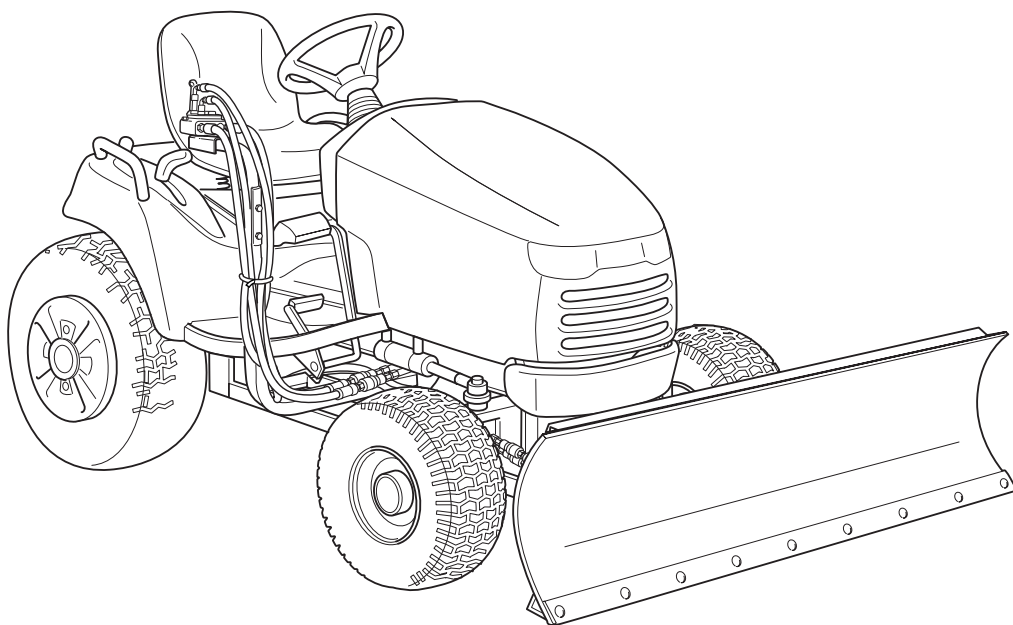


ATTACHMENT OPERATOR'S MANUAL



60" Hydraulic Angling Dozer Blade

60" Hydraulic Angling Dozer Blade Attachment

Mfg. No.	Description
1692925	60" Hydraulic Angling Dozer Blade Attachment (for use with Legacy / 2000 / 2900 Series)

1718437

Rev 12/97
TP 100-2137-00-AT-SMA



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SAFETY RULES

Recommended Accessories1
 Safety Rules2

FEATURES & CONTROLS

Control Functions3

OPERATION

Checks Before Starting4
 Engine & Ground Speed Selection4
 Transporting4
 Operating On Slopes4
 Starting & Stopping4
 Changing Blade Angle5
 Dozing Tips5
 Snow Plowing Tips5

STORAGE

Daily Storage5
 Off-Season Storage5

MAINTENANCE

Schedule for Normal Care6
 Lubricate Dozer Blade6

TROUBLESHOOTING

Troubleshooting Chart7
 Hydraulic System Diagram8

ADJUSTMENTS

Skid Shoe Adjustment9
 Rotate / Replace Scraper Bar9
 Lift Height Adjustment9
 Downward Pressure Adjustment9

INITIAL ASSEMBLY & INSTALLATION

Attach Dozer Lift Arm10
 Assemble Dozer Blade10
 Install Front Hitch Mounting Brackets11
 Install Rear Hitch Mounting Brackets11
 Install Attachment Lift extension12
 Assemble Ladder Hitch12
 Install Hitch Onto Tractor12
 Install Lift Rod12
 Install Dozer Blade13
 Install New Master Valve14
 Install Cross Over Tubes15
 Install Bypass Hose & T-Connector16
 Assemble Control Arm16
 Install Control Valve17
 Install Hydraulic Cylinder On Dozer19

DOZER & HITCH REMOVAL

Dozer & Hitch Removal21

NORMAL INSTALLATION

Install Hitch Onto Tractor22
 Install Lift Rod22
 Install Dozer Blade22

HARDWARE IDENTIFICATION & TORQUE SPECIFICATIONS

Chart24

NOTE: In these instructions, "left" and "right" are referred to as seen from the operating position.

Recommended Accessories

Tire chains and Simplicity Quick Tach weights are recommended when installing this attachment on your tractor. Quick Tach weights are an easy way to improve traction and stability making your dozer more efficient. Quick Tach weights are easy to install and remove, and can be added in 50 lb. increments (maximum of 300 lbs). To purchase tire chains, Quick Tach weights, or wheel weights, see you Simplicity Dealer.

For operation on slopes greater than 15% (8.5°), Quick Tach Weights, tire chains, and wheel weights are recommended. Never operate on slopes greater than 30% (16.7°).

Safety Rules



Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of unit, severe personal injury or death to you, or bystanders, or damage to property or equipment.

The triangle  in text signifies important cautions or warnings which must be followed.

GENERAL WARNINGS

- Know the tractor controls and how to stop quickly. **READ THE TRACTOR OPERATOR'S MANUAL.**
- Read this manual and the tractor Operator's Manual carefully. Be thoroughly familiar with the controls and the proper use of the equipment.
- Never allow children to operate the machine. Do not allow adults to operate it without proper instruction.
- Do not carry passengers.
- Use only attachments or accessories designed for your machine. See your dealer for a complete list of recommended attachments or accessories.
- Keep the area of operation clear of all persons, particularly small children, and pets.
- Never direct discharge towards bystanders.
- Make sure all hardware is secure and that dozer blade is in good operating condition.
- Check to be sure all safety devices and shields are in place.
- Check that all adjustments are correct before using this unit.
- Gasoline is highly flammable. Follow all precautions listed in your tractor's operator's manual.
- Always wear eye protection while operating and performing adjustments to protect eyes from debris thrown by the dozer.
- When cleaning, repairing, or inspecting the unit make sure all moving parts have stopped. Disconnect and secure the spark plug wires and remove the key to prevent accidental starting.

DANGER

OPERATING ON SLOPES CAN BE DANGEROUS

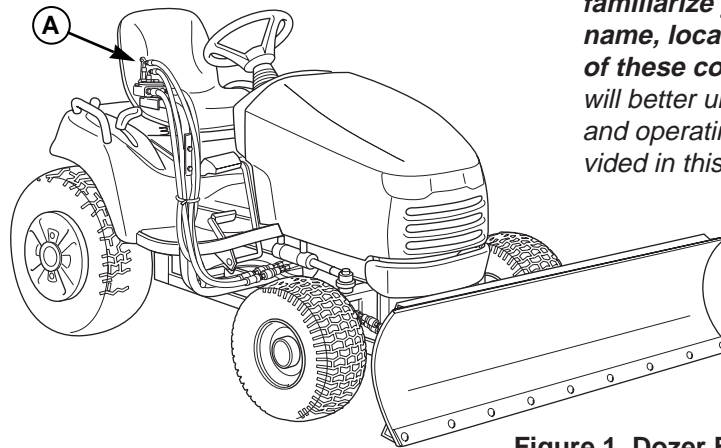
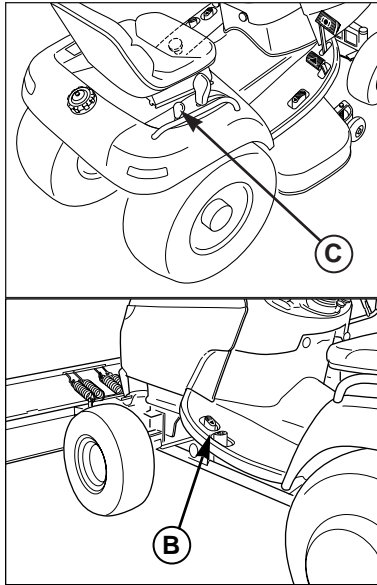
For operation on slopes greater than 15% (8.5°), weight box, tire chains, and wheel weights are recommended. **NEVER OPERATE ON SLOPES GREATER THAN 30% (16.7°).**

PREPARATION

- Disengage the PTO before making any adjustments.
- Never attempt to make any adjustments while engine is running.
- Thoroughly inspect the area where the dozer is to be operated and remove all foreign objects.
- Adjust the skid shoe height to clear gravel or crushed stone surface. See the Adjustments section for procedure.

OPERATING SAFETY

- Always clear snow up and down the face of slopes, never across the face. Exercise extreme caution when changing direction on slopes. Do not attempt to clear steep slopes.
- Exercise extreme caution when operating on, or crossing, gravel drives, walks or roads. Stay alert for hidden hazards or traffic.
- After striking an object or if unit starts to vibrate abnormally, stop the engine and remove the key. Check for the cause and any damage before restarting. Before any inspection, make sure all moving parts have stopped.
- Take all possible precautions before leaving operator's position. Lower the attachment, set the parking brake, stop the engine and remove the key.
- Never operate the dozer blade near glass enclosures, automobiles, window wells, drop-offs, etc.
- Do not put hands or feet near or under the dozer blade. Keep clear of the dozer blade at all times.
- Do not overload machine capacity by attempting to plow too much material at too fast a rate.
- Never operate unit at high transport speeds on slippery surfaces. Use care when travelling in reverse.
- Never operate the dozer blade without good visibility or light. Always be sure your feet are properly placed on the footrests and keep a firm hold on the steering wheel.
- Do not run the engine indoors.
- Never allow anyone in front of, or behind, the unit.



Please Take a moment and familiarize yourself with the name, location, and function of these controls so that you will better understand the safety and operating instructions provided in this manual.

Figure 1. Dozer Blade Controls
A. Angling Control Lever
B. Attachment Lift Pedals
C. Two-Speed Control

CONTROL FUNCTIONS

The information below briefly describes the function of individual controls. Operating the tractor and dozer require the combined use of these controls and additional controls whose operation is described in the tractor Operator's Manual.

A. Angling Control Lever

The angling control lever is used to change the angle of the dozer blade.

While the engine is running, moving the lever forward rotates the blade counterclockwise. Moving the lever back rotates the blade clockwise.

B. Attachment Lift

The attachment lift pedals (see inset above) raise and lower attachments such as the dozer blade.

To RAISE an attachment, depress the REAR attachment lift pedal. To LOWER an attachment, depress the FRONT attachment lift pedal.

C. Two-Speed Control

The two-speed control (see inset above) allows the operator to switch the transmission into high or low-speeds, and to disengage the transmission into a NEUTRAL (free-wheeling) position.

Select the low-speed for all Dozing work and high-speed for travelling to and from work areas. **DO NOT SHIFT WHILE MOVING.** See the Tractor Operator's Manual for more details.



TRACTOR CONTROLS

Before you begin operating the tractor with the dozer blade attachment, make certain you have:

- Read and understood the instructions in the tractor Operator's Manual.
- Become thoroughly familiar with all of the tractor controls and their operation, including how to safely and properly start and stop the unit.
- Practiced driving in an open area—without dozing—to become accustomed to the unit.

Operation

Checks Before Starting

1. Refer to the Maintenance & Adjustments sections of this manual and perform any needed service. Also, refer to the tractor Operator's Manual and perform any required service.
2. Remove any objects from the work area which might interfere with dozing activity.
3. Adjust the skid shoes to desired height. See Skid Shoe Adjustment.
4. Make sure all hardware is present and secure.

Engine & Ground Speed Selection

Always run the engine at full throttle.

Normally, a slow ground speed is best for dozing. The heavier the material, the slower the recommended ground speed. When dozing always set the 2-Speed control to LOW.

Transporting

1. Use the attachment lift to raise the dozer blade.
2. Adjust ground speed according to surface conditions. Select a slow ground speed when transporting on a slippery surface.

⚠️ DANGER

OPERATING ON SLOPES CAN BE DANGEROUS

Never operate on slopes greater than 30 percent (16.7°) which is a rise of three feet vertically in 10 feet horizontally.

Operate the unit at a slow ground speed when driving onto slope. Avoid using brakes to control ground speed.

When operating on slopes that are greater than 15 percent (8.5°) but less than 30 percent, use additional wheel weights or counterweights.

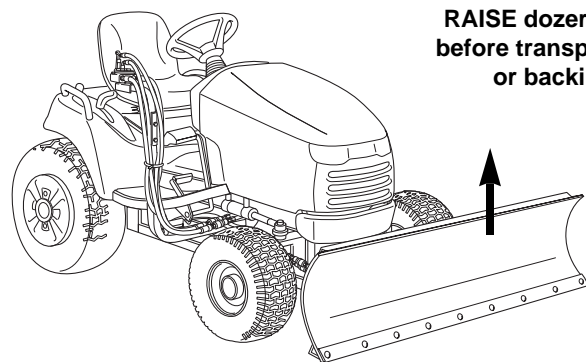
In addition to counterweights, use extra caution when operating on slopes. Drive UP and DOWN the slope, never across the face, use caution when changing directions and DO NOT START OR STOP ON SLOPE.

⚠️ WARNING

Perform the Safety System Interlock test found in your tractor Operator's Manual. If tractor does not pass the test, do not operate the tractor. See your authorized dealer. Under no circumstances should you attempt to defeat the safety system.

