TO: ALL HOLDERS OF LANDING GEAR ACCESSORY UNIT ASSEMBLY M338 OVERHAUL MANUAL, 32-66-43

REVISION NO. 6, DATED JUN 5/92

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
Changed proximity switch card A1, A2, A3 (limited), A4, A5, A7 (limited), A8 actuation tolerances from 0.290 to 0.315 inch to 0.275 to 0.325 inch. Changed deactuation tolerance from 0.005 to 0.025 inches to 0.005 to 0.030 inches								X					
Changed proximity switch card A3 (limited), A6, A7 (limited) actuation tolerances from 0.132 to 0.158 inches to 0.130 to 0.160 inches								X					

LANDING GEAR ACCESSORY UNIT ASSEMBLY M338

32-66-43

BOEING P/N 69-62234-3, -4
65-52811-100, -101, -139, -166, -167

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
32-1051		MC 3452-1K	Dec 25/73
32-1093 R2		MC 3010-25K	Jul 5/80
27-1114 R2		PRR 33143	Dec 5/83
27-1114R3		PRR 33143	Dec 5/87

LIST OF EFFECTIVE PAGES

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

	PAGE	DATE
	32-66-43	
	T-1	Dec 5/87
	T-2	BLANK
*	LEP-1	Jun 5/92
	LEP-2	BLANK
	T/C-1	Sep 10/70
	T/C-2	BLANK
	1	Jul 5/80
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	3	Sep 10/70
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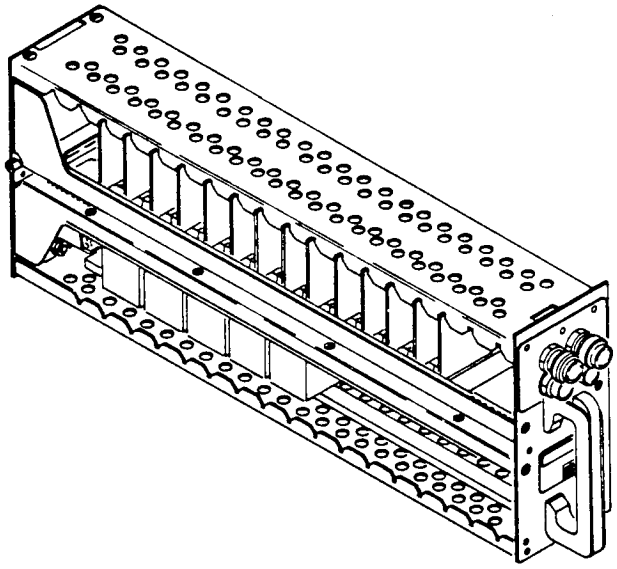
LANDING GEAR ACCESSORY UNIT ASSEMBLY (M338)



Landing Gear Accessory Unit Assembly (M338)
Figure 1

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.)

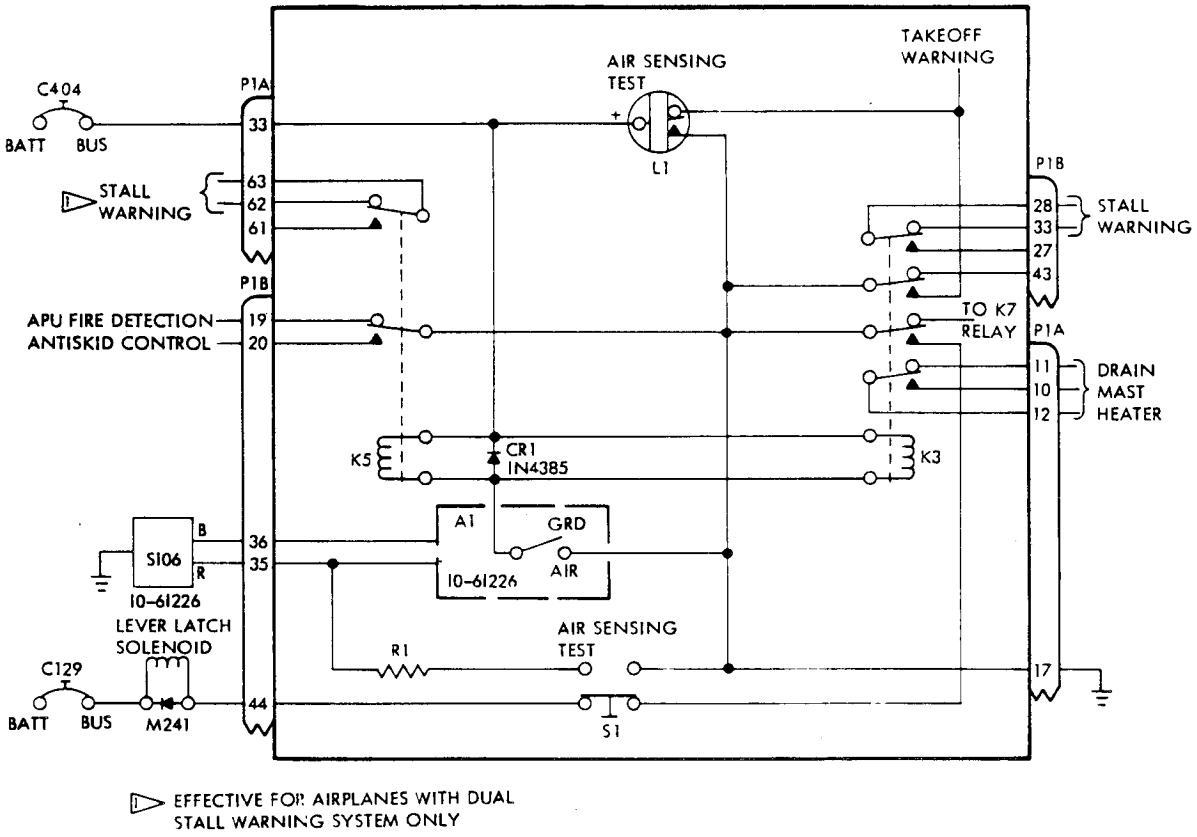
A. The safety relay system (squat switches) consists of the air safety relays and the ground safety relays.

(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 being operated to the up position.

Air Safety Relay Functions
Figure 2

(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.

(3) 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.

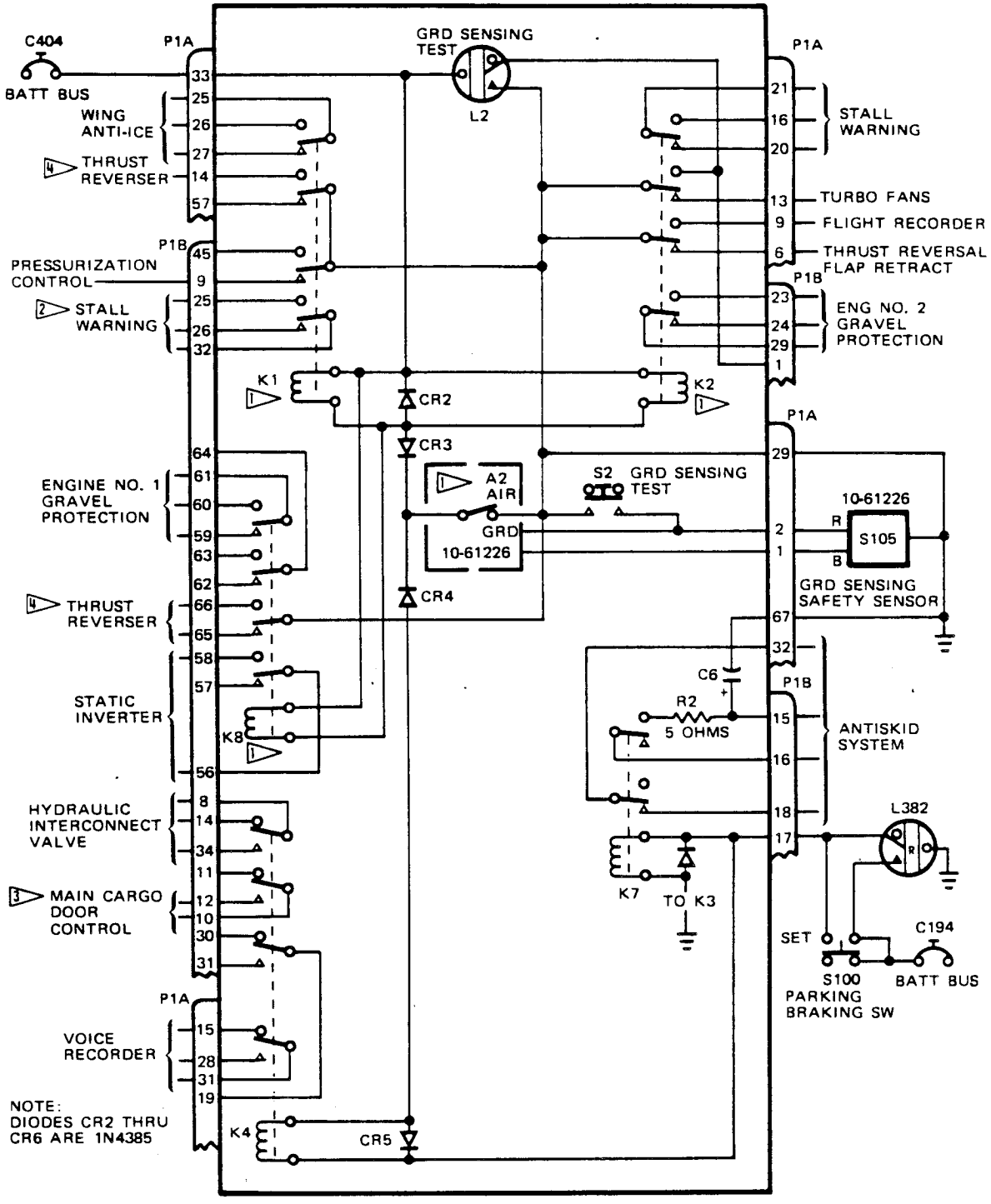
Air Critical System	Ground Mode	Air Mode
1. Pressurization Control	Deactivates the pressurization control circuit	Activates the automatic control circuit to maintain cabin pressurization when airplane is in the air.
2. Wing Anti-Ice	Prevents hot air from entering anti-ice duct	Permits hot air to enter 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.

Ground Safety Relay Functions
Figure 4 (Sheet 1)

Air Critical System	Ground Mode	Air Mode
9. Thrust Reversal Flap Retraction	Activates thrust reversal flap retract valve "By-pass"	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 Mode and Parking Brake Set	Air Mode or Parking Brake NOT Set
11. Hydraulic Interconnect Valve	Permits hydraulic system interconnection	Automatically closes the hydraulic interconnect valve to isolate the A and B hydraulic systems.
12. Voice Recorder	Permits the erasure of recorder tape	Deactivates the voice recorder erasure circuit.
13. Main Cargo Door Control	Permits cargo door operation	Deactivates the cargo door control circuit.
14. Antiskid System	Permits antiskid trouble shooting isolation test	Removes antiskid system tests electrical power.

Ground Safety Relay Functions
Figure 4 (Sheet 2)

(4) Sensor S105 and switch A2 are connected at pins A1 and A2. 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 A33. Circuit ground is at pin A29. In addition, when the parking brake switch is set, 28 volts dc is applied at pin B17. (See figure 5.)



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

Ground Safety and Parking Brake Relays
Figure 5

(a) K1, K2 and K8 are energized when A2 is actuated. 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) Relays K1, K2, K4 and K8 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.

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 pin B47 or through A10Q1 and A10Q2, K6 is energized and provides power to the seal control valves at pin B2. Pin B47 is connected to ground through external switch.

(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.

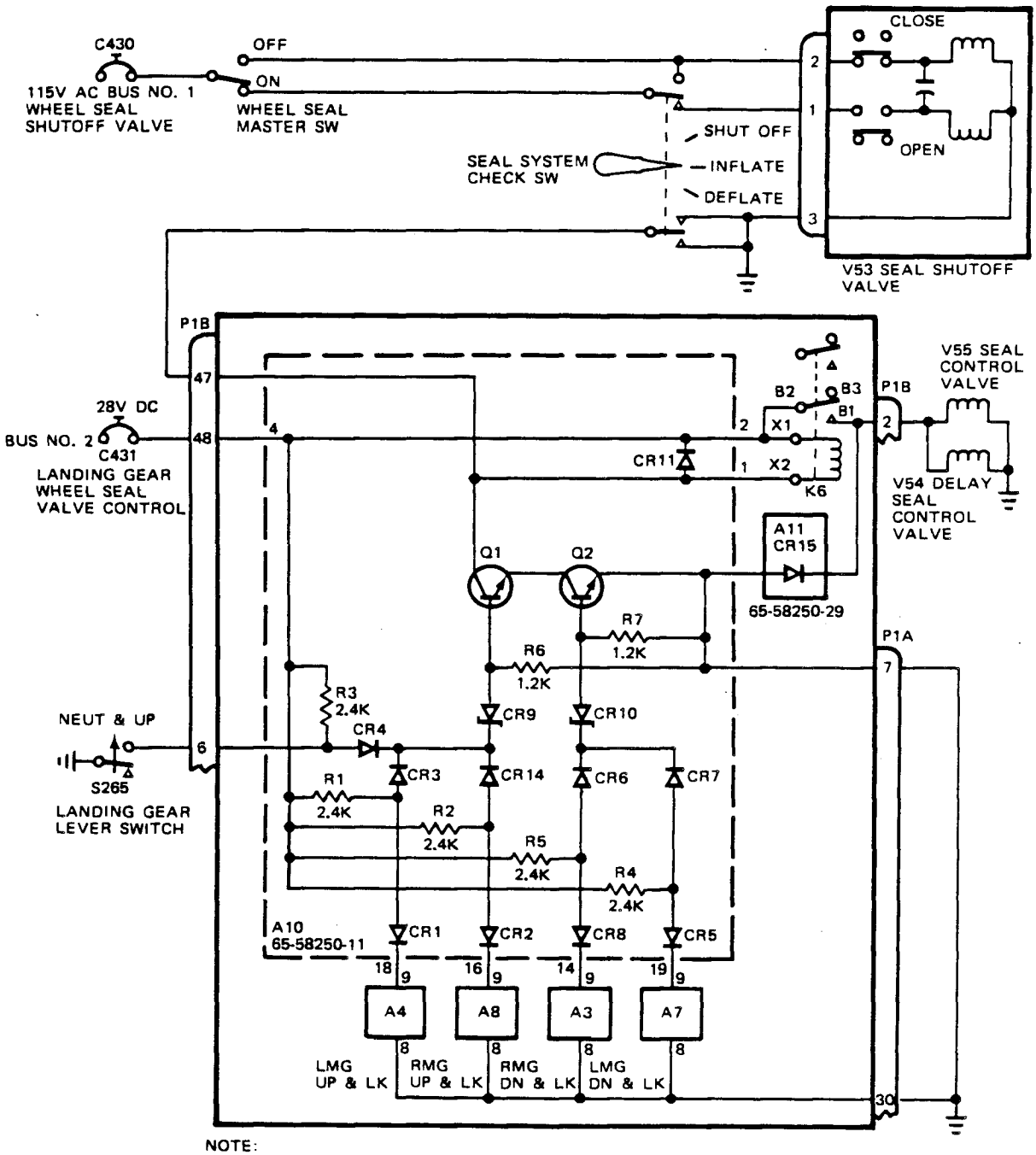
2) Left main gear in up and locked position to actuate A4 and ground J10 pin 18.

