



**SPARTAN  
EQUIPMENT®**

## OPERATOR'S MANUAL

**DOZER BLADE 84" & 96"**

**FOR  
SKID STEER LOADERS**



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# PREFACE

## GENERAL COMMENTS

Congratulations on the purchase of your new SPARTAN EQUIPMENT product! This product was carefully designed and manufactured to give you many years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all maintenance procedures and safety precautions in this manual and on any safety decals located on the product and on any equipment on which the attachment is mounted.

This manual has been designed to help you do a better, safer job. Read this manual carefully and become familiar with its contents.

**WARNING!** Never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual.  
 Always choose hard, level ground to park the vehicle on and set the brake so the unit cannot roll.

Unless noted otherwise, right and left sides are determined from the operator's control position when facing forward.

**NOTE:** The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the attachment as may be necessary without notification.

## BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure the equipment is operated only by trained individuals that have read and understand this manual. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer to obtain further assistance. Keep this manual available for reference. Provide the manual to any new owners and/or operators.

## SAFETY ALERT SYMBOL



This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

## SERVICE

Use only manufacturer replacement parts. Substitute parts may not meet the required standards.

Record the model and serial number of your unit on the cover of this manual. The parts department needs this information to insure that you receive the correct parts.

## SOUND AND VIBRATION

Sound pressure levels and vibration data for this attachment are influenced by many different parameters: some items are listed below (not inclusive):

- Prime mover type, age, condition, with or without cab enclosure and configuration
- Operator training, behavior, stress level
- Job site organization, working material condition, and environment

Based on the uncertainty of the prime mover, operator, and job site, it is not possible to get precise machine and operator sound pressure levels or vibration levels for this attachment.

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## SAFETY STATEMENTS



THIS SYMBOL BY ITSELF OR WITH A WARNING WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN Inj<sub>u</sub>ry OR DEATH.



### DANGER

THIS SIGNAL WORD INDICATES A Hazardous SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS Inj<sub>u</sub>ry.



### WARNING

THIS SIGNAL WORD INDICATES A Hazardous SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS Inj<sub>u</sub>ry.



### CAUTION

THIS SIGNAL WORD INDICATES A Hazardous SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE Inj<sub>u</sub>ry.

### NOTICE

NOTICE IS USED TO ADDRESS PRACTICES NOT RELATED TO PHYSICAL Inj<sub>u</sub>ry.

## GENERAL SAFETY PRECAUTIONS

### WARNING!



#### READ MANUAL PRIOR TO INSTALLATION

Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).**



#### READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to operating or working on this equipment. Know and obey all OSHA regulations, local laws, and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.



#### KNOW YOUR EQUIPMENT

Know your equipment's capabilities, dimensions, and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to ensure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued, or excessively worn parts. Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn or hard to read.



## GENERAL SAFETY PRECAUTIONS

### WARNING!



### PROTECT AGAINST FLYING DEBRIS

Always wear proper safety glasses, goggles, or a face shield when driving pins in or out, or when any operation causes dust, flying debris, or any other hazardous material.

### WARNING!



### LOWER OR SUPPORT RAISED EQUIPMENT

Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or on blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

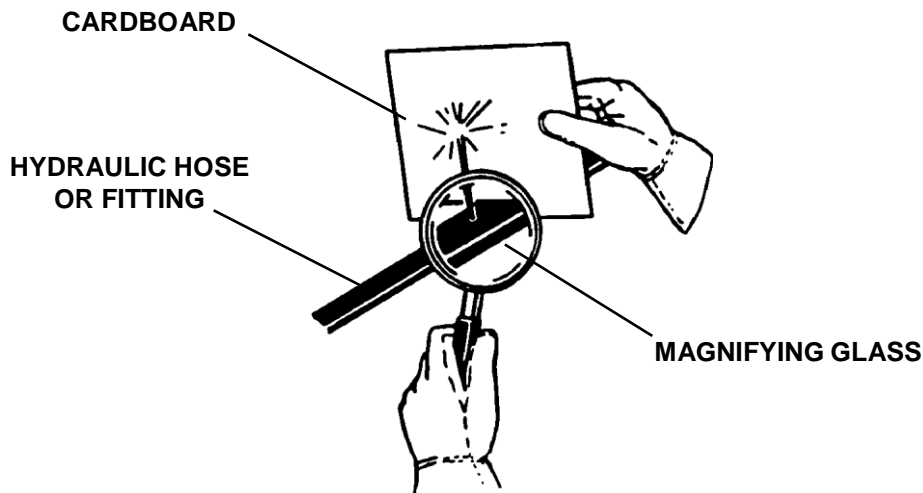
### WARNING!



### USE CARE WITH HYDRAULIC FLUID PRESSURE

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime mover's operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.
- If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS!**  
**SEE ILLUSTRATION.**



## GENERAL SAFETY PRECAUTIONS

### WARNING!



### DO NOT MODIFY MACHINE OR ATTACHMENTS

Modifications may weaken the integrity of the attachment and may impair the function, safety, life, and performance of the attachment. When making repairs, use only the manufacturer's genuine parts, following authorized instructions. Other parts may be substandard in fit and quality. Never modify any ROPS (Roll Over Protective Structure) or FOPS (Falling Object Protective Structure) equipment or device. Any modifications must be authorized in writing by the manufacturer.

### WARNING!



### SAFELY MAINTAIN AND REPAIR EQUIPMENT

- Do not wear loose clothing or any accessories that can catch in moving parts. If you have long hair, cover or secure it so that it does not become entangled in the equipment.
- Work on a level surface in a well-lit area.
- Use properly grounded electrical outlets and tools.
- Use the correct tools for the job at hand. Make sure they are in good condition for the task required.
- Wear the protective equipment specified by the tool manufacturer.



### SAFELY OPERATE EQUIPMENT

Do not operate equipment until you are completely trained by a qualified operator in how to use the controls, know its capabilities, dimensions, and all safety requirements. See your machine's manual for these instructions.

- Keep all step plates, grab bars, pedals, and controls free of dirt, grease, debris, and oil.
- Never allow anyone to be around the equipment when it is operating.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operator's position.
- Never leave equipment unattended with the engine running, or with this attachment in a raised position.
- Do not alter or remove any safety feature from the prime mover or this attachment.
- Know your work site safety rules as well as traffic rules and flow. When in doubt on any safety issue, contact your supervisor or safety coordinator for an explanation.

### WARNING!



### CALIFORNIA PROPOSITION 65 WARNING

This product may contain a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# EQUIPMENT SAFETY PRECAUTIONS

## WARNING!



### KNOW WHERE UTILITIES ARE

Observe overhead electrical and other utility lines. Be sure equipment will clear them. When digging, call your local utilities for location of buried utility lines, gas, water, and sewer, as well as any other hazard you may encounter.

