning indicator system.

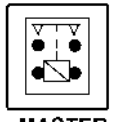


CROSSING GATE (CANCEL): Switch that blocks extension of crossing gate.



STOP ARM CANCEL: Momentary switch retracts Stop Arm / Crossing Gate and turns on chime, while RED warning flashers are on.

MASTER DISCONNECT: Controls power to designated body circuits, ignition switch, or rocker switch operations.



AIR HORN: Controls solenoid that turns optional Air Horn ON or OFF.

Power Outlet

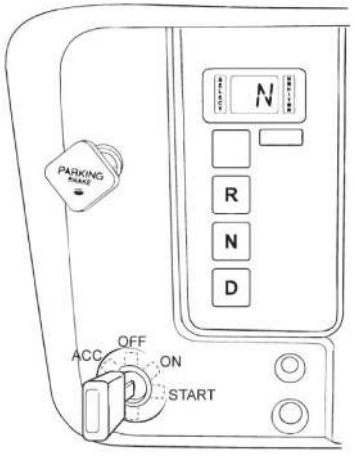
The optional power outlet is located inside the storage compartment. The power outlet supplies a 12-volt power supply for driver accessories, such as cellular phones and two-way radios.

Drive Mode Selector, Parking Brake, and Ignition Switch Panel

Before reading this section of the manual, sit in driver's seat and become familiar with the location of these controls.

The Drive Mode Selector / Parking Brake / Ignition Switch Panel provides the mounting for the drive mode selector, the knob to engage / disengage the parking brake, and the ignition switch.

For instruction on the operation of the components on this panel, refer to the **Operation** section.



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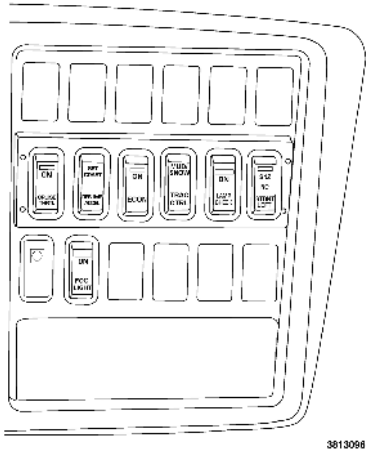
Right-Side Console Switch Panel

Rocker Switches and Their Functions

NOTE: Due to differences in state and local requirements, the location and arrangements of the controls and switches on the console switch panels may be different. Some switch positions may be empty, while other rows may have only one switch. Switches are installed in the same location unless precluded by state regulations. Before reading this section of the manual, sit in driver's seat and become familiar with the location of the controls and switches in this bus.

NOTE: Your bus may not be equipped with all the switches listed.



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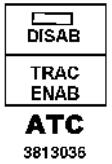
CRUISE SWITCH: Turns the cruise control system ON and OFF.

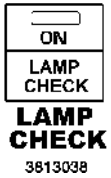
SET / COAST — RESUME / ACCEL SWITCH: Sets and controls the vehicle speed.

FOG LAMP SWITCH: Turns the fog lamps ON and OFF.

DISAB / TRAC ENAB SWITCH: Turns Traction Control system ON or OFF (Air Brake chassis).

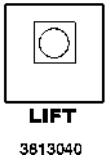


ON / LAMP CHECK: Initiates exterior lamp test during pre-trip inspection.



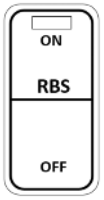
SNZ (Snooze) / NO STDNT (Student) LEFT: Initiates delay of post-trip inspection system activation.

(If Equipped) Lift Door Indicator: GREEN indicator flashes to indicate that lift door is opened.

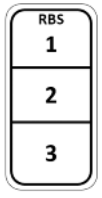


PEDAL ADJ – FWD / BACK (If Equipped): Allows forward / upward and back / downward repositioning of power-adjustable pedals when key is in the ON position, the park brake is set, and the drive mode selector is in neutral.

RBS Switch – ON / OFF: Switches ON / OFF the Regenerative Braking System (RBS).



Selects the Regenerative Braking System (RBS) level.



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Cruise Control

Operation

WARNING

To prevent personal injury and / or death, or damage to property, do not use the cruise control system when unpredictable driving conditions are present. Such conditions include heavy traffic and / or roads that are winding, icy, snow covered, slippery, wet, or with a loose surface. These conditions may cause wheel slippage and loss of vehicle control.

NOTE: The right-side console switch panel is the standard location for the cruise control switches. These switches may be located on the steering wheel as an available option, moving the entry door controls and pupil warning indicator to the right-side console switch panel.

The electronic vehicle speed controls are activated by the switches located on the console switch panel.

The left-side ON / OFF switch turns the control feature ON or OFF. The right-side switch (SET / COAST — RESUME / ACCEL) sets and controls the vehicle speed.

1. Press the ON position on the ON / OFF rocker switch to activate the cruise control feature.
2. Press the SET position on the rocker switch after reaching a speed of at least 56 km/h (35 mph) to set the cruise speed.
3. Push and hold the RESUME / ACCEL to increase your set speed, or the SET / COAST to decrease your set speed.
4. A slight tap on the brake pedal deactivates the cruise. To return to this speed, press the RESUME / ACCEL position switch.
5. Push the OFF position on the switch to cancel the previous speed setting. The previous speed setting is also canceled when the vehicle is turned OFF.

Regenerative Braking

Operating principle

During regenerative braking, the drive motor converts the momentum of the moving vehicle into electrical energy, which is stored in the high-voltage batteries.

- Regenerative braking starts as soon as you take your foot off the accelerator pedal and slows down the vehicle. You can adjust the regenerative braking strength.
- Applying the bus brake pedal will reduce the amount of regenerative braking energy that is recovered. When safe to do so, use the regenerative braking function to recover energy. This will extend the total vehicle range. The level of energy recovered can be viewed in the power meter in the instrument panel. To increase regenerative braking efficiency apply and disengage the throttle pedal and brake pedal slowly and only with as much position as needed. Avoid all the way on or all the way off the throttle pedal driving.

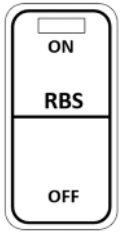
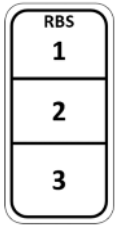
WARNING

To prevent personal injury and / or death, or damage to property please note:

Regenerative braking is a system that is used only for energy recovery. When simultaneously using a regenerative braking stage with a driver assistance system like Cruise Control or ATC, the control behavior of the driver assistance system is always prioritized (independently of the display). It is not a driver assistance system and cannot take over any driver assistance system tasks.

- **Do not use the deceleration effect of regenerative braking as a distance control system.**
- **Always be ready to brake and stay a safe distance away from the vehicle in front.**
- **For greater braking power or for braking the vehicle to a standstill, press the brake pedal as required.**

Regenerative Braking Settings

Switch	Description / Function
 0000469801	ON: regenerative braking with moderate deceleration of the vehicle. OFF: no regenerative braking
 0000469800	Selects level or regenerative braking strength. 1: lowest level of regenerative braking strength felt and lowest level of energy recovery. 3: highest level of regenerative braking strength felt and highest level of energy recovery.

The deceleration effect of regenerative braking can be limited due to high-voltage battery temperature and / or high-voltage batteries being at a full state of charge. This temporary reduction in regenerative braking will be accompanied by the RBS lamp illuminated on the cluster.

- Compensate for reduced regenerative braking by pressing the brake if necessary. The regenerative braking strength is displayed in the power meter.

Mirror Adjustment

WARNING

To prevent personal injury and / or death, or damage to property, use patience and always check the overall field of vision when unloading, as some children could be outside the field of vision. Do not move your bus until you have confirmed the location of every child and confirmed that they are clear.

WARNING

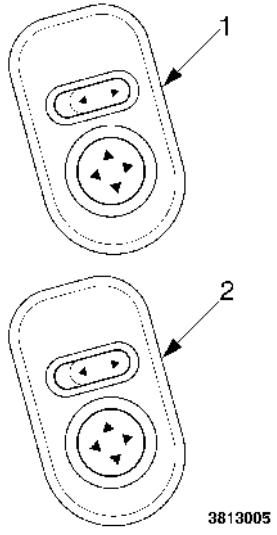
To prevent personal injury and / or death, or damage to property, mirrors are not a substitute for exercising care in operating the vehicle. Mirrors must be properly adjusted for each driver and the driver must be aware of the limitations on the viewing area that exists even when the mirrors are properly used.

WARNING

To prevent personal injury and / or death, or damage to property, only use the crossview mirrors to view pedestrians while the bus is stopped. Images in such mirrors do not accurately show other vehicle locations.

WARNING

To prevent personal injury and / or death, or damage to property, make sure your path is clear in all directions before moving your vehicle. All vehicles have blind spots. If necessary, ask for assistance when moving vehicle. Backup alarms are available through your IC Bus® dealer. However, they are never a substitute for the above procedures.



1. Left- / Right-side flat mirror adjustment switch
2. Left- / Right-side convex mirror adjustment switch

The optional mirror adjustment controls are located on the left-side console control panel. The switches with the left and right directional arrows control which side will be adjusted. For left-side adjustment make sure the switch is in the left position. For right-side mirror adjustment make sure the switch is in the right position.

Before driving the bus, check the mirror adjustment. The mirrors enhance visibility and assist safe vehicle operation. Make sure you can see the entire front of the bus using the cross view mirrors. Use the rearview mirrors to see both sides of the bus, and at least four bus lengths behind the bus. Use the following steps to adjust the mirrors before you operate the bus.

1. Adjust the driver's seat to the desired position, and observe the view through all outside mirrors to enhance visibility in all directions
2. Look through the right-side flat driving mirror and make sure that the top of the side windows are visible in the upper edge of the mirror, and that the right-side of the bus body is visible in the inside edge of the right-side flat mirror.
3. Look through the right-side convex driving mirror and make sure that the view in the top of the convex mirror overlaps the view covered by the right-side flat driving mirror, and that the right-side of the bus body is visible in the inside edge of the right-side convex mirror.
4. Look through the left-side flat driving mirror and the left-side convex driving mirror and observe that the views are the same as described for the right-side mirrors. Refer to Steps 2 and 3.
5. Look through and adjust the cross view mirrors to make sure that there is complete visibility around both sides and the front of the bus

SECTION 6 — LIGHTS

Headlight Switch and Panel Lighting Control

Headlight Switch

The headlights, parking, marker and tail lights are controlled by the three-position PARK / HEADLIGHT rocker switch. This switch functions even when ignition key is turned OFF.

- Place the switch in the top position to turn ON the headlights, parking, marker and tail lights. The instrument panel gauge cluster illuminates when the park or headlights are turned ON.
- Place the switch in the middle position to turn ON the parking lights, marker lights, and taillights.
- Place the switch in the lower position to turn OFF the lights.

Headlight Warning Buzzer Feature This optional buzzer sounds when headlight switch is ON and ignition switch is in the OFF position.

Daytime Running Lights Feature This feature provides for vehicle headlights to be turned on when vehicle is running and headlight switch is in OFF position.

Optional Headlight Feature (08WPY) Provides for headlights, tail lights, park / marker lights, and instrument panel gauge cluster lights to function with ignition switch ON and headlight switch OFF.

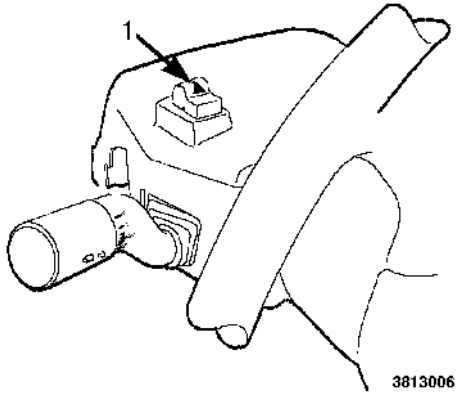
Panel Lighting Control

The PANEL rocker switch controls the panel lighting brightness. Press the upper portion of the rocker switch to increase the brightness. Press the lower portion of the rocker switch to dim the brightness.

Interior (Dome) Lights

For control of inside lights, see the **Driver Controls** section.

Hazard Warning Light Switch



1. Hazard warning light switch

Use the hazard warning light switch in an emergency to warn traffic of vehicle breakdown, approaching danger, the vehicle is in tow, or is operating at a reduced speed. The hazard warning lights can be operated with the ignition in any key switch position.

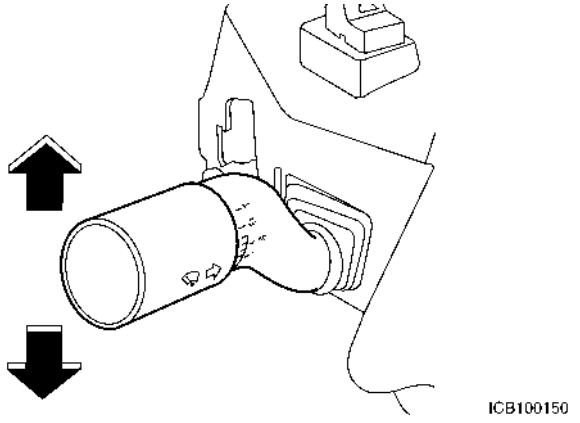
Press the button to activate all hazard flashers simultaneously.

Press the button again to turn the flashers OFF.

Turn Signal Switch

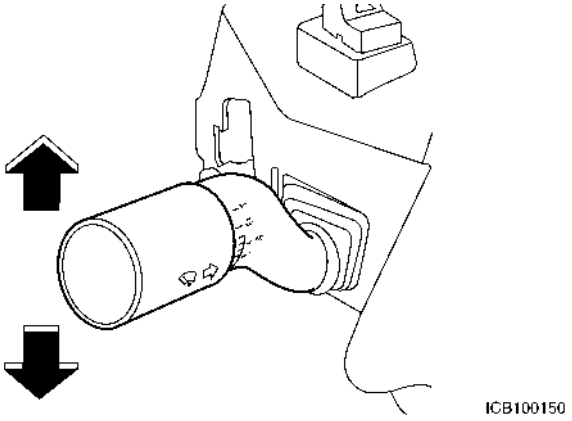
The turn signal switch is mounted on the left-side of the steering column below the steering wheel. The GREEN directional indicator lights, which are activated by the turn signal switch, are located on the instrument panel.

Signaling for a Turn



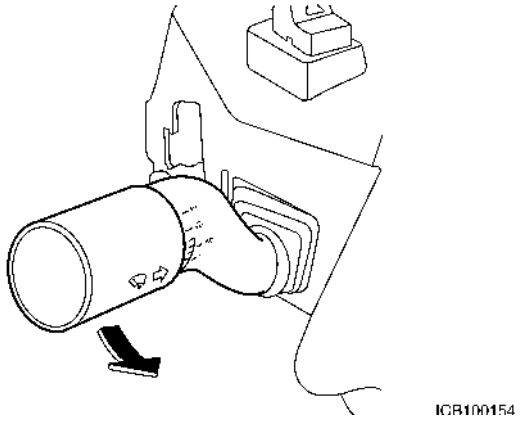
Move the turn signal lever up or down to the full turn position which is past the point of resistance. The turn signal automatically cancels if the steering wheel is turned through a large enough degree.

Lane Change



Some switches include a lane change feature, which allows you to signal your intention to change lanes without locking the switch into the full turn position. Move the turn signal lever, up or down, to the point where resistance to movement is felt. The turn signal lever returns to the OFF position when released.

HI / LO Beam



Pull the turn signal lever past the click position, the lights switch to high-beam position. Pull again to return to low-beam.

Strobe Light

The optional strobe light comes on automatically unless operated by a separate switch. Check your state regulations on strobe light use.

Exterior Lamp Check

Switch Location

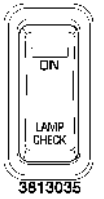
The switch to activate and deactivate the exterior lamp check system is one of the right-side user switches.

Function

The exterior lamp check is a feature that allows the driver to conduct the exterior lamp check by themselves. The exterior lamp check is included in the **Vehicle Inspection Guide** section of this manual. While the system is active, the driver can exit the bus and visually inspect all lights on the exterior of the vehicle for proper operation.

Activation

To activate the exterior lamp check:



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- Turn the key to the ON or Accessory (ACC) ignition position.
- All lights that will be checked must be turned OFF.
- The parking brake must be applied.
- Place the exterior lamp check switch in the ON (up) position. The exterior lamp switch ON indicator will then illuminate GREEN.

Deactivation

To deactivate the system, do any one of the following:

- Press the exterior lamp switch to the OFF (down) position.
- Move the ignition switch to the OFF or ACC position.
- Manually turn on lamps being checked with this feature.
- Release the parking brake.

When the exterior lamp check system is deactivated the GREEN indicator on the switch will turn OFF.

SECTION 7 — PASSENGER CONTROL

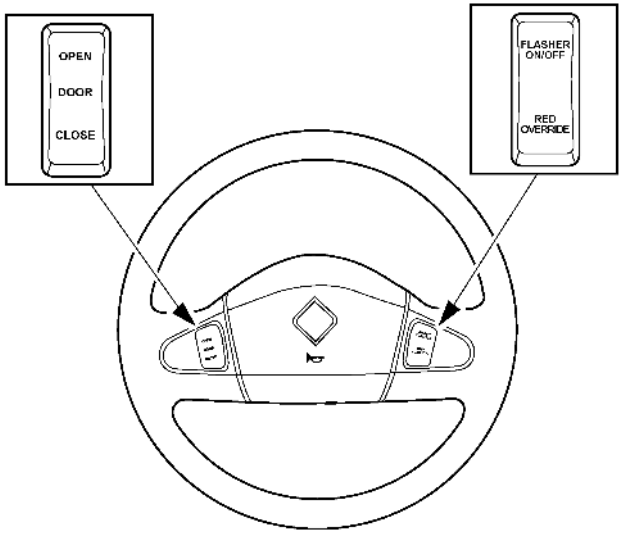
Door Opening / Closing

Opening / Closing

WARNING

To prevent personal injury and / or death, or damage to property, make sure that each child, and all of their clothing, backpacks, book bags and other belongings are clear of the vehicle before the door is closed and the bus operated. Consult with local and state authorities for specific procedures that may apply for children entering or exiting buses.

NOTE: Due to various state and local requirements, the location of the entrance door OPEN / CLOSE switches shown may be different from your vehicle.



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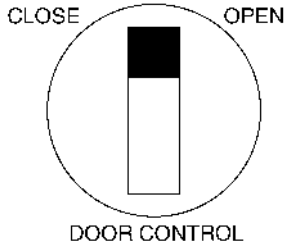
The entrance door OPEN / CLOSE button is located on the steering wheel in the left-side button position.

Press the top of the button to open the entrance door.

Press the bottom of the button to close the entrance door.

Two-Position Door Switch



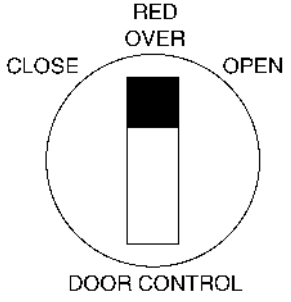
ICB900012

The optional two-position door switch is located on the left-side or right-side console switch panel.

With the ignition ON, the entrance door can be opened by moving the switch to the OPEN position.

With the ignition ON, the entrance door can be closed by moving the switch to the CLOSE position.

Three-Position Door Switch



ICB900013

The optional three-position door switch is located on the left-side or right-side console switch panel.

With the ignition ON, the entrance door can be opened by moving the switch to the OPEN position.

With the ignition ON, the entrance door can be closed by moving the switch to the CLOSE position.

Moving the switch to the RED OVER position will start the RED flashers (assuming the master flasher switch is ON) but will not open or close the entrance door.

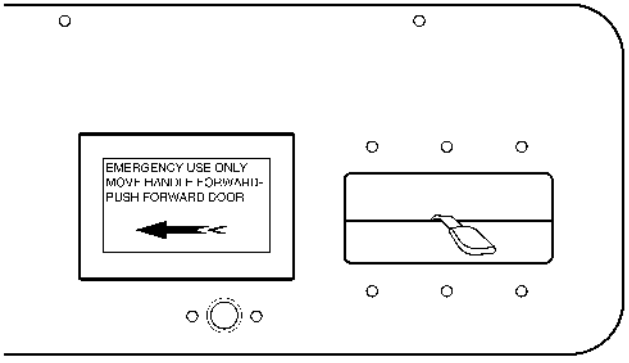
Opening the Entrance Door

Opening the Entrance Door Manually

WARNING

To prevent personal injury and / or death, or damage to property, for outward opening doors, when the door Manual / Automatic switch is in the manual position, do not allow anyone to lean against the entrance doors, as they will open allowing a person to fall out of the bus. The manual position is only to be used in Emergency or Service Conditions.

Electric-Actuated Door



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The emergency release for the electrically actuated door is located behind the access panel over the entrance door. To release the electrically actuated door, grasp the handle and move forward (left).

Air-Actuated Door

The emergency release for the air actuated door is located on the right-side of the instrument panel. To release the air actuated door, move the toggle switch from NORMAL to EMERGENCY.

ICB100156

Traffic Warning System

The Traffic Warning System alerts both oncoming and following drivers when the bus is preparing for safety stops, such as railroad crossing stops, or when loading and unloading passengers. The system consists of an eight-lamp RED and AMBER warning indicator system and an optional electronic safety messages sign. Both of these systems will be described below.

Electronic Safety Messages

The electronic messaging system is an electronic rear facing LED sign that provides two distinct safety messages to alert drivers when the bus is stopping or stopped. When the AMBER warning lights are activated, the alternating ***Caution - Stopping*** LED message flashes.

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When the RED warning lights are activated and the stop arm is deployed, the alternating ***Stop – Do Not Pass*** LED message flashes. See the description of the eight-lamp AMBER and RED warning lights below.

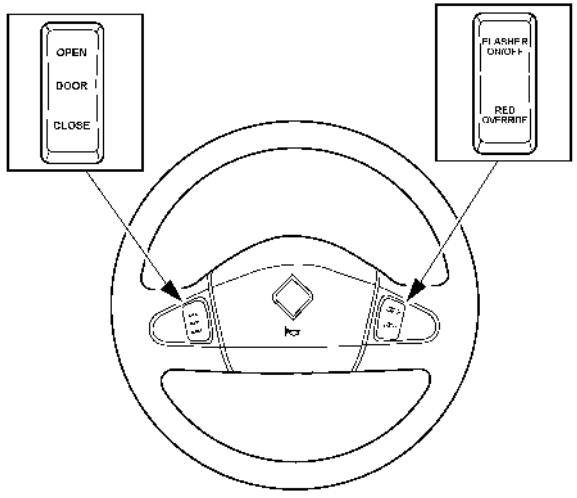
3813008

Eight-Lamp AMBER and RED Warning Lights

The eight-lamp AMBER and RED warning system is made up of four AMBER (two front and two rear), and four RED (two front and two rear) flashing lights, and is part of the warning flasher system.

The AMBER warning lights alert the public of the intent to stop and load / unload students onto / from the bus. The RED warning lights and the stop arm are intended to warn the public that students are boarding or leaving the bus.

The warning indicator control is located on the right-side of the steering wheel.



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Optional Rocker Switches

NOTE: These switches can be located on the left-side or right-side console switch panel.

NOTE: These rocker switches are an optional alternative to the steering wheel controls. When this option is chosen, the cruise / throttle switches move to the steering wheel location.

Sequential System

Press the FLASHER LIGHT ON / OFF button to engage the AMBER warning lights.

The AMBER warning lights change automatically to the RED warning lights when the entrance door is opened.

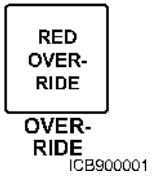
The RED warning lights will deactivate when the door is closed and the vehicle travels faster than a preset road speed parameter.

The optional RED warning lights will deactivate when the door is closed when the bus is not moving.

NOTE: If the entrance door is reopened without pressing the FLASHER ON / OFF or the RED OVERRIDE buttons, the RED warning lights will not activate.

Press the RED OVERRIDE button twice to turn OFF the RED warning lights while the door is open and the bus is not moving or traveling at a speed lower than the preset road speed parameter with the door closed.

Non-Sequential System



With the master flasher switch in the ON position, press the FLASHER ON / OFF button to engage the AMBER warning lights. (If the master switch is not turned ON, there will be no activation of the lights or stop arm.)

The AMBER warning lights change automatically to the RED warning lights when the entrance door is opened.

The RED warning lights will deactivate when the doors are closed.

NOTE: If the door is reopened, the RED lights will reactivate without pressing the FLASHER LIGHT ON / OFF or the RED OVERRIDE buttons.

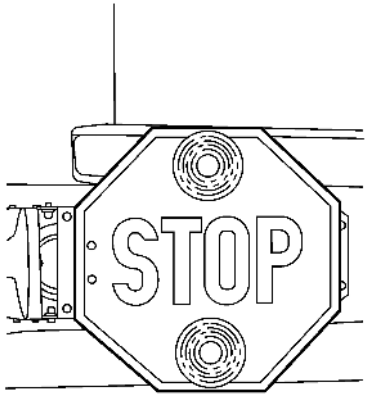
To turn OFF the RED warning lights while the door is open and the bus is not moving, press the RED OVERRIDE switch twice, or turn OFF the master flasher switch.

WIG WAG Warning System (If Equipped)

The optional Wig Wag is a device for flashing the right-side and left-side headlights alternately at a preset rate of about 75 times per minute. If the low beams are on, the high beams will alternate and vice versa. If the driving lights are on, the low beams will alternate.

Flashing Stop Arm

Used to warn the public that students are boarding or leaving the bus



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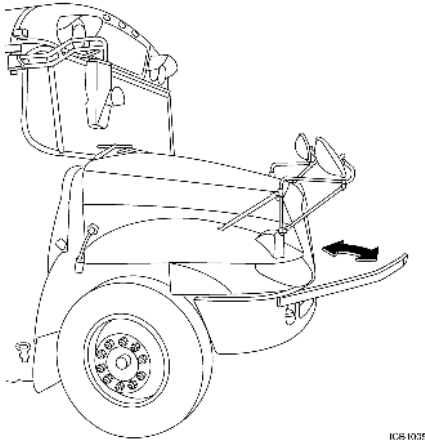
Crossing Gate



The crossing gate extends when the RED warning lights are on to make sure that students do not cross too close to the front of the bus and out of the view of the driver.

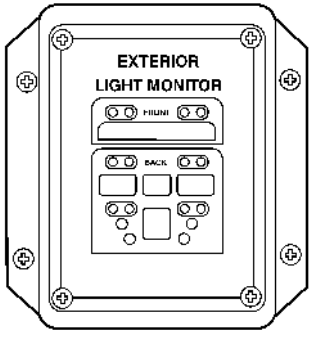
NOTE: The illustration is for reference only and may differ from the actual vehicle.

Driver Visual Warning Lights and Indicators

The driver's visual warning lights, located in the instrument panel gauge cluster, indicate the operation of the eight lamp warning system (either AMBER or RED), the wheelchair lift door indicator, and other optional equipment.

Each indicator only comes on when the respective light or switch is activated.

EXTERIOR LIGHT MONITOR (OPTIONAL): The light monitor is mounted in the overhead console panel.



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Audible Warning Buzzer

The audible warning device buzzer is activated when the rear emergency door, roof hatch (if equipped with a buzzer), kickout windows, or side emergency doors are open with the ignition switch in the ON or Accessory (ACC) position.

Post-Trip Inspection Systems

It is the driver's responsibility to check for children who may be left on the bus at the end of every trip. The post-trip inspection system is intended to be an aid to the driver in order to ensure that the responsibility is not accidentally overlooked.

Post-Trip Inspection Activation (No Student Left Behind® System)

Normal student pickup and drop off operation of the bus will automatically activate the system. The system can be simulated by performing the following procedure:

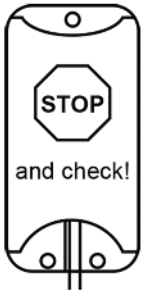
1. Start the bus or turn the ignition to the ON position.
2. Activate the RED flashers.

Post-Trip Inspection Deactivation (No Student Left Behind® System)

To deactivate the Post-Trip (No Student Left Behind® System) perform the following steps to avoid horn honking and headlights flashing:

NOTE: If the disarm procedure is not followed and the ignition is in the OFF position, turn the ignition to the ON position to stop the horn from honking and start the procedure again.

1. Turn the ignition to the OFF position and then back to the ON position, the system will give a reminder beep every 30 seconds for up to 4 minutes.
2. Proceed to the rear of the bus checking for children that may still be on the bus. Once the rear of the bus is reached, press and release the post-trip inspection button. The system is now deactivated.
3. Return to the front of the bus and turn the ignition to the OFF position. Remove the key if exiting the bus.



