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General Specifications

Battery Specifications		
Maintenance Free (Gel Type) Battery		
Description	Specification	
Type Number	8G31	
Voltage	12	
Cold Cranking Amps (CCA) @ 0° F	550	
Approximate Weight Lbs (Kgs)	71.7 (32.5)	
Dimensions (LxWxH) In (mm)	12 ^{15/16} x 6 ^{3/4} x 9 ^{3/8} (329x171x238)	
Flooded (Water Filled) Battery		
Description	Specification	
Type Number	31XHS	
Voltage	12	
Cold Cranking Amps (CCA) @ 0° F	550	
Approximate Weight Lbs (Kgs)	67 (30)	
Dimensions (LxWxH) In (mm)	13 x 6 ^{3/4} x 9 ^{1/2} (331x171x242)	
Lubrication Specifications		
Description	Part Number	Ford Specification
Electrical Grease	F8AZ-19G208-AA	WSB-M1C239-A
Motorcraft High Performance DOT 3 Motor Vehicle Brake Fluid	C6AZ-19542-AB	ESA-M6C25-A
80W90 Premium Rear Axle Lubricant. (Gearbox Lubricant)	XY-80W90-QL	WSP-M2C197-A
Halfshaft splines (CV joint high temp. grease)	E43Z-19590-A	ESP-M1C207-A
Lock cylinders (Penetrating and Lock Lubricant)	Motorcraft XL-1	None

Description and Operation

The TH!NK neighbor is a combination of conventional and unique Electric Vehicle (EV) components and systems. Because the EV uses an electric motor rather than a gasoline engine, there are unique warnings and cautions. The procedures outlined are designed to encourage safe repair of the vehicle and should be carefully followed. The EV uses many electronic components that can be easily damaged if the procedures are not followed.

Acids

WARNING!

LEAD-ACID BATTERIES CONTAIN SULFURIC ACID. AVOID CONTACT WITH SKIN, EYES OR CLOTHING. ALSO, SHIELD YOUR EYES WHEN WORKING NEAR BATTERIES TO PROTECT AGAINST SPLASHING OF THE ACID SOLUTION. IN CASE OF ACID CONTACT WITH THE SKIN OR EYES, FLUSH IMMEDIATELY WITH WATER FOR A MINIMUM OF FIFTEEN MINUTES AND GET PROMPT MEDICAL ATTENTION. IF ACID IS SWALLOWED, DRINK LARGE QUANTITIES OF MILK OR WATER, FOLLOWED BY MILK OF MAGNESIA, A BEATEN EGG, OR VEGETABLE OIL. CALL A PHYSICIAN IMMEDIATELY.

The battery pack is composed of 6 12-volt lead acid batteries wired in series. These batteries are similar in design to the battery in a gasoline-powered vehicle. The batteries contain sulfuric acid which can cause severe skin or eye damage if allowed to contact these areas. Follow all safety precautions outlined in the EV-Specific Precautions prior to working on the battery pack.

WARNING!

BATTERIES NORMALLY PRODUCE EXPLOSIVE GASES WHICH CAN CAUSE PERSONAL INJURY OR DEATH. DO NOT ALLOW FLAMES, SPARKS OR LIGHTED SUBSTANCES TO COME NEAR THE BATTERIES. WHEN CHARGING OR WORKING NEAR THE BATTERIES, ALWAYS SHIELD YOUR FACE AND PROTECT YOUR EYES. ALWAYS PROVIDE ADEQUATE VENTILATION.

Brake Fluid

CAUTION:

When adding brake fluid to the brake reservoir, avoid spilling fluid onto the vehicle's plastic panels, including the instrument panel. If brake fluid is spilled on any surface, wash it immediately with soap and water to prevent cracking, discoloration, or other damage.

Electric Shock

WARNING!

THE BATTERY PACK ASSEMBLY CAN DELIVER IN EXCESS OF 72 VOLTS OF DC POWER. IMPROPER HANDLING OF THE BATTERY PACK CAN RESULT IN INJURY OR FATALITY. ONLY AUTHORIZED PERSONNEL TRAINED TO WORK WITH BATTERY PACK COMPONENTS ARE PERMITTED TO HANDLE THE BATTERIES.

There are two electrical systems on the EV. A 72V high voltage system used to power the motor/gearbox. Orange color or orange wrapping on the harness bundle identifies high voltage wiring contained within the bundle. Components that have larger connectors, orange coverings on the wires, or warning labels contain or carry high voltage. The second is a 12V voltage system is used to operate the standard systems such as headlamps, windshield wipers and turn signals. These components should be treated with extreme caution. Do not perform any service on them until all system warnings and cautions are read and understood.

EV-Specific Precautions

When working on the 72-volt system the following precautions must be taken.

1. A buffer zone must be placed around the vehicle.
2. Rubber insulating gloves must be worn.
3. A face shield must be worn to shield the face and protect the eyes from electric arc.

Safety

Throughout this service manual there are paragraphs that are marked with a title of **WARNING**, or **CAUTION**. These special paragraphs contain specific safety information, and must be read, understood, and heeded before continuing the procedure, or performing the step(s).

WARNING!

A WARNING INDICATES AN IMMEDIATE HAZARD, WHICH COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH.

CAUTION:

A Caution indicates conditions that could result in damage to the vehicle or other property.

A third special paragraph that appears throughout this service manual is marked with the title of "Note"

A “Note” is a paragraph that describes essential service or maintenance information that relates to a particular step(s) or procedure. The “Note” must be read, understood and heeded before continuing with the procedure, or performing the step(s).

Note:

A note contains additional information to make the procedure, or step(s), more easily understood or implemented. Or it may contain essential maintenance information to assure proper operation of the vehicle.

Rubber Insulating Gloves Testing

Note:

The rubber insulating gloves that are to be worn while working on the high voltage system are rated for use on equipment of up to 1000volts. They must be inspected before each use and must always be worn in conjunction with the leather outer glove. Any hole in the rubber-insulating glove is a potential entry point for high voltage.

