



A Racers Best Friend!



SO-LO Starter Systems Owners Manual

The SO-LO is a low profile, easily assembled, single person starting system.

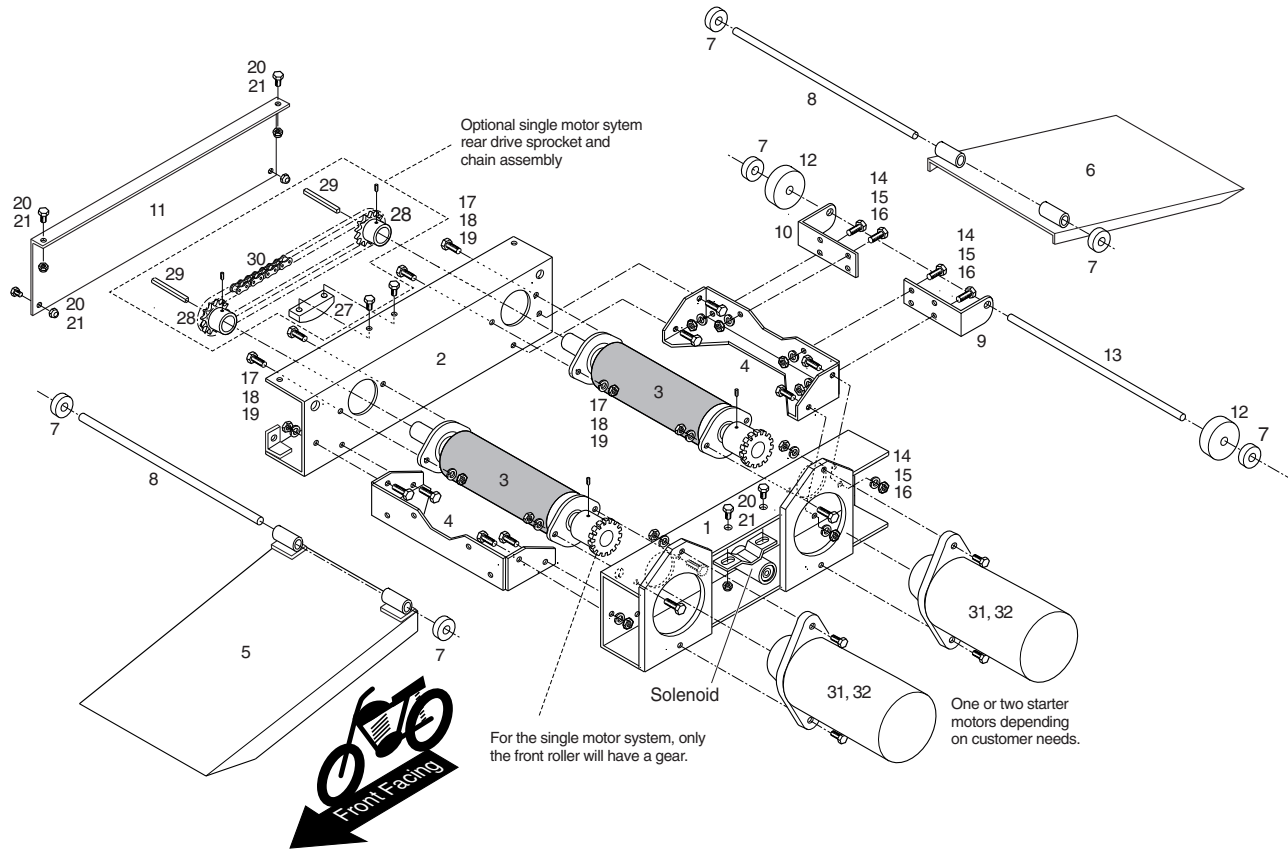
Engineered and manufactured to the highest standards.

Designed for years of reliable service.

SO-LO takes the labor out of starting your motorcycle.

Assembly Required.

SO-LO Starter Systems



Parts List Before starting assembly check all parts.

