TO: ALL HOLDERS OF LANDING GEAR ACCESSORY UNIT ASSEMBLY M338 OVERHAUL MANUAL, 32-66-40

REVISION NO. 18, DATED SEP 1/97

HIGHLIGHTS

DESCRIPTION OF CHANGE	TOPICS AFFECTED												
	D&O	D/Assy	Cleaning	Insp/Chk	Repair	Assy	F/C	Test	T/Shooting	S/Tools	Storage	IPL	L/Overhaul
Added optional test for antiskid test, paragraph 2.R. Renumbered paragraph 2.S. to V. Updated vendors list								X				X	

LANDING GEAR ACCESSORY UNIT ASSEMBLY M338

32-66-40

BOEING P/N 65-52811-21, 23, -25, -30, -31, -44, -51, -54, -73 thru -77, -84, -85, -117 thru -121, -135, -137, -144 thru 148, -151

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
		MC 3010-8	May 15/68
		PRR 30042-1	May 15/68
		PRR 30042-3	May 15/68
24-1001		PRR 30202	May 15/68
		PRR 30319	May 15/68
		PRR 30503	May 15/68
		PRR 30940	May 15/68
		PRR 31550	Aug 15/69
		PRR 31611	Aug 15/69
21-1030			Sep 10/70
78-1005, Rev 1		PRR 31030K	Sep 10/70
32-1093, Rev 2		PRR 32675	Jan 5/80
		MR 39121-26	Jan 5/82
27-1114, Rev 2	32-6	PRR 33143	Dec 5/83

LIST OF EFFECTIVE PAGES

* Indicates pages revised, added or deleted in latest revision
F Indicates foldout pages - print one side only

	PAGE	DATE
	32-66-40	
	T-1	Dec 5/85
	T-2	BLANK
*	LEP-1	Sep 1/97
	LEP-2	BLANK
	T/C-1	Dec 5/83
	T/C-2	BLANK
	1	Jul 5/79
	2	Nov 10/69
	3	Nov 10/69
	4	Nov 10/69
	5	Dec 5/85
	6	Dec 5/85
	7	Nov 10/69
	8	Nov 10/69
	9	Nov 10/69
	10	Nov 10/69
	11	Nov 10/69
	12	Dec 5/85
	13	Nov 10/69
	14	Nov 10/69
	15	Jan 5/82
	16	Dec 5/85
	16A	Jan 5/82
	16B	BLANK
F	16C	Dec 5/85
	16D	BLANK
F	17	Dec 5/85
	18	BLANK
	18A	Jan 5/82
	18B	Dec 5/83
	19	Nov 10/69
	20	Jul 5/79
	401	Dec 5/85
	402	BLANK
	701	Dec 5/85
*	702	Sep 1/97
*	703	Sep 1/97
	704	Dec 5/83
	705	Dec 5/85
	706	Dec 5/85
	707	Dec 5/85
*	708	Sep 1/97
	709	Dec 5/85
	710	Jun 5/85
	711	Jun 5/92
	712	Dec 5/83
	713	Dec 5/83
	714	Dec 5/85
	715	Jun 5/92
	716	Jun 5/92
	717	Jun 5/92
	718	Sep 5/88
	719	Dec 5/85
	720	Dec 5/85
	721	Mar 5/89
	722	Dec 5/85
	723	Dec 5/85
	724	Dec 5/83
	725	Dec 5/85
	726	Dec 5/83
*	727	Sep 1/97
*	728	Sep 1/97
	801	Dec 5/85
	802	Dec 5/85
	803	Dec 5/83
	804	BLANK
	805	BLANK
F	806	Dec 5/85
F	807	Dec 5/85
	808	BLANK
F	808A	Dec 5/83
	808B	BLANK
	808C	Dec 5/85
	808D	BLANK
	809	BLANK
F	810	Sep 5/88
F	811	Dec 5/85
	812	BLANK
F	812A	Dec 5/83
	812B	BLANK
	813	BLANK
F	814	Dec 5/83
F	815	Dec 5/83
	816	BLANK
F	817	Dec 5/83
	818	BLANK
	1101	Mar 5/85
	1102	Dec 5/83
	1103	Dec 5/83
	1104	Dec 5/85
	1105	Mar 5/90
	1106	Mar 5/90
	1107	Dec 5/85
	1108	Dec 5/85
	1108A	Dec 5/85
	1108B	BLANK
	1109	Dec 5/85
	1110	Mar 5/90
	1111	Dec 5/83
*	1112	Sep 1/97

TABLE OF CONTENTS

*[1] Use applicable overhaul procedures in 20-11-05 and standard industry practices.

*[2] Special instructions not required.

LANDING GEAR ACCESSORY UNIT ASSEMBLY (M338)

Figure 1 - Deleted

DESCRIPTION AND OPERATION

1. Description

   A. The landing gear accessory unit assembly consists of control and safety relays, solid-state circuits, and related wiring and connectors mounted in a chassis assembly. The accessory unit assembly includes air and ground sensing indicators and test switches.

2. Operation

   A. The landing gear accessory unit assembly receives signals from proximity sensors on the landing gear. These signals are transmitted to solid-state switching circuits in the accessory unit assembly to control the relays. The relays provide the required control and indication of the landing gear. The air and ground sensing indicators and test switches are used to check for malfunction in the accessory unit assembly and to isolate the safety relays for airplane maintenance purposes.

B. The assembly controls and monitors the following systems.

(1) Safety Relay System (squat switches)

(2) Landing Gear Wheel Seal System

(3) Landing Gear Warning System

(4) Automatic Ground Speed Brake System

(5) Takeoff Warning System

3. Functional Description (See Schematic Diagram.)

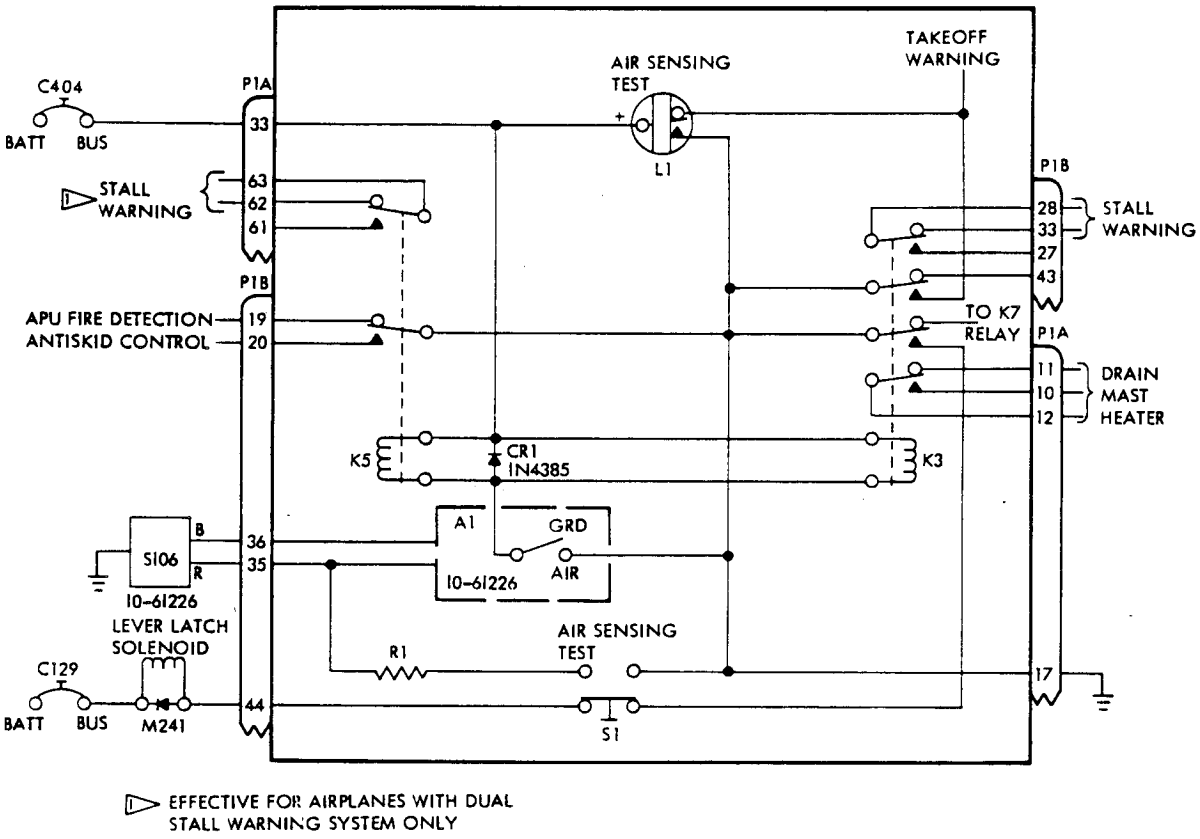
A. The safety relay system (squat switches) consists of the air safety relays and the ground safety relays.

(1) The air safety relay system consists of normally open proximity switch A1, relays K3 and K5, test switch S1, test indicator L1, and an external proximity sensor S106. The air safety relays provide the functions listed in figure 2 to the ground critical systems.

Ground Critical Systems	Air Mode	Ground Mode
1. Drain mast heater	Switches the heater from 28-volt to 115-volt power source to provide higher heating of the drain mast.	Switches the heater from 115-volt to 28-volt power source to reduce heating of the drain mast.
2. Stall Warning	Arms the stall warning system.	Deactivates the stall warning system.
3. Antiskid System	Prevents inboard brake application by actuating the antiskid control valves to the full dump position.	Deactivates the antiskid touchdown protection circuit and allows normal braking application.
4. APU Fire Detection Horn	Deactivates the APU wheel well fire warning horn circuit.	Arms the APU wheel well fire warning horn circuit.
5. Landing Gear Latch	Energizes the lever latch solenoid to enable the landing gear retraction without override.	De-energizes the landing gear lever latch solenoid to prevent the landing gear handle from operated to the up position.

Air Safety Relay Functions
Figure 2

Sensor S106 and switch A1 are connected at pins B35 and B36 and form a bridge circuit. S106 appears as an inductance to A1. (See Manufacturer's Overhaul Manual for details.) S106 is located in the right main landing gear wheel well and will actuate A1 when the landing gear oleo is extended. Twenty-eight volt dc circuit power is provided at pin A33. Circuit ground is at pin A17. (See figure 3.)



Air Safety Relays
Figure 3

(a) K3 and K5 are energized when A1 is actuated and provides a ground path for the relay coils. K3 and K5 provide the switching to activate (or deactivate) the circuits indicated in figure 2.

(b) The relays can be tested while the airplane is on the ground by pressing S1. This actuates A1 and simulates air mode. L1 will illuminate while S1 is depressed.

(2) The ground safety relays system consists of normally open proximity switch A2, relays K1, K2, K4, K7 and K8, test switch S2, test indicator L2, and an external proximity sensor (S105). The ground safety relays provide the functions indicated in figure 4 to the air critical systems.

Air Critical System	Ground Mode	Air Mode
1. Pressurization Control	Deactivates the pressurization control circuit	Activates the automatic control circuit to maintain cabin pressurization when airplane is in the air.
2. Wing Anti-Ice	Prevents hot air from entering anti-ice duct	Permits hot air entering anti-ice duct.
3. Stall Warning	Deactivates the stall warning system	Activates the stall warning system.
4. Turbofans	Opens turbofan valves	Closes turbofan valves.
5. Flight Recorder	Deactivates flight recorder	Activates flight recorder.
6. Comparator-NAV (when installed)	Prevents a NAV warning	Permits a NAV warning.
7. Static Inverter	Prevents automatic operation of the static inverter	Permits automatic operation of the static inverter.
8. Engine gravel protection	Activates gravel protection valve	Deactivates gravel protection valve.
9. Thrust Reversal Flap Retraction	Activates thrust reversal flap retract valve "Bypass"	Activates thrust reversal flap retract valve "Normal"
10. Thrust Reversers	Deactivates thrust reverser disarming circuits	Activates thrust reverser disarming circuits.

The ground safety relays when activated by the parking brake switch provide the following functions to the air critical systems:

Ground Safety Relay Functions
Figure 4 (Sheet 1)

Air Critical System	Ground Mode and Parking Brake Set	Air Mode or Parking Brake NOT Set
1. Hydraulic Interconnect Valve	Permits hydraulic system interconnection	Automatically closes the hydraulic interconnect valve to isolate the A and B hydraulic systems.
2. Voice Recorder	Permits the erasure of recorder tape	Deactivates the voice recorder erasure circuit.
3. Main Cargo Door Control	Permits cargo door operation	Deactivates the cargo door control circuit.
4. Antiskid System	Permits antiskid trouble shooting isolation test	Removes antiskid system tests electrical power.

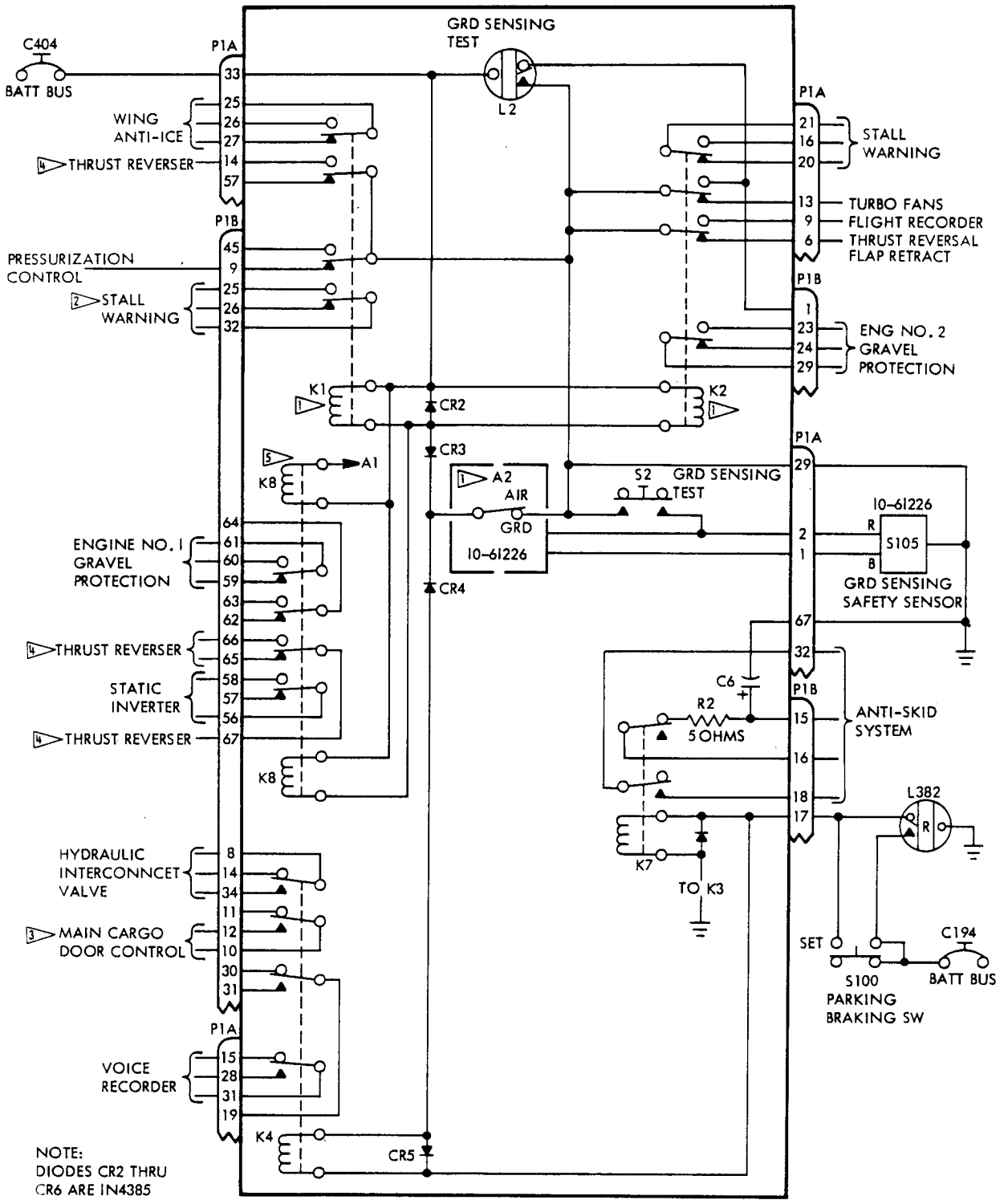
Ground Safety Relay Functions
Figure 4 (Sheet 2)

Sensor S105 and switch A2 are connected at pins A-1 and A-2. S105 is in the right main gear wheel well and will actuate A2 when the landing gear oleo is compressed. Twenty-eight volt dc circuit power is provided at pin A-33. Circuit ground is at pins A-29. In addition, when the parking brake switch is set, 28 volts dc is applied at pin B-17. (See Fig. 5.)

(a) K1, K2, and K8 are energized when A2 is actuated. (K8 used on 65-52811-21, -51, -54, -73, -117, -135, -137, -144 is a two-coil relay. See paragraph 3.A.(2)(b). K4 will energize when the parking brake switch is set and A2 is actuated. K7 will energize when the parking brake switch is set and K3 is not energized.

(b) K8 on 65-52811-21, -51, -54, -73, -117, -135, -137, -144 is a two-coil relay energized by A1 or A2. When one coil has been energized and de-energized, the other coil must be energized to switch contacts.

(c) Relays K1, K2, K4, and K8 (except K8 on 65-52811-21, -51, -54, -73, -117, -135, -137, -144) can be tested while the airplane is on the ground by pressing S2. This deactuates A2 and simulates air mode (or brake switch not set). L2 will remain lit while S2 is depressed.



NOTE:
DIODES CR2 THRU CR6 ARE IN4385

1. RELAYS K1, K2 AND K8 SHOWN IN ENERGIZED POSITION; SWITCH A2 SHOWN ACTUATED
2. EFFECTIVE FOR AIRPLANES WITH DUAL STALL WARNING SYSTEM ONLY
3. EFFECTIVE FOR CARGO AIRPLANES ONLY
4. EFFECTIVE FOR TARGET-TYPE ONLY
5. 65-52811-21,-51,-54,-73,-117,-135,-137, -144 ONLY USES TWO-COIL RELAY (K8)

Ground Safety and Parking Brake Relays
Figure 5

B. The wheel seal system consists of logic card A10, relay K6, proximity switches A3, A4, A7 and A8 and their associated external sensors, external switches, valves, and a lamp. Twenty-eight volt dc power is applied through K6 to energize external seal control valves (deflate seals), or removed to de-energize the valve (inflate seals). Twenty-eight volt dc circuit power is applied at pin B48. Circuit grounds are at pins A7 and A30. (See figure 6 schematic and figure 7 logic diagram.)

(1) Power is available to K6 coil and contacts from J10 pin 2. When a ground path is available at pins B7, or B47 or through A10Q1 and A10Q2, K6 is energized and provides power to the seal control valves at pin B2. Pins B7 and B47 are connected to ground through external switches.

(2) A10Q1 and A10Q2 are connected in series with A10Q2 emitter connected to ground at pin A7. Twenty-eight volts dc is applied at J10 pin 4 to provide base voltage for the transistors. With the transistors on, the ground path for K6 is available.

(3) Ground through transistors A10Q1 and A10Q2 can be removed by either of the following:

(a) Removal of A10Q1 base voltage when the following conditions exist:

1) Landing gear lever switch S265 in up or neutral position to ground pin B6.

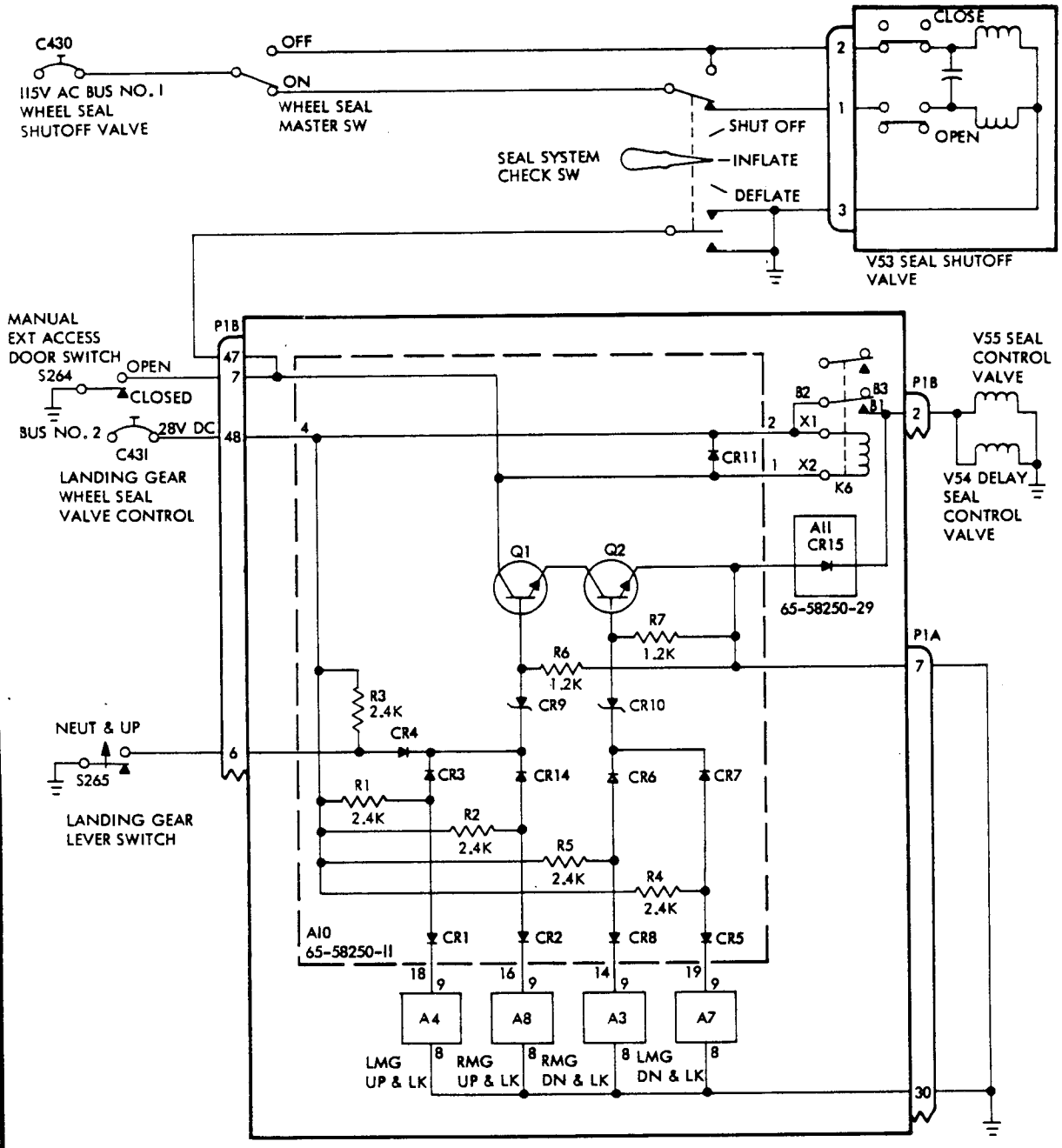
2) Left main gear in up and locked position to actuate A4 and ground J10 pin 18.

3) Right main gear in up and locked position to actuate A8 and ground J10 pin 16.

