NEW HOLLAND

SKID STEER LOADER
COMPACT TRACK LOADER

L180
L185
L190
C185
C190

Mechanical and Pilot Control

(Cab Upgrade Machines)

REPAIR MANUAL

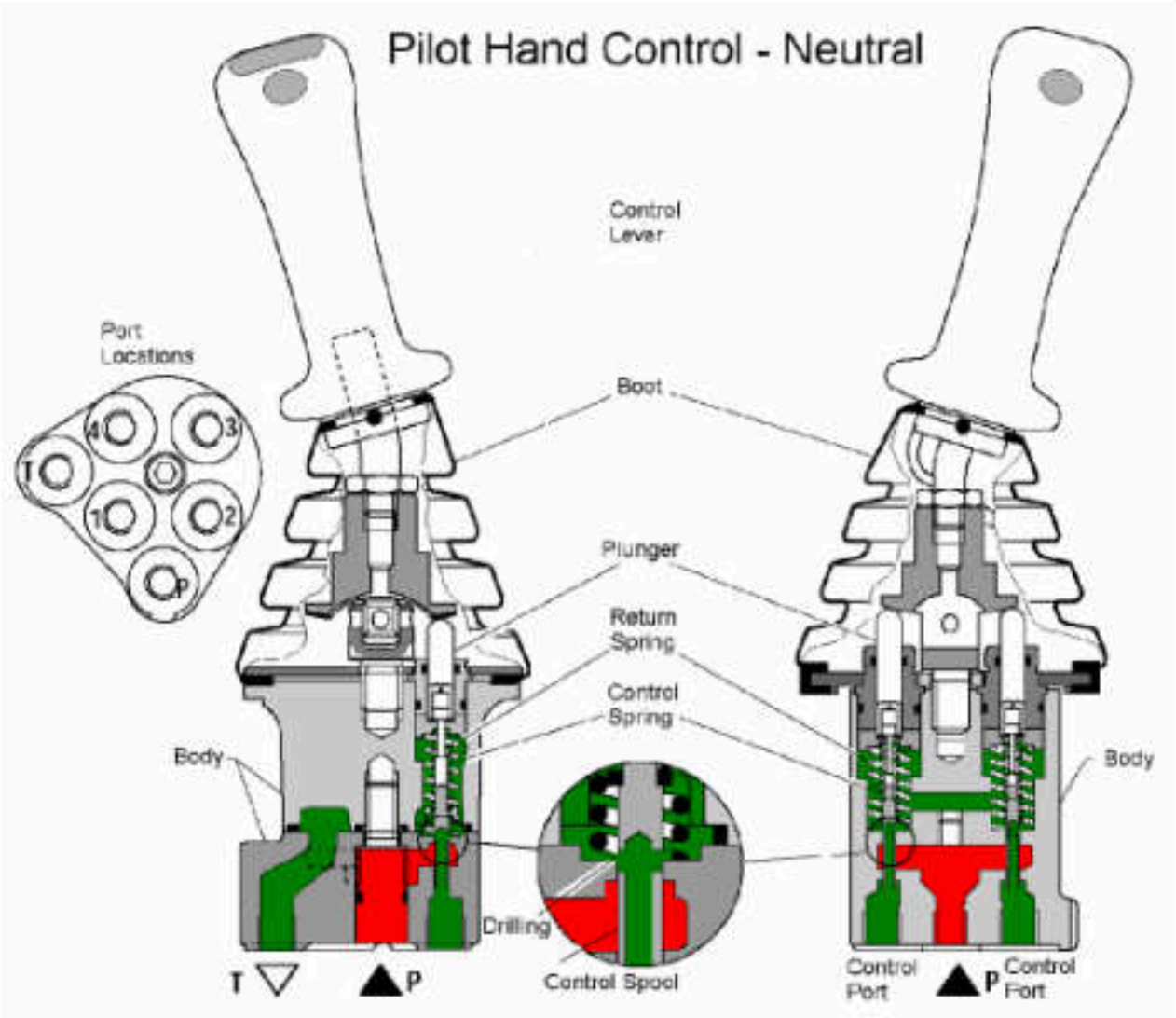
87630288 NA
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Revised 05-2007

