



**1998-1999
ELECTRICAL WIRING
MANUAL**

MVP-EF

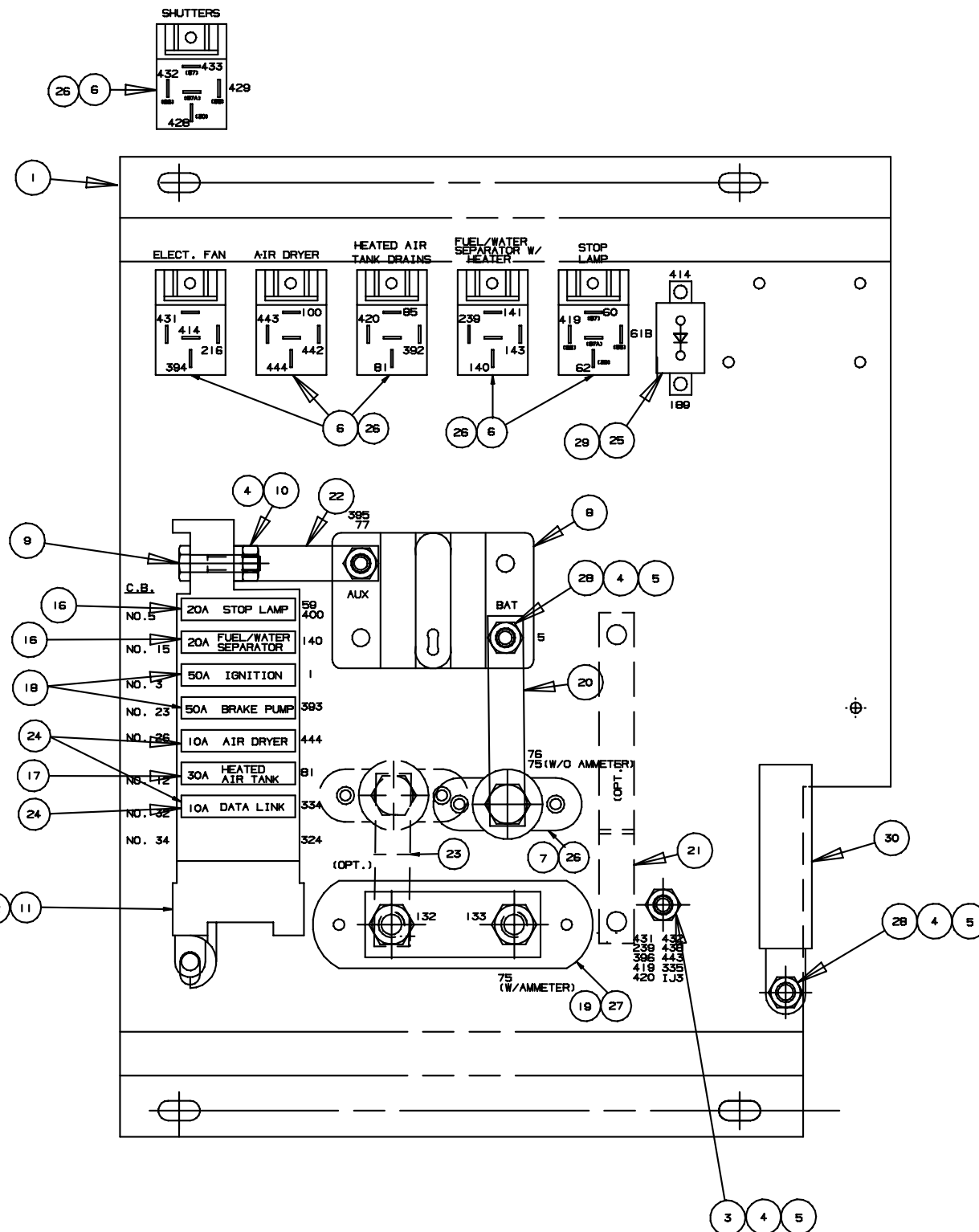
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QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	PART NO.	DESCRIPTION	ITEM	
										1	62202419	PANEL, FRONT ELECT., FC CHASSIS	1
											61200938	TERMINAL BD. - 4 POSITION	2
											61370804	BOLT - HEX HEAD, 1/4-20 X 1 1/4	3
											61370348	FLAT WASHER - 1/4	4
											61370050	NUT - HEX 1/4-20	5
											61200915	RELAY - CONTROL, SEALED	6
											61200463	TERMINAL BD. - 1 POSITION	7
											61200870	CIRCUIT BREAKER - 150 AMP	8
											61370882	BOLT - HEX HEAD (METRIC) M6 - 1.0 X 30	9
											61370215	LOCKNUT, ELASTIC - METRIC (M6-1.0)	10
											61200855	FUSEBLOCK MODULE - 8 POSITION	11
											61200856	COVER - TOP	12
											61200857	BASE, MODULE - MOUNTING	13
											61200858	LATCH - COVER	14
											61200859	COMB - SECONDARY LOCK	15
											61200916	CIRCUIT BREAKER - MAXIFUSE, 20 AMP	16
											61200917	CIRCUIT BREAKER - MAXIFUSE, 30 AMP	17
											61200878	FUSE - MAXIFUSE 50 AMP	18
											61200728	SHUNT - AMMETER	19
											62201424	BUSS BAR - POWER STUD TO MAIN C.B. (BAT)	20
											62201423	BUSS BAR - AMMETER SHUNT TO MAIN C.B. (BAT.)	21
											62201425	BUSS BAR - MAIN C.B. (AUX.) TO FUSEBLOCK MODULE	22
											62201427	BUSS BAR - POWER STUD TO AMMETER SHUNT	23
											61200946	CIRCUIT BREAKER - MAXIFUSE, 10 AMP	24
											61200926	DIODE - ENCLOSED, 5 AMP	25
											61370334	SCREW, SELF TAPPING - #10 X 5/8	26
											61370337	SCREW, SELF TAPPING - #10 X 1 1/4	27
											61370802	BOLT - HEX HEAD, 1/4-20 X 3/4	28
											61370335	SCREW, SELF TAPPING - #8 X 5/8	29
											61480473	CLAMP, LOOP - CUSHION	30
											62230894	BRACKET, MTG. - DATA LINK PLUG (NOT SHOWN)	31
											61370026	SCREW, MACH. #4-40 X 3/8	32
											61370027	LOCKNUT #4-40	33

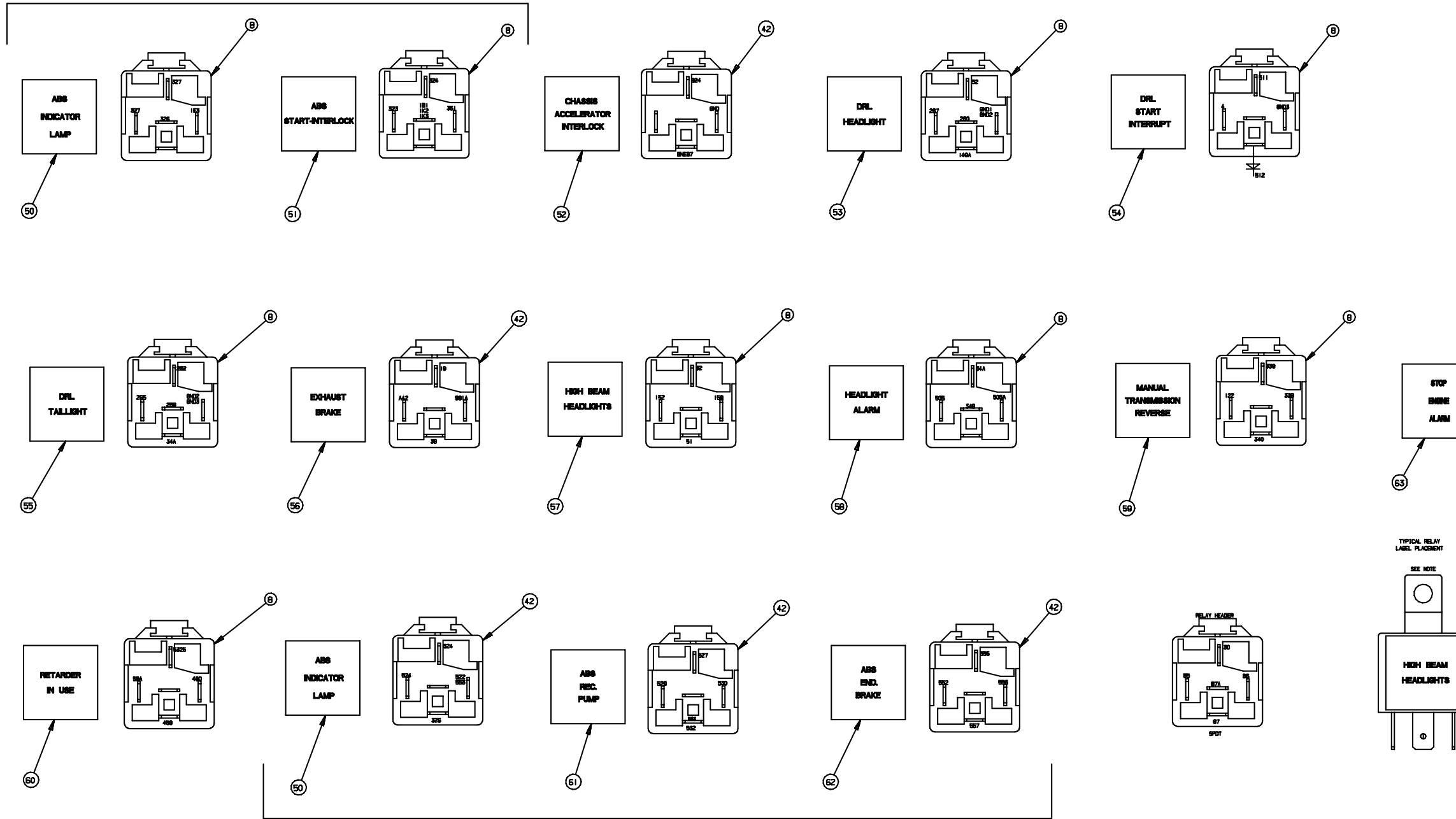
- STANDARD EQUIPMENT
- (OPTION) HYDRAULIC BRAKES C2075-00-000
- AIR BRAKES
- (OPTION) AMMETER GAUGE C3615-01
- (OPTION) FUEL/WATER SEPARATOR W/HEATER C2305-00
- (OPTION) HEATED AIR TANK DRAINS C1153-00-000
- (OPTION) ELECTRIC FAN (RADIATOR) W/SHUTTERS C4010-02-000
- (OPTION) AIR DRYER C1158-00
- (OPTION) ANTI-LOCK BRAKES C2070-04

62201724 F

**ELECT. COMPONENT
FRONT ELECT. PANEL
CAT 3126 ENGINE
(CHASSIS)**

RELAY LABELS		
ITEM	PART NUMBER	DESCRIPTION
50	62202667	ABS INDICATOR LAMP
51	62202668	ABS START-INTERLOCK
52	62202672	CHASSIS ACCELERATOR INTERLOCK
53	62202673	DRL HEADLIGHT
54	62202675	DRL START INTERRUPT
55	62202676	DRL TAILLIGHT
56	62202677	EXHAUST BRAKE
57	62202684	HIGH BEAM HEADLIGHTS
58	62202688	HEADLIGHT ALARM
59	62202689	MANUAL TRANSMISSION REVERSE
60	62202690	RETARDER IN USE
61	62202709	ABS REC. PUMP
62	62202710	ABS END. BRAKE
63	62202882	STOP ENGINE ALARM

