



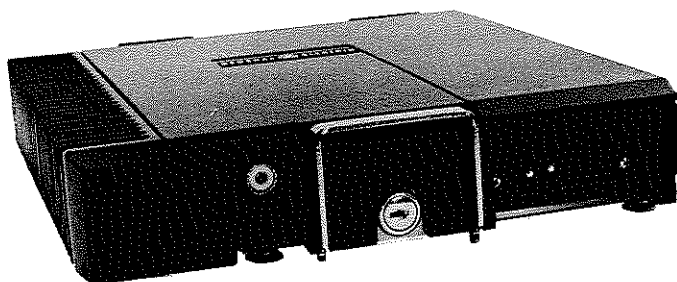
INSTALLATION MANUAL FOR **DELTA-S, SX** MOBILE COMBINATIONS

Mobile Combinations feature ruggedly constructed two-way mobile radios with unusually flexible mounting possibilities. The two-way radio locks into a steel mounting frame to provide an exceptionally stable mobile installation. Safety Release mounting brackets for the control unit and speaker are provided for the safety of the occupants

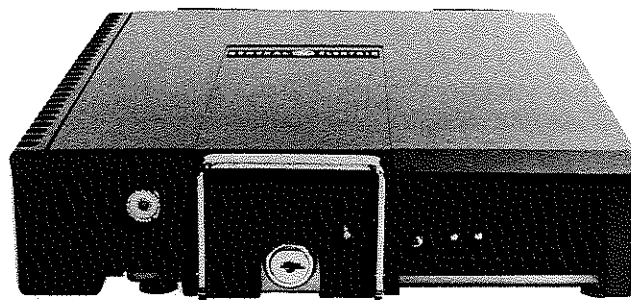
LB1-31549A

TWO-WAY RADIO

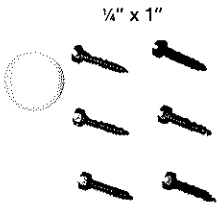
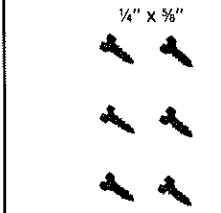
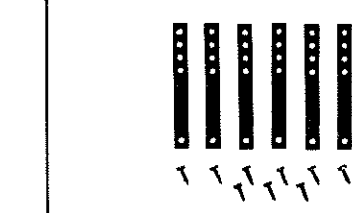
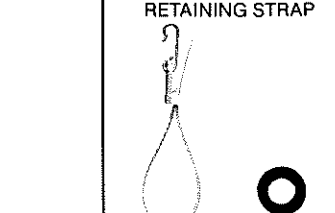
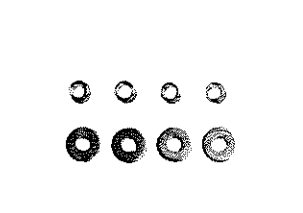
MEDIUM/HIGH POWER



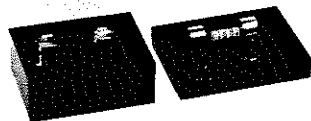
LOW POWER



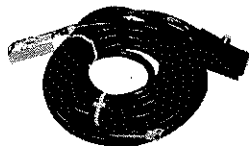
MOUNTING HARDWARE

 1/4" x 1"	 1/4" x 5/8"	 CABLE STRAPS & 6 x 1/2" MOUNTING SCREWS	 RETAINING STRAP GROMMET	 SPACERS & 1/4" WASHERS
--	---	--	---	--

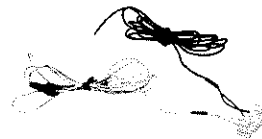
ACCESSORIES



FUSE
ASSEMBLY



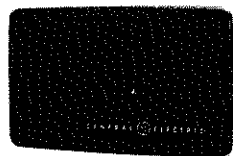
POWER/CONTROL CABLE



IGNITION SWITCH ASSEMBLY



CONTROL UNIT



SPEAKER



MICROPHONE



HANDSET &
HOOKSWITCH



ANTENNA

GENERAL  ELECTRIC

UNPACKING AND CHECKING EQUIPMENT

Refer to the Maintenance Manual for instructions. When ready for installation, carefully unpack the radio. It is recommended that you identify the items in the packing case and check them off in the appropriate column below before discarding the packing material. If any damage has occurred to the equipment during shipment, file a claim with the carrier immediately.

RADIO

- Two-Way Radio ☐
- Tuning Tool 19B800716P2 ☐
- Tuning Tool 4038831P1 ☐
- Key 19B800004P3 ☐
- Mounting Plate 19D900139P1 ☐
- Mounting Hardware 19A129374G1 ☐
- Spacer Kit 19A121884G2 ☐
- Fuse Assembly (12-Volt) ☐
 - High Power (30 Amp Fuse)
(66 to 110 Watts)
19B216021G3
 - Medium Power (25 Amp Fuse)
(41 to 65 Watts)
19B216021G2
 - Low Power (20 Amp Fuse)
(1 to 40 Watts)
19B216021G6

CONTROL UNIT & ACCESSORIES

- Control Unit ☐
- Mounting Hardware ☐
- Ignition Switch Cable Assembly ☐
- Power/Control Cable ☐
- Speaker ☐
- Microphone/Microphone Hanger or ☐
- Handset/Handset Hookswitch ☐
- Antenna, Cable and RF Connector ☐

PLANNING THE INSTALLATION

The accompanying photographs of typical installations should help you in planning your installation.

Before starting, plan your installation carefully—so that it will be:

- Safe for the operator and passengers in the vehicle
- Convenient for the operator to use
- Neat
- Protected from damage from water
- Easy for the serviceman to service
- Out of the way of auto mechanics
- Out of the way of passengers
- Positioned to protect the front connector

It is suggested that you take advantage of the experiences of one of the many authorized General Electric Service Stations located throughout the United States by having them install your two-way radio and make the final adjustments.

WARNING

Interference with Vehicular Electronics — *Electronic fuel injection systems, electronic anti-skid braking systems, electronic cruise control systems, etc., are typical of the types of electronic devices which may be prone to malfunction due to the lack of protection from radio frequency energy present when transmitting. If the vehicle contains such equipment, consult the dealer for the make of vehicle and enlist his aid in determining if such electronic circuits will perform normally when the radio is transmitting.*

TYPICAL INSTALLATION

The mobile combinations are designed so that the two-way radio can be mounted up to 6 meters from the operator (3 or 9 meters with option cables), such as in the trunk compartment or under the seat of a vehicle. The position of the front connector should always be a consideration. When the radio is mounted in the trunk of the automobile it should be located in one corner and positioned with the front connector facing a vertical edge. This will provide maximum protection for the radio cable connections. Allow enough room to unlock and move the handle freely. The control unit mounts on the instrument panel (or the transmission hump) of the vehicle, along with the microphone and speaker. Refer to the Control Unit installation manual for detailed Installation Instructions.

