



Mobile Communications



STANDARD M-RK
VEHICULAR CHARGER
344A4616P1

ENHANCED M-RK
VEHICULAR CHARGER
344A4616P2

**Installation/
Operator's Manual**

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SAFETY INFORMATION

The operator of any mobile radio should be aware of certain hazards common to the operation of vehicular radio transmissions. **A list of several possible hazards is given:**

- 1. Explosive Atmospheres** - Just as it is dangerous to fuel a vehicle with the motor running, similar hazards exist when operating a mobile radio, be sure to turn the radio off while fueling the vehicle. Do not carry containers of fuel in the trunk of the vehicle if the radio is mounted in the trunk.
- 2. Interference to Vehicular Electronics Systems** - Electronic fuel injection systems, electronic anti-skid braking systems, electronic cruise control systems, etc., are typical electronic systems that may malfunction due to the lack of protection from radio frequency energy present when transmitting. If the vehicle contains such equipment, consult the dealer and enlist his aid in determining the expected performance of electronic circuits when the radio is transmitting.

3. **Dynamite Blasting Caps** - Dynamite blasting caps may be caused to explode by operating a radio within 500 feet of the blasting caps. Always obey the "**Turn Off Two-Way Radios**" signs posted where dynamite is being used.

When transporting blasting caps in your vehicle:

- a. Carry the blasting caps in a closed metal box with a soft lining.
 - b. Leave the radio **OFF** whenever the blasting caps are being put into or removed from the vehicle.
4. **Radio Frequency Energy** - To prevent burns or related physical injury from radio frequency energy, do not operate the transmitter when anyone outside of the vehicle is within two feet of the antenna.
5. **Liquefied Petroleum (LP) Gas Powered Vehicles** - Mobile radio installations in vehicles powered by liquefied petroleum gas with the LP gas container in the trunk or other sealed-off space within the interior of the vehicle must conform to the **National Fire Protection Association standard (NFPA) 58** requiring:
 - a. The space containing the radio equipment shall be isolated by a seal from the space containing the LP gas container and its fittings.
 - b. Outside filling connections shall be used for the LP gas container.
 - c. The LP gas container shall be vented to the outside of the vehicle.

CAUTION

<p>Before jump starting or changing the vehicle battery, it is strongly suggested that the 3A fuse located in the Yellow lead (IGN A+) be removed. This will insure that the radio is protected from damage during the battery charging process. Replace fuse when charging is completed.</p>

SAFE DRIVING RECOMMENDATIONS FOR USERS OF MOBILE RADIOS RECOMMENDED BY AAA

- Read the literature on the safe operation of the radio.
- Keep both hands on the steering wheel and the microphone in its hanger whenever the vehicle is in motion.
- Place calls only when vehicle is stopped.
- When talking from a moving vehicle is unavoidable, drive in the slower lane. Keep conversations brief.
- If a conversation requires taking notes or complex thought, stop the vehicle in a safe place and continue the call.
- Whenever using a mobile radio exercise caution.

OPERATING RULES AND REGULATIONS

Two-way FM radio systems must be operated in accordance with the rules and regulations of the Federal Communications Commission (FCC). As an operator of two-way radio equipment, you must be thoroughly familiar with the rules that apply to your particular type of radio operation. Following these rules helps eliminate confusion, assures the most efficient use of the existing radio channels, and results in a smoothly functioning radio network.

When using your two-way radio, remember these rules:

1. It is a violation of FCC rules to interrupt any distress or emergency message. As your radio operates in much the same way as a telephone "**party line**", always listen to make sure that the channel is clear before transmitting. Emergency calls have priority over all other messages. If someone is sending an emergency message - such as reporting a fire or asking for help in an accident - ***KEEP OFF THE AIR!***
2. The use of profane or obscene language is prohibited by Federal law.

3. It is against the law to send false call letters or false distress or emergency messages. The FCC requires that you keep conversations brief and confine them to business. To save time, use coded messages whenever possible.
4. Using your radio to send personal messages (except in an emergency) is a violation of FCC rules. You may send only those messages that are essential for the operation of your business.
5. It is against Federal law to repeat or otherwise make known anything you overhear on your radio. Conversations between others sharing your channel must be regarded as confidential.
6. The FCC requires that you identify yourself at certain specific times by means of your call letters. Refer to the rules that apply to your particular type of operation for the proper procedure.
7. No changes or adjustments shall be made to the equipment except by an authorized or certified electronic technician.