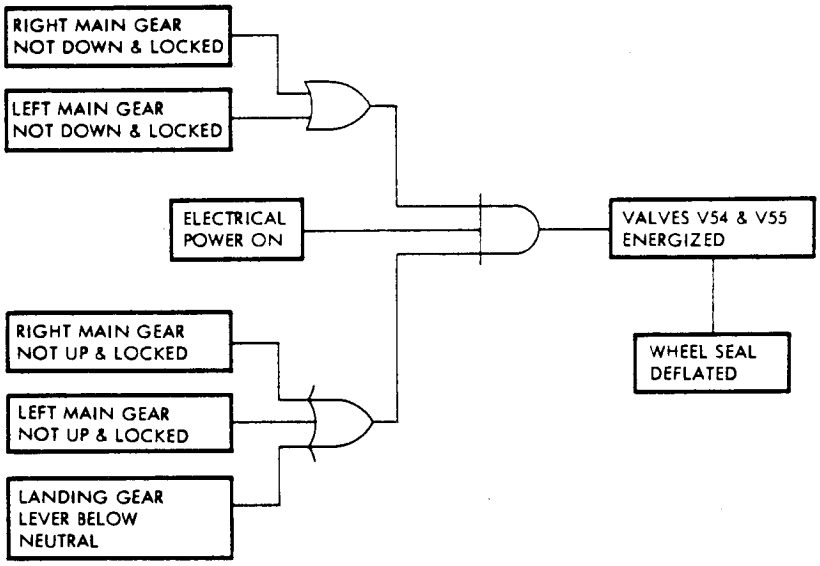
(b) Removal of A10Q2 base voltage when the following conditions exist:

1) Left main gear in down and locked position to actuate A7 and ground J10 pin 14.

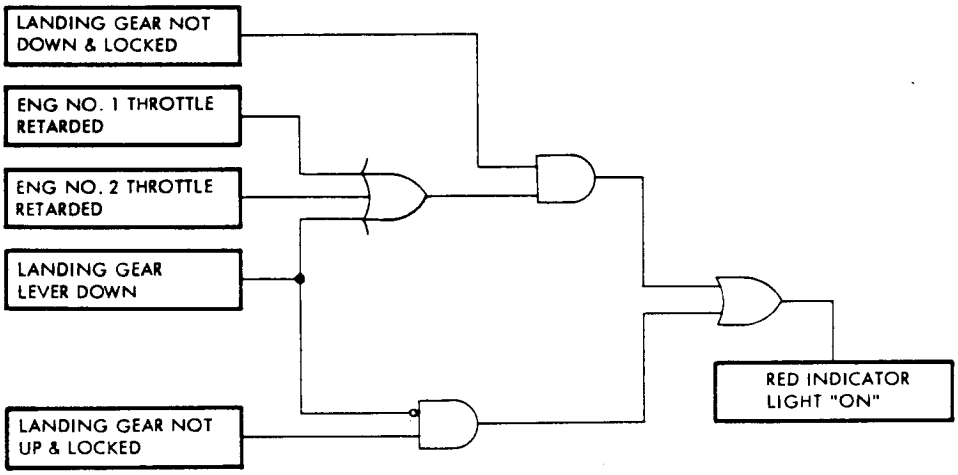
2) Right main gear in down and locked position to actuate A3 and ground J10 pin 14.



NOTE:
A3, A4, A7 & A8 ARE 10-61226 SWITCHES
DIODES CR1 THRU CR8, CR11 AND CR14 ARE IN4385
UNLESS OTHERWISE SPECIFIED ALL RESISTANCES ARE IN OHMS ±5%



Wheel Seal Deflation Logic Diagram
Figure 7



Red Indicator Lamp "ON" Logic Diagram
Figure 8

C. The landing gear warning system consists of logic cards A11 and A12, proximity switches A3 through A8 and their associated external proximity sensors, and external indicator lamps and switches. The system provides green lamp indications when the landing gears are down and locked. Also, it provides red lamp indications indicating unsafe conditions (see figure 8) when:

(1) The landing gear is in transit.

(2) The landing gear position and the landing gear control lever are not in agreement.

(3) The engine throttles are retarded to the idle range and the landing gear is not down and locked.

D. Since the lamp indication circuits are the same, only the right main gear circuit will be explained. (See figure 9.) Circuit power (Q1, Q2 base drive) is provided at pin A33 (J11 pin 12). Circuit grounds are at pin A30 and pin A55 (J11 pin 2).

(1) A ground path will be provided at pin A41 to turn on the green lamp when normally-open proximity switch A7 is actuated. A7 is connected to an external proximity sensor. When the landing gear is down and locked, the sensor will actuate A7.

(2) A ground path will be provided for the red lamp at pin A42 when either of the following conditions exist:

(a) A11Q1 will provide ground when:

1) The landing gear lever is not down (open circuit to pin A35) and:

2) The landing gear is not in the up and locked position (normally-open proximity switch A8 not actuated).

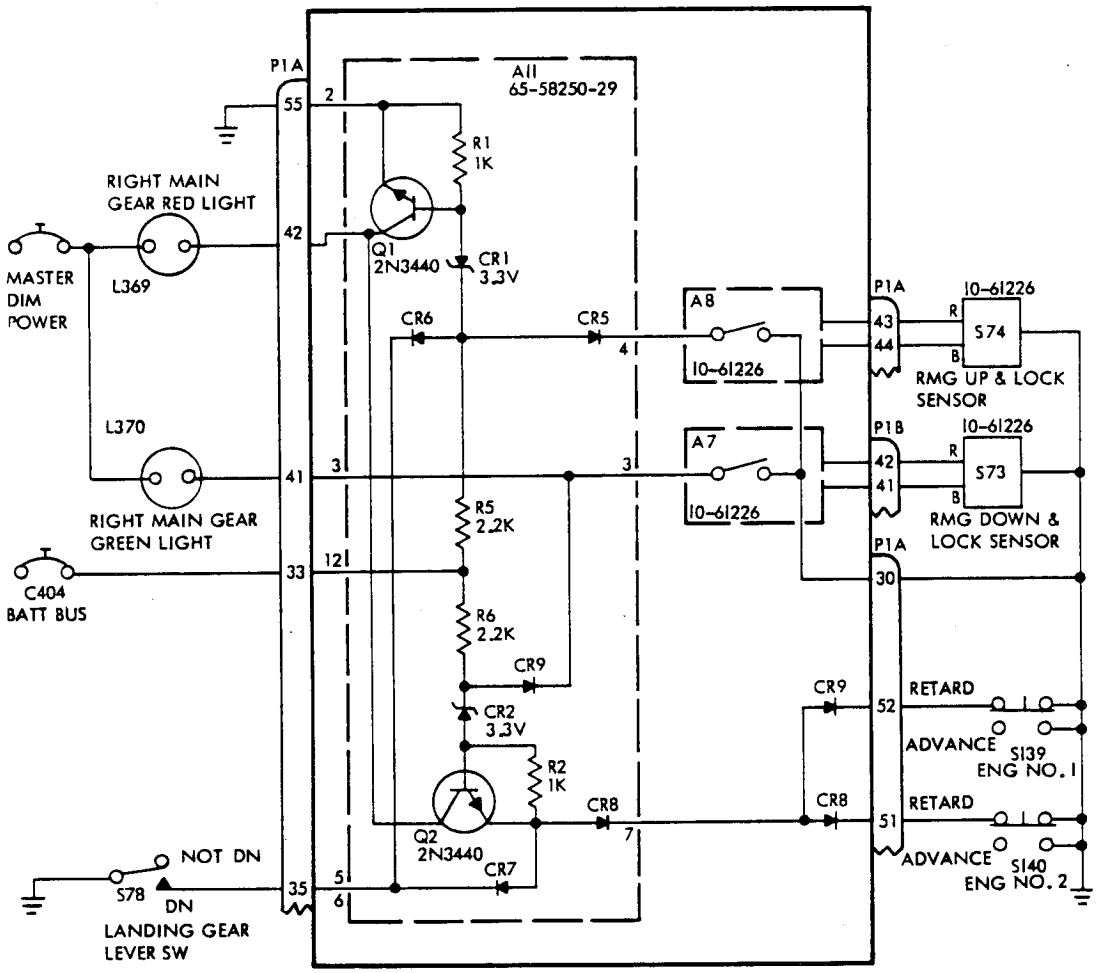
(b) A11Q2 will provide ground when the landing gear is not in the down and locked position (normally-open proximity switch A7 is not actuated) and one of the following occur:

1) The landing gear lever is down (ground to pin A35).

2) Engine No. 1 throttle is retarded (ground to pin A52).

3) Engine No. 2 throttle is retarded (ground to pin A51).

E. The landing gear aural warning system consists of logic card A9, load card A13, normally-open proximity switches and associated landing gear position sensors, and external switches and a horn. Figure 10, sheet 1,



NOTE:
UNLESS OTHERWISE SPECIFIED
ALL RESISTANCES ARE IN OHMS ± 5%
ALL DIODES ARE IN4385

Right Main Gear Visual Indication
Figure 9

illustrates aural warning circuitry for assemblies 65-52811-21, -23, -30, -44, -51, -54, -73, -74, -76, -84, -85, -117, -118, -120, -135, -137, -144, -145, -147, -151. Figure 10, Sheet 2, illustrates aural warning circuitry for assemblies 65-52811-25, -31, -75, -77, -119, -121, -146, -148. The module will provide a ground path for the horn when unsafe conditions exist. Circuit power, +28 volts dc, is applied at pin A-33 (pin B-51 for 65-52811-25, -31, -75, -77, -119, -121, -146, -148). (See Fig. 11 for logic diagram.)

(1) When one or more of the landing gears are not down and locked (proximity switches not actuated) and the flaps are not up, base voltage is available to A9Q1. A9Q1 will conduct and provide a ground path for the horn when one of the following conditions exist:

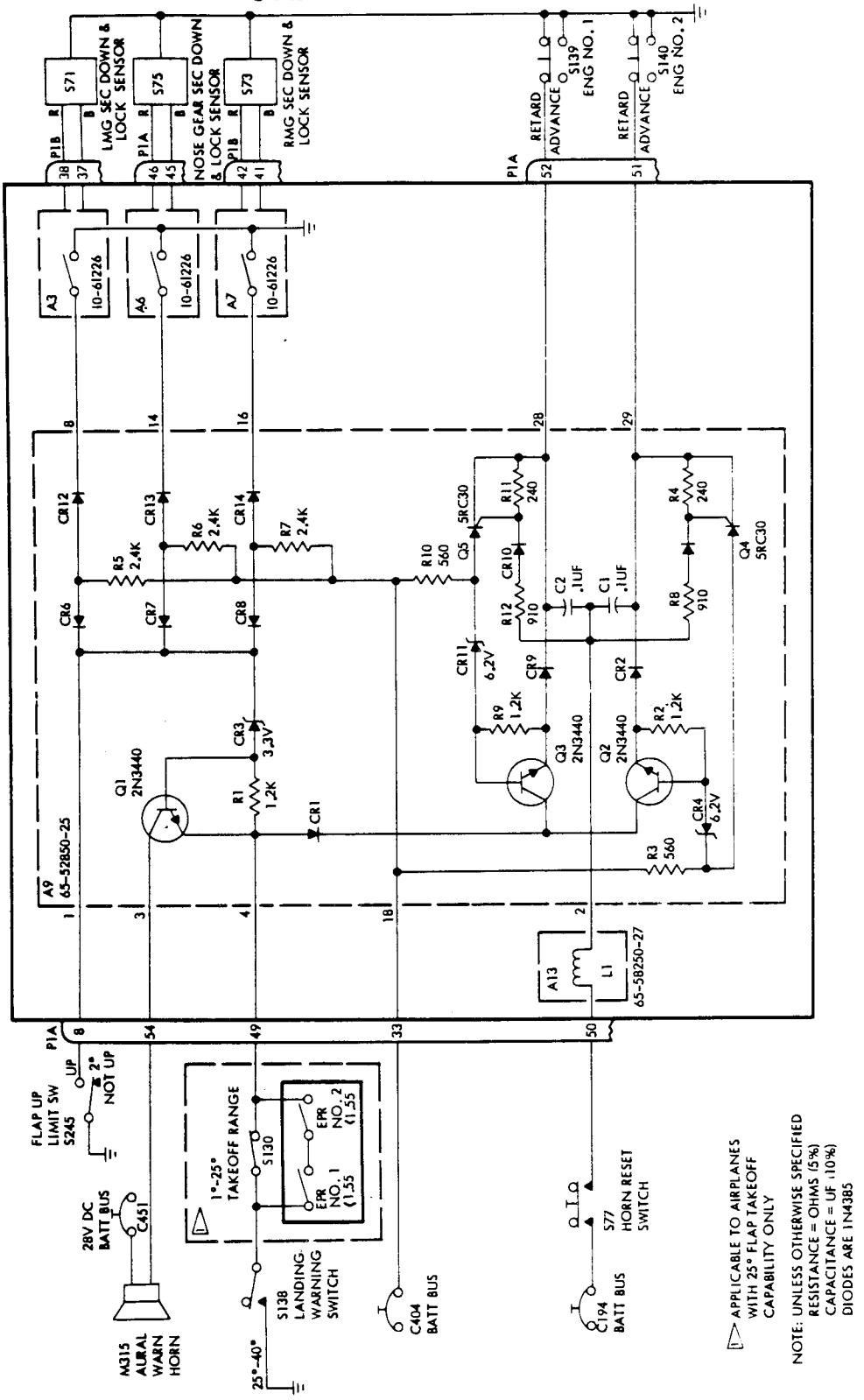
(a) The flaps are extended beyond 25-handle units (and for airplanes with 25-degree flap takeoff capability, both engine pressure ratios are below 1.55 or the flaps are extended beyond 30 degrees). This provides ground at pin A49 and allows A9Q1 to conduct.

(b) Either engine is retarded to idle. This provides a ground at pins A-51 and A-52 and allows A9Q2 or A9Q3 to conduct.

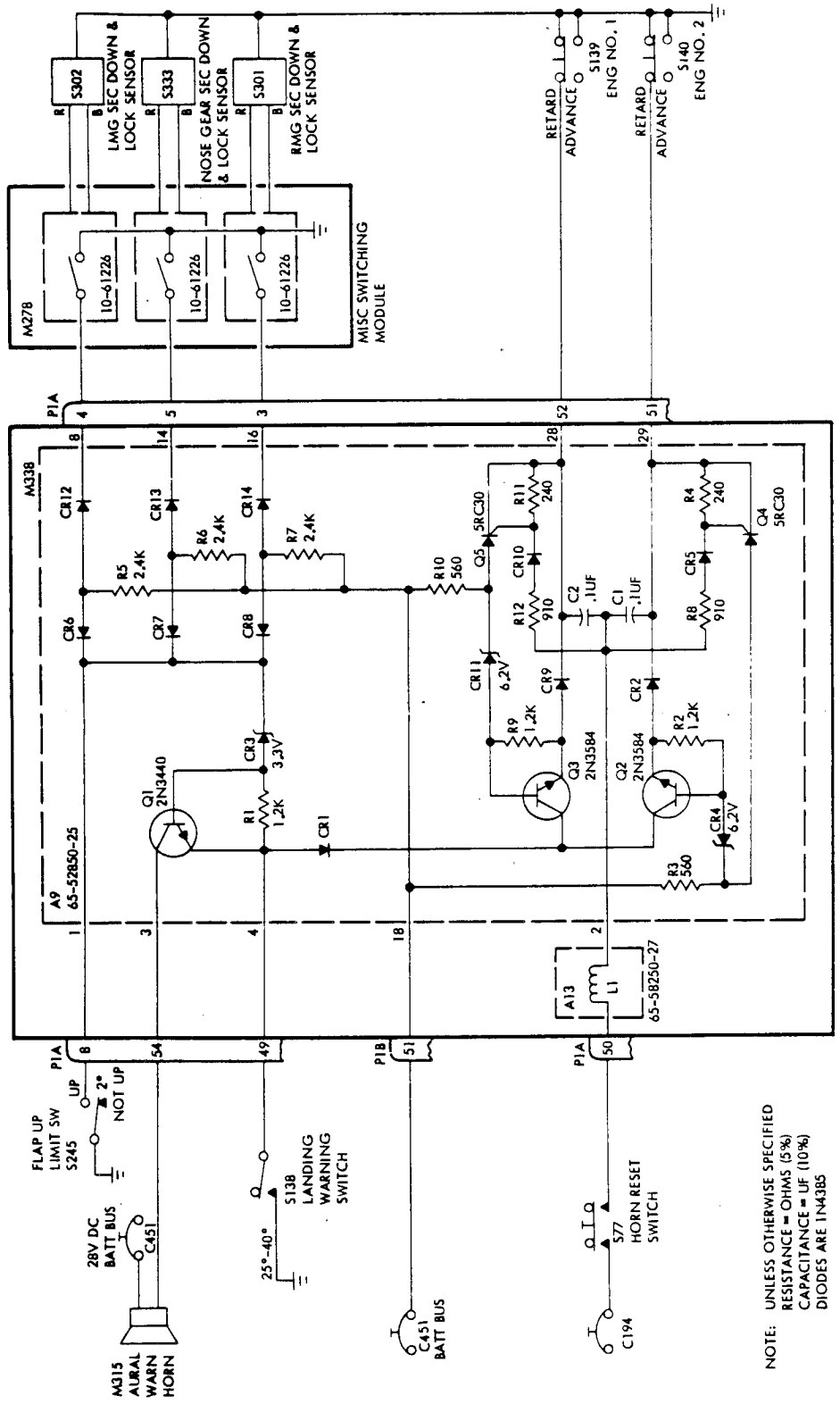
1) In this condition, depressing the horn reset switch provides a positive voltage to the gate of SCR's to turn off A9Q2 and A9Q3 by grounding their base. Advancing either will reset one SCR to again enable the horn circuit.

F. The automatic ground speed brake system actuates the ground and flight spoilers to aid braking after touchdown (Fig. 12). The system consists of logic card A14, relays K9 thru K13, and external switches, lamps and modules. The landing gear module controls the automatic mode of operation of the spoilers when the system is armed. It will provide voltage to cause the spoilers to be raised (pin B-13) or lowered (pin B-5) and provide ground to cause indicator lamps L441 (pin A-34) or L442 (pin A-18) to illuminate. When either lamp is illuminated, the other must be extinguished. Circuit power (system armed) is provided at pin A-56 (and pin B-3 on 65-52811-117 thru -121, -137, -144 thru -148). Pins A-7 and A-67 are circuit grounds.

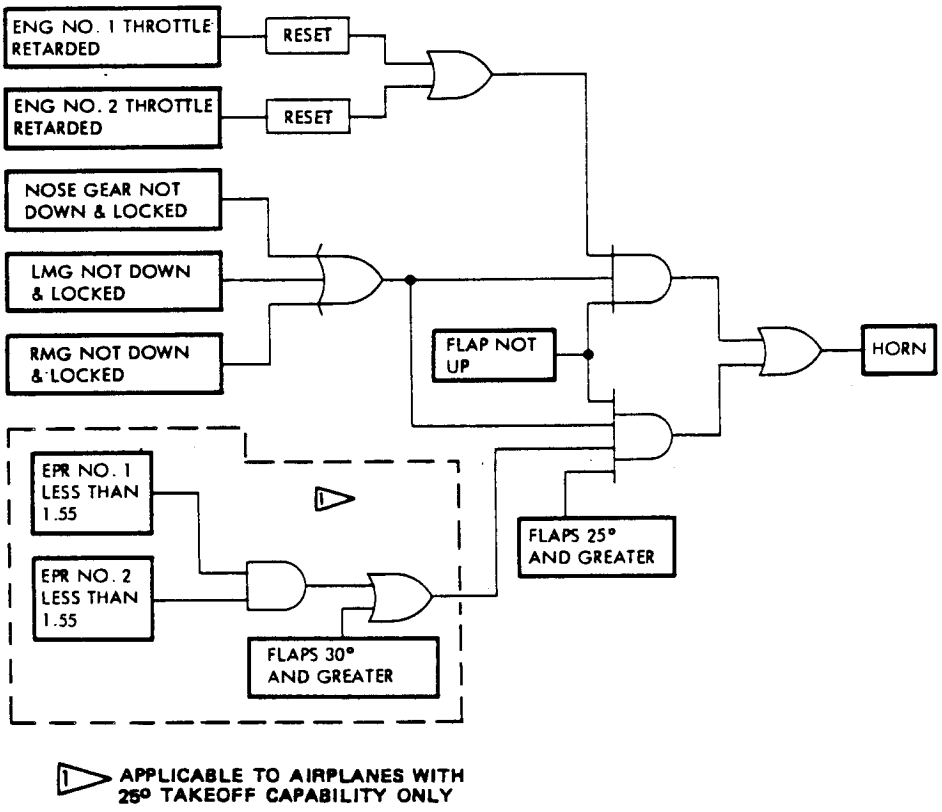
(1) When the speed brake control lever is set to the ARMED position, 28 volts dc is provided to pin 12 of circuit card A14 through pin A-56. This provides base voltage for Q1 through R1, for Q2 through CR11 and CR9/CR7, and for Q3 through CR5. When Q1 is on, L442 (DO NOT ARM) is illuminated. When Q2 is on, L441 (ARMED) is illuminated, and at the same time Q1 is turned off by shunting its base voltage to ground. When Q3 is on, base voltage to Q2 received through CR9 or CR7 is shunted to ground.



Landing Gear Aural System (FAA Certified only)
Figure 10 (Sheet 1 of 2)



Landing Gear Aural System (FAA Certified only)
Figure 10 (Sheet 2 of 2)



Landing Gear Aural Warning Logic Diagram
Figure 11

(2) At the time the speed brake control lever is set to ARMED, if both inboard and outboard antiskid systems are inoperative, Q2 base voltage is shunted to ground through CR8 and CR10. Q2 will be off, Q1 will be on, and the DO NOT ARM indicator will be illuminated.

(3) Presuming antiskid systems operative, and control lever set to ARMED, the 28-volt dc input to pin A-56 (and B-3 on 65-52811-117 thru -121, -137, -144 thru -148) can be passed through two of relays K9, K10, K11, or K12 provided main landing gear speeds have reached 60 knots. Wheel speed inputs from the antiskid control system energize the wheel speed relays individually. Sixty knots on both outboard wheels, both inboard wheels, or both wheels on one side, is the minimum combination required to energize two relays such that 28 volts dc is passed through pin B-13 to the raise coils of the handle actuator (M359). The handle will be driven to the raise position. The lower limit switch shunts A14-Q3 base voltage (received through R4) to ground. As the handle departs the lower limit, the shunt is removed. However, the combination of relays that provided power to the raise windings also passes 28 volts dc to pin 4 of card A14. This holds Q2 on, L441 (ARMED) illuminated even though Q3 is turned on. On 65-52811-51, -54, -137, the combination of K9, K10, K11, and K12 relays also passes 28 volts dc from pin B-46 to the automatic brake control module (M577) autobrake output relay.

(4) On 65-52811-51, -54, -135, -137, a ground input to the automatic brake control module (M577) wheel speed relay is provided at pin A-55 until all four wheels reach 60 knots (K9, K10, K11, and K12 all energized). When any wheel speed reaches 60 knots (any of the four relays energized) a ground output to the M577 wheel speed relay is provided at B-7.

(5) When either throttle is advanced to the 25-degree position, K13 coil is grounded, K13 is energized, and 28 volts dc is provided through pin B-5 to lower the handle actuator.

(6) The following are self-check test circuits that simulate the system operation (control in ARMED position).

(a) Test circuit 1 simulates K9 or K10. Twenty-eight volts is applied at pin A-58 (J14 pin 3) to remove the ground path at pin A-34 (J14 pin 11).

(b) Test circuit 2 simulates K11 or K12. J14 pin 5 is grounded through a 150-ohm resistor at pin A-60. This removes the ground path at pin A-34 (J14 pin 11).

(c) Test circuit 3 simulates engine throttle advance. It grounds pin B-4 to actuate K13. Also, it applies 28 volts dc from pin A-60, through K13 to J14 pin 6. This removes the ground path at pin A-34 (J14 pin 11).

G. The takeoff aural warning system (figures 13 and 14) consists of logic card A12, relay K3, external switches and the M315 aural warning module (which contains the horn). The landing gear module provides a ground path to M315 when an unsafe flight control condition exists prior to takeoff. The intermittent horn will operate and will not turn off until the condition is corrected. Twenty-eight volt dc circuit power is applied at pin A33. Circuit ground is at pin A30. The ground to M315 to operate the horn is available at pin A22 when the following conditions exist.

