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 Support 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, her, 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).

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.

Tools Needed: (depending upon vehicle)

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

This installation guide focuses specifically on installing in-dash and component navigation systems. In-dash navigation systems are installed just like any other stereo, but with a few extra steps. For tips on installing a receiver, see our receiver installation guide or refer to your Crutchfield MasterSheet™ (available for most vehicles).

Component systems have a navigation module that is installed in a convenient spot, and then connected to the in-dash receiver. These sometimes require a few other wiring connections, which we’ll discuss below.

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. It installs just like a satellite radio antenna. Please see our satellite radio installation guide and our satellite radio and GPS antenna installation video for further information.

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A note about connections

Regarding the speed sensor and reverse light connections
If you don’t see wires for these connections in your navigation system’s harness – don’t panic. Many newer navigation systems do not require these connections. Instead, they rely solely on GPS satellite info to determine your car’s rate and direction of movement. And you get the benefit of an easier installation.

Finding and connecting to the speed sensor
Your car’s speed sensor sends information from the transmission to the speedometer. Some navigation systems use this information to calculate vehicle speed and distance traveled, and to estimate time of arrival.

As mentioned above, many navigation systems no longer require this connection. But for those navigation systems that do require it, you’ll have to find and make a connection to your car’s speed sensor wire.

Where the wire is depends on the vehicle. You’ll need to consult a comprehensive wiring diagram for your vehicle to identify it correctly. If you’re not comfortable with this, you should probably 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 female 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 twist the exposed end of the navigation system’s lead around the exposed wire and solder the two together. Wrap with electrical tape or use heat-shrink tubing for strength and insulation.
Connecting to the Speed Sensor (cont.) and the Reverse Light

If the speed sensor wire is under the dash, you can run the lead to the navigation module under the vehicle’s carpet. 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 navigation module under the vehicle’s carpet.

Finding and connecting to the reverse light
As with the speed sensor, some navigation systems need to be connected to your vehicle’s reverse light; it has to know when you’re going backwards for accurate positioning and route calculation. If your navigation system doesn’t have a reverse light lead, then you don’t need to do this.

If your system needs this connection, the easiest way to do it is to connect to the reverse light wire right at the tail light. As with the speed sensor, 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.)

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. 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 taillights to the navigation module. Depending on the vehicle you drive, this could involve removal of trim panels, lifting of sections of carpet, and even backseat removal (to run the lead into the trunk of a car).

SAFETY CHECK

✔ Check reverse light wiring connection and test operation.
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 Trim panel 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 the dash**
Route the wire behind the dash and secure with plastic wire ties. Be sure that the 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 as necessary to route and conceal wires. Test the system before reinstalling panels.

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**SAFETY CHECK**

✔ Make sure seats and seat belts are secured to manufacturers specifications.
Installing the navigation module
The navigation module 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.

Many of these modules contain a gyroscope, which relays important direction information about the turns you make to the navigation 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 (flat); mounting the box at an angle will throw the gyroscope off, and cause the system to deliver incorrect in-route guidance.

The navigation module 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
Most of the connections are made via a single cable to the in-dash receiver, but sometimes you will have to connect power and ground separately. Connect the module to both constant and switched 12-volt power. You can use the same connections that the receiver uses, or use a multimeter to help with the task. You’ll also need to find a place to ground the navigation module — using a seat bolt usually works well.

If you made connections to the speed sensor or reverse light, run those leads to the module. Once that’s done, all you have left are the audio/video connections, and these might also be handled by the cable mentioned above.

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 touchscreen 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. 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.

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.

CAUTION:
Removing your seat could deactivate your vehicle's Safety Restraint System. See the included SRS Fact Sheet for more information.

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.