721D Loader

Service Manual

Bur 6-47543

CASE CONSTRUCTION

MidWestTech | Case 721D Loader Service Manual | Publication 6-47283

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700 State Street
Racine, WI 53404 U.S.A.

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Issued April, 2003/Revised July, 2005

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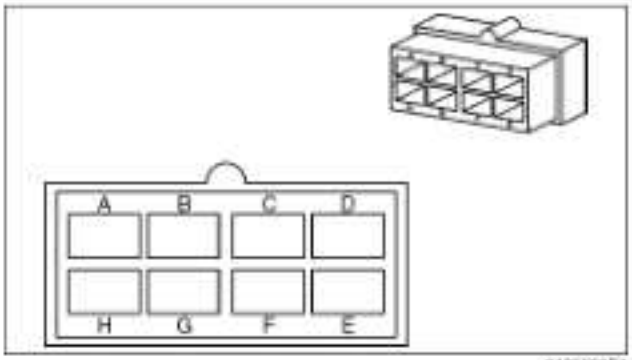
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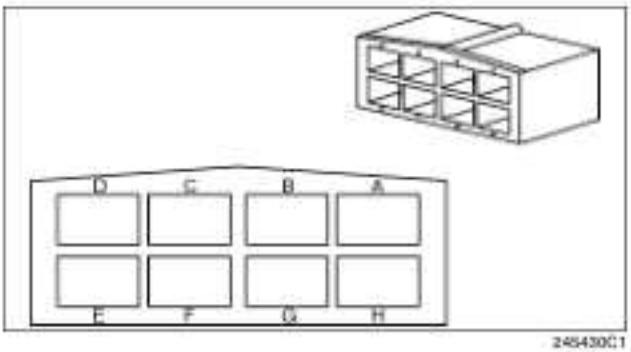
CONNECTOR 23F - CAB MAIN HARNESS TO CAB ROOF HARNESS



3195530R1

CAV	WIRE IDENT	CIRCUIT
A	68C_A Or-1.0	Rear Wiper Park
B	0_DT Bk-1.0	Dome Court Work Light Ground
C	0_DU Bk-1.0	Beacon Wiper Diode Ground
D	19U_A Or-1.0	Dome Light Horn Fused Power
E	46_A K-0.8 46_C K-1.0	Beacon Switched Power
F	19K_B Or-1.0	Rear Wiper Wash Fused Power
G	68L_A Or-1.0	Rear Wiper Low Speed
H	42R_B DU-0.8	Rear Work Light Power

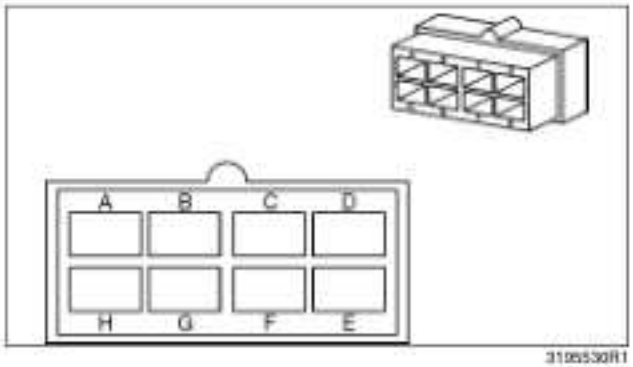
CONNECTOR 23M - CAB ROOF HARNESS TO CAB MAIN HARNESS



245430C1

CAV	WIRE IDENT	CIRCUIT
A	68C_B Or-1.0	Rear Wiper Park
B	0_MG Bk-1.0	Rear Work Light Ground
C	0_MD Bk-1.0	Beacon Rear Wiper Ground
D	19U_D Or-1.0	Dome Light Fused Power
E	46_D K-1.0	Beacon Switched Power
F	19K_E Or-1.0	Rear Wiper Wash Fused Power
G	68L_C Or-1.0	Rear Wiper Low Speed
H	42R_F DU-1.0	Rear Work Light Power