ITEM	QTY.	PART DESCRIPTION
1	1	Channel, motor mount, (double motor plate)
2	1	Channel, right side
3	2	Roller Assembly, Complete w/gear and bearing ass'y as per motor requirements
4	2	Angle bracket, rear tie and front tie
5	1	Narrow ramp
6	1	Wide ramp
7	6	1/2" i.d. lock collar
8	2	1/2" dia. Pivot bar 11 3/16 lg.
9	1	Rear wheel axle bracket (L.H.)
10	1	Rear wheel bracket (R.H.)
11	1	Chain guard
12	2	Wheels 3" dia
13	1	Axle 1/2" dia. X 18" lg.
14-15-16	16	3/8 NC x 1" lg. hex bolt, lock washer, nut
17-18-19	8	5/16NC x 1" lg. hex bolt, lock washer, nut
20-21	4 (6*)	1/4 NC 3/4 lg. hex bolt, nut (*6 with solenoid)
22	1	Foot switch with wires

OPTIONAL SINGLE STARTER MOTOR ADAPTER KIT

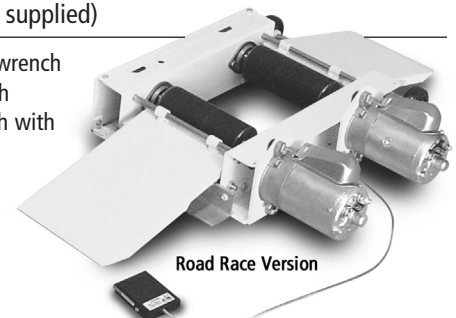
27	1	Chain tensioner (per motor requirement)
28	2	35 Pitch sprocket w/set screws (16 t)
29	2	1/4" square key
30	1	#35 chain and master link assembly (70 pitches)

STARTER MOTOR OPTIONS

31	1 OR 2	2 bolt mounting, 4" field case, 9 tooth, 12 Volt, Automatic Transmission, or MT Ford #3153, 3180, or 3186 (used on 87 Crown Vic, E series vans 91-85, F series pickups 4.9L and 5.0L), (NAPA #244-9227) (solenoid reqd.-NAPA #ST95 or equiv.)
32	1 OR 2	Custom Hi-Torque starter (Big Mike special)
33	1	Owners manual with serial number
34	1	Optional bumper roller assembly for Flat Track racers

TOOLS REQUIRED (Not supplied)

- 1/2" - 9/16" open end wrench
- 1/2" - 9/16" box wrench
- 3/8 drive ratchet wrench with short extension
- 9/16" socket
- set of Allen keys
- duct tape
- Loctite blue



NOTE: Your starter may not function properly if all components are not accurately assembled. Please read instructions thoroughly before you begin and follow the directions for the safe operation of your SO-LO Starting System. Can be disassembled if necessary. Save these instructions for future reference.

Operating Instructions

NOTE: USE CARE AND CAUTION WHEN USING THE SOLO STARTER SYSTEM. IT IS NOT RECOMMENDED TO FREE RUN STARTERS WITHOUT A LOAD IMPOSED ON THE ROLLERS. FREE RUNNING CAN DAMAGE THE COMMUTATORS. MOST MOTORCYCLES SHOULD BE STARTED IN THIRD GEAR. IF STARTING A 125 cc ENGINE OR A TWO STROKE 250cc/350cc, YOU MAY START IN FIRST OR SECOND GEAR.

NOTE: ENSURE STARTER IS SET ON A LEVEL SURFACE. GRASS, CINDERS, CONCRETE OR ASPHALT ACCEPTABLE.



Troubleshooting

Bike won't start? Make sure gas and ignition are on. Determine if your drive line is binding, remove the spark plug(s) and with your ignition off see if the starter will rotate the wheels freely. Try this test with your clutch engaged and disengaged.

Starter moves while attempting start?

Select higher gear. Allow starter motor(s) to reach maximum rpm. Re-align bike on rollers. Hold front brake if applicable.

Bike placed in wrong direction on rollers?

Starter motor(s) will always be on your left side.