1. Roll the glove up from the open end until the lower portion of the glove begins to balloon from the resulting air pressure. If the glove leaks any air it must not be used.
2. The gloves should not be used if they exhibit any signs of wear and tear.
3. The leather gloves must always be worn over the rubber insulating gloves in order to protect them.
4. The rubber insulating gloves must be class "O" and meet all of the American Safety Testing Materials Standards.

Buffer Zone

Note:

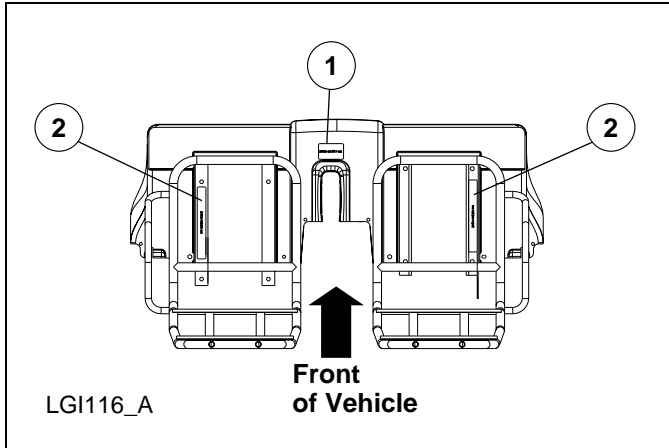
The buffer zone is required only when working on the 72-volt system.

1. Position the vehicle in the service bay.
2. Mark off a 1m (3ft) perimeter around the vehicle.
3. Do not allow any unauthorized personnel into the buffer zone during repairs involving high voltage. Only personnel trained for service on the high voltage system are to be permitted in the buffer zone.

Warning Labels

The vehicle is equipped with nine different warning labels. These labels are to assist in preventing the personal injury or death as a result of coming into contact with the high voltage current generated by, or used to operate, the component. The following illustrations show the locations of the warning labels.

Seat Stanchion Warning Labels



Item	Part Number	Description
1	00014	Parking Brake Warning Label
2	00014	High Voltage Warning Label

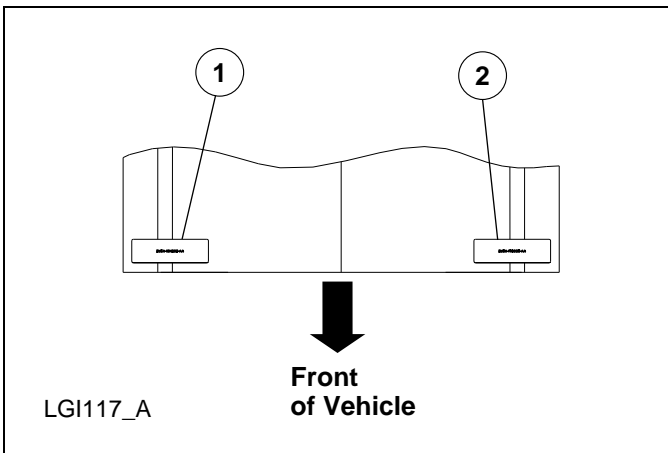
Parking Brake Warning Label



High Voltage Warning Label



Roof Warning Labels

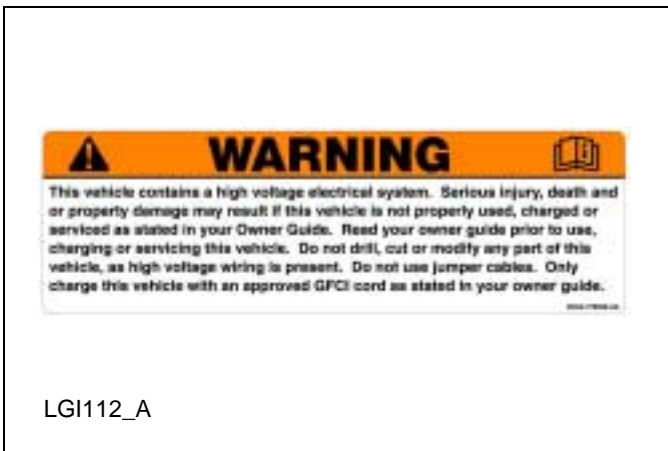


Item	Part Number	Description
1	00014	Slow Moving Vehicle Warning
2	00014	High Voltage Warning Label

Slow Moving Vehicle Warning

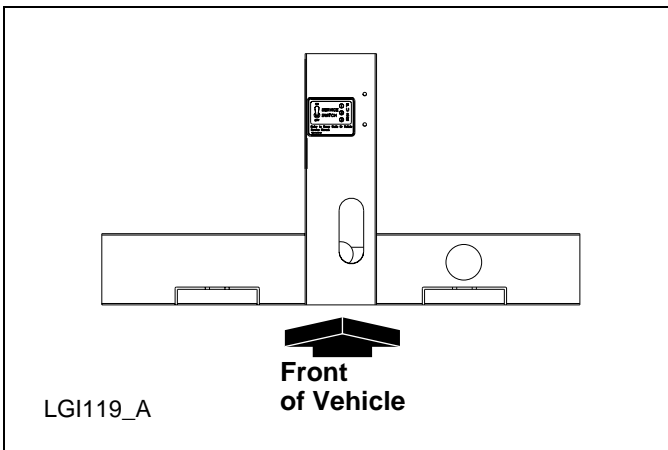


High Voltage Warning Label

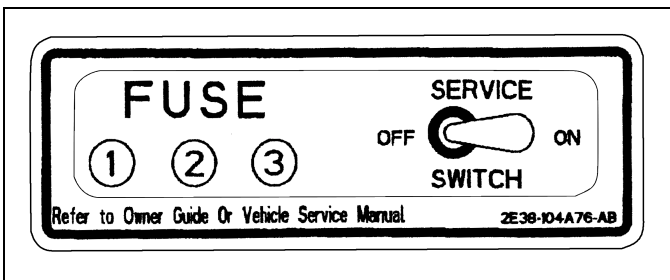
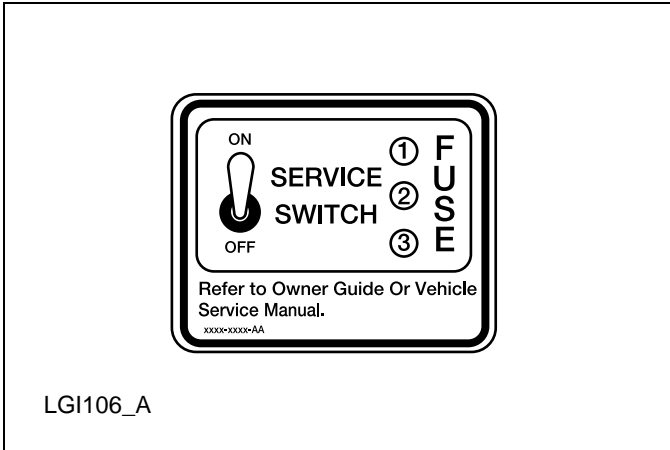


