

The following catalog
has gaps in its page
numbers, or doesn't
have any numbers.
We have chosen to
leave the page
numbering in the
order that Acrobat
assigns it.

THIS LEGACY DOCUMENT CONTAINS SOME IMAGES THAT ARE OF POOR QUALITY. THE SEARCH FEATURE WILL BE OF LIMITED USE WITH THIS DOCUMENT. THE DOCUMENT CAN BE PRINTED OR YOU CAN LOCATE THE MODEL AND SPEC IN THE INDEX TO FIND THE ALPHANUMERIC PAGE NUMBER.

1 A3 ***** DATA TABLE

STANDARD GROUPS

| FICHE LOCATION | | ILLUSTRATION |
|----------------|-------|---------------------------|
| 1 A3 | ***** | INDEX FOR SPEC A CONTROLS |
| 1 A5 | ***** | INDEX FOR SPEC B CONTROLS |
| 1 A5 | ***** | INDEX FOR SPEC C CONTROLS |
| 1 A7 | ***** | INDEX FOR SPEC D CONTROLS |

907-0012 (1-78)

WIRING DIAGRAMS/PARTS LISTING

FOR

HA AUTOMATIC DEMAND CONTROLS

All of the wiring diagrams apply to HA automatic demand controls and should be used for service and parts information. Before looking up any diagrams, read the description and explanations below.

HA controls use a decimal system model designation previously not used. As an example, the designation 7.5HA was formerly 705HA and 15.0HA was formerly 15HA. Because Spec B controls had both designations, use the decimal system when looking up the wiring diagrams for the 7.5 and 15 kW controls. Therefore, to find the wiring diagram for a Spec B 705HA-21 control, use the Spec B 7.5HA-21 model designation.

The decimal system applies to all of the Spec C and D controls but not to any of the Spec A controls.

When using the wiring diagrams, remember all components are shown in de-energized positions unless otherwise noted. To find the diagram in question, proceed to the index page shown below corresponding with the control's specification letter (last letter of model designation as shown on control nameplate).

INDEX FOR SPEC A CONTROLS

Find the appropriate model and proceed to the indicated page for the wiring diagram.

| WATT RATING | MODEL | WIRING DIAGRAM | PAGE |
|-------------|---------------|----------------|------|
| 3,500 | 305HA-21/1 | 617-0082 | A9 |
| | 305HA-21/10 | 617-0079 | A10 |
| | 305HA-21-4/1 | 617-0089 | A11 |
| | 305HA-21-4/10 | 617-0081 | A12 |
| 7,500 | 705HA-21/1 | 617-0078 | A13 |
| | 705HA-21/10 | 617-0085 | A14 |
| | 705HA-21/12 | 617-0086 | B1 |
| | 705HA-21-3/1 | 617-0108 | B2 |
| | 705HA-21-3/10 | 617-0115 | B3 |
| | 705HA-21-4/1 | 617-0080 | B4 |
| | 705HA-21-4/10 | 617-0087 | B5 |
| | 705HA-22/1 | 617-0083 | B6 |
| | 705HA-22/10 | 617-0077 | B7 |
| | 705HA-22-3/10 | 617-0109 | B8 |
| | 705HA-22-3/12 | 617-0110 | B9 |
| | 705HA-23/1 | 617-0073 | B10 |
| | 705HA-23/10 | 617-0075 | B11 |
| | 705HA-23/12 | 617-0074 | B12 |
| | 705HA-23-3/1 | 617-0124 | B13 |
| | 705HA-23-3/10 | 617-0122 | B14 |
| | 705HA-23-3/12 | 617-0123 | C1 |
| | 705HA-23-4/10 | 617-0076 | C2 |
| 15,000 | 15HA-22/10 | 617-0071 | C3 |
| | 15HA-22-3/10 | 617-0106 | C4 |
| | 15HA-22-3/12 | 617-0107 | C5 |
| | 15HA-23-10 | 617-0070 | C6 |
| | 15HA-23/12 | 617-0089 | C7 |
| | 15HA-23-3/1 | 617-0121 | C8 |
| | 15HA-23-3/10 | 617-0119 | C9 |
| | 15HA-23-3/12 | 617-0120 | C10 |
| | 15HA-23-4/10 | 617-0072 | C11 |

INDEX FOR SPEC B CONTROLS

Find the appropriate model and proceed to the indicated page for the wiring diagram.

| WATT RATING | MODEL | WIRING DIAGRAM | PAGE |
|-------------|----------------|----------------|------|
| 3.500 | 305HA-21/1 | 617-0090 | C12 |
| | 305HA-21/10 | 617-0091 | C13 |
| 7.500 | 7.5HA-21/1 | 617-0092 | C14 |
| | 7.5HA-21/10 | 617-0093 | D1 |
| | 7.5HA-21/12 | 617-0094 | D2 |
| | 7.5HA-21/17 | 617-0129 | D3 |
| | 7.5HA-21-4/1 | 617-0113 | D4 |
| | 7.5HA-21-4/10 | 617-0114 | D5 |
| | 7.5HA-22/1 | 617-0095 | D6 |
| | 7.5HA-22/10 | 617-0096 | D7 |
| | 7.5HA-22/12 | 617-0097 | D8 |
| | 7.5HA-23/1 | 617-0102 | D9 |
| | 7.5HA-23/10 | 617-0101 | D10 |
| | 7.5HA-23/12 | 617-0103 | D11 |
| | 7.5HA-23-4/1 | 617-0128 | D12 |
| | 7.5HA-23-4/10 | 617-0111 | D13 |
| 15.000 | 15.0HA-22/10 | 617-0098 | D14 |
| | 15.0HA-22/12 | 617-0099 | E1 |
| | 15.0HA-23/1 | 617-0100 | E2 |
| | 15.0HA-23/10 | 617-0105 | E3 |
| | 15.0HA-23/12 | 617-0104 | E4 |
| | 15.0HA-23/15 | 617-0116 | E5 |
| | 15.0HA-23/17 | 617-0130 | E6 |
| | 15.0HA-23/18 | 617-0131 | E7 |
| | 15.0HA-23-4/10 | 617-0112 | E8 |

INDEX FOR SPEC C CONTROLS

Find the appropriate model and proceed to the indicated page for the wiring diagram.

| WATT RATING | MODEL | WIRING DIAGRAM | PAGE |
|-------------|----------------|----------------|------|
| 7.500 | 7.5HA-21/1 | 617-0132 | F9 |
| | 7.5HA-21/10 | 617-0133 | E9 |
| | 7.5HA-21/12 | 617-0133 | E10 |
| | 7.5HA-21-4/1 | 617-0138 | E11 |
| | 7.5HA-21-4/10 | 617-0139 | D12 |
| | 7.5HA-21-4/12 | 617-0139 | D12 |
| | 7.5HA-23/1 | 617-0140 | E13 |
| | 7.5HA-23/10 | 617-0141 | E14 |
| | 7.5HA-23/12 | 617-0141 | E14 |
| | 7.5HA-23-4/10 | 617-0142 | F1 |
| | 7.5HA-23-4/12 | 617-0142 | F1 |
| | | | |
| 15.000 | 15.0HA-22/1 | 617-0134 | F2 |
| | 15.0HA-22/10 | 617-0135 | F3 |
| | 15.0HA-22/12 | 617-0135 | F3 |
| | 15.0HA-23/1 | 617-0143 | F4 |
| | 15.0HA-23/10 | 617-0144 | F5 |
| | 15.0HA-23/12 | 617-0144 | F5 |
| | 15.0HA-23-4/10 | 617-0145 | F6 |
| | 15.0HA-23-4/12 | 617-0145 | F6 |
| | | | |

PRINTED CIRCUIT BOARDS

Individual components of the printed circuit boards are given on pages G1 and G2

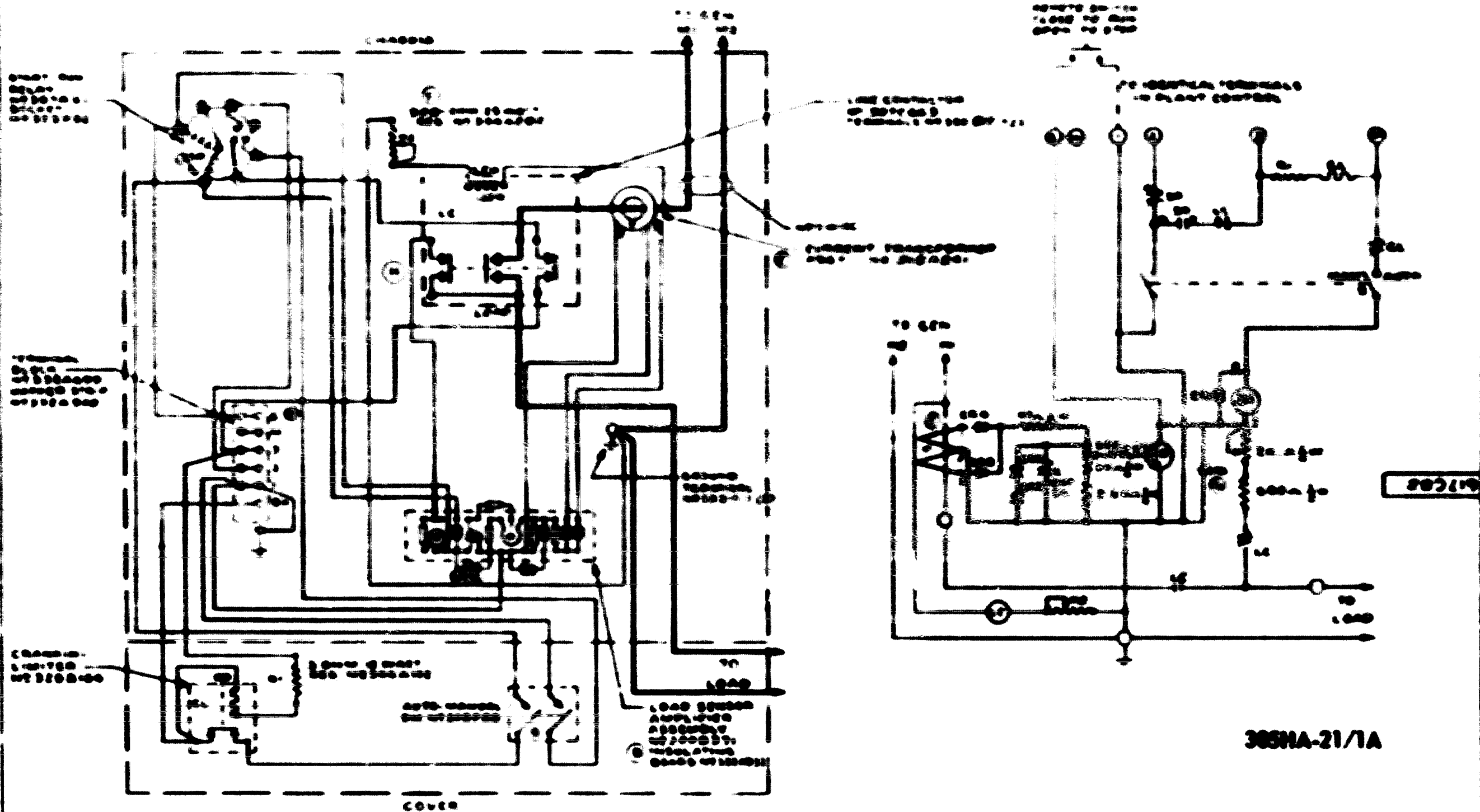
INDEX FOR SPEC D CONTROLS

Find the appropriate model and proceed to the indicated page for the wiring diagram.

| WATT RATING | MODEL | WIRING DIAGRAM | PAGE |
|-------------|--------------|----------------|------|
| 7.500 | 7.5HA-21/1 | 617-0147 | F7 |
| | 7.5HA-21/10 | 617-0149 | F8 |
| | 7.5HA-21/12 | 617-0149 | F8 |
| | 7.5HA-23/1 | 617-0153 | F9 |
| | 7.5HA-23/10 | 617-0155 | F10 |
| | 7.5HA-23/12 | 617-0155 | F10 |
| 15.000 | 15.0HA-22/1 | 617-0150 | F11 |
| | 15.0HA-22/10 | 617-0152 | F12 |
| | 15.0HA-22/12 | 617-0152 | F12 |
| | 15.0HA-23/1 | 617-0156 | F13 |
| | 15.0HA-23/10 | 617-0158 | F14 |
| | 15.0HA-23/12 | 617-0158 | F14 |

PRINTED CIRCUIT BOARDS

Individual components of the printed circuit boards are given on pages G1 and G2.



305HA-21/A

| | | | |
|-------------|---------|------------|---------|
| DATE | 5-5-68 | BY | TV, WJB |
| DESIGNED BY | TV, WJB | CHECKED BY | TV, WJB |
| APPROVED BY | TV, WJB | DATE | 5-5-68 |
| REVISION | 1 | DATE | 5-5-68 |
| REVISION | 2 | DATE | 5-5-68 |
| REVISION | 3 | DATE | 5-5-68 |
| REVISION | 4 | DATE | 5-5-68 |
| REVISION | 5 | DATE | 5-5-68 |
| REVISION | 6 | DATE | 5-5-68 |
| REVISION | 7 | DATE | 5-5-68 |
| REVISION | 8 | DATE | 5-5-68 |
| REVISION | 9 | DATE | 5-5-68 |
| REVISION | 10 | DATE | 5-5-68 |

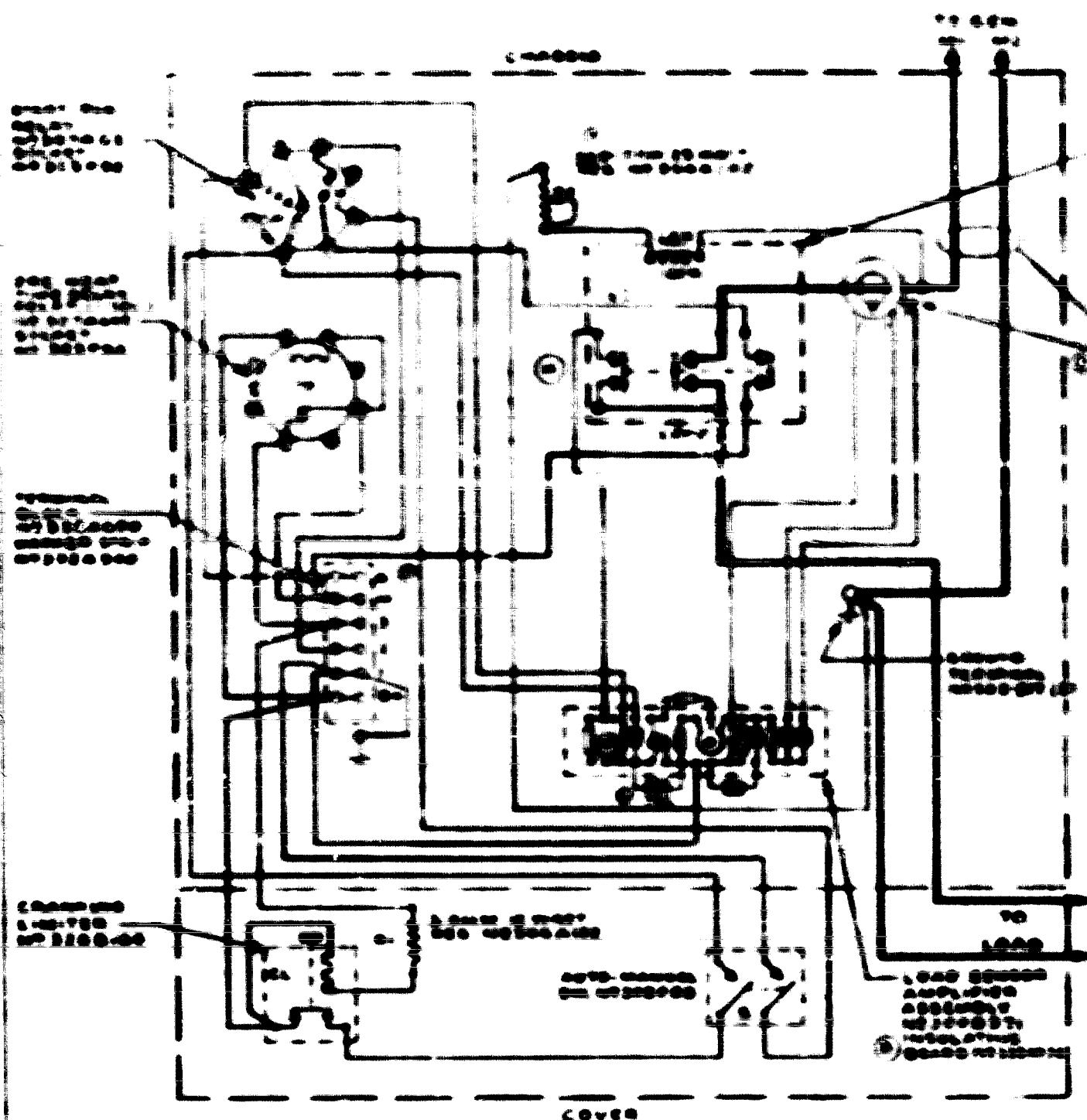
Osgood

| | | | | | |
|---------------|------------|------|--------|----|---------|
| MODEL | 305HA-21/A | DATE | 5-5-68 | BY | TV, WJB |
| 120 VOLT 1PH. | | | | | |
| 2 WIRE 50-60~ | | | | | |
| 12 V CRANKING | | | | | |
| | | | | | |

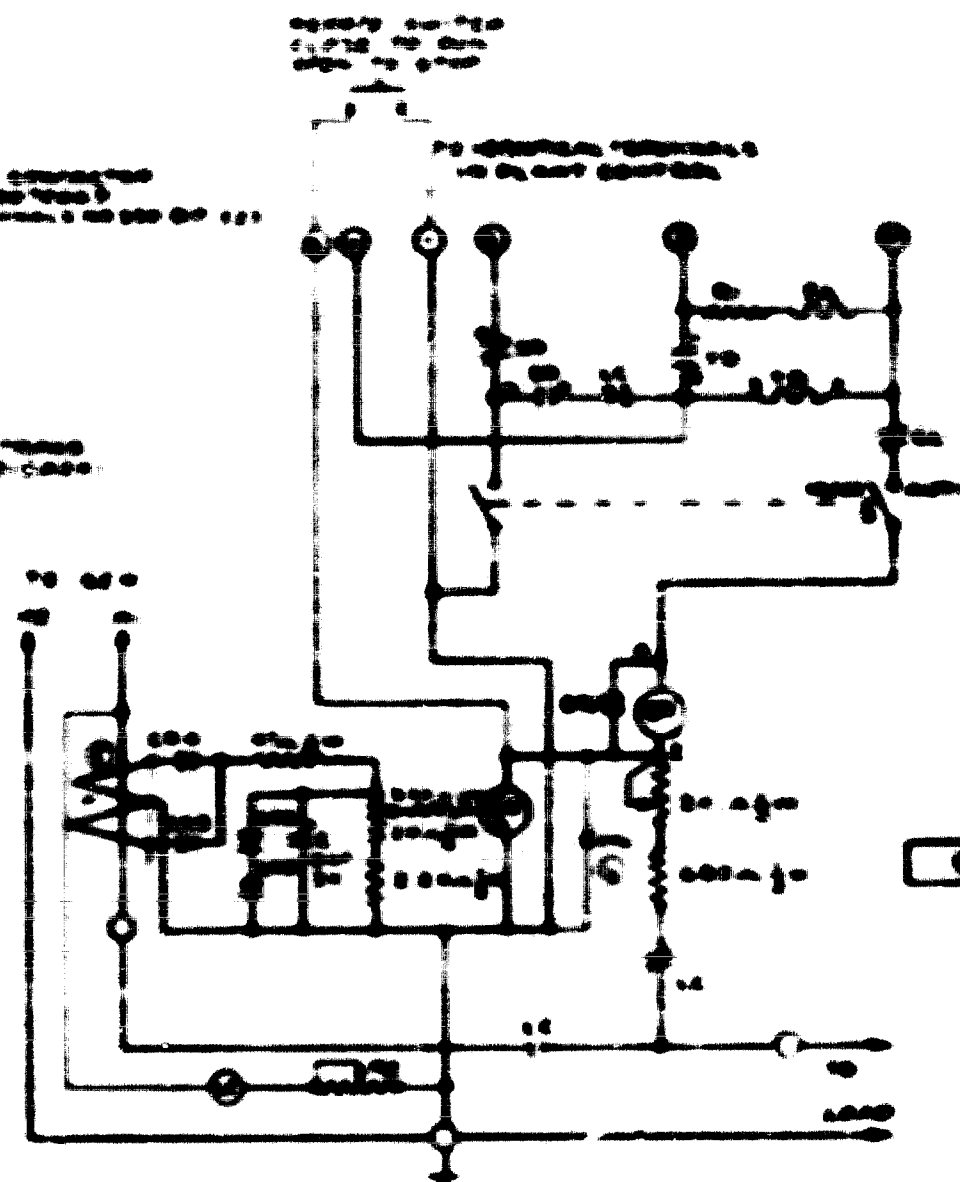
AUTOMATIC DEMAND

CONTROL WIRING DIAGRAM

617C82



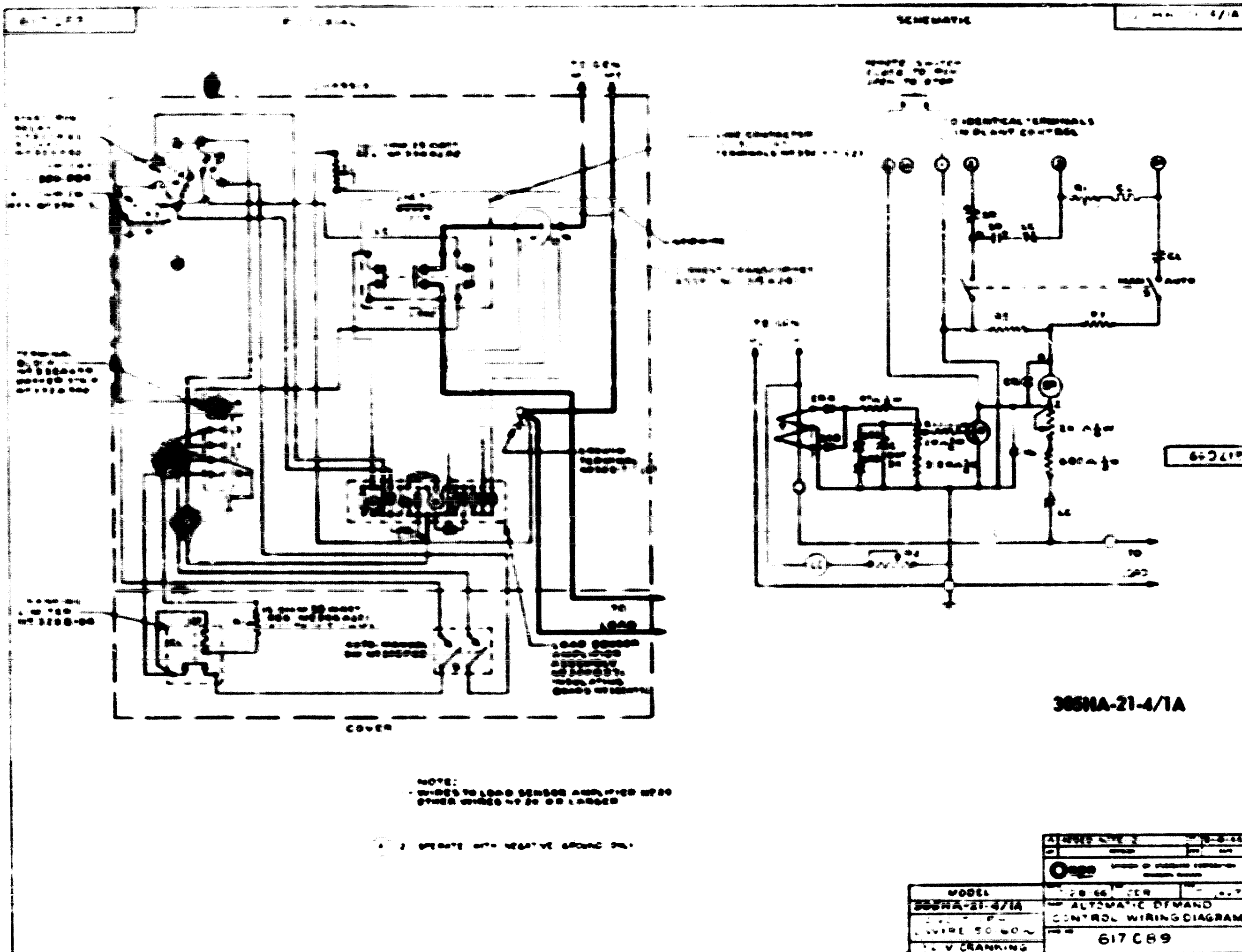
NOTES:



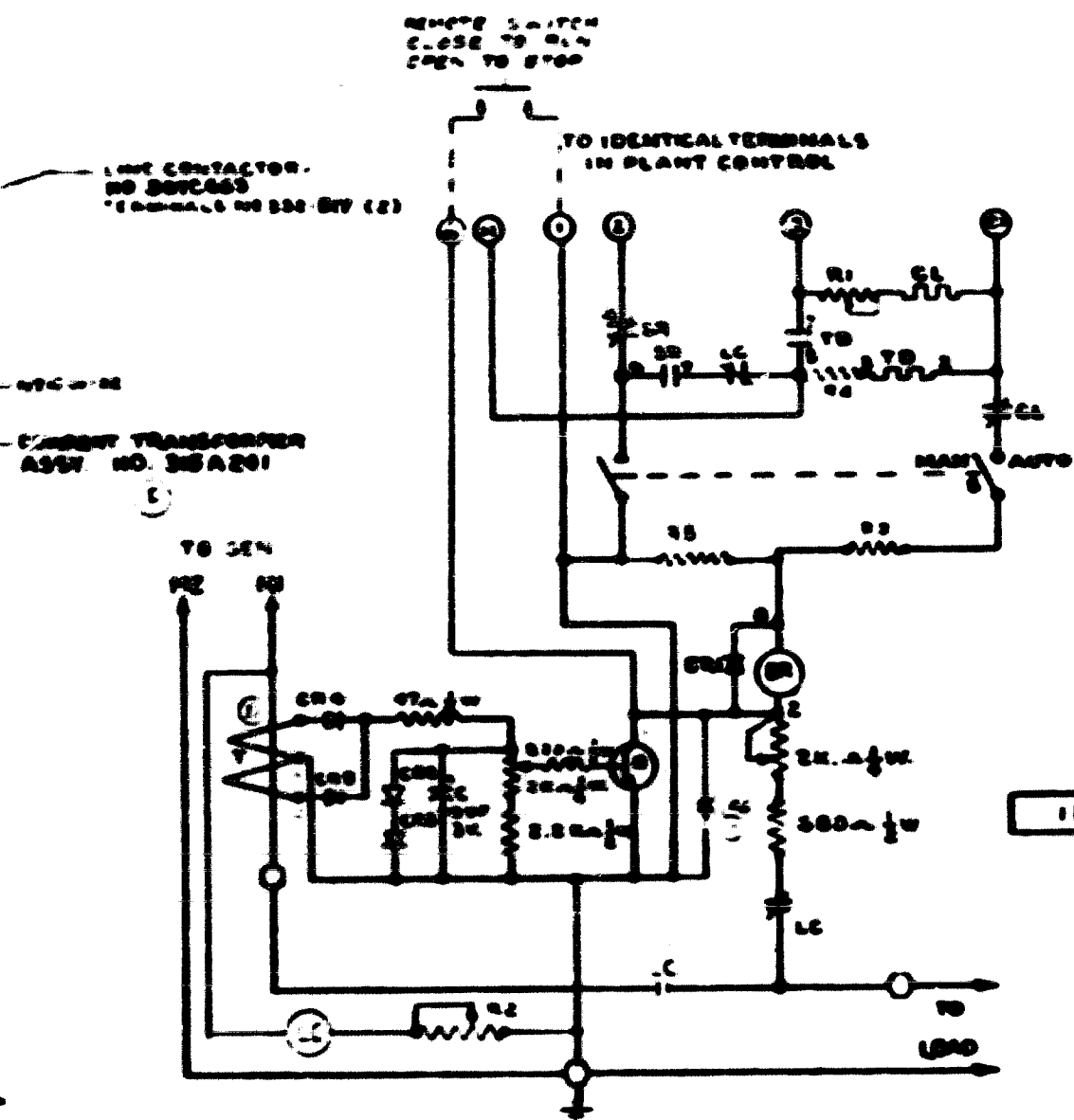
624

305NA-21/76A

| | | | |
|-----------------------|-------------------------------|--------|---------|
| MODEL | 4-16-68 | CALIF. | Ty. 409 |
| 305 HA-21/10A | AUTOMATIC DEMAND | | |
| 120 VOLT 1PH. | CONTROL WIRING DIAGRAM | | |
| 2 WIRE 50-60~ | | | |
| 12 V. CRANKING | 617 C 79 | | |



305 MA-21-4/10A

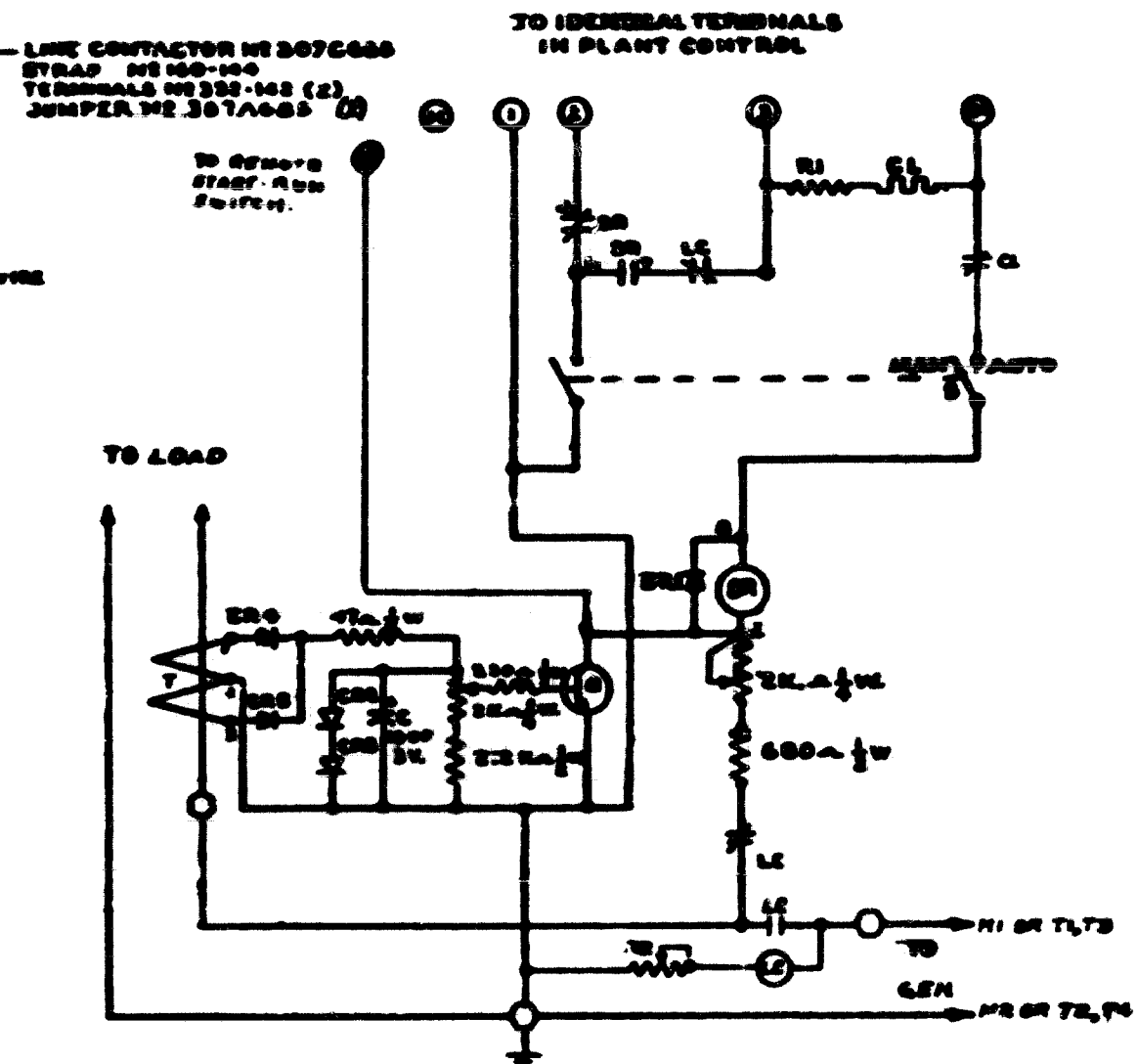


617C41

2 - O-TWO-FIVE WITH SEVEN-ONE AIRCRAFT ONLY

| | | | |
|----------------|------------------------|----|------|
| MODEL | TYPE | CW | TYPE |
| 305HA-21-4/10A | AUTOMATIC DEMAND | | |
| 2 WIRE 50-60~ | CONTROL WIRING DIAGRAM | | |
| 50 V. GRATING | 617 C 21 | | |

SCHEMATIC



705HA-21/1A

NOTE:
WIRES TO LOAD SENSOR AMPLIFIER #20.
OTHER WIRES #20 OR LARGER.

| | |
|-------------------|--|
| 705HA-21/1A | AUTOMATIC DEMAND CONTROL WIRING DIAGRAM |
| 120 VOLT | |
| 1PH. 2 WIRE 50-60 | |
| 12 V. CRANKING | |

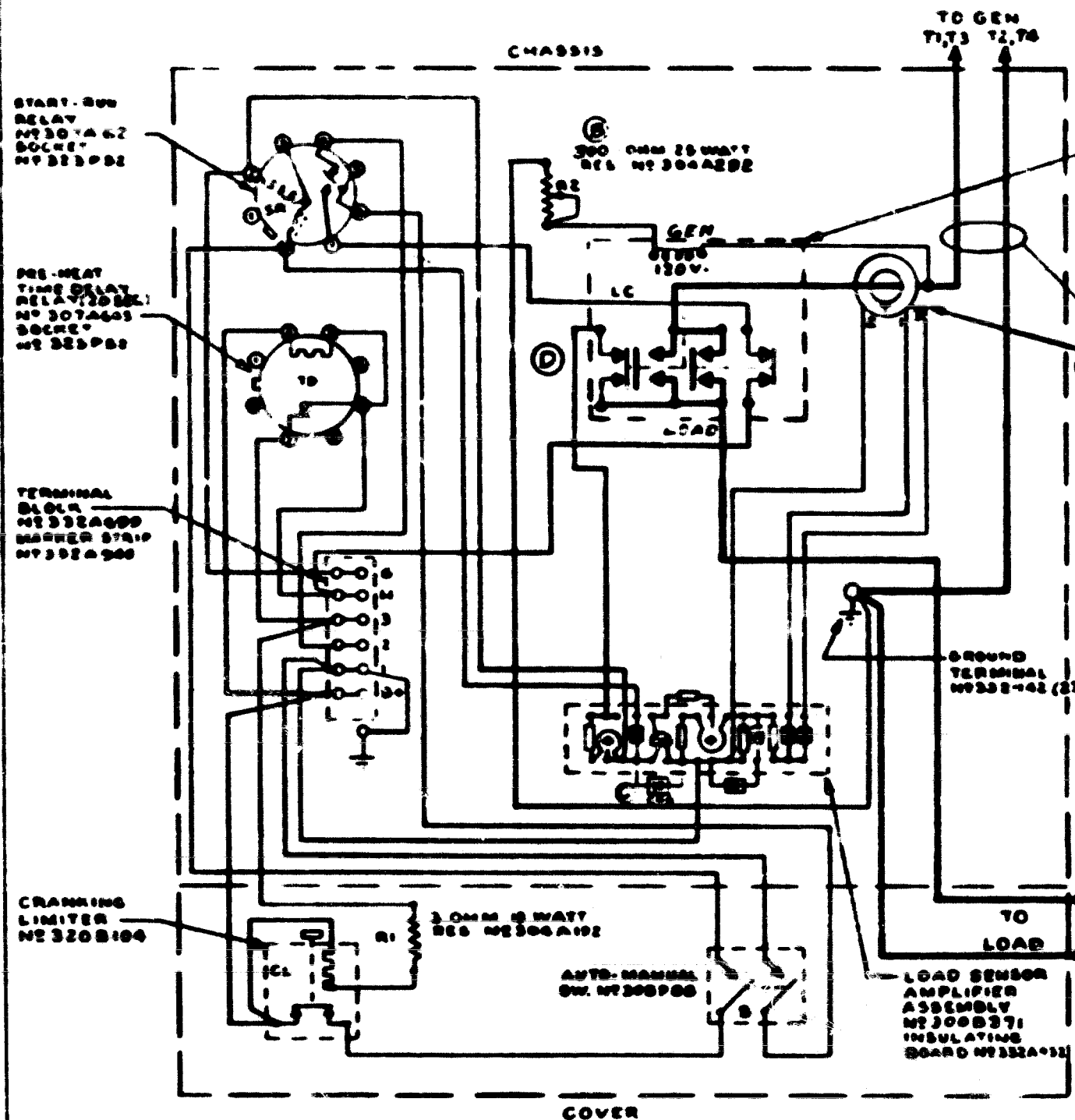
617 C 78

617 C 85

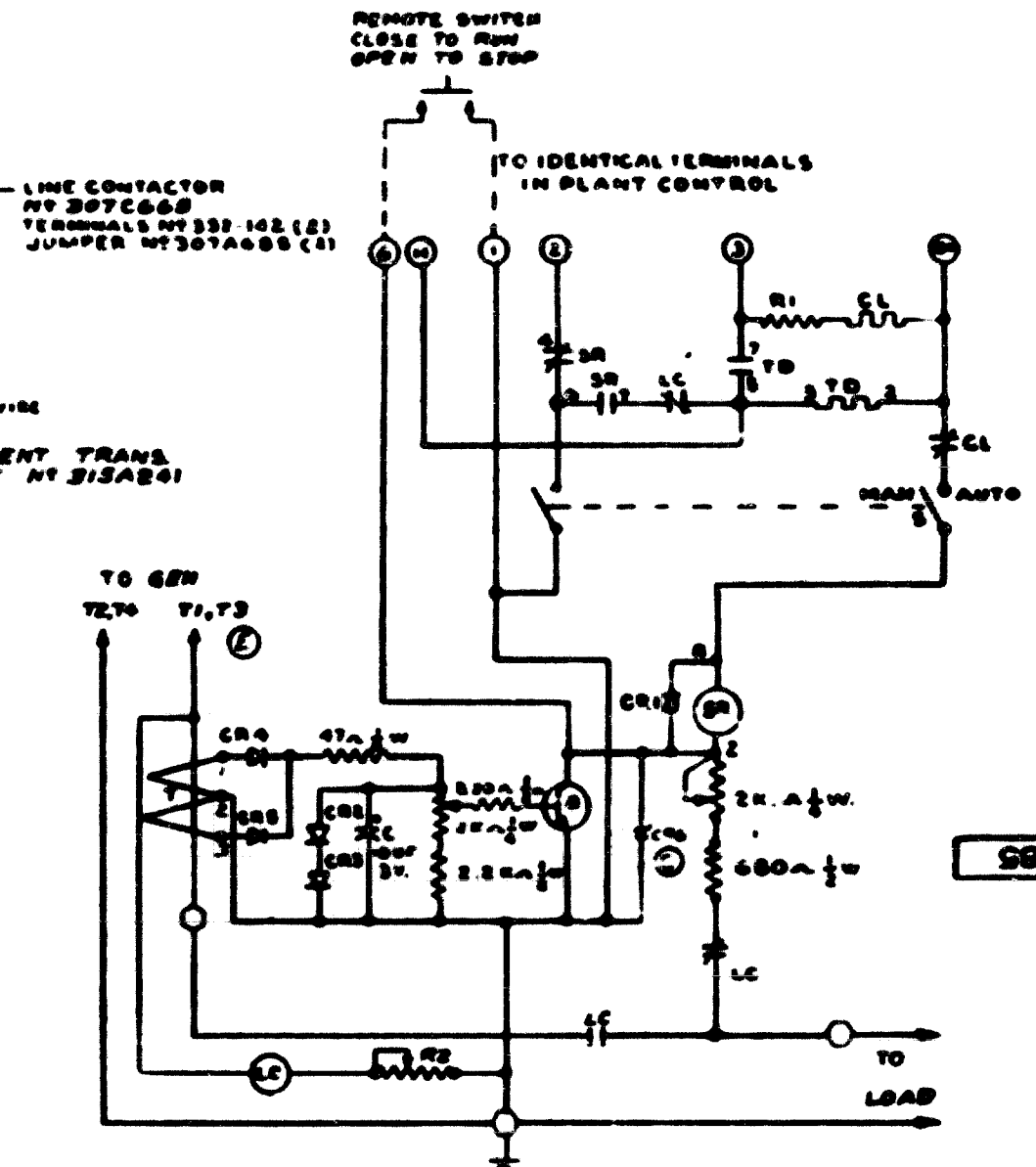
PICTORIAL

SCHEMATIC

75 HA-21/10A



NOTE:
WIRES TO LOAD SENSOR AMPLIFIER NT 30
OTHER WIRES NT 20 OR LARGER



705HA-21/10A

| | | |
|--------|----|----------|
| 1 WAS | Y4 | 11-20-65 |
| 2 WAS | Y4 | 11-20-65 |
| 3 WAS | Y4 | 11-20-65 |
| 4 WAS | Y4 | 11-20-65 |
| 5 WAS | Y4 | 11-20-65 |
| 6 WAS | Y4 | 11-20-65 |
| 7 WAS | Y4 | 11-20-65 |
| 8 WAS | Y4 | 11-20-65 |
| 9 WAS | Y4 | 11-20-65 |
| 10 WAS | Y4 | 11-20-65 |

617 C 85

| MODEL | 11-20-65 | 75 | 11-20-65 |
|-------------------|---|----|----------|
| 7.5 HA-21/10A | AUTOMATIC DEMAND CONTROL WIRING DIAGRAM | | |
| 120 VOLT | | | |
| 1PH. 2WIRE 50-60~ | | | |
| 12 V. CRANKING | | | |

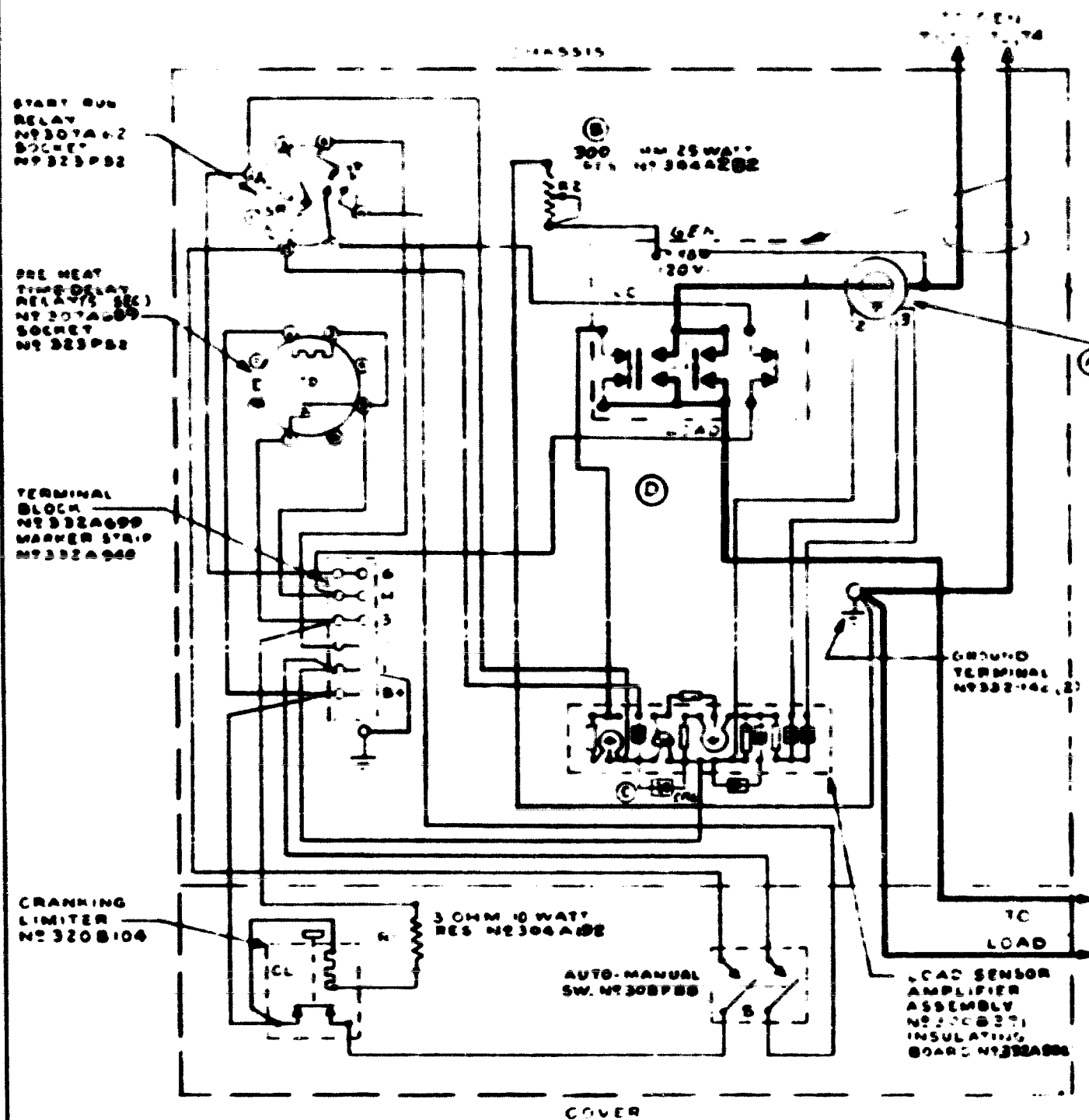
617 C 85

617C86

PICTORIAL

SCHEMATIC

705HA-21/12A

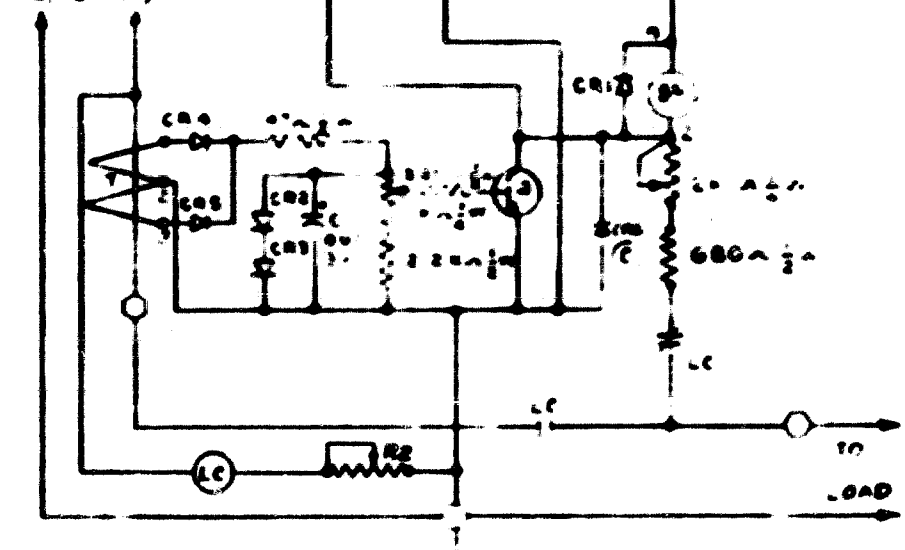


NOTE:
WIRES TO LOAD SENSOR AMPLIFIER N2200B37
OTHER WIRES N220 OR LARGER

INT. CONT. TOP
N2307C665
TERMINAL BLOCK N2332-144 (2)
RELAY N2307A405 (1)

CURRENT TRANS
ASSY N2315A241

120V AC
T2, T3, T1, T4



980.12

705HA-21/12A

| WIRE | CONN. | WIRE | CONN. | WIRE | CONN. |
|------|---------|------|--------|------|--------|
| 1 | 120V AC | 2 | 12V DC | 3 | 12V DC |
| 4 | 120V AC | 5 | 12V DC | 6 | 12V DC |
| 7 | 120V AC | 8 | 12V DC | 9 | 12V DC |
| 10 | 120V AC | 11 | 12V DC | 12 | 12V DC |
| 13 | 120V AC | 14 | 12V DC | 15 | 12V DC |
| 16 | 120V AC | 17 | 12V DC | 18 | 12V DC |
| 19 | 120V AC | 20 | 12V DC | 21 | 12V DC |
| 22 | 120V AC | 23 | 12V DC | 24 | 12V DC |
| 25 | 120V AC | 26 | 12V DC | 27 | 12V DC |
| 28 | 120V AC | 29 | 12V DC | 30 | 12V DC |
| 31 | 120V AC | 32 | 12V DC | 33 | 12V DC |
| 34 | 120V AC | 35 | 12V DC | 36 | 12V DC |
| 37 | 120V AC | 38 | 12V DC | 39 | 12V DC |
| 40 | 120V AC | 41 | 12V DC | 42 | 12V DC |
| 43 | 120V AC | 44 | 12V DC | 45 | 12V DC |
| 46 | 120V AC | 47 | 12V DC | 48 | 12V DC |
| 49 | 120V AC | 50 | 12V DC | 51 | 12V DC |
| 52 | 120V AC | 53 | 12V DC | 54 | 12V DC |
| 55 | 120V AC | 56 | 12V DC | 57 | 12V DC |
| 58 | 120V AC | 59 | 12V DC | 60 | 12V DC |
| 61 | 120V AC | 62 | 12V DC | 63 | 12V DC |
| 64 | 120V AC | 65 | 12V DC | 66 | 12V DC |
| 67 | 120V AC | 68 | 12V DC | 69 | 12V DC |
| 70 | 120V AC | 71 | 12V DC | 72 | 12V DC |
| 73 | 120V AC | 74 | 12V DC | 75 | 12V DC |
| 76 | 120V AC | 77 | 12V DC | 78 | 12V DC |
| 79 | 120V AC | 80 | 12V DC | 81 | 12V DC |
| 82 | 120V AC | 83 | 12V DC | 84 | 12V DC |
| 85 | 120V AC | 86 | 12V DC | 87 | 12V DC |
| 88 | 120V AC | 89 | 12V DC | 90 | 12V DC |
| 91 | 120V AC | 92 | 12V DC | 93 | 12V DC |
| 94 | 120V AC | 95 | 12V DC | 96 | 12V DC |
| 97 | 120V AC | 98 | 12V DC | 99 | 12V DC |
| 100 | 120V AC | 101 | 12V DC | 102 | 12V DC |
| 103 | 120V AC | 104 | 12V DC | 105 | 12V DC |
| 106 | 120V AC | 107 | 12V DC | 108 | 12V DC |
| 109 | 120V AC | 110 | 12V DC | 111 | 12V DC |
| 112 | 120V AC | 113 | 12V DC | 114 | 12V DC |
| 115 | 120V AC | 116 | 12V DC | 117 | 12V DC |
| 118 | 120V AC | 119 | 12V DC | 120 | 12V DC |

| MODEL | DATE | REV. | BY | CHK. |
|------------------|----------|------|------|------|
| 705HA-21/12A | 11-20-65 | 25 | W.B. | |
| 120VOLT | | | | |
| 1PH. 2WIRE 50/60 | | | | |
| 12 V. CRANKING | | | | |

| MODEL | DATE | REV. | BY | CHK. |
|------------------|----------|------|------|------|
| 705HA-21/12A | 11-20-65 | 25 | W.B. | |
| 120VOLT | | | | |
| 1PH. 2WIRE 50/60 | | | | |
| 12 V. CRANKING | | | | |

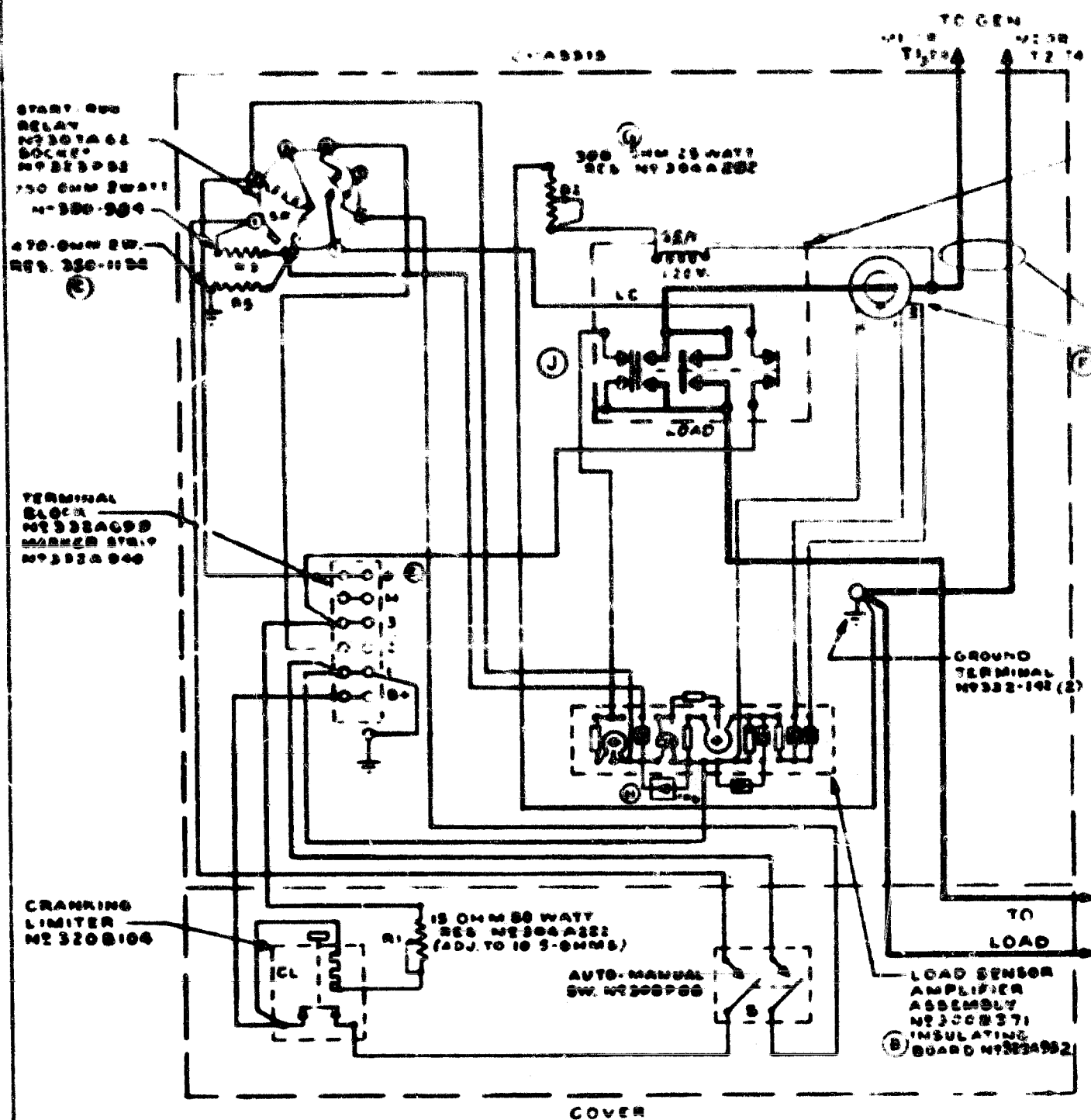
617C86

617C80

PICTORIAL

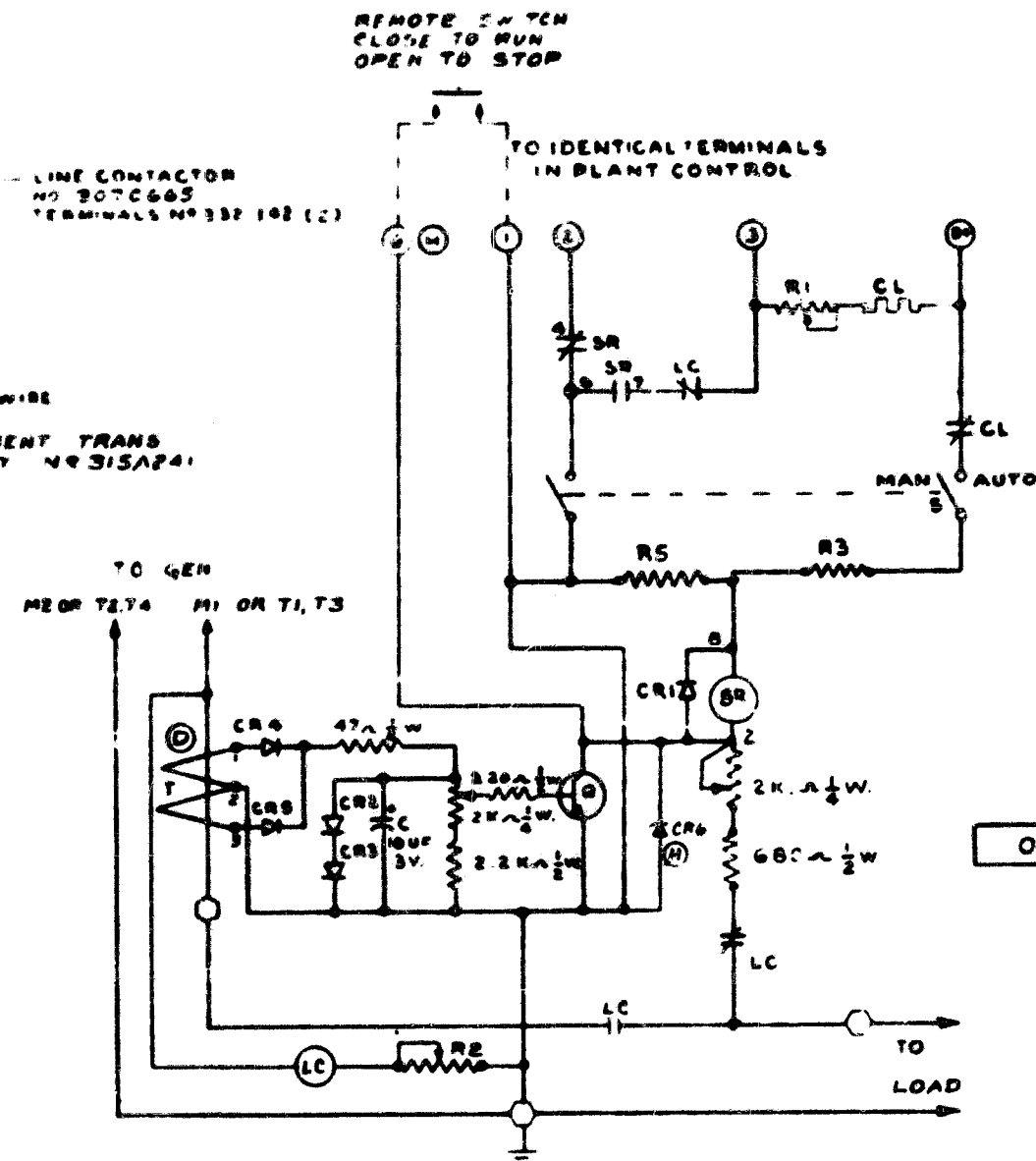
SCHEMATIC

705HA-21-4/1A



NOTE:
WIRE TO LOAD SENSOR AMPLIFIER N2308S71
OTHER WIRES N2308S71 OR LARGER

2 OPERATE WITH NEGATIVE GROUND ONLY



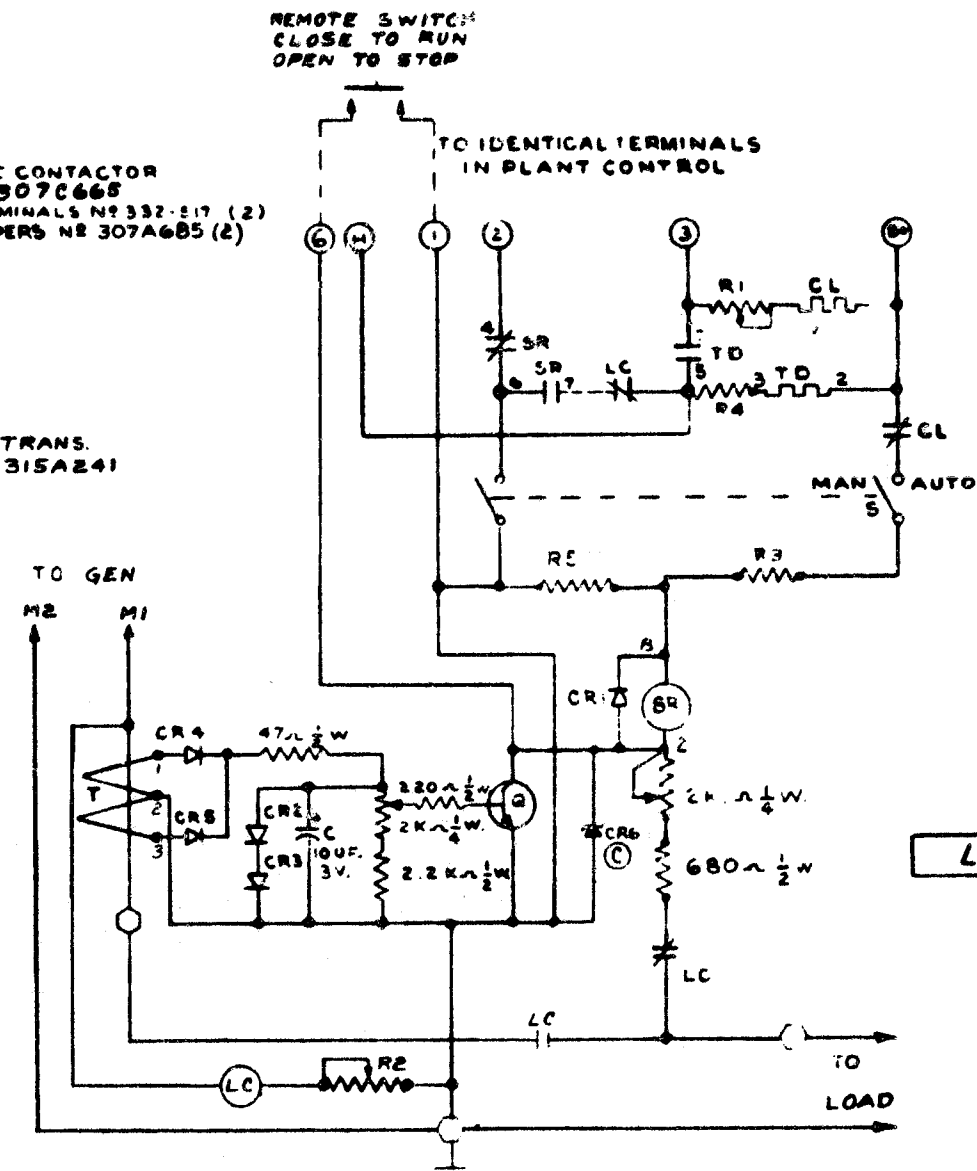
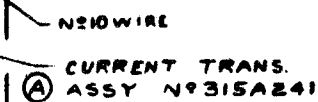
705HA-21-4/1A

| | | | |
|----|------------------------|------|---------|
| 1 | ADDED NOTE 2 | TV | 5-3-66 |
| 2 | WIRE CONN CHANGED | TV | 5-25-66 |
| 3 | ADDED CR6 | TV | 4-7-66 |
| 4 | WAS NO. 304A5 | TV | 3-11-66 |
| 5 | MOVED 'E' WAS N2308S71 | TV | 2-7-66 |
| 6 | ADDED TERMINAL C | TV | 11-1-65 |
| 7 | MOVED FROM SENSITIVE | TV | 9-10-65 |
| 8 | ADDED R5 350-1132 | TV | 6-8-65 |
| 9 | WAS 332A707 | TV | 6-3-65 |
| 10 | WAS B2A557 2C B2588 | TV | 6-3-65 |
| 11 | | DATE | |

ORION DIVISION OF STUDEBAKER CORPORATION
AUTOMATIC DEMAND CONTROL WIRING DIAGRAM

| | | | | |
|----------------|---------|-----|----|-----|
| MODEL | 4-16-65 | CKM | TV | WJB |
| 705HA-21-4/1A | | | | |
| 120 VOLT 1 PH | | | | |
| 2 WIRE 50-60~ | | | | |
| 32 V. CRANKING | | | | |

