



3 Point Hitch

Skid Steer

TREE SAW

**3 POINT HITCH & SKID STEER
Models TTS12-100 & TTS12-200**

**OPERATOR'S MANUAL
& PARTS BOOK**

TEBBEN ENTERPRISES

TREE SAW

WARRANTY

Tebben Enterprises of Clara City, Minnesota 56222, warrants that its products and their components will be free from defects in material and workmanship for a period of one (1) year from the date of original purchase when used as intended and under normal service and conditions. This warranty is limited to the replacement of any defective part by **Tebben Enterprises**, provided that any such defective part must be returned to **Tebben Enterprises**, TRANSPORTATION PREPAID, accompanied by a letter setting forth the nature of the defect. If the part is found to be defective by reason of materials or workmanship, **Tebben Enterprises**, shall replace the part, but shall not be responsible for its re-installation.

This warranty does not cover or apply to any products or component parts which have been tampered with, modified or altered in any way or which have been subject to misuse, negligence, involved in an accident, or damaged by and act of God.

EXCLUSION OF WARRANTIES

TEBBEN ENTERPRISES MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE IN RESPECT TO ITS PRODUCTS OR COMPONENT PARTS. TEBBEN ENTERPRISES SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES FROM ANY BREACH OF WARRANTY, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, INCONVENIENCE, AND THE COST OF RENTAL OR REPLACEMENT EQUIPMENT. NO AGENT, EMPLOYEE OR REPRESENTATIVE OF TEBBEN ENTERPRISES HAS THE AUTHORITY TO BIND IT TO ANY AFFIRMATION, STATEMENT OF WARRANTY CONCERNING ITS PRODUCTS AND THEIR COMPONENT PARTS EXCEPT AS SPECIFICALLY SET FORTH HEREIN.



TEBBEN ENTERPRISES TREE SAW

WARRANTY REGISTRATION FORM & INSPECTION REPORT

WARRANTY REGISTRATION

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Customer's Name _____ Dealer's Name _____
Address _____ Address _____
City, State/Prov., Code _____ City, State/Prov., Code _____
Phone Number (____) _____
Tree Saw Model _____
Serial Number _____
Delivery Date _____

DEALER INSPECTION REPORT

_____ Saw Blade Turns Freely
_____ Fasteners Tight
_____ Lubricate Machine
_____ Grapple Moves Freely
_____ Saw Teeth Installed
_____ Hydraulic Components in Good Condition
_____ Retainers Installed through Mounting Pins

SAFETY

_____ All Decals Installed
_____ Guards and Shields Installed and Secured
_____ Review Operating and Safety Instructions

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date _____ Dealer's Rep. Signature _____

Signature _____

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

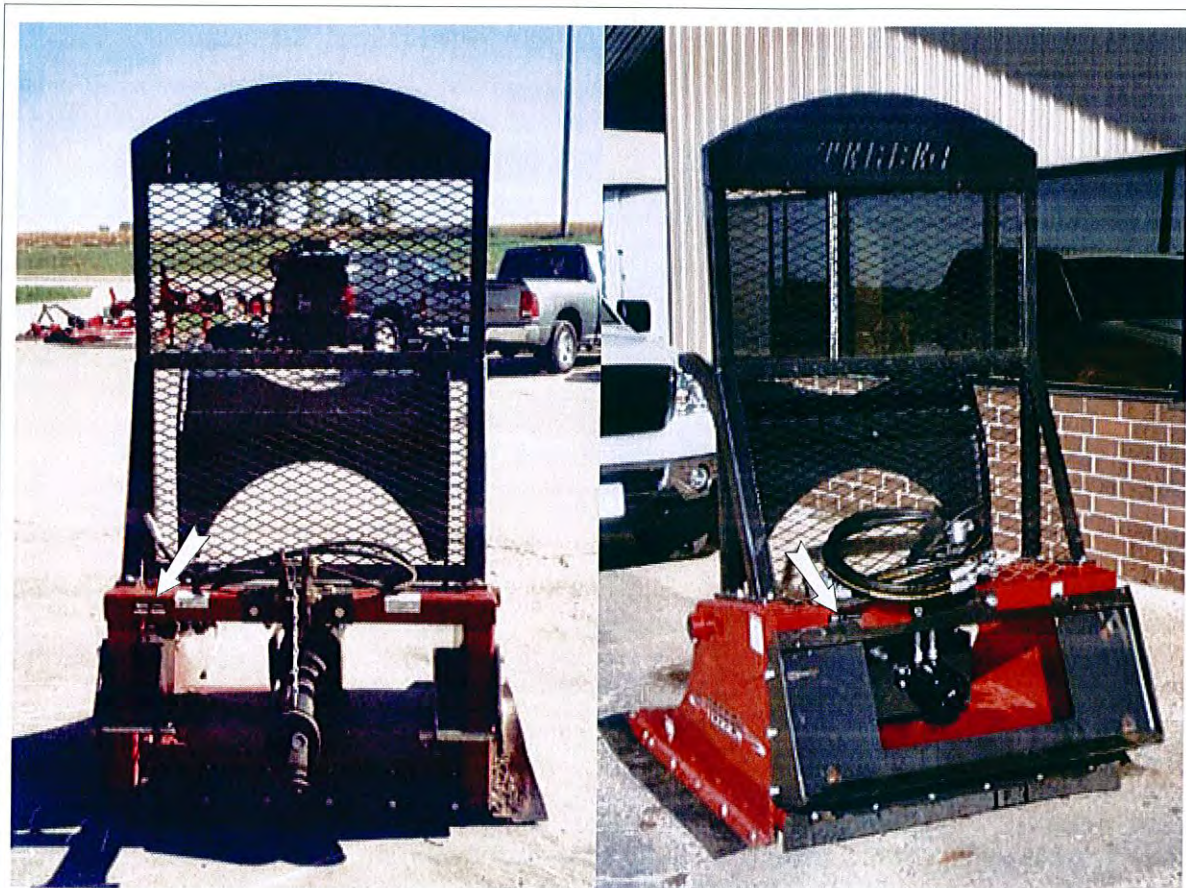
Date _____ Owner's Signature _____

WHITE	YELLOW	PINK
TEBBEN ENT.	DEALER	CUSTOMER

SERIAL NUMBER LOCATION

Always give your dealer the serial number of your Tebben Ent. Tree Saw 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.



3 Point Hitch

Skid Steer

Model Number _____

Tree Saw Serial Number _____

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1 INTRODUCTION

Congratulations on your choice of an Tebben Ent. Tree Saw to complement your operation. This equipment has been designed and manufactured to meet the needs of a discriminating buyer for the efficient removal of unwanted stumps, brush and trees.

Safe, efficient and trouble free operation of your Tebben Ent. Tree Saw 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.



3 Point Hitch



Skid Steer

This manual covers the Tebben Ent. Tree Saw models TTS12-100 and TTS12-200. Use the Table of Contents or Index as a guide to locate required information.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Tebben Ent. distributor, dealer or the factory if you need assistance, information or additional copies of the manuals.

OPERATOR ORIENTATION - The directions left, right, front and rear, as mentioned throughout this manual, where the saw blade and grapple are the front of the machine.

2 SAFETY

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 Tebben Tree Saw 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 guide-lines:

DANGER - Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

WARNING - Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION - Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please contact your distributor, dealer or Tebben Enterprises, 10009 50th St SE, Clara City, MN 56222, Phone 320-847-2200, Fax 320-847-3112 , www.tebben.us

SAFETY

YOU are responsible for the **SAFE** operation and maintenance of your Tebben Ent. Tree Saw. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Tree Saw 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 alerts you to all good safety practices that should be adhered to while operating the Tree Saw.

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 **EVERYONE** 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.

- Tree Saw owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter.
- 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. Most 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, adjusting or unplugging the Tree Saw.



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



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



4. Do not allow riders.

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. Install and secure all guards before starting.

7. Wear suitable ear protection for prolonged exposure to excessive noise.



8. Lower machine to ground, place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

9. Clear the area of people, especially small children, before starting the unit.

10. Review safety related items annually with all personnel who will operating or maintaining the Tree Saw.

2.2 EQUIPMENT SAFETY GUIDELINES

1. Safety of the operator and bystanders is one of the main concerns in designing and developing a machine. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury or death, study the following precautions and insist those working with you, or for you, follow them.
2. In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.
3. Replace any safety sign or instruction sign that is not readable or is missing. Location of such safety signs is indicated in this manual.
4. Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.
5. **Under no circumstances should young children be allowed to work with this equipment. Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works.** Review the safety instructions with all users annually.
6. This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible, properly trained and physically able person familiar with machinery and trained in this equipment's operations. If the elderly are assisting with work, their physical limitations need to be recognized and accommodated.
7. Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question - **DON'T TRY IT.**
8. Do not modify the equipment in any way. Unauthorized modification result in serious injury or death and may impair the function and life of the equipment.
9. In addition to the design and configuration of this implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the power unit, engine and machine Manuals. Pay close attention to the Safety Signs affixed to the power unit and the machine.

2.3 SAFETY TRAINING

1. Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.
2. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.
3. It has been said, "The best safety feature is an informed, careful operator." We ask you to be that kind of an operator.  It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Accidents can be avoided.
4. **Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your power unit, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than yourself, or is loaned or rented, it is the machine owner's responsibility to make certain that the operator, prior to operating:**
 - a. **Reads and understands the operator's manuals.**
 - b. **Is instructed in safe and proper use.**
5. Know your controls and how to stop power unit engine and machine quickly in an emergency. Read this manual and the one provided with your power unit.
6. Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will operate the machinery. 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. If the elderly are assisting with work, their physical limitations need to be recognized and accommodated.