Seat Stanchion Support Warning Label

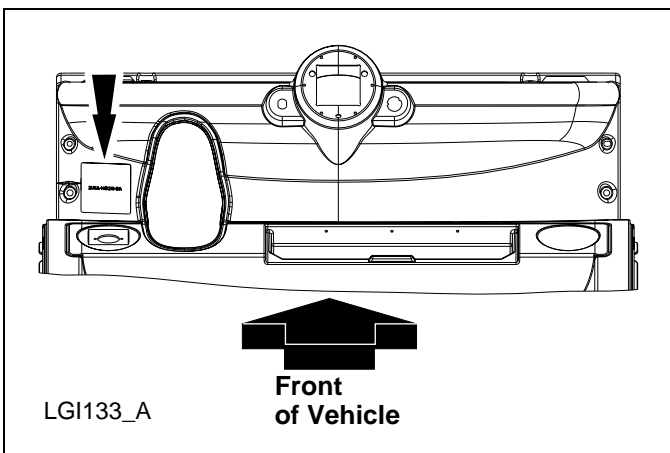
The seat stanchion support is located under the driver seat within the seat stanchion cover.



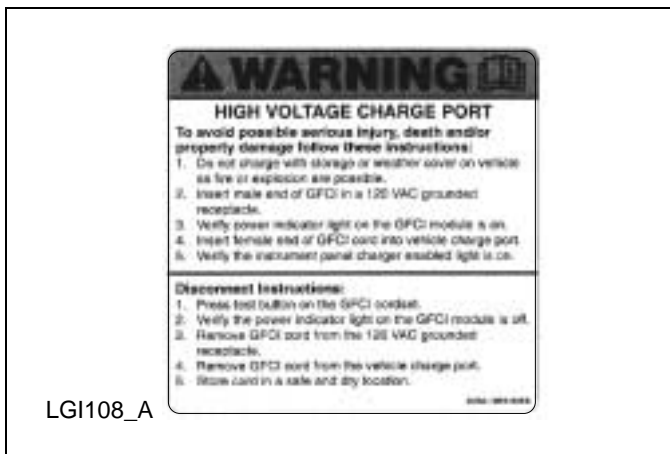
Service Disconnect Switch Labels



Instrument Panel Charge Warning Label



Charge Warning Label



Vehicle Identification Number (VIN) Label

The Vehicle Identification Number (VIN) label has seventeen digits and is located on the LH side of the instrument panel at the base of the windshield. The following is a breakdown of what each digit represents.

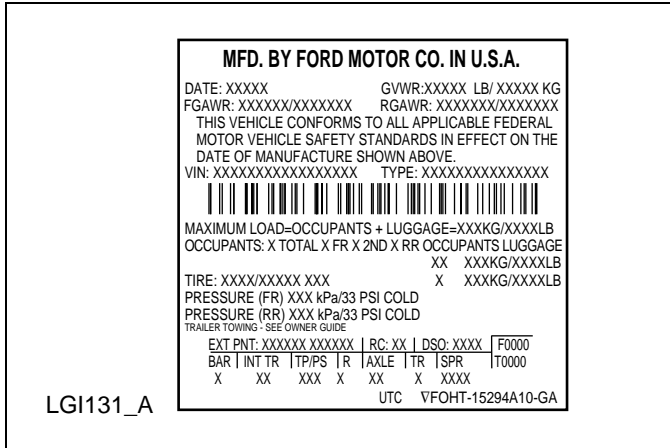


LGI115_A

Item	Position and Description	Code
1	Positions 1-3 World Manufacturer Identifier	1FA (Passenger vehicle produced in the U.S.)
2	Position 4 Restraint Code	B (Active belts only)
3	Positions 5-7 Body codes	P20 – 2 passenger, TH!NK Neighbor
		P21 – 2 passenger wagon, TH!NK Neighbor
		P22 – 4 passenger, TH!NK Neighbor
4	Position 8 Engine code	5 – 5Kw, 72V (350 amp), General Electric, Lead Acid Battery, 6hp
5	Position 9 Check Digit	0 - 9
6	Position 10 Model Year	2 – 2002MY
		3 – 2003MY
7	Position 11 Manufacture Plant	0 – Detroit Michigan (Detroit Empowerment Zone)
8	Position 12-17 Serialization	100001 – 599999

Certification Label

The certification label is located on the roof panel towards the rear of the vehicle.



Jacking, Lifting and Towing

Jacking

WARNING!

NEVER RUN THE MOTOR WITH ONE WHEEL OFF THE GROUND, SUCH AS WHEN CHANGING A TIRE. THE WHEEL STILL ON THE GROUND COULD CAUSE THE VEHICLE TO MOVE.

CAUTION:

Under no circumstances should the vehicle ever be lifted by the front control arms, rear trailing arms or halfshafts. Severe damage to the vehicle could result.

CAUTION:

Do not attempt to use a jack on the front or rear bumper. Damage to the bumpers will occur.

Front Jacking Point

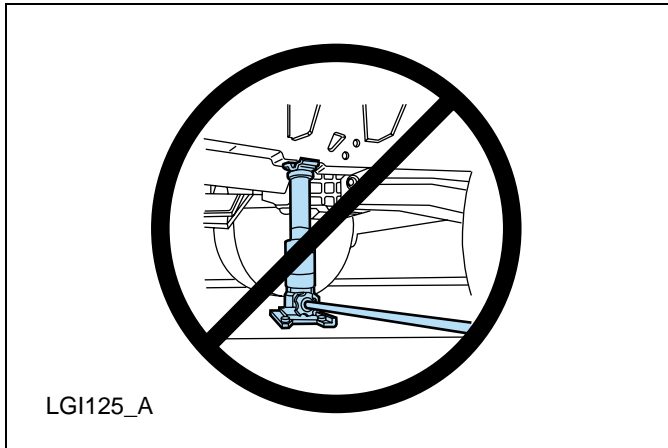


Rear Jacking Point



CAUTION:

The vehicle should not be lifted using a bottle type jack. Severe damage to the vehicle could result.