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:

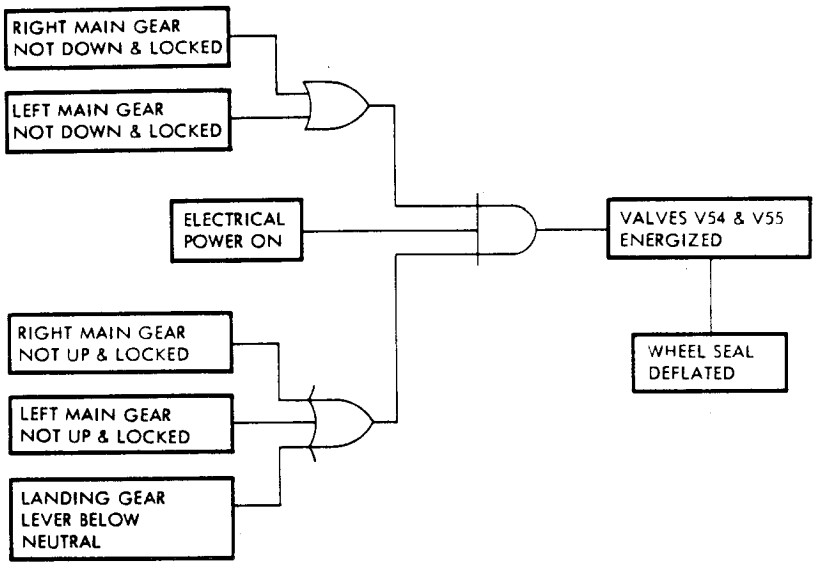
1) Left main gear in down and locked position to actuate A7 and ground J10 pin 19.

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



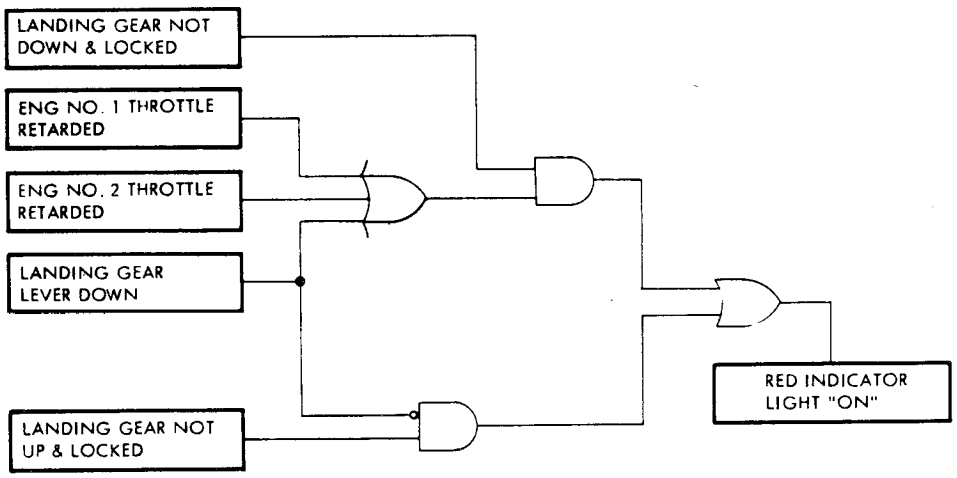
NOTE:
A3, A4, A7 & A8 ARE 10-61226 SWITCHES
DIODES CR1 THRU CR8, CR11 AND CR14 ARE 1N4385
UNLESS OTHERWISE SPECIFIED ALL RESISTANCES ARE IN OHMS ± 5%

Wheel Seal System
Figure 6



Wheel Seal Deflation Logic Diagram
Figure 7

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 (figure 8) when:



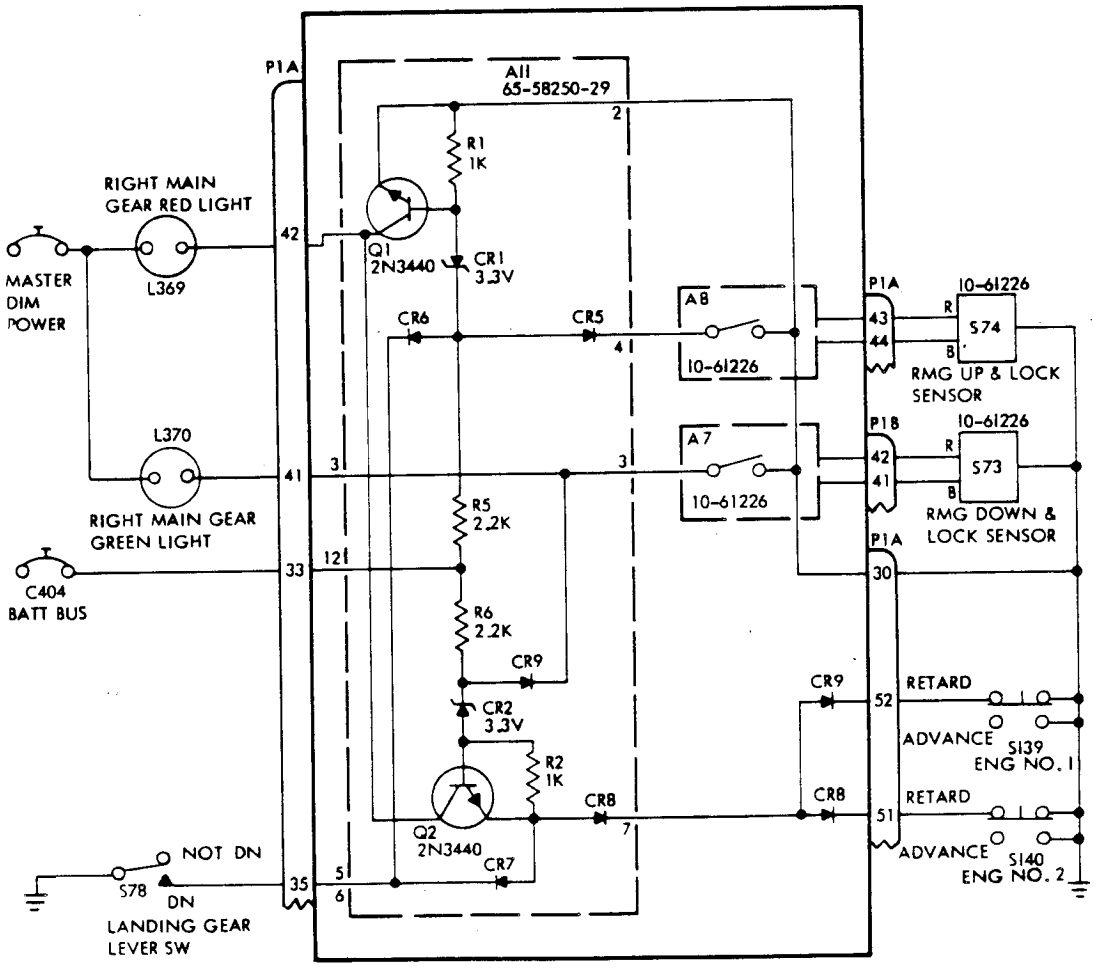
Red Indicator Lamp ON Logic Diagram
Figure 8

(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 ground is at pin A30.



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

Right Main Gear Visual Indication
Figure 9

(1) A ground path will be provided at pin A-41 to turn on the green lamp when normally-open proximity switch A7 is actuated. A7 is connected to an external proximity sensor (S73). 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 A-42 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 A-35) 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 A-35).

2) Engine No. 1 throttle is retarded (ground to pin A-52).

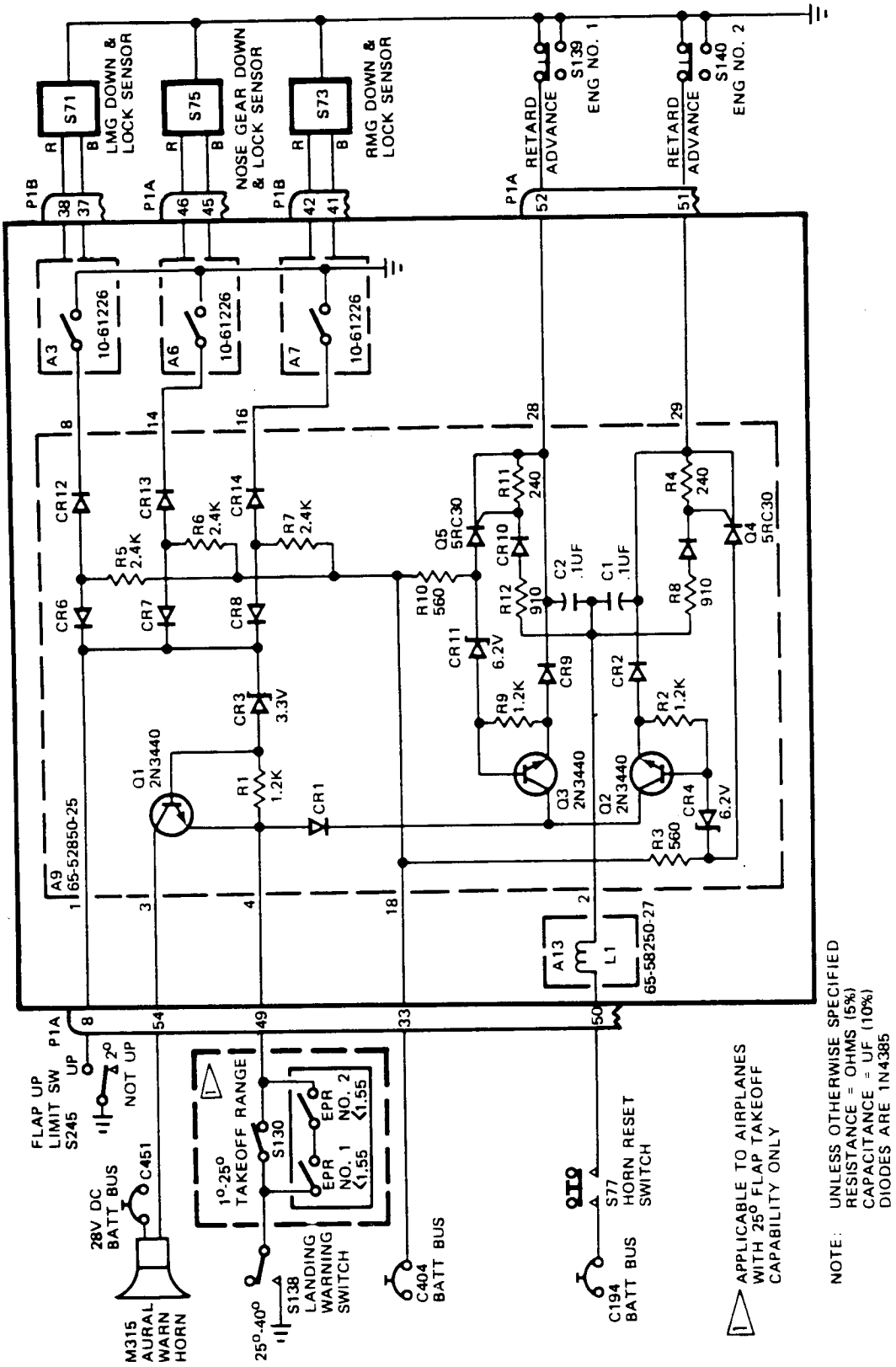
3) Engine No. 2 throttle is retarded (ground to pin A-51).

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, illustrates aural warning circuitry for assembly 69-62234-3, and 65-52811-100, -166. Figure 10, sheet 2, illustrates aural warning circuitry for assembly 69-62234-4, and 65-52811-101, -167. 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 69-62234-4, and 65-52811-101, -167). (See Fig. 11 for logic diagram.)

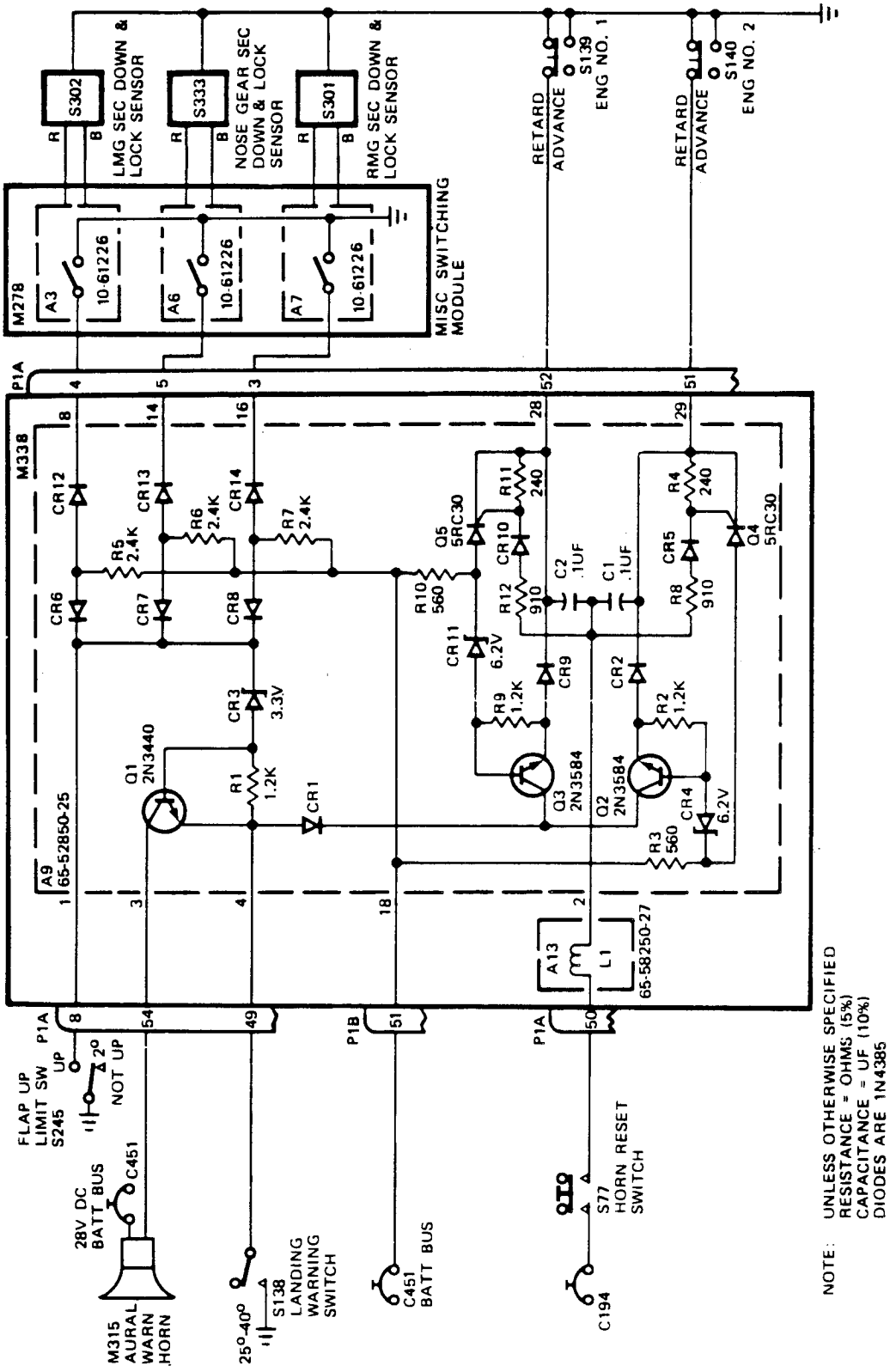
(1) When one or more of the landing gears are not down and locked (proximity switches not actuated) and the flaps are not up, base voltage is available to A9Q1. A9Q1 will conduct and provide a ground path for the horn when one of the following conditions exist:

(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 A-49 and allows A9Q1 to conduct.

