

Electrical Service



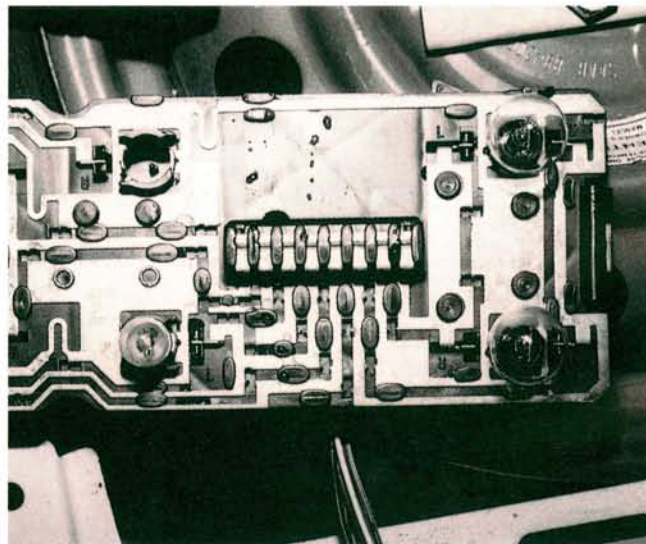
Volkswagen Fuel Injection Ground Wires

Broken ground wires at the intake manifold (arrow) on Volkswagen Golfs and Jettas equipped with CIS-E fuel injection will prevent proper operation of the differential pressure regulator. Symptoms are poor acceleration and black exhaust at wide open throttle. Remove the broken ground wire ends, then add extra wire to allow for engine movement. An alternative ground location is one of the valve cover hold down studs. The wires are then inspected with each valve cover removal.

The last time we got together, we talked about the importance of good connections for proper electrical system operation. There are plenty of things that can stand in the way of a good electrical connection, but one of the surest ways to mess things up is to add a little corrosion.

Last winter's cold, snow, and salt are just an unpleasant memory to most of us as we bask in the August heat. But some of the electrical corrosion seeds that were planted during the winter are just beginning to bear fruit in the summer sun. If you've ever seen cauliflower growing on top of a neglected "maintenance free" battery, you know what I'm talking about.

Several of the tips in this installment of *Electrical Service* deal with electrical system corrosion; both where to look for it, and what to do when you find it. We've harvested a bumper crop of guaranteed hair pullers for your enjoyment. So get out those wire brushes, and read on.



Saab 900 Tail Lamp Circuit

Corrosion (there's that word again) on the tail lamp printed circuit strips of Saab 900 four door models can cause some interesting feedback situations. The corrosion can either cause an open circuit or may bridge two strips. If the two strips happen to be power supplies for different circuits, the dashboard turn signal indicators may glow dimly when the brakes are applied, or tail lamp and brake light fuses will blow for no apparent reason.



Nippondenso Starter Repair

Burned starter solenoid contact posts on gear reduction ND starters used on many Hondas, Subarus, and Toyotas, can cause an intermittent no-crank condition. Remove the three solenoid cover screws, then remove the cover and solenoid plunger. Inspect the solenoid contact posts. The post connected to the positive battery cable will usually be more heavily pitted than the contact post leading to the starter windings.



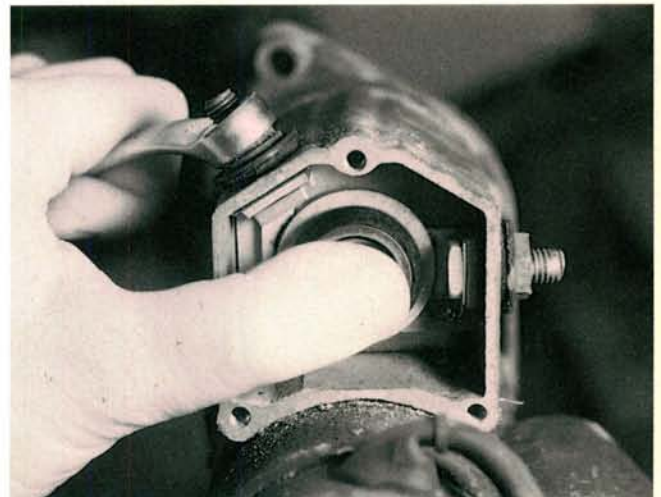
Polishing the Solenoid Plunger—ND Starter

