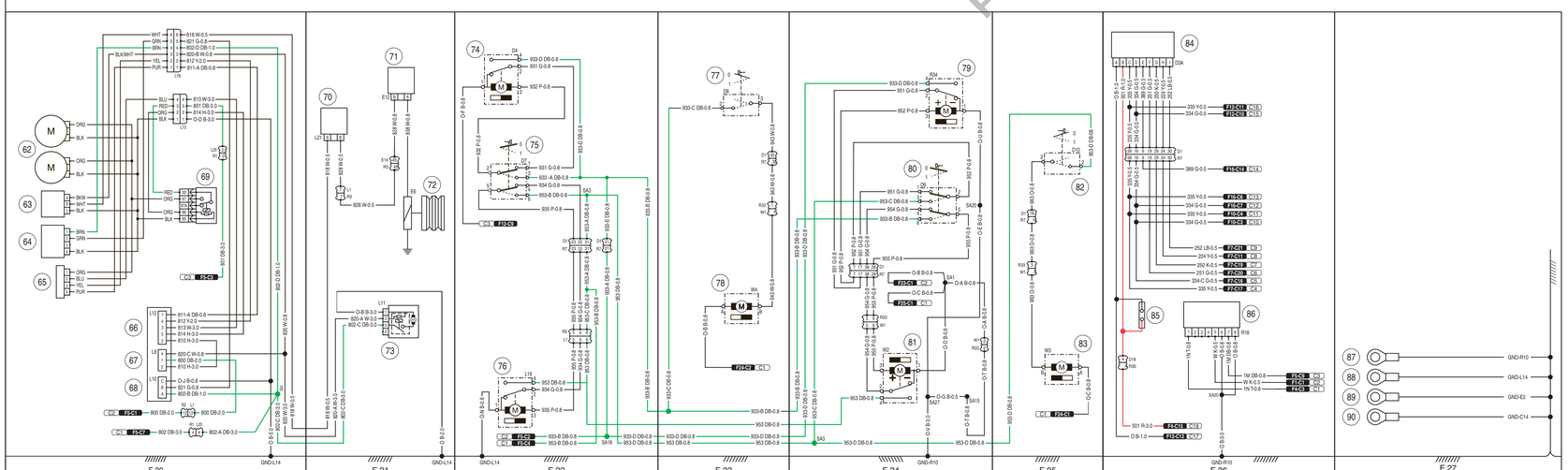




PREVIEW - YOUFIXTHIS.COM

COMPONENTS

FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS
F-1 CHARGING CIRCUIT 1 - 1. Battery 1 - 2. Master Disconnect Switch 1 - 3. Alternator	**F-9 PUMPS AND MOTORS** 9 - 25. Left-Hand Motor Speed Sensor 9 - 26. Right-Hand Motor Speed Sensor 9 - 27. Left-Hand Hydrostatic Pump 9 - 28. Right-Hand Hydrostatic Pump 9 - 29. Left-Hand Motor Solenoid 9 - 30. Right-Hand Motor Solenoid	**F-16 ENGINE CONTROL UNIT** 16- 53. Engine Controller 16- 54. Water-in-Fuel Sensor	**F-25 DOOR WIPER SWITCH AND WASHER** 25- 82. Washer Switch (Left/Right) 25- 83. Washer Pump (Left/Right)
F-2 CRANKING CIRCUIT AND COLD START 2 - 4. Ignition Switch 2 - 5. Starter Solenoid 2 - 6. Starter 2 - 7. Grid Heater Relay 2 - 7A. Grid Heater Fuse 2 - 7B. Grid Heater	**F-10 FORWARD-NEUTRAL-REVERSE (F-N-R) JOYSTICK AND REVERSE RATIO SWITCH** 10- 31. Reverse Ratio Switch 10- 32. Forward-Neutral-Reverse (F-N-R) Joystick	**F-17 RADIO** 17- 55. Radio 17- 56. Right Speaker 17- 57. Left Speaker	**F-26 DIAGNOSTIC AND FLEET** 26- 84. Connector - Diagnostic 26- 85. 12 Volt Power Socket 26- 86. Connector - Fleet Tracker
F-3 POWER RELAYS 3 - 8. Power Relay - Module A 3 - 9. Power Relay - Module B	**F-11 BRAKES** 11- 33. Brake Pressure Switch 11- 34. Brake Solenoid	**F-18 DOME LAMPS** 18- 58. Interior Lamp Switch 18- 59. Interior Lamp	**F-27 GROUND CONNECTIONS (SEE NOTE 1)** 27- 87. R10 - Located in Firewall (Ground contacts in Frames 3, 4, 6, 10, 12, 19, 24, and 26.) 27- 88. L14 - Located top of Cab (Ground contacts in Frames 14, 17, 18, 20, 21, and 22.) (Cab Units) 27- 89. E2 - Located at right-hand rear Engine Mount (Ground contacts in Frames 9, 13, 15, and 16.) 27- 90. C14 - Located top of Cab (Ground contacts in Frames 14 and 17.) (Canopy Units)
F-4 FUSE AND RELAY BLOCK 4 - 10. Ignition Relay 4 - 11. Vehicle Safety Relay 4 - 12. Starter Relay 4 - 13. Fleet Relay 4 - 14. Start Sensing Relay 4 - 15. Fuses F1 to F10	**F-12 MENU SWITCHES AND INSTRUMENT CLUSTER** 12- 35A. Instrument Cluster A 12- 35B. Instrument Cluster B 12- 36. Warning Buzzer 12- 37. Enter/Escape Switch 12- 38. Up/Down Switch	**F-19 ROPS HEATER AND AIR SUSPENSION SEAT** 19- 60. Heater - ROPS 19- 61. Air Suspension Seat	
F-5 FUSE BLOCK 5 - 16. Fuses F1 to F10 5 - 17. Fuses F11 to F20	**F-13 SENDING UNITS** 13- 39. Air Filter Restriction 13- 40. Hydrostatic Filter Restriction Switch 13- 41. Transmission Temperature 13- 42. Equipment Filter Restriction Switch 13- 43. Fuel Sending Unit 13- 44. Transmission Charge Pressure Switch	**F-20 BLOWER MOTOR** 20- 62. Blower Motors 20- 63. Thermostat 20- 64. Water Valve 20- 65. Resistor 20- 66. Fan Speed Switch 20- 67. Mode Switch 20- 68. Temperature Switch 20- 69. Fan High Speed Relay	LEGEND INDICATES CONSTANT POWER INDICATES POWER WHEN KEY SWITCH IS ON
F-6 BRAKE, DECELERATOR, AND THROTTLE POTENTIOMETER 6 - 18. Right-Hand Brake Proximity Switch 6 - 19. Left-Hand Brake Proximity Switch 6 - 20. Brake Position Sensor 6 - 21. Decelerator Position Sensor 6 - 22. Low Idle Switch 6 - 23. Throttle Position Sensor	**F-14 FRONT AND REAR LAMPS** 14- 45. Front Lamp Switch 14- 46. Rear Lamp Switch 14- 47. Front Lamps 14- 48. Front Lamps (Optional) 14- 49. Rear Lamps	**F-21 AIR CONDITIONING** 21- 70. Air Conditioner Low Pressure Switch 21- 71. Air Conditioner High Pressure Switch 21- 72. Air Conditioner Clutch 21- 73. Air Conditioner Condenser	
F-7 DRIVE TRAIN CONTROLLER 7 - 24A. Drive Train Controller - Connector R4	**F-15 HORN AND BACKUP ALARMS** 15- 50. Backup Alarm 15- 51. Horn Switch 15- 52. Horn	**F-22 WINDSHIELD WIPER SWITCH AND MOTORS** 23- 74. Front Wiper Motor 23- 75. Wiper Switch (Front/Rear) 23- 76. Rear Wiper Motor	
F-8 DRIVE TRAIN CONTROLLER 8 - 24B. Drive Train Controller - Connector R5		**F-23 WINDSHIELD WIPER SWITCH AND WASHER** 23- 77. Washer Switch (Front/Rear) 23- 78. Washer Pump (Front/Rear)	
		F-24 DOOR WIPER SWITCH AND MOTORS 24- 79. Wiper Motor (Left) 24- 80. Wiper Switch (Left/Right) 24- 81. Wiper Motor (Right)	

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., MOMENTARY, MAINTAINED CONTACTS

MISCELLANEOUS SYMBOLS: VARIABLE RESISTOR, RESISTOR, FUSE, CIRCUIT BREAKER, MALE TERMINAL, FEMALE TERMINAL, 54 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

WIRE IDENTIFICATION

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

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

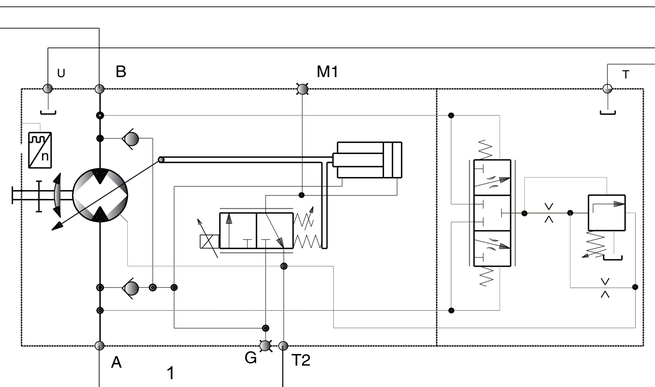
NOTES

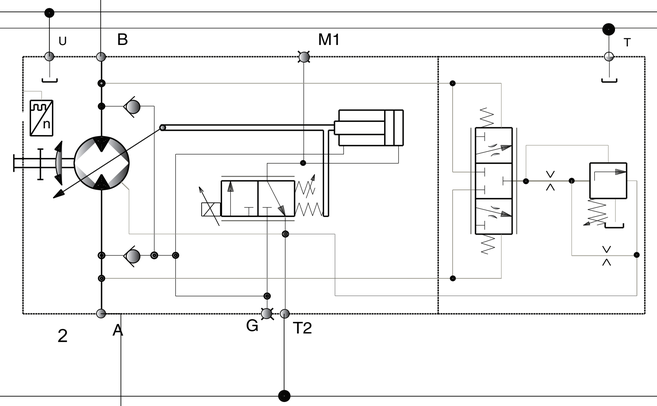
NOTE 1 See in the REPAIR MANUAL for locations and Troubleshooting information.
NOTE 2 Ground C14 is for CANOPY UNITS
Ground L14 is for LAB UNITS

