

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

Aviation Ground Power Unit (AGPU)

INTERIM OPERATION AND MAINTENANCE PROCEDURES FOR

P/N 83-360D, NSN 1730-01-466-9371

**Headquarters, Department of the Army, Washington, D. C.
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NOTE

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1. Priority Classification. Routine

2. Introduction.

a. All AGPUs used to support the AH-64D, Longbow Apache helicopter are being modified by MWO 1-1730-229-50-2 to upgrade the 400 Hertz, AC, output and the gas turbine engine performance. The upgraded AGPU has a new 48 KVA AC generator, a modified generator control unit (GCU), a 250-amp transformer rectifier unit (TRU), a modified exhaust ejector, and associated wiring changes. The upgraded AGPU has been assigned a new part number and national stock number for tracking.

b. The purpose of this TB is to detail these changes and provide revised operation and maintenance procedures for the P/N 83-360D AGPU until the appropriate changes to Technical Manual TM 55-1730-229-12 are published. Required changes to repair parts and special tools list contained in TM 55-1730-229-24P are also included.

3. Differences Between Part Numbers.

a. The primary hardware change incorporated by MWO 55-1730-229-50-2 is replacement of the P/N 83-360A (formerly MEP-360A) generator, which has a combined AC and DC output, with a larger capacity AC generator. The 83-360D generator has no DC output. An aircraft (AH-64A) type, 400 Hertz to 28 VDC, transformer rectifier unit (TRU) is used on the 83-360D to power the battery charger, the 60-Hertz inverter and to start or service DC aircraft.

b. The exhaust ejector assembly on the 83-360D has also been modified to reduce the backpressure. This improves the GTE efficiency, thereby increasing shaft horsepower, increasing the pneumatic output and reducing fuel consumption.

c. This reduction in exhaust backpressure has also allowed changes in surge control operations. A continuous bleed of GTE compressor output has been eliminated on the 83-360D and the setting of the pneumatic system switch no longer controls the function of the surge control valve.

4. Repair Parts Support.

a. Repair parts peculiar to the 83-360D that do not have NSNs assigned can be obtained through the AMCOM Project OLR at Savannah, Georgia. The point of contact is:

Mr. Dale DeRoia, DSN 971-6869, commercial (912) 352-6869 or Mr. Ron Lewis, DSN 971-6297, commercial (912) 352-6297.

b. A listing of repair parts peculiar to the 83-360D is contained in paragraph 6, followed by a narrative discussion on necessary changes to TM 55-1730-229-24P.

5. Changes to TM 55-1730-229-12.

a. Changes to the TM are addressed in narrative form, not always in the exact wording of a manual change. Only those chapters, sections, paragraph, tables, or figures that are affected by the upgrade are covered. For ease of reference to the affected area in the TM, the remaining portion of this paragraph is numbered the same as the existing AGPU TM.

COVER

Changed to read as follows:

AC - 400 Hz, 3 PH, 115/200 V, 0.8 PF

DC - 28 V

PNEUMATIC - 60 LBS/MIN AT 40 PSIG

HYDRAULIC - 15 GPM AT 3300 PSIG

<u>PART NUMBER</u>	<u>AC OUTPUT</u>	<u>DC OUTPUT</u>	<u>NSN</u>
83-360A	30 KW (37.5 KVA)	700 AMPS	1730-01-144-1897
83-360D	38.4 KW (48 KVA)	250 AMPS	1730-01-466-9371

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. SCOPE. (Page 1-1) The first sentence to be revised to read as follows:

a.. This manual is for use in operating and maintaining the Multi-Output Aviation Power Unit, P/N 83-360A and P/N 83-360D, referred to as the Aviation Ground Power Unit (AGPU), as allocated by the maintenance allocation chart.

Add the following:

b. The 83-360D has been modified by application of MWO 55-1730-229-50-2. This MWO is applied only to AGPUs that support the AH-64D, Longbow Apache helicopter. While these power units have been assigned a new part number and NSN because of the changes in AC and DC output ratings, there are only minor changes to the operation and maintenance of the modified AGPUs

Section II. DESCRIPTION AND DATA

1-9. DESCRIPTION, P/N 83-360D. (Page 1-2)

a.. General. Replace "MEP-360A" with "P/N 83-360A and P/N 83-360D".

b. Exterior Features. Add a Note as follows:

NOTE

There are only minor changes to the exterior of the AGPU. The 83-360D can be identified by an MWO identification plate located just below the nameplate and revised labeling on the control panel. The TRU can be seen in the upper left of the DC cable bay, just under a 6-inch flexible flap marked "83-360D".

- c. Engine/Gearcase. Add a Note as follows:

NOTE

The exhaust ejector inlet tube, Item 2, Figure 1-8, is being replaced with an open 30-degree elbow directing the exhaust gas down toward the inlet to the flu. The 17 tubes shown at the inlet to the flu are replaced with a rectangular duct. Figure 1-8a will be revised. (Attached Figure A shows the modified exhaust ejector.)

- d. Generator. Add a Note as follows:

NOTE

The 83-360D AC generator is also a self-cooled, continuous duty, self-excited, brushless unit only without the two windings used to provide 28 VDC output. The rectangular box on the top of the generator is eliminated. It contained the DC output terminals and the generator control unit (GCU) connector, which is located on the primary housing of the AC generator. The GCU has been modified to control the larger capacity AC generator. Since AC power is still needed, even when only DC is being supplied by the TRU, the CURRENT LIMIT SELECTOR switch is rewired so that the GCU is always monitoring the AC output.

1-10. TABULATED DATA, P/N 83-369D.

Table 1-1. Tabulated Data. (Page 1-16) To be revise as follows:

- 1. Aviation Ground Power Unit (AGPU).

Manufacturer: Marconi Astronics Inc.
(Serial No. 0001-0659) (CAGE 63631)

Manufacturer: Engineered Air Systems Inc.
(Serial No. 1001-1155) (CAGE 90598)

Model: Delete.

Operating environmental capabilities: (No change.)

AC voltage output: (No change.)

Add the following between AC voltage output and AC power output:

Part Number 83-360A: NSN 1730-01-144-1897

Add the following just before pneumatic output:

Part Number 83-360D: NSN 1730-01-466-9371

AC power output:

38.4 KW (48.0 KVA) continuous
 30.0 KW (37.5 KVA) continuous with 250 amperes 28 VDC output from the TRU
 66.0 KW (82.5 KVA) for 30 seconds

DC power output:

250 amperes continuous at 26 volts minimum
 350 amperes continuous at 25 volts minimum
 500 amperes for 1 minute
 1000 amperes for 5 seconds

Change "Noise Level" to read as follows:

Noise Level. Less than:

85	dBA at 23 foot (7 meter) radius
90/93	dBA at operator panel
103/105	dBA at GTE air inlet

5. Generator and Generator Control Unit (GCU). Revise remainder of page 1-20 to read:

Manufacturer: Leland Electrosystems
 Smiths Industries, Aerospace
 (CAGE 07639)

P/N 83-360A: AGH 815-1 (Generator)
 CSV 3370-2 (Generator Control Unit)

Rated-continuous duty, single mode

AC 30 KW, 3 phase, 400 Hertz, 115/200V,
 0.8 power factor
 DC 700 amperes, 28 vdc

P/N 83-360D: AGH 828-3 (Generator)
 CSV 3370-3 (Generator Control Unit)

Rated-continuous duty, single mode

AC 38.4 KW, 3 phase, 400 Hertz, 115/200V, 0.8 power factor

b. Table 1-2. Stenciling Nomenclature and Instruction Plates. (Page 1-23)

A modification identification plate is added just below item 8 on Figure 1-13.

CHAPTER 2- OPERATING INSTRUCTION

Section I. OPERATING PROCEDURES

2-2. CONTROLS AND INSTRUMENTS, P/N 83-360D.

Table 2-1. Control Panel, Controls and Indicators. (Page 2-1)

Control Panel (figure 2-1)

A new Figure 2-1a, Current Limit Selector Switch Marking (83-350D) will be added. (See Figure B, attached.)

DC 28 VDC Section (Page 2-5) Add the following to the Function column:

VOLTAGE FAULT indicator (DS18)	Red warning indicator light	On the 83-360D AGPU, the DC section of the GCU has been disconnected and a label applied stating this indicator is DISABLED.
DC AMPS X 10 meter (M12)	0 to 120 AMP x 10 (0 to 1200 AMP) scale. Green band below 700 amps, yellow band at 700-1000 amps, and red band above 1000 amps.	On the 83-360D AGPU, the green, yellow, and red bands are no longer correct. A label "MAX. CONT. 350 AMP" has been applied below this gage to indicate the green band. The yellow band should be from 350-500 amps and the red bands should be above 500 amps.
OVER CURRENT Indicator (DS19)	Red warning indicator light	On the 83-360D AGPU, the current is not limited by the GCU. This light is now used to indicate an overheat condition in the TRU, which is an indication of DC over current or cooling fan failure.
CURRENT LIMIT SELECTOR switch (S11)	Rotary four-position switch (200A, 500A, 700A, and 1000A)	On the 83-360D, the DC side of this switch is not used. DC current is limited only by the capacity of the TRU. All DC settings have been masked. DC output is available at any of the newly marked settings.

AC 115 VAC, 400 Hz Section (Page 2-5) Add the following to the Function column:

AC % LOAD meter (M9)	0 to 150% scale. Green band below 100% and yellow band above 100%	On the 83-360D, the AC % LOAD readings are not correct. A label "MAX. CONT. 130%" has been applied below this gage to indicate the continuous AC output power rating of the upgraded units.
CURRENT LIMIT SELECTOR switch (S11)	Rotary switch with four AC positions (10 KW, 20 KW, 30 KW, and 45 KW)	On the 83-360D, the AC current limit selections are: 17 KVA, 38 KVA, 59 KVA (AH-64A/H-60), and 90 KVA (AH-64D) When the CURRENT LIMIT SELECTOR switch is set at 45KW and 1000 AMP on the 83-360A, or AH-64D/90 KVA on the 83-360D this switch also opens a surge control valve to increase available shaft horsepower.

2-3. PLACING THE AGPU IN OPERATION, 83-360D.

c. Engine Start Procedures. (Page 2-21)

(3) Add Note as follows:

NOTE

On the 83-360D, the DC voltage monitoring function of the GCU has been disabled. The DC VOLTAGE FAULT will not illuminate when the PRESS TO TEST button is pushed.

2-4. AC MODE OPERATION, 83-360D.

b. AC Power Application. (Page 2-23)

(1) Add Note:

NOTE

The 83-360D has been modified specifically to meet the combined AC, hydraulic, and pneumatic servicing requirements of the AH-64D. When the CURRENT LIMIT SELECTOR switch is set to AH-64D, the maximum AC current is available to handle transient power requirements. Since the surge control valve remains open even with the pneumatic system switch is ON, this setting should not be used when air output is required.

(2) Add: On the 83-360D, set CURRENT LIMIT SELECTOR switch (1, figure 2-10) to the type aircraft to be supported or desired current limit.