617C80



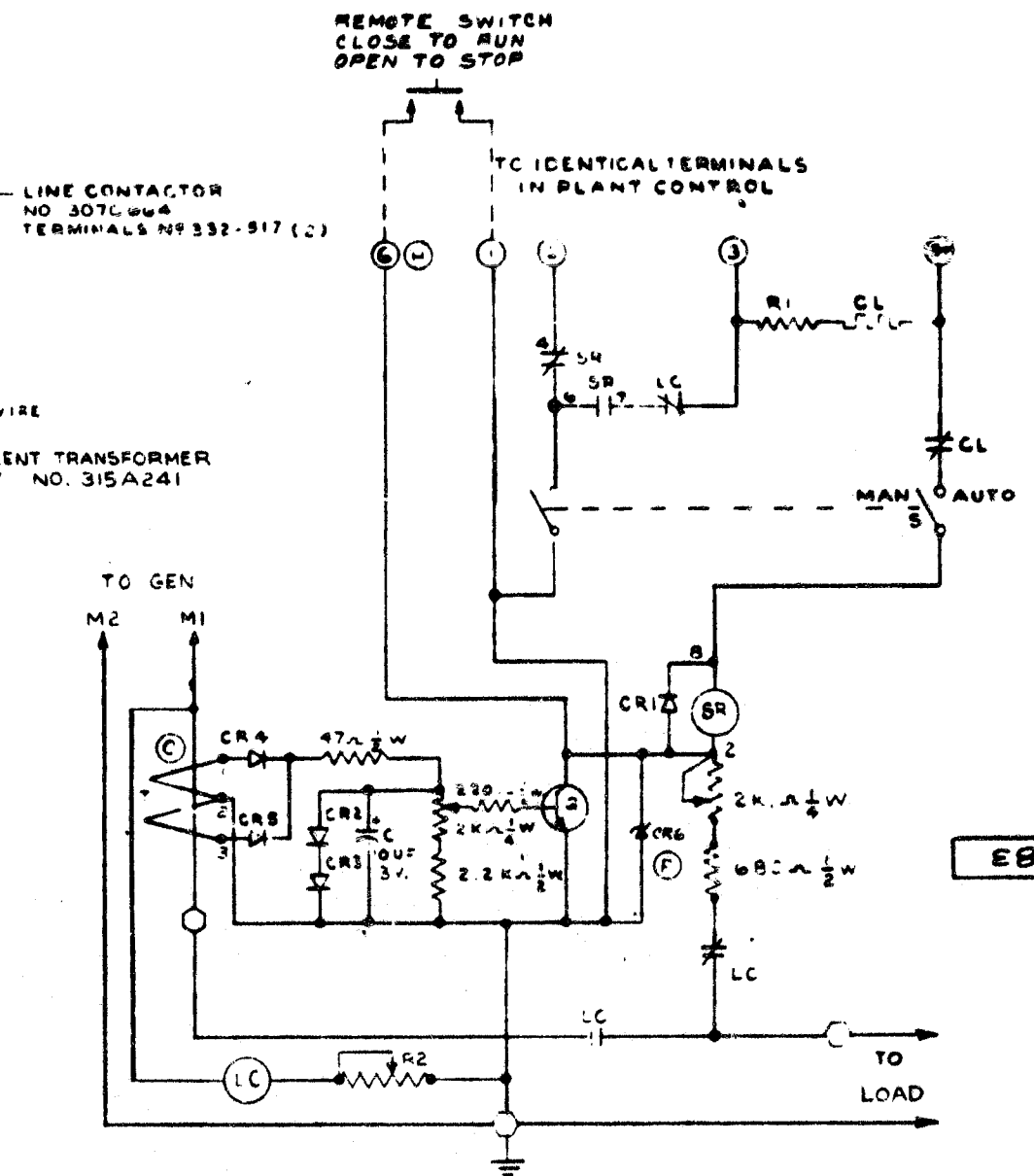
617C87

(G) 2- OPERATE WITH NEGATIVE GROUND ONLY

| | | | |
|------|---------------------------|-----|---------|
| G | ADDED NOTE 2 | SV | 9-13-66 |
| F | WIRE CONN. CORRECTED | SV | 8-27-66 |
| E | NAS 303A262 | SV | 8-28-66 |
| D | NAS 307A645 | SV | 8-28-66 |
| C | ADDED CR6 | SV | 4-7-66 |
| B | NAS NO. 304A5 | SV | 2-11-66 |
| A | MOVED - 6 WAS NO. 315A233 | SV | 2-7-66 |
| LIST | REVISION | CR6 | DATE |

Onen DIVISION OF STUDERBAER CORPORATION
 10000 10th Avenue, North
 Minneapolis, Minnesota 55412

| | | | |
|----------------|------------------------|---------|--------|
| MODEL | DATE | BY | CHK |
| 705HA-21-4/10A | 11-20-65 | TS | TV, WB |
| 120 VOLT 1 PH. | NAME AUTOMATIC DEMAND | | |
| 2 WIRE 50-60 ~ | CONTROL WIRING DIAGRAM | | |
| 32 V. CRANKING | DWG NO | 617 C87 | |



617083

| | | | |
|---|--------------------------|-----|---------|
| G | WIRE CONN. CORRECTED | 7 | 6-25-66 |
| F | ADDED C&G | 8 | 6-27-66 |
| E | MOVED T 1 WAS 40 315A233 | 9 | 6-27-66 |
| D | ADDED TERMINAL 6 | 10 | 11-1-65 |
| C | MOVED T FROM GEN SIDE | 11 | 2-14-65 |
| B | WAS 332 A707 | 12 | 6-4-65 |
| A | WAS BOX ASSY 301 B2508 | 13 | 6-4-65 |
| | REVISION | COR | DATE |

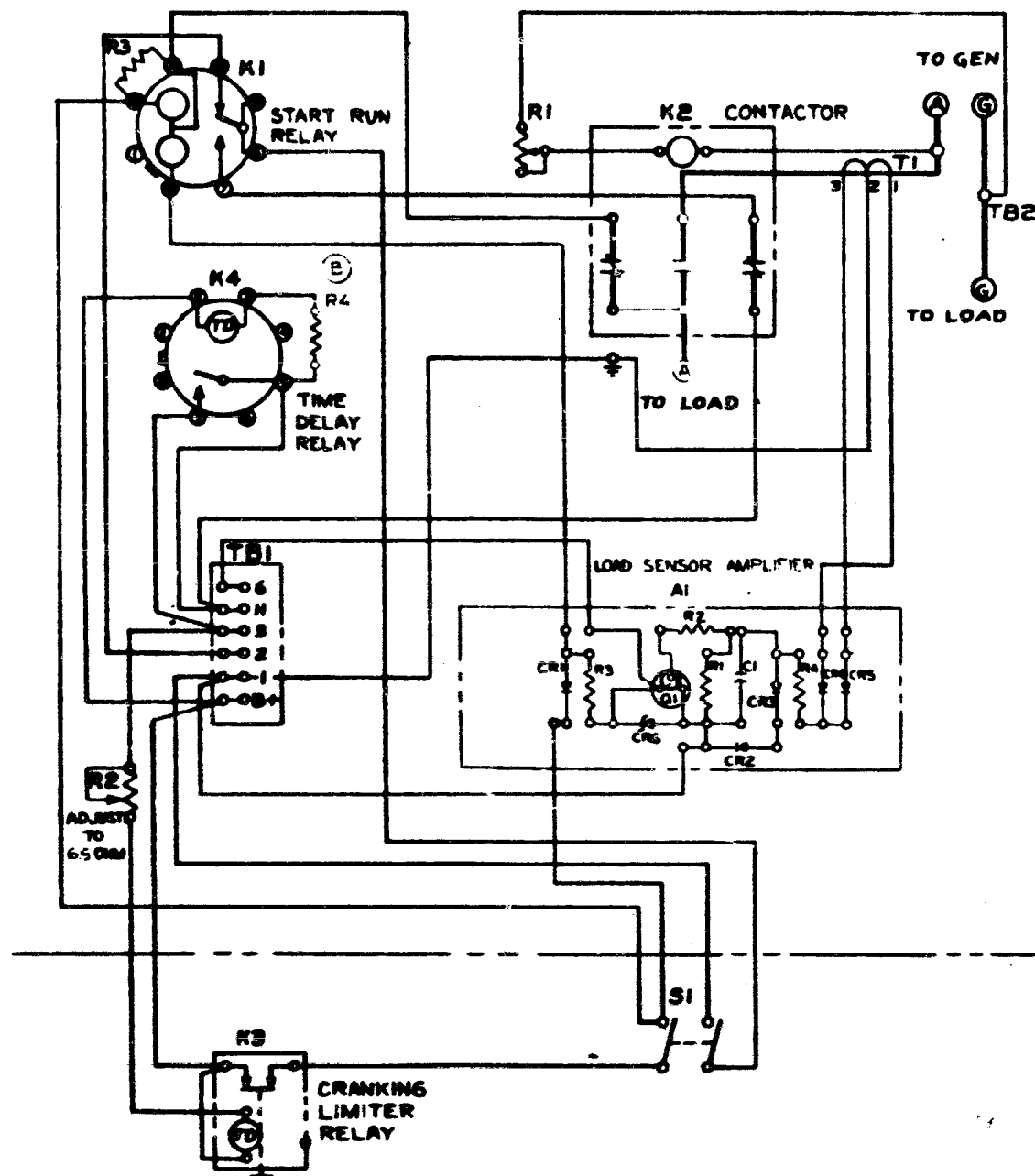
Onor DIVISION OF STUDEBAKER CORPORATION

| | | | |
|---------------|------------------------|-----|-----|
| MODEL | DATE | BY | CHK |
| 705HA-22/1A | 5-5-65 | WJB | WJB |
| 240 VOLT 1PH. | AUTOMATIC DEMAND | | |
| 2 WIRE 50-60~ | CONTROL WIRING DIAGRAM | | |
| 12 V CRANKING | DWG NO 617 C 83 | | |

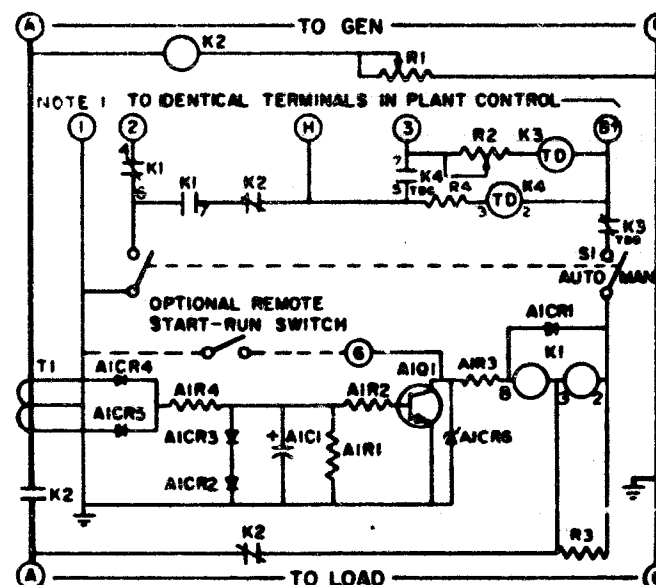


| | | | |
|----------------|------------------------|----------|------------|
| MODEL | DATE | BY | CHK |
| 705HA-22/10A | 4-15-65 | C K M | J V, W J B |
| 240 VOLT 1 PH. | NAME AUTOMATIC DEMAND | | |
| 2 WIRE 50-60~ | CONTROL WIRING DIAGRAM | | |
| 12 V. CRANKING | TYPE NO. | 617 C 77 | |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS



SCHEMATIC



| | | | PARTS LIST |
|----------|----------|-------|-----------------------------|
| REF DES. | PART NO. | QTY | DESCRIPTION |
| A1 | 300B482 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 332A932 | 1 | BOARD - INSULATING |
| K1 | 307A62 | 1 | RELAY - START RUN |
| | 323P380 | 1 | SOCKET |
| K2 | 307C864 | 1 | CONTACTOR |
| | 332-517 | 2 | TERMINAL |
| | 38A2045 | 1 | CAUTION LABEL |
| K3 | 3208104 | 1 | RELAY-CRANKING LIMITER |
| K4 | 307AC45 | 1 | RELAY-TIME DELAY, STARTING |
| | 323P380 | 1 | SOCKET |
| R1 | 304A131 | 1 | RESISTOR, 50-OHM, 25W |
| R2 | 304A66 | 1 | RESISTOR, 10-OHM, 50 W |
| S1 | 308P88 | 1 | SWITCH-AUTO MANUAL |
| T1 | 315A241 | 1 | TRANS. ASSY - CURRENT |
| TB1 | 332A699 | 1 | BLOCK-TERMINAL |
| | 98A1927 | 1 | SILK SCREEN |
| TB2 | 332-517 | 2 | TERMINAL-GROUND |
| R3 | 304A47 | 1 | RESISTOR, 15-OHM, 25 W |
| R4 | 352-114 | 1 | RESISTOR, 62-OHM, 2 W |
| | | | |
| | | | |
| | | | |
| | 301D2573 | 1 | CONTROL BOX |
| | 98C1815 | 1 | SILK SCREEN |
| | 98A1957 | 1 | SILK SCREEN |
| | 301B2586 | 1 | TRIM |
| | 518P237 | 3 | FASTENER-TRIM |
| | 815-178 | 1 | SCREW-HEX HD #10-32x3/16 L6 |
| | 850-30 | 1 | LOCKWASHER #10 |
| | 99A966 | 1 | NAMEPLATE-CONTROL |
| | | | |
| | | | |
| | | | |
| | 334A1890 | 25 FT | WIRE-FLEXBLE NO. 20 AWG |
| | 334A1842 | 2 FT | WIRE-FLEXBLE NO. 16 AWG |
| | | | 6012217 |

NOTES:

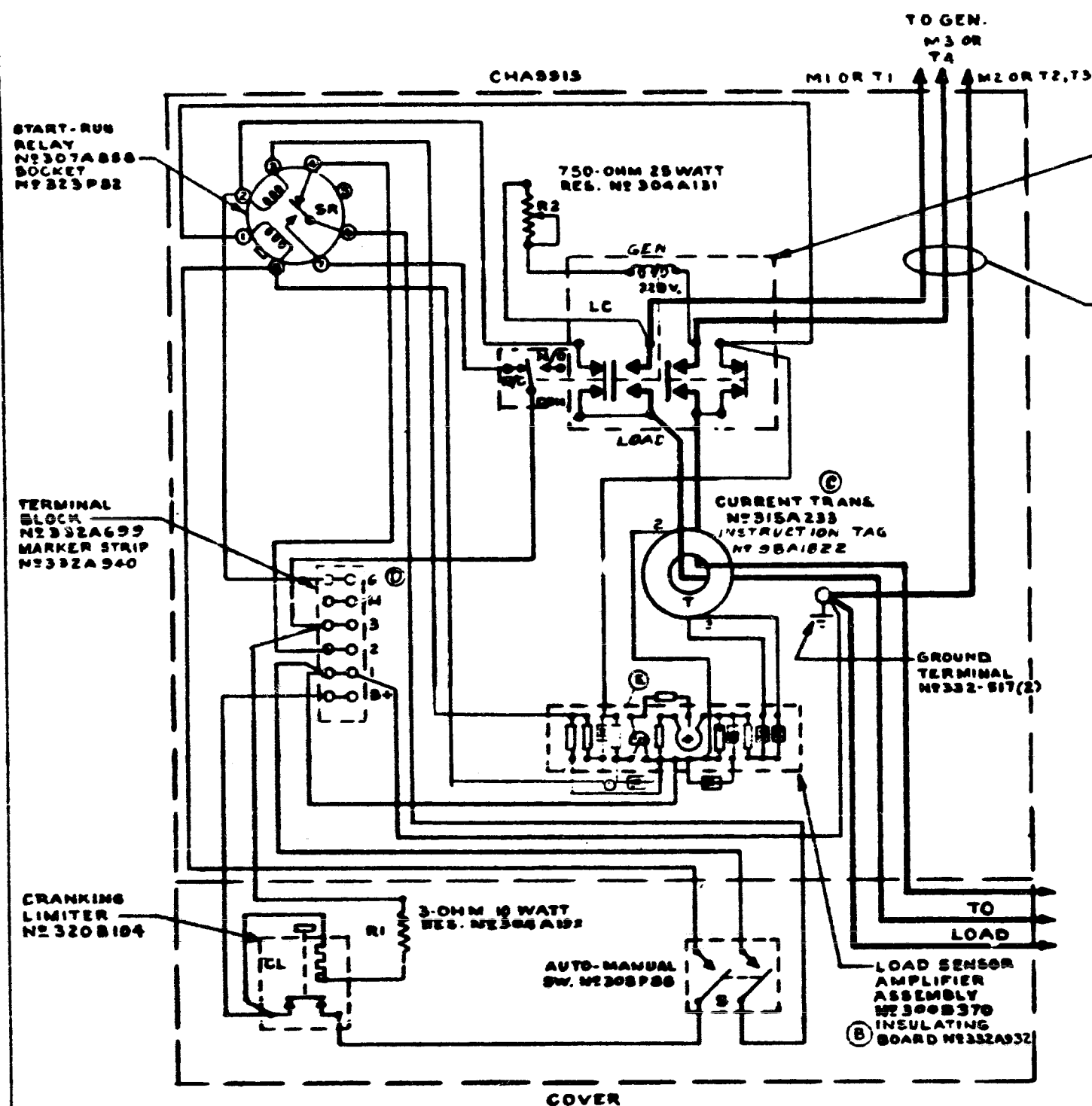
1. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.
2. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

705HA-22-3/10A

| | | | |
|----|-----------------------|---|-------|
| H | ADDED WOE NO 3344 542 | 1 | 1-1-6 |
| G | " " " 3344 595 | 1 | 1-1-6 |
| F | WAS 333FF 550-ET | 1 | 1-1-6 |
| E | WAS 323P52 SCOVE | 1 | 1-1-6 |
| D | ACCEC 10TE 1 & 2 | 1 | 1-1-6 |
| C | ACCEC 10TE 100-20-8 | 1 | 1-1-6 |
| B | ADDED 335 - | 1 | 1-1-6 |
| A | WAS 3074-879 | 1 | 1-1-6 |
| MR | OFFICE | 1 | 1-1-6 |

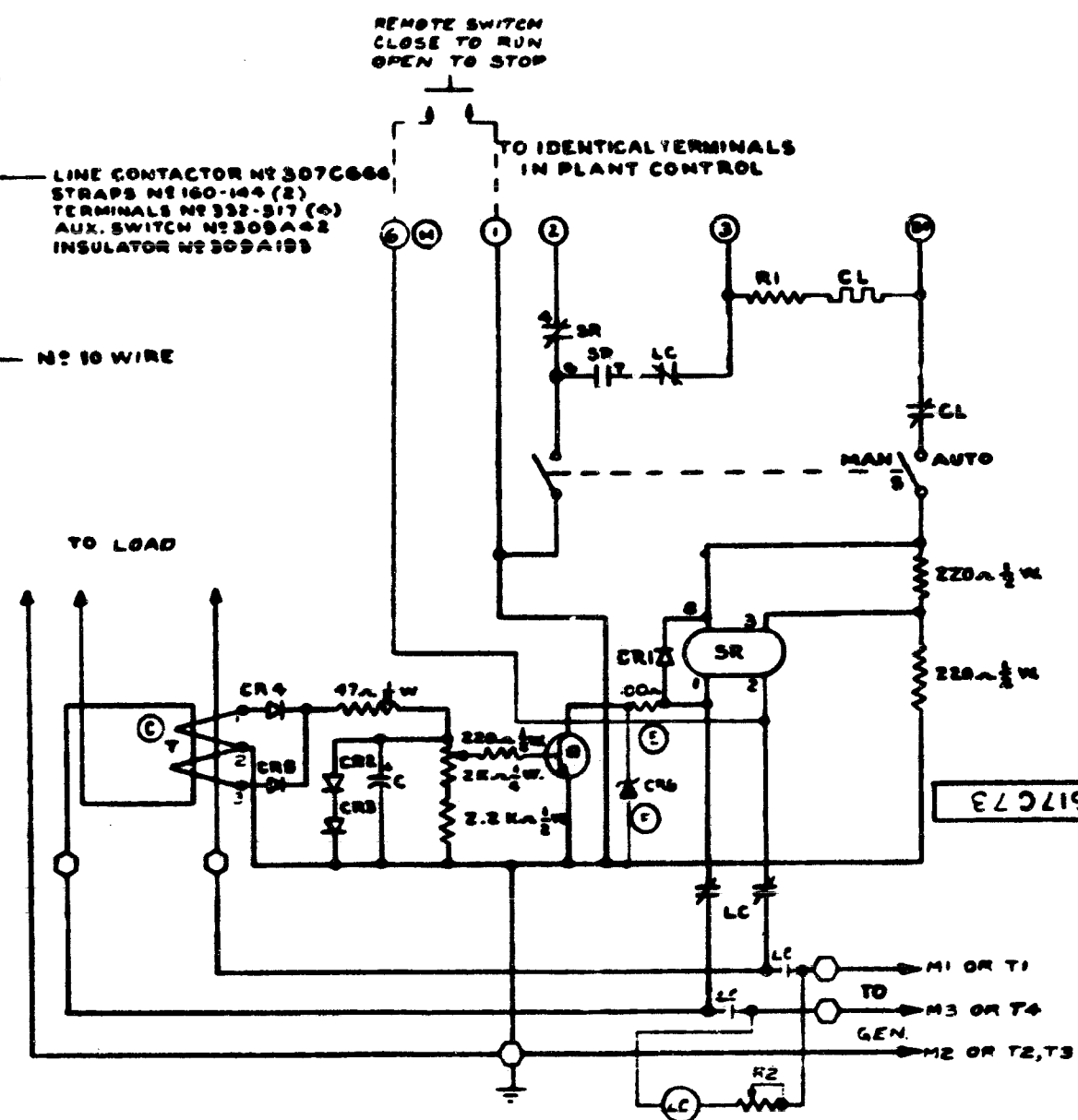
Origin DIVISION OF FOREIGN CORPORATIONS
HARRISBURG, PENNSYLVANIA

| | | | |
|---------------------------|----------------------------|-----|-----|
| MOBILE NO | REV | BY | CHK |
| 705HA-22-3/10A | 7-30-66 | CEK | WJB |
| 24 VOLT CRANKING | SCHEMATIC & WIRING DIAGRAM | | |
| | AUTOMATIC DEMAND CONTROL | | |
| 240V, 1PH, 2W, 50/60CY | PAGE NO. 617C109 | | |



NOTE:
1- WIRES TO LOAD SENSOR AMPLIFIER NO 20
OTHER WIRES NO 20 OR LARGER.

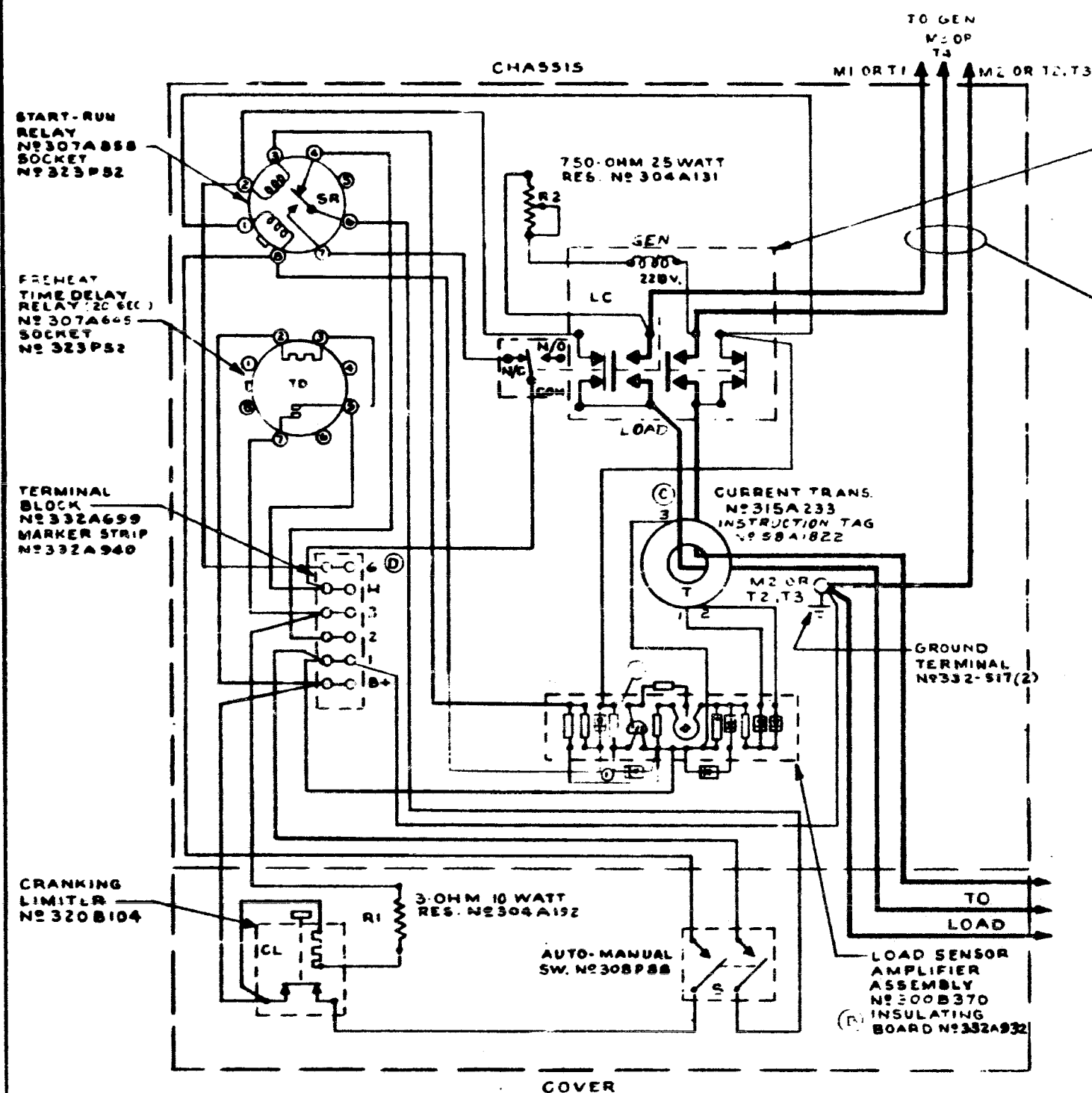
⑥ 2- OPERATE WITH NEGATIVE GROUND ONLY



705HA-23/1A

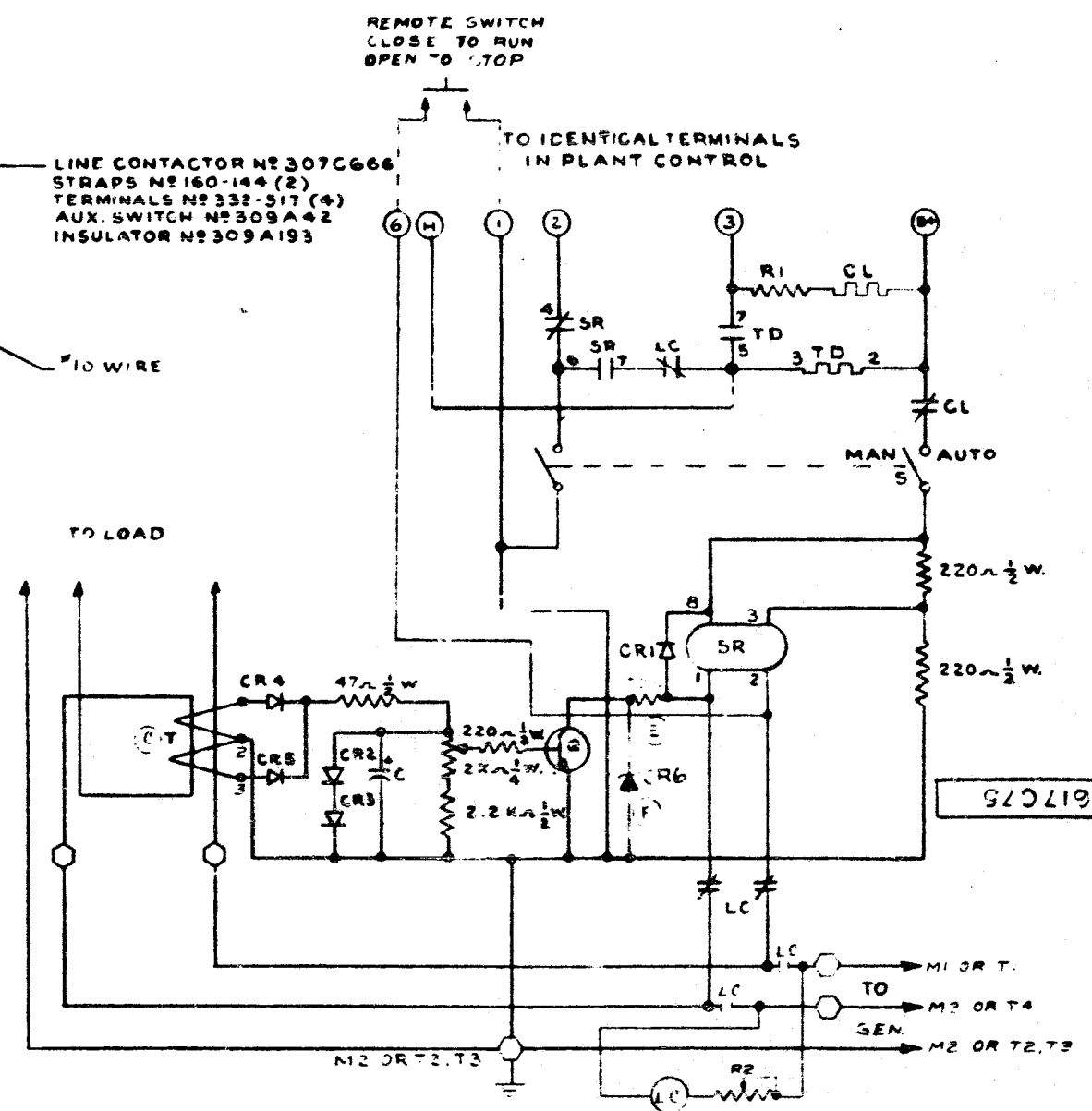
| | | |
|-----|-------------------------|--------|
| G | ADDECT NOTE 2 | 9-2-66 |
| F | ADDED CNG | 9-2-66 |
| E | ADDED COM RES | 9-2-66 |
| D | ADDED TERMINAL 6 | 9-2-66 |
| C | MOVED T. 5. CALLEN SIDE | 9-2-66 |
| B | 443 342A 207 | 9-2-66 |
| A | WAS BOX ASSV. 30181580 | 9-2-66 |
| LET | OFFICE | DATE |

| | | | |
|--------------------|------------------------|-----|--------|
| MODEL | DATE | BY | CHK |
| 7.5HA-23/1A | 4-9-65 | CKM | JV,WJB |
| 120-240 VOLT | NAME AUTOMATIC DEMAND | | |
| 1PH. 3 WIRE 50-60~ | CONTROL WIRING DIAGRAM | | |
| 12 V. CRANKING | FIG. NO. 617 C 7 3 | | |




NOTE:
1- WIRES TO LOAD SENSOR AMPLIFIER NO 20
OTHER WIRES NO 20 OR LARGER.

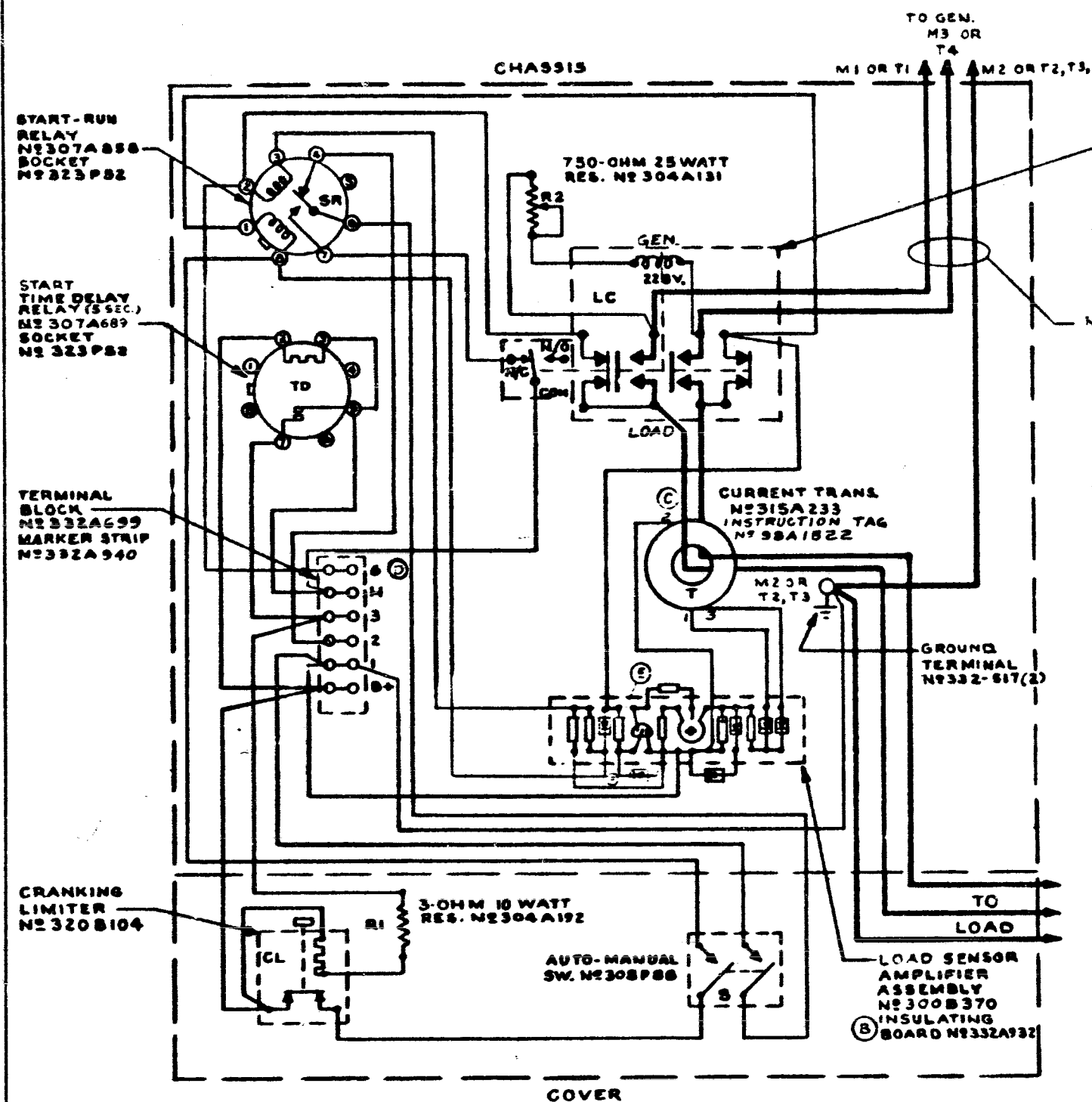
6. 2-OPERATE WITH INEFFECTIVE GROUND OR



705HA-23/10A

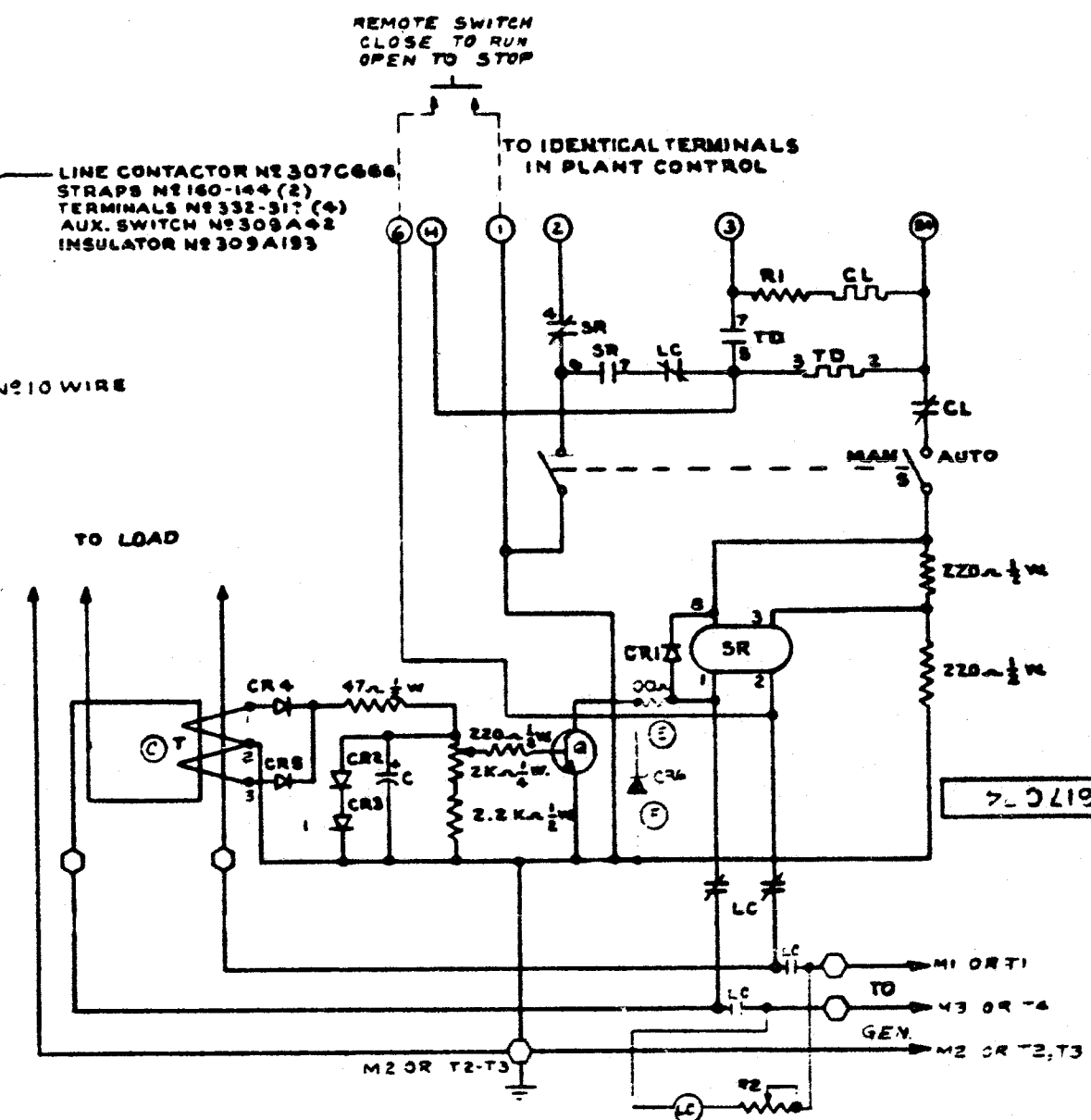
| | | |
|----|--------------------|----------|
| 3 | ADDED NOTE 2 | 20-13-66 |
| 4 | ADDED CR6 | 4-13-66 |
| 5 | ADDED ACCRES | 4-13-66 |
| 6 | ADDED TERMINAL 6 | 11-1-65 |
| 7 | MOVED FROM GEN EFF | 5-14-65 |
| 8 | WAS 10032A707 | 6-4-65 |
| 9 | WAS 10032A707 | 6-4-65 |
| 10 | WAS 10032A707 | 6-4-65 |
| 11 | WAS 10032A707 | 6-4-65 |
| 12 | WAS 10032A707 | 6-4-65 |
| 13 | WAS 10032A707 | 6-4-65 |
| 14 | WAS 10032A707 | 6-4-65 |
| 15 | WAS 10032A707 | 6-4-65 |
| 16 | WAS 10032A707 | 6-4-65 |
| 17 | WAS 10032A707 | 6-4-65 |
| 18 | WAS 10032A707 | 6-4-65 |
| 19 | WAS 10032A707 | 6-4-65 |
| 20 | WAS 10032A707 | 6-4-65 |
| 21 | WAS 10032A707 | 6-4-65 |
| 22 | WAS 10032A707 | 6-4-65 |
| 23 | WAS 10032A707 | 6-4-65 |
| 24 | WAS 10032A707 | 6-4-65 |
| 25 | WAS 10032A707 | 6-4-65 |
| 26 | WAS 10032A707 | 6-4-65 |
| 27 | WAS 10032A707 | 6-4-65 |
| 28 | WAS 10032A707 | 6-4-65 |
| 29 | WAS 10032A707 | 6-4-65 |
| 30 | WAS 10032A707 | 6-4-65 |
| 31 | WAS 10032A707 | 6-4-65 |
| 32 | WAS 10032A707 | 6-4-65 |
| 33 | WAS 10032A707 | 6-4-65 |
| 34 | WAS 10032A707 | 6-4-65 |
| 35 | WAS 10032A707 | 6-4-65 |
| 36 | WAS 10032A707 | 6-4-65 |
| 37 | WAS 10032A707 | 6-4-65 |
| 38 | WAS 10032A707 | 6-4-65 |
| 39 | WAS 10032A707 | 6-4-65 |
| 40 | WAS 10032A707 | 6-4-65 |
| 41 | WAS 10032A707 | 6-4-65 |
| 42 | WAS 10032A707 | 6-4-65 |
| 43 | WAS 10032A707 | 6-4-65 |
| 44 | WAS 10032A707 | 6-4-65 |
| 45 | WAS 10032A707 | 6-4-65 |
| 46 | WAS 10032A707 | 6-4-65 |
| 47 | WAS 10032A707 | 6-4-65 |
| 48 | WAS 10032A707 | 6-4-65 |
| 49 | WAS 10032A707 | 6-4-65 |
| 50 | WAS 10032A707 | 6-4-65 |
| 51 | WAS 10032A707 | 6-4-65 |
| 52 | WAS 10032A707 | 6-4-65 |
| 53 | WAS 10032A707 | 6-4-65 |
| 54 | WAS 10032A707 | 6-4-65 |
| 55 | WAS 10032A707 | 6-4-65 |
| 56 | WAS 10032A707 | 6-4-65 |
| 57 | WAS 10032A707 | 6-4-65 |
| 58 | WAS 10032A707 | 6-4-65 |
| 59 | WAS 10032A707 | 6-4-65 |
| 60 | WAS 10032A707 | 6-4-65 |
| 61 | WAS 10032A707 | 6-4-65 |
| 62 | WAS 10032A707 | 6-4-65 |
| 63 | WAS 10032A707 | 6-4-65 |
| 64 | WAS 10032A707 | 6-4-65 |
| 65 | WAS 10032A707 | 6-4-65 |
| 66 | WAS 10032A707 | 6-4-65 |
| 67 | WAS 10032A707 | 6-4-65 |
| 68 | WAS 10032A707 | 6-4-65 |
| 69 | WAS 10032A707 | 6-4-65 |
| 70 | WAS 10032A707 | 6-4-65 |
| 71 | WAS 10032A707 | 6-4-65 |
| 72 | WAS 10032A707 | 6-4-65 |
| 73 | WAS 10032A707 | 6-4-65 |
| 74 | WAS 10032A707 | 6-4-65 |
| 75 | WAS 10032A707 | 6-4-65 |
| 76 | WAS 10032A707 | 6-4-65 |
| 77 | WAS 10032A707 | 6-4-65 |
| 78 | WAS 10032A707 | 6-4-65 |
| 79 | WAS 10032A707 | 6-4-65 |
| 80 | WAS 10032A707 | 6-4-65 |
| 81 | WAS 10032A707 | 6-4-65 |
| 82 | WAS 10032A707 | 6-4-65 |
| 83 | WAS 10032A707 | 6-4-65 |
| 84 | WAS 10032A707 | 6-4-65 |
| 85 | WAS 10032A707 | 6-4-65 |
| 86 | WAS 10032A707 | 6-4-65 |
| 87 | WAS 10032A707 | 6-4-65 |
| 88 | WAS 10032A707 | 6-4-65 |
| 89 | WAS 10032A707 | 6-4-65 |
| 90 | WAS 10032A707 | 6-4-65 |
| 91 | WAS 10032A707 | 6-4-65 |
| 92 | WAS 10032A707 | 6-4-65 |
| 93 | WAS 10032A707 | 6-4-65 |
| 94 | WAS 10032A707 | 6- |

| | | | |
|---|-----|---|---------|
|  | | DIVISION OF STUDEBAKER CORPORATION <small>Manufacturers of Insurance</small> | |
| EST. 1905 | CHN | TEL. TW 1018 | TW 1018 |
| NAME AUTOMATIC DEMAND CONTROL WIRING DIAGRAM | | | |
| CPG NO. 617 C75 | | | |



NOTE:
1- WIRES TO LOAD SENSOR AMPLIFIER N° 20
OTHER WIRES N° 20 OR LARGER.

(6) 2-OPERATE WITH NEGATIVE GROUND ONLY

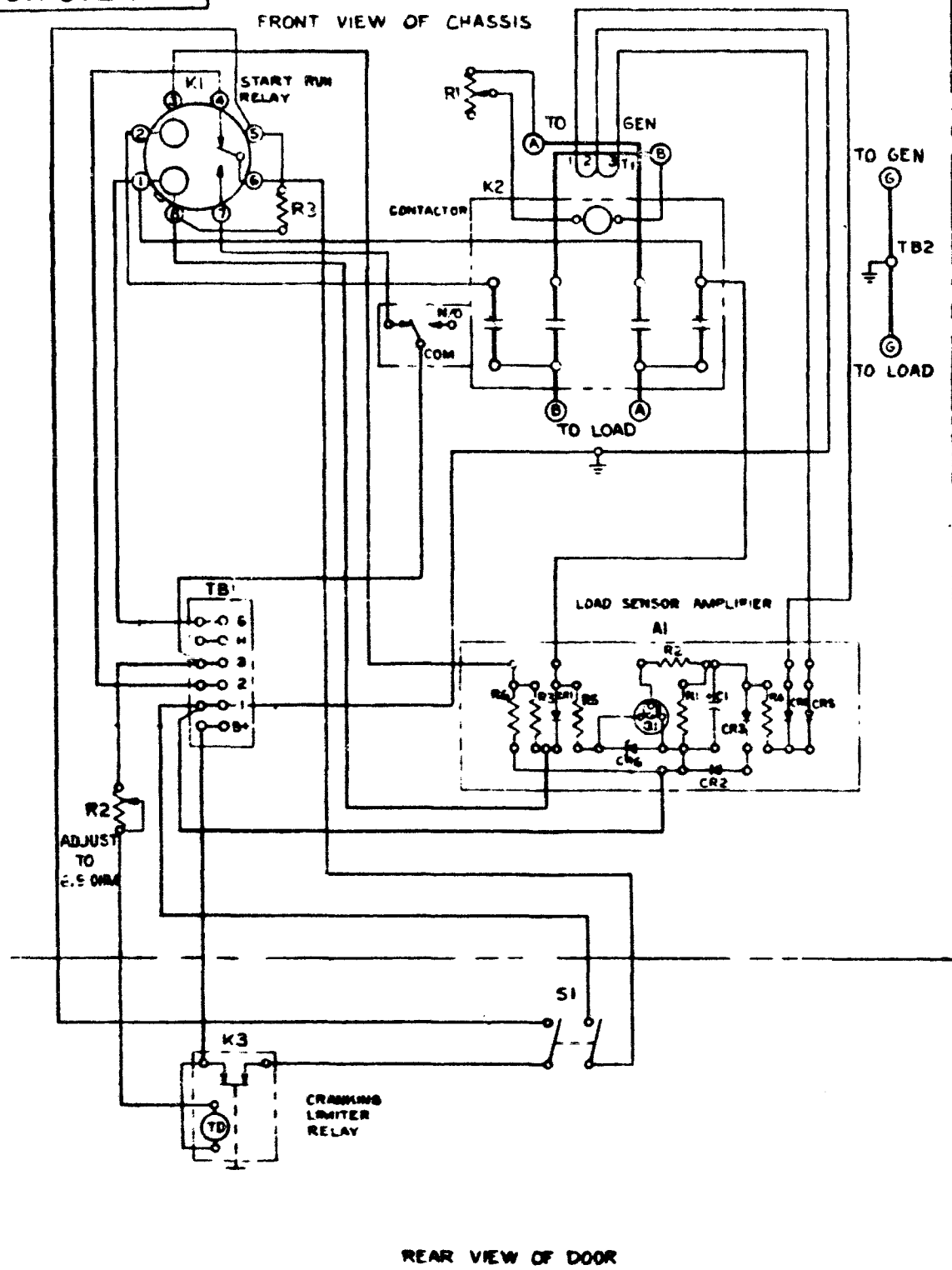


705HA-23/12A

| | | | |
|-----|-----------------|-----|---------|
| 6 | ADDED NOTE 2 | 7 | 13-3-66 |
| F | ADDED 126 | 8 | 13-3-66 |
| E | ADDED 126 | 9 | 13-3-66 |
| D | ADDED 126 | 10 | 13-3-66 |
| C | MOVED TO FR 126 | 11 | 13-3-66 |
| B | WAS 932A797 | 12 | 13-3-66 |
| A | WAS 932A797 | 13 | 13-3-66 |
| LET | DELETED | CRD | DATE |

| | | | |
|--------------------|------------------------|---------|---------|
| MODEL | DATE | BY | CBS |
| 7.5HA-23/12A | 4-3-55 | GKM | JY, NIE |
| 120-240 VOLT | NAME AUTOMATIC DEMAND | | |
| 1PH. 3 WIRE 50-60~ | CONTROL WIRING DIAGRAM | | |
| 12 V. CRANKING | DRWG. NO. | 617 C74 | |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

[illegible]

705HA-23-3/1A

| | | | |
|--|--|---|---|
| <div data-bbox="1951 1652 2033 1696" data-label="Text"> <p>705HA-23-3/1A</p> </div> | <div data-bbox="2203 1652 2333 1696" data-label="Text"> <p>1-25-66</p> </div> | <div data-bbox="2344 1652 2474 1696" data-label="Text"> <p>CDR</p> </div> | <div data-bbox="2488 1652 2596 1696" data-label="Text"> <p>617C124</p> </div> |
| <div data-bbox="1951 1705 2188 1756" data-label="Text"> <p>24 VOLT CRANKING</p> </div> | <div data-bbox="2203 1705 2596 1756" data-label="Text"> <p>SCHEMATIC & WIRING DIAGRAM</p> </div> | | |
| <div data-bbox="1951 1760 2188 1809" data-label="Text"> <p>120/240 V, 1PH, 3 WIRE, 50/60 CY</p> </div> | <div data-bbox="2203 1760 2596 1809" data-label="Text"> <p>AUTOMATIC DEMAND CONTROL</p> </div> | | |

3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

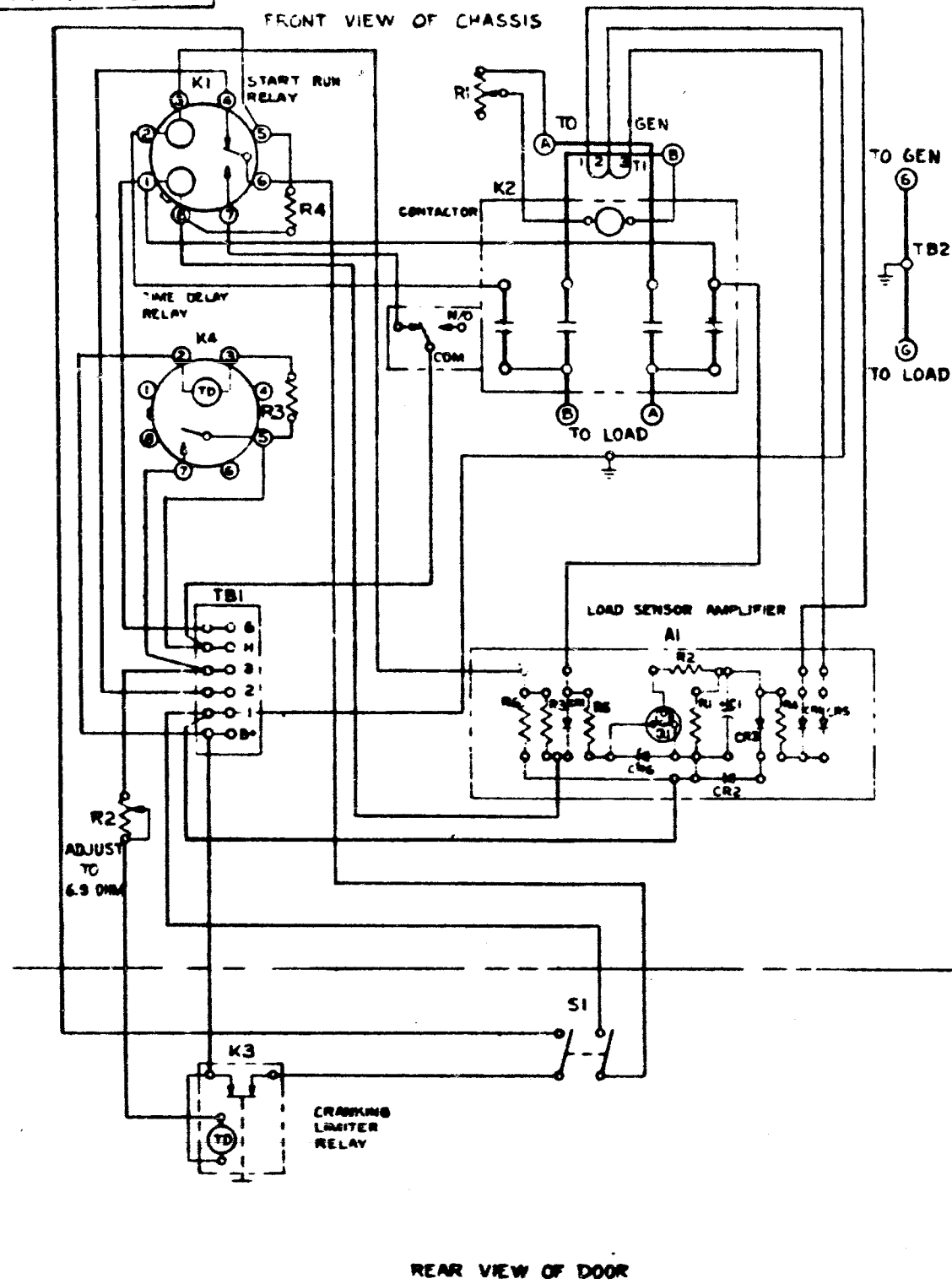
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

NOTE: 1 - OPERATE WITH NEGATIVE GROUND ONLY

D4

D2

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

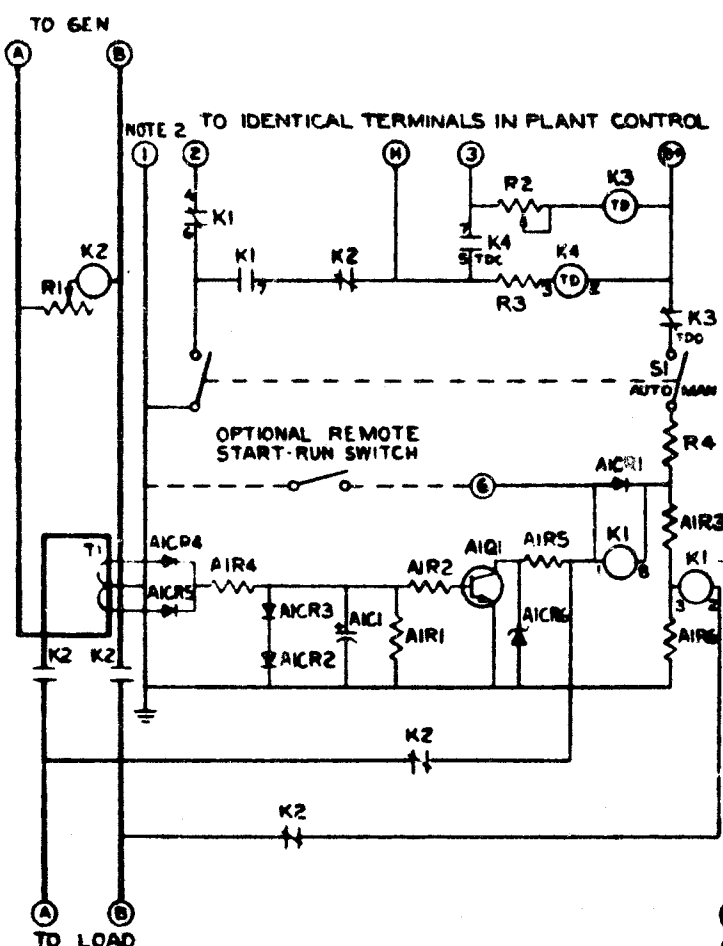


3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

NOTE: 1 - OPERATE WITH NEGATIVE GROUND ONLY

SCHEMATIC

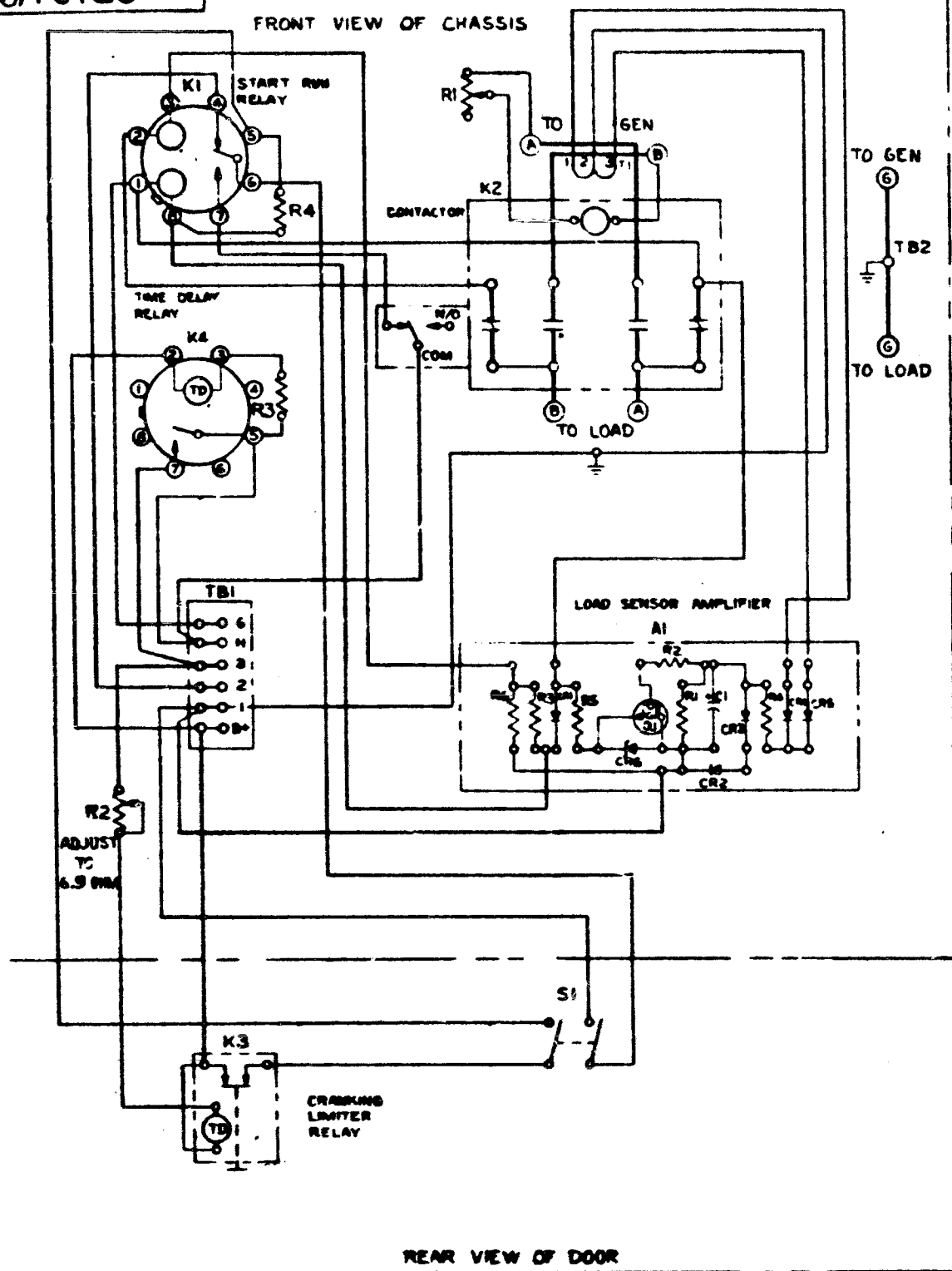


| PARTS LIST | | |
|------------|----------|------------------------------------|
| REF DES | PART NO | QTY DESCRIPTION |
| A1 | 300B463 | 1 AMPLIFIER ASSY - LOAD SENSOR |
| | 332A932 | 1 BOARD - INSULATING |
| K1 | 307A858 | 1 RELAY - START RUN |
| | 323P380 | 1 SOCKET |
| K2 | 307C666 | 1 CONTACTOR |
| | 98A2045 | 1 CAUTION LABEL |
| | 160-144 | 2 STRAP |
| | | |
| | 332-517 | 4 TERMINAL |
| | 309A42 | 1 SWITCH - AUX |
| | 309A193 | 1 INSULATOR |
| K3 | 320B104 | 1 RELAY - CRANKING LIMITER |
| K4 | 307A645 | 1 RELAY - TIME DELAY, PREHEAT (20) |
| | 323P380 | 1 SOCKET |
| R1 | 304A131 | 1 RESISTOR, 750 OHM, 25W |
| R2 | 304A222 | 1 RESISTOR, 15 OHM, 50W |
| S1 | 308P88 | 1 SWITCH - AUTO MANUAL |
| T1 | 315A291 | 1 TRANS. ASSY - CURRENT |
| TB1 | 332A699 | 1 BLOCK - TERMINAL |
| | 98A1927 | 1 SILK SCREEN |
| TB2 | 332-517 | 2 TERMINAL - GROUND |
| R3 | 352-114 | 1 RESISTOR, 62 OHM, 2 W |
| R4 | 350-984 | 1 RESISTOR, 750 OHM, 2 W |
| | | |
| | | |
| | 301D2573 | 1 CONTROL BOX |
| | 98C1815 | 1 SILK SCREEN |
| | 98A1949 | 1 SILK SCREEN |
| | 301B2586 | 1 TRIM |
| | 518P237 | 3 FASTENER - TRIM |
| | 815-178 | 1 SCREW - HEX HD #10-32 X 5/8 LG |
| | 850-30 | 1 LOCKWASHER #10 |
| | 99A966 | 1 NAMEPLATE - CONTROL |
| | | |
| | | |
| | | 22107.9 |
| | 334A1890 | 25 FT WIRE-FLEX BLE NO. 20 AWG |
| | 334A1842 | 2 FT WIRE-FLEXIBLE NO. 16 AWG |

705HA-23-3/10A

| | | | |
|---|--|---------|-------|
| | A. YERMINA | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| S | DOTTED WIRE | 0046819 | 007-1 |
| A | | 3546820 | 007-2 |
| REF | DIVISION | F&S | 007B |
| Ogma | DIVISION OF SUBMARINE CORPORATION Norfolk, Virginia | | |
| NOV | 1-25-67 | CDR | VLT |
| NAUTIC SCHEMATIC & WIRING DIAGRAM AUTOMATIC DEMAND CONTROL | | | |
| PAGE TWO | | | |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS



| REF DES | PART NO | QTY | DESCRIPTION |
|---------|----------|-------|---------------------------------|
| A1 | 300B463 | 1 | AMPLIFIER ASSY - LOAD SENSOR |
| | 332A932 | 1 | BOARD - INSULATING |
| K1 | 307A858 | 1 | RELAY - START RUN |
| | 323P380 | 1 | SOCKET |
| K2 | 307C666 | 1 | CONTACTOR |
| | 98A2045 | 1 | CAUTION LABEL |
| | 160-144 | 2 | STRAP |
| | | | |
| | 332-517 | 4 | TERMINAL |
| | 309A42 | 1 | SWITCH - AUX |
| | 309A193 | 1 | INSULATOR |
| K3 | 320B104 | 1 | RELAY - CRANKING LIMITER |
| K4 | 307A689 | 1 | RELAY - TIME DELAY, PREHEAT (S) |
| | 323P380 | 1 | SOCKET |
| R1 | 304A131 | 1 | RESISTOR, 750 OHM, 25W. |
| R2 | 304A222 | 1 | RESISTOR, 15 OHM, 50W. |
| S1 | 308P88 | 1 | SWITCH - AUTO MANUAL |
| T1 | 315A291 | 1 | TRANS. ASSY - CURRENT |
| TB1 | 332A699 | 1 | BLOCK - TERMINAL |
| | 98A1927 | 1 | SILK SCREEN |
| TB2 | 332-517 | 2 | TERMINAL - GROUND |
| R3 | 352-14 | 1 | RESISTOR, 62 OHM, 2 W. |
| R4 | 350-984 | 1 | RESISTOR, 750 OHM, 2 W. |
| | | | |
| | | | |
| | 301D2573 | 1 | CONTROL BOX |
| | 98C1813 | 1 | SILK SCREEN |
| | 98A1949 | 1 | SILK SCREEN |
| | 301B2586 | 1 | TRIM |
| | 518P237 | 3 | FASTENER - TRIM |
| | 813-178 | 1 | SCREW - HEX HD #10-32 X 5/8 LG |
| | 850-30 | 1 | LOCKWASHER #10 |
| | 99A966 | 1 | NAMEPLATE - CONTROL |
| | | | |
| | | | |
| | | | 8212719 |
| | 334A1890 | 25 FT | WIRE-FLEXIBLE NO. 20 AWG |
| | 334A1842 | 12 FT | WIRE-FLEXIBLE NO. 6 AWG |

705HA-23-3/12A

3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN, BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

