



# **SCRAPER OPERATOR'S MANUAL**

***EARTH MOVING SYSTEMS***

**OM07-01-01**

**For Model Series: CD Clam Discharge**

**ORTHMAN MANUFACTURING, INC.**

P.O. Box B, Lexington, Nebraska 68850

Phone: 308-324-4654 1-800-658-3270 Fax: 308-324-5001

Web Site: [www.orthman.com](http://www.orthman.com)

# Farm Safety

**Contrary to the popular image of fresh air and peaceful surroundings, a farm is not a hazard-free work setting. Every year, thousands of farm workers are injured and hundreds more die in farming accidents. According to the National Safety Council, agriculture is the most hazardous industry in the nation.**

## How You Can Improve Farm Safety

You can start by increasing your awareness of farming hazards and making a conscious effort to prepare for emergency situations including fires, vehicle accidents, electrical shocks from equipment and wires, and chemical exposures. Be especially alert to hazards that may affect children and the elderly. Minimize hazards by carefully selecting the products you buy to ensure that you provide good tools and equipment. Always use seat belts when operating tractors, and establish and maintain good housekeeping practices. Here are some other steps you can take to reduce illnesses and injuries on the farm:

- Read and follow instructions in equipment operator's manuals and on product labels.
- Inspect equipment routinely for problems that may cause accidents.
- Discuss safety hazards and emergency procedures with your workers.
- Install approved rollover protective structures, protective enclosures, or protective frames on tractors.
- Make sure that guards on farm equipment are replaced after maintenance.
- Review and follow instructions in material safety data sheets (MSDSs) and on labels that come with chemical products and communicate information on these hazards to your workers.

## Health and Safety Hazards on Farms

Farm workers including farm families and migrant workers are exposed to hazards such as the following:

Danger	Potential Effect or Injury	Prevention
Chemicals/Pesticides	Skin and respiratory injury or death	MSDS and proper Personal Protective Equipment. Review Manufacturers data sheets
Cold	Illness, Frostbite or death	Dress properly for the day.
Dust	Respiratory injury or explosive combinations	Be aware of your surroundings and activity
Electricity	Shock, burns, fire, death	Use a qualified professional for wiring dangerous electrical devices. Never overload a circuit. Replace damaged electrical devices or cords. Electrical tape will not insulate you from injury.
Grain bins, Silos	Entrapment, Suffocation, Explosion from formation of dangerous gases and poisoning.	Make sure the bin is properly ventilated and maintained. Never walk the grain.
Hand tools	Injury including cuts abrasions, electrocution, strains, sprains and death	Make sure you hand tools are in good condition. Never leave a damaged tooling accessible for someone else to use.
Highway traffic	Collisions resulting in injury or death	Follow regulations, stay alert. Avoid alcohol and use of communication devices while driving
Lifting and lifting devices	Back injury, sprains, strains. Falling material resulting in being struck or crushed by heavy material	Use proper lifting technique. Get help when the load is too heavy. Inspect chains, straps or cables routinely to make sure they are in good condition.
Livestock handling	Serious injury or death resulting from being pinned struck or trampled.	Always make sure you have adequate room and an escape route
Machinery/Equipment	Cuts, abrasions, amputations, death.	Thoroughly read and understand your Owners Equipment Manual. Never operate the equipment without guards in place. Make sure the equipment can not be energized or otherwise put into operation while you are working on it.
Manure pits	Explosion from formation of dangerous gases. Suffocation. Poisoning	Proper maintenance.
Mud	Sprains, strains, entrapment and suffocation. Eye injury and skin irritation.	Proper Personal Protective Equipment. In some conditions a "Spotter" may be needed.
Noise	Hearing damage	Personal Protective Equipment.
Ponds	Drowning	Wear a life preserver and make sure help is readily available.
Slips/Trips/Falls	Sprains, strains, back and neck injury, bone breaks or death	Keep work area free from clutter and organized. If working on anything elevated make sure you have appropriate guarding and/or fall protection such as a harness and lanyard.
Sun/Heat	Sun burn, Heat Stroke, shock, death	Use common sense on excessively hot days, use sun screen, wear a hat and stay hydrated.
Toxic gases	Skin and respiratory injury or death. Explosion.	MSDS and proper Personal Protective Equipment. Review Manufacturers data sheets
Tractors	Cuts, abrasions, amputations, death.	Thoroughly read and understand your Owners Equipment Manual. Never operate the equipment without guards in place. Anti-roll over devices.
Wells	Electrocution, amputation, death	Avoid contact with water while working on an electrical device. Always be sure the equipment can/will not be energized during repair or maintenance. Make sure all guarding is in place.
Severe Weather	Electrocution, "struck by" injuries, death	Move to a safe place. Lightening, hail and tornadoes are unpredictable.

