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 applicable if special graphities, Molydisulfide

Grade 8 Bolts, Nuts, and Studs


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MAINTENANCE SCHEDULE

Model 721E

SERVICE INTERVAL	ITEM NUMBER	SERVICE POINTS	Initial Service	FREQUENCY IN HOURS						
				CHECK	CLEAN	CHANGE	DRAIN	LUBRICATE	REPLACE	ADJUST
Variable Periodic (*)	29	Air cleaner		*	*					
	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						
	18	Bleed Fuel Filter of Condensation					50			
	3	Check Transmission Oil Level		50						
	4	Check Hydraulic Oil Level		50						
	5 & 6	Grease Bucket Mounting Fittings						50		
First 100 Hours	17	Change Engine Oil and Filters	100							
	18 & 26	Replace Fuel Filters	100							
	19	Change Hydraulic Filter	100							
	21	Change Oil in Axles	100							
Every 100 Hours	9	Grease Front Drive Shaft Support Bearing						100		
	8	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 & 23	Check Cab Air Filter		250						
	22	Check Drive Belt		250						
	13	Check Radiator Coolant Level		250						
	14	Check Tire Pressure & Wheel Torque	4	250						
	XX	Trans Clutch Calibration (See Section 6002)	250	1000						
Every 500 Hours	17	Change Engine Oil and Filter				500				
	17	Change Crankcase Filter				500				
	15	Check Axle Oil Level		500						
	16	Check Battery Electrolyte Level		500						
	26	Replace Fuel Filter							500	
	18	Drain Fuel Tank Condensation & Water Separator					500			
Every 1000 Hours	19	Replace Hydraulic Oil filter							1000	
	20	Grease Articulation Fittings						1000		
	21	Change Front & Rear Axle Oil				1000				
	22	Replace Cab Air Filter							1000	
	24	Change Transmission Oil and Filter				1000				
	XX	Replace Drive Belt							1000	
	XX	Check Injector Calibration		1000						
	XX	Check Valve Adjustment (Engine Manual)		1000						
	XX	Trans Clutch Calibration (See Section 6002)		1000						
Every 2000 Hours	26	Change Hydraulic Oil				2000				
	27	Change Coolant				2000				
	28	Replace Engine Air Cleaner							2000	
	XX	Valve Clearance (Engine Manual)								2000
Every 6000 hours	XX	Engine Injectors (Engine Manual)			6000					
	XX	Fuel Pump (Engine Manual)			6000					6000

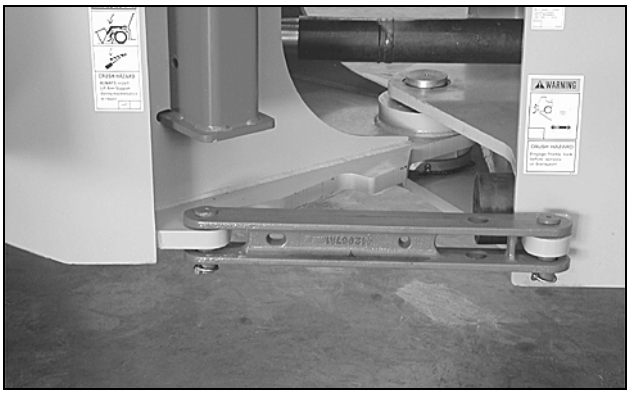
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ENGINE

Removal

STEP 1



BD03A040

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

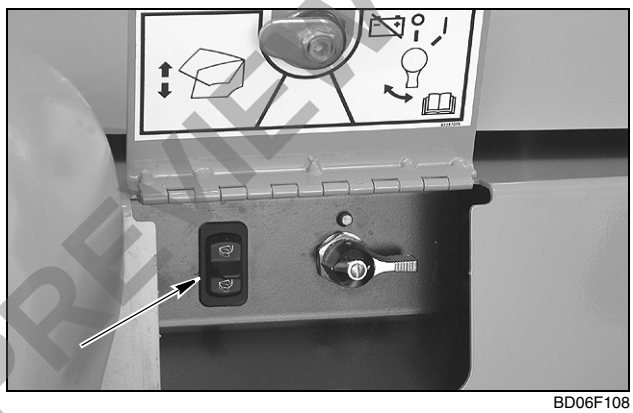
STEP 2

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



BD06F108

The master and hood raise switch are located in the right batter box. Raise the hood with the hood lift motor. Put master disconnect switch in OFF position. Remove both battery covers and disconnect batteries from the machine.

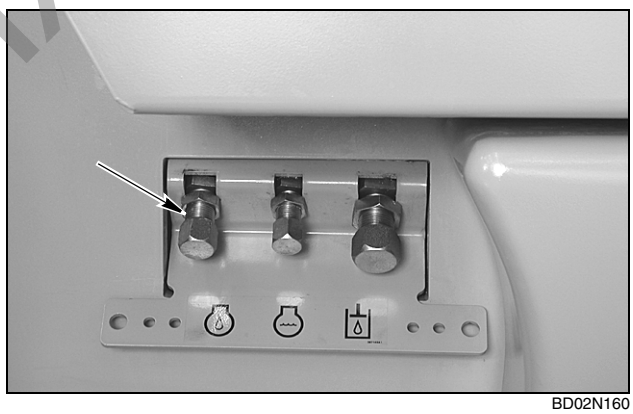
STEP 5



BD02N160

Put a 37 liter (10 gallon) container 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 14.2 liter (15 U.S. quarts) container 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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PERFORMING STALL TESTS

Test No. 1 - Torque Converter and Hydraulic Stall Together

1. Sit in the seat.
2. Start the engine and run the engine at low idle.
3. Press the brake pedal, release the park brake, shift into Forward.
4. Run engine at low idle. Push the clutch cutout switch to OFF. Put the transmission in manual mode. Push down and hold the brake pedal for the remainder of this procedure.
5. Turn the transmission control lever to third gear.
6. Increase the engine speed to full throttle.
7. Hold the bucket control lever in the ROLLBACK position and raise the lift arms.

NOTE: *The stall speed must be read while the lift arms are in motion.*

8. Check the engine speed.
9. Release the bucket control lever.
10. Decrease the engine speed to low idle.
11. Lower the bucket to the ground, place the transmission in neutral and apply the parking brake.
12. Stop the engine.

Understanding the Results of Test No. 1

1. If the engine speed was as specified, the engine, torque converter, transmission and hydraulic system are probably good.
2. If the engine speed was not as specified, do Test No. 2 and 3.

Test No. 2 - Torque Converter Stall

1. Sit in the seat.
2. Start the engine and run the engine at low idle.
3. Press the brake pedal, release the park brake, shift into Forward.
4. Run the engine at low idle.
5. Push down and hold the brake pedal for the remainder of this test.
6. Turn the transmission control lever to third gear.
7. Increase the engine speed to full throttle.
8. Check the engine speed.
9. Decrease the engine speed to low idle.
10. Place the transmission in neutral and apply the parking brake.
11. Stop the engine.

Understanding the Results of Test No. 2

1. If the engine speed was as specified, the engine, torque converter and transmission are probably good.
2. If the engine speed was more than specified, the problem can be in the torque converter or the transmission. See Section 6002 for troubleshooting information.
3. If the engine speed was less than specified, do Test No. 3.

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Test No. 3 - Hydraulic Stall

1. Sit in the seat.
2. Start the engine and run the engine at low idle.
3. Increase the engine speed to full throttle.
4. Hold the bucket control lever in the ROLLBACK position and raise the lift arms.

NOTE: *The stall speed must be read while the lift arms are in motion.*

5. Check the engine speed.
6. Release the bucket control lever.
7. Decrease the engine speed to low idle.
8. Lower the bucket to the ground.
9. Stop the engine.

Understanding the Results of Test No. 3

1. If the engine speed was as specified, the engine and hydraulic system are good.
2. If the engine speed was more or less than specified the main relieef setting may be too low or too high. See Section 8002 for troubleshooting information.
3. If the engine speed was less than specified in all tests, the engine is probably the cause.