The solenoid plunger has a much larger contact area than the contact posts. The plunger rotates in the housing each time the starter is engaged, so arcing isn't confined to just one spot on the plunger. Clean the plunger's contact surface with light sandpaper. If sanding won't do the trick, new plungers (P/N H/C 123245) are available from Honda. Even if you have to replace both the terminal post and the plunger, you'll still save your customer some money.



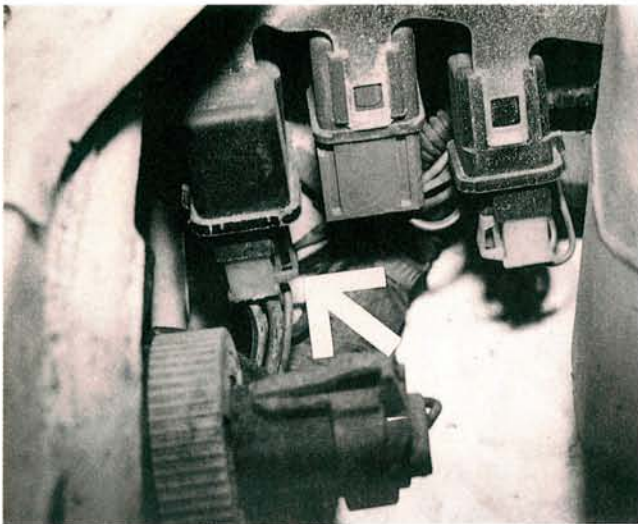
Nippondenso Starter Identification

Solenoid contact posts are available from Honda to repair their version of the ND starter. It can be identified by the location of the contact posts in the 11 and 3 o'clock positions when facing the solenoid cover. The battery contact post is mounted in the 9 o'clock position on other versions of the starter. Some technicians claim the starter's problems begin when engine oil leaks into the solenoid. Repairing oil leaks near the starter is good insurance against repeat performances.



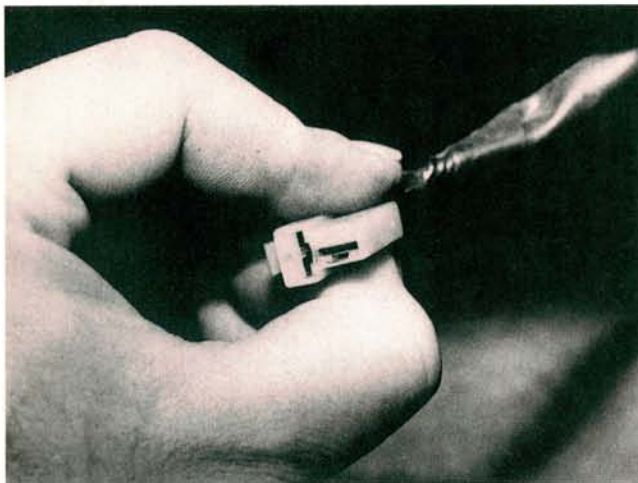
Installing Contact Post—ND Starter

Install the new contact post (P/N H/C 123244), insulating washers, lock washer, and nut. For proper alignment of the contact post, push in and hold the solenoid plunger against the contact post. While holding the plunger, tighten the post nut. Don't over-tighten it or you'll crack the insulating washer. Reinstall the solenoid cover, gasket, and screws. Check your repair by running a voltage drop test across the solenoid terminals.



Nissan Sentra Hesitation or No Start

Corroded terminals at the ECC main relay can cause an intermittent or complete loss of power to the engine control unit on 1984-86 Nissan Sentras. The relay is mounted on a bracket inside the right front fender. The plastic inner fender doesn't always protect the relay from salt and road splash. Remove the radiator overflow bottle and relay cover, then check terminals inside the relay connector for corrosion. Clean or replace corroded terminals and the relay as necessary.



