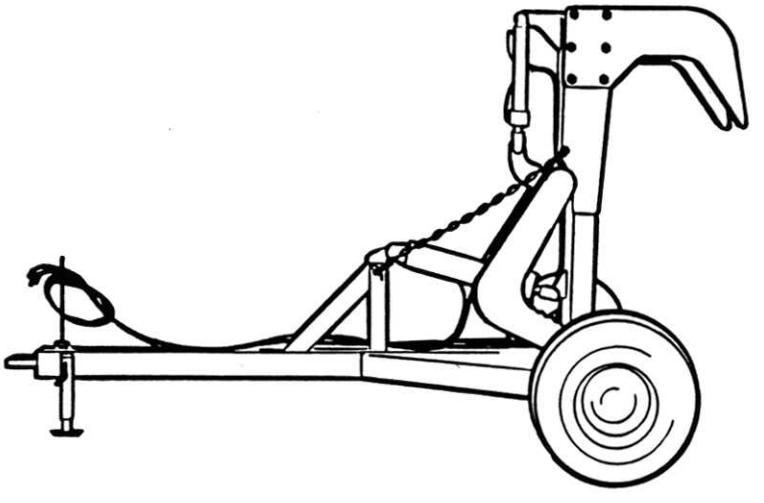
Degelman

"BEST IN THE FIELD - - - -WHERE IT COUNTS"

ROCK DIGGER RD320



OPERATOR'S and PARTS MANUAL

142384

SEPT 90

farm implements

DEGELMAN
ROCK DIGGER
MODEL RD 320

W A R R A N T Y

Degelman Industries Ltd. warrants its products to the original owner for a period of one (1) year from date of purchase. All matters related with the warranty of our products must be handled through the authorized selling dealer. Warranty does not cover normal wear of the machine components or damages caused by lack of maintenance or misuses, and is subject to the following provisions:

REPLACEMENT PARTS:

Will be warranted for a period of ninety (90) days.

WARRANTY ON MACHINES USED FOR CUSTOM WORK, RENTALS OR INDUSTRIAL USE:

Will be warranted as stated above, with the exception that is shall be for a period of ninety (90) days only.

TIRES:

Will be adjusted for warranty by the tire manufacturer.

LABOUR:

Any labour subject to warranty must be authorized by a Degelman representative before work is started. Warranty labour allowance and rates will be handled according to established service warranty policy.

GOVERNMENT LEGISLATION:

Warranty terms and conditions are subject to Provincial or State Legislation.

MODIFICATIONS:

Warranty will be void if any component is altered or modified, unless written authorization is granted by Degelman Industries Ltd.

WARRANTY on ATTACHED EQUIPMENT:

No responsibility will be assumed for whatever damages may occur to equipment attached to this Degelman product.

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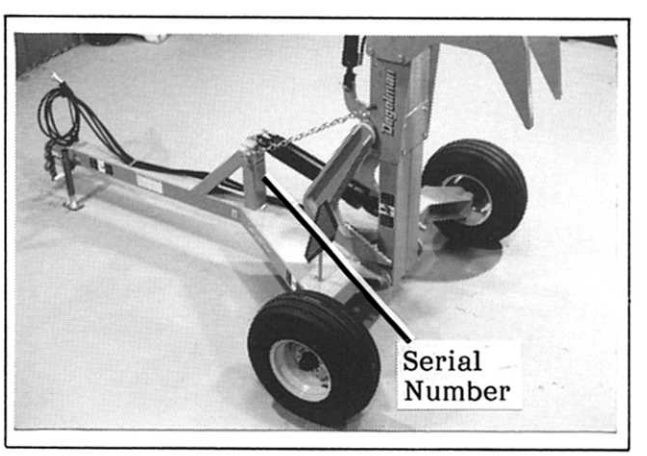
SERIAL NUMBER LOCATION

Always give your dealer the serial number of your machine when ordering parts or requesting service or other information.

The serial number plate is located where indicated. Please mark the number in the space provided for easy reference.



Model Type _____

Serial Number _____

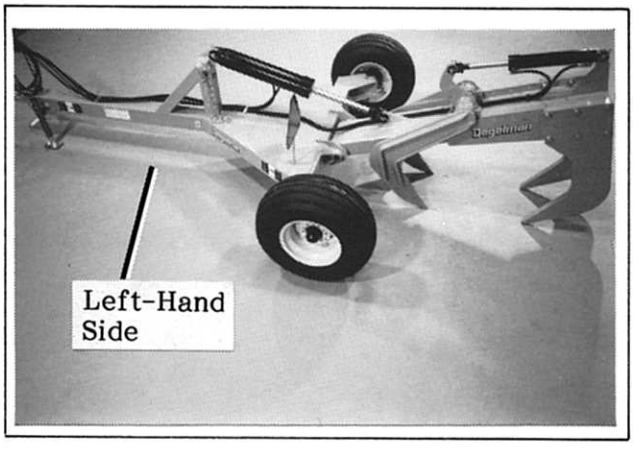
1 INTRODUCTION

Congratulations on your choice of a Degelman Rock Digger to complement your farming operation. It has been designed and manufactured to meet the needs of a discerning Agricultural market for the efficient removal of large buried rocks.

Use this manual as your first source of information about this machine. If you follow the instructions given in this manual, your machine will work well for many years.

Safe, efficient and trouble free operation of your Degelman Rock Digger requires that you and anyone else who will be operating or maintaining the machine, read and understand the Safety, Operation, Maintenance and Trouble Shooting information contained within the Operator's Manual.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Degelman Dealer if you need assistance, information or additional copies of the manual.



OPERATOR ORIENTATION - The directions left, right, front and rear, as mentioned throughout the manual , are as seen from the tractor driver's seat and facing in the direction of travel.

SAFETY ALERT SYMBOL

This Safety Alert symbol means: **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

The Safety Alert symbol identifies important safety messages on the machine and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 BIG REASONS!

- Accidents Disable and Kill **- Accidents Cost** **-Accidents Can Be Avoided**

SIGNAL WORDS:

Note the use of the signal words **DANGER, WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guidelines.

DANGER: An immediate and specific hazard which WILL result in severe personal injury or death if the proper precautions are not taken.

WARNING: A specific hazard or unsafe practice which COULD result in severe personal injury or death if proper precautions are not taken.

CAUTION: Unsafe practices which could result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

SAFETY

YOU are responsible for the SAFE operation and maintenance of your Degelman Rock Digger. YOU must ensure that you and anyone else who is going to operate, maintain or work around the machine be familiar with the operating and maintenance procedures and related SAFETY information contained in this manual. This manual will take you step-by-step through your working day and will alert you to all good safety practices that should be adhered to while operating this equipment.

Remember, YOU are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that EVERY-ONE operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Rock Digger owners must give operating instructions to operators or employees before allowing them to operate the unit, and at least annually thereafter per OSHA regulation 1928.57.

- The most important safety device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. All accidents can be avoided.

- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.

- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.

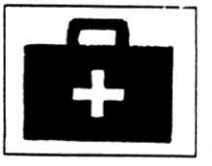
- Think SAFETY! Work SAFELY!

2.1 GENERAL SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining or adjusting the Digger.

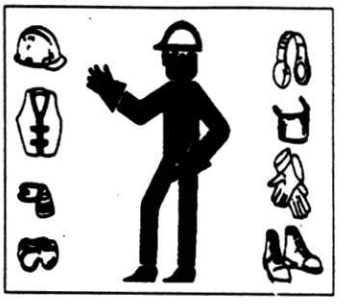
2. Install and properly secure all shields and guards before operating.

3. Have a first-aid kit available for use should the need arise and know how to use it.



4. Have a fire extinguisher available for use should the need arise and know how to use it.

5. Wear appropriate protective gear. This list includes but is not limited to:
- a hard hat
- protective shoes with slip resistant soles
- protective glasses or goggles
- heavy gloves
- wet weather gear
- hearing protection
- respirator or filter mask



6. Clear the area of people, especially small children, and remove foreign objects from the machine before starting and operating.

7. Do not allow riders.

8. Lower rear arm and hook arm to ground, stop tractor engine, place all controls in neutral, set park brake and remove ignition key before servicing, adjusting or repairing.

9. Review safety related items with all operators annually.

2.2 OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before using.

2. Lower rear arm and hook arm to ground, stop tractor engine, place all controls in neutral, set park brake and remove ignition key before servicing, adjusting or repairing.

3. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.

4. Do not allow riders on the machine or tractor during operation or transporting.

5. Clear the area of all bystanders, especially children, before starting.

6. Do not operate machine on steep side hills or slopes.

7. Be careful when working around or maintaining a high-pressure hydraulic system. Ensure all components are tight and in good repair before starting.

8. Clean all reflectors, lights and the SMV sign before transporting on a highway or public road. Be sure to check with local highway authorities and comply with their lighting requirements.

9. Stay well back from machine when operating. Keep others away.

2.3 MAINTENANCE SAFETY

1. Review the Operator's Manual and all safety items before working with, maintaining or operating the machine.

2. Lower rear arm and hook arm to ground, stop the tractor engine, place all controls in neutral, set park brake and remove ignition key before servicing, adjusting or repairing.

3. Keep hands, feet, clothing and hair away from all moving and/or rotating parts.

4. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making adjustments.

5. Place safety stands or large blocks under the frame before removing tires or working beneath the machine.

6. Be careful when working around or maintaining a high-pressure hydraulic system. Wear proper eye and hand protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop when searching for a pin hole leak in a hose or a fitting.

7. Always relieve pressure before disconnecting or working on hydraulic system.

2.4 HYDRAULIC SAFETY

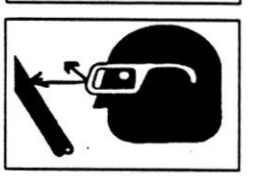
1. Always place all tractor hydraulic controls in neutral before dismounting.

2. Make sure that all components in the hydraulic system are kept in good condition and are clean.

3. Replace any worn, cut, abraded, flattened or crimped hoses and metal lines.

4. Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cement. The hydraulic system operates under extremely high pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

5. Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.



6. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.

7. Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are not damaged.

- Think SAFETY! Work SAFELY!

2.5 TRANSPORT SAFETY

1. Read and understand ALL the information in the Operator's Manual regarding procedures and SAFETY when operating the machine in the field/yard or on the road.

2. Check with local authorities regarding machine transport on public roads. Obey all applicable laws and regulations.

3. Always travel at a safe speed. Use caution when making corners or meeting traffic.

4. Make sure the SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.

5. Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the shoulder, if permitted by law.

6. Always use hazard warning flashers on tractor when transporting, unless prohibited by law.

7. Always use a pin with provisions for a mechanical retainer and a safety chain when attaching to a tractor or towing vehicle.

8. Locate the transport lock-up chain in position before moving on a public road.

2.6 STORAGE SAFETY

1. Store unit in an area away from human activity.

2. Store implement only with rear arm and hook arm lowered to ground.

3. Do not permit children to play around the stored unit.

2.7 TIRE SAFETY

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce a blow out which may result in serious injury or death.

2. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.

3. Have a qualified tire dealer or repair serviceman perform required tire maintenance.

2.8 SAFETY DECALS

1. Keep safety decals and signs clean and legible at all times.

2. Replace safety decals and signs that are missing or have become illegible.

3. Replaced parts that displayed a safety sign should also display the current sign.

4. Safety decals or signs are available from your Dealer Parts Department. Safety decals will be available free of charge upon request.

How to Install Safety Decals:

- Be sure that the installation area is clean and dry.

- Decide on the exact position before you remove the backing paper.

- Remove the smallest portion of the split backing paper.

- Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.

- Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.

- Small air pockets can be pierced with a pin and smoothed out using the piece of decal backing paper.

2.9 SIGN-OFF FORM

Degelman follows the general Safety Standards specified by the American Society of Agricultural Engineers (ASAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining this machine must read and clearly understand ALL Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Annually review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all your equipment. We feel that an untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the safe operation of the equipment.

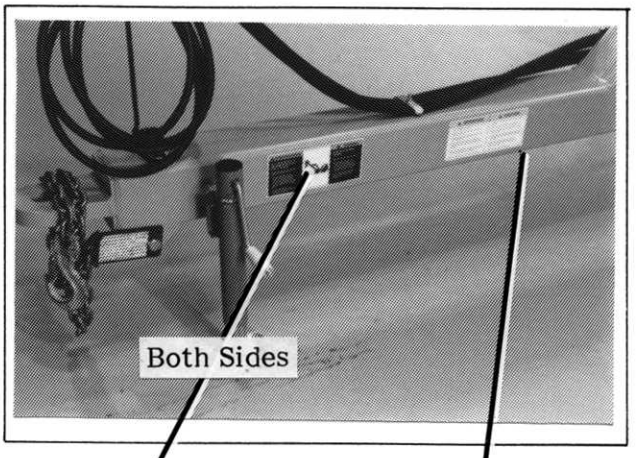
SIGN-OFF FORM

DATE	EMPLOYEE'S SIGNATURE	EMPLOYER'S SIGNATURE

3 SAFETY DECAL LOCATIONS

The types of decals and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize yourself with the various Safety Decals, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!