2-5. DC OPERATION, 83-360D. (Page 2-24) Add Note as follows:

NOTE

The 83-360D only operates in the AC mode. All DC output power is obtained by converting AC. The CURRENT LIMIT SELECTOR switch should be set to one of the four marked locations (left side of switch) for AC, DC, or combined AC and DC output.

b **DC Power Application.** (Page 2-25)

(2) Add. On the 83-360D, DC may be supplied with the CURRENT LIMIT SELECTOR switch (1, figure 2-12) at any of the AC setting.

(6) Add. On the 83-360D, insure that the DC AMPS meter (4) does not read above 350 AMPS except during aircraft starting (or slave start of another AGPU).

CAUTION

The 83-360D does not monitor or regulate the DC output of the TRU. The TRU output is not protected from an overload. When operating at high DC output the DC AMPS meter and the DC OVER CURRENT light must be closely monitored to protect the TRU from overload.

2-6. PNEUMATIC SYSTEM OPERATION, 83-360D.

b **Pneumatic Power Application.** (Page 2-27) Add Note as follows:

NOTE

The air output is reduced when the surge control valve is open. Do not attempt to service the AH-64A or ground air start any aircraft when the CURRENT LIMIT SELECTOR switch is in the "AH-64D" setting.

2-8. COMBINED OUTPUT OPERATION, 83-360D.

a. (Page 2-34)

(1) Start the first sentence with: On the 83-360A AGPU ----

(2) Add new subparagraph: On the 83-360D AGPU all the DC comes from the TRU, which is powered by the AC output of the generator, its input load requirement is not available as AC output. The CURRENT LIMIT SELECTOR switch position selected must consider both the AC and DC output loads. The generator control unit can no longer regulate the DC output so its control over the DC contactor has been bypassed. Also on the 83-360D, the AH-64D position of the CURRENT LIMIT SELECTOR switch opens the surge control valve, which reduces the available airflow.

(3) Re-number and add the following additional combined load condition:

(c) Condition 3. (83-360D only)

AC 36 KW 0.8 PF

Hydraulic: 3,000 psig at 6.5 GPM

Pneumatic: ON, only surge control valve open

c. (Page 2-35) Add Note as follows:

NOTE

While 83-360D still has the capability of providing 50 amps DC output from the battery charger in combination with AC, this operation is not recommended. Using normal DC output procedures, the TRU can deliver 5-7 times the DC with no danger of overloading and burning out the battery charger. For the 83-360D, DC power output is obtained in the same way, whether in combination with AC power (1b.) or with no AC power (1c). Settings in 1c of the table are used.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE

Section IX. MAINTENANCE OF DC ELECTRICAL AND CONTROL SYSTEMS

4-23 GENERAL.

a. Master DC Power Control System. (Page 4-160)

(3) Add Note as follow:

NOTE

On the 83-360D, the generator output is provided directly to the TRU at the line side of the AC contactor. The TRU output is then connected to the battery charger and controls as described in the rest of this section.

e. Pneumatic Control System. (Page 4-164) Add the following new subparagraphs:

All AGPUs are equipped with a surge control valve. The surge control valve is used to bleed off a portion of the GTE compressor output to delay the onset of compressor stall. This increases the available shaft horsepower for high electrical or hydraulic loads. The surge control valve is opened when the CURRENT LIMIT SELECTOR switch S11 is set to highest current limits

On the 83-360A, power to operate the surge control valve is routed through the PNEUMATIC POWER switch 1S8 to the 45 KW and 1000 AMP pins on the CURRENT LIMIT SELECTOR switch. On serial numbers 1036 and higher, the surge control valve also opens at the 30 KW setting of the CURRENT LIMIT SELECTOR switch S11. On the 83-360A the surge control valve will not open if the PNEUMATIC POWER 1S8 is ON.

On the 83-360D, a jumper is installed on the PNEUMATIC POWER 1S8 allowing the surge control valve L1H-2 to open even when the pneumatic system is on. The surge control valve does not open at the 30 KW setting of the CURRENT LIMIT SELECTOR switch S11 on the 83-360D.

4-33 TERMINAL BOARDS (TB) AND COMPONENTS.

Figure 4-10. Terminal Boards TB1 Components. (Page 4-184)

Figure to be revised to add an additional diode, CR6X, between the No. 16 terminal screw on the anode and cathode boards. Add to legend: "15. DIODE 1N5061 (83-360D only)"

Section X. MAINTENANCE OF ELECTRICAL POWER GENERATION AND CONTROL SYSTEM

4-50 GENERAL. (Page 4-205)

Table 4-11. Electrical Power Generation and Control System

"83-360D" is to be added after "Ac/dc generator (G1)" in the first column. The following will be added under that line:

Component	Location	Installation Fig. Ref.	Schematic/Wiring Diagram Fig. Ref.
AC generator (G1) (83-360D only)	Figure 4-36, item 5	4-39a	FO-5D, FO-6D(1)
AC to DC transformer rectifier unit (TRU) (83-360D only)	Figure 4-37, item 4	4-39a (sheet 3)	FO-2D, FO-5D, FO-6D(1)

Figure 4-36. Generator and AC Output Current Transformers (Page 4-207)

Add to legend: "5. AC GENERATOR (83-360D only)".

a. DC Power Generation and Control. Add after 3K1 on line 7, "AC to DC transformer rectifier unit (83-360D only)".

(1) Add: On the 83-360D, the only DC output of the generator is from the two permanent magnet stator windings, which is rectified to provide power to the GCU.

(2) Add: On the 83-360D, all the AGPU's DC output power is supplied by the TRU, which is powered from the AC output of the generator. The GCU on the 83-360D must remain in the AC mode to regulate this AC output. The GCU has been disconnected from the DC contactor K2 and a jumper has been installed to allow the contactor to close whenever the DC POWER switch is set to ON.

(3) Add: On the 83-360D, the GCU can only operate in the AC mode. DC current limiting and DC voltage fault monitoring are not provided.

(4) Add: The TRU used on the 83-360D, is a rugged solid-state power converter currently used on the AH-64A helicopter to provide essential DC power. It has a minimum continuous output voltage of 26 VDC at a 250 amp and 25 VDC at a 350-amp output. Ripple is 1.5 volt maximum. Maximum output is 500 amps for 1 minute, 1000 amps for 6 seconds.

(5) Add: The TRU on the 83-360D is protected by an overheat indicator. Activation of this switch will illuminate the DC OVER CURRENT light (DS19) on the control panel. Neither the TRU nor the GCU can open the DC contactor to prevent continued overheating of the TRU. Activation of the overheat indicator is most often caused by a failure of the TRU cooling fan. Table 4-12 is not applicable to the 83-360D.

Figure 4-37. Output Power Cables, 400 Hz AC-to-DC TRU, and DC-to -60 Hz Inverter

The TRU will be added to this figure as item 4, located in the upper right side wall of the DC cable compartment.

Table 4-12. Generator DC Faults (Page 4-210)

Change title to "Generator DC Faults, 83-360A Only"

b. AC Power Generation and Control. (Page 4-211)

(5) Add at line 6: "On the 83-360D the current limit setting are: 17 KVA, 38 KVA, 59 KVA (AH-64A/H-60), and 90 KVA(AH-64D)".

Table 4-13. Generator AC Faults. (Page 4-212)

Change title to "Generator AC Faults, 83-360A Only"

Add "Table 4-13a, Generator AC Faults 83-360D Only" as follows:

Faults					Protective Action	Fault Lamp Indication During fault	Indication (latched) After Fault
Voltage/ Frequency	Current for CURRENT LIMIT SELECTOR Switch Settings						
	17KVA (50A/Ø)	38KVA (110A/Ø)	59KVA (170A/Ø)	90KVA (259A/Ø)			
Voltage Normal (108-118 vrms)	>50 <191	>110 <191	>170 <191		None (see note)	None	None
	>191	>191	>191	>191	Field excitation removed after 30 seconds	OVER CURRENT	UNDER VOLTAGE after 5 second delay
Voltage <108 vrms	= or <50	= or <110	= or <170	= or <259	AC contactor opened after 4-7 seconds	None	UNDER VOLTAGE
	>50 <191	>110 <191	>170 <191				
	>191	>191	>191	>191			
Voltage >108 vrms					AC contactor opened	None	OVER VOLTAGE
Frequency <375 Hz					AC contactor opened	None	UNDER FREQUENCY

Note: When voltage is within normal limits and output power is less than 66 KVA, the generator will continue to operate regardless of the CURRENT LIMIT SELECTOR switch setting. The GCU will reduce field excitation to reduce generator voltage as current increases above the selected limit. The voltage will drop below the normal limit (104 ±4 vac) and the GCU will open the AC contactor when current exceeds the values listed.

Figure 4-39. AC/DC Generator and AC Output Current Transformers (Page 4-218) Add: "(83-360A Only)"

Figure 4-39a. AC Generator and AC Output Current Transformers (83-360D Only)

A revised figure 4-39 will be added as follows:

(sheet 1 of 3) Legend 1. Replace "AC/DC GENERATOR" with "AC GENERATOR". This illustration will be changed to delete DC connections and relocate GCU cannon plug connection.

(sheet 2 of 3) This illustration will be changed to delete DC connections and relocate AC connections.(See Figure C, attached.)

(sheet 3 of 3) A new illustration will be added showing TRU installation in the DC cable bay.

4-56a. TRANSFORMER RECTIFIER UNIT (TRU). (Page 4-220)

A new paragraph will be added describing removal and replacement of the TRU.

4-61. AC POWER CABLE.

Figure 4-42. AC and DC Power Cables (sheet 1 of 3) (Page 4-225) Add: "(83-360A Only)"

Figure 4-42a. AC Power Cables (83-360D Only)

Add a revised figure 4-42, (sheet 1 of 3) as follows:

Delete DC connections and relocated connections to the new AC generator on the 83-360D.
(See Figure C attached.)

Section XII. MAINTENANCE OF PNEUMATIC SYSTEM**4-74 GENERAL.** (Page 4-244)

Change line three from "a solenoid valve" to two solenoid valves"

Figure 4-54, Pneumatic System Diagram (page 4-247) will be changed to show the surge control valve

Add a new subparagraph g. as follows:

"g. Surge Control Valve (SCV). This solenoid valve (31) opens when the CURRENT LIMIT SELECTOR switch S11 is set to 45KW or 1000 A on the 83-360A and when set to AH-64D on the 83-360D. On the 83-360A the 28 vdc signal to open the valve is routed through the both the PNEUMATIC POWER switch S8 and the CURRENT LIMIT SELECTOR switch S11 so that the surge control valve will not open whenever pneumatic power is ON. On the 83-360D the 28 vdc signal is routed directly to the CURRENT LIMIT SELECTOR switch S11, which then operates the surge control valve, whether the pneumatic power is On or OFF. This valve is needed to off load the GTE compressor to eliminate stall. This is necessary when large shaft horsepower is required."

Figure 4-55, Pneumatic System (page 4-249) will be changed to show the surge control valve (Reference Figure 68 in TM 55-1730-229-24P for details.)

FO-2D LIGHTING SYSTEM SCHEMATIC/WIRING DIAGRAM, 83-360D

Changes in this new wiring diagram will include:

- Disconnecting wires L10B20 and P16B20 from the positive and wires P53B20N and P53C20N from the negative terminal of the DC Over Current light DS19. This disconnects both DS19 and

the DC Voltage light DS18 from the 28 vdc press-to-test signal from TB2. (See Figure D, attached.)