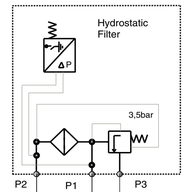
ELECTRICAL SCHEMATIC
650L CRAWLER

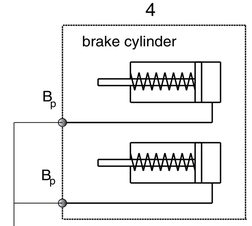
Additional copies of this Hydraulic and Electrical Schematic can be ordered through Technical Publications Distribution System.
The part number is 84271238

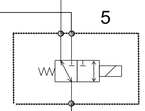
Download full manual at youfixthis.com

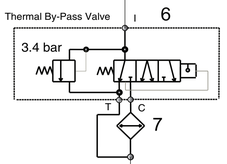


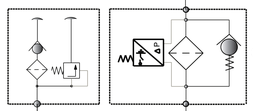


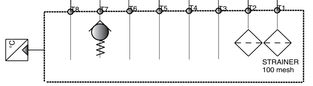


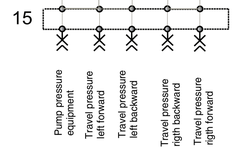


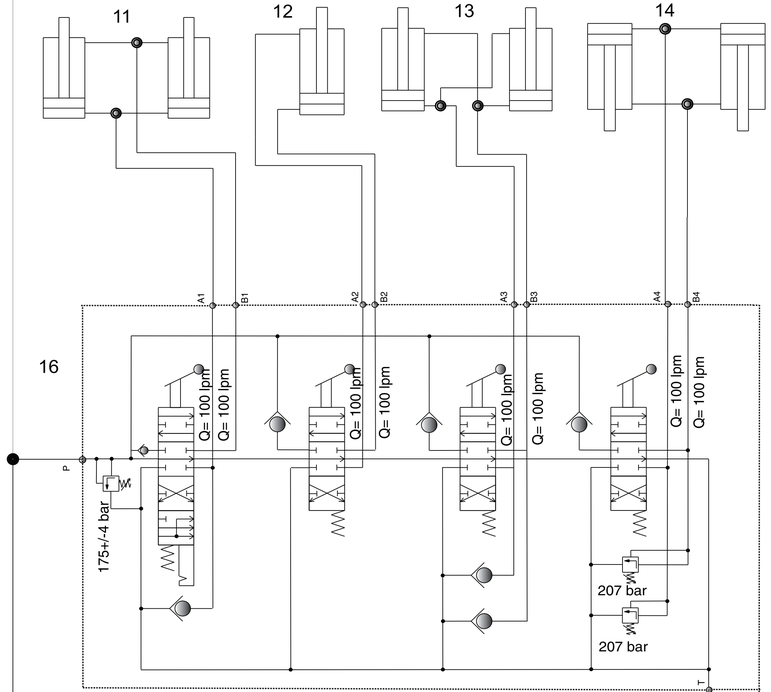


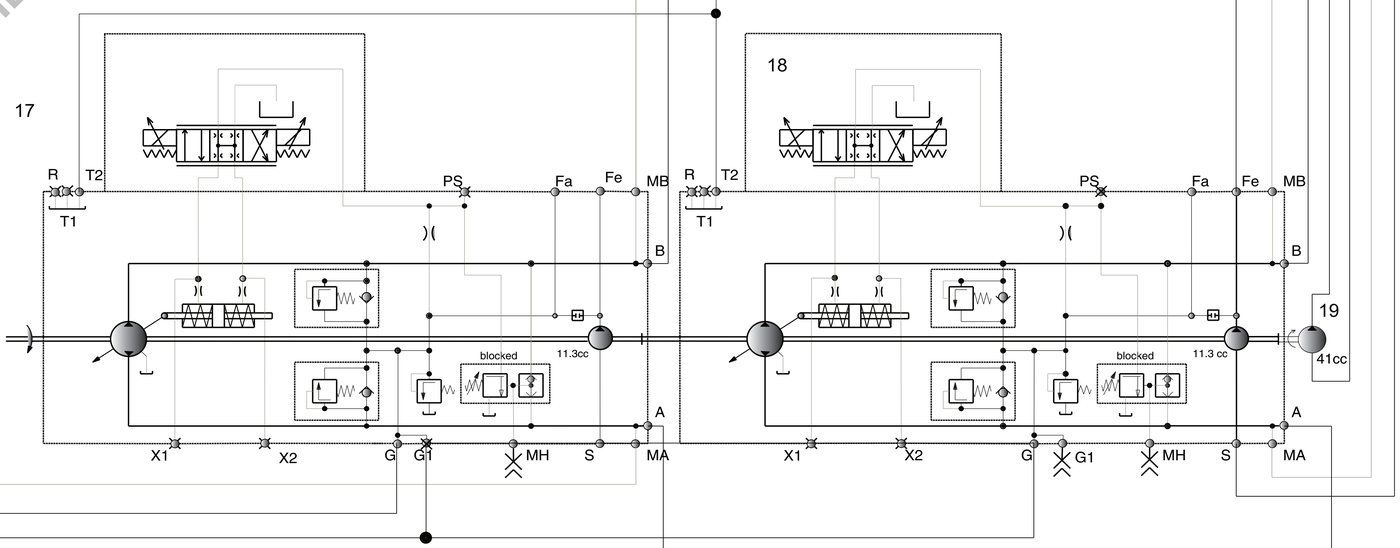












PREVIEW - YOUFIXTHIS.COM

COMPONENT	BORE DIA. (mm)	STROKE (mm)	ROD DIA. (mm)
LIFT CYLINDERS	88.9	394.5	44.4
TILT CYLINDERS	88.9	137.0	44.4
ANGLE CYLINDERS	88.9	342.0	44.4
RIPPER CYLINDERS	82.6	206.0	44.4

COMPONENTS

1: RIGHT HYDROSTATIC MOTOR
2: LEFT HYDROSTATIC MOTOR
3: HYDROSTATIC FILTER
4: BRAKE CYLINDERS
5: BRAKE SOLENOID VALVE ASSEMBLY
6: THERMAL BYPASS VALVE
7: OIL COOLER
8: HYDRAULIC FILTER
9: BREATHER
10: RESERVOIR
11: LIFT CYLINDER
12: TILT CYLINDER
13: ANGLE CYLINDERS
14: RIPPER CYLINDERS
15: DIAGNOSTIC PARTS
16: 4 - SPOOL VALVE
17: RIGHT HYDROSTATIC PUMP
18: LEFT HYDROSTATIC PUMP
19: EQUIPMENT PUMP

HYDRAULIC SCHEMATIC
650L CRAWLER

Additional copies of this Hydraulic and Electrical Schematic can be ordered through Technical Publications Distribution System.
The part number is 84271238

Download full manual at youfixthis.com

Final drive - Torque

Rolling Torque	**0 - 5.4 Nm** (**0.0 - 47.8 lb in**)
Input Shaft Bearing Retainer Plate Mounting Bolts	**77 - 100 Nm** (**57 - 74 lb ft**)
Sandwich Housing Bolts	**195 - 250 Nm** (**145 - 185 lb ft**)
Brake Housing Cover - 24 mm Hex Head	**195 - 250 Nm** (**145 - 185 lb ft**)
Gauge Flange To Wheel Hub Bearing Plate	**77 - 100 Nm** (**57 - 74 lb ft**)
Planetary Gear Retaining Bolts	**118 - 133 Nm** (**87 - 98 lb ft**)
Planetary Assembly to Hub Retainer Plate Fitting	**118 - 133 Nm** (**87 - 98 lb ft**)
Hub Assembly to Gear Box	**195 - 250 Nm** (**145 - 185 lb ft**)
Brake Line Fitting	**55 - 60 Nm** (**40 - 44 lb ft**)
Fill Check Plug	**43 - 47 Nm** (**32 - 35 lb ft**)
Drain Plug	**90 - 99 Nm** (**66 - 73 lb ft**)
Final Drive To Center Box Mounting Bolts	**195 - 250 Nm** (**145 - 185 lb ft**)
Rear Cover Plate - 30 mm Hex Head	**430 - 485 Nm** (**315 - 355 lb ft**)
18 mm Hex Head	**77 - 100 Nm** (**57 - 74 lb ft**)
16 mm Hex Head	**50 - 65 Nm** (**37 - 48 lb ft**)
Final Drive to Frame Mounting Bolts	**1160 - 1300 Nm** (**856 - 959 lb ft**)
Cab Frame Support Bracket Mounting Bolts	**1160 - 1300 Nm** (**856 - 959 lb ft**)
Cab Frame Support Bracket Mounting Bolts to Cab Frame	**280 - 320 Nm** (**207 - 236 lb ft**)

Final drive - Special tools

Kit	380000849*
Dowel Bolts	380000848*
Driver Handle	380000847*
Bearing Cup Drivers - Input Shaft Bearing	380000845*
Counter Shaft Bearing	380000846*
Lower Gear Bearing	380001452
Wheel Hub Inner Bearing	380000828
Wheel Hub Outer Bearing	380000827

IMPORTANT: *If you do not already have the special tools marked with an (*) contact the manufacturer for details.*