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Inspection Activation (Child Check-Mate System)

Normal student pickup and drop off operation of the bus will automatically activate the system. The system can be simulated by performing the following procedure:

1. Turn the ignition to the Key ON position.
2. Activate RED flashers or the system will self arm after 10 minutes of the bus ignition being in the Key ON position with the door closed.

Post-Trip Inspection Deactivation (Child Check-Mate System)

To deactivate the Post-Trip (Child Check-Mate) perform the following steps to avoid horn honking and headlights flashing:

NOTE: If the disarm procedure is not followed, turn the ignition to the ON position and close the entrance door to stop the horn from honking and start the procedure again.

1. Turn the ignition to the Key OFF position and close the entrance door.
2. The dome lights will turn ON for added view of the bus. Proceed to the rear of the bus checking for children that may still be on the bus.

NOTE: Post-Trip

The operator will have 60 seconds to press the post-trip inspection button at the rear of the bus.

3. Press and release the post-trip inspection button at the rear of the bus.
4. The system is now deactivated, the dome lights will flash to confirm the system is disarmed. The dome lights will remain ON for the next 60 seconds.
5. Proceed to the front of the bus and remove the key if exiting the bus.

Emergency Exits

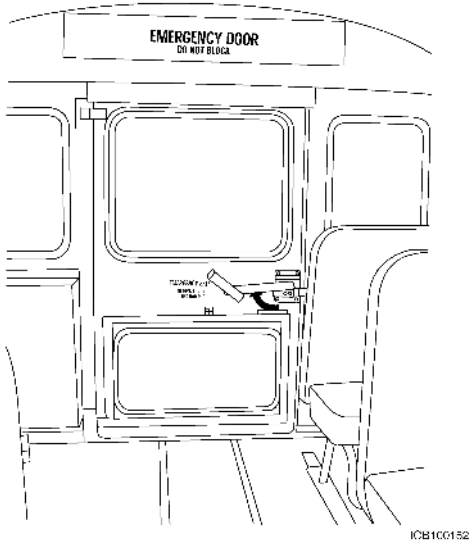
NOTE: Make sure the printed operating instructions are present and visible at all times. Inspect every emergency exit every day for proper operation.

Opening any emergency exit will trigger an alarm to alert the driver when the key is in the on or accessory position.

NOTE: A label stating Do Not Block is required by each emergency door and side emergency exit window. This label is a warning to the user of the bus not to block the emergency exits with wheelchair, child restraint systems or other items; for example, trash containers.

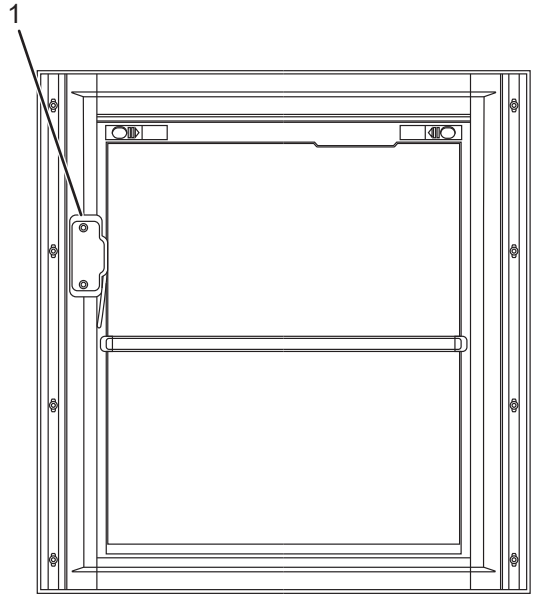
Pull up the RED lever to unlatch the emergency door. After the door is unlatched, push outward to open. Make sure the printed operating instructions are present and visible at all times. Inspect every emergency exit every day for proper operation.

Emergency Door



Emergency Exit Windows

Emergency Exit Window

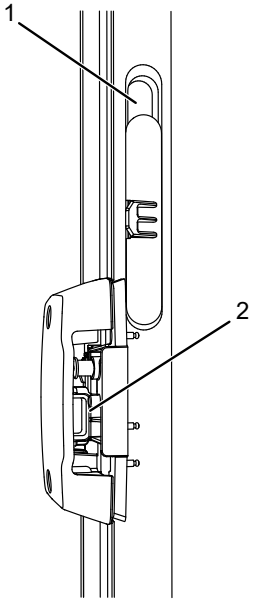


0000428403

1. Release handle

NOTE: Ensure the printed operating instructions are present and visible at all times. Inspect every emergency exit every day for proper operation.

Pull up on the release handle to unlatch the emergency exit window, and push the window outward to open.



0000433122

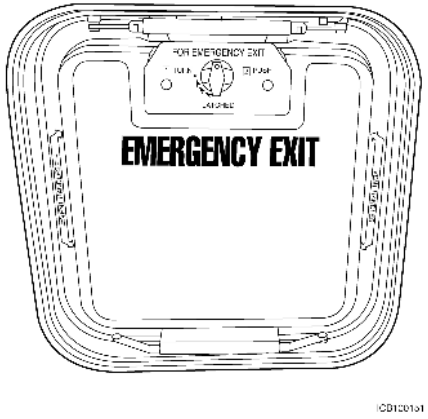
1. Slide lubrication point
2. Release handle lubrication point

Make sure windows are free of dirt, fog, condensation, and snow. Make sure the windows can open and close completely. Once a year, pull up on the release handle to open the emergency windows and lubricate the window slides (2) and release handle. Only specific lubricants should be used on the emergency exit window lubrication points. For emergency exit window lubrication specification, refer to the **Maintenance Intervals and Specifications** section of this manual.

Roof Vent / Hatch

When using the vent, push upward at the locations marked on the hatch.

Open the hatch by turning the RED knob to the 2 position, then push upward on the knob. Make sure the printed operating instructions are present and visible at all times. Inspect every emergency exit for proper operation every day. The emergency hatch type may be different in your bus. If your emergency hatch is different, become completely familiar with its operation before driving the bus.



Vandal Locks

The optional vandal lock mechanism is used to lock access doors, rear emergency window, and roof hatches to prevent unauthorized access to the bus while not in use. Vandal locks can be provided on front entrance doors, side emergency door, rear emergency window, roof hatches, and lift doors.

On the side emergency door, the vandal lock is a dead bolt lock that the driver slides in place to secure the bus from unwanted vehicle access.

On the rear emergency window, the driver uses the vandal lock handle to slide the lock in place.

The vandal lock, for the front entrance door, is engaged with a standard-looking door key, which is rotated clockwise to lock the door and counterclockwise to unlock the door.

Vandal locks for all emergency exits include ignition starter interlocks. The front entrance door vandal lock may include an ignition starter interlock.

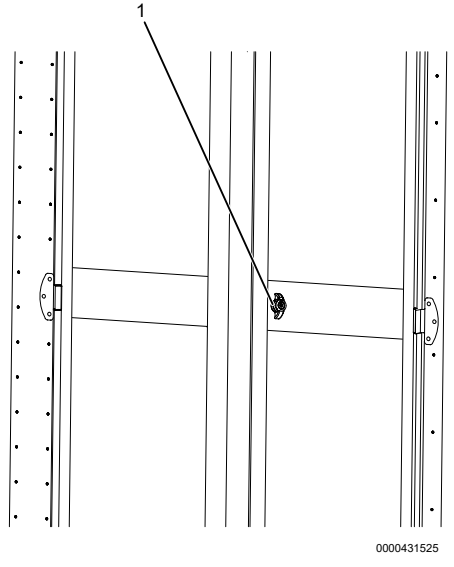
Vandal Locks with Starter Interlock (If Equipped)

NOTE: Once the bus is in operational readiness mode, the vandal lock / starter interlock will not stop the bus, but it will prevent it from restarting when the lock is engaged. The alarm will be activated to alert the driver.

As an extra measure of security, the bus may be equipped with the optional vandal lock feature with starter interlock.

The ignition starter interlock prevents the bus from being started while the exit door is locked. If the ignition switch is turned to the START position while vandal locks are in place, an alarm will be activated as long as the door is locked.

Entrance Door Lock (If Equipped)



1. Latch

As an extra measure of security, the bus may be equipped with an entrance door lock. This lock mechanism is used to lock the entrance door to the bus in order to prevent unauthorized access to the bus while not in use or attended.

To lock the entrance door lock feature, rotate the latch clockwise.

To unlock, rotate the latch counterclockwise.

SECTION 8 — SEATING AND SAFETY RESTRAINTS

Driver Seat Adjustment

WARNING

To prevent personal injury and / or death, or damage to property, always use driver restraint system when vehicle is moving.

WARNING

To prevent personal injury and / or death, or damage to property, do not adjust driver's seat while vehicle is moving. The seat could suddenly or unexpectedly move, causing the driver to lose control of vehicle.

WARNING

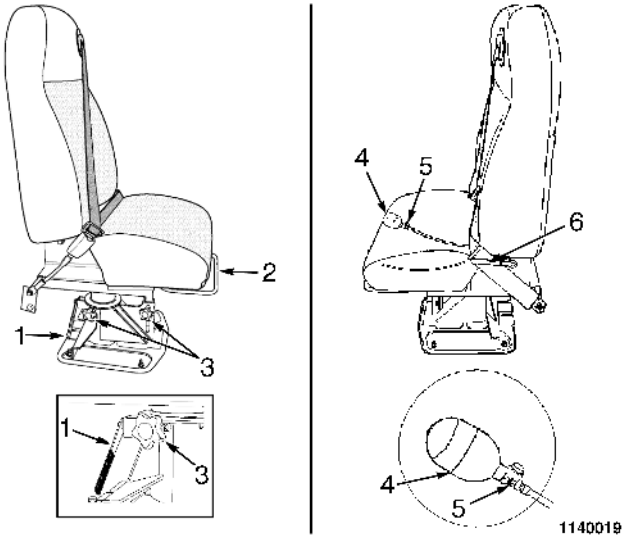
To prevent personal injury and / or death, or damage to property, use caution and reduce speed when operating this vehicle over rough roads or surfaces as this can cause loss of vehicle control. Use caution and reduce speed. Properly adjusted seats and seating systems may not compensate completely for severe road conditions. Ensure that head clearance will be maintained during all road conditions, as the seat may move up and decrease the available space.

WARNING

To prevent personal injury and / or death, or damage to property, apply Neutral prior to exiting the driver seat.

NOTE: This bus may be equipped with an optional driver seat that may be different from the one described in this manual. If so, refer to the seat manufacturer's manual for proper operation and maintenance.

Seat Height Adjustment



1. Seat height lever
2. Forward / aft adjustment bar
3. Seat height adjustment lock knob
4. Lumbar support squeeze bulb
5. Release valve
6. Seat back adjustment lever

There are three possible seat heights available: top, middle, and low. At the top position three adjustment holes are visible, and at the low position none of the holes are visible.

WARNING

To prevent personal injury and / or death, or damage to property, do not adjust driver's seat while vehicle is moving. The seat could suddenly or unexpectedly move, causing the driver to lose control of vehicle.

NOTE: All seat height adjustments must be made WHILE NOT SITTING IN THE SEAT.

Adjust the seat height as follows:

1. Loosen the seat height adjustment lock knob just enough to allow seat height adjustment.
2. While standing to the side of the seat, lift and hold the seat height lever while raising or lowering the seat to the desired height, then release the lever. While adjusting the seat height, the seat height lever may remain in the up position. The location and orientation of the height adjustment lever may vary.
3. When at the desired position, move the seat slightly up or down until the seat height lever snaps to its height engaged (down) position.
4. After the desired seat position is satisfied, tighten the seat height adjustment lock knob.

Forward / Aft Adjustment

Lift and hold the forward / aft adjustment bar to move the seat forward or backward, and release the lever at the desired position.

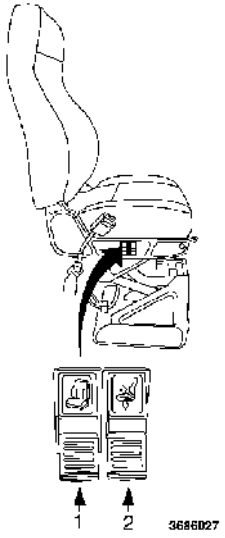
Seat Back Adjustment

The seatback adjustment lever is located on the left-side of the seat. Lift and hold the seatback lever while moving the seatback forward, or rearward, and release the lever at the desired position.

Lumbar Support Adjustment

Squeeze the lumbar support squeeze bulb to move the support upward. To move the lumbar support downward, release the air from the lumbar support squeeze bulb, by turning the release valve counterclockwise.

Optional Air Suspension Seat



1. Lumbar adjustment
2. Height adjustment

Forward / Aft Adjustment Lever

Move and hold the forward / aft adjustment lever to the left to move the seat forward or backward.

Seat Back Adjustment Knob

The seat back adjustment knob is located on the left-side of the seat at the intersection of the seat back and the lower seat cushion. Turn the seatback adjustment knob clockwise to tilt the seatback forward and rotate the knob counterclockwise to tilt the seat back rearward.

Lumbar Support

Pull the left-side switch (lumbar support switch) upward or push downward to adjust the lumbar support to your preference.

Height Adjustment Switch

Lift the height adjustment switch upward to adjust the seat height. While seated, pull the lever up and release when an acceptable height has been achieved. To lower the seat, depress the switch and stop when an acceptable height has been reached.

Driver Seat Belts

WARNING

To prevent personal injury and / or death, or damage to property, any seat belt in use during an accident must be replaced. When replacement of any part of the seat belt is required, the entire belt must be replaced, both retractor and buckle sides.

WARNING

To prevent personal injury and / or death, or damage to property, properly inspect and maintain seat belts every 10,000 miles or sooner during heavy usage.

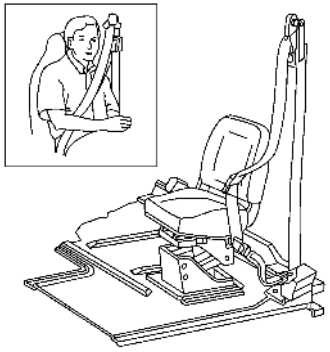
Wear your seat belt at all times the vehicle is in motion to avoid personal injury. Before fastening the seat belt, adjust the seat to the desirable driving position. Driver's lap and shoulder (three-point) seat belt with retractor is standard.

Driver's Adjustable Lap and Shoulder (Three-Point) Belt

WARNING

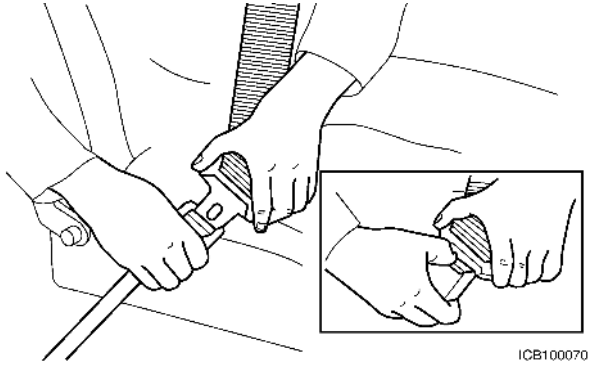
To prevent personal injury and / or death, or damage to property, position the safety belt height adjusters so that the belt rests across the middle of your shoulder. Failure to adjust the safety belt properly could reduce the effectiveness of the seat belt.

Inspect the entire seat belt assembly for corrosion, wear, fraying or weak spots. Check the retractor, latch, and buckle for proper function, and all seat belt mounting bolts for tightness.



ICB100069

Bring the belt across your hips and chest and insert the latch plate into the buckle until secure to fasten the seat belt. The web is free to slide through the latch plate, allowing the belt tension to equalize across your hips and chest. The retractor is a locking type that allows the webbing to adjust for body movement.



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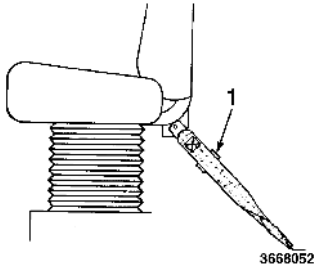
Press the release button to disconnect the seat belt.

Seat Belt Tether

NOTE: The majority of the driver seats have nonadjustable tethers. Driver seats with adjustable tethers must follow the Tether Adjuster Procedure.

Tether Adjuster Procedure

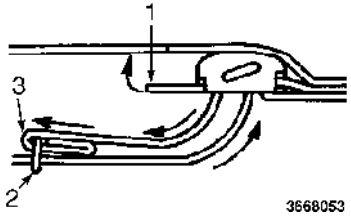


1. Tether adjuster

NOTE: The seat belt tether must be checked for proper adjustment prior to vehicle operation.

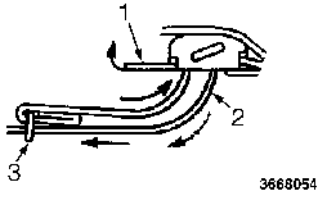
1. Adjust the driver seat fore and aft to accommodate driver comfort.
2. After the seat is adjusted, take weight off the seat to allow the seat to rise to its highest point.
3. Pull the webbing through the tether adjuster until there is no slack.

Adjusting the Length of the Tether



1. Tether adjuster
2. Wire loop
3. Nub

To shorten the tether, squeeze the tether adjuster and pull the nub and wire loop to move the webbing away from the tether adjuster (as shown by the arrows).



1. Tether adjuster
2. Strap
3. Wire loop

To lengthen the tether, squeeze the tether adjuster and, while firmly holding the strap, use the nub and wire loop to move the webbing toward the adjuster (as shown by the arrows).

Care of Seat Belts

WARNING

To prevent personal injury and / or death, or damage to property, do not bleach or re-dye seat belt webbing. Bleaching or re-dyeing may cause a weakening / premature deterioration of the webbing.

WARNING

To prevent personal injury and / or death, or damage to property, use caution when cleaning seat belts. Disinfectant products can contain solvent based chemicals that can adversely affect seat belt components.

NOTE:

- **Do not use a 70% isopropyl solution as a wash solution.**
- **Do not use a 70% isopropyl solution wipe on seats that are hot from day time heat.**
- **Vapors can accumulate quickly when using a 70% isopropyl solution wipe. Maintain adequate ventilation by opening windows and doors.**
- **The effectiveness of the 70% isopropyl solution can be diminished when used in high heat conditions due to evaporation.**

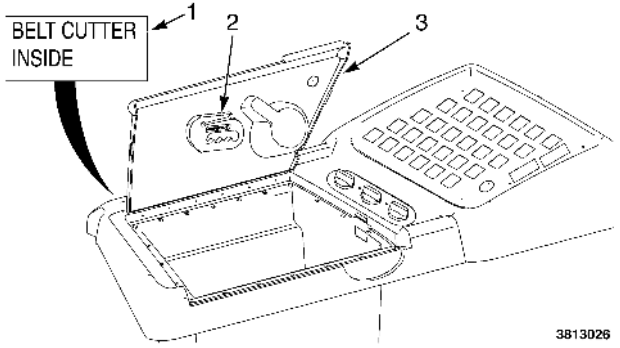
Clean the belts occasionally with mild soap. Do not use cleaning solvents or abrasives.

A 70% solution of isopropyl alcohol can be used as a disinfectant wipe. A 70% isopropyl solution is readily available from local sources.

Inspection of Seat Belts

Inspect the buckle and latch plate for positive engagement and effective release. Inspect the webbing and assembly for damage or wear. Replace the entire belt if any deficiencies are found.

Seat Belt Cutter



1. Belt cutter label
2. Seat belt cutter
3. Lid

If it becomes necessary to cut through a seat belt, the seat belt cutter is located inside of the driver's compartment lid.

NOTE: Location of seat belt cutter may vary according to state regulations.

Passenger Seat Belts

Buses may be equipped with optional passenger seat belts.

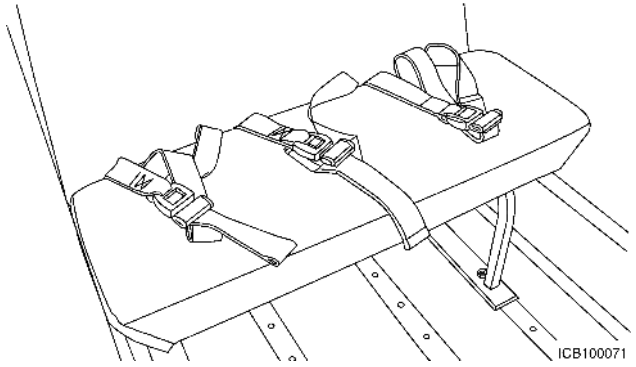
WARNING

To prevent personal injury and / or death, or damage to property, properly inspect and maintain seat belts every 10,000 miles or sooner during heavy usage.

WARNING

To prevent personal injury and / or death, or damage to property, any seat belt in use during an accident must be replaced. When replacement of any part of the seat belt is required, the entire belt must be replaced, both retractor and buckle sides.

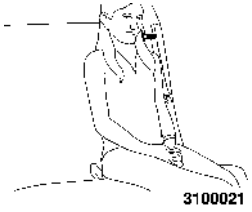
Passenger Two-Point Seat Belt (Lap Belts)



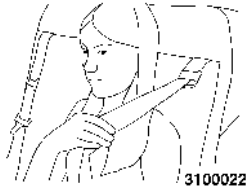
To loosen the belt, slide the latch up the webbing as far as necessary to make the belt go around the passenger's lap. Insert the latch plate into the buckle until secure. To loosen, pull up on the lap belt. Tighten the belt until it is snug by pulling on the loose end of the belt. Push the release button on the buckle to release the seat belt. Position the lap portion of the belt so that the webbing is below the passenger's waist, not over the stomach or abdomen area. The lap portion of the belt must be low and snug over the bony structure of the passenger's hips.

Passenger Three-Point Seat Belts (Optional)

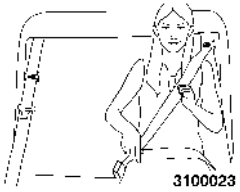
Buckling Up



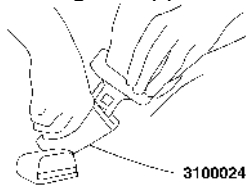
1. The passenger should sit as flat against the seat back as possible to achieve the best possible fit of the lap-shoulder belt on the passenger's upper and lower torso.



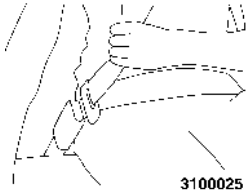
2. Pull out the shoulder belt webbing from the upper seat back. Do not let the belt get twisted. (The shoulder belt may lock if pulled across the body too quickly. If this happens, let the belt retract slightly to unlock it. Then pull the belt across you more slowly).



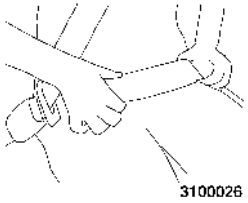
3. Place the lap-shoulder belt over the shoulder and around the passenger's upper body.



4. Insert the latch plate into the matching seat belt buckle on the lower seat cushion.

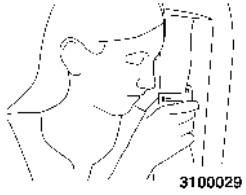


5. Listen for an audible click when the latch plate is fastened. Check that the buckle connection is secure by pulling on the shoulder portion of the lap-shoulder belt.



6. Position the lap portion of the belt so that the webbing is below the passenger's waist, not over the stomach or abdomen area. The lap portion of the belt must be low and snug over the bony structure of the passenger's hips.

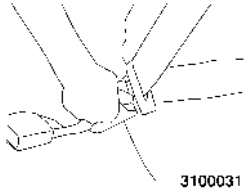
7. Pull up on the shoulder portion of the lap-shoulder belt to tighten the lap portion. **This step is important and must be done to ensure proper fit of lap-shoulder belt to passenger**. The shoulder portion of the belt must be snug across the chest and in the center of the passenger's shoulder.



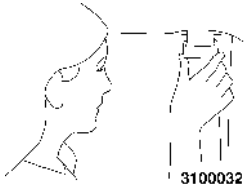
8. Position the shoulder height adjuster at or just above the passenger's shoulder. The shoulder belt should not cross the passenger's face or neck.

9. Make sure the lap-shoulder belt is snug and lies flat against the passenger. There should be no twisting of the webbing.

Unbuckling

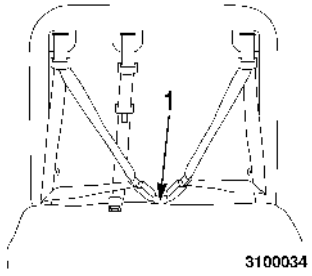


1. Push the RED buckle release button and remove the latch plate from the buckle. The buckle has a release mechanism that separates the latch plate from the buckle.
2. Allow the shoulder belt to retract and stow in the upper seat back.



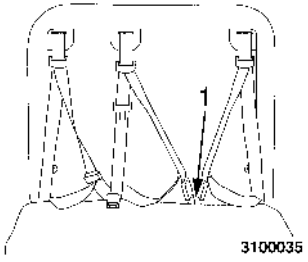
3. As a courtesy to the next passenger, move the shoulder height adjuster up to the highest position.

39-Inch Flex Seat



1. Sliding dual buckles (two seating position)

Use for two children: Slide the sliding dual buckles on right-side all the way left to create two seating positions.



1. Sliding dual buckles (three seating position)

Use for three children: Slide the sliding dual buckles on right-side all the way right to create three seating positions.

WARNING

To prevent personal injury and / or death, or damage to property, observe the following:

- **A frayed or torn child restraint belt could rip apart in a collision and leave your child with no protection. Inspect the belt system periodically, checking for cuts, frays, or loose parts. Damaged parts must be replaced immediately.**
- **Do not disassemble or modify the system.**
- **Child restraint belt systems must be replaced after a collision if they have been damaged (such as a bent buckle or five-point connector, or torn webbing). Similarly, the child restraint-equipped bench or bucket seat must be replaced after a collision if it is damaged (such as a bent or broken seat frame).**

WARNING

To prevent personal injury and / or death, or damage to property, observe the following:

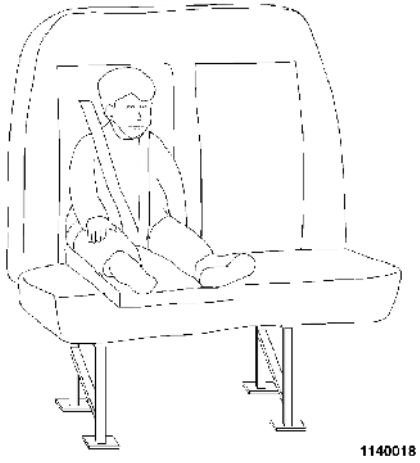
- **Follow all instructions on the child restraint and in this manual.**
- **It is important to use an approved rearward facing infant restraint for a full year to allow the neck and spine to develop enough to support the weight of the child's head in the event of a collision.**
- **Adjust the belts provided with this child restraint snugly around the child.**

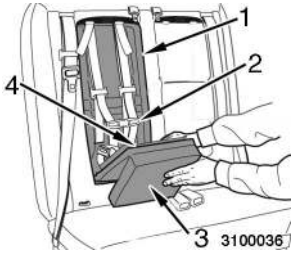
Indiana Mills and Manufacturing Inc. (IMMI®) Integrated Child Restraint Seats (Optional)

WARNING

To prevent personal injury and / or death, or damage to property, observe the following:

- **Use only with children who weigh between 22 and 85 lb (10 and 39 kg), children whose height is 49 in (124 cm) or less, or with children who are over one year of age.**
- **Top portion of the seat cushion must be folded under lower portion of seat cushion to form seating surface for child.**





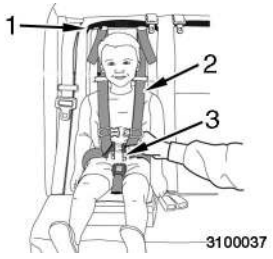
1. Removable seat pad
2. Chest clip
3. Two-piece seat cushion
4. Harness buckle

Activate the restraint system by lowering the two-piece seat cushion. Fold the top portion of the cushion under the bottom portion to form a seating surface for the child. Be sure seat belt buckles (if equipped) are NOT beneath the two-piece seat cushion. Failure to fold the seat cushion under can result in damage to the restraint and thus improper restraint of the child.

Open chest clip by squeezing middle tabs and pulling chest clip apart.

Unbuckle harness buckle by pressing down on RED release button.

To loosen harness, lift metal at top of seat and pull down on shoulder strap to loosen strap. Repeat with second shoulder strap.



1. Metal tabs
2. Shoulder straps
3. Harness buckle

Place the child in the restraint with the child's back flat against the back of the bus seat cushion. Position shoulder straps over the child's shoulders.

Buckle harness by inserting buckle tongues into harness buckle.

Listen for an audible click when each buckle tongue is fastened.

Check that the buckle connection is secure by pulling on the shoulder straps.

