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**Bobcat®**

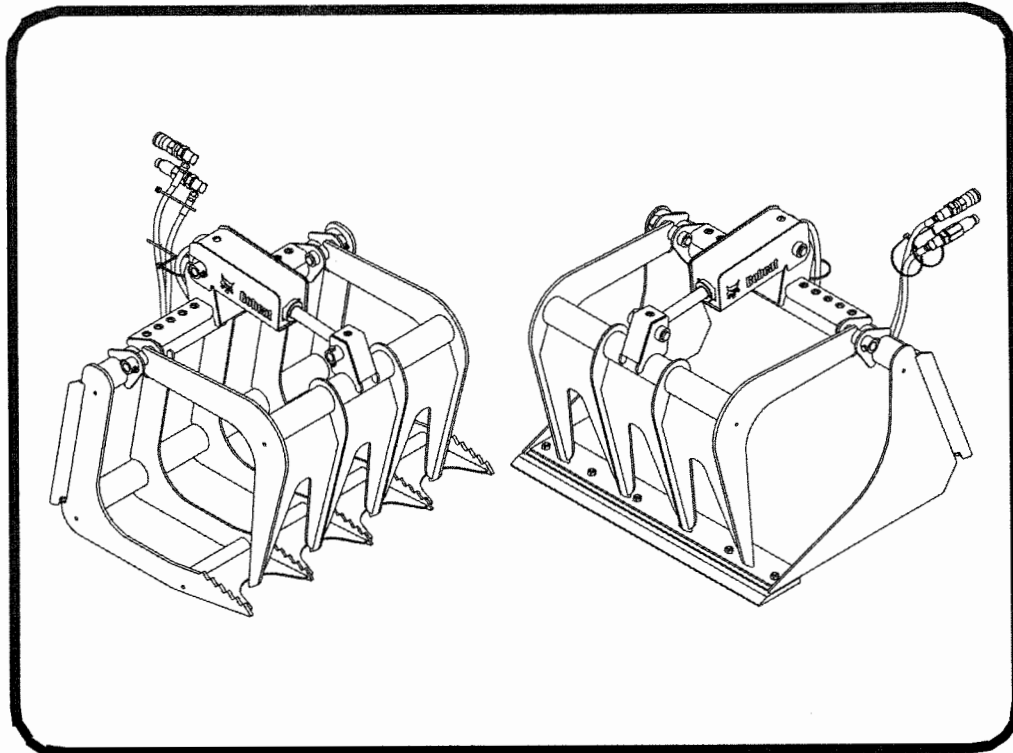
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# Operation & Maintenance Manual

## Root / Industrial Grapple

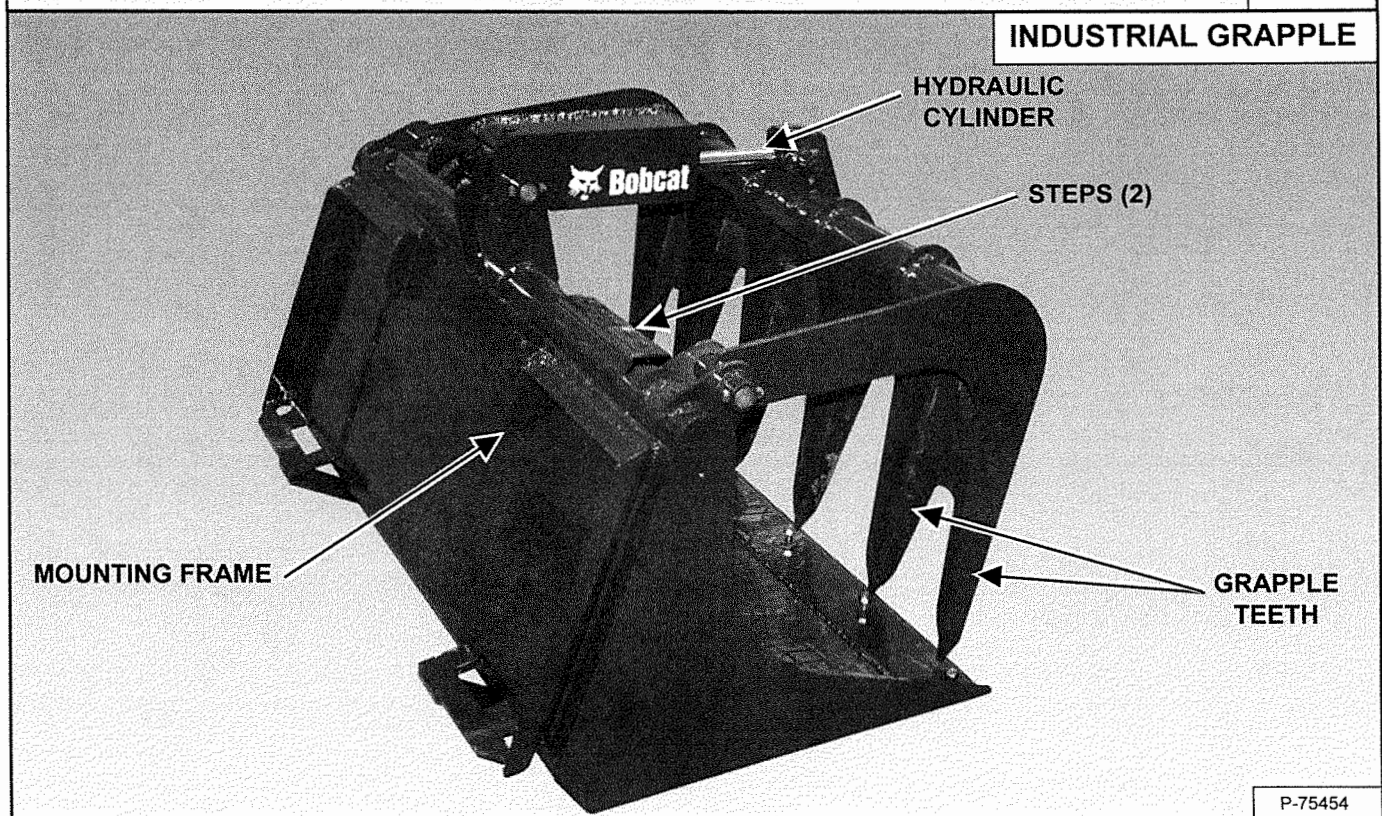
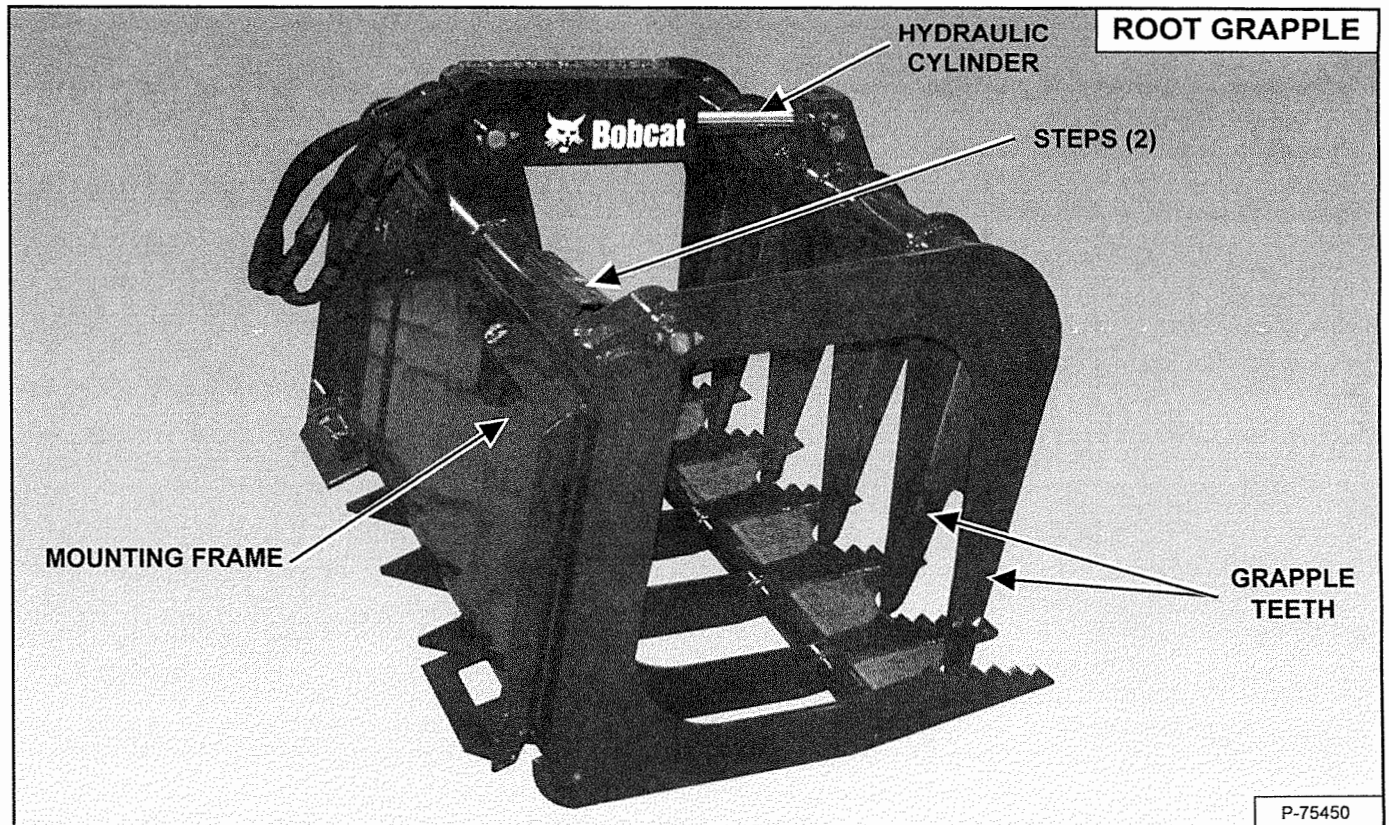
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(36 Root Grapple) S/N A67800101 & Above  
(48 Root Grapple) S/N A87D00101 & Above  
(36 Ind Grapple) S/N A6S100101 & Above  
(48 Ind Grapple) S/N A87900101 & Above



## ATTACHMENT IDENTIFICATION

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.



## FEATURES AND ACCESSORIES

### Standard Items

The root / industrial grapple is equipped with the following Standard items.

- Fully Enclosed Mounting Frame (All Models).
- Curved Skeletal Teeth (Root Grapple).
- Bolt-on Cutting Edge (Industrial Grapple).

## SAFETY AND TRAINING RESOURCES

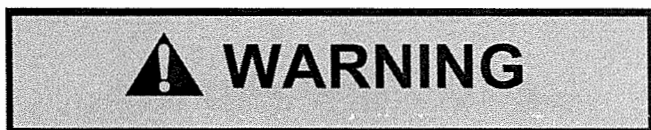
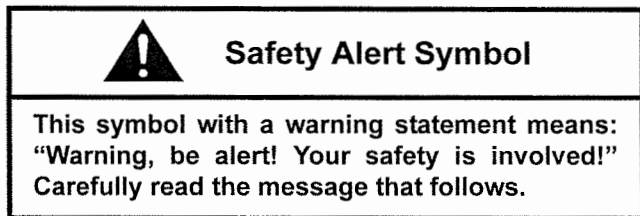
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## SAFETY INSTRUCTIONS

### Safe Operation Is The Operator's Responsibility



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

W-2001-0502



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

I-2019-0284



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



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. Regulations may apply to local driving requirements or use of a Slow Moving Vehicle (SMV) emblem. 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. Call local utilities or the TOLL FREE phone number found in the *Call Before You Dig* section of this manual.
- Wear tight fitting clothing. Always wear safety glasses when doing maintenance or service. Safety glasses, respiratory equipment, and hearing protection are required for some work. See your Bobcat dealer about Bobcat safety equipment for your machine.

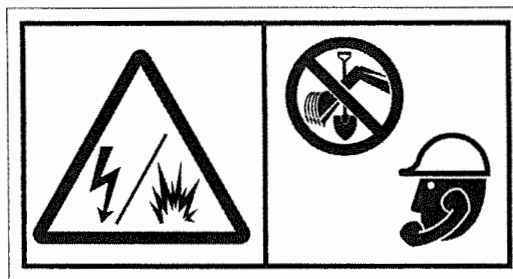
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## SAFETY INSTRUCTIONS (CONT'D)

### 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.

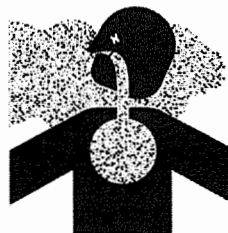
### Call Before You Dig



## Call Before You Dig Dial 811 (USA Only) 1-888-258-0808 (USA & Canada)

When you call, you will be directed to a location in your state / province, or city for information about buried lines (telephone, cable TV, water, sewer, gas, etc.).

### Avoid Silica Dust



Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Do not exceed Permissible Exposure Limits (PEL) to silica dust as determined by OSHA or other job site Rules and Regulations. Use a respirator, water spray or other means to control dust. Silica dust can cause lung disease and is known to the state of California to cause cancer.

SI ATT-0819

## 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 coolant 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 gasoline or diesel fuel for cleaning parts. Use commercial nonflammable 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).

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## FIRE PREVENTION (CONT'D)

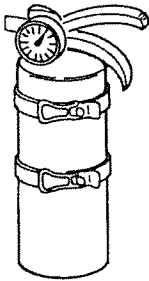
### Welding And Grinding

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 nonmetallic 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

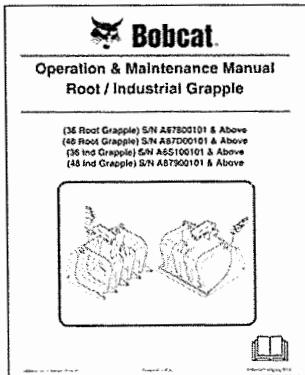


Know where fire extinguishers and first aid kits are located and how to use them. Inspect the fire extinguisher and service the fire extinguisher regularly. Obey the recommendations on the instructions plate.

## 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.com**.



### OPERATION & MAINTENANCE MANUAL

6986604enUS

Complete instructions on the correct operation and the routine maintenance of the Bobcat Attachment



**Bobcat®**

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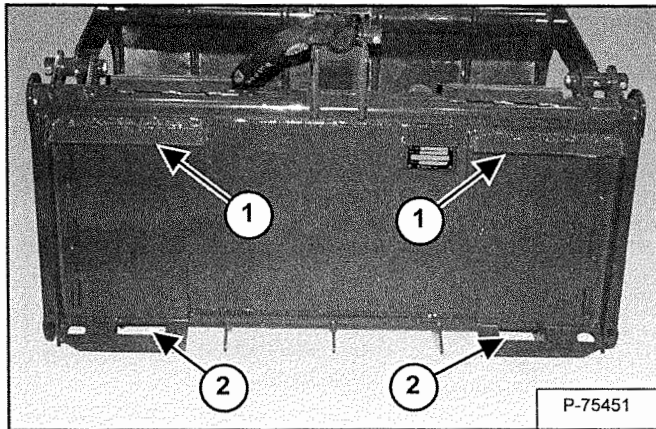


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## DAILY INSPECTION

### Root / Industrial Grapple Mount Inspection

Figure 3



Inspect the Bob-Tach® mounting flange (Item 1), mounting frame holes (Item 2) **[Figure 3]** and all welds on the root / industrial grapple for wear and damage each time the root / industrial grapple is removed from the loader.

Frequently inspect the root / industrial grapple 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

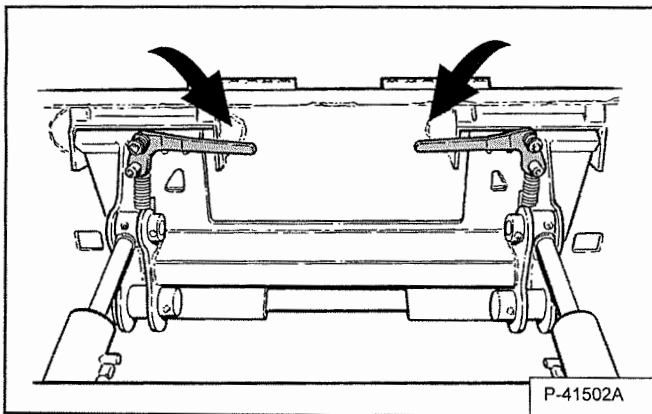
# ! WARNING

## 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.

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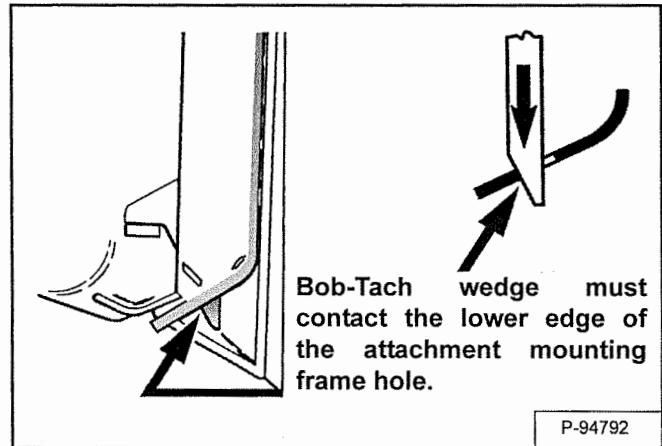
Figure 4



Push down on the Bob-Tach levers until they are fully engaged in the locked position [Figure 4] (wedges fully extended through the attachment mounting frame holes).

The levers and wedges must move freely [Figure 4].

Figure 5



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 5].

