TurboSaw

OPERATORS MANUAL

DOUGHERTY
FORESTRY
MANUFACTURING

DELIVERY RECORD

PLEASE KEEP & FORWARD COPY

- The checklist is a reminder of very important information which should be conveyed to the customer at the time the Turbo Saw Skid steer saw unit is delivered.
  Check off each item as it is fully explained to the customer.

- Dougherty Forestry Manufacturing warranty.
- Safe and correct operation and service.
- Daily and periodic inspections.
- Servicing machine regularly and correctly.
- Explain proper cutting procedures.
- Give the Operator's Manual to the customer and encourage customer to read entire manual.
- Advise customer of safety precautions that must be observed while using the skid steer saw.
- Review information on how to maintain the skid steer saw (See Maintenance section.)
- Review recommended procedures for attaching to or detaching from skid steer (See Attaching and Detaching section.)
- Recommended transporting information. (See Transporting section.)
- Review equipment safety features (i.e. pushing bar, blade shield).
- Review skid steer saw operation. (See Operating the Cutter section.)
- Review service intervals and lubrication points. (See Lubrication and Maintenance section.)
- Review all adjustments. (See Service section.)
- Recommended machine storage.
- Have customer record machine serial number in the Introduction section.
- Dougherty Forestry parts and service.
- Remove and file this page.

DATE DELIVERED _____

SIGNATURE _____

***DATE OF PURCHASE/WARRANTY CERTIFICATE**

MODEL NUMBER_____ UNIT SERIAL NUMBER _____

PURCHASE DATE _____

DEALER (if purchased through dealer) _____

ORIGINAL PURCHASER (PRINT)

ADDRESS _____

CITY _____

STATE _____ ZIP _____

PHONE _____ _____

FAX _____

EMAIL _____

SIGNATURE _____

PLEASE COPY, AND MAIL OR FAX TO:

Dougherty Forestry Manufacturing LTD Co.

211 W. Canyon Run,

Hinton, OK 73047

FAX: (405) 542-6928

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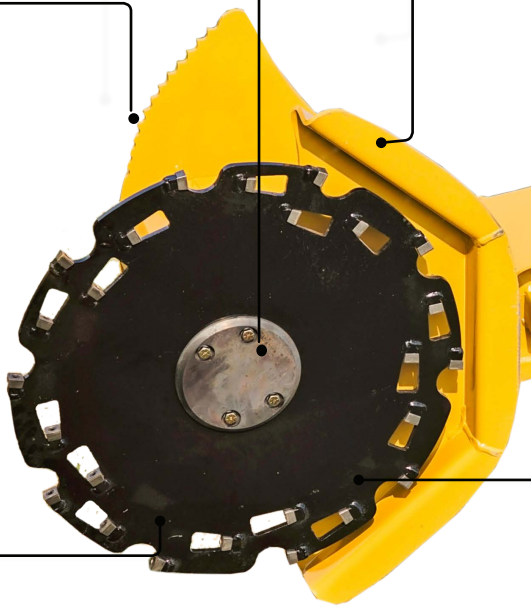
HYDRAULIC ROTATE/SWING/GRIND SAW: RS2600HD RS3000HD RS3400HD

V-Shield
Should a tree or branch fall in the direction of the skid loader, the V-shield deflects it to either side. This is especially useful when trimming limbs where the fall of the limb may be unpredictable.

Hardened Skid Plate
A hardened steel skid plate is fastened to the cutting disc protecting its fasteners from wear. This makes it possible to cut below ground level.

Rotating Cutting Head
The cutting head rotates from horizontal to vertical at the touch of a button. This is an ideal feature for trimming limbs or cutting along fence rows.

Pushing Guard Lid
The lid on the rotating saw's head doubles as a pushing guard. The pushing guard allows the operator to direct the fall of a tree away from himself and his machine.