IMPORTANT

<p>Under U.S. law, operation of an unlicensed radio transmitter within the jurisdiction of the United States may be punishable by a <i>fine of up to \$10,000, imprisonment for up to two years, or both!</i></p>

OPERATING TIPS

The following conditions tend to reduce the effective range of two-way radios and should be avoided whenever possible:

- Operating the radio in areas of low terrain, or while under power lines or bridges.
- Obstructions such as mountains and buildings.

In areas where transmission or reception is poor, some improvement may be obtained by insuring that the antenna is vertical.

Moving a few yards in another direction or moving to a higher elevation may also improve communication.

INTRODUCTION

The Ericsson GE M-RK Standard Vehicular Charger (344A4616P1) and Enhanced Vehicular Charger (344A4616P2) units can be used with both the M-RK I and M-RK II Personal radios with swivel mount or belt clips attached. Any of the four batteries listed below can be used with the MR-K I, or II radios and these chargers.

19A149838P1	1200 mAh
19A149838P2	1200 mAh (intrinsically safe)
344A3278P1	1700 mAh
344A3278P2	1700 mAh (intrinsically safe)

A vehicular charger enhances the operational versatility of an M-RK radio in the mobile environment. See Table 1 for the features of each unit.

The Standard Vehicular Charger (Repeater) (344A4616P1) is designed to provide recharge of M-RK radio batteries without provision for operation while in the charger. With this model charger, M-RK radio operation is only possible outside of the charger. The vehicular repeater is automatically disabled when the M-RK radio is placed in the Charger and the unit performs the charging function. The Charger has an ON/OFF repeater enable switch for operation with the M-RK radio outside the Charger. Both fast and slow charge rates are built into the charger that operate automatically based upon battery pack voltage and temperature.

The Enhanced Vehicular Charger (344A4616P2) simultaneously charges the M-RK's battery pack while allowing the radio to operate as a mobile radio with an external antenna, speaker, and microphone. The same fast and slow charge rates are provided (as in Part 1) that depend upon the battery pack voltage and temperature conditions. Mobile radio operation is accomplished through the use of an external speaker, external microphone and external antenna connections. A speaker amplifier in the charger unit provides up to 10 watts of audio output power to an external speaker. A volume control on the charger

provides audio level adjustment for the external speaker. The MRK's volume setting does not affect the audio level of the charger.

With the Enhanced charger, operation of the M-RK radio while inserted in the charger is possible even though the NICAD battery is completely discharged.

Table 1 gives feature comparisons for the two vehicular chargers and Figure 1 shows the Front Panels of both units.

TABLE 1 - FEATURES

FEATURE	STANDARD	ENHANCED
Fast Charge	Yes	Yes
Slow Charge	Yes	Yes
Dead Battery Pack Operation	No	Yes
Charge and Ready Indicator Lights	Yes	Yes
Transmitter Enabled Indicator Light	No	Yes
Vehicular Repeater Enabled Indicator Light	Yes	No
10-Watt External Speaker Amplifier with Volume Control	No	Yes
External Microphone Control	No	Yes
External Antenna Connector	No	Yes

