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TORQUE SPECIFICATIONS - DECIMAL HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not

Grade 8 Bolts, Nuts, and Studs

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CAPACITIES AND LUBRICANTS

Engine Oil
- Capacity ..... 10.9 liters (11.5 U.S. Quarts)
- Capacity with Filter Change ..... 11.8 liters (12.5 U.S. Quarts)
- Type of oil ..... Case AKCELA (SAE 15W-40)

Engine Cooling System
- Capacity ..... 22 liters (23.2 U.S. Quarts)
- Type of Coolant ..... 50% water and 50% Ethylene Glycol

Fuel Tank
- Capacity ..... 189.3 liters (50 U.S. Gallons)
- Type of Fuel ..... See Diesel fuel specifications on page 6

Hydraulic System
- Hydraulic Reservoir Refill Capacity ..... 56.8 liters (15.0 U.S. Gallons)
- Total System Capacity ..... 113.6 liters (30.0 U.S. Gallons)
- Type of Oil ..... Case AKCELA Hy-Tran Ultra®

Transmission
- Refill Capacity with Filter Change ..... 18.9 liters (20 U.S. Quarts)
- Total System Capacity ..... 26 liters (27.5 U.S. Quarts)
- Type of Oil ..... Case AKCELA (SAE 15W-40)

Axles
- Capacity
  - Front ..... 22.0 liters (23.2 U.S. Quarts)
  - Rear ..... 22.0 liters (23.2 U.S. Quarts)
- Type of Lubricant ..... Case AKCELA Transaxle Fluid (SAE 80W-140)

NOTE: *DO NOT use an alternate oil in the axles. The brake components in the axles could be damaged as a result of using an alternate oil. Machines are shipped from the factory with break-in oil.*

Brake System
Type of Fluid (Same as Hydraulic System) ..... Case AKCELA Hy-Tran Ultra®

Fittings
- Grease as required ..... Case AKCELA Molydisulfide

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MAINTENANCE SCHEDULE
Model 521E

SERVICE INTERVAL	ITEM NUMBER	SERVICE POINTS	Initial Service	FREQUENCY IN HOURS						
				CHECK	CLEAN	CHANGE	DRAIN	LUBRICATE	REPLACE	ADJUST
Variable Periodic (*)	29	Air cleaner		*		*				
	18	Bleed Fuel Filter of Condensation					*			
	19	Hydraulic Filter		*						
	22	Alternator, AC, Drive Belt		*						
	13	Radiator Coolant Level		*						
	XX	Fire extinguisher		*						
	14	Tires		*						
Every 10 Hours	1	Check Engine Oil Level		10						
Every 50 Hours	2	Check Engine Coolant Level		50						
	3	Check Transmission Oil Level		50						
	4	Check Hydraulic Oil Level		50						
	5 & 6	Grease Bucket Mounting Fittings						50		
Every 100 Hours	7	Grease Front Drive Shaft Support Bearing						100		
	8 & 9	Lubricate The Steering Cylinder Pivots - Rod And Closed End (4 Fittings)						100		
	10	Lubricate Loader Lift & Cylinder Pivots (10) Z-bar						100		
	11	Lubricate Loader Lift & Cylinder Pivots (18) XT						100		
Every 250 Hours	12	Check Cab Air Filter		250						
	13	Check Tire Pressure & Wheel Torque	**100**	250						
	14	Check Drive Belt		250						
Every 500 Hours	15	Check Battery Electrolyte Level		500						
	16	Check Axle Oil Level		500						
	17	Drain Fuel Tank Condensation & Water Separator					500			
	18	Change Engine Oil and Filter	**100**			500				
	18	Change Crankcase Filter				500				
	19 & 27	Replace Fuel Filter	**100**						500	
	XX	ROPS/CSF and seat belt torques		500						
Every 1000 Hours	20	Change Front & Rear Axle Oil	**100**			1000				
	21	Replace Hydraulic Oil filter	**100**						1000	
	22	Replace Cab Air Filter							1000	
	23	Replace Drive Belt							1000	
	24	Change Transmission Oil and Filter	**100**			1000				
	25	Grease Articulation Fittings						1000		
	26	Check Injector Calibration		1000						
	27	Fuel Pre-Filter				1000				
	XX	Drive Shaft Slip Joint						1000		
	XX	Check Valve Adjustment (Engine Manual)		1000						
	XX	Trans Clutch Calibration (See Section 6002)	**250**	1000						
Every 2000 Hours	28	Change Hydraulic Oil				2000				
	29	Change Coolant				2000				
	30	Replace Engine Air Cleaner							2000	
Every 4000 Hours	XX	Valve Clearance (Engine Manual)								4000

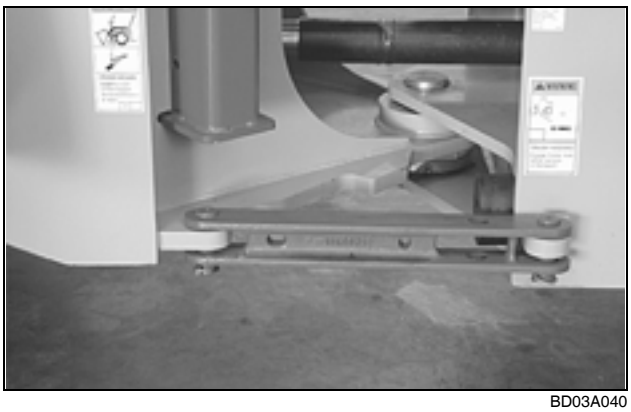
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ENGINE

Removal

STEP 1



BD03A040

Park machine on a level surface and lower bucket to ground. Put articulation lock in LOCKED position.

STEP 2

Stop engine. Actuate brake pedal several times to discharge brake accumulators. Put key switch in ON position and move loader control lever back and forth at least 30 times to release any pressure from hydraulic circuit. Put key switch in OFF position.

STEP 3

Slowly loosen the filler cap for hydraulic reservoir to release air pressure in hydraulic reservoir.

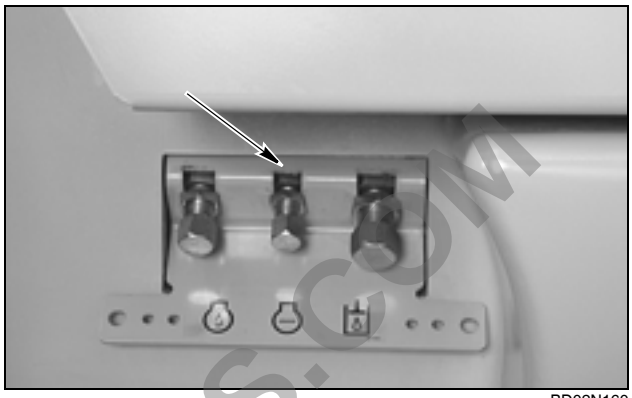
STEP 4



BD07N563-01

The master disconnect is located under the hood on the left read side of the machine. Raise the hood put master disconnect switch in OFF position. Remove both battery covers and disconnect batteries from the machine.

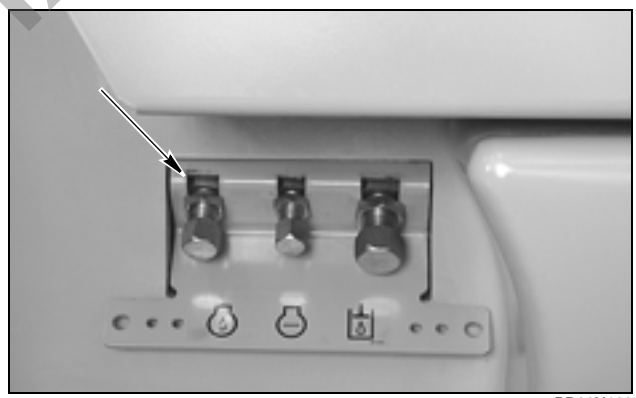
STEP 5



BD02N160

Put a container capable of holding at least 22.7 liter (6.0 gallon) below radiator drain. Remove radiator cap. Remove cap and drain coolant into container. Install cap after coolant has drained. Install radiator cap.

STEP 6



BD02N160

Put a container capable of holding at least 12.3 liter (13 U.S. quarts) below engine oil drain. Remove cap and drain oil into container. Install cap after oil has drained.

NOTE: *After draining oil disconnect drain hose from frame for removal with engine.*

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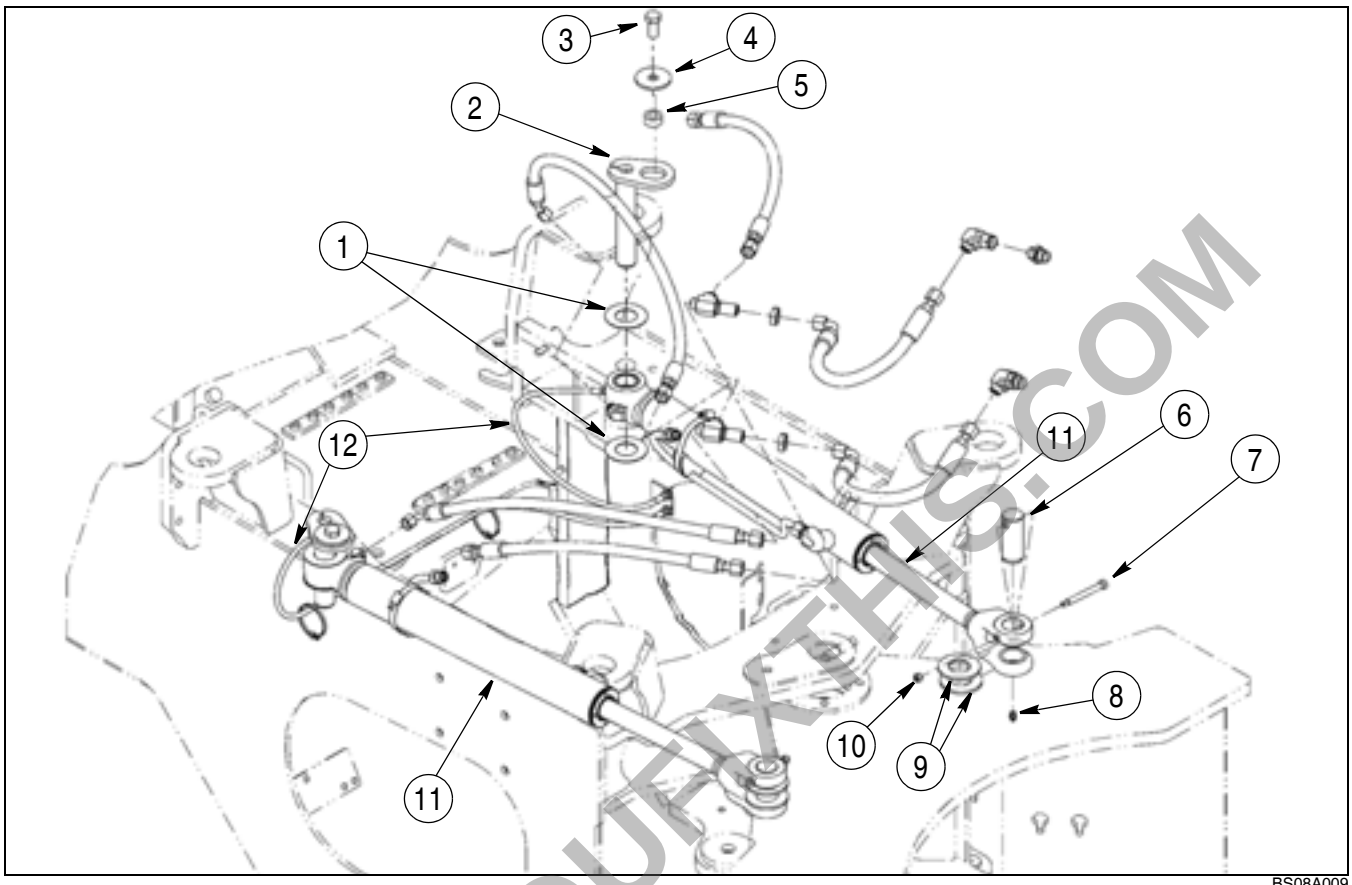
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VEHICLE FAULT CODES