2.4 SAFETY SIGNS

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety signs are available from your Dealer Parts Department or the factory.

How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Determine exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper (Refer to Section 3).
- Align the sign 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 sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

2.5 PREPARATION

1. Do not operate the power unit and machine until you have read and completely understand this manual, the power unit operator's manual, and each of the safety messages found on the safety signs on the power unit and machine.

2. Personal protection equipment including hard hat, safety glasses, safety shoes, and gloves are recommended during assembly,



installation, operation, adjustment, maintaining, repairing, removal, or moving the implement. Do not allow long hair, loose fitting clothing or jewelry to be around equipment.

3. **PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!**

Power units with or without equipment attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a full-time basis if the noise in the Operator's position exceeds 80db. Noise over 85db on a long-term basis can cause severe hearing loss. Noise over 90db adjacent to the Operator over a long-term basis may cause permanent, total hearing loss. **NOTE:** Hearing loss from loud noise (from power units, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.



4. Operate the machine only with a power unit equipped with an approved Roll-Over-Protective Structure (ROPS). Always wear your seat belt. Serious injury or even death could result from falling off the power unit ---particularly during a turnover when the operator could be pinned under the ROPS or the power unit.



5. Clear working area of stones, branches or hidden obstacles that might be hooked or snagged, causing injury or damage.
6. Inspect the trees in the working area for wire, fencing or any other metal objects. Remove metal objects or work around them.

7. Operate only in daylight or good artificial light.
8. Be sure machine is properly mounted, adjusted and in good operating condition.
9. Ensure that all safety shielding and safety signs are properly installed and in good condition.

2.6 OPERATING SAFETY

1. Read and understand the operators manual and all safety signs before operating, servicing, adjusting, repairing or unplugging the machine.
2. Please remember it is important that you read and heed the safety signs on the Tree Saw and in the manual. Clean or replace all safety signs if they cannot be clearly read and understood.
3. Place all controls in neutral before starting engine.
4. Never start or operate power unit and machine unless sitting in operator's seat of power unit.
5. If a safety shield or guard is removed for any reason, it must be replaced before the machine is again operated.
9. Place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
10. Stay away from PTO shaft and machine when engaging saw blade. Keep others away.
11. Use extreme care during travel. Slow down on turns and watch out for bumps. Clean reflectors, SMV and lights before transporting. Use hazard flashers on power unit when transporting.
12. Do not allow riders on the machine or power unit at any time. There is no safe place for any riders.
13. Before you operate the machine, check over all pins, bolts, and connections to be sure all are securely in place. Replace any damaged or worn parts immediately.
14. Do not allow anyone who is not familiar with the safety rules and operation instructions to use this machine.
15. Never allow children to operate or be around this machine. Clear the area of bystanders before starting.
16. Always know what you are cutting. Clear the work area of objects which might be picked up and snagged or entangled in the machine. Never operate the Tree Saw in an area that has hidden obstacles.
17. Keep hands, feet, hair, jewelry, and clothing away from all moving and/or rotating parts.
18. Do not operate the Skid Steer Tree Saw close to power lines to prevent electrocution. A skid steer loader can lift high enough for trees to contact power lines.
19. Do not place hands or feet under the machine while engine or machine is running.
20. Objects can be thrown out from under the machine with sufficient force to severely injure people. Stay away from machine when it is running. Keep others away.
21. Review safety instructions with all operators annually.

2.7 HYDRAULIC SAFETY

1. Always place all power hydraulic controls in neutral before disconnecting from power unit or working on hydraulic system.
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.
4. Relieve pressure from hydraulic circuit before servicing or disconnecting from power unit.
5. Do not attempt any makeshift repairs to the hydraulic fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

6. 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.



7. 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.
8. Before applying pressure to hydraulic system, make sure all components are tight and that lines, hoses and couplers are in good repair

2.8 TRANSPORT SAFETY

1. Comply with state and local laws governing highway safety and movement of machinery on public roads.
2. The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements.
3. At all times when driving the power unit and equipment on the road or highway under 20 mph (32 kph), use flashing amber warning lights and a slow moving vehicle (SMV) identification emblem. Do not exceed 20 mph (32 kph). Reduce speed on rough roads and surfaces.
4. Plan your route to avoid heavy traffic.
5. Use a mounting pin with provisions for a retainer. Install the retainer.
6. Do not drink and drive.
7. Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc. Watch for traffic when operating near or crossing roadways.
8. Never allow riders on either power unit or machine.
9. Do not exceed 15 mph (24 kph). Reduce speed on rough roads and surfaces.

2.9 STORAGE SAFETY

1. Store the unit in an area away from human activity.
2. Do not permit children to play on or around the stored machine.
3. Store the unit in a dry, level area. Support the frame with planks if required.

2.10 MAINTENANCE SAFETY

1. Good maintenance is your responsibility. Poor maintenance is an invitation to trouble. Follow all maintenance instructions.

2. Follow good shop practices.

- Keep service area clean and dry.
- Be sure electrical outlets and tools are properly grounded.
- Use adequate light for the job at hand.



3. Never wear ill-fitting, baggy or frayed clothing when working around or on the drive system components.
4. Before working on this machine, shut off the power unit engine, set the brakes, remove the ignition keys and disconnect driveline. Keep hands, feet, hair and clothing away from moving or rotating parts.
5. Never work under equipment unless it is blocked securely.
6. Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance work.
7. Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.

8. A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.



9. Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to ensure unit is in a safe condition.
10. When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

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

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

SIGN-OFF FORM

[illegible]

3 SAFETY SIGN LOCATIONS

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

- Think SAFETY! Work SAFELY!



REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

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- Think SAFETY! Work SAFELY!



REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

4 OPERATION



OPERATING SAFETY

- Read Operator's Manual before using machine. Review safety instructions with all operators annually.
- Please remember it is important that you read and heed the safety signs on the Tree Saw. Clean or replace all safety signs if they cannot be clearly read and understood.
- If a safety shield or guard is removed for any reason, it must be replaced before the machine is again operated.
- Stop tractor engine, lower machine to the ground, place all controls in neutral, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, unplugging or fitting.
- Install and secure all guards before starting.
- Do not allow riders.
- Keep all hydraulic lines, fittings and couplers tight and free of leaks.
- Clean reflectors, SMV and lights before transporting.
- Install safety locks before transporting or working beneath components.
- Add extra lights and use a pilot vehicle when transporting during times of limited visibility.
- Use hazard flashers on power unit when transporting.
- Stay away from saw blade when engine is running. Keep others away.
- Do not direct saw discharge toward people, animals or buildings. Chips can be ejected fast enough to injure or kill.
- Keep away from overhead electrical lines. Electrocution can occur without direct contact.

4.1 TO THE NEW OPERATOR OR OWNER

Tebben Ent. Tree Saws are designed to quickly and efficiently, cut down trees or brush and then use the grapple to move the material away.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment. It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine.

Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the worksite. Untrained operators are not qualified to operate the machine.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum field efficiency. By following the operating instructions in conjunction with a good maintenance program, your Tree Saw will provide many years of trouble-free service.

4.2 MACHINE COMPONENTS

The Tebben Ent. Tree Saw is a large spinning circular blade with cutting teeth designed to cut trees or brush. A grapple on the front of the frame is used to pick up and move the cut trees or brush. Power to the saw blade is provided by a PTO on the 3 point hitch model and a hydraulic motor on the skid steer model. A slip clutch in the PTO driveline limits the power to the blade. Frame members on the front guide trees and brush into the blade. A large screen on top of the frame prevents chips and debris from hitting the operator.



FIG. 1 PRINCIPLE COMPONENTS

4.3 BREAK-IN

Although there are no operational restrictions on the Tree Saw when it is used for the first time, it is recommended that the following mechanical items be checked:

A. After operating for 1 hour:

1. Torque all fasteners and hardware.
2. Check condition of the teeth on the saw blade.
3. Check the hydraulic components to be sure all are in good condition.
4. Check the oil level in the gearbox. Add as required.
5. Check for and remove all entangled material.
6. Check that the PTO driveline shield turns freely.
7. Lubricate all grease points.

B. After operating for 10 hours:

1. Repeat steps 1 through 7 listed above. (Section A).
2. Go to the normal servicing and maintenance schedule as defined in the Maintenance Section.

4.4 PRE-OPERATION CHECKLIST

Efficient and safe operation of the Tebben Ent. Tree Saw requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section. A pre-operation checklist is provided for the operator. It is important for both personal safety and for maintaining the machine in good mechanical condition that this checklist be followed.

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

1. Lubricate the machine per the schedule outline in the Maintenance Section.
2. Use only an agricultural tractor or skid steer loader of horsepower within the limits of the recommended power range in Table 1.
3. Check that the Tree Saw is properly attached to the power unit with retainers through the mounting pins.
4. Check that all bearings turn freely. Replace any that are rough or seized.
5. Make sure that all guards and shields are in place, secured and functioning as designed.
6. Check for and remove all entangled material.
7. Check the condition of the hydraulic components. Replace any that are damaged or broken.
8. Check that the PTO driveline turns freely and that the driveline can telescope easily.
9. Check the carbide cutting teeth bolts. Tighten to their specified torque.
10. Check the carbide teeth. Be sure they are not damaged or broken. Replace as required.

