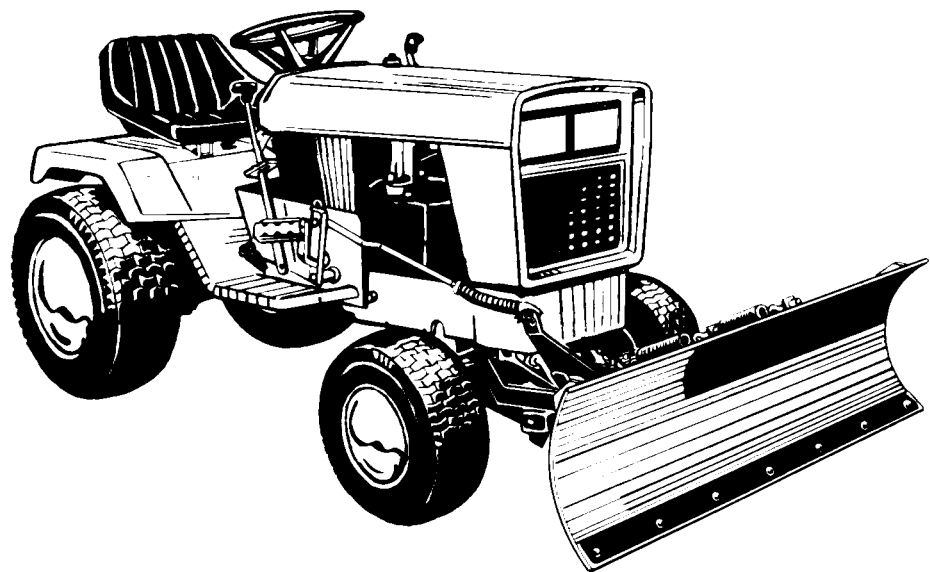


# ATTACHMENT OPERATOR'S MANUAL



## Snow/Dozer Blade & Hitch

### Snow Plow/Dozer Blade

Mfg. No.	Description
1693754	42" Remote Angling Snow Plow/Dozer Blade

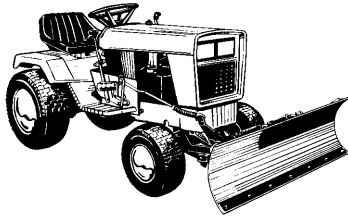
### Hitch

Mfg. No.	Description
1693757	Hitch (for Sovereign / 900 / 2800 Series)

1721303-01

Rev 1/2001

TP 100-2374-01-AT-SMA



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

## Recommended Accessories

For best performance, it is recommended to use tire chains and two rear wheel weights. The maximum weight added to the tractor should not exceed 35 lbs. per wheel.

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 17.6% (10°).

# Safety Rules & Information



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 17.6% (10°).**

## 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.

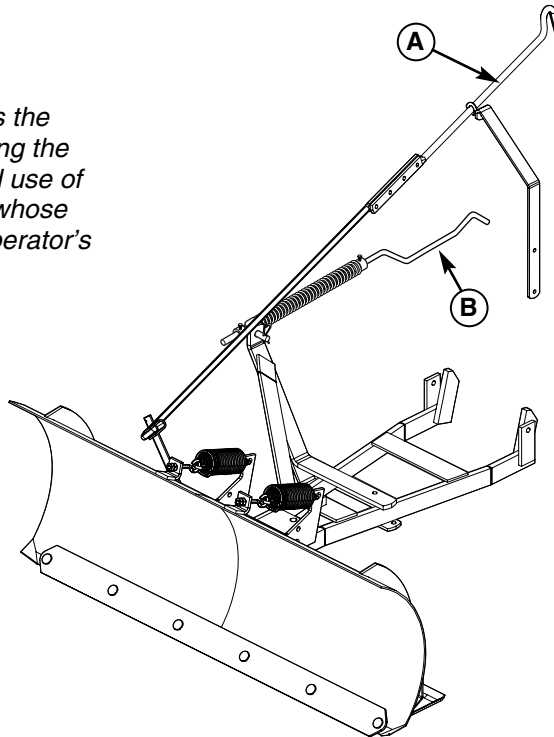
## OPERATING SAFETY

- 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 near glass enclosures, automobiles, window wells, dropoffs, 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 clear 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 the unit.

## 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.

**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. Control Locations**  
**A. Blade Angle Control Lever**  
**B. Attachment Lift**

### A. Blade Angle Control Lever

The blade angle release lever controls a spring-loaded plate which locks the blade in one of three positions.

Use an abrupt pushing/pulling motion to release the angling mechanism and move the blade left or right. Push the angling lever forward fully to lock the blade in the left position. Pull the lever fully back to lock the blade in the right position. Move the lever slowly past center to lock in the centered position.

*NOTE: It is easier to change the angle of the blade with the attachment raised.*

### B. Attachment Lift

*NOTE: Models with hydraulic or electric lift should refer to the tractor operator's manual for lift control information.*

The attachment lift lever raises and lowers the dozer blade. See the tractor operator's manual for control information. See the Adjustments section for proper attachment lift adjustment.



## 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.**
- **Practice driving in an open area—without dozing—to become accustomed to the unit.**

# General Operating Instructions



## 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 plowing 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.

Set tractor speed to obtain the needed power to move the material. Operate at a safe speed, depending on conditions, so that you have complete control of the tractor. Rear wheel weights and chains are recommended for slippery surfaces.

A weight box is recommended for additional traction.

## Transporting

For maximum ground clearance, transport the blade to and from work areas fully raised and angled straight ahead.

## Starting & Stopping

1. Start the tractor engine. Set engine throttle to full.
2. Raise the attachment lift and travel to the work site.
3. Set the angling control to the desired angle.
4. Lower the attachment lift and begin plowing.
5. Raise the plow before backing up.
6. To stop the tractor, set ground speed to neutral and set the parking brake. Before leaving the seat, stop the engine, set the parking brake, remove the key, and wait for all moving parts to stop.