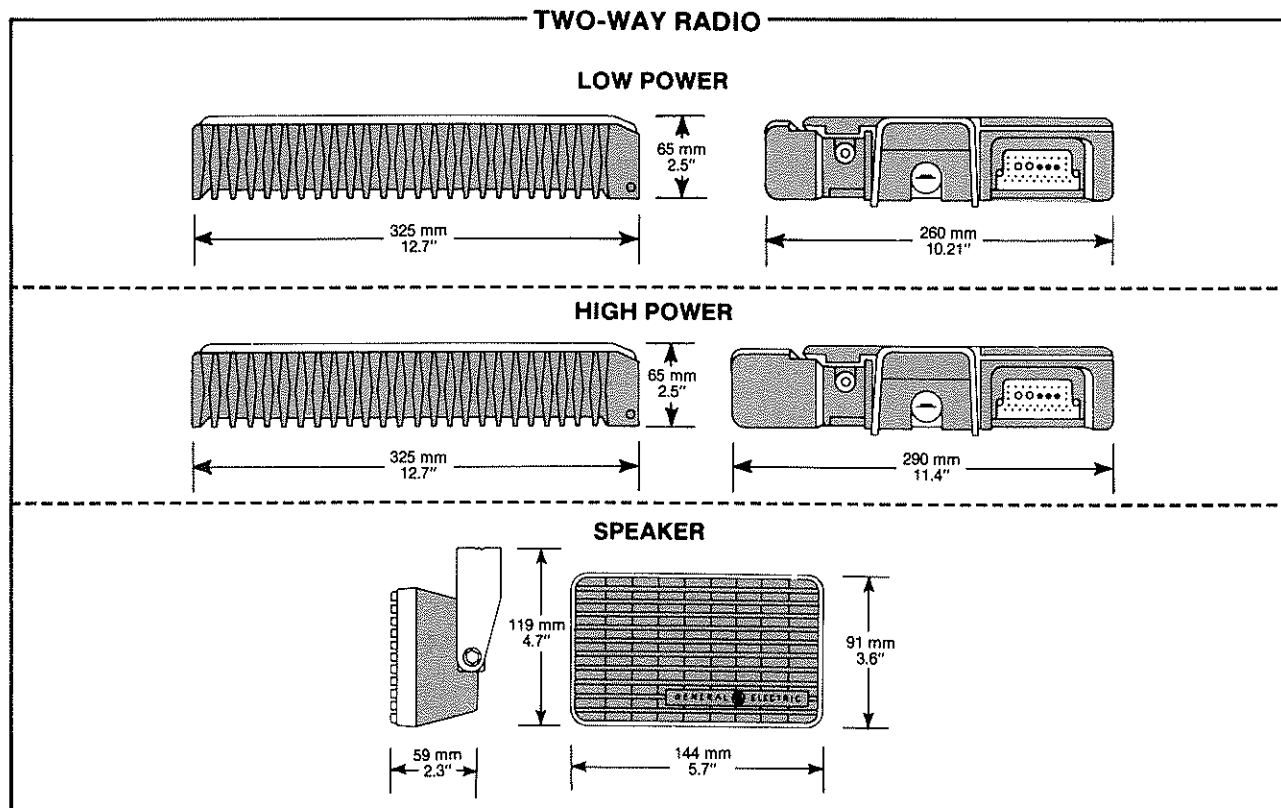


Figure 1. Mounting Dimensions

EQUIPMENT REQUIRED

- Electric drill for drilling mounting holes.
- Drills and circle cutters (see sizes in box at right)
- Soldering iron (for 138 to 512 MHz antenna)
- Phillips and flat-blade screwdrivers, 1/4-inch and 5/16-inch hex-head drivers for mounting screws.

DRILL SIZES

- No. 36 (7/64-inch) Drill for No. 6 Self-Tapping Screws
- No. 31 (1/8-inch) Drill for No. 8 Self-Tapping Screws
- No. 27 (9/64-inch) Drill for No. 10 Self-Tapping Screws
- No. 9 (3/16-inch) Drill for 1/4-inch or No. 14 Self-Tapping Screws
- 3/4-inch Drill for High-Band and UHF Antenna
- 1-1/8-inch Circle Cutter, Holesaw or Socket Punch for Rubber Grommet

RUNNING CABLES

To assure the feasibility of the cable routings you plan to use, it is suggested that you run the cables before mounting the two-way radio. Be sure to leave some slack in each cable going to the control unit and two-way radio so that they may be pulled out for servicing with the power applied.

Try to route the cables away from locations where they will be exposed to heat (exhaust pipes, mufflers, tailpipes, etc.), battery acid, sharp edges, or mechanical damage or where they will be a nuisance to automobile mechanics, the driver, or passengers. Keep wiring away from ignition circuits to help prevent noise pickup in the radio equipment.

In addition, try to utilize existing holes in the firewall and trunk wall and the channels above or beneath the doors. You may also use the channels through door and window columns, where they are convenient for running cables, unless you plan to install rigid or flexible conduit in which to run the cables.

If an existing hole is not conveniently located for the passage of the power cable through the firewall, drill a 1-1/8-inch hole and insert the rubber grommet provided. Leave at least 18 inches of slack in the plug end of the cables at the location for the two-way radio. Refer to the Cable Routing Diagram (Figure 2) for additional information.

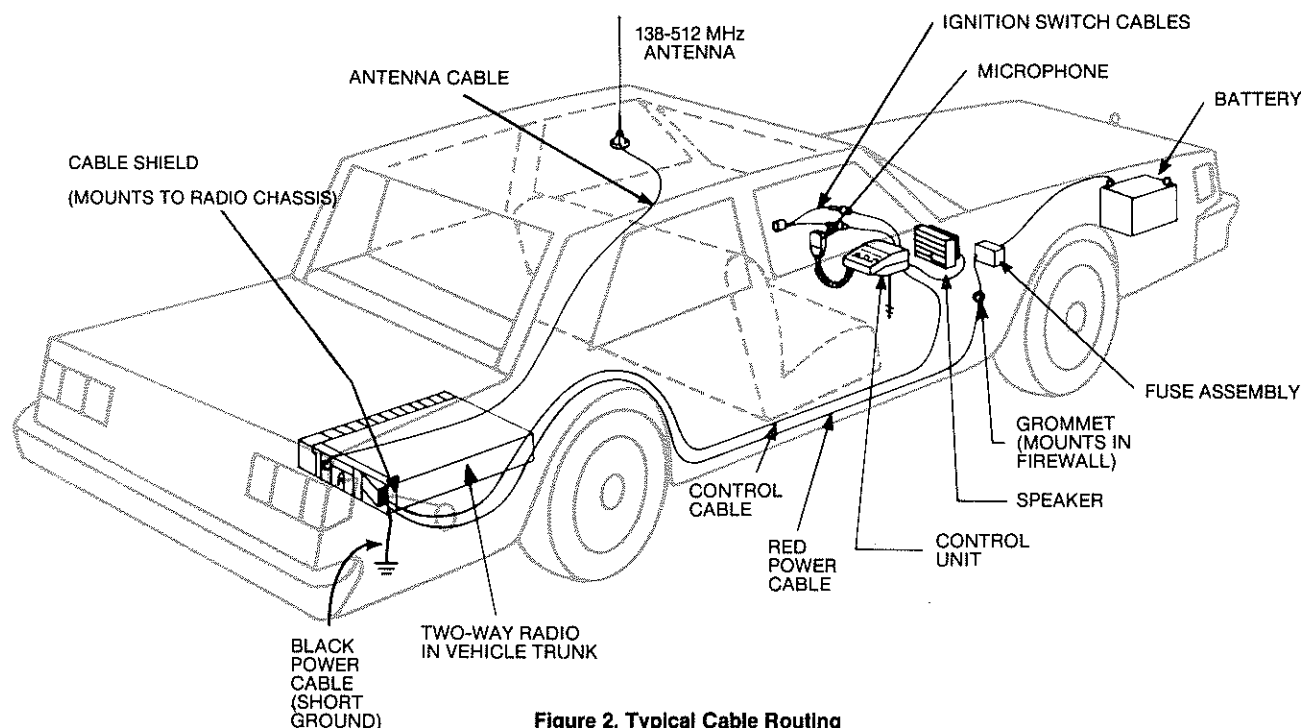


Figure 2. Typical Cable Routing

POWER AND CONTROL CABLES

NOTE

Terminal 19A115799P15 is available for use with batteries having side terminals. To use the terminal, trim off 1/2 inch of the ridge on the plastic corrosion shield on the battery to allow the terminal to lie flat. Remove the screw in the battery terminal and slide the power cable terminal over the screw. Then replace the screw. **Do not** strap the power cable within one foot of the battery terminal.

