

COMPONENT IDENTIFIER (CID) LIST	
Automatic Retarder Control (ARC)	
CID No.	Component
091	Accelerator Position Signal ¹
168	Electrical System Voltage
190	Engine RPM Sensor
248	CAT Data Link
627	Parking Brake Signal ¹
650	Harness Code
700	Actual Gear Signal ¹
702	Selected Gear Signal ¹
710	ARC Supply Solenoid
711	ARC Control Solenoid
712	Retarder Lamp
713	ARC On/Off Switch
714	Auto Retarder Pressure Switch
715	Retarder Pressure Switch

¹ Signal received by ARC on the CAT data link.

COMPONENT IDENTIFIER (CID) LIST	
Electronic Programmable Transmission Control II (EPTC II) (MID No. 027)	
CID No.	Component
168	Electrical System Voltage
190	Engine RPM Sensor
248	CAT Data Link
269	Sensor Supply
627	Parking Brake Switch
650	Harness Code
672	Torque Converter Output Speed Sensor
700	Transmission Gear Switch
701	Transmission Output Speed Sensor
702	Shift Lever Switch
704	Service Brake Pressure Switch
705	Body Raise Switch
706	Body Up Switch
707	Up Solenoid
708	Down Solenoid
709	Lockup Solenoid

COMPONENT LOCATION CHART					
Machine Location	Component	Schematic Location	Machine Location	Component	Schematic Location
1	Alarm - Action (EMS)	C-2	27C	Solenoid - ARC Supply Valve	C-9
2	Alarm - Backup	B-15	28	Solenoid - Down Shift	A-14
A	Alarm - Engine Overspeed	F-1	29	Solenoid - Engine Fan (Fan Clutch)	A-5
3	Alternator	A-3	30	Solenoid - Engine Shutdown	A-3
4	Batteries	A-7	16	Solenoid - Lockup	A-13
A	Breakers	C-5, C-6, D-5, D-6	25	Solenoid - Proportional	A-14
5C	Control - Auto Retarder (ARC)	C-8	31	Solenoid - Start Aid	A-5
6	Control - Engine Shutdown	C-3	28	Solenoid - Up Shift	A-14
7	Control - Supplemental Steering	E-1	A	Speedometer	F-2
B	Control - Traction Aid (AETA)	D-15	26	Switch - AC Pressure (Fan Clutch)	A-5
B	Control - Transmission (EPTC II)	D-13	32C	Switch - Accelerator Press (ARC)	C-9
8C	Converter - 24V/12V	C-4	A	Switch - Auto Retarder OFF/ON (ARC)	D-3
9C	Distributor - Transmission Speed	E-15	33	Switch - Backup Alarm	D-11
10	Dryer - Air	A-8	17	Switch - Blower	E-11
A	Flasher	E-5	B	Switch - Body Raise (EPTC II)	D-12
11	Fuse - Supplemental Steering Lamp	A-8	34	Switch - Brake Master Cylinder Overstroke	A-10
A	Fuses	D-6	19	Switch - Brake Oil Temp (EMS)	A-9
A	Gauge - Air Press	D-3	35	Switch - Brake Retarder Press	F-15
A	Gauge - Brake Oil Temp	F-2	36C	Switch - Brake System Air Press (EMS)	C-15
A	Gauge - Coolant Temp	F-3	37	Switch - Converter/Retarder Temp	A-9
12C	Ground - Cab	E-12	4	Switch - Disconnect	A-6
13	Ground - Cab/Frame	C-11	A	Switch - EMS/AETA Test	D-3
13	Ground - Frame	B-9	38	Switch - Engine Coolant Flow (EMS)	A-4
A	Indicator - Transmission Gear	D-10	3	Switch - Engine Coolant Temp (EMS)	B-4
A	Lamp - Action (EMS)	F-2	39	Switch - Engine Coolant Temp (Start Aid)	A-5
A	Lamp - Brake Retarder	F-2	29	Switch - Engine Oil Press (EMS)	A-4
A	Lamp - Engine Overspeed Warning	F-2	40	Switch - Fuel Press (EMS)	B-4
A	Lamp - Retarder (ARC)	C-9	A	Switch - Key Start	F-3
A	Lamp - Supplemental Steering	E-2	35	Switch - Manual Retarder Press (ARC)	C-9
B	Meter - Service	E-13	41C	Switch - Parking Brake Press (EMS)	C-15
14	Module - Stop/Tail Lamp	B-14	42	Switch - Refrigerant Press (AC)	B-7
6	Monitor - Engine Overspeed	E-1	27C	Switch - Retarder Press (ARC)	C-9
A	Monitor - Operator (EMS)	D-1	A	Switch - Running Lamp	E-3
15	Motor - Starting	A-6	41C	Switch - Secondary Brake Press (EPTC II)	E-15
16	Motor - Supplemental Steering	A-7	43C	Switch - Service Brake Press (AETA)	E-15
17	Motors - Blower	E-10	43C	Switch - Service Brake Press (EPTC II)	E-15
18	Pickup - Engine Speed (Tachometer)	A-5	5C	Switch - Service Clear (ARC)	C-8
6	Relay - Main Power	D-6	B	Switch - Service Clear (EPTC II)	E-13
11	Relay - Starter	A-6	5C	Switch - Service Set (ARC)	C-8
11	Relay - Supplemental Steering Motor	A-7	B	Switch - Service Set (EPTC II)	F-13
17	Resistor - Blower Speed	E-10	33	Switch - Shift Lever	D-11
15	Resistor - Start/Charge Diagnostic Conn	A-6	A	Switch - Start Aid	D-3
19	Sender - Brake Oil Temp (Gauge)	A-9	10	Switch - Steering Flow	A-8
20	Sender - Coolant Temp (Gauge)	A-4	43C	Switch - Stop Lamp Press (Module)	F-15
14	Sensor - Body Up (EPTC II)	A-13	A	Switch - Supplemental Steering	E-3
21	Sensor - Engine Coolant Temp (Fan Clutch)	A-5	17	Switch - Thermostat	E-11
23	Sensor - Wheel Speed (LH)	B-15	44	Switch - Transmission Filter Press (EMS)	A-9
24	Sensor - Wheel Speed (RH)	A-15	44	Switch - Transmission Oil Temp (EMS)	A-9
25	Solenoid - 4 Way	A-14	A	Switch - Turn Signal	D-5
26	Solenoid - Air Conditioner Clutch	B-3	B	Tachograph	F-12
27C	Solenoid - ARC Control Valve	C-9	A	Tachometer	F-3