4.5 DRIVELINE DIMENSION 3 POINT HITCH MODEL

A PTO driveline is supplied with the machine. To accompany the variety of 3 point hitch geometry available today, the driveline can be too long for most machines or too short for others. It is very important that the driveline be free to telescope but not to bottom out when going through its working range. If the driveline bottoms out, the bearings on both the machine and power unit PTO shaft will be overloaded and fail in a short time.

1. **To determine the proper length of the driveline, follow this procedure:**

- Clear the area of bystanders, especially small children.
- Attach the Tree Saw to the power unit (see section 4.8) but do not attach the driveline.
- Raise the machine until the input shaft is level with the power unit PTO shaft.
- Measure the dimension between the locking grooves on the power unit PTO shaft and the machine input shaft.
- Measure the same dimensions on the compressed driveline.
- If the compressed driveline dimension exceeds the machine dimension, the driveline will have to be cut.

2. **When cutting the driveline, follow this procedure:**

- Subtract the machine dimension (A) from the uncut driveline dimension (B) or (B-A). This dimension determines how much too long the driveline is.
- Add another inch (25 mm) to the dimension to be sure it doesn't bottom out, to determine (C) the cut off dimension.
- Use a hacksaw to cut dimension (C) from both ends. Cut both the plastic tubes and the metal cores.
- Use a file to remove the burrs from the edges that were cut.
- Assemble the 2 ends of the shaft.
- Make sure the shaft can telescope freely. If it does not, separate the 2 parts and inspect for burrs or cuttings on the shaft ends. Be sure it telescopes freely before installing.

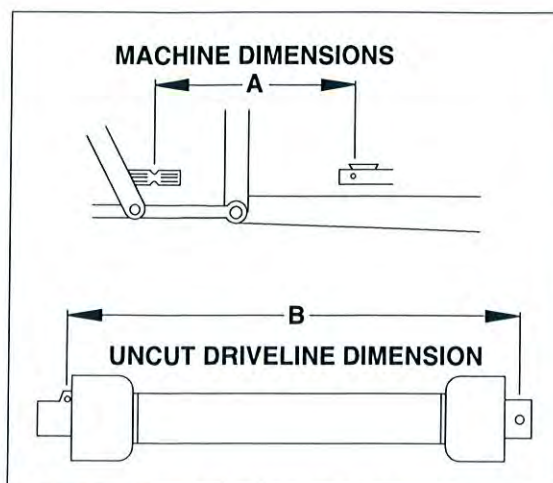


FIG. 2 DRIVELINE DIMENSIONS

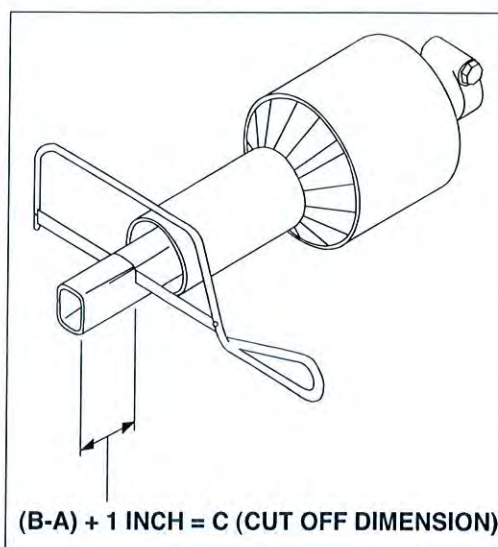


FIG. 3 CUT OFF DIMENSION

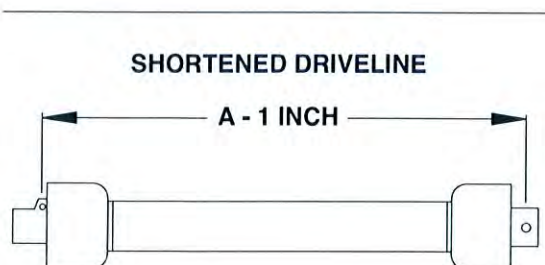


FIG. 4 SHORTENING

4.6 EQUIPMENT MATCHING

The Tebben Tree Saw 3 Point Hitch model, is designed to be used with a tractor and operated at a speed of 540 PTO RPM. The Skid Steer model requires an auxiliary hydraulic outlet to power the machine. The following specifications must be maintained when selecting a power unit.

1. **Horsepower:**

It is recommended that the turf power unit have the recommended horsepower for all conditions. This will provide sufficient power for the saw with enough power remaining for tractive needs.

2. **PTO Shaft:**

The tractor must be equipped with a 6 spline 1 3/8 inch PTO shaft when used with the 3 Point Hitch model. It should never be operated faster than 540 RPM. Use an accurate hand-held tachometer to check the speed if there is doubt about RPM. Never operate the tractor at maximum RPM but only at rated PTO speed.

Do not use shaft adapters when operating. It changes the drawbar dimensions and can lead to over speeding. It is not recommended that the machine be used with imported tractors that have a variable speed PTO. This can also lead to over speeding.

3. **Hydraulic System:**

a. **Grapple:**

The grapple system requires a flow of 4 GPM (15 LPM) at 2000 psi (13,800 KPa).

NOTE:

A skid steer provides a flow of oil that is too large for the grapple. Switch the system into low-flow range and utilize the optional selector valve to direct the flow from the saw to the grapple.

b. **Saw Blade (Skid Steer model only):**

The saw blade requires 40 GPM (150 LPM) at 2500 psi (17,250 KPa) for effective operation. Lower flows or pressures will result in decreased performance levels but the saw will still run.

4. **Electrical:**

A 12 Volt, 10 amp power source in the skid steer cab must be available if equipped with the optional selector valve. Mount the control switch in the cab within easy reach prior to starting.

Table 1: **Model vs. Horsepower**

Model	Recommended Tractor Horsepower
TTS12-100	50
TTS12-200	50

4.7 ATTACHING/UNHOOKING

The Tree Saw should always be located on a level, dry area that is free of debris and other foreign objects. When attaching the machine to a power unit, follow this procedure:

1. Clear the area of bystanders, especially small children.
2. Make sure there is enough room and clearance to safely drive up to the machine.
3. **3 Point Hitch model:**
 - a. Attach the PTO driveline to the machine if it was removed for storage.
 - b. Place the power unit arms in their sway position.
 - c. Back up slowly and align the lower link arms to the mounting brackets on the machine.
 - d. Be sure the PTO shaft dimension is at the correct length for the power unit being used (refer to Section 4.5).
 - e. Stop power unit, set park brake, remove ignition key and wait for all moving parts to stop before dismounting.



FIG. 5 ALIGNING

- f. Align the lower link with the left mounting bracket.

IMPORTANT

It may be necessary to add weight to the lower lift arms to bring them to the required height.

- g. Insert the left pin through the ball and install the retainer.
- h. Align the right arm to the pin by turning the jackscrew on the arm.
- i. Insert the right pin through the ball and install the retainer. Return the jackscrew to its starting position.



FIG. 6 LOWER ARMS

j. **Install the PTO driveline:**

NOTE

Be sure the telescoping portion of the shaft is greased and free of dirt.

- Retract the collar on the yoke, align the splines and slide the yoke on the power unit.
- Release the collar and make sure the locking pin clicks into position.

NOTE

The driveline should already have been cut to the required length.

- Attach guard anchor chain to adjacent frame member.
- k. Remove the top pin and install the top link. Use the turnbuckle to align the top link. Insert the pins and install the retainers. Return the turnbuckle to its original length and lock.



FIG. 7 PTO SHAFT



FIG. 8 TOP LINK

i. **Connect the hydraulic system:**

- Use a clean cloth or paper towel to clean the dirt and build-up from around the couplers and the male tips.
- Connect the hoses to the power unit couplers. Be sure the couplers are securely seated.
- Route and secure hoses along the hitch with clips, tape or plastic ties to prevent binding and pinching.



FIG. 9 HYDRAULICS



- m. Slowly raise the machine through its working range to make sure the telescoping portion of the PTO shaft doesn't bottom out.
- n. Level the machine front and rear, and side to side using the jackscrew on the right arm and the turnbuckle on the top link.

The frame should always be slightly tilted toward the power unit.

- o. To unhook from the power unit, reverse the above procedure. Always park the machine in a dry, level area. If vandalism is a problem, remove the PTO driveline and store in a secure location.

4. Skid Steer:

- a. Drive into mounting frame.
- b. Seat the top of the face plate into the frame of the tree saw.
- c. Raise the loader and tilt the face plate until it is fully mated.
- d. Engage the lock pins to secure the tree saw to the loader.



Mated



Latched

FIG. 10 MOUNTING

e. **Connect the hydraulics:**

- Use a clean rag or paper towel to clean the dirt from the couplers on the hose ends and the skid steer.
- Connect the hoses to the skid steer couplers. Be sure the couplers are securely seated.
- Route the hoses to prevent binding and pinching. Be sure to provide slack for tilting.



- f. Connect the wiring harness if equipped with the optional hydraulic selector valve.



