



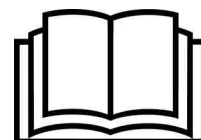
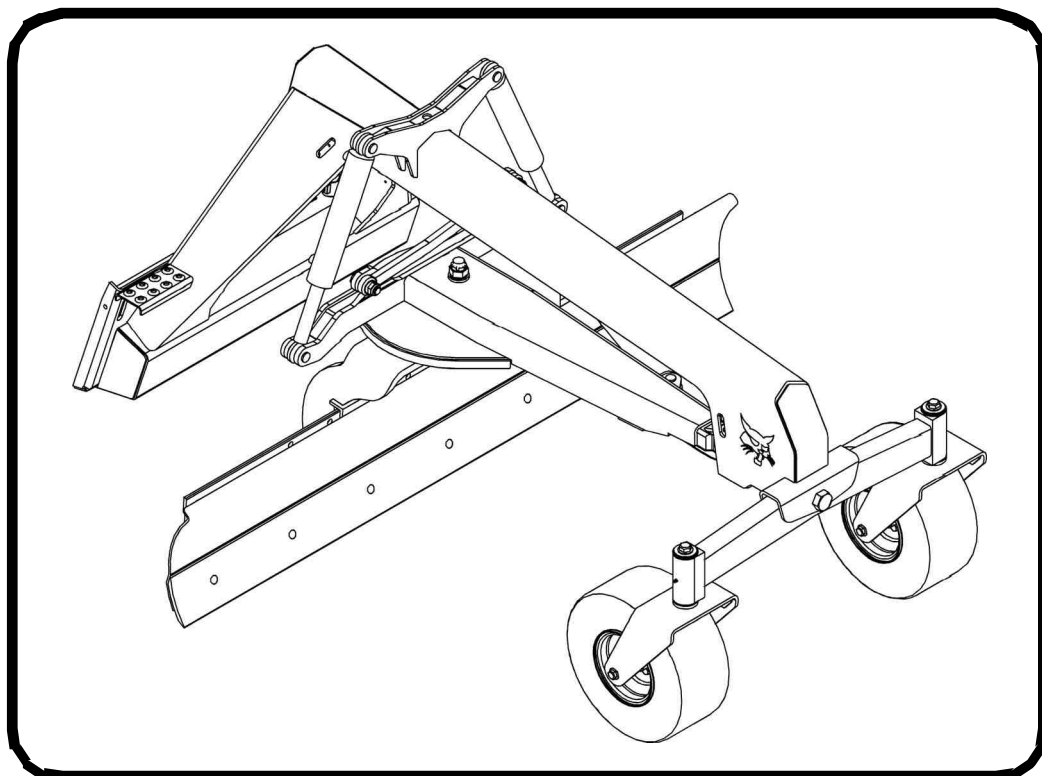
Bobcat®

EN

Operation & Maintenance Manual

Grader

(Grader 84) S/N 648000101 & Above



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REFERENCE INFORMATION

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

Attachment Serial Number _____

NOTES:

YOUR BOBCAT DEALER:

ADDRESS:

PHONE:

Bobcat Company
P.O. Box 128
Gwinner, ND 58040-0128
UNITED STATES OF AMERICA

Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
263 12 Dobris
CZECH REPUBLIC



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FOREWORD

This Operation & Maintenance Manual was written to give the owner / operator instructions on the safe operation and maintenance of the Bobcat attachment. **READ AND UNDERSTAND THIS OPERATION & MAINTENANCE MANUAL BEFORE OPERATING YOUR BOBCAT ATTACHMENT.** If you have any questions, see your Bobcat dealer. This manual may illustrate options and accessories not installed on your Bobcat attachment.

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**Declaration of Conformity
for Interchangeable Equipment**
Directive 2006/42/EC of the European Parliament and of The Council
"Machinery Directive Article 1(1)(b)"

Manufacturer



Bobcat Company
World Headquarters
250 East Beaton Drive
West Fargo, ND 58078-6000
UNITED STATES OF AMERICA

**Equipment Also Compliant to Other EC
Directive(s) or Standard(s) Listed Below:**

Technical Documentation

Homologation Manager
Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
26312 Dobříš
CZECH REPUBLIC

Description of Equipment

Type of Interchangeable Equipment:	Graders		
Model Name:	Grader 84	Grader 96	Grader 108
Model Code:			
Lot Series:	648000101 & above	ACW900101 & above	AJ2E00101 & above

Declaration of Conformance

This equipment conforms to the requirements of an interchangeable equipment as specified in Machinery Directive 2006/42/EC Article1(1)(b) and any other directives listed. This declaration applies exclusively to the interchangeable equipment and does not include any hydraulic, electrical or mechanical adaptation done by the installer. Installation shall be done in accordance with instructions and specifications included in this manual.

Authorized Signatory and Place of Declaration

Troy Kraft
Vice President Engineering

Date: December 29, 2009
Place: Bismarck, North Dakota, USA



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**UK Declaration of Conformity
for Interchangeable Equipment
Supply of Machinery (Safety) Regulations 2008
Paragraph 3(b)**

Manufacturer



Bobcat Company
World Headquarters
250 East Beaton Drive
West Fargo, ND 58078-6000
UNITED STATES OF AMERICA

**Equipment Also Compliant to Other UK
Regulations(s) or Standard(s) Listed Below:**

Technical Documentation

Homologation Manager
Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
26312 Dobříš
CZECH REPUBLIC

Description of Equipment

Type of Interchangeable Equipment:	Graders		
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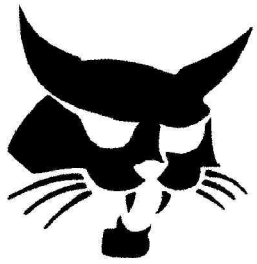
Declaration of Conformance

This equipment conforms to the requirements of an interchangeable equipment as specified in Supply of Machinery (Safety) Regulations 2008, paragraph 3(b), and any other regulations listed. This declaration applies exclusively to the interchangeable equipment and does not include any hydraulic, electrical or mechanical adaptation done by the installer. Installation shall be done in accordance with instructions and specifications included in this manual.

Authorized Signatory and Place of Declaration

Troy Kraft
Vice President Engineering

Date: December 29, 2009
Place: Bismarck, North Dakota, USA



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BOBCAT COMPANY IS ISO 9001 CERTIFIED



ISO 9001 is an international standard that specifies requirements for a quality management system that controls the processes and procedures which we use to design, develop, manufacture, and distribute Bobcat products.

British Standards Institute (**BSI**) is the Certified Registrar Bobcat Company chose to assess the company's compliance with the ISO 9001 at Bobcat's manufacturing facilities in Gwinner, North Dakota (U.S.A.), Pontchâteau (France), and the Bobcat corporate offices (Gwinner, Bismarck, and West Fargo) in North Dakota. **TÜV Rheinland** is the Certified Registrar Bobcat Company chose to assess the company's compliance with the ISO 9001 at Bobcat's manufacturing facility in Dobris (Czech Republic). Only certified assessors, like BSI and TÜV Rheinland, can grant registrations.

ISO 9001 means that as a company we say what we do and do what we say. In other words, we have established procedures and policies, and we provide evidence that the procedures and policies are followed.

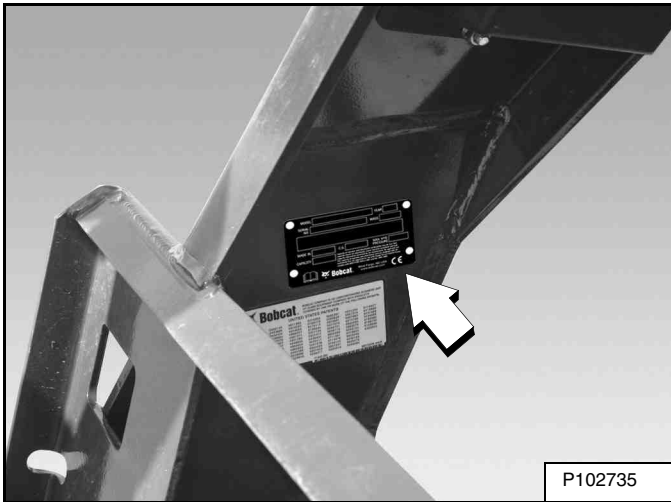


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SERIAL NUMBER LOCATION

Attachment Serial Number

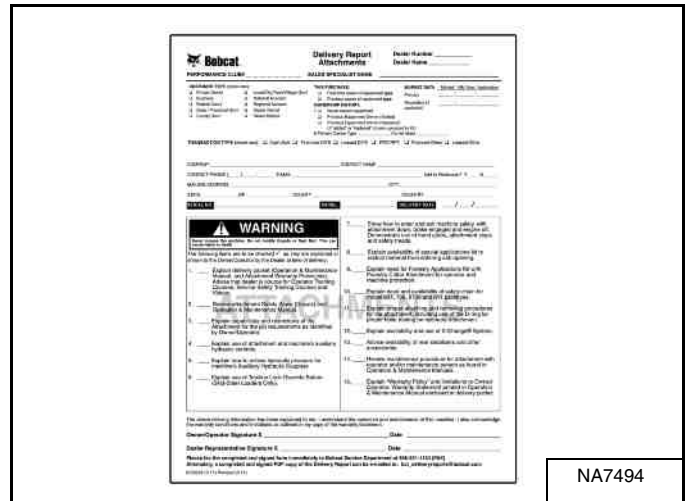
Figure 1



Always use the serial number of the grader when requesting service information or when ordering parts. Earlier 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

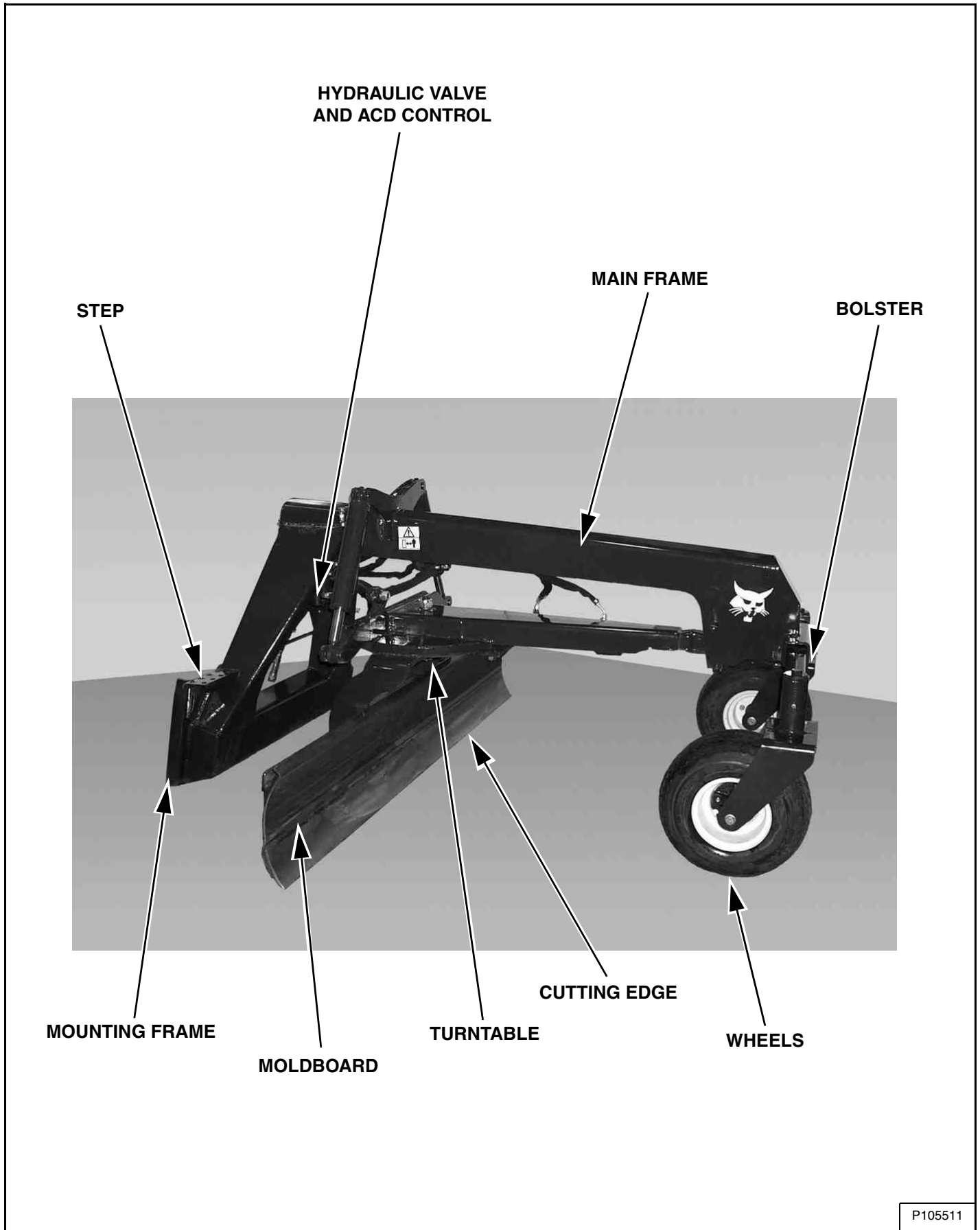
Figure 2



The delivery report [Figure 2] contains a list of items that must be explained or shown to the owner or operator by the dealer when the Bobcat grader is delivered.

The delivery report must be reviewed and signed by the owner or operator and the dealer.

ATTACHMENT IDENTIFICATION



P105511

FEATURES AND ACCESSORIES

Standard Items

The grader is equipped with the following Standard items:

- Reversible Cutting Edge
- Flotation Tyres
- Moldboard Manually Adjusts Side To Side Up To 305 mm (12 in)



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SAFETY AND TRAINING RESOURCES

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SAFETY INSTRUCTIONS

Safe Operation Is The Operator's Responsibility

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

	WARNING
---	----------------

Operator must have instructions before operating the machine. Untrained operators can cause injury or death.

W-2001-0502

IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the machine.

I-2019-0284

	DANGER
---	---------------

The signal word DANGER on the machine and in the manuals indicates a hazardous situation which, if not avoided, will result in death or serious injury.

D-1002-1107

	WARNING
---	----------------

The signal word WARNING on the machine and in the manuals indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

W-2044-1107

The Bobcat machine and attachment must be in good operating condition before use.

Check all of the items on the Bobcat Service Schedule Decal under the 8-10 hour column or as shown in the Operation & Maintenance Manual.

Safe Operation Needs A Qualified Operator

For an operator to be qualified, he or she must not use drugs or alcoholic drinks which impair alertness or coordination while working. An operator who is taking prescription drugs must get medical advice to determine if he or she can safely operate a machine and the attachment.

A Qualified Operator Must Do The Following:

Understand the Written Instructions, Rules and Regulations

- The written instructions from Bobcat Company include the Delivery Report, Operation & Maintenance Manual, Operator's Handbook, Safety Manual and machine signs (decals).
- Check the rules and regulations at your location. The rules may include an employer's work safety requirements. For driving on public roads, the machine must be equipped as stipulated by the local regulations authorising operation on public roads in your specific country. Regulations may identify a hazard such as a utility line.

Have Training with Actual Operation

- Operator training must consist of a demonstration and verbal instruction. This training is given by your Bobcat dealer before the product is delivered.
- The new operator must start in an area without bystanders and use all the controls until he or she can operate the machine and attachment safely under all conditions of the work area. Always fasten seat belt before operating.

Know the Work Conditions

- Know the weight of the materials being handled. Avoid exceeding the machine load capacities. Material which is very dense will be heavier than the same volume of less dense material. Reduce the size of load if handling dense material.
- The operator must know any prohibited uses or work areas, for example, he or she needs to know about excessive slopes.
- Know the location of any underground lines.
- Wear tight fitting clothing. Always wear safety glasses when doing maintenance or service. Safety glasses, respiratory equipment, hearing protection, Special Applications Kits or a Front Window Guard are required for some work. See your Bobcat dealer about Bobcat Safety equipment for your machine.

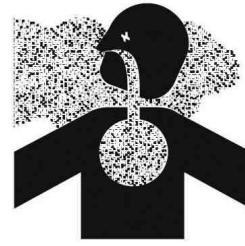
SI ATT EMEA-0817

SAFETY INSTRUCTIONS (CONT'D)

Use Safety Rules

- Read and follow instructions in the machine and the attachment's Operation & Maintenance Manual before operating.
- Check for underground lines before operating attachment (if applicable).
- In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.
- Check that the Bob-Tach® levers are in the locked position and the wedges are fully engaged into the holes of the attachment (if applicable).
- Check that the attachment is securely fastened to the machine.
- Make sure all the machine controls are in the NEUTRAL position before starting the machine.
- Operate the attachment only from the operator's position.
- Operate the attachment according to the Operation & Maintenance Manual.
- When learning to operate the attachment, do it at a slow rate in an area clear of bystanders.
- DO NOT permit personnel to be in the work area when operating the machine and attachment.
- The attachment must be used ONLY on approved machines. See your Bobcat dealer for updated list of approved attachments for each machine model.
- DO NOT modify equipment or add attachments that are not approved by the manufacturer.
- DO NOT make any adjustments or repairs on the machine or attachment while the engine is running.
- Keep shields and guards in place. Replace if damaged.

Avoid Silica Dust



Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Use a respirator, water spray or other means to control dust.

FIRE PREVENTION



Maintenance

The machine and some attachments have components that are at high temperatures under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential fire hazard.

The operator's area, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.

All fuels, most lubricants and some coolants mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Operation

Do not use the machine where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.

Electrical



Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part or wires that are loose or frayed.

Battery gas can explode and cause serious injury. Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting. Do not jump start or charge a frozen or damaged battery. Keep any open flames or sparks away from batteries. Do not smoke in battery charging area.

Hydraulic System

Check hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Hydraulic tubes and hoses must be properly routed and have adequate support and secure clamps. Tighten or replace any parts that show leakage.

Always clean fluid spills. Do not use petrol or diesel fuel for cleaning parts. Use commercial non-flammable solvents.

Fueling



Stop the engine and let it cool before adding fuel. No smoking! Do not refuel a machine near open flames or sparks. Fill the fuel tank outdoors.

Ultra Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations with higher Sulfur content. Avoid death or serious injury from fire or explosion. Consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

Starting

Do not use ether or starting fluids on any engine that has glow plugs. These starting aids can cause explosion and injure you or bystanders.

Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting.

Spark Arrester Exhaust System

The spark arrester exhaust system is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot.

Check the spark arrester exhaust system regularly to make sure it is maintained and working properly. Use the procedure in the Operation & Maintenance Manual for cleaning the spark arrester muffler (if equipped).

FIRE PREVENTION (CONT'D)

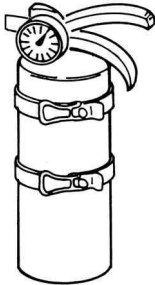
Welding And Grinding

Always clean the machine and attachment, disconnect the battery, and disconnect the wiring from the Bobcat controllers before welding. Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the machine when welding.

Have good ventilation when grinding or welding painted parts. Wear dust mask when grinding painted parts. Toxic dust or gas can be produced.

Dust generated from repairing non-metallic parts such as hoods, fenders or covers can be flammable or explosive. Repair such components in a well ventilated area away from open flames or sparks.

Fire Extinguishers

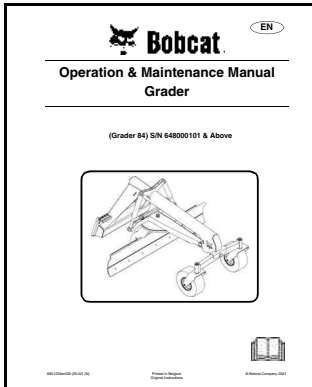


Know where fire extinguishers and first aid kits are located and how to use them. Inspect the fire extinguisher and service the fire extinguisher regularly. Obey the recommendations on the instructions plate.

PUBLICATIONS AND TRAINING RESOURCES

The following publications are also available for your Bobcat attachment. You can order from your Bobcat dealer.

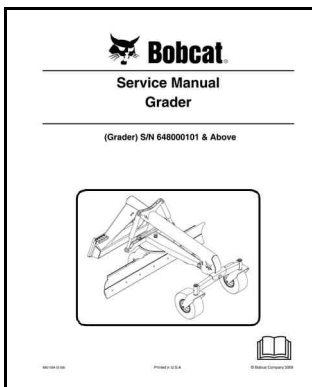
For the latest information on Bobcat products and the Bobcat Company, visit our web site at Bobcat.eu



OPERATION & MAINTENANCE MANUAL

6901233enGB

Complete instructions on the correct operation and the routine maintenance of the Bobcat attachment.



SERVICE MANUAL

6901594

Complete maintenance and overhaul instructions for your Bobcat attachment.

ATTACHMENT SIGNS (DECALS)

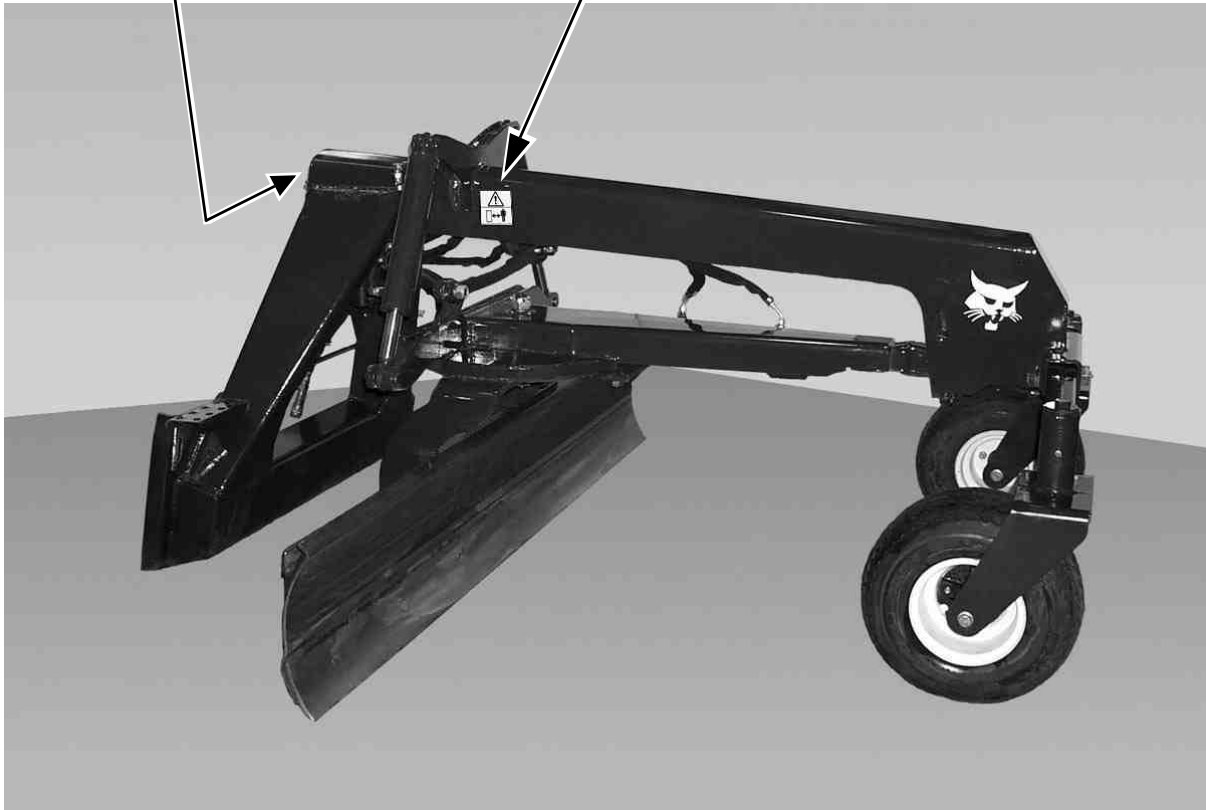
Follow the instructions on all the Attachment Signs (Decals) that are on the attachment. Replace any damaged attachment signs and be sure they are in the correct locations. Attachment signs are available from your Bobcat attachment dealer.



7130141 (1)



7130132 (2) (2)



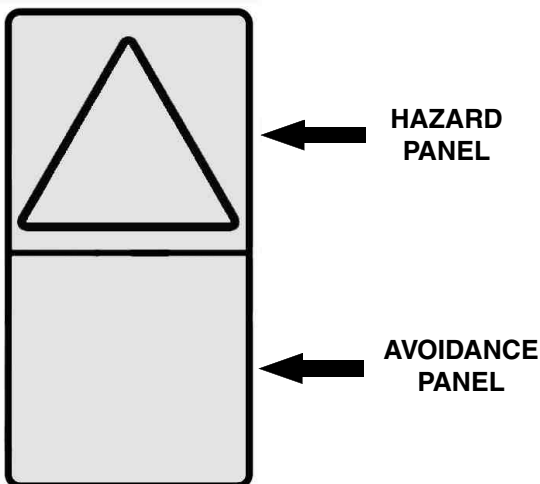
P105511

ATTACHMENT SIGNS (DECALS) (CONT'D)

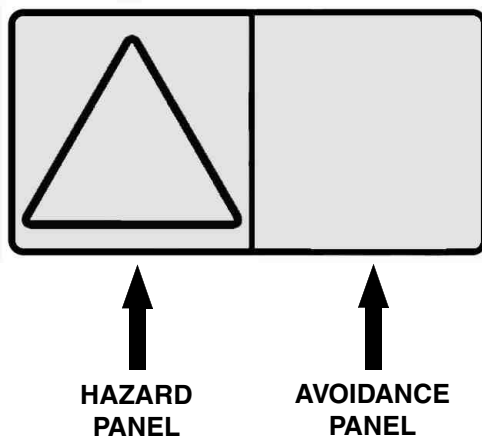
Pictorial Only Safety Signs

Safety signs are used to alert the equipment operator or maintenance person to hazards that may be encountered in the use and maintenance of the equipment. The location and description of the safety signs are detailed in this section. Please become familiarized with all safety signs installed on the machine / attachment.

Vertical Configuration



Horizontal Configuration



The format consists of the hazard panel(s) and the avoidance panel(s):

Hazard panels depict a potential hazard enclosed in a safety alert triangle.

Avoidance panels depict actions required to avoid the hazards.

A safety sign may contain more than one hazard panel and more than one avoidance panel.

NOTE: See the numbered ATTACHMENT SIGNS (DECALS) on Page 22 for the location of each correspondingly numbered pictorial only decal.

1. Tripping Hazard (7130141)

This safety sign is located on the left side of the grader frame.



FALLING HAZARD

With attachment / implement connected, entering or exiting from left can lead to a slip, trip or fall and cause serious injury or death. Enter or exit from the correct side of the attachment and carrier.

W-2809-0623

ATTACHMENT SIGNS (DECALS) (CONT'D)

Pictorial Only Safety Signs (Cont'd)

2. Keep Away (7130132)

This safety sign is located on both sides of the grader frame.



AVOID INJURY OR DEATH

- Bystanders must keep at least 3 m (10 ft) away from the machine and attachment when operating.
- Never leave the operating position when the engine is running.

W-2320-0910

OPERATING INSTRUCTIONS

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INITIAL SETUP

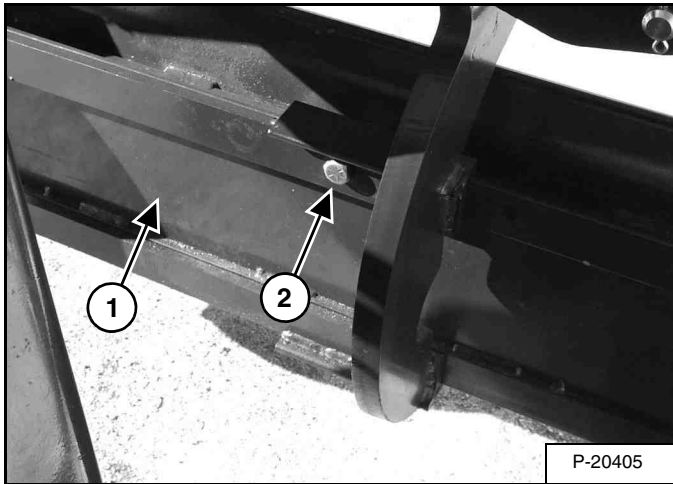
Assembly

Moldboard Installation (If Required)

The grader may be shipped with the moldboard not installed on the grader.

Remove the grader and the moldboard from the shipping container.

Figure 3



Slide the moldboard (Item 1) [Figure 3] onto the grader.

NOTE: A lifting device and a minimum of two people are required for lifting and positioning the moldboard onto the grader.

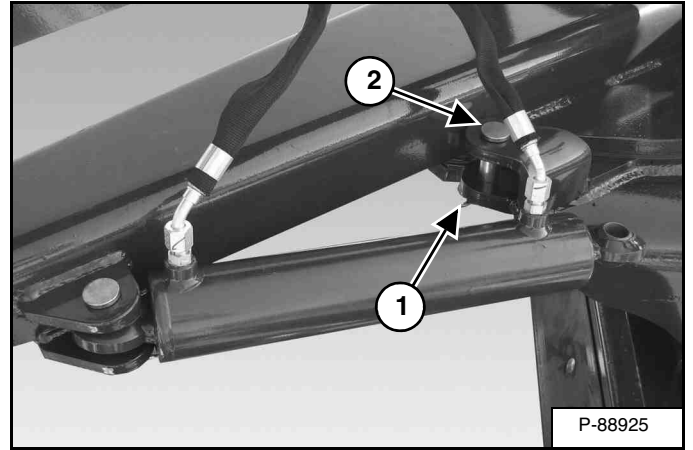
Install the bolt and locknut (Item 2) [Figure 3]. Tighten to 170 N•m (125 ft-lb) torque.

Angle Cylinder Installation (If Required)

The rod end of the angle cylinder may be shipped unpinned which allows the grader to be angled further to save on shipping space.

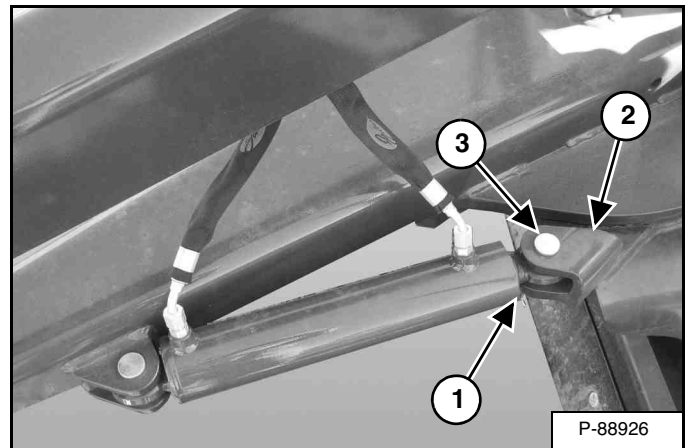
Remove the grader from the shipping pallet.

Figure 4



Remove the cotter pin (Item 1) and pin (Item 2) [Figure 4] from the cylinder mount.

Figure 5



Insert rod end of cylinder (Item 1) into the cylinder mount (Item 2), install the pin and cotter pin (Item 3) [Figure 5].

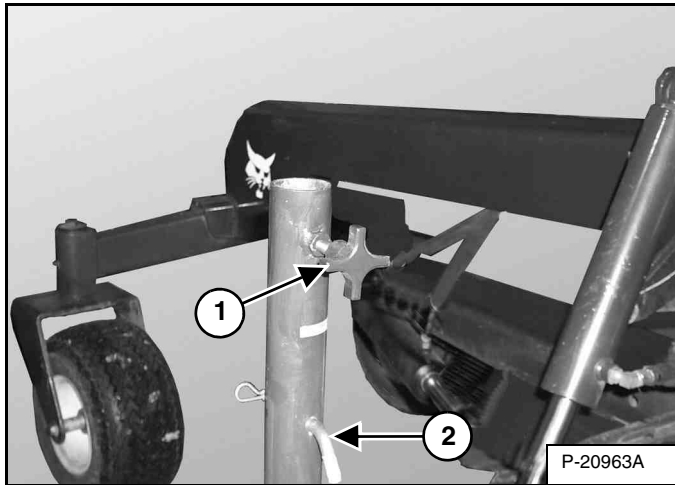
NOTE: A lifting device may be required to lift the grader to reposition the moldboard / turntable to allow angle cylinder installation.

INITIAL SETUP (CONT'D)

Installation And Setup (Laser Option)

Receiver Poles

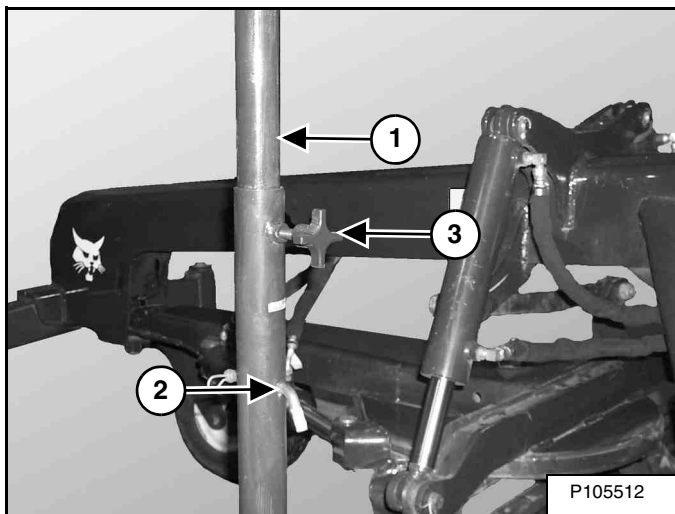
Figure 6



Loosen knob (Item 1) [Figure 6].