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Wire Identification Codes

21C Bk - 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 Name

Wire Identification			From Connector		To Connector	
Wire	**Circuit**	**Color, Size, and Material**	**Connector**	**Cavity**	**Connector**	**Cavity**
55A C	RTT Float Sw Power	W 0.8 GXL	SFL, Return to Travel Switch	3	SPL-RTT, Ultrasonic	A
55B	RTT Float Switch Control	W 0.8 GXL	SFL, Return to Travel Switch	5	EM, RTD Height Control RTT	6
56 A	Fan Control PWM	W 1.0 SXL	ENG, Engine Cab	23	YFN, Fan PWM Solenoid	A
57 A	Pin Engage Sol Pwr	W 0.8 GXL	CAB-F, Cab Front Chassis	20	SPL-PINE, Ultrasonic	A
57 B	Pin Engage Sol Pwr	W 0.8 GXL	SPE, Pin Engage Switch	1	SPL-PINE, Ultrasonic	A
57 C	Pin Engage Sol Pwr	W 0.8 TXL	SPL-PINE, Ultrasonic	A	AIC-2, Adv Instrument Cluster 2	16
58C	Ride Control Switch Jumper	W 0.8 GXL	SRC, Ride Control Switch	5	SRC, Ride Control Switch	3
58H A	Ride Control Sw Pwr VPS2	W 0.8 TXL	TECM, Trans	8	ECD, Elect Center D	D7
58L	Ride Control Relay LSD	Bk 0.8 TXL	TECM, Trans	57	ECD, Elect Center D	B8
58S E	Ride Control Sol to Front Cab	W 1.0 SXL	FRONT, Cab Front Chassis	21	YRC, Ride Control Option	1
58T	Ride Control Relay Sw Pwr	W 0.8 GXL	SRC, Ride Control Switch	4	ECD, Elect Center D	B7
58 A	Ride Control Sol Pwr	W 1.0 SXL	202M, Rollback Jumper	A	202M, Rollback Jumper	B
58 B	Ride Control Sol Pwr	W 1.0 SXL	FRONT, Cab Front Chassis	21	PRBF, Rollback Pressure Switch	B
58 C	Ride Control Sol Pwr	W 0.8 GXL	CAB-F, Cab Front Chassis	21	SPL-D26, Ultrasonic	A
58 D	Ride Control Sol Pwr	W 0.8 GXL	140M, Diode Module	D	SPL-D26, Ultrasonic	A
58 E	Ride Control Sol Pwr	W 0.8 GXL	SPL-D26, Ultrasonic	A	ECD, Elect Center D	D8
58 F	Ride Control Sol Pwr	W 0.8 GXL	SRC, Ride Control Switch	6	SPL-D26, Ultrasonic	A
59D	Hood Relay Control Down	W 1.0 GXL	CAB-E, Cab Engine	37	ECC, Work Lights	D3
59D A	Hood Relay Control Down	W 1.0 SXL	ENG, Engine Cab	37	HD, Hood Switch	A
59U	Hood Relay Control Up	W 1.0 GXL	CAB-E, Cab Engine	39	ECC, Work Lights	D1
59U A	Hood Relay Control Up	W 1.0 SXL	ENG, Engine Cab	39	HD, Hood Switch	C
60D	Hood Down Relay Out	W 1.0 GXL	CAB-E, Cab Engine	36	ECC, Work Lights	B3
60D A	Hood Down Relay Out	W 1.0 SXL	ENG, Engine Cab	36	HDM, Hood Lift Motor	2
60U	Hood Up Relay Out	W 1.0 GXL	CAB-E, Cab Engine	38	ECC, Work Lights	B1
60U A	Hood Up Relay Out	W 1.0 SXL	ENG, Engine Cab	38	HDM, Hood Lift Motor	1
61A	Trinary Press Sw Input	W 1.0 SXL	ENG, Engine Cab	30	PR, Trinary Press Sw	A
61A B	Trinary Press Sw Input	W 0.8 GXL	CAB-E, Cab Engine	30	HVAC1, HVAC1	1
61C	AC Relay Out	Or 0.8 GXL	CAB-E, Cab Engine	2	ECD, Elect Center D	D10
61C A	AC Relay Out	Or 1.0 SXL	ENG, Engine Cab	2	ACT, AC Comp Clutch	1
61C B	AC Relay Out	Or 1.0 SXL	ENG, Engine Cab	2	ACT-9, AC Comp Clutch	1
61R	AC Relay Control	W 1.0 SXL	ENG, Engine Cab	29	PR, Trinary Press Sw	B

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92 – Flasher Module

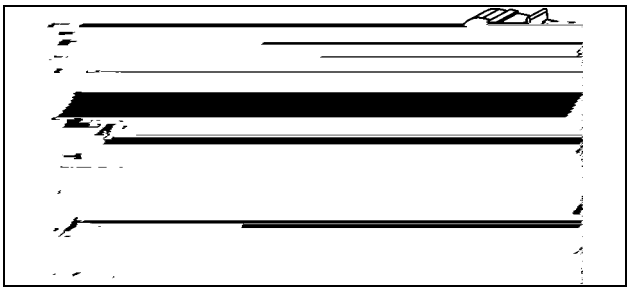
Located in the cab access panel for fuses and relays, rear of compartment.

Check Points	Correct Reading	Possible Cause of Bad Reading
NOTE: *Wiring harness connectors 64F and 64M must be connected for North American Machines for opposite side steady on operation and disconnected for European machines for opposite side off operation.*		
Terminal for wire 0-EG to ground	Continuity	Bad ground circuit.
Terminal for wire 0-EH to ground	Continuity	Bad ground circuit.
Terminal for wire 45N-A to terminal for wire 45N-B (North American machines only)	Continuity	Bad 45N circuit.
NOTE: *Put master disconnect switch in ON position.*		
Terminal for wire 1-DU to ground	24 volts	Check fuse ECC-F4. Also check wires 1-DU and 1-DV.
NOTE: *Put ignition switch in the ON position. Put the hazard switch (93) ON.*		
Terminal for wire 45H to ground	24 volts	Bad hazard switch (93). Also check wire 45H.
Terminal for wire 45L-D to ground	Intermittent 24 volts	Bad flasher module.
Terminal for wire 45R-E to ground	Intermittent 24 volts	Bad flasher module.
NOTE: *Put hazard switch (93) in OFF position. Put turn signal switch (94) in RIGHT turn position.*		
Terminal for wire 45B-A to ground	24 volts	Bad turn signal switch (94) or fuse ECA-F8. Also check wires 45B-A and 45B.
Terminal for wire 45R-E to ground	Intermittent 24 volts	Bad flasher module.
NOTE: *Put turn signal switch (94) in LEFT turn position.*		
Terminal for wire 45A-A to ground	24 volts	Bad turn signal switch (94) or fuse B. Also check wire 45A-A.
Terminal for wire 45L-D to ground	Intermittent 24 volts	Bad flasher module.

