

**FOR  
SERVICE, INFORMATION OR  
PARTS**

**WRITE:**

**TENDAIRE INDUSTRIES, INC.**

*1100 WEST CEDAR STREET  
BERESFORD, SD 57004*

**PHONE: (800) ON WATTS**

**(605) 763-5500**

**FAX: (605) 763-5073**

*www.tendaire.com  
acpower@tendaire.com*

*Serial No.* \_\_\_\_\_

*Date Shipped from Factory* \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_



**INSTALLATION &  
OPERATING  
INSTRUCTIONS FOR  
HYDRAULIC DRIVEN  
ELECTROL™ 60 Hz  
AC GENERATORS**

**115 V AC MODELS**

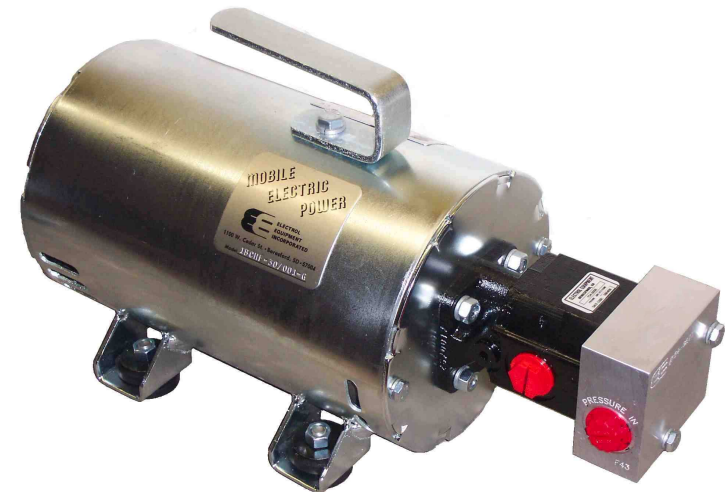
**1BCH-20/, 30/, 40/**

**1BCHF-20/, 30/, 40/**

**230/115 V AC MODELS**

**2BCH-20/, 30/, 40/**

**2BCHF-20/, 30/, 40**



**TENDAIRE**  **ELECTROL**  
**INDUSTRIES, INC.**

**1100 W. Cedar St., Beresford, SD 57004  
Phone (605) 763-5500 \* Fax (605) 763-5073**

**Experts in Mobile Electric Power Since 1961**

## IMPORTANT

This booklet contains important information. Please read this booklet before you install the ELECTROL hydraulic drive A.C. generator.

All ELECTROL generators are thoroughly tested and run under load conditions before they leave the factory.

When properly installed, operated and maintained, they will give many years of trouble-free service. Keep this booklet with the unit for future reference.

## HYDRAULIC DRIVE GENERATOR MAINTENANCE SCHEDULE

DAILY ☞ Check the voltage output.

WEEKLY ☞ Inspect hydraulic motor and flow control for oil leakage.

Inspect hydraulic lines and connections leading to the generator for wear or possible fatigue.

MONTHLY ☞ Check the cleanliness of the hydraulic oil. A #10 micron filter should be used. Dirty hydraulic oil will cause excessive wear inside the motor. A worn motor will cause low voltage under load.

## CAUTION

Over speed of the self-excited generator will cause overheating and/or damage to the full wave bridge located in the endbell. (Maximum generator speed 3600 R.P.M.)

\*SEE: Electrical trouble-shooting (no output voltage)

DATE	NAME	TYPE OF PREVENTATIVE MAINTENANCE OR REPAIR

## WARRANTY

Tendaire Industries, Inc. hereby guarantees for a period of one year as hereinafter stated, the alternator described below to be free from defects in material and workmanship of properly installed, operated and serviced under normal conditions according to our instructions.

All parts will be repaired or replaced by Tendaire Industries, Inc. if found by it to be defective in material or workmanship within one year FROM DATE OF SHIPMENT.