FIG. 11 HYDRAULIC HOSES

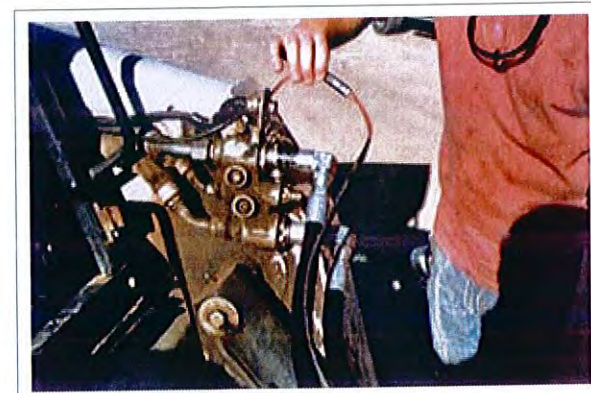


FIG. 12 WIRING HARNESS



FIG. 13 MOUNTED

- g. Reverse the above procedure when unhooking.
- h. Place planks or boards under the frame for extra support if required.

4.8 CONTROLS

An optional electrically powered selector valve is available to switch the hydraulic circuit from the saw blade to the grapple.

Mount the switch in the cab and connect to a 12 volt power source to operate the selector valve. Position it convenient to the operator.



FIG. 14 TOGGLE SWITCH (TYPICAL)

4.9 FIELD OPERATION



OPERATING SAFETY

- Read Operator's Manual before using machine. Review safety instructions with all operators annually.
- Please remember it is important that you read and heed the safety signs on the Tree Saw. Clean or replace all safety signs if they cannot be clearly read and understood.
- If a safety shield or guard is removed for any reason, it must be replaced before the machine is again operated.
- Stop tractor engine, lower machine to the ground, place all controls in neutral, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, unplugging or fitting.
- Install and secure all guards before starting.
- Do not allow riders.
- Keep all hydraulic lines, fittings and couplers tight and free of leaks.
- Clean reflectors, SMV and lights before transporting.
- Install safety locks before transporting or working beneath components.
- Add extra lights and use a pilot vehicle when transporting during times of limited visibility.
- Use hazard flashers on power unit when transporting.
- Stay away from saw blade when engine is running. Keep others away.
- Do not direct saw discharge toward people, animals or buildings. Chips can be ejected fast enough to injure or kill.
- Keep away from overhead electrical lines. Electrocuting can occur without direct contact.

Although the Tree Saw is easy to use, each operator should review this section to familiarize himself with the detailed safety and operating procedures. When using the machine, follow this procedure:

1. Clear the area of bystanders, especially small children.
2. Review and follow the Pre-Operation Checklist (see Section 5.4).
3. Attach the machine to the power unit (see Section 5.6). Be sure the frame is level.
4. Transport to the working area (refer to Section 5.8).

5. **Starting:**

- a. Clear the area of bystanders, especially small children.
- b. Place all controls in neutral or turn off.
- c. Start the power unit engine.
- d. Set the engine RPM at low idle.
- e. Engage the PTO or hydraulic circuit.
- f. Slowly increase the engine speed and bring to the rated RPM.
- g. Proceed with the work.

6. **Stopping:**

- a. Decrease RPM to low idle.
- b. Disengage the PTO clutch or hydraulic circuit.
- c. Stop engine and remove ignition key.

7. **Emergency Stopping:**

If an emergency occurs and the Tree Saw must be shut down, disengage PTO clutch or hydraulic circuit or turn engine off. Correct condition before resuming work.

8. **Speed:**

Set the forward speed appropriate for the job being done. Proceed faster if the power unit engine speed is remaining at rated speed. Slow the forward speed if the engine is being pulled down by the load. If the engine speed drops very much, the saw blade will stop.



FIG. 15 WORKING

9. **Direction:**

The machine is designed with a grapple that is positioned directly on top of the blade. Use the grapple frame to put pressure on the tree as it is being cut to push it away from the machine.

NOTE:

Always use the direction the tree is leaning when cutting to insure the tree falls away from the machine.



Right



Left

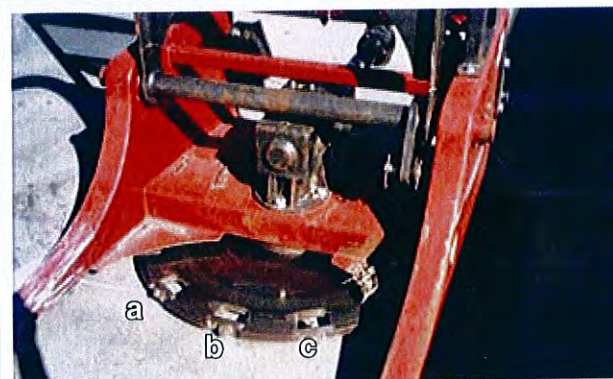
FIG. 16 DIRECTION (TYPICAL)

10. **Kerf:**

The saw blade is designed with angled mounting brackets for mounting the carbide tipped teeth to generate a kerf as it moves through the wood/tree during operation. This provides a wider cut (kerf) to minimize binding.

- a. 15° down.
- b. Even.
- c. 15° up.

A 1.25" (33 mm) cut will be created as the blade moves into the tree.



Saw Blade



Cutting

FIG. 17 KERF

11. **Binding/Unplugging:**

Although the machine is designed to handle a heavy load, the blade can occasionally bind, plug or stop turning. When it does, follow this procedure when unplugging:

a. **Skid Steer:**

The skid steer power unit provides pressurized oil to the hydraulic motor to turn the saw blade. When the blade is moved into the tree too fast and it is overloaded or it binds in the cut, the blade will stop as the hydraulic system will go over relief.

To correct:

- Stop forward motion.
- Slowly back away until the blade starts to turn again and returns to operating speed.
- Slowly move back into the cut and continue with the work.

b. **PTO Power (3 Point Hitch):**

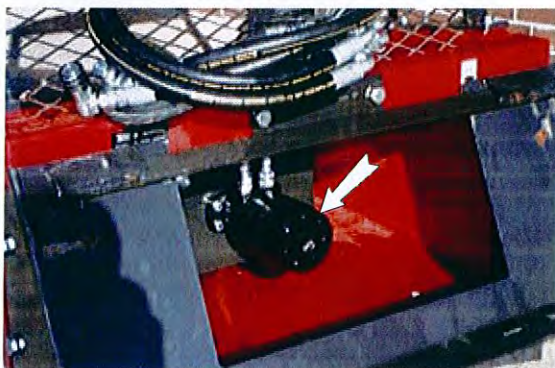
The PTO input shaft provides power to turn the saw blade. When the blade is moved into the tree too fast and becomes overloaded or binds in the cut, the slip clutch will slip and the blade will stop.

To correct:

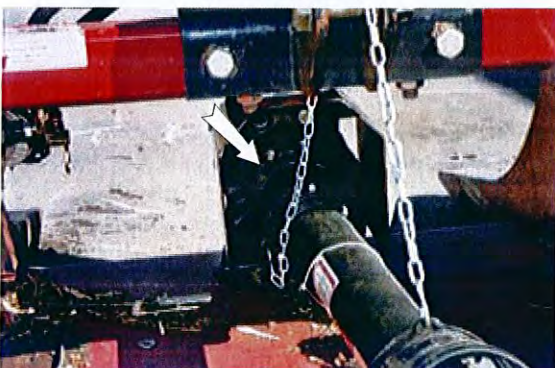
- Disengage PTO clutch.
- Back out of cut.
- Re-engage PTO when clear of the cut and bring saw blade back up to operating speed.
- Slowly move back into the cut and continue with the work.



Binding (Typical)



Hydraulic Motor



Slip Clutch

FIG. 18 BINDING/UNPLUGGING

12. **Overload Protection:**

When the saw blade is overloaded from binding or cutting too aggressively, the blade will stop. Actions to take to prevent overloading include but are not limited to:

- a. Slowing forward speed.
- b. Move into the tree until the blade speed starts to slow. Back out until blade clears the tree. Then move into the tree again 1 inch (25 mm) above or below the first cut. This will provide a deeper cut and minimize binding.

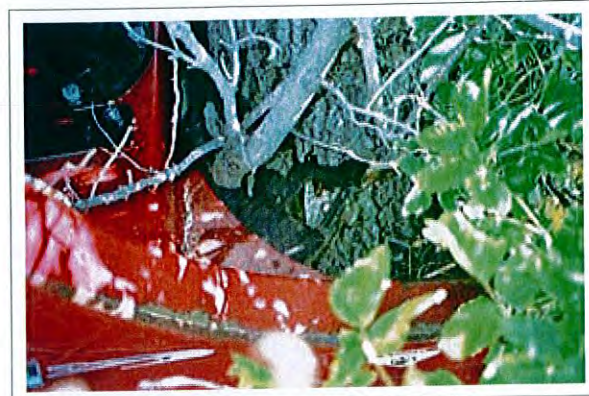


FIG. 19 OVERLOAD PROTECTION

13. **Slip Clutch:**

The PTO driveline on the 3 Point Hitch model is designed with a slip clutch to prevent damage from overloading the drive system components. It is set from the factory and does not require servicing or adjustments.



FIG. 20 SLIP CLUTCH

14. **Grapple:**

The Tree Saw is designed with a grapple on the front of the frame to allow the operator to pick up the cut tree or brush and move it.

NOTE:

Always select the low-flow range on the skid steer hydraulic circuit when using the grapple. Return to high-range before resuming work.



Tree



Brush

FIG. 21 GRAPPLE

15. **Carbide Teeth:**

The machine is designed with replaceable carbide teeth on the edge of the saw blade to remove wood. Teeth will wear quickly if sand, soil, wire and other hard materials are encountered during operation. Check the condition of the teeth if encountering metal or rocks and replace if chipped, bent or broken.

