



GMNA Engineering Centers General Motors Corporation

January 2002 Issue

Radio Telephone / Mobile Radio Installation Guidelines



Certain radio telephones or land mobile radios or the way in which they are installed may adversely affect vehicle operations such as the performance of the engine and driver information, entertainment and electrical charging systems. Expenses incurred to protect the vehicle systems from any adverse effect of any such installation are not the responsibility of General Motors Corporation. The following are general guidelines for installing a radio telephone or land mobile radio in General Motors vehicles. These guidelines are intended to supplement, but not to be used in place of, detailed instructions for such installations which are the sole responsibility of the manufacturer of the involved radio telephone or land mobile radio.

INSTALLATION GUIDELINE

(refer to enclosed [figures](#) during installation)

1. Transceiver Location

A. Locate transceiver for remote radios on driver's side of trunk as near to the vehicle body side as possible.

B. One piece transceivers should be mounted under dash or on transmission hump where they will not interfere with vehicle controls or passenger movement.

C. Great care should be taken not to mount any transceivers, microphones, speakers or any other item in the deployment path of a Supplemental Inflatable Restraint or "Air Bag".

2. Antenna Installation

A. Each vehicle model and body style reacts to radio frequency energy differently. When dealing with an unfamiliar vehicle, it is suggested that a magnetic-mount antenna be used to check the proposed antenna location for unwanted effects on the vehicle. Antenna location is a major factor in these effects.

B. The antenna should be a permanent-mount type located in the center of the roof or center of the rear deck lid. Glass mounted antennas should be kept as high as possible in the center of the rear window or windshield. If a magnet-mount antenna is used, care should be taken to mount

3.) Connect the positive lead to the auxiliary power terminal and connect the negative lead to the battery body connection point (identified by a short #10 AWG or larger wire running from the negative battery terminal to the body of the vehicle).

4.) Connect the positive and negative leads to the Special Equipment Option (SEO) wiring provided for this purpose.

B. If connections are made directly to the battery terminals, the GM approved methods of connecting auxiliary wiring include the adapter package illustrated in [Figure 2](#), NAPA-Belden replacement battery bolts (part # 728198), or drilling and tapping the hex end of the original battery bolts 10-32 X 3/8" deep. NOTE: It is recommended that a fuse be placed in the transceiver negative lead to prevent possible transceiver damage in the event the battery to engine-block ground lead is inadvertently disconnected.

C. For ONE-PIECE TRANSCEIVERS where ignition switch control is desired and no SEO wiring exists, a 12 Volt power contactor must be installed in the transceiver positive lead. The contactor should be located near a proper 12 Volt feed. The coil of the contactor should be connected through an appropriate in-line fuse to an available accessory circuit or ignition circuit not

the antenna in the same location as a permanent-mount type. If a disguise-mount antenna is used, great care should be taken to shield any tuning network from vehicle electronics and wiring, or to mount the tuning network in an area completely clear of vehicle electronics and wiring.

C. Standard metal mount antennas may be mounted on a vehicle with nonmetallic body panels by two methods. Most nonmetallic skinned vehicles have metal frames underneath. Mounting the antenna near a metal frame section and bonding the antenna mount to the frame with a short metal strap will provide the groundplane connection. Some antenna manufacturers offer "groundplane kits" that consist of self adhesive metal foil that may be attached to the body panel to provide the groundplane for the antenna.

D. Some vehicles use glass that contains a thin metallic layer for defrosting or to control solar gain. Glass mount antennas will NOT function when mounted on this type of glass. Consult your GM dealer or owner's manual to determine if this glass is installed on your vehicle.

E. If RF related interactions occur when using a hitch or bumper mount HF antenna on a vehicle that has body on frame construction (ie Pickup, SUV) connect a ground strap from the vehicle frame to the bottom rear of the vehicle body (for station wagon type vehicles), or from the vehicle frame to the bottom rear of the cab (pickup style vehicles).

3. Antenna Cable Routing

A. Always use a high quality coax (at least 95% shield coverage) located away from the Engine Control Module and other electronic modules.

