650K/750K/850K CRAWLER
Service Manual
Bur 6-47050

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Reprinted

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

Bur 6-44620

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Issued December, 2002

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Section 1002

FLUIDS AND LUBRICANTS

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

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Section
2000

ENGINE AND RADIATOR REMOVAL AND INSTALLATION

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

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STEP 40

Close the drain valve.

STEP 41

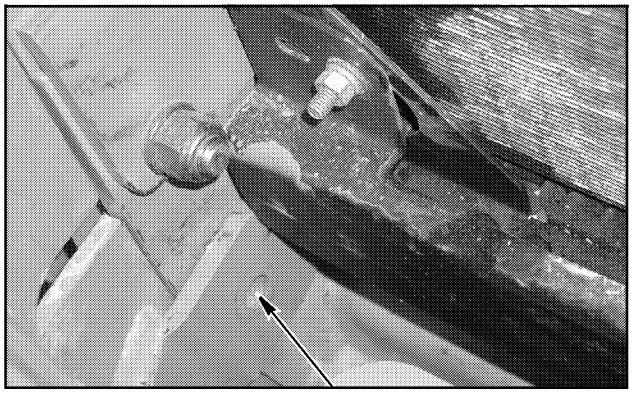
Carefully pull the horn and wires over the radiator. Mount the horn.

STEP 42

BS02J050

Push the two lower radiator wrap mount bolts back into place. Install the washer and self locking nuts. Tighten the nuts.

STEP 43

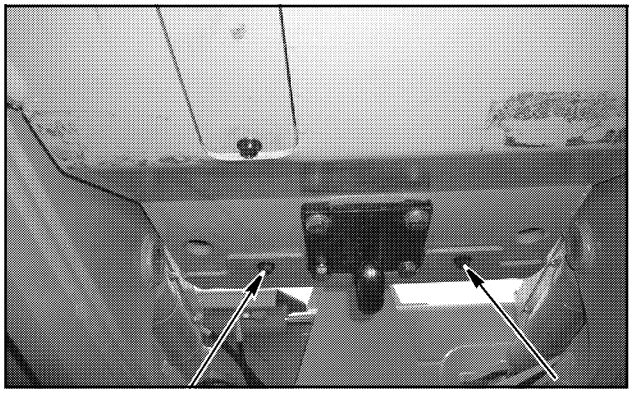


BS02J059

BS02J058

Install and tighten the two inside front bumper mounting bolts.

STEP 44



BD02H038

Install and tighten the two mounting bolts in the underside of the front bumper.

STEP 45

Remove the lifting equipment from the front bumper.

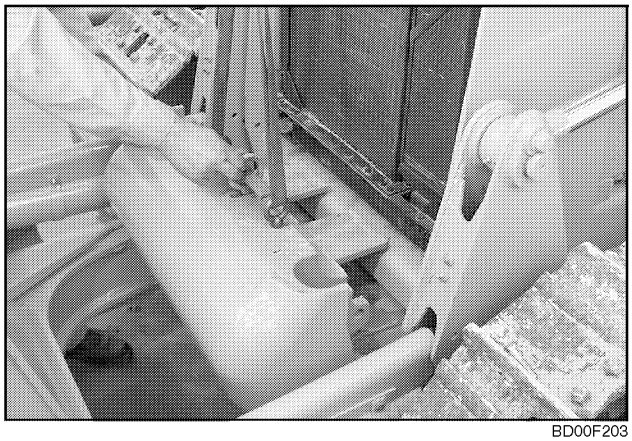
STEP 46

Install the two plates and seal that are located just below the grille hinge. Items 1, 2, 3 and 4 on page 4.

NOTE: *If your machine does not have a front counterweight, go to Step 55.*

WARNING: *Do not place any part of your body beneath the counterweight. You could be seriously injured if lifting equipment fails.*

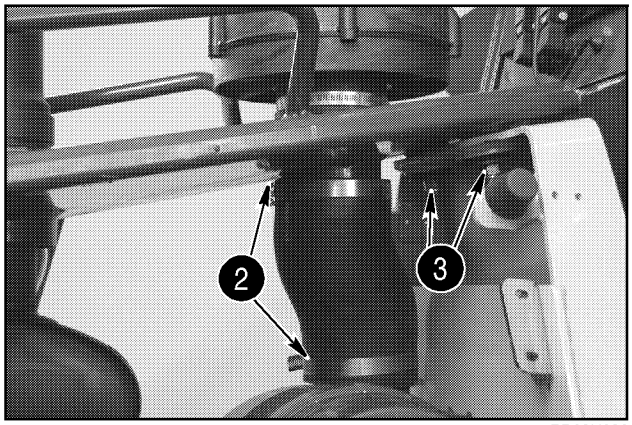
STEP 47



BD00F203

Move the front counterweight in front of the machine and position on the machine.

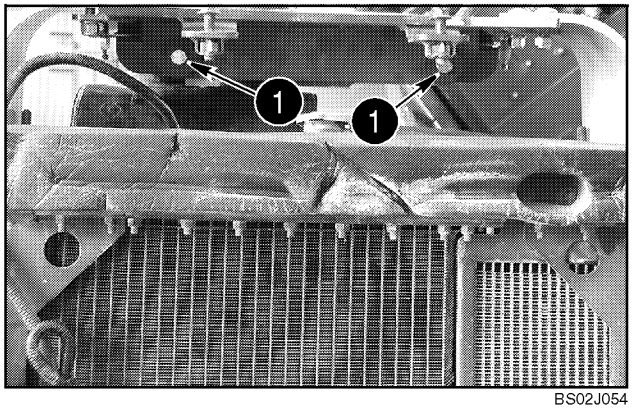
STEP 40



BD02H030

Have another person assist you to install the hood. The rear mounts are slotted, set the hood down on the rear bolts, slide the hood to the front. Install and tighten the two nuts and washers (3) on the rear of the engine hood. Install the air cleaner hose and tighten the hose clamps (2) to a torque of 11 to 12 Nm (97 to 106 lb-inch).

STEP 41



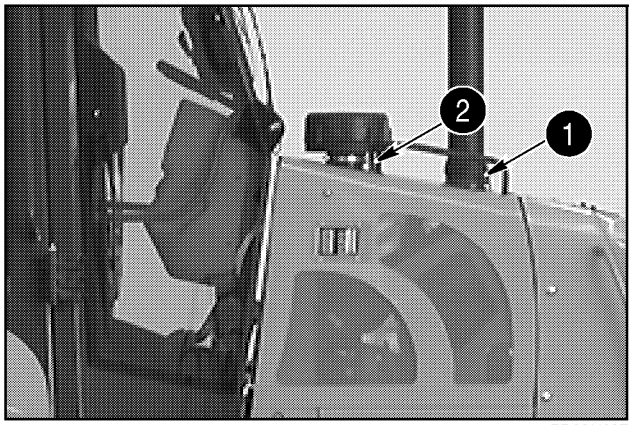
BS02J054

Install two bolts (1), washer, locking nuts and tighten.

STEP 42

Install the engine compartment side doors.

STEP 43



BD02H097

Install the exhaust pipe and tighten the clamp (1) on the exhaust pipe. Install the air cleaner stack and precleaner assembly. Tighten the clamp (2) on the air cleaner stack.

STEP 44

If equipped with a brush guard, connect suitable lifting equipment to brush guard and move into position. Install the two lower bolts, lock nuts, and washers. Install the two upper bolts and washers. Torque the upper bolts to 570 to 730 Nm (420 to 540 lb-ft).

STEP 45

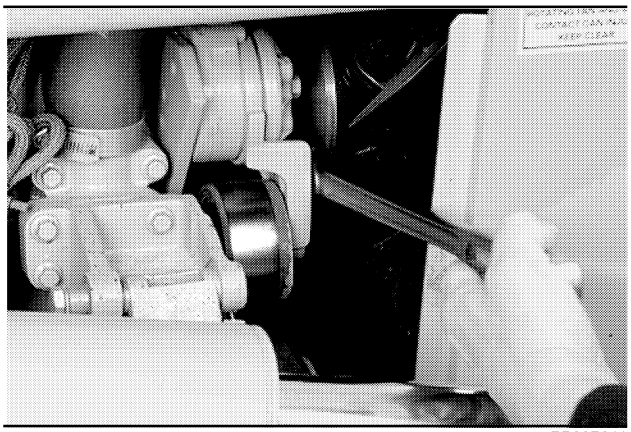
Check and ensure that the engine has been filled with the correct engine oil, see section 1002.

STEP 46

Start engine and run at low idle. Check for leaks. Check that gauges show the correct indications.

DRIVE BELT REPLACEMENT

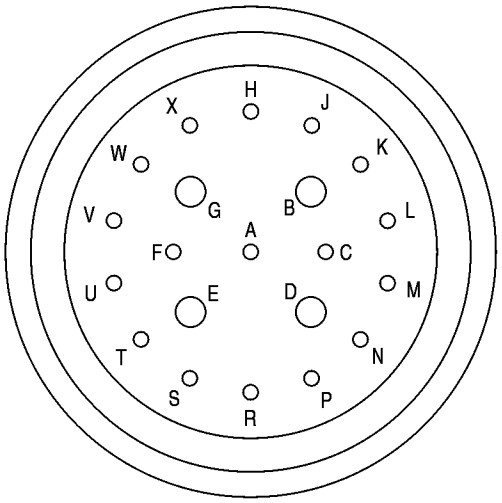
1. Park the machine on a level surface.
2. Lower the attachments to the floor.
3. Apply the parking brake and stop the engine, remove the key from the ignition switch.
4. Fasten a Do Not Operate tag to the instrument panel.
5. Open the left rear ROPS door.
6. Put the battery disconnect switch in the off position.
7. Open right-hand side engine panel.
8. Remove the right-hand side lower panel.
9. Put a 12.7 (1/2 inch) drive breaker bar in the bracket for the automatic belt tensioner.



BP00B041

10. Lift up on the breaker bar to release the belt tension while removing the old drive belt.
11. Use the breaker bar to hold the tension pulley out of the way while installing the new drive belt on the pulleys. Make sure that the drive belt is seated in the grooves in each of the pulleys.
12. Install the right-hand side lower panel.
13. Close the right-hand engine side panel.
14. Remove the Do Not Operate tag from the instrument panel.

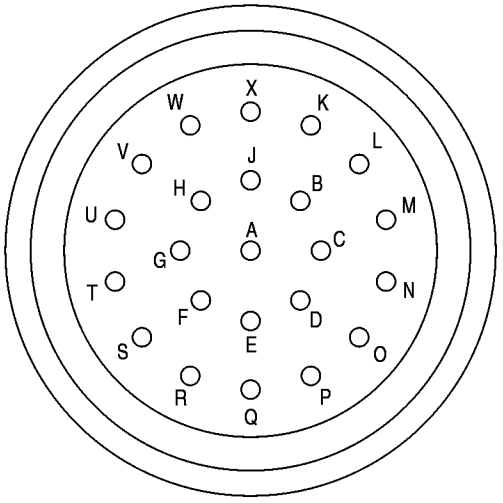
CONNECTOR X26



A	--
B	706
C	824
D	709
E	10
F	21E
G	745
H	552
J	32P
K	885
L	886
M	164A
N	559
P	119
R	0
S	164B
T	21F
U	503
V	32F
W	580
X	557

BC02K170

CONNECTOR X55



A	235
B	234
C	214
D	19C
E	215
F	206
G	233
H	205
J	232
K	213
L	241
M	0
N	243
O	244
P	538
Q	--
R	21
S	66
T	537
U	--
V	--
W	--
X	--

BC02K171

9 – Start/Injection Energize Power Relay

Left ROPS side panel, item 14 in schematic.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
NOTE: *Put the master disconnect switch in the ON position and the ignition switch in the RUN position. Put the directional control in the neutral position and the parking brake control levers in the applied position.*		
Terminal for wire 0 to ground.	Continuity	Bad ground circuit.
Terminal for wire 21 to ground.	12 volts	Bad wire between Start/Injection Energize Power relay and connector X55/R, bad connector, bad wire to directional control. Bad directional control (10).
NOTE: *Disconnect the electrical connector from the fuel shutoff solenoid on the injection pump. Put the directional control in the neutral position and the parking brake control levers in the applied position. Have another person hold the ignition switch in the START position.*		
Terminal for wire 907 to ground.	12 volts	Bad wire between relay and connector X25/3, bad connector X25/3.
NOTE: *Check directional control before continuing, see step 10,* ***DO NOT*** *reconnect the directional control.*		
NOTE: *Turn the ignition switch OFF, disconnect the X25 connector. Have another person hold the ignition switch in the START position.*		
Connector X25 cab harness between pin 3 and pin 10.	Continuity	Bad wire L-B from pin 3, bad wire R from pin 10 or bad ignition switch (13).
Connector X25 cab harness from pin 3 to dash fuse box 3a.	Continuity	Bad wire L-B to dash fuse box 3a, bad connector.
Terminal for wire A-G at dash fuse box 3a to ignition start terminal.	Continuity	Bad wire A-G from dash fuse box 3a to ignition switch.
Connector X25 cab harness from pin 10 to ignition switch BATT terminal.	Continuity	Bad wire R to ignition switch, bad connector.

WARNING: ***FOR THE NEXT PRCEDURE BLOCK BOTH TRACKS FRONT AND REAR TO PREVENT ANY ACCIDENTAL MOVEMENT.***

16 – Brake Relay

Left ROPS side panel, item 52 in schematic.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
NOTE: *Put the master disconnect switch in the ON position. Disconnect the harness connector at the brake solenoid.*		
Terminal for wire 0 to ground.	Continuity	Bad ground circuit.
Terminal for wire 19D to ground.	12 volts	Bad wire between relay and drivetrain control module fuse block connector A. Bad 10A fuse.
WARNING: ***DO NOT*** *connect the harness back to the brake solenoid this* ***WILL*** *keep the brakes applied internally.* ***DO NOT*** *place the directional control in the* ***F*** *or* ***R*** *position.*		
NOTE: *Have another person place the ignition switch in the run position. Release the parking brake levers.* ***DO NOT*** *press the brake pedal.*		
Terminal for wire 537 to ground.	12 volts	Bad wire between relay and connector X64 cavity 1, connector to drivetrain control module pin 37. Bad drivetrain control module, See Section 6003.
Terminal for wire 52 to ground.	12 volts	Bad brake relay.

WARNING: ***FOR THE NEXT PRCEDURE BLOCK BOTH TRACKS FRONT AND REAR TO PREVENT ANY ACCIDENTAL MOVEMENT.***

17 – Brake Solenoid

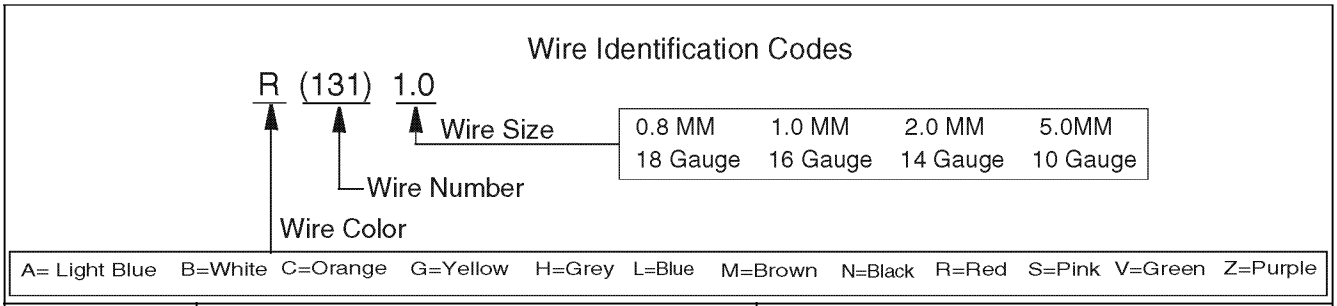
Left ROPS side panel behind ROPS tilt cylinder, item 53 in schematic.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
NOTE: *Put the master disconnect switch in the ON position. Disconnect the harness connector for the brake solenoid.*		
Check brake solenoid coil resistance between the connector cavities of the solenoid connector.	9 to 10 ohms at 25° C (77° F)	Bad brake solenoid.
Main harness terminal for wire 0 to ground.	Continuity	Bad ground circuit.
WARNING: ***DO NOT*** *connect the harness back to the brake solenoid this* ***WILL*** *keep the brakes applied internally.* ***DO NOT*** *place the directional control in the* ***F*** *or* ***R*** *position.*		
NOTE: *Have another person place the ignition switch in the run position. Release the parking brake levers.* ***DO NOT*** *press the brake pedal.*		
Main harness terminal for wire 52 to ground.	12 volts	Bad wire between the brake solenoid and the brake relay. Bad brake relay (16).
NOTE: *If the readings are good, replace the brake solenoid. Also see Section 6002 and check the hydrostat charge pressure.*		

24 – Tractor Relay

Left ROPS side panel, item 57 in schematic.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
NOTE: *Put the master disconnect switch in the ON position.*		
Terminal for wire 0 to ground.	Continuity	Bad ground circuit.
NOTE: *Put the ignition switch in the RUN position.*		
Terminal for wire 19 to ground.	12 volts	Bad wire between main fuse block connector A to tractor relay. Bad 30A fuse.
Terminal for wire 801 to ground.	12 volts	Bad wire 801 to connector X25/1. Bad connector.
NOTE: *Turn the ignition switch OFF, disconnect the X25 connector. Put the ignition switch in the RUN position.*		
Connector X25 cab harness between pin 1 and pin 10.	Continuity	Bad wire N-Z from pin 1, bad wire R from pin 10 or bad ignition switch (13).
Connector X25 cab harness from pin 1 to dash fuse box 1a.	Continuity	Bad wire N-Z to dash fuse box, bad connector.
From dash fuse box 1a to ignition switch ACC terminal.	Continuity	Bad wire M-V to ignition switch.
Connector X25 cab harness from pin 10 to ignition switch BATT terminal.	Continuity	Bad wire R to ignition switch, bad connector.
Connector X25 main harness from pin 12 to terminal for wire 864 at tractor relay.	Continuity	Bad wire 864 to tractor relay, bad connector.
NOTE: *Turn the ignition switch OFF, connect the X25 connector. Put the ignition switch in the RUN position.*		
Terminal for wire 864 to ground.	12 volts	Bad tractor relay.

30 – Engine Oil Pressure Switch

Left side of the engine, item 28 in schematic.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
Check between the engine oil pressure switch housing and the engine block.	Continuity	Bad ground connection.
NOTE: *Disconnect wire 503 from the engine oil pressure switch.*		
Terminal of engine oil pressure switch to ground.	Continuity	Bad engine oil pressure switch.
NOTE: *Put the master disconnect switch in the ON position. Put the ignition switch in the RUN position.*		
Wire 503 to ground.	12 volts	Bad wire 503 between engine oil pressure switch and connector X26/U. Bad wire V-B between connector X26/U and cavity 2 of the instrument cluster connector. Bad connector. Check instrument cluster engine oil pressure bulb; check instrument cluster (36).
NOTE: *Turn the ignition switch OFF, disconnect the X26 connector and the instrument cluster connector.*		
Connector X26 cab harness from pin U to cavity 2 of instrument cluster connector.	Continuity	Bad wire V-B, bad connector.
Connector X26 main harness from pin U to wire 503 at engine oil pressure switch.	Continuity	Bad wire 503, bad connector.
NOTE: *Start and run the engine at approximately 1500 rpm (r/min).*		
Terminal of engine oil pressure switch to ground.	Open	Bad engine oil pressure switch.



Wire Identification	From	To
H-R	Dash Fuse Panel 3b	Left And Right Hand Door Wiper Switch, Right Hand Door Wiper Motor
L	Blower Switch	Deutsch Connector X26/G, Wire 745 To Fan (Low)
L	AC Switch	AC Pressure Switch
L-B	Dash Fuse Panel 3a	Deutsch Connector X25/3, Wire 907 To Start/Injection Energize Power Relay
L-N	Engine Oil Pressure/Coolant Temperature Buzzer.	Cavity 35 Instrument Cluster
L-N	RH Door Wiper Switch	RH Door Wiper Motor
L-N	Horn Push Button Switch	Deutsch Connector X26/0, Wire 119 To Horn
L-R	Dash Fuse Panel 4a	Instrument Cluster Switched Power, Splice To Engine Oil Pressure/Coolant Temperature Buzzer
M	Blower Switch	Deutsch Connector X26/D, Wire 709 To Fan (Medium)
M	AC Pressure Switch	Deutsch Connector X26/C, Wire 824 To AC Thermostat Switch
M-B	Dash Cluster Cavity 4	Deutsch Connector X26/W, Wire 580 To Hydraulic Filter Restriction Switch
M-N	RH Door Wiper Switch	RH Door Wiper Motor
M-V	Ignition Switch Accessory	Dash Fuse Panel 1a
N	Ground Circuit	Master Disconnect Switch
N-Z	Dash Fuse Panel 1a	Deutsch Connector X25/1, Wire 801 To Drivetrain Control Module, Tractor, Heater/Seat And Cab Relays
S-G	Dash Fuse Panel 2a	Proximity Switches +, Deutsch Connector X25/2, Wire 903 To Neutral OK Relay, Fuel Shutoff Solenoid Hold
R	Deutsch Connector X25/18	Dash Fuse Panel 9a, 6a and 7b
R	Deutsch Connector X25/10	Ignition Switch Battery Terminal
R-N	Deutsch Connector X25/16	Dash Fuse Panel 2b, 3b, 4b, 5b, 6b And Radio Connector
R-N	Dash Fuse Panel 9a	Radio Connector, Power Jack, Lighter, Cab Interior Lights, Unswitched Power To Dash Cluster
R-N	Dash Fuse Panel 4b	Left And Right Hand Door Wiper Switch, Left Hand Door Wiper Motor, Door Washer Switch
S	Blower Switch	AC Switch
S	Dash Cluster Cavity 5	Deutsch Connector X25/5, Wire 637 To Alternator D+
S-N	Dash Cluster Cavity 21	Deutsch Connector X26/N, Wire 559 To Transmission Temperature Sender
S-N	Dash Fuse Panel 6a	Horn Switch

39 – Cab Interior Lamps

Left and right headliners in cab, items 66 and 67 in schematic.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
Bulb.	Continuity	Bad bulb.
NOTE: *Put the master disconnect switch in the ON position.*		
Terminal for wire N to ground.	Continuity	Bad ground circuit.
Terminal R-N in connector to ground.	12 volts	Bad wire R-N to dash fuse box 9a, bad fuse, bad wire R to connector X25/18. Bad connector.
From pin 18 in connector X25 at wire 772 to ground.	12 volts	Bad wire 772 to accessory fuse block connector B. Bad 30A fuse.
NOTE: *Turn the interior light switch on.*		
Positive connector at light to ground.	12 volts	Bad wire between light and switch. Bad switch.

