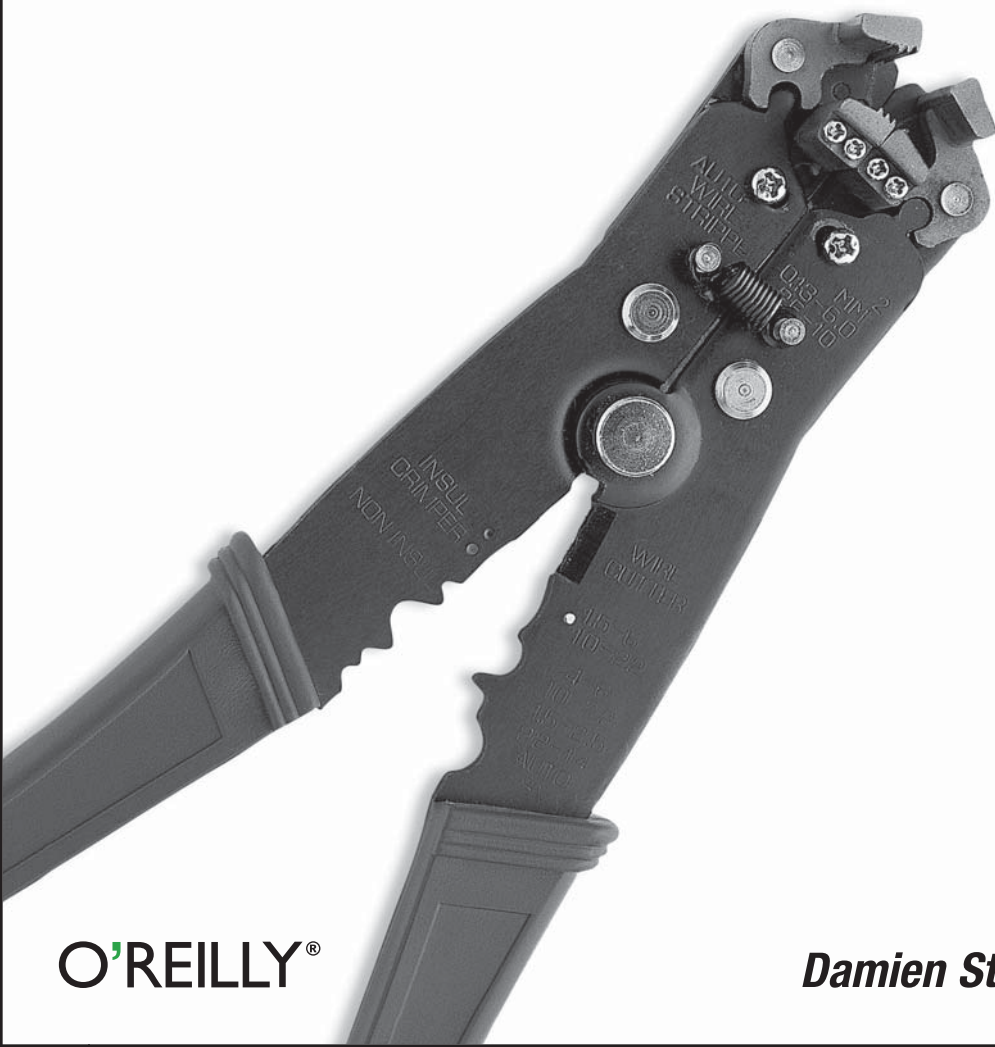


CAR PC HACKS™

Tips & Tools to Geek Your Ride



O'REILLY®

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HACK

#7

Add New Power Connectors Throughout Your Car

Modern devices such as laptops, cell phones, and video cameras often have 12V power adapters so they can be used, or charged, from a car's cigarette lighter outlet. If you have more devices than outlets, you can easily add more power connectors.

Some modern vehicles come with switched and unswitched 12V outlets throughout the car. If your vehicle is not so equipped, you can easily and cleanly install 12V power outlets wherever you have a plastic panel.