NEGATIVE GROUND SYSTEMS

NOTE

The Power/Control Cable plug assembly is supplied connected for negative ground systems.

1. Starting with the plug end of the Power/Control Cable, run the black control cable to the control unit location and the red power cable to the vicinity of the battery. Drill a No. 9 (3/16-inch) pilot hole and connect the short black power cable to a good vehicle ground with the 1/4 x 5/8-inch hex-head self-tapping screw and the two external tooth lock washers. The external tooth lock washers are placed on each side of the black power cable ring terminal. Refer to the Cable Routing Diagram (Figure 2).

The terminal connected to the power/control cable shield should be mounted to the front right hand side of the radio chassis using the screw and lockwasher provided.

On older radios the existing hole in the chassis must be tapped using a #12-24 NC fluted taper tap. The Hardware for mounting the cable shield terminal is supplied in hardware kit 19A704915G1. Refer to Fig 2A.

IGNITION SWITCH CABLE ASSEMBLIES

Two optional cable assemblies are available - a two-wire assembly for systems without ignition switch standby, and a three-wire assembly for systems with ignition switch standby. Refer to page seven and eight for the two-wire installation. Refer to pages eight and nine for the three-wire installation.

TWO WIRE CABLE ASSEMBLY

The two-wire Ignition Switch Assembly consists of a yellow "Y" fused lead, a black "Y" lead, and a 19-pin Vehicle System Plug. In-line connectors are provided for shortening the fused leads, if desired. If the in-line connectors are used, install the connectors between the fuse and the Vehicle Systems Plug. See Figure 7.

NOTE

The speaker connections and other option connections (hookswitches, etc.) are also made to the Systems Plug. Do not connect the Systems Plug to the Control Unit until all connections have been made.

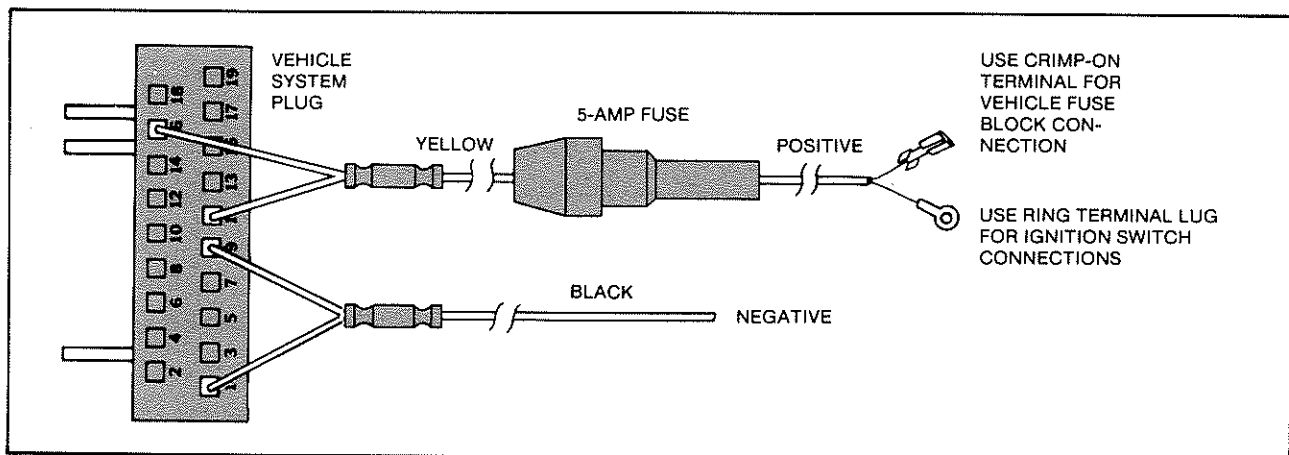


Figure 7. 12-Volt, Negative Ground Connections

Power to the radio can be controlled by one of two methods shown here. Select the type of control desired, and connect the ignition switch cables as shown.

1

IGNITION SWITCH CONTROL

Transmitter and receiver will operate only with ignition switch in ACCESSORY or ON position. Turning ignition switch OFF removes all power to the radio.

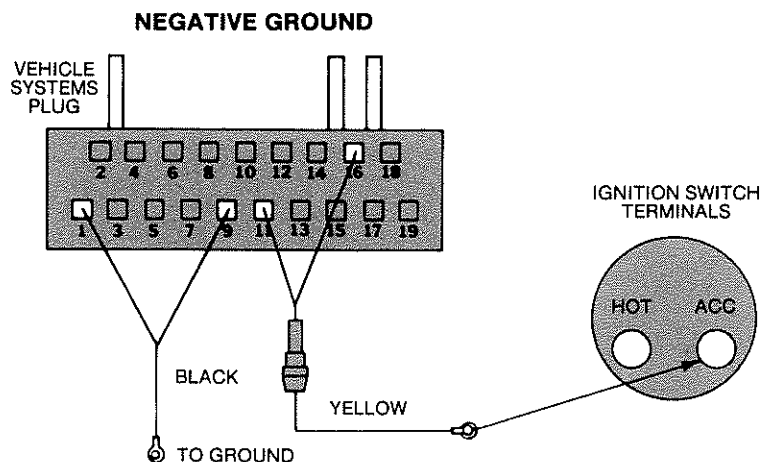


Figure 8. Connections for 12-Volt Ignition Switch Cables

2

IGNITION SWITCH BYPASS

Transmitter and receiver will operate independently of ignition switch. Unit can be turned ON and OFF only by control unit switch.

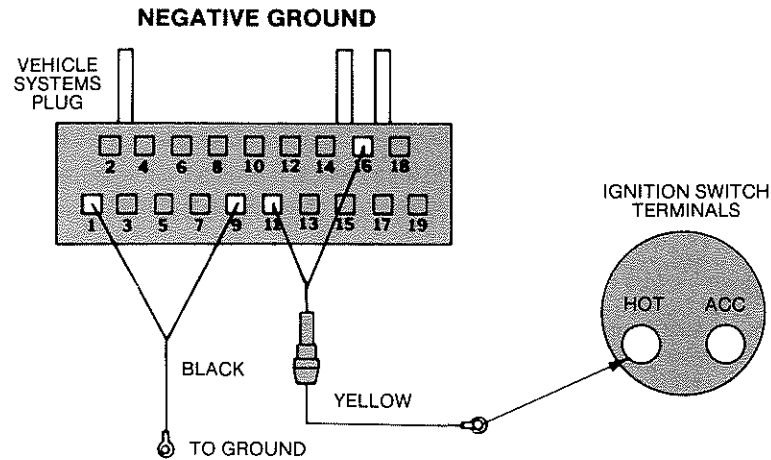


Figure 8. Connections for 12-Volt Ignition Switch Cables

3-WIRE CABLE ASSEMBLY

The Three-Wire Ignition Switch Assembly consists of a red and a yellow fused lead, a "Y" black ground lead, and a 19-pin Vehicle Systems Plug. For ignition switch connections, refer to Figure 10.