## WARNING!



### EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.

It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

## WARNING!



### REMOVE PAINT BEFORE WELDING OR HEATING

Hazardous fumes/dust can be generated when paint is heated by welding, soldering or using a torch. Do all work outside or in a well ventilated area and dispose of paint and solvent properly. Remove paint before welding or heating.

When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

## WARNING!



### END OF LIFE DISPOSAL

At the completion of the useful life of the unit, drain all fluids and dismantle by separating the different materials (rubber, steel, plastic, etc.). Follow all federal, state and local regulations for recycling and disposal of the fluid and components.



### OPERATING THE BLADE

- Do not exceed the capacity of your prime mover when pushing loads or objects.
- Operate only from the operator's station. Do not operate the blade when standing beside the machine.
- Prime mover may feel heavy in the front with the added weight of the blade. Stability and handling may be affected.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- An operator must not use drugs or alcohol, which can change his or her alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not he or she can safely operate equipment.
- Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover's engine, and remove the key.
- Use the blade only for its designed purpose. Do not use it to pull objects, as a battering ram, or attach ropes or chains to the unit.

# EQUIPMENT SAFETY PRECAUTIONS



## TRANSPORTING THE BLADE

- Allow for the added width and length when transporting so as not to catch unit on obstacles.
- Carry blade low when transporting to lower its center of gravity. Drive slowly over rough ground and on slopes.
- When driving on public roads use safety lights, reflectors, Slow Moving Vehicle signs etc., to prevent accidents. Check local government regulations that may affect you.
- Do not drive close to ditches, excavations, etc., cave in could result.
- Do not smoke when refueling the prime mover. Allow room in the fuel tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.
- When transporting on a trailer: Secure attachment at recommended tie down locations using tie down accessories that are capable of maintaining attachment stability.



## MAINTAINING THE BLADE

- Before performing maintenance, lower the attachment to the ground, apply brakes, turn off the engine, and remove the key.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manuals before any repair is made. After completing maintenance or repair, check for correct functioning of the attachment. If not functioning properly, always tag “DO NOT OPERATE” until all problems are corrected.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from Paladin.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.

# DECALS

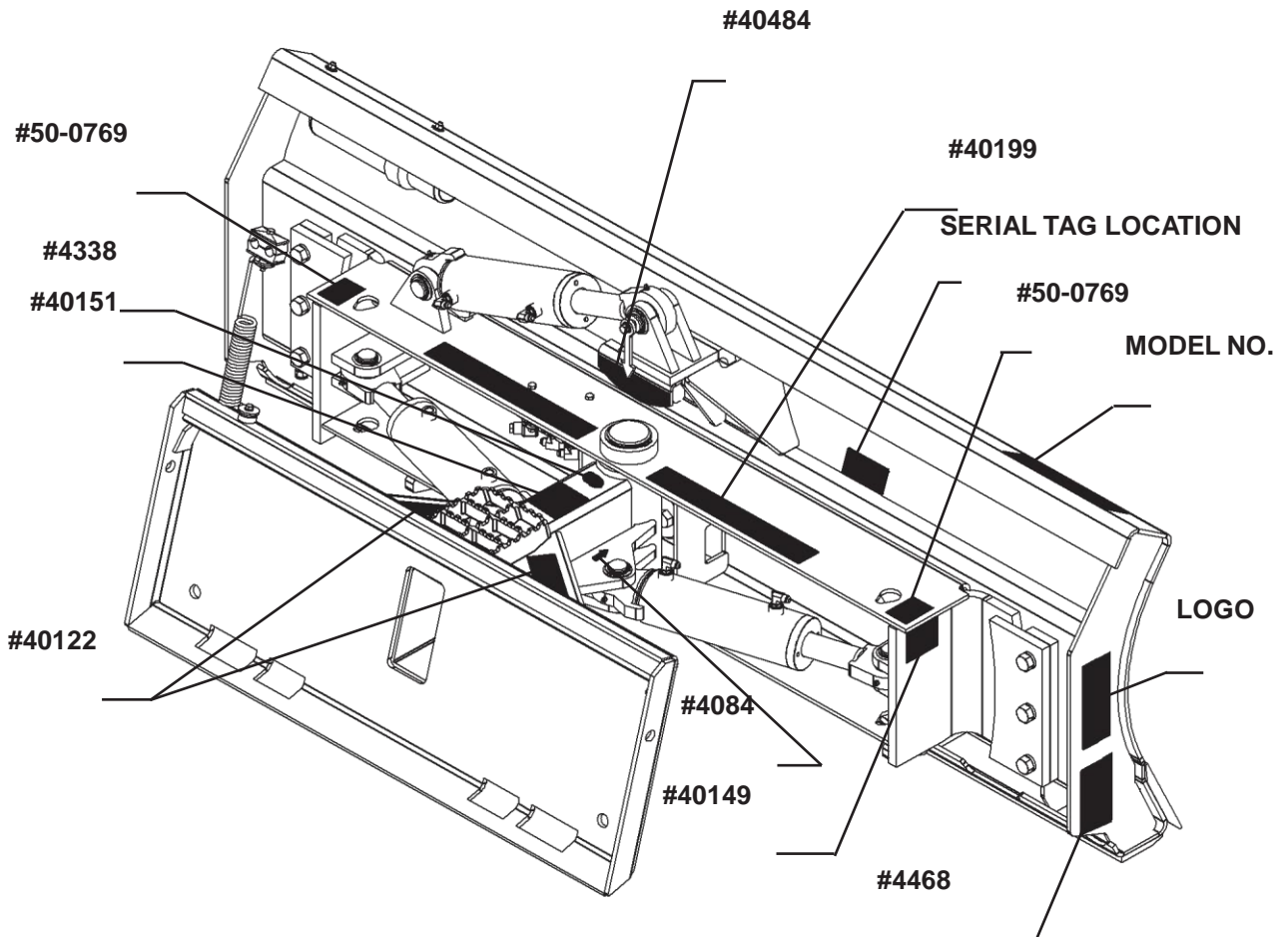
## DECAL PLACEMENT

### GENERAL INFORMATION

The following diagrams show the location of all the decals used on your attachment. The decals are identified by their part numbers, with the reductions of the actual decals shown on the following pages. Use this information to order replacements for lost or damaged decals. Be sure you understand all decals before operating the attachment. They contain information you need to know for attachment safety.

**IMPORTANT:** Keep all safety decals clean and legible. Replace all missing, or damaged safety decals. When replacing parts with safety decals attached, the safety decals must also be replaced.