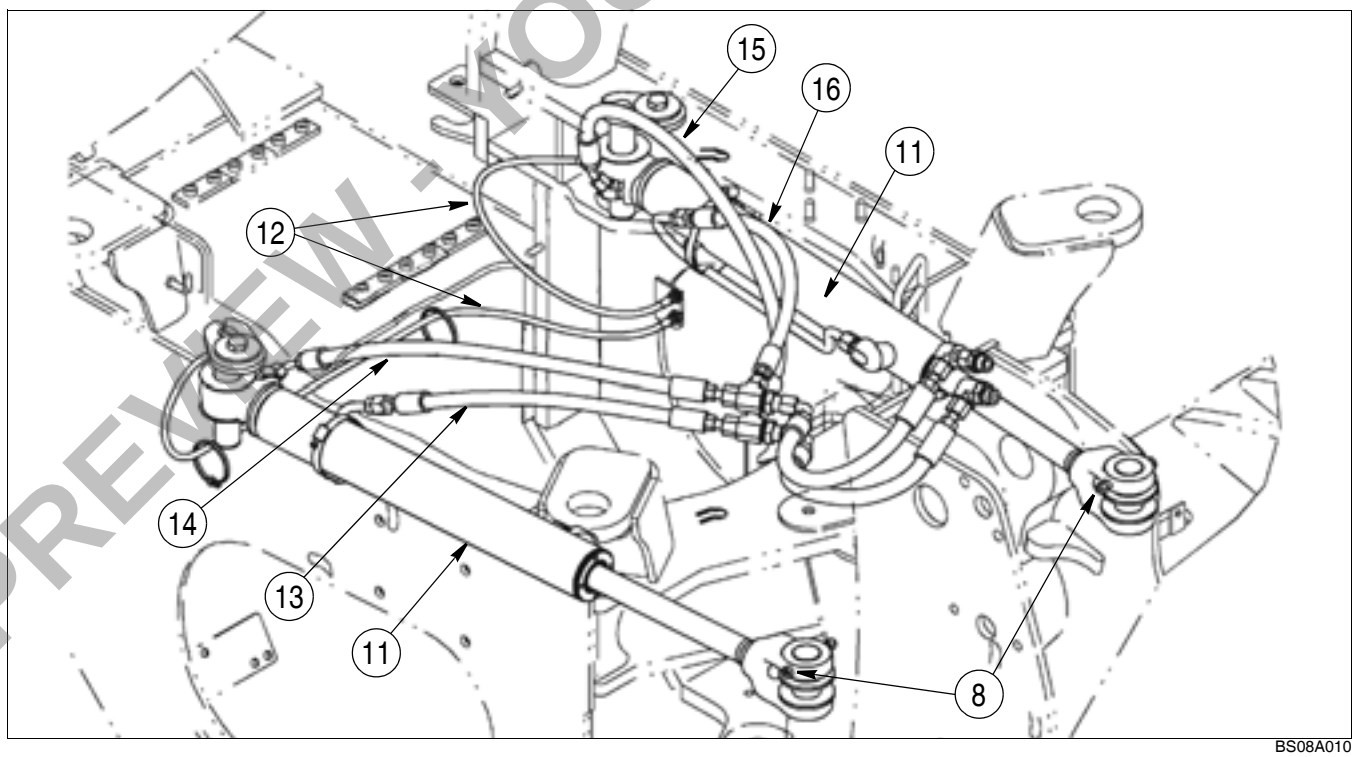
CODE	DEFINITION	POSSIBLE STEPS FOR REPAIR
1310	Hydraulic filter blocked	Change filter
1311	Engine air filter blocked	Change filter
1312	Hydraulic oil temperature above normal	1. Stop machine operations 2. Run engine at 1500 rpm 3. Check fan operation 4. Check cooling core for clogs
1313	Hydraulic oil temperature to high	
1314	Transmission oil temperature above normal	
1315	Transmission oil temperature to high	
1316	Brake pressure too low	1. Stop machine operations 2. Run engine at 1500 rpm 3. Check brake system pressure 4. Check brake system for leaks
1317	Steering pressure too low	1. Stop machine operations 2. Run engine at 1500 rpm 3. Check steering system for operation 4. Check steering system for leaks
1318	Engine coolant temperature above normal	1. Stop machine operations 2. Run engine at 1500 rpm 3. Check fan operation 4. Check radiator core for clogs
1319	Engine coolant temperature high - critical	
1320	Engine oil pressure too low	1. Stop machine operations 2. Check engine oil level 3. Check pressure sender unit
1321	Engine oil pressure below normal	
1322	Engine oil pressure above normal	1. Check engine oil for proper type 2. Check pressure sender unit
1323	Battery voltage low	Check charging system
1324	Battery voltage high	
1325	Oil temperature too high	1. Stop machine operations 2. Run engine at 1500 rpm 3. Check sending unit
1326	Coolant level low	Fill radiator level
1327	Moved during accelerated idle	No information available at time of print.
1328	Moving when shifting to low idle	No information available at time of print.
1331	Electrical charging system voltage low - critical level	1. Stop machine operations 2. Check charging system
1332	Water detected in fuel	Drain fuel filter
1333	Engine overspeed	Check engine speeds
1334	Intake manifold temperature high - critical	Check for defective or clogged after cooler
1335	Brake pressure too low	1. Stop machine operations 2. Run engine at 1500 rpm 3. Check brake system pressure 4. Check brake system for leaks
1336	Transmission oil filter blocked	Replace filter

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BS08A009



BS08A010

1. WASHER
2. PIVOT PIN
3. BOLT
4. WASHER
5. SPACER
6. PIN
7. SHOULDER BOLT
8. GREASE FITTING
9. WASHER
10. LOCKNUT
11. STEERING CYLINDER
12. GREASE HOSE
13. HOSE ASSEMBLY
14. HOSE ASSEMBLY
15. HOSE ASSEMBLY
16. HOSE ASSEMBLY

STEERING CYLINDER ILLUSTRATION

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TROUBLESHOOTING PROCEDURE

Visually check the machine for oil leakage and damaged or missing parts. Repair or replace any damaged or missing parts.

Check the oil level in the hydraulic reservoir. Is the oil level correct?. → No: Fill the hydraulic reservoir with the hydraulic oil specified in Section 1002.

Yes ↓

Heat the oil in the hydraulic system to operating temperature. Operate the machine to find which circuits have problems.

Problem in all Circuits

Replace the return line hydraulic filter.

See Section 2002. Do the stall test to see if the engine is good.

See Section 8003 and check for contaminated oil. Is the oil contaminated? → No: See page 7. Test and adjust pump differential pressure then proceed to Page 7 and do the flowmeter tests of the hydraulic pump. See page 12 and test the pilot pressure.

Yes ↓

See Section 8003 and clean or replace the oil.

Problem in all Loader Circuits

See Page 10 and check the pressure setting of the main relief valve in the loader control valve. Is the pressure setting correct? → No: Adjust the main relief valve. See page 10 in this section.

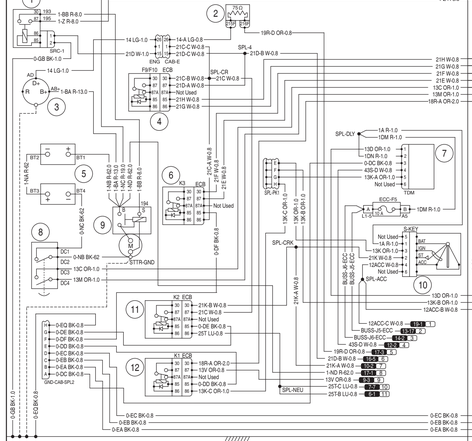
Problem in the Braking Circuit

See Section 7002 and check the braking circuit.

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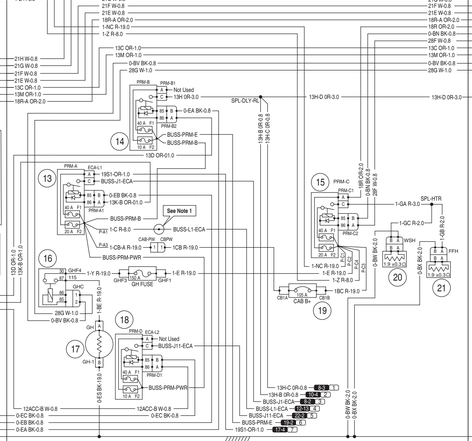
STARTING AND CHARGING SYSTEM