NOTE: 1 - OPERATE WITH NEGATIVE GROUND ONLY

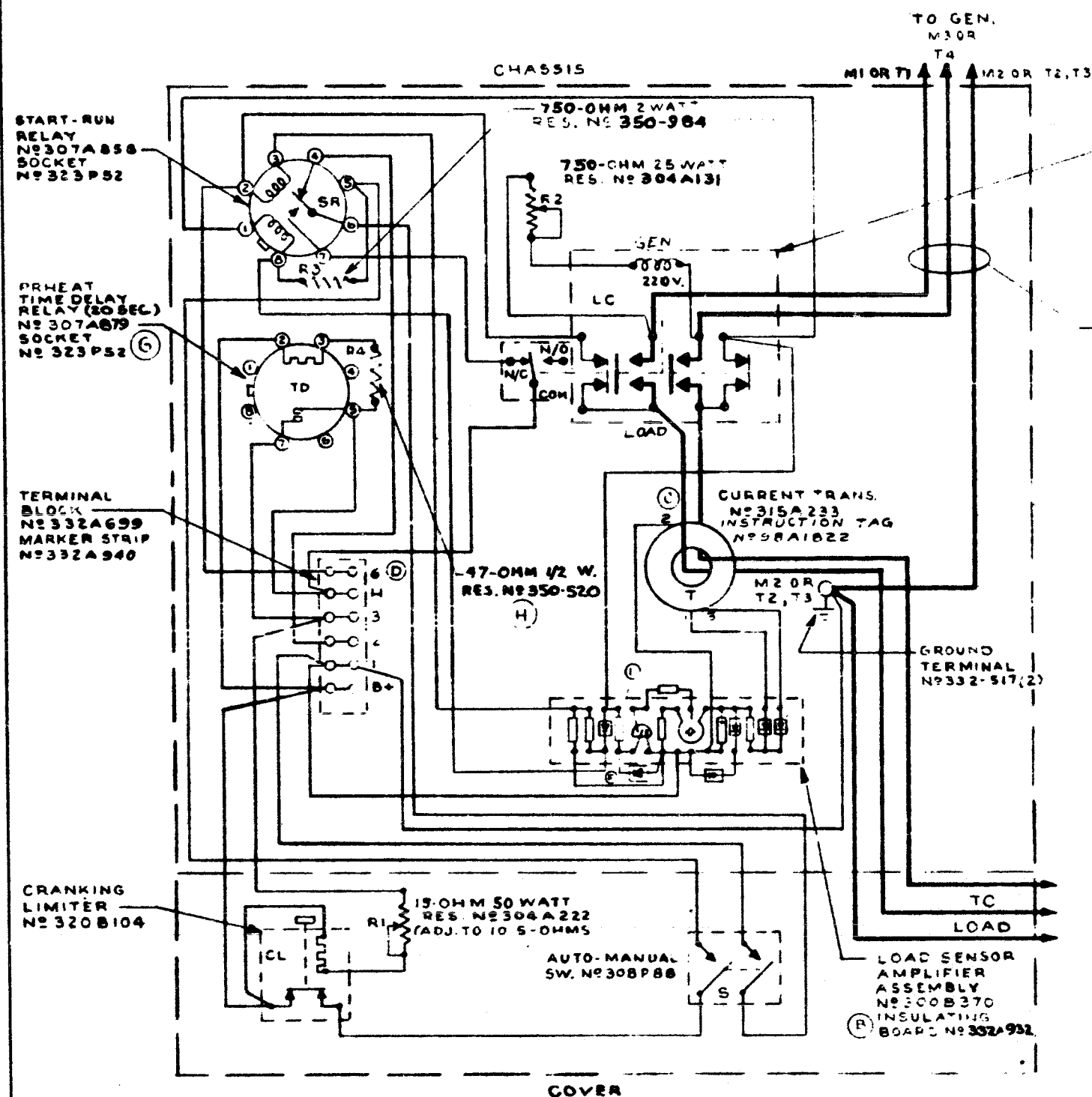
| | |
|--|---------|
| 705HA-23-3/12A 24 VOLT CRANKING 120/240 V, 1PH, 3 WIRE. 50/60 CY. | 617C123 |
| | 617C123 |
| | 617C123 |
| | 617C123 |

617C76

PICTORIAL

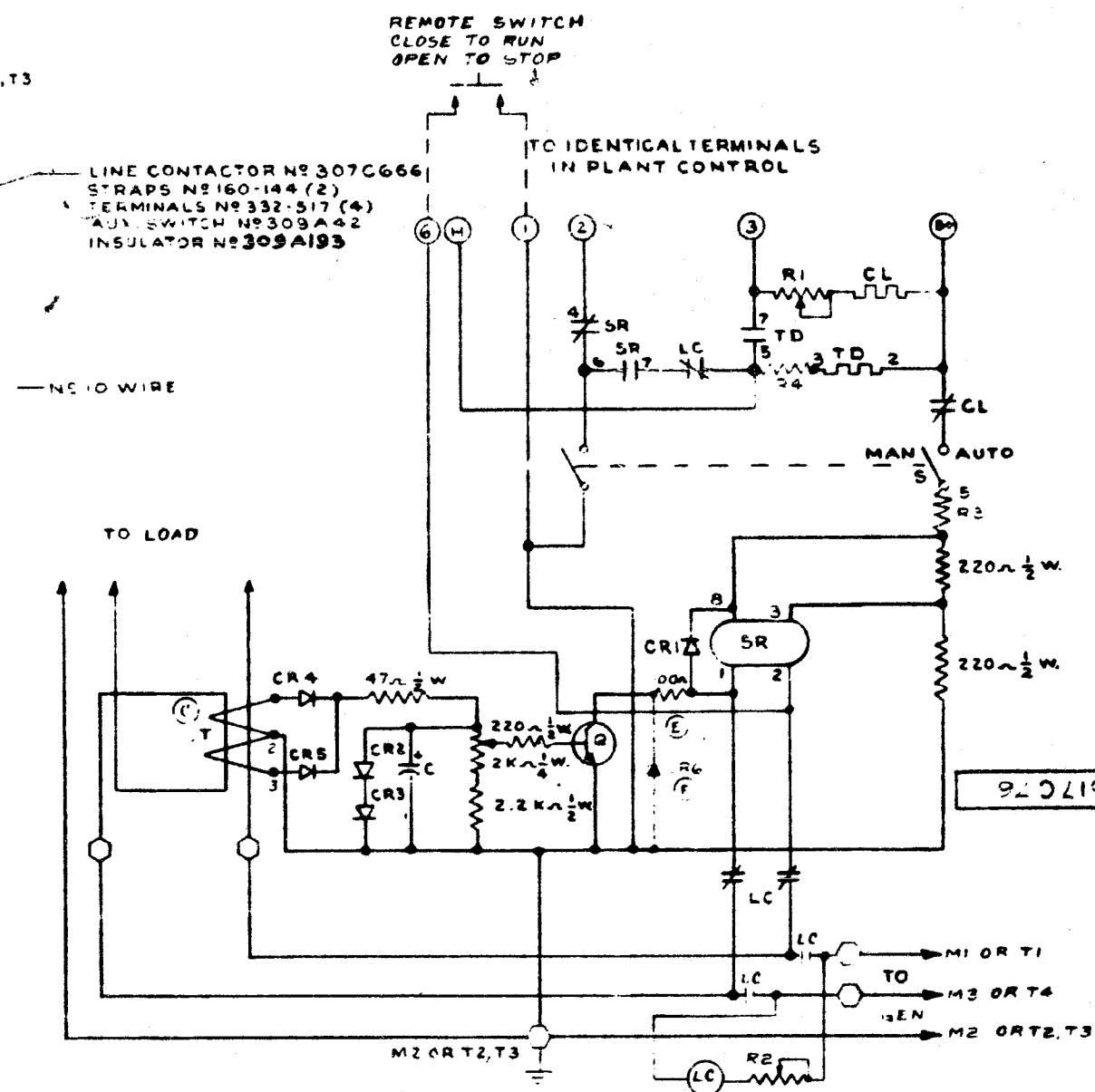
SCHEMATIC

705HA-23-4/10A



NOTE:
WIRES TO LOAD SENSOR AMPLIFIER N330
OTHER WIRES N320 OR LARGER

(J) 2- OPERATE WITH NEGATIVE GROUND ONLY



705HA-23-4/10A

| | |
|--------------------------|------------|
| REVISED NOTE 2 | 5/19-13-66 |
| WAS 100A767 | 5/4-28-66 |
| G WAS 100A645 | 5/4-28-66 |
| F ADDED CRG | 5/4-11-66 |
| E ADDED 30A RES | 5/4-1-66 |
| D ADDED TERMINAL 6 | 5/11-1-65 |
| C MOVED FROM LEN SIDE | 5/9-14-65 |
| B WAS 100A707 | 5/6-3-65 |
| A WAS BOX ASSY. 301B-588 | 5/6-3-65 |
| REV. 500 | DATE |

Original DIVISION OF SULLYBANK CORPORATION

| | | | | |
|-------|----------------|-------------|-------------------|----------------|
| MODEL | 705HA-23-4/10A | 120-240VOLT | 1PH. 3WIRE 50-60~ | 32 V. CRANKING |
| MODEL | 705HA-23-4/10A | 120-240VOLT | 1PH. 3WIRE 50-60~ | 32 V. CRANKING |
| MODEL | 705HA-23-4/10A | 120-240VOLT | 1PH. 3WIRE 50-60~ | 32 V. CRANKING |
| MODEL | 705HA-23-4/10A | 120-240VOLT | 1PH. 3WIRE 50-60~ | 32 V. CRANKING |
| MODEL | 705HA-23-4/10A | 120-240VOLT | 1PH. 3WIRE 50-60~ | 32 V. CRANKING |

AUTOMATIC DEMAND CONTROL WIRING DIAGRAM

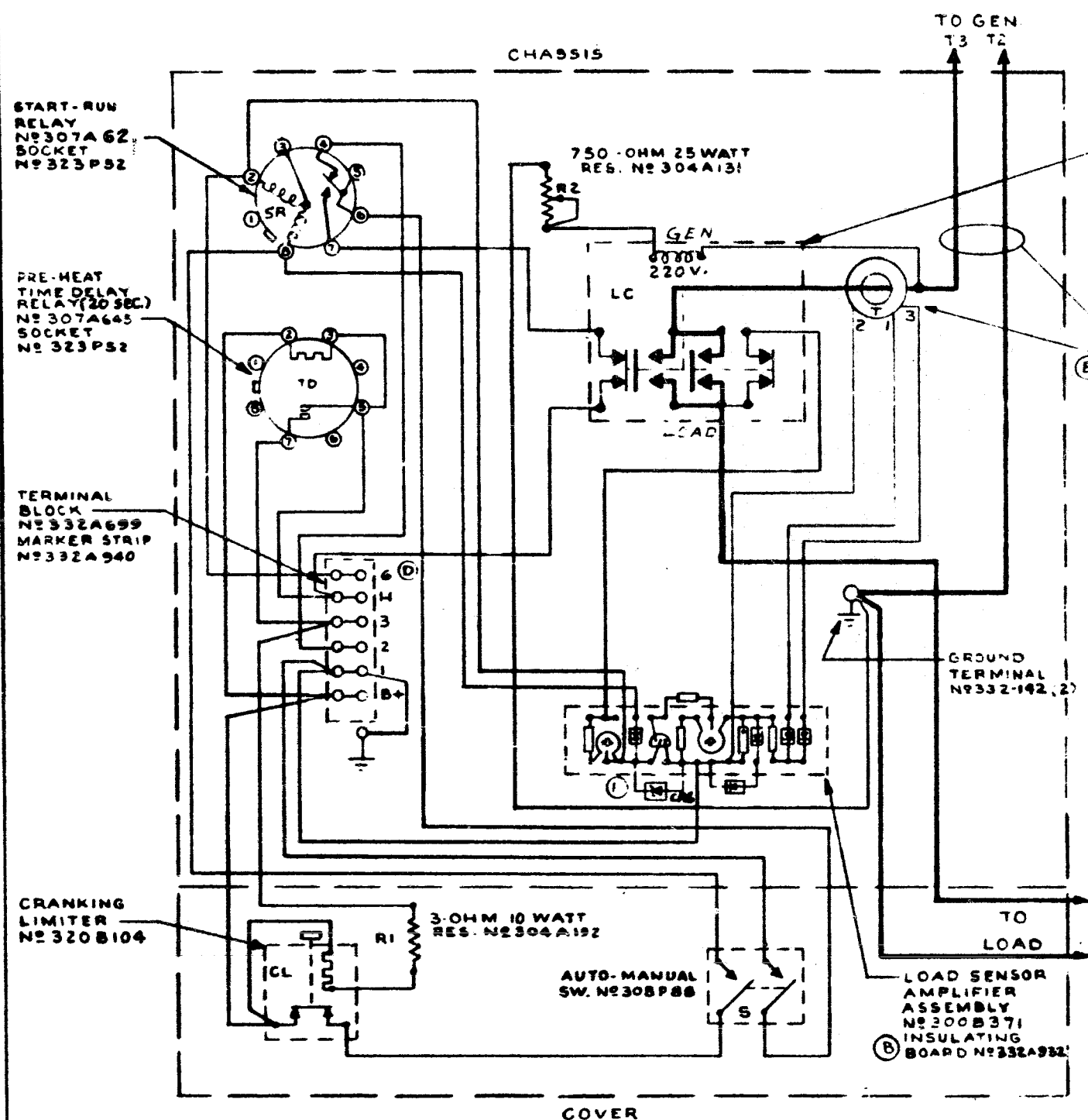
617C76

617C71

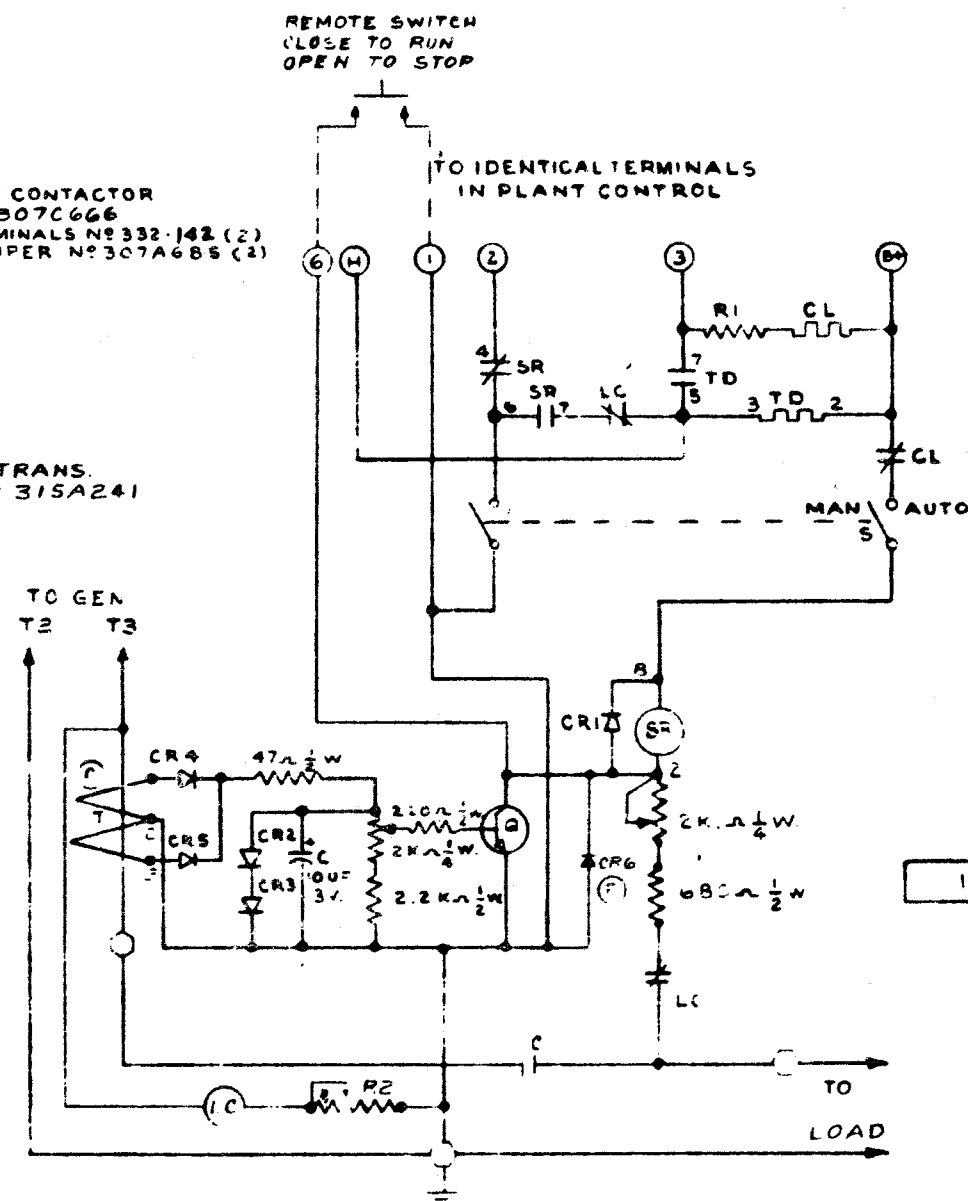
PICTORIAL

SCHEMATIC

15HA-22/10A



NOTE:
WIRES TO LOAD SENSOR AMPLIFIER N° 20
OTHER WIRES N° 20 OR LARGER.



15HA-22/10A

| | | |
|----------------|-------------------|----------|
| APPROVED | CRG | 15-7-66 |
| MOVED TO | WAS 10315A23 | 2-7-66 |
| ADDED TERMINAL | 6 | 10-25-68 |
| MOVED | FROM GEN SIDE | 10-18-65 |
| WAS | PLATED | 6-7-65 |
| WAS | BOX ASSY 301B2518 | 1-3-65 |
| LET | REVISION | 159 |
| DATE | | |

Onan DIVISION OF STUDEBAKER CORPORATION
Manufacture of Engines

| | |
|----------------|-------------------|
| MODEL | 15HA-22/10A |
| 240 VOLT | 1PH. 2WIRE 50-60~ |
| 12 V. CRANKING | |

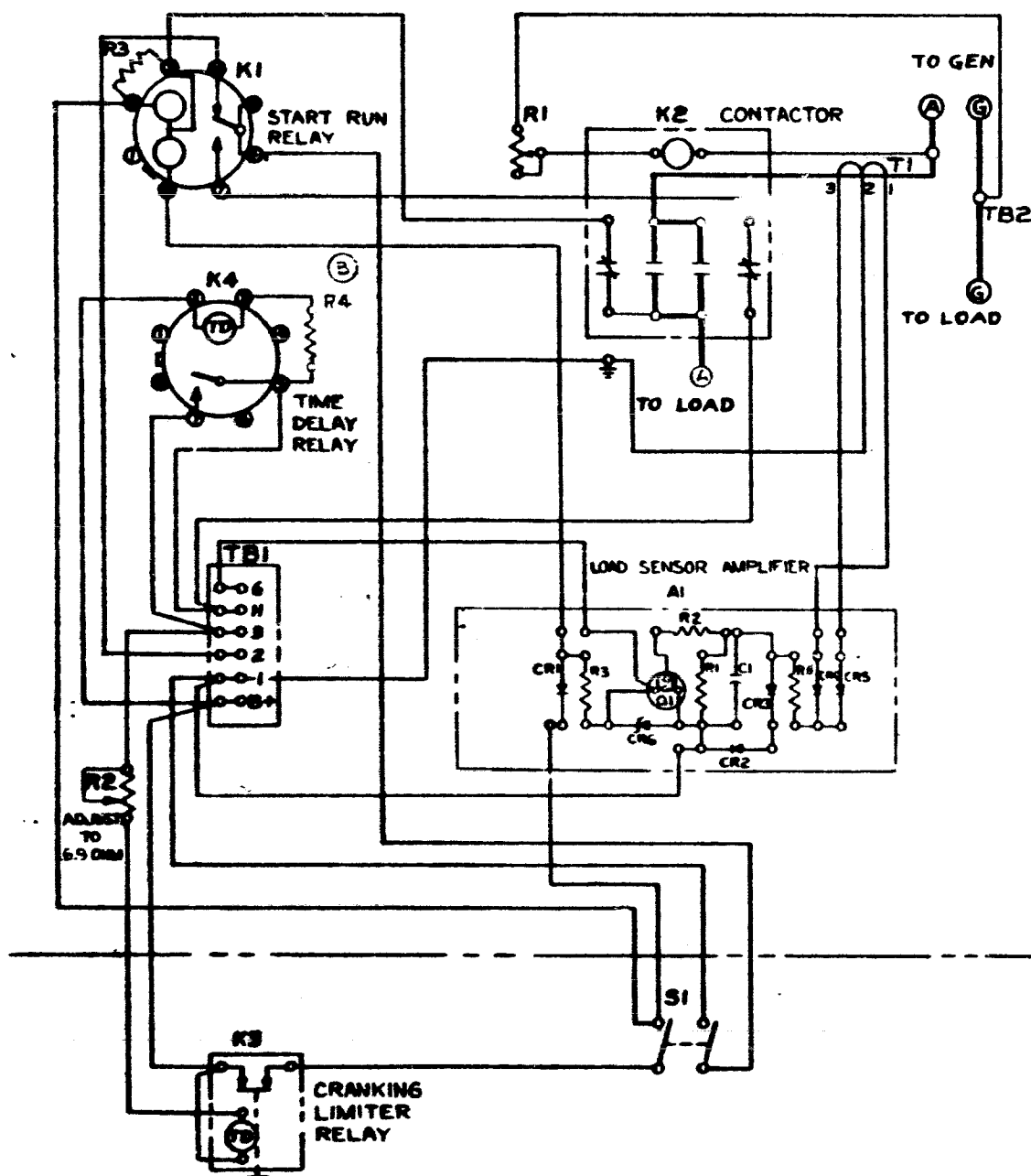
DATE 2-65 BY CKH CTE J.A.B.
AUTOMATIC DEMAND
CONTROL WIRING DIAGRAM

FIG. NO. 617C71

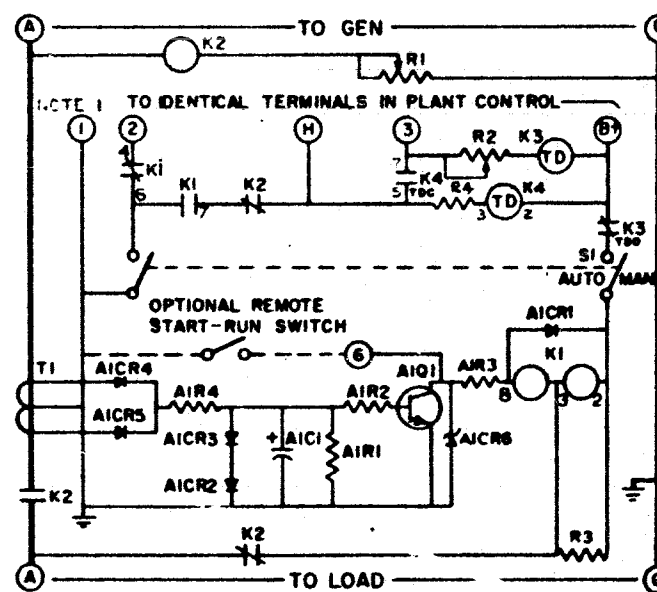
617C107

WIRING DIAGRAM

FRONT VIEW OF CHASSIS



SCHEMATIC



PARTS LIST

[illegible]

NOTES:

1. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN, BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.
2. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

15HA-22-3/12A

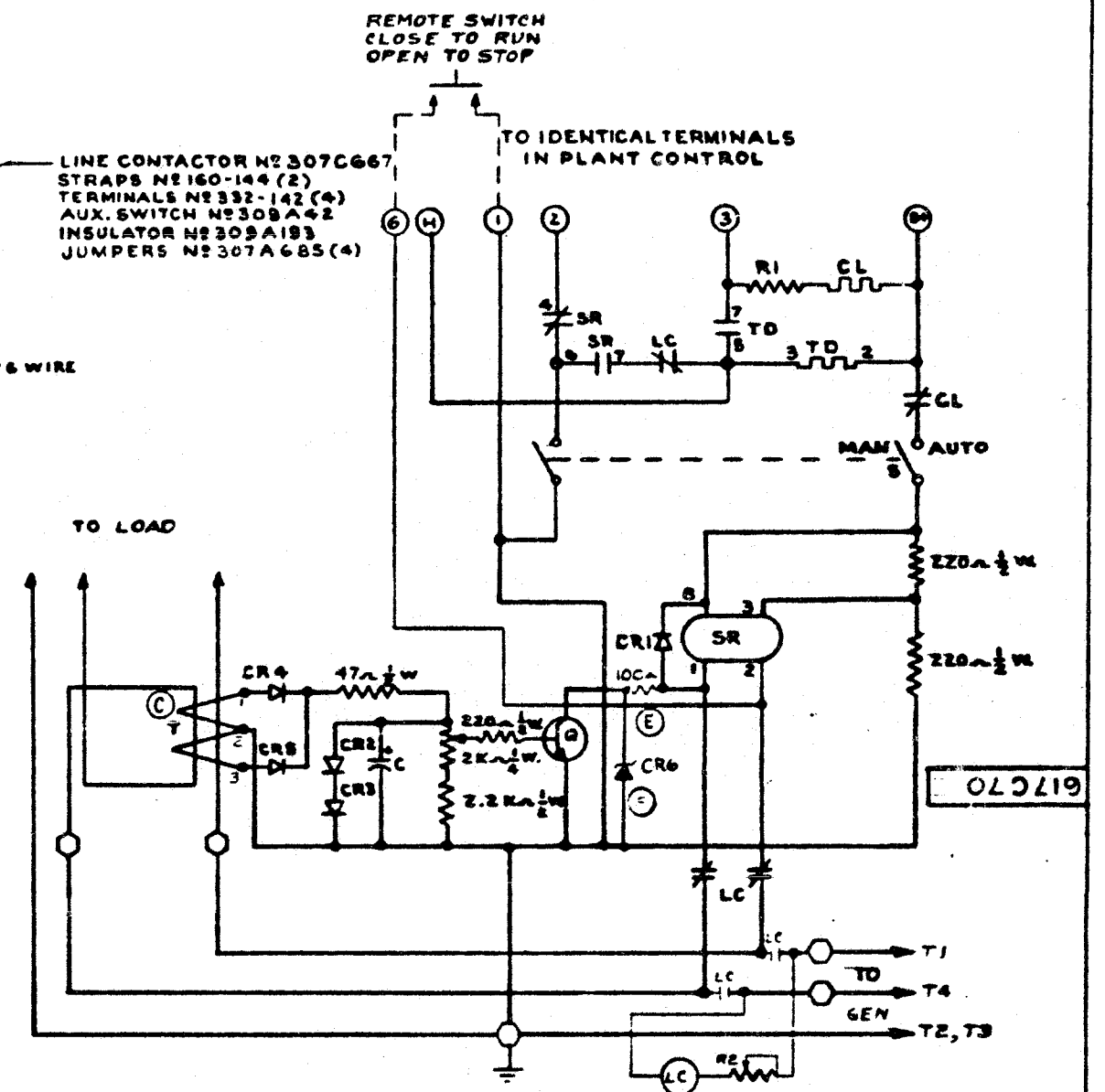
| | | |
|-----|--------------------------|---------|
| H | ADDED NAME NO 3344-642-1 | 11-1-67 |
| G | 3344-650-1 | 3-4-69 |
| F | WAS 333P82 SECRET | 1-1-67 |
| E | " " | 1-1-67 |
| D | ADDED NAMES 12 2 | 11-1-67 |
| C | ADDED LIST 3344-642-1 | 1-1-67 |
| B | ADDED 3344-642-1 | 1-1-67 |
| A | WAS 333P82 | 1-1-67 |
| REF | 3344-642-1 | 1-1-67 |

ORCA DIVISION OF STANLEY CORPORATION
Minneapolis, Minnesota

**SCHEMATIC WIRING DIAGRAM
AUTOMATIC DEMAND CONTROL**

617C107

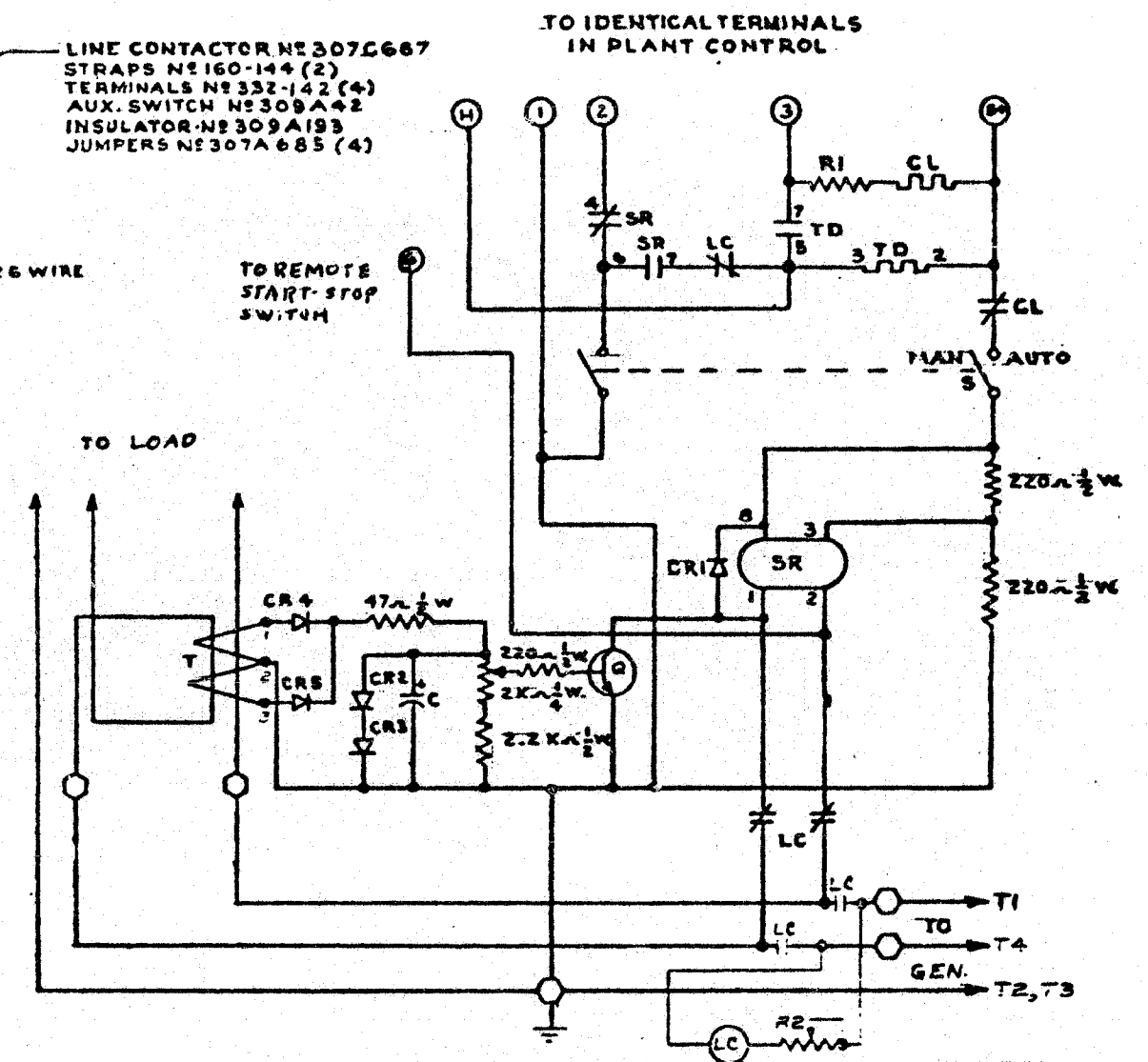
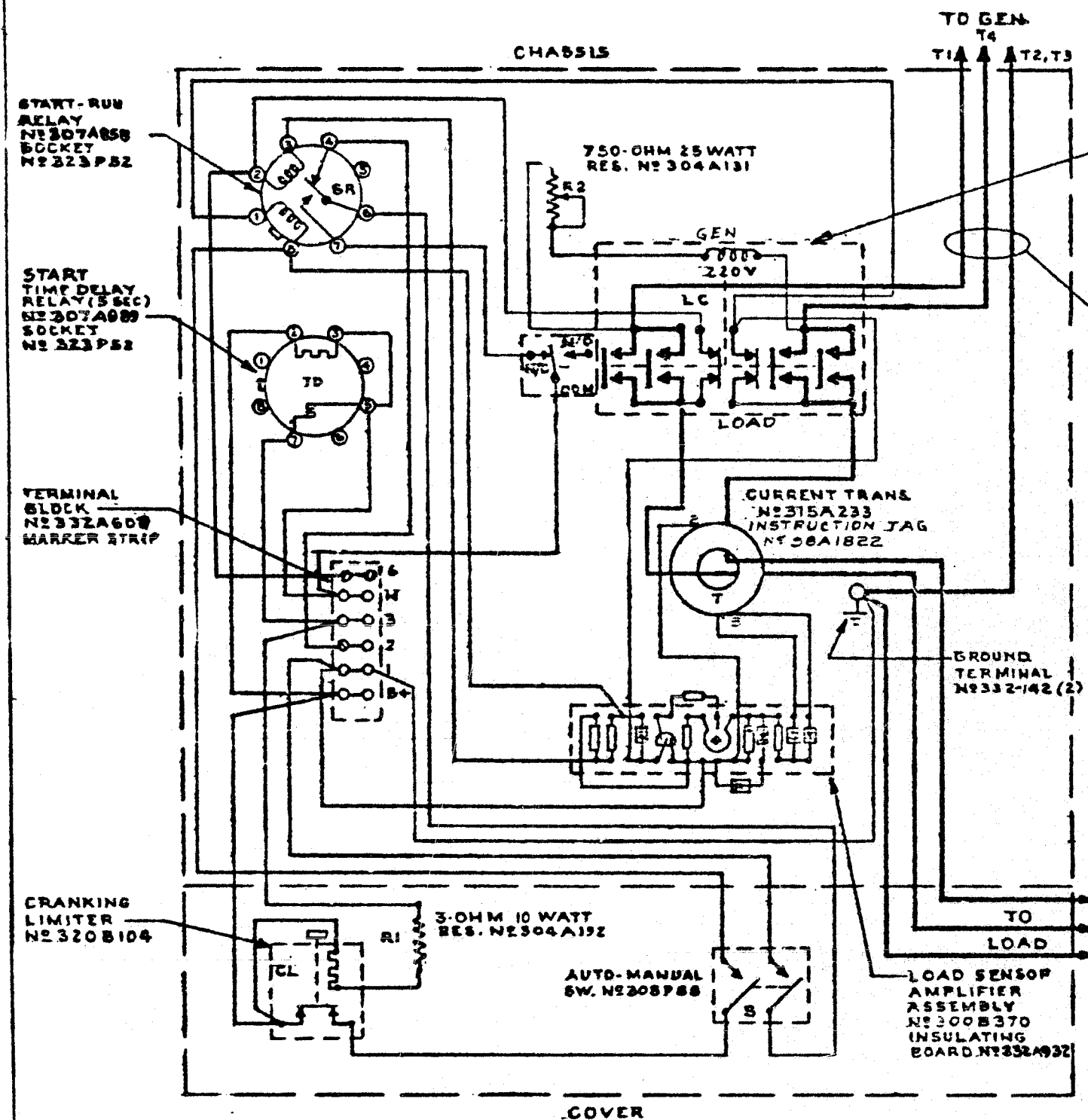
15.04A-23/10A



| | | | |
|---------------------|------------------------|--------|-------------|
| MODEL | DATE 4-12-65 | BY CKH | CHK TV, WCB |
| 15.0 HA-23/10A | NAME AUTOMATIC DEMAND | | |
| 120-240 VOLT | CONTROL WIRING DIAGRAM | | |
| 1 PH. 3 WIRE 50-60~ | PWS 102 | | |
| 12 V. CRANKING | 617 C 70 | | |

PICTORIAL

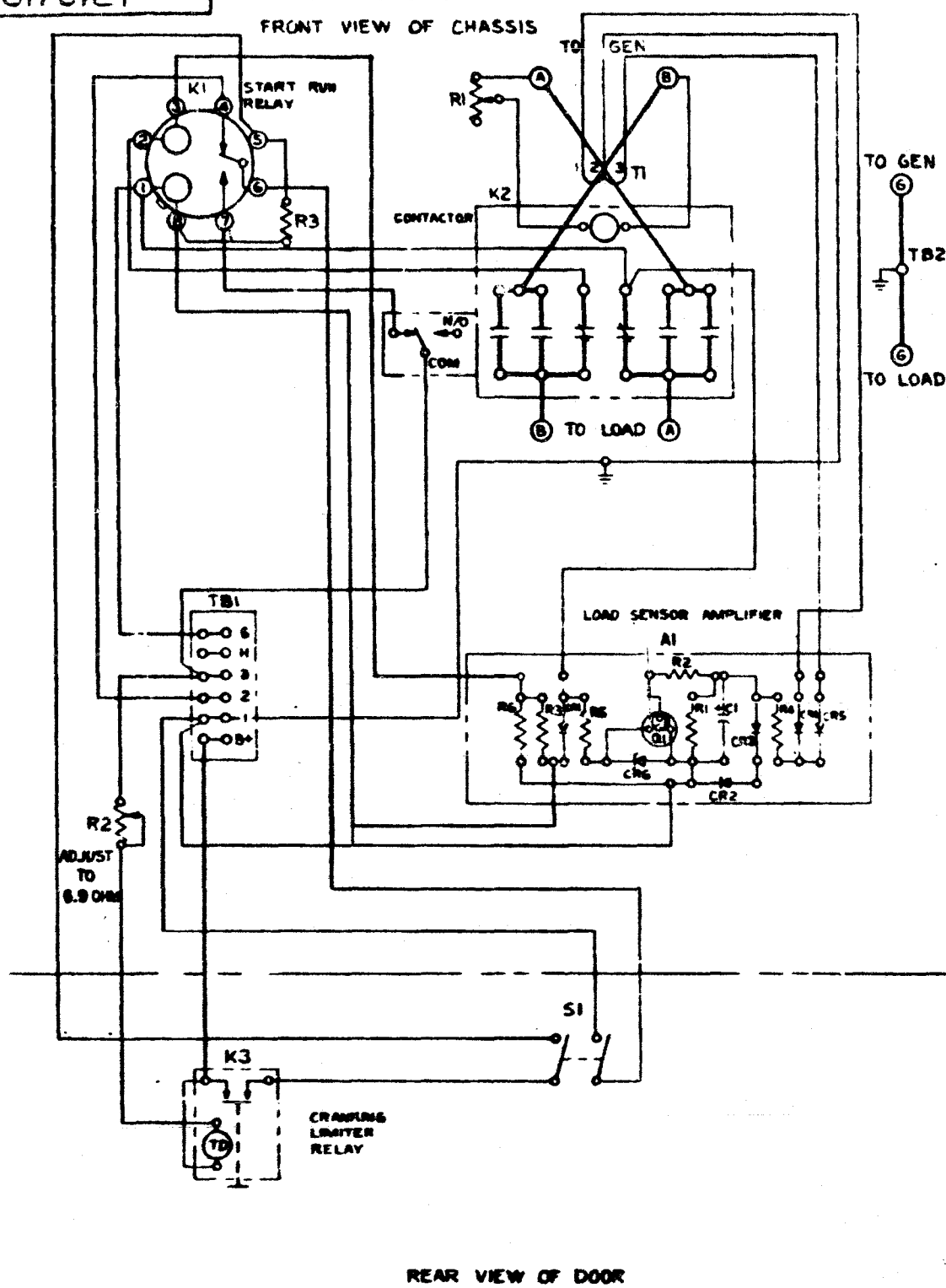
SCHEMATIC



15HA-23/12A

| | |
|----------------------------------|--|
| 15HA-23/12A | NAME AUTOMATIC DEMAND CONTROL WIRING DIAGRAM |
| 120-240 VOLT 1PH 3WIRE 50-60~ | REV. NO. 617 C 69 |
| 12 V. CRANKING | |

WIRING DIAGRAM

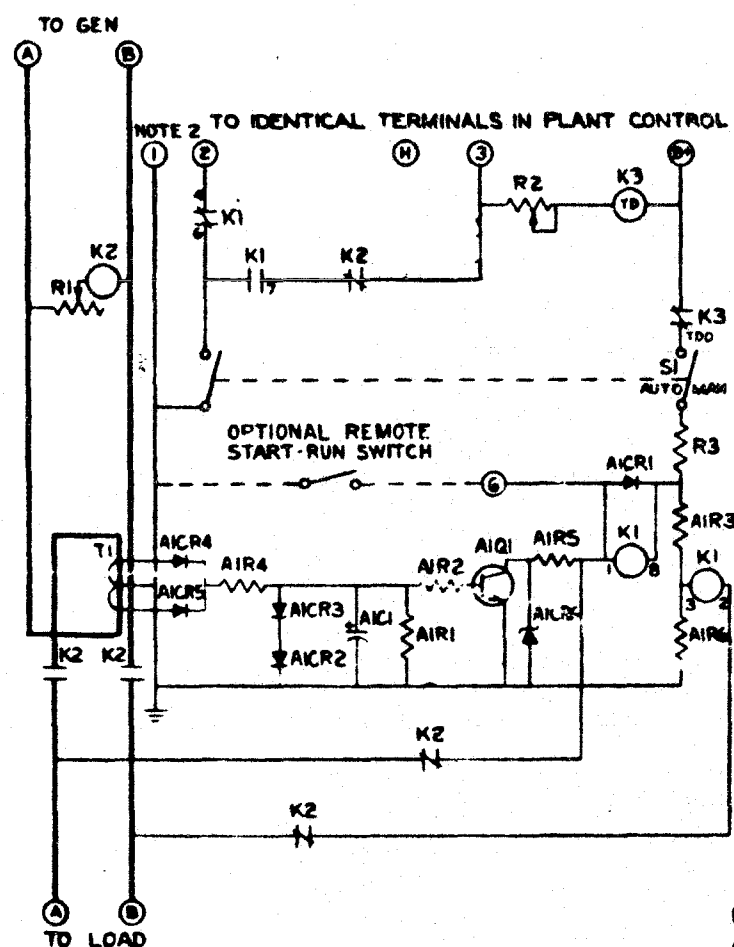


3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE
GENFRATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

NOTE: - OPERATE WITH NEGATIVE GROUND ONLY


SCHEMATIC



PARTS LIST

[illegible]

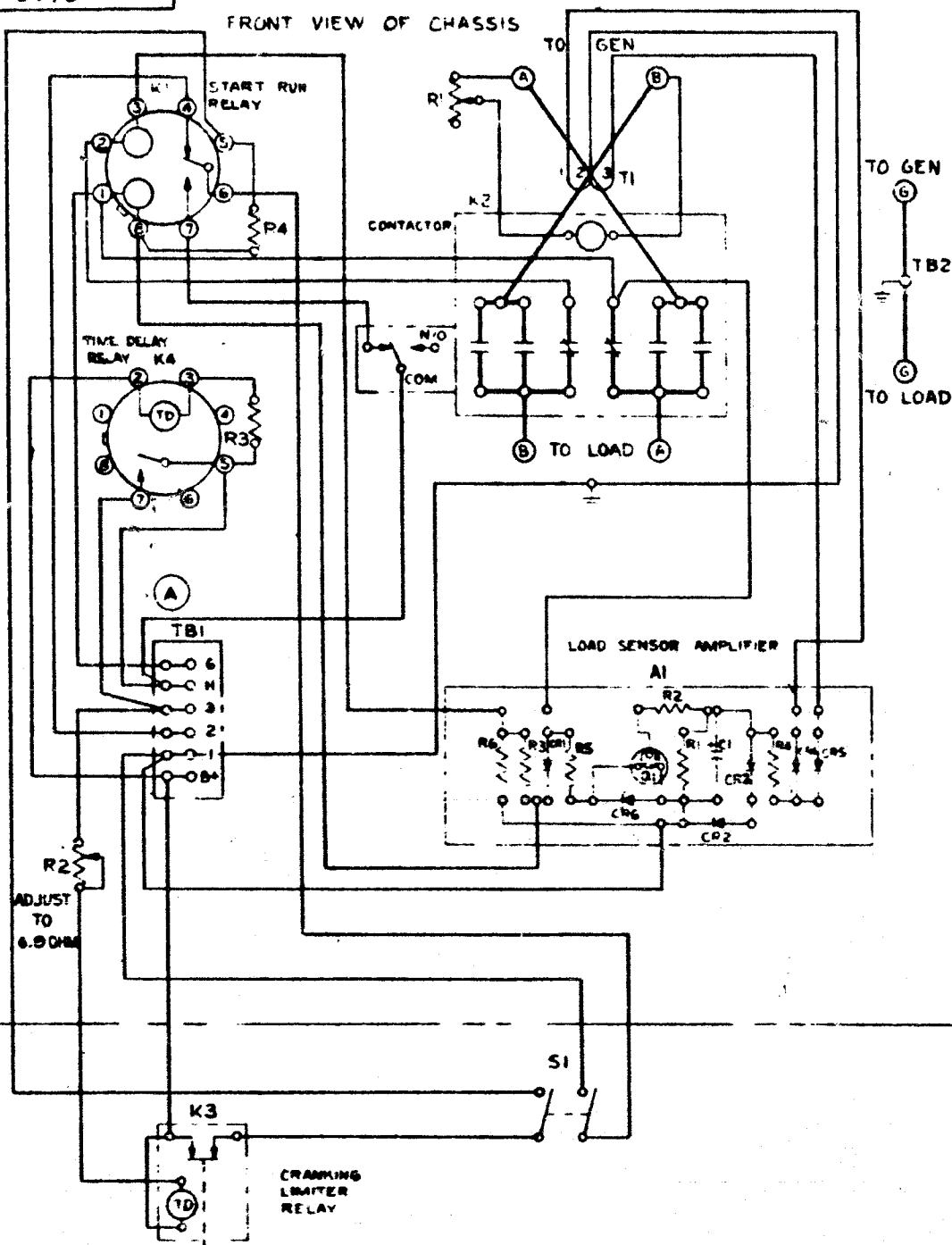
15HA-23-3/1A

| | | | |
|---|--------------------------|-----------|---------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | ROUTED WIRE NO. 336A1942 | | 3-17-6 |
| | 3364530 | | 5-17-6 |
| | LT | DIVISION | DATE |
|  DIVISION OF STUDYBASE CORPORATION Atmospheric Research | | | |
| MODEL NO. 15HA-23-3/1A | DATE 1-24-68 | BY CDR | FOR 15HA-23-3/1A |
| NAME SCHEMATIC & WIRING DIAGRAM AUTOMATIC DEMAND CONTROL | | | |
| DRAW NO. 617C121 | | | |

617C119

WIRING DIAGRAM

FRONT VIEW OF CHASSIS



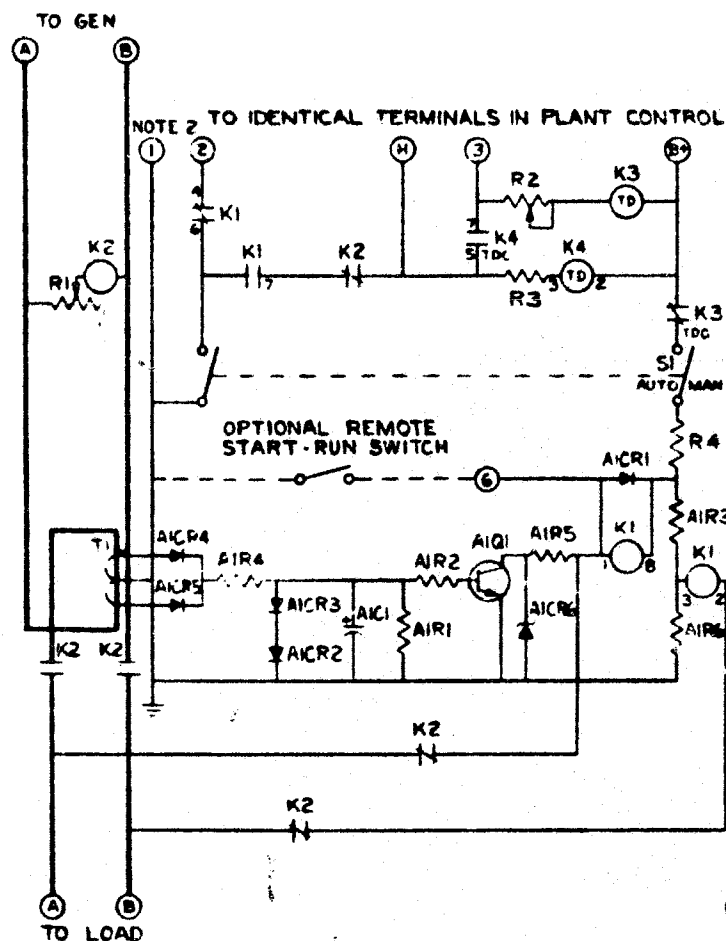
REAR VIEW OF DOOR

3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

NOTE: 1 - OPERATE WITH NEGATIVE GROUND ONLY

SCHEMATIC



PARTS LIST

| REF DES | PART NO | QTY | DESCRIPTION |
|---------|----------|-----|-----------------------------------|
| AI | 300H463 | 1 | AMPLIFIER ASSY - LOAD SENSOR |
| | 332A932 | 1 | BOARD - INSULATING |
| K1 | 307A858 | 1 | RELAY - START RUN |
| | 323P380 | 1 | SOCKET |
| K2 | 307C667 | 1 | CONTACTOR |
| | 307A685 | 4 | JUMPER |
| | 160-144 | 2 | STRAP |
| | 307A942 | 2 | BUS BAR |
| | | 2 | SLEEVING 1/4" OF (898-22) |
| | 332-142 | 4 | TERMINAL |
| | 309A42 | 1 | SWITCH - AUX |
| | 309A193 | 1 | INSULATOR |
| K3 | 32CB104 | 1 | RELAY - CRANKING LIMITER |
| K4 | 307A645 | 1 | RELAY - TIME DELAY, PREHEAT (203) |
| | 323P380 | 1 | SOCKET |
| R1 | 304A131 | 1 | RESISTOR, 750 OHM, 25W |
| R2 | 304A222 | 1 | RESISTOR, 15 OHM, 50W |
| S1 | 308P88 | 1 | SWITCH - AUTO MANUAL |
| T1 | 315A233 | 1 | TRANS. ASSY - CURRENT |
| TB1 | 332A699 | 1 | BLOCK - TERMINAL |
| | 98A1927 | 1 | SILK SCREEN |
| TB2 | 332-142 | 2 | TERMINAL - GROUND |
| R3 | 352-114 | 1 | RESISTOR, 62 OHM, 2 W. |
| R4 | 350-532 | 1 | RESISTOR, 470 OHM, 1/2 W. |
| | 98A2045 | 1 | CAUTION LABEL |
| | 301D2573 | 1 | CONTROL BOX |
| | 98C1815 | 1 | SILK SCREEN |
| | 98A1949 | 1 | SILK SCREEN |
| | 301B2586 | 1 | TRIM |
| | 518P237 | 3 | FASTENER - TRIM |
| | 815-178 | 1 | SCREW - HEX HD #10-32 X 5/8 L3 |
| | 850-30 | 1 | LOCKWASHER #10 |
| | 99A966 | 1 | NAMEPLATE - CONTROL |

611219

15HA-23-3/10A

| | |
|--------------------------|---------|
| CHANGED WEEKEND 7944-942 | 7-12-69 |
| 234A 800 | 7-12-69 |
| A REV. WIRING TERMINAL 6 | 7-12-69 |
| REVISION | DATE |

Onan DIVISION OF STURGEON CORPORATION

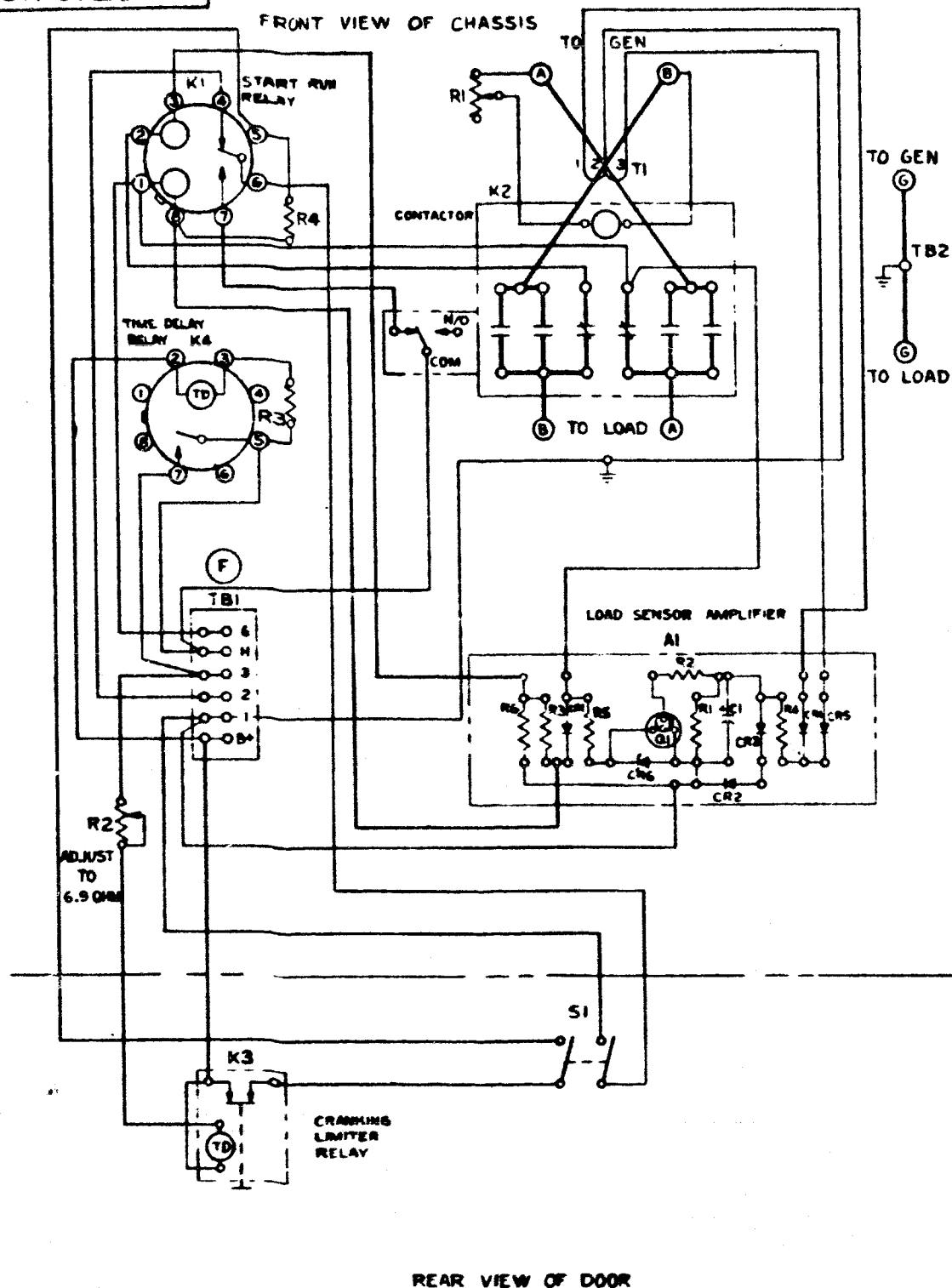
| | | | |
|--------------------------------------|----------------------------|-----|---------|
| 15HA-23-3/10A | 1-12-69 | CDR | 7-12-69 |
| 24 VOLT CRANKING | SCHEMATIC & WIRING DIAGRAM | | |
| 120/240 V., 1 PH., 3 WIRE, 50/60 CY. | AUTOMATIC DEMAND CONTROL | | |
| 617C119 | | | |

E10

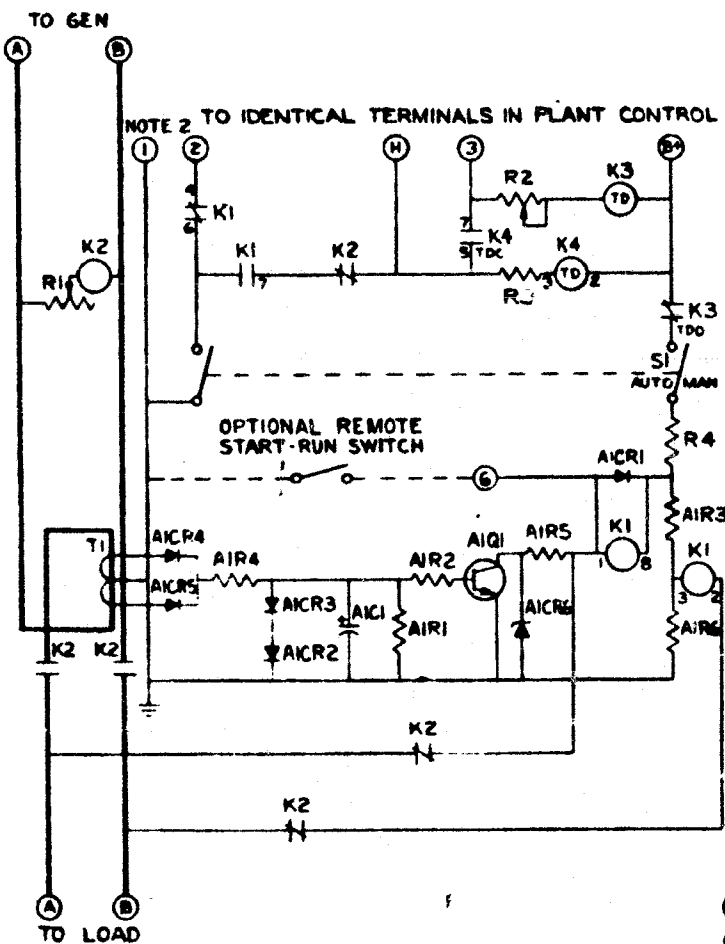
617C120

WIRING DIAGRAM

FRONT VIEW OF CHASSIS



SCHEMATIC



| PARTS LIST | | | |
|------------|----------|-------|-----------------------------------|
| REF DES | PART NO. | QTY | DESCRIPTION |
| A1 | 300B463 | 1 | AMPLIFIER ASSY - LOAD SENSOR |
| | 332A932 | 1 | BOARD - INSULATING |
| K1 | 307A858 | 1 | RELAY - START RUN |
| | 323P380 | 1 | SOCKET |
| * K2 | 307C667 | 1 | CONTACTOR |
| | 307A685 | 4 | JUMPER |
| | 160-144 | 2 | STRAP |
| | 307A942 | 2 | BUS BAR |
| | | 2 | SLEEVING 1/4" OF (89B-22) |
| | 332-142 | 4 | TERMINAL |
| | 309A42 | 1 | SWITCH - AUX |
| | 309A193 | 1 | INSULATOR |
| K3 | 320B104 | 1 | RELAY - CRANKING LIMITER |
| K4 | 307A689 | 1 | RELAY - TIME DELAY, PREHEAT (6 S) |
| | 323P380 | 1 | SOCKET |
| R1 | 304A131 | 1 | RESISTOR, 750 OHM, 25W |
| R2 | 304A222 | 1 | RESISTOR, 15 OHM, 50W |
| S1 | 308P88 | 1 | SWITCH - AUTO MANUAL |
| T1 | 315A233 | 1 | TRANS. ASSY - CURRENT |
| TB1 | 332A699 | 1 | BLOCK - TERMINAL |
| | 98A1927 | 1 | SILK SCREEN |
| TB2 | 332-142 | 2 | TERMINAL - GROUND |
| R3 | 352-114 | 1 | RESISTOR, 62 OHM, 2 W |
| R4 | 350-984 | 1 | RESISTOR, 750 OHM, 2 W |
| | 98A2045 | 1 | CAUTION LABEL |
| | 301D2573 | 1 | CONTROL BOX |
| | 98C1813 | 1 | SILK SCREEN |
| | 98A1949 | 1 | SILK SCREEN |
| | 301B2506 | 1 | TRIM |
| | 518P237 | 3 | FASTENER - TRIM |
| | 815-178 | 1 | SCREW - HEX HD #10-32 X 5/8 LG |
| | 850-30 | 1 | LOCKWASHER #10 |
| | 99A966 | 1 | NAMEPLATE - CONTROL |
| 021219 | | | |
| A | 334A1890 | 25 FT | WIRE-FLEXIBLE NO. 20 AWG |
| B | 334A1842 | 12 FT | WIRE-FLEXIBLE NO. 16 AWG |

3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

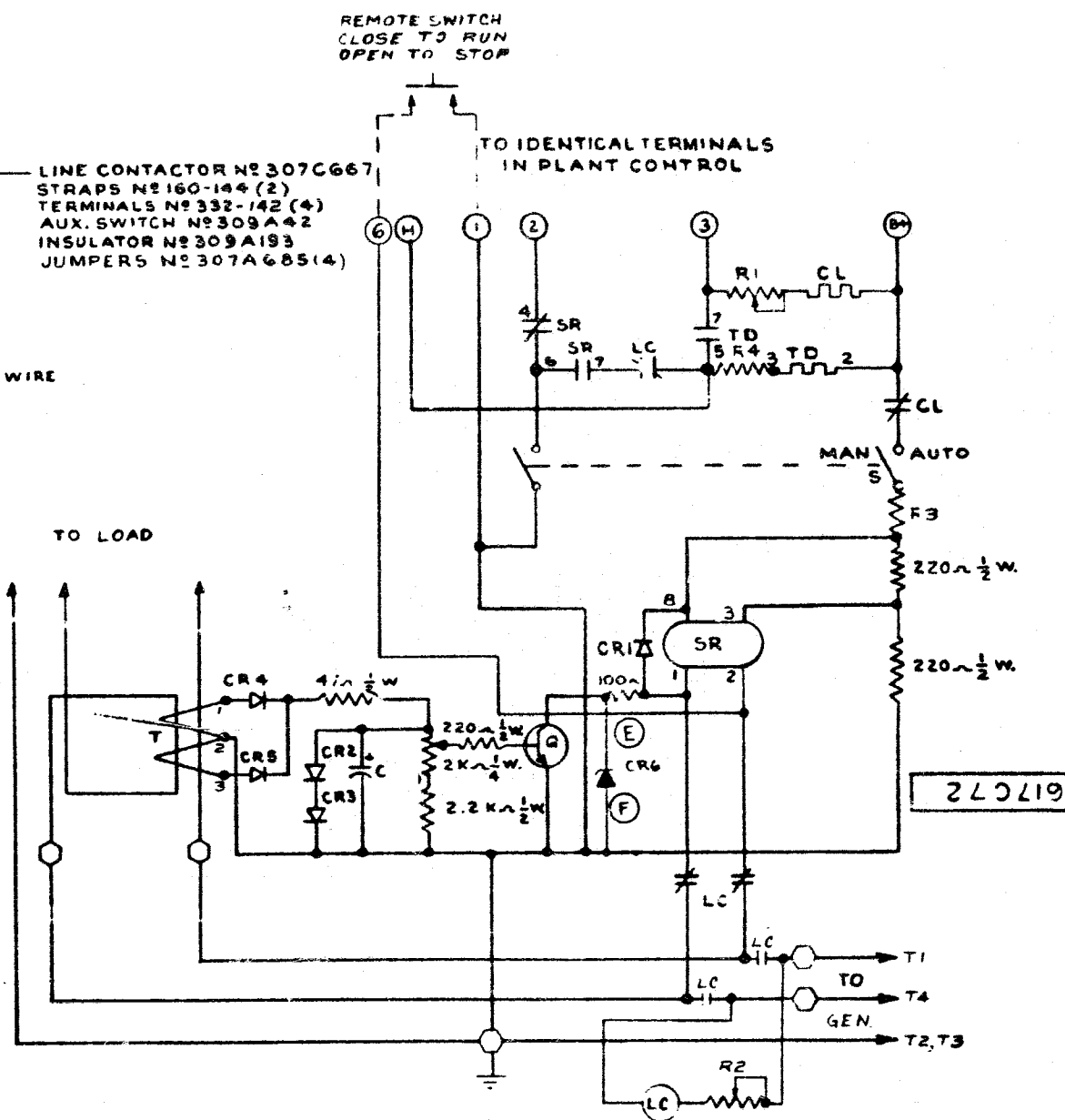
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN, BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

NOTE: 1 - OPERATE WITH NEGATIVE GROUND ONLY

15HA-23-3/12A

| | | | | | | | |
|------------------------------------|--|----------------------------|--|--------------------------|--|---------|--|
| 15HA-23-3/12A | | 1-24-66 | | CDR | | DATE | |
| 24 VOLT CRANKING | | SCHEMATIC & WIRING DIAGRAM | | AUTOMATIC DEMAND CONTROL | | 617C120 | |
| 120/240 V, 1 PH., 3 WIRE, 50/60 CY | | | | | | | |

E12



15HA-23-4/10A

(J) 2-OPERATE WITH NEGATIVE GROUND ONLY

| | | | |
|---|------------------------|-----|---------|
| | ADDED NOTE 2 | IN | 9-13-66 |
| | WAS 004A262 | IN | 4-28-66 |
| | WAS 307A645 | IN | 4-28-66 |
| F | ADDED CRG | IN | 4-13-66 |
| I | ADDED 100 ~ RES | IN | 4-13-66 |
| D | ADDED TERMINAL 6 | IN | 0-29-65 |
| C | MOVED T FROM GEN SIDE | IN | 6-13-65 |
| E | WAS 332A707 | IN | 6-3-65 |
| A | WAS BOX ASSY. 301B758B | IN | 6-3-65 |
| | REVISION | CRG | DATE |

