

Product: Bobcat Grader Service Repair Workshop Manual
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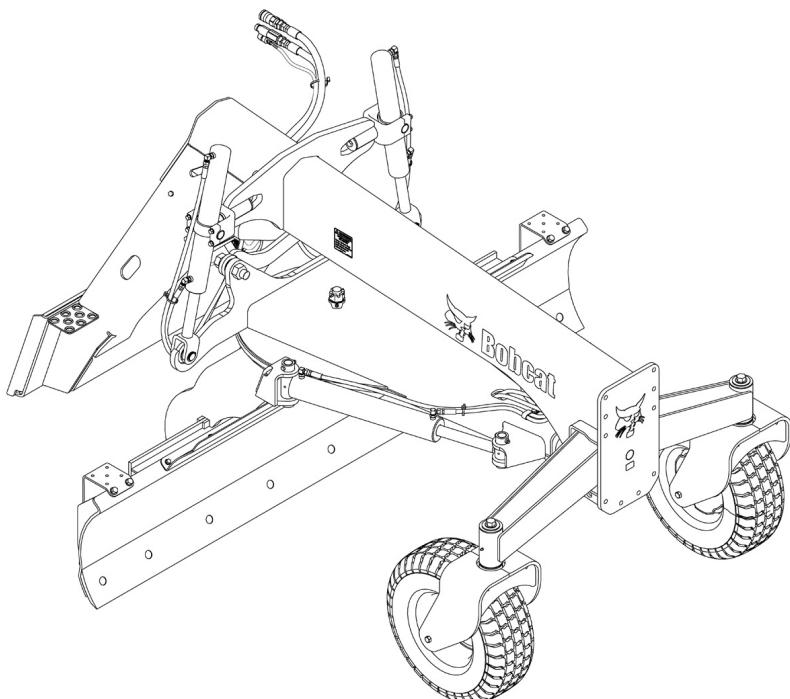


Bobcat®

Service Manual

Grader

(Grader 96) S/N ACW900101 & Above
(Grader 108) S/N AJ2E00101 & Above



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MAINTENANCE SAFETY



WARNING

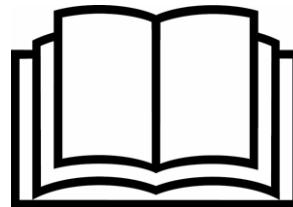
Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0807



Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

CORRECT



P-90216

- ⚠ Never service attachments / implements without instructions. See Operation & Maintenance Manual and Attachment / Implement Service Manual.
- ⚠ Cleaning and maintenance are required daily.
- ⚠ Never service or adjust attachment / implement with the engine running unless instructed to do so in manual.
- ⚠ Always lower the attachment / implement to the ground before lubricating or servicing.
- ⚠ Avoid contact with leaking hydraulic fluid or diesel fuel under pressure. It can penetrate skin or eyes.
- ⚠ Stop, cool and clean engine of flammable materials before checking fluids.
- ⚠ Keep body, loose objects and clothing away from moving parts, electrical contacts, hot parts and exhaust.
- ⚠ Safety glasses are needed for eye protection from electrical arcs, battery acid, compressed springs, fluids under pressure and flying debris or when tools are used. Use eye protection approved for type of welding.



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SAFETY AND MAINTENANCE

HYDRAULIC SYSTEM

MAIN FRAME

SPECIFICATIONS AND SCHEMATICS

REFERENCE INFORMATION

Write the correct information for YOUR grader in the spaces below. Always use these numbers when referring to your grader.

Grader Serial Number

NOTES:

YOUR BOBCAT® DEALER:

ADDRESS:

PHONE:

