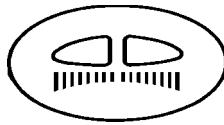


Hard Start Troubleshooting

Applies to most Volkswagen Models 6 or 12 Volt

1. Check to insure the all battery cables/wiring harness connections are tight. Be sure that they are clean and devoid of corrosion which can inhibit a full current flow.
2. Check to insure that the Ground Strap between the front of the Transmission to the Chassis is tight, clean and devoid of corrosion. My experience has been that 90 percent of the Starter problems I have encountered is due to this one potential problem area. A rusted out Ground Strap will not permit a full negative ground.
3. Check the Ignition Switch and the connections between the Headlight Switch and the ignition switch. Badly connected wires will inhibit full current flow. Although unseen and unfelt at the key, worn contacts in your Ignition Switch will result in either intermittent or failure of full current flow to the Starter.
4. Worn Starter Bushing in the Transmission Bell-Housing (Manual Transmission Models) can result in the Starter Shaft to wobble, causing the Armature to come in direct contact with the Field Windings, resulting in a direct short. This can ruin a Starter as well as the teeth on the Flywheel. Always replace the Starter Bushing when replacing the Starter (Bosch and most high quality rebuilders provide one with a starter and your warranty is usually conditional upon it's replacement). A thin coat of disc brake wheel bearing grease on the inside of the Bushing and on the Starter Shaft is recommended for extended bushing life.
5. Although not common, sometimes the Solenoid "freezes" up or "hangs". I have had this happen to a Bus I used to own and a buddy suggested I lubricate the Solenoid Piston. You know what - it worked. Bosch does lubricate the Solenoid Piston and bore, but usually with just a bare amount. Most Starters I have pulled the Solenoids off have been dryer than a "popcorn fart" in this area and have revived these so-called "bad starters" by re-lubricating the piston and bore. I have found that grease with a MOS2 base, such as CV Joint Grease does the trick as it's usually high temperature rated. Use Brake Parts Cleaning Spray to clean the bore and piston before re-lubricating.
6. When having your Starter tested, be sure that the shaft on Manual Trans Starters (SR15X, SR87X) are supported properly in the test stand. Most Friendly Local Auto Parts Stores (FLAPS) do not have a fixture on their testing stands to do this, so I recommend that you have it tested at an Auto Electric Shop or better yet, a local Electrical Rebuilder as they should have the proper fixture(s) to do this test properly (Reason for this - see Item 4 above). In addition, have your tester perform a "load" test as a "no-load" test will not give proper electrical test readings as to the Starter's condition. Even a Starter in poor condition will rotate real well if there is no load on the starter drive.
7. Installing a Hard Start Relay, such as Bosch's WR-1, can definitely enhance the starting action. Essentially, it "shortens" the current flow from the Ignition/Start Switch from the Battery to the Starter Solenoid. While the WR-1 Kit is convenient, all that's needed is a Karmann Ghia Horn Relay and some guidance in proper installation. The following page shows the proper wiring of such a relay.

(Continued On The Next Page)

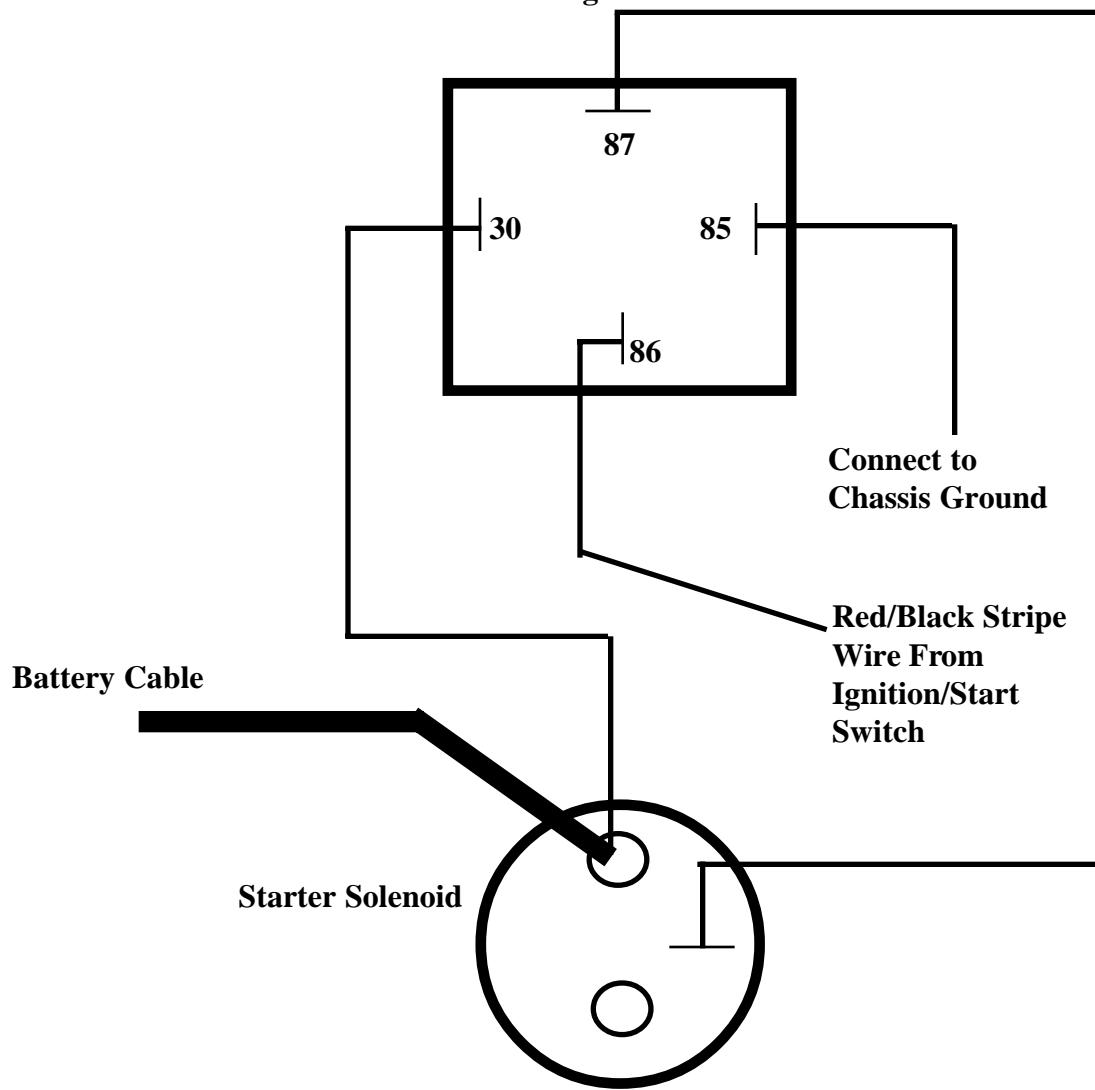


Hard Start Relay Diagram

Applies to the Bosch WR-1 Relay Kit

Applies to Do-It-Yourself Retrofit

Most Volkswagen Models 6 or 12 Volt



Where can you find the relay?

Most any Auto Parts Store carries this relay which is used in Foglight, Headlight and Horn Relay Set-ups.

For the Volkswagen-minded, it is the same as the Karmann Ghia Horn Relay,

Part Number 141-953-251B (6 Volt), 141-953-253A, B or C (12 Volt).

IMPORTANT! - This relay must be mounted as close as possible to starter to provide the most minimum of current flow and least resistance.

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