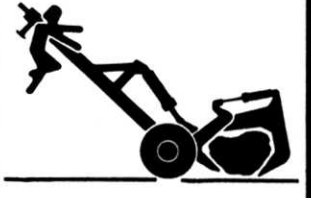


⚠ AVERTISSEMENT

IL Y A RISQUE QUE LA MACHINE SE SOULÈVE DANS LES AIRS.

Ce qui peut causer des blessures graves, ou même la mort.

- Il ne faut pas détacher la machine de la remorque sans avoir, au préalable, baisser le bras arrière jusqu' à terre, ou lever complètement la chaine de verrouillage (sur un terrain plat).
- Il ne faut pas détacher la machine du tracteur lorsqu' on transporte des pierres.



⚠ WARNING

UPENDING MACHINE HAZARD

Can cause serious injury or death.

- Do not detach machine from towing vehicle unless rear arm is either lowered to ground or fully raised with lock up chain installed, on a level surface.
- Do not detach machine from tractor when rock is held in transport.

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⚠ ATTENTION

1. Lire et comprendre le manuel de l'opérateur avant de mettre la machine en marche.
2. Utiliser la cheville d'attache avec un dispositif de blocage mécanique.
3. Eloigner tout spectateur, spécialement les enfants, avant le démarrage.
4. Baisser la machine au sol, arrêter le moteur du tracteur, fixer le frein de stationnement et enlever la clef de contact avant de faire le service ou toute réparation.
5. Enlever la pression avant de "travailler"sur le système hydraulique. Il faut toujours utiliser une pièce de bois ou un carton pour chercher les "fuites".
6. Reviser annuellement les instructions de sécurité.

⚠ CAUTION

1. Read and understand the Operator's Manual before operating.
2. Use hitch pin with a mechanical locking device.
3. Clear area of bystanders, especially small children, before starting.
4. Lower machine to ground, stop tractor engine, set park brake and remove ignition key before servicing or repairing.
5. Relieve pressure before working on hydraulic system. Use a piece of wood or cardboard when searching for leaks.
6. Review safety instructions annually.

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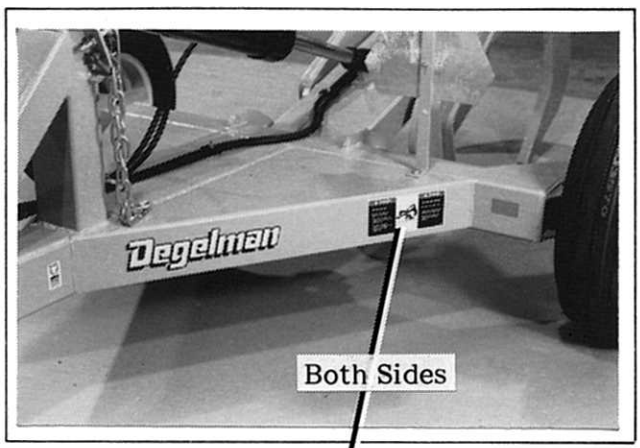
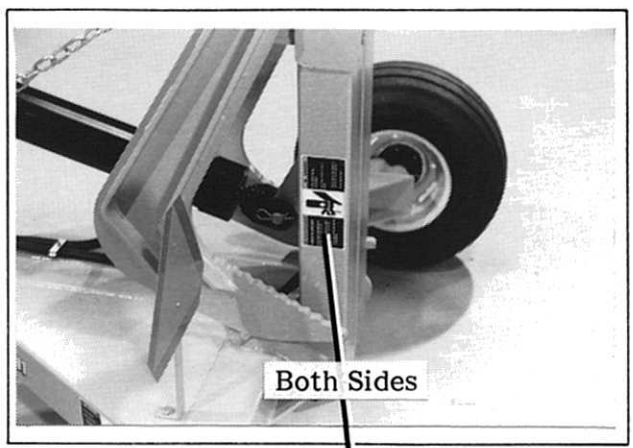
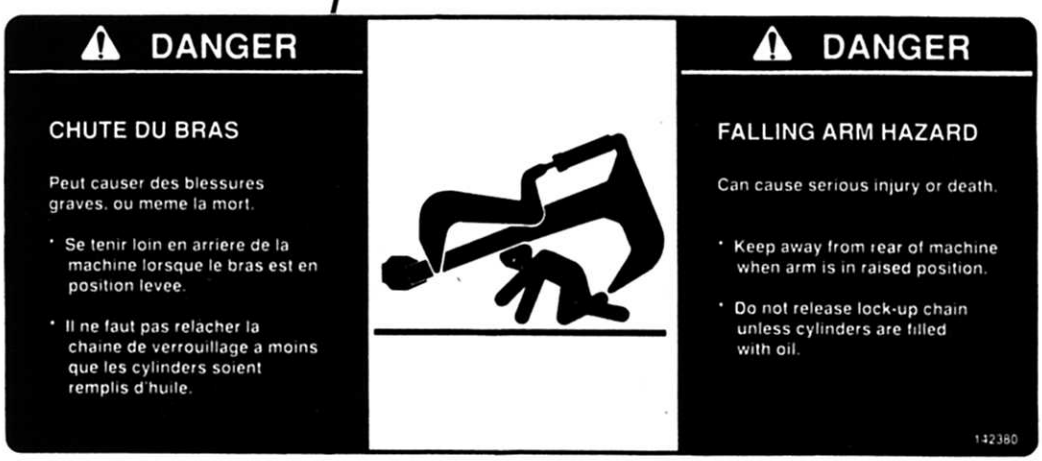
REMEMBER - If Safety Decals have been damaged, removed, become illegible or parts replaced without decals, new decals must be applied. New decals are available from your authorized dealer free of charge.

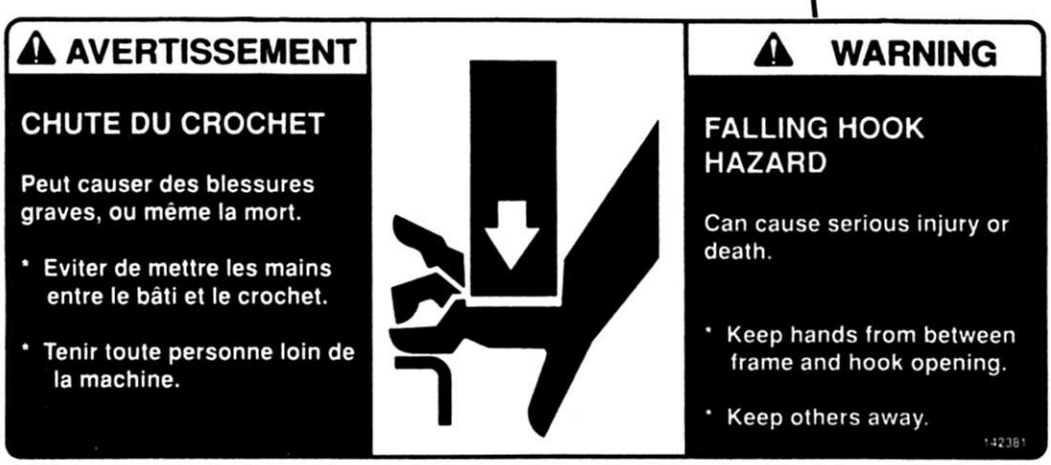
The types of decals and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize yourself with the various Safety Decals, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!









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4 OPERATION

⚠ OPERATING SAFETY

1. Read and understand the Operator's Manual before starting.

2. Lower rear arm and hook arm to ground, stop engine, place all controls in neutral, set park brake and remove ignition key before servicing, adjusting or repairing.

3. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.

4. Do not allow riders.

5. Clear the area of bystanders, especially small children.

5. Stay well back from machine when operating. Keep others away.

4.1 TO THE NEW OPERATOR OR OWNER

The Degelman Rock Digger is designed to efficiently dig out large buried rock and debris from fields. Many of the features incorporated into this machine are the results of suggestions made by customers like you.

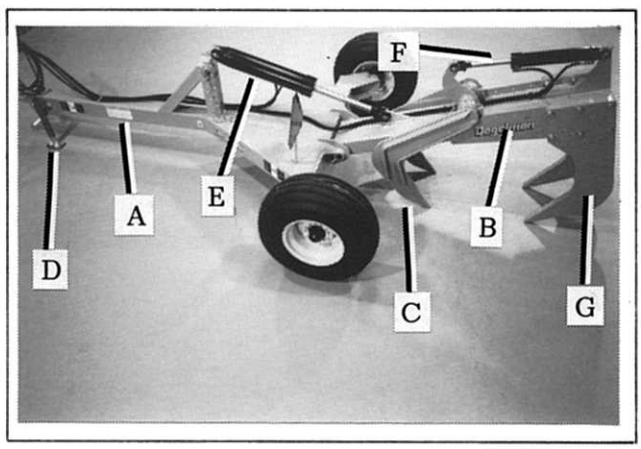
It is the owner's or operator's responsibility to read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum efficiency. Safety is everyone business. By following safe operating practices, a safe environment is provided for the operator and bystanders.

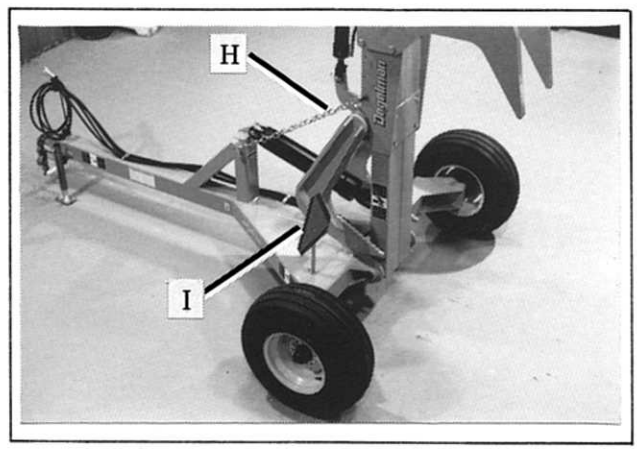
The manual will take you step-by-step through your working day. By following the operating instructions in conjunction with a good maintenance program your machine will provide many years of trouble-free service.

4.2 PRINCIPLES of OPERATION

The Rock Digger consists of a hitch pole/frame unit, a rear arm/tooth assembly, a hooking arm frame and two tires.

The rear frame/tooth assembly is designed to do the bulk of the rock removal while the hooking arm is designed to cradle the rock for transporting the obstacle.





A Pole/Frame Assembly

B Rear Arm

C Hook Arm

D Jack

E Rear Arm Cylinder

F Hook Arm Cylinder

G Tooth

H Lock-up Chain

I SMV Sign

4.3 BREAK-IN

Although there are no operational restrictions on the Rock Digger when it is new, there are some mechanical checks that must be done to ensure the long term integrity of the unit. When using the machine for the first time, follow this procedure:

A. Before using:

1. Read Operator's Manual.
2. Lubricate both wheel bearings.
3. Check all bolt tightness.

B. After operating for 2 hours:

1. Retorque wheel bolts.
2. Check all hardware tightness.
3. Check all hydraulic system connections. Tighten if any are leaking.

C. After operating 10 hours:

1. Repeat Step B.
2. Go to the service schedule as outlined in the Maintenance Section.

4.4 PRE-OPERATION CHECKLIST

Efficient and safe operation of the Rock Digger requires that each operator reads and understands the operating procedures and all related safety procedures outlined in this manual. A pre-operational check list is provided for the operator. It is important for both personal safety and maintaining the good mechanical condition of the machine that this checklist be followed.

WARNING

DO NOT disconnect the lock-up chain until the Rock Digger has been hitched up to a tractor, hydraulic hoses connected and the hydraulic system pressurized.

Failure to heed this warning can result in unexpected dropping of teeth along with rapid upending of the machine due to an air pocket or lack of oil in the cylinders.

Before operating the machine and each time thereafter, the following areas should be checked off:

1. Lubricate the machine per the schedule outlined in the "Maintenance Section".

2. Use only a tractor of adequate power (100 hp minimum) and weight to handle the Digger.

3. Ensure that the machine is properly attached to the tractor using a drawbar pin with provisions for a mechanical retainer. Make sure that a retainer such as a Klik pin is installed.