- Rewiring of the DC Over Current lamp DS19 to indicate an overheat condition in the TRU. A constant 28 VDC signal is obtained from the AC Power ON switch DS20 through wire X47E20. Ground is established by wire X5X16 from J20 on the TRU or through wires 53E20 and 53E20A and diode CR6X, in TB1 for the press-to-test indication. (See Figure E, attached.)

FO-5D DC POWER GENERATION AND CONTROL SYSTEM SCHEMATIC/WIRING DIAGRAM, 83-360D

Changes in this new wiring diagram will include:

- Connecting the TRU AC input ground wire X1X16 and the DC output ground wire P1A2/0NA to the DC ground stud. The 28 vdc output wire P2A2/0A is connected to the line side of the DC contactor K2. (See Figure F, attached.)
- Disconnecting wires P14A20 and P38B20 from the GCU to the DC Contactor (K2) and install a jumper wire P2E20A from B1 to X1. This allows the DC contactor to close by the DC Power switch without regard to the conditions of the DC power. (See Figure F, attached.)
- Disconnecting ground wire P53D20N from the DC Voltage light DS18 and DC Over Current light DS19. Re-establish the ground for the DC Power On light DS21 from DC Volt meter M11 through wire P53B20NA. (See Figure G, attached.)

FO-6D AC POWER GENERATION & CONTROL SYSTEM SCHEMATIC/WIRING DIAGRAM, 83-360D

Changes in this new wiring diagram will include:

- Connecting the TRU input J20 to the line/generator side of the AC contactor K1 with wires X2X12, X3X12, AND X4X12. (See Figure H, attached.)
- Installation of a jumper wire X48F20 to maintain the GCU in the AC mode regardless of the position of the CURRENT LIMIT SELECTOR switch S11. (See Figure I, attached.)
- This wiring diagram will also be changed to show the operation of the surge control valve in all AGPUs.

FO-7D DC PNEUMATIC CONTROL SYSTEM SCHEMATIC/WIRING DIAGRAM, 83-360D

This wiring diagram will be changed to add jumper wire H1D20A allowing the surge control valve to be controlled by the CURRENT LIMIT SELECTOR switch S11, independent of the PNEUMATIC POWER SWITCH S8 (See Figure J, attached.)

FO-x TRANSFORMER/RECTIFIER FUNCTIONAL SCHEMATIC, 83-360D

This wiring diagram needs to be added. (See Figure K, attached.)

FO-15 MAIN HARNESS WIRING LIST, 83-360D

Add "83-360A ONLY" to the REMARKS column on the following wires:

- WL83-14625, Page 7 of 12, line 24, WIRE NO. P14E20
- WL83-14625, Page 8 of 12, line 2, WIRE NO. P2E20
(This disconnects the GCU from the DC contactor)
- WL83-14625, Page 10 of 12, line 4, WIRE NO. X9D8N
- WL83-14625, Page 12 of 12, line 1., WIRE NO. X9U4N
(To insure proper phase rotation on new AC generator.)
- WL83-14625, Page 11 of 12. line 10, WIRE NO. P1A4/0N and line 11, WIRE NO P2A4/0
(These DC output wires from the AC/DC generator, which are not used on the 83-360D).

Add the following new lines at bottom of page wire is currently listed:

WIRE NO.	SIZE	COLOR	LENGTH	FROM	TO	REMARKS
P14E20	20	WHITE	18"	P12-H	DISCONNECTED	83-360D ONLY
P2E20	20	WHITE	18"	P12-M	DISCONNECTED	83-360D ONLY
X9D8N	8	WHITE	66"	J4(-) AC OUTLET	AC GENERATOR T5	83-360D ONLY
X9U4N	4	WHITE	32"	AC GENERATOR T4	FRAME DC GRD STD	83-360D ONLY

FO-16 CONTROL PANEL HARNESS WIRING LIST, 83-360D

Add "83-360A ONLY" to the REMARKS column on the following wires:

- WL83-14626, Page 3 of 8, line 8, WIRE NO. P16B20
- WL83-14626, Page 3 of 8, line 23, WIRE NO. L10B20
- WL83-14626, Page 7 of 8, line 13, WIRE NO. P53B20N
- WL83-14626, Page 7 of 8, line 14, WIRE NO. P53C20N
- WL83-14626, Page 7 of 8, line 15, WIRE NO. P53D20N

Add the following new lines at bottom of page wire is currently listed:

WIRE NO.	SIZE	COLOR	LENGTH	FROM	TO	REMARKS
P16B20	20	WHITE	36"	DISCONNECTED at DS19(+)	J5-20R	83-360D ONLY
L10B20	20	WHITE	36"	DISCONNECTED	J7-2R	83-360D ONLY
P53B20N	20	WHITE	13.5"	DS21(-)	DISCONNECTED	83-360D ONLY
P53C20N	20	WHITE	6"	DISCONNECTED	DS18 (-)	83-360D ONLY
P53D20N	20	WHITE	4"	DISCONNECTED	M11 (-)	83-360D ONLY

These changes remove the DC VOLTAGE FAULT (DS18) and the DC OVER CURRENT (DS19) lights from the GCU and the 28 VDC positive press-to-test signal

FO-xx TRANSFORMER RECTIFIER UNIT HARNESS WIRING LIST, 83-360D

WL83-15085. The following tables list the wires actually incorporated into the TRU harness and those loose wires provided as part of the MWO 1-1730-229-50-2 kit A.

TRU Harness (AC input):

WIRE NO.	SIZE	COLOR	LENGTH	FROM	TO	REMARKS
X1X16	16	WHITE	20"	P20(D)	DC GRD	1/2 LUG
X2X12	12	WHITE	48"	P20(F)	K1-A1	3/8 LUG
X3X12	12	WHITE	48"	P20(I)	K1-B1	3/8 LUG
X4X12	12	WHITE	48"	P20(B)	K1-C1	3/8 LUG
X5X16	16	WHITE	55"	P20(G)	DS19(-)	#4 LUG

Loose wires used to connect the DC output of the TRU:

WIRE NO.	SIZE	COLOR	LENGTH	FROM	TO	REMARKS
P1A2/0NA	00	BLACK	29"	(-) ON TRU	DC GROUND	3/8", 1/2" LUGS
P2A2/A	00	BLACK	33"	(+) ON TRU	K2-A1	3/8", 3/8" LUGS

Loose wires used to connects the DC OVER CURRENT light (DS19) to the ground press-to-test signal:

WIRE NO.	SIZE	COLOR	LENGTH	FROM	TO	REMARKS
P53B20NA	20	WHITE	9"	M11 (-)	DS21 (-)	1/4" LUG, #4 LUG
P53E20	20	WHITE	29"	DS19(-)	TB1-16	ANODE, #6 LUG
P53E20A	20	WHITE	7"	TB1-16	TB1-11	CATHODE, #6 LUG
X47E20	20	WHITE	14"	DS19(+)	DS20(+)	#4 LUG, #4 LUG

Jumper to bypass GCU signal:

WIRE NO.	SIZE	COLOR	LENGTH	FROM	TO	REMARKS
P2E20A	20	WHITE	5"	K2-B1	K2-X1	#8 LUG, #8 LUG

Jumper to keep the GCU in the AC mode at all times:

WIRE NO.	SIZE	COLOR	LENGTH	FROM	TO	REMARKS
X48F20	20	WHITE	2"	S11-A1	S11-AC	SOLDER
H5B20B	20	WHITE	2"	S11-C4	S11-C3	REMOVE IF INSTALLED

Jumper to allow surge control valve signal to bypass the pneumatic power switch:

WIRE NO.	SIZE	COLOR	LENGTH	FROM	TO	REMARKS
H1D20A	20	WHITE	11"	S8-11	S8-10	#8 LUG, #8 LUG

6. Changes to TM 55-1730-229-24P.

LIST OF MWO KIT PARTS - P/N 83-360D

NOMENCLATURE	NATIONAL STOCK NUMBER	PART NUMBER	CAGE	QTY RQD
Generator	6115-01-471-0888	AGH828-3	07639	1
O-ring	5331-00-292-0570	MS28775-210	96906	1
Generator Control Unit (Modified)	2920-01-471-0887	CSV3370-3	07639	1
Transformer Rectifier Unit	6120-01-245-9884	9B40-15-D	83298	1
Screw, cap, Hex Head, ¼20 UNC, 1" long	5305-00-071-1318	MS51957-83	96906	4
Washer, Flat, ¼	5310-00-582-5677	MS15795-810	96906	8
Washer, Lock, ¼	5310-00-582-5965	MS35338-44	96906	4
Nut, Hexagon ¼20 UNC 2B	5310-00-903-5966	MS51971-1	96906	4
Grommet, Plastic, Edge	5325-00-074-3301	MS21266-2	69609	1
Harness, Wiring, TRU input	None	83-15085	81996	1
Connector, Plug, Electric	5935-01-005-2328	MS2456W20-18S	96906	1
Cable Adapter, Right Angle	5935-01-262-1013	M85049/63-20W	81349	1
Terminal, 16 AWG, 1/2 Lug	5940-00-660-3633	MS25036-155	96906	1
Terminal, 10/12 AWG, 3/8 lug	5940-00-113-9826	MS25036-114	96906	3
Terminal, 18 AWG, #4 lug	5940-00-113-9828	MS25036-148	96906	1
Wire, DC output, ground, 29" long		P1A2/0NA		1
Terminal, Lug, 00 AWG, 3/8	5940-00-115-5004	MS20659-120	96906	1
Terminal, Lug, 00 AWG, 1/2	5940-00-113-8201	MS25036-137	96906	1
Insulation Sleeving, Electrical	5970-00-914-3118	M23053/5-109-0	81349	AR
Wire, DC output, positive 33" long		P2E2/0A		1
Terminal, 00 AWG, 3/8 Lug	5940-00-113-9835	MS25036-136	96906	2
Insulation Sleeving, Electrical	5970-00-914-3118	M23053/5-109-0	81349	AR
Wire, DS20 to DS19, 14" long		X47E20		1
Terminal, 18 AWG, #4 Lug	5940-00-113-9828	MS25036-148	96906	2
Wire, M11 to DS21, 9" long		P53B20NA		1
Terminal, 18 AWG, #4 Lug	5940-00-113-9828	MS25036-148	96906	1
Terminal, 18 AWG, ¼ Lug	5940-00-113-8184	MS25036-150	96906	1
Wire, DS19 to TB1-16, 29" long		P53E20		1
Terminal, 18 AWG, #4 Lug	5940-00-113-9828	MS25036-148	96906	1
Terminal, 18 AWG, #6 Lug	5940-00-813-0698	MS25036-101	96906	2
Diode, CR-6X (TB1-16)	5961-00-111-4795	1N5061	80131	1
Wire, TB1-16 to TB1-11, 7" long		P53E20A		1
Terminal, 18 AWG, #6 Lug	5940-00-813-0698	MS25036-101	96906	2
Wire, K2 jumper, 5" long		P2E20A		1
Terminal, 18 AWG, #8 Lug	5940-00-557-1629	MS25036-149	96906	2
Wire, S8 jumper, 11" long		H1D20A		1
Terminal, 18 AWG, #4 Lug	5940-00-113-9828	MS25036-148	96906	2
Wire, S11 jumper, 2" long		X48F20		1

NOMENCLATURE	NATIONAL STOCK NUMBER	PART NUMBER	CAGE	QTY RQD
Flap, TRU cover		83-15086	81996	1
Strip, Backing, Flap		83-15087	81996	1
Screw, cap, Hex Head, 10-24, UNC-2A, 1/2" long	5305-00-984-6210	MS35206-263	96906	5
Nut, Hexagon, 10-24-UNC-2B	5310-00-934-9758	MS35649-202	96906	5
Exhaust Ejector Assembly (Modified)	2990-01-325-1868	83-14541B	81996	1
Inlet Tube (Modified)		83-14542A	81996	1
Muffler, Bleed Air Exhaust		ASP-8	04049	1
Screw, Self-tapping, 5/16"	5305-01-090-3012	MS51851-106	96906	1
Washer, Lock, 5/16 inch	5310-01-338-7338	MS35338-45	96906	1
Marking Plate, Current Limit Selector Switch		83-15088	81996	1
Name Plate, P/N 83-360D		83-15089	81996	1
Screws, Self-tapping, 1/8 inch	5305-00-140-8001	MS51861-12	96906	6

a. Changes to TM 55-1730-229-24P are addressed in narrative form, not in the exact wording of a manual change. Only those chapters, sections, paragraph, tables, or figures that are affected by the upgrade are covered. For ease of reference to the affected area in the TM, the remaining portion of this paragraph is numbered the same as the existing AGPU TM.