**REPLACING SAFETY DECALS:** Clean the area of application with a nonflammable solvent, then wash the same area with soap and water. Allow the surface to dry. Remove the backing from the safety decal, exposing the adhesive surface. Apply the safety decal to the position shown in the diagram, and smooth out any bubbles.



## DECALS



**DANGER! PINCH POINTS**  
PART #40149



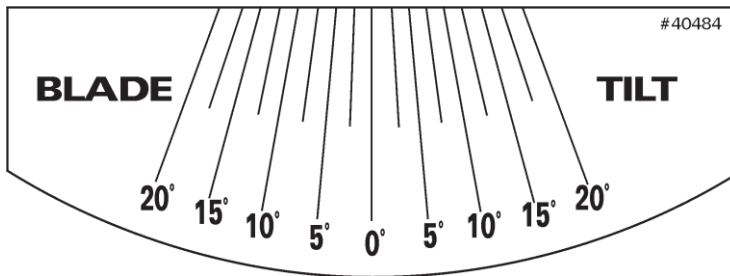
**WARNING!**  
PART #4468



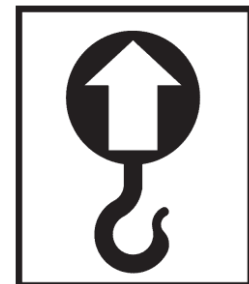
**MADE IN U.S.A.**



**GREASE 8 HOURS**  
PART #4084



**TILT INDICATOR DECAL**  
PART #40484



**LIFT POINT**  
PART #50-0769



**NON-SLIP SURFACE (2" X 11")**  
PART #40122



**NON-SLIP SURFACE (2" X 15")**  
PART #40199

**NOTE: CONTACT YOUR LOCAL DEALER FOR MODEL NUMBER AND LOGO DECALS.**

# PREOPERATION

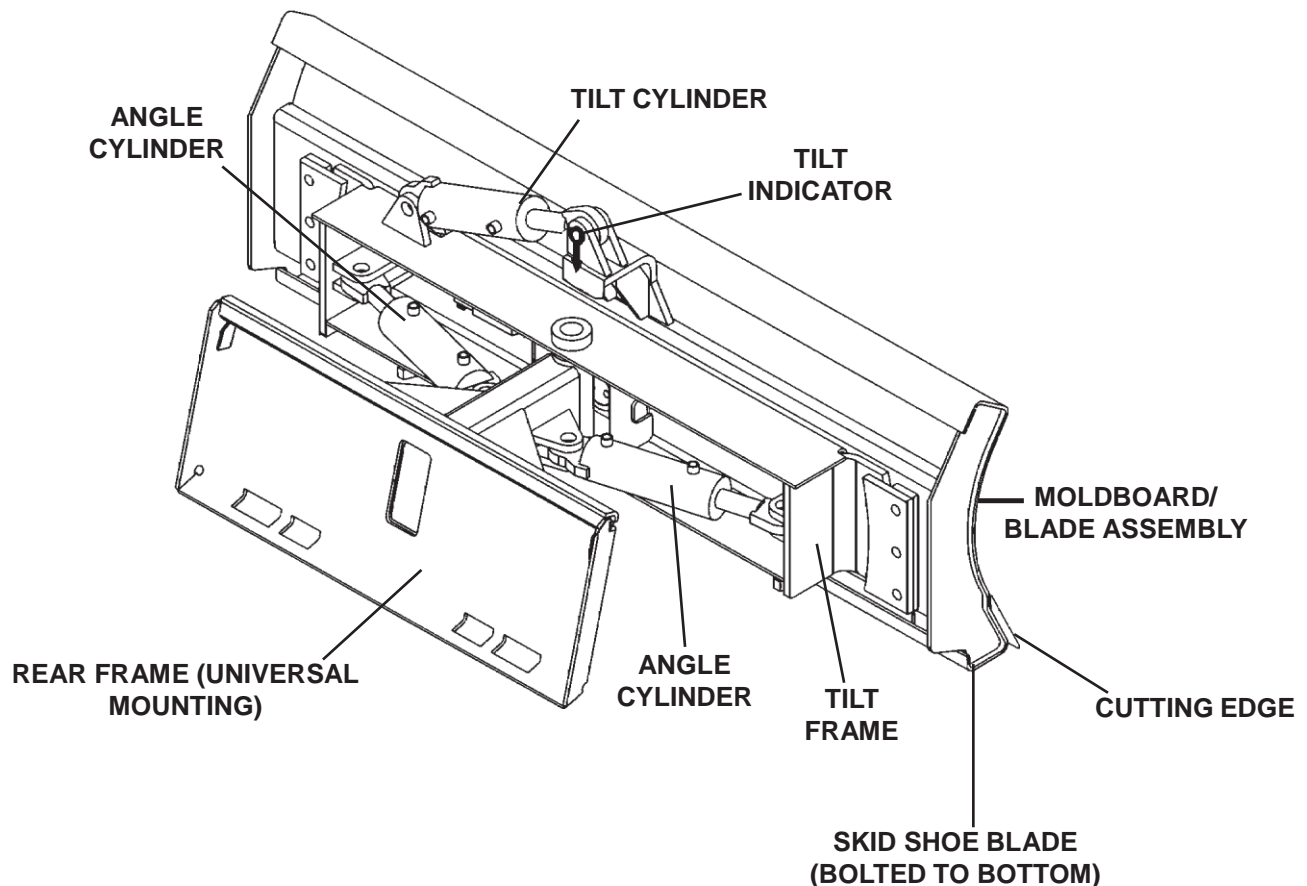
## PRIME MOVER

The dozer angle and tilt mechanisms are powered by three hydraulic cylinders. Your prime mover must have an auxiliary hydraulic system to run the blade. There is an optional control box assembly for the secondary controls, if your prime mover is not equipped with an auxiliary electrical outlet.

You will need a pair of hydraulic couplers to complete the hydraulic hook-up. These couplers must fit a #8MP end and connect to your skid-steer auxiliary hydraulic system couplers. These couplers are available through your dealer.

## NOMENCLATURE

Throughout this manual, reference is made to various blade components. The purpose of this page is to acquaint you with the various names of these components. This knowledge will be helpful when reading through this manual or when ordering service parts.





# INSTALLATION

## GENERAL INFORMATION

The following instructions will help you to mount your blade onto your loader. The blade uses the prime mover's quick-attach system for ease of installation. Therefore, if you know how to attach the prime mover bucket, attaching the blade should prove no problem.

## INSTALLATION

Remember to read all safety warnings, decals and operating instructions before operating the prime mover or blade.