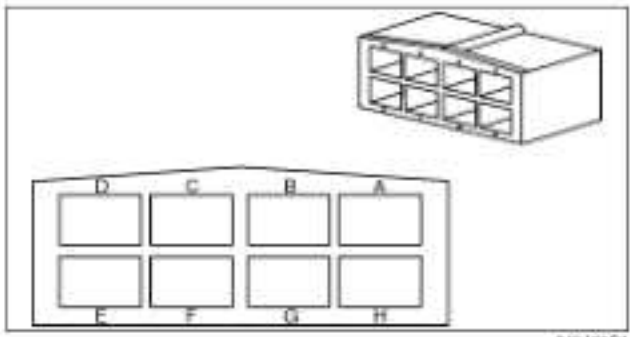
CONNECTOR 24F - CAB ROOF HARNESS TO CAB MAIN HARNESS



3195530R1

CAV	WIRE IDENT	CIRCUIT
A		None
B		None
C		None
D		None
E	0_MN Bk-0.8	Dome Courtesy Light Ground
F	49_V S-0.8	Courtesy Pilot Light
G	0_MK Bk-1.0	Front Work Light Ground
H	42C_D DU-1.0	Front Work Lights Power

CONNECTOR 24M - CAB MAIN HARNESS TO CAB ROOF HARNESS



245430C1

CAV	WIRE IDENT	CIRCUIT
A		None
B		None
C		None
D		None
E	0_DR Bk-1.0	Dome Court Work Light Ground
F	49_S S-1.0	Courtesy Pilot Light
G	0_DS Bk-1.0	Dome Court Work Light Ground
H	42C_A DU-1.0	Front Work Lights Power

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FAULT CODES

CODE	DEFINITION	POSSIBLE STEPS FOR REPAIR
12110	Engine coolant temperature is 110° C (230° F) or greater	Troubleshoot electrical circuits.
12900	Engine coolant temperature sensor short circuit measuring less than 50 ohms.	
12901	Engine coolant temperature sensor open circuit measuring greater than 10,000 ohms with hydraulic oil temperature at 40° C (104° F) or more, indicated by a resistance of 1463 ohms or less.	
13000	Low engine coolant level - This code will not be generated if the engine coolant temperature is below 20° C (68° F).	1. A critical stop function warning has occurred. 2. Red stop indicator comes on and continuous buzzer sounds. 3. Stop machine and perform required service on the critical area.
21070	Engine oil pressure is measured below 70 kPa (10 psi)	
21900	Engine oil pressure sensor short circuit measuring less than 16 ohms and engine coolant temperature is greater than or equal to 70° C (158° F).	Troubleshoot electrical circuits. **NOTE:** *Fault code 21900 is possible during cold engine start-up. After machine warm up, verify proper operation.*
21901	Engine oil pressure sensor open circuit measuring more than 270 ohms.	
33900	Fuel level sender short circuit measuring less than 16 ohms.	Troubleshoot electrical circuits.
33901	Fuel level sender open circuit measuring more than 270 ohms.	
34000	Short circuit in fuel solenoid circuit.	
35000	High air filter restriction.	1. A caution level warning has occurred. 2. Yellow caution indicator comes on and buzzer sounds for 3 seconds. 3. Perform required service on the cautioned area.
42125	Transmission temperature measured above 125° C (257° F)	1. A critical stop function warning has occurred. 2. Red stop indicator comes on and continuous buzzer sounds. 3. Stop machine and perform required service on the critical area.
45000	High transmission filter restriction when the transmission oil is above 20° C (68° F).	1. A caution level warning has occurred. 2. Yellow caution indicator comes on and buzzer sounds for 3 seconds. 3. Perform required service on the cautioned area.
46017	Gear range fault error	1. Check the cables from TCU to shift lever. 2. Check signal combinations of shift lever positions for gear range.
46018	Logical error at direction select signal	1. Check the cables from TCU to shift lever. 2. Check signal combinations of shift lever positions F-N-R.

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STEP 43



BD01F106

Determine the gap between the measuring shaft and the measuring pin with a feeler gauge.

Dim. B e.g. . . . . 1.00 mm (0.039 inch)

Example A.:

Dimension A (tool constant)	204.25 mm (8.041 inch)
Dimension B (gap)	+ 1.00 mm (0.039 inch)
Results in Dimension X	**s = 205.25 mm (8.08 inch)**

STEP 44

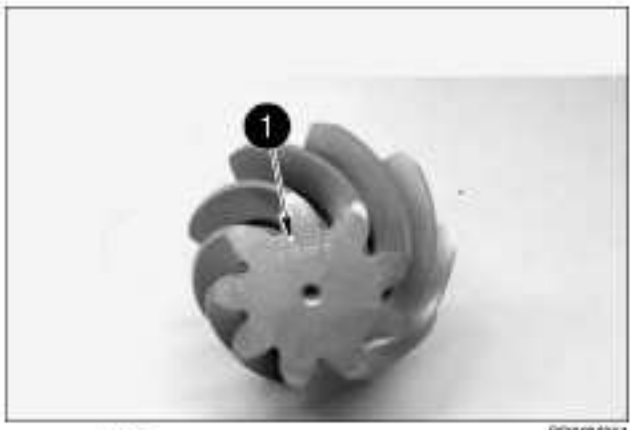


BD03M050

Determine Dimension I (bearing width).