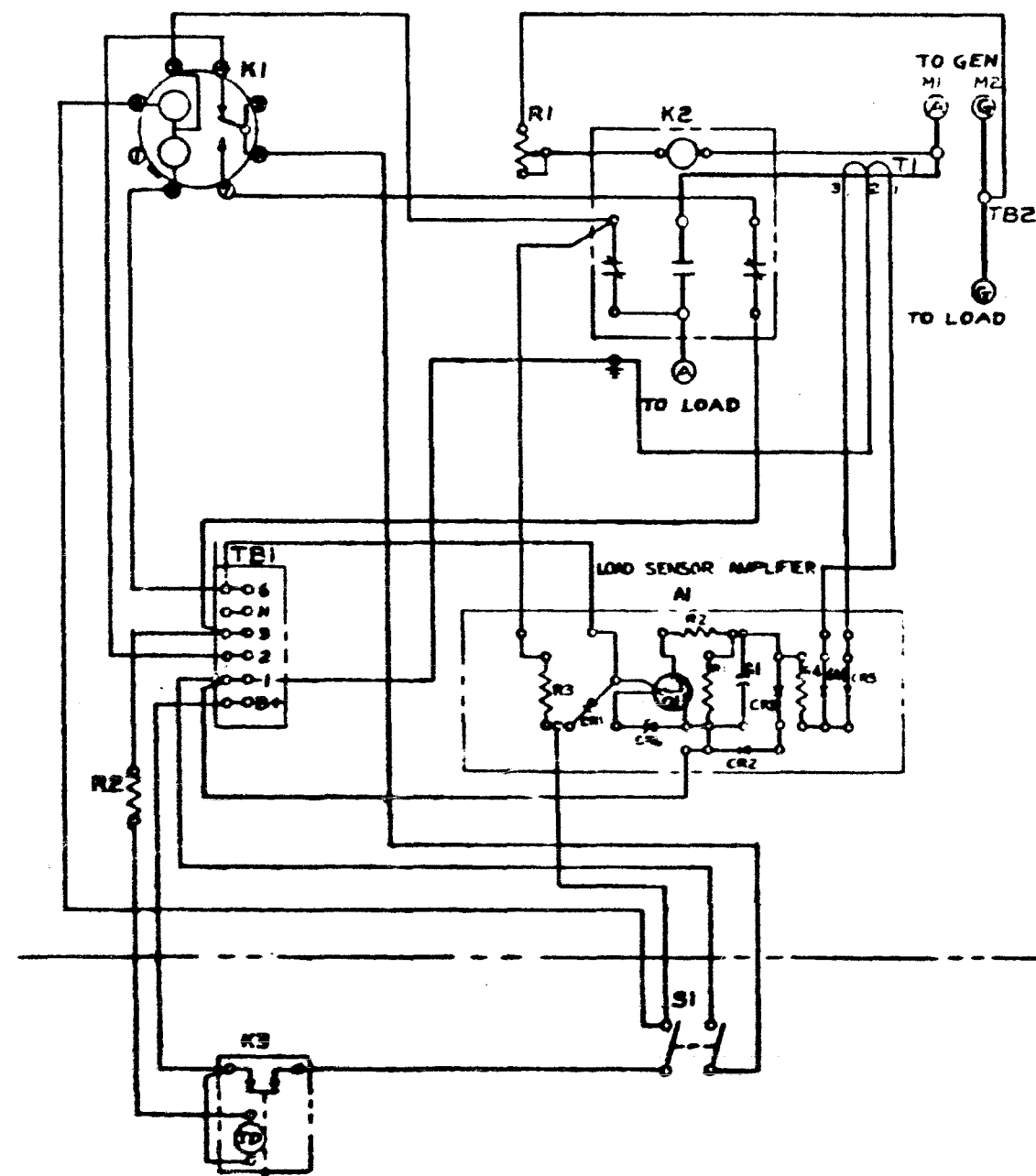
Onan DIVISION OF STUDEBAKER CORPORATION

| | | | |
|-------------------|------------------------|----------|---------|
| MODEL | DATE | NO | REV |
| 151A-23-4/10A | 11-12-65 | CKH | SV, WJB |
| 120-240VOLT | PART AUTOMATIC DEMAND | | |
| 1PH. 3WIRE 50-60- | CONTROL WIRING DIAGRAM | | |
| 32 V. CRANKING | ENG NO | 617 C 72 | |

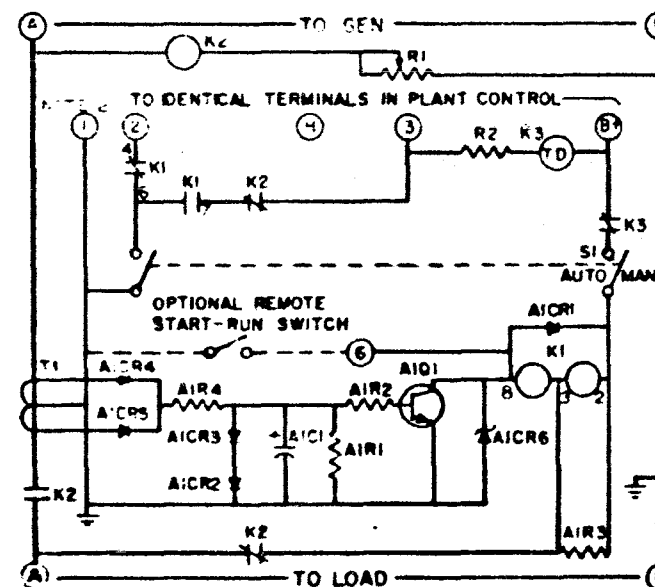
617C90

WIRING DIAGRAM

FRONT VIEW OF CHASSIS



SCHEMATIC



PARTS LIST

| REF DES | PART NO. | QTY | DESCRIPTION |
|---------|----------|-----|----------------------------|
| A1 | 3008437 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 332A932 | 1 | BOARD-INSULATING |
| K1 | 307A62 | 1 | RELAY-START RUN |
| | 323P380 | 1 | SOCKET |
| K2 | 307C663 | 1 | CONTACTOR |
| | 332-517 | 2 | TERMINAL |
| | 98A2045 | 1 | CAUTION LABEL |
| K3 | 320B104 | 1 | RELAY-CRANKING LIMITER |

| | | | |
|-----|---------|---|------------------------|
| R1 | 304A282 | 1 | RESISTOR, 300-OHM, 25W |
| R2 | 304A192 | 1 | RESISTOR, 3-OHM, 10W |
| S1 | 308P68 | 1 | SWITCH-AUTO MANUAL |
| T1 | 315A241 | 1 | TRANS ASSY-CURRENT |
| TB1 | 332A699 | 1 | BLOCK-TERMINAL |
| | 98A1927 | 1 | SILK SCREEN |
| TB2 | 332-517 | 2 | TERMINAL-GROUND |

| | | |
|----------|---|--------------------------|
| 300D2573 | 1 | CONTROL BOX |
| 98C1815 | 1 | SILK SCREEN |
| 98A1928 | 1 | SILK SCREEN |
| 301B2586 | 1 | TRIM |
| 518P237 | 3 | FASTENER-TRIM |
| 815-178 | 1 | SCREW-HEX HD #10-32X5/16 |
| 850-30 | 1 | LOCKWASHER #10 |
| 89A966 | 1 | NAMEPLATE-CONTROL |

062219

NOTE:

1- OPERATE WITH NEGATIVE GROUND ONLY

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD

3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

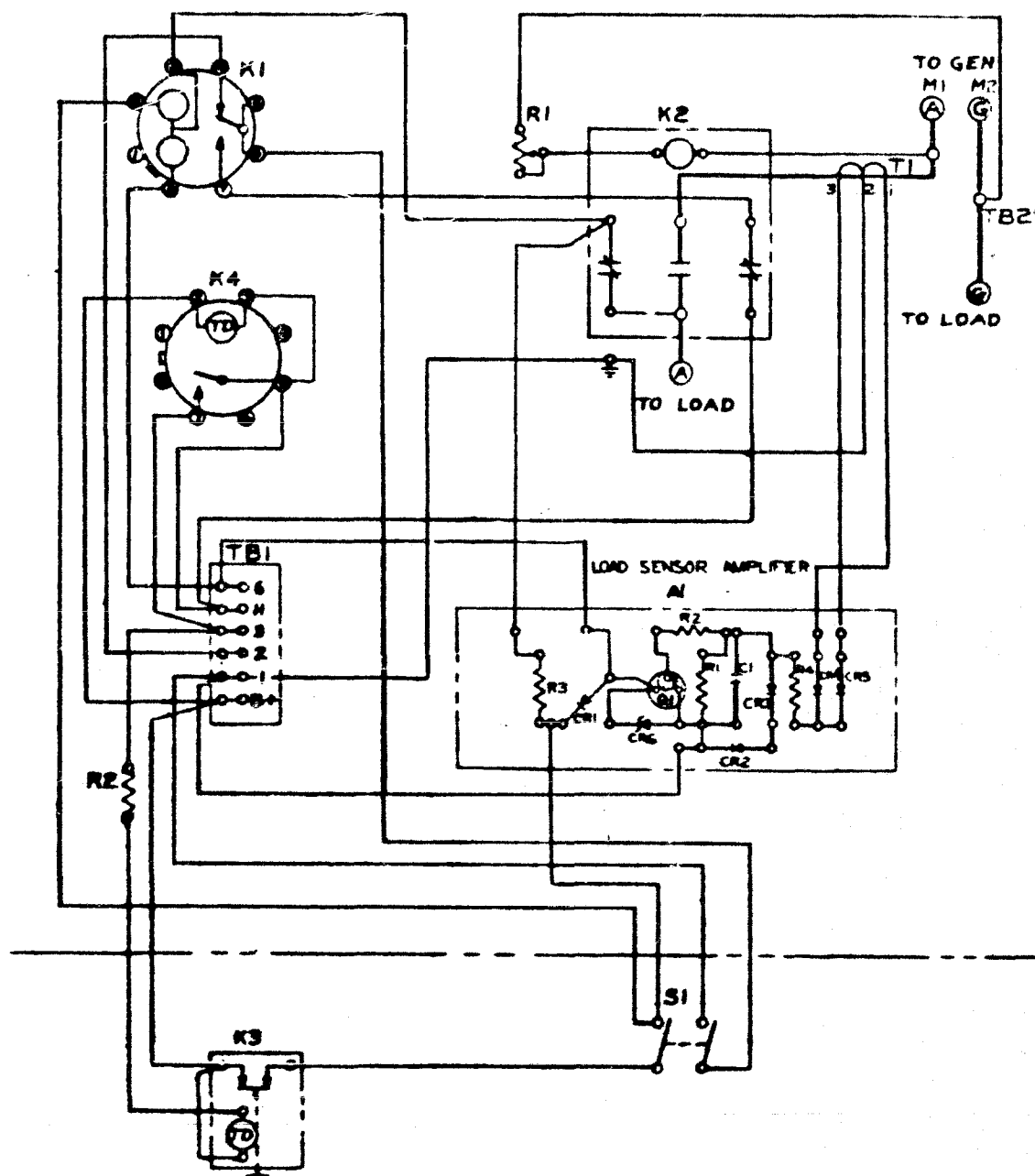
305HA-21/1B

| | |
|----------------|---------|
| 305HA-21/1B | 1-9-67 |
| ADDED LABEL | 3-31-67 |
| SURDS DWS SAME | 8-22-66 |
| REVISION | DATE |

DIVISION OF POWER CORPORATION

| | | |
|----------------------------|--------------------------|-------------------------|
| 305HA-21/1B | 12 VOLT CRANKING | 120V, 1PH, 2W, 50/60CY. |
| SCHEMATIC & WIRING DIAGRAM | AUTOMATIC DEMAND CONTROL | 617C90 |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

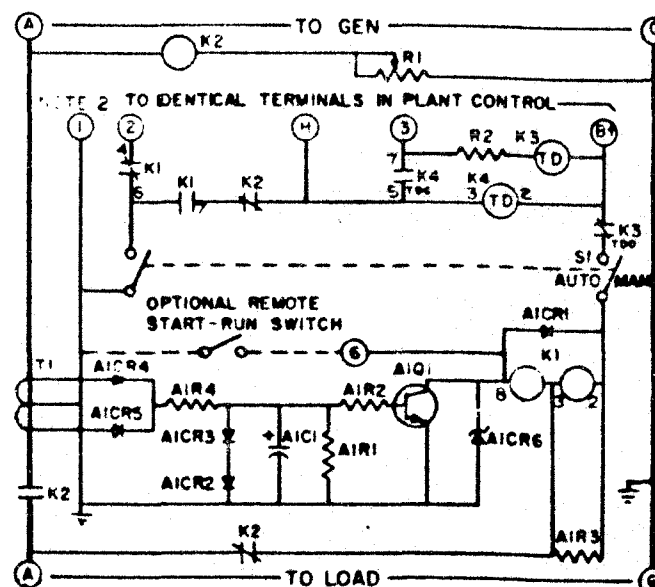


1 - OPERATE WITH NEGATIVE GROUND ONLY

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.


SCHEMATIC

[illegible]

162419

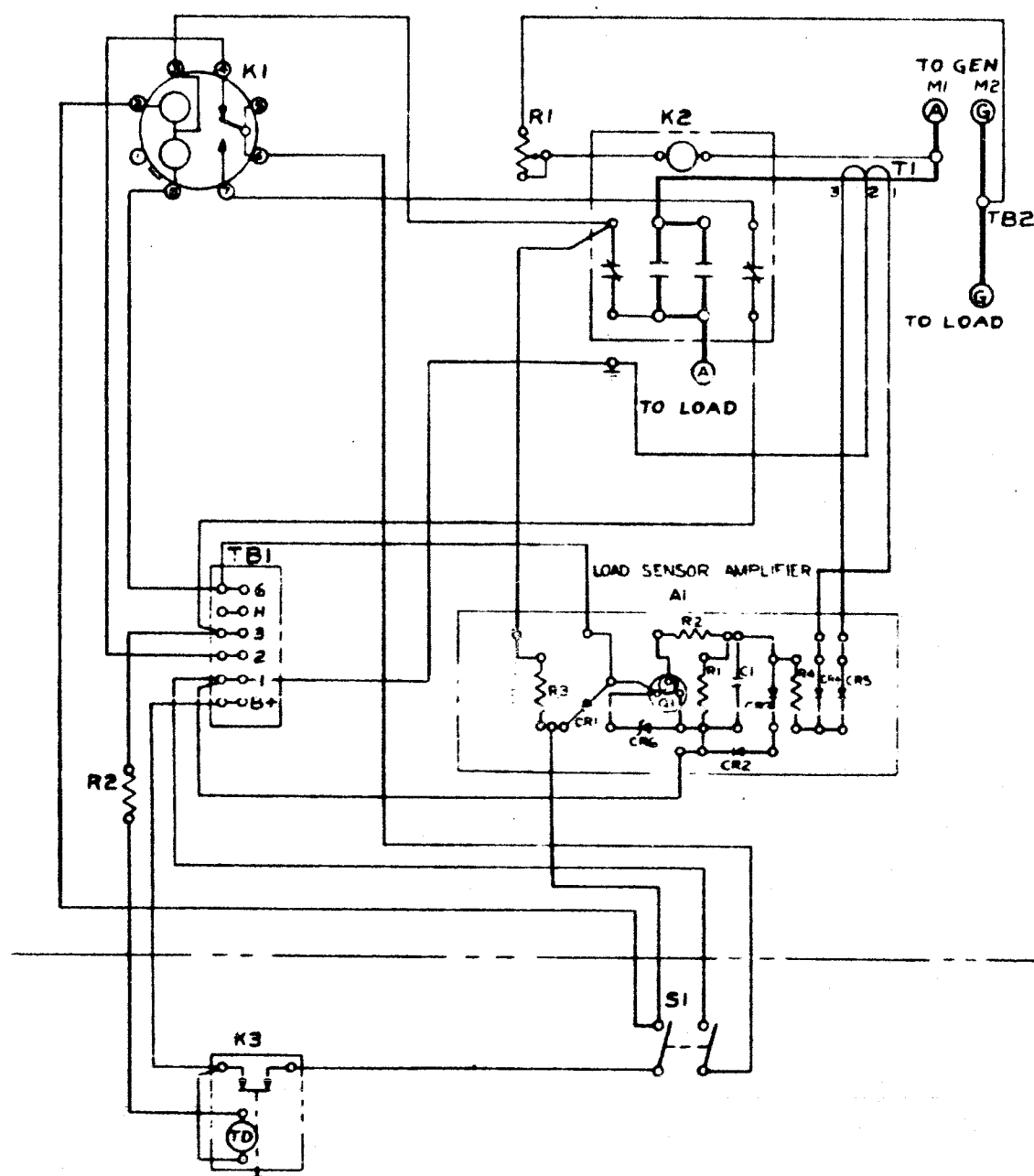
305HA-21/10B

| | | | |
|----|-------------------|----|-----|
| D | REF 323P52 SOCKET | 71 | -3- |
| G | | 71 | -3- |
| H | | 71 | -3- |
| I | | 71 | -3- |
| J | | 71 | -3- |
| K | | 71 | -3- |
| L | | 71 | -3- |
| M | | 71 | -3- |
| N | | 71 | -3- |
| O | | 71 | -3- |
| P | | 71 | -3- |
| Q | | 71 | -3- |
| R | | 71 | -3- |
| S | | 71 | -3- |
| T | | 71 | -3- |
| U | | 71 | -3- |
| V | | 71 | -3- |
| W | | 71 | -3- |
| X | | 71 | -3- |
| Y | | 71 | -3- |
| Z | | 71 | -3- |
| AA | | 71 | -3- |
| AB | | 71 | -3- |
| AC | | 71 | -3- |
| AD | | 71 | -3- |
| AE | | 71 | -3- |
| AF | | 71 | -3- |
| AG | | 71 | -3- |
| AH | | 71 | -3- |
| AI | | 71 | -3- |
| AJ | | 71 | -3- |
| AK | | 71 | -3- |
| AL | | 71 | -3- |
| AM | | 71 | -3- |
| AN | | 71 | -3- |
| AO | | 71 | -3- |
| AP | | 71 | -3- |
| AQ | | 71 | -3- |
| AR | | 71 | -3- |
| AS | | 71 | -3- |
| AT | | 71 | -3- |
| AU | | 71 | -3- |
| AV | | | |

| | | | |
|---|---|-----|------|
| LF | DIVISION | CEO | DATE |
|  | MINISTRY OF DEFENSE CORPORATION Washington, D.C. 20315 | | |

| | |
|-----------------------------|----------------------------|
| 305HA-21/10B | DATE 7 1968 |
| 12 VOLT CRANKING | SCHEMATIC & WIRING DIAGRAM |
| 120V. 1 PH. 2W. 30/60CY. | AUTOMATIC DEMAND CONTROL |
| | 617C91 |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS



1 - OPERATE WITH NEGATIVE GROUND ONLY

2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE
GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD


3 CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR
(K2) THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER

| REF DES | PART NO | QTY | DESCRIPTION |
|---------|---------|-----|----------------------------|
| A1 | 300B437 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 332A932 | 1 | BOARD - INSULATING |
| K1 | 307A62 | 1 | RELAY - START RUN |
| | 323P380 | 1 | SOCKET |
| K2 | 307C665 | 1 | CONTACTOR |
| | 332-142 | 2 | TERMINAL |
| | 307A685 | 2 | JUMPER |
| K3 | 320B104 | 1 | RELAY-CRANKING LIMITER |
| | 98AZ045 | 1 | CAUTION LABEL |
| R1 | 304A282 | 1 | RESISTOR, 300-OHM, 25W |
| R2 | 304A192 | 1 | RESISTOR, 3-OHM, 10W |
| S1 | 308P88 | 1 | SWITCH-AUTO MANUAL |
| T1 | 315A241 | 1 | TRANS ASSY - CURRENT |
| TB1 | 332A699 | 1 | BLOCK - TERMINAL |
| | 98A1927 | 1 | SILK SCREEN |
| TB2 | 332-142 | 2 | TERMINAL - GROUND |

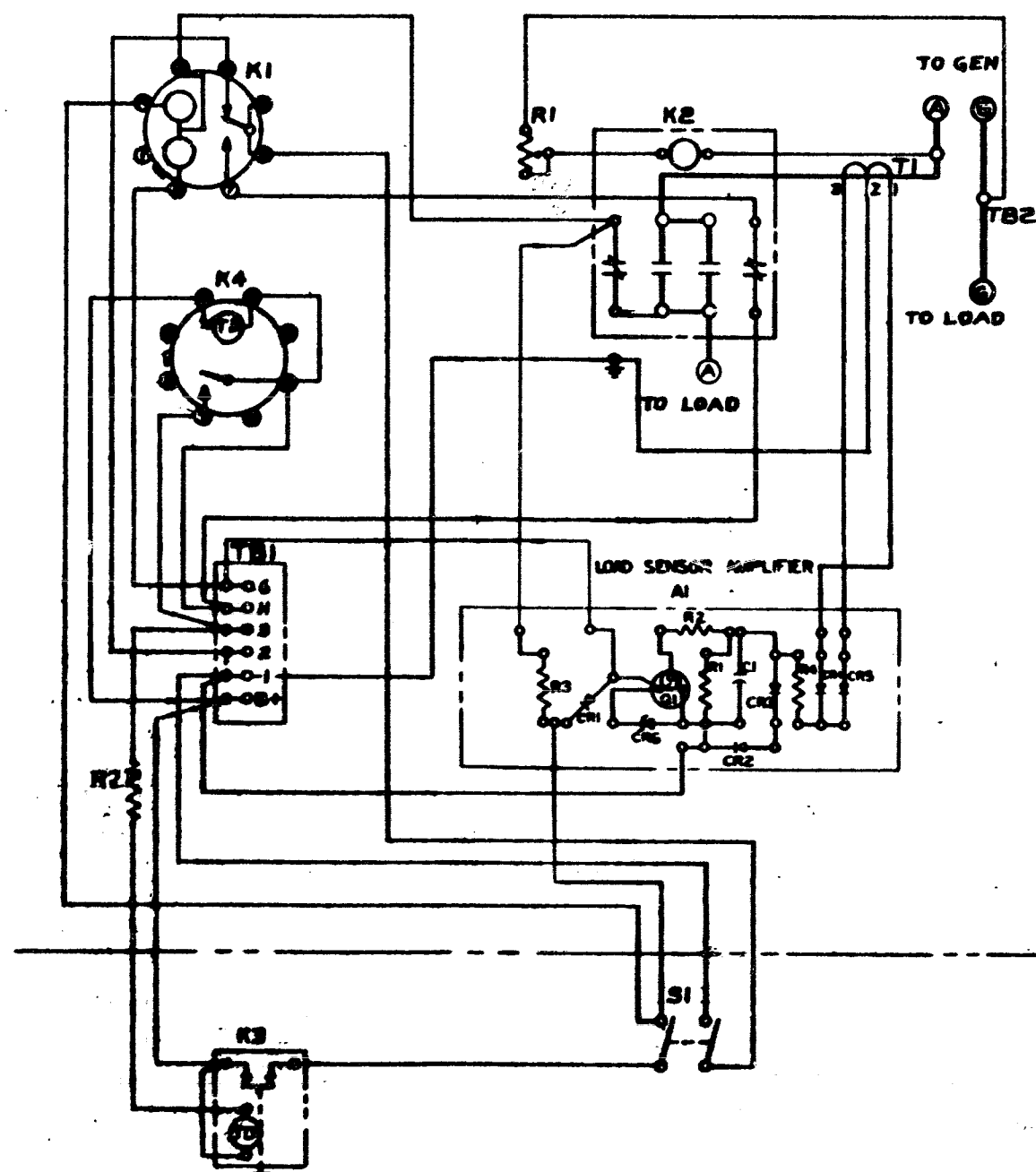
| | | |
|----------|---|-----------------------------|
| 30D2573 | 1 | CONTROL BOX |
| 98C1815 | 1 | SILK SCREEN |
| 98A1928 | 1 | SILK SCREEN |
| 301B2586 | 1 | TRIM |
| 518P237 | 3 | FASTENER-TRIM |
| A15-178 | 1 | SCREW-HEX WD #10-32X 3/8 LG |
| 850-30 | 1 | LOCKWASHER #10 |
| 99A966 | 1 | NAMEPLATE-CONTROL |

262419

7.5HA-21/1B

| | | | |
|---|---------|---|------|
| CROSSED CASH NO. | | JUL-16-70 | |
| CROSS-POCKET | | | |
| SUBSIS DWG SAME N° DATED 8-22-66 | | | |
| REV | REVISON | CRS | DATE |
|  | | DIVISION OF SINGER-REAR CORPORATION Hingham, Massachusetts | |
| DATE | BY | CHK | WJB |
| JUL 16 1970 | CR | | |
| SCHEMATIC WIRING DIAGRAM AUTOMATIC DEMAND CONTROL | | | |
| DWG NO 617C92 | | | |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

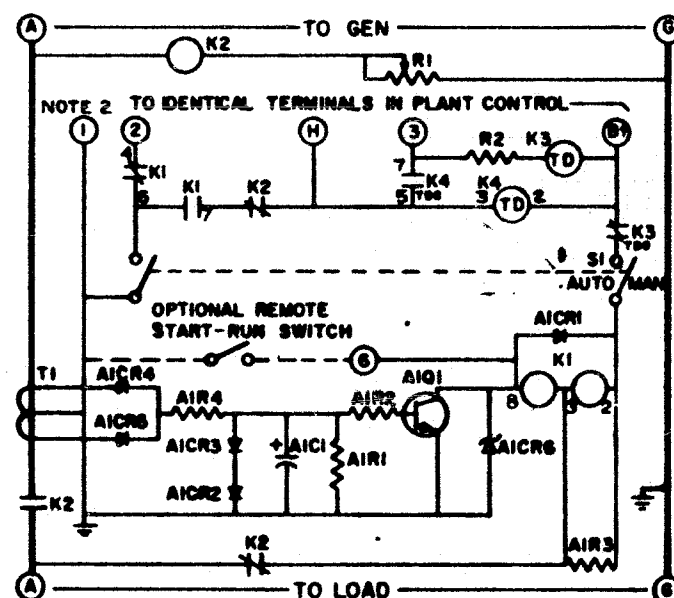


1 - OPERATE WITH NEGATIVE GROUND ONLY

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN, BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

SCHEMATIC

[illegible]

21763

7.54A-21/10B

| | | | |
|---|----------------------------------|----|----------|
| D | WAS 323P52 SOCKET | JV | 11-9-67 |
| C | " " " | JV | 11-9-67 |
| B | ADDED NOTES 2 & 3 | JV | 10-31-67 |
| A | ADDED LABEL 98A2045 | JV | 10-31-67 |
| | SUPSDS DWG SAME NR DATED 8-23-66 | | |

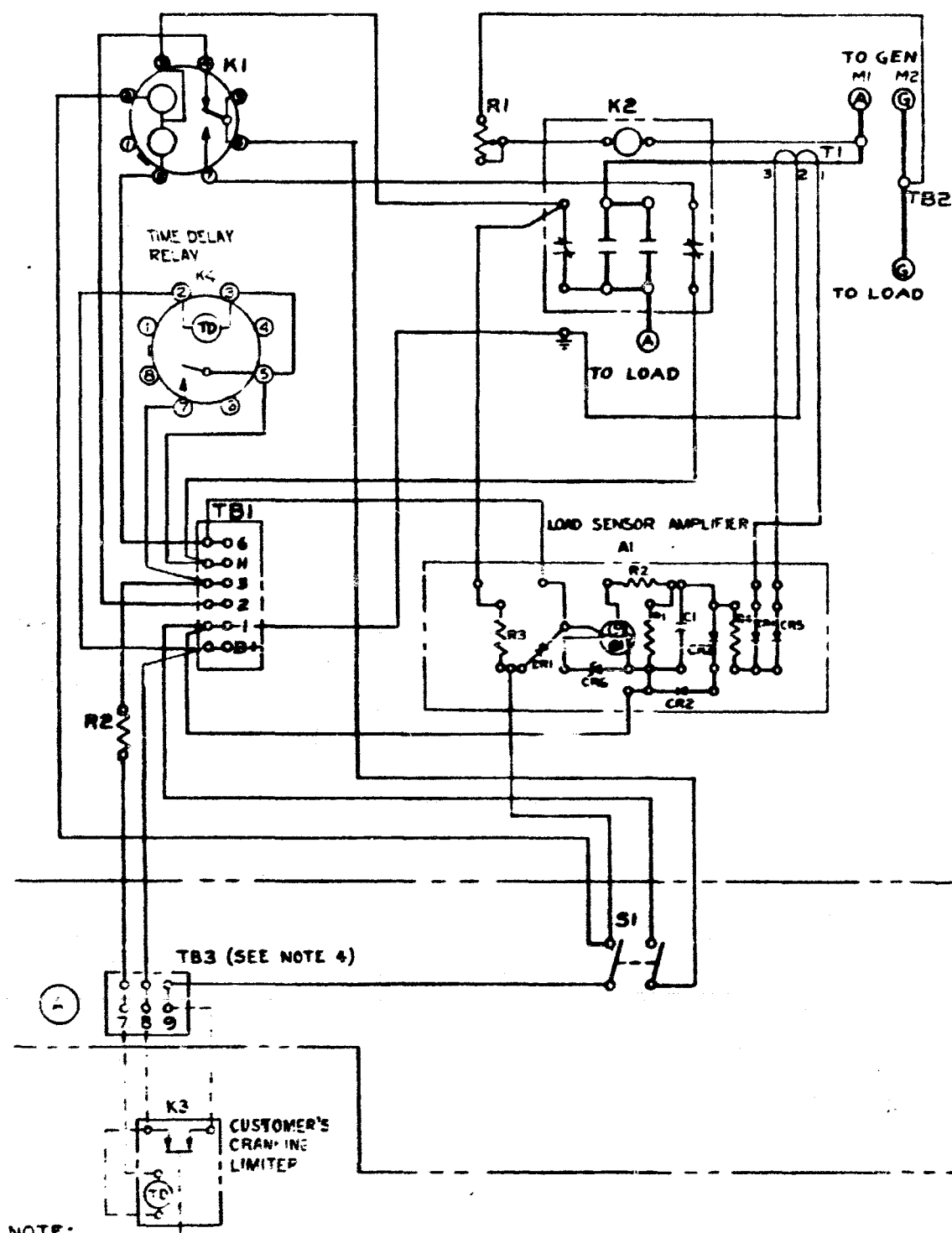
Origin DIVISION OF STUDEBAKER CORPORATION
Minneapolis, Minnesota

| | | | |
|--|--|------------------|----------------------------|
| DOWRY NO 7.5HA-21/10B | DATE 2-24-67 | BY CDR | FOR 11th WFT WJB |
| 12 VOLT CRANKING | SCHEMATIC & WIRING DIAGRAM | | |
| 120V, 1PH. 2W, 30/60CY. | ATMATIC DEMAND CONTROL 617C93 | | |

617C129

WIRING DIAGRAM

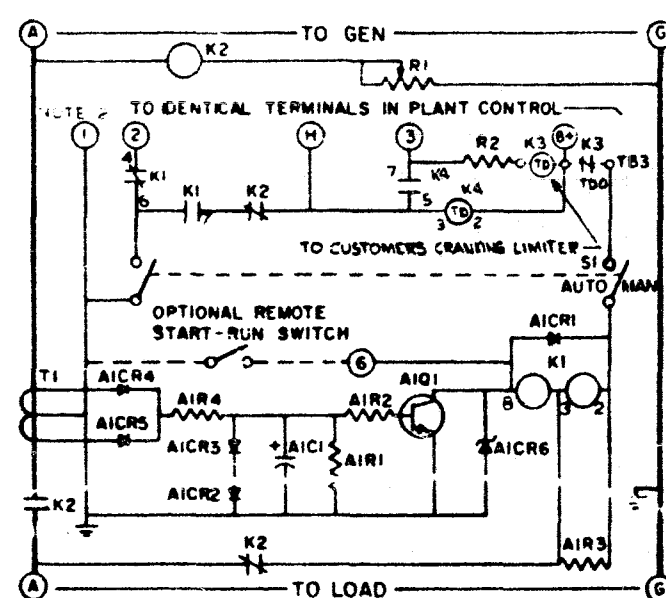
FRONT VIEW OF CHASSIS



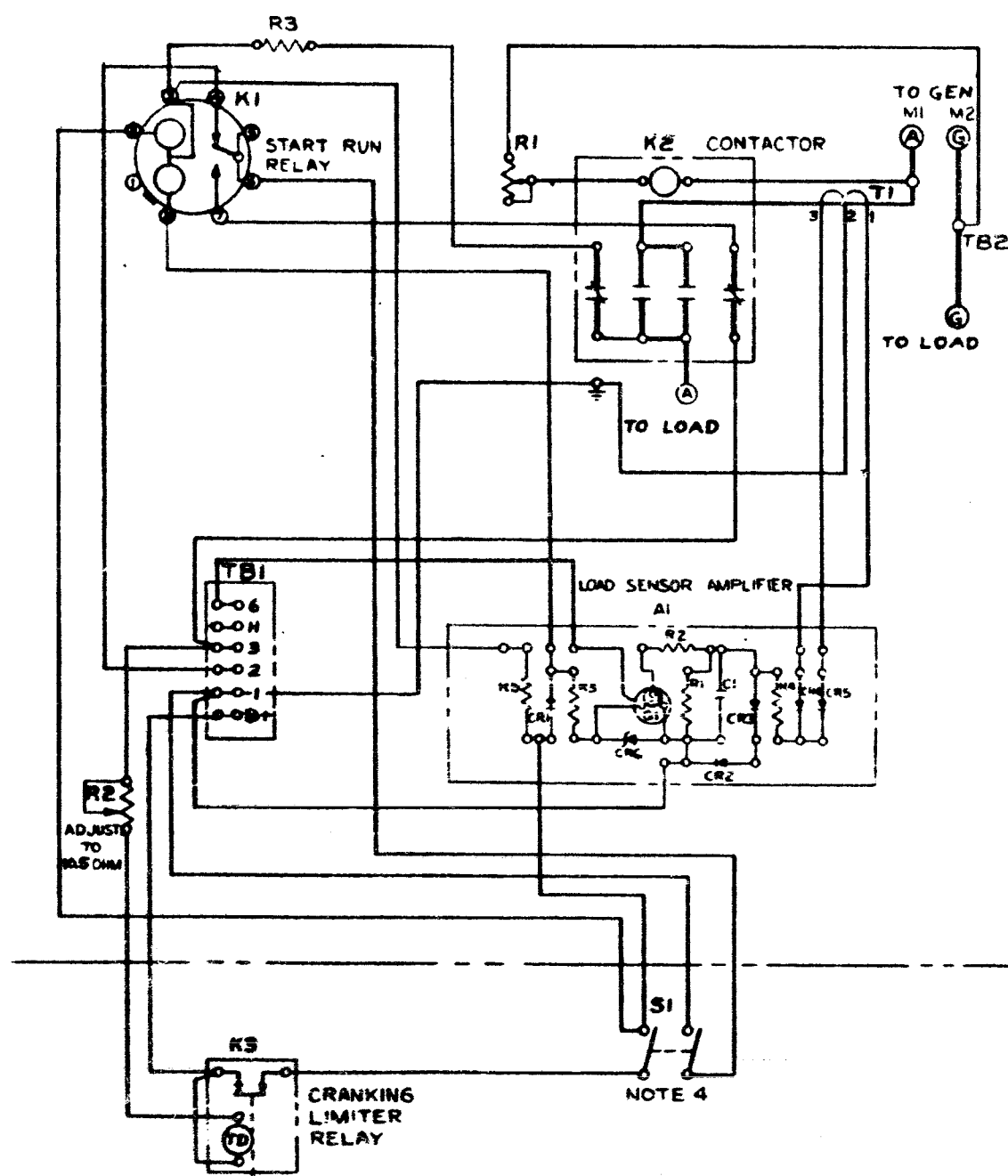
NOTE:

- 1- OPERATE WITH NEGATIVE GROUND ONLY
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.
3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2). THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.
4. FAINT BACK OF MARKER STRIP WHITE, BEFORE MOUNTING IT IN BOX.

SCHEMATIC



WIRING DIAGRAM
FRONT VIEW OF CHASSIS



B 1. OPERATE WITH NEGATIVE GROUND ONLY.

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.
3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.
4. MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL.

NOTE 2 TO IDENTICAL TERMINALS IN PLANT CONTROL

OPTIONAL REMOTE START-RUN SWITCH

AUTO/MAN

TO GEN

TO LOAD

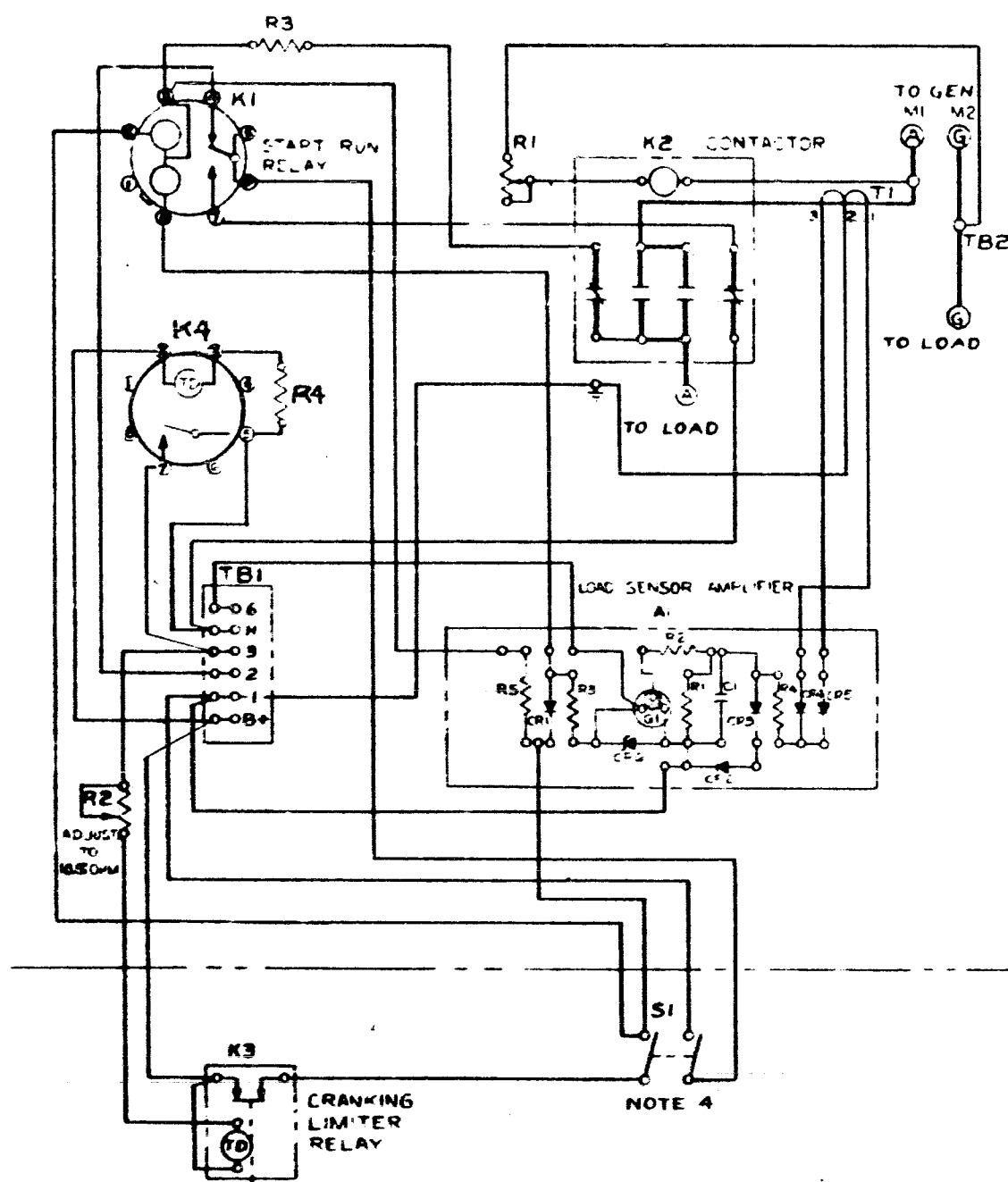
| REF DES | PART NO | QTY | DESCRIPTION |
|---------|----------|------|----------------------------|
| A1 | 300B488 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| K1 | 332A932 | 1 | BOARD - INSULATING |
| K1 | 307A62 | 1 | RELAY - START RUN |
| K2 | 323P380 | 1 | SOCKET |
| K2 | 307C665 | 1 | CONTACTOR |
| | 332-142 | 2 | TERMINAL |
| | 307A685 | 2 | JUMPER |
| K3 | 320B104 | 1 | RELAY-CRANKING LIMITER |
| R1 | 304A282 | 1 | RESISTOR, 300-OHM, 25W |
| R2 | 304A222 | 1 | RESISTOR, 15-OHM, 50W |
| S1 | 308P88 | 1 | SWITCH-AUTO MANUAL |
| T1 | 315A241 | 1 | TRANS. ASSY - CURRENT |
| TB1 | 332A699 | 1 | BLOCK-TERMINAL |
| | 98A1927 | 1 | SILK SCREEN |
| TB2 | 332-142 | 2 | TERMINAL-GROUND |
| R3 | 304A520 | 1 | RESISTOR, 90-OHM, 10W |
| | | | |
| | | | |
| | 301D2573 | 1 | CONTROL BOX |
| | 98C1815 | 1 | SILK SCREEN |
| | 98A1957 | 1 | SILK SCREEN |
| | 301B2586 | 1 | TRIM |
| | 518P237 | 3 | FASTENER- TRIM |
| | 815-17B | 1 | SCREW-HEX HD #10-32X 3/16 |
| | 850-30 | 1 | LOCKWASHER #10 |
| | 99A966 | 1 | NAMEPLATE-CONTROL |
| | 98A2045 | 1 | LABEL, CAUTION |
| | | | |
| | | | |
| | 334A1890 | 25FT | WIRE-FLEXIBLE NO. 20 AWG |
| | 334A1842 | 12FT | WIRE-FLEXIBLE NO. 16 AWG |
| | | | E110219 |

7.5HA-21-4/1B

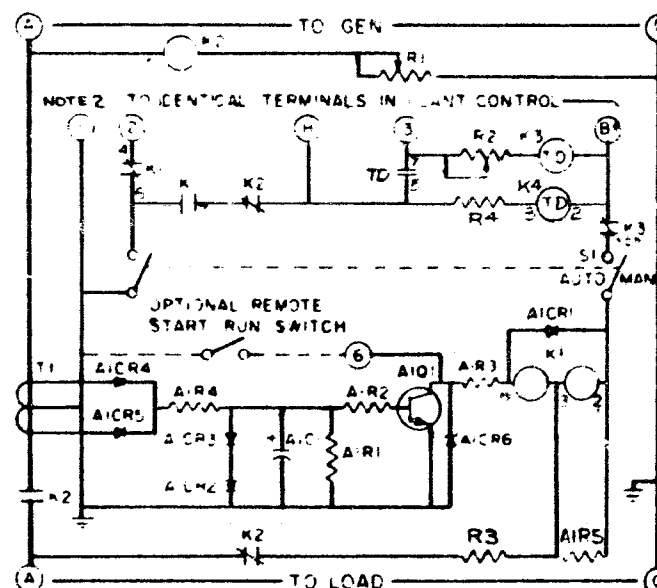
| | | | | | | | | |
|-----|----|-------------------------------|--|--------|----|-----|-----|------|
| (F) | Q1 | 7.5NA-21-4/18 | DATE | 1-1-67 | BY | CDS | CDR | W.18 |
| | | 32 VOLT CRANKING | SCHEMATIC WIRING DIAGRAM AUTOMATIC DEMAND CONTROL | | | | | |
| | | 120 V. 1 PH. 2W. 50/60 Hz. | 617C113 | | | | | |

WIRING DIAGRAM

FRONT VIEW OF CHASSIS



SCHEMATIC

[illegible]

| | | | |
|----------|-------|---------------|------------|
| 334A1890 | 25 FT | WIRE-FLEXIBLE | NO. 20 AWG |
| 334A1842 | 12 FT | WIRE-FLEXIBLE | NO. 16 AWG |

3112419

NOTES:

1. OPERATE WITH NEGATIVE GROUND ONLY.
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.
3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2). THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.
4. MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL.

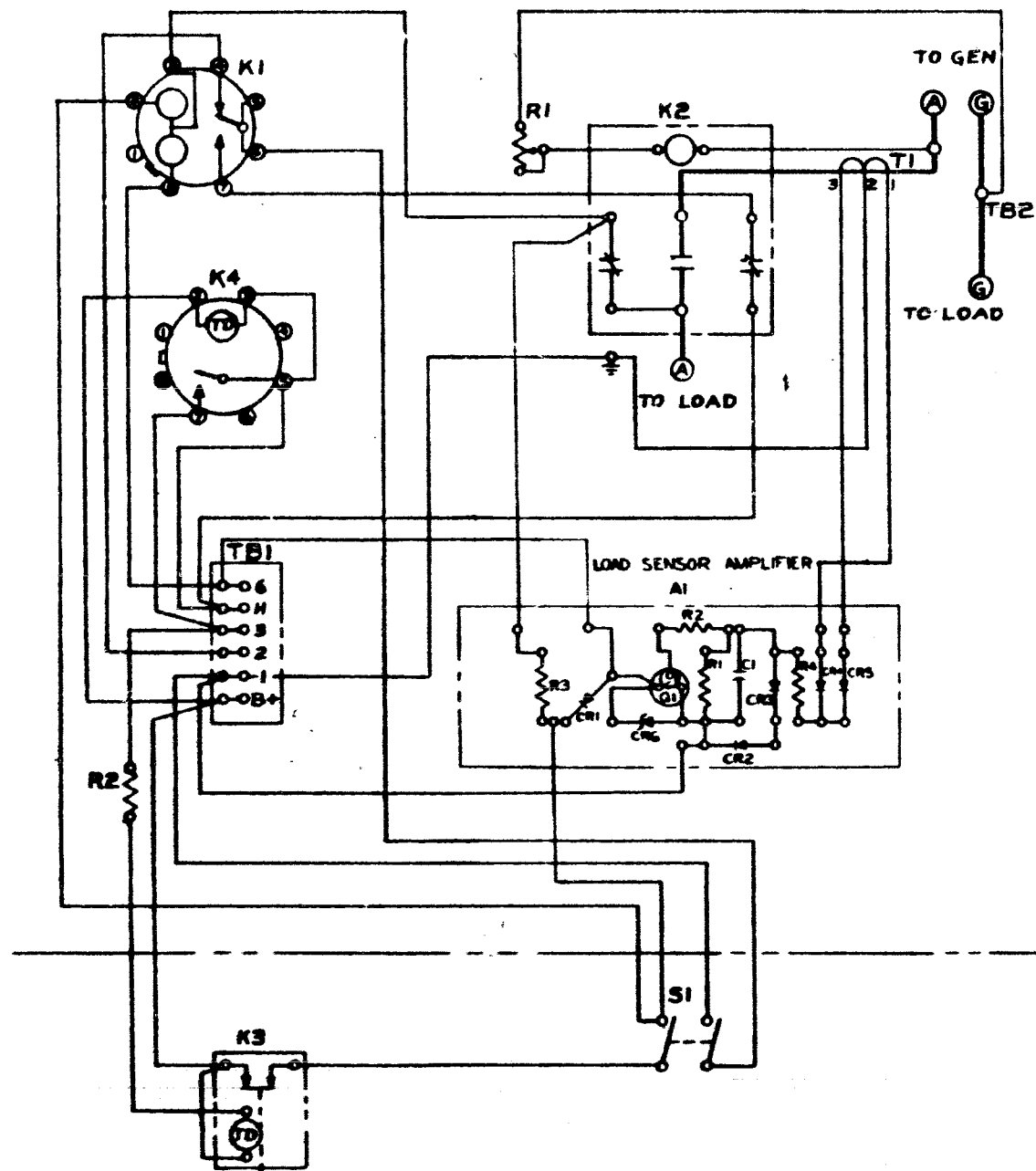
7.5HA-21-4/10B

[illegible]

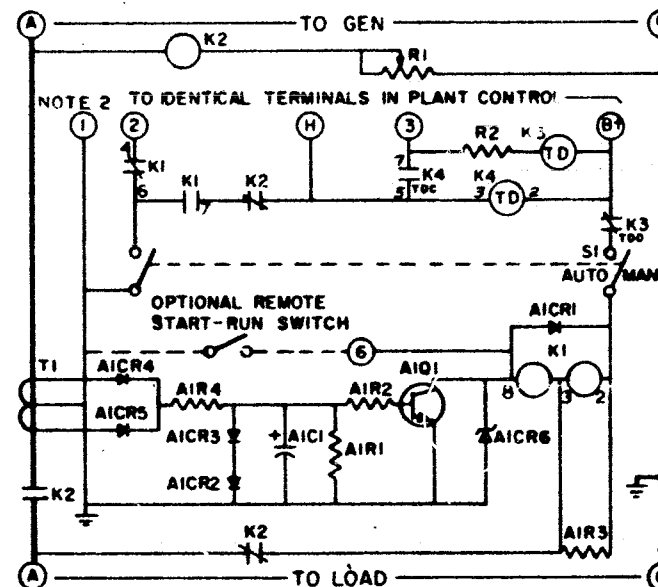
617C96

WIRING DIAGRAM

FRONT VIEW OF CHASSIS



SCHEMATIC



PARTS LIST

| REF DES | PART NO. | QTY | DESCRIPTION |
|---------|----------|-----|--------------------------------|
| AI | 300B443 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 332A932 | 1 | BOARD-INSULATING |
| K1 | 307A62 | 1 | RELAY-START RUN |
| | 323P380 | 1 | SOCKET |
| K2 | 307C664 | 1 | CONTACTOR |
| | 332-517 | 2 | TERMINAL |
| | 98A2045 | 1 | CAUTION LABEL |
| K3 | 320B104 | 1 | RELAY-CRANKING LIMITER |
| K4 | 307A645 | 1 | RELAY-TIME DELAY, PREHEAT, 20S |
| | 323P380 | 1 | SOCKET |
| R1 | 304A131 | 1 | RESISTOR, 750-OHM, 25W |
| R2 | 304A192 | 1 | RESISTOR, 3-OHM, 10W |
| S1 | 308P88 | 1 | SWITCH-AUTO MANUAL |
| T1 | 315A241 | 1 | TRANS. ASSY-CURRENT |
| TB1 | 332A699 | 1 | BLOCK-TERMINAL |
| | 98A1927 | 1 | SILK SCREEN |
| TB2 | 332-517 | 2 | TERMINAL-GROUND |

| | | |
|----------|---|---------------------------|
| 301D2573 | 1 | CONTROL BOX |
| 98C1815 | 1 | SILK SCREEN |
| 98A1928 | 1 | SILK SCREEN |
| 301B2586 | 1 | TRIM |
| 518P237 | 3 | FASTENER-TRIM |
| 815-178 | 1 | SCREW-HEX HD #8-32X3/8 LG |
| 850-30 | 1 | LOCKWASHER #10 |
| 99A966 | 1 | NAMEPLATE-CONTROL |

962119

NOTE:

1- OPERATE WITH NEGATIVE GROUND ONLY

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.

7.5HA-22/10B

| | | | |
|---|------------------------|----|----------|
| D | WAS 323P52 SOCKET | JV | 11-9-67 |
| C | | JV | 11-9-67 |
| E | ADDED NOTES 2 & 3 | JV | 10-31-67 |
| A | ADDED LABEL 98A2045 | JV | 7-31-67 |
| S | SAVED N. DATES 8-23-66 | | |

| REV | REVISION | DATE |
|-----|----------|------|
| 1 | | |

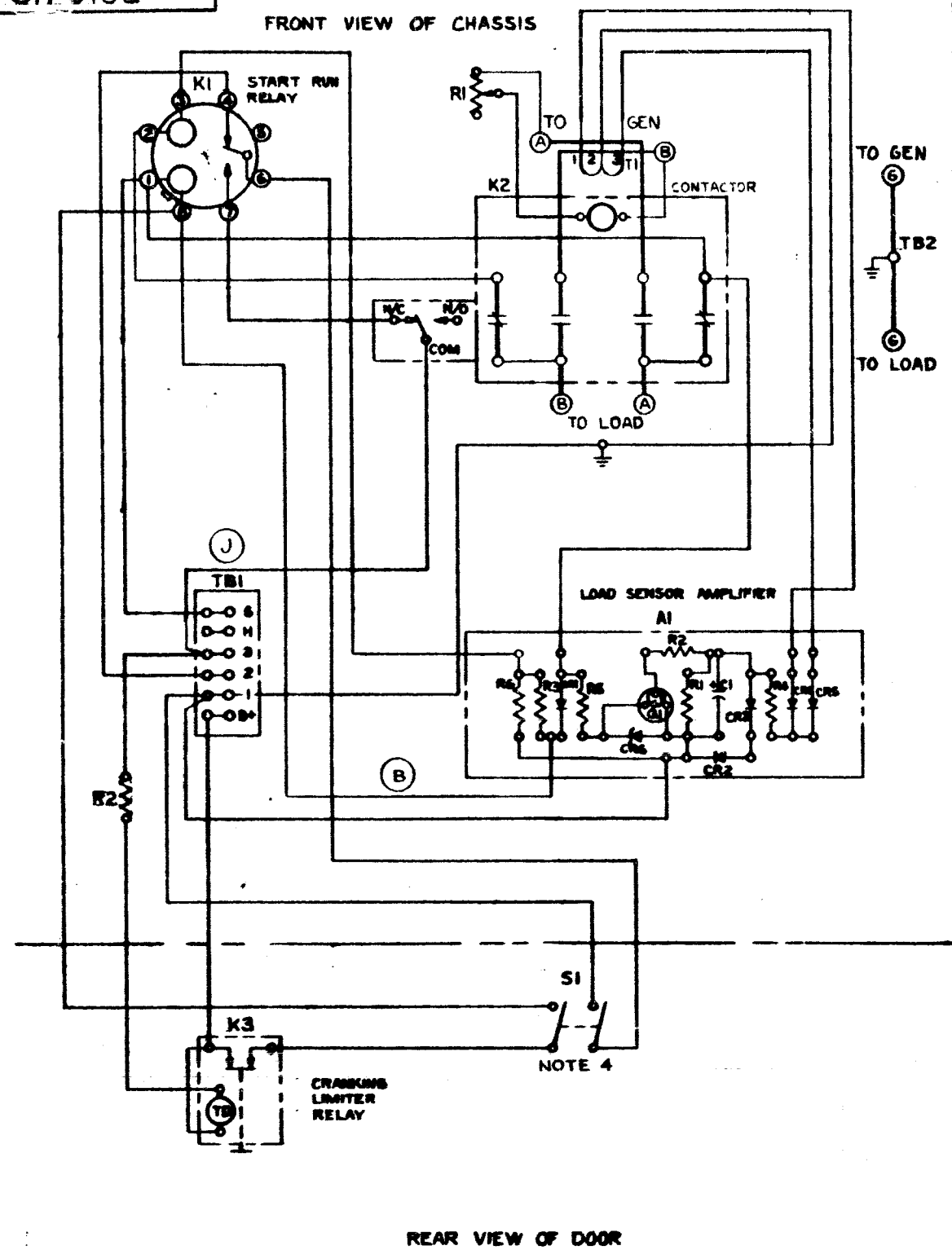
Onon DIVISION OF STUDEBAKER CORPORATION

| | | |
|------------------------|-----|-----|
| 7.5HA-22/10B | CDK | WJB |
| 12 VOLT CRANKING | | |
| 240V, 1PH, 2W, 50/60CY | | |

SCHEMATIC & WIRING DIAGRAM
AUTOMATIC DEMAND CONTROL

617C96

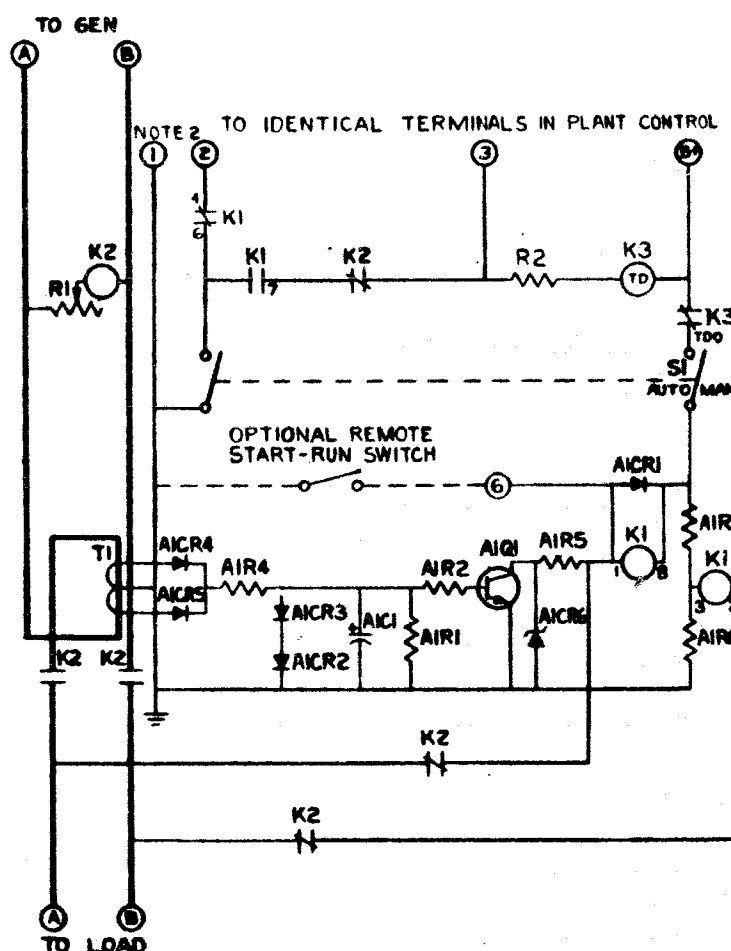
WIRING DIAGRAM
FRONT VIEW OF CHASSIS



- (H) 4. MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL.
3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.
- (D) 2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN, BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

NOTE: 1 - OPERATE WITH NEGATIVE GROUND ONLY

SCHEMATIC

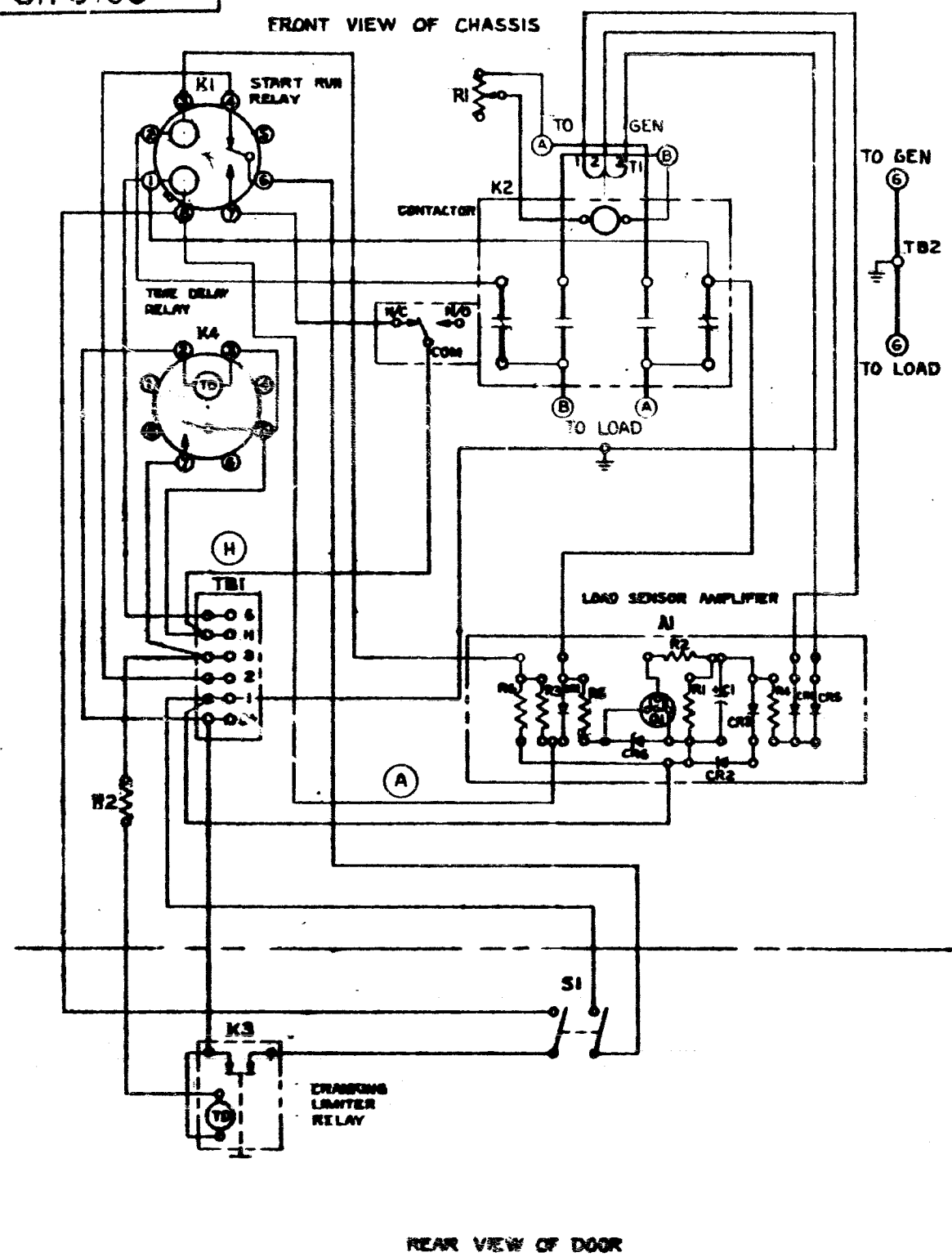
[illegible]

7.5HA-23/1B

| | | | | |
|-----|-------------------------|------|-----|----------|
| L | ADDED WIRE NO. 334A1842 | JV | WB | 3-14-69 |
| K | " " " 334A1890 | JV | WB | 3-14-69 |
| J | REV. WIRING TERMINAL 6 | JV | WB | 1-24-68 |
| H | ADDED NOTE 4 | JV | WB | 11-13-67 |
| G | WAS 315A233 | JV | WB | |
| F | 307A969 6A970 REMOVED | JV | WB | ↓ |
| E | WAS 323P52 SOCKET | JV | WB | 11-9-67 |
| D | ADDED NOTES 2 & 3 | JV | WB | 11-1-67 |
| C | ADDED LABEL 98A2045 | JV | WB | 11-1-67 |
| B | MOVED LEAD S1 TO K1 | JV | WB | 7-25-67 |
| A | WAS 332-142 | JV | WB | 5-1-67 |
| REF | REVISION | DATE | CHK | |

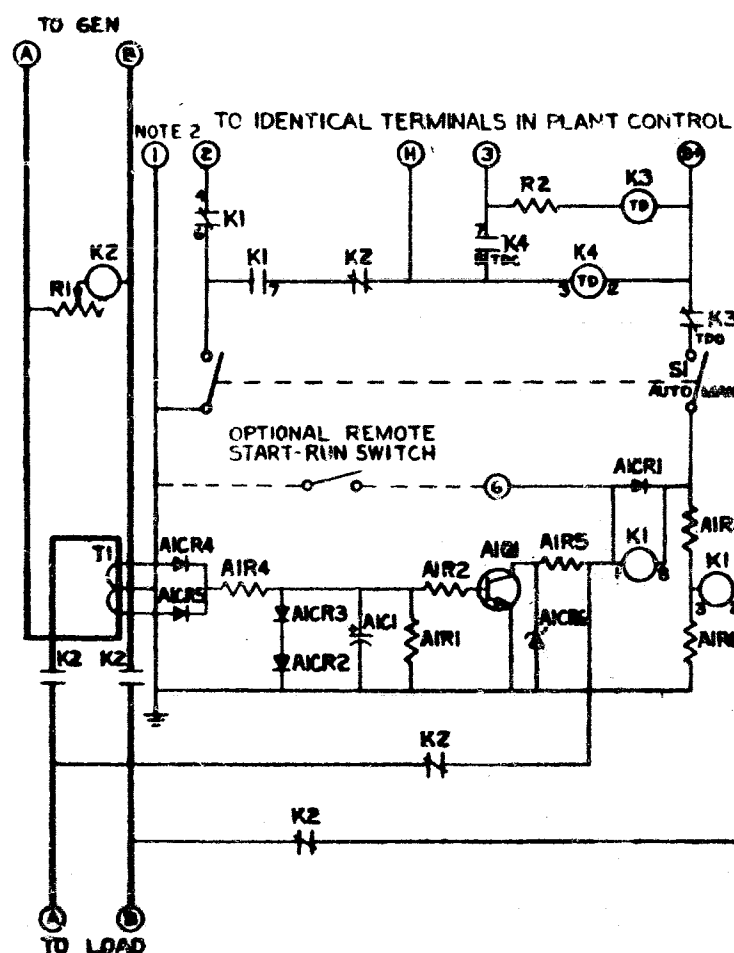
| | | | |
|--|----------------------------|-----------|---------------------|
| MODEL NO 7.5HA-23/1B | DATE 12-29-66 | BY CDR | EXT Jim Vint WJE |
| 12 VOLT CRANKING | SCHEMATIC & WIRING DIAGRAM | | |
| 120/240 V., 1PH., 3 WIRE. 50/60 CY. | AUTOMATIC DEMAND CONTROL | | |
| | 617C102 | | |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS



(C) 2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN, BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.