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Capacities

650L

Component	Capacity	Type of lubricant
Fuel tank refill	**154.4 l** (**40.8 US gal**)	Diesel fuel
Cooling system	**21.4 l** (**22.6 US qt**)	50/50 mixture antifreeze and water
Transmission and hydraulic system refill	**72.7 l** (**19.2 US gal**)	MAT3508
Engine with filter	**12.3 l** (**13 US qt**)	MAT3520
Engine without filter	**11.5 l** (**12.2 US qt**)	MAT3520
Final drive each side	**14.2 l** (**15 US qt**)	MAT3505
Track roller each	**0.18 l** (**0.19 US qt**)	MAT3511 80W-90
Front Idler each	**0.4 l** (**0.42 US qt**)	MAT3511 80W-90
Carrier roller each	**0.24 l** (**0.25 US qt**)	MAT3511 80W-90
CLT and CELT track each pin	**21.9 ml** (**0.74 US fl oz**)	MAT3511 80W-90
Track adjuster	Use as required	#2 Moly disulfide grease
Drive shaft	Use as required	#2 Moly disulfide grease
Dozer pivot joints	Use as required	#2 Moly disulfide grease

PREVIEW - YOUFIXTHIS.COM

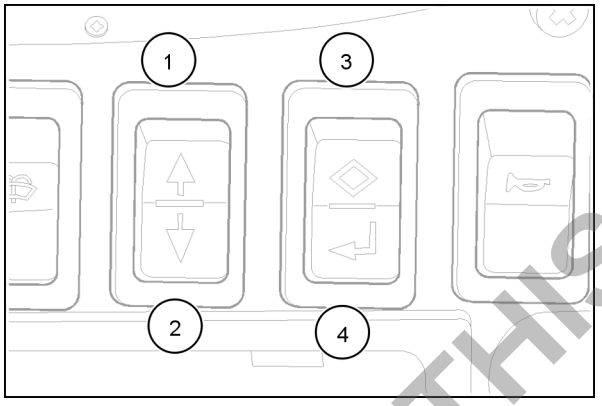
Download full manual at youfixthis.com

0000-Retrieving fault codes, Crawlers

Context:
General fault code identification

Solution:

1. Press and hold the escape key and up arrow key for more than 2 seconds to access the fault codes.



BD06G112-01 1

(1)	Up key	**(3)**	Escape key
(2)	Down key	**(4)**	Enter key

2. Yellow Faults, buzzer will beep once every 2 seconds:

(A)	Operator can acknowledge it by pressing the enter key.
(B)	The message will disappear.
(C)	Buzzer will not beep anymore.
(D)	Yellow lamp will stay ON.
(E)	Fault will remain in Yellow list until it is closed.

3. Red Faults, buzzer will be continuous, alternating sounds:

(A)	Operator can acknowledge it by pressing the enter key.
(B)	Buzzer will change to a less stressing sound, but will remain.
(C)	Message will remain on display with indication of URGENT STOP.

4. Fault Code Grouping

(1)	1000 to 1999 vehicle errors.
(2)	2000 to 2999 not used.
(3)	3000 to 3999 engine errors.
(4)	4000 to 4999 transmission errors.
(5)	5000 to 5999 electro-hydraulic system errors.
(6)	6000 to 6999 reserved.
(7)	7000 to 7999 reserved.
(8)	8000 to 8999 optional equipment IE: GPS.
(9)	9000 to 9999 internal AIC errors.

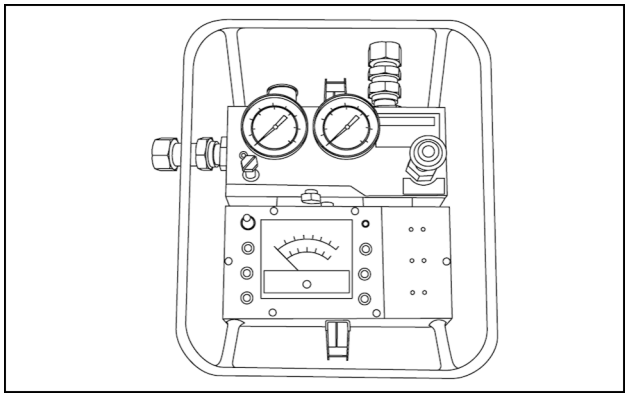
5. Clearing the AIC faults.

   (1) Press and hold the enter button for 3 seconds.

   (2) Using the up and down arrow scroll until "RESET" is highlighted.

   (3) Press the enter button.

Download full manual at youfixthis.com
PREVIEW - YOUFIXTHIS.COM



RCPH09CWL339AAD 4

CAS10280 Flowmeter

PRIMARY HYDRAULIC POWER SYSTEM - General specification

Type of oil	**CASE AKCELA AW68 HYD FLUID** MAT 3508

Temperature of hydraulic oil when testing	**52 - 79 °C (125 - 175 °F)**
Neutral system pressure	**12 - 15 bar (180 - 220 psi)** at **2000 RPM**
Main relief valve pressure All models at **2000 RPM**	**203 - 214 bar (2950 - 3100 psi)**
Circuit relief valves A and B ports ripper/auxiliary section	**214 - 227 bar (3100 - 3300 psi)** with hand pump
Dozer blade lift speed	**457 mm** second **(18 in** second)
Dozer blade lift time (measure from ground level to full height)	2 seconds

PREVIEW - YOUFIXTHIS.COM

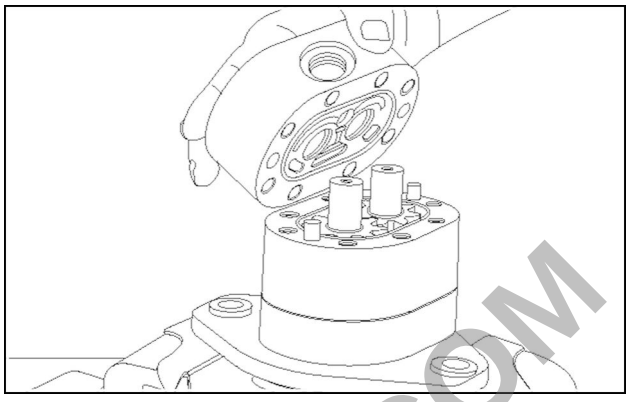
Download full manual at youfixthis.com

INTRODUCTION

PREVIEW - YOUFIXTHIS.COM

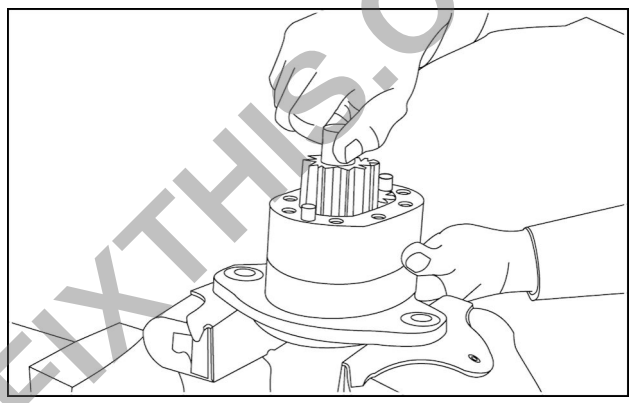
Download full manual at youfixthis.com

5. Remove the port end cover with wear plate.



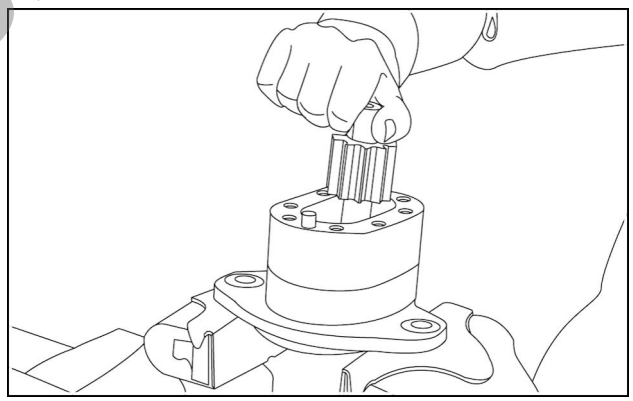
RCPH09CWL459AAD 4

6. Remove the drive gear from the gear housing.



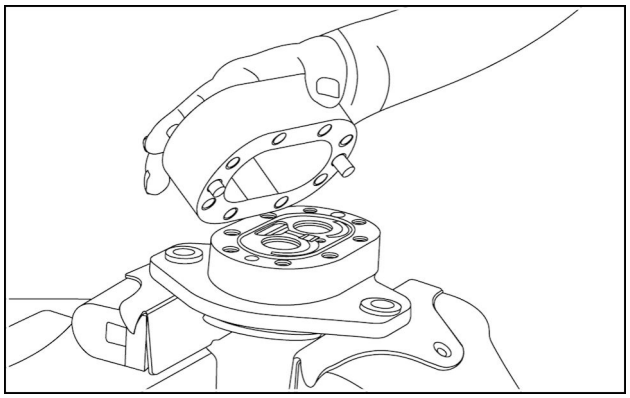
RCPH09CWL183AAD 5

7. Remove the driven gear from the gear housing.



RCPH09CWL182AAD 6

8. Remove the gear housing from the drive end cover.



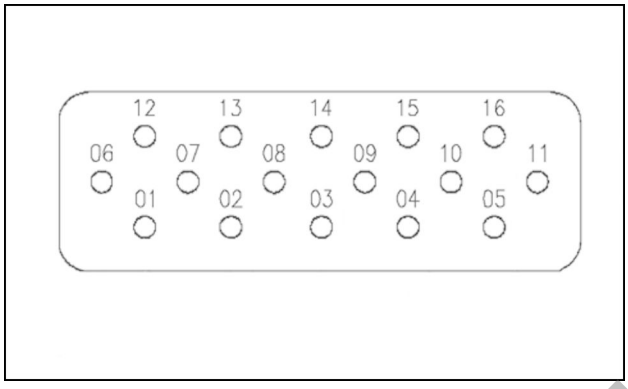
RCPH09CWL141AAD 7

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Connector - Component diagram 08 Engine controller to engine components.