- A** Pre-select 3rd gear. (Forth gear recommended for flat track bikes.) Roll bike back on to compression (if a single), pull and hold clutch. Roll bike such that rear wheel is set between the rollers. **(WHEN YOU ARE SITTING ON THE BIKE, THE STARTER MOTORS WILL ALWAYS BE ON YOUR LEFT)** The foot switch should be conveniently located by your foot.(see photo)
- B** Be sure the bikes running system is on (ignition, fuel)
- C** Straddling the motorcycle and using your legs as a guide keep the rear wheel centrally located on the rollers and keep the bike upright.
- D** Hold the front brake to maintain control of the bike and prevent it from moving frontward or backward on the rollers. Press the foot switch and let the starter motor build up to speed. (Motor speed will stabilize). Release the clutch, and, as the rear wheel begins to spin the bike engine should fire. Once the bike is started, pull in and hold the clutch and immediately remove your foot from the starter foot switch. Put your motorcycle in neutral and roll it off the SOLO.

Maintenance Instructions

Always discontnt power supply from SOLO starter system when servicing.

A regular inspection of the SOLO starter system will ensure many years of good service. Listed below are inspection points that should be adhered to periodically.

- 1.** Check all fasteners for tightness.
- 2.** Check roller gears for excessive wear. (Small metal filings are normal especially during initial operation.)
- 3.** Check that roller gears are locked in place and don't move on roller shaft. If they are loose, remove duct tape and retighten setscrews. Note locktite is used for the gears. (replace duct tape)
- 4.** If using rear drive sprocket assembly, ensure sprockets are firmly locked onto shafts. If they are loose, remove duct tape and retighten setscrews. (replace duct tape)
- 5.** Lubricate chain every 2 or 3 race meetings using motorcycle chain lube.
- 6.** Bearings are sealed and should require very little attention. If starter is used to start multiple motorcycles, a seasonal inspection for excessive movement should be in order. Contact DocZ International if bearings require replacing.
- 7.** Battery should be charged at end of each race day.

FULLY GUARANTEED

Every effort has been made to manufacture and assemble the finest product available. Our guarantee is limited to replacing any defective parts. Doc Z International will not warranty or guarantee parts supplied by companies other than Doc Z. We will pass on any warranties made by third party manufacturers. Doc Z International will not be held responsible for indirect or consequential damages.

Include SOLO serial number, part number and return address with parts orders.



*MFG & Distributor
USA & Canada*

Art Zimmerman

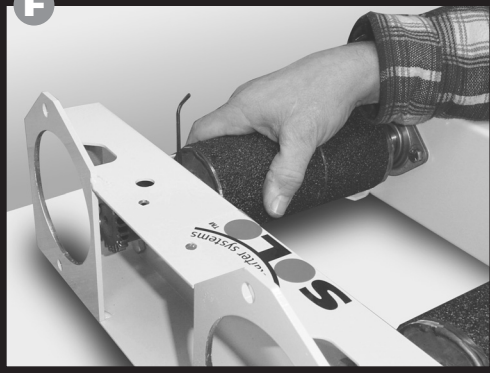
'DocZ' International

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Assembly Instructions

Setting the lateral position of the roller shafts



- A** Working on a clear flat surface, insert roller assembly (3) through motor mount channel (1B) and right channel (2).

NOTE: If using one motor, place geared roller assembly into the ramp end of the frame (where the motor mount plate is welded closest to the edge).

NOTE: The powder coating will fill some holes. Specifically, scrape or lightly grind away paint from motor mount adapter hole and bearing mount holes.

- B** Place crossties (4) inside channels (1B&2) align holes. Rear wheel brackets (11L, 11R) should be placed as shown in exploded view.
- C** Loosely bolt together the frame using 3/8x1" lg. Hex bolts, lockwashers and nuts (14,15,16). Also place 3/8 bolts, nuts, and lock washers through wheel brackets and rear cross tie.
- D** Insert 5/16 x 3/4" lg. Hex bolts, lockwashers, and nuts (16,17,18) through the flange bearings (part of the roller assembly 3) and through the channels (1B&2).

NOTE: Ensure the bolt heads are mounted inside the channel.