Use caution when dozing a snow covered area. Snow can cover objects such as curbs, drop-offs, and other obstacles. Be familiar with the area you are dozing.

To prevent an explosion or fire, never store the tractor with fuel in the tank inside a building where an ignition source is present.



**RAISE dozer blade
before transporting
or backing up.**

Starting & Stopping

1. Start the tractor engine. Set engine throttle to full.
2. Raise the attachment lift and travel to the work site.
3. Stop the tractor and set the Two-Speed control to LOW.
4. Use the angling control lever to set the blade to the desired angle.
5. Lower the attachment lift and depress the forward ground speed pedal to plow.
6. Raise the plow before backing up.
7. To stop the tractor, release the ground speed control pedals. Before leaving the seat, stop the engine, set the parking brake, remove the key, and wait for all moving parts to stop.

Changing Blade Angle

See Figure 1 on page 3 for location of Controls.

1. Fully raise the attachment lift by depressing the REAR attachment lift pedal (B, Figure 1).
2. Push the angling control lever (A, Figure 1) forward to rotate the blade counterclockwise. Pull the lever back to rotate the blade clockwise.

Dozing Tips

- Determine the best dozing pattern before beginning.
- When land contour permits, it is best to travel in the longest direction to minimize turning.
- In very deep snow or gravel, it may be necessary to make the first pass with dozer blade partially raised, then repeat each pass with the blade lowered to clear the material left on the surface. Also, it may be necessary to clear less than the full width of the dozer blade or reduce ground speed.
- When dozing, push the dirt to the desired location, then drag the blade backwards for final leveling. Pack down the dirt or gravel by driving the tractor over the leveled area.
- Use any slight grade to your advantage, doze downhill, and set the blade angle so that the plowed material is moving downhill as it leaves the blade.

Snow Plowing Tips

- Determine the best snow removal pattern before beginning.
- Plan the pattern so that you avoid pushing snow onto cleared areas.
- When land contour permits, it is best to travel in the longest direction to minimize turning.
- In very deep or heavy snow, it may be necessary to make the first pass with dozer blade partially raised, then repeat each pass with the blade lowered to clear the material left on the surface. Also, it may be necessary to clear less than the full width of the dozer blade or reduce ground speed.
- Snow tends to freeze into solid banks when plowed off a driveway or other large area. Because of this you may want to plow snow several feet past the edge of the drive to allow space for future dozing to build up.
- If pushing snow past the edges of driveways or sidewalks, be careful not to tear up the grass buried under snow next to the drive or sidewalk. Lift the blade several inches off the ground to avoid damaging the grass.

Storage



IMPORTANT NOTE
Refer to Tractor Operator's Manual for important information concerning safely storing your tractor.

Daily Storage

1. Allow tractor engine to cool before storing in any enclosure.
2. After dozing jobs are completed, hose or brush down the blade to remove excess dirt.
3. Lightly oil all pivot points. Coat bare metal surfaces to prevent corrosion.

Off-Season Storage

1. Remove dozer blade from the tractor. Hitch can remain installed if other front mounted attachments are to be used.
2. Use water pressure or a brush to thoroughly clean the dozer blade.
3. Paint, or lightly coat with oil, any area where paint has been worn or chipped away.
4. Lubricate the dozer blade.
5. Store the dozer blade and hitch in a dry place.

Maintenance

MAINTENANCE

Schedule For Normal Care

Care Required	Schedule
Clean debris from dozer blade.	After each use.
Lubricate dozer blade.	Every 10 hours or at least once a year.

⚠ WARNING

To avoid serious injury, perform maintenance on the tractor or dozer blade only when the engine is stopped, parking brake is set and all moving parts have stopped. Always remove the ignition key before beginning maintenance or adjustments to prevent accidental starting of the engine.

When performing service work, support the blade using wood blocks placed under the scraper bar or skid shoes.

Never put hands or feet under the dozer blade.

Lubricate Dozer Blade

Lubricate the dozer blade as shown in Figure 2. Where an oil can is shown, wipe the area clean, apply a few drops of oil (SAE 30), then wipe up drips or spills.

In general, linkage connections and other parts that have partial rotational or sliding movement should be lubricated periodically with SAE 30 weight oil. Avoid applying excessive amounts of oil since this may cause a build-up of dirt around the lubricated area, making subsequent lubrication more difficult to accomplish.

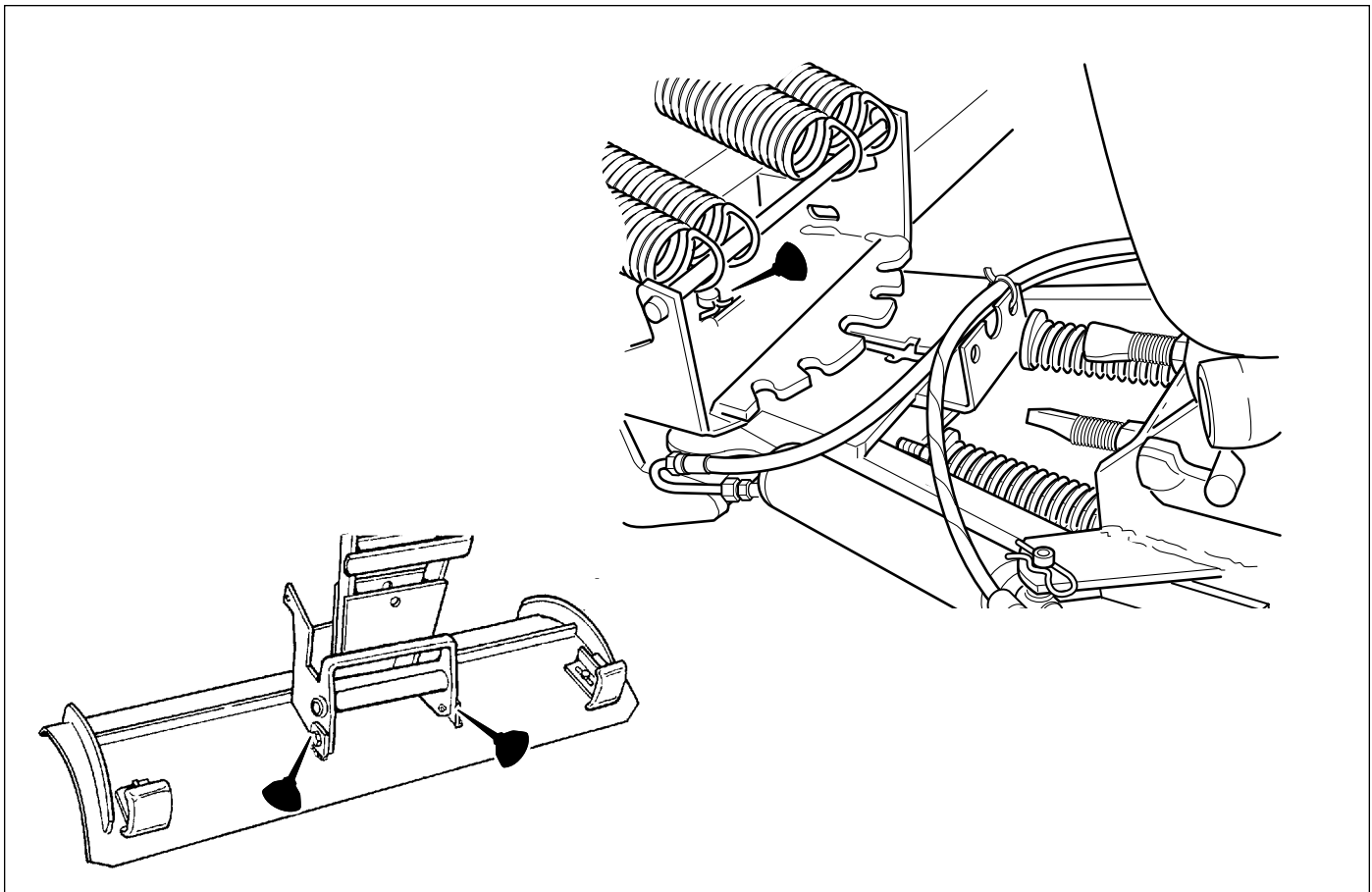


Figure 2. Lubrication Points

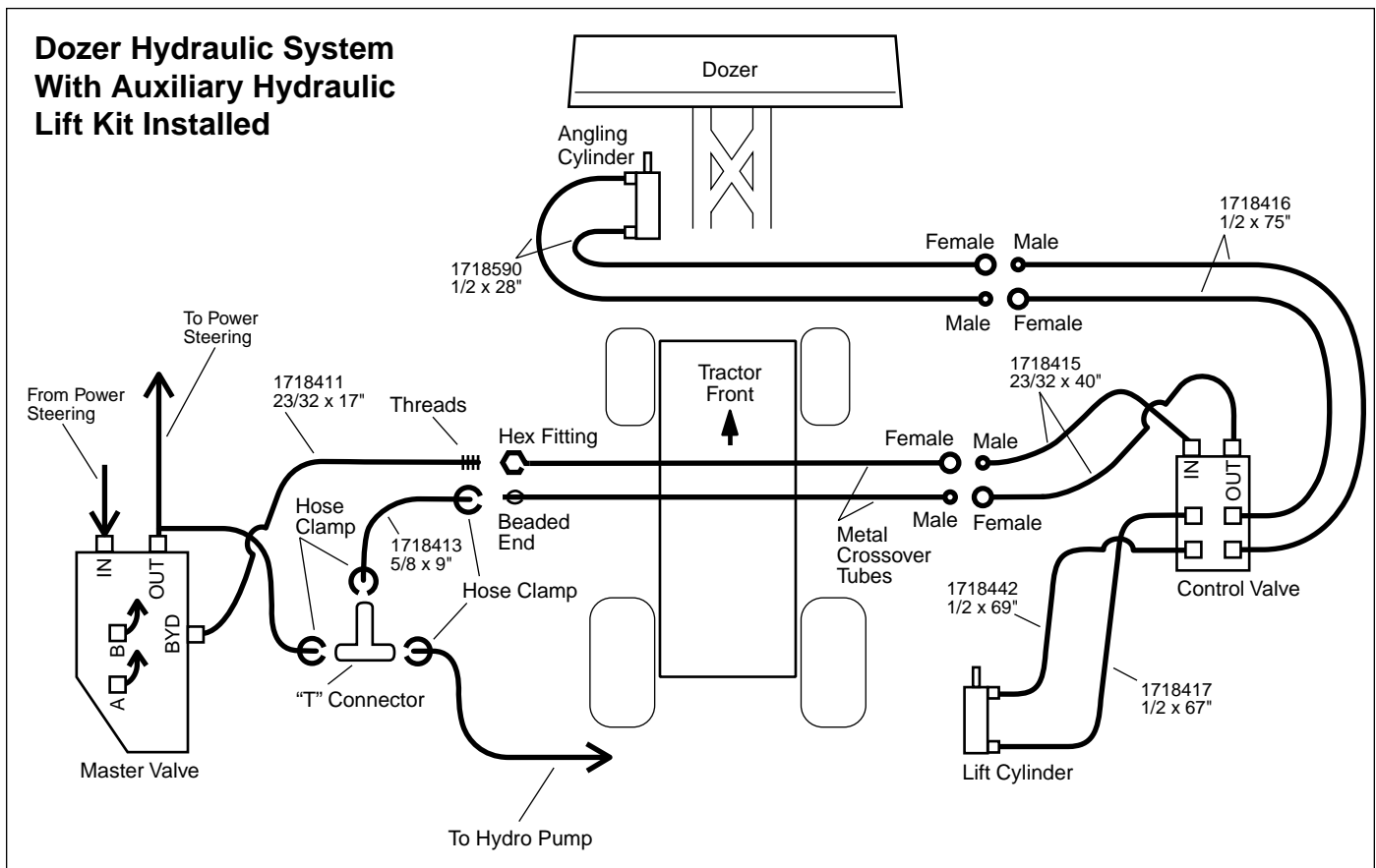
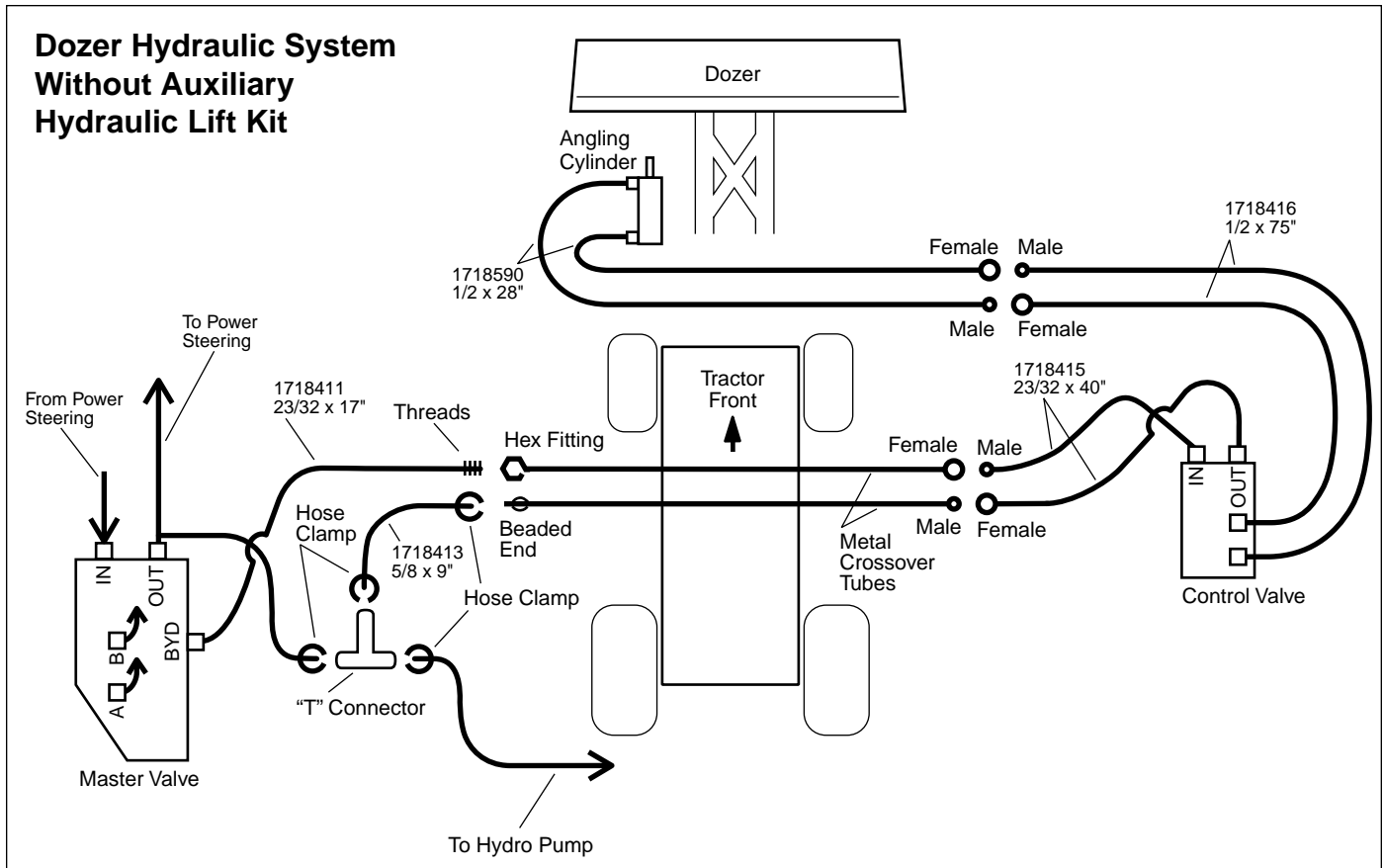
Locate the problem you've encountered in the chart below. Check the possible causes one at a time in the order listed. Correct any problems that are found and operate the snowthrower to see if you have eliminated the problem.