**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 and 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



#### 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 6

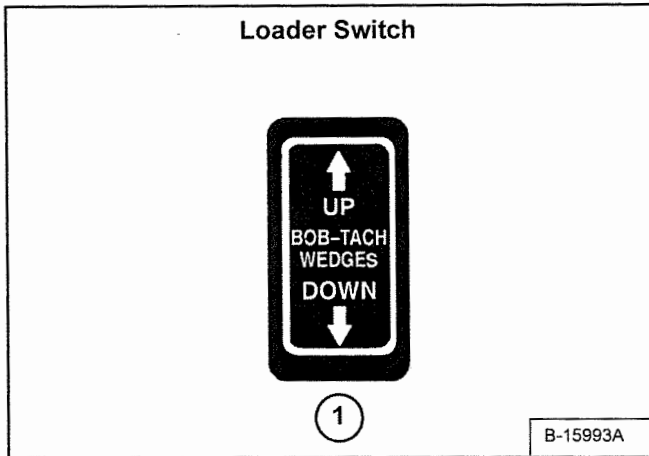
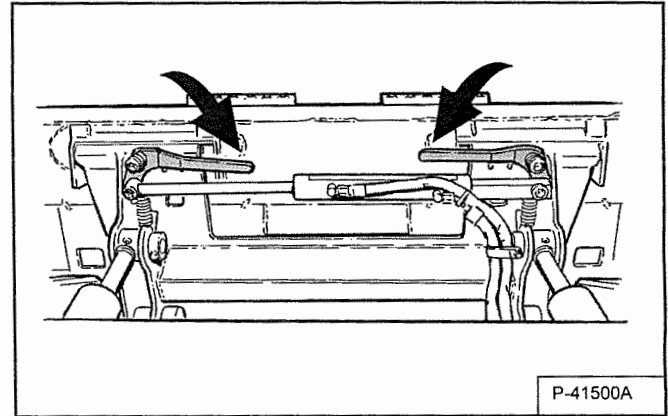
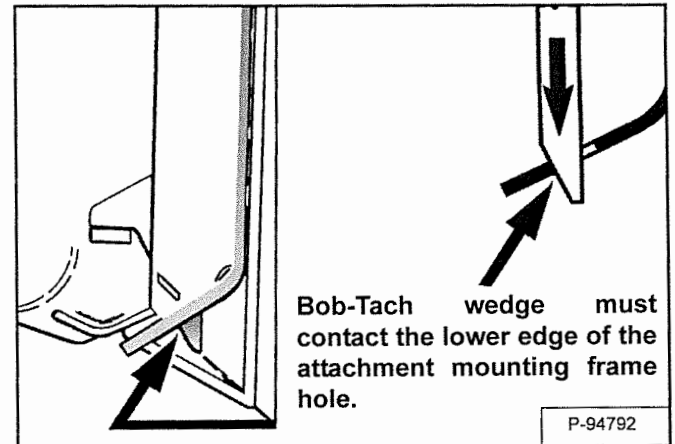


Figure 7



Push and hold the BOB-TACH "WEDGES DOWN" switch (Item 1) [Figure 6] until the levers are fully engaged in the locked position [Figure 7] (wedges fully extended through the attachment mounting frame holes).

Figure 8



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 8].

**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 9

LOADER MODEL	36 ROOT / INDUSTRIAL GRAPPLE	48 ROOT / INDUSTRIAL GRAPPLE
463	X	
553		X
S70	X	
S100		X
T110		X

X = Approved

The chart [Figure 9] shows the root / industrial grapple models approved for each model loader.

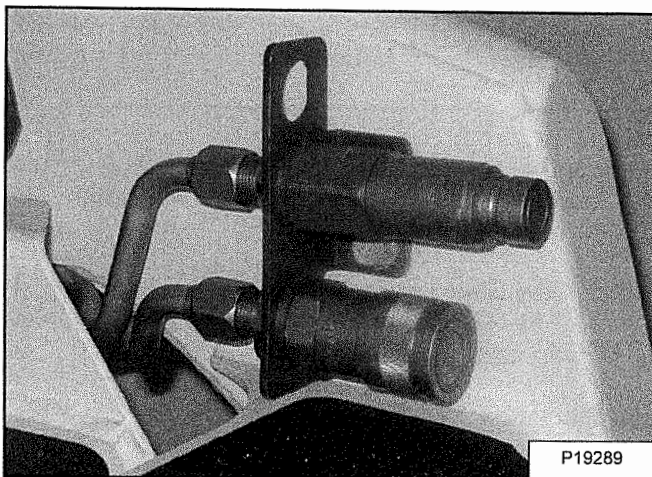
The warranty is void if this attachment is used on a non-approved carrier. See your Bobcat dealer for an updated list of approved carriers.



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

W-2662-0108

Figure 10



The machine must be equipped with front auxiliary hydraulics [Figure 10] for proper operation of the grapple. See your Bobcat dealer for available kits for your model loader.

## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Entering And Exiting The Loader



#### AVOID INJURY OR DEATH

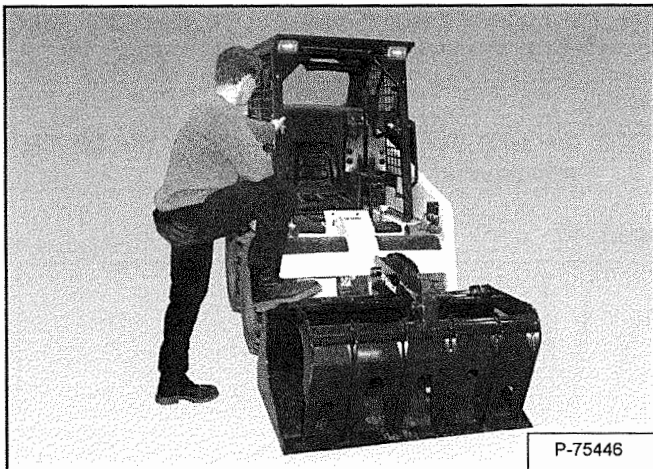
When operating the machine:

- 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

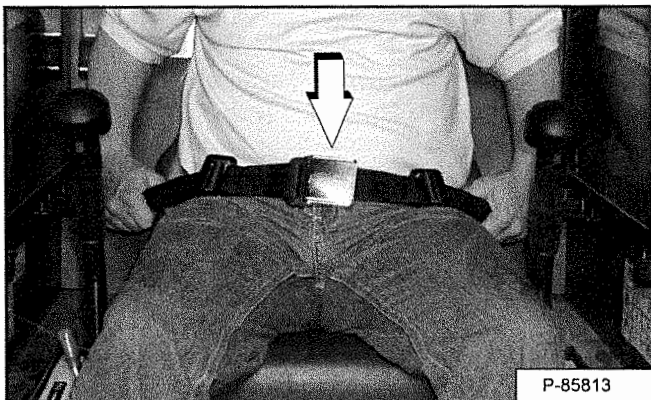
#### Entering

Figure 11



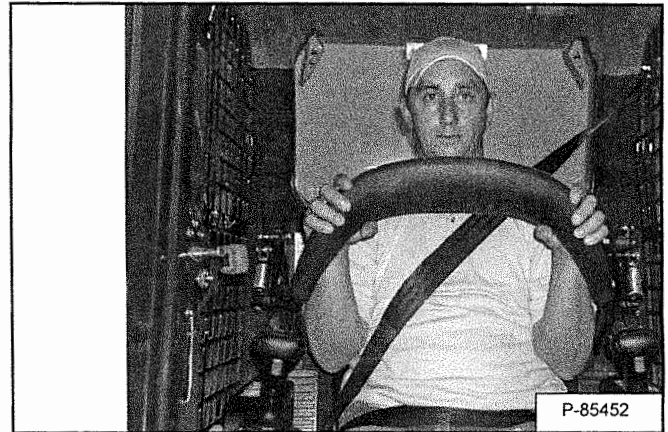
Use the attachment steps, grab handles and safety treads (on the loader lift arms and frame) to get on and off the loader [Figure 11]. Do not jump.

Figure 12



Enter the loader. Fasten the seat belt and adjust it so the buckle is centered between your hips [Figure 12].

Figure 13



Lower the seat bar and engage the parking brake [Figure 13].

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.

#### 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.



#### 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-2722-0208

## 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.

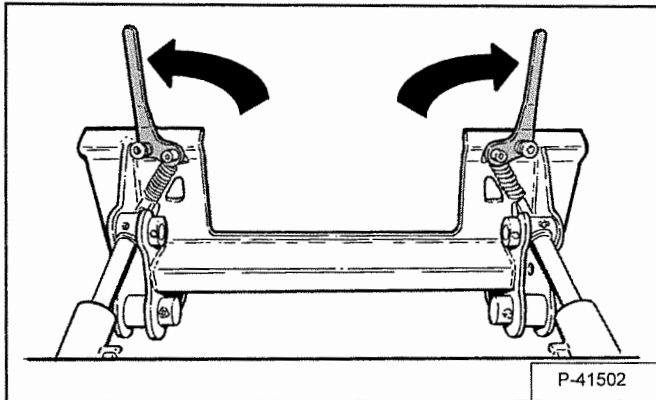
## WARNING

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

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 19.)

Figure 14

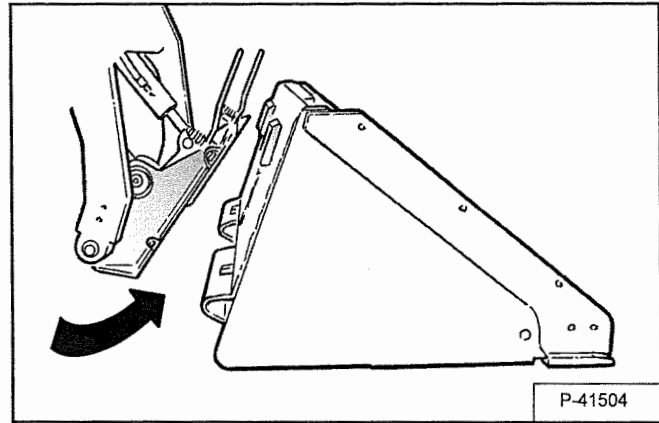


Pull the Bob-Tach levers up until they are fully raised (wedges fully raised) [Figure 14].

Enter the loader. (See Entering And Exiting The Loader on Page 23.)

Start the engine, press the PRESS TO OPERATE LOADER button and release the parking brake.

Figure 15

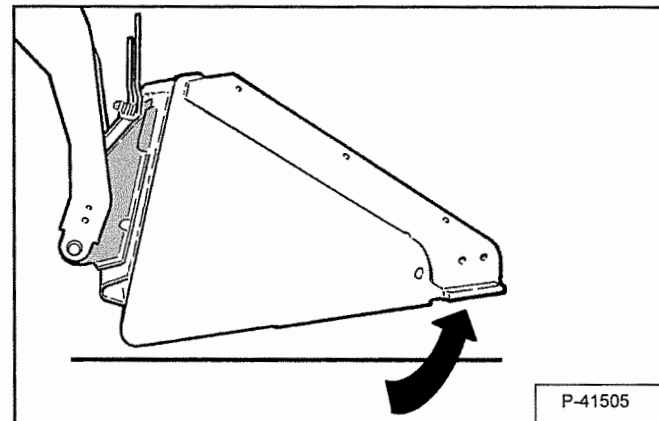


Lower the lift arms and tilt the Bob-Tach forward.

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 15].

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

Figure 16



Tilt the Bob-Tach backward until the attachment is slightly off the ground [Figure 16]. 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 23.)

## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Installation (Cont'd)

#### Hand Lever Bob-Tach (Cont'd)

# ! WARNING

### AVOID INJURY OR DEATH

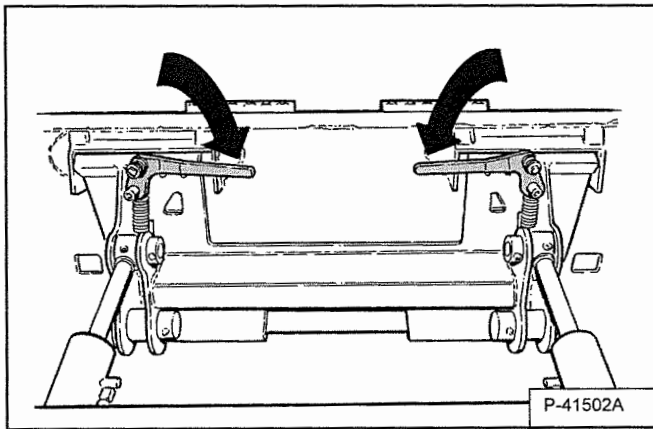
Before you leave the operator's seat:

- 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.

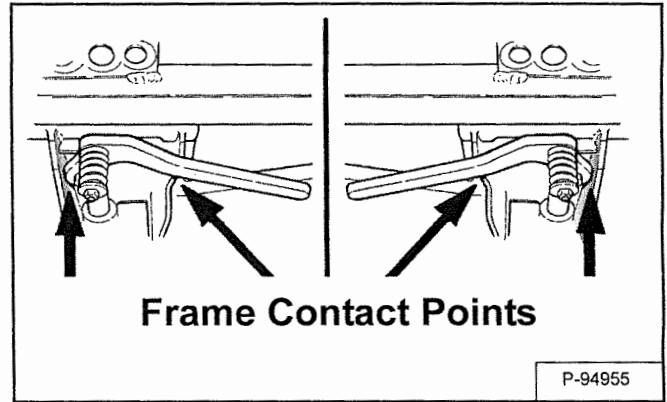
W-2463-1110

Figure 17



Push down on the Bob-Tach levers until they are fully engaged in the locked position [Figure 17] (wedges fully extended through the attachment mounting frame holes).

Figure 18



Both levers must contact the frame as shown when locked [Figure 18].

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

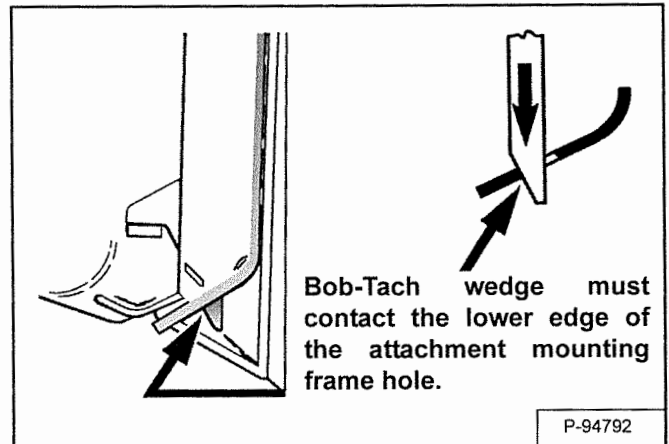
# ! WARNING

### 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 19



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 19].

## 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

This loader may be equipped with a Power Bob-Tach.

Enter the loader. (See Entering And Exiting The Loader on Page 23.)

Start the engine, press the PRESS TO OPERATE LOADER button and release the parking brake.

Figure 20

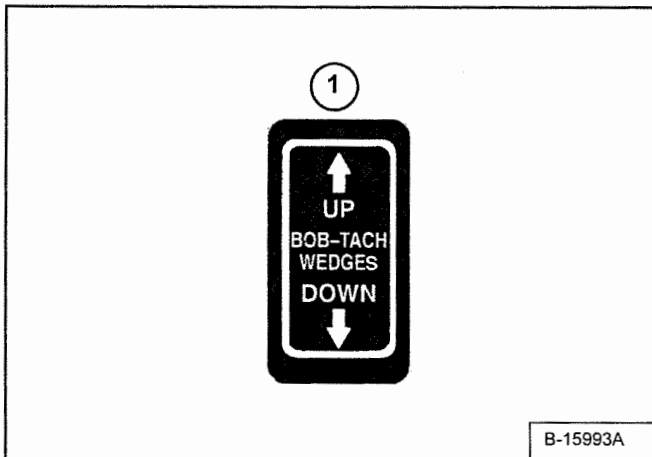
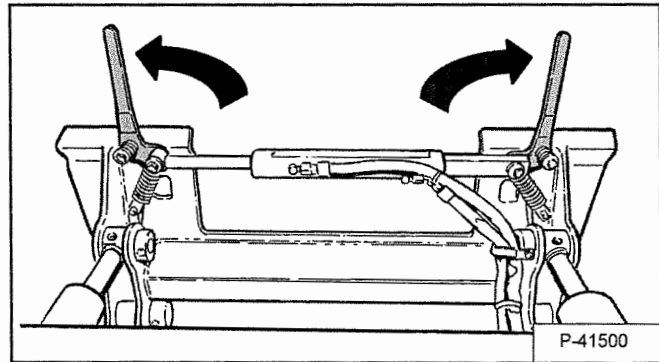
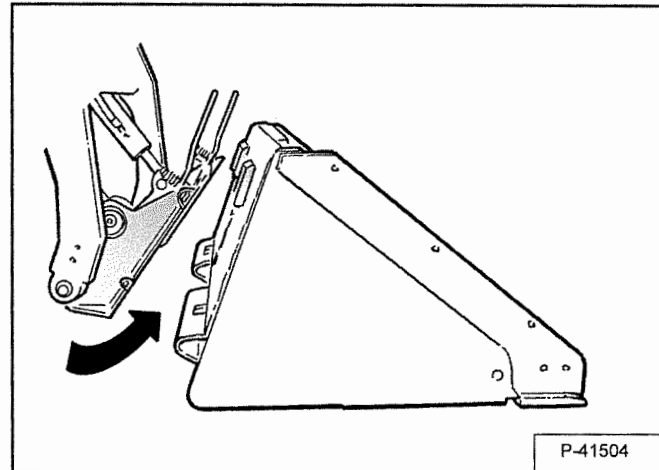


Figure 21



Push and hold the BOB-TACH "WEDGES UP" switch (Item 1) [Figure 20] until the levers are fully raised (wedges fully raised) [Figure 21].

Figure 22



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 22].

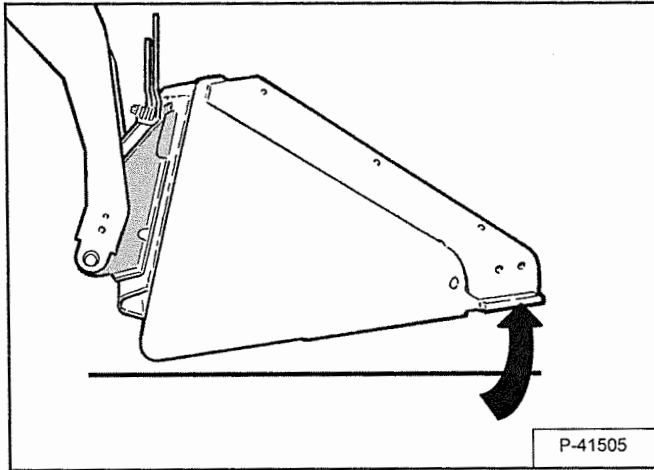
**NOTE:** Be sure the Bob-Tach levers do not hit the attachment.

## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Installation (Cont'd)

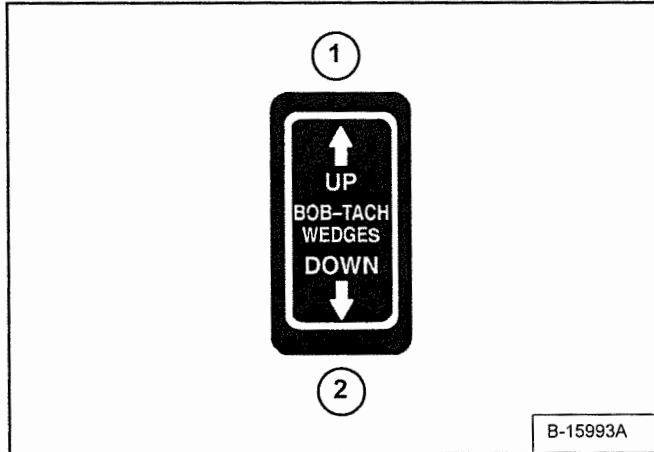
#### Power Bob-Tach (Cont'd)

Figure 23



Tilt the Bob-Tach backward until the attachment is slightly off the ground [Figure 23]. This will cause the attachment mounting frame to fit up against the front of the Bob-Tach.