- E** Tighten all 3/8 bolts, nuts and lock washers. Proceed in a zigzag pattern. Finally, tighten rear wheel brackets.

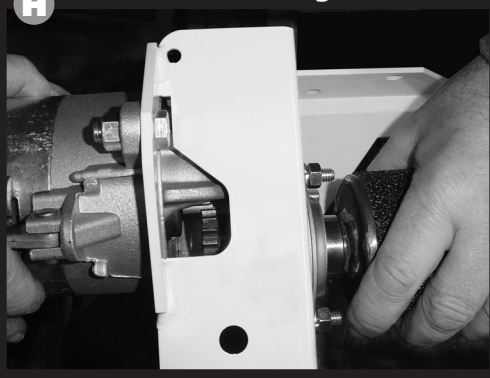
THE FOLLOWING PROCEDURE ENSURES MINIMUM GEAR WEAR AND MAXIMUM POWER TRANSMISSION THROUGH THE GEARS.

- F** Move the roller shafts (3) laterally away from the motor plate channel (1B). Ensure rear hub of driven gear is against flange bearing. Using an Allen key, lock all 8 of the set screws in the bearing collars. Using thin strips of duct tape, wrap each collar to ensure that the setscrews cannot loosen and fall out.
- G** Mount a Ford Starter motor in either of the motor plates using 3/8 x 1" hex bolts and nuts. Lock in place.
- H** Remove small retainer screw from the Bendix actuator cover on top of the Ford Starter and remove cover. The actuator lever is now exposed. Depress the lever while gently rocking the roller. The small pinion gear will now engage the affixed drive gear on the end of the roller. With both gears engaged, again rock the roller back and forth and observe the amount of free play between the gears. Generally, it is not possible to create a locking condition between these mating gears. The proper adjustment will allow for a small amount of play between the mating teeth. When this has been set, finger tighten the 5/16 x 1" hex bolts, nuts and lock washers. The final tightening using wrenches, can now be accomplished. Repeat this procedure for the next roller. It is advisable at this time to apply power to the starter(s). This will necessitate the mounting of the solenoid as well as the associated cables and foot switch and battery. (See accompanying drawing for solenoid mounting as well as wiring diagram for switch mounting.) Depress the foot switch and run the SOLO. Observe the engagement and disengagement of the gears. The operation should be smooth and the pinion of the Ford starter should retract smartly when the foot switch is let go. If there should be a "hang gear" condition, (i.e. pinion doesn't retract smartly) repeat the above procedure.

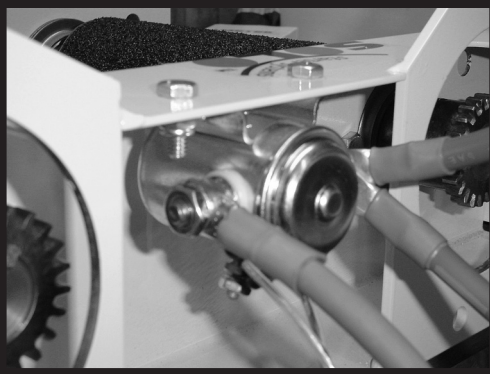
CAUTION: DO NOT FREE RUN STARTER MOTORS EXCESSIVELY, THIS COULD CAUSE DAMAGE TO THE UNITS.

- I** The ramps may now be mounted (7,9) See exploded drawing. The narrow ramp (7) is mounted to the front of the SOLO assembly. Before mounting the side guard (22) ensure all bolts on the frame and all 5/16 bearing flange bolts are secured.
- J** Your SOLO starter is now ready for service.