Machine locations are repeated for components located close together.

A = Components located in dash area.
B = Components located behind operator's seat.
C = Components located in rear compartment.

OFF MACHINE SWITCH SPECIFICATIONS				
Part No.	Function	Actuate	Deactuate	Contact Position
2M-9346	Stop Lamp Pressure (Module)	45 kPa MAX (6.5 psi MAX)	5 kPa MIN (0.5 psi MIN)	Normally Open
3E-2033	Secondary Brake Air Pressure (EPTC II) Parking Brake Pressure (EMS)	840 kPa (92.0 psi)	530 ± 40 kPa (77.0 ± 6.0 psi)	Normally Open
3E-2034	Service Brake Air Pressure (AETA) Service Brake Air Pressure (EPTC II)	80 kPa (12.0 psi)	55 ± 20 kPa (8.0 ± 3.0 psi)	Normally Closed
3E-2035	Brake Retarder Air Pressure Manual Retarder Pressure (ARC)	60 kPa (8.5 psi)	28 ± 15 kPa (4.0 ± 2.0 psi)	Normally Open
3E-7868	Transmission Filter Bypass Pressure (EMS)	210 ± 70 kPa (30 ± 10 psi)	-	Normally Open
6T-7663	Engine Oil Pressure (EMS)	93 ± 20 kPa (13.5 ± 3.0 psi)	68.9 ± 20.8 kPa (10.0 ± 3.0 psi)	Normally Open
7N-7854	Brake Oil Temperature (EMS) Converter/Retarder Temperature (EMS)	123.9 ± 2.8°C (255 ± 9°F)	112.8°C MIN (235°F MIN)	Normally Closed
7N-9785	Converter/Retarder Temperature (EMS)	107.2 ± 2.8°C (225 ± 9°F)	91.0°C MIN (196°F MIN)	Normally Closed
8N-1693	Engine Coolant Temperature (Start Aid)	37.8 ± 2.8°C (100 ± 5°F)	26.7°C MIN (80°F MIN)	Normally Closed
8T-9792	Brake System Air Pressure (EMS)	517 ± 35 kPa (75.0 ± 5.0 psi)	448 ± 35 kPa (65.0 ± 5.0 psi)	1-3, Normally Closed 1-2, Normally Open
9G-3341	Transmission Oil Temperature (EMS)	51.7 ± 2.8°C (123 ± 5°F)	43.0°C MIN (110°F MIN)	Normally Closed
9W-0263	Retarder Pressure (ARC)	48.2 ± 13.3 kPa (7.0 ± 2.0 psi)	24.1 kPa MIN (3.5 psi MIN)	Normally Closed
9W-3187	Fuel Pressure (EMS)	93 ± 21 kPa (13.5 ± 3.0 psi)	69 ± 21 kPa (10.0 ± 3.0 psi)	Normally Closed
9X-3040	Engine Coolant Flow (EMS)	362 ± 29 mL (45.6 mm ID post) (1.3 ± 1.0 L in ID post)	303 mL MIN (11.0 L MIN)	Normally Open
101-0912	AC Pressure (Fan Clutch)	1650 ± 135 kPa (230 ± 20 psi)	1275 ± 100 kPa (185 ± 15 psi)	Normally Open
107-0615	Accelerator Pressure (ARC)	48 ± 14 kPa (7.0 ± 2.0 psi)	24 kPa MIN (3.5 psi MIN)	Normally Closed
109-4215	Steering Flow	4 grams (1.4 oz)	1.5 grams (0.53 oz)	Normally Open
114-5334	Refrigerant Pressure (AC)	275 to 1750 kPa (40 to 255 psi)	-	Normally Open 2