SCHEMATIC

[illegible]

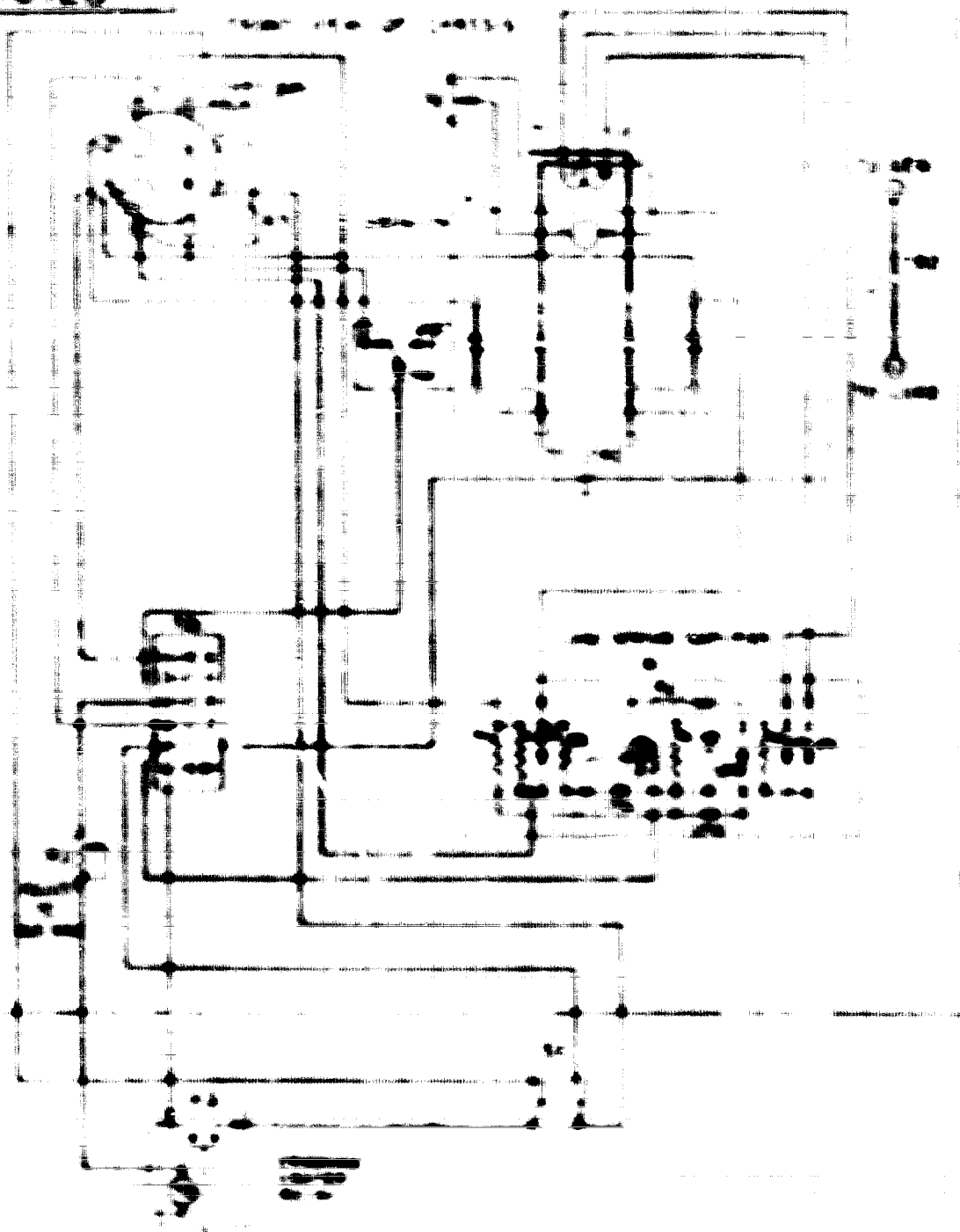
7.5HA-23/12B

| | | | |
|------|---------------------------------|----|----------|
| L | WAS N#10 | JV | 7-9-69 |
| K | WAS N#12 | JV | 7-9-69 |
| L | ADDED WIRE NO. 334A1842 | JV | 3-14-69 |
| K | " " " 334A1890 | JV | 3-14-69 |
| J | TB2 WAS 332-142 | JV | 2-20-68 |
| H | REV. WIRING TERMINAL 6 | JV | 1-24-68 |
| G | ADDED 315A291 | JV | 11-10-67 |
| F | REM. 307A969, 307A970 & 315A233 | JV | 11-10-67 |
| E | WAS 323P52 SOCKET | JV | 11-9-67 |
| D | " " | JV | 11-9-67 |
| C | ADDED NOTES 2 & 3 | JV | 11-1-66 |
| B | ADDED LABEL 58A2045 | JV | 11-1-66 |
| A | MOVED LEAD S1 TO K1 | JV | 7-25-66 |
| REF. | REF. 4000 | CS | DATE |

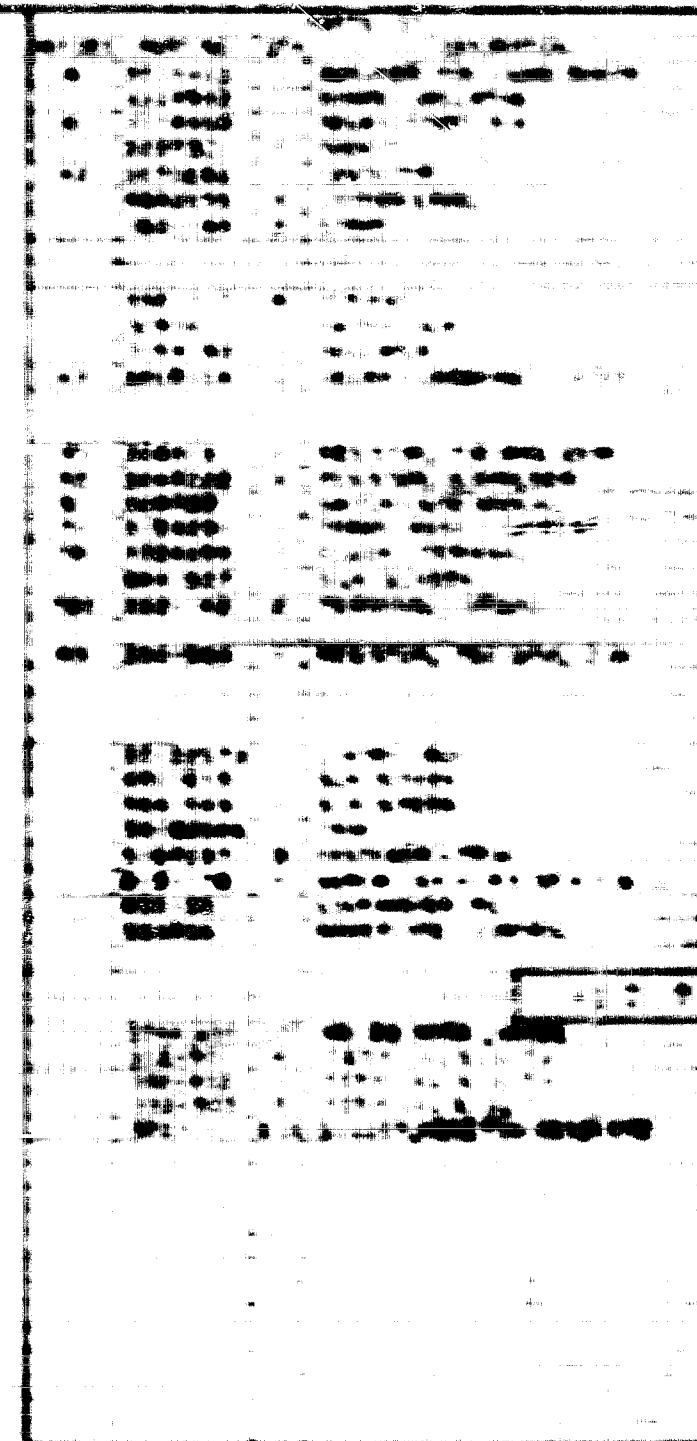
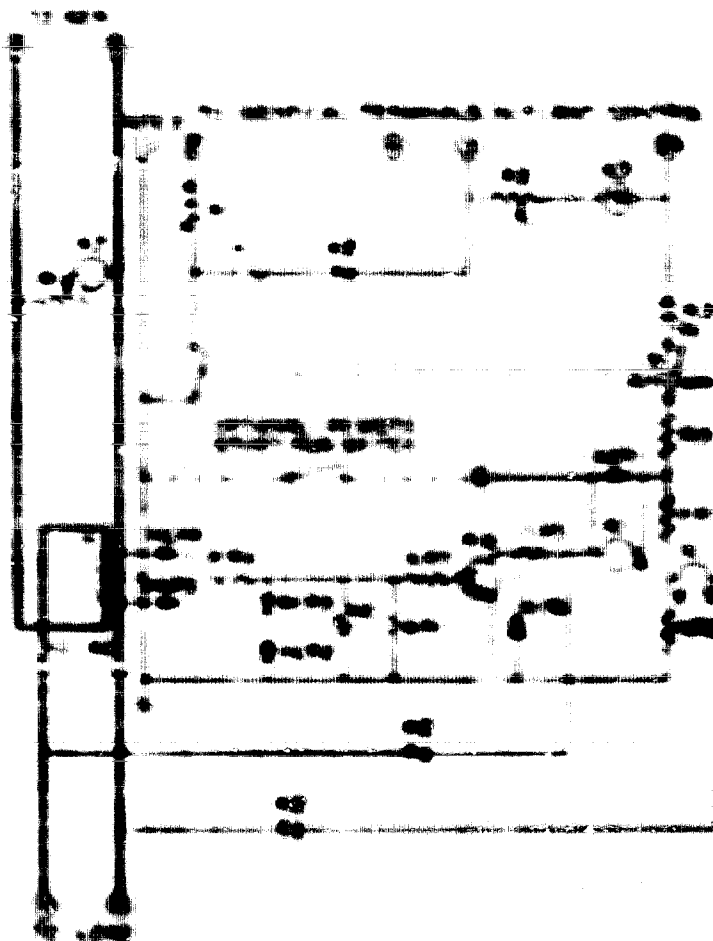
Origin DIVISION OF STUDEBAKER CORPORATION
Minneapolis, Minnesota

| | | | |
|--------------------------------------|----------------------------|-----------|-------------------|
| MODEL NO 7. SHA-23/2B | DATE 12-29-66 | BY CDR | CHK 1st Lt WLB |
| 12 VOLT CRANKING | SCHEMATIC & WIRING DIAGRAM | | |
| 120/240 V., 1PH., 3WIRE. 50/60 CY | AUTOMATIC DEMAND CONTROL | | |
| | 617C103 | | |

67C128



GEN. VIEW OF GEN



7.5NA-23-4/18

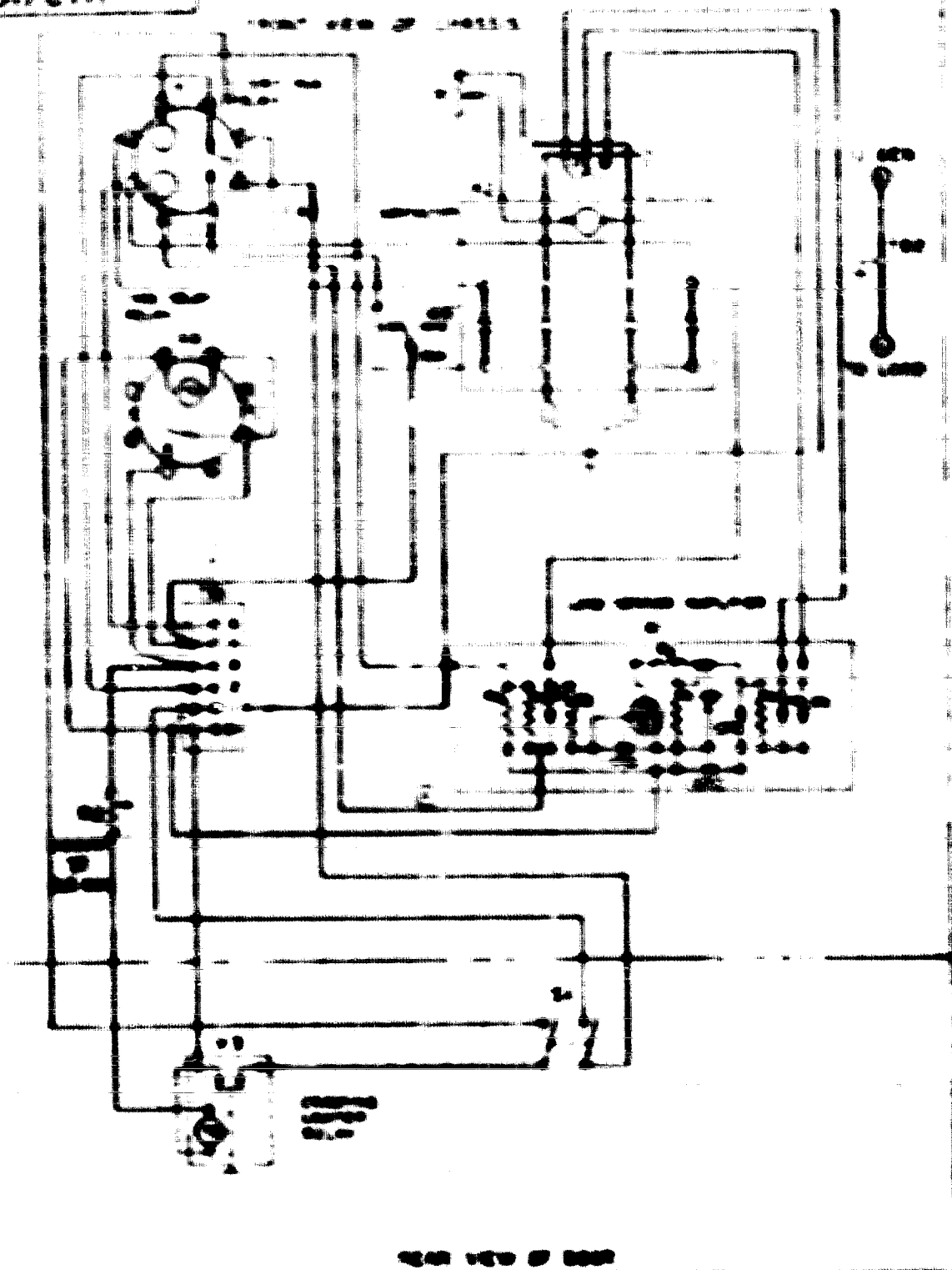
1. CAUTION: IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (C), THE AC OUTPUT WILL NOT BE LOST WHEN THE LOAD SENSOR OPERATES.
2. IT IS NOT NECESSARY TO CONNECT THE GEN TO GEN BECAUSE GENERATOR AND CONTROL ARE CONNECTED TO THE AC MACHINERY.

NOTE: OPERATE WITH NEGATIVE GROUND ONLY

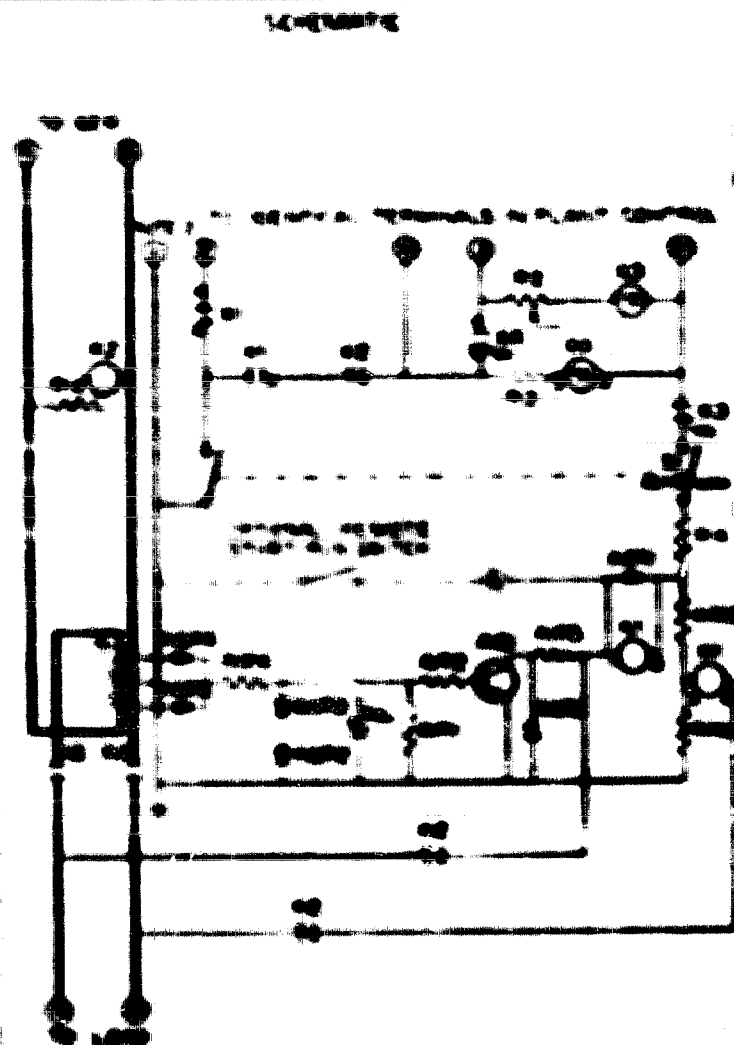
WIRE
 100% (100% WIRE)
 100% (100% WIRE)
 100% (100% WIRE)

| | |
|---------------------|--|
| 7.5NA-23-4/18 | <div> <div>Original</div> <div> <div>7.5NA-23-4/18</div> <div> <div>32 VOLT (100% WIRE)</div> <div>100% (100% WIRE)</div> <div>100% (100% WIRE)</div> </div> </div> </div> |
| 32 VOLT (100% WIRE) | <div> <div>SCHEMATIC & WIRING DIAGRAM</div> <div> <div>100% (100% WIRE)</div> <div>100% (100% WIRE)</div> </div> </div> |
| 100% (100% WIRE) | <div> <div>100% (100% WIRE)</div> <div> <div>100% (100% WIRE)</div> <div>100% (100% WIRE)</div> </div> </div> |

617C128



1992 1993 1994 1995



ACKNOWLEDGMENTS

| NO | NAME | ADDRESS | CITY | STATE | ZIP |
|----|------------|----------------|----------|-------|-------|
| 01 | JOHN DOE | 123 MAIN ST | NEW YORK | NY | 10001 |
| 02 | JANE SMITH | 456 E 1ST AVE | NEW YORK | NY | 10002 |
| 03 | JOHN DOE | 789 W 1ST ST | NEW YORK | NY | 10003 |
| 04 | JANE SMITH | 101 N 1ST ST | NEW YORK | NY | 10004 |
| 05 | JOHN DOE | 202 S 1ST ST | NEW YORK | NY | 10005 |
| 06 | JANE SMITH | 303 E 2ND ST | NEW YORK | NY | 10006 |
| 07 | JOHN DOE | 404 W 2ND ST | NEW YORK | NY | 10007 |
| 08 | JANE SMITH | 505 N 2ND ST | NEW YORK | NY | 10008 |
| 09 | JOHN DOE | 606 S 2ND ST | NEW YORK | NY | 10009 |
| 10 | JANE SMITH | 707 E 3RD ST | NEW YORK | NY | 10010 |
| 11 | JOHN DOE | 808 W 3RD ST | NEW YORK | NY | 10011 |
| 12 | JANE SMITH | 909 N 3RD ST | NEW YORK | NY | 10012 |
| 13 | JOHN DOE | 1010 S 3RD ST | NEW YORK | NY | 10013 |
| 14 | JANE SMITH | 1111 E 4TH ST | NEW YORK | NY | 10014 |
| 15 | JOHN DOE | 1212 W 4TH ST | NEW YORK | NY | 10015 |
| 16 | JANE SMITH | 1313 N 4TH ST | NEW YORK | NY | 10016 |
| 17 | JOHN DOE | 1414 S 4TH ST | NEW YORK | NY | 10017 |
| 18 | JANE SMITH | 1515 E 5TH ST | NEW YORK | NY | 10018 |
| 19 | JOHN DOE | 1616 W 5TH ST | NEW YORK | NY | 10019 |
| 20 | JANE SMITH | 1717 N 5TH ST | NEW YORK | NY | 10020 |
| 21 | JOHN DOE | 1818 S 5TH ST | NEW YORK | NY | 10021 |
| 22 | JANE SMITH | 1919 E 6TH ST | NEW YORK | NY | 10022 |
| 23 | JOHN DOE | 2020 W 6TH ST | NEW YORK | NY | 10023 |
| 24 | JANE SMITH | 2121 N 6TH ST | NEW YORK | NY | 10024 |
| 25 | JOHN DOE | 2222 S 6TH ST | NEW YORK | NY | 10025 |
| 26 | JANE SMITH | 2323 E 7TH ST | NEW YORK | NY | 10026 |
| 27 | JOHN DOE | 2424 W 7TH ST | NEW YORK | NY | 10027 |
| 28 | JANE SMITH | 2525 N 7TH ST | NEW YORK | NY | 10028 |
| 29 | JOHN DOE | 2626 S 7TH ST | NEW YORK | NY | 10029 |
| 30 | JANE SMITH | 2727 E 8TH ST | NEW YORK | NY | 10030 |
| 31 | JOHN DOE | 2828 W 8TH ST | NEW YORK | NY | 10031 |
| 32 | JANE SMITH | 2929 N 8TH ST | NEW YORK | NY | 10032 |
| 33 | JOHN DOE | 3030 S 8TH ST | NEW YORK | NY | 10033 |
| 34 | JANE SMITH | 3131 E 9TH ST | NEW YORK | NY | 10034 |
| 35 | JOHN DOE | 3232 W 9TH ST | NEW YORK | NY | 10035 |
| 36 | JANE SMITH | 3333 N 9TH ST | NEW YORK | NY | 10036 |
| 37 | JOHN DOE | 3434 S 9TH ST | NEW YORK | NY | 10037 |
| 38 | JANE SMITH | 3535 E 10TH ST | NEW YORK | NY | 10038 |
| 39 | JOHN DOE | 3636 W 10TH ST | NEW YORK | NY | 10039 |
| 40 | JANE SMITH | 3737 N 10TH ST | NEW YORK | NY | 10040 |
| 41 | JOHN DOE | 3838 S 10TH ST | NEW YORK | NY | 10041 |
| 42 | JANE SMITH | 3939 E 11TH ST | NEW YORK | NY | 10042 |
| 43 | JOHN DOE | 4040 W 11TH ST | NEW YORK | NY | 10043 |
| 44 | JANE SMITH | 4141 N 11TH ST | NEW YORK | NY | 10044 |
| 45 | JOHN DOE | 4242 S 11TH ST | NEW YORK | NY | 10045 |
| 46 | JANE SMITH | 4343 E 12TH ST | NEW YORK | NY | 10046 |
| 47 | JOHN DOE | 4444 W 12TH ST | NEW YORK | NY | 10047 |
| 48 | JANE SMITH | 4545 N 12TH ST | NEW YORK | NY | 10048 |
| 49 | JOHN DOE | 4646 S 12TH ST | NEW YORK | NY | 10049 |
| 50 | JANE SMITH | 4747 E 13TH ST | NEW YORK | NY | 10050 |

7-501A-23-4/100

617C111

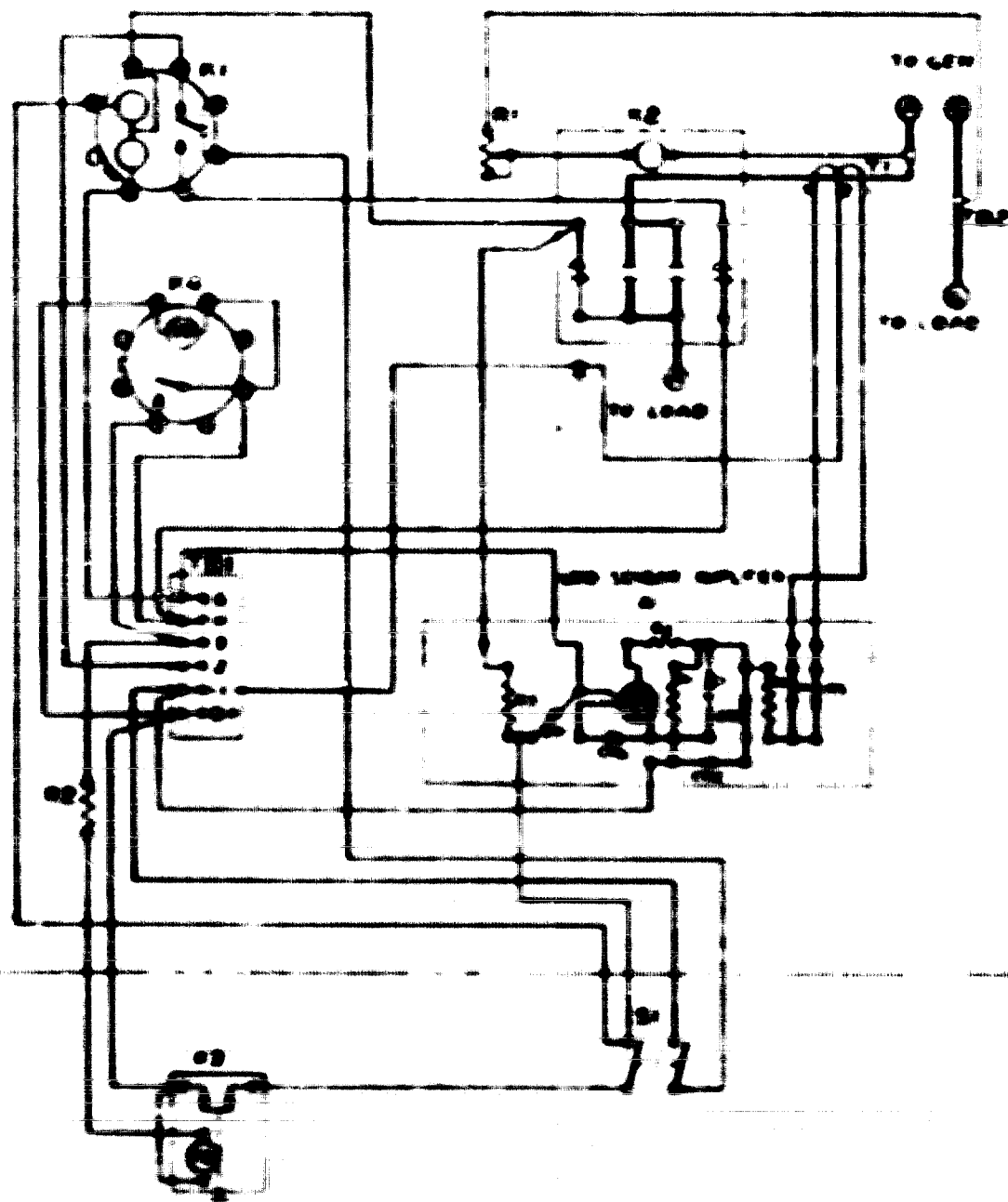
3) CAUTION - IF GUN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR
- 277 THE 280 VOLTAGE WILL DESTROY THE LOAD SOURCE UNIT (L.S.U.)

2. IT IS NOT NECESSARY TO CONVERT TEMPERATURE TO GRS BECAUSE
TEMPERATURE AND CONTROL ARE LOGARITHMIC INSTEAD OF LINEAR. (E.G.)

~~DO NOT COMBINE WITH NEGATIVE GROUP ONLY~~

617C

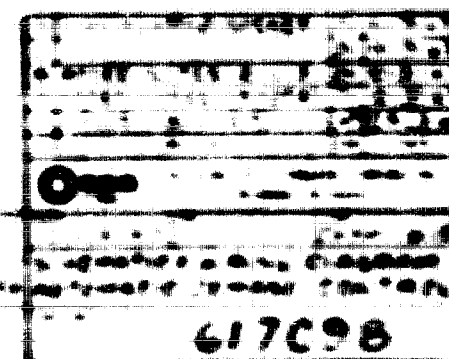
WIRING DIAGRAM



| REF ID | PART NO. | QTY | DESCRIPTION |
|--------|----------|-----|----------------------------|
| A1 | 3000442 | 1 | AMPLIFIER ASSY-LOAD SENSE |
| | 332A932 | 1 | BOARD-INSULATING |
| K1 | 307A62 | 1 | RELAY-START RUN |
| | 323P-40 | 1 | SECRET |
| A2 | 307C686 | 1 | CONTACTOR |
| | 332-142 | 2 | TERMINAL |
| | 307A105 | 2 | JUMPER |
| M3 | 3200100 | 1 | RELAY-CRACKING LIMITER |
| M4 | 307A648 | 1 | RELAY-TIME DELAY, CRACKING |
| | 323P-40 | 1 | SECRET |
| M1 | 304A121 | 1 | RESISTOR, 700 OHM, 25W |
| M2 | 304A132 | 1 | RESISTOR, 3 OHM, 10W |
| S1 | 300P00 | 1 | SWITCH-AUTO-MANUAL |
| T1 | 315A261 | 1 | TRANS ASSY-CURRENT |
| TP | 332A699 | 1 | SLOTTED TERMINAL |
| | 30A1327 | 1 | SILK SCREEN |
| T02 | 332-142 | 2 | TERMINAL-GROUND |
| | 3002003 | 1 | CAPACITOR 100P |
| | 3000237 | 1 | CONTROL BOX |
| | 3001015 | 1 | SILK SCREEN |
| | 3001928 | 1 | SILK SCREEN |
| | 3000236 | 1 | TRIM |
| | 3000237 | 3 | FASTENER-YOIM |
| | 015-170 | 1 | SCREW-#10 X 3/8" 304 |
| | 300-20 | 1 | LOCKWASHER #10 |
| | 300-966 | 1 | NAMEPLATE-CONTROL |

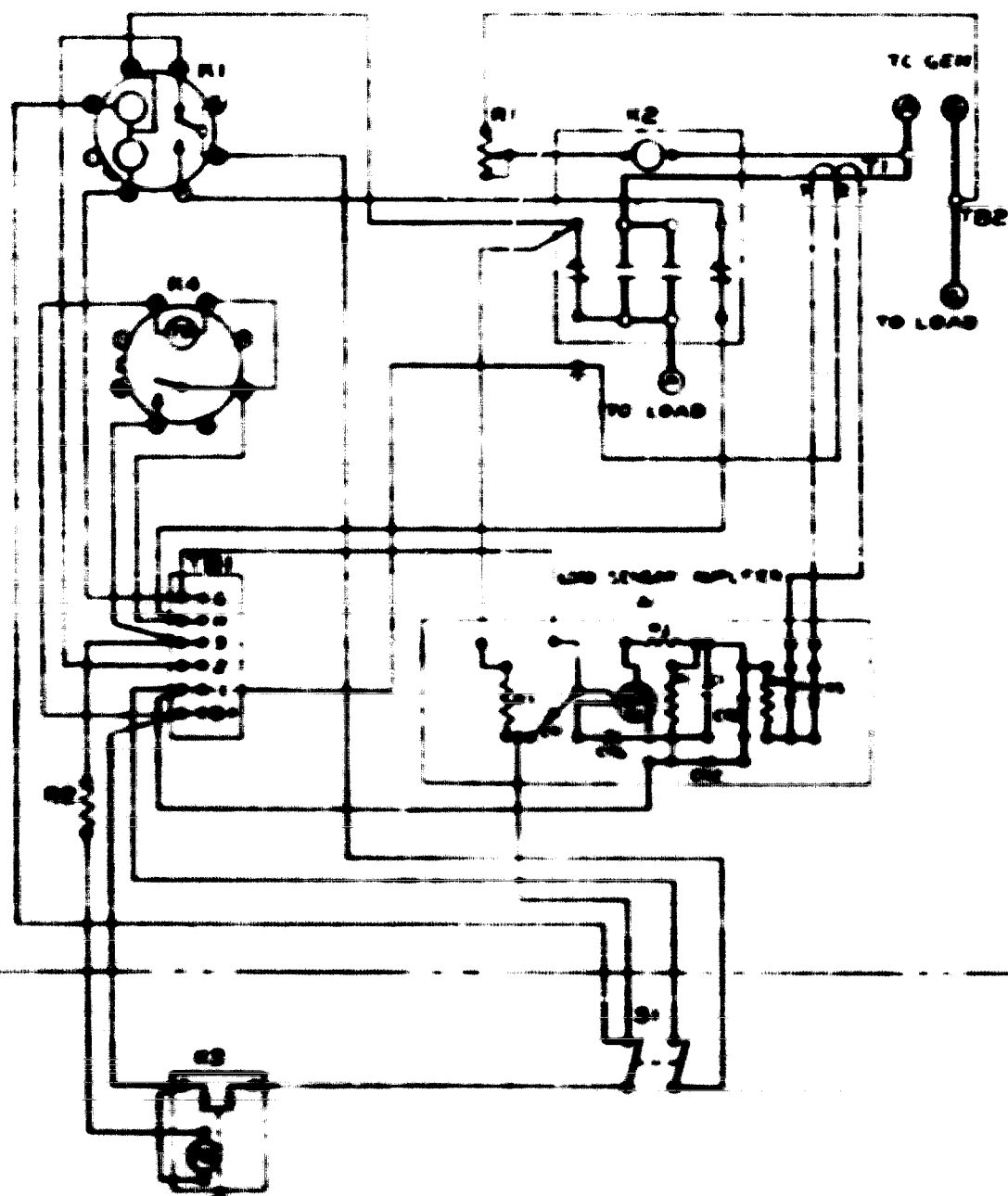
062417

15.01A-22/100



61709e

WIRING DIAGRAM
FRONT VIEW OF CHASSIS



| REF DES | PART NO | QTY | DESCRIPTION |
|---------|----------|-----|-------------------------------|
| A1 | 3000443 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 332A982 | 1 | BOARD-INSULATING |
| R1 | 307A62 | 1 | RELAY-START RUN |
| | 323P300 | 1 | SOCKET |
| R2 | 307C666 | 1 | CONTACTOR |
| | 332-142 | 2 | TERMINAL |
| | 307A488 | 2 | JUMPER |
| M3 | 3208104 | 1 | RELAY-CRANKING LIGHTEN |
| R4 | 307A609 | 1 | RELAY-TIME DELAY STARTING (S) |
| | 323P300 | 1 | SOCKET |
| R1 | 304A131 | 1 | RESISTOR, 750-Ohm, 25W |
| R2 | 304A132 | 1 | RESISTOR, 3-Ohm, 10W |
| S1 | 300P00 | 1 | SWITCH-AUTO MANUAL |
| T1 | 318A241 | 1 | TRANS ASSY-CURRENT |
| TM | 332A992 | 1 | BLOCK-TERMINAL |
| | 304A127 | 1 | SILK SCREEN |
| TB2 | 332-142 | 2 | TERMINAL-GROUND |
| | 332-2045 | 1 | CAUTION LABEL |
| | 304A127 | 1 | CONTROL BOX |
| | 304A128 | 1 | SILK SCREEN |
| | 304A129 | 1 | SILK SCREEN |
| | 304A130 | 1 | TRIM |
| | 304A131 | 2 | FASTENER-TRIM |
| | 304A132 | 1 | SCREW-#2-32X1/2 |
| | 304A133 | 1 | LOCKWASHER #10 |
| | 304A134 | 1 | NAMEPLATE-CONTROL |

662419

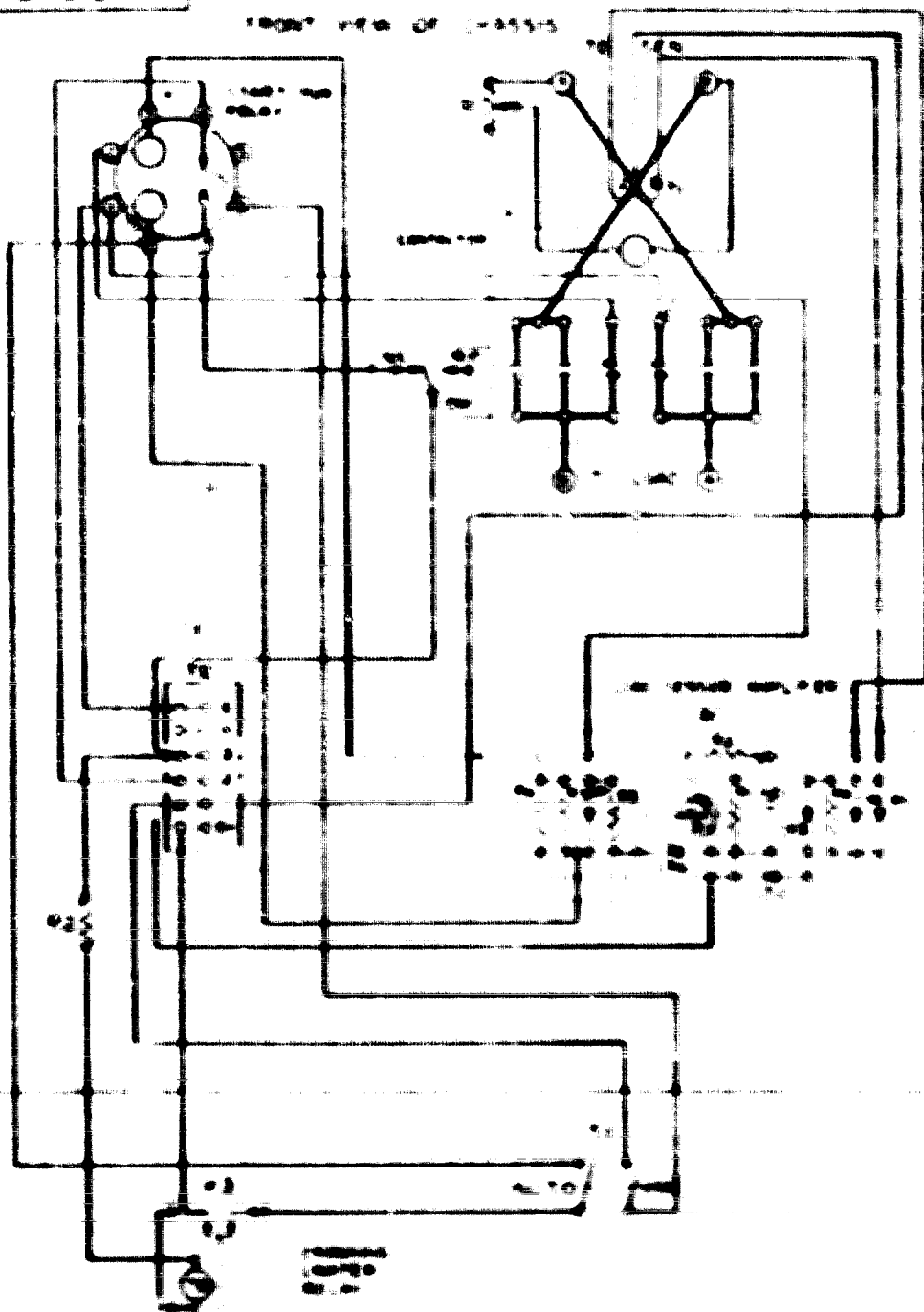
CONFIDENTIAL - SECURITY INFORMATION

15-01A-22/120

617C99

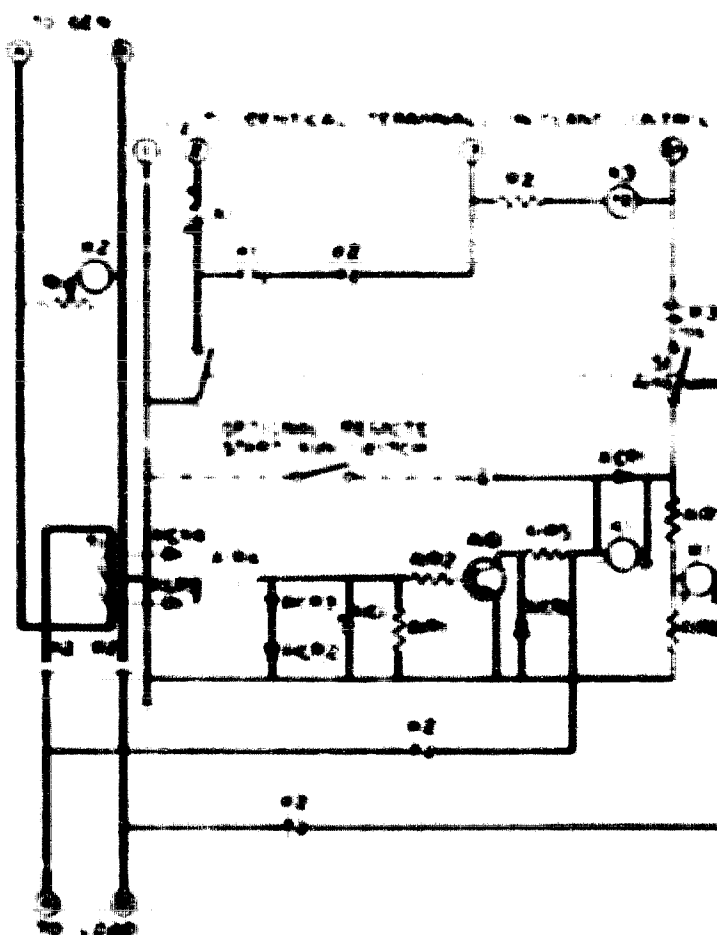
6170100

WIRING DIAGRAM
RIGHT VIEW OF CHASSIS



RIGHT VIEW OF CHASSIS

SCHEMATIC



| REF ID | QTY | DESCRIPTION |
|--------|-----|--------------------|
| 1 | 1 | RESISTOR 100K 1/2W |
| 2 | 1 | RESISTOR 100K 1/2W |
| 3 | 1 | RESISTOR 100K 1/2W |
| 4 | 1 | RESISTOR 100K 1/2W |
| 5 | 1 | RESISTOR 100K 1/2W |
| 6 | 1 | RESISTOR 100K 1/2W |
| 7 | 1 | RESISTOR 100K 1/2W |
| 8 | 1 | RESISTOR 100K 1/2W |
| 9 | 1 | RESISTOR 100K 1/2W |
| 10 | 1 | RESISTOR 100K 1/2W |
| 11 | 1 | RESISTOR 100K 1/2W |
| 12 | 1 | RESISTOR 100K 1/2W |
| 13 | 1 | RESISTOR 100K 1/2W |
| 14 | 1 | RESISTOR 100K 1/2W |
| 15 | 1 | RESISTOR 100K 1/2W |
| 16 | 1 | RESISTOR 100K 1/2W |
| 17 | 1 | RESISTOR 100K 1/2W |
| 18 | 1 | RESISTOR 100K 1/2W |
| 19 | 1 | RESISTOR 100K 1/2W |
| 20 | 1 | RESISTOR 100K 1/2W |
| 21 | 1 | RESISTOR 100K 1/2W |
| 22 | 1 | RESISTOR 100K 1/2W |
| 23 | 1 | RESISTOR 100K 1/2W |
| 24 | 1 | RESISTOR 100K 1/2W |
| 25 | 1 | RESISTOR 100K 1/2W |
| 26 | 1 | RESISTOR 100K 1/2W |
| 27 | 1 | RESISTOR 100K 1/2W |
| 28 | 1 | RESISTOR 100K 1/2W |
| 29 | 1 | RESISTOR 100K 1/2W |
| 30 | 1 | RESISTOR 100K 1/2W |
| 31 | 1 | RESISTOR 100K 1/2W |
| 32 | 1 | RESISTOR 100K 1/2W |
| 33 | 1 | RESISTOR 100K 1/2W |
| 34 | 1 | RESISTOR 100K 1/2W |
| 35 | 1 | RESISTOR 100K 1/2W |
| 36 | 1 | RESISTOR 100K 1/2W |
| 37 | 1 | RESISTOR 100K 1/2W |
| 38 | 1 | RESISTOR 100K 1/2W |
| 39 | 1 | RESISTOR 100K 1/2W |
| 40 | 1 | RESISTOR 100K 1/2W |
| 41 | 1 | RESISTOR 100K 1/2W |
| 42 | 1 | RESISTOR 100K 1/2W |
| 43 | 1 | RESISTOR 100K 1/2W |
| 44 | 1 | RESISTOR 100K 1/2W |
| 45 | 1 | RESISTOR 100K 1/2W |
| 46 | 1 | RESISTOR 100K 1/2W |
| 47 | 1 | RESISTOR 100K 1/2W |
| 48 | 1 | RESISTOR 100K 1/2W |
| 49 | 1 | RESISTOR 100K 1/2W |
| 50 | 1 | RESISTOR 100K 1/2W |
| 51 | 1 | RESISTOR 100K 1/2W |
| 52 | 1 | RESISTOR 100K 1/2W |
| 53 | 1 | RESISTOR 100K 1/2W |
| 54 | 1 | RESISTOR 100K 1/2W |
| 55 | 1 | RESISTOR 100K 1/2W |
| 56 | 1 | RESISTOR 100K 1/2W |
| 57 | 1 | RESISTOR 100K 1/2W |
| 58 | 1 | RESISTOR 100K 1/2W |
| 59 | 1 | RESISTOR 100K 1/2W |
| 60 | 1 | RESISTOR 100K 1/2W |
| 61 | 1 | RESISTOR 100K 1/2W |
| 62 | 1 | RESISTOR 100K 1/2W |
| 63 | 1 | RESISTOR 100K 1/2W |
| 64 | 1 | RESISTOR 100K 1/2W |
| 65 | 1 | RESISTOR 100K 1/2W |
| 66 | 1 | RESISTOR 100K 1/2W |
| 67 | 1 | RESISTOR 100K 1/2W |
| 68 | 1 | RESISTOR 100K 1/2W |
| 69 | 1 | RESISTOR 100K 1/2W |
| 70 | 1 | RESISTOR 100K 1/2W |
| 71 | 1 | RESISTOR 100K 1/2W |
| 72 | 1 | RESISTOR 100K 1/2W |
| 73 | 1 | RESISTOR 100K 1/2W |
| 74 | 1 | RESISTOR 100K 1/2W |
| 75 | 1 | RESISTOR 100K 1/2W |
| 76 | 1 | RESISTOR 100K 1/2W |
| 77 | 1 | RESISTOR 100K 1/2W |
| 78 | 1 | RESISTOR 100K 1/2W |
| 79 | 1 | RESISTOR 100K 1/2W |
| 80 | 1 | RESISTOR 100K 1/2W |
| 81 | 1 | RESISTOR 100K 1/2W |
| 82 | 1 | RESISTOR 100K 1/2W |
| 83 | 1 | RESISTOR 100K 1/2W |
| 84 | 1 | RESISTOR 100K 1/2W |
| 85 | 1 | RESISTOR 100K 1/2W |
| 86 | 1 | RESISTOR 100K 1/2W |
| 87 | 1 | RESISTOR 100K 1/2W |
| 88 | 1 | RESISTOR 100K 1/2W |
| 89 | 1 | RESISTOR 100K 1/2W |
| 90 | 1 | RESISTOR 100K 1/2W |
| 91 | 1 | RESISTOR 100K 1/2W |
| 92 | 1 | RESISTOR 100K 1/2W |
| 93 | 1 | RESISTOR 100K 1/2W |
| 94 | 1 | RESISTOR 100K 1/2W |
| 95 | 1 | RESISTOR 100K 1/2W |
| 96 | 1 | RESISTOR 100K 1/2W |
| 97 | 1 | RESISTOR 100K 1/2W |
| 98 | 1 | RESISTOR 100K 1/2W |
| 99 | 1 | RESISTOR 100K 1/2W |
| 100 | 1 | RESISTOR 100K 1/2W |

6170100

15.01A-23/18

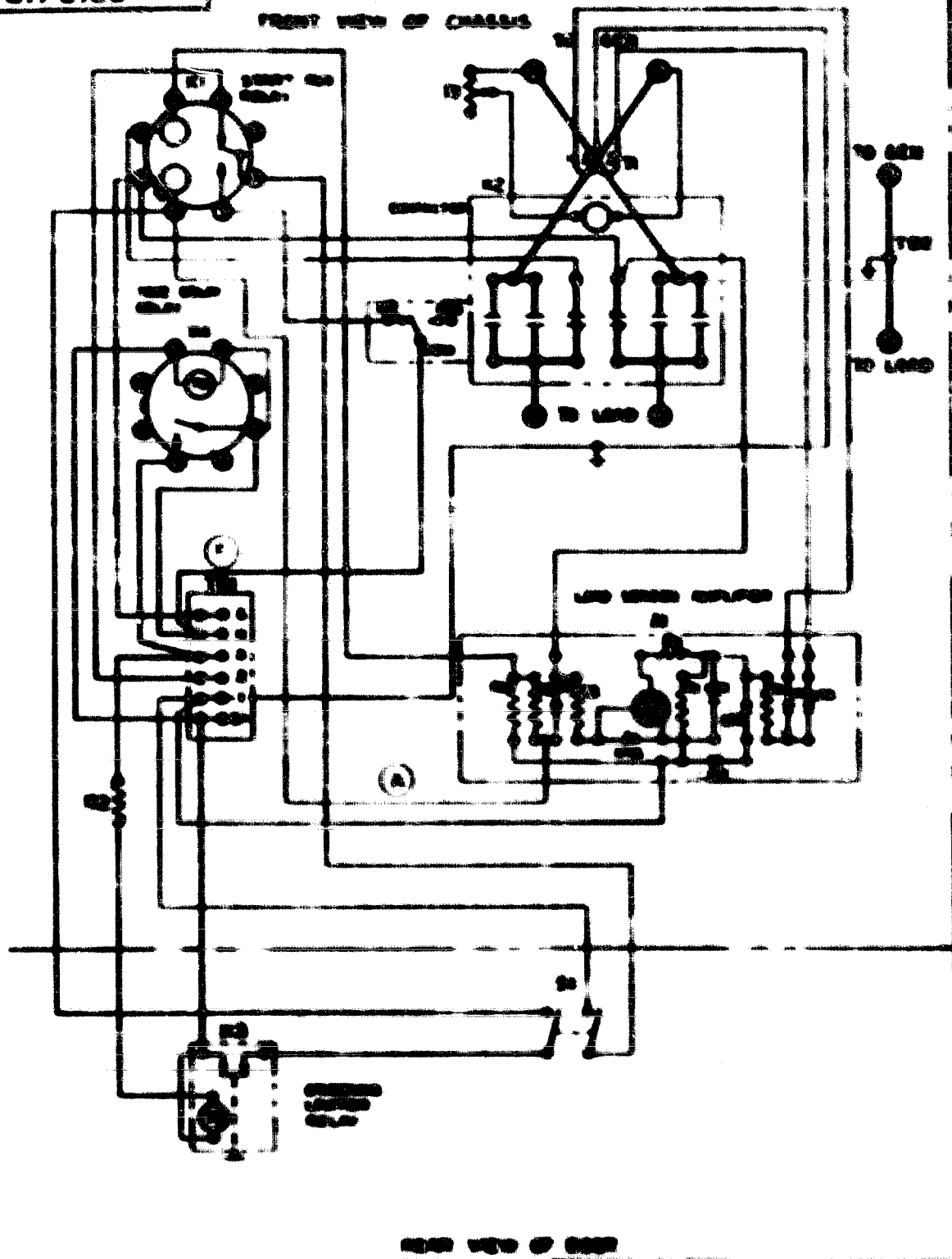
6170100

15.01A-23/18

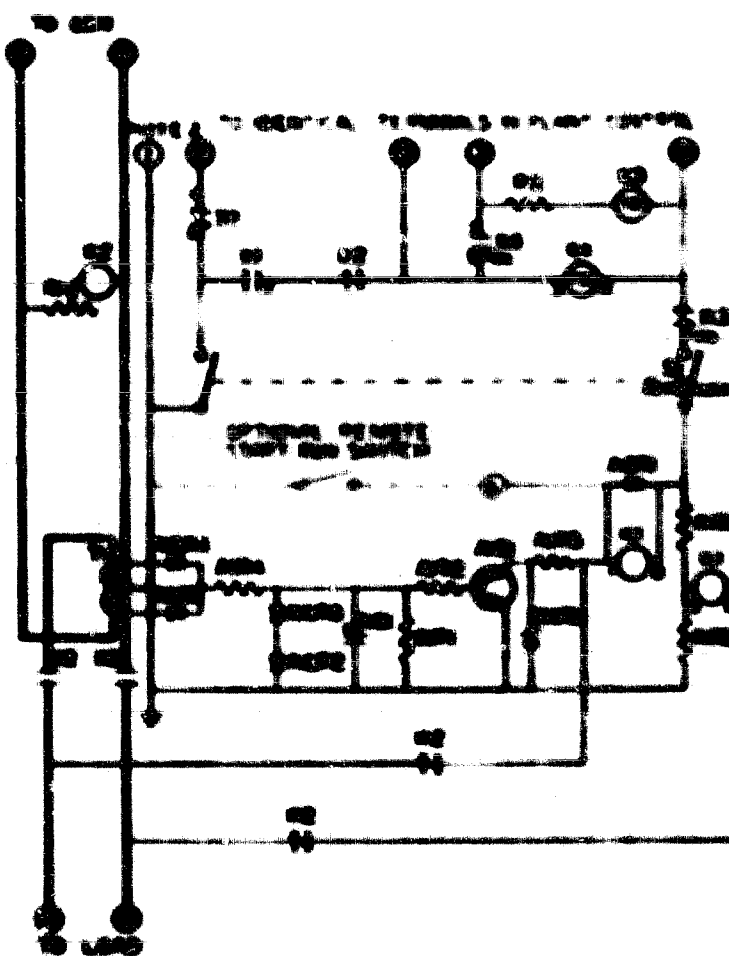
6170100

617C105

WIRING DIAGRAM
FRONT VIEW OF CHASSIS



SCHEMATIC



| REF. NO. | REV. | DATE | BY | CHKD. | DESCRIPTION |
|----------|------|----------|----------|----------|----------------|
| 1 | 1 | 11-15-54 | J. H. B. | J. H. B. | INITIAL DESIGN |
| 2 | 2 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 3 | 3 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 4 | 4 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 5 | 5 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 6 | 6 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 7 | 7 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 8 | 8 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 9 | 9 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 10 | 10 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 11 | 11 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 12 | 12 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 13 | 13 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 14 | 14 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 15 | 15 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 16 | 16 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 17 | 17 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 18 | 18 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 19 | 19 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 20 | 20 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 21 | 21 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 22 | 22 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 23 | 23 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 24 | 24 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 25 | 25 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 26 | 26 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 27 | 27 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 28 | 28 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 29 | 29 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 30 | 30 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 31 | 31 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 32 | 32 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 33 | 33 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 34 | 34 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 35 | 35 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 36 | 36 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 37 | 37 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 38 | 38 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 39 | 39 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 40 | 40 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 41 | 41 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 42 | 42 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 43 | 43 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 44 | 44 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 45 | 45 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 46 | 46 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 47 | 47 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 48 | 48 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 49 | 49 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 50 | 50 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 51 | 51 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 52 | 52 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 53 | 53 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 54 | 54 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 55 | 55 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 56 | 56 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 57 | 57 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 58 | 58 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 59 | 59 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 60 | 60 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 61 | 61 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 62 | 62 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 63 | 63 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 64 | 64 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 65 | 65 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 66 | 66 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 67 | 67 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 68 | 68 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 69 | 69 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 70 | 70 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 71 | 71 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 72 | 72 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 73 | 73 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 74 | 74 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 75 | 75 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 76 | 76 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 77 | 77 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 78 | 78 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 79 | 79 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 80 | 80 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 81 | 81 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 82 | 82 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 83 | 83 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 84 | 84 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 85 | 85 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 86 | 86 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 87 | 87 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 88 | 88 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 89 | 89 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 90 | 90 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 91 | 91 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 92 | 92 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 93 | 93 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 94 | 94 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 95 | 95 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 96 | 96 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 97 | 97 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 98 | 98 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 99 | 99 | 11-15-54 | J. H. B. | J. H. B. | REVISION |
| 100 | 100 | 11-15-54 | J. H. B. | J. H. B. | REVISION |

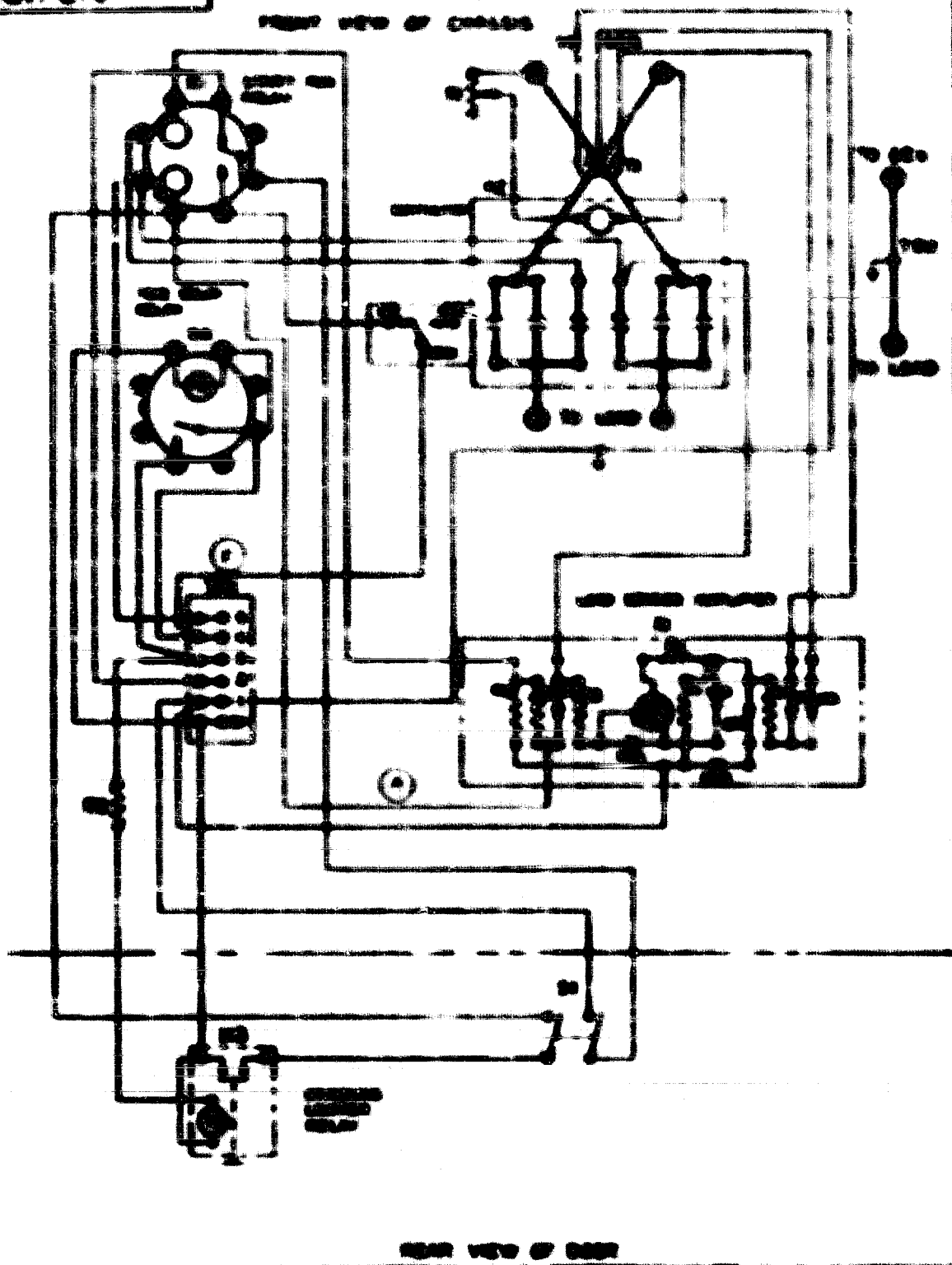
15.01A-23/100

1. CIRCUITRY IS TO BE CONNECTED TO LOAD TERMINALS OF COMPONENTS IN SUCH A MANNER THAT THE CIRCUITRY WILL BE PROTECTED FROM OVERHEATING.
 2. IT IS NOT NECESSARY TO CONNECT TERMINALS TO THE LOAD TERMINALS OF THE CIRCUITRY IN SUCH A MANNER THAT THE CIRCUITRY WILL BE PROTECTED FROM OVERHEATING.
- END OF DOCUMENT

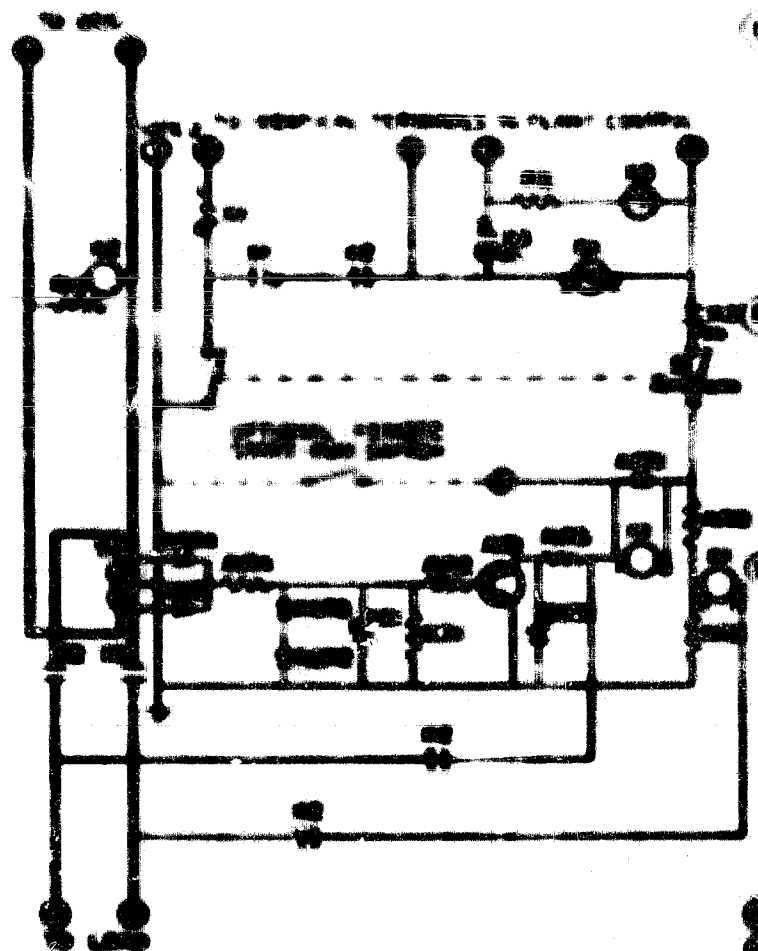
15.01A-23/100

617C105

617C104

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

SCHEMATIC



| WIRE NO. | WIRE COLOR | TO | FROM |
|----------|------------|-----|------|
| 1 | RED | GEN | 1 |
| 2 | RED | GEN | 2 |
| 3 | RED | GEN | 3 |
| 4 | RED | GEN | 4 |
| 5 | RED | GEN | 5 |
| 6 | RED | GEN | 6 |
| 7 | RED | GEN | 7 |
| 8 | RED | GEN | 8 |
| 9 | RED | GEN | 9 |
| 10 | RED | GEN | 10 |
| 11 | RED | GEN | 11 |
| 12 | RED | GEN | 12 |
| 13 | RED | GEN | 13 |
| 14 | RED | GEN | 14 |
| 15 | RED | GEN | 15 |
| 16 | RED | GEN | 16 |
| 17 | RED | GEN | 17 |
| 18 | RED | GEN | 18 |
| 19 | RED | GEN | 19 |
| 20 | RED | GEN | 20 |
| 21 | RED | GEN | 21 |
| 22 | RED | GEN | 22 |
| 23 | RED | GEN | 23 |
| 24 | RED | GEN | 24 |
| 25 | RED | GEN | 25 |
| 26 | RED | GEN | 26 |
| 27 | RED | GEN | 27 |
| 28 | RED | GEN | 28 |
| 29 | RED | GEN | 29 |
| 30 | RED | GEN | 30 |
| 31 | RED | GEN | 31 |
| 32 | RED | GEN | 32 |
| 33 | RED | GEN | 33 |
| 34 | RED | GEN | 34 |
| 35 | RED | GEN | 35 |
| 36 | RED | GEN | 36 |
| 37 | RED | GEN | 37 |
| 38 | RED | GEN | 38 |
| 39 | RED | GEN | 39 |
| 40 | RED | GEN | 40 |
| 41 | RED | GEN | 41 |
| 42 | RED | GEN | 42 |
| 43 | RED | GEN | 43 |
| 44 | RED | GEN | 44 |
| 45 | RED | GEN | 45 |
| 46 | RED | GEN | 46 |
| 47 | RED | GEN | 47 |
| 48 | RED | GEN | 48 |
| 49 | RED | GEN | 49 |
| 50 | RED | GEN | 50 |
| 51 | RED | GEN | 51 |
| 52 | RED | GEN | 52 |
| 53 | RED | GEN | 53 |
| 54 | RED | GEN | 54 |
| 55 | RED | GEN | 55 |
| 56 | RED | GEN | 56 |
| 57 | RED | GEN | 57 |
| 58 | RED | GEN | 58 |
| 59 | RED | GEN | 59 |
| 60 | RED | GEN | 60 |
| 61 | RED | GEN | 61 |
| 62 | RED | GEN | 62 |
| 63 | RED | GEN | 63 |
| 64 | RED | GEN | 64 |
| 65 | RED | GEN | 65 |
| 66 | RED | GEN | 66 |
| 67 | RED | GEN | 67 |
| 68 | RED | GEN | 68 |
| 69 | RED | GEN | 69 |
| 70 | RED | GEN | 70 |
| 71 | RED | GEN | 71 |
| 72 | RED | GEN | 72 |
| 73 | RED | GEN | 73 |
| 74 | RED | GEN | 74 |
| 75 | RED | GEN | 75 |
| 76 | RED | GEN | 76 |
| 77 | RED | GEN | 77 |
| 78 | RED | GEN | 78 |
| 79 | RED | GEN | 79 |
| 80 | RED | GEN | 80 |
| 81 | RED | GEN | 81 |
| 82 | RED | GEN | 82 |
| 83 | RED | GEN | 83 |
| 84 | RED | GEN | 84 |
| 85 | RED | GEN | 85 |
| 86 | RED | GEN | 86 |
| 87 | RED | GEN | 87 |
| 88 | RED | GEN | 88 |
| 89 | RED | GEN | 89 |
| 90 | RED | GEN | 90 |
| 91 | RED | GEN | 91 |
| 92 | RED | GEN | 92 |
| 93 | RED | GEN | 93 |
| 94 | RED | GEN | 94 |
| 95 | RED | GEN | 95 |
| 96 | RED | GEN | 96 |
| 97 | RED | GEN | 97 |
| 98 | RED | GEN | 98 |
| 99 | RED | GEN | 99 |
| 100 | RED | GEN | 100 |