Dimension I e.g. . . . . 36.00 mm (1.417 inch)

STEP 45



BD03M051

1. $168.0^{+0.05}$

Read Dimension II (dimension for pinion).

Dimension II e.g. . . . . 168.05 mm (6.62 inch)

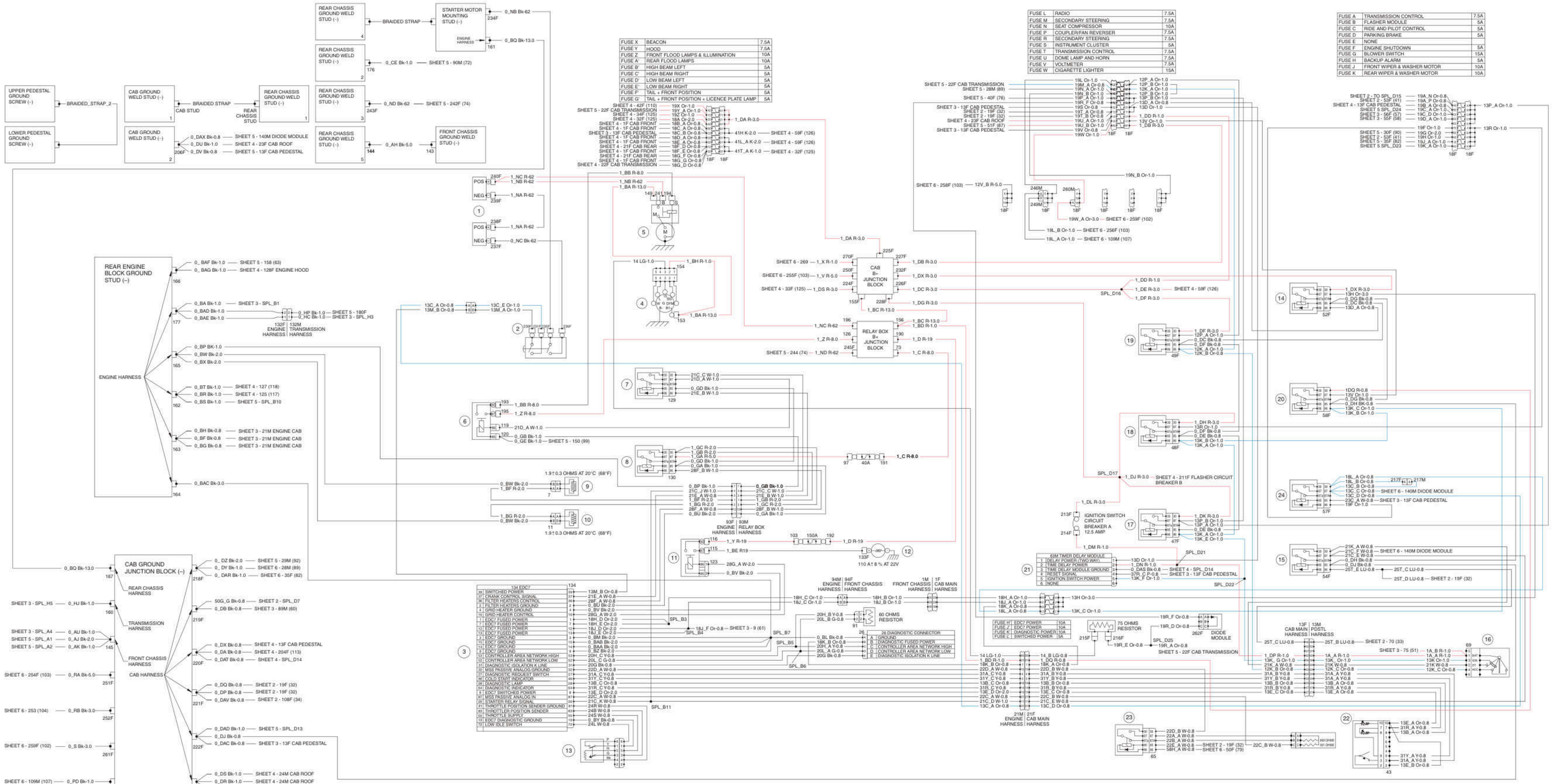
Example B:

Dimension I	36.00 mm (1.417 inch)
Dimension II	+ 168.05 mm (6.616 inch)
Results in Dimension Y	**s = 204.05 mm (8.04 inch)**