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CONNECTOR DM - DIODE OR



245485C1

CAV	WIRE IDENT	CIRCUIT
A	19RR	Sec. Steering Ignition Fused Pwr
B		Not Used
C	19R	Sec. Steering Ignition Fused Pwr

CONNECTOR DNS-AC-SWITCH

CAV	WIRE IDENT	CIRCUIT
1	DNS72	
2	DNS68	
4	DNS71	

CONNECTOR DNS-ACTUATOR

CAV	WIRE IDENT	CIRCUIT
5	DNS48	
6	DNS49	

CONNECTOR DNS-BLUE - ATC CONTROL PANEL

CAV	WIRE IDENT	CIRCUIT
1	DNS8	
3	DNS10	
5	DNS11	
6	DNS2	
7	DNS4	
9	DNS3	
10	DNS6	
14	DNS9	
15	DNS31	
16	DBS13	
17	DNS18	
21	DNS7	
23	DNS12	
26	DNS19	

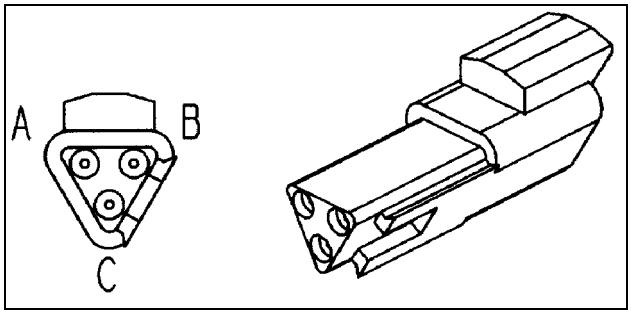
CONNECTOR DNS-COMPRESSOR-RELAY

CAV	WIRE IDENT	CIRCUIT
85	DNS19	
86	DNS20	
30	DNS16	
87	DNS14	

CONNECTOR DNS-EXTERNAL-AIR-TEMP-SNS

CAV	WIRE IDENT	CIRCUIT
1	DNS2	
2	DNS1	

CONNECTOR DNS-HVAC-CAN1



225294C1

CAV	WIRE IDENT	CIRCUIT
A	DNS9	
B	DNS8	

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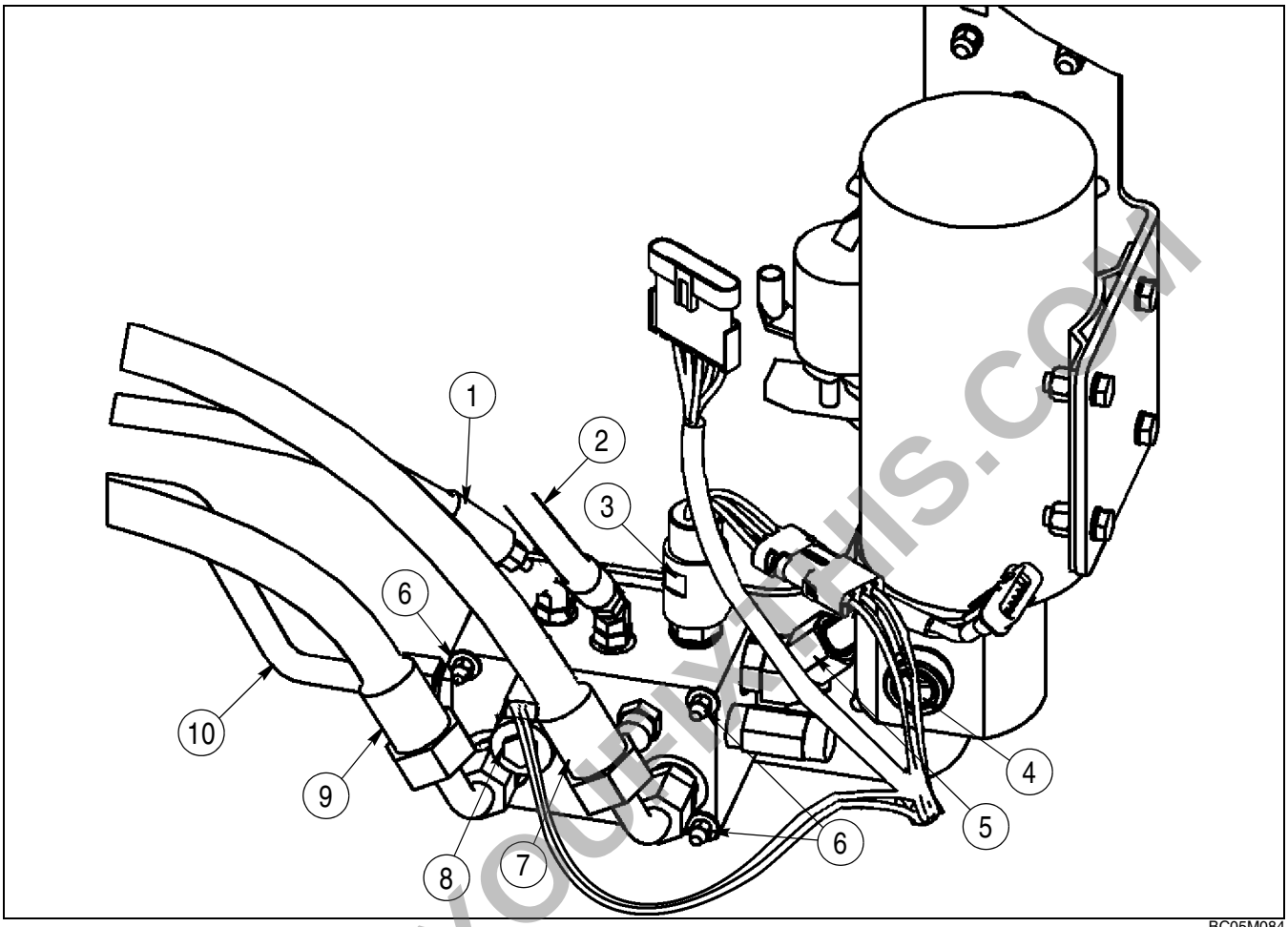
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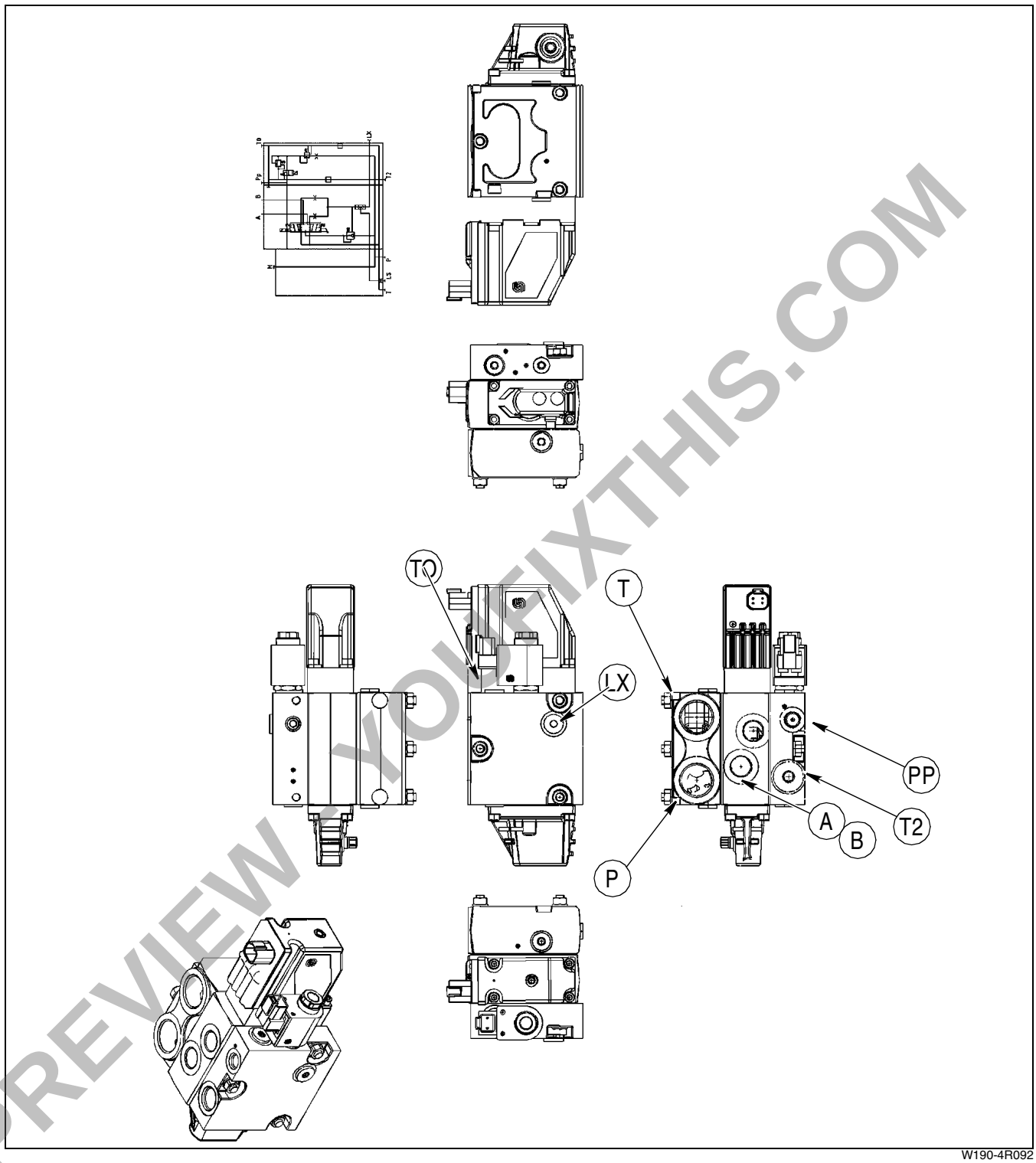
BC05M084

