

**KI-213-1 R44-series (28V only) External Power Plug Installation Kit Instructions**  
*For R44-series (28V) with aft battery (engine compartment) installation only.*

**NOTE**

Visit [www.robinsonheli.com](http://www.robinsonheli.com) to verify kit instructions are current revision. Review instructions before installation; contact RHC Technical Support with questions. Verify kit contents match list; contact RHC Customer Service if parts are missing or damaged.

ITEM	PART NUMBER	KIT CONTENTS	QTY
1	KI-213 Instr.	Kit Instructions . . . . .	1
2	A448-17	Bus Bar . . . . .	1
3	A780-61	Cable Assembly (marked "-1991"). . . . .	1
4	A780-77	Cable Assembly . . . . .	1
5	B263-3	Pin . . . . .	3
6	B297-20	Circuit Breaker (20 amp) . . . . .	1
7	B304-13	Diode Assembly . . . . .	1
8	B415-2	Relay - 28V . . . . .	1
9	C452-5	Guard . . . . .	1
10	D033-2242A	Wire Assembly (marked "-2242") . . . . .	1
11	D210-3	Nut . . . . .	3
12	D210-4	Nut . . . . .	1
13	D420-1	Block . . . . .	2
14	D420-4	Block Assembly . . . . .	2
15	G597-6	Receptacle Assembly . . . . .	1
16	G598-2	Faceplate . . . . .	1
17	KI-213-3	Wire Assembly (marked "-1964") . . . . .	1
18	STPS80H100TV	Rectifier . . . . .	1
19	AN4-4A	Bolt . . . . .	1
20	MS21042L06	Nut . . . . .	2
21	MS21042L08	Nut . . . . .	2
22	MS21919WDG6	Clamp . . . . .	2
23	MS21919WDG8	Clamp . . . . .	1
24	MS21919WDG9	Clamp . . . . .	1
25	MS21919WDG10	Clamp . . . . .	1
26	MS21919WDG14	Clamp . . . . .	1
27	MS21919WDG16	Clamp . . . . .	1
28	MS25171-2S	Nipple . . . . .	2
29	MS27039C0807	Screw . . . . .	2
30	MS27039C1-06	Screw . . . . .	1

ITEM	PART NUMBER	KIT CONTENTS	QTY
31	MS27039C1-08	Screw .....	1
32	MS27039C1-14	Screw .....	2
33	MS3367-5-9+	Ty-rap (Note: "+" in contents part number indicates 20-qty pack) .....	2
34	MS35206-228	Screw .....	2
35	NAS1149F0332P	Washer .....	7
36	NAS1149F0432P	Washer .....	2
37	NAS1149FN616P	Washer .....	2
38	NAS1149FN816P	Washer .....	2
39	NAS6603-16	Bolt .....	4

**Special Tools:**

- Scotch-Brite or other gentle abrasive pad for finish removal.
- Drilling and deburring tools.
- Wire stripping and pin crimping tools.
- Electrical pin extractor.

**Kit Instructions**

**NOTE**  
 Parenthetic dash numbers, such as (-580), indicate number marked on wiring.

Refer to Figures 6 and 7 for External Power Plug Installation schematic.

**CAUTION**  
 To minimize risk of electrical discharge: When disconnecting battery, disconnect negative (ground) cable from the battery first, then the positive cable. When connecting battery, connect positive cable first, then the negative (ground) cable.

1. Turn BATTERY switch OFF and disconnect battery.
2. Refer to R44 Illustrated Parts Catalog (IPC) Figures 6-11, 6-13, 25-1, 28-1 & 53-1. Remove C377 and C378 engine cowling assemblies, and C794-3 aft belly panel. Remove C474-1 and C474-2 aft tunnel covers, C474-3 trim, and C932-2 left backrest.
3. If helicopter is equipped with blind encoder refer to IPC Figures 97-19, 97-23 or 97-35. Cut and discard ty-raps securing wire bundles and pitot/static lines to bulkhead stiffeners as required. Remove mounting hardware and move blind encoder away from bulkhead.
4. Refer to Figure 1. Remove hardware securing cables to B415-2 (battery) relay contactor terminals (inboard and outboard). Newer relays identify terminals as 88 and 88a, as shown in View A. Insulate cable terminals to prevent contact with firewall during drilling.

**Kit Instructions (continued)****NOTE**

Remove foam as required from cabin bulkhead to access relay and rectifier mounting hardware.