AIR ABS



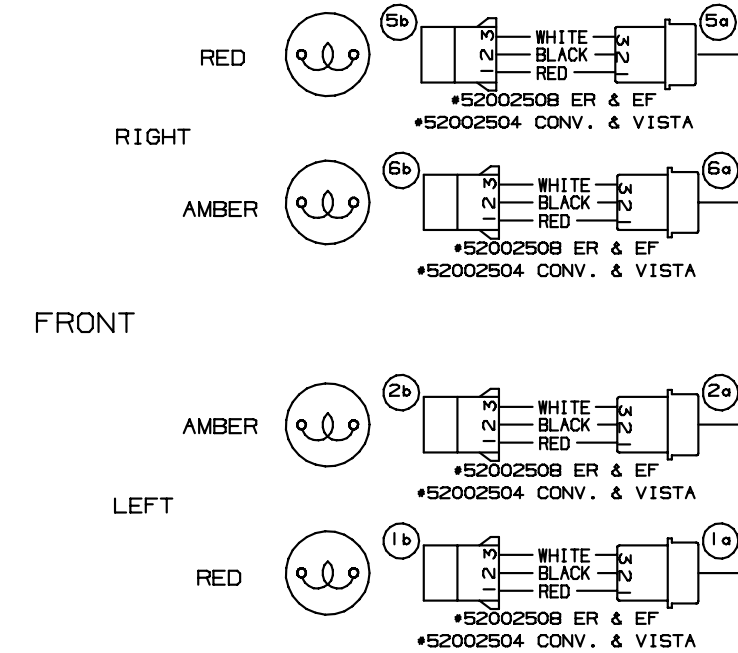
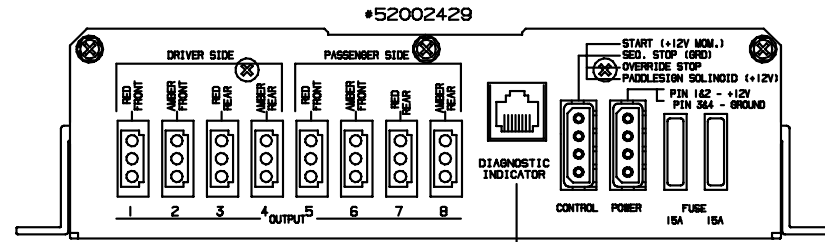
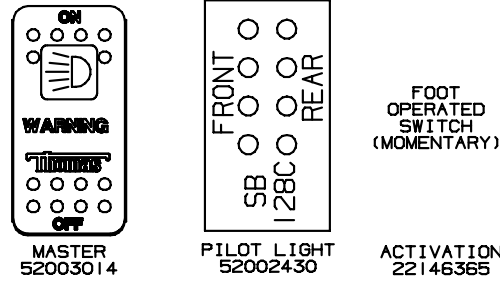
HYDRAULIC ABS

NOTE: TYPICAL RELAY PLACEMENT: CENTERED ON FRONT FACE WHEN MOUNTED.

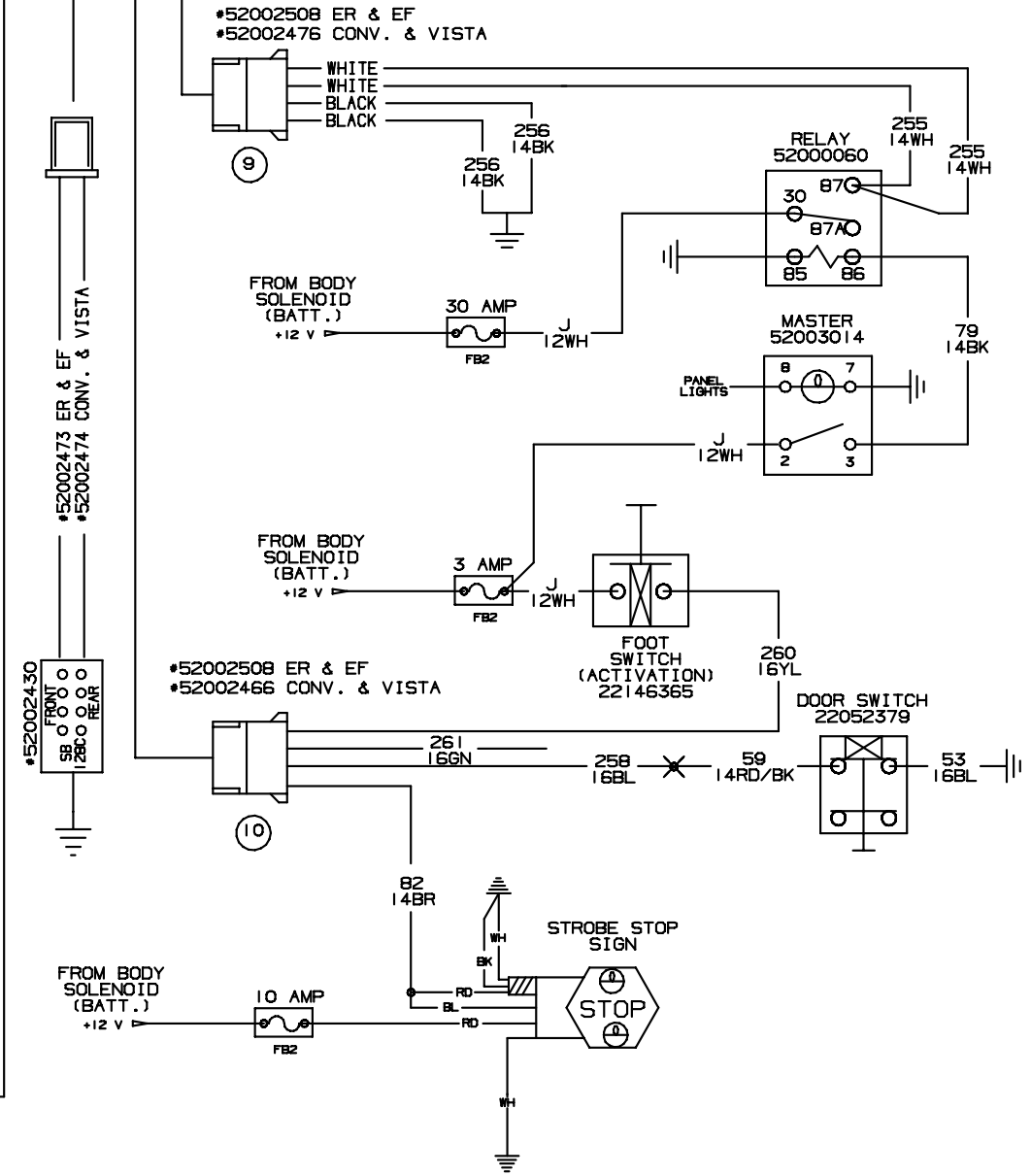
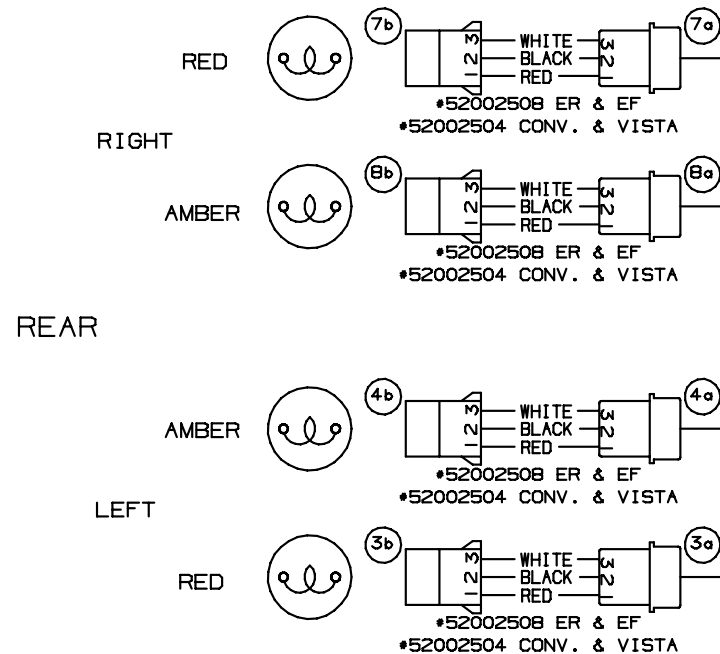
	62202145 N
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**MVP-EF
MAIN BODY
SCHEMATICS**

SWITCH LAYOUT



STROBE LIGHTHEADS: RED #52002431
AMBER #52002481



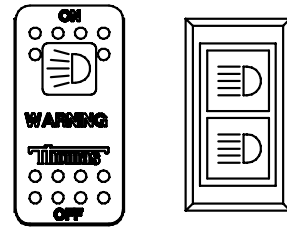
B3580-30-000 SYSTEM OPERATION

- (4) 5 1/2 AMBER STROBE LIGHTS AND (4) 5 1/2 RED STROBE LIGHTS.
- AMBER LIGHTS MANUALLY ENERGIZED BY FOOT OPERATED SWITCH LOCATED ON THE DRIVER'S FLOOR.
- RED LIGHTS AUTOMATICALLY ENERGIZED (WITH AMBER LIGHTS AUTOMATICALLY DE-ENERGIZED) WHEN BUS SERVICE DOOR IS OPENED.
- RED LIGHTS AND STOP ARM ACTIVATED WHENEVER SERVICE DOOR IS OPENED (NONSEQUENTIAL).
- MASTER SWITCH LOCATED IN SWITCH PANEL.
- RED AND AMBER PILOT LIGHTS IN SWITCH CABINET TO INDICATE SYSTEM OPERATION.
- WHELEN SCHOOL BUS STROBE WARNING SYSTEM.