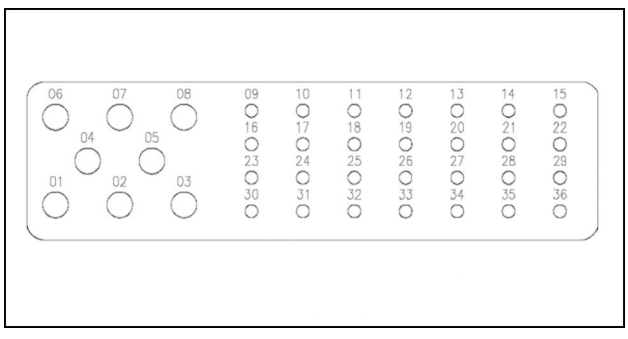
Connector A



BS07J141-01 1

For Six Cylinder Models			
Cavity	**Circuit**	**Cavity**	**Circuit**
(1)	Cylinder 5 injector	**(9)**	High pressure regulator with fuel metering
(2)	Cylinder 6 injector	**(10)**	High pressure regulator with fuel metering
(3)	Cylinder 4 injector	**(11)**	Cylinder 2 injector
(4)	Cylinder 1 injector	**(12)**	Cylinder 3 injector
(5)	Cylinder 3 injector	**(13)**	Cylinder 1 injector
(6)	Cylinder 2 injector	**(14)**	Cylinder 4 injector
(7)	Not used	**(15)**	Cylinder 6 injector
(8)	Not used	**(16)**	Cylinder 5 injector
For Four Cylinder models			
Cavity	**Circuit**	**Cavity**	**Circuit**
(1)	Cylinder 3 injector	**(9)**	High pressure regulator with fuel metering
(2)	Cylinder 2 injector	**(10)**	High pressure regulator with fuel metering
(3)	Not used	**(11)**	Not used
(4)	Cylinder 1 injector	**(12)**	Cylinder 4 injector
(5)	Cylinder 4 injector	**(13)**	Cylinder 1 injector
(6)	Not used	**(14)**	Not used
(7)	Not used	**(15)**	Cylinder 2 injector
(8)	Not used	**(16)**	Cylinder 3 injector

Connector C

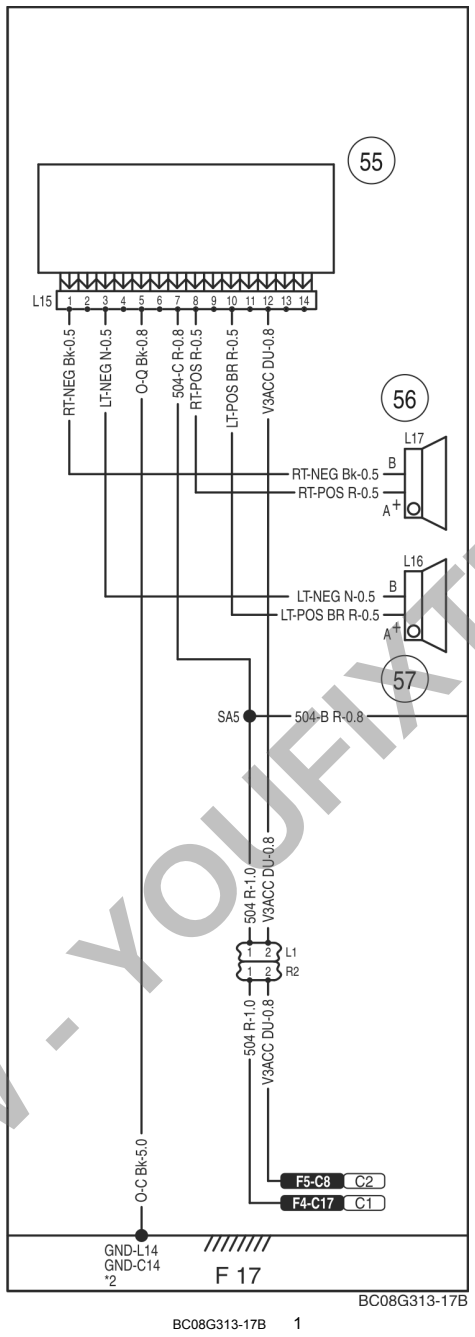


BS07J142-01 2

Cavity	Circuit	Cavity	Circuit
(1)	Not used	**(19)**	Crankshaft speed sensor- Ground

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

Wiring harness - Electrical schematic frame 17 Radio



BC08G313-17B 1

(55) Radio
(56) Right Speaker
(57) Left Speaker

PREVIEW - YOUFIXTHIS.COM

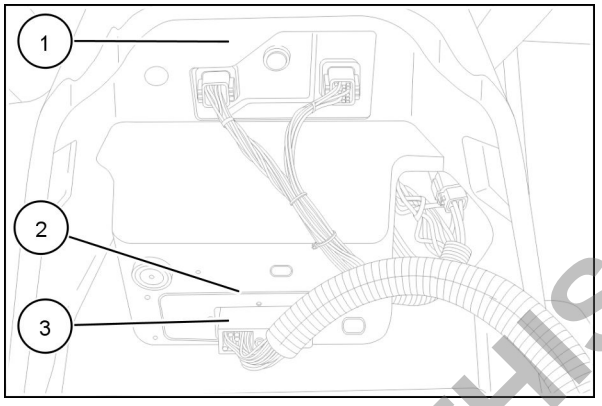
Download full manual at youfixthis.com

(3) Turn the ignition switch to the ON position, check for voltage at pin 1 of **Instrument Cluster Connector A** and pins 18 and 21 of **Instrument Cluster Connector B**, a reading of battery voltage should be obtained.

A. NOT OK – Check fuse F8 in fuse and relay panel. Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **4**.

4. Checking circuit.



BD08H455-01 2

(1)	Back side of dash
(2)	Dash to Main Harness Connector (on inside)
(3)	Main Harness to Dash Connector

(1). Disconnect the **Dash to Main Harness Connector** from the **Main Harness to Dash Harness Connector**, inspect pin 15 on connectors.

(2). Check circuit from pin 15 of the **Dash to Main Harness Connector** to pin 1 of **Instrument Cluster Connector A** and pins 18 and 21 of **Instrument Cluster Connector B**. If circuit is open check splice SA-8.

(3). Check circuit from pin 15 of the **Main Harness to Dash Harness Connector** to pin A8 of the **Non Bussed Fuse and Relay Panel Connector**. If circuit is open check splice SA-14.

A. NOT OK - Repair break in circuit. Return to Step **1** to confirm elimination of fault.

B. OK - Go to Step **5**.

5. Test alternator, refer to **Alternator - Testing (A.30.A)**.

A. NOT OK – Replace alternator. Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **6**.

6. Replace the Instrument cluster.

Prior to replacing the instrument cluster contact Technical Services Group for assistance.

(1) Remove and replace instrument cluster.

(2) Write symptom on failed instrument cluster.

A. Return to Step **1** to confirm elimination of fault. If fault is recorded again contact Technical Services Group for assistance.

Wiring harness - Electrical schematic frame 01 (A.30.A.88 - C.20.E.01)
Wiring harness - Electrical schematic frame 02 (A.30.A.88 - C.20.E.02)
Wiring harness - Electrical schematic frame 04 (A.30.A.88 - C.20.E.04)
Wiring harness - Electrical schematic frame 12 (A.30.A.88 - C.20.E.12)

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

(4) Clean female pins by installing and removing.

A. NOT OK – Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **3**.

3. Check for open circuit in the Parking Brake Solenoid.

(1) Measure the resistance of the coil at the Parking Brake Solenoid. The resistance should be **41.8 Ω 20 °C** (**68 °F**).

A. NOT OK – Replace Solenoid and return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **4**.

4. Check for open circuit between the Parking Brake Solenoid Circuit and ground.

(1) Check for continuity between pin 2 of **Connector E26** and ground.

A. NOT OK - Determine break in ground and repair. Return to Step**1** to confirm elimination of fault.

B. OK – Go to Step **5**.

5. Check for open circuit between connector E26 and connector R4.

(1) Check for open circuit between pin 1 of **Connector E26** to pins 15 and 29 of **Connector R4**.

A. NOT OK - Go to Step **6**.

B. OK – Go to Step **8**.

6. Check for open circuit between connector E26 and connector E14.

(1) Check for open circuit between pin 1 of **Connector E26** to pin 8 of **Connector E14**.

A. NOT OK - Determine break between connectors and repair. Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **7**.

7. Check for open circuit between connector R3 and connector R4.

(1) Check for open circuit between pin 8 of **Connector R3** to pin 15 and 29 of **Connector R4**.

A. NOT OK - Determine break between connectors and repair. Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **8**.

8. Contact Technical Services Group for additional assistance prior to replacing the control module.

(1) Remove and replace Drivetrain Control Module, refer to **Electrical control - Replace (C.20.F)**.