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

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



## IMPORTANT NOTE

To prevent damage to the unit, always raise the dozer blade BEFORE turning or backing up.

## DANGER

### OPERATING ON SLOPES CAN BE DANGEROUS

Never operate on slopes greater than 17.6% (10°) which is a rise of 3-1/2 feet (106cm) vertically in 10 feet (607cm) 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 % (8.5°) but less than 17.6%, 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.

For additional traction, tire chains and wheel weights can be added. Maximum weight added to tractor should not exceed 35 lbs. per wheel.

## Changing Angle of the Blade:

See Figure 1 for location of Controls.

*NOTE: It is easier to change the angle of the blade with the attachment raised.*

1. Raise the attachment lift.
2. Use an abrupt pushing/pulling motion to release the angling mechanism and move the blade left or right. Push the angling lever forward fully to lock the blade in the left position. Pull the lever fully back to lock the blade in the right position. Move the lever slowly over center to lock in the centered position.

## 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 plowing 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.
- Spinning tires with tire chains can leave unsightly marks or permanent damage to asphalt or concrete driveways or sidewalks. Avoid sudden stops or starts.

## 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 or plowing 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 and hitch from the tractor.
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.

## **⚠ 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.

## 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.

## 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.

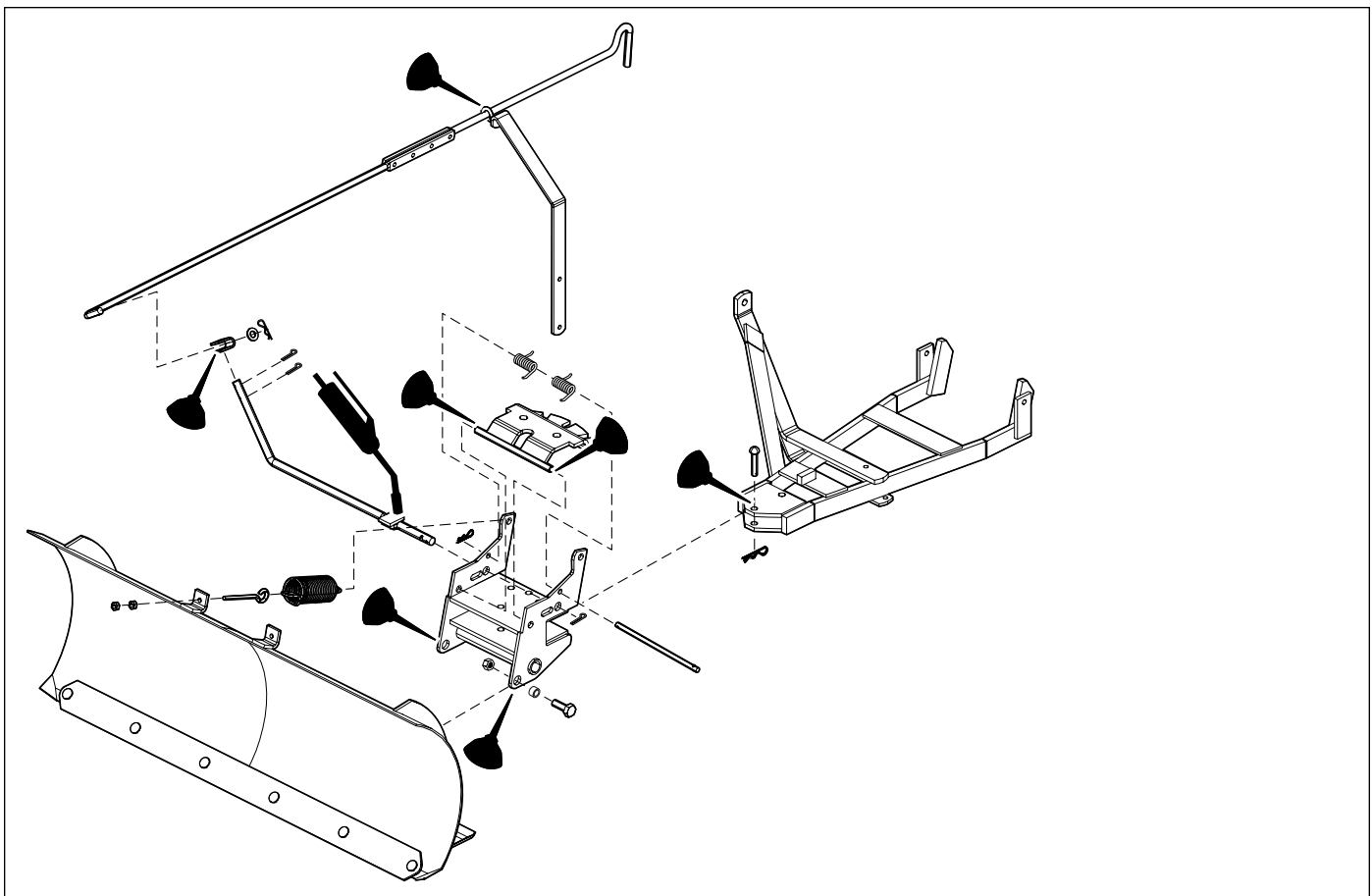


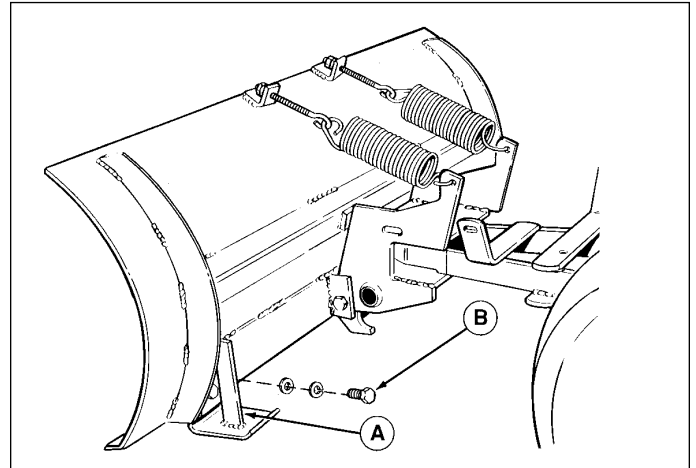
Figure 2. Lubrication Points

## Skid Shoe Adjustment

Slotted holes are provided to permit adjustment of the shoe assemblies for raising and lowering the blade to various working heights (see Figure 3).