40 – Accessory Power Jack

Left side console, item 68 in schematic.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
NOTE: *Put the master disconnect switch in the ON position.*		
Terminal for wire N to ground.	Continuity	Bad ground circuit
Terminal for wire R-N to ground.	12 volts	Bad wire R-N to dash fuse box 9a, bad fuse, bad wire R to connector X25/18. Bad connector.
Connector X25 main harness from pin 18 to ground.	12 volts	Bad wire 772 to accessory fuse block connector B. Bad 30A fuse.

48 – Cab Heater Control

Left console, items 95, 96 and 97 in schematic.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
NOTE: *Put the master disconnect switch in the ON position and the ignition switch in the RUN position.*		
Terminal for wire H-R to ground.	12 volts	Bad wire H-R to dash fuse box 9b, bad fuse.
Terminal for wire R-N at dash fuse box 9b to ground.	12 volts	Bad wire R-N to connector X25/16, bad connector, bad cab relay (35).
NOTE: *Turn the ignition switch OFF, disconnect the X25 connector.*		
Connector X25 cab harness from pin 16 to dash fuse box 9b.	Continuity	Bad wire R-N, bad connector.
NOTE: *Connect the X25 connector, pull the switch mounting bracket from the console. Put the master disconnect switch in the ON position and the ignition switch in the RUN position.*		
Between pins B and A on switch while turning knob.	0.2 to 10.2 volts	Bad heater control switch.
Between pins C and A on switch while turning knob.	0.2 to 10.2 volts	Bad heater control switch.
NOTE: *Tilt the ROPS cab/canopy, see section 9008. Place the heater control on high heat. Take readings at heater control valve.*		
Pin 6 to ground.	7.5 volts	Bad control module.
Pin 4 to ground.	0.5 volt	Bad control module.
Pin 3 to ground.	3.5 volts	Bad control module.
Pin 2 to ground.	8.7 volt	Bad control module.
Pin 1 to ground.	7.5 volt	Bad control module.
NOTE: *If all tests are good, replace heater control valve.*		

56 – Front Windshield Wiper And Switch Assembly

Front windshield and dash panel, items 80 and 81 ins schematic.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
NOTE: *Put the master disconnect switch in the ON position.*		
Terminal for wire N to ground.	Continuity	Bad ground circuit.
NOTE: *Put the ignition switch in the RUN position.*		
Terminal for wire B-R at wiper switch to ground.	12 volts	Bad wire B-R to dash fuse box 6b, bad fuse. Bad wire R-N from dash fuse box to connector X25/16, bad connector, bad wire 887 from connector X25/16 to cab relay, bad cab relay(35).
NOTE: *Turn the ignition switch OFF, disconnect the X25 connector.*		
Connector X25 cab harness pin 16 to dash fuse box 6b.	Continuity	Bad wire R-N to dash fuse box 6b.
Terminal for wire B-R at wiper switch to dash fuse box 6b.	Continuity	Bad wire B-R.
Connector X25 main harness pin 16 to wire 887 at cab relay.	Continuity	Bad wire 887 to cab relay.
NOTE: *Connect the X25 connector. Put the ignition switch in the RUN position.*		
Cab relay terminal 87 to ground.	12 volts	Bad cab relay (35).
NOTE: *Turn the wiper switch ON.*		
Terminal for wire A at wiper switch to ground.	12 volts	Bad wiper switch.
Terminal for wire A at wiper motor to ground.	12 volts	Bad wire from wiper switch to wiper motor.
NOTE: *If the tests are good and the wiper does not work, repair or replace the wiper motor.*		

INDEX

Section
4004

STARTER AND STARTER SOLENOID

4004

CASE, LLC.
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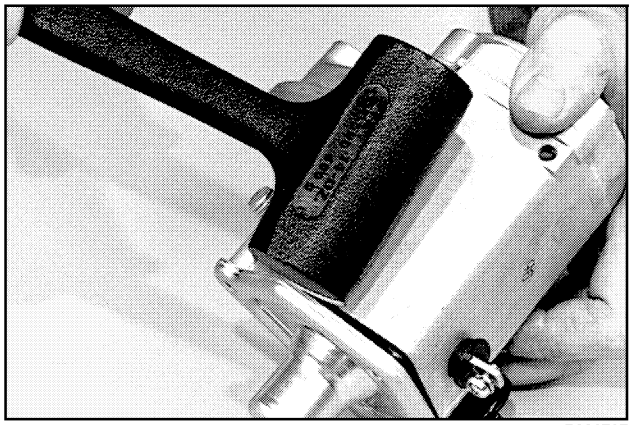
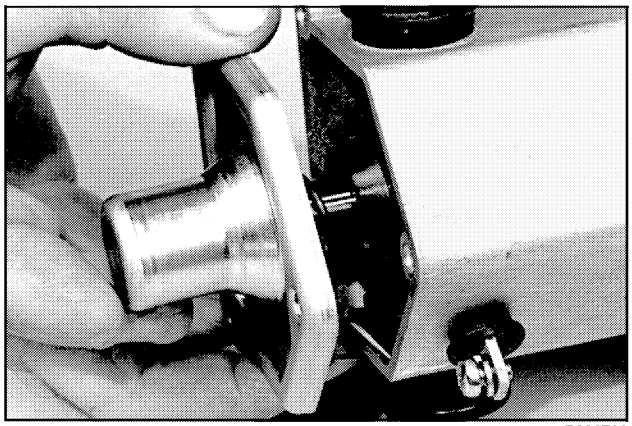
STEP 19



B330707

If necessary, use a hammer to loosen the cover.

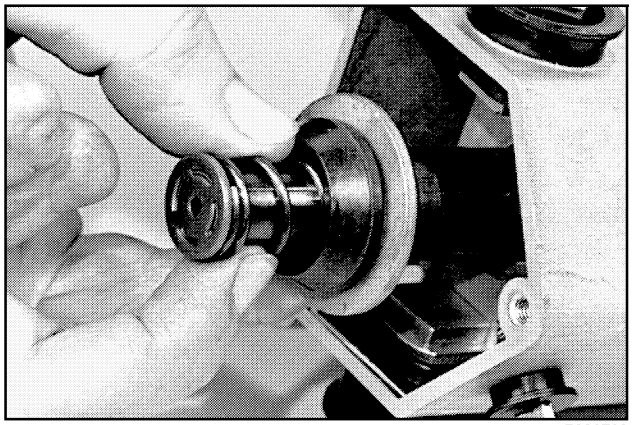
STEP 20



B330708

Remove the cover.

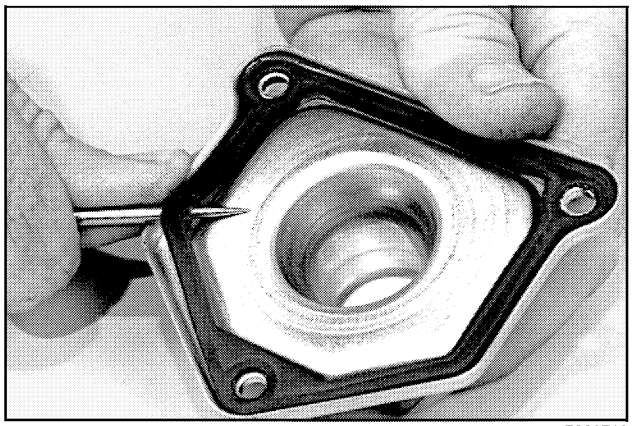
STEP 21



B330709

Remove the plunger.

STEP 22



B330710

If necessary, remove the gasket from the cover.

Section
4005

INSTRUMENT CLUSTER

4005

CASE, LLC.
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Racine, WI 53404 U.S.A.

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Section
4007

ALTERNATOR

4007

CASE, LLC.
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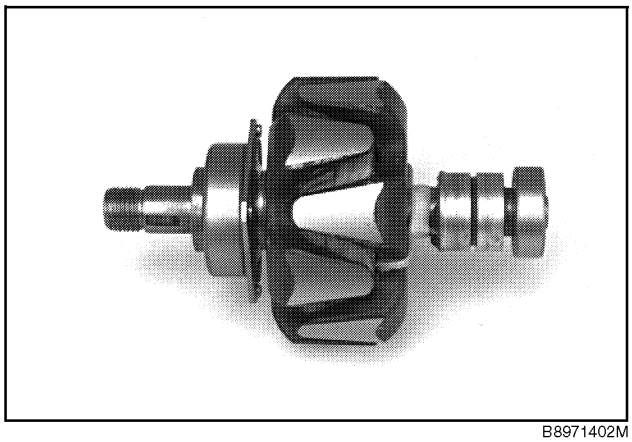
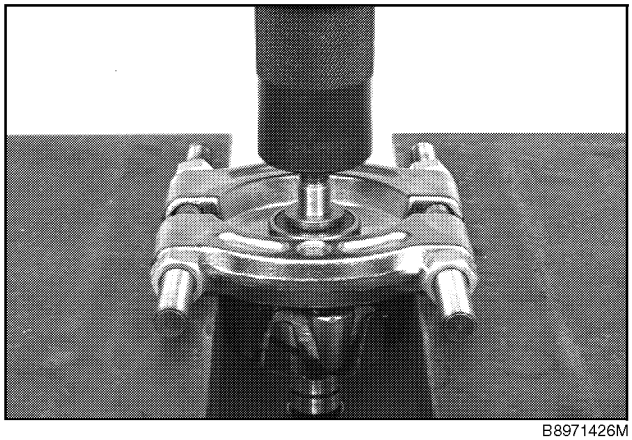
Inspection and Replacement of Bearings

STEP 38



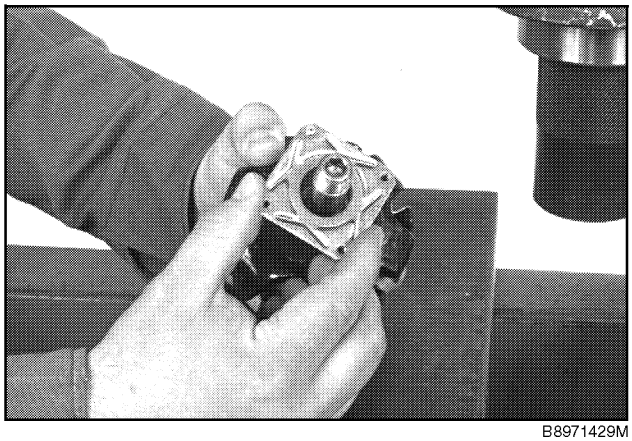
B8971402M

Inspect the bearings on the rotor. If the bearings are damaged, use the following procedure to replace the bearings.



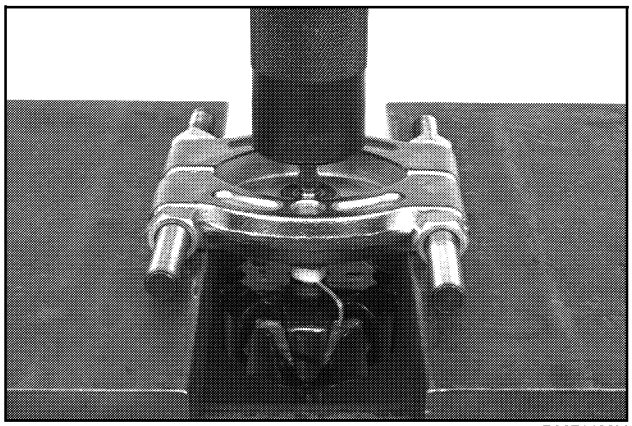
B8971426M

1. Use a suitable support between the front bearing and the bearing retainer on the rotor shaft and press the rotor shaft out of the front bearing and the spacer.



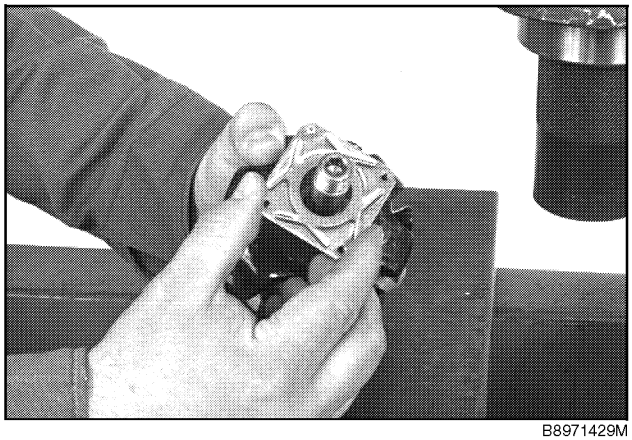
B8971429M

2. Remove the bearing retainer.



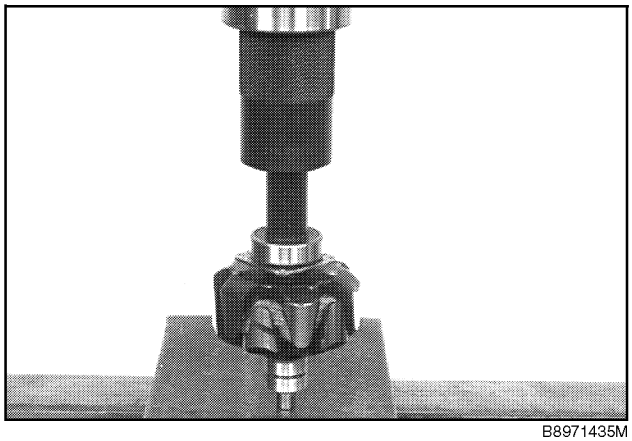
B8971432M

3. Use a suitable support between the rear bearing and the slip ring on the other end of the rotor shaft and press the rotor shaft out of the rear bearing.



B8971429M

4. Install the bearing retainer on the rotor shaft.



B8971435M

5. Press the new front bearing onto the rotor shaft until the front bearing stops moving.

Section 5001

UNDERCARRIAGE FUNDAMENTALS

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

Bur 6-48020

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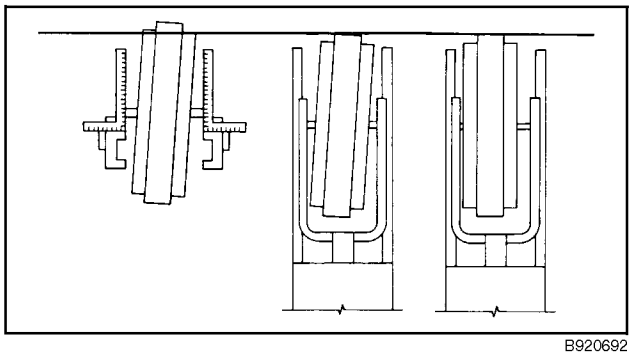
- Bending, cracking or breaking the track shoes, shoe hardware and links.
- Constant problems with loose shoe hardware that makes the bolt holes larger.
- Increased wear on links, roller flanges and idler flanges caused by constant twisting of the track chain.
- Decreased pin and bushing life, or decreased link life due to elongated pin and bushing bores. This is a result of the twisted links.
- Possible loss of lubricant in the Case Lubricated Track or Case Extended Life Track pins. This will result in early pin and bushing wear.

TRACK ALIGNMENT

Correct track alignment is required to prevent early wear of the undercarriage components. When you replace parts of the track system, always see the service manual for your machine and check the alignment of the undercarriage components.



B920692

Misalignment problems will affect more of the undercarriage components than any other cause of wear. Misalignment will cause accelerated wear on the track links, idler flanges, track and carrier roller flanges, sprockets and rock guards. Alignment problems can be caused by all of the following:

- Bent or twisted track frames that are not parallel or perpendicular to the centerline of the machine. Realign, repair or replace damaged or misaligned track frames as required.
- Idlers that are misaligned vertically or horizontally or are not in line with the sprocket and carrier rollers. Realign the idlers.
- Sprockets that are not shimmed correctly or are not in line with the track and carrier rollers. Realign the sprockets.
- Carrier rollers that are not in line between the sprocket and idler. Realign the carrier rollers.

IMPORTANT: *Tight tracks will greatly increase the effect of misalignment by causing an increase in load between the components. Track tension must be checked on a regular basis - more often during packing conditions. See Page 36 for the correct procedure to check and adjust the track tension.*

Measuring Sprocket Wear

The purpose of this section is to help you measure the wear of undercarriage components as accurately as possible.

Also, by measuring wear and using the charts that are available for your machine, you will be able to determine the remaining life of all the components.

SPROCKET WEAR

Sprocket tooth wear is not measurable. The sprocket teeth have no clear reference point from which to take a measurement. The wear on the sprocket teeth is due to (1) the contact with the track chain bushings and (2) any material trapped (packed) between the components. As the components wear, certain wear patterns develop on the sprockets.

A visual examination of the sprocket teeth along with the bushing outside diameter measurements will give you a good idea of the sprocket condition.

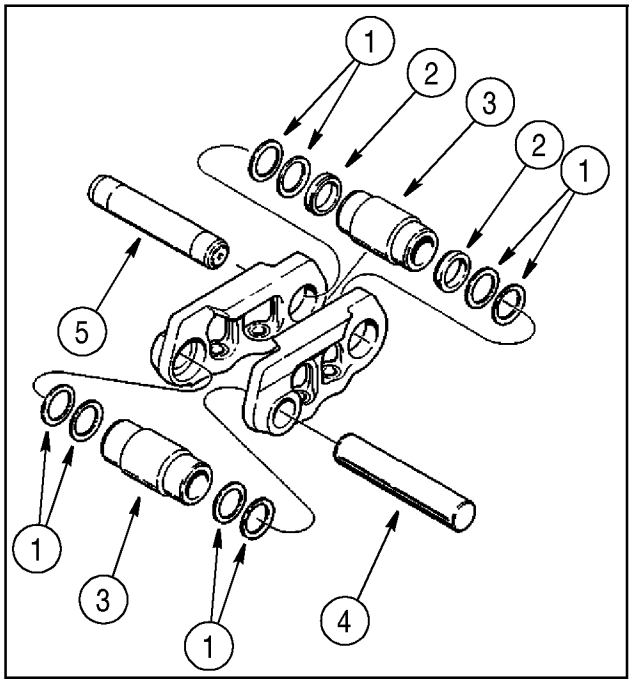
When replacing the track chain or turning the pins and bushings, always replace the sprockets or sprocket segments (sections). Never mix old components with new.

CASE NON-LUBRICATED TRACK

Case Lubricated Track (C.L.T.) and the Case Extended Life Track (C.E.L.T.) provide substantially more service life than the sealed track or non-lubricated track.

Because of the greatly reduced internal wear of the (C.L.T. & C.E.L.T.) pins and bushings, the wear patterns of the undercarriage will be somewhat different from those of the sealed track.

This track is assembled with pins, bushings and Belleville seals on each side to reduce the amount of dirt entering the bushings. Parts are lubricated at assembly.



B900615

1. BELLEVILLE SEALS
2. SPACERS AT MASTER LINK
3. BUSHINGS
4. PIN
5. MASTER PIN

Turning Pins and Bushings (Non-Lubricated Track)

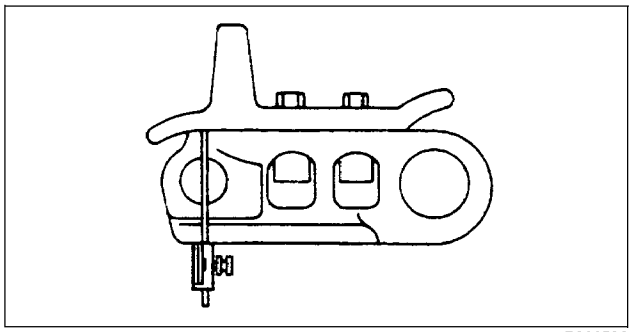
Turning the pin/bushing assembly in the track link returns the track chain to the original length and puts fresh bushing material in contact with the sprocket teeth.