NOTE: It is important to pin the draw bar in the central location only.

4. Ensure that a safety chain on the hitch is installed.

5. Check the oil level in the tractor hydraulic reservoir. Top up as required.

6. Inspect all hydraulic lines, hoses, fittings and couplers for tightness. Tighten if there are leaks. Use a clean cloth to wipe any accummulated dirt from the couplers before connecting to the tractor's hydraulic system.

7. Check the tires and ensure that they are inflated to the specified pressure: 36 psi (250 kPa).

4.5 EQUIPMENT PREPARATION

4.5.1 TRACTOR PREPARATION

Follow this procedure when selecting and preparing a tractor for use with this machine:

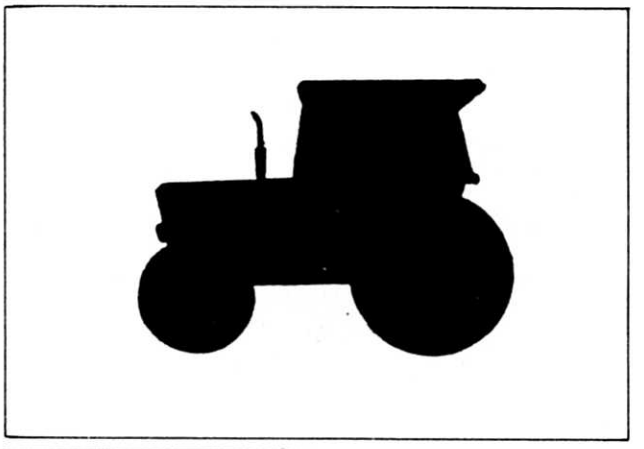
1. Use only a tractor of sufficient power and weight to adequately handle the machine. It is recommended that the tractor have at least 100 PTO horsepower for normal operating conditions.

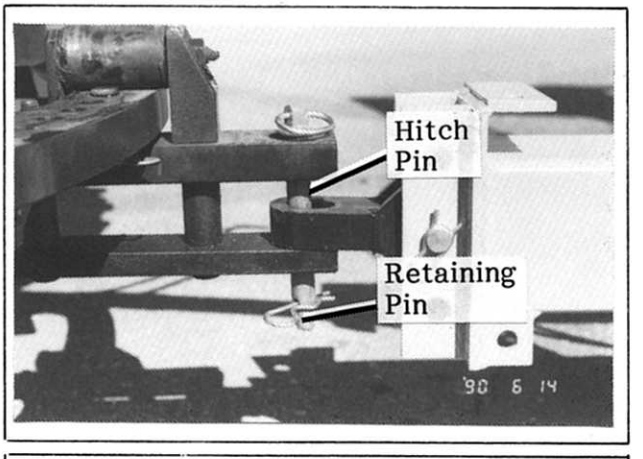
2. Locate the drawbar in its center position to prevent it from swinging.

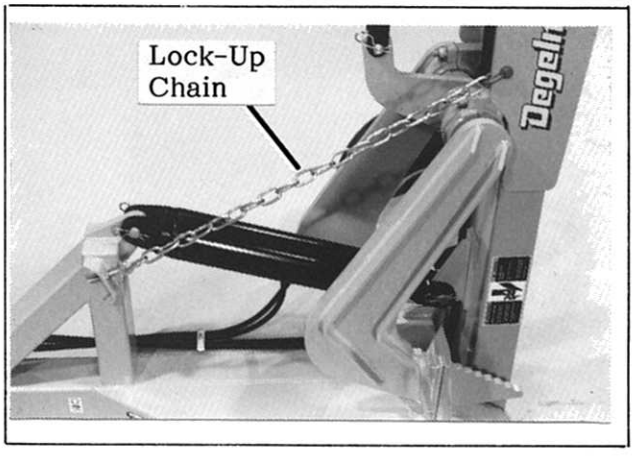
3. Use only a drawbar pin with provisions for a mechanical retainer such as a Klik pin. Always install the retainer.

4. Check that adequate hydraulic fluid is in tractor resevoir and top up if necessary.

5. Check for any oil leaks.







4.5.2 IMPLEMENT PRE-OPERATIONAL WARNING

WARNING

DO NOT disconnect the lock-up chain until the Rock Digger has been hitched up to a tractor, hydraulic hoses connected and the hydraulic system pressurized.

Failure to heed this warning can result in unexpected dropping of teeth along with rapid upending of the machine due to an air pocket or lack of oil in the cylinders.

4.6 ATTACHING/UNHOOKING

The Rock Digger should always be parked on a level, dry area that is free of debris and foreign objects. Follow this procedure when attaching:

1. Clear the area of bystanders and remove foreign objects from the machine and working area.

2. Make sure there is enough room to back the tractor up to the hitch pole.

3. Start the tractor and slowly back it up to the hitch point.

4. Stop the tractor engine, place all controls in neutral, set park brake and remove ignition key before dismounting.

5. Use the hitch pole jack to raise or lower the pole to align with the drawbar.

6. Install a drawbar pin with provisions for a mechanical retainer such as a Klik pin. Install the retainer.

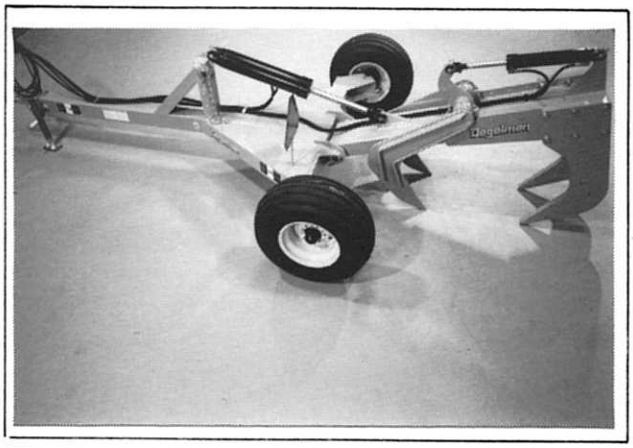
7. Install a safety chain between the tractor drawbar and the hitch pole.

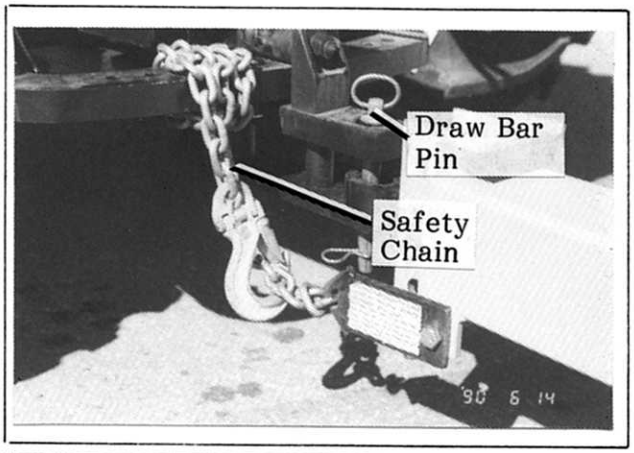
8. Connect the hydraulics. To connect, proceed as follows:

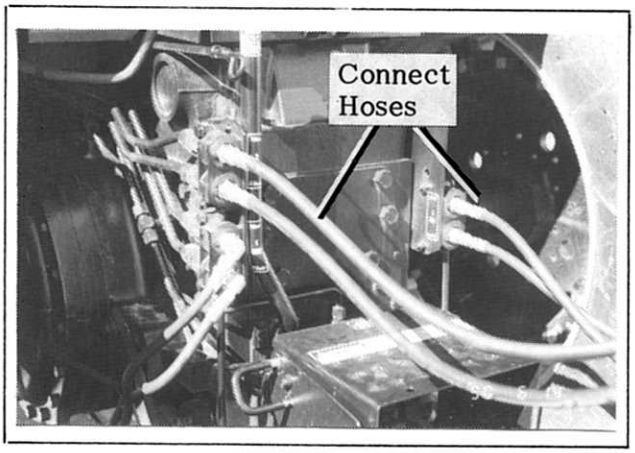
   a. Use a clean cloth or paper towel to clean the couplers on the ends of the hoses. Also clean the area around the couplers on the tractor.
   b. Remove the plastic plugs from the couplers and insert the male ends. Be sure to match the pressure and return line to one valve bank.

9. Raise the hitch jack and rotate it 90° to place in its stowed position.

10. When unhooking from the tractor, reverse the above procedure.





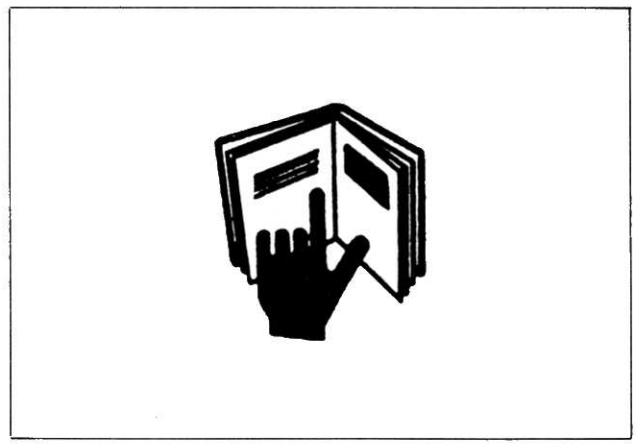


WARNING

Never unhook the Rock Digger from tractor when rock is being held in raised position. Machine will upend.

1. **Operator's Responsibility:**

Every operator should read this manual and be instructed in safe operating procedures. An untrained operator is not qualified to operate this machine and could place themselves or bystanders in danger.



2. **Bleeding the Hydraulics:**

Before beginning operation, bleed the hydraulic system to remove any air.

To do this, cycle the hydraulics several times by holding the cylinder fully extended for several seconds. This will cause any trapped air to be purged from cylinder.

WARNING

Stay clear of the machine and surrounding area when performing this operation. Keep others away.

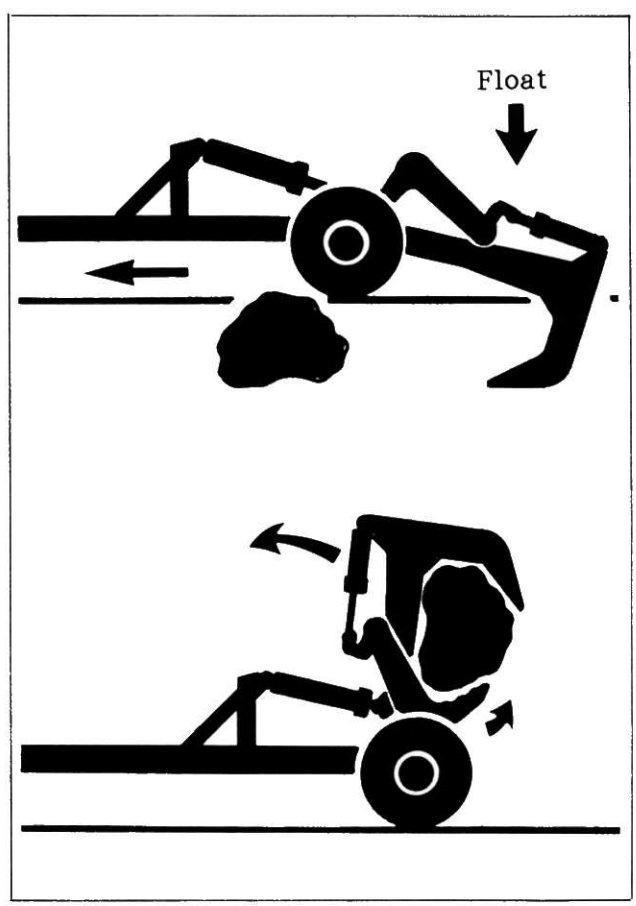
3. **Methods of Operation:**

Two basic methods of operating the Digger can be utilized.

The first method is to lower the rear teeth to ground level about 20-25 ft. (6-8m) from the rock to be removed. Place the rear teeth hydraulics into "float position". By slowly driving the tractor ahead the teeth will automatically penetrate the ground as the rock is approached.