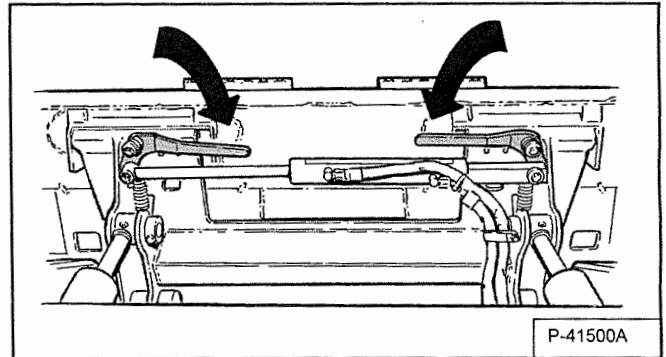
Figure 24



**NOTE:** The Power Bob-Tach system has continuous pressurized hydraulic oil 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.

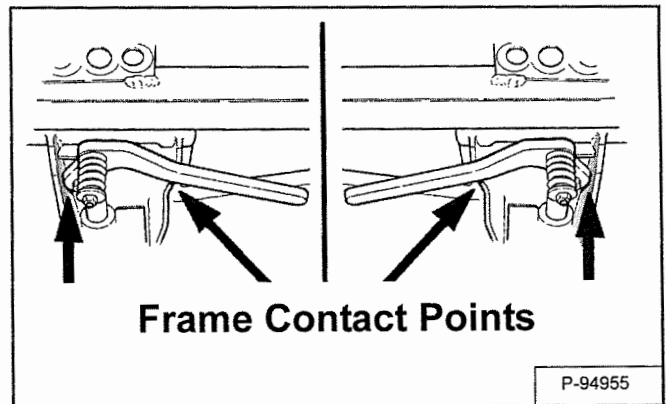
Push and hold the BOB-TACH "WEDGES UP" switch (Item 1) [Figure 24] until the levers are fully raised (wedges fully raised).

Figure 25



Push and hold the BOB-TACH "WEDGES DOWN" switch (Item 2) [Figure 24] until the levers are fully engaged in the locked position [Figure 25] (wedges fully extended through the attachment mounting frame holes).

Figure 26



Both levers must contact the frame as shown when locked [Figure 26].

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.

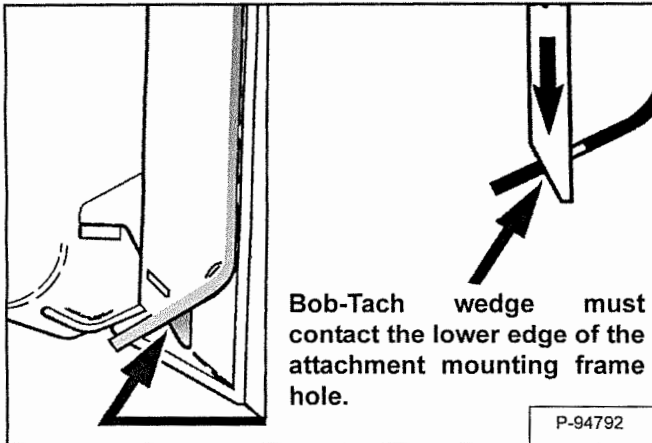
W-2715-0208

## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Installation (Cont'd)

#### Power Bob-Tach (Cont'd)

Figure 27



The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 27].

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 23.)

## 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-2463-1110

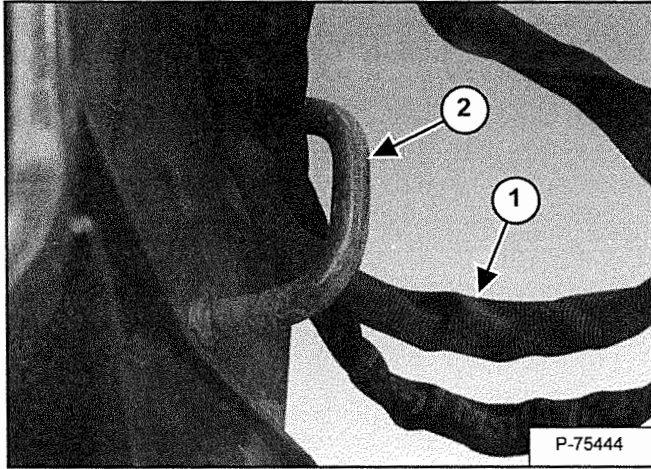
Connect auxiliary hydraulic hoses. (See Hydraulic Quick Couplers on page 32.)

## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Installation (Cont'd)

#### 463 Hydraulic Hose Routing

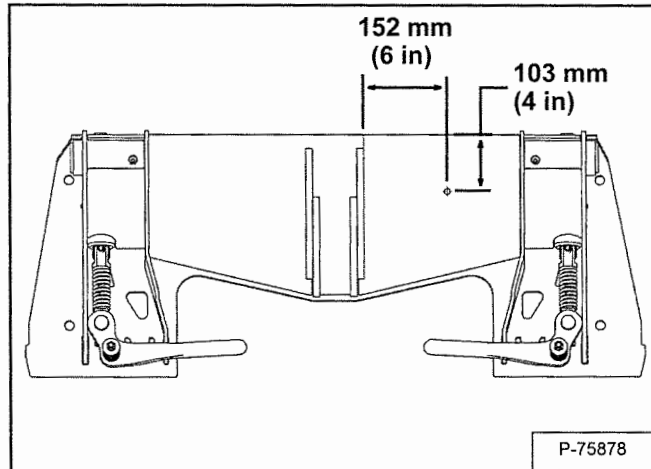
Figure 28



Route the hydraulic hoses (Item 1) through the hose guide (Item 2) [Figure 28] located behind the Bob-Tach on the machine.

#### 553 Hydraulic Hose Routing

Figure 29



Drill a 8,7 mm (0.343 in) hole through the Bob-Tach plate to the measurement shown [Figure 29]. Drill out the existing threads on the hose guide with a 10,3 mm (0.406 in) bit.

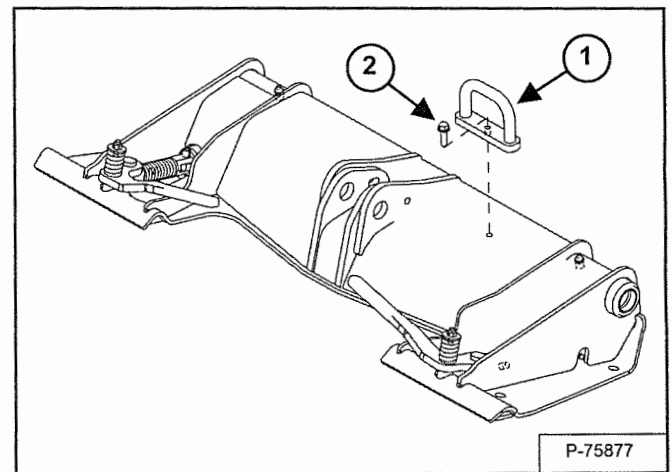
## ! WARNING

### AVOID INJURY OR DEATH

Wear safety goggles to prevent eye injury when drilling or grinding.

W-2108-1186

Figure 30



Mount the hose guide (Item 1) to the Bob-Tach with a 9,5 mm (0.38 in) self-tapping screw (Item 2) [Figure 30].

## ! 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

Route the hydraulic hoses through the hose guide.

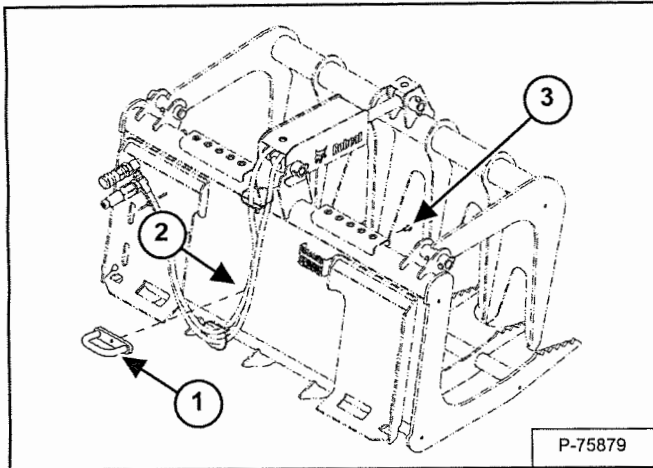


## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Installation (Cont'd)

#### S100 Hydraulic Hose Routing

Figure 31



Mount the hose guide (Item 1) to the hole (Item 2) [Figure 31] provided on the attachment mounting frame.

**NOTE: Hose guide is pre-threaded.**

Secure with a 9,5 mm (0.38 in) screw socket button head (Item 3) [Figure 31] with thread locker.

## **WARNING**

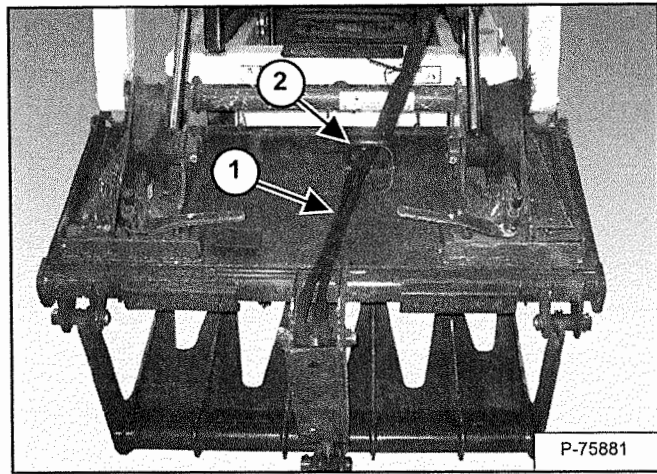
### AVOID INJURY OR DEATH

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 32



Route the hydraulic hoses (Item 1) through the hose guide (Item 2) [Figure 32].

## 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 32.)

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

**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.

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 23.)

Start the engine and release the parking brake (if equipped).

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 physician familiar with this injury.

W-2072-0807

Check the attachment hydraulic quick coupler connections for leaks.

## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Hydraulic Quick Couplers

# IMPORTANT

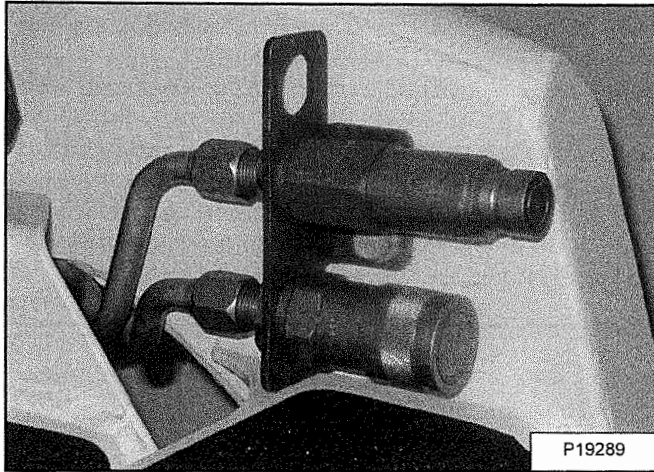
- Thoroughly clean the quick couplers before making connections. Dirt can quickly damage the system.
- Contain and dispose of any oil leakage in an environmentally safe manner.

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 33



# ⚠ 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-2220-0396

### 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 33].

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

**NOTE:** Check that the attachment hydraulic hoses are not twisted or contacting any moving parts of the attachment or loader. (See For First Time Installation on Page 31.) 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)

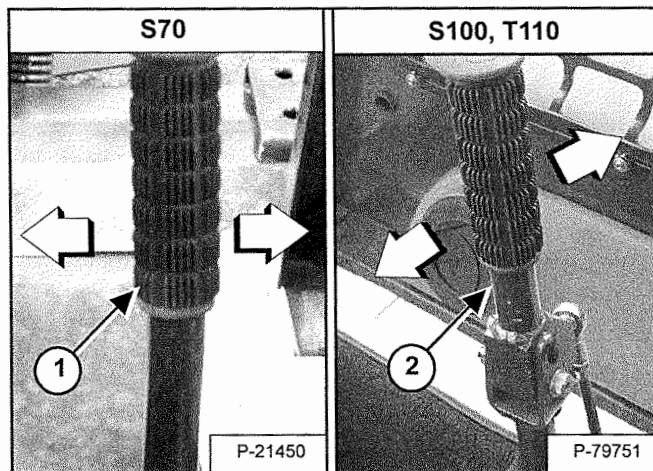
### Control Functions

#### Standard (If Equipped)

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.)

Figure 34



**NOTE:** Remove the hydraulic control lockout bolt from the right control lever before using the auxiliary control for the first time. See your loader's Operation & Maintenance Manual for correct procedure.

To close the grapple, move the lever (Item 1) [Figure 34] to the left.

To open the grapple, move the lever (Item 1) [Figure 34] to the right.

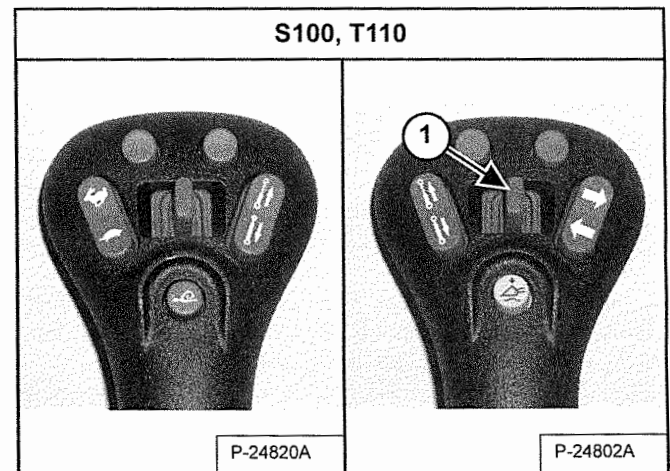
**NOTE:** If the grapple does not function as explained above, stop the engine. Relieve the auxiliary hydraulic pressure. Exit the loader and switch the couplers on the hoses.

#### SJC (If Equipped)

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.)

Figure 35



To open the grapple, press the right steering handle thumbswitch (Item 1) [Figure 35] to the right.

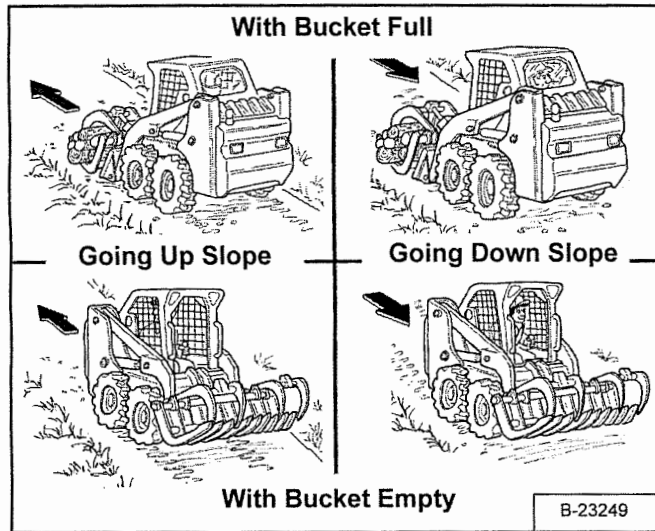
To close the grapple, press the right steering handle thumbswitch (Item 1) [Figure 35] to the left.

**NOTE:** If the grapple does not function as explained above, stop the engine. Relieve the auxiliary hydraulic pressure. Exit the loader and switch the couplers on the hoses.

## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Operation With The Loader

Figure 36



Go up and down slopes with the heavy end of the machine toward the top of the slope [Figure 36]. Go directly up or down a slope, not across the slope.

Raise the root / industrial grapple only high enough to avoid obstructions on rough ground.

## WARNING

### 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

### Filling The Root / Industrial Grapple

Figure 37

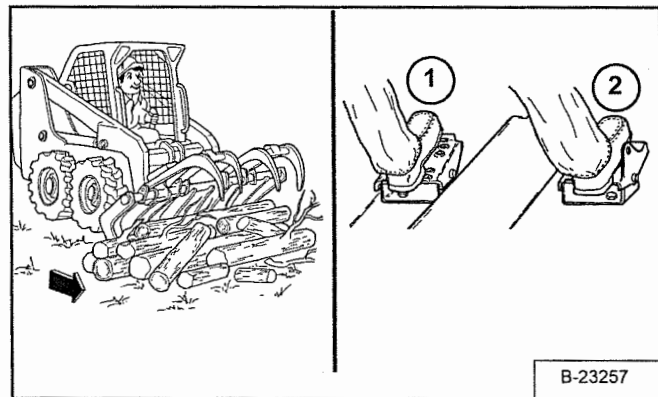
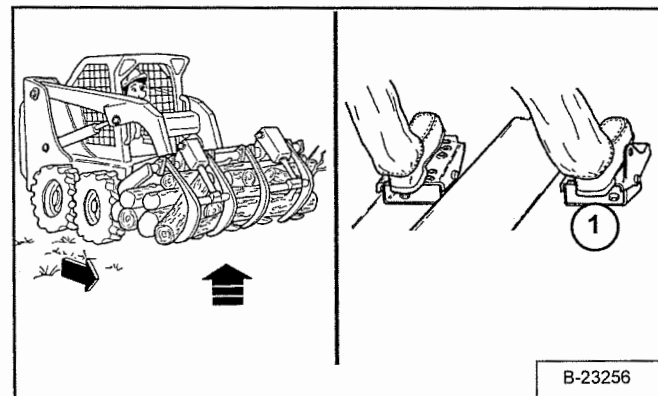


Figure 38



Open the grapple fully.

Lower the lift arms (Item 1) and tilt the root / industrial grapple forward (Item 2) [Figure 37] until the tip of the lower grapple forks are on the ground.

Drive slowly forward into the material. Tilt the root / industrial grapple backward (Item 1) [Figure 38] all the way when the root / industrial grapple is full. Close the grapple. (See Control Functions on Page 33.)

Drive backward away from the material.

## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Operation With The Loader (Cont'd)

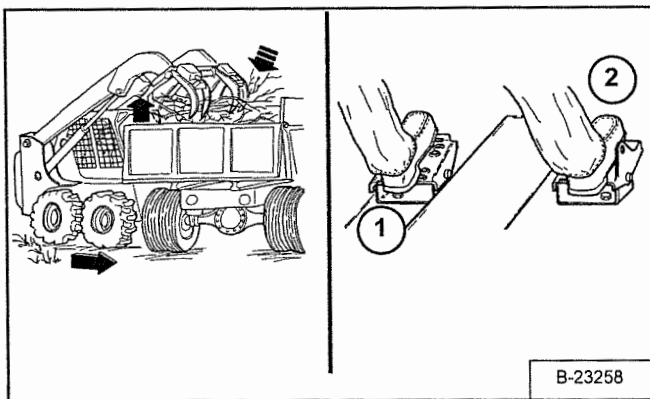
#### Emptying The Root / Industrial Grapple



Never dump over an obstruction, such as a post, that can enter the operator cab. The machine could tip forward and cause injury or death.

W-2057-0694

Figure 39



Keep the root / industrial grapple low when moving to the area where you want to empty the root / industrial grapple.

Raise the lift arms (Item 1). Level the root / industrial grapple (Item 2) [Figure 39] while raising the lift arms to help prevent material from falling off the back of the root / industrial grapple.