TRACK GAUGE	This is the distance from the centerline of the right track chain to the centerlink of the left track chain. Sometimes referred to as the distance between the centerline of each sprocket.
TRACK PITCH	This is the distance from the center of one track pin to the center of the next track pin.
TRACK ROLLER	The track rollers support the weight of the machine and guide the track chain.
TRACK SAG	Track sag is the amount of track chain deflection of the upper part of the track chain. This deflection is measured when you adjust the track tension.
TRACK STRETCH - SEALED TRACK	This is the increase of the track pitch due to internal bushing wear and pin wear.
TRACK TENSION	Track tension is the measurement of how tight or loose the track chain is on your machine.
TURNING PINS AND BUSHINGS	
SEALED TRACK	This is the rotation of the pins and bushings 180 degrees in each chain link to give new wear surfaces.
CASE LUBRICATED TRACK	WET TURN- A wet turn can be made when pins, bushings, and seals are in condition to be used again to make a sealed and lubricated joint. Lubricant is added after assembly DRY TURN- A dry turn can be made when pins, bushing, and seals are in condition to be used again but not good enough to make a sealed joint. Lubricant is not added after assembly. **IMPORTANT:** If hollow pins are used in a dry turn, the lubrication hole must be positioned vertically - 180 degrees to the track shoe mounting surface. **IMPORTANT:** A joint that shows leakage can be assembled only as a dry turn if new parts are not used.
UNDERCARRIAGE SIMULATOR	A teaching aid that is used to demonstrate concepts and causes of track pin, bushing, and sprocket wear.
WEAR RATE	The rate at which a component or system of components wears. This wear rate is controlled directly by service methods, ground conditions, and operating methods.

TRACK LINK WEAR

The only wear that can be measured is wear of the rail (top) on the track links. This wear is caused by the rolling and sliding contact with the track and carrier rollers and the idler. Other causes of wear are speed, a tight track chain, track shoe width, the work environment and increased track pitch.

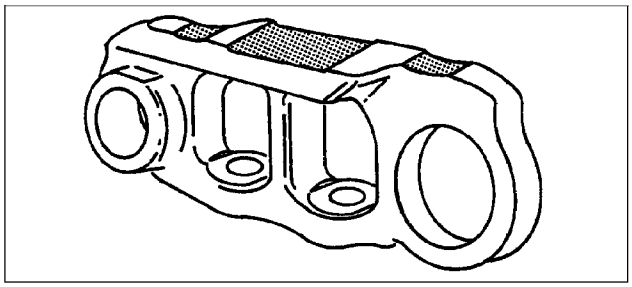
To measure the height of the track links (wear of rail), assemble the rulers in the CAS-1950A kit. Make sure that the rail and the bottom of the track shoe are clean. Make the measurement in the areas shown in the illustration at the bottom of this column. Make sure that the vertical ruler is at 90 degrees to the track shoe. Record the smallest measurement on the Track Component Appraisal Form. Measure two more track links at 0.9 to 1.2 M (3 to 4 feet) intervals and record the measurements on the Track Component Appraisal Form. See the chart on Page 17 to find the percent of wear.



B900596

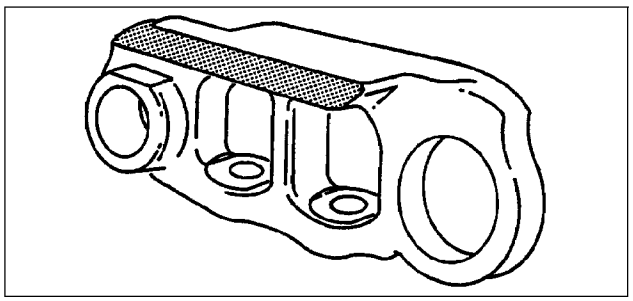
Shown below is uneven wear on the rail. Wear over the pins will occur faster because of the narrow width of the rail and contact with the rollers. This wear can also be caused by working on an uneven surface (rocks) which can cause the track rail to hit the roller(s).

The wear in the center of the rail is caused by contact with the idler and carrier and track rollers.



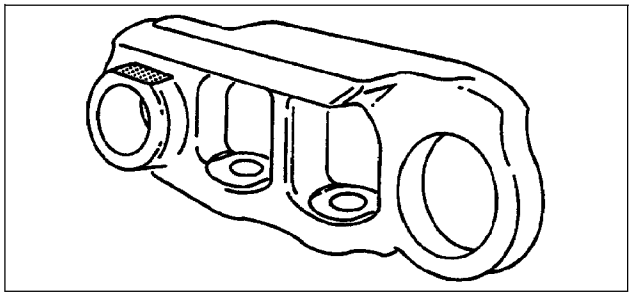
B900597

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.



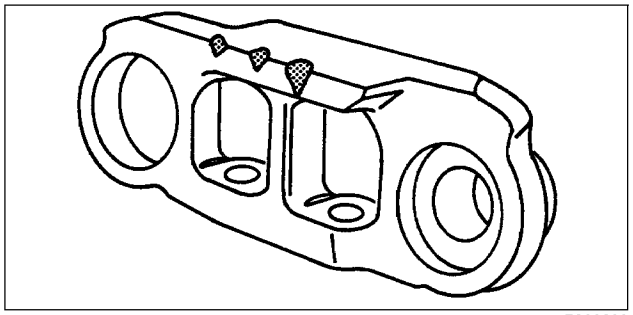
B900598

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.



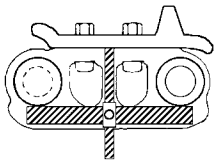
B900599

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

WEAR CHART FOR VERTICAL BUSHING WEAR
For Case Lubricated Track With 171 mm (6.73 in) Pitch



Case Lubricated Track (C.L.T.)
170.9 mm (6.73 inch) pitch

Depth Gauge Measurement		Percent Worn	
mm	Inches	High Impact*	Low Impact*
71.45	2.81	0	0
71.12	2.80	5	4
70.87	2.79	10	8
70.61	2.78	15	12
70.36	2.77	20	15
70.10	2.76	25	19
69.85	2.75	30	23
69.60	2.74	35	27
69.34	2.73	40	31
69.09	2.72	45	35
68.83	2.71	50	39
68.58	2.70	55	42
68.33	2.69	60	46
68.07	2.68	65	50
67.82	2.67	70	54
67.56	2.66	73	58
67.31	2.65	76	62
67.06	2.64	79	65
66.80	2.63	82	68
66.55	2.62	85	70
66.29	2.61	88	73
66.04	2.60	90	75
65.79	2.59	92	77
65.53	2.58	94	80
65.28	2.57	96	82
65.02	2.56	98	84
64.77	2.55	100	85
64.52	2.54	102	86
64.26	2.53	104	88
64.01	2.52	106	90
63.75	2.51	107	91
63.50	2.50	108	93
63.25	2.49	110	94
62.99	2.48	112	96
62.74	2.47	113	97
62.48	2.46	115	98
62.23	2.45	117	100

IMPORTANT: *It is recommended the pins and bushings be replaced if the wear measurement is in the shaded area. Turn pins and bushings before this point.*

BS97N002

SPECIFICATION

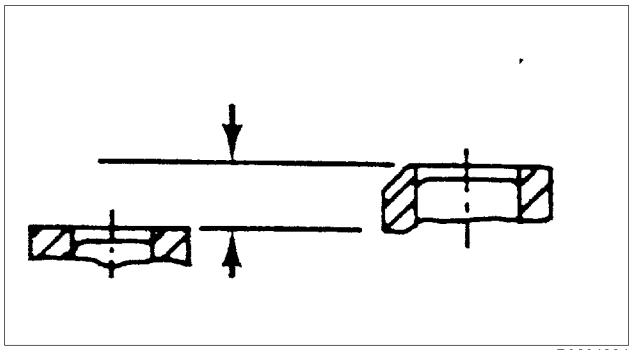
Torque

Master link bolts.....430 to 470 Nm (318 to 346 lb-ft)
Standard link shoe bolts .....406 to 447 Nm (300 to 330 lb-ft)

Track Adjustment

Track deflection .....38 to 50 mm (1-1/2 to 2 inches)

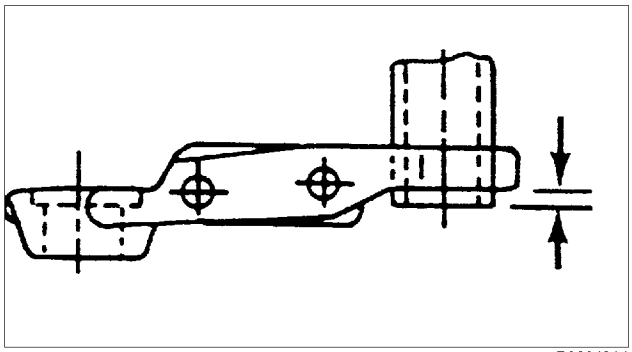
Track Assembly and Track Press



B860492J

DRIVER HOUSING OFFSET

33.3 MM (1.31 INCH)



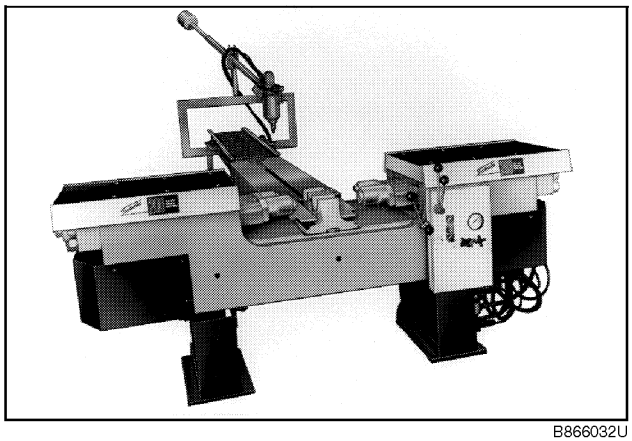
B860491J

BUSHING PROJECTION

1.7 MM (0.067 INCH)

Maximum Pressure OTC 180 Metric ton (200 US ton) only .....40 825 kPa (5921 psi)
Lubricant ..... Case IH 135-H gear lubricant
Torque for track shoe bolts in the master link with two bolts in each half ..... 305 to 335 Nm (225 to 247 pound-feet)

Special Tools

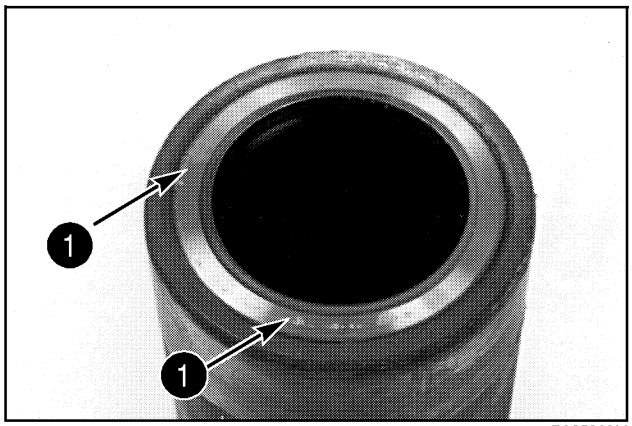


B866032U

The track press is a dual ram 180 Metric ton (200 US ton) press used to disassemble and assemble the track links.

B866034U

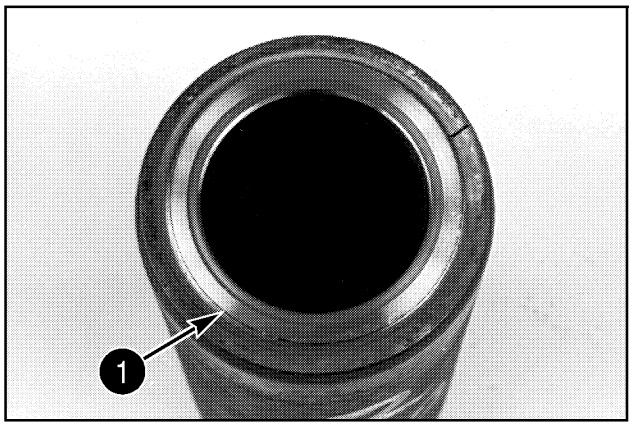
The lubricator uses a vacuum function to make sure that the seals are seated, and a pressure system to fill the reservoir in the track pins. The part number of the lubricator is CAS10762



B865389M

1. PITTING

3. The bushing shown has pitting in the area between the seal and the spacer. If the pitting is not deep, the bushing can be used for a wet turn.

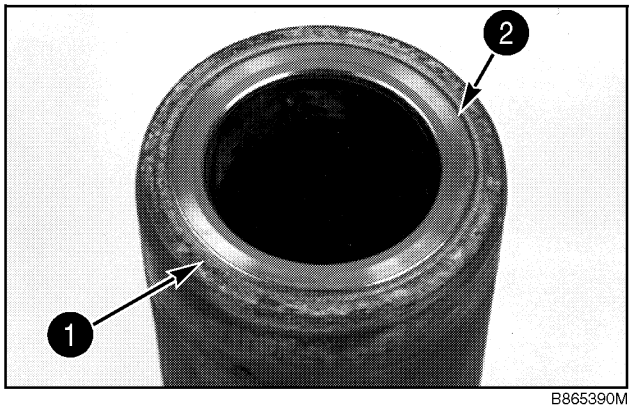


B865388M

1. CRACK

4. The bushing shown has a fine crack in the area between the seal and the spacer. This bushing can be used for a wet or dry turn. A bushing with two or more fine cracks or one large and rough crack can only be used for a dry turn.

5. The bushing shown has a groove that is not even all the way around the bushing. If this bushing came from a wet joint, the bushing can be used for a wet turn. If this bushing came from a dry joint, the bushing can only be used for a dry turn.

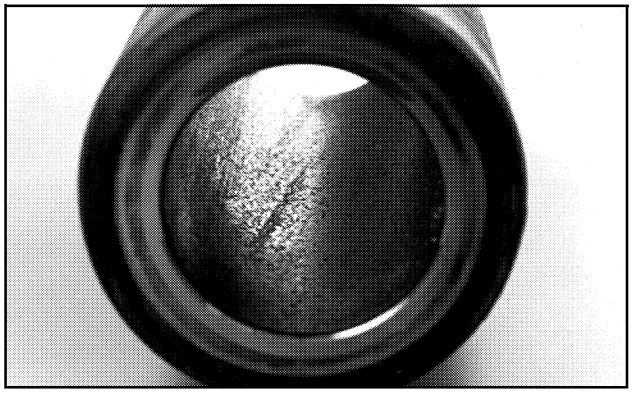


B865390M

1. WIDE GROOVE 2. NARROW GROOVE

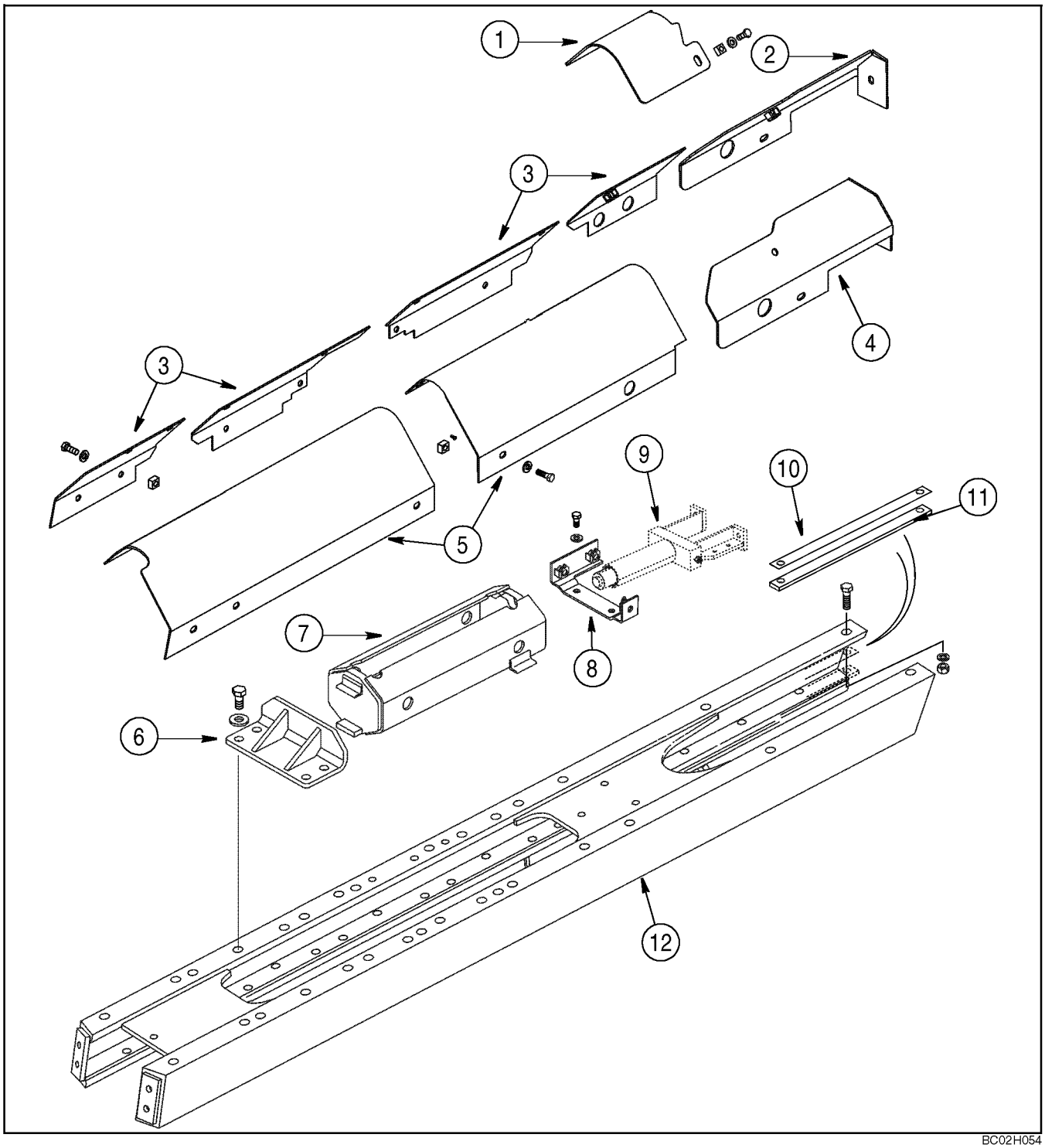
6. A bushing that has deep pitting or scratches in the area between the spacer and seal can only be used for a dry turn.

7. A bushing that has pitting in the bore, if the pitting is not deep, the bushing can be used for a wet turn. If the pitting is deep, the bushing can only be used for a dry turn.



B865375M

8. The bushing shown has rust in the bore. This bushing can only be used for a dry turn. Use a wire brush and electric drill and remove the rust.



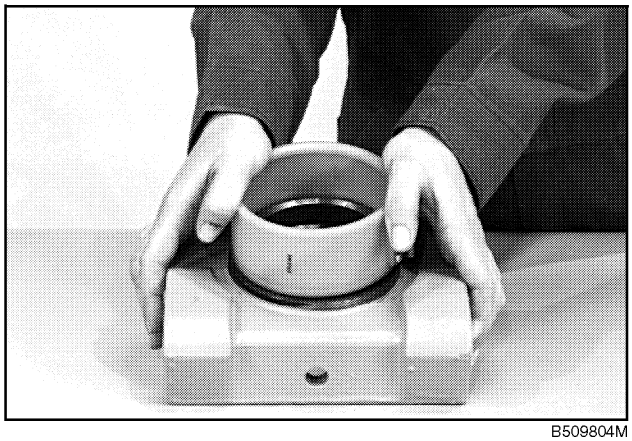
BC02H054

1. COVER ASSY IDLER
2. INSIDE IDLER COVER
3. COVER ASSY INNER
4. OUTSIDE IDLER COVER
5. COVER ASSY OUTER
6. BRACKET
7. RECOIL HOUSING ASSY
8. BRACKET COVER
9. TRACK ADJUSTER
10. SHIM
11. BAR
12. TRACK FRAME

STEP 34

For the 750K and the 850K. Install the small roll pin in the large roll pin so that the slots in the roll pins are 90 degrees from each other. Make sure that the roll pins do not protrude from the idler bracket.

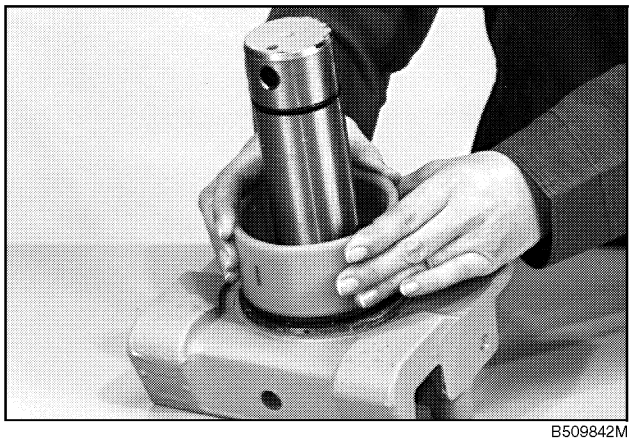
STEP 35



B509804M

Make sure that the seal area in the brackets is clean and dry. Use soap and water or a fast drying oil free compound on the rubber ring. Use the tool CAS-1755 to install the metal ring and rubber ring in the bracket.

STEP 36



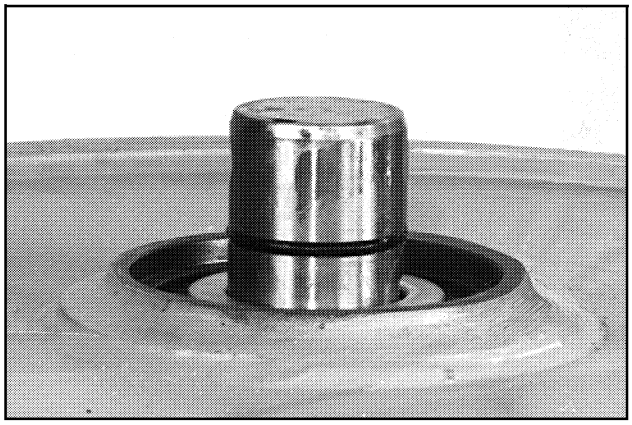
B509842M

Use soap and water or a fast drying oil free compound on the rubber ring. Use the tool CAS-1755 to install the metal ring and rubber ring in the bracket and shaft assembly.