Remove the retaining pin (Item 2) [Figure 6] and clip.

Figure 7



Install the receiver pole(s) (Item 1) [Figure 7].

Install retaining pin (Item 2) and clip, then tighten knob (Item 3) [Figure 7].

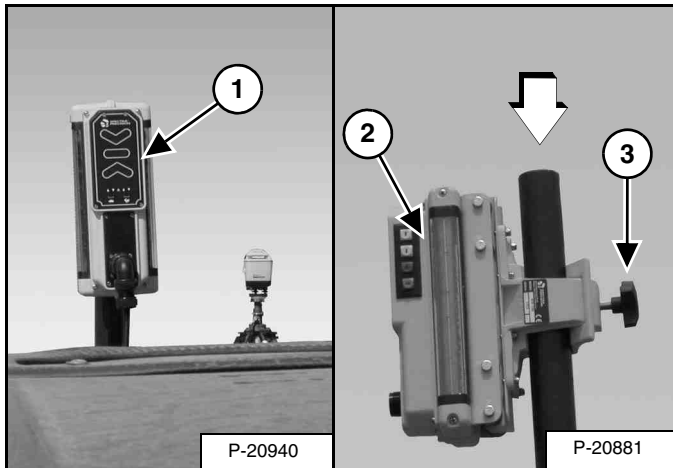
INITIAL SETUP (CONT'D)

Receiver Installation And Setup (Laser Option)

GCR Receiver

NOTE: GCR Laser Receivers can be used with all Graders S/N 648000101 & Above.

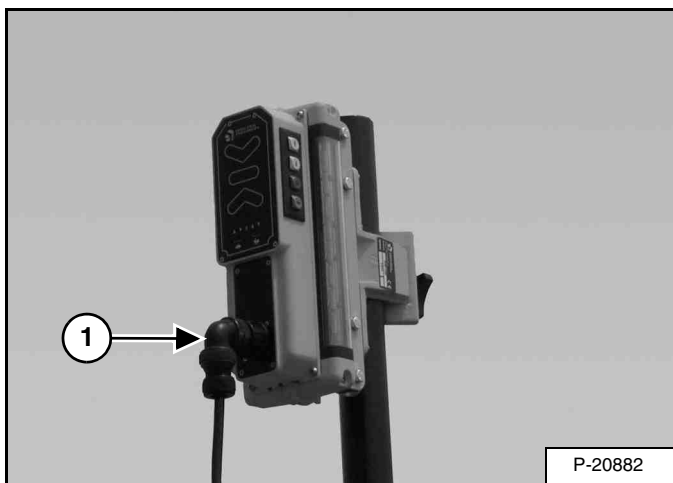
Figure 8



NOTE: When installing the receivers, the level indicator light panel (Item 1) [Figure 8] should face the loader.

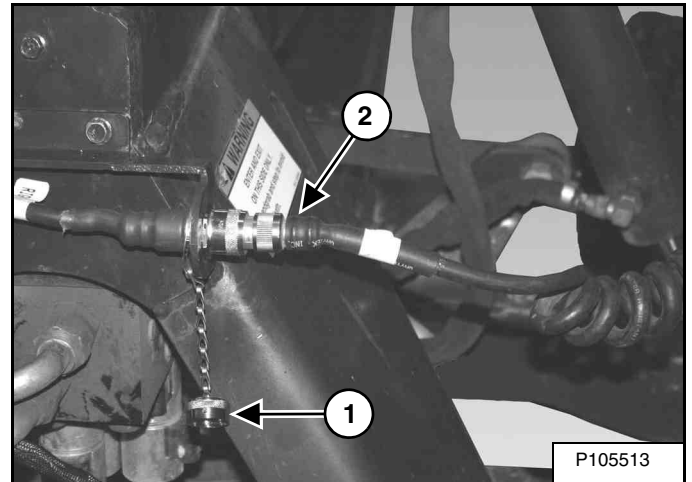
Install the receiver (Item 2) onto the pole, from the top down, then tighten knob (Item 3) [Figure 8].

Figure 9



Connect the wire harness (Item 1) [Figure 9] to the receiver.

Figure 10



Remove cap (Item 1) [Figure 10].

Connect the receiver harness to the valve harness (Item 2) [Figure 10].

Repeat procedure for other receiver.

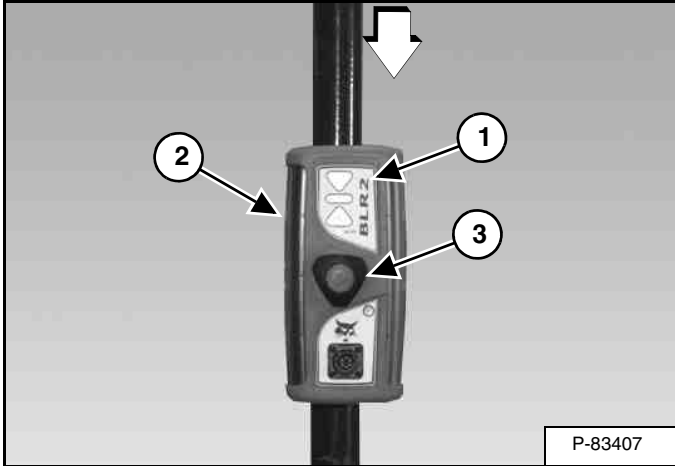
INITIAL SETUP (CONT'D)

Receiver Installation And Setup (Laser Option) (Cont'd)

BLR2 Receiver

NOTE: The BLR2 Laser Receivers are for use with Graders S/N 648001631 & Above only.

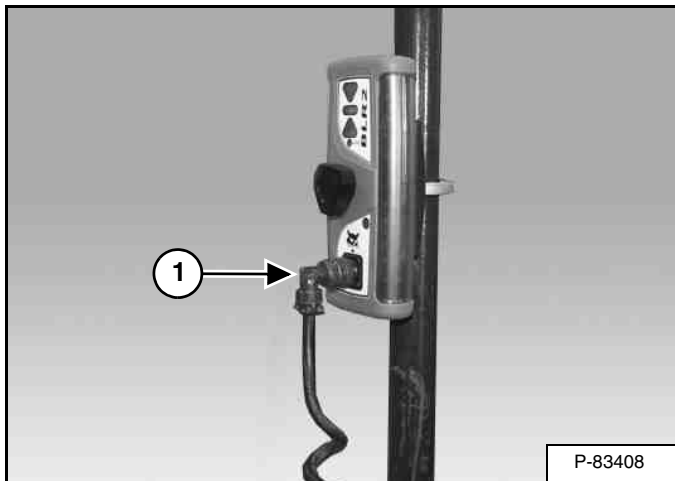
Figure 11



NOTE: When installing the receivers, the level indicator light panel (Item 1) [Figure 11] should face the loader.

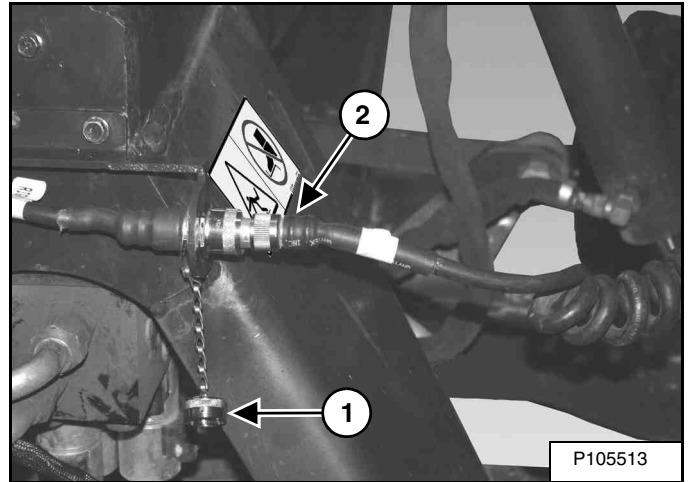
Install the receiver (Item 2) onto the pole, from the top down, then tighten knob (Item 3) [Figure 11].

Figure 12



Connect the wire harness (Item 1) [Figure 12] to the receiver.

Figure 13



Remove cap (Item 1) [Figure 13].

Connect the receiver harness to the valve harness (Item 2) [Figure 13].

Repeat procedure for other receiver.

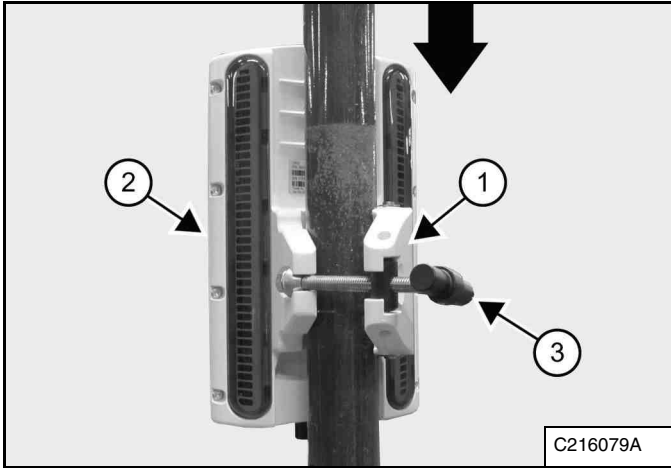
INITIAL SETUP (CONT'D)

Receiver Installation And Setup (Laser Option) (Cont'd)

LR410 Receiver

NOTE: The LR410 Laser Receivers are for use with Graders S/N 648001631 & Above only.

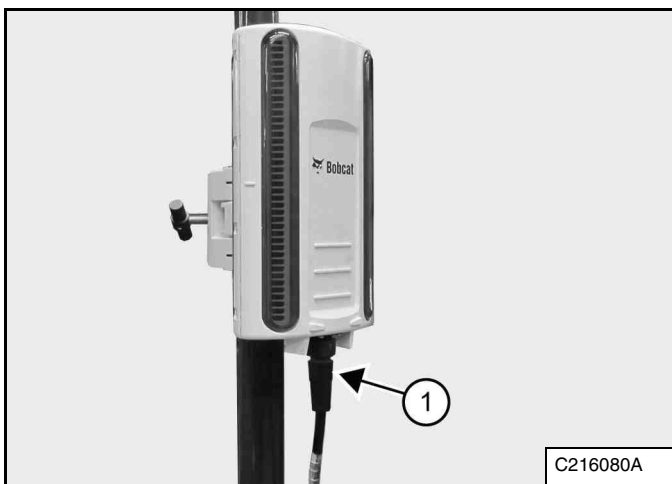
Figure 14



NOTE: When installing the receivers, the front of the receiver (Item 2) [Figure 14] should face the loader.

Install the receiver (Item 2) onto the pole, from the top down, then tighten T-handle (Item 3) [Figure 14].

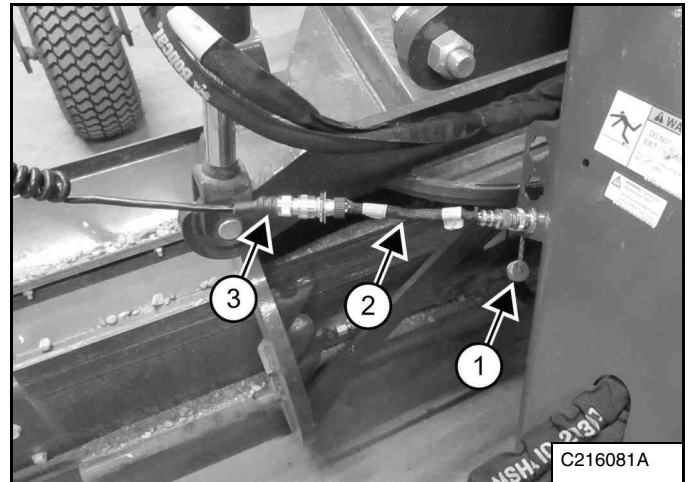
Figure 15



Connect the wire harness (Item 1) [Figure 15] to the receiver.

Repeat the process for the other receiver.

Figure 16



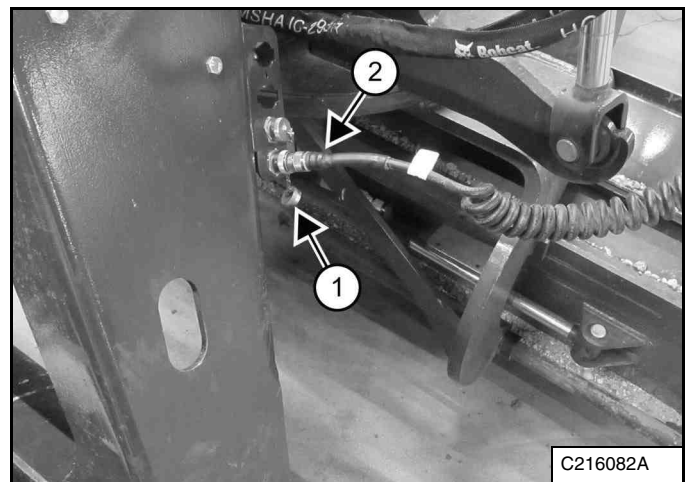
Remove left side cap (Item 1) [Figure 16].

Connect the jumper harness (Item 2) [Figure 16] to the left side valve harness.

NOTE: Make sure to install the jumper harness to the left side valve harness only.

Connect the left side receiver harness (Item 3) [Figure 16] to the jumper harness.

Figure 17



Remove right side cap (Item 1) [Figure 17].

Connect the right side receiver harness (Item 2) [Figure 17] to the right side valve harness.

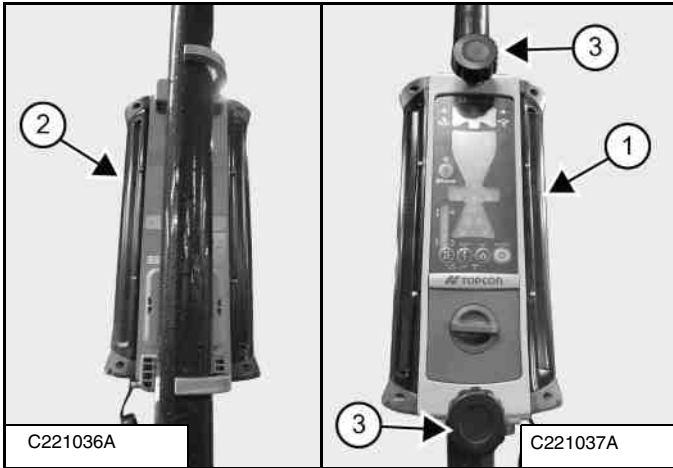
INITIAL SETUP (CONT'D)

Receiver Installation And Setup (Laser Option) (Cont'd)

LS-B200W Receiver

NOTE: The LS-B200W Laser Receivers are for use with Graders S/N 64800987 & Below & S/N 64800988 & Above.

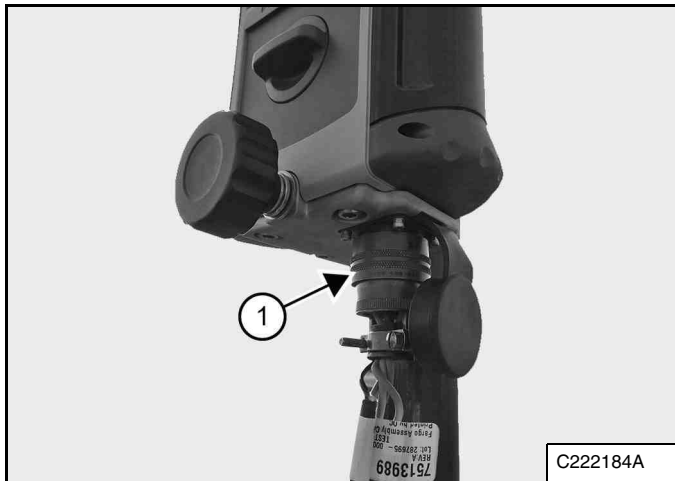
Figure 18



NOTE: When installing the receivers, the front of the receiver (Item 1) [Figure 18] should face the loader.

Install the receiver (Item 2) onto the pole, then tighten both knobs (Item 3) [Figure 18].

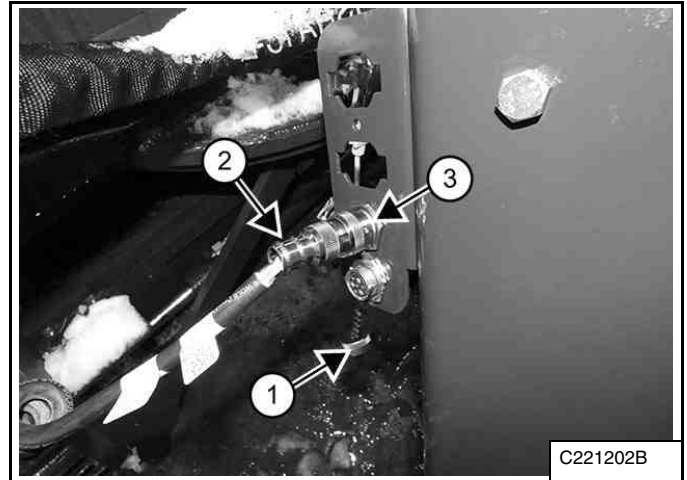
Figure 19



Connect the wire harness (Item 1) [Figure 19] to the receiver.

Repeat the process for the other receiver.

Figure 20



Remove left side cap (Item 1) [Figure 20].

Connect the left side receiver harness (Item 2) to the left side valve harness (Item 3) [Figure 20].

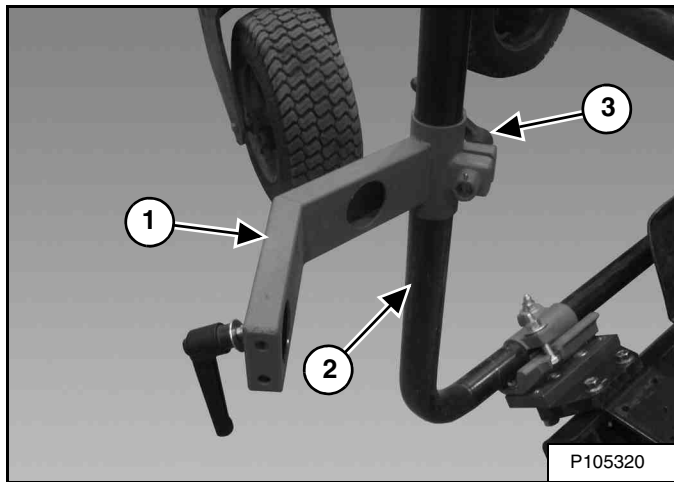
NOTE: The left side LS-B200W receiver harness features yellow heatshrink.

Repeat procedure for the right side receiver.

INITIAL SETUP (CONT'D)

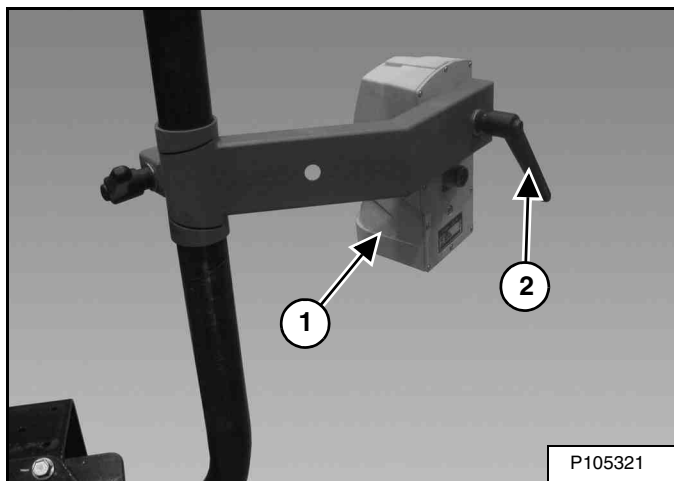
Sonic Tracer / Slope Sensor Installation And Setup (Option)

Figure 21



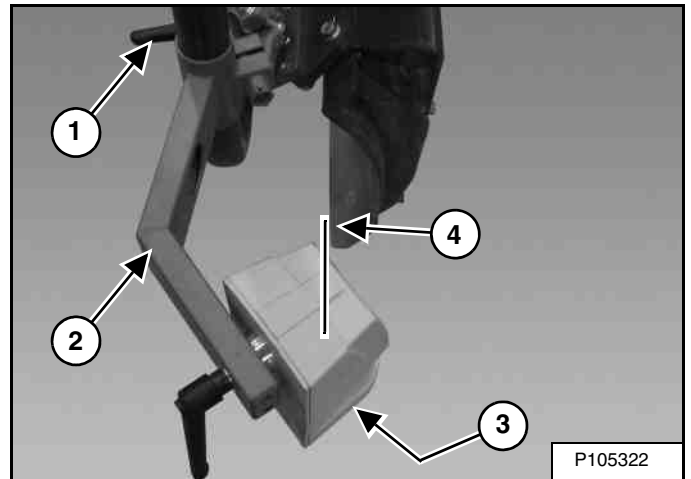
Install tracer bracket arm (Item 1) at desired height on the tracer pole (Item 2) and tighten handle (Item 3) [Figure 21].

Figure 22



Install Sonic Tracer Sensor (Item 1) and tighten handle (Item 2) [Figure 22].

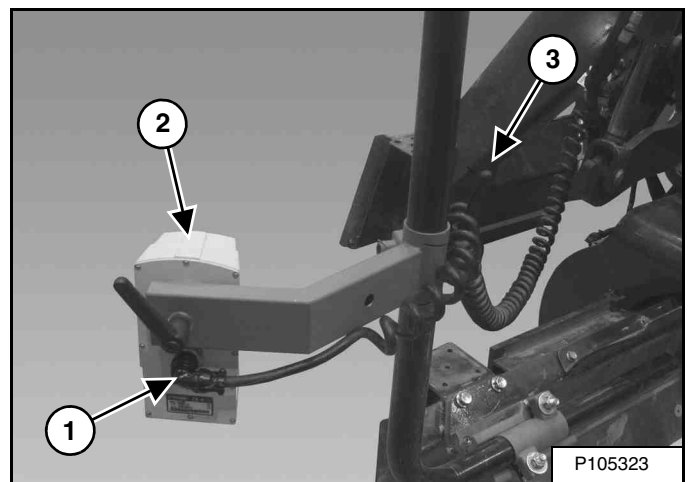
Figure 23



Loosen handle (Item 1) and adjust bracket arm (Item 2) so the Sonic Tracer Sensor (Item 3) is centered with the grader moldboard cutting edge (Item 4) [Figure 23].

NOTE: Sensor located at bottom of Sonic Tracer Sensor housing.

Figure 24

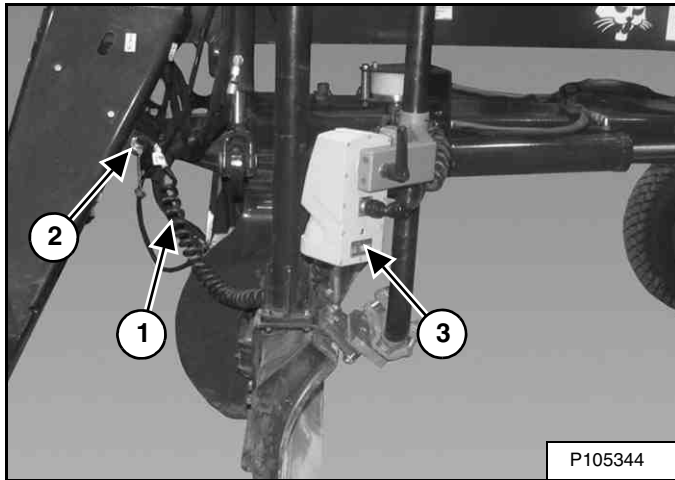


Connect the receiver harness (Item 1) to the Sonic Tracer Sensor (Item 2) connector. Route the receiver harness as shown, with harness wrapped over the bracket arm handle (Item 3) [Figure 24].

INITIAL SETUP (CONT'D)

Sonic Tracer / Slope Sensor Installation And Setup (Option) (Cont'd)

Figure 25



Connect the receiver harness (Item 1) to the 7-Pin connector (Item 2) [Figure 25] on the grader.

NOTE: The receiver harness will connect to the 7-Pin connector on the side of the grader that the Sonic Tracer Sensor (Item 3) [Figure 25] is mounted. The sonic sensor harness (mainfall / slope / rotation) will connect to the other 7-Pin connector located on the opposite side of the grader.

Sensor Calibration

NOTE: Calibration of the sensors should be done on initial installation and is recommended every three months.

If the grader is not installed on the machine, install the grader to the machine. (See the machine's Operation & Maintenance Manual for correct procedure.)

Enter the machine. (See Entering And Exiting The Loader on Page 58.)

Start the machine and move to a well ventilated, level area (< +/-1%, hard surface preferred).

Figure 26

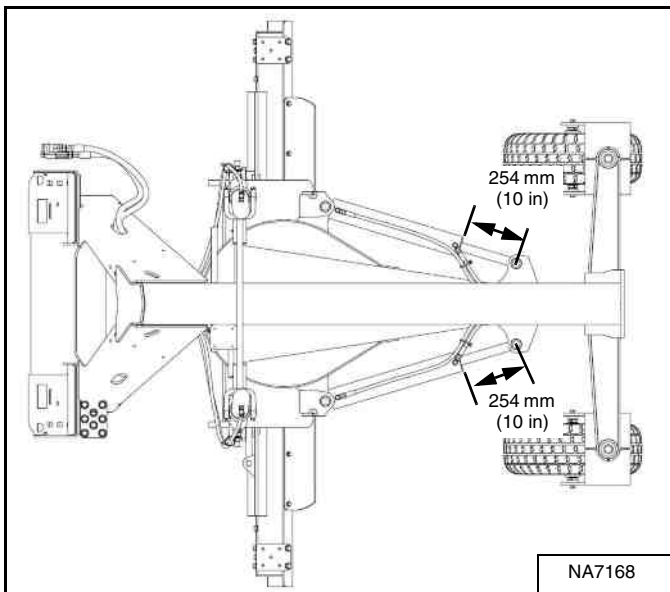


Make sure the machine's lift arms are lowered all the way down and the grader is set in operating position [Figure 26].

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

Figure 27



NOTE: The moldboard needs to be square with the grader frame for this calibration [Figure 27].

Stop the engine and exit the machine. (See Entering And Exiting The Loader on Page 58.)

Measure the distance from top of the cylinder base end to the rod-eye center [Figure 27]. The distance should be approximately 254 mm (10 in).

Enter the machine and start the engine. (See Entering And Exiting The Loader on Page 58.)

Deluxe Display

Figure 28



On the deluxe instrumentation panel press the right arrow (Item 1) to go to the ATTACHMENTS icon (Item 2) [Figure 28] and push ENTER.

Figure 29



Once in the GRADER ATTACHMENT screen, push the #8 key (tools) to get to the SONIC TRACER [Figure 29].

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

Deluxe Display (Cont'd)

Figure 30



On the SONIC TRACER screen, push key #4 to get to the DIAGNOSTICS screen [Figure 30].

Figure 31



Each sensor will be calibrated by pushing the associated number [Figure 31].

1. Moldboard reported slope value. Push to begin calibration process.
2. Mainfall reported slope value. Push to begin calibration process.
3. Rotation angle reported value. Push to begin calibration process.
4. Sonic Tracer offset from edge of moldboard value. Push to change the value.

Figure 32



NOTE: The reported values may differ from what is shown in [Figure 32].

Figure 33



NOTE: If the rotation sensor is reading a number outside of a +/- 35°, See [Figure 44] thru [Figure 46].

If the rotation sensor reads within +/- 35° of zero, push the #3 key to calibrate the Rotation Sensor [Figure 33].

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

Deluxe Display (Cont'd)

Figure 34



Push the checkmark button to calibrate the Rotation Sensor and return to the DIAGNOSTICS screen. The rotation sensor should now read 0.0° [Figure 34].

Figure 35



On the DIAGNOSTICS screen, push key #2 to calibrate the Mainfall Slope Sensor [Figure 35].

NOTE: The grader must be on a level area (< +/-1%, hard surface preferred).

Figure 36



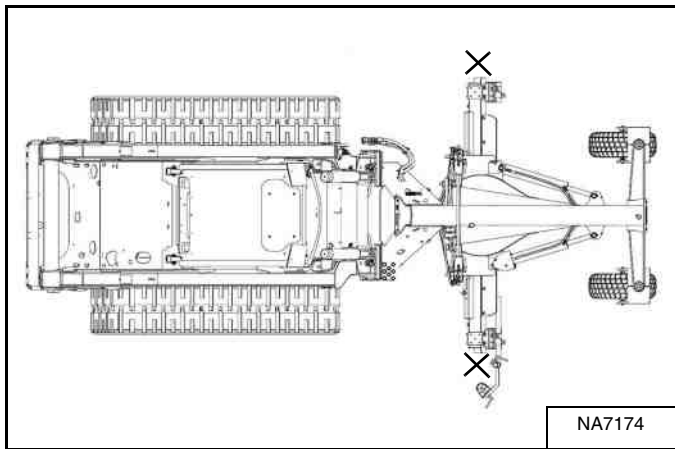
Push the checkmark to calibrate the Mainfall Slope Sensor. The Mainfall Slope Sensor should now read 0.00% [Figure 36].

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

Deluxe Display (Cont'd)

Figure 37



NOTE: Calibrating the moldboard cross-slope sensor will consist of a two step calibration process.

Keeping the rotation sensor at 0.00°, move the cutting edge so the cutting edge is flat and on a hard level surface.

Stop the engine and exit the machine. (See Entering And Exiting The Loader on Page 58.)

Mark where the cutting edge is on the ground [Figure 37].

Enter the machine and start the engine. (See Entering And Exiting The Loader on Page 58.)

On the deluxe instrumentation panel press the right arrow to go to the attachment icon and push enter. (See [Figure 28].)

Once in the GRADER ATTACHMENT screen, push the #8 key (tools) to get to the SONIC TRACER. (See [Figure 29].)

Push the #4 key to get to the DIAGNOSTICS screen. (See [Figure 30].)

Figure 38



On the DIAGNOSTICS screen, push the #1 key to calibrate the MOLDBOARD SLOPE sensor [Figure 38].

Figure 39



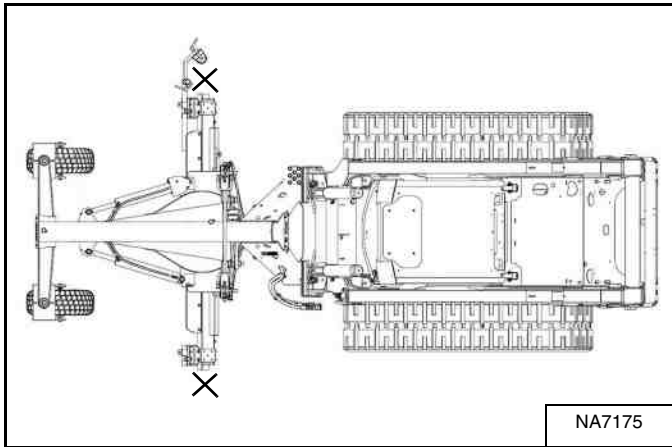
Push the checkmark to perform the first step of moldboard calibration [Figure 39].

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

Deluxe Display (Cont'd)

Figure 40



Drive the loader and grader such that the moldboard is 180° from where it was originally. Place the cutting edge flat on the ground on the original marks [Figure 40].

Figure 41



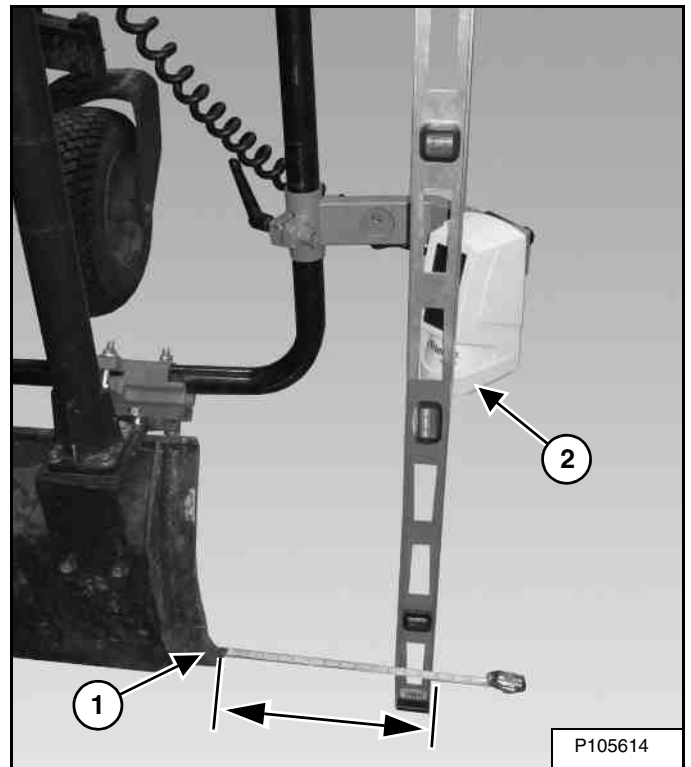
Push the checkmark button to perform the second step of moldboard sensor calibration [Figure 41].