1. Top straps

To tighten harness, pull down equally on top straps on both sides until the harness is snug around the child.

A snug strap should not allow any slack. It lies in a relatively straight line without sagging. It does not press on the child's flesh or push the child's body into an unnatural position.

1. Shoulder height adjuster
2. Chest clip

Fasten chest clip by pushing both sides together, then position chest clip at middle of the child's chest, at armpit level.

Position each shoulder height adjuster at or just above the child's shoulder. Be sure harness is snug and tight on child's thighs and chest.

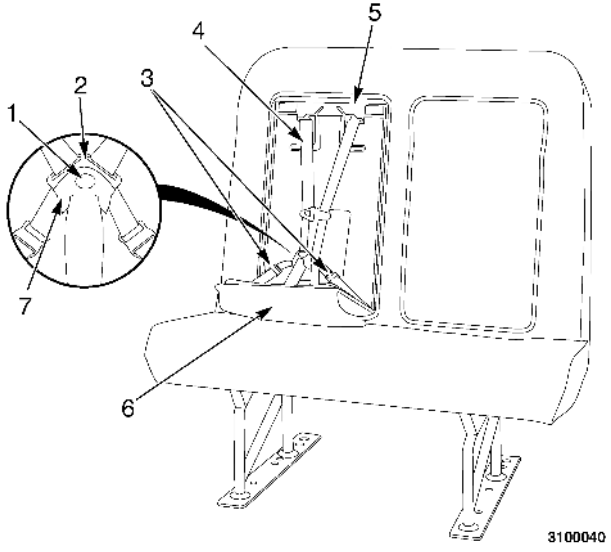
C.E. White Integrated Child Restraint Seats (Optional)

WARNING

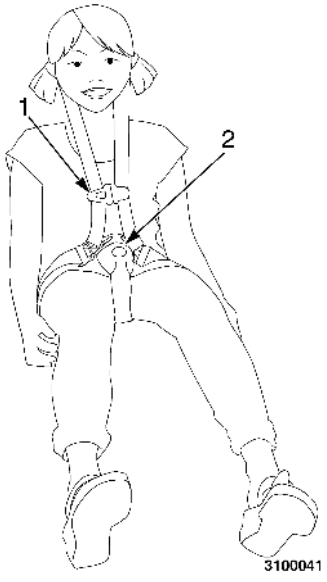
To prevent personal injury and / or death, or damage to property, observe the following:

This integrated child seat is designed for use only by children who weigh between 20 and 85 lb (9 and 39 kg).

Refer to the following illustration to become familiar with the parts of the child seat and five-point seat belts. This child restraint system conforms to U.S. Federal Motor Vehicle Safety Standard 213 and Canada Motor Vehicle Safety Standard No. 213.4.



1. Buckle release button
2. Seat belt latch plates
3. Adjustment
4. Shoulder belt strap
5. Removable pad
6. Folded down leg rest pad
7. Buckle



1. Shoulder belt clip
2. Seat belt latch plates

To open the child restraint, grasp the upper portion (leg rest pad) and lower the child seat cushion.

To secure the child:

1. Before placing the child in the seat, add slack to the shoulder belts. Release the seat belts by pulling up on the belt adjustment strap, then pull up on the seat belts.
2. Place the child into the child seat, pull the shoulder belts through the appropriate shoulder slot for the height of the child and put a shoulder belt over each shoulder. Insert both seat belts latch plates into the buckle and pull up on them to make sure they are firmly latched.

   NOTE: Be sure that the seat belt buckle is free of foreign objects that may prevent you from properly latching latch plates. If an object is in the opening, and cannot be removed, see your dealer for service immediately.
3. Fasten the two halves of the shoulder belt clip together and put it 2 - 3 in (5 - 7.6 cm) below the child's chin. The purpose of the clip is to keep the shoulder belts positioned correctly on the shoulders.

To remove the child, reverse Steps 1 - 3.

Child Restraint Anchorage Systems (Optional)

The following provides information pertaining to attaching add-on child seats to passenger seats with child restraint anchorage systems including tether anchors.

When installing an add-on child seat, follow the instructions located on the add-on child seat for the forward facing position. Ensure that the seat chosen is able to be installed in the forward facing position and is designed to be used with the child restraint anchorage system.

Passenger seats with optional child restraint anchorage systems for attaching add-on child seats are usually located in the first few rows of passenger seats behind the operator and / or entrance door. To determine the location of the passenger seats in the vehicle that are equipped with child restraint anchorage systems, look for the pockets in the seat back just above the seat cushion with a bar inside, or bars protruding up, between the seat back and the seat cushion. Lower Anchors and Tethers for Children (LATCH) anchor locations may be identified with the anchorage symbol just above the anchor.

Canadian school buses and all commercial buses must attach the tether of the add-on child seat to the tether anchor located on the passenger seat per the following instructions.

NOTE: Tethers are not required in U.S. school buses in combination with child restraint anchorage system (UCRA) when installing add on child restraint seats.

Passenger seats may have one or two child restraint anchorage systems. If two anchor systems are present in the same passenger seat, and only one add-on child seat is going to be installed, it is recommended to use the system closest to the wall to improve the mobility of the passenger in the open seat in case of an emergency.

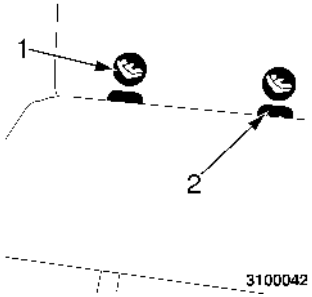
WARNING

To prevent personal injury and / or death, or damage to property, observe the following:

Follow all instructions on the child restraint and in this manual. Follow the manufacturer's warnings for proper use of the child restraint system and LATCH attachments.

Follow the manufacturer's warnings for proper use of the child restraint system and LATCH attachments.

Location and Use of Lower LATCH Anchors

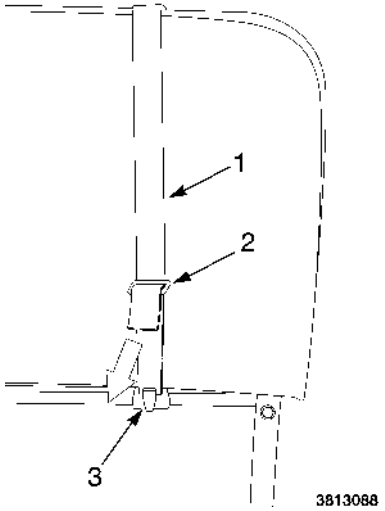


1. Anchorage symbols
2. Lower latch anchors

Location of the Tether Anchor (Optional)

The tether anchor style and location may vary between seat manufactures.

IC and C.E. White seats tether installation is as follows:



1. Child strap
2. Adjuster
3. Tether anchor

NOTE: IC and C.E. White tether anchors are mounted to the seat belt bar and are visible under the rear of the seat back.

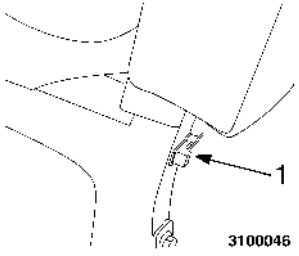
For the attachment of an add-on child seat tether, wrap the tether over the seat as shown then connect the snap hook to the tether anchor. Adjust the tether to a snug and tight fit by pulling on the free end of the strap at the adjuster.

IMMI® Seats Tether Installation

1. Child seat tether

All base, three-point, and integrated child restraint (BTI) bus seats equipped with LATCH are also equipped with tether anchors for add-on child seats.

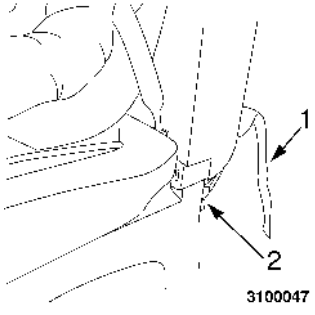
Location and Use of Tether Anchors (BTI Bus Seats)



1. Tether anchor

Tether anchors are located on the aisle side rear pedestal and on the seat wall mount bracket rear edge.

Installing Tether

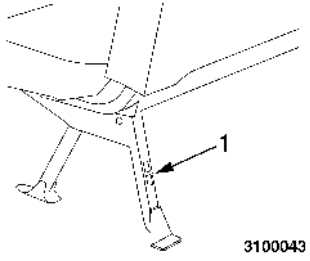


1. Strap (free end)
2. Tether anchor

To attach an add-on child seat tether, route the tether on the child seat over the top of the belted BTI bus seat. Extend the tether and connect the snap hook to the nearest tether anchor provision at the lower rear of the seat. Adjust the tether to a snug and tight fit by pulling on the free end of the strap at the adjuster.

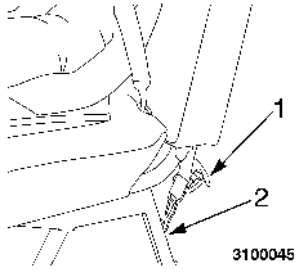
Location and Use of Tether Anchors (SafeGuard® XChange Bus Seats)

SafeGuard® XChange bus seats are equipped with tether anchors for add-on child seats.



1. Tether anchor

Tether anchors are located on the aisle side rear pedestal and on the seat wall mount bracket rear edge.



1. Strap (Free End)
2. Tether anchor

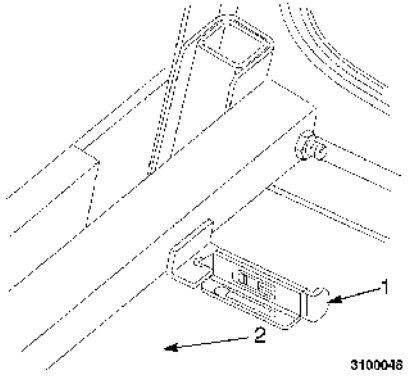
To attach an add-on child seat tether, route the tether on the child seat over the top of the SafeGuard® XChange bus seat. Extend the tether and connect the snap hook to the nearest tether anchor provision at the lower rear of the seat. Adjust the tether to a snug and tight fit by pulling on the free end of the strap at the adjuster.

Cushion Release Latch

WARNING

To prevent personal injury and / or death, or damage to property, make sure seat belts and equipment are held out of the way when lowering the cushion to seated position. Keep hands and feet clear while lowering the seat cushion.

Rear Latching

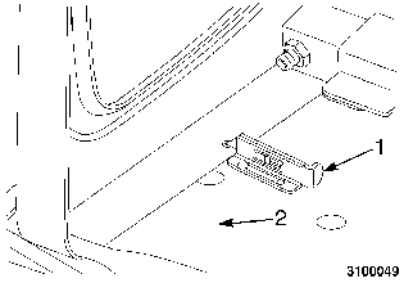


1. Latch
2. Seat bottom

Optional release latches may vary based on seat style. Seats automatically latch when sat upon. Pull up on seat cushion to confirm cushion is latched.

For both rear and side latching designs, pull the latch to release.

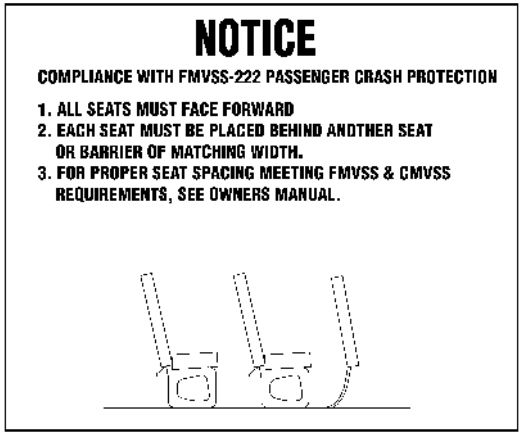
Side Latching



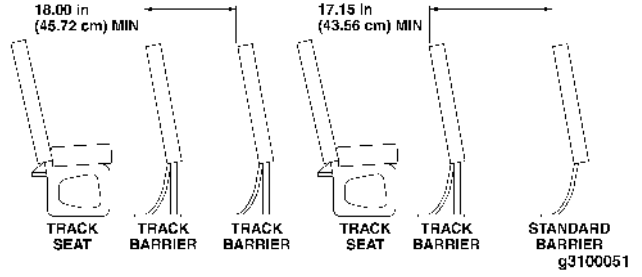
1. Latch
2. Seat bottom

Track Seat Mounting For Each Seat Type

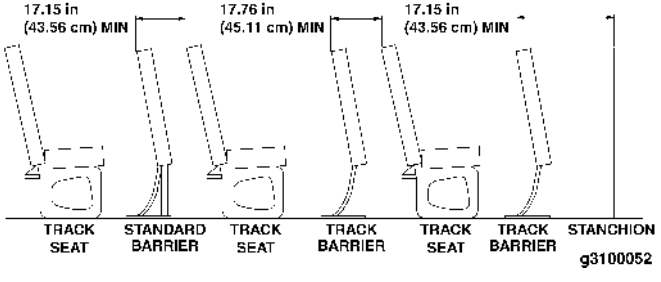
The following diagrams outline the maximum seat spacing for specific seat and barrier types to ensure FMVSS / CMVSS 222 school bus compliance requirements are met. Original seat layout for a specific unit can be obtained by contacting your IC Bus® dealer.



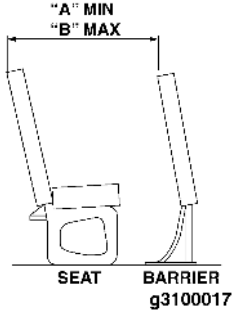
The standard track seat label is found on the front bulkhead of all buses with track seating.



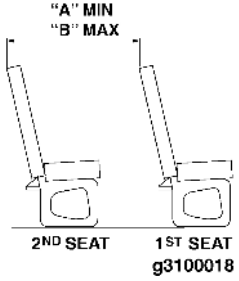
Minimum spacing with standard barrier to track barrier, and track barrier to track barrier.



Minimum spacing with stanchion to track barrier, track seat to track barrier, and track seat to standard barrier.



Barrier Type	Seat	A - Minimum	B - Maximum
Standard	IC Track	28.75 in (73.03 cm)	34.35 in (87.25 cm)
Track	IC Track	29.24 in (74.27 cm)	34.24 in (86.97 cm)
Standard	CEW-CR11 Track Seat (with or without lap belts, with Integrated Child Seat)	28.51 in (72.41 cm)	32.54 in (82.65 cm)
Track	CEW-CR11 Track Seat (with or without lap belts, with Integrated Child Seat)	29.10 in (73.91 cm)	32.10 in (81.53 cm)
Standard	CEW-QSCR11 Track Seat (with 3-point belts, with Integrated Child Seat)	28.49 in (72.36 cm)	32.52 in (82.60 cm)
Track	CEW-QSCR11 Track Seat (with 3-point belts, with Integrated Child Seat)	29.35 in (74.55 cm)	32.35 in (82.17 cm)
Standard	CEW-QS11 Track Seat (with 3-point belts, without Integrated Child Seat)	28.53 in (72.47 cm)	32.56 in (82.70 cm)
Track	CEW-QS11 Track Seat (with 3-point belts, without Integrated Child Seat)	29.36 in (74.57 cm)	32.36 in (82.19 cm)
Standard	IMMI® Track Seat (without Integrated Child Seat)	30.54 in (77.57 cm)	36.44 in (92.56 cm)
Track	IMMI® Track Seat (without Integrated Child Seat)	30.92 in (78.54 cm)	34.92 in (88.70 cm)
Standard	IMMI® ICS Track Seat (with Integrated Child Seat)	30.54 in (77.57 cm)	36.44 in (92.56 cm)
Track	IMMI® ICS Track Seat (with Integrated Child Seat)	30.92 in (78.54 cm)	35.92 in (91.24 cm)



Seat to Seat			Spacing
First Seat	Second Seat	A - Minimum	B - Maximum
IC Track	IC Track	26.00 in (66.04 cm)	31.00 in (78.74 cm)
IC Track	CEW-CR11 Track Seat (with or without lap belts, with Integrated Child Seat)	25.87 in (65.71 cm)	28.87 in (73.32 cm)
IC Track	IMMI® ICS Track Seat (with Integrated Child Seat)	27.68 in (70.31 cm)	32.68 in (83.01 cm)
CEW-CR11 Track Seat (with or without lap belts, with Integrated Child Seat)	IC Track	29.13 in (73.99 cm)	34.13 in (86.69 cm)
IMMI® ICS Track Seat (with Integrated Child Seat)	IC Track	26.32 in (66.85 cm)	30.32 in (77.01 cm)
CEW-CR11 Track Seat (with or without lap belts, with Integrated Child Seat)	CEW-CR11 Track Seat (with or without lap belts, with Integrated Child Seat)	28.00 in (71.12 cm)	31.00 in (78.74 cm)
CEW-QSCR11 Track Seat (with 3-point belts, with Integrated Child Seat)	CEW-QSCR11 Track Seat (with 3-point belts, with Integrated Child Seat)	28.00 in (71.12 cm)	31.00 in (78.74 cm)
CEW-QS11 Track Seat (with 3-point belts, without Integrated Child Seat)	CEW-QS11 Track Seat (with 3-point belts, without Integrated Child Seat)	27.00 in (68.58 cm)	30.00 in (76.20 cm)

Seat to Seat		Spacing	
First Seat	**Second Seat**	**A - Minimum**	**B - Maximum**
CEW-QSCR11 Track Seat (with 3-point belts, with Integrated Child Seat)	CEW-QS11 Track Seat (with 3-point belts, without Integrated Child Seat)	27.00 in (68.58 cm)	30.00 in (76.20 cm)
CEW-QS11 Track Seat (with 3-point belts, without Integrated Child Seat)	CEW-QSCR11 Track Seat (with 3-point belts, with Integrated Child Seat)	28.00 in (71.12 cm)	31.00 in (78.74 cm)
IMMI® Track Seat (without Integrated Child Seat)	IMMI® Track Seat (without Integrated Child Seat)	27.00 in (68.58 cm)	31.00 in (78.74 cm)
IMMI® ICS Track Seat (with Integrated Child Seat)	IMMI® ICS Track Seat (with Integrated Child Seat)	27.00 in (68.58 cm)	32.00 in (81.28 cm)
IMMI® Track Seat (without Integrated Child Seat)	IMMI® ICS Track Seat (with Integrated Child Seat)	27.00 in (68.58 cm)	31.00 in (78.74 cm)
IMMI® ICS Track Seat (with Integrated Child Seat)	IMMI® Track Seat (without Integrated Child Seat)	27.00 in (68.58 cm)	32.00 in (81.28 cm)

SECTION 9 — WHEELCHAIR INSTRUCTIONS AND INFORMATION

Introduction

This section will cover information pertaining to wheelchair lift (if equipped) operation, instructions and information. It is important to understand and follow the warnings, cautions, and instructions in this section to ensure the safety of any passengers or operators that may utilize the wheelchair lift or restraints.

Wheelchair Lift Operation

For operation of the optional wheelchair lift (including the lift door), refer to the manufacturer's operator manual.

WARNING

To prevent personal injury and / or death, or damage to property / vehicle components, always set the parking brake when operating the wheelchair lift, or unexpected and sudden vehicle movement may occur.

Wheelchair Lift Interlocks – Extending

Read the following before operating the wheelchair lift.

The wheelchair lift system for these buses are designed with interlocks that require the vehicle to be completely stopped with the drive mode selector in Neutral (N) and the parking brake applied, before the wheelchair lift system can be fully utilized.

Power will not be supplied to the wheelchair lift mechanism unless all of the following steps have been performed **(this is true even with the optional lift switch in the ON position — See Driver Controls section for the switch description)**.

Also, refer to the **Brake** sections for wheelchair lift interlocks.

1. Ensure that the ignition switch is in the OFF, ON or ACC (Accessory) position.
2. Place drive mode selector in the Neutral (N) position.
3. Apply parking brake. The instrument panel gauge cluster PARK indicator will turn ON.

An **(Optional)** feature provides for the parking brake to automatically be applied (Auto-Apply) when the drive mode selector is in Neutral (N).

4. Open the wheelchair lift door. The optional GREEN indicator (in left-side control panel) will flash as long as lift door is opened.

NOTE: An optional exterior light is provided, which is mounted below the lift door and activated by opening lift door. It is used to light up the area while the wheelchair lift is in operation.

The wheelchair lift can now be operated (according to the manufacturer's operator manual instructions). The LIFT DOOR instrument panel gauge cluster indicator will turn ON and will remain ON as long as the wheelchair lift door is opened.

Wheelchair Lift Interlocks – Retracting and Stowing

The vehicle cannot be moved, until the following procedures are completed. Also, refer to the **Parking Brake** sections for their wheelchair interlocks.

Follow the steps below in the order listed when retracting and stowing the wheelchair lift:

1. First stow the wheelchair lift (according to the manufacturer's operator manual instructions).
2. Then close the wheelchair lift door (according to the manufacturer's operator manual instructions). The LIFT DOOR instrument panel gauge cluster indicator will then turn OFF.

Wheelchair Lift Alarm

The instrument panel gauge cluster alarm (a continuous beeping) will be triggered if:

1. The wheelchair lift door is extended **and**:
2. The parking brake is not applied (knob is not pulled and released) **or**:
3. The drive mode selector is not in Neutral (N).

NOTE: The alarm will continue to beep until the above conditions are corrected.

Parking Brake / Wheelchair Lift Interlock and Alarm

Parking Brake / Wheelchair Lift Interlock (If Equipped). On vehicles equipped with an optional wheelchair lift, power will not be supplied to the wheelchair lift mechanism unless the parking brake is applied.

NOTE: On vehicles equipped with optional wheelchair lift, the parking brake cannot be released until the wheelchair lift is completely stowed.

NOTE: For a complete description of these interlocks, see the Parking Brake / Wheelchair Lift (If Equipped) Interlock procedures in the Brake section.

On vehicles equipped with an optional wheelchair lift, the following will describe the optional parking brake / wheelchair lift interlock and parking brake / wheelchair lift alarm. Read

and understand these paragraphs and the wheelchair lift manufacturer's operator manual before operating the wheelchair lift.

Power will not be supplied to the wheelchair lift mechanism unless all of the following steps have been performed.

WHEELCHAIR LIFT EXTENSION OPERATION

NOTE: Some vehicles with wheelchair lift extensions are configured to operate with the ignition switch OFF. This optional configuration requires the lift door to be open, the drive mode selector to be set in Neutral (N) and the parking brake to be applied.

1. Ensure that the ignition switch is in the ON or ACC (Accessory) position.
2. Set drive mode selector to Neutral (N).
3. Pull parking brake knob. (Park indicator on instrument panel gauge cluster will turn ON.)
4. Open the wheelchair lift door.

The wheelchair lift can now be operated (according to the manufacturer’s operator manual instructions). The LIFT DOOR instrument panel gauge cluster indicator will turn ON and will remain ON as long as the wheelchair lift door is opened.

PARKING BRAKE / WHEELCHAIR LIFT INTERLOCK – RETRACTING AND STOWING OPERATION

The vehicle cannot be moved (the parking brake cannot be released), until the following operations are performed:

1. Turn ignition ON.
2. Retract and stow the wheelchair lift. The LIFT DOOR instrument panel gauge cluster indicator will be turned OFF.
3. Close the lift door.
4. Depress the service brake and press and hold the button on the gearshift lever handle and select Reverse (R) or Drive (D) position.
5. Push in on the parking brake knob. (Park indicator on instrument panel gauge cluster will turn OFF).
6. Lift foot from the brake pedal, and then slowly press the accelerator pedal.

PARKING BRAKE / WHEELCHAIR LIFT ALARM (IF EQUIPPED)

- The instrument panel gauge cluster alarm will beep continuously if the wheelchair lift door is extended
- The parking brake is released.

NOTE: When either the powered parking brake is set, or the wheelchair lift door is closed, the instrument panel gauge cluster alarm will immediately stop beeping.

Parking the Bus With Wheelchair Lift Interlocks

WARNING

To prevent property damage, personal injury, and / or death, always set the parking brake when operating the wheelchair lift, or unexpected and sudden vehicle movement may occur.

Read and understand these paragraphs, along with the wheelchair lift manufacturer's operator manual before operating the wheelchair lift. On vehicles equipped with an optional wheelchair lift, the optional wheelchair lift Interlock provides that power will not be supplied to the wheelchair lift mechanism, and therefore, the wheelchair lift cannot be operated until the previous steps have been completed.

WHEELCHAIR LIFT EXTENSION OPERATION

After the bus has been safely parked (see previous steps):

1. Open the wheelchair lift door. (LIFT DOOR instrument panel gauge cluster indicator should be turned ON.)
2. Extend the wheelchair lift (according to the manufacturer’s Operation Manual instructions). The LIFT DOOR instrument panel gauge cluster indicator turned ON and will remain ON as long as the wheelchair lift door is opened.

Starting Bus in Motion With Wheelchair Lift Interlocks

Read and understand the wheelchair lift manufacturer's Operation Manual before operating the wheelchair lift.

On vehicles equipped with an optional wheelchair lift, the optional wheelchair lift interlock will prevent shifting out of the PB Parking Brake, until the wheelchair lift door is closed. This will prevent the vehicle from being moved while the wheelchair lift is still extended. For a description of the wheelchair lift retraction and stowing operation, go to the **Passenger Control** section.

Retracting and Stowing Operation

After using the wheelchair lift to load passengers, the wheelchair lift must be stowed before you can shift the gearshift lever out of the Park (P) position. Retract and stow the wheelchair lift according to the wheelchair lift manufacturer's operator manual instructions. Then, close the lift door (LIFT DOOR gauge cluster indicator should be turned OFF).

When the wheelchair lift has been safely stowed, the bus can be safely moved as follows:

1. Depress the service brake pedal.
2. Press and hold the button on the gearshift lever handle.
3. Move the gearshift lever from Park (P) to Reverse (R) or Drive (D) position.
4. Release the button.
5. Release the parking brake (push and release the parking brake knob).
6. Lift foot from service brake pedal.
7. Slowly press the accelerator pedal (the instrument panel gauge cluster PARK indicator should be OFF).

SECTION 10 — CLIMATE CONTROLS

Heater System

WARNING

To prevent personal injury and / or death, or damage to property, observe the following:

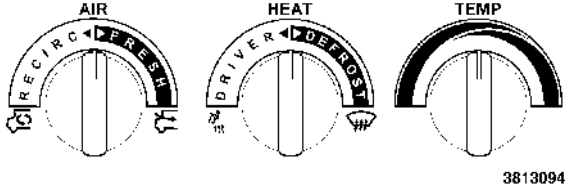
Never drive the vehicle unless the windshield and all other windows are clear. A fogged, ice / snow covered, or dirty windshield or window limits vision, which could cause an accident. To improve defroster efficiency, remove ice and / or snow by hand from the windshield and windows with a non-metallic scraper.

Driver Heater

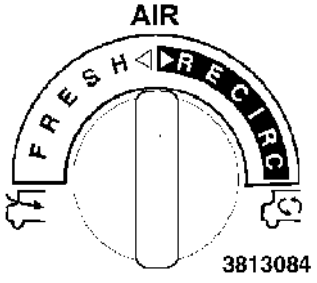
NOTE: The electric heater switch (left-side) must be activated prior to using driver heater controls, defroster, and stepwell heaters.

The driver heater console is located below the left-side switch panel.

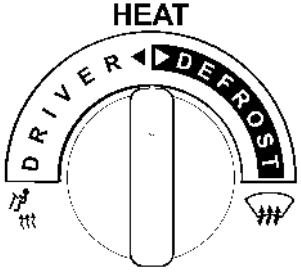
Three heater control knobs provide air flow direction, fresh air or recirculation control, and temperature selection.



Adjust the air knob to provide outside air into the driver area.



Adjust the heat knob to direct the air flow either into the driver area or the defrost area.



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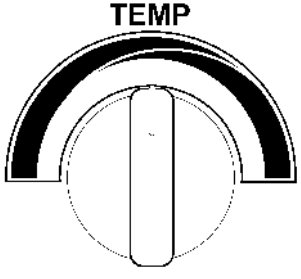
Adjust the temperature (TEMP) knob to control the temperature of the air through the heater vents.



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The heater fan speed is controlled by the DRIVER HEATER DEFROST fan switch on the left-side console switch panel.

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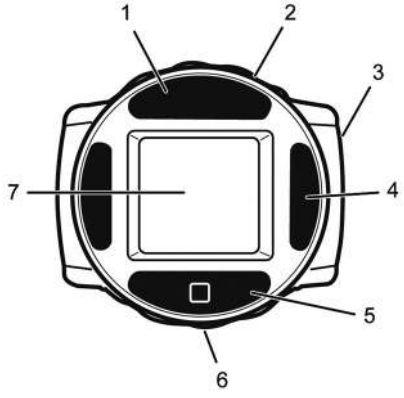
Auxiliary Heaters

The heating of the cabin is done via forced air and convection heat radiation. Three operation modes exist for the HT cabin heat system: fuel fire heater operation, electric heater operation, and combined fuel fire and electric heaters operation.