1. STEERING LOAD SENSING HOSE TO PRIORITY VALVE
2. STEERING LOAD SENSING HOSE TO STEERING VALVE
3. PRESSURE SWITCH
4. SUCTION PORT
5. PUMP OUT PRESSURE TUBE FITTING
6. CAP SCREWS AND NUTS
7. PRESSURE HOSE
8. STEERING SOLENOID
9. STEERING PRESSURE HOSE
10. TANK RETURN TUBE

AUXILIARY STEERING PRIORITY VALVE ILLUSTRATION

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W190-4R092

ILLUSTRATION OF THE VALVE PVG32

Connections

Ports A / B	to the steering cylinder on the stem side and bottom side 350 bar, 65 l/min	Port PP	pilot pressure switch 8 bar
		Port T	outlet 25/40 bar
LS port	to port 3 of the valve PVFC	Port T2	not used
Port P	to the steering priority valve 350 bar, 65 l/min	Port TO LX	not used

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ERROR CODES

Errors for the JSS will only be displayed if the switch is in the ON position.

The errors can be reset by turning the JSS system OFF and On. The following two errors will not reset:

- 1821r Power Supply Failure
- 1830y Activation Switch failure.

The errors will always be shown on the display once they are present. To reset these errors the engine must be turned off.

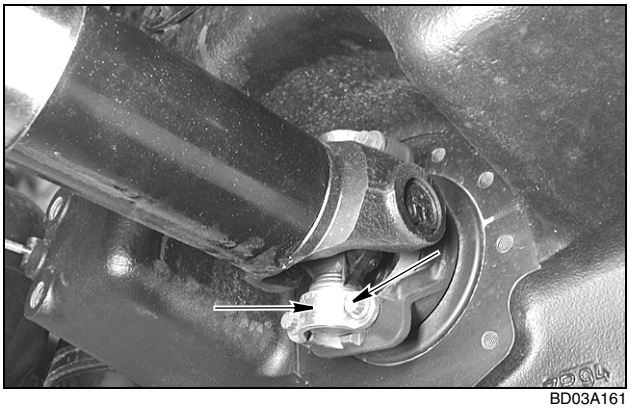
ERROR CODES TABLE

Error Item	Error	Message
1	1812	JSS Failure Armrest Switch
2	1816	JSS Activation Button Failure
3	1820	JSS Power Supply Failure
4	**1821**	**JSS Power Supply Failure JSS Active**
5	1823	JSS Relais Grd Failure
6	1824	JSS Activation Switch Short to Battery
7	**1830**	**JSS Activation Switch failure**
8	1831	JSS Error JSC
9	1832	JSS Signal Input Error JSC
10	1833	JSS Signal Output Error JSC
11	1835	JSS Valve Failure Power Supply
12	1841	JSS Valve Alarm
13	1842	JSS Valve Alarm Open Circuit
14	1843	JSS Pilot Pressure is High
15	1844	JSS Pilot Pressure Switch Short to Ground
16	1845	JSS Pilot Pressure is Low
17	1846	JSS Failure on LS Pressure Switch
18	1850	JSS Joystick Failure Neutral Switch / Power Supply
19	1852	JSS Error in Ground Connection
20	9134	JSS CAN communication failed
21	9135	JSS CAN communication failed

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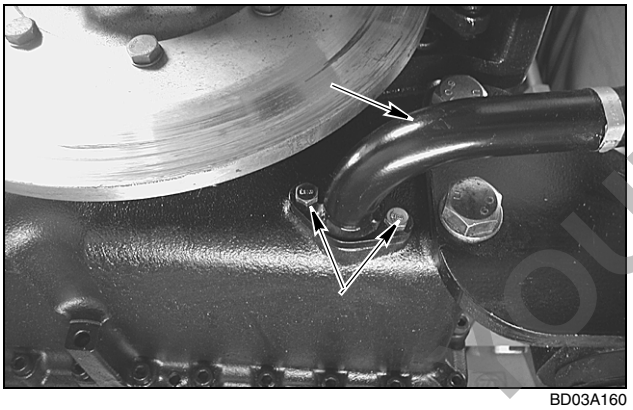
STEP 15



BD03A161

Remove four bolts and two straps securing rear drive shaft to transmission output flange. Disconnect rear drive shaft from transmission.

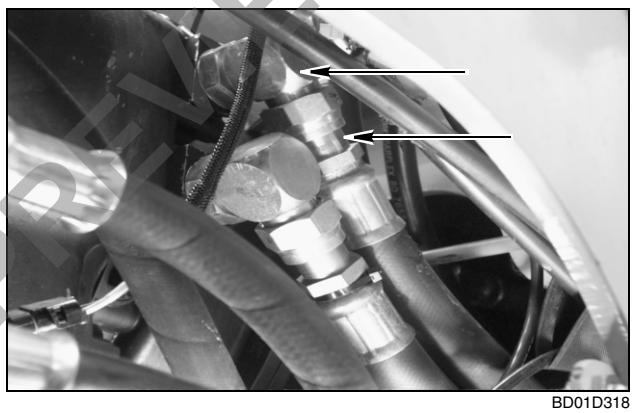
STEP 16



BD03A160

Remove two bolts. Remove fill tube, with cap and oil gauge assembled, two seals, and metal strainer. Discard seals.

STEP 17



BD01D318

Identify, tag, and disconnect cooler hose from fitting installed in LH side of transmission. Install a plug in hose. Remove and discard O-ring face seal from fitting.

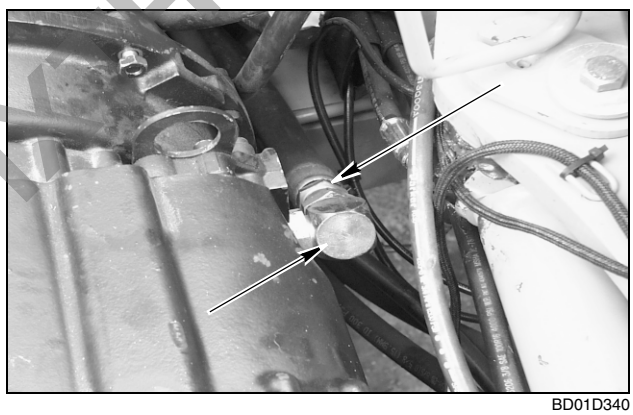
STEP 18



BD01D339

Remove fitting. Remove and discard O-ring from fitting. Install a plug in transmission port.

STEP 19



BD01D340

Repeat Steps 17 and 18 and disconnect the other cooler hose and remove fitting.

STEP 20



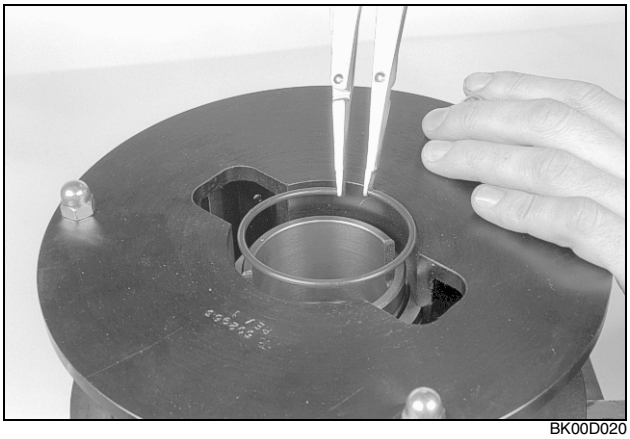
BD01D343

Connect lifting equipment to transmission lifting eyes. Take up all slack in lifting equipment.