1. Remove any attachment from the front of the loader.
2. Following all standard safety practices and the instructions for installing an attachment in your prime mover operator's manual, install the attachment onto your loader.

**WARNING!** To avoid serious personal injury, make sure the attachment is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the attachment from the prime mover.



3. Lower the unit to the ground and relieve pressure to the auxiliary hydraulic lines.
4. Following the safety shut down procedure for your prime mover, shut down and exit the prime mover.
5. After making sure that the hydraulic couplers are free from any foreign material or contaminants, connect the couplers to the auxiliary hydraulic system of your prime mover.
6. Connect the wire assembly from the hydro-electric valve on the blade to the optional control box or to prime movers auxiliary electrical outlet (if so equipped).
7. Following the standard start up procedure for your prime mover, start the loader and run all cylinders on the attachment to purge any air from the system. Check for proper hydraulic connection, hose routing and hose length.
8. Attachment installation is complete.

## DETACHING

1. Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover's engine, and remove the key.
2. Follow prime mover operator's manual to relieve pressure in the hydraulic lines.
3. Disconnect couplers and connect them together or install dust caps and plugs to prevent contaminants from entering the hydraulic system. Store hoses on attachment, off the ground.
4. Disconnect the electrical wire assembly from the auxiliary electrical connector or optional control box and store on attachment, off the ground.
5. Follow your prime mover operator's manual for detaching (removing) an attachment.



# OPERATING INSTRUCTIONS

## GENERAL INFORMATION

Simplicity of operation is one of the key features of the SPARTAN EQUIPMENT dozer blades. There are just a few controls and adjustments to make that affect the blade. It is important however, to be familiar with, and know the controls and adjustments on both the blade and prime mover. Such knowledge is crucial for safe efficient operation of equipment. Take the time to learn how they operate now.

## THE PRIME MOVER

The blade mounts to the toolbar/quick-attach mechanism of your prime mover loader. Due to this arrangement, thorough knowledge of the prime mover controls is necessary for blade operation. Read your prime mover operator's manual for information regarding prime mover operation before attempting to use the blade.

## RAISING / LOWERING THE BLADE

Raise / lower the blade unit by raising / lowering the prime mover loader arms through their appropriate prime mover controls.

**WARNING!** Be aware of any overhead power or telephone lines, tree limbs, etc., that the raised blade / loader arms could come into contact with. Take notice of any water or gas shut offs, stumps, sidewalk edges etc., that the lowered blade could come into contact with. Contact with electrical lines could cause electrocution and death.



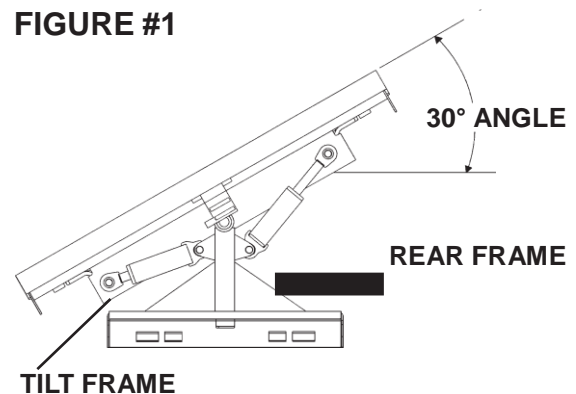
## TILTING THE BLADE

The dozer blade is tilted hydraulically by one tilt cylinder connected to the blade and the tilt frame. The blade can be tilted 10° each way from horizontal (left or right) and this can be measured by the tilt indicator arrow located on the back of the blade.

The tilt cylinder is activated by the auxiliary hydraulic system controls. See your prime mover owner's manual for location and proper operation of auxiliary hydraulic system controls and operate accordingly to tilt the blade left or right when the hydraulic system on your blade is routed in such a way that TILT is your default. If tilt is not the default on your blade HOLD down the toggle switch on the control box for secondary auxiliary controls and operate in the same manner.

## ANGLING THE BLADE

The dozer blade is angled hydraulically by two angle cylinders connected to the blade and the tilt frame and rear frame. It can be angled 30° left or right. See Figure #1



# OPERATING INSTRUCTIONS

The angle cylinders are activated by the auxiliary hydraulic system controls. See your prime mover owner's manual for location and proper operation of auxiliary hydraulic system controls and operate accordingly to angle the blade left or right when the hydraulic system on your blade is routed in such a way that ANGLE is your default. If angle is not the default on your blade HOLD down the toggle switch on the control box for secondary auxiliary controls and operate in the same manner.

**IMPORTANT: IF AFTER OPERATING YOUR DOZER YOU PREFER TO CHANGE THE DEFAULT OPERATION OF YOUR BLADE, REFER TO THE HYDRAULIC PARTS DIAGRAMS IN THE BACK OF THIS MANUAL. STUDY THE DIAGRAMS AND SWITCH THE EXISTING HOSES AROUND TO THE CORRECT LOCATION FOR THE DESIRED DEFAULT.**

**CAUTION!** Drive slowly and with caution when operating the blade. The force of the impact if the blade hits an immovable object could cause damage to the blade & prime mover, and injury to the operator.



## BLADE FLOAT

For some conditions (such as plowing snow) you may want the blade in float position. This is done by engaging the prime mover loader arms into float position. This allows the blade to follow the contour of the surface without digging in. See your prime mover operator's manual for float position control instructions.

## OPERATION

The design of your blade makes it relatively simple to use. With the help of the information in this section and a little practice you should become proficient in its operation in no time. Observe the following points to obtain the best results with the least amount of wear on the machine. Read the "Safety Precautions" section of this manual before you begin.

**CAUTION!** Operate the blade only when seated at the prime mover controls.



**Do not operate the prime mover without proper ROPS (Roll-Over-Protective-Structure), seatbelt, and hard hat.**

**Pay attention to the job at hand. Be alert to the possibilities of others in the work area.**

**Never let anyone work around, or perform maintenance on the blade while the prime mover is running.**

Take the time to become familiar with the blade and its controls. Learn how to operate the blade before you actually start the job. Time spent familiarizing yourself with the controls now will pay off with a safer, more efficient operation later.

# OPERATING INSTRUCTIONS

Prior to starting the job, take the time to check for and mark any hidden obstructions such as sidewalk edges, water and gas shut offs, etc. Hitting such obstructions when operating the blade at higher speeds could cause damage to the obstruction, blade, and prime mover not to mention injuring the operator. If you think there may be any hidden obstructions, operate at a low speed.

Take notice of the ground conditions and operate accordingly. Be aware of soft ground or rocky conditions. Drive slowly when traveling on slopes, hilly ground, or when turning.

Additional requirements may be necessary for proper traction in snow or soft ground. See your prime mover dealer for possible tire track options.