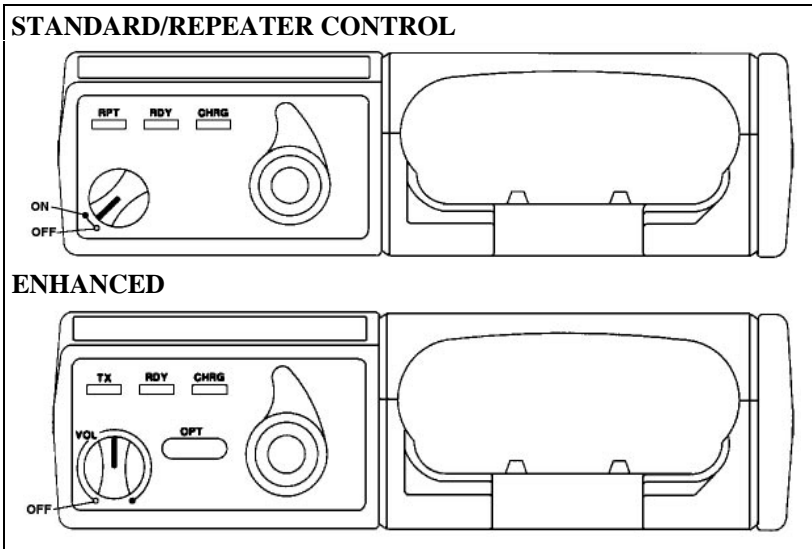


Figure 1- -Standard and Enhanced Vehicular Chargers

OPERATION

MOBILE CHARGER OPERATION

Operation of the Charger is possible in three configurations. (1) As a standard vehicular charger and repeater control, (2) as an Enhanced Charger providing added operational features, and (3) as an Enhanced Charger operating via the ORION™ Control Head. For operation in configuration (3) see the applicable Operator's Manual.

Standard Vehicular Charger (with Repeater) (344A4616P1)

Operation of the chargers is automatic when the M-RK personal radio is inserted. The radio is inserted in the charger when the battery needs recharging. With the charger standard model, no operation of the radio is possible while the radio battery is charging. Operation of the radio with this model charger is done after the personal radio battery is charged, it is removed from the charger and (normally) is taken outside the vehicle and operated via a repeater radio. Note that the vehicular repeater is automatically disabled when the radio is in

the charger unit for recharging. Charging commences immediately, whether or not the UDC INTERFACE is engaged.

The radio is normally operated via a vehicular repeater with this charger to improve communication range. For this operation, the operator takes the following steps:

1. Remove the radio from the charger.
2. Turn on the radio.
3. Turn on the vehicular repeater using the small knob at the lower left corner of the radio front panel. The RPT indicator light, in the upper left corner of the front panel, glows AMBER when the repeater is ON.
4. After monitoring the channel for activity and finding it free, press PTT and make your call.

Enhanced Vehicular Charger (344A4616P2)

The Enhanced Vehicular Charger (344A4616P2) allows the M-RK Personal radio to operate in the charger while the battery pack is simultaneously being charged. The procedure is as follows:

1. Before attempting to insert the M-RK personal radio in the charger, verify that the ROTARY LATCH KNOB is in the released position. If not, unlock if necessary and press down on the RELEASE BUTTON until the knob snaps to the released position.

NOTE

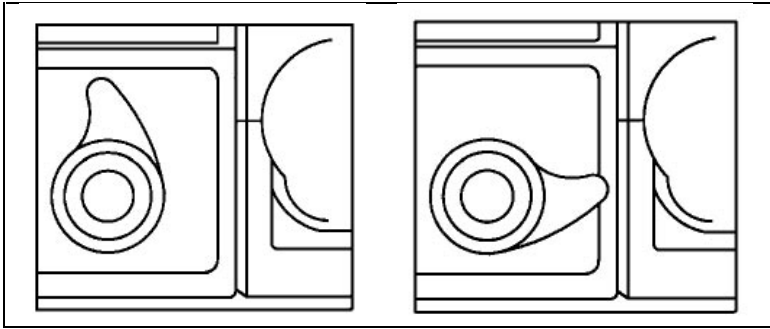
<p>NEVER insert nor remove the radio from the charger unit by pulling on the antenna, or using it as a handle, as this may damage the antenna.</p>

2. Insert the M-RK Personal Radio into the charger by sliding it down into the slot. The radio should be inserted so that the front of it faces the top of the charger unit (as shown in Figure 2). When fully inserted, the radio extends approximately 1/8" inch above the front of the charger. The fast charge begins immediately and the yellow charge indicator is illuminated.

4. Engage the UDC INTERFACE connector by turning the ROTARY LATCH KNOB approximately 1/4 turn in a clockwise direction until it clicks into the latched position. This onnects the M-RK radio to the Vehicular Charger's audio circuits and to the external antenna. The radio cannot be removed from this position until the UDC INTERFACE connector is unlatched using the RELEASE BUTTON in the center of the ROTARY LATCH KNOB.