When cleaning snow from gravel or earth drives or walks, the shoe assemblies should be lowered fully to prevent blade contact with gravel or ground. When cleaning smooth hard surfaces like concrete, the shoe assemblies are normally placed fully up to allow the blade to scrape the surface.

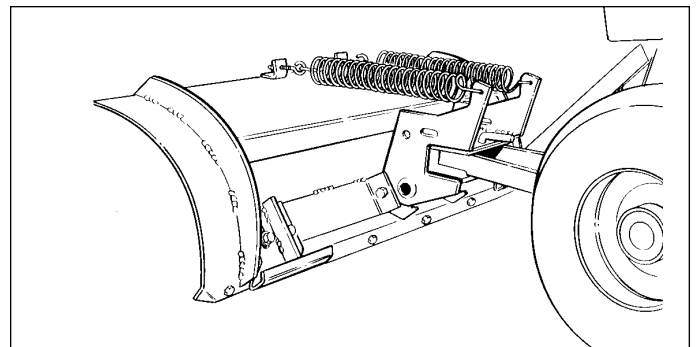
To adjust the skid, raise the blade off the ground and block with a piece of wood. Loosen the bolts (B, Figure 3) and move the skid shoes (A) up or down to desired height. Tighten the bolts securely.



**Figure 3.**  
**A. Skid Shoes**  
**B. Bolts**

## Spring Tension

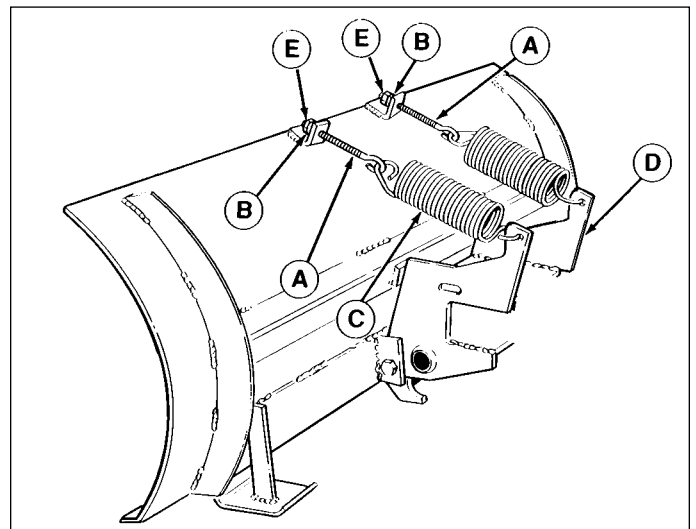
See Figure 4. This snow plow/dozer blade is spring loaded so that when the blade strikes a solid object, the springs will allow the blade to release as shown, rather than cause damage. The blade will go back to its original position after object is cleared.



**Figure 4. Dozer Blade "Released"**

See Figure 5. To adjust spring tension hold rear nut (B) and loosen front nut (E). Tighten rear nut (B) to increase spring tension, or loosen to decrease tension.

For initial adjustment, tighten nut (B) on each eyebolt enough to expose about 3/4" (19mm) of thread. Tighten front nut (E) against rear nut (B) to lock adjustment in place.



**Figure 5. Tension Springs**  
**A. Eyebolt**  
**B. Nut, 5/16**  
**C. Spring**  
**D. Pivot Frame**  
**E. Nut, 5/16**



# Adjustments

## Lift Rod Adjustment

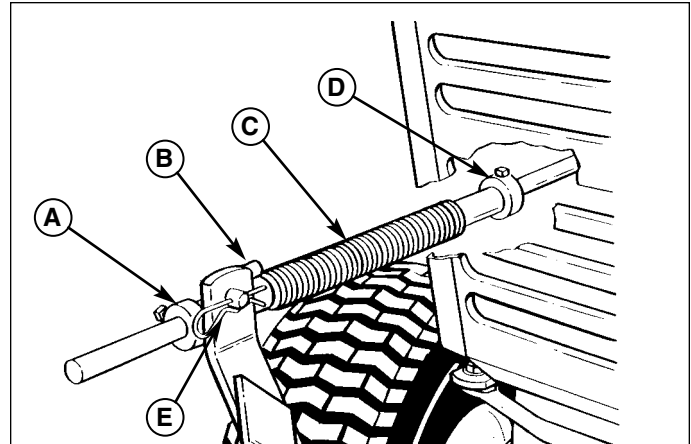
In the fully raised position the blade should be 6" off the ground. In the fully lowered position, the lift rod should slightly compress the spring creating downward pressure on the blade.