(1) Airplane is on ground (K3 de-energized). This removes the ground at pin A17 (A12Q2 base) and:

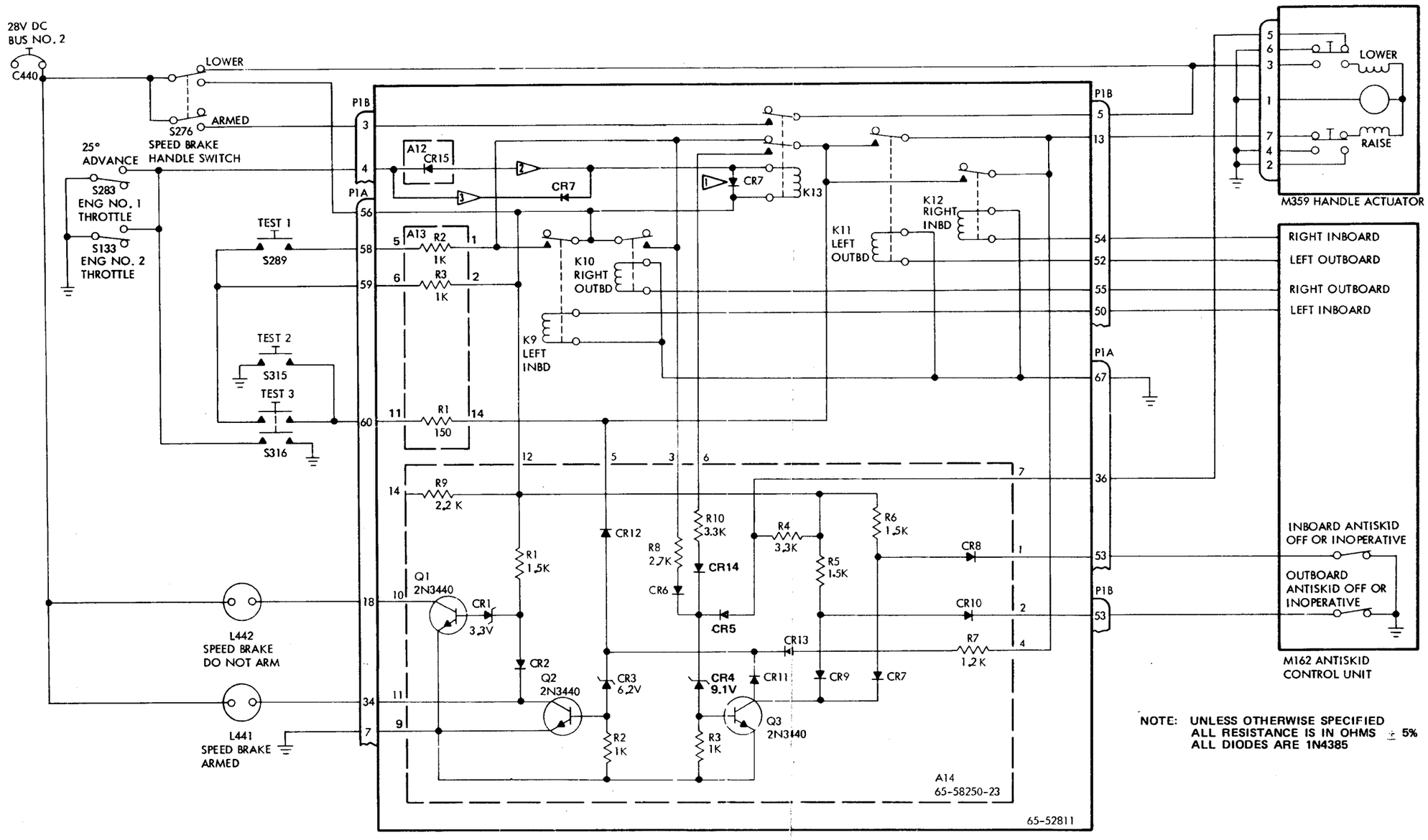
(2) Either engine throttle is in the advanced position. This grounds pin B4 (A12Q1 base) and prevents A12Q1 from conducting, and:

(3) Pin A23 is grounded (A12Q2 emitter) due to any of the following conditions:

(a) Stabilizer set too high or too low, or:

(b) Flaps extended too far, or

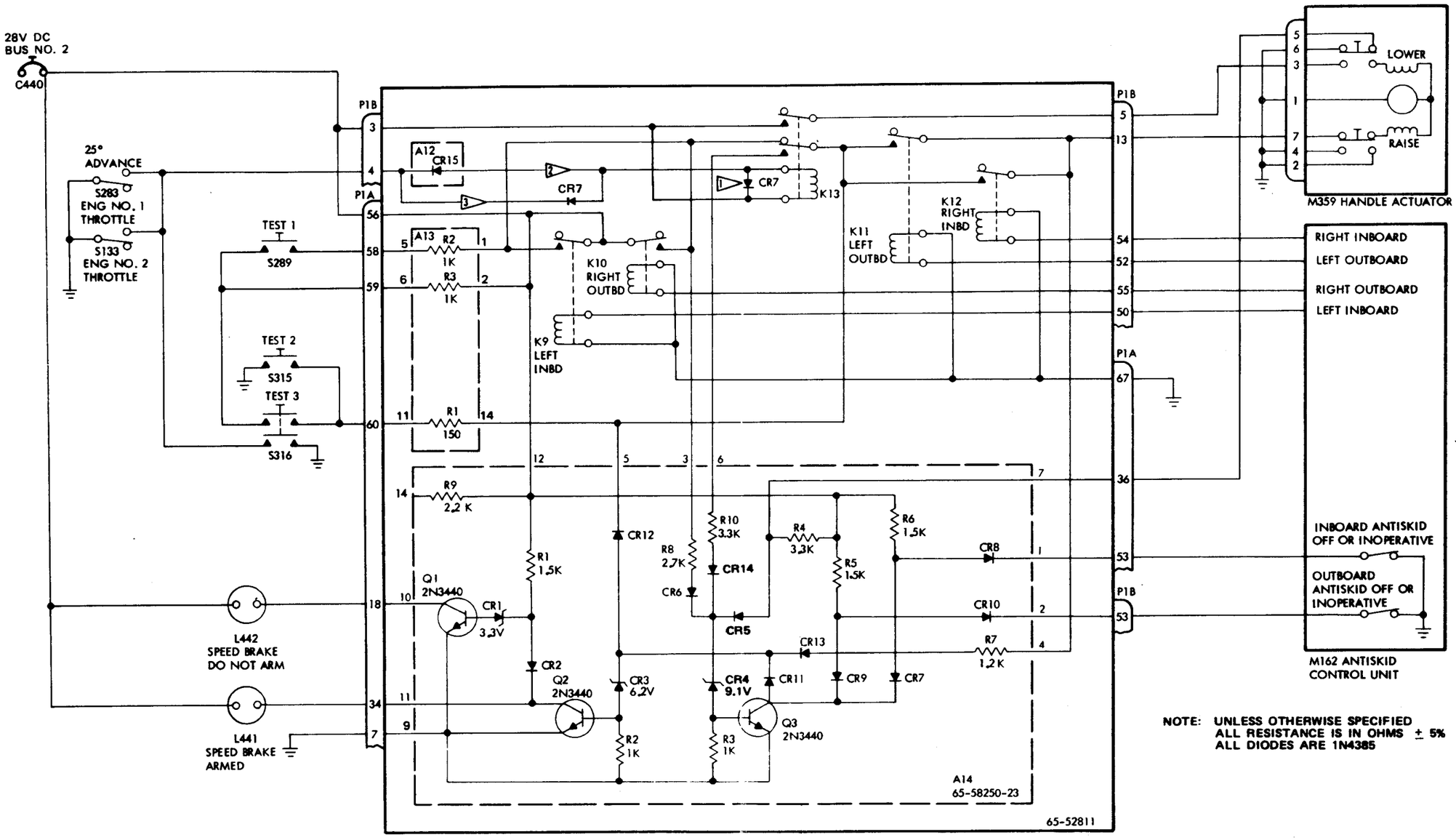
(c) Speed brake lever not in proper position.



NOTE: UNLESS OTHERWISE SPECIFIED
ALL RESISTANCE IS IN OHMS ± 5%
ALL DIODES ARE 1N4385

65-52811-21, -23, -25, -30, -44, -51, -54, -73 THRU -77, -84, -85

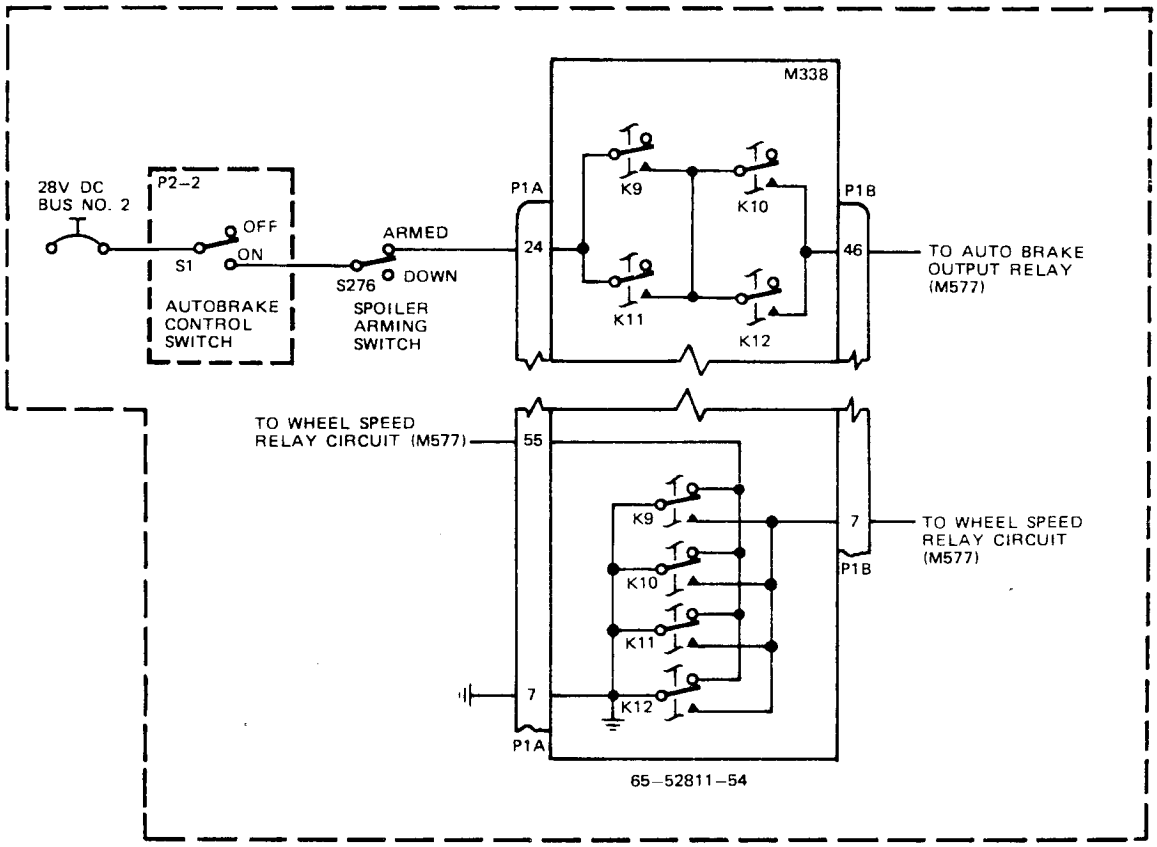
1 CR3 ON 65-52811-23, -30, -44, -74, -75, -84, -85
2 65-52811-21, -25, -51, -54, -73, -75, -77
3 65-52811-23, -30, -44, -74, -76, -84, -85

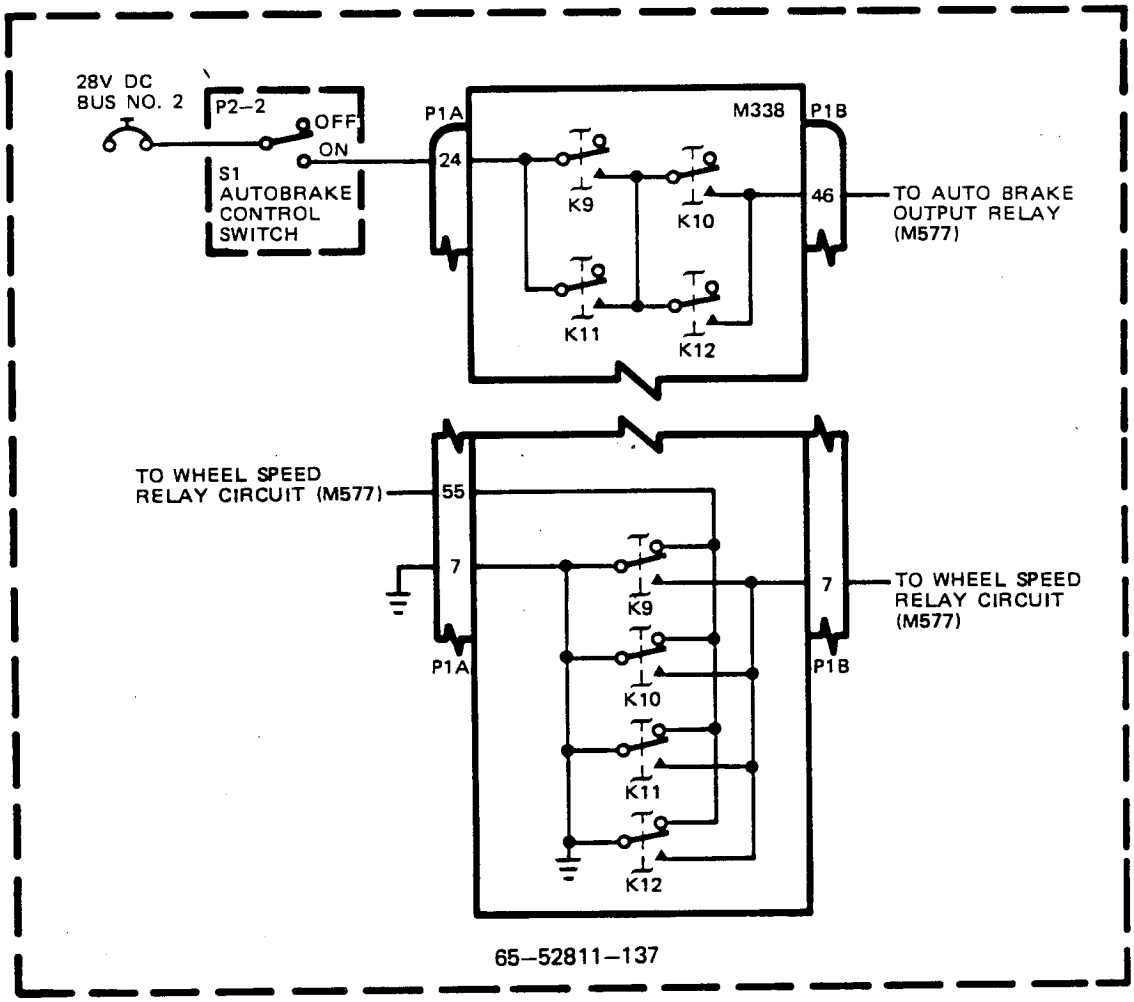


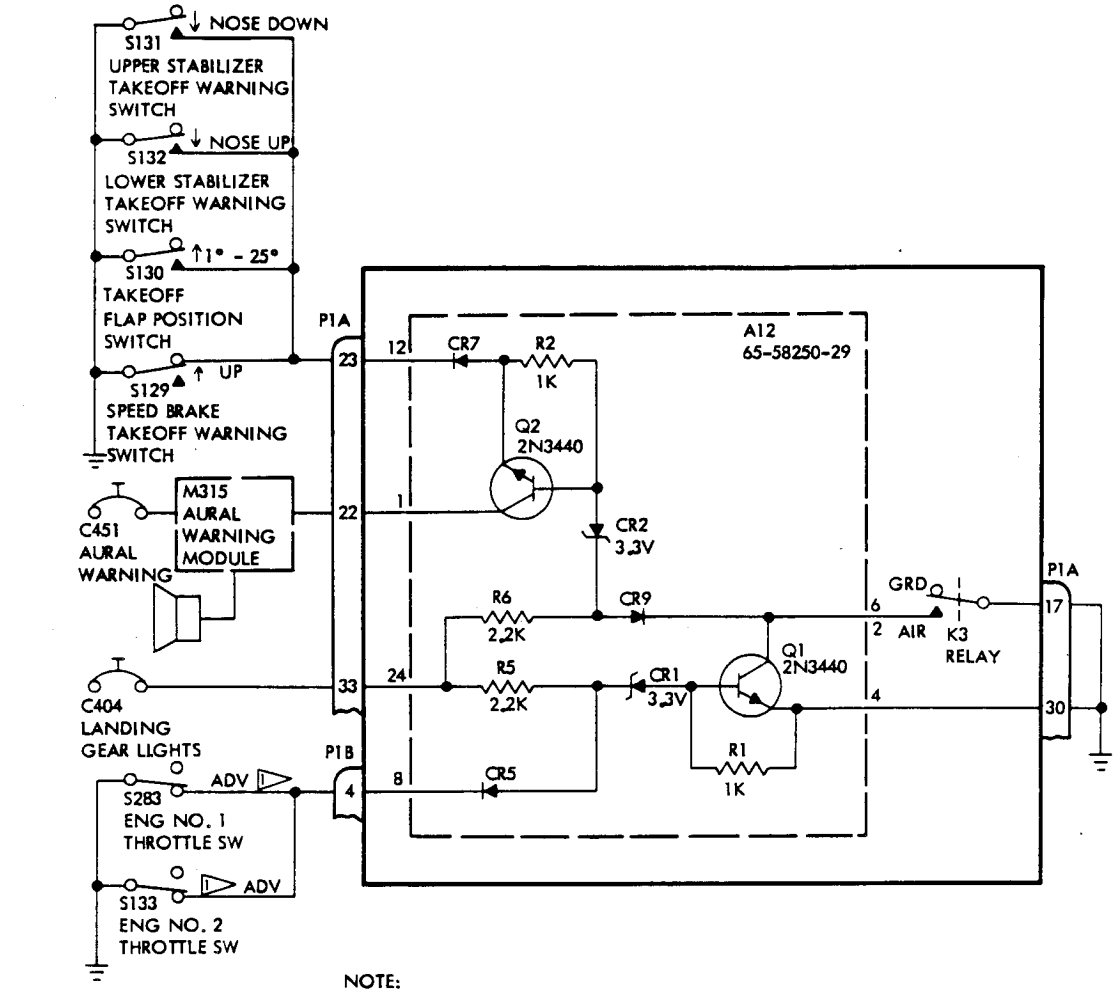
NOTE: UNLESS OTHERWISE SPECIFIED
ALL RESISTANCE IS IN OHMS ± 5%
ALL DIODES ARE 1N4385

65–52811–117 THRU –121, –135, –137, –144, THRU –148, –151

1 CR3 ON 65–52811–118, –120, –145, –147, –151
2 65–52811–117, –119, –121, –135, –137, –144, –146, –148
3 65–52811–118, –120, –145, –147, –151

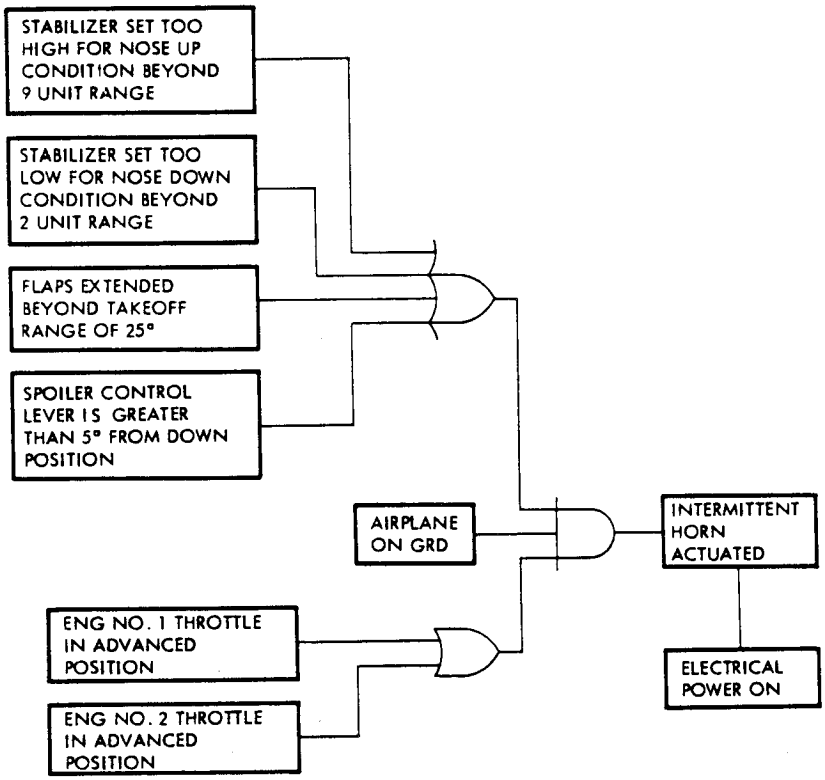

28V DC
BUS NO. 2
P2-2
OFF
ON
S1
AUTOBRAKE
CONTROL
SWITCH
ARMED
DOWN
S276
SPOILER
ARMING
SWITCH
M338
P1A
P1B
24
46
K9
K10
K11
K12
TO AUTO BRAKE
OUTPUT RELAY
(M577)
TO WHEEL SPEED
RELAY CIRCUIT (M577)
55
7
TO WHEEL SPEED
RELAY CIRCUIT
(M577)
65-52811-54


28V DC
BUS NO. 2
P2-2
OFF
ON
S1
AUTOBRAKE
CONTROL
SWITCH
P1A
24
M338
P1B
K9
K10
K11
K12
46
TO AUTO BRAKE
OUTPUT RELAY
(M577)
TO WHEEL SPEED
RELAY CIRCUIT (M577)
55
7
7
TO WHEEL SPEED
RELAY CIRCUIT
(M577)
P1A
P1B
65-52811-137



NOTE:
UNLESS OTHERWISE SPECIFIED
ALL RESTANCES ARE IN OHMS ± 5%
DIODES CR5, CR7 AND CR9 ARE 1N4385

Takeoff Warning System
Figure 13



Takeoff Warning System Logic Diagram
Figure 14

4. Deleted

REPAIR

1. Repair

   A. Repair can be accomplished using applicable instructions in 20-11-05 and standard industry practices, except as noted below.

   B. If keying plugs (55, Fig. 1101) require replacement, install in connectors as indicated in Fig. 401.

Connector	Position
J1,J2,J4,J5,J8	10-L
J3,J7*[1]	10-L
J3,J7*[2]	2-B
J6	2-B
J9	23-24,25-26
J10	5-6,11-12
J11	8-J,9-K
J12	15-16,17-18
J13	3-C,12-N
J14	8-J,13-P

*[1] 65-52811-21, -23, -25, -30, -31, -51, -54, -117 thru -121, -135, -137

*[2] 65-52811-44, -73 thru -77, -84, -85, -144 thru -148, -151

Keying Plug Installation
Figure 401

   C. When installing relay K8 (65-52811-21, -51, -54, -73, -117, -135, -137, -144), orient with contrasting bead at pin 2 of socket.