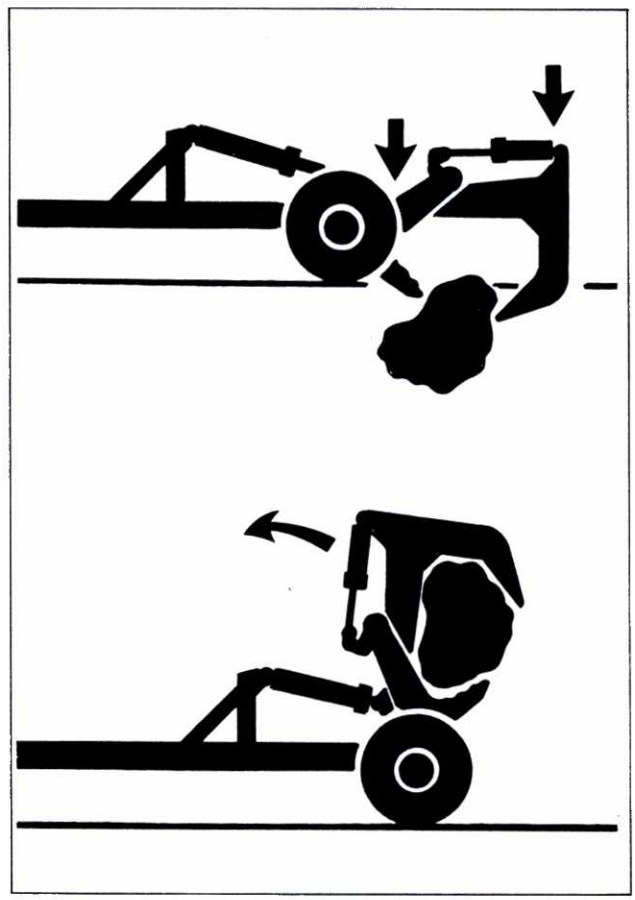
When contact is made, continue forward speed which will roll the rock up and out of the ground.

To remove the rock, activate the hook arm hydraulics to cradle the rock securely, then raise the rear arm fully. Finally tow rock to desired dumping site.



The second method disturbs less soil but requires working both hydraulic circuits simultaneously in an attempt to grab the rock between the rear teeth and the hook arm.

Drive the digger teeth over the rock and lower the teeth at the edge of the obstacle. Rock the tractor ahead slightly to set the teeth under the rock. Next, lower the hook arm to also grasp the rock and work both hydrualic circuits until the obstruction can be pulled out of the ground. Finally raise up the rear frame and tow rock to the desired dumping site.



4. **Unloading:**

WARNING

Stay clear of the machine and surrounding area when unloading. Keep others away.

Back up to the dumping site. Lower the rear arm to approximately 30-45° and release the hook arm hydraulics to allow the rock to roll out.

⚠ TRANSPORT SAFETY

1. Use only a drawbar pin with a mechanical retainer.

2. Always install the safety chain between the drawbar and hitch pole.

3. Clean the SMV sign, lights and reflectors before starting.

4. Always use hazard flashing lights on tractor.

5. Secure the lock-up chain.

6. Travel at a safe speed. Use care when making corners or meeting traffic.

Follow this procedure when preparing to transport:

1. Clear the area of bystanders, especially small children, before converting into transport configuration.

2. Retract both hydraulic cylinders fully.

3. Position the lock-up chain into the position shown and secure with the pin and hair pin combination.

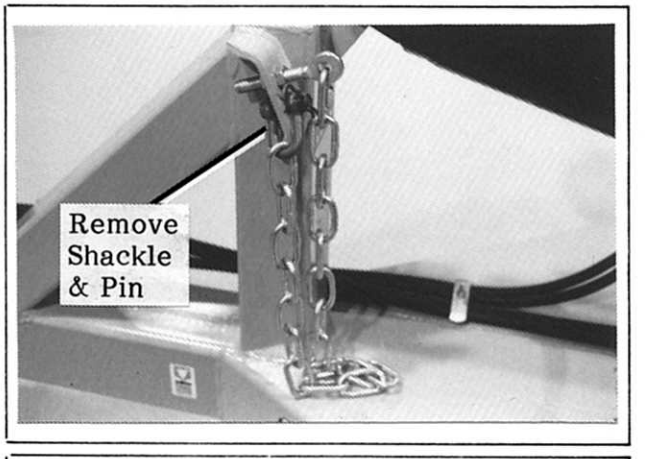
4. Swing hitch pole jack up and secure with chained pin.

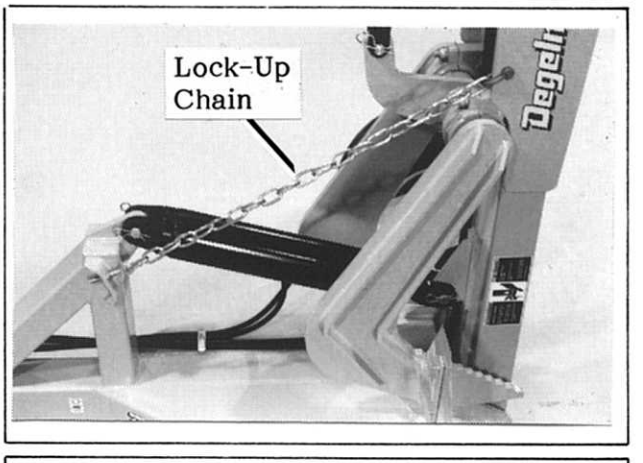
5. Clean the SMV sign, lights and reflectors.

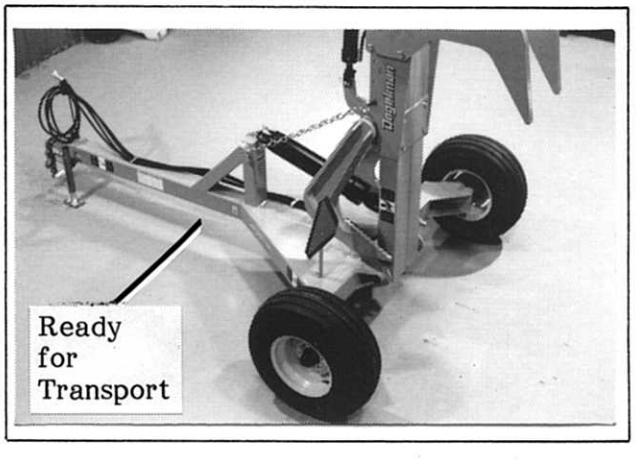
6. Maintain a safe speed. Slow down when cornering and on rough roads.

7. Slow down and pull off to the side of the road when meeting other traffic.

8. Use hazard flashers on tractor unless prohibited by law.







⚠ STORAGE SAFETY

1. Store in an area away from human activity.

2. Do not allow children to play on or around the stored unit.

After the season's use, completely inspect all major systems of the machine. Repair or replace any worn or damaged components to prevent unnecessary down time at the beginning of next season.

Since the unit can be used in extremely adverse conditions during the season, the machine should be carefully prepared for storage to ensure that all dirt, mud, debris and moisture has been removed.

Follow this procedure when preparing to store:

1. Wash the entire machine thoroughly using a water hose or pressure washer to remove all dirt, mud, debris or residue.

2. Inspect all parts to see if anything has become entangled in them. Remove the entangled material.

3. Lubricate all grease fittings to remove any moisture in the bearings.

4. Inspect all hydraulic hoses, fittings, lines and couplers. Tighten any loose fittings. Replace any hose that is badly cut, nicked or abraded or is separating from the crimped end of the fitting.

5. Touch up all paint nicks and scratches to prevent rusting.

6. Oil the exposed rams on the hydraulic cylinder to prevent rusting.

7. Select an area that is dry, level and free of debris.

8. Follow the procedure given in Section 4.6 when unhooking.

5 SERVICE AND MAINTENANCE

MAINTENANCE SAFETY

1. Read Operator's Manual before servicing, or maintaining machine.

2. Lower rear arm and hook arm to ground, stop tractor engine, set park brake and remove ignition key before servicing, adjusting, repairing or maintaining.

3. Be careful when working around or maintaining a high pressure hydraulic system. Wear the proper eye and hand protection when searching for a leak. Use a piece of wood or cardboard as a backstop when searching for a pin hole leak in a hose or a fitting.

4. Place safety stands or large blocks under the frame before removing the tires or working beneath the machine.

5.1 SERVICE

5.1.1 LUBRICANTS

1. Grease: Use an SAE multi-purpose grease with extreme pressure (EP) performance. Also acceptable is an SAE multi-purpose lithium base grease.

2. Storing Lubricants: Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminents.

5.1.2 GREASING

Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.

1. Use only a hand-held grease gun for all greasing.

2. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt.

3. Replace and repair broken fittings immediately.

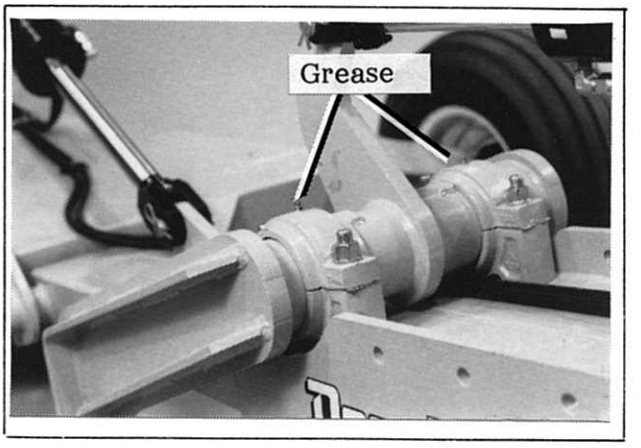
4. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

5. Inject grease until you see grease being expelled from the bearing or bushing areas.

5.1.3 SERVICING INTERVALS

25 Hours:

Grease the two locations shown.

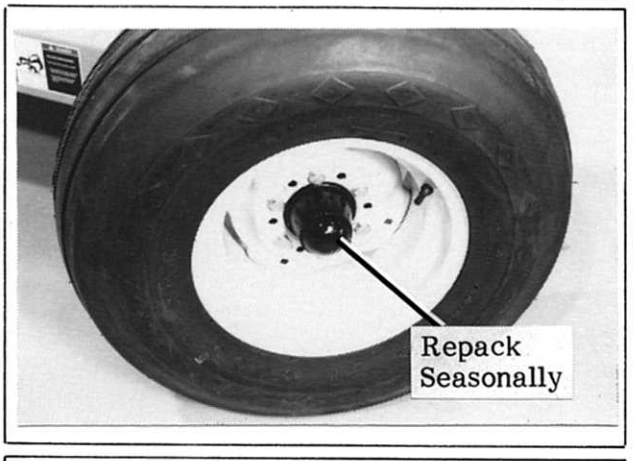


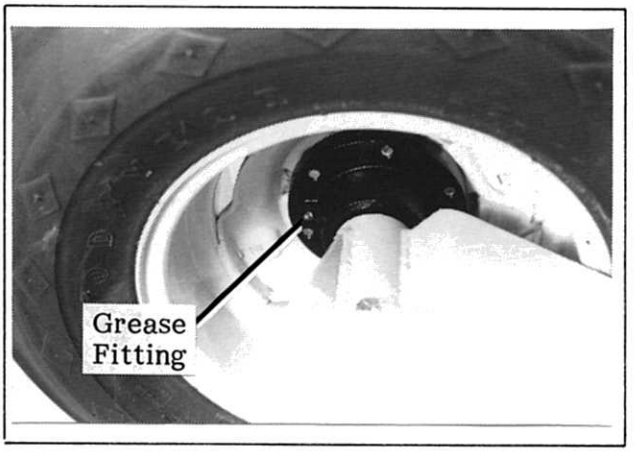
Annually:

Wheel Bearing Lubrication:

Repack wheel bearing seasonally with a good grade of bearing grease.

NOTE: Additional grease can also be pumped into the hub through the grease fitting shown.





5.1.4 SERVICE RECORD

See Lubrication and Maintenance sections for details of service. Copy this page to continue record.

ACTION CODE: ✓ **CHECK** **C CHANGE** **CL CLEAN**
L LUBRICATE **R REPLACE**

MAINTENANCE \ HOURS / SERVICED BY																	
8 HOURS:																	
✓ Hyd. fluid leaks/cut hoses																	
✓ Tire pressure 36 psi (250 kPa)																	
25 HOURS:																	
✓ Safety signs clean/legible																	
✓ Tooth wear																	
✓ Working points and pins																	
L Hook arm bearings																	
ANNUALLY:																	
L Wheel bearings (2)																	
✓ Pole jack condition																	
✓ Bolt tightness																	

5.2.1 LOCK-UP CHAIN

To set the correct tension on the lock-up chain, proceed as follows:

1. Fully retract the rear arm hydraulic cylinder.

WARNING

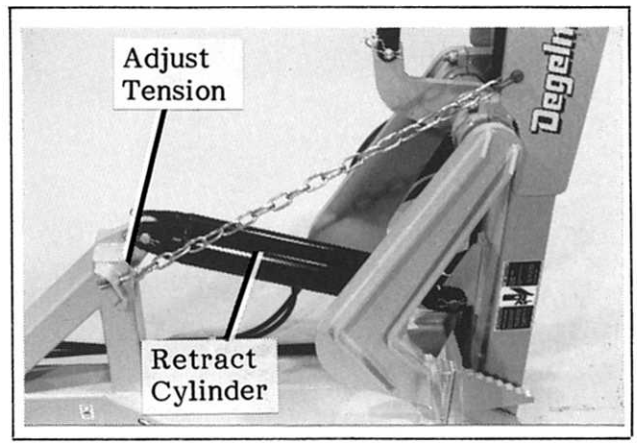
Stay clear of the machine and surrounding area when raising. Keep others away.