5. Refer to Figure 2. Lay out hole locations on vertical, stainless steel firewall for STPS80H100TV rectifier and B415-2 (external-power) relay. Using suitable (cobalt) bit with drill-stop, drill pilot holes then drill to final size one 0.190-inch (relay) and two 0.140-inch (rectifier) diameter holes and deburr. Use of a vacuum cleaner to capture chips while drilling is recommended. Clean up chips.
6. Install hardware and secure rectifier, with slot inboard, to firewall.
7. Remove (battery) relay inboard mounting fastener and discard screw. Install hardware and secure C452-5 guard (direction of overlap is optional) and (external-power) relay (direction of overlap is optional) to firewall. Verify security of guards and relays.
8. Refer to Figure 3, Detail A. Lay out hole location on C015-4 skin, drill 0.256-inch diameter hole, and deburr. Remove paint or primer on skin interior adjacent to hole to ensure electrical ground when ground cable is attached. Clean up debris.
9. Refer to Figure 3. Install hardware securing two D420-1 and two D420-4 block assemblies to C046-2 (RH) frame assembly, finger tight.
10. Install screws and secure G598-2 faceplate and G597-6 receptacle assembly to blocks. Temporarily install C378 engine cowling. Position blocks for  $0.50 \pm 0.25$  inch clearance between plug and cowl door's bottom and forward edges. Remove cowling. Special torque bolts to 54 in.-lb and torque stripe per R44 Maintenance Manual (MM) Figure 2-1.
11. Install B297-20 circuit breaker on faceplate and ensure locator tab engages slot. Verify security.
12. On receptacle assembly: secure 90-degree ("-") terminal of A780-61 cable assembly's (-1991) wire to aft large pin, and 90-degree ("+") terminal of A780-77 cable assembly's (-1970) wire to middle large pin; ensure cables are inboard of and clear diagonal tube of steel frame. Special torque nuts to 75 in.-lb. Secure A780-77 cable assembly's (-2055) wire to forward small pin and special torque nut to 20 in.-lb. Torque stripe nuts per MM Figure 2-1.

**CAUTION**

Do not apply side loads to plug pin studs when torquing nuts.

13. Attach A780-77 cable assembly's (12-gage, unmarked) wire and A780-77 cable assembly's (-2324) wire to circuit breaker, one wire per terminal. Verify security.
14. Refer to Figure 3. Install hardware and secure A780-61 cable assembly's (-1991) wire to frame with clamps at location shown. Install hardware and secure cable to skin, standard torque bolt per MM Section 1.320, and torque stripe per MM Figure 2-1.
15. Install hardware and secure A780-77 cable assembly's (-1970) wire to frame with clamps at location shown; position clamps for 0.25 inch minimum clearance between cable and intake hose.

**Kit Instructions (continued)**

16. Refer to Figure 2. Remove hardware and MS21919WDG clamp securing C859 or C059 harness to vertical firewall. Reinstall hardware securing C859 or C059 harness and A780-77 cable assembly's (-1970) wire to firewall with supplied MS21919WDG8, WDG9, or WDG10 clamp as required to eliminate harness play. Verify security.
17. Refer to Figure 1. Slide one MS25171-2S nipple onto A780-77 cable assembly's (-1970) wire. Install hardware securing A780-77 cable assembly's (-1970) wire to (external-power) relay inboard stud and special torque nut to 110 in.-lb. Torque stripe per MM Figure 2-1. Position nipple over stud. Install hardware securing A780-77 cable assembly's (-2055) wire to (external-power) relay forward ("86", "+") terminal and special torque screw to 10 in.-lb. Verify security.
18. Install hardware securing D033-2242A wire assembly's (-2242) large terminal and cable (removed in step 4) to battery relay outboard stud and special torque nut to 110 in.-lb. Verify security. Torque stripe per MM Figure 2-1. Route other end of (-2242) wire thru nipple and position nipple over stud.
19. Refer to Figure 2. Install screw and secure D033-2242A wire assembly's (-2242) small terminal to rectifier upper outboard terminal.
20. Install screw securing A780-77 cable assembly's (-2324) wire to rectifier top inboard terminal. Verify security.
21. Refer to Figure 4. Determine if helicopter has provisional wiring: Later helicopters have a stowed (-1964) wire (connector protected with heat shrink) located on left-hand side of engine compartment vertical firewall. Perform **A** or **B** below, as necessary.
  - A. For helicopters with stowed (-1964) wire:** Refer to Figures 1 and 6. Discard KI-213-3 wire assembly. Connect B304-13 diode assembly to (-1964) wire. Install hardware securing diode's ring terminal to (external-power) relay aft ("-", "85") terminal and special torque screw to 10 in.-lb. Verify security.

Refer to Figure 1. Position A448-17 bus bar on (battery) relay inboard stud and (external-power) relay outboard stud. Install hardware securing bus bar and cable (removed in step 4) to (battery) relay inboard stud. Install hardware securing bus bar to (external-power) relay outboard stud. Special torque nuts to 110 in.-lb and torque stripe per MM Figure 2-1.
  - B. For helicopters without stowed (-1964) wire:** Refer to Figures 1, 5, and 7. Strip end of KI-213-3 (-1964) wire assembly, and connect KI-213-3 wire assembly to B304-13 diode assembly at connectors. Install hardware securing diode's ring terminal to (external-power) relay aft ("-", "85") terminal and special torque screw to 10 in.-lb. Verify security. Cut and discard ty-raps as required to locate and disconnect three-pin connector for C059-65 and C059-66 wires. Release C059-65 wire's existing pin from housing, cut off pin, and strip wire end. Crimp B263-3 pin on KI-213-3 (-1964) and C059-65 (stripped) wire ends, perform crimp inspection per Figure 5, and install pin in original location in housing. Reconnect same three-pin connector. Secure wiring using MS3367-5-9 ty-raps as required. Cinch ty-raps until snug without overtightening and trim tips flush with heads.