**Lifting****WARNING!**

NEVER RUN THE MOTOR WITH ONE WHEEL OFF THE GROUND, SUCH AS WHEN CHANGING A TIRE. THE WHEEL STILL ON THE GROUND COULD CAUSE THE VEHICLE TO MOVE.

CAUTION:

Under no circumstances should the vehicle ever be lifted by the front control arms, rear trailing arms or halfshafts. Severe damage to the vehicle could result.

CAUTION:

Do not attempt to use a jack on the front or rear bumper. Damage to the bumpers will occur.

Lift the vehicle using the appropriate lifting points as indicated.

Front Lifting Points

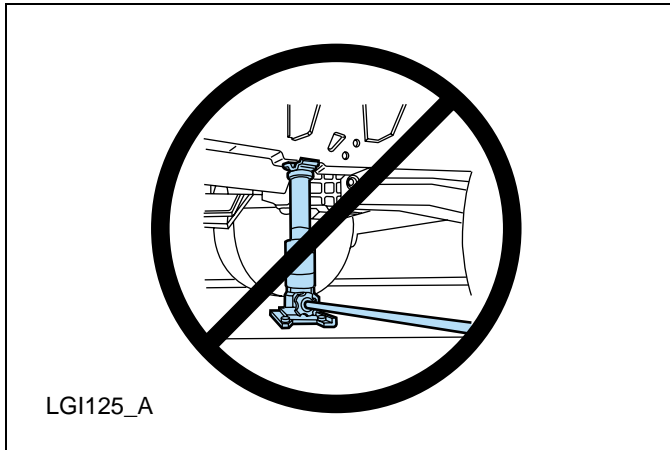


Rear Lifting Points



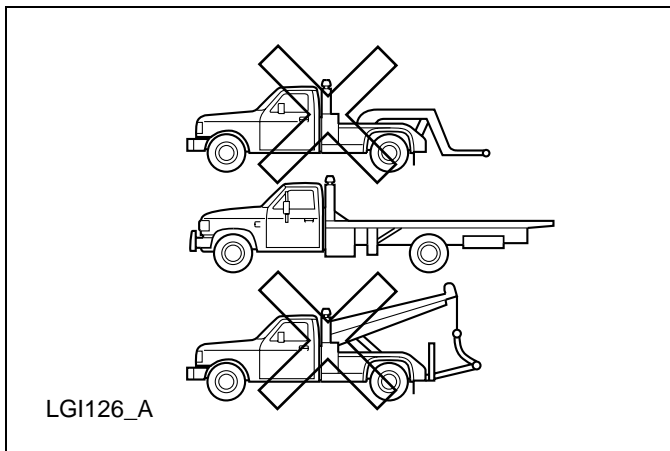
CAUTION:

The vehicle should not be lifted using a bottle type jack. Severe damage to the vehicle could result.

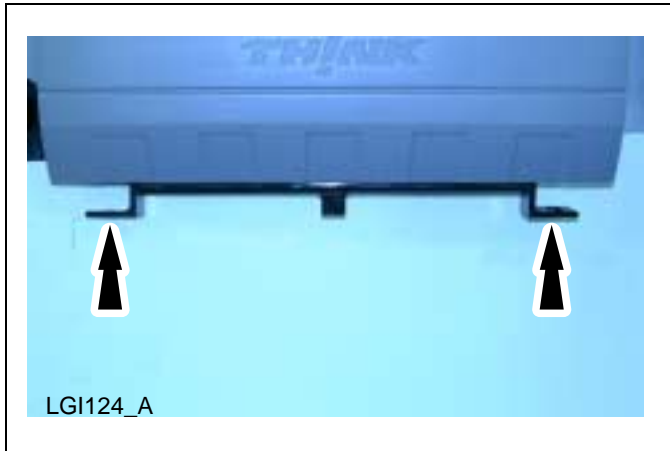
**Towing/Tow Hooks****CAUTION:**

Vehicle damage could occur if the vehicle is improperly towed or transported.

The vehicle should be towed on a flatbed tow truck. It should not be towed using a sling belt or wheel lift truck.



Each corner of your vehicle is equipped with a tow/tie down hook. Both front or both rear tow hooks must be used for towing or recovery operations. Additionally, when shipping or transporting, all 4 tow/tie down hooks must be used to prevent damage.



Battery Information

WARNING:

BATTERIES NORMALLY PRODUCE EXPLOSIVE GASSES THAT CAN CAUSE PERSONAL INJURY. THEREFORE, DO NOT ALLOW FLAMES, SPARKS OR LIGHTED SUBSTANCES TO COME NEAR THE BATTERIES. WHEN CHARGING OR WORKING NEAR A BATTERY, ALWAYS SHIELD YOUR FACE AND PROTECT YOUR EYES. ALWAYS PROVIDE VENTILATION.

WARNING:

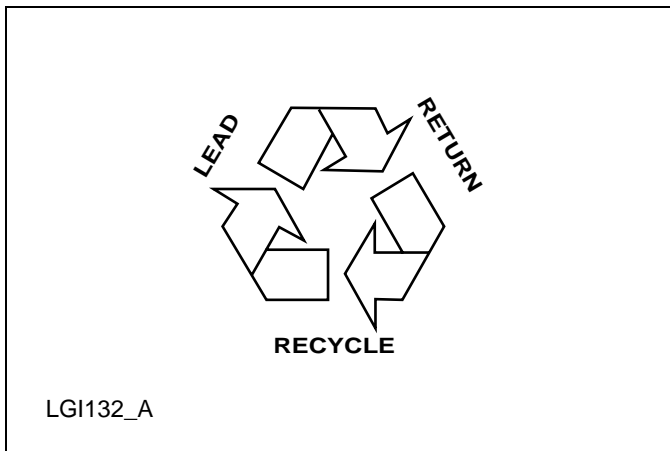
WHEN LIFTING A BATTERY, EXCESSIVE PRESSURE ON THE END WALLS COULD CAUSE ACID TO SPEW THROUGH THE VENT CAPS, RESULTING IN PERSONAL INJURY. LIFT WITH A BATTERY CARRIER OR WITH YOUR HANDS ON OPPOSITE CORNERS.

