

Electrical Service



Volvo Ignition System Cable Harness

Several different ignition control units and cable harnesses have been used on 240-series Volvos since the 1980 model. You may need to make some changes when replacing either one. If you use a new harness with an old ignition control unit, the female pin sleeves on control unit terminals 3, 5, and 9 must be removed. When using a new control unit with an old harness, sleeves must be installed on these same control unit terminals, or you'll end up with a loose connection and a no-start condition.

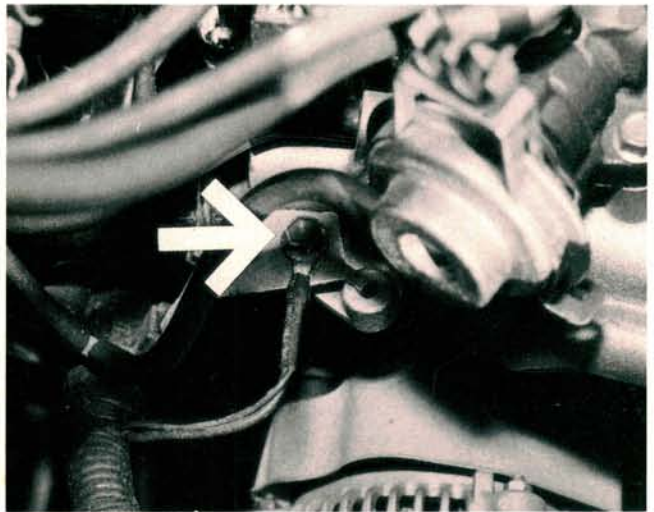
Whenever I find myself struggling with a particularly troublesome electrical problem, I always remember what my old boss would say.

"It's probably just a bad connection," he'd tell me.

That can be pretty annoying to hear when you've got the dashboard wiring harness apart in your lap, but nine times out of ten he was right!

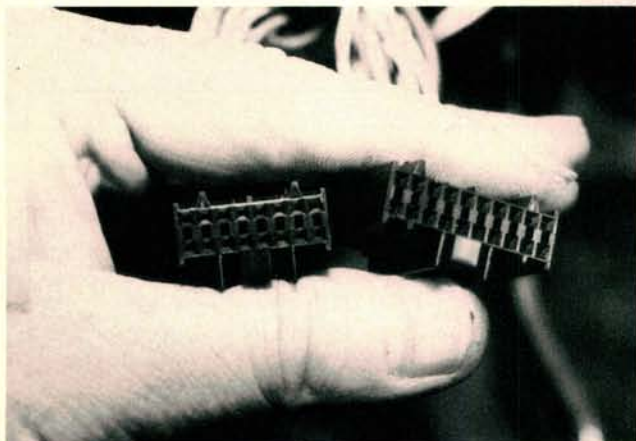
What's the moral to this story? It's easy to overlook the obvious while searching for a more complicated answer to a problem. You've heard of the Black Box Syndrome. We don't know how the black box works, so it gets blamed for the problem. My old boss's non-technical approach worked well in this situation. He had more faith in what he didn't understand than he did in connections.

None of the tips offered here is particularly exotic or high-tech. But most have at least a little to do with good connections. The Toyota In-line Fuse Location Chart should save you some diagnostic time too.



Loose Isuzu I-Mark ECM Ground Connection

A loose or corroded ECM ground wire connection (arrow) on non-turbo 1986-88 Isuzu I-Marks can cause a false Trouble Code 13 (defective oxygen sensor) or Trouble Code 44 (lean engine condition) to be displayed. The loose ground may also cause the "CHECK ENGINE" light to flash intermittently with the engine running. Turbo models have two ECM ground wires in the same area. Remove the plastic cover (if so equipped) and the bolt, clean the wire terminal end, then torque the bolt to 8 Nm (6 ft-lbs).