**Orthman Manufacturing, Inc. does not limit the potential effects or injuries nor prevention measures to those listed above. They are provided solely as a guideline to making your farm life safer. Always consult your Owner/Operators Manual for specific tool and equipment safety requirements.**

## High Risk Factors on Farms

The following factors may increase risk of injury or illness for farm workers:

- **Age** – Injury rates are highest among children age 15 and under and adults over 65.
- **Equipment and Machinery** – Most farm accidents and fatalities involve machinery. Proper machine guarding and doing equipment maintenance according to manufacturers' recommendations can help prevent accidents.
- **Protective Equipment** – Using protective equipment, such as seat belts on tractors, and personal protective equipment (such as safety gloves, coveralls, boots, hats, aprons, goggles, face shields) could significantly reduce farming injuries.
- Take precautions to prevent entrapment and suffocation caused by unstable surfaces of grain storage bins, silos, or hoppers. Never "walk the grain."
- Be aware that methane gas, carbon dioxide, ammonia, and hydrogen sulfide can form in unventilated grain silos and manure pits and can suffocate or poison workers or explode.
- Take advantage of safety equipment, such as bypass starter covers, power take-off master shields, and slow-moving vehicle emblems.
- **Medical Care** – Hospitals and emergency medical care are typically not readily accessible in rural areas near farms.

## The Benefits of Improved Safety and Health Practices

Orthman Manufacturing Provides this document in the hope that everyone that has a job to do, does it SAFELY. Our goal and yours should be to end each day in the best possible health. Better safety and health practices reduce fatalities, injuries, and illnesses as well as associated costs such as workers' compensation insurance premiums, lost production, and medical expenses. A safer and more healthful workplace improves morale and productivity.

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# INTRODUCTION

Congratulations on your selection of the Orthman Soilmover Scraper to aid you in your operation. This operator's manual will assist you in realizing the benefits you can gain from using the Orthman Soilmover Scraper.

Many people have contributed to the design, production, and delivery of this Orthman product. They have an interest in its successful performance. Their years of field testing and normal usage have contributed valuable information to this operator's manual.

You will find it very beneficial to read this entire manual to have a thorough understanding of the scraper before taking it to the field. Also, keep this manual handy for future reference.

Proper operation and care of the scraper contribute immensely to its successful performance. Your Orthman Dealer will be glad to answer any questions you may have on the operation and care of this product. Also, for parts and service, see your nearest Orthman Dealer.

Your Orthman Soilmover Scraper is a rugged, heavy-duty scraper; yet, it is so versatile it can easily handle a wide range of earth-moving jobs proficiently and economically.

Earth-moving conditions will vary from year to year. Items affecting earth-moving conditions include amount of moisture, soil structure, soil type, etc. Therefore, the normal settings outlined in this manual are really suggested starter settings. Adjustment may need to be made to fit a particular earth-moving situation. Operating information contained in this manual will aid in making the necessary adjustments.

After your scraper has been in operation for a few hours, check for loose bolts, etc. All are tight when the scraper leaves the factory; however, after a break-in period, some items may require additional tightening. Like any other machine, your scraper requires proper care and intelligence in operation. Misuse and neglect will only cause unnecessary expense and dissatisfaction.