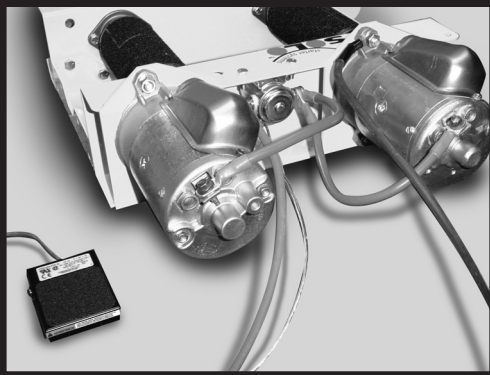
Allow for a small amount of play between the mating teeth



Solenoid is attached under motor mount channel



View showing motors, solenoid, cables and foot switch

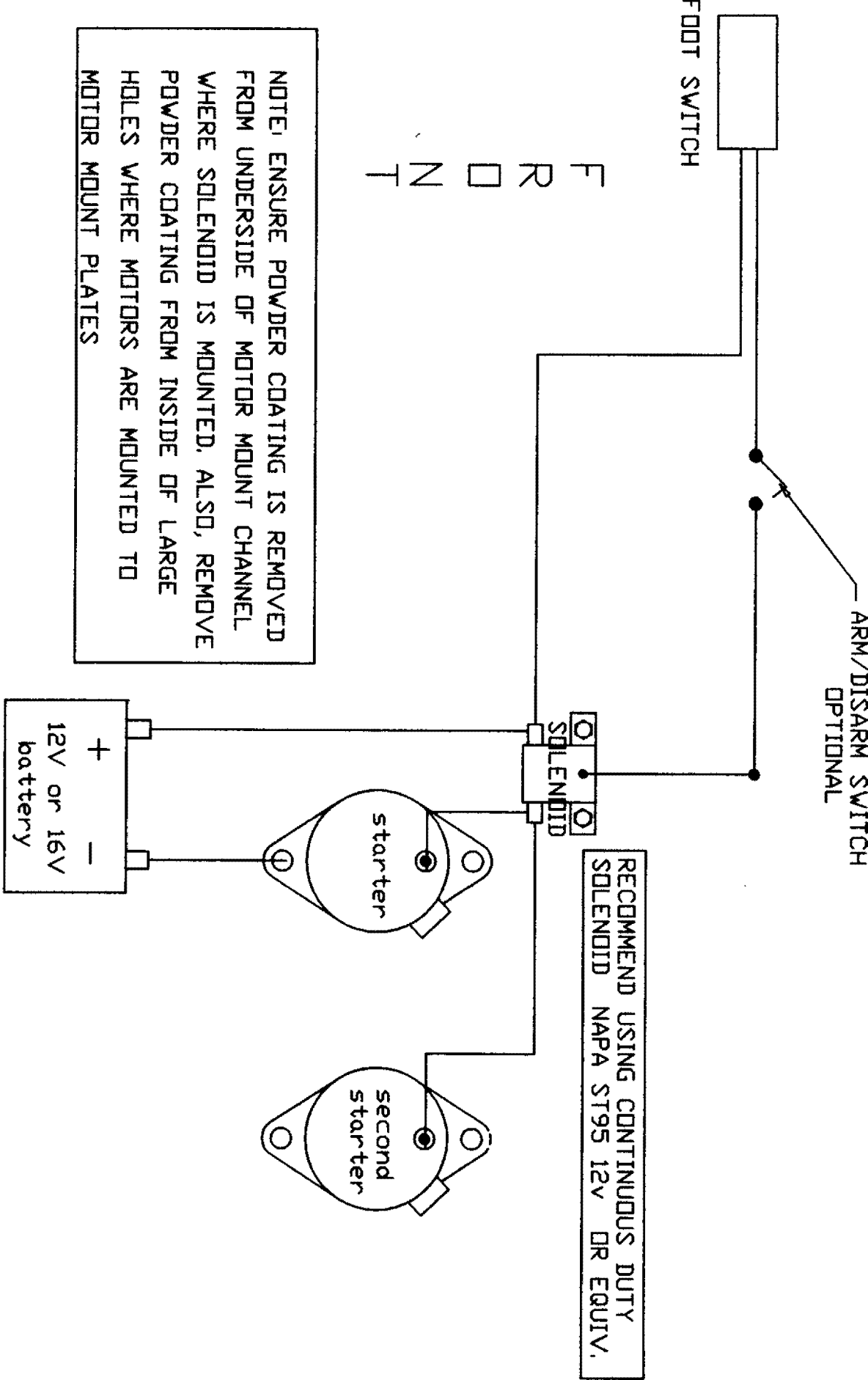


One Motor Option

- A** In right channel (2) mount sprockets (15) on roller ends using 1/4" square keys (19).
- B** Apply Loctite blue to set screws, position and align both sprockets and lock in place using Allen key. Cut thin strips of duct tape and wrap hubs. This ensures that the small setscrews will not be lost if they should work free. Assemble chain onto sprockets with master link. Mount chain tensioner block (17) using 5/16" hex bolts (18).
- C** Mount chain guard using 1/4" bolts, and nuts.

Battery Selection

A deep cycle marine battery (850 CCA or greater) is recommended. Hard wiring is recommended. #4 cable (nominal length-36") should be used between the battery and the starters and #4 cable should be used between starters and solenoid. (Nominal length 12") Some applications may require the use of an additional 6-Volt battery. Read the applicable wiring diagram and wire accordingly.