The blade is designed for pushing snow and grading material. In the case of pushing snow the best results are usually obtained by angling the blade to the left or right. For grading you will find the best results are usually obtained with the blade tilted perpendicular to the prime mover frame.

## STORAGE

- Clean the unit thoroughly, removing all mud, dirt, and grease.
- Inspect for visible signs of wear, breakage, or damage. Order any parts required and make the necessary repairs to avoid delays when starting next season.
- Tighten loose nuts, capscrews, and hydraulic connections.
- Seal hydraulic system from contaminants and secure all hydraulic hoses off the ground to help prevent damage.
- Coat the exposed portions of the cylinder rods with grease.
- Store the unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

### Additional Precautions for Long Term Storage:

- Touch up all unpainted surfaces with paint, to prevent rust.

## REMOVAL FROM STORAGE

- Remove Cover.
- Wash unit and replace any damaged and/or missing parts.
- Lubricate grease fittings.
- Check hydraulic hoses for damage and replace as necessary.

## TRANSPORTING

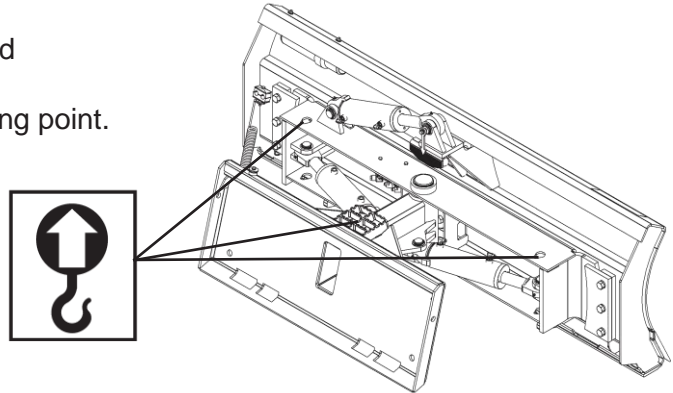
Follow all local government regulations that may apply along with recommended to tie down points and any equipment safety precautions at the front of this manual when transporting your attachment.

# OPERATING INSTRUCTIONS

## LIFT POINTS

Lifting points are identified by lifting decals where required. Lifting at other points is unsafe and can damage attachment. Do not attach lifting accessories around cylinders or in any way that may damage hoses or hydraulic components. See Diagram

- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.



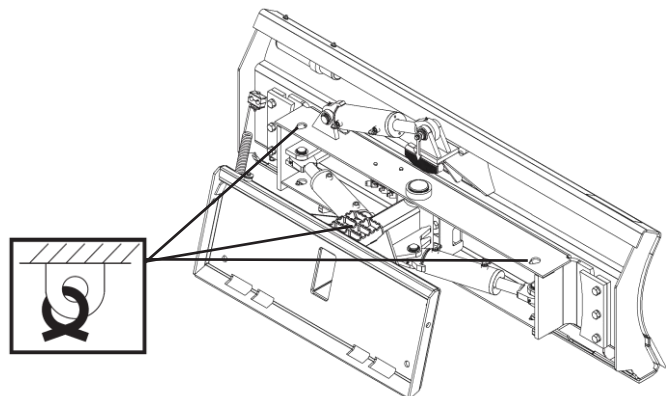
**WARNING!** Use lifting accessories (chains, slings, ropes, shackles and etc.) that are capable of supporting the size and weight of your attachment. Secure all lifting accessories in such a way to prevent unintended disengagement. Failure to do so could result in the attachment falling and causing serious personal injury or death.



## TIE DOWN POINTS

Tie down points are identified by tie down decals where required. Securing to trailer at other points is unsafe and can damage attachment. Do not attach tie down accessories around cylinders or in anyway that may damage hoses or hydraulic components. See Diagram

- Attach tie down accessories to unit as recommended.
- Check unit stability before transporting.



**WARNING!** Verify that all tie down accessories (chains, slings, ropes, shackles and etc.) are capable of maintaining attachment stability during transporting and are attached in such a way to prevent unintended disengagement or shifting of the unit. Failure to do so could result in serious personal injury or death.



# MAINTENANCE AND SERVICE

## GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to an absolute minimum. However, it is very important that these maintenance functions be performed as described below.

Procedure	Daily	Every 40 Hours
Check all bolts and nuts for tightness.	✓	
Replace any missing bolts or nuts with approved replacement parts.	✓	
Check hydraulic system for hydraulic oil leaks. See procedure below.	✓	
Visually inspect the machine for worn parts or cracked welds, and repair as necessary.	✓	
Check for missing or illegible Safety / Warning Decals.	✓	
Lubricate all grease fittings.		✓

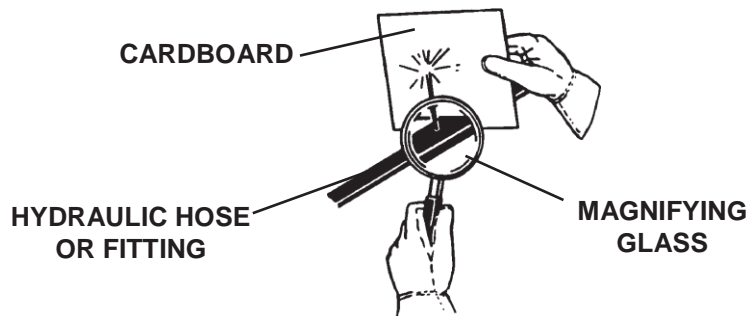
**WARNING!** Escaping hydraulic / diesel fluid under pressure can penetrate the skin causing serious injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks.



Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities. If injured by injected fluid, see a doctor at once.

Stop the engine and relieve pressure before connecting or disconnecting lines.

Tighten all connections before starting engine or pressurizing lines.



# MAINTENANCE AND SERVICE

Periodic waxing of the front surface of the blade and moldboard will help keep snow and ice from building up on the blade during winter use.