NOTE: The moldboard slope sensor should now be calibrated.

NOTE: The reported value may not read exactly 0.00% on the diagnostics screen. The value reported will be the slope of the surface that the cutting edge is on.

Stop the engine and exit the machine. (See Entering And Exiting The Loader on Page 58.)

Figure 42



Measure the distance from the side of the cutting edge (Item 1) to the center of the Sonic Tracer Sensor (Item 2) [Figure 42] and record the Sonic Tracer Sensor offset value.

Enter the machine and start the engine. (See Entering And Exiting The Loader on Page 58.)

On the deluxe instrumentation panel press the right arrow to go to the ATTACHMENTS icon and push ENTER. (See [Figure 28].)

Once in the GRADER ATTACHMENT screen, push the #8 key (tools) to get to the SONIC TRACER. (See [Figure 29].)

Push the #4 key to get to the DIAGNOSTICS screen. (See [Figure 30].)

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

Deluxe Display (Cont'd)

Figure 43



Push key #4 on the DIAGNOSTICS screen and enter the Sonic Tracer offset value [Figure 43].

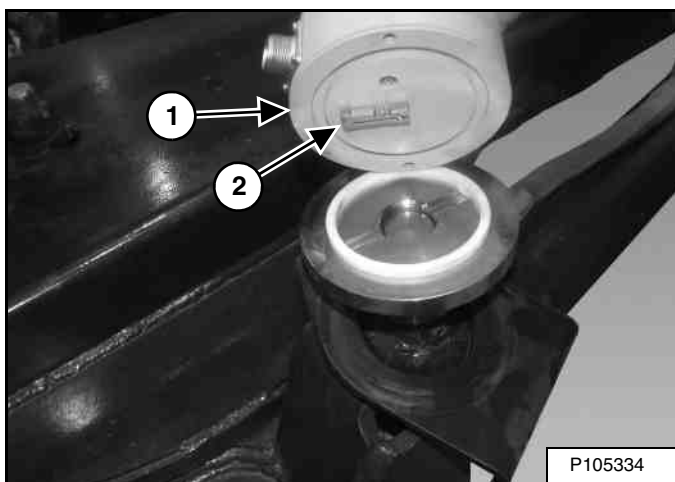
Push the save button when value is entered. The diagnostics screen should read the typed value.

NOTE: The calibration procedures are now complete.

NOTE: If rotation sensor value is more than +/- 35° continue with [Figure 44] thru [Figure 46].

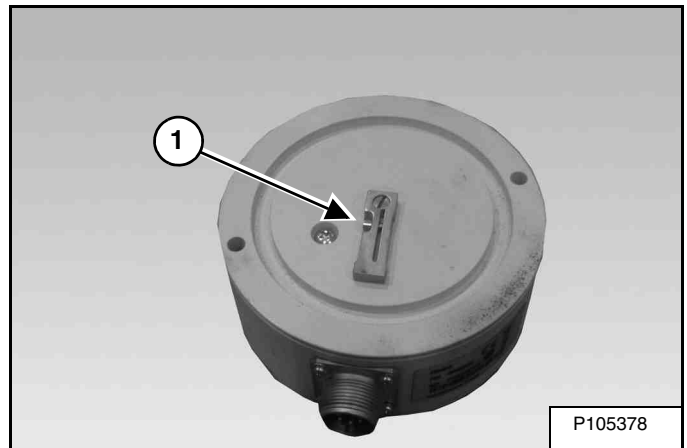
Stop the engine and exit the machine. (See Entering And Exiting The Loader on Page 58.)

Figure 44



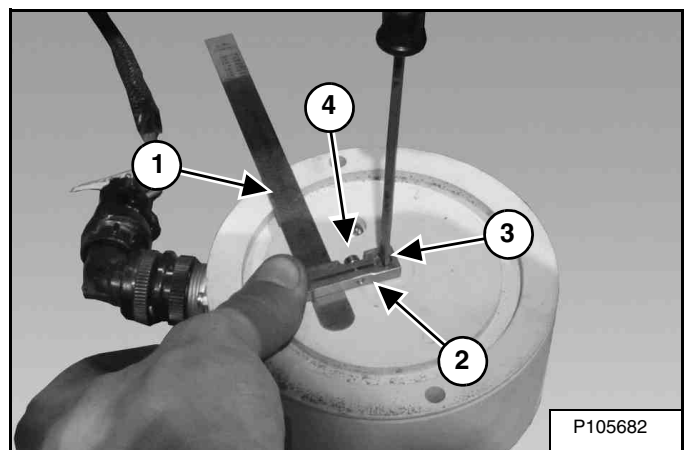
Remove the rotation sensor (Item 1) from the mounting plates, keeping the rotation tab (Item 2) in the same location [Figure 44].

Figure 45



Loosen the set screw (Item 1) [Figure 45] on the side of the rotation arm.

Figure 46



Place a 0,5 to 1,0 mm (0.02 to 0.04 in) feeler gauge (Item 1) under the rotation arm (Item 2) to provide proper rotation during operation. If a feeler gauge is not available, a folded business card can work well to provide the proper space under the rotation arm [Figure 46].

Enter the machine and press the "RUN" button. (See the machine's Operation & Maintenance Manual for correct procedure.)

While holding the rotation arm, turn the center screw (Item 3) [Figure 46] until the reported value is within +/- 35° of zero in the DIAGNOSTICS screen.

Tighten the set screw (Item 4) [Figure 46].

Repeat calibration [Figure 28] through [Figure 43].

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

Touch Display

Figure 47



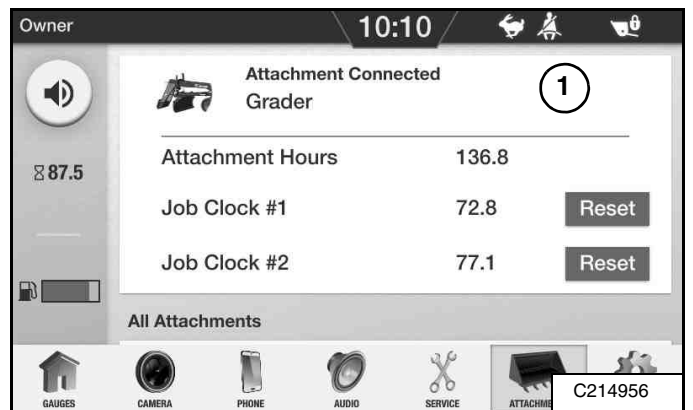
Enter the correct password to display the main screen [Figure 47] (if required).

Figure 48



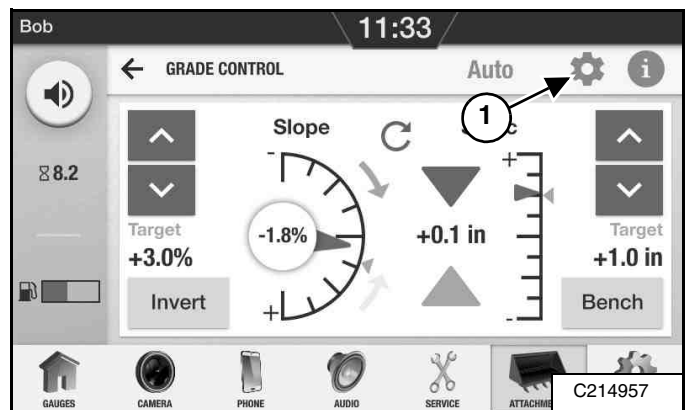
Select [ATTACHMENTS] (Item 1) [Figure 48].

Figure 49



Press the Grader section (Item 1) [Figure 49] on the touch display.

Figure 50



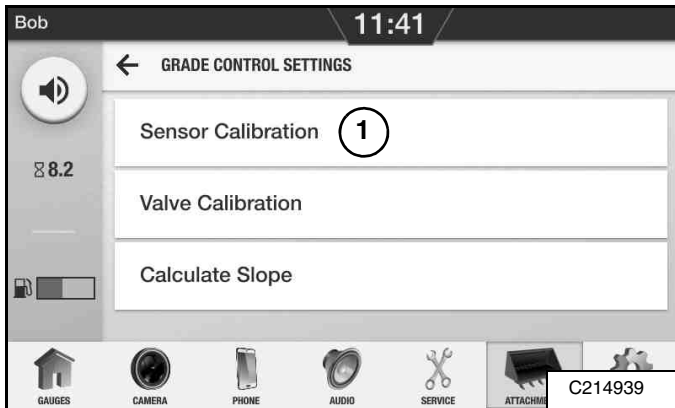
On the GRADE CONTROL screen, push gear icon (Item 1) [Figure 50] to get to the GRADE CONTROL SETTINGS screen.

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

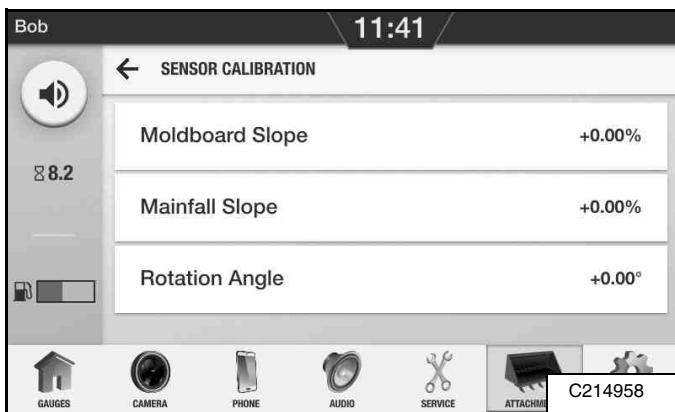
Touch Display (Cont'd)

Figure 51



On the GRADE CONTROL SETTINGS screen, push SENSOR CALIBRATION selection tab (Item 1) [Figure 51].

Figure 52

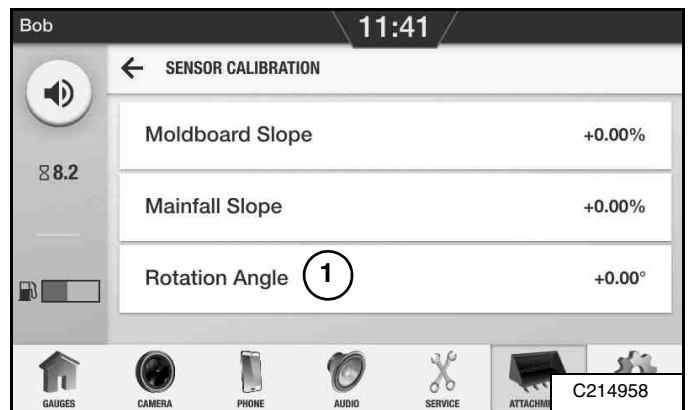


Each sensor will be calibrated by pushing the associated selection tab [Figure 52].

- Moldboard reported slope value. Push to begin calibration process.
- Mainfall reported slope value. Push to begin calibration process.
- Rotation angle reported value. Push to begin calibration process.

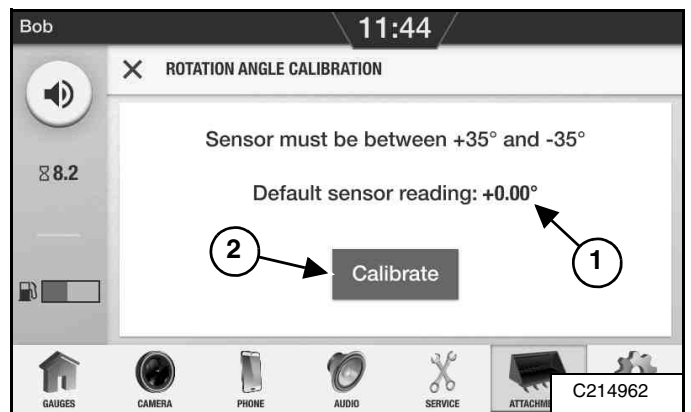
NOTE: The reported values may differ from what is shown in [Figure 52].

Figure 53



On the SENSOR CALIBRATION screen, push the ROTATION ANGLE selection tab (Item 1) [Figure 53].

Figure 54



NOTE: If the default sensor reading (Item 1) [Figure 54] is a number outside of +/- 35°, See [Figure 62] thru [Figure 64].

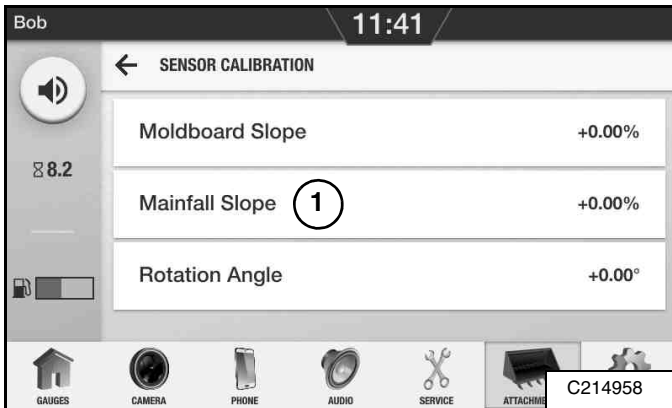
Push the blue calibrate button (Item 2) [Figure 54] to calibrate the Rotation Sensor and return to the SENSOR CALIBRATION screen. The rotation sensor should now read 0.0°.

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

Touch Display (Cont'd)

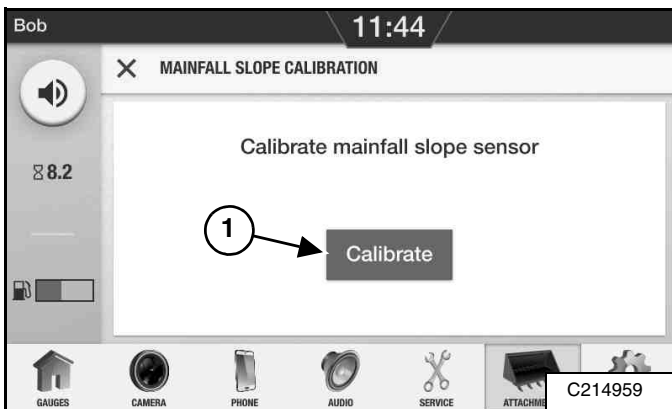
Figure 55



On the SENSOR CALIBRATION screen, push MAINFALL SLOPE selection tab (Item 1) [Figure 55] to calibrate the Mainfall Slope Sensor.

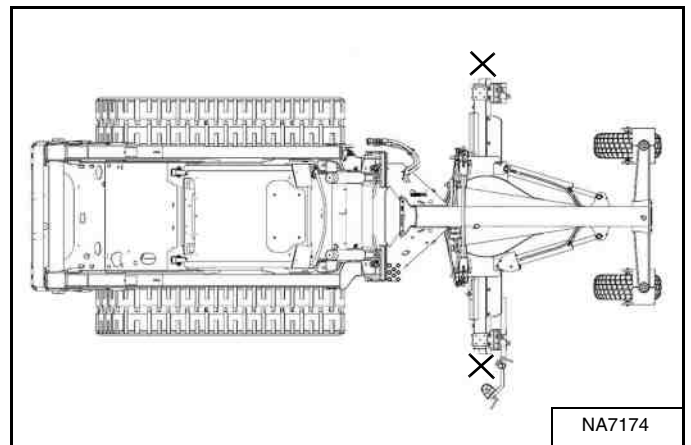
NOTE: The grader must be on a level area (< +/-1%, hard surface preferred).

Figure 56



Push the blue calibrate button (Item 1) [Figure 56] to calibrate the Mainfall Slope Sensor and return to the SENSOR CALIBRATION screen. The Mainfall Slope Sensor should now read 0.00%.

Figure 57



NOTE: Calibrating the moldboard cross-slope sensor will consist of a two step calibration process.

Keeping the rotation sensor at 0.00°, move the cutting edge so the cutting edge is flat and on a hard level surface.

Stop the engine and exit the machine. (See Entering And Exiting The Loader on Page 58.)

Mark where the cutting edge is on the ground [Figure 57].

Enter the machine and start the engine. (See Entering And Exiting The Loader on Page 58.)

On the touch display press the ATTACHMENTS icon. (See [Figure 48].)

Once in the GRADER ATTACHMENT screen, push the Grader section to get to the GRADE CONTROL screen. (See [Figure 49].)

Push the gear icon to get to the GRADE CONTROL SETTINGS screen. (See [Figure 50].)

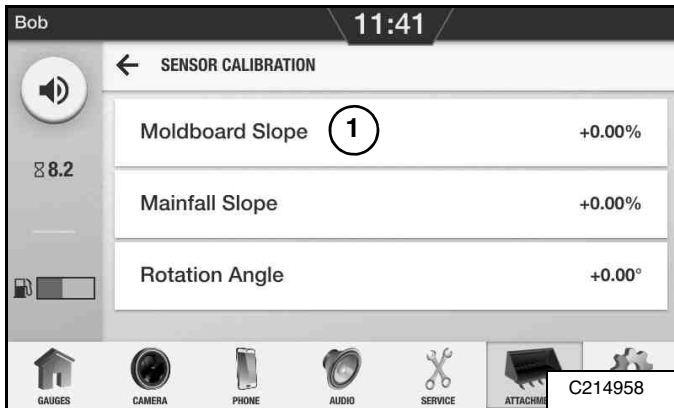
On the GRADE CONTROL SETTINGS screen, push SENSOR CALIBRATION. (See [Figure 51].)

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

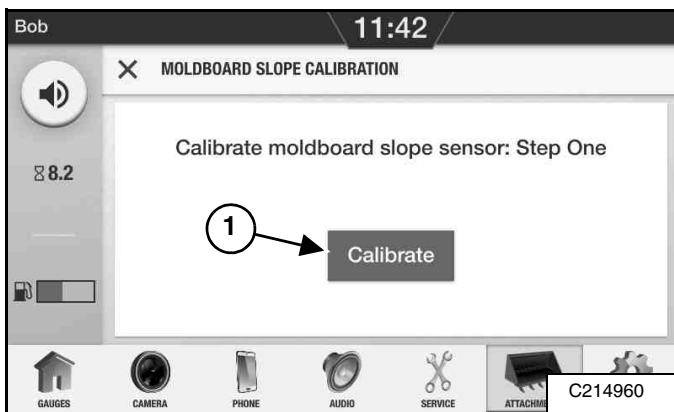
Touch Display (Cont'd)

Figure 58



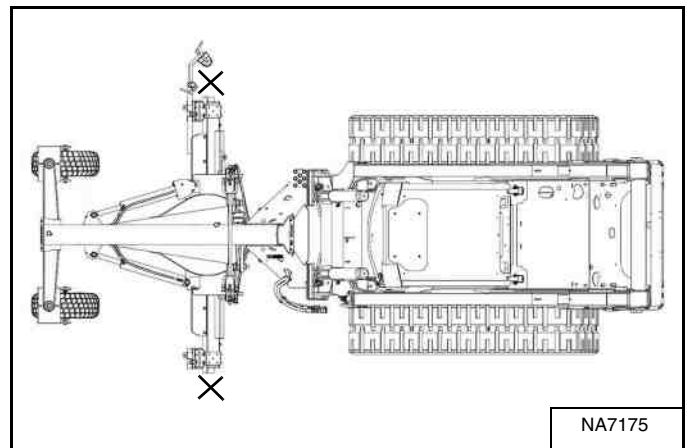
On the SENSOR CALIBRATION screen, push MOLDBOARD SLOPE selection tab (Item 1) [Figure 58] to calibrate the moldboard slope sensor.

Figure 59



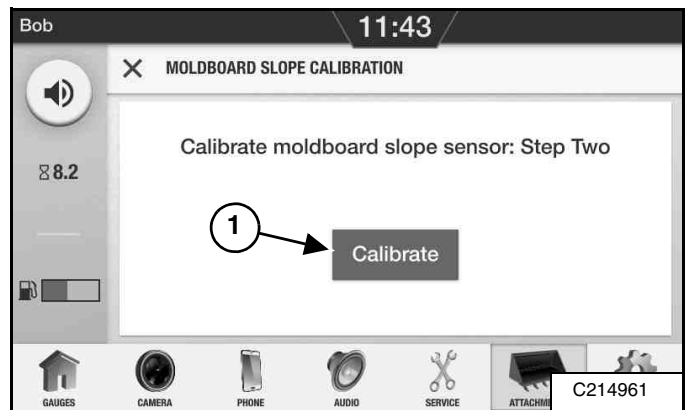
Push the blue calibrate button (Item 1) [Figure 59] to perform the first step of moldboard calibration.

Figure 60



Drive the loader and grader such that the moldboard is 180° from where it was originally. Place the cutting edge flat on the ground on the original marks [Figure 60].

Figure 61



Push the blue calibrate button (Item 1) [Figure 61] to perform the second step of moldboard sensor calibration.

NOTE: The moldboard slope sensor should now be calibrated.

NOTE: The reported value may not read exactly 0.00% on the diagnostics screen. The value reported will be the slope of the surface that the cutting edge is on.

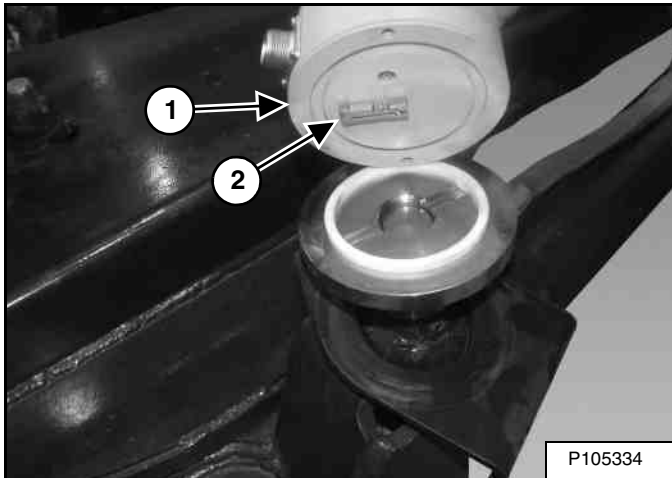
Stop the engine and exit the machine. (See Entering And Exiting The Loader on Page 58.)

INITIAL SETUP (CONT'D)

Sensor Calibration (Cont'd)

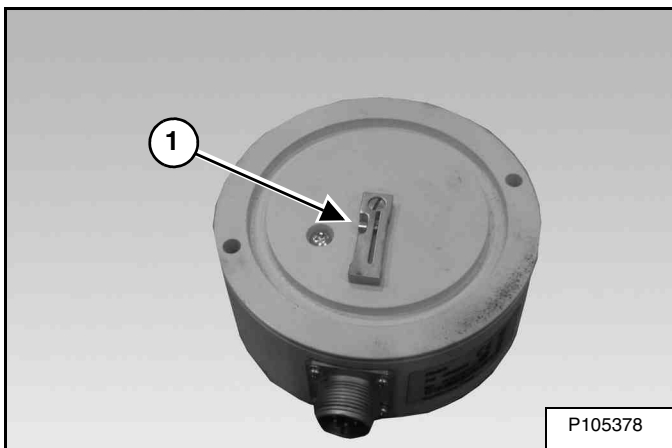
Touch Display (Cont'd)

Figure 62



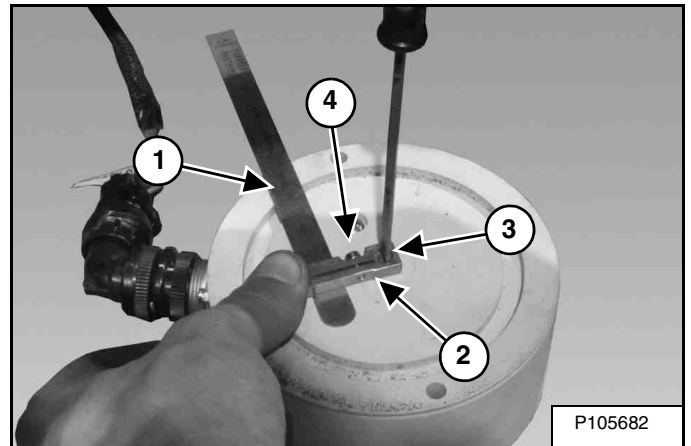
Remove the rotation sensor (Item 1) from the mounting plates, keeping the rotation tab (Item 2) in the same location [Figure 62].

Figure 63



Loosen the set screw (Item 1) [Figure 63] on the side of the rotation arm.

Figure 64



Place a 0,5 to 1,0 mm (0.02 to 0.04 in) feeler gauge (Item 1) under the rotation arm (Item 2) to provide proper rotation during operation. If a feeler gauge is not available, a folded business card can work well to provide the proper space under the rotation arm [Figure 64].

Enter the machine and press the “RUN” button. (See the machine’s Operation & Maintenance Manual for correct procedure.)

While holding the rotation arm, turn the center screw (Item 3) [Figure 64] until the reported value is within +/- 35° of zero in the diagnostics screen.

Tighten the set screw (Item 4) [Figure 64].

Repeat calibration [Figure 47] through [Figure 61].

INITIAL SETUP (CONT'D)

Valve Calibration (Software Version 8.0 & Above) (Deluxe Display Panel Software Version 6.6 & Above)

NOTE: Calibration of the valve should be done on initial installation and is recommended if the grader operation is not smooth.

If the grader is not installed on the machine, install the grader to the machine. (See the machine's Operation & Maintenance Manual for correct procedure.)

Enter the machine. (See Entering And Exiting The Loader on Page 58.)

Start the machine and move to a well ventilated, level area (< +/-1%, hard surface preferred).

NOTE: Bring the engine and hydraulics to operating temperature for best calibration results.

Activate the auxiliary hydraulics.

Figure 65



Make sure the machine's lift arms are lowered all the way down and the grader is set in operating position as shown in [Figure 65].

The sensor configuration should cause the mold board edge to be 25 mm (1 in) to 51 mm (2 in) from the ground when on target.

Figure 66



On the deluxe instrumentation panel press the right arrow (Item 1) to go to the ATTACHMENTS icon (Item 2) [Figure 66] and push enter.

Figure 67

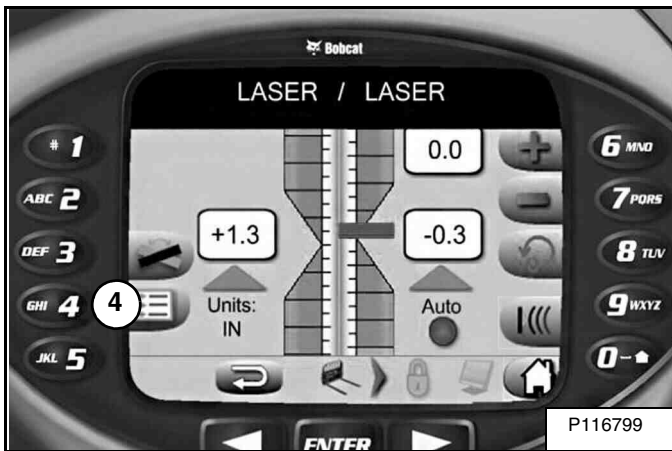


Once in the GRADER ATTACHMENT screen, push the #8 key (tools) to get to the SENSOR screen [Figure 67].

INITIAL SETUP (CONT'D)

Valve Calibration (Software Version 8.0 & Above) (Deluxe Display Panel Software Version 6.6 & Above) (Cont'd)

Figure 68



On the SENSOR screen, push key #4 to get to the DIAGNOSTICS screen [Figure 68].

Figure 69



On the DIAGNOSTICS screen, press the VALVE CALIBRATION button #1 [Figure 69].

Figure 70



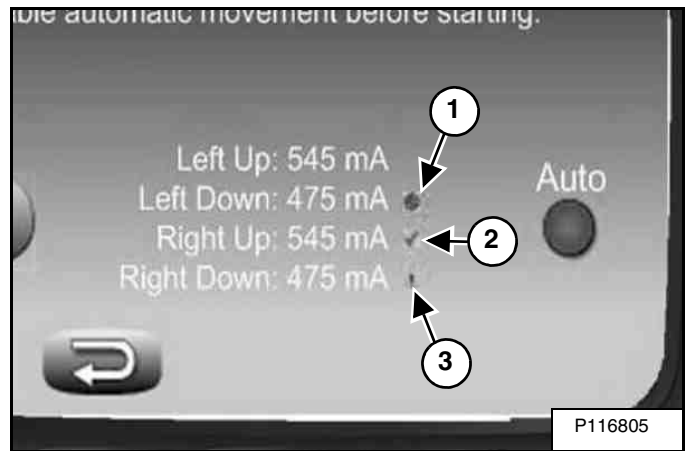
Set the target to 102 mm (4 in) - 152 mm (6 in) above the ground. Make sure the moldboard is on target.

Enable automatic movement. When enabled, a green circle (Item 1) [Figure 70] will be displayed.

Press the red check mark button #4 [Figure 70] to start the calibration process.

The calibration will start with the first valve and then proceed to the remaining valves.

Figure 71



A blue/green circle will be displayed next to the valve being calibrated (Item 1) [Figure 71].

After the calibration is successfully completed, a green check mark will be displayed (Item 2) [Figure 71].

If the calibration was not successful, a yellow triangle will be displayed (Item 3) [Figure 71].

If the calibration is unsuccessful, check all electrical connections and repeat the calibration procedure.

INITIAL SETUP (CONT'D)

Valve Calibration (Touch Display)

NOTE: Calibration of the valve should be done on initial installation and is recommended if the grader operation is not smooth.

If the grader is not installed on the machine, install the grader to the machine. (See the machine's Operation & Maintenance Manual for correct procedure.)

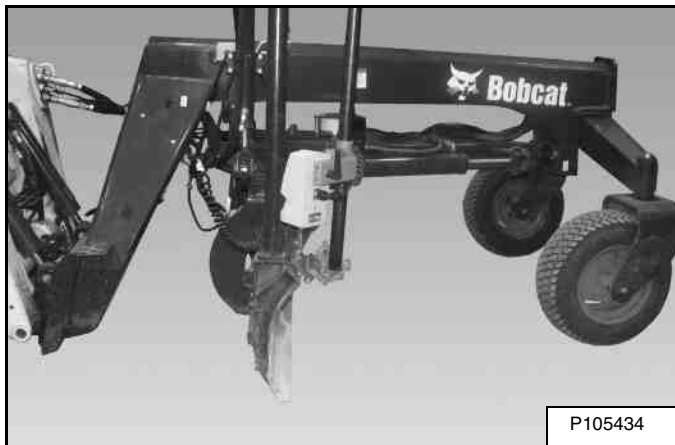
Enter the machine. (See Entering And Exiting The Loader on Page 58.)

Start the machine and move to a well ventilated, level area (< +/-1%, hard surface preferred).

NOTE: Bring the engine and hydraulics to operating temperature for best calibration results.

Activate the auxiliary hydraulics.

Figure 72



Make sure the machine's lift arms are lowered all the way down and the grader is set in operating position as shown in [Figure 72].

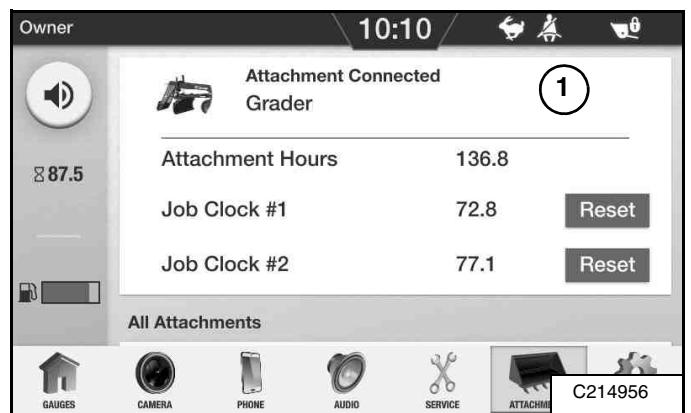
The sensor configuration should cause the moldboard edge to be 25 mm (1 in) to 51 mm (2 in) from the ground when on target.

Figure 73



Select [ATTACHMENTS] (Item 1) [Figure 73].

Figure 74

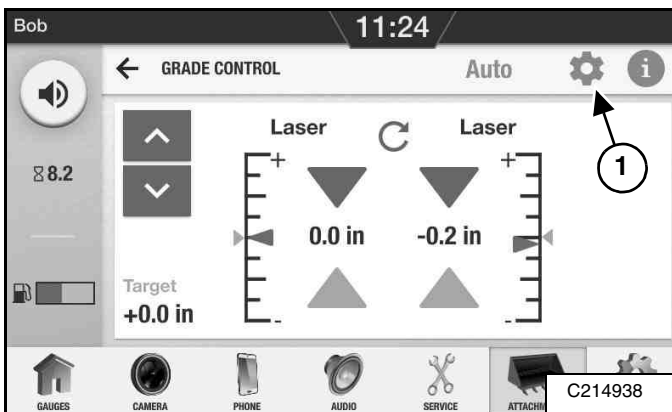


Press the Grader section (Item 1) [Figure 74] on the touch display.

