AVI-ATS

AVI-ATC and AVI-ATT

Anti-theft Automatic Vehicle Identification operating and installation instructions

TECHNICAL INFORMATION FOR
AVI-ATS SYSTEM COMPRISED OF THE AVI-ATC and AVI-ATT MODULES.

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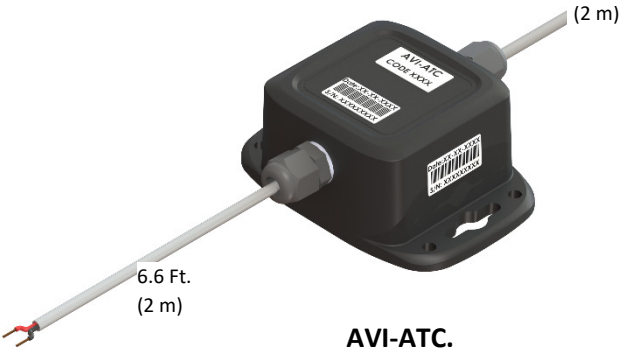

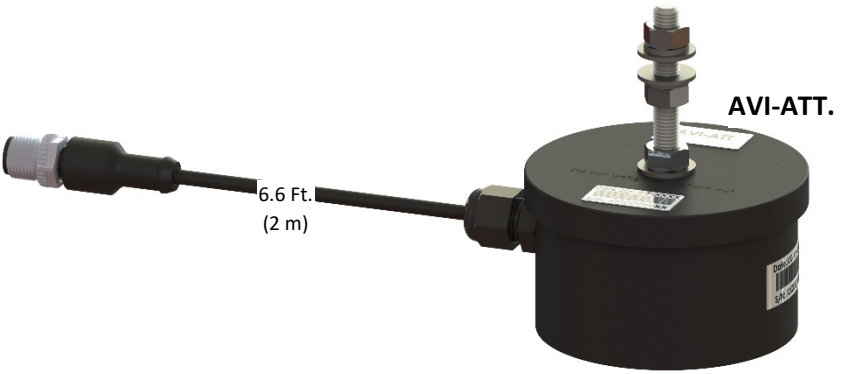

Figure 1 – AVI-ATS system, comprised of the AVI-ATT and AVI-ATC.

AVI (AUTOMATIC VEHICLE IDENTIFICATION) EQUIPMENT IS DESIGNED AND MANUFACTURED IN THE USA BY
RENO A&E, A BRAND OF EBERLE DESIGN INC.

EBERLE DESIGN INC. IS CERTIFIED TO ISO 9001:2015 QUALITY SYSTEMS STANDARDS.

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Section 1 General

The AVI-ATS is a two-module device. One module, the AVI-ATT, is installed on the front undercarriage of a vehicle; and the other module, AVI-ATC, is typically installed higher up inside the engine compartment inaccessible from the undercarriage and from outside the vehicle.

The two modules are connected via an insulated cable (12 feet long) and a water tight quick-disconnect. Once connected to the electrical system of the vehicle, via a separate insulated cable (6 feet long), the AVI-ATC automatically and continuously generates a unique coded signal that drives the AVI-ATT module. The AVI-ATT in turn broadcasts this encoded signal toward the roadway.

When the vehicle/AVI-ATT pass over a wire loop installed in the roadway that is connected to Reno A&E Automatic Vehicle Identification (AVI) Receivers, configured to recognize the code being broadcast, the vehicle is identified as a valid transmitter. The loop in the roadway can be a Reno A&E prefabricated loop, (see prefabricated loop product line). (Also our see AVI Receiver product line).

The AVI Receiver (detector) typically interfaces with an access gate controller, or traffic signal controller, which requires the vehicle identification at one specific location or possibly multiple locations along or within the vehicle's path.

Anti-theft

Although the AVI-ATT module is accessible from the outside of the vehicle and is therefore open to theft, it is a “dumb” transmitter. If stolen from the undercarriage of a vehicle, it is of no use by itself; it cannot generate any of the required AVI codes without connecting to the AVI-ATC. The AVI-ATC and AVI-ATT interfaces and passes electronic signals to each other to generate and transmit the valid (selected) AVI signal. The transmitted AVI

signal is near-field coupled to the installed loop connected to an AVI receiver at the point of access (Gate for example).

The AVI-ATC provides both the proper power and a signal encoding a valid AVI code to the AVI-ATT transmitter. With this signal, the AVI-ATT modulates a high frequency carrier which is then transmitted. The AVI-ATT also generates a timing signal back to the AVI-ATC ensuring the modulating signal the AVI-ATC generates is clocked correctly.

Thus, a great impedance to anti-theft is achieved by ensuring each module must have the other in order to broadcast a valid AVI code from the vehicle.