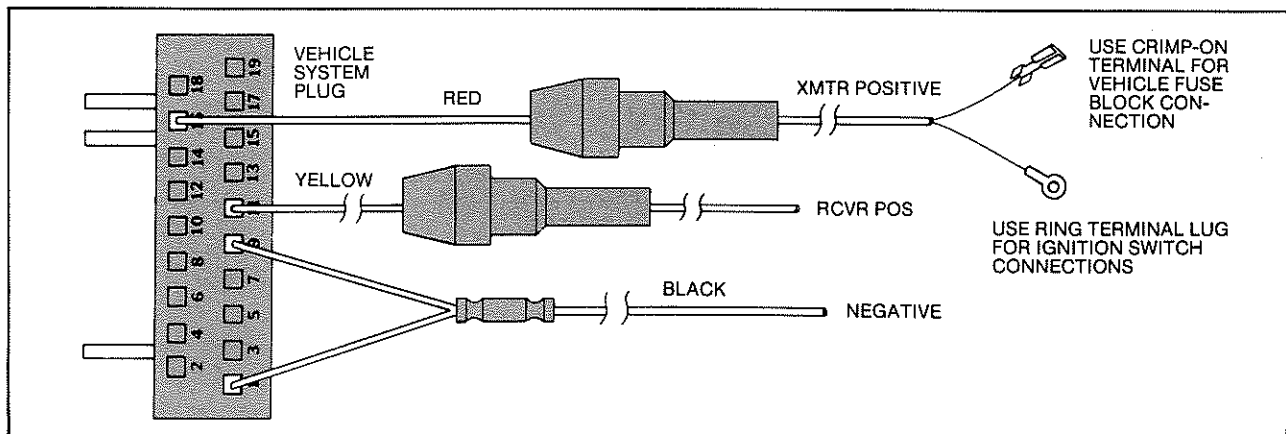


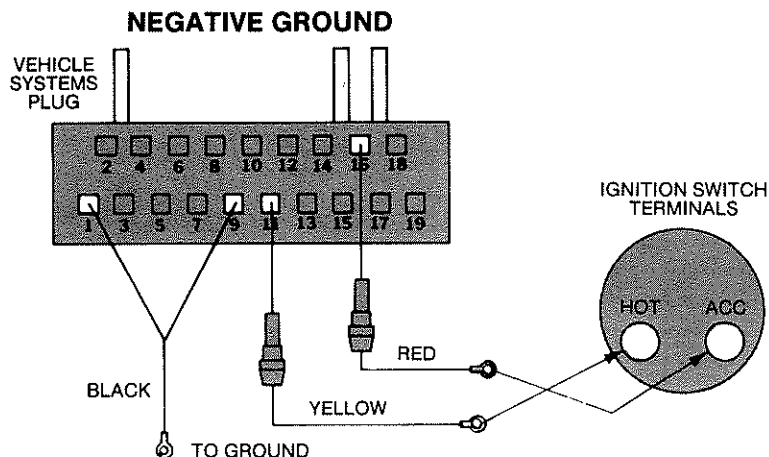
Figure 9. 12-Volt, Negative Ground Connections

Power to the radio can be controlled by one of the three methods described below. Select the type of control desired, and connect the ignition switch cables as shown.

1

IGNITION SWITCH STANDBY

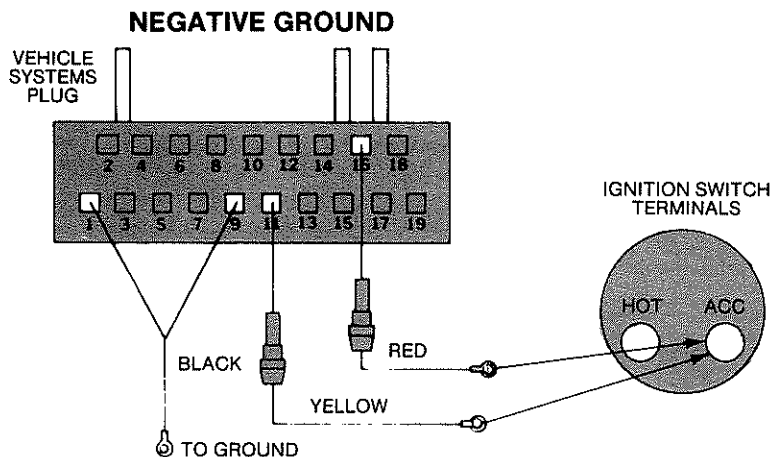
Receiver will operate independently of ignition switch. Transmitter will operate only with ignition switch in ACCESSORY or ON position.



2

IGNITION SWITCH CONTROL

Transmitter and receiver will operate only with ignition switch in ACCESSORY or ON position. Turning ignition switch OFF removes all power on the radio.



3

IGNITION SWITCH BYPASS

Transmitter and receiver operate independently of ignition switch. Unit can be turned ON and OFF only by control unit switch.

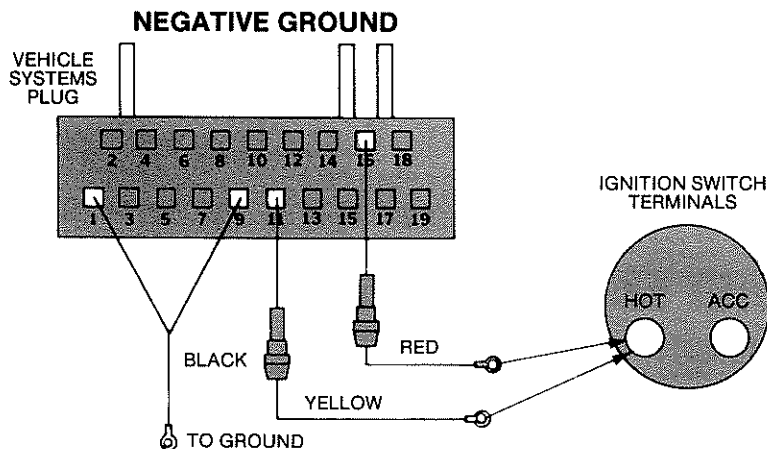


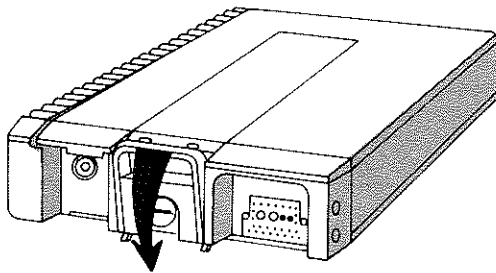
Figure 10. Connections for 12-Volt Ignition Switch Cables

TWO-WAY RADIO

The two-way radio may be mounted horizontally, vertically, or on its side (fins up). Select a mounting location with sufficient room for the radio to be pulled out of the mounting frame for servicing. Mount the two-way radio as shown in Figure 11.

WARNING

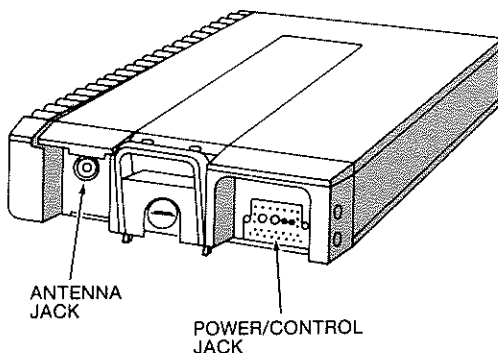
For passenger safety, mount the radio securely so that the unit will not break loose in the event of a collision. This is especially important in station wagons, vans and similar type installations where a loose radio could be extremely dangerous to the vehicle occupants.