¹ A hysteresis band exists; with increasing pressure the closed condition can be maintained up to 2800 kpa (405 psi), with decreasing pressure the closed condition can be maintained down to 170 kpa (25psi).
² Contact position at the contacts of the harness connector.

RESISTOR AND SOLENOID SPECIFICATIONS			
Component	Part No.	Resistance (Ohms) 1	
Resistor - Blower Motor Speed	9G-1950	Overall 2.0 ± .1, Tap 1.0 ± .05	
Resistor - Starter/Diagnostic Conn	6T-2217	150 ± 7.5	
Solenoid - 4 Way	9G-9888	24.9	
Solenoid - AC Clutch	8T-8813	14.4 ± 0.6	
Solenoids - ARC Control Valve, ARC Supply Valve	8X-7876 (from 3E-8891)	29.8 ± 1.5	
Solenoids - Down Shift, Up Shift, Lockup	7X-1120	33.7	
Solenoid - Engine Fan	101-0329	62.0 ± 6.2	
Solenoid - Engine Shutdown	9X-1413	3.70 ± .3	
Solenoid - Proportional	3T-0062	16.0	
Solenoid - Start Aid	7N-7259		

HARNESS CONNECTOR LOCATION CHART							
Connectors	Machine Location	Harness And/Or Components	Schematic Location	Connectors	Machine Location	Harness And/Or Components	Schematic Location
37 Connectors		L-109-4159 Transmission Control	D-12			M-111-0714 Engine Overspeed Monitor	E-1
		PR-111-0715 Auto Retarder Control	C-7			9X-8728 9X-8727 (Body Attachment)	C-3
25 Connectors		A-109-4160 H-111-8137	C-11			A-109-4160	A-14
		A-109-4160 J-111-8138	D-12			A-109-4160	E-9
		B-109-4160 Starting And Charging Systems	D-12			A-109-4160	E-15
20 Connectors		L-109-4159 Transmission Control	C-13			D-104-3939 Transmission Speed Distributor	E-15
		PR-111-0715 Auto Retarder Control	C-7			L-109-4159 Transmission Gear Indicator	C-10
		Y-111-0715 Auto Retarder Control	C-8			P-109-4196 Engine Shutdown Control	D-3
		W-991-6419 Shift Lever Switch	D-11			A-109-4160 M-111-0713	D-4
14 Connectors		Z-77-3418 Transmission Switch	A-13			A-109-4160 S-66-8462	D-5
		Y-111-0715 Auto Retarder Control	C-8			A-109-4160 T-71-5829	D-4
		A-109-4160 G-109-4052	E-3			E-194-7638 J-111-8138	B-14
		A-109-4160 G-109-4052	E-3			NR-109-6556 Converter	C-4
		L-109-4159 Transmission Control	E-13			P-109-4196 M-111-0714	F-1
10 Connectors		Y-111-0715 Auto Retarder Control	C-8			A-109-4160 N-7X-1784	E-10
		W-991-6419 Shift Lever Switch	D-11			A-109-4160 R-71-4854	D-15
		Z-77-3418 Transmission Switch	A-13			U-71-5824 T-71-5823	B-9
		Y-111-0715 Auto Retarder Control	C-8			P-109-4196 ZZ-8X-1482	D-1
		A-109-4160 P-109-4341	E-8			PR-111-0715 RR-109-4050	C-7
		A-109-4160 P-109-4196	E-8			F-71-5825 T-71-5823	B-1
9 Connectors		C-104-3939 P-109-4196	C-10			Y-111-0715 RR-109-4050	B-12
		A-109-4160 P-109-4196	E-7			E-104-7638 Stop/Tail Lamp Module	B-14
		L-109-4159 Transmission Control	E-12			H-111-8137 M-111-0714	B-5
		PR-111-0715 Auto Retarder Control	C-7			L-109-4159 L-2A-7073	F-14
		A-109-4160 P-109-4341	E-8			L-109-4159 Body Raise Switch	D-12
		A-109-4160 Q-109-4341	E-5			A-109-4159 Transmission Gear Indicator	D-10
8 Connectors		A-109-4160 PR-111-0715	C-6			9X-8728 4 Way Solenoid	A-14
		M-111-0714 Engine Overspeed Monitor	E-1				

Machine locations are repeated for components located close together.

* = Connector is located at the component.
A = Connector is located behind the dash.
B = Connector is located behind the operator's seat.
C = Connector is located in the rear compartment.
D = Connector is located at the right side wall of the rear compartment.