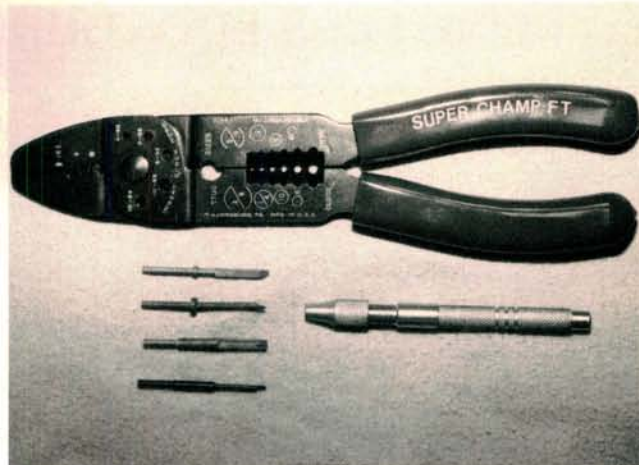
Multi-pin Connector Diagnosis—Subaru

I'm sure by now you've come to hate the word intermittent. Multi-pin connectors like these used on a Subaru ECU are a good source of intermittent electrical problems. Maybe the connectors snap together just fine. But are you sure the twenty or so terminals inside the connectors are making good electrical contact? Unplugging and replugging the connectors might cure the problem, temporarily. Many electrical parts are mistakenly replaced when the terminals inside their connectors are really at fault.



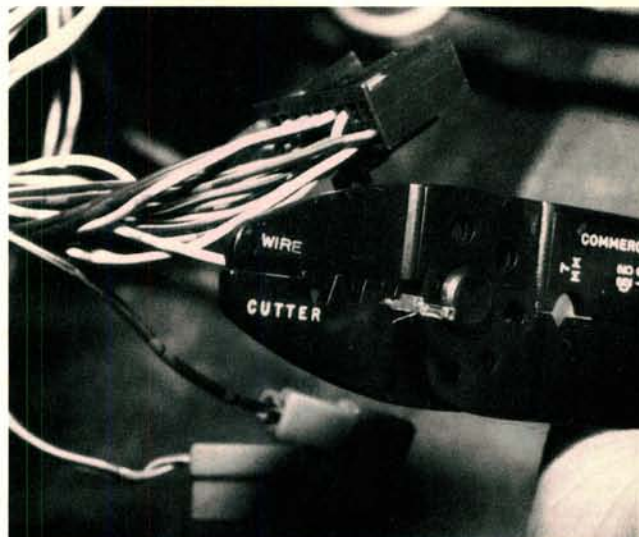
Sliding Resistance Test—Subaru

Remove one terminal. Then remove its mate from the opposite connector. Plug the two terminals together, then measure their sliding resistance by checking how easily they are pulled apart. A loose fit may result in an intermittent connection when both terminals are back in their connectors. Carefully tighten a loose fitting female terminal end before reinstalling both terminals in their connectors. Move on to the next pair until all the terminals in the problem circuit have been tested.



Pin Vice and Crimping Pliers—Subaru

Subaru has recognized this problem and now offers this set of tools to safely remove individual terminals from their connectors. Four different tips for the pin vice will handle several types of connectors used on Subarus and other vehicles. It beats digging around inside a connector with a pocket screwdriver trying to release a terminal. And if you damage the locking mechanism, the terminal may back out later. The crimping pliers are used to replace damaged terminals.

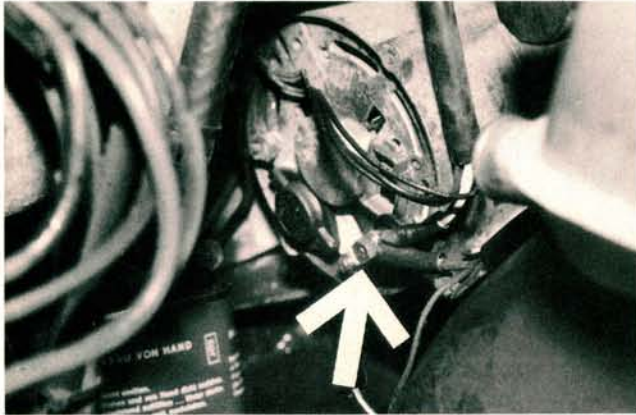


Replacing Terminal Ends—Subaru

Subaru also offers two assortments of terminal ends to replace damaged terminals used on models produced since 1983. Don't try to use an ordinary wire crimping tool to replace these ECU terminals. Only a crimper with these square jaws will make the proper crimp on the terminal end. The Connector Remover Kit P/N SOA636414, Crimping Pliers P/N SOA475T100, and Terminal End Assortments A: P/N 81072GA140 and B: P/N 81072GA150 are available through Subaru parts departments.

