

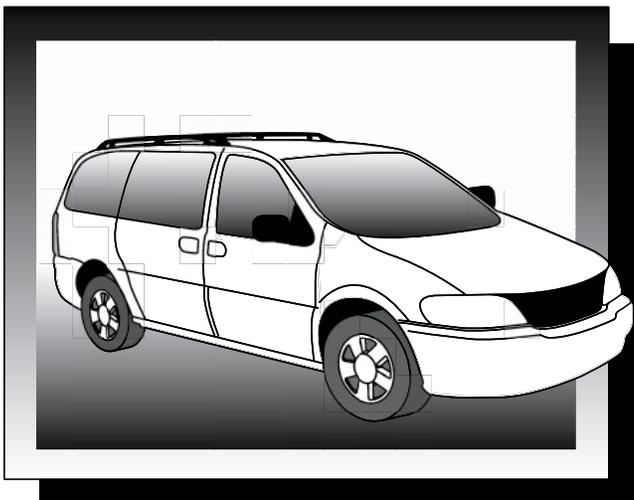
CRUTCHFIELD®

Navigation Installation Guide

IMPORTANT

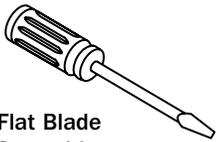
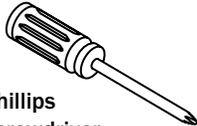
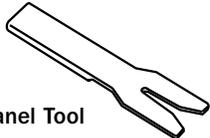
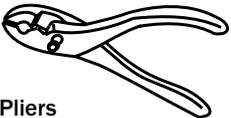
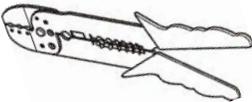
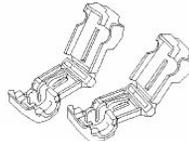
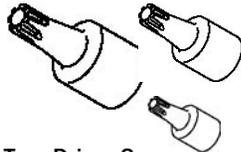
Before starting, compare items on your invoice with items received. Carefully check through packaging material. If any item is missing, please call: **Crutchfield Customer Service at 1-800-955-9091**

Although reasonable attempts are made to verify the accuracy of the information contained in this guide, it is presented without warranties or guarantees of any type due to the constantly changing nature of this type of information and running changes in vehicle production. Any person or entity using this information does so at his or its own risk. If you find that our instructions do not apply to your vehicle, or if you have questions, do not continue with your installation. Contact our toll-free technical support for assistance (Tech support number is on your invoice).



Tools Needed: (depending upon vehicle)

 As with any car audio/video installation, your first step is to disconnect the negative terminal of your car battery to prevent short circuits. Check your Crutchfield MasterSheet™ (available for most vehicles) or vehicle owner's manual for specific directions. In some vehicles, disconnecting the battery may require you to re-enter a security code or have the dealer reset the internal computer.

 <p>Flat Blade Screwdriver</p>	 <p>Phillips Screwdriver</p>	 <p>Panel Tool</p>	 <p>Utility Knife</p>
 <p>Pliers</p>	 <p>Drill & Bit Set</p>	 <p>Male and Female Disconnects</p>	 <p>Socket & Ratchet Set</p>
 <p>Wire Stripper/Crimp Tool</p>	 <p>Wire taps</p>	 <p>Torx Driver Set</p>	

Types of Navigation Systems; Connecting to the Speed Sensor

There are several different types of navigation systems available, including remote-mount (or component) DVD-ROM systems, in-dash DVD receivers with built-in monitors and navigation capability, and portable navigation pieces.

This installation guide focuses specifically on installing component navigation systems. The main component in this case is a DVD-ROM drive that is installed in a convenient spot, and to which certain wiring connections need to be made. For tips on installing a receiver, visit our receiver installation guide and our receiver installation video on crutchfieldadvisor.com, or refer to your Crutchfield MasterSheet™ (available for most vehicles). Portables, meanwhile, don't require permanent installation methods, and are generally quite easy to use; you'll just need to follow a few simple instructions in the owner's manual.

Please note, too, that all navigation systems require a GPS antenna. It can be placed in the car, on the rear deck, for example. However, for optimum performance, it should be mounted outside the vehicle. In this regard, it installs just like a satellite radio antenna. Please see our satellite radio installation guide and our satellite radio antenna installation video for further information.