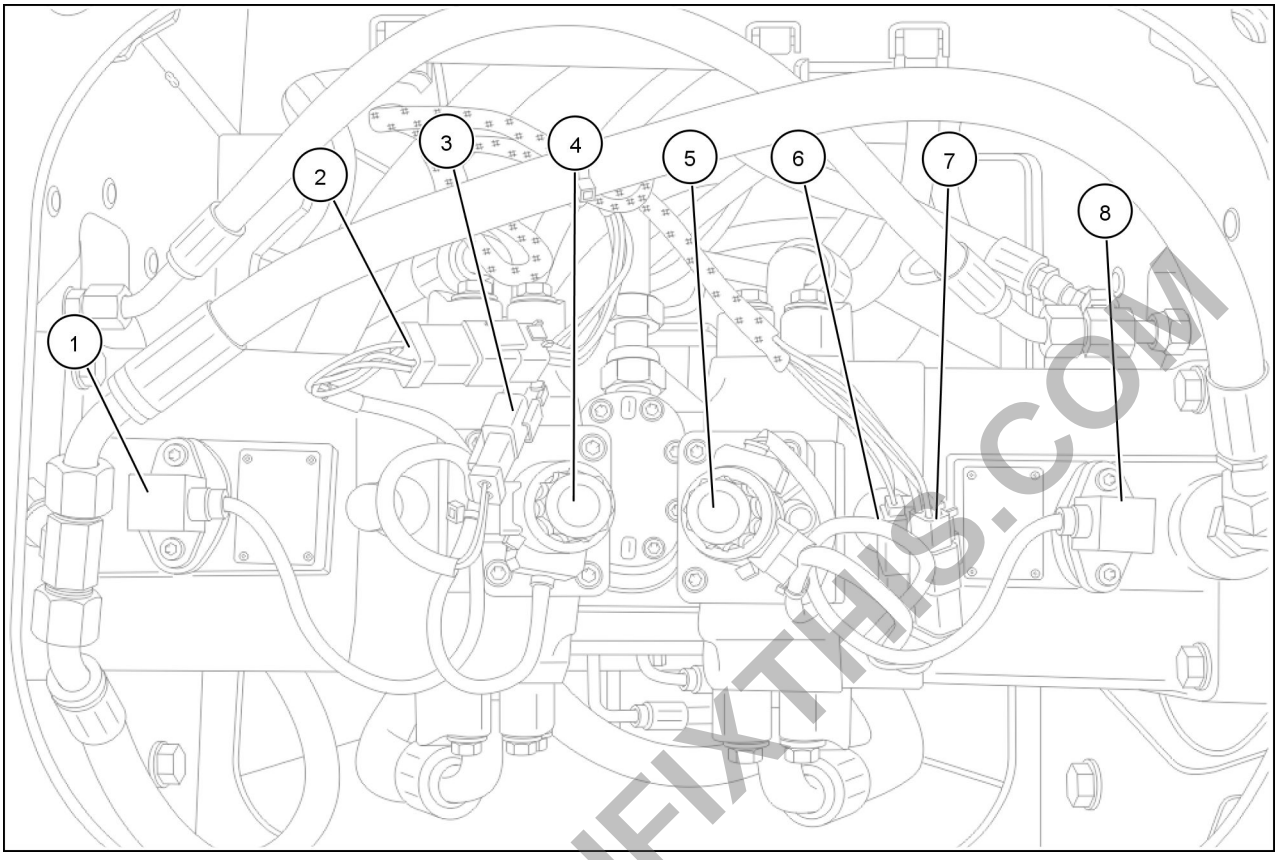
(2) Write symptom on failed Drivetrain Control Module.

(3) Install program with Electronic Service Tool (EST) and calibrate the system.

Wiring harness - Electrical schematic frame 07 (A.30.A.88 - C.20.E.07)
Wiring harness - Electrical schematic frame 11 (A.30.A.88 - C.20.E.11)

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com



BD08H452-01 6

(1)	Left motor speed sensor	**(5)**	Right motor solenoid
(2)	Left motor speed sensor Connector E17	**(6)**	Right motor solenoid Connector E20
(3)	Left motor solenoid Connector E19	**(7)**	Right motor speed sensor Connector E18
(4)	Left motor solenoid	**(8)**	Right motor speed sensor

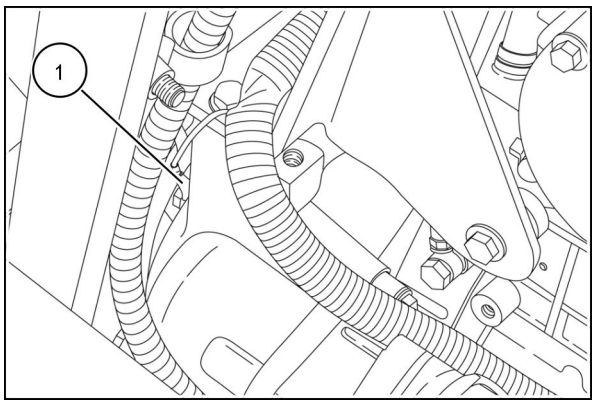
(1) Disconnect **Connector E20** from right motor solenoid, inspect pins.

(2) Take an Ohm reading from pin 1 to pin 2 of right motor solenoid, a reading of **5.00 - 6.50 Ω** should be obtained.

A. NOT OK – Replace solenoid, return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **8**.

8. Check grounding circuit at right motor solenoid.



BD08H454-01 7

(1)	Connector E2 ground (located on right rear of engine block)

(1) Check from pin 2 of **Connector E20** to **Connector E2** ground, a reading of continuity should be obtained.

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

3060-Cylinder 1 - Unclassifiable Error In Injector

Control Module : EDC

IMPORTANT: *When available use special tool 380040185 harness diagnostic/repair kit and 380040188 electro injector test fixture.*

IMPORTANT: *Always turn ignition switch and master disconnect switch to the OFF position before removing or installing connections to the engine controller.*

NOTE: *See engine repair manual for electrical schematic information.*

⚠ WARNING ⚠

Wear safety glasses or a protective face shield when working with high-pressure fuel. Keep eyes and hands away from nozzle spray. Fuel spraying from the nozzle under high pressure can penetrate the skin and cause blood poisoning. Medical attention should be provided immediately in the event of skin penetration. Take extreme care of moving belts and pulleys.

Z031

⚠ WARNING ⚠

Fuel is highly flammable. Do not smoke or allow open flame while disconnecting fuel lines. Always wipe up spilled fuel.

M691

Cause:

1. Engine misfires, runs erratic.
2. Faulty reading from component.
3. Connectors not mated fully, pins not pushed into connector fully, bent pin or broken wire at rear of connector.
4. Wiring or circuits open.
5. Wiring or circuits shorted.
6. Connector pins corroded or dirty. When removing connectors inspect and clean pins. Clean female pins by installing and removing.

Solution:

1. Find out if the fault code is still active, refer to
   0000 - Retrieving fault codes, Crawlers

   Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.

   (1) Turn ignition switch to RUN position to power instrument cluster.

   (2) Clear all fault codes from the cluster.

   (3) To check for fault code: Start and operate machine.

   A. NOT OK – Fault code 3060 is recorded again. Go to Step **2**.

   B. OK – Fault is not recorded again. OK for return to service.
2. Check circuits from engine controller to injector connector.

Download full manual at youfixthis.com

3104-Rail Pressure Relief Valve - Open

Control Module : EDC

IMPORTANT: *When available use special tool 380040185 harness diagnostic/repair kit and 380040188 electro injector test fixture.*

NOTE: *See engine repair manual for electrical schematic information.*

⚠ WARNING ⚠

Do not open the high-pressure fuel system or loosen any fittings with the engine running. Engine operation causes high fuel pressure. High-pressure fuel spray can cause serious injury or death.

M1002

⚠ WARNING ⚠

Wear safety glasses or a protective face shield when working with high-pressure fuel. Keep eyes and hands away from nozzle spray. Fuel spraying from the nozzle under high pressure can penetrate the skin and cause blood poisoning. Medical attention should be provided immediately in the event of skin penetration. Take extreme care of moving belts and pulleys.

Z031

⚠ WARNING ⚠

Fuel is highly flammable. Do not smoke or allow open flame while disconnecting fuel lines. Always wipe up spilled fuel.

M691

Cause:

1. Rail pressure below set range.
2. Faulty reading from component.
3. Connectors not mated fully, pins not pushed into connector fully, bent pin or broken wire at rear of connector.
4. Wiring or circuits open.
5. Wiring or circuits shorted.
6. Connector pins corroded or dirty. When removing connectors inspect and clean pins. Clean female pins by installing and removing.

Solution:

1. Find out if the fault code is still active, refer to
   0000 - Retrieving fault codes, Crawlers

   Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.

   (1) Turn ignition switch to RUN position to power instrument cluster.

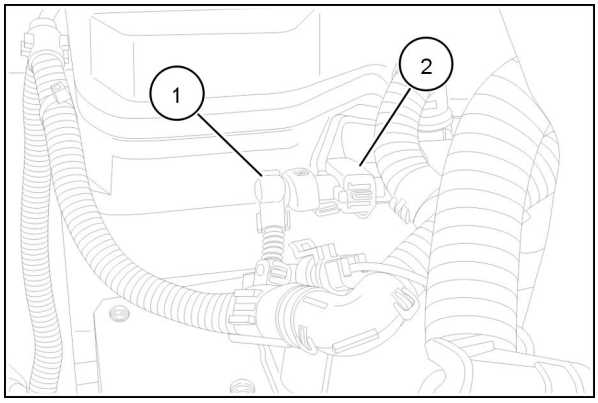
   (2) Clear all fault codes from the cluster.

   (3) To check for fault code: Start and operate machine.

   A. NOT OK – Fault code 3104 is recorded again. Go to Step **2**.

   B. OK – Fault is not recorded again. OK for return to service.
2. Check rail pressure sensor. The sensor is located at the front of the common rail.

Download full manual at youfixthis.com
PREVIEW - YOUFIXTHIS.COM



BD08H434-01 1

(1)	Connector rail pressure sensor
(2)	Rail pressure sensor

(1) Disconnect connector from rail pressure sensor.

(2) Take an Ohm reading between pins 1 and 2 on the sensor, a reading of **45k Ω** should be obtained.

A. NOT OK – Replace sensor. Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **3**.

3. Check voltage at rail pressure sensor.

(1) Disconnect connector from rail pressure sensor.