TESTING

1. Test Equipment

   A. Power Supplies:

      (1) 28 ± 1 vdc, 1 amp

      (2) 28 ± 1 vac, 400 ± 5 Hz

   B. Multimeter:

      (1) Simpson 260P or equivalent

   C. Oscilloscope:

      (1) Tektronix 475 or equivalent

   D. Test Lamps:

      (1) 28 vdc, 100 ma (1820 or equivalent) (9 required) (L1-L7, L10, L11)

      (2) 28 vdc, 40 ma (327,387,1819 or equivalent) (2 required) (L8, L9)

      (3) 28 vdc, 500 ma (three 313 or 1821 lamps in parallel or equivalent) (L12)

   E. Test Sensors:

      (1) ELDEC P/N 1-899-3 *[1] (Boeing 10-61226-3)(10-61226-2 optional) (4 required) (S72, S74, S105, S106) (65-52811-21, -51, -54, -73, -117, -135, -137, -144 only)

      (2) ELDEC P/N 1-899-3 *[1] (Boeing 10-61226-3) (2 required) (S71, S73) (65-52811-21, -51, -54, -117, -135, -137 only)

   F. Test Gage *[2]:

      (1) ELDEC P/N 8-005100-1 *[1]

   G. Actuating Slug *[2]: Hi-Mu 80 or Permalloy steel

      (1) 1.20 x 0.50 x 0.05 ±0.01 inches (4 required) (65-52811-21, -51, -54, -73, -117, -135, -137, -144 only)

      (2) 1.20 x 0.50 x 0.05 ±0.01 inches (2 required) (65-52811-21, -51, -54, -117, -135, -137, only)

H. Plexiglass spacer *[2]:

(1) 2 x 3 x 0.150 +0/-0.01 inches (4 required) (65-52811-21, -51, -54, -73, -117, -135, -137, -144 only)

(2) 2 x 3 x 0.150 +0/-0.01 inches (2 required) (65-52811-21, -51, -54, -117, -135, -137 only)

(3) 2 x 3 x 0.250 +0.01/-0 inches (4 required) (65-52811-21, -51, -54, -73, -117, -135, -137, -144 only)

(4) 2 x 3 x 0.250 +0.01/-0 inches (2 required) (65-52811-21, -51, -54, -117, -135, -137 only)

I. Switches:

(1) SPST

(a) 22 required (S1-S16, S18, S20, S23, S26, S75, S76)

(b) 1 required (S24) (65-52811-25, -31, -75, -77, -119, -121, -146, -148 only)

(c) 1 required (S25) (65-52811-117 thru -121, -137, -144 thru -148 only)

(d) 2 required (S71, S73) (65-52811-23, -25, -30, -31, -44, -73 thru -77, -84, -85, -118 thru -121, -144 thru -148, -151 only)

(e) 4 required (S72, S74, S105, S106) (65-52811-23, -25, -30, -31, -44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151 only)

(2) SPDT 3-position (2 required) (S17, S22)

(3) Pushbutton, normally open (S21)

J. Banana Jacks and Plugs:

(1) Jacks

(a) Dual

1) 2 required (J75, J76)

2) 2 required (J71, J73) (65-52811-23, -25, -30, -31, -44, -73 thru -77, -84, -85, -118 thru -121, -144 thru -148, -151 only)

3) 4 required (J72, J74, J105, J106) (65-52811-23, -25, -30, -31, -44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151 only)

(b) Single (J23)

J. (Continued)

(2) Plugs (used with centerpoint sensor)

(a) Dual

(b) Single

K. Resistors:

(1) 8.2K, 10PCT, 1W (2 required) (R5, R6)

(2) 8.2K, 10PCT, 1W (2 required) (R3, R7) (65-52811-23, -25, -30, -31, -44, -73 thru -77, -84, -85, -118 thru -121, -144 thru -148, -151 only)

(3) 8.2K, 10PCT, 1W (4 required) (R1, R2, R4, R8) (65-52811-23, -25, -30, -31, -44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151 only)

(4) 1K, 10 pct, 1w (R10)

L. Calibration Test (Dial) Stand (including 1.2" x 0.5" x 0.05" target and dial indicator):

(1) ELDEC P/N 3-455-16 *[1]

M. Centerpoint Sensor Kit (including 1-899-15CP02 centerpoint sensor):

(1) ELDEC P/N 1-899-15CP01 *[1]

N. Connector (with pigtail lead):

(1) DPX2MB67S67S33B0000 *[3]

O. Diode: 1N4385 or equivalent.

*[1] ELDEC Corp., 16700 13th Ave. West, P.O. Box 100, Lynnwood, Washington 98036

*[2] Actuating slug and plexiglass spacer optional to test gage.

*[3] International Telephone and Telegraph Corp., ITT Cannon Electric Div., 10550 Talbert Ave., P.O. Box 8040, Fountain Valley, California 92708.

2. Functional Test

A. Using of Sensors in Testing

(1) When sensor actuation is required, use zero gap between test slug and sensor.

(2) When proximity switch tolerance test specified, use three-step procedure specified in Fig. 701 when using actuating slug and plexiglass spacers or steps 2 and 3 when using test gage with sensor actuating and non-actuating sides.

Step	Procedure
1	Use zero gap between slug and sensor. Test results shall indicate actuated sensor. If not actuated, suspect defective proximity switch.
2	Use 0.250-inch plexiglass spacer between slug and sensor. Test results shall indicate deactuated sensor. If actuated, suspect defective proximity switch.
3	Use 0.150-inch plexiglass spacer between slug and sensor. Test results shall indicate actuated sensor. If not actuated, suspect defective proximity switch, or extension of red and blue leads between connector and card crossed.

NOTE: Tolerance vary with permeability of actuating slug. Those given are for Hi-Mu 80.

Proximity Switch Tolerance Selection
Figure 701

B. Verify continuity between pin-pairs listed in Fig. 702. Use position lead of multimeter on pin listed in from pin column.

Component Tested	From Pin (+)	To Pin (-)
K2	A-29	A-9
	A-29	B-1
	A-16	A-21
	B-29	B-23
K1	B-25	B-32
	A-26	A-25
	A-29	A-14
	A-29	B-45
K4	A-19	B-30
	A-31	A-15
	B-8	B-14
	B-11	B-10
K7/R2	B-15	B-16*[1]

Component Tested	From Pin (+)	To Pin (-)
K5	B-19	A-17
	A-62	A-63
	A-65	A-66 *[2]
	B-21	B-49 *[2]
K3	B-43	A-17
	B-33	B-28
	A-11	A-12
K3/CR6 *[3]	A-17	B-17 *[4]
K8 *[2]	B-58	B-56
	B-61	B-60
	B-64	B-63
	B-67	B-66

*[1] 4 to 6 ohms

*[2] 65-52811-23, -25, -30, -31, -44, -74 thru -77 -84, -85, -118 thru -121, -145 thru -148, -151 only

*[3] CR6 on 65-52811-21, -25, -31, -51, -54, -73, -75, -77, -117, -119, -121, -135, -137, -144, -146, -148

CR4 on 65-52811-23, -30, -44, -74, -76, -84, -85, -118, -120, -145, -147, -151

*[4] 25 ohms max

Continuity Tests
Figure 702

C. Verify no continuity (50 K minimum) between pin-pairs per Fig. 703. Use positive lead of multimeter on pin listed in from pin column.

Component Tested	From Pin (+)	To Pin (-)
K2	A-6	A-29
	A-13	A-29
	A-20	A-21
	B-24	B-29
K1	A-27	A-25
	A-57	A-29
	B-9	A-29
	B-26	B-32
K4	A-28	A-31
	B-12	B-10
	B-31	A-19
	B-34	B-8

Component Tested	From Pin (+)	To Pin (-)
K7	B-18	A-32
K5	A-61	A-63
	B-64	A-66 *[1]
	B-20	A-17
	B-22	B-49 *[1]
K3	A-10	A-12
	B-27	B-28
K3/S1	B-44	A-17
K8 *[1]	B-57	B-56
	B-59	B-61
	B-62	B-64
	B-65	B-67

*[1] 65-52811-23, -25, -30, -31, -44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151 only

No-Continuity Tests
Figure 703

D. Verify 1150 ± 10% between pins A-58 and A-60.

E. Verify 1000 ± 25% between pins A-59 and A-56.

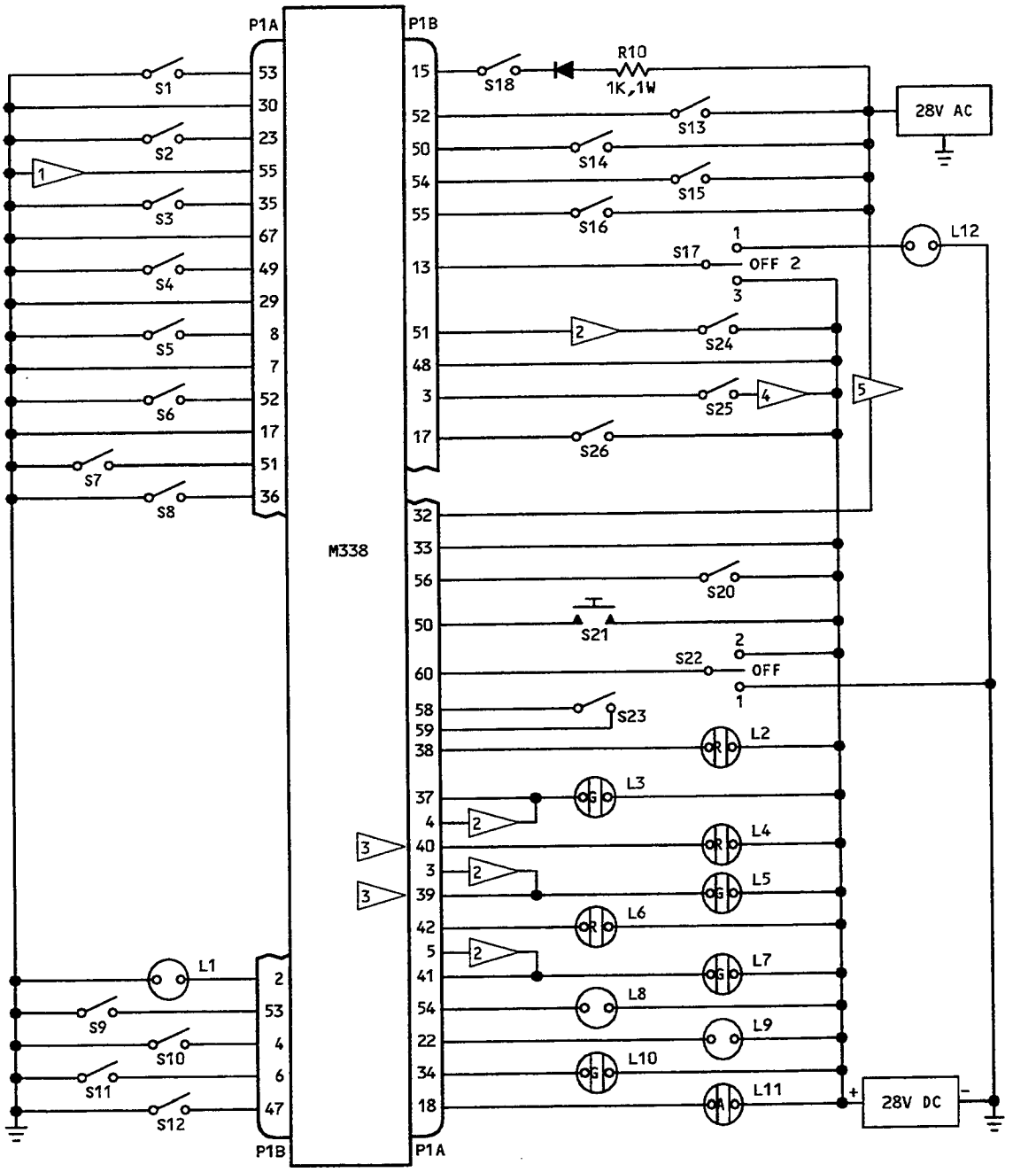
F. Connect test setup per Fig. 704. Turn on both power supplies.

NOTE: The centerpoint sensor leads are terminated in banana plugs. The red and blue leads are terminated in a dual banana plug such that they are inserted and removed as a pair. The yellow lead is terminated in a single banana plug which is inserted into the Y jack (J23) of the test setup, Fig. 704. It is important that the red lead connects to the red banana jack and that the blue lead connects to the blue banana jack throughout the entire test.

Figure 705 lists the functions simulated by the test setup. The reference designators are the same as the airplane reference designators for that function. The M reference designators are for the module within which a function occurs.

Reference Designators DS1 and DS2 are used in place of module indicators L1 and L2 for 65-52811-23, -30, -44, -54, -74, -76, -84, -85, -118, -120, -137, -145, -147, -151.

The test setup and module both have indicators L1 and L2, and switches S1 and S2. Consider all indicators and switches as part of test setup unless module indicators and switches are specifically listed.



1 NOT APPLICABLE TO 65-52811-54,-137

2 65-52811-25,-31,-75,-77,-119,-121,-146,-148 ONLY

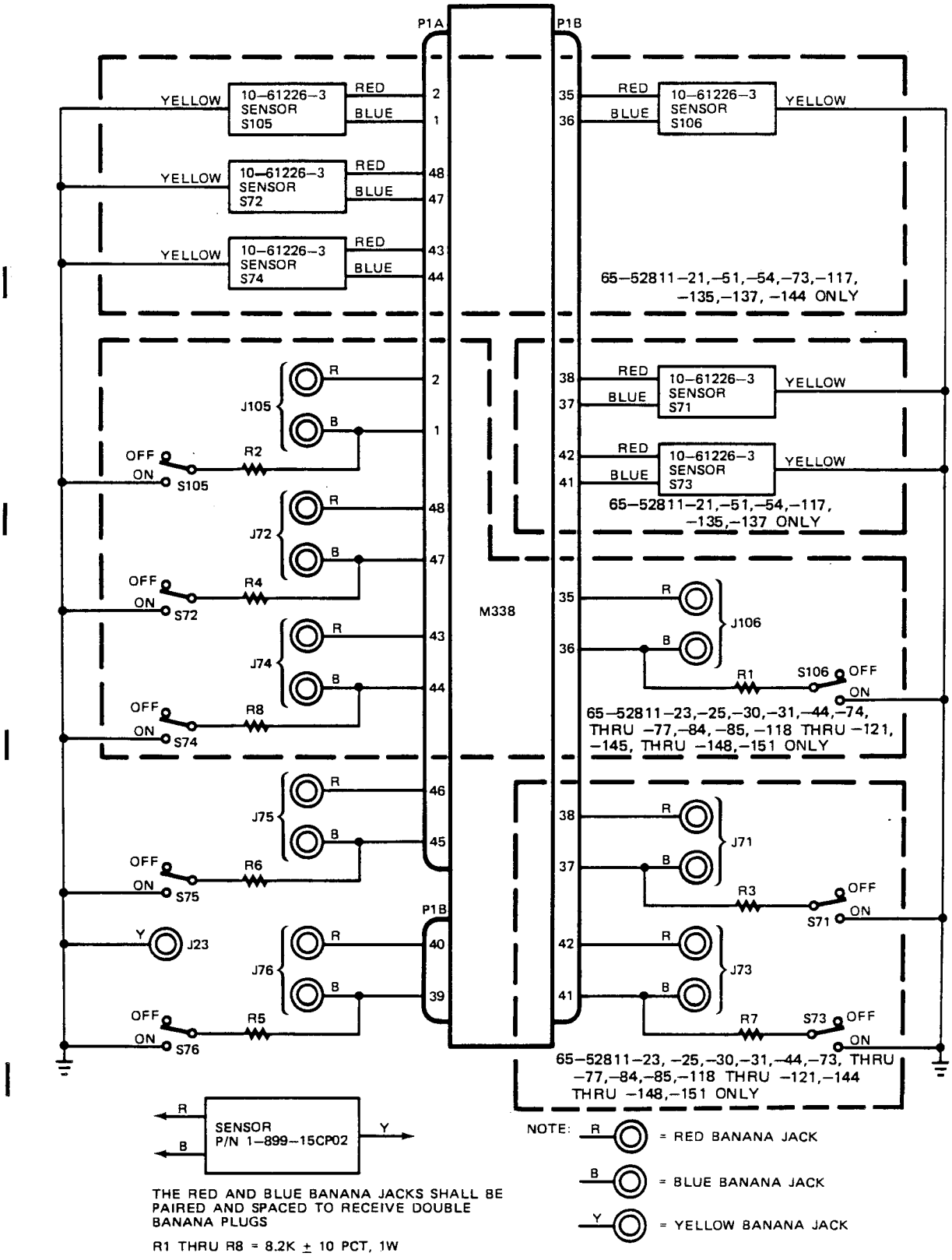
3 INTERCHANGE PINS 39 AND 40 WHEN TESTING 65-52811-44,-73 THRU -77,-84,-144 THRU -148

4 65-52811-117 THRU -121,-137,-144 THRU -148 ONLY

5 65-52811-21,-51,-54,-73,-117,-135,-137,-144 ONLY

Test Setup
Figure 704 (Sheet 1)

GT74662



Test Setup
Figure 704 (Sheet 2)

Test Item	Initial Condition	Aircraft Circuit Function	Aircraft Ref Desig.
S1	On	Simulates Inboard Antiskid Inoperative	M162F
S2	On (Beyond 25°)	Flap Position Warning Switch	S130
S3	Off (Not Down)	Landing Gear Lever Switch	S78
S4	On (Down)	Landing Warning Switch	S138
S5	On (Up)	Flap Up Limit Switch	S245
S6	Off (Advanced)	Engine No. 1 Throttle	S139
S7	Off (Advanced)	Engine No. 2 Throttle	S140
S8	On	Simulates Speed Brake Handle Actuator	M359B
S9	On	Simulates Outboard Antiskid Inoperative	M162E
S10	Off (Retard)	Engine Throttle Switch	S133
S11	Off (Down)	Landing Gear Lever Switch	S265
S12	On (Door Open)	Manual Extension Access Door Switch	S264
S13	Off	Simulates Left Outboard Wheelspeed	M162C
S14	Off	Simulates Left Inboard Wheelspeed	M162A
S15	Off	Simulates Right Inboard Wheelspeed	M162D
S16	Off	Simulates Right Outboard Wheelspeed	M162B
S17	Position 2	Simulates Speed Brake Handle Actuator	M359A
S20	Off (Not Armed)	Speed Brake Handle	S276
S21	Off	Throttle Horn Reset	S77
S22	Off	Ground Spoiler Test Switch No. 2	S315
S23	Off	Ground Spoiler Test Switch No. 1	S289
S24*[1]	On	Simulates ARB Configuration	M278A
S25	Off (Not Armed)	Speed Brake Arming Warning Switch	S276
S26	Off (Not Set)	Parking Brake Switch	S100
S106,J106*[3]	Deactuated(Off)	Air Sensing Sensor	S106,J106
S105,J105*[3]	Deactuated(Off)	Ground Sensing Sensor	S105,J105
S71,J71*[3]	Deactuated(Off)	Left Main Gear Downlock Sensor	S71,J71
S72,J72*[3]	Deactuated(Off)	Left Main Gear Uplock Sensor	S72,J72
S76,J76	Deactuated(Off)	Nose Gear Uplock Sensor	S76,J76
S75,J75	Deactuated(Off)	Nose Gear Downlock Sensor	S75,J75
S73,J73*[3]	Deactuated(Off)	Right Main Gear Downlock Sensor	S73,J73
S74,J74*[3]	Deactuated(Off)	Right Main Gear Uplock Sensor	S74,J74
L1	Illuminated	Simulates Wheel Seal Valve	V55
L2	Illuminated	Left Main Gear (Red)	L367
L3	Not Illuminated	Left Main Gear Downlock (Green)	L368
L4	Illuminated	Nose Gear (Red)	L365
L5	Not Illuminated	Nose Gear Downlock (Green)	L366
L6	Illuminated	Right Main Gear (Red)	L369
L7	Not Illuminated	Right Main Gear Downlock (Green)	L370
L8	Not Illuminated	Simulates Continuous Horn	M315B
L9	Not Illuminated	Simulates Interrupted Horn	M315A
L10	Not Illuminated	Speed Brake Armed (Green)	L441
L11	Not Illuminated	Speed Brake Do Not Arm (Amber)	L442
L12	Not Illuminated	Simulates Speed Brake Handle Actuator	M359

Items Simulated by Test Setup
Figure 705 (Sheet 1)

*[1] 65-52811-25, -31, -75, -77, -119, -121, -146, -148 only
*[2] J72, J74, J105 and J106 on 65-52811-23, -25, -30, -31, -44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151
*[3] J71 and J73 on 65-52811-23, -25, -30, -31, -44, -73 thru -77, -84, -85, -118 thru -121, -144 thru -148, -151

Item Simulated by Test Setup
Figure 705 (Sheet 2)

G. Set switches per initial conditions listed in Fig. 705. Verify initial condition for L1 thru L12.

H. Verify module lamp L1 is extinguished and module lamp L2 is illuminated.

I. Perform functional test per Fig. 706.

NOTE: (65-52811-21, -51, -54, -73, -117, -135, -137, -144 only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate test sensors S105 and S106.
(65-52811-23, -25, -30, -31, -44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, 151 only). Module indicators L1 and L2 respond to the test centerpoint sensor as actuation is accomplished. Actuation shall occur as the target bar is brought within 0.275 to 0.325 inches from the sensor. The proximity switch card shall remain actuated as the gap is decreased to zero. Deactuation shall occur as the bar is moved away from the sensor 0.005 to 0.030 inches from the actuation point.

Step	Procedure	Required Results
	Air Sensing Squat Switch	
1	Measure resistance between:	
	(K1,K2) A-9 to B-45	Con
	(K7,R2) B-15 to B-16	4 to 6 ohms
	(K3,K5) B-19 to B-43	Con
	(K4) B-30 to A-19	Con
2	*[1] Connect deactuated sensor to test jack J106	
3	Set S26 to ON	
4	Measure resistance between:	
	(K7) B-18 to A-32	Con
	(K4) B-30 to A-19	Con
	(K7) B-16 to B-15	No Con
5	Press module switch S1, hold	Module lamp L1 on
6	Measure resistance between:	
	(K3,S1) B-44 to A-17	No Con
7	Release module switch S1	Module lamp L1 off
8	*[1] Actuate test sensor	Module lamp L1 on
	*[2] Actuate sensor S106	Module lamp L1 on
9	Measure resistance between:	
	(K1,K2) A-9 to A-14	Con
	(K3) A-10 to A-12	Con
	(K5) A-61 to A-63	Con
	(K5) B-20 to A-17	Con
	(K7,R2) B-16 to B-15	4 to 6 ohms
	*[1] (K5) A-64 to A-66	Con
	*[1] (K5) B-22 to B-49	Con
	(K3) B-27 to B-28	Con
	(K4) B-30 to A-19	Con
	(K3,S1) B-44 to A-17	Con
	*[2] (K8) B-56 to B-58	Con
	*[2] (K8) B-61 to B-60	Con
	*[2] (K8) B-64 to B-63	Con
	*[2] (K8) B-67 to B-66	Con
10	Verify both module lamps L1 and L2 illuminated	
11	Measure resistance between:	
	(K3) A-11 to A-12	No Con
	(K5) A-17 to B-19	No Con
	(K5) A-62 to A-63	No Con

Functional Test
Figure 706 (Sheet 1)

Step	Procedure	Required Results
	*[1] (K5) A-65 to A-66	No Con
	*[1] (K5) B-21 to B-49	No Con
	(K3) B-33 to B-28	No Con
	(K3) A-17 to B-43	No Con
	*[2] (K8) B-56 to B-57	No Con
	*[2] (K8) B-61 to B-59	No Con
	*[2] (K8) B-64 to B-62	No Con
	*[2] (K8) B-67 to B-65	No Con
12	*[1] Deactuate test sensor	Module lamp L1 off
	*[2] Deactuate sensor S106	Module lamp L1 off
13	*[1] Disconnect sensor from test jack J106	
	Take-Off Warning	
14	Set S10 to ON	L9 on
15	Measure voltage between:	
	(A12) A-22 to GND	1 vdc max
16	*[1] Set S106 to ON	L9 off, module lamp L1 on
	*[2] Actuate test sensor S106	L9 off, module lamp L1 on
17	*[1] Set S106 to OFF	L9 on, module lamp L1 off
	*[2] Deactuate test sensor S106	L9 on, module lamp L1 off
18	Set S2 to OFF	L9 off
	Ground Sensing Squat Switch	
19	*[1] Connect deactuated sensor to test jack J105	
20	*[1] Actuate test sensor	Module lamp L2 off
	*[2] Actuate sensor S105	Module lamp L2 off
21	Measure resistance between:	
	(K1) B-9 to A-29	Con
	(K1) A-57 to A-29	Con
	(K1) A-27 to A-25	Con
	(K1) B-26 to B-32	Con
	(K2) A-6 to A-29	Con
	(K2) A-13 to A-29	Con
	(K2) A-20 to A-21	Con
	(K2) B-24 to B-29	Con
	(K4) B-31 to A-19	Con
	(K4) B-34 to B-8	Con
	(K4) B-12 to B-10	Con
	(K4) A-28 to A-31	Con

Functional Test
Figure 706 (Sheet 2)

Step	Procedure	Required Results
	(K7) B-18 to A-32	Con
	(K8) B-57 to B-56	Con
	(K8) B-59 to B-61	Con
	(K8) B-62 to B-64	Con
	(K8) B-65 to B-67	Con
22	Measure voltage between:	
	(K2) B-1(+) to A-29	26 to 28 vdc
23	Measure resistance between:	
	(K1) B-45 to A-29	No Con
	(K1) A-14 to A-29	No Con
	(K1) A-26 to A-25	No Con
	(K1) B-25 to B-32	No Con
	(K2) A-9 to A-29	No Con
	(K2) A-16 to A-21	No Con
	(K2) B-23 to B-29	No Con
	(K4) B-30 to A-19	No Con
	(K4) B-14 to B-8	No Con
	(K4) B-11 to B-10	No Con
	(K4) A-15 to A-31	No Con
	(K8) B-58 to B-56	No Con
	(K8) B-60 to B-61	No Con
	(K8) B-63 to B-64	No Con
	(K8) B-66 to B-67	No Con
24	Set S26 to OFF	
25	Measure resistance between:	
	(K7,R2) B-16 to B-15	4 to 6 ohms
	(K4) B-30 to A-19	Con
	(K1,K2) A-57 to A-13	Con
26	Press module switch S2, release	Module lamp L2 on while pressed
27	Press-to-test module lamps L1 and L2	Module lamps L1 and L2 on while pressed
28	*[1] Deactuate test sensor	Module lamp L2 on
	*[2] Deactuate sensor S105	Module lamp L2 on
29	*[1] Disconnect sensor from test jack J105	

*[1] 65-52811-23, -25, -30, -31, -44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151 only
*[2] 65-52811-21, -51, -54, -73, -117, -135, -137, -144 only

Functional Test
Figure 706 (Sheet 3)

J. Nose and Main Landing Gear Proximity Switch Card Tests

(1) Verify all test switches and lamps are in the initial conditions listed in Fig. 705.