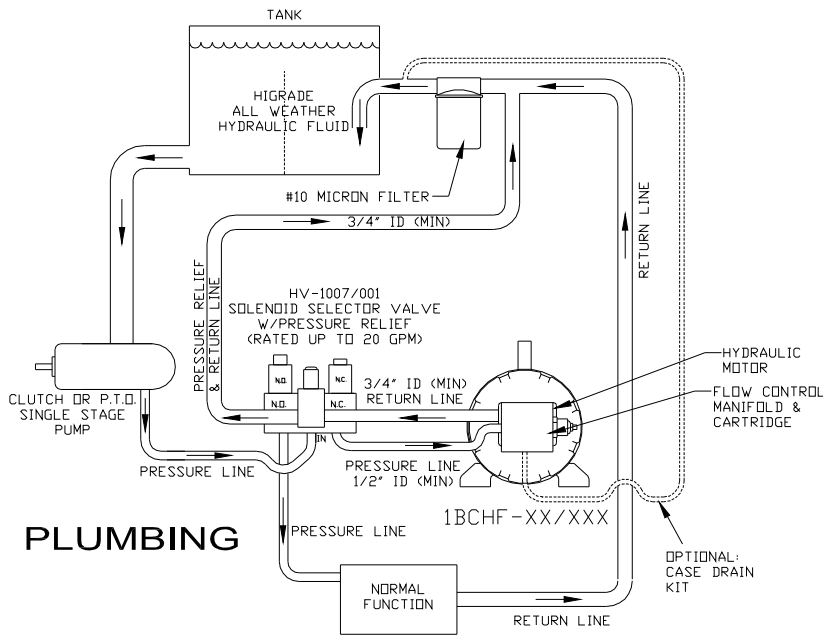
All transportation charges on parts, or units submitted for replacement or repair, under this warranty must be borne by the purchaser.

There is no other warranty expressed or implied. Tendaire Industries, Inc. shall in no event be liable for consequential damages.

# GENERAL DESCRIPTION

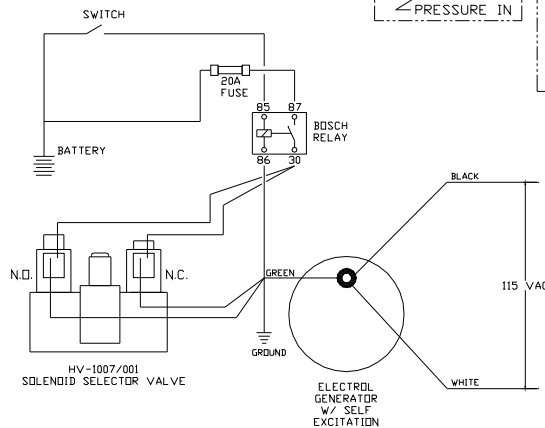
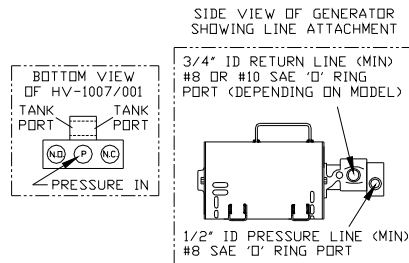
## HYDRAULIC DRIVE

<b>ROTATION</b>	<i>Clockwise at hydraulic motor end</i>
<b>SPEED</b>	<i>3600 R.P.M. (60 Hz.)</i>
<b>VOLTAGE REGULATION</b>	<i>Self-regulating 12 volt D.C. regulator 24 volt D.C. regulator</i>
<b>EXCITATION</b>	<i>Internal (self-excited) External (12 V D.C., battery) External (24 V D.C. battery)</i>
<b>COOLING</b>	<i>Internal fan</i>
<b>TEMPERATURE RISE</b>	<i>50° centigrade</i>
<b>INSULATION</b>	<i>Class F (155° centigrade rating)</i>



### PLUMBING

ALL HYDRAULIC LINES SHOULD BE AS SHORT AND DIRECT AS POSSIBLE WITH A MINIMUM OF FITTINGS. AVOID USING 90° FITTINGS.