Bobcat Company
P.O. Box 128
Gwinner, ND 58040-0128

Bobcat Company Europe
Dréve Richelle 167
B-1410 WATERLOO
Belgium

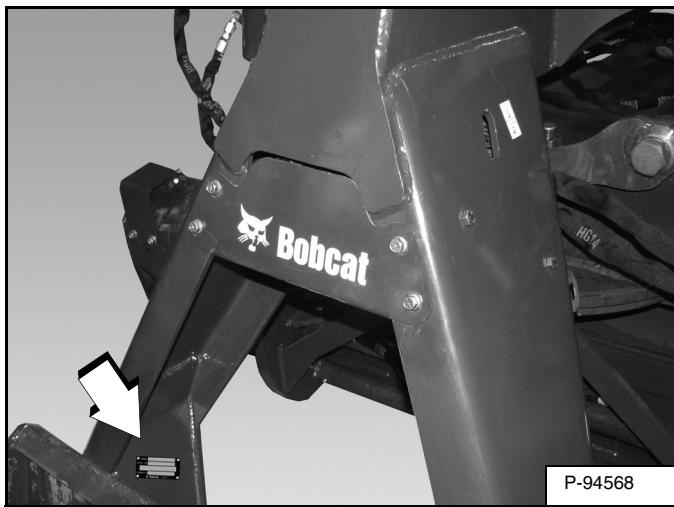


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SERIAL NUMBER LOCATION

Attachment Serial Number

Figure 1



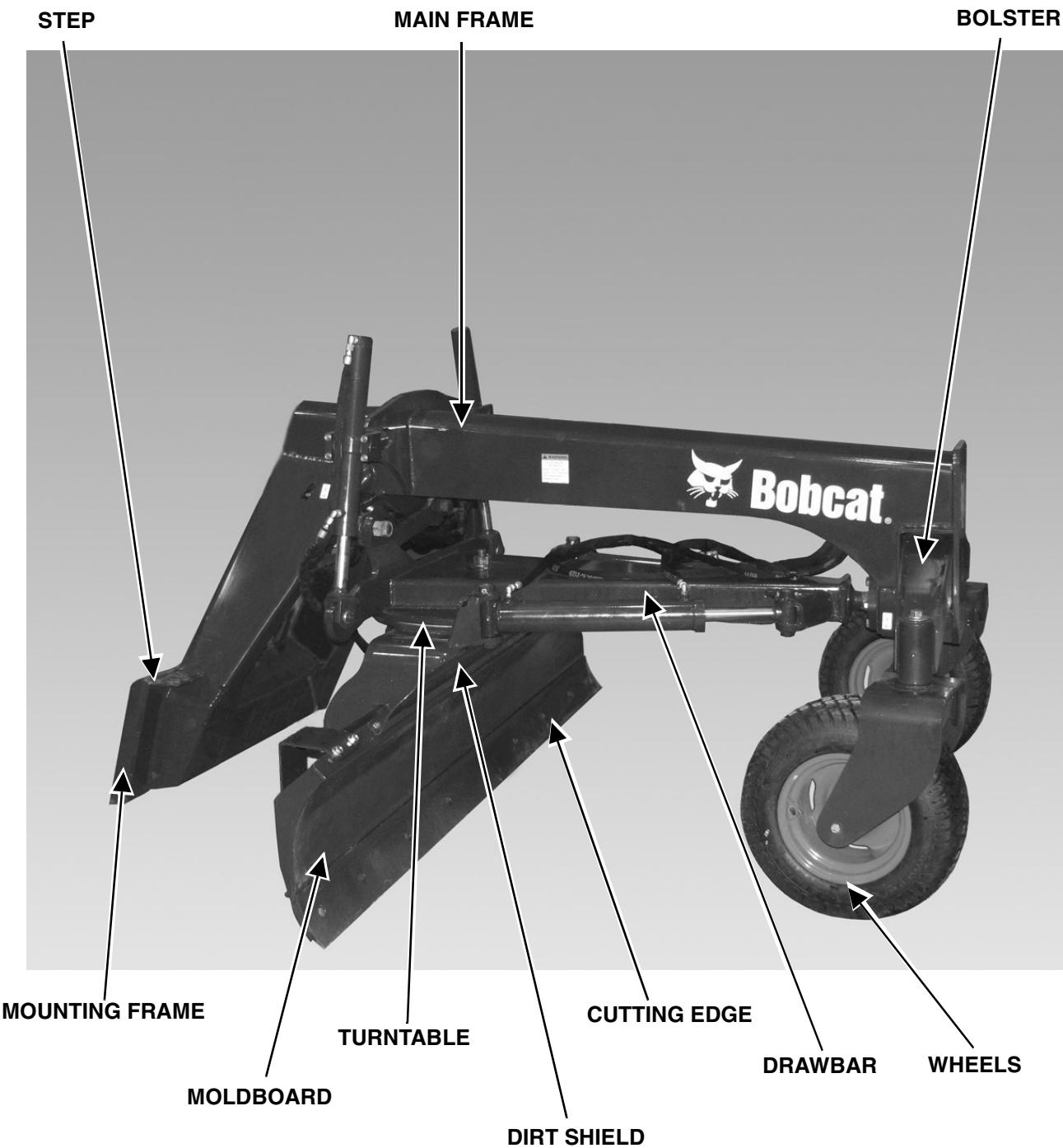
Always use the serial number of the grader when requesting service information or when ordering parts. Early or later models (identification made by serial number) may use different parts, or it may be necessary to use a different procedure in doing a specific service operation **[Figure 1]**.

DELIVERY REPORT

Figure 2

The delivery report must be filled out by the dealer and signed by the owner or operator when the grader is delivered. An explanation of the form must be given to the owner. Make sure it is filled out completely **[Figure 2]**.

ATTACHMENT IDENTIFICATION



P-94266

SAFETY AND MAINTENANCE

SAFETY AND MAINTENANCE

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TROUBLESHOOTING

Chart



WARNING

AVOID INJURY OR DEATH

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W-2003-0807

TROUBLESHOOTING THE GRADER

PROBLEM	CAUSE	CORRECTION
Grader does not mount properly on the Bob-Tach.	Bob-Tach wedges are not fully retracted prior to mounting.	Retract Bob-Tach wedges before installation.
	Mud, dirt or stones are lodged between the Bob-Tach and the Grader mount.	Remove debris between Bob-Tach and Grader mount.
Grader cut is not level.	Moldboard is not properly positioned.	Adjust moldboard to desired position.
	Cutting edge is worn.	Reverse cutting edge or install new cutting edge.
Grader blade does not maintain it's position.	Hydraulic cylinder has internal leakage.	Test and repair cylinder.
	Control valve has internal leakage.	Repair control valve.
Grader blade moves up and down uncontrollably.	Auxiliary flow is enabled and receiver is not properly connected.	Disable auxiliary flow and check receiver connection.
Grader blade will not angle, oscillate or side shift.	Electrical harness not connected.	Connect electrical harness.
	Wires disconnected or broken at control valve.	Repair or replace as needed.
	Control harness disconnected or damaged ACD control module.	Check harness and control module, repair or replace as needed.
Laser graded surface is uneven.	Excessive ground speed.	Drive slower.
	Receivers are not setup level on poles.	Adjust receivers. See Operation & Maintenance Manual.

NOTE: For other problems, see Operation Manual or contact your Bobcat Dealer.

TROUBLESHOOTING (CONT'D)

BLR2 Receiver Chart

TROUBLESHOOTING THE BLR2 RECEIVER		
PROBLEM	CAUSE	CORRECTION
Unit will not turn on.	No power to the unit.	Make sure the system's Power Cable is connected to the machine's battery.
	Not enough power to the unit.	Make sure the machine has enough power (9 to 30 VDC required).
	Receiver cable loose.	Make sure the Grade Control Receiver cable is secure at both ends.
	Bad fuse.	Check the fuse.
	Receiver cable is bad.	If you have a spare, try a different Grade Control Receiver cable.
Erratic display of arrows.	Receivers are not properly initialized.	Shut off carrier and restart.
	ACD harness damaged.	Replace the harness.
	Receiver harness damaged or not properly installed.	Check connections or replace harness as required.
Trimble Support Machine Control - Construction Instructions Americas: 1 - 800 - 538 - 7800 (Option 3 For Support) Outside Of Americas: 1 - 303 - 323 - 4111 E-Mail: Trimble_Support@Trimble.com		

TROUBLESHOOTING (CONT'D)

Laser Beacon Chart

TROUBLESHOOTING THE LASER BEACON		
PROBLEM	CAUSE	CORRECTION
Laser Beacon will not operate.	No power.	Press power button.
	Batteries are bad.	Check or replace batteries.
	Laser needs servicing.	Return laser to service center for inspection.
Laser Beacon out-of-level indicator does not shut off.	Laser not mounted securely.	Make sure the laser is mounted to stable surface.
	Laser in wrong mode.	Press the mode button so that the laser is in automatic self-leveling or grade mode.
	Leveling screws not turning.	Make sure the leveling screws are free to turn.
	Laser not level.	Allow the laser to re-level.
	Laser needs servicing.	Return laser to service center for inspection.
SafeGuard LED is on.	Calibration is off.	Check and adjust laser plane calibration as necessary.
	Laser needs servicing.	Return laser to service center for inspection.
Laser Beacon plane not accurate.	Calibration is off.	Check and adjust laser plane calibration as needed.
	Laser needs servicing.	Return laser to service center for inspection.
NOTE: For other problems related to the laser products, see Trimble Operation Manual or contact your Bobcat Dealer.		
Trimble Support Machine Control - Construction Instructions Americas: 1 - 800 - 538 - 7800 (Option 3 For Support) Outside Of Americas: 1 - 303 - 323 - 4111 E-Mail: Trimble_Support@Trimble.com		