INITIAL SETUP (CONT'D)

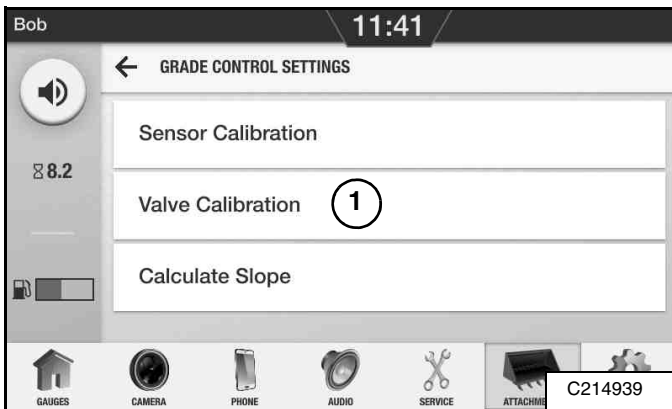
Valve Calibration (Touch Display) (Cont'd)

Figure 75



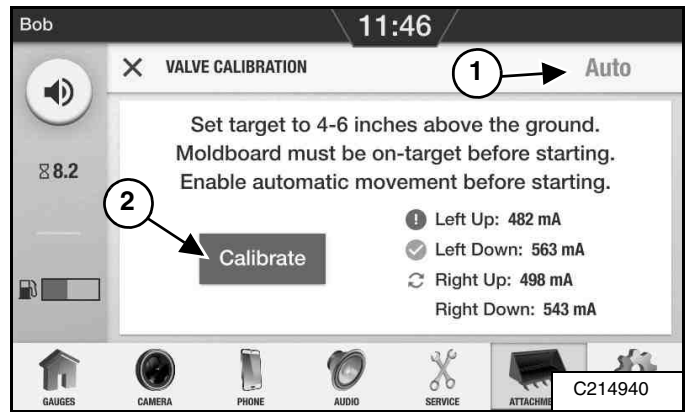
On the GRADE CONTROL screen, press the gear icon (Item 1) [Figure 75] to get to the GRADE CONTROL SETTINGS screen.

Figure 76



On the GRADE CONTROL SETTINGS screen, press the VALVE CALIBRATION selection [Figure 76].

Figure 77



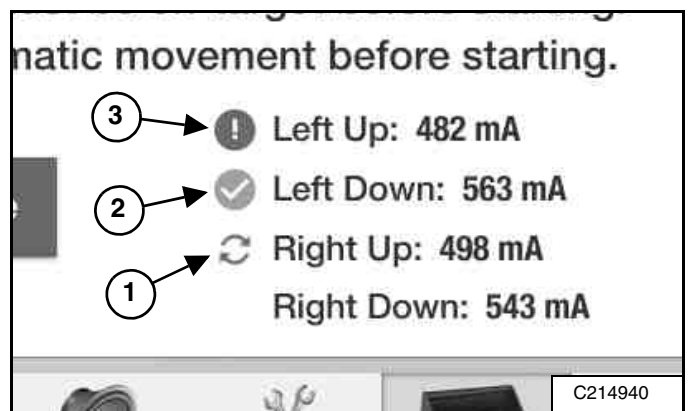
Set the target to 102 mm (4 in) - 152 mm (6 in) above the ground. Make sure the moldboard is on target.

Enable automatic movement. When enabled, a green AUTO (Item 1) [Figure 77] will be displayed.

Press the blue calibrate button (Item 2) [Figure 77] to start the calibration process.

The calibration will start with the first valve and then proceed to the remaining valves.

Figure 78



A blue busy indicator will be displayed next to the valve being calibrated (Item 1) [Figure 78].

After the calibration is successfully completed, a green circle with a check mark will be displayed (Item 2) [Figure 78].

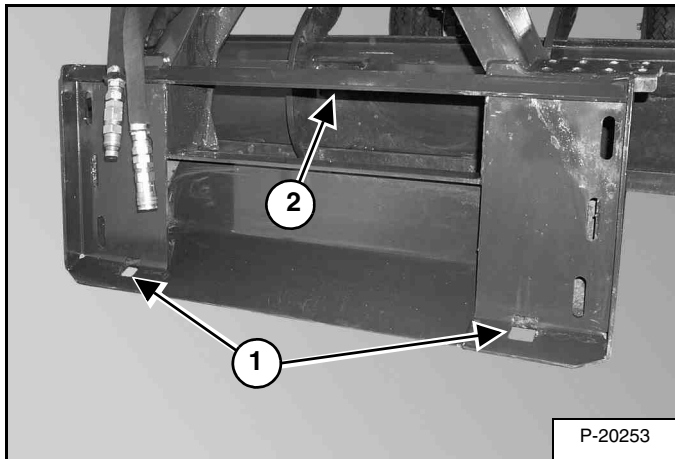
If the calibration was not successful, a red circle with an exclamation point will be displayed (Item 3) [Figure 78].

If the calibration is unsuccessful, check all electrical connections and repeat the calibration procedure.

DAILY INSPECTION

Attachment Mounting Frame

Figure 79



Inspect the Bob-Tach wedge mounts (Item 1), mounting flange (Item 2) [Figure 79] 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.

DAILY INSPECTION (CONT'D)

Bob-Tach

Hand Lever Bob-Tach

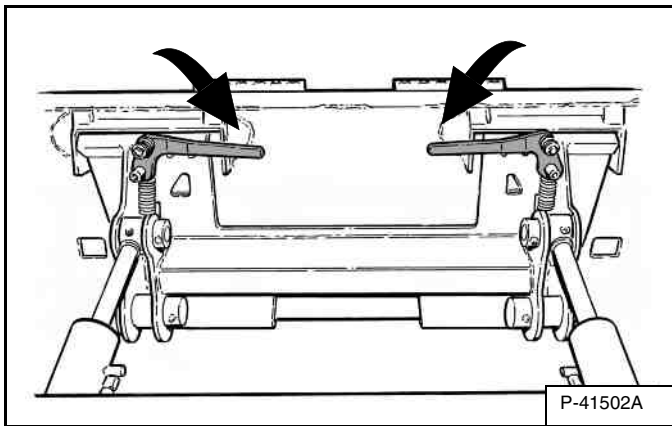
WARNING

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

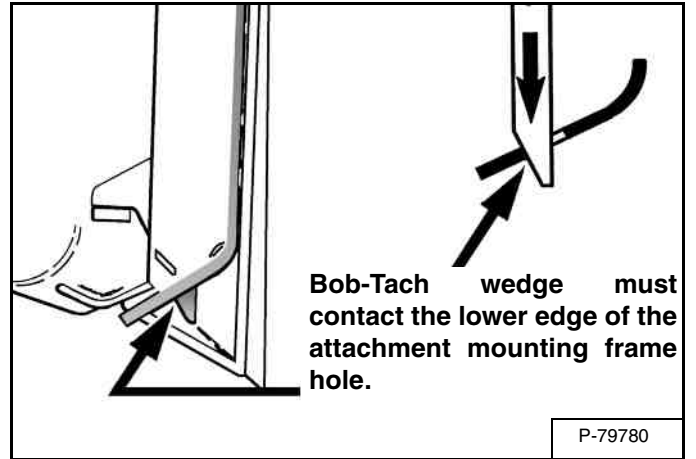
Figure 80



Push down on the Bob-Tach levers until they are fully engaged in the locked position [Figure 80] (wedges fully extended through the attachment mounting frame holes).

The levers and wedges must move freely [Figure 80].

Figure 81



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 81].

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 82

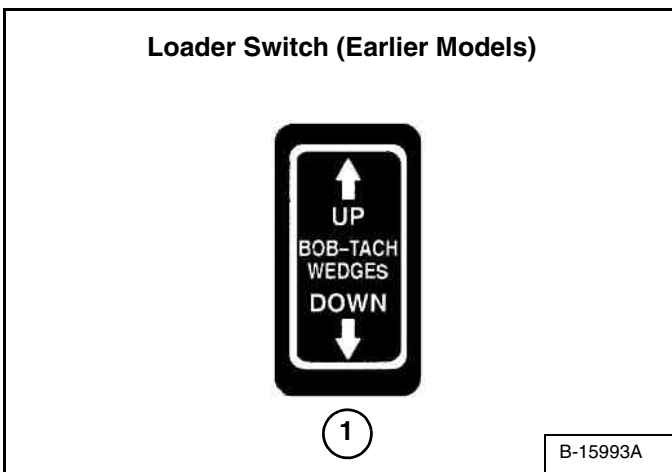
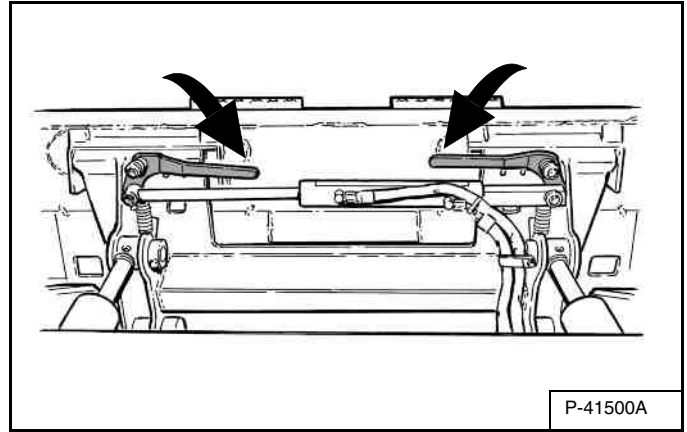


Figure 83

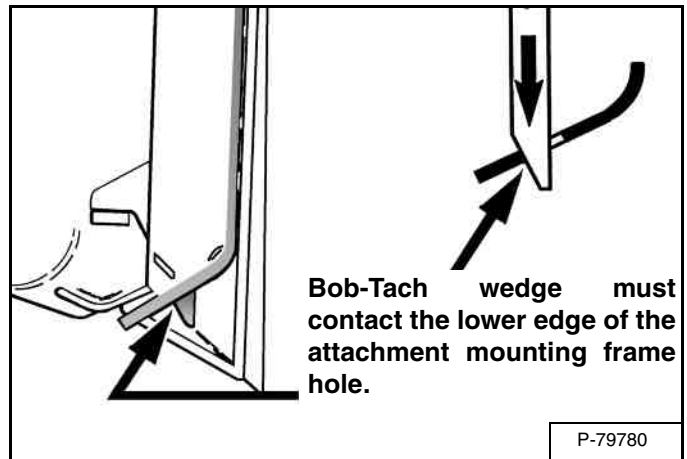


Figure 84



Push and hold the Bob-Tach “wedges down” switch (Item 1) [Figure 82] or [Figure 83] until the levers are fully engaged in the locked position [Figure 84] (wedges fully extended through the attachment mounting frame holes).

Figure 85



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 85].

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.)

OPERATING PROCEDURE WITH LOADERS

Approved Loader Models And Requirements

Figure 86

LOADER MODEL	GRADER 84
A205	X
A300	X
A770	X
S130	X
S150	X
S160	X
S175	X
S185	X
S205	X
S220	X
S250	X
S300	X
S330	X
S450	X
S510	X
S530	X
S550	X
S570	X
S590	X
S630	X
S650	X
S740	X
S770	X
S66	X
S76	X
S86	X
T140	X
T180	X
T190	X
T450	X
T550	X
T590	X
T650	X
T66	X

(X = Approved)

The chart [Figure 86] lists the loader models approved for use with the grader.

The warranty is void if this attachment is used on a non-approved carrier. See your Bobcat dealer for an updated list of approved carriers.

WARNING

Never use attachments, implements, or buckets which are not approved by the Bobcat Company. Attachments, implements, and buckets for safe loads of specified densities are approved for each model. Unapproved attachments or buckets can cause injury or death.

W-2662-0623

Figure 87

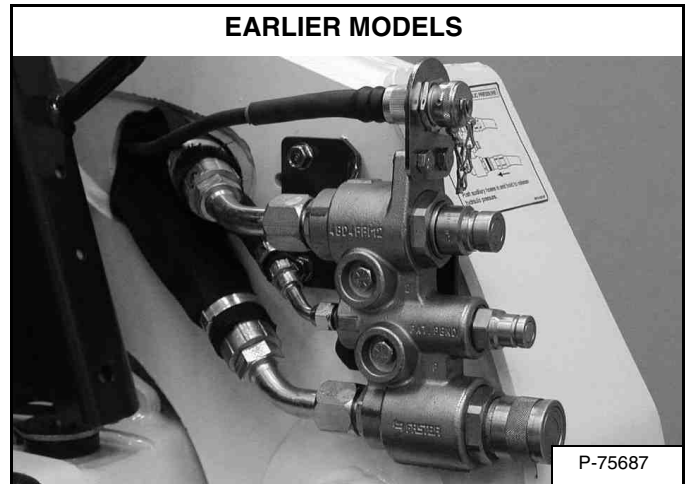
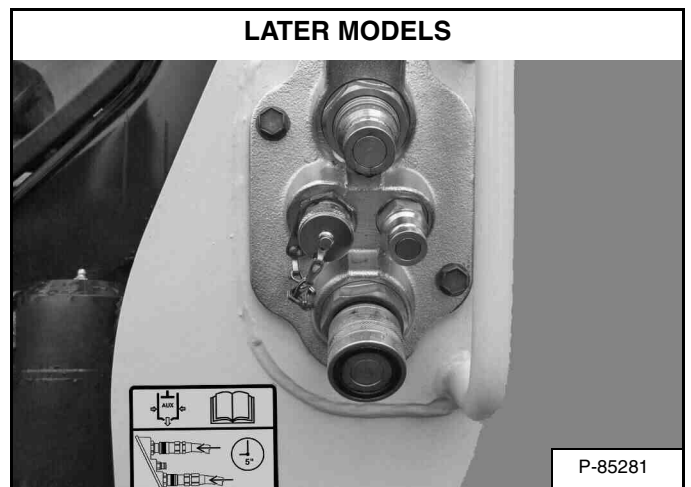


Figure 88



The loader must be equipped with front auxiliary hydraulics and electrical attachment control kit [Figure 87] or [Figure 88] for proper operation of the grader. See your Bobcat dealer for available electrical attachment control kits.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Machine / Attachment Setup

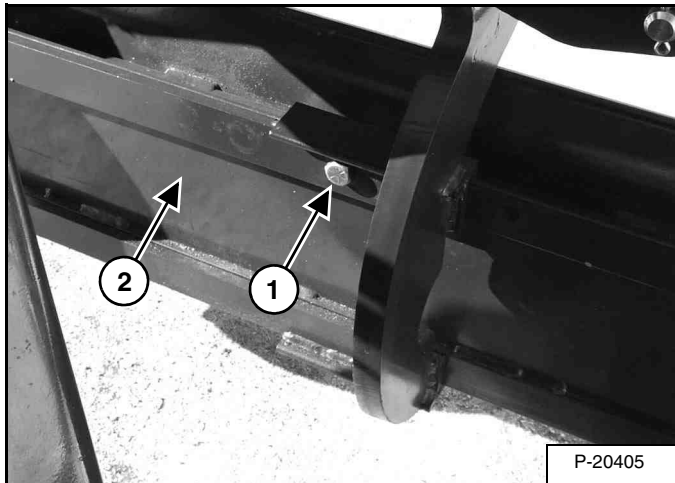
Moldboard Side Shift Adjustment

Raise the moldboard so it is slightly off the ground.

Stop the engine and exit the loader. (See Entering And Exiting The Loader on Page 58.)

Disconnect the hydraulic couplers at the loader. (See Hydraulic Quick Couplers on Page 67.)

Figure 89



Remove the bolt and locknut (Item 1) from the moldboard (Item 2) **[Figure 89]**.

Slide the moldboard left or right as needed. The moldboard can be manually shifted approximately 305 mm (12 in) to either side.

Reinstall the bolt and locknut before operation.

Tighten to 170 N•m (125 ft-lb) torque.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Machine / Attachment Setup (Cont'd)

Changing Units Of Measure (Without Deluxe Instrumentation Panel)

NOTE: Loader software upgrade may be required to change between standard and metric units of measure. See your Bobcat dealer for available software upgrades.

Figure 90



Enter the loader. Engage loader's electronics by turning key switch to RUN (Standard Key Panel) or press RUN / ENTER button (Deluxe Instrumentation Panel). The left instrument panel will be ON [Figure 90]. (See the loader's Operation & Maintenance Manual and Operator's Handbook for correct procedure.)

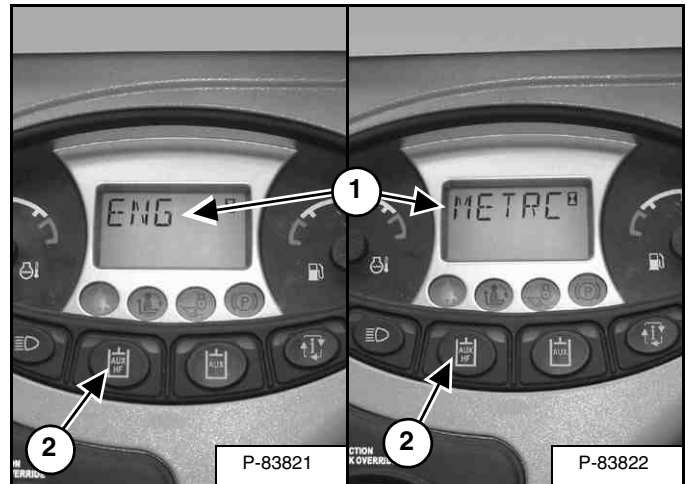
Figure 91



Press and hold the Auxiliary button (Item 1) [Figure 91] for three seconds to enter the OPTIONS menu.

The display (Item 2) [Figure 91] will then show [OPT] to denote you are entering the OPTIONS menu.

Figure 92



The display (Item 1) [Figure 92] will then show the current units setting.

Press the Auxiliary HF button (Item 2) [Figure 92] to change between units of measure.

NOTE: The default setting from the factory is English, denoted by [ENG] in the display.

Figure 93



To save the setting selected, press and hold the Auxiliary HF button (Item 1) for three seconds or until [SAVED] appears in the display screen (Item 2) [Figure 93].

Press the Auxiliary button (Item 3) [Figure 93] to return to previously displayed information [Figure 90].

Once the units setting is saved, the attachment will stay within those units until they are changed.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Machine / Attachment Setup (Cont'd)

Changing Units Of Measure (With Deluxe Instrumentation Panel)

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Figure 94



On the deluxe instrumentation panel press the right arrow (Item 1) [Figure 94] until DISPLAY screen comes up.

Figure 95



Press #4 [Figure 95] to get units of measure.

Figure 96



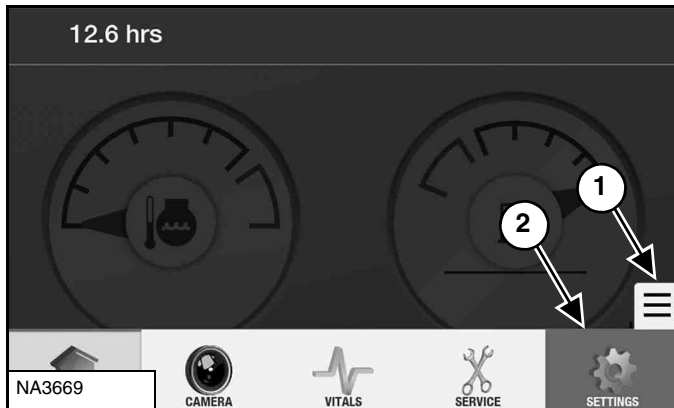
Press #1 to change between units of measure [Figure 96].

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Machine / Attachment Setup (Cont'd)

Changing Units Of Measure - Touch Display

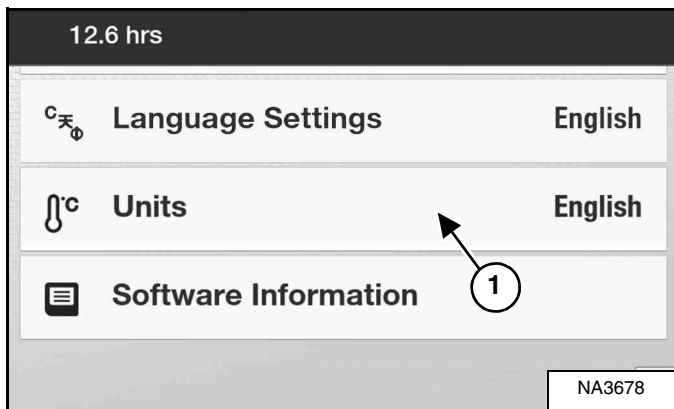
Figure 97



Select the navigation handle (Item 1) **[Figure 97]**.

Select the SETTINGS icon (Item 2) **[Figure 97]**.

Figure 98



Scroll down and select the Units icon (Item 1) **[Figure 98]** to toggle between English and Metric.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Entering And Exiting The Loader

WARNING

AVOID INJURY OR DEATH

When operating the machine:

- Keep the seat belt fastened snugly.
- The seat bar must be lowered.
- Keep your feet on the pedal controls or footrests and hands on the controls.

W-2261-0909

Entering

Figure 99



Use the attachment steps, grab handles and safety treads (on the loader lift arms and frame) to get on and off the loader [Figure 99].

Figure 100



Enter the loader. Fasten the seat belt and adjust it so the buckle is centred between your hips [Figure 100].

Figure 101



Lower the seat bar and engage the parking brake [Figure 101].

Put the foot pedals or hand controls in neutral position.

NOTE: Keep your hands on the steering levers and your feet on the foot pedals (or footrests) while operating the loader.

See the loader's Operation & Maintenance Manual and Operator's Handbook for detailed information on operating the loader.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Entering And Exiting The Loader

Exiting

Lower the lift arms and put the attachment flat on the ground.

Stop the engine and engage the parking brake.

Lift the seat bar and make sure the lift and tilt functions are deactivated.

Remove the key.

Exit the loader.



WARNING

AVOID INJURY OR DEATH

Before you leave the operator's position:

- Lower the lift arms, put the attachment flat on the ground.
- Stop the engine and engage the parking brake.
- Move all pedals, handles, joysticks, and other controls until they are LOCKED or in the NEUTRAL position.

SEE THE MACHINE OPERATION & MAINTENANCE MANUAL FOR MORE INFORMATION.

W-2722-0623

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Installation

Hand Lever Bob-Tach

NOTE: The illustrations and instructions provided explain how to install a bucket attachment on to a loader. Follow these same instructions if you are installing different attachments such as a grapple, tiller, combo bucket, etc.

The attachment mounting frame for the attachment has a top flange that is designed to receive the top edge of the Bob-Tach and the lower part of the frame is designed to receive the Bob-Tach wedges.

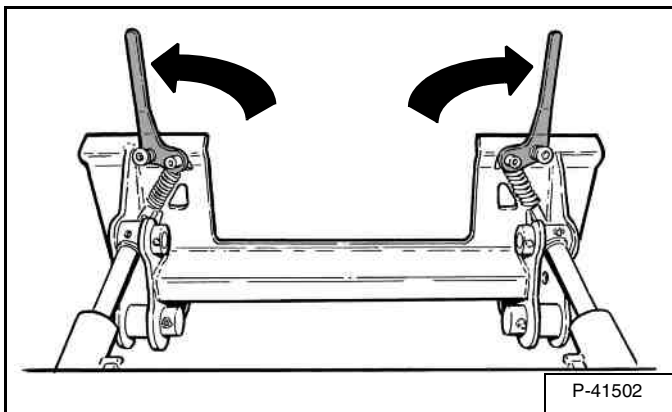


Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause serious injury or death.

W-2744-0608

Always inspect the loader's Bob-Tach and the attachment mounting frame before installation. See the loader's Operation & Maintenance Manual. (See DAILY INSPECTION on Page 50.)

Figure 102

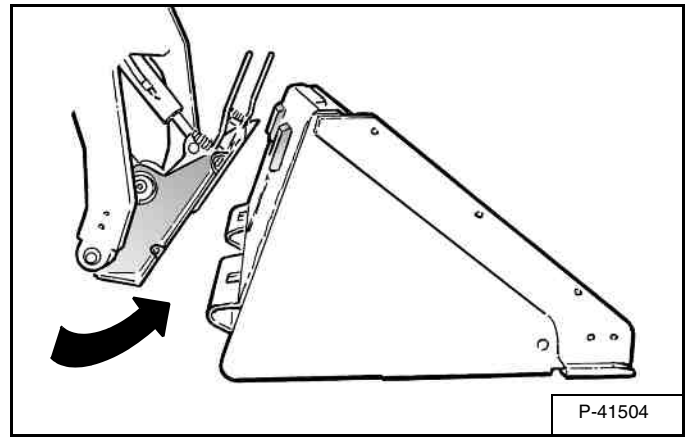


Pull the Bob-Tach levers up until they are fully raised (wedges fully raised) [Figure 102].

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Start the engine, press the operate button and release the parking brake.

Figure 103



Lower the lift arms and tilt the Bob-Tach forward.

Drive the loader slowly forward until the top edge of the Bob-Tach is completely under the top flange of the attachment mounting frame [Figure 103].

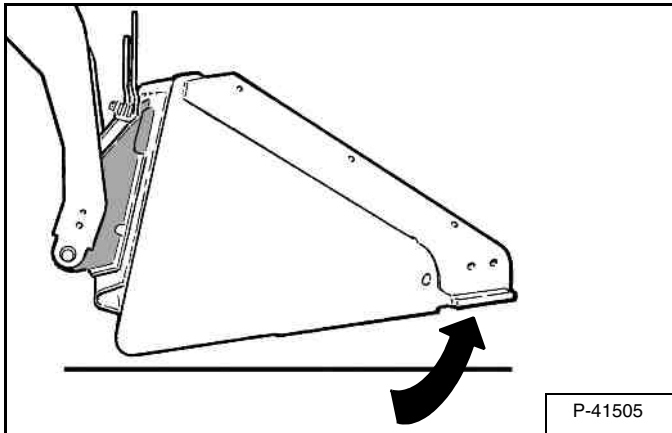
NOTE: Be sure the Bob-Tach levers do not hit the attachment.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Installation (Cont'd)

Hand Lever Bob-Tach (Cont'd)

Figure 104



Tilt the Bob-Tach backward until the attachment is slightly off the ground [Figure 104]. This will cause the attachment mounting frame to fit up against the front of the Bob-Tach.

NOTE: When leaving the operator's seat to install an attachment, tilt the attachment until it is slightly off the ground.

Stop the engine and exit the loader. (See Entering And Exiting The Loader on Page 58.)

WARNING

AVOID INJURY OR DEATH

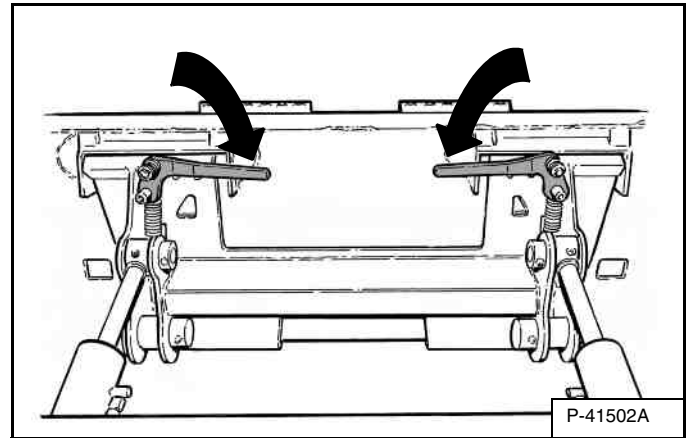
Before you leave the operator's seat:

- Lower the lift arms and put the attachment flat on the ground.
- Stop the engine.
- Engage the parking brake.
- Raise the seat bar.
- Move all controls to the **NEUTRAL / LOCKED** position to make sure the lift, tilt and traction drive functions are deactivated.

The seat bar system must deactivate these functions when the seat bar is up. See your Bobcat dealer for service if controls do not deactivate.

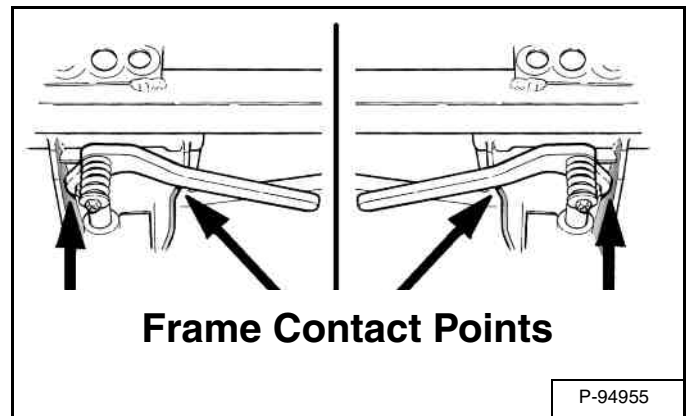
W-2463-0623

Figure 105



Push down on the Bob-Tach levers until they are fully engaged in the locked position [Figure 105] (wedges fully extended through the attachment mounting frame holes).

Figure 106



Both levers must contact the frame as shown when locked [Figure 106].

If both levers do not engage in the locked position, see your Bobcat dealer for maintenance.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Installation (Cont'd)

Hand Lever Bob-Tach (Cont'd)

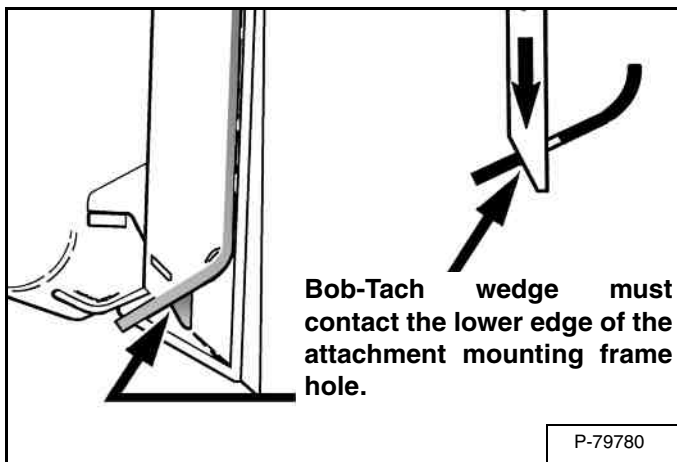
WARNING

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 107



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 107].

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Installation (Cont'd)

Power Bob-Tach

⚠ WARNING

Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause serious injury or death.

W-2744-0608

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Start the engine, press the operate button and release the parking brake.

Figure 108

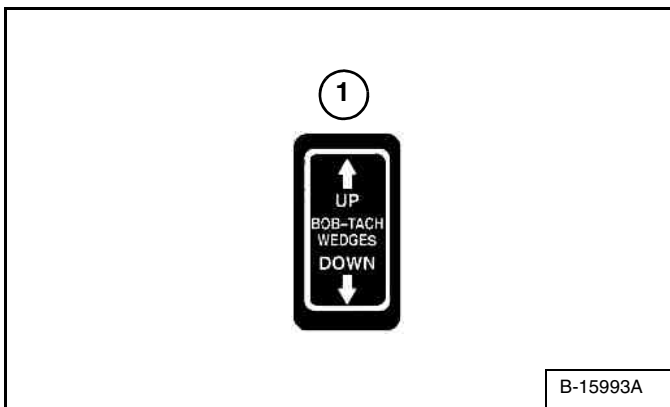
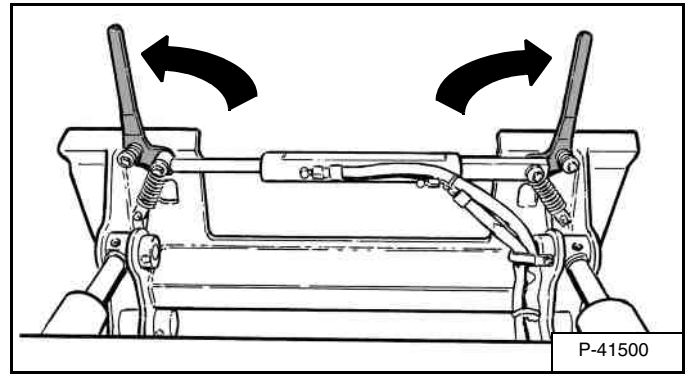


Figure 109

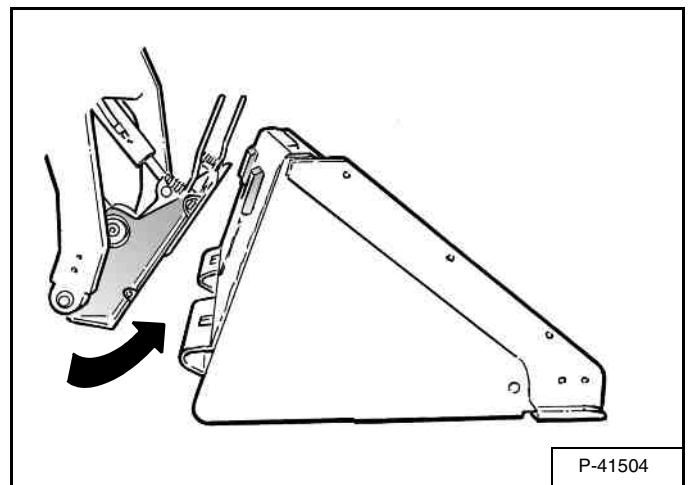


Figure 110



Push and hold the Bob-Tach “wedges up” switch (Item 1) [Figure 108] (earlier models) or [Figure 109] (later models) until the levers are fully raised (wedges fully raised) [Figure 110].

