

## Part 2: Radio installation procedures

<b>Installation warnings</b> .....	<b>22</b>
Warning: Safe radio mounting .....	22
Warning: Interference with vehicular electronics .....	22
Warning: Liquefied petroleum gas powered vehicles .....	22
Important: Non-standard radio installations .....	23
<b>Installation planning</b> .....	<b>24</b>
MPT 1362 code of practice .....	24
Checking equipment .....	24
Installation tools .....	24
Mounting position .....	25
<b>Radio installation</b> .....	<b>26</b>
Mounting the U-bracket .....	26
Control head handling precautions .....	26
Installing the control head on the radio body .....	26
Installing the microphone .....	28
Installing the antenna .....	28
Power cable .....	29
Installing the radio in the U-bracket .....	30
Installing the microphone clip .....	31
TM8105 programming connector .....	31
Installation checks .....	32
<b>Other installation options</b> .....	<b>32</b>

## Installation warnings



### Warning: Safe radio mounting

- Mount the radio securely so that it will not break loose in the event of a collision. An unsecured radio is dangerous to the vehicle occupants.
- Mount the radio where it will not interfere with the deployment of passenger air bags.
- Do not mount the radio vertically, with the control head facing down. This will violate compliance with the European Union standard EN 60950, Safety of Information Technology Equipment.



### Warning: Interference with vehicular electronics

Some vehicular electronic devices may be prone to malfunction, due to the lack of protection from RF energy present when your radio is transmitting.

Examples of vehicular electronic devices that may be affected by RF energy are:

- electronic fuel injection systems
- electronic anti-skid braking systems
- electronic cruise control systems.

If the vehicle contains such equipment, consult the vehicle manufacturer or dealer in order to determine whether these electronic circuits will perform normally when the radio is transmitting.



### Warning: Liquefied petroleum gas powered vehicles

Radio installation in vehicles powered by LP (liquefied petroleum) gas with the LP gas container in a sealed-off space within the interior of the vehicle must conform to the National Fire Protection Association Standard NFPA 58. This standard states that the radio equipment installation must meet the following requirements.

- The space containing the radio equipment shall be isolated by a seal from the space containing the LP gas container and its fitting.
- Outside filling connections shall be used for the LP gas container and its fittings.
- The LP gas container space shall be vented to the outside of the vehicle.

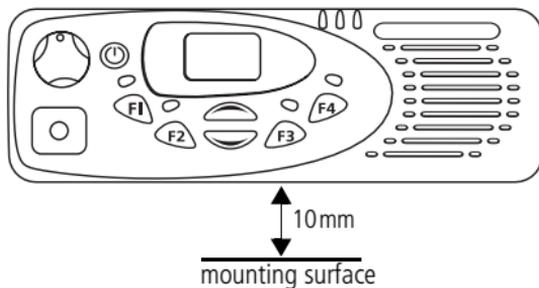


### Important: Non-standard radio installations

The installation U-bracket described in this guide has been designed so that there is enough airflow around the radio to provide cooling.

If a non-standard installation method is used, care must be taken that sufficient heat can be dissipated from the radio heatsink fins and the bottom surface of the radio chassis.

For this to be achieved, there must be a gap of more than 10mm (0.4 inch) between the bottom surface of the radio chassis and the mounting surface. This is illustrated in the following diagram.



### Important: Negative ground supply

TM8100 radios are designed to operate only in a negative ground system.

## Installation planning

The procedures outlined in this and the following sections are for installing a TM8100 radio in a vehicle, using a standard U-bracket.

### MPT 1362 code of practice

TM8100 radios should be installed in accordance with the MPT 1362 Code of Practice. This code of practice covers the installation of mobile radio equipment in land based vehicles and has been developed by the United Kingdom Radiocommunications Agency.

The full text of the MPT 1362 Code of Practice can be found at the Radiocommunications Agency website, [www.radio.gov.uk](http://www.radio.gov.uk).

### Checking equipment

Unpack the radio and check that you have the following items:

- radio control head with connecting loom
- radio body
- microphone with microphone clip and screws (TM8110 and TM8115 only)
- installation kit, consisting of:
  - U-bracket with screws
  - power cable with DC connector
  - 10A fuses
  - fuse holders
  - BNC antenna plug.