WARNING:

KEEP OUT OF REACH OF CHILDREN. BATTERIES CONTAIN SULFURIC ACID. AVOID CONTACT WITH SKIN, EYES OR CLOTHING. ALSO, SHIELD YOUR EYES WHEN WORKING NEAR THE BATTERIES TO PROTECT AGAINST POSSIBLE SPLASHING OF THE ACID SOLUTION. IN CASE OF ACID CONTACT WITH THE SKIN OR EYES, FLUSH IMMEDIATELY WITH WATER FOR A MINIMUM OF 15 MINUTES AND GET PROMPT MEDICAL ATTENTION. IF ACID IS SWALLOWED, CALL A PHYSICIAN IMMEDIATELY.

WARNING!

THE BATTERY PACK ASSEMBLY CAN DELIVER IN EXCESS OF 72 VOLTS OF DC POWER. IMPROPER HANDLING OF THE BATTERY PACK CAN RESULT IN INJURY OR FATALITY. ONLY AUTHORIZED PERSONNEL TRAINED TO WORK WITH BATTERY PACK COMPONENTS ARE PERMITTED TO HANDLE THE BATTERIES.



TH!NK Mobility strongly recommends that lead-acid batteries be returned to an authorized recycling facility for disposal.

Battery Types

There are two types of batteries, which may be used in the neighbor:

Flooded, or wet

Maintenance free, or gel

Both utilize lead acid technology. As the name implies, maintenance-free or gel batteries do not require addition of electrolyte. Flooded, or wet, batteries require periodic addition of deionized or distilled water.

Do not mix battery types within a battery pack. Use either six flooded batteries, or six maintenance free, or gel, batteries in a battery pack.

Flooded type batteries are identified by the following:

1. Fill caps have slots in the top of them and are threaded into the battery, visible from the top.
2. Deionized or distilled water must be added periodically.
3. The case of the battery is black in color.

4. There is no carrying handle built in to aid in removal and installation.
5. Part number 10655-AA

Maintenance Free (Gel type) batteries are identified by the following:

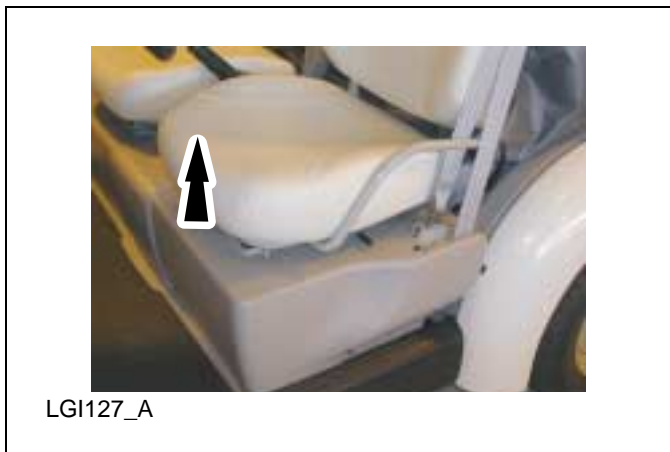
1. Fill caps are a hexagonal shape and are permanently installed. They are not intended to be removed and non-serviceable. DO NOT OPEN
2. The case of the battery is gray in color.
3. There is a handle built in to aid in removal and installation.
4. Part number 10655-BA

Battery Fill Procedure – Flooded Batteries Only

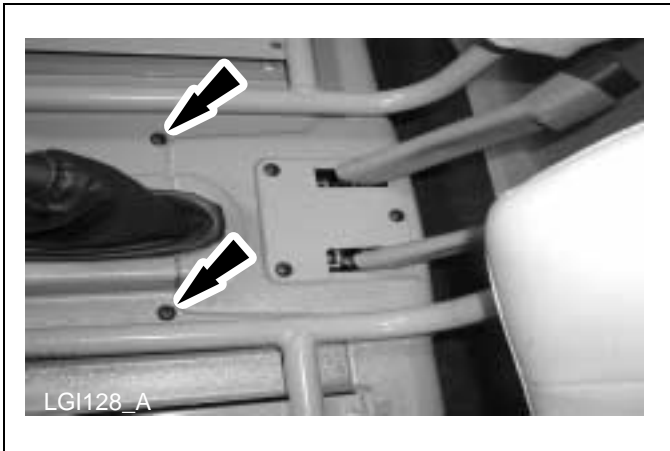
Note:

Be sure you have correctly identified the type of battery installed in the vehicle. Do not add electrolyte to maintenance-free, or gel, batteries. For additional information, refer to [Battery Types](#) in this section.

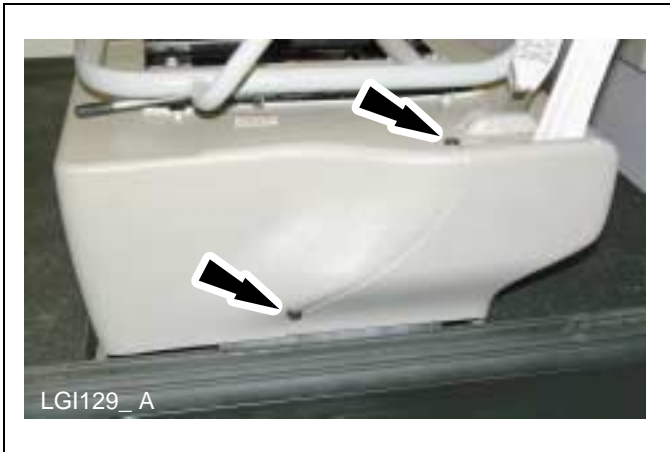
1. Pull straight up on the front seat cushions to release the clips.