Figure 111



Lower the lift arms and tilt the Bob-Tach slightly forward.

Drive the loader slowly forward until the top edge of the Bob-Tach is completely under the top flange of the attachment mounting frame [Figure 111].

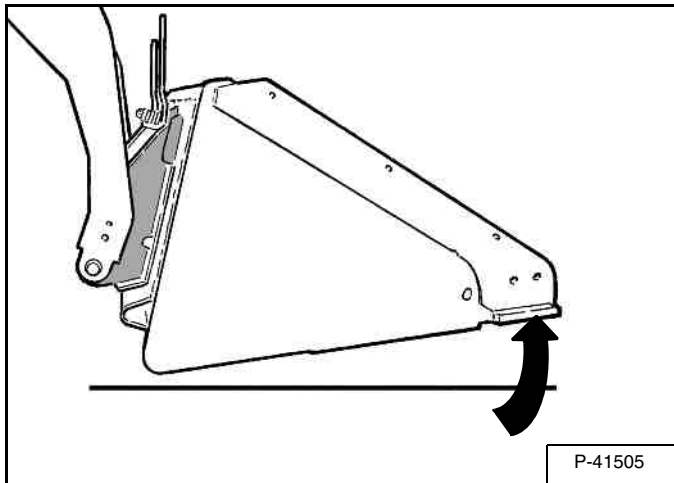
NOTE: Be sure the Bob-Tach levers do not hit the attachment.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Installation (Cont'd)

Power Bob-Tach (Cont'd)

Figure 112



Tilt the Bob-Tach backward until the attachment is slightly off the ground [Figure 112]. This will cause the attachment mounting frame to fit up against the front of the Bob-Tach.

Figure 113

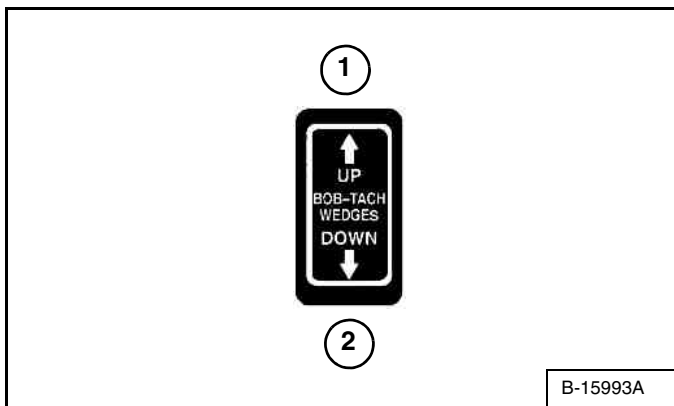


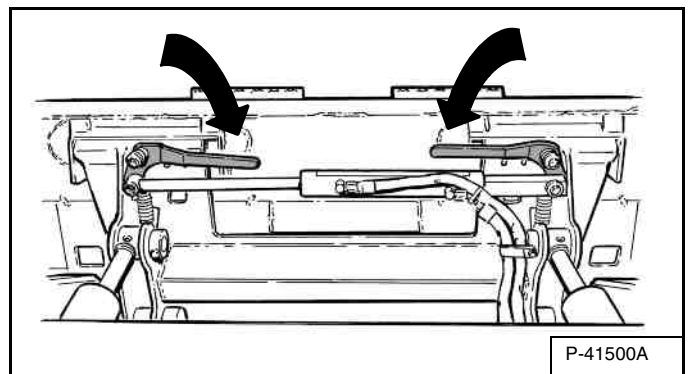
Figure 114



NOTE: The Power Bob-Tach system has continuous pressurised hydraulic fluid to keep the wedges in the engaged position and prevent attachment disengagement. Because the wedges can slowly lower, the operator may need to reactivate the switch (Bob-Tach “wedges up”) to be sure both wedges are fully raised before installing the attachment.

Push and hold the Bob-Tach “wedges up” switch (Item 1) [Figure 113] (earlier models) or [Figure 114] (later models) until the levers are fully raised (wedges fully raised).

Figure 115



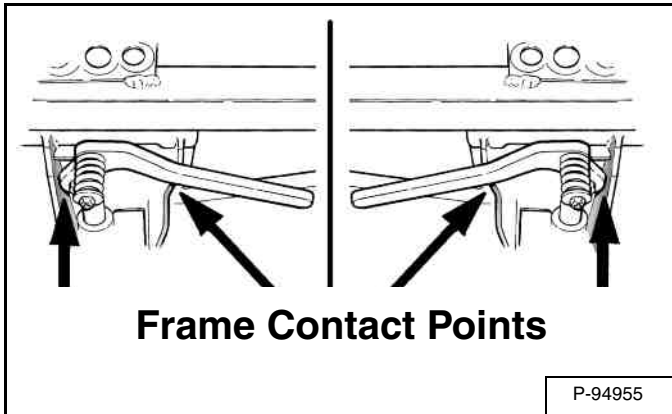
Push and hold the Bob-Tach “wedges down” switch (Item 1) [Figure 113] (earlier models) or [Figure 114] (later models) until the levers are fully engaged in the locked position [Figure 115] (wedges fully extended through the attachment mounting frame holes).

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Installation (Cont'd)

Power Bob-Tach (Cont'd)

Figure 116



Both levers must contact the frame as shown when locked [Figure 116].

If both levers do not engage in the locked position, see your Bobcat dealer for maintenance.

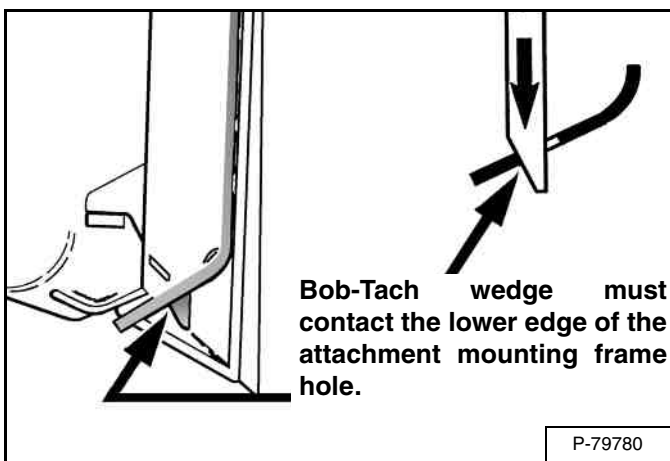
WARNING

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 117



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 117].

Lower the lift arms and put the attachment flat on the ground.

Stop the engine and exit the loader. (See Entering And Exiting The Loader on Page 58.)

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Installation (Cont'd)

For First Time Installation

New attachments and new loaders are factory equipped with flush face couplers. If installing an attachment equipped with poppet style couplers, the attachment couplers will have to be changed to match the loader. See your Bobcat dealer for parts information.

IMPORTANT

- **Thoroughly clean the quick couplers before making connections. Dirt can quickly damage the system.**
- **Contain and dispose of any oil leakage in an environmentally safe manner.**

I-2278-0608

With the loader engine off and using the hose guides (if equipped), route the attachment hydraulic hoses to the loader. Connect the attachment hydraulic quick couplers to the loader couplers. (See Hydraulic Quick Couplers on Page 67.)

Check that the attachment hydraulic hoses are not twisted or contacting any moving parts of the loader or attachment.

NOTE: It may be necessary to loosen the quick couplers on the attachment hydraulic hoses to remove any twists in the hoses.

! 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

Loosen the quick coupler connections on the attachment hydraulic hoses while connected to the loader. Do not remove the quick couplers.

Rotate the attachment hydraulic hoses as needed so the hoses are not twisted or contacting any moving parts of the loader or attachment.

With the twist(s) removed from the hydraulic hoses, tighten the attachment quick coupler connections while the couplers are still connected to the loader. This will help hold the hydraulic hoses in position while tightening.

Tighten the quick couplers connections to 63 N•m (46 ft-lb) torque before starting the loader.

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Start the engine, press the operate button and release the parking brake.

Engage auxiliary hydraulics. (See the loader's Operation & Maintenance Manual and Operator's Handbook for correct procedure.)

! WARNING

AVOID INJURY OR DEATH

Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a doctor familiar with this injury.

W-2072-EN-0909

Check the attachment hydraulic quick coupler connections for leaks.

Hydraulic Quick Couplers

IMPORTANT

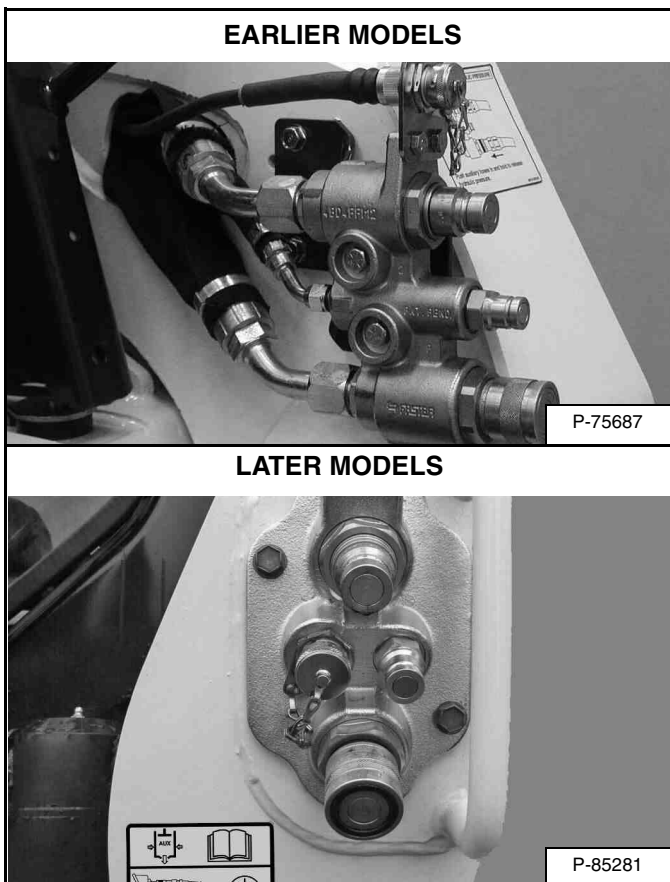
- Thoroughly clean the quick couplers before making connections. Dirt can quickly damage the system.
- Contain and dispose of any oil leakage in an environmentally safe manner.

I-2278-0608

New attachments and new loaders are factory equipped with flush face couplers. If installing an attachment equipped with poppet style couplers, the attachment couplers will have to be changed to match the loader. See your Bobcat dealer for parts information.

NOTE: Make sure the quick couplers are fully engaged. If the quick couplers do not fully engage, check to see that the couplers are the same size and type.

Figure 118



! WARNING

AVOID BURNS

Hydraulic fluid, tubes, fittings and quick couplers can get hot when running machine and attachments. Be careful when connecting and disconnecting quick couplers.

W-2220-0623

To Connect:

Remove any dirt or debris from the surface of both the male and female couplers, and from the outside diameter of the male coupler. Visually check the couplers for corroding, cracking, damage, or excessive wear. If any of these conditions exist, the coupler(s) must be replaced [Figure 118].

Install the male coupler into the female coupler. Full connection is made when the ball release sleeve slides forward on the female coupler [Figure 118].

NOTE: Check that the attachment hydraulic hoses are not twisted or contacting any moving parts of the loader or attachment. (See For First Time Installation on Page 66.) for proper adjustment.

To Disconnect:

Relieve hydraulic pressure. (See the loader's Operation & Maintenance Manual and Operator's Handbook for correct procedure.)

Push the couplers together, retract the sleeve on the female coupler until the couplers disconnect.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Electrical Harness

Electrical Connection - ACD Version (Use With Laser Option)

Figure 119

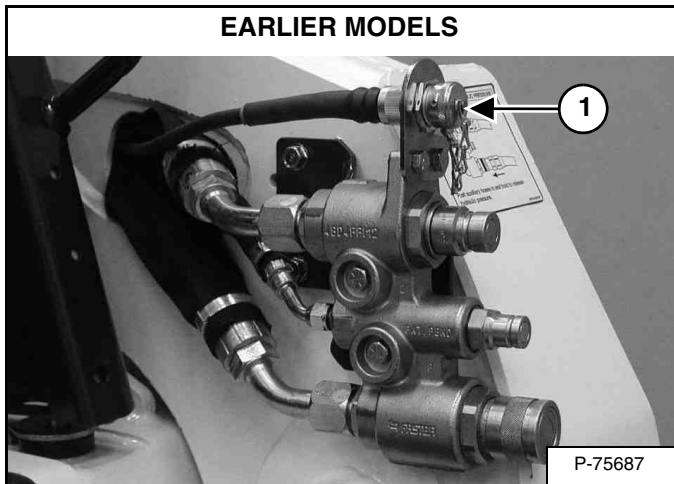
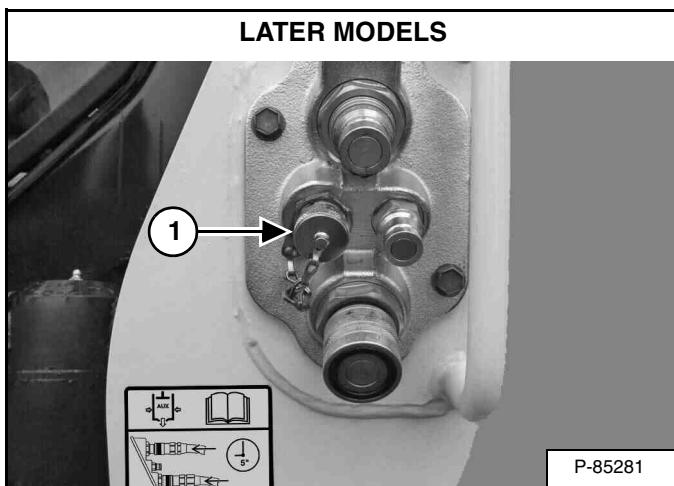


Figure 120



Connect the attachment's electrical harness to the attachment control device (Item 1) [Figure 119] or [Figure 120].

Figure 121

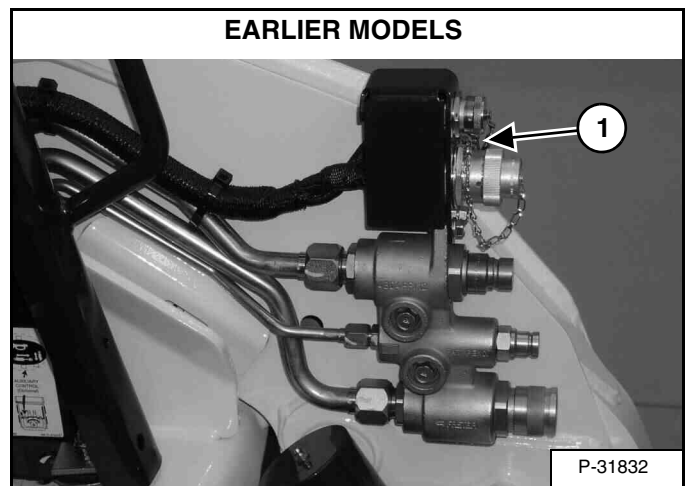
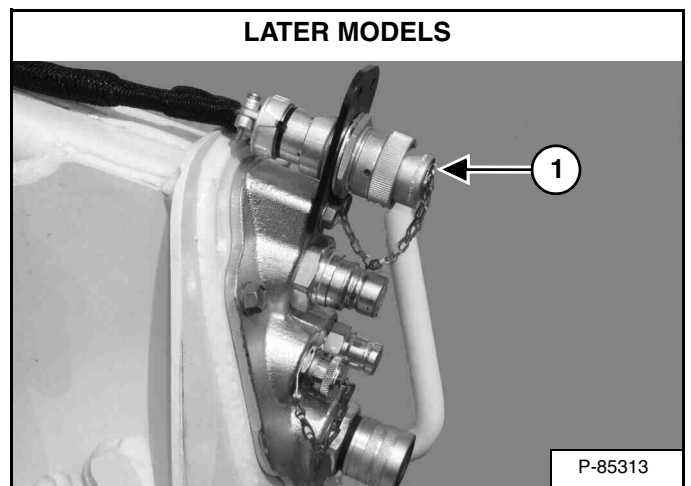


Figure 122



The Dual-Connector (7-Pin / 14-Pin) kit (Item 1) [Figure 121] or 14-Pin Attachment Control Device kit (Item 1) [Figure 122] may be needed to operate earlier model attachments. See your Bobcat dealer for available kits.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions

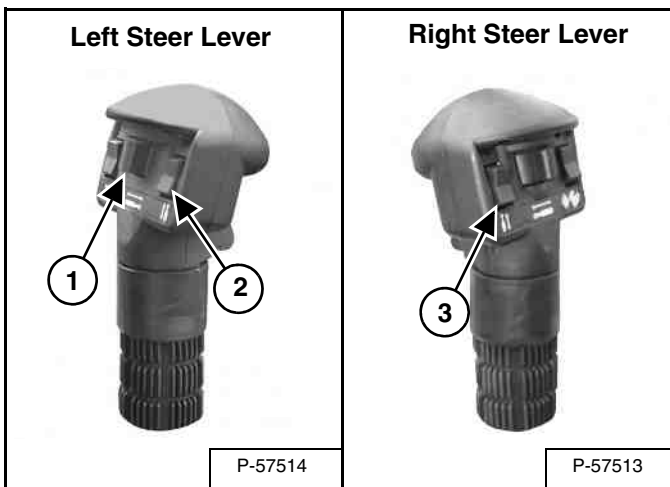
Enter the loader. Fasten the seat belt, lower the seat bar and start the engine. Release the parking brake.

Engage auxiliary hydraulics. (See the loader's Operation & Maintenance Manual and Operator's Handbook for correct procedure.)

NOTE: The auxiliary hydraulics must be activated prior to attachment operation.

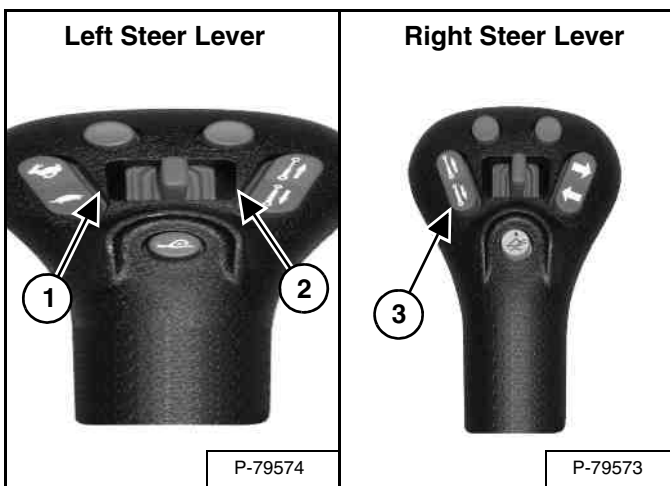
Moldboard Rotation (For Use With Or Without Laser Option)

Figure 123



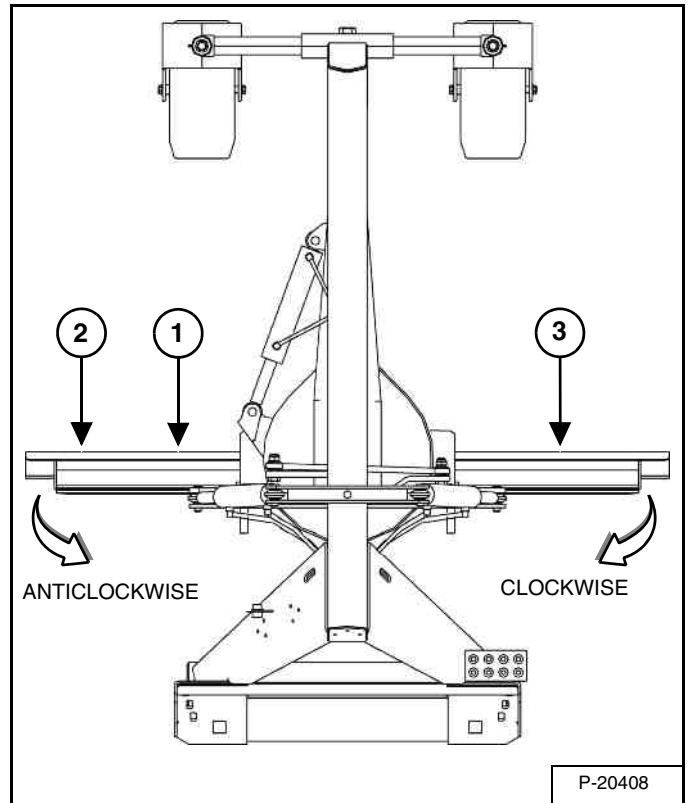
Standard and ACS controls [Figure 123].

Figure 124



SJC controls [Figure 124].

Figure 125



Press the switch (Item 1) [Figure 123] or [Figure 124] to the right, to rotate the moldboard (Item 1) [Figure 125] clockwise.

Press the switch (Item 1) [Figure 123] or [Figure 124] to the left, to rotate the moldboard (Item 1) [Figure 125] anticlockwise.

Raise And Lower The Moldboard (For Use With Or Without Laser Option)

Push the switch (Item 2) [Figure 123] or [Figure 124] up, to raise the left side moldboard (Item 2) [Figure 125].

Push the switch (Item 2) [Figure 123] or [Figure 124] down, to lower the left side moldboard (Item 2) [Figure 125].

Push the switch (Item 3) [Figure 123] or [Figure 124] up, to raise the right side moldboard (Item 3) [Figure 125].

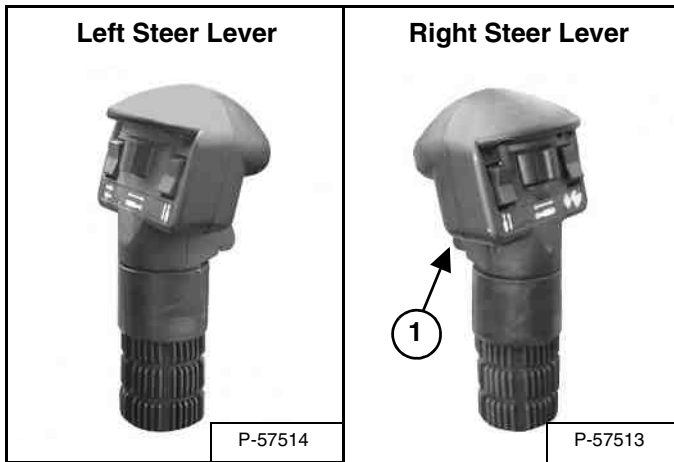
Push the switch (Item 3) [Figure 123] or [Figure 124] down, to lower the right side moldboard (Item 3) [Figure 125].

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

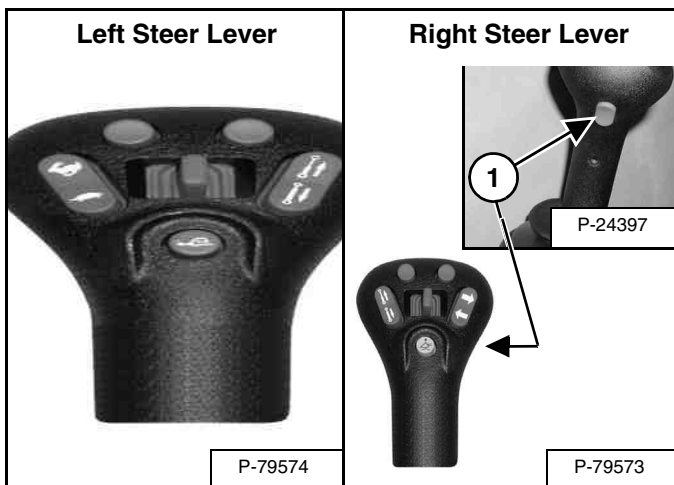
Leveling Modes (With Laser Option)

Figure 126



Standard and ACS controls [Figure 126].

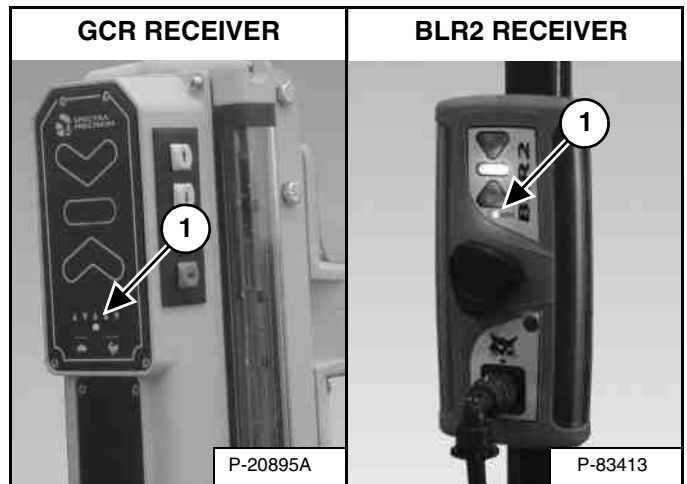
Figure 127



SJC controls [Figure 127].

The switch (Item 1) [Figure 126] or [Figure 127] allows the operator to switch between manual and auto-leveilling modes.

Figure 128

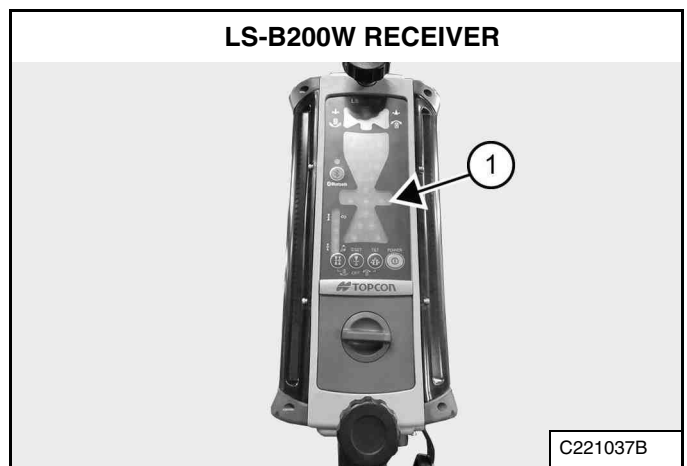


GCR Receiver: Green light (Item 1) [Figure 128] under the A, indicates laser receiver is in auto-leveilling mode.

NOTE: When using 14-Pin laser tee harness, green light (Item 1) [Figure 128] will not turn off when switching to manual operation.

BLR2 Receiver: Green light (Item 1) [Figure 128], indicates laser receiver is in auto-leveilling mode.

Figure 129



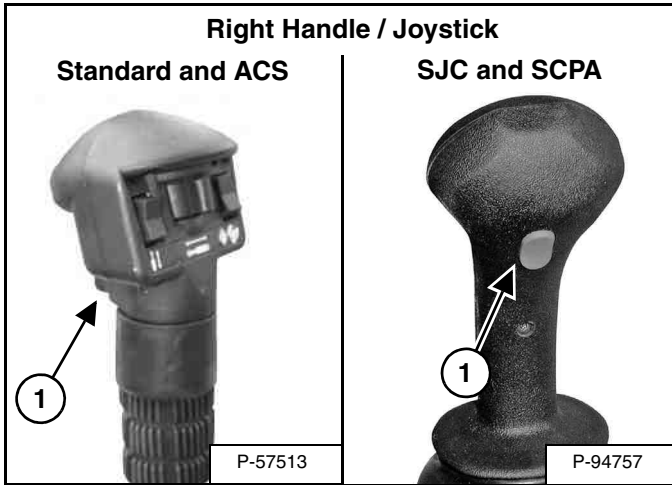
LS-B200W Receiver: Solid red light (Item 1) [Figure 129], indicates laser receiver level/complete.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

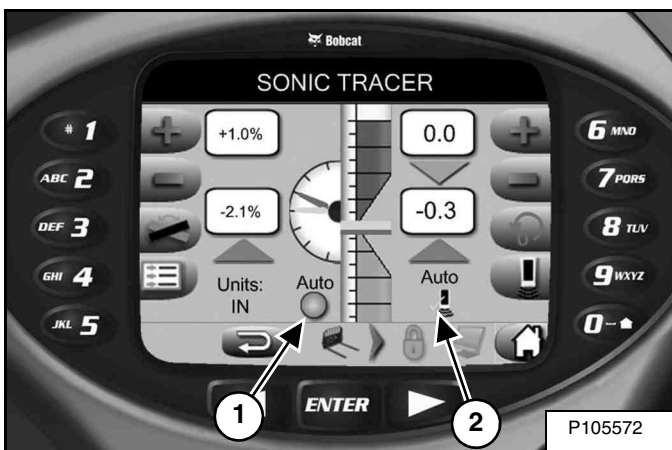
Leveling Modes (With Sonic Tracer)

Figure 130



The trigger (Item 1) [Figure 130] allows the operator to switch between manual and automatic modes.

Figure 131

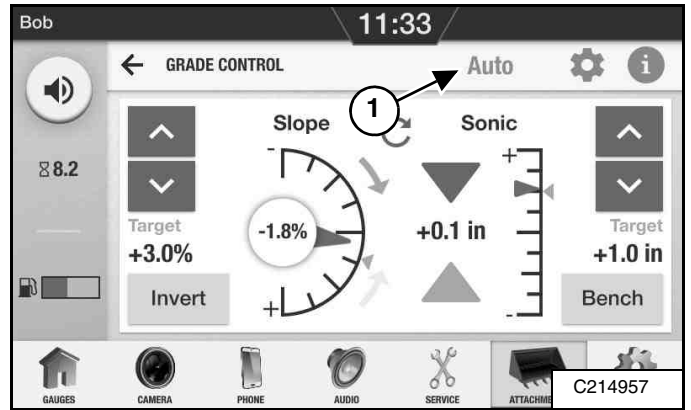


Sonic Tracer: (Deluxe Display) Green light (Item 1) will appear below “Auto” and a green checkmark (Item 2) [Figure 131] next to the tracer icon.

NOTE: All manual functions operate normally while the receivers are in automatic mode.

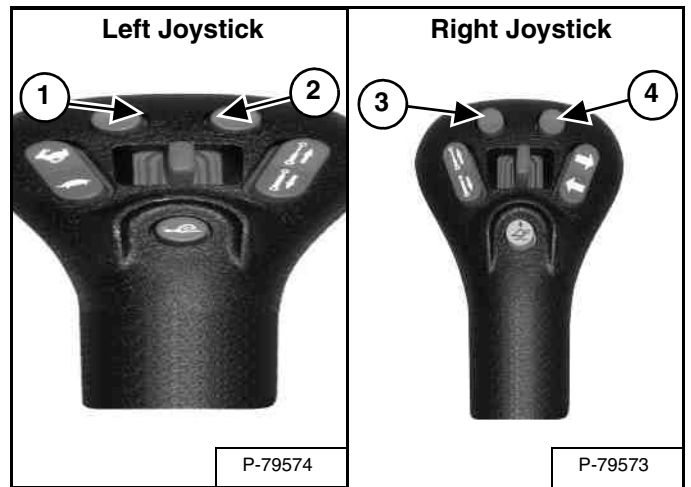
NOTE: Raising and lowering the moldboard will override the receiver signal to the hydraulic control valve.

Figure 132



Sonic Tracer: (Touch Display) Text will display if the control is in either “Manual” or “Auto” (Item 1) [Figure 132].

Figure 133



1. Desired moldboard cross-slope down 0.1% [Figure 133].
2. Desired moldboard cross-slope up 0.1% [Figure 133].
3. Sonic Tracer height down 2,54 mm (0.1 in) [Figure 133].
4. Sonic Tracer height up 2,54 mm (0.1 in) [Figure 133].

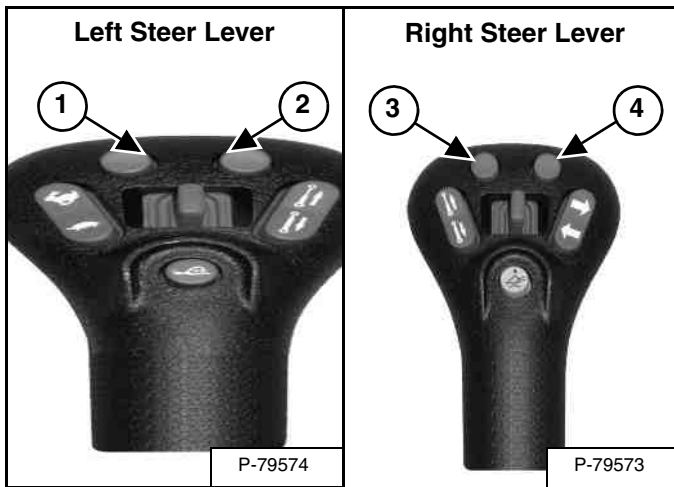
NOTE: Sonic Tracer height and slope control functions will switch between the left and right joysticks dependent on which side the sensors are connected (as described above, the tracer is mounted on the right end of the moldboard).

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

In Cab Grade Incrementing (Without Deluxe Instrument Panel) (SJC Using BLR2 Laser Receivers)

Figure 134



Grade level can be adjusted up by pressing button (Item 1) or down by pressing button (Item 2) [Figure 134].