	52002432 C
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STROBE WARNING SYSTEM, WHELEN SCHOOL
Option B3580-30-000

SWITCH LAYOUT



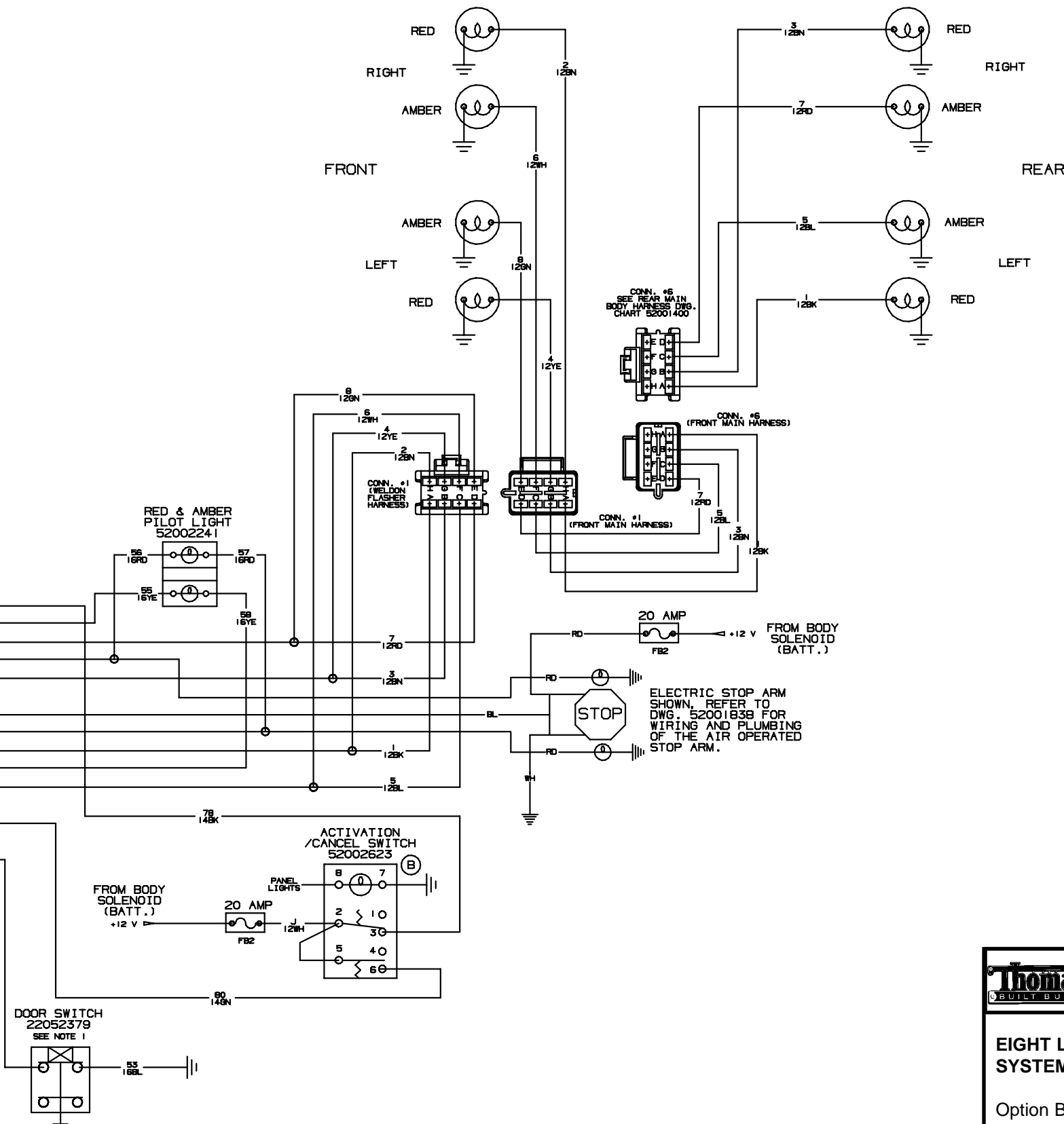
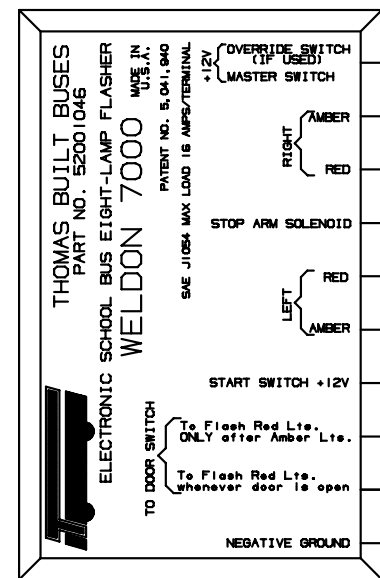
ACTIVATION /CANCEL 52002623
PILOT 52002241

SWITCH BOX REQUIRED (CONV.)

	DOOR		
	MANUAL	AIR	ELECTRIC
CONV.	52002144	52002145	52002145
VISTA	SW. CABINET	SW. CABINET	SW. CABINET
PUSH		SW. CABINET	SW. CABINET
F.C.	SW. CABINET	SW. CABINET	SW. CABINET

B3580-11-000 SYSTEM OPERATION

1. FOUR 7" AMBER LIGHTS AND FOUR 7" RED LIGHTS.
2. AMBER LIGHTS MANUALLY ENERGIZED BY ROCKER SWITCH LOCATED ON THE SWITCH PANEL OR CONTROL BOX LEFT OF STEERING COLUMN.
3. RED LIGHTS AUTOMATICALLY ENERGIZED (WITH AMBER LIGHTS AUTOMATICALLY DE-ENERGIZED) WHEN BUS SERVICE DOOR IS OPENED.
4. AMBER LIGHTS CAN ALSO BE DEACTIVATED BY ROCKER SWITCH LOCATED ON THE SWITCH PANEL OR CONTROL BOX.
5. RED LIGHTS AND STOP ARM ONLY ACTIVATED AFTER AMBER LIGHTS.
6. RED AND AMBER PILOT LIGHT IN SWITCH CABINET OR CONTROL BOX TO INDICATE SYSTEM OPERATION.
7. WELDON 7000 ELECTRONIC FLASHER.



- NOTES:
1. USE PRESSURE SWITCH 22036377 WHEN AIR SERVICE DOORS ARE ORDERED.
 2. WIRING HARNESS 22054376 IS USED FOR WIRING INSIDE THE SWITCH CABINET ON THE VISTA, ER, AND FC.
 3. WIRING HARNESS 52000176 IS USED FOR WIRING THE SWITCH BOX ON THE CONV..

52002498 C

EIGHT LIGHT WARNING SYSTEM

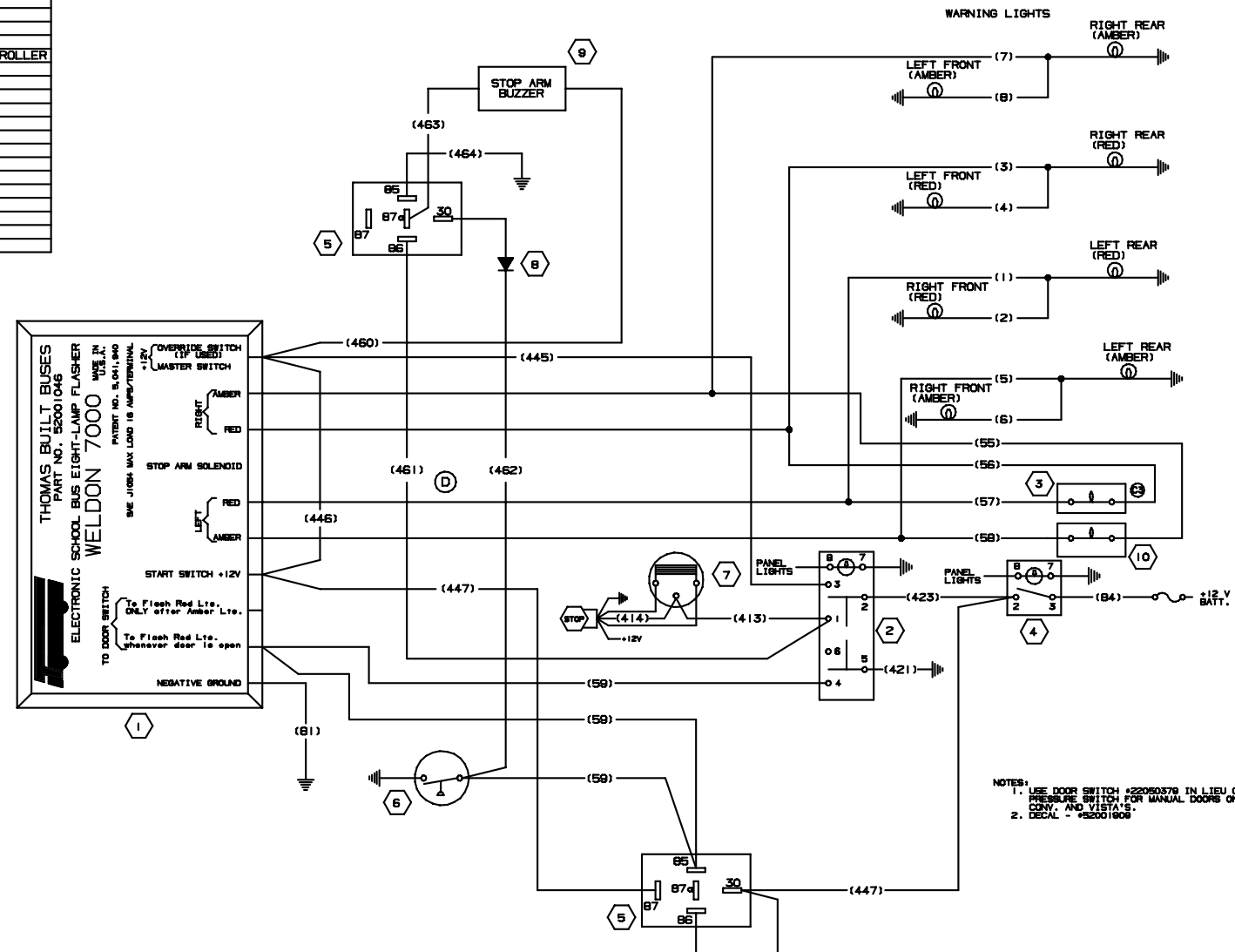
Option B3580-11-000

CIR	GA	COLOR	CIRCUIT CHART
1	12	BLACK	LEFT REAR WARNING LIGHT (RED)
2	12	BROWN	RIGHT FRONT WARNING LIGHT (RED)
3	12	ORANGE	RIGHT REAR WARNING LIGHT (RED)
4	12	YELLOW	LEFT FRONT WARNING LIGHT (RED)
5	12	BLUE	LEFT REAR WARNING LIGHT (AMBER)
6	12	WHITE	RIGHT FRONT WARNING LIGHT (AMBER)
7	12	RED	RIGHT REAR WARNING LIGHT (AMBER)
8	12	GREEN	LEFT FRONT WARNING LIGHT (AMBER)
55	16	YELLOW	WARNING LIGHT PILOT LIGHT (AMBER)
56	16	RED	WARNING LIGHT PILOT LIGHT (RED)
57	16	RED	WARNING LIGHT PILOT LIGHT (RED)
59	16	YELLOW	WARNING LIGHT PILOT LIGHT (AMBER)
59	16	RED/BLACK	3 POS. SW. (4) TO DOOR SW. ON FLASHER TO RELAY (85) TO SW. ON CONTROLLER
84	16	WHITE	MASTER SWITCH TO FUSE PANEL (+12 V.)
413	16	RED	3 POSITION SWITCH (3) TO STOP SIGN FLASHER
414	16	RED	STOP SIGN FLASHER TO STOP SIGN
421	16	BLUE	3 POSITION SWITCH (5) TO GROUND
423	16	BLACK	3 POSITION SWITCH (2) TO MASTER SWITCH
424	16	BLACK	MASTER SWITCH TO DOOR SWITCH RELAY (30 & 86)
445	16	WHITE/BLACK	3 POSITION SWITCH (1) TO MASTER SWITCH ON FLASHER
446	16	WHITE/BLACK	MASTER SWITCH ON FLASHER TO START SWITCH ON FLASHER
447	16	GREEN	START SWITCH ON FLASHER TO DOOR SWITCH RELAY (87)
460	16	RED	MASTER SWITCH ON FLASHER TO STOP ARM BUZZER (+12V)
461	16	RED	STOP ARM SOLENOID ON FLASHER TO STOP ARM BUZZER RELAY TERM. 86
462	16	RED	STOP ARM BUZZER RELAY TERM. 30 (TO DIODE) TO DOOR SWITCH
463	16	WHITE	STOP ARM BUZZER RELAY TERM. 87A TO STOP ARM BUZZER GND
464	16	WHITE	STOP ARM BUZZER RELAY TERM. 85 TO GND