(2) Perform proximity switch card test per Fig. 707.

Step	Procedure	Required Results
	NOTE: (65-52811-21,-51,-54,-73,-117,-135,-137,-144 only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate sensors S72 and S74. (65-52811-23,-25,-30,-31,-44,-74 thru -77,-84,-85,-118 thru -121,-145 thru -148,-151 only). Indicators L2 and L6 respond to the test centerpoint sensor as actuation is accomplished. Actuation shall occur as the target bar is brought within 0.275 to 0.325 inches from the sensor. The proximity switch card shall remain actuated as the gap is decreased to zero. Deactuation shall occur as the bar is moved away from the sensor 0.005 to 0.030 inches from the actuation point.	
1	*[1] Connect deactuated sensor to test jack J72	
2	*[1] Actuate test sensor	L2 off
	*[2] Actuate sensor S72	L2 off
3	*[1] Deactuate test sensor	L2 on
	*[2] Deactuate sensor S72	L2 on
4	*[1] Disconnect sensor from test jack J72	
5	*[1] Connect deactuated sensor to test jack J74	
6	*[1] Actuate test sensor	L6 off
	*[2] Actuate sensor S74	L6 off
7	*[1] Deactuate test sensor	L6 on
	*[2] Deactuate sensor S74	L6 on
8	*[1] Disconnect sensor from test jack J74	
	NOTE: Indicator L4 responds to the test centerpoint sensor as actuation is accomplished. Actuation shall occur as the target bar is brought within 0.275 to 0.325 inches from the sensor. The proximity switch card shall remain actuated as the gap is decreased to zero. Deactuation shall occur as the bar is moved away from the sensor 0.005 to 0.030 inches from the actuation point.	

Step	Procedure	Required Results
9	Connect deactuated sensor to test jack J76	
10	Actuate sensor	L4 off
11	Deactuate sensor	L4 on
12	Disconnect sensor from test jack J76	
	NOTE: (65-52811-21,-51,-54,-117,-135,-137, only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate sensors S71 and S73. (65-52811-23,-25,-30,-31,-44,-73 thru -77,-84,-85,-118 thru-121,-144 thru -148,-151 only). Indicators L3 and L7 respond to the test centerpoint sensor as actuation is accomplished. Actuation shall occur as the target bar is brought within 0.275 to 0.325 *[3] inches from the sensor. The proximity switch card shall remain actuated as the gap is decreased to zero. Deactuation shall occur as the bar is moved away from the sensor 0.005 to 0.030 *[4] inches from the actuation point.	
13	*[5] Connect deactuated sensor to test jack J71	
14	*[5] Actuate test sensor	L3 on
	*[6] Actuate sensor S71	L3 on
15	*[5] Deactuate test sensor	L3 off
	*[6] Deactuate sensor S71	L3 off
16	*[5] Disconnect sensor from test jack J71	
17	*[5] Connect deactuated sensor to test jack J73	
18	*[5] Actuate test sensor	L7 on
	*[6] Actuate sensor S73	L7 on
19	*[5] Deactuate test sensor	L7 off
	*[6] Deactuate sensor S73	L7 off
20	*[5] Disconnect sensor from test jack J73	
	NOTE: Indicator L5 responds to the test centerpoint sensor as actuation is accomplished. Actuation shall occur as the target bar is brought within 0.130 to 0.160 inches from the sensor. The proximity switch card shall remain actuated as the gap is decreased to zero. Deactuation shall occur as the bar is moved away from the sensor 0.005 to 0.020 inches from the actuation point.	

Step	Procedure	Required Results
21	Connect deactuated sensor to test jack J75	
22	Actuate sensor	L5 on
23	Deactuate sensor	L5 off
24	Disconnect sensor from test jack J75	

*[1] 65-52811-23, -25, -30, -31, -44,-74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151 only
*[2] 65-52811-21, -51, -54, -73, -117, -135, -137, -144 only
*[3] 0.275 to 0.325 inches for 65-52811-23, -25, -30, -31, -44, -84, -85, -118 thru -121, -151
0.130 to 0.160 inches for 65-52811-73 thru -77, -144 thru -148
*[4] 0.005 to 0.030 inches for 65-52811-23, -25, -30, -31, -44, -84, -85, -118 thru -121, -151
0.005 to 0.020 inches for 65-52811-73 thru -77, -144 thru -148
*[5] 65-52811-23, -25, -30, -31, -44, -73 thru -77, -84, -85, -118 thru -121, -144 thru -148, -151 only
*[6] 65-52811-21, -51, -54, -117, -135, -137 only

Proximity Switch Card Tests
Figure 707 (Sheet 3)

K. Wheel Seal Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 705.

(2) Perform wheel seal circuitry tests per Fig. 708.

NOTE: L4 must remain illuminated. L5 and L8 thru L12 must remain extinguished.
(65-52811-21, -51, -54, -117, -135, -137 only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate sensors S71 thru S74.
(65-52811-73, -144 only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate sensors S72 and S74.

Step	Condition	Procedure	Required Results				
			L1	LM Red L2	LM Grn L3	RM Red L6	RM Grn L7
1	Door Close	Set S12 to OFF					
1A	LM Gear Down	*[1] Actuate sensor S71	On	On	On	On	Off
		*[2] Set S71 to ON	On	On	On	On	Off
2	RM Gear Down	*[1] Actuate sensor S73	Off	On	On	On	On
		*[2] Set S73 to ON	Off	On	On	On	On
3	RM Gear Up	*[3] Actuate sensor S74	Off	On	On	Off	On
		*[4] Set S74 to ON	Off	On	On	Off	On
4	LM Gear Up	*[3] Actuate sensor S72	Off	Off	On	Off	On
		*[4] Set S72 to ON	Off	Off	On	Off	On
5	Door Open	Set S12 to ON	On	Off	On	Off	On
6	RM Gear Not Down	*[1] Deactuate sensor S73	On	Off	On	Off	Off
		*[2] Set S73 to OFF	On	Off	On	Off	Off
7	Gear Handle Up	Set S11 to ON	On	Off	On	Off	Off
8	LM Gear Not Up	*[3] Deactuate sensor S72	On	On	On	Off	Off
		*[4] Set S72 to OFF	On	On	On	Off	Off
9	RM Gear Down	*[1] Actuate sensor S73	On	On	On	Off	On
		*[2] Set S73 to ON	On	On	On	Off	On
10	LM Gear Not Down	*[1] Deactuate sensor S71	On	On	Off	Off	On
		*[2] Set S71 to OFF	On	On	Off	Off	On
11	LM Gear Up	*[3] Actuate sensor S72	On	Off	Off	Off	On
		*[4] Set S72 to ON	On	Off	Off	Off	On
12	RM Gear Not Up	*[3] Deactuate sensor S74	On	Off	Off	On	On
		*[4] Set S74 to OFF	On	Off	Off	On	On

*[1] 65-52811-21, -51, -54, -117, -135, -137 only
*[2] 65-52811-23, -25, -30, -31, -44, -73 thru -77, -84, -85, -118 thru -121, -144 thru -148, -151 only
*[3] 65-52811-21, -51, -54, -73, -117, -135, -137, -144 only
*[4] 65-52811-23, -25, -30, -31, 44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151 only

Wheel Seal Circuitry Tests
Figure 708

L. Left Main Gear Indication Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 705.

(2) Perform left main gear indication circuitry test per Fig. 709.

NOTE: L1, L4 and L6 must remain illuminated. L5 and L7 thru L12 must remain extinguished.
(65-52811-21,-51,-54,-117,-135,-137 only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate sensors S71 and S72.
(65-52811-73,-144 only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate sensor S72.

Step	Condition	Procedure	Required Results	
			LM Red L2	LM Grn L3
1	LM Gear Down	*[1] Actuate sensor S71	On	On
		*[2] Set S71 to ON	On	On
2		Verify voltage at A-38	1 vdc max	
3	Gear Handle Down	Set S3 to ON	Off	On
4	LM Gear Not Down	*[1] Deactuate sensor S71	On	Off
		*[2] Set S71 to OFF	On	Off
5	Gear Handle Not Down	Set S3 to OFF	On	Off
6	LM Gear Up	*[3] Actuate sensor S72	Off	Off
		*[4] Set S72 to ON	Off	Off
7	Throttle 1 Retard	Set S6 to ON	On	Off
8	Throttle 1 Advance	Set S6 to OFF	Off	Off
9	Throttle 2 Retard	Set S7 to ON	On	Off
10		Verify voltage at A-38	2.5 vdc max	

*[1] 65-52811-21, -51, -54, -117, -135, -137 only
*[2] 65-52811-23, -25, -30, -31, -44, -73 thru -77, -84, -85, -118 thru -121, -144 thru -148, -151 only
*[3] 65-52811-21,-51, -54, -73, -117, -135, -137, -144 only
*[4] 65-52811-23, -25, -30, -31, -44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151 only

Left Main Gear Indication Circuitry Tests
Figure 709

M. Right Main Gear Indication Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 705.

(2) Perform right main gear indication circuitry test per Fig. 710.

NOTE: L1, L2 and L4 must remain illuminated. L3, L5 and L8 thru L12 must remain extinguished.
(65-52811-21,-51,-54,-117,-135,-137 only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate sensors S73 and S74.
(65-52811-73,-144 only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate sensor S74.

Step	Condition	Procedure	Required Results	
			LM Red L6	LM Grn L7
1	RM Gear Down	*[1] Actuate sensor S73	On	On
		*[2] Set S73 to ON	On	On
2		Verify voltage at A-42	1 vdc max	
3	Gear Handle Down	Set S3 to ON	Off	On
4	RM Gear Not Down	*[1] Deactuate sensor S73	On	Off
		*[2] Set S73 to OFF	On	Off
5	Gear Handle Not Down	Set S3 to OFF	On	Off
6	RM Gear Up	*[3] Actuate sensor S74	Off	Off
		*[4] Set S74 to ON	Off	Off
7	Throttle 1 Retard	Set S6 to ON	On	Off
8	Throttle 1 Advance	Set S6 to OFF	Off	Off
9	Throttle 2 Retard	Set S7 to ON	On	Off
10		Verify voltage at A-42	2.5 vdc max	

*[1] 65-52811-21, -51, -54, -117, -135, -137 only
*[2] 65-52811-23, -25, -30, -31, -44, -73 thru -77, -84, -85, -118 thru -121, -144 thru -148, -151 only
*[3] 65-52811-21, -51, -54, -73, -117, -135, -137, -144 only
*[4] 65-52811-23, -25, -30, -31, -44, -74 thru -77, -84, -85, -118 thru -121, -145 thru -148, -151 only

Right Main Gear Indication Circuitry Tests
Figure 710

N. Nose Gear Indication Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 705.

(2) Perform nose gear indication circuitry test per Fig. 711.

NOTE: L1, L2 and L6 must remain illuminated. L3 and L7 thru L12 must remain extinguished.

Step	Condition	Procedure	Required Results	
			LM Red L4 *[2]	LM Grn L5 *[2]
1	Nose Gear Downlock	Set S75 to ON	On	On
2		Verify voltage at A-40 *[1]	1 vdc max	
3	Gear Handle Down	Set S3 to ON	Off	On
4	Nose Gear Not Down	Set S75 to OFF	On	Off
5	Gear Handle Not Down	Set S3 to OFF	On	Off
6	Nose Gear Uplock	Set S76 to ON	Off	Off
7	Throttle 1 Retard	Set S6 to ON	On	Off
8	Throttle 1 Advance	Set S6 to Off	Off	Off
9	Throttle 2 Retard	Set S7 to ON	On	Off
10		Verify voltage at A-40 *[1]	2.5 vdc max	

*[1] Use A-39 on 65-52811-44, -73 thru -77, -84, -144 thru -148.
*[2] On 65-52811-44, -73 thru -77, -84, -144 thru -148. Connect L4 to pin A-39 and L5 to pin A-40.

Nose Gear Indication Circuitry Tests
Figure 711

O. Aural Warning Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 705.

(2) Perform aural warning circuitry test per Fig. 712.

NOTE: L1,L2,L4 and L6 must remain illuminated. L9 thru L12 must remain extinguished. (65-52811-21,-51,-54,-117,-135,-137 only). Use 3-step procedures listed in Fig. 701 to actuate or deactuate sensors S71 and S73.

Step	Condition	Procedure	Required Results			
			LM Grn L3	Nose Grn L5	RM Grn L7	Horn L8
1	Flap Not Up	Set S5 to OFF	Off	Off	Off	On
2	Landing Warning SW. Up	Set S4 to OFF	Off	Off	Off	Off
3	Throttle 1 Retard	Set S6 to ON	Off	Off	Off	On
4	Horn Reset	Press and release S21	Off	Off	Off	Off
5	Throttle 2 Retard	Set S7 to ON	Off	Off	Off	On
6	Horn Reset	Press and release S21	Off	Off	Off	Off
7	Throttle 1 Advance	Set S6 to OFF	Off	Off	Off	Off
8	Throttle 1 Retard	Set S6 to ON	Off	Off	Off	On
9	Horn Reset	Press and release S21	Off	Off	Off	Off
10	Throttle 2 Advance	Set S7 to OFF	Off	Off	Off	Off
11	Throttle 2 Retard	Set S7 to ON	Off	Off	Off	On
12	Horn Reset	Press and release S21	Off	Off	Off	Off
13	Landing Warn SW. Down	Set S4 to ON	Off	Off	Off	On
14	LM Gear Down	*[1] Actuate sensor S71	On	Off	Off	On
		*[2] Set S71 to ON	On	Off	Off	On
15	RM Gear Down	*[1] Actuate sensor S73	On	Off	On	On
		*[2] Set S73 to ON	On	Off	On	On
16	Nose Downlock	Set S75 to ON	On	On	On	Off
17	RM Gear Not Down	*[1] Deactuate sensor S73	On	On	Off	On
		*[2] Set S73 to OFF	On	On	Off	On

Aural Warning Circuitry Tests
Figure 712 (Sheet 1)

Step	Condition	Procedure	Required Results			
			LM Grn L3	Nose Grn L5	RM Grn L7	Horn L8
18	RM Gear Down	*[1] Actuate sensor S73	On	On	On	Off
		*[2] Set S73 to ON	On	On	On	Off
19	LM Gear Not Down	*[1] Deactuate sensor S71	Off	On	On	On
		*[2] Set S71 to OFF	Off	On	On	On
20		*[3] Set S24 to OFF	Off	On	On	Off
21	LM Gear Down	*[1] Actuate sensor S71	On	On	On	Off
		*[2] Set S71 to ON	On	On	On	Off
22		Verify voltage at A-39*[4]	1 vdc max			
23		Verify voltage at A-41	1 vdc max			
24		Verify voltage at A-37	1 vdc max			

*[1] 65-52811-21, -51, -54, -117, -135, -137 only
*[2] 65-52811-23, -25, -30, -31, -44, -73 thru -77, -84, -85, -118 thru -121, -144 thru -148, -151 only
*[3] 65-52811-25, -31, -75, -77, -119, -121, -146, -148 only
*[4] A-39 on 65-52811-21, -23, -25, -30, -31, -51, -54, -85, -117 thru -121, -135, -137, -151
A-40 on 65-52811-44, -73 thru -77, -84, -144 thru -148

Aural Warning Circuitry Tests
Figure 712 (Sheet 2)

P. Automatic Ground Spoiler Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 705.

(2) Perform automatic ground spoiler circuitry test per Fig. 713.

NOTE: L1, L2, L4 and L6 must remain illuminated. L3, L5, L7 and L8 must remain extinguished.

Step	Condition	Procedure	Required Results			
			L9	L10	L11	L12
1		*[1] Set S25 to ON				
2	Speed Brake Armed	Set S20 to ON	Off	Off	On	Off
3	Park Switch	Set S17 to position 3	Off	On	Off	Off
4	Park Switch	Set S17 to position 2	Off	Off	On	Off
5	Inbd Antiskid Off	Set S1 to OFF	Off	On	Off	Off
6	Inbd Antiskid On	Set S1 to ON	Off	Off	On	Off
7	Outbd Antiskid Off	Set S9 to OFF	Off	On	Off	Off
8	Inbd Antiskid Off	Set S1 to OFF	Off	On	Off	Off
9	Speed Brake Handle Off	Set S8 to OFF	Off	Off	On	Off
10	Speed Brake Handle On	Set S8 to ON	Off	On	Off	Off
11	Auto Spoiler Test 1	Set S22 to position 1	Off	Off	On	Off
12	Auto Spoiler Test Off	Set S22 to OFF	Off	On	Off	Off
13	Auto Spoiler Test On	Set S23 to ON	Off	Off	On	Off
14	Auto Spoiler Test Off	Set S23 to OFF	Off	On	Off	Off
15	Auto Spoiler Test 2	Set S22 to position 2	Off	Off	On	Off
16	Eng. Throttle Advance	Set S10 to ON	On	Off	On	Off
17		*[1] Measure voltage between: (+) B-5 and B-4	26 to 28 vdc			
		*[2] Measure resistance between: B-3 and B-5	2 ohms max			
18		Measure voltage between: A-18 and GND	1 vdc max			
19		Verify all test switches are in the initial condition listed in Fig.705	Off	Off	Off	Off
20		*[1] Set S25 to ON				
21	Speed Brake Armed	Set S20 to ON	Off	Off	On	Off
22	Right Inbd Power On	Set S15 to ON	Off	Off	On	Off
23	Right Outbd Power On	Set S16 to ON	Off	On	Off	Off

Automatic Ground Spoiler Circuitry Tests
Figure 713 (Sheet 1)

Step	Condition	Procedure	Required Results			
			L9	L10	L11	L12
24	Speed Brake Actuator	Set S17 to position 1	Off	On	Off	On
25	Eng. Throttle Advance	Set S10 to ON	On	Off	On	Off
26	Eng. Throttle Retard	Set S10 to OFF	Off	On	Off	On
27	Right Outbd Power Off	Set S16 to OFF	Off	Off	On	Off
28	Left Inbd Power On	Set S14 to ON	Off	On	Off	On
29	Eng. Throttle Advance	Set S10 to ON	On	Off	On	Off
30	Eng. Throttle Retard	Set S10 to OFF	Off	On	Off	On
31	Right Inbd Power Off	Set S15 to OFF	Off	Off	On	Off
32	Left Outbd Power On	Set S13 to ON	Off	On	Off	On
33	Eng. Throttle Advance	Set S10 to ON	On	Off	On	Off
34	Eng. Throttle Retard	Set S10 to OFF	Off	On	Off	ON
35	Left Inbd Power Off	Set S14 to OFF	Off	Off	On	Off
36	Right Outbd Power On	Set S16 to ON	Off	On	Off	On
37	Eng. Throttle Advance	Set S10 to ON	On	Off	On	Off
38	Eng. Throttle Retard	Set S10 to OFF	Off	On	Off	On
39	Right Outbd Power Off	Set S16 to OFF	Off	Off	On	Off
40	Right Inbd Power On	Set S15 to ON	Off	Off	On	Off
41	Left Inbd Power On Right Outbd Power On	Set S14, S16 to ON				
42	Left Outbd Power Off Right Inbd Power Off	Set S13, S15 to OFF	Off	Off	On	Off
43	Left Outbd Power On Right Inbd Power On	Set S13, S15 to ON				
44	Eng. Throttle Advance	Set S10 to ON	On	Off	On	Off
45	Eng. Throttle Retard	Set S10 to OFF	Off	On	Off	On
46		Measure voltage between: A-34 and GND	1 vdc max			

*[1] 65-52811-117 thru -121, -137, -144 thru -148 only
*[2] 65-52811-21, -23, -25, -30, -31, -44, -51, -54, -73 thru -77, -84, -85, -135, -151 only

Automatic Ground Spoiler Circuitry Tests
Figure 713 (Sheet 2)

Q. (65-52811-54, -137 only). Auto-Brake and Auto-Land Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 705.

(2) Perform auto-brake and auto-land circuitry tests per Fig. 714.

NOTE: No Test lamps change state during test.

Step	Condition	Procedure	Measure Between Pins:	Required Results
	Auto-Brake			
1	Left Outbd Power On	Set S13 to ON		
2	Left Inbd Power On	Set S14 to ON		
3	Right Inbd Power On	Set S15 to ON		
4	Right Outbd Power On	Set S16 to ON	A-55 and A-7	No Con
5	Right Inbd Power Off	Set S15 to OFF	A-55 and A-7	Con
6	Right Inbd Power On	Set S15 to ON		
&	Left Inbd Power Off	Set S14 to OFF	A-55 and A-7	Con
8	Left Inbd Power On	Set S14 to ON		
9	Right Outbd Power Off	Set S16 to OFF	A-55 and A-7	Con
10	Right Outbd Power On	Set S16 to ON		
11	Left Outbd Power Off	Set S13 to OFF	A-55 and A-7	Con
12	Right Inbd Power Off	Set S15 to OFF	A-24 and B-46	Con
13	Left Inbd Power Off	Set S14 to OFF	A-24 and B-46	No Con
14	Left Outbd Power On	Set S13 to ON	A-24 and B-46	Con
15	Right Outbd Power Off	Set S16 to OFF		
16	Right Inbd Power On	Set S15 to ON	A-24 and B-46	Con
17	Left Outbd Power Off	Set S13 to OFF	A-24 and B-46	No Con
18	Left Inbd Power On	Set S14 to ON	A-24 and B-46	Con
19	Left Outbd Power On	Set S13 to On		
20	Right Outbd Power On	Set S16 to ON	A-24 and B-46	Con
	Auto-Land			
21	Right Outbd Power Off	Set S16 to OFF		
22	Left Outbd Power Off	Set S13 to OFF		
23	Right Inbd Power Off	Set S15 to OFF	A-33 and B-21	Con
			A-33 and A-64	No Con
			A-33 and A-65	No Con
			A-33 and A-66	No Con

Auto-Brake and Auto-Land Circuitry Tests, 65-52811-54, -137 only
Figure 714 (Sheet 1)

Step	Condition	Procedure	Measure Between Pins	Required Results
24	Left Inbd Power Off	Set S14 to OFF		
25	Right Outbd Power On	Set S16 to ON	A-33 and A-66	Con
			A-33 and A-65	No Con
			A-33 and A-64	No Con
			A-33 and B-21	No Con
26	Right Outbd Power Off	Set S16 to OFF		
27	Left Outbd Power On	Set S13 to ON	A-33 and B-21	No Con
			A-33 and A-64	No Con
			A-33 and A-65	Con
			A-33 and A-66	No Con
28	Left Outbd Power Off	Set S13 to OFF		
29	Right Inbd Power On	Set S15 to ON	A-33 and A-66	No Con
			A-33 and A-65	No Con
			A-33 and A-64	Con
			A-33 and B-21	No Con
30	Right Inbd Power Off	Set S15 to OFF		

Auto-Brake and Auto-Land Circuitry Tests, 65-52811-54, -137 only
Figure 714 (Sheet 2)

R. Antiskid Test (Optional Test)

(1) Set S18 to ON.