### WIRING

SINGLE STAGE HYD. PUMP  
1BCHF-XX/ SELF-EXCITED GENERATOR &  
HV-1007/001 (20 GPM) SOLENOID SELECTOR VALVE

### 2000 WATT

*This generator is designed for lighter duty, providing power for lights, electric power tools, heaters, most universal motors up to 2 horse power or induction motors up to 1/3 horse power.*

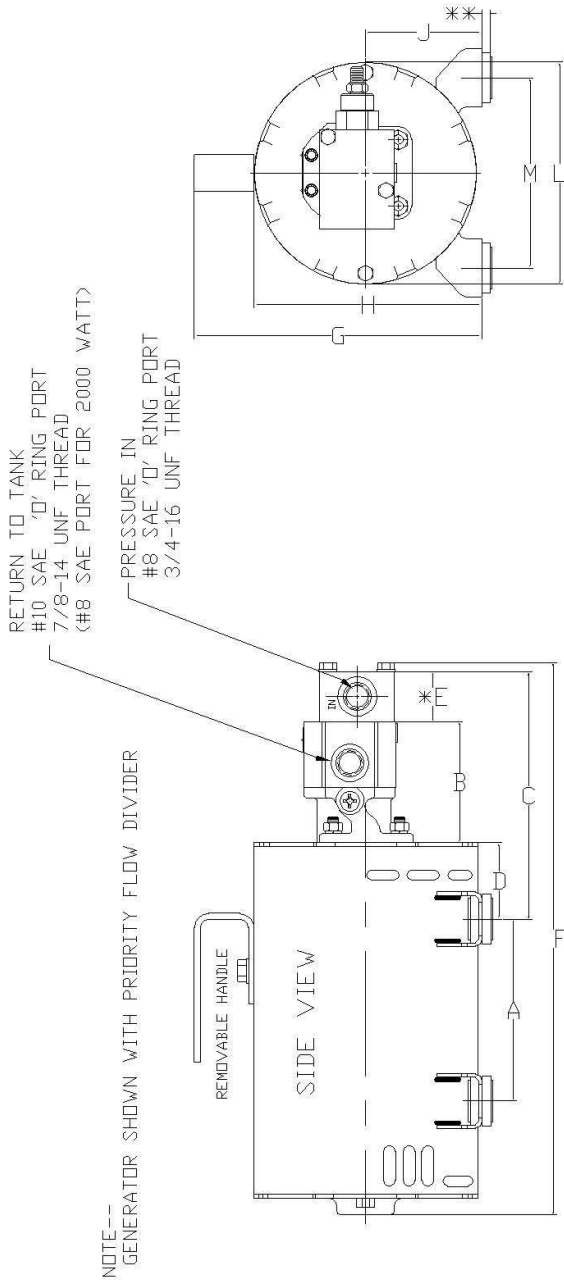
### 3000 WATT

*This generator is designed to provide power for electric tools such as chain saws, drills, impact wrenches, core drills, heaters, pumps, sprayers, universal motors up to 4 horse power or induction motors up to 1 horse power.*