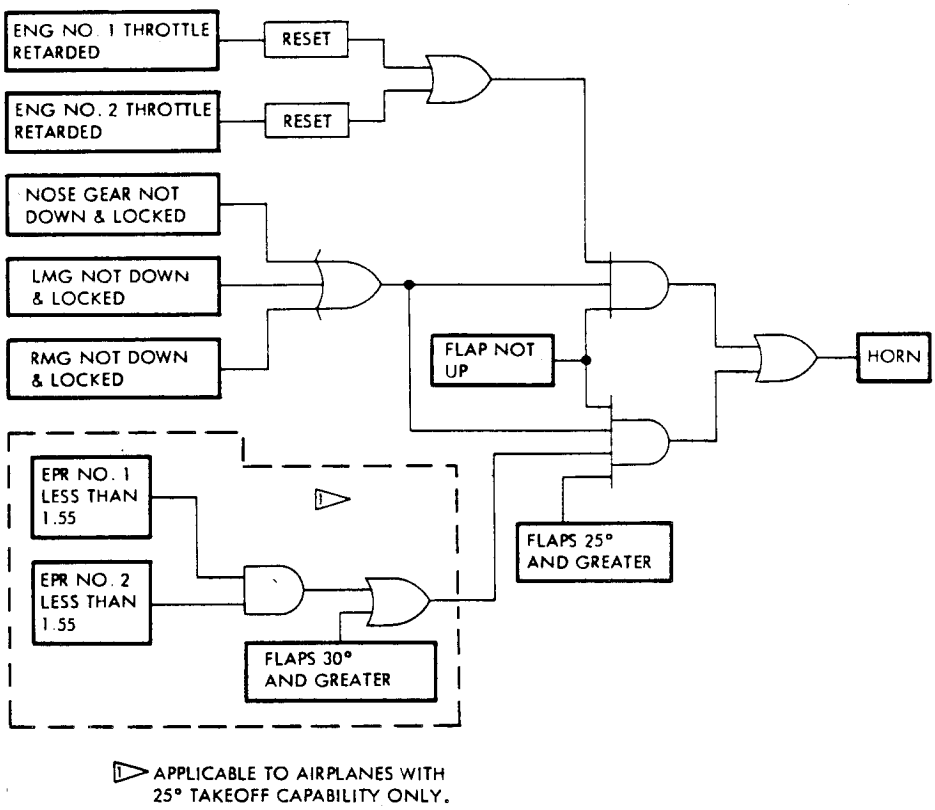
(b) Either engine is retarded to idle. This provides a ground at pins A-51 and/or A-52 and allows A9Q2 or A9Q3 to conduct.



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



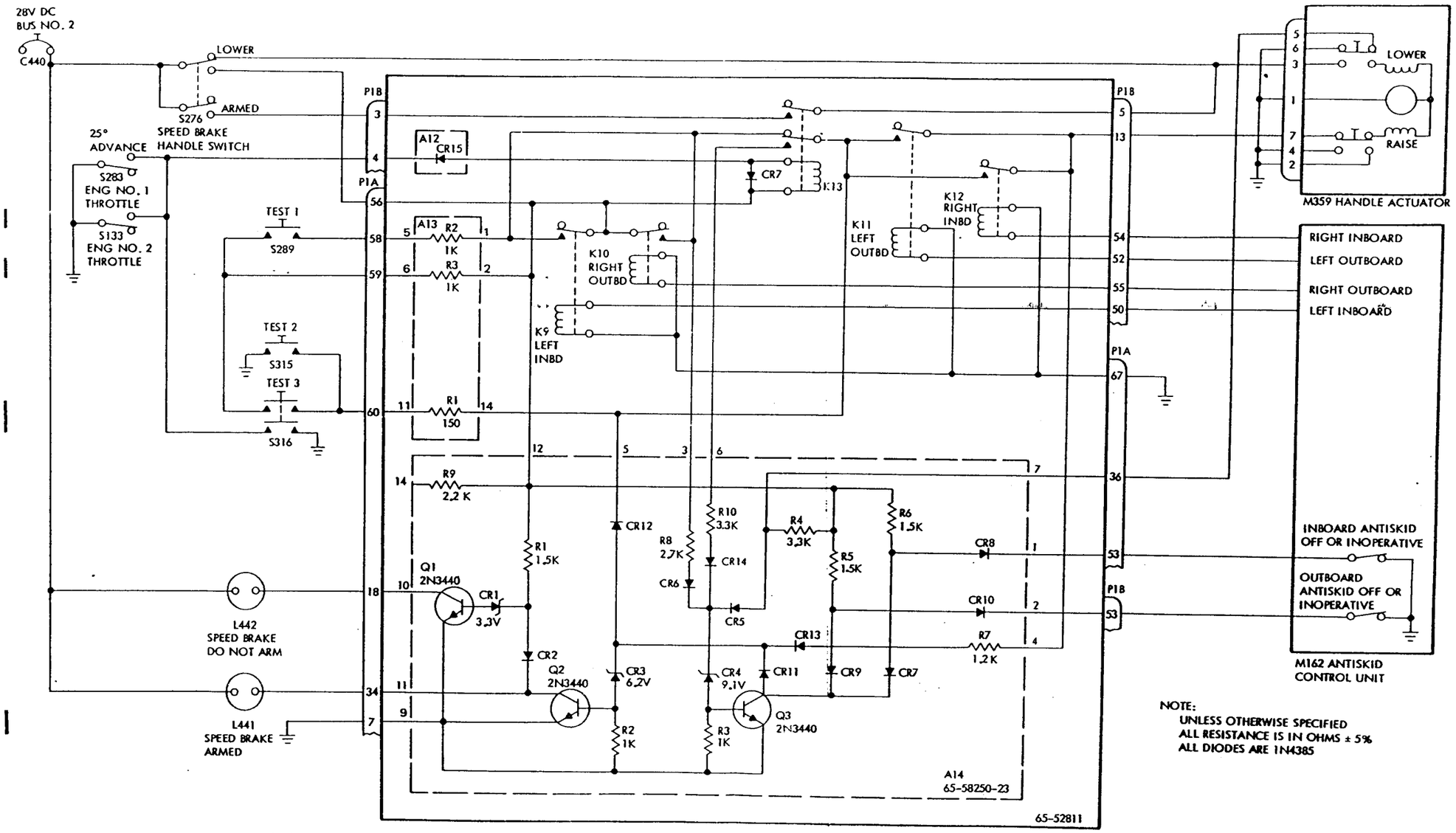
Landing Gear Aural System (FAA Certified only)
Figure 10 (Sheet 2)



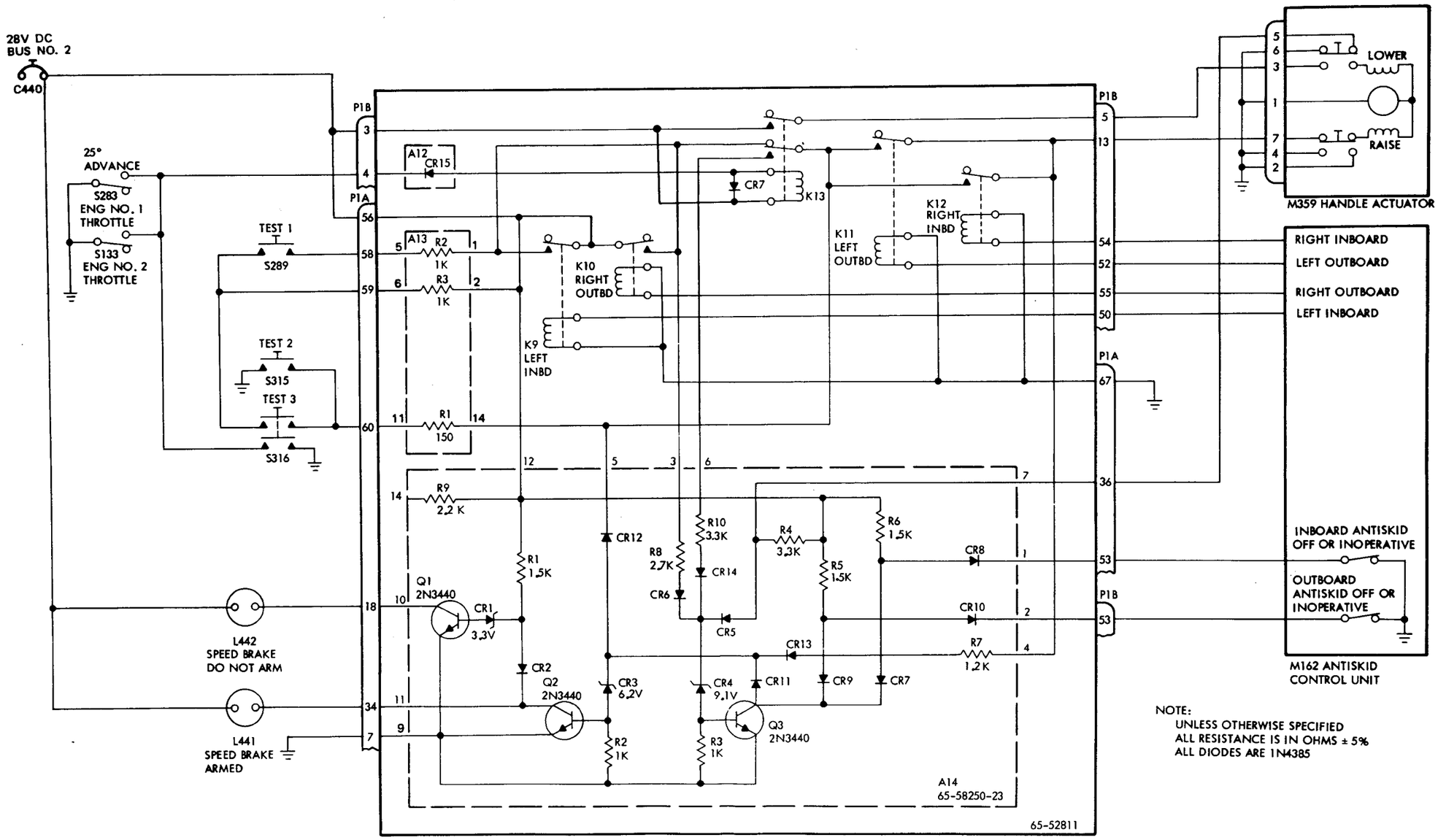
Landing Gear Aural Warning Logic Diagram
Figure 11

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.

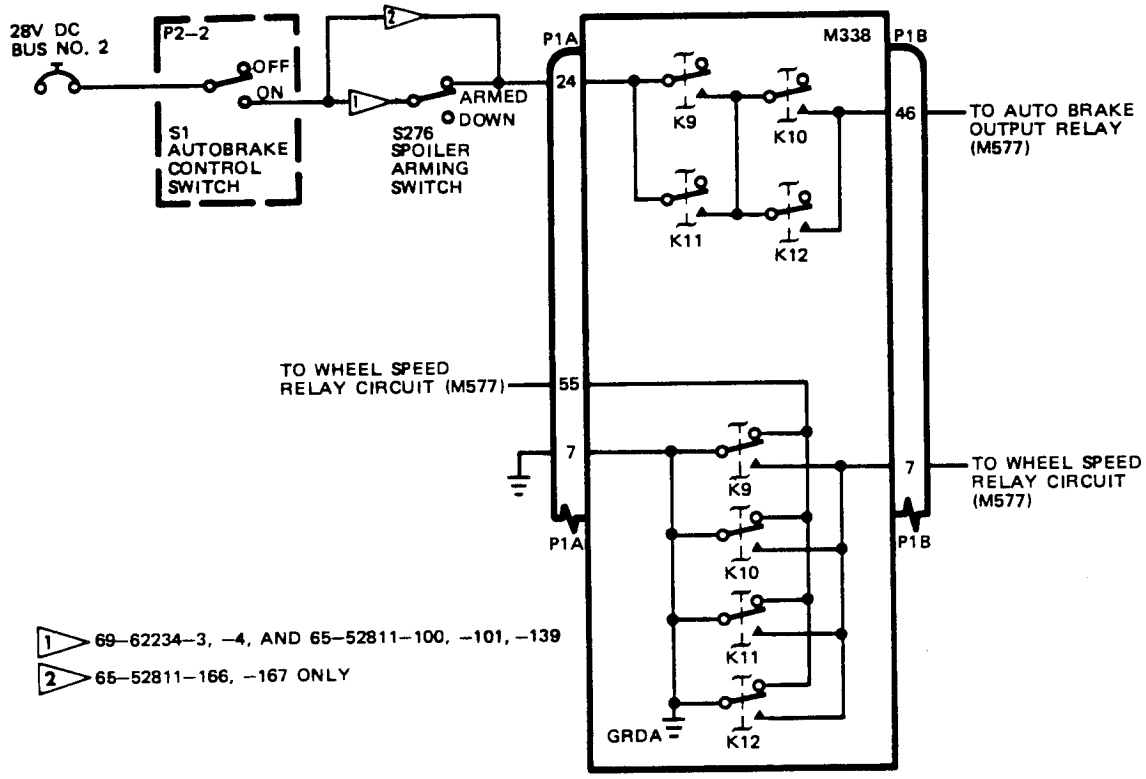
F. The automatic ground speed brake system actuates the ground and flight spoilers to aid braking after touchdown. (See figures 12 and 13.) The system consists of logic card A14, relays K9 through K13, and external switches, lamps and modules. The landing gear module controls the automatic mode of operation of the spoilers when the system is armed. It will provide voltage to cause the spoilers to be raised (pin B13) or lowered (pin B5) and provide ground to cause indicator lamps L441 (pin A34) or L442 (pin A18) to illuminate. When either lamp is illuminated, the other must be extinguished. Circuit power (system armed) is provided at pin A56. Pins A7 and A67 are circuit grounds.



65-52811-100, -101, AND 69-62234-3, -4



65-52811-139, -166, -167



Automatic Ground Speed Brake System
Figure 13

(1) When the speed brake control lever *[1] 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 of its base voltage to ground. When Q3 is on, base voltage to Q2 received through CR9 or CR7 is shunted to ground.

(2) At the time the speed brake control lever *[1] 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 *[1] set to ARMED, the 28-volt dc input to pin A-56 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

*[1] 69-62234-3, -4, and 65-52811-100, -101, -139 only

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 B13 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. The combination of K9, K10, K11, and K12 relays also passes 28 volts dc from pin B46 to the automatic brake control module (M577) autobrake output relay.

(4) A ground input to the automatic brake control module (M577) wheel speed relay light circuit is provided at pin A55 until both outboard and both inboard wheels reach 60 knots and all four relays K9, K10, K11, and K12 are energized. Then the ground is removed from pin A55 and a ground is provided from pin B7 for the M577 wheel speed relay light circuit.

(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 B5 to lower the handle actuator.