⚠ WARNING

To avoid serious injury, perform maintenance on the tractor or dozer blade only when the engine is stopped, parking brake is set, and all moving parts have stopped. Always remove the ignition key before beginning maintenance or adjustments to prevent accidental starting of the engine.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Dozer slow to lift or change angle.	Air in hydraulic hoses.	Cycle valves repeatedly to work air out of lines & hoses.
	Hoses loose or kinked.	Tighten hose connections and un-kink hoses.
	Dirt in hydraulic system.	Drain and flush hydraulic system.
Dozer chatters or vibrates when raised or lowered.	Air leak in pump inlet line.	Check, tighten, or replace line.
	Air in hydraulic hoses.	Cycle valves repeatedly to work air out of the lines.
	Low oil level.	Check / add oil.
Excessive noise.	Inlet line restricted.	Check for air leaks, restrictions, or collapsed hoses. Tighten or replace faulty hoses and fittings.
	Worn or damaged o-rings or wiper seal in cylinder rod end.	See your dealer.
	Worn or damaged o-rings in valve.	See your dealer.
Oil leaks.	Defective fittings or hoses.	Replace fittings or hoses.
	Worn or damaged o-rings or wiper seal in cylinder rod end.	See your dealer.
	Worn or damaged o-rings in valve.	See your dealer.
Excessive scraper bar wear.	Skid shoes set too low.	See Skid Shoe Adjustment.
	Downward pressure not adjusted.	See Downward Pressure Adjustment.
Dozer does not clear down to surface.	Skid shoes set too high.	See Skid Shoe Adjustment.
	Dozer lift incorrectly adjusted.	See Downward Pressure Adjustment.
	Scraper bar worn.	See Rotate / Replace Scraper Bar.

Hydraulic System Diagram



ADJUSTMENTS

Skid Shoe Adjustment

When clearing snow off smooth surfaces such as concrete or asphalt, the scraper bar should scrape the surface. On surfaces such as gravel, the scraper bar should be set high enough so that it will not pick up debris.

1. Loosen the capscrews (A, Figure 3) securing the skid shoes.
2. Raise or lower the scraper bar to the desired height. Use wood blocks to hold the blade in position.
3. Set the skid shoes so that they are in contact with the ground and tighten the capscrews (A, Figure 3).

Rotate / Replace Scraper Bar

If the scraper bar has become worn, it can be rotated end over end once, or replaced.

1. Raise the dozer blade and support the skid shoes using wood blocks.
2. Remove the carriage bolts (B, Figure 3), lockwashers (C), and nuts (D).
3. Rotate the scraper bar end over end, or replace the blade.
4. Secure the scraper bar to the blade using the carriage bolts (B, Figure 3), lockwashers (C), and nuts (D), removed in step 1.

Lift Height Adjustment

To adjust the lift height:

1. Fully raise the attachment lift and shut off the engine. Set the parking brake and remove the key.
2. Loosen the nuts (C, Figure 4).
3. Turn the lift height bolts (D) until the dozer blade is at the desired height and level.
4. Hold the lift height bolts (D) in position and lock in place with the nuts (C).

Downward Pressure Adjustment

1. Fully lower the attachment lift and shut off the engine. Set the parking brake and remove the key.
2. Turn the nuts (E) evenly until the desired downward force is achieved. Do not "lock-up" the springs. The springs should have some flex.



IMPORTANT NOTE

Do not over-compress the springs. In addition to providing downward pressure, the springs are an elastic medium that absorbs shocks caused by bumps and cracks in ground surfaces. Over-compressing the springs defeats this and could cause damage to the unit.

⚠ WARNING

To avoid serious injury, perform maintenance on the tractor or dozer blade only when the engine is stopped, parking brake is set and all moving parts have stopped. Always remove the ignition key before beginning maintenance or adjustments to prevent accidental starting of the engine.

When performing service work, support the blade using wood blocks placed under the scraper bar or skid shoes.

Never put hands or feet under the dozer blade.

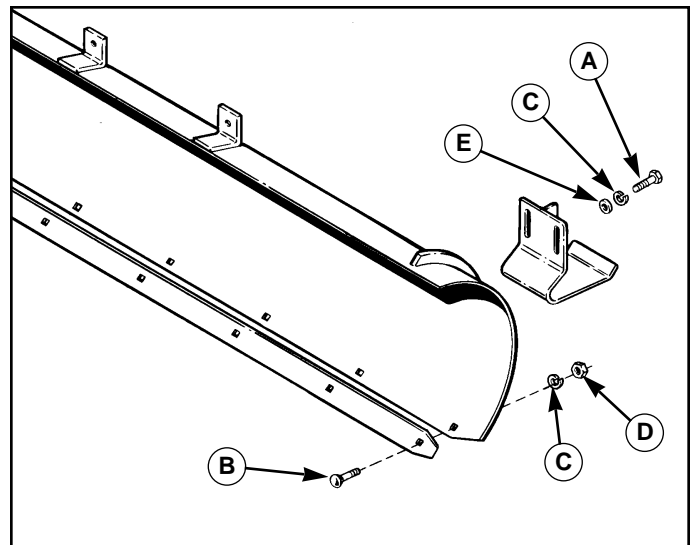


Figure 3. Skid Shoes and Scraper Bar

- | | |
|------------------|-----------|
| A. Capscrew | D. Nut |
| B. Carriage Bolt | E. Washer |
| C. Lockwasher | |

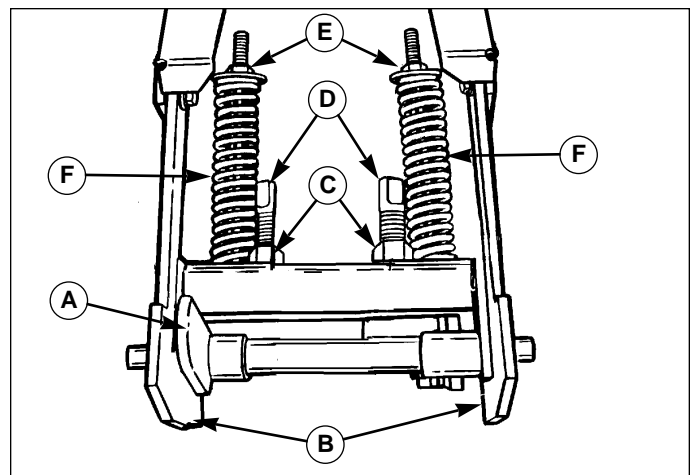


Figure 4. Lift Adjustment

- | | |
|-------------|----------------------|
| A. Lift Bar | D. Lift Height Bolts |
| B. Hitch | E. Nuts |
| C. Nuts | F. Springs |

Initial Assembly & Installation

INITIAL ASSEMBLY & INSTALLATION

Attach Dozer Lift Arm

1. See Figure 5. Assemble the dozer lift arm (B) to the dozer hitch (A) using two 1/2-13 x 1-3/4" capscrews, lockwashers, and nuts. Insert the capscrews from left to right in the holes shown.

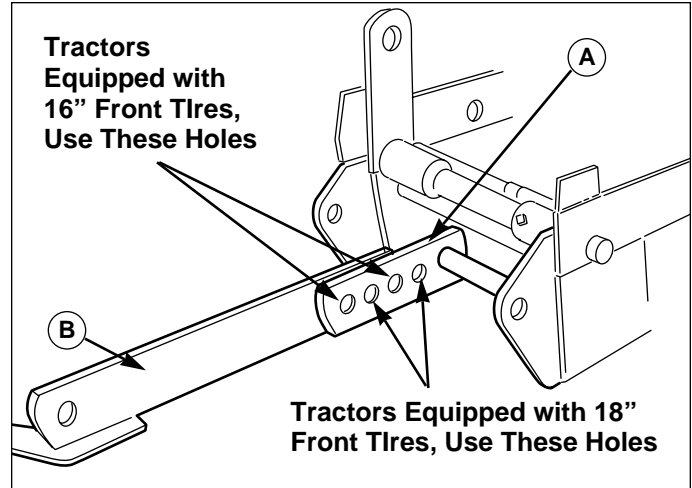


Figure 5. Assemble Dozer Lift Arm

- A. Dozer Hitch
- B. Dozer Lift Arm

Assemble Dozer Blade

NOTE: Once assembled, the dozer blade and hitch pivot assembly need not be separated.

1. Slide the dozer blade assembly (B) and hitch pivot assembly (A) together as shown in Figure 6.
2. Install the pivot pin (C) and secure with a cotter pin (D) at both ends.

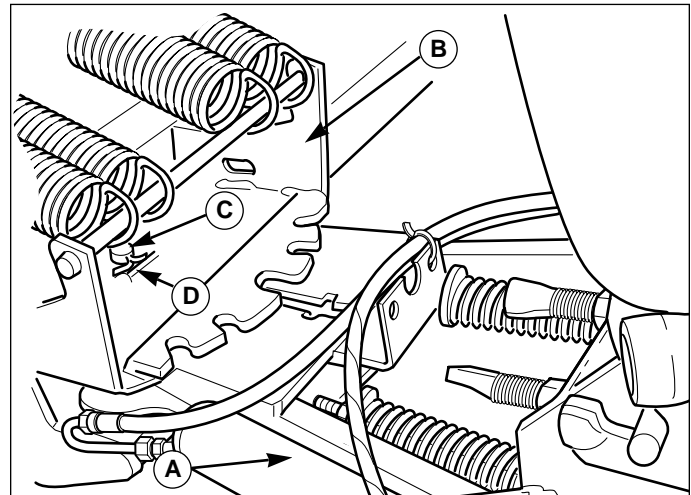


Figure 6. Assemble Dozer Blade

- A. Hitch Pivot Assy.
- B. Dozer Blade Assy.
- C. Pivot Pin
- D. Cotter Pin

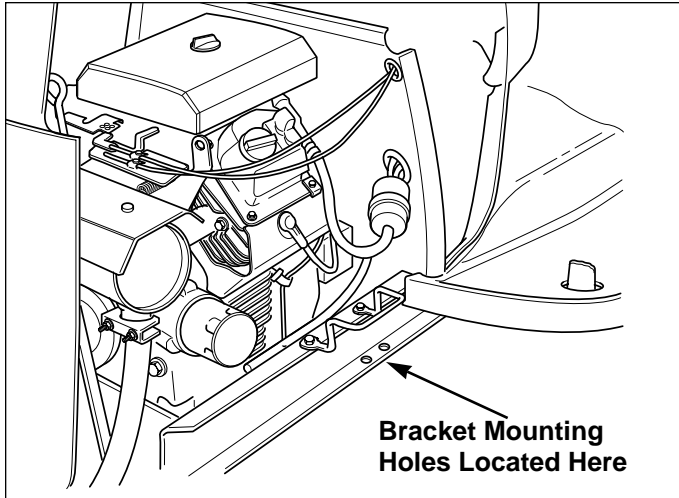


Figure 7. Front Hitch Bracket Mounting Holes

Install Front Hitch Mounting Brackets

NOTE: Once installed, the front and rear hitch mounting brackets need not be removed.

