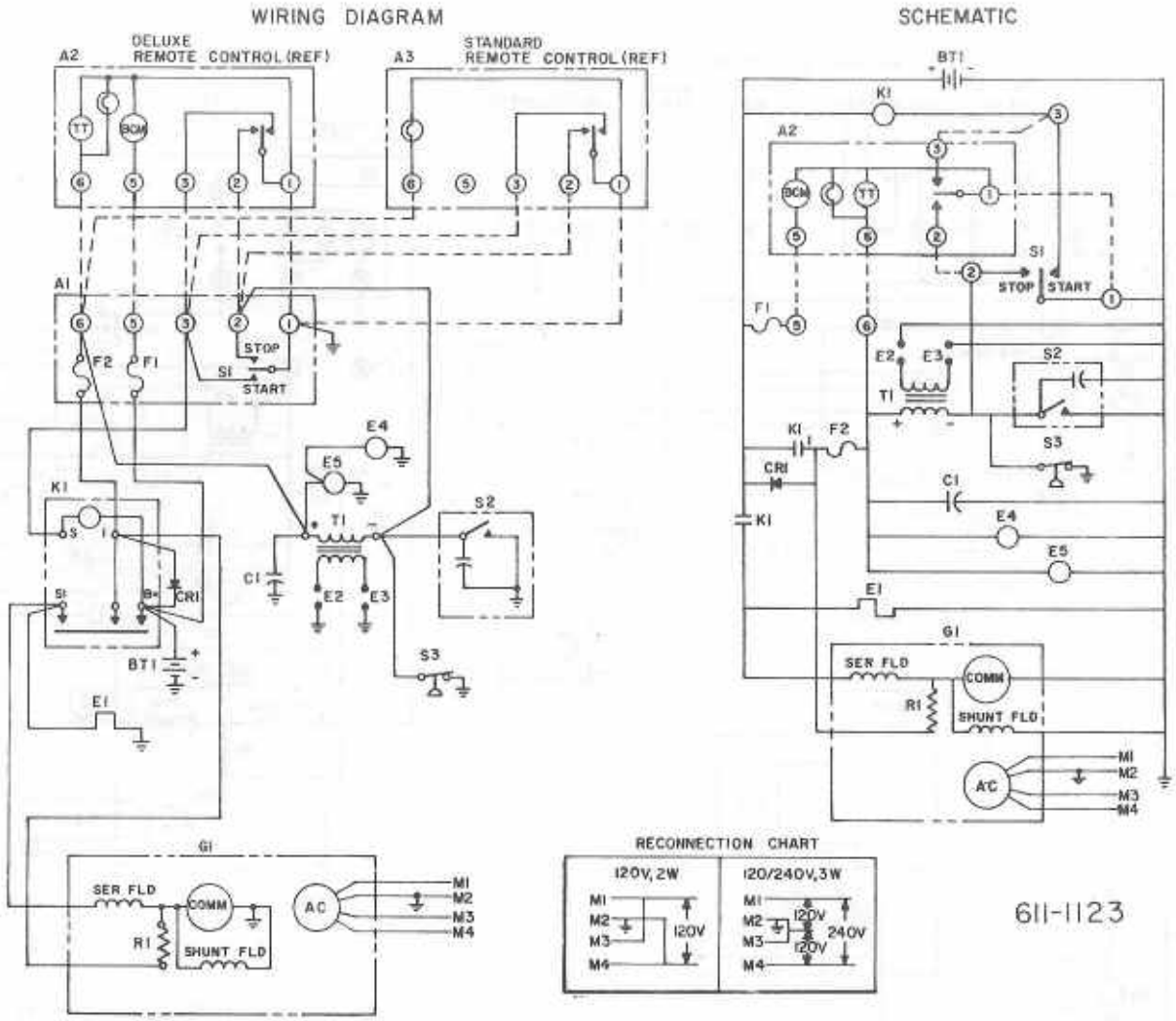
