

# INSTRUCTION SHEET

## Gear Reduction Racing Starter

### Mastertorque 9613, XS Torque 9513, 9523



## INSTALLATION

*These instructions are provided as supplementary information to the factory service manual instructions for starter replacement.*

### DISCONNECT THE BATTERY.

**MOUNT STARTER.** Make sure the mounting surface of the bellhousing is smooth, flat and free of paint buildup. Torque the starter mounting bolts to the engine manufacturer's specifications, typically 32 ft. lbs.

**ATTACH BATTERY CABLE AND SWITCH WIRE.** Reconnect the original ignition switch wire to the IGN terminal on the Mastertorque starter. The switch wire should be capable of handling 50A intermittent and 10A continuous, typically a 12AWG wire. Reconnect the original battery cable to the Mastertorque starter. The battery cable must be the proper size for the length of the cable (see chart). All connections should be clean and tight and terminals should be soldered if possible. The ground cable is important and the best ground path is direct to the engine block. With steel frame vehicles the ground path can be to the frame. This ground cable should be the same size as the starter positive cable. Also, a ground strap should be installed from the frame to the engine.

DISTANCE	3'	5'	7'	10'	+10'
AWG	4	2	1	0	00

### CONNECT THE BATTERY.

**OPERATE THE STARTER.** It should operate quietly. The cables and connectors themselves should be checked for voltage drop with a voltmeter. To check any wire or cable for voltage drop, connect one side of the voltmeter to one end of the cable and the other side of the voltmeter to the other end. OPERATE THE CIRCUIT and simultaneously measure the volt drop. It should be 0.5VDC or less. A high voltage drop indicates a bad connector or an undersized cable. The ground circuit can be checked in the same manner. Measure input voltage by connecting the positive probe of a voltmeter to the "MOTOR" terminal of the solenoid and connecting the negative to the starter housing. This should be 9.6V minimum while cranking.

### ADDITIONAL NOTES ON INSTALLATION

- A NOTE ABOUT RING GEARS.** It is important for long starter life that the ring gear be round and true. Check the ring gear in at least six places verifying that the clearance for the starter is the same in all locations. If not remove the ring gear and make sure the mounting surface of the crankshaft is clean and free of paint buildup or rust. Reinstall the ring gear and properly torque the mounting bolts. If this does not correct the problem, replace the ring gear.
- DISCONNECT SWITCHES IN RACE CARS AND OTHER OFF ROAD VEHICLES.** The switch used for a battery disconnect is very important. All of the starter current will go across this switch during cranking which, depending on the starter, can be as high as 700A! After the engine is running, all of the current from the alternator will be running across this switch. Therefore make sure that the switch that is being used can handle these amounts of current. Switches are rated in intermittent amps and continuous amps. The intermittent rating should match or exceed the amount the starter will pull and the continuous rating should match or exceed the amount the alternator can produce. Using a switch that is too small will result in voltage loss and possible switch failure.