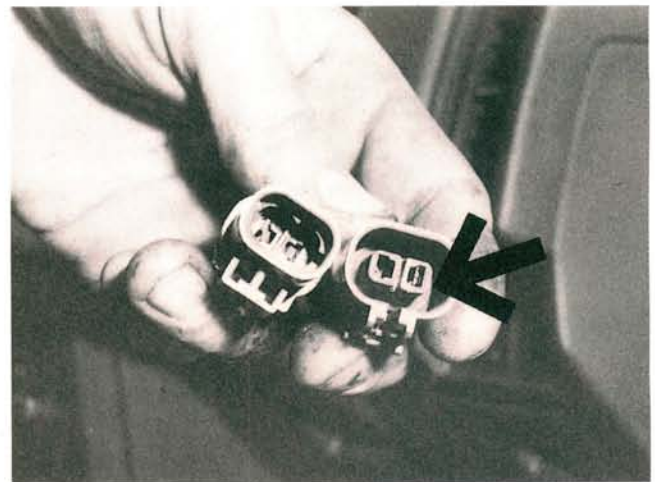
Nissan Sentra Blown Blower Fuses

High current flow through the blower motor wiring harness on 1982-86 Nissan Sentras can produce enough heat to melt this jumper harness's plastic connector. If the blower motor is blowing fuses instead of air, give the jumper harness connector at the blower motor a close inspection. Heat melts the plastic between the two wire terminals, allowing them to short against one another. An improved, melt-proof jumper harness is available through Nissan parts departments.



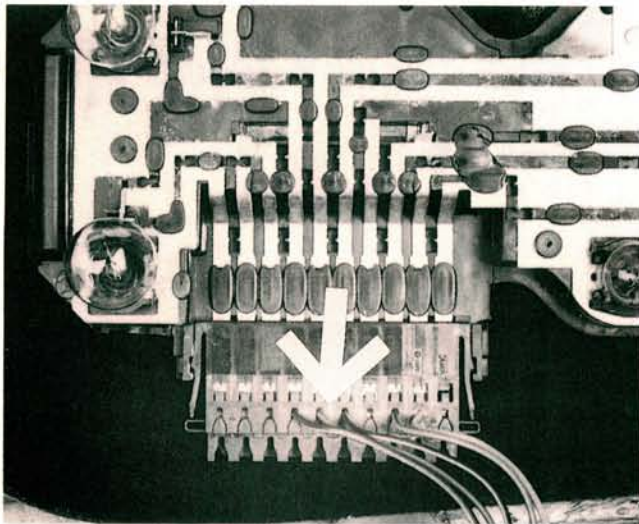
Nissan Sentra Blown Engine Control Fuse

A misrouted engine wiring harness near the alternator bracket on 1982-86 Nissan Sentras can allow the wire to chafe against this cylinder head reinforcement plate (arrow). The wires may only ground against the plate when the engine is under load. Turn the harness over near the reinforcement plate, then peel open the plastic harness cover and check for insulation breaks. Repair the damaged wiring, then reroute the harness away from the plate and secure it with tiewraps.



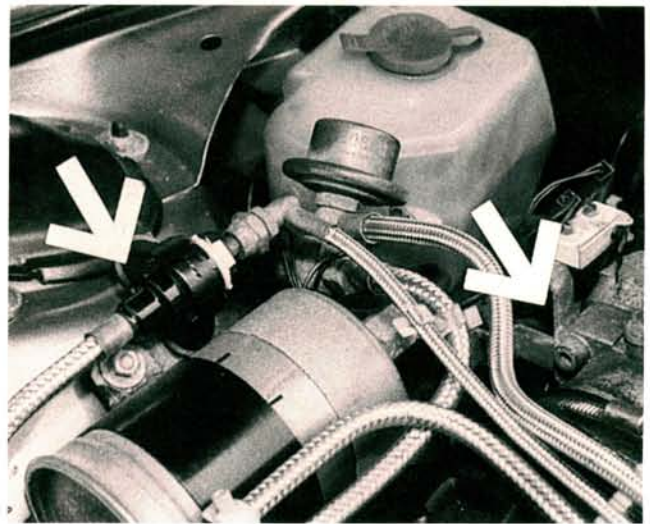
Nissan Corroded Wiring Harness Connectors

These grommeted wiring harness connectors are used extensively on Nissans and other imports in areas exposed to moisture. When the power windows and door locks on this 1987 Nissan Stanza began acting strangely at only 5000 miles, the Weatherpack connectors in the door were about the last thing anybody suspected. Both male terminals and one female terminal had completely disappeared. Make sure that the sealing grommet (arrow) is in place before reconnecting the connectors.