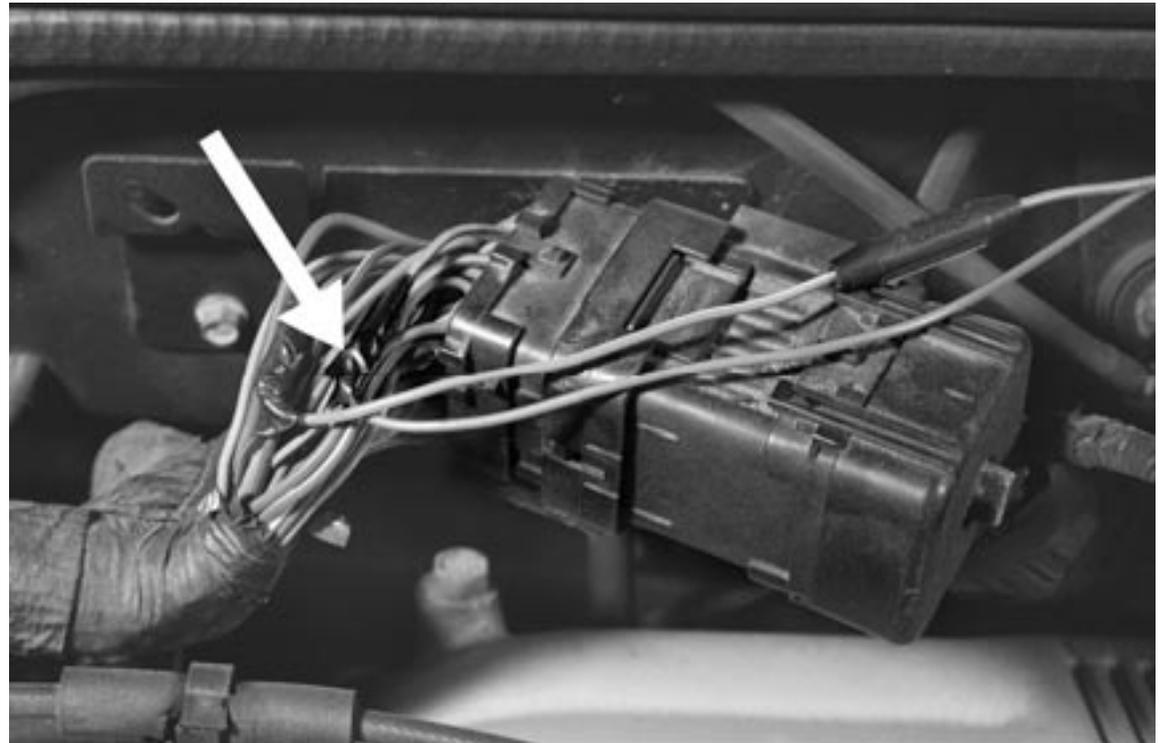
To install a navigation system in your car, you'll need to be able to do four things: find and make a connection to the vehicle's speed sensor, find and make a connection to the reverse light, install the DVD-ROM drive, and make all the power and audio/video connections. (If you're not connecting the DVD-ROM drive to an in-dash receiver with a monitor, you'll need an external monitor. Front-seat external monitors usually come with adjustable mounting brackets; their owner's manuals feature mounting details.)

Finding and connecting to the speed sensor

Your car's speed sensor sends information from the transmission to the speedometer. A navigation system (component or in-dash) uses this information to calculate vehicle speed and distance traveled, and to estimate time of arrival during a trip. To get this information to the navigation system, you'll have to find and make a connection to your car's speed sensor wire.

Where the wire is depends on the vehicle. Sometimes it can be accessed from under the dash, sometimes from under the hood. You'll need to consult a comprehensive wiring diagram for your vehicle in order to identify it correctly. Make sure you feel comfortable with this. If not, you'll probably want to have your navigation system installed by a professional.

Once you find the vehicle speed sensor wire, connect the navigation system's speed sensor lead to it. The easiest way is to attach a wire-tap to the car's wire and connect the navigation system's lead with a male disconnect. For an even stronger connection, you can strip away some of the jacket from the car's wire — be sure not to break the wire itself — then wrap the exposed end of the navigation system's lead around the exposed wire and solder the two together. Wrap electrical tape around the connection or use heat-shrink tubing for strength and insulation.