### Installation tools

- Portable drill
- 8mm (0.3 inch) socket
- BNC crimp tool

- In-line RF power meter capable of measuring forward and reflected power at the operating frequency of the radio

### **Microphone clip installation tools**

- Centre punch
- Drill bit
- Pozidriv screwdriver
- Hammer

## **Mounting position**

Inspect the vehicle and determine the safest and most convenient location for mounting the radio.

The installation must meet the following requirements:

- sufficient clearance behind the radio for the heatsink and cables
- a large enough flat surface so that the mounting bracket will not be distorted
- no danger of the radio interfering with air bag deployment.

# Radio installation

## Mounting the U-bracket

Screw the U-bracket in the chosen mounting position using the self-tapping screws provided. At least four screws must be installed. If the U-bracket is being mounted over a curved surface, bend the U-bracket tabs slightly.



Important: Check that the U-bracket is not distorted when the screws are tightened.

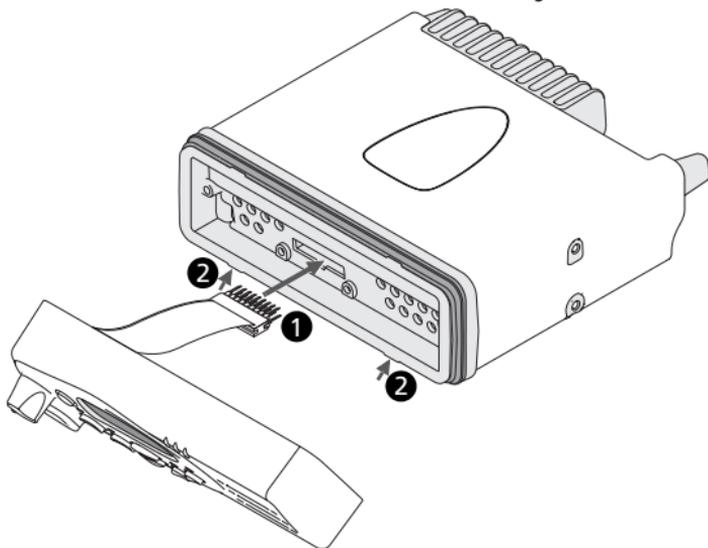
## Control head handling precautions



Important: The control head contains devices which can be damaged by static discharges. Always install or remove the control head in a static-safe environment.

Information on antistatic precautions can be found at the Electrostatic Discharge Association (ESD) website, [www.esda.org](http://www.esda.org).

## Installing the control head on the radio body

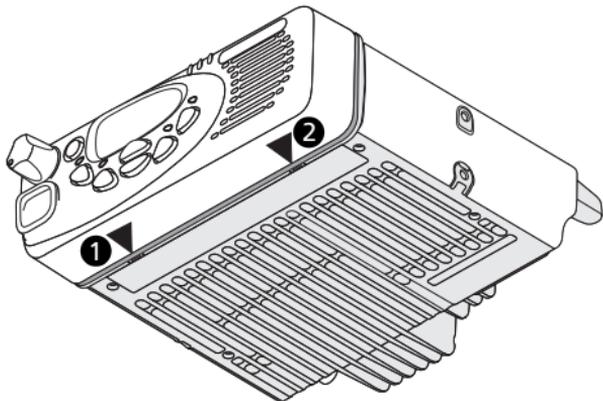


The orientation of the U-bracket mounting determines which way up the control head is mounted on the radio body. The

numbers in the diagram on the previous page refer to the numbered steps below.

1. Plug the control head loom onto the control head connector.
2. Insert the bottom edge of the control head onto the two clips in the front of the radio chassis, then snap into place.

## Removing the control head



 Important: During this procedure, take care that the chassis seal is not damaged. Damage to this seal reduces environmental protection.

1. On the underside of the radio, insert a flat-bladed screwdriver between the control head and the radio chassis seal, in either position **1** or **2**.



Note: Insertion points **1** and **2** are indicated on the radio chassis by a dot-dash-dot pattern (•—•).