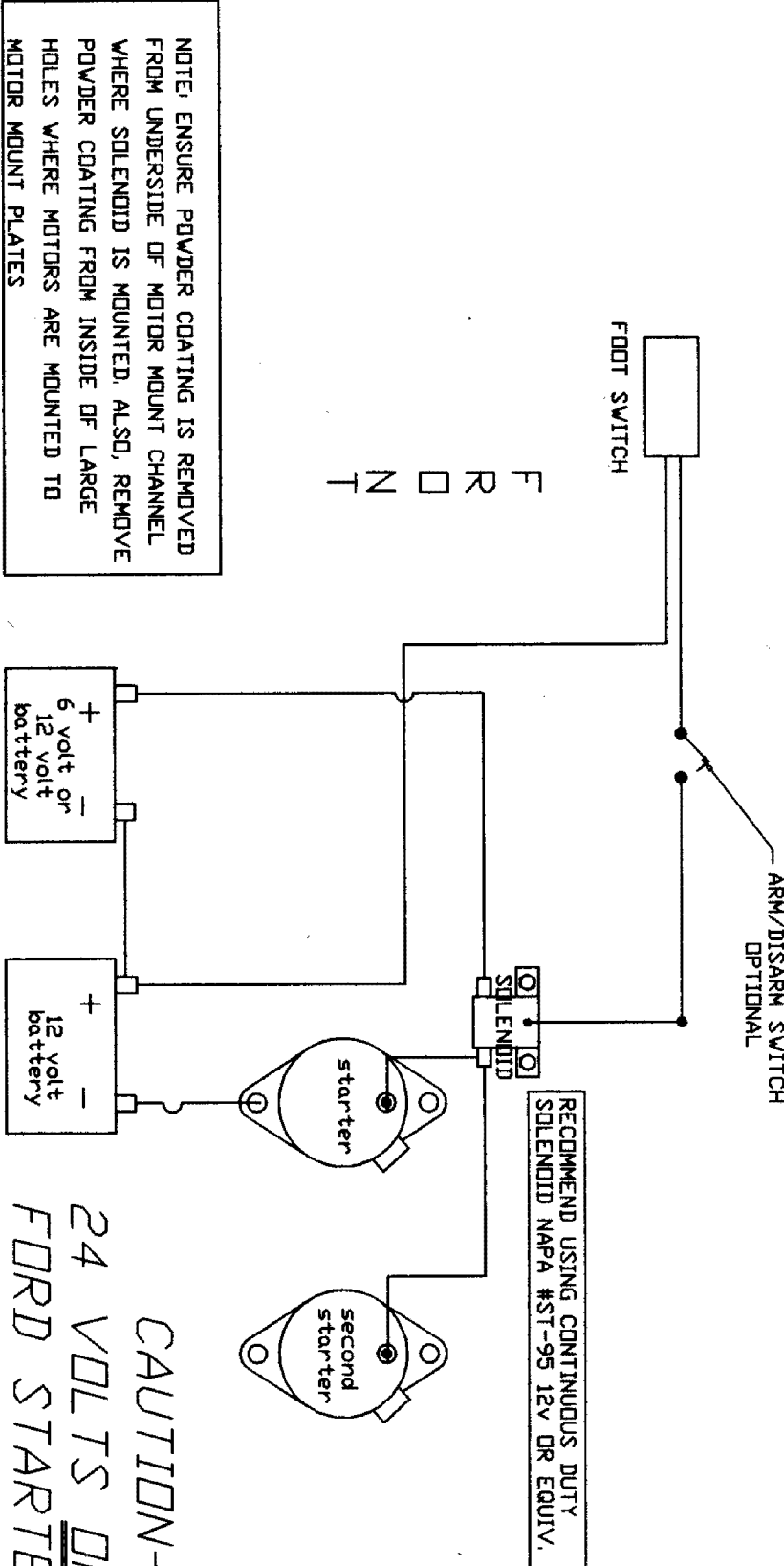
F R O N T

NOTE: ENSURE POWDER COATING IS REMOVED FROM UNDERSIDE OF MOTOR MOUNT CHANNEL WHERE SOLENOID IS MOUNTED. ALSO, REMOVE POWDER COATING FROM INSIDE OF LARGE HOLES WHERE MOTORS ARE MOUNTED TO MOTOR MOUNT PLATES

SIMPLIFIED SCHEMATIC FOR TWD
 GENERIC (LESTER #3153 /3180 / 3186 or EQUIVALENT) FORD MOTOR

12 VOLT BATTERY

WIRING DIAGRAM



F R O N T

NOTE: ENSURE POWDER COATING IS REMOVED FROM UNDERSIDE OF MOTOR MOUNT CHANNEL WHERE SOLENOID IS MOUNTED. ALSO, REMOVE POWDER COATING FROM INSIDE OF LARGE HOLES WHERE MOTORS ARE MOUNTED TO MOTOR MOUNT PLATES

SIMPLIFIED SCHEMATIC FOR ONE/TWO GENERIC (LESTER #3153 / 3180 / 3186 or EQUIVALENT) FORD STARTER MOTOR(S) WIRED IN SERIES FOR 18 OR 24 VOLTS
 NOTE: SOLENOID IS STILL WIRED FOR 12 VOLTS

CAUTION-- WIRE FOR 24 VOLTS ONLY IF BIG MIKE FORD STARTERS ARE USED

18 OR 24 VOLT BATTERY

WIRING DIAGRAM

C A U T I O N