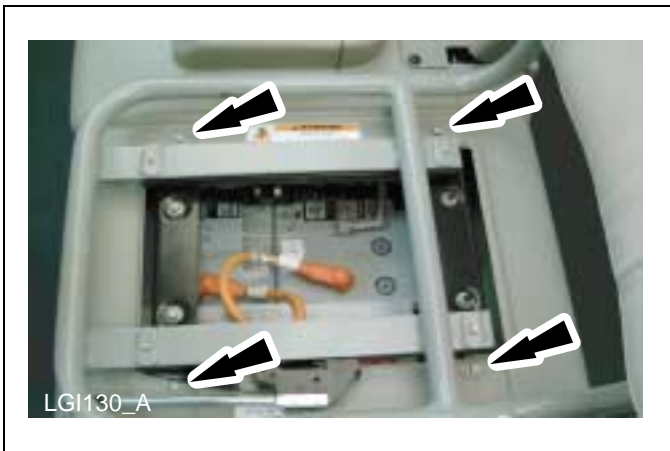
2. Remove the two center pushpins.



3. From both sides of the vehicle, remove the two pushpins.

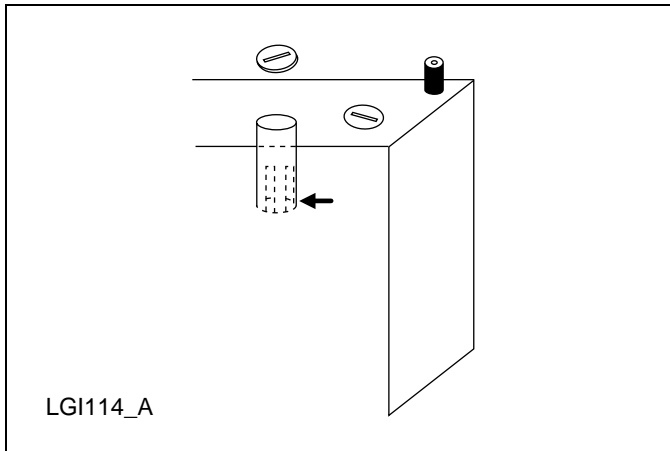


4. From both sides of the vehicle, remove the four seat stanchion cover bolts.

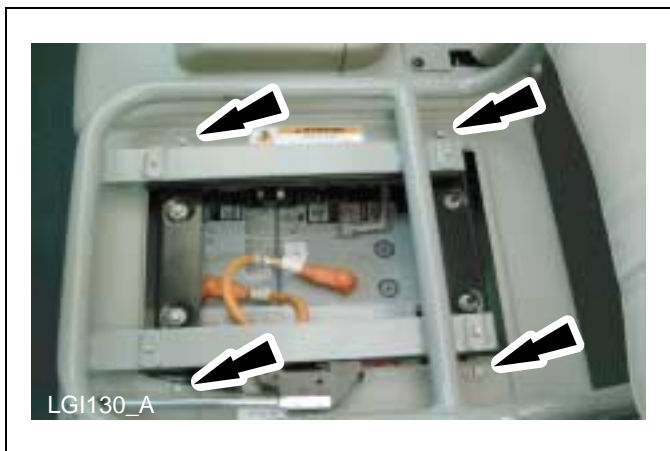


5. Carefully slide the seat stanchion cover forward and remove from the vehicle.

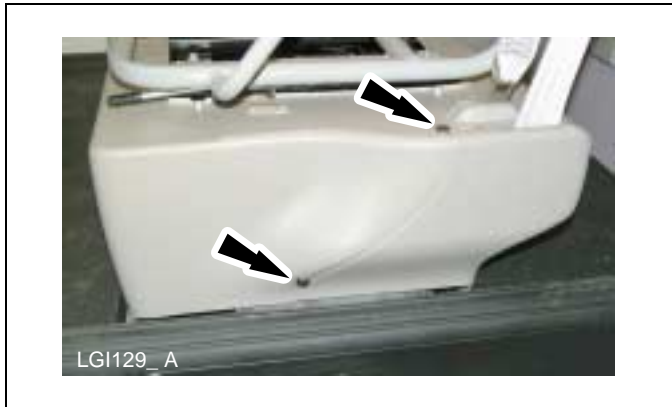
6. Remove each battery cell cap. Make sure battery fluid is visible at the bottom of the slotted cup. If fluid is not visible, fill with demineralized water or distilled water until level reaches bottom of slotted cup.



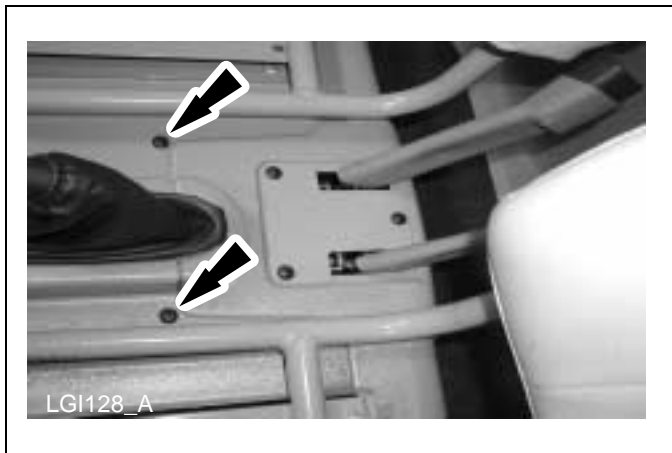
7. Install the battery cell caps.
8. Carefully slide the seat stanchion cover rearward over the batteries and stanchion support.
9. From both sides of the vehicle, install the four seat stanchion cover bolts. Tighten the seat stanchion cover bolts to 20-25N.m. (15-18 lb-ft.)



10. From both sides of the vehicle, install the two pushpins.



11. Install the two center pushpins.



12. Slide the seat cushion as far back on the seat as possible and press down firmly to lock in place.

Battery Charging

Battery charging requires 120volt AC 15A service. The GFCI (ground fault circuit interrupt) charge cord supplied with the vehicle plugs directly into the charge inlet located in the left side of the front kickup. Approximately 8-10 hours are needed to replenish a 20% (one bar showing) charged battery pack. Charge the vehicle whenever the state of charge is less than 80% (four bars showing), to maximize your travel range and prolong the battery life.