NEW HOLLAND

www.newhollandconstruction.com

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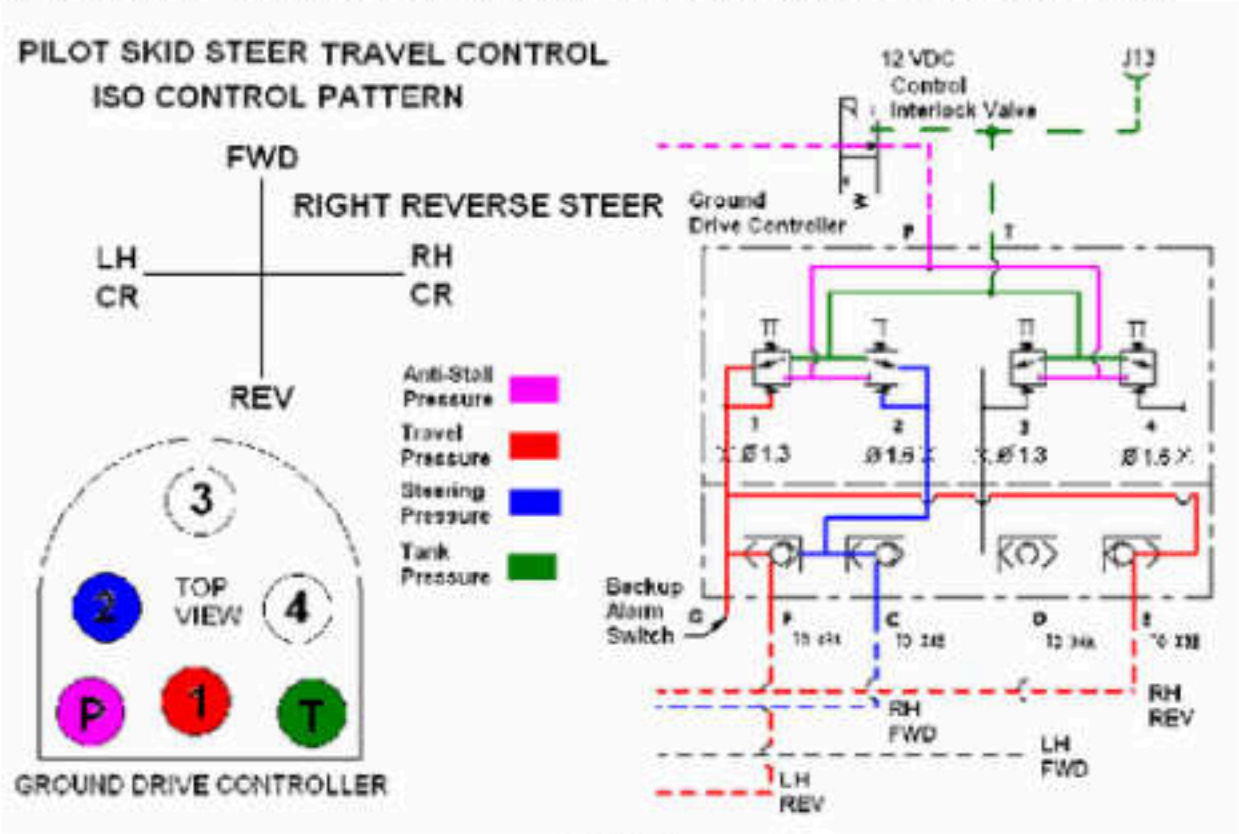
Pilot Hand Control - Activated

The travel control joystick valve assembly has four control spools. Any time that one to more of these spools are not actuated, the travel port pressure for the spool is connected to the tank. The supply pressure is completely blocked off at this time also. The travel control spool in the joystick is not directly connected to the actuating lever/plunger. There is a spring(s) between the plunger and the control spool. As the control handle is actuated, the plunger is moved downward and the top end of the actuating spring moves downward. This then causes the control spool to move downward slightly. With this slight movement, the control spool tank port is blocked off and the supply pressure is then allowed to pass through holes in the side of the spool and out the bottom end. This pressure is then ultimately ported to one end of the servo travel control piston in the hydrostatic pump. Each of the hand control valve spools provides a variable pressure to its respective end of each servo piston in proportion to the movement applied to the control lever. A small amount of control lever movement causes a low control pressure to be applied to the servo piston which will cause the unit to travel slowly.