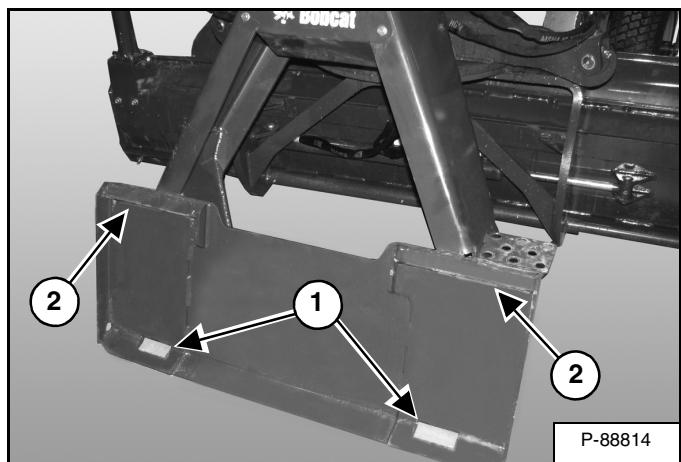


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DAILY INSPECTION

Attachment Mounting Frame

Figure 10-20-1



Inspect the Bob-Tach wedge mounts (Item 1), mounting flange (Item 2) [Figure 10-20-1] and all welds on the grader mount for wear and damage each time the grader is removed from the machine.

Frequently inspect the grader to ensure that all components are secure and that all bolts and nuts are thoroughly tightened.

Bob-Tach

Hand Lever Bob-Tach



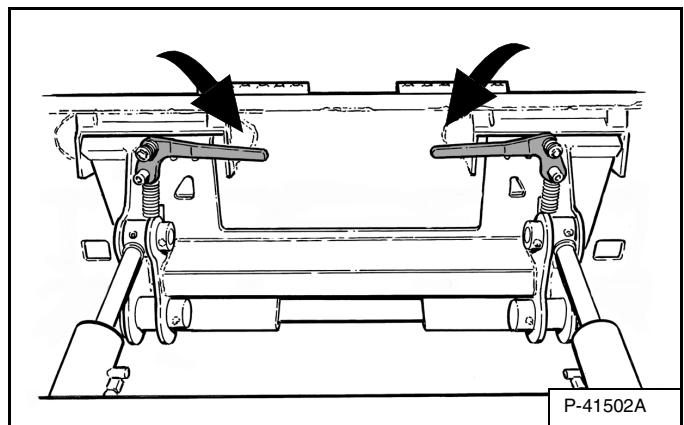
WARNING

AVOID INJURY OR DEATH

The Bob-Tach wedges must extend through the holes in the attachment mounting frame. Levers must be fully down and locked. Failure to secure wedges can allow attachment to come off.

W-2715-0208

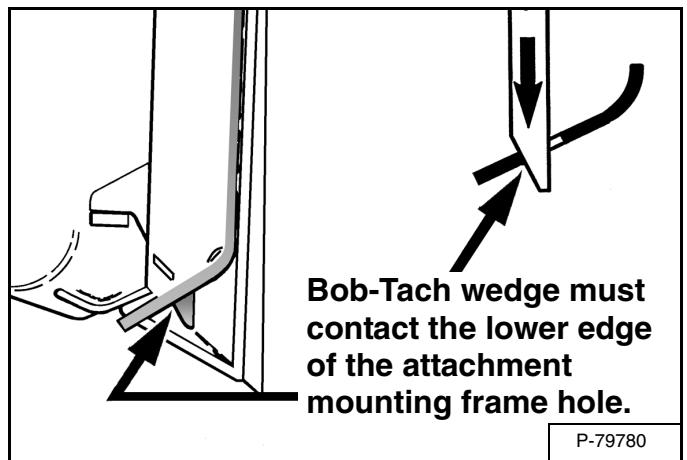
Figure 10-20-2



Push down on the Bob-Tach levers until they are fully engaged in the locked position [Figure 10-20-2] (wedges fully extended through the attachment mounting frame holes).

The levers and wedges must move freely [Figure 10-20-2].

Figure 10-20-3



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 10-20-3].

NOTE: If the wedge does not contact the lower edge of the hole, the attachment will be loose and can come off the Bob-Tach.

Inspect the mounting frame on the attachment. (See the machine's Operation & Maintenance Manual for inspecting the Bob-Tach). Replace any parts that are damaged, bent or missing. Keep all fasteners tight. Look for cracked welds. Contact your Bobcat dealer for repair or replacement parts.

Lubricate the wedges. (See the machine's Operation & Maintenance Manual for the correct procedure.)

DAILY INSPECTION (CONT'D)

Bob-Tach (Cont'd)

Power Bob-Tach

! WARNING

AVOID INJURY OR DEATH

The Bob-Tach wedges must extend through the holes in the attachment mounting frame. Levers must be fully down and locked. Failure to secure wedges can allow attachment to come off.