You must make a secure connection to your vehicle's speed sensor to get the most accurate navigation possible. Speed sensor wire location varies; it may be under the hood, as pictured above. Call the Tech Support phone number on your Crutchfield invoice for assistance in locating the speed sensor in your specific vehicle.

Connecting to the Speed Sensor (cont.); Connecting to the Reverse Light

If the speed sensor wire is under the dash, you can run the lead to the DVD-ROM drive under the carpet on your vehicle's floor. If the wire is under the hood, you'll have to get the navigation system's lead to it through the firewall.

Try to locate an existing hole on the firewall of your vehicle; most cars will have a pre-drilled hole through which some of the car's wiring already runs. If you can't find one, you'll have to find a good place to drill one — take care not to drill through a gas line or electrical wiring. We recommend that you drill your own hole only if necessary.

Once you've found or drilled a suitable hole, run the speed sensor lead through the hole into the engine compartment, then connect it to the speed sensor wire. (If you've drilled the hole, install a rubber grommet in it to prevent damage to the lead.) Once you've made the connection, run the lead to the DVD-ROM drive under the vehicle's carpet.

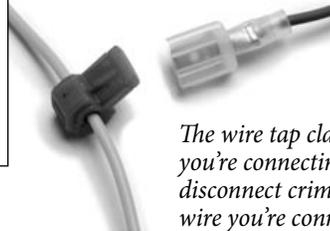
Finding and connecting to the reverse light

The navigation system also needs to be connected to your vehicle's reverse light; it has to know when you're going backwards for accurate positioning and route calculation. The easiest way to do this is to connect to the reverse light wire right at the taillight. As with the speed sensor, you can consult your wiring diagram in order to find it. You can also check each wire that goes into the taillight with a multimeter; connect the multimeter to a wire, have someone put the car in reverse (while keeping the brake engaged, of course), then see if you get a 12-volt reading. Repeat this process with each wire until you've found the right one. (**Note:** if you get a 12-volt reading, make sure it's because you've found the reverse wire, not the brake wire; you'll know it's the brake wire if you get a reading as soon as the brake is pressed.)

As with the speed sensor, either wire-tap the reverse light wire or strip and solder it. You can then run the connecting wire from the tail lights to the DVD-ROM drive. Depending on the vehicle you drive, this could involve removal of trim panels, lifting of sections of carpet, and even backseat removal (if you're running the lead from the trunk to the DVD-ROM drive in a passenger car). The reverse wire can sometimes be found under the dash or under the hood, but you'll have to consult your wiring diagram carefully in order to identify it correctly; tapping into it at the taillight tends to be much easier.

! CAUTION:
Always be careful when drilling or cutting in a vehicle. Be aware of things such as wiring, windows, fuel lines and safety devices. Check drilling/cutting depth and location to avoid damage to vehicle appearance.

Using a wire tap and male disconnect is the easiest way to make the wiring connections you'll need.



The wire tap clamps on the wire you're connecting to; the male disconnect crimps onto the new wire you're connecting.



The male disconnect slides firmly onto the end of the wire tap, making a secure connection.



When running a wire from under the hood into the cab through the vehicle's firewall, we recommend you find and use a pre-existing opening, where other wires come into the vehicle cab.

! SAFETY CHECK
✓ Check reverse light wiring connection and test operation.



The easiest place to connect to your reverse light is in the back of the vehicle. As pictured above, however, you may choose to make a connection under the hood instead.

Panel removal

The wire routing and concealment depends upon your vehicle and where the components of your system are placed. The instructions below address, in general, what panels may need to be removed and how they typically come off. Often, panels can be pried up at edges. Screws and retaining clips might also be present that will require removal (Figure 1). To prevent damage, always use care when removing panels.

Door Scuff Plate removal

The plates are usually removed by prying up the edges to release clips. Some vehicles will have screws present which will need to be removed (Figure 2).

Seat Belt removal

A seat belt may be located on the panel that needs to be removed. Most seat belt anchor covers pry off. The seat belt anchor is secured with a large nut or bolt (Figure 3).

Pillar Trimpanel removal

Remove seat belt if present. Remove screw covers, screws and plastic retaining clips, if present. Pry up edges of panel to remove (Figures 4 & 5).