B. Care should be taken to maintain as great a distance as possible between any vehicle wiring and the feedline.

4. Antenna Tuning

A. It is important that the antenna be tuned properly and reflected power be kept to less than 10% (VSWR less than 2:1).

5. Radio Wiring and Connection Locations

A. Connecting radio power on General Motors vehicles is model dependent. The installer must decide which one of the following four methods will be appropriate.

- 1.) Connect the positive and negative leads directly to the battery terminals (illustrated in this guideline).
- 2.) Connect the positive lead to the auxiliary power

powered during cranking. The contactor coil must return to a proper negative point. Detail "A" illustrates direct connection to the vehicle battery.

D. Any negative lead from a handset or control unit must return to a proper negative connection point. It is preferable that the positive lead for a handset or control unit be connected directly to a proper positive feed. If ignition switch control is desired, the handset or control unit positive lead may be connected through an appropriate in-line fuse to an available accessory circuit or ignition circuit not powered during cranking. It is recommended that the handset or control unit positive and negative leads be appropriately fused separately from the transceiver positive and negative leads.

E. If multiple transceivers or receivers are to be installed in the vehicle, power leads to the trunk or under dash should be connected to covered, insulated terminal strips. All transceivers or receivers may then have their power leads connected to the strips. This makes a neater installation and reduces the number of wires running to the vehicle underhood area.

6. Radio Wire Routing

A. The power leads should be brought through a grommeted hole in the front bulkhead that must be provided by the installer. For trunk-mounted transceivers, the cables should continue on along the driver's side door sills, under the rear seat, and into the trunk through the rear bulkhead. All attempts should be made to maintain as great a distance as possible between radio power leads and vehicle electronic modules and wiring.

B. If the battery is located on the passenger side, radio power leads should cross the vehicle in front of the engine.

7. Troubleshooting

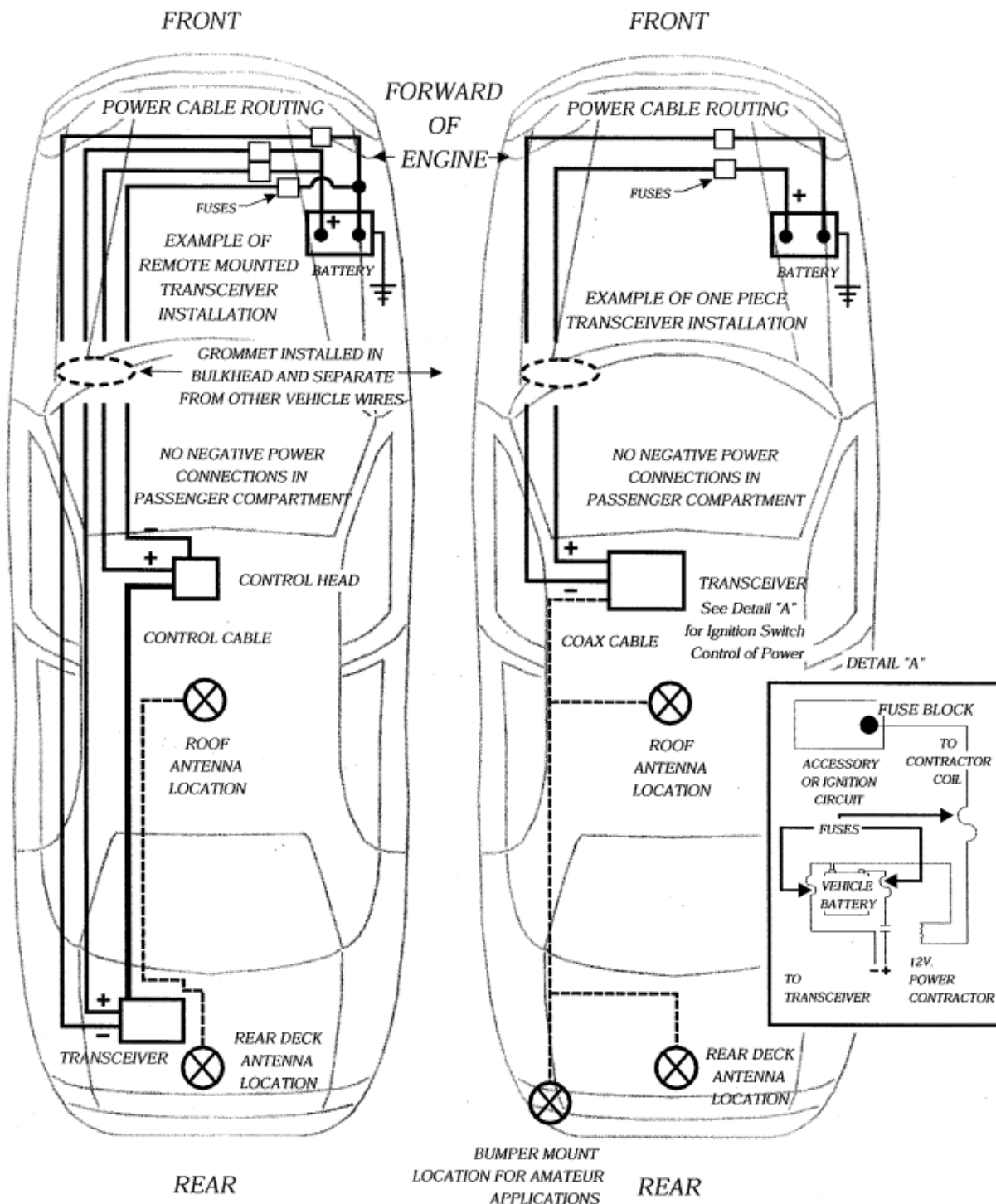
A. Should vehicle-radio interaction develop following installation, the source of the problem should be determined prior to further operation of the vehicle. Most interaction problems can be eliminated by following the installation guideline.