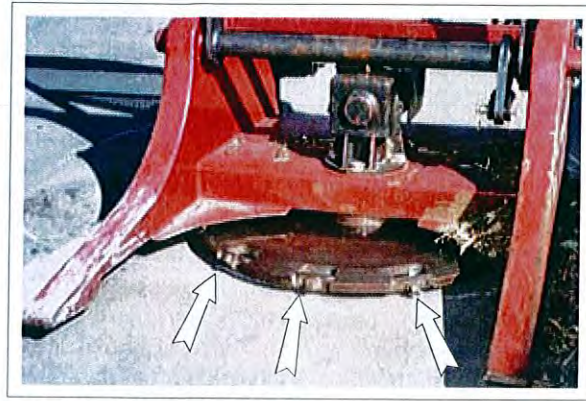


FIG. 22 CARBIDE TEETH

16. **Power Lines:**

When used with a skid steer power unit, the loader can be raised high enough for material to potentially contact overhead power lines. Contact with power lines can lead to serious injury or death from electrocution. To prevent electrocution, do not work around power lines.



17. **Thrown Object Hazard:**

When tree saw carbide teeth contact wooden material, they generate chips, splinters and other small debris that can be thrown out from under the machine. These can be thrown with enough force to seriously injure or kill. Do not direct the discharge toward people, animals or buildings when operating. Do not allow anyone to stand next to the machine during operation. Use special care when operating in populated or congested areas.



FIG. 23 OPERATING



18. Application Hints:

- a. Always direct the stream of chips away from people, animals or property to avoid injury or damage.



- b. Use the top portion of the grapple to push the tree over when cuttings to prevent it from falling back on the power unit.
- c. Use the grapple to move trees and brush out of the working area as required.



FIG. 24 WORKING



Trees



Brush

FIG. 25 GRAPPLE

4.10 TRANSPORTING



TRANSPORT SAFETY

- Comply with state and local laws governing highway safety and movement of machinery on public roads.
- The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements.
- At all times when driving the power unit and equipment on the road or highway under 20 mph (32 kph), use flashing amber warning lights and a slow moving vehicle (SMV) identification emblem. Do not exceed 20 mph (32 kph). Reduce speed on rough roads and surfaces.
- Plan your route to avoid heavy traffic.
- Use a mounting pin with provisions for a retainer. Install the retainer.
- Do not drink and drive.
- Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc. Watch for traffic when operating near or crossing roadways.
- Never allow riders on either power unit or machine.

When transporting the machine, review and follow these instructions:

1. Clear the area of bystanders, especially small children.
2. Insure that the machine is securely attached to the power unit with mechanical retainers through the mounting pins.
3. At all times when driving the power unit and equipment on the road or highway under 20 mph (32 kph), use flashing amber warning lights and a slow moving vehicle (SMV) identification emblem. Do not exceed 20 mph (32 kph). Reduce speed on rough roads and surfaces.
4. Do not allow riders on Tree Saw.
5. Never exceed a safe travel speed. Never travel faster than 32 kph (20 mph). The ratio of the power unit weight to the machine weight plays an important role in defining acceptable travel speed. The following table summarizes the weight ratio to travel speed.
6. Always shift to a lower gear when going down hill to use the engine as a restraining force.
7. Apply the brakes carefully to prevent losing control.
8. Never disengage power unit transmission and coast down hills. Always keep power unit in gear.
9. When transporting on a trailer, tie down securely before transporting.

Table 2 **Travel Speed vs. Weight Ratio**

Road Speed	Weight of fully equipped or loaded implement(s) relative to weight of power unit
Up to 32 km/h (20 mph)	1 to 1, or less
Up to 16 km/h (10 mph)	2 to 1, or less
Do not push	More than 2 to 1



FIG. 26 TRANSPORTING ON TRAILER

4.11 STORAGE



STORAGE SAFETY

- Store the unit in an area away from human activity.
- Do not permit children to play on or around the stored machine.
- Store the unit in a dry, level area. Support the frame with planks if required.

At the end of the season, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the beginning of the next season. Follow this procedure:

1. Thoroughly wash the machine with a pressure washer or water hose to remove all dirt, mud, debris or residue.
3. Lubricate all grease points to remove any water residue from washing.
4. Remove any material that has become entangled around any moving part.
5. Touch up all paint nicks and scratches to prevent rusting.
6. Move the machine to its storage area.
7. Store in a dry, level spot.
8. Store in an enclosed building if possible. If space is not available, cover with a waterproof tarpaulin and tie down securely.
9. Unhook from the power unit (see Section 4.7).
10. Place planks under the frame or rollers for added support if required.
11. Remove PTO shaft and store in a secure location if vandals are a concern.
12. Store in an area away from human activity.
13. Do not allow children to play around the stored unit.



FIG. 27 STORED (TYPICAL)

5 SERVICE AND MAINTENANCE



MAINTENANCE SAFETY

- Good maintenance is your responsibility. Poor maintenance is an invitation to trouble. Follow all maintenance instructions.
- Follow good shop practices.
 - Keep service area clean and dry.
 - Be sure electrical outlets and tools are properly grounded.
 - Use adequate light for the job at hand.
- Never wear ill-fitting, baggy or frayed clothing when working around or on the drive system components.
- Before working on this machine, shut off the power unit engine, set the brakes, remove the ignition keys and disconnect driveline. Keep hands, feet, hair and clothing away from moving or rotating parts.
- Never work under equipment unless it is blocked securely.
- 6. Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance work.
- Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.
- A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
- Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to ensure unit is in a safe condition.
- When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

5.1 SERVICE

5.1.1 FLUIDS AND LUBRICANTS

1. **Grease:**
Use an SAE multipurpose high temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multipurpose lithium base grease.
2. **Gearbox Oil:**
Use an SAE 85W90, synthetic or equivalent gear oil for all operating conditions.

Capacity: 1.0 US qt.
3. **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 contaminants.

5.1.2 GREASING

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

1. Use a hand-held grease gun for all greasing.
2. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
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.

5.1.3 SERVICING INTERVALS

The period recommended is based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication or oil changes.

8 - 10 Hours or Daily

1. Grease PTO Driveline (3 locations).

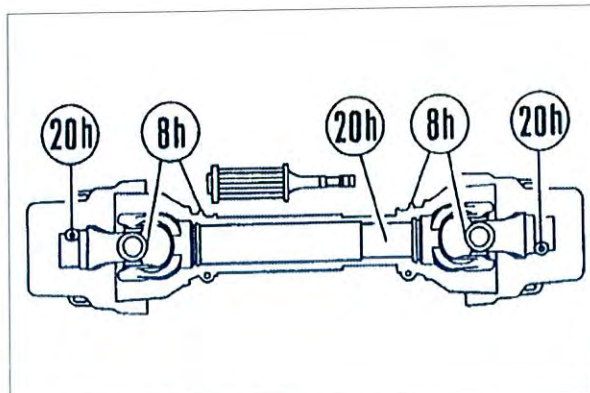


FIG. 28 PTO DRIVELINE

20 Hours

1. Grease PTO Driveline (3 locations).
2. Grease the telescoping section of the PTO shaft.



FIG. 29 PTO DRIVELINE LUBRICATION

50 Hours

1. Grease grapple bushings.



FIG. 30 GRAPPLE BUSHINGS

2. Check oil level in gearbox.

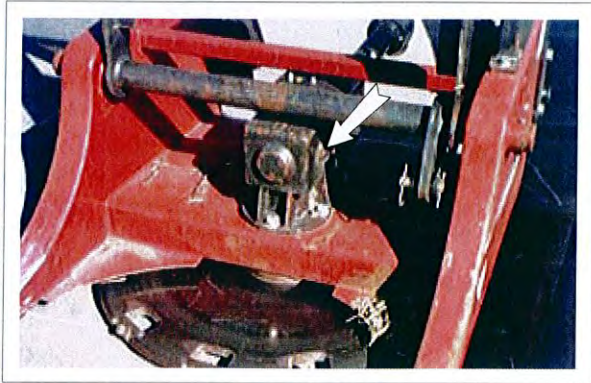


FIG. 31 GEARBOX LEVEL PLUG

Annually

1. Clean machine.



FIG. 32 MACHINE

2. Change gearbox oil.

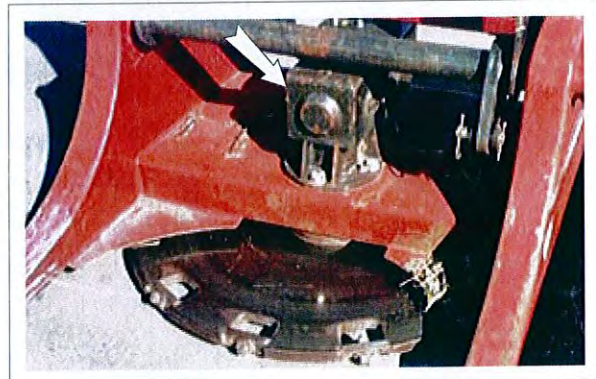


FIG. 33 GEARBOX

5.1.4 SERVICE RECORD

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

ACTION CODE: CL CLEAN CK CHECK G GREASE

Maintenance

[illegible]

5.2 MAINTENANCE

By following a careful service and maintenance program for your machine, you will enjoy many years of trouble-free service.

5.2.1 CARBIDE TEETH

The machine is designed with carbide teeth on the rim of the saw blade to contact and remove wood material from trees while operating. They must be maintained in good condition to function efficiently. Check the condition of the teeth at the start of each working day. Replace if bent, chipped or broken.