When adjusting increment, the left hand panel will display the deviation from the centre of the laser receiver.

Figure 135



Figure 136



NOTE: Loader software upgrade may be required to use grade incrementing. See your Bobcat dealer for available software upgrades.

The display screen [Figure 135] and [Figure 136] will indicate the distance above (+) or below (-) neutral grade.

Start Of Run Button

Press button (Item 3) [Figure 134] to lower the grader to the on-grade position. Press the switch (Item 1) [Figure 127] to enable self-levelling mode.

End Of Run Button

Press button (Item 4) [Figure 134] to raise the grader and deactivate the auto-levelling mode.

When ready to continue grading, the start of run feature will need to be re-engaged.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

In Cab Grade Incrementing (With Deluxe Instrumentation Panel / BLR)

Figure 137



1. Increments BLR neutral position up 2,54 mm (0.1 in) [Figure 137].
2. Increments BLR neutral position down 2,54 mm (0.1 in) [Figure 137].

In Cab Grade Incrementing (With Deluxe Instrumentation Panel / BLR) (Software Version 8.0 & Above)

Figure 138



1. Increments BLR neutral position up 2,54 mm (0.1 in) [Figure 137].
2. Increments BLR neutral position down 2,54 mm (0.1 in) [Figure 137].
3. Re-bench the laser setting to zero.
4. Sensor toggle, if equipped with more than one sensor.

In Cab Grade Incrementing (With Deluxe Instrumentation Panel / Sonic Tracer)

Figure 139



1. Desired moldboard cross-slope up 0.1% [Figure 139].
2. Desired moldboard cross-slope down 0.1% [Figure 139].
3. Sonic Tracer height up 2,54 mm (0.1 in) [Figure 139].
4. Sonic Tracer height down 2,54 mm (0.1 in) [Figure 139].

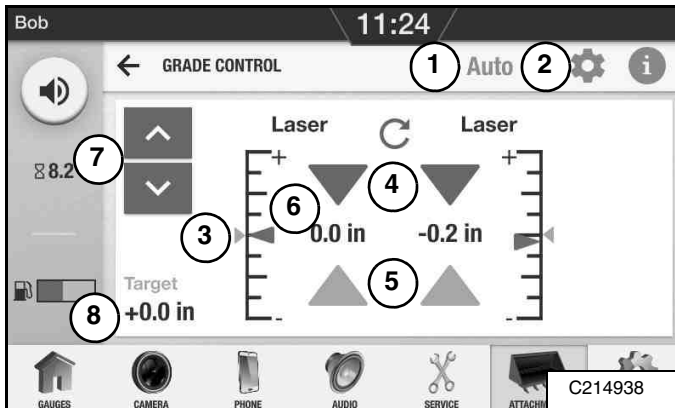
NOTE: If the Sonic Tracer is mounted on the left side of the grader, the deluxe instrumentation panel graphical indicators and button functions will switch sides. [Figure 139] depicts the deluxe instrumentation panel with the Sonic Tracer mounted on the right side of the grader.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

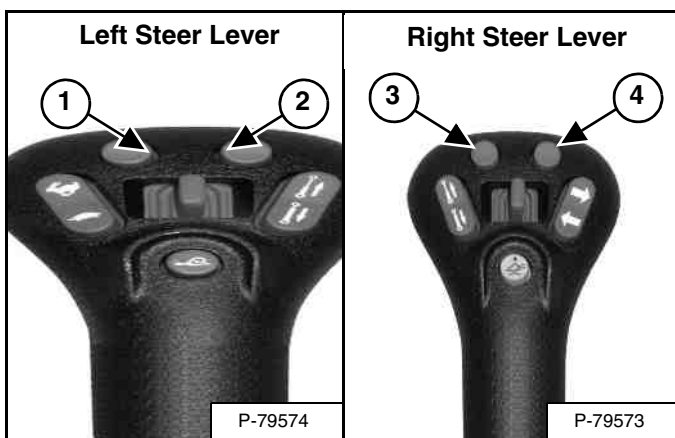
In Cab Grade Incrementing (With Touch Display / BLR)

Figure 140



1. Mode Indication - Manual / Auto
2. Gear Icon - Grading Settings Screen
3. Blue Arrow - Target
4. Blue Triangle - when highlighted, the moldboard is above target (both blue and amber triangle are "lit" when on target)
5. Amber Triangle - when highlighted, the moldboard is below target (both blue and amber triangle are "lit" when on target)
6. Red Arrow - Representative of where the laser is currently striking on the laser receiver
7. Blue Buttons - Increment / Decrement
8. Current Target - Increment / Decrement

Figure 141



Grade level can be adjusted by pressing the up or down buttons (Item 7) [Figure 140] on the touch display or the grade level can be adjusted up by pressing button (Item 1) [Figure 141] or down by pressing button (Item 2) [Figure 141].

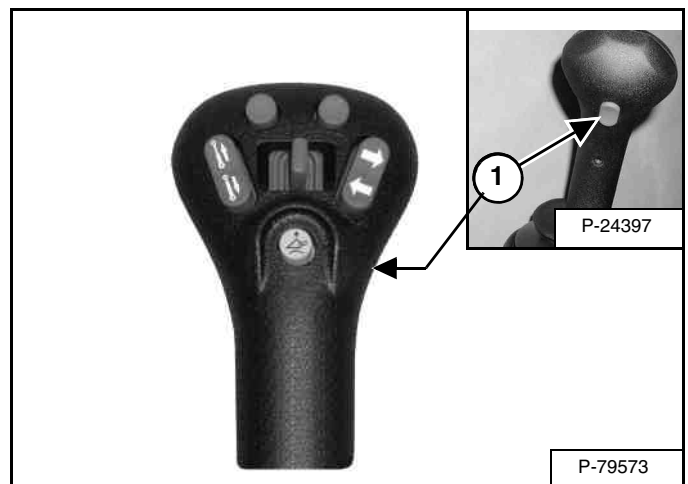
When adjusting increment, the touch display will display the deviation from the center of the laser receiver.

The touch display [Figure 140] will indicate the distance above (+) or below (-) neutral grade.

Start Of Run Button

Press button (Item 3) [Figure 141] to lower the moldboard to the on-grade position.

Figure 142



Press switch (Item 1) [Figure 142] to enable automatic mode.

End Of Run Button

Press and hold button (Item 4) [Figure 141] to raise the moldboard and deactivate automatic mode.

When ready to continue grading, the start of run feature will need to be re-engaged.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

Touch Display Laser Position Display

Install the grader on the loader. (See Installation on Page 60.)

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Figure 143



Enter the correct password to display the main screen [Figure 143] (if required).

Figure 144



Select [ATTACHMENTS] (Item 1) [Figure 144].

Figure 145



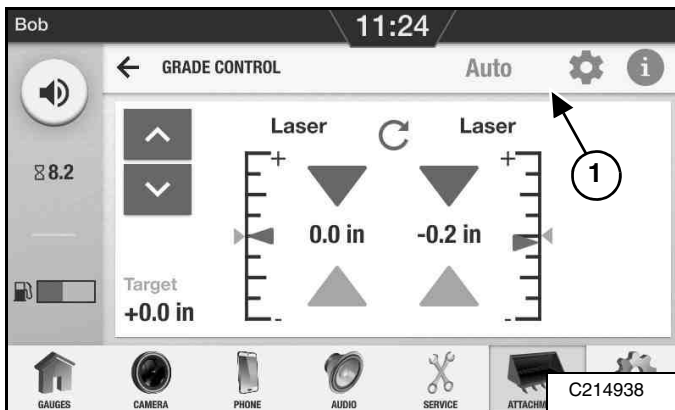
Press the Grader section (Item 1) [Figure 145] on the touch display.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

Touch Display Laser Position Display (Cont'd)

Figure 146

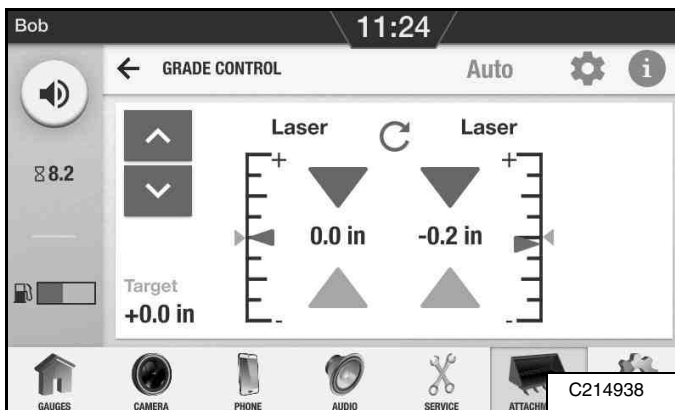


Press switch (Item 1) [Figure 142] to enable automatic mode.

The grader will be operated in automatic mode (Item 1) [Figure 146].

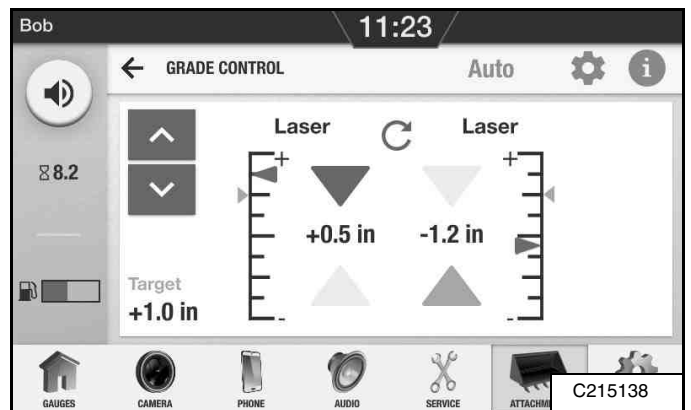
Press switch (Item 1) [Figure 142] again to switch back to manual mode.

Figure 147



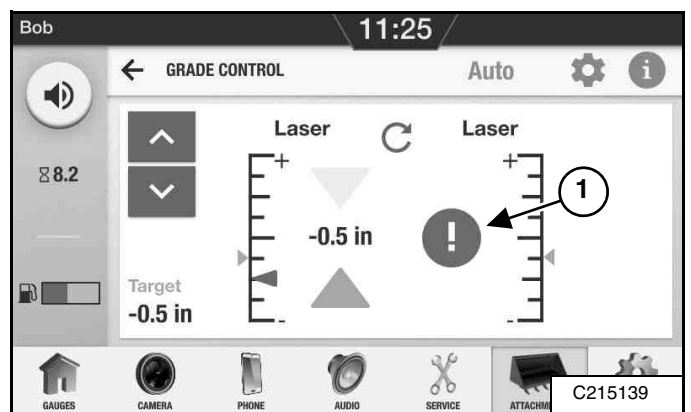
Grade is on target [Figure 147].

Figure 148



Grade is off target [Figure 148].

Figure 149



If transmitter signal is not detected by the receiver, the no signal symbol (Item 1) [Figure 149] will appear on the display screen.

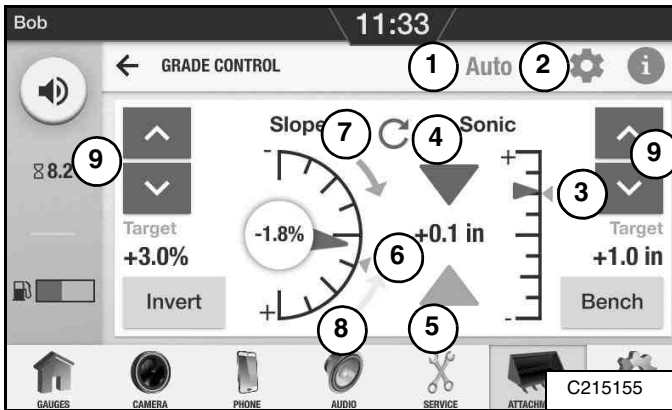
Refer to the troubleshooting chart to diagnose and correct any issues. (See TROUBLESHOOTING on Page 101.)

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

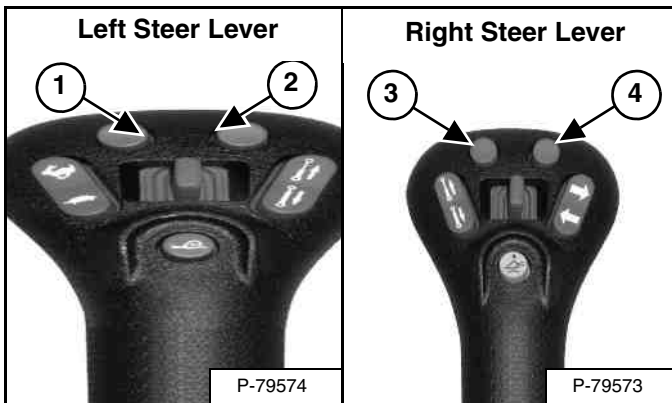
In Cab Grade Incrementing (With Touch Display / Sonic Tracer)

Figure 150



1. Mode Indication - Manual / Auto
2. Gear Icon - Calibration Screens
3. Blue Arrow - Sonic Tracer Target
4. Blue Triangle - when highlighted, the moldboard is above target (both blue and amber triangle are "lit" when on target)
5. Amber Triangle - when highlighted, the moldboard is below target (both blue and amber triangle are "lit" when on target)
6. Blue Arrow - Slope Target
7. Amber Arrow - when highlighted, the slope degree is above target
8. Amber Arrow - when highlighted, the slope degree is below target
9. Blue Buttons - Increment / Decrement slope and moldboard height

Figure 151



Grade level can be adjusted by pressing the up or down buttons (Item 7) [Figure 150] on the touch display or the grade level can be adjusted up by pressing button (Item 1) [Figure 151] or down by pressing button (Item 2) [Figure 151].

When adjusting increment, the touch display will display the deviation from the center of the laser receiver.

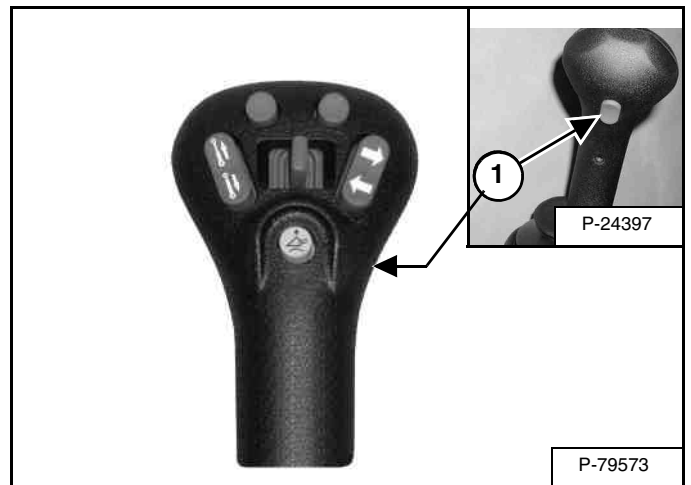
The touch display [Figure 150] will indicate the distance above (+) or below (-) neutral grade.

NOTE: Sonic Tracer height and slope control functions will switch between the left and right joysticks dependent on which side the sensors are connected (as described above, the tracer is mounted on the right end of the moldboard).

Start Of Run Button

Press button (Item 3) [Figure 151] to lower the moldboard to the on-grade position.

Figure 152



Press switch (Item 1) [Figure 152] to enable automatic mode.

End Of Run Button

Press and hold button (Item 4) [Figure 151] to raise the moldboard and deactivate automatic mode.

When ready to continue grading, the start of run feature will need to be re-engaged.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

Touch Display Laser Position Display

Install the grader on the loader. (See Installation on Page 60.)

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Figure 153



Enter the correct password to display the main screen [Figure 153] (if required).

Figure 154



Select [ATTACHMENTS] (Item 1) [Figure 154].

Figure 155



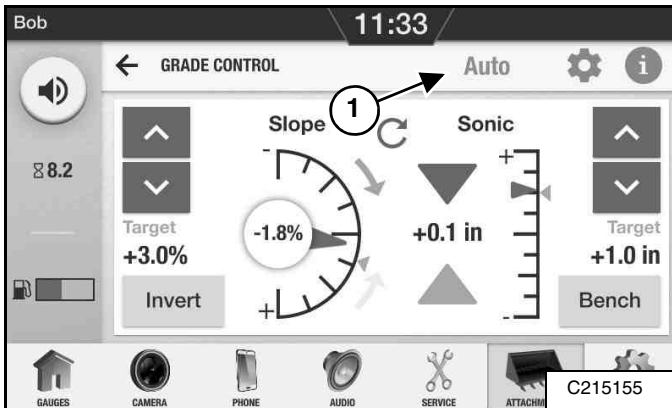
Press the Grader section (Item 1) [Figure 155] on the touch display.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Control Functions (Cont'd)

Touch Display Laser Position Display (Cont'd)

Figure 156

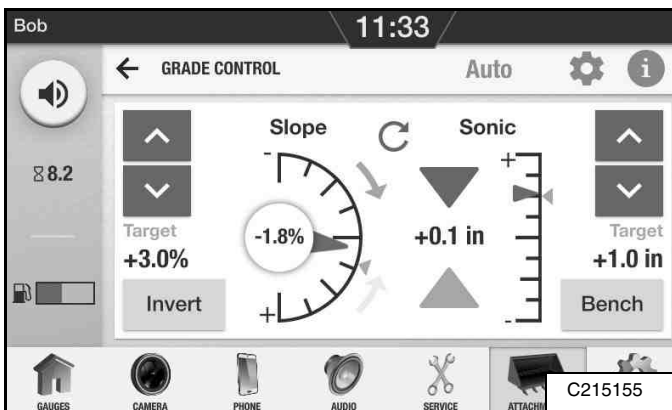


Press switch (Item 1) [Figure 152] to enable automatic mode.

The grader will be operated in automatic mode (Item 1) [Figure 156].

Press switch (Item 1) [Figure 152] again to switch back to manual mode.

Figure 157



Sonic is on target and slope is off target [Figure 157].

Figure 158



Sonic is off target and slope is off target [Figure 158].

Figure 159



If transmitter signal is not detected by the receiver, the no signal symbol (Item 1) [Figure 159] will appear on the display screen.

Refer to the troubleshooting chart to diagnose and correct any issues. (See TROUBLESHOOTING on Page 101.)

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader

Operating The Grader (Without Laser)

Figure 160



Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Fasten seat belt, lower the seat bar, start the engine, and release the parking brake.

Tilt the Bob-Tach forward until the front of the loader is 50,8 - 101,6 mm (2 - 4 in) off the ground **[Figure 160]**.

This operating position will provide the best grading results.

While moving forward, position the moldboard cutting edge for desired grading. (See Control Functions on Page 69.)

Setting Grader To Grade (Flat Grade) - Method 1

Figure 161



Set grader and loader on area that is on grade **[Figure 161]**.

Position moldboard cutting edge on grade.

Tilt the Bob-Tach forward until the front of the loader is 50,8 - 101,6 mm (2 - 4 in) off the ground.

NOTE: The following illustrations may not show your Laser Beacon exactly as it appears but the procedure is the same.

Figure 162



Set up beacon and start in auto-levelling mode **[Figure 162]**. (See the Laser Beacon Manual and Operator's Manual for more information on setup and operation of your laser beacon.)

NOTE: Beacon should be above the top of the loader cab.

! WARNING

AVOID EYE INJURY

Never look directly into the laser beam. Set the laser at a height that prevents the beam from shining directly into bystanders eyes.

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OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Setting Grader To Grade (Flat Grade) – Method 1 (Cont'd)

Figure 163

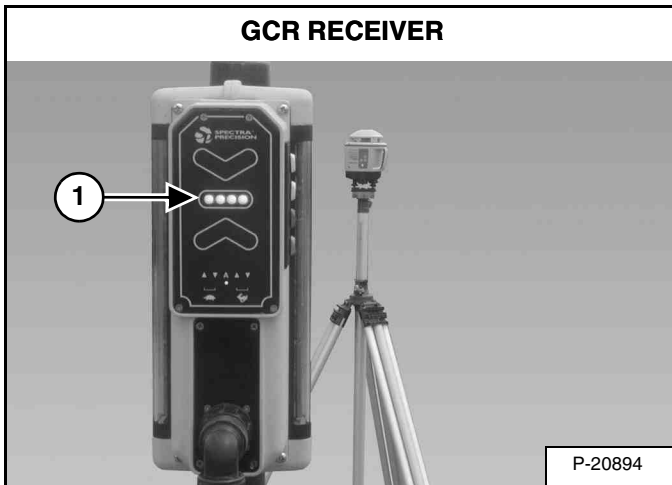


Figure 164

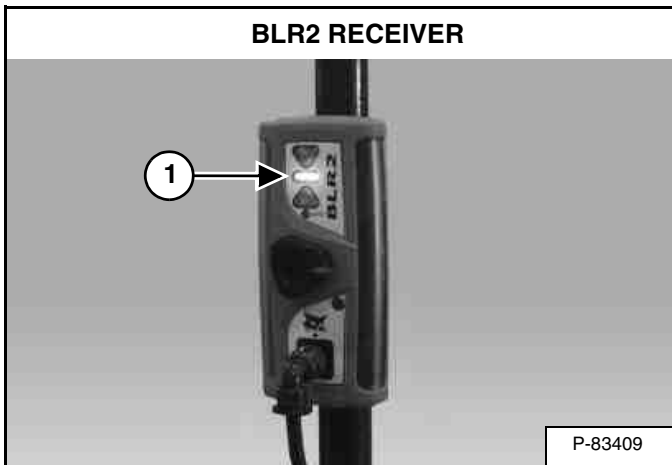
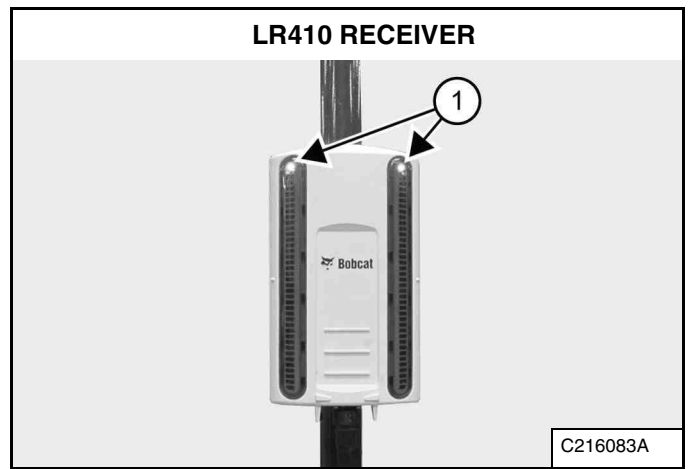


Figure 165



Adjust receiver height until indicator light(s) (Item 1) [Figure 163], [Figure 164], or [Figure 165] on level indicator are on.

Measure the distance from cutting edge of the moldboard to the center of the receiver.

Record the distance.

Set the second receiver at the recorded distance.

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Fasten seat belt, lower the seat bar, start the engine, and release the parking brake.

The grader is ready to operate.

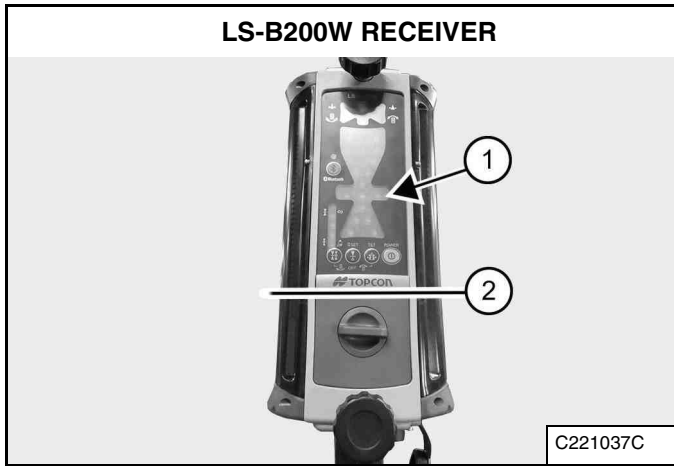
LR410 STATUS	MODE	LED PATTERN (2 SECONDS - SHOWN IN TENTHS OF SEC)																		
		1	2	3	4	5	6	7	8	9	10									
Beam above center of receiver	Flashes 5 times per second (5 Hz)	■	□	■	□	■	□	■	□	■	□	■	□	■	□	■	□	■	□	■
Beam at center of receiver	Solid	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Beam below center of receiver	Flashes 2.5 times per second (2.5 Hz)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
ON but no beam detected	One flash every 1.6 seconds	■	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Error	Two flash at 5 Hz every 1.6 seconds	■	■	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Undecided mode	Four flashes at 5 Hz every 1.6 seconds	■	■	■	■	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Setting Grader To Grade (Flat Grade) – Method 1 (Cont'd)

Figure 166



Adjust receiver height until indicator light(s) (Item 1) [Figure 166] on level indicator are blinking.

Measure the distance from cutting edge of the moldboard to the receiver height line (Item 2).

Record the distance.

Set the second receiver at the recorded distance.

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Fasten seat belt, lower the seat bar, start the engine, and release the parking brake.

The grader is ready to operate.

LS-B200W PATTERN	LED LIGHTS	LED INDICATOR
0	On Grade, Green LEDs, Blink Fast	● ● ●
1	Raise Pattern 1, Red LEDs Blink Fast	● ● ●
2	Raise Pattern 2, Red LEDs Blink Fast	● ● ●
3	Raise Pattern 3, Red LEDs Blink Slow	● ● ●
4	Raise Pattern 4, Red LEDs Blink Very Slow	● ● ●
5	Lower Pattern 1, Yellow LEDs Blink Fast	○ ○ ○
6	Lower Pattern 2, Yellow LEDs Blink Fast	○ ○ ○
7	Lower Pattern 3, Yellow LEDs Blink Fast	○ ○ ○
8	Lower Pattern 4, Yellow LEDs Blink Fast	○ ○ ○
9	Lower Pattern 5, Yellow LEDs Blink Slow	○ ○ ○
10	Lower Pattern 6, Yellow LEDs Blink Very Slow	○ ○ ○

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Setting Grader To Grade (Flat Grade) - Method 2

NOTE: The following illustrations may not show your Laser Beacon exactly as it appears but the procedure is the same.

Figure 167



Set up beacon and start in auto-levelling mode [Figure 167]. (See the Laser Beacon Manual and Operator's Manual for more information on setup and operation of your laser beacon.)

NOTE: Beacon should be above the top of the loader cab.

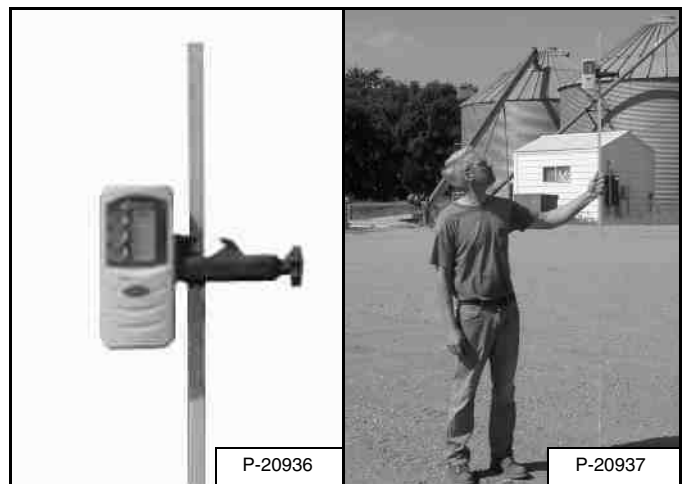
! WARNING

AVOID EYE INJURY

Never look directly into the laser beam. Set the laser at a height that prevents the beam from shining directly into bystanders eyes.

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Figure 168



Attach laser detector to grade rod (Left) [Figure 168] or a straight board.

Position laser detector and board on grade mark or area that is on grade.

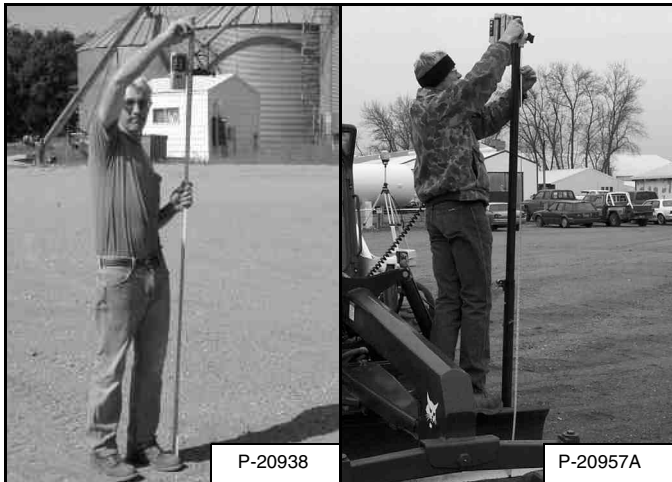
Move the detector until it signals on grade (Right) [Figure 168].

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Setting Grader To Grade (Flat Grade) - Method 2 (Cont'd)

Figure 169



Measure up from the bottom of the board to laser detector centre (Left) **[Figure 169]**, then record that distance.

Measure up from the bottom of the cutting edge and position centre of receivers at the recorded distance (Right) **[Figure 169]**.

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Fasten seat belt, lower the seat bar, start the engine, and release the parking brake.

Figure 170



The grader is ready to operate **[Figure 170]**.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Operating The Grader With Sonic Tracer - Existing Surface Or Stringline (Option)

Position the Sonic Tracer Sensor at least 152 mm (6 in), but no more than 609 mm (24 in) from the edge of the moldboard. (Adjust offset in diagnostics screen.)

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Start the engine and go to the Sonic Tracer screen on the deluxe instrumentation panel.

Figure 171



Position grader so the moldboard cutting edge (Item 1) [Figure 171] is close to the existing surface (curb, sidewalk, pavement, etc.).

Lower the moldboard cutting edge for desired grading until the cutting edge is at desired cut level. (This may take multiple passes.)

Figure 172



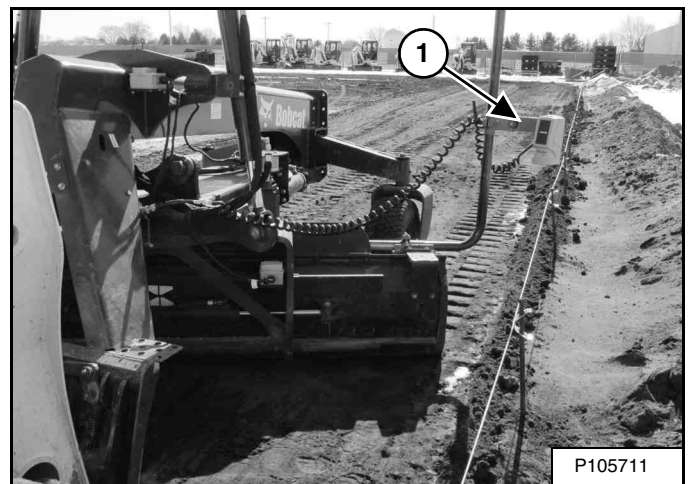
Reset benchmark surface by pressing the #8 key on the Sonic Tracer deluxe instrumentation panel [Figure 172].

Set the desired cross-slope value using the deluxe instrumentation panel #1 key (increment desired slope up) or #2 key [Figure 172] (decrement desired slope down) or joystick.

Rotate moldboard as needed to prevent unwanted spoil from entering the area under the sonic tracer.

Once the first pass is completed, additional passes can be made moving away from initial surface.

Figure 173



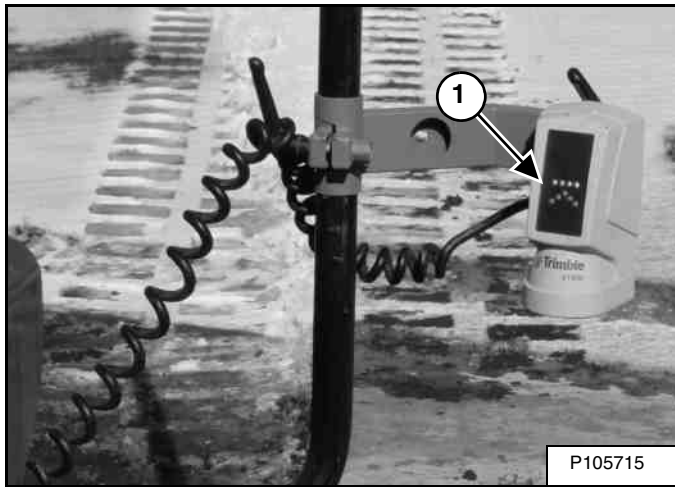
NOTE: If using with a stringline, Sonic Tracer Sensor (Item 1) [Figure 173] location of 457 mm (18 in) above the stringline is preferred.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Operating The Grader With Sonic Tracer - Existing Surface Or Stringline (Option) (Cont'd)

Figure 174



NOTE: The stringline can be difficult to follow, make sure the Sonic Tracer has benchmarked itself to the stringline by moving the string up and down and see if the display arrows (Item 1) [Figure 174] move up and down as well.