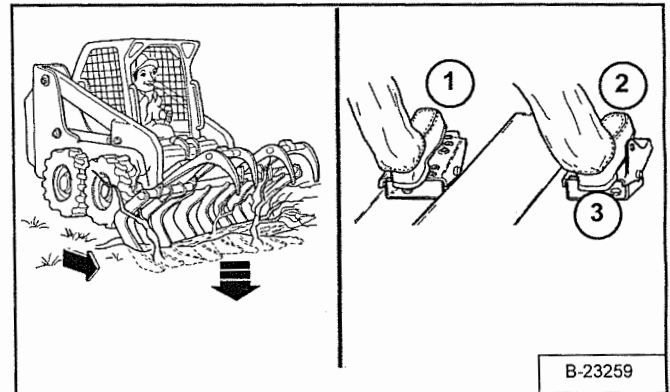
Drive forward slowly until the root / industrial grapple is over the top of the truck box or bin.

Open the Grapple. (See Control Functions on Page 33.)

Empty the root / industrial grapple (Item 2) [Figure 39]. If all the material is near the side of the truck box or bin, use the root / industrial grapple tilt to move it to the other side.

#### Digging Into The Ground

Figure 40



Lower the lift arms (Item 1) and put the root / industrial grapple on the ground (Item 2) [Figure 40].

Drive forward slowly and continue to tilt the root / industrial grapple down (Item 2) [Figure 40] until it enters the ground.

Raise the root / industrial grapple a small amount (Item 3) to increase traction. Continue to drive forward until the root / industrial grapple is full. When the ground is hard, raise and lower the cutting edge of the root / industrial grapple (Items 1 and 2) [Figure 40] while driving forward slowly.

Tilt the root / industrial grapple backward (Item 3) [Figure 40] as far as it will go when the root / industrial grapple is full and close the grapple. (See Control Functions on Page 33.)

## 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. (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 23.)

## ! WARNING

### AVOID INJURY OR DEATH

Before you leave the operator's seat:

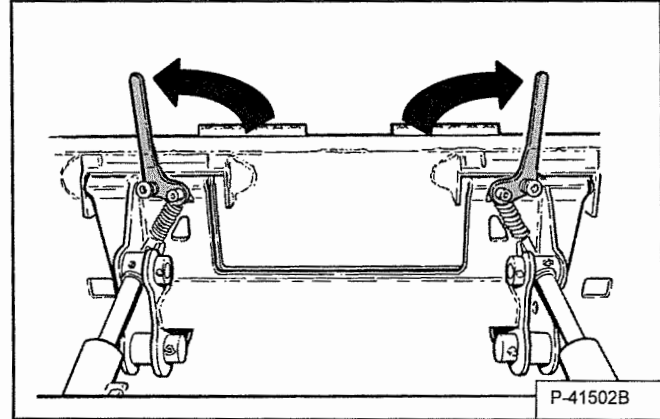
- Lower the lift arms and put the attachment flat on the ground.
- Stop the engine.
- Engage the parking brake.
- Raise the seat bar.
- Move all controls to the **NEUTRAL / LOCKED** position to make sure the lift, tilt and traction drive functions are deactivated.

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-2463-1110

Disconnect auxiliary hydraulic hoses. (See Hydraulic Quick Couplers on Page 32.)

Figure 41



Pull the Bob-Tach levers up [Figure 41] until they are fully raised (wedges fully raised).

## ! WARNING

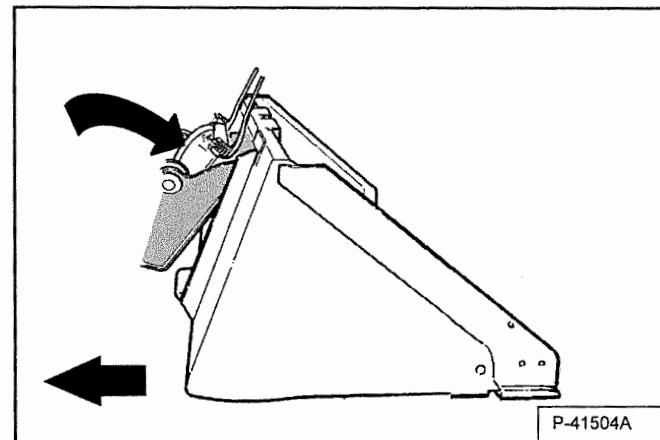
Bob-Tach levers have spring tension. Hold lever tightly and release slowly. Failure to obey warning can cause injury.

W-2054-1285

Enter the loader. (See Entering And Exiting The Loader on Page 23.)

Start the engine, press the **PRESS TO OPERATE LOADER** button and release the parking brake.

Figure 42



Tilt the Bob-Tach forward and drive the loader backward, away from the attachment [Figure 42].

## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Removal (Cont'd)

#### *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 machine.

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 23.)



#### 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-2463-1110

Disconnect auxiliary hydraulic hoses (if applicable). (See Hydraulic Quick Couplers on Page 32.)

Enter the loader. (See Entering And Exiting The Loader on Page 23.)

Start the engine, press the **PRESS TO OPERATE LOADER** button and release the parking brake.

Figure 43

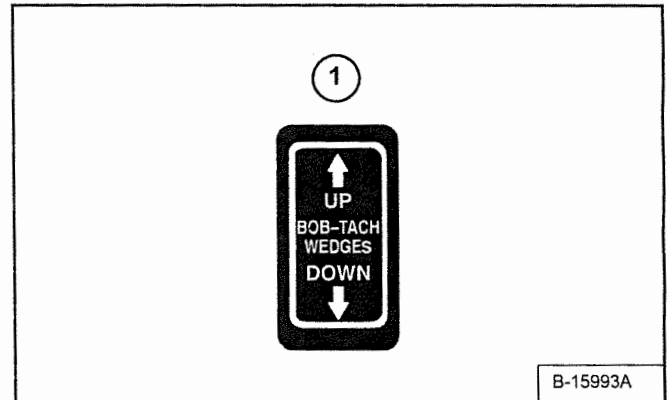
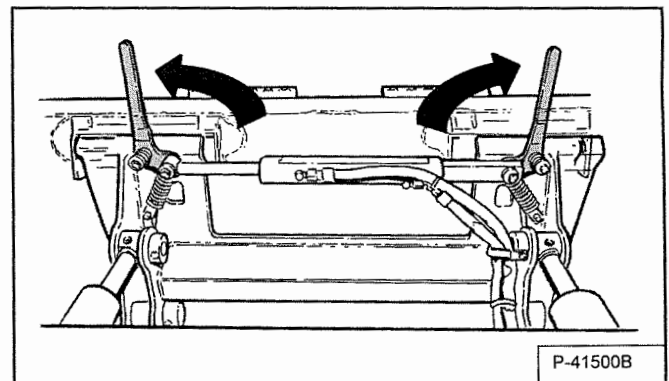


Figure 44



Push and hold the BOB-TACH "WEDGES UP" switch (Item 1) [Figure 43] (Front Panel) until the levers [Figure 44] are fully raised (wedges fully raised).

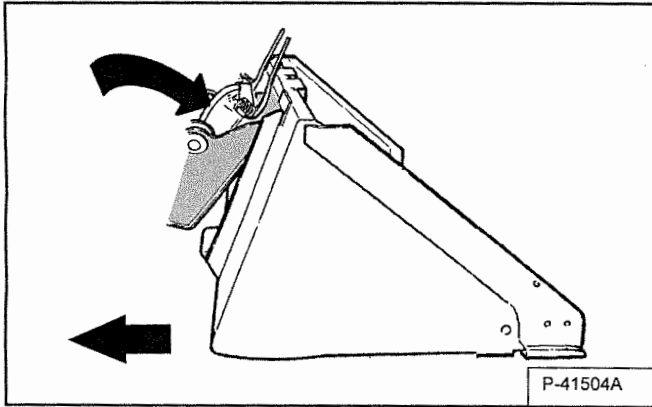


## OPERATING PROCEDURE WITH LOADERS (CONT'D)

### Removal (Cont'd)

#### Power Bob-Tach (Cont'd)

Figure 45



Tilt the Bob-Tach forward and drive the loader backward, away from the attachment [Figure 45].

**NOTE:** The Power Bob-Tach system has continuous pressurized hydraulic oil 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.

## OPERATING PROCEDURE WITH MINI LOADERS

### Approved Mini Loader Models And Requirements

Figure 46

MINI LOADER MODEL	36 ROOT / INDUSTRIAL GRAPPLE	48 ROOT / INDUSTRIAL GRAPPLE
MT50		
MT52	X	
MT55	X	
MT85		X
MT100		X

X = Approved

The chart [Figure 46] shows the root / industrial grapple models approved for each model mini loader.

(See your Bobcat dealer for an up to date list of approved models.)

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.

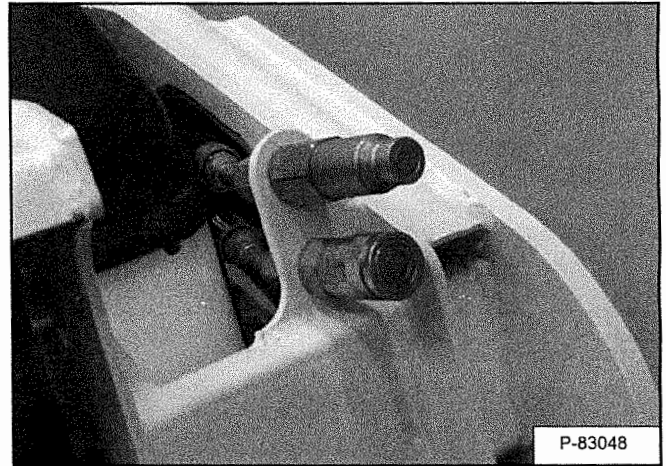


## WARNING

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

W-2662-0108

Figure 47



The loader must be equipped with front auxiliary hydraulics [Figure 47] for proper operation of the root / industrial grapple. See your Bobcat dealer for available kits.

## OPERATING PROCEDURE WITH MINI LOADERS (CONT'D)

### Entering And Leaving The Operator's Position

# WARNING

## AVOID INJURY OR DEATH

When operating the machine:

- Operate only from the operator's position at the rear of the loader.
- Always keep your hands on the controls.
- Stay away from the tracks.

W-2407-0801

# WARNING

## AVOID INJURY OR DEATH

- Movement of the attachment will occur if the tilt control is NOT in neutral when the engine is started.
- Always check that all levers are in neutral before starting the engine.

W-2482-1003

# WARNING

## AVOID INJURY OR DEATH

When using the ride-on platform:

- Operate only with feet on platform and hands on controls or grab handles.
- Always look in the direction of travel.
- Make sure swing area is clear of bystanders and objects.
- Avoid drop-offs and obstacles.

W-2480-1003

### Entering

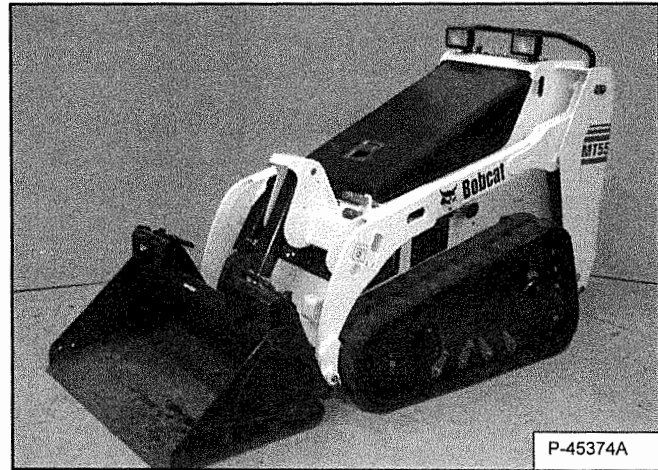
Enter the operator's position at the rear of the mini loader.

Engage the parking brake and place all controls in neutral.

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

### Leaving

Figure 48



Stop the mini loader on level ground [Figure 48].

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

Disengage the auxiliary hydraulics.

Engage the parking brake.

Stop the engine.

Remove the key to prevent operation of the mini loader by unauthorized personnel.

Leave the operator's position.

# 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-2722-0208

## OPERATING PROCEDURE WITH MINI LOADERS (CONT'D)

### Installation

#### Hand Lever Bob-Tach

**NOTE:** The illustrations and instructions provided explain how to install a bucket attachment on to a mini 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.

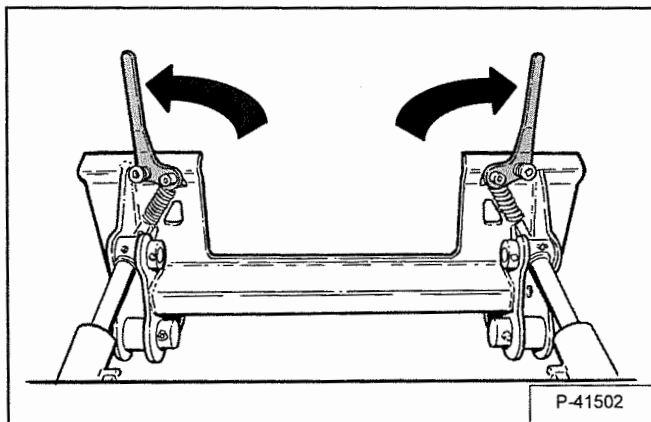


Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause serious injury or death.

W-2744-0608

Always inspect the mini loader's Bob-Tach and the attachment mounting frame before installation. See the mini loader's Operation & Maintenance Manual. (See DAILY INSPECTION on Page 19.)

Figure 49

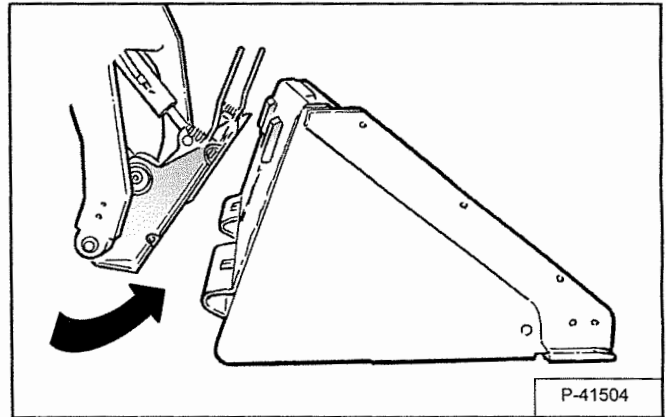


Pull the Bob-Tach levers up until they are fully raised (wedges fully raised) [Figure 49].

Move to the operator's position.

Start the engine and release the parking brake.

Figure 50

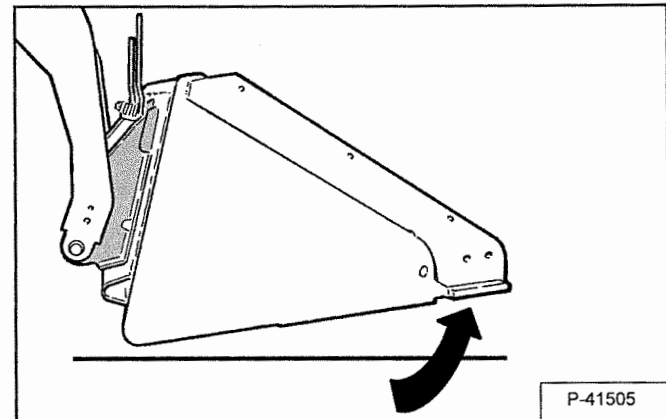


Lower the lift arms and tilt the Bob-Tach forward.

Drive the mini loader slowly forward until the top edge of the Bob-Tach is completely under the top flange of the attachment [Figure 50].

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

Figure 51



Tilt the Bob-Tach backward until the attachment is slightly off the ground [Figure 51]. This will cause the attachment mounting frame to fit up against the front of the Bob-Tach.

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

Stop the engine and leave the operator's position. (See Entering And Leaving The Operator's Position on Page 40.)

## OPERATING PROCEDURE WITH MINI LOADERS (CONT'D)

### Installation (Cont'd)

#### Hand Lever Bob-Tach (Cont'd)

# ! WARNING

### AVOID INJURY OR DEATH

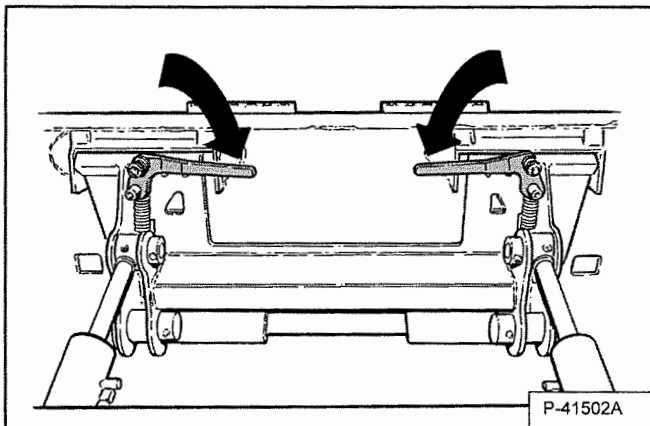
Before you leave the operator's position:

- 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.

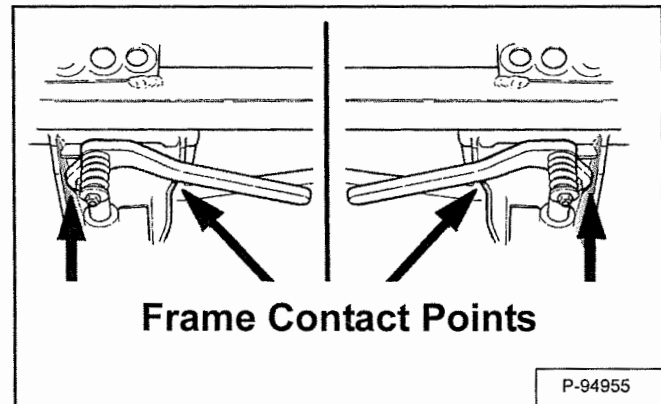
W-2722-0208

Figure 52



Push down on the Bob-Tach levers until they are fully engaged in the locked position [Figure 52] (wedges fully extended through the attachment mounting frame holes).

Figure 53



Both levers must contact the frame as shown when locked [Figure 53].