### 4000 WATT

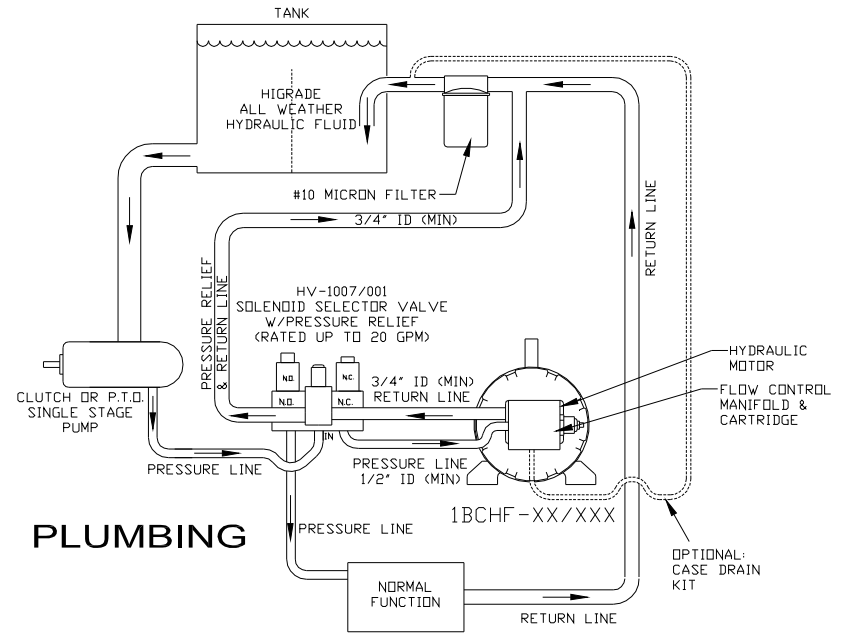
*This generator is designed to run any of the above and give you reserve to operate lights and other tools as well.*

# Generator Dimensions - 115 and 230/115 VAC: 2 Kw to 4 Kw



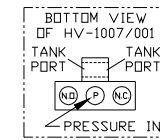
CAPACITY	A	B	C	D	*E	F	G	H	J	L	M
2000 Watts- 110 VAC	3 1/2	3 3/16	7	2 5/16	1 1/2	14 1/4	8 11/16	6 3/4	3 7/16	6 3/4	5 1/2
3000 Watts- 110 VAC	5 1/2	3 11/16	7 1/2			16 3/4					
4000 Watts- 110 VAC											
4000 Watts- 220/110											

\* SUBTRACT 1 1/4" FROM OVERALL LENGTH FOR GENERATORS WITHOUT A FLOW DIVIDER (BCH SERIES)  
 \*\* ADD 5/16" TO OVERALL HEIGHT FOR SHOCK MOUNTING WASHERS.

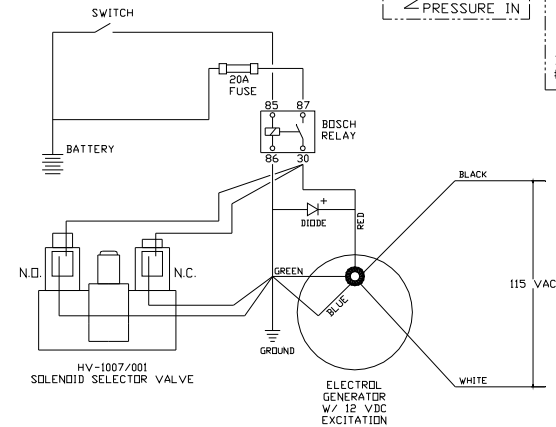
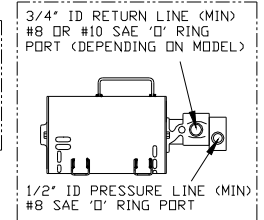


## PLUMBING

ALL HYDRAULIC LINES SHOULD BE AS SHORT AND DIRECT AS POSSIBLE WITH A MINIMUM OF FITTINGS. AVOID USING 90° FITTINGS.