Refer to Figure 1. Position A448-17 bus bar on (battery) relay inboard stud and (external-power) relay outboard stud. Install hardware securing bus bar and (-581) cable to (battery) relay inboard stud. Slide one MS25171-2S nipple on (-580) cable and install cable to (external-power) relay outboard stud. Special torque nuts to 110 in.-lb and torque stripe per MM Figure 2-1. Position nipples over studs.

**Kit Instructions (continued)**

22. Secure A780-77 cable assembly to C859 or C059 harness using MS3367-5-9 ty-raps as required. Cinch ty-raps until snug without overtightening and trim tips flush with heads.

**CAUTION**  
Damage can occur if wiring is incorrect.

23. Refer to Figures 6 and 7, as applicable. Verify installed wiring matches schematic.

24. If helicopter is equipped with blind encoder refer to IPC Figures 97-19, 97-23 or 97-35. Install hardware securing blind encoder to cabin. Verify security. Secure wire bundles and pitot/static lines to bulkhead stiffeners using MS3367-5-9 ty-raps as required. Cinch ty-raps until snug without overtightening and trim tips flush with heads.

25. Functional check installation.

- a. Turn BATTERY switch OFF.
- b. Connect an external power source as indicated on receptacle faceplate.
- c. Turn BATTERY switch ON. Power should activate instruments and gages as normal.
- d. Turn BATTERY switch OFF. Disconnect external power source.

26. Verify battery surfaces are clean. Install positive cable on battery positive terminal and install battery hardware. Special torque terminal bolt as noted on battery label and torque stripe per MM Figure 5-1. Position nipple over terminal.

27. Install negative (ground) cable to battery negative terminal and install battery hardware. Special torque terminal bolt as noted on battery label and torque stripe per MM Figure 5-1.

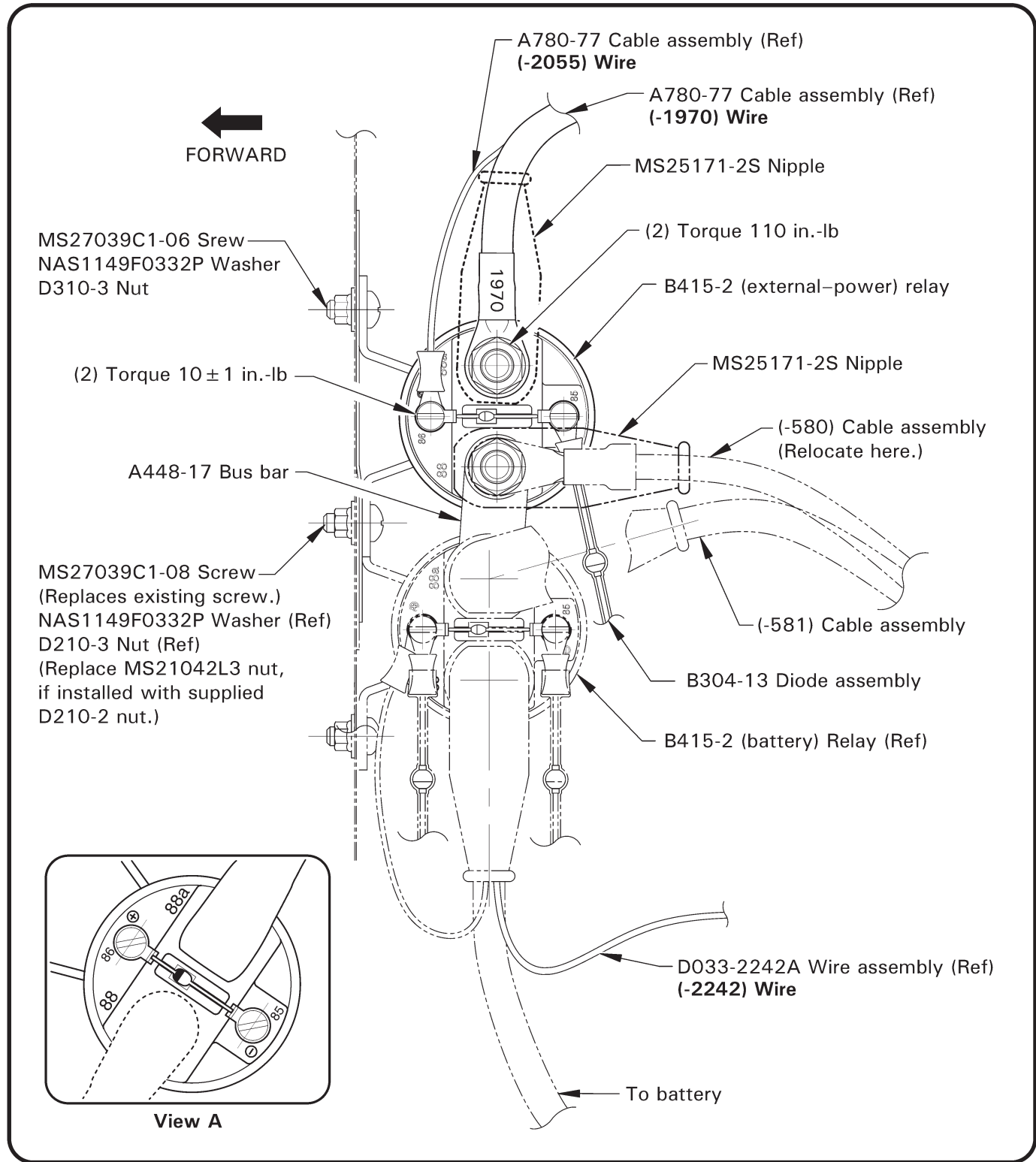
28. Refer to R44 Illustrated Parts Catalog (IPC) Figures 6-11, 6-13, 25-1, 28-1 & 53-1. Install C474-1 and C474-2 aft tunnel covers, C474-3 trim, and C932-2 left backrest. Install C377 and C378 engine cowling assemblies, and C794-3 aft belly panel.