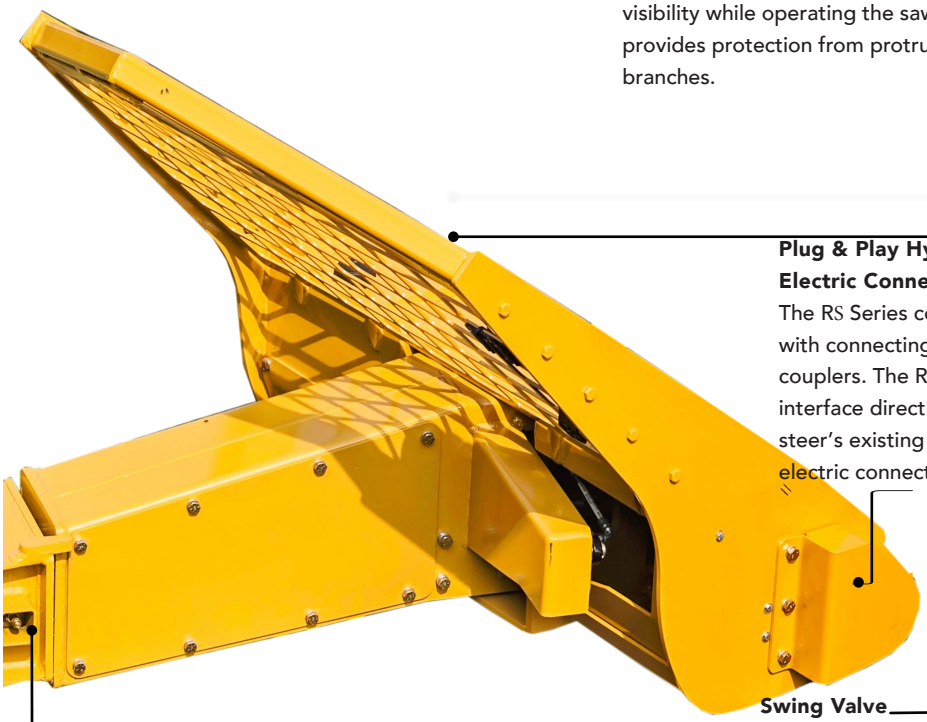


High-Speed Cutting Disc
The cutting disc on the Turbo Saw turns at 2,000 rpm allowing the Turbo Saw to cut brush as well as trees. Powering the cutting disc is a heavy-duty drive train consisting of a high volume hydraulic motor, spherical bearings, and a machined billet hub.

TS3 Cutting Tooth System
The TS3's impact resistant carbide allows for ground contact and it can be rotated 3 times for up to 500 hours of life. Its durability lies in the unique bolt-on tooth design and a low profile bite.

150° Blade Shield
A blade shield covers 150° of the blades circumference. This projects cut material away from the operator.

Full Mesh Shield
The mesh shield offers excellent visibility while operating the saw and provides protection from protruding branches.

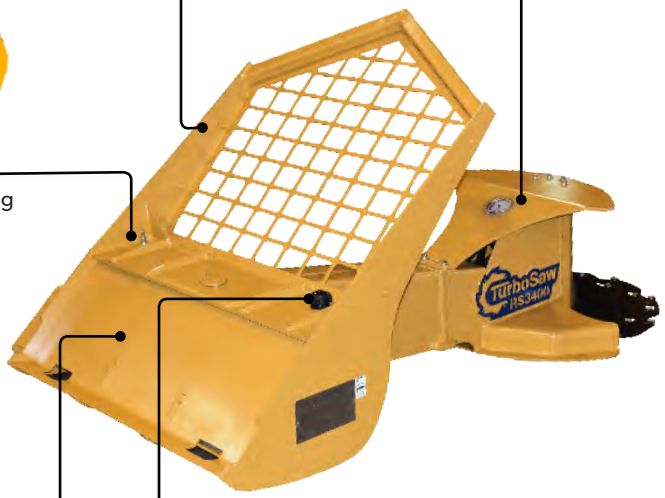


Plug & Play Hydraulic and Electric Connections
The RS Series comes standard with connecting hoses and couplers. The RS Series controls interface directly with the skid steer's existing hydraulic and electric connections.

Ingenuity in Frame Design
The frame has been designed to give the operator a 7' reach from the attachment plate to the tip of the blade. All the hydraulic and electric components have been fitted inside the frame to protect them from operational hazards.

RPM Gauge
The RS Series comes with an RPM gauge for monitoring the operating system.

Swing Valve
Adjustable swing control valve.



Brass Sprayer Tip
The elbow fittings and sprayer tip are made of corrosion resistant brass.

Multi-Surface Blade
Multi-surface blade features 25 cutting teeth multi-layered for grinding capability.

Universal Quick-Attach Mounting Bracket
The mounting bracket has been engineered with a generous roll back angle giving the operator the flexibility to reach difficult areas. The 7' boom allows for trimming up to 18' high, depending on the skid steer.