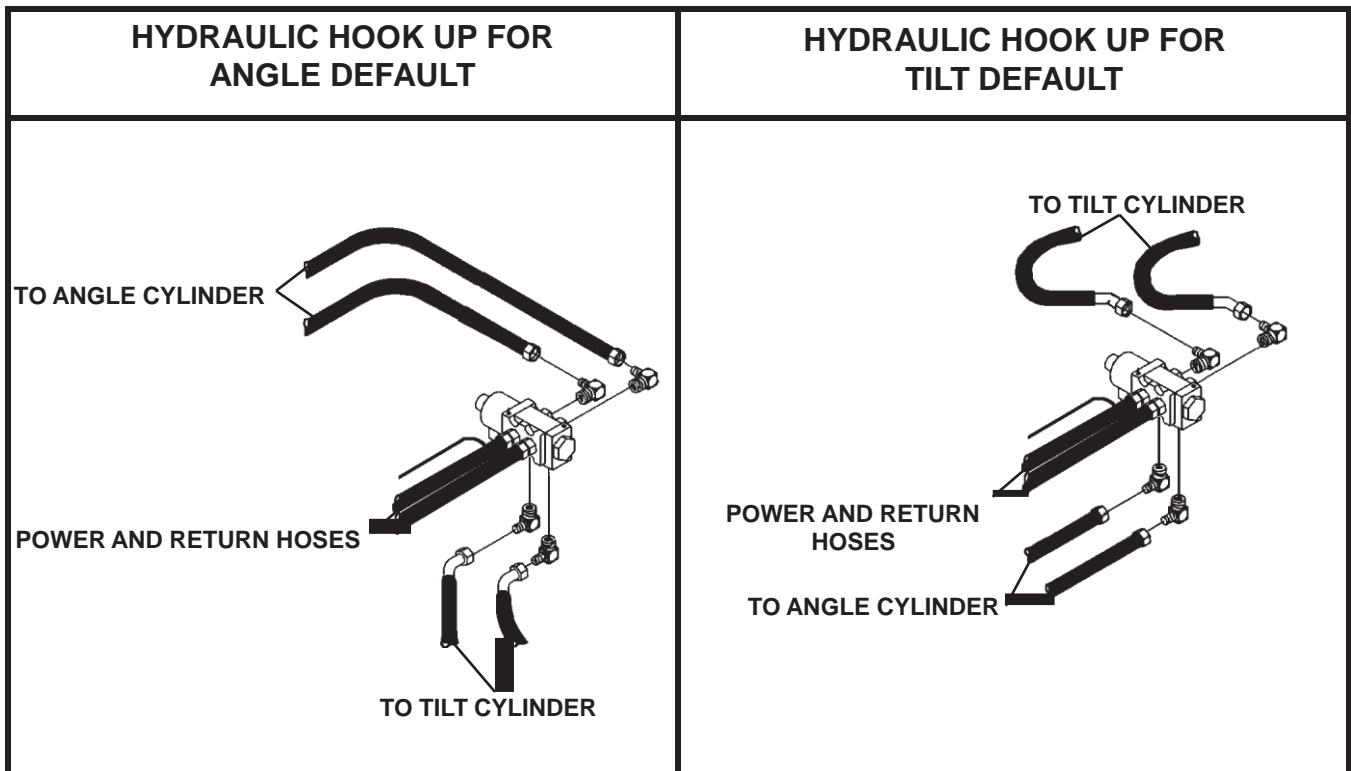
## CUTTING EDGE AND SKID SHOE REPLACEMENT

The cutting edge and the skid shoe are subject to wear due to their very nature. Replacement cutting edges and skid shoes are available from your dealer. Replacement is a simple bolt on procedure.

**NOTE: The cutting edge is a reversible cutting edge and when wear is determined the cutting edge can be removed, flipped end for end and rebolted onto the blade assembly. When both edges are worn replacement is required.**

## CHANGING THE HYDRAULIC ANGLE AND TILT DEFAULT OPERATION

Depending on how the hydraulic hoses are connected on your unit either the angle or tilt operation is the default control function and can be activated by the auxiliary hydraulics on your prime mover. If after operating your blade you prefer to change the default, refer to the diagrams below and switch the existing hoses around to the correct location for the desired default operation.



# MAINTENANCE AND SERVICE

## CYLINDER SEAL REPLACEMENT

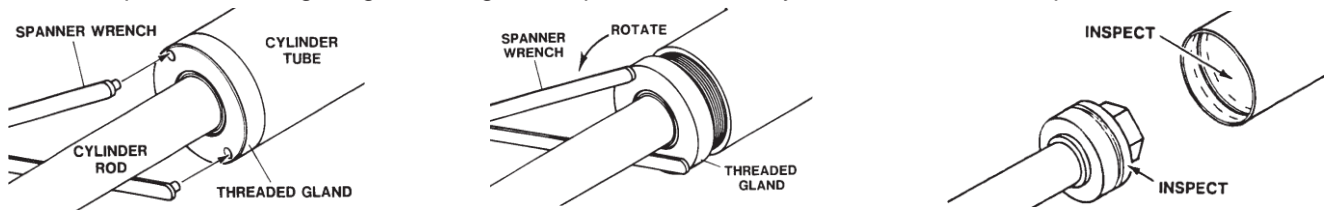
The following information is provided to assist you in the event you should need to repair or rebuild a hydraulic cylinder. When working on hydraulic cylinders, make sure that the work area and tools are clean and free of dirt to prevent contamination of the hydraulic system and damage to the hydraulic cylinders. Always protect the active part of the cylinder rod (the chrome section). Nicks or scratches on the surface of the rod could result in cylinder failure. Clean all parts thoroughly with a cleaning solvent before reassembly.

### DISASSEMBLY PROCEDURE

**IMPORTANT:** Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

#### THREADED TYPE GLAND

1. Rotate the gland with a spanner wrench counterclockwise until the gland is free of the cylinder tube.
2. Pull the cylinder rod from the cylinder tube and inspect the piston and the bore of the cylinder tube for deep scratches or galling. If damaged, the piston AND the cylinder tube must be replaced.



3. Remove the hex nut, piston, flat washer or spacer tube (if so equipped), and gland from the cylinder rod. If the cylinder rod is rusty, scratched, or bent, it must be replaced.
4. Remove and discard all the old seals.

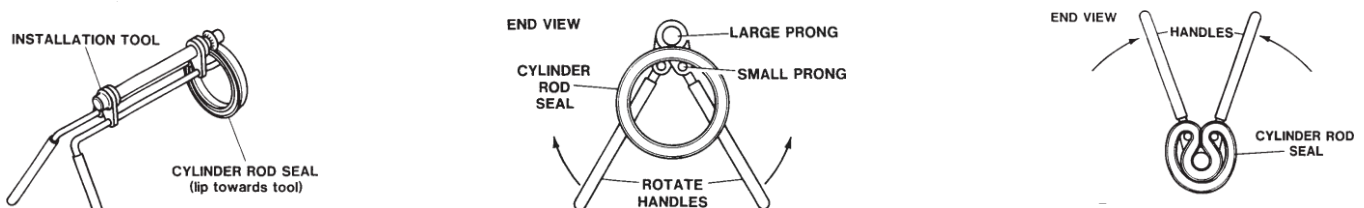


### ASSEMBLY PROCEDURE

**IMPORTANT:** Replace all seals even if they do not appear to be damaged. Failure to replace all seals may result in premature cylinder failure. **NOTE:** Seal kits will service most cylinders of similar bore size and rod diameter.