29. Revise helicopter’s Weight & Balance Record in Pilot’s Operating Handbook (POH) Section 6 to reflect this installation by incorporating the following data:

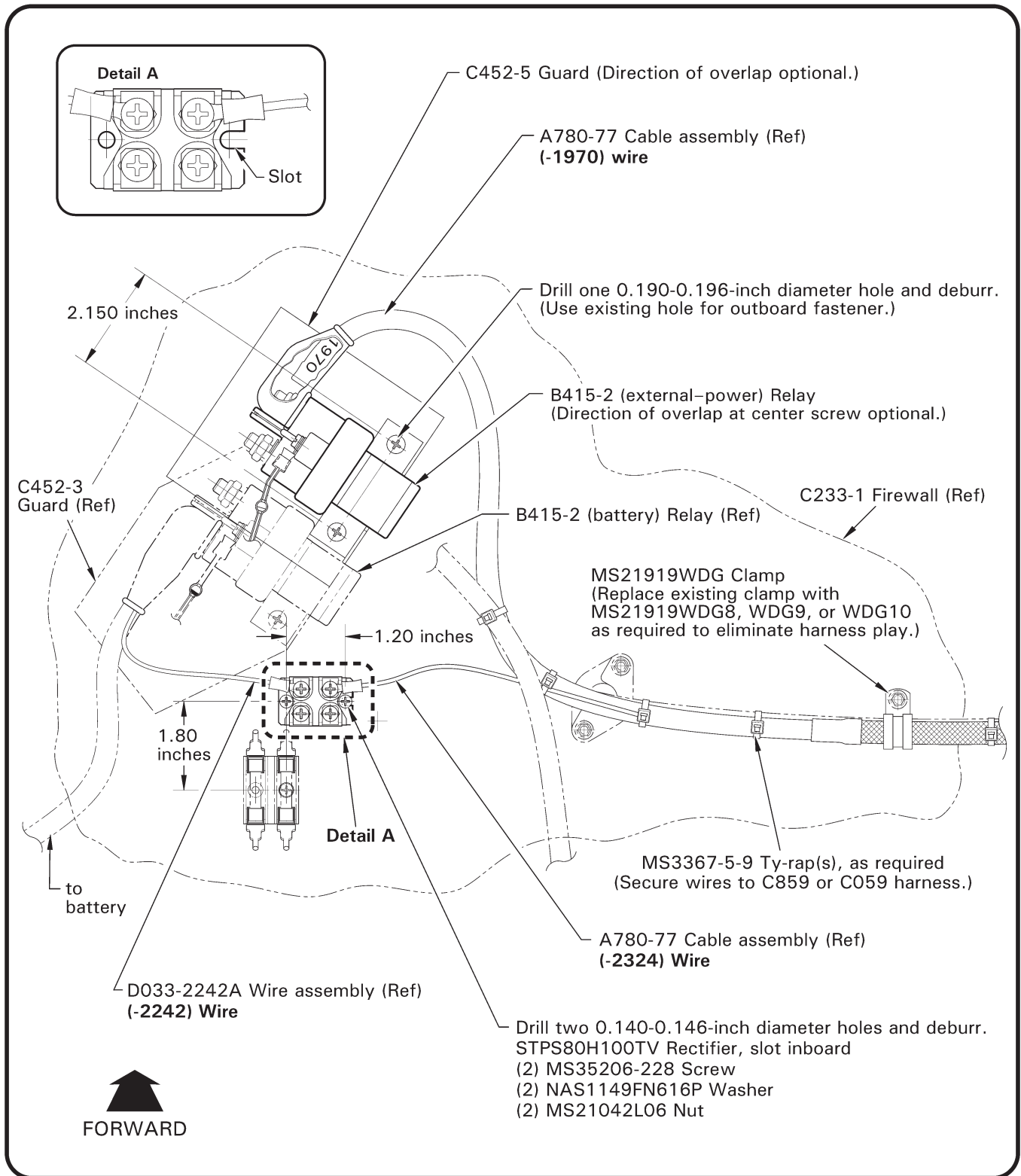
**Install:**

Item	Weight	