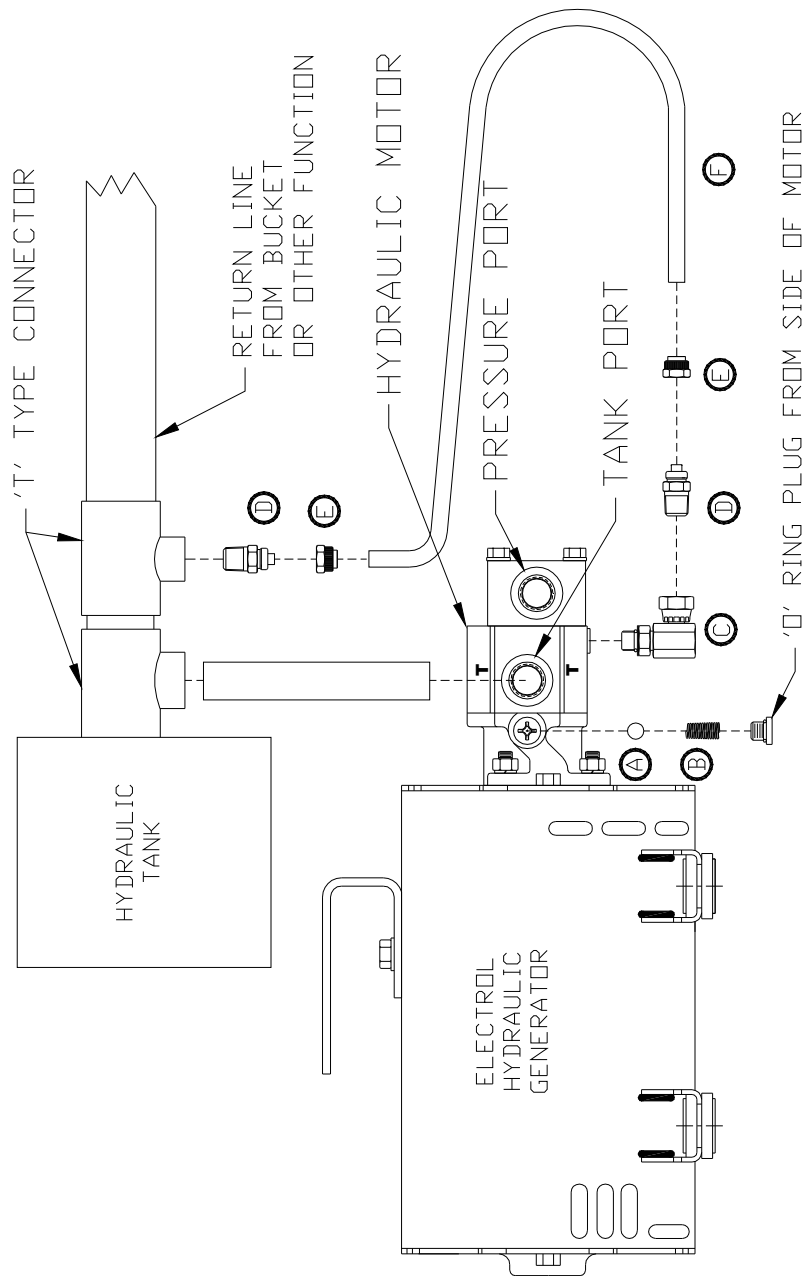
SIDE VIEW OF GENERATOR SHOWING LINE ATTACHMENT



## WIRING

SINGLE STAGE HYD. PUMP  
 1BCHF-XX/ 12 VDC EXCITED GENERATOR &  
 HV-1007/001 (20 GPM) SOLENOID SELECTOR VALVE

## Case Drain Illustration



## INSTALLATION

The hydraulic driven generator can be mounted in any convenient location provided there is access to the hydraulic system.

The generator can be mounted in any horizontal position (side, top, or bottom). **DO NOT** mount with armature shaft in vertical position.

Generators mounted in compartments must have direct and unrestricted access to outside ventilation.

Any electrical outlets must be weather proof and wired into the generator's electrical system with #12-3/S cord.

### CAUTION

Over speed of the self-excited generator will cause overheating and/or damage to the full wave bridge located on the endbell. (maximum generator speed 3600 R.P.M.)