*NOTE: Always adjust the lift height before and after adjusting the downward pressure.*



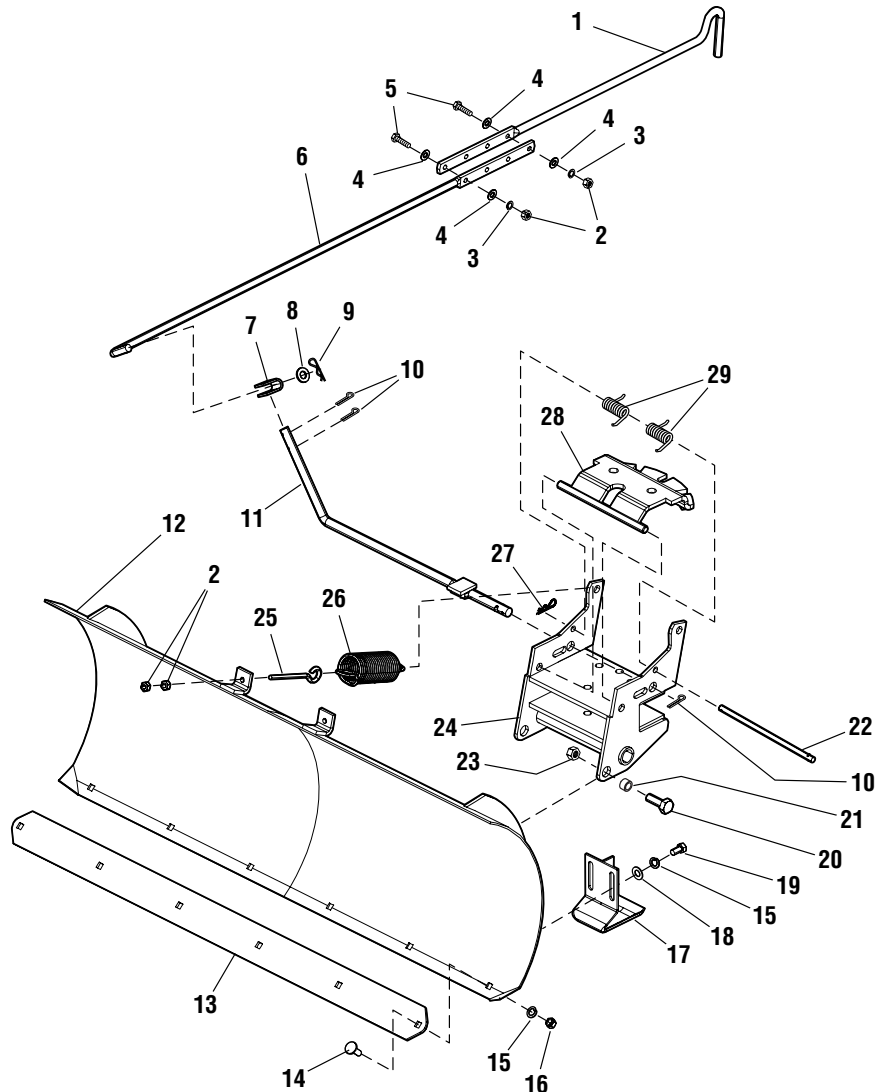
### IMPORTANT NOTE

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 may cause damage to the unit.



**Figure 6. Adjusting Lift Rod**

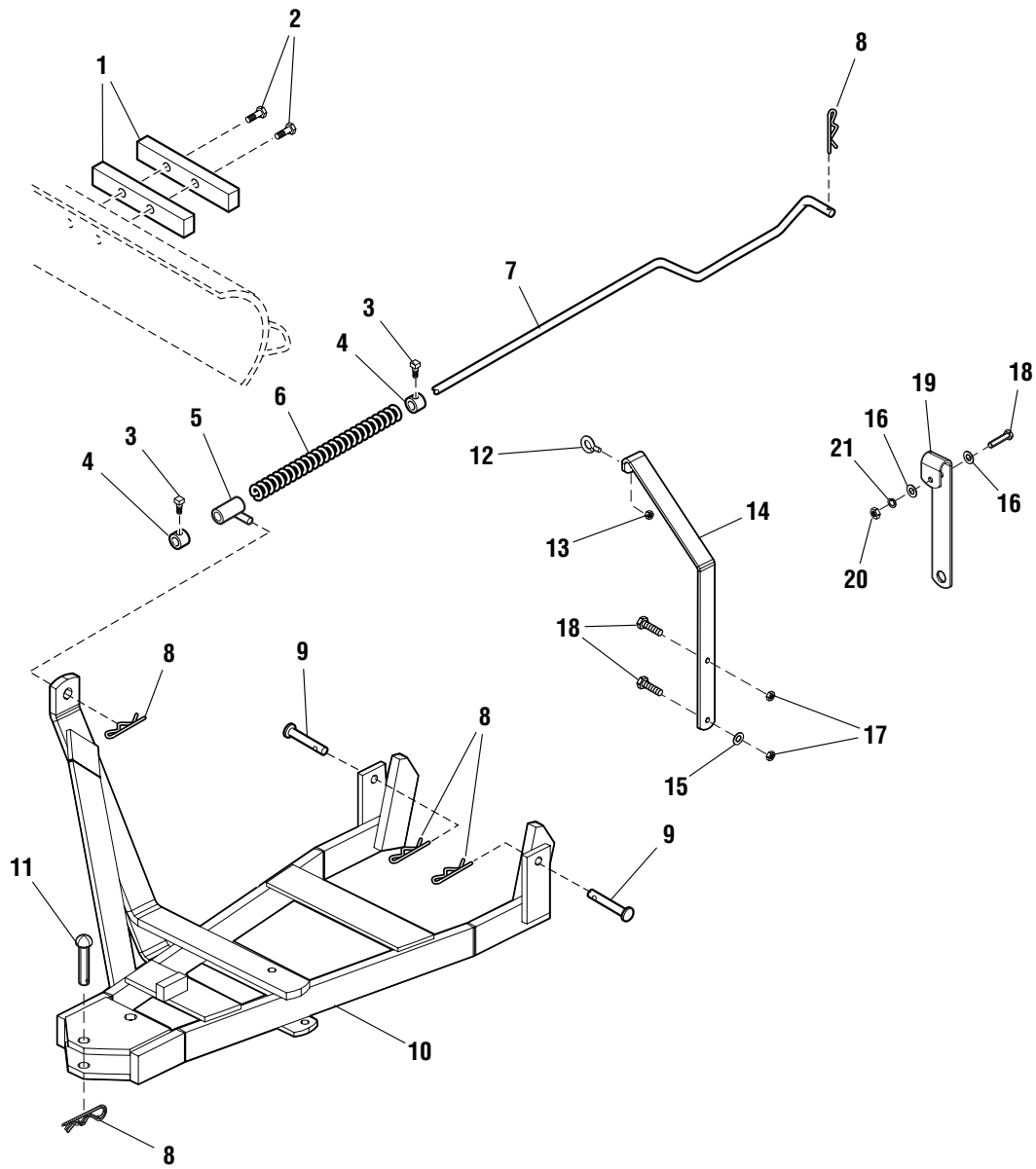
- A. Front Set Collar**
- B. Rod Guide**
- C. Spring**
- D. Rear Set Collar**
- E. Spring Clip**