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

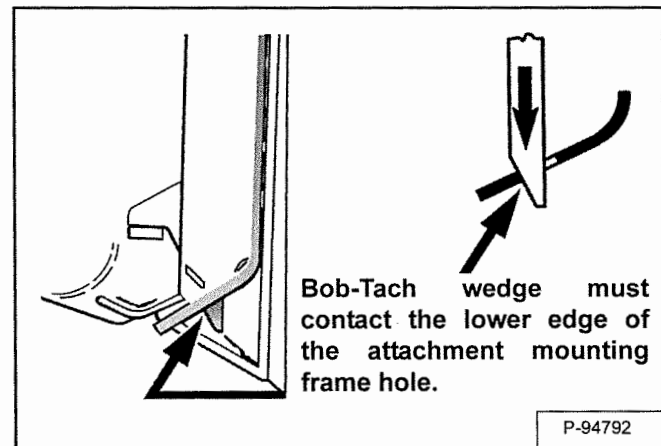
# ! WARNING

### 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 54



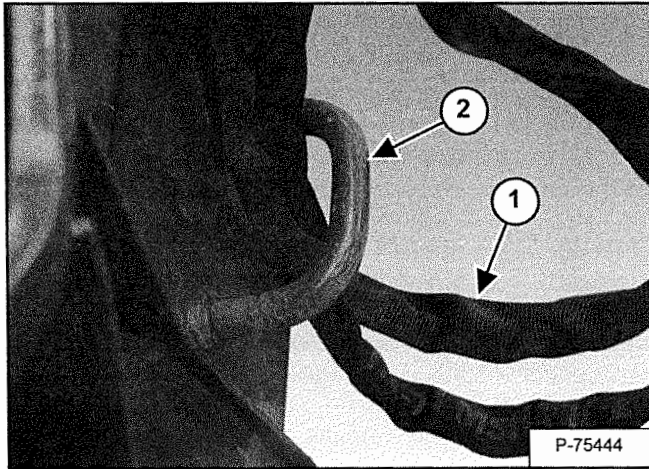
The wedges must extend through the holes in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 54].

## OPERATING PROCEDURE WITH MINI LOADERS (CONT'D)

### Installation (Cont'd)

#### *Hose Routing*

**Figure 55**



Route the hydraulic hoses (Item 1) through the hose guide (Item 2) [Figure 55] located behind the Bob-Tach on the machine.

Connect auxiliary hydraulic hoses. (See Hydraulic Quick Couplers on Page 45.)

## OPERATING PROCEDURE WITH MINI LOADERS (CONT'D)

### Installation (Cont'd)

#### *For First Time Installation*

New attachments and new mini 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 mini 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 mini loader engine off and using the hose guides (if equipped), route the attachment hydraulic hoses to the mini loader. Connect the attachment hydraulic quick couplers to the mini loader couplers. (See Hydraulic Quick Couplers on Page 45.)

Check that the attachment hydraulic hoses are not twisted or contacting any moving parts of the mini 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 mini loader. Do not remove the quick couplers.

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

With the twist(s) removed from the hydraulic hoses, tighten the attachment quick coupler connections while they are still connected to the mini 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 mini loader.

Enter the operator's position. (See Entering And Leaving The Operator's Position on Page 40.)

Start the engine and release the parking brake (if equipped).

Engage auxiliary hydraulics. (See the mini 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 physician familiar with this injury.**

W-2072-0807

Check the attachment hydraulic quick coupler connections for leaks.

## OPERATING PROCEDURE WITH MINI LOADERS (CONT'D)

### Hydraulic Quick Couplers

# IMPORTANT

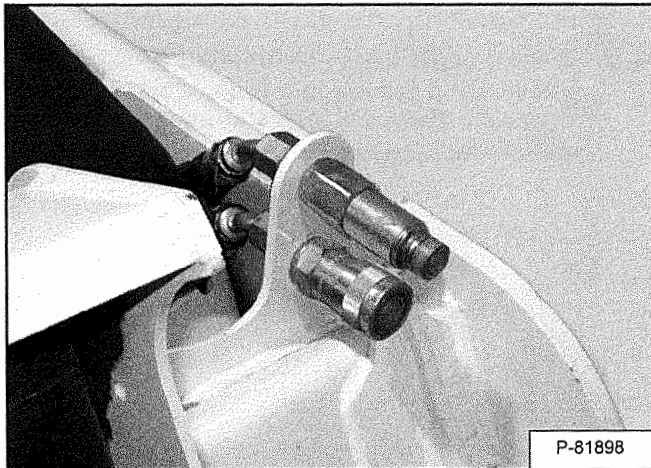
- Thoroughly clean the quick couplers before making connections. Dirt can quickly damage the system.
- Contain and dispose of any oil leakage in an environmentally safe manner.

I-2278-0608

New attachments and new mini 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 mini 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 56



# ! 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-2220-0396

### *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 56].

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

**NOTE:** Check that the attachment hydraulic hoses are not twisted or contacting any moving parts of the mini loader or attachment. (See For First Time Installation on Page 44.) for proper adjustment.

### *To Disconnect:*

Relieve hydraulic pressure. (See the mini 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 MINI LOADERS (CONT'D)

### Control Functions

# WARNING

### AVOID INJURY OR DEATH

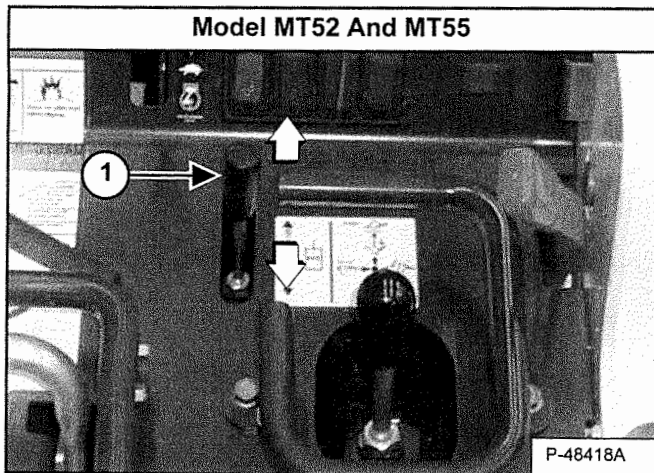
When operating the machine:

- Operate only from the operator's position at the rear of the loader.
- Always keep your hands on the controls.
- Stay away from the tracks.

W-2407-0801

With the operator at the operator's position at the rear of the mini loader, start the engine.

Figure 57



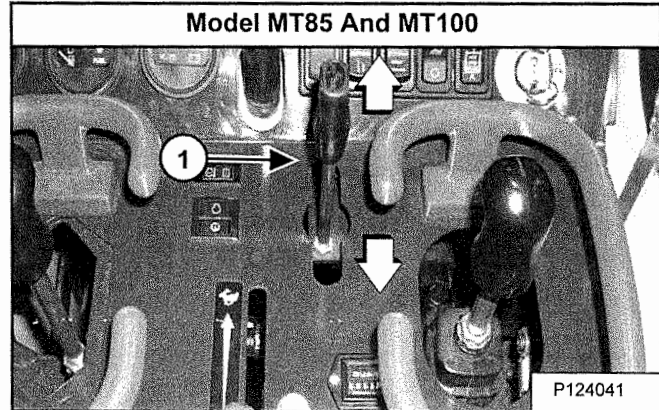
Your mini loader is equipped with auxiliary hydraulics which provides hydraulic power for attachments. The auxiliary control lever (Item 1) [Figure 57] (MT52 and MT55) will be used to operate the grapple.

Push the auxiliary hydraulic lever forward to close the grapple.

Pull the auxiliary hydraulic lever back to open the grapple.

**NOTE:** If the grapple does not function as explained above, stop the engine. Relieve the auxiliary hydraulic pressure. Exit the mini loader and switch the couplers on the hoses.

Figure 58



Your mini loader is equipped with auxiliary hydraulics which provides hydraulic power for attachments. The auxiliary control lever (Item 1) [Figure 58] (MT85 and MT100) will be used to operate the grapple.

Push the auxiliary hydraulic lever forward to close the grapple.

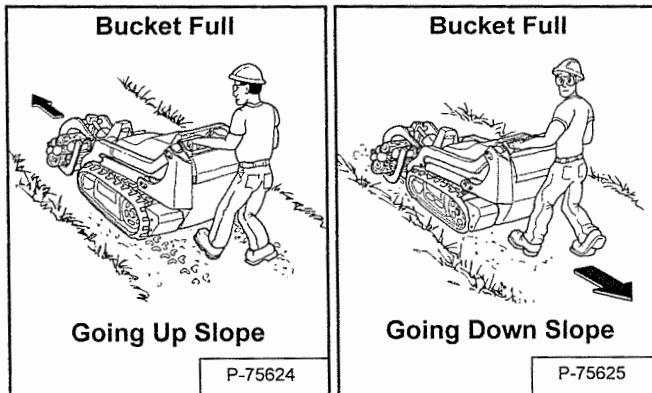
Pull the auxiliary hydraulic lever back to open the grapple.

**NOTE:** If the grapple does not function as explained above, stop the engine. Relieve the auxiliary hydraulic pressure. Exit the mini loader and switch the couplers on the hoses.

## OPERATING PROCEDURE WITH MINI LOADERS (CONT'D)

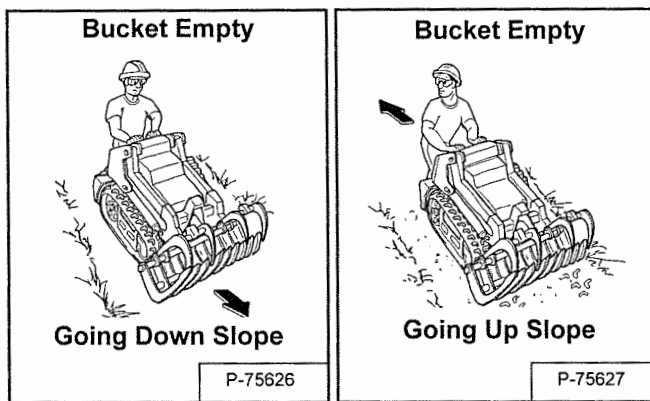
### Operation With The Mini Loader

Figure 59



Keep the heavy end uphill. With a full grapple, the front of the machine is the heavy end [Figure 59].

Figure 60



Keep the heavy end uphill. With empty grapple, the rear of the machine is the heavy end [Figure 60].

Go directly up or down a slope; never across a slope or curb.

Raise the root / industrial grapple only high enough to avoid obstructions on rough ground.

## **WARNING**

### 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

### Filling The Root / Industrial Grapple

**NOTE:** The procedure outlined below is shown using the M52 and M55 controls. For use with the MT85 and MT100, the controls may vary slightly, but the procedure is the same.

Figure 61

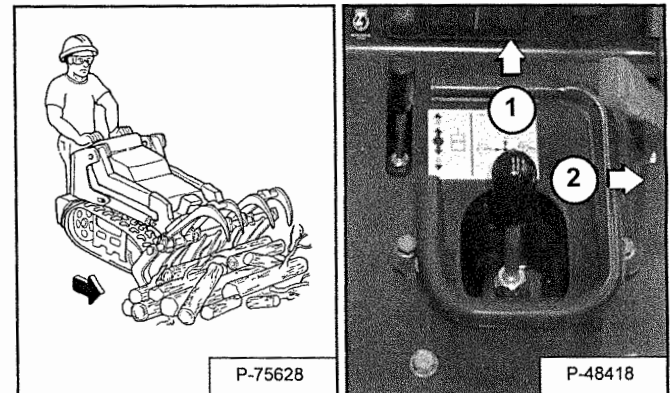
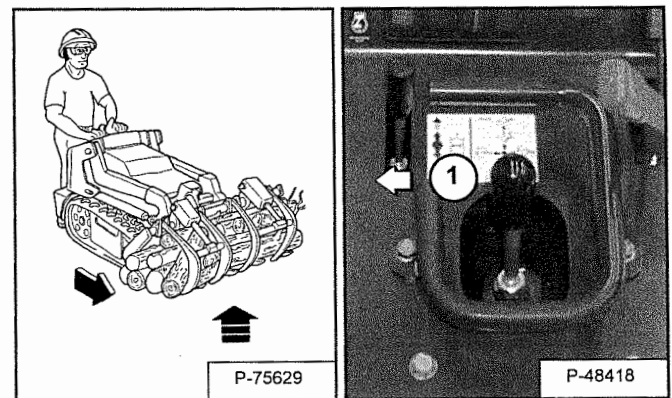


Figure 62



Open the grapple fully. (See Control Functions on Page 46.)

Lower the lift arms (Item 1) and tilt the root / industrial grapple forward (Item 2) [Figure 61] until the tip of the lower grapple forks are on the ground.

Drive slowly forward into the material. Tilt the root / industrial grapple backward (Item 1) [Figure 62] all the way when the root / industrial grapple is full. Close the grapple. (See Control Functions on Page 46.)

Drive backward away from the material.

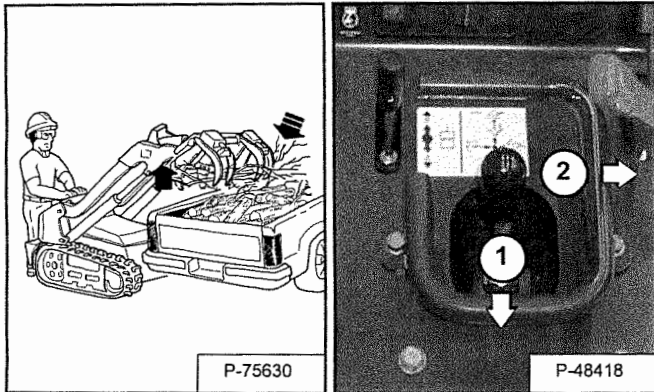
## OPERATING PROCEDURE WITH MINI LOADERS (CONT'D)

### Operation With The Mini Loader (Cont'd)

#### Emptying The Root / Industrial Grapple

**NOTE:** The procedure outlined below is shown using the M52 and M55 controls. For use with the MT85 and MT100, the controls may vary slightly, but the procedure is the same.

Figure 63



Keep the root / industrial grapple low when moving to the area where you want to empty the root / industrial grapple.

Raise the lift arms (Item 1). Level the root / industrial grapple (Item 2) [Figure 63] while raising the lift arms to help prevent material from falling off the back of the root / industrial grapple.

Drive forward slowly until the root / industrial grapple is over the top of the truck box or bin.

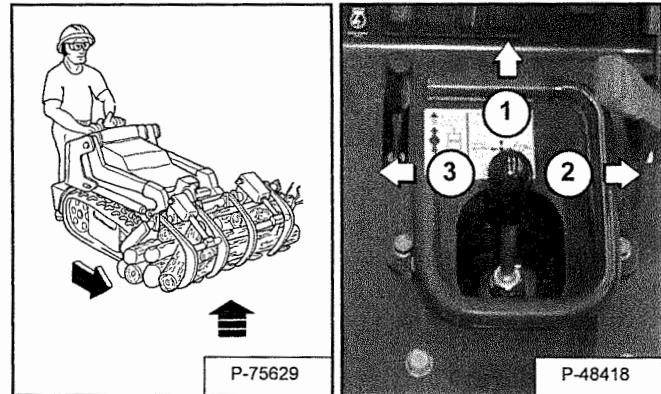
Open the Grapple. (See Control Functions on Page 46.)

Empty the root / industrial grapple (Item 2) [Figure 63]. If all the material is near the side of the truck box or bin, use the root / industrial grapple tilt to move it to the other side.

#### Digging Into The Ground

**NOTE:** The procedure outlined below is shown using the M52 and M55 controls. For use with the MT85 and MT100, the controls may vary slightly, but the procedure is the same.

Figure 64



Lower the lift arms (Item 1) and put the root / industrial grapple on the ground (Item 2) [Figure 64].

Drive forward slowly and continue to tilt the root / industrial grapple down (Item 2) [Figure 64] until it enters the ground.

Raise the root / industrial grapple a small amount (Item 3) to increase traction. Continue to drive forward until the root / industrial grapple is full. When the ground is hard, raise and lower the cutting edge of the root / industrial grapple (Items 1 and 2) [Figure 64] while driving forward slowly.

Tilt the root / industrial grapple backward (Item 3) [Figure 64] as far as it will go when the root / industrial grapple is full and close the grapple. (See Control Functions on Page 46.)

## OPERATING PROCEDURE WITH MINI 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 mini loader.

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

Leave the operator's position. (See Entering And Leaving The Operator's Position on Page 40.)

## ! WARNING

### AVOID INJURY OR DEATH

Before you leave the operator's position:

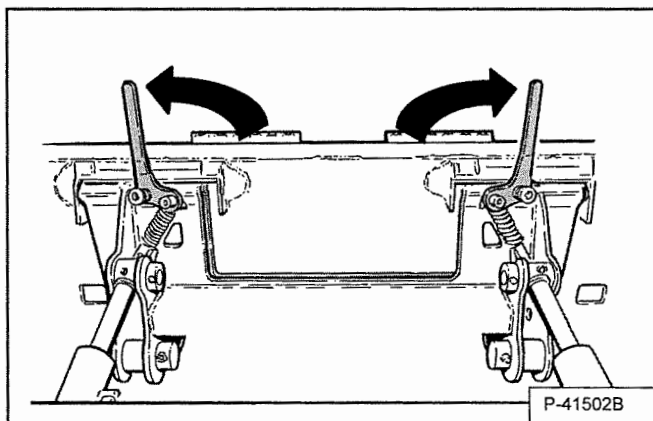
- Lower the lift arms, put the attachment flat on the ground.
- Stop the engine and engage the parking brake.
- Move all pedals, handles, joysticks, and other controls until they are LOCKED or in the NEUTRAL position.

**SEE THE MACHINE OPERATION & MAINTENANCE MANUAL FOR MORE INFORMATION.**

W-2722-0208

Disconnect auxiliary hydraulic hoses. (See Hydraulic Quick Couplers on Page 45.)

Figure 65



Pull the Bob-Tach levers up until they are fully raised (wedges fully raised) [Figure 65].

## ! WARNING

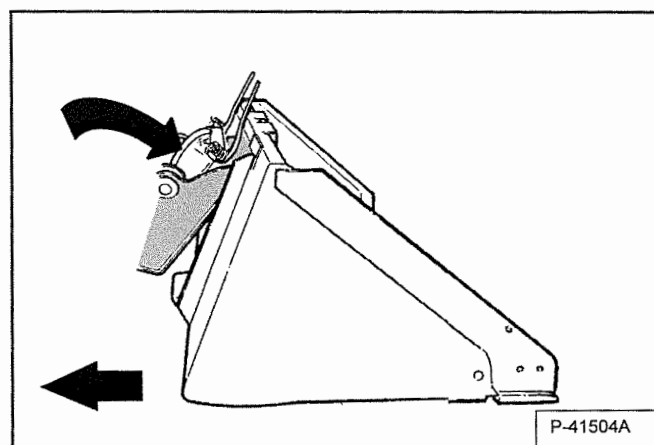
Bob-Tach levers have spring tension. Hold lever tightly and release slowly. Failure to obey warning can cause injury.

W-2054-1285

Enter the operator's position. (See Entering And Leaving The Operator's Position on Page 40.)

Start the engine and release the parking brake.

Figure 66



Tilt the Bob-Tach forward and drive the mini loader backward, away from the attachment [Figure 66].