Additional movement to the control lever will cause an increase in control pressure and an increase in machine travel speed. As the control lever moves, the plunger moves the top of the control spring more. This movement will then try to move the spool downward further. As the spool tries to move downward further, additional supply pressure is ported through the bottom end of the control spool to the servo control spool piston of the hydrostatic pump. As this pressure builds up, more hydraulic force is applied to the bottom end of the control spool. This hydraulic force balances the additional spring force and tries to shut the spool off again. No matter what position the control lever is in, the control spool will continuously balance between sending out pressure and connecting to the tank. This makes the servo control pressure, and then the travel control speed react in direct relation to the control lever position.

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The backup alarm will also actuate any time that the unit is traveling in the reverse direction.
Activating the control lever to the left activates controller number 2 which pressurizes both the C and F Shuttle Check Valves.
Because shuttle check valve F is already pressurized when controller number 1 is actuated, oil pressure from controller number 2 will not pass through it.
Pressurized oil from controller number 2 then is allowed to pass through Shuttle Check Valve C which is then connected to RH Forward servo piston through controller port C and pump port X4B.
This pressurized oil ported to the RH Forward servo piston counteracts the pressure ported to the RH Reverse servo piston.
With a difference in pressure at both ends of the RH pump servo piston, the RH travel speed slows down causing the unit to steer to the right.
The amount that the unit steers to the right is proportional to the distance that the lever is moved to the left.

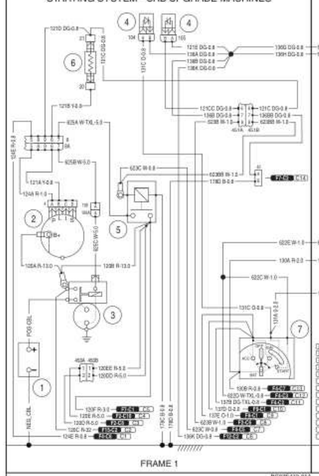


Left Hand Reverse Steer

The hydrostatic pump displacement is infinitely variable between zero and 100%. A given swashplate position can be affected by drive system pressure, control pressure to the pilot hand control valve from the anti-stall cartridge, pilot hand control lever position, pump drive speed, as well as the servo stroking piston centering springs. Flow direction is determined by which pump servo cylinder control port is pressurized. Steering is caused by porting an opposing pressure to the servo piston causing the servo piston to return towards neutral. The slower the travel side causes the machine to steer in that direction.
There are four shuttle check valves installed in the lower section of the travel system. These shuttle check valves interconnect a number of the control spool output ports.
•One of the shuttle check valves interconnects the output from control spool number 1 to both the E and F output ports. The backup alarm switch is also actuated when this controller is activated.
•Another shuttle check valve interconnects the output from control spool number 2 to both the C and F output ports.
•Another shuttle check valve interconnects the output from control spool number 3 to both the C and D output ports.
•Another shuttle check valve interconnects the output from control spool number 4 to both the D and E output ports.
Steering to the LH Reverse direction is caused by moving the lever toward the reverse direction and also the left hand direction.
Actuating the travel control lever toward the straight reverse direction causes controller number 1 to be pressurized in proportion to the distance that the lever is moved. Activating controller number 1 causes the machine to travel in

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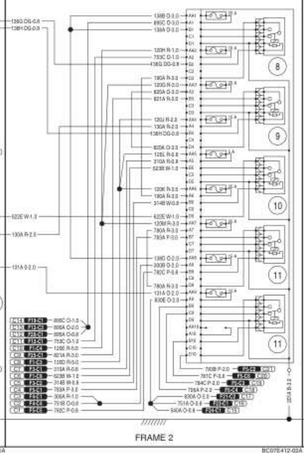
STARTING SYSTEM - CAB UPGRADE MACHINES