(2) Connect oscilloscope between B-15 and ground. Verify that voltage is between 28 and 50 vdc with a ripple content of less than 5 volts peak to peak.

(3) Set S18 to OFF.

S. Turn off both power supplies.

T. Disconnect test setup, Fig. 704.

U. Antiskid Test

(1) Connect test setup per Fig. 715.

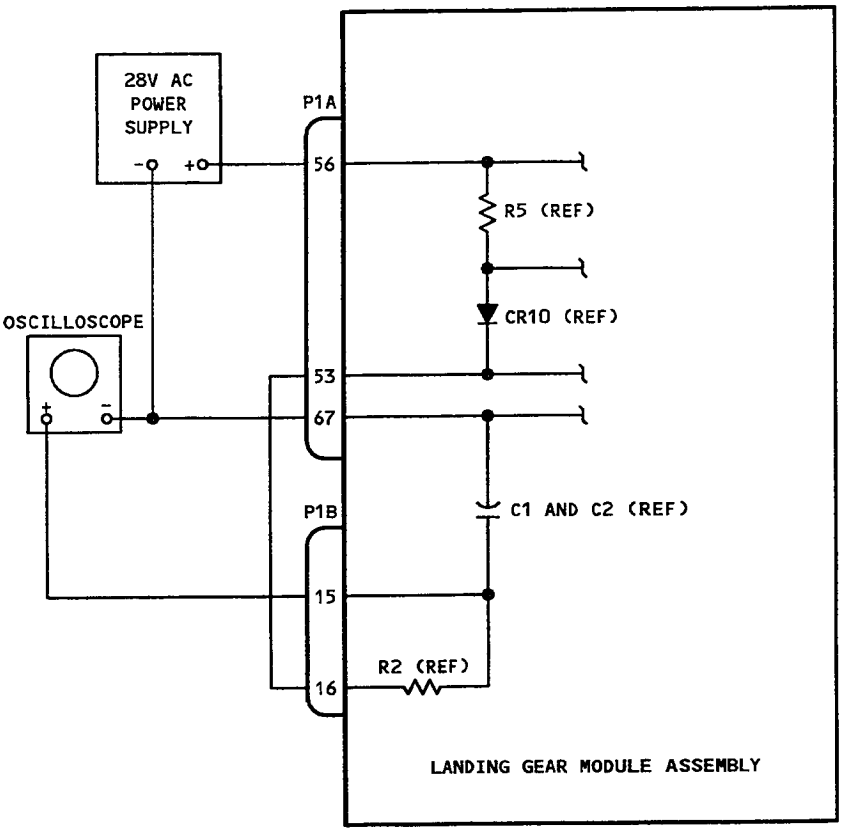
(2) Turn on power supply.

(3) Verify dc voltage at pin B-15 shall be greater than 28 vdc but less than 50 vdc.

(4) Verify ripple voltage shall be less than 5 volts peak to peak.

(5) Turn off power supply.

(6) Disconnect test setup, Fig. 715.



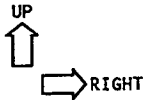
Test Setup
Figure 715

V. Verify indexing on rear connector as follows:

65-52811-21, -51, -54, -117, -135, -137

65-52811-23, -30, -44, -84, -85, -118, -120, -151

65-52811-25, -31, -119, -121



65-52811-73, -74, -76, -144, -145, -147

65-52811-75, -77, -146, -148

NOTE: Darkened portion indicates extended part of keying post.

G74723

TROUBLE SHOOTING

1. Trouble shooting is keyed to the steps of the functional test procedures. Check for defective connections or wiring prior to replacing components.

NOTE: L1 and L2 refer to test lamps unless module lamp specifically stated.

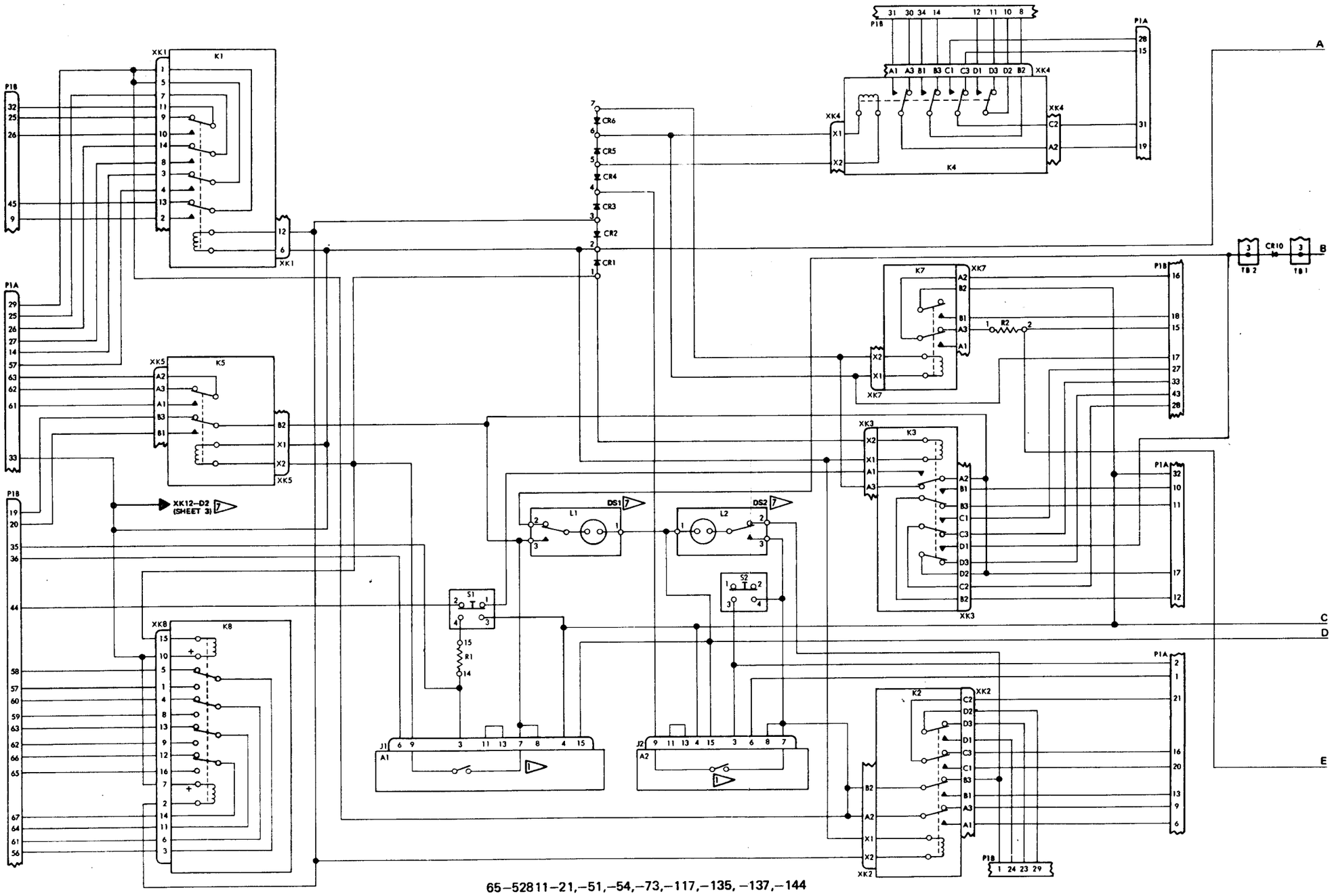
Trouble	Possible Cause and Correction
Fig. 702 and 703	Component listed
Par. 2.D and .E	A13
Par. 2.F.	
L1 fault	A10, A11, K6
L2 fault	A4, A11
L3 fault	A3 or A9 CR12 shorted
L4 fault	A5, A12
L5 fault	A6 or A9 CR13 shorted
L6 fault	A8, A11
L7 fault	A7 or A9 CR14 shorted
L8 fault	A9
L9 fault	A12
L10, L11 fault	A14
Par. 2.H.	
Module lamp L1 *[1]	A1, K3, L1 *[1]
Module lamp L2 *[1]	A2, K2, L2 *[1]
Fig. 706	
Steps 1, 4, 9, 11	Listed components
Steps 5-7	
Continuity fault	R1, S1
Module lamp L1 *[1] fault	A1, K3, R1, S1
Steps 8, 10, 12	A1
Steps 14-18	A12
Steps 20, 28	A2
Steps 21-25	Listed component
Step 26	A2, S2
Step 27	Module lamp L1 or L2 *[1]

*[1] L1, L2 on 65-52811-21, -25, -31, -51, -73, -75, -77, -117, -119, -121, -135, -144, -146, -148
DS1, DS2 on 65-52811-23, -30, -44, -54, -74, -76, -84, -85, -118, -120, -137, -145, -147

Trouble	Possible Cause and Correction
Fig. 707	
Steps 1-4	A4
Steps 5-8	A8
Steps 9-12	A5
Steps 13-16	A3
Steps 17-20	A7
Steps 21-24	A6
Fig. 708	
L3, L7 fault	A3, A7
L2, L6 fault	A4, A8, A11
L1 fault, step 1 or 5	K6
L1 fault, all other steps	A10, A11
Fig. 709, 710	A11
Fig. 711	A12
Fig. 712	
L3, L5, L7 fault	A3, A6, A7 respectively
L8 fault	A9, or if reset failure, A13 involved
Voltage fault	A3 (pin A-37), A6 (pin A-39 *[2]), A7 (pin A-41)
Fig. 713	
Step 2, L9 fault	A12
L10, L11 fault	A14
Steps 3, 5, 7, 8, 15, L10, L11 fault	A14
Steps 11, 12, L10, L11 fault	A13, A14
Step 16, L9 fault	A12
Step 17	K13
Step 18	A14
Steps 21-45, L9 fault	A12
L10, L11 fault	If combined with L12 failure to illuminate, suspect one of relays K9 thru K13. If L12 illuminated, replace A14. Replace relays by trial and error except: At Step 25 - Relay K13 first

*[2] Pin A-39 on 65-52811-21, -23, -25, -30, -31, -51, -54, -85, -117 thru -121, -135, -137
Pin A-40 on 65-52811-44, -73 thru -77, -84, -144 thru -148

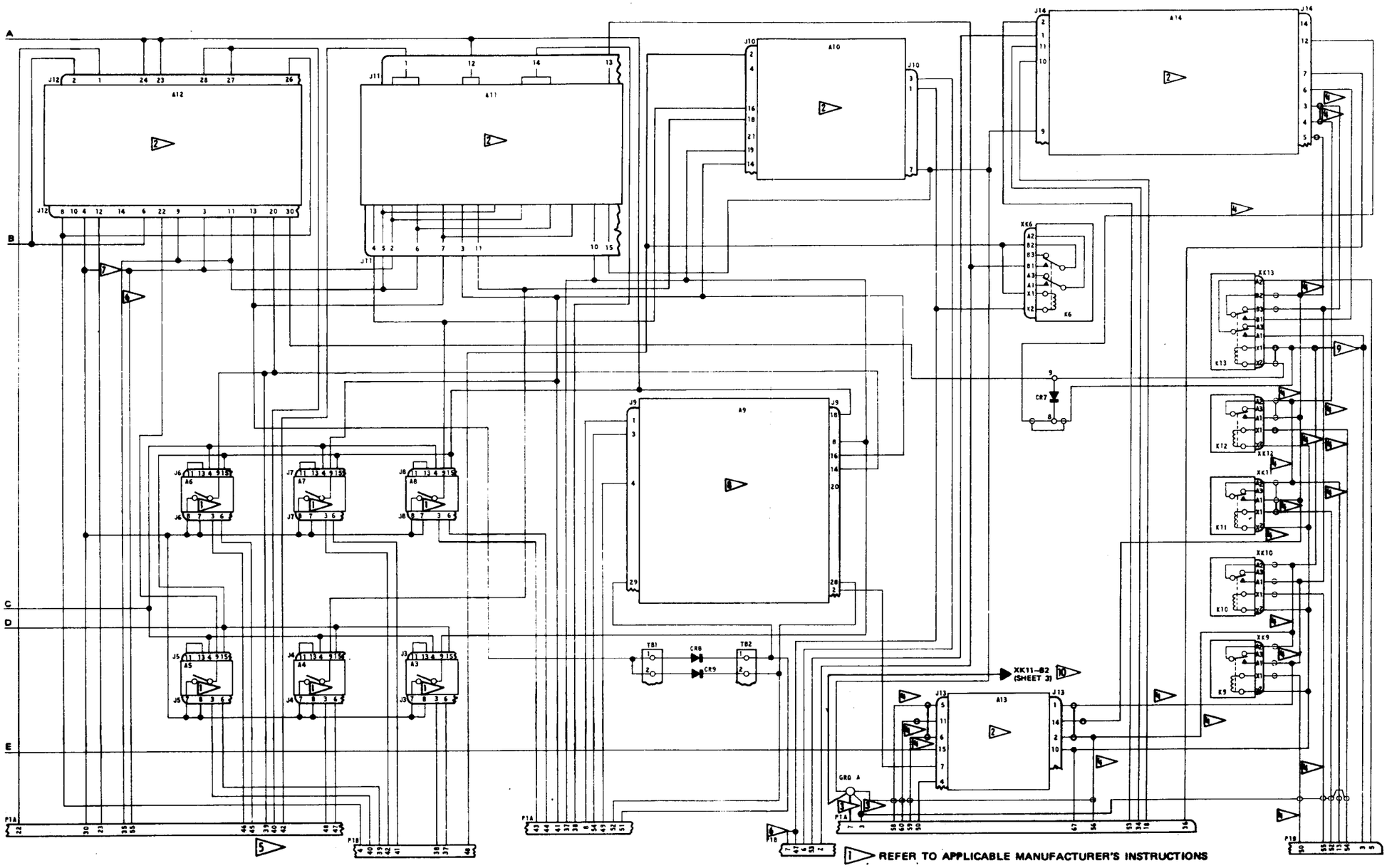
Trouble	Possible Cause and Correction
	At S13 actuation - Replace K11 first At S14 actuation - Replace K9 first At S15 actuation - Replace K12 first At S16 actuation - Replace K10 first
Step 46	A14
Fig. 714	K9 thru K12 (65-52811-54, -137 only)
Par.2.T.	A13



65-52811-21,-51,-54,-73,-117,-135, -137,-144

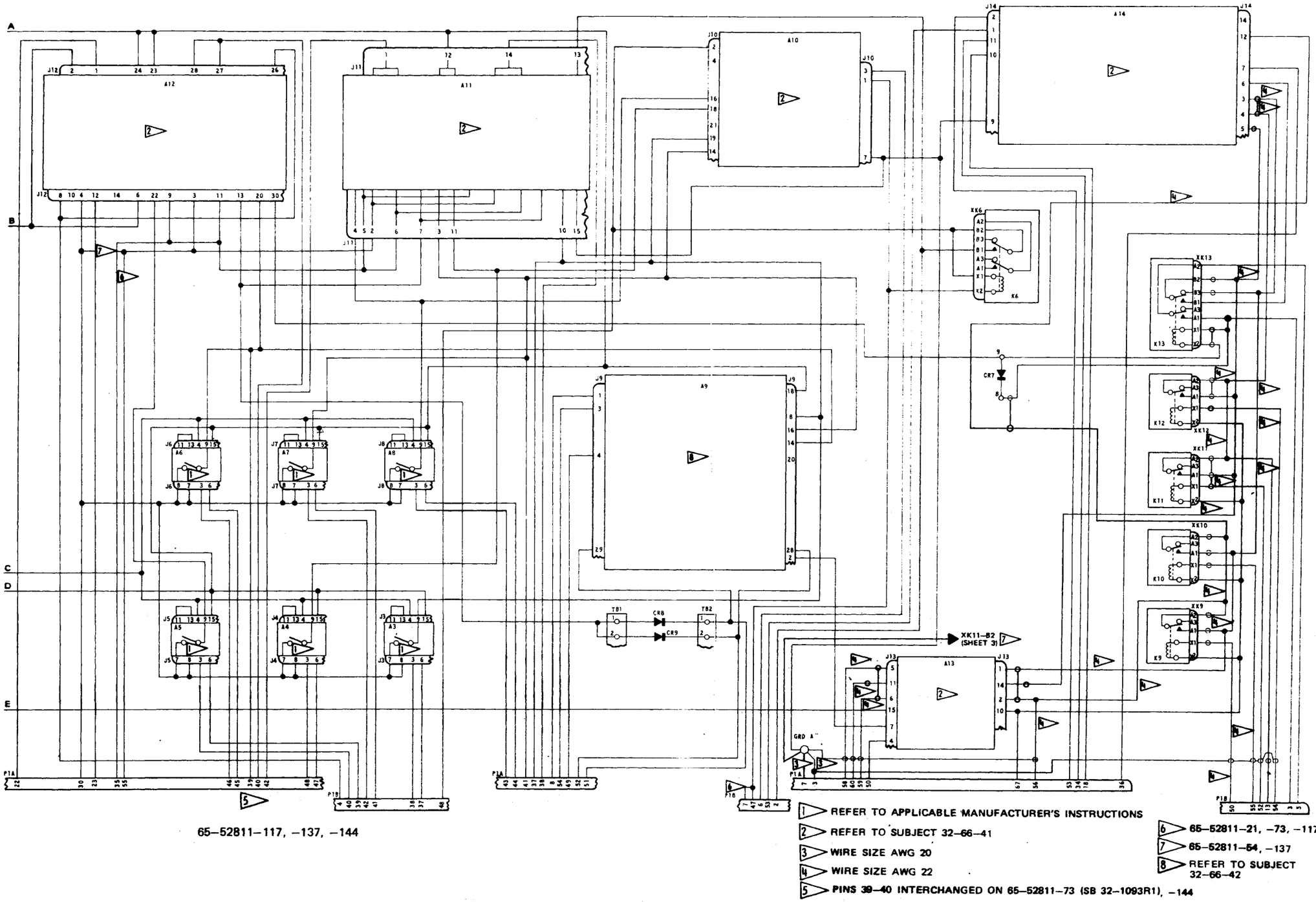
NOTE: ALL WIRE BMS13-16, SIZE AWG 24 UNLESS OTHERWISE NOTED

Schematic Diagram
Figure 801 (Sheet 1)



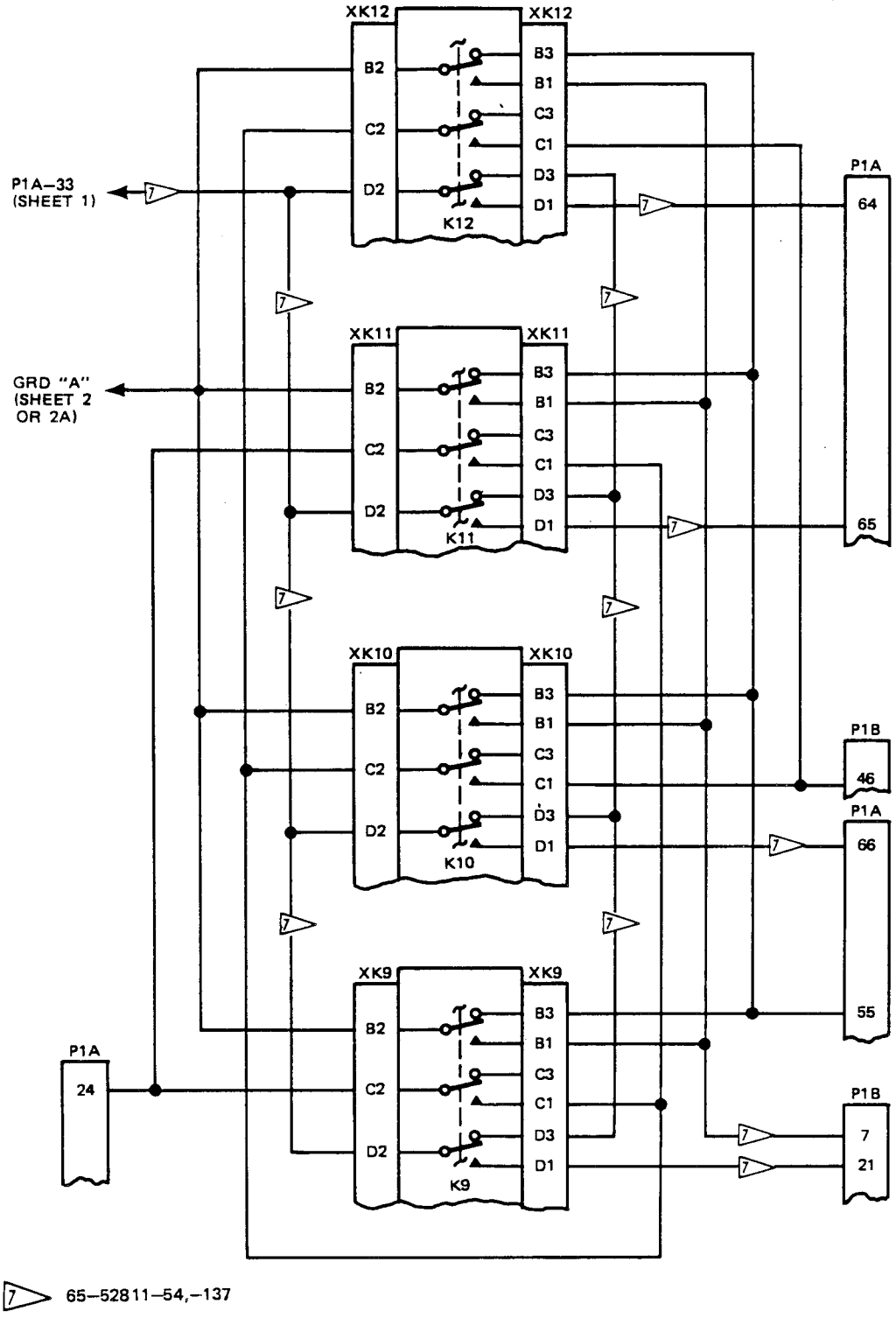
65-52811-21,-51,-54,-73,-117,-135,-137,-144

Schematic Diagram
Figure 801 (Sheet 2)