1. Locate the bracket mounting holes on both sides of the frame (see Figure 7).
2. Attach the front hitch mounting brackets (A, Figure 8) to the bracket mounting holes in both sides of the frame using 5/16-18 x 1-1/4 capscrews (C), lockwashers, and nuts (D).

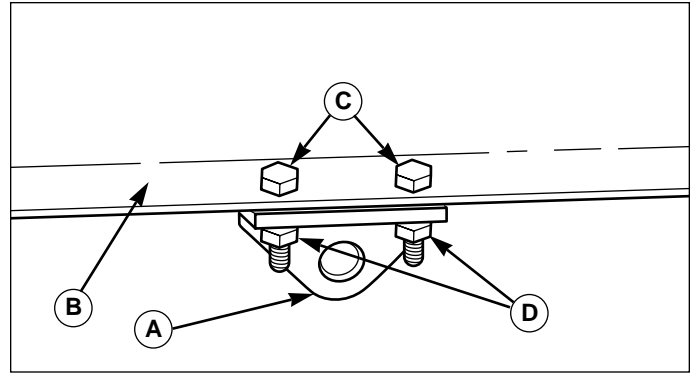


Figure 8. Front Hitch Mounting Brackets
A. Hitch Bracket **C. Capscrews, 5/16-18 x 1-1/4"**
B. Frame **D. Nut & Lockwasher**

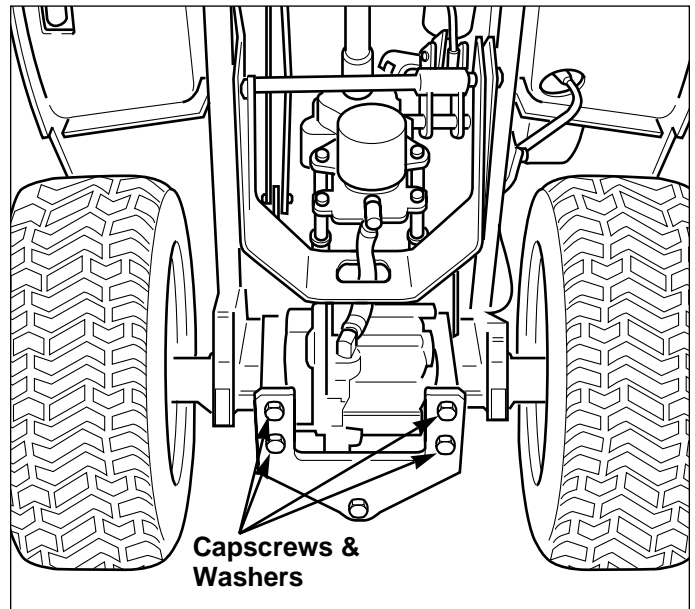


Figure 9. Drawbar Bolts & Washers

Install Rear Hitch Mounting Brackets

1. Remove the front four capscrews and lockwashers securing the drawbar to the transmission (see Figure 9).
2. Attach the rear hitch brackets (A, Figure 10) to the drawbar and transmission with the 5/8-11 x 2" capscrews (C) and washers (B) provided.

NOTE: During initial installation do not tighten the capscrews (C, Figure 10) securing the rear hitch mounting brackets until the attachment is completely installed.

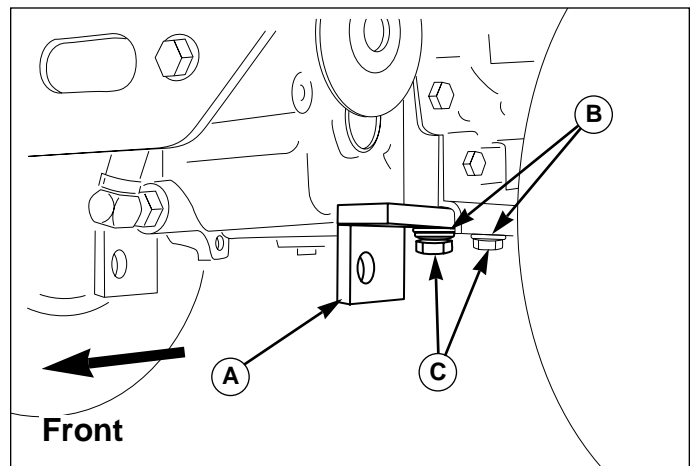


Figure 10. Rear Hitch Brackets
A. Bracket **C. Capscrew, 5/8-11 x 2"**
B. Washer, 5/8

Initial Assemble & Installation

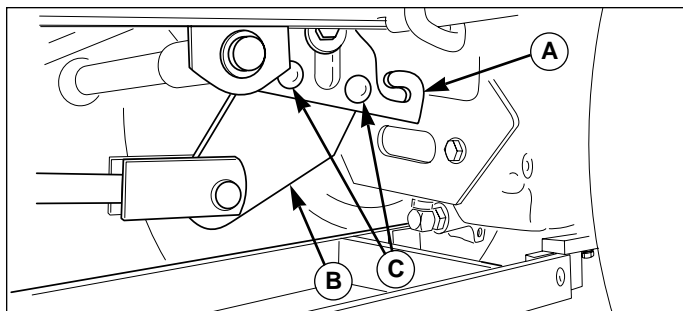


Figure 11. Attachment Lift Extension
A. Lift Arm
B. Lift Extension
C. Carriage Bolt, 3/8-16 x 1"

Install Attachment Lift Extension

NOTE: The attachment lift extension must be removed when using mower.

1. Install the attachment lift extension (B, Figure 11) on the left attachment lift arm (A) using two 3/8-16 x 1" carriage bolts (C), lockwashers, and nuts as shown.

Assemble Ladder Hitch

1. Attach the hanger brackets (A, Figure 12) to the hitch assembly (F) using 3/8-16 x 1" capscrews and nylock nuts (B). Do not torque the nuts. The hanger brackets (A) should be able to pivot freely.
2. Attach the lift rod (C, Figure 12) to the hitch lift arm (D) using one 1/2" x 2" flat head clevis pin and safety clip (E).

Install Hitch Onto Tractor

1. Slide the hitch and lift rod assembly under the tractor. Use 4x4 wood blocks to support the hitch and help align the mounting holes.
2. Attach the rear end of the ladder hitch (B, Figure 13) to the rear hitch brackets (A) using two 5/8 x 1-5/8" flat head clevis pins (C) and safety clips.
3. Attach the front end of the ladder hitch (D, Figure 14) to the front hitch brackets using two 1/2 x 1-1/2" round head clevis pins (A) and safety clips (C).

Install Lift Rod

1. If not already done, attach the lift rod (F, Figure 14) to the hitch lift arm (E) using a 1/2 x 2" flat head clevis pin and safety clip.
2. Attach the lift rod (F, Figure 14) to the attachment lift extension (H) using a 5/8 x 1-5/8" flat head clevis pin (I) and safety clip (C).

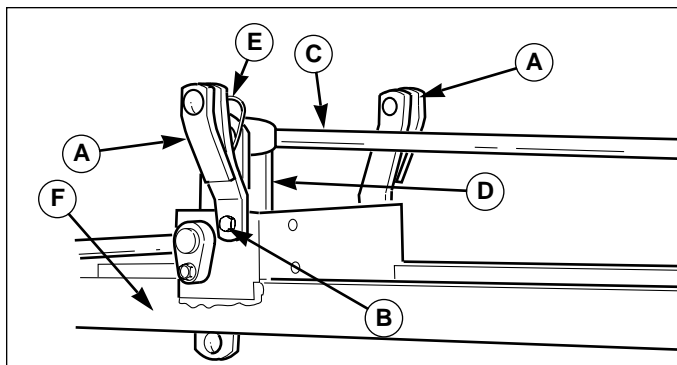


Figure 12. Assemble Hitch
A. Hanger Bracket
B. 3/8-16 x 1 Capscrew & Nylock Nut
C. Lift Rod
D. Hitch Lift Arm
E. 1/2 x 2" Flat Head Clevis Pin & Safety Clip
F. Hitch Assembly

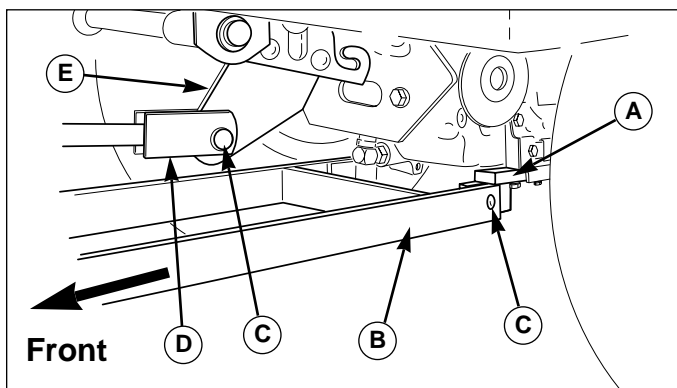


Figure 13. Rear Brackets & Lift Extension
A. Rear Hitch Brackets
B. Ladder Hitch
C. 5/8x1-5/8" Flat Head Clevis Pin
D. Lift Rod
E. Lift Extension

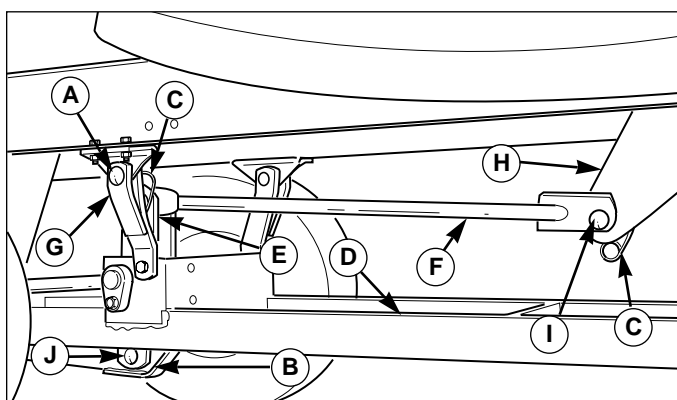


Figure 14. Lift Rod
A. 1/2 x 1-1/2" Round Head Clevis Pin
B. Snowthrower Lift Arm
C. Safety Clip
D. Ladder Hitch
E. Hitch Lift Arm
F. Lift Rod
G. Front Hitch Bracket
H. Lift Extension
I. 5/8 x 1-5/8" Flat Head Clevis Pin
J. 1/2 x 2" Flat Head Clevis Pin

Install Dozer Blade

1. Fully lower the attachment lift.
2. See Figure 15. Attach the dozer to the tractor by resting the dozer pins (A) on the front attachment hooks (C).
3. See Figure 15. Install two clevis pins (B) on both sides and secure with safety clips.

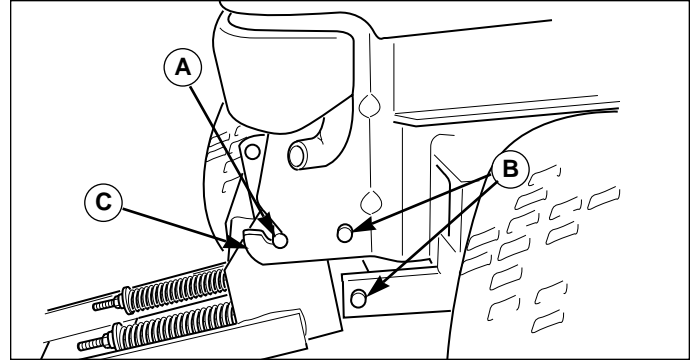


Figure 15. Attach Dozer

- A. Dozer Pins
B. 5/8 x 1-5/8" Flat Head Clevis Pin
C. Attachment Hooks

4. See Figure 16. Attach the dozer lift arm (B) to the hitch lift arm (E) using a clevis pin and safety clip.

NOTE: At this point during initial installation tighten the capscrews (C, Figure 10) securing the rear hitch mounting brackets. This is only necessary when installing the attachment for the first time.