Kick panel removal

Look for screws and pry-out retaining clips to remove. Pry out edges of panel to release and remove (Figure 6).

Routing wire behind dash

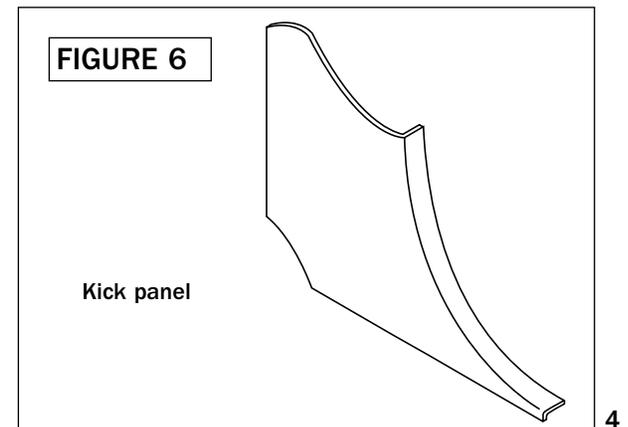
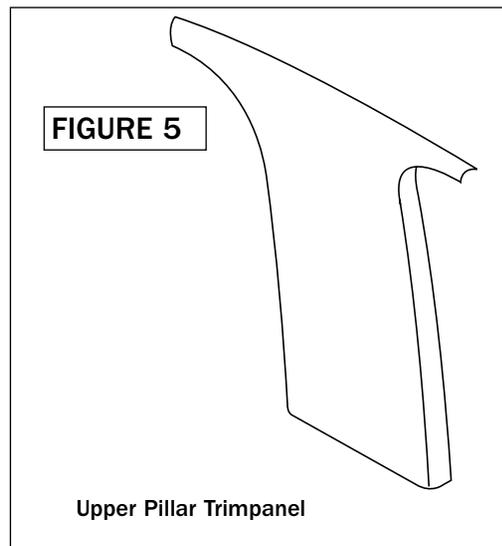
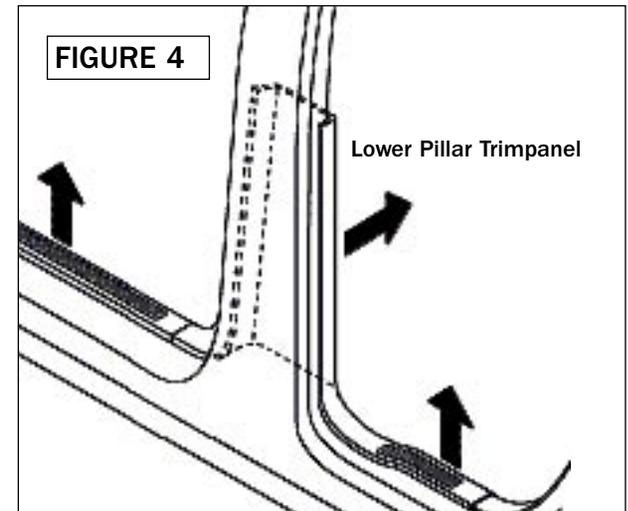
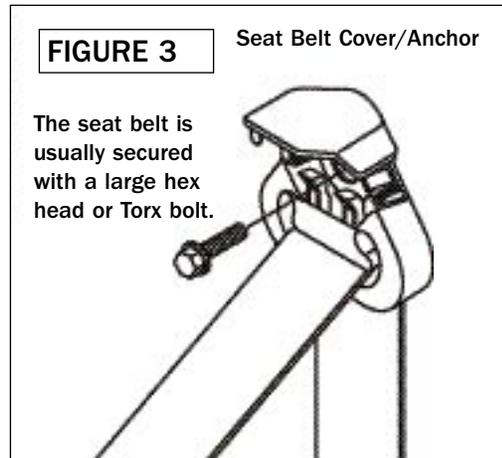
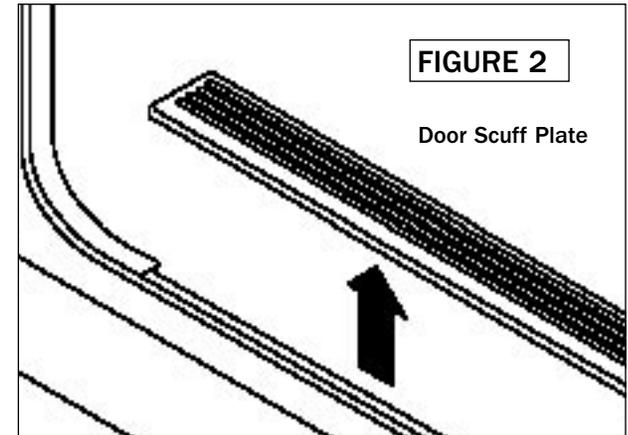
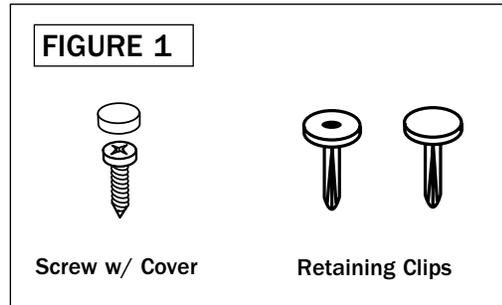
Route wire behind dash and secure with plastic wire ties. Be sure that wire does not interfere with any moving parts to ensure safe operation of vehicle.