FRAME 1

BC07E412-01A

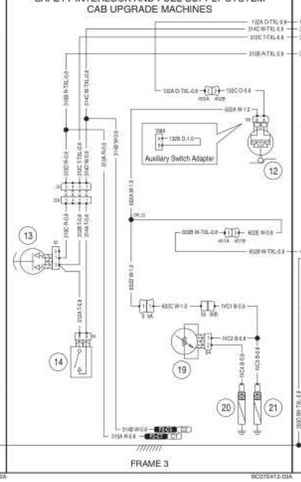
POWER DISTRIBUTION
CAB UPGRADE MACHINES



FRAME 2

BC07E412-02A

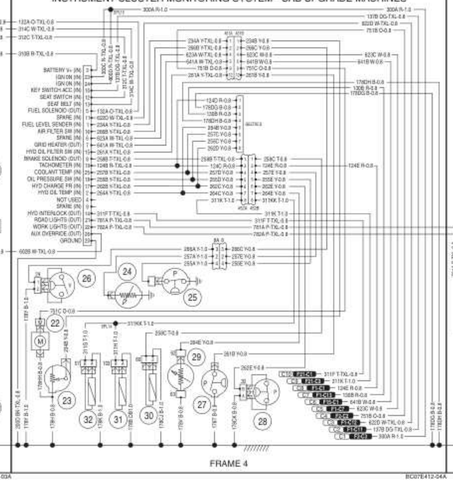
SAFETY INTERLOCK AND FUEL SUPPLY SYSTEM
CAB UPGRADE MACHINES



FRAME 3

BC07E412-03A

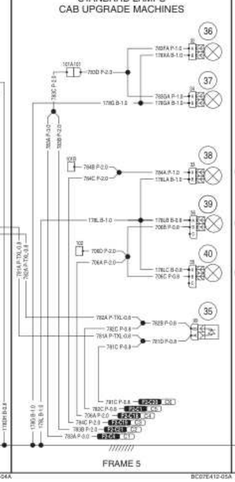
INSTRUMENT CLUSTER MONITORING SYSTEM - CAB UPGRADE MACHINES



FRAME 4

BC07E412-04A

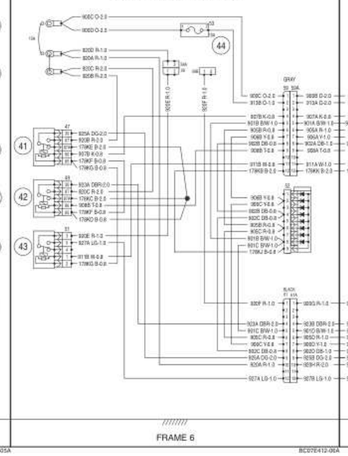
STANDARD LAMPS
CAB UPGRADE MACHINES



FRAME 5

BC07E412-05A

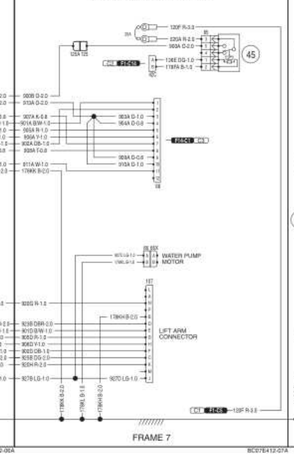
LOADER ARM
AUXILIARY ELECTRIC CONTROL BOX (OPTIONAL)
CAB UPGRADE MACHINES



FRAME 6

BC07E412-06A

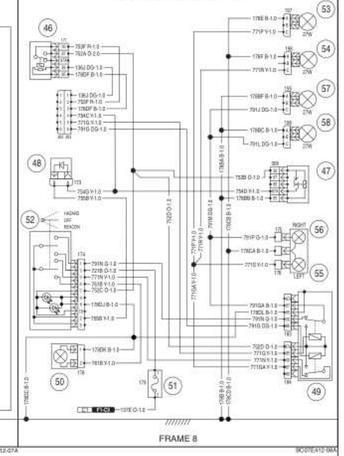
LOADER ARM
AUXILIARY ELECTRIC POWER CONTROLS (OPTIONAL)
CAB UPGRADE MACHINES



FRAME 7

BC07E412-07A

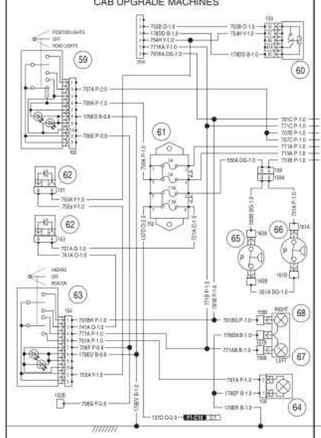
FLASHER AND TURN SIGNALS
NORTH AMERICAN ELECTRICAL
CAB UPGRADE MACHINES



FRAME 8

BC07E412-08A

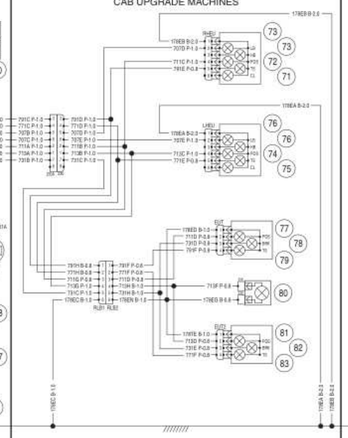