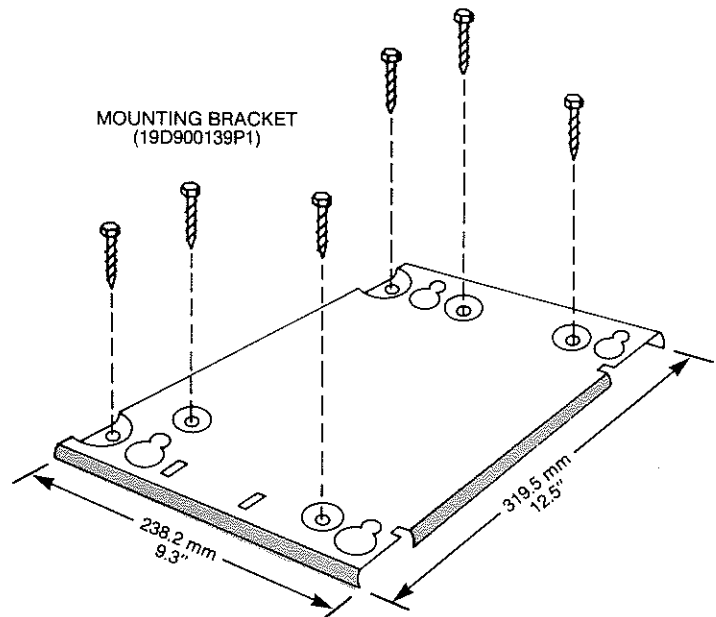
- ① TO REMOVE RADIO FROM MOUNTING FRAME, UNLOCK RADIO AND PULL HANDLE DOWN AS SHOWN. THEN PULL RADIO FORWARD OUT OF FRAME

CAUTION

Be careful to avoid damaging some vital part of the vehicle when drilling mounting holes. Always check to see how far the mounting screws will extend below the mounting surface before installing.



- ② INSTALL MOUNTING FRAME WITH NO. 14 x 5/8-INCH HEX HEAD SELF-TAPPING SCREWS. (USE 1-INCH SCREWS IF NEEDED).
USE 1/4-INCH FLAT WASHERS (AND SPACER WASHERS IF REQUIRED) TO LEVEL RADIO. WHEN NECESSARY, USE SPACER WASHERS TO PREVENT MOUNTING SCREWS FROM PENETRATING GAS TANK, GAS LINES, ETC.,



- ③ REPLACE RADIO IN MOUNTING BRACKET. PUSH UP HANDLE TO SECURE IN FRAME AND LOCK RADIO.
④ CONNECT THE POWER/CONTROL CABLE AND ANTENNA CABLE TO THE JACKS

Figure 11. Installing the Two-Way Radio

CONTROL UNIT

The control unit should be mounted within convenient reach of the operator, and where it will not interfere with the safe operation of the vehicle or provide a hazard to the vehicle passengers in case of an accident. *Use the Safety Release mounting brackets for passenger safety whenever the mounting location requires, or where swivel action is desired.*

NOTE

Refer to the appropriate control unit installation manual for detailed procedures.

MICROPHONE

Mount the microphone where it will be within easy reach of the operator, but will not interfere with safe operation of the vehicle. After the microphone bracket is mounted, connect the microphone plug into the microphone jack on the back of the control unit, and tighten the retaining screw in the plug. Refer to Figure 12 for mounting instructions.

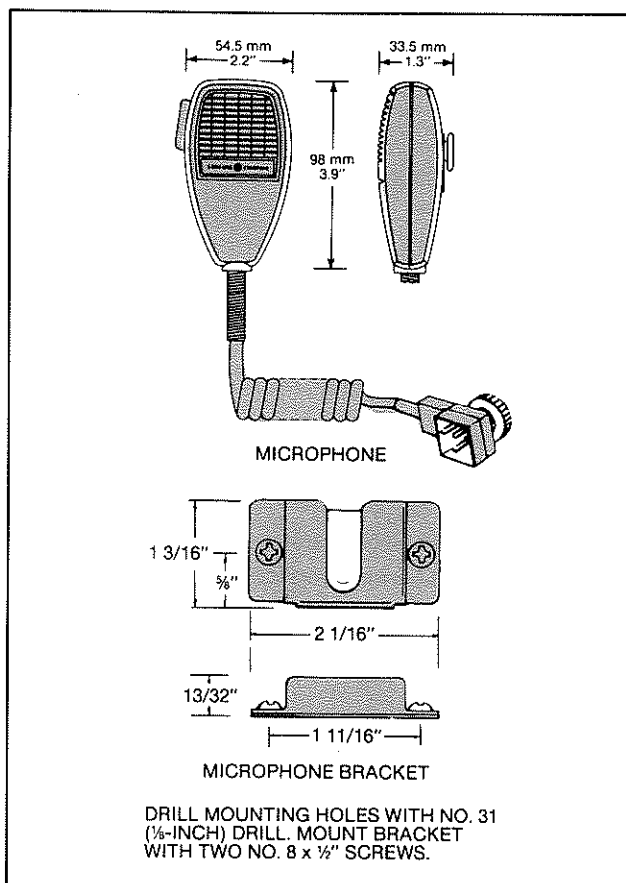


Figure 12. Microphone Bracket Mounting

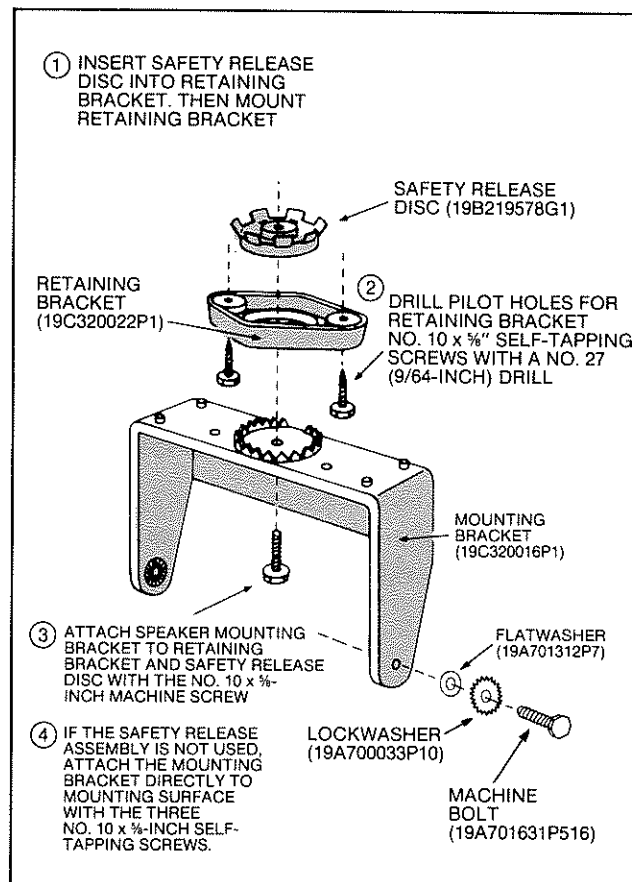


Figure 13. Mounting the Speaker

SPEAKER

The speaker should be mounted where it will direct sound to the operator, but not interfere with his vision or be hazardous to passengers in case of an accident. *Use the Safety Release mounting brackets for passenger safety whenever the mounting location requires, or where swivel action is desired.*

The speaker may be mounted on the lower edge of the instrument panel on the firewall, above the windshield in some trucks, or behind the built-in speaker grille in some vehicles. Use the mounting bracket as a template for locating the mounting holes, and mount the speaker as shown in Figure 13. If the internal speaker has been disconnected, connect the two pins to holes 4 and 17 on the Vehicle Systems Plug.

If an external speaker is used connect the speaker wires to pins 3 and 19 on the vehicle systems plug.

CHANNEL GUARD HOOKSWITCH

For Channel Guard with automatic monitoring applications, a hookswitch is used in place of the microphone bracket. Mount the hookswitch as shown in Figure 14. After mounting the hookswitch, connect the two pins to holes 10 and 14 on Vehicle Systems Plug. NOTE: When the C600 or S600 control unit is used, connect the hookswitch leads to P3-10 and P2-19 on the vehicle systems plug.