FRAME 1

BC08B245-01A

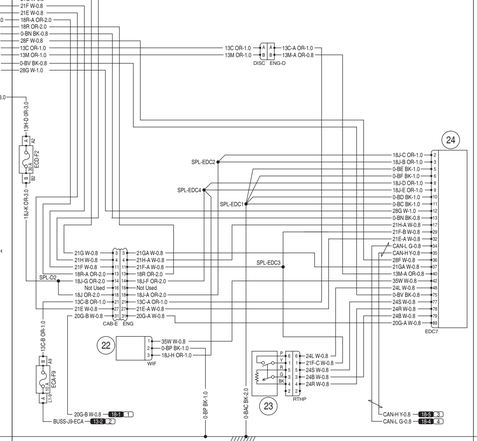
POWER RELAY MODULES - COLD STARTING SYSTEM



FRAME 2

BC08B245-02A

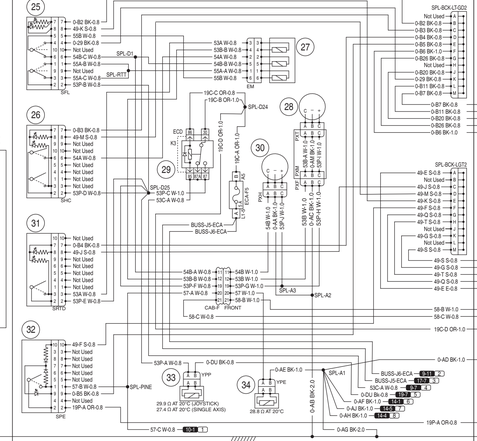
ENGINE CONTROLLER



FRAME 3

BC08B245-03A

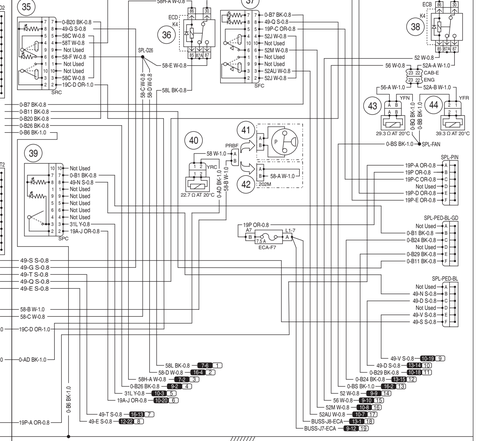
RETURN TO TRAVEL • RETURN TO DIG • PIN ENGAGE



FRAME 4

BC08B245-04A

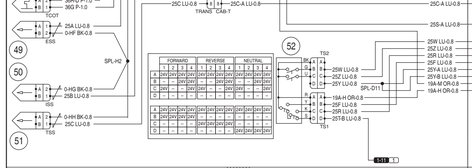
PILOT CONTROL - RIDE CONTROL - FAN CONTROL



FRAME 5

BC08B245-05A

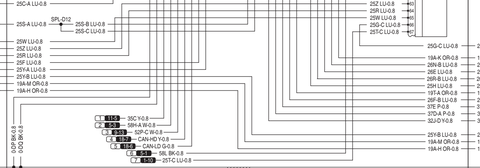
TRANSMISSION-01



FRAME 6

BC08B245-09A

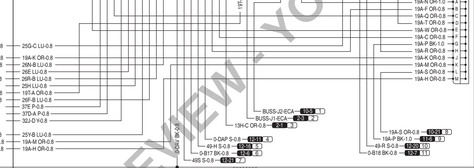
TRANSMISSION-02



FRAME 7

BC08B245-09A

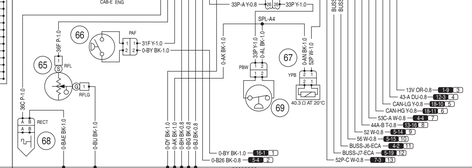
TRANSMISSION-03



FRAME 8

BC08B245-08A

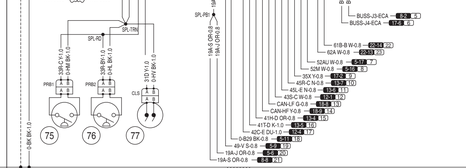
WARNING BUZZER - INSTRUMENT CLUSTER 1 - PARK BRAKE



FRAME 9

BC08B245-09A

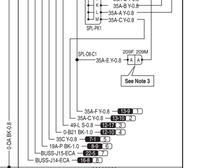
SWITCH PAD - INSTRUMENT CLUSTER 2 - PARK BRAKE



FRAME 10

BC08B245-10A

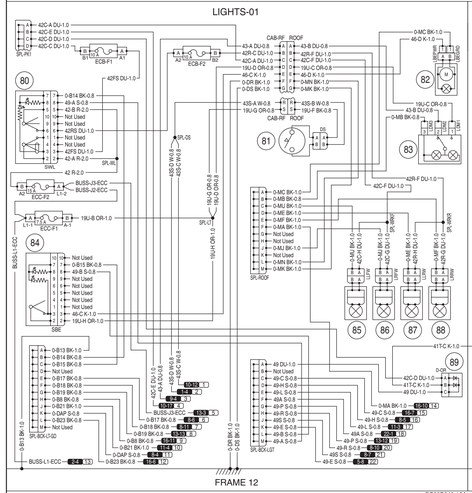
BACK-UP ALARM



FRAME 11

BC08B245-11A

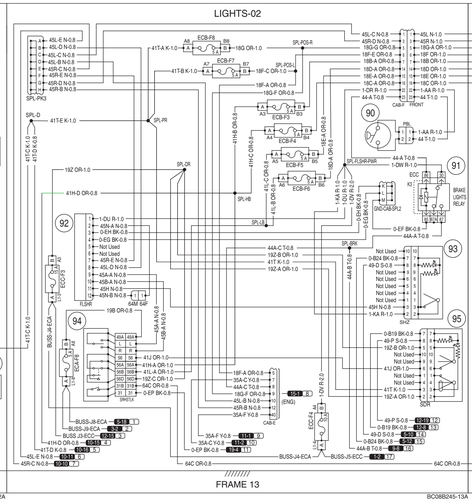
LIGHTS-01



FRAME 12

BC08B245-12A

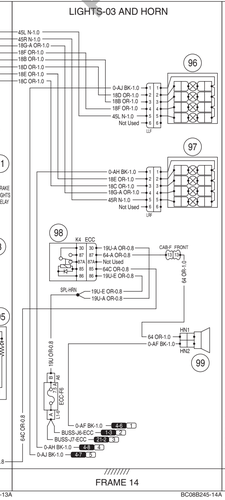
LIGHTS-02



FRAME 13

BC08B245-13A

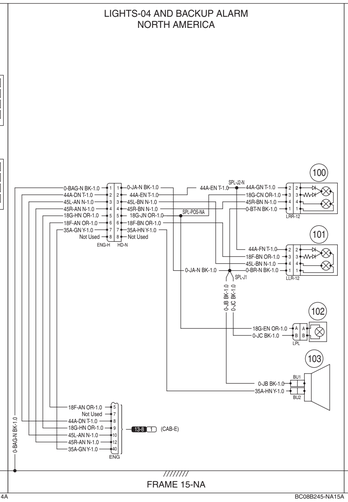
LIGHTS-03 AND HORN



FRAME 14

BC08B245-14A

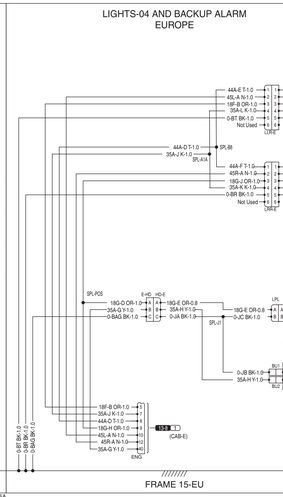
LIGHTS-04 AND BACKUP ALARM NORTH AMERICA



FRAME 15-NA

BC08B245-NA15A

LIGHTS-04 AND BACKUP ALARM EUROPE



FRAME 15-EU

BC08B245-EU15A

COMPONENT

FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS	FRAME - COMPONENT NUMBERS
1 - 1. Starting Relay	5 - 37. Fan Control Switch (Option)	10 - 73. Hydraulic Oil Temperature Sender	NORTH AMERICA
1 - 2. Resistor - 75 Ohm	5 - 38. Fan Reverse Relay (Option)	10 - 74. Park Brake Switch	
1 - 3. Alternator	5 - 39. Pilot Control Switch	10 - 75. Redundant Brake Pressure Switch 1	15 - 100. Right-Hand Rear Combination Lamps
1 - 4. Crank Control Relay	5 - 40. Ride Control Solenoid (Option)	10 - 76. Redundant Brake Pressure Switch 2	Pin 1 - Ground
1 - 5. Batteries	5 - 41. Rollback Pressure Switch (XT with Ride Control Only)	10 - 77. Coolant Level Sender	Pin 2 - Brake Lamp
1 - 6. Crank Request Relay	5 - 42. Rollback Jumper	11 - 78. Backup Alarm Relay	Pin 3 - Tail Lamp
1 - 7. Time Delay Module	5 - 43. Fan PWM Solenoid	11 - 79. Backup Alarm Disable Switch	Pin 4 - Turn Lamp
1 - 8. Master Disconnect Switch	5 - 44. Fan Reverse Solenoid (Option)	12 - 80. Work Lamps Switch	15 - 101. Left-Hand Rear Combination Lamps
1 - 9. Starter	6 - 45. Output Speed Sensor	12 - 81. Door Switch	Pin 1 - Ground
1 - 10. Ignition Switch	6 - 46. Transmission Solenoid Valve and Temperature Sender	12 - 82. Rotating Beacon (Optional)	Pin 2 - Brake Lamp
1 - 11. Neutral Start Relay	6 - 47. Filter Maintenance Switch	12 - 83. Dome Lamp	Pin 3 - Tail Lamp
1 - 12. Voltmeter Relay	6 - 48. Torque Convertor Output Temperature Sender	12 - 84. Rotating Beacon Switch (Optional)	Pin 4 - Backup Lamp
2 - 13. Power Relay Module A	6 - 49. Engine Speed Sensor	12 - 85. Left-Hand Front work Lamp	Pin 5 - Ground
2 - 14. Power Relay Module B	6 - 50. Intermediate Speed Sensor	12 - 86. Right-Hand Front work Lamp	Pin 6 - Not Used
2 - 15. Power Relay Module C	6 - 51. Turbine Speed Sensor	12 - 87. Left-Hand Rear work Lamp	102. Licence Plate Lamp
2 - 16. Grid heater Relay	6 - 52. Transmission Shifter	12 - 88. Right-Hand Rear work Lamp	103. Backup Alarm
2 - 17. Grid Heater	7 - 53. Transmission Electronic Control Module	12 - 89. Diodes	
2 - 18. Power Relay Module D		13 - 90. Brake Lamp Switch	EUROPE
2 - 19. Circuit Breaker Cab +	8 - 54. Transmission Enable Switch	13 - 91. Brake Lamp Relay	
2 - 20. Water Separator Heater	8 - 55. FNR Switch for Joystick Controls	13 - 92. Flasher Module	100. Right-Hand Rear Combination Lamps
2 - 21. Fuel Filter Heater	8 - 56. Transmission Kick-Down Switch	13 - 93. Hazard Switch	Pin 1 - Brake Lamp
3 - 22. Water In Fuel Sensor	8 - 57. FNR Switch for Single Axis Controls	13 - 94. Turn Signal, High-Low Beam, and Horn Switch	Pin 2 - Turn Lamp
3 - 23. Throttle Potentiometer	8 - 58. Transmission Auto Switch	13 - 95. Driving Lamps Switch	Pin 3 - Tail Lamp
3 - 24. Engine Controller	8 - 59. Brake Declutch Pressure Switch	14 - 96. Left-Hand Front Combination Lamps	Pin 4 - Backup Lamp
4 - 25. Return-to-Travel Float Switch	8 - 60. Declutch Switch	Pin 1 - Ground	Pin 5 - Ground
4 - 26. Height Control Switch	8 - 61. Diagnostic Connector	Pin 2 - Low Beam	Pin 6 - Not Used
4 - 27. Electromagnetic Detents Pins 3 and 4 - Return-to-Dig Pins 2 and 5 - Height Control Pins 1 and 6 - Return-to-Travel	9 - 62. Instrument Cluster Connector 1	Pin 3 - High Beam	101. Left-Hand Rear Combination Lamps
4 - 28. Return-to-Dig Proximity Switch	9 - 63. Warning Buzzer	Pin 4 - Position	Pin 1 - Brake Lamp
4 - 29. Pilot Control Relay ECD-K3	9 - 64. Parking Brake Relay	Pin 5 - Turn Signal	Pin 2 - Turn Lamp
4 - 30. Height Control and Return-to-Travel Proximity Switch	9 - 65. Fuel Level Sender	14 - 97. Right-Hand Front Combination Lamps	Pin 3 - Tail Lamp
4 - 31. Return-to-Dig Switch	9 - 66. Air Filter Restriction Switch	Pin 1 - Ground	Pin 4 - Backup Lamp
4 - 32. Pin Engage Switch (Option)	9 - 67. Parking Brake Solenoid	Pin 2 - Low Beam	Pin 5 - Ground
4 - 33. Pilot Pressure Solenoid	9 - 68. Radiator Coolant Temperature Sender	Pin 3 - High Beam	Pin 6 - Not Used
4 - 34. Pin Engage Solenoid (Option)	9 - 69. Brake Pressure Warning Switch	Pin 4 - Position	102. Licence Plate Lamp
5 - 35. Ride Control Switch (Option)	10 - 70. Switch Pad	Pin 5 - Turn Signal	103. Backup Alarm
5 - 36. Ride Control Relay (Option)	10 - 71. Instrument Cluster Connector 2	14 - 98. Horn Relay	
	10 - 72. Hydraulic Filter Restriction Switch	14 - 99. Horn	

CIRCUIT DIAGRAM LEGEND

SHOWS CIRCUIT CROSSING NOT CONNECTED

SHOWS CIRCUIT SPLICE CONNECTION

Frame and Wire Tag Number where circuit continues. WIRE TAGS: 0006 (1), 0007 (2). FRAME - WIRE

Wire Tag assigned to wire in Frame.