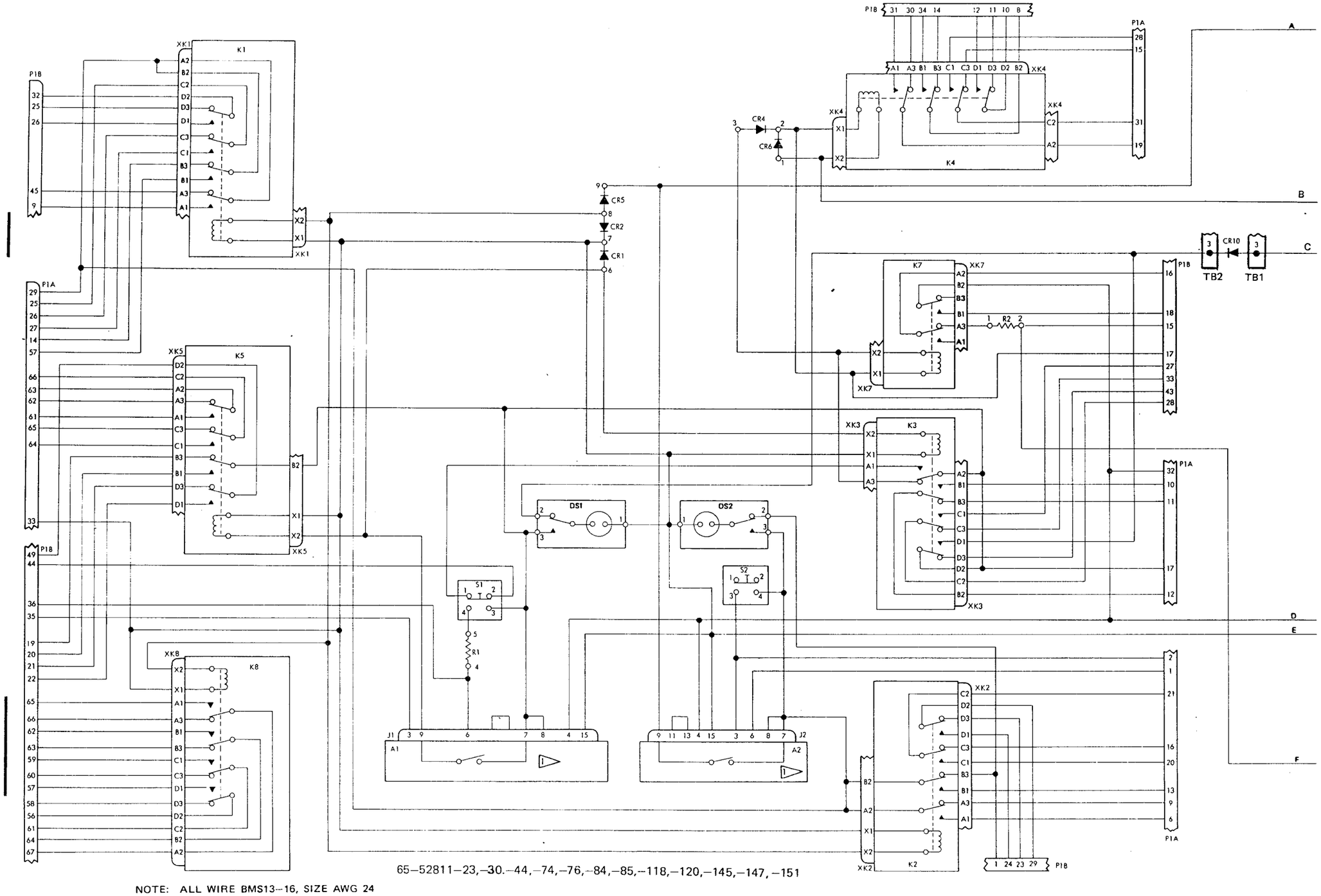


65-52811-117, -137, -144

Schematic Diagram
Figure 801 (Sheet 2A)



65–52811–51,–54,–135,–137

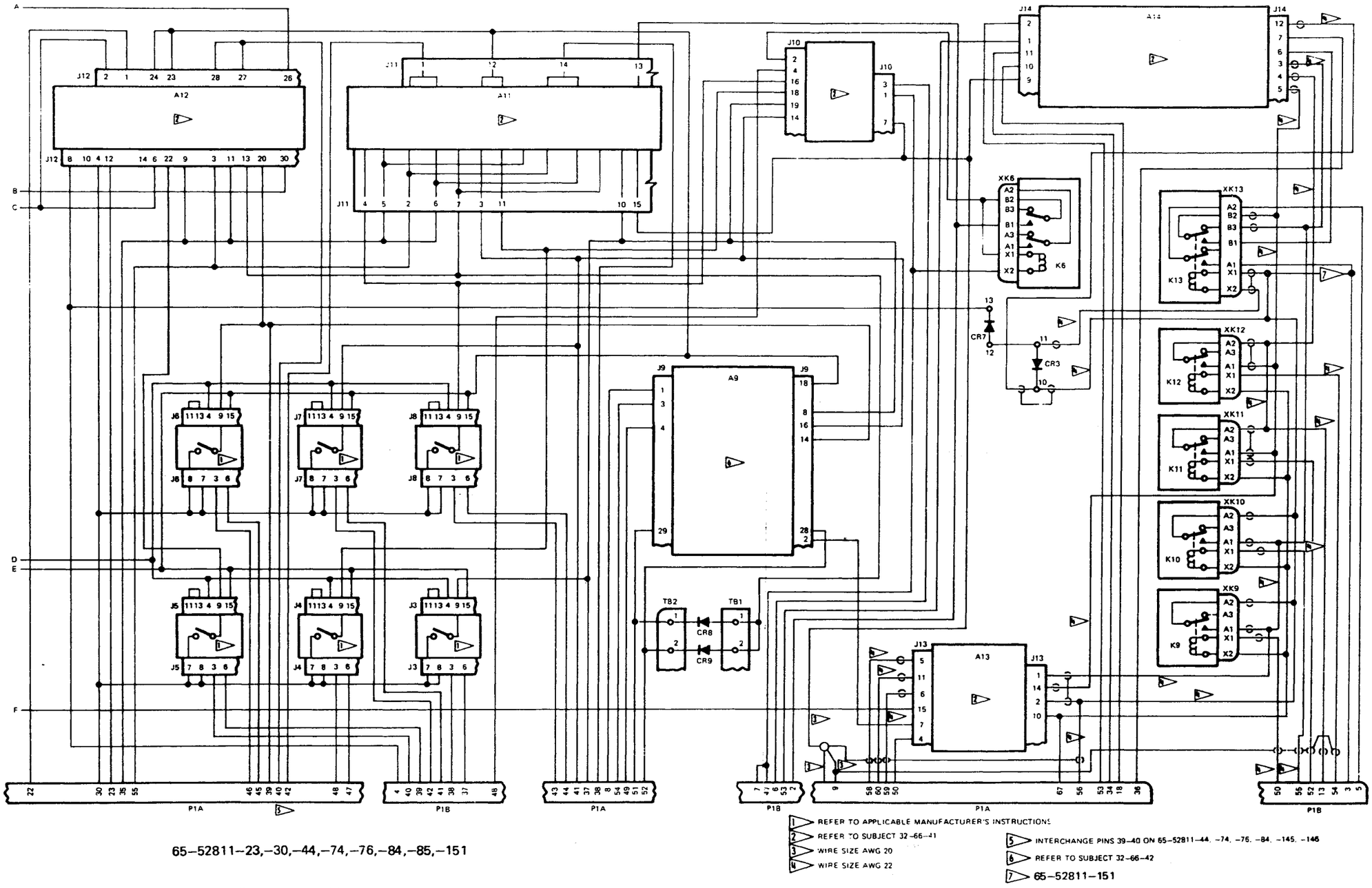


65-52811-23,-30.-44,-74,-76,-84,-85,-118,-120,-145,-147,-151

NOTE: ALL WIRE BMS13-16, SIZE AWG 24
UNLESS OTHERWISE MOTED NOTED

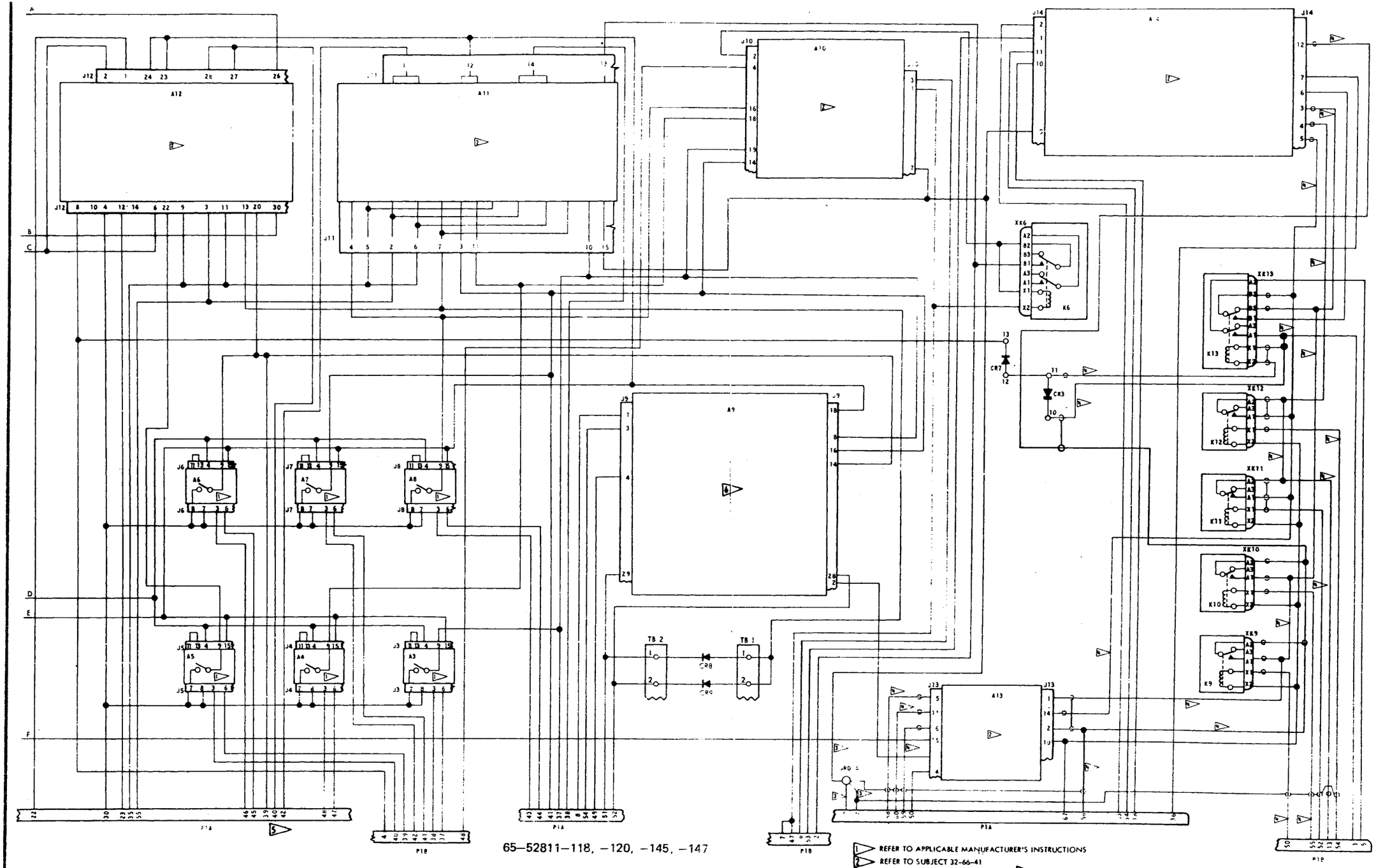
REFER TO APPLICABLE MANUFACTURER'S INSTRUCTION

Schematic Diagram
Figure 802 (Sheet 1)

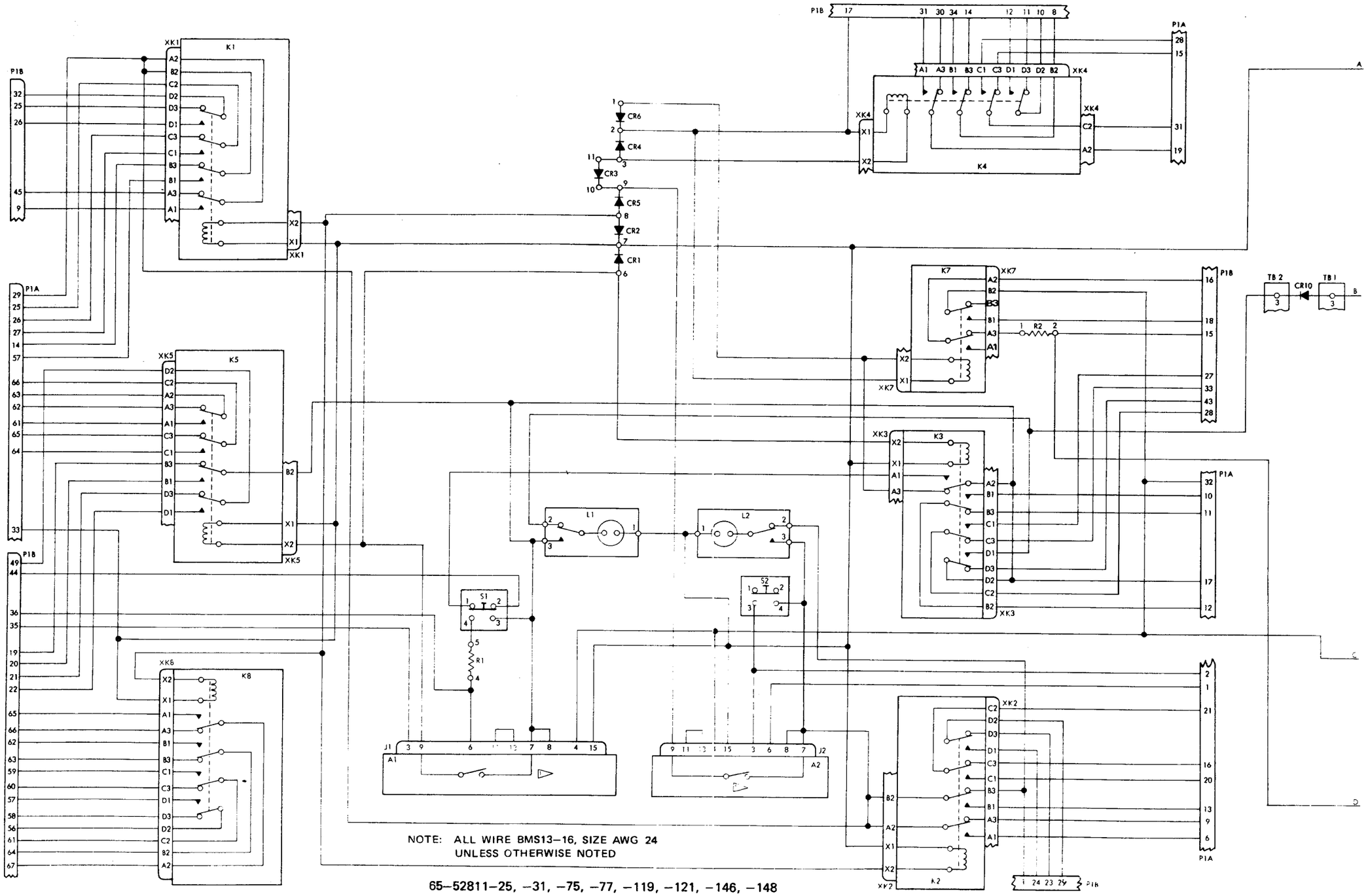


65-52811-23,-30,-44,-74,-76,-84,-85,-151

Schematic Diagram
Figure 802 (Sheet 2)

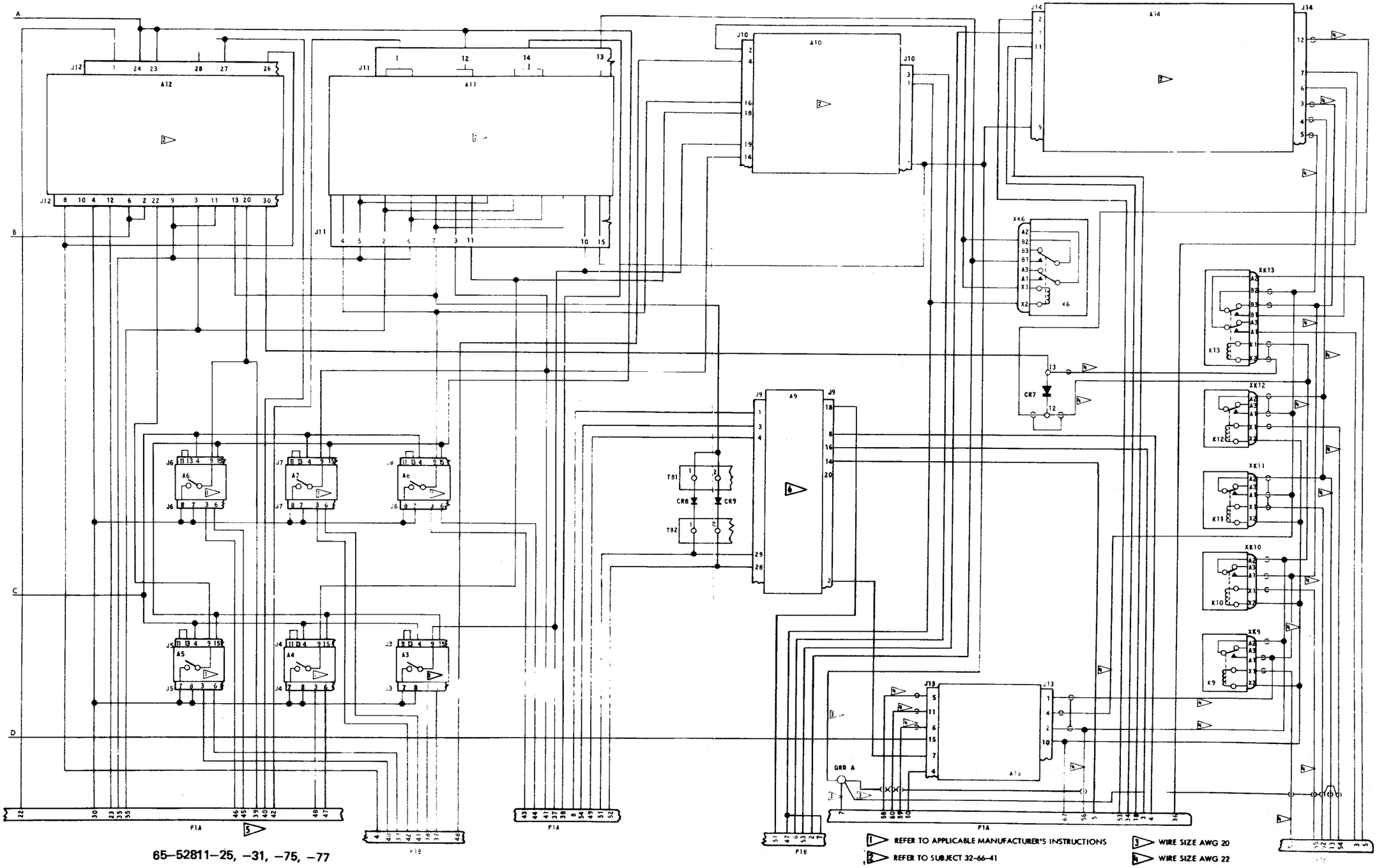


Schematic Diagram
Figure 802 (Sheet 3)



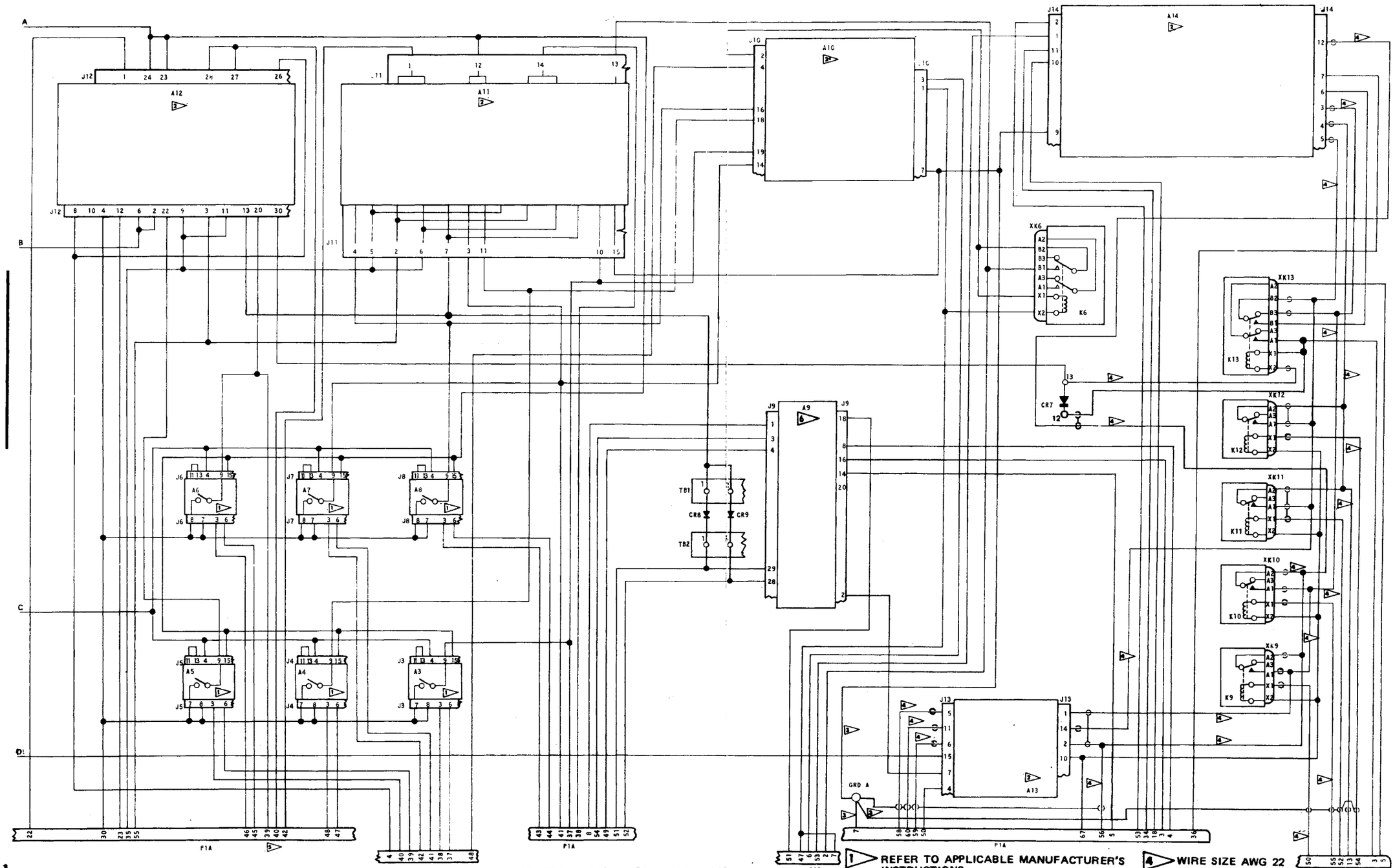
65-52811-25, -31, -75, -77, -119, -121, -146, -148

Schematic Diagram
Figure 803 (Sheet 1)



65-52811-25, -31, -75, -77

Schematic Diagram
Figure 803 (Sheet 2)