COVER

Change to read as follows:

AC - 400 Hz, 3 PH, 115/200 V, 0.8 PF

DC - 28 V

PNEUMATIC - 60 LBS/MIN AT 40 PSIG

HYDRAULIC - 15 GPM AT 3300 PSIG

<u>PART NUMBER</u>	<u>AC OUTPUT</u>	<u>DC OUTPUT</u>	<u>NSN</u>
83-360A	30 KW (37.5 KVA)	700 AMPS	1730-01-144-1897
83-360D	38.4 KW (48 KVA)	250 AMPS	1730-01-146-9371

Figure 1. Frame and Housing, Panels and Doors, Right-Hand Side

The following items will be added:

FIG NO.	ITEM NO.	SMR CODE ARMY	NATIONAL STOCK NUMBER	DESCRIPTION REF NUMBER & CAGE CODE	USEABLE ON CODE	U/M	QTY INC IN UNITS
1	35	XDFZZ		PLATE, MWO IDENTIFICATION 83-15089 81996	83-360D		1
1	36		5305-00-140-8001	SCREWS, SELF-TAPPING, 1/8 INCH MS51861-12 96906	83-360D		4

Figure 4. Roof Panel Subassembly

The following items will be added:

FIG NO.	ITEM NO.	SMR CODE ARMY	NATIONAL STOCK NUMBER	DESCRIPTION REF NUMBER & CAGE CODE	USEABLE ON CODE	U/M	QTY INC IN UNITS
4	21			FLAP, TRU COVER 83-15086 81996	83-360D	EA	1
4	22			STRIP, MOUNTING FLAP 83-15087 81996	83-360D	EA	1
4	23		5305-00-984-6210	SCREW, CAP, HEX HEAD, 10-24, UNC-2A, 1/2" LG MS35206-263 96906	83-360D	EA	5
4	24		5310-00-934-9758	NUT, HEXAGON, 10-24-UNC-2B MS35649-202 96906	83-360D	EA	5

Figure 14. GTE/Exhaust Ejector Installation

Item No 3. EXHAUST EJECTOR ASSEMBLY, P/N 83-14541 will be coded as replaced by 83-14541A and the illustration will be revised to show rectangular duct in place of ejector tubes.

Item No. 7. TUBE, INLET, EJECTOR ASSEMBLY, P/N 83-14542 will be coded as replaced by 83-14542A and illustration will be revised to show 30-degree open elbow in place of closed perforated inlet tube.

Figure 17. Generator and Engine Installation

Item No 10. GENERATOR, P/N AGH815-1. A USABLE ON CODE "83-360A" will be added. The following item will be added:

FIG NO.	ITEM NO.	SMR CODE ARMY	NATIONAL STOCK NUMBER	DESCRIPTION REF NUMBER & CAGE CODE	USEABLE ON CODE	U/M	QTY INC IN UNITS
17	10		6115-01-471-0888	GENERATOR, AC AGH828-3 (Not illustrated.) 07639	83-360D	EA	1

Figure 19. GTE/Exhaust Ejector Assembly

Code P/N 83-14541 to be replaced with P/N 83-14541A and revise illustration to show duct in place of tubes.

Figure 22a. Transformer Rectifier Unit (TRU) Installation, 83-360D. This figure will be added. See Figure L attached.)

The following items will be listed:

FIG NO.	ITEM NO.	SMR CODE ARMY	NATIONAL STOCK NUMBER	DESCRIPTION		U/M	QTY INC IN UNITS
				REF NUMBER & CAGE CODE	USEABLE ON CODE		
22a	1		6120-01-245-9884	TRANSFORMER RECTIFIER UNIT 9B40-15-D 83298	83-360D	EA	1
22a	2		65305-00-071-1318	SCREW, CAP, HEX HEAD, 1/4-20 UNC, 1" LONG MS51957-83 96906	83-360D	EA	4
22a	3		5310-00-582-5677	WASHER, FLAT, 1/4 MS15795-810 96906	83-360D	EA	8
22a	4		5310-00-582-5965	WASHER, LOCK, 1/4 MS35338-44 96906	83-360D	EA	4
22a	5		5310-00-903-5966	NUT, HEXAGON 1/4-20 UNC 2B MS51971-1 96906	83-360D	EA	4
22a	6		5325-00-960-2410	GROMMET, PLASTIC, EDGE MS21266-1N 96906	83-360D	EA	1

Figure 22b. Transformer Rectifier Unit (TRU) Harness Assembly, 83-360D This figure will be added. See Figure M attached.)

The following items will be listed:

FIG NO.	ITEM NO.	SMR CODE ARMY	NATIONAL STOCK NUMBER	DESCRIPTION		U/M	QTY INC IN UNITS
				REF NUMBER & CAGE CODE	USEABLE ON CODE		
22b			65305-00-071-1318	HARNESS, WIRING, TRU INPUT 83-15085 81996	83-360D	EA	1
22b	1		5935-01-005-2328	CONNECTOR, PLUG, ELECTRIC MS2456W20-18S 96906	83-360D	EA	1
22a	2		5935-01-262-1013	CABLE ADAPTER, RIGHT ANGLE M85049/63-20W 81349	83-360D	EA	1
22a	3		5940-00-660-3633	TERMINAL, 16 AWG, 1/2 LUG MS25036-155 96906	83-360D	EA	1
22a	4		5940-00-113-9826	TERMINAL, 10/12 AWG, 3/8 LUG MS25036-114 96906	83-360D	EA	3
22a	5		5940-00-113-9828	TERMINAL, 18 AWG, #4 LUG MS25036-148 96906	83-360D	EA	1

Figure 23. Electrical System Installation - Power Control

Item No 9. CONTROL UNIT, GENERATOR (GCU), P/N CSV3370-2. A USABLE ON CODE "83-360A" will be added. The following item will be added:

FIG NO.	ITEM NO.	SMR CODE ARMY	NATIONAL STOCK NUMBER	DESCRIPTION REF NUMBER & CAGE CODE	USEABLE ON CODE	U/M	QTY INC IN UNITS
23	9		2920-01-471-0887	CONTROL UNIT, GENERATOR CSV3370-3 07639	83-360D	EA	1

Figure 32. Electrical Bay Sub-Floor Assembly

Item No 7. DIODE, P/N 1N5061. "CRX6" will be added to list and the QTY increased to 24.

Figure 45. Generator Covers - Figure 51. Generator Subassembly

Figures and listings will be revised as necessary to reflect both the AGH815-1 and AGH828-3 generators.

Figure 52. Generator Control Unit - Figure 57. Base Panel Assembly

Figures and listings will be revised as necessary to reflect both the CSV3370-1 and -3 GCUs.

Figure 68. Pneumatic System Installation Illustration will be revised to show a muffler at the exit to the surge control valve (51) and a screw plugging a hole in the connecting unit (50). The following items will be added:

FIG NO.	ITEM NO.	SMR CODE ARMY	NATIONAL STOCK NUMBER	DESCRIPTION REF NUMBER & CAGE CODE	USEABLE ON CODE	U/M	QTY INC IN UNITS
68	57			MUFFLER, BLEED AIR EXHAUST ASP-8 04049		EA	1
68	58		5305-01-090-3012	SCREW, SELF-TAPPING, 5/16" MS51851-106 96906		EA	1
68	59		5310-01-338-7338	WASHER, LOCK, 5/16 INCH MS35338-45 96906		EA	1

Figure 118. Control Panel Assembly - Harness and Switches The new marking plate for current limit selector switch (11) will be added to the figure and to the listing as follows:

FIG NO.	ITEM NO.	SMR CODE ARMY	NATIONAL STOCK NUMBER	DESCRIPTION REF NUMBER & CAGE CODE	USEABLE ON CODE	U/M	QTY INC IN UNITS
118	20			MARKING PLATE, CURRENT LIMIT SELECTOR 83-15088 81996	83-360D	EA	1
118	21		5305-00-140-8001	SCREWS, SELF-TAPPING, 1/8 INCH MS51861-12 96906	83-360D	EA	2

7. Points of Contact.

a. Technical point of contact for this TB is Mr. William Gursky, AMSAM-MMC-VS-AM, DSN 897-1449 or commercial (256)313-1449.

b. Engineering point of contact for this TB is Mr. Jerome Smith, AMSAM-AR-E-I-F-C, DSN 897-4926 or commercial (256)313-4926.

8. List of Illustrations.

Figure A. Exhaust Ejector Modification

Figure B. Current Limit Selector Switch Marking (83-350D)

Figure C. Electrical Connection, AGH828-3 Generator Terminal Block

Figure D. FO-2D Lighting System Schematic/Wiring Diagram
(Disconnect press-to-test from TB2.)

Figure E. FO-2D Lighting System Schematic/Wiring Diagram
(Connect press-to-test to TB1.)

Figure F. FO-5D DC Power Generation And Control System Schematic/Wiring Diagram
(TRU Output Connections and GCU Bypass Jumper.)

Figure G. FO-5D DC Power Generation And Control System Schematic/Wiring Diagram
(Reconnect Ground to DS21.)

Figure H. FO-6D AC Power Generation & Control System Schematic/Wiring Diagram
(Sheet1 of 2) (TRU Input Connections.)

Figure I. FO-6D AC Power Generation & Control System Schematic/Wiring Diagram
(Sheet2 of 2) (Current Limit Selector Switch S11 Jumper.)

Figure J. FO-7D DC Pneumatic Control System Schematic/Wiring Diagram
(Pneumatic Power Switch S8 Jumper.)

Figure K. TRU Schematic/Wiring Diagram

Figure L. Transformer Rectifier Unit (TRU) Installation, 83-360D

Figure M. Transformer Rectifier Unit (TRU) Harness Assembly, 83-360D.