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS

### Approved Small Articulated Loaders Models And Requirements

Figure 67

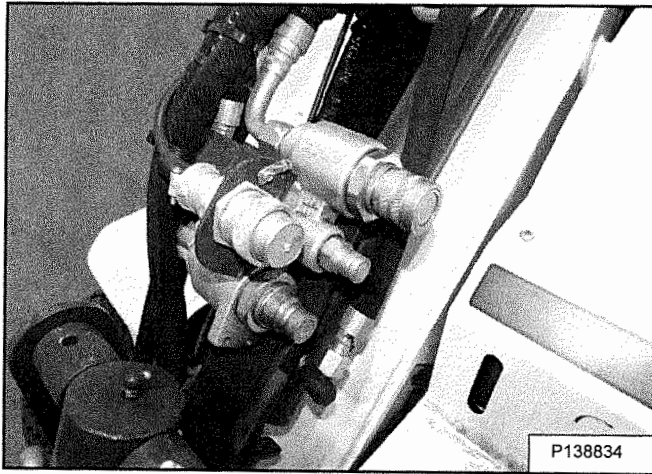
SMALL ARTICULATED LOADER MODEL	36 ROOT / INDUSTRIAL GRAPPLE
L23	X
L28	X

X = Approved

The chart [Figure 67] shows the approved root / industrial grapple models for each small articulated loader model.

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

Figure 68



The small articulated loader must be equipped with front auxiliary hydraulics [Figure 68] for proper operation of the grapple. See your Bobcat dealer for available kits.

## **WARNING**

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

W-2662-0108

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Entering And Exiting The Small Articulated Loader

#### Entering

**NOTE:** The right and left side of the small articulated loader as viewed from the operator seat.



#### AVOID INJURY OR DEATH

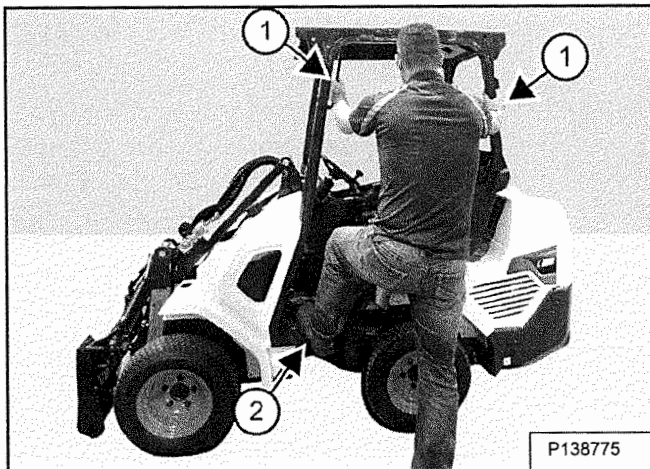
When operating the machine:

- Keep the seat belts fastened snugly.
- The arm rest must be lowered.
- Keep your feet and arms inside the cab.

W-2454-1102

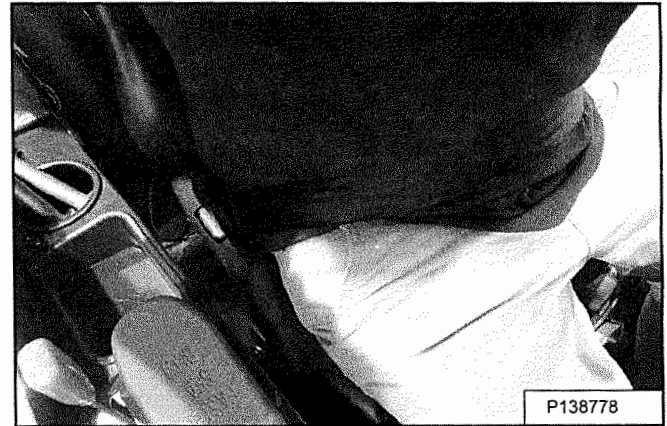
**NOTE:** The following picture may not show your exact machine but the procedure is the same.

Figure 69



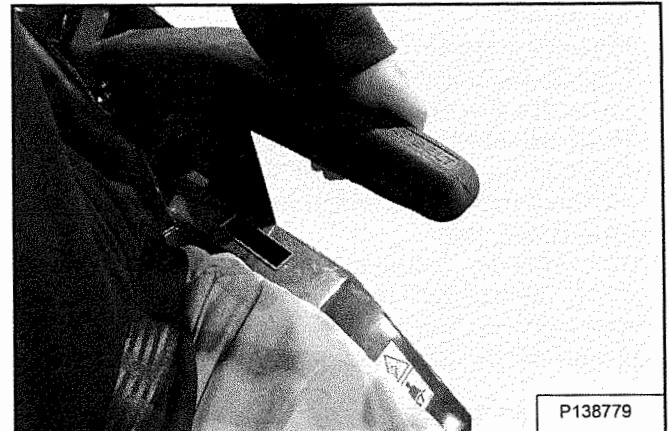
Use the grab handles (Item 1) and step (Item 2) [Figure 69] (on cab) to enter and exit the small articulated loader.

Figure 70



Enter the small articulated loader and fasten the seat belt [Figure 70].

Figure 71



Fully lower the arm rest and engage parking brake [Figure 71].

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

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Entering And Exiting The Small Articulated Loader (Cont'd)

#### *Exiting*

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

Stop the engine and engage the parking brake.

Lift the arm rest and make sure the lift, tilt, auxiliary hydraulics, drive functions and telescopic (if equipped) are deactivated.

Remove the key.

Exit the small articulated loader.



#### **AVOID INJURY OR DEATH**

Before you leave the operator's seat:

- Lower the lift arm and put the attachment flat on the ground.
- Stop the engine.
- Engage the parking brake.
- Raise the arm rest.
- Move all controls to the **NEUTRAL / LOCKED** position to make sure the lift, tilt, telescoping, auxiliary hydraulics and traction drive functions are deactivated.
- The Operator Interlock Control System (OICS) must deactivate these functions when the armrest is up. See your Bobcat dealer for service if controls do not activate.

**SEE THE MACHINE OPERATION & MAINTENANCE MANUAL FOR MORE INFORMATION.**

W-3095-0220

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Installation

#### Hand Lever Bob-Tach

**NOTE:** The illustrations and instructions provided explain how to install a bucket attachment on to a small articulated 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.

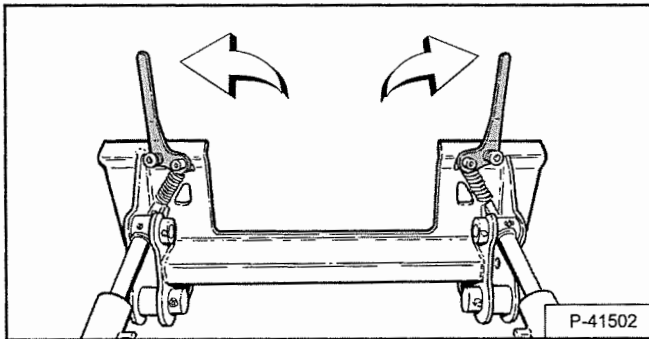
## WARNING

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

Always inspect the small articulated loader's Bob-Tach and the attachment mounting frame before installation. See the small articulated loader's Operation & Maintenance Manual. (See DAILY INSPECTION on Page 19.)

Figure 72

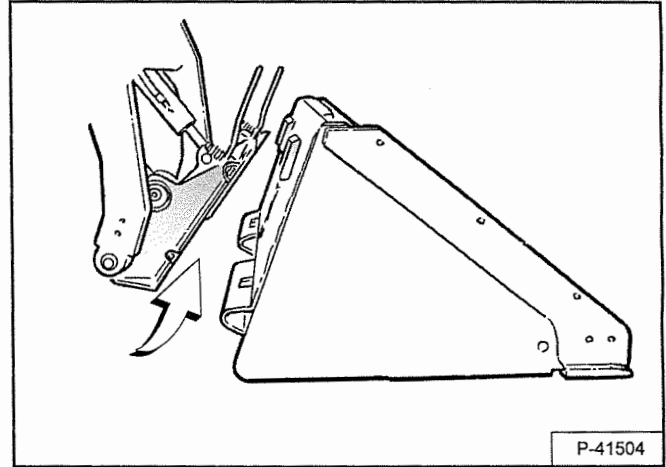


Pull the Bob-Tach levers up until they are fully raised (wedges fully raised) [Figure 72].

Enter the small articulated loader. (See Entering And Exiting The Small Articulated Loader on Page 51.)

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

Figure 73

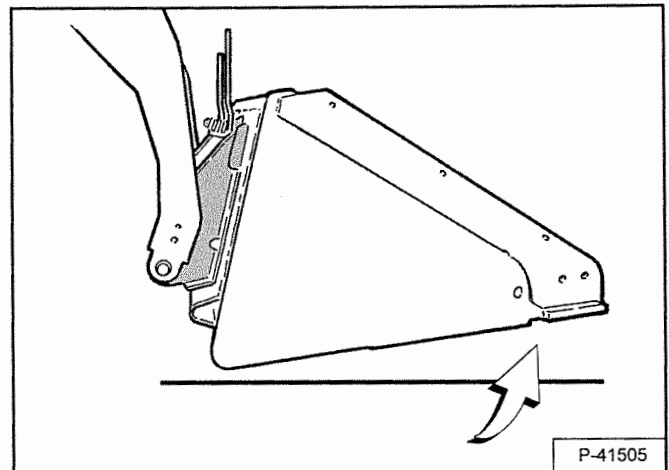


Lower the lift arm and tilt the Bob-Tach forward.

Drive the small articulated loader slowly forward until the top edge of the Bob-Tach is completely under the top flange of the attachment mounting frame [Figure 73].

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

Figure 74



Tilt the Bob-Tach backward until the attachment is slightly off the ground [Figure 74]. This will cause the attachment mounting frame to fit up against the front of the Bob-Tach.

Stop the engine and exit the small articulated loader. (See Entering And Exiting The Small Articulated Loader on Page 51.)



## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Installation (Cont'd)

#### Hand Lever Bob-Tach (Cont'd)

# ! WARNING

## AVOID INJURY OR DEATH

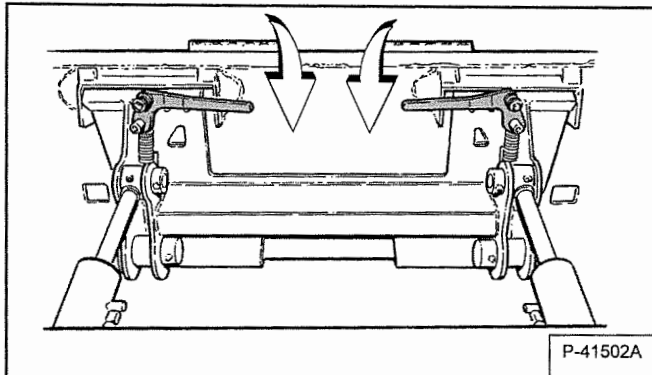
Before you leave the operator's seat:

- Lower the lift arm and put the attachment flat on the ground.
- Stop the engine.
- Engage the parking brake.
- Raise the arm rest.
- Move all controls to the NEUTRAL / LOCKED position to make sure the lift, tilt, telescoping, auxiliary hydraulics and traction drive functions are deactivated.
- The Operator Interlock Control System (OICS) must deactivate these functions when the armrest is up. See your Bobcat dealer for service if controls do not activate.

SEE THE MACHINE OPERATION & MAINTENANCE MANUAL FOR MORE INFORMATION.

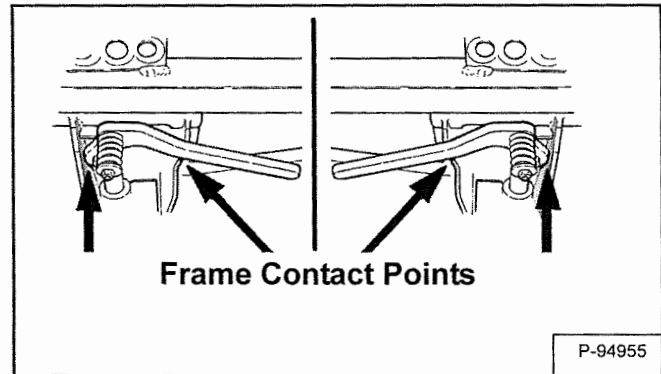
W-3095-0220

Figure 75



Push down on the Bob-Tach levers until they are fully engaged in the locked position [Figure 75] (wedges fully extended through the attachment mounting frame holes).

Figure 76



Both levers must contact the frame as shown when locked [Figure 76].

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

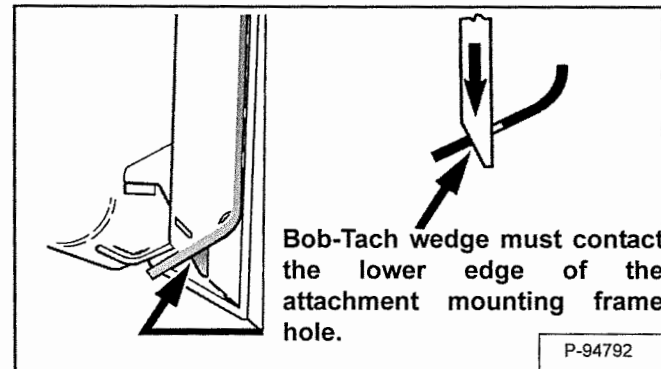
# ! WARNING

## 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 77



The wedges must extend through the holes (Item 2) in the attachment mounting frame, securely fastening the attachment to the Bob-Tach [Figure 77].

Connect auxiliary hydraulic hoses. (See Hydraulic Quick Couplers on Page 59.)

## OPERATING PROCEDURE WITH SMALL ARTICULATED 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

This small articulated loader may be equipped with a Power Bob-Tach.

Enter the small articulated loader. (See Entering And Exiting The Small Articulated Loader on Page 51.)

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

Figure 78

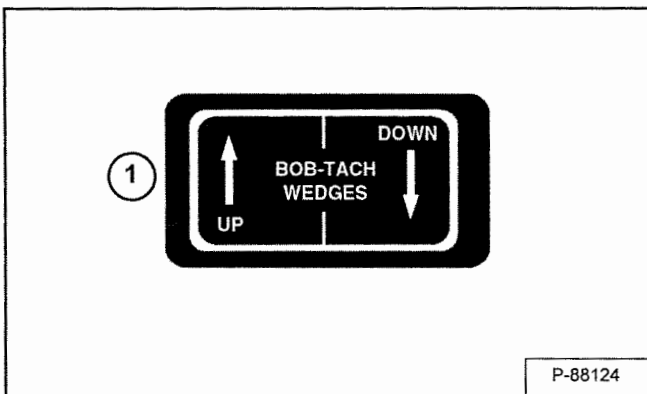
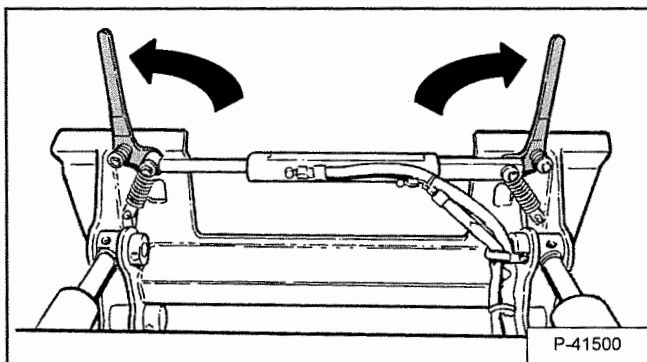
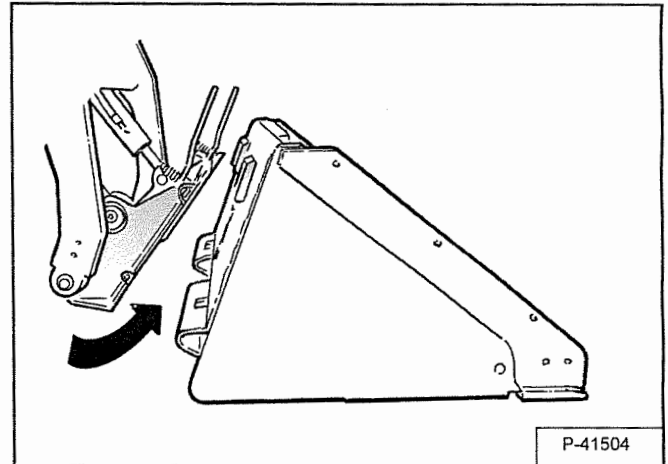


Figure 79



Push and hold the BOB-TACH "WEDGES UP" switch (Item 1) [Figure 78] until the levers are fully raised (wedges fully raised) [Figure 79].

Figure 80

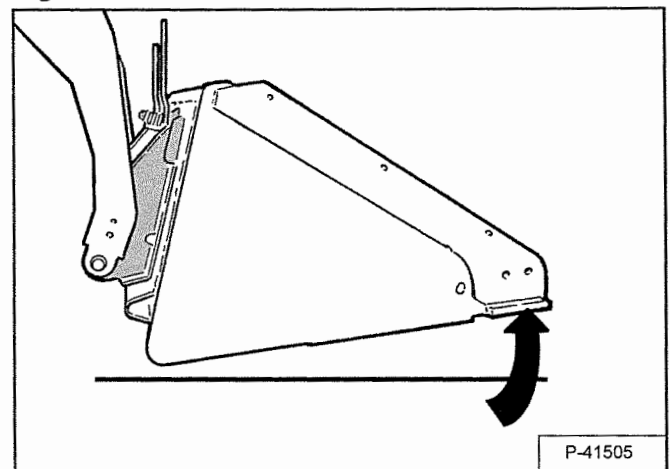


Lower the lift arm and tilt the Bob-Tach slightly forward.

Drive the small articulated loader slowly forward until the top edge of the Bob-Tach is completely under the top flange of the attachment mounting frame [Figure 80].

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

Figure 81



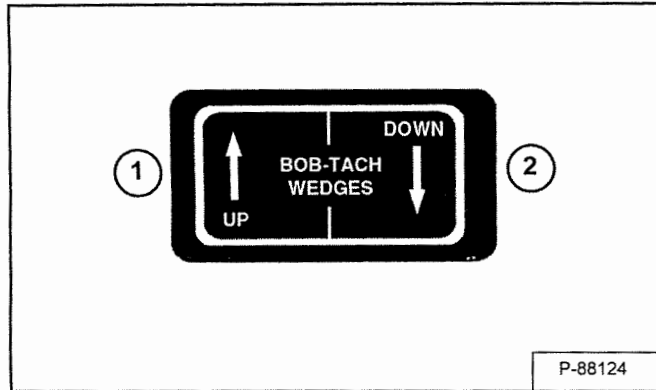
Tilt the Bob-Tach backward until the attachment is slightly off the ground [Figure 81]. This will cause the attachment mounting frame to fit up against the front of the Bob-Tach.

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Installation (Cont'd)

#### Power Bob-Tach (Cont'd)

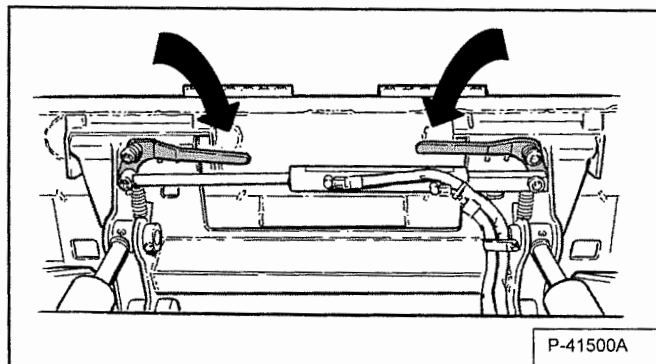
Figure 82



**NOTE:** The Power Bob-Tach system has continuous pressurized hydraulic oil 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.