**Figure 7. Dozer Components**

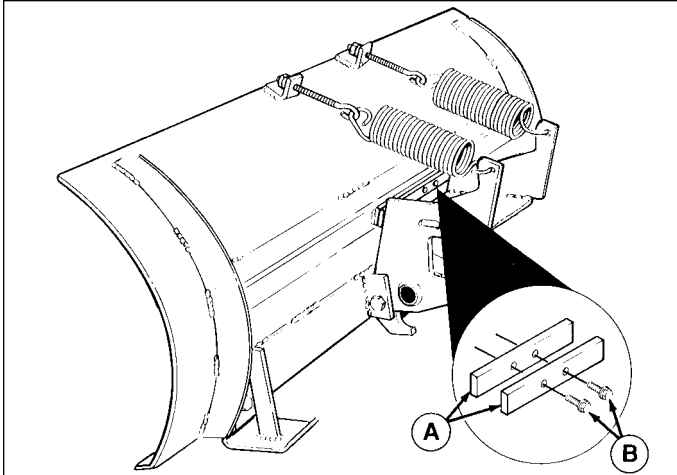
Ref	Qty	Description	Ref	Qty	Description
1	1	ROD, Control Handle, Upper	16	6	NUT, Hex, 3/8-16
2	6	NUT, Hex, 5/16-18	17	2	SKID SHOE
3	2	LOCKWASHER, 5/16	18	4	WASHER, Plain, 3/8
4	4	WASHER, 5/16	19	4	CAPSCREW, 3/8-16 x 3/4
5	2	CAPSCREW, 5/16-18 x 1-1/4	20	2	CAPSCREW, 1/2-13 x 1-1/2
6	1	ROD, Control Handle, Lower	21	2	SPACER, 1/2 ID x 3/4 OD x 5/16 LG
7	1	CLEVIS	22	1	ROD, Latch Stop
8	1	WASHER, 1/2	23	2	LOCKNUT, 1/2-13
9	1	CLIP, Hair Pin	24	1	FRAME ASMY, Dozer
10	3	COTTER PIN	25	2	EYEBOLT
11	1	ROD & PLATE ASMY, Pivot	26	2	SPRING, Extension
12	1	DOZER BLADE ASMY, 42"	27	1	CLIP, Hair Pin
13	1	SCRAPER BAR	28	1	PLATE ASMY, Latch
14	6	CARRIAGE BOLT, 3/8-16 x 1	29	2	SPRING, Torsion
15	10	LOCKWASHER, 3/8			

# Initial Setup & Assembly

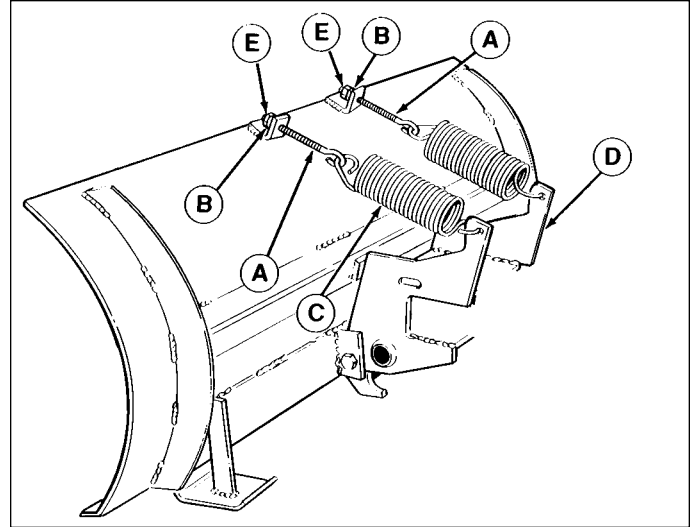


**Figure 8. Push Bar, Hitch, & Lift Rod Components**

Ref	Qty	Description	Ref	Qty	Description
1	2	STOP, Bar	12	1	EYEBOLT, 1/4-20 x 1-1/2
2	2	SCREW, Taptite, 5/16-18 x 1	13	1	LOCKNUT, Center, 1/4-20
3	2	SETSCREWS, 5/16 x 1/2	14	1	BRACKET, Control Rod
4	2	SET COLLAR	15	1	WASHER, 3/8
5	1	ROD GUIDE ASSY.	16	2	WASHER, 5/16
6	1	SPRING	17	2	LOCKNUT, Flange, Whizlock 5/16-18
7	1	ROD, Lift, Electric/Hydraulic	18	2	CAPSCREW, 5/16-18 x 1-1/2
8	5	CLIP, Hairpin	19	1	BRACKET, Control Rod
9	2	CLEVIS PIN	20	1	NUT, Hex, Full, 5/16
10	1	PUSH BAR ASSY, Front	21	1	LOCKWASHER, 5/16
11	1	PIVOT PIN			



**Figure 9. Bar Stop**  
A. Bar Stops  
B. Taptite Screws, 5/16-18 x 1



**Figure 10. Tension Springs**  
A. Eyebolt  
B. Nut, 5/16  
C. Spring  
D. Pivot Frame  
E. Nut, 5/16

## INITIAL SETUP & ASSEMBLY

*NOTE: Some of the following setup procedures may already be completed.*

### Assemble Blade

1. Place the blade on a flat surface.
2. Install the bar stops (A, Figure 9) using the two 5/16-18 x 1 taptite screws (B).
3. See Figure 10. Insert threaded end of eyebolt (A) through lug on blade, and screw on 5/16 nut (B) just far enough so that it is flush with the end of the eyebolt.
4. Hook the springs (C) into the pivot frame (D). Using a pliers, stretch the springs to hook the opposite ends to the eyebolts (A).
5. Tighten the nut (B) on each eyebolt enough to expose about 3/4" (19 mm) of thread.
6. Holding the first nut (B) with a wrench, add a second nut (E) to each eyebolt, and tighten securely against the first nut to act as a jam nut.