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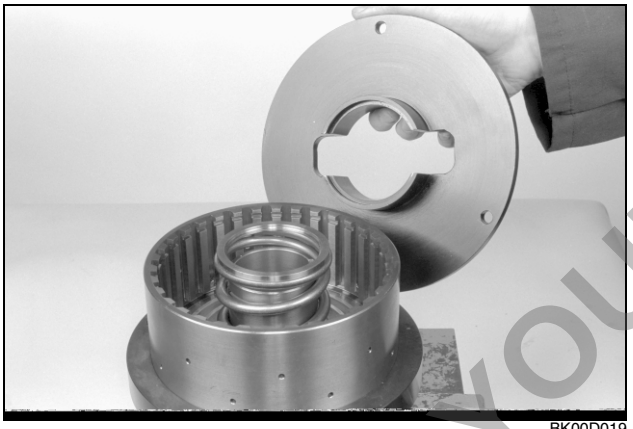
STEP 62



BK00D020

Remove the snap ring.

STEP 63



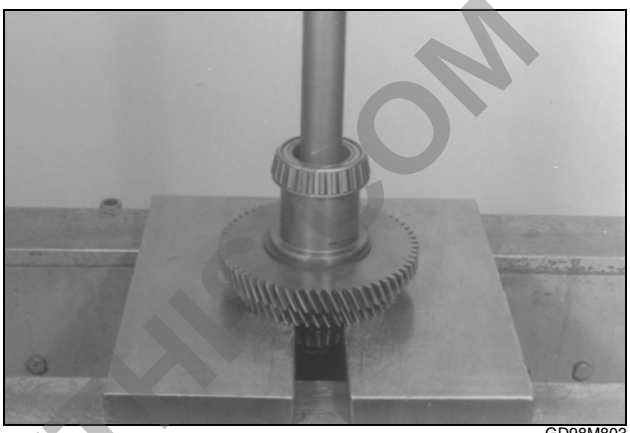
BK00D019

Remove the compression spring.

NOTE: *The following two steps are for disassembly of the input shaft.*

NOTE: *A snap ring is used to lock turbine shaft in input shaft. Snap ring will be destroyed when turbine shaft is pressed from input shaft.*

STEP 64



GD98M803

If turbine shaft is to be removed from input shaft, use proper size diameter sleeve or rod and press turbine shaft out of input shaft.

STEP 65

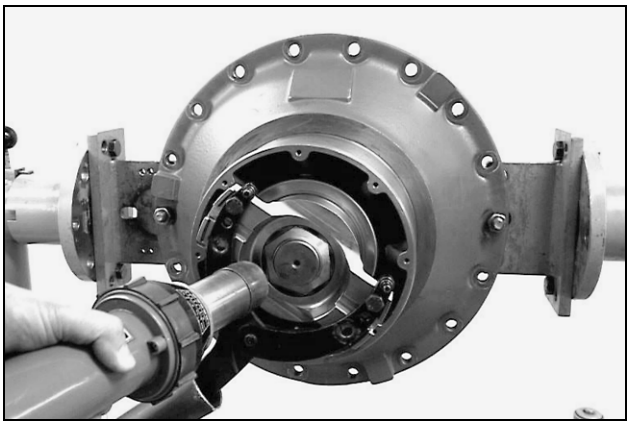
Remove bearings from input shaft using a bearing puller.

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DISASSEMBLY OF DRIVE PINION

STEP 20

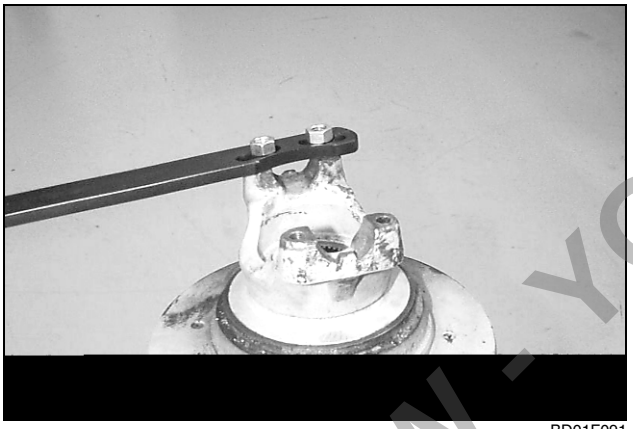


BD00M409

Heat the pinion shaft locknut with a hot air gun.

NOTE: *Locknut is held with Loctite Type No. 262.*

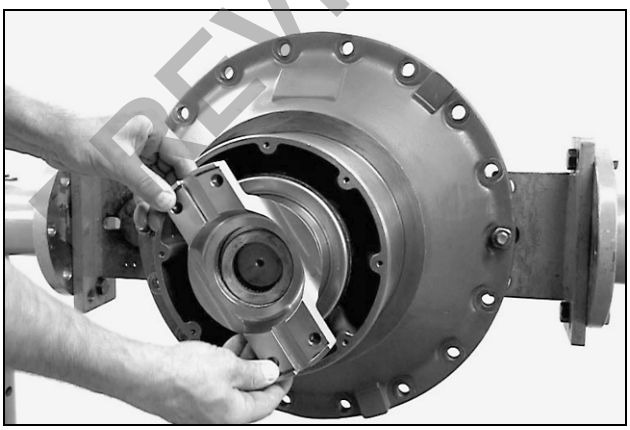
STEP 21



BD01F091

Using CAS1579A yoke holding wrench, loosen the locknut and remove the washer behind it.

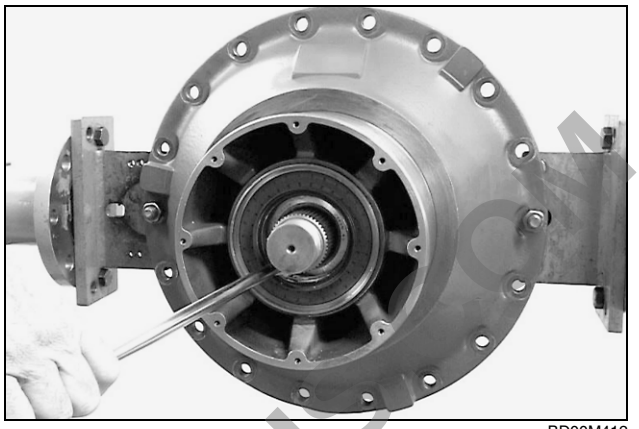
STEP 22



BD00M411

Pull the input yoke from the drive pinion shaft.

STEP 23



BD00M412

Remove the shaft seal from the differential carrier.

STEP 24

Use a rubber hammer to remove the drive pinion out of the differential carrier.

STEP 25

Take off the spacer ring and pull the bearing inner ring from the drive pinion shaft.

STEP 26



BD00M414

If necessary drive out both bearing outer rings from the differential carrier.

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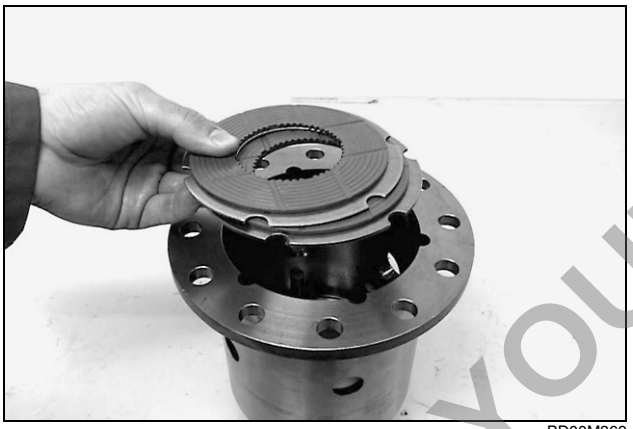
STEP 148



BD00M368

Install both thrust washers in the differential housing.