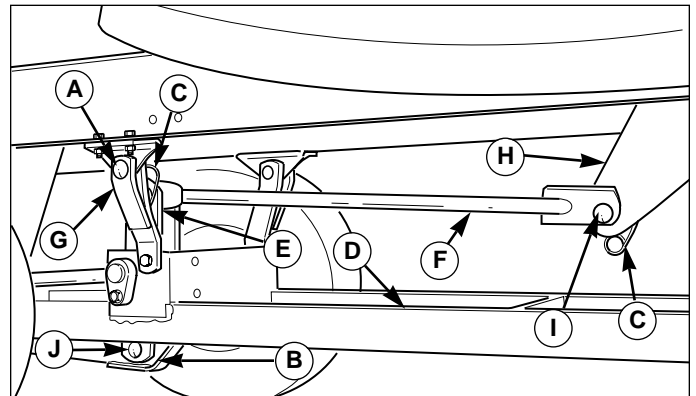


Figure 16. Lift Rod

- A. 1/2 x 1-1/2" Round Head Clevis Pin
B. Dozer Lift Arm
C. Safety Clip
D. Ladder Hitch
E. Hitch Lift Arm
F. Lift Rod
G. Front Hitch Bracket
H. Lift Extension
I. 5/8 x 1-5/8" Flat Head Clevis Pin
J. 1/2 x 2" Flat Head Clevis Pin

Initial Assemble & Installation

Install New Master Valve

1. Remove the two screws that connect the plastic upper dash to the left side of the lower air screen to provide access to the master valve.
2. Remove the foam (A, Figure 17) located below the master valve (B).
3. Note the markings on the body of the master valve (B, Figure 17). **Label the hoses with these same markings** and disconnect the hoses.
4. Remove the hairpin clip (E, Figure 17) securing the actuator arm (C).
5. Remove & retain the two screws (D, Figure 17) securing the master valve (B) and remove the valve assembly.
6. Transfer the hose fittings from the old valve to the new master valve. Retain the old master valve.

NOTE: The old master valve will be used as the control valve later.

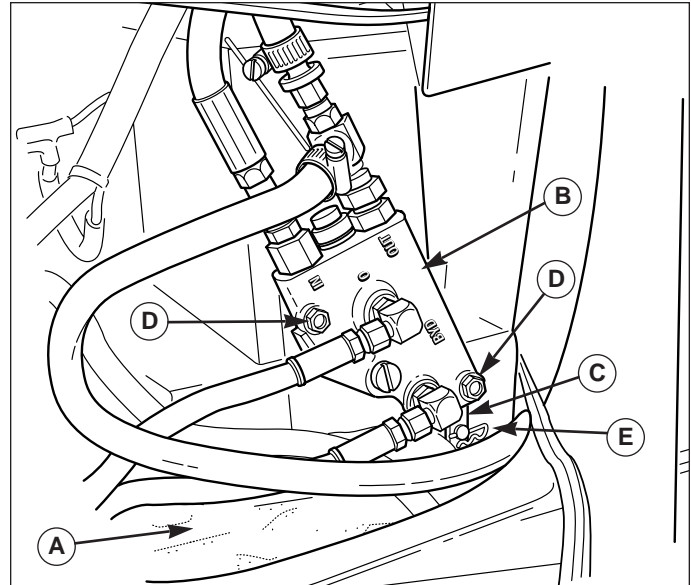


Figure 17. Old Master Valve

- | | |
|-----------------|------------------|
| A. Foam | D. Screw |
| B. Master Valve | E. Hair Pin Clip |
| C. Actuator Arm | |

7. Install a new right-angle fitting (F, Figure 18) in the power beyond port of the new valve
8. Connect the actuator arm (C, Figure 18) to the new master valve using a hair pin clip (E) and secure the valve using the two screws (D) removed in step 5.
9. Reattach the hoses to the new valve.

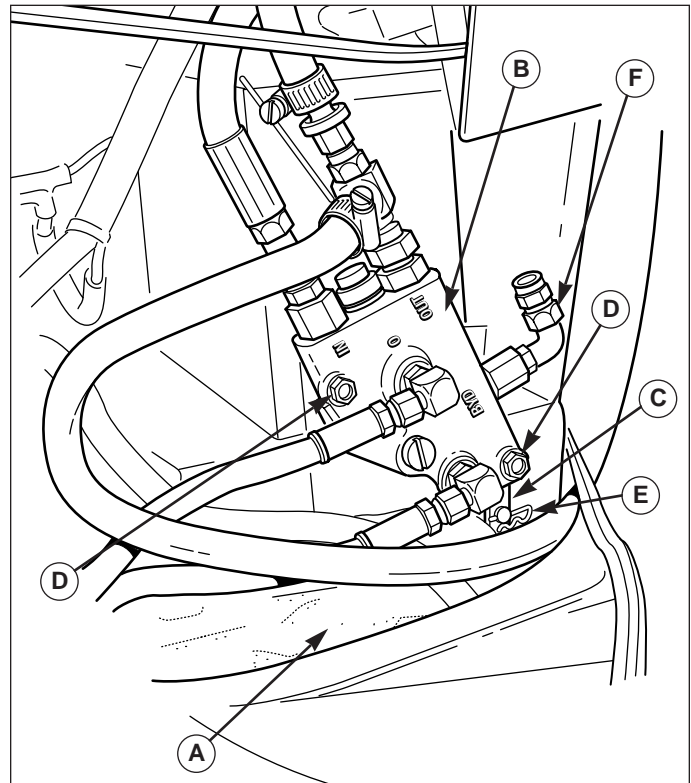


Figure 18. New Master Valve and Fittings

- | | |
|-----------------|------------------------|
| A. Foam | D. Screw |
| B. Master Valve | E. Hair Pin Clip |
| C. Actuator Arm | F. Right Angle Fitting |

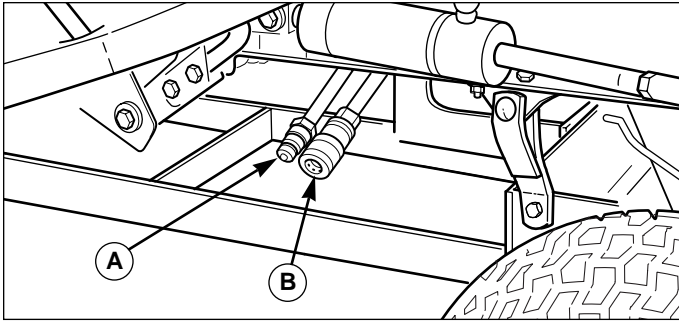


Figure 19. Install Quick Connectors
A. Male Connector B. Female Connector

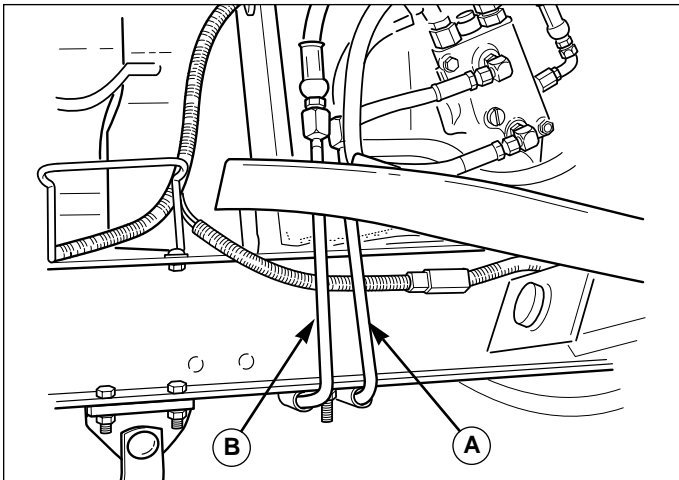


Figure 20. Cross-Over Tubes
A. Tube w/ Beaded End B. Tube w/ Threaded End

Install Cross-Over Tubes

1. Locate the metal cross-over tube with a male threaded fitting on one end and a female hex fitting on the other. Install one female quick connector (B, Figure 19) on the male threaded fitting.
2. Locate the metal cross-over tube with a male threaded fitting on one end and a bead on the other. Install one male quick connector (A, Figure 19) on the threaded end.
3. Install the cross-over tubes (A, B, Figure 20) under the tractor. Route the tubes through the frame as shown in Figures 20 and 22. The tube with the beaded end (A, Figure 20) goes in back, the tube with the hex fitting (B) goes in front.
4. Secure the tubes according to the following steps.

Models with Kohler Air Cooled Engines:

- a. Remove the two taptite screws (C, Figure 22) located in the rear holes (see Figure 21) and replace with two 5/16-18 x 1" taptite screws.
- b. Secure the hoses using a large washer (D, Figure 22), lock washer (E), and clamp (B) as shown.

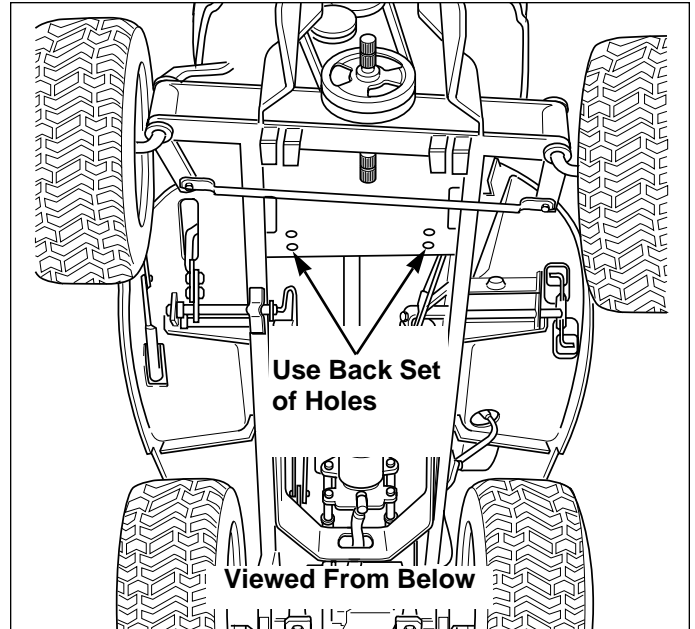


Figure 21. Mounting Hole Location

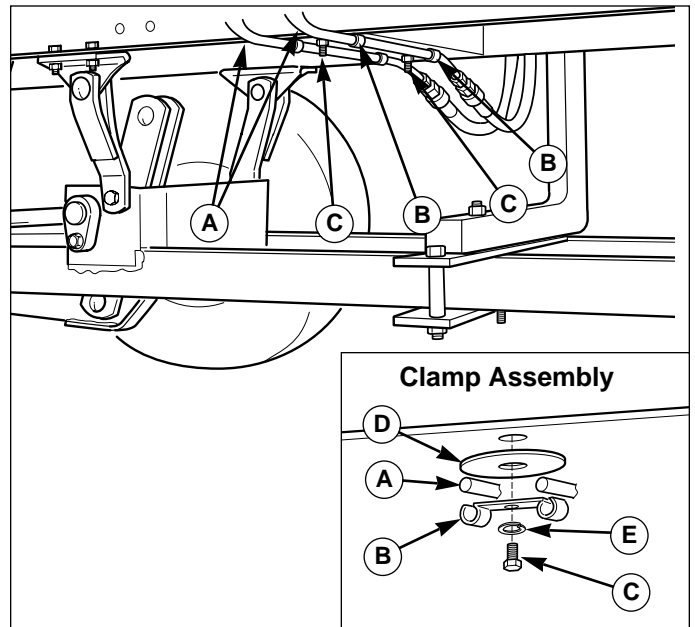


Figure 22. Secure Cross-Over Tubes
A. Cross-Over Tube D. Large Washer
B. Clamp E. Lock Washer
C. Taptite Screw, 5/16-18x1 F. 5/16 Nut

Models with Kawasaki Liquid Cooled Engines:

- a. Secure the cross-over tubes to the bottom of the tractor using two 5/16-18 x 1" taptite screws (C, Figure 22), large washers (D), lock washers (E), and clamps (B) using the rear set of holes shown in Figure 21.

Initial Assemble & Installation

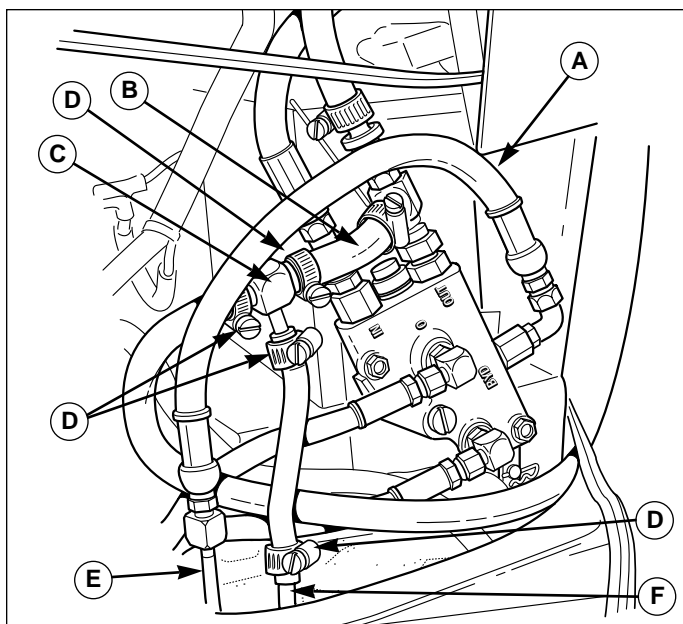


Figure 23. Install T-Connector

- A. Bypass Hose
- B. Return Hose
- C. T-Connector
- D. Hose Clamp
- E. Front Cross Over Tube
- F. Back Cross Over Tube

Install Bypass Hose & T-Connector

1. Install the 23/32" x 17" bypass hose (A, Figure 23) from the power beyond port of the master valve to the front cross-over tube (E).
2. Cut the return hose (B, Figure 23) 3" from the valve as shown.
3. Install the T-connector (C, Figure 23) in the return hose (B) and secure with hose clamps.
4. Connect the third leg of the T-connector (C, Figure 23) to the back cross-over tube (F) using the 5/8" x 9" hose and hose clamps.
5. Tighten all fittings and hose clamps.
6. Run the tractor and check for leaks.
7. Reinstall the foam and lower dashboard screen.