CIRCUIT CONTINUATION

54 COMPONENT NUMBER

MALE TERMINAL

FEMALE TERMINAL

INDICATES EXTERNAL GROUND

GROUND

INDICATES INTERNALLY GROUNDED COMPONENT

FEMALE CONNECTOR

MALE CONNECTOR

CONNECTOR NUMBER

CONNECTOR IDENTIFICATION

INDICATES PARTIAL CONNECTOR

NOT ALL CONNECTIONS ARE SHOWN

WIRE IDENTIFICATION

702A G-1.0 (WIRE NUMBER / WIRE COLOR — WIRE SIZE)

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 . . . GREY
T . . TAN
U . . BLUE
W . . WHITE
Y . . . YELLOW

NOTES

NOTE 1: Electrical Center C - Power Stud
NOTE 2: Indicates Modulated and Current Controller.
NOTE 3: Disconnect when Backup Alarm Disable Switch is installed. Applicable only on TUV Road Approved Machines.

ELECTRICAL SCHEMATIC
521E WHEEL LOADER

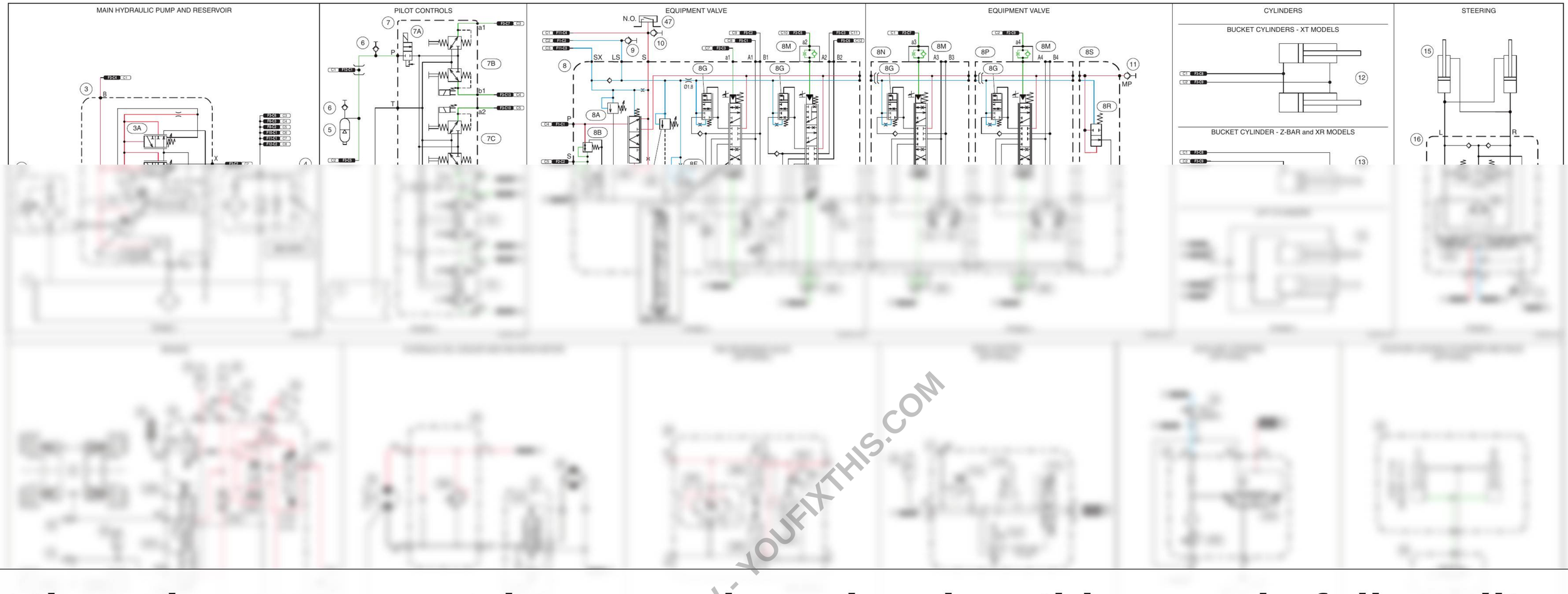
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521E Wheel Loader
Repair Manual
87728450 A - EU

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Engine and Radiator Removal and Installation	2000
Stall Tests	2002
After Cooler	2003
For Engine Repair, See the Engine Service Manual 87630273	
Fuel System	**Tab 3**
Section Index - Fuel System	
For Fuel System Repair, See the Engine Service Manual 87630273	
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Removal and Installation of Starter and Alternator	4001
Electrical Specifications and Troubleshooting	4002
Batteries	4003
Instrument Cluster	4005
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Section Index - Steering	
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Steering Specifications, Pressure Checks, and Troubleshooting	5002
Steering Cylinders	5005
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Auxiliary Steering Motor and Pump	5008

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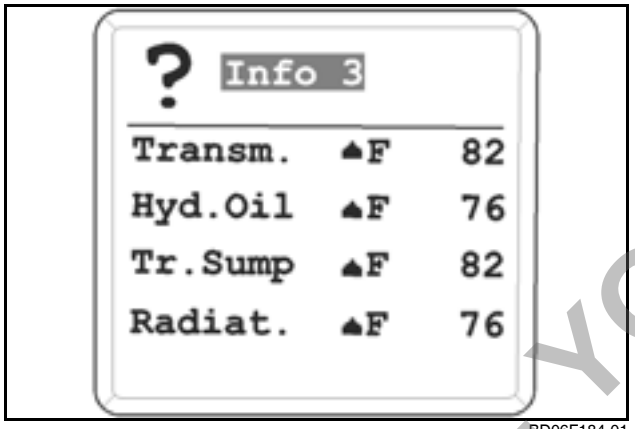
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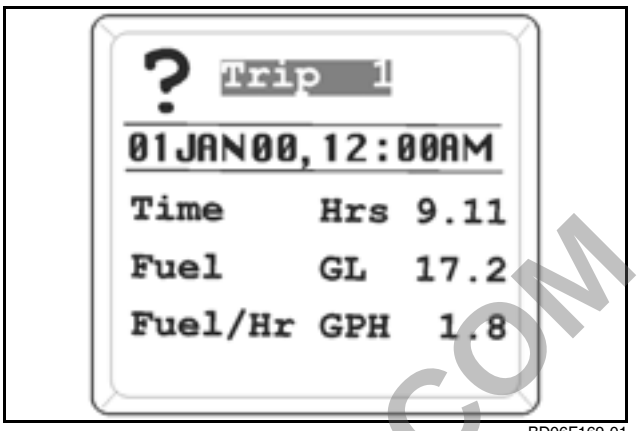
BD06F027-01

4. **Info 2** will be displayed next. The Info 2 screen will display coolant temperature, turbocharger air temperature, engine oil temperature in either Fahrenheit or Celsius, as well as oil pressure PSI.



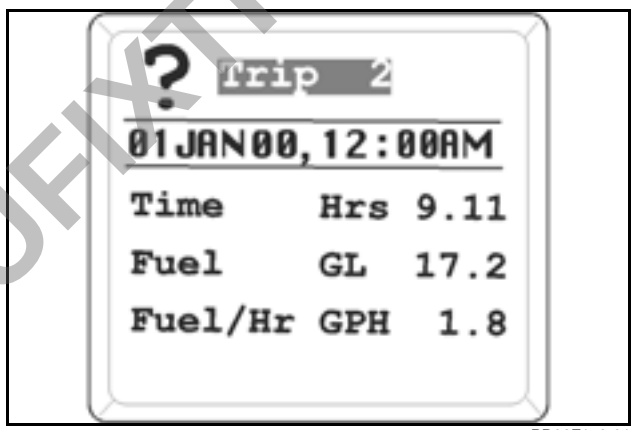
BD06F184-01

5. Push the down button again and the Info 3 screen. This screen displays the temperature in Fahrenheit or Celsius of the transmission oil, hydraulic oil, sump oil, and radiator coolant temperature.



BD06F169-01

6. Press the down button again and the Trip 1 screen will display. The LCD provides two trip computers. These will display since last reset the total time in hours, the total fuel, and the average fuel consumption per hour.



BD06F170-01

7. By continuing to scroll down, the fifth screen will display the Trip 2 screen. Trip 1 and Trip 2 screens can be reset independently. The previous screen can be accessed by using the up arrow key.