Auxiliary Heater



SmarTemp Control

1. ON / OFF button
2. Rotary knob
3. Screw cap
4. Status Indicator Lights
5. Selection Button
6. Micro USB Service Port
7. LCD Screen

WARNING

To prevent property damage, personal injury, and / or death, the auxiliary heater system must be OFF before filling any fuel tank or moving the vehicle into an enclosed area where combustible fumes may be present.

WARNING

To prevent property damage, personal injury, and / or death, the auxiliary heater system must not be operated in garages or other enclosed areas without properly venting the heater unit exhaust to the outside.

WARNING

To prevent personal injury and / or death, be sure the heater is turned OFF when this vehicle is in enclosed spaces and during refueling. This vehicle is equipped with a fuel operated heater that starts automatically when the timer is set.

The Webasto SmarTemp Control fx 2.0 enables you to preset start-up cycles of your Webasto heater seven days a week with four individual times each day.

The Webasto SmarTemp Control fx 2.0 is controlled using a rotary dial around the outside of the unit to scroll through menu options. Simply click the selection button to make your choice.

Menu Descriptions

Item	Description	Default
Mode	Two modes are possible: — Auto mode enables the predefined timer programs. Manual ON / OFF functionality is still possible while in this mode. — Manual Mode allows the heater to be operated via the Webasto button on the SmarTemp Control fx 2.0. While in Manual Mode, all Auto Mode functionality is permanently disabled. **NOTE: While in manual mode the heater will continue to operate based on the predefined Duration set by the user. See Duration for further detail**.	Manual
Language	Language changes between English, French, and Spanish	English
Duration	Duration allows user to select the heater runtime of the heater. Set range is between 10 – 120 minutes selectable by 10-minute increments. **NOTE: Duration time for all timers will default to the set duration time. User will have the ability to manually change duration for each timer.**	60 minutes
Error Code	This section will log the last five error codes and the date that it was set. Highlight and select an error code for a full description. If the heater produces an error code, the status indicator lights will flash red and the error will display on the main screen. Error codes cannot be reset through the Webasto SmarTemp Control fx 2.0 on the heater, a Webasto PC Diagnostics tool is needed. Refer to the heater manufacturer service manual for resetting an error code. **NOTE: Diagnostics via blink code is not available on all coolant heaters. Error Codes on products with no blink code functionality can still be obtained using the PC Diagnostics test tool. Refer to the applicable service manual by visiting www.techwebasto.com for detailed PC diagnostics information.**	No Errors
Options	Advanced Level adjustment; see below.	

Item	Description	Default
Time & Date	Time & Date allows user to properly set the current date and time. User also has the ability to switch between AM/PM and 24-hour format. If the 24-hour format is selected the date format will change to dd/mm/yyyy. Use the rotary knob to choose the time / date and the selection button to confirm each entry. The Webasto button can be used to go back to the previous field if additional changes are needed.	AM/PM mm/dd/yyyy
Timer	There are four heater start-up cycles possible seven days per week. The timer is separated into three categories. The user can select Monday through Friday (Mon-Fri), set each specific timer (T1 - T4) for a typical work week all at once. Saturday and Sunday (or a full week) can be scheduled in the same manner by selecting Mon-Sun. The “custom” link allows the user to set a specific timer (T1 - T4) for each individual day. When selecting a specific timer, a sub-menu will appear **Edit**, **Skip**, and **Off**. To change the timer cycle, select edit. Changes are saved immediately. The skip feature allows a timer cycle to be skipped one time within a seven day period. Timer will reactivate after this one-time skip cycle. **NOTE: To turn a specific timer off permanently, select Off.**	
LVD	12V Disconnect Switch allows the user to adjust the battery voltage level at which the Webasto SmarTemp Control fx 2.0 will shut the heater OFF. A warning (LED and message) will appear after 8 minutes of low voltage. The warning will remain on for 2 minutes before the heater is shut off. If battery voltage is equal to or less than the threshold selected +0.1V, the heater will not start. If an 11.5V threshold is selected the heater cannot be started until battery voltage has reached 11.7V. **12V**- Range between 11V - 12.5V | **24V**- Range between 21V - 25.5V	11.4V | 24.2V
Default	Default allows the user to perform a reset to all default values. **NOTE: A power loss will not reset user programmed values.**	N/A

Item	Description	Default
Password	A password can be set to prevent access to the advanced Options menu. Enter a 4-digit code passcode to begin securing the Options menu. **NOTE: This is typically used in fleet vehicle applications.**	Off
Hour Meter	The hour meter logs the operating hours of an active ON signal to the heater. This does not reflect the true runtime of the heater itself. **NOTE: For warranty purposes a diagnostic printout is still required where applicable. This hour meter is for reference only.**	N/A
SW Version	This displays the firmware version of the Webasto SmarTemp Control fx 2.0.	Installed Version
Back	Select this to return to the previous screen.	N/A

NOTE: The Red status indicators HEATER ON and LCD screen backlight turn off after 30 seconds. A touch of any button or a turn of the rotary knob will reactivate these lights. If the Webasto button is used to re-activate these lights, an additional press of this button is necessary to turn the heater off. Note that when the heater is ON the display is active.

Defrost Operating Instructions

The defroster blower is controlled by the three-position (OFF / LO / HI) DRIVER HEATER / DEFROST fan switch, located on the left-side switch panel. Press the switch to the desired position to control blower speed.

Air is directed through the defrost duct to the windshield and side window outlets utilizing the Defrost Climate Control Heat selector. Use this mode at maximum fan speed and temperature setting for best windshield and side window defrosting.

If equipped, the optional step well heater may be turned on for added air flow to the defroster vents.

Circulation Fans

WARNING

To prevent personal injury and / or death, or damage to property, wait until the motor cools off before repositioning the fan motor. It can become extremely hot when operated in normal ambient temperatures for long periods of time.

Some buses are equipped with circulation fans. The controls are labeled RIGHT FAN and LEFT FAN and are located on the left-side switch panel driver console. Each fan has OFF / LO / HI speed control.

Each fan can be positioned in several directions. First turn its fan control switch to the OFF position and then grasp the cage and pivot fan to the desired position to reposition the fan.

Heater Booster Pump

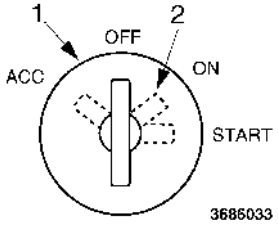
The heater booster pump assists coolant flow and increases heater performance. The pump automatically runs when the electric heater is ON. When in fuel fired heater mode, turn the heater booster pump ON to provide the vehicle with additional interior heat. Auxiliary heater can also be turned on by the Aux Heater switch located on the left-side switch panel. If the bus is not equipped with the booster pump switch, the booster pump is automatically turned on when either the Heater or the Aux Heater switch is turned on.

SECTION 11 — OPERATION

Starting Procedures

Established Operational Readiness

NOTE: Use of the cup holder during operation of the vehicle should be in accordance with state regulations, school district guidelines, and bus provider's operating policies.



1. Key switch
2. Key position

NOTE: Vehicle will not start unless all steps in the procedure below are followed correctly.

NOTE: When the key is in the ON position, it is common to hear components such as cooling pumps and air compressors operating. This is normal.

NOTE: If restarting the vehicle after a recent Key OFF, driver must wait 30 seconds after gauge cluster display is OFF before attempting to restart the vehicle.

NOTE: Do not press the accelerator when powering on the vehicle.

1. Apply the parking brake. Turn OFF the headlights and all accessories.
2. Turn key to ON position. Using 12V battery voltage gauge in cluster, verify that voltage is at least 12.9 volts. If the gauge does not reach 12.9 volts within 5 seconds, turn key to OFF position, wait until bus completely shuts down, then retry Step 1.
3. Set the drive mode selector to Neutral (N).
4. Depress and hold brake pedal. Then, set Key to START position.

5. Verify that Drive Enable indicator illuminates GREEN. If Drive Enable indicator does not illuminate within 5 seconds after pressing START, wait 5 seconds and then retry Step 4. (This is normal when the air brake system has no pressure.)
6. While brake pedal is depressed, select appropriate gear: Drive (D) or Reverse (R).

Cold Weather Operation

WARNING

To prevent personal injury and / or death, or damage to property, do not use the washers in freezing weather without first warming the windshield with the defrosters; otherwise, the washer solution may freeze on the windshield and obscure your vision, which could cause an accident.

WARNING

To prevent personal injury and / or death, or damage to property, do not use radiator coolant or antifreeze in the windshield washer reservoir. Radiator coolant in the washer reservoir can severely reduce visibility when sprayed on the windshield.

Follow these instructions when operating the vehicle in temperatures of 32°F (0°C) or lower:

- Make sure 12 volt batteries are of sufficient size and are fully charged. Check other electrical components to make sure they are in optimum condition.
- Consult your IC Bus® dealer for information about special cold weather equipment and precautions if operating in ambient temperatures of -20°F (-29°C) or lower.

Hot Weather Operation

- Keep the cooling systems filled with clean, permanent coolant solution to protect against damage from overheating.
- Keep external surface of the radiator and Battery Thermal Management System (BTMS) fan opening clean to avoid dirt buildup.

NOTE: If above normal operating temperatures persist, have vehicle serviced at first available opportunity.

Driver Assist Systems

There are various driver assist systems that could be configured on your bus. The driver assist systems are safety features that assist the driver in various driving conditions.

Brakes

Downhill Operation

Always descend hills with extreme care. Heed warning signs posted for any grade. Stop and check brakes for condition and adjustment at available pull off areas before starting a descent.

Observe the following precautions:

- Allow the regenerative braking system to assist in downhill operation. Select the appropriate regenerative braking level. Always be prepared to use the service brakes to control vehicle speed. There is no transmission to select lower gears.

- The service brakes should be used to supplement the Regenerative Braking System (RBS). When descending long grades requiring use of the brakes, short applications (5 - 10 seconds duration) should be made rather than long, lighter, continuous applications. This minimizes temperature brake fade.
- Monitor high-voltage battery charge level on long descents. When it reaches 100%, regenerative brake system's power will be significantly reduced.

Warning Indicators

Instrument panel gauge cluster indicators identify brake system fault conditions. Certain faults may also result in cluster alarms. The following lists some of the common faults (See fault indicators in **Instrumentation** section):

NOTE: Whenever a brake system warning indicator is lit, do not operate the vehicle until the faulty condition has been corrected.

- **Brake Pressure.** ON STEADY when **either** front or rear brake system brake pressure failure is detected. This lamp will illuminate during Key ON to indicate that the vehicle will have reduced braking ability.
- **Service Parking Brake.** ON steady when a fault is detected in parking brake circuit of the SmartTrac™ brake system.

NOTE: There may be a fault condition that results in more than one warning indicator being lit.

WARNING

To prevent personal injury and / or death, or damage to property, if part of the brake system fails, reduce speed and use caution as stopping distance may increase under the failed condition or if only one section of the brake system is operating. Have brake system repaired immediately. Loss of braking capability could cause an accident.

WARNING

To prevent personal injury and / or death, or damage to property, always check and maintain brakes in proper condition and adjustment. Out-of-adjustment brakes could cause reduced braking ability.

WARNING

To prevent personal injury and / or death, or damage to property, if the brake pressure warning indicator comes on while driving, be aware that your stopping distance may be significantly increased. Safely stop the vehicle as soon as possible and have the brake system repaired immediately as reduced braking capability could cause an accident.

NOTE: Whenever a brake system warning indicator is lit, do not operate the vehicle until the faulty condition has been corrected.

Air Brakes

WARNING

To prevent personal injury and / or death, or damage to property, never operate the vehicle when insufficient air pressure (less than 70 psi [483 kPa]) is indicated for either the primary or secondary air system, or if a low-pressure alarm is sounding and a warning indicator is illuminated. The volume of air required to stop the vehicle may be greater than that available. Have the brake system checked and repaired before returning the vehicle to service.

All air brake equipped vehicles have a split brake system. A split system provides a way to stop the vehicle if a failure occurs in either the primary or secondary brake system. If air pressure is lost in one system, the remaining system continues to provide braking action.

Even though there is braking capability for emergency stopping, do not operate the vehicle when a failure is indicated, because there may be no way of replenishing air pressure.

If vehicle has been parked for an extended period in cold weather, always check to be sure all wheels are rolling free (brakes are not frozen) when starting out. Always clean accumulated ice and snow from brake linkage.

If air pressure in either section of the split air brake system is reduced to 57 psi (393 kPa) the warning buzzer will sound and a RED indicator on the instrument panel gauge cluster glows. In addition, the air gauge(s) will indicate low air pressure in at least one of the split systems.

The warning buzzer and RED indicator automatically shut OFF when the air pressure in both systems is sufficient (approximately 70 psi [483 kPa]) to operate the vehicle.

If the RED indicator and buzzer do not shut off after start-up, check the air pressure gauge(s) and see if one or more sections of the split system has low air pressure.

If the RED indicator, buzzer, and gauge indicate a loss of pressure while driving, the vehicle will still have some braking capability. Either one-half of the split system or the spring brake system braking capability is retained. However, the distance required to stop the vehicle will be increased.

Air Disc Brakes

The air disc brake system encompasses a floating caliper design that is activated when air pressure is introduced into the system.

The air disc brake system works by converting air pressure into braking force. When braking is applied, air will enter the brake chamber applying pressure to the diaphragm. The pressure created activates the system causing the brake pads to contact the rotor. When braking is released, the air pressure in the brake chamber is released, exhausting the pressure on the diaphragm causing the brake pads to return to their neutral / non-braked position.

Using Air Brakes

WARNING

To prevent personal injury and / or death, or damage to property, always check and maintain brakes in proper condition and adjustment. Out-of-adjustment brakes could cause reduced braking ability.

Do not apply and release (pump) the brakes rapidly. This is an inefficient way of slowing or stopping a vehicle and inefficient use of air pressure. This also reduces the ability of the ABS system to function properly.

Using the Air Parking Brake

WARNING

To prevent personal injury and / or death, or damage to property, before setting to operational readiness, the parking brake control knob must be in the applied (pulled) position. Failure to do so could allow the vehicle to roll.

The purpose of the parking brake is to hold the vehicle in the parked position. It should NOT be used to brake the vehicle during normal driving. It may be used to assist in making an emergency stop in the event of service brake failure.

Parking Brake / Wheelchair Lift (If Equipped) Interlock. On vehicles equipped with an optional wheelchair lift, power will not be supplied to the wheelchair lift mechanism unless the parking brake is applied.

NOTE: On vehicles equipped with optional wheelchair lift, the parking brake cannot be released until the wheelchair lift is completely stowed.

To engage Air Parking Brake

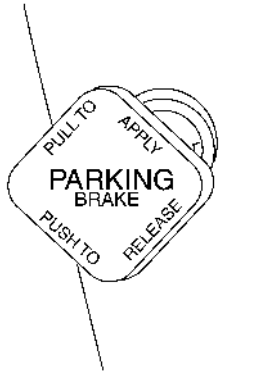
1. Bring the vehicle to a complete stop, using your brake pedal.
2. With your foot still firmly on brake pedal, set the drive mode selector to Neutral (N).
3. Pull the parking brake control knob to apply the parking brake.

To release Air Parking Brake

1. Have your foot on the service brake pedal.
2. Push in the control knob.
3. Wait until system pressure has reached 70 psi.

NOTE: DO NOT operate vehicle until system pressure has reached 70 psi.

NOTE: To release the parking brake on vehicles with the optional wheelchair lift, the lift must be completely retracted and stowed.



Air Parking Brake Control Knob

Air Brake Gauge

CAUTION

To prevent property / vehicle damage, if air system pressure falls below 70 psi (483 kPa), pull off the roadway, apply the parking brake, and correct the low pressure condition.

The air operated parking brake has an air gauge and warning buzzer. When pressure in the parking brake air reservoir has been reduced to about 57 psi (393 kPa), the buzzer sounds.

A loss of pressure in the control circuit prevents normal operation of the parking brake.

If air pressure is reduced to approximately 40 psi (276 kPa) in both the primary and secondary systems, the parking brakes will automatically apply.

Antilock Braking System (ABS)

WARNING

To prevent personal injury and / or death, or damage to property, Antilock Brake System(s) (ABS) are designed to enhance overall vehicle safety when a vehicle is driven within its safe operating limits. ABS cannot compensate for a vehicle that is being driven beyond the physical limits of control. Drivers operating an ABS-equipped vehicle should employ safe driving practices and assume no additional driving risks.

WARNING

To prevent personal injury and / or death, or damage to property, if the Antilock Brake System (ABS) warning indicator comes on, have the ABS repaired immediately as stopping distances may increase under certain braking conditions. Take every precaution to prevent wheel lockup, which could result in loss of vehicle control.

CAUTION

To prevent damage to the electrical system or ABS components, when welding on an ABS-equipped vehicle disconnect the power connector from the ABS control unit.

The ABS system is a mandated system used with the Air Brake systems. The antilock brake system electronically monitors vehicle wheel speed, and only engages when wheel lock is imminent. The standard brake system controls normal braking when the ABS is not engaged. ABS requires few changes in driving practices. For the best stopping performance, press, do not pump the brake pedal until the vehicle slows to desired speed or stops. The ABS system cannot provide any better braking and steering capability than the available road traction permits. If the road is slippery, it takes longer to stop than on a dry road. Steering maneuverability is similarly limited.

Vehicle speed must be reduced to compensate for the extended time and distance required to stop or slow the vehicle on slippery roads. ABS prevents lockup of controlled wheels if you over brake for existing road conditions.

The wheel hubs carry exciter rings used by the axle mounted sensors to transmit wheel speed information to the ABS electronic control unit located on the chassis frame. The control unit monitors and compares all wheel speed inputs to determine if any wheel(s) are about to lock. If wheel lockup is about to occur, the control unit commands the appropriate modulator valve to adjust pressure delivery to prevent wheel lockup.

If over-braking causes wheel lockup on the rear drive axles while retarding devices are in operation, the ABS will interrupt and disable the retarder until the lockup situation has stopped.

The ABS is equipped with a warning indicator located in the vehicle's instrument panel gauge cluster. Each time the ignition is turned on the ABS performs a self check. The ABS warning indicator will illuminate and if the ABS passes the self check, the indicator will turn OFF a few seconds after the ignition is turned on. ABS fault codes will be electronically stored in the ABS.

Antilock Driving Tips

- Use controlled, even pressure to stop the vehicle, being careful not to skid. Most effective stopping will be achieved in this situation.
- If the vehicle begins to skid, maintain even pressure on the brake pedal. The ABS controller will rapidly cycle the brakes on the skidding wheel(s), while maintaining even pressure on the non-skidding wheels.
- While maintaining even pressure on the brake pedal, steer around any hazardous objects in your path.

- Attempt to steer clear of traffic, pedestrians or other obstacles while you are in an emergency braking situation. The antilock brake system will allow you to steer the vehicle during braking while it comes to a full stop. ABS is not an excuse to take unnecessary risks. Always drive carefully and stay a safe distance away from the vehicle in front of you.
- Do not pump the brake pedal during a skid unless the ABS system is not functioning.

ABS Self-Check

NOTE: If the ABS indicator stays illuminated or continues to flash, have the system serviced immediately.

NOTE: If an antilock fault develops, standard brake system operation is maintained. The brake system is still operational, but the antilock system does not operate to prevent wheel lockup if you over apply the brakes for existing conditions.

A YELLOW warning indicator on the instrument panel indicates the status of the ABS. Each time the ignition is turned ON the indicator comes on and the system goes through an ABS self-check sequence. If the system is working normally when the ignition is turned ON, the ABS indicator comes on then flashes twice, and finally the ABS indicator remains on for several seconds before going out.

Pedal Adjustment Switch (If Equipped)

The pedal adjustment switch (optional) allows the operator to reposition the power-adjustable pedals to enhance comfort and safety. The pedals can be repositioned closer to or further away from the operator. For more information on pedal switch operation, refer to the **Driver Controls** section of this manual.

Manual Pedal Adjustment

Manual adjustment of brake pedal free travel should not be necessary, but if it is, it is extremely important that the work be properly performed. Allow only qualified technicians to perform this operation.

Traction Control (If Equipped)

WARNING

To prevent personal injury and / or death, or damage to property, drivers operating a Traction Control equipped vehicle should employ safe driving practices and assume no additional driving risks. Traction Control systems are designed to enhance overall vehicle safety when a vehicle is driven within its safe operating limits. Traction Control cannot compensate for a vehicle which is being driven beyond the physical limits of control.

Your vehicle may be equipped with an optional traction control system which helps you maintain the stability and steerability of your vehicle, especially on snow or ice-covered roads and gravel roads. It reduces electric drive motor power and / or selectively applies the rear brakes. The system allows your vehicle to make better use of available traction in these conditions by also limiting the electric drive motor rpm when you push further on the accelerator, which limits wheel spin. The TRAC CTRL indicator in the instrument panel gauge cluster will illuminate during this Traction Control event. The TRAC CTRL indicator will also illuminate if the system is malfunctioning.

NOTE: The traction control braking (ATC action) to limit wheel spin does not occur at vehicle speeds above approximately 31 mph (50 km/h). Therefore, at speeds above 31 mph (50 km/h), all ATC events are controlled only by electric drive motor Power Limiting.

The Traction Control switch for Air Brake equipped vehicles. If the system is enabled (traction control switch in the TRAC ENAB position), the TRAC CTRL indicator in the instrument panel gauge cluster will flash during a traction control event and electric drive motor may not increase rpm when you push further on the accelerator.

Stability Control Systems – Bendix® ESP

WARNING

To prevent personal injury and / or death, or damage to property, be aware that vehicles equipped with stability control have reduced effectiveness. Excessive speed and aggressive maneuvers should be avoided.

WARNING

To prevent personal injury and / or death, or damage to property, Stability Control systems are designed to enhance overall vehicle stability by automatically reducing vehicle speed under certain conditions. Drivers operating a Stability Control equipped vehicle should employ safe driving practices and assume no additional driving risks.

CAUTION

To prevent damage to property, modification to vehicles equipped with stability control systems require prior approval through IC Bus® or the stability control system manufacturer. Unapproved modifications may result in diminished stability control performance.

NOTE: This section gives a brief explanation of the Electronic Stability Control system, for more information refer to http://www.bendix.com.

The stability control system provides the core ABS function, as well as automatic traction control (ATC) and roll stability functions.

Core ABS Functions: The core ABS system reduces wheel lockup to help drivers maintain steering control while braking. antilock braking systems (ABS) use wheel speed sensors, ABS pressure modulator valves, and an electronic control unit (ECU) to control either four or six wheels of a vehicle. ECUs optimize slip between the tire and the road surface by monitoring individual wheel turning motion during braking.

Yaw Control: This function reduces the tendency of the vehicle to spin or jackknife when an under-steer or over-steer event occurs.

Vehicle Stability Control Speed Reduction: In the case of a potential roll event, the stability system will remove the throttle and quickly apply brake pressure to slow the vehicle combination below the threshold.

Steering Angle Sensor: This sensor enables the advanced stability system to capture the driver's steering input and intervene if a yaw correction is needed. The sensor also provides the earliest indication of an increase in lateral acceleration that might cause a potential roll event. A steering angle sensor provides a greater stability margin than a vehicle that is not equipped with this sensor.

Brake Demand Sensors: The stability control system was designed to supplement the driver's actions. By directly measuring driver brake demand, the system can transition seamlessly between driver-intended and system-intended braking pressure. For example, if during a certain maneuver, the system calculates 40 psi (276 kPa) is needed and the driver is only applying 20 psi (138 kPa), the system compensates automatically to deliver the needed 40 psi (276 kPa). If, however, during the same maneuver, the driver steps on the brake pedal quickly to apply a higher [above 40 psi (276 kPa)] braking level, the driver's braking input overrides the temporary change made by the system.

ABS / Stability System Interaction: With the ABS–based stability control system, the ABS system is given priority at the wheel ends to manage wheel slip for optimal braking. The ABS system functions similarly whether the stability system or the driver applies the brakes.

International® Ride Optimized Suspension (IROS) (If Equipped)

CAUTION

To prevent vehicle and / or component damage, do not operate a vehicle without air in the suspension springs. Operating the vehicle without air in the air suspension springs will damage the suspension, degrade ride performance.

The suspension system automatically adjusts to different loads to maintain a constant frame height. The system allows for ease of vehicle loading and provides improved vehicle ride and increased driver comfort. The system is completely automatic.

Driving an Electric Vehicle

WARNING

To prevent personal injury and / or death, or damage to property, check to see that area behind vehicle is clear of people, animals, and objects before backing up. Use a spotter whenever possible and always keep that person in sight. If so desired, backup alarms are available through your IC Bus® or International® dealer. However, they are never a substitute for the above procedures.

WARNING

To prevent personal injury and / or death, or damage to property, hold the brake pedal down while you move the drive mode selector from position to position to prevent unexpected vehicle movement.

Roll Back

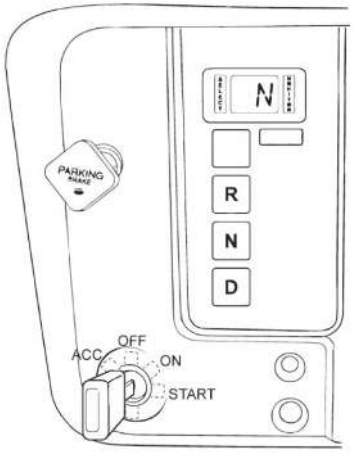
WARNING

To prevent personal injury and / or death, or damage to property, when stopping your vehicle on a grade during normal operation, ALWAYS apply the service brake to prevent vehicle from rolling rearward.

The inherent design of the current Electric Vehicle drivetrain components, as compared to most internal combustion engine drivetrains, may allow a noticeable difference in what is referred to as roll back. This can occur whenever the vehicle is positioned on an incline or a surface with sufficient grade, and during transition from the service brake pedal to the accelerator pedal, the vehicle may exhibit a tendency to roll. This can also occur when the emergency brake is released while parking on a grade. Vehicle size, weight, facing direction, intended direction of travel and grade of incline can all contribute to the roll forward or roll back characteristic.

It is important the vehicle operator is aware of this characteristic and the operator is applying the service brake pedal during normal operation appropriately whenever these, or similar scenarios can occur.

Drive Mode Selector



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- To shift the vehicle into Reverse (R) or Drive (D), press the brake pedal, then press R or D, then release the brake pedal.
- To set the drive mode selector to Neutral (N), press N.

Parking the Vehicle

WARNING

To prevent personal injury and / or death, or damage to property, when parking your vehicle on a grade during normal operation, ALWAYS chock the rear wheels, apply the parking brake, and turn front wheels to prevent vehicle from rolling.

1. Use your service brake pedal to bring the vehicle to a complete stop.
2. Set the drive mode selector to Neutral (N).
3. Pull the parking brake knob. (PARK indicator on instrument panel gauge cluster will turn ON.)
4. Slowly remove your foot from the service brake pedal and make sure that the parking brake is properly engaged. (The instrument panel gauge cluster PARK indicator will turn ON.)

Starting Bus in Motion

To start the bus in motion:

1. Depress the service brake pedal and select Reverse (R) or Drive (D) position.
2. Release the parking brake (push and release the parking brake knob), lift foot from service brake pedal, and then slowly press the accelerator pedal. The instrument panel gauge cluster Neutral indicator should be turned OFF.

Backup Alarms

This bus may be equipped with one of two backup alarms options to warn, anyone standing behind the vehicle, that it is in the process of backing up. The backup alarm is activated by:

Reverse gear Alarm Option. With foot on the service brake pedal, set the drive mode selector to Reverse (R). **The backup alarm will sound as long as the drive mode selector is in the Reverse (R) position.**

Noise Generator (If Equipped)

The noise generator creates audible indication to alert pedestrians and other vehicle operators of the electric vehicle presence. The noise generator will operate while the vehicle is turned on and in a forward or reverse drive position from stationary up to 20 mph(32.2 km/h). The audible indication will change with vehicle speed. There is no volume control, tone adjustment or ON / OFF switch.

SECTION 12 — CHARGING HIGH-VOLTAGE BATTERIES

Charging High-Voltage Batteries

Incorrect Charging

WARNING

To prevent personal injury and / or death, or damage to property, observe the following:

- **Before starting the vehicle, remove the vehicle charging cable, close the cover and charge port door and store the vehicle charging cable in a safe place.**
- **Always observe the specified sequence when charging the high-voltage batteries. Do not unplug the vehicle charging cable from the electrical socket during the charging process. Finish charging before disconnecting the vehicle charging cable from the electrical socket.**
- **Observe the safety notes in the instructions for charging equipment.**
- **Do not work in or on the vehicle during the charging process.**

WARNING

To prevent personal injury and / or death, or damage to property, pay strict attention to the following:

An incorrect charging process, non-observance of the generally applicable safety precautions and improper handling of the high-voltage batteries can cause electric shocks, short circuits, explosions, fire or burns.