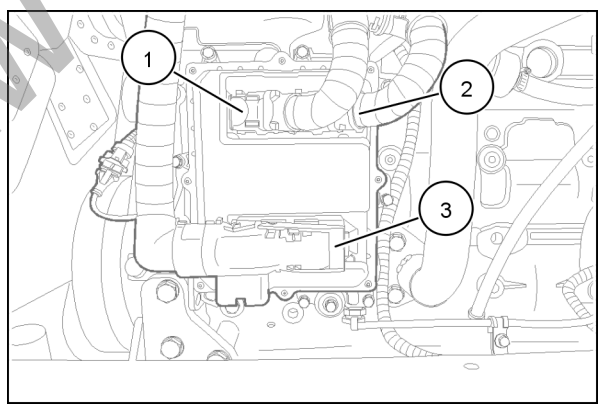
(2) Turn the ignition switch ON to power the system.

(3) Take a voltage reading at pin 3 on connector, a reading of **5 V** should be obtained.

A. OK – Replace sensor. Return to Step **1** to confirm elimination of fault.

B. NOT OK – Go to Step **4**.

4. Check circuit.



BD07F080-01 2

(1)	Connector C
(2)	Connector A
(3)	Engine Control Unit Connector

(1) If no voltage is present, turn ignition switch to the OFF position. Disconnect **Connector C** from engine controller.

(2) Check for open circuit from pin 3 Connector rail pressure sensor to pin 13 of **Connector C**, a reading of continuity should be obtained.

A. NOT OK – Determine the break between connectors and repair. Return to Step **1** to confirm elimination of fault.

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

3230-Injection processor error - stop engine

Control Module : EDC

IMPORTANT: *When available use special tool 380040185 harness diagnostic/repair kit and 380040188 electro injector test fixture.*

NOTE: *See engine repair manual for electrical schematic information.*

Cause:

1. Disturbed SPI communication.
2. Faulty reading from component.
3. Connectors not mated fully, pins not pushed into connector fully, bent pin or broken wire at rear of connector.
4. Wiring or circuits open.
5. Wiring or circuits shorted.

Solution:

1. Find out if the fault code is still active, refer to
   0000 - Retrieving fault codes, Crawlers

   Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.

   (1) Turn ignition switch to RUN position to power instrument cluster.

   (2) Clear all fault codes from the cluster.

   (3) To check for fault code: Start and operate machine.

   A. NOT OK – Fault code 3230 is recorded again. Go to Step **2**.

   B. OK – Fault is not recorded again. OK for return to service.
2. Reset engine control module.

   (1) Reset engine control module by turning ignition switch OFF then back ON.

   A. OK – Return to Step **1** to confirm elimination of fault.

   B. NOT OK – Fault is recorded again. Go to Step **3**.
3. Replace the engine control module.

   Prior to changing the engine control module contact Technical Services Group for further assistance.

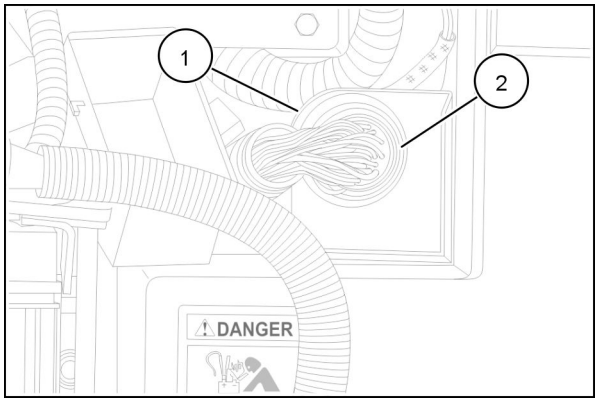
   (1) Remove and replace engine control module.

   (2) Write symptom on failed engine control module.

   A. Return to Step **1** to confirm elimination of fault. If fault is recorded again contact Technical Services Group for assistance.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com



BD08H441-01 3

(1)	Connector E14 (mounted to panel)
(2)	Connector R3

(4) If circuit is open, disconnect **Connector R3** from **Connector E14**. Inspect pins.

(5) Check for open circuit from pins 2 and 3 of **Connector E4** to pin 4 of **Connector E14**, a reading of continuity should be obtained.

(6) Check for open circuit from pins 8 and 9 of **Connector E4** to pin 5 of **Connector E14**, a reading of continuity should be obtained.

(7) Check for open circuit from pin 40 of **Connector E4** to pin 2 of **Connector E14**, a reading of continuity should be obtained.

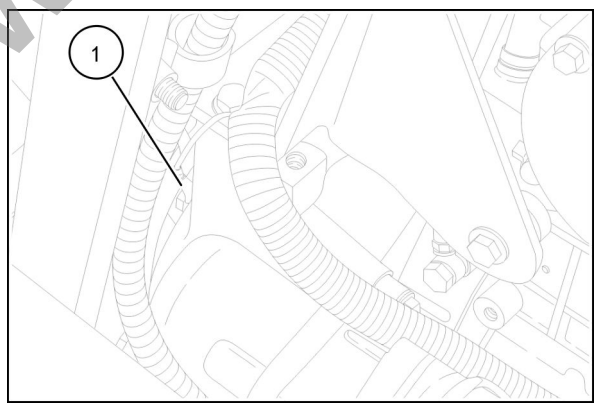
(8) Check for open circuit from pin 4 and 5 of **Connector R3** to pin A6 of **Connector R8**, a reading of continuity should be obtained.

(9) Check for open circuit from pin 2 of **Connector R3** to pin A8 of **Connector R8**, a reading of continuity should be obtained.

A. NOT OK – Determine the break between connectors and repair. Return to Step **1**

B. OK – Go to Step **5**.

5. Check ground circuit.



BD08H454-01 4

(1)	Connector E2 Ground (Located at right rear of engine block)

(1) Disconnect **Connector E4** from engine control module.

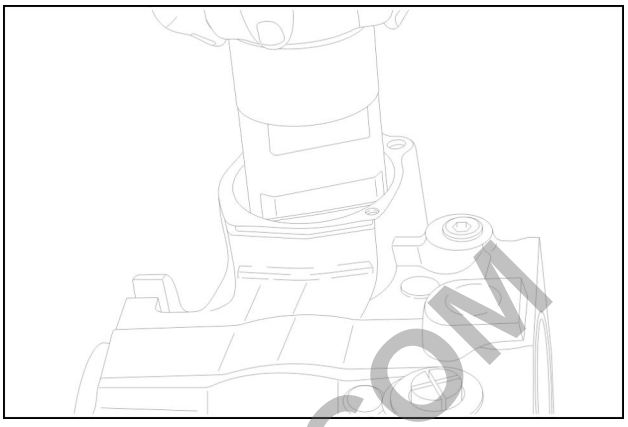
(2) Check circuit from pins 5, 6, 10, and 11 of **Connector E4** to **Connector E2** ground. If circuit is open check splices SA-1 and SA-3.

A. NOT OK— Determine the break between connectors and repair. Return to Step **1** to confirm elimination of fault.

Download full manual at youfixthis.com
PREVIEW - YOUFIXTHIS.COM

52. Remove piston (2) from housing.

ATTENTION: *Note orientation of piston in housing when removing, so cradle plate and rod on solenoid fit in the slots of piston during assembly.*

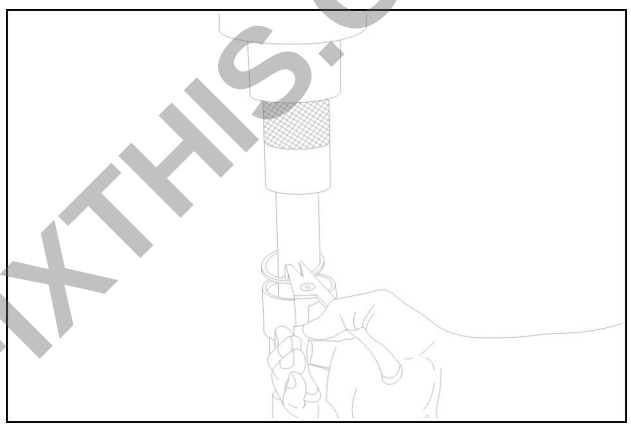


BD08H589-01 52

53. Put piston (2) in press and apply slight pressure to relive pressure on snap ring and remove snap ring.

NOTE: *Parts are under spring pressure.*

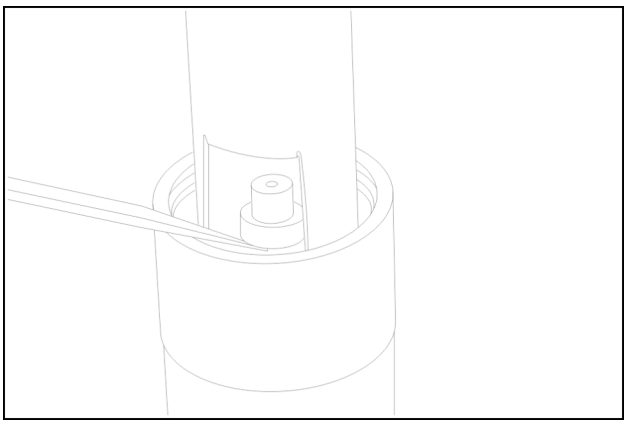
ATTENTION: *Note orientation of the piston rod in the piston during disassembly.*



BD08H590-01 53

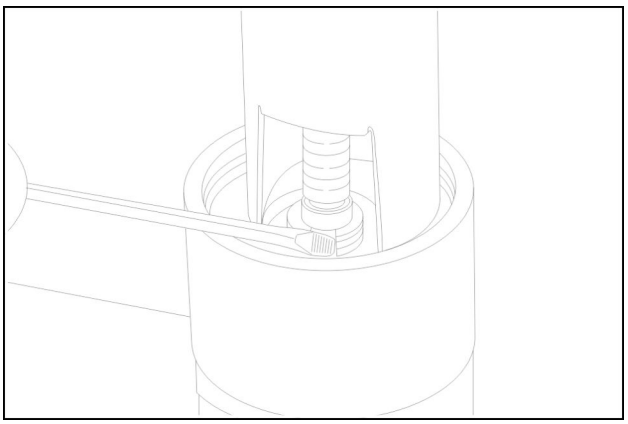
54. Use a slotted pipe or suitable tool in a press, apply slight pressure and remove plastic retainer cap (7) from end of piston.