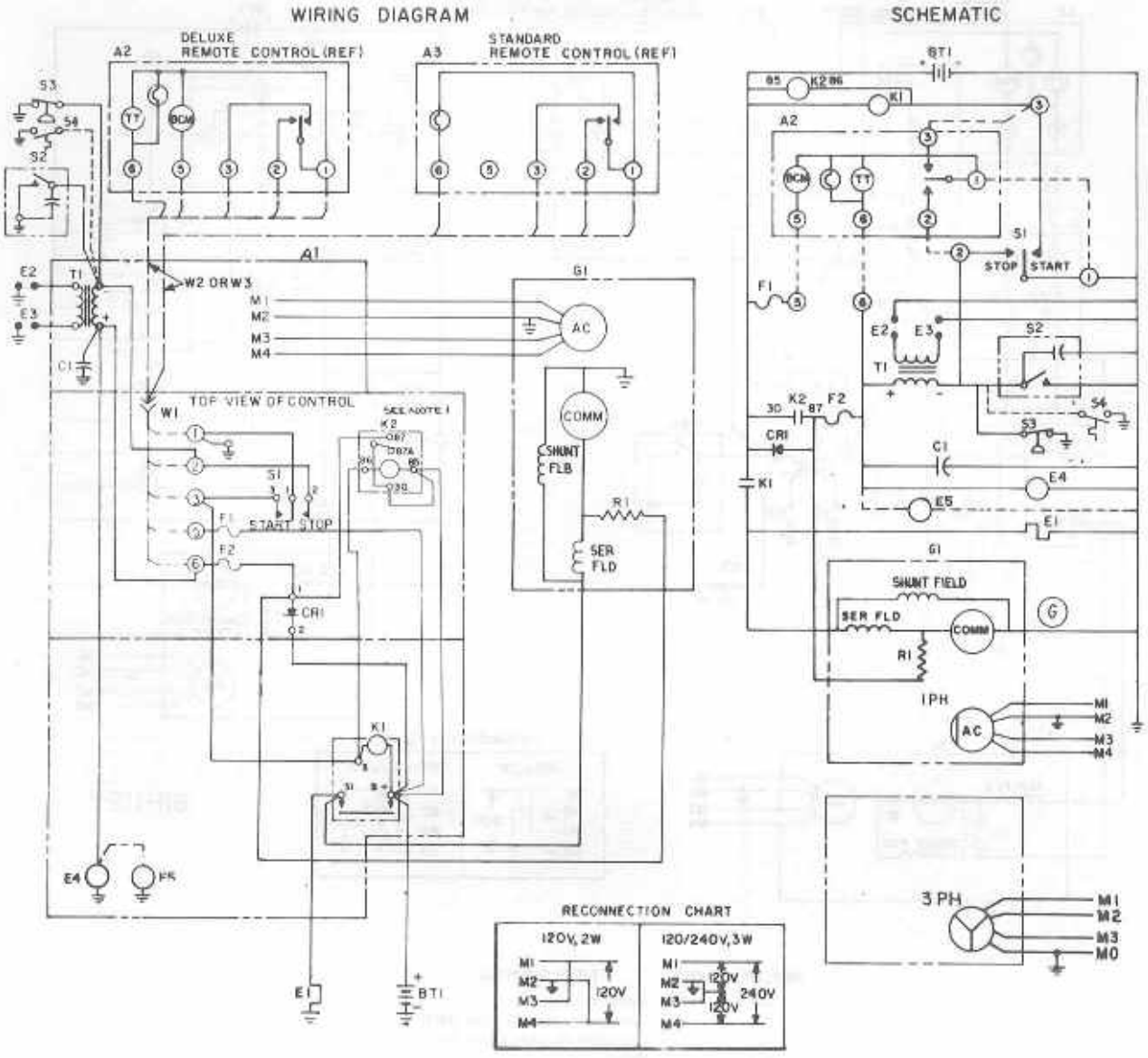