WITH MASTER SWITCH, CONTROL SWITCH, AND SERVICE DOOR IN THE FOLLOWING POSITIONS:

MASTER SWITCH POSITION (ON OR OFF)	CONTROL SWITCH POSITION (3 POSITION: OFF, AMBER, ON RED)	SERVICE DOOR POSITION	STOP ARMS, STOP ARM LIGHTS	AMBER WARNING AND PILOT LIGHTS	RED WARNING AND PILOT LIGHTS	AUDIBLE ALARM	
1	ON	OFF	CLOSED	1 RETRACTED, OFF	OFF	OFF	OFF
2	ON	OFF	OPEN	2 RETRACTED, OFF	OFF	ON	ON
3	ON	AMBER	CLOSED	3 RETRACTED, OFF	ON	OFF	OFF
4	ON	AMBER	OPEN	4 RETRACTED, OFF	ON	ON	ON
5	ON	RED	CLOSED	5 EXTENDED, ON	OFF	ON	OFF
6	ON	RED	OPEN	6 EXTENDED, ON	OFF	ON	ON
7	OFF	ANY POS.	ANY POS.	7 RETRACTED, OFF	OFF	OFF	OFF

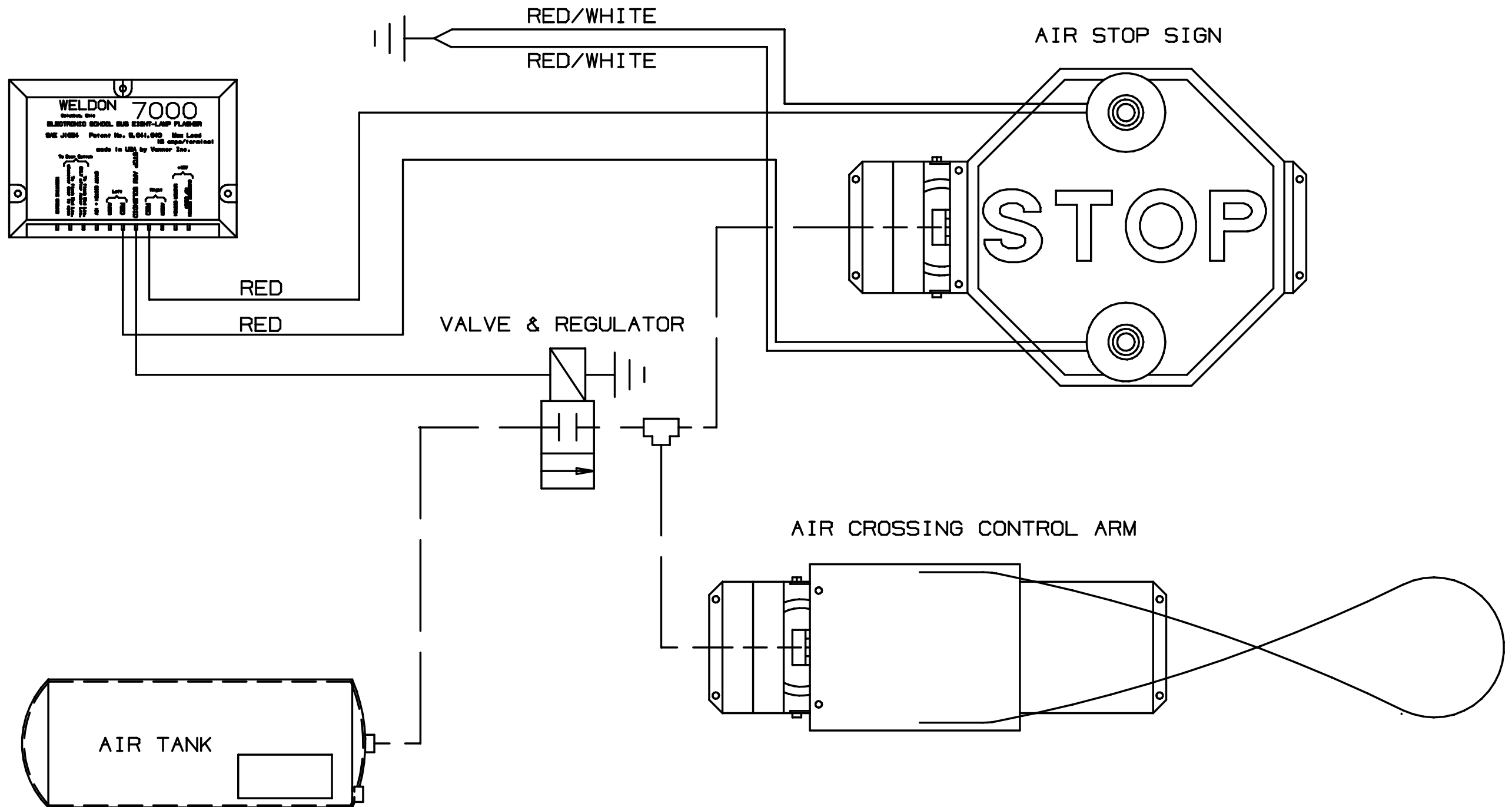
CONDITION OF STOP ARM(S), STOP ARM LIGHTS, AMBER WARNING LIGHTS AND RED WARNING LIGHTS MUST BE:



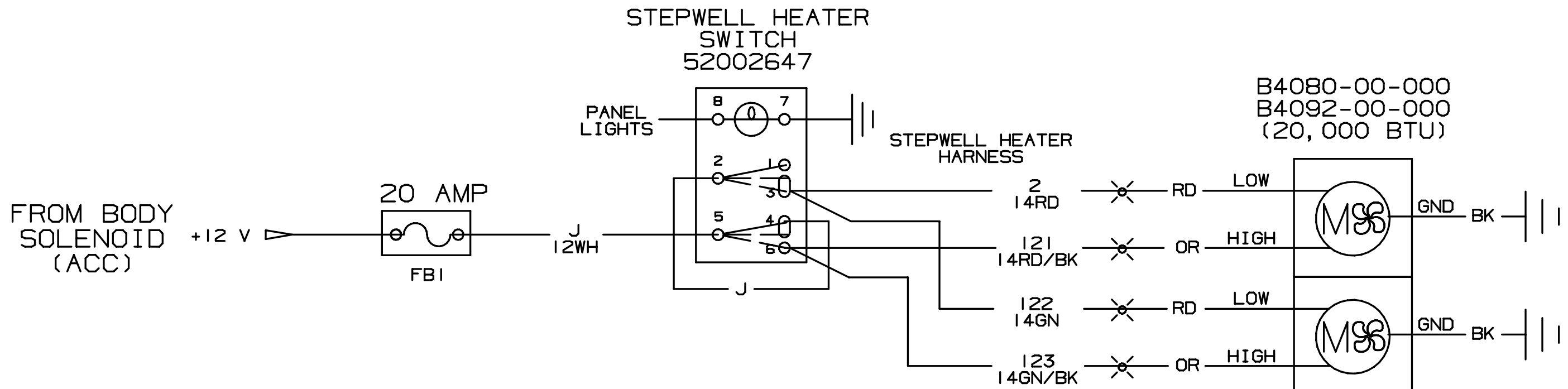
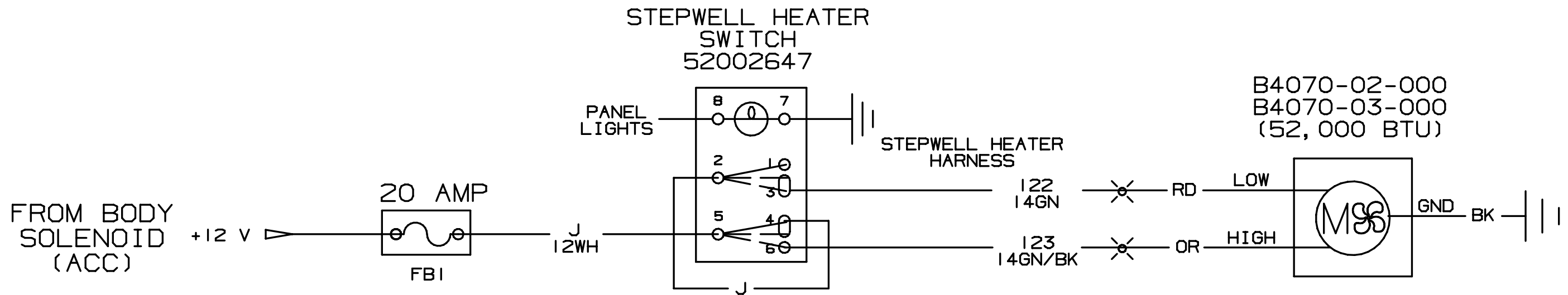
NOTES:
 1. USE DOOR SWITCH #22050379 IN LIEU OF PRESSURE SWITCH FOR MANUAL DOORS ON CONY. AND VISTA'S.
 2. DECAL - #52001906


ITEM	PART NO.	DESCRIPTION
10	52002125	LIGHT - PILOT AMBER
9	22016365	BUZZER - WARNING
8	52001907	DIODE ASM. - 6 AMP, 600V
7	22019369	FLASHER - THERMAL
6	22036377	SWITCH - STOPLIGHT
5	52000060	RELAY - SPDT, 12 V., 30/20 AMP
4	52002087	SWITCH - ROCKER, ON-OFF
3	52002124	LIGHT - PILOT, RED
2	52002086	SWITCH - ROCKER DPDT, CENTER OFF (3 POS.)
1	52001046	FLASHER - ELECTRONIC 8-LIGHT WARNING, WELDON MODEL 7000