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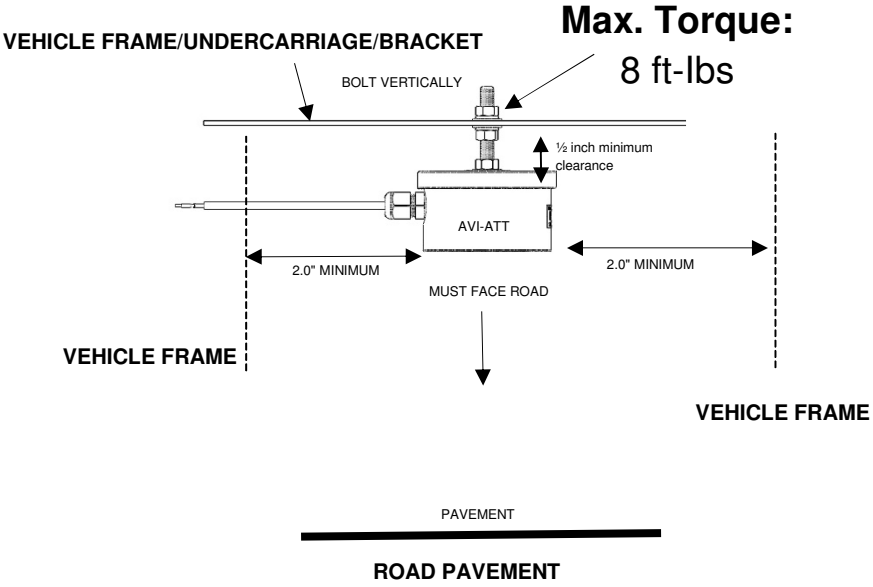
NOTE: If the AVI-ATT module is disconnected from the AVI-ATC module, the coded signal will stop transmitting. The AVI-ATT must be connected to the AVI-ATC to transmit a coded signal.

Section 2 Installation Procedure

1. AVI-ATT. Proper location and installation are essential for correct operation of this device. In order to ensure the most consistent and earliest detection of the vehicle, select a location on the underside of the vehicle that is in front of the front wheels and behind the front bumper. Make sure that it is oriented properly with the large puck shaped portion pointing downward and the mounting bolt vertical. Refer to figures 2 through 4.



AVI-ATT Transmitter Installation and Orientation

Figure 2

Note 1: The transmitter should be located as low as practical on the vehicle to provide an uninterrupted signal path to the receiving antenna (installed in the roadway).

Note 2: It is critical that the AVI-ATT module of the transmitter is mounted in a location that does not make it vulnerable to possible damage from any form of road obstacle or debris.

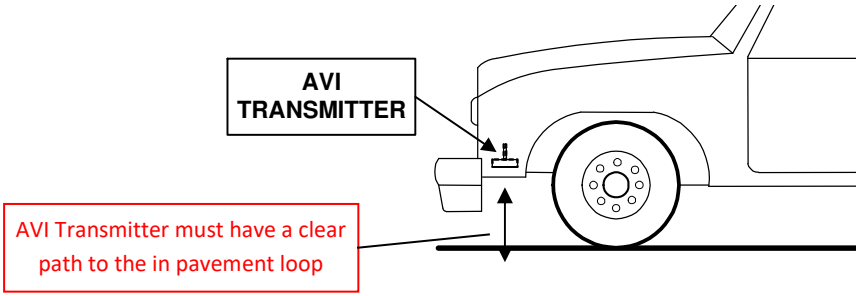


Figure 3

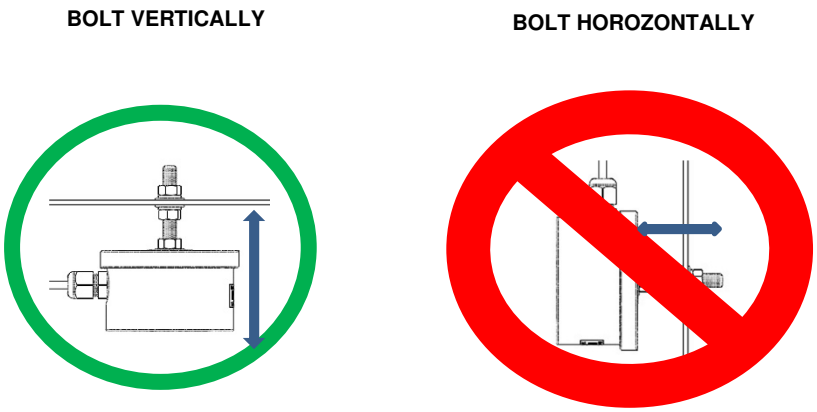


Figure 4

GOOD **BAD**

WARNING: **DOES NOT TRANSMITT CODE**

The transmitter must not be located directly above metal surfaces, or in close proximity to heat sources such as exhaust pipes and mufflers. Failure to observe this requirement will significantly shorten the life of the transmitter. The transmitter's mounting bolt *must* be in the *vertical* orientation. If the mounting bolt is in the *horizontal* orientation, the AVI Transmitter will not transmit the code

Section 3 Mounting Recommendations

AVI-ATT

1. The AVI-ATT must be mounted to a strong structural member (on the underside of the vehicle) that does not obstruct the transmission signal path to the receiving antenna (inductive loop).