STEP 149- LIMITED SLIP DIFFERENTIAL



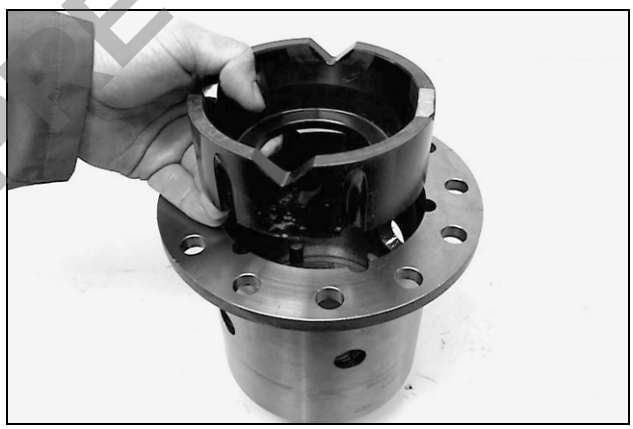
BD00M369

Starting with an outer clutch disc install alternately the outer and inner clutch discs. Thickness of disc pack must be the same on both sides.

STEP 150- OPEN DIFFERENTIAL

Install four outer clutch discs in differential housing. Thickness of disc pack must be the same on both sides.

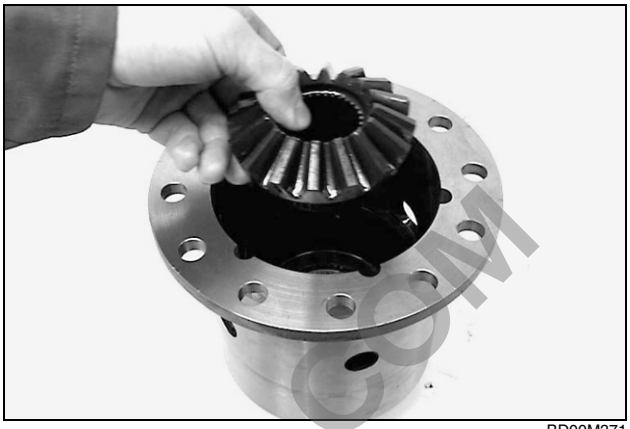
STEP 151



BD00M370

Install the pressure ring in the differential housing.

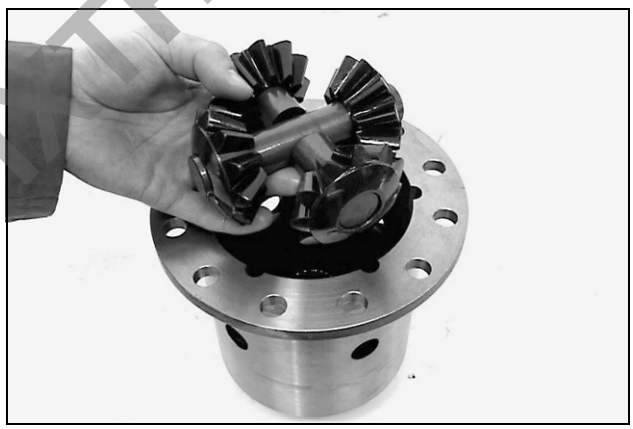
STEP 152



BD00M371

Install the axle bevel gear. Make sure axle bevel gear splines mate with splines of all inner clutch discs.

STEP 153



BD00M372

Assemble the differential spider and install into the differential housing.

STEP 154



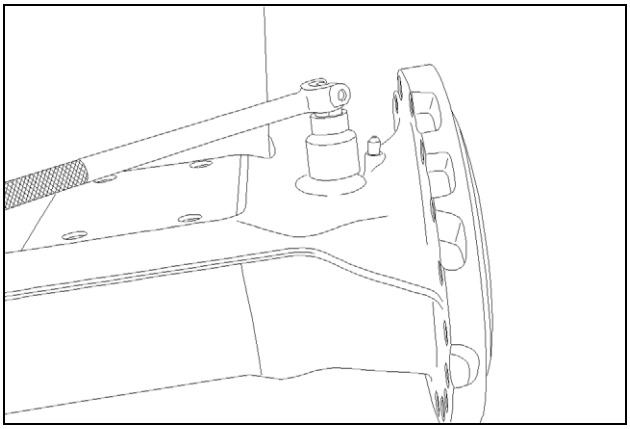
BD00M373

Install the second axle bevel gear.

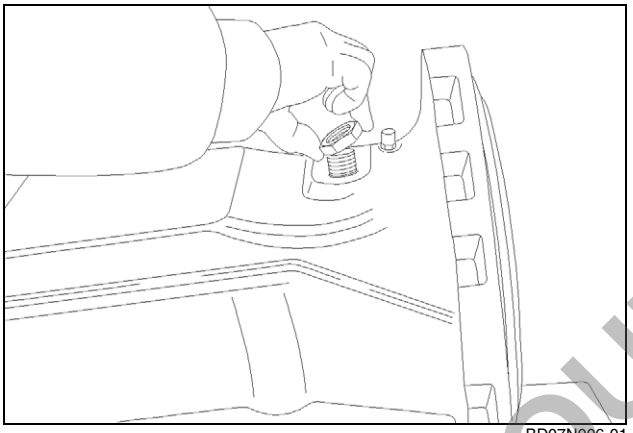
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STEP 176



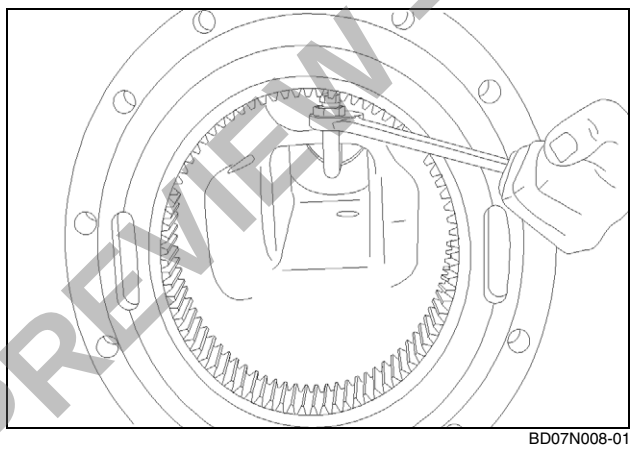
BD07N004-01



BD07N006-01

Loosen and remove the nut holding the brake tube connector to the axle housing.

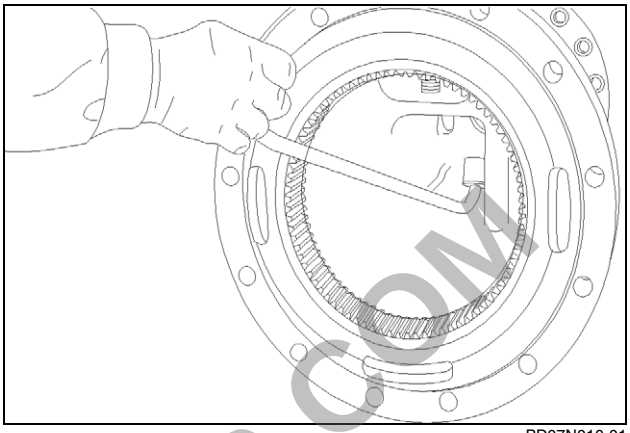
STEP 177



BD07N008-01

Loosen the opposite end of brake tube from fitting inside axle housing.

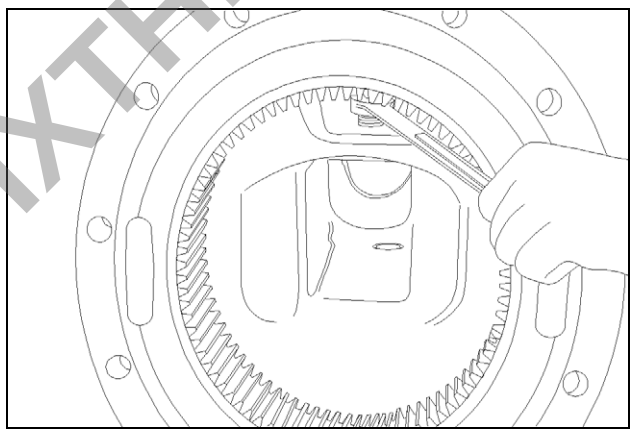
STEP 178



BD07N010-01

Remove the brake tube from the axle housing.