STEP 37

Lubricate the O-rings on the shaft with petroleum jelly.

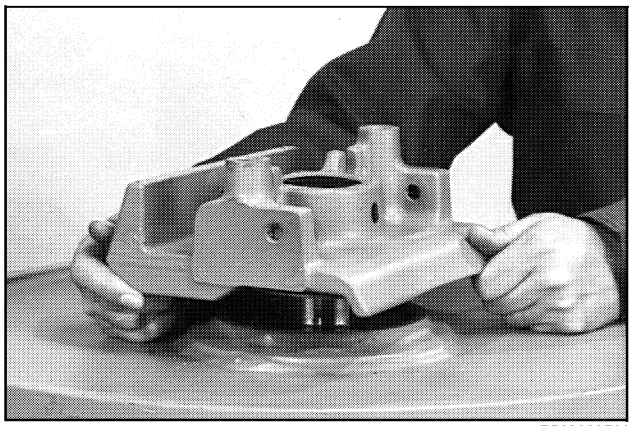
STEP 38



B509922M

Put the bracket and shaft assembly in the press. Lower the idler wheel onto the shaft, install the O-ring shown after the shaft is through the idler wheel.

STEP 39



B509838RM

Put the other bracket on the shaft. Make sure that the brackets are aligned correctly.

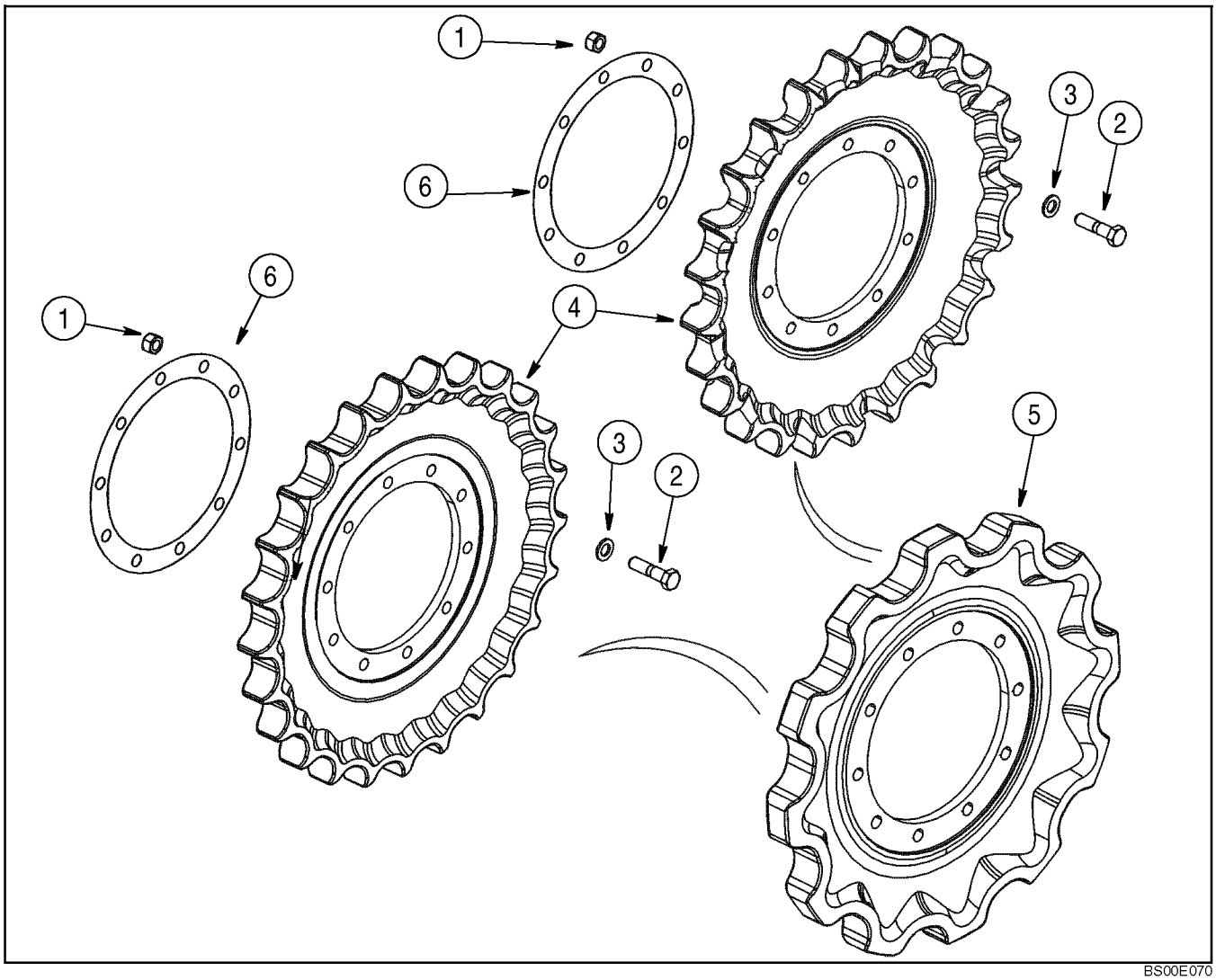
REMOVAL

NOTE: *See Section 5501 for checking wear on the sprocket.*

1. Refer to Section 5504 and separate the track. It is not necessary to completely remove the track.
2. Remove the track from the sprocket.
3. Remove the bolts that hold the outer cover at the rear of the track frame.
4. Remove the outer cover.
5. Remove the bolts that hold the inner cover at the rear of the track frame.
6. Remove the inner cover.
7. Raise the rear of the machine until the sprocket is free of the track links.
8. Put an acceptable support under the rear of the machine to hold the machine in place.
9. Loosen and remove the nuts from the bolts holding the sprocket.
10. Remove the bolts and washers.

IMPORTANT: *Sprocket weight is in excess of 45 kg (100 lb). Get help when removing the sprocket to prevent hurting yourself.*

11. Remove the sprocket.

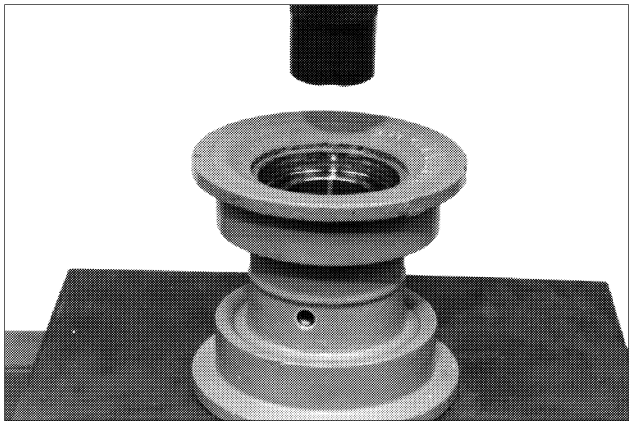


BS00E070

1. NUT
2. BOLT
3. WASHER
4. SPROCKET (STANDARD AND RELIEVED)
5. SPROCKET (LGP)
6. SHIM

ASSEMBLY

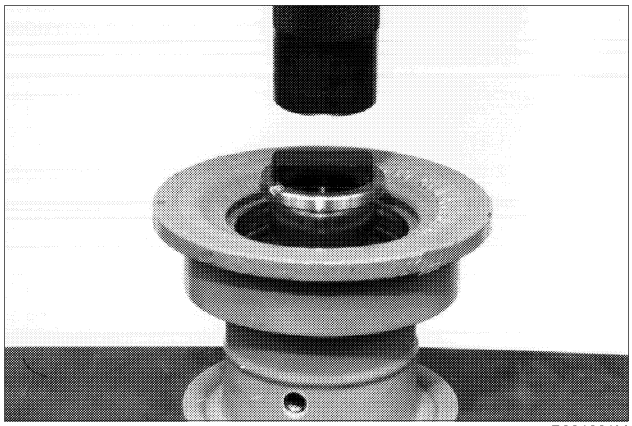
STEP 17



B921329M

Start a bearing into the roller so that a notch is aligned with the filler hole.

STEP 18



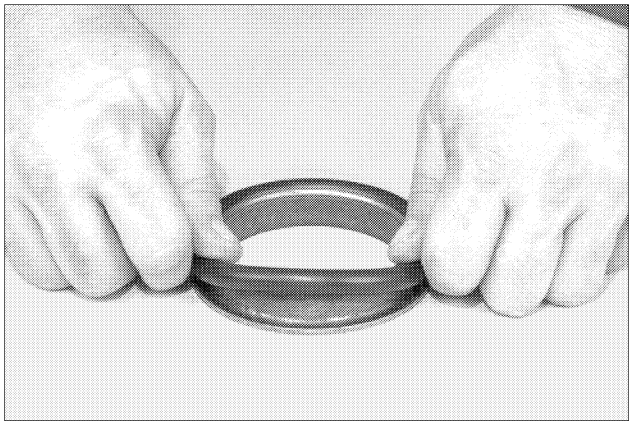
B921331M

Use an acceptable driver and press the bearing all the way into the roller.

STEP 19

Repeat steps 17 and 18 for the other bearing.

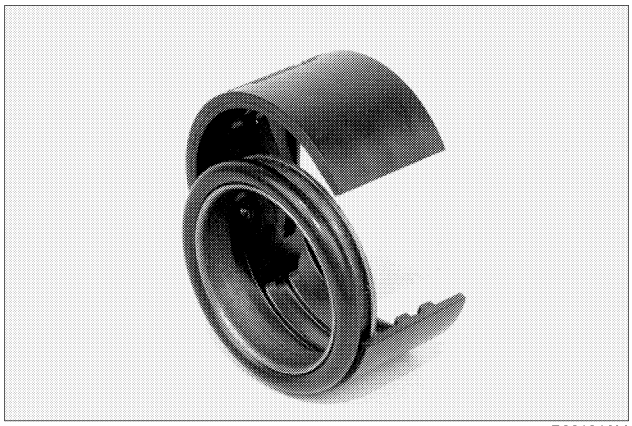
STEP 20



B921312M

Install a rubber ring on each metal ring.

STEP 21



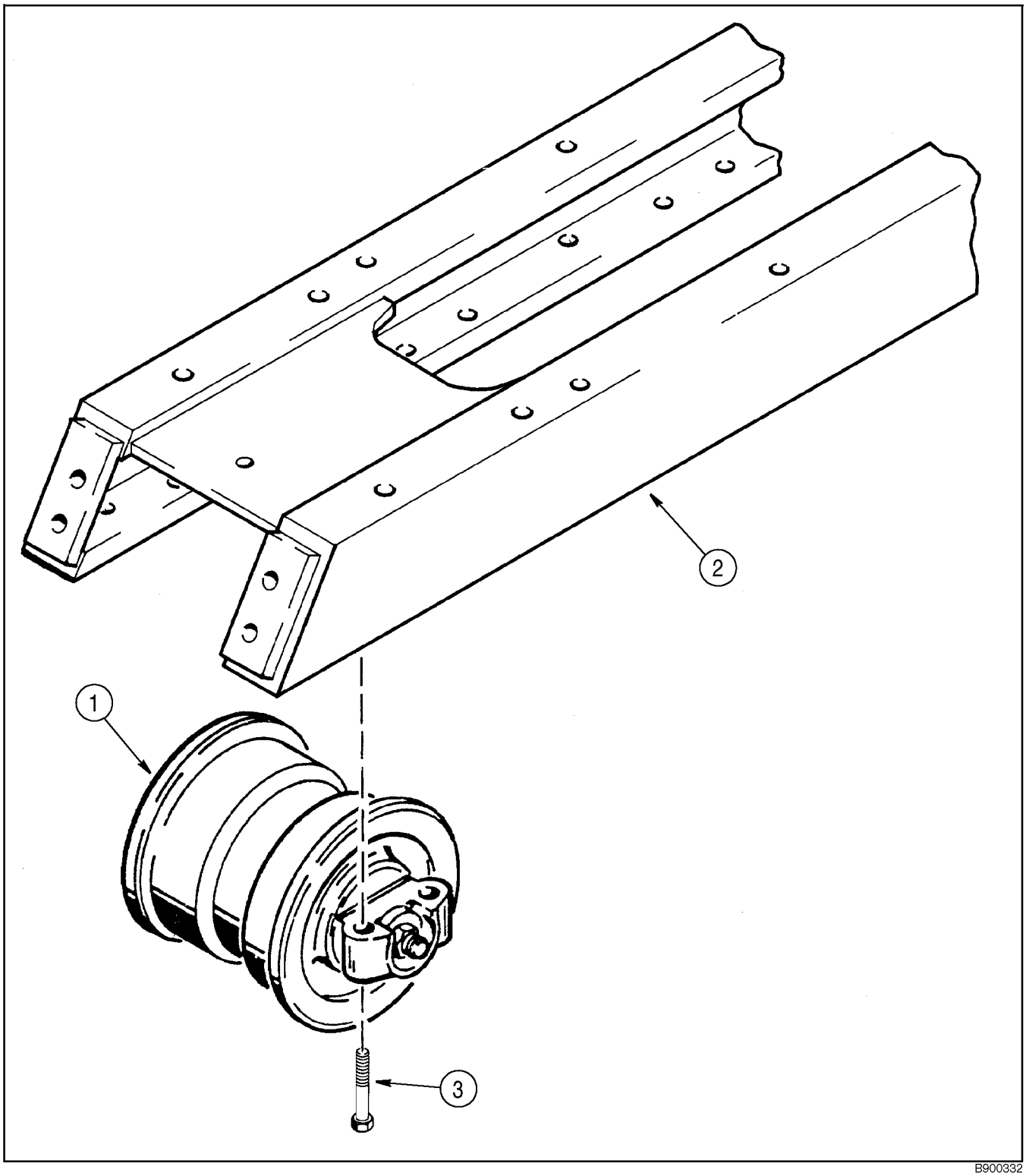
B921310M

Install a seal in the CAS-1283 seal installation tool as shown.

STEP 22

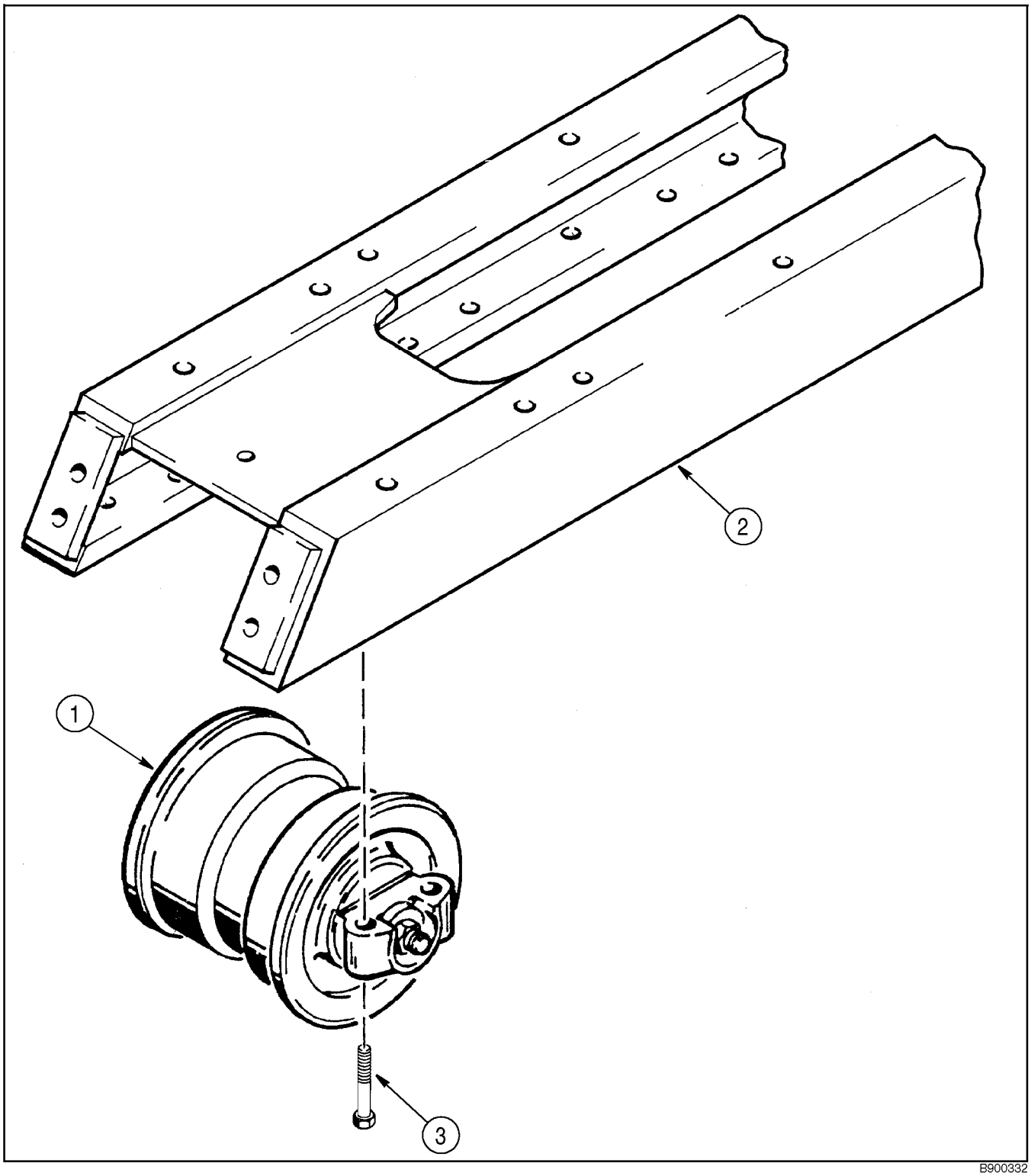
B921336M

Make sure each bore for the rubber rings are clean and free of any lubricant.



B900332

1. TRACK ROLLER
2. TRACK FRAME
3. SELF-LOCKING BOLT



B900332

1. TRACK ROLLER
2. TRACK FRAME
3. SELF-LOCKING BOLT
   TIGHTEN TO 434 TO 447 NM (320 TO 330 POUND-FEET) WITH LOCTITE

HYDROSTATIC PUMP

Removal

NOTE: *After removal of lines, cap and plug lines and fittings.*

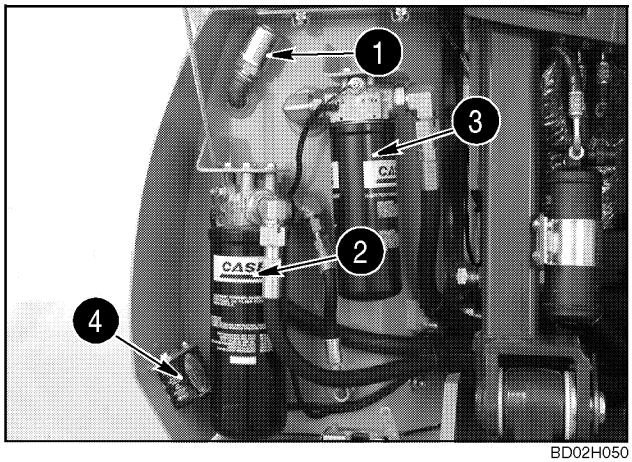
STEP 1

Park the machine on a level surface, lower the blade and any attachment to the floor, apply the parking brake levers and turn off the master disconnect.

STEP 2

Tilt the ROPS cab or canopy, see section 9008.

STEP 3



BD02H050

1. RESERVOIR VENT
2 TRANSMISSION FILTER
3. HYDRAULIC FILTER
4. BACK UP ALARM

Remove the vent from the hydraulic reservoir and connect a vacuum pump to the reservoir. Turn on the vacuum pump.

IMPORTANT: ***DO NOT*** *disconnect two lines at the same time going to the hydraulic reservoir. Plug or cap any line prior to disconnecting another.*

NOTE: *Tag all lines and wires before disconnecting for proper identification for assembly. See page 4 for locations.*

STEP 4

Disconnect the hydraulic pump inlet line (9).

STEP 5

Disconnect the rear charge pump inlet line (8).

STEP 6

Disconnect the case drain to reservoir line (6).

STEP 7

Disconnect the filter output line (14).

STEP 8

Disconnect hydraulic pump outlet line (7).

STEP 9

Disconnect the equipment valve return line (11).

STEP 10

Disconnect the thermal valve to filter line (18).

STEP 11

Disconnect the solenoid and pressure switch wiring harness from both solenoids and pressure switch (17).

STEP 12

Disconnect the five lines to the diagnostic center (13). Three lines are located on the right side of the pump.

STEP 13

Disconnect the brake solenoid pressure line from the front charge pump (10).

STEP 14

Disconnect the left motor pressure lines (12).

STEP 15

Disconnect the right motor pressure lines (5).

STEP 16

Disconnect lift cylinder crossover lines (4). Remove two bolts and clamps from front mounting bracket.

STEP 17

NOTE: *Line 3 and line 15 do not need to be removed prior to pump removal.*

Attach suitable lifting equipment to the pumps, ensure proper balance of the pumps to keep from tilting during removal.