Unsuitable or Damaged Electrical Sockets and Vehicle Charging Cables

WARNING

To prevent personal injury and / or death, or damage to property, observe the following:

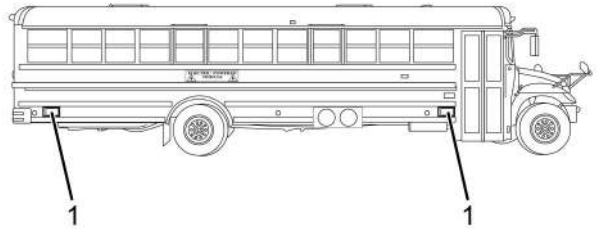
The use of unsuitable or damaged electrical sockets and vehicle charging cables and improper handling of the high-voltage batteries can cause electric shocks, short circuits, explosions, fire or burns.

WARNING

To prevent personal injury and / or death, or damage to property, please note:

- **Do not use extension cables, cable reels, multiple sockets or travel adapters.**
- **Do not modify or repair any of the electrical components.**
- **Protect electrical sockets and plug connections from water, moisture and other fluids and liquids.**
- **Do not use sharp-edged or pointed objects to remove dirt, ice and snow from the charging socket.**
- **Never insert objects into the charge port on the vehicle.**

Charging Process



Charge Port Overview

1. Charge port: located either in front or in rear area of the bus.

Depending on the customer options ordered, the IC Bus Electric CE Series School Bus may be powered by three (105 kWh), six (210 kWh), or nine (315 kWh) separate batteries. It is recommended the vehicle remain on the charger when not in use to ensure the maximum range is available when returned to service. While charging, the bus will maintain the batteries at the optimal temperature to maximize battery life.

WARNING

Always refer to the charger manufacturer's instructions for instructions on charger connection and use.

CAUTION

To prevent property damage, do not fully deplete the high-voltage lithium iron phosphate batteries before charging. The high-voltage lithium iron phosphate batteries on this bus retain charge efficiently.

CAUTION

To prevent reduced life or permanent damage to the batteries, do not operate the bus when the battery state of charge is below 10%. Operating the bus below this state of charge level may result in reduced life or permanent damage to the batteries. It is recommended that the vehicle be recharged when the state of charge reaches 20%.

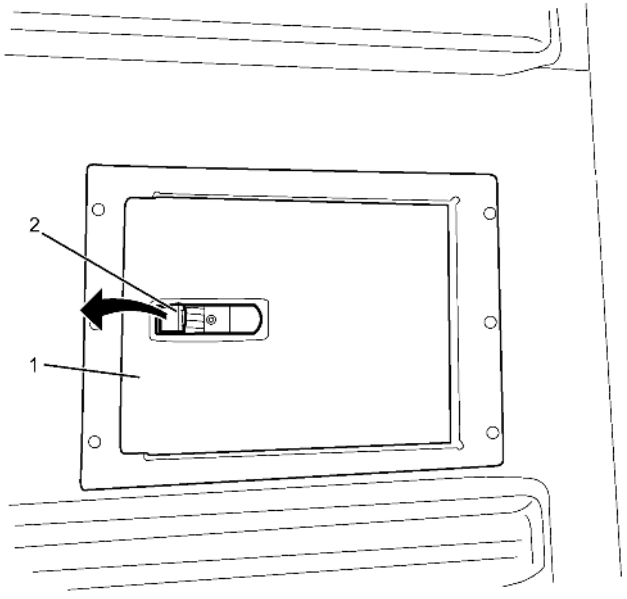
NOTE: Once vehicle charging has begun, you will not be able to power on the vehicle or shift out of Neutral (N).

NOTE: In the event of charging a fully depleted vehicle, connect an approved 12 volt battery charger to the 12 volt battery system. The 12V battery system must have enough charge to wake up the high-voltage control system to enable charging. If the high-voltage batteries have been depleted completely, they may not accept charge without being reset. Contact your local IC Bus service location.

NOTE: The bus must be stationary, in Neutral (N), and have the parking brake set to enable charging.

1. Park the vehicle so the charge port is within reach of the charging cable, switch the vehicle OFF, and set the parking brake.
2. Ensure that the 12V disconnect switch is in the ON position. The disconnect switch must be in the ON position in order to charge the batteries.
3. Open the access door to the charge port.
4. Press down on the J1772 charging plug release button and insert the charging plug straight into the vehicle charge port. An audible click should be heard when the charging plug is fully engaged.
5. The LED light around the charge interface button will illuminate BLUE to indicate the charger to vehicle connection is secure.

Opening and Closing the Charge Port Door



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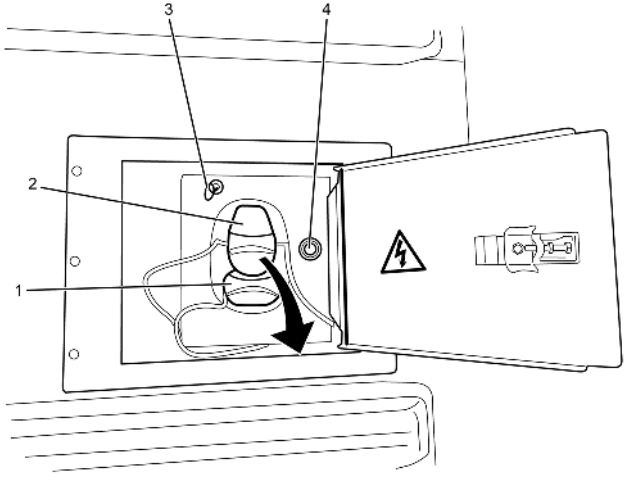
1. Electric charge port door
2. Locking latch

Release the latch and open the electric charge port door.

Charging Port



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Charging Port

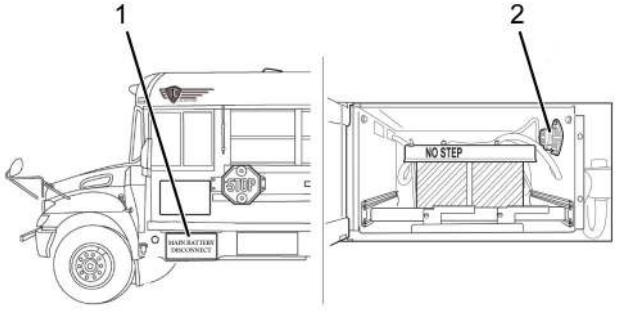
1. AC charge port
2. DC charge port
3. Emergency charger plug release cable
4. Charge interface button

The bus is equipped with the SAE J1772 Combined Charging System (CCS) charging port. This port allows for either AC level 2 or DC fast charging. The charging station to be used must be equipped with the matching SAE J1772 AC or DC charging plug.

For AC charging only, the AC port lid must be removed.

For DC charging, both the AC port lid and the DC port lid must be removed.

Inserting the Vehicle Plug into the Vehicle Charge Port and Starting the Charging Process



12V Disconnect Switch

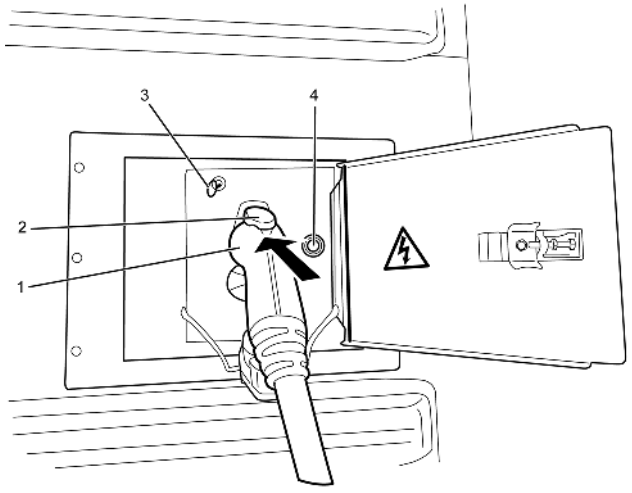
1. 12V battery compartment
2. 12V disconnect switch

NOTE: The bus needs a minimum of 10 kW power from the charger to condition the high-voltage batteries, especially in cold below 32°F (0°C), or heat above 86°F (30°C). Therefore, the bus may not enter charging mode if a charger with lower than 10 kW power is connected.

- Park the bus so the charge port is within reach of the charging cable
- Activate parking brake and put the drive mode selector in Neutral (N) position.
- Ensure that the 12V disconnect switch is in the ON position. The 12V disconnect switch (2) in the 12V battery compartment (1) must be in the ON position in order to charge the batteries.

After charging plug is locked, the charging process is started automatically in accordance with the local charging infrastructure. Charging is automatically carried out up to a charge state at or near 100%.

NOTE: It may not be possible to achieve 100% SOC with some AC Level 2 chargers. You may notice the SOC top out in the 95% to 99% SOC range. This is normal.



Charging Plug in Charge Port

1. Charging plug
2. Release button
3. Emergency charging plug release cable
4. Charge interface button

If the charging process was not started:

1. Press the release button (2) and insert the charging plug completely into the charge port. If the charging plug is heavy, lift the plug in the charge port slightly so that it will lock into position. An audible click should be heard when the charging plug is fully engaged.
2. The LED light around the charge interface button will illuminate BLUE to indicate the charge to vehicle connection is secure.
3. The vehicle and charger will begin the interface process, which can take up to 60 seconds to complete.
4. The LED indicator on the button will begin to flash GREEN. The speed of the flashing indicates the vehicle State of Charge (SOC). As vehicle approaches a full charge, the frequency of the flashing slows. When fully charged, the LED stays on solid GREEN.

LED Color	State of Charge
BLUE	A charging plug has just been inserted (and is verifying and locking the connection). This color is also used to indicate when the charging plug is ready to be removed.
BLINKING AMBER	The vehicle is in a state that prevents charging. The parking brake must be set and the transmission must be in Neutral (N).
SOLID AMBER	The charging plug is not fully inserted.
BLINKING GREEN	Charging is in progress.
SOLID GREEN	Charging is complete. Charge interface button needs to be pressed to unlatch.
RED	A fault is detected, and charging has stopped. Check for a fault message.

While charging, the SOC may also be determined by turning the ignition to the ON position and viewing the SOC on the instrument panel.

Ending the Charging Process and Removing the Charging Plug From the Vehicle Charge Port

1. Push the charge interface button to cancel the charger to vehicle interface. After 15 to 60 seconds the LED indicator around the button will turn BLUE.
2. Push the button (1) on the charging plug and remove the charging plug from the vehicle.
3. Replace charging plug and cord at charger per the charger manufacturer's instructions.
4. Replace charge port lid, and close charge port door.

Additional information:

- End the charging process before disconnecting the vehicle charging plug from the charge port.
- An ongoing charging process can be ended at any time by following the process above and removing the charging plug.
- Observe the safety instructions for charging the high-voltage batteries.

NOTE: In the event of an emergency, pull an emergency charging plug release cable located near the charge port. See Item 3 in Charge Port figure (Charging Port, page 124).

Charging Times

The charging power levels and charging times depend on various factors that may significantly increase the charging times compared to the specified values:

Charging times vary based on a number of factors including:

- Available power from the electrical infrastructure.
- Customer-specific installation, e.g. electrical socket used.
- Fluctuations in the power grid voltage.
- Ambient temperature for the vehicle and charging equipment.
- Temperature of the high-voltage batteries and control unit.
- Charge level of the high-voltage batteries.
- Type and age of the high-voltage batteries.

The IC Bus Electric CE Series School Bus is equipped with the J1772 Combo CCS1 charge port and can support AC Level 2 or DC Fast Charging.

AC Level 1 Charging is not recommended, as the charging rates are insufficient to efficiently charge the batteries. DC fast chargers should be rated with a maximum charging voltage of at least 750 volts.

SECTION 13 — ROADSIDE EMERGENCIES

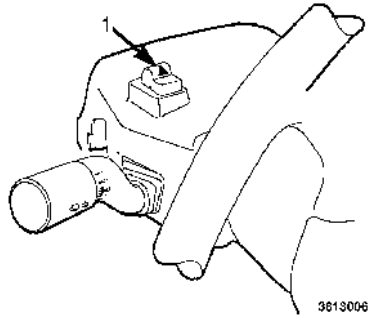
Hazard Warning Switch

WARNING

To prevent personal injury and / or death, NEVER ATTEMPT TO ASSESS OR INVESTIGATE ANY VEHICLE DAMAGE INVOLVING A HIGH VOLTAGE VEHICLE in an emergency situation. Only certified personnel (first responders or trained service personnel) should interact with a compromised vehicle.

WARNING

To prevent personal injury and / or death, or damage to property, in the event that electric driven motor shut down occurs, make certain the vehicle is safely off the roadway, the hazard flashers are on and the warning devices are properly placed.



1. Hazard warning light switch

1. Use the hazard warning light switch in an emergency to warn traffic of vehicle breakdown, approaching danger, the vehicle is in tow, or is operating at a reduced speed.
2. Press the button to activate all hazard flashers simultaneously.
3. Press the button again to turn OFF the flashers.

Emergency Equipment (Recommended On-Board)

Fire Extinguisher

ICB100515

Inspect the fire extinguisher monthly to make sure it has a sufficient charge. Look at the gauge located at the top of the extinguisher to verify proper charge.

First Aid Kit

ICB130512

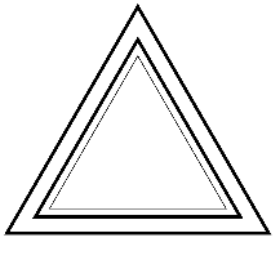
Make sure to keep the first aid kit completely stocked and ready for use at all times by replacing any items used.

Body Fluid Cleanup Kit

ICB100578

Use this whenever any type of body fluid comes in contact with the bus. When items are used, they should be immediately replaced.

Reflective Triangle



Use the triangle whenever the bus is pulled over to the side of the road. The reflective triangle kit is usually located behind the driver's seat. After opening the kit, unfold the triangle and make sure it locks in place.

Fuse / Circuit Breaker Charts

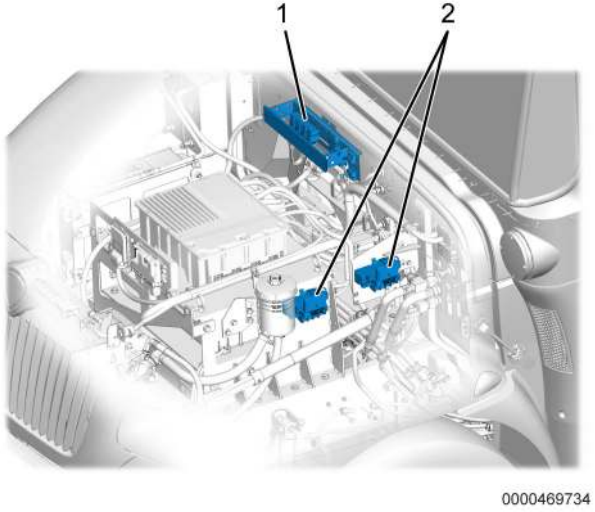
NOTE: To gain access to the fuse and circuit breakers, reference for the location of the low voltage Electrical Compartment Access Panel.

The following fuse illustrations represent typical fuse panel layouts. The actual vehicle fuse panels will vary depending on the vehicle options.

12 Volt Fuses and Circuit Breakers

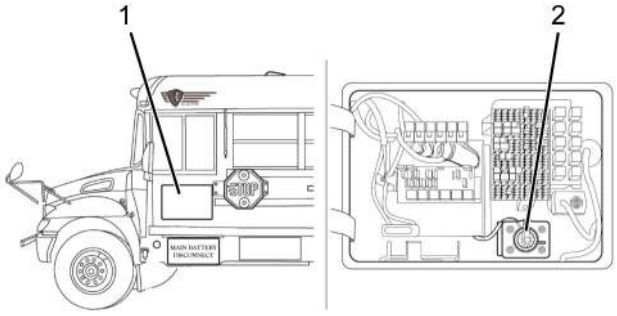
The wiring circuits in the vehicle are protected from short circuits by a combination of fuses and circuit breakers. This greatly reduces the chance of damage caused by electrical problems.

Fuse panels can be located in the electrical compartment access panel and under the hood. Power Distribution Modules (PDM) are locatedunder the hood near the power steering reservoir on the driver side of the vehicle.



Under Hood Fuse Panel and Power Distribution Modules

1. Fuse panel
2. Power Distribution Modules



Fuse Panel and High-Voltage Disconnect Switch

1. Fuse panel cover
2. High-voltage disconnect switch (OFF position)

WARNING

To prevent personal injury and / or death, or damage to property, NEVER attempt to change or access any fuse, circuit breaker, or relay associated with the high-voltage system.

WARNING

To prevent personal injury and / or death, or damage to property, do not exceed the specified amperage ratings when replacing fuses and circuit breakers. Fuses and circuit breakers are marked with their amperage rating. Use of an oversized fuse or circuit breaker could result in a thermal event.

CAUTION

To prevent damage to property, avoid spilling liquid on any electrical component. Always keep the covers on any electrical component.

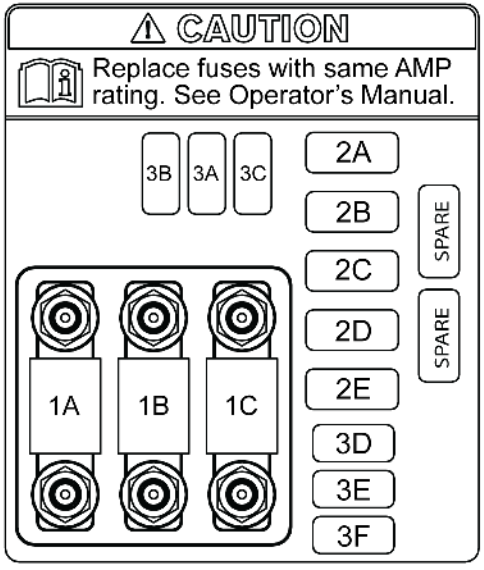
To check a fuse, look at the silver-colored band inside the fuse. If the band is broken or melted, replace the fuse. Be sure to replace a bad fuse with a new one of the identical size and rating. Refer to the schematic located on the fuse panel cover for fuse and circuit breaker layout.

Typical Under-Hood Power Distribution Module (PDM) Fuse Panel Layout

The following illustration shows the typical layout of the fuse panel in the underhood PDMs.

WARNING

To prevent personal injury and / or death, or damage to property, do not increase size of fuse or circuit breaker or change type of breaker supplied with your truck, as this could cause wiring to overheat and possibly burn. Electrical circuits are designed with a particular wire gauge to meet the fuse and circuit breaker current rating.



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The left-hand module (PDM 1) has the following fuses:

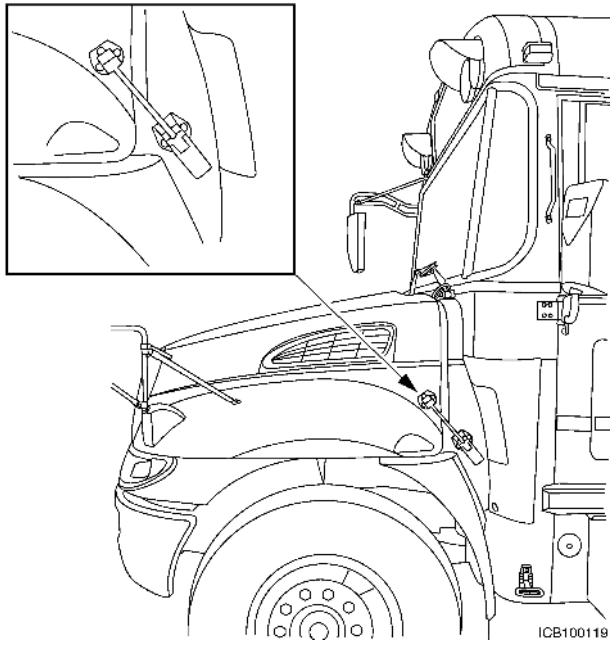
Location	Component	Fuse Rating
1A	Radiator Fan	150A
1B	HVAC Fuse	80A
1C	Not Used	-
2A	Not Used	-
2B	Not Used	-
2C	Heated Air Dryer	25A
2D	Not Used	-
2E	Cabin Heat Pump	30A
3A	Not Used	-
3B	Not Used	-
3C	Not Used	-
3D	Climate Control	10A
3E	Battery Management	10A
3F	Not Used	-

The right-hand module (PDM 2) has the following fuses:

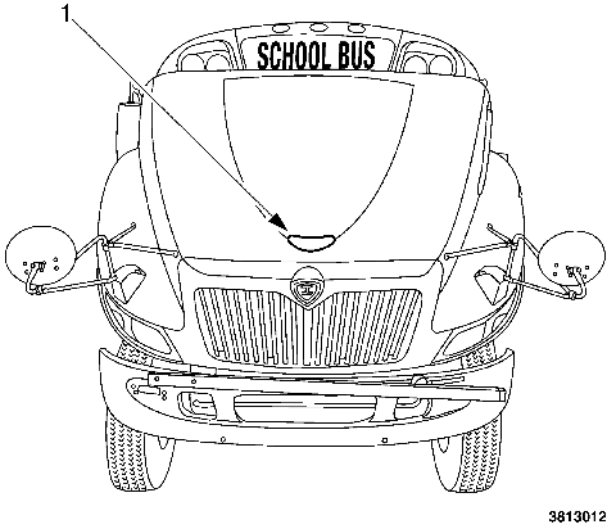
Location	Component	Fuse Rating
1A	Not Used	-
1B	Not Used	-
1C	BTMS	125A
2A	Not Used	-
2B	Not Used	-
2C	MT Coolant Pump	30A
2D	OCI / TPIM	25A
2E	VCU	30A
3A	Not Used	-
3B	Not Used	-
3C	Not Used	-
3D	HVDU / HVDM	20A
3E	SCU	10A
3F	Global Power A / B	20A

Tilt Hood

Raising the Hood



Release the latches on both sides of the cowl.

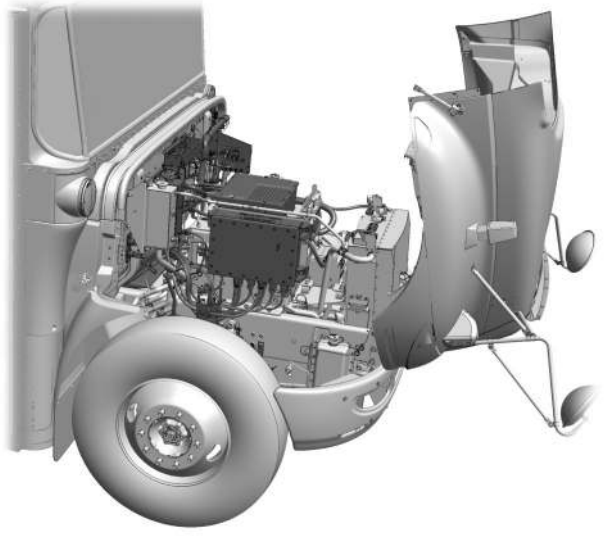


1. Hood handle

CAUTION

To prevent damage to property, never use the crossview mirrors as a handle. Mirror damage and misadjustment can occur.

Use the hood handle and pull the hood forward over center and allow it to settle into the raised position.



Lowering the Hood

NOTE: Make sure that the hood has no tools / parts / people in its path of motion.

Use the hood handle and push the hood backward over center and allow it to settle into lowered position.

Engage the latches at both sides of cowl.

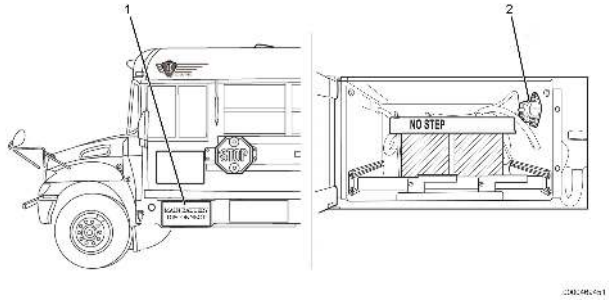
Disable Direct Hazards

WARNING

To prevent personal injury and / or death, or damage to property, do not touch damaged high-voltage cables and high-voltage components such as the on-board charger, the high-voltage cabin heater, the high-voltage batteries, the power electronics, or the high-voltage A/C compressor; doing so can cause a fatal electric shock.

All high-voltage components of the electrical system are marked with warning stickers. The high-voltage cables are ORANGE in color and / or ORANGE with STRIPE.

- **Do not perform any work on the high-voltage vehicle electrical system, ORANGE / ORANGE with STRIPE high-voltage cables, or any high-voltage components marked with warning stickers.**
- **Never damage, remove or disconnect the ORANGE / ORANGE with STRIPE high-voltage cables from the high-voltage vehicle electrical system.**
- **Do not touch parts of the electrical system that have been damaged, such as following an accident.**
- **Never remove the high-voltage batteries.**



12V Disconnect Switch

1. 12V battery cover
2. 12V disconnect switch (OFF position)

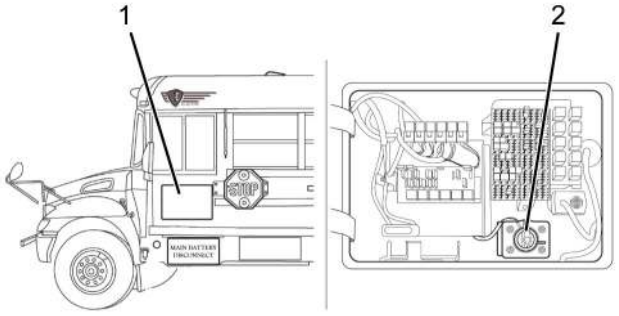
To disconnect the electrical system of the vehicle:

1. Open the 12V battery cover (Item 1).

   The cover has a lock. In emergency and if keys not available open by force.

2. Turn the red 12V disconnect switch (Item 2) to OFF position.
3. Lock the switch with a padlock to avoid unlocking.

Disconnect the High-Voltage Service Disconnect Switch



High-Voltage Disconnect Switch

1. High-voltage disconnect cover
2. High-voltage disconnect switch (OFF-position)

WARNING

To prevent personal injury and / or death, ALWAYS REMEMBER the High-Voltage Disconnect Switch only isolates high-voltage from components after the S-Box. The High-Voltage Disconnect Switch does NOT disconnect high-voltage in the S-Box, the high-voltage batteries, or the cables between these items. Also, the vehicle 12 volt system could still be energized. ALWAYS shut OFF both the High-Voltage Disconnect Switch and the 12V Disconnect Switch whenever interacting with a damaged vehicle. NEVER touch ORANGE cables without wearing appropriate high-voltage Personal Protection Equipment (PPE).

1. Open the high-voltage disconnect cover (Item 1). The cover has a lock. In emergency and if keys not available open by force.
2. Turn the BLACK high-voltage disconnect switch to the OFF position (Item 2).
3. Lock the switch with a padlock to avoid anyone from turning back ON.

Towing Instructions

WARNING

To prevent personal injury and / or death, or damage to property, observe the following: Always install wheel chocks when manually releasing the spring brakes. For towing make sure the vehicle is securely connected to the tow vehicle and the tow vehicle parking brakes are applied before releasing the disabled vehicle parking brakes.

- **Always install wheel chocks when manually releasing the parking brakes, or the vehicle can roll.**
- **For towing, make sure the vehicle is securely connected to tow vehicle and tow vehicle parking brakes are applied before releasing the disabled vehicle's parking brakes.**
- **To ensure release of parking brake, always cage the spring in the brake chamber.**
- **Under no circumstances should the spring brake chamber be disassembled for the purpose of releasing the parking brake.**

WARNING

To prevent personal injury and / or death, or damage to property, always use both tow hooks to prevent possible overloading and breaking of individual hooks. This vehicle may be equipped with (optional) dual tow hooks for recovery purposes only.

WARNING

To prevent personal injury and / or death, or damage to property, NEVER attach tow hooks or tie downs to high-voltage components or supports. Prohibited components include:

- **High-voltage battery cages**
- **S-Box supports / mounting structure**
- **Drive motor mounting structure**

CAUTION

To prevent personal injury and / or death, or damage to property, observe the following: Due to many variables that exist in towing, positioning and lifting, towing is the sole responsibility of the towing operator.

Refer to the differential and electric drive motor manufacturer for specific instructions on towing your vehicle. Further information can be located in the component owner manual that came with this bus on delivery for original sale.

Damage caused by improper towing procedures is not a warrantable failure.