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Wire Identification Codes

21C Bk - 1.0

Wire Name: 21C

Wire Color: Bk

Wire Size (mm^2): 1.0

Wire Size (mm^2)	0.8 mm	1.0 mm	2.0 mm	5.0 mm

Wire Color					
Bk = Black	DU = Dark Blue	S = Gray	LG = Light Green	K = Pink
T = Tan	W = White	N = Brown	G = Green	U = Blue
LU = Light Blue	Or = Orange	R = Red	P = Purple	Y = Yellow

Wire Identification			From Connector		To Connector	
Wire	**Circuit**	**Color, Size, and Material**	**Connector**	**Cavity**	**Connector**	**Cavity**
52C	Parking Brake Solenoid LSD	W 0.8 TXL	AIC-1, Adv Instrument Cluster 1	14	ECB, Elect Center B	B10
52J	Fan Control Switch Jumper	W 0.8 GXL	SFC, Fan Control Switch	4	SFC, Fan Control Switch	2
52M	Fan Reverse Manual	W 0.8 TXL	SFC, Fan Control Switch	6	AIC-2, Adv Instrument Cluster 2	7
52P	Parking Brk Relay Out	W 1.0 SXL	FRONT, Cab Front Chassis	24	YPB, Park Brake Solenoid	1
52P A	Parking Brk Relay Out	W 0.8 GXL	CAB-F, Cab Front Chassis	24	SPL-PB, Ultrasonic	A
52P B	Parking Brk Relay Out	W 0.8 GXL	SPL-PB, Ultrasonic	A	ECB, Elect Center B	D10
52P C	Parking Brk Relay Out	W 0.8 TXL	SPL-PB, Ultrasonic	A	TECM, Trans	21
53A	RTD Switch Power	W 0.8 GXL	SRTD, Detent Switch	3	EM, RTD Height Control RTT	3
53B	RTD Signal	W 1.0 SXL	FRONT, Cab Front Chassis	12	PXF, RTD	C
53B A	RTD Signal	W 1.0 SXL	PXM, RTD	A	PXT, RTD	A
53B B	RTD Signal	W 0.8 GXL	EM, RTD Height Control RTT	4	CAB-F, Cab Front Chassis	12
53C A	Pilot Control Solenoid LSD	W 0.8 TXL	AIC-1, Adv Instrument Cluster 1	20	ECD, Elect Center D	B6
53P A	Pilot Control Relay Out	W 0.8 GXL	SPL-D25, Ultrasonic	A	YPP, Pilot Pressure Solenoid	A
53P B	Pilot Control Relay Out	W 0.8 GXL	SFL, Return to Travel Switch	2	SPL-D25, Ultrasonic	A
53P C	Pilot Control Relay Out	W 1.0 GXL	SPL-D25, Ultrasonic	A	ECD, Elect Center D	D6
53P D	Pilot Control Relay Out	W 0.8 GXL	SHC, Height Control Switch	2	SPL-D25, Ultrasonic	A
53P E	Pilot Control Relay Out	W 0.8 GXL	SRTD, Detent Switch	2	SPL-D25, Ultrasonic	A
53P F	Pilot Control Relay Out	W 0.8 GXL	CAB-F, Cab Front Chassis	19	SPL-D25, Ultrasonic	A
53P G	Pilot Control Relay Out	W 1.0 SXL	FRONT, Cab Front Chassis	19	SPL-A3, Ultrasonic	A
53P H	Pilot Control Relay Out	W 1.0 SXL	SPL-A3, Ultrasonic	A	PXF, RTD	C
53P I	Pilot Control Relay Out	W 1.0 SXL	PXM, RTD	C	PXT, RTD	C
53P J	Pilot Control Relay Out	W 1.0 SXL	SPL-A3, Ultrasonic	A	PXH, Height Control RTT	C
54A	Height Control Switch Power	W 0.8 GXL	SHC, Height Control Switch	6	EM, RTD Height Control RTT	2
54B	Height RTT Control Signal	W 1.0 SXL	FRONT, Cab Front Chassis	11	PXH, Height Control RTT	A
54B A	Height RTT Control Signal	W 0.8 GXL	CAB-F, Cab Front Chassis	11	SPL-D1, Ultrasonic	A
54B B	Height RTT Control Signal	W 0.8 GXL	EM, RTD Height Control RTT	5	SPL-D1, Ultrasonic	A
54B C	Height RTT Control Signal	W 0.8 GXL	SFL, Return to Travel Switch	6	SPL-D1, Ultrasonic	A
55A A	RTT Float Sw Power	W 0.8 GXL	EM, RTD Height Control RTT	1	SPL-RTT, Ultrasonic	A
55A B	RTT Float Sw Power	W 0.8 GXL	SFL, Return to Travel Switch	1	SPL-RTT, Ultrasonic	A

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96 – Left Hand Front Combination Lamp

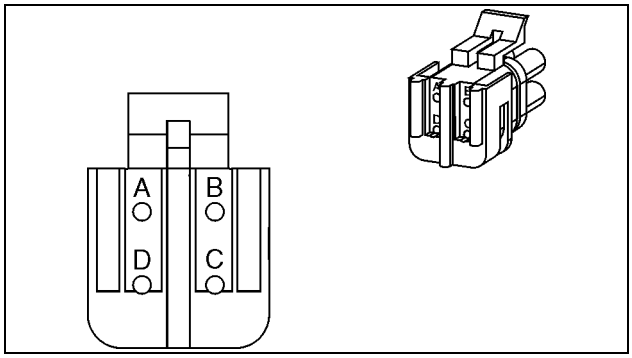
Located on the left front of the machine.

Check Points	Correct Reading	Possible Cause of Bad Reading
NOTE: *Disconnect wiring harness connector LF from LH front combination lamp connector.*		
Combination lamp connector pin 3 to pin 1	Continuity	Bad high beam lamp bulb.
Combination lamp connector pin 4 to pin 1	Continuity	Bad position lamp bulb.
Combination lamp connector pin 2 to pin 1	Continuity	Bad low beam lamp bulb.
Combination lamp connector pin 5 to pin 1	Continuity	Bad turn signal lamp bulb.
NOTE: *Connect wiring harness connector LF to LH front combination lamp connector.*		
Terminal for wire 0-AJ to ground	Continuity	Bad ground circuit.
NOTE: *Put master disconnect switch in ON position and driving lamp switch (95) in position 2.*		
Terminal for wire 18F to ground	24 volts	Check fuse ECB-F7 and driving lamp switch (95). Also check circuit 18F.
NOTE: *Put high/low beam lever (94) in HIGH beam position.*		
Terminal for wire 18B to ground	24 volts	Check fuse ECB-F3, high/low beam relay (80), driving lamp switch (95), and high/low beam switch (94). Also check circuit 18B and wire 41H.
NOTE: *Put high/low beam lever (94) in LOW beam position.*		
Terminal for wire 18D to ground	24 volts	Check fuse ECB-F6, driving lamp switch (95), and high/low beam switch (94). Also check circuit 18D and wire 41L-A.
NOTE: *Put ignition switch in ON position. Put turn signal lever in LEFT turn position.*		
Terminal for wire 45L to ground	Intermittent 24 volts	Check the turn signal switch (94) and flasher module (92). Also check circuit 45L to flasher module.
NOTE: *If all readings are good, and lamps still do not turn ON replace the LH front combination lamp.*		

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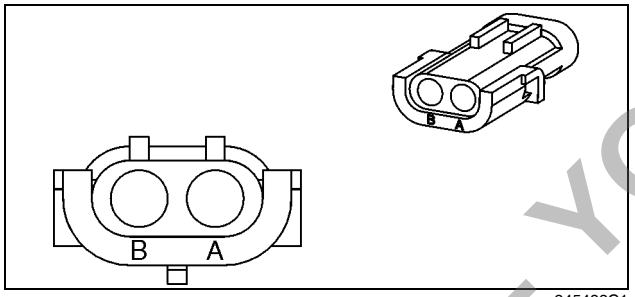
CONNECTOR LLR-N - LH REAR COMBINATION LAMP



245715C1

CAV	WIRE IDENT	CIRCUIT
A	44A-FN	Brake Lamp Relay Out
B	18F-BN	LH Tail Lamp Fused Pwr
C	45L-BN	Left Turn Signal
D	0-BR-N	LH Rear Light Ground (NA)

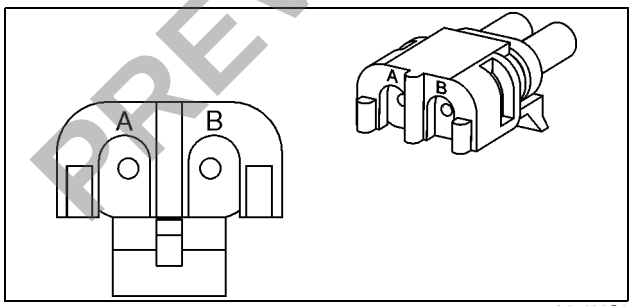
CONNECTOR LLRW- LH REAR WORK LAMP



245483C1

CAV	WIRE IDENT	CIRCUIT
A	42R-H	LH Rear Work Lamp Fused Pwr
B	0-ME	LH Rear Work Lamp Ground

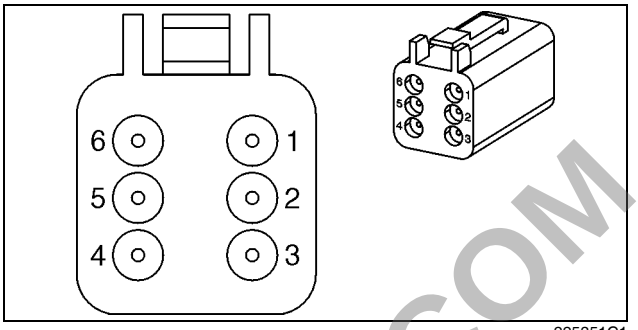
CONNECTOR LPL - LICENSE PLATE LAMP



245482C1

CAV	WIRE IDENT	CIRCUIT
A	18G-E	License Plate Lamp Fused Pwr
A	18G-EN	License Plate Lamp Fused Pwr
B	0-JC	License Plate Lamp Ground

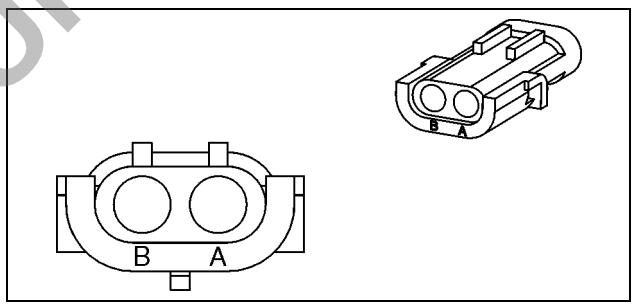
CONNECTOR LRF - RH FRONT COMBINATION LAMP



225351C1

CAV	WIRE IDENT	CIRCUIT
1	0-AH	RH Front Lights Ground
2	18E	RH Low Beam Fused Pwr
3	18C	RH High Beam Fused Pwr
4	18G-A	RH Position/Tail Fused Pwr
5	45R	Right Turn Signal
6		Not Used

CONNECTOR LRFW - RH FRONT WORK LAMP



245483C1

CAV	WIRE IDENT	CIRCUIT
A	42C-G	RH Front Work Lamp Fused Pwr
B	0-MJ	RH Front Work Lamp Ground

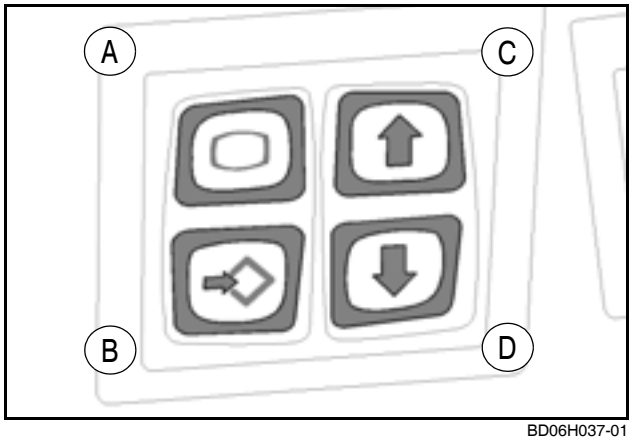
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RETRIEVING FAULT CODES