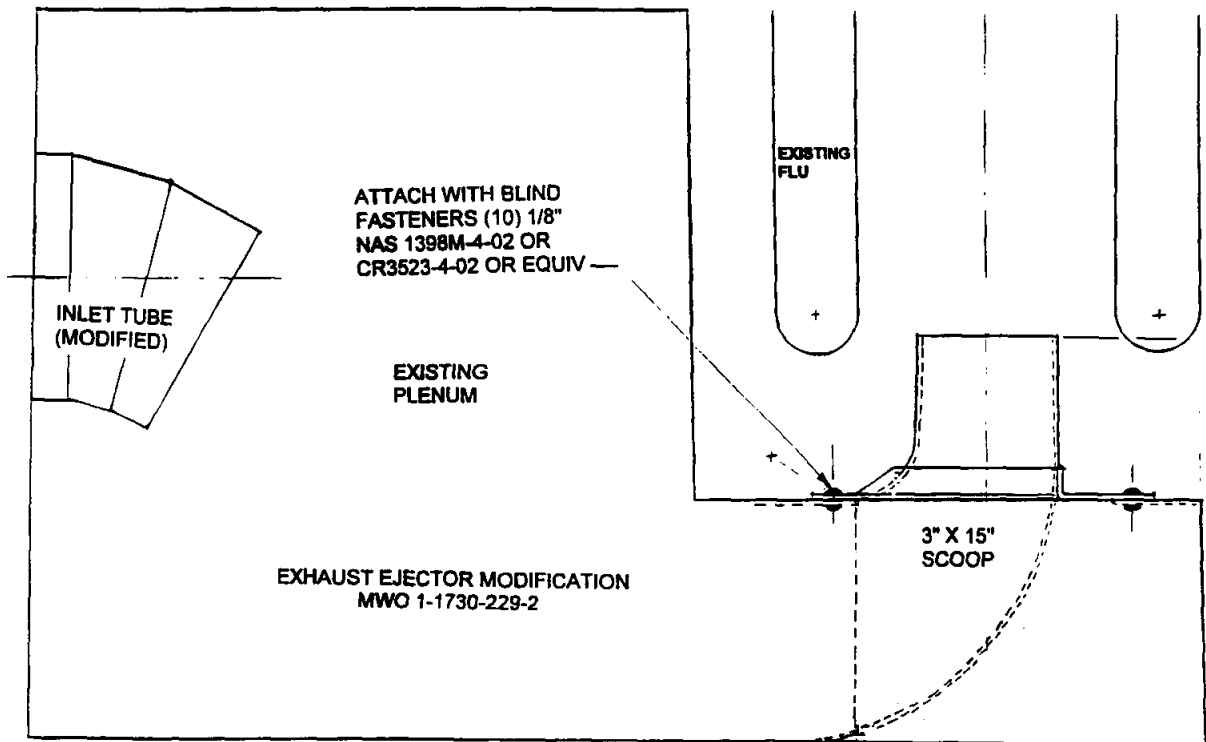


Figure A. Exhaust Ejector Modification

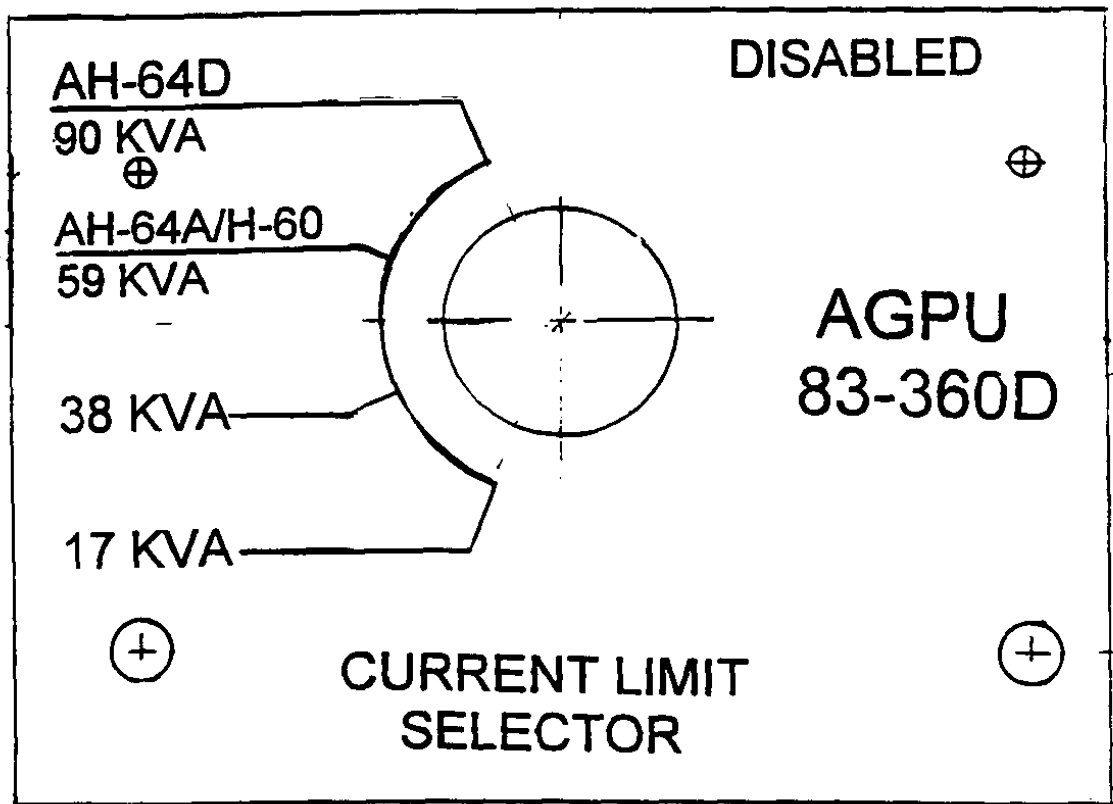


Figure B. Current Limit Selector Switch (83-350D)

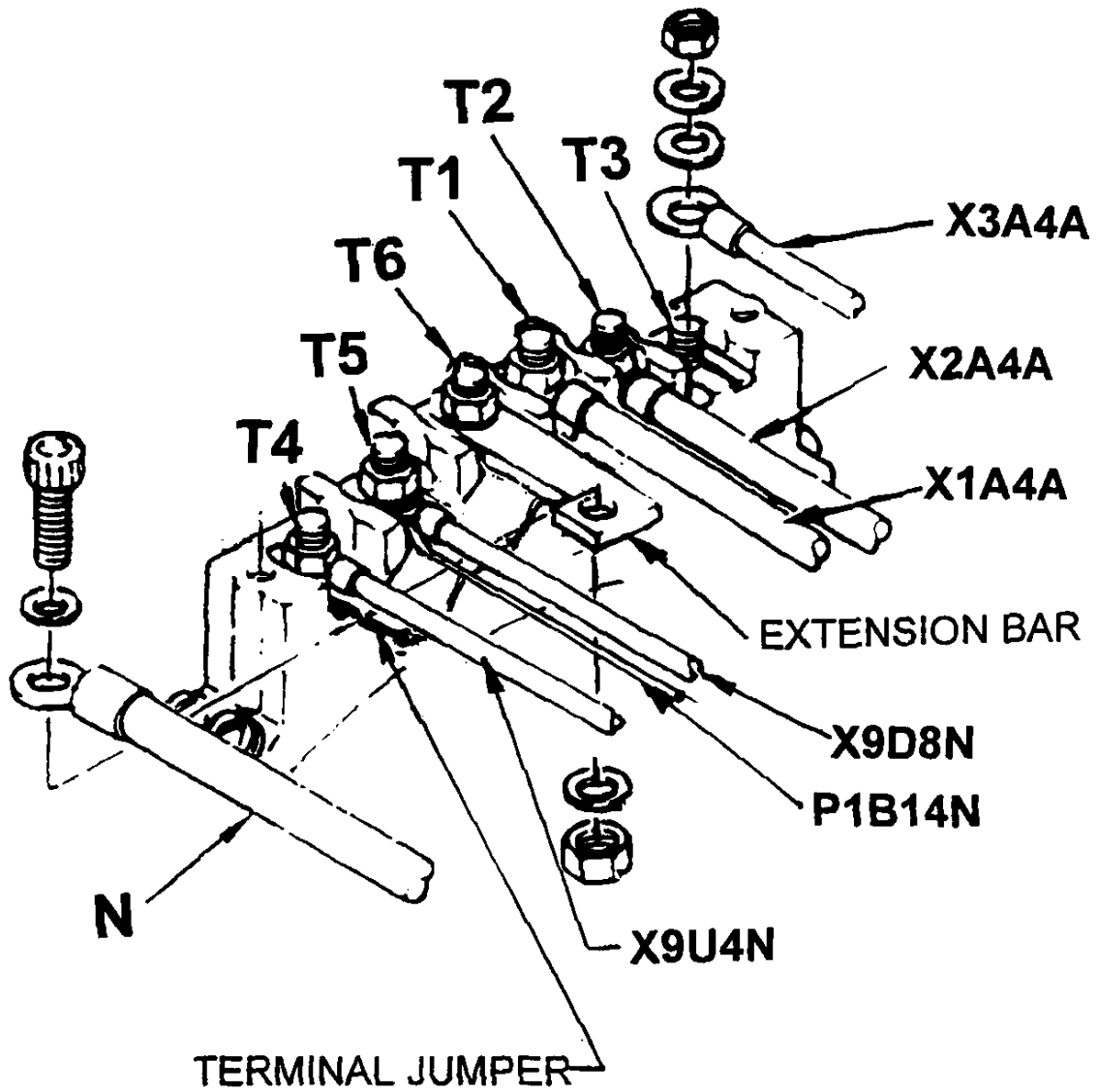


Figure C. Electrical Connection, AGH828-3 Generator Terminal Block

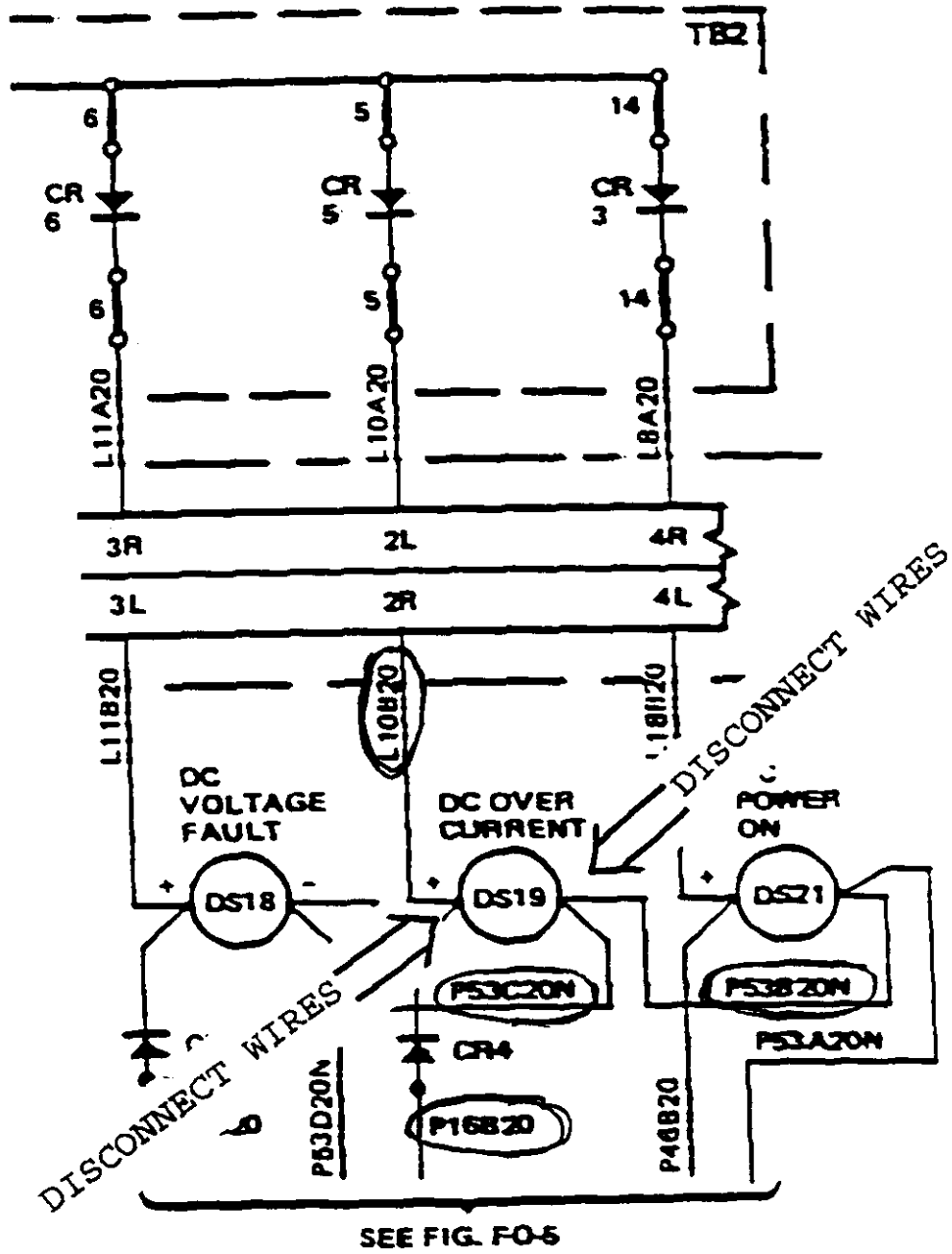


Figure D. FO-2D Lighting System Schematic/Wiring Diagram
(Disconnect press-to-test from TB2.)

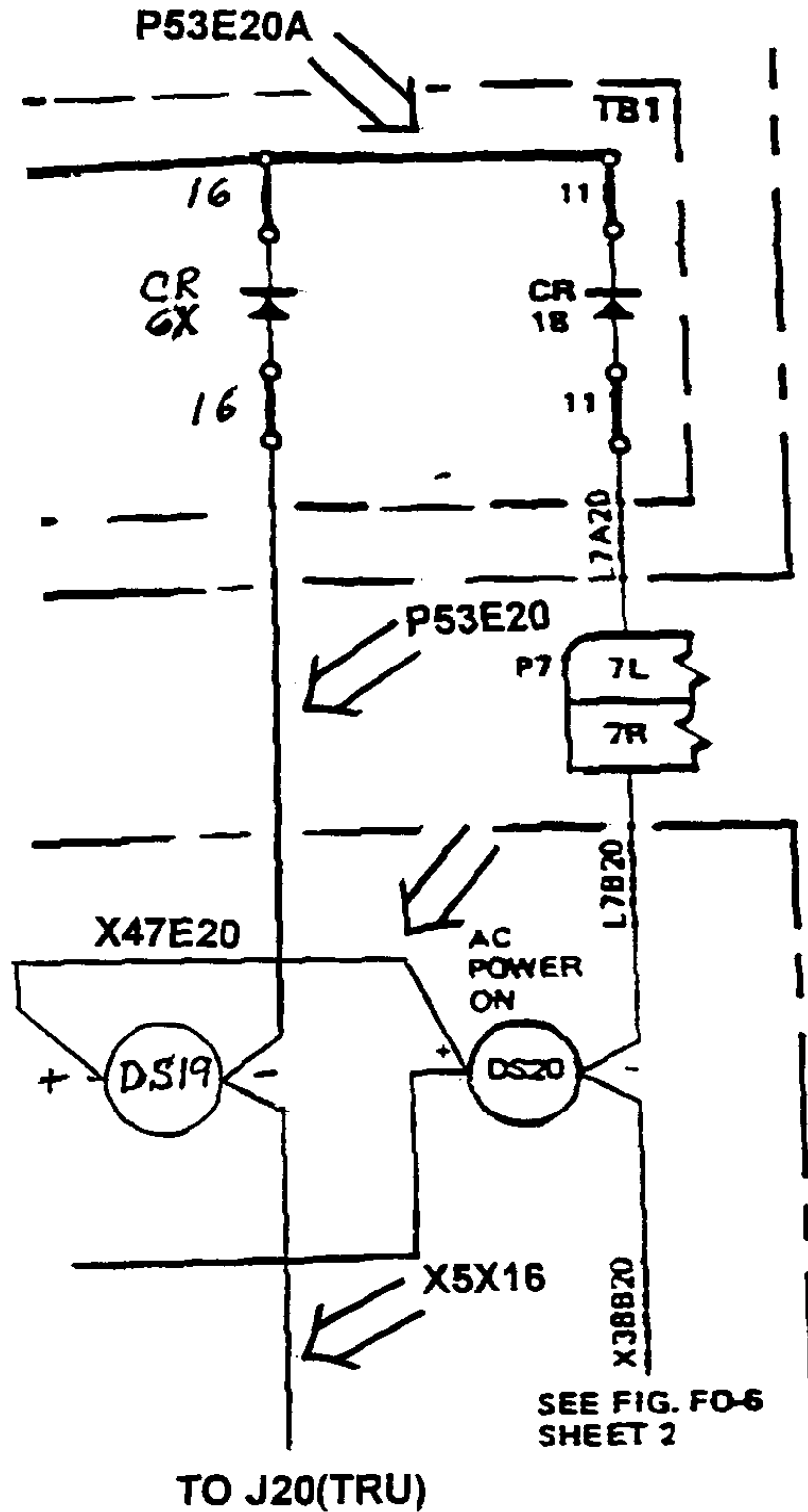


Figure E. FO-2D Lighting System Schematic/Wiring Diagram
 (Connect press-to-test to TB1.)

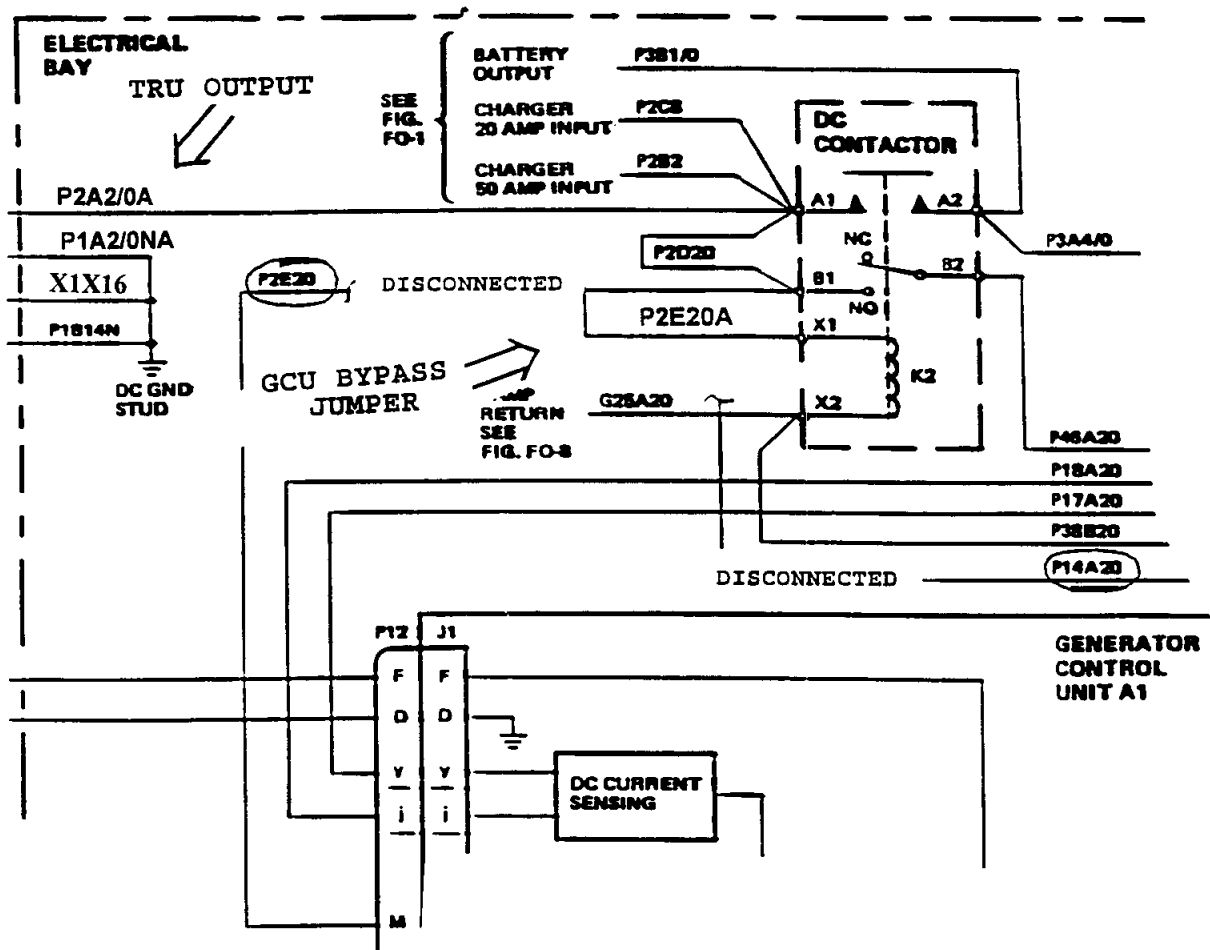


Figure F. FO-5D DC Power Generation And Control System Schematic/Wiring Diagram (TRU Output Connections and GCU Bypass Jumper.)

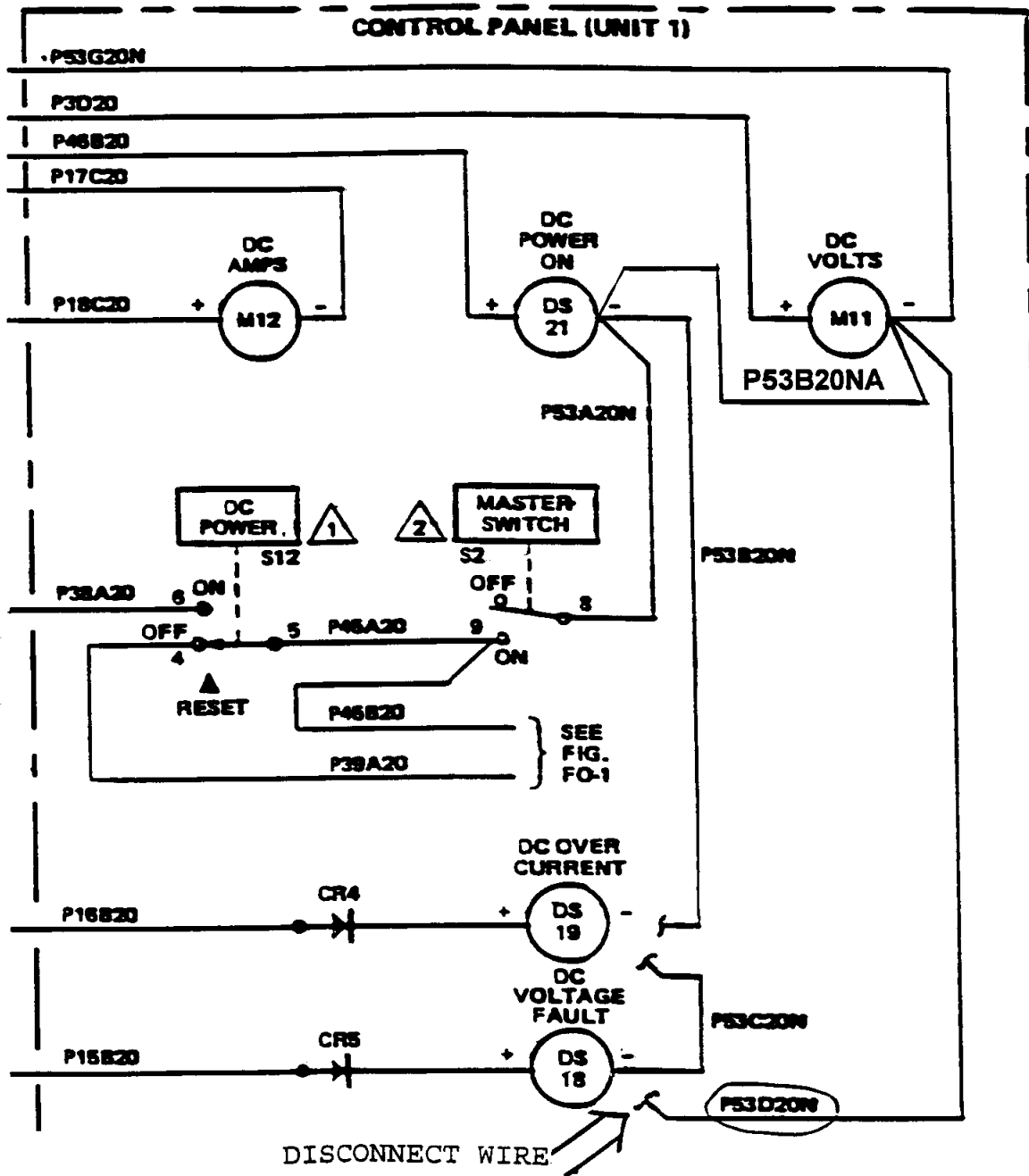


Figure G. FO-5D DC Power Generation And Control System Schematic/Wiring Diagram (Reconnect Ground to DS21.)

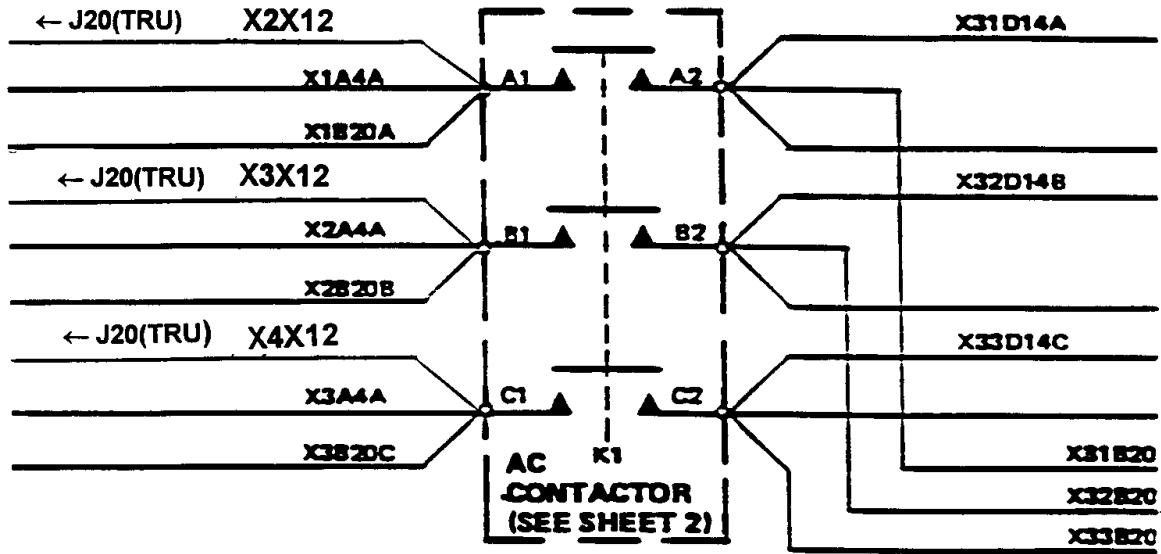


Figure H. FO-6D AC Power Generation & Control System Schematic/Wiring Diagram
 (Sheet 1 of 2) (TRU Input Connections.)

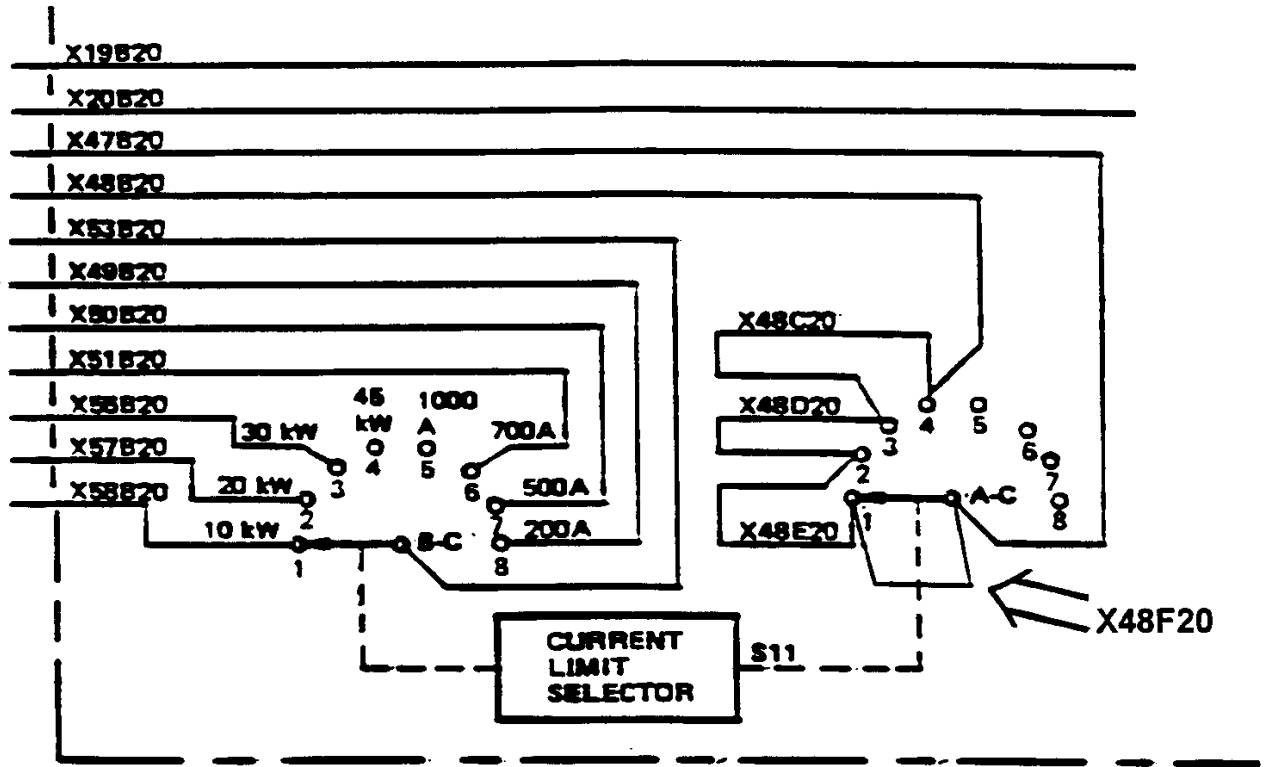


Figure I. FO-6D AC Power Generation & Control System Schematic/Wiring Diagram
 (Sheet 2 of 2) (Current Limit Selector Switch S11 Jumper.)

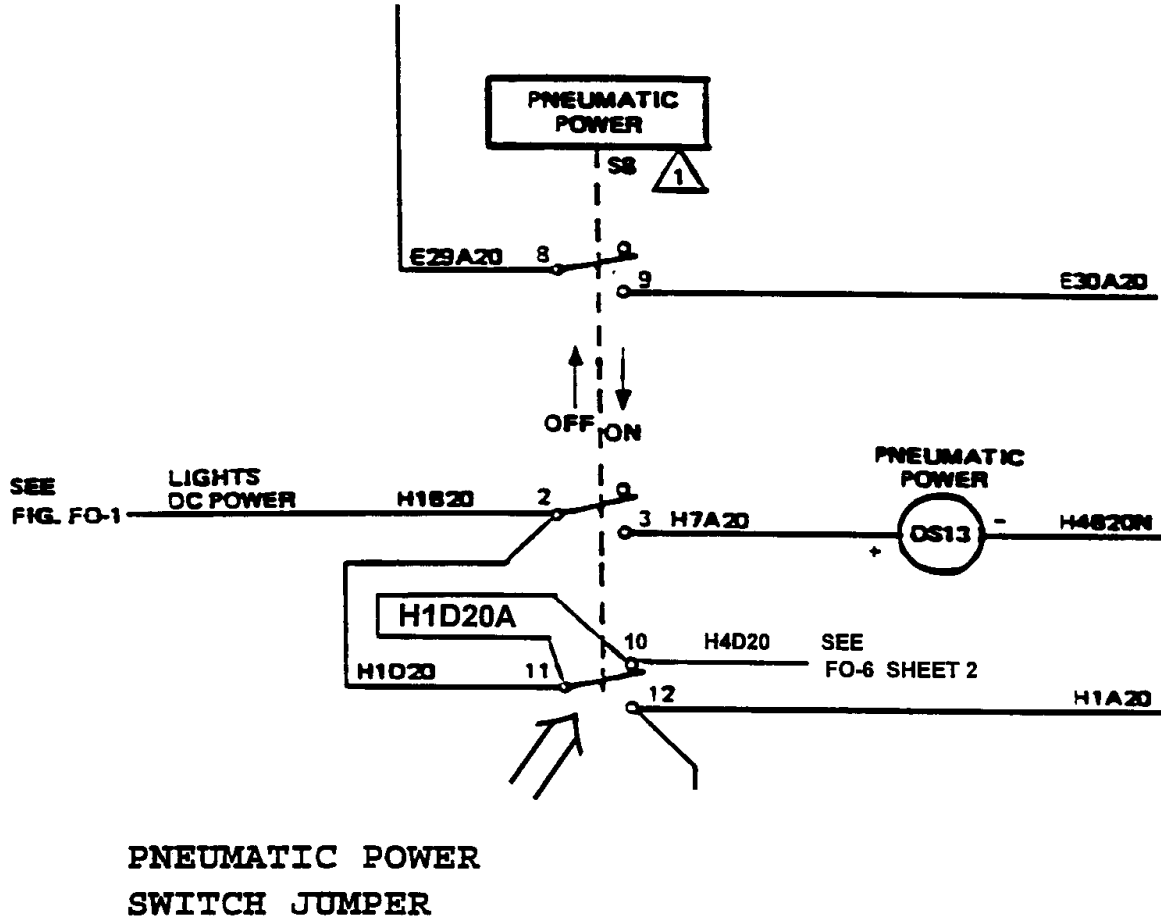


Figure J. FO-7D DC Pneumatic Control System Schematic/Wiring Diagram
(Pneumatic Power Switch S8 Jumper.)