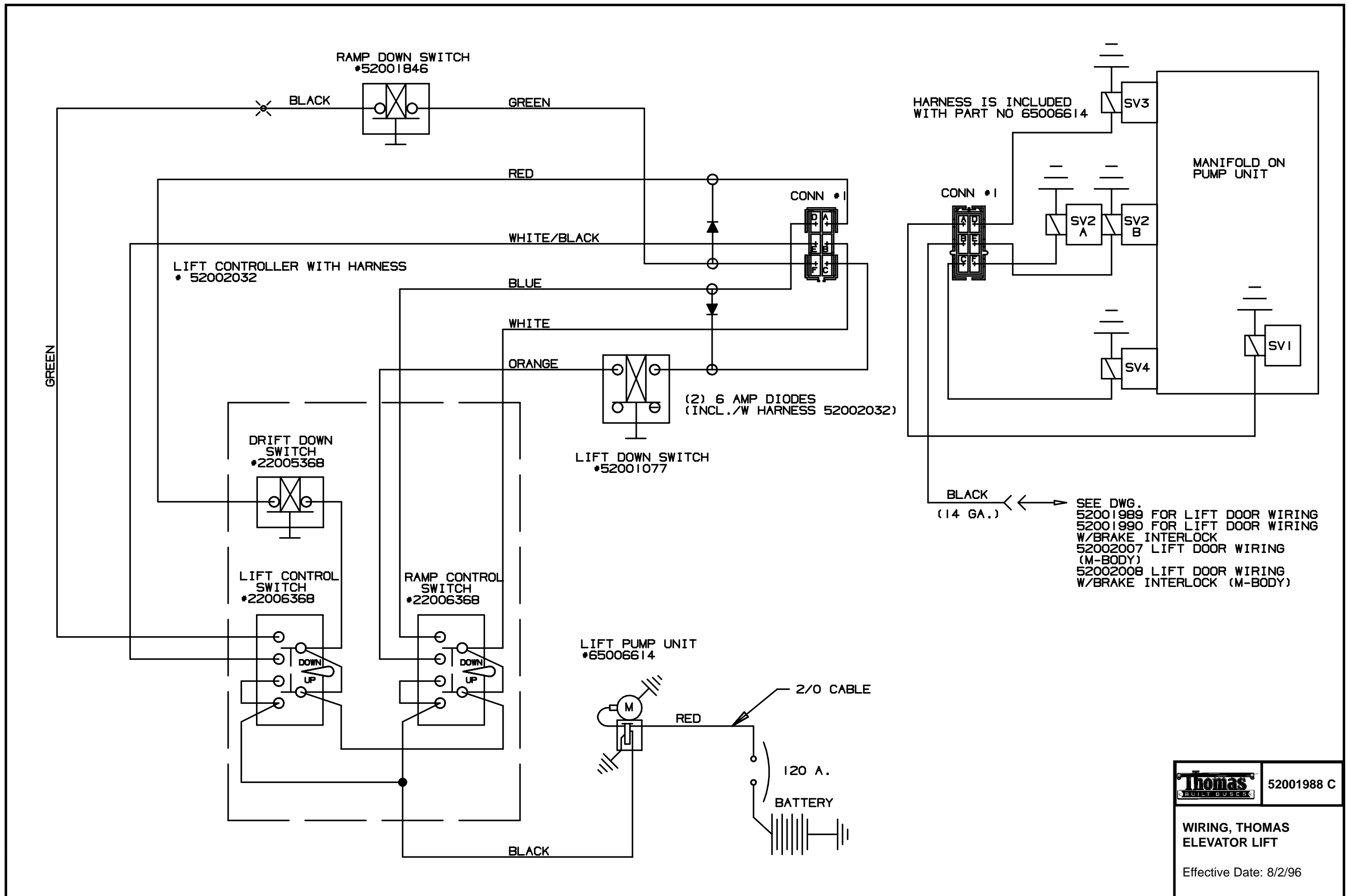
	52001908 C
EIGHT LIGHT WARNING SYSTEM (FLORIDA)	
Option B3580-26-000	



	52001838 A
AIR STOP SIGN & AIR CROSSING CONTROL ARM	



	52002663 A
STEPWELL HEATER	



	52001988 C
WIRING, THOMAS ELEVATOR LIFT	
Effective Date: 8/2/96	

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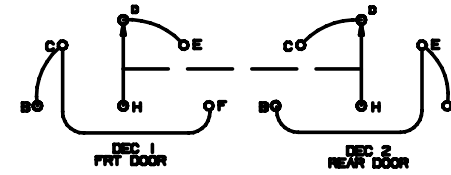
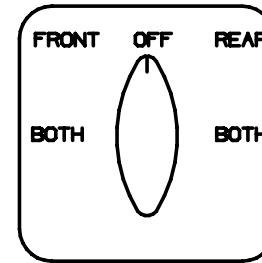
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DOOR SWITCH WIRING

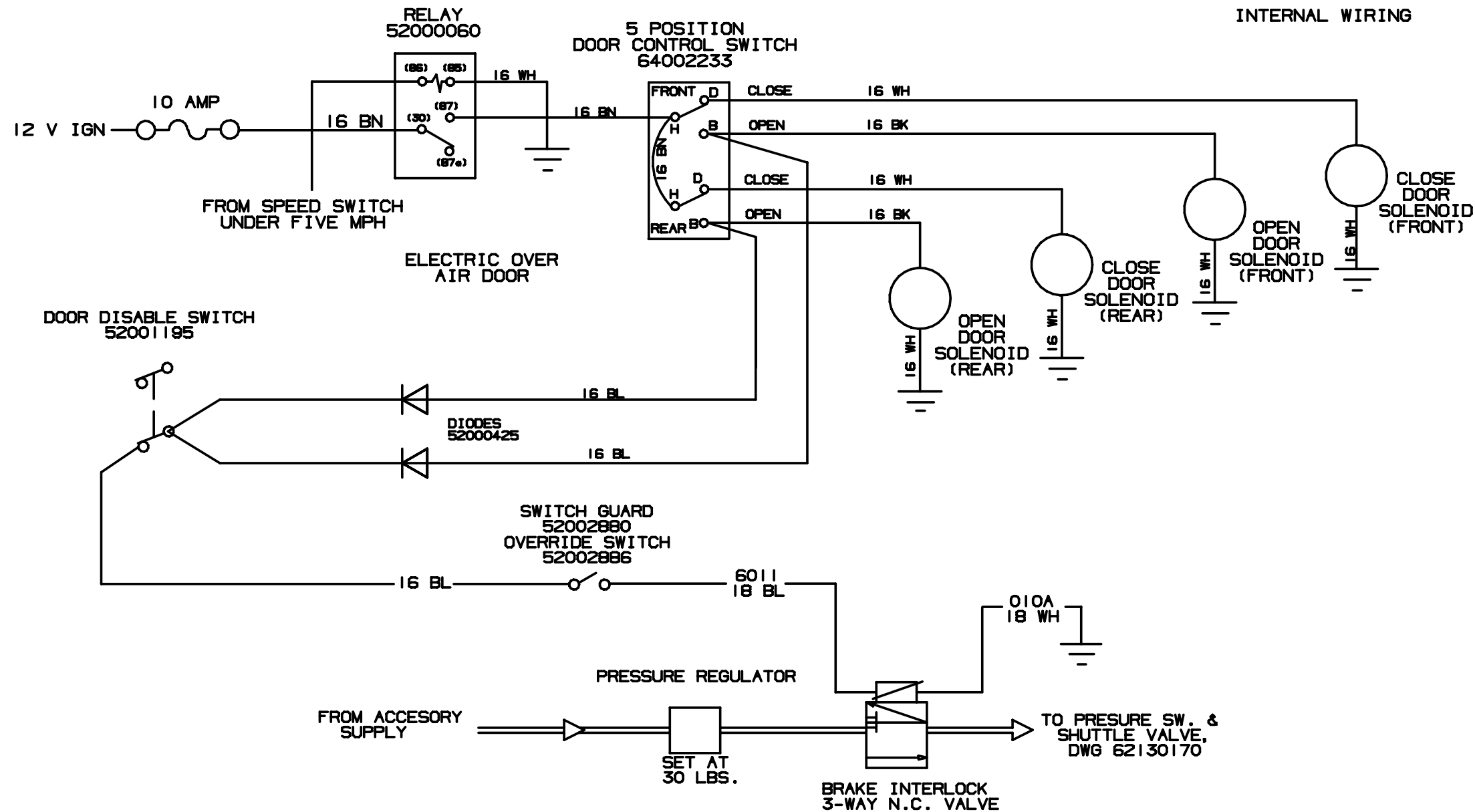
5 POSITION SWITCH

5 POSITION SWITCH OUTPUT

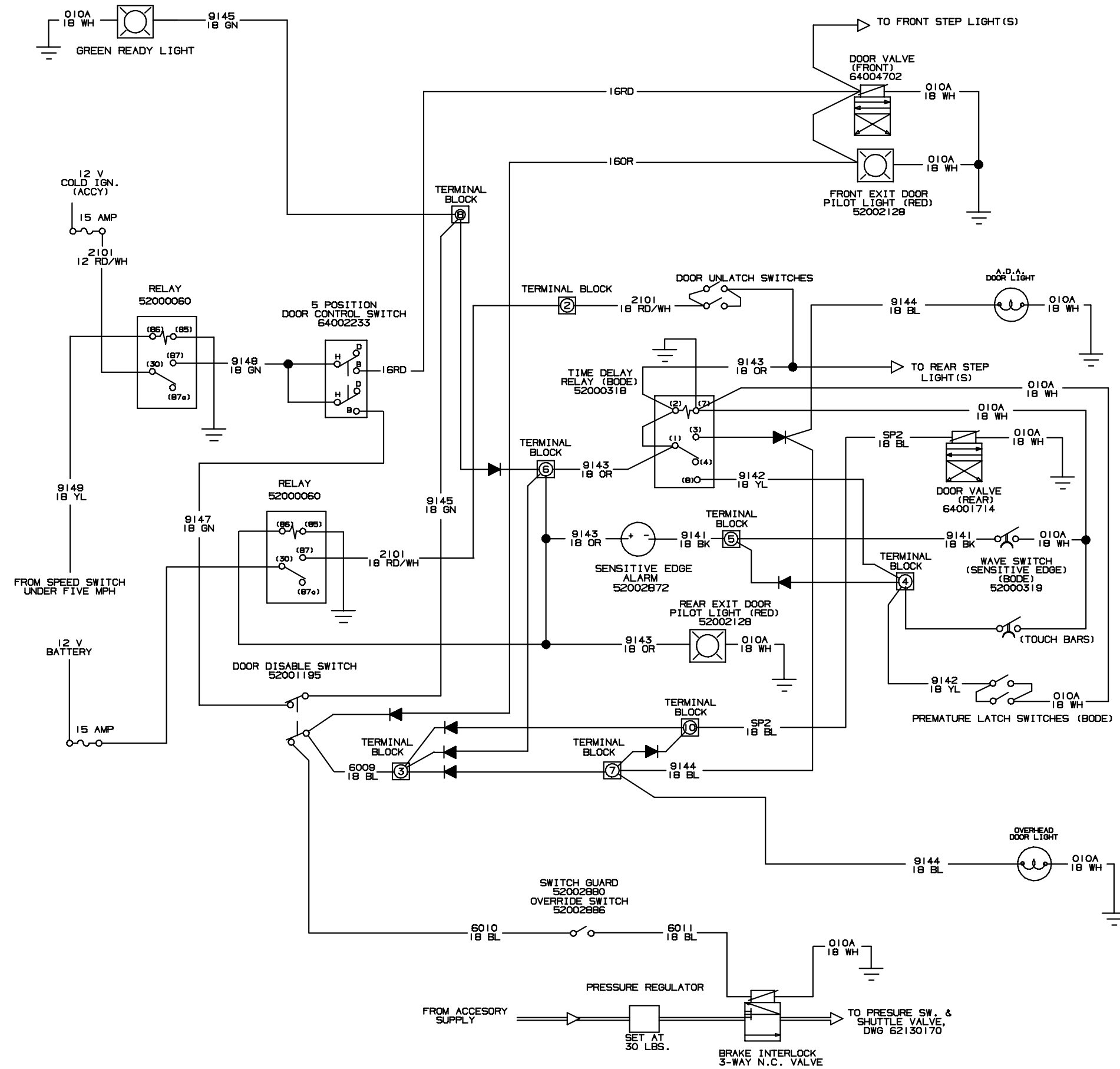


	FRONT	REAR
OFF CENTER POS.		
REAR DOOR ONLY (1ST REAR POS.)		
BOTH FRONT & REAR DOOR (2ND REAR POS.)		
FRONT DOOR ONLY (1ST LFT POS.)		
BOTH FRONT & REAR DOOR (2ND LFT POS.)		