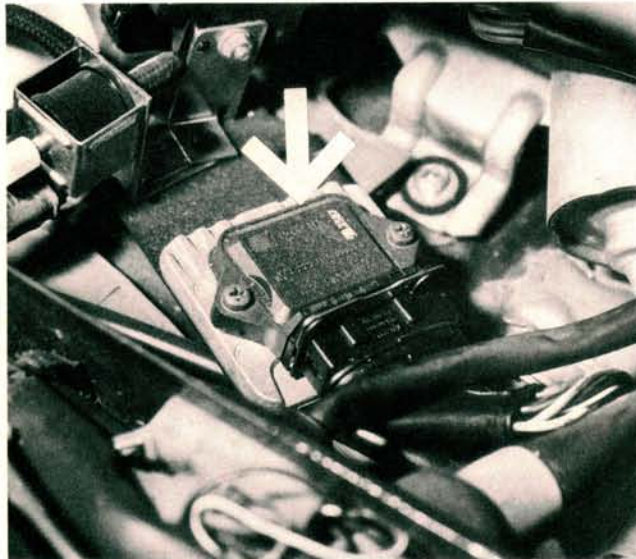
INLINE FUSE LOCATIONS ON 1976-1980 TOYOTAS

Model/Year	Circuit	Fuse Size	Location
Corolla (TE, KE)			
1976 TE 1977½-1979 KE, TE	Rear Window Defroster Ammeter	20 amp 5 amp (2)	Behind right kick panel Below windshield washer next to battery
1977½-1979 KE, TE	Horn	10 amp	Taped to positive battery cable near battery
1977½-1979 KE, TE	Charge/brake light warning	5 amp	Taped to main wire harness near battery
1977½-1979 KE, TE	Overhead interior light	5 amp	Taped to wire harness under left-hand side of dash near fuse panel
1977½-1979 KE, TE	Heavy duty defogger	10 amp (2)	Taped to wire harness under left-hand side of dash near fuse panel
1977½-1979 KE, TE	Ammeter	5 amp (2)	Taped to wire harness under battery
Celica (RA) 1978-1979 RA			
1978 RA	Charge/brake warning lights	5 amp	On the left front fender apron in front of the air cleaner duct nose
1979 RA	Interior light	5 amp	Behind left kick panel, taped to wire harness
1979 RA	Air conditioner	15 amp	Behind right kick panel, taped to wire harness
Supra MA			
1979 MA	Interior light Power window Air conditioner	5 amp 30 amp 15 amp	Behind right kick panel Behind right kick panel Behind right kick panel
Cressida			
1978 MX	Charge/brake warning lights	5 amp	Right front corner of engine compartment
1978-1980 MX	Air conditioner indicator light and magnetic clutch	10 amp	Behind right kick panel
1978 MX	Rear defogger	20 amp	Behind right kick panel
1979-1980 MX	Dome light	5 amp	Behind left kick panel
1979-80 MX	Backup lights and gauges	15 amp	Mounted under dash below fuse box
1979-80 MX	Cigarette lighter	15 amp	Mounted under dash below fuse box
Truck			
1976 RN	Radio	2 amp	In the radio power lead near the tuner
1979-80 RN	Ammeter	5 amp (2)	Near battery
Land Cruiser (FJ 40, 55)			
1978 FJ 55	Ammeter	5 amp (2)	Near battery
1978 FJ 55	Engine cooling fan	5 amp	Under dash—left side of center vent
1978 FJ 40	Engine cooling fan	5 amp	Located inside the cab on the right side of the firewall near the seatbelt warning relay
1979-1980 FJ 40	Air conditioner	15 amp	Taped to wire harness near battery



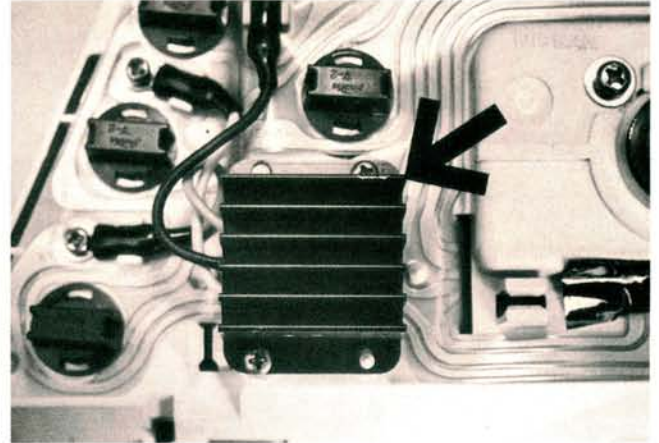
Grounding Saab Alternator Positive Terminal

Saab 900s beginning with the 1981 model year have the alternator mounted low on the left rear side of the engine. The positive terminal may extend beyond the surrounding insulator block. Some alternators have no insulator block, leaving the terminal exposed to accidental grounding. Keep tools clear of the terminal during oil changes. The transmission kickdown cable on automatics and the radio suppression wire found on 1986-87 models should also be tiedrapped to avoid contact with the terminal.