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## **Model Number And Serial Number Of Your Orthman Scraper**

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For future reference, record below the model number and serial number of your Orthman Soilmover Scraper. This information appears on a label affixed to the front of your scraper.

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

# SPECIFICATIONS

## 630 SERIES

Model	CD630	CDX630
Heaped Capacity-Cu. Yds.	3	3
Weight-Lb.	2,310	2,070
Width of Cut-Inches	72"	72"
Overall Length-Ft./Inches	16'-6"	14'-9"
Overall Height-Inches	38"	38"
Overall Width-Inches	87"	87"
Front Tires	9.5L-15	-----
Rear Tires	9.5L-15	9.5L-15
Power Requirements		
Minimum Horsepower	40	40
Maximum Horse power	80	80

For optimum performance, a hydraulic system developing 3,000 PSI at 12-20 GPM is recommended. Do Not Exceed 3,000 PSI.

## 655 SERIES

Model	CD655	CDX655
Heaped Capacity-Cu. Yds.	5.5	5.5
Weight-Lb.	3,640	3,450
Width of Cut-Inches	78"	78"
Overall Length-Ft./Inches	18'-6"	16'
Overall Height-Inches	48"	48"
Overall Width-Inches	96"	96"
Front Tires	9.5L-15	-----
Rear Tires	11L-15	11L-15
Power Requirements		
Minimum Horsepower	60	60
Maximum Horse power	120	120

For optimum performance, a hydraulic system developing 3,000 PSI at 12-20 GPM is recommended. Do Not Exceed 3,000 PSI.

## 675 SERIES

Model	CD675	CDX675
Heaped Capacity-Cu. Yds.	7.5	7.5
Weight-Lb.	5,920	5,120
Width of Cut-Inches	78"	78"
Overall Length-Ft./Inches	21'-10"	16'-8"
Overall Height-Inches	62"	62"
Overall Width-Inches	96"	96"
Front Tires	9.00-16	-----
Rear Tires	15-22.5	15-22.5
Power Requirements		
Minimum Horsepower	100	100
Maximum Horse power	140	140

For optimum performance, a hydraulic system developing 3,000 PSI at 12-20 GPM is recommended. Do Not Exceed 3,000 PSI.

# **WARRANTY**

Orthman Manufacturing, Inc. warrants the products it manufactures to be free from defects in materials and workmanship, for a period of one year from the date of sale to the original user. The warranty is valid provided Orthman Manufacturing, Inc. during said period and within ten days receives written notice of the alleged defect after its discovery.

If proven to our satisfaction that the product is defective as to material and workmanship, the necessary parts will be replaced and/or repaired, this being Orthman Manufacturing, Inc. sole responsibility. Our obligation under this warranty is limited to repair or replacement of Orthman product or part only and does not obligate Orthman Manufacturing, Inc. to bear any other cost involved.

This warranty will apply only if the product has not been subject to misuse, misapplication, neglect, repair or alteration.

In respect to products and parts not manufactured by Orthman Manufacturing, Inc. the warranty obligations of Orthman Manufacturing, Inc. shall in all respects conform and be limited to our suppliers warranty.

Incoming freight should be prepaid. If products are found to be within warranty, credit will be allowed on the incoming charges and return freight will be prepaid.

THE WARRANTY IN THE ABOVE STATEMENT BY ORTHMAN MANUFACTURING, INC. IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE WARRANTY OF MERCHANTABILITY AND FITNESS FOR USE. WE NEITHER ASSUME, NOR AUTHORIZE ANY OTHER PERSON TO ASSUME FOR US, ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF OUR PRODUCTS.



# **SAFETY**

Do not attempt to service tire, wheel or hub assembly without proper equipment, as hazardous conditions may exist. A qualified tire serviceman must perform repairs.