Example C:

Dimension X	205.25 mm (8.081 inch)
Dimension Y	– 204.05 mm (8.033 inch)
Difference = Shim e.g.	**s = 1.20 mm (0.048)**

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COMPONENTS

1. Batteries
2. Master Disconnect Switch
3. Electronic Diesel Control (EDC) 7
4. Alternator
5. Starter Motor
6. Starting Relay
7. Crank Control Relay
8. Filters Heaters Relay
9. Water Separator Heater
10. Fuel Filter Heater
11. Grid Heater Relay
12. Grid Heater
13. Throttle Potentiometer
14. Engine Control Relay -Number 6
15. Neutral Start Relay - Number 8
16. Ignition Switch
17. Ignition Relay - Number 1
18. Ignition Relay - Number 2
19. Accessory Relay - Number 3
20. Voltmeter Relay - Number 12
21. Time Delay Module
22. Diagnostic Switch
23. MSS Relay - Number 16
24. Relay Socket - Number 11
25. Output Speed Sensor
26. Engine Speed Sensor
27. Intermediate Speed Sensor
28. Turbine Speed Sensor
29. Filter Maintenance Switch
30. Torque Converter Output Temperature Sender
31. Transmission Solenoid Valve and Temperature Sensors
32. Transmission Electronic Control Module
33. Transmission Shifter
34. Diagnostic Connector
35. Transmission Kick-down Switch
36. Transmission Auto Switch
37. Declutch Switch
38. Brake Declutch Pressure Switch
39. Transmission Enable Switch
40. FNR Switch
41. Backup Alarm Relay - Number 7
42. Backup Alarm Disable Switch (TUV road approved machines only)
43. Backup Alarm
44. Brake Warning Pressure Switch
45. Coolant Level Sender
46. Fuel Level Sender
47. Hydraulic Oil Temperature Sender
48. Hydraulic Filter Restriction Switch
49. Engine Coolant Temperature Sender
50. Air Filter Restriction Switch
51. Program Reset Switch
52. Parking Brake Switch
53. Instrument Cluster
54. Pilot Control Switch
55. Up/Down Count Switch
56. Engine Oil Pressure Switch
57. Pilot Control Relay - Number 10
58. Parking Brake Relay - Number 9
59. Parking Brake Solenoid
60. Pilot Pressure Solenoid
61. Water Separator Sensor
62. Fan Reversing Switch (Option)
63. Fan Reversing Solenoid (Option)
64. Redundant Brake Pressure Switches
65. Detent Switch
66. Bucket Control Valve Electromagnetic Detents
67. Return-To-Travel/Float Switch
68. Return-To-Dig Proximity Switch
69. Height Control/Return-To-Travel Proximity Switch
70. Rollback Pressure Switch (Option)
71. Float Solenoid
72. Secondary Steering Module (Option)
73. Secondary Steering Pressure Switch (Option)
74. Secondary Steering Motor (Option)
75. Secondary Steering Solenoid (Option)
76. Pin Engage Switch (Option)
77. Pin Engage Solenoid (Option)
78. Ride Control Switch
79. Ride Control Relay - Number 4
80. Ride Control Solenoid
81. Front Wiper Motor
82. Front Wiper and Washer Switch
83. Front Washer Pump Motor
84. Rear Wiper and Washer Switch
85. Rear Washer Pump Motor
86. Rear Wiper Motor
87. Horn Relay - Number 5
88. Horn
89. Seat Compressor and Switch (Option)
90. Blower Switch
91. Blower Motor Speed Resistors with Thermal Fuse
92. Blower Motor
93. Air Conditioning Low Pressure Switch
94. Air Conditioning High Pressure Switch
95. Thermostat Switch
96. Compressor Clutch Lockout Relay - Number 14
97. Compressor Clutch
98. Hood Switch
99. Hood Up Relay - Number 17
100. Hood Down Relay - Number 18
101. Hood Motor
102. Cigar Lighter (Option)
103. Power Converter - 24 volts to 12 volts (Option)
104. Power Outlet (Option)
105. Remote Radio or 24 Volt Radio (Option)
106. 12 Volt Radio (Option)
107. Radio Power Converter - 24 volts to 12 volts (Option)
108. Left Speaker (Option)
109. Right Speaker (Option)
110. Beacon Switch (Option)
111. Rotating Beacon (Option)
112. Brake Lamp Pressure Switch
113. Brake Lamps Relay - Number 15
114. Hazard Switch
115. Turn Signal, Hi/Low Beam, and Horn Switch
116. Flasher Module
117. Left-Hand Rear Combination Lamp
118. Right-Hand Rear Combination Lamp
119. Left-Hand Front Combination Lamp
120. Right-Hand Front Combination Lamp
121. Left-Hand Rear Work Lamp
122. Right-Hand Rear Work Lamp
123. Left-Hand Front Work Lamp
124. Right-Hand Front Work Lamp
125. Five Position Rotary Lamp Switch
126. High/Low Beam Relay - Number 13
127. License Plate Lamp
128. Dome Lamp
129. Courtesy Lamp