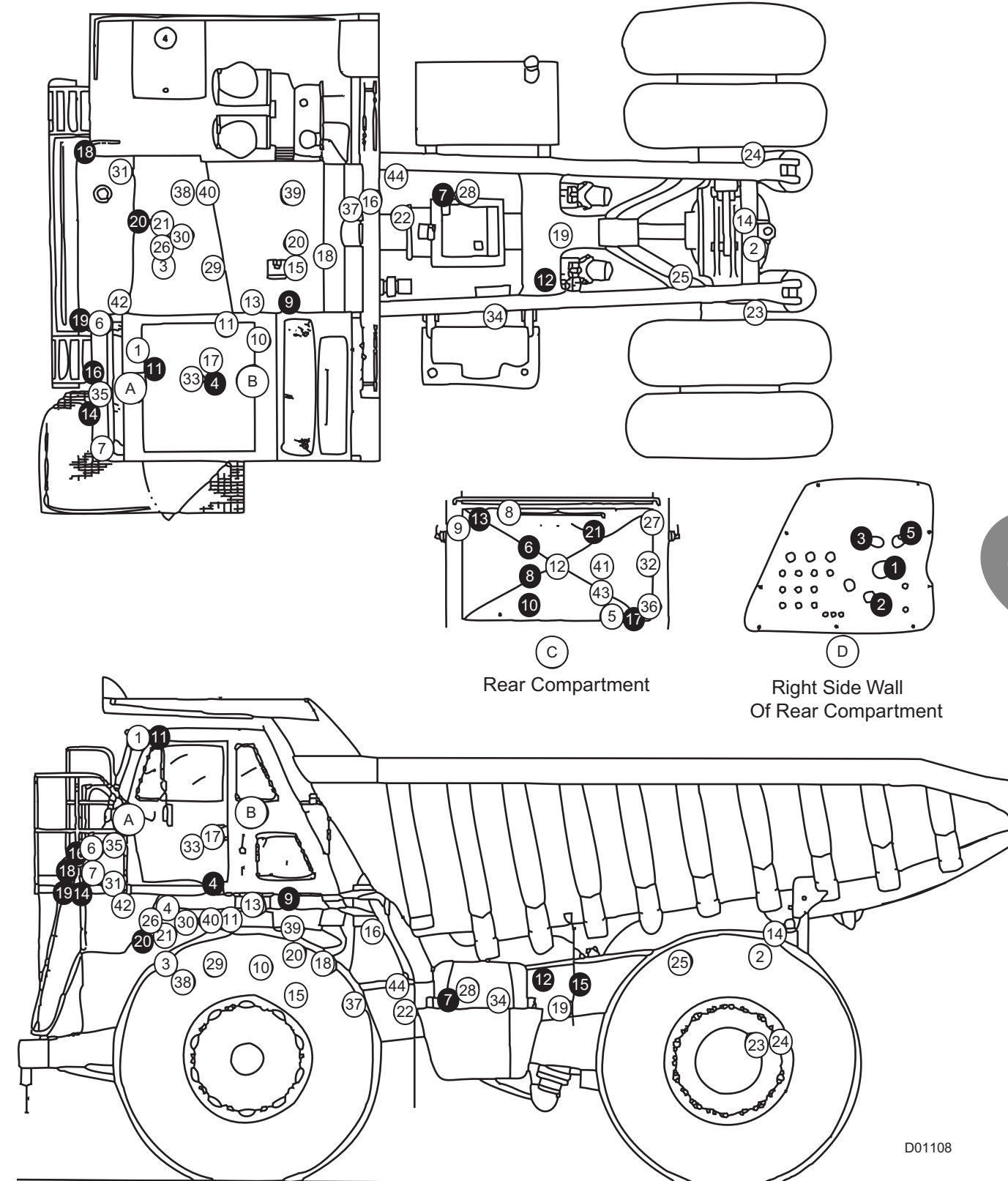
Schematic

768C Tractor 769C & 771C Trucks Electrical System

768C: 2X400-UP
769C: 1X6000-UP
771C: 3B1200-UP

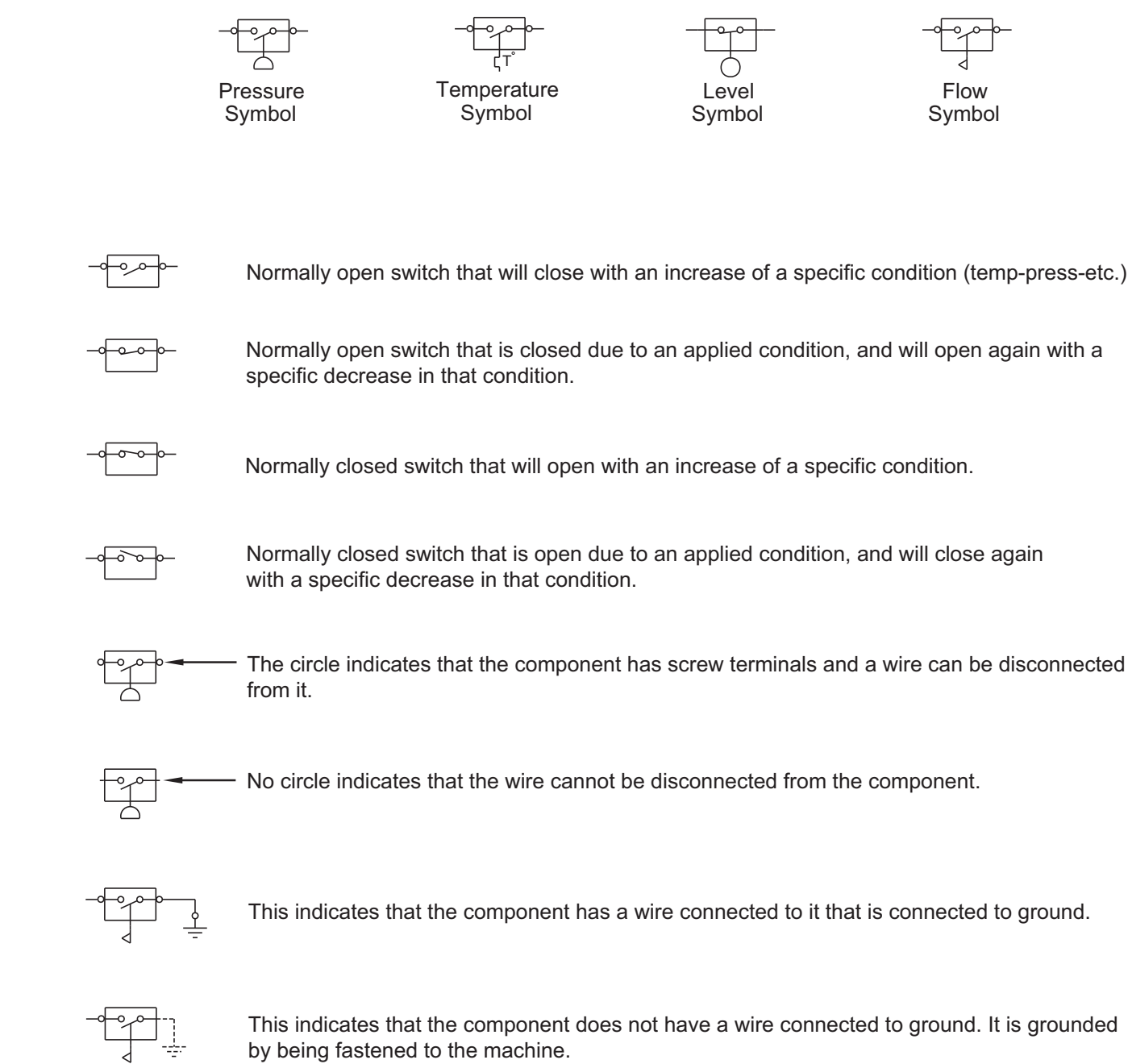
FAILURE MODE IDENTIFIER (FMI) LIST	
FMI No.	Failure Description
0	Data valid but above normal operational range.
1	Data valid but below normal operational range.
2	Data erratic, intermittent, or incorrect.
3	Voltage above normal or shorted high.
4	Voltage below normal, or shorted low.
5	Current below normal or open circuit.
6	Current above normal, or grounded circuit.
7	Mechanical system not responding properly.
8	Abnormal frequency, pulse width, or period.
9	Abnormal update.
10	Abnormal rate of change.
11	Failure mode not identifiable.
12	Bad device or component.
13	Out of calibration.