The battery charger receives 120volt AC power from an external standard grounded 3-prong 15A outlet and converts it to DC energy. The battery charger only operates when a GFCI charger cord is plugged into your vehicle. If the battery charger detects any presence of AC current (from the GFCI charger cord), the vehicle cannot be started or driven.

WARNING!

THERE ARE HYDROGEN GASES AROUND THE BATTERIES THAT CAN EXPLODE IF EXPOSED TO FLAMES, SPARKS, OR LIT CIGARETTES. THE AMOUNT OF HYDROGEN GAS IS INCREASED DURING BATTERY CHARGING. AN EXPLOSION COULD RESULT IN PERSONAL INJURY OR VEHICLE DAMAGE.

WARNING!

BATTERIES CONTAIN SULFURIC ACID, WHICH CAN BURN SKIN, EYES, AND CLOTHING, IF CONTACTED.

CAUTION:

Do not allow the vehicle to remain in a discharged state, as the batteries may be permanently damaged and vehicle range will be decreased.

To recharge the vehicle batteries:

Note:

Use only the GFCI cord supplied with the vehicle. If the GFCI cord does not fit the receptacle, have a qualified electrician install the proper outlet.

Note:

The outlet must be properly installed and grounded in accordance with all local codes and ordinances.

1. Park the vehicle within GFCI charger cord length of a 120 volt AC 15A grounded 3-prong wall outlet.
2. Place the key in the black dot (off) position, remove the key and set the parking brake.

Note:

Make sure the power point, if equipped, is not in use.

3. Plug the GFCI charger cord into the 120volt AC 15A grounded 3-prong wall outlet. Do not use any plug adapters or extension cords to make the electrical connection.
4. Open the charge inlet access door. Make sure that the inlet is clean and dry.

CAUTION:

If the vehicle is allowed to sit in conditions of -6°C (20°F) or less with a state of charge of 20% (one bar showing on gauge) or less, the batteries could freeze. Allowing the batteries to freeze may cause permanent damage to the batteries and permanently reduce their capacity. In cold conditions, place the vehicle in an area warmer than 0°C (32°F) and allow it to warm up before charging. Never charge the vehicle if the batteries may be frozen. Allow the batteries to warm above 0°C (32°F) first, then charge.

CAUTION:

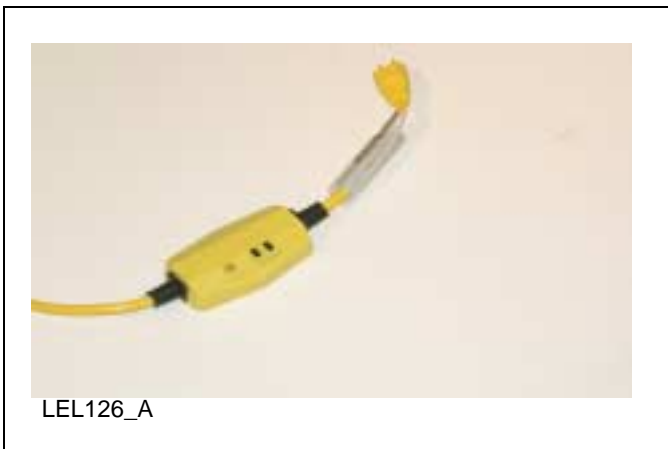
Do not park and leave the vehicle with discharged batteries. The batteries could discharge to the point where damage could occur and the battery charger will not charge.



5. Align the GFCI charger cord with the charge inlet and fully insert the plug into the outlet.



6. Verify the POWER indicator is illuminated on the GFCI charger cord. Also, the battery charge indicator on the instrument panel cluster will illuminate during the charging process.



Note:

The humming noise you will hear is the transformer on the charger, which will operate regardless of whether the vehicle is accepting the charge.

Note:

If the charge indicator fails to display make sure the service disconnect switch is in the “ON” position. If the service disconnect switch is on while charging and charge indicator fails to display, refer to the following flowchart.

To stop charging the vehicle batteries:

1. Push the TEST button on the GFCI charger cord. Verify the power indicator on the GFCI is off.

2. Disconnect the GFCI charger cord from the wall outlet.
3. Disconnect the GFCI charger cord from the charge inlet.
4. Close the charge inlet access door.
5. Store the cord in a safe and dry location.

Vehicle Storage - Battery

WARNING:

TO AVOID SERIOUS INJURY AND/OR DEATH, NEVER PERFORM ANY VEHICLE SERVICE OR MAINTENANCE WHILE THE ELECTRICAL LEAKAGE WARNING IS ILLUMINATED. REFER TO LEAKAGE DETECTION IN THE ELECTRICAL SECTION AND RESOLVE THE LEAKAGE CONDITION PRIOR TO BEGINNING OTHER REPAIRS.

The service disconnect switch (see photo below) is located either under the driver seat cushion or toward the center of the vehicle behind the parking brake lever within the seat stanchion. The front of the seat stanchion cover should be removed to access the service disconnect switch and the fuse holders on vehicles with the switch located behind the parking brake lever. It is not encouraged to blindly reach down through the opening on top of the driver's side seat stanchion cover when the cushion is removed.

The vehicle can be stored for 14 days with the service disconnect switch on. This assumes a full charge when stored. If 14 days is exceeded or the batteries were not fully charged prior to storing, the vehicle batteries may be severely discharged resulting in permanent damage. This would reduce the batteries capacity and vehicle range.