Remove tow hooks from their installed position in the front of the vehicle before operating the vehicle. Failure to do so could result in the tow hooks becoming unintentionally detached from the vehicle.

CAUTION

To prevent electric motor damage, vehicles should not be towed even short distances without suspending rear wheels or removing the axle shafts or propeller shaft.

CAUTION

To prevent vehicle or electric drive motor damage, do not use the front or rear bumper as a lift point when lifting or jacking the vehicle.

Important factors to keep in mind when using tow hooks:

- Use both tow hooks when retrieving vehicle.
- Use a slow steady pull, do not jerk on hooks.
- Tow hooks are not designed for towing, but for retrieval only.

Before moving the towed vehicle, check for adequate road clearance of vehicle components. IC Bus recommends unloading the towed vehicle prior to towing to reduce any abnormal loads to the vehicle components resulting from the towing procedures. Before towing, be sure to fully release the parking brake.

Towing Preparation: Air Parking Brakes

The spring actuated type parking brake can be released by recharging the air system with at least 64 psi (441 kPa) of air. If brake system does not retain air pressure, then manually cage the spring brakes.

Towing Vehicle With Front Wheels Suspended

WARNING

To prevent personal injury and / or death, or damage to property, observe the following. Operation of the system outside the specified limitations could permanently damage the system. The user is required to restrict the usage of the system within the limits of the specifications defined in this guide. Powering off the system while it is operational may permanently damage the system. This system may be permanently damaged if it is unpowered while the speed exceeds a value where the drive motor back-EMF exceeds the maximum operating voltage of the internal power module of the drive motor.

Whenever necessary, always tow the vehicle with the front wheels suspended. This method requires extra precautions that must be taken to avoid vehicle / component damage:

1. Prior to towing the vehicle, use a paint marker to record propeller shaft mating positions at the drive motor, and rear axle.
2. Disconnect and remove the propeller shaft between the rear axle and drive motor yokes. Save fasteners for reinstallation.
3. Once the vehicle is towed to the destination, install the driveshaft / propeller shaft between the rear axle and drive motor yokes using the previously removed fasteners and recorded propeller shaft mating positions. Tighten the fasteners to 115 lb-ft (156 N•m).

SECTION 14 — CLEANING

WARNING

To prevent personal injury and / or death, or damage to property, set drive mode selector to Neutral, set parking brake, and install wheel chocks before performing diagnostic or service procedures.

WARNING

To prevent personal injury and / or death, or damage to property, read and adhere to all safety instructions on the labels of all cleaners. Many cleaners contain solvents that may become concentrated in the vehicle interior breathing space. While cleaning the interior area, maintain adequate ventilation by opening windows and doors.

WARNING

To prevent personal injury and / or death, or damage to property, read and adhere to all safety instructions on the labels of all cleaners. While most cleaning products are safe when used individually, certain cleaners can form hazardous gases if mixed with other cleaning products.

WARNING

To prevent personal injury and / or death, or damage to property, NEVER use a pressure washer / power washer to clean any under hood or undercarriage components.

NOTE: Chemicals used to clean or disinfect your IC Bus® vehicle can adversely affect materials used to build the vehicle. Many common cleaning chemicals can damage or ruin the appearance of materials like ABS plastic, vinyl, rubber, aluminum, glass and painted surfaces. As with the cleaning chemicals used, the cleaning process (or the lack of a cleaning process), can also affect the life and appearance of the vehicle.

Chemicals used in premixed or aerosol disinfectant solutions can damage or affect the appearance of many interior surfaces.

The following information should be used to determine an acceptable method to clean your vehicle while maintaining the appearance and integrity of the components to be cleaned.

Surface Cleaning

General Cleaning, All Surface Types

Use a soft dry cloth on hard surfaces and a whisk broom or vacuum cleaner on flooring and upholstery to remove loose dirt and debris. Surfaces can then be washed with a damp cloth and a warm water and mild soap solution. Use a clear water damp cloth rinse to remove soap residue, then wipe dry.

NOTE: When using isopropyl alcohol as a disinfectant, the following precautions must be followed.

- **Do not use a 70% isopropyl solution as a wash solution.**
- **Do not use a 70% isopropyl solution wipe on seats that are hot from day time heat.**
- **Vapors can accumulate quickly when using a 70% isopropyl solution wipe. Maintain adequate ventilation by opening windows and doors.**
- **The effectiveness of the 70% isopropyl solution can be diminished when used in high heat conditions due to evaporation.**

A 70% solution of isopropyl alcohol can be used as a disinfectant wipe. A 70% isopropyl solution is readily available from local sources.

ABS / Plastic

Plastic (ABS, thermal plastic, plastic) material should only be cleaned with a warm water and mild soap solution.

Glass

NOTE: Use of abrasive cleaners can scratch or damage glass.

Use a soft cloth and glass cleaner only.

Interior

The best method to preserve the appearance and extend the life of the interior components of your IC Bus® vehicle is frequent and thorough cleaning of the components. A cleaning schedule and the cleaning requirements should be determined based on the type of service conditions in which the unit is operated.

Interior Light Bar Cleaning

All interior light bars are only to be cleaned with a mild detergent and warm water. No other cleaners are to be used, as they may damage the surface.

Upholstery Care

WARNING

To prevent personal injury and / or death, or damage to property, observe the following. Disinfectant products can contain solvent based chemicals that can adversely affect seat belt components.

Use a whisk broom and vacuum cleaner to remove loose dust and dirt from upholstery and floor. Wash vinyl and woven

plastic upholstery with warm water and mild soap. Wipe dry. If commercial cleaners are used, follow instructions supplied with cleaner.

Flooring

NOTE: Some buses are built with an insulating wooden sub-floor under the floor covering. Do not use a hose to clean the interior floor of the bus. Standing water may damage the wood sub-floor.

Use a damp mop with warm water and mild soap solution. Use a clear water damp mop rinse to remove soap residue. Remove any excess water remaining on the flooring after the rinse process.

Floor mounted wheelchair track should be clean of dirt, debris and cleaning solution residue when completed. Many chemicals used to maintain roads and walkways are tracked into the bus and may react with the cleaning solution. Failure to properly clean the floor track can result in track deterioration.

Exterior

NOTE: Certain cleaners contain chemicals that can damage emblems and decals. If the cleaning product label states that it should not be used on plastic parts, do not use the product to clean the unit or damage may occur that would not be covered by warranty.

The best way to preserve painted surface finish is to keep it clean by washing it often. Frequent and regular washing will lengthen the life of the vehicle's painted finish.

Wash the vehicle often with warm or cold water to remove dirt and preserve the original luster of the paint.

- Never wash the vehicle in the direct rays of the sun or when the sheet metal is hot to the touch as this may cause streaks in the finish.
- Do not use hot water, strong soaps or detergents.
- Never wipe dirt off a dry surface as the dirt will scratch the paint.

Always make certain that steps, and grab handles, or any external accessories or components attached to the body exterior, are clean and free of road grime, salt, grease, ice and other debris.

To maintain optimum vehicle preservation, wash the vehicle thoroughly immediately after operating it in the presence of road salts. Many municipalities are now using magnesium chloride and calcium chloride salts in the winter time. These salts are much more corrosive than typical sodium chloride salt and must be brushed-off in addition to spraying with high-pressure water. Merely rinsing surfaces exposed to these chemicals will not remove them fully.

In addition to the body, it is highly recommended, because of the various road chemicals used in harsh winter weather, that the under chassis and wheel ends be pressure washed during the winter and spring breaks. Adverse weather and road conditions may require more frequent washing. When exposed to heavier amounts of road chemicals, clean the vehicle as soon as possible.

Waxing or Polishing Vehicles

Thoroughly wash the vehicle before using any wax or polish. Use a high quality paste wax and follow the wax manufacturer's instructions to help prevent bus paint from fading.

Crossing Arm Cleaning

The crossing arm is only to be cleaned with a mild detergent and warm water. No other cleaners are to be used, as they may damage the surface.

Pressure / Power Washing

WARNING

To prevent personal injury and / or death, or damage to property, NEVER use a pressure washer / power washer to clean any under hood components, undercarriage, or the interior of the vehicle.

NOTE: Certain cleaners contain chemicals that can damage emblems and decals. If the cleaning product label states that it should not be used on plastic parts, do not use the product to clean the unit or damage may occur that would not be covered by warranty.

Pressure / power washing is permitted for the body exterior of the vehicle. Under hood components can only be cleaned using a garden hose.

SECTION 15 — MAINTENANCE INSTRUCTIONS

Preface

WARNING

To prevent personal injury and / or death, or damage to property, observe the following. If the owner / operator of the vehicle is a skilled technician and intends to perform the vehicle maintenance and servicing, they are strongly urged to purchase and follow the appropriate IC Bus® service information.

WARNING

To prevent personal injury and / or death, or damage to property, observe the following. This vehicle has many parts dimensioned in the metric system as well as the English system. Some fasteners are metric and are very close in dimension to English fasteners in the inch system. Mismatched or incorrect fasteners can loosen and reduce clamping load.

WARNING

To prevent personal injury and / or death, or damage to property, do not touch damaged high-voltage cables and high-voltage components such as the on-board charger, the high-voltage cabin heater, the high-voltage batteries, the power electronics, or the high-voltage A/C compressor; doing so can cause a fatal electric shock.

All high-voltage components of the electrical system are marked with warning stickers. The high-voltage cables are ORANGE in color and / or ORANGE with STRIPE.

- **Do not perform any work on the high-voltage vehicle electrical system, ORANGE / ORANGE with STRIPE high-voltage cables, or any high-voltage components marked with warning stickers.**
- **Never damage, remove or disconnect the ORANGE / ORANGE with STRIPE high-voltage cables from the high-voltage vehicle electrical system.**
- **Do not touch parts of the electrical system that have been damaged, such as following an accident.**
- **Never remove the high-voltage batteries.**

Your bus has been engineered and manufactured to provide economical and trouble free service. However, it is the owner's

responsibility to make sure the vehicle receives proper care and maintenance.

IC Bus® service parts are available through your IC Bus® dealer. If IC Bus® service parts are not used, the owner must make sure the parts used are an equivalent.

As with any machine, take care to avoid being injured when performing maintenance, repairs or inspections. Improper or incomplete service could result in the vehicle not working properly which, in turn, may result in personal injury, damage to the vehicle or its equipment, or death. If you have any questions about performing some service, contact your nearest IC Bus® bus dealer or have the service done by a skilled professional technician.

Special features of the electric vehicle: voltage in the high-voltage vehicle electrical system and high-voltage batteries can be extremely dangerous. Touching damaged electrical system components such as the high-voltage cables, the on-board charger, the high-voltage cabin heater, the high-voltage batteries, the power electronics, or the high-voltage A/C compressor can result in a fatal electric shock. The high-voltage cables are ORANGE / ORANGE with STRIPE. All components of the high-voltage electrical system are marked with warning stickers.

Maintenance Guidelines

When servicing your bus, always:

- Turn the key to the OFF position unless the procedure calls for it.
- Set the parking brake and install wheel chocks.
- Use support stands, not a jack, whenever you must be under a raised vehicle.
- Do not smoke.
- Wear safety glasses for eye protection.
- Do not work on brakes unless the proper precautions have been taken to avoid inhaling friction material dust.
- Do not wear loose clothing, hanging jewelry, watches or rings. Tie up hair when around rotating machinery.
- Avoid contact with hot metal parts; allow hot components to cool before working on them.
- Repair or replace any defects that were revealed during inspection, prior to operating the vehicle.
- High voltage can result in serious injury or death. Never touch the battery terminals with your fingers, tools, jewelry or other metal objects.
- The high-voltage batteries can burn. The high-voltage batteries must never be exposed to fire, sparks, or open flames. Always handle the high-voltage batteries with care to prevent damage and fluid leakage.
- Always keep children away from the high-voltage batteries.

- Improper handling of the high-voltage batteries can result in serious injury or death. Never remove the cover of a high-voltage battery or remove a high-voltage battery.
- Improper handling of the high-voltage batteries can result in serious injury or death. Only have maintenance work on high-voltage batteries performed by appropriately qualified and trained specialist personnel. Never make modifications to the high-voltage batteries. High-voltage batteries must not come into contact with water or other liquids. Liquids can cause short circuits, electric shocks and burns.

WARNING

To prevent personal injury and / or death, or damage to property, use only genuine IC Bus® service parts. The use of inferior parts can adversely affect the quality and reliability of your vehicle.

WARNING

To prevent personal injury and / or death, or damage to property, take care when performing any maintenance or making any checks or repairs. Some of the materials in this vehicle may also be hazardous if used, serviced, or handled improperly. If you have any questions pertaining to the service, have the work done by a skilled technician.

WARNING

To prevent personal injury and / or death, or damage to property, do not touch damaged high-voltage cables and high-voltage components such as the on-board charger, the high-voltage cabin heater, the high-voltage batteries, the power electronics, or the high-voltage A/C compressor; doing so can cause a fatal electric shock.

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- **Never damage, remove or disconnect the ORANGE / ORANGE with STRIPE high-voltage cables from the high-voltage vehicle electrical system.**
- **Do not touch parts of the electrical system that have been damaged, such as following an accident.**
- **Never remove the high-voltage batteries.**

WARNING

To prevent personal injury and / or death, or damage to property, do not make modifications to any part, component, or system of the vehicle, as that can adversely affect the quality and reliability of your vehicle.

WARNING

To prevent personal injury and / or death, or damage to property, park vehicle on hard flat surface, switch off operational readiness, set the parking brake, and install wheel chocks to prevent the vehicle from moving in either direction.

WARNING

To prevent personal injury and / or death, or damage to property, whenever disconnecting 12 volt battery terminals, always disconnect ground terminal first. When reconnecting, always connect ground terminal last. Failure to follow this procedure could also result in a short to ground.

Supporting Your Vehicle for Service

WARNING

To prevent personal injury and / or death, or damage to property, always use floor stands to support the vehicle before working under it. Using only a jack could allow the vehicle to fall.

WARNING

To prevent personal injury and / or death, or damage to property, do not use bumper as a lifting point when raising the vehicle.

When performing service repairs on a vehicle:

1. Park vehicle on level concrete floor.
2. Set parking brake and / or install wheel chocks to prevent vehicle from moving.
3. Select jack with a rated capacity sufficient to lift and hold up the vehicle.
4. Raise vehicle with jack applied to axle(s). DO NOT use bumper as a lifting point.
5. Support vehicle with floor stands under axle(s).

If axle or suspension components are to be serviced, support vehicle with floor stands under frame side members.

Disable Direct Hazards

WARNING

To prevent personal injury and / or death, or damage to property, do not touch damaged high-voltage cables and high-voltage components such as the on-board charger, the high-voltage cabin heater, the high-voltage batteries, the power electronics, or the high-voltage A/C compressor; doing so can cause a fatal electric shock.

All high-voltage components of the electrical system are marked with warning stickers. The high-voltage cables are ORANGE in color and / or ORANGE with STRIPE.

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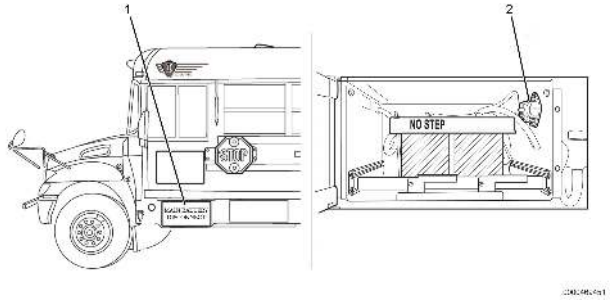
- **Never damage, remove or disconnect the ORANGE / ORANGE with STRIPE high-voltage cables from the high-voltage vehicle electrical system.**
- **Do not touch parts of the electrical system that have been damaged, such as following an accident.**
- **Never remove the high-voltage batteries.**



12V Disconnect Switch

1. 12V battery cover
2. 12V disconnect switch (OFF position)

To disconnect the 12V electrical system of the vehicle:

1. Open the 12V battery cover (Item 1).

   The cover has a lock. In emergency and if keys not available open by force.

2. Turn the red 12V disconnect switch (Item 2) to OFF position.
3. Lock the switch with a padlock to avoid unlocking.

Pre-Trip and Post-Trip Inspections

Pre-trip inspections should be performed each day by the operator before operating this vehicle. In many circumstances, a Post-trip inspection can be even more valuable since it may reveal problems in time for service work to be performed prior to the next trip. This can help to minimize unwelcome surprises and unscheduled downtime. A convenient checklist of items to include in a pre- / post-trip inspection are identified in the **Vehicle Inspection Guide** section as well as Commercial Driver's License (CDL) Manuals.

Chassis Lubrication

New vehicles are lubricated at the factory. After the vehicle is placed in operation, regular lubrication and maintenance intervals, based on the type of service and road conditions, should be established. The loads carried, speed, road and weather conditions all contribute to the frequency of lubrication intervals. Thorough lubrication and maintenance at the specified intervals will insure Outstanding Life Cycle Value and will reduce overall operating expense.

In some types of operation, and where operating conditions are extremely severe (such as in deep water, mud or unusually dusty conditions), the vehicle may require relubrication after every 24 hours of operation.

Only lubricants of superior quality, such as Fleetrite® lubricants, should be used. The use of inferior products will reduce the service life of the vehicle or result in failure of its components. IC Bus recommends the use of Fleetrite® lubricants and IC Bus® original equipment parts.

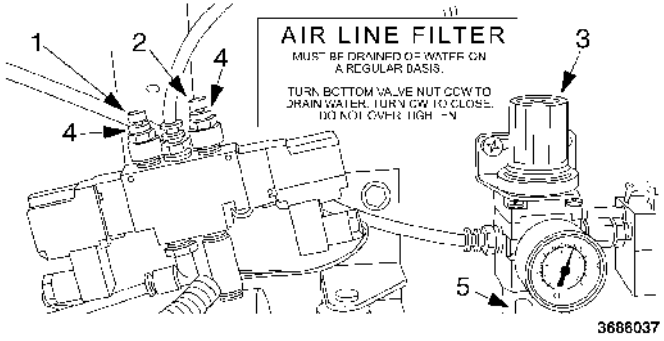
The lubrication intervals specified should be performed at whatever interval occurs first, whether it is kilometers (miles), hours, or months.

Refer to the **Lubrication and Maintenance Intervals Chart** at the end of this section for further details.

Air-Operated Passenger Door Adjustments

The air-operated door opening and closing speeds can be adjusted by the air cylinder mounted flow control valves located behind the access panel above the entrance door. The closing force of the entrance door is determined by the adjustment of the pressure regulator. To perform these adjustments, open access panel door and use the procedures below.

Door Opening and Closing Speed Adjustment Points



1. Opening speed screw
2. Closing speed screw
3. Pressure regulator adjustment knob
4. Lock nuts
5. Air filter

Pressure Regulator Adjustment

WARNING

To prevent personal injury and / or death, or damage to property, do not replace the air door regulator with one that allows pressure settings above 60 psi (414 kPa).

A properly adjusted entrance door should take approximately 4 - 5 seconds to open or close depending on the pressure and speed settings.

The pressure regulator should be set at approximately 60 psi (276-345 kPa). The regulator can only be set to a maximum of 60 psi (414 kPa). In cold weather, seals may stiffen and require more air pressure for proper operation. The pressure can be increased by lifting and turning the adjustment knob clockwise. Then press the cap back down.

Opening Speed Adjustment

Loosen the locknut and turn the opening speed screw clockwise to slow the door opening speed, or counterclockwise, to increase the door opening speed. Tighten the locknut.

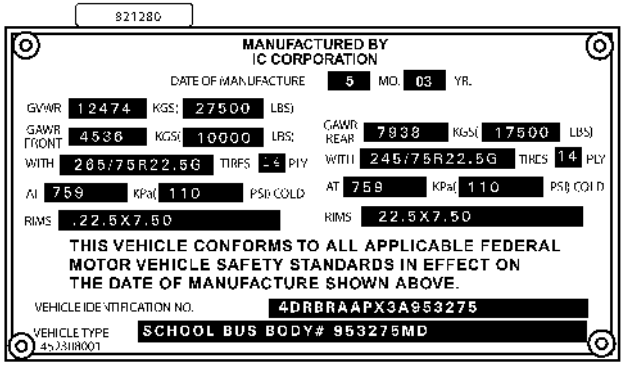
Closing Speed Adjustment

Loosen the locknut and turn the closing speed screw clockwise to slow the door closing speed, or counterclockwise, to increase the door closing speed. Tighten the locknut.

Electrically Actuated Entrance Door Adjustment

Electrically actuated doors are set to operate in 2 to 2 1/2 seconds. There is no adjustment for electrically actuated door opening and closing speed.

Axles



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Typical Axle, Tire, and Rim Specifications-Vehicle Identification Label

Front Axle – Inspection and Lubrication

Check to make sure that the front axle mounting U-bolts and nuts are securely tightened.

Check front axle for damaged, binding, or worn parts, and adequate lubrication.

- Kingpin wear inspection requires that no weight is on the tires.
- Kingpin and kingpin bushing lubrication requires that the vehicle weight is off tires prior to installing grease to maximize grease distribution.
- Kingpin thrust bushing lubrication requires that the vehicle weight is resting on the tires.
- Power grease guns may be used. However, a hand-pumped grease gun should be used for optimal grease distribution within each component joint.

  Refer to the **Lubrication and Maintenance Intervals Chart** and the **Lubricant and Sealer Specifications Chart** at the end of this section for additional information.
- Inspect, lubricate and adjust the wheel bearings at regular intervals. Refer to **Lubrication and Maintenance Interval Chart** at the end of this section for recommended service intervals. Also refer to **Lubricant and Sealer Specifications** and **Torque Specifications** at the end of this section.

Front Axle – Normal Maintenance

During operation the air and oil inside the hub / wheel cavity expands. It is normal for a mist of oil to be present on the outside of the hubcap around the vent slit or hole. Over time, if not wiped off, this film may collect dust and appear unsightly. If the entire face and end of the hubcap become wet with oil, investigate the cause. Refer to the Service Manual for repair procedure.

Routinely clean the hubcap to ensure that the lube level can be easily observed through the clear window as intended. In situations where the window is clean on the outside but discolored on the inside, check the lube level by removing the rubber fill / vent plug and insert a finger into the hole.

The specified lube level for clear window type hubcaps is from the minimum line to 5/16 in (8 mm) above the minimum line.

If the lube level suddenly drops dramatically below the minimum level, see the IC Bus® Electric CE Series Technician Manual (Service and Diagnostic) Service Manual for diagnostic procedure.

Front Axle – Alignment

Maintaining front axle alignment is very important to achieve maximum tire life and vehicle control. Inspecting steer axle tires in the first 3,000 (5,000 km) to 10,000 (16,000 km) service miles will generally show if tires are wearing normally.

- Rapid outside shoulder wear on both tires indicates too much toe-in.
- Rapid inside shoulder wear on both tires indicates too much toe-out.
- Excessive wear on the inside or outside of one steer tire but not the other can indicate a toe-in or toe-out condition coupled with a misaligned front or rear axle.
- Pulling to the right or left can indicate misalignment of the front or rear axle, unequal tire pressures, or a defective / mismatched tire.

Refer to the **TIRES** subsection for additional related information.

Rear Axle – Inspection and Lubrication

Make sure the axle mounting U-bolt nuts, and attaching or mounting bolts and nuts are securely tightened. Loose or misaligned rear axles will affect vehicle alignment, front tire wear, and handling. Refer to **Axle U-Bolt Nut Torque Chart** at the end of this section for torque specifications.

Check the rear axle oil level. Proper oil level minimizes gear wear, heat and damage to the wheel bearings and seals. The oil level should be at the lower edge of the level inspection hole when the vehicle is on level ground. Add oil as necessary.

Refer to the **Lubrication and Maintenance Interval Chart** and the **Lubricant and Sealer Specifications Chart** at the end of this section for additional information.

Body

Inspect the undercoating of school buses annually and recoat as required.

Refer to **Section 2 – Vehicle Inspection Guide** and the **Lubrication and Maintenance Interval Chart** at the end of this section for items to be inspected / serviced and recommended service intervals.

Brakes

General Information

All new IC Bus® vehicles are manufactured with non-asbestos brake linings. However, exposure to excessive amounts of brake material dust may be a health hazard.

WARNING

To prevent personal injury and / or death, or damage to property, pay strict attention to the following: if your vehicle is equipped with Automatic Traction Control or any type of locking or limited slip differential, power will be transmitted to the opposite wheel should one of the wheels slip. Both wheels must be raised free of the ground should it be necessary to operate one wheel with the vehicle stationary; otherwise, the wheel that is not raised will pull the vehicle off its support.

WARNING

To prevent personal injury and / or death, avoid breathing brake lining fiber dust. Always use a respirator while performing brake maintenance. Follow precautions listed below.

WARNING

To prevent personal injury and / or death, or damage to property, always check and maintain brakes in proper condition and adjustment. Out-of-adjustment brakes could cause reduced braking ability.

Follow the these precautions:

- Always wear a respirator approved by the National Institute of Occupational Safety and Health (NIOSH) or the Occupational Safety and Health Administration (OSHA) during all brake service procedures. Wear the respirator during removal of the wheels until assembly is complete.
- Never use compressed air or dry brushing to clean brake parts or assemblies.
- Clean brake parts and assemblies in the open air. During disassembly, carefully place all the parts on the floor to avoid getting dust in the air. Use an industrial vacuum cleaner with a HEPA filter system to clean dust from the brake rotors / drums, backing plates and other brake parts. After using the vacuum, remove any remaining dust with a rag soaked with water and wrung until nearly dry.
- NEVER use compressed air or dry sweeping to clean the work area. Use an industrial vacuum cleaner with a HEPA filter system and rags soaked in water and wrung until nearly dry. Carefully dispose of used rags to avoid getting dust into the air. Use an approved respirator when emptying vacuum cleaners and handling used rags.
- Wash your hands before eating, drinking or smoking. Vacuum work clothes exposed to brake dust after every use and launder them separately, without shaking them, to prevent dust from getting in the air.

Air Brakes

Brake Inspection and Adjustment

WARNING

To prevent personal injury and / or death, or damage to property, pay strict attention to Brake Automatic Slack Adjusters (ASAs). ASAs should not need to be manually adjusted in service. ASAs should not routinely have to be adjusted to correct excessive push rod stroke. Excessive stroke indicates that a problem exists with the foundation brake, ASA, brake actuator, other brake system components or their installation or adjustment.

In the event that a manual adjustment must be made (although this should not be a common practice), a service appointment and full foundation brake, ASA, and other brake system component inspection must be conducted as soon as possible to ensure the integrity of the overall brake system prior to returning the vehicle to service.

WARNING

To prevent personal injury and / or death, or damage to property, always install wheel chocks when manually releasing the spring brakes, or the vehicle could roll.

WARNING

To prevent personal injury and / or death, or damage to property, under no circumstances should a spring brake chamber be disassembled. Disassembly will release a powerful spring.

IC Bus recommends that you establish a regular schedule for periodic cleaning, lubrication, adjustment and inspection of brakes, based on the type of vehicle operation. It is difficult to predetermine an exact maintenance interval (time or mileage), since vehicles are used in a variety of applications and conditions. If you are uncertain of the proper schedule and procedures for your vehicle, contact your IC Bus® dealer.

Periodically, check the push rod travel or brake adjustment. Check the push rod travel every service interval to determine if adjustment is necessary. Brake chamber push rods on original equipment chambers have a stroke indicator (an ORANGE / RED paint marker / rib near the base of the push rod) to aid adjustment checks. If the push rod is clean and the brakes require adjustment, the ORANGE / RED marker can be seen protruding from the chamber when the brakes are applied.

Check the slack adjusters to ensure proper operation of the adjuster mechanism. Push rod travel should be at a minimum without brakes dragging.

This inspection or adjustment should only be performed by qualified service personnel and must be in accordance with instructions provided by the IC Bus® Electric CE Series Technician Manual (Service and Diagnostic).

At regular intervals, inspect the entire brake system. Check:

- Rubber components for deterioration. Replacement intervals vary according to environmental severity and time in service.
- Condition of rotors / drums, brake chambers, and slack adjusters.
- System for air leaks.
- Hose or pipes for corrosion, damage, deterioration.
- Operation of service and parking brakes.

Periodically, inspect the air brake chamber diaphragm, air compressor, and air cleaner, and replace if unserviceable. Refer to **Section 2 - Vehicle Inspection Guide** as well as the **Lubrication and Maintenance Intervals Chart** later in this section.

Inspect brake lining at every maintenance interval. When brake lining or blocks are worn to within 1/16 in (1.6 mm) of the rivets, replace the brake lining.