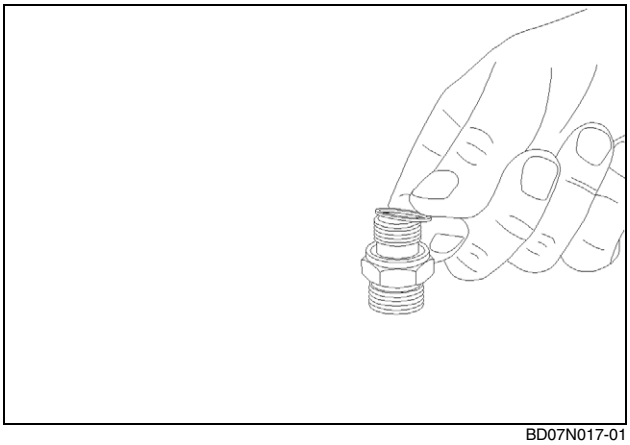
STEP 179



BD07N015-01

Loosen and remove brake tube fitting inside axle housing.

STEP 180



BD07N017-01

Remove and discard O-ring from fitting.

NOTE: *Repeat Steps 174 through 180 for the other side of the axle*

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Installation

STEP 142
Use acceptable lifting equipment to install the bucket cylinder (10) closed end on the pivot pins (7).

STEP 143
Install the grease line (9) and the nut (8) on the bucket cylinder (10).

STEP 144
Install the inner bellcrank (6) on the pivot pins (7).

STEP 145
Install the washers (5) and nuts (4) on the retaining bolts. Tighten the nuts (4).

STEP 146
Align and install the pivot pin (3) in the yoke (2).

STEP 147
Install the roll pin (1) in the yoke (2) and pivot pin (3).

STEP 148
Install the Return-to Dig target bar and proximity switch assembly. Connect the proximity switch connector to the wiring harness connector. This step applies only to the left hand bucket cylinder.

STEP 149
Remove the plugs and caps and connect the hoses to the elbows at the cylinder ports.

STEP 150
Start the engine and run the engine at low idle.

STEP 151
SLOWLY, extend and retract the piston rod three times to remove any air from the bucket cylinder (10).

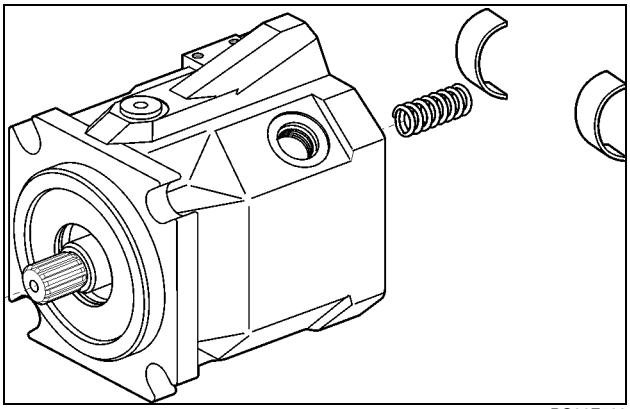
STEP 152
Lubricate the pivot pins with molydisulfide grease.

STEP 153
Check the level of the hydraulic oil in the hydraulic reservoir and add as required. See Section 1002 for the correct hydraulic oil.

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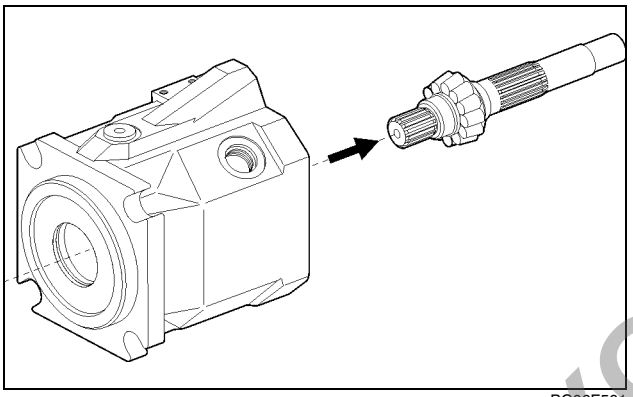
STEP 11



BC06F560

Remove the bearing and spring.

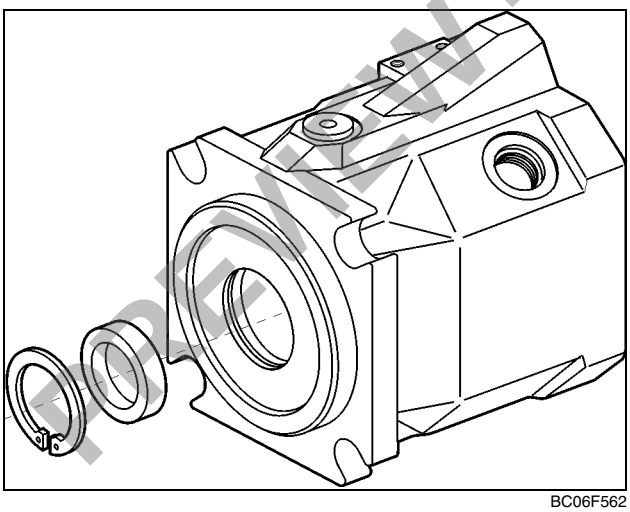
STEP 12



BC06F561

Remove the shaft and bearing.

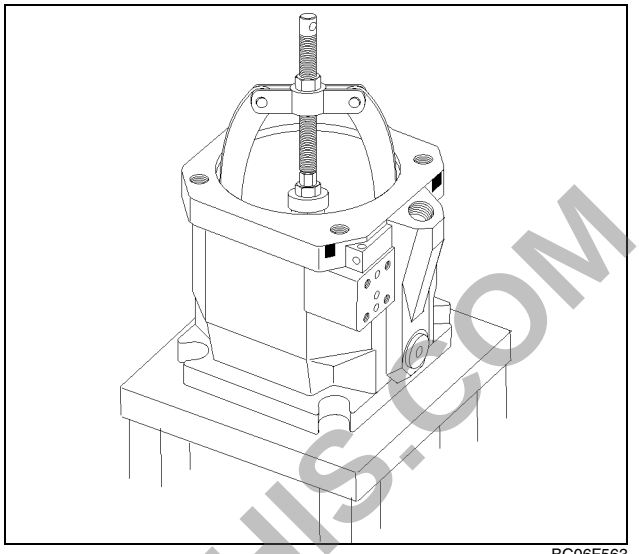
STEP 13



BC06F562

Remove the retaining ring an seal.

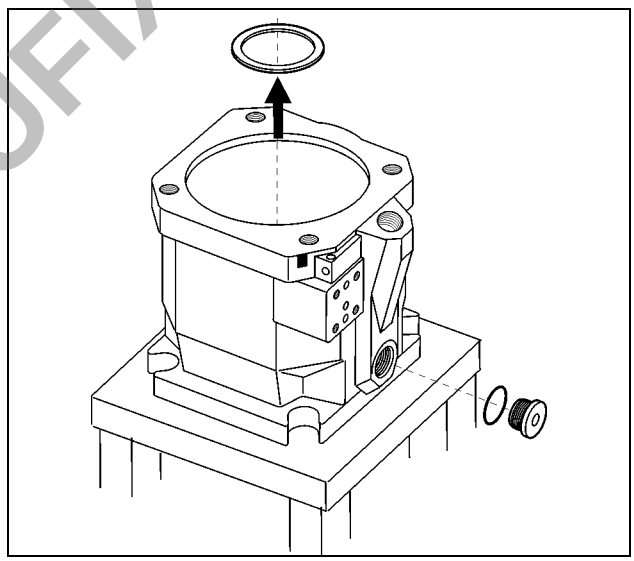
STEP 14



BC06F563

Use a suitable bearing race puller and pull the bearing race from the housing.