MAIN ELECTRICAL
EUROPEAN ON-ROAD REGULATIONS
CAB UPGRADE MACHINES



FRAME 9

BC07E412-09A

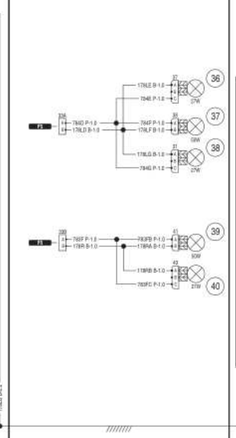
BOOM/REAR ELECTRICAL
EUROPEAN ON-ROAD REGULATIONS
CAB UPGRADE MACHINES



FRAME 10

BC07E412-10A

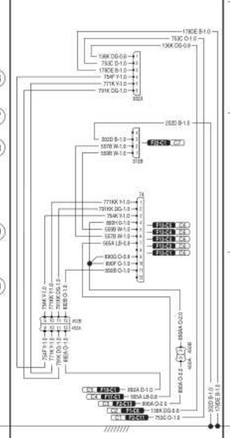
WORK LAMPS
CAB UPGRADE MACHINES



FRAME 11

BC07E412-11A

CONTROL LEVER INTERFACE
CAB UPGRADE MACHINES

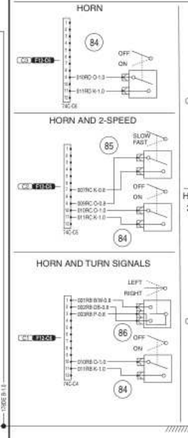


FRAME 12

BC07E412-12A

LEFT-HAND CONTROL LEVER (OPTIONS)
CAB UPGRADE MACHINES

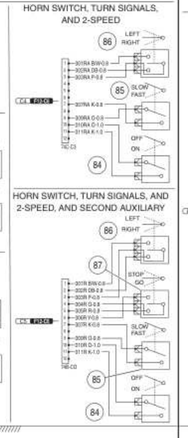
HORN



HORN AND 2-SPEED

HORN AND TURN SIGNALS

HORN SWITCH, TURN SIGNALS, AND 2-SPEED



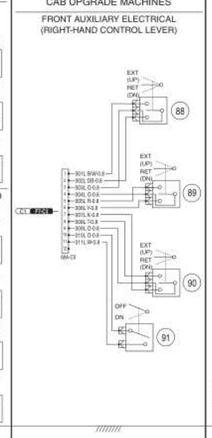
HORN SWITCH, TURN SIGNALS, AND 2-SPEED, AND SECOND AUXILIARY

FRAME 13

BC07E412-13A

RIGHT-HAND CONTROL LEVER (OPTIONAL)
CAB UPGRADE MACHINES

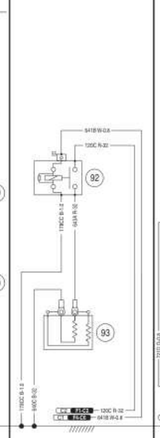
FRONT AUXILIARY ELECTRICAL (RIGHT-HAND CONTROL LEVER)