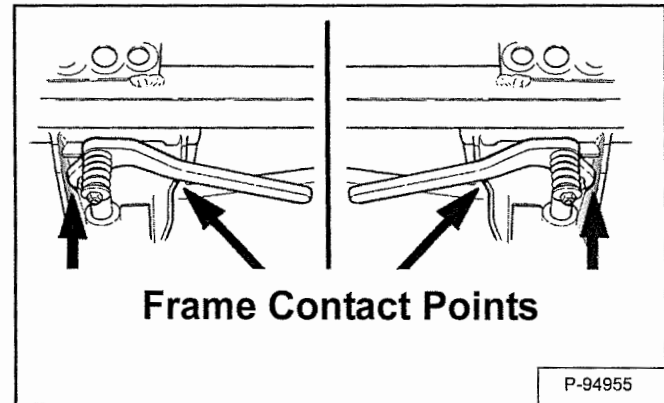
Push and hold the BOB-TACH "WEDGES UP" switch (Item 1) [Figure 82] until the levers are fully raised (wedges fully raised).

Figure 83



Push and hold the BOB-TACH "WEDGES DOWN" switch (Item 2) [Figure 82] until the levers are fully engaged in the locked position [Figure 83] (wedges fully extended through the attachment mounting frame holes).

Figure 84



Both levers must contact the frame as shown when locked [Figure 84].

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.

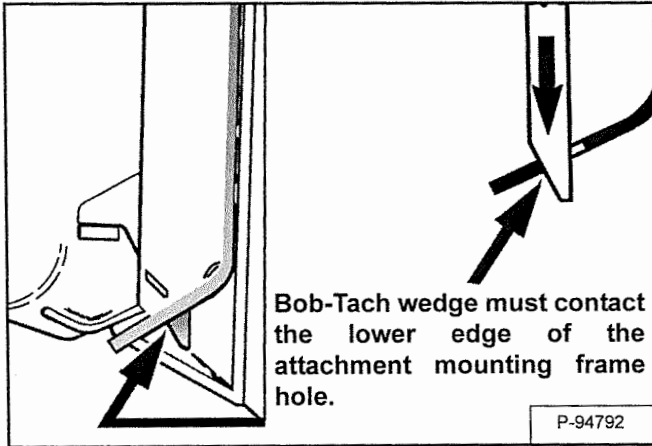
W-2715-0208

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Installation (Cont'd)

#### *Power Bob-Tach (Cont'd)*

**Figure 85**



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

Connect auxiliary hydraulic hoses. (See Hydraulic Quick Couplers on Page 59.)

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Installation (Cont'd)

#### *For First Time Installation*

New attachments and new small articulated 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 small articulated 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 small articulated loader engine off and using the hose guides (if equipped), route the attachment hydraulic hoses to the small articulated loader. Connect the attachment hydraulic quick couplers to the small articulated loader couplers. (See Hydraulic Quick Couplers on Page 59.)

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

Enter the small articulated loader. (See Entering And Exiting The Small Articulated Loader on Page 51.)

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

Engage auxiliary hydraulics. (See the small articulated 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 physician familiar with this injury.

W-2072-0807

Check the attachment hydraulic quick coupler connections for leaks.

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Hydraulic Quick Couplers

# IMPORTANT

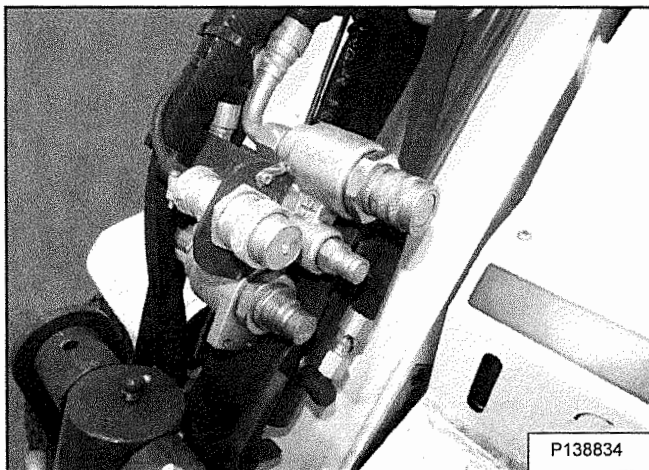
- Thoroughly clean the quick couplers before making connections. Dirt can quickly damage the system.
- Contain and dispose of any oil leakage in an environmentally safe manner.

I-2278-0608

New attachments and new small articulated 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 small articulated 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 86



# ! 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-2220-0396

### *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 86].

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

**NOTE:** Check that the attachment hydraulic hoses are not twisted or contacting any moving parts of the small articulated loader or attachment. (See For First Time Installation on Page 58.) for proper adjustment.

### *To Disconnect:*

Relieve hydraulic pressure. (See the small articulated 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 SMALL ARTICULATED LOADERS (CONT'D)

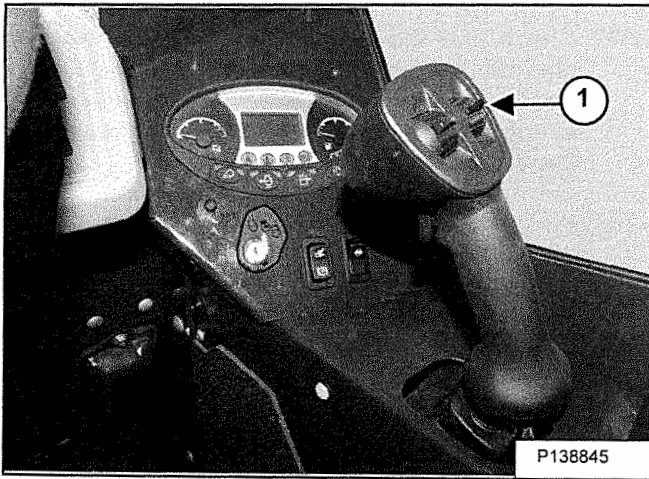
### Control Functions

Enter the small articulated loader. Fasten the seat belt, lower the arm rest and start the engine. Press the operate switch and release the parking brake.

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

**NOTE: Auxiliary hydraulics must be activated prior to attachment operation.**

Figure 87



To open the grapple, press the thumbswitch (Item 1) [Figure 87] up.

To close the grapple, press the thumbswitch (Item 1) [Figure 87] down.

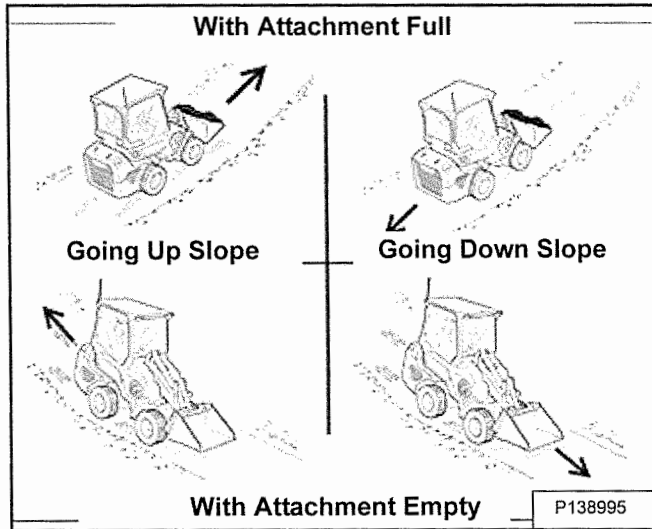
**NOTE: If the grapple does not function as explained above, stop the engine. Relieve the auxiliary hydraulic pressure. Exit the loader and switch the couplers on the hoses.**

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Operation With The Small Articulated Loader

**NOTE:** The illustrations and instructions provided explain how to operate the small articulated loader with a bucket attachment. Follow these same instructions for all load-carrying attachments.

Figure 88



Go up and down slopes with the heavy end of the machine toward the top of the slope [Figure 36]. Go directly up or down a slope, not across the slope.

Raise the root / industrial grapple only high enough to avoid obstructions on rough ground.

## **WARNING**

### 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.

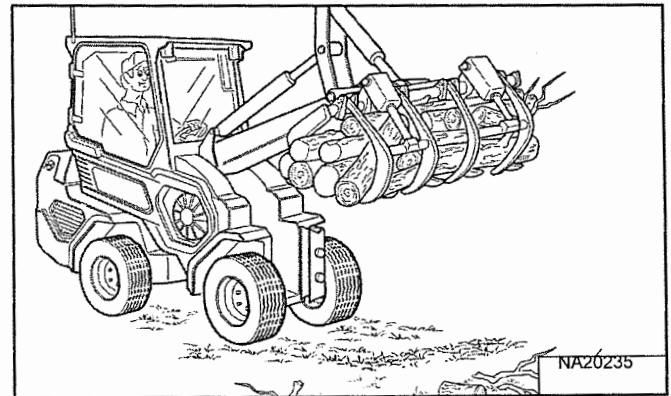
W-2320-0910

### Filling The Root / Industrial Grapple

Figure 89



Figure 90



Open the grapple fully.

Lower the lift arm and tilt the root / industrial grapple forward until the tip of the lower grapple forks are on the ground [Figure 89].

Drive slowly forward into the material. Tilt the root / industrial grapple backward all the way when the root / industrial grapple is full. Close the grapple [Figure 90]. (See Control Functions on Page 33.)

Drive backward away from the material.



## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Operation With The Small Articulated Loader (Cont'd)

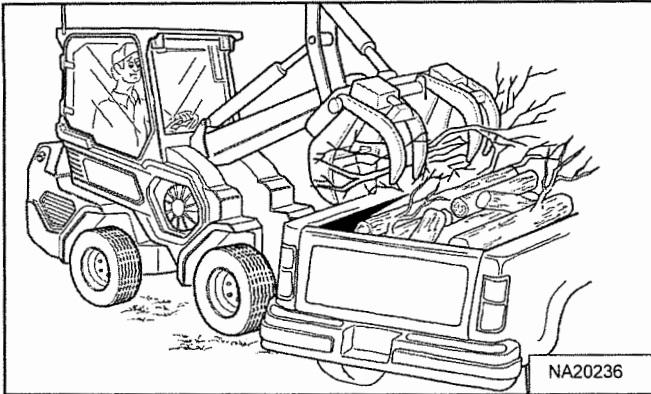
#### Emptying The Root / Industrial Grapple

# ! WARNING

Never dump over an obstruction, such as a post, that can enter the operator cab. The machine could tip forward and cause injury or death.

W-2057-0694

Figure 91



Keep the root / industrial grapple low when moving to the area where you want to empty the root / industrial grapple.

Raise the lift arms. Level the root / industrial grapple while raising the lift arms to help prevent material from falling off the back of the root / industrial grapple [Figure 91].

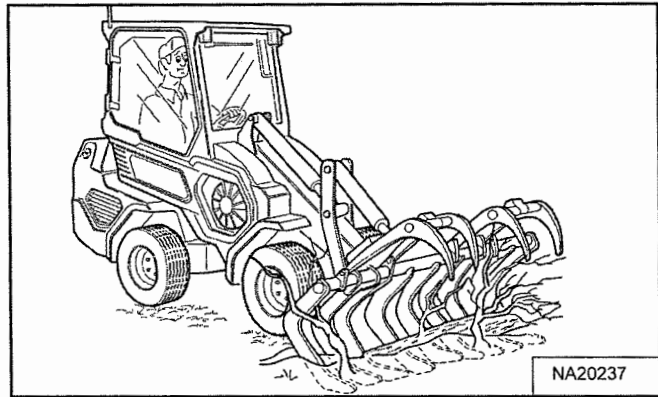
Drive forward slowly until the root / industrial grapple is over the top of the truck box or bin.

Open the Grapple. (See Control Functions on Page 33.)

Empty the root / industrial grapple. If all the material is near the side of the truck box or bin, use the root / industrial grapple tilt to move it to the other side [Figure 91].

#### Digging Into The Ground

Figure 92



Lower the lift arms and put the root / industrial grapple on the ground [Figure 92].

Drive forward slowly and continue to tilt the root / industrial grapple down (Item 2) until it enters the ground [Figure 92].

Raise the root / industrial grapple a small amount (Item 3) to increase traction. Continue to drive forward until the root / industrial grapple is full. When the ground is hard, raise and lower the cutting edge of the root / industrial grapple while driving forward slowly [Figure 92].

Tilt the root / industrial grapple backward as far as it will go when the root / industrial grapple is full and close the grapple [Figure 92]. (See Control Functions on Page 33.)

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Removal

#### *Hand Lever Bob-Tach*

Lower the lift arm 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 small articulated loader.

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

Exit the small articulated loader. (See Entering And Exiting The Small Articulated Loader on Page 51.)

## **WARNING**

### **AVOID INJURY OR DEATH**

Before you leave the operator's seat:

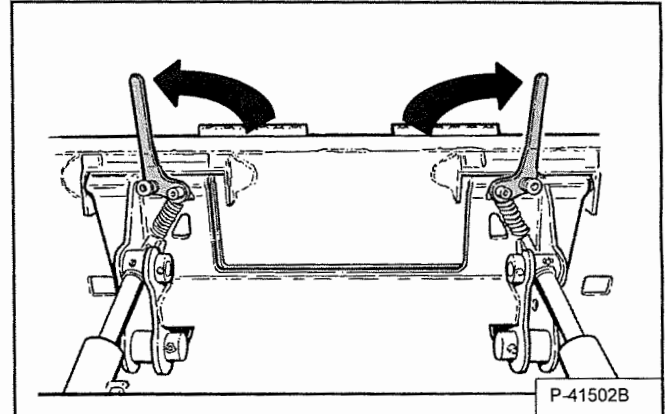
- Lower the lift arm and put the attachment flat on the ground.
- Stop the engine.
- Engage the parking brake.
- Raise the arm rest.
- Move all controls to the **NEUTRAL / LOCKED** position to make sure the lift, tilt, telescoping, auxiliary hydraulics and traction drive functions are deactivated.
- The Operator Interlock Control System (OICS) must deactivate these functions when the armrest is up. See your Bobcat dealer for service if controls do not activate.

**SEE THE MACHINE OPERATION & MAINTENANCE MANUAL FOR MORE INFORMATION.**

W-3095-0220

Disconnect auxiliary hydraulic hoses. (See Hydraulic Quick Couplers on Page 59.)

**Figure 93**



Pull the Bob-Tach levers up [Figure 93] 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

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Removal (Cont'd)

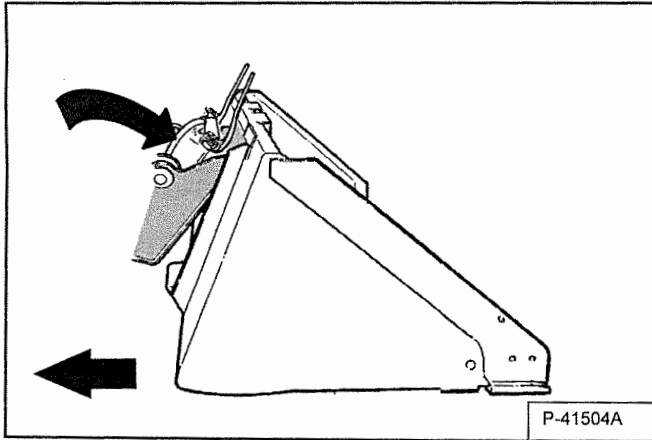
#### *Hand Lever Bob-Tach (Cont'd)*

Enter the small articulated loader. (See Entering And Exiting The Small Articulated Loader on Page 51.)

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

Lower the grapple to the ground.

**Figure 94**



Tilt the Bob-Tach forward and drive the small articulated loader backward, away from the attachment **[Figure 94]**.

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Removal (Cont'd)

#### *Power Bob-Tach*

Lower the lift arm 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 small articulated loader.

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

Exit the small articulated loader. (See Entering And Exiting The Small Articulated Loader on Page 51.)

## **WARNING**

### AVOID INJURY OR DEATH

Before you leave the operator's seat:

- Lower the lift arm and put the attachment flat on the ground.
- Stop the engine.
- Engage the parking brake.
- Raise the arm rest.
- Move all controls to the **NEUTRAL / LOCKED** position to make sure the lift, tilt, telescoping, auxiliary hydraulics and traction drive functions are deactivated.
- The Operator Interlock Control System (OICS) must deactivate these functions when the armrest is up. See your Bobcat dealer for service if controls do not activate.

**SEE THE MACHINE OPERATION & MAINTENANCE MANUAL FOR MORE INFORMATION.**

W-3095-0220

Disconnect auxiliary hydraulic hoses. (See Hydraulic Quick Couplers on Page 59.)

Enter the small articulated loader. (See Entering And Exiting The Small Articulated Loader on Page 51.)

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

Figure 95

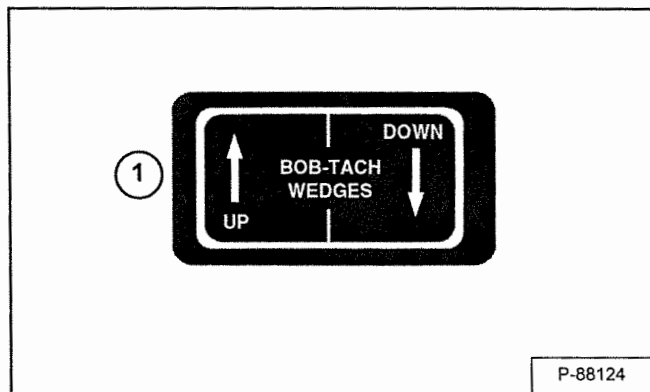
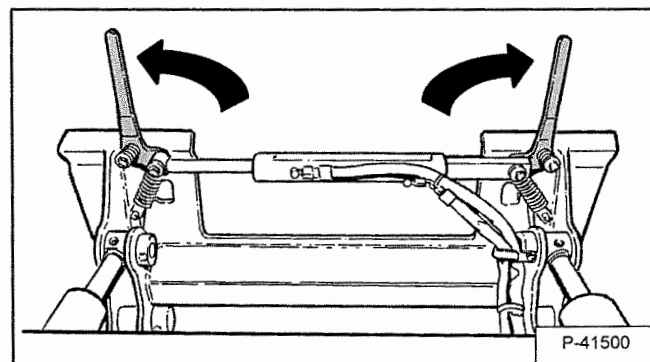


Figure 96



Push and hold the BOB-TACH "WEDGES UP" switch (Item 1) [Figure 96] until the levers are fully raised (wedges fully raised) [Figure 96].