STEP 15



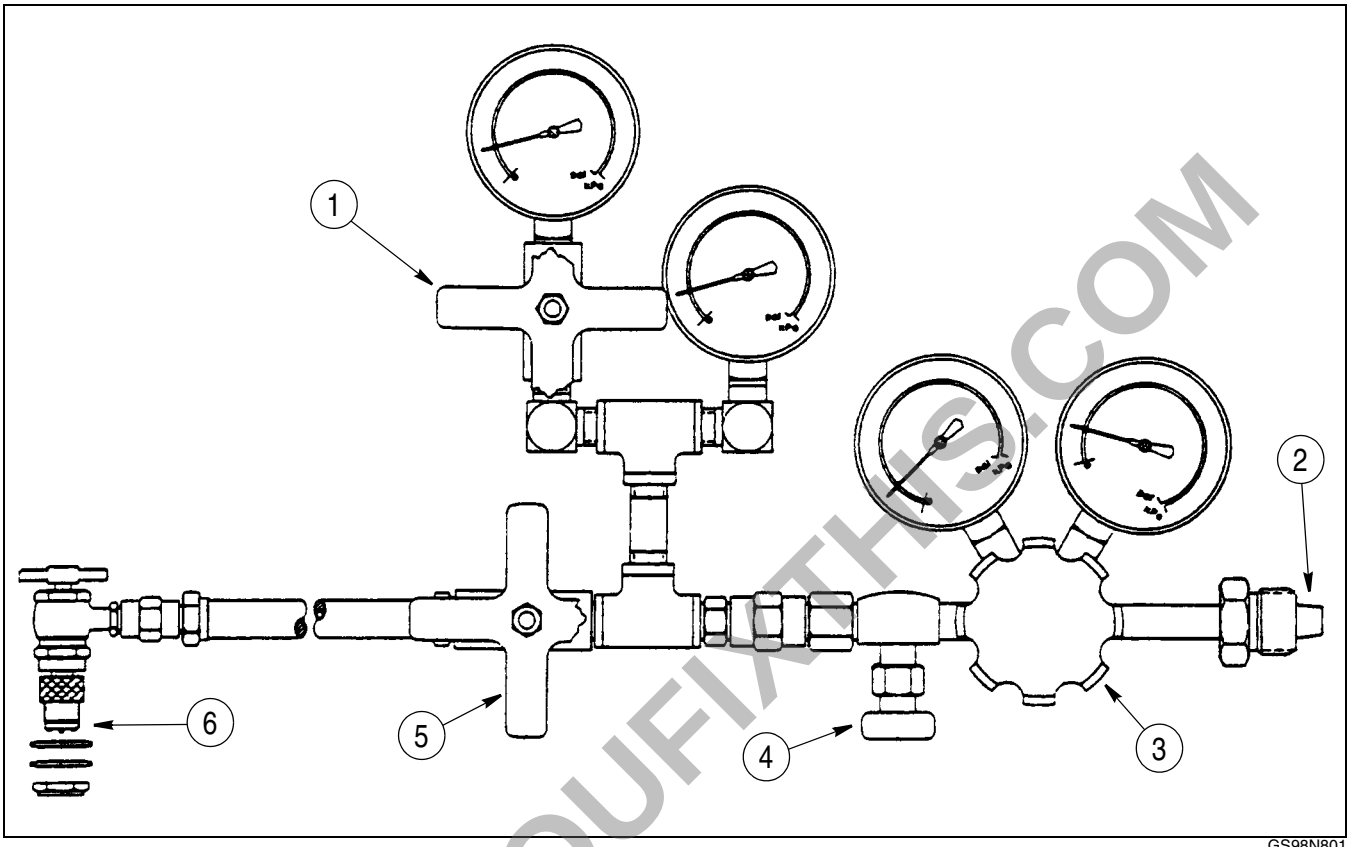
BC06F564

Remove the shim and plug.

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CHARGING THE ACCUMULATOR WITH NITROGEN



GS98N801

1. VALVE C
2. TO NITROGEN TANK
3. VALVE A
4. VALVE B
5. VALVE D
6. TO ACCUMULATOR

NITROGEN CHARGING KIT CAS10899

WARNING: *Use only nitrogen when charging the accumulator. Do not use air or oxygen that will cause an explosion.*

M253A

WARNING: *Do not drop the accumulator. A charged accumulator contains nitrogen compressed to 31 bar (450 psi). If the charging valve breaks away from the accumulator, the escaping nitrogen will propel the accumulator at a dangerous rate of speed.*

M406

WARNING: *Do not expose the accumulator to temperatures above 49° C (120° F). A charged accumulator contains nitrogen compressed to 31 bar (450 psi). High heat will cause the safety plug to blow out of the accumulator and the escaping nitrogen will propel the accumulator at a dangerous rate of speed.*

M407

IMPORTANT: *The four valves must be in the positions noted in the procedure before connecting the Nitrogen Accumulator Charging Kit to the machine or nitrogen, refer to the above illustration.*

IMPORTANT: *To help prevent equipment damage, the low pressure gauge valve C MUST BE SHUT OFF during high pressure (10 bar/150 psi and above) applications.*

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Removal

STEP 17

Park the machine on a level surface and lower the bucket to the floor.

STEP 18

If changing any air conditioning components, discharge the air conditioning system according to the instructions in Section 9003.

STEP 19



BD02N160

If changing the heater core, put a 37 liter (10 gallon) container below radiator drain. Remove radiator cap. Remove cap and drain coolant into container. Install cap after coolant has drained. Install radiator cap.

STEP 20

Place the master disconnect in the OFF position.

STEP 21

Disconnect the wiring harness from the operator's seat (if equipped with air seat option).

STEP 22



BD06G202

Remove the four bolts that fasten the operator's seat to the upper box, remove the seat from the machine.

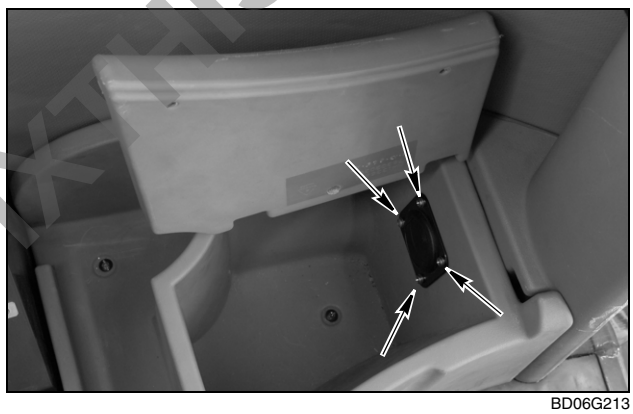
STEP 23



BD06G212

Open the cover on the cooler.

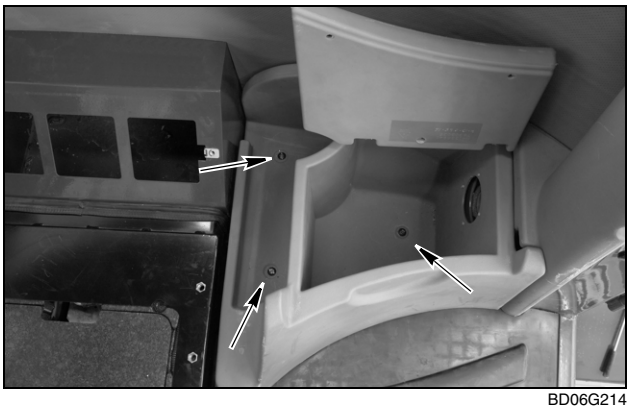
STEP 24



BD06G213

Remove the four screws securing the air vent, remove the vent cover.

STEP 25



BD06G214

Remove the three screws securing the cooler to the cab, remove the cooler.

STEP 26

Fold the rubber mat over to gain access to the upper box mounting bolts.

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