RELATED SERVICE MANUALS	
Title	Form No.
Actual Gear Indicator	SENR4252
Alternator (100-3007)	SENR2082
Consult No. 100-5046	SENR4130
Automatic Electronic Traction Aid	SENR2686
Automatic Retarder Control System	SENR5683
Electronic Monitoring System	SENR2945
Electronic Programmable Transmission Control II	SENR5686
Engine Overspeed Indicator	SENR4263
Starting And Charging Systems	SENR2947
Starting Motor (3T-8967)	SENR3660

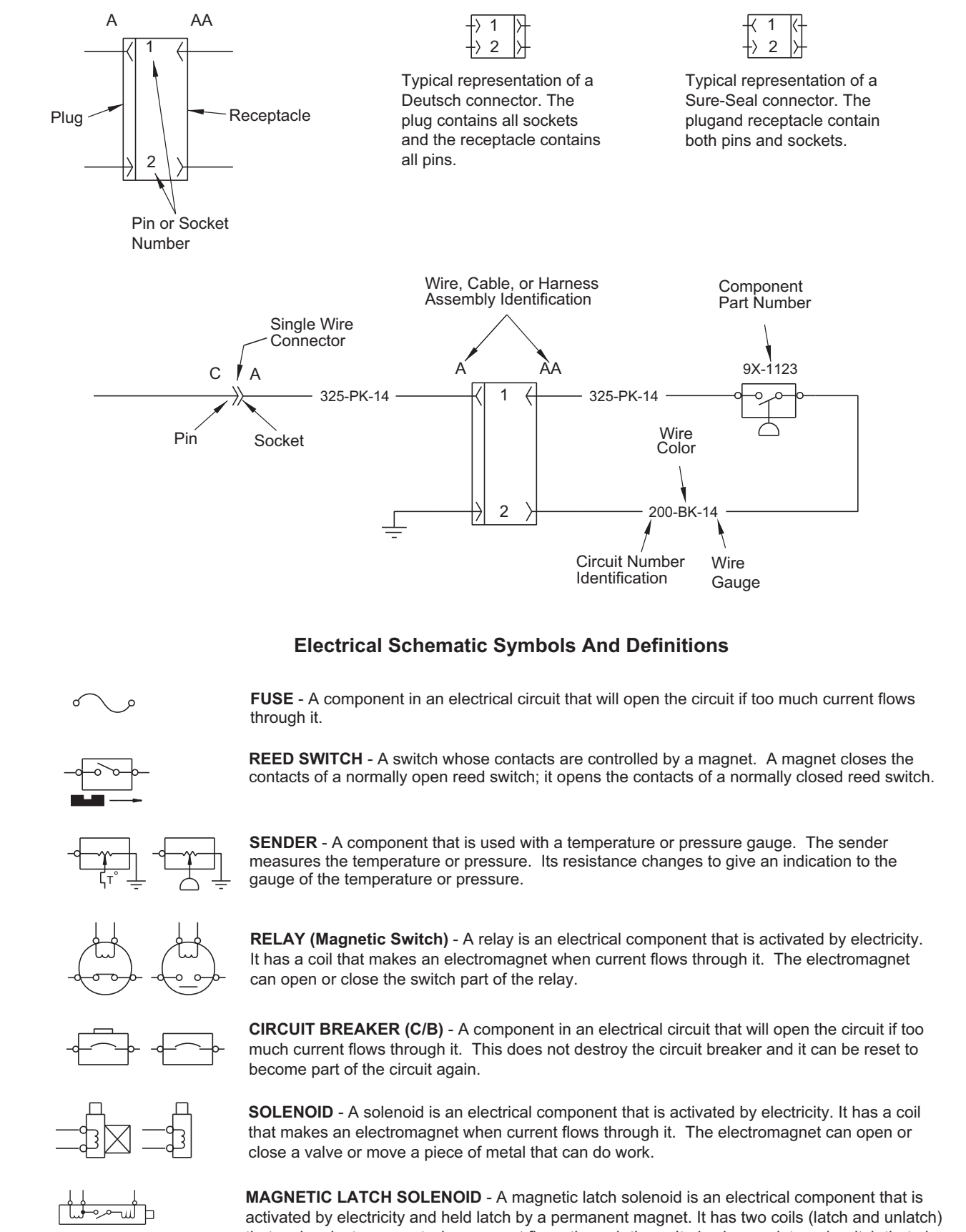


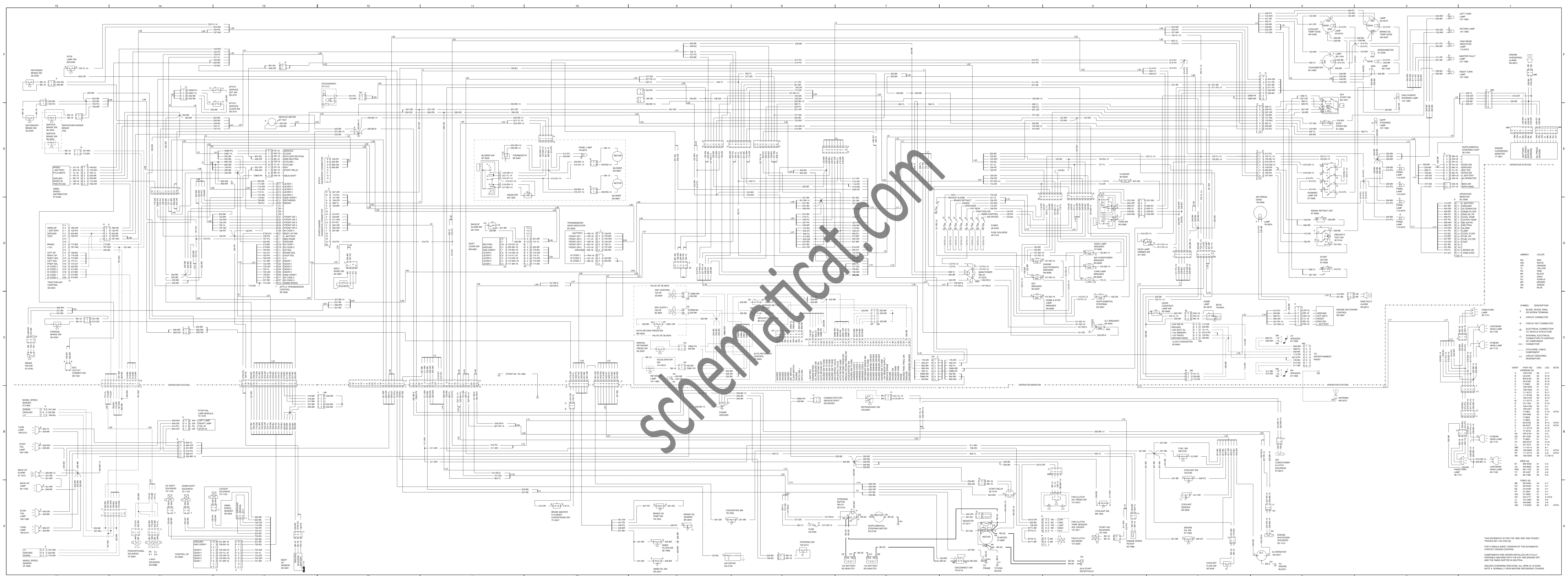
Machine Harness Connector And Component Locations