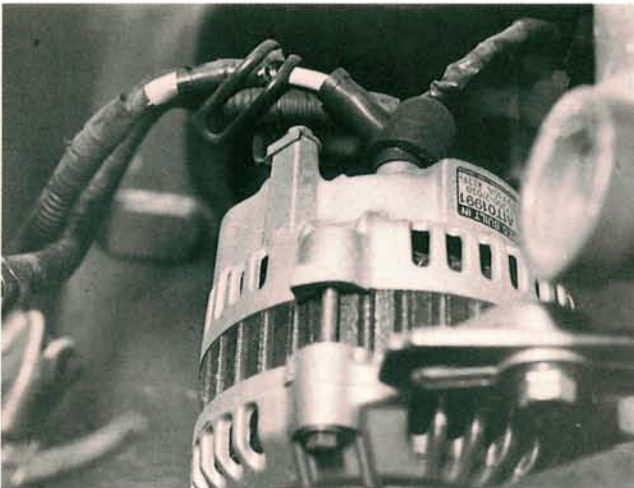
Audi 5000 Tail Lamps

Corrosion at the tail lamp wiring connections on 1978-83 Audi 5000s can cause dim or inoperative brake lights and an inoperative cruise control system. Like the Volkswagen system, the Audi cruise control will not engage unless all brake lights are working properly. Corrosion usually hits the brown ground wire (arrow). For a long lasting repair, solder a ground wire to the tail lamp printed circuit, then solder it directly to the body harness.



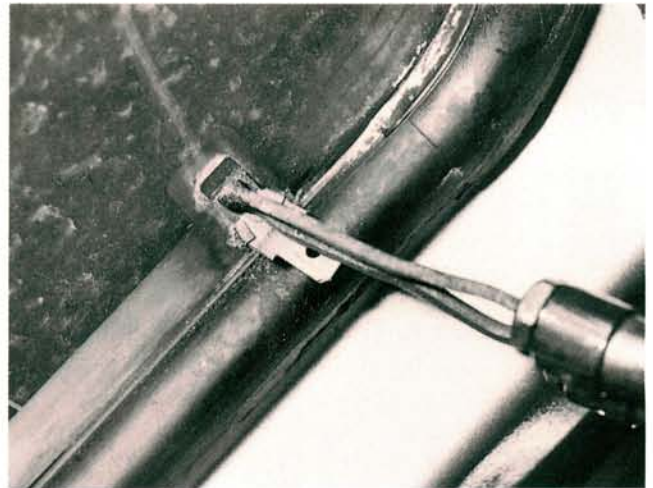
Audi 5000 Engine Ground

An inoperative frequency valve (left arrow) on Audi 5000s with CIS fuel injection may be caused by broken fuel system ground wires. Engine vibration and movement may cause these fuel system ground wires (right arrow) to break. The wires are secured under a bolt below the throttle switch. Replace the damaged ground wires, allowing enough extra length to take the strain off the wires caused by normal engine movement.