INTERNAL WIRING



	52003098 A
DOOR CONTROL 5 POSITION, w/INTERLOCK	
Option: B5016-16-000	



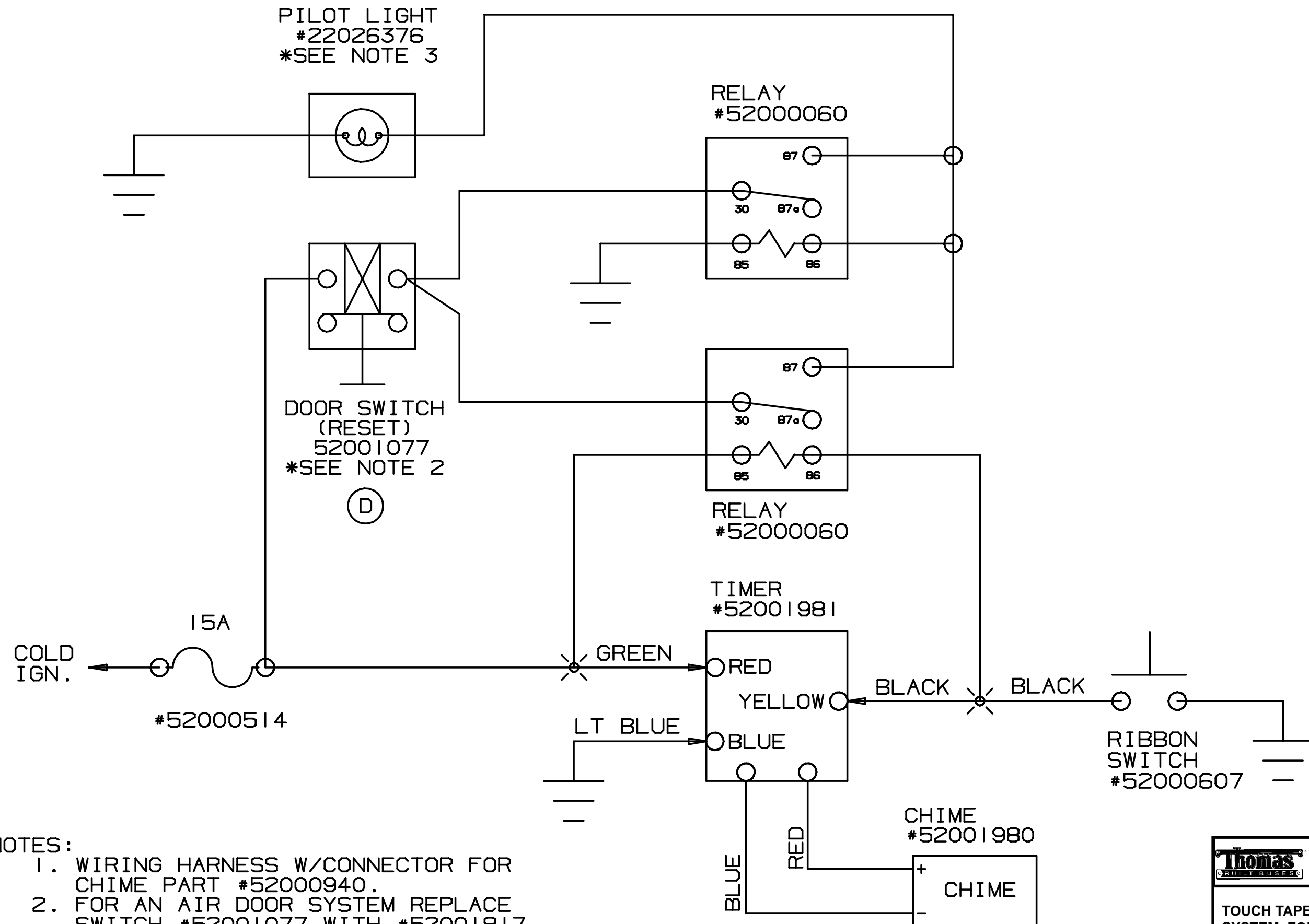
5 POSITION DOOR CONTROL		
	FRONT	REAR
OFF CENTER POS.		
REAR DOOR ONLY (1ST RIGHT POS.)		
BOTH FRONT & REAR DOOR (2ND RGT POS.)		
FRONT DOOR ONLY (1ST LFT POS.)		
BOTH FRONT & REAR DOOR (2ND LFT DOOR)		

(5) POSITION DOOR CONTROL W/ TIMER B5016-15-000

	52002895 C
REAR DOOR w/FRONT DOOR, 5 POSITION DOOR CONTROL, w/BRAKE INTERLOCK (BODE)	

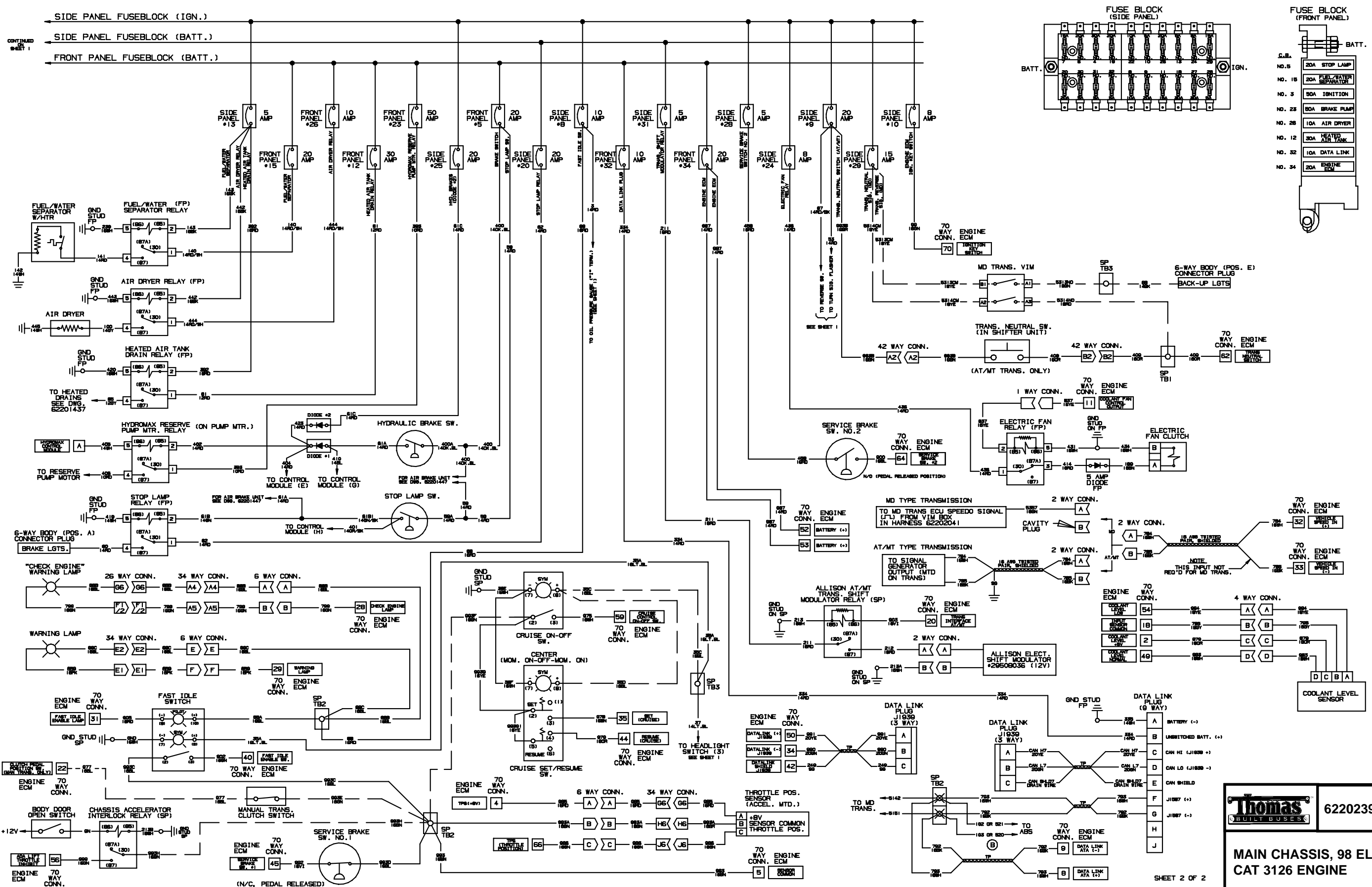
**MVP-EF
RADIO & SPEAKERS
SCHEMATICS**

**MVP-EF
MISCELLANEOUS
SCHEMATICS**



- NOTES:
1. WIRING HARNESS W/CONNECTOR FOR CHIME PART #52000940.
 2. FOR AN AIR DOOR SYSTEM REPLACE SWITCH #52001077 WITH #52001817.
 3. FOR M-BODY USE PILOT LIGHT IN BODY PILOT ASM. #6221000.

