

Converting the 10DN Alternator to an Internally Regulated 10SI Alternator.

by Bob Nichols.

Replacing the externally regulated 10DN alternator with the internally regulated 10SI is a popular modification. On Chevrolet vehicles, other than the Corvair, you simply replace the 10DN with the 10SI and make some minor wiring changes. There are kits sold that allow the simple installation of connectors that negate the need for altering the wiring. The Corvair's 10DN alternator cannot be simply replaced because it is unique as follows:

- The Corvair alternator has a different front housing for mounting to the Corvair engine.
- The alternator fan/pulley assembly is designed to turn reverse rotation versus other Chevrolet vehicles.

The front housing of the Corvair 10DN must be installed on the rear housing of the 10SI to install it in the Corvair.

Refer to the shop manual for removal and installation procedures. Mechanical processes will be mentioned here that are not adequately addressed in the shop manual.

A 10SI has to be obtained and rebuilt units are available from auto parts stores. The 10SI was commonly available on Chevrolet products from the mid 70's to mid 80's. It came in different amperage ratings from 37 to 63 Amp. If you want the maximum amperage rating of 63 Amps, then ask for a unit used on cars like a 1978 Camaro with air conditioning should get you a 63 Amp 10SI.

A word of caution about the variations of the 10SI:

- **100+ Amp 10SI aftermarket alternators.** - Sometimes more is better, but the modified 10SI "100 Amp" alternators is an instance when more is NOT better. Why? The Corvair alternator cooling fan is generally considered to be adequate up to 80Amps (although the claim seems reasonable it has not been verified). When GM started installing 100 Amp plus alternators they went with a more efficient cooling fan and corresponding front housing on the 12SI model. The 12SI cooling fan WILL NOT WORK on the reverse rotation Corvair.
- **The "One Wire" alternator.** - A term frequently given to the 10SI alternator. The "One Wire" term has been applied to all sorts of 10SI designs meant to allow car enthusiast the simple option of "just hooking up one wire". It does sound attractive, but the Corvair requires a three wire type 10SI to work with the Corvair's wiring to provide:
 - GEN/FAN warning lamp connection.
 - Battery sense connection.
 - Alternator excitation at engine startup
- **"Clone" 10SI alternators.** - A number of manufactures are making 10SI copies. Rebuilders are using these parts to replace damaged original parts. They fit just like the original units, BUT they can use metric hardware and threads. This may or may not be an issue when installing the Corvair front housing and fan/pulley. If possible look for a rebuilt 10SI with the original DELCO housing.

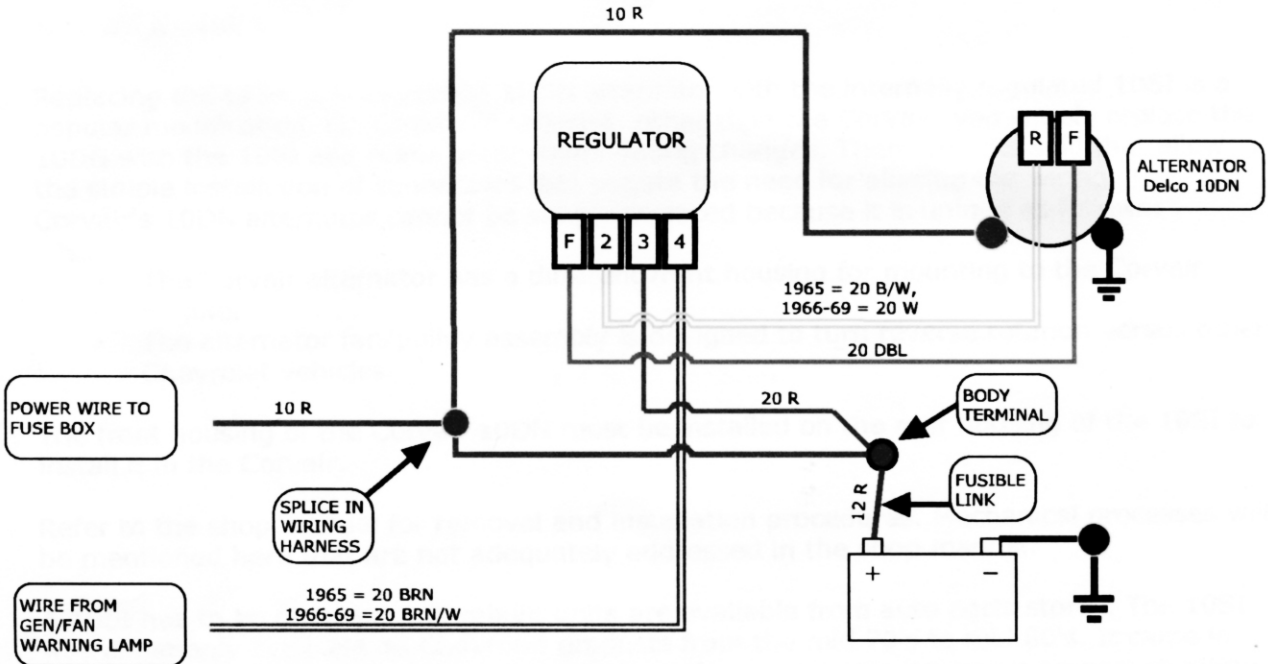
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Configuring the 10SI to use the Corvair 10DN front housing, fan and pulley. Refer to the Corvair Chassis Shop Manual to locate and remove items.