**\*SEE:** Electrical trouble-shooting (no output voltage).

### AFTER INSTALLATION:

Start engine

Engage generator

(Self-excited generator may experience loss of residual magnetism- Refer to Page 10)

Apply load to generator

Allow generator to operate for 15 minutes (to warm hydraulic oil)

Inspect all connections for oil leaks

### \*\*NOTE\*\*

Hydraulic oil return line to tank **MUST NOT** exceed 50 P.S.I. back pressure **AT THE MOTOR PORT**. Return line should be sized such that line velocity does not exceed 10 F.P.S. (Feet per second).

# HYDRAULIC REQUIREMENTS

MODEL	MOTOR	G.P.M.	P.S.I.
<u>115 Volt AC, 60 Cycle</u>			
1BCH-20/	.258 CID	4.3 GPM (max)	2000 PSI
1BCH-30/	.388 CID	6.5 GPM (max)	
1BCH-40/	.517 CID	8.5 GPM (max)	
1BCHF-20/	.258 CID	5 GPM	
1BCHF-30/	.388 CID	7 GPM	
1BCHF-40/	.517 CID	9 GPM	
<u>230/115 Volt AC, 60 Cycle</u>			
2BCH-20/	.258 CID	4.3 GPM (max)	2000 PSI
2BCH-30/	.388 CID	6.5 GPM (max)	
2BCH-40/	.517 CID	8.5 GPM (max)	
2BCHF-20/	.258 CID	5GPM	
2BCHF-30/	.388 CID	7 GPM	
2BCHF-40/	.517 CID	9 GPM	

**\*\*NOTES\*\***

**20 GPM (max) to flow control**

Hydraulic oil return line to tank **MUST NOT** exceed 50 P.S.I. back pressure **AT THE MOTOR PORT.**

Return line should be sized such that line velocity does not exceed 10 F.P.S. (feet per second).

## CASE DRAIN INSTALLATION

### Instructions— (Refer to Illustration on Pg. 11)

- 1) Remove "O" ring plug from side of motor as shown (The side with pressure & tank ports). Do NOT discard!
- 2) Place checkball 'A' in port followed by checkball spring 'B'. Position the spring's narrow end toward ball.
- 3) Replace and tighten "O" ring plug removed in step 1).
- 4) Remove case drain plug from underside of Hydraulic motor.
- 5) Tighten 90° "O" ring swivel adapter 'C' into case drain port.
- 6) Tighten male connector 'D' into swivel adapter 'C' using pipe thread sealant compound.
- 7) Cut Poly. Tubing 'F' to required length making sure both ends are cut cleanly and squarely.
- 8) Slide nut 'E' onto tubing, push tubing onto connector 'D'. Again use pipe sealant and secure tubing to 'D' with nut 'E'.
- 9) Attach other end of tubing to 'T' in return line, using pipe sealant, nut 'E' and connector 'D'.
- 10) Plumbing the generator tank return and case drain return as shown, with returns at 90° to main return line, is the preferred method.

### Case Drain Parts List

- |          |   |  |
|----------|---|--|
| <b>A</b> | 1 | 3/8 Dia. Plastic Checkball                           |
| <b>B</b> | 1 | Checkball Spring (Install-- smaller end toward ball) |
| <b>C</b> | 1 | 90° Swivel Adaptor- #4 "O" Ring to 1/4" NPT Female   |
| <b>D</b> | 2 | 1/4" NPT Male to 3/8" tubing connector               |
| <b>E</b> | 2 | 3/8" Poly-tite fitting nut                           |
| <b>F</b> | 1 | 3/8" Dia. Polyethylene tubing (Length as needed)     |

Case drain kits may be ordered from Tendaire Industries, Inc.  
Inquire about P/N 154-0087.