15.0NA-23/12B

3 CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (C2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER

2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD

NOTE: 1 - OPERATE WITH NEGATIVE GROUND ONLY

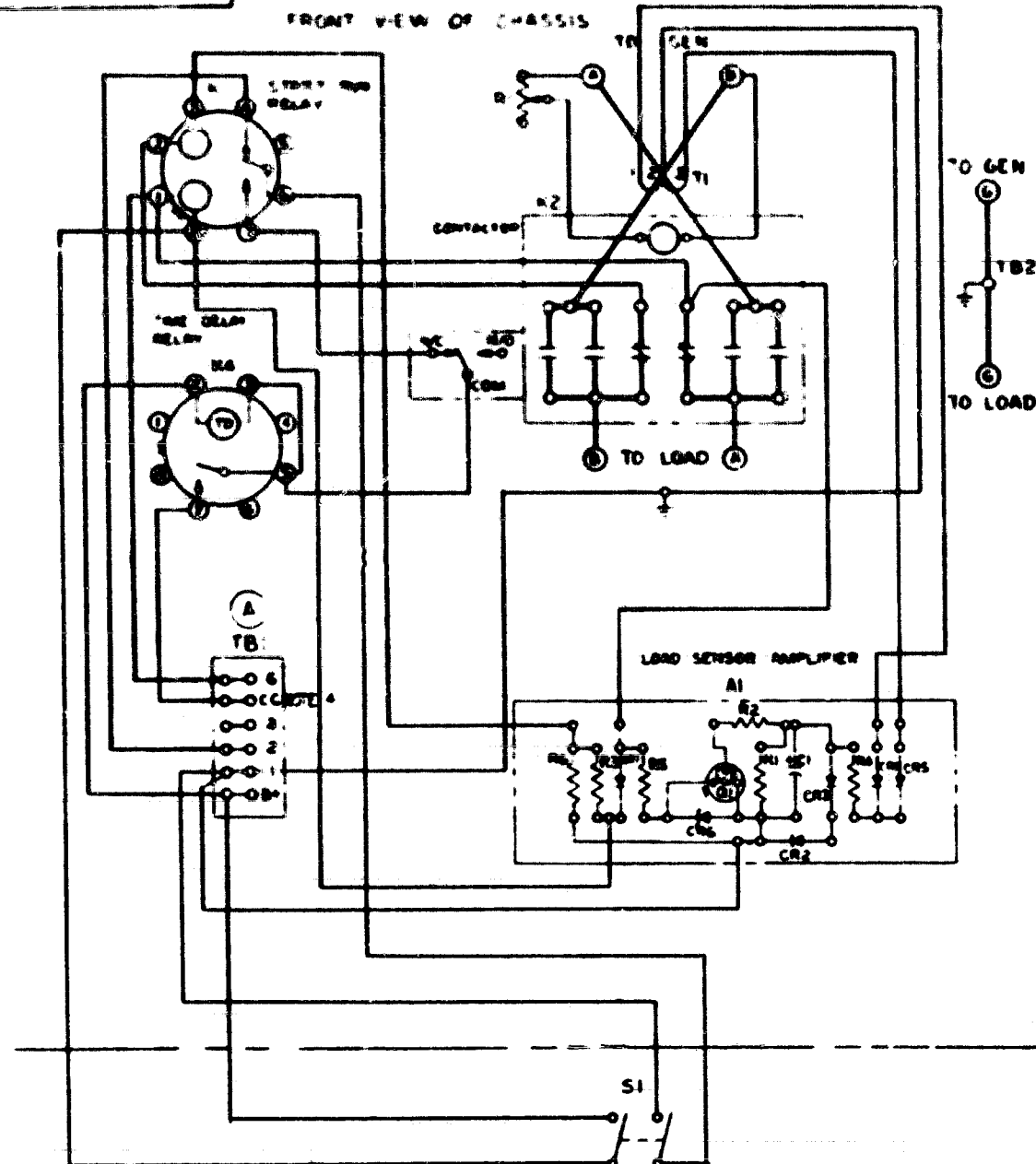
| | | | | |
|---|-------------------|----------|-----|----------|
| 1 | 15.0NA-23/12B | 12-20-64 | CDR | 12-20-64 |
| 2 | 12 VOLT CROSSED | 12-20-64 | CDR | 12-20-64 |
| 3 | 120/240 V. 1PH. | 12-20-64 | CDR | 12-20-64 |
| 4 | 1 WIRE, 50/60 CY. | 12-20-64 | CDR | 12-20-64 |

| | | | | |
|---|-------------------|----------|-----|----------|
| 1 | 15.0NA-23/12B | 12-20-64 | CDR | 12-20-64 |
| 2 | 12 VOLT CROSSED | 12-20-64 | CDR | 12-20-64 |
| 3 | 120/240 V. 1PH. | 12-20-64 | CDR | 12-20-64 |
| 4 | 1 WIRE, 50/60 CY. | 12-20-64 | CDR | 12-20-64 |

617C104

617C116

ALIGNING DIAGRAM
FRONT VIEW OF CHASSIS



REAR VIEW OF DOOR

USE WITH TYPE III CYCLE CRANKER W.D. 625B224

6. ON SILKSCREEN 98C1815, PAINT GREEN OVER "CRANKING LIMITER" & "RESET AFTER 1 MINUTE"

5. PASTE PRINT OF SCHEMATIC INSIDE COVER OF CONTROL BOX

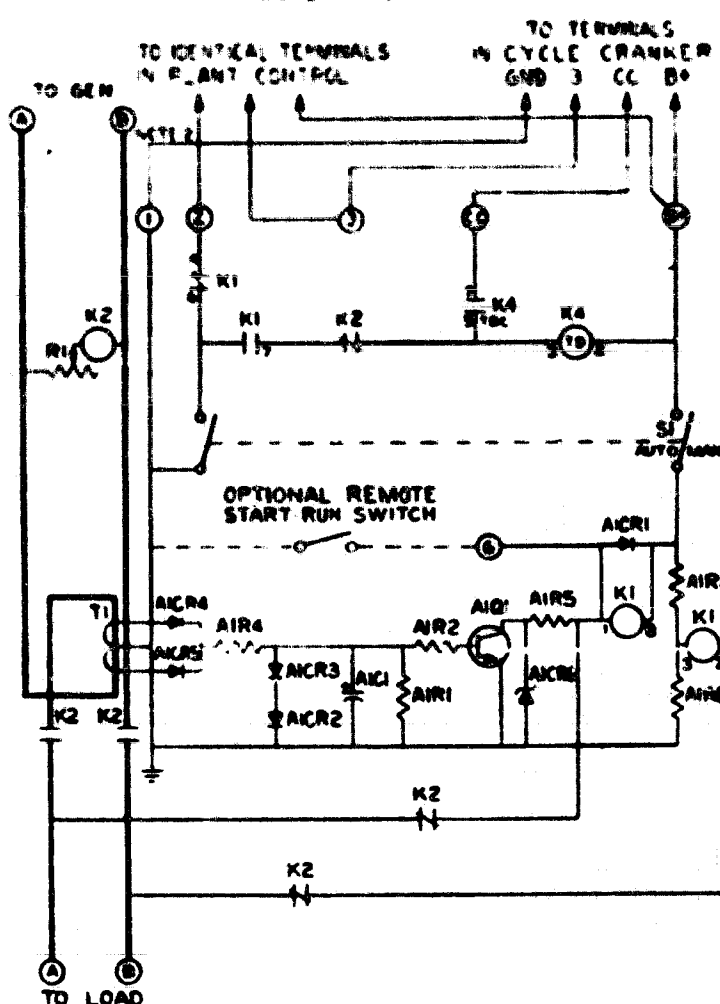
4. BESIDE T61, STAMP CC IN PLACE OF H

3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2) THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE
GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD

NOTE: 1- OPERATE WITH NEGATIVE GROUND ONLY


SCHEMATIC



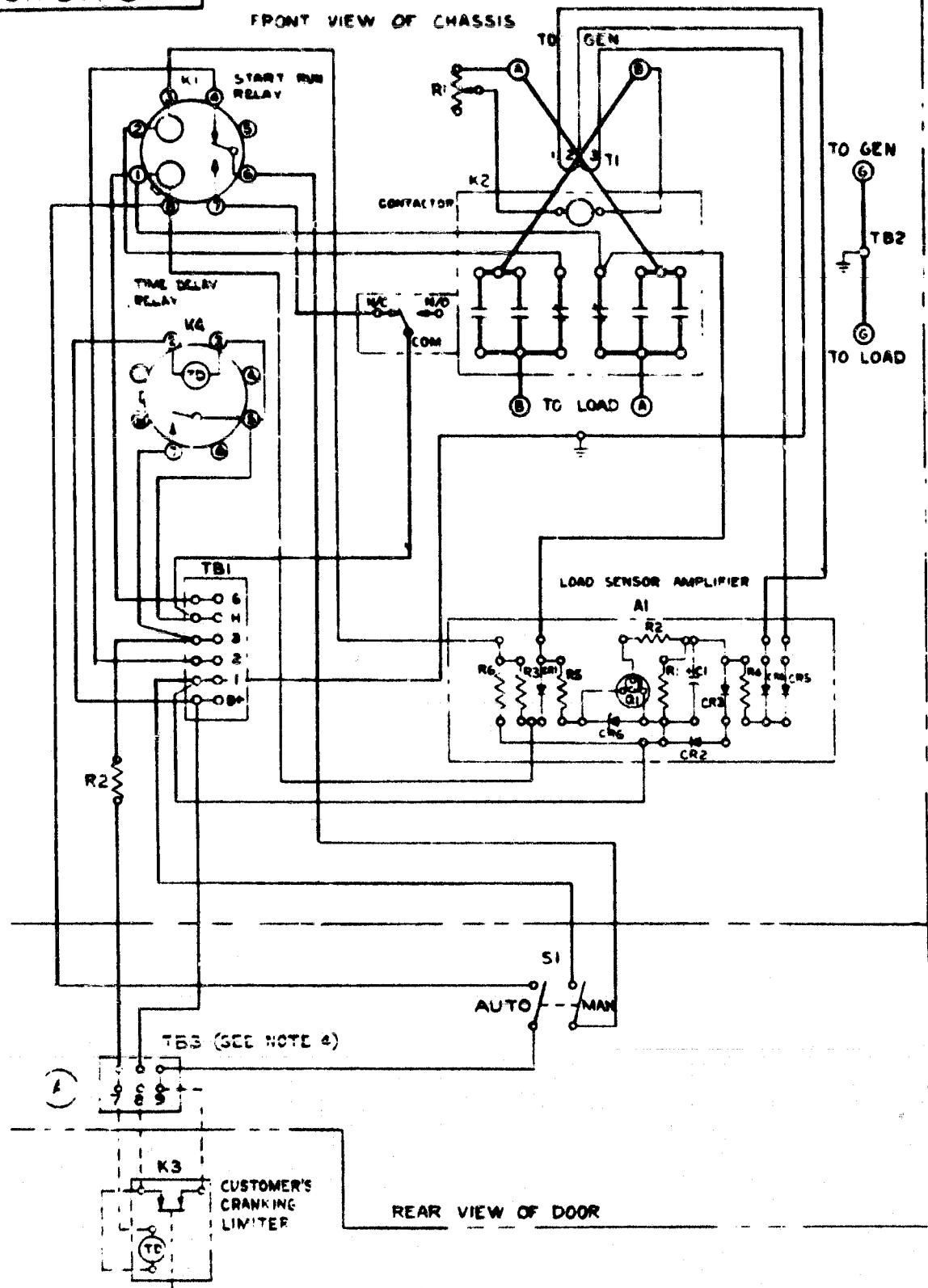
NOTE:
UNLESS OTHERWISE NOTED, ALL
COMPONENTS ARE SHOWN IN THE
DE-ENERGIZED POSITION.

| REF DES | PART NO | QTY | DESCRIPTION |
|---------|----------|------|---------------------------------|
| A1 | 302H463 | 1 | AMPLIFIER ASSY - LOAD SENSOR |
| | 332A932 | 1 | BOARD - INSULATING |
| K1 | 307A658 | 1 | RELAY - START RUN |
| | 323P380 | 1 | SOCKET |
| K2 | 307C667 | 1 | CONTACTOR |
| | 307A685 | 4 | JUMPER |
| | 160-144 | 2 | STRAP |
| | 307A942 | 2 | BUS BAR |
| | | 2 | SLEEVING 1/2" OF (D98-22) |
| | 332-142 | 4 | TERMINAL |
| | 309A42 | 1 | SWITCH - AIR |
| | 309A183 | 1 | INSULATOR |
| K4 | 307A689 | 1 | RELAY - TIME DELAY, PREHEAT () |
| | 323P380 | 1 | SOCKET |
| R1 | 304A131 | 1 | RESISTOR, 750 OHM, 25W |
| S1 | 308P88 | 1 | SWITCH - AUTO MANUAL |
| T1 | 319A239 | 1 | TRANS. ASSY - CURRENT |
| TB1 | 332A699 | 1 | BLOCK - TERMINAL |
| | 98A1927 | 1 | SLK SCREEN |
| TB2 | 332-142 | 2 | TERMINAL - GROUND |
| | 98A2045 | 1 | CAUTION LABEL |
| | | | |
| | 301D2573 | 1 | CONTROL BOX |
| | 98C1818 | 1 | SLK SCREEN (NOTE 5) |
| | | | |
| | 301B2586 | 1 | TRIM |
| | 518P237 | 3 | FASTENER - TRIM |
| | 815-178 | 1 | SCREW - HEX HD #10-32 X 5/8 LG |
| | 850-30 | 1 | LOCKWASHER #10 |
| | 99A966 | 1 | NAMEPLATE - CONTROL |
| | 517-12 | 1 | DOT BUTTON |
| | | | |
| | 517-43 | 2 | DOT BUTTON |
| | | | |
| | 334A1890 | 35FT | WIRE-FLEXIBLE |
| | 334A1842 | 2FT | WIRE-FLEXIBLE |

15.0HA-23/15B

| | | | | | |
|---|----------|--|--------------|-----|--------|
| | | | | | |
| C | CTED | PERC | 31141441 | - | 5-2-6 |
| E | | | | - | 13-3-6 |
| A | REV | WIR | S TERMINAL 5 | - | 26-6 |
| 151 | | DESIGN | | CDR | MATE |
|  | | DIVISION OF SUBMARINE CORPORATION Groton, Connecticut | | | |
| DATE | 11-17-67 | BY | CDR | 151 | |
| NAME SCHEMATIC & WIRING DIAGRAM AUTOMATIC DEMAND CONTROL | | | | | |
| PWS (4) | | 617C116 | | | |

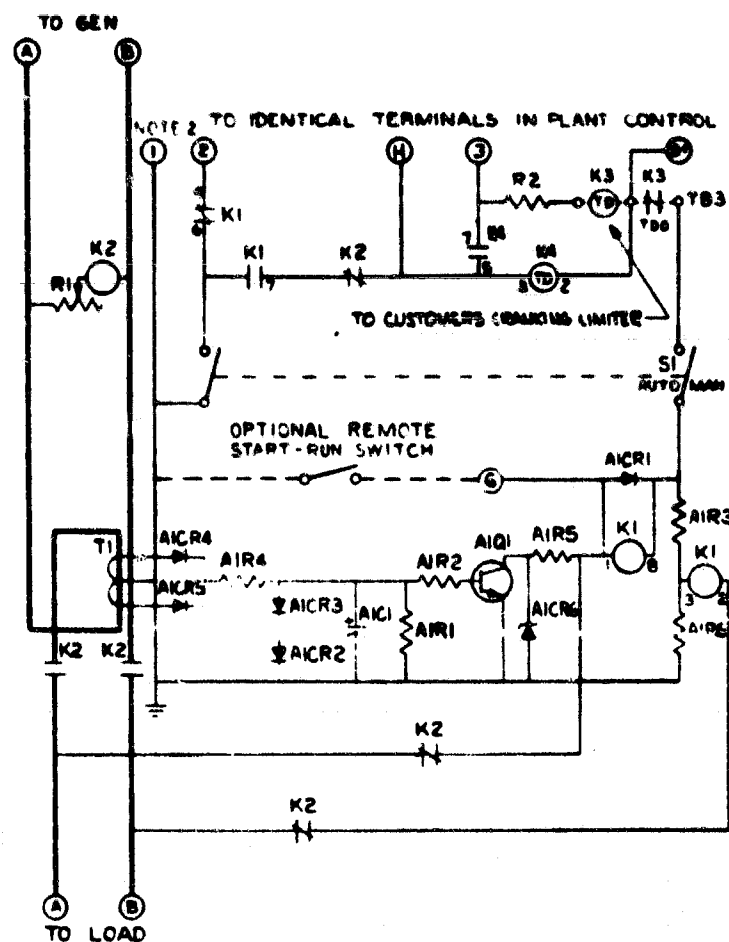
WIRING DIAGRAM
FRONT VIEW OF CHASSIS



4. PAINT BACK OF MARKER STRIP WHITE, BEFORE MTG IT IN BOX
3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2) THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD

NOTE: 1 - OPERATE WITH NEGATIVE GROUND ONLY

SCHEMATIC



PARTS LIST

[illegible]

15.0HA-23/17B

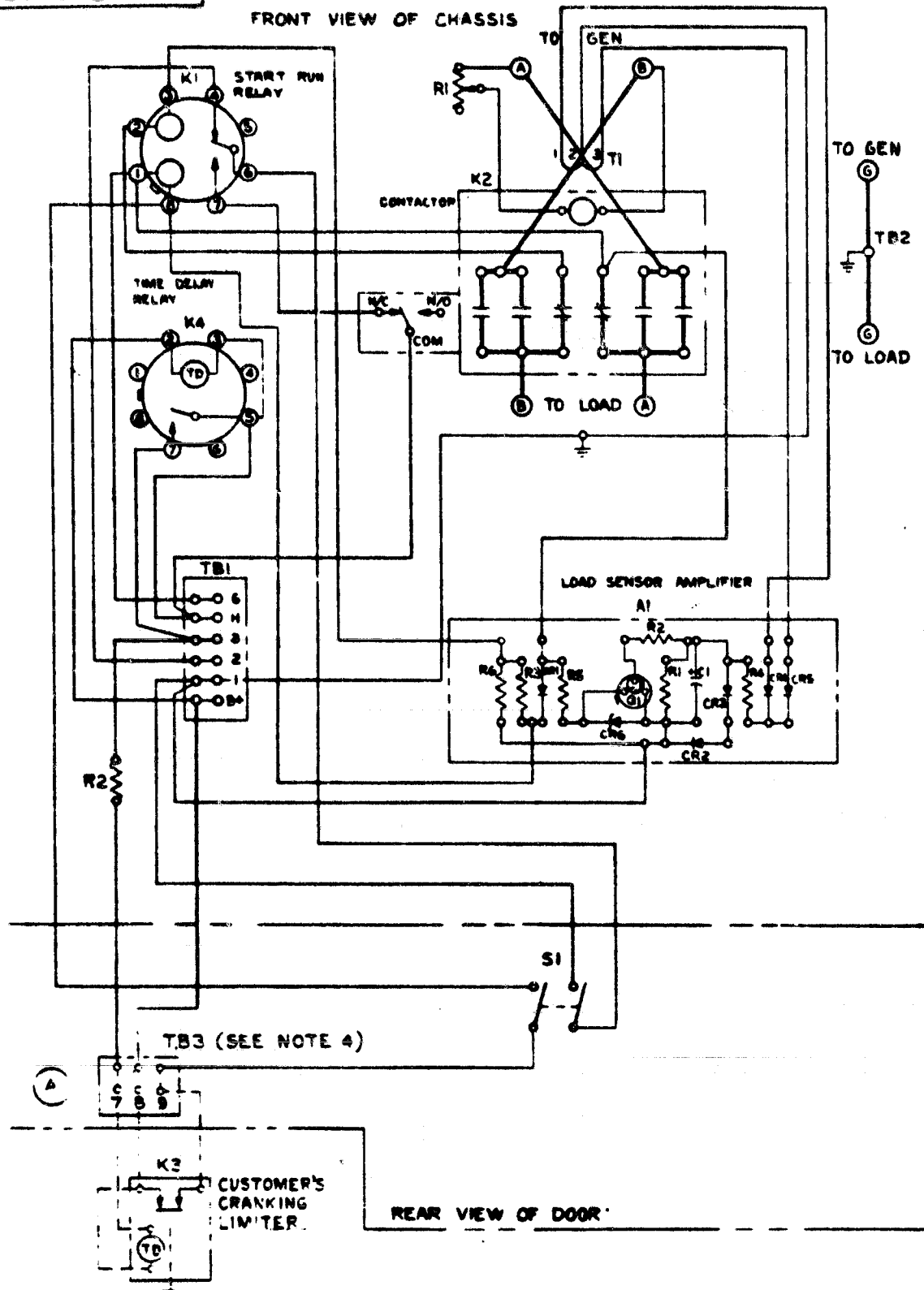
| | | | |
|-----|--------------------------|----|---------|
| E | 323P380 ADDED | 37 | 8-8-70 |
| D | K4(307A245) ADDED | 37 | 8-8-70 |
| C | FP 45 * SACCE | 37 | 8-8-70 |
| A | REMOVED F3 350 9x4 | 37 | 9-10-70 |
| A | ADDED TERM MACHINE CNTES | 37 | 8-8-70 |
| REF | 88-15-2 | CR | DATE |

Open DIVISION OF STUDENTS CORPORATION
Non-Profit Corporation

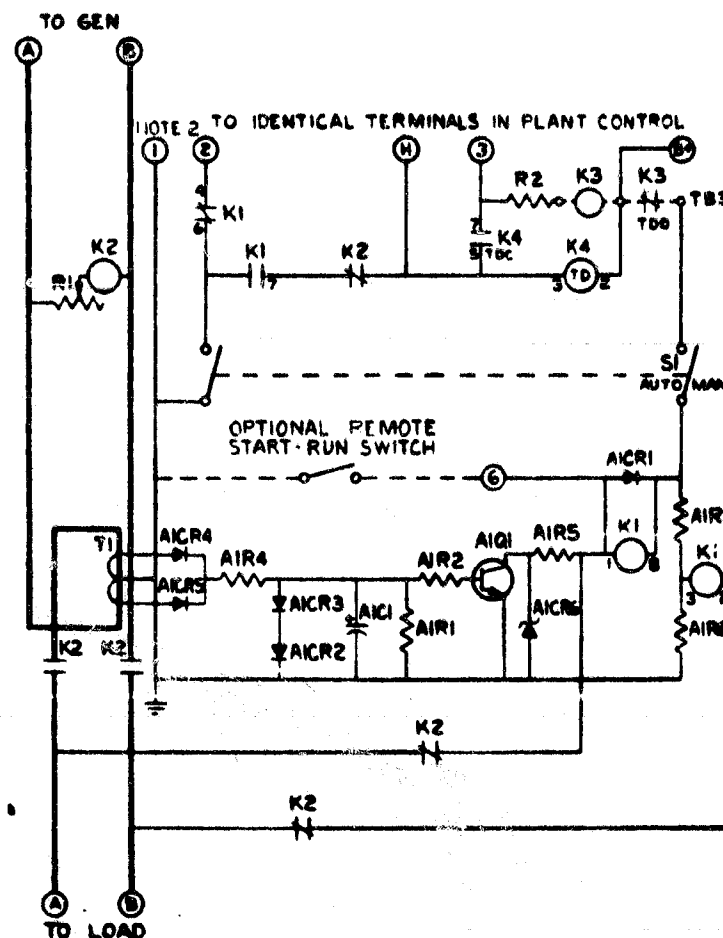
| | | | | | |
|------|-------------------------------|--------|--|-----|----|
| DATE | 15.0 HA - 23/17B | DATE | 7-2-69 | CDR | 15 |
| | 12 VOLT CRANKING | NAME | WIRING DIAGRAM CONTROL - AUTOMATIC DEMAND | | |
| | 120/240V, 1PH, 3W. 50/60CY | QWG NO | 617C130 | | |

617C131

WIRING DIAGRAM FRONT VIEW OF CHASSIS



SCHEMATIC



| REF DES | PART NO | QTY | DESCRIPTION |
|---------|--------------|-----|---------------------------------|
| A1 | 300B463 | 1 | AMPLIFIER ASSY - LOAD SENSOR |
| | 332A932 | 1 | BOARD - INSULATING |
| K1 | 307A858 | 1 | RELAY - START RUN |
| | 323P380 | 1 | SOCKET |
| * K2 | 307C667 | 1 | CONTACTOR |
| | 307A685 | 4 | JUMPER |
| | 160-144 | 2 | STRAP |
| | 307A942 | 2 | BUS BAR |
| | 332-142 | 4 | SLEEVING 1/4" OF (898-22) |
| | 309A42 | 1 | SWITCH - AUX |
| | 309A193 | 1 | INSULATOR |
| K3 | 3208104(REF) | 1 | RELAY - CRANKING LIMITER |
| K4 | 307A682 | 1 | RELAY - TIME DELAY, PREHEAT (S) |
| | 323P380 | 1 | SOCKET |
| R1 | 304A131 | 1 | RESISTOR, 750 OHM, 25W |
| R2 | 304A192 | 1 | RESISTOR, 3 OHM, 10W |
| S1 | 308P88 | 1 | SWITCH - AUTO MANUAL |
| T1 | 319A233 | 1 | TRANS. ASSY - CURRENT |
| TB1 | 332A699 | 1 | BLOCK - TERMINAL |
| | 98A1927 | 1 | SILK SCREEN |
| TB2 | 332-142 | 2 | TERMINAL - GROUND |
| TB3 | 332A611 | 1 | BLOCK - TERMINAL |
| | 332A612 | 1 | STRIP - MARKER (SEE NOTE 4) |
| | 98A2045 | 1 | CAUTION LABEL |
| | 301D2573 | 1 | CONTROL BOX MODIFY |
| | 98C1813 | 1 | SILK SCREEN |
| | 98A1948 | 1 | SILK SCREEN |
| | 301B2586 | 1 | TRIM |
| | 518P237 | 3 | FASTENER - TRIM |
| | 818-178 | 1 | SCREW - HEX NO 10-32 X 5/8 LG |
| | 850-30 | 1 | LOCKWASHER #10 |
| | 98A966 | 1 | NAMEPLATE - CONTROL |

1517C131

334A1890 25 FT WIRE-FLEXIBLE NO 20 AWG
334A1842 12 FT WIRE-FLEXIBLE NO 16 AWG

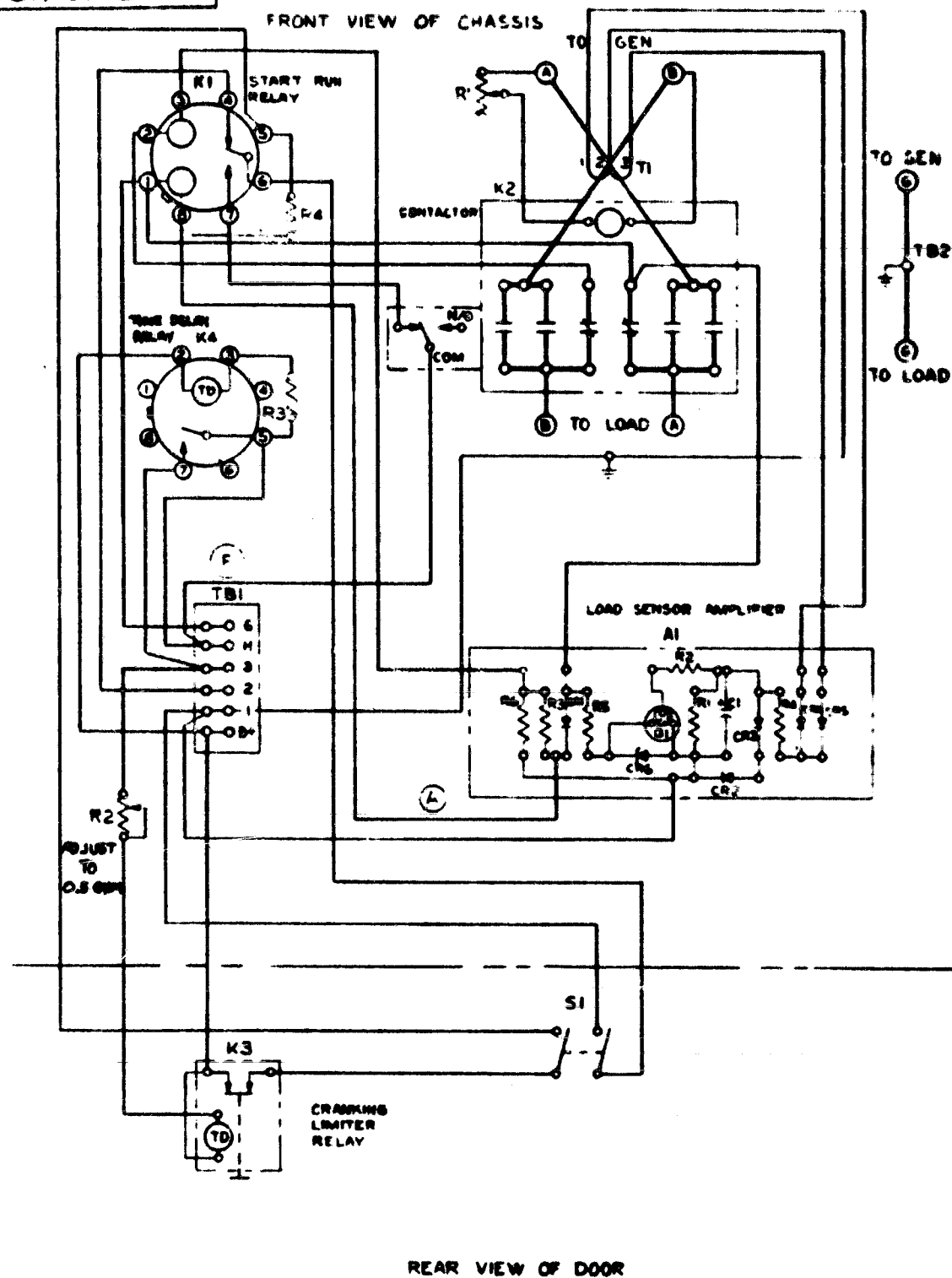
- PAINT BACK OF MARKER STRIP WHITE, BEFORE MTG IT IN BOX
- CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL DESTROY THE LOAD SENSOR AMPLIFIER.
- IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN, BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD

NOTE: 1 - OPERATE WITH NEGATIVE GROUND ONLY

15.0HA-23/18B

| | | | | | |
|----------------------------------|--|--------------------|--|--------------------------|--|
| A | | ARMED TERM MARKING | | DATE | |
| DIVISION | | DATE | | DATE | |
| <div> </div> | | | | | |
| DIVISION OF STANDARD CORPORATION | | | | | |
| <div> </div> | | | | | |
| PART NO | | REV | | DATE | |
| 15.0HA-23/18B | | 7-8-69 | | COR | |
| 12 VOLT CRANKING | | WIRING DIAGRAM | | CONTROL-AUTOMATIC DEMAND | |
| 120/240 V. 1PH. | | 3 WIRE, 50/60 CY. | | 617C131 | |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

[illegible]

| QTY | | DESCRIPTION |
|------|------|------------------------------|
| 1 | 1 | MULTIPLEX ASSY - LOAD SENSOR |
| 1 | 1 | INSUL - INSULATING |
| 1 | 1 | RELAY - START RUN |
| 1 | 1 | SOCKET |
| 1 | 1 | CONTACTOR |
| 1 | 1 | JASPER |
| 1 | 1 | STRAP |
| 1 | 1 | W/ BAR |
| 1 | 1 | SLEEVE 1 3/4" OF (898-A) |
| 1 | 1 | TERMINAL |
| 1 | 1 | SWITCH - AUX |
| 1 | 1 | INSULATOR |
| 1 | 1 | RELAY - CRANKING |
| 1 | 1 | RELAY - TIME DELAY |
| 1 | 1 | SOCKET |
| 1 | 1 | RESISTOR, 750 OHM, 50W |
| 1 | 1 | RESISTOR, 5 OHM, 10W |
| 1 | 1 | SWITCH - AUTO MANUAL |
| 1 | 1 | TRANS. ASSY - CURRENT |
| 1 | 1 | BLOCK - TERMINAL |
| 1 | 1 | SILK SCREEN |
| 2 | 2 | TERMINAL - GROUND |
| 1 | 1 | RES STCR, 4" LONG |
| 1 | 1 | RESISTOR, 75 OHM, 10W |
| 1 | 1 | CAUTION LABEL |
| 1 | 1 | CONTROL BOX |
| 1 | 1 | SILK SCREEN |
| 1 | 1 | SILK SCREEN |
| 1 | 1 | TRIM |
| 1 | 1 | FASTENER - TRIM |
| 1 | 1 | SCREW - HEX 10-30 |
| 1 | 1 | LOCKWASHER 10 |
| 1 | 1 | NAMEPLATE - COPPER |
| 334A | 33FT | RE-FLEX |
| 334A | 33FT | RE-FLEX |

15.0HA-23-4/100

2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD

NOTE - OPERATE WITH NEGATIVE GROUND ONLY

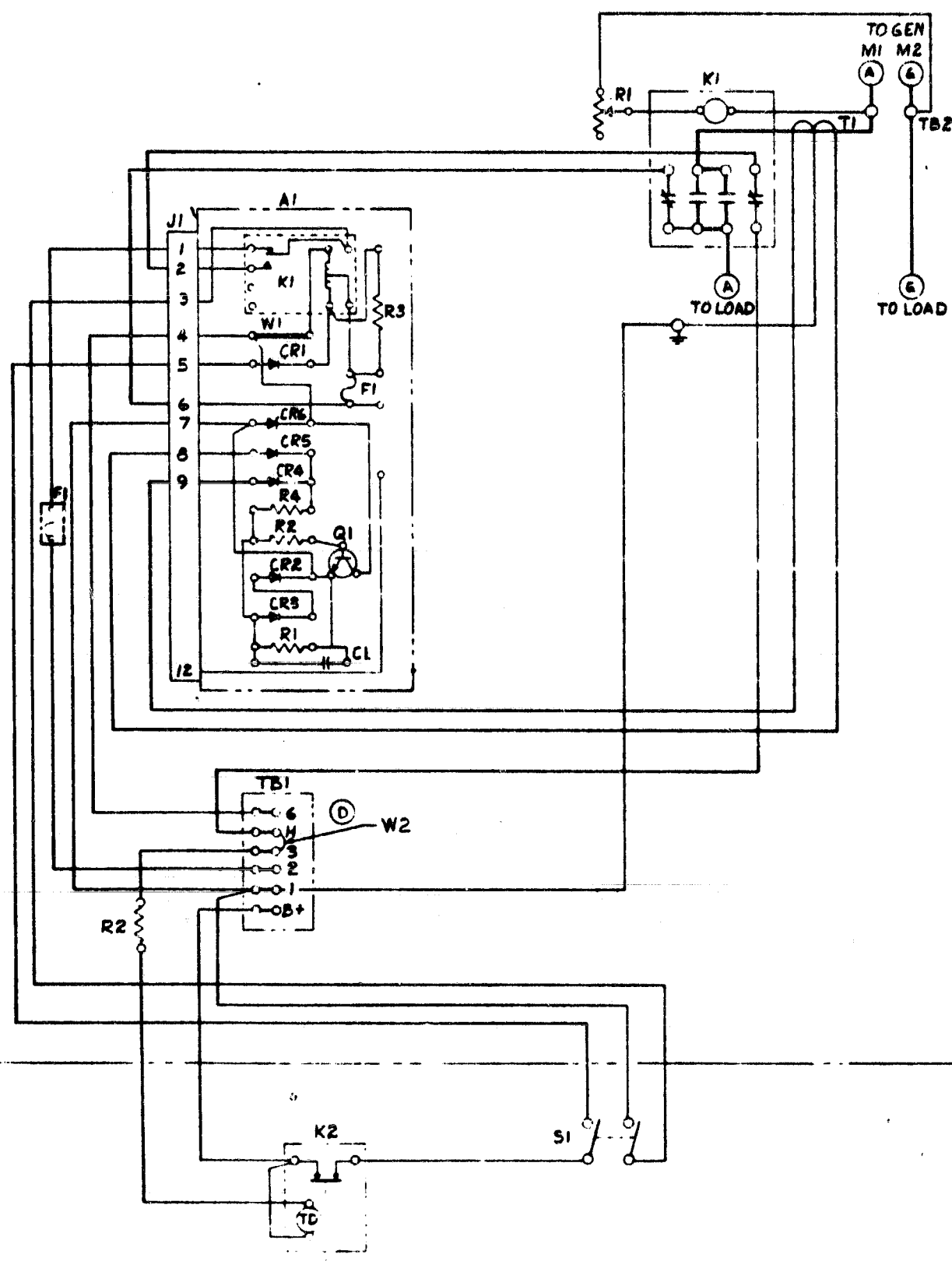
15.04A-23-4/10B

32 VOLT CRANKING

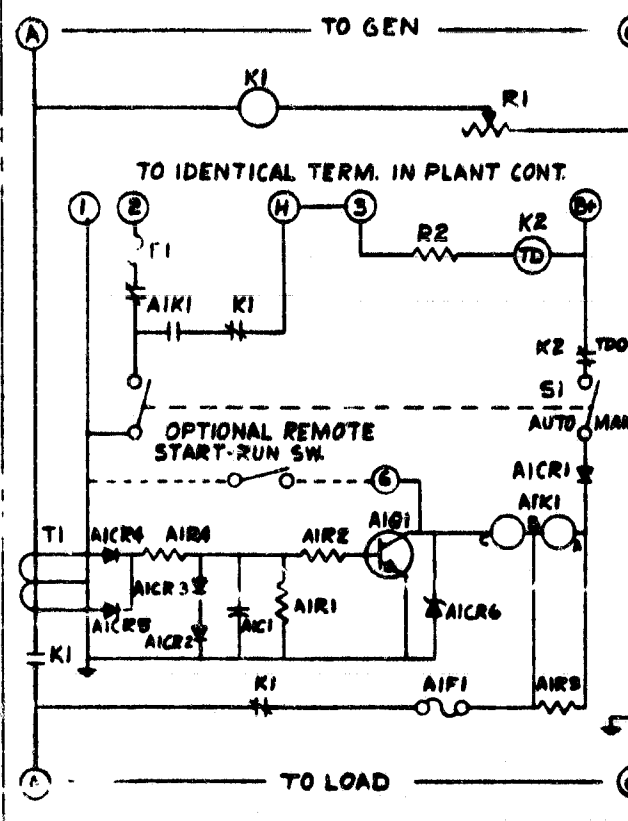
3072401, 194
3 WIFE, 50/0

6174

617C132

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

SCHEMATIC



NOTES

- 1 OPERATE WITH NEGATIVE GROUND ONLY
- 2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU THE AC GROUND LEAD

PARTS LIST

| REF. DES. | PART NO. | QTY. | DESCRIPTION |
|-----------|---------------|------|------------------------|
| A1 | 300B740 | 1 | CONTROL-LOAD SENSOR |
| | 301A3280 | 2 | BRACKET-MOUNTING |
| | 518A295 | 2 | FASTENER-SNAP IN |
| K1 | 307C885 | 1 | CONTACTOR |
| | 332-142 | 2 | TERMINAL |
| | 307A885 | 2 | JUMPER |
| | 180A144 | 1 | JUMPER |
| R2 | 329B104 | 1 | RELAY-CRANKING LIMITER |
| R1 | 304A879 | 1 | RESISTOR ASSY |
| | 304A282 (REF) | 1 | RESISTOR-300 OHM, 25 W |
| R2 | 304A192 (REF) | 1 | RESISTOR-3 OHM, 10 W |
| S1 | 308P88 (REF) | 1 | SWITCH-AUTO MANUAL |
| T1 | 375A344 | 1 | TRANSFORMER ASSY |
| TD1 | 332A99 (REF) | 1 | TERMINAL BLOCK |
| | 332A940 | 1 | MARKER STRIP |
| TD2 | 332-142 | 2 | TERMINAL-GROUND |
| W1 | 338C548 | 1 | WIRING HARNESS |
| W2 | 332A592 | 1 | JUMPER |
| | 301B3273 | 1 | CONTROL BOX |
| | 98C1815 | 1 | SILKSCREEN |
| | 98A2239 | 1 | SILKSCREEN-SCHWARTZ |
| | 301B2793 | 1 | TRIM |
| | 518P237 | 3 | FASTENER-TRIM |
| | 98A886 | 1 | NAMEPLATE-CONTROL |
| F1 | 321P153 | 1 | FUSE, 3 AMP |
| | 321-000 (REF) | 1 | BLOCK-FUSE |

617C132

7.5HA-21/1C

| | | |
|---|-------------------------|------------|
| D | REVISED WIRING ON TB1 | TV 10-3-70 |
| C | ADDED 33A592 (W2) | Jr 8-3-70 |
| B | TRIM WAS 301B2586 | W 11-5-70 |
| A | ADDED REF | W 11-5-70 |
| A | ADDED 321P153 & 321-000 | W 11-5-70 |

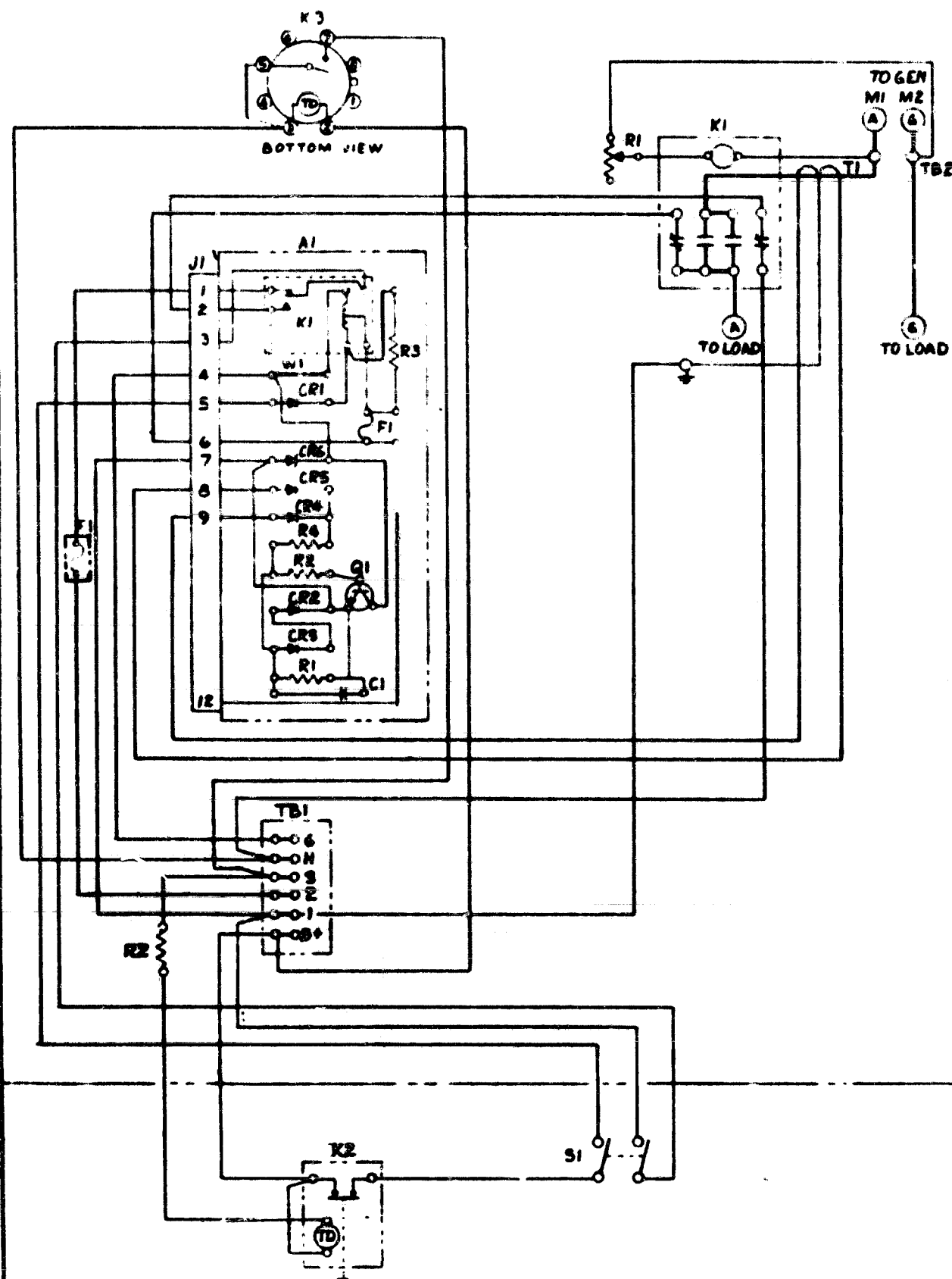
ORIGINAL

| | | | | | |
|-------------|---------|-----|-----|-----|-----|
| 7.5HA-21/1C | 2-16-70 | WKR | 3.0 | 1.0 | 1.0 |
| 120V 1FH | | | | | |
| 2W 50/60 CY | | | | | |

WIRING DIAGRAM
CONTROL-AUTO DEMAND

617C132

WIRING DIAGRAM
FRONT VIEW OF CHASSIS



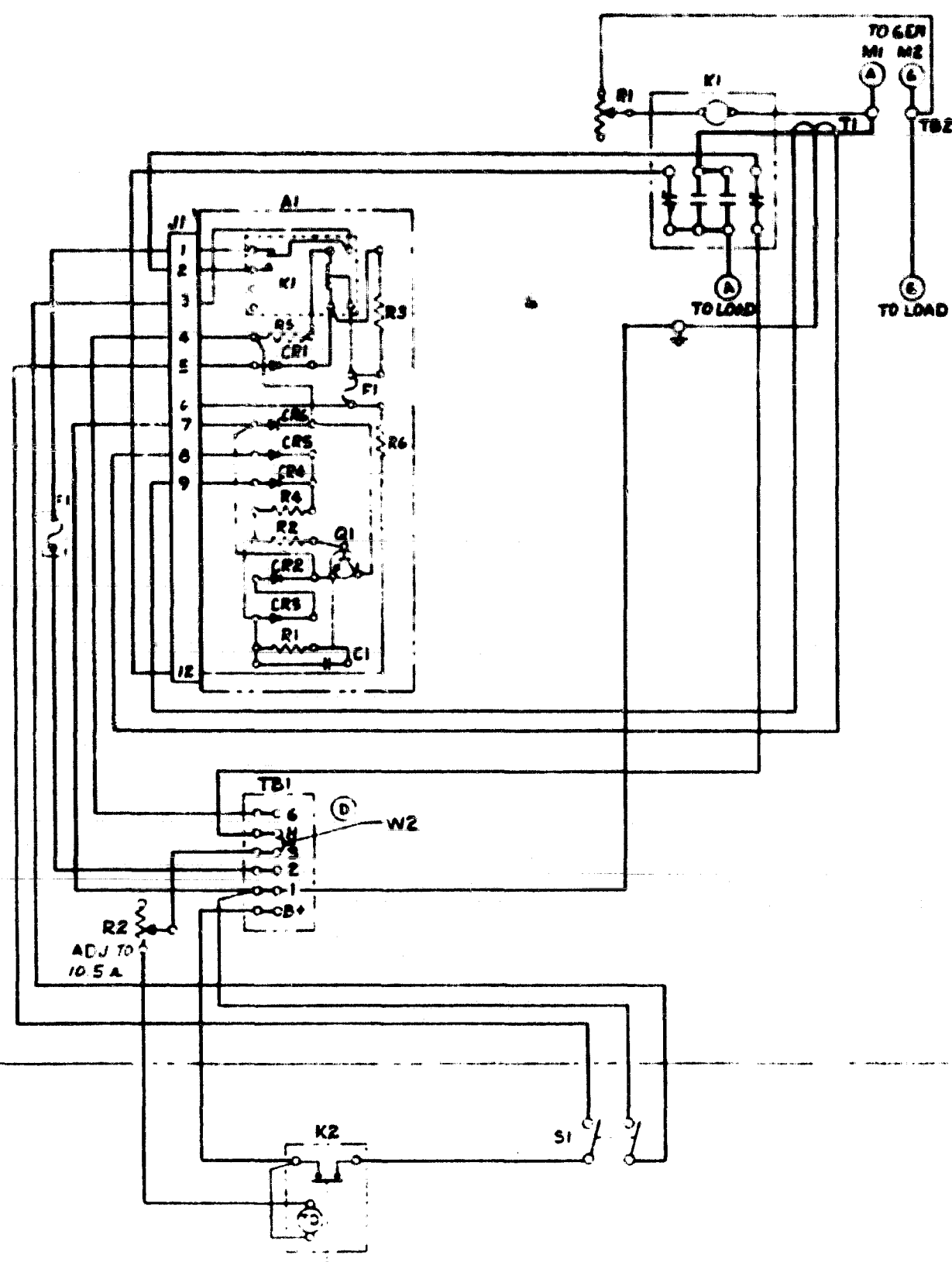
2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN 8 CONTROL ARE CONNECTED THRU AC GROUND LEAD

| PART QTY | PART NO | QTY | DESCRIPTION |
|----------|-------------|-----|-------------------------|
| A1 | 3000740 | 1 | CONTROL-LOAD SENSOR |
| | 30103200 | 2 | BRACKET-MOUNTING |
| | 5100295 | 2 | FASTENER-SHOP IN |
| R1 | 307C065 | 1 | CONTACTOR |
| | 332-147 | 1 | TERMINAL |
| | 3074005 | 2 | JUMPER |
| | 180A744 | 1 | JUMPER |
| R2 | 3200104 | 1 | RELAY-CRANKING LIMITED |
| A3 | 3070400-01 | 1 | RELAY-TIME DELAY 75 SEC |
| | 3070400-02 | 1 | RELAY-TIME DELAY 15 SEC |
| | 3000400 | 1 | SOCKET ASSY |
| R1 | 304A010 | 1 | RESISTOR ASSY |
| | 304A202-REF | 1 | RESISTOR-300 OHM 25 W |
| R2 | 304A197-REF | 1 | RESISTOR-3 OHM 10 W |
| S1 | 300P08-REF | 1 | SWITCH-AUTO MANUAL |
| T1 | 315A344 | 1 | TRANSFORMER ASSY |
| T01 | 332A099-REF | 1 | TERMINAL BLOCK |
| | 332A040 | 1 | WASHER STRIP |
| T02 | 332-142 | 2 | TERMINAL-GROUND |
| O1 | 330C546 | 1 | WEAVING HARNESS |
| | 30103273 | 1 | CONTROL BOX |
| | 000-015 | 1 | GLASS SCREEN |
| | 000A7239 | 1 | GLASS SCREEN-SEMIWAYTE |
| | 30101293 | 1 | TRIM |
| | 510P237 | 2 | FASTENER-TRIM |
| | 000-002 | 1 | NAMETPLATE-CONTROL |
| F1 | 321P053 | 1 | FUSE 3 AMP |
| | 321-10074EF | 1 | BLOCK-FUSE |

7.5HA-21/12C

| | | | |
|------------------------------|--|--|--|
| 12V CRANKING | | TRIN HAS 3012586 HAS 3012666 (HILL RE) 32153 & 321100 321100 | |
| 7.5HA-21/10C 7.5HA-21/12C | | 2-16-70 WKR WIRING DIAGRAM CONTROL AUTO DEMAND 617C133 | |
| 120V 2W 1PH 50/60CY | | | |

WIRING DIAGRAM FRONT VIEW OF CHASSIS



| REF DES | PART NO | QTY | DESCRIPTION |
|---------|----------------|-----|------------------------|
| A1 | 3080243 | 1 | CONTROL-LOAD SENSOR |
| | 301A3280 | 2 | BRACKET-MOUNTING |
| | 510A195 | 2 | FASTENER-SNAP IN |
| B1 | 307C005 | 1 | CONTACTOR |
| | 332-142 | 2 | TERMINAL |
| | 307A005 | 2 | JUMPER |
| | 100A144 | 1 | JUMPER |
| B2 | 3200104 | 1 | RELAY-CRANKING LIMITER |
| | | | |
| | | | |
| B1 | 304A 670 | 1 | RESISTOR ASSY |
| | 304A 707 (REF) | 1 | RESISTOR- 300 OHM 25 W |
| B2 | 304A 722 | 1 | RESISTOR- 15 OHM 50 W |
| S1 | 300P00 (REF) | 1 | SWITCH-AUTO MANUAL |
| T1 | 315 A344 | 1 | TRANSFORMER ASSY |
| T01 | 332A099 (REF) | 1 | TERMINAL BLOCK |
| | 332A040 | 1 | MARKER STRIP |
| T02 | 332-142 | 2 | TERMINAL-GROUND |
| W1 | 330C540 | 1 | WIRING HARNESS |
| W2 | 332A592 | 1 | JUMPER |
| | | | |
| | | | |
| | 30103273 | 1 | CONTROL BOX |
| | 90C1015 | 1 | SILKSCREEN |
| | 90A2240 | 1 | SILKSCREEN-SCHEMATIC |
| | 30103293 | 1 | TRIM |
| | 510P237 | | FASTENER-TRIP |
| | 49A000 | 1 | NAMEPLATE-CONTROL |
| | | | |
| F1 | 321F153 | 1 | FUSE, 3 AMP |
| | 321-100 (REF) | 1 | BLOCK-FUSE |

2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU AC GROUND LEAD

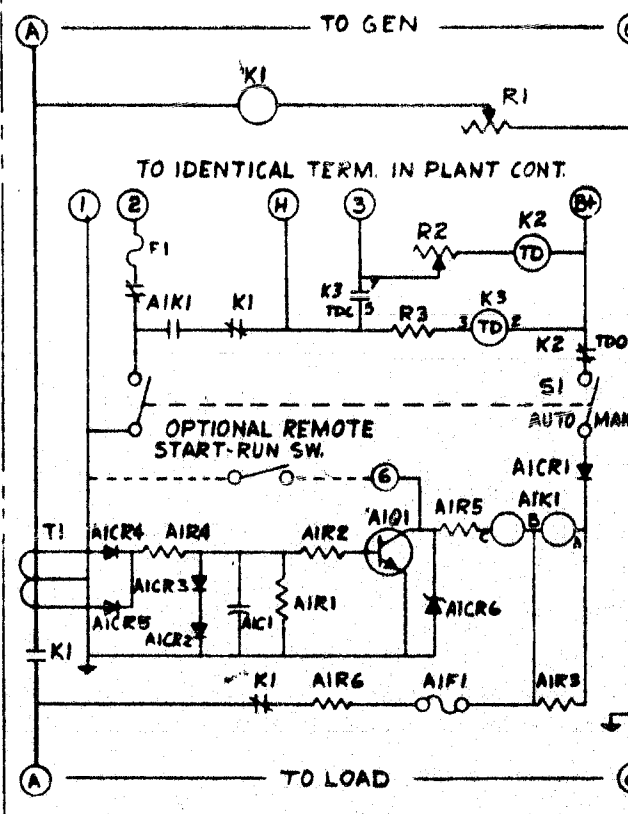
7.5HA-21-4/1C

| | | | | |
|---|----------------------------|-----|----|---------|
| D | REVISED WIRING ON T81 | A/B | EY | 8-3-77 |
| C | ADDED 332AE92 (WZ) | A/B | EY | 6-3-77 |
| B | PLA & 332AE92-00 | A/B | EY | 7-24-77 |
| A | ADDED FEB | A/B | EY | 5-8-77 |
| A | RECEIVED 332P 53 & 321-1C0 | A/B | EY | 6-14-77 |

Quest

| | | | | | | |
|-----|-------------------------------|---------------------------------------|------------|------------|------------|------------|
| -01 | 7.5 HA21-4/1C 32V CRANKING | 216 TO WKR | 100 100 | 100 100 | 100 100 | 100 100 |
| | | AIRING DIAGRAM CONTROL AUTO DEMAND | | | | |
| | 120V 1PH 2W 50/60CY | 617C138 | | | | |

WIRING DIAGRAM FRONT VIEW OF CHASSIS



- NOTES:
1. OPERATE WITH NEGATIVE GROUND ONLY.
 2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU AC GROUND LEAD.