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
KI-213-1	+2.74 lbs	96.39 inches	264 in.-lb	+4.55 inches	12.5 in.-lb

30. Make appropriate maintenance record entries.

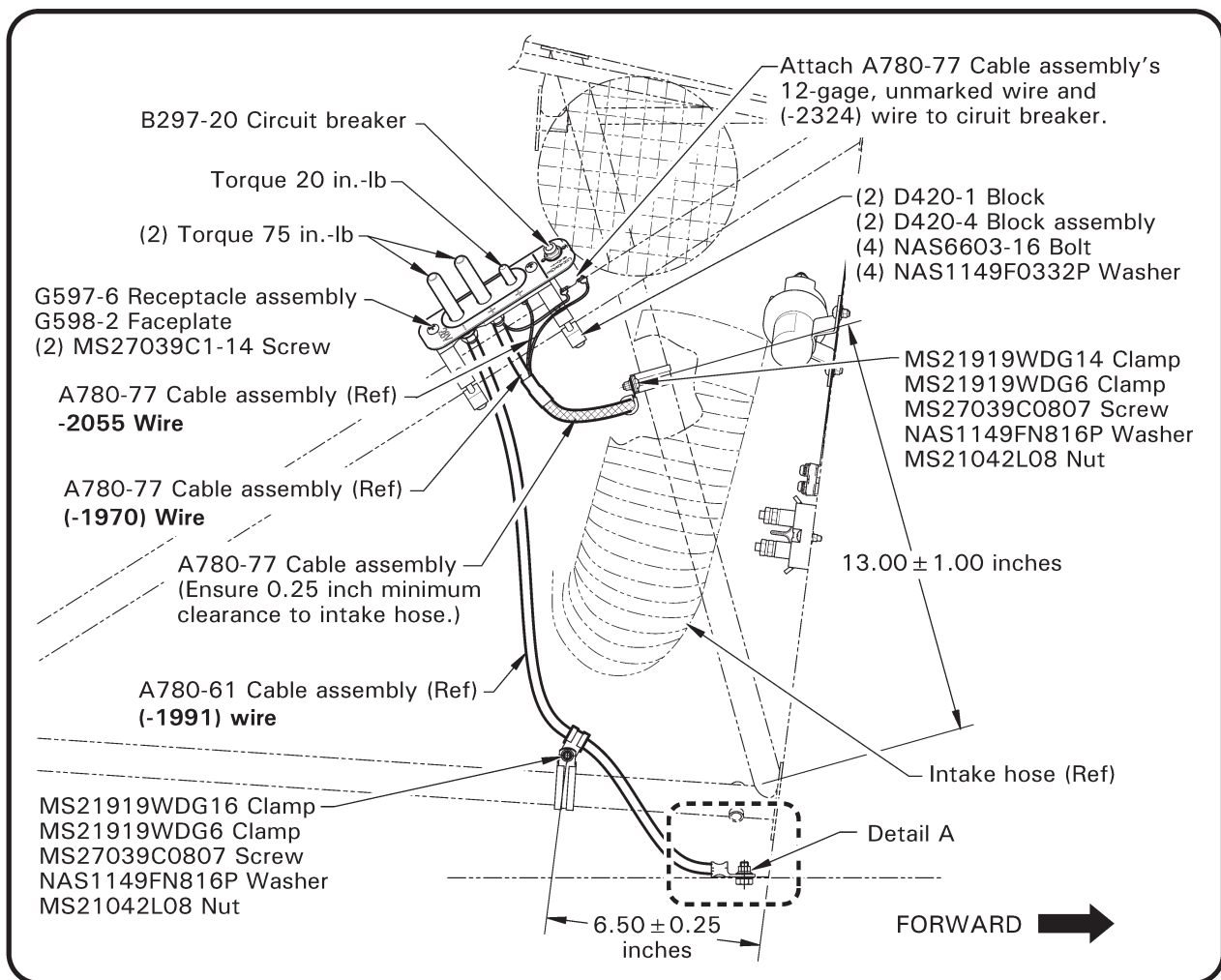
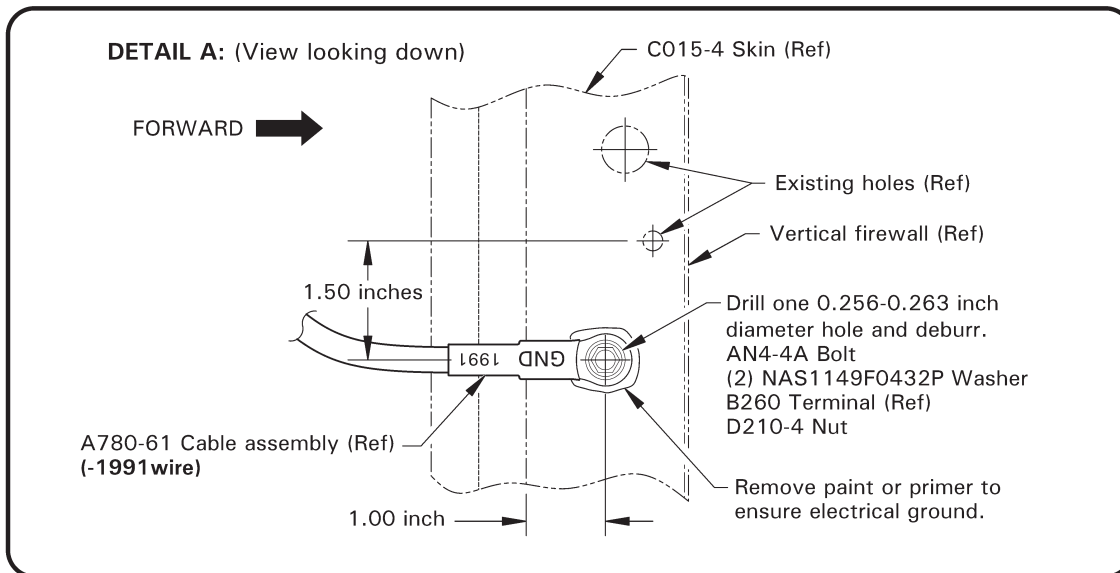