NOTE: If grader moldboard is not able to cut into the ground, additional actions may be taken:

1. Turn Sonic Tracer off of automatic mode and operate that side of the moldboard manually to a reasonable depth.
2. Increment Sonic Tracer up until the loader is able to push the grader.
3. Increment the slope down or up until the loader is able to push the grader.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Operating The Grader With Sonic Tracer - No Benchmark Surface (Option)

NOTE: The moldboard can be operated manually on the Sonic Tracer Sensor side and still retain automatic cross-slope correction.

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Figure 175



A benchmark surface can be created by leaving the Sonic Tracer off of automatic mode by pressing the #9 key on the deluxe instrument panel [Figure 175].

Set the desired cross-slope value using the deluxe instrumentation panel #1 key (increment desired slope up) or #2 key [Figure 175] (decrement desired slope down) or joystick.

Activate automatic operation by pressing the #9 key on the deluxe instrument panel [Figure 175] or pressing the trigger switch on the joystick. Operate the Sonic Tracer Sensor side using the elevation switch on the Joystick to control the overall digging depth of the moldboard.

Figure 176



Once the initial surface has been graded to desired depth / slope, the Sonic Tracer can be used [Figure 176].

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Job Site Recommendations

Figure 177



Tilt the Bob-Tach forward until the front of the loader is 50,8 - 101,6 mm (2 - 4 in) off the ground **[Figure 177]**.

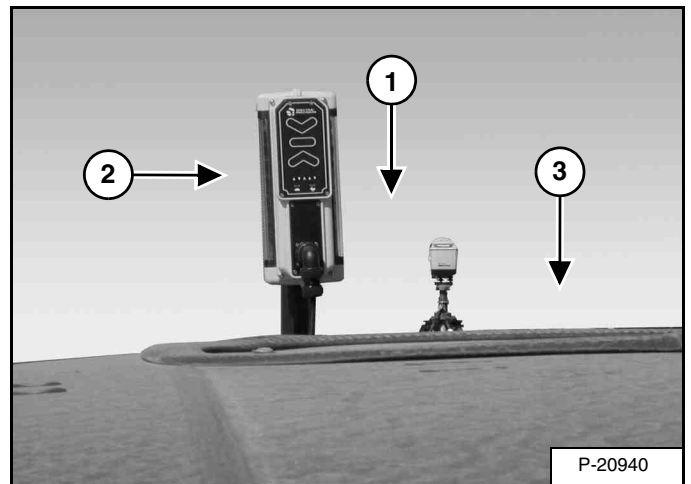
Rough grade area **[Figure 177]** without laser.

The grader will fill in low spots and carry material to get the surface close to grade (This will require less material to be moved when using the laser).

Travel at a slow speed when laser grading.

Throttle should be set at 1/2 speed.

Figure 178



Position laser beacon (Item 1) and receiver (Item 2) above the loader cab (Item 3) **[Figure 178]**.

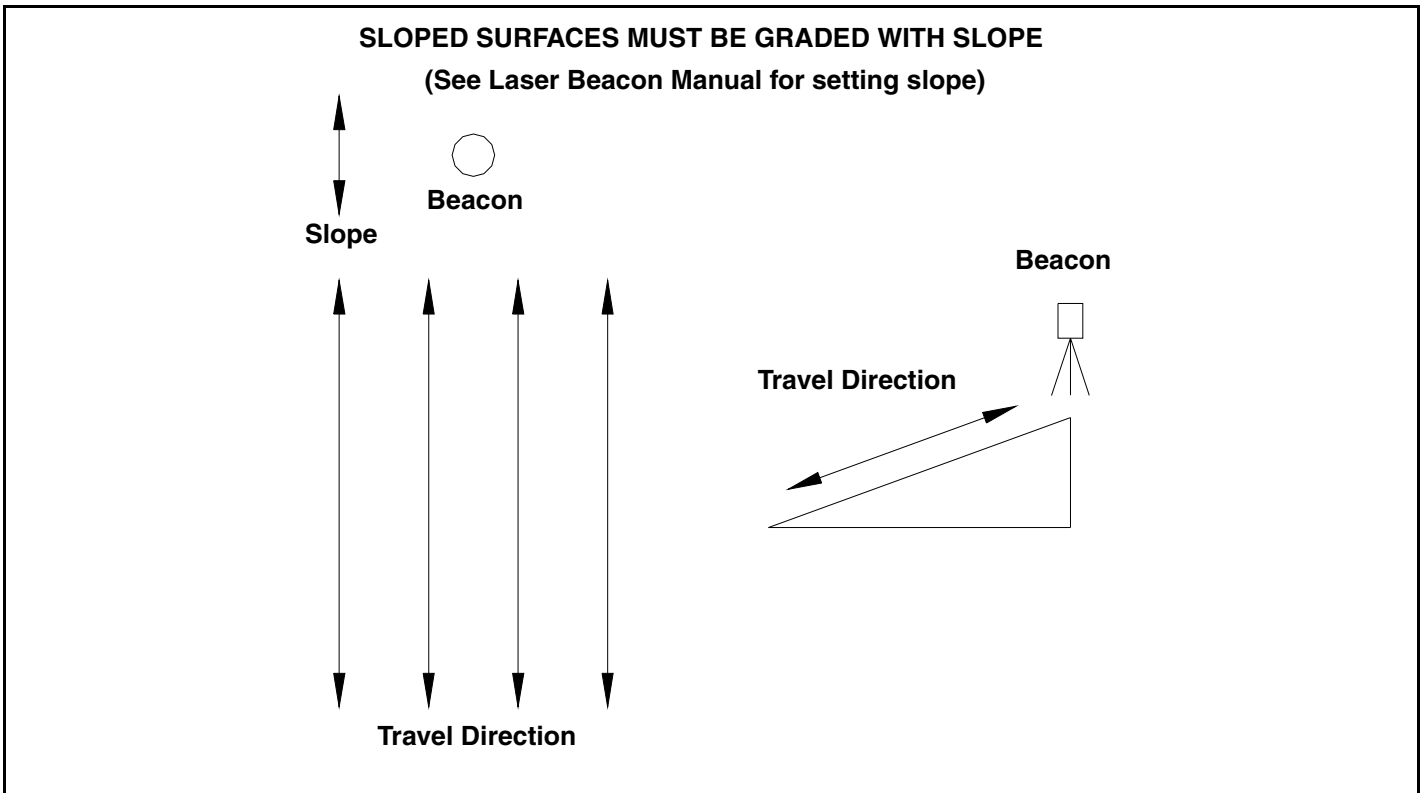
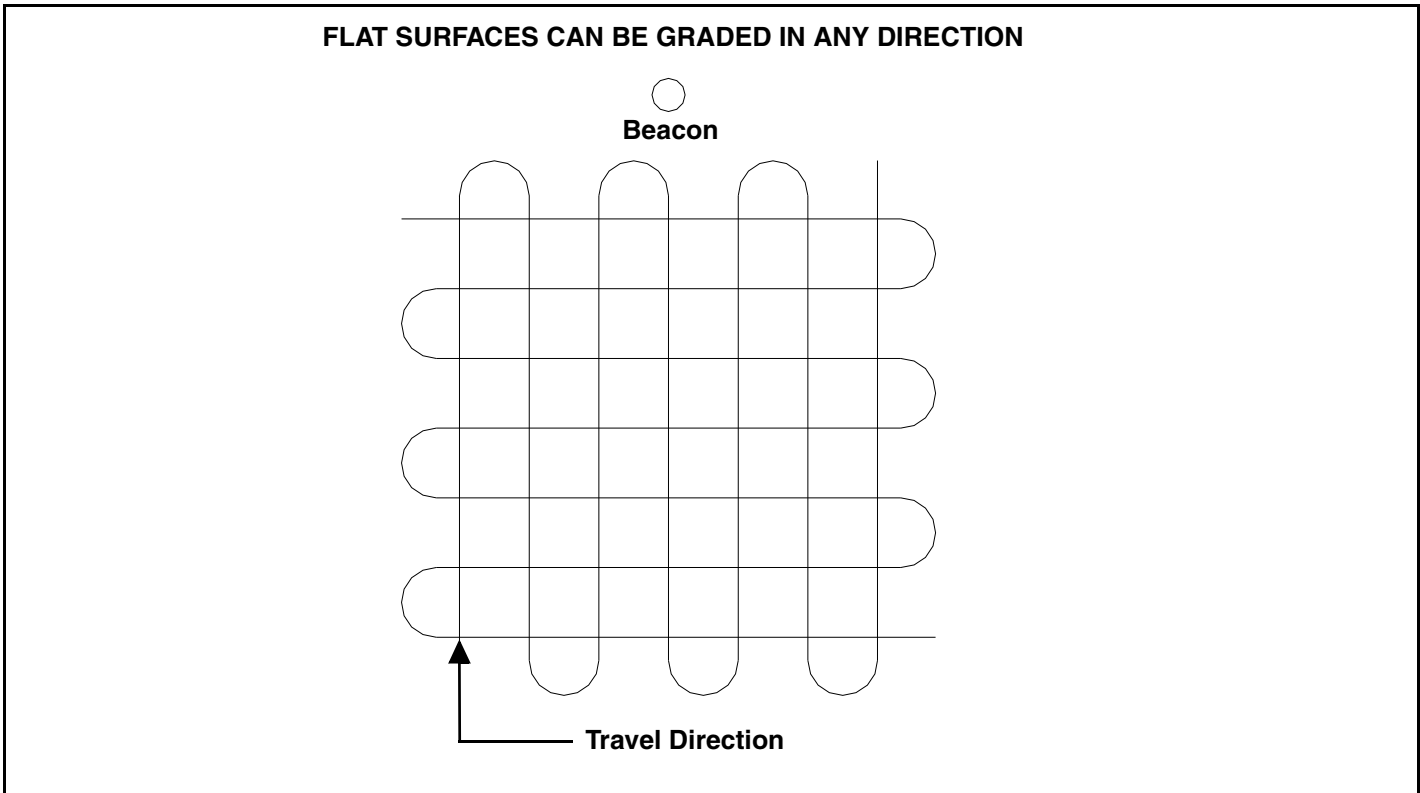
This will allow the operator to flat grade in any direction.

Turn laser to manual when turning around.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Job Site Recommendations (Cont'd)



OPERATING PROCEDURE WITH LOADERS (CONT'D)

Operation With The Loader (Cont'd)

Adjusting the Correction Speed (GCR Only)

The correction speed comes preset from the factory.

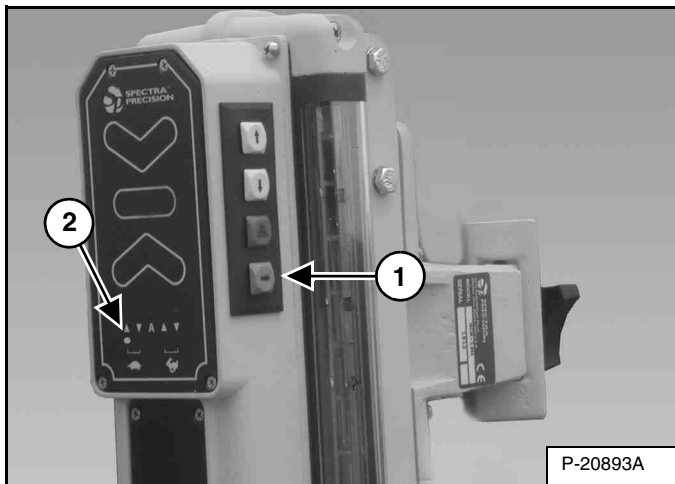
The correction speed may be adjusted to allow the operator to drive faster or slower.

NOTE: The correction speed is the amount of time the grader takes to move from an “off grade” condition to an “on grade” position. If the speed is set to fast, it will cause the moldboard to chatter or hunt. If it is set to slow, it will not correct fast enough to keep up with the loader travel speed.

Make sure the receiver is removed from the pole.

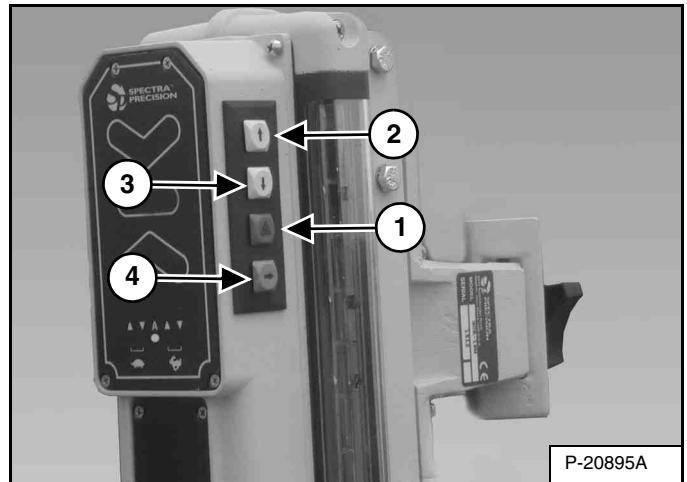
Turn the loader key switch to ON.

Figure 179



Press and hold the Select Button (Item 1) (about 2 seconds) on the Calibration Control Panel until the first Mode LED (Item 2) [Figure 179] lights (the up triangle above the turtle symbol on the Grade Display Panel).

Figure 180



Press the Engage Button (Item 1) [Figure 180] to start calibration.

Adjust the Correction Speed by pressing either the Correction Increase (Item 2) or Correction Decrease (Item 3) while pressing the Engage Button (Item 1) [Figure 180].

Press the Select Button (Item 4) [Figure 180] to cycle to the next Calibration Mode.

Repeat the above procedure until each Correction Speed is satisfactory for your loader.

When the light above the turtle is on, the moldboard raise and lower speed can be adjusted faster or slower when the moldboard is near grade.

A light under the up arrow indicates the moldboard raise speed can be adjusted when the moldboard is near grade.

A light under the down arrow indicates the moldboard lower speed can be adjusted when the moldboard is near grade.

NOTE: This speed should be set slower than the rabbit speed. If the near grade speed is too fast the moldboard may over shoot grade, causing it to “Hunt”. Adjusting far from grade speed too slow will cause the moldboard to not adjust fast enough. The valve solenoids will click while adjusting.

When a light arrow above the rabbit is on, the moldboard raise and lower speed can be adjusted faster or slower when the moldboard is far from grade.

A light under the up arrow indicates the moldboard raise speed can be adjusted when the moldboard is far from grade.

A light under the down arrow indicates the moldboard lower speed can be adjusted when the moldboard is far from grade.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Removal

Hand Lever Bob-Tach

Lower the lift arms and put the attachment flat on the ground. Lower or close the hydraulic equipment (if equipped).

NOTE: In muddy conditions or to prevent the attachment from freezing to the ground, put the attachment on planks or blocks before removing the attachment from the loader.

Stop the engine and release auxiliary hydraulic pressure (if applicable). (See the loader's Operation & Maintenance Manual and Operator's Handbook for correct procedure.)

Exit the loader. (See Entering And Exiting The Loader on Page 58.)

WARNING

AVOID INJURY OR DEATH

Before you leave the operator's seat:

- Lower the lift arms and put the attachment flat on the ground.
- Stop the engine.
- Engage the parking brake.
- Raise the seat bar.
- Move all controls to the **NEUTRAL / LOCKED** position to make sure the lift, tilt and traction drive functions are deactivated.

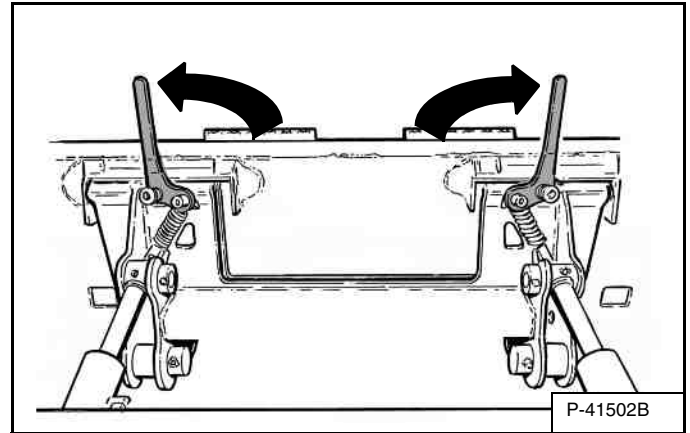
The seat bar system must deactivate these functions when the seat bar is up. See your Bobcat dealer for service if controls do not deactivate.

W-2463-0623

Disconnect auxiliary hydraulic hoses (if applicable). (See Hydraulic Quick Couplers on Page 67.)

Disconnect electrical harness (if applicable). (See Electrical Harness on Page 68.)

Figure 181



Pull the Bob-Tach levers up [Figure 181] until they are fully raised (wedges fully raised).

WARNING

Bob-Tach levers have spring tension. Hold lever tightly and release slowly. Failure to obey warning can cause injury.

W-2054-1285

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

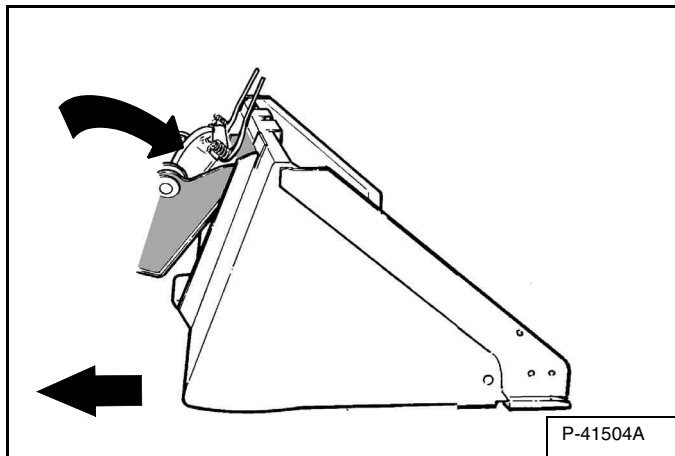
Start the engine, press the operate button and release the parking brake.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Removal (Cont'd)

Hand Lever Bob-Tach (Cont'd)

Figure 182



Tilt the Bob-Tach forward and drive the loader backward, away from the attachment [Figure 182].

Power Bob-Tach

Lower the lift arms and put the attachment flat on the ground. Lower or close the hydraulic equipment (if equipped).

NOTE: In muddy conditions or to prevent the attachment from freezing to the ground, put the attachment on planks or blocks before removing the attachment from the loader.

Stop the engine and release auxiliary hydraulic pressure (if applicable). (See the loader's Operation & Maintenance Manual and Operator's Handbook for correct procedure.)

Exit the loader. (See Entering And Exiting The Loader on Page 58.)

WARNING

AVOID INJURY OR DEATH

Before you leave the operator's seat:

- Lower the lift arms and put the attachment flat on the ground.
- Stop the engine.
- Engage the parking brake.
- Raise the seat bar.
- Move all controls to the NEUTRAL / LOCKED position to make sure the lift, tilt and traction drive functions are deactivated.

The seat bar system must deactivate these functions when the seat bar is up. See your Bobcat dealer for service if controls do not deactivate.

W-2463-0623

Disconnect auxiliary hydraulic hoses (if applicable). (See Hydraulic Quick Couplers on Page 67.)

Disconnect electrical harness (if applicable). (See Electrical Harness on Page 68.)

Enter the loader. (See Entering And Exiting The Loader on Page 58.)

Start the engine, press the operate button and release the parking brake.

OPERATING PROCEDURE WITH LOADERS (CONT'D)

Removal (Cont'd)

Power Bob-Tach

Figure 183

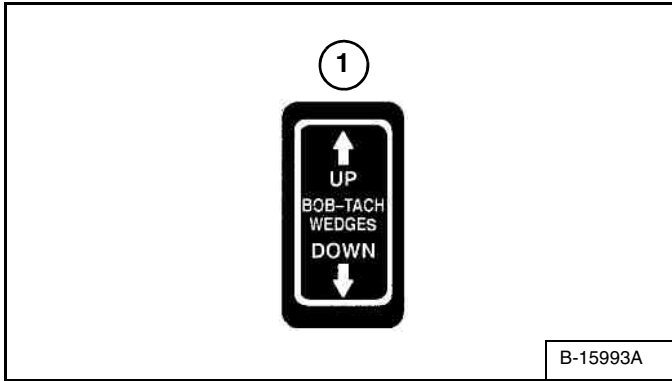
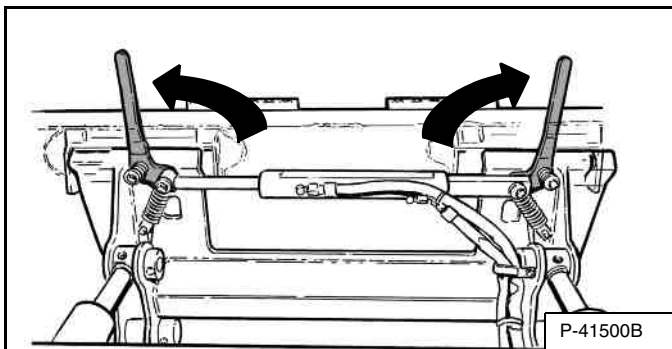


Figure 184

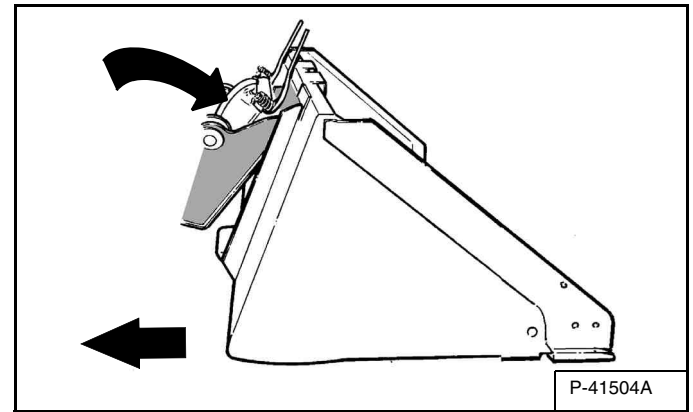


Figure 185



Push and hold the Bob-Tach “wedges up” switch (Item 1) [Figure 183] (earlier models) or [Figure 184] (later models) until the levers [Figure 185] are fully raised (wedges fully raised).

Figure 186



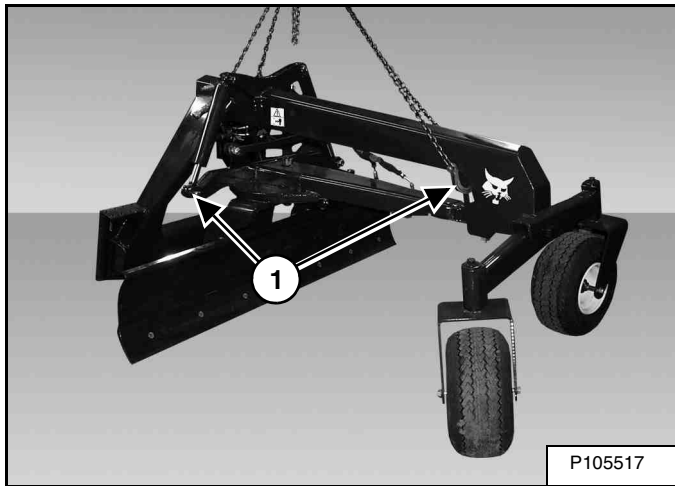
Tilt the Bob-Tach forward and drive the loader backward, away from the attachment [Figure 186].

NOTE: The Power Bob-Tach system has continuous pressurised hydraulic fluid to keep the wedges in the engaged position and prevent attachment disengagement. Because the wedges can slowly lower, the operator may need to reactivate the switch (Bob-Tach “wedges up”) when removing an attachment to be sure both wedges are fully raised.

LIFTING THE ATTACHMENT

Procedure

Figure 187



Fasten the chains to the grader (Item 1) [Figure 187].

NOTE: Use chains that are in good condition and of adequate size to lift the attachment.

TRANSPORTING THE ATTACHMENT ON A TRAILER

Fastening

Figure 188

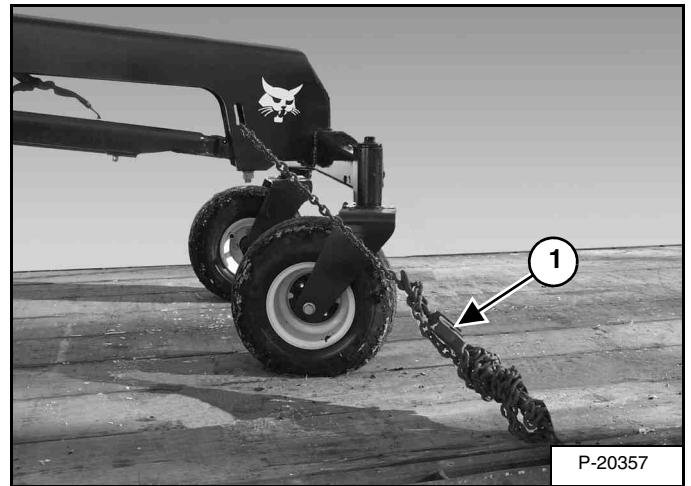
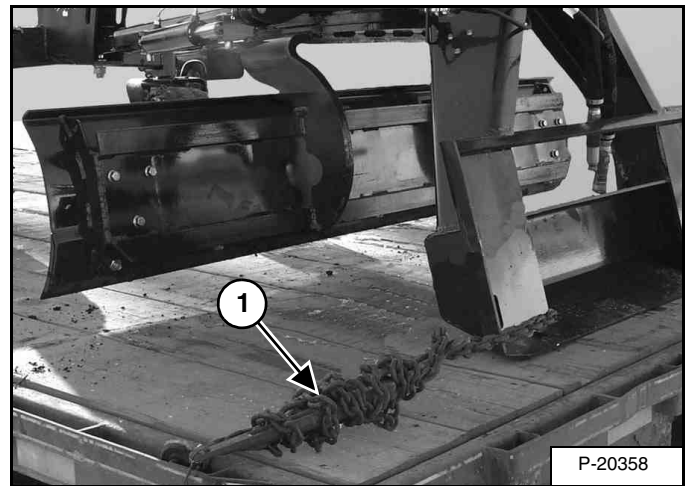


Figure 189



Fasten the chains to the attachment (Item 1) [Figure 188] and [Figure 189] and fasten each end of the chain to the transport vehicle.

Use chain binders to prevent the attachment from moving during transport.

TRANSPORTING THE ATTACHMENT AND MACHINE ON A TRAILER

Loading And Fastening



AVOID SERIOUS INJURY OR DEATH

Adequately designed ramps of sufficient strength are needed to support the weight of the machine when loading onto a transport vehicle. Wood ramps can break and cause personal injury.

W-2058-0807

Be sure the transport and towing vehicles are of adequate size and capacity for weight of machine and attachment combination. (See machine and attachment Operation & Maintenance Manuals for specifications.)

Loading

The rear of the trailer must be blocked or supported when loading and unloading to prevent the front of the trailer from raising.

- Load the heaviest end of the machine and attachment combination first.
- Lower the attachment to the floor.
- Stop the engine.
- Engage the parking brake (if equipped).
- Exit the machine. (See the machine's Operation & Maintenance Manual for the correct procedure.)

Fastening

Install the chains at the front and rear tie-down positions on the machine. (See the machine's Operation & Maintenance Manual to properly chain the machine to the transport vehicle.)

- Install chains on the attachment (if needed).
- Fasten each end of the chain to the transport vehicle.

NOTE: Use chain binders to prevent the attachment and machine from moving during transport.



Bobcat®

PREVENTIVE MAINTENANCE

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MAINTENANCE SAFETY



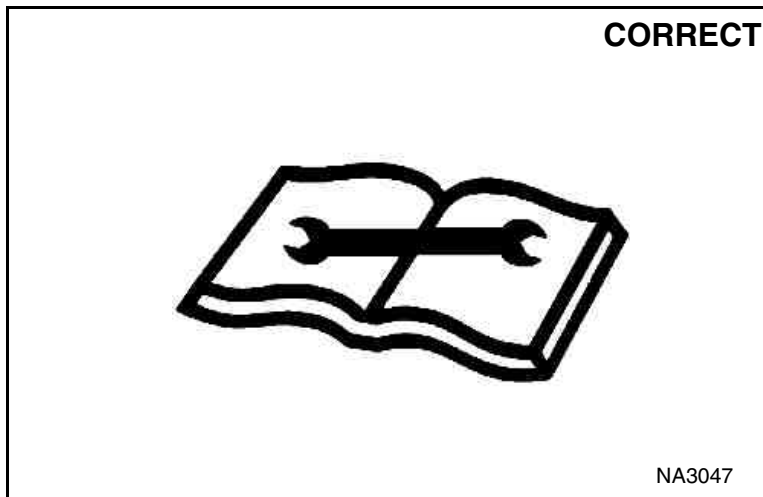
WARNING

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.



- ⚠ **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.**


Maintenance procedures which are given in the Operation & Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedures which are **not** in the Operation & Maintenance Manual must be performed **ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL**. Always use genuine Bobcat replacement parts.



Bobcat®

TROUBLESHOOTING

Chart

 <b style="font-size: 24pt; margin-left: 10px;">WARNING	<p>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.</p> <p style="text-align: right; font-size: 10pt;">W-2003-0807</p>
--	--

If the attachment is not working correctly, check the hydraulic system of the machine thoroughly before making any repairs on the attachment. Attachment problems can be affected by a hydraulic system that is not operating to specifications. Connect a flow meter to the machine to check the hydraulic pump output, relief valve setting and tube lines to check flow and pressure. (See the machine's Service Manual for the correct procedure to connect the flow meter.)

Use the following troubleshooting chart to locate and correct problems which most often occur with the attachment.

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 mounting frame.	Remove debris between Bob-Tach and grader mounting frame.
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 will not angle or oscillate.	Hydraulic auxiliary controls not activated.	Activate auxiliary hydraulics.
	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 Setting Grader To Grade (Flat Grade) - Method 1 on Page 80.)
NOTE: For other problems, see the loader's Operation Manual or contact your Bobcat Dealer.		

TROUBLESHOOTING (CONT'D)

Chart (GCR Receiver)

TROUBLESHOOTING THE GCR 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.
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		

TROUBLESHOOTING (CONT'D)

Chart (BLR2 Receiver)

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 (9v to 16v DC required).
	Receiver cable loose.	Make sure the receiver cable is secure at both ends.
	Bad fuse.	Check the fuse.
	Receiver cable is bad.	If you have a spare, try a different receiver cable.
Single green LED is lit and arrows flash alternately.	Receiver is seeing laser beacon but there's no CAN communication with ACD.	Check 9xxx (purple) wires for correct routing.
		Check 9xxx (purple) wires for pushed back terminals.
		Receiver is damaged, replace receiver.
All lights flash once and then go from bright to dim.	Ambient light sensor on receiver is damaged.	Replace receiver.
Auto light goes not respond to trigger when used with 7 pin connector.	No CAN communication between receiver and ACD.	Check 9xxx (purple) wires for correct routing.
		Check 9xxx (purple) wires for pushed back terminals.
		Receiver is damaged, replace receiver.
Arrows do not respond to laser beacon and single LED does a double flash once every two seconds.	Receiver is not detecting laser beacon.	Adjust laser beacon or receiver height to bring receiver within range.
		Make sure laser beacon is at least 3 m (10 ft) away from receiver.
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.
	Valve harness has left and right receiver connection points swapped.	Swap valve harness receiver connection points. (Black tie strap / 'RIGHT' identification tag should be on the right side of frame as viewed from the operators position.)
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TROUBLESHOOTING (CONT'D)

Chart (LR410 Receiver)

TROUBLESHOOTING THE LR410 RECEIVER		
PROBLEM	CAUSE	CORRECTION
Unit will not turn on.	Bad fuse.	Check the fuse.
	No or low power to the Unit.	Check electrical connections.
	Receiver cable loose.	Make sure the receiver cable is secure at both ends.
	Receiver cable is bad.	If you have a spare, try a different receiver cable.
LED flashes once every 1.6 seconds.	Receiver is not detecting laser beacon.	Adjust laser beacon or receiver height to beam within receiver detection window.
		Make sure the laser beacon is at least 3m (10 ft) away from receiver.
Erratic flashing of LEDs.	Jumper harness not installed.	Dual receiver attachment: ensure the jumper harness is installed on the left side of attachment as viewed from operator seat.
		Single receiver attachment: ensure the jumper harness is installed.
	Jumper harness installed wrong.	Dual receiver attachment: ensure the jumper harness is installed on the left side of attachment as viewed from operator seat.
		Single receiver attachment: ensure the jumper harness is installed.
	ACD harness damaged.	Replace the harness.
Receiver harness damaged or not properly installed.	Check connections or replace harness as required.	
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TROUBLESHOOTING (CONT'D)

Chart (LS-B200W Receiver)

TROUBLESHOOTING THE LS-B200W RECEIVER		
PROBLEM	CAUSE	CORRECTION
Unit will not turn on.	Bad fuse.	Check the fuse.
	No or low power to the Unit.	Check electrical connections.
	Receiver cable loose.	Make sure the receiver cable is secure at both ends.
	Receiver cable is bad.	If you have a spare, try a different receiver cable.
Unit does not function accurately	Electronic devices interfering.	Check for interfering devices.
Erratic flashing of LEDs.	Receiver harness damaged or not properly installed.	Check connections or replace harness as required.
The display shows ••• even though the location is not datum position.	Beam receiving window has dirt, oil, water droplets etc.	Clean beam receiving window.
NOTE: For other problems related to the laser products, see Topcon Instruction Manual or contact your Bobcat Dealer.		
Topcon Positioning Systems, Inc. Americas: 1 - 925 - 245 - 8300 (support@topcon.com) Europe: +31 - 79 - 799 - 5200 (support@topcon.com)		

TROUBLESHOOTING (CONT'D)

Chart (Laser Beacon)

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 centre for inspection.
No Laser Beam.	No power.	Press power button and verify the unit turns on.
	Unit is outside of self-leveling range.	Verify that the unit is within the self-leveling range.
	Laser needs servicing.	Return laser to service center for inspection.
	Laser in wrong mode.	Place the transmitter to manual mode.
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 auto-levelling or grade mode.
	Levelling screws not turning.	Make sure the levelling screws are free to turn.
	Laser not level.	Allow the laser to re-level.
	Laser needs servicing.	Return laser to service centre for inspection.
SafeGuard LED is on.	Calibration is off.	Check and adjust laser plane calibration as necessary.
	Laser needs servicing.	Return laser to service centre 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 centre 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		

TROUBLESHOOTING (CONT'D)

Chart (Sonic Tracer)

Use the following troubleshooting chart to locate and correct problems which most often occur with the Sonic Tracer.