1. Install the cylinder rod seal in the gland first. Be careful not to damage the seal in the process, as it is somewhat difficult to install.

**NOTE:** A special installation tool (Part #65349) is available to help with installing the seal. Simply fit the end of the tool over the seal so that the large prong of the tool is on the outside of the seal, and the two smaller prongs on the inside. The lip of the seal should be facing towards the tool. Rotate the handles on the tool around to wrap the seal around the end of the tool.

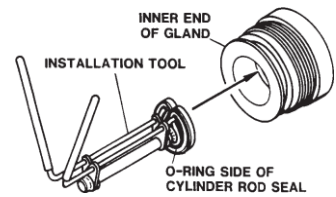


Rotate the handles on the tool around to wrap the seal around the end of the tool.



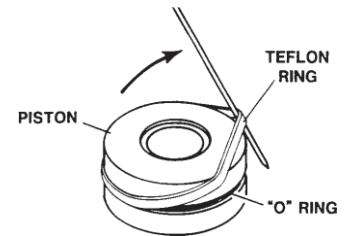
# MAINTENANCE AND SERVICE

Now insert the seal into the gland from the inner end. Position the seal in its groove, and release and remove the tool. Press the seal into its seat the rest of the way by hand.



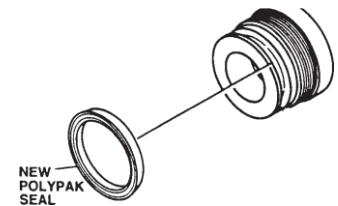
2. Install the new piston ring, rod wiper, O-rings and backup washers, if applicable, on the piston.

Be careful not to damage the seals. Caution must be used when installing the piston ring. The ring must be stretched carefully over the piston with a smooth, round, pointed tool.



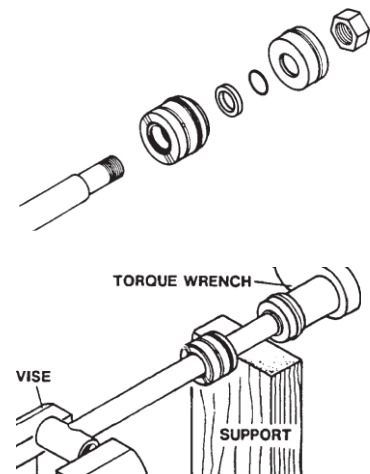
3. After installing the rod seal inside the gland, as shown in step #1, install the external seal.

NOTE: Threaded glands may have been equipped with a separate O-ring and backup washer system or a polypak (all in one) type seal. Current seal kits contain a polypak (all in one) type seal to replace the discarded seal types on ALL THREADED GLANDS.



4. Slide the gland onto the cylinder rod, being careful not to damage the rod wiper. Then install the spacer, or flat washer (if so equipped), small o-ring, piston, and hex nut onto the end of the cylinder rod.
5. Secure the cylinder rod (mounting end) in a vise with a support at its center. Torque the nut to the amount shown for the thread diameter of the cylinder rod (see chart).

Thread Diameter	POUNDS - FEET
7/8"	150-200
*1"	230-325
1-1/8"	350-480
1-1/4"	490-670
1-3/8"	670-900
* 1" Thread Diameter WITH 1.25" Rod Diameter	
Min. 230 ft. lbs. Max. 250 ft. lbs.	



**IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.**

6. Apply a lubricant (such as Lubriplate #105) to the piston and teflon ring. Insert the cylinder rod assembly into the cylinder tube.

**IMPORTANT: Ensure that the piston ring fits squarely into the cylinder tube and piston groove, otherwise the ring may be damaged and a leak will occur.**

7. Use a spanner wrench to rotate the gland clockwise into the cylinder. Continue to rotate the gland with the spanner wrench until it is tight.

**WARNING!** Cylinders serviced in the field are to be tested for leakage prior to the attachment being placed in work. Failure to test rebuilt cylinders could result in damage to the cylinder and/or the attachment, cause severe personal injury or even death.



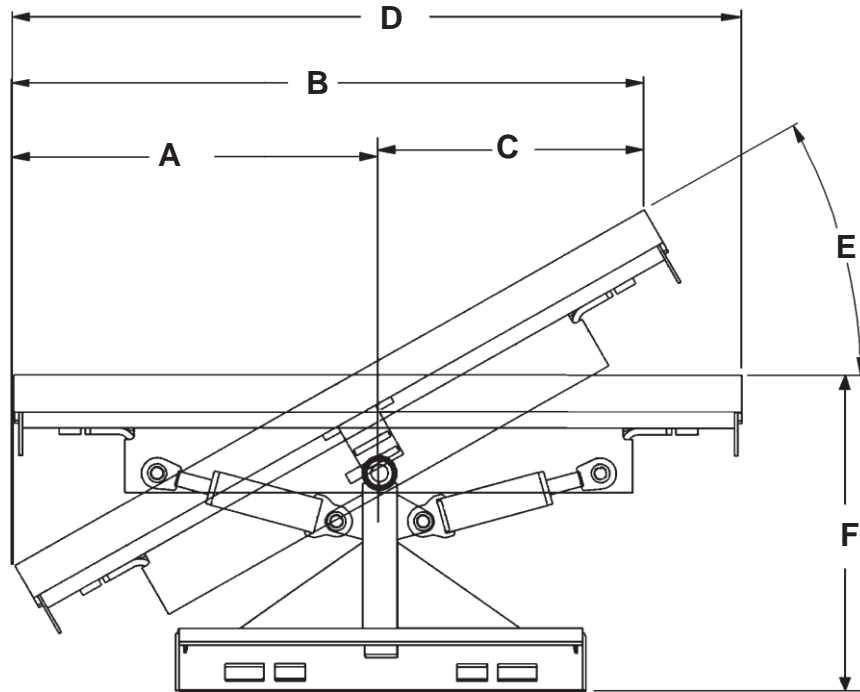


## TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Blade fails to tilt or angle.	Improper hose hook-up.	Check hydraulic diagram.
	Broken hydraulic line.	Check and Replace.
	Hydraulic couplers malfunctioning or non-compatible.	Replace.
Blade angling or tilting too slowly.	Cold oil.	Warm oil with engine at idle.
	Engine speed too slow.	Open throttle.
	Restriction in diverter valve.	Clean or Replace.
	Oil leaking past cylinder packings.	Replace cylinder packings.
Blade fails to maintain angle or tilt.	Broken or leaking hydraulic lines.	Replace broken hose and check for leaks.
	Oil leaking past cylinder packings.	Replace cylinder
	Internal leak in diverter valve.	packings. Clean or Replace.
	Skid-steer relief too low.	Adjust relief as per prime mover manufacturer's instructions.
Oil heating.	Poor operating technique causing excessive oil flow.	Learn smooth operating methods.
External leaking.	Cylinder seals damaged.	Replace and Repair.
	Broken or loose hydraulic line.	Check for leaks and repair or replace.
Blade functions in default circuit only.	No electrical power to the blade diverter valve.	Check for proper connections in control box or auxiliary electrical circuit on the prime mover.
Blade functions in default circuit only WITH power to the solenoid.	Blade diverter valve coil malfunctioning.	Repair or replace.
	Spool in valve sticking.	Clean or replace.