2. For best results, the sides and top of the device should be at least two inches away from any vehicle structural member.

3. Generally, the optimal mounting height will be 12 to 18 inches above the pavement, for most cars and small trucks. Large trucks may, because of greater over-the-road clearance, require greater mounting heights.

4. Do not install the transmitter or its cable near moving parts, or in areas exposed to temperatures exceeding 180 degrees Fahrenheit (82 degrees Centigrade). All mounting hardware supplied with this device is corrosion resistant stainless steel.

NOTE: The location of the AVI-ATT transmitter shown in figure 3 is for reference only. The actual location will depend on the specific vehicle to which the transmitter is being mounted.

AVI-ATC

1. Open the front engine compartment; find a convenient mounting location in the upper engine compartment away from moving parts and hot spots. In some vehicle models, some areas to mount the AVI-ATC, may be:
    a. Located near the battery support
    b. Located near or amongst electronic terminal boxes, fuse box, and cable runs
    c. Located on the firewall separating the driver's compartment from the engine compartment

d. Located near the top of the side walls of the engine compartment
e. Located near/behind headlights
f. Mounted underneath the dash within the cab of the vehicle out of sight.

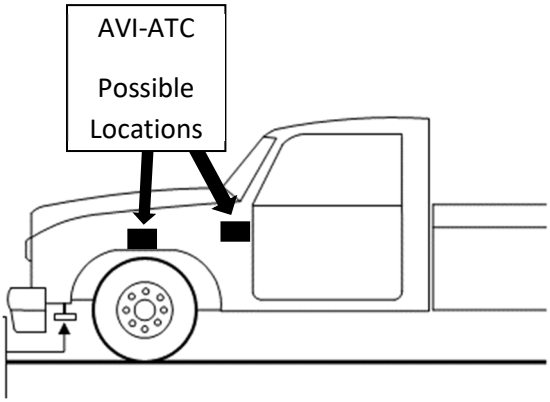


Figure 3. Mounting location of AVI-ATC Module. For reference only**.**

2. Route the smaller length cable (the cable having no quick disconnect and only a red and black colored wires) into the driver's compartment, avoiding sharp edges, hot spots, and abrasion points. This is the DC power cable for the AVI-ATC transmitter. The positive red wire (+) of the power cable should be fused with a one amp. Fuse to protect the vehicle's electrical system if the power cable becomes damaged. The black wire (-) should be connected directly to the negative side of the vehicle's DC electrical system.

Note: Poor electrical connections through the vehicle's chassis may cause problems.

Section 4 DC Power Cable Recommendations:

1. Whenever possible, the transmitter should be connected to the accessory position of the ignition switch. If this is not possible, a separate switch must be installed on or under the dashboard to turn off the transmitter when the vehicle is not running, eliminating the constant drain on the battery.

2. When AVI-ATT transmitter is used on emergency vehicles, the transmitter may be connected through the switch for the emergency beacons, flashers or light bar.

3. Make certain that all connections are electrically and mechanically secure.

4. All connection points must be clean. This is extremely important for the ground connections. Thoroughly clean the ground point with fine sandpaper or emery cloth.

5. All terminals installed on the wires must be properly and securely crimped. For an even stronger and more secure connection, the crimped connections may be soldered (recommended).

6. The screw or bolt used to make the ground connection should be securely tightened. If the transmitter is mounted in a vibration prone environment, use a lock washer or similar hardware to ensure tight, secure connections.

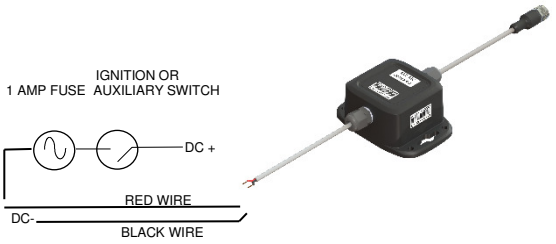
7. When finished, coat the connection with a protective sealant to prevent potential moisture and/or salt damage.

8. Avoiding sharp edges, hot spots, and abrasion points, route the connectorized cable from the AVI-ATC module to the AVI-ATT module

located on the vehicle under carriage. Secure cable against other cable runs or pre-installed cable mounts.

9. Plug together the quick disconnect. Ensure it is securely engaged.

10. Zip tie any excess cable into a coil and zip-tie it against the top of the transmitter bolt or vehicle frame. Excess cable can also be coiled and zip tied to a convenient location/bolt or structure at the other end near the AVI-ATC module as well.



Section 5 Test Installation

1. To test the installation and verify proper operation of the AVI-XMC transmitter on a vehicle, with the vehicle in park and idling, read the AVI code from the AVI-ATT being broadcasted using the Reno A&E Model CR-100 or CR-200 AVI Code reader.

Figure 4. Reading AVI code transmitted from AVI-ATT using AVI code reader. (Code 9841 being read.)

Figure 5. CR-100 Code Reader