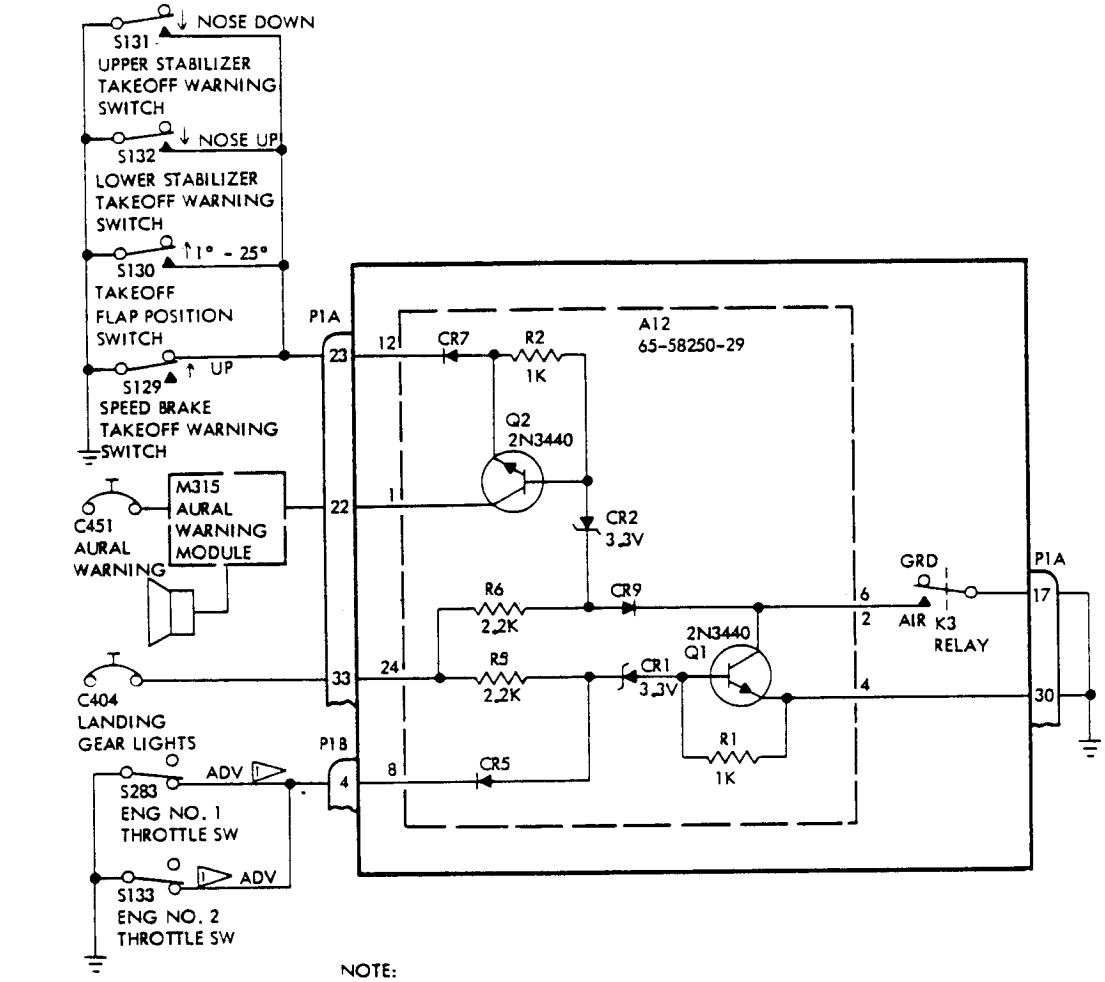
(6) The following are self-check test circuits that simulate the system operation (control in ARMED position).

(a) Test circuit 1 simulates K9 or K10. Twenty-eight volts is applied at pin A58 (J14 pin 3) to remove the ground path at pin A34 (J14 pin 11).

(b) Test circuit 2 simulates K11 or K12. J14 pin 5 is grounded through a 150-ohm resistor at pin A60. This removes the ground path at pin A34 (J14 pin 11).

(c) Test circuit 3 simulates engine throttle advance. It grounds pin B4 to actuate K13. Also, it applies 28 volts dc from pin A60, through K13 to J14 pin 6. This removes the ground path at pin A34 (J14 pin 11).

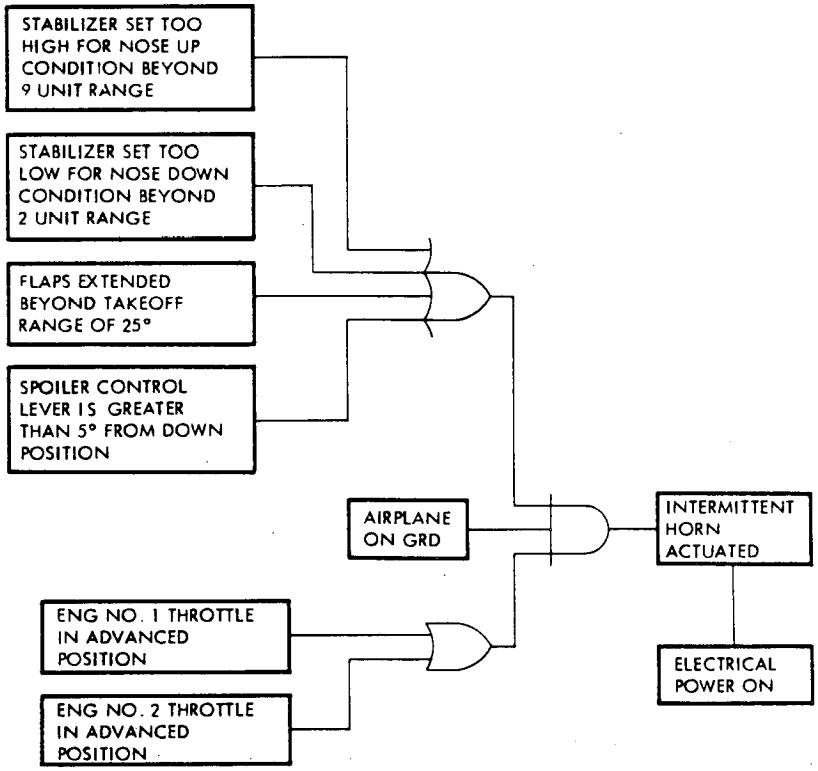
G. The takeoff aural warning system (figures 14 and 15) consists of logic card A12, relay K3, external switches and the M315 aural warning module (which contains the horn). The landing gear module provides a ground path to M315 when an unsafe flight control condition exists prior to takeoff. The intermittent 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.



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

25 ± 2% TO FULL ADVANCE

Takeoff Warning System
Figure 14



Takeoff Warning System Logic Diagram
Figure 15

(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.

4. Leading Particulars

Length -- 22 inches
Height -- 7.60 inches
Width -- 3.70 inches
Weight -- 12.12 pounds (approx)
Operating Voltage -- 28 volts ac, rms, 400 Hz
-- 28 volts dc

DISASSEMBLY

1. General

   A. Disassemble only as necessary for cleaning, inspection, repair, and replacement of components.

   B. Unsolder wiring connections and remove connector pins only when replacement of wire or component is required. Tag disconnected wires to facilitate reassembly. Refer to Repair of Electrical Connectors, Subject 20-11-02 and to Soldering Electrical Connections, Subject 20-12-01.

2. Disassemble Unit (See figure 1101.)

   A. Remove screw to unfasten dust cover, disengage spring fastener in rear and remove dust cover from chassis assembly (1).

   B. Remove printed circuit assemblies (2 through 9) from connectors (27 and 28).

      NOTE: Refer to applicable manufacturer's instructions for overhaul of printed circuit assemblies (2, 3 and 4). Refer to Subject 32-66-41 for overhaul of printed circuit assemblies (5 through 9) and to Subject 32-66-42 for printed circuit assembly (5).

   C. Remove relays (10 through 17) from chassis assembly (1).

      NOTE: Disassemble remaining components only for repair or replacement.

CLEANING

CAUTION: USE ONLY CLEANING MATERIAL SPECIFIED HEREIN. USE OF UNAPPROVED MATERIALS MAY DAMAGE THE ASSEMBLY OR CAUSE CIRCUIT FAILURE.

1. Remove dust or foreign matter from assembly using low pressure air suction.

2. Clean with aliphatic naphtha or isopropyl alcohol. Dry thoroughly with low pressure air.

   WARNING: WHEN USING ISOPROPYL ALCOHOL OR ALIPHATIC NAPHTHA, AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. USE ONLY WITH ADEQUATE VENTILATION. AVOID CONTACT WITH SKIN, EYES, AND CLOTHING. KEEP AWAY FROM HEAT, SPARKS OR OPEN FLAME.

3. For cleaning information related to soldering, refer to Preparation for Soldering, in Soldering Electrical Connections, Subject 20-12-01.

4. Clean terminal lugs and other bonding areas per Repair of Electrical Terminations and Electrical Bonding Areas, Subject 20-11-03.

INSPECTION/CHECK

1. Check wiring, electrical components, and solder connections with a minimum of 5-power magnification.

   A. Check components for security of mounting.

   B. Check components and wire for damage.

   C. Check wire terminals and connections for proper installation.

   D. Check wire insulation for charring, cracking, and brittleness.

   E. Check connectors for bent, corroded, or cracked pins.

2. Check nameplates, metal labels, and Metal-Cals for proper installation and legibility.

3. Check components for legibility of reference designations and terminal identification.

4. Check finished surfaces for damage.

5. Check chassis assembly for damage.

6. Check insulating sleeving for proper installation and evidence of damage.

REPAIR

1. Repair

   A. Repair electrical connectors per Repair of Electrical Connectors, Subject 20-11-02.

   B. Repair soldered connections per Soldering Electrical Connections, Subject 20-12-01.

   C. Repair wire terminations at terminal lugs and bonding areas per Repair of Electrical Terminations and Electrical Bonding Areas, Subject 20-11-03.

   D. Where required, straighten box assembly components and connector pins and tighten component mounting hardware.

   E. Restore reference designations, terminal numbers, or component identification markings to a legible condition. Refer to Application of Stencils, Insignia, Silk Screen, Part Numbering and Identification Markings, Subject 20-50-10.

2. Refinish

   NOTE: Refer to Subject 20-30-02 for stripping of protective finishes and Subject 20-41-01 for decoding of F and SRF finish symbols and their BAC equivalents.

   A. If protective finishes are worn or damaged, refinish as indicated.

      (1) All structural parts -- Apply F-2.21, F-2.30, or SRF-2.30 all over.

      (2) Front plate or baseplate -- Apply F-12.75 or SRF-14.9031 to front surface and edges.

      (3) Screws (with heads exposed on front of front plate or baseplate) -- Apply F-14.91 to heads.

3. Replacement

   A. Replace damaged wire with wire type as noted on the schematic diagram.

   B. Replace damaged Metal-Cals, per Application of Metal-Cals, Subject 20-50-05.

   C. Replace damaged heat shrinkable sleeving per Repair of Electrical Terminations and Electrical Bonding Areas, Subject 20-11-03.

D. Replace damaged grommets per Installation of Protective Grommets, Subject 20-50-09.

E. If rivets or nutplates require replacement, apply a coat of primer, Specification BMS 10-11, type 1, to faying surfaces and install while primer is wet.

F. Replace damaged pads with BAC5010, type 60 adhesive per Application of Adhesives, 20-50-12.

G. If keying plugs require replacement, install in connector as indicated in figure 401. Bond in place per Subject 20-50-12 using type 38 adhesive.

Connector	Position
J1-J2, J4 J5, J8	10-L
*[1] J3, J7	10-L
*[2] J3, J7	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] 69-62234-3, -4, and 65-52811-139
*[2] 65-52811-100, -101, -166, -167 only

Keying Plug Installation
Figure 401

H. If resistor (47) requires replacement, apply Wakefield 120 thermal compound (Wakefield Engineering Incorporated, 139 Foundry Street, Wakefield, Massachusetts 01881) between resistor (47) and upper rear plate assembly. Wipe off excess compound after installation, using cloth wetted with acetone or alcohol.

ASSEMBLY

1. General

   A. Complete required REPAIR procedures.

   B. Connect electrical wires per schematic diagram.

2. Reassemble Unit (See figure 1101.)

   A. Install relays (10 through 17) in chassis assembly (1).

   B. Install printed circuit assemblies (2 through 9) in connectors (27 and 28).

   C. Position top and bottom cover assemblies on chassis assembly (1) and install screws.

   D. Position dust cover on chassis assembly (1), fasten dust cover fastener and install screw at top and front of assembly.

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. Switches:

(1) SPST

(a) 27 required (S1-S16, S20, S23, S26, S71-S76, S105, S106)

(b) 1 required (S24) (69-62234-4, and 65-52811-101, -167 only)

(c) 1 required (S25)(65-52811-139, -166, -167 only)

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

(3) Pushbutton, normally open (S21)

F. Banana Jacks and Plugs:

(1) Jacks

(a) Dual (8 required) (J71-J76, J105, J106)

(b) Single (J23)

(2) Plugs (Used with centerpont sensor)

(a) Dual

(b) Single

G. Resistors:

(1) 8.2K, 10 PCT, 1 W (8 required) (R1-R8)

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

(1) ELDEC P/N 3-455-35 (ELDEC Corp., 16700 13th Ave. West, P.O. Box 100, Lynnwood, Washington 98036)

I. Centerpoint Sensor Kit (including 1-899-13CP02 centerpoint sensor)

(1) ELDEC P/N 1-899-15CP01 (ELDEC Corp., 16700 13th Ave. West, P.O. Box 100, Lynnwood, Washington 98036)

J. Test Connector (with pigtail lead):

(1) DPX2MB67S67S33B0000 (International Telephone and Telegraph Corp., ITT Cannon Electric Div., 10550 Talbert Ave., P.O. Box 8040, Fountain Valley, California 92708)

2. Functional Test

A. Verify continuity between pin-pairs listed in Fig. 701. Use positive 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-23	B-29
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-16	B-15*[1]

Component Tested	From Pin (+)	To Pin (-)
K5	B-19	A-17
	A-62	A-63
	A-65	A-66
	B-21	B-49
K3	B-43	A-17
	B-33	B-28
	A-11	A-12
K3/CR6 *[2]	A-17	B-17*[3]
K8	B-58	B-56
	B-61	B-60
	B-64	B-63
	A-29	B-66
Wiring	A-7	Chassis

*[1] 4 to 6 ohms
*[2] CR4 on 69-62234-3, and 65-52811-100, -166
CR6 on 69-62234-4, and 65-52811-101, -139, -167
*[3] 25 ohms max

Continuity Tests
Figure 703

B. Verify no continuity (50K minimum) between pin-pairs listed in Fig. 702. 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
	A-64	A-66
	B-20	A-17
	B-22	B-49
K3	A-10	A-12
	B-27	B-28
K3/S1	B-44	A-17
K8	B-57	B-56
	B-59	B-61
	B-62	B-64
	B-65	A-29