W-2715-0208

Figure 10-20-4

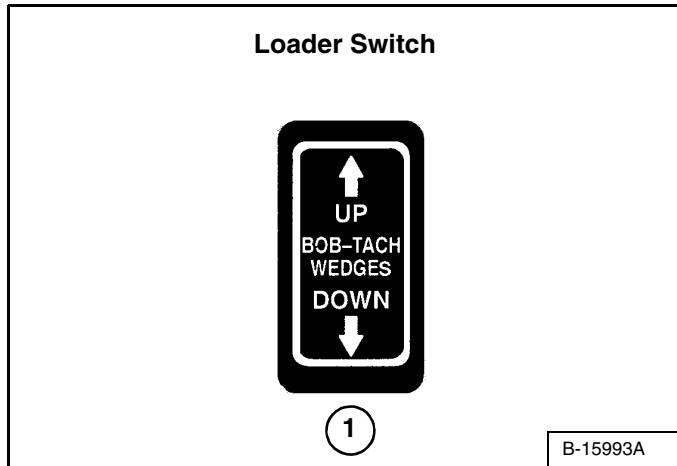
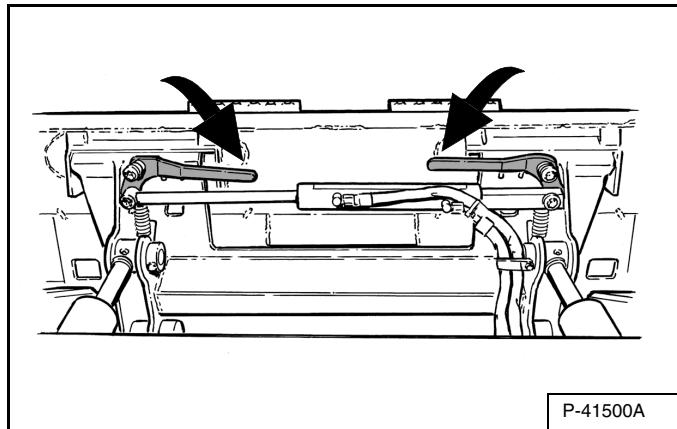
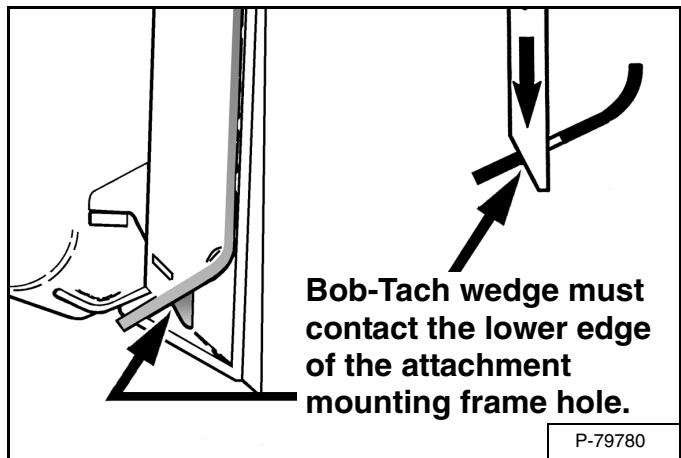


Figure 10-20-5



Push and hold the BOB-TACH "WEDGES DOWN" switch (Item 1) [Figure 10-20-4] and until the levers are fully engaged in the locked position [Figure 10-20-5] (wedges fully extended through the attachment mounting frame holes).

Figure 10-20-6



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 10-20-6].

NOTE: If the wedge does not contact the lower edge of the hole, the attachment will be loose and can come off the Bob-Tach.

Inspect the mounting frame on the attachment. (See the machine's Operation & Maintenance Manual for inspecting the Bob-Tach). Replace any parts that are damaged, bent or missing. Keep all fasteners tight. Look for cracked welds. Contact your Bobcat dealer for repair or replacement parts.

Lubricate the wedges. (See the machine's Operation & Maintenance Manual for the correct procedure.)

LUBRICATING THE ATTACHMENT

Lubrication Locations

Always use a good quality lithium base multi purpose grease when lubricating the attachment. Apply lubricant until extra grease shows.

IMPORTANT

Fluid such as engine oil, hydraulic fluid, coolants, grease, etc. must be disposed of in an environmentally safe manner. Some regulations require that certain spills and leaks on the ground must be cleaned in a specific manner. See local, state and federal regulations for the correct disposal.

I-2067-0499

WARNING

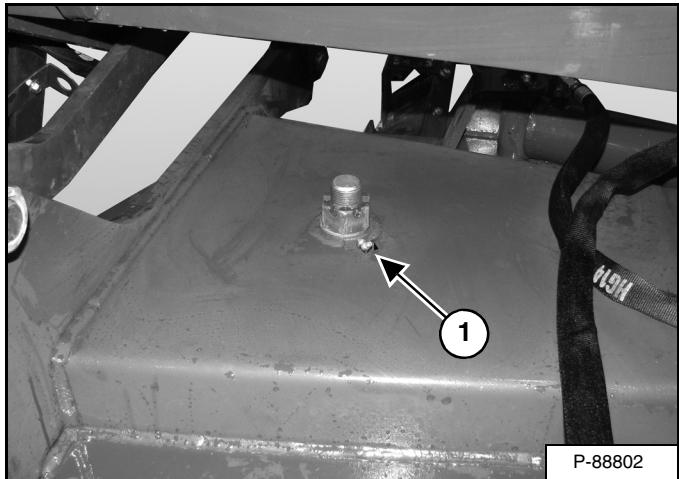
AVOID INJURY OR DEATH

Wear safety glasses to prevent eye injury when any of the following conditions exist:

- When fluids are under pressure.
- Flying debris or loose material is present.
- Engine is running.
- Tools are being used.

W-2019-0907

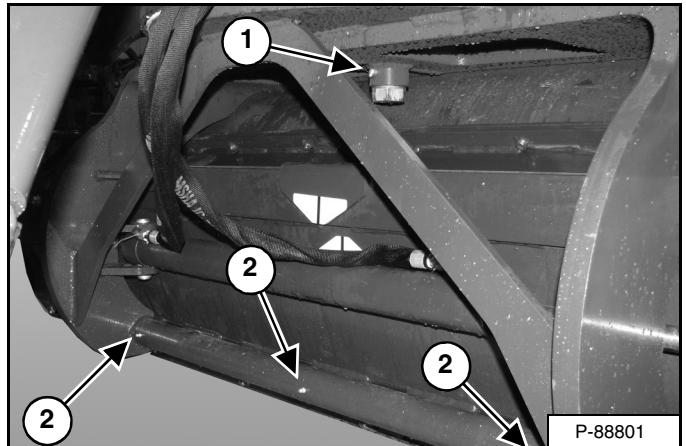
Figure 10-30-1



Lubricate the following location (Item 1) [Figure 10-30-1] every **10 hours** of operation.

1. Turntable upper pivot.

Figure 10-30-2

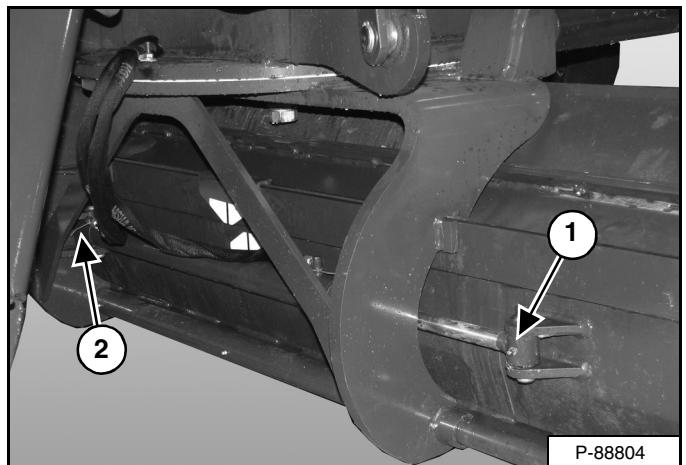


Lubricate the following location (Item 1) [Figure 10-30-2] every **10 hours** of operation.

Lubricate the following locations (Item 2) [Figure 10-30-2] daily.