To replace teeth, follow this procedure:

1. Stop power unit engine, lower machine to ground, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
2. Loosen and remove the mounting bolt anchoring the tooth.
3. Replace with genuine Tebben parts.
4. Tighten mounting bolt to its specified torque.
5. Repeat with remaining teeth.

NOTE:

Always check the condition of the teeth after encountering any rocks, metal objects or hard debris.

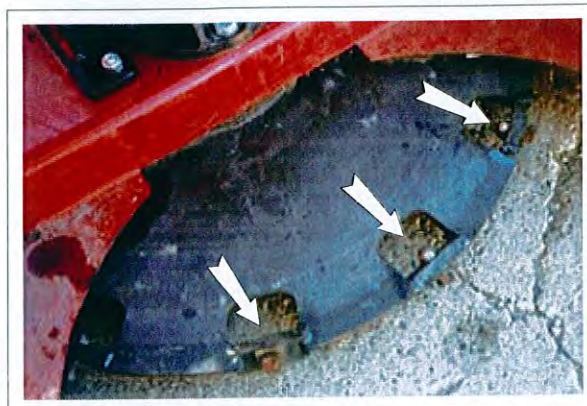


FIG. 34 CARBIDE TEETH

5.2.2 GEARBOX OIL

Each Tree Saw blade is driven by a hydraulic motor or a PTO shaft into a gearbox. Each gearbox is equipped with a drain, level and fill plug. Every 100 hours, the oil level should be checked. Every 500 operating hours or annually, whichever comes first, the oil should be replaced. Check more frequently if there are leaks around any of the plugs or shaft seals.

When checking oil level or changing oil, follow this procedure:

1. Run the machine until the gearbox is warm. Warm oil will remove more contaminants than cold, stagnant oil.
2. Stop power unit engine, lower machine to ground, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. **Checking Oil Level:**
 - a. Remove the level plug from the side of the gearbox.
 - b. When the oil just fills the threads of the level plug hole, it is at the correct level.
 - c. If required, add oil through the fill/breather plug.
 - d. Reinstall and tighten level and breather/fill plugs.
4. **Changing Oil:**
 - a. Place a container under the drain plug.
 - b. Remove the drain, level and fill/breather plugs.
 - c. Allow 10 minutes for oil to drain.
 - d. Reinstall and tighten drain plug.

NOTE:

It may be necessary to add teflon tape or pipe sealant to the drain plug threads prior to installation to prevent leakage.

- e. Add new gear oil. Use the level plug to determine the correct amount of oil.
- f. Check to make sure the air passage through the fill/breather plug is open.
- g. Reinstall and tighten the fill/breather and level plugs.
- h. Dispose of the used oil in an environmentally safe manner.



FIG. 35 GEARBOX

5.2.3 BREATHER CLEANING

Each gearbox is equipped with a breather in the fill plug that vents the internal pressure to atmosphere. As the gearbox temperature increases and decreases during operation, pressure in the gearbox will increase or decrease if it is not vented. An increase in internal pressure can cause the shaft seals to leak until the gearbox runs low or out of oil.

To check or clean the breather, follow this procedure:

1. Stop power unit engine, lower machine to ground, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
2. Remove the fill/breather plug from the gearbox.
3. Inspect the vent passage.
4. If plugged, soak in solvent overnight.
5. Use a high-pressure air hose to blow and debris out of the passage. Carefully use a probe to clear the passage if caked in dirt.
6. Reinstall and tighten fill/breather plug.

IMPORTANT:

Always clean the breather if any leaks are noticed around the shaft seals.



FIG. 36 GEARBOX

5.2.4 DRIVELINE MAINTENANCE

The PTO driveline is designed to telescope to allow for dimensional changes as the machine goes through its operational range. A tubular guard encloses the driving components and is designed to turn relative to the driving components. The driveline should telescope easily and the guard turn freely on the shaft at all times. Annual disassembly, cleaning and lubrication is recommended to insure that all components function as intended. To maintain the driveline, follow this procedure:

1. Stop power unit engine, lower machine to ground, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
2. Remove the driveline from the machine.
3. Pull driveline apart.
4. Use a screwdriver to remove 3 anchor screws holding tube to bell.
5. Pull the shaft out of the plastic tubular guard and bell.
6. Use a solvent to clean the male and female portions of the telescoping ends.
7. Apply a light coat of grease to each end.
8. Use a solvent to wash the grooves on each end where the bearings run. Clean the grooves on each end.
9. Apply a light coat of grease to each groove.
10. Insert the shaft into its respective guard and align.
11. Install and tighten the anchor screws.
12. Check that each guard turns freely on bearings and its shaft.
13. Reassemble the driveline.
14. Check that the driveline telescopes easily.
15. Replace any components that are damaged or worn.
16. Reinstall the driveline on the machine.



Anchor Screws



Disassembled

FIG. 37 PTO DRIVELINE (TYPICAL)

6 TROUBLE SHOOTING

The Tebben Ent. Tree Saw is designed to cut trees or brush and use the grapple to move the cut material. It is a simple system that requires minimal maintenance.

In the following Trouble Shooting section, we have listed many of the problems, causes and solutions that can help you to solve the problems that you might encounter.

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please call your dealer, distributor or the factory. Before you call, please have this Operator's Manual and the serial number of your machine at hand.

PROBLEM	CAUSE	SOLUTION
PTO Model		
Saw blade doesn't turn.	Slip clutch failure.	Replace slip clutch.
	PTO clutch failure.	Have power unit checked by your local dealer.
Machine vibrates.	Driveline out of phase.	Detach driveline from power unit. Take apart. Rotate ends 90° and reassemble. Repeat procedure until vibration is gone.
Skid Steer Model		
Saw blade doesn't turn.	Hydraulic motor failure.	Replace hydraulic motor.
	Hydraulic flow too low.	Switch hydraulic system to high range.
Both models		
Grapple doesn't move.	Hydraulic flow too high.	Switch hydraulic system to low range.
	Incorrect circuit.	Switch circuit to grapple and system to low range.

7 SPECIFICATIONS

7.1 MECHANICAL

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

7.2 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	Nut Size Across Flats	Torque Value*		Recommended Turns To Tighten (After Finger Tightening)	
		(N.m)	(lb-ft)	(Flats)	(Turn)
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

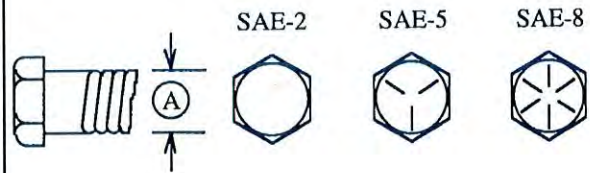
7.3 BOLT TORQUE

CHECKING BOLT TORQUE

The tables shown below give correct torque values 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.

TORQUE SPECIFICATIONS

Bolt Diameter "A" 1/4"	Bolt Torque *					
	SAE 2		SAE 5		SAE 8	
	N.m	(lb-ft)	N.m	(lb-ft)	N.m	(lb-ft)
5/16"	8	(6)	12	(9)	17	(12)
3/8"	13	(10)	25	(19)	36	(27)
7/16"	27	(20)	45	(33)	63	(45)
1/2"	41	(30)	72	(53)	100	(75)
9/16"	61	(45)	110	(80)	155	(115)
5/8"	95	(70)	155	(115)	220	(165)
3/4"	128	(95)	215	(160)	305	(220)
7/8"	225	(165)	390	(290)	540	(400)
1"	230	(170)	570	(420)	880	(650)
	345	(225)	850	(630)	1320	(970)



Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

* Torque value for bolts and capscrews are identified by their head markings.

8 PARTS

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PARTS LIST

This manual contains a parts list for your machine. It is divided into major sections which correspond to the groups shown in the table of contents and the accompanying illustration.

The first page of each major section lists the contents of that section, each of which consists of exploded views and related tabular listings.

WHEN ORDERING PARTS

Always give your dealer the Model and Serial Number of your machine to assist him in ordering and obtaining the correct parts. Use the exploded view and tabular listing of the area of interest to exactly identify the required part.

USING THE MANUAL

Parts data consists of exploded view illustrations and associated parts list tables which are read as follows:

ITEM

The item number is the identifier number from the illustration. For example, number 3 on an illustration points to a component which is item 3 on the accompanying table.