2. Loosen jam nut/eye bolt combination.

3. Attach chain to hole in rear arm.

4. Start tightening the chain by turning the lower jam nut on the chain until there is a slight amount of slack.

5. Secure this setting by tightening the top jam nut.



5.3.1 WHEEL HUB REPAIR

WARNING

Be sure to block up frame section before removing tires.

Disassembly:

1. Carefully pry off dust cap.

2. Remove cotter pin from nut.

3. Remove nut and washer.

4. Pull off spindle.

5. Dislodge the inner cone bearing and dust seal.

6. Inspect cups that are press fitted into hub for pits or corrosion and remove if necessary.

7. Inspect and replace defective parts with new ones.

Assembly:

1. If cups need replacing, be careful to install them gently and evenly into hub until they are fully seated.

2. Apply a thick wall of grease inside hub. Pack grease into cones.

3. Install dust seal as illustrated, and inner cone.

4. Position hub onto spindle and fill surrounding cavity with grease.

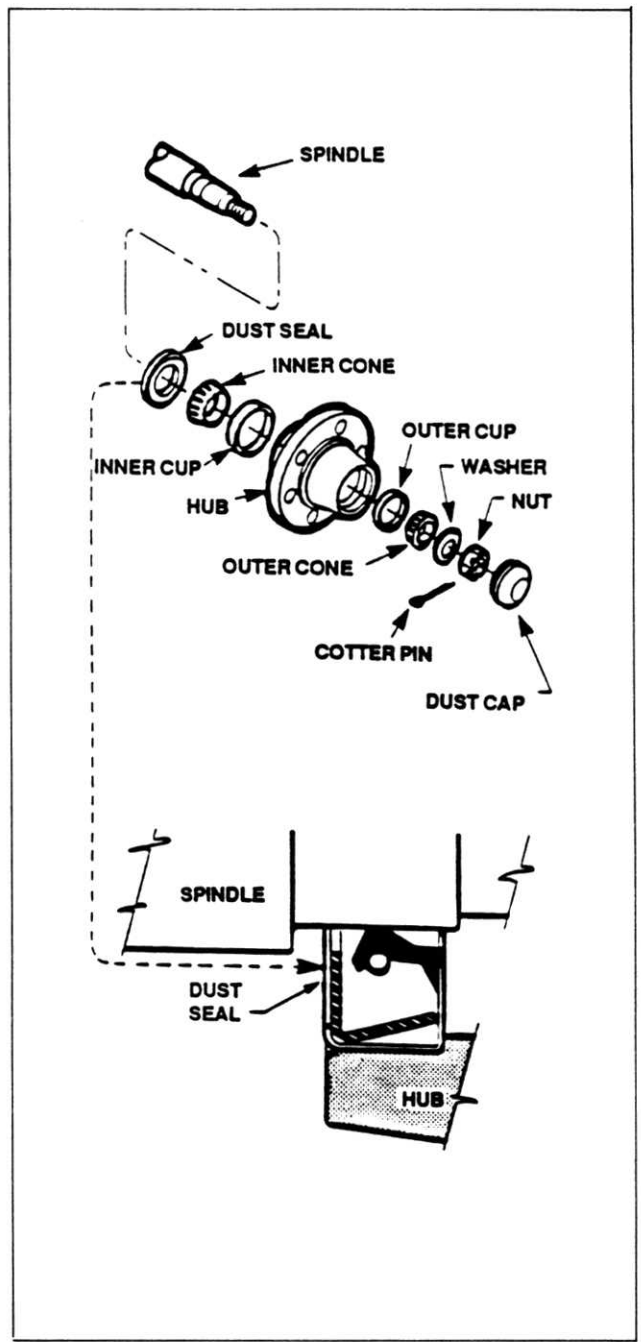
5. Assemble outer cone, washer and nut.

6. Tighten nut while rotating hub until there is a slight drag.

7. Turn nut back approximately 1/2 turn to align cotter pin hole with notches on nut.

8. Install cotter pin and bend legs sideways over nut.

9. Fill dust cap half full of grease and gently tap into position.



5.3.2 HYDRAULIC CYLINDER REPAIR

Complete seal kits and cylinder components are available when repair work becomes necessary due to excessive oil leakage or damage to various parts.

NOTE: Complete rebuilt cylinder may be available. Contact your dealer for further information.

Disassembly:

1. Loosen lock ring and turn off end cap.

2. Carefully remove piston, rod and cap combination.

3. Disassemble piston from rod by removing lock nut.

NOTE: **DO NOT** clamp rod by chromed surface.

4. Slide off end cap.

5. Remove seals and inspect all parts for damage.

6. Install new seals and replace damaged parts with new components.

Assembly:

1. Reinstall rod through end cap.

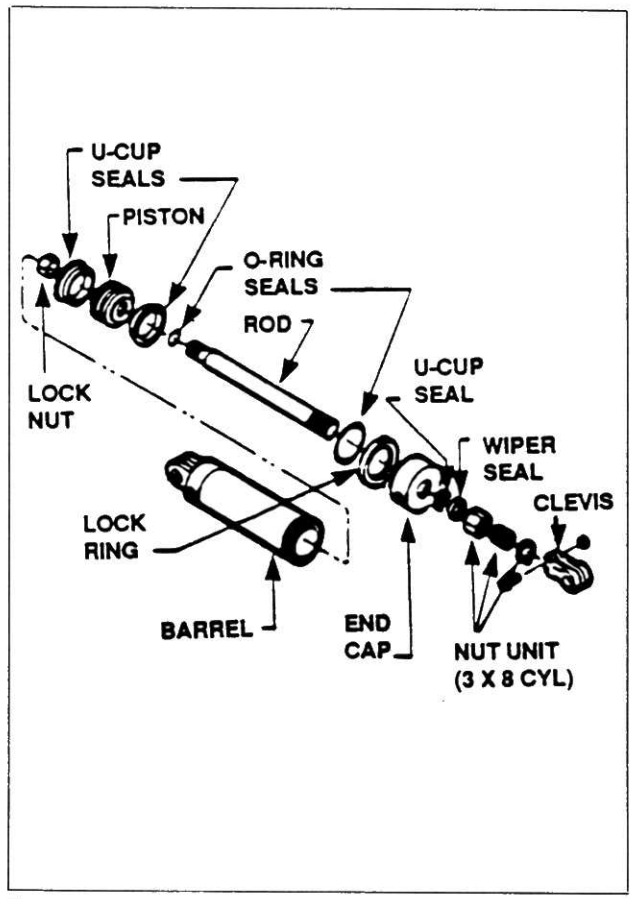
2. Secure piston to rod with lock nut. Torque to 225 ft. lbs.

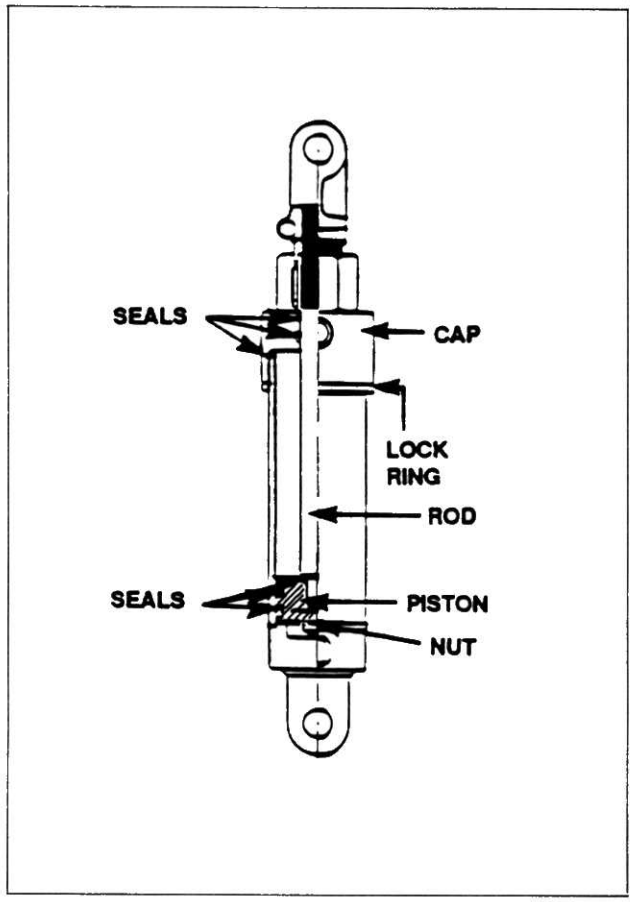
3. With cylinder body held gently in a vise, insert piston and rod combination using a slight rocking motion.

4. Thread lock ring fully onto barrel.

5. Turn end cap fully against lock ring then back off end cap to align ports.

6. Tighten lock ring against end cap using a drift punch and hammer.

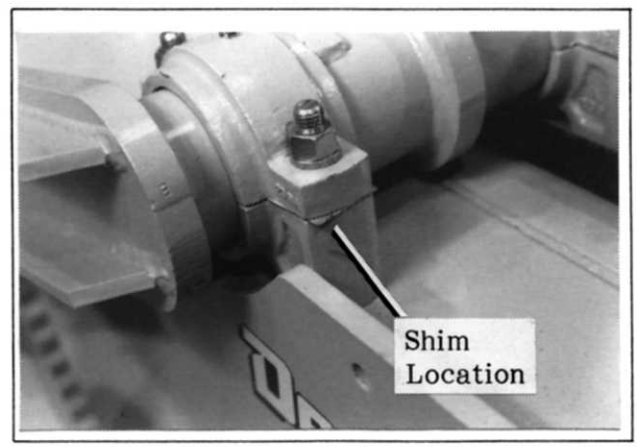




5.3.3 SPACER SHIM REMOVAL - ROCK-SHAFT

When execssive wear is apparent between the rockshaft and cast bearings, remove the spacer shims on both sets of bearings.

Loosen bolts and pull out slotted shims.



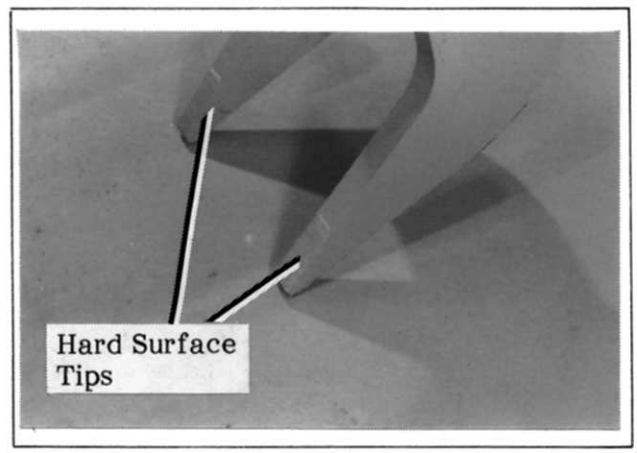
5.3.4 TOOTH REPAIR and HARD SUR-FACING

Hard surfacing should be done on a regular basis to prevent excess wear on teeth.

Build up worn portions of teeth to restore them to their original contour using a low hydrogen 7018 build up rod.

Resurface teeth (a double pass is recommended) using hard surface welding rods. A hardness of RC 45-50 is desirable.

NOTE: Special hard surfacing rod kits are available through Degelman Industries Ltd. or your local Degelman dealer.



6 TROUBLESHOOTING

In the following section, we have listed some of the problems, causes and solutions that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this troubleshooting section, please call your local dealer or distributor. Before you call, have this Operator's Manual and the serial number from your unit ready.