Thomas BUILT TO USE	52001843 D
TOUCH TAPE CHIME SYSTEM, FOR ADA STOP REQUEST	



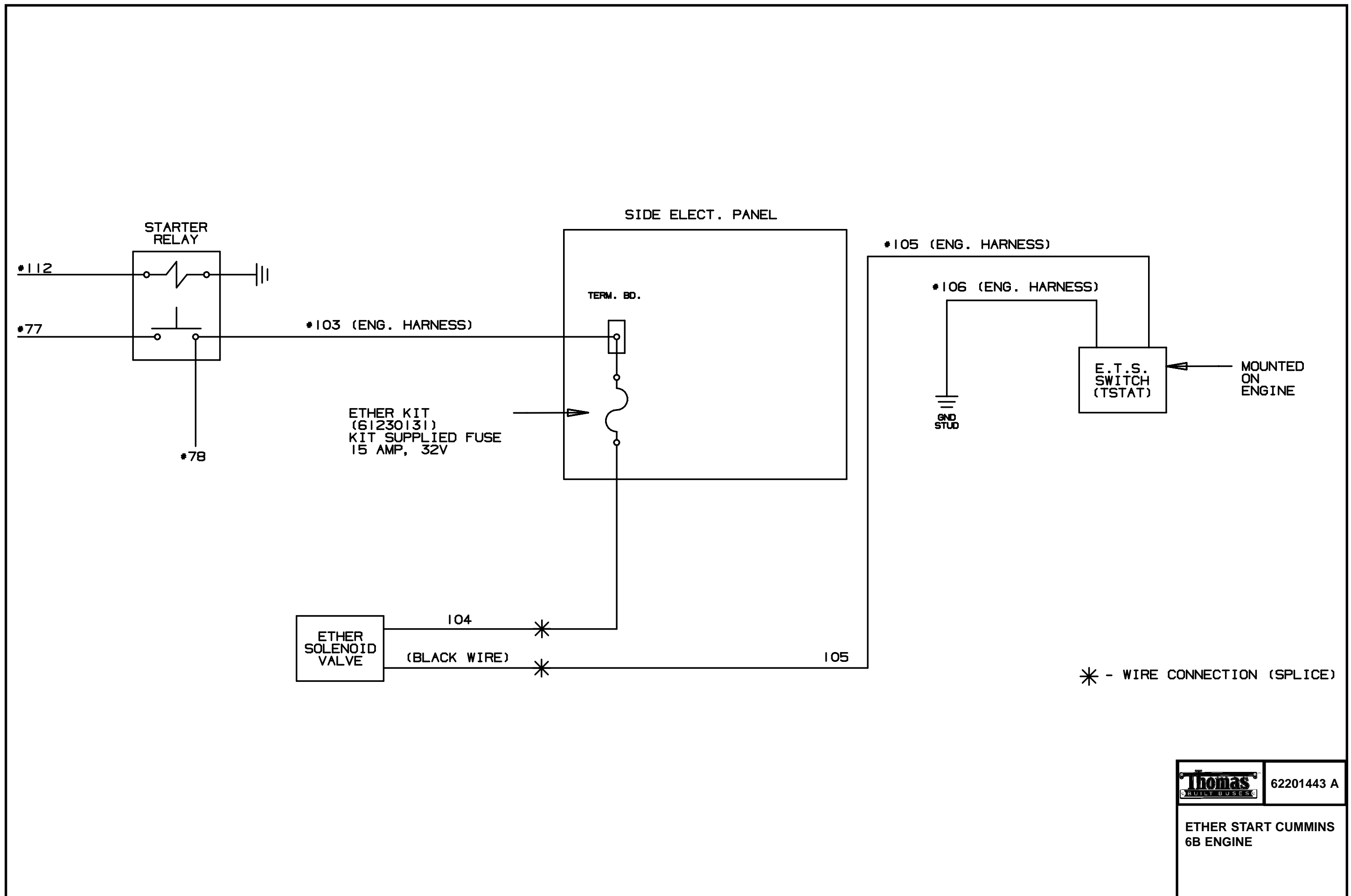
Thomas
BULB & FUSE BLOCK

62202396 C

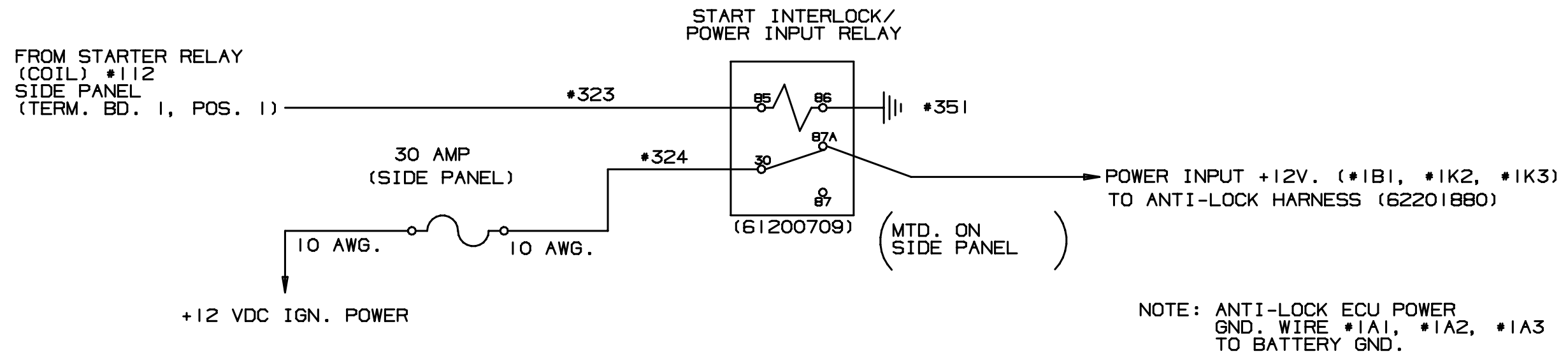
**MAIN CHASSIS, 98 ELECT.
CAT 316 ENGINE**

End Date: 01/20/99
w/No Replacement

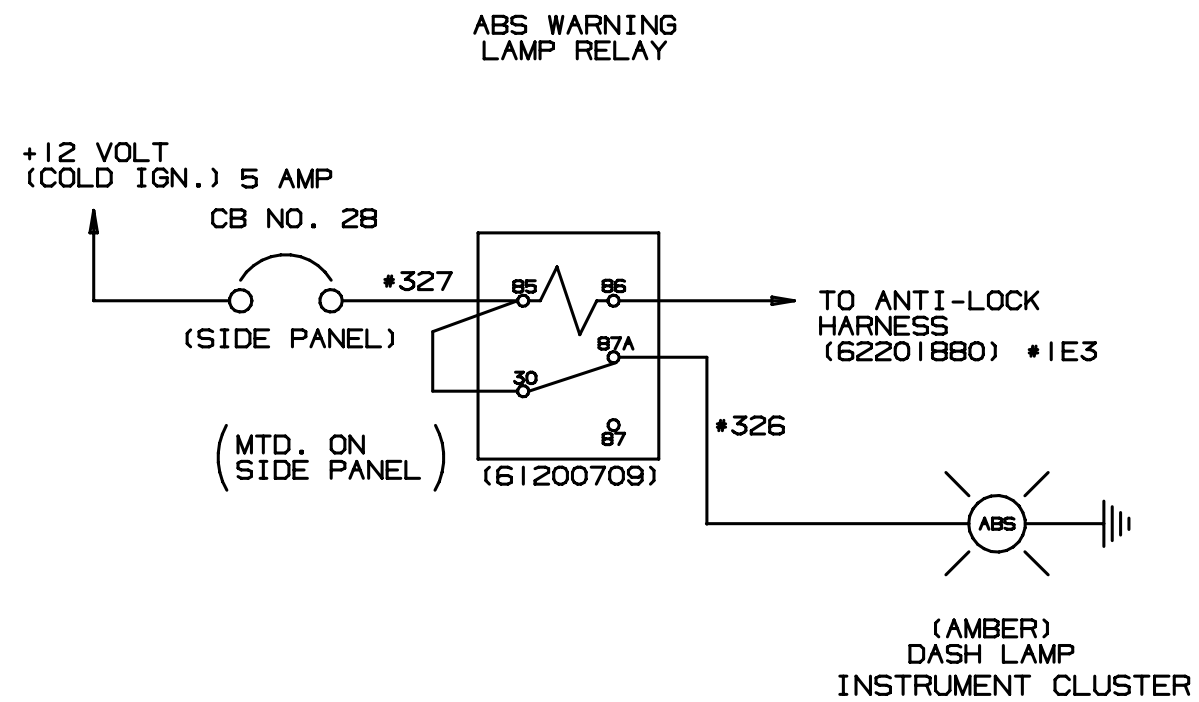
SHEET 2 OF 2



	62201443 A
ETHER START CUMMINS 6B ENGINE	



STANDARD WIRING EA. INSTALLATION

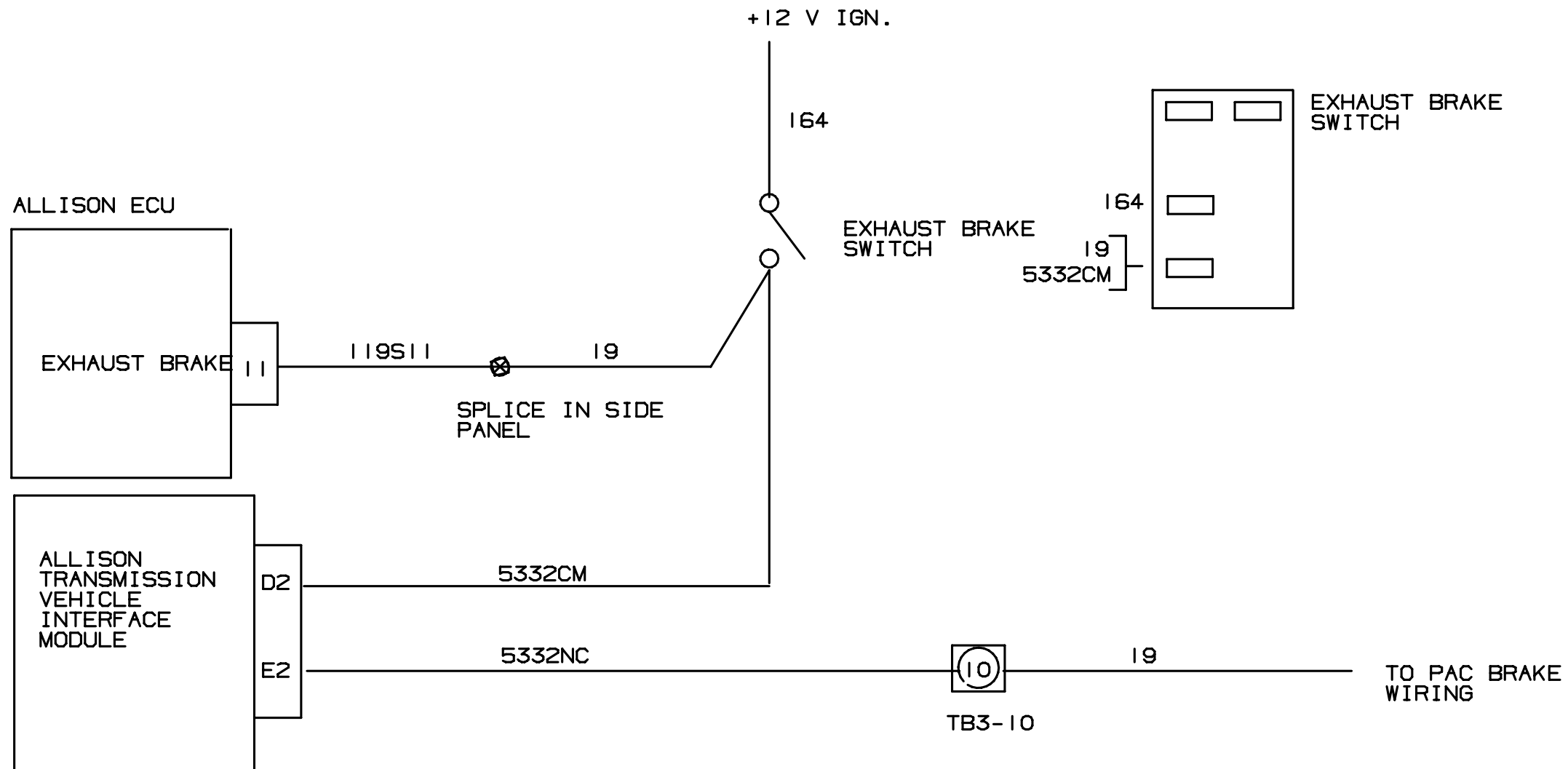


STANDARD WIRING EA. INSTALLATION

SHEET 2 OF 2



ANTI-LOCK BRAKE
SYSTEM (97 MODELS)