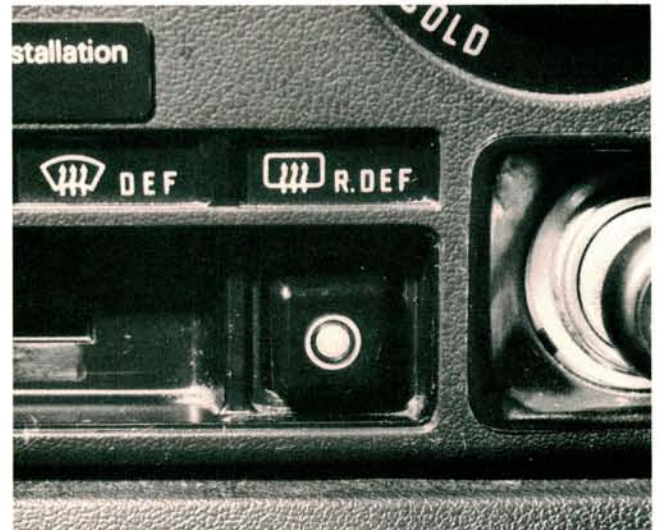
Volkswagen Ignition Control Unit

An intermittent stalling problem on Volkswagens equipped with this Hall effect ignition control unit (arrow) may be caused by metal shavings trapped between the unit and its heat sink. The shavings warp the control unit as its mounting bolts are tightened. This may distort and damage the control unit's integrated circuits and cause an intermittent stalling problem as the unit and heat sink heat up. Clean the control unit and heat sink, then reinstall the control unit.



Nissan Dash Gauge Voltage Regulator

The voltage regulator mounted on the dashboard printed circuit of 1987 Nissan Sentras has caused some problems. Nearly all the early non-heat-sinked voltage regulators have either failed already or will eventually. If the fuel and temperature gauges are both inoperative, you can bet the regulator has gone South. Nissan has offered extended warranty coverage to repair failures. The silver colored voltage regulator caused the headaches. The black, heat-sinked design (shown) holds up a lot better.



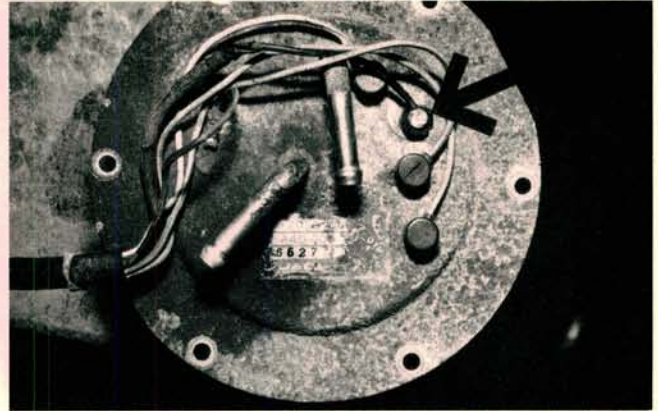
Mystery Battery Discharge

When diagnosing a discharged battery with no apparent cause, check the rear window defogger circuit. The defogger draws heavy amperage, and some imports don't use a timer to turn the defogger off. The battery may become discharged if the defogger is left on for long periods and the car is driven only short distances at low speeds with the air conditioning and other accessories on too. Honda has a replacement Switch/Timer Assembly P/N 35500-SEO-A11 for 1986-87 Accords with this problem.



Remote Starter Switch Modification

Starter solenoid terminals are often located in hard to reach, out of the way places. It's pretty frustrating to get half way through a valve adjustment and have the alligator clip on your remote starter switch fall off the solenoid terminal. This can be avoided by installing an insulated female spade connector on one wire of your remote starter switch. By installing a male spade connector on the 8-10 inch section of wire you've just removed, both alligator clips can still be used when needed.



Nissan Fuel Pump Wiring Corrosion

The soldered wiring terminals for the in-tank fuel pump on 1984-88 Nissan 200SXs can cause a variety of problems. This unit had a corroded ground terminal (arrow). The insulation had split around the ground terminal, which let the fuel pump ground through the metal of the sending unit. The ECU controls the fuel pump through its ground circuit, so the pump ran with the key off. Corroded terminals can also cause an intermittent stalling condition. Replacing the sending unit is the only sure fix.