WIRE IDENTIFICATION

1. WIRE NUMBER
2. WIRE COLOR SYMBOL
3. WIRE SIZE (mm²) TYPICAL

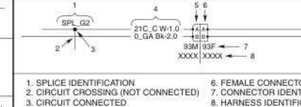
23F_A W-2.0 (1 2 3)

Bk = BLACK	LU = LIGHT BLUE	S = GRAY	
DU = DARK BLUE	N = BROWN	T = TAN	
G = GREEN	Or = ORANGE	U = BLUE	
K = PINK	P = PURPLE (VIOLET)	W = WHITE	
LG = LIGHT GREEN	R = RED	Y = YELLOW	

SHOWS POWER - MASTER DISCONNECT SWITCH IN ON POSITION

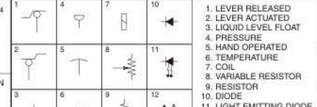
SHOWS POWER - KEY SWITCH IN ON POSITION

CIRCUIT LEGEND



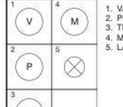
1. SPLICE IDENTIFICATION
2. CIRCUIT CROSSING (NOT CONNECTED)
3. CIRCUIT CONNECTED
4. WIRE IDENTIFICATION
5. MALE CONNECTOR
6. FEMALE CONNECTOR
7. CONNECTOR IDENTIFICATION
8. HARNESS IDENTIFICATION
9. INDICATES PARTIAL CONNECTOR
10. CIRCUIT IDENTIFICATION
11. SCHEMATIC SHEET NUMBER FOR CIRCUIT CONTINUATION
12. CONNECTION POINT ON SCHEMATIC
13. COMPONENT NUMBER (IF ASSIGNED)
14. COMPONENT NUMBER
15. INDICATES INTERNALLY GROUNDED COMPONENT

ACTUATOR SYMBOLS



1. LEVER RELEASED
2. LEVER ACTUATED
3. LIQUID LEVEL FLOAT
4. PRESSURE
5. HAND OPERATED
6. TEMPERATURE
7. COIL
8. VARIABLE RESISTOR
9. RESISTOR
10. DIODE
11. LIGHT EMITTING DIODE
12A. MOMENTARY CONTACT
12B. MAINTAINED CONTACT