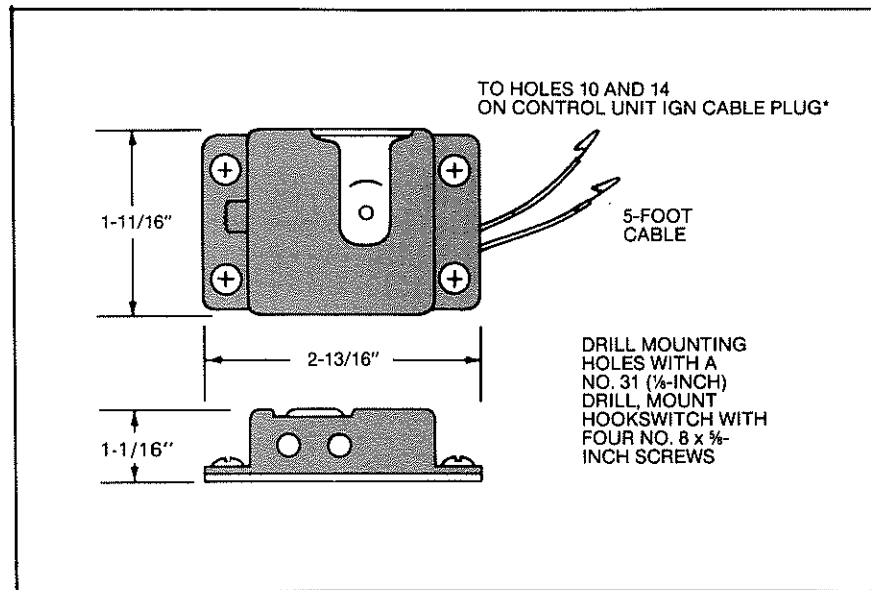


Figure 14. Hookswitch Mounting

HANDSET AND HANDSET HOOKSWITCH (OPTIONAL)

Mount the handset hookswitch as shown in Figure 15. After mounting the handset hookswitch, connect the handset plug to microphone jack on the bottom of the control unit. If the hookswitch has been disconnected, connect the hookswitch cable to the Vehicle Systems Plug as shown in Figure 15. Refer to Control Unit Maintenance Manual for jumper changes in control unit.

SYSTEM CABLE PLUG ASSEMBLY		
WIRE	CONTROL UNIT	
	S600/C600	OTHERS
BLACK	P2-19 *	PIN 14
GREEN	P3-2 *	PIN 2
RED	P3-10	PIN 10
ORANGE	P3-13	PIN 15
BLUE	P3-12	PIN 13
BROWN	P3-18	PIN 18

* Black wire must be spliced into existing wire at P2-19

* Green wire must be spliced into existing wire at P3-2 (if present) from external speaker.

Figure 15. Handset Hookswitch Mounting.

ANTENNA

Installation instructions for the antenna are packaged with the antenna. The antenna must be installed in accordance with good engineering practice for optimum results.

For the 138—512 MHz antenna, the most effective mounting position is usually in the center of the roof of the vehicle. The antenna cable will normally run from the front of the two-way radio, behind sections of the interior trim to a door or window post, and then up between the roof and headliner in the passenger compartment to the antenna base.

Try to route the cable away from locations where it will be exposed to heat, sharp edges or mechanical damage, and where it will be out of the way of the driver, passengers or vehicles mechanics. Wherever possible, existing holes in the trunk wall, and the channels above or beneath doors and window columns should be utilized.

PLACE THE TWO-WAY RADIO IN OPERATION

After completing the installation of the two-way radio, the following final operations should be performed:

Have a certified electronics technician make the final adjustments.

These include:

Transmitter: Measure Forward and Reflected Power and adjust antenna length for optimum ratio. Set transmitter to rated power output (or to the specific output or input that may be required by the FCC station authorization). Measure the frequency and modulation and enter these measurements on the FCC-required Station Records.

Vehicle: Check to see if any electrical noise suppression is needed.

Instructions for making these adjustments are included in the Maintenance Manual for the two-way radio. Give the alignment tools (packed with the unit) to the technician.

Fill out and mail the "ON ARRIVAL" Information Card.

Give the Operator's Manual for the two-way radio to the person who is going to operate it, or place the manual in the vehicle where he will find it.



POSITIVE GROUND APPLICATIONS-OPTION PG01

Option PG01, A Positive Ground Application Kit, is available for those users having vehicles with positive ground. Option PG01 consists of:

Cable Kit 19A136690G1	<input type="checkbox"/>
Polarity Converter 19B801392P1	<input type="checkbox"/>
Extractor Tool Kit 19B227456G1	<input type="checkbox"/>

POLARITY CONVERTER

The Polarity Converter provides a regulated +13.8 VDC source for the mobile radio receiver. It utilizes a 20 kHz PWM (pulse width modulation) current limited circuit (12 amperes maximum) with overvoltage protection (15 Vdc maximum).

TYPICAL SPECIFICATIONS

Input Voltage	13.8 VDC
Output Voltage, Regulated	13.8 VDC \pm 200 mv. (0-full load)
Current Capacity	9 Amperes (12A maximum)
Ripple	50 mv nominal

INSTALLATION

The converter can be mounted inside of the vehicle, on the firewall, or on the bottom of the instrument panel. It may also be mounted in a dry location in the engine compartment.

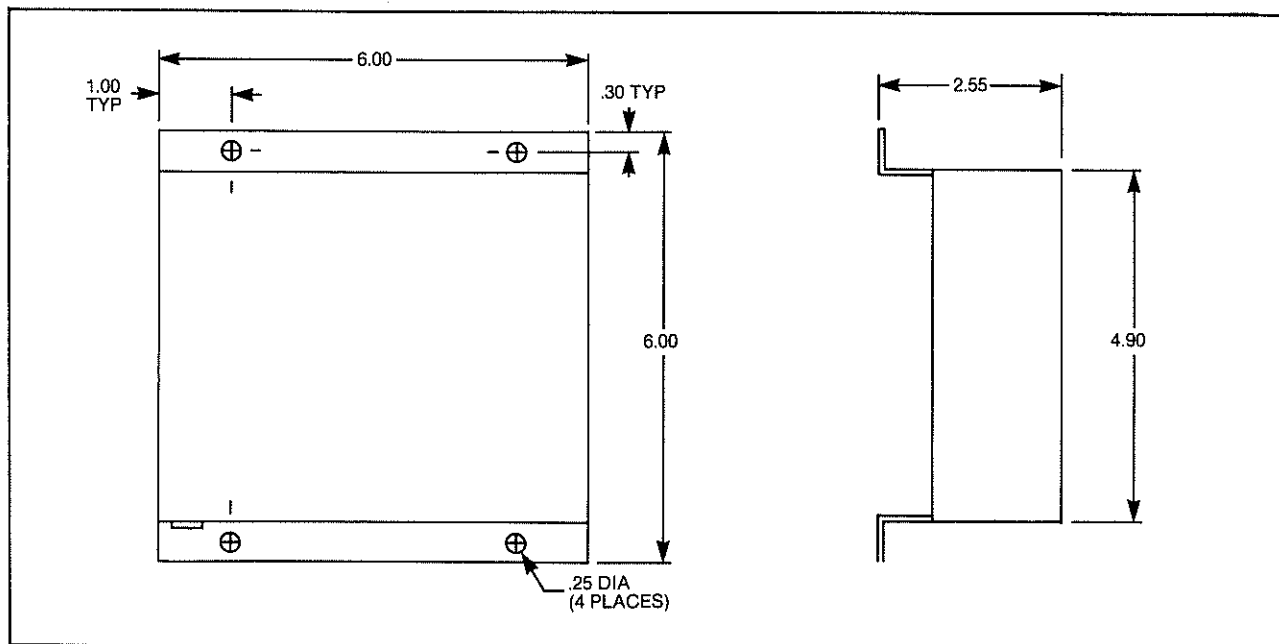


Figure 16. Polarity Converter Mounting Dimension

EQUIPMENT REQUIRED

- Electric Drill with 1/4" Bit

Wherever possible use existing holes in the firewall or the bottom of the instrument panel for mounting the converter. Using the converter base as a template, mark and drill the mounting holes accordingly. Install the converter using four No. 10 metal screws (N130P1710C6) and flat washers (N402P39C6) provided.