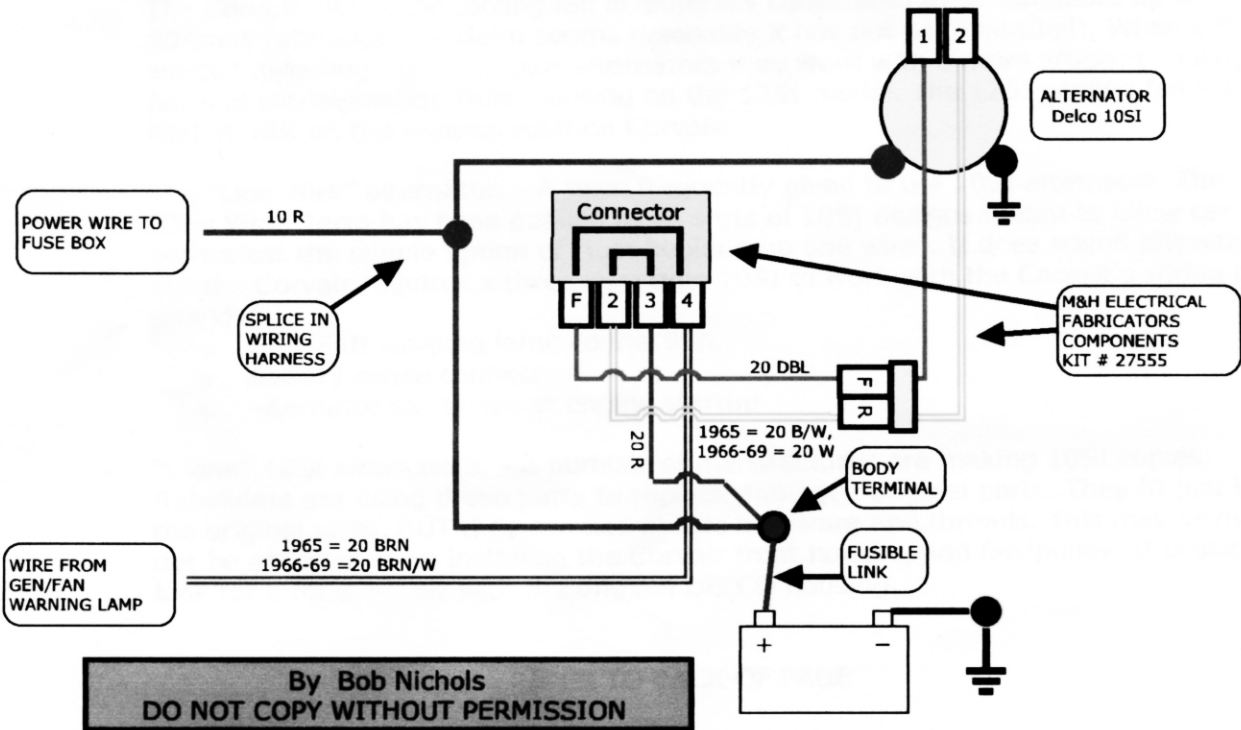
1. Disconnect the battery cables.
2. Remove the 10DN Corvair alternator.
3. Remove the external regulator.
4. Dismantle the 10DN and 10SI.
 - Remove the Corvair 10DN alternator Corvair specific fan/pulley and note the spacer under the fan on the shaft that must be re-installed.
 - Remove the 10SI alternator fan and pulley and note the spacer under the fan.
 - On the rear housing (connector side) locate and remove four case thru bolts located at 90 degree intervals from the 10DN and 10SI.
 - Carefully remove the front housing from each alternator and **DO NOT PULL THE STATOR OUT OF THE LOWER HOUSING** or the brushes will move off the stator slip rings.
 - **DO NOT** rotate the stator while the front housing is removed to prevent damage.
5. Assemble 10DN front housing onto the 10SI.
 - Remove the new bearing from the 10SI front housing by removing the three screws holding on the retaining plate and gently pressing the bearing out of the frame. Use the new bearing to replace the old bearing in the 10DN front housing. Take care not to damage the bearing when removing it and installing it. Replacement bearings are available if needed.
 - Install the 10DN front housing onto the 10SI rear housing. Note the front and rear housings have four positions evenly spaced where the thru bolt holes line up. This allows the front housing to rotate 90 degrees to four locations. This is called "clocking" the housings. Typically the best position is with the two prong terminal at the top to allow a good position for the rear brace. On FC's clearance may require the terminal be to the side.
 - Install the thru bolts, but insure the cases sit squarely together.
 - Install the spacer on the rotor shaft, then the fan/pulley, and the locking washer and nut. It is recommended that you use the new locking washer and nut from the 10SI to ensure they fit rotor shaft as there is a possibility the 10SI rotor threads may be different than the 10DN rotor nut threads.
6. **NOTE: the Corvair alternator turns reverse rotation and will cause the rotor nut retaining the fan/pulley to loosen if it is not tightened adequately.** The Corvair Chassis Shop Manual describes the procedure, tools, and torque rating. The torque rating is significant and a simple allen wrench to hold the rotor shaft will not be adequate to tighten the nut securely.
7. Install the modified alternator to the engine support.
8. The rear brace used with the 10DN will not fit the 10SI unless it is modified. Some create a new brace. **NOTE: The rear brace from the alternator to the engine is required. If it is not installed the housing or engine mount could fracture!**
9. Reconfigure the wiring for a 10SI internally regulated alternator. Refer to attached diagrams. Using a kit like #27555 from M&H Electrical Fabricators (eff. 2017), sold by vendors, does not require alteration of the wiring harness.