Figure 2 - Charger with M-RK II Personal Radio Inserted



UDC Released

UDC Engaged

Figure 3 - UDC Connector Rotary Latch Knob

5. If desired, the radio can now be locked into the charger to prevent unauthorized removal. To lock the radio in the charger, insert the key in the hole in the **RELEASE BUTTON**, turn in a clockwise direction until it stops and remove the key. To unlock the radio, insert the key and turn it in a counterclockwise direction.
6. Turn the radio on by rotating its power on-off/**VOLUME** knob clockwise out of the detent (**OFF**) position.
7. The charger and radio are now set for mobile operation. Use the charger's **VOLUME CONTROL KNOB** to adjust the external speaker volume level and use the **MICROPHONE**'s **PTT** button to transmit. The red **TRANSMIT INDICATOR** lights when the radio is transmitting.
8. When removal of the **M-RK** is necessary, disengage the **UDC INTERFACE** by pressing down on the **RELEASE BUTTON** until the **ROTARY LATCH KNOB** snaps to the released position. (If the Rotary Latch Knob is locked, it must be unlocked before it will snap release. See step 5. above.) Grip the radio on its sides and pull it out of the charger.

NOTE

NEVER insert nor remove the radio from the charger unit by pulling on the antenna, or using it as a handle, as this may damage the antenna.

FRONT PANEL SWITCHES AND INDICATORS

Standard Vehicular Charger (344A4616P1)

This front panel contains three (3) indicator lights; RPT, RDY, and CHRG, an ON/OFF switch for the Repeater Radio and the UDC ROTARY LATCH KNOB.

- (1) Indicator Lights -
 - RPT (Amber) - Lights if the Repeater Radio is enabled.
 - RDY (Green) - Lights if the Battery is 90 to 100 percent charged and the charger reverts to "trickle" charge.
 - CHRG (Yellow) - Lights when radio is first inserted in the charger. Indicates Radio is being "fast" charged.
- (2) Repeater ON/OFF switch -

Turning this switch ON any time the M-RK personal radio is out of the charger enables the repeater radio and lights the Amber Indicator light.
- (3) UDC Rotary Latch Knob -

This knob latches the M-RK personal radio in the charger and connects the UDC connector to all circuits within the charger to allow radio operation as a mobile radio. It should *always* be latched when the radio is in the charger and the vehicle is moving.

Enhanced Vehicular Charger (344A4616P2)

This front panel contains three (3) indicator lights; TX, RDY, and CHRG, an ON/OFF volume control switch for operation of the M-RK Personal radio as a mobile radio, an Option pushbutton, and the UDC ROTARY LATCH KNOB.

- (1) Indicator Lights -
 - TX (Red) - Lights if the M-RK transmitter is active.
 - RDY (Green) - Lights if the Battery is 90 to 100 percent charged and the charger reverts to "trickle" charge.

CHRG (Yellow) - Lights when radio is first inserted in the charger. Indicates Radio is being "fast" charged.

(2) ON/OFF Volume Control Switch -

This switch powers the radio for operation as a mobile. Check to assure that the UDC LATCH KNOB is in the "engaged" position.

(3) Option Pushbutton -

This button can be programmed for many functions, but factory programming causes the same action as the M-RK "Clear" function. (See the M-RK Operator's Manual LBI-38732 or LBI-38733).

(4) UDC Rotary Latch Knob -

This knob latches the M-RK personal radio in the charger and connects the UDC connector to all circuits within the charger to allow M-RK radio operation as a mobile radio. It should *always* be latched when the radio is in the charger and the vehicle is moving.

BATTERY CHARGER DETAILS

NOTE

To maximize nickel cadmium battery life, the M-RK vehicular chargers are designed with automatic controls which limit the rapid charging of M-RK batteries if the internal battery temperature is below 0° C (+32° F) or above +45° C (+113° F). The charger indicates this high or low internal temperature condition by a yellow LED which blinks at a slow rate.

If a slow blinking, yellow LED is observed, the operator must wait until the internal battery temperature stabilizes within the allowable range before restarting the charging procedure by removing and re-inserting the radio into the charger.

In a vehicular application, with either high ambient temperature inside or outside of the vehicle, the automatic charging control will often prevent rapid charging or limit the time of rapid charging.

In other situations, where the operator inserts and removes the radio many times during a short period of time, the automatic control will sense a high internal battery temperature (due to start-up rapid charging of the battery) and will prevent further rapid charging of the battery until the internal temperature of the battery stabilizes within the acceptable range.

When the M-RK radio (with its battery pack) is placed in the charger, the radio's battery pack is charged. The fast or "rapid" charge feature, normally is applied immediately, and is controlled by the microprocessor circuits within the charger. The following details apply to the battery charge feature:

- Normally, when initially placed in the charger, the battery pack is fast charged and the yellow charge indicator glows continuously until it is near a full charge (between 90% and 100% full charge). At this time the charger switches to a slow or "trickle" charge rate and completes the charge. During the "trickle" charge the green ready indicator is illuminated.