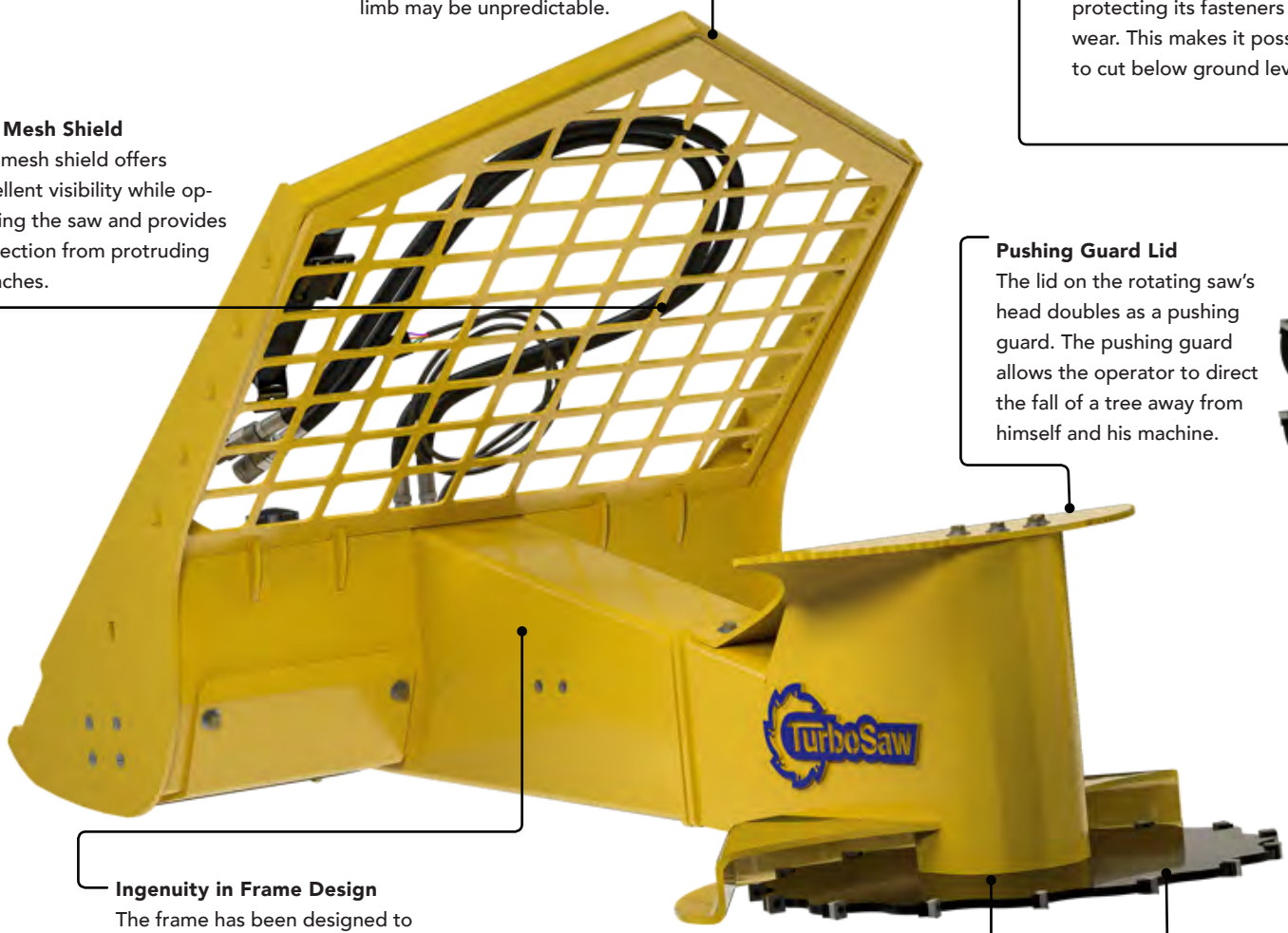
Hybrid Herbicide Diesel Sprayer System
The RS Series comes standard with a sprayer system to treat stumps for regrowth. This system includes: a 5 gallon, ploy-urethane sprayer tank, a hybrid herbicide/diesel sprayer pump, and brass fittings and sprayer tip. All sprayer system components are housed safely inside the frame.

HYDRAULICALLY ROTATE SAW: RT2600HD RT3000HD RT3400HD

V-Shield
Should a tree or branch fall in the direction of the skid loader, the V-shield deflects it to either side. This is especially useful when trimming limbs where the fall of the limb may be unpredictable.

Hardened Skid Plate
A hardened steel skid plate is fastened to the cutting disc protecting its fasteners from wear. This makes it possible to cut below ground level.

Full Mesh Shield
The mesh shield offers excellent visibility while operating the saw and provides protection from protruding branches.