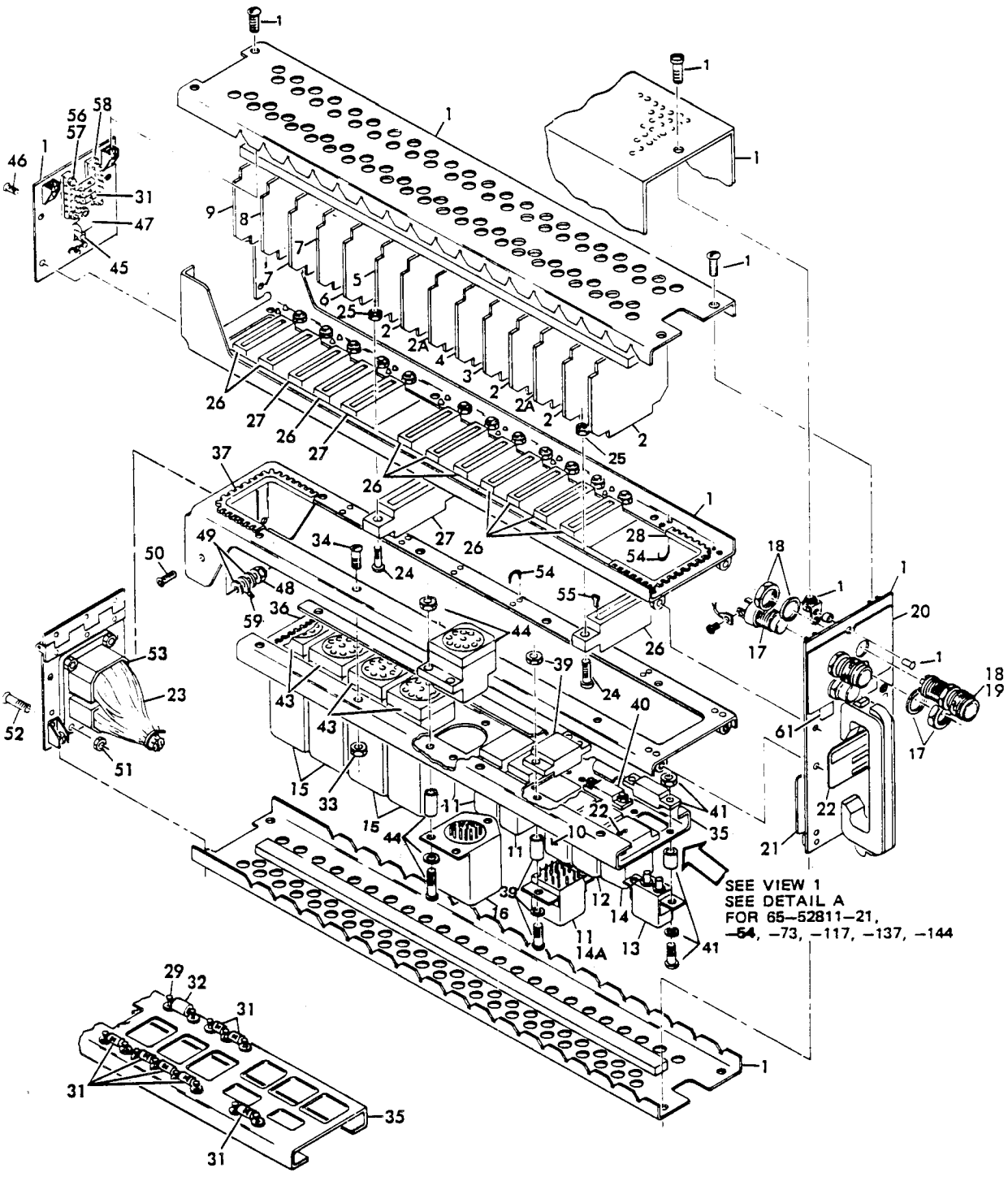


1. REFER TO APPLICABLE MANUFACTURER'S INSTRUCTIONS
2. REFER TO SUBJECT 32-66-41
3. WIRE SIZE AWG 20
4. WIRE SIZE AWG 22
5. INTERCHANGE PINS 39-40 ON 65-52811-75,-77, -146, -148
6. REFER TO SUBJECT 32-66-42

65-52811-119, -121, -146, -148

Schematic Diagram
Figure 803 (Sheet 3)

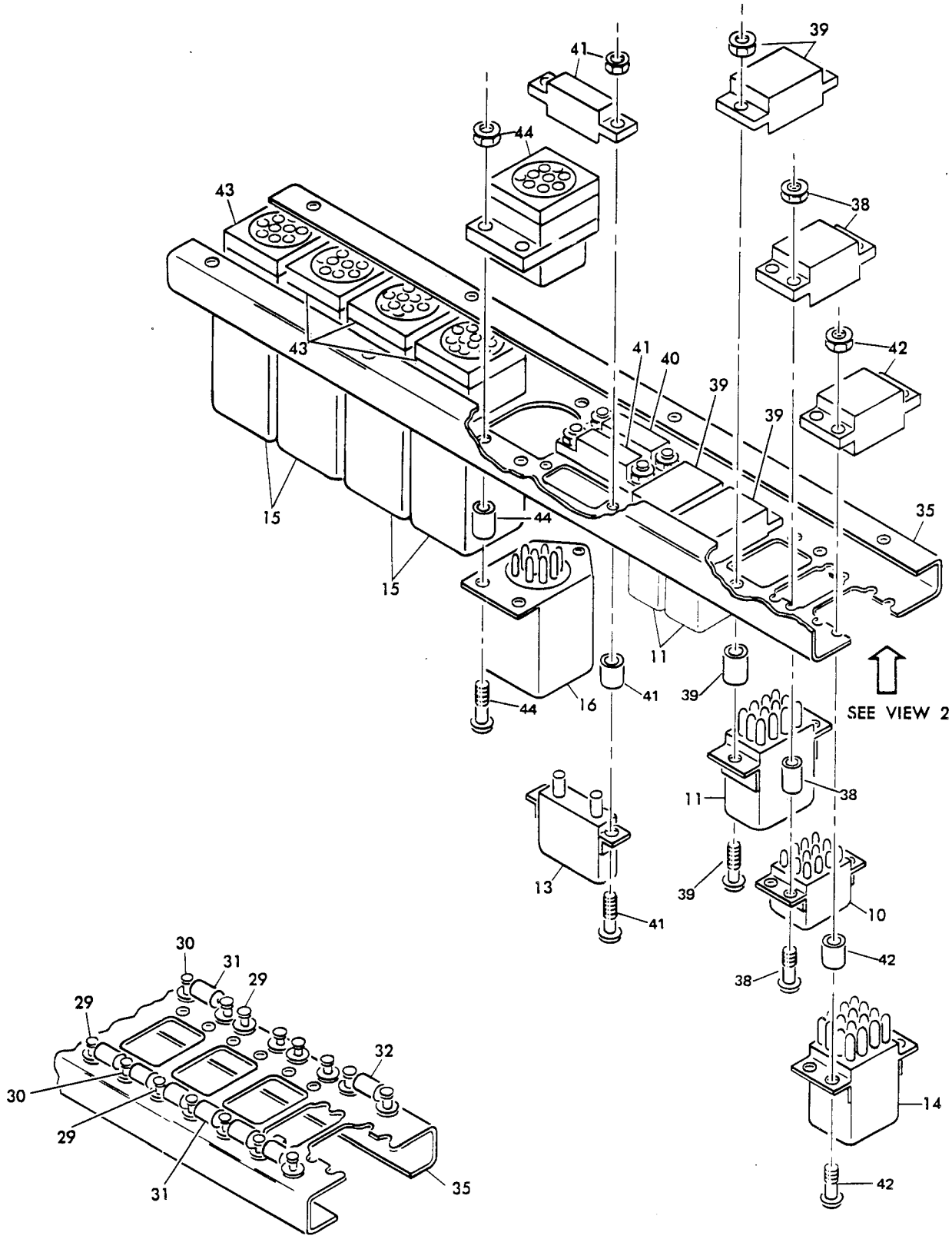
ILLUSTRATED PARTS LIST



VIEW 1

65-52811-23, -25, -30, -31, -44, -74 THRU -77,
-84, -118 THRU -121, -145 THRU -148

Landing Gear Accessory Unit Assembly (M338)
Figure 1101 (Sheet 1)



VIEW 2

DETAIL A
65-52811-21, -54, -73, -117, -137, -144

Landing Gear Accessory Unit Assembly (M338)
Figure 1101 (Sheet 2)

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
	65-52811-21		LANDING GEAR ACCESSORY UNIT ASSY (M338)	A	
	65-52811-23		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 24-1001)	B	
	65-52811-25		LANDING GEAR ACCESSORY UNIT ASSY (M338)	C	
	65-52811-30		LANDING GEAR ACCESSORY UNIT ASSY (M338)	D	
	65-52811-31		LANDING GEAR ACCESSORY UNIT ASSY (M338)	E	
	*[1]		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 21-1030)	F	
	65-52811-73		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1093)	G	
	65-52811-74		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1093)	H	
	65-52811-75		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1093)	I	
	65-52811-76		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1093)	J	
	65-52811-77		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1093)	K	
	65-52811-54		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1093)	L	
	65-52811-117		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	M	
	65-52811-118		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	N	
	65-52811-119		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	O	
	65-52811-120		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	P	
	65-52811-121		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	Q	
	65-52811-137		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	R	
	65-52811-144		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	S	
	65-52811-145		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	T	
	65-52811-146		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	U	

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
	65-52811-147		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	V	
	65-52811-148		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	W	
	65-52811-44		LANDING GEAR ACCESSORY UNIT ASSY (M338) (SB 21-1030)	X	
	65-52811-84		LANDING GEAR ACCESSORY UNIT ASSY (M338) (SB 32-1093R2)	Y	
	65-52811-51		LANDING GEAR ACCESSORY UNIT ASSY (M338)	Z	
	65-52811-85		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1093R2)	BA	
	65-52811-135		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	CA	
	65-52811-151		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R2)	DA	
1	65-51805-68		. CHASSIS ASSY (PREF)(REF 24-01-05)	ABCGH IL-O R-UZ-DA	1
1	65-51805-35		. CHASSIS ASSY (OPT)(REF 24-01-05)	ABCGH IL-O R-UZ-DA	1
1	65-51805-60		. CHASSIS ASSY (OPT)(REF 24-01-05)	ABCGH IL-O R-UZ-DA	1
1	65-51805-78		. CHASSIS ASSY (PREF)(REF 24-01-05)	DEJK PQV-Y	1
1	65-51805-75		. CHASSIS ASSY (OPT)(REF 24-01-05)	DEJK PQV-Y	1
1	65-51805-76		. CHASSIS ASSY (OPT)(REF 24-01-05)	DEJK PQV-Y	1
1	65-73698-58		. CHASSIS ASSY (OPT)(REF 24-01-05)	A-E G-WZ-DA	1
1	*[1]		. CHASSIS ASSY (REF 24-01-05 OR 24-01-07)	F	1

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
2	2-899-2		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-102)	AGLM RSZCA	4
2	8-060-02		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-211) (PREF)	B-E H-K N-Q T-Y	4
2	2-899-111		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-111)	B-E H-K N-Q T-Y	4
2A	8-899-2		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-102)	ALMRZ CA	2
2A	8-060-02		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-211) (PREF)	B-E N-Q	2
2A	2-899-111		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-111)	B-E N-Q	2
2A	8-060-07		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-213)	G-K S-YBA DA	2
3	8-060-02		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-211) (PREF)		1
3	2-899-211		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-211)		1
4	8-060-07		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-213) (PREF)		1
4	2-899-113		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226-113)		1
5	69-60177-21		. PRINTED CIRCUIT ASSY (REF 32-66-42) (PREF)		1
5	69-60177-1		. PRINTED CIRCUIT ASSY (REF 32-66-42) (OPT)		1
5	65-58250-25		. PRINTED CIRCUIT ASSY (REF 32-66-41) (OPT)		1
6	65-58250-11		. PRINTED CIRCUIT ASSY (REF 32-66-41)		1
7	65-58250-29		. PRINTED CIRCUIT ASSY (REF 32-66-41)		2

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
8	65-58250-31		. PRINTED CIRCUIT ASSY (REF 32-66-41) (PREF)		1
8	65-58250-27		. PRINTED CITCUIT ASSY (REF 32-66-41) (OPT)		1
9	65-58250-23		. PRINTED CIRCUIT ASSY (REF 32-66-41)		1
10	BACR13CE2		. RELAY	AGLMR SZCA	1
10	KD4A		. RELAY, V35344	BCHIN OTUBA	1
10	BACR13CG2		. RELAY, (PREF)	DEJKP QV-Y	1
10	BACR13CG1		. RELAY (OPT)	DEJKP QV-Y	1
10	KD4A		. RELAY, V35344 (OPT)	DEJKP QV-Y	1
11	KD4A		. RELAY, V35344	ABCG HIL-O R-UZ -CA	3
11	BACR13CG2		. RELAY (PREF)	DEJKP QV-Y	3
11	BACR13CG1		. RELAY (OPT)	DEJKP QV-Y	3
11	KD4A		. RELAY, V35344 (OPT)	DEJKP QV-Y	3
12	JD4A		. RELAY, V35344	AGLMR SZCA	1
12	KD4A		. RELAY, V35344	BCHIN OTUBA CA	1
12	BACR13CG2		. RELAY (PREF)	DEJKP QV-Y	1
12	BACR13CG1		. RELAY (OPT)	DEJKP QV-Y	1
12	KD4A		. RELAY, V35344 (OPT)	DEJKP QV-Y	1
13	JD4A		. RELAY, V35344		2
14	BR18AXC2V3		. RELAY, V82050	AGLMR SZCA	1
14	KD4A		. RELAY, V35344	BCHIN OTUBA DA	1

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
14	BACR13CG2		. RELAY (PREF)	DEJKP QV-Y	1
14	BACR13CG1		. RELAY (OPT)	DEJKP QV-Y	1
14	KD4A		. RELAY, V35344 (OPT)	DEJKP QV-Y	1
14A	69-61700-1		. STRAP (USED WITH BACR13CG1 ONLY)	DEJKP QV-Y	6
15	10-60450-3 (BOEING)		. RELAY APPROVED PARTS ARE: A410-159673-03, V73949; 9524-6508, V35344		4
16	9524-6506		. RELAY, V35344		1
17	C2006		. SWITCH, V81640		2
18	MS25041-6		. INDICATOR		2
19	MS18209-387		. LAMP		2
20	69-34180-30		. METAL LABEL		1
21	69-34180-13		. METAL LABEL		1
22	69-31184-39		. NAMEPLATE		1
23	65-52811-22		. WIRE BUNDLE	A	1
23	65-52811-24		. WIRE BUNDLE	BDBADA	1
23	65-52811-26		. WIRE BUNDLE	CE	1
23	65-52811-22		. WIRE BUNDLE (SB 32-1093)	G	1
23	65-52811-24		. WIRE BUNDLE (SB 32-1093)	HJ	1
23	65-52811-26		. WIRE BUNDLE (SB 32-1093)	IK	1
23	65-52811-72		. WIRE BUNDLE	L	1
23	65-52811-22		. WIRE BUNDLE (SB 27-1114R2)	M	1
23	65-52811-24		. WIRE BUNDLE (SB 27-1114R2)	NP	1
23	65-52811-26		. WIRE BUNDLE (SB 27-1114R2)	OQ	1
23	65-52811-72		. WIRE BUNDLE (SB 27-1114R2)	R	1
23	65-52811-22		. WIRE BUNDLE (SB 32-1093)(SB 27-1114R2)	S	1
23	65-52811-24		. WIRE BUNDLE (SB 32-1093)(SB 27-1114R2)	TV	1
23	65-52811-26		. WIRE BUNDLE (SB 32-1093)(SB 27-1114R2)	UW	1
23	65-52811-24		. WIRE BUNDLE (SB 21-1030)	X	1
23	65-52811-24		. WIRE BUNDLE (SB 32-1093R2)	Y	1
23	65-52811-55		. WIRE BUNDLE	ZCA	1
24	NAS600-7P		. SCREW	ABCGH IL-O R-UZ-DA	28

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
24	NAS600-9P		. SCREW (USED WITH 65-73698-58 ONLY)	A-E G-DA	28
24	NAS600-9P		. SCREW	DEJKP QV-Y	28
25	BACN10DN40		. NUT	A-E G-DA	28
26	582553-1		. CONNECTOR, V00779		11
27	582585-1		. CONNECTOR, V00779		3
28	BACG20ZA600		. GROMMET		1
29	4444B4		. TERMINAL, V88245		13
30	4445B4		. TERMINAL, V88245	AGLMR SZCA	2
31	1N4385		. DIODE, V14936		10
32	RC32GF102J		. RESISTOR, 1.0K OHM (± 5%), 1 W	AGLMR SZCA	1
32	RC32GF332J		. RESISTOR, 3.3K OHM (± 5%), 1 W	B-E H-K N-Q T-YBA DA	1
33	BACN10DN40		. NUT		8
34	NAS600-4P		. SCREW		8
35	69-48983-4		. BRACKET	AGLMR SZCA	1
35	69-48983-6		. BRACKET	B-E H-K N-Q T-YBA DA	1
36	BACG20ZA250		. GROMMET		1
37	BACG20ZA375		. GROMMET		1
38	HRCC5KM		. SOCKET, V91663	AGLMR SZCA	1
38	18-0006-0000		. SOCKET, V05574	B-E H-K N-Q T-YBA DA	1
38	BACS16W1		. SOCKET, (OPT)	B-E H-K N-Q T-Y	1
39	18-0006-0000		. SOCKET, V05574		3
39	BACS16W1		. SOCKET (OPT)		3

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
40	18-0007-0000		. SOCKET, V05574	AGLMR SZCA	1
40	BACS16X1		. SOCKET (OPT)	AGLMR SZCA	1
40	18-0006-0000		. SOCKET, V05574	B-E H-K N-Q T-YBA DA	1
40	BACS16W1		. SOCKET (OPT)	B-E H-K N-Q T-YBA DA	1
41	18-0007-0000		. SOCKET, V05574		2
41	BACS16X1		. SOCKET (OPT)		2
42	VB16/1UE20-42		. SOCKET, V05574	AGLMR SZCA	1
42	18-0006-0000		. SOCKET, V05574	B-E H-K N-Q T-YBA DA	1
42	BACS16W1		. SOCKET (OPT)	B-E H-L N-Q T-YBA DA	1
43	000300-0598		. SOCKET, V05574		4
44	000300-0596		. SOCKET, V05574		1
45	BACN10DN26		. NUT		2
46	MS35190-213		. SCREW		2
47	RH5-5		. RESISTOR, 5 OHMS, 3%, 5 W, V91637		1
48	22NM107-62		. NUT, V72962		1
49	AN960PD6L		. WASHER		2
50	NAS514P632-()		. SCREW		1
51	BACN10DN40		. NUT		4
52	NAS514P440-6		. SCREW		4
53	DPX2MB67P67P 34B0058		. CONNECTOR, V71468	ALMRZ CA	1
53	DPX2MB67P67P 34B0059		. CONNECTOR, V71468	BDNPXY BADA	1

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
53	DPX2MB67P67P 34B0060		. CONNECTOR, V71468	CEOQ	1
53	DPX2MB67P67P 34B0065		. CONNECTOR, V71468	GHJST V	1
53	DPX2MB67P67P 34B0064		. CONNECTOR, V71468	IKUW	1
54	BACS38C100C3		. STRAP		14
55	582507-1		. KEYING PLUG, V00779		20
56	NAS67904W		. NUT	AGLMR SZCA	4
56	BACN10DN40		. NUT	B-E H-K N-Q T-YBA DA	4
57	BACS12BF04-8		. SCREW	AGMSZ CA	4
57	BACS12BE04-8		. SCREW	LR	4
57	NAS514P440-8P		. SCREW	B-E H-K N-Q T-WY BADA	4
58	411GMF1903-4		. TERMINAL BLOCK, V75382		2
59	BACT12AC		. TERMINAL		AR
60	66143-2LP		. TERMINAL, V00779		AR
61	BAC27DEX861		. MARKER	ADEG J-M P-SV-Y ZCA	1

*[1] No Boeing part number assigned

FIGURE 1101 REFERENCE DESIGNATION INDEX (SEE SCHEMATIC DIAGRAM)

REFERENCE DESIGNATION	PART NUMBER	ITEM NO.
A1, A2, A4, A8	2-899-2	2
A1, A2, A4, A8	2-899-111	2
A1, A2, A4, A8	*8-060-02	2
A3, A7	2-899-2	2A
A3, A7	2-899-111	2A
A3, A7	8-060-07	2A
A3, A7	*8-060-02	2A
A5	*2-899-111	3
A5	2-899-211	3
A5	*8-060-02	3
A6	*2-899-113	4
A6	2-899-213	4
A6	*8-060-07	4
A9	65-58250-25	5
A9	*69-60177-21	5
A9	69-60177-1	5
A10	65-58250-11	6
A11, A12	65-58250-29	7
A13	65-58250-27	8
A13	*65-58250-31	8
A14	65-58250-23	9
CR1 THRU CR10	1N4385	31
DS1, DS2	MS25041-6	18
J1 THRU J8, J11, J13, J14	582553-1	26
J9, J10, J12	582585-1	27
K1	BACR13CE2	10
K1	KD4A	10
K1	*BACR13CG2	10
K1	BACR13CG1	10
K2, K3, K4	KD4A	11
K2, K3, K4	*BACR13CG2	11
K2, K3, K4	BACR13CG1	11
K5	KD4A	12
K5	JD4A	12
K5	*BACR13CG2	12
K5	BACR13CG1	12
K6, K7	JD4A	13
K8	BR18AXC2V3	14
K8	KD4A	14
K8	*BACR13CG2	14
K8	BACR13CG1	14
K9 THRU K12	10-60450-3	15

FIGURE 1101 REFERENCE DESIGNATION INDEX (SEE SCHEMATIC DIAGRAM)

REFERENCE DESIGNATION	PART NUMBER	ITEM NO.
K13	9524-6506	16
L1, L2	MS25041-6	18
P1A, P1B	DPX2MB67P67P34B0058	53
P1A, P1B	DPX2MB67P67P34B0059	53
P1A, P1B	DPX2MB67P67P34B0060	53
P1A, P1B	DPX2MB67P67P34B0064	53
P1A, P1B	DPX2MB67P67P34B0065	53
R1	RC32GF102J	32
R1	RC32GF332J	32
R2	RH5-5	47
S1, S2	C2006	17
TB1, TB2	411GMF1903-4	58
XK1	HRCC5KM	38
XK1	*18-0006-000	38
XK1	BACS16W1	38
XK2, XK3, XK4	*18-0006-0000	39
XK2, XK3, XK4	BACS16W1	39
XK5	*18-0006-000	40
XK5	BACS16W1	40
XK5	*18-0007-0000	40
XK5	BACS16X1	40
XK6, XK7	*18-0007-0000	41
XK5, XK7	BACS16X1	41
XK8	VB16/1UE20-42	42
XK8	*18-0006-0000	42
XK8	BACS16W1	42
XK9 THRU XK12	000300-0598	43
XK13	000300-0596	44

*PREFERRED PART

VENDORS

V00779	AMP, INC., 2800 FULLING MILL, MIDDLETOWN, PENNSYLVANIA 17057
V05574	VIKING ELECTRONICS INC., 9250 INDEPENDENCE AVENUE, CHATSWORTH, CALIFORNIA 91311
V08748	ELDEC CORP., 16700 13TH PLACE WEST, P.O. BOX 100, LYNNWOOD, WASHINGTON 98036
V14936	GENERAL INSTRUMENT CORP., POWER SEMI-CONDUCTOR DIV., 600 WEST JOHN STREET, HICKSVILLE, NEW YORK 11802
V35344	LEACH CORPORATION, CONTROL PRODUCTS DIV., 6900 ORANGE THORPE AVE, BUENA PARK, CALIFORNIA 90620-1351
V71468	ITT CANNON DIV. OF ITT CORP., 666 EAST DYER ROAD, SANTA ANA, CALIFORNIA 92702
V72962	ELASTIC STOPNUT, A DIV. OF HARTFORD INDUSTRIES INC., 2330 VAUXHALL ROAD, UNION, NEW JERSEY 07083-5038
V73949	GUARDIAN ELECTRIC MFG. COMPANY, 1425 LAKE AVE., WOODSTOCK, ILLINOIS 60098
V75382	DIALIGHT CORP. MANASQUAN DIV., 1913 ATLANTIC AVE., MANASQUAN, NEW YORK 08736-1005
V81640	EATON CORP., AEROSPACE AND COMMERCIAL CONTROL DIV., 2250 WHITFIELD AVE E., SARASOTA, FLORIDA 34243-9703
V82050	ESTERLINE ELECTRONICS CORP., 3501 HARBOR BLVD, P.O. BOX 1499, COSTA MESA, CALIFORNIA 92626
V88245	WINCHESTER ELECTRONICS, LITTON SYSTEMS INC., USECO DIV., 13536 SATICOY ST., VAN NUYS, CALIFORNIA 91409
V91637	DALE ELECTRONICS, INC., P.O. BOX 609, 1122 23RD STREET, COLUMBUS, NEBRASKA 68601-3632
V91663	ARMEL ELECTRONICS INC., 1601-75TH STREET, NORTH BERGEN, NEW JERSEY 07047-4046