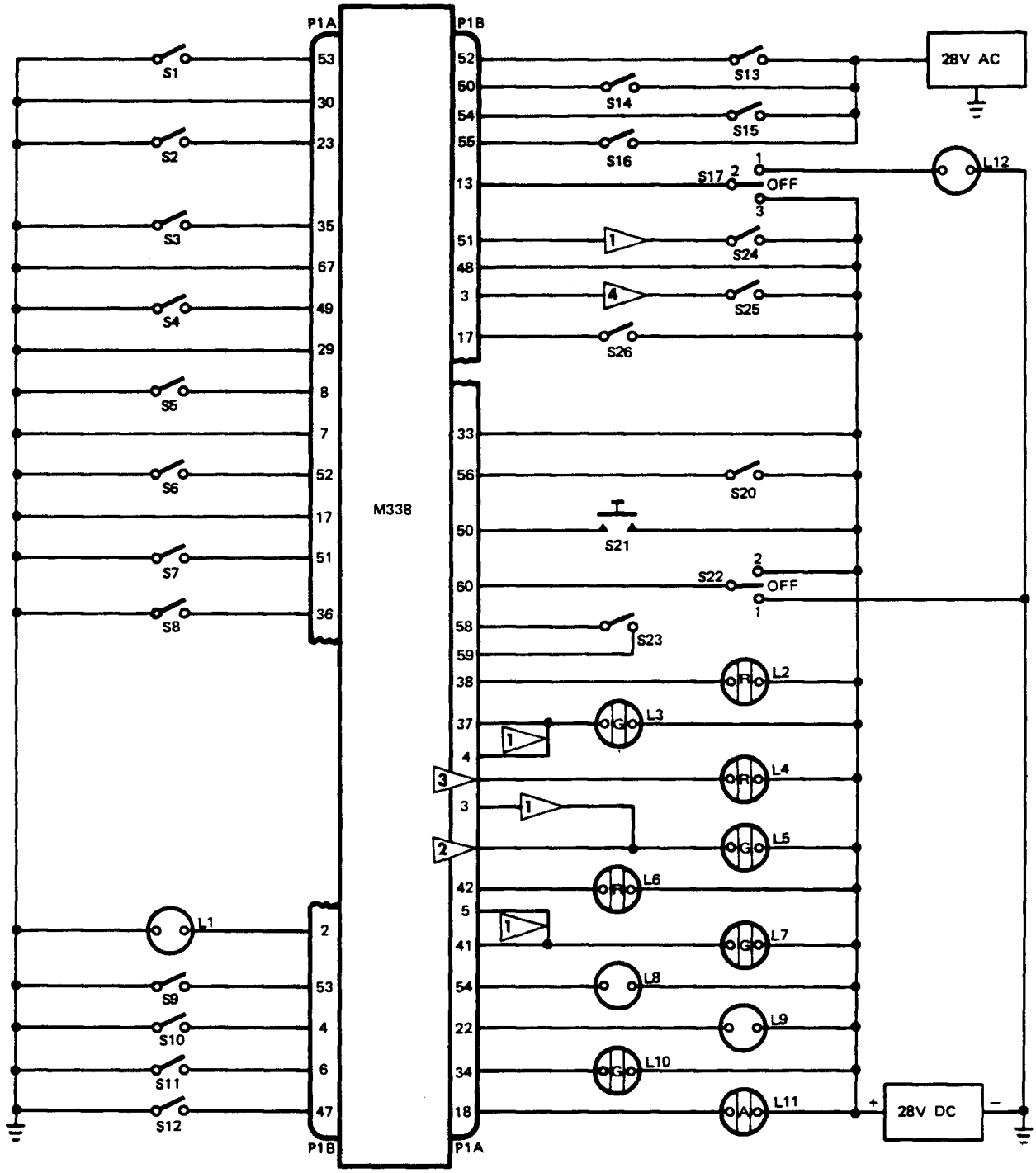
No-Continuity Tests
Figure 702

C. Verify 1150 ohms ±10% between pin A-58(+) and A-60.

D. Verify 1000 ohms ±25% between pin A-59(+) and A-56.

E. Connect test setup per Fig. 703. 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. 703. 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 704 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 L1 and L2 for 69-62234-3, and 65-52811-100, -139, -166. 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.



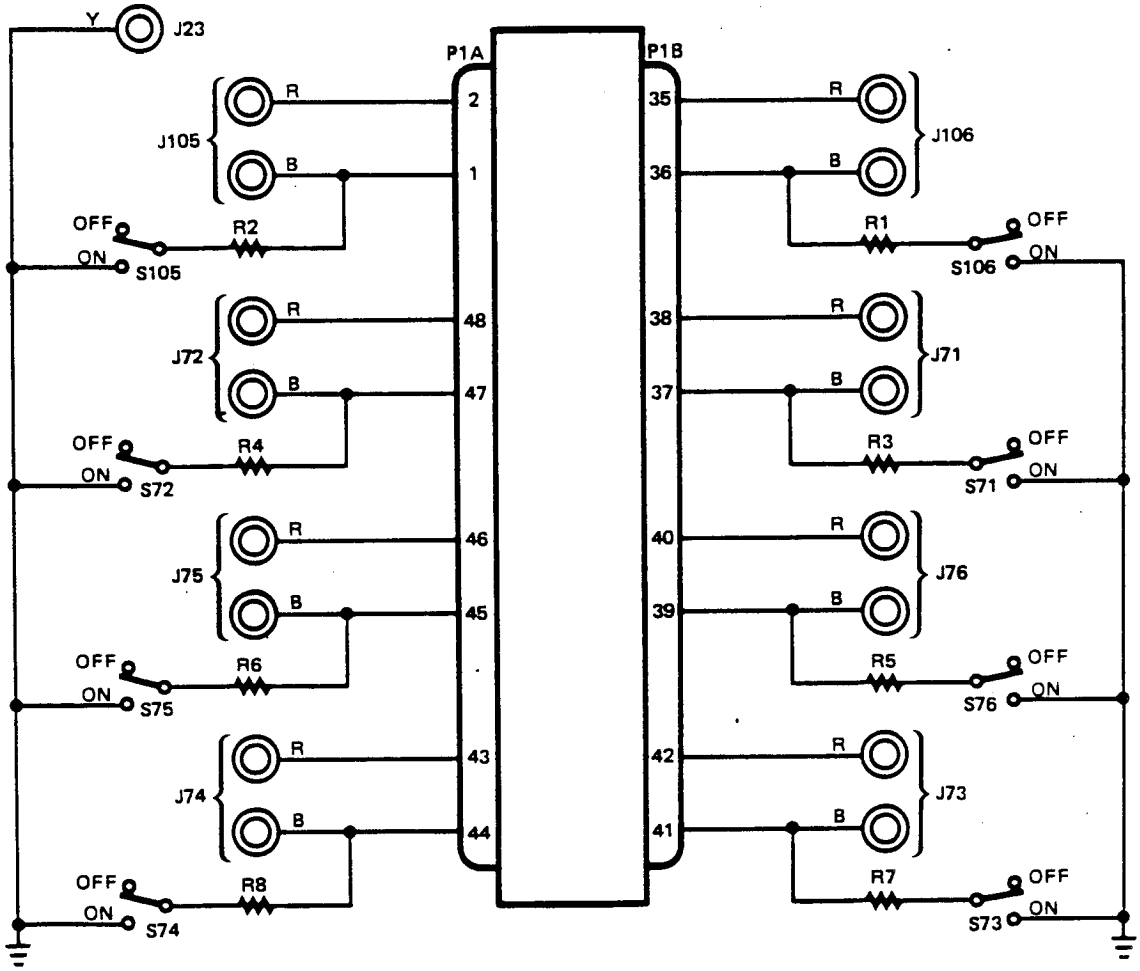
1 69–62234–4 AND 65–52811–101, –167 ONLY

2 PIN 39 ON 69–62234–3, –4, 65–52811–139
PIN 40 ON 65–52811–100, –101, –166, –167

3 PIN 39 ON 65–52811–100, –101, –166, –167
PIN 40 ON 69–62234–3, –4, 65–52811–139

4 65–52811–139, –166, –167 ONLY

Test Setup
Figure 703 (Sheet 1)



THE RED AND BLUE BANANA JACKS SHALL BE PAIRED AND SPACED TO RECEIVE DOUBLE BANANA PLUGS

R1 THRU R8 = 8.2K ± 10 PCT, 1W

Test Setup
Figure 703 (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
S106,J106	Deactuated, Off	Air Sensing Sensor	S106,J106
S105,J105	Deactuated, Off	Ground Sensing Sensor	S105,J105
S71,J71	Deactuated, Off	Left Main Gear Downlock Sensor	S71,J71
S72,J72	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	Deactuated, Off	Right Main Gear Downlock Sensor	S73,J73
S74,J74	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

*[1] 69-62234-4, an 65-52811-101, -167 only

Items Simulated by Test Setup
Figure 704

F. Set switches per initial condition listed in Fig. 704. Verify initial indications for lamps L1 thru L12.

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

H. Perform functional test per Fig. 705.

NOTE: 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 inch 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 inch 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-16 to B-15	4 to 6 ohms
	(K3,K5) B-19 to B-43	Con
	(K4) B-30 to A-19	Con
	(K8) B-66 to A-29	Con
2	Connect deactuated sensor to test jack J106	
3	Set S26 to ON	
4	Measure resistance between:	
	(K7) B-18 to A-32	Con
	(K7) B-16 to B-15	No Con
	(K4) B-30 to A-19	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	Actuate sensor	Module lamp L1 on
9	Measure resistance between:	
	(K1,K2) A-9 to A-14	Con
	(K3) A-10 to A-12	Con
	(K3) B-27 to B-28	Con
	(K3,S1) B-44 to A-17	Con
	(K4) B-30 to A-19	Con

Functional Tests
Figure 705 (Sheet 1)

Step	Procedure	Required Results
	(K5) A-61 to A-63	Con
	(K5) A-64 to A-66	Con
	(K5) B-20 to A-17	Con
	(K5) B-22 to B-49	Con
	(K7,R2) B-16 to B-15	4 to 6 ohms
10	Verify both module lamps L1 and L2 are illuminated	
11	Measure resistance between:	
	(K3) A-11 to A-12	No Con
	(K3) B-33 to B-28	No Con
	(K3) A-17 to B-43	No Con
	(K5) A-17 to B-19	No Con
	(K5) B-21 to B-49	No Con
	(K5) A-62 to A-63	No Con
	(K5) A-65 to A-66	No Con
12	Deactuate sensor	Module lamp L1 off
13	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	Set S106 to ON	L9 off Module lamp L1 on
17	Set S106 to OFF	L9 on Module lamp L1 off
18	Set S2 to OFF	L9 off
	Ground Sensing Squat Switch	
19	Connect deactuated sensor to test jack J105	
20	Actuate sensor	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

Step	Procedure	Required Results
	(K4) B-31 to A-19	Con
	(K4) A-28 to A-31	Con
	(K4) B-34 to B-8	Con
	(K4) B-12 to B-10	Con
	(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 A-29	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) A-15 to A-31	No Con
	(K4) B-14 to B-8	No Con
	(K4) B-11 to B-10	No Con
	(K7) B-16 to B-15	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 A-29	No Con
24	Set S26 to OFF	
25	Measure resistance between:	
	(K1,K2) A-57 to A-13	Con
	(K4) B-30 to A-19	Con
	(K7,R2) B-16 to B-15	4 to 6 ohms
26	Press module switch S2, release	Module lamp L2 on while pressed
27	Press-to-test module lamps L1 and L2	Module lamps on while pressed
28	Deactuate sensor	Module lamp L2 on
29	Disconnect sensor from test jack J105	

I. Nose and Main Landing Proximity Switch Card Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 704.

(2) Perform proximity switch card tests per Fig. 706.

Step	Procedure	Required Results
	NOTE: Indicators L2, L4 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 inch 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 inch from the actuation point.	
1	Connect deactuated sensor to test jack J2	
2	Actuate sensor	L2 off
3	Deactuate sensor	L2 on
4	Disconnect sensor from test jack J72	
5	Connect deactuated sensor to test jack J76	
6	Actuate sensor	L4 off
7	Deactuate sensor	L4 on
8	Disconnect sensor from test jack J76	
9	Connect deactuated sensor to test jack J74	
10	Actuate sensor	L6 off
11	Deactuate sensor	L6 on
12	Disconnect sensor from test jack J74	
	NOTE: 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 inch *[1] 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 inch *[2] from the actuation point.	
13	Connect deactuated sensor to test jack J71.	
14	Actuate sensor	L3 on
15	Deactuate sensor	L3 off
16	Disconnect sensor from test jack J71	
17	Connect deactuated sensor to test jack J73.	
18	Actuate sensor	L7 on
19	Deactuate sensor	L7 off
20	Disconnect sensor from test jack J73	

Proximity Switch Card Tests
Figure 706 (Sheet 1)

Step	Procedure	Required Results
	NOTE: Indicators 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 inch 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 inch from the actuation point.	
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] 0.275 to 0.325 inch for 69-62234-3, -4 and 65-52811-139
0.130 to 0.160 inch for 65-52811-100, -101, -166, -167
*[2] 0.005 to 0.030 inch for 69-62234-3, -4 and 65-52811-139
0.005 to 0.020 inch for 65-52811-100, -101, -166, -167

Proximity Switch Card Tests
Figure 706 (Sheet 2)

J. Wheel Seal Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 704.

(2) Perform wheel seal circuitry tests per Fig. 707.

NOTE: L4 must remain illuminated. L5 and L8 thru L12 must remain extinguished.

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

Wheel Seal Circuitry Tests
Figure 707

K. Left Main Gear Indication Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 704.

(2) Perform left main gear indication circuitry tests per Fig. 708.

NOTE: L1, L4 and L6 must remain illuminated. L5 and L7 thru L12 must remain extinguished.

Step	Condition	Procedure	Required Results	
			LM Red L2	LM Grn L3
1	LM Gear Down	Set S71 to ON	On	On
2		Measure voltage between: A-38 and GND	1 vdc max	
3	Gear Handle Down	Set S3 to ON	Off	On
4	LM Gear Not Down	Set S71 to OFF	On	Off
5	Gear Handle Not Down	Set S3 to OFF	On	Off
6	LM Gear Up	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		Measure voltage between: A-38 and GND	2.5 vdc max	

Left Main Gear Indication Circuitry Tests
Figure 708

K. Right Main Gear Indication Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 704.

(2) Perform right main gear indication circuitry tests per Fig. 709.

NOTE: L1, L2 and L4 must remain illuminated. L3, L5 and L8 thru L12 must remain extinguished.

Step	Condition	Procedure	Required Results	
			RM Red L6	RM Grn L7
1	RM Gear Down	Set S73 to ON	On	On
2		Measure voltage between: A-42 and GND	1 vdc max	
3	Gear Handle Down	Set S3 to ON	Off	On
4	RM Gear Not Down	Set S73 to OFF	On	Off
5	Gear Handle Not Down	Set S3 to OFF	On	Off
6	RM Gear Up	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		Measure voltage between: A-42 and GND	2.5 vdc max	

Right Main Gear Indication Circuitry Tests
Figure 709

M. Nose Gear Indication Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 704.

(2) Perform nose main gear indication circuitry tests per Fig. 710.

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

Step	Condition	Procedure	Required Results: Nose Red L4	Required Results: Nose Grn L5
1	Nose Gear Downlock	Set S75 to ON	On	On
2		Measure voltage between: A-40*[1] and GND	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		Measure voltage between: A-40*[1] and GND	2.5 vdc max	

*[1] Pin A-39 on 65-52811-100, -101, -166, -167
*[2] Pin A-40 on 69-62234-3, -4 and 65-52811-139

Nose Gear Indication Circuitry Tests
Figure 710

N. Aural Warning Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 704.

(2) Perform aural warning circuitry tests per Fig. 711.

NOTE: L1, L2, L4 and L6 must remain illuminated. L9 thru L12 must remain extinguished.

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 Warning Sw. Down	Set S4 to ON	Off	Off	Off	On
14	LM Gear Down	Set S71 to ON	On	Off	Off	On
15	RM Gear Down	Set S73 to ON	On	Off	On	On
16	Nose Down	Set S75 to ON	On	On	On	Off
17	RM Gear Not Down	Set S73 to OFF	On	On	Off	On
18	RM Gear Down	Set S73 to ON	On	On	On	Off
19	LM Gear Not Down	Set S71 to OFF	Off	On	On	Off
20		*[1] Set S24 to OFF	Off	On	On	Off
21	LM Gear Down	Set S71 to ON	On	On	On	Off
22		Measure voltage between:				
		A-37 and GND	1 vdc max			
		*[2] A-39 and GND	1 vdc max			
		A-41 and GND	1 vdc max			

*[1] 69-62234-4, and 65-52811-101, -167 only
*[2] Pin A-39 on 69-62234-3, -4 and 65-52811-139
Pin A-40 on 65-52811-100, -101, -166, -167

Aural Warning Circuitry Tests
Figure 711

O. Automatic Ground Spoiler Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 704.

(2) Perform automatic ground spoiler circuitry tests per Fig. 712.