TROUBLESHOOTING GUIDE - SONIC TRACER		
PROBLEM	CAUSE	CORRECTION
Sonic Tracer will not turn on.	No power to the sensors.	Check power on attachment harness.
	Not enough power to the sensors.	Make sure the machine has enough power (9v to 16v DC required).
	Sensor cables loose / bad.	Tighten or replace cables.
	Bad fuse.	Check the fuse.
Sonic Tracer will not locate "zero" position while grading.	Terrain in reflected area too uneven.	Terrain must be less than approximately +/- 76 mm (3.0 in).
	Not following benchmarked surface properly.	Make sure Tracer is located over benchmarked surface.
	Stringline is not reflective enough.	See recommended target surface.
	Stringline is too reflective.	See recommended target surface.
	Tracer is not vertically aligned with stringline or other surface.	Make sure Tracer is vertical from reflective surface.
	Reference surface out of range.	Stringline: 203 - 914 mm (8 - 36 in).
	Reference surface out of range.	Surface: 203 - 1295 mm (8 - 51 in).
Erratic display of arrows on Sonic Tracer.	Sonic Tracer did not properly initialize.	Shut off engine and restart.
	ACD harness damaged.	Replace the harness.
	Sonic Tracer harness damaged or not properly installed.	Check connections or replace the harness as required.
	Valve harness has left and right sensor connection points swapped.	Swap valve harness receiver connection points ("Right" should be on the right when sitting in the cab).
Down arrows flashing alternately.	Moldboard is above the sonic gate.	Lower the moldboard.
Up arrows flashing alternately.	Moldboard is below the sonic gate.	Raise the moldboard.
Outer up and down arrows flashing alternately.	No echo detected.	Sonic Tracer may need to be re-benchmarked.
Deluxe instrumentation panel shows no Tracer connected.	No power to the sensors.	Check power on attachment harness.
	Not enough power to the sensors.	Make sure the machine has enough power (9v to 16v DC required).
	Sensor cables loose / bad.	Tighten or replace cables.
	Bad fuse.	Check the fuse.

TROUBLESHOOTING (CONT'D)

Sonic Tracer Chart (Cont'd)

TROUBLESHOOTING GUIDE - SONIC TRACER		
PROBLEM	CAUSE	CORRECTION
Sonic Tracer moldboard end does not move up and down when in automatic mode.	Sonic Tracer is not in automatic mode.	Press button on deluxe instrumentation panel to place Sonic Tracer in automatic mode.
NOTE: For other problems, 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		

Rotation / Angle Sensors Chart

TROUBLESHOOTING GUIDE - ROTATION / ANGLE SENSORS		
PROBLEM	CAUSE	CORRECTION
Degrees of rotation do not show up on diagnostics screen.	Bad harness connection.	Check harness connection to the rotation sensor.
	Damaged harness.	Replace harness.
Rotation Sensor does not reset to "zero" during calibrating.	Make sure sensor is +/- 35° from zero when moldboard is centered.	Tab on rotation sensor will need to be adjusted.
Mainfall or moldboard sonic slope sensors do not report slope value.	Sensor cables loose / bad.	Tighten or replace cables.
NOTE: For other problems, 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		

TROUBLESHOOTING (CONT'D)

General Chart

TROUBLESHOOTING GUIDE - GENERAL		
PROBLEM	CAUSE	CORRECTION
Moldboard height is not correct on Sonic Tracer side.	Sonic Tracer was not zeroed properly on benchmarked surface.	Re-benchmark Sonic Tracer.
	Sonic Tracer offset distance not entered properly.	Enter Sonic Tracer offset distance in the calibration screen on the deluxe instrumentation panel.
Cross-slope is not correct.	Sensors are not calibrated properly.	See install instructions, re-calibrate sensors.
	Moldboard cross-slope, mainfall or rotation sensors are not connected.	Make sure all sensors are connected to valve harness.
	Sonic Tracer Sensor is not connected to 7-pin on same side as mounted.	Connect Sonic Tracer Sensor receiver harness on same side as Sonic Tracer Sensor is mounted.
Moldboard digs into ground when automatic mode is selected.	Sonic Tracer was not zeroed properly on benchmarked surface.	Re-benchmark Sonic Tracer.
	Benchmarked surface is lower than the surface needed to be graded.	Increase Tracer offset on the deluxe instrumentation panel.
	Desired slope is lower than the actual slope being graded.	Increase Tracer offset on the deluxe instrumentation panel, this will raise the moldboard height opposite the Sonic Tracer Sensor.
Moldboard continuously digs into ground while grading an area.	Benchmarked surface is lower than the surface needed to be graded.	Re-benchmark Sonic Tracer.
	Desired slope is not close enough to existing slope.	Re-adjust desired slope, or raise Sonic Tracer benchmarked height.
	Grader moldboard is taking too large of a cut.	Need to increase Sonic Tracer height or increase desired slope.
Blade digs into ground when turning and in automatic mode.	Centrifugal force causes sonic slope sensor to give false reading.	Turn grader out of automatic mode when at end of run.
Calibrated sensors incorrectly and cannot reset.	Improper calibration process.	Try setup process in the operation manual again.
		While on the calibration screens, press button 6 and 7 at the same time. This will restore ALL sensors to factory settings.
NOTE: For other problems, 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		

TROUBLESHOOTING (CONT'D)

Sonic Tracer Target Compatibility Chart

SONIC TRACER TARGET COMPATIBILITY				
REFERENCE	TYPE	SONIC RECOMMENDED	RANGE MINIMUM	RANGE MAXIMUM
String	Polyester outer*	YES	200 mm [8.0 in]	900 mm [36.0 in]
String	Nylon	NO - Moisture		
String	Cotton	NO - Moisture		
Wire (G & Z)	.041 in Dia.	NO - Stealth		
Surface	Curb & Gutter	YES	200 mm [8.0 in]	900 mm [36.0 in]
Surface	Ground	YES	200 mm [8.0 in]	1300 mm [51.0 in]
Surface	Concrete	YES	200 mm [8.0 in]	1300 mm [51.0 in]
Surface	Asphalt	YES	200 mm [8.0 in]	1300 mm [51.0 in]
Other	3/4 in PVC Pipe	YES	200 mm [8.0 in]	900 mm [36.0 in]
Other	3/8 in Fiberglass rod	YES	200 mm [8.0 in]	900 mm [36.0 in]
Other	Flat Fiberglass bar	YES	200 mm [8.0 in]	900 mm [36.0 in]
<p>*Recommended String - Anvil American SL141 or equivalent Stringline and mounting brackets available at http://www.anvilamerican.com/</p>				

REGULAR MAINTENANCE ITEMS

Cutting Edge

WARNING

AVOID INJURY OR DEATH

Securely block up the attachment before working underneath.

W-2795-0623

WARNING

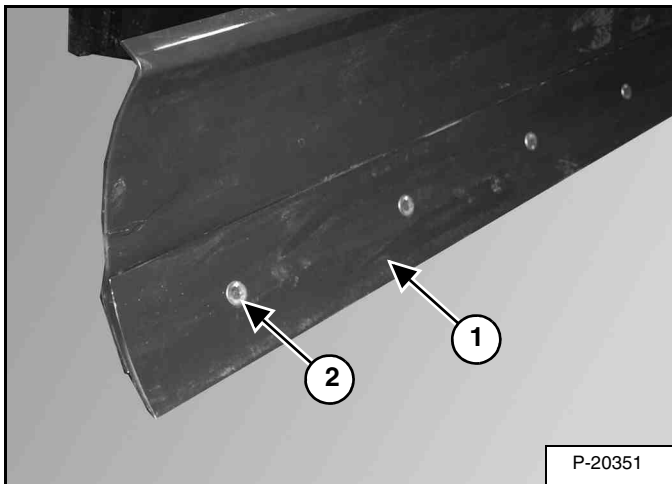
AVOID INJURY OR DEATH

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

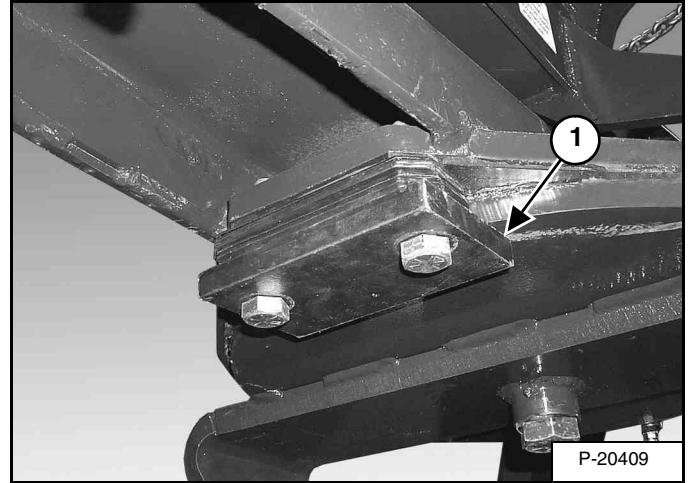
Figure 190



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 190] (See REMOVAL AND INSTALLATION OF CUTTING EDGE on Page 114.)

Turntable Clamp Clearance

Figure 191



Check the clearance (Item 1) [Figure 191] between the bottom of the turntable and the turntable clamp.

If the clearance is over 0,8 mm (0.03 in) (See REMOVAL AND INSTALLATION OF TURNTABLE CLAMP on Page 115.)

LUBRICATING THE ATTACHMENT

Lubrication Locations

Always use a good quality lithium base multipurpose 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

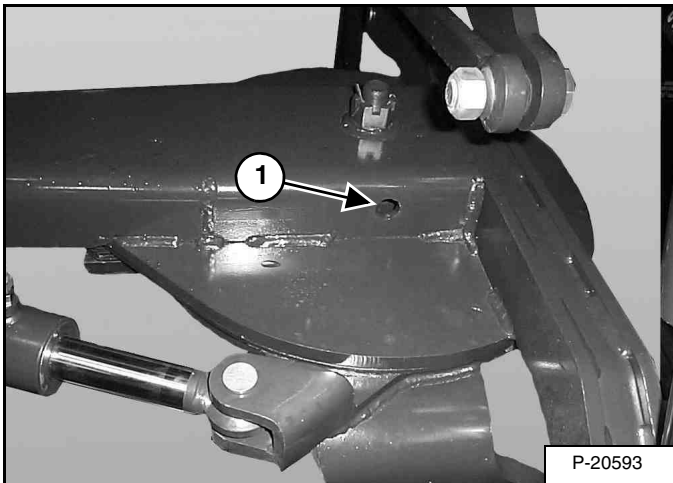
AVOID INJURY OR DEATH

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

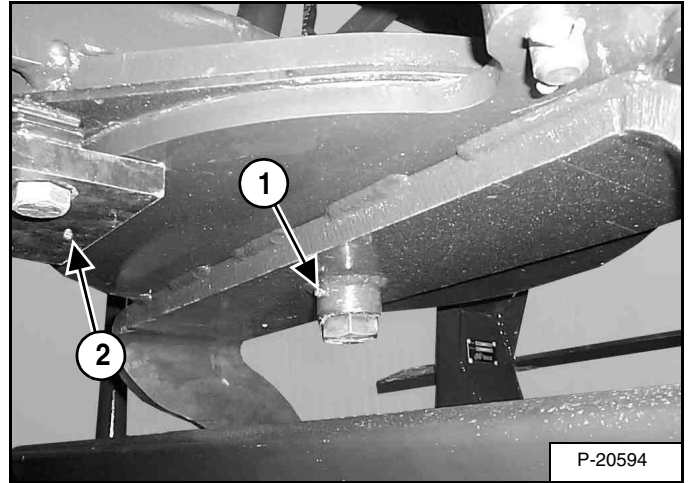
Figure 192



Lubricate the following locations [Figure 192] daily.

1. Turntable Pivot

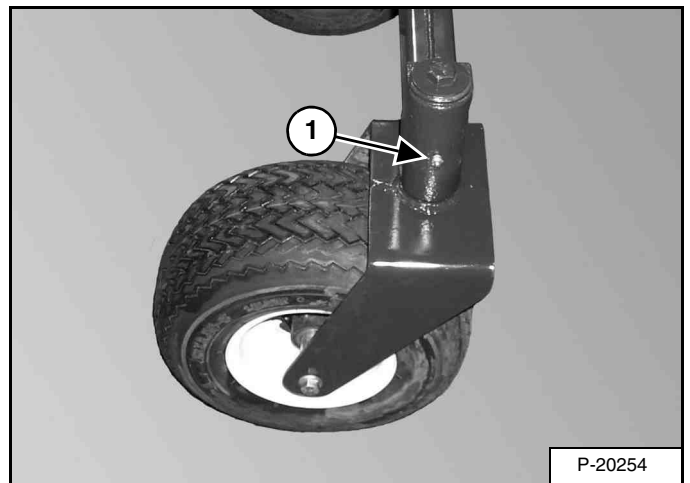
Figure 193



Lubricate the following locations [Figure 193] daily.

1. Turntable Pivot
2. Turntable Clamp

Figure 194



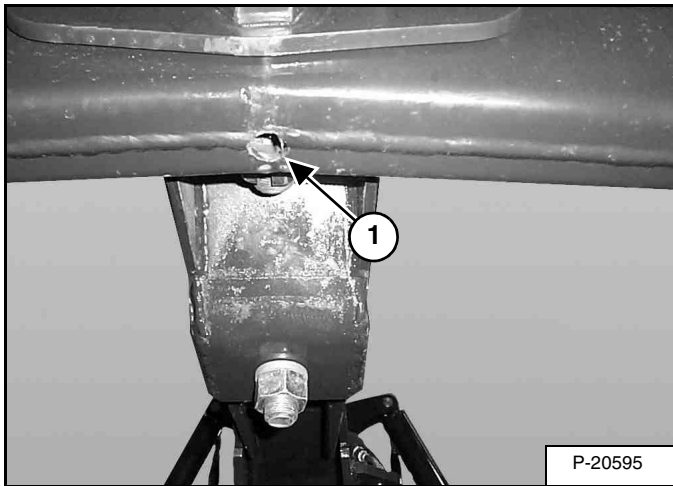
Lubricate the following locations [Figure 194] daily.

1. Caster Wheel Spindle (Both Sides)

LUBRICATING THE ATTACHMENT (CONT'D)

Lubrication Locations (Cont'd)

Figure 195



Lubricate the following locations **[Figure 195]** daily.

1. Bolster Bolt

REMOVAL AND INSTALLATION OF CUTTING EDGE

WARNING

AVOID INJURY OR DEATH

Securely block up the attachment before working underneath.

W-2795-0623

WARNING

AVOID INJURY OR DEATH

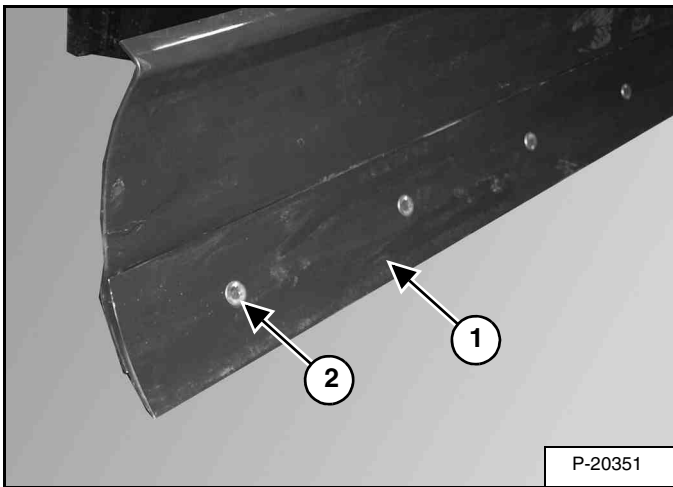
Wear safety glasses to prevent eye injury when any of the following conditions exist:

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

W-2019-0907

Procedure

Figure 196



The cutting edge (Item 1) [Figure 196] is reversible.

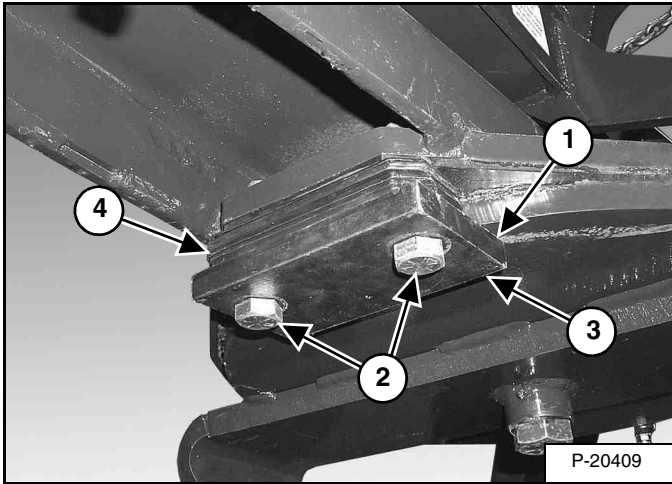
When the cutting edge becomes worn or damaged, remove the nuts and bolts (Item 2) [Figure 196] from the cutting edge, rotate it 180° and reinstall.

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

REMOVAL AND INSTALLATION OF TURNTABLE CLAMP

Procedure

Figure 197



Check the clearance (Item 1) [Figure 197] between the bottom of the turntable and the turntable clamp.

If the clearance is over 0,8 mm (0.03 in), remove the two bolts (Item 2) and clamp (Item 3) [Figure 197].

Remove or add the shim(s) (Item 4) [Figure 197] as needed. Replace the clamp and tighten the bolts.

Installation: Tighten bolts to 408 - 469 N•m (301 - 339 ft-lb) torque.

ATTACHMENT STORAGE AND RETURN TO SERVICE

Storage

Sometimes it may be necessary to store your Bobcat attachment for an extended period of time. Below is a list of items to perform before storage.

- Thoroughly clean the attachment.
- Lubricate the attachment.
- Inspect the Bob-Tach wedge mounts, mounting flange and all welds on the attachment for wear and damage.
- Check for loose hardware, missing guards, or damaged parts.
- Replace worn or damaged parts.
- Check for damaged or missing decals. Replace if necessary.
- Place the attachment in a dry protected shelter.
- Place the attachment flat on the ground.

NOTE: In muddy conditions or to prevent the attachment from freezing to the ground, put the attachment on planks or blocks before removing the attachment from the machine.

Return To Service

After the Bobcat attachment has been in storage, it is necessary to follow a list of items to return the attachment to service.

- Be sure all shields and guards are in place.
- Lubricate the attachment.
- Install and operate attachment, check for correct function.
- Check for leaks. Repair as needed.

SPECIFICATIONS

(GRADER 84) SPECIFICATIONS	119
Dimensions	119
Performance	120
Hydraulic System	120

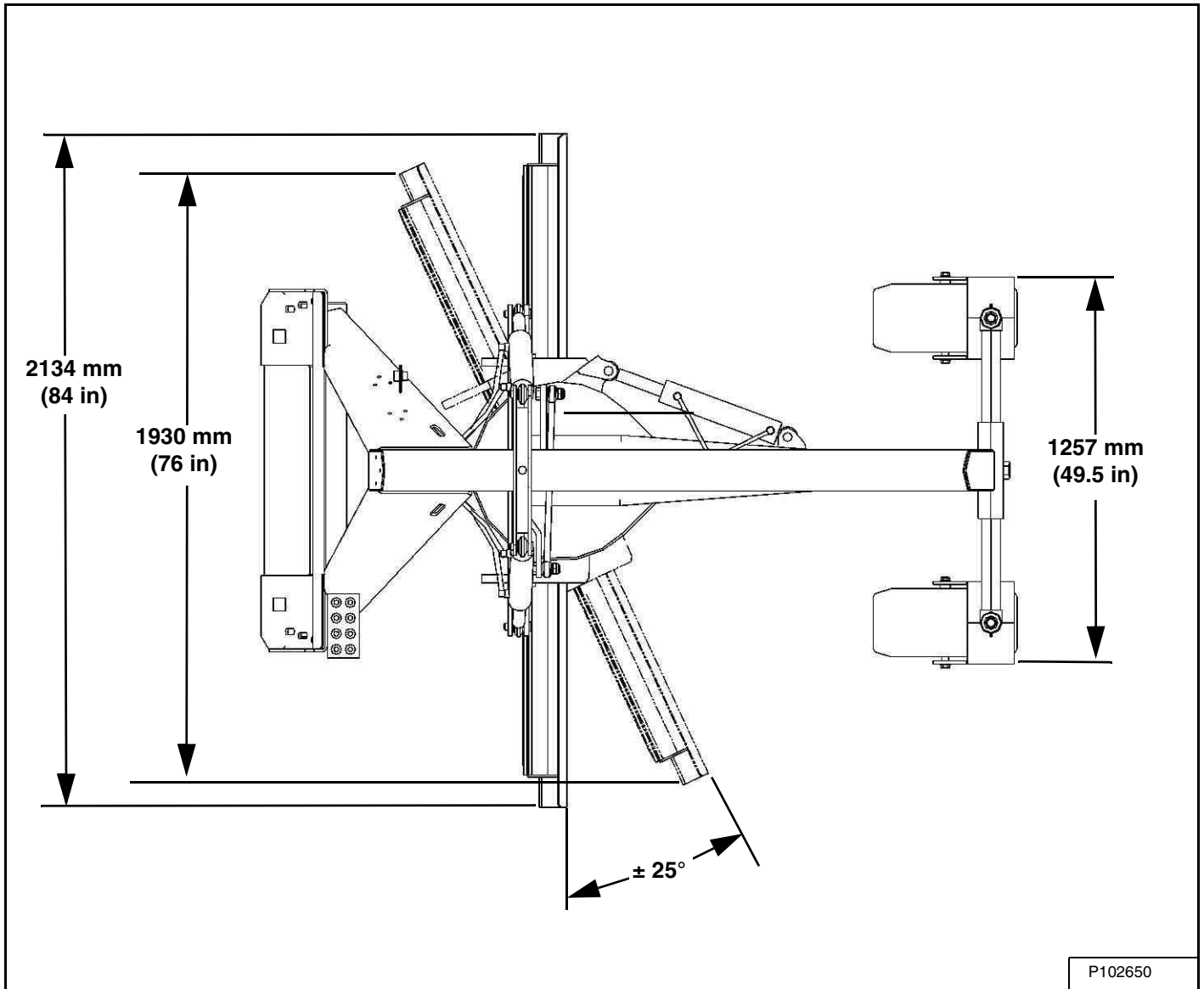


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(GRADER 84) SPECIFICATIONS

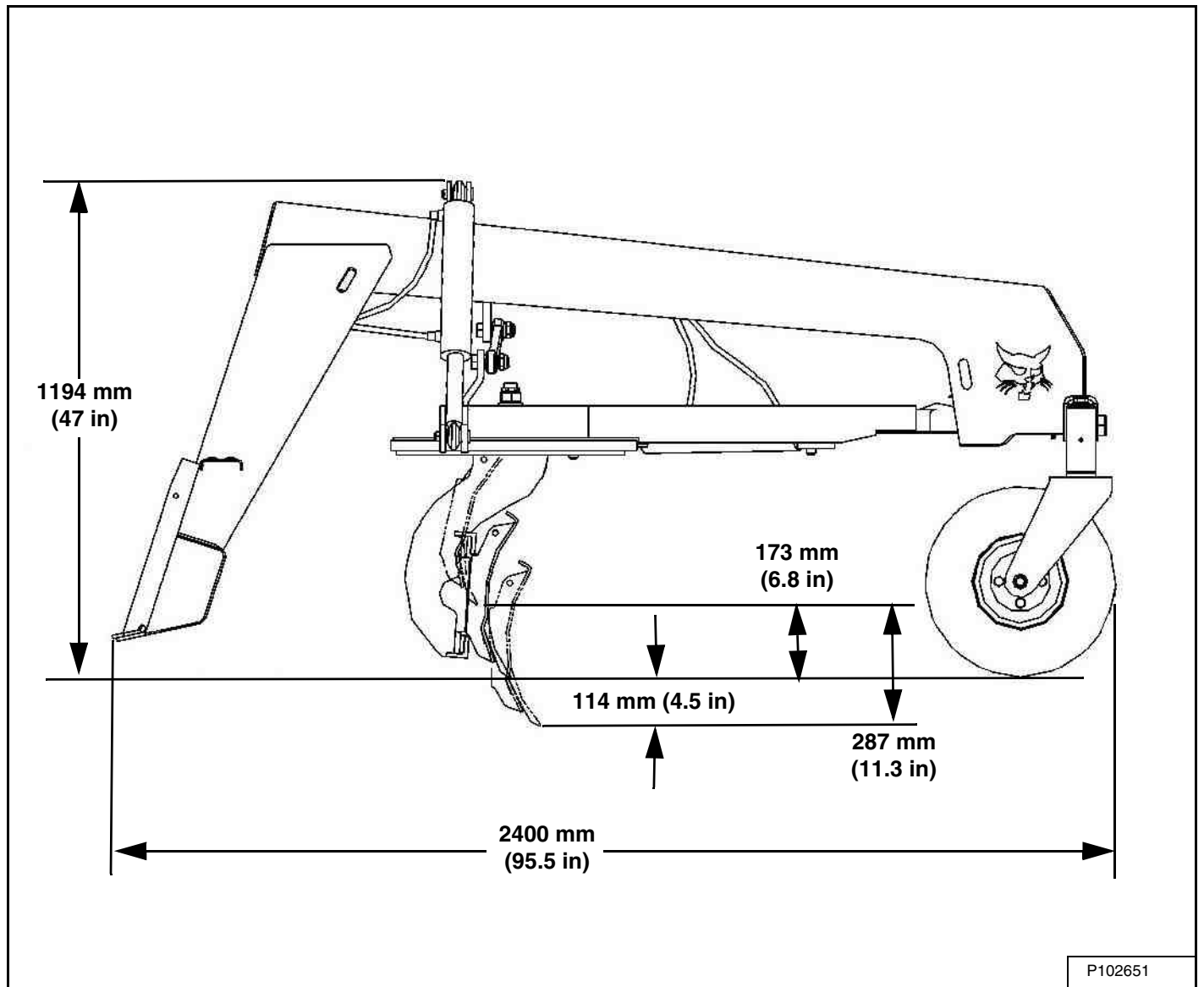
Dimensions

- Where applicable, specifications conform to **SAE and ISO** standards and are subject to change without notice.



(GRADER 84) SPECIFICATIONS (CONT'D)

Dimensions (Cont'd)



Performance

DESCRIPTION	GRADER 84
Grader Weight	624 kg (1375 lb)
Maximum Hydraulic Operating Pressure	24131 kPa (241,31 bar) (3500 psi)

Hydraulic System

DESCRIPTION	CYLINDER (3)
Bore	63,5 mm (2.50 in)
Rod	38,1 mm (1.50 in)
Stroke	286 mm (11.26 in)

WARRANTY

WARRANTY 123



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WARRANTY

BOBCAT® ATTACHMENTS

Doosan Bobcat EMEA s.r.o. ("Bobcat") warrants that Bobcat® Attachments will be free from defects in design, material or workmanship for twelve (12) months from the retail date to the owner. During the warranty period, only official Bobcat dealers (as listed on www.bobcat.com) are entitled to deal with warranty claims and shall repair or replace, at Bobcat's option, without charge for parts, labour or travel of technicians, any part of the Bobcat® equipment which fails because of defects in design, material or workmanship. The owner shall provide any official Bobcat dealer with prompt written notice of the defect and allow reasonable time for replacement or repair. Bobcat may, at its option, request failed parts to be returned to the factory or to any other designated location. Transportation of the Bobcat® equipment to the official Bobcat dealer for warranty work is not the responsibility of Bobcat. Service schedules must adhere to prescribed intervals and Bobcat® genuine parts/lubricants must be used. The warranty does not apply to tires, tracks or other accessories not manufactured by Bobcat. For these non-covered items, the owner shall refer solely to the warranty, if any, of the respective manufacturers thereof, in accordance with the respective manufacturers warranty statement. Coverage for couplers is limited as failures generally originate from factors not under Bobcat's control such as, but not limited to, prolonged storage or abuse. This limited coverage is 50 hours of machine usage. The warranty does not cover: (i) Oils and lubricants, coolant fluids, filter elements, brake linings, tune-up parts, bulbs, fuses, drive belts, pins, bushings, wire rope, rubber pads, scrapers, bearings, and other high-wear items. (ii) Damages resulting from abuse, misuse, accidents, alterations, use of non-genuine Bobcat parts, use of the attachment with any product not approved by Bobcat, air flow obstructions, or failure to maintain or use the Bobcat product according to the instructions applicable to it. (iii) Ground engaging parts such as bucket teeth and cutting edges. (iv) Hydraulic system cleaning, brake inspection or adjustment. (v) Adjustments or slight defects which generally do not affect the stability or reliability of the machine. (vi) Damage or defect resulting from improper storage, weathering, lack of use, use and operation in a corrosive or chemical environment. (vii) Damage or defect caused by operation of the product under extreme weather or geographical conditions without the written agreement of Bobcat.

BOBCAT EXCLUDES OTHER CONDITIONS, WARRANTIES OR REPRESENTATIONS OF ALL KINDS, EXPRESSED OR IMPLIED, STATUTORY OR OTHERWISE (EXCEPT THAT OF TITLE) INCLUDING ALL IMPLIED WARRANTIES AND CONDITIONS RELATING TO MERCHANTABILITY, SATISFACTORY QUALITY AND FITNESS FOR A PARTICULAR PURPOSE. CORRECTIONS BY BOBCAT OF NON-CONFORMITIES WHETHER PATENT OR LATENT, IN THE MANNER AND FOR THE WARRANTY PERIOD PROVIDED ABOVE, SHALL CONSTITUTE FULFILLMENT OF ALL LIABILITIES OF BOBCAT FOR SUCH NON-CONFORMITIES, WHETHER BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE WITH RESPECT TO OR ARISING OUT OF SUCH PRODUCT. THE REMEDIES OF THE END-USER/OWNER SET FORTH UNDER THE PROVISIONS OF THE WARRANTY OUTLINED ABOVE ARE EXCLUSIVE AND THE TOTAL LIABILITY OF BOBCAT INCLUDING ANY HOLDING, SUBSIDIARY, ASSOCIATED OR AFFILIATED COMPANY OR DISTRIBUTOR WITH RESPECT TO THIS SALE OR THE PRODUCT AND SERVICE FURNISHED HEREUNDER IN CONNECTION WITH THE PERFORMANCE OR BREACH THEREOF, OR FROM DELIVERY, INSTALLATION, REPAIR OR TECHNICAL DIRECTION COVERED BY OR FURNISHED UNDER THIS SALE, WHETHER BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE SHALL NOT EXCEED THE PURCHASE PRICE OF THE PRODUCT UPON WHICH SUCH LIABILITY IS BASED. BOBCAT INCLUDING ANY HOLDING, SUBSIDIARY, ASSOCIATED OR AFFILIATED COMPANY AND DISTRIBUTOR SHALL IN NO EVENT BE LIABLE TO THE END-USER/OWNER, ANY SUCCESSORS IN INTEREST OR ANY BENEFICIARY OR ASSIGNEE RELATING TO THIS SALE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES ARISING OUT OF THIS SALE OR BY ANY BREACH THEREOF, OR ANY DEFECT IN, OR FAILURE OF, OR MALFUNCTION OF THE PRODUCT UNDER THIS SALE, WHETHER BASED UPON LOSS OF USE, LOST PROFITS OR REVENUE, INTEREST, LOST GOODWILL, WORK STOPPAGE, IMPAIRMENT OF OTHER GOODS, LOSS BY REASON OF SHUTDOWN OR NON-OPERATION, INCREASED EXPENSES OF OPERATION OR CLAIMS OF USER OR CUSTOMERS OF THE USER FOR SERVICE INTERRUPTION WHETHER OR NOT SUCH LOSS OR DAMAGE IS BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE.





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