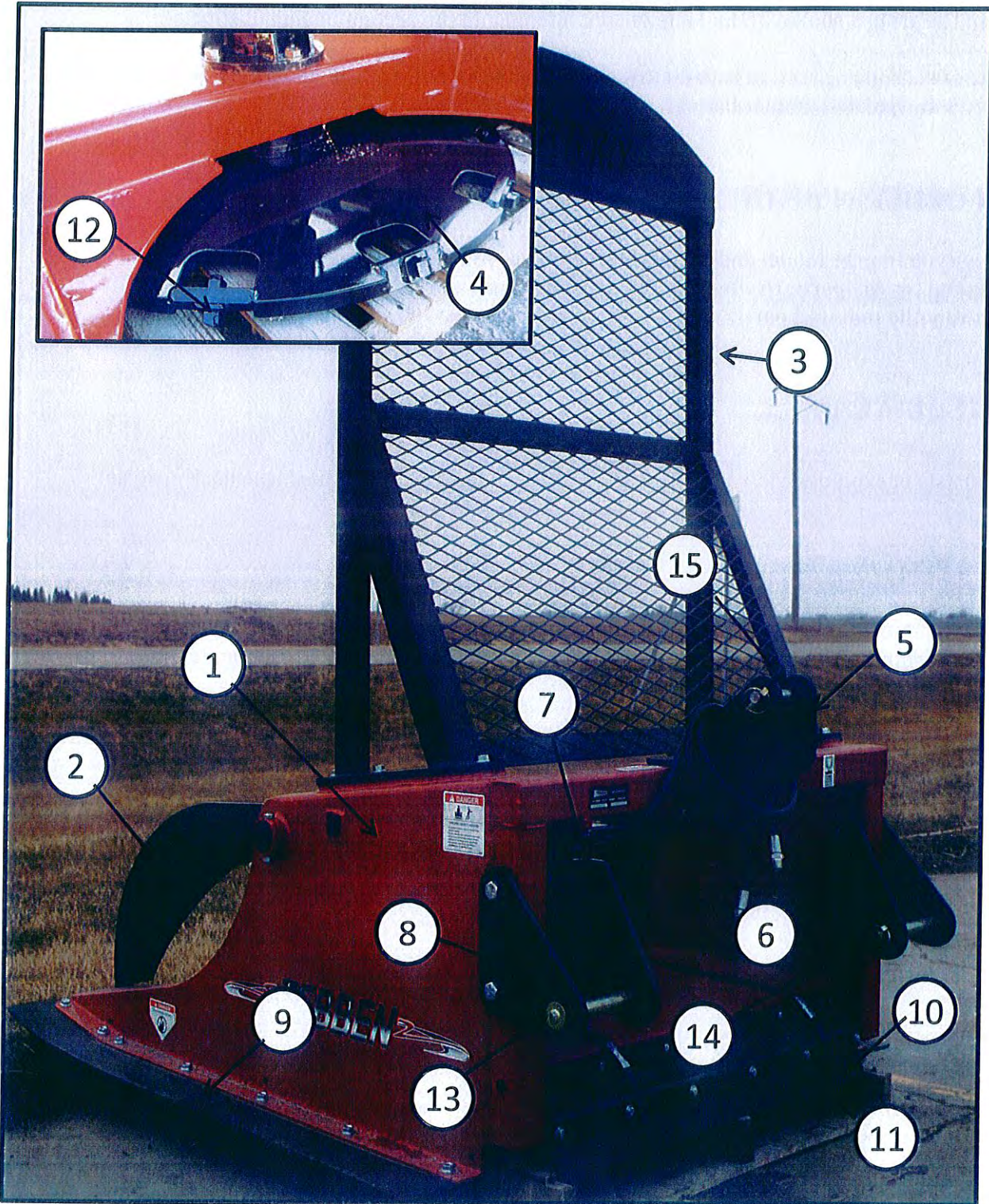
PART NUMBER

The part number is the number by which the component may be identified and ordered from Tebben Enterprises and its network of dealers and distributors.

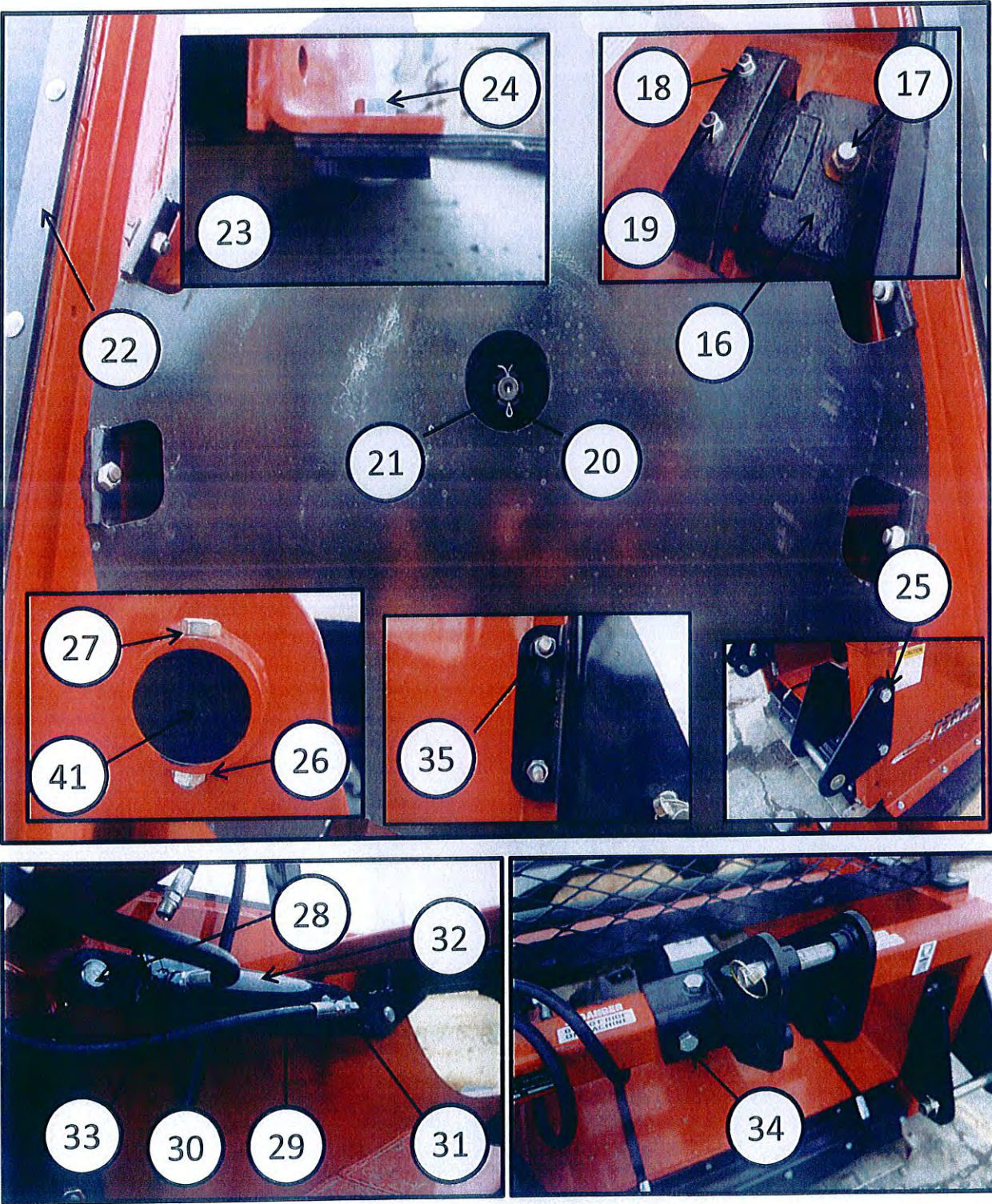
DESCRIPTION

This column contains the name and description of the part.

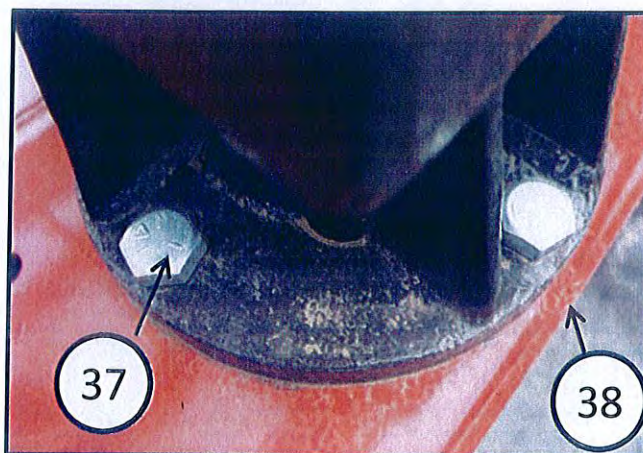
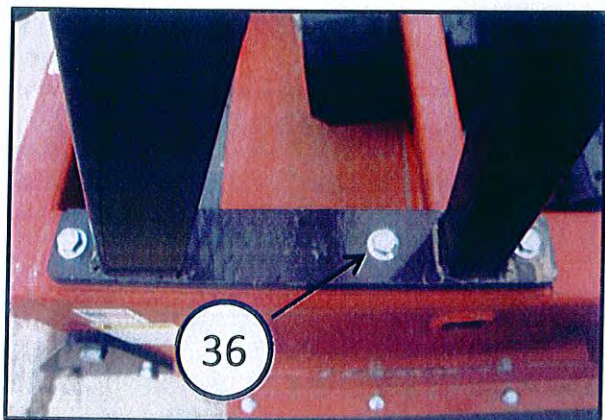
TREE SAW PARTS BREAKDOWN