HOUSINGS



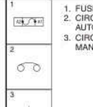
1. VACUUM SWITCH
2. PRESSURE SWITCH
3. TEMPERATURE SWITCH
4. MOTOR
5. LAMP

CONTACT SYMBOLS



1. SINGLE POLE, SINGLE THROW
2. SINGLE POLE, DOUBLE THROW
3. DOUBLE POLE, SINGLE THROW
4. DOUBLE POLE, DOUBLE THROW

FUSE AND CIRCUIT BREAKER



1. FUSE
2. CIRCUIT BREAKER, AUTOMATIC RESET
3. CIRCUIT BREAKER, MANUAL RESET

NOTES

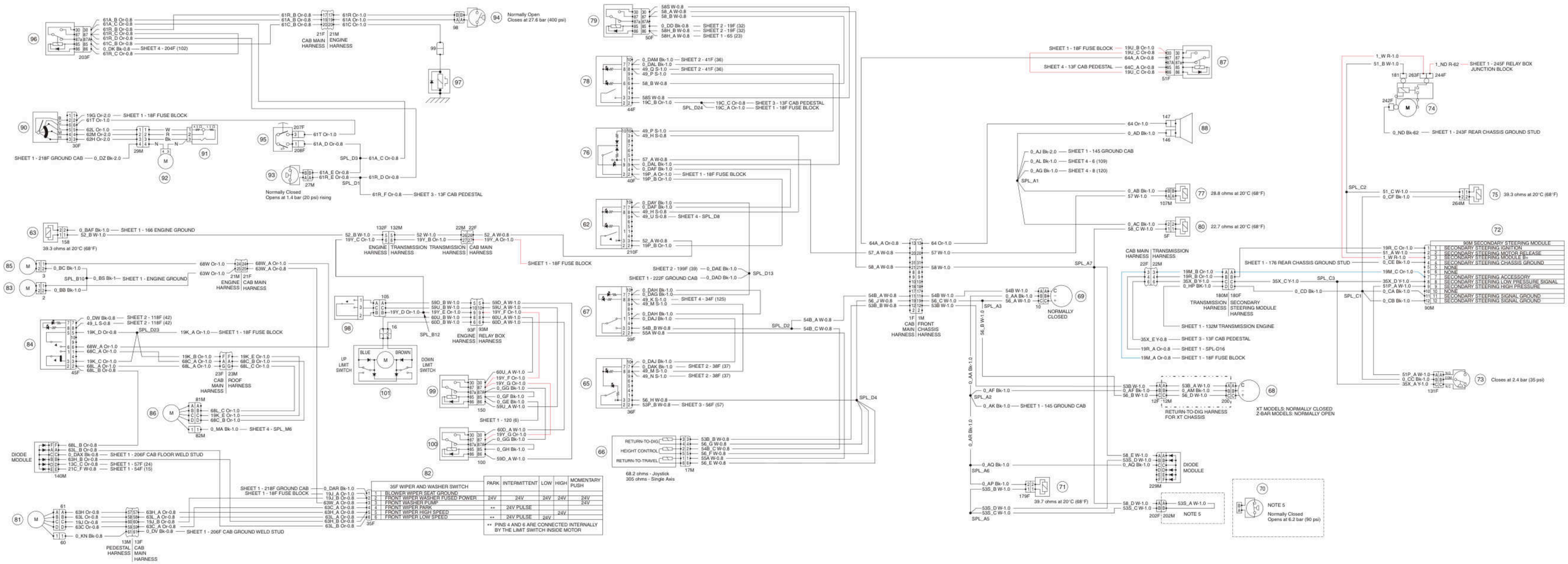
1. 209M and 209F disconnected when backup alarm disable switch is installed (TUV road approved machines only).
2. Resistors part of ground wire assembly.
3. 64M and 64F connected for North American machines, opposite side steady ON. 64M and 64F disconnected for European machines, opposite side OFF.
4. 217F and 217M disconnected when engine shutdown relay special feature is installed.
5. Replace jumper with rollback pressure switch for XT chassis with ride control only.

ELECTRICAL SCHEMATIC
721D Z-BAR, 721D XR, and 721D XT WHEEL LOADERS

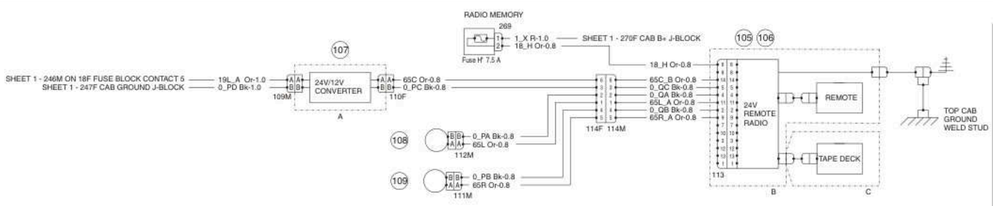
Additional copies of this Hydraulic and Electrical Schematic can be ordered throughTechnical Publications Distribution System. The Part Number is 6-47530

8C02M20U

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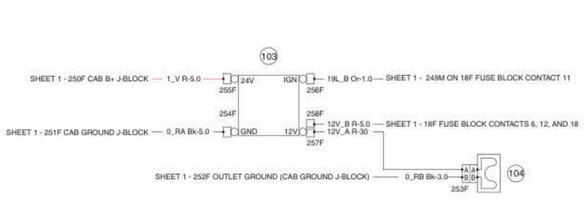


SHEET 5 - MACHINE CONTROLS

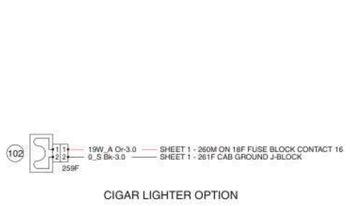


1. 24V REMOTE RADIO (ALL CIRCUITS SHOWN INCLUDING BOX B BUT EXCLUDING BOXES A AND C (109M CONNECTED TO 110F))
2. 24V REMOTE RADIO WITH TAPE DECK (ALL CIRCUITS SHOWN INCLUDING BOXES B AND C BUT EXCLUDING BOX A (109M CONNECTED TO 110F))
3. 24V RADIO READY (ALL CIRCUITS SHOWN EXCLUDING BOXES A, B, AND C (109M CONNECTED TO 110F))
4. 12V RADIO READY (ALL CIRCUITS SHOWN INCLUDING BOX A BUT EXCLUDING BOXES B AND C)