FRAME 14

BC07E412-14A

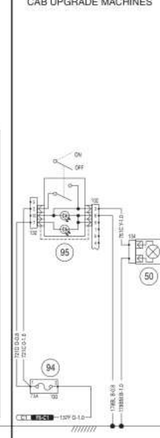
GRID HEATER SYSTEM
CAB UPGRADE MACHINES



FRAME 15

BC07E412-15A

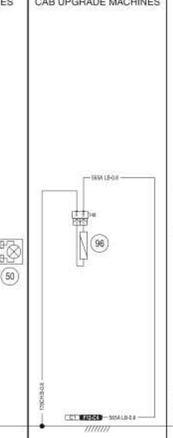
ROTATING BEACON
(OPTIONAL)
CAB UPGRADE MACHINES



FRAME 16

BC07E412-16A

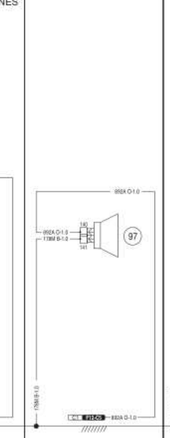
2 SPEED
(OPTIONAL)
CAB UPGRADE MACHINES



FRAME 17

BC07E412-17A

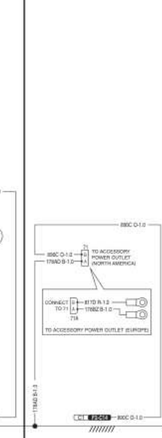
HORN
CAB UPGRADE MACHINES



FRAME 18

BC07E412-18A

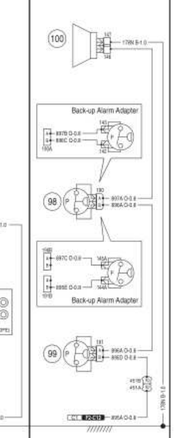
ACCESSORY OUTLET
CAB UPGRADE MACHINES



FRAME 19

BC07E412-19A

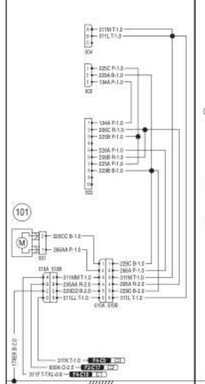
BACK-UP ALARM
CAB UPGRADE MACHINES



FRAME 20

BC07E412-20A

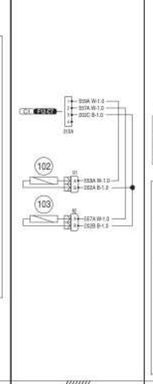
WIPER/WASHER
AND DOOR SWITCH
(OPTIONAL)
CAB UPGRADE MACHINES



FRAME 21

BC07E412-21A

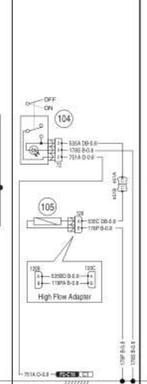
AUXILIARY HYDRAULICS
(OPTIONAL)
CAB UPGRADE MACHINES



FRAME 22

BC07E412-22A

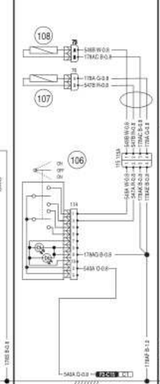
HIGH FLOW
(OPTIONAL)
CAB UPGRADE MACHINES



FRAME 23

BC07E412-23A

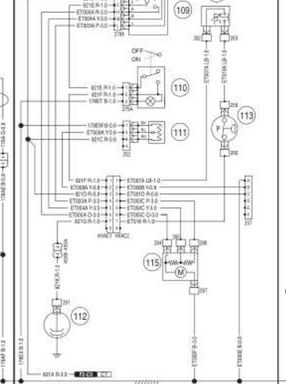
HYDRAULIC
MOUNT PLATE
(OPTIONAL)
CAB UPGRADE MACHINES



FRAME 24

BC07E412-24A

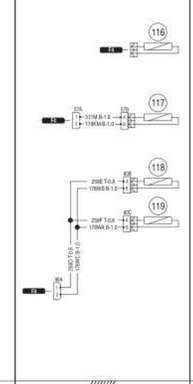
HEATING AND AIR CONDITIONING
(OPTIONAL)
CAB UPGRADE MACHINES



FRAME 25

BC07E412-25A

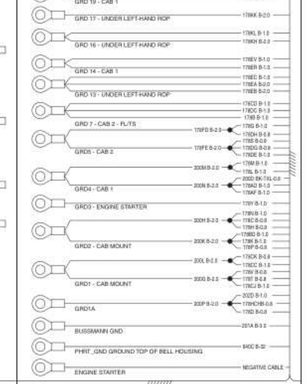
PILOT HYDRAULIC CONTROLS
(OPTIONAL)
CAB UPGRADE MACHINES



FRAME 26

BC07E412-26A

GROUND CONNECTIONS - CAB UPGRADE MACHINES



FRAME 27

BC07E412-27A

COMPONENTS - MECHANICAL AND PILOT CONTROL MACHINES

FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS
FRAME 1 COMPONENTS 1- 1. Battery 1- 2. Alternator 1- 3. Starter and Solenoid 1- 4. Reverse Polarity Diode 1- 5. Starter Relay 1- 6. Resistor 1- 7. Ignition Switch FRAME 2 COMPONENTS 2- 8. Electrical Accessory (Run) Relay 2- 9. HVAC Relay 2- 10. Starter Relay 2- 11. Lamp Relay #1 2- 11. Lamp Relay #2 FRAME 3 COMPONENTS 3- 12. Auxiliary Override Switch 3- 13. Seat Switch 3- 14. Seat Belt Switch 3- 15. Not Used 3- 16. Not Used 3- 17. Not Used 3- 18. Not Used 3- 19. Cold Start Advance Temperature Sender 3- 20. Cold Start Advance Solenoid 3- 21. Fuel Hold-In Solenoid FRAME 4 COMPONENTS 4- 22. Fuel Pump (ISM Engine Only) 4- 23. Fuel Sender 4- 24. Engine Coolant Temperature Sender 4- 25. Engine Oil Pressure Switch 4- 26. Air Filer Restriction Switch 4- 27. Hydraulic Filter Pressure Switch 4- 28. Charge Pressure Switch 4- 29. Hydraulic Oil Temperature Sender 4- 30. Brake Release / Tandem Pump Neutral Override Switch 4- 31. Loader Valve Solenoid 4- 32. Loader Valve Solenoid	FRAME 5 COMPONENTS 5- 33. Not Used 5- 34. Not Used 5- 35. Diode 5- 36. Left Front Work Lamp 5- 37. Right Front Work Lamp 5- 38. Rear Work Lamp 5- 39. Left Rear Indicator Lamp 5- 40. Right Rear Indicator Lamp FRAME 6 COMPONENTS 6- 41. Motor Control Left Relay 6- 42. Motor Control Right Relay 6- 43. Wiper Motor Relay 6- 44. Fuse (10 amp) FRAME 7 COMPONENTS 7- 45. Attachment Relay FRAME 8 COMPONENTS 8- 46. Hazard / Turn Relay 8- 