STEP 18

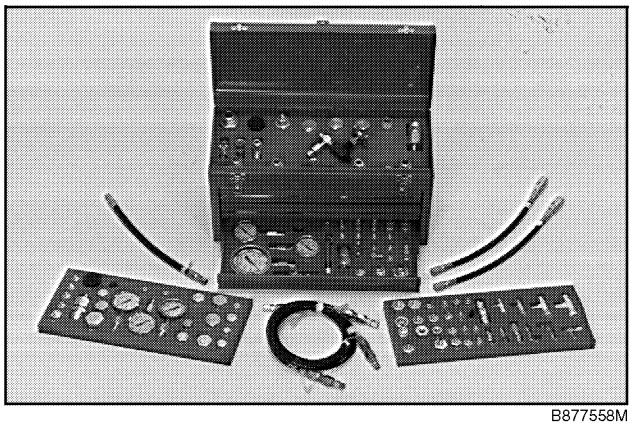
Remove the two front mounting bolts (2).

SPECIFICATIONS

Charge Pump Pressure	24 bar (350 psi)
Left Forward Pump Port MA	414 bar (6000 psi)
Left Reverse Pump Port MB	414 bar (6000 psi)
Right Forward Pump Port MB	414 bar (6000 psi)
Right Reverse Pump Port MA	414 bar (6000 psi)

NOTE: *The hydraulic and hydrostatic oil must be at an operating temperature of 49° to 63° C (120° to 145° F) when checking pressure specifications.*

SPECIAL SERVICE TOOLS



B877558M

CAS-1804 PRESSURE TEST FITTING KIT

CHECKS TO DO BEFORE TROUBLESHOOTING

1. Check the oil level, type, and grade in the hydraulic reservoir. See Section 1002 for correct hydraulic oil specifications.
2. Check hydrostatic oil filter condition and change as necessary. See Section 8002 for procedure.
3. Check control linkage for correct operation. See section 9001 for adjustment.
4. Check engine r/min (rpm). See Section 2001 for adjustment.

CHECKING PRESSURE OF LEFT PUMP

Equipment Required

CAS-1804 Pressure test and fitting kit.

Left Pump Pressure Test

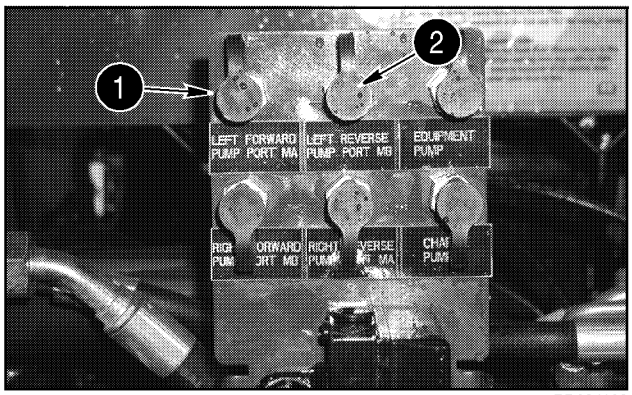
Make sure the hydraulic and hydrostatic oil is at operating temperature.

1. It will be necessary to operate the machine against an immovable object or into a spoil pile. The surface must be one that will allow the track to dig in, in both FORWARD and REVERSE.

> **WARNING:** *Always know the location of all workers in your area. Warn them before you start working the machine. Always keep all other persons away from your area. Serious injury or death can result if you do not follow these instructions.*

SA015

2. Connect a 414 to 690 bar (6000 to 10,000 psi) gauges on the quick disconnect fitting marked Left Reverse Pump Port MB (2) and Left Forward Pump Port MA (1). The hose for the pressure gauge must have at least a 690 bar (10,000 psi) rating.



BD02J109

3. Direct the gauges into the ROPS or cab to view them from the operators seat.
4. Start the engine.
5. Make sure the Hand Throttle is in the idle position.
6. Use the UP range button to place the machine in its highest range. The instrument cluster will reflect the hydrostat range.
7. Make sure both parking brakes are in the OFF position.
8. Place the directional control in the F position.
9. Raise and maintain engine r/min (rpm) at 2000. When the pressure stops increasing, record the pressure reading.
10. Move the Hand throttle to the IDLE position.
11. Place the directional control in the R position.
12. Raise and maintain engine r/min (rpm) at 2000. When the pressure stops increasing, record the pressure readings.
13. Move the Hand throttle to the IDLE position, place the directional control in neutral and apply the parking brakes, stop the engine.
14. Compare the pressure readings recorded to the specifications on page 3.
15. If pressures are not within specification on page 3, tilt the ROPS cab/canopy, see section 9008.
16. Adjust the pressure reliefs of the left pump by doing the following procedure:
    A. Check the torque of the pressure relief valves in the pump body, 150 Nm (110 lb-ft).
    B. Remove the plastic cap from the pressure relief valve, loosen the jam nut and turn the adjusting screw in until it is fully seated, tighten the jam nut.

NOTE: *Repeat the procedure for the other pressure relief valve.*

17. Lower the ROPS cab/canopy, see section 9008.
18. Repeat Steps 3 through 14 to check the pressure setting.
19. If pressure is still not within specification on page 3, tilt the ROPS cab/canopy, see section 9008.
20. Adjust the pressure over ride valve by doing the following procedure:
    A. Remove the plastic cap from the POR valve, loosen the jam nut and turn the adjusting screw in until it just seats, tighten the jam nut.

IMPORTANT: ***DO NOT*** *over tighten the adjusting screw in the POR valve, this* ***WILL*** *damage internal components of the POR valve.*

21. Lower the ROPS cab/canopy, see section 9008.
22. Repeat procedures 3 through 14 to check the pressure setting.

NOTE: *If the pressure reading is not within specifications see section 6000 removal and installation of power train components, see sections 6003 and 6004 for repair of pumps and motors.*

FAULT 4121

Left Forward Pump Solenoid Circuit Open or Over Current

Condition:

Crawler will not move forward.

Possible Failure Modes:

1. Connectors not mated fully, pins not pushed into connector fully, bent pin or broken wire at rear of connector.
2. Wiring or solenoid circuits open.
3. Wiring or solenoid circuits shorted.
4. Failed Drivetrain Control Module.

NOTE: *Go to the electrical schematic for a complete view of the controller circuit.*

STEP 1

Find out if the fault code is still active.

A. Turn ignition switch to RUN position to power drivetrain controller.

B. Clear all fault codes from the controller.

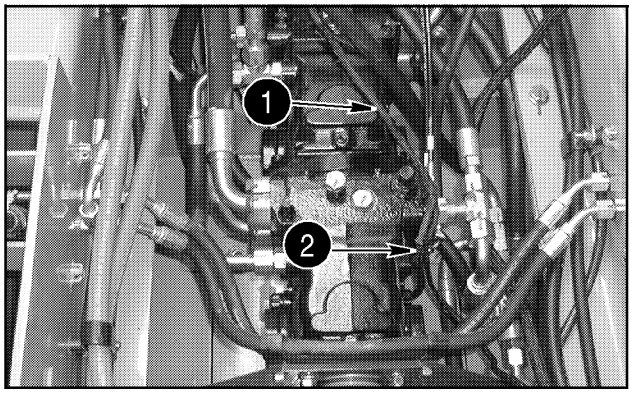
NOTE: *Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.*

C. To check for fault code: Move directional control to neutral, ignition switch to run (engine does not need to be running), move both parking levers to down position, move hand throttle to high idle position, and push directional control to forward position.

NOT OK – Fault code 4121 is recorded again. Go to Step 2.

OK – Fault is not recorded again. Ok for return to service.

STEP 2



BD02H004

1. CONNECTOR X 63 2. CONNECTOR X 62

Clean and inspect the Left Forward Pump Solenoid Connection.

A. Turn ignition switch and master disconnect off.

B. Tilt ROPS cab/canopy, see section 9008.

C. Disconnect the Left Forward Pump Solenoid, Connector X63.

D. Inspect pins 1 through 4. Clean connections.

E. Clean female pins by installing and removing.

F. Measure the resistance of the coil at the Left Forward Pump Solenoid, Connector X63 pins 1 and 2. The resistance should be 5.75 Ohms ± 0.75 Ohms.

NOT OK – Replace the solenoid. Return to Step 1 to confirm elimination of fault.

OK – Go to Step 3.

STEP 3

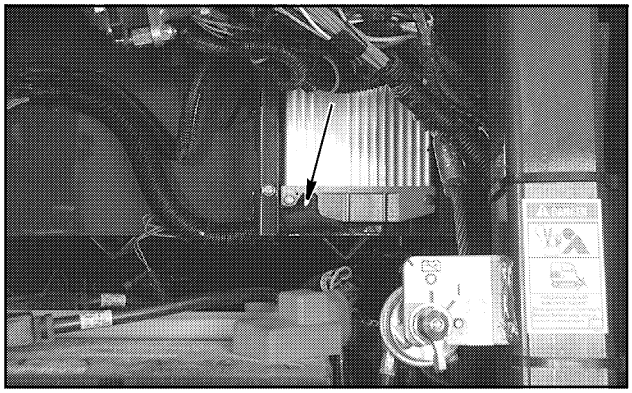
Check the Left Forward Pump Solenoid Ground Connection.

A. Measure the resistance between **Connector X63**, pin 1 and battery ground, must be less than 10 Ohms.

NOT OK – Determine break in ground connection and repair. Return to Step 1 to confirm elimination of fault.

OK – Go to Step 4.

STEP 5



BD02M044

Check for open circuit in the Left Motor Solenoid control wire between connectors X55 and X50.

A. Disconnect the Main Drivetrain Controller, **Connector X50**.

B. Inspect pin 34 on **Connector X50**. Clean connections.

C. Clean female pins by installing and removing.

D. Check for open circuit between pin B of **Connector X55**, and pin 34 of the Main Drivetrain Controller, **Connector X50**.

NOT OK – Determine break between connector X50 and X55 and repair. Return to Step 1 to confirm elimination of fault.

OK – Go to Step 6.

STEP 6

Replace the Drivetrain Control Module.

A. Remove and replace Drivetrain Control Module.

B. Write symptom on failed Drivetrain Control Module.

C. Install program with Electronic Service Tool (EST) and recalibrate system.

STEP 7

Install the rear cover and torque the 30mm hex bolts to 430 to 485 Nm (315 to 355 lb-ft), the 18mm hex bolts to 77 to 100 Nm (57 to 74 lb-ft).

FAULT 4321

Throttle Potentiometer Circuit Out of Range

Condition:

Anti stall function is no longer active, engine will stall under heavy load.

Possible Failure Modes:

1. Connectors not mated fully, pins not pushed into connector fully, bent pin or broken wire at rear of connector.
2. Water in connectors
3. Adjust sensor and re-calibrate
4. Wiring or sensor circuits shorted
5. Failed Drivetrain Control Module

NOTE: *Go to the Electrical Schematic for a complete view of the controller circuit.*

STEP 1

Find out if the fault code is still active.

A. Turn ignition switch to RUN position to power drivetrain controller.

B. Clear all fault codes from the controller.

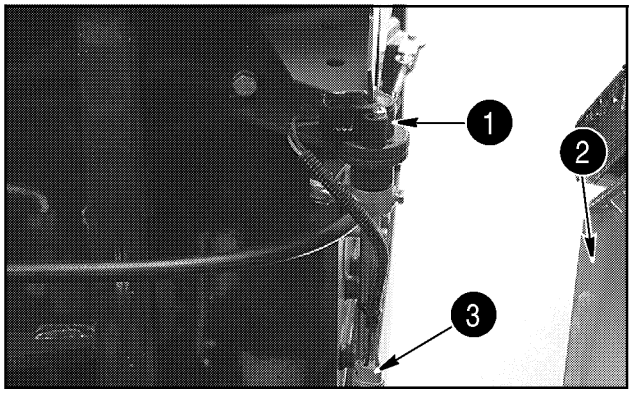
NOTE: *Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.*

C. To check for fault code: Move directional control to neutral, ignition switch to run (engine does not need to be running), move both parking levers to down position, move hand throttle to high idle position.

NOT OK – Fault code 4321 is recorded again. Go to Step 2.

OK – Fault is not recorded again. Ok for return to service.

STEP 2



BD02F014

1 POTENTIOMETER
2 ENGINE FIRE WALL
3 CONNECTOR X 59

Inspect the Throttle Potentiometer Connection.

A. Turn ignition switch and master disconnect off.

B. Disconnect the Throttle Potentiometer, **Connector X59**.

C. Inspect pins A, B, and C. Clean connections.

D. Check for water in connectors.

E. Clean female pins by installing and removing.

NOT OK – Replace and adjust Throttle Potentiometer. Return to Step 1 to confirm elimination of fault.

OK – Go to Step 3.

FAULT 4521

Bump Up Switch Stuck On at Power Up

Condition:

The Instrument Cluster is indicating that the Maximum Speed setting is increasing, when Bump Up Switch is not being commanded.

Possible Failure Modes:

1. Connectors not mated fully, pins not pushed into connector fully, bent pin or broken wire at rear of connector.
2. Button is mechanically stuck
3. Wiring or switch circuits shorted
4. Failed Drivetrain Control Module

NOTE: *Go to the Electrical Schematic for a complete view of the controller circuit.*

STEP 1

Find out if the fault code is still active.

A. Turn ignition switch to RUN position to power drivetrain controller.

B. Clear all fault codes from the controller.

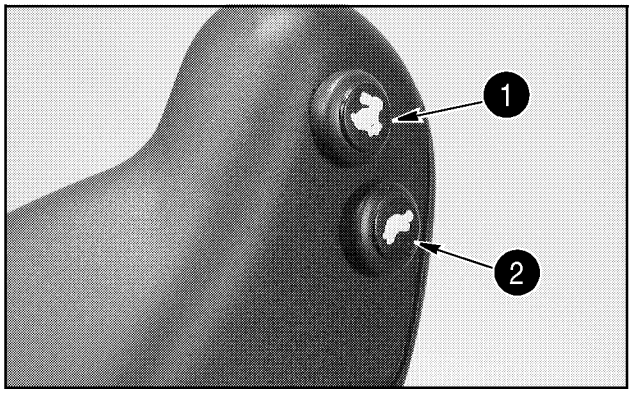
NOTE: *Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.*

C. To check for fault code: Move directional control to neutral, ignition switch to run (engine does not need to be running), move both parking levers to down position, move hand throttle to high idle position, and push directional control to forward position.

NOT OK – Fault code 4521 is recorded again. Go to Step 2.

OK – Fault is not recorded again. Ok for return to service.

STEP 2



BD02M166

1. BUMP UP SWITCH 2. BUMP DOWN SWITCH

Inspect the Bump Up Switch Connection.

A. Turn ignition switch and master disconnect off.

B. Check for button mechanically stuck.

C. Clear buttons of any foreign debris.

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

OK – Go to Step 3.

STEP 3

Check for open circuit in the Bump Up Switch.

A. Disconnect the Bump Up Switch Connector.

B. Check wiring and connector for Bump Up Switch.

NOT OK – Replace handle and button, and return to Step 1 to confirm elimination of fault.

OK – Go to Step 4.

STEP 4

Replace the Drivetrain Control Module.

A. Remove and replace Drivetrain Control Module.

B. Write symptom on failed Drivetrain Control Module.

C. Install program with Electronic Service Tool (EST) and recalibrate system.

Section
6007

FINAL DRIVES

6007

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

Bur 6-48130

Printed in U.S.A.
Issued December, 2002

STEP 13

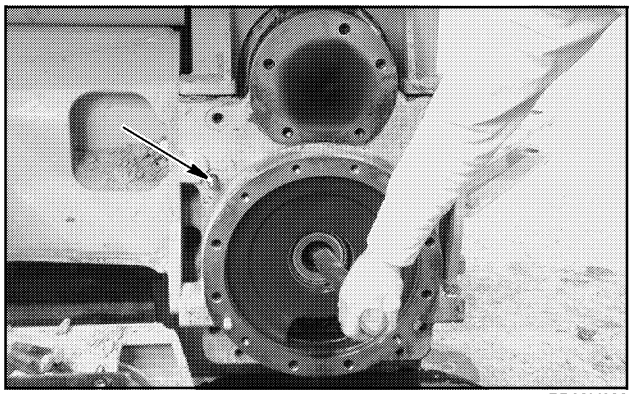
ATTENTION: *The cover is under spring pressure and must be loosened evenly to prevent damage.*

Loosen the five bolts (27) on the housing cover (28) 2 turns, continue to loosen the bolts 2 turns until the brake spring (26) pressure is released, then remove the bolts (27), housing cover (28) and spring washers (26).

STEP 14

Remove six of the eight bolts (29) from the sandwich housing (24).

STEP 15



BD02M092

Install 380000848 dowel bolts, place a long rod into the lower gear, support the lower gear (14) in the housing.

STEP 16

Remove the last two mounting bolts (29), separate the sandwich housing (24) from the drop box (30).

NOTE: *There are two dowel pins (12) in the housings, use pry bars on the bolt bosses for attachments to help separate the housings.*

STEP 17

Put a nylon lifting strap through the brake bore of the sandwich housing (24) and attach suitable lifting equipment.

IMPORTANT: ***DO NOT*** *allow all of the weight of the sandwich housing to be placed on the outer portion of the dowel bolts.*

STEP 18

Remove the sandwich housing (24) from the drop box (30).

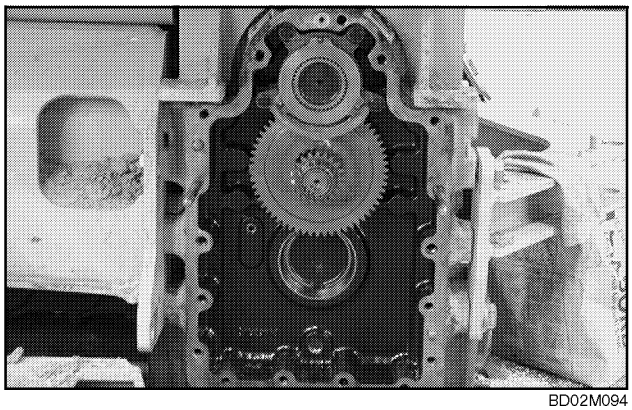
STEP 19

Lay the sandwich housing (24) face down on a flat surface.

STEP 20

Remove the brake piston plate (17) and the brake piston (25). Separate the brake piston plate (17) and the brake piston (25).

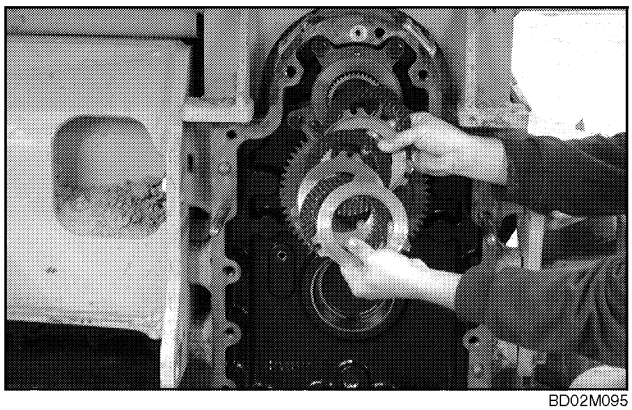
STEP 21



BD02M094

Remove the lower gear (14) from the drop box (30).

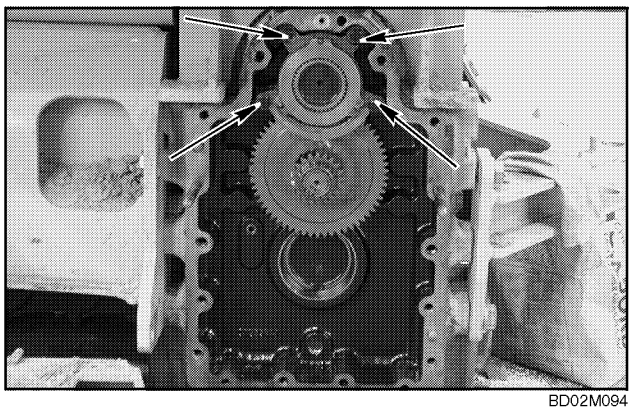
STEP 22



BD02M095

Remove the four separator plates (22) and three friction clutch plates (19).

STEP 23

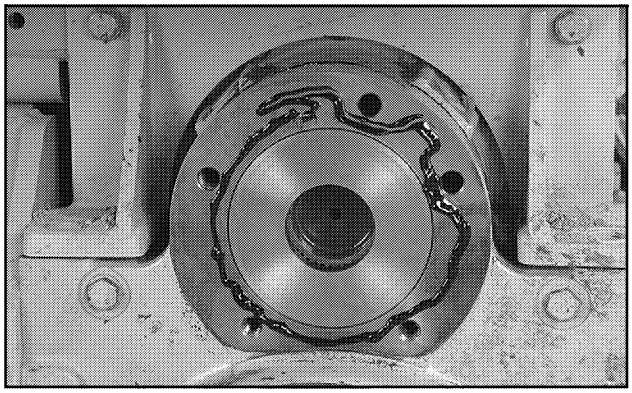


BD02M094

Remove the four retaining bolts (8) and bearing housing (7) from the input gear (6).

IMPORTANT: *Have another person hold the gears in the drop box when removing the retaining bolts.*

STEP 67



BD02M112

Using Loctite 515 make a bead on the inner diameter of the final drive sandwich housing (24).

NOTE: *Make a bead on the inside of the bolt holes with no breaks in the bead.*

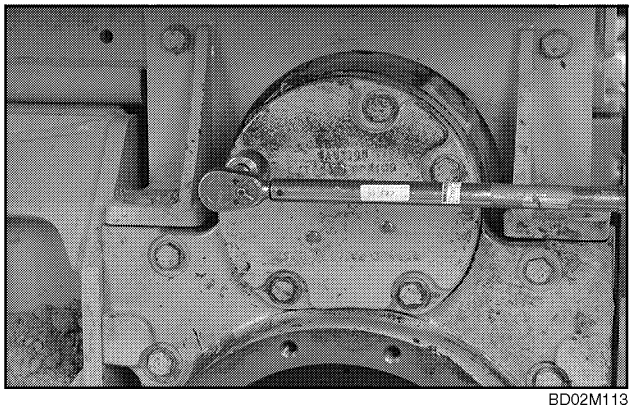
STEP 68

Install the outer cover (28) and five retaining bolts (27).

STEP 69

Tighten the bolts (27) down evenly until springs (26) are compressed and cover (28) is flat on the sandwich housing (24).

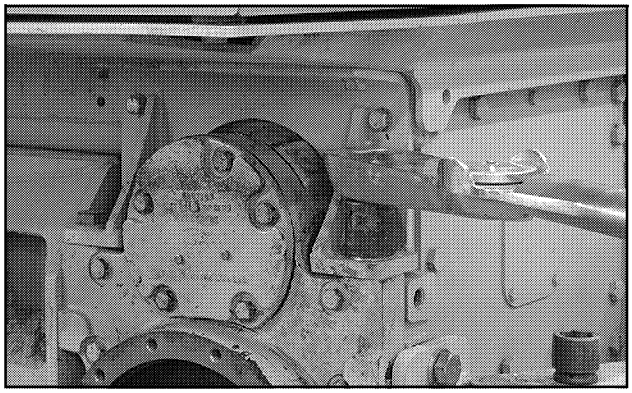
STEP 70



BD02M113

Torque the bolts to 195 to 250 Nm (145 to 185 lb-ft).

STEP 71



BD02M114

Install the two bolts and washers (54) securing the ROPS frame support (56 or 57), torque to 1160 to 1300 Nm (855 to 960 lb-ft).

STEP 72

Install the two bolts and washers (58) securing the sandwich housing (24) to the frame, torque to 1160 to 1300 Nm (855 to 960 lb-ft).

STEP 73

Make sure that the dowel pins (12) are in the sandwich housing (24). Install the 380000848 dowel bolts in the sandwich housing (24).

STEP 74

Attach suitable lifting equipment to the sprocket mounting flange, place the hub assembly (42) on the dowel bolts.

IMPORTANT: ***DO NOT*** *allow all of the weight of the* hub assembly (42) *to be placed on the outer portion of the dowel bolts.*

NOTE: *Make sure to place the hub assembly (42) on the dowel bolts in such a manner that the dowel pins (12) will align with dowel pin bores during assembly.*

STEP 19

Remove the cap and plug, connect the brake line.

STEP 20

Install the four bolts (53) and washers securing the ROPS frame support bracket (56 or 57) to the ROPS frame, torque to 280 to 320 Nm (206 to 235 lb-ft).

STEP 21

Install the three bolts (58) and washers securing the front of the drop box (30) to the frame, torque to 1160 to 1300 Nm (855 to 960 lb-ft).

NOTE: *Install the drive motor, see section 6000.*

NOTE: *Do step 34 through 94, FINAL DRIVE REPAIR (FINAL DRIVE INSTALLED ON MACHINE), this section, to finish assembly of the final drive.*

SECTION INDEX

HYDRAULICS

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Bur 6-48160

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8002

Section 8002

HYDRAULIC SPECIFICATIONS TROUBLSHOOTING AND PRESSURE CHECKS

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

Bur 6-47150

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Issued December, 2002

Ripper Circuits - (if equipped)

> **WARNING:** *Make sure that everyone is clear of the ripper prior to proceeding.*

29. Hold the ripper control lever in the LIFT position and adjust the pressure Load Valve on the Flowmeter as required to keep the pressure at 138 bar (2000 psi). Adjust the engine speed to keep the engine running at 2000 r/min (rpm). Read the flow gauge and write the reading on the check sheet.
30. Hold the ripper control lever in the LOWER position and adjust the pressure Load Valve on the Flowmeter as required to keep the pressure at 138 bar (2000 psi). Adjust the engine speed to keep the engine running at 2000 r/min (rpm). Read the flow gauge and write the reading on the check sheet.
31. Open the pressure Load Valve on the Flowmeter. Decrease the engine speed and stop the engine.
32. Move the control levers in all directions to release any pressure in the hydraulic circuits.
33. Tilt the ROPS cab/canopy to gain access to the hydraulic spool valve. See Section 9008.
34. Remove the flowmeter return line from the reservoir and replace the filler cap.
35. Turn the vacuum pump on.
36. Remove the tee fitting from the hydraulic pump hose and the equipment control valve.
37. Connect the hydraulic pump hose to the equipment control valve.
38. Turn the vacuum pump off and remove the hose from the vent fitting.
39. Install the vent in the reservoir.
40. Lower and secure the ROPS cab/canopy. See Section 9008.
41. Check the oil level in the reservoir, add oil as needed. See Section 1002.
42. Start and run the engine at 2000 r/min (rpm) and hold the blade control in the raise position for 5 seconds. Lower the blade to the ground and stop the engine.
43. Check for hydraulic leaks, repair as necessary.

Understanding Results of Test

1. If the flow indication for each circuit was approximately the same as the flow indication at the same pressure in Test No. 1 - Equipment Pump flow Test, the circuit is good.
2. If the flow indication for a circuit was **more** than 3.79 L/min (1 gpm) **less** than the flow indication at the same pressure in Test No. 1 - Equipment Pump Flow Test, there is leakage in that circuit.
3. Leakage in the dozer/ripper circuits can be caused by:
   A. Damaged or worn packing in one or both cylinders in that circuit.
   B. Damaged or missing O-rings on the plugs or circuit relief valve to the work ports in the control valve.
   C. Damaged or worn spool or spool bore in the control valve section for that circuit.
   D. A ripper circuit can have a circuit relief valve not adjusted to the correct pressure setting or worn and damaged.
4. If the flow indication for **all** of the circuits was **more** than 3.79 L/min (1 gpm) **less** than the flow indication at the same pressure in Test No. 1 - Equipment Pump Flow Test, there is leakage at a point common to the entire system.
   A. The main relief valve not adjusted to the correct pressure setting or the main relief valve begins to open at 203 bar (2950 psi) or a lower pressure, adjust the main relief valve and do flow test over.
   B. Damaged or worn main relief valve. Also inspect for damaged or missing O-rings and seals.

FLUSHING WATER FROM THE HYDRAULIC SYSTEM

1. Start and run the engine at 1500 rpm (r/min).
2. Completely retract the cylinders of all attachments on the machine. Angle the blade to the right, the right cylinder will be fully retracted and the left will be fully extended. Stop the engine.

> **WARNING:** *If retracting the cylinder rods causes the attachments to be raised, block the attachments in place before proceeding to the next step!*

39-4

NOTE: *Any attachment or part of an attachment that is raised must be supported with acceptable equipment to prevent the attachment from falling.*

3. Move each control lever in both directions to release pressure in the hydraulic circuits.
4. Loosen and remove the filler cap from the reservoir.
5. Drain the hydraulic oil from the reservoir.
   A. The reservoir holds approximately 20 U.S. gallons (75.7 litres) of hydraulic oil.
   B. Have available acceptable equipment to drain the hydraulic oil.
   C. Remove the drain plug from the bottom of the reservoir.
6. Remove the hydraulic and hydrostat filter elements from the machine.
7. Install new hydraulic and hydrostat filter elements on the machine.
8. Install the drain plug in the bottom of the reservoir.
9. Fill the hydraulic reservoir with 20 U.S. gallons (75.7 litres) of Case TCH Fluid.
10. Disconnect the line from the OPEN end and CLOSED end of each cylinder.
11. Be sure all control levers are in the NEUTRAL position.
12. Start and run the engine at low idle.

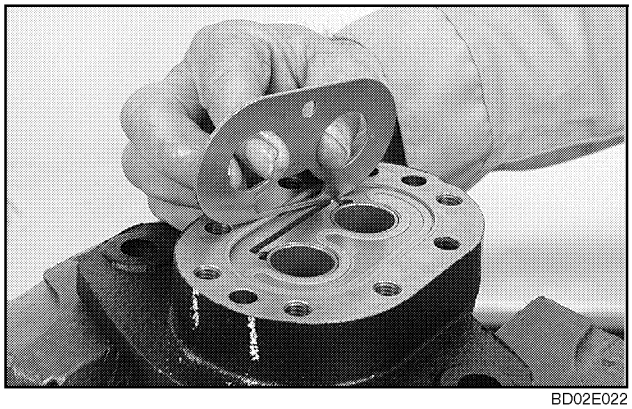
IMPORTANT: *Check the oil level in the hydraulic reservoir frequently while doing step 13. Have another person hold a container under the hydraulic lines while you do step 13.*

13. Slowly move each control lever in both directions until oil begins to flow from the open line. Hold the control lever in place until clean oil flows from the open line.
14. Stop the engine.
15. Connect the system line to the CLOSED end of each cylinder.
16. Connect a suitable drain line to the OPEN end of each cylinder and place the other end in an acceptable container for contaminated oil.
17. Start the engine and run the engine at low idle.
18. Slowly and completely extend all cylinders. As the piston rod comes in/out of the cylinder, oil will be pushed out of the OPEN end of the cylinders.

NOTE: *Any attachment or part of an attachment that is raised must be supported with acceptable equipment to prevent the attachment from falling.*

19. Support any attachments that will be in the RAISED position.
20. Stop the engine.
21. Disconnect the drain lines and connect the system lines to the cylinders.
22. Check the oil level in the hydraulic reservoir. Add oil as required. See Section 1002 for specifications.
23. Install the filler cap on the reservoir.
24. Remove the hydraulic and hydrostat filter elements from the machine.
25. Install new hydraulic and hydrostat filter elements on the machine.
26. Start and run the engine at 1500 rpm (r/min), operate each hydraulic circuit to completely extend and retract the cylinders.
27. Stop the engine and check for leaks. Check the oil level in the hydraulic reservoir. Add oil as required. See Section 1002 for specifications.

STEP 22

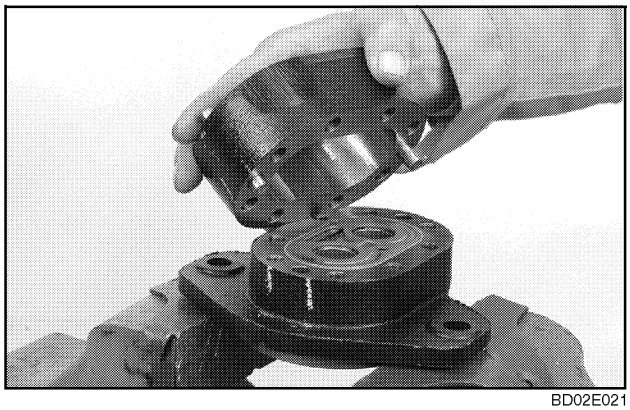


BD02E022

Install a new wear plate in the drive end cover. Make sure that the bronze face of the wear plate is up.

NOTE: *Make sure that the large cavity on the wear plate is over the oil grooves.*

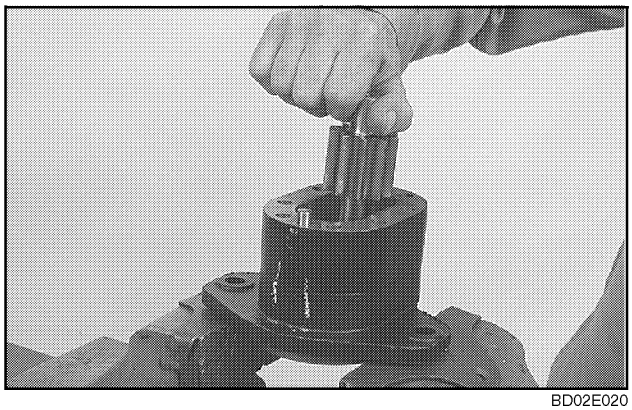
STEP 23



BD02E021

Apply a thin layer of grease to both faces of the gear housing. Install the gear housing on the drive end cover.

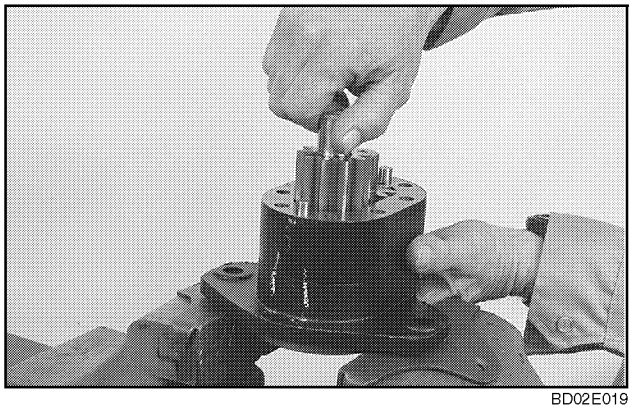
STEP 24



BD02E020

Use clean oil to lubricate the driven gear. Install the driven gear.

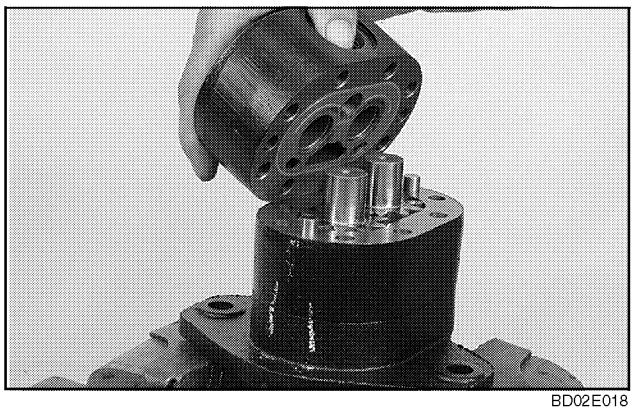
STEP 25



BD02E019

Use clean oil to lubricate the drive gear. Install the drive gear, being careful not to damage the lips of the shaft seal.

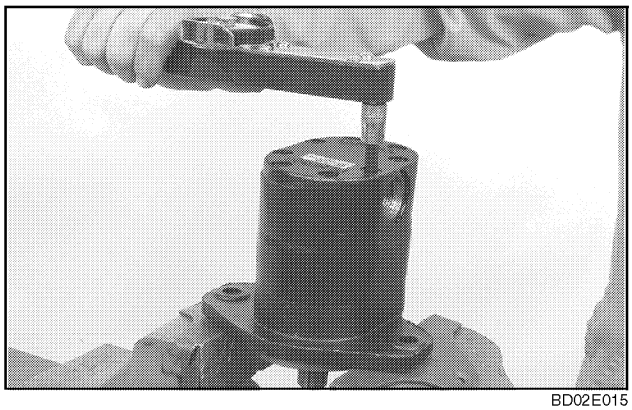
STEP 26



BD02E018

Install the port end cover on the gear housing.

STEP 27

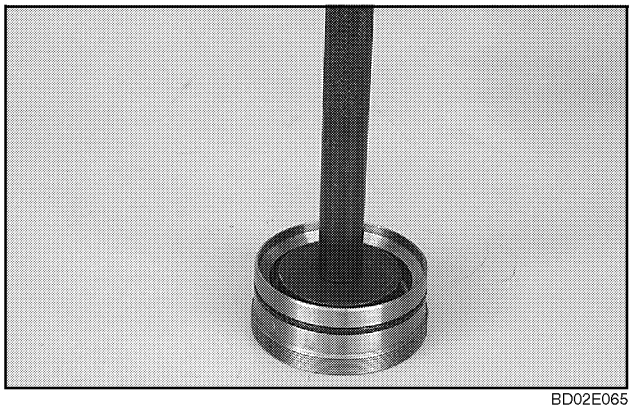


BD02E015

Install the cover bolts and torque.

Assembly

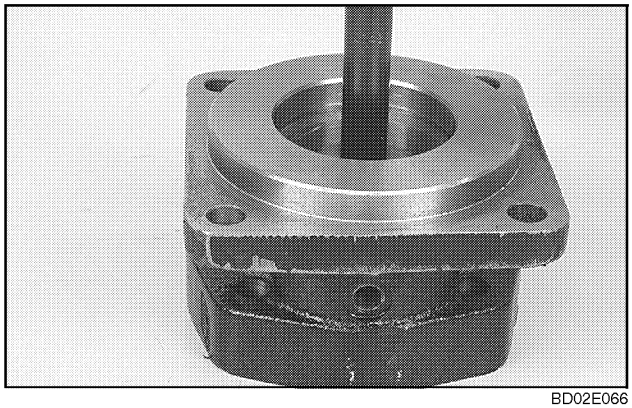
STEP 25



BD02E065

Using a suitable driver install a new seal in the bearing retainer. Install a new O-ring on the bearing retainer.

STEP 26

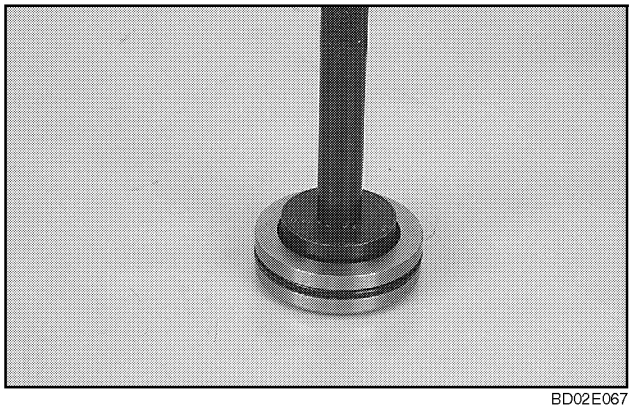


BD02E066

Using a suitable driver install a new seal in the drive end cover.

NOTE: The seal must be pressed flush with face of the recess with lip of seal towards pump gears.

STEP 27

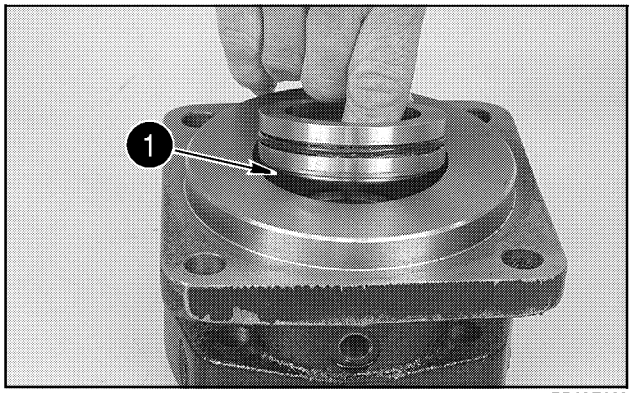


BD02E067

Using a suitable driver install a new seal in the seal retainer. Install a new O-ring on the seal retainer.

NOTE: The seal must be pressed flush with the counter bore with lip of seal away from pump gears.

STEP 28

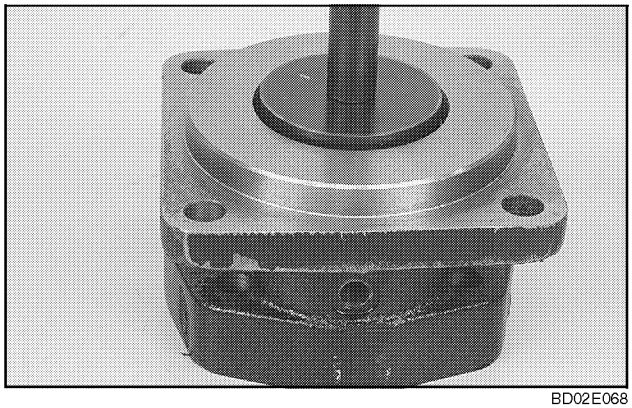


BD02E069

1. TAPPERED SIDE OF REATAINER

Use a light coat of grease to lubricate the O-ring and seal. Install the seal retainer with the tapered side down.

STEP 29



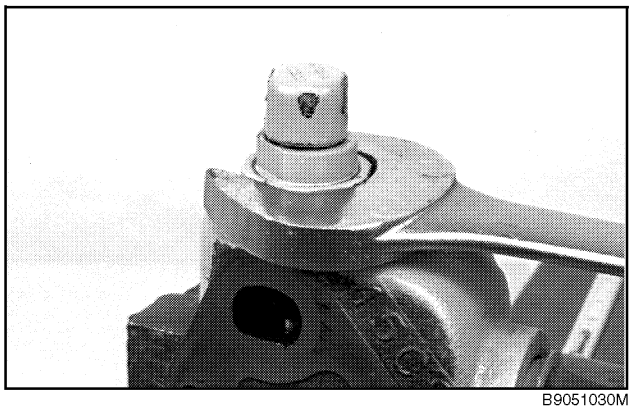
BD02E068

Use a suitable driver to seat the seal retainer.

INLET SECTION

Disassembly

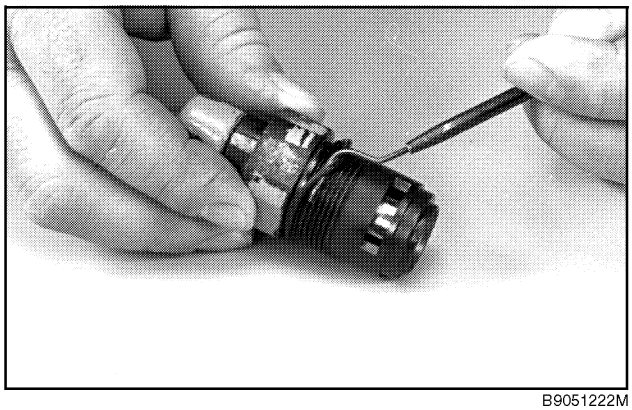
STEP 14



B9051030M

Fasten the inlet section in a vise with soft jaws. Remove the main relief valve.

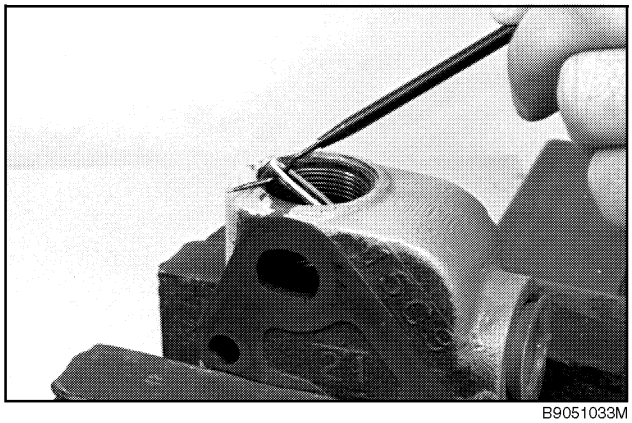
STEP 15



B9051222M

Remove the O-ring from the main relief valve.

STEP 16



B9051033M

Remove the O-ring and the backup ring from the inlet section.

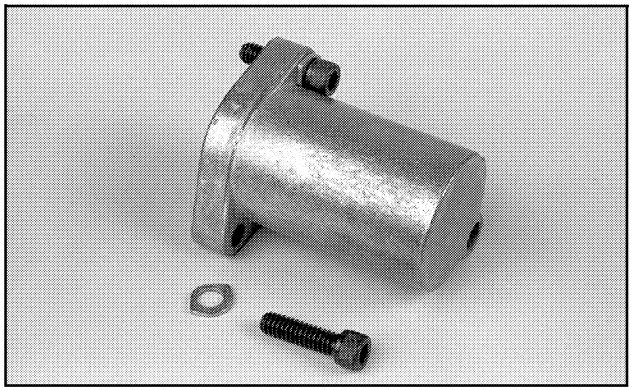
Assembly

NOTE: *Inspect all parts for wear and damage. See page 33.*

For assembly, do the reverse of disassembly.

Tighten the main relief valve to a torque of 24 to 30 Nm (216 to 264 lb-in).

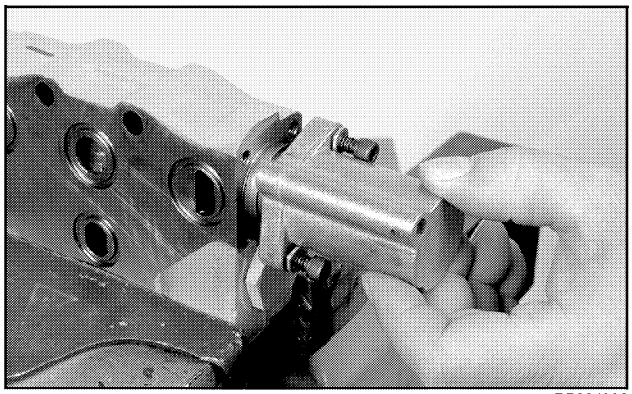
STEP 61



BP99J101

Install new washers and Allen head screws in the spring cap.

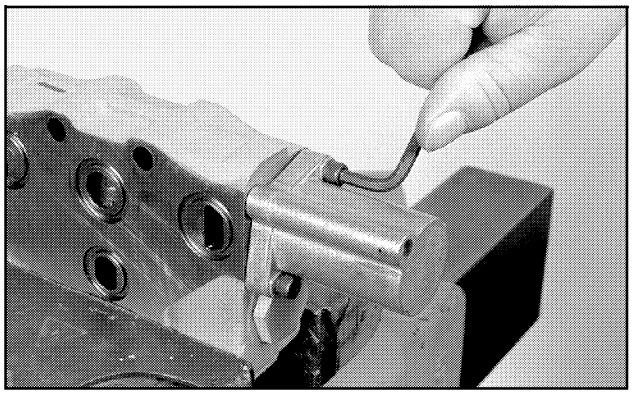
STEP 62



BP99J086

Install the spring cap on the body.

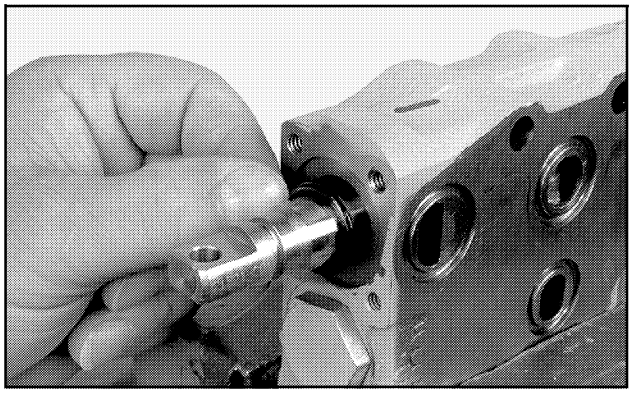
STEP 63



BP99J085

Tighten the Allen head screws to a torque of 12 to 15 Nm (106 to 133 lb-in).

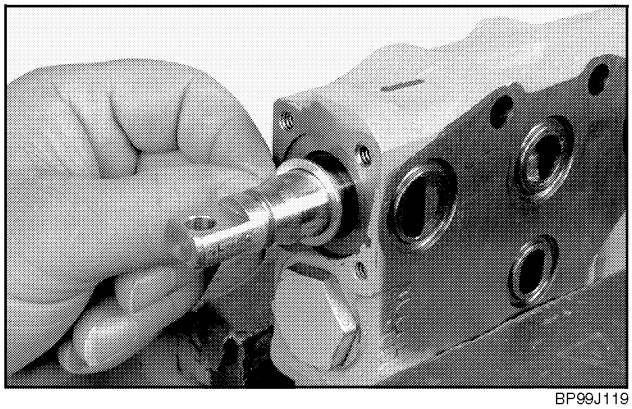
STEP 64



BP99J118

Install a small O-ring over the spool and into the bore of the body.

STEP 65

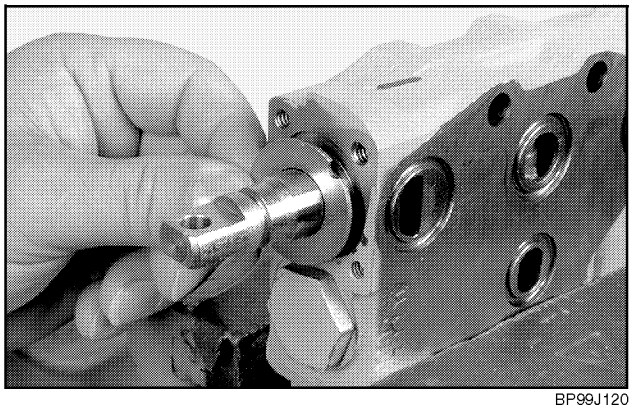


BP99J119

Install the backup ring over the small O-ring.

NOTE: *The small O-ring and backup ring replace the lip seal and wiper found in some valve sections.*

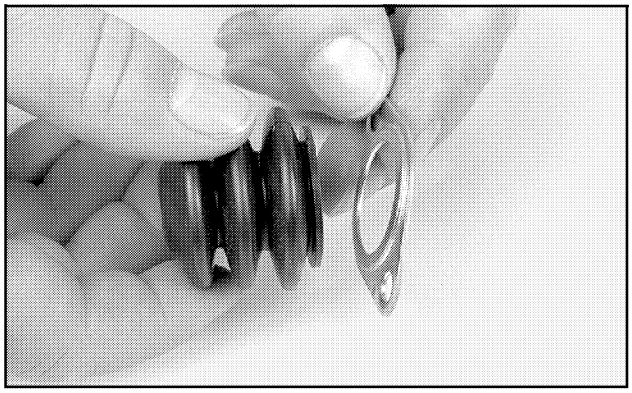
STEP 66



BP99J120

Install the seal retainer.

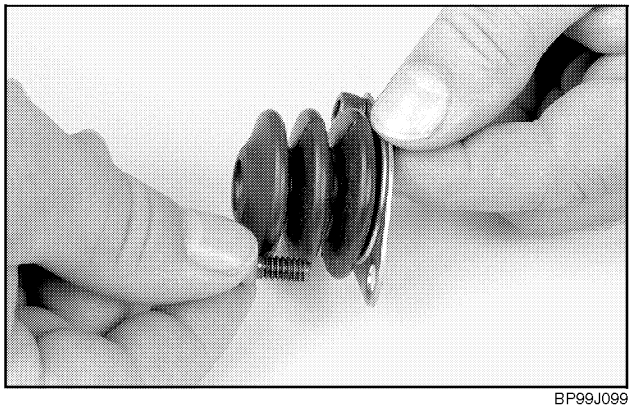
STEP 107



BP99J100

Install the boot retainer on the end of the spool boot. Make sure that the raised ring of the boot retainer is toward the spool boot as shown above.

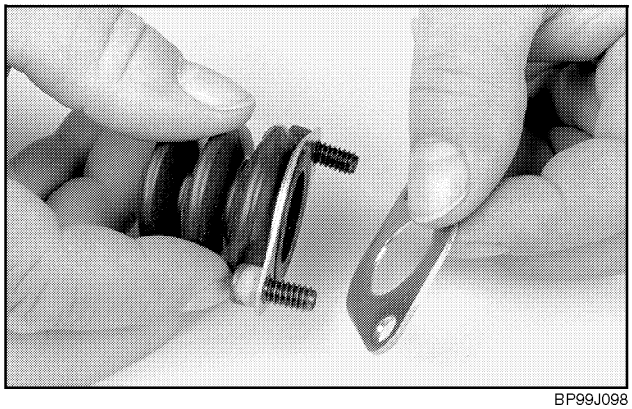
STEP 108



BP99J099

Install the Allen head screws in the boot retainer.

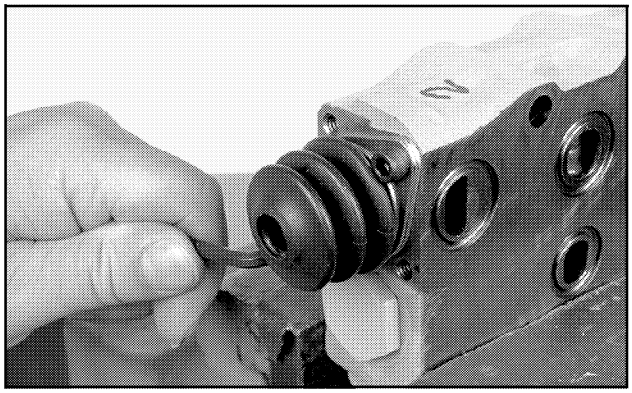
STEP 109



BP99J098

Install the retainer plate on the Allen head screws.

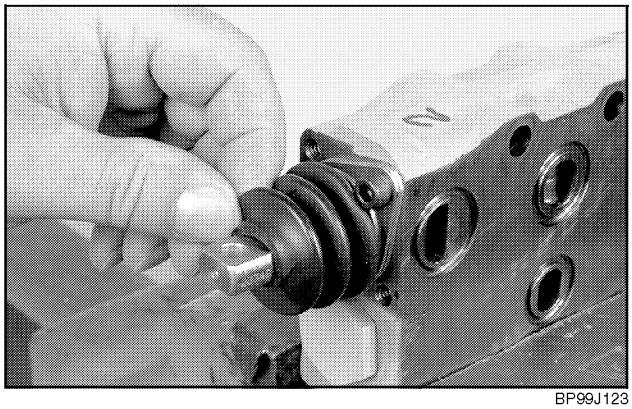
STEP 110



BP99J127

Install the boot and retainer assembly. Tighten the Allen head screws to a torque of 12 to 15 Nm (106 to 133 lb-in).

STEP 111



BP99J123

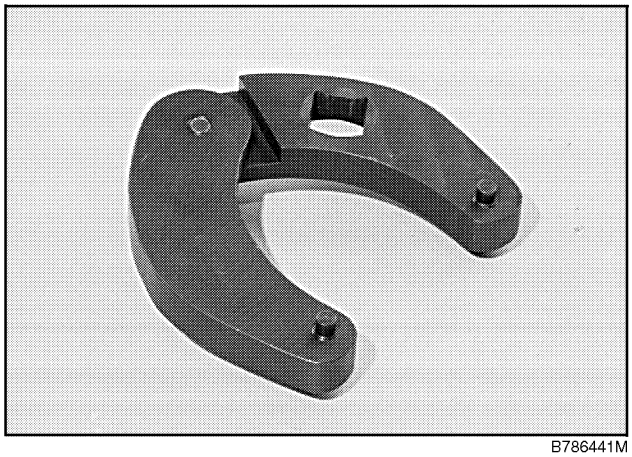
Make sure that the top edge of the spool boot is seated in the groove in the spool.

SPECIFICATIONS

Torque for all piston bolts ..... 895-1110 Nm (660-820 ld-ft)
Torque for all glands ..... 135-542 Nm (100-400 lb-ft)

NOTE: *Torque piston bolt with blue Loctite 242 on threads.*

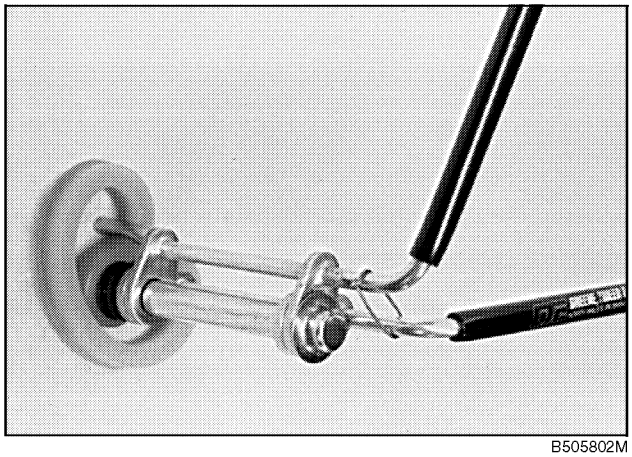
SPECIAL TOOLS



B786441M

CAS-1456 Gland Wrench

This tool is used to remove and install the gland on Case cylinders.

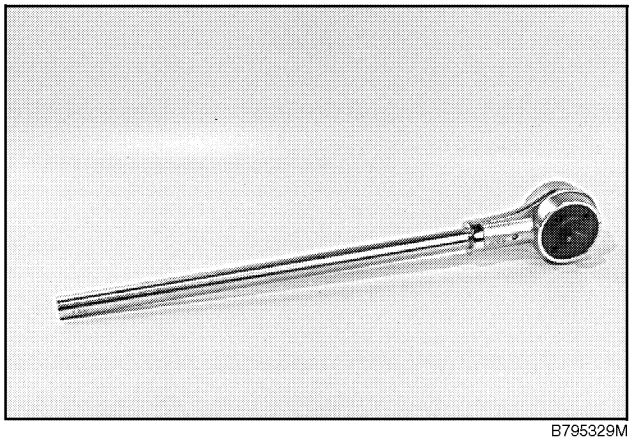


B505802M

1. CAS-1660 For 32 and 38 mm (1-1/4 and 1-1/2 Inch) Rods

2. CAS-1758 For 51 mm (2 Inch) rods

This tool is used to install the buffer seal in the glands of the cylinders.



B795329M

CAS-1039 Torque Multiplier

This tool is used to loosen and tighten the piston bolts.

Section
8007

BRAKE SOLENOID VALVE

8007

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

Bur 6-48230

Printed in U.S.A.
Issued December, 2002

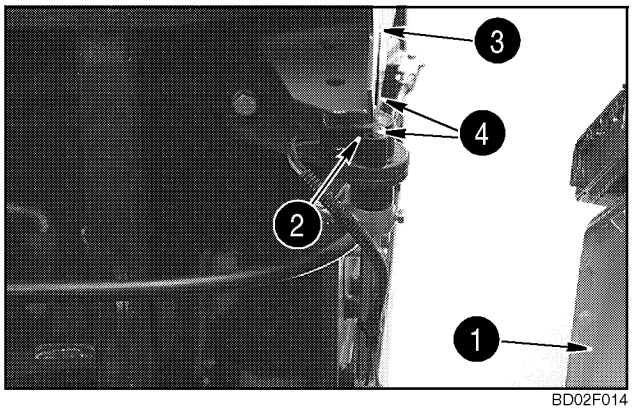
Section 9001

PEDALS AND LEVERS

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

Bur 6-47160

Printed in U.S.A.
Issued December, 2002



BD02F014

1. ENGINE FIRE WALL
2. SENSOR
3. CAB RIGHT FRONT
4. SENSOR MOUNTING SCREWS

12. Select item “F1 \ 7 Calibration \ 6 Throttle Poti”. The display will read: 6 Throttle Poti, Minimal Position, X.X V, the X.X will be the voltage reading.
13. With the throttle lever in the low idle position the voltage reading should be between 0.7 to 1.2 volts.
14. To adjust the voltage loosen the mounting screws (4) and turn the sensor (2) until proper voltage is achieved, tighten the mounting screws (4).
15. Press enter and the display will be changed automatically. The display will read: 6 Throttle Poti, Maximal Position, X.X V, the X.X will be the voltage reading.
16. Move the throttle lever to the high idle position, the voltage reading should be between 3.8 to 4.3 volts.
17. Press enter to confirm, save the adjusted values with item “TEACH\1 Save Params”.

NOTE: *Lower the ROPS cab/canopy, see section 9008.*

18. Start the engine. Select item “F1 \ 8 Mode \ 1 Learning Curve”. The display will read: 1 Learning Curve, XXXX Hz, X.X V, the XXXX Hz is engine r/min (RPM), the X.X V will be the throttle potentiometer voltage reading.
19. Move the throttle lever from low idle to high idle very slowly, approximately 1 minute.
20. Keep the throttle in the high idle position and press enter, the learning curve is stored in the EEPROM.
21. Put the throttle lever in the low idle position and turn the engine off, disconnect the service tool from the machine.

OPERATION

The refrigerant circuit of the air conditioning system contains five major components: compressor, condenser, receiver-drier, expansion valve and evaporator. These components are connected by tubes and hoses and operate as a closed system. The air conditioner system is charged with HFC134a refrigerant.

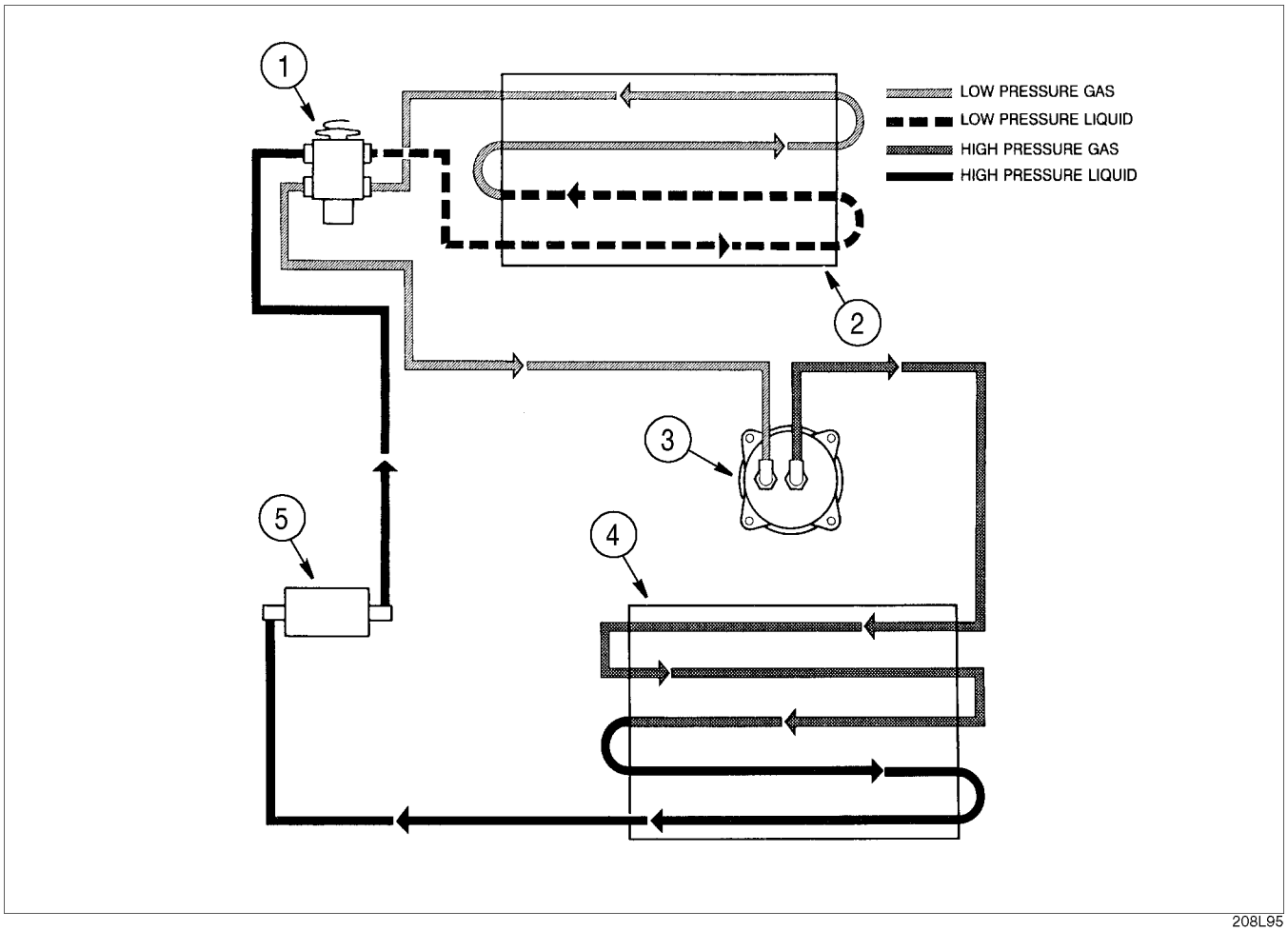
The compressor receives the refrigerant as a low pressure gas. The compressor then compresses the refrigerant and sends it in the form of a high pressure gas to the condenser. The air flow through the condenser then removes the heat from the refrigerant. As the heat is removed the refrigerant changes to a high pressure liquid.

The high pressure refrigerant liquid then flows from the condenser to the receiver-drier. The receiver-drier is a container filled with moisture removing material, which removes any moisture that may have entered the air conditioner system in order to prevent corrosion of the internal components of the air conditioner system.

The refrigerant still in a high pressure liquid form, then flows from the receiver-drier to the expansion valve. The expansion valve then causes a restriction in flow of refrigerant to the evaporator core.

As the refrigerant flows through the evaporator core the refrigerant is heated by the air around and flowing through the evaporator fins. The combination of increased heat and decreased pressure causes the air flow through the evaporator fins to become very cool and the liquid refrigerant to become a low pressure gas. The cooled air then passes from the evaporator to the cab for the operator's comfort.

The electrical circuit of the Air Conditioning System consists of a fan speed control, temperature control, three (3) mini relays, two (2) 10 amp circuit breakers, two (2) fan motors, a blower motor, blower resistor, compressor clutch, low pressure switch, high pressure switch, and warning light.



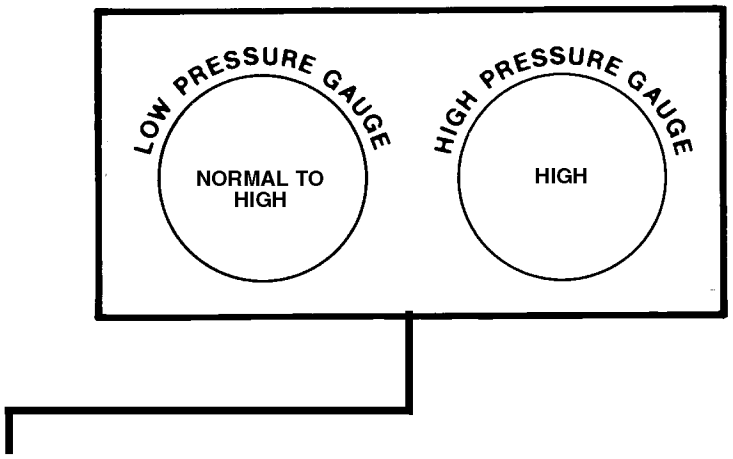
208L95

1. EXPANSION VALVE
2. EVAPORATOR
3. COMPRESSOR
4. CONDENSER
5. RECEIVER-DRIER

QUICK REFERENCE TROUBLESHOOTING CHART

PROBLEM	LOW PRESSURE GAUGE	HIGH PRESSURE GAUGE	SEE PAGE
NO COOLING	VERY LOW	VERY LOW	16
NO COOLING	HIGH	HIGH	17
NOT ENOUGH COOLING	NORMAL TO HIGH	NORMAL	19
NOT ENOUGH COOLING	LOW	LOW	20
NOT ENOUGH COOLING	HIGH	LOW	22
NOT ENOUGH COOLING	HIGH	HIGH	23
INTERMITTENT COOLING	NORMAL	NORMAL	24
NOISE IN SYSTEM	NORMAL TO HIGH	HIGH	25

Problem - Noise in System



See pressure - temperature chart, Page 13.

476L7

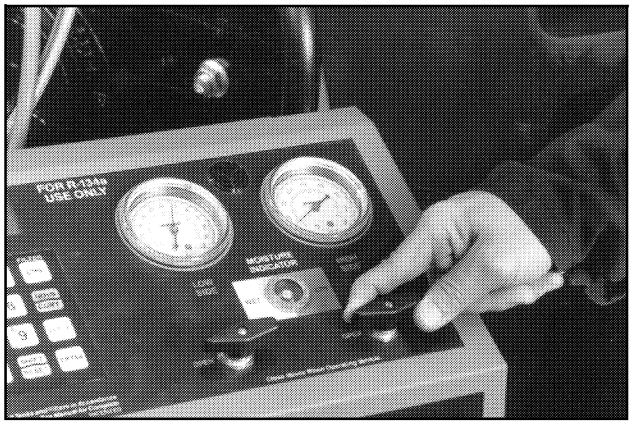
Too much Refrigerant in System - Indications:

A. Cool discharge air from heater/evaporator.

B. Compressor makes noise.

1. Recover the refrigerant from system until gauge readings are below normal. See Section 9004.
2. Add new refrigerant until gauge readings are normal. See Section 9004.

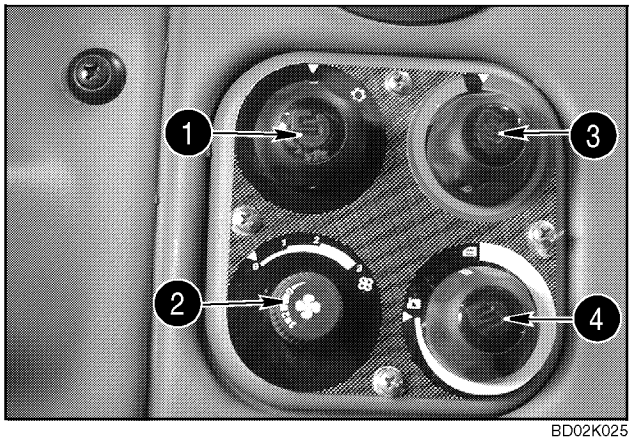
STEP 18



A22114

Completely close the high and low pressure manifold valves.

STEP 19



BD02K025

1. AC SWITCH
2. FAN SWITCH
3. THERMOSTAT CONTROL
4. VENT CONTROL

Start the engine and run at 1500 rpm. Operate the air conditioner system at maximum cooling setting and blower speed with the doors and windows open.

NOTE: *The compressor will not operate if the system pressure is too low or too high. If the compressor fails to operate and the condenser blowers also fail to operate when you actuate the A/C switch, check the system pressure to determine if refrigerant is present. Check for continuity at the pressure switch located at the receiver-dryer and the temperature switch located at the evaporator.*

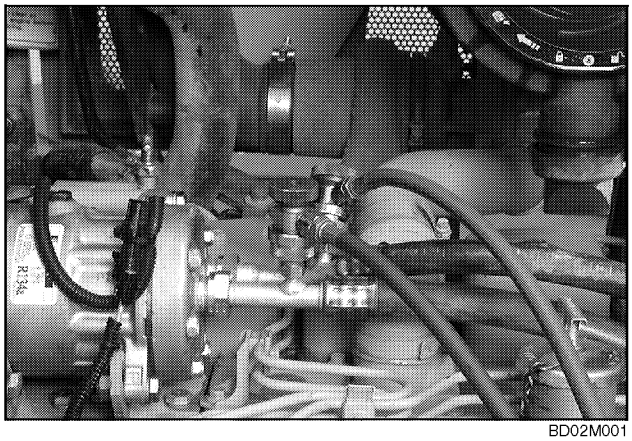
STEP 20

A22117

Observe the pressure gauge readings to determine that the correct amount of refrigerant has entered the system. See chart on Page 9003-9 for temperature and pressure variations.

IMPORTANT: *Check the OEM equipment manual before performing Step 20 to avoid damaging recovery unit. Pressure reading should be obtainable with valves closed. Damage may occur if the machine is started with the valves accidently open or if either or both valves are opened while the A/C system operating.*

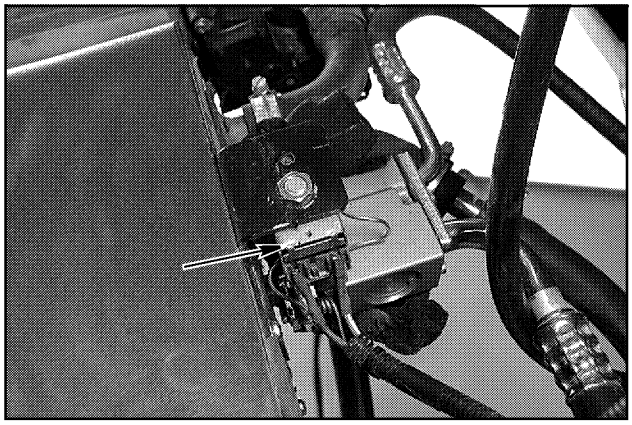
STEP 21



BD02M001

Stop the engine, close any open valves and carefully remove the manifold gauge hoses.

STEP 8



BD02M147

Remove the insulation tape from around the temperature switch, expansion valve and fittings.

STEP 9

Remove the retaining clamp and sensor coil from the evaporator core tube.

STEP 10

Disconnect the wires to the temperature switch, remove the mounting nut for the switch, remove the switch.

Installation

STEP 11

Place the switch in the mounting bracket, install and tighten the mounting nut for the switch, connect the wires to the temperature switch.

STEP 12

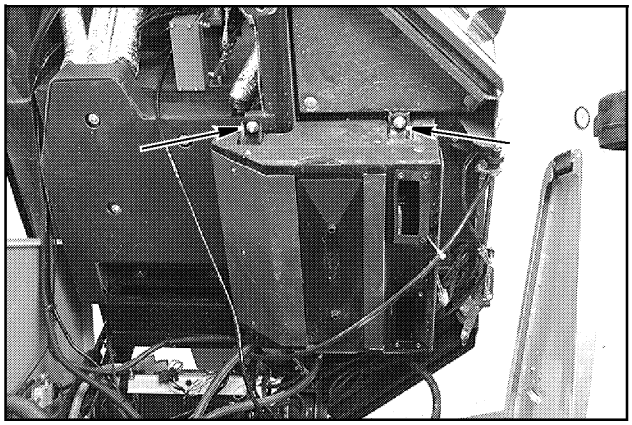
Carefully route the sensor coil to the evaporator core tube, install the retaining clamp.

NOTE: *Do not over tighten the retaining clamp and distort the sensor coil.*

STEP 13

Install new insulation tape around the temperature switch, expansion valve and evaporator lines that are exposed.

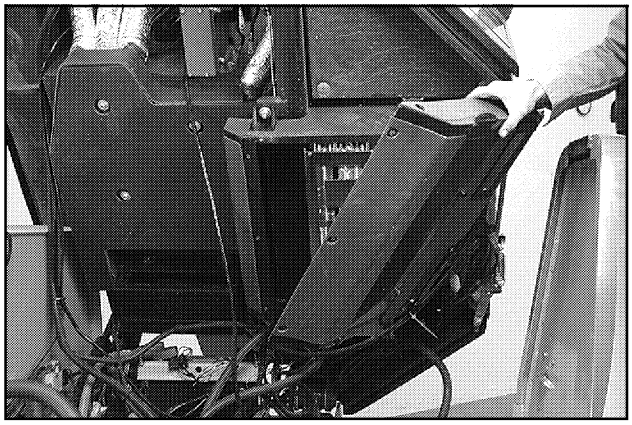
STEP 14



BD02M143

Have another person assist you and install the upper two bolts into the air box, install the two lower mounting bolts for the air box.

STEP 10



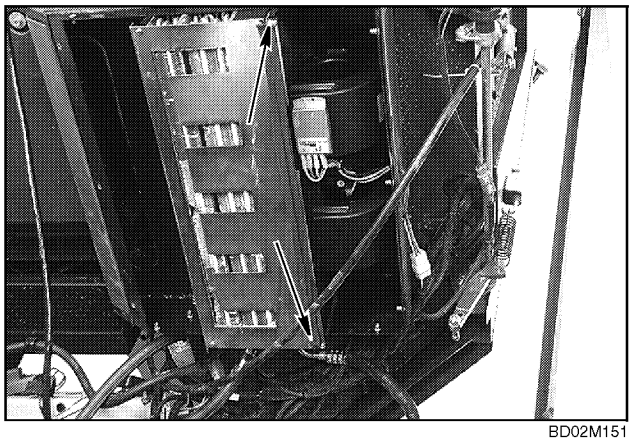
BD02M144

Remove the condensation pan and the insulating foam from under the evaporator and heater core housing.

STEP 11

Tag and disconnect the wires from the blower motor and fan speed control for correct connection during assembly.

STEP 12

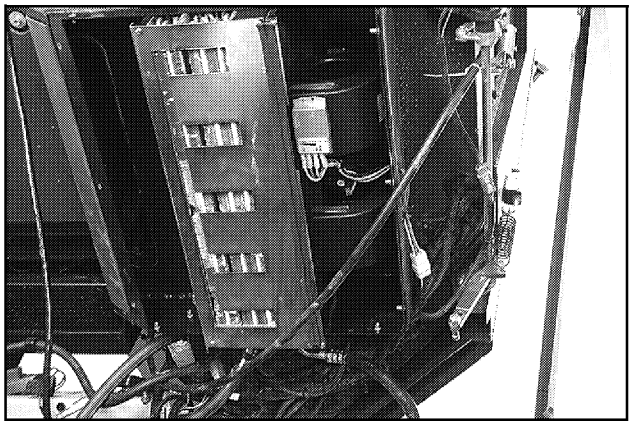


BD02M151

Remove the two mounting screws and remove the fans.

Installation

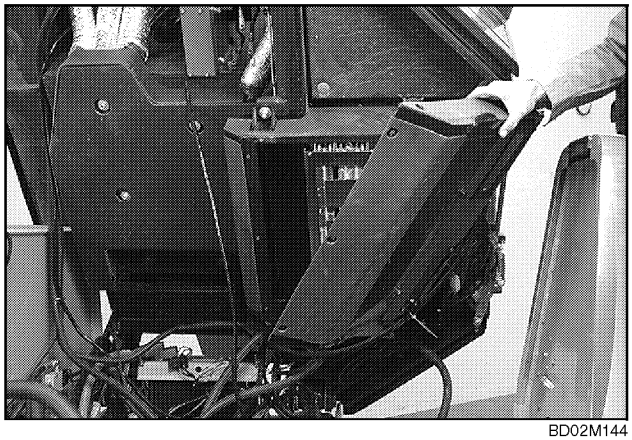
STEP 13



BD02M151

Slide the fans and mounting bracket into the evaporator and heater core housing. Install the two mounting screws and tighten. Connect the wires to the blower motor and fan speed control.

STEP 14



BD02M144

Install the condensation pan and the insulating foam to the evaporator and heater core housing.

STEP 7

Remove the dipstick. Count the oil level marks on the dipstick. Use the following table to find the correct oil level for the mounting angle of the compressor.

Compressor Oil Level

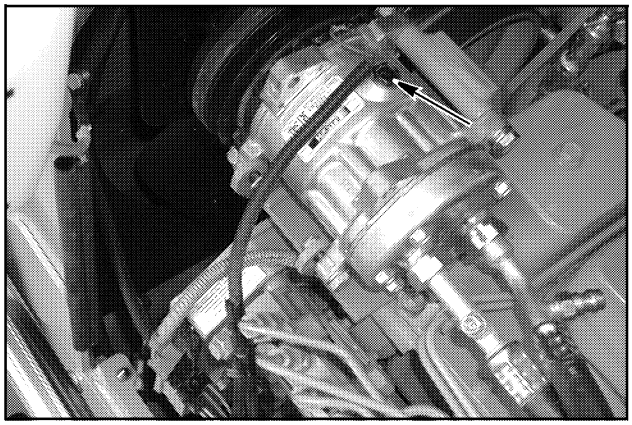
MOUNTING ANGLE (DEGREES)	DIPSTICK READING
0	4 to 6
10	6 to 8
20	7 to 9
30	8 to 10
40	9 to 11
50	9 to 11

STEP 8

If the oil level is not correct, add or subtract oil to the correct level shown in the above chart.

IMPORTANT: *Use only SP-20 PAG oil.*

STEP 9



BD02H034

Install a new O-ring on the oil filler plug. Install the plug and tighten to a torque of 15 to 24 Nm (11 to 18 lb ft).

Section
9007

DOZER BLADE

9007

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

Bur 6-48300

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Issued December, 2002

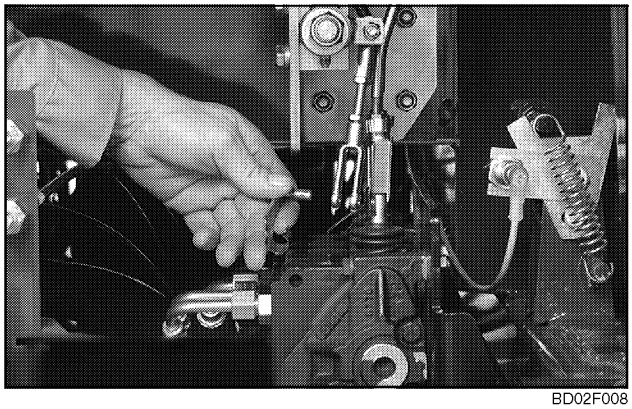
STEP 6

BD02F005

Tilt the brush guard until the brush guard is free of the canopy.

NOTE: *The removed bolts can be used in the tilting brackets to hold the brush guard up.*

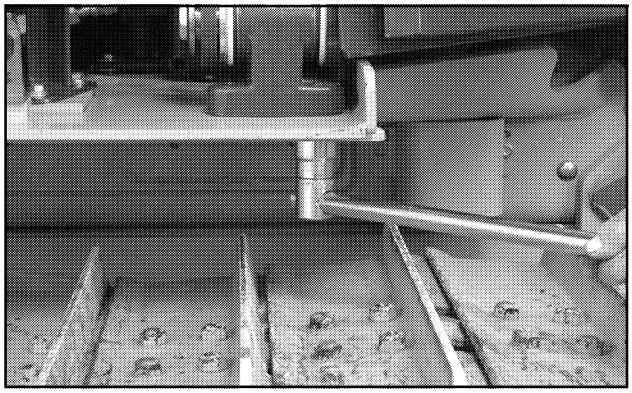
STEP 7



BD02F008

Disconnect the control rods from the hydraulic control valve.

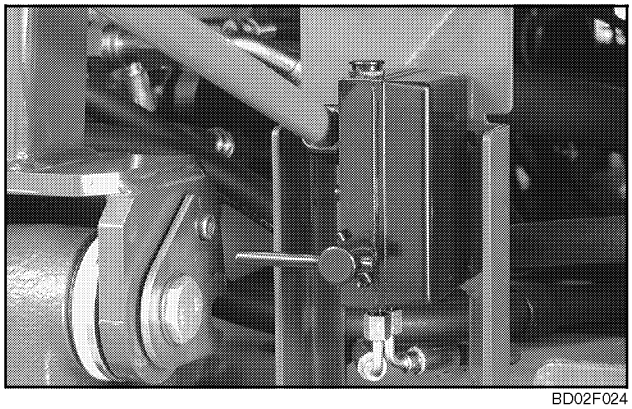
STEP 8



BD02M138

Remove the six support mount bolts on the right side of the cab.

STEP 9



BD02F024

Turn the pump diverter valve into the cab tilt position. Actuate the hand pump and tilt the cab slowly.

NOTE: *Cab travel will be stopped by the safety cable.*

Section

9009

STANDARD AND MECHANICAL SUSPENSION SEATS AND SEAT BELTS

9009

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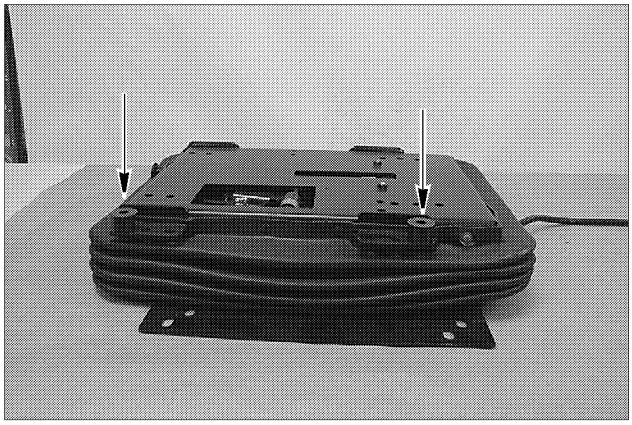
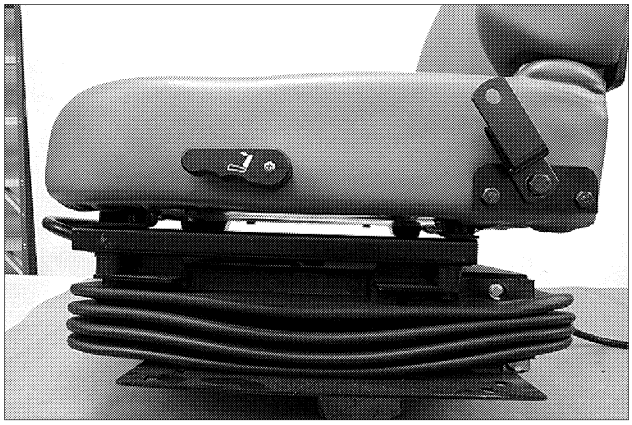
STEP 39



BS02N013

Place the 4 bushings and washers onto the upper plate.

STEP 40



BS02N013

Use new self locking nuts and install the seat assembly onto the frame assembly.