- The yellow CHARGE INDICATOR lights when the unit is fast charging.
- If the CHARGE INDICATOR flashes, the battery is not being fast charged. Several factors may cause this to occur. These include, dirty battery pack contacts, an extremely hot or cold battery pack, or a defective battery pack.
- The yellow CHARGE INDICATOR turns off and the green READY INDICATOR turns on when the unit has completed the fast charge and the "trickle" charge commences.
- If the battery pack is completely dead, M-RK mobile mode operation can continue normally (with a P2 Enhanced Charger unit). To do this, insert the radio (with the dead battery pack) into the charger and engage the UDC INTERFACE for operation.
- Normal engagement of the UDC INTERFACE is not necessary for battery charge operation, but is required to operate an M-RK Personal in the enhanced vehicular charger during the charging cycle. The UDC INTERFACE ROTARY LATCH KNOB should also be in the "engaged" position whenever the vehicle is moving, for both the standard and enhanced models, to firmly hold the radio in the charger in case of an accident.

INSTALLATION

UNPACKING AND CHECKING THE EQUIPMENT

Before starting the installation, carefully unpack the equipment in the shipping container and identify each item as listed below. If any damage has occurred to the equipment during shipment, file a claim with the carrier immediately.

- M-RK Standard Vehicular Charger 344A4616P1
- or**
- M-RK Enhanced Vehicular Charger 344A4616P2
- Interconnect Cable 344A4616P10
(For Vehicular Repeater Control operation, optional power cable 344A4616P12 must be used)

- Mounting Bracket and Mounting Hardware 344A4616P11 (mounting hardware includes four machine screws, four lock washers, six self-tapping screws and one cable tie)
- Operator's/Installation Manual LBI-38935 (this manual)

PLANNING THE INSTALLATION

The installation of the Standard Vehicular Charger or the Enhanced Vehicular Charger should be carefully planned, before work actually begins.

Mechanical installation guidelines include mounting the unit:

- in a location that is safe for the operator and any passengers in the vehicle
- in a location that is convenient for the operator to use
- in a location that allows the operator to easily slip the radio into and out of the unit
- in a location that allows easy operator access to the external microphone or other options that can be attached (Enhanced Vehicular Charger unit only)
- in a location that is protected from water damage
- in a location that is out-of-the-way of auto mechanics
- in a location that is out-of-the-way of any passengers
- in a location that provides adequate clearance for attaching cables and connectors
- so it can be easily removed for cleaning and servicing
- securely so that it is not likely to break loose in the event of a collision

Electrical installation guidelines include:

- wiring the unit in accordance with the diagrams and instructions provided in this manual
- observing quality wiring techniques

Ericsson GE recommends that the unit be installed by one of the many authorized General Electric Service Stations located throughout the United States. Personnel at these centers are experienced in installations of this type of equipment and can provide a safe, neat and functional installation.

TOOLS REQUIRED

- Electric Drill
- No. 28 Drill Bit
- Hole Saw
- Phillips and Flat-Blade Screwdrivers
- POZIDRIV Driver

SETTING THE DIP SWITCHES

A DIP (Dual-Inline-Package) switch is located inside the unit that allows it to be configured for several different operational modes.

DIP SWITCH POSITION FACTORY SETTINGS

SW 3 (7-POSITION SWITCH)	1	2	3	4	5	6	7
P1 VEH REPEATER CHARGER	ON	OFF	ON	OFF	OFF	OFF	OFF
P2 ENHANCED VEH CHARGER	ON	OFF	ON	ON	ON	OFF	OFF

SW5 1-POSITION SWITCH	1
P1 VEH REPEATER CHARGER	N/A *
P2 ENHANCED VEH CHARGER	ON

* SW5-1 Not included in 344A4616P1 (all revision)
Included in 344A4616P2, Rev A (Not included in Rev. -)

OPERATIONAL MODES - DIP SWITCH CONTROL STD/REPEATER

1. IGNITION A+ CONTROL

To control the power to the charger by the ignition switch, a control wire must be connected from the rear DB-25 connector, Pin 10 to the ignition switch.

Connect this added wire to the ignition "ON" sense point (preferably an "accessory" point on the fuse panel that is switched on when the ignition switch is in the accessory position and in the "RUN" position).