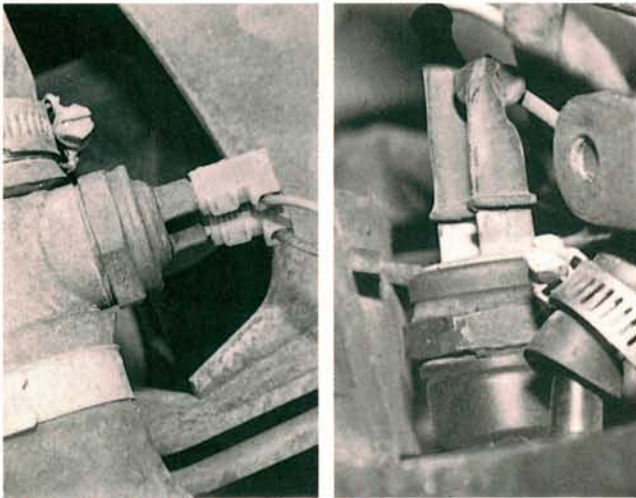
Broken Hyundai Alternator Terminal

High current flow through the B+ terminal on Hyundai Excels with Mitsubishi and Mando alternators may cause the terminal to melt and break off. A terminal repair kit, P/N 37366-21200, and B+ alternator wire, P/N 00214-S7700 are available from Hyundai dealers to correct the problem. Use the original B+ wire to fish the new wire through the cross-member. After installing the new wire, cut off and tape both ends of the original wire where it enters and exits the main harness.



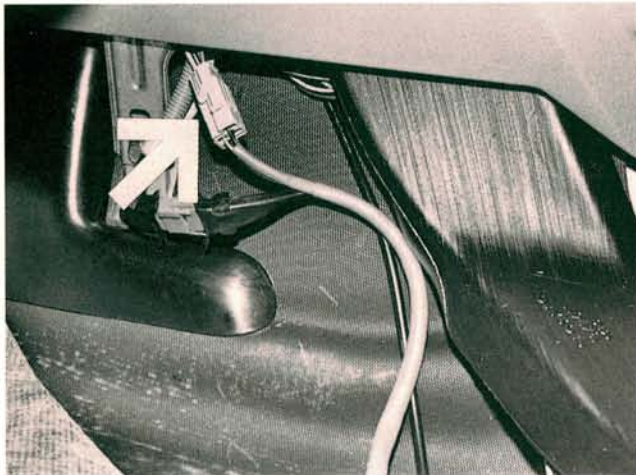
Rear Window Defogger Terminals

Broken rear window defogger terminals can often be repaired without replacing the glass. Clean the broken terminal and the contact area on the glass with an abrasive pad. If the terminal is missing, a replacement terminal kit, P/N H/C 0252437 available from Honda, should work well on other makes too. Apply paste flux, then hold the terminal in place with a 300 watt soldering iron. Add solder when the terminal is sufficiently heated. Turn the iron off, then hold the terminal in place until the solder dries.



Saab Coolant Sensor Mixup

Two similar coolant temperature sensors used on Saab 900s can be mistakenly interchanged. The left sensor is a normally-closed type, attached to the upper radiator hose. The sensor disables the A/C compressor clutch circuit if coolant temperature exceeds a set value. The right sensor is a normally-open type, mounted in the radiator to control cooling fan operation. Reverse the sensors, and you'll have a cooling fan that runs constantly and a compressor that only engages when the engine is on the verge of overheating.



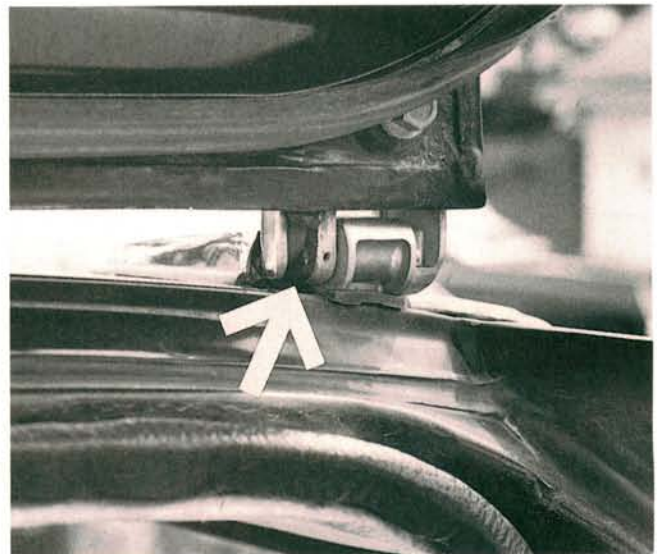
Volvo SRS Harness

Several high line imports are now equipped with Supplemental Restraint Systems (SRS). The SRS wiring harness on this Volvo runs along the driver's side of the transmission tunnel, right where a cellular phone installer might drill his mounting holes. Always familiarize yourself with SRS layout and operation. On pre-1989 700 series Volvos, the yellow connector (arrow) should always be disconnected with the ignition off before doing any electrical fault tracing or repairs.