Electrical Schematic Symbols And Definitions



Harness And Wire Electrical Schematic Symbols





ABBREV COLOR

RD	RED
OR	ORANGE
YL	YELLOW
PK	PINK
BL	BLACK
GR	GREEN
BR	BROWN
WH	WHITE

- SYMBOL DESCRIPTION
- SLASH SPACE INCL OR EXIST TERMINAL
 - CIRCUIT CONNECTED
 - CIRCUIT NOT CONNECTED
 - ELECTRICAL CONNECTION TO WIRE STRUCTURE
 - INTERNAL ELECTRICAL CONNECTION TO SURFACE OF COMPONENT
 - ATTACH WIRE CABLE
 - CIRCUIT GROUPING DESIGNATOR

IDENT PART NO. CHG LOC NOTE

A	109-410	01	C-11	
B	24-231	01	B-10	
D	84-205	01	B-10	
E	109-428	01	E-3	
G	109-428	01	E-3	
H	111-817	01	B-11	
I	111-818	01	B-11	
J	111-813	01	B-11	
K	109-436	01	D-15	ATCH
L	75-264	01	B-1	
M	111-813	01	B-11	
N	109-436	01	D-15	ATCH
O	84-207	01	A-15	ATCH
P	111-813	01	B-11	
Q	109-436	01	D-15	ATCH
R	109-436	01	D-15	ATCH
S	109-436	01	D-15	ATCH
T	109-436	01	D-15	ATCH
U	109-436	01	D-15	ATCH
V	109-436	01	D-15	ATCH
W	84-205	01	B-10	
X	84-207	01	A-15	ATCH
Y	111-813	01	B-11	
Z	75-264	01	B-1	
AA	24-231	01	B-10	
AB	84-205	01	B-10	
AC	84-205	01	B-10	
AD	84-205	01	B-10	
AE	84-205	01	B-10	
AF	84-205	01	B-10	
AG	84-205	01	B-10	
AH	84-205	01	B-10	
AI	84-205	01	B-10	
AJ	84-205	01	B-10	
AK	84-205	01	B-10	
AL	84-205	01	B-10	
AM	84-205	01	B-10	
AN	84-205	01	B-10	
AO	84-205	01	B-10	
AP	84-205	01	B-10	
AQ	84-205	01	B-10	
AR	84-205	01	B-10	
AS	84-205	01	B-10	
AT	84-205	01	B-10	
AV	84-205	01	B-10	
AW	84-205	01	B-10	
AX	84-205	01	B-10	
AY	84-205	01	B-10	
AZ	84-205	01	B-10	

THIS SCHEMATIC IS FOR THE 1980 AND 1980 PHASE I TRUCKS (S/N 1142 CHG 03)

FOR A SINGLE SHEET VERSION OF THIS SCHEMATIC CONTACT DESIGN CENTER.

COMPONENTS ARE SHOWN INSTALLED ON A FULLY OPERABLE MACHINE WITH THE ENGINE OFF AND THE MAIN SHIFTER IN NEUTRAL.

UNLESS OTHERWISE SPECIFIED ALL WIRE IS 16 GAGE AND A NORMALLY OPEN BEFORE REFERENT CHANGE.