PLEASE READ THIS DOCUMENT BEFORE BUILDING AND OPERATING YOUR NEW SOLO STARTING SYSTEM

- ▶ READ AND UNDERSTAND YOUR OWNERS MANUAL.
- ▶ READ THE WIRING DIAGRAM CAREFULLY, ENSURE ALL WIRES ARE FASTENED TIGHTLY (DONOT OVER TIGHTEN) THIS WILL AVOID ANY DANGER OF DIRECT SHORTS.
- ▶ DO NOT FREE RUN THE UNIT EXCESSIVELY WITHOUT A LOAD ON THE ROLLERS. IT IS POSSIBLE TO BURN OUT THE MOTORS.
- ▶ ONCE BIKE IS STARTED, QUICKLY REMOVE FOOT FROM ACTUATING SWITCH. PROLONGED GEAR ENGAGEMENT WITH THE STARTER MOTORS COULD CAUSE DAMAGE.
- ▶ **ALWAYS DISCONNECT POWER SUPPLY FROM THE SOLO SS WHEN SERVICING**
- ▶ DON'T OVER REACH – KEEP PROPER BALANCE AND FOOTING AT ALL TIMES.
- ▶ AVOID UNINTENTIONAL STARTING.
- ▶ KEEP VISITORS, CHILDREN AND PETS AWAY FROM STARTING AREA.
- ▶ USE ONLY IN PROPER VENTILATED AREA.
- ▶ KEEP FINGERS AWAY FROM DRIVE GEARS AND ROLLERS DURING OR OR PRIOR TO OPERATION.
- ▶ AVOID DROPPING UNIT ON THE GROUND. THIS COULD DAMAGE THE STARTER.