The ignition control logic inside the charger must be enabled by setting the following SW3 dip switch positions:

SW3-1	Set to "OFF"
SW3-2	Set to "ON"

2. FRONT PANEL CONTROL

This function is not applicable in the STD/REPEATER.

3. REMOTE CONTROL OPERATION

This function is not applicable in the STD/REPEATER.

OPERATIONAL MODES-DIP SWITCH CONTROL ENHANCED CHARGER

1. IGNITION A+ CONTROL

To control the power to the charger by the ignition switch, a control wire must be connected from the rear DB-25 connector, Pin 10 to the ignition switch.

Connect this added wire to the ignition **"ON"** sense point (preferably an **"accessory"** point on the fuse panel that is switched on when the ignition switch is in the accessory position and in the **"RUN"** positions:

The ignition control logic inside the charger must be enabled by setting the following SW3 dip switch positions:

SW3-1	Set to "ON"
SW3-6	Set to "OFF"
SW5-1	Set to "OFF"

2. DISPLAY INVERT CONTROL

To **M-RK II** display may either be placed in the normal mode or the inverted mode by setting the following SW3 dip switch positions:

DISPLAY NORMAL	SW3-5	Set to "ON"
	SW3-6	Set to "OFF"
	SW3-7	Set to "OFF"
	SW5-1	Set to "OFF"
DISPLAY INVERTED	SW3-5	Set to "OFF"
	SW3-6	Set to "ON"
	SW3-7	Set to "OFF"
	SW5-1	Set to "OFF"

3. REMOTE CONTROL OPERATION

The enhanced charger can be operated under remote control of an **ORION** control head. For interconnection details see the applicable maintenance manual (LBI). When operating in the remote control mode the following functions must be sent using the dip switches.

IGNITION A+	Inhibited	SW3-1 SW3-2	Set to " ON " Set to " OFF "
FRONT OPTION SWITCH	Inhibited	SW3-4	Set to " OFF "
REMOTE CONTROL	Enabled	SW3-7	Set to " ON "
SWITCH SW5	Enabled	SW5-1	Set to " ON "

MOUNTING THE UNIT

The unit can be mounted on the underside of the dash panel of the vehicle or in a DIN-size opening in the dash panel. It can also be mounted to the vehicle's floor "hump" using an optional hump-mount bracket. The following instructions outline the mechanical installation details.

1. Select a mounting location. Confirm that the location is appropriate as outlined in the section entitled "**PLANNING THE INSTALLATION**".
2. Using the mounting bracket as a template, mark six (6) mounting screw hole locations on the mounting surface (dash panel, floor board, etc).
3. Using a No. 28 drill bit, drill holes in the mounting surface at the marked locations.

CAUTION

Before drilling any hole, verify that no damage will occur to any vital part of the vehicle. Fuel tanks, transmission housings, fuel lines, brake lines and wiring harnesses are typical items that can be damaged when a drill bit or screw penetrates through the mounting surface.

NOTE

If mounting on a surface covered with carpet, punch holes in the carpet with a small punch, make a small incision in the carpet, insert a short piece of metal tubing and then drill through the tubing. This prevents twisting the carpet with the drill flukes.

4. Using the six (6) self-tapping screws, secure the mounting bracket to the mounting surface.
5. Using the four (4) machine screws and lock washers, secure the unit to the mounting bracket. It can be fastened in any of three (3) different positions: parallel to the mounting surface or tilted ± 20 degrees from the parallel position. See Figure 4.