Air Dryer

The function of the air dryer is to collect and remove moisture and contaminants before the compressed air reaches the air reservoirs. This protects the air system components from malfunctioning including blockage, corrosion, and freezing. For air tank draining requirements, refer to the **Maintenance Instructions** section as well as local regulations.

The air dryer is installed in the discharge line between the air compressor and the air system reservoirs. The air dryer includes a replaceable desiccant cartridge and oil blocking filter that is periodically serviced. It also may include a heater to prevent the discharge valve from freezing in cold weather.

Air Dryer Desiccant Replacement

Open reservoir drain valves and check for presence of water. Small amounts of water due to condensation is normal. If the wet (air) tank and primary or secondary tanks are collecting an abnormally high amount of water between regular air tank drain intervals, replace the air dryer desiccant.

The air dryer desiccant replacement interval may vary; it is generally recommended that the desiccant be replaced every 12 months for small air dryers like the Bendix AD-IP®, or every 24 months for large air dryers like the Bendix AD-9®. If experience has shown that extended or shortened life has resulted for a particular installation, then the interval should be increased or reduced accordingly.

Air Dryer Purge Valve

Check that the purge valve opens and expels moisture when the air governor shuts off the air compressor. Air should escape rapidly and then quickly stop. If the purge valve does not open, or you can hear a slight audible air leakage past the valve for longer than 30 seconds, the valve may be sticking and should be rebuilt. Purge valves may also stick if the air dryer heater has failed and ice is clogging the valve.

Air Dryer Heater

Check that the air dryer heater activates at temperatures below freezing. With the vehicle in a cold environment and before start driving, turn on the ignition and touch the air dryer housing. It should be warmer than other metallic items on the vehicle. If some warmth cannot be felt it, may indicate that the heater element or the wiring powering it should be serviced.

Air Reservoir / Tanks Moisture Draining

Moisture taken in with the air through the compressor inlet valves collects in the reservoirs. Drain the wet tank reservoir every day at the end of the trip. Drain the primary and secondary tanks periodically. Open the drain cock located either on the bottom of the tank or in the end of the tank. For ease of draining, some or all tanks may be equipped with optional pull cords. There must be some air pressure in the system to ensure proper drainage. Close the drain cocks after all moisture has been expelled. If you are unsure which tank is the wet tank, drain all tanks daily.

On vehicles equipped with automatic drain valve(s), moisture and contaminants are automatically removed from the reservoir to which it is connected. It operates automatically and requires no manual assistance or control lines from other sources. Periodically, manually drain the reservoir and make sure the drain passage is not plugged.

Some vehicles are equipped with remote air piloted drain valves. These are actuated (drained) using dedicated individual controls from the driver's control panel.

Chassis Inspection

Regular maintenance and replacement of worn, loose, or damaged parts will usually prevent more serious problems from developing later.

The lubrication and maintenance intervals present a good opportunity to inspect the vehicle. Refer to the **Lubrication and Maintenance Interval Chart** at the end of this section for detailed information on specific chassis items to inspect.

Electrical (Low Voltage)

Terminal Inspection–Cleaning–Corrosion Protection

Periodically, inspect electrical connectors in the 12V battery box and electrical panel box for corrosion and tightness. Clean all exposed terminals and apply a lubricant sealing grease. Refer to the **Maintenance Intervals** section for appropriate sealing grease specification. The inspection / cleaning / corrosion protection should include feed-through connections, power and ground cable connections for 12V batteries.

Inspect exposed cables for fraying or signs of abrasion.

Connectors that are more subject to corrosion may be disassembled and sprayed with a light coating of dielectric grease. Use grease sparingly. Too much grease will not allow air to escape from the connection and this compressed air will push the connection apart.

Accessory Feed Connections

WARNING

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- **Never damage, remove or disconnect the ORANGE / ORANGE with STRIPE high-voltage cables from the high-voltage vehicle electrical system.**
- **Do not touch parts of the electrical system that have been damaged, such as following an accident.**
- **Never remove the high-voltage batteries.**

WARNING

To prevent personal injury and / or death, or damage to property, do not increase size of fuse or circuit breaker or change type of breaker supplied with your bus, as this could cause wiring to overheat and possibly burn. Low voltage electrical circuits are designed with a particular wire gauge to meet the fuse and circuit breaker current rating.

Vehicle low voltage electrical systems are complex and often include electronic components such as controls, instrument panels, and antilock brakes among others. While most systems still operate on battery voltage (12 volts), some systems can be as high as 600 volts or as low as 5 volts. Refer to the Electrical Circuit Diagram Manuals available from IC Bus® to ensure that any additional body lights and accessories are connected to circuits that are both appropriate and not overloaded. No modification should be made to any vehicle control system without first contacting your IC Bus® dealer.

Electric Drive Motor

General

The vehicle owner is responsible for the performance of all scheduled maintenance. The required maintenance operations may be performed by the owner or at a service establishment of the owner’s choosing. Any replacement parts used for required maintenance services or repairs should be genuine IC Bus® service parts. Use of inferior replacement parts may hinder

operation of the bus and can reduce bus life and / or jeopardize the warranty.

Keep the receipts covering the performance of regular maintenance in case questions arise concerning maintenance. The receipts should be transferred to each subsequent owner of the vehicle.

This system is designed to self-limit the speed and the applied torque in order to maintain system integrity. However, some special usage conditions such as towing, driving down a steep hill or in a test environment could submit the system to conditions outside of its control which could cause permanent damage.

WARNING

To prevent personal injury and / or death, or damage to property, observe the following. Operation of the system outside the specified limitations could permanently damage the system. The user is required to restrict the usage of the system within the limits of the specifications defined in this guide. Powering off the system while it is operational may permanently damage the system. This system may be permanently damaged if it is unpowered while the speed exceeds a value where the motor back-EMF exceeds the maximum operating voltage of the internal power module of the drive motor.

Maximum Operating Speed

The system speed is limited to a maximum operating speed according to manufacturer recommendations.

Towing

In case of any breakdown or system failure, refer to Towing Instructions (Towing Instructions, page 138) for information on towing the vehicle in a way that is safe for the electric drive motor.

Gravity Acceleration

In the event that the vehicle is on a lengthy descent that is so steep that the speed increases without requesting torque, the driver should acknowledge the overspeed warning using air brakes, regenerative braking be applied or all available means of speed reduction to avoid damage of the system.

WARNING

To prevent personal injury and / or death, or damage to property, observe the following. Be aware of the overspeed condition. Operating the system in overspeed can cause damage to the system creating hazardous conditions that could endanger the lives of the occupants of the vehicle

Heater and Coolant Hose Inspection and Replacement Guide

Proper maintenance and inspection of the heater and coolant distribution systems is required to maximize hose life, maintain performance of these systems, and avoid potential failures.

Poorly maintained coolant is cause for hose failure. Coolant level and condition should be inspected on a regular basis.

- Check coolant level as part of the daily inspection.
- Check coolant concentration per coolant manufacturer requirements.

Heater and coolant hose inspections should be performed on an annual basis, or anytime a hose repair is made. To properly inspect body heater hoses, protective metal or plastic covers and closeout panels are to be removed to allow inspection of the complete heater and coolant / hose system. After protective covers and closeout panels are removed, the following basic steps should be followed.

- Perform a visual and touch inspection of all hoses. Hose inspection process is to include all body, interior and under body, hoses.
- Check heater and coolant systems for signs of cold and hot leaks.
- Pay attention to the hose ends and contact points that will typically show early signs of hose failure. Observe the area around all hoses for signs of leakage.
- Synthetic rubber can oxidize and harden over time. Squeeze the hose to make sure it is pliable. Entire hose length should have a consistent feel and appearance.
- Many times hoses will fail from the inside. A hose that appears in good condition can fail due to deterioration of the inner hose and reinforcement. This type of deterioration can sometimes be detected during pressure testing.
- Cracks, blisters, or splits in the hose outer cover are the most visible signs of hose failure.
- Pressure test complete heater and cooling system annually. Test should be completed while performing hose inspection to allow all hoses to be observed for bulges and leaks.

After inspection, reinstall all protective covers and closeout panels to original condition.

Many factors influence hose life such as location, years in service and service environment. Heater and coolant hose replacement is recommended after 5 years of service. In the event a hose failure is experienced prior to the recommended replacement time frame, age and condition of remaining hoses should be considered to determine if all body hoses should be replaced to reduce the potential for additional failures.

Heater System

Check all heating / cooling fans for operation. Maintain heat exchanger air filters (if equipped). The driver-side heater filter is located behind the grille near the floor, to the left-side of the driver's seat. The optional step well heater filter is located behind the grille to the front of the step well. Heater booster pumps should not be run dry for more than 30 seconds. This may cause the seals to fail.

Auxiliary Heater

The Webasto Scholastic Series heater requires a minimum amount of maintenance to operate. The following maintenance procedures should be performed annually to keep the system in good working order.

- Enclosure Area: Clean the heater and enclosure area of any accumulated debris or dust with compressed air.
- Electrical System: Check all wiring harness for damage or corrosion. Check the condition of the vehicles 12 volt batteries and connections. Repair or replace as necessary.
- Fuel System: Replace the fuel filter (prime) and inspect the fuel line for wear or damage.
- Burner System: Open the burner head and clean the flame detection (photo eye), pull out the combustion chamber tube and inspect. Clean the inside area of the heat exchanger. Replace the fuel nozzle if necessary. Reinstall the combustion chamber and properly reattach the burner head.
- Operational Check: Run the Scholastic Series for at least 15 minutes. Check all water and fuel connections for leakage.

Integrated Air Conditioning (IC Air) System

The following conditions require the immediate attention of your nearest authorized IC Air Service Center.

- Vibration and / or noise from high-voltage A/C compressor
- Oil around refrigeration hose connections
- Water dripping from evaporator and / or air ducts
- Vibration and / or noise from the evaporator area
- Noticeable decrease in system performance
- Reduced air flow (this condition is normally a result of dirty or clogged evaporator filters).

Drive Shaft

At the regular lubrication interval, check universal joints, slip joint, and slip joint boot for any evidence of wear or looseness.

Suspension (Air and Steel Springs)

CAUTION

To prevent vehicle and / or electric drive motor damage, do not adjust air suspension height to any setting other than the specified setting. Altering the height setting will change the driveline angle and may result in unwarrantable component damage.

Periodically verify driveline axle air suspension height and height control valve performance. Refer to the **Lubrication and Maintenance Intervals Chart** at the end of this section.

Periodically:

- Check condition of spring leaves for evidence of fatigue, bending or breakage.
- Check condition of suspension mounting brackets and bushings.
- Check that torque rod mounting fasteners are tight.

NOTE: When retorque is required, make sure the part is in like new condition. If it can't be retorqued, then the part needs to be replaced.

Suspension alignment must be maintained at all times.

Check the U-bolts as follows:

- After the bus has been operating under load for 1,000 miles (1,600 km), retorque the U-bolt nuts.
- Thereafter, retorque the U-bolt nuts every 36,000 miles (58,000 km).
- Clean and lubricate the U-bolt, nut threads, and seats to ensure a like new condition when retorquing.

Frame and Optional Tow Hooks

The bus chassis are manufactured with frame rails of high strength low alloy (HSLA) steel and must be handled in a specific manner to ensure maximum service life. Specific instructions are published concerning proper repair of frame rails. Before attempting frame repair or modification, consult the service manager of your IC Bus® dealer.

Inspect front and rear tow hooks for damage or loose mountings.

Steering

General

WARNING

To prevent personal injury and / or death, or damage to property, always follow recommended procedures for steering system maintenance. Failure to maintain the steering system in proper condition can cause reduced steering ability.

NOTE: Steering problems must be corrected at once by a qualified mechanic.

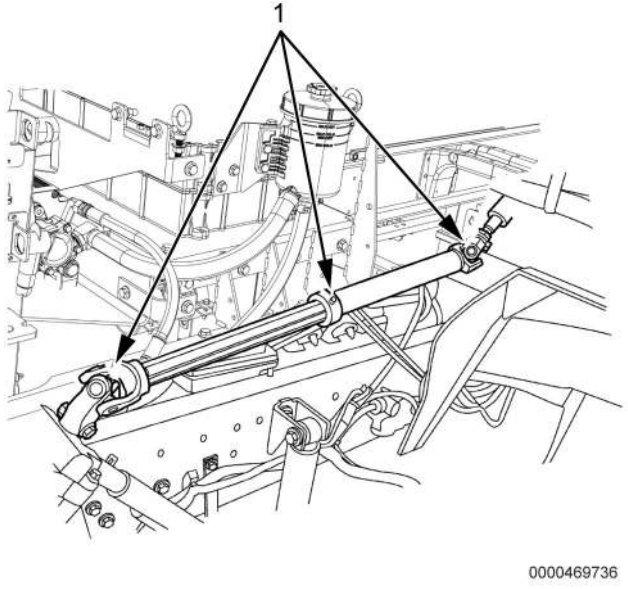
Inspect the steering system:

- Check tie rod ends, drag link ends, and king pins. Joints and fasteners must be tight. Articulating joints must be well lubricated.
- Check for installation and spread of cotter pins and tightness of nuts at both ends of tie rod and drag link.
- Check that pitman arm (steering arm at steering gear) mounting is tight and locked. Check the power steering system for leaks or hose chafing. Repair at once.
- Maintain proper power steering fluid level.
- Regularly inspect steering column joint bolts and steering linkage, particularly for body-to-chassis clearance.

Tightening Steering Intermediate Shaft Joint Bolts

Check the steering intermediate shaft joint bolts for tightness every 60,000 miles (96,000 km) or annually, whichever occurs first. Tighten bolts to torque specified in the torque specification charts in the **Maintenance Intervals and Specifications** section. Do not overtighten.

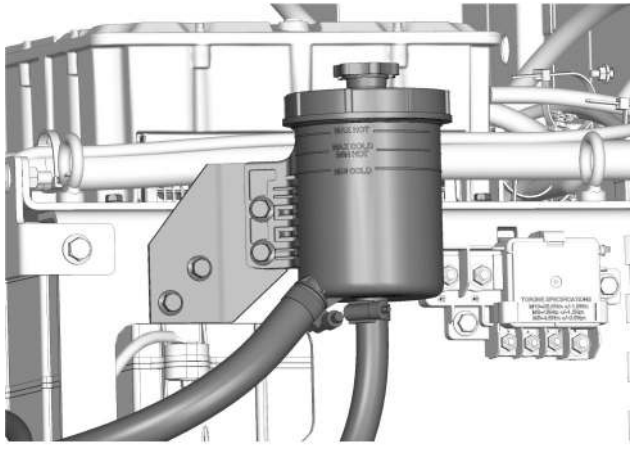
Lubrication Points



1. Lubrication points

The steering shaft is lubricated at the three points shown above. For the correct maintenance interval, refer to the Lubrication and Maintenance Interval Chart in the **Maintenance Intervals and Specifications** section.

Power Steering



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Periodically replace the power steering fluid.

Whenever the hydraulic (power steering) system has been drained and refilled, bleed air from the system before returning the vehicle to service. Failure to properly bleed the hydraulic system can result in shimmy complaints and / or steering wheel oscillation when striking a bump.

Consult your IC Bus® dealer or IC Bus® Electric CE Series Technician Manual (Service and Diagnostic) for the proper procedures for filling and bleeding the system.

The power steering fluid filter is located inside the power steering reservoir. To remove the filter, unscrew the large cap on the power steering reservoir and unscrew the filter. Reverse the procedure to install the new filter.

Refer to the refer to the Lubrication and Maintenance Interval Chart in the **Maintenance Intervals and Specifications** section. for the fluid and filter replacement intervals.

Tires

Tire Warnings

WARNING

To prevent personal injury and / or death, or damage to property, for field maintenance, only inflate and load tires to the maximum of the least-rated tire on the axle. Due to tire manufacturers re-marking tires to conform to the SI (metric) system, tires marked with old and new loads or inflation pressures could be placed on the same vehicle.

WARNING

To prevent personal injury and / or death, or damage to property:

- **Always maintain your tires in good condition.**
- **Frequently check and maintain correct inflation pressures as specified by tire manufacturers.**
- **Inspect periodically for abnormal wear patterns and repair / replace cut or broken tire casing.**
- **Always use experienced, trained personnel with proper equipment and correct procedures to mount or remove tires and wheels.**

WARNING

To prevent personal injury and / or death, or damage to property, always follow these instructions when mounting tires on wheels:

- **Only personnel who have had proper training and experience should mount or remove tires from rims or wheels.**
- **Use only heavy-duty rims or rims approved for radial tires. It may be necessary to contact your wheel and rim distributor to determine if your rims are approved for radial tires.**
- **If a tube is to be used, make sure special radial tire tubes are used because of the increased flexing of the sidewalls on radial tires.**
- **Never use antifreeze, silicones, or petroleum-based lubricants when mounting radial tires. Only an approved lubricant should be used as an aid for mounting tires.**
- **Always inflate tires in a safety cage.**

WARNING

To prevent personal injury and / or death, or damage to property:

- **Do not mix stud-piloted wheels or fasteners with hub-piloted wheels or fasteners. Mixing wheel types may cause premature wheel failure.**
- **Do not change from steel wheels or a steel inner and aluminum outer wheel combination to aluminum wheels without changing the mounting hardware since the thicker aluminum wheels require longer studs. In some cases with flange nut mounting systems, changing the hub and stud assembly may be required. Improperly mixing components could cause wheel or fastener failures.**
- **Do not mix foreign (not made in North America) wheel mounting parts with domestic (made in North America) parts. Many foreign wheel components look similar to, but are not exactly the same as, domestic made components. Mixing components can cause wheel or fastener failures.**

WARNING

To prevent personal injury and / or death, or damage to property, do not mount tube-type tires on tubeless wheels or tubeless tires on tube-type wheels.

Tire Maintenance

Preserving proper inflation pressure is a very important maintenance practice to ensure safe vehicle operation and long life for the tires.

Failure to maintain correct inflation pressure may result in sudden tire destruction, improper vehicle handling, and may cause rapid and irregular tire wear. Therefore, inflation pressures should be checked daily and always before long-distance trips.

Follow the tire manufacturer's recommended cold inflation pressure for the tire size, type, load range (ply rating), and axle loading typical for your operation. (Each steer axle tire load will equal 1/2 steer axle loading. Each drive tire load will be 1/4 the axle loading, if fitted with four tires.)

Checking Inflation

Always check inflation pressure when tires are cold. Never bleed air from hot tires to relieve normal pressure buildup. Normal increases in pressure during operation will be 10 to 15 psi (69 to 103 kPa), which is allowable in truck tires. Tires on the same axle should have the same air pressure as the corresponding other tire(s) on that axle. Steer tires should be within a 3 psi (21 kPa) pressure range of each other. All drive tires should be within a 5 psi pressure range of each other. Tag or pusher axle tires on the same axle should be within a 5 psi (34 kPa) pressure range of each other.

To minimize rim corrosion, it is particularly important to keep moisture from the inside of tires and proper selection of air compressor equipment, proper air line routing, and the use of

shop air dryers is strongly recommended to avoid moisture in the high-pressure air used for tire inflation.

Underinflation

Tires should not be permitted to become underinflated. Increased flexing due to underinflation causes heat buildup within the tire components. This leads to reduced strength, breakdown of the rubber compounds, and possible separation of the tire components (such as ply and tread separation and reduced retreadability).

Underinflation is also the primary cause of blowouts. In addition, low inflation causes an increase in rolling resistance. This results in reduced fuel mileage, a loss in tread life, and uneven wear due to increased tread movement. To determine proper inflation, refer to the tire inflation range stated on the tire sidewall and the tire manufacturer's tire load pressure charts.

Inspection

Check condition of tires for abnormal wear patterns and proper inflation pressures. Cut or broken tire casing must be repaired or replaced.

Tires should be inspected for the following conditions. If any are present, the tire should be removed and repaired, retreaded, or scrapped as the condition indicates.

- Any blister, bump, or raised portion anywhere on the surface of the tire tread or sidewall (other than a bump made by a repair). These indicate the start of internal separation.
- Any cut that reaches to the belt or ply cords or any cut that is large enough to grow in size and depth.
- Any nail or puncturing object.
- If any stone or object is held by a tread groove and is starting to drill into the tread base, remove the object.

Proper tire inflation, toe-in adjustment, loads, and road speeds are important factors governing tire life, steering ease, maneuverability, fuel economy, and ride quality.

Loads

WARNING

To prevent personal injury and / or death, or damage to property, do not load tires beyond their rated capacity as this decreases tire life, requiring more frequent replacement of tires. Overloading creates an unsafe condition that may result in sudden air loss from a tire failure resulting in an accident.

NOTE: The load rating of the tires installed on your vehicle at the time of your vehicle's production is at or in excess of the Gross Axle Weight Rating (GAWR) generally found on a label on the bulkhead above the driver. When replacing tires, be sure that the replacement tire load rating (listed separately in pounds and kilograms on the tire sidewall for single or dual applications) multiplied by the number of tires on that axle is equal to or higher than the specific listed Steer Axle or Drive Axle GAWR. Failure to do so will adversely affect maximum load-carrying capacity. Tires with the same size specification do not always have the same load specification.

Dual Tires Matching

Dual tires should be matched using tires of equivalent size. Tires that differ more than 1/4 in (6 mm) in diameter or 3/4 in (19 mm) in circumference should not be mounted on the same dual wheel assembly.

Dual Tires Mixing

NOTE: Never mix bias and radial tires on this vehicle.

It is recommended for best overall performance that only radial tires be used on this vehicle.

Never mix different tire sizes or constructions on the same axle.

Rotation

- Steer tires that have developed some type of irregular wear pattern can be rotated to drive axles if rib tires are being used on all wheel positions. Applying steer tires to a drive position will often wear off the irregularities, and they can be moved back to the steer axles or run out to retread stage on the rear axle.
- Another rotation possibility for fleets with rib tires in all wheel positions is to break in the new steer tires in the drive axle positions, then move them to steer axles. This will wear away tread rubber relatively quick in the early life of a tire when it is most likely to develop an unusual wear pattern.
- Drive axle tires may be placed on the other end of the same axle so that direction of rotation is reversed. This is often helpful if a heel and toe or alternate wheel nut wear pattern has developed.

Rotation Is Advisable

1. If front (steering) axle tires become irregularly worn, move to rear position.
2. In a dual assembly, reverse the position of the tires if one tire wears much faster than its mate.
3. On the drive axle, if heel and toe wear or alternate wheel nut wear occurs, rotating the tires from one end of the axle to the other end of the axle may help even out this wear.

Tire Replacement

NOTE: Retread tires are not recommended for use on steering axles of trucks.

- **Front (Steering) Axle– Tires must be removed when tread is worn to 4/32 in (3 mm) or less. Retread or rotate worn tires to drive position.**
- **Rear Axles– Tires must be removed when tread is worn to 2/32 in (2 mm).**

If rib tire is used on front axle and lug- or off-road-type on rear axle positions:

- **Front (Steering) Axle– Replace tires at front wheels when tread is worn to 4/32 in (3 mm) or less.**
- **Rear Axles– Tires must be removed when the tread is worn to 2/32 in (2 mm) or less. Tires identified with the word REGROOVABLE molded on the sidewall can be regrooved. A minimum of 3/32 in (2.38 mm) of undertread must be left at the bottom of the grooves.**

Wheel and Tire Balancing

Out-of-round or out-of-balance wheels or tires can cause vehicle vibration and bounce, and shimmy. Replace damaged or out-of-round wheels. Out-of-round tires and wheel assemblies can be corrected by rechecking the tire relative to the wheel. The tire and wheel assembly should thereafter be dynamically balanced and reinspected while spinning for an out of round condition.

Wear

Radial tires can exhibit three types of normal wear patterns: even, erosion, or chamfer.

Even Wear is a sign that the tire is being properly used and maintained.

Erosion Wear has also been called rolling wear, channel, or river wear. Erosion wear is found more often at free rolling tires. This is an indication that the tire is being used in a slow wearing operation. What happens is that the belt plies are held very rigid and the tread is not allowed to distort as it passes through the contact area. Wear will only occur at the edge of the tread. No corrective action is required. If erosion gets to be 1/16 in (2 mm) or more, the tire may be rotated to a drive axle.

Chamfer or Shoulder Wear, with tires inflated properly, is a normal tendency of most radial tire designs. If both inside and outside shoulders are wearing evenly around the tire, no further action is required. Overinflation is not effective in correcting this effect.

Irregular Wear

If irregular wear is present, check the axle alignment, tire pressure, wheel balance, shock and suspension component condition, and wheel bearing end play.

This condition not only shortens tire life but will adversely affect the handling of your vehicle.

Rotating tires from one wheel position to another is a way often used to even out many types of irregular wear or to avoid it altogether. See **Tires – Rotation** for more information. Some of the more effective tire rotation programs are listed below:

Irregular wear can be minimized by:

- Using the correct inflation pressure for the load being carried
- Maintaining proper front wheel alignment – **especially toe-in** – to specifications
- Maintaining proper tire and wheel balance
- Maintaining shock absorbers and suspension components
- Maintaining proper wheel bearing adjustment

Use of Tire Chains

Refer to chain manufacturer’s recommendation for correct tire chain usage, installation, and removal.

Wheels

Wheel and Wheel Nut Maintenance and Installation

WARNING

To prevent personal injury and / or death, or damage to property, always follow these instructions when mounting tires on wheels:

- **Only personnel who have had proper training and experience should mount or remove tires from rims or wheels.**
- **Use only heavy-duty rims or rims approved for radial tires. It may be necessary to contact your wheel and rim distributor to determine if your rims are approved for radial tires.**
- **If a tube is to be used, make sure special radial tire tubes are used because of the increased flexing of the sidewalls on radial tires.**
- **Never use antifreeze, silicones, or petroleum-based lubricants when mounting radial tires. Only an approved lubricant should be used as an aid for mounting tires.**
- **Always inflate tires in a safety cage.**

WARNING

To prevent personal injury and / or death, or damage to property:

- **Do not mix stud-piloted wheels or fasteners with hub-piloted wheels or fasteners. Mixing wheel types may cause premature wheel failure.**
- **Do not change from steel wheels or a steel inner and aluminum outer wheel combination to aluminum wheels without changing the mounting hardware since the thicker aluminum wheels require longer studs. In some cases with flange nut mounting systems, changing the hub and stud assembly may be required. Improperly mixing components could cause wheel or fastener failures.**
- **Do not mix foreign (not made in North America) wheel mounting parts with domestic (made in North America) parts. Many foreign wheel components look similar to, but are not exactly the same as, domestic made components. Mixing components can cause wheel or fastener failures.**

WARNING

To prevent personal injury and / or death, or damage to property, when installing the tire and rim assembly on disc brake-equipped axles, make sure the tire valve stem clears the brake caliper. The use of either an IC Bus® or International® truck valve stem retainer or a tire manufacturer's stem forming tool is the only acceptable method of obtaining clearance when necessary. Failure to obtain proper clearance may result in rapid tire deflation.

Wheel Nut Torque Maintenance

Tighten and maintain wheel and rim mounting nuts to the proper torque. Loose nuts or overtightened nuts can lead to premature wear and possible failure of the wheel, rim, and / or mounting hardware.

Hub-Piloted Wheel Installation Procedures

WARNING

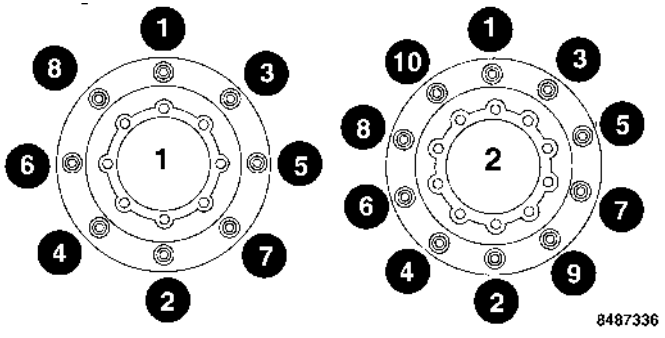
To prevent personal injury and / or death, or damage to property, use only the same type and style wheels and mounting hardware to replace original parts. Failure to do so may result in an assembly that looks fine but does not fit together properly. This could cause wheel or fastener failures.

Out-of-round tires and wheel assemblies can sometimes be corrected by reclocking the tire relative to the wheel.