# Initial Setup & Assembly

## Assemble Lift Rod

1. Assemble lift rod per Figure 11.

### Lift Rod Adjustment

Different types of terrain may require an adjustment to the lift rod assembly. For instructions on how to make this adjustment refer to the “**Lift Rod Adjustment**” procedure in the **ADJUSTMENTS** section of this manual.

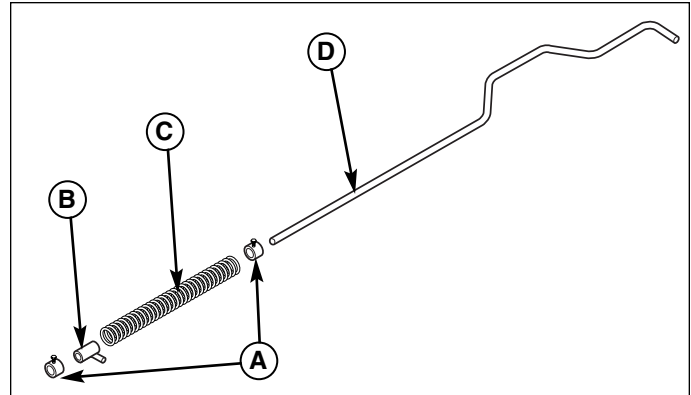


Figure 11. Lift Rod Assembly

- |                |             |
|----------------|-------------|
| A. Set Collars | C. Spring   |
| B. Rod Guide   | D. Lift Rod |

## Install Blade

1. Drive the tractor over the push bar until rear of push bar is under front hitch.
2. Stop engine, remove key and set parking brake.
3. Raise rear of push bar so its arms fit between lugs of hitch (A, Figure 12) just behind front axle. Use two clevis pins (B) and spring clips (C) to secure push bar to hitch.
4. Insert front of push bar (D) into pivot frame on rear of blade. Then install king pin (E) down through holes in hitch and pivot frame. Secure king pin with spring clip (F).
5. Insert prong of rod guide assembly (H) thru hole in upright of push bar. Secure with spring clip (I).
6. Connect rear of lift rod (J) to tractor lift arm (K) using spring clip (G).

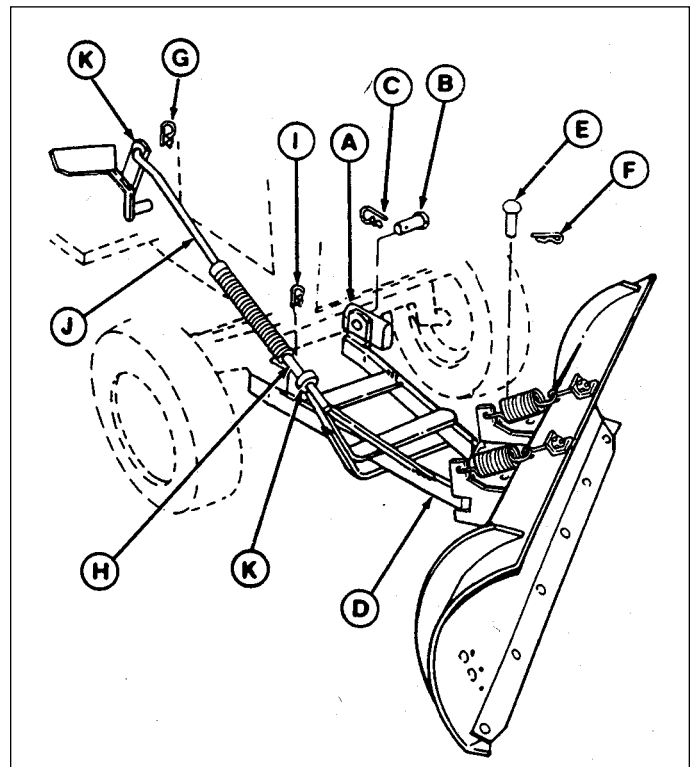


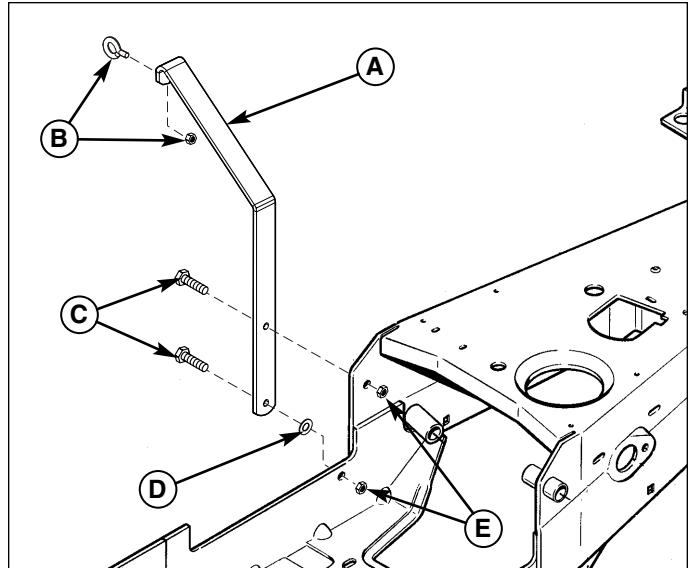
Figure 12. Push Bar Installation

- |                  |                       |
|------------------|-----------------------|
| A. Tractor Hitch | G. Spring Clip        |
| B. Clevis Pin    | H. Rod Guide Assembly |
| C. Spring Clip   | I. Spring Clip        |
| D. Push Bar      | J. Lift Rod           |
| E. King Pin      | K. Lift Arm           |
| F. Spring Clip   |                       |