# SPECIFICATIONS

## DOZER BLADES



**SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE AND WITHOUT LIABILITY THEREFOR.**

DESCRIPTION	84"	96"
A. Width From Centerline to Inside Edge @ 15° Angle.....	43.53"	49.31"
Width From Centerline to Inside Edge @ 30° Angle.....	42.19"	47.38"
B. Dozer Blade Width @ 15° Angle.....	81.13"	92.73"
Dozer Blade Width @ 30° Angle.....	73.13"	83.56"
C. Width From Centerline to Outside Edge @ 15° Angle.....	37.63"	43.41"
Width From Centerline to Outside Edge @ 30° Angle.....	30.94"	36.16"
D. Overall Width.....	84.00"	96.00"
E. Angle Left and Right.....	30°	30°
F. Overall Length.....	36.68"	36.68"
Overall Height.....	29.89"	29.89"
Approx. Weight.....	1365#	1460#
<b><u>CYLINDER SPECIFICATIONS</u></b>		
Bore.....	3.50"	3.50"
Stroke.....	8.00"	8.00"
Rod Diameter.....	1.75"	1.75"




# BOLT TORQUE SPECIFICATIONS

## GENERAL TORQUE SPECIFICATION TABLES

Use the following charts when determining bolt torque specifications when special torques are not given. Always use grade 5 or better when replacing bolts.




## SAE BOLT TORQUE SPECIFICATIONS

**NOTE:** The following torque values are for use with extreme pressure lubricants, plating or hard washer applications. Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.

Bolt Size		SAE GRADE 5 TORQUE				SAE GRADE 8 TORQUE				Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		
Inches	Millimeters	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	
1/4	6.35	8	9	11	12	10	13	14	18	<p>GRADE 2</p>  <p>GRADE 5</p>  <p>GRADE 8</p> 
5/16	7.94	14	17	19	23	20	25	27	34	
3/8	9.53	30	36	41	49	38	46	52	62	
7/16	11.11	46	54	62	73	60	71	81	96	
1/2	12.70	68	82	92	111	94	112	127	152	
9/16	14.29	94	112	127	152	136	163	184	221	
5/8	15.88	128	153	174	207	187	224	254	304	
3/4	19.05	230	275	312	373	323	395	438	536	
7/8	22.23	340	408	461	553	510	612	691	830	
1	25.40	493	592	668	803	765	918	1037	1245	
1-1/8	25.58	680	748	922	1014	1088	1224	1475	1660	
1-1/4	31.75	952	1054	1291	1429	1547	1700	2097	2305	
1-3/8	34.93	1241	1428	1683	1936	2023	2312	2743	3135	
1-1/2	38.10	1649	1870	2236	2535	2686	3026	3642	4103	

## METRIC BOLT TORQUE SPECIFICATIONS

**NOTE:** The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.

Bolt head identification marks as per grade.		
		

Size of Bolt	Grade No.	Pitch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	5.6	1.0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1.25	7.2-14	9.8-19	1.0	12-17	16.3-23
	8.8		17-22	23-29.8		19-27	25.7-36.6
	10.9		20-26	27.1-35.2		22-31	29.8-42
M10	5.6	1.5	20-25	27.1-33.9	1.25	20-29	27.1-39.3
	8.8		34-40	46.1-54.2		35-47	47.4-63.7
	10.9		38-46	51.5-62.3		40-52	54.2-70.5
M12	5.6	1.75	28-34	37.9-46.1	1.25	31-41	42-55.6
	8.8		51-59	69.1-79.9		56-68	75.9-92.1
	10.9		57-66	77.2-89.4		62-75	84-101.6
M14	5.6	2.0	49-56	66.4-75.9	1.5	52-64	70.5-86.7
	8.8		81-93	109.8-126		90-106	122-143.6
	10.9		96-109	130.1-147.7		107-124	145-168
M16	5.6	2.0	67-77	90.8-104.3	1.5	69-83	93.5-112.5
	8.8		116-130	157.2-176.2		120-138	162.6-187
	10.9		129-145	174.8-196.5		140-158	189.7-214.1
M18	5.6	2.0	88-100	119.2-136	1.5	100-117	136-158.5
	8.8		150-168	203.3-227.6		177-199	239.8-269.6
	10.9		175-194	237.1-262.9		202-231	273.7-313
M20	5.6	2.5	108-130	146.3-176.2	1.5	132-150	178.9-203.3
	8.8		186-205	252-277.8		206-242	279.1-327.9
	10.9		213-249	288.6-337.4		246-289	333.3-391.6

## PARTS

In order to provide you with the most UP-TO-DATE part information, all parts for this attachment have been moved to our website at [www.spartanequipment.com](http://www.spartanequipment.com). Please use these diagrams and parts lists to locate replacement parts.

When servicing your attachment, remember to use only original manufacturer replacement parts. Substitute parts may not meet the standards required for safe, dependable operation.

To facilitate parts ordering when contacting the factory, please have the product control number (PCN) or model and serial number of your product ready to ensure that you receive the correct parts for your specific attachment.

The product control number (PCN), model and serial number for your attachment should be recorded in the space provided on the cover of this manual. This information may be obtained from the serial number identification plate located on your attachment.

**NOTE: Any emergency parts orders (in stock) received by 10:30 A.M. (Eastern Standard Time) will be shipped UPS Ground the same day received and must be PAID in advance by customer. UPS Next Day orders must be received by 1:30 PM (Eastern Standard Time.)**

### SERVICE DEPARTMENT

(888) 888-1085

#### E-mail Orders

[orders@spartanequipment.com](mailto:orders@spartanequipment.com)

## WARRANTY

In order to provide you with the most UP-TO-DATE Warranty information, on the Warranty Statement and Warranty Procedures along with Warranty Registration and Claim Forms have been moved to our website at <https://www.spartanequipment.com/pages/warranty-submission-claim-form.html>.