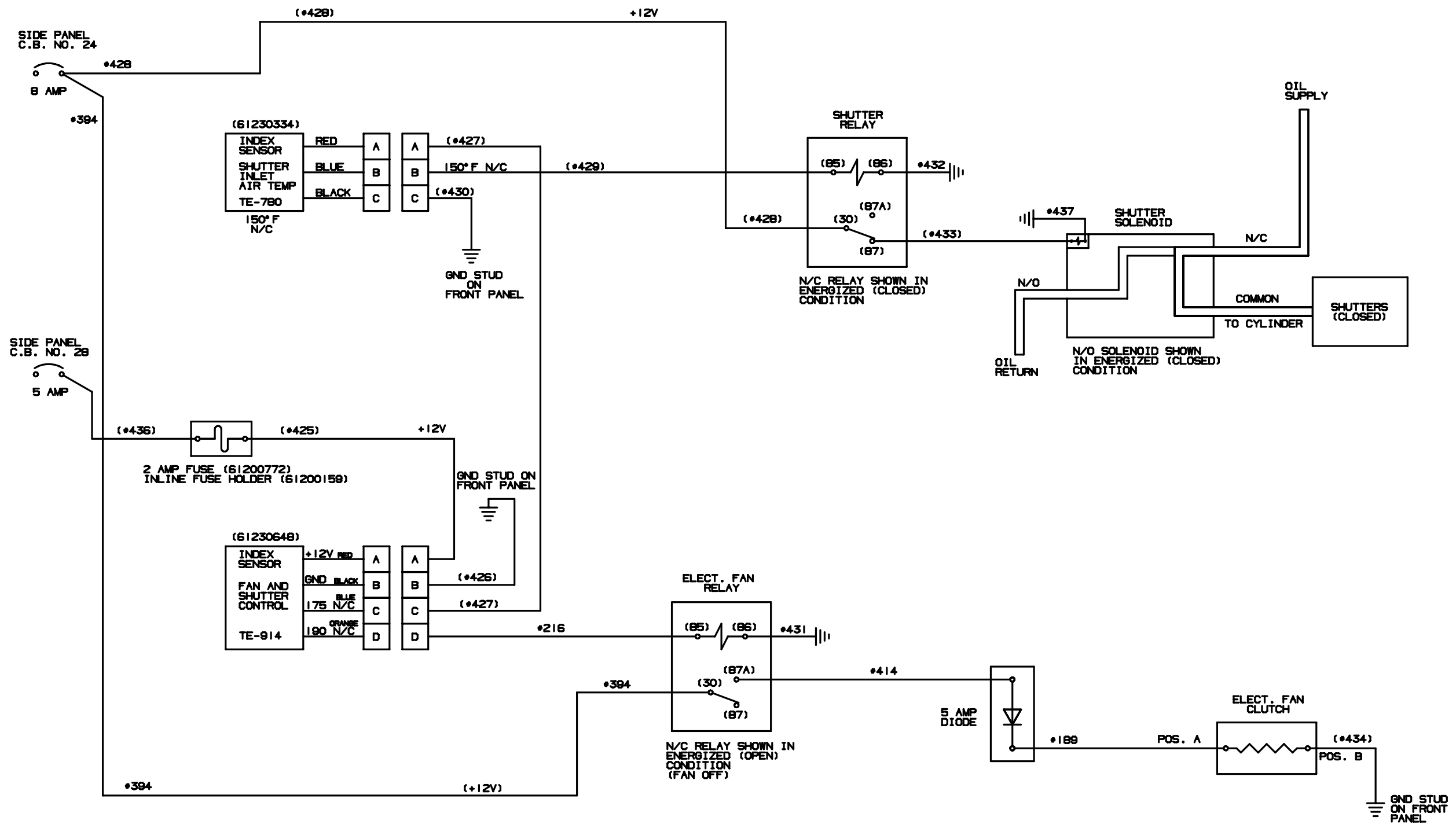
WIRING INSTRUCTIONS:

1. CUT BUTT SPLICE FROM WIRE 5332CM AND FEMALE PUSH-ON FROM WIRE 19 AT EXHAUST BRAKE SWITCH.
2. CONNECT WIRE 5332CM AND WIRE 19 AT DASH USING FEMALE .25" PUSH-ON TERMINAL.
3. REMOVE WIRE 19 GOING TO DASH FROM TERMINAL BOARD AT THE SIDE PANEL
4. SPLICE WIRE 119 AND WIRE 19 TOGETHER AT SIDE PANEL
5. CONNECT WIRE 5332NC TO WIRE 19 IN MAIN HARNESS AT TERMINAL BOARD.

TESTING INSTRUCTIONS:


1. ACCELERATE VEHICLE TO 25 MPH OR ABOVE.
2. TURN EXHAUST BRAKE SWITCH INTO THE ON POSITION.
3. RELEASE THROTTLE AND VERIFY EXHAUST BRAKE COMES ON. (NOTE: EXHAUST BRAKE WILL ONLY OPERATE IN 2ND GEAR OR ABOVE WITH THROTTLE RELEASED.)

Thomas BUILT BUSES	62202713 A
EXHAUST BRAKE w/WTEC III TRANSMISSION	



COMPONENT DESCRIPTION/OPERATION NOTES

1. TE-780 INLET AIR TEMP. SENSOR REMAINS CLOSED UNTIL ENGINE AIR INLET TEMP. REACHES SET POINT (IN NORMAL OPERATION). SHUTTER RELAY IS ENERGIZED AND APPLYS +12V TO SHUTTER SOLENOID TO SUPPLY OIL PRESS. (N/C) TO POWER SHUTTERS CLOSED. INLET AIR TEMP. SENSOR OPENS WHEN TEMP. REACHES 150°F, RELAY IS DE-ENERGIZED AND REMOVES +12V FROM SHUTTER SOLENOID TO (N/O) TO BYPASS OIL FROM SHUTTER CYLINDER TO OPEN SHUTTERS. SENSOR WILL RE-CLOSE AT 143°F, ENERGIZING RELAY TO CLOSE SHUTTERS.
2. TE-914 SHUTTER CONTROL WILL OPEN WHEN COOLANT TEMP. REACHES 175°F. TE-780 LOSES +12V TO POWER SHUTTER RELAY AND REMOVES +12V FROM SHUTTER SOLENOID TO (N/O) TO OPEN SHUTTERS. FAN CONTROL WILL OPEN WHEN COOLANT TEMP. REACHES 190°F. FAN RELAY IS DE-ENERGIZED AND APPLYS +12V TO ELECT. FAN CLUTCH. SHUTTER CONTROL WILL RECLOSE AT 168°F. FAN CONTROL WILL RECLOSE AT 183°F.

 Thomas <small>BUILT IN U.S.A.</small>	62201451 A
ELECT. FAN/SHUTTER OPERATION (97 MODELS)	


INSTALLATION INSTRUCTIONS

THE FOLLOWING STEPS MAY BE COMPLETED IN ANY ORDER
SO AS TO SUIT BEST MANUFACTURING PRACTICES:

STEP	CIRCUIT(S)	DESCRIPTION	STEP	CIRCUIT(S)	DESCRIPTION
1)		MOUNT (3) ITEM #2 RELAYS TO ELECTRICAL PANEL.	17)	#265	CUT SPRING SPADE TERMINAL FROM ITEM #4 DIODE ANODE (RED WIRE), AND CRIMP TO CIRCUIT #265 SPLICE.
2)	#4	ATTACH JUMPER WIRE (FROM ITEM #6 HARNESS) RING TERMINAL TO TB3-1 AND ROUTE TO START TO START INTERRUPT RELAY (TERM.85).		#265A	CRIMP (SAME) ITEM #4 DIODE CATHODE (BLACK WIRE) TO CIRCUIT #265A JUMPER WIRE (INSTALLED IN STEP 10).
3)	#GND3	ROUTE JUMPER WIRE FROM START INTERRUPT RELAY (TERM.86) TO DRL TAILLIGHT RELAY (TERM.86)	18)	#267	CUT SPRING SPADE TERMINAL FROM ITEM #4 DIODE ANODE (RED WIRE), AND CRIMP TO CIRCUIT #265 SPLICE.
	#GND2	AND ATTACH RING TERMINAL TO SIDE PANEL GROUND STUD.		#267A	CRIMP (SAME) ITEM #4 DIODE CATHODE (BLACK WIRE) TO CIRCUIT #267A JUMPER WIRE (INSTALLED IN STEP 11).
	#GND1		19)	#149A	CONNECT CIRCUIT #149A JUMPER WIRE PUSH-ON TERMINAL TO DRL HEADLIGHT RELAY (TERM.87).
4)		ATTACH ITEM #7 TERMINAL TO CIRCUIT BREAKER #27 FUSE BLOCK TERMINAL.			
5)	#511	ATTACH JUMPER WIRE PUSH-ON TERMINAL TO CIRCUIT BREAKER #27 TERMINAL (ATTACHED IN STEP 4) AND ROUTE TO START INTERRUPT RELAY (TERM.30).			
6)	#258/#259	ATTACH JUMPER WIRE PUSH-ON TERMINAL TO CIRCUIT BREAKER #27 TERMINAL (ATTACHED IN STEP 4)			
	#258	AND ROUTE TO DRL TAILLIGHT RELAY (TERM.87A)			
	#259	AND CRIMP TO ITEM #1 DIODE ANODE BUTT SPLICE.			
7)	#260	ATTACH MALE BLADE TERMINAL TO ITEM #1 DIODE CATHODE AND ROUTE TO DRL HEADLIGHT RELAY (TERM.87A).			
8)	(#512)	ATTACH ITEM #5 DIODE ANODE PUSH-ON TERMINAL TO START INTERRUPT RELAY (TERM.87) AND ROUTE TO START CONTROL SIGNAL SERVICE TERMINAL TB3-5.			
9)	#513/#514	ATTACH JUMPER WIRE RING TERMINALS TO START CONTROL SERVICE TERMINAL TB3-5.			
10)	#513/#265A	ATTACH JUMPER WIRE PUSH-ON TERMINAL TO DRL TAILLIGHT RELAY (TERM.85).			
11)	#514/#267A	ATTACH JUMPER WIRE PUSH-ON TERMINAL TO DRL HEADLIGHT RELAY (TERM.85).			
12)	#34/#262	REMOVE CIRCUIT #34 FROM 6-WAY BODY CONNECTOR PLUG (POS.D); REPLACE WITH CIRCUIT #262 JUMPER WIRE. ROUTE #262 TO DRL TAILLIGHT RELAY (TERM.30).			
13)	#34/#34A	CUT TERMINAL (REMOVED FROM PLUG IN STEP 12) OFF OF CIRCUIT #34 AND CRIMP TO BUTT SPLICE ON #34A JUMPER WIRE. ROUTE #34A TO DRL TAILLIGHT RELAY (TERM.87).			
14)	#265	CONNECT CIRCUIT #265 TO #265 W/#34 AT HEADLIGHT SWITCH CONNECTOR PLUG (DASH HARNESS).			
15)	#267	CONNECT CIRCUIT #267 TO #267 W/#32 AND #149 AT HEADLIGHT SWITCH CONNECTOR PLUG (DASH HARNESS).			
16)	#149A	CONNECT #149A INTO 4-WAY CONNECTOR PLUG (OPEN POSITION) CAVITY.			

SEE SHEET 1 FOR WIRING SCHEMATIC
SEE SHEET 2 FOR CIRCUIT NUMBER TABLE, PARTS LIST TABLE, AND OPERATION NOTES

Sheet 3 of 3

 Thomas <small>BUILT BUSES</small>	62202750 A
DAYTIME RUNNING LIGHTS w/STD. HEADLIGHT SWITCH & STARTER INTERRUPT Effective Date: 10/29/98	

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