POSITIVE GROUND APPLICATIONS-OPTION PG01

POWER AND CONTROL CABLES

For positive ground systems, the red and the black power cable terminals at the Power/Control Cable plug assembly must be reversed. Refer to the connector housing and Terminal Identification Diagram (Figure 17) and proceed as follows:

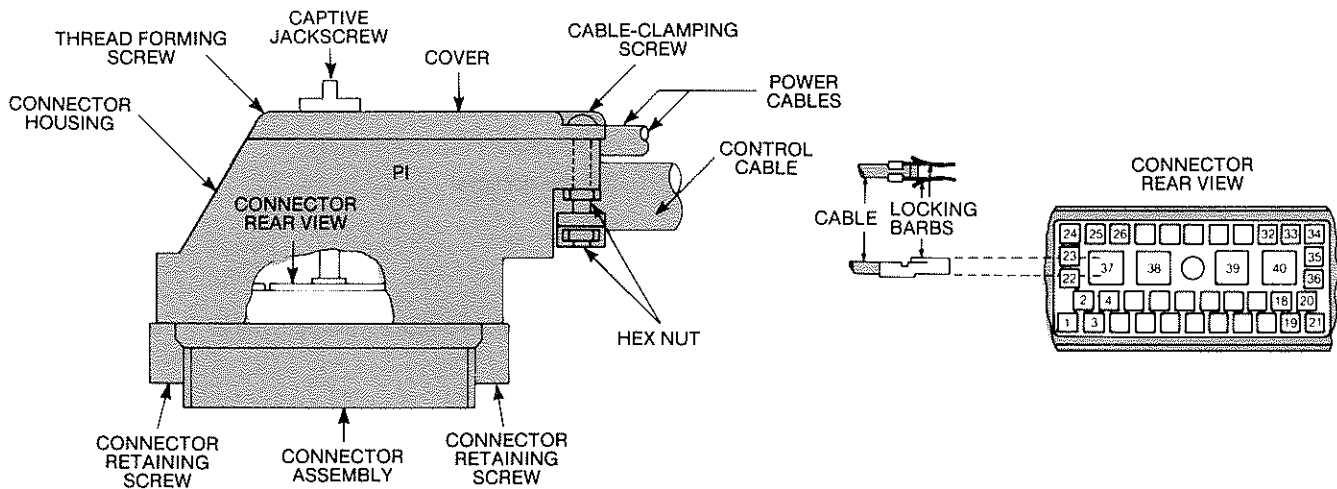


Figure 17. Connector Housing & Terminal Identification

- A. Remove the four hex nuts, the thread-forming screw and two cable-clamping screws from the connector cover.
- B. Remove the two connector retaining screws and slide the housing back on cable.
- C. Insert the terminal extractor tool (19B800772G2) in the front of terminal cavity 37 and remove the red power cable terminal from the rear of the connector. Remove the black power cable terminal in terminal cavity 38 in the same manner.
- D. Insert the red power cable terminal in the rear of terminal cavity 38 and the black power cable terminal in terminal cavity 37. If a longer black cable is needed use Cable 19A136690G1 (supplied). Make sure the terminals are fully seated and locked into the terminal cavity.
- E. Dress the cables into the proper exit locations; close the housing, and replace the five housing screws and two hex nuts.

After the terminals are reversed run the cables in the same manner as for negative ground systems. See Page 5 & 6.

POSITIVE GROUND APPLICATIONS-OPTION PG01

FUSE ASSEMBLY

Mount the fuse assembly near the battery (See Figure 18). Cut the red power cable and connect to the fuse assembly with the ring terminals and lockwashers provided. Assemble one lockwasher between each terminal and head of each screw. Refer to the Power Cable Connections to Fuse Assembly Diagram (Figure 19).

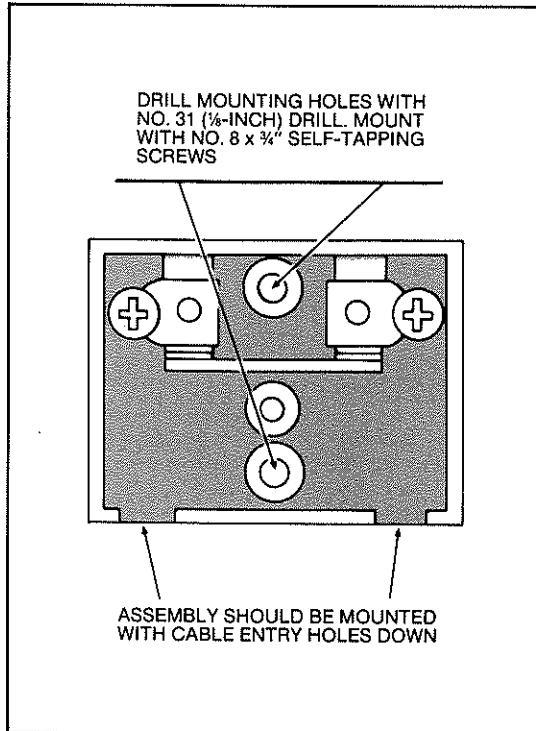


Figure 18. Installation of 12-Volt Fuse Assembly

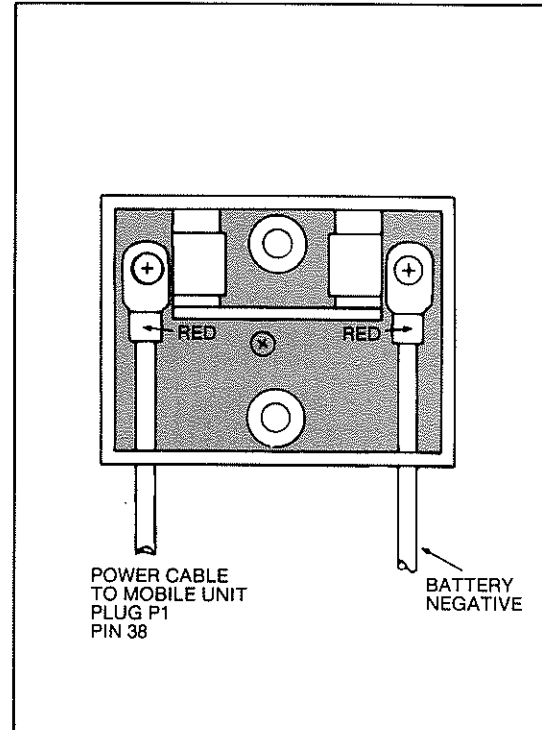


Figure 19. Power Cable Connections to Fuse Assembly

IGNITION SWITCH CABLE ASSEMBLIES

Two optional cable assemblies are available -- a two-wire and three-wire assembly. These may be connected for ignition switch control or ignition switch bypass.

TWO WIRE CABLE ASSEMBLY

The two-wire Ignition Switch Assembly consists of a Yellow "Y" fused lead, a black "Y" lead, and a 19-pin Vehicle System Plug. In-line connectors are provided for shortening the fused leads, if desired. If the in-line connectors are used, install the connectors between the fuse and the Vehicle Systems Plug.