## Install Angling Control Rod

*NOTE: If installing the dozer attachment on a unit equipped with a snowcab, replace the control rod support (A, Figure 13) with the hanging support (Ref. No. 19, Figure 8). Mount the hanging support to the front cab cross-bar.*

1. Set the angling control support (A, Figure 13) against the right side of the frame. Insert two 5/16-18 x 1-1/2 capscrews (C) through the support (A), and frame. Space the lower hole away from the frame with a 5/16 washer (D). Secure using flange locknuts (E).
2. Install the eyebolt (B) in the support (A) and secure with a centerlock nut.



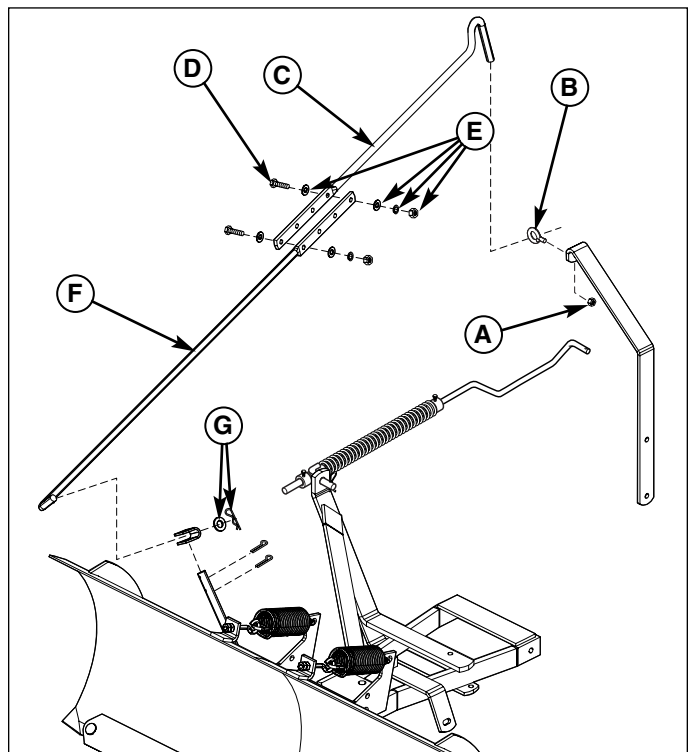
**Figure 13. Control Rod Support**

- |                                     |                           |
|-------------------------------------|---------------------------|
| <b>A. Angling Support</b>           | <b>D. 5/16 Flatwasher</b> |
| <b>B. Eyebolt &amp; Locknut</b>     | <b>E. Flange Locknuts</b> |
| <b>C. 5/16-18 x 1-1/2 Capscrews</b> |                           |

3. Connect the lower angling rod (F, Figure 14) to the dozer release lever using a hair pin clip and washer (G).
4. Insert the upper control rod (C) through the eyelet (B), and secure the eyelet to the support using a 1/4-20 centerlock nut (A).

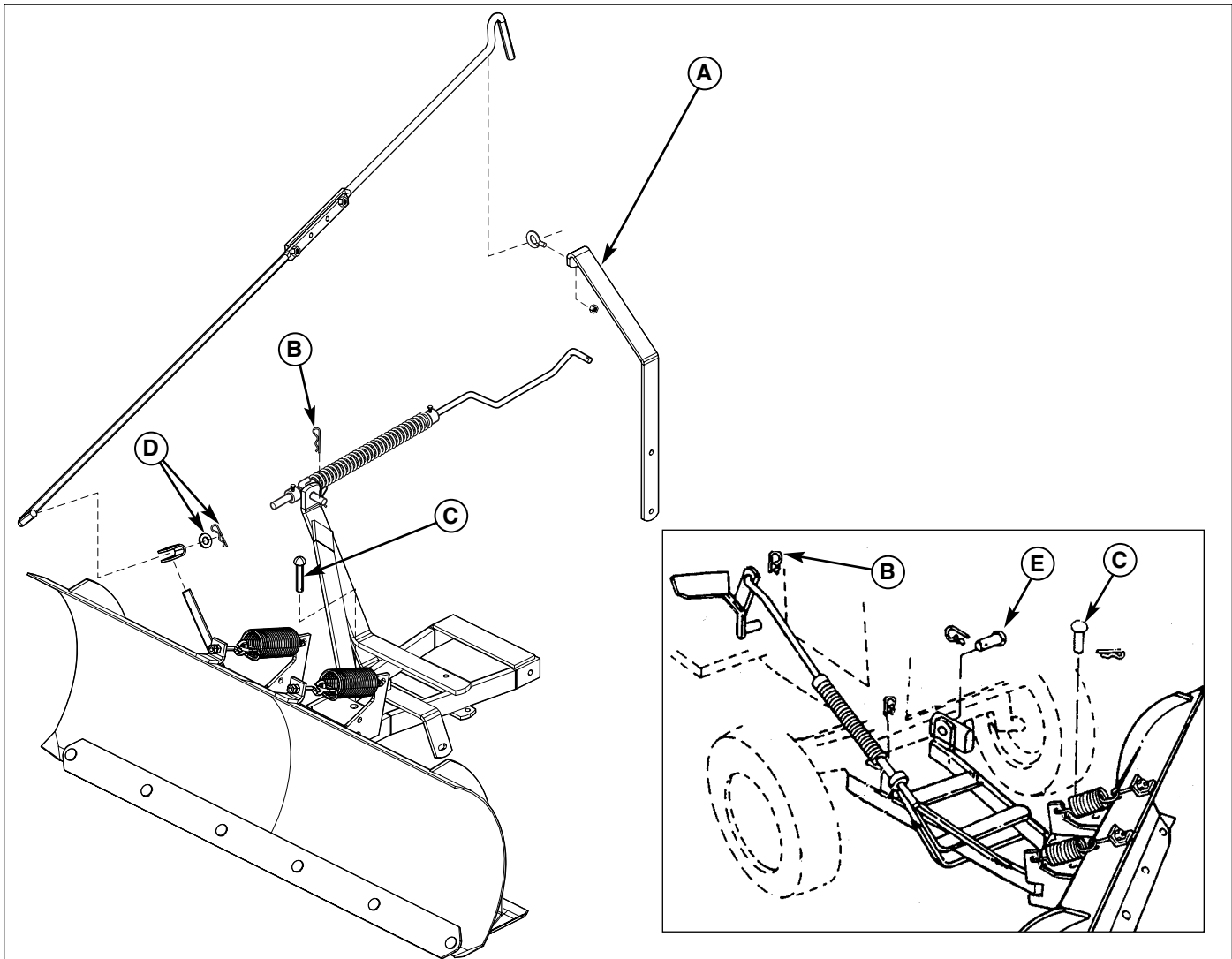
*NOTE: It may be necessary to leave the eyebolt nut (A, Figure 14) loose to prevent binding.*