## Loss of Residual Magnetism

### How to "flash" a generator when output is lost due to loss of excitation

*Residual magnetism in the generator exciter field allows the generator to build up voltage during start-up. This magnetism is sometimes lost due to shelf time or improper operation, among other reasons. Restoring this residual magnetism is possible and is sometimes referred to as*

#### **"flashing the exciter field".**

*To restore the small amount of residual magnetism necessary to begin voltage buildup, connect a 12 volt battery to the exciter field while the generator is **NOT ROTATING**, as follows:*

- 1. Connect White lead of generator to the positive pole of the battery.*
- 2. Hold the Black lead of generator by the insulated portion of the lead wire, touch Black lead to the negative pole of the battery for a few seconds, then remove.*
- 3. Repeat the procedure if the generator fails to build voltage.*

*Note: Self excited generators with receptacles will require a short pig tail with plug.*

## HYDRAULIC TROUBLE-SHOOTING HYDRAULIC DRIVE

*Internal-excitation (self excited)  
External-Excitation (12 V.D.C. battery excited)  
External-Excitation (24 V.D.C. battery excited)*

<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>REMEDY</b>
<i>No output voltage or low output voltage with or without load</i>	<i>No oil flow</i>	<i>Provide oil flow</i>
	<i>Dirty oil and filter</i>	<i>Change oil and filter, a #10 micron filter should be used</i>
	<i>Dirty flow control cartridge</i>	<i>(1) Clean cartridge (2) Replace cartridge</i>
	<i>Flow control setting is too low</i>	<i>Adjust flow control (generator speed 3000 RPM)</i>
<i>Hydraulic oil leak</i>	<i>Loose fittings</i>	<i>Tighten fittings</i>
	<i>Damaged oil seal, "O" ring and/or gasket</i>	<i>Replace oil seal, replace "O" ring and/or gasket</i>

#### **\*\*NOTE\*\***

**The hydraulic system providing oil to the generator must be efficient, with proper adjustments capable of supplying required GPM at 2000 P.S.I. continuous to the generator. Refer to hydraulic requirements for required GPM.**

# ELECTRICAL TROUBLESHOOTING

## HYDRAULIC DRIVE

*Internal-excitation (self excited)*

*External-Excitation (12 V.D.C. battery excited)*

*External-Excitation (24 V.D.C. battery excited)*

SYMPTOM	PROBABLE CAUSE	REMEDY
No output voltage	Fuse (External excitation only)	Replace fuse
	No oil flow or Low oil flow on Self excited generators	Provide oil flow
	Open or short in electric solenoid valve	Replace electric solenoid valve
No output voltage (in Self-Excited Generator)	Dirty, worn or sticking brushes	Clean and free up brushes. Replace if less than 3/8" in length
	<b>NOTE:</b> Loss of residual magnetism will occur upon disassembly and after long term storage or disuse. <b>See Page 10</b>	"Flash" the generator <b>WARNING</b> Armature must <b>NOT</b> be rotating!!
(Will not apply to 12/24 volt D.C. external excitation) →	Open or short in full wave bridge (Located in endbell) <b>NOTE:</b> Disconnect leads for testing	(1) Replace bridge (2) Replace endbell assembly

-- continued --

# ELECTRICAL TROUBLE-SHOOTING

## HYDRAULIC DRIVE

*Internal-excitation (self excited)*

*External-Excitation (12 V.D.C. battery excited)*

*External-Excitation (24 V.D.C. battery excited)*

SYMPTOM	PROBABLE CAUSE	REMEDY
No output voltage (Will not apply to 12/24 volt D.C. external excitation)	Open or short in armature	Replace armature
	Open or short in stator shunt field	Replace stator
Low voltage output with no load and low voltage output with load	Inadequate oil supply	Refer to hydraulic section
	Dirty, worn or sticking brushes	Clean and free up brushes. Replace if less than 3/8" in length.
	Open or short in full wave bridge (located in stator)	Replace bridge
	<b>NOTE:</b> Disconnect leads for testing.	
	Open or short in armature	
	Open or short in stator series field	Replace armature
		Replace stator

### \*\*NOTE\*\*

**It is extremely important that all wires be marked before they are disconnected. It may be necessary to flash generator when it is reassembled. Refer to "loss of residual magnetism." (Pg. 10)**