B. If any vehicle-radio interaction problems exist after following this guideline, the vehicle should be returned to a GM dealer for examination and resolution of the problem.

terminal (located at the underhood fuse center or identified by a red plastic cover in the underhood area) and connect the negative lead directly to the negative battery terminal.

[^ Instructions ^](#)

TRANSCEIVER INSTALLATIONS

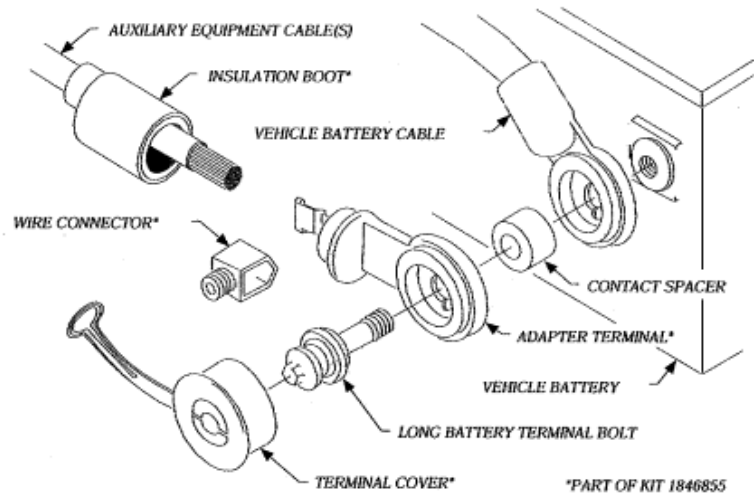


[^ Instructions ^](#)

Figure 2

Auxiliary Electrical
Equipment
GM Recommended
Installation

AC-Delco Side Terminal Adapter
Package 1846855, when combined with
the longer battery bolt and spacer will
provide the simple, tight, corrosion
resistant connection illustrated. Parts can
also be purchased at car dealerships.



| Item | AC-DELCO Catalog 7A10 | CAR DEALER "Parts" Book |
|--------|--------------------------|----------------------------|
| Kit | 1846855 | 1846855 |
| Bolt | 7803 | 12004188 |
| Spacer | 7804 | 12004189 |