5. Secure the upper rod (C) to the lower rod (F) using two 5/16-18 x 1-1/4 capscrews (D), washers (qty. 4), lockwashers, and nuts (E). *NOTE: Match offset to offset so the rods form a straight line.*



**Figure 14. Assemble Control Rods**

- |   |
|---|
| <b>A. 1/4-20 Centerlock Nut</b>                 |
| <b>B. Eyelet</b>                                |
| <b>C. Upper Control Rod</b>                     |
| <b>D. 5/16-18 x 1-1/4 Capscrew</b>              |
| <b>E. 5/16 Washers, Lockwashers, &amp; Nuts</b> |
| <b>F. Lower Control Rod</b>                     |
| <b>G. Hair Pin Clip &amp; Washer</b>            |



**Figure 15. Dozer Removal**

**A. Support Arm**

**B. Hair Pin Clip**

**C. Pivot Pin**

**D. Hair Pin Clip & Washer**

**E. Clevis Pins**

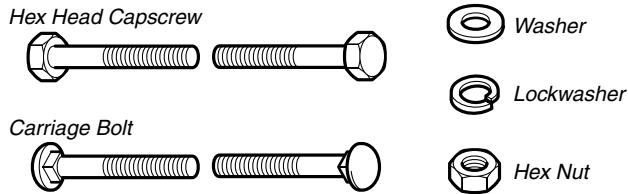
## REMOVAL & INSTALLATION

### Removing & Attaching Dozer Blade

1. Lower the blade.
  2. Remove the hair pin clip and washer (D, Figure 15) securing the angling control rod to the clevis. Disconnect the angling control rod.
  3. Remove the angling control rod from the support arm (A).
  4. Remove the pivot pin (C) connecting the blade and pushbar. Remove the blade.
  5. Remove pin (E) securing hitch to the tractor.
  8. Reinstall all pins for storage.
- Install in reverse order of removal.

# Hardware Identification & Torque Specifications

## Common Hardware Types

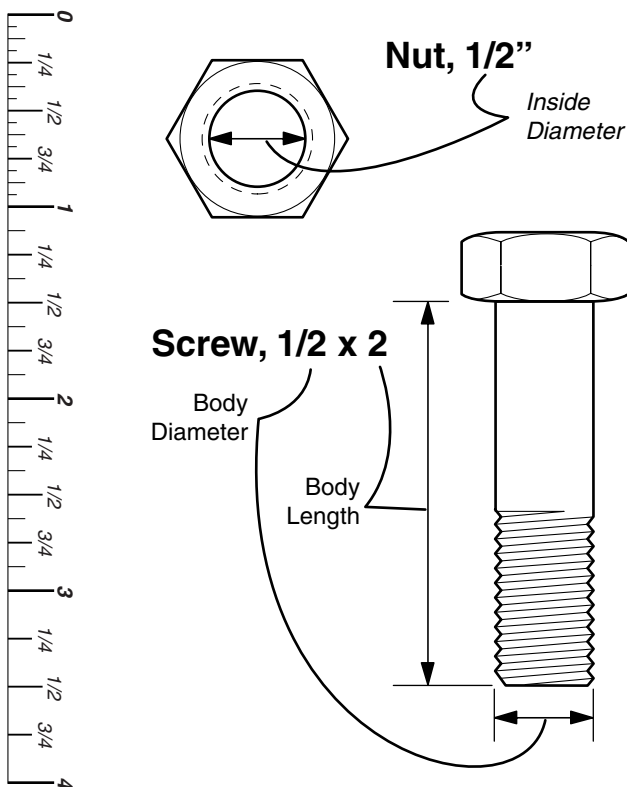


## Standard Hardware Sizing

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	Nm.	in/lbs	Nm.	in/lbs	Nm.	in/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		

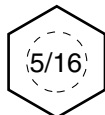
### NOTES

- 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.

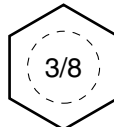
## Wrench & Fastener Size Guide



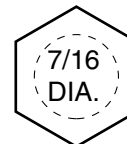
**1/4" Bolt or Nut**  
Wrench—7/16"



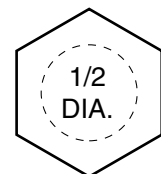
**5/16" Bolt or Nut**  
Wrench—1/2"



**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"







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