Installing a brighter FAN/GEN warning lamp. - Due to the circuit design the GEN/FAN warning lamp is not as bright as the TEMP/PRESS lamp. Some consider the FAN/GEN indicator to be too dim and substitute a brighter bulb, like an 1816. The 1816 bulb will produce slightly more heat that may impact the plastic housing. As of this writing it has not been determined if this change is without issues.

Corvair Externally Regulated Alternator (10DN)



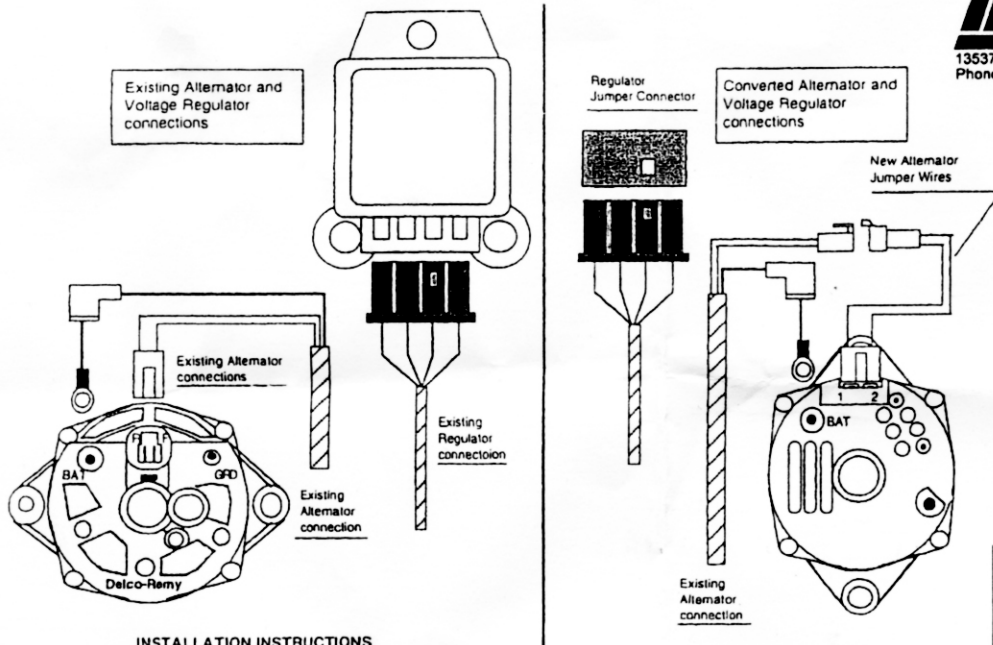
DELCO Internally Regulated Alternator (10SI)



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Conversion from external to internal regulator alternator

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 AUTOMOTIVE WIRING SYSTEMS
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INSTALLATION INSTRUCTIONS

1. Before attempting any modifications involving the charging system, the battery should be disconnected.
2. Unplug the 2 place connector from the existing alternator and plug it into the new alternator jumper wires mating connector.
3. Unbolt the power lead wire from the existing alternator and remove the old alternator from the car.
4. Install your new internally regulated alternator. Plug in the 2 place connector on the new alternator jumper wires and bolt the alternator power wire to the "BAT" post.
5. Make sure that the alternator is properly grounded. In most cases the alternator is grounded through the engine block to the frame. However, this is not always true. If in doubt, a ground wire can be installed from the alternator case ground bolt to a good chassis ground.
6. Unplug the 4 place connector from the external voltage regulator and plug it into the supplied regulator jumper connector.
7. Remove the existing voltage regulator from the car.
8. Reconnect the battery.

27555

ALTERNATOR
 CONVERSION
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INSTRUCTION SHEET

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