Assemble Control Arm

1. Assemble one clamp plate (C, Figure 24) below the ladder hitch and one clamp plate (C) and lower control arm (E) above the hitch. Secure using two 1/2-13 x 5-1/2 capscrews, lockwashers, and nuts (F) and one 1/2-13 x 3-1/2 capscrew, lockwasher, and nut (G).

The clamp plate assembly (A, Figure 25) should be approximately 7" behind the hitch mounting brackets (D) as shown in Figure 25.

2. Insert the upper control arm (A, Figure 24) into the lower control arm (E) and control valve plate (D). Secure with 5/16-18 x 3/4" capscrews (B).

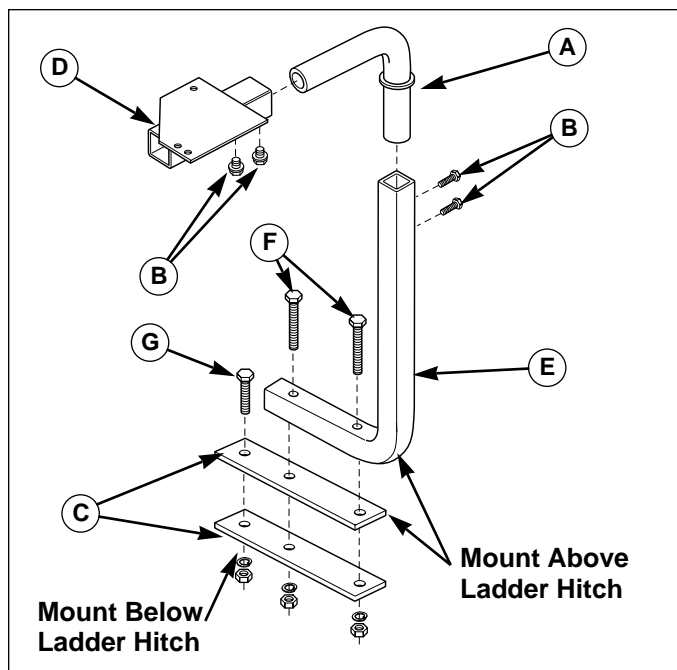


Figure 24. Assemble Upper Control Arm

- A. Upper Control Arm
- B. 5/16-18 x 3/4" Capscrew
- C. Clamp Plate
- D. Control Valve Plate
- E. Lower Control Arm
- F. 1/2-13 x 5-1/2 Capscrews, Lockwasher, & Nuts
- G. 1/2-13 x 3-1/2 Capscrew, Lockwasher, & Nut

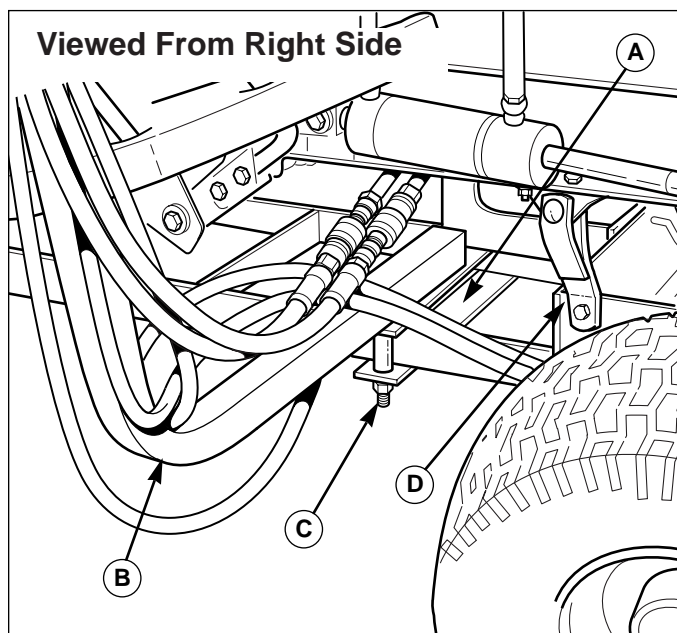


Figure 25. Attach Lower Control Arm Support

- A. Clamp Plate
- B. Lower Control Arm
- C. 1/2-13 x 3-1/2" Capscrew, Lockwasher, & Nut
- D. Hitch Mounting Bracket

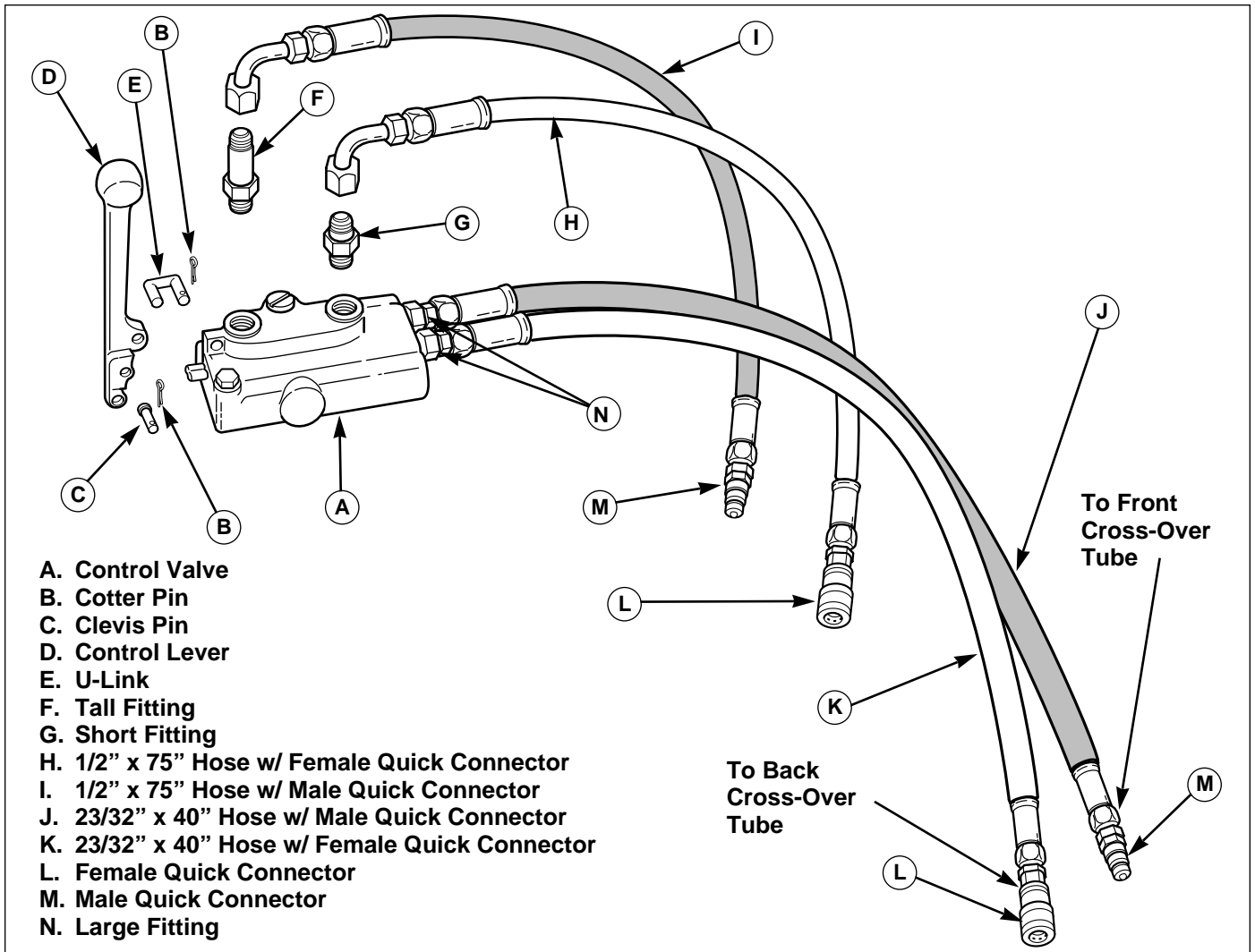


Figure 26. Assemble Control Valve

Install Control Valve

1. Locate the old single spool master valve removed from tractor (A, Figure 26).

NOTE: From this point on, the old master valve will be referred to as the control valve (A, Figure 26).

2. Install the control lever (D, Figure 26) using a small clevis pin (C), the U-link (E), and small cotter pins (B) as shown.
3. Install a tall fitting (F, Figure 26) and a short fitting (G) into the control valve (A) as shown.
4. Install a male quick connector (M, Figure 26) on one of the 1/2" x 75" long hoses (I), and connect the other end of the hose to the tall fitting (F)
5. Install a female quick connector (L, Figure 26) on the other 1/2" x 75" long hose (H) and connect it to the short fitting (G).

NOTE: The quick connector ends of the 1/2" x 75" hoses attached to the control valve in steps 4 and 5 will be connected to the dozer hydraulic hoses later.

6. Install two large fittings (N, Figure 26) in the front of the control valve (A).
7. Install a male quick connector (M, Figure 26) on one of the 23/32" x 40" hoses (J) and a female quick connector (L) on the other 23/32" x 40" hose (K).

Initial Assemble & Installation

- Mount the control valve (A, Figure 27) to the support arm (D) using two 1/4-20 x 1-3/4" taptite screws (E).
- Using the 23/32" x 40" hose with the male quick connector (B, Figure 27), connect the IN port of the control valve (A) to the front cross-over tube (A, Figure 28).
- Using the 23/32" x 40" hose with the female quick connector (C, Figure 27), connect the OUT port of the control valve (A) to the back cross-over tube (B, Figure 28).

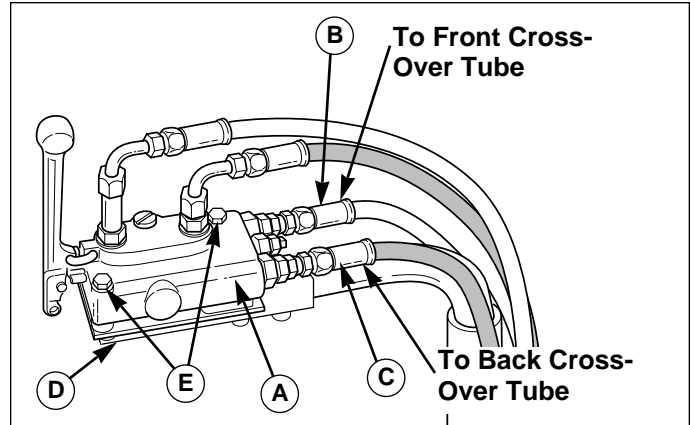


Figure 27. Control Valve

- A. Control Valve
- B. 23/32" x 40" Hose w/ Male Quick Connector
- C. 23/32" x 40" Hose w/ Female Quick Connector
- D. Support Arm
- E. 1/4-20 x 1-3/4" Taptite Screws

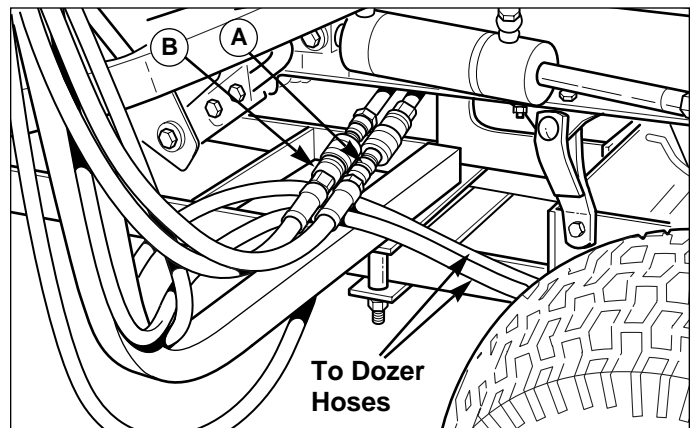


Figure 28. Cross-Over Tubes

- A. Front Cross-Over Tube
- B. Back Cross-Over Tube

Install Hydraulic Cylinder On Dozer Blade

1. Install the cylinder (A, Figure 29) onto the dozer blade using clevis pins and hair pin clips (B) as shown. Connect the cylinder rod to the front of the dozer blade.
2. Install one hose fitting in each end of the cylinder.
3. Locate two 1/2" x 28" hoses. Install one male quick connector on one of the hoses and a female quick connector on the other.
4. Attach the 1/2" x 28" hose with the male quick connector (C, Figure 29) to the front (piston side) fitting of the cylinder.
5. Attach the 1/2" x 28" hose with the female connector (D, Figure 29) to the back (base side) fitting of the cylinder.
6. Route the hoses across the top of the dozer hitch to the right side of the tractor.
7. Connect the dozer hydraulic hoses (B, Figure 30) to the 1/2" x 75" long hoses (A) coming from the top of the control valve.
8. Secure the control valve hoses (A, Figure 30) to the control arm and ladder hitch using plastic tie straps.
9. Secure the dozer blade hoses (B, Figure 30) to the dozer blade hitch assemble using plastic tie straps.