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		Measure between: (+)B-5 and B-4 *[1] B-3 and B-5 *[2] A-18 and GND	 26 to 28 vdc 2 ohms max 1 vdc max			
18		Return all test switches and lamps to the initial condition listed in Fig. 704				
19		*[1] Set S25 to ON				
20	Speed Brake Armed	Set S20 to ON	Off	Off	On	Off
21	Right Inbd Power On	Set S15 to ON	Off	Off	On	Off
22	Right Outbd Power On	Set S16 to ON	Off	On	Off	Off
23	Speed Brake Actuator	Set S17 to position 1	Off	On	Off	On
24	Engine Throttle Advance	Set S10 to ON	On	Off	On	Off

Automatic Ground Spoiler Circuitry Tests
Figure 712 (Sheet 1)

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

*[1] 65-62811-139, -166, -167 only
*[2] 69-62234-3, -4, and 65-52811-100, -101 only

Automatic Ground Spoiler Circuitry Tests
Figure 712 (Sheet 2)

O. Auto-Brake Circuitry Test

(1) Verify all test switches and lamps are in the initial condition listed in Fig. 704.

(2) Perform auto-brake circuitry tests per Fig. 713.

NOTE: No test lamps change state during test.

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

Auto-Brake Circuitry Tests
Figure 713

Q. Turn off both power supplies.

R. Disconnect test setup, Fig. 703.

S. Antiskid Test

(1) Connect test setup per Fig. 714.

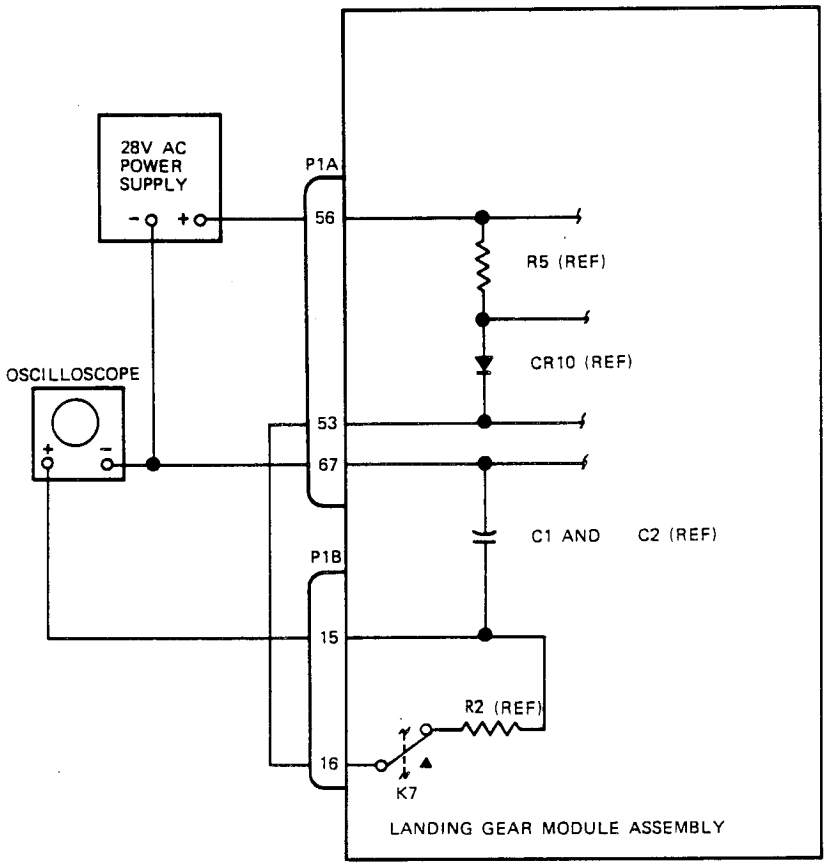
(2) Turn on power supply.

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

(4) Verify ripple voltage is less than 5 volts peak-to-peak.

(5) Turn off power supply.

(6) Disconnect test setup, Fig. 714.

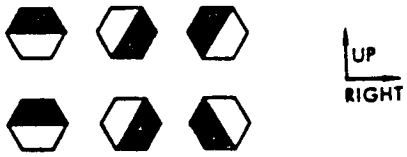


Test Setup
Figure 714

T. Verify indexing on rear connector as follows:

69-62234-3, 65-52811-100, -139, -166

69-62234-4, 65-52811-101, -167



NOTE: Darkened portion indicates extended part of keying post.

TROUBLE SHOOTING

1. Trouble shooting is keyed to steps of the test procedures. Paragraph and step references are to that portion of TESTING wherein the fault specified could occur. The presumption is made that when a fault indication is encountered, the results of all previous steps were normal.

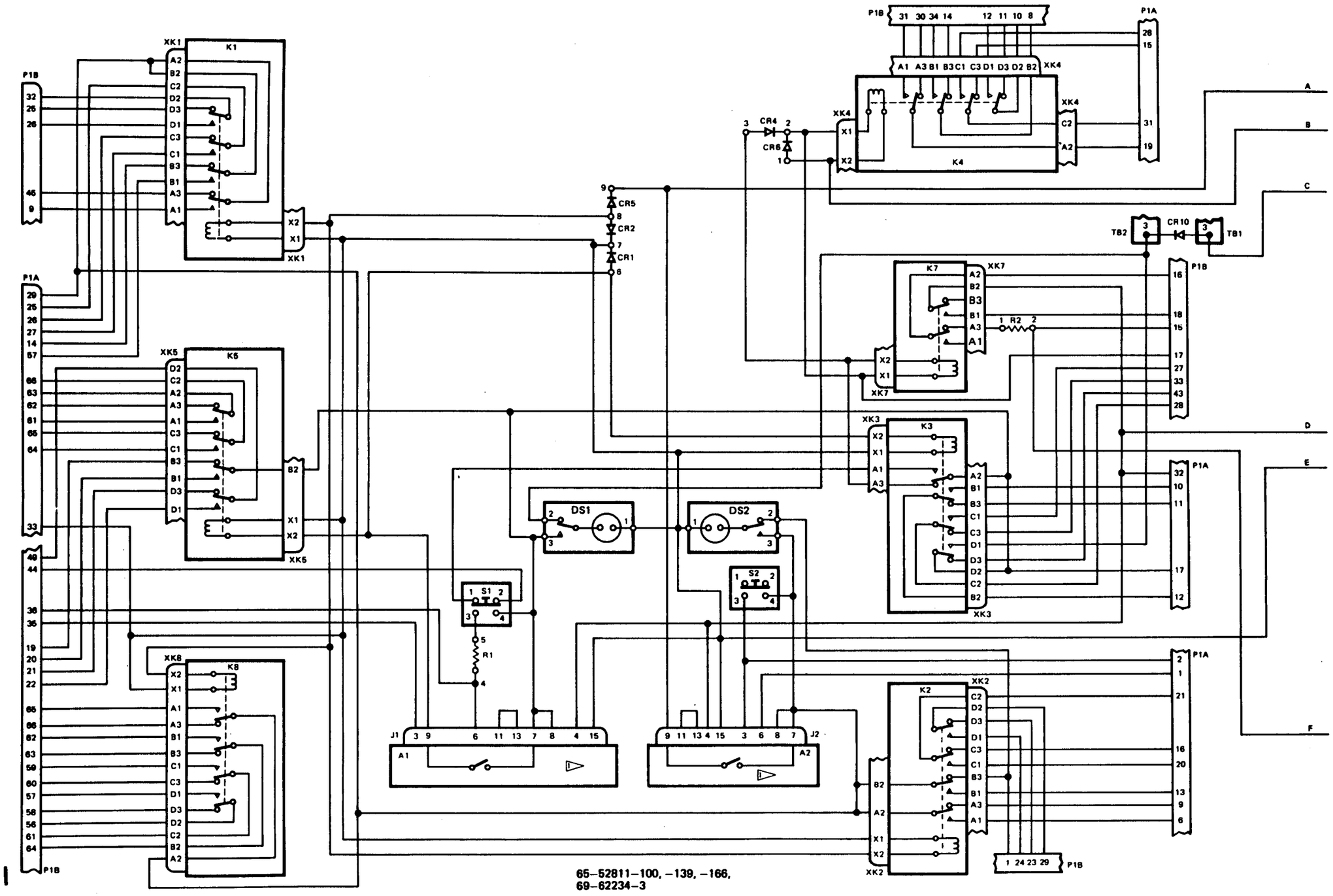
   NOTE: L1 and L2 refer to test lamps unless module lamps specifically stated.

Trouble	Possible Cause and Correction
Fig. 701,702	Listed Component
Par. 2.C.	A13, K13
Par. 2.D.	A13
Fig. 704	
L1 fault	A10, A11, K6
L2 fault	A4, A11
L3 fault	A3 or A9
L4 fault	A5, A12
L5 fault	A6 or A9
L6 fault	A8, A11
L7 fault	A7 or A9
L8 fault	A9
L9 fault	A12
L10, L11 fault	A14
Par. 2.G.	
Module lamp L1 *[1]	A1, K3, L1 (Air Sensing)
Module Lamp L2 *[1]	A2, K2, L2 (Ground Sensing)
Fig. 705	
Steps 1, 4, 9, 11, 21-25	Listed component
Steps 5-7	
Continuity fault	R1, S1
Module lamps L1 *[1] fault	A1, K3, R1, S1
Steps 8, 12	A1
Steps 14-18	A12
Steps 20, 28	A2
Steps 26	A2, S2
Step 27	Module lamp L1 or L2 *[1]

*[1] Module lamps L1 and L2 on 69-62234-4, and 65-52811-101, -167
Module lamps DS1 and DS2 on 69-62234-3, and 65-52811-100, -139, -166

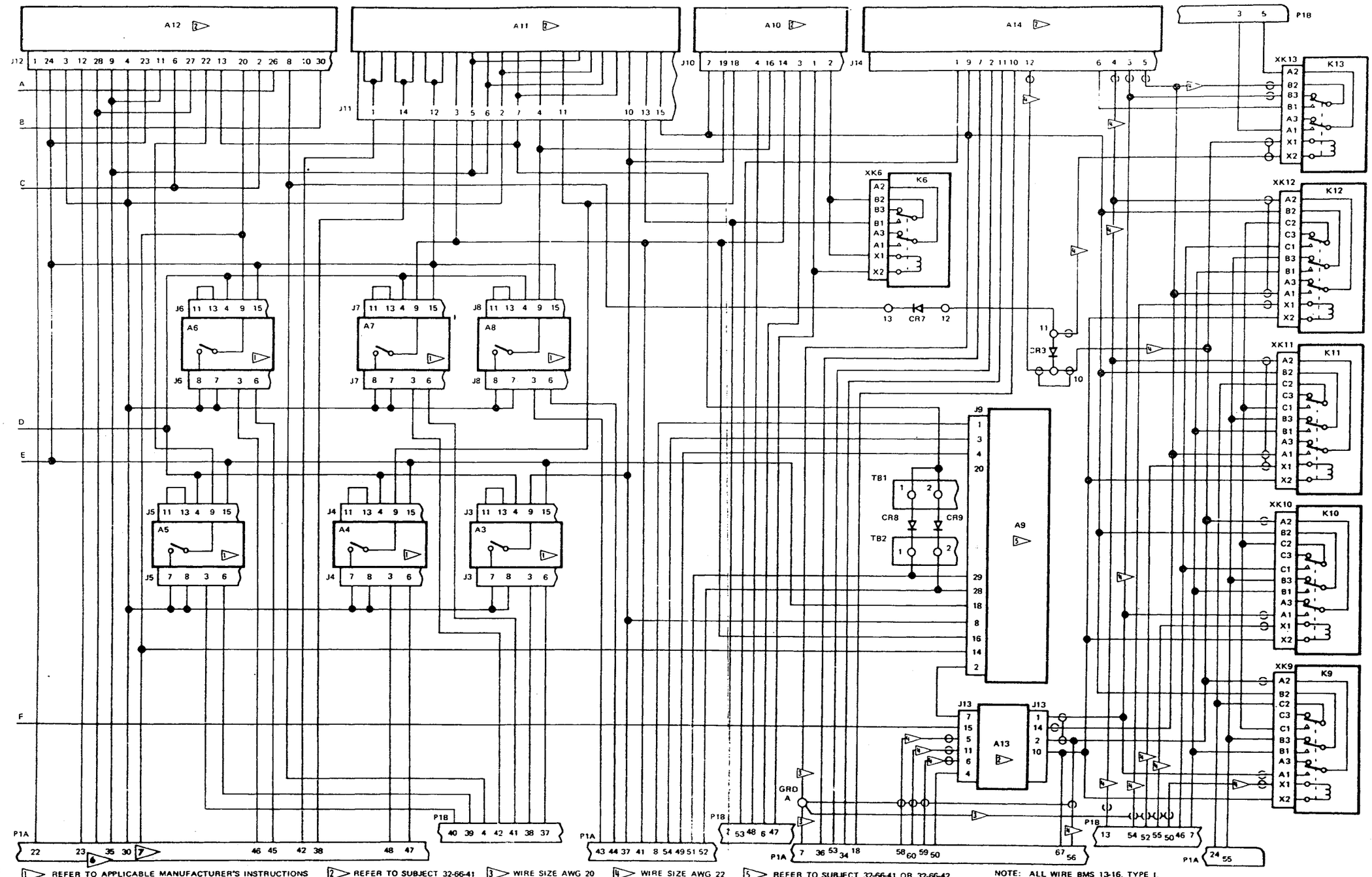
Trouble	Possible Cause and Correction
Fig. 706	
Steps 1-4	A2
Steps 5-8	A5
Steps 9-12	A8
Steps 13-16	A3
Steps 17-20	A7
Steps 21-24	A6
Fig. 707	
L3, L7 fault	A3, A7
L2, L6 fault	A3, A8, A11
L1 fault, step 1 or 5	K6
L1 fault, all other steps	A10
Fig. 708, 709	A11
Fig. 710	A12
Fig. 711	
L8 fault	A8, or if reset failure, A13 involved
L3, L5, L7 fault	A3, A6, A7 respectively
Voltage fault	A6 (pin A-39 *[2], A7 (pin A-41), A3 (pin A-37)
Fig. 712	
Step 2, L9 fault	A12
L10, L11 fault	A14
Steps 3-10, L10, L11 fault	A14
Steps 11-15, L10, L11 fault	A13, A14
Step 16, L9 fault	A12
Step 17	A14 or K13
Steps 19-44	
L9 fault	A12
L10, L11 fault	If combined with L12 failure to illuminate, suspect one of relays K9 thru K12. If L12 illuminated, replace A14. Replace relays by trial and error except: At step 24 - Replace K13 first 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. 713	K9-K12
Par. 2.S.	A13

*[2] Pin A-39 on 69-62234-3, -4 and 65-52811-139
Pin A-40 on 65-52811-100, -101, -166, -167