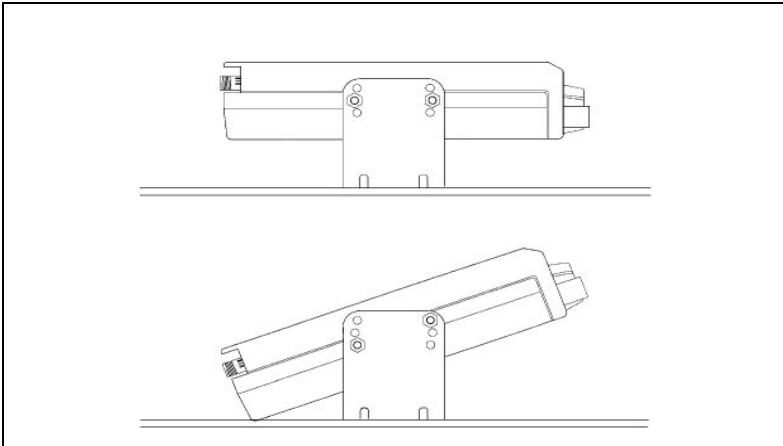


Figure 4 - Mounting the Charger

INTERCONNECT CABLE

Power Leads

The power leads of the interconnect cable supplied with the charger must be connected to the vehicle's battery (for the Part 2 and ORION Control Head chargers). The vehicle must have a negative-ground electrical system. Power leads are approximately 8 feet in length. The YELLOW (positive) lead includes a fuse holder and 5-ampere fuse located near the battery end.

The charger can be wired to an unswitched power source so the charger can operate when the vehicle's ignition switch is turned off. However, if desired, the charger can be controlled by a switched power source by running a lead to the ignition switch power (be sure to connect this lead behind the vehicle's fuse box so that the vehicle's fuse protection is used). The other end of this lead must be connected to the DB-25 connector at pin 10. The power source must have adequate current supply capability. If the switched power connections are used the Charger's DIP switch settings must be changed as shown under, "**SETTING THE DIP SWITCHES**", to Enable Ignition A+.

If the charger is wired directly to the vehicle's battery it will be necessary to route the power leads through the vehicle's firewall. If an existing hole is not conveniently located in the firewall, drill a small hole and install an appropriately sized rubber grommet before routing the leads through the firewall. This grommet is required to prevent lead chaffing. Additional grommets may be required if the leads must pass through shields or guards in the engine compartment between the firewall and battery. Route the leads away from high heat sources in the engine compartment that may cause lead damage and introduce a fire hazard. In addition, the leads *should not* be routed near noise sources such as electronic ignition modules or cruise control modules. Use appropriate lacing techniques to secure the leads away from all moving parts.

Connect the BLACK lead to the negative power source ("NEG" or "-" battery post) and connect the YELLOW lead to the positive power source ("POS" or "+" battery post).

Speaker Leads (For P2 Enhanced Vehicular Charger Only)

Other leads on the interconnect cable include the external speaker leads that are approximately 18 inches in length. Route and connect these leads to the external speaker. Since the charger has differential-type speaker amplifier output lines, use speaker option 19A149590P1, or *do not* ground either speaker lead if another speaker is used. The speaker must be rated for at least 10 watts and a 4-ohm impedance is recommended.

The external speaker normally supplied with the charger is option H2LS1F (19A149590P1). This speaker has a 20-watt rating and a 4-ohm impedance.

Antenna Connection (For P2 Enhanced Vehicular Charger Only)

The TNC connector at the back of the Enhanced Vehicular Charger must be connected to the external antenna. For optimum performance, the antenna should be installed in accordance with the installation instructions provided with the antenna package.

Other Connections

See the Interconnection Diagrams in the following pages for specific details on other connections that may be required. Standard cable wiring is shown in these diagrams for the Part 2 and ORION Control Head connections that include power connections. For the Part 1 Charger, power is supplied via the Repeater as shown by identification of leads in that connection.