- Never attempt to assemble tire lock rings or to inflate tire yourself.
- Never attempt to weld or apply heat to wheel and hub assembly.
- When servicing wheel bearings, precautions must be taken to prevent accidental dislodging of tire lock ring.
- Repair or replace any part of the hydraulic system that is worn or damaged.
- Keep away from the machine while it is being operated through its cycle. Fingers or hands could easily be pinched, smashed or caught in the linkage system. Never work on any machine when the tractor is running.
- Never work under a part suspended solely by the hydraulic system. If a hydraulic component should fail, the part could drop quickly. Always use blocks to support the part. **DO NOT RELY ON TRACTOR HYDRAULIC SYSTEM FOR SUPPORT.**
- Do not carry riders or allow anyone near any moving parts.
- Do not lubricate the machine or make any adjustments or repairs while it is in motion.
- Do not pull the machine at top speed in crowded places or over rough terrain.

Keep in mind the fact that your Soilmover when loaded can exceed 12 tons gross weight. Think ahead! Beware of steep grades and ditches. Allow for increased stopping distances. It is possible to load your scraper with a tractor, which is too small to provide adequate stopping ability and control during transport.

Avoid the following conditions, which may cause your Soilmover to upset:

- Steep side slopes.
- Short turns at high speeds.
- Traveling over rough ground at high speeds.
- Striking a rock, mound of dirt or other projection with one rear wheel.

For your own safety and comfort as well as increased life of your tractor and Orthman Soilmover Scraper, take a few minutes to analyze your project. Prepare a smooth haul road--away from hazards.

During transport, always keep your hand on or near the bucket lift-control lever. In the event of runaway, drop the bowl for an emergency stop.

- When storing this machine, never leave any parts suspended in air. Always rest the bucket on a flat surface and release the hydraulic pressure.
- This machine is not intended for travel on public roadways or for long distances at high speeds.
- Do not turn with the cutting edge on the ground. This could cause damage to the scraper.

Before attempting any maintenance or repair on this machine:

- Stop tractor and shut off engine.
- Release hydraulic pressure on all lines, disconnect from tractor and then proceed. Use block and chain for support when necessary. **DO NOT RELY ON HYDRAULIC SYSTEM FOR SUPPORT.**

**CAUTION:** Do not cross hydraulic lines on this assembly, as it would spring the frame when put into operation. Orthman Mfg. cannot assume any responsibility for damage to any machine resulting from improper installation of hydraulic lines.

It has been brought to our attention that while using these scrapers in certain types of soil, such as sod, the gate may be forced open far enough to become over center and lay on top of the scraper bowl.

When the scraper is cycled to the unload position, the scraper may shift enough to force the gate on top of the front roller bracket and continued hydraulic pressure in the unload mode will cause serious damage to the scraper gate.

Chaining the gate open or restricting the free movement of the gate in any way can also cause the same situation.

Caution must be taken to prevent this action from taking place. Sharp turning with the scraper in the load mode or the unloading mode should also be avoided to prevent any side loading on the scraper structure which would add to the side shift.

# OPERATING INSTRUCTIONS

The Orthman Soilmover Clam Discharge scraper is shipped factory assembled.

## HYRAULIC HOOKUP:

To hook the Scraper to your tractor, first back the tractor up to your machine and secure the hitch. Connect oil lines to tractor remote. Extend cylinders slightly to release tension on transport brackets. Unpin bracket and flip back, pin to storage strap.

The larger the volume of pump output, the faster the load can be dumped. Recommended pressures are 1,500 to 3,000 p.s.i. (maximum). Keep the oil as clean as possible and make sure the hoses are not kinked as this will restrict the flow of oil. **CAUTION:** Make sure that oil lines on the Scraper are not crossed, as this will spring the frame.

## CUTTING EDGE:

The blade has a slight bow in the downward direction. This is manufactured into the moldboard, which has a tendency to give the bucket better loading action. The three-piece blade can be reversed when one side becomes dull. The center section can be shifted down to provide a frost bit for harder soil. It can be easily removed for sharpening. Because this blade is made of a high carbon steel, DO NOT attempt to weld objects onto it.