Let's say you're going on a trip. You and your friend/spouse both have cell phones, but they're from different manufacturers, so you have different car chargers. You've also brought along your laptop, so the kids/passengers can watch DVDs on the way, and your iPod adapter, so you can recharge it while you're playing tunes. You have a cold box that stays cool when it's plugged into the cigarette lighter adapter, and to top it all off, you've got your video camera plugged into a [power inverter \[Hack #11\]](#) (you were scatter-brained and forgot to charge it, and you're hoping to recharge it on the way so you can use it tonight).

How can you make it possible to use all of these devices simultaneously? Well, the first approach is to get one of those triple-decker one-outlet-to-three splitters, which look strange and take up a good deal of dashboard space. But if your car only has the cigarette lighter power socket that really *holds* a cigarette lighter, and points awkwardly up from an open ashtray (as in older Mercedes), then what you really need to do is install more outlets.

Your friends/family surely won't mind while you implement this hack in just a few hours. You'll be on the road in no time, and all your devices will have the power they need, where they need it.

Planning Your Wiring

The first step is simply to draw a quick sketch of where you want the outlets. The cleanest installation will be where you can find a nice flat plastic, vinyl, or other panel with a few inches of depth behind it.

Depending on whether you want to separate the wires into different fuses or put them all together, you may be able to handle all your outlets with one long pair of wires running from front to back. Pick a continuous path for the wires to flow through the car, hopefully with a minimum of pulling up carpets or pulling down headliners.

The advice in “Gauge Your Wires” [Hack #3] applies here—you want to pick a wire thickness that can handle all your devices. If you figure that each gadget draws perhaps 2A, and you plan to add 5 outlets, then a 15A or 20A fuse should be enough to handle them (and their spiking current demands when you first plug them in or turn them on), and you should have wire that can handle all this (perhaps 12 gauge or 10 gauge).

You can purchase car adapter outlets from Radio Shack, Pep Boys, and even Wal-Mart. The auto stores are likely to be cheaper and have more accessories. You want to find outlets that are designed for tidy installation in a pre-drilled hole, and if you’re lucky you will find something in stock that you can use.

If not, your best bet is the dealer—any dealer. Most new cars have an option for these power outlets, and a little rubber cap that says “12V.” These units are designed to flush mount in a hole in the plastic. You can just go to a dealer and say “I need a 12V power outlet insert,” and mumble when they ask you what car it’s for. The part should probably cost around \$10–15.

If you’re still trying to leave town on schedule, you may want to just grab an external adapter from Pep Boys and go. Later, when you have time, you can do the clean installation described in the next section.

Drilling Holes

The satisfying part of this installation is when you drill the holes. Remove each panel where you’ve decided you want an outlet, together with all its little screws and clips. Be careful not to lose them, as there’s nothing that screams “lousy install” like a panel that never quite fits again. Once you’ve taken off the panel and verified that there’s enough room behind the panel for the outlet, you can then draw a circle the size of your outlet on the panel and start drilling.

Plastic is very forgiving, so if you don’t have a lot of drill bits—especially the large (approximately 1” diameter) needed for this install—you can use any wide metal blade with the same inner diameter to bore out your hole. Of course, your best bet is an exactly sized drill bit for the outlet (or a reamer); you’ll find that the bits used to cut holes for doorknobs work well for this.

Switched or Unswitched Outlets?

Assuming you’ve remembered to purchase two reels (black and either yellow or red) of 10- or 12-gauge wire and an in-line fuse assembly at Pep Boys or the hardware store, you can now tap off the power. If you want unswitched outlets (which are always on, whether the car is on or not), you can simply run your two wires to the battery terminals, tapping off the

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power there. You should put a fuse right near the battery, at the beginning of the 12V wire.