NOTE

The speaker connections and other option connections (hookswitches, etc.) are also made to the Systems Plug. Do not connect the Systems Plug to the control unit until all connections have been made.

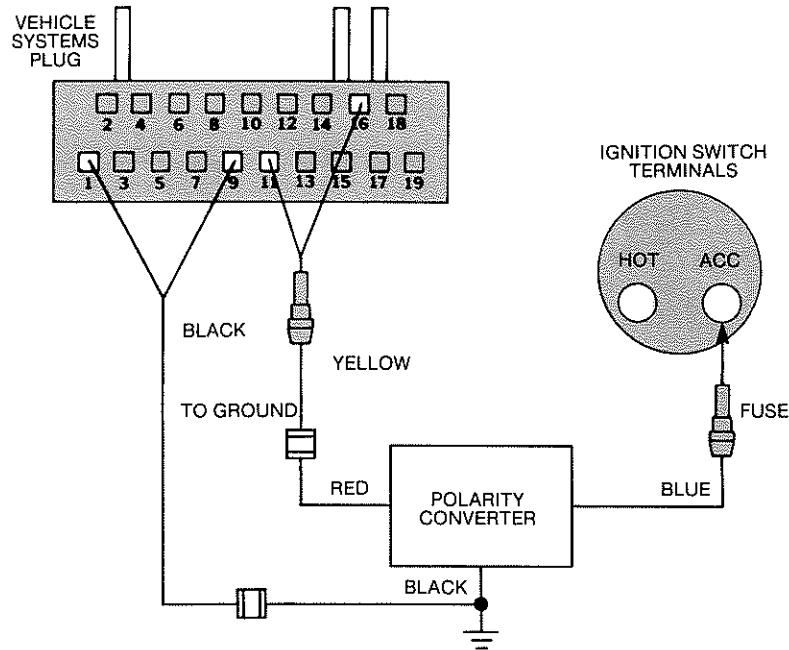
POSITIVE GROUND APPLICATIONS-OPTION PG01

Power to the radio can be controlled by one of two methods shown here. Select the type of control desired, and connect the Ignition Switch cables as directed.

1

IGNITION SWITCH CONTROL

Transmitter and receiver will operate only with ignition switch in ACCESSORY or ON position. Turning ignition switch OFF removes all power to the radio.



2

IGNITION SWITCH BYPASS

Transmitter and receiver operate independently of ignition switch. Unit can be turned ON and OFF only by control unit switch.

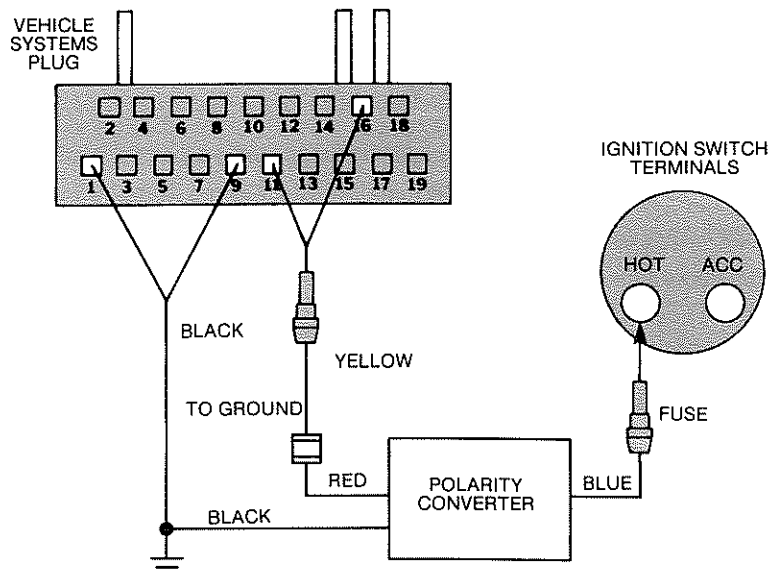


Figure 20. Connections for 12-Volt Ignition Switch Cables

POSITIVE GROUND APPLICATIONS-OPTION PG01

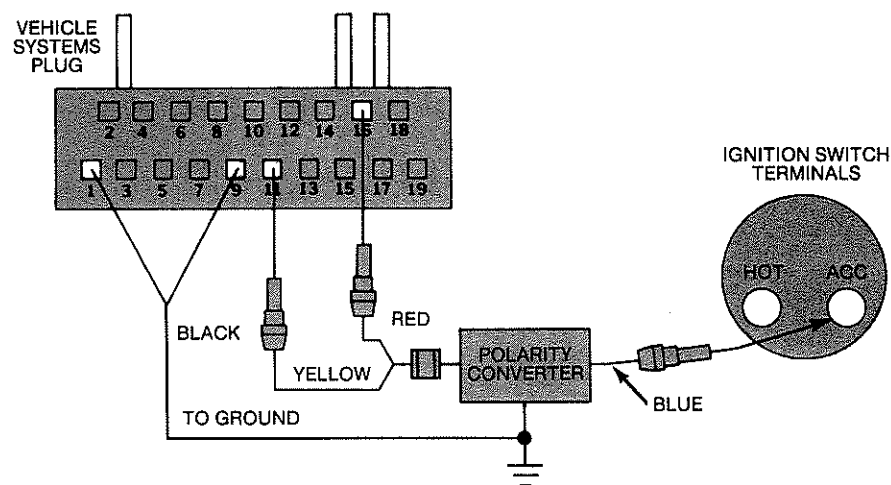
3-WIRE CABLE ASSEMBLY

The Three-Wire Ignition Switch Assembly consists of a red and a yellow fused lead, a "Y" black ground lead, and a 19-pin Vehicle Systems Plug. For ignition switch connections, refer to Figure 10.

1

IGNITION SWITCH CONTROL

Transmitter and receiver will operate only with ignition switch in ACCESSORY or ON position. Turning ignition switch OFF removes all power to the radio.



2

IGNITION SWITCH BYPASS

Transmitter and receiver operate independently of ignition switch. Unit can be turned ON and OFF only by control unit switch

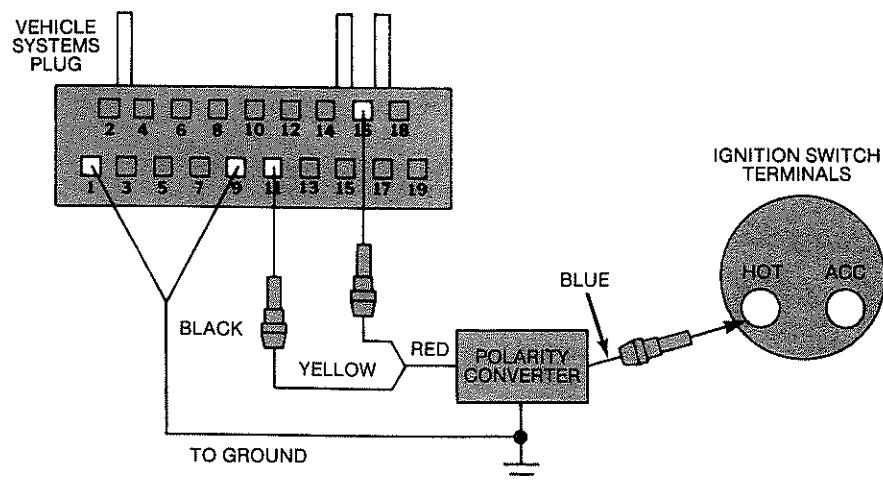


Figure 21. Connections For 12 Volt Ignition Switch Cables

PLACING THE RADIO IN OPERATION Refer to Page 14