1. Moldboard hanger/turtable lower pivot.
2. Moldboard hanger, lower slide tube fittings.

Figure 10-30-3



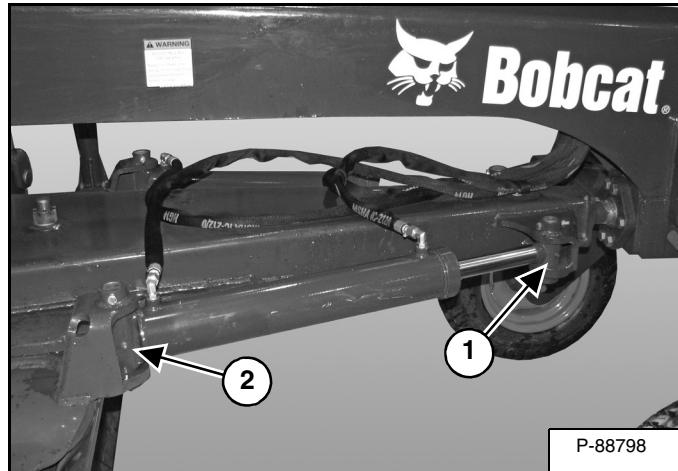
Lubricate the following locations (Item 1 & 2) [Figure 10-30-3] every **8 - 10 hours** of operation.

1. Moldboard side shift hydraulic cylinder rod end.
2. Moldboard side shift hydraulic cylinder base end.

LUBRICATING THE ATTACHMENT (CONT'D)

Lubrication Locations (Cont'd)

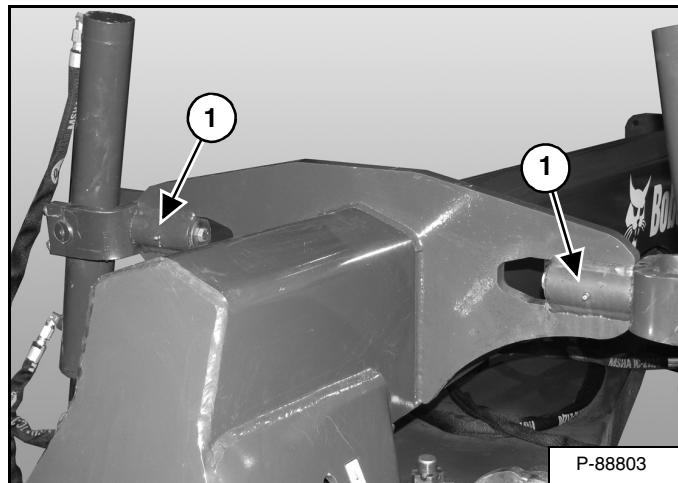
Figure 10-30-4



Lubricate the following locations (Item 1 & 2) [Figure 10-30-4] every 8 - 10 hours of operation.

1. Moldboard angle hydraulic cylinder rod end (Both Sides).
2. Moldboard angle hydraulic cylinder base end (Both Sides).

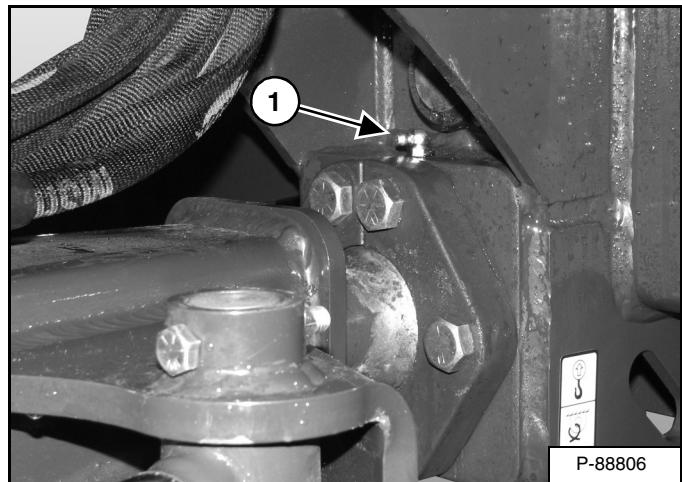
Figure 10-30-5



Lubricate the following locations (Item 1 & 2) [Figure 10-30-5] every 8 - 10 hours of operation.

1. Moldboard elevation hydraulic cylinder mounts.

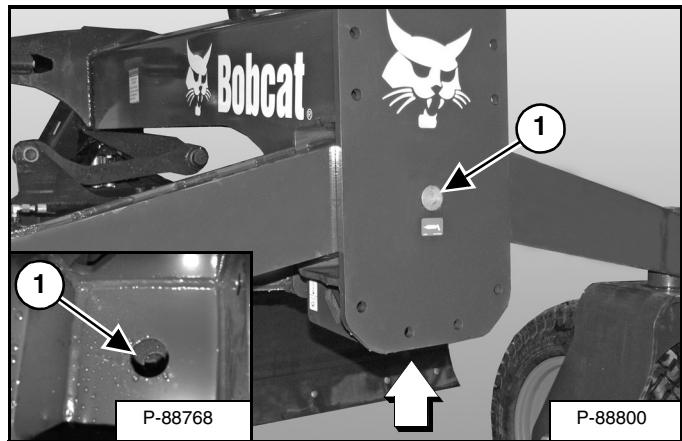
Figure 10-30-6



Lubricate the following locations (Item 1) [Figure 10-30-6] daily.

1. Drawbar front pivot mount.

Figure 10-30-7



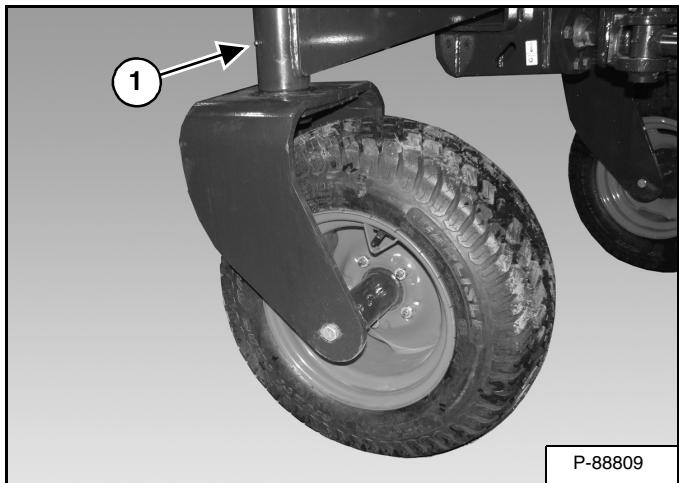
Lubricate the following location (Item 1) [Figure 10-30-7] daily.