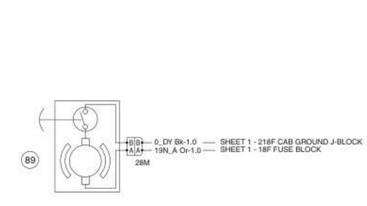
RADIO OPTIONS



24 VOLT - 12 VOLT POWER CONVERTER OPTION



CIGAR LIGHTER OPTION



AIR SEAT OPTION

SHEET 6 - OPTIONS

COMPONENTS

1. Batteries
2. Master Disconnect Switch
3. Electronic Diesel Control (EDC) 7
4. Alternator
5. Starter Motor
6. Starting Relay
7. Crank Control Relay
8. Filters Heaters Relay
9. Water Separator Heater
10. Fuel Filter Heater
11. Grid Heater Relay
12. Grid Heater
13. Throttle Pedal
14. Engine Control Relay -Number 6
15. Neutral Start Relay - Number 8
16. Ignition Switch
17. Ignition Relay - Number 1
18. Ignition Relay - Number 2
19. Accessory Relay - Number 3
20. Voltmeter Relay - Number 12
21. Time Delay Module
22. Diagnostic Connector
23. MSS Relay - Number 16
24. Relay Socket - Number 11
25. Output Speed Sensor
26. Engine Speed Sensor
27. Intermediate Speed Sensor
28. Turbine Speed Sensor
29. Filter Maintenance Switch
30. Torque Converter Output Temperature Sender
31. Transmission Solenoid Valve and Temperature Sensors
32. Transmission Electronic Control Module
33. Transmission Shifter
34. Diagnostic Connector
35. Transmission Kick-down Switch
36. Transmission Auto Switch
37. Declutch Switch
38. Brake Declutch Pressure Switch
39. Transmission Enable Switch
40. FNR Switch
41. Backup Alarm Relay - Number 7
42. Backup Alarm Disable Switch (TUV road approved machines only)
43. Backup Alarm
44. Brake Warning Pressure Switch
45. Coolant Level Sender
46. Fuel Level Sender
47. Hydraulic Oil Temperature Sender
48. Hydraulic Filter Restriction Switch
49. Engine Coolant Temperature Sender
50. Air Filter Restriction Switch
51. Program Reset Switch
52. Parking Brake Switch
53. Instrument Cluster
54. Pilot Control Switch
55. Up/Down Count Switch
56. Engine Oil Pressure Switch
57. Pilot Control Relay - Number 10
58. Parking Brake Relay - Number 9
59. Parking Brake Solenoid
60. Pilot Pressure Solenoid
61. Water Separator Sensor
62. Fan Reversing Switch (Option)
63. Fan Reversing Solenoid (Option)
64. Redundant Brake Pressure Switches
65. Detent Switch
66. Bucket Control Valve Electromagnetic Detents
67. Return-To-Travel/Float Switch
68. Return-To-Dig Proximity Switch
69. Height Control/Return-To-Travel Proximity Switch
70. Rollback Pressure Switch (Option)
71. Float Solenoid
72. Secondary Steering Module (Option)
73. Secondary Steering Pressure Switch (Option)
74. Secondary Steering Motor (Option)
75. Secondary Steering Solenoid (Option)
76. Pin Engage Switch (Option)
77. Pin Engage Solenoid (Option)
78. Ride Control Switch
79. Ride Control Relay - Number 4
80. Ride Control Solenoid
81. Front Wiper Motor
82. Front Wiper and Washer Switch
83. Front Washer Pump Motor
84. Rear Wiper and Washer Switch
85. Rear Washer Pump Motor
86. Rear Wiper Motor
87. Horn Relay - Number 5
88. Horn
89. Seat Compressor and Switch (Option)
90. Blower Switch
91. Blower Motor Speed Resistors with Thermal Fuse
92. Blower Motor
93. Air Conditioning Low Pressure Switch
94. Air Conditioning High Pressure Switch
95. Thermostat Switch
96. Compressor Clutch Lockout Relay - Number 14
97. Compressor Clutch
98. Hood Switch
99. Hood Up Relay - Number 17
100. Hood Down Relay - Number 18
101. Hood Motor
102. Cigar Lighter (Option)
103. Power Converter - 24 volts to 12 volts (Option)
104. Power Outlet (Option)
105. Remote Radio or 24 Volt Radio (Option)
106. 12 Volt Radio (Option)
107. Radio Power Converter - 24 volts to 12 volts (Option)
108. Left Speaker (Option)
109. Right Speaker (Option)
110. Beacon Switch (Option)
111. Rotating Beacon (Option)
112. Brake Lamp Pressure Switch
113. Brake Lamps Relay - Number 15
114. Hazard Switch
115. Turn Signal, Hi/Low Beam, and Horn Switch
116. Flasher Module
117. Left-Hand Rear Combination Lamp
118. Right-Hand Rear Combination Lamp
119. Left-Hand Front Combination Lamp
120. Right-Hand Front Combination Lamp
121. Left-Hand Rear Work Lamp
122. Right-Hand Rear Work Lamp
123. Left-Hand Front Work Lamp
124. Right-Hand Front Work Lamp
125. Five Position Rotary Lamp Switch
126. High/Low Beam Relay - Number 13
127. License Plate Lamp
128. Dome Lamp
129. Courtesy Lamp