**FIGURE 1**  
(View looking down)



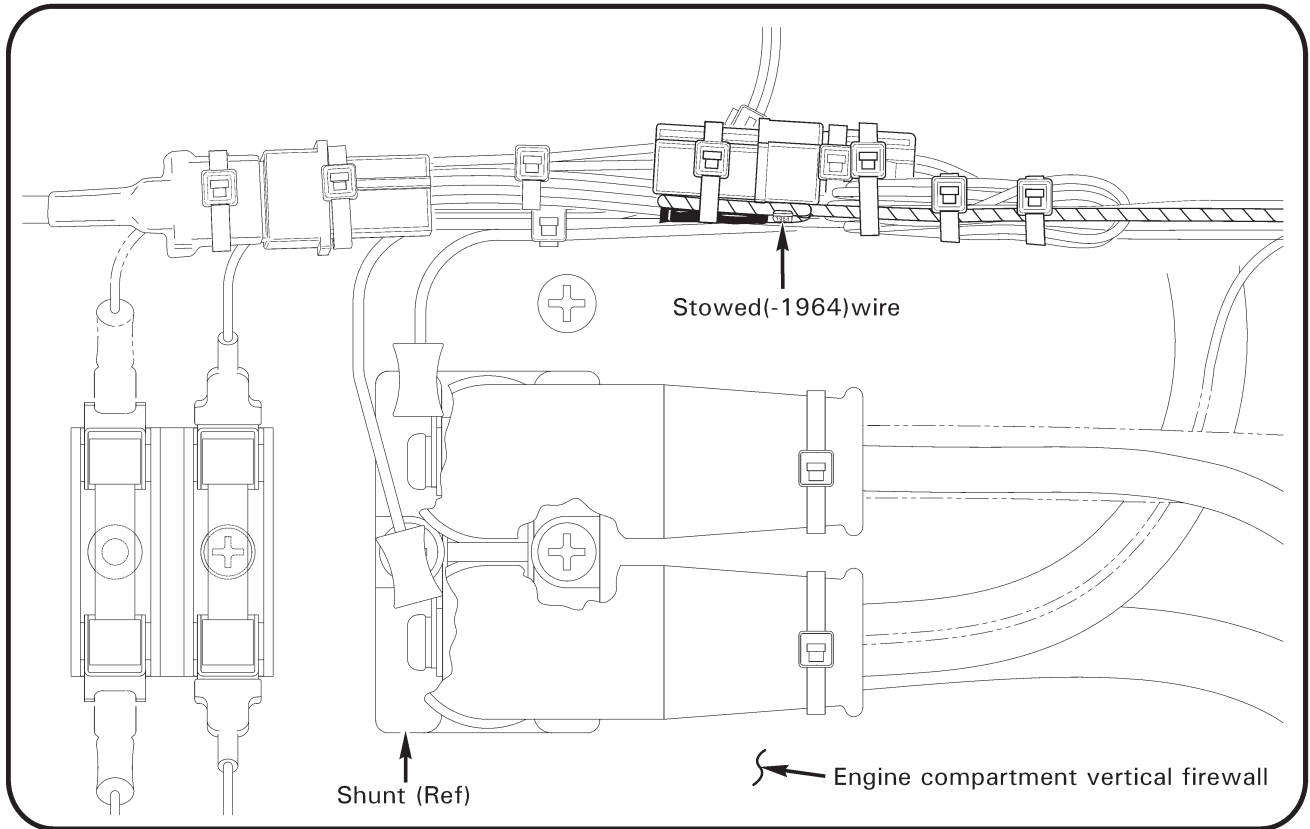
**FIGURE 2**  
(View looking forward)