## TIRES:

Tires should be inflated equally with 75 to 80 pounds of pressure. If this is not done, the machine will have a tendency to cut deep on one side and consequently you will get uneven loading. If the tires are too soft, they may allow the machine to dig heavy on one side, since the blade suction would cause the tire to squat. Excessive tire pressure would cause the machine to bounce over uneven ground and result in an uneven cut.

## LOADING SCRAPER:

Retract cylinders to lower cutting blade to ground. Front gate will automatically open to allow soil to enter scraper bowl.

1. Lower blade to the desired cutting depth with the tractor moving at 3-6 mph.
2. It is best to maintain operating speed and use a modest cutting depth. Cutting too deep may cause the tractor to spin out and not give optimum performance.
3. Fill the bowl until material is overflowing.
4. Raise bowl up until front gate closes.

When the rear wheels have traveled to where the soil has been removed, the blade will dig in as originally allowed. To compensate for this, the blade will have to be lifted out slightly as soon as the wheels reach the spot where the cut is first started. The original cut may be started at half the desired cutting depth. Depth of cut is to be done with ease. If this is not done, you will find you get an irregular finish. Do not fight the controls.

When using the Scraper-Train, load the lead scraper first. Start loading the trailing scraper where the lead scraper was raised out of the ground. The rear scraper can be used for planing by lowering the blade to desired height.

#### **UNLOADING SCRAPER:**

1. Pull scraper to desired unloading area.
2. Extend cylinders to tip scraper bowl forward. Front gate will automatically roll open to allow complete emptying of the scraper bowl.
3. Maintain constant operating speed of 3-6 mph. This will allow material to spread over the desired area.
4. After scraper bowl is empty, retract the cylinders until front gate closes.

# MAINTENANCE

The following discussion is furnished as a guide for performing routine service.

Generally: Grease new machine prior to operation. During periods of heavy use, carefully examine your Scraper at least once a month with particular attention to the following points:

- Make sure all bolts and nuts are tight.
- Check all bearings and pivot points. Replace worn bearings or bushings. A worn bearing or pivot bushing may fail and cause damage to related components.
- Inspect cutting edges for wear.

Check wheel bearings and seals frequently, especially when first putting machine to work, but more frequently when working in conditions where mud, abrasives or water contact sealing surfaces. If machine must be operated with wheel bearings and seals submerged in water or slurry, additional precautions must be taken to prevent premature failure of the wheel bearings.

If seals appear to be worn, damaged, packed with dirt or show signs of losing lubricant—remove wheels. Disassemble spindle bearings and seals from hubs. Clean and inspect hub, spindle, bearing cups and cones. Replace worn parts and pack with a good grade of wheel bearing grease. Always reassemble with new seals.

Adjust the tapered roller bearings for proper “set” with spindle nuts. Tighten adjusting nut until wheel starts to “lock” or “drag”. Then loosen until wheel spins freely but has no end play, and lock adjusting nut securely. Check adjustment again after short operation to be sure hub is not hot from being too tight or that it has not developed end play from becoming loose. Adjust as indicated.

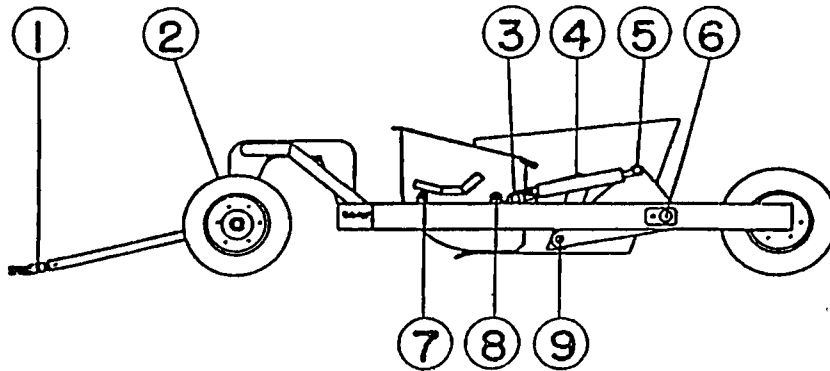
To grease the ball on the front truck, retract the cylinders until the front wheels are off the ground. This will allow the grease to lubricate the whole ball and reduce wear.