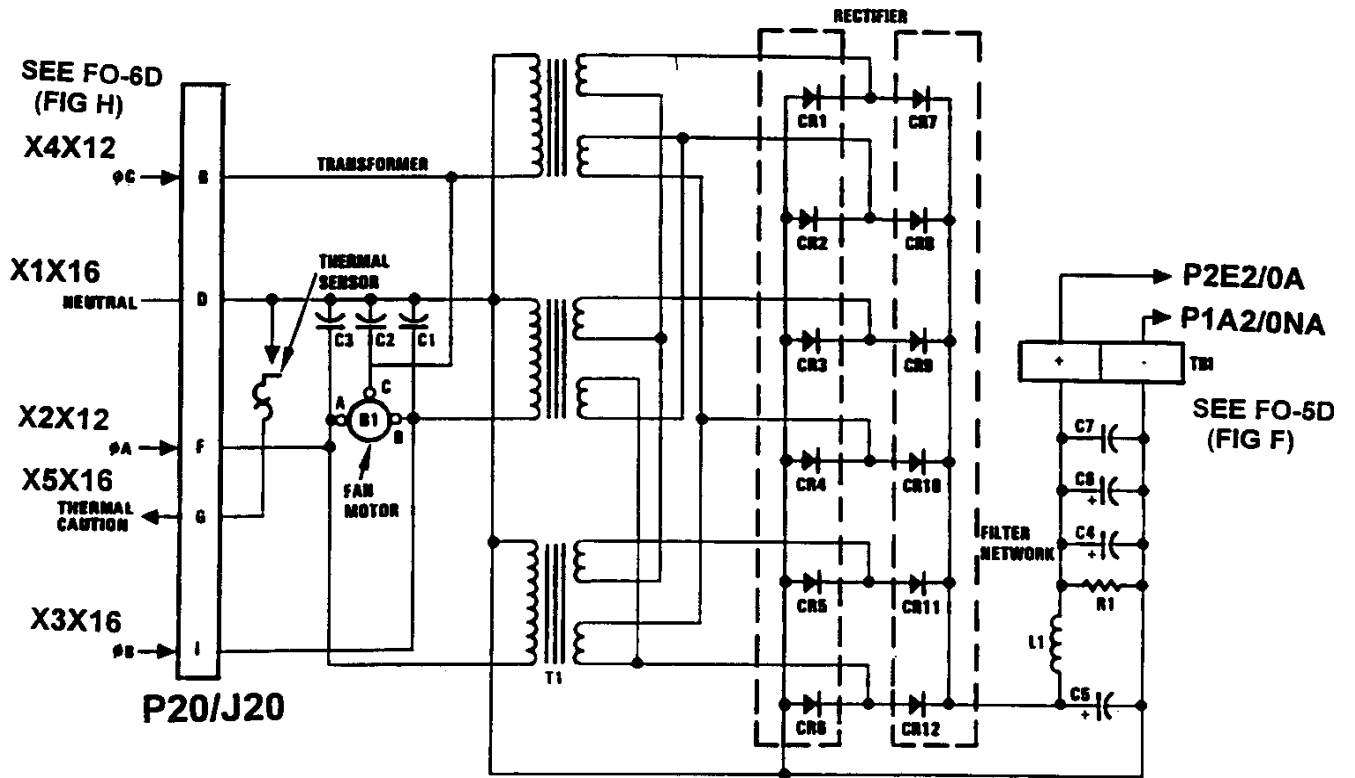


Figure K. TRU Schematic/Wiring Diagram

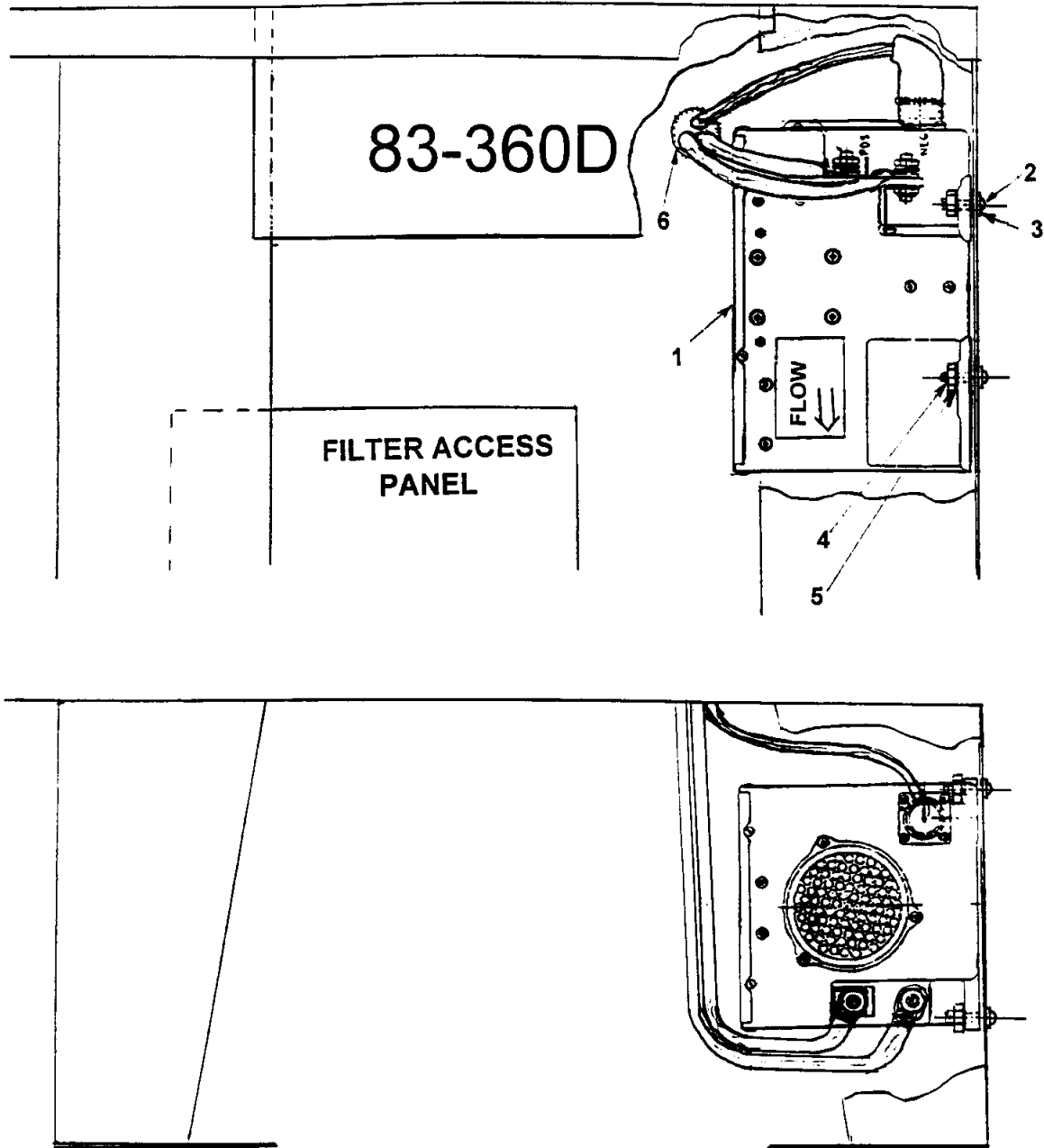


Figure L. Transformer Rectifier Unit (TRU) Installation, 83-360D

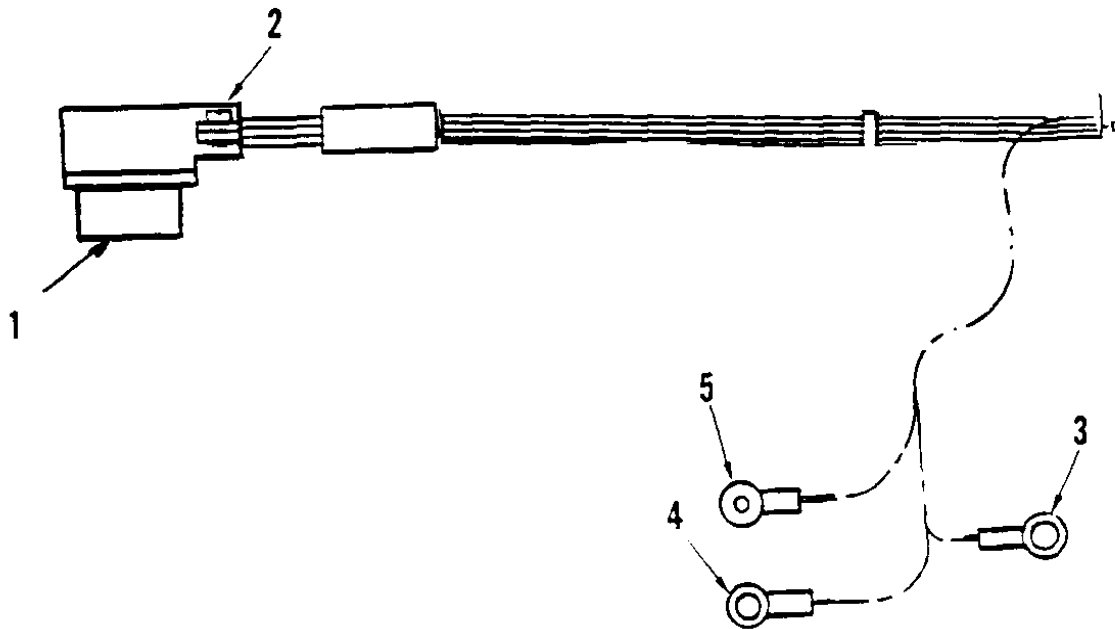


Figure M. Transformer Rectifier Unit (TRU) Harness Assembly, 83-360D

By Order of the Secretary of the Army:

TB 1-1730-229-20-2

By Order of the Secretary of the Army:



JOEL B. HUDSON
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Secretary of the Army*
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*General, United States Army
Chief of Staff*

Distribution:

To be distributed in accordance with Initial Distribution Number (IDN) 313889, requirements for TB 1-1730-229-20-2.