PROBLEM	CAUSE	SOLUTION
Hydraulics creeps down during operation.	Tractor hydraulic leak.	To verify raise both arms, disconnect at tractor and observe if arms creep down. If not, repair tractor hydraulics.
	Damaged hoses or fittings.	Search for leaks with a piece of paper (not by hand). Repair as necessary.
	Hydraulic cylinder leak.	Replace seals or damaged components.
Arms raise too slowly.	Low tractor pressure.	Check pressure (1500-2500 PSI) and service as necessary.
	Restriction in hoses.	Disconnect hoses and blow out lines.
	External leaks in hydraulic system.	Search for leaks with a piece of paper (not by hand). Repair as necessary.
Oil accummulation on hydraulic cylinder shaft.	Oil bypassing seals.	Seal manufacturer advises that small amounts of oil getting past seals is desirable. If problem becomes excessive, replace seals.
Tractor stalls.	Insufficient tractor horsepower.	100 hp recommended minimum.

7 SPECIFICATIONS

7.1 MECHANICAL

MODEL:
- Rock Digger RD320

TRACTOR REQUIREMENTS:
- 100 horsepower (75 kW) minimum
- Hydraulic pressure output 1500-2500 psi (10,300-17,300 kPa)

DIMENSIONS:
- Overall height (in transport) 7 ft. 6 in. (2.3m)
- Overall width (in transport) 8 ft. 4 in. (2.5m)
- Overall length (in transport) 13 ft. 6 in. (4.1m)
- Overall length (in operation) 17 ft. 2 in. (5.3m)
- Frame clearance 12 in. (305mm)
- Tooth clearance (in transport) 5 ft. 10 in. (1.8m)

FRAME CONSTRUCTION:
- .250 in. (6.4mm) wall hollow structural steel tubing and 3/16 in. (4.5mm) plate

MACHINE WEIGHT:
- 2400 lbs. (1090kg)

WHEEL/HUBS:
- Two 12.5 L x 15-8 ply tubeless type tires
- 6 bolt rim
- Heavy duty hubs - greaseable

PENETRATING TEETH:
- 32 in. (813mm)
- 2 in. (50mm) plate

HOOK ARM TRANSPORT TEETH:
- Dual serrated teeth
- Hydraulically activated
- 1 1/2 in. (38mm) plate

HYDRAULICS:
- Lift/dig cylinder - 5 x 24 in.
- Hook arm cylinder - 3 x 16 in.
- Hoses 3/8 in. (9.5mm) 2 wire braid construction
- JIC/ORB fittings
- Pressure relief valve on 5 x 24 in. cylinder circuit

SPECIFICATIONS AND DESIGN SUBJECT TO CHANGE WITHOUT NOTICE

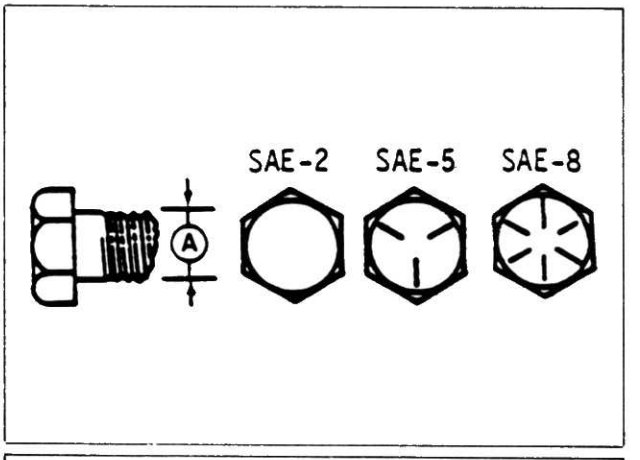
7.2 BOLT TORQUE

Checking Bolt Torque:

The tables given below give correct bolt torque for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

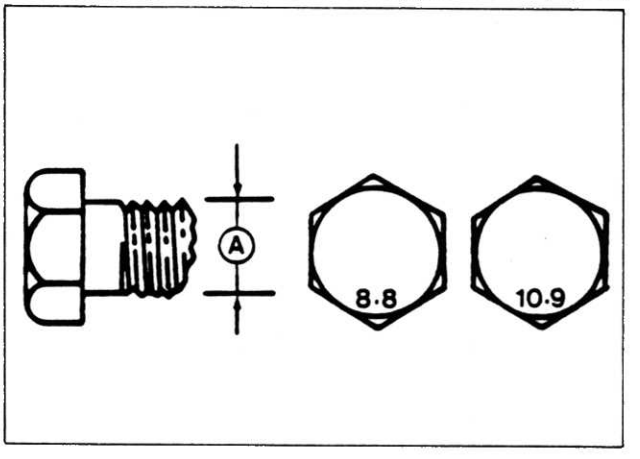
Imperial Torque Specifications:

BOLT DIAMETER A	BOLT TORQUE SAE 2 N.m (lb-ft)	SAE 5 N.m (lb-ft)	SAE 8 N.m (lb-ft)
1/4 in.	8 (6)	12 (9)	16 (12)
5/16 in.	13 (10)	24 (18)	34 (25)
3/8 in.	27 (20)	41 (30)	51 (45)
7/16 in.	41 (30)	63 (50)	95 (70)
1/2 in.	61 (45)	101 (75)	149 (110)
9/16 in.	95 (70)	150 (110)	210 (155)
5/8 in.	128 (95)	210 (155)	290 (215)
3/4 in.	225 (185)	365 (270)	520 (385)
7/8 in.	230 (170)	590 (435)	840 (620)
1 in.	345 (255)	895 (660)	1250 (930)



Metric Torque Specifications:

BOLT DIAMETER A	BOLT TORQUE 8.8 N.m	(lb-ft)	10.9 N.m	(lb-ft)
M3	0.5	(0.4)	1.8	(1.3)
M4	3	(2.2)	4.5	(3.3)
M5	6	(4)	9	(7)
M6	10	(7)	15	(11)
M8	25	(18)	35	(26)
M10	50	(37)	70	(52)
M12	90	(66)	125	(92)
M14	140	(103)	200	(148)
M15	225	(166)	310	(228)
M20	435	(321)	610	(450)
M24	750	(553)	1050	(774)



7.3 HYDRAULIC FITTING TORQUE

Tightening Flare Type Tube Fittings*:

1. Check flare and flare seat for defects that might cause leakage.

2. Align tube with fitting before tightening.

3. Lubricate connection and hand tighten swivel nut until snug.

4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

*The torque values shown are based on lubricated connections as in reassembly.

TUBE SIZE OD (in.)	NUT SIZE ACROSS FLATS (in.)	TORQUE VALUE*		RECOMMENDED TURNS to TIGHTEN (AFTER FINGER TIGHTENING)	
		(N.m)	(lb-ft)	(Flats)	(Turns)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

7.4 PUBLICATIONS

Additional copies of the manuals are available through your local dealer. If the dealer is unable to assist you, contact Degelman Industries Ltd. and order per Part No. below:

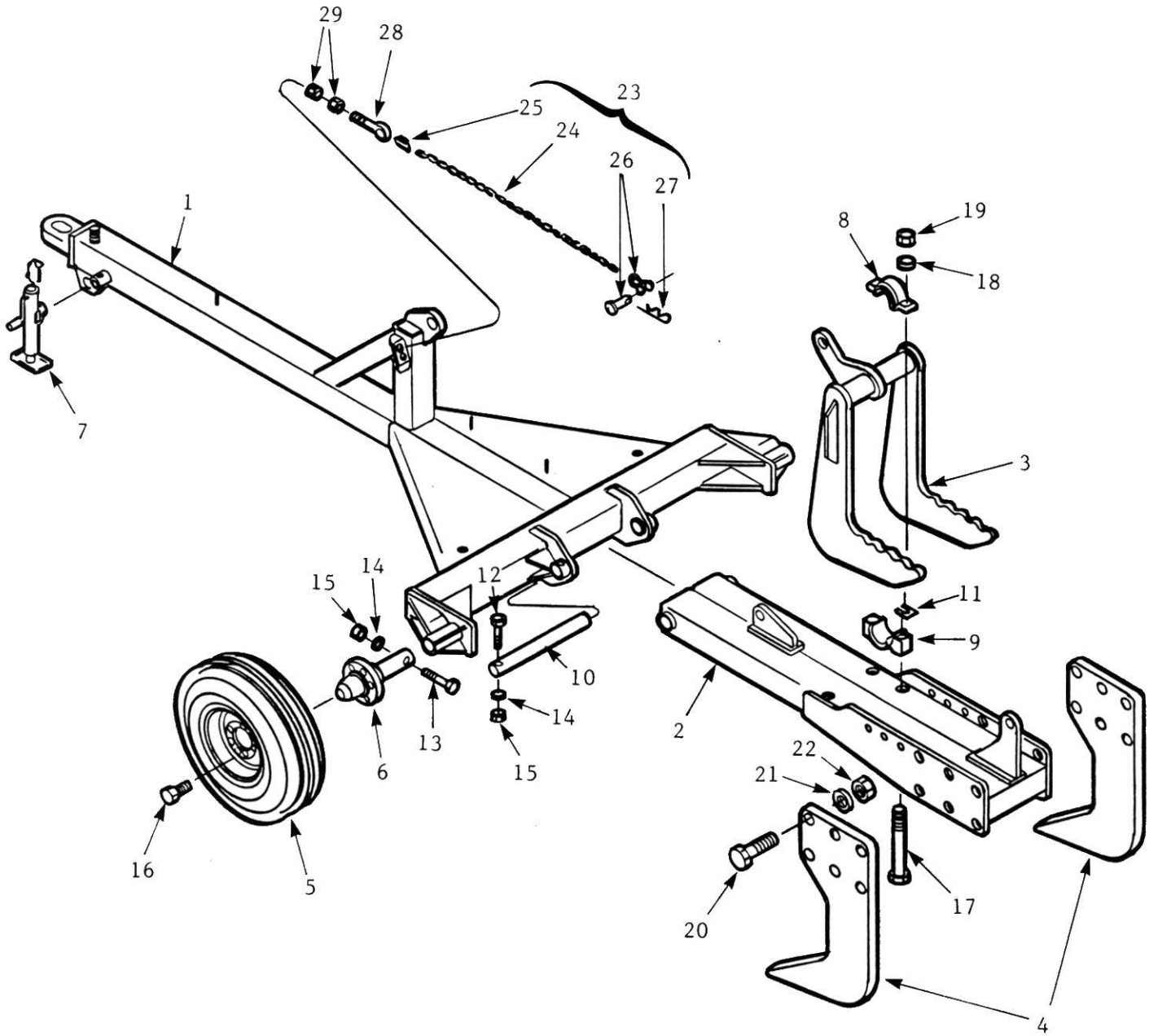
PART No.	DESCRIPTION
142384	Manual - Operator's/Parts
142385	Manual - Assembly

8 PARTS

8.1 ORDERING INFORMATION

When ordering replacement parts, be sure to include the machine model number and serial number along with the part number, description and quantity required.

