

3. BATTERIES

SAFETY PRECAUTIONS

1. Combustible gases are produced when the batteries are being charged. Be sure that there is adequate ventilation when charging indoors. Connect a hose to the battery compartment outlet (Fig. 3-1) and vent the charging fumes outdoors.
2. When performing battery service, do not allow acid to come in contact with your skin, clothing, or the vehicle. Battery service should only be performed where emergency wash stations are available. Protective acid-proof clothing and eye protection should always be worn when working on batteries.
3. If battery acid is spilled, immediate action is required check or to eliminate its corrosive effects.

EXTERNAL: Flush with cold water.

EYES: Flush with cold water for 15 minutes, and then get medical attention immediately.

INTERNAL: Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately.

CAR OR CLOTHING: Should be washed immediately with cold water and the area neutralized with or household ammonia solution. Bleaching or other damage can result.

The battery pack consists of 18 six-volt modules of three cells each. The nominal voltage of the pack is 108 volts. However, depending on the state of charge, the voltage could range from as low as 80 volts to as high as 145 volts. The pack is protected by a current limiting fuse located at approximately the half voltage point. (Fig. 34) Refer to the battery specifications for the correct fuse application.

Main battery pack power is totally isolated from the vehicle chassis, circuits conducting main battery pack power must never be connected to chassis ground.

Battery maintenance requirements consist of inspection and testing that must be performed at weekly and monthly intervals. All inspection and testing should be performed on fully charged battery packs.

Electrolyte level must be maintained just at the indicator ring at the bottom of the filler hole. When topping up the cells, always use distilled water. Contaminated water will shorten battery life and reduce performance. Refer to the battery specifications for acceptable water impurity levels.

Fully charged cells should have a specific gravity of 1.310 at 77°F (25°C).

During the first few months of operation, it may be necessary to conduct an equalization charge in order to achieve this high specific gravity.

To equalize the cells, first complete a full charge cycle on high voltage input. Following this, leave the vehicle on charge for an additional eight hours with the low (115 VAC) input.

Located under the hood is a 12-volt storage battery to provide power for the lights, wipers, radio, blowers, and controller.

The specific gravity of the 12volt accessory battery should be 1.265 at 80°F (27°C) when fully charged.

Be sure to conduct these tests only on fully charged batteries and to use a high quality temperature compensated hydrometer. (Fig. 3-3)

Batteries with cells that vary by .050 or more after equalization charging must be replaced. At monthly intervals, the specific gravity of each cell must be checked and recorded. In this way, any cells that show a tendency to be weak can be monitored.

Do not dilute the electrolyte by overfilling or by losses during specific gravity tests. To do so will reduce performance and battery life.

In the sedan model, an inspection panel at the rear of the battery compartment cover allows access to a row of pilot cells. (Fig. 3-4) Check the level and specific gravity of the electrolyte in these cells. If any of them are low, the battery compartment cover must be removed and the entire pack must be checked.

To remove the cover, disconnect the air outlet duct at the rear of the cover. Release the six rubber latches around the perimeter of cover and lift it out of the vehicle through the rear hatch opening.

On the pickup truck model it will be necessary to lower the rear pack to check the cells. If any of them are low, the front pack will have to be lowered also.

To lower the battery packs, the vehicle must be raised so that the bottom of the battery packs are at least 26" from the floor. Fasten the spring restrainers (see Section 2) to the axle housing. Disconnect the main leads at the quick disconnect fitting on the left side of the pack. Disconnect the ventilation ducts at the front and rear of the pack. Support the pack from underneath with a suitable lifting device. Remove the four bolts holding the battery pack to the underside of the vehicle and lower the pack.

The cable connections at each battery should be checked during the monthly inspection. Clean and tighten the cables as necessary to maintain maximum performance. Replace the red anti-corrosion pads when they are no longer moist. Also be sure to keep the tops of the batteries clean and dry.

NOTE: The condition of the batteries and the battery cable connections are the major factors in maintaining optimum performance levels. Do not neglect them. Damaged battery cells cannot be repaired, they must be replaced. Poor connections reveal themselves by overheating. Inspect carefully any cable that appears warmer than its counterparts.

CAUTION: Under conditions of high current demand, a connection can become extremely hot, even to the point of melting the cable end and/or battery post.