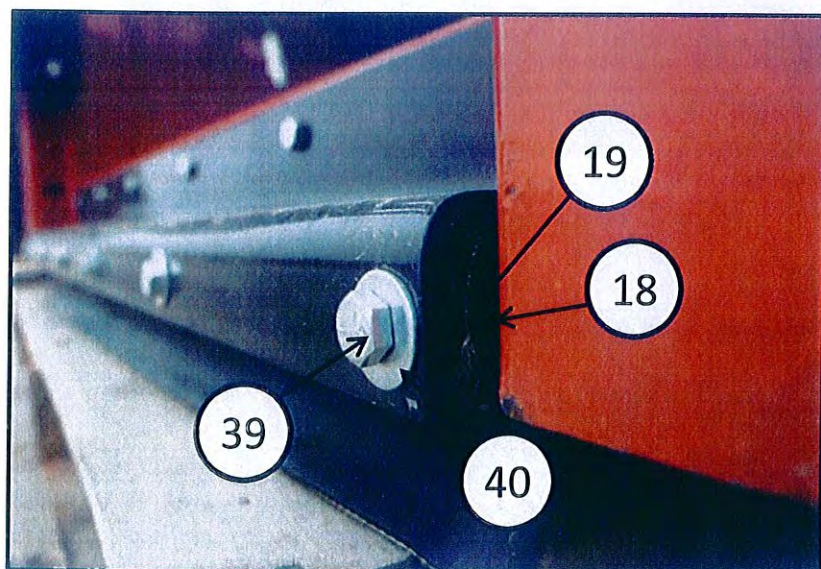
TREE SAW PARTS BREAKDOWN



TREE SAW PARTS BREAKDOWN



Ref. No. 38 (3/4-10 Nylon Lock Nut Not Shown in Picture)



TREE SAW PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	QTY
1	18-140	MAIN FRAME	1
2	18-150	GRAPPLE (OPTIONAL)	1
3	18-160	BACK GUARD	1
4	18-110	CUTTING WHEEL	1
5	18-375	UPPER 3PT BRACKET	1
6	18-380	LOWER 3PT BRACKET INNER LH	1
7	18-385	LOWER 3PT BRACKET INNER RH	1
8	18-370	LOWER 3PT BRACKET OUTER	2
9	18-145	RUBBER SIDE GUARD	2
10	18-125	RUBBER GUARD REAR	1
11	18-120	REAR DEFLECTOR BRACKET	1
12	18-115	CARBIDE CUTTING TOOTH W/ LOCK NUT	12
13	60-991	LOWER 3PT PIN	2
14	TZ75-00-34	LYNCH PIN	3
15	18-376	UPPER 3PT PIN	1
16	60-975	GEARBOX (75HP)	1
17	09-008	BREATHER	1
18	60-927	3/8 LOCK WASHER	14
19	60-926	3/8-16 HX NUT	14
20	64-662	3/16 X 1-1/2 COTTER PIN	1
21	64-661	CASTLE NUT	1
22	18-130	STRAP	2
23	8-7013	1/2-13 X 1-1/2 CARRIAGE BOLT 5NC	14
24	83D8	1/2-13 FLANGE LOCK NUT	14
25	18-406	3/4-10 X 5-1/2 HX CAP 5NC	4
26	60-903	1/2-13 CENTER LOCK NUT	2
27	18-407	1/2-13 X 3-1/2 HX CAP 5NC	2
28	53-1040	CYLINDER PIN	2
29	18-400	HYDRAULIC HOSE	1
30	18-405	HYDRAULIC HOSE	1
31	18-409	HYDRAULIC ADAPTOR 90 DEGREE	1
32	53-4003	HYDRAULIC CYLINDER	1
33	22-827	HYDRAULIC ADAPTOR STRAIGHT (6400-6-6)	1
34	18-408	3/4-10 X 4-1/2 HX CAP 5NC	4
35	60-925	3/4-10 CENTERLOCK NUT	8
36	18-410	1/2-13 X 1-1/2 FLANGE BOLT	6
37	60-934	3/4-10 X 2-1/2 HX CAP 5NC	4
38	61-625	3/4-10 NYLON LOCK NUT	4
39	TZ75-00-141	3/8-16 X 1 HX CAP 5NC	12
40	19-6015	3/8 FLAT WASHER	12
41	18-1507	Grapple Pin	2

HYDRAULIC SAFETY & MAINTENANCE

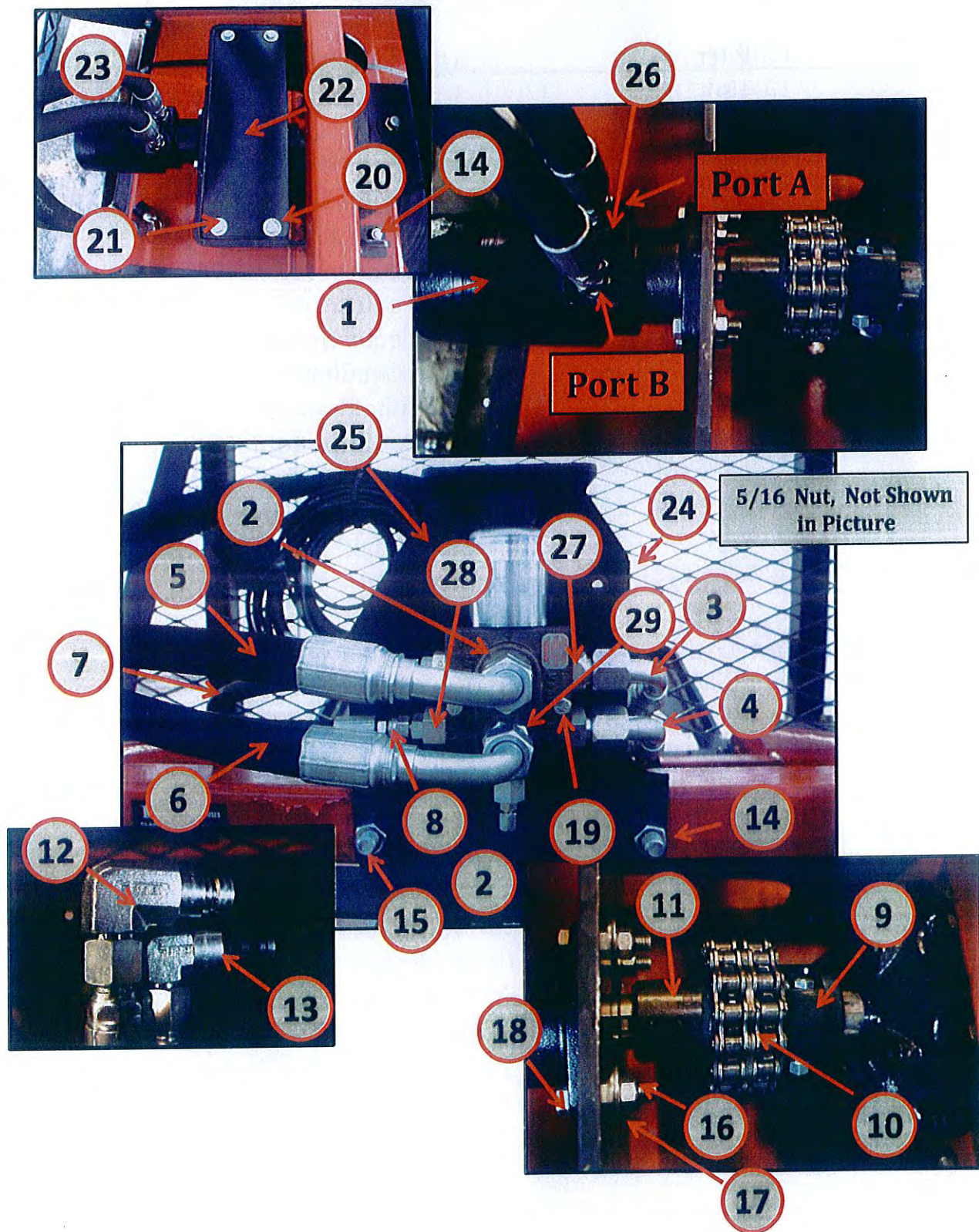
Before operating the unit, check all hydraulic hoses and fittings for wear or leaks. Replace hoses or fittings if needed.

Inspect quick couplers on hose ends and clean any dirt or debris that may be present. If damaged, replace to assure proper function.

While servicing your unit, if hydraulic leaks are found, check hose ends for tightness and tighten if needed. If hose is damaged, replace to assure proper safety.

For replacement parts, contact your local dealer or distributor.

MODEL TTS12-200 TREE SAW PARTS BREAKDOWN



TTS12-200 TREE SAW PARTS LIST

SKID STEER MOUNTED TREE SAW

Ref. No.	Part No.	Description	Qty
1	18-410	Hydraulic Motor	1
2	18-415	Valve	1
3	18-416	Hydraulic Hose	1
4	18-417	Hydraulic Hose	1
5	18-418	Hydraulic Hose	1
6	18-419	Hydraulic Hose	1
7	18-420	Hydraulic Hose	1
8	18-421	Hydraulic Hose	1
9	18-135	Gearbox Coupler	1
10	19-1048	Coupler Chain	1
11	18-130	Hydraulic Motor Coupler	1
12	19-5014	Male Quick Coupler	1
13	19-5015	Female Quick Coupler	1
14	60-925	¾-10 Hex Nut, Center Lock	6
15	18-406	¾-10 x 5 ½ Hex Bolt	2
16	53-85D8	½-13 Hex Nut, Top Lock	4
17	61-613	½ Flat Washer	4
18	18-426	½-13 x 1 ¾ Hex Bolt	4
19	18-427	5/16-18 x 3 Hex Bolt	2
20	19-5016	3/8 Flat Washer	4
21	TZ75-00-141	3/8-16 x 1 Hex Bolt	4
22	18-201	Shield	1
23	18-200	Hydraulic Motor Bracket	1
24	60-904	5/16-18 Hex Nut, Center Lock	2
25	18-155	Valve Bracket	1
26	18-428	Hydraulic Motor Adaptor	2
27	18-429	Straight Adaptor w/ Check Valve	1
28	18-433	Straight Hydraulic Adaptor	2
29	18-436	Straight Hydraulic Adaptor	3