Routing wire for components and power connections

Determine desired locations for each component. Use the most direct route for wires. Remove panels necessary to route and conceal wires. Test system before reinstalling panels.

SAFETY CHECK

✓ *Make sure seats and seat belts are secured to manufacturers specifications.*



Installing the DVD-ROM drive

The DVD-ROM drive box installs like an external amplifier or satellite radio tuner. First, find a good location for it. Under the passenger seat is the most common location — don't worry about accessing the drive regularly; once you've inserted the map disc, you won't likely take it out.

The box also contains a gyroscope, which relays important direction information about the turns you make to the system. The system uses this information in conjunction with the information it receives from the GPS satellites with which it's in contact via the antenna. You must mount the box horizontally; mounting the box at an angle will throw the gyroscope off, and cause the system to deliver incorrect in-route guidance.

The DVD-ROM drive box has four mounting feet or a mounting bracket. Once you've found the spot in which you'd like to mount the box, mark the location of the feet. Drill holes for the screws (which are usually included). Before drilling, check beneath the mounting location to make sure you don't puncture the fuel tank, fuel lines, transmission or brake lines, etc.

Wiring the system

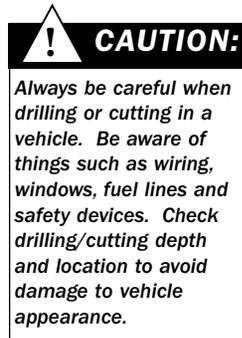
Connect the box to both a constant and a switched 12-volt power source. Using a multimeter can help you with this task. You'll also need to find a place to ground the DVD-ROM drive — using a seat bolt usually works well.

Run the speed sensor and reverse light leads to the box. Once that's done, all you have left are the audio/video connections.

If you have an in-dash receiver with a monitor, you can run a video cable from the navigation system to the receiver's video input. If you're using an external monitor, run the video cable from the navigation system to the monitor's video input. Some video receivers and external monitors feature special navigation inputs for same-brand navigation systems, which provide the best screen resolution, frees up the monitor's standard input for another video component, and sometimes facilitates touch-screen operation of the navigation system. It also takes care of the required audio connection.

Lastly, you'll need to connect the navigation system to an audio source in order to take advantage of its voice prompts. Some navigation systems come with a small external speaker (or will accommodate an optional one); if this is the case, check your owner's manual for speaker placement tips. Otherwise, you can connect the audio from the navigation system to your external monitor or in-dash receiver via a set of standard RCA patch cables.

To ensure neat cable runs that are out of sight, you might have to remove trim panels and pull up some of your vehicle's carpet. Though not difficult, this should be done carefully. Once the cables are connected, and the box is mounted, you're ready to navigate.



The best place for the navigation unit itself is on the floor. For the gyroscope to work accurately, you must make sure the unit is mounted horizontally, and aligned correctly with respect to the vehicle. ("Brain box" of the Pioneer AVIC-N1 navigation receiver shown above.)



All wires, including power, audio, and video, must be run from the navigation unit to the appropriate locations, usually under the vehicle's carpet.