8.2 PARTS TABLE OF CONTENTS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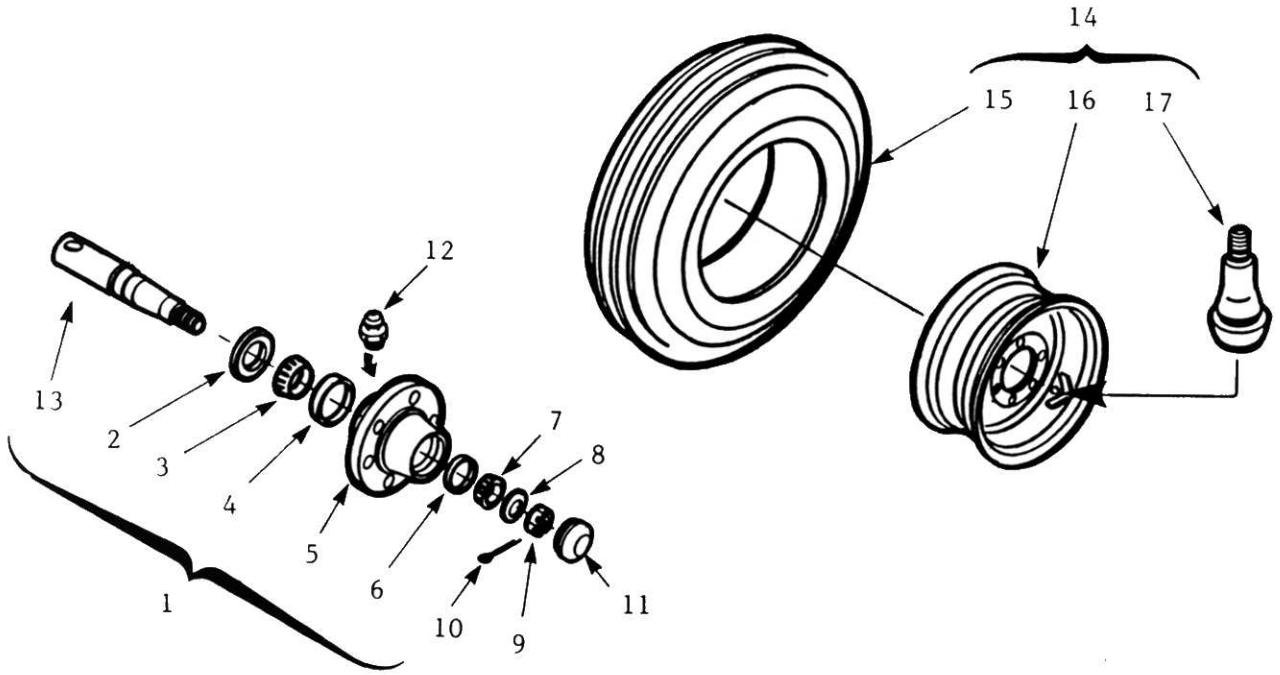
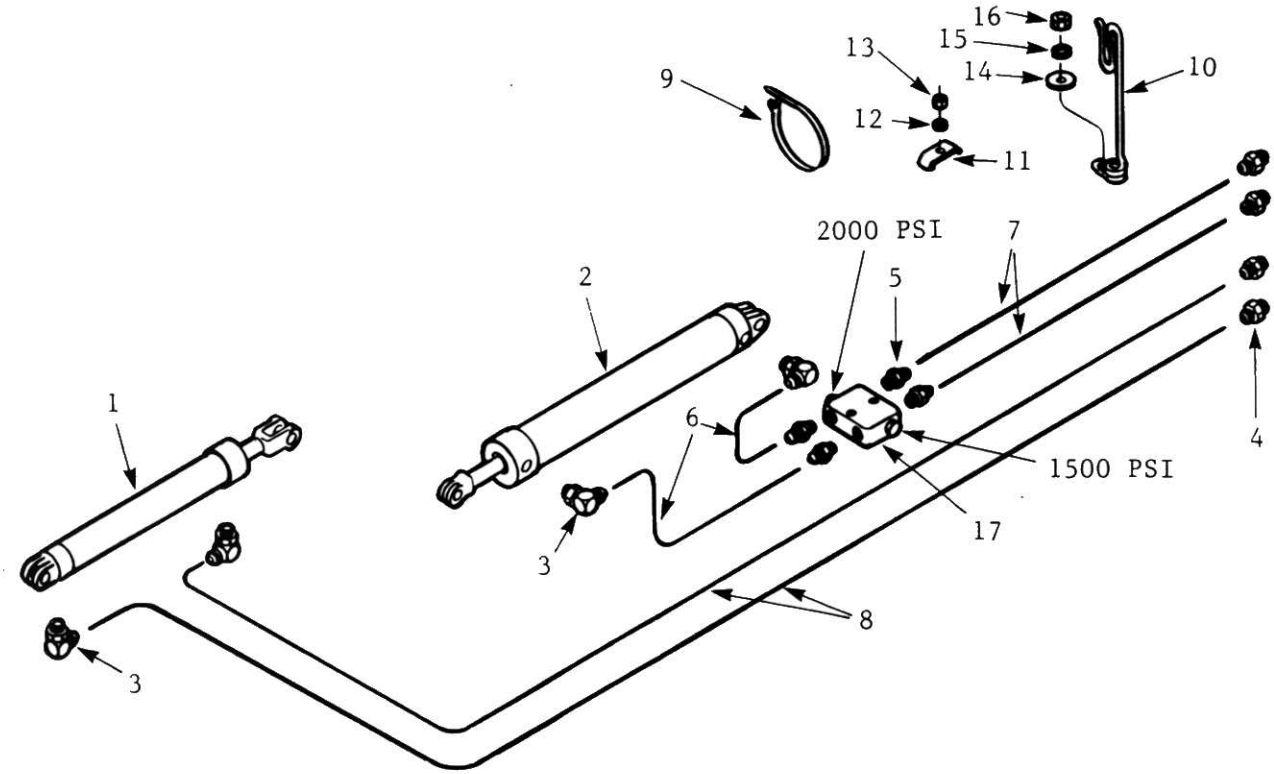
BASIC COMPONENTS

ITEM	PART No.	DESCRIPTION	QTY.
1	242000	Pole/Frame Assembly - RD320	1
2	242021	Arm, Rear Assembly - RD320	1
3	242031	Arm, Hook Assembly - RD320	1
4	242038	Tooth - RD320 - 50mm thick	2
5	131329	Wheel Assembly - 12.5 L x 15-8 Ply - 3/4 in. Positive Offset	2
6	131324	Hub/Spindle Assembly - H618 - 2.188 in. dia.	2
7	132005	Jack - Side Wind SWS - 150 - DTSF	1
8	110015	Casting, Bearing Cap # 207 c/w Fitting	2
9	110003	Casting, Bearing Base # 207	2
10	242037	Pin 52.4 x 570mm length overall	1
11	611080	Shim 2 x 2 x 14 Gage, Galvanized	4
12	118082	Bolt, Hex 1/2 x 3 1/2 in. UNC, Gr5, Plated	1
13	118126	Bolt, Hex 1/2 x 4 in. UNC, Gr5, Plated	2
14	118504	Washer, Lock 1/2 in. Plated	3
15	118405	Nut, Hex 1/2 in. UNC, Gr5, Plated	3
16	118313	Bolt, Wheel 9/16 x 1 1/16 in. UNF, Gr5, Plated	12
17	118155	Bolt, Hex 3/4 x 11 in. UNC, Gr5, Plated	4
18	118509	Washer, Lock 3/4 in. Plated	4
19	118410	Nut, Hex 3/4 in. UNC, Gr5, Plated	4
20	118180	Bolt, Hex 1 x 4 in. UNC, Gr5, Plated	12
21	118510	Washer, Lock 1 in. Plated	12
22	118412	Nut, Hex 1 in. UNC, Gr5, Plated	12
23	242039	Chain, Lock-up - RD320, Plated (includes Items #24, 25, 26, & 27)	1
24	116236	Chain 3/8 in. long Link - 40 11/16 in. Plated	1
25	116237	Connector 3/8 x 2 9/16 in. Gr30, Plated	1
26	116238	Shackle, Forged c/w 5/8 in. Pin	1
27	118831	Pin, Hair 1/8 x 2 3/8 in. Plated	1
28	118240	Bolt, Eye 5/8 x 5 1/4 in. UNC, Gr5, Plated	1
29	118416	Nut, Jam 5/8 in. UNC, Gr2, Plated	2

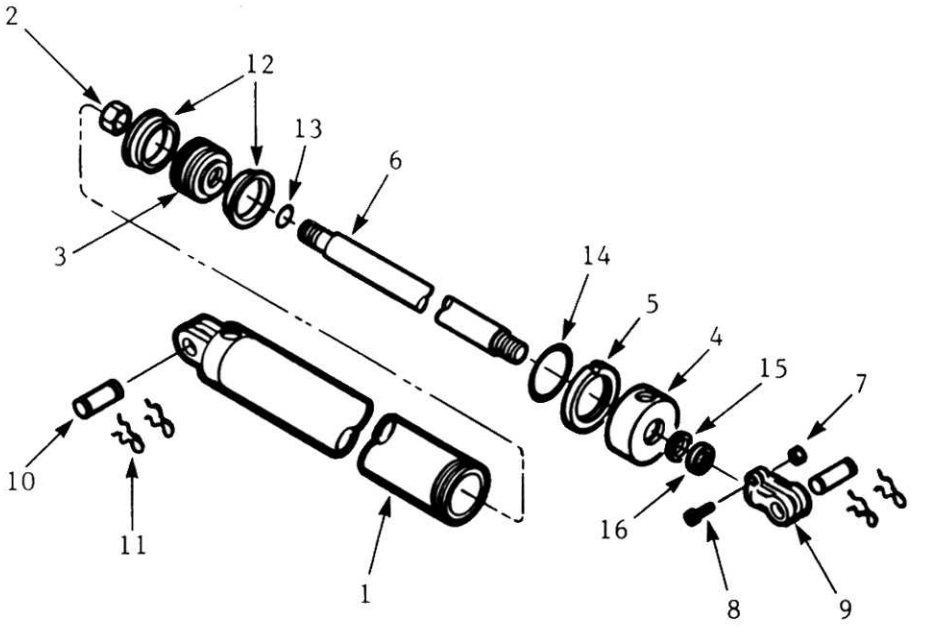


ITEM	PART No.	DESCRIPTION	QTY.
1	131324	Hub/Spindle Assembly - H618 - 2.188 x 12 in. - complete	2
2	131026	Dust Seal - CR#20140 - 2.000 in. ID	1
3	131022	Cone, Bearing #25580 - 1.750 in. ID	1
4	131023	Cup, Bearing #25520 - 3.265 in. OD	1
5	131013	Hub - H618G	1
6	131025	Cup, Bearing - LM48510 - 2.563 in. OD	1
7	131024	Cone, Bearing - LM48548 - 1.375 in. OD	1
8	131020	Washer, Flat 1 in. SAE	1
9	118423	Nut, Slotted 1 in. UNS, Gr5	1
10	118835	Pin, Cotter 3/16 x 1 1/2 in.	1
11	131016	Cap, Hub - H618 & H619 Hub	1
12	118335	Grease Fitting 1/4-28 AMNF Thread-Straight	1
13	131322	Spindle - S618 - 2 3/16 x 12 in. Stress Proof c/w Nut #9	1
14	131329	Wheel Assembly -12.5 L x 15-8 Ply - 3/4 in. Positive Offset	2
15	127007	Tire 12.5 L x 15-8 Ply Tubeless	1
16	131328	Rim, Wheel 15 x 10 LBH-6 Bolt - 3/4 in. Positive Offset	1
17	127006	Valve Stem-TR415	1



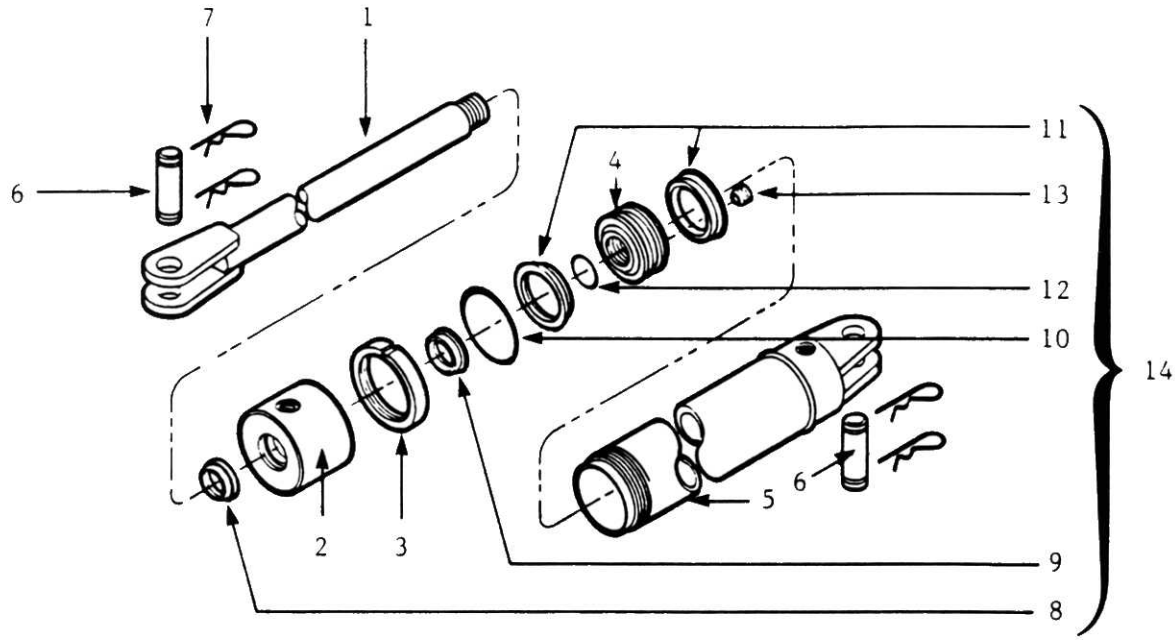
ITEM	PART No.	DESCRIPTION	QTY.
1	121674	Cylinder, Hydraulic 3 x 16 in. - D.I.L.	1
2	121750	Cylinder, Hydraulic 5 x 24 in. - D.I.L.	1
3	141504	Elbow, 90° - 3/4 JIC(M) x 3/4 ORB(M)	4
4	141514	Nipple 1/2 NPT(M) x 3/4 JIC(M)	4
5	141515	Nipple 3/4 JIC(M) x 3/4 ORB(M)	4
6	126504	Hose 3/8 x 32 in. - 2WB - 3/4 JIC(F-SW)	2
7	126552	Hose 3/8 x 144 in. - 2WB - 3/4 JIC(F-SW)	2
8	126506	Hose 3/8 x 249 in. - 2WB - 3/4 JIC(F-SW)	2
9	133008	Hose Tie - Plastic - Black 3/32 x 9/64 x 11 in.	2
10	143111	Holder, Hose - Flexible	1
11	650256	Hose Clip - 2 Hose, Plated	4
	660747	Hose Clip - 4 Hose, Plated	3
12	118530	Washer, Lock 5/16 in. Plated	7
13	118427	Nut, Hex 5/16 in. UNC, Gr5, Plated	7
14	118514	Washer, Flat 5/8 in. Plated	1
15	118508	Washer, Lock 5/8 in. Plated	1
16	118407	Nut, Hex 5/8 in. UNC, Gr5, Plated	1
17	141570	Valve, Dual Relief - 1500/2000 PSI - 3/4 ORB	1

HYDRAULIC CYLINDER 3 x 16 in. - D.I.L.