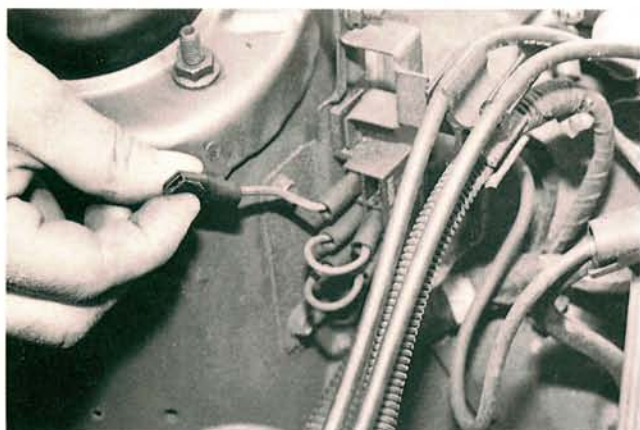
Saab 900 Cooling Fan Operation

Here's one for the winter corrosion file. The cooling fan relay (arrow) was moved out of the fuse panel to this location on the left inner fender on 1985 and later Saab 900s. Corrosion at the relay terminals will cause intermittent or inoperative radiator cooling fan operation. This might go unnoticed when the weather is cold enough, but will cause some serious problems in a traffic jam in August. Replace any damaged terminals, then coat the connector with dielectric grease.



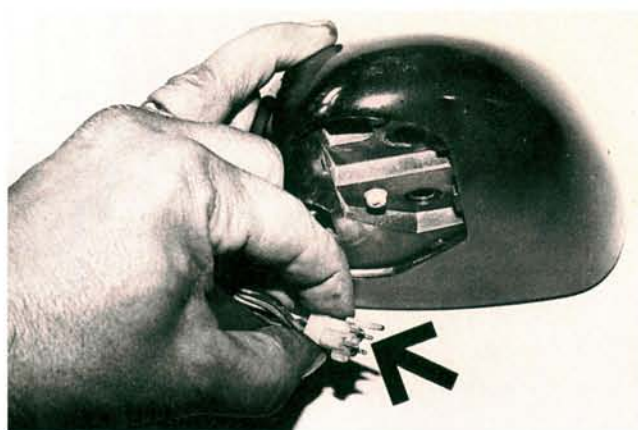
Volvo Wagon Tailgate Wiring Harness

Here's one to watch for on 240 Volvo station wagon models. Individual wires in the tailgate wiring harness become frayed or broken after years of opening and closing the tailgate. This can cause some strange electrical problems when the frayed wires start making and breaking contact with themselves or adjacent wires in the harness. Harness breaks in this area aren't unique to Volvos. Check this spot (arrow) on hatchbacks and wagons from other manufacturers too.



Mazda RX-7 Fusible Links

Heavy current flow through fusible links can weaken them over time. They continue to pass current, but build up additional resistance and heat due to their partially melted condition. Testing the link with an ohmmeter can be misleading. A high impedance DVOM could show an acceptable resistance reading when testing a link with only one wire strand left. Test for voltage drop across each fusible link and replace any link that drops more than 0.2 of a volt.



Mazda RX-7 Power Side View Mirrors

These tiny pin terminals (arrow) supply power to the side view mirror motors on Mazda RX-7s. Moisture inside the doors can cause the terminals in the unprotected connectors to corrode. For a long lasting repair, first remove any damaged terminals from the connector. Cut off the damaged terminals, then solder the power mirror motor wires directly to the door wiring harness. Finish the repair by covering the solder joints with heat shrink tubing, then reinstall the mirror.