Recheck all bolts and nuts every hour for the first 24 hours of running time; and tighten if necessary, paying special attention to the wheel lug nuts and bolts. Visually inspect the machine daily.

When your SCRAPER is to be stored for any period of time, liberally coat the cylinder rods with heavy grease.

### LUBRICATION:

Before operating the scraper for the first time, lubricate the machine using three or four strokes of a standard grease gun at each fitting. It is a good practice to apply grease to each fitting any time you stop for coffee, lunch or fuel. (See Diagram Below)



<u>FITTING</u>	<u>LOCATION</u>	<u>QTY.</u>
1	Swivel Hitch	(1)
2	Ball & Ball Socket	(1) RF Only
3	Floating Link	(2) 1 Each Side
4	Floating Link	(2) 1 Each Side
5	Cylinder Pin	(2) 1 Each Side
6	End Mount	(2) 1 Each Side
7	Gate Roller	(2) 1 Each Side
8	Gate Roller	(2) 1 Each Side
9	Torque Arm Pin	(2) 1 Each Side

### HYDRAULIC CYLINDERS:

The hydraulic cylinders used on this machine are double acting. Failure of any cylinder to operate properly may be due to insufficient oil in the pump reservoir, air in the tractor lines, faulty or mismatched break-away couplers, faulty hydraulic system or worn cylinder seals. A filter will prolong the life of the pump and cylinder seals. Do not reduce the size of the oil lines, as this will restrict the flow of oil.

CYLINDER REPAIR: Should it become necessary to replace the seals in a cylinder, the following procedure should be observed:

First, remove the retaining ring from the cylinder. Then remove the cylinder cap by pulling the piston to the outer end of the cylinder. As the piston strikes the cap, it will be forced out. Remove the cap and the piston and shaft. Now the seals can be inspected and replaced if necessary. Be careful not to damage the piston shaft, as a scratched or damaged shaft will cut the oil seals and cause leakage. During re-assembly, be careful not to pinch the seals as the piston slides into the barrel. Oil or light grease should be used on the seals when the cylinder is reassembled.

Leakage past the piston can be checked without disassembly of the hydraulic cylinder. Disconnect the oil line from the cylinder fitting located on the butt-end of the barrel. Actuate the hydraulic control valve to pump oil into the rod-end of the cylinder. If oil is bypassing the piston, it will run out the butt-end oil port after a few seconds.

A faulty or mismatched breakaway coupler can cause a cylinder to appear defective. The rod may extend or retract in short, jerky motions with or without oil line chatter or move in one direction and not the other. The coupler can also restrict the oil flow so much that cylinder speed is slowed considerably with an accompanying loss of effective hydraulic pressure.

WHEN ORDERING CYLINDER PARTS, GIVE THE CYLINDER PART NUMBER STAMPED ON THE COLLAR AND THE NUMBER STAMPED ON THE OUTSIDE FACE OF THE ALUMINUM CAP WHICH SEALS THE ROD-END OF THE CYLINDER.

### CUTTING EDGE:

The cutting edge can be reversed when one side becomes dull. The cutting edges are made of a high-carbon steel, which may be weakened by welding.

When working in hard ground or frost conditions, using the rear set of holes should move the center section of the cutting edge forward.

The main cutting edges should be inspected regularly for wear. Do not allow cutting edges to wear to such an extent that the blade support becomes the leading edge. This will result in weakening of these parts and may lead to costly repairs later.