General Fault Code Identification

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



BD06H037-01

A. Escape key

B. enter key

C. up key

D. down 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.

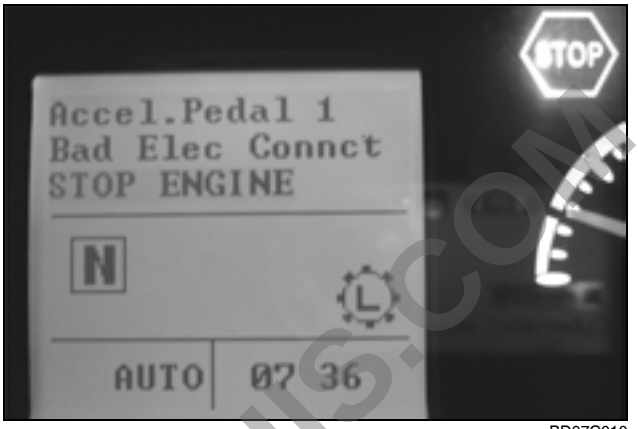
3. Red Faults, buzzer will be continuous, alternating sounds:

   A. Operator can acknowledge it by pressing the enter key.

   B. Buzzer will change to a less stressing sound, but will remain.

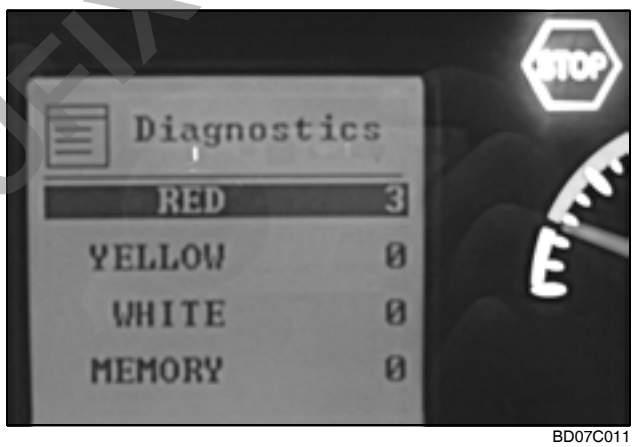
   C. Message will remain on display with indication of URGENT STOP.

Fault Code Display



BD07C010

1. If a fault code occurs, it will be displayed in the upper zone of the LCD. Depending on how critical the code is, the RED master STOP or the YELLOW caution indicator will also come on.



BD07C011

2. To retrieve the code/s, press the two upper buttons of the keypad for 2 seconds. When the screen comes up press ENTER on the category with codes present.



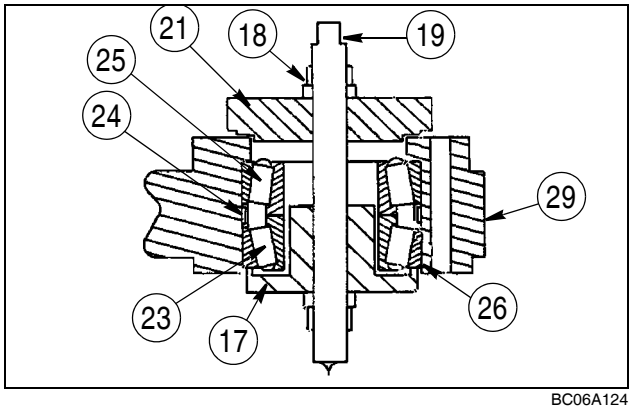
BD07C012

3. If more than one code is present in the category, scroll through to each by pressing the DOWN button on the keypad.

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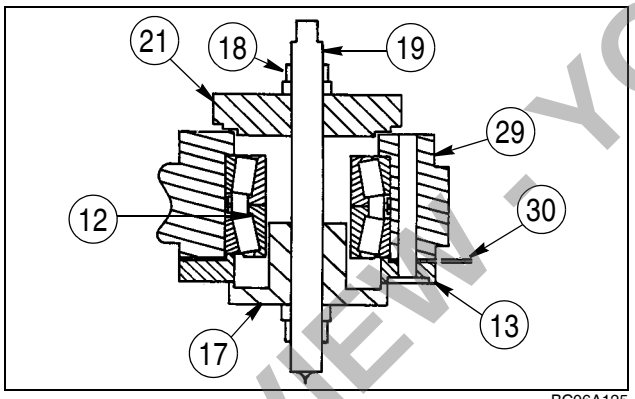
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28. Install a bearing cone (25), spacer (24), the other bearing cone (23), and the remaining bearing cup (26) in the bottom pivot (29).
29. Install the bearing driver (17) and plate (21).



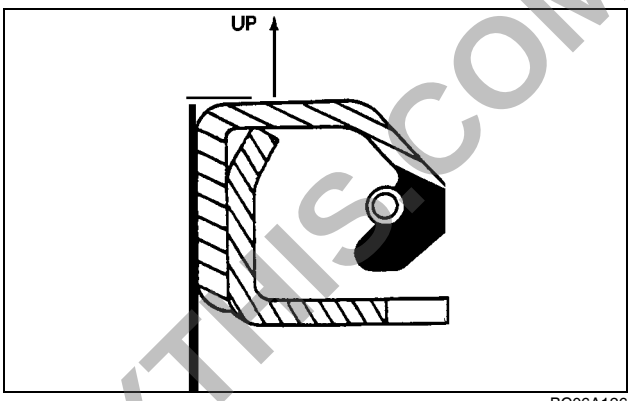
BC06A124

30. Tighten a nut (18) on the screw (19) until the bottom bearing cup (26) is seated against the spacer (24).
31. Remove the bearing driver (17) and plate (21) from the bottom pivot (29).
32. Put the bearing retainer (13) in place on the lower pivot bearing (12).
33. Install the bearing driver and plate.



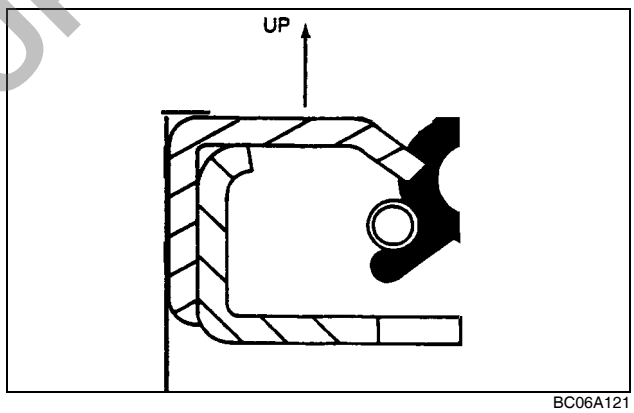
BC06A125

34. Tighten a nut (18) on the screw (19) until the bearing retainer (13) is tight against the lower pivot bearing assembly (12).
35. Measure the gap (30) between the bearing retainer (13) and the bottom pivot (29). Make a record of the measurement. Subtract 0.0762 to 0.1016 mm (0.003 to 0.004 inch) from the measurement. Select shims (8) equal to that value.
36. Remove the bearing driver (17), plate (21) and bearing retainer (13) from the bottom pivot.
37. Install the shims (8), the bearing retainer (13), washers (2) and M12 bolts (1).
38. Apply one drop of 15W40 engine oil to each bolt and immediately torque the M12 bolts (1) to 124 - 132 Nm (91 - 97 pound-feet).
39. Fill the seal (6) for the bearing retainer (13) with grease.
40. Install the seal (6) in the bearing retainer (13). The bottom of the seal (6) must be even with the bearing retainer (13).



BC06A126

41. Install the other seal (6) in the bottom pivot. The top of the seal (6) must be even with the top of the bottom pivot.



BC06A121

42. Install the lower bearing spacer (11) and the bottom spacer (14).
43. Apply grease to the lower pivot pin (10).
44. Install the lower pivot pin (10) in the bottom pivot.
45. Hold the bottom spacer (14) in place and lubricate the bottom pivot until grease is forced out of the seal (6).
46. Rotate the lower pivot pin (10) to check the bearing assembly. The lower pivot pin (10) must rotate smoothly, but not easily.
47. Remove the lower pivot pin (10) and the upper pivot pin (4).
48. Remove the bottom spacer (14).

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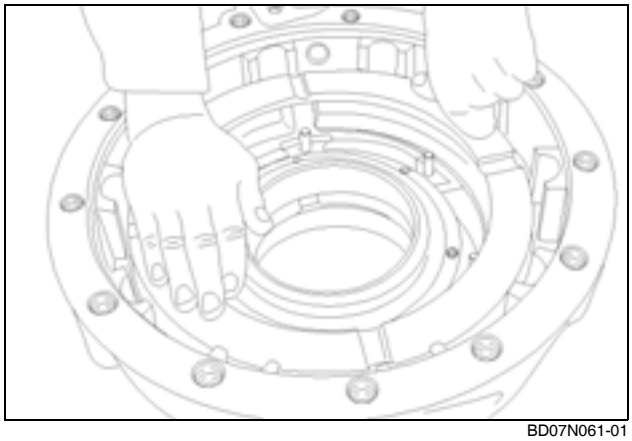
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NOTES

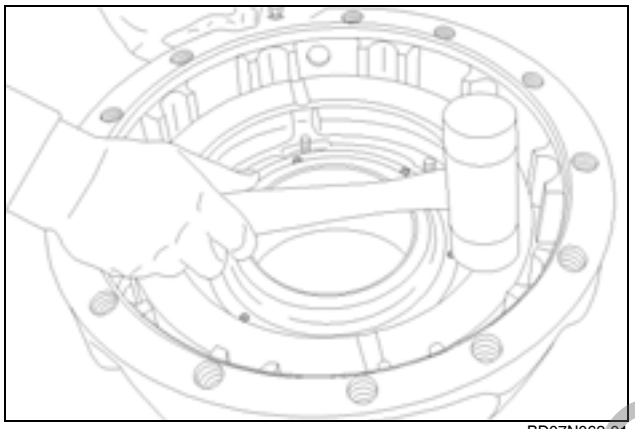
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STEP 58



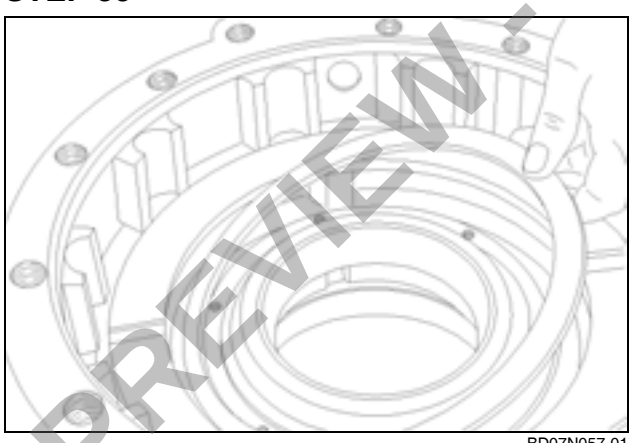
BD07N061-01



BD07N062-01

Apply oil on the sliding surface of the brake piston, Carefully install piston in the brake housing.