REF. DES.	QTY.	DESCRIPTION
A1	1	Control Assy
A2	1	Deluxe Remote Control (Ref)
A3	1	Standard Remote Cont (Ref)
BT1	1	Battery 12 V
C1	1	Capacitor
CR1	1	Diode Assy (Ref)
E1	1	Choke - Onan
E2,3	2	Spark Plug
E4	1	Solenoid-Fuel (Ref)
E5	1	Fuel - Pump (Ref)
F1,2	2	Fuse (9 Amp, 32 V) (Ref)
G1	1	Generator
K1	1	Solenoid - Start
R1	1	Resistor Fixed (Ref)
S1	1	Switch-Start-Stop
S2	1	Breaker & Cap Assy
S3	1	Switch - Low Oil Press (Ref)
T1	1	Coil - Ignition
Option	1	Wiring Harness (Conn-Remote) (Ref)
Option W1	1	Wiring Harness (Cable-Remote Control) (10 Feet Long) (Ref)
Option W2	1	Wiring Harness (Cable-Remote) Control (30 Feet Long) (Ref)

FIGURE 36. TYPICAL WIRING DIAGRAM - BF SPEC A



611-1127

REF. DES.	QTY.	DESCRIPTION
A1	1	Control Assy - 01 -05
	1	Control Assy - 02
	1	Control Assy - 05
	1	Control Assy - 04
A2	1	Deluxe Remote Control
A3	1	Standard Remote Control
BT1	1	Battery 12 V
C1		Capacitor
CR1	1	Rectifier
E1	1	Choke - Onan
E2,E3	2	Spark Plug
E4	1	Fuel Pump
E5	1	Solenoid - Fuel (When Used)
F1,2	2	Fuse (5 Amp, 32 V)
G1	1	Generator
K1	1	Solenoid - Start
K2	1	Relay - Ignition
R1	1	Resistor - Fixed (BF)
	1	Resistor - Fixed (NH & CCK)
S1	1	Switch - Start-Stop
S2	1	Breaker & Cap Assy
S3	1	Switch - Low Oil Press
S4	1	Switch - High Air Temp
T1	1	Coil - Ignition
Option	W1	1 Wiring Harness (Conn - Remote)
Option	W2	1 Wiring Harness (Cable - Remote) Control) (10 Feet Long)
Option	W3	1 Wiring Harness (Cable - Remote) Control) (30 Feet Long)

FIGURE 37. TYPICAL WIRING DIAGRAM - BF SPEC B AND NH SPEC J HMC

OPERATION DESCRIPTION FOR BFA, BGA, AND NH (SPEC K-P) HMC

This operation description applies to BFA, BGA, and NH (Spec K-P) series generator sets. The wiring diagrams are included as examples to help trace or isolate problems. However, always refer to the wiring diagram that corresponds to the model and spec number of the generator set when troubleshooting.

Starting

When switch S1 is closed to START (Figure 38), battery ground is connected through switch S1 to the start solenoid K1 and the crank ignition relay K2. Start solenoid relay K1 closes its normally open K1 contacts to connect battery positive to the cranking windings of the generator and to choke E1. The generator acts as a motor and cranks the engine. Ignition relay K2 closes its normally open K2 contacts to connect battery positive to the ignition coil T1, and fuel pump E4. This provides the ignition spark and pumps fuel to the carburetor.

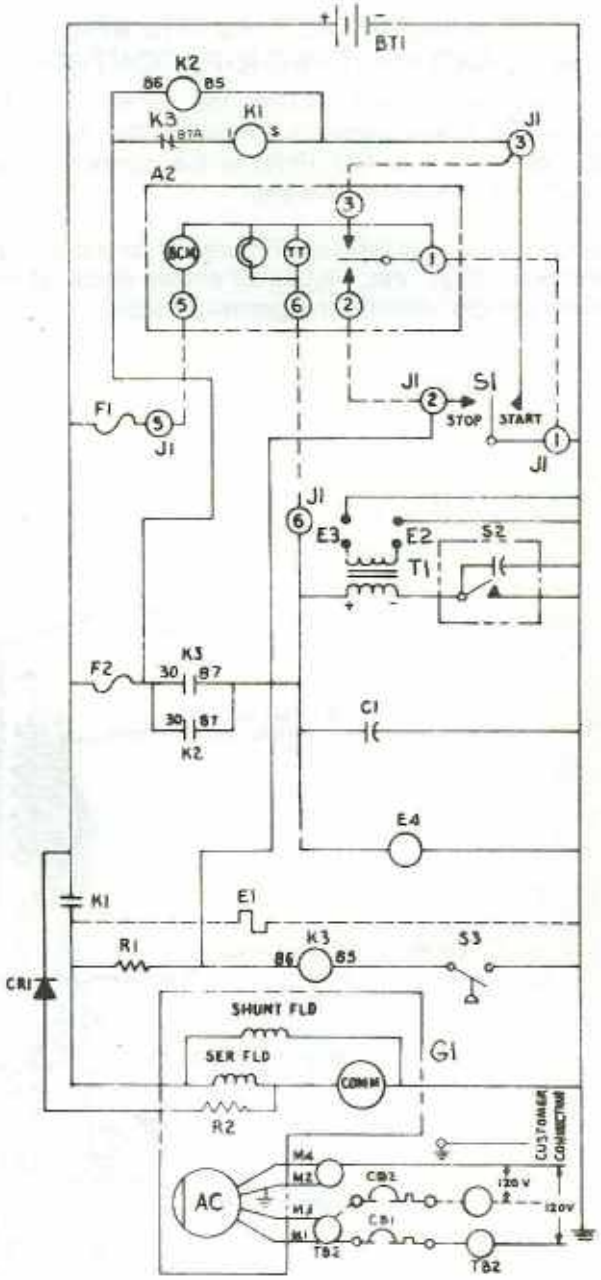
Start Disconnect-Run

When the engine starts, oil pressure closes switch S3 which connects battery ground to the K3 run ignition relay. Generator voltage energizes the K3 relay which has two sets of contacts, one set normally open and the other set normaly closed. The normally open set of K3 contacts close to connect battery positive to the ignition coil and fuel pump. The normally closed K3 contacts open to disconnect battery positive from the K1 start solenoid.

De-energizing the K1 start solenoid opens the K1 contacts to disconnect battery positive from the cranking windings of the generator. The operator releases the start-stop switch which de-energizes the K2 crank ignition relay and opens the K2 contacts. The engine continues to run because battery positive is supplied to the fuel pump and ignition coil through the closed K3 contacts. Generator voltage is supplied to the electric choke heater E1 to open the choke. Generator voltage is also supplied through diode CR1 to charge the battery.

Stopping

Moving start-stop switch S1 to STOP grounds the K3 ignition relay causing it to de-energize and open the K3 contacts. Opening the K3 contacts disconnects battery positive from the ignition coil and fuel pump. When the engine stops, blocking diode CR1 prevents battery discharge through the generator.



A2	Deluxe Remote Control
BT1	Battery
E1	Electric Choke
E2,E3	Spark Plug
E4	Fuel Pump
G1	Generator
K1	Start Solenoid Relay
K2	Crank Ignition Relay
K3	Run Ignition Relay
R1,R2	Resistor
S1	Start-Stop Switch
S2	Breaker Points
S3	Low Oil Pressure Switch
T1	Ignition Coil
CB1,CB2	Circuit Breakers

FIGURE 38. TYPICAL SCHEMATIC AND PARTS IDENTIFICATION

TROUBLESHOOTING THE BFA, BGA, AND NH (SPEC K-P) CONTROL

To correct a problem, answer the question in the appropriate troubleshooting chart on the following pages either YES or NO. Refer to the number in that column and proceed to that step.

Use the wiring diagram (see Figure 40) for location of terminals, relays, etc. Figure 39 shows some of the control components for the generator sets.

The troubleshooting chart is divided into seven sections. Determine the problem and then refer to the chart (A, B, C, D, E, F, or G) for the troubleshooting procedures.

A. Engine does not crank.
B. Engine cranks but does not start.
C. Engine starts but stops when start switch is released.
D. Generator set is running — then stops.
E. Low battery — no charge rate.
F. Running Time Meter Inoperative.
G. Battery Condition Meter Inoperative.

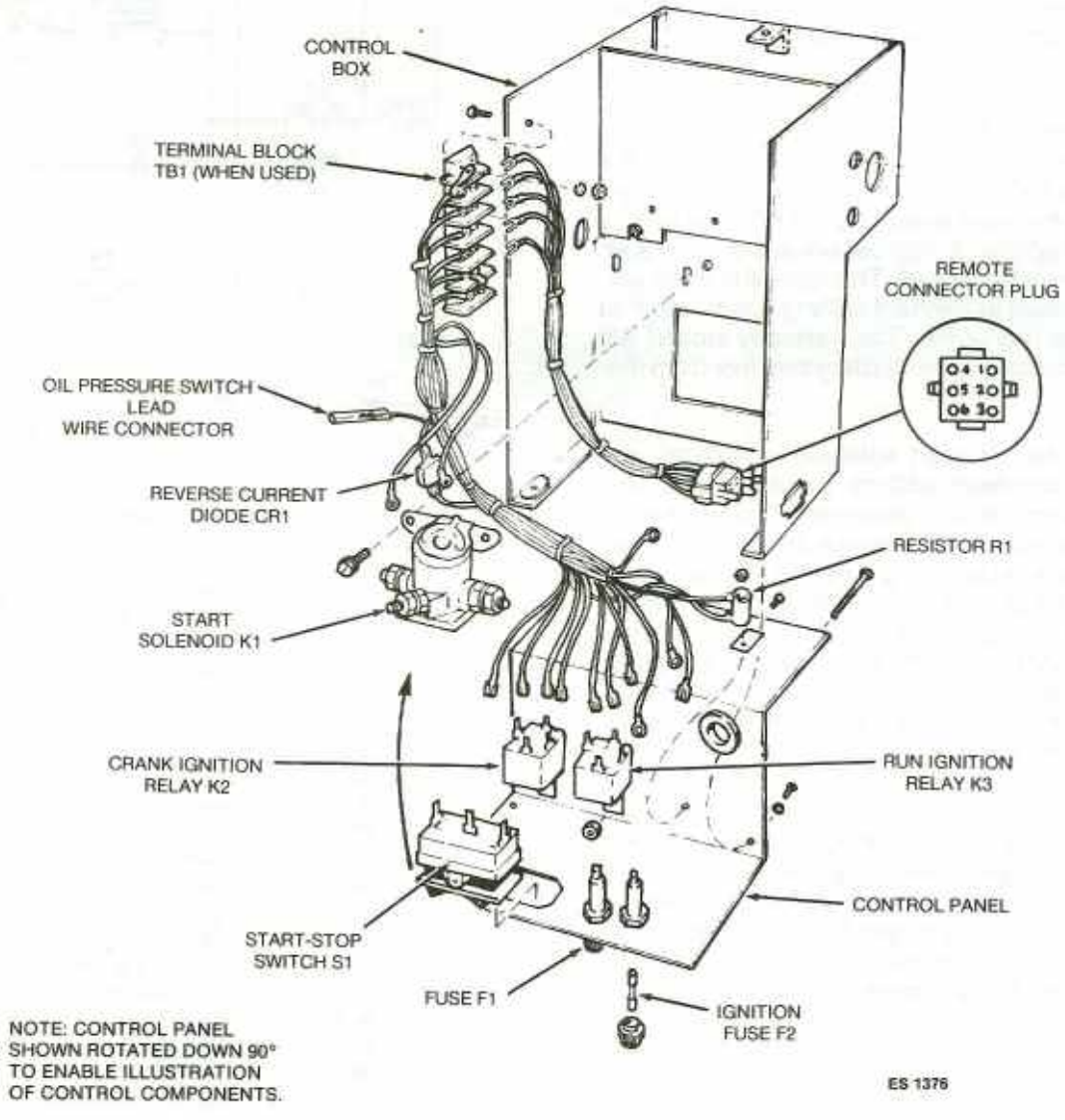


FIGURE 39. BGA, BFA, AND NH (SPEC K-P) CONTROL HMC

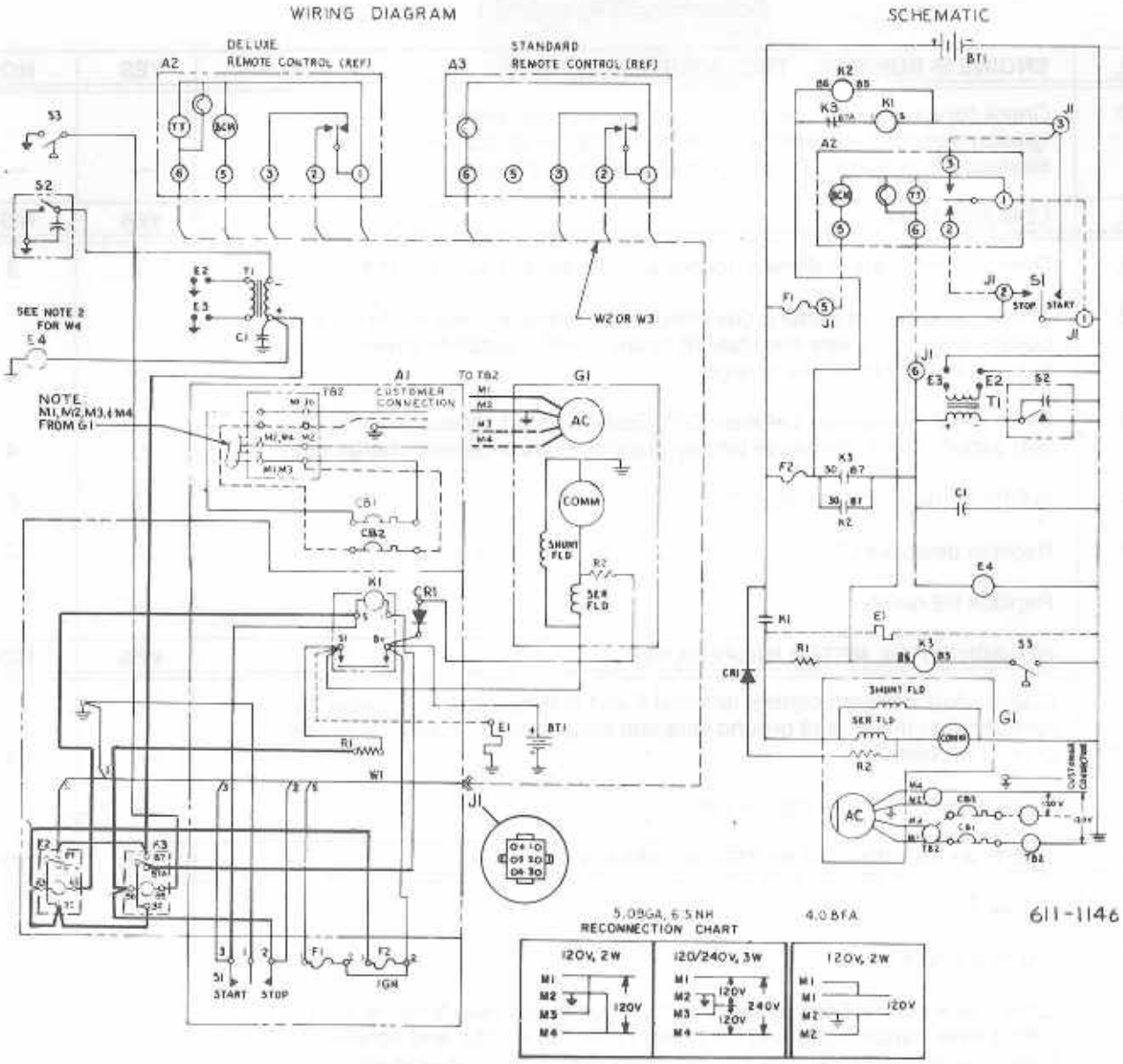
A.	ENGINE DOES NOT CRANK	YES	NO
1.	Does engine crank at set but not at remote start panel?	2	4
2.	Check remote start control wires for continuity between the generator set and the remote start panel. Are control wires sized large enough to avoid excessive voltage drop?	4	3
3.	Replace control wires with correct wire gauge.	—	—
4.	Check condition of battery and terminal connections. Is battery fully charged and are all terminal connections clean and tight?	6	5
5.	Recharge battery and clean and tighten all terminal connections.	—	—
6.	Is battery voltage present between remote connector plug terminals 3 and 5 (between terminals TB1-3 and TB1-5 where applicable) when switch S1 is pushed to START? When the remote start switch is pushed to START? (Make certain fuse F1 is not open.)	8	7
7.	Replace start-stop switch S1 or remote start switch as required.	—	—
8.	Is battery voltage present between ground and K3 relay terminal 87A?	12	9
9.	Is fuse F2 open?	11	10
10.	Replace run ignition relay K3. (Contacts 87A-30 not closed.)	—	—
11.	Replace fuse F2.	—	—
12.	Is battery voltage present between K1 start solenoid terminal S1 and ground when start-stop switch S1 is pushed to START?	14	13
13.	Replace K1 start solenoid.	—	—
14.	Check generator brushes, commutator, DC armature windings, and DC field windings. See Generator Service Procedures section.	—	—

B.	ENGINE CRANKS BUT DOES NOT START	YES	NO
1.	Is battery voltage present between remote connector plug terminal 6 and ground when start-stop switch is pushed to START?	3	2
2.	Check all terminal connections on K2 crank ignition relay. If OK, replace K2 relay.	—	—
3.	Does the fuel pump operate during cranking?	6	4
4.	Check the fuel pump lead wire connections and repair or replace as necessary. Will pump operate?	—	5
5.	Refer to the Fuel System section for testing and service procedures.	—	—
6.	Is the choke closed? A small pointer on the choke shaft indicates if the choke is open or closed.	7	5
7.	Refer to the Ignition System section for testing and service procedures.	—	—

C.	ENGINE STARTS BUT STOPS WHEN START SWITCH IS RELEASED	YES	NO
1.	Does engine have correct oil level?	3	2
2.	Add oil as required.	—	—
3.	If oil level is OK, disconnect the low oil pressure switch lead wire. An insulated connector is spliced into this wire and is located within the control. After disconnecting the oil switch lead wire, ground the end that is connected to the control. Push the start-stop switch to START. Does the engine start and run? CAUTION ***To prevent engine damage from low oil pressure, make sure the engine builds up oil pressure to 30 psi (207 kPa) after starting. See Lubrication System section.***	4	5
4.	Check low oil pressure switch operation. Switch should close when oil pressure builds up and open when oil pressure drops. Replace if necessary.	—	—
5.	Check low oil pressure lead wire for an open circuit and repair or replace as necessary. Reconnect oil pressure lead wire and push start-stop switch to START. Does engine start and run?	—	6
6.	Check wire connections between R1 resistor and K3 run ignition relay and between R1 resistor and K1 start solenoid. Check resistance of R1 resistor (see Parts Catalog for resistance value). Is R1 OK?	8	7
7.	Replace R1 resistor.	—	—
8.	Connect a jumper wire between remote connector plug terminals 5 and 6 (or TB1-5 and TB1-6 where applicable) and push start-stop switch S1 to START. (Make certain fuse F1 is not open.) Does engine start and run?	9	11
9.	Connect a voltmeter between remote connector plug terminal 6 and ground (or between TB1-6 and ground where applicable) and push start-stop switch S1 to START. Does voltmeter read 12 volts?	10	11
10.	Replace K3 run relay.	—	—
11.	Check generator brushes, commutator, DC armature, and field windings. Refer to Generator Service Procedures section.	—	—

D.	ENGINE IS RUNNING - THEN STOPS	YES	NO
1.	Check the set for low fuel level or low oil level and refill as necessary. Will set start and run without stopping?	—	2
2.	Check for low oil pressure or low oil pressure switch malfunction. See sections C3, C4, and C5 for troubleshooting procedures. Does this locate problem?	—	3
3.	Connect a voltmeter between remote connector plug terminal 6 and ground (or TB1-6 and ground if applicable) and push start-stop switch S1 to START. Is battery voltage present?	6	4
4.	Is fuse F2 open?	5	6
5.	Replace fuse F2.	—	—

D.	ENGINE IS RUNNING - THEN STOPS (Continued)	YES	NO
6.	Check for an open R1 resistor, an open connection between K3 run ignition relay and R1 resistor, or defective K3 run ignition relay. See sections C6 through C11 for troubleshooting procedures.	—	—
E.	**LOW BATTERY**	**YES**	**NO**
1.	Does battery charger show a normal charge rate of 1 to 1-1/2 amps?	2	3
2.	Check condition of battery. Generator set charger will not recharge a battery that is in a very low state of charge. Use a separate battery charger to bring battery up to full charge.	—	—
3.	Check wire connection between CR1 diode, K1 start solenoid, R2 resistor, and battery. Does this cause battery charger to show normal charge rate?	—	4
4.	Is CR1 diode shorted or open?	5	6
5.	Replace defective CR1 diode.	—	—
6.	Replace R2 resistor.	—	—
F.	**RUNNING TIME METER INOPERATIVE**	**YES**	**NO**
1.	Check wires between control terminal 6 and battery positive terminal for running time meter, and ground wire and connection to meter. Does this correct problem?	—	2
2.	Replace defective running time meter.	—	—
G.	**BATTERY CONDITION METER INOPERATIVE**	**YES**	**NO**
1.	Is fuse F1 open?	2	3
2.	Replace fuse F1.	—	—
3.	Check wire connections between remote connector plug terminal 5 (or TB1-5 where applicable) and the battery condition meter and between the battery condition meter and ground. Does this correct the problem?	—	4
4.	Use voltmeter to measure voltage between battery charge meter positive terminal and ground. Does voltmeter read battery voltage minus 10 volts?	6	5
5.	Replace defective zener diode.	—	—
6.	Replace defective battery condition meter.	—	—



A1	Control Assy (-01) 30 Amp Control Assy (-02) (1) 20 & (1) 30 Amp Control Assy (-03) (2) 30 Amp Control Assy (-04) 30 Amp Control Assy (-05) (2) 30 Amp	R1 R2 J1	Resistor - 150 ohm 5W Resistor Socket Plug - Remote
A2	Deluxe Remote Control	S1	Switch - Start Stop
A3	Standard Remote Control	S2	Switch - Breaker & Cap Assy
BT1	Battery - 12 V	S3	Switch - Low Oil Pressure
C1	Capacitor	T1	Coil - Ignition
CR1	Rectifier (Batt. Charging)	TB2	Terminal Board Silkscreens
E1	Choke - Onan (Not Used w/LPG)		
E2,3	Spark - Plug	CB1,CB2	Circuit Breaker 30 Amp
E4	Fuel Pump or Shutoff/Filter - LPG	CB2	Circuit Breaker 30 Amp (-02)
F1, 2	Fuse Holder Fuse - 5 Amp 32 V	W1 W2	Wiring Harness Conn Remote Wiring Harness - Cable Remote Control 110 Feet Long
G1	Generator		
K1	Start Solenoid	W3	Wiring Harenss - Cable Remote Control - 130 Feet Long
K2	Relay - Crank Ignition		
K3	Relay - Run Ignition	W4	Lead Assy (Shutoff/Fltr Only)

FIGURE 40. TYPICAL WIRING DIAGRAM - BFA, BGA, AND NH (SPEC K-P)