[illegible]

7.5HA-21-4/12C

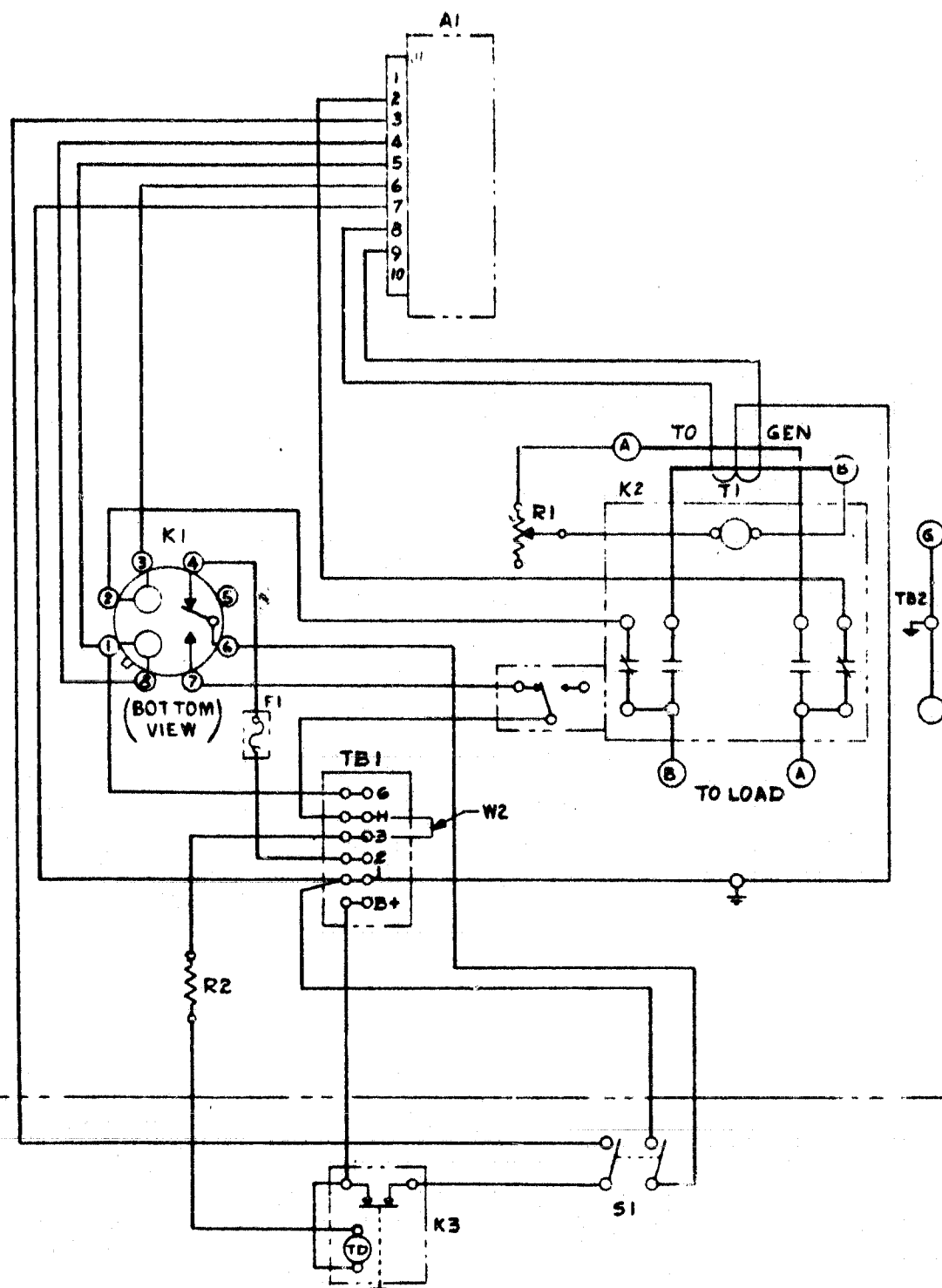
| | | | | |
|---|-------------------------|----|----|---------|
| D | TRAIN WAS 301R2586 | WB | TV | 3-20-76 |
| C | ADDED (REF) | JD | TV | 5-8-76 |
| E | ADDED 321P153 & 321-100 | JD | TV | 6-6-76 |
| F | 253A772 WAS 252A773 | CS | TV | 3-18-76 |
| A | R3 WAS 62A ZW | CS | TV | 3-17-76 |

32V CRANKING

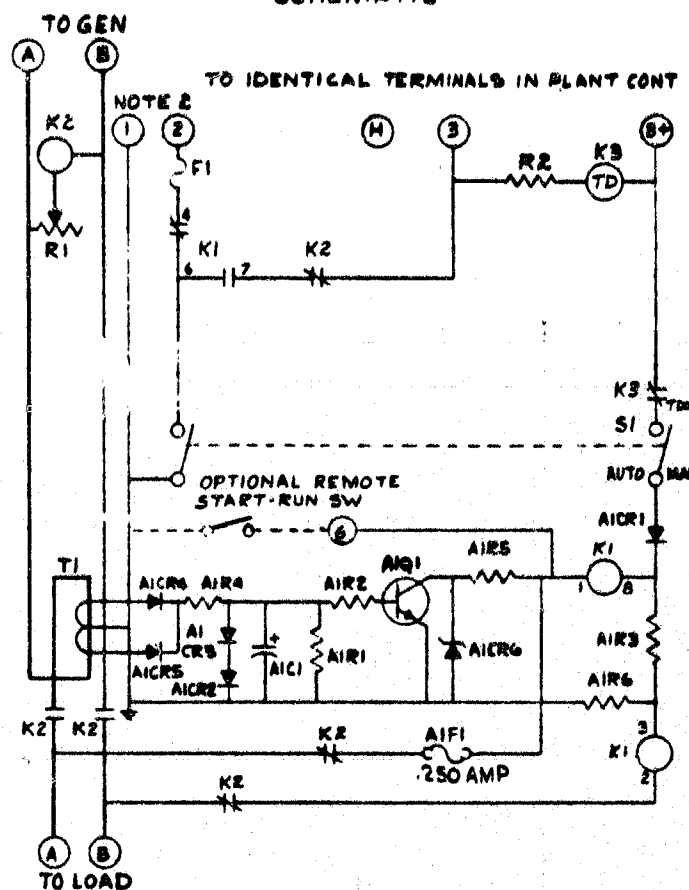
| | | | | | |
|-----|-------------------------|---------------------------------------|--------|--------------|----------|
| -01 | 7.5 HA-21-4/10C | DATE 2-16-70 | BY WKR | TIME 3:14 PM | FILE WJB |
| -02 | 7.5 HA-21-4/12C | WIRING DIAGRAM CONTROL-AUTO DEMAND | | | |
| | 120V 1PH 2W 50/60 CY | 617C139 | | | |

617C140

WIRING DIAGRAM FRONT VIEW OF CHASSIS



SCHEMATIC

[illegible]

NOTES:

1. OPERATE WITH NEGATIVE GROUND ONLY.
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU AC GROUND LEAD

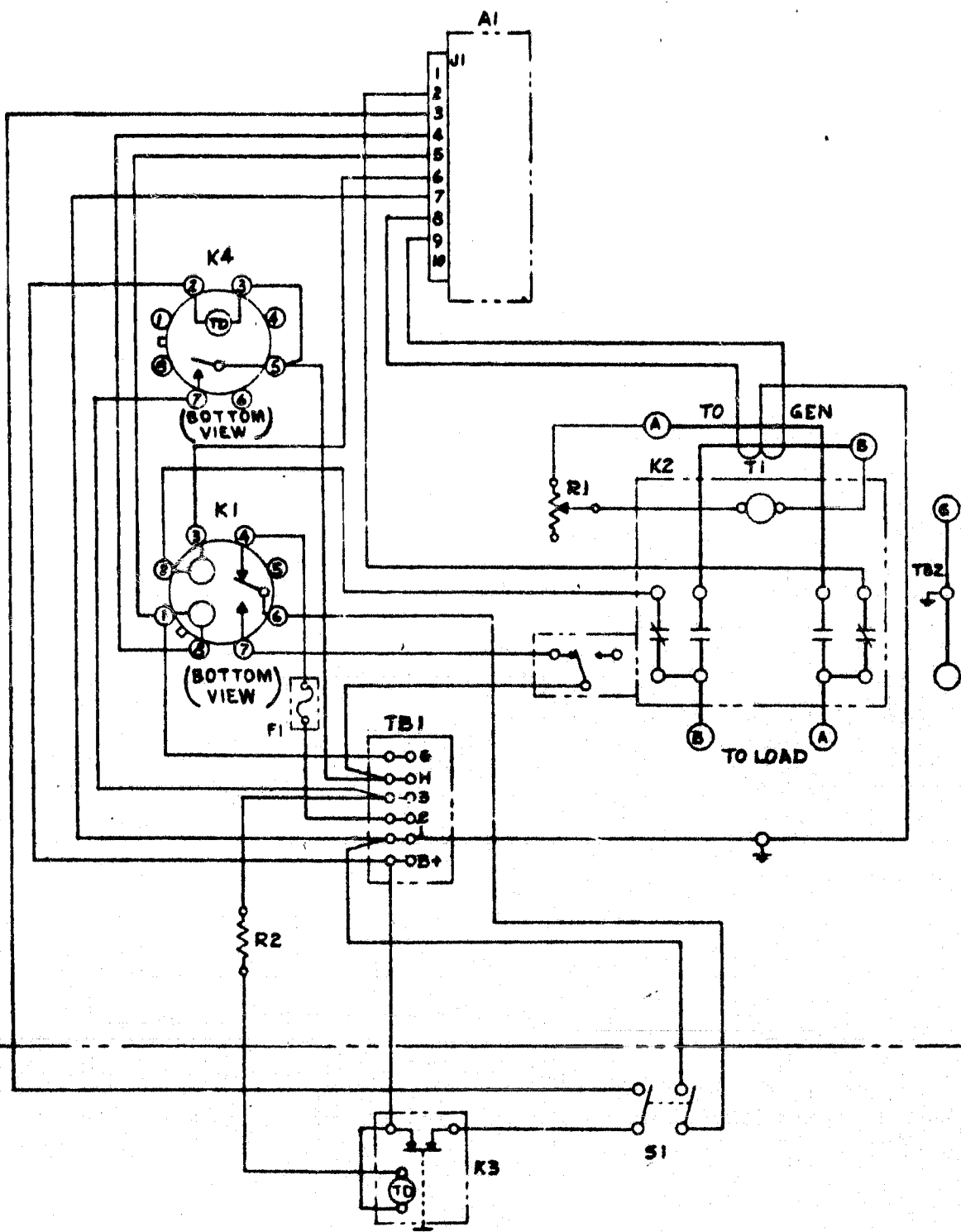
7.5HA-23/1C

| | | | | | | | | |
|--------------|----------------------------|---------------------------------------|---------------------------|--|----|-------|----|---------|
| | | B | | REVERSE WIRES 213 ON KI | | D | JV | 10-21-7 |
| | | - | FEED (REF) | LD | JV | 5-B-7 | | |
| | | A | AD. LI 32IP 53 & 32-1-100 | LD | EV | 4-10- | | |
| | | 11 | REVERSE | LD | EV | 4-10- | | |
| | | | | | | LD | EV | 4-10- |
| 12V CRANKING | | Onan | | DIVISION OF STANDARDS CORPORATION BIRMINGHAM, ALABAMA 35202 | | | | |
| -01 | 7.5HA-23/1C | 3-12-70 | | WKR | | JWD | | |
| | | WIRING DIAGRAM CONTROL-AUTO DEMAND | | | | | | |
| | 120/240V 1PH 3W 50/60CY | 617C140 | | | | | | |

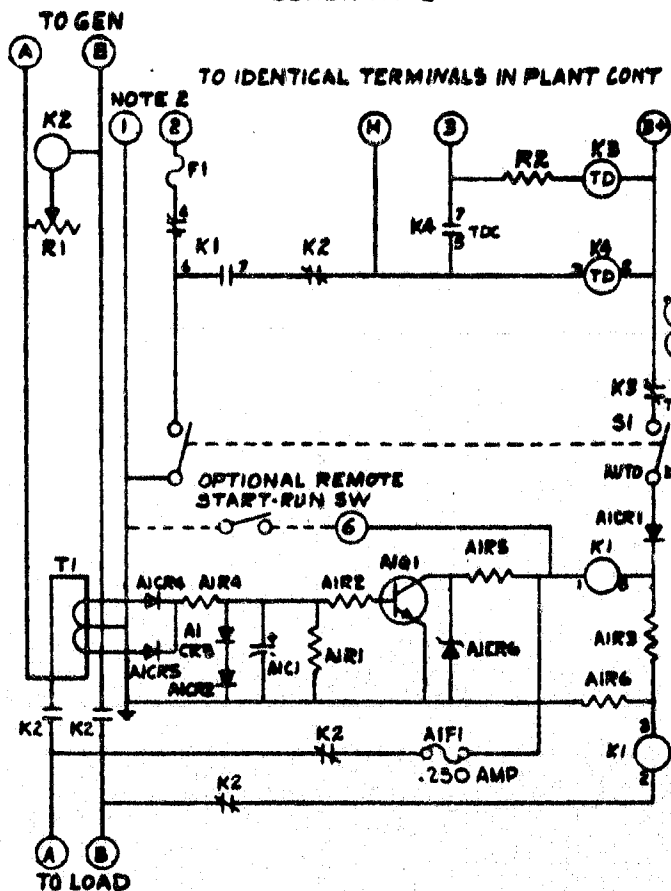
C4

617C141

WIRING DIAGRAM FRONT VIEW OF CHASSIS



SCHEMATIC



PLAYS LIST

[illegible]

7.5HA-23/10C

7.5HA-23/12C

NOTES:

1. OPERATE WITH NEGATIVE GROUND ONLY.
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU AC GROUND LEAD.

| | | | | |
|----|------------------------|----|------|----------|
| D | REVERSE WIRES 215 MNKJ | JD | TV | 10-21-77 |
| C | WAS 307A789 | WJ | TV | 8-26-77 |
| C | WAS 307A571 | JD | TV | 5-12-77 |
| E | WAS 3072875 | JD | TV | 5-12-77 |
| A | ALCED 'RLP' | JD | TV | 5-12-77 |
| A | ALCED 321P53 & 321-100 | JD | TV | 4-4-77 |
| UT | IN VISION | CT | DATA | |

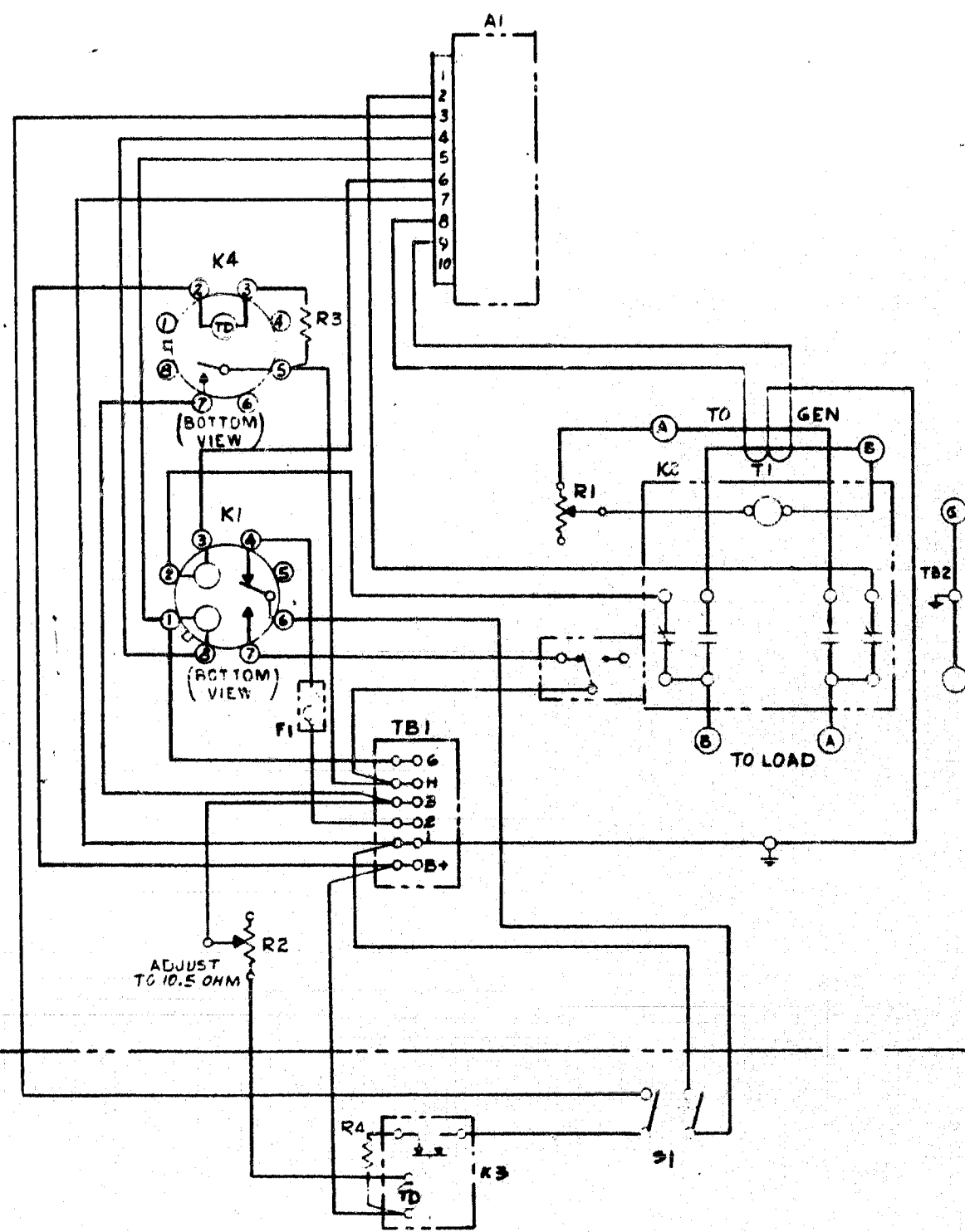
Ongn DIVISION OF SUBMERSE CORPORATION
Birmingham, Alabama

REV CRANKING

| | |
|-----|--------------|
| | MODEL 100 |
| -01 | 7.5HA-23/10C |
| -02 | 7.5HA-23/12C |
| | 120/240V 1PH |
| | 3W 30/60C |

| | | | | | |
|-----------|---|-----|-----------|-----|-----|
| DATE | 3-12-70 | WKR | JOHN VINT | CHK | JWD |
| NAME | (WIRING DIAGRAM) CONTROL-AUTO DEMAND | | | | |
| DRWG. NO. | 617C141 | | | | |

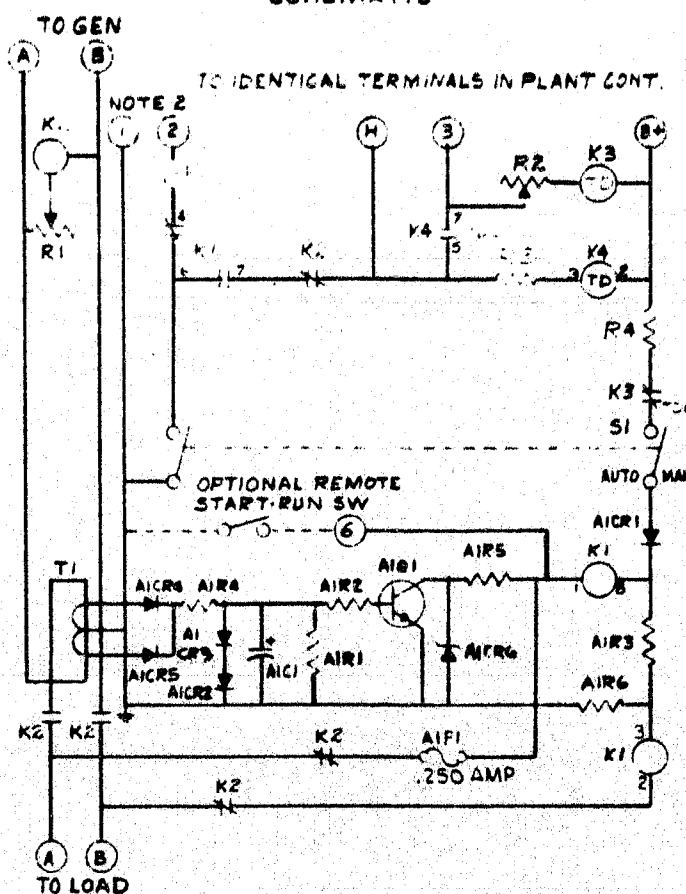
617C142

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

NOTES

1. OPERATE WITH NEGATIVE GROUND ONLY
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU AC GROUND LEAD

SCHEMATIC



| REF DES | PART NO | QTY | DESCRIPTION |
|---------|--------------|-----|----------------------------|
| A1 | 3008247 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 30183780 | 2 | BRACKET-MOUNTING |
| | 518A295 | 2 | FASTENER-SWAP IN |
| R1 | 3072858 | 1 | RELAY-START RUN |
| K2 | 3072666 | 1 | CONTACTOR |
| | 160-144 | 2 | STRAP |
| | 382-517 | 4 | TERMINAL |
| | 309A42 | 1 | SWITCH-AUXILIARY |
| | 309A193 | 1 | INSULATOR |
| K3 | 320B104 | 1 | RELAY-CRANKING LIMITER |
| K4 | 307A679-01 | 1 | RELAY-TIME DELAY 20 SEC |
| | 307A671-02 | 1 | RELAY-TIME DELAY 15 SEC |
| | 323A773 | 1 | SOCKET ASSY |
| R1 | 304A682 | 1 | RESISTOR ASSY-750 OHM 25W |
| R2 | 304A222 | 1 | RESISTOR-15 OHM 50W |
| R3 | 350-520(REF) | 1 | RESISTOR-47 OHM 1/2W |
| R4 | 350-984 | 1 | RESISTOR-750 OHM 2W |
| S1 | 308P88(REF) | 1 | SWITCH-AUTO MANUAL |
| T1 | 315A345 | 1 | TRANSFORMER ASSY-CURRENT |
| TB1 | 332A699(REF) | 1 | TERMINAL BLOCK |
| | 332A940 | 1 | MARKER STRIP |
| TB2 | 332-142 | 2 | TERMINAL-GROUND |
| W1 | 338C553 | 1 | WIRING HARNESS |

| | | | |
|--|----------|---|----------------------|
| | 301D3273 | 1 | CONTROL BOX |
| | 90C1815 | 1 | SILKSCREEN |
| | 98A2252 | 1 | SILKSCREEN-SCHEMATIC |
| | 301B3293 | 1 | TRIM |
| | 518P237 | 3 | FASTENER-TRIM |
| | 99A966 | 1 | NAMEPLATE-CONTROL |

2410719

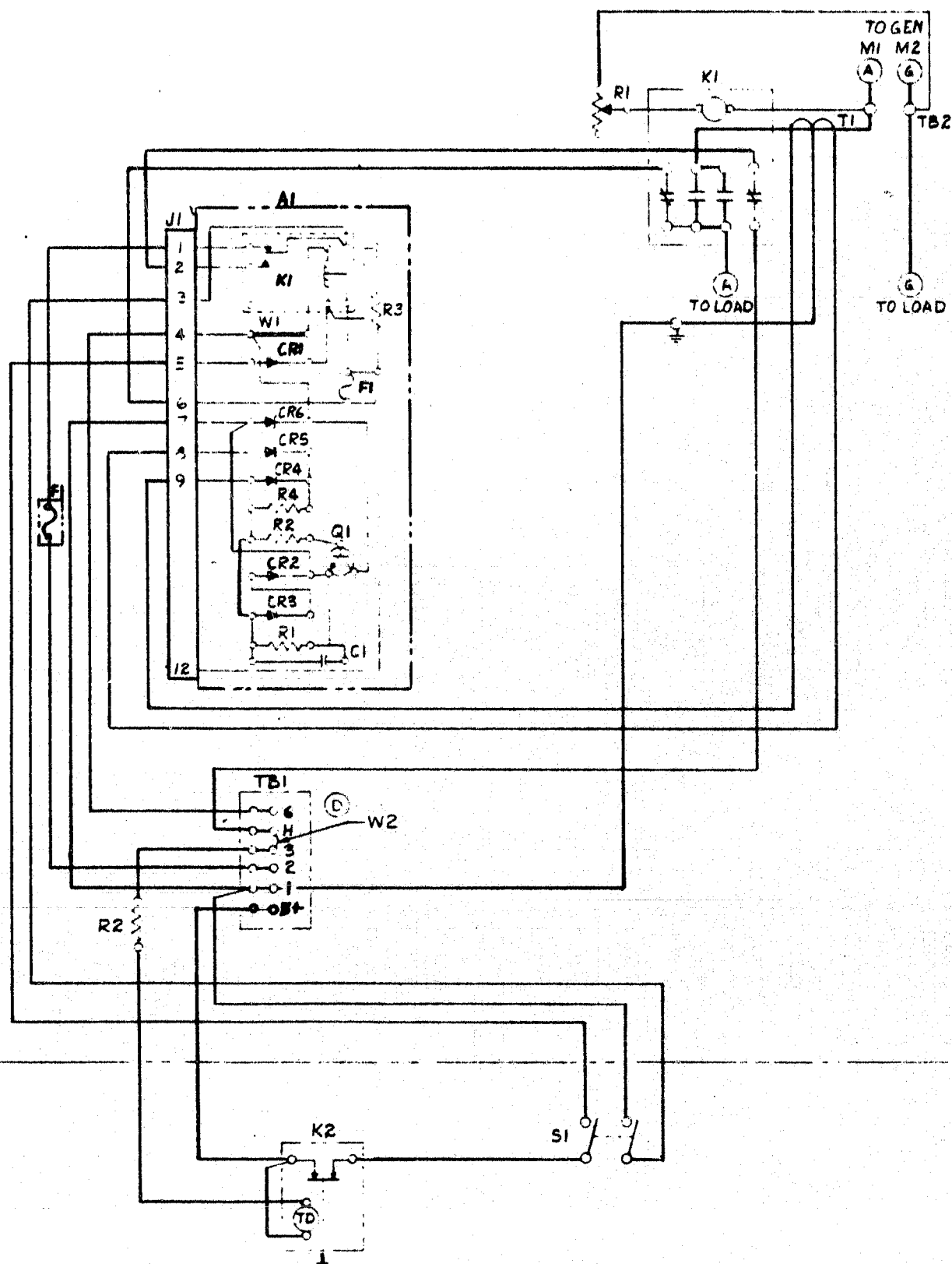
| | | | |
|----|--------------|---|-------------|
| F1 | 321P153 | 1 | FUSE, 3 AMP |
| | 321-100(REF) | 1 | BLOCK-FUSE |

7.5HA-23-4/10C

7.5HA-23-4/12C

| | | | |
|--------------|----------------|--------------|---------------------|
| 32V CRANKING | | 32V CRANKING | |
| -01 | 7.5HA-23-4/10C | 3-12-70 | WIRING DIAGRAM |
| OR | 7.5HA-23-4/12C | 3-12-70 | CONTROL-AUTO DEMAND |
| 120/240V 1PW | | 617C142 | |
| 3 W 50/60 CY | | | |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS



TO GEN

TO IDENTICAL TERM. IN PLANT CONT.

OPTIONAL REMOTE START-RUN SW.

TO LOAD

- NOTES:
1. OPERATE WITH NEGATIVE GROUND ONLY
 2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU 40 GROUND LEAD

| PARTS LIST | | DESCRIPTION | |
|------------|---------------|-------------|-----------------------|
| QTY | PART NO | QTY | DESCRIPTION |
| 1 | 300B741 | 1 | CONTROL-LOAD SENSOR |
| 2 | 301A3280 | 2 | BRACKET-MOUNTING |
| 2 | 518A295 | 2 | FASTENER-SNAP IN |
| 1 | 307C666 | 1 | CONTACTOR |
| 2 | 332 142 | 2 | TERMINAL |
| 2 | 357A665 | 2 | JUMPER |
| 1 | 160A144 | 1 | JUMPER |
| 1 | 320B104 | 1 | FLY-CRANKING LIMITER |
| 1 | 304F682 | 1 | RESISTOR ASSY |
| 1 | 304A131 (REF) | 1 | RESISTOR-250 OHM 25 W |
| 1 | 304A102 (REF) | 1 | RESISTOR-3 OHM 10 W |
| 1 | 308P88 (REF) | 1 | SWITCH-AUTO MANUAL |
| 1 | 315A344 | 1 | TRANSFORMER ASSY |
| 1 | 332A699 (REF) | 1 | TERMINAL BLOCK |
| 1 | 332A840 | 1 | MARKER STRIP |
| 2 | 332 142 | 2 | TERMINAL-GROUND |
| 1 | 3380F46 | 1 | WIRING HARNESS |
| 1 | 332A592 | 1 | JUMPER |
| 1 | 301U3273 | 1 | CONTROL BOX |
| 1 | 98C1815 | 1 | SILKSCREEN |
| 1 | 98A2739 | 1 | SILKSCREEN-SCHEMATIC |
| 1 | 301B3213 | 1 | TRIM |
| 1 | 518P237 | 1 | FASTENER TRIM |
| 1 | 09A666 | 1 | NAMEPLATE-CONTROL |

| | | | |
|----|--------------|---|-------------|
| F1 | 321F153 | 1 | FUSE, 3 AMP |
| | 321-WO (REF) | 1 | BLOCK-FUSE |

6.7.34

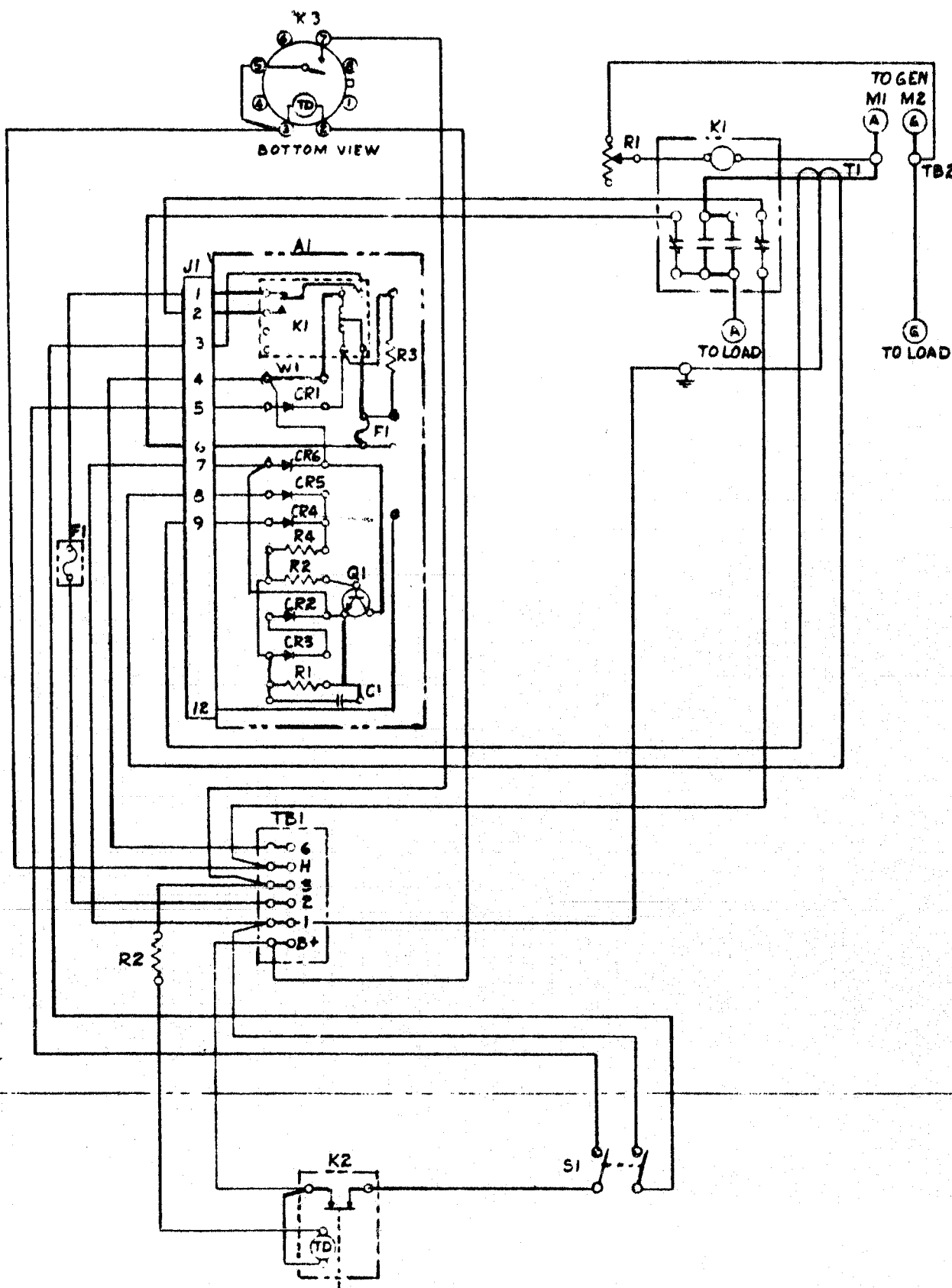
15.0HA-22/1C

| | | | |
|---|---------------------|--|----------|
| | | | |
| D | REVISED WIRING - B1 | | 11-16-70 |
| C | ADDED - 12A92 (W2) | | 11-16-70 |
| | | | 11-16-70 |
| | | | 11-16-70 |
| | | | 11-16-70 |
| | | | 11-16-70 |

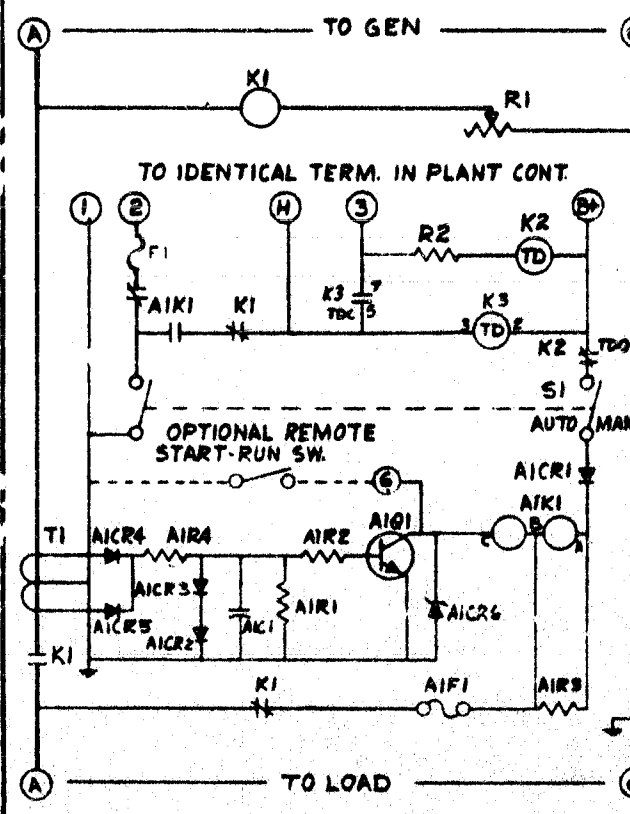
Onen

| | | | | | |
|-----|------------------------------|---------------------------------------|-----|--|--|
| -01 | 15.0HA-22/1C 12V CRANKING | 21670 | WKR | | |
| | | WIRING DIAGRAM CONTROL-AUTO DEMAND | | | |
| | 240V 1PH 2W 50/60CY | 617C134 | | | |

617C135

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

SCHEMATIC



NOTES:

- 1 OPERATE WITH NEGATIVE GROUND ONLY.
- 2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU AC GROUND LEAD

PARTS LIST

| REF. DES. | PART NO. | QTY | DESCRIPTION |
|-----------|---------------|-----|---------------------------|
| A1 | 300B741 | 1 | CONTROL-LOAD SENSOR |
| | 301A3280 | 2 | BRACKET-MOUNTING |
| | 518A295 | 2 | FASTENER-SNAP IN |
| K1 | 307C886 | 1 | CONTACTOR |
| | 332-142 | 2 | TERMINAL |
| | 307A685 | 2 | JUMPER |
| | 180A144 | 1 | JUMPER |
| K2 | 320B104 | 1 | RELAY-CRANKING LIMITER |
| K3 | 307A645 (01) | 1 | RELAY-TIME DELAY (20 SEC) |
| | 307A629 (02) | 1 | RELAY-TIME DELAY (5 SEC) |
| | 223A175 | 1 | SOCKET ASSY |
| R1 | 304A682 | 1 | RESISTOR ASSY |
| | 304A131 (REF) | 1 | RESISTOR-750 OHM 25 W |
| R2 | 304A192 (REF) | 1 | RESISTOR-3 OHM 10 W |
| S1 | 308P88 (REF) | 1 | SWITCH-AUTO MANUAL |
| T1 | 315 A344 | 1 | TRANSFORMER ASSY |
| TB1 | 332A699 (REF) | 1 | TERMINAL BLOCK |
| | 332A940 | 1 | MARKER STRIP |
| TB2 | 332-142 | 2 | TERMINAL-GROUND |
| W1 | 338C546 | 1 | WIRING HARNESS |
| | | | |
| | 30103273 | 1 | CONTROL BOX |
| | 98C1815 | 1 | SILKSCREEN |
| | 98A2239 | 1 | SILKSCREEN-SCHWATC |
| | 301B2293 | 1 | TRIM |
| | 518P237 | 3 | FASTENER-TRIM |
| | 98A966 | 1 | NAMEPLATE-CONTROL |
| | | | |
| F1 | 321P153 | 1 | FUSE, 3 AMP |
| | 321-100 (REF) | 1 | BLOCK-FUSE |

SE10719

15.0HA-22/10C

15.0HA-22/12C

| | |
|------------------------|---------------|
| C TRIM WAS 301B2566 | REV. 10-24-70 |
| B ACCEL. REF | REV. 5-8-70 |
| E FILE 321-53 & 321-CC | REV. 6-15-70 |
| A 323A775 WAS 332A775 | REV. 3-17-70 |

Onan

2-16-70

WKR
WIRING DIAGRAM
CONTROL AUTO DEMAND

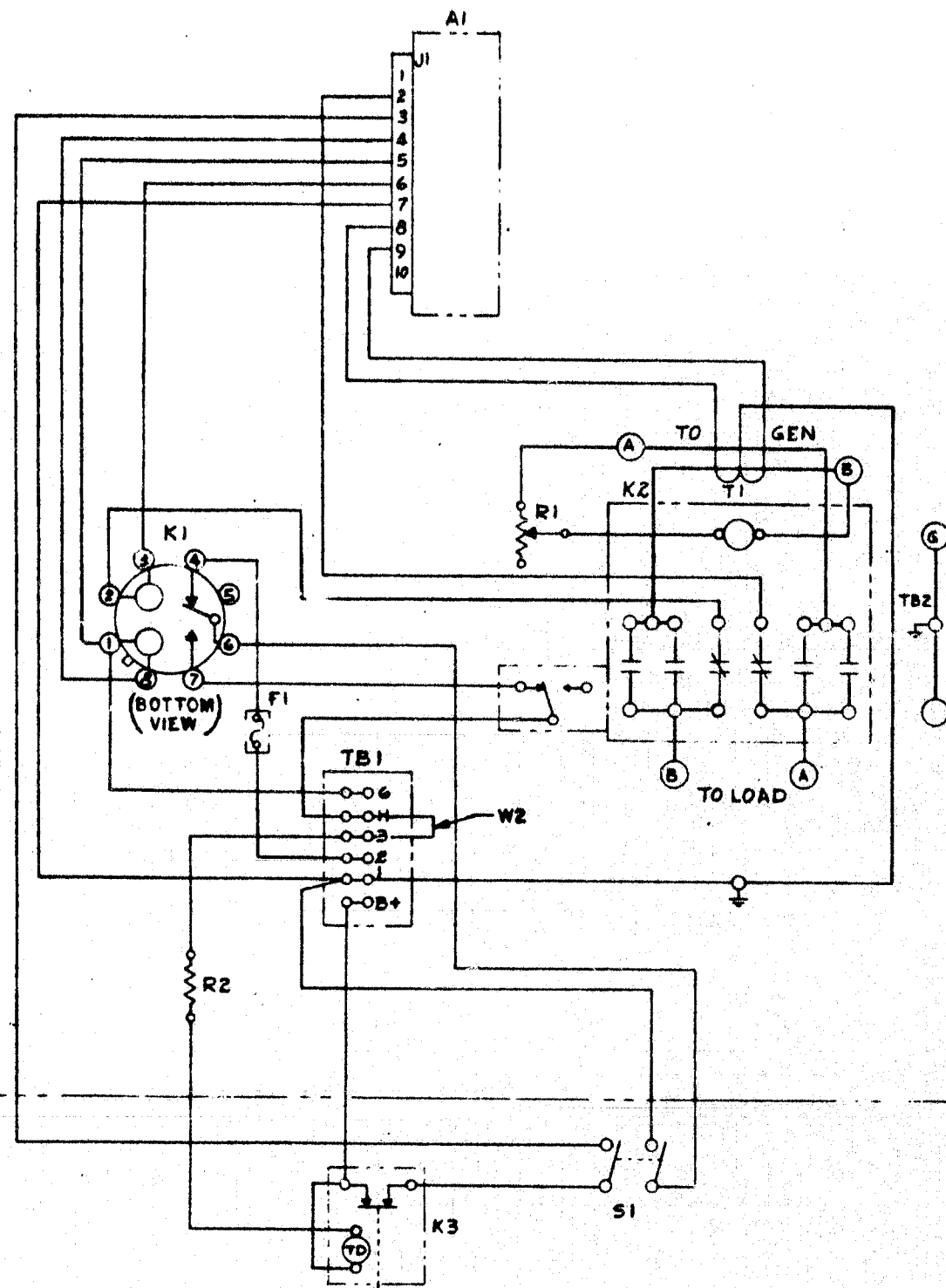
617C135

12V CRANKING

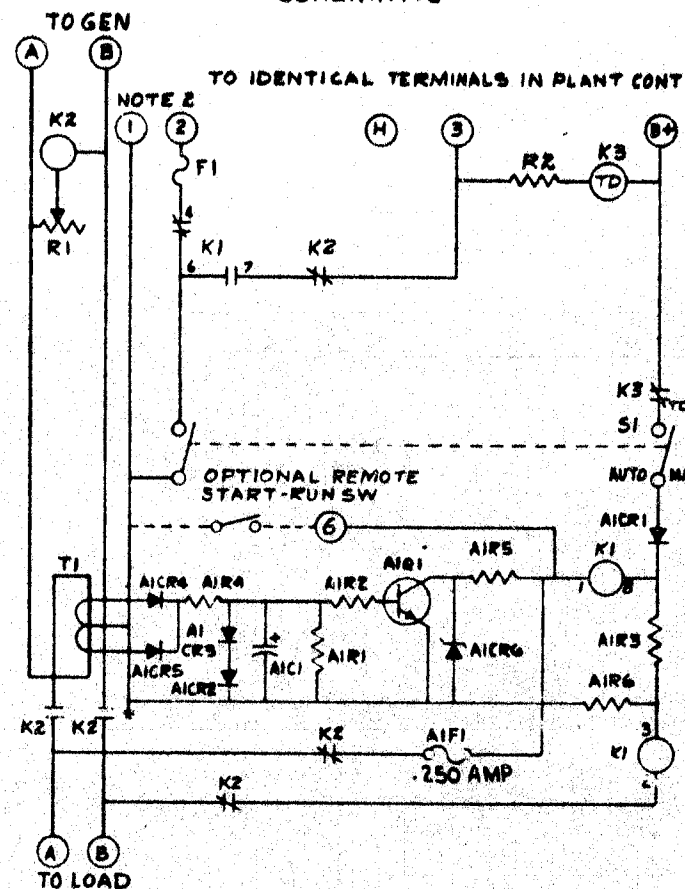
| | |
|-----|---------------|
| -01 | 15.0HA-22/10C |
| -02 | 15.0HA-22/12C |
| | 240V 1PH |
| | 2W 50/60 CY |

617C143

WIRING DIAGRAM
FRONT VIEW OF CHASSIS



SCHEMATIC




| PARTS LIST | | | |
|------------|--------------|------|-----------------------------|
| REF. DES. | PART NO. | QTY. | DESCRIPTION |
| A1 | 3008747 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 30183280 | 2 | BRACKET-MOUNTING |
| | 518A295 | 2 | FASTENER-SNAP IN |
| K1 | 307A856 | 1 | RELAY-START RUN |
| K2 | 307C667 | 1 | CONTACTOR |
| | 160-144 | 2 | STRAP |
| | 307A942 | 2 | BUS BAR |
| | | 2 | SLEEVING 1-3/4" OF (89B-22) |
| | 332-142 | 4 | TERMINAL |
| | 509A42 | 1 | SWITCH-AUXILIARY |
| | 309A193 | 1 | INSULATOR |
| | 307A685 | 4 | JUMPER |
| K3 | 320B104 | 1 | RELAY-CRANKING LIMITER |
| R1 | 304A882 | 1 | RESISTOR ASSY-750 OHM, 25 W |
| R2 | 304A192(REF) | 1 | RESISTOR-3 OHM, 10 W |
| S1 | 308P88(REF) | 1 | SWITCH-AUTO MANUAL |
| T1 | 315A346 | 1 | TRANSFORMER ASSY-CURRENT |
| TB1 | 332A698(REF) | 1 | TERMINAL BLOCK |
| | 332A940 | 1 | MARKER STRIP |
| TB2 | 332-142 | 2 | TERMINAL-GROUND |
| W1 | 338C552 | 1 | WIRING HARNESS |
| W2 | 332A592 | 1 | JUMPER |
| | 301D3273 | 1 | CONTROL BOX |
| | 98C1815 | 1 | SILKSCREEN |
| | 98A2752 | 1 | SILKSCREEN-SCHEMATIC |
| | 301B3293 | 1 | TRIM |
| | 518P237 | 3 | FASTENER-TRIM |
| | 99A966 | 1 | NAMPLATE-CONTROL |
| F1 | 321P153 | 1 | FUSE, 3 AMP |
| | 321-100(REF) | 1 | BLOCK - FUSE |

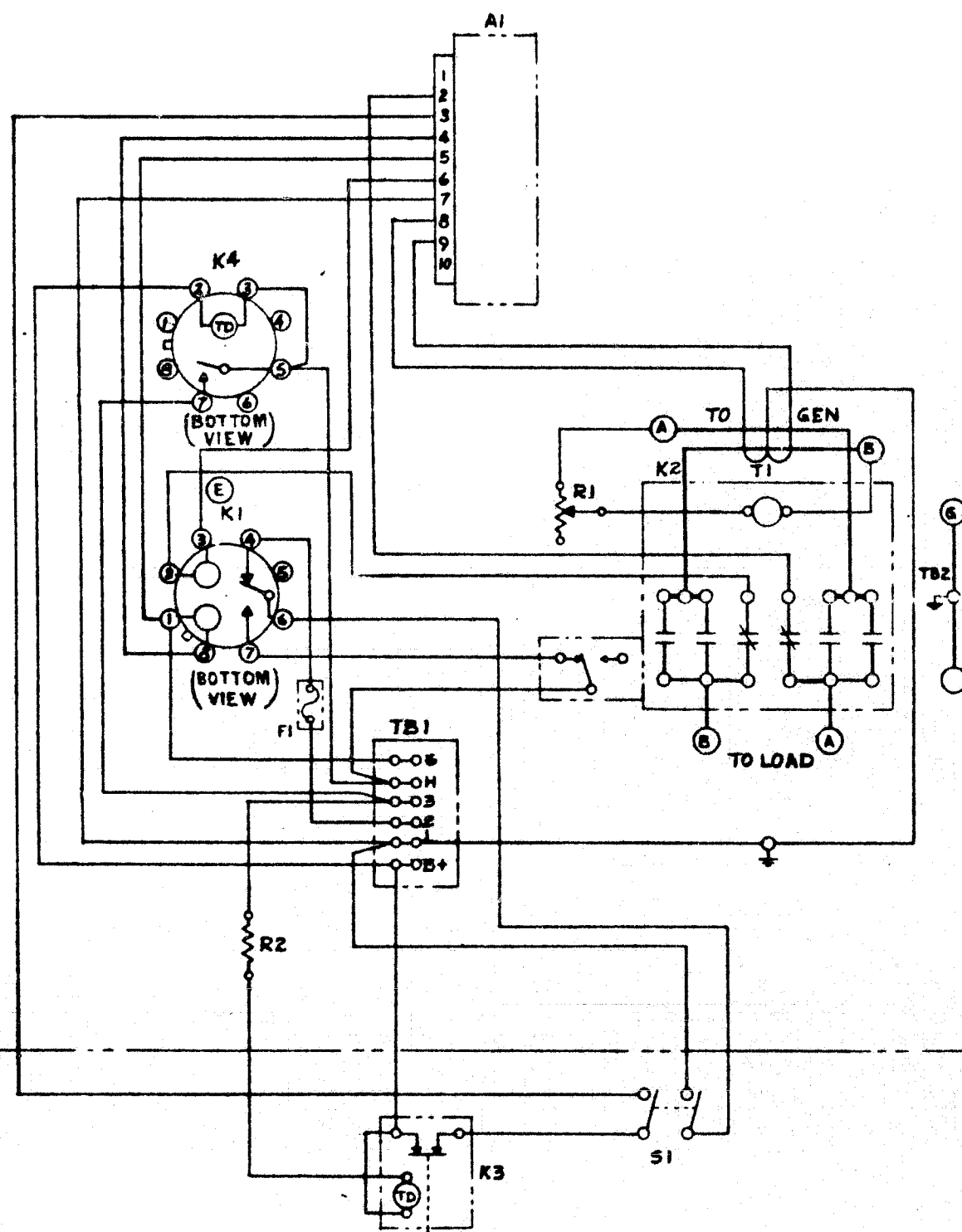
NOTES:

1. OPERATE WITH NEGATIVE GROUND ONLY.
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU AC GROUND LEAD.

15.0HA-23/1C

| | | | |
|-----------------------------|--|---|--|
| 12V CRANKING | | B REVERSE WIRES 203 ON KI JD JV 7-8-70 A ACCLD (REF) JD JV 5-8-70 A ACCLD 321P153 & 321-100 JD JV 6-8-70 (1) REVISION (2) INCH DATE | |
| MOOT NO -01 150HA-23/1C | |  DIVISION OF STUDENT BODY CORPORATION Birmingham, Alabama | |
| | | DATE 3-12-70 BY WKR JIM WILF CEE J.W.D. NAME WIRING DIAGRAM CONTROL-AUTO DEMAND DWG NO 617C143 | |
| 120/240V 1PH 3W 50/60 CY | | | |

WIRING DIAGRAM
FRONT VIEW OF CHASSIS

[illegible][illegible]

44-172144

NOTES:

1. OPERATE WITH NEGATIVE GROUND ONLY.
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GEN & CONTROL ARE CONNECTED THRU AC GROUND LEAD.

15.0HA-23/10C

15.0HA-23/12C

| | | | | |
|-----|----------------------------|----|------|----------|
| E | REVERSED WIRES 2 & 3 ON K1 | JD | JV | 10-21-74 |
| D | WAS 307A789 | AE | JV | 8-28-74 |
| D | WAS 307A971 | JD | JV | 5-2-74 |
| C | WAS 307B879 | JD | JV | 5-12-74 |
| B | ADDED (REF) | JD | JV | 5-8-74 |
| B | ADDED 32-P 53 & 321-100 | JD | JV | 6-14-74 |
| A | WAS 304A131 | VB | JV | 4-7-70 |
| ALL | REVISION | 28 | ENGR | 10-21-74 |

Ogden DIVISION OF STUDEBAKER CORPORATION
 Des Moines, Iowa, U.S.A.

| | | | | | | | |
|------|---------|----|-----|-------|----------|-----|------|
| DATE | 3-12-70 | BY | WKR | FILED | JIM VINT | COB | J.W. |
|------|---------|----|-----|-------|----------|-----|------|

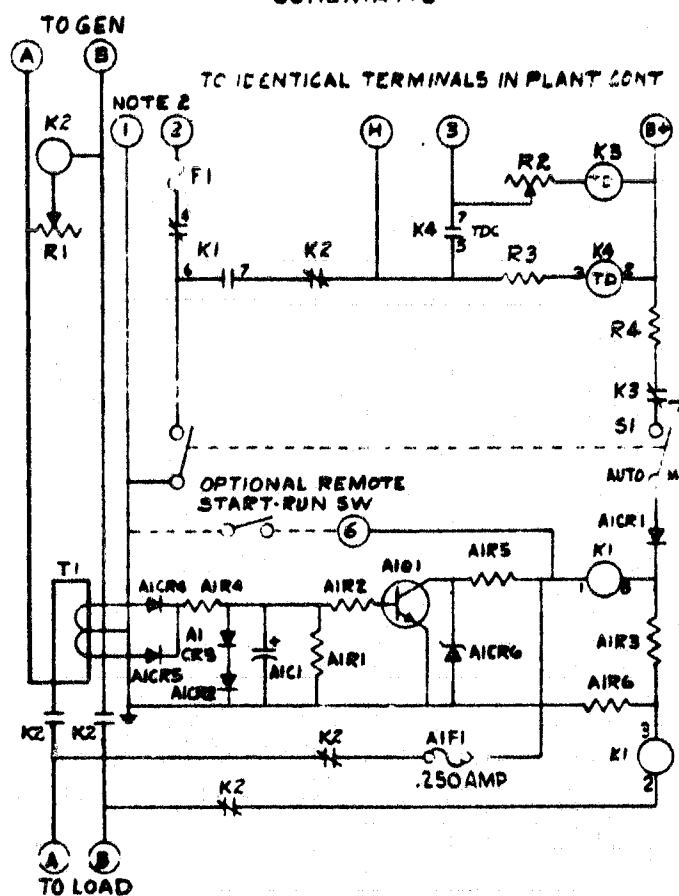
74-641 (WIRING DIAGRAM)
CONTROL-AUTO DEMAND

DWG NO. 617C144

12V CRANKING

| | | | | | | | | | |
|----------------------------|--------------|---------------------|------------------|----|-----|------|------|-----|------|
| 2200T NS | | DATE | 3-12-70 | BY | WKR | TIME | VIEW | CR. | J.W. |
| -01 | 150HA-23/10C | NAME | (WIRING DIAGRAM) | | | | | | |
| -02 | 150HA-23/12C | CONTROL-AUTO DEMAND | | | | | | | |
| 120/240V 1PH 3W 50/60CY | | DWG. NO. | 617C144 | | | | | | |

WIRING DIAGRAM FRONT VIEW OF CHASSIS

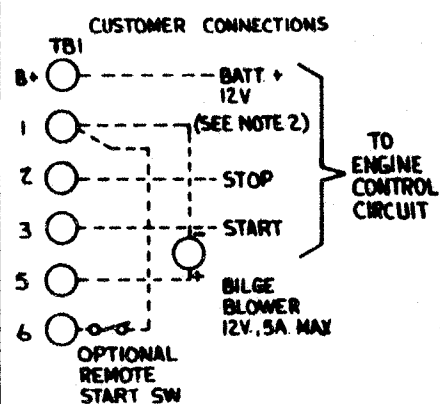
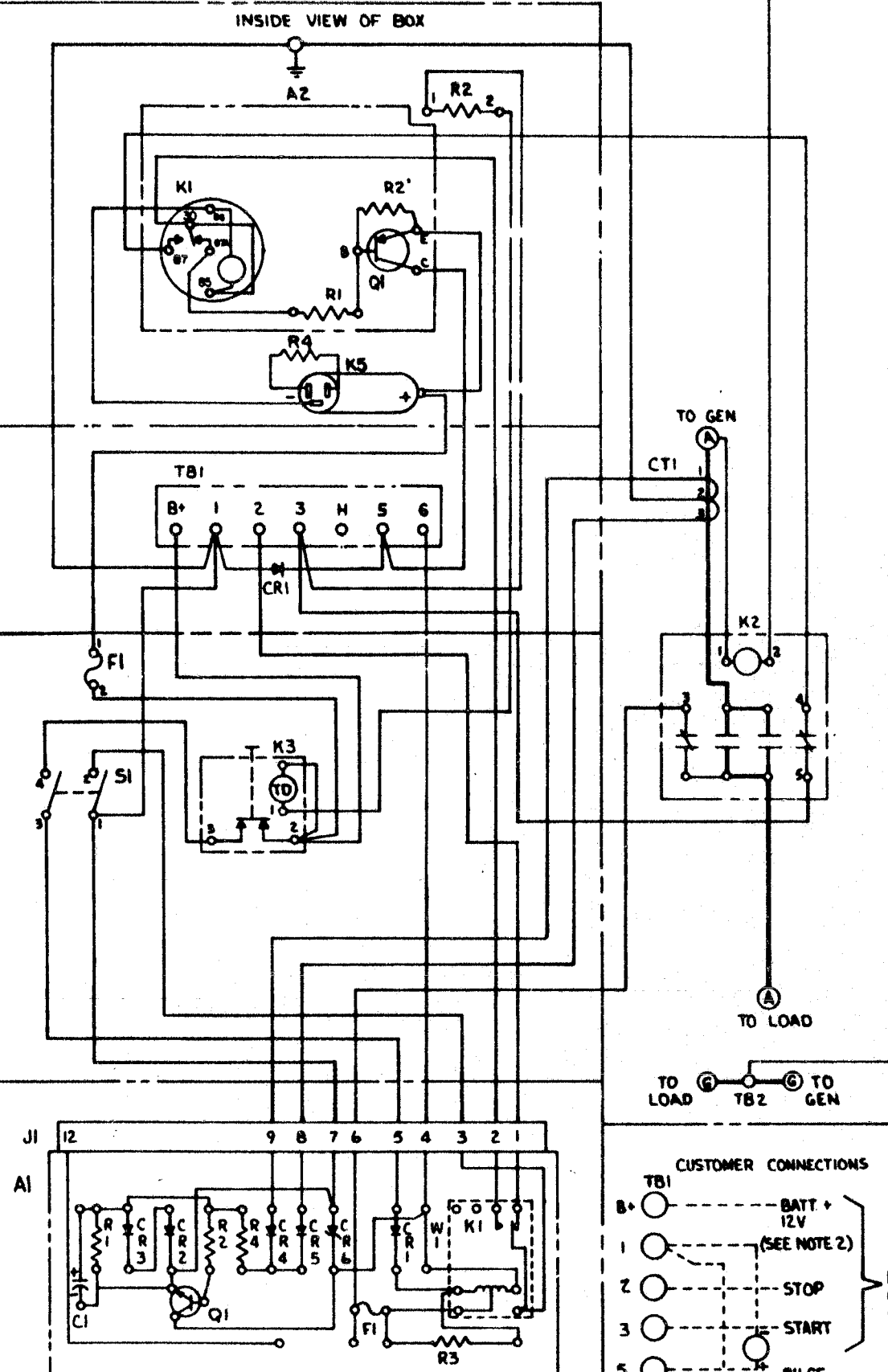


617C145

| | | | | | | |
|-----|----------------------------|---------------------------------------|---------|-----|-----|-----|
| -01 | 150HA-25-4/10C | DATE | 3-12-70 | WKR | WGT | UWD |
| -02 | 150HA-25-4/12C | WIRING DIAGRAM CONTROL-AUTO DEMAND | | | | |
| | 120/240V 1PH 3W 50/60CY | 617C145 | | | | |

617C145

A circuit diagram showing a relay with a normally open contact labeled R1. The contact is represented by a zigzag line with a small circle at the top and a small circle at the bottom. The top circle is connected to a horizontal line, and the bottom circle is connected to another horizontal line. The label R1 is placed to the left of the contact.



UNLESS OTHERWISE NOTED, ALL
COMPONENTS ARE SHOWN IN THE
DE-ENERGIZED POSITION.

The schematic diagram illustrates a complex motor control circuit. It features two main power sources at the top: "TO GEN" (Generator) connected through terminal A and "TO STOP AUTOMATICALLY - REMOVE ALL LOAD" connected through terminal G. The circuit includes several relays (K1, K2, K3, K4, K5), fuses (R1, R2, R3, R4), switches (S1, S2, S3), and thermal relays (AIKI, AZKI, AIQI). Key components include a stop button (K2), a start/run switch (S1), and a thermal relay (AIQI) for motor protection. The diagram also shows a section labeled "OPTIONAL REMOTE START-RUN SW" which can be bypassed or controlled remotely via terminals TBI and TDO. Various interlocking mechanisms are shown to ensure safe operation, such as preventing simultaneous starting and stopping.

4. MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL

| PARTS LIST | | | |
|------------|---------------|-----|-------------------------------------|
| REF DES | PART NO | QTY | DESCRIPTION |
| A1 | 300-0740 | B | 1 CONTROL-LOAD SENSOR |
| | 301-3280 | A | 2 BRACKET-MOUNTING |
| | 518-0235 | A | 2 FASTENER-SNAP IN |
| A2 | 308-0587 | B | 1 BULGE BLOWER CONT ASSY |
| | 332-1179 | A | 4 SPACER |
| CT1 | 315-0427 | A | 1 TRANSFORMER ASSY-CUR |
| CR1 | 357-0004 | A | 1 DIODE |
| F1 | 321-0139 | - | 1 FUSE 6 25 AMP |
| | 321-0104 | P | 1 HOLDER-FUSE |
| K2 | 307-0685 | C | 1 CONTACTOR |
| | 332-0142 | A | 2 TERMINAL |
| | 307-0685 | A | 2 JUMPER |
| | 98-2045 | A | 1 CAUTION LABEL |
| | 160-0144 | A | 1 STRAP |
| K3 | 320-0104 | B | 1 RELAY-CRANKING LIMITER |
| R4 | 350-1089 | A | 1 RESISTOR-ASSY |
| | 304-0014 | - | 1 WASHER-CENTERING |
| R1 | 304-0719 | A | 1 RESISTOR ASSY |
| | 304-0282(REF) | A | 1 RESISTOR-300Ω, 25W |
| | 304-0292 | A | 1 INSULATOR |
| R2 | 304-0492(REF) | A | 1 RESISTOR-3Ω, 10W |
| S1 | 308-0088 | P | 1 SWITCH-AUTO MANUAL |
| K5 | 307-1577 | A | 1 RELAY |
| | 425-1749 | D | 1 CLAMP |
| YB1 | 332-1972 | A | 1 BLOCK-TERMINAL |
| | 332-1939 | A | 1 STRIP-MARKER |
| 1B2 | 332-0142 | A | 2 TERMINAL-GROUND |
| | 898-0593 | - | 1.5' SLEEVING (USED ON CR1) |
| | 332-0050 | - | 1 CLIP-WIRE |
| | 338-1018 | D | 1 WIRING HARNESS-CONTROL |
| | 301-3011 | D | 1 BRACKET |
| | 301-3012 | D | 1 CONTROL BOX |
| | 301-3010 | B | 1 COVER-CONTROL BOX |
| | 98-2992 | A | 1 SILKSCREEN-SCHEMATIC |
| | 98-2081 | C | 1 SILKSCREEN-AUTO DEMAND CONT COVER |
| | 98-2082 | A | 1 SILKSCREEN-AUTO DEMAND CONT BART |
| | 99-0468 | A | 1 NAMEPLATE |

7.5HA-21/1D

| | | | | |
|---|----------------------------|----|----|----------|
| F | ADDED 307-15776425-1799 | WV | 22 | 6-9-77 |
| E | ADDED 898-0593 | WV | 22 | 5-27-77 |
| D | PART NO. WAS 99-0966 | WV | 22 | 5-27-77 |
| C | ADDED 350-1189 | WV | 23 | 4-18-77 |
| B | REVISED NOTE 3 | WV | 23 | 10-29-76 |
| A | ADDED WASHER TO PARTS LIST | WV | 23 | 10-4-76 |

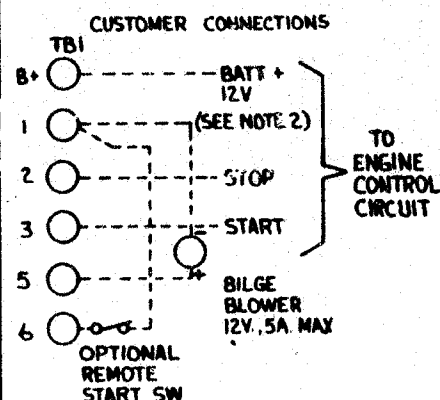
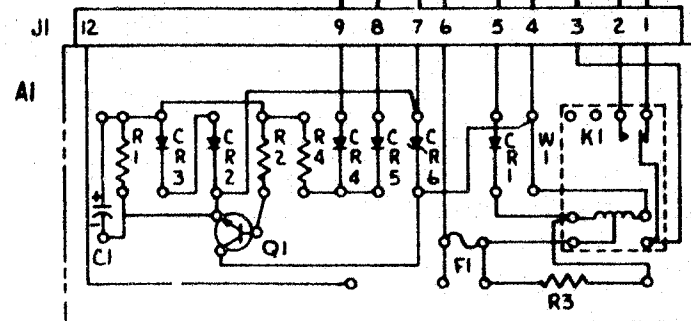
ORDER DIVISION OF CHAM CORPORATION
Minneapolis, Minnesota

**AUTOMATIC DEMAND CONTROL
(WIRING DIAGRAM)**

| | |
|------------------------|---------------|
| SERIA FROM 617-0153 | D 617-0147 |
|------------------------|---------------|

617-0141

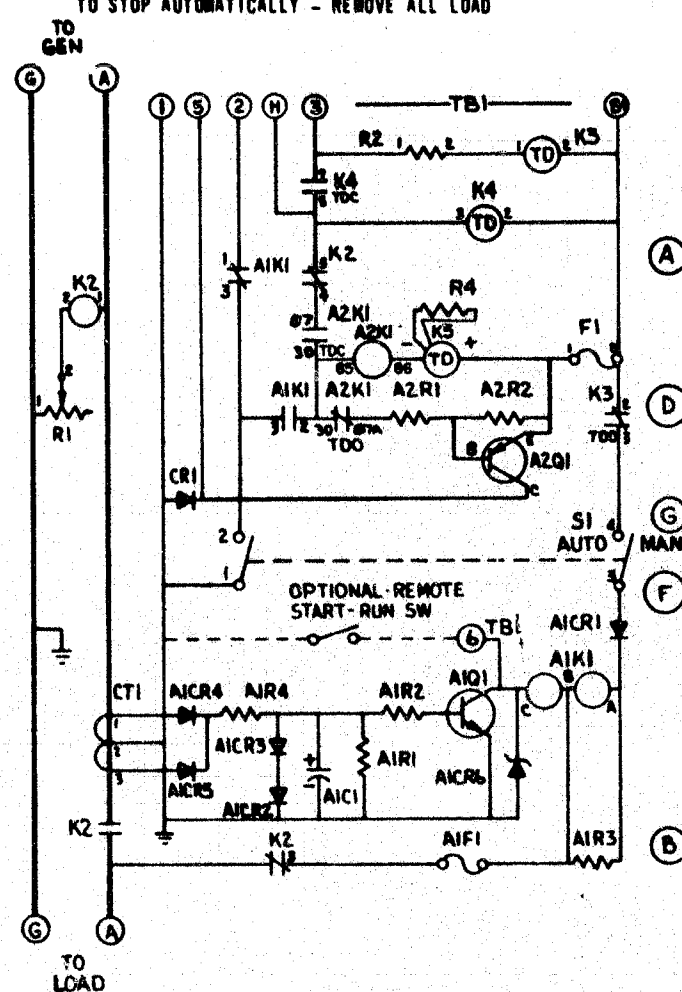
INSIDE VIEW OF BOX



OPERATE WITH NEGATIVE GROUND ONLY
TO START AUTOMATICALLY - APPLY LOAD

LOAD FOR 240V; INCANDESCENT LAMP OF 100W OR HEATER
OF 1000W MIN (57-OHMS)

TO STOP AUTOMATICALLY - REMOVE ALL LOAD



OPERATE WITH NEGATIVE GROUND ONLY

2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN.
BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC
GROUND LEAD

Ⓒ3 CAUTION: - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2) THE AC OUTPUT VOLTAGE WILL BE LOW THE PROTECTIVE FUSE.

4. MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL

UNLESS OTHERWISE NOTED ALL
COMPONENTS ARE SHOWN IN THE
DE-ENERGIZED POSITION.

| | | | | | |
|--------------|---|---------|---|---------------|----------|
| SLAMP REL | | DASH NO | | MOOFL NO | |
| PROD | | -01 | | 7.5 HA-21/10D | |
| REL | | -02 | | 7.5 HA-21/12D | |
| PROD | | | | | |
| REL | | | | | |
| 1 | 2 | 3 | 4 | 120V. | 1PH. |
| 1 | 2 | 3 | 4 | 2W. | 50/60 Hz |

[illegible]

617-0149

7.5HA-21/10D
7.5HA-21/12D

| | | | |
|-----|-----------------------------|----------|----------|
| G | ADDED 307-1577425-1799 | 10/26/77 | 6-9-77 |
| F | ADDED 898-0593 | 10/26/77 | 5-27-77 |
| E | PART NO. WAS 99-0966 | 10/26/77 | 5-27-77 |
| D | ADDED 350-1189 | 10/26/77 | 4-8-77 |
| C | REVISED NOTE 3 | 10/26/77 | 10-29-77 |
| B | ADDED CLIP | 10/26/77 | 10-4-77 |
| A | ADDED WASHER TO PARTS LIST. | 10/26/77 | 10-4-77 |
| LET | REVISION | ENGR | CHK DATE |

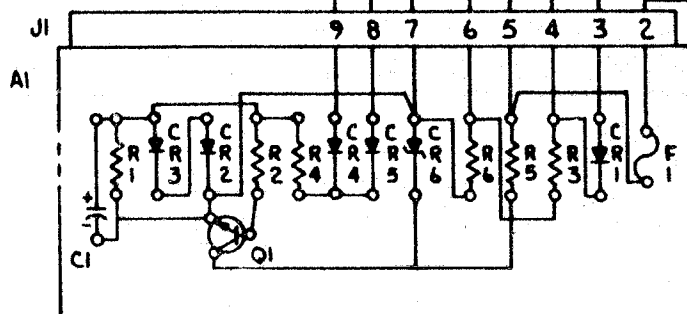
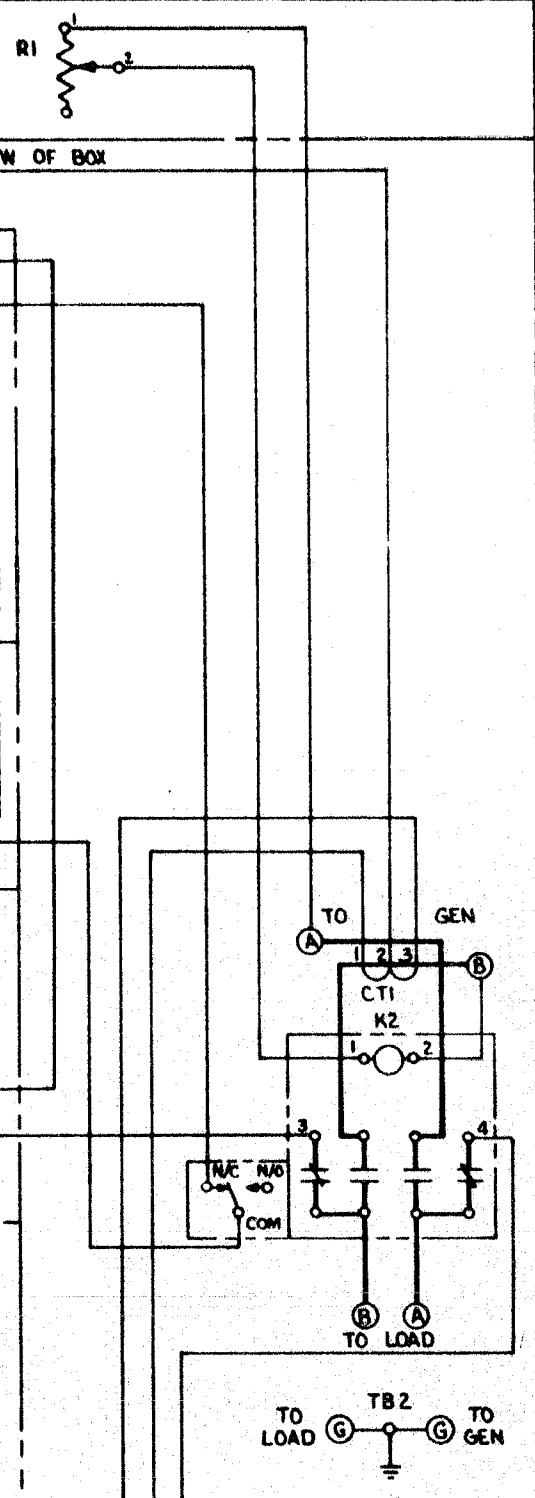
Ongn. DIVISION OF CHAN CORPORATION
Minneapolis, Minnesota

| | | | | | |
|--|----------|----|-----|-----|-----|
| DATE | 12-17-75 | BY | DFD | FOR | CHK |
| AUTOMATIC DEMAND CONTROL (WIRING DIAGRAM) | | | | | |

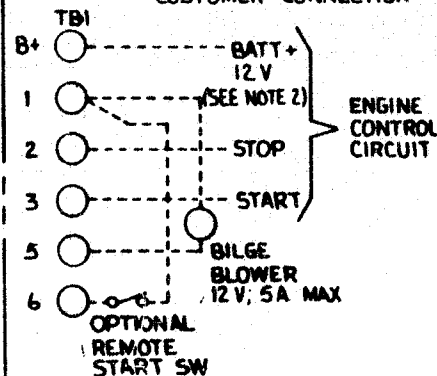
| | | | |
|-----------|-----|----------|------------------|
| SEPA FROM | DWG | 617-0149 | DWG SIZE C |
|-----------|-----|----------|------------------|

0520

WIRING DIAGRAM



CUSTOMER CONNECTION



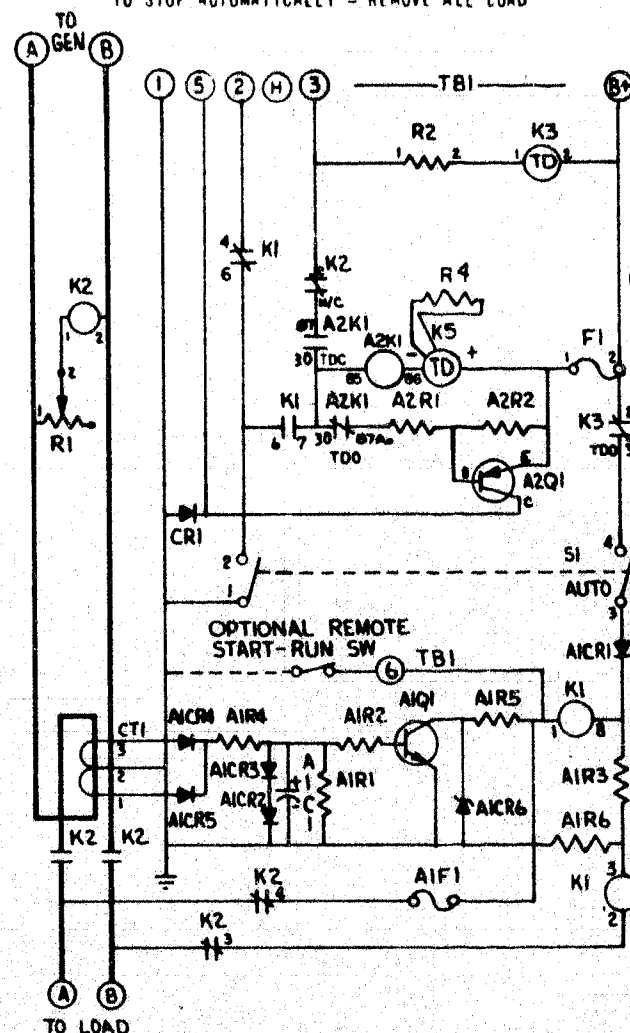
OPERATE WITH NEGATIVE GROUND ONLY

TO START AUTOMATICALLY - APPLY LOAD

LOAD FOR 120V; INCANDESCENT LAMP OF 40W OR HEATER
OF 425W. MIN (35-OHMS)

LOAD FOR 240V; INCANDESCENT LAMP OF 100W OR HEATER
OF 1000W MIN (57-OHMS)

TO STOP AUTOMATICALLY - REMOVE ALL LOAD



NOTES:

1. OPERATE WITH NEGATIVE GROUND ONLY
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD
3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF C (K2), THE AC OUTPUT VOLTAGE WILL BLOW THE PROTE FUSE
4. MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL

NOTE.


UNLESS OTHERWISE NOTED, ALL COMPONENTS ARE SHOWN IN THE DE-ENERGIZED POSITION.

| | | | | | |
|-------------|----|----------|----|------------|----------|
| CAMP REL | | BASH NO. | | MODEL NO. | |
| PICK | | -01 | | 75HA-23/1D | |
| REL | | | | | |
| REL | | | | | |
| REL | | | | | |
| ✓ | ✓ | ✓ | ✓ | 120/240V; | 1PH.. |
| 50 | 60 | more | 20 | 3W.. | 50/60 Hz |

| REF DES | PART NO | QTY | DESCRIPTION |
|---------|---------------|-------|-----------------------------------|
| A1 | 300-0747 | B 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 301-3280 | B 2 | BRACKET MOUNTING |
| | 518-0295 | A 2 | FASTENER-SNAP IN |
| A2 | 300-0587 | B 1 | BILGE BLOWER CONT ASSY |
| | 332-1179 | A 4 | SPACER |
| CRI | 357-0004 | A 1 | DIODE |
| CT1 | 315-0428 | B 1 | TRANSFORMER ASSY-CUR |
| F1 | 321-0139 | - 1 | FUSE 6 25 AMP |
| | 321-0104 | P 1 | HOLDER-FUSE |
| K1 | 307-0858 | A 1 | RELAY-START RUN |
| K2 | 307-0666 | C 1 | CONTACTOR |
| | 160-0144 | A 2 | STRAP |
| | 332-0517 | A 4 | TERMINAL |
| | 309-0042 | A 1 | SWITCH-AUXILIARY |
| | 309-0193 | A 1 | INSULATOR |
| | 96-2045 | A 1 | LABEL-GEN CAUTION |
| | 304-0014 | - 1 | WASHER-CENTERING |
| K3 | 320-0104 | B 1 | RELAY-CRANKING LIMITER |
| R1 | 304-0720 | A 1 | RESISTOR ASSY |
| | 304-0131(REF) | A 1 | RESISTOR-750 Ω 25W |
| | 304-0292 | A 1 | INSULATOR |
| R2 | 304-0192(REF) | A 1 | RESISTOR-3 Ω 10W |
| S1 | 308-0088 | P 1 | SWITCH-AUTO MANUAL |
| TB1 | 332-1972 | A 1 | TERMINAL BLOCK |
| | 332-1939 | A 1 | MARKER STRIP |
| TB2 | 332-0517 | A 2 | TERMINAL-GROUND |
| R4 | 350-1189 | A 1 | RESISTOR-ASSY |
| K5 | 307-1577 | A 1 | RELAY |
| | 425-1799 | P 1 | CLAMP |
| | 898-0593 | - 15" | SLEEVING (USED ON CRI) |
| | 332-0050 | - 1 | CLIP-WIRE |
| | 338-1025 | D 1 | WIRING HARNESS-CONTROL |
| | 301-3011 | D 1 | BRACKET |
| | 301-3012 | D 1 | CONTROL BOX |
| | 301-3010 | B 1 | COVER-CONTROL BOX |
| | 98-2996 | A 1 | SILKSCREEN-SCHEMATIC |
| | 98-2081 | C 1 | SILKSCREEN-AUTO DEMAND CONT COVER |
| | 98-2082 | A 1 | SILKSCREEN-AUTO DEMAND CONT BRKT |
| | 99-0966 | A 1 | NAMEPLATE |

7.5HA-23/1D

| | | | | |
|-----|----------------------------|-------|-----|---------|
| E | ADDED 307-1577, 425-1799 | WA | 24 | 4-11 |
| D | ADDED 898-0593 | WA | 24 | 5-27 |
| C | ADDED 350-1189 | WA | 24 | 4-877 |
| B | REVISED NOTE 3 | WA | 24 | 4-237 |
| A | ADDED WASHER TO PARTS LIST | WA | 24 | 10-8-76 |
| LET | REVISION | INDEX | COR | DATE |



DIVISION OF ONAN CORPORATION
Minneapolis, Minnesota

DATE
1-7-76

BY
DFO

FOR
JYM

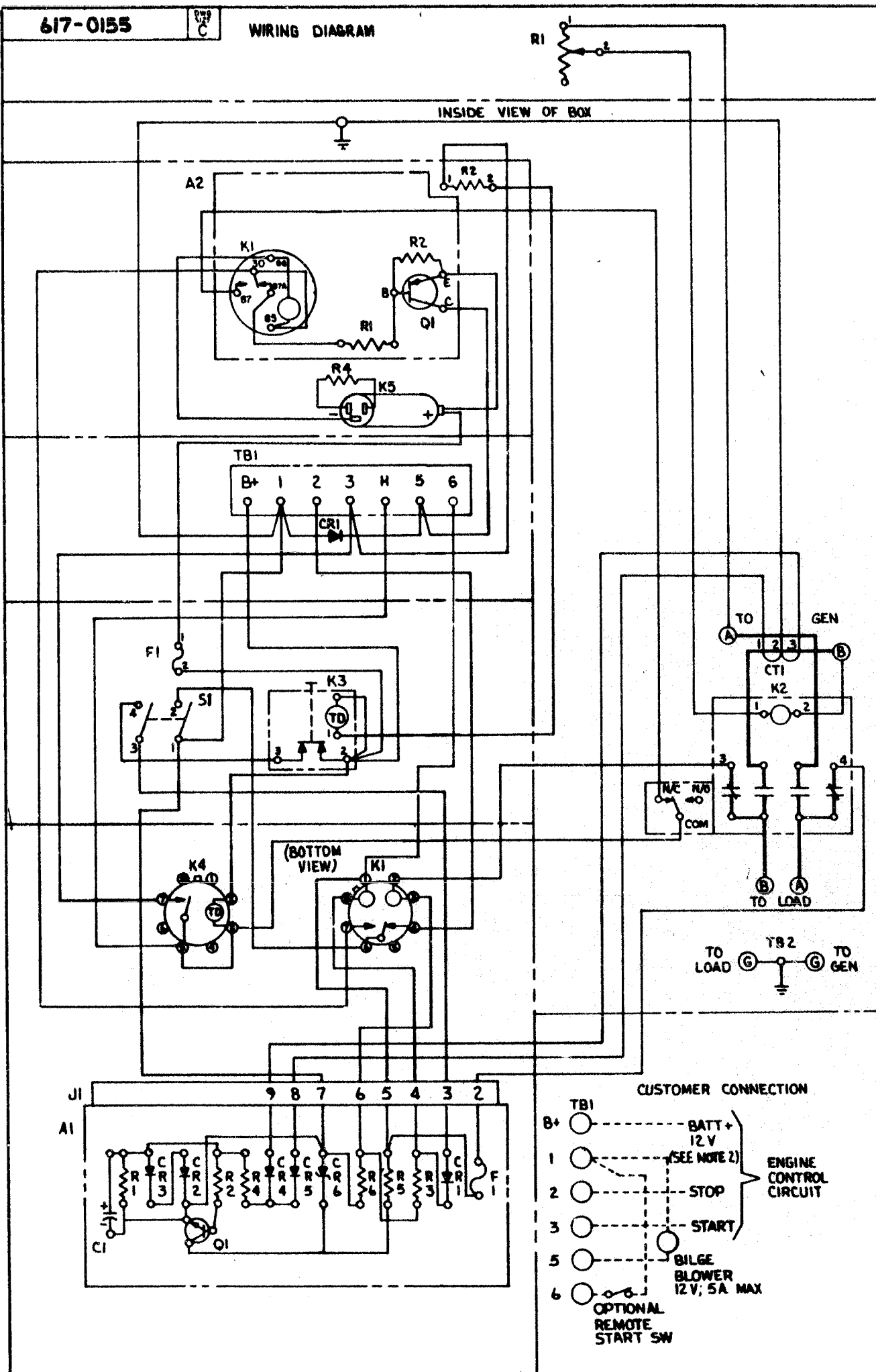
CHKD
COR

CONTROL - AUTO DEMAND
(WIRING DIAGRAM)

SEPA FROM

617-0153

USE
 C



SCHEMATIC

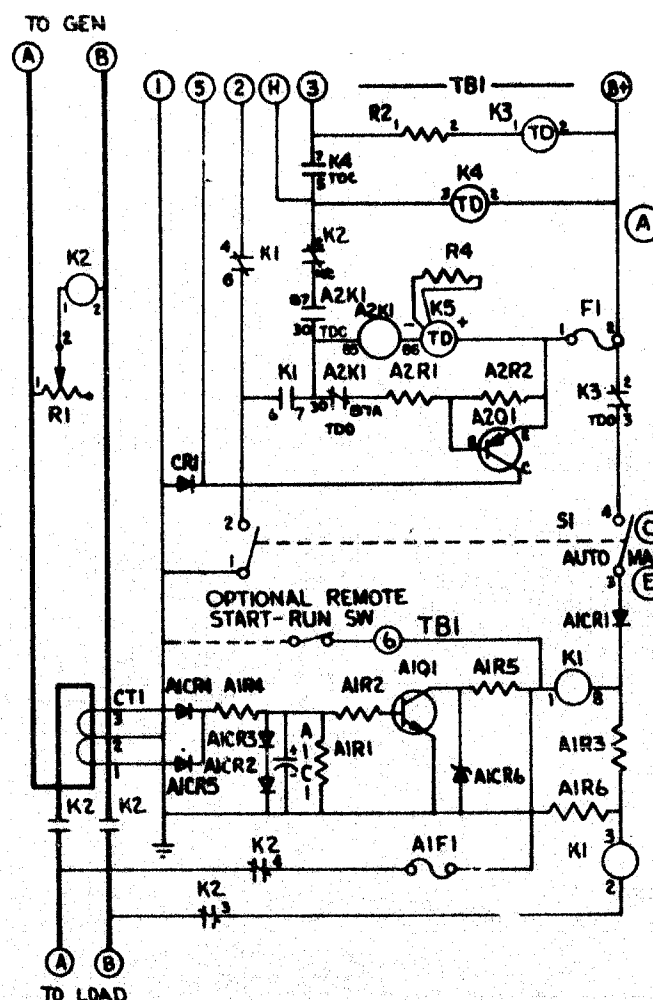
OPERATE WITH NEGATIVE GROUND ONLY

TO START AUTOMATICALLY - APPLY LOAD

LOAD FOR 120V; INCANDESCENT LAMP OF 40W OR HEATER
OF 425W MIN (35-OHMS)

LOAD FOR 240V; INCANDESCENT LAMP OF 100W OR HEATER
OF 1000W MIN (57-OHMS)

TO STOP AUTOMATICALLY - REMOVE ALL LOAD



NOTES:

- 1 OPERATE WITH NEGATIVE GROUND ONLY
- 2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD
- 3 CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL BLOW THE PROTECTIVE FUSE.
- 4 MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL.

NOTE.

UNLESS OTHERWISE NOTED, ALL COMPONENTS ARE SHOWN IN THE DE-ENERGIZED POSITION.

| | | | | | | | | | | | | | |
|--------------|---|-----------|---|------------------|---|---|--|-----------|--|----------|--|-----------------|--|
| CLASS REL | | BATCH NO. | | MODEL NO. | | DATE | | SR | | JTM | | CNR | |
| PROD WHX | | -01 | | 75 HA - 23 / 10D | | 1-7-76 | | DFO | | | | SPR | |
| PROD | | -02 | | 75 HA - 23 / 12D | | CONTROL-AUTO DEMAND (WIRING DIAGRAM) | | | | | | | |
| | ✓ | ✓ | ✓ | ✓ | ✓ | 120/240V; IPH., 3W.. 50/60 Hz | | SEPA FROM | | 617-0155 | | SND SID C | |

[illegible]

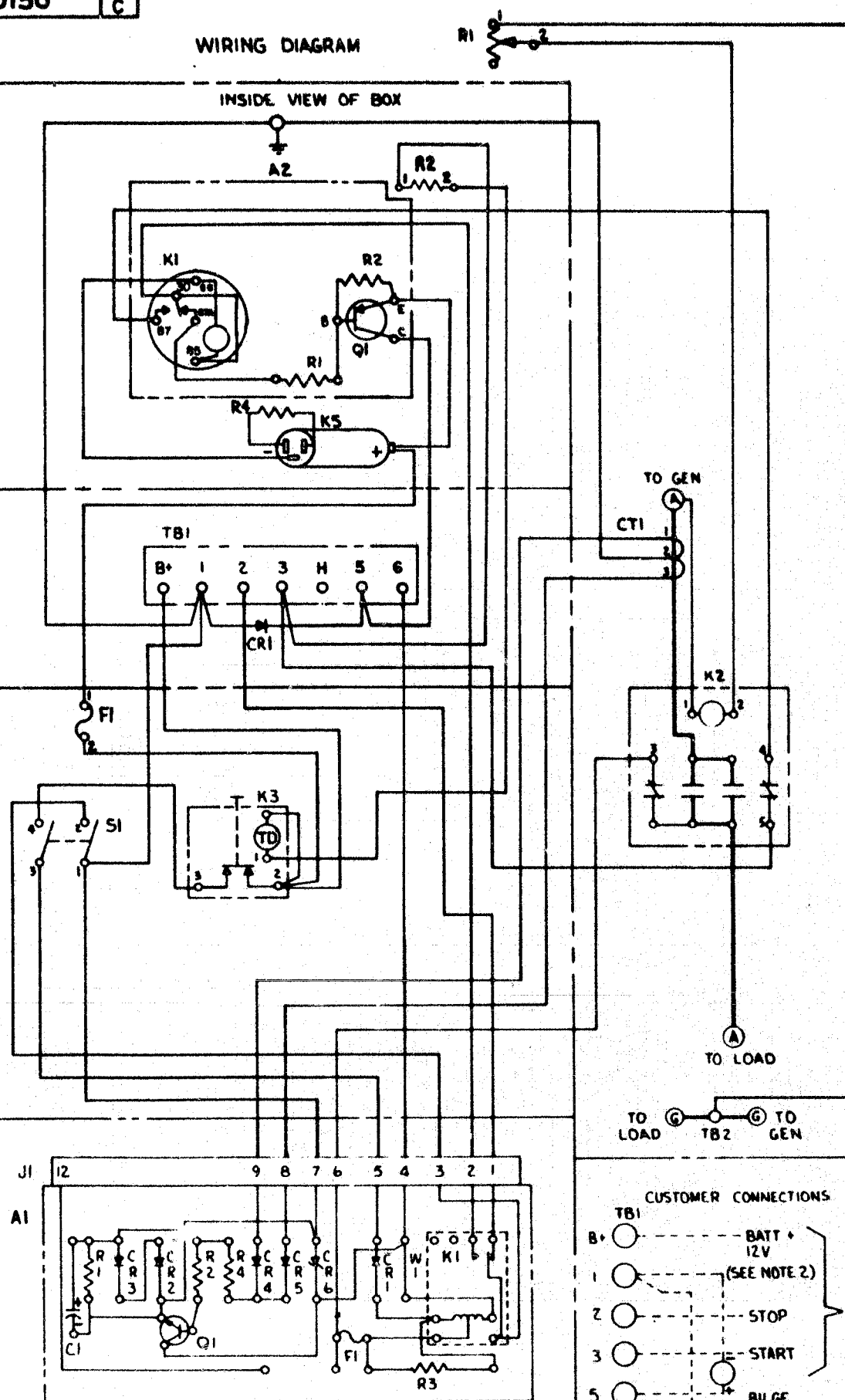
617-0155

7.5HA-23/10D
7.5HA-23/12D

617-0150

C

WIRING DIAGRAM



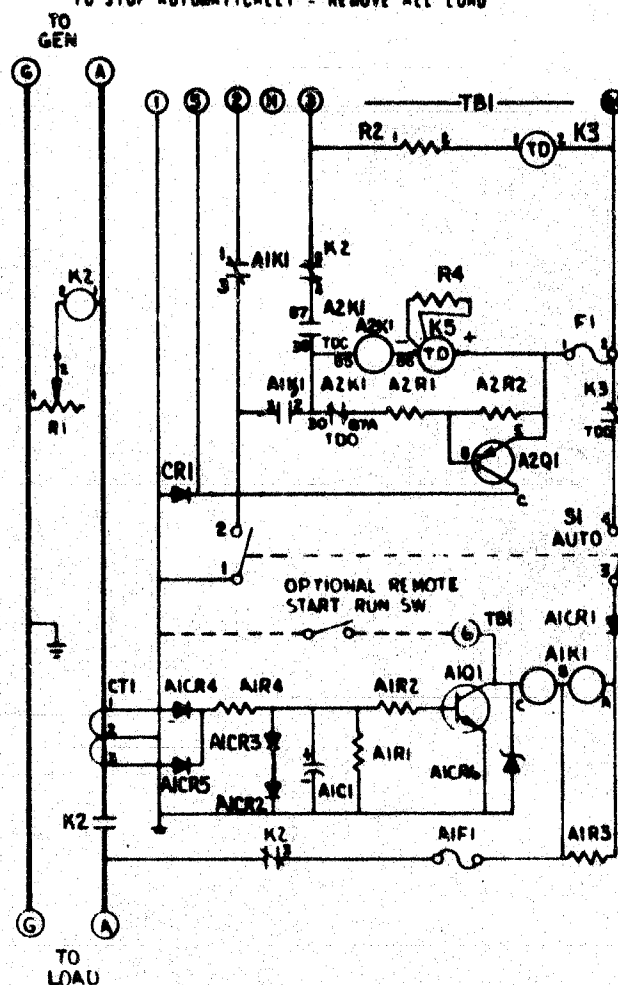
SCHEMATIC

OPERATE WITH NEGATIVE GROUND ONLY

TO START AUTOMATICALLY - APPLY LOAD

LOAD FOR 120V, INCANDESCENT LAMP OF 40W OR HEATER
OF 425W MIN (35-OHMS)LOAD FOR 240V, INCANDESCENT LAMP OF 100W OR HEATER
OF 1000W MIN (57-OHMS)

TO STOP AUTOMATICALLY - REMOVE ALL LOAD



NOTES

- 1 OPERATE WITH NEGATIVE GROUND ONLY
- 2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD
- 3 CAUTION IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL BLOW THE PROTECTIVE FUSE.
- 4 MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL

NOTE

UNLESS OTHERWISE NOTED ALL COMPONENTS ARE SHOWN IN THE DE-ENERGIZED POSITION

PARTS LIST

| REF DES | PART NO. | QTY | DESCRIPTION |
|---------|---------------|------|-----------------------------------|
| A1 | 300-0741 | 1 | CONTROL-LOAD SENSOR |
| | 301-3200 | 2 | BRACKET-MOUNTING |
| | 510-0295 | 2 | FASTENER-SNAP IN |
| A2 | 300-0507 | 1 | BILGE BLOWER CONT ASSY |
| | 332-1170 | 4 | SPACER |
| CT1 | 315-0427 | 1 | TRANSFORMER ASSY-CUR |
| CR1 | 357-0004 | 1 | DIODE |
| F1 | 321-0130 | 1 | FUSE, 6.25 AMP |
| | 321-0104 | 1 | HOLDER-FUSE |
| K2 | 307-0006 | 1 | CONTACTOR |
| | 332-0142 | 2 | TERMINAL |
| | 307-0005 | 2 | JUMPER |
| | 98-2045 | 1 | CAUTION LABEL |
| | 46-0144 | 1 | STRAP |
| K3 | 320-0104 | 1 | RELAY CRANKING LIMITER |
| R4 | 350-1189 | 1 | RESISTOR-ASSY |
| | 304-0014 | 1 | WASHER-CENTERING |
| R1 | 304-0720 | 1 | RESISTOR ASSY |
| | 304-0292 | 1 | INSULATOR |
| | 304-131 (REF) | 1 | RESISTOR-750Ω, 25W |
| R2 | 304-192 (REF) | 1 | RESISTOR-3Ω, 0.5W |
| S1 | 308-0000 | 1 | SWITCH AUTO/MANUAL |
| K5 | 307-1577 | 1 | RELAY |
| | 425-1799 | 1 | CLAMP |
| TB1 | 332-1972 | 1 | BLOCK TERMINAL |
| | 332-1939 | 1 | STRIP WARKER |
| TB2 | 332-0142 | 2 | TERMINAL GROUND |
| | 698-0593 | 1.5" | SLEEVING (USED ON CR1) |
| | 332-0050 | 1 | CLIP-WIRE |
| | 338-1018 | 1 | WIRING HARNESS-CONTROL |
| | 301-3011 | 1 | BRACKET |
| | 301-3012 | 1 | CONTROL BOX |
| | 301-3010 | 1 | COVER CONTROL BOX |
| | 98-2992 | 1 | SILKSCREEN SCHEMATIC |
| | 98-2001 | 1 | SILKSCREEN AUTO DEMAND CONT COVER |
| | 98-2002 | 1 | SILKSCREEN AUTO DEMAND CONT PART |
| | 99-0966 | 1 | NAMEPLATE |

15.0HA-22/1D

| | | | |
|---|----------------------------|---|----------|
| E | ADDED 307-1577/425-1799 | 1 | 6-9-77 |
| D | ADDED 698-0593 | 1 | 5-27-77 |
| C | ADDED 350-1189 | 1 | 4-18-77 |
| B | REVISED NOTE 3 | 1 | 10-29-76 |
| A | ADDED WASHER TO PARTS LIST | 1 | 10-4-76 |

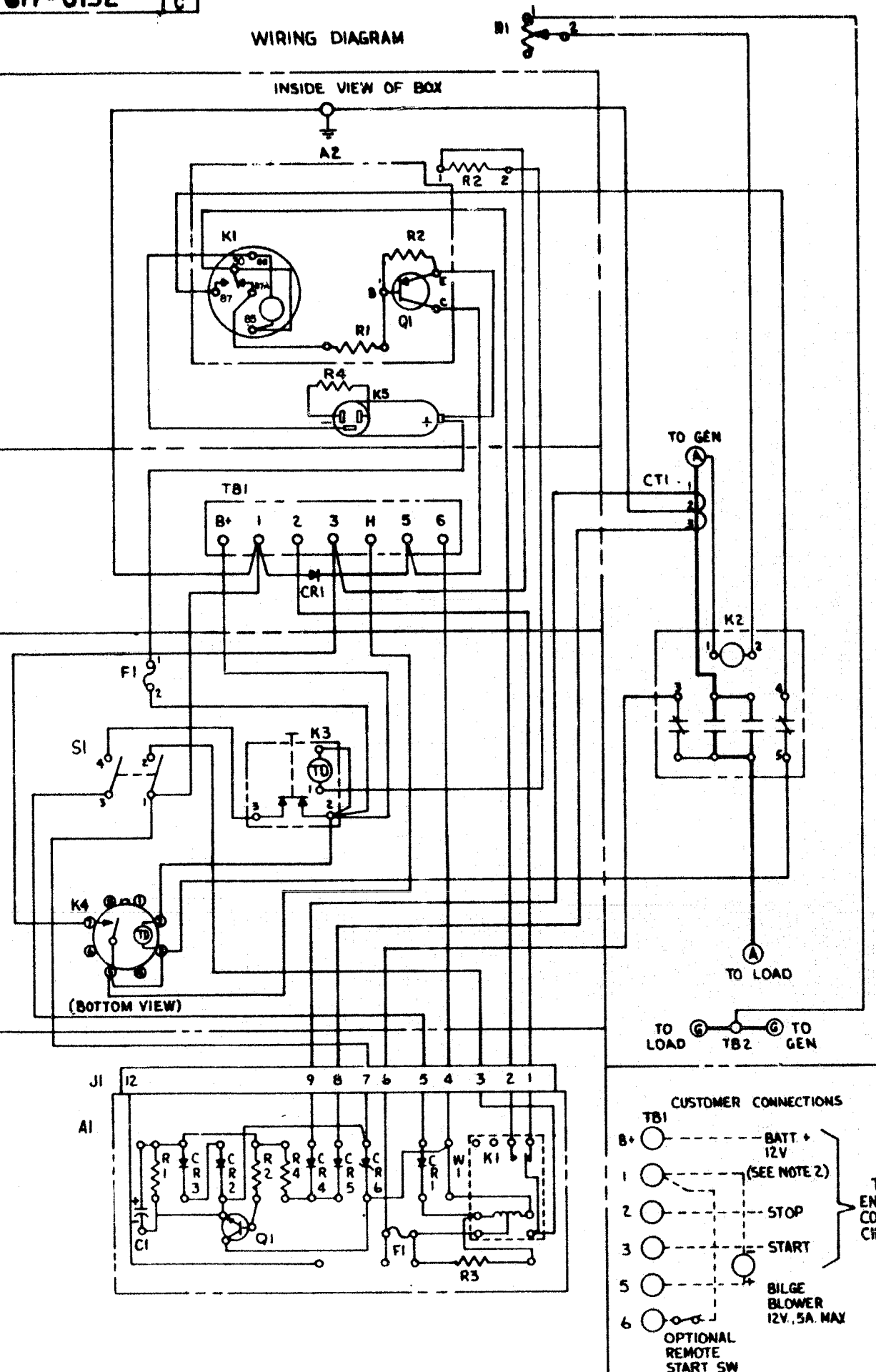
| | | | | | |
|--|----------|-----|----------|------|-----|
| DATE | 12-19-75 | BY | DFO | CHK | CDP |
| DIVISION OF ONAN CORPORATION Minneapolis, Minnesota | | | | | |
| AUTOMATIC DEMAND CONTROL (WIRING DIAGRAM) | | | | | |
| SEP. FROM | 617-0147 | DOC | 617-0150 | PAGE | 1 |
| SIZE | C | | | | |

| | | | |
|------|-----|----------|-----------------------|
| SAMP | NO | MODEL NO | 240V., 1PH., 50/60 Hz |
| PROD | WHH | -01 | 15 HA-22/1D |
| REV | 01 | | |

617-0150

617-0152

WIRING DIAGRAM



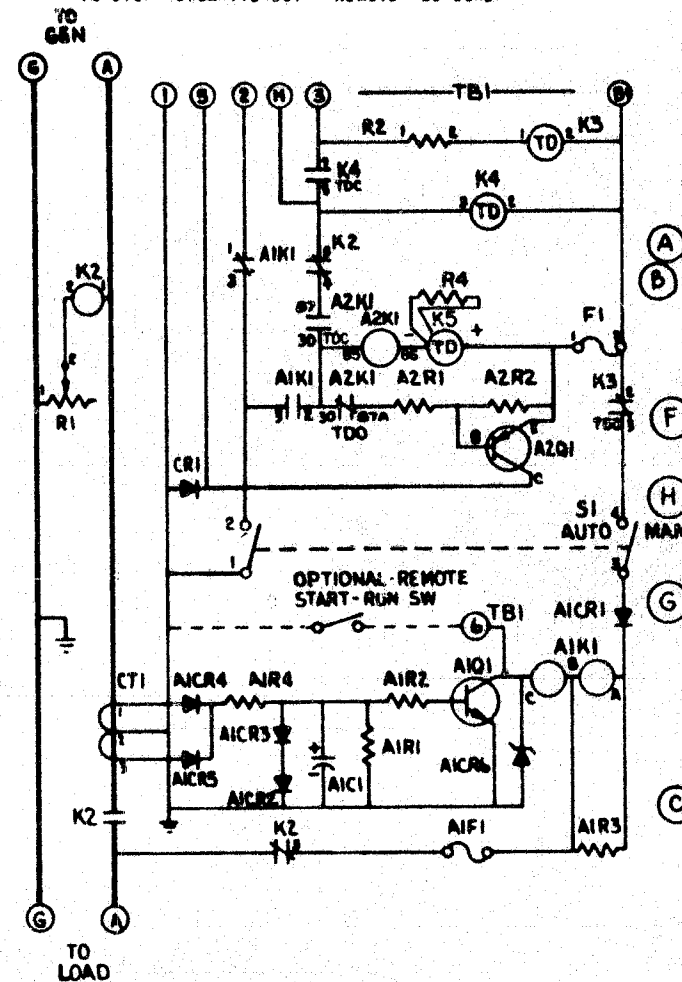
SCHEMATIC

OPERATE WITH NEGATIVE GROUND ONLY

TO START AUTOMATICALLY - APPLY LOAD

LOAD FOR 120V; INCANDESCENT LAMP OF 40W OR HEATER
OF 425W MIN (35-OHMS)LOAD FOR 240V; INCANDESCENT LAMP OF 100W OR HEATER
OF 1060W MIN (57-OHMS)

TO STOP AUTOMATICALLY - REMOVE ALL LOAD



NOTES

- 1 OPERATE WITH NEGATIVE GROUND ONLY
- 2 IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD
- 3 CAUTION: - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2) THE AC OUTPUT VOLTAGE WILL BLOW THE PROTECTIVE FUSE.
- 4 MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL

NOTE:

UNLESS OTHERWISE NOTED, ALL COMPONENTS ARE SHOWN IN THE DE-ENERGIZED POSITION.

PARTS LIST

| REF DES | PART NO | QTY | DESCRIPTION |
|---------|---------------|------|-----------------------------------|
| A1 | 300-0741 | 1 | CONTROL-LOAD SENSOR |
| | 301-3200 | 2 | BRACKET-MOUNTING |
| | 610-0295 | 2 | FASTENER-SNAP IN |
| A2 | 300-0587 | 1 | BILGE BLOWER CONT ASSY |
| | 333-1170 | 4 | SPACER |
| CT1 | 315-0427 | 1 | TRANSFORMER ASSY-CUR |
| CR1 | 357-0804 | 1 | DIODE |
| F1 | 321-0130 | 1 | FUSE 8 25 AMP |
| | 321-0104 | 1 | HOLDER-FUSE |
| K2 | 307-0806 | 1 | CONTACTOR |
| | 332-0142 | 2 | TERMINAL |
| | 307-0805 | 2 | JUMPER |
| | 98-2045 | 1 | CAUTION LABEL |
| | 140-0144 | 1 | STRAP |
| K3 | 320-0104 | 1 | RELAY-CRANKING LIMITER |
| K4 | 307-0645 | 1 | RELAY-T.D (20 SEC)-01 |
| | 307-0689 | 1 | RELAY-T.D (5 SEC)-02 |
| | 304-0014 | 1 | WASHER-CENTERING |
| R1 | 304-0720 | 1 | RESISTOR ASSY |
| | 304-0292 | 1 | INSULATOR |
| | 304-0282(REF) | 1 | RESISTOR-300 Ω, 10W |
| R2 | 304-0M2(REF) | 1 | RESISTOR-3 Ω, 10W |
| S1 | 300-0080 | 1 | SWITCH-AUTO MANUAL |
| | | | |
| R4 | 350-1189 | 1 | RESISTOR-ASSY |
| TB1 | 332-1972 | 1 | BLOCK-TERMINAL |
| | 332-1939 | 1 | STRIP-MARKER |
| TB2 | 332-0142 | 2 | TERMINAL-GROUND |
| K5 | 307-1577 | 1 | RELAY |
| | 425-1799 | 1 | CLAMP |
| | 898-0593 | 1.5" | SLEEVING (USED ON CR1) |
| | | | |
| | 332-0050 | 1 | CLIP-WIRE |
| | 330-0998 | 1 | WIRING HARNESS-CONTROL |
| | 301-3011 | 1 | BRACKET |
| | 301-3012 | 1 | CONTROL BOX |
| | 301-3010 | 1 | COVER-CONTROL BOX |
| | 98-2990 | 1 | SILKSCREEN-SCHEMATIC |
| | 98-2081 | 1 | SILKSCREEN-AUTO DEMAND CONT COVER |
| | 98-2082 | 1 | SILKSCREEN-AUTO DEMAND CONT BRY |
| | 99-0966 | 1 | NAMEPLATE |

15.0HA-22/10D
15.0HA-22/12D

| | | |
|---|----------------------------|---------|
| H | ADDED 307-1577, 425-1799 | 10-5-77 |
| G | ADDED 898-0593 | 10-5-77 |
| F | ADDED 350-1189 | 10-5-77 |
| E | REVISED NOTE 3 | 10-5-76 |
| D | WAS 15HA-21/10 & 12 | 10-5-76 |
| C | ADDED CLIP | 10-5-76 |
| B | R1 WAS 304-0719 | 10-5-76 |
| A | ADDED WASHER TO PARTS LIST | 10-4-76 |

DIVISION OF OHAN CORPORATION
Minneapolis, Minnesota

DATE 12-17-75 BY DFO

AUTOMATIC DEMAND CONTROL
(WIRING DIAGRAM)

617-0149 617-0152

| | |
|-----------------------|--------------|
| MODEL NO | 15 HA-22/10D |
| DASH NO | -01 |
| 15 HA-22/12D | |
| 240V., 1PH., 50/60 Hz | |

617-0152

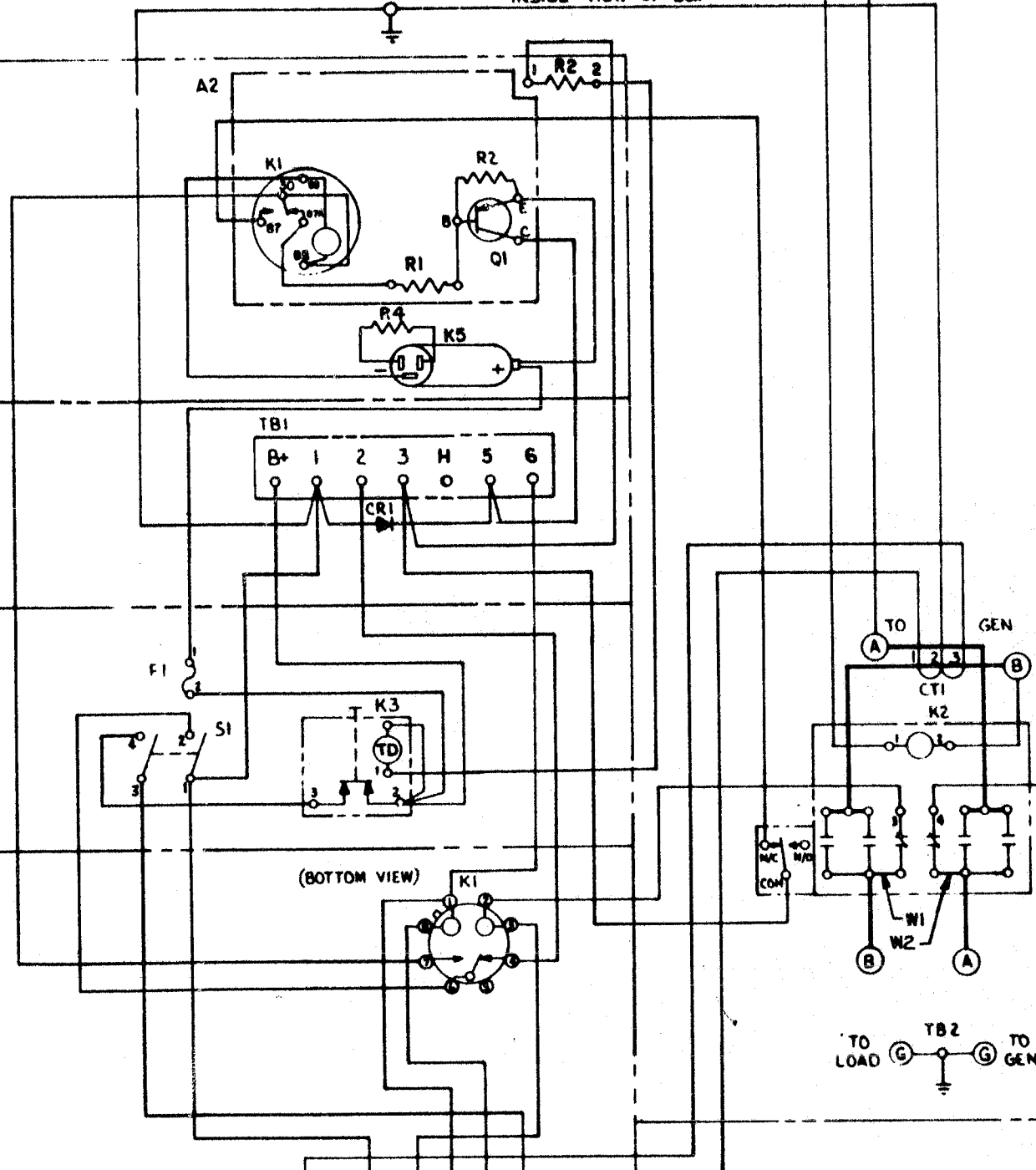
617-0156

C

WIRING DIAGRAM

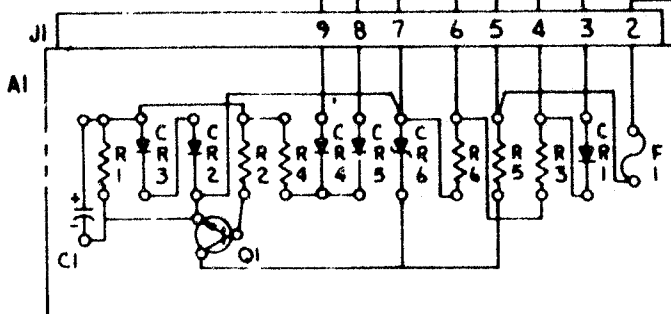


INSIDE VIEW OF BOX

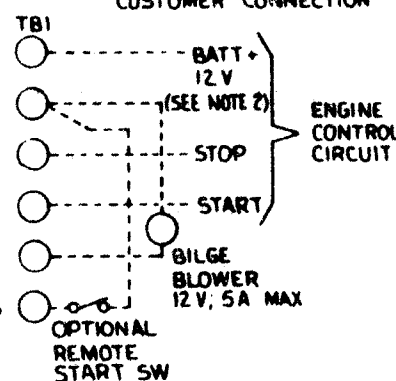


(BOTTOM VIEW)

TO LOAD (G) TO GEN



CUSTOMER CONNECTION

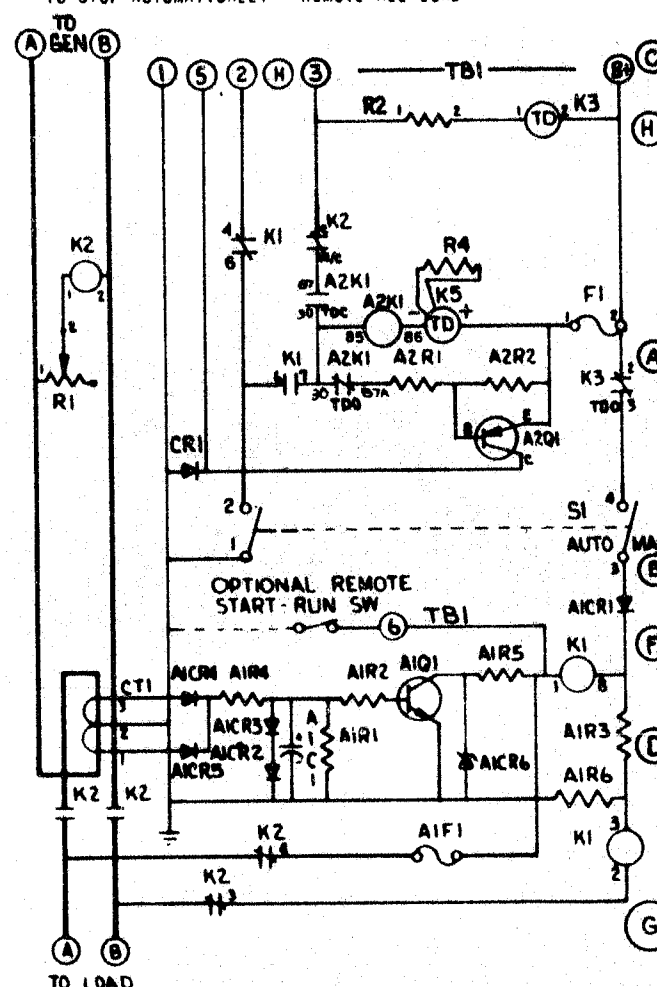


OPERATE WITH NEGATIVE GROUND ONLY

TO START AUTOMATICALLY - APPLY LOAD

LOAD FOR 120V. INCANDESCENT LAMP OF 40W OR HEATER
OF 425W MIN (35-OHMS)LOAD FOR 240V. INCANDESCENT LAMP OF 100W OR HEATER
OF 1000W MIN (57-OHMS)

TO STOP AUTOMATICALLY - REMOVE ALL LOAD



NOTES

- OPERATE WITH NEGATIVE GROUND ONLY
- IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN. BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD
- CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2) THE AC OUTPUT VOLTAGE WILL BLOW THE PROTECTIVE FUSE.
- MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL

NOTE

UNLESS OTHERWISE NOTED ALL COMPONENTS ARE SHOWN IN THE DE-ENERGIZED POSITION

PARTS LIST

| REF DES | PART NO | QTY | DESCRIPTION |
|---------|----------|-----|-----------------------------------|
| A1 | 300-0747 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 301-3200 | 2 | BRACKET MOUNTING |
| | 518-0295 | 2 | FASTENER-SNAP IN |
| A2 | 300-0587 | 1 | BILGE BLOWER CONT ASSY |
| | 332-1179 | 4 | SPACER |
| CR1 | 357-0004 | 1 | DIODE |
| CT1 | 315 0426 | 1 | TRANSFORMER - CURRENT |
| F1 | 321-0139 | 1 | FUSE 6 25 AMP |
| | 321 0104 | 1 | HOLDER-FUSE |
| K1 | 307-0858 | 1 | RELAY-START RUN |
| K2 | 307-0667 | 1 | CONTACTOR |
| | 332-0142 | 4 | TERMINAL |
| | 307-0685 | 4 | JUMPER-CONTACTOR |
| | 309-0042 | 1 | SWITCH-AUXILIARY |
| K5 | 307-1577 | 1 | RELAY |
| | 425-1799 | 1 | CLAMP |
| | 309-0193 | 1 | INSULATOR |
| | 307-1517 | 2 | BUS BAR-CONTACTOR |
| | 898-0692 | 2 | SLEEVING (EXPAND FIRST) |
| | 98-2045 | 1 | LABEL-GEN CAUTION |
| K3 | 320-0104 | 1 | RELAY-CRANKING LIMITER |
| | 304-0014 | 1 | WASHER-CENTERING |
| R1 | 304-0720 | 1 | RESISTOR ASSY |
| | 304-0131 | 1 | RESISTOR-750Ω, 25W |
| | 304-0292 | 1 | INSULATOR |
| R2 | 304-0192 | 1 | RESISTOR 3Ω, 10W |
| ST | 308-0088 | 1 | SWITCH-AUTO MANUAL |
| TB1 | 332-1972 | 1 | TERMINAL BLOCK |
| | 332-1939 | 1 | MARKER STRIP |
| TB2 | 332-0142 | 2 | TERMINAL-GND |
| W1,2 | 336-2597 | 2 | LEAD ASSY |
| R4 | 350-1189 | 1 | RESISTOR-ASSY |
| | 332-0050 | 1 | CLIP-WIRE |
| | 338-1025 | 1 | WIRING HARNESS-CONTROL |
| | 301 3011 | 1 | BRACKET |
| | 301 3012 | 1 | CONTROL BOX |
| | 301 3010 | 1 | COVER-CONTROL BOX |
| | 98 2996 | 1 | SILKSCREEN-SCHEMATIC |
| | 98 2081 | 1 | SILKSCREEN-AUTO DEMAND CONT COVER |
| | 98 2082 | 1 | SILKSCREEN-AUTO DEMAND CONT BRKT |
| | 99-0566 | 1 | NAMEPLATE |
| | 898-0593 | 1.5 | SLEEVING (USED ON CR1) |

617-0156

15.0HA-23/1D

| | | | |
|-----|----------------------------|------|----------|
| H | ADDED 307-1577/425-1799 | 1/1 | 2/6-9-77 |
| G | ADDED 898-0593 | 1/1 | 5-27-77 |
| F | ADDED 350-1189 | 1/1 | 4-18-77 |
| E | REVISED NOTE 3 | 1/1 | 11-1-76 |
| D | WAS 301-3047 | 1/1 | 10-15-76 |
| C | WAS 332-0517 | 1/1 | 10-5-76 |
| B | WAS 332-0517 | 1/1 | 10-5-76 |
| A | ADDED WASHER TO PARTS LIST | 1/1 | 10-5-76 |
| REV | REVISION | DATE | |

DIVISION OF CNAN CORPORATION
Minneapolis, Minnesota

DATE 1-6-76 BY DFO

CONTROL-AUTO DEMAND
(WIRING DIAGRAM)

617-0156

| | | |
|-----------------|--------------|---------------------|
| DATE 1-6-76 | BY DFO | MODEL NO 15HA-23/1D |
| 120/240V.. 1PH. | 3W., 50/60Hz | |

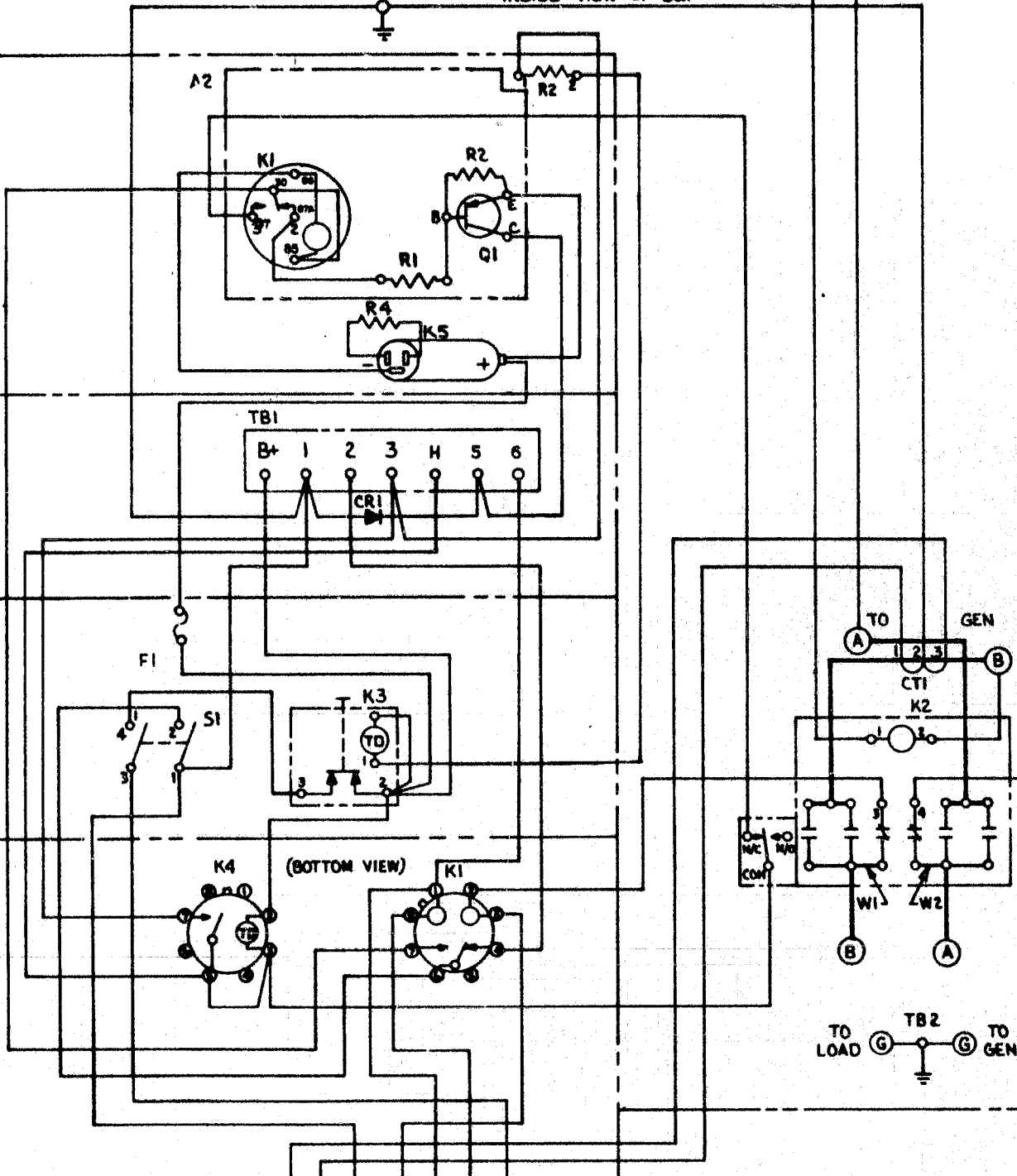
617-0158

C

WIRING DIAGRAM



INSIDE VIEW OF BOX

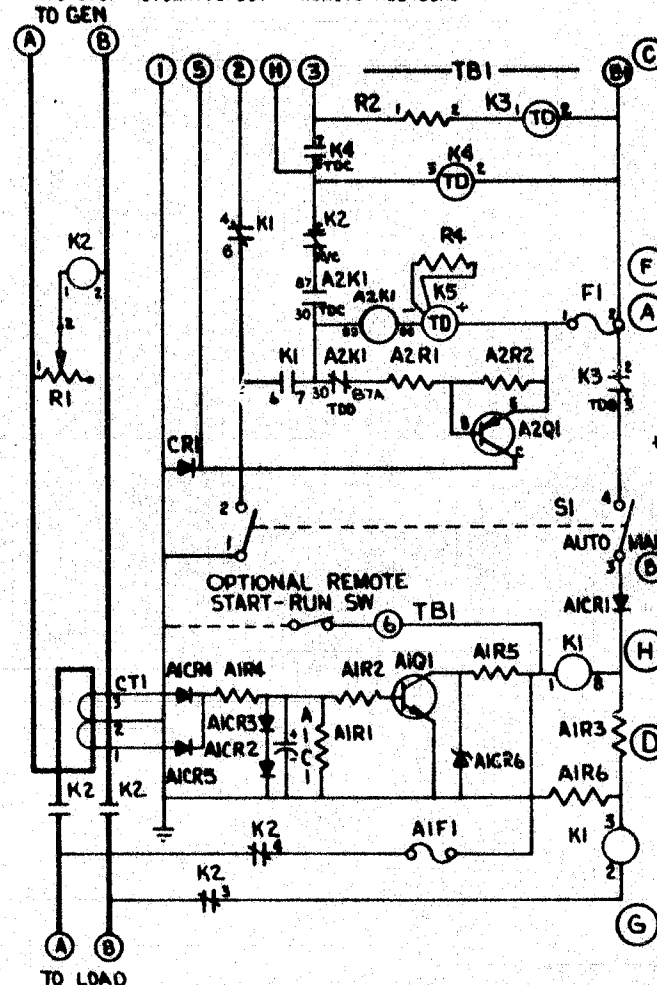


OPERATE WITH NEGATIVE GROUND ONLY

TO START AUTOMATICALLY - APPLY LOAD

LOAD FOR 120V; INCANDESCENT LAMP OF 40w OR HEATER
OF 425w MIN (35-OHMS)LOAD FOR 240V; INCANDESCENT LAMP OF 100w OR HEATER
OF 1000w MIN (57-OHMS)

TO STOP AUTOMATICALLY - REMOVE ALL LOAD



NOTES:

1. OPERATE WITH NEGATIVE GROUND ONLY
2. IT IS NOT NECESSARY TO CONNECT TERMINAL 1 TO GEN, BECAUSE GENERATOR AND CONTROL ARE CONNECTED THRU THE AC GROUND LEAD.
3. CAUTION - IF GEN IS CONNECTED TO LOAD TERMINALS OF CONTACTOR (K2), THE AC OUTPUT VOLTAGE WILL BLOW THE PROTECTIVE FUSE.
4. MOUNT SWITCH WITH FINISHING NUT ON THE FRONT PANEL.

NOTE:

UNLESS OTHERWISE NOTED, ALL COMPONENTS ARE SHOWN IN THE
DE-ENERGIZED POSITION.

PARTS LIST

| REF DES | PART NO | QTY | DESCRIPTION |
|---------|---------------|------|-----------------------------------|
| A1 | 300-0747 | 1 | AMPLIFIER ASSY-LOAD SENSOR |
| | 301-3200 | 2 | BRACKET MOUNTING |
| | 510-0295 | 2 | FASTENER-SNAP IN |
| A2 | 300-0567 | 1 | BILGE BLOWER CONT ASSY |
| | 332-1179 | 4 | SPACER |
| CR1 | 357-0004 | 1 | DIODE |
| CT1 | 315-0426 | 1 | TRANSFORMER - CURRENT |
| F1 | 321-0138 | 1 | FUSE-8.25 AMP |
| | 321-0104 | 1 | HOLDER-FUSE |
| K1 | 307-0858 | 1 | RELAY-START RUN |
| K2 | 307-0667 | 1 | CONTACTOR |
| | 332-0142 | 4 | TERMINAL |
| | 307-0685 | 4 | JUMPER-CONTACTOR |
| | 309-0042 | 1 | SWITCH-AUXILIARY |
| | 309-0193 | 1 | INSULATOR |
| | 307-1517 | 2 | BUS BAR- CONTACTOR |
| | 98-2045 | 1 | LABLE-GEN CAUTION |
| | 898-0692 | 2 | SLEEVING (EXPAND FIRST) |
| R4 | 350-1189 | 1 | RESISTOR - ASSY |
| | 304-0014 | 1 | WASHER-CENTERING |
| K3 | 320-0104 | 1 | RELAY-CRANKING LIMITER |
| K4 | 307-0645 | 1 | RELAY-TIME DELAY (20 SEC) -01 |
| | 307-0609 | 1 | RELAY-TIME DELAY (6 SEC) -02 |
| R1 | 304-0720 | 1 | RESISTOR ASSY |
| | 304-0292 | 1 | INSULATOR |
| R2 | 304-0192(RED) | 1 | RESISTOR - 3Ω, 2.5W |
| S1 | 308-0088 | 1 | SWITCH-AUTO MANUAL |
| TB1 | 332-1972 | 1 | TERMINAL BLOCK |
| | 332-1939 | 1 | MARKER STRIP |
| TB2 | 332-0142 | 2 | TERMINAL-GND |
| W1 2 | 336-2587 | 2 | LEAD ASSY |
| K5 | 307-1577 | 1 | RELAY |
| | 425-1799 | 1 | CLAMP |
| | 332-0050 | 1 | CLIP-WIRE |
| | 338-1019 | 1 | WIRING HARNESS-CONTROL |
| | 301-3011 | 1 | BRACKET |
| | 301-3012 | 1 | CONTROL BOX |
| | 301-3010 | 1 | COVER-CONTROL BOX |
| | 98-2995 | 1 | SILKSCREEN-SCHEMATIC |
| | 98-2081 | 1 | SILKSCREEN-AUTO DEMAND CONT COVER |
| | 98-2082 | 1 | SILKSCREEN-AUTO DEMAND CONT BRKT |
| | 99-0966 | 1 | NAMEPLATE |
| | 898-0593 | 1.5" | SLEEVING (USED ON CR1) |
| | 304-0131(RED) | 1 | RESISTOR - 750Ω, 25W |

617-0158

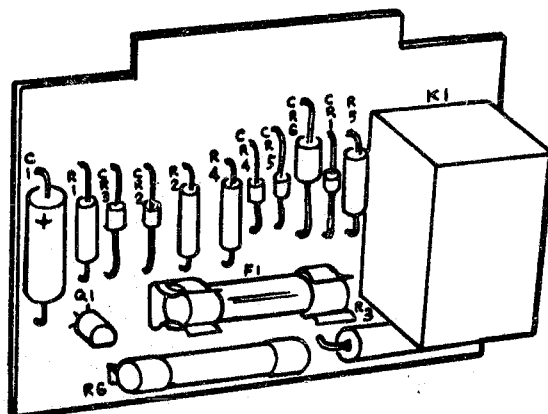
15.0HA-23/10D
15.0HA-23/12D

| | | | |
|---|----------------------------|---|----------|
| H | ADDED 307-1577(425-1799) | 1 | 6-21-77 |
| G | ADDED 898-0593 | 1 | 6-21-77 |
| F | ADDED 350-1189 | 1 | 4-18-76 |
| E | REVISED NOTE 3 | 1 | 11-1-76 |
| D | WAS 301-3047 | 1 | 10-15-76 |
| C | WAS 332-0517 | 1 | 10-5-76 |
| B | WAS 332-0517 | 1 | 10-5-76 |
| A | ADDED WASHER TO PARTS LIST | 1 | 10-5-76 |

| REV | REVISION | DATE | BY | CHK | DATE |
|---|----------|--------|-----|--------|--------|
| 1 | 1-6-76 | 1-6-76 | DFD | 1-1-76 | 1-1-76 |
| CONTROL - AUTO DEMAND (WIRING DIAGRAM) | | | | | |
| 617-0158 | | | | | |

| QAMP | QASH NO | MODEL NO |
|------------------------------|---------|----------------|
| 15 HA - 23/10D | -01 | 15 HA - 23/10D |
| 15 HA - 23/12D | -02 | 15 HA - 23/12D |
| 120/240V; 1PH., 3W., 50/60Hz | | |

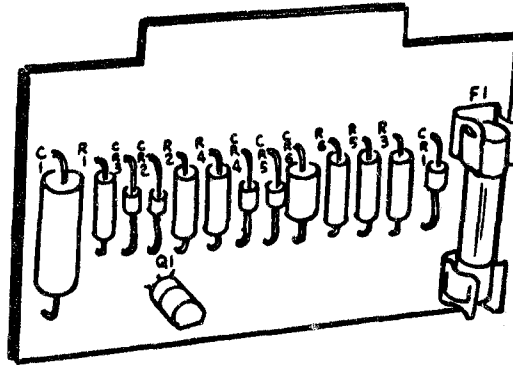
300-0740, 300-0741 AND 300-0743 PRINTED CIRCUIT BOARDS (FOR 2-WIRE CONTROLS)



| COMPONENT | PART NUMBER | QTY. USED | DESCRIPTION |
|-----------|--|-----------|------------------------|
| R1 | 350-0540 (p.c. board 300-0741) | 1 | Resistor, 2.2 K ohm |
| | 350-0548 (p.c. board 300-0740, 300-0743) | 1 | Resistor, 10 K ohm |
| R2 | 350-0528 | 1 | Resistor, 220 ohm |
| R3 | 352-0111 (p.c. board 300-0740, 300-0743) | 1 | Resistor, 47 ohm |
| | 352-0119 (p.c. board 300-0741) | 1 | Resistor, 100 ohm |
| R4 | 350-0520 | 1 | Resistor, 47 ohm |
| R5 | 350-0538 (p.c. board 300-0743 only) | 1 | Resistor, 1.5 K ohm |
| R6 | 352-0156 (p.c. board 300-0743 only) | 1 | Resistor, 150 ohm |
| C1 | 356-0009 | 1 | Capacitor, 10 mfd |
| CR1 - CR5 | 357-0004 | 5 | Diode, 400 MA |
| CR6 | 359-0018 (p.c. board 300-0743) | 1 | Diode, Zener |
| | 359-0029 (p.c. board 300-0740, 300-0741) | 1 | Diode, Zener |
| F1 | 321-0202 | 1 | Fuse, 3/8 ampere |
| K1 | 307-1087 | 1 | Relay, Dual Coil |
| MP1 | 332-1299 (p.c. board 300-0740, 300-0741) | 1 | Board, Printed Circuit |
| | 332-1304 (p.c. board 300-0743) | 1 | Board, Printed Circuit |
| Q1 | 362-0007 (p.c. board 300-0740, 300-0741) | 1 | Transistor, Signal |
| | 362-0014 (p.c. board 300-0743) | 1 | Transistor, Signal |
| | 321-0163 | 2 | Clip, Fuse |

NOTE: Components R5 and R6 on p.c. board 300-0743 only.

**300-0747 PRINTED CIRCUIT BOARD
(FOR 3-WIRE CONTROLS)**



| COMPONENT | PART NUMBER | QTY. USED | DESCRIPTION |
|-----------|-------------|-----------|------------------------|
| R1 | 350-0540 | 1 | Resistor, 2.2 K ohm |
| R2 | 350-0528 | 1 | Resistor, 220 ohm |
| R3 | 350-0528 | 1 | Resistor, 220 ohm |
| R4 | 350-0520 | 1 | Resistor, 47 ohm |
| R5 | 350-0524 | 1 | Resistor, 100 ohm |
| R6 | 350-0528 | 1 | Resistor, 220 ohm |
| C1 | 356-0009 | 1 | Capacitor, 10 mfd |
| CR1 - CR5 | 357-0004 | 5 | Diode, 400 MA |
| CR6 | 359-0029 | 1 | Diode, Zener |
| F1 | 321-0202 | 1 | Fuse, 3/8 ampere |
| MP1 | 332-1308 | 1 | Board, Printed Circuit |
| Q1 | 362-0007 | 1 | Transistor, Signal |
| | 321-0163 | 2 | Clip, Fuse |