If you want switched outlets that have power only when the car key is in the on or accessory positions, you'll need to locate a wire that has 12V only when the car is on. The color of this wire varies from car to car. Also, in this case, you don't need to use a fuse—and you may want to match the diameter of the wire you find to tap off of. (It's pointless and possibly misleading to use a thicker gauge of wire to connect to a 10A fused accessory wire.) If, however, you plan to upgrade later, running thicker wire won't hurt—as long as you don't later look at the thick wire and think “Okay, looks thick enough for my power drill,” fire up the drill, and melt the accessory wires it's attached to.

You'll find switched 12V wires in [Figure 1-16](#), in the dashboard, behind the radio, and behind the ignition switch itself. Your best bet in this case is to get a Chilton's or other car manual for your vehicle so you know exactly what you're hooking up to and sharing power with and can choose a red accessory wire that has a nice big 15A or 20A fuse on it.



You don't want to blow a fuse and suddenly have no driving lights, so make sure you stick to wires that are for accessories, not for main car functions.

Installing the Power Outlets

Once you have attached your fused wire to the car's battery, or connected to a wisely chosen accessory wire, you can run your cables under the car's carpet or under and along the floor edge plastic or metal framing to your first outlet.



Make sure that your battery is disconnected while running the wires, or at least that the wires are disconnected. If the wire shorts with the body of the car, it can make a nice, slow, smoldering fire, or at least ruin all the wires in your dash by melting them together.

You should connect the red or yellow wire to the middle post of the power outlet, and the black ground wire to the frame or sleeve of the outlet. Depending on the back of the outlet, you will need to either splice a few wires, or use a blade-edge connector to fit into whatever factory power connector came with your expensive dealership-provided power outlet.

You can now “daisy-chain” your power outlets. To run power to the next outlet, simply run the red/yellow and black wires from the first outlet to the next, and so on. Make sure that you wire things well and use copious

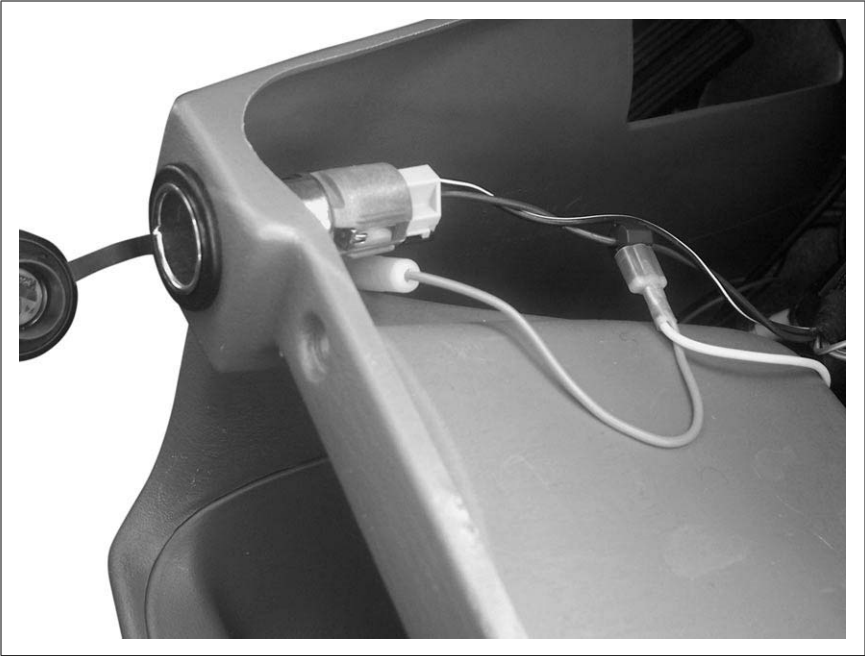


Figure 1-16. Conveniently located switched 12V wires

amounts of electrical tape as needed, to ensure that there are no exposed wires that could short with the body of the vehicle and create electrical fires.

In the time it took to do this hack, you probably could have recharged your video camera in the house; but you've now solved your power needs for *future* trips, and your car now has an outlet for every passenger. The few hours you delayed in leaving for your trip will be more than made up by the mobile entertainment you can now enjoy on the way.