Tightening procedure for disc wheels with flange nuts (hub-piloted):

1. Clean the mating surfaces of the hub, drum, and wheel(s) as well as the wheel studs and wheel nuts with a wire brush prior to assembly.
2. Lubricate the two-piece wheel nuts by putting two drops of oil in the slot between the nut and washer and spin the washer to spread the oil around the nut-to-washer contact surface.
3. Carefully lubricate the wheel stud threads by wiping them with a freshly oiled cloth. Do not get the oil on any other surfaces or the wheel clamping effectiveness will be reduced.
4. To prevent aluminum wheels from getting stuck on the hub due to corrosion, apply a thin coat of antiseize compound or disc brake corrosion control grease to the hub pilot pads only.
5. Slide the inner wheel (if duals) or steer wheel over the wheel studs and onto the pilot pads of the hub. Care must be taken to avoid damage to the stud threads while positioning the wheel. Ensure that the wheel is resting on the pilot pads and is against the brake drum.
6. Hand-start all wheel nuts to avoid cross-threading.
7. Starting with the nut at the 12 o'clock position and using the appropriate star or crisscross pattern (see wheel nuts torque sequence diagram), run the wheel nuts down the wheel studs with an impact wrench until they are snug

against the wheel. The purpose of this step is to snug the wheel(s) in the correct position, not to apply the final torque. The tightening of each nut should be stopped immediately when the wheel is contacted, resulting in a wheel nut torque well below the final specified torque.



1. Flange nut mount – 8 stud
2. Flange nut mount – 10 stud

8. Use a calibrated torque wrench to apply the specified torque to each wheel nut in the sequence specified in the wheel nuts torque sequence diagram above. Refer to **Maintenance Intervals and Specifications** for proper torque values.

9. All wheels undergo a process called joint settling when placed in service after a wheel installation has been performed. This process results in a reduction in the torque on the wheel nuts. To correct this condition, operate the vehicle normally for approximately 50 miles (80 km), then use a calibrated torque wrench to retorque the wheel nuts to specification using the appropriate pattern shown in the wheel nuts torque sequence diagram.

10. As part of a daily pre-trip inspection, look for loose or missing wheel nuts. Also look for rust streaks extending outward from the wheel nuts; this can be an indicator that one or more wheel nuts are loose, even if they cannot be turned by hand. Normal periodic maintenance should also include checking the wheel nut torque with a torque wrench.

Windshield Wiper

Wiper Blade Assembly Replacement

1. Press the plastic lever at the wiper blade assembly to the wiper arm hinge.
2. Slide the wiper blade assembly up the wiper arm and detach it.
3. Snap the new wiper blade assembly onto the arm in the opposite direction of the removal.
4. Check to see that the rubber wiper blade rests flat against the windshield.

SECTION 16 — MAINTENANCE INTERVALS AND SPECIFICATIONS

Maintenance Intervals

All new vehicles are factory lubricated. Once the vehicle is in operation, regular lubrication and maintenance intervals (based on the type of service and road conditions) must be established and performed. Load weight, vehicle speed, road conditions, and weather conditions all contribute to lubrication frequency. Performing thorough lubrication and maintenance at the specified intervals will ensure an outstanding vehicle life and will reduce overall operating expense.

The Lubrication and Maintenance Intervals Chart contains an extensive list of components and systems. Listed items and systems must be regularly inspected, serviced, and / or replaced to maximize vehicle availability and minimize unexpected failures. Recommended synchronized intervals are shown for each item. This chart can serve as a convenient one-stop reference to research most maintenance needs.

Only lubricants of superior quality, such as Fleetrite® lubricants, should be used. The use of inferior products will reduce the service life of the vehicle or result in failure of its components. The use of Fleetrite® lubricants is recommended for optimum performance.

Maintenance intervals provided in this manual are for normal highway and environmental service conditions.

These intervals may be expressed in miles (kilometers), hours of operation, and / or months of operation. It is important to note that in high duty cycle types of operation and / or where operating conditions are extremely severe (such as in deep water, mud or unusually dusty conditions), the vehicle may require lubrication much more frequently than specified in this manual.

The synchronized A and B service intervals are designed to coordinate maintenance activities and to provide the appropriate levels for servicing components. Following the service intervals minimizes the number of times per year that the vehicle must be brought into the shop. In addition to the A and B service intervals, the Special Service Interval column is provided for items that need infrequent servicing. In most cases, these service intervals represent the recommended maximum intervals. For some components, however, the manufacturer’s recommended maintenance intervals may have been shortened to allow synchronization with other maintenance tasks.

Lubrication and Maintenance Interval Chart Symbols Key

Symbol	Interval Definition
A	A interval: 5,000 miles (8,000 km) / 200 hours / 6 months
B	B interval: 10,000 miles (16,000 km) / 400 hours / 12 months

Lubrication and Maintenance Interval Chart Notes

NOTE 1: A hand-pumped grease gun should be used for optimal grease distribution within the component joint.
NOTE 2: Kingpin thrust washers must be lubricated with vehicle weight on tires. Kingpins and kingpin bushings must be lubricated with weight off of the wheels and tires.
NOTE 3: Certain services are performed at Special Intervals or in addition to A or B Service when the interval dictates.

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Pre-Trip Inspection	Pre-trip Inspection Items listed in Section 2 – Check All		
Axle – Front	Axle U-Bolts – Retorque	B	At first 1,000 miles (1,600 km), then every B interval thereafter
	Drag Link – Lubricate (1)	A, B	
	Kingpins and Bushings – Lubricate (1,2)	A, B	
	Shock Absorbers – Inspect	A, B	
	Suspension Fasteners / Components – Check	A, B	
	Tie Rod Ends – Lubricate (1)	A, B	
	Wheel Bearings – Check End-play	B	
	Wheel Bearing-Grease Type – Repack		30,000 miles (48,000 km) / – / 6
	Wheel Bearing-Oil Type (including synthetic) – Change Oil		60,000 miles (96,000 km) / – / 6
	Wheel Bearing-Oil Type – Check Level	A, B	

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Axle – Rear	**Stable Ride** Suspension Fasteners / Components – Check	A, B	
	Axle Flange Nuts – Retorque	B	
	Ride Height - Check	B	
	Axle U-Bolts – Retorque	B	At first 1,000 miles (1,600 km), then every B interval thereafter
	Rear Axle With Petroleum Oil – Change		60,000 miles (96,000 km) / – / 12
	Rear Axle Wheel Ends – Inspect for leaks, lube level / condition, and check end play with dial indicator.	100,000 miles (160,000 km) / – / 12 Also at brake lining service If wheel end play is found to be outside the 0.001 in to 0.005 in specification, or lube condition is contaminated or low, then perform a full wheel end tear down. Inspect bearings, spindle, and spindle nuts for excessive wear and replace as necessary.	
	Rear Axle With Synthetic Oil – Change	Dana® Spicer®: 180,000 miles (288,000 km) / – / 36 months	
	Rear Axle Wheel Ends – Full tear down inspection of all wheel end components, regardless of condition of lube and wheel bearing end play.		500,000 miles (800,000 km) / – / 60 months

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Body / Components	Accelerator Pedal – Check Function	A, B	
	Air Conditioner (Optional) – Check Performance	B	
	All Seat Base Bolts	B	
	Body – Check loose, damaged, missing parts	A, B	
	Body Mounting Bolts – Inspect Tightness		1 month or 1,500 miles (2,414 km) and then 3 months or 3,000 miles (4,828 km) thereafter
	Chassis – Check for loose, damaged, missing, parts	A, B	
	Emergency Windows Slides – Lubricate		Every 12 months
	Emergency Doors / Exits and Buzzers – Check	A, B	
	Entry Door – Check Operation	A, B	
	Fluid Leaks – Check	A, B	
	Headlights, Bright / Dim / Daytime – Check	A, B	
	Heater Hoses and Connections – Check Condition	12 months **NOTE: See Heater and Coolant Hose Inspection and Replacement Guide in the Maintenance Instructions section for additional information.**	

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Body / Components (Cont.)	Inspect and Clean Step Well and All Other Heater Cores and Blower Areas	A, B	**NOTE: For units without filter, more frequent cleaning may be required.**
	Lights Interior / Exterior – Check	A, B	
	Optional Components As Equipped – Check	A, B	
	Post-Trip Inspection Feature – Check	A, B	
	Roof Hatch(es) – Check Operation	A, B	
	Safety Equipment As Equipped – Check	A, B	
	Step Well and All Heater Core Air Filters – Inspect / Clean or Replace	A, B	
	Seat Belt(s) Bolts – Check Operation / Condition	A, B	
	Undercoating Inspection	Inspect the undercoating of school buses annually and recoat as required.	
	Warning lights, Stop Arm(s), Crossing Gate, Entrance Door / Warning lights Interaction – Check	A, B	

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Brakes — Air	Air Dryer Desiccant – Replace		AD-9 Model: 250,000 miles (400,000 km) / - / 24 Other Models: 125,000 miles (200,000 km) / - / 12
	Air Dryer Heater & Purge Valve – Check		AD-IP: 12; AD-9: 24
	Air Tanks (all) – Drain Water	A, B	
	Air Wet Tank – Drain Water		Every 24 hours
	Brake Chamber Rod Travel – Check	A, B	
	Governor Cut-In / Cut-Out Pressure – Check	A, B	
	Low Air Pressure Warning Alarm – Check	A, B	
	Parking Brake Operation – Check	A, B	
	Rotors / Drums, Calipers, Chambers, Hoses, and related items – Check for wear / damage	A, B	
	S-Cam Bushings – Lubricate	A, B	
	Service Brakes Operation – Check	A, B	
	Shoes – Check for wear and drag	A, B	

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
High-Voltage Air Compressor	Check if the connection bolts at the bottom plate of the air compressor, the motor, motor mounting pad, or end cover are loose. Visually inspect and torque as necessary.	B	
	Check the inlet and exhaust pipe connectors are firm.	B	
	Remove the dust on the surface of the head units and on the fan blades, verify the air passages of the cylinder head are clean. External compressed air blown over these areas no requirement for disassembly.	B	
	Verify that the air intake system is taking in air. Tighten, or replace components as necessary.	B	
	Replace the air filter element, if necessary whole filter.	B	
Cabin Cooling System	Cabin Heater Coolant Check Level	A, B	
	Cabin Heater Coolant Fluid Replacement		Every 150,000 miles (240,000 km) / – / 60 months

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Power Electronics Cooling System	Coolant Liquid Visual Only (Top off as necessary)	B	
	Coolant Liquid Fluid Replacement		Every 150,000 miles (240,000 km) / – / 60 months
	Fan Blade / Shroud – Check Damage / Contact	A, B	
	Radiator – Check for Blockage	A, B	
Drive Shaft SPL	U-Joints – Lubricate; Slip Joint Boot – Inspect	B	
Electrical low voltage	ABS Wiring Connections & Sensors - Reseat	A, B	
	Electrical lines routing and clipping (lines are not tangled, crimped or pinched or rubbing against surfaces); not spliced or taped; insulation not cut, cracked, chafed or worn. – Inspect	B	
	Start and Gauge / Warning Lights – Check	A, B	
	Instrument Readings Proper – Check	A, B	
	Power Distribution Center: Corrosion throughout case and on pins of fuses and breakers – Inspect	B	

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Dana Drive Motor and Cabling Intervals	Inspect HV Cables, HV and Phase Cables Glands, Phase Cables	B	
	Inspect Encoder & Thermal Cable and Connectors	B	
	Inspect VCU Interface Connector	B	
	Inspect coolant in/out of Drive Motor	B	
	Ground Location Drive Motor Visual, and correct as necessary (May have to unbolt and clean ground cable mounting location)	B	
	Inspect Drive Motor Visual inspection: general condition of housing and components	B	
	Vent	B	
	Mounting Point Motor	B	
	Cleaning (Clean surface of equipment with compressed air)	B	
	Vent Cleaning (Visual Inspection)	B	

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Battery Thermal Management System (BTMS)	BTMS Case/Structure Inspect support structure for any damage or loose mounting hardware	B	
	BTMS Case/Structure Inspect mounting isolators for damage or cracking	B	
	BTMS Coolant System Inspect system for signs of coolant leak	B	
	BTMS Coolant System Change and Refill Coolant must be maintained according to the coolant Manufacturers instructions		Every 150,000 miles (240,000 km) / – / 60 months
	BTMS Coolant System Coolant level in surge tank – check	B	
	BTMS Coolant System Inspect coolant lines for signs of damage	B	
	BTMS Coolant System Check the radiator for signs of damage or clogging. If the radiator is clogged with dirt, flush it with high volume, low pressure water to remove dirt. NEVER use a high pressure cleaner to clean this cooler! This will risk damage to the radiator or a coolant leak.	B	
	BTMS Refrigerant System Inspect system for signs of refrigerant leak.	B	
	BTMS Refrigerant System Inspect refrigerant lines for damage	B	

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Battery Thermal Management System (BTMS)(Cont.)	BTMS Refrigerant System Inspect condenser for signs of damage or clogging. If condenser is clogged with debris, flush with high volume, low pressure water to remove debris. NEVER use a pressure washer to clean the condenser! This will risk damage to the condenser, or a refrigerant leak	B	
	BTMS High-Voltage System Inspect power cables for wear or frayed insulation. Ensure connectors are properly secured and secondary locks are engaged. Check for any signs of damage	B	
	BTMS High-Voltage System Inspect components for damage and replace if necessary	B	
	BTMS High-Voltage System Ensure distribution box cover bolts are secured	B	
	BTMS High-Voltage System Inspect ground cables for damage and ensure connections are not damaged or corroded	B	
	BTMS High-Voltage System Visually inspect hardware on all ground connections and apply dielectric grease as needed	B	

Lubrication and Maintenance Interval: Bus — Recommended Synchronized Intervals (cont.)

System	Item	Intervals	Special Interval (3) : miles (km) / hours / months
Battery Thermal Management System (BTMS)(Cont.)	BTMS High-Voltage System Inspect external wire connections for wear or frayed insulation. Ensure connectors are properly secured and secondary locks engaged. Check for any signs of damage	B	
	BTMS High-Voltage System Inspect the main wiring harness and connections to the system controller, components, and sensors	B	
	BTMS High-Voltage System Inspect fuses and fuse holders	B	
Steering	Power Steering Fluid – Change		24 months
	Power Steering Fluid – Check Level	A, B	
	Power Steering Filter – Replace		24 months
	Steering System – Check Tightness	A, B	
	Steering Gear – Lubricate	A, B	ATTN: Install grease slowly at low pressure. Power grease guns may blow out seals.
	Steering Intermediate Shaft U-Joints / Slip Joint – Lubricate	A, B	
	Steering Intermediate Shaft U-Joints – Retorque		60,000 miles (96,000 km) / 1,500 / 12
Tires / Wheels	Air Pressure – Check	A, B	
	Spin Balance	At time of tire mounting	
	Wear and Condition – Check	A, B	
	Wheel Stud Nuts – Retorque	A, B	

Unit Refill Capacities

Air Conditioner Refrigerant

See air conditioner manufacturer's Service / Operation Manual for aftermarket bus A/C system specifications.

Cooling System Refill Capacities

Cooling system capacities vary greatly due to variations in bus length and number of heaters.

SmartTrac™ Brakes – Brake Fluid

Approximately 1.6 gallons (6 liters).

Power Steering System

Steering Gear	Power Steering Fluid Volume (pints / liters)
M-100	8.4/3.9*
TAS66	8.4/3.9*
* Approximate refill quantity; refer to power steering reservoir for proper fill marks.	

Rear - Axle

Axle	Lube Capacities Pints (Liters)
Dana® Spicer® S23-172F,	26.4 (12.5)
Dana® Spicer® 21060SP	21.2 (10.0)

Tire and Rim Combinations

Approved Tire and Wheel Combinations

Tire Size	Rim Width (Inches)
9R22.5	6.75, 7.50
10R22.5	6.75, 7.50
11R22.5	7.50, 8.25
12R22.5	8.25, 9.00
225/70R19.5	6.75
235/80R22.5	6.75, 7.50
245/70R19.5	6.75, 7.50
255/70R22.5	6.75, 7.50, 8.25
265/70R19.5	6.75, 7.50, 8.25
275/80R22.5	7.50, 8.25
295/75R22.5	8.25, 9.00

Lubricant and Sealer Specifications

Component	Component Vendor / Lubrication Type	Viscosity / Ambient Temperature / Notes
Non-driving Front Axle		
Front axle wheel bearing oil	Eaton® / Dana® axle (Generic)	75W: -40°F to -15°F (-40°C to -26°C) 75W-80: -40°F to 80°F (-40°C to 27°C) 75W-90: -40°F to 100°F (-40°C to 38°C) 75W-140: -40°F and above (-40°C and above) 80W-90: (-26°C to 38°C) -15°F to 100°F 80W-140: -15°F and above (-26°C and above) 85W-140: 10°F and above (-12°C and above)
	Eaton® / Dana® axle: multipurpose EP gear lube of API GL-5 quality meeting MIL-PRF-2105E specs including *synthetic lubricants. ***: Do not mix conventional lube with Synthetic lube.**	75W: -40°F to 32°F (-40°C to 0°C) 75W-90: -40°F to 100°F (-40°C to 38°C) 75W-140: -40°C and above (-40°F and above) 80W: -15°F to 70°F (-26°C to 21°C) 80W-140: -15°F and above (-26°C and above) 90W: 10°F to 100°F (-12°C to 38°C) 85W-40: 10°F and above (-12°C and above) 140W: 40°F and above (4°C and above)

Component	Component Vendor / Lubrication Type	Viscosity / Ambient Temperature / Notes
Front axle wheel bearing oil (Cont)	Meritor®: Synthetic from factory with Cognis Emgard® 75W-90 will have a tag attached to fill plug that reads as follows: **Filled with synthetic lube. Do not mix**.	75W-90
	Meritor: Petroleum 0-76-A Hypoid Gear Oil 0-76-D Hypoid Gear Oil 0-76-E Hypoid Gear Oil 0-76-J Hypoid Gear Oil Petroleum oil: engine oil API-CK-4 or CJ-4	85W-140: 10°F and above (-12°C and above) 80W-90: -15°F and above (-26°C and above) 75W-90: -40°F and above (-40°C and above) 75W: (-40°C to 2°C) -40°F to 36°F SAE 40 or 50: 10°F and above (-12°C and above) SAE 30: -15°F and above (-26°C and above)
Front axle wheel bearing grease, tie rod ends, drag link, king pin and bushing	Eaton® / Dana® axle: Fleetrite® NLGI #2 Lithium Complex Based Moly grease P/N 991044C2 or equivalent GC / LB NLGI #2 Multi-purpose Lithium Complex grease	**NOTE: Eaton® / Dana® Easy Steer axles: With chassis load on axle, force grease through thrust bearings; then with axle lifted clear of floor, force grease between kingpin and bushing surfaces.**
Body Components		
Emergency Window Slides	WD-40 Specialist Dirt & Dust Resistant Dry Lube PTFE Spray or equivalent PTFE lubricant	

Component	Component Vendor / Lubrication Type	Viscosity / Ambient Temperature / Notes
Cooling System		
CAUTION **To prevent property damage to the cooling system, do not use windshield washer in the BTMS reservoir. Windshield washer fluid in the BTMS reservoir can damage the seals in the system leading to leaks.**		
Coolant	Fleetrite®NOAT Extended Life Coolant 50/50 Premix. P/N: • FLTRELC5050G (gallon) • FLTRELC5050P (5 gal pail) • FLTRELC5050D (55 gal drum)	
Electrical Low-Voltage		
Terminals – Lubricant Sealing Grease	Fleetrite® 472141-C1	
Connectors – Dielectric Grease	NYOGEL® 760 G	
Steering System		
Strg. Gear Ross TAS-Output Seal – Lubricate	Fleetrite® Lithium Complex Based Moly grease P/N 991044C2 or equivalent GC / LB NLGI #2 Multi-purpose Lithium Complex grease	

Component	Component Vendor / Lubrication Type	Viscosity / Ambient Temperature / Notes
Strg. Intermediate Shaft U-Joints / Slip Joint – Lubricate	Fleetrite® NLGI #2 Lithium Complex Based Moly grease P/N 991044C2 or equivalent GC / LB NLGI #2 Multi-purpose Lithium Complex grease	
Approved (Power Steering Fluid)		
Power Steering Fluid	Fleetrite® Power Steering Fluid P/N FLTPSF32 (MPAPS B-6811 Specification)	-24°F to 92°F (-33°C to 32°C)
NOTE: The power steering system is filled with ATF fluid at the factory. **CAUTION** **To prevent component / system / property damage, ONLY use fluid types listed.** **NOTE: Certain fluid types may be better suited for use in your vehicle, dependant on geographic location and temperature. It is recommended to use the Ambient Temperatures listed above to determine what fluid best fits the application of the user's fleet or vehicle.** **NOTE: The same type of approved power steering fluid that is present in the system must be used when topping off. When switching to another approved power steering fluid type, the power steering system must be drained and flushed prior to refill.**		
Drive Shaft		
U-Joint - Lubricate	Fleetrite® NLGI #2 Lithium Complex Based Moly grease P/N 991044C2 or equivalent GC / LB NLGI #2 Multipurpose Lithium Complex grease	

Component	Component Vendor / Lubrication Type	Viscosity / Ambient Temperature / Notes
Rear Axle		
Single speed	Gear oil meeting MIL-PRF-2105E, API MT-1, GL-5	75W: -40°F to - 15°F -40°C to -26°C() 75W-80: -40°F to 80°F (-40°C to 27°C) 75W-90: -40°F to 100°F (-40°C to 38°C) 75W-140: -40°F and above (-40°C and above) 80W-90: -15°F to 100°F (-26°C to 38°C) 80W-140: -15°F and above (-26°C and above) 85W-140: 10°F and above (-12°C and above)
Single speed continued.	International® axle: multipurpose EP gear lube of API GL-5 quality meeting MIL-PRF-2105E or SAE J2360 specs including synthetic lubricants.	75W: -40°F to 32°F (-40°C to 0°C) 75W-90: -40°F to 100°F (-40°C to 38°C) 75W-140: -40°F and above (-40°C and above) 80W: -15°F to 70°F (-26°C to 21°C) 80W-140: -15°F and above (-26°C and above) 90W: 10°F to 100°F (-12°C to 38°C) 85W-140: 10°F and above (-12°C and above) 140W: 40°F and above (4°C and above)
	Meritor: Synthetic from factory with Cognis Emgard® 75W-90 will have a tag attached to fill plug that reads as follows: **Filled with synthetic lube. Do Not Mix**.	
	Meritor petroleum: 0-76-A Hypoid Gear Oil 0-76-B Hypoid Gear Oil 0-76-D Hypoid Gear Oil 0-76-E Hypoid Gear Oil 0-76-L Hypoid Gear Oil	 GL-5, SAE 85W-140: Above 10°F (-12°C) GL-5, SAE 85W-140: Above -15°F(-26°C) GL-5, SAE 80W-90: Above -15°F (-26°C) GL-5, SAE 75W Max outside temp. 35°F (2°C): Above -40°F (-40°C) GL-5, SAE 75W-140: Above -40°F (-40°C)

Torque Specification Charts

Disc Wheels Torque Chart

Stud Size	Nut Size	Specified Torque	
		lb-ft	N•m
22 mm	Flange Nut – 33 mm Across Flats	450 - 500	610 - 678

NOTE: Do not use lubrication on dry threads. Where excessive corrosion exists, a light coat of lubricant on first three threads of stud bolt is permitted. Keep lubricant away from:

- **Hex nut**
- **Flange nut washer surface and flat on disc wheel**

Axle U-Bolt Nut Torque Chart

Feature Code	Rear Suspension Capacity and Type	Torque	
		lb-ft	N•m
14TBS	21,000-lb Capacity, International Air Suspension (IROS).	400	542
14TBT	23,000-lb Capacity, International Air Suspension (IROS)	400	542

NOTE: For all other vendor supplied suspensions, refer to vendor's website for proper torque specifications.

Feature Code	Front Suspension Capacity and Type	Torque	
		lb-ft	N•m
3ADB	10,000-lb Capacity, Parabolic Taper Leaf	400	542

Steering Column Pinch Bolts Torque Chart

Bolt Type	Specified Torque	
	lb-ft	N•m
7/16-20	68 - 76	92 - 103

Wiper Arm Torque Chart

	Specified Torque	
	N•m	lb-ft
Wiper Pivot M20 Hex Nut	28	21

Seat Base Bolts

	Specified Torque	
	N•m	lb-ft
All Seat Base Bolts	21.7 to 27	16 to 20

Drive Motor Ground Cable

	Specified Torque	
	N•m	lb-ft
M8 Ground Cable Mounting Bolt	18	13

Filter List

Filter part numbers and / or specifications may change during the life-cycle of this vehicle. Current information on the appropriate chassis filters for your vehicle can be obtained by contacting your local IC Bus® or International® dealer parts department. If you need assistance finding a local IC Bus® or International® dealer, use the Dealer Locator icon at www.icbus.com.

SECTION 17 — CUSTOMER ASSISTANCE

Service Information

The continued premium performance of this IC Bus® vehicle can best be ensured through proper servicing. This can be accomplished in several ways.

IC Bus® Dealers: Your local IC Bus® dealer provides an excellent resource – through his knowledgeable, experienced, and well equipped service staff – to handle all your maintenance, repair, and replacement work.

Service Publications: Those persons who are properly trained technicians with the facilities, equipment, tools, safety instructions and know-how to properly and safely service a bus can purchase the appropriate service manual sections applicable to specific vehicle components or areas of this vehicle. Information on the purchase of available service publications for this vehicle can be found on the www.icbus.com or www.internationaltrucks.com Web site, or by contacting your local IC Bus® or International® Truck Dealer.

These resources are also available via the internet, by an annual subscription to the International® Service Portal SM website, or via the OnCommand® Service Information USB. For information on the International Service Portal website's content, availability, and fee structure, contact your local International Truck dealer or, in the case of a National Account, your International Fleet Service Manager. The OnCommand Service Information USB contains International® and IC Bus® branded truck, engine, and bus information including service and diagnostic manuals, troubleshooting guides, circuit diagram manuals, and new vehicle processing manuals.

These resources are also available via the internet, by an annual subscription to the **International®Service Portal℠ Website**, or via the **OnCommand® Service Information USB**. For information on the International Service Portal℠ website 's content, availability, and fee structure, contact your local International Truck dealer or, in the case of a National Account, your International Fleet Service Manager. The OnCommand® Service Information USB contains International® and IC Bus® branded truck, engine, and bus information including service and diagnostic manuals, troubleshooting guides, circuit diagram manuals, and new vehicle processing manuals.

NOTE: When ordering any service information, be sure to provide your vehicle's model designation, build date, engine series, and the Vehicle Identification Number (VIN).

Navistar, Inc., Warranty Program

Standard Warranty • Optional Service Contracts • Custom Service Contracts • Performance PM®

The Navistar, Inc. Warranty Program provides IC Bus customers with a better choice when it comes to Standard Warranty and Service Contract Coverage. The **Standard Warranty** is the first tier of the Navistar, Inc. Warranty Program. It provides the foundation for all extended coverages.

Vehicle Coverage, Towing, Engine and Engine Electronics, Major Component, and Prepackaged System Component protection can be obtained under the Navistar Warranty Program through **Optional Service Contracts**.

Custom Service Contracts, the most flexible aspect of the Navistar Warranty Program, can provide extended protection that is specifically tailored to meet each customer's specific requirements.

Finally, through **Performance PM®**, customers can obtain a comprehensive preventative maintenance program designed to ensure consistency in pricing and the level of service received.

ADVANTAGES of Navistar, Inc. Warranties

- Extends warranty protection to specified length and component coverage to suit individual needs
- Honored at all IC Bus® dealer locations in North America
- Stabilized and predictable maintenance costs
- Increased owner confidence and peace of mind
- Improved resale value on your vehicle – International Truck Warranties may be transferable for a nominal fee. Contact the Service Contract Center 1-800-336-4500 option 5 for transferability
- Most coverage is 100% parts and labor with **NO DEDUCTIBLES**
- Customized warranty programs are offered to suit your needs - your specification - your vocation
- Optional Service Contracts, Custom Service Contracts, and Performance PM, designed to ensure the lowest possible cost of ownership, are also available
- Published Service Contracts Performance PM® Service, designed to ensure the lowest possible cost of ownership, are also available.
- Optional Service Contracts have been pre-packaged to fit most common applications.

HOW TO OBTAIN Navistar, Inc. Warranties

- **Standard Warranty:** Your new IC Bus® vehicle is automatically registered in the Navistar Warranty System at the time of delivery. No further action on your part is required.
- **Optional Service Contracts, Custom Service Contracts, or Performance PM®:** These programs are sold exclusively through your IC Bus® dealer. You have 365 days and up to a maximum of 160,000 km (100,000 miles), from DTU (delivery to end user), to purchase an extended warranty on your vehicle. The vehicle must also have coverage remaining under the Standard Warranty. For extended warranty purchases between 181 through 365 days from DTU and <160,000 km (100,000 miles) an additional fee will be assessed. If you would like the predictable cost of ownership and peace of mind provided by the Navistar Warranty Program, please contact your IC Bus® dealer today!

SECTION 18 — INDEX

B

C

***C** (CONT.)*