BATTERY SPECIFICATIONS

Main Propulsion Batteries: (Note: Battery availability at time of vehicle manufacture may necessitate substitution of a different battery of similar specifications.)	EVI130, ESB, Inc.
Number:	18
System Voltage:	108 VDC
Capacity:	130 minutes @ 75 amp to 94.5 V. 162.5 AH minimum.
Specific Gravity of Electrolyte:	1.310 @ 77°F (25°C) (fully charged)
Fuse:	Sedan Bussman FWA 300/350 Pickup Bussman FWA 350
Accessory Battery:	Sears Diehard Marine/RV #9650
Voltage:	12 VDC
Capacity:	66 amp hours (25 amps to 10.5 volts)
Specific Gravity of Electrolyte:	1.265 @ 80°F (27°C) (fully charged)

BATTERY SPECIFICATIONS
RECOMMENDED ALLOWABLE
IMPURITIES IN WATER

<u>IMPURITY</u>	<u>CALCULATED AS</u>	<u>PARTS PER MILLION</u>
Color		Clear and white
Suspended Matter		Trace
Total Solids		100
Calcium and Magnesium Oxides	CaO & MgO	40
Iron	FE	5.0
Ammonia	NH ₄	8.0
Organic & Volatile Matter		50
Nitrates	NO ₃	10
Nitrates	NO ₂	5.0
Chloride	C ₁	5.0

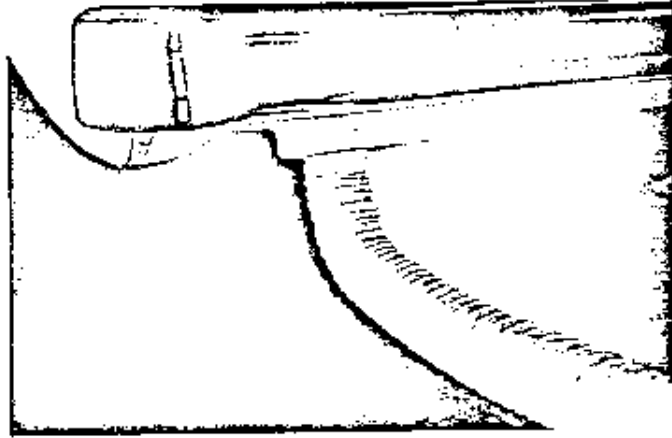


FIG. 3-1

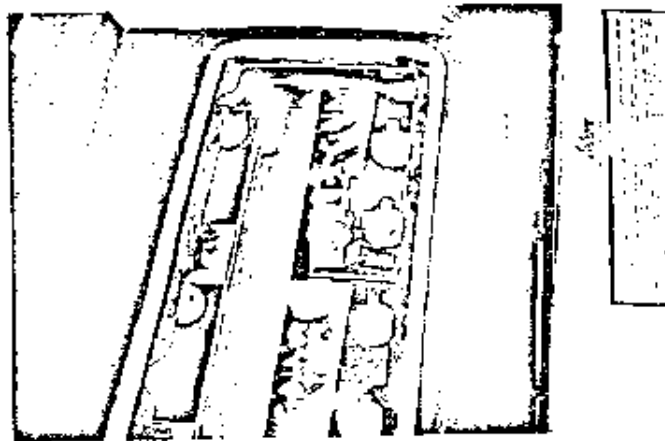


FIG. 3-2

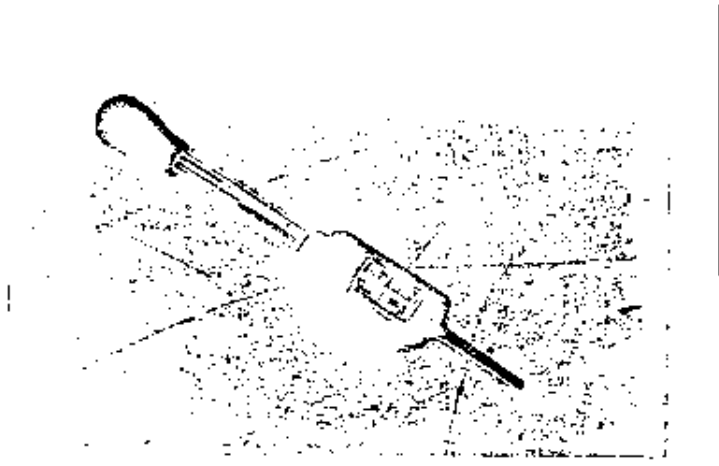


FIG. 3-3

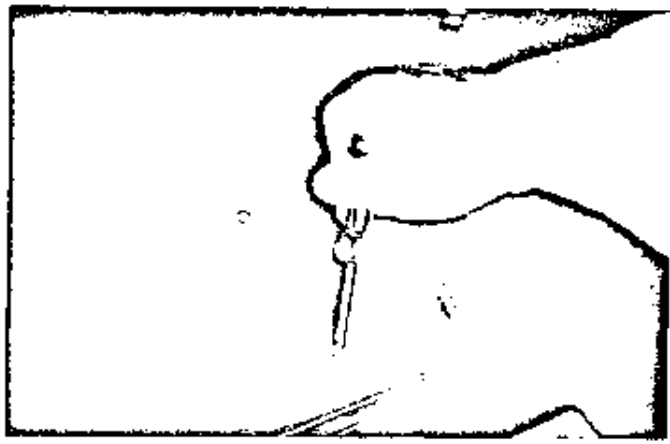


FIG. 3-4