1. Bolster pivot pin (Both Locations).

LUBRICATING THE ATTACHMENT (CONT'D)

Lubrication Locations (Cont'd)

Figure 10-30-8



Lubricate the following location (Item 1) [Figure 10-30-8] daily.

1. Caster Wheel Spindle (Both Sides).



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REGULAR MAINTENANCE ITEMS

Cutting Edge



WARNING

AVOID INJURY OR DEATH

Securely block up the attachment before working underneath.

W-2795-0409



WARNING

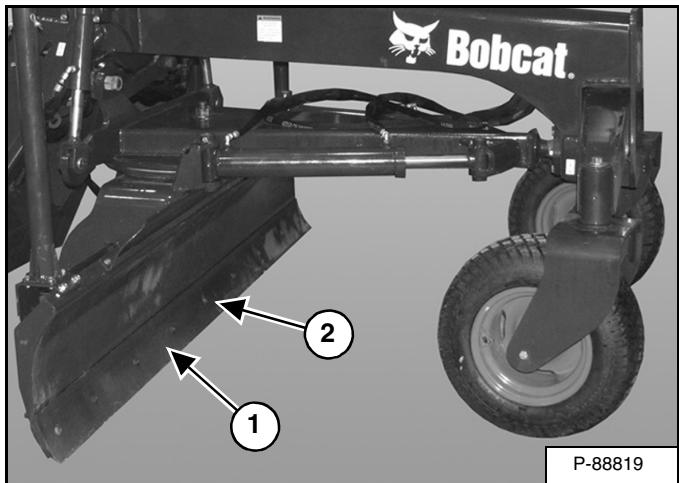
AVOID INJURY OR DEATH

Wear safety glasses to prevent eye injury when any of the following conditions exist:

- When fluids are under pressure.
- Flying debris or loose material is present.
- Engine is running.
- Tools are being used.

W-2019-0907

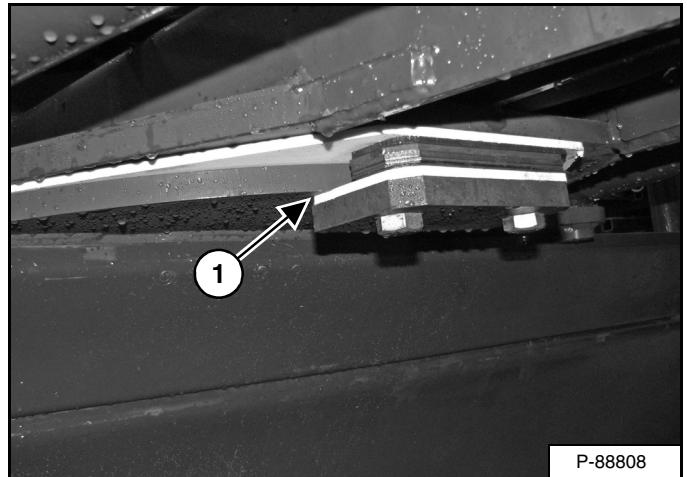
Figure 10-40-1



Inspect the cutting edge (Item 1), replace if any damage or excessive wear is visible. Tighten or replace any loose or missing bolts or nuts (Item 2) [Figure 10-40-1]. (See REMOVAL AND INSTALLATION OF CUTTING EDGE on Page 10-50-1.)

Turntable Clamp Slide

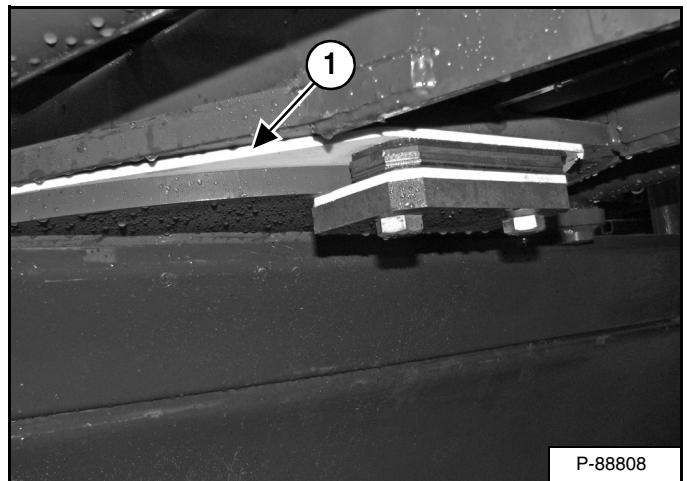
Figure 10-40-2



Check the turntable clamp slide (Item 1) [Figure 10-40-2], replace if any damage or excessive wear is visible. (See REMOVAL AND INSTALLATION OF TURNTABLE CLAMP on Page 10-51-1.)

Turntable Slide

Figure 10-40-3



Check the turntable slide (Item 1) [Figure 10-40-3], replace if any damage or excessive wear is visible. (See REMOVAL AND INSTALLATION OF TURNTABLE WEAR SLIDE on Page 10-52-1.)

REGULAR MAINTENANCE ITEMS (CONT'D)

Laser System

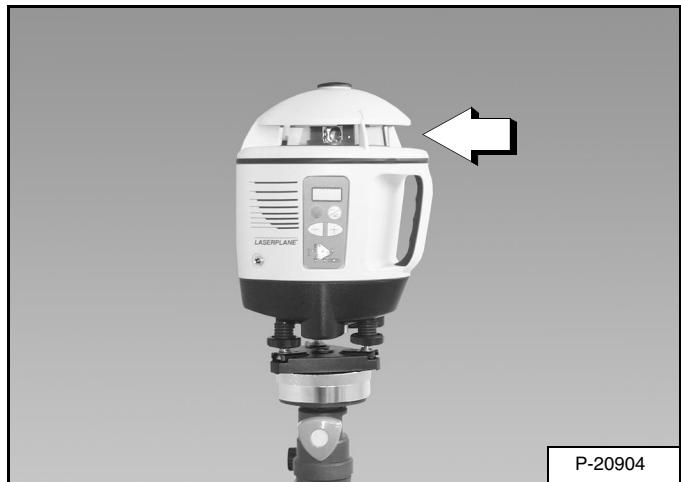
Be sure to store the laser receiver(s) in the case when you're not using it.

Be sure to store the laser beacon in its case when you're not using it.

NOTE: Do not store the laser receiver or laser beacon in a wet carrying case. If the case gets wet, open it and let it dry before storing.

NOTE: Remove the batteries from the laser beacon and laser receiver (if equipped) when storing the equipment more than 30 days.