NOTE: *Parts are under spring pressure.*



BD08H598-01 54

55. Press piston slightly farther to release pressure on split ring retainers (8) and pry them apart and remove.



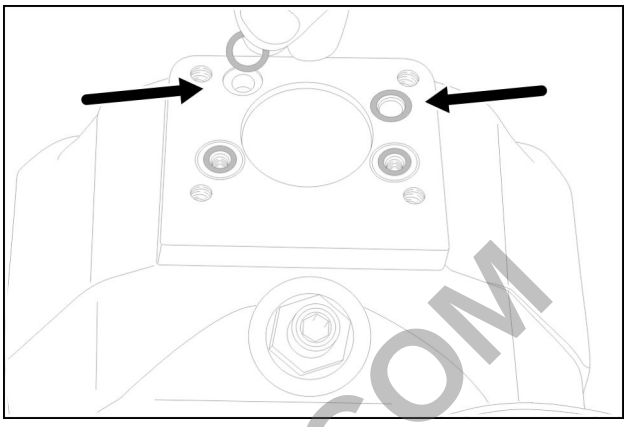
BD08H593-01 55

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

32. Install new O-rings on the solenoid port of the control block.

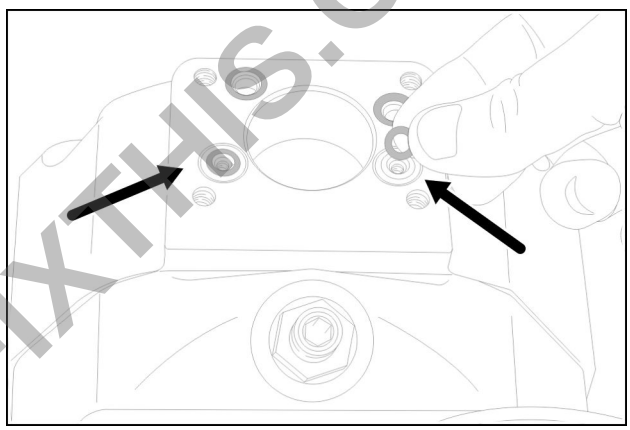
NOTE: *The O-rings are larger on the top.*



BD08H022-01 28

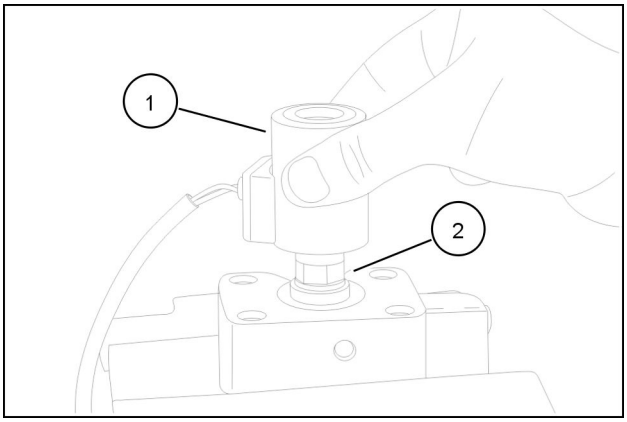
33. Install new O-rings on the solenoid port of the control block.

NOTE: *The O-rings are smaller on the bottom.*



BD08H023-01 29

34. Install a new valve (2) if defective, into solenoid body. Torque to **19 Nm** (**14 lb ft**). Install a new coil (1) if defective.

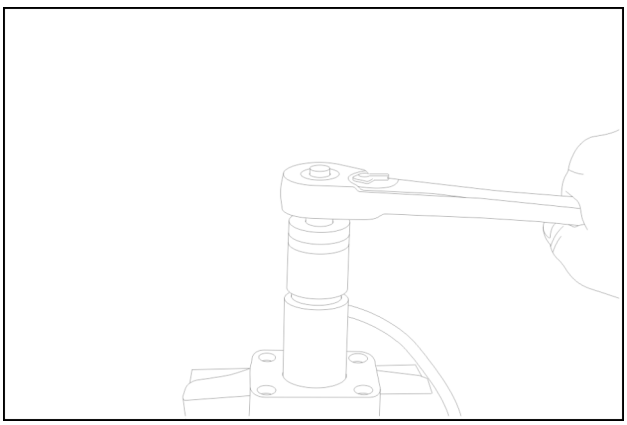


BD08H040-01 30

NOTE: *Do not over torque damage to valve can occur.*

35. Install the cap securing the coil to the solenoid valve. Torque cap to **5 - 6 Nm** (**44.3 - 53.1 lb in**).

NOTE: *Do not over torque the cap, damage to the coil can occur.*

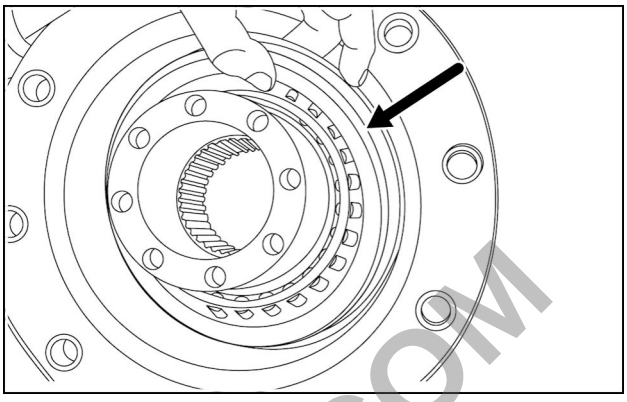


BD08H520-01 31

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

2. Discard all seals and O-rings.

NOTE: *The outer wheel hub seal* ***(43)*** *can be replaced without removing the wheel hub bearing* ***(33)****.*



RCPH09CWL229AAD 2

3. Inspect bearing rollers for pitting, scoring, deformation, or other damage. Check the inner face and bearing cage for deformation, dents, and other damage. Replace part if any of these conditions are seen. Check that bearings rotate easily without binding. If the bearing binds or action is not smooth, replace the bearing.
4. Inspect bearing cups for pitting, scoring, or other damage.
5. Remove and replace cups and rollers if any of these conditions are seen.

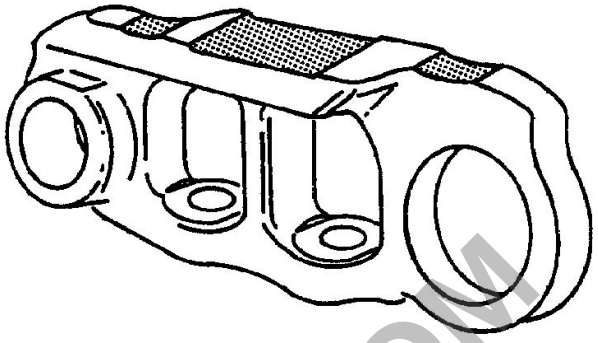
NOTE: *Replace bearings as a set, cup and roller.*

IMPORTANT: *Use only authorized service parts, any aftermarket bearings WILL NOT allow for proper assembly of the final drive.*

PREVIEW - YOUFIXTHIS.COM

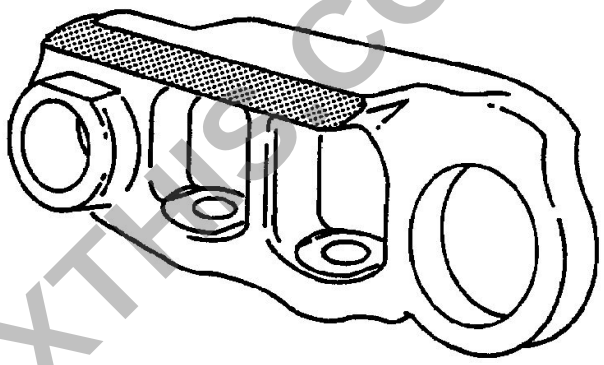
Download full manual at youfixthis.com

8. Shown below is uneven wear on the rail. Wear over the pins will occur faster because of the narrow width of the rail and contact with the rollers. This wear can also be caused by working on an uneven surface (rocks) which can cause the track rail to hit the roller(s). The wear in the center of the rail is caused by contact with the idler and carrier and track rollers.



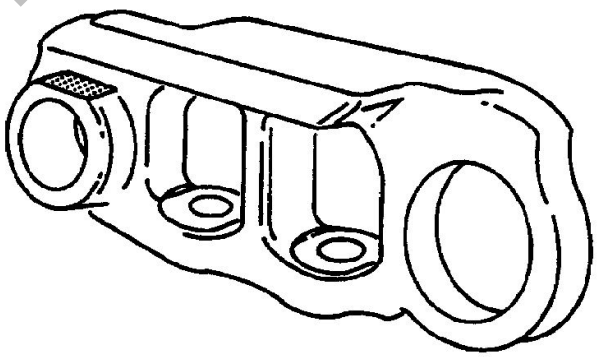
B900597 8

9. Shown below is wear on the side of the rail. This wear occurs because of contact with the flanges on the rollers and the idler. This wear will occur faster during side hill operation, turning, and with increased track pitch which makes the track flexible.