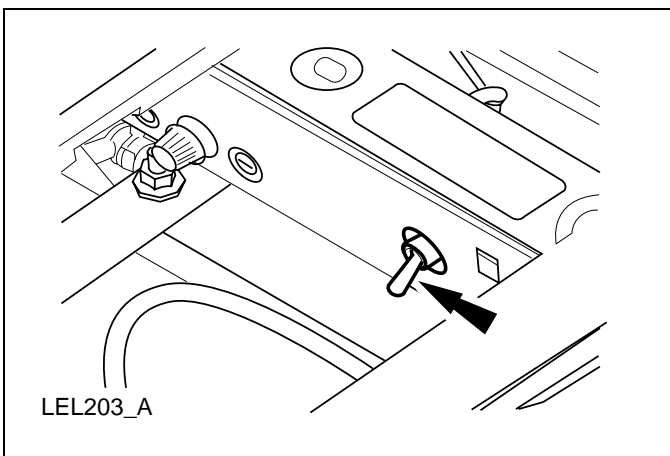
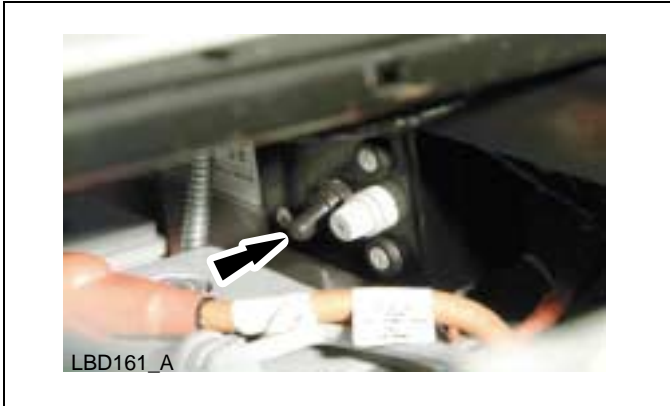
The vehicle can be stored for six months with the service disconnect switch off if starting with a full charge; however, the vehicle should be charged monthly if possible. With the service disconnect switch in the OFF position, there is a minimal draw from the vehicle components. The battery self-discharge determines the storage time. This is less than 5% per month at temperatures between 40 and 70° F (21° C). The self-discharge rate increases slightly at higher temperatures. If the batteries are nearly discharged then they may freeze at 32° and below. This will cause severe damage that may even cause battery case damage and leakage of the electrolyte.

When storing the neighbor:

1. Make sure the batteries are fully charged. Refer to [Battery Charging](#) in this section.
2. If storing the vehicle for more than 14 days, toggle the service disconnect switch to the off position.

Note:

Service disconnect switch location could be either under the driver seat or below and behind the parking brake lever.



Battery Water Reminder Indicator Resetting (Flooded Batteries Only)

Caution:

If the vehicle is equipped with flooded batteries, the instrument cluster gauge must be programmed for flooded batteries. Damage to the batteries can occur if the battery type is incorrectly programmed. Refer to [Battery Type Reprogramming](#) in this section.

Note:

The battery water reminder function of the instrument cluster gauge must be reset whenever the battery water has been checked and filled. The indicator will illuminate every 300miles (483kms). Battery electrolyte levels should be checked every 300 miles (483kms) or monthly, whichever comes first. The only time the battery water indicator can be reset is when the key is in the R (Reverse) position, the instrument cluster gauge is in the flooded battery mode and the battery water reminder indicator is on.

1. Turn the key to R (Reverse) position.
2. Press and hold the Select/Reset button for over 3 seconds.
3. Turn the key to the OFF (black dot) position.

Battery Type Reprogramming

CAUTION:

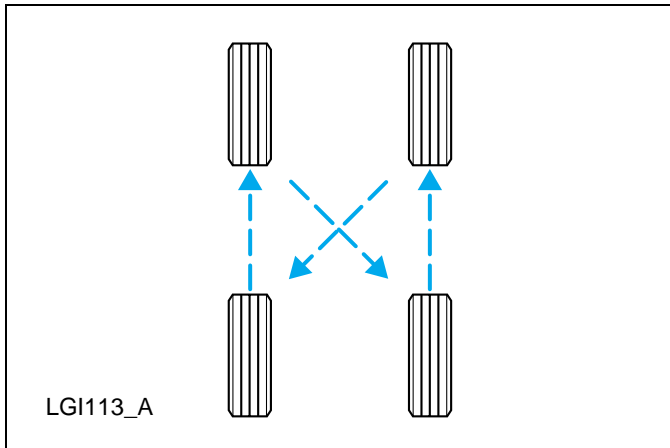
If the type of battery (flooded to gel, gel to flooded) is being changed, the instrument cluster gauge must be reprogrammed to avoid battery pack damage. The charging rate differs between type of battery and the battery water reminder indicator must be turned on for flooded type batteries.

1. With the key in the OFF (black dot) position, press and hold down the Select/Reset button.
2. Turn the key to the D (Drive) position.
3. Release the Select/Reset button.
4. Turn the key to the R (Reverse) position.
5. Press and release the Select/Reset button to alternate between the flooded and sealed battery modes.

6. Turn the key to the OFF (black dot) position. The gauge will automatically exit the reprogramming mode after 10 seconds.

Tire Rotation

The tire rotation pattern is the same as on other rear wheel drive vehicles. The front wheels move to the opposite side of the vehicle at the rear position. The rear wheels move to the same side of the vehicle at the front position.



Maintenance Schedule

WARNING:

TO AVOID SERIOUS INJURY AND/OR DEATH, NEVER PERFORM ANY VEHICLE SERVICE OR MAINTENANCE WHILE THE ELECTRICAL LEAKAGE WARNING IS ILLUMINATED. REFER TO LEAKAGE DETECTION IN THE ELECTRICAL SECTION AND RESOLVE THE LEAKAGE CONDITION PRIOR TO BEGINNING OTHER REPAIRS.

Regular Interval	Item	Service
Daily service (by owner)	Batteries	Charge batteries after each use.
Monthly service (by owner or technician)	Batteries	Flooded Only-Check electrolyte level. Add distilled or demineralized water as necessary.
		Wash battery tops and clean terminals with baking soda/water solution. Dispose of wastewater properly.
	Tires	Check air pressure and adjust as necessary.
	General Vehicle	Wash battery compartment and underside of vehicle. Dispose of the wastewater properly.
Semi-annual service by a qualified technician	Brake system	Check brake shoes.
		Lubricate brake slides.
	Brake linkage and pivots	
Front wheel alignment	Check and adjust as required.	
Annual service by a qualified technician	Batteries	Test batteries. Check for proper battery terminal tightness.
	Gearbox	Drain/fill gearbox fluid.
	Front suspension	Inspect and lubricate front wheel bearings.
	Brake system	Pushrod locknut for tightness.