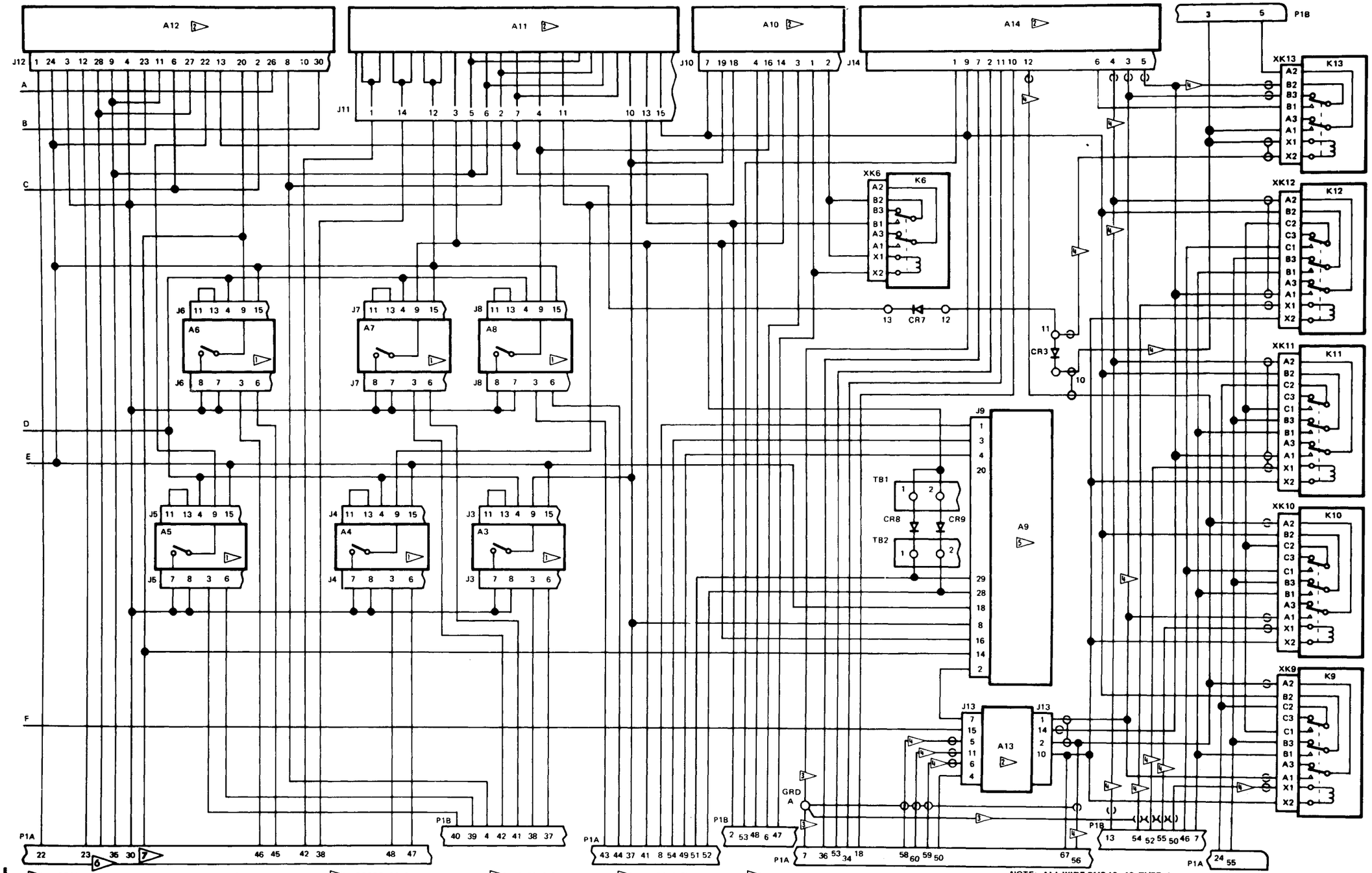
65-52811-100, -139, -166,
69-62234-3

Schematic Diagram
Figure 801 (Sheet 1)



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 REFER TO SUBJECT 32-66-41 OR 32-66-42
6 PIN 39 ON 69-62234-3; PIN 40 ON 65-52811-100, -186
7 PIN 39 ON 65-52811-100, -186; PIN 40 ON 69-62234-3

65-52811-100, 69-62234-3
Schematic Diagram
Figure 801 (Sheet 2)

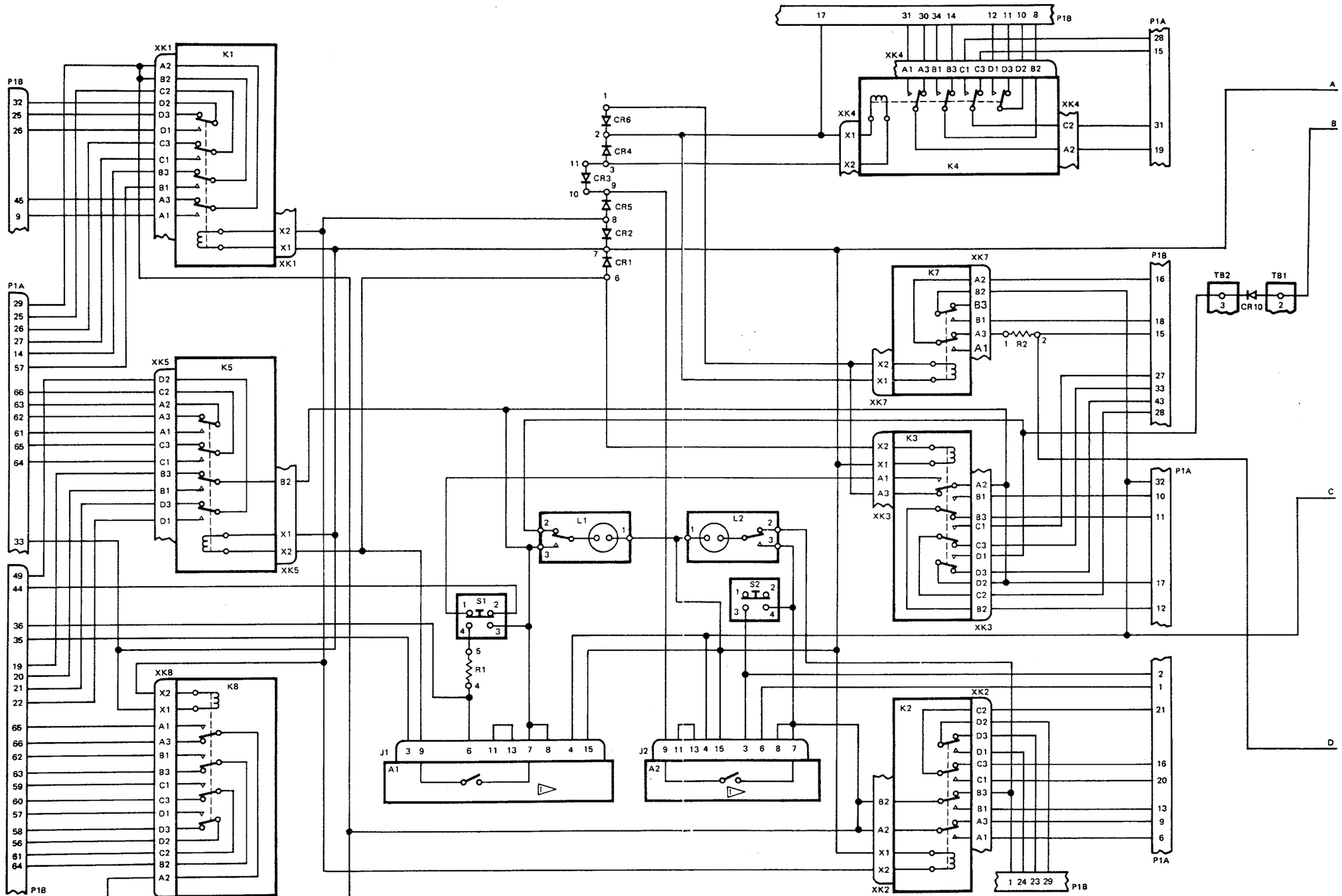


1. REFER TO APPLICABLE MANUFACTURER'S INSTRUCTIONS
2. REFER TO SUBJECT 32-66-41
3. WIRE SIZE AWG 20
4. WIRE SIZE AWG 22
5. REFER TO SUBJECT 32-66-41 OR 32-66-42
6. PIN 39 ON 65-52811-139
   PIN 40 ON 65-52811-166
7. PIN 39 ON 65-52811-166
   PIN 40 ON 65-52811-139

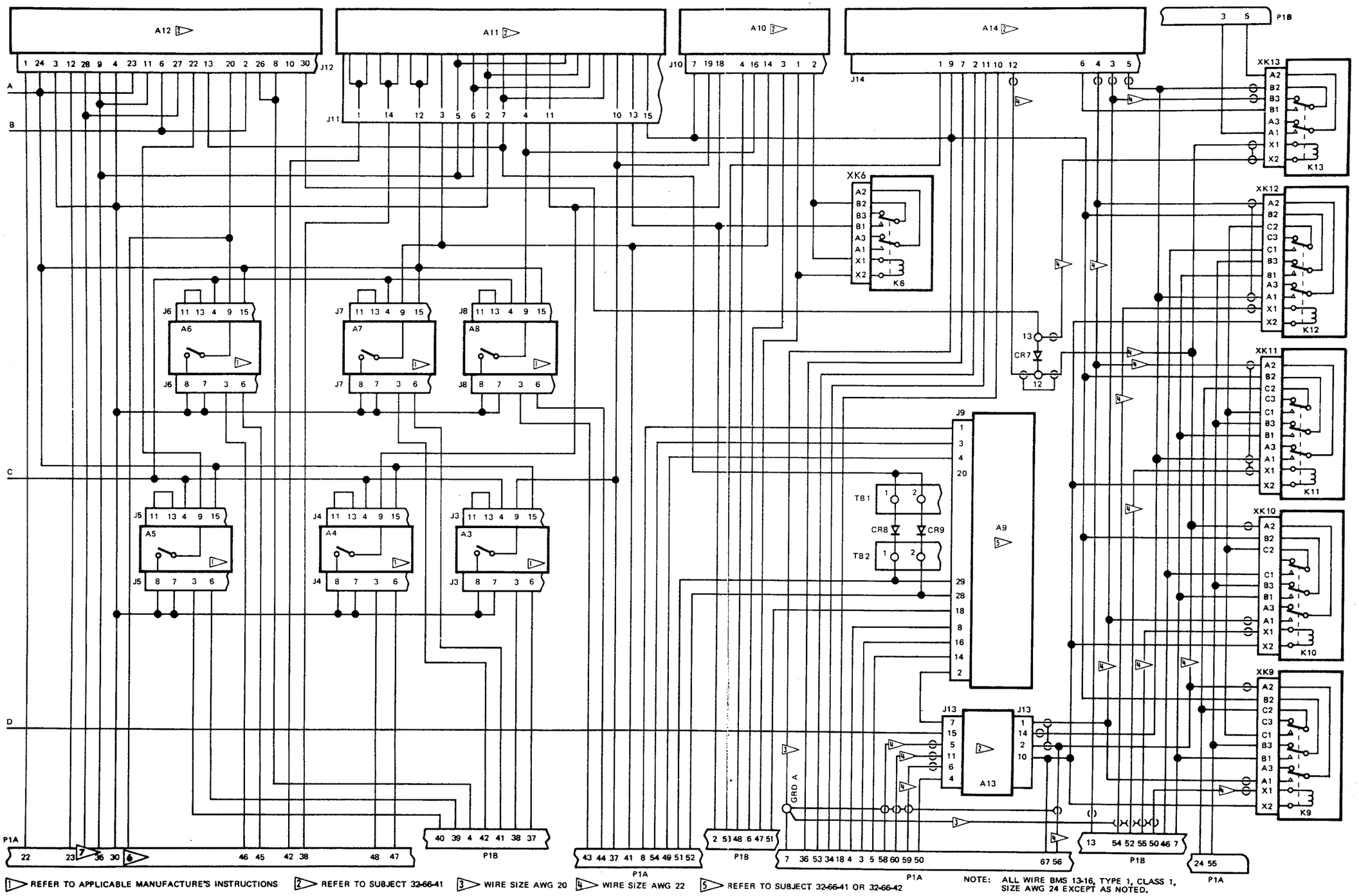
NOTE: ALL WIRE BMS 13-16, TYPE 1, CLASS 1, SIZE AWG 24 EXCEPT AS NOTED

65-52811-139, -166

Schematic Diagram
Figure 801 (Sheet 3)



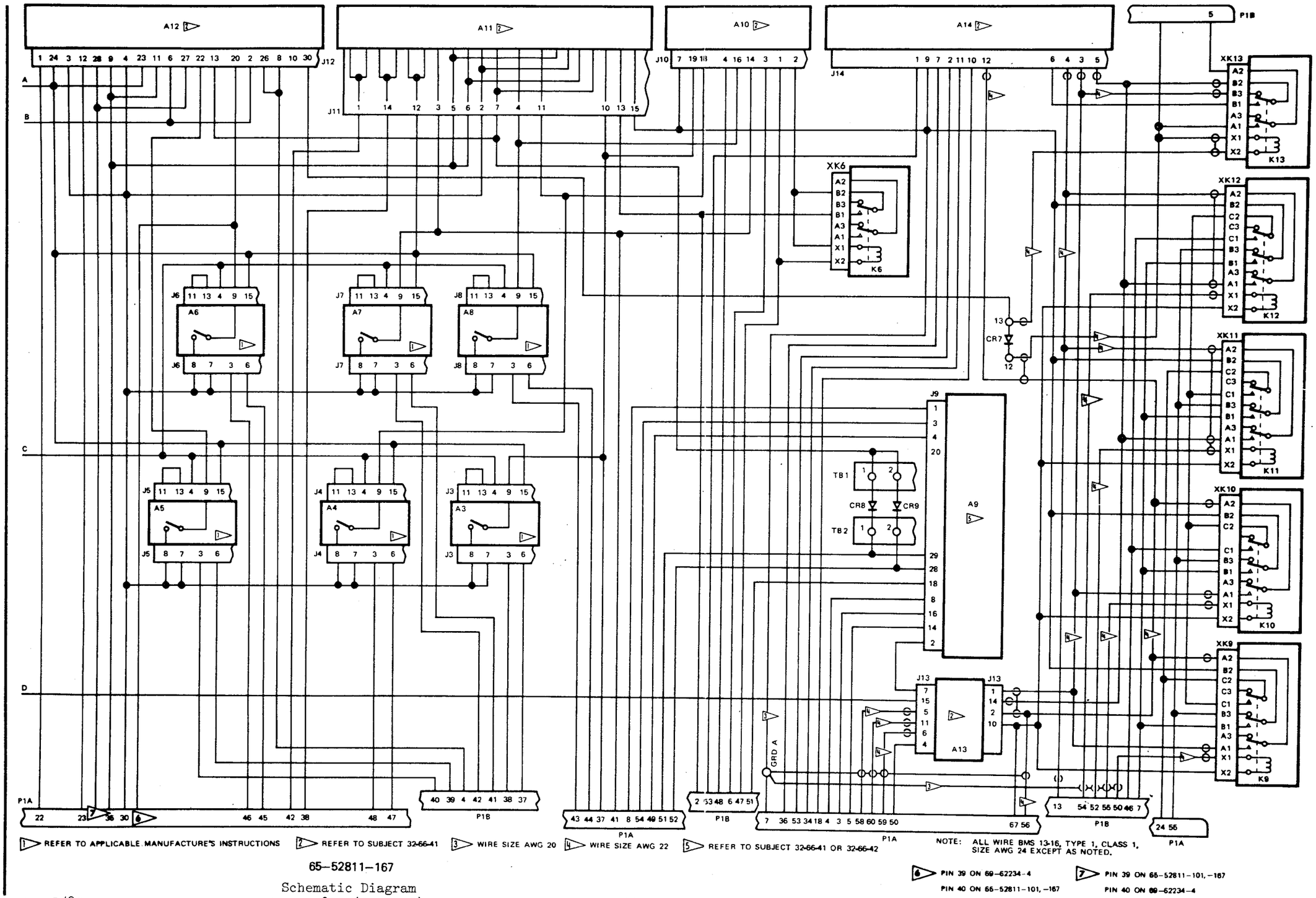
Schematic Diagram
Figure 802 (Sheet 1)



1 REFER TO APPLICABLE MANUFACTURE'S INSTRUCTIONS
2 REFER TO SUBJECT 32-66-41
3 WIRE SIZE AWG 20
4 WIRE SIZE AWG 22
5 REFER TO SUBJECT 32-66-41 OR 32-66-42
6 PIN 39 ON 69-62234-4
PIN 40 ON 65-52811-101, -167
7 PIN 39 ON 65-52811-101, -167
PIN 40 ON 69-62234-4

65-52811-101, 69-62234-4

Schematic Diagram
Figure 802 (Sheet 2)



1 REFER TO APPLICABLE MANUFACTURE'S INSTRUCTIONS
2 REFER TO SUBJECT 32-66-41
3 WIRE SIZE AWG 20
4 WIRE SIZE AWG 22
5 REFER TO SUBJECT 32-66-41 OR 32-66-42

NOTE: ALL WIRE BMS 13-16, TYPE 1, CLASS 1, SIZE AWG 24 EXCEPT AS NOTED.