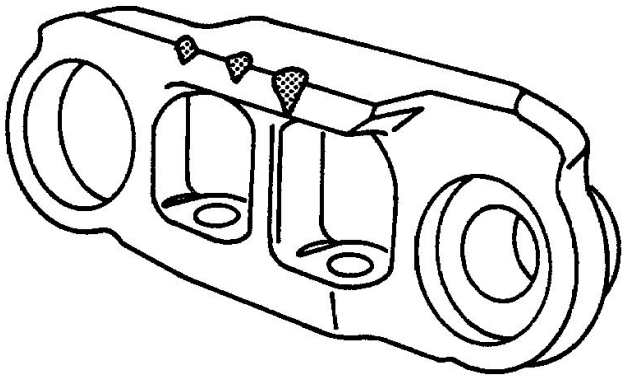
B900598 9

10. Shown below is wear on the top of the boss for the pin. This wear is caused by the flanges on the track links and the decreased diameter of the track rollers. This is the result of bad maintenance and track system management.



B900599 10

11. Shown below is wear on the inside of the track link. This wear is caused by contact with the tips of the sprocket teeth. This wear occurs because the sprocket is not aligned with the track and rear track roller, increased track pitch which makes the track flexible, side hill operation and wide track shoes.



B900600 11

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Index

TRAVELLING - D

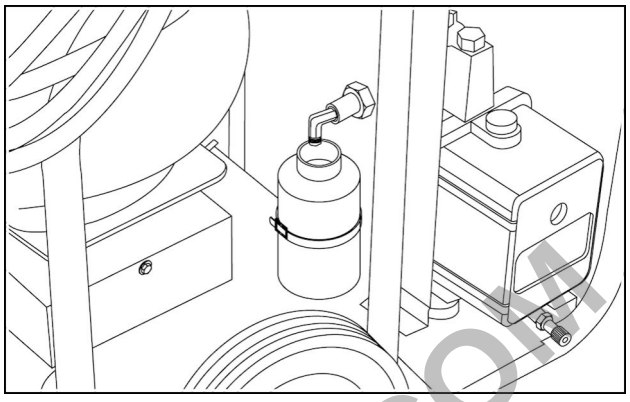
WHEELS AND TRACKS Tracks - 50.B

Drive sprocket - Install 30
Drive sprocket - Remove 28
Drive sprocket - Torque 5
Frame - Exploded view 27
Idler wheel - Assemble 94
Idler wheel - Dimension 21
Idler wheel - Disassemble 88
Idler wheel - Exploded view 26
Idler wheel - Install 99
Idler wheel - Leakage test 98
Idler wheel - Remove 87
Idler wheel - Special tools 21
Idler wheel - Visual inspection 92
Roller - Special tools 17
Roller Lower roller - Assemble 76
Roller Lower roller - Dimension 18
Roller Lower roller - Disassemble 70
Roller Lower roller - Exploded view 25
Roller Lower roller - Filling 84
Roller Lower roller - Install 85
Roller Lower roller - Leakage test 82
Roller Lower roller - Remove 69
Roller Lower roller - Torque 18
Roller Lower roller - Visual inspection 74
Roller Upper roller - Dimension 19
Roller Upper roller - Visual inspection 86
Steel track - Check 35
Steel track - Exploded view 23
Steel track - Install 39
Steel track - Remove 33
Steel track - Special tools 6
Steel track - Tension adjust 41
Steel track - Torque 7
Steel track Chain - Assemble For reference only 52

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

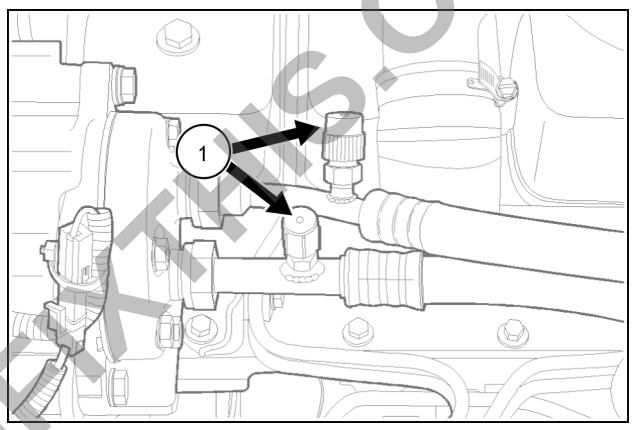
10. Fill the A/C compressor with fresh SP-15 PAG oil equal to the amount in the reservoir.



RCPH09CWL065AAD 8

11. Disconnect the hoses from the service ports and install the caps.

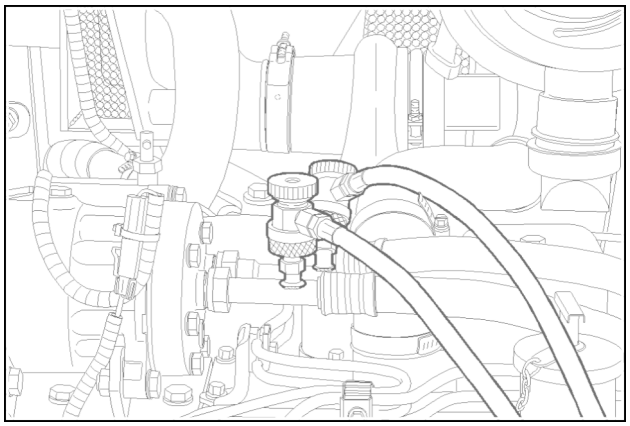
    (1) Service Ports



RCPH09CWL014BAD 9

12. Replace the receiver-drier if one or more of the following conditions occurs before you remove the air and moisture from the system.
    (A.) The system has been opened for service before.
    (B.) Receiver-drier has operated two or more years.
    (C.) Disassembly of compressor shows small particles of moisture removing material (gold or brown particles).
    (D.) Large system leak (broken hose, break in line).
    (E.) Too much air or moisture in system.
    (F.) Removal of compressor caused the system to be open (uncapped) longer than 5 minutes.

13. Make sure the charging station manifold gauge valves are in the closed position. Connect the hose from the low pressure gauge to the port on the suction hose. Connect the hose from the high pressure gauge to the port on the discharge hose. Turn in both thumbscrews to depress the service valves.

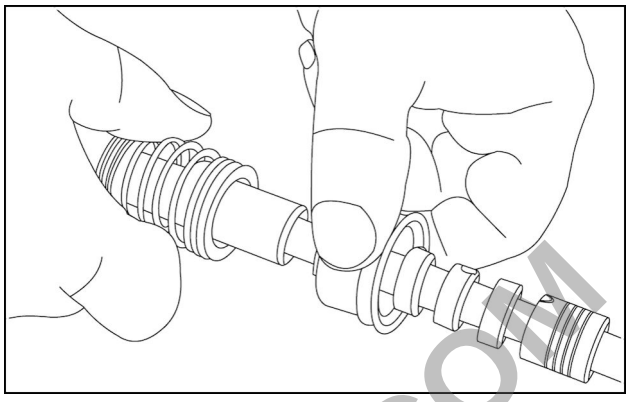


RCPH09CWL015BAD 10

PREVIEW - YOUFIXTHIS.COM

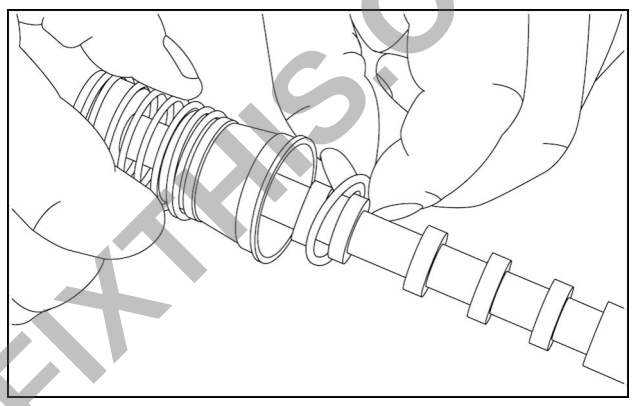
Download full manual at youfixthis.com

9. Install the detent sleeve.



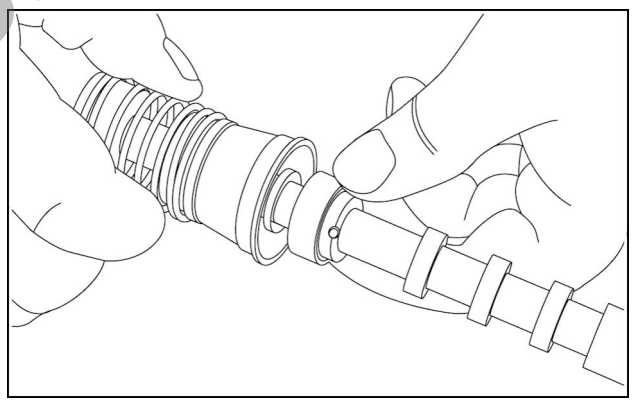
RCPH09CWL325AAD 9

10. Install a small O-ring over the spool and into the bore of the detent sleeve. Be careful so that you do not cut the O-ring on the edges of the spool.



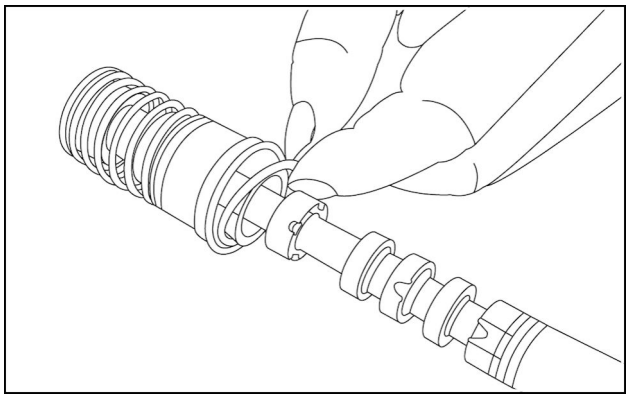
RCPH09CWL321AAD 10

11. Install the spool sleeve on the spool.



RCPH09CWL320AAD 11

12. Install the large O-ring in the end of the detent sleeve.



RCPH09CWL155AAD 12

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 25 of 1228 pages

The full manual includes:

- All 1228 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Case 650L Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual