INSTALLATION INSTRUCTIONS

Original Issue Date: **5/00**
Model: **230–2000 kW with Digital and Microprocessor Controllers**
Market: **Industrial**
Subject: **Remote Connection Kits 365647-KP1 to 365647-KP4**

Introduction

Use the 2 m (5 ft.), 5 m (15 ft.), 8 m (25 ft.), or 12 m (40 ft.) remote connection kit to mount the Digital or Microprocessor controller in a location remote from the generator set. The connection box mounts to the junction box in place of the controller and connects to the generator set. A wiring harness connects the connection box to the remote mounted controller.

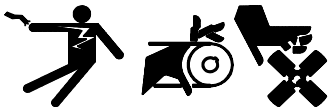
Select a harness length adequate for the intended remote installation. Avoid selecting a longer than necessary harness and do not cut and splice the harness in an attempt to make it longer *or* shorter. Any splicing of the wiring harness ultimately leads to bad connections and generator set controller problems.

Read the entire installation procedure and compare the kit parts with the parts list at the end of this publication before beginning installation. Perform the steps in the order shown. **It is recommended that the installer obtain the appropriate generator set wiring diagram for further wiring information.**

Safety Precautions

Observe the following safety precautions while installing the kit.

⚠ WARNING



Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

⚠ WARNING

Hazardous voltage. Moving rotor.
Can cause severe injury or death.

Operate the generator set only when all guards and electrical enclosures are in place.

Grounding electrical equipment. Hazardous voltage can cause severe injury or death. Electrocution is possible whenever electricity is present. Open the main circuit breakers of all power sources before servicing the equipment. Configure the installation to electrically ground the generator set, transfer switch, and related equipment and electrical circuits to comply with applicable codes and standards. Never contact electrical leads or appliances when standing in water or on wet ground because these conditions increase the risk of electrocution.

Short circuits. Hazardous voltage/current can cause severe injury or death. Short circuits can cause bodily injury and/or equipment damage. Do not contact electrical connections with tools or jewelry while making adjustments or repairs. Remove wristwatch, rings, and jewelry before servicing the equipment.

Installation Procedure

1. Remove the Generator Set from Service

1.1 Place the generator set master switch in the OFF position.

1.2 Disconnect the AC power to the battery charger, if equipped.

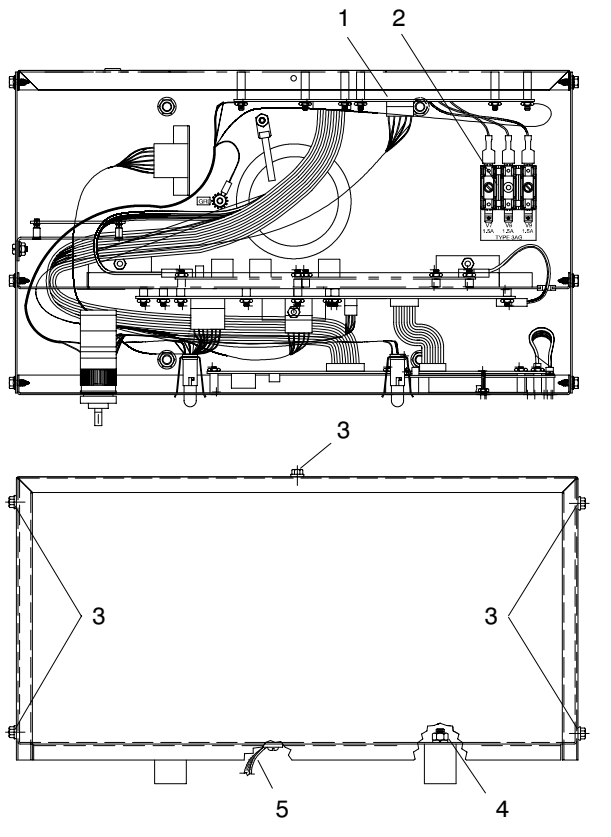
1.3 Disconnect the generator set engine starting battery(ies), negative (–) lead first.

2. Install the Remote Connection Kit

2.1 Disconnect the following external leads from the controller and see Figure 1 (digital controller) or Figure 2 (microprocessor controller).

2.1.1 Plug P1 from the controller board.

2.1.2 Leads V0, V7, V8, and V9 from the AC fuse terminal block.



1. Controller board
2. AC fuse terminal block
3. Controller cover screws
4. Controller mounting nuts
5. Ground strap

Figure 1 Digital Controller

2.1.3 Leads V0, C0, C1, C2, and C3 from the CT/meter terminal block.

2.1.4 Lead 5 (water temperature sender input) from the circuit board (digital controller) or water temperature gauge (microprocessor controller).

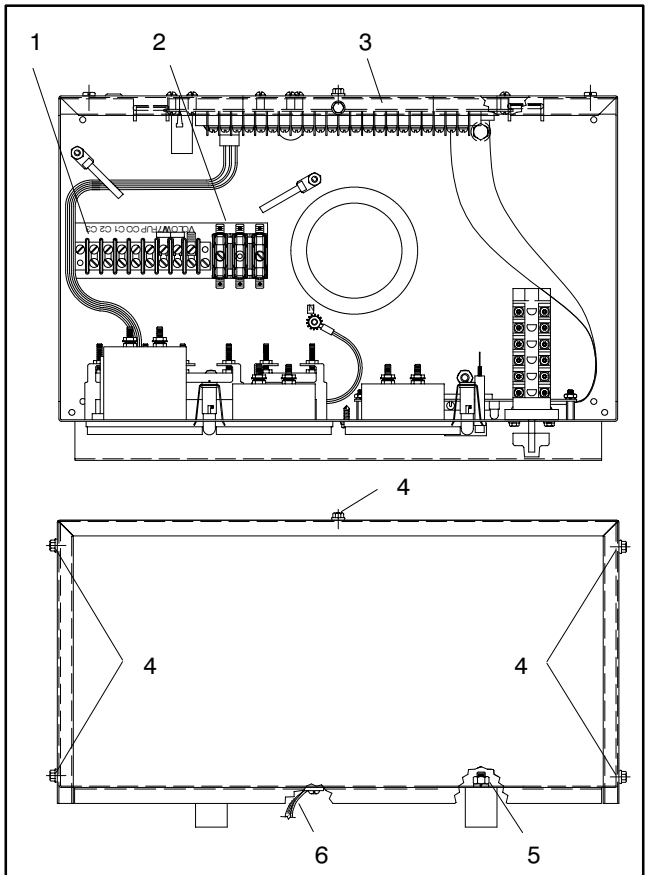
2.1.5 Lead 7C (oil pressure sender input) from the circuit board (digital controller) or oil pressure gauge (microprocessor controller).

2.1.6 Connector at the voltage adjustment potentiometer leads 67 and 68 if equipped (microprocessor controller only).

2.1.7 Controller ground strap.

2.1.8 Plug P2 from the controller board (microprocessor controller only) (microprocessor controller only).

2.1.9 Plugs P4 and P5 from the DDEC interface circuit board if equipped.



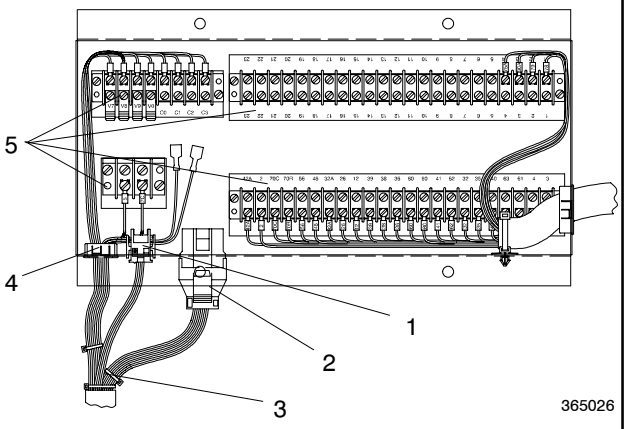
1. CT/meter terminal block
2. AC fuse terminal block
3. Controller board
4. Controller cover screws
5. Controller mounting nuts
6. Ground strap

Figure 2 Microprocessor Controller

2.2 Remove the four controller mounting nuts and washers (save hardware for mounting the remote connection box). See Figure 2. Carefully push the wires through the opening in the bottom of the controller and remove the controller assembly.

2.3 Mount the controller assembly in the required location with customer-supplied mounting hardware. Do not mount the controller at a distance greater than the length of the remote harness.

2.4 Insert the generator leads through the grommet of the remote connection box. Route the leads through the cable tie loop and connect the leads to the corresponding terminals on the terminal blocks. See Figure 3.



1. Connector P2
2. Connector P1
3. Wiring harness
4. Grommet
5. Terminal block

Figure 3 Remote Connection Box Assembly

2.5 Connect plugs P1, P2, P4, and P5 to the corresponding connectors on the remote connection box. Plug P2 available with microprocessor controller only. Plugs P4 and P5 available on units with DDEC engines only.

2.6 Secure the remote connection box assembly (A-347239) to the controller mounts on the generator junction box. Secure with the nuts and washers removed in step 5.

Note: Verify that all of the connections are tight and the leads are securely attached to the inside of the junction box before mounting the connection box to the junction box.

2.7 Route the wiring harness to the remote mounted controller. Connect the harness leads to the corresponding terminals. See Figure 4 through Figure 8 for digital controllers and Figure 9 through Figure 11 for microprocessor controllers.

2.8 Reinstall the generator set controller cover.

3. Restore the Generator Set to Service and Test Generator Set Operation

3.1 Check that the generator set master switch is in the OFF position.

3.2 Reconnect the generator set engine starting battery, negative (–) lead last.

3.3 Reconnect power to the battery charger, if equipped.

3.4 Place the generator set master switch in the RUN position to start the generator set.

3.5 Verify that the generator set and controller function correctly including displays, meters, gauges, lamps, switches, accessories, etc. Stop the generator set.

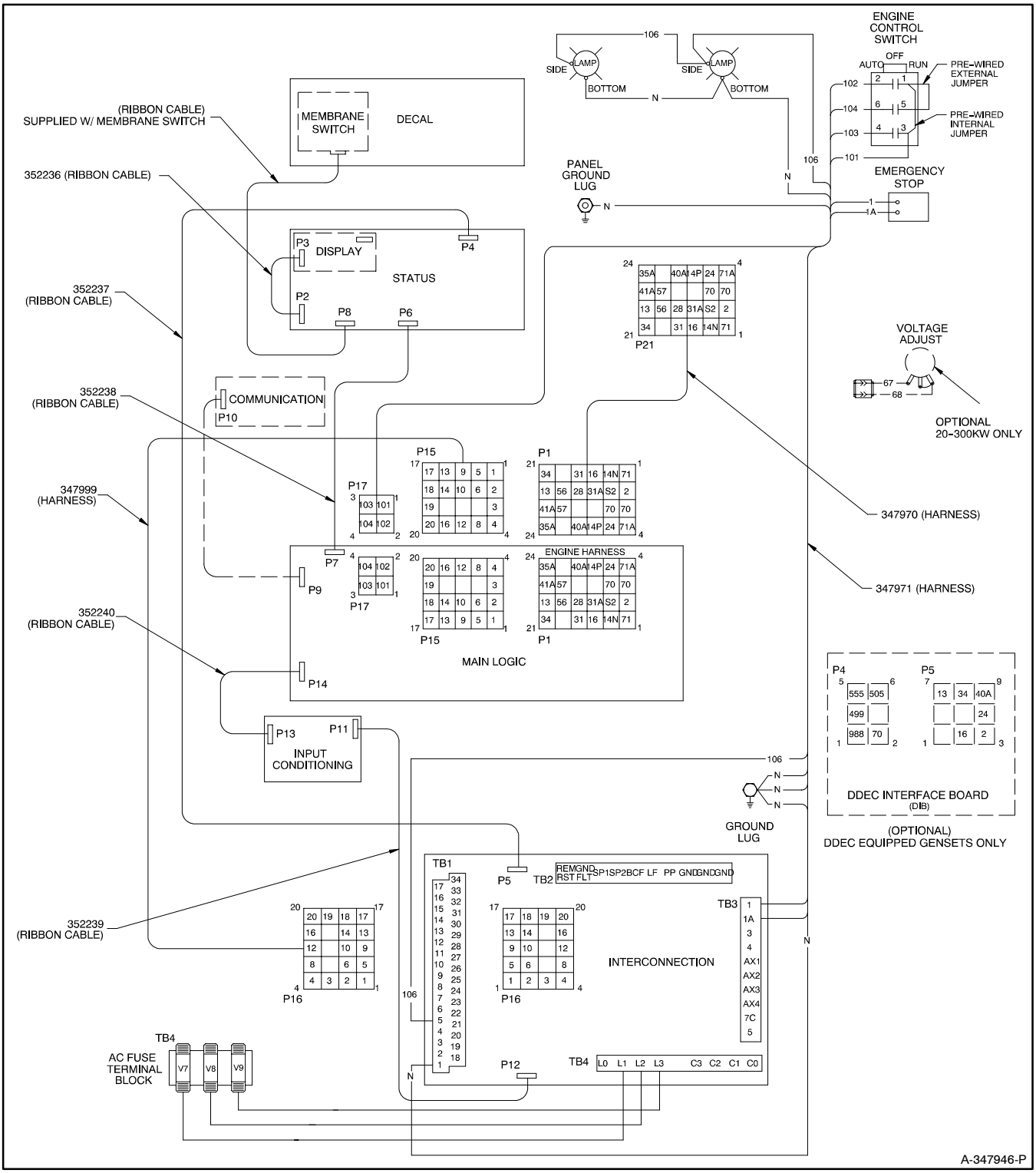


Figure 4 Digital Controller Wiring Diagram

Terminal	Purpose
1	Engine ground (-)
2	Engine ground (-)
3	Engine ground (-)
4	Engine ground (-)
5	Panel lamp output
6	Relay driver output (RDO)—10
7	Relay driver output (RDO)—9
8	Relay driver output (RDO)—7
9	Relay driver output (RDO)—5
10	Not in auto relay output (80)
11	Overcrank relay output (12)
12	Low battery voltage relay output
13	Low coolant temperature relay output (35)
14	Low oil pressure relay output (38)
15	High coolant temperature relay output (36)
16	Low oil pressure warning relay output (41)
17	High coolant temperature warning relay output (40)
18	42A battery voltage (+)—accessory power supply
19	42A battery voltage (+)—accessory power supply
20	42A battery voltage (+)—accessory power supply
21	Digital voltage regulator (DVR) adjustment down
22	Digital voltage regulator (DVR) adjustment common
23	Digital voltage regulator (DVR) adjustment up
24	Relay driver output (RDO)—8
25	Relay driver output (RDO)—6
26	Relay driver output (RDO)—4
27	Relay driver output (RDO)—3
28	Relay driver output (RDO)—2
29	Relay driver output (RDO)—1
30	System ready relay output (60)
31	Emergency stop relay output (48)
32	Battery charger fault relay output (61)
33	Low fuel relay output
34	Overspeed relay output (39)
NOTE: RDO outputs are active low, battery voltage (-).	

Figure 5 Digital Controller TB1 Terminal Strip Output Connections

Terminal	Purpose
REM RST	Remote reset*
GND FLT	Ground fault*
SP1	Not used
SP2	Not used
BCF	Battery charger fault*
LF	Low fuel*
PP	Prime power mode*
GND	Engine ground
GND	Engine ground
GND	Engine ground
* Connect to ground to activate	

Figure 6 Digital Controller TB2 Terminal Strip Input Connections

Terminal	Purpose
1	Emergency stop ground
1A	Emergency stop
3	Remote start
4	Remote start
AX1	Auxiliary 1*
AX2	Auxiliary 2*
AX2	Auxiliary 3*
AX4	Auxiliary 4*
7C	Oil pressure
5	Coolant temperature
* Connect to ground to activate	

Figure 7 Digital Controller TB3 Terminal Strip Input Connections

Terminal	Purpose
L0	L0 (V0)
L1	L1 (V7)
L2	L2 (V8)
L3	L3 (V9)
-	Not used
C3	C3
C2	C2
C1	C1
C0	C0
* Connect to ground to activate	

Figure 8 Digital Controller TB4 Terminal Strip AC Input Connections

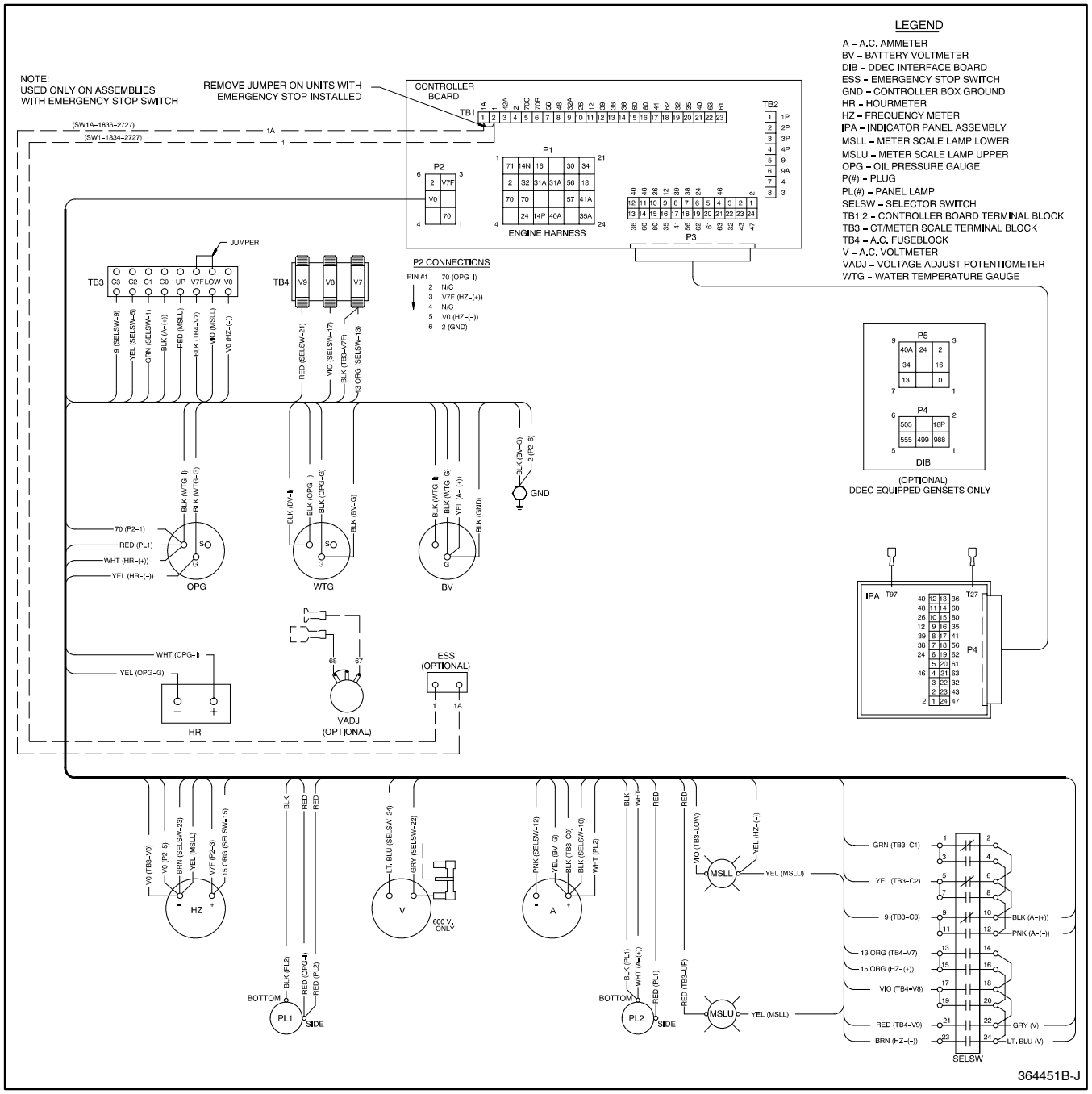


Figure 9 Microprocessor Controller Wiring Diagram

Terminal	Purpose
1	Ground. Emergency stop relay (K4). Connect emergency stop across terminals TB1-1 and 1A. *
1A	Emergency stop relay (K4) coil; negative side. Connect emergency stop across terminals TB1-1 and 1A. *
2	Ground terminal
12	Overcrank (OC) signal †
26	Auxiliary (AUX) signal †
32	Common fault/prealarm line 1. A/V alarm or common fault relay activated by OC, 12; AUX, 26; LWT, 35; HET, 36; LOP, 38; OS, 39; AHET, 40; ALOP, 41; and LF, 63 faults.
32A	Common fault/prealarm line 2. A/V alarm or common fault relay activated by AUX, 26; HET, 36; LOP, 38; OS, 39; and ES, 48 faults.
35	Low water temperature (LWT) signal
36	High engine temperature (HET) signal †
38	Low oil pressure (LOP) signal †
39	Overspeed (OS) signal †
40	Anticipatory high engine temperature (AHET) signal †
41	Anticipatory low oil pressure (ALOP) signal †
42A	Battery voltage (fuse #1 protected). Accessory power supply; Customer may also provide separate accessory power source.
48	Emergency stop (ES) signal †
56	Air damper (AD) switch (if equipped). Standard on all 200–2000 kW Detroit Diesel powered models.
60	System ready signal †
61	Battery charger fault. Connect battery charger alarm contact to TB1-61 to activate fault lamp (active low) (if used).
62	Low battery volts. Connect battery charger alarm contact to TB1-62 to activate fault lamp (active low) (if used).
63	Low fuel (LF) fault. Connect fuel level sensor to TB1-63 to activate fault lamp (active low) (if used).
70C	Generator in cool down mode signal
70R	Generator in running mode signal
80	Not in auto signal †

* Connect jumper across terminals 1 and 1A if emergency stop switch is not used.

† Use a remote annunciator and/or A/V alarm kit as an indicator with a dry contact kit connected to controller terminal strip TB1.

Figure 10 Microprocessor Controller TB1 Terminal Strip

Terminal	Purpose
1P	Prime power operation
2P	Prime power operation
3	Remote start ground. Connect transfer switch or remote start switch to TB2–3 and TB2–4.
3P	Prime power operation
4	Remote start. Connect transfer switch or remote start switch to TB2–3 and TB2–4.
4P	Prime power operation
9	Crank mode selection (open: cyclic crank, ground: continuous crank). Connect TB2–9 to TB2–9A for continuous cranking; leave TB2–9 open cyclic cranking; see starting instructions in the operation manual.
9A	Crank mode ground

Figure 11 Microprocessor Controller TB2 Terminal Strip

Parts List

Remote Connection Kits

Kits: 365647-KP1–365647-KP4			Unique Parts			
Qty.	**Description**	**Common Parts**	**365647-KP1**	**365647-KP2**	**365647-KP3**	**365647-KP4**
1	Box, assembly		365026-1	365026-2	365026-3	365026-4
1	Harness, extension		365021	365022	365023	365024
1	Box, remote connection	365026-B				
1	Harness, interconnection		GM11653	GM11654	GM11655	GM11656
4	Screw, slotted round head machine	X-51-53				
1	Bushing, 1.312 x 1.50 in. NPT	X-634-16				
2	Strip, terminal	328913				
1	Strip, marker	328914				
1	Strip, marker	GM11657				
1	Base, tie wrap snapin	361567				