## OPERATING PROCEDURE WITH SMALL ARTICULATED LOADERS (CONT'D)

### Removal (Cont'd)

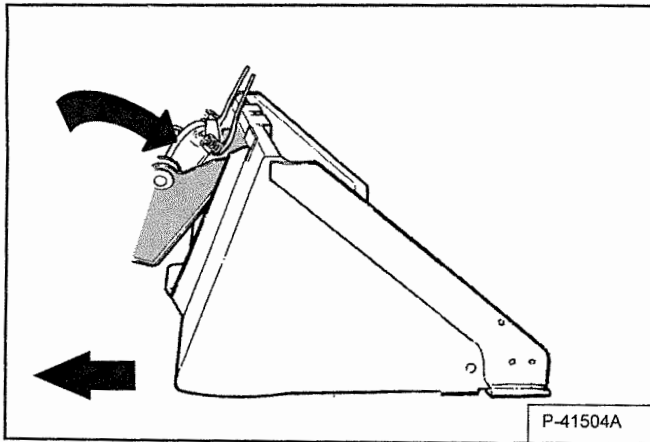
#### *Power Bob-Tach (Cont'd)*

Enter the small articulated loader. (See Entering And Exiting The Small Articulated Loader on Page 51.)

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

Lower the grapple to the ground.

**Figure 97**



Tilt the Bob-Tach forward and drive the small articulated loader backward, away from the attachment [Figure 97].

**NOTE:** The Power Bob-Tach system has continuous pressurized hydraulic oil 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 98

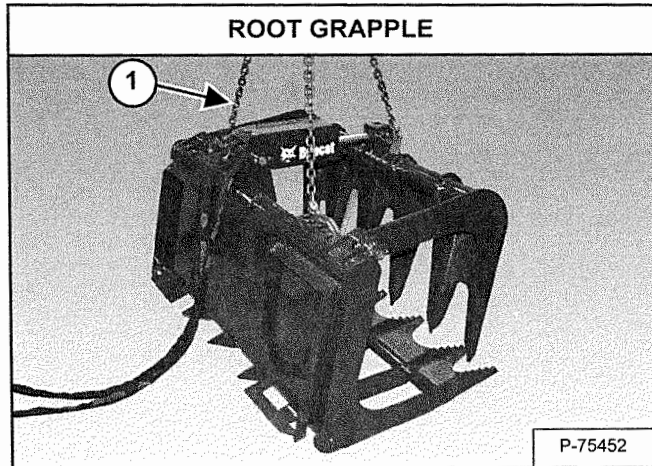
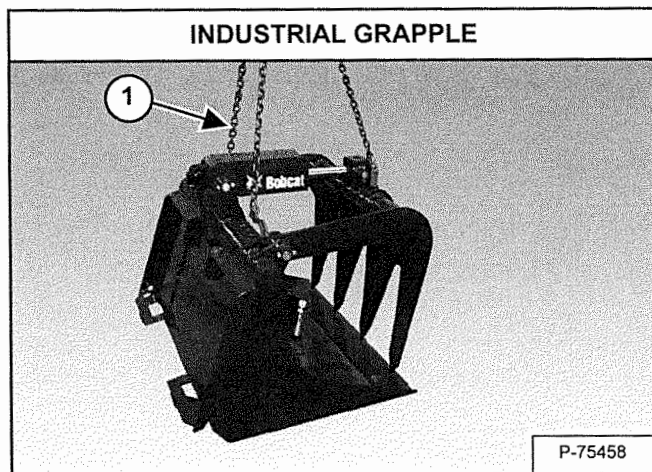


Figure 99



Fasten chains (Item 1) [Figure 98] and [Figure 99] to the root / industrial grapple.

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

## TRANSPORTING THE ATTACHMENT ON A TRAILER

### Fastening

Figure 100

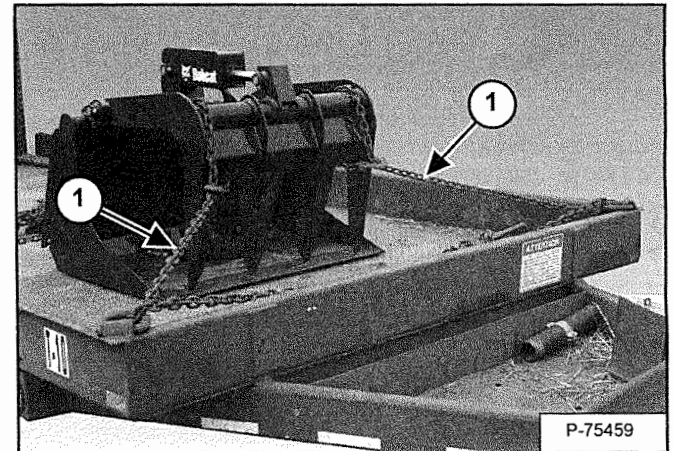
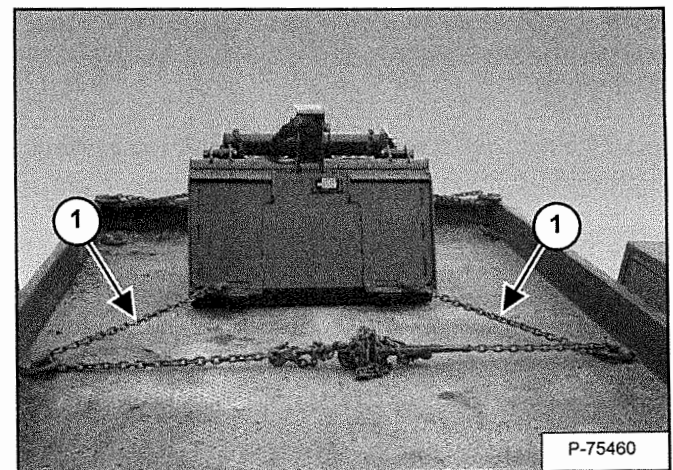


Figure 101



Put the root / industrial grapple on the transport vehicle and fasten chains to both ends of the grapple frame (Item 1) [Figure 100] and [Figure 101]. Secure the chains to the transport vehicle.

Use chain binders to prevent the root / industrial grapple from moving during transport.

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

## 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.

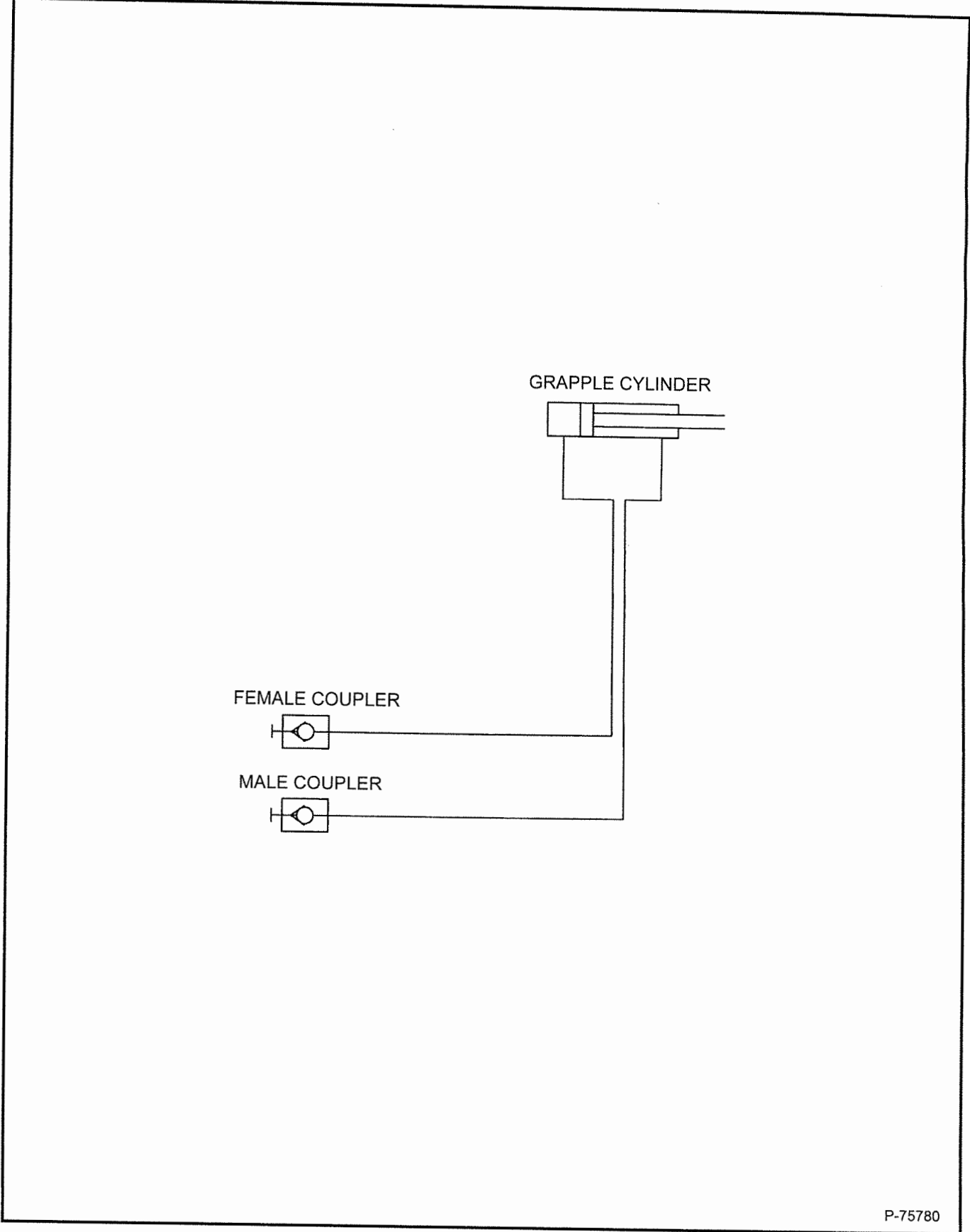
- Load the heaviest end of the machine and attachment combination first.
- Lower the attachment to the floor.
- Stop the engine.
- Engage the parking brake (if equipped).
- Exit the machine. (See your machine's Operation & Maintenance Manual for the correct procedure.)

#### *Fastening*

- Install chains at the front and rear tie down positions on the machine. (See your 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.

SCHEMATIC(S)

Hydraulic Schematic



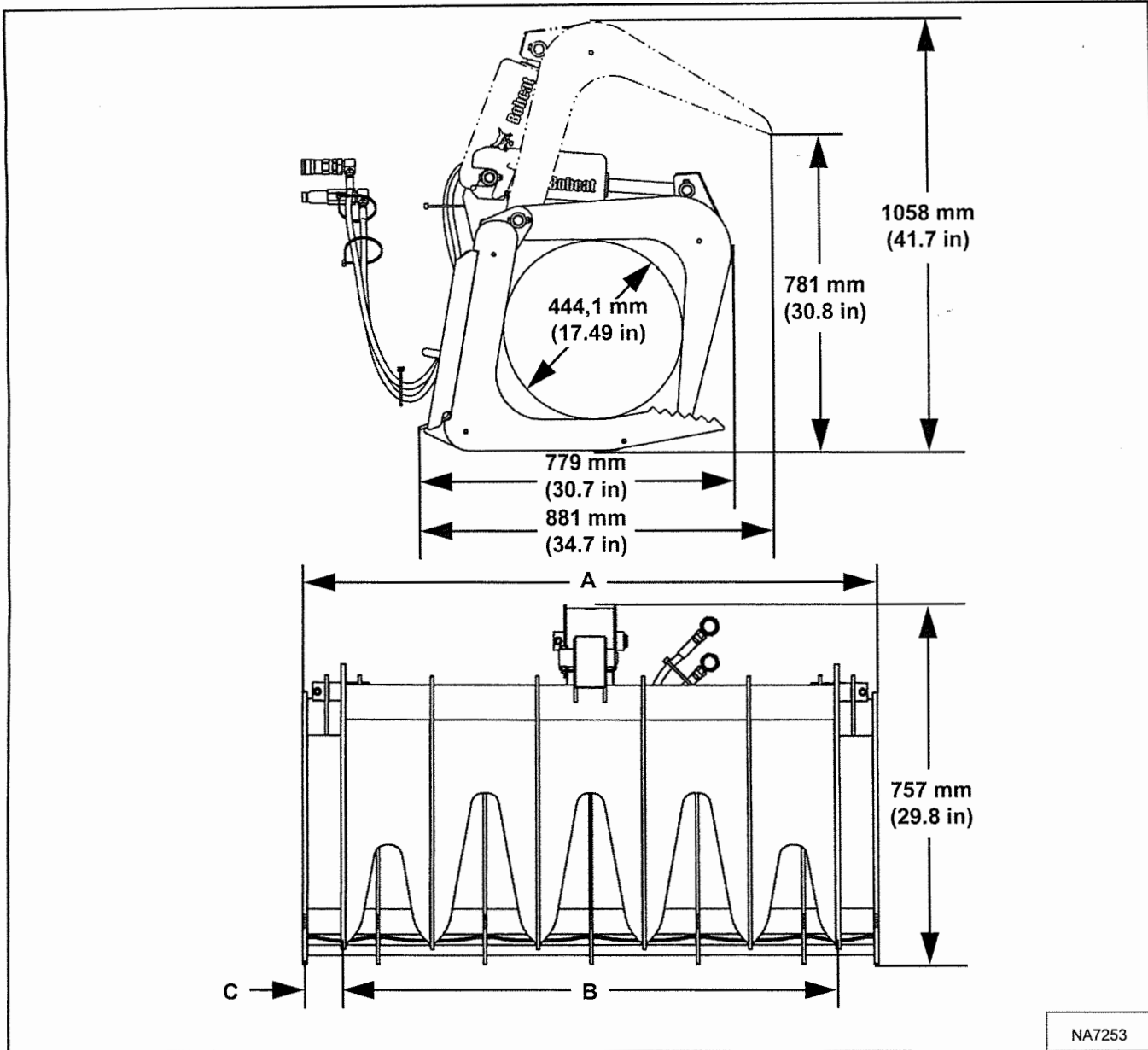
P-75780



## SPECIFICATIONS

### Root Grapple

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

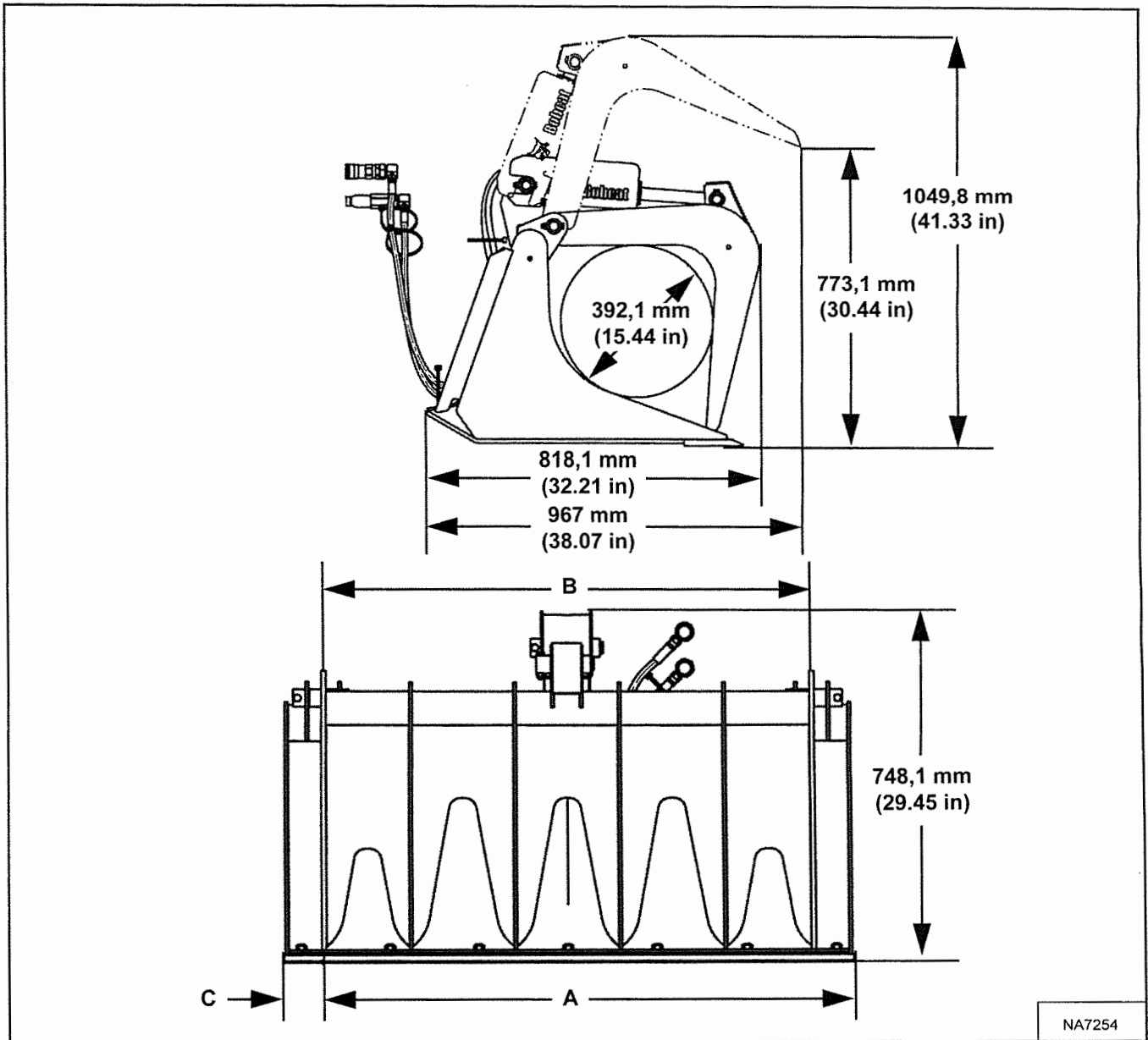


ROOT GRAPPLE		
Grapple	36 Root Grapple	48 Root Grapple
Dimension A (Overall Width)	914,4 mm (36 in)	1219,2 mm (48 in)
Dimension B (Arm Width)	685,8 mm (27 in)	1057,7 mm (41.6 in)
Dimension C	114,3 mm (4.5 in)	80,8 mm (3.2 in)
Weight	135 kg (297 lb)	168 kg (371 lb)
Cylinder Bore Diameter	63,5 mm (2.50 in)	
Cylinder Rod Diameter	31,8 mm (1.25 in)	
Cylinder Stroke	152,4 mm (6 in)	

## SPECIFICATIONS (CONT'D)

### Industrial Grapple

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



NA7254

INDUSTRIAL GRAPPLE		
Grapple	36 Ind Grapple	48 Ind Grapple
Dimension A (Overall Width)	914,4 mm (36 in)	1219,2 mm (48 in)
Dimension B (Arm Width)	685,8 mm (27 in)	1057,7 mm (41.6 in)
Dimension C	114,3 mm (4.5 in)	80,8 mm (3.2 in)
Weight	166 kg (365 lb)	203 kg (448 lb)
Cylinder Bore Diameter	63,5 mm (2.50 in)	
Cylinder Rod Diameter	31,8 mm (1.25 in)	
Cylinder Stroke	152,4 mm (6 in)	