47. Flasher Module 8- 48. Diode (6 amp) 8- 49. Turn Signal Converter Module 8- 50. Beacon 8- 51. Fuse 8- 52. Hazard/Beacon Switch 8- 53. Left Front Flashing Lamp 8- 54. Left Rear Flashing Lamp 8- 55. Turn Indicator Lamp (Left) 8- 56. Turn Indicator Lamp (Right) 8- 57. Right Front Flashing Lamp 8- 58. Right Rear Flashing Lamp FRAME 9 COMPONENTS 9- 59. Road Lamp Switch (Europe) 9- 60. Flasher Module (Europe) 9- 61. Cab Fuse Block (Europe) 9- 62. Diode (6 amp) 9- 63. Hazard/Beacon Switch (Europe) 9- 64. Beacon (Europe) 9- 65. Left Brake Lamp Switch (Europe) 9- 66. Right Brake Lamp Switch (Europe) 9- 67. Turn Indicator Lamp (Left) (Europe) 9- 68. Turn Indicator Lamp (Right) (Europe 9- 69. Not Used 9- 70. Not Used	FRAME 10 COMPONENTS 10- 71. Right Front Turn Lamp (Europe) 10- 72. Right Front Position Lamp (Europe) 10- 73. Right Front Road Lamp (Europe 10- 74. Left Front Position Lamp (Europe) 10- 75. Left Front Turn Lamp (Europe) 10- 76. Left Front Road Lamp (Europe) 10- 77. Right Rear Position Lamp (Europe) 10- 78. Right Rear Brake Lamp (Europe) 10- 79. Right Rear Turn Lamp (Europe) 10- 80. License Plate Lamp 10- 81. Left Rear Position Lamp (Europe) 10- 82. Left Rear Brake Lamp (Europe) 10- 83. Left Rear Turn Lamp (Europe) FRAME 11 COMPONENTS 11- 36. Optional Right Rear Work Lamp 11- 37. Standard Rear Work Lamp 11- 38. Optional Left Rear Work Lamp 11- 39. Standard Front Work Lamp 11- 40. Optional Front Work Lamp FRAME 12 COMPONENTS No Components FRAME 13 COMPONENTS 13- 84. Horn Switch 13- 85. 2-Speed Switch 13- 86. Turn Signal Switch 13- 87. Auxiliary Hydraulic Switch FRAME 14 COMPONENTS 14- 88. Front Electric Control Switch #1 14- 89. Front Electric Control Switch #2 14- 90. Front Electric Control Switch #3 14- 91. Front Electric Control Switch #4 FRAME 15 COMPONENTS 15- 92. Grid Heater Relay 15- 93. Grid Heater FRAME 16 COMPONENTS 16- 50. Beacon 16- 94. Fuse (7.5 amp) 16- 95. Beacon Switch	FRAME 17 COMPONENTS 17- 96. 2 Speed Solenoid FRAME 18 Components 18- 97. Horn (Optional) FRAME 19 COMPONENTS No Components FRAME 20 COMPONENTS 20- 100. Back-Up Alarm 20- 98. Back-Up Alarm Switch 20- 99. Back-Up Alarm Switch FRAME 21 COMPONENTS 21- 101. Washer Pump FRAME 22 COMPONENTS 22- 102. Second Auxiliary Hydraulics - Solenoid #1 22- 103. Second Auxiliary Hydraulics - Solenoid #2 FRAME 23 COMPONENTS 23- 104. High Flow Switch (Optional) 23- 105. High Flow Solenoid (Optional) FRAME 24 COMPONENTS 24- 106. Hydraulic Coupler Switch (Optional) 24- 107. Hydraulic Coupler Release Solenoid (Optional) 24- 108. Hydraulic Coupler Engage Solenoid (Optional)	FRAME 25 COMPONENTS 25- 109. Blower Switch (Optional) 25- 110. Air Conditioner Switch (Optional) 25- 111. Heater Control Switch (Optional) 25- 112. Compressor Clutch 25- 113. Pressure Switch 25- 114. Thermostat 25- 115. Blower Motor FRAME 26 COMPONENTS 26- 116. Loader Control Pressure Solenoid 26- 117. Magnetic Detent Solenoid 26- 118. Ground Drive Control Pressure Solenoid 26- 119. Brake Valve Solenoid