Figure 10-40-4



P-20904

Figure 10-40-5



P-83407

Use only a good quality glass cleaner and a soft cloth to clean all external optical components [Figure 10-40-4] and [Figure 10-40-5]. A dry cloth used on the laser exit windows, laser receiving window, or displays could scratch or damage these surfaces.

As needed, wipe off with a moist, clean cloth any dust or dirt from the laser beacon and receiver's outer surface. Blow off any loose debris before cleaning any surfaces to prevent scratching the optical surfaces.

REMOVAL AND INSTALLATION OF CUTTING EDGE

Procedure



WARNING

AVOID INJURY OR DEATH

Securely block up the attachment before working underneath.

W-2795-0409



WARNING

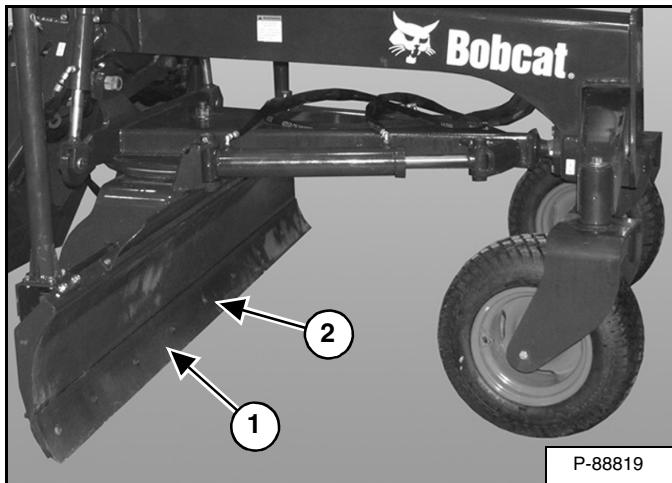
AVOID INJURY OR DEATH

Wear safety glasses to prevent eye injury when any of the following conditions exist:

- When fluids are under pressure.
- Flying debris or loose material is present.
- Engine is running.
- Tools are being used.

W-2019-0907

Figure 10-50-1



The cutting edge (Item 1) [Figure 10-50-1] is reversible.

When the cutting edge becomes worn or damaged, remove the nuts and bolts (Item 2) [Figure 10-50-1] from the cutting edge, rotate it 180° and reinstall.

Installation: Tighten nuts and bolts to 125 - 140 ft.-lb. (170 - 190 N•m) torque.

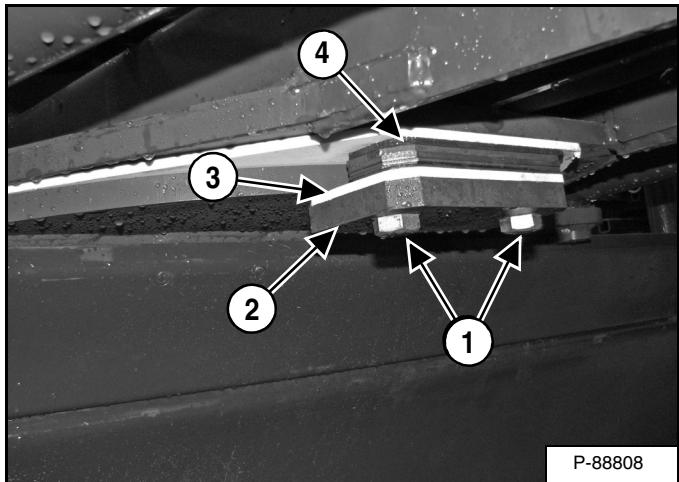


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REMOVAL AND INSTALLATION OF TURNTABLE CLAMP

Procedure

Figure 10-51-1



Remove the two bolts (Item 1), turntable clamp (Item 2), wear slide (Item 3) and spacers (Item 4) [Figure 10-51-1].

Installation: Install spacers, new wear slide and turntable clamp. Tighten bolts to 301 - 339 ft.-lb. (408 - 469 N·m) torque.



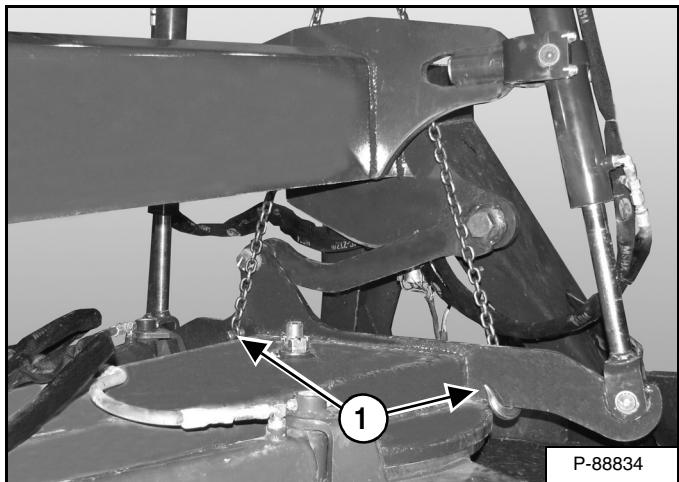
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REMOVAL AND INSTALLATION OF TURNTABLE WEAR SLIDE

Procedure

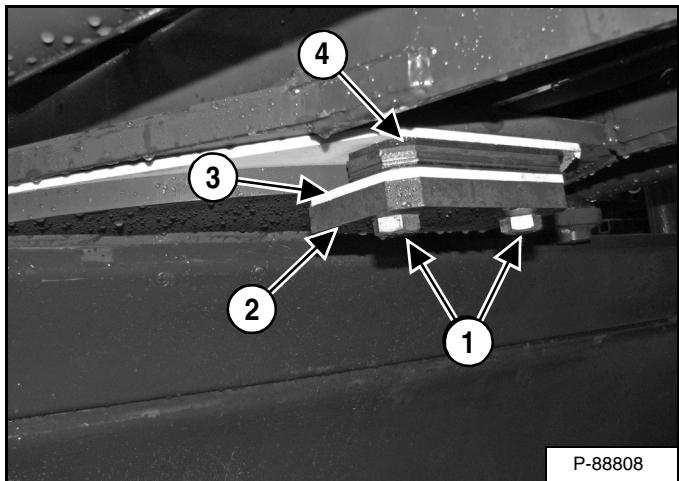
Remove the moldboard. (See MOLDBOARD on Page 30-40-1.)

Figure 10-52-1



Fasten chains and lifting device to the drawbar (Item 1) [Figure 10-52-1].