WIRE IDENTIFICATION

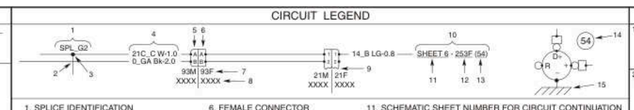
1. WIRE NUMBER
2. WIRE COLOR SYMBOL
3. WIRE SIZE (mm²) TYPICAL

23F_A W-2.0
1 2 3

Bk = BLACK
DU = DARK BLUE
G = GREEN
K = PINK
LG = LIGHT GREEN
LU = LIGHT BLUE
N = BROWN
Or = ORANGE
P = PURPLE (VIOLET)
R = RED
S = GRAY
T = TAN
U = BLUE
W = WHITE
Y = YELLOW

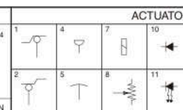
SHOWS POWER - MASTER DISCONNECT SWITCH IN ON POSITION
SHOWS POWER - KEY SWITCH IN ON POSITION

CIRCUIT LEGEND



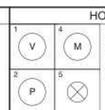
1. SPLICE IDENTIFICATION
2. CIRCUIT CROSSING (NOT CONNECTED)
3. CIRCUIT CONNECTED
4. WIRE IDENTIFICATION
5. MALE CONNECTOR
6. FEMALE CONNECTOR
7. CONNECTOR IDENTIFICATION
8. HARNESS IDENTIFICATION
9. INDICATES PARTIAL CONNECTOR
10. CIRCUIT IDENTIFICATION
11. SCHEMATIC SHEET NUMBER FOR CIRCUIT CONTINUATION
12. CONNECTION POINT ON SCHEMATIC
13. COMPONENT NUMBER (IF ASSIGNED)
14. COMPONENT NUMBER
15. INDICATES INTERNALLY GROUNDED COMPONENT

ACTUATOR SYMBOLS



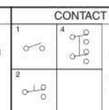
1. LEVER RELEASED
2. LEVER ACTUATED
3. LIQUID LEVEL FLOAT
4. PRESSURE
5. HAND OPERATED
6. TEMPERATURE
7. COIL
8. VARIABLE RESISTOR
9. RESISTOR
10. DIODE
11. LIGHT EMITTING DIODE
12A. MOMENTARY CONTACT
12B. MAINTAINED CONTACT

HOUSINGS



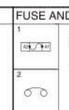
1. VACUUM SWITCH
2. PRESSURE SWITCH
3. TEMPERATURE SWITCH
4. MOTOR
5. LAMP

CONTACT SYMBOLS



1. SINGLE POLE, SINGLE THROW
2. SINGLE POLE, DOUBLE THROW
3. DOUBLE POLE, SINGLE THROW
4. DOUBLE POLE, DOUBLE THROW

FUSE AND CIRCUIT BREAKER



1. FUSE
2. CIRCUIT BREAKER, AUTOMATIC RESET
3. CIRCUIT BREAKER, MANUAL RESET

NOTES

1. 209M and 209F disconnected when backup alarm disable switch is installed (TUV road approved machines only).
2. Resistors part of ground wire assembly.
3. 64M and 64F connected for North American machines, opposite side steady ON. 64M and 64F disconnected for European machines, opposite side OFF.
4. 217F and 217M disconnected when engine shutdown relay special feature is installed.
5. Replace jumper with rollback pressure switch for XT chassis with ride control only.

ELECTRICAL SCHEMATIC
721D Z-BAR, 721D XR, and 721D XT WHEEL LOADERS

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