ACTUATORS: LEVER, HAND, FOOT, COIL, TEMP., DIODE, PRESSURE, FLOAT LIQUID LEVEL

HOUSINGS: VACUUM SWITCH, PRESSURE SWITCH, LAMP, MOTOR, TEMPERATURE SWITCH

CONTACT CONFIGURATIONS: S.P.S.T., S.P.D.T., D.P.S.T., D.P.D.T.

MISCELLANEOUS SYMBOLS: MOMENTARY CONTACTS, MAINTAINED CONTACTS, VARIABLE RESISTOR, RESISTOR, FUSE, CIRCUIT BREAKER, MALE TERMINAL, FEMALE TERMINAL, COMPONENT NUMBER

SHOWS CIRCUIT SPLICE CONNECTION (SPL-00); SHOWS CIRCUIT CROSSING NOT CONNECTED

INDICATES EXTERNAL GROUND; INDICATES INTERNALLY GROUNDED COMPONENT

FEMALE CONNECTOR; MALE CONNECTOR; CONNECTOR NUMBER; CONNECTOR IDENTIFICATION; INDICATES PARTIAL CONNECTOR; NOT ALL CONNECTIONS ARE SHOWN

CIRCUIT CONTINUATION

Frame Number and Circuit Number where Circuit continues.

CIRCUIT TAGS (CKT. 23) FRAME 25 CIRCUIT

FRAME - CIRCUIT CIRCUIT

Circuit Number assigned to Circuit in Frame.

WIRE IDENTIFICATION

B . . . BLACK	O . . . ORANGE
DB. . DARK BLUE	P . . . PURPLE
G . . . GREEN	R . . . RED
K . . . PINK	T . . . TAN
LG. . LIGHT GREEN	W . . . WHITE
LB. . LIGHT BLUE	Y . . . YELLOW
DG . DARK GREEN	

702A G-1.0 — WIRE NUMBER, WIRE COLOR, WIRE SIZE

BC07ES19-09A

NOTES

ELECTRICAL SCHEMATIC FOR CAB UPGRADE MACHINES
(MECHANICAL and PILOT CONTROL MACHINES)
L180 / L185 / L190 SKID STEER and C185 / C190 TRACK LOADER

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