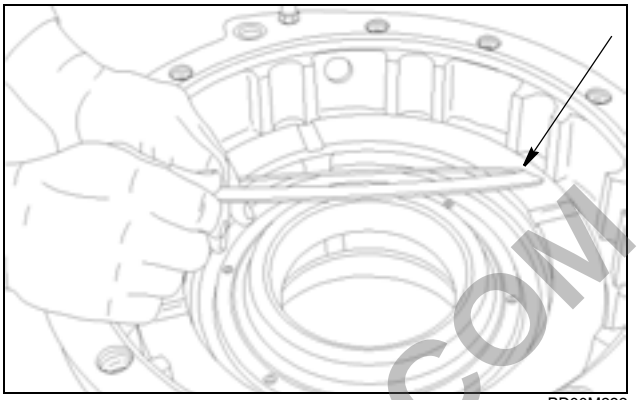
STEP 59



BD07N057-01

Install shim into the brake housing.

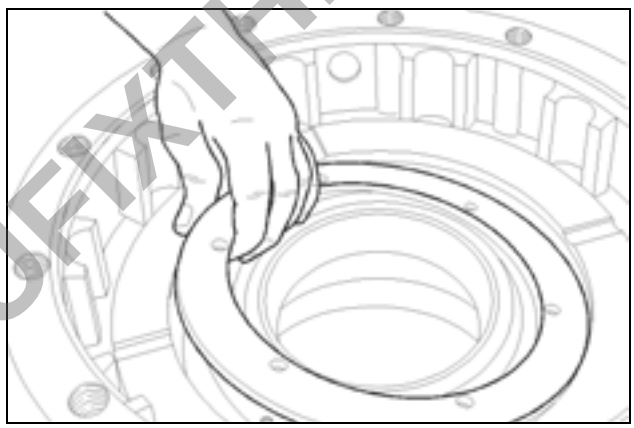
STEP 60



BD00M283

Install return spring in the brake housing. Install with the tapered end facing upward.

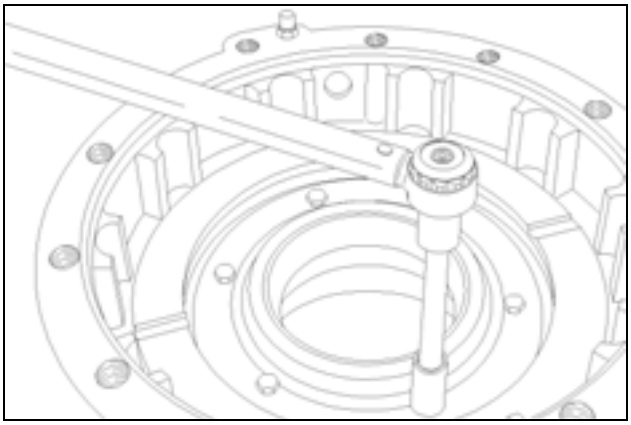
STEP 61



BD07N054-01

Install the return spring retainer into the brake housing.

STEP 62



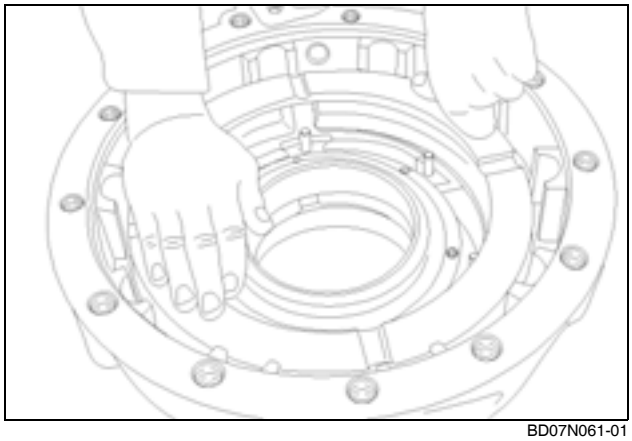
BD00M285

Install the six bolts into the return spring retainer and tighten to 34 Nm (25.1 pound feet).

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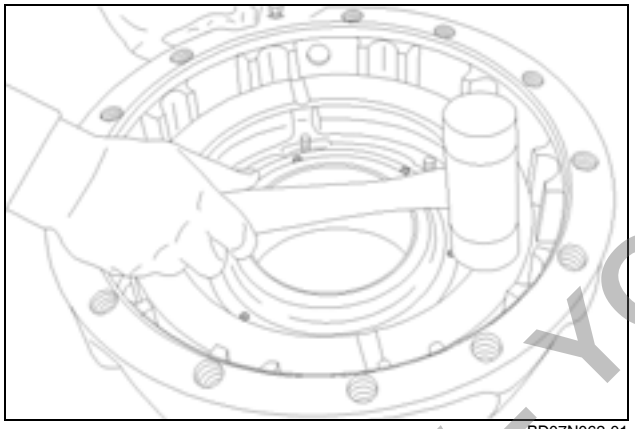
STEP 56



BD07N061-01

Apply oil on the sliding surface of the piston, back-up rings, seals and wear ring. Carefully install piston in the brake housing.

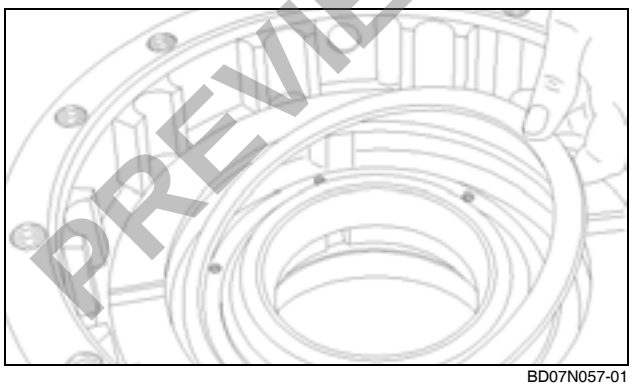
STEP 57



BD07N062-01

Using a plastic mallet fully seat the brake piston. Strike piston on alternate sides to seat piston evenly.

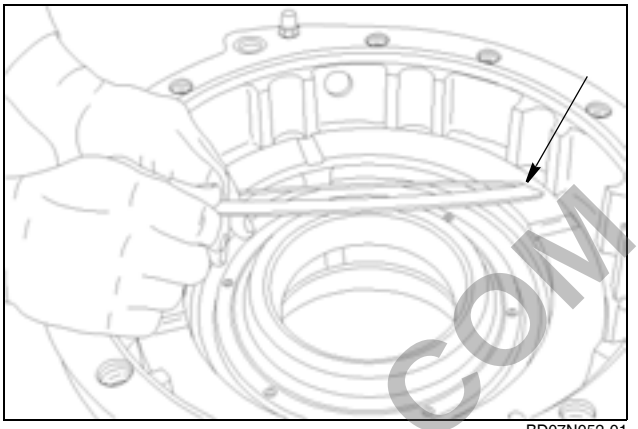
STEP 58



BD07N057-01

Apply oil to both sides of return spring shim and install in brake housing.

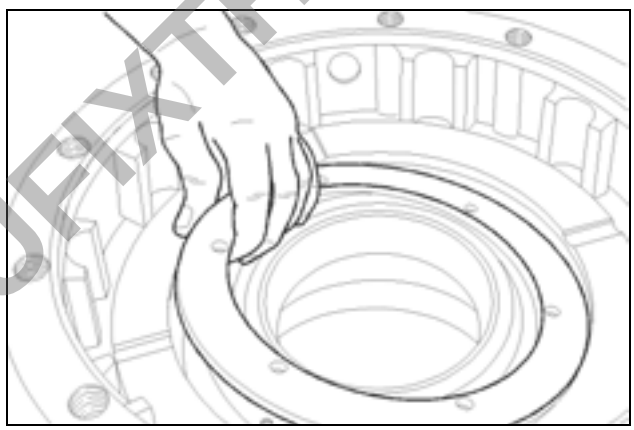
STEP 59



BD07N052-01

Install the brake return spring, make sure that the tapered end of the spring is facing up.

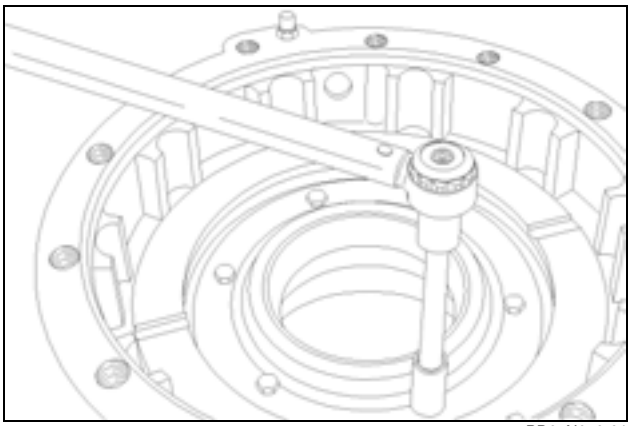
STEP 60



BD07N054-01

Install the brake spring retainer.

STEP 61



BD07N050-01

Install the six retainer bolts and tighten to a torque of 34 Nm (25 pound feet).

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CHANGING TIRES

WARNING: *The split rim wheels used on this machine can be dangerous. When inflating a tire on the machine, use a self-locking nozzle and stand at the front or rear of the tire.*

When inflating a tire off the machine, put the wheel in a tire inflation cage. The retaining ring and rim can come off with enough force to result in death to a person in front of the rim.

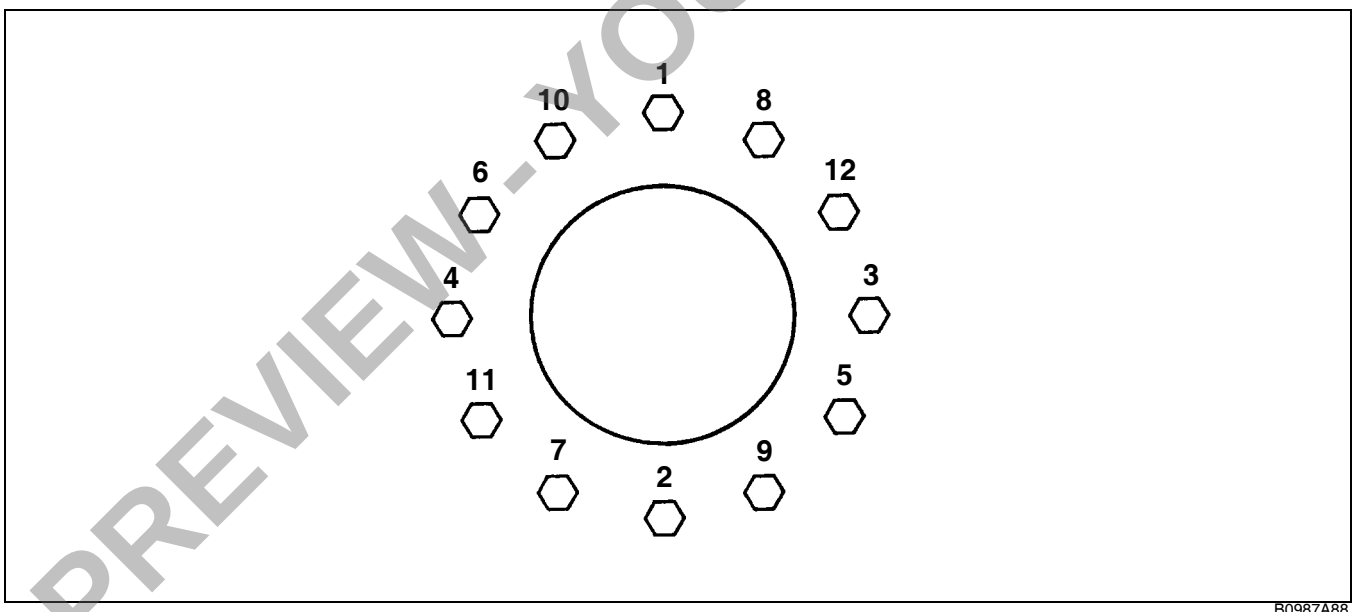
48-44

1. Have a qualified tire mechanic service the split rim wheels used on this machine.
2. The correct tire equipment, especially a tire inflation cage, is required. Using the wrong procedure for a split rim wheel can result in death.

IMPORTANT: *When installing a Michelin tire, lubricate the tire with a tire mounting lubricant and inflate the tire to 551 kPa, 5.5 bar (80 psi) to make sure that the tire is seated on the rim. Then decrease the pressure to the specified pressure.*

INSTALLING A WHEEL

1. Make sure the mounting surfaces of the rim and axle flange are clean and free of dirt and grease.
2. Install the wheel, hardened washers and wheel bolts.
3. Use a hand wrench (not an impact) to tighten the wheel bolts to pull the wheel against the planetary housing. DO NOT use an impact wrench to tighten the wheel bolts.
4. Tighten the wheel bolts to 298 Nm (220 pound-feet) in the sequence shown in Figure 1. Then tighten the wheel bolts in the same sequence to 640 to 720 Nm (475 to 530 pound-feet).



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FIGURE 1. WHEEL BOLT TORQUE SEQUENCE

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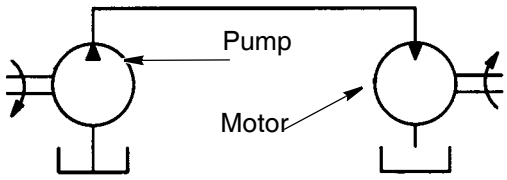
Hydraulic Motor Symbols



Nonreversible Motor Reversible Motor

BS07B639

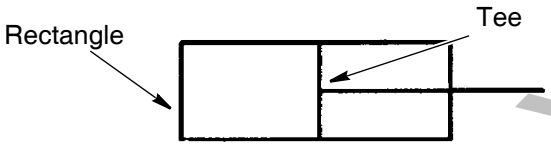
Hydraulic motor symbols are circles with black triangles, but opposite a pump the triangles point inward to show the motor is a receiver of oil. One triangle is used for a non-reversible motor and two triangles are used for a reversible motor.



BS07B640

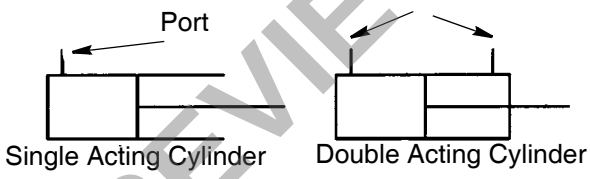
A simple schematic diagram is shown with a hydraulic motor connected to a hydraulic pump.

Cylinder Symbols



BS07B641

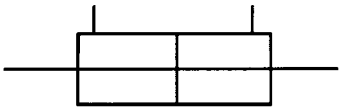
A cylinder symbol is a simple rectangle representing the barrel. The piston and rod are represented by a tee that is inserted into the rectangle. The symbol can be drawn in any position.



BS07B642

If the cylinder is single acting, there is only one port shown on the symbol. The port is shown on the end of the cylinder that receives pressurized fluid and the opposite end of the cylinder is left open.

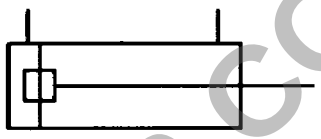
A double acting cylinder symbol has both ends closed and has two ports on the symbol.



Double Rod End Cylinder

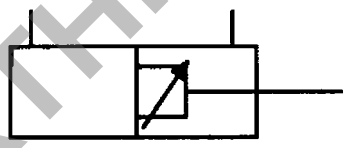
BS07B643

A double rod end cylinder has a rod extending from each end of the rectangle.



Single Rod End Fixed Cushion Both Ends

BS07B644



Single Rod End Adjustable Cushion Rod End Only

730LBE

SINGLE ROD END ADJUSTABLE CUSHION ROD END ONLY

Some cylinders have cushions built into them. The cushion slows down the movement of the piston as it nears the end of its stroke. Cylinder cushions are shown as a smaller rectangle on the piston. If the cushion has an adjustable orifice, a slanted arrow is drawn at 45 degrees across the symbol.

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Installation

STEP 208

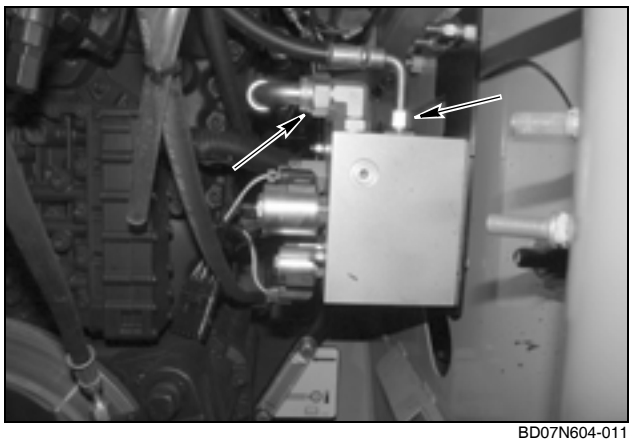
Place the fan reversing valve into position on the machine.

STEP 209

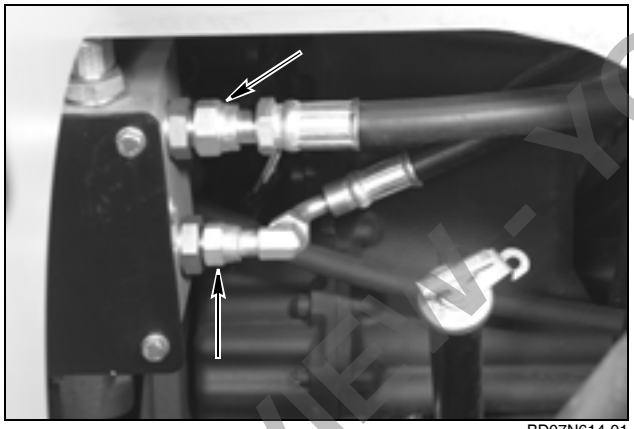
Lubricate and install new O-rings in the fittings.

STEP 210

Install the bolts, washers and nuts. Tighten the nuts.



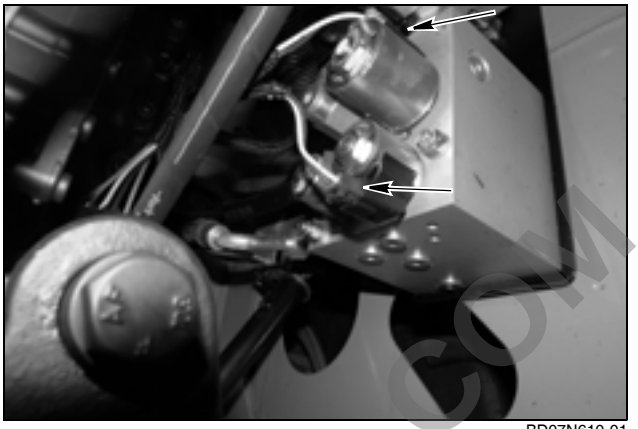
BD07N604-011



BD07N614-01

Remove caps from fittings and plugs from hoses. Connect hoses to the fan reversing valve, remove and discard tags.

STEP 211



BD07N610-01

Connect the electrical connectors on the fan reversing valve.

STEP 212

Turn off the vacuum pump and disconnect from the hydraulic reservoir.

STEP 213

Check the level of the hydraulic oil in the reservoir.

STEP 214

Start the engine and run the engine at low idle for two minutes.

STEP 215

Stop the engine and check for hydraulic oil leakage at the fan reversing valve.

STEP 216

Put the articulation lock in the OPERATING position.

STEP 217

Check the level of the hydraulic oil in the reservoir and add as required. Tighten the filler cap on the reservoir.

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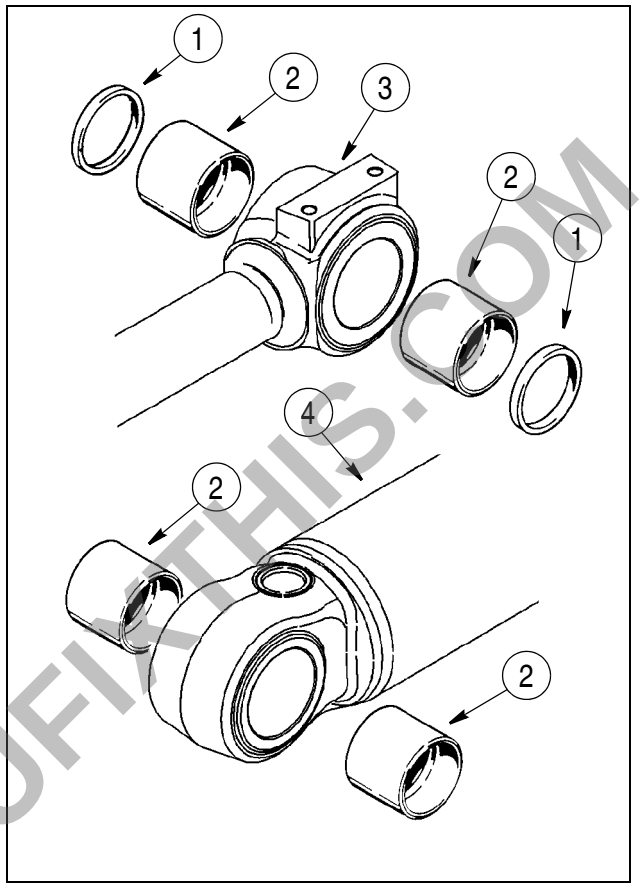
REPLACING BUSHINGS FOR THE BUCKET CYLINDER Z-BAR MODELS

Disassembly

1. Put the piston rod eye (3) in a press, refer to Figure 6.
2. Use an acceptable driver to press the wipers (1) and bushing (2) out of the piston rod eye (3).
3. Put the tube (4) in a press.
4. Use an acceptable driver to press the bushings (2) out of the tube (4).
5. Clean the bore for the bushings (2) in the piston rod eye (3) and the tube (4).

Assembly

1. Use an acceptable driver to press new bushings (2) into the piston rod eye (3). Refer to Figure 6.
2. Use an acceptable driver to install the wipers (1) in the piston rod eye (3). The lips of the wipers (1) must be towards the outside of the bore.
3. Use an acceptable driver to press new bushings (2) into the tube (4).



BS01C004

1. WIPER
2. BUSHING
3. PISTON ROD EYE
4. TUBE

FIGURE 6. BUSHING AND WIPER REMOVAL AND REPLACEMENT BUCKET CYLINDER

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