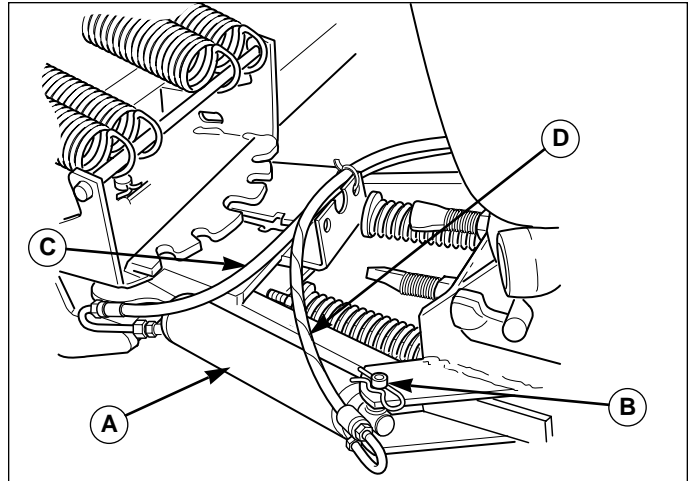


Figure 29. Dozer Hydraulic Cylinder

A. Cylinder

B. Clevis Pin & Hair Pin Clip

C. 1/2" x 28" Hose with Male Quick Connector

D. 1/2" x 28" Hose with Female Quick Connector

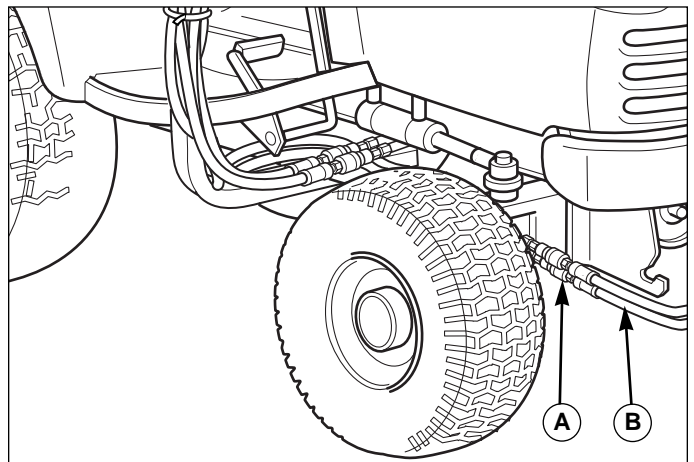


Figure 30. Connect Hydraulic Hoses

A. 1/2" Control Valve Hoses

Initial Assemble & Installation

10. Install a male and female quick connector on the 1/2" x 11" hose (see Figure 31). This hose must be installed when the dozer blade is removed from the tractor.



IMPORTANT NOTE
After removing the dozer blade, do not operate the tractor without first installing the bypass hose (Figure 31).

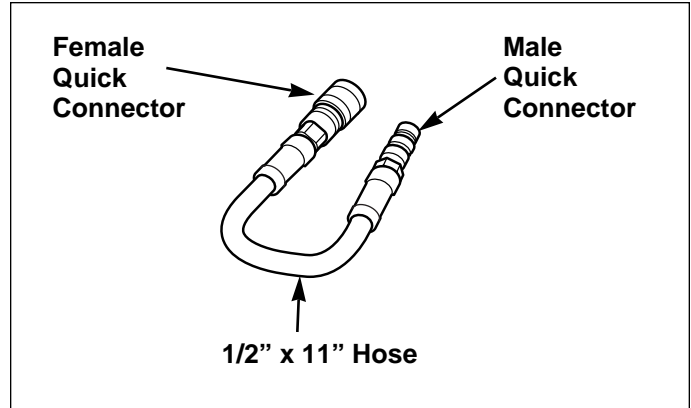


Figure 31. Assemble Bypass Hose

11. Start the unit and check for leaks.
12. Run the unit for at least 10 minutes and move the blade from side to side 10 times to bleed air out of the hydraulic system.
13. Check the oil level. Observe the oil level in the plastic tube at the rear of the unit (see Figure 32).
There should be 1" to 1-1/2" of oil in the tube. If there is no oil in the tube add Type-F automatic transmission oil a few ounces at a time. The transmission fill tube is located under the seat (see Figure 33).

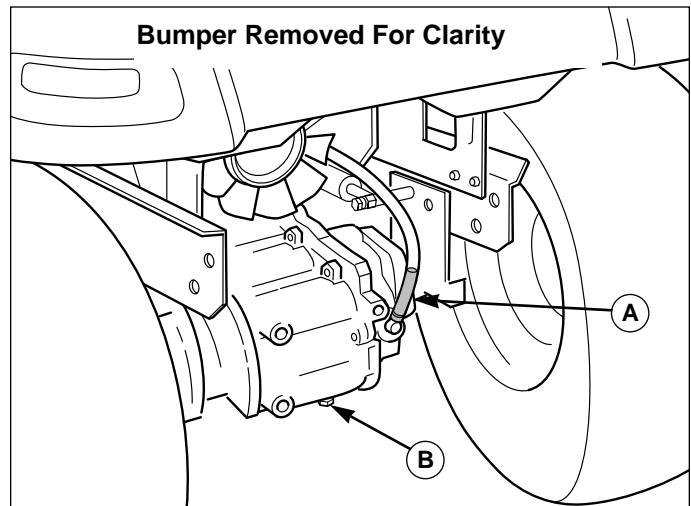


Figure 32. Transmission Fluid Check
A. Hydraulic Tube

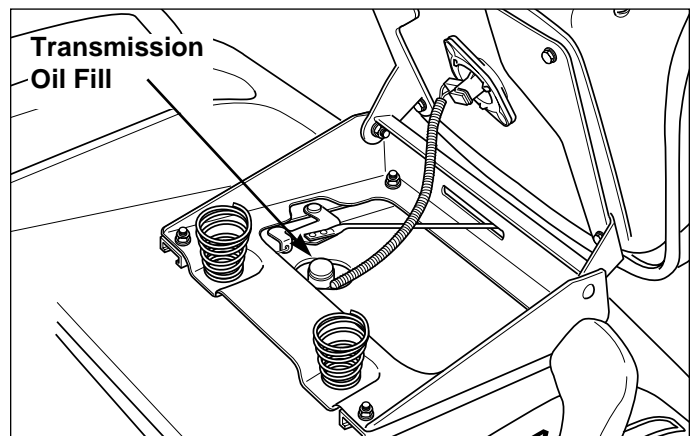


Figure 33. Transmission Oil Fill

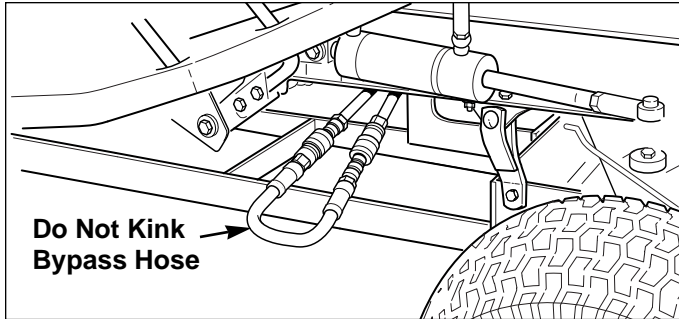


Figure 34. Install Bypass Hose

DOZER & HITCH REMOVAL

NOTE: Connect male and female quick connectors to prevent dirt and water from entering the hoses.

NOTE: Cross-over tubes must remain installed on the tractor

1. Fully lower the attachment lift.
2. Disconnect the 1/2" (small) dozer hoses (D, Figure 35) from the 1/2" control valve hoses (C).
3. Connect the dozer hoses' (D, Figure 35) male and female quick connectors together. Also connect the 1/2" control valve hoses (C) to each other.
4. Disconnect the 23/32" (large) hoses (B, Figure 35) from the cross-over tubes (A).
5. Connect the 23/32" hoses (B) to each other.
6. Install the 1/2" x 11" bypass hose (Figure 34) in the cross-over tube quick connectors. You may need to spread the cross-over tubes apart to keep the bypass hose from kinking.



IMPORTANT NOTE

After removing the dozer blade, do not operate the tractor without first installing the the bypass hose (Figure 34).

7. See Figure 36. Disconnect the dozer lift arm (B) from the hitch lift arm (E).
 8. See Figure 37. Remove the 4 safety clips and clevis pins (B) securing the dozer to the tractor and lift the dozer off the attachment hooks (C).
 9. See Figure 36. Disconnect the lift rod (F) from the lift extension (H).
- NOTE: The control arm support can remain attached to the hitch.*
10. See Figure 36. Remove the clevis pins (A) attaching the front and rear of the hitch to the tractor. Remove the hitch.
 11. If the mower deck is being installed, remove the lift extension (H, Figure 36).

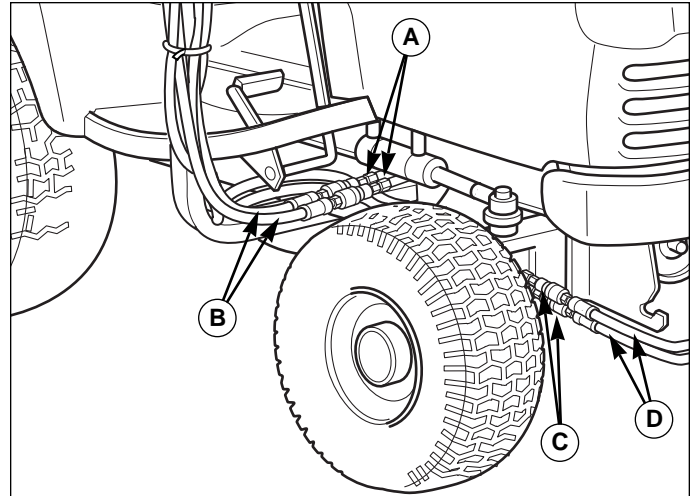


Figure 35. Disconnect Hydraulic Hoses

- A. Cross Over Tubes
- B. 23/32" Control Valve Hoses
- C. 1/2" Control Valve Hoses
- D. 1/2" Dozer Blade Hoses

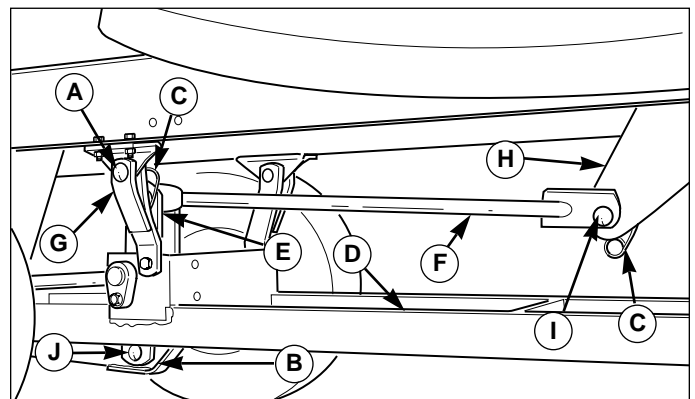


Figure 36. Lift Rod

- A. 1/2 x 1-1/2" Round Head Clevis Pin
- B. Dozer Lift Arm
- C. Safety Clip
- D. Ladder Hitch
- E. Hitch Lift Arm
- F. Lift Rod
- G. Front Hitch Bracket
- H. Lift Extension
- I. 5/8 x 1-5/8" Flat Head Clevis Pin
- J. 1/2 x 2" Flat Head Clevis Pin

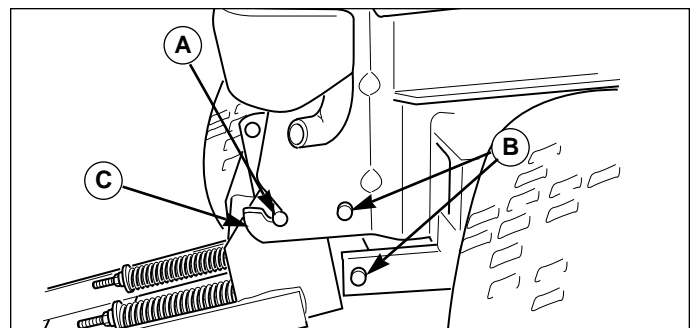


Figure 37. Attach Dozer

- A. Dozer Pins
- B. 5/8 x 1-5/8" Flat Head Clevis Pin
- C. Attachment Hooks

Normal Installation

NORMAL INSTALLATION

Install Hitch Onto Tractor

1. Slide the hitch and lift rod assembly under the tractor. Use 4x4 wood blocks to support the hitch and help align the mounting holes.
2. Attach the rear end of the ladder hitch (B, Figure 38) to the rear hitch brackets (A) using two 5/8 x 1-5/8" flat head clevis pins (C) and safety clips.
3. Attach the front end of the ladder hitch (D, Figure 39) to the front hitch brackets using two 1/2 x 1-1/2" round head clevis pins (A) and safety clips (C).