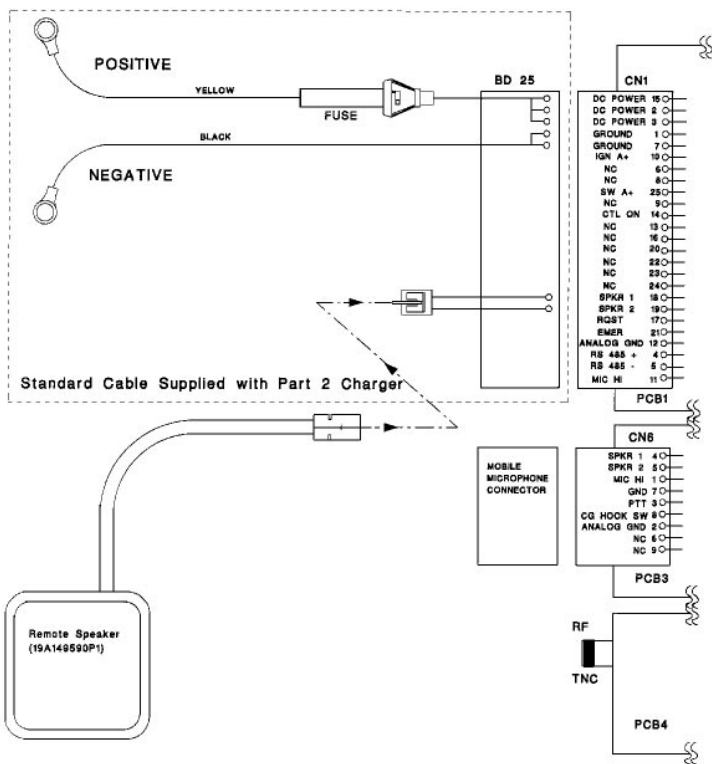
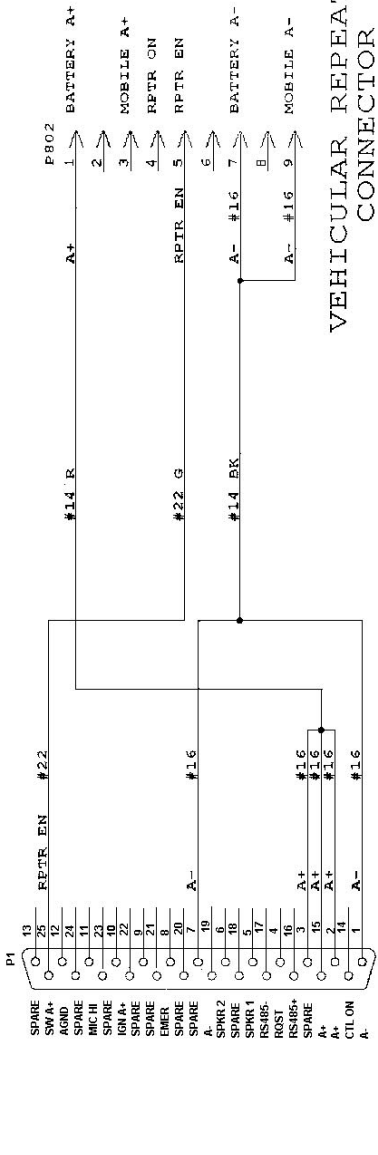


Figure 5 - Interconnection Drawing For P2 Charger Using 344A4616P10 Cable



MRK VEHICULAR
CHARGER CONNECTOR
(MALE DB25 WITH HOOD)

(19B209288F21 MALE HOUSING
WITH 19B209288F1 FEMALE CONTACTS)

VEHICULAR REPEATER
CONNECTOR



Figure 6 - P1 STD/Repeater Interconnection Diagram Using 344A4616P12 Cable

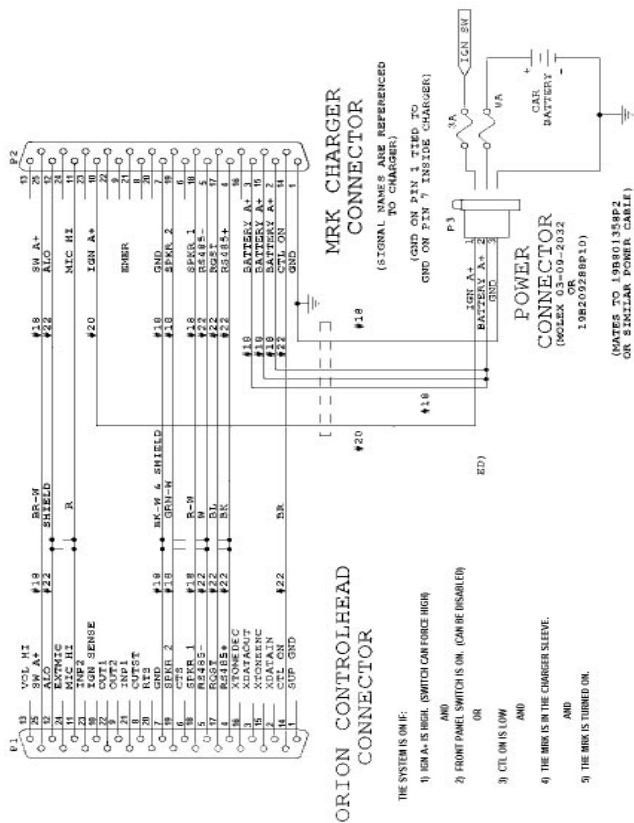


Figure 7 - P2 Enhanced Charger Interconnection Diagram Using Optional ORION™ Control Head Cable



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