6 PIN 39 ON 69-62234-4
PIN 40 ON 65-52811-101, -167

7 PIN 39 ON 65-52811-101, -167
PIN 40 ON 69-62234-4

65-52811-167

Schematic Diagram
Figure 802 (Sheet 3)

STORAGE INSTRUCTIONS

1. Protect assembly from dust, moisture, and rough handling. Place assembly in plastic bag and insert in protective carton, padded sufficiently to ensure against damage during storage and handling. Close, tape, and mark carton with assembly identity and date of overhaul.

2. For further information, refer to Protection, Storage, and Handling of Airplane Components, Subject 20-70-01.

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

1. Tools used for repair of electrical connectors are listed in Repair of Electrical Connectors, Subject 20-11-02.

2. Tools used for repair of electrical terminations and for replacement of insulating sleeving are listed in Repair of Electrical Terminations and Electrical Bonding Areas, Subject 20-11-03.

3. Tools used for soldering electrical connections are listed in Soldering Electrical Connections, Subject 20-12-01.

   NOTE: For additional equipment required for testing, refer to TESTING.

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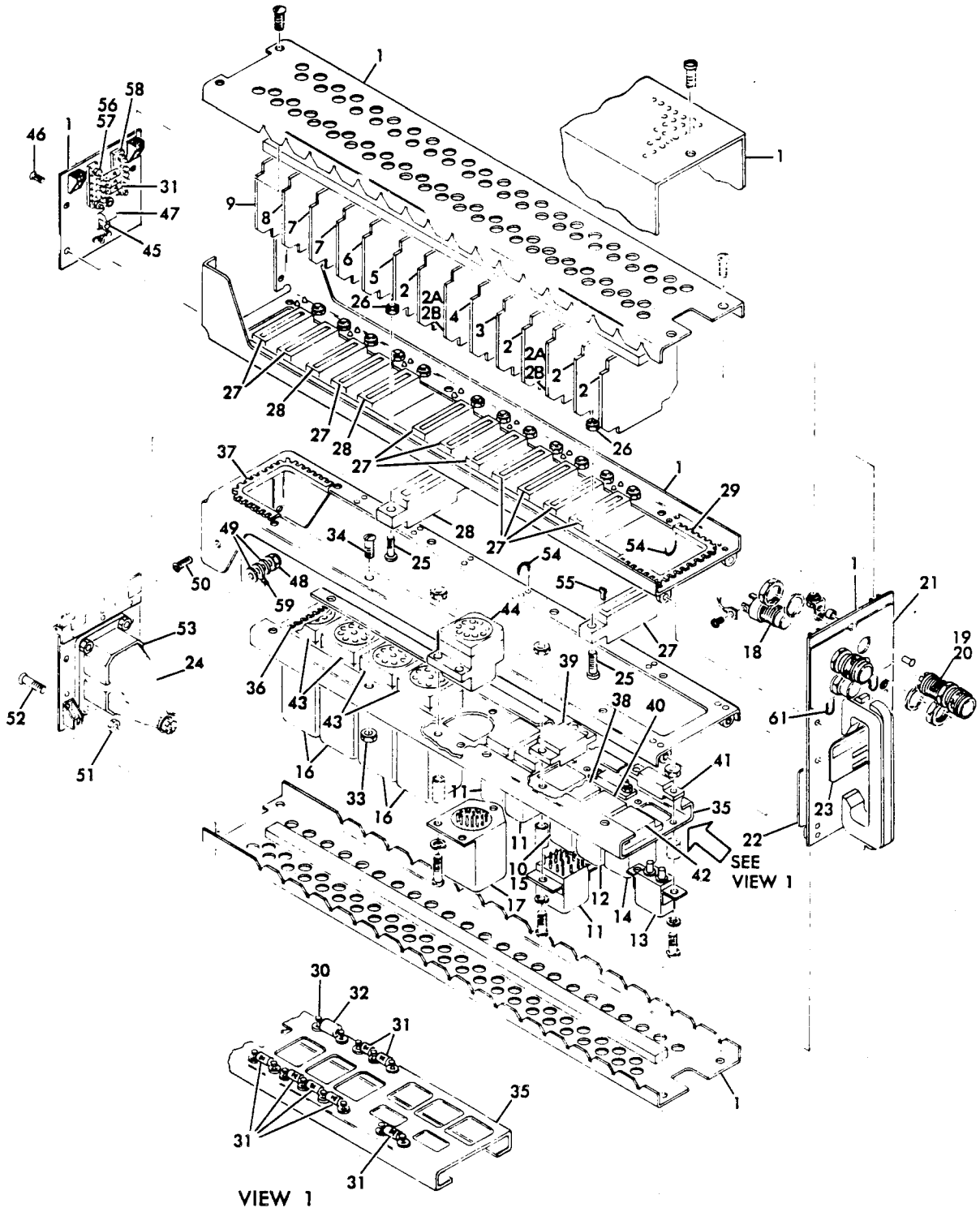

Landing Gear Accessory Unit Assembly (M338)
Figure 1101

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
	69-62234-3		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1051)	A	
	69-62234-4		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1051)	B	
	65-52811-100		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1093 R2)	C	
	65-52811-101		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 32-1093 R2)	D	
	65-52811-166		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114 R2)	E	
	65-52811-167		LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114 R2)	F	
	65-52811-139		. LANDING GEAR ACCESSORY UNIT ASSY (M338)(SB 27-1114R3)	G	1
1	65-51805-78		. CHASSIS ASSY (REF 24-01-05)		1
1	65-73698-58		. CHASSIS ASSY (OPT)(REF 24-01-07)		1
1	65-51805-75		. CHASSIS ASSY (OPT)(REF 24-01-05)		1
1	65-51805-76		. CHASSIS ASSY (OPT)(REF 24-01-05)		1
2	8-060-02		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226 -211)(PREF)		4
2	2-899-111		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226 -111)(OPT)		4
2A	8-060-02		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226 -211)(PREF)	ABG	2
2A	2-899-111		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226 -111)(OPT)	ABG	2
2B	8-060-07		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226 -213)	C-F	2
3	8-060-02		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226- -211)(PREF)		1
3	2-899-111		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226 -111)(OPT)		1
4	8-060-07		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V8748 (BOEING 10-61226- -213)(PREF)		1 1
4	2-899-113		. PRINTED CIRCUIT ASSY, PROXIMITY SWITCH, V08748 (BOEING 10-61226 -113)(OPT)		1

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
5	69-60177-1		. PRINTED CIRCUIT ASSY (32-66-42)		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
8	65-58250-31		. PRINTED CIRCUIT ASSY (REF 32-66-41)		1
8	65-58250-27		. PRINTED CIRCUIT ASSY (REF 32-66-41) (OPT)		1
9	65-58250-23		. PRINTED CIRCUIT ASSY (REF 32-66-41)		1
10	BACR13CG2		. RELAY		1
10	BACR13CG1		. RELAY (OPT)		1
10	KD4A		. RELAY, V35344 (OPT)		1
11	BACR13CG2		. RELAY		3
11	BACR13CG1		. RELAY (OPT)		3
11	KD4A		. RELAY, V35344 (OPT)		3
12	BACR13CG2		. RELAY		1
12	BACR13CG1		. RELAY (OPT)		1
12	KD4A		. RELAY, V35344 (OPT)		1
13	JD4A		. RELAY, V35344		2
14	BACR13CG2		. RELAY		1
14	BACR13CG1		. RELAY (OPT)		1
14	KD4A		. RELAY, V35344 (OPT)		1
15	69-61700-1		. STRAP (USED WITH BACR13CG1 ONLY)		6
16	10-60450-3 (BOEING)		. RELAY APPROVED PARTS ARE: A410-159673-03, V73949; 9524-6508, V35344		4
17	9524-6506		. RELAY, V35344		1
18	C2006		. SWITCH, V81640		2
19	MS25041-6		. INDICATOR		2
20	MS18209-387		. LAMP		2
21	69-34180-30		. METAL LABEL		1
22	69-34180-13		. METAL LABEL		1
23	69-31184-53		. NAMEPLATE		1
23	69-31184-39		. NAMEPLATE	G	1
24	65-52811-24		. WIRE BUNDLE (SB 32-1051)	A	1
24	65-52811-26		. WIRE BUNDLE (SB 32-1051)	B	1
24	65-52811-24		. WIRE BUNDLE (SB 32-1093R2)	C	1
24	65-52811-26		. WIRE BUNDLE (SB 32-1093R2)	D	1
24	65-52811-24		. WIRE BUNDLE (SB 27-1114R2)	E	1
24	65-52811-26		. WIRE BUNDLE (SB 27-1114R2)	F	1
24	65-52811-24		. WIRE BUNDLE (SB 27-1114R3)	G	1
25	NAS600-9P		. SCREW		28
26	BACN10DN40		. NUT		28
27	582553-1		. CONNECTOR, V00779		11

FIG. & ITEM NO.	PART NO.	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USE CODE	QTY PER ASSY
1101-					
28	582585-1		. CONNECTOR, V00779		3
29	BACG20ZA600		. GROMMET		1
30	4444B4		. TERMINAL, V88245		13
31	1N4385		. DIODE, V14936		10
32	RC32GF332J		. RESISTOR, 3.3K, 5%, 1W		1
33	BACN10DN40		. NUT		8
34	NAS600-4P		. SCREW		8
35	69-48983-6		. BRACKET		1
36	BACG20ZA250		. GROMMET		1
37	BACG20ZA375		. GROMMET		1
38	18-0006-0000		. SOCKET, V05574		1
38	BACS16W1		. SOCKET (OPT)	G	1
39	BACS16W1		. SOCKET (OPT)	G	3
39	18-0006-0000		. SOCKET, V05574		3
40	18-0006-0000		. SOCKET, V05574		1
40	BACS16W1		. SOCKET (OPT)	G	1
41	BACS16X1		. SOCKET (OPT)	G	2
41	18-0007-0000		. SOCKET, V05574		2
42	18-0006-0000		. SOCKET, V05574		1
42	BACS16W1		. SOCKET (OPT)	G	1
43	000300-0598		. SOCKET, V05574		4
44	000300-0596		. SOCKET, V05574		1
45	BACN10DN26		. NUT		2
46	MS35190-213		. SCREW		2
46	MS35206-204		. SCREW	G	2
47	RH5-5		. RESISTOR, V91637, 5 OHMS (± 3%), 5W		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 34B0059		. CONNECTOR, V71468	ACE	1
53	DPX2MB67P67P 34B0060		. CONNECTOR, V71468	BDF	1
54	BAC38C100C3		. STRAP		14
55	582507-1		. KEYING PLUG, V00779		20
56	BACN10DN40		. NUT		4
57	NAS514P440-8P		. SCREW		4
58	411GMF1903-4		. TERMINAL BLOCK, V75382		2
59	BACT12AC		. TERMINAL		AR
60	66143-2LP		. TERMINAL, V00779		AR
61	BAC27DEX861		. MARKER, ALUM FOIL		1

FIG. 1101 REFERENCE DESIGNATION INDEX (SEE SCHEMATIC DIAGRAM)

REFERENCE DESIGNATION	PART NUMBER	ITEM NO.
A1, A2, A4, A8	*8-060-02	2
A1, A2, A4, A8	2-899-111	2
A3, A7	*8-060-02	2A
A3, A7	2-899-111	2A
A3, A7	8-060-07	2B
A5	*8-060-02	3
A5	2-899-111	3
A6	*8-060-07	4
A6	2-899-113	4
A9	65-58250-25	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	19
J1 THRU J8,J11,J13,J14	582553-1	27
J9, J10, J12	582585-1	28
K1	*BACR13CG2	10
K1	BACR13CG1	10
K1	KD4A	10
K2, K3, K4	*BACR13CG2	11
K2, K3, K4	BACR13CG1	11
K2, K3, K4	KD4A	11
K5	*BACR13CG2	12
K5	BACR13CG1	12
K5	KD4A	12
K6, K7	JD4A	13
K8	*BACR13CG2	14
K8	BACR13CG1	14
K8	KD4A	14
K9 THRU K12	10-60450-3	16
K13	9524-6506	17
L1, L2	MS25041-6	19
P1A, P1B	DPX2MB67P67P34B0059	53
P1A, P1B	DPX2MB67P67P34B0060	53
R1	RC32GF332J	32
R2	RH5-5	47
S1, S2	C2006	18
TB1, TB2	411GMF1903-4	58

FIG. 1101 REFERENCE DESIGNATION INDEX (SEE SCHEMATIC DIAGRAM)		
REFERENCE DESIGNATION	PART NUMBER	ITEM NO.
XK1	18-0006-0000	38
	BACS16W1	38
XK2, XK3, XK4	18-0006-0000	39
	BACS16W1	39
XK5	18-0006-0000	40
	BACS16W1	40
XK6, XK7	18-0007-0000	41
	BACS16X1	41
XK8	18-0006-0000	42
	BACS16W1	42
XK9 THRU XK12	000300-0598	43
XK13	000300-0596	44

*PREFERRED PART

VENDORS

V00779 AMP, INCORPORATED, P.O. BOX 3608, HARRISBURG, PENNSYLVANIA 17105

V05574 VIKING CONNECTORS, INC., SUB OF CRITON CORP., 21001 NORDOFF ST., CHATSWORTH, CALIFORNIA 91311

V08748 ELDEC CORP., 16700 - 13TH AVE. WEST, P.O. BOX 100, LYNNWOOD, WASHINGTON 98036

V14936 GENERAL INSTRUMENT CORPORATION, 600 WEST JOHN STREET, HICKSVILLE, L.I., NEW YORK 11802

V35344 LEACH CORPORATION, RELAY DIV., 5915 AVALON BOULEVARD, LOS ANGELES, CALIFORNIA 90003

V71468 INTERNATIONAL TELEPHONE AND TELEGRAPH CORP., ITT CANNON ELECTRIC DIV., 10550 TALBERT AVE., P.O. BOX 8040, FOUNTAIN VALLEY, CALIFORNIA 92708

V72962 ESNA DIV., AMERACE CORP., 2330 VAUXHALL ROAD, UNION, NEW JERSEY 07083

V73949 GUARDIAN ELECTRIC MFG. COMPANY, 1550 WEST CARROLL AVENUE, CHICAGO, ILLINOIS 60607

V75382 KUKLA ELECTRIC CORPORATION, SUB OF NORTH AMERICANS PHILIPS CORP., 520 SOUTH FULTON AVENUE, MOUNT VERNON, NEW YORK 10550

V81640 EATON CORP,. AEROSPACE CONTROL AND SYSTEMS DIV., MANATEE PLANT, 2074 WHITFIELD AVE. EAST, P.O. BOX 1978, SARASOTA, FLORIDA 33578

V88245 LITTON SYSTEMS INC., USECO DIVISION, 13536 SATICOY ST., VAN NUYS, CALIFORNIA 91409

V91637 DALE ELECTRONICS, INCORPORATED, P.O. BOX 609, COLUMBUS, NEBRASKA 68601