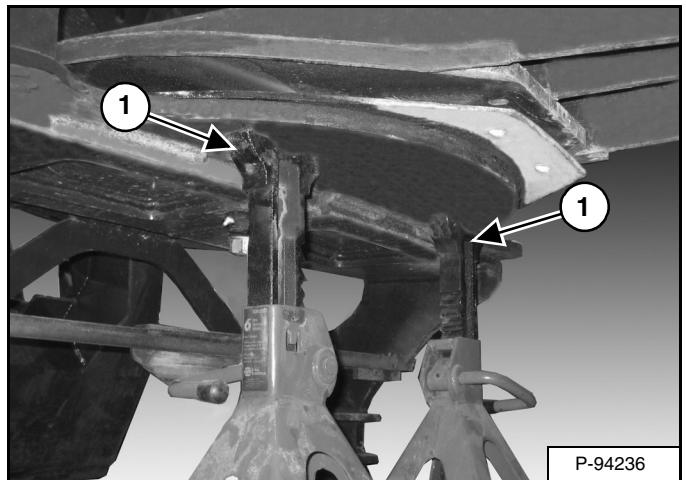
Figure 10-52-2



Remove the two bolts (Item 1), turntable clamp (Item 2), clamp wear slide (Item 3) and spacers (Item 4) [Figure 10-52-2].

Installation: Install spacers, new wear slide and turntable clamp. Tighten bolts to 301 - 339 ft.-lb. (408 - 469 N•m) torque.

Figure 10-52-3



Place jack stands (Item 1) [Figure 10-52-3] under the front of the hanger to prevent the hanger from falling.

Figure 10-52-4

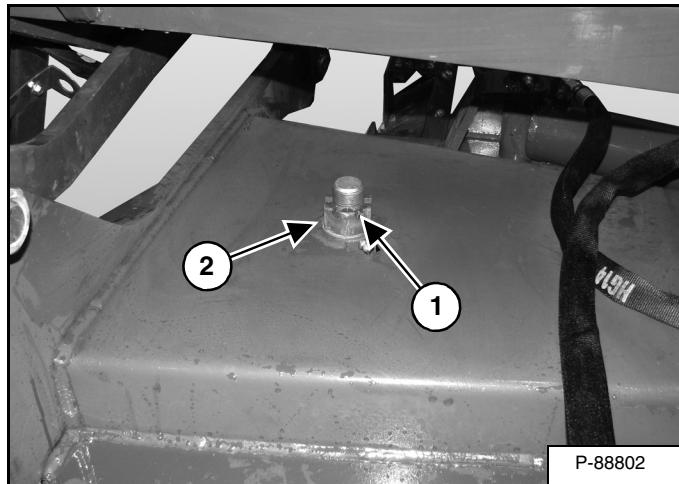
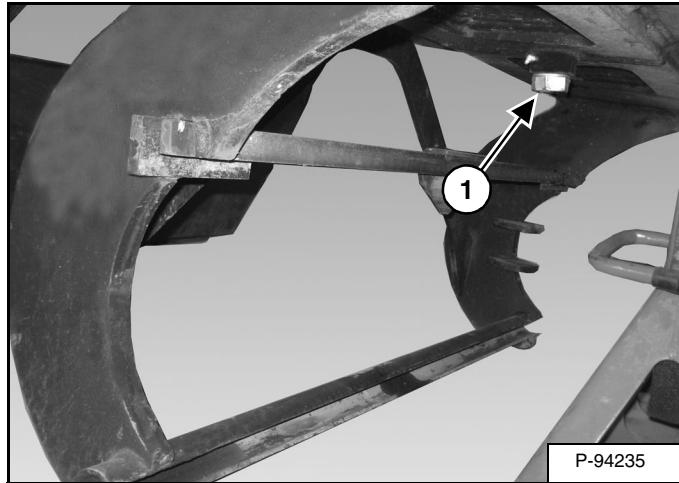
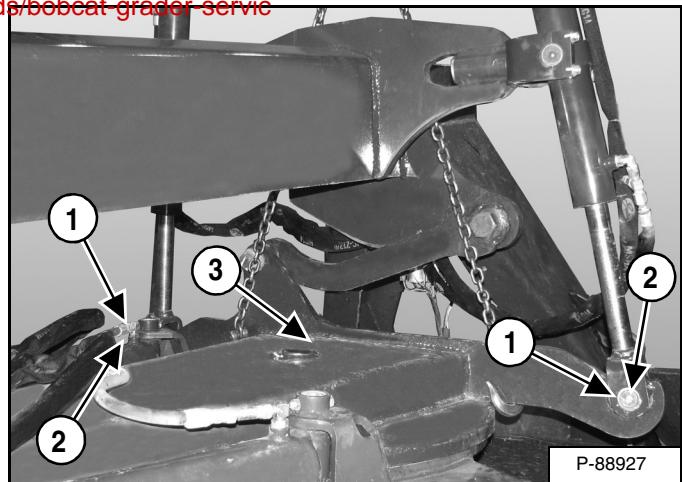


Figure 10-52-5



Remove the roll pin (Item 1) and nut (Item 2) [Figure 10-52-4]. Remove the bolt (Item 1) [Figure 10-52-5].

Installation: Install bolt, nut and roll pin. Tighten to 300 ft. -lb. (407 N·m) torque.

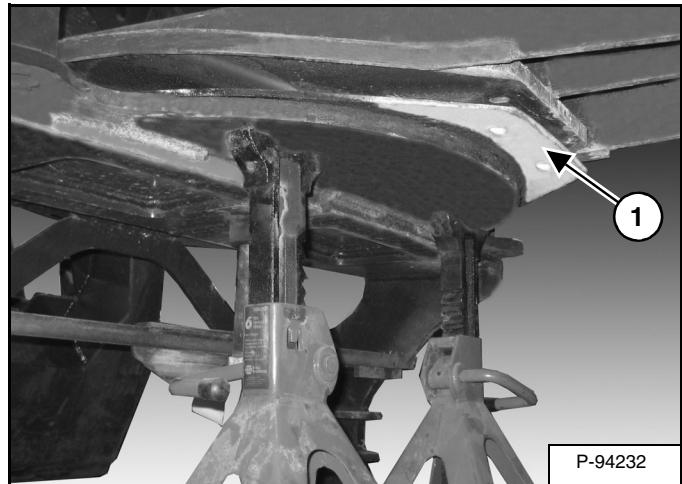


Remove snap rings (Item 1) and pins (Item 2) [Figure 10-52-6] from elevation cylinders. Swing cylinders out.

Raise the drawbar (Item 3) [Figure 10-52-6] upward with lifting device.

Installation: Lower drawbar into position. Connect elevation cylinders, install pins and snap rings.

Figure 10-52-7



Remove turntable wear slide (Item 1) [Figure 10-52-7].

Installation: Install new turntable wear slide.