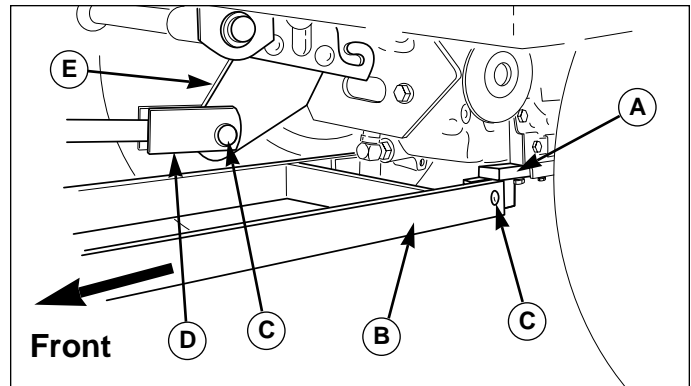


Figure 38. Rear Brackets & Lift Extension
A. Rear Hitch Brackets D. Lift Rod
B. Ladder Hitch E. Lift Extension
C. 5/8x1-5/8" Flat Head Clevis Pin

Install Lift Rod

1. If not already done, attach the lift rod (F, Figure 39) to the hitch lift arm (E) using a 1/2 x 2" flat head clevis pin and safety clip.
2. Attach the lift rod (F, Figure 39) to the attachment lift extension (H) using a 5/8 x 1-5/8" flat head clevis pin (I) and safety clip (C).

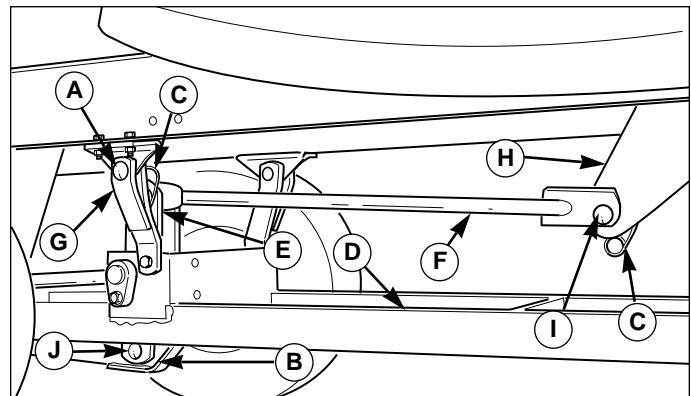


Figure 39. Lift Rod
A. 1/2 x 1-1/2" Round Head Clevis Pin F. Lift Rod
B. Dozer Lift Arm G. Front Hitch Bracket
C. Safety Clip H. Lift Extension
D. Ladder Hitch I. 5/8 x 1-5/8" Flat Head Clevis Pin
E. Hitch Lift Arm J. 1/2 x 2" Flat Head Clevis Pin

Install Dozer Blade

1. Fully lower the attachment lift.
2. See Figure 40. Attach the dozer to the tractor by resting the dozer pins (A) on the front attachment hooks (C).
3. See Figure 40. Install two 5/8 x 1-5/8 clevis pins (B) on both sides and secure with safety clips.
4. See Figure 39. Attach the dozer lift arm (B) to the hitch lift arm (E) using a clevis pin and safety clip.

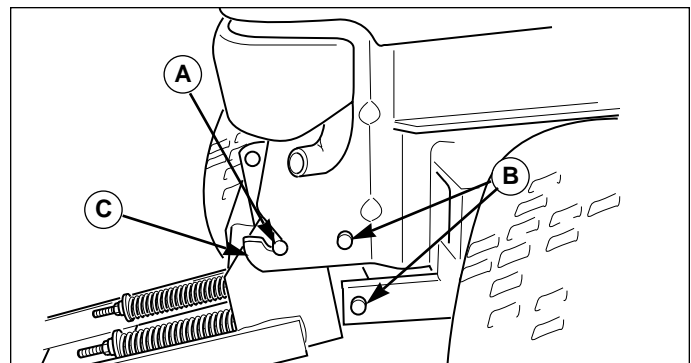


Figure 40. Attach Dozer
A. Dozer Pins C. Attachment Hooks
B. 5/8 x 1-5/8" Flat Head Clevis Pin

Normal Installation

5. Remove the bypass hose (Figure 41) from the cross-over tubes.

See Figure 42.

6. Connect the 23/32" x 40" hoses (B) from the control valve to the the cross-over tubes (A).
7. Connect the 1/2" x 75" hoses (C) from the control valve to the dozer hoses (D).
8. Lubricate the dozer as shown in the Maintenance section of this manual.
9. Perform all adjustments as shown in the Adjustments section of this manual.

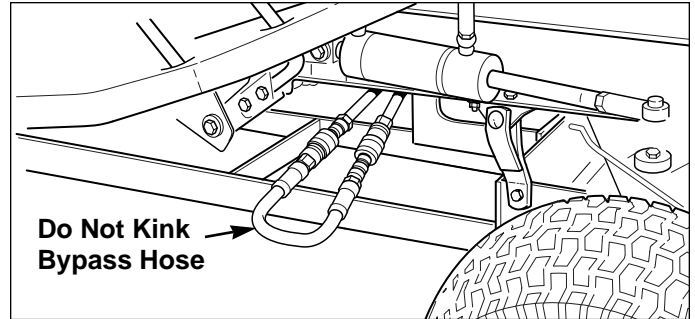


Figure 41. Remove Bypass Hose

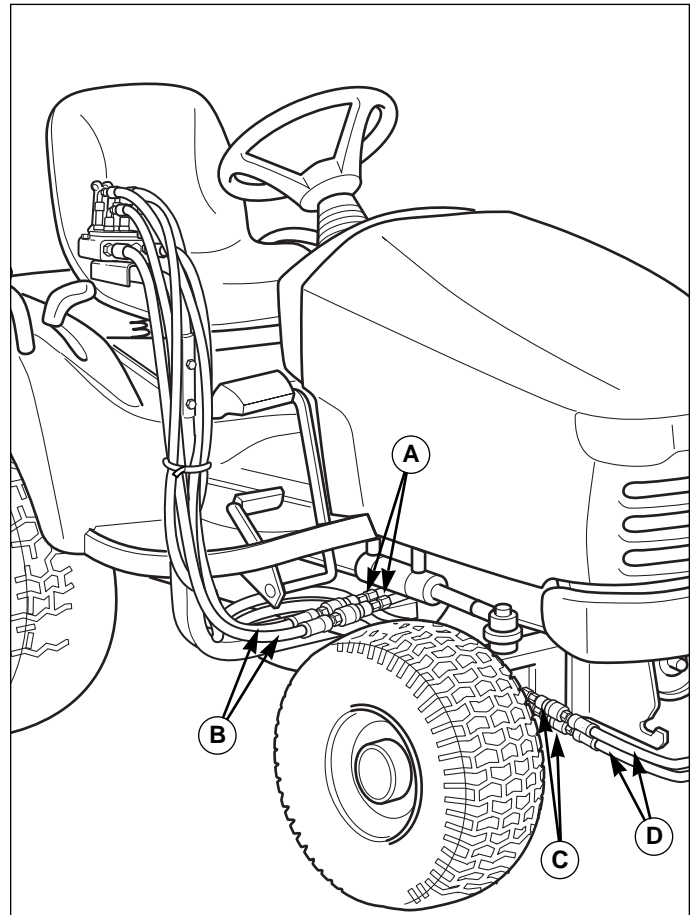
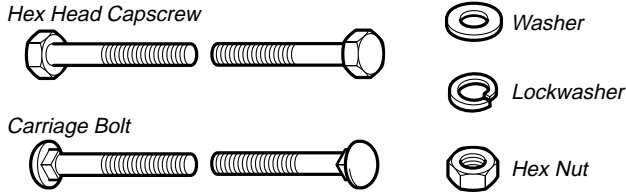


Figure 42. Connect Hydraulic Hoses

- A. Cross-Over Tubes
- B. 23/32" Control Valve Hoses
- C. 1/2" Control Valve Hoses
- D. 1/2" Dozer Blade Hoses

Hardware Identification & Torque Specifications

Common Hardware Types

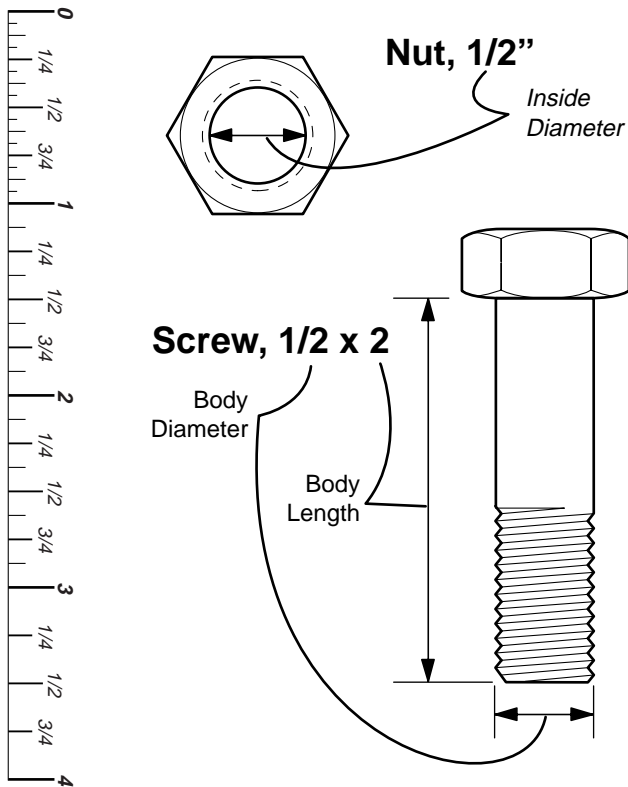


Standard Hardware Sizing

When a washer or nut is identified as **1/2"**, this is the *Nominal size*, meaning the *inside diameter* is 1/2 inch; if a second number is present it represents the *threads per inch*

When bolt or capscrew is identified as **1/2 - 16 x 2"**, this means the *Nominal size*, or *body diameter* is 1/2 inch; the second number represents the *threads per inch* (16 in this example, and the final number is the *body length* of the bolt or screw (in this example 2 inches long).

The guides and ruler furnished below are designed to help you select the appropriate hardware and tools.



Torque Specification Chart

FOR STANDARD MACHINE HARDWARE (Tolerance $\pm 20\%$)

Hardware Grade	No Marks SAE Grade 2		SAE Grade 5		SAE Grade 8	
	in/lbs ft/lbs	Nm.	in/lbs ft/lbs	Nm.	in/lbs ft/lbs	Nm.
8-32	19	2.1	30	3.4	41	4.6
8-36	20	2.3	31	3.5	43	4.9
10-24	27	3.1	43	4.9	60	6.8
10-32	31	3.5	49	5.5	68	7.7
1/4-20	66	7.6	8	10.9	12	16.3
1/4-28	76	8.6	10	13.6	14	19.0
5/16-18	11	15.0	17	23.1	25	34.0
5/16-24	12	16.3	19	25.8	27	34.0
3/8-16	20	27.2	30	40.8	45	61.2
3/8-24	23	31.3	35	47.6	50	68.0
7/16-14	30	40.8	50	68.0	70	95.2
7/16-20	35	47.6	55	74.8	80	108.8
1/2-13	50	68.0	75	102.0	110	149.6
1/2-20	55	74.8	90	122.4	120	163.2
9/16-12	65	88.4	110	149.6	150	204.0
9/16-18	75	102.0	120	163.2	170	231.2
5/8-11	90	122.4	150	204.0	220	299.2
5/8-18	100	136	180	244.8	240	326.4
3/4-10	160	217.6	260	353.6	386	525.0
3/4-16	180	244.8	300	408.0	420	571.2
7/8-9	140	190.4	400	544.0	600	816.0
7/8-14	155	210.8	440	598.4	660	897.6
1-8	220	299.2	580	788.8	900	1,244.0
1-12	240	326.4	640	870.4	1,000	1,360.0

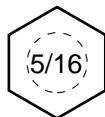
NOTES

- These torque values are to be used for all hardware excluding: locknuts, self-tapping screws, thread forming screws, sheet metal screws and socket head setscrews.
- Recommended seating torque values for locknuts:
 - for prevailing torque locknuts - use 65% of grade 5 torques.
 - for flange whizlock nuts and screws - use 135% of grade 5 torques.
- Unless otherwise noted on assembly drawings, all torque values must meet this specification.

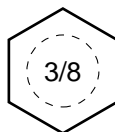
Wrench & Fastener Size Guide



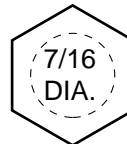
1/4" Bolt or Nut
Wrench—7/16"



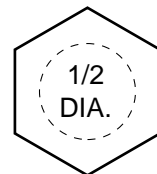
5/16" Bolt or Nut
Wrench—1/2"



3/8" Bolt or Nut
Wrench—9/16"



7/16" Bolt or Nut
Wrench (Bolt)—5/8"
Wrench (Nut)—11/16"



1/2" Bolt or Nut
Wrench—3/4"