**CHANGING OR REVERSING THE CUTTING EDGE:** From the operator position on the tractor, raise the bowl off the ground, place blocks under it and immediately behind the cutting edge; then relax the bowl onto the blocks. Using the ejection circuit, raise the apron. **SECURE THE APRON BY USING A HEAVY CHAIN AND BLOCKS TO PREVENT DROPPING IN CASE OF HYDRAULIC FAILURE. SHUT OFF TRACTOR AND RELAX THE APRON ONTO THE SUPPORT YOU HAVE PROVIDED. LOCK PARKING BRAKE AND BLOCK THE WHEELS. PROCEED WITH REPAIRS AS NEEDED. WARNING: NEVER PLACE ANY PART OF YOUR BODY UNDER THE BOWL OR APRON UNLESS THEY ARE BLOCKED UP.**

**TIRES:**

Tires should be inflated equally to the maximum pressure recommended by the tire manufacturer. It is very important that the rear tire pressures and diameters are exactly the same. If one tire has less pressure than the other does, the softer tire will squat more than the other will. This will result in an uneven cut and an uneven load. If one of the rear tires has a smaller diameter than the other, this same condition will result, since the scraper will cut deeper on the side having the smaller tire. Excessive tire pressure will cause the scraper to bounce over uneven ground, resulting in a rough and uneven cut. The rear wheels may be adjusted vertically to compensate for uneven tire wear or tires having slight differences in diameter by adding or removing shims between axle mounting blocks. Shims may be removed from the "high" side and added to the "low" side.

When a seal is damaged or worn out, the bearing should be re-packed when replacing the seal. A good grade of wheel bearing grease is recommended. Tapered bearings are used in the hub; and proper "set" is given by adjusting the spindle nut. The wheel should be allowed to rotate freely, but it should have no endplay. An improper adjustment can result in premature bearing failure and possible damage to related parts as well. **NOTE:** The bearings should be checked for grease frequently when working in fine, dusty conditions, or when seals are submerged.



# **TROUBLE SHOOTING**

**MACHINE CUTS DEEPER ON ONE SIDE.** Check rear tire diameters and pressures to be sure that they are the same. (See Maintenance Section—Tires.) If the tire size and pressures are the same, remove one set of shims from the rear spindle-mounting block on the opposite side of the one that cuts deep. To remove shims, loosen the mounting bolts and slide the notched shims out. If this is not enough, the shims can be added to the side that cuts deeper.

Beginning a cut while still on a turn will also cause one side of the machine to cut deeper.

**MACHINE ROCKS WHILE CUTTING (washboard effect).** Beginning a cut while the machine is bouncing over uneven ground will carry through the loading operation. As the blade rocks and gouges on first one side and then the other, the rear tires traveling in these depressions will continue to rock the machine. To eliminate this effect, begin the cut at a slow speed so that the machine settles. As the rear wheels travel to the even cut, the speed can be increased.

**MACHINE TENDS TO DROP SLOWLY WHILE TRANSPORTING A LOAD.** Oil is bypassing either in the hydraulic control valve or in the scraper cylinders. To check the cylinders, disconnect the oil lines from the tractor. If hydraulic couplers are not being used, the bucket will have to be jacked up. Plug the ends of the oil lines and remove the jack. If oil is bypassing in the cylinders, the bucket will gradually lower. New seals would then have to be installed. (See Maintenance Section—Cylinder Repair.)

**CYLINDERS NOT LIFTING THE LOADED BUCKET.** This may be due to insufficient hydraulic pressure or to the piston seals not allowing oil to pass. A gauge should be put in the line and the pressure checked. (See Maintenance Section—Hydraulic Cylinders.)

**CYLINDERS LOCK (will not move in either direction or will move one way but not the other).** Check to be sure that oil lines are connected properly and not crossed.

Check the hydraulic couplers on the tractor to be sure that they are not restricting the oil flow. If the couplers appear to function properly and the cylinders are still locked, hook up the hydraulic line directly to the tractor outlets without the use of the couplers by removing the couplers entirely. Then operate the control valve. A faulty coupler is sometimes difficult to spot and may even permit free flow in one direction while restricting the flow in the opposite direction.

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