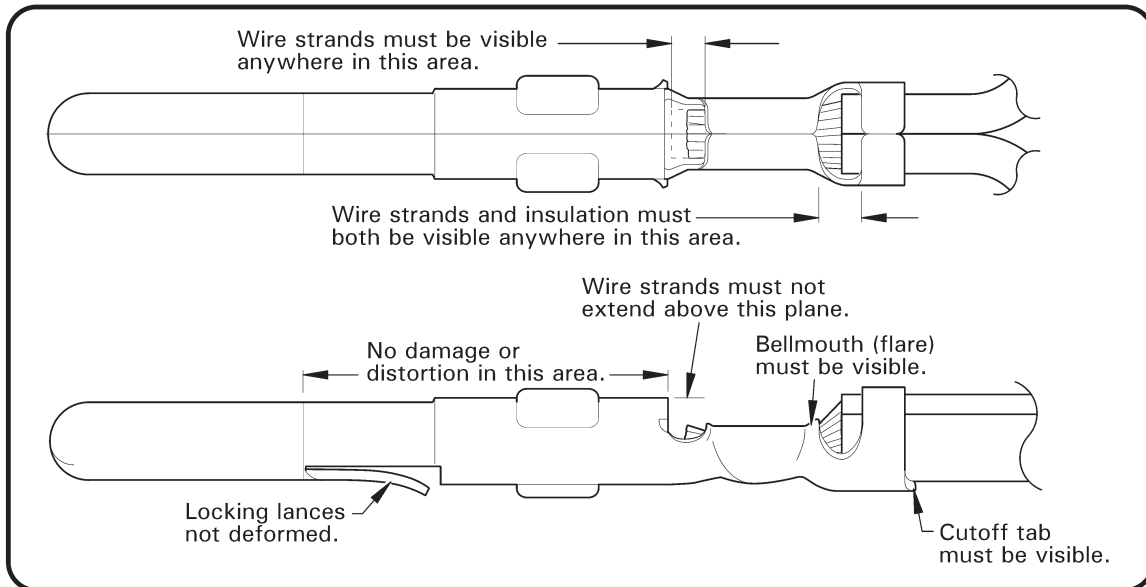


**FIGURE 3**

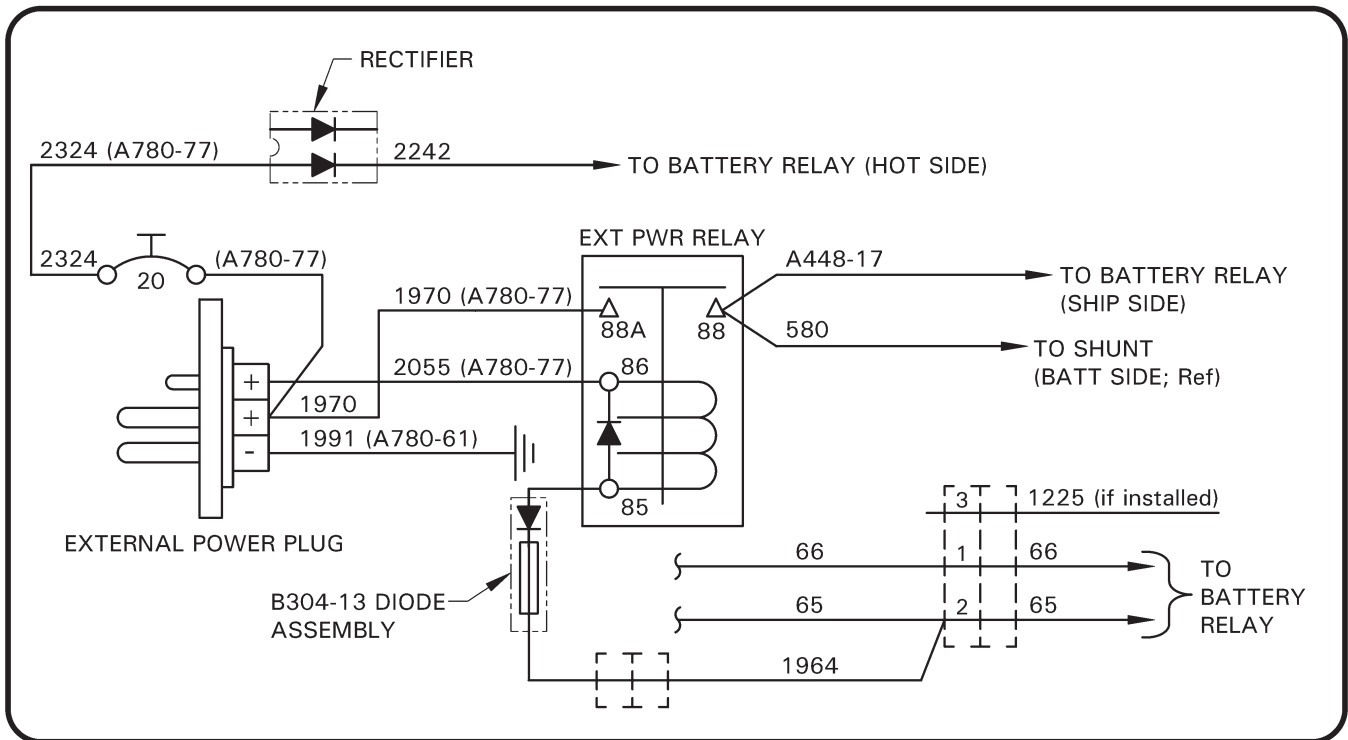




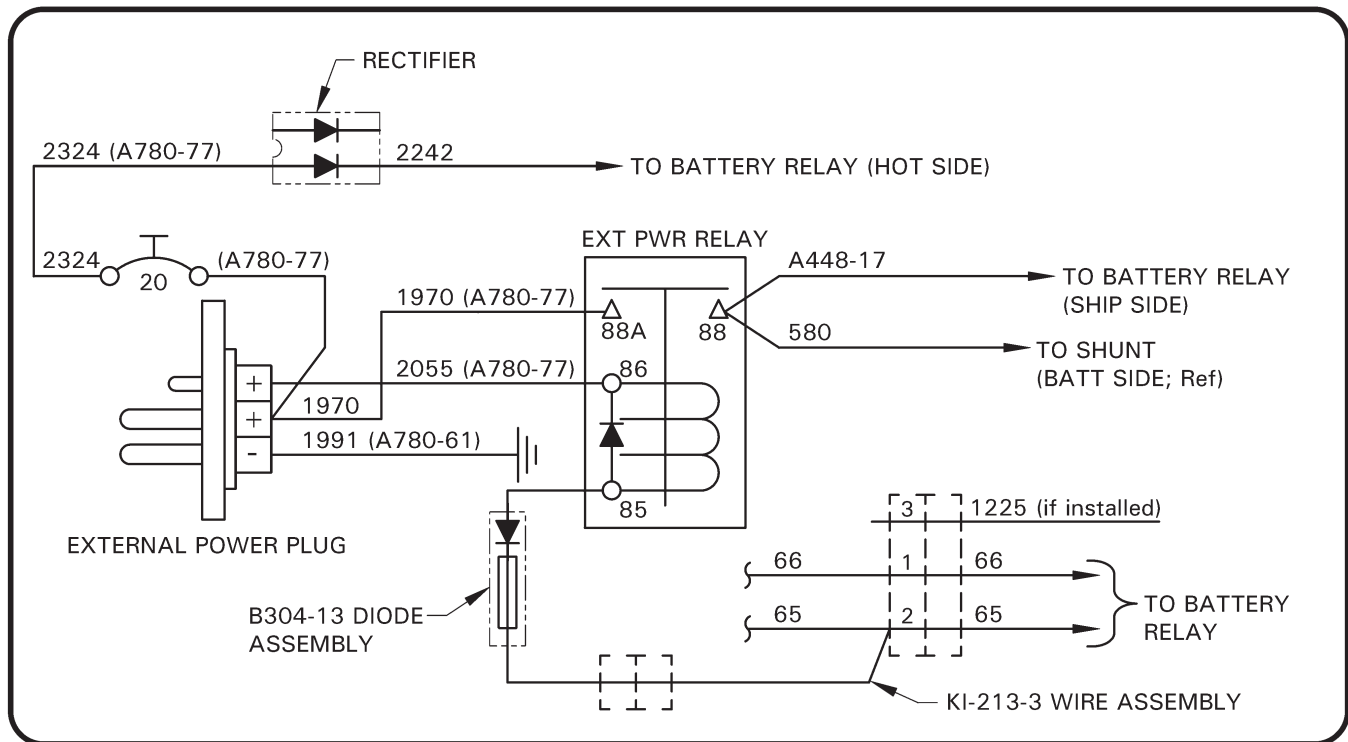
**FIGURE 4**



**FIGURE 5**



**FIGURE 6**  
(cabin harness with -1964 wire provision)



**FIGURE 7**  
(cabin harness without -1964 wire provision)