2. Use the screwdriver to lift the control head off the chassis clip, then repeat in the other position.

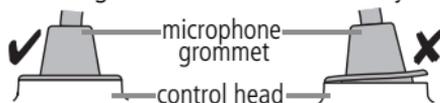
The control head can now be removed from the radio body.

## Installing the microphone

 Important: The microphone grommet must be installed whenever the microphone is plugged into the microphone socket. When installed, the grommet has two functions:

- to prevent damage to the microphone socket when there is movement of the microphone cord, and
- to ensure that the control head is sealed against water, dust and other environmental hazards.

1. Plug the microphone into the microphone socket on the control head.
2. Slide the microphone grommet along the microphone cord and push two adjacent corners of the grommet into the microphone socket cavity.
3. Squeeze the grommet and push the remaining corners into position.
4. Check that the grommet is seated correctly in the cavity.



## Installing the antenna

Install the external antenna according to the supplier's instructions. Good quality 50 ohm coaxial cable must be used, such as RG58 or UR76.

 Important: The cable should be routed in a manner that minimizes coupling into the electronic control systems of the vehicle.



### Warning: RF exposure hazard

To comply with FCC RF exposure limits, this product must be installed using an externally mounted antenna with either a 2.15dBi or 5.15dBi gain.

This antenna must not be mounted at a location such that any person or persons can come closer than 0.9m (35 inches) to the antenna.

## Antenna termination

1. Run the free end of the coaxial cable to the radio's mounting position and cut it to length, allowing 20 - 30cm (8 - 12 inches) excess.
2. Terminate the free end of the cable with the BNC plug supplied.

## Power cable



Important: This radio is designed to operate from a nominal 12V negative ground supply and may draw up to 8A of current. The radio will tolerate a supply voltage range of 10.8V to 16.0V at the radio.

In vehicles with a supply voltage greater than 16.0V, such as many trucks, it is essential to provide a suitably rated DC to DC converter. This will isolate the radio from excessive battery voltage and provide the correct DC operating conditions.

## Installing the power cable



Important: Disconnecting the vehicle's battery may cause problems with some electronic equipment, such as vehicle alarms, engine management systems and in-car entertainment systems. Check that the vehicle owner has the necessary information to make all electronic equipment function correctly after battery reconnection.

1. Disconnect the vehicle's battery, unless specifically prohibited from doing so by the customer, vehicle manufacturer, agent or supplier.

If the battery is not disconnected, exercise extreme caution throughout the installation and install the fuses only when the installation is ready to be checked (see "Installation checks" on page 32).

2. Determine where the power cable will be routed.



Important: The power cable should be protected from engine heat, sharp edges and from being pinched or crushed.

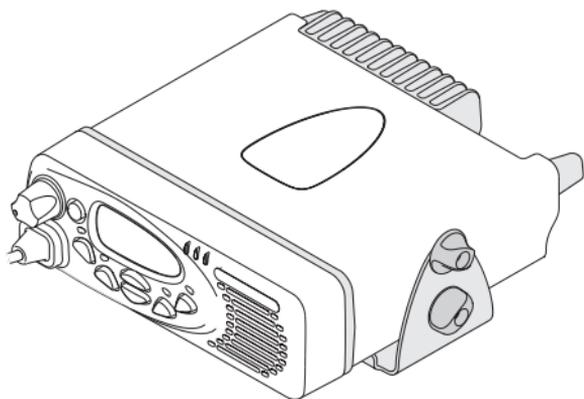
- Cut the negative and the positive wires where the in-line fuse holders will be placed (as close to the battery as possible).



Note: Do not install the fuses until the installation is ready to be checked.

- Insert each end of the negative wire into one of the in-line fuse holders and crimp them to force the metal contacts onto the wires.
- Connect the negative wire to the battery ground.
- Repeat step 4 for the positive wire and connect it to the positive terminal of the battery.

## Installing the radio in the U-bracket



- Connect the antenna and power cables to the rear of the radio.
- Position the radio in the U-bracket so that the holes in the U-bracket line up with the holes in the radio chassis.
- Screw the radio into position using the four thumb screws but without fully tightening the screws.
- Position the radio in the U-bracket for best viewing angle, then tighten the thumb screws.