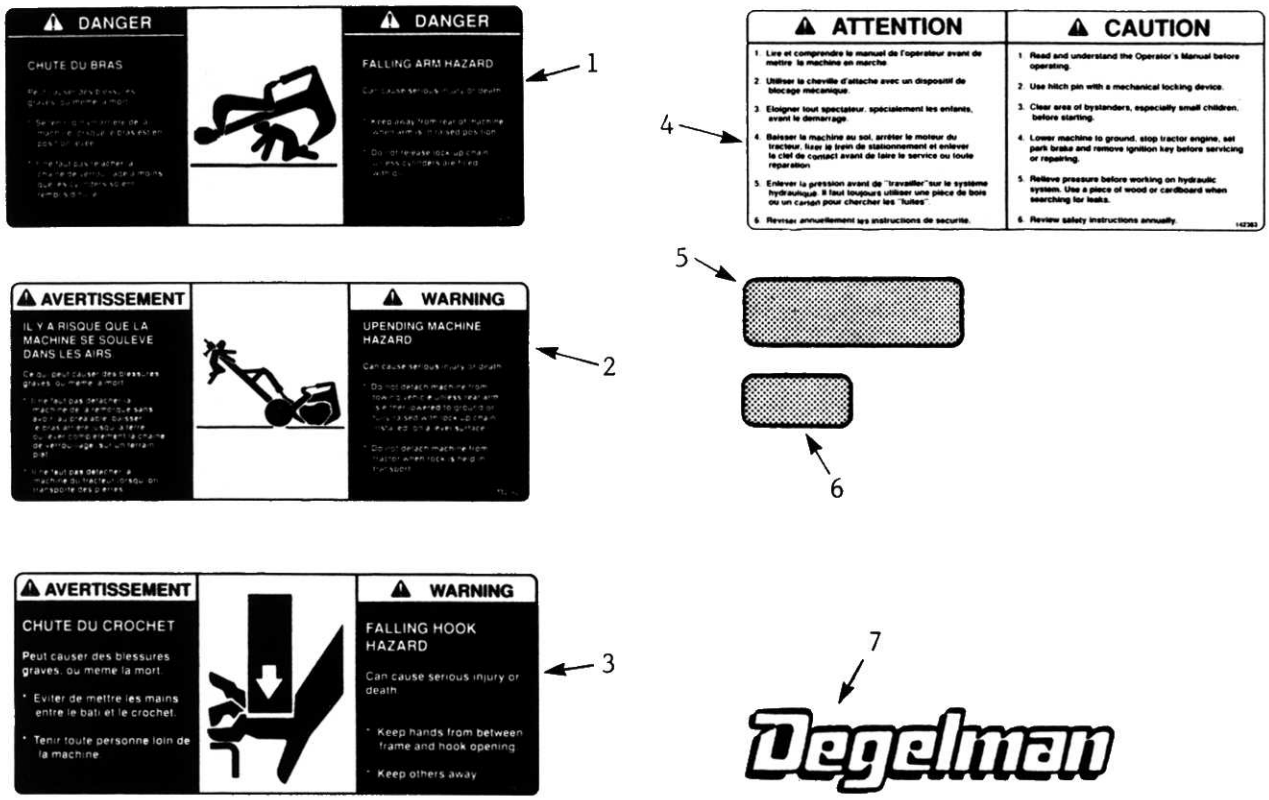
ITEM	PART No.	DESCRIPTION	QTY.
—	121674	Cylinder, Hydraulic 3 x 16 in. -D.I.L.	1
1	121671	Barrel Assembly 3 x 16 in. - D.I.L.	1
2	118441	Nut, Lock 7/8 in. UNF, Gr5, Uni-torque	1
3	121606	Piston 3 in. Cylinder (U-Cup Type) - D.I.L.	1
4	121629	Cap, Open 3 in. Cylinder - 1 1/2 in. Rod - D.I.L.	1
5	121746	Ring, Lock 3 in. Cylinder - D.I.L.	1
6	121658	Rod, Cylinder 3 and 3 1/2 x 16 in. - D.I.L.	1
7	118403	Nut, Hex 3/8 in. UNC, Gr5, Plated	1
8	118311	Cap Screw 3/8 x 1 3/4 in. Allen	1
9	121631	Clevis, Rod 1 1/4-12 UNF - D.I.L.	1
10	121941	Pin 25.4 x 73mm (effective) Plated-N/D	2
11	118882	Pin, Hair 3/16 x 2 3/4 in. Plated-N/D	4
—	121612	Kit, Seal 3 in. Cylinder 1 1/2 in. Rod - D.I.L.	1
		Consists of:	
12	--	U-Cup, Piston	2
13	--	O-Ring, Piston	1
14	--	O-Ring, Cap	1
15	--	U-Cup, Cap	1
16	--	Seal, Rod Wiper	1
		NOTE: Complete Rebuilt Units may be available	
—	121787	Cylinder, Hydraulic 3 x 16 in. c/w Pins. - D.I.L. "Rebuilt"	a/r

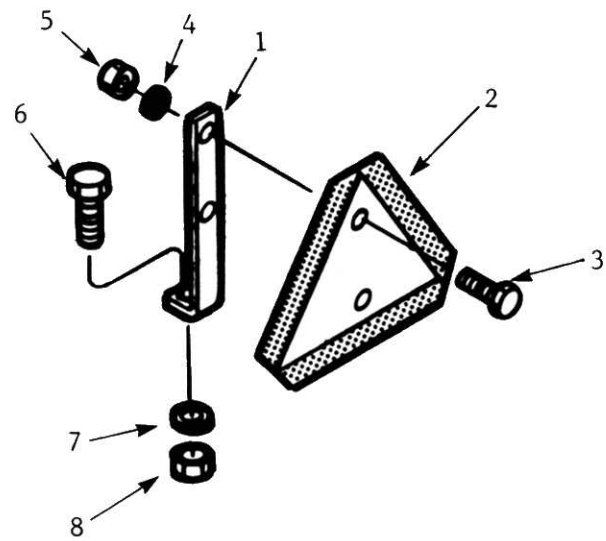
HYDRAULIC CYLINDER 5 x 24 in. - D.I.L.



ITEM	PART No.	DESCRIPTION	QTY.
–	121750	Cylinder, Hydraulic - 5 x 24 in. - D.I.L.	a/r
1	121830	Rod Assembly 5 x 24 in. - D.I.L.	1
2	121827	Cap, Open 5 in. Cylinder - 2 in. Rod - D.I.L.	1
3	121769	Ring, Lock 5 in. Cylinder - D.I.L.	1
4	121765	Piston 5 in. Cylinder - D.I.L.	1
5	121829	Barrel Assembly - 5 x 24 in. Cylinder - D.I.L.	1
6	121823	Pin 31.8 x 85mm (effective) Plated	2
7	118817	Pin, Hair 4.5 x 95mm long, Plated	4
8	--	Rod Wiper 2 ID x 2 1/2 in. OD	1
9	--	U-Cup 2 ID x 2 1/2 in. OD	1
10	--	O-Ring 5 3/8 ID x 1/8 in. #253	1
11	--	U-Cup 4 1/4 ID x 5 in. OD	2
12	--	O-Ring 1 3/4 ID x 1/8 in. #224	1
13	118328	Setscrew 1/2 x 1/2 in. UNF - Nylon Lock	1
14	121832	Kit, Seal 5 in. Cylinder - 2 in. Rod - D.I.L.	1
		NOTE: Rebuilt Units may be available	

DECALS/SLOW MOVING VEHICLE SIGN

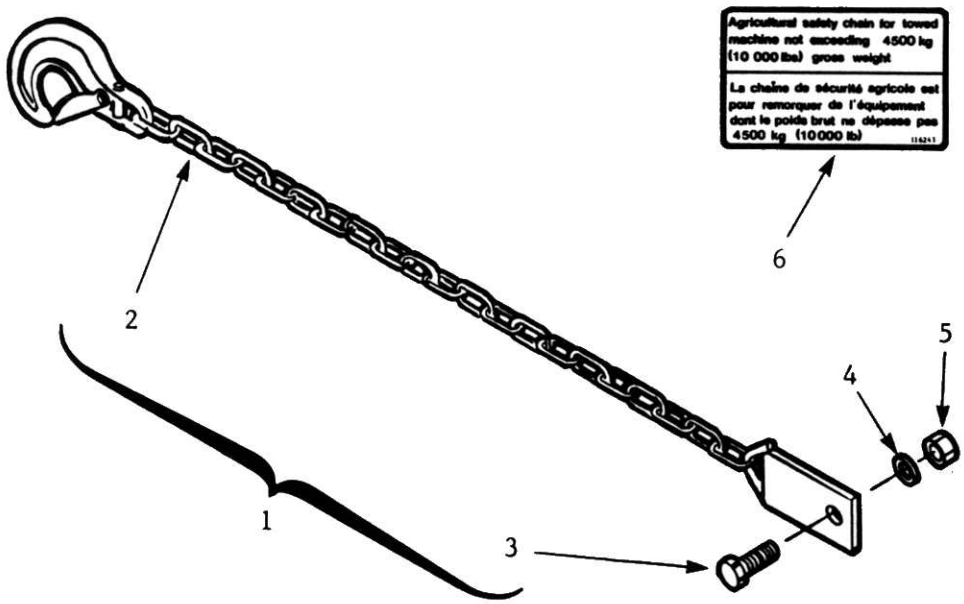




DECALS/SLOW MOVING VEHICLE SIGN

ITEM	PART No.	DESCRIPTION	QTY.
1	142380	Decal, **Danger** - Falling Arm	2
2	142382	Decal, **Warning** - Upending Machine	2
3	142381	Decal, **Warning** - Falling Hook	2
4	142383	Decal, **Caution** - 6 Points Safety	1
5	142280	Reflector Tape 50 x 160mm - **Red**	2
6	142279	Reflector Tape 43 x 82mm - **Amber**	2
7	142009	Decal, **Degelman** 3 3/4 x 16 1/4 in.	4

ITEM	PART No.	DESCRIPTION	QTY.
1	305165	Bracket, Slow Moving Sign - RR	1
2	142135	Sign, Slow Moving Vehicle - Rigid	1
3	118123	Bolt, Hex 1/4 x 1 in. UNC, Gr5, Plated	2
4	118533	Washer, Lock 1/4 in. Plated	2
5	118402	Nut, Hex 1/4 in. UNC, Gr5, Plated	2
6	118024	Bolt, Hex 5/8 x 1 1/2 in. UNC, Gr5, Plated	1
7	118508	Washer, Lock 5/8 in. Plated	1
8	118407	Nut, Hex 5/8 in. UNC, Gr5, Plated	1



ITEM	PART No.	DESCRIPTION	QTY.
1	116245	Carton - Safety Chain - 4500 Kg	1
		Consists of:	
2	116244	Chain, Safety - Assembly - 4500 Kg c/w Items #3, 4, 5, & 6	1
3	118043	Bolt, Hex 3/4 x 2 in. UNC, Gr5, Plated	1
4	118509	Washer, Lock 3/4 in. Plated	1
5	118410	Nut, Hex 3/4 in. UNC, Gr5, Plated	1
6	116243	Decal, Identification "Ag Safety Chain"	1

9 INDEX

NOTES

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