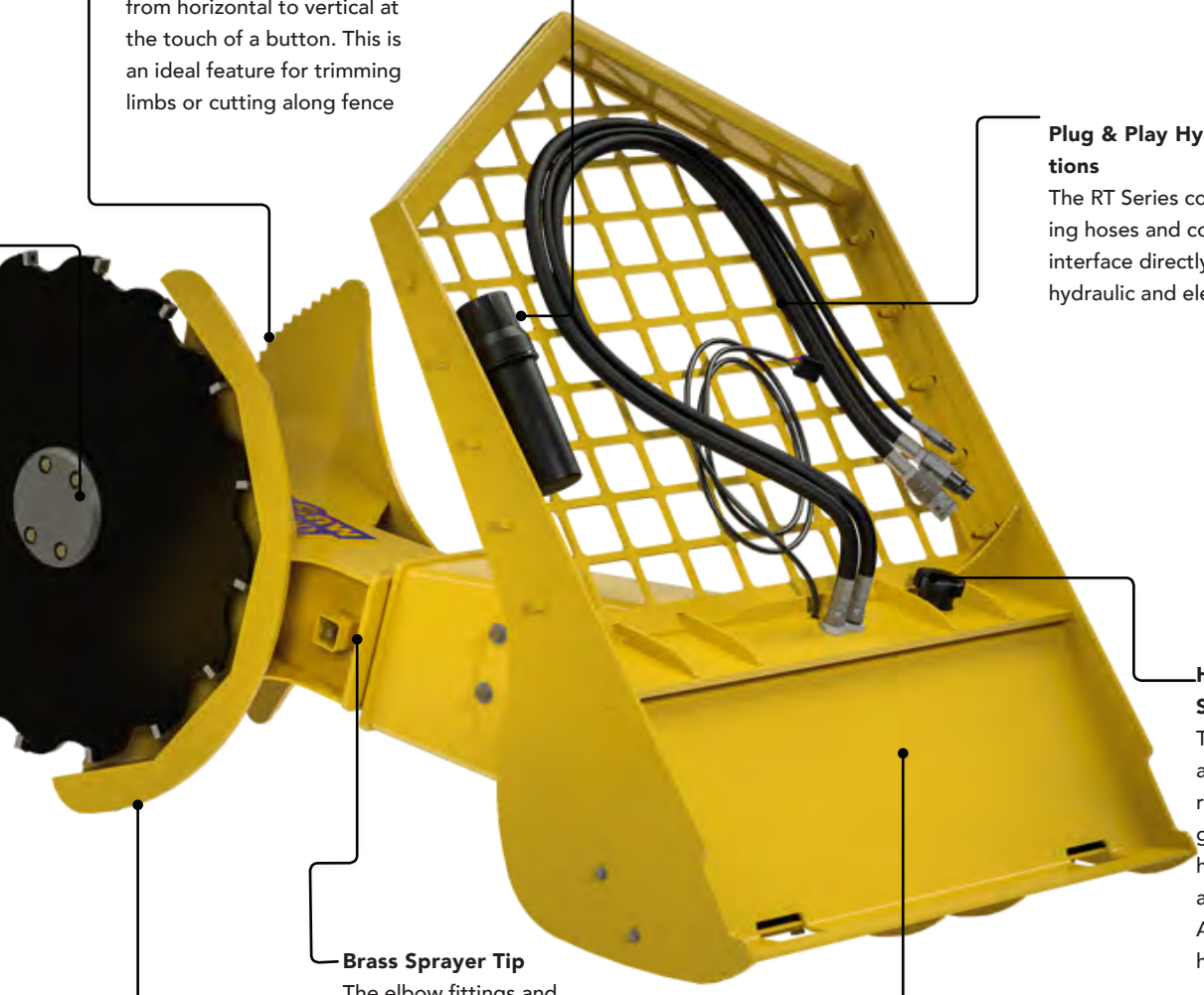
Pushing Guard Lid
The lid on the rotating saw's head doubles as a pushing guard. The pushing guard allows the operator to direct the fall of a tree away from himself and his machine.

Ingenuity in Frame Design
The frame has been designed to give the operator a 7' reach from the attachment plate to the tip of the blade. All the hydraulic and electric components have been fitted inside the frame to protect them from operational hazards.

TS3 Cutting Tooth System
The TS3's impact resistant carbide allows for ground contact and it can be rotated 3 times for up to 500 hours of life. Its durability lies in the unique bolt-on tooth design and a low profile bite.

Manual Canister
Safety is a primary concern at Dougherty Forestry Manufacturing. The operators manual is full of useful operating and safety tips and it is readily available in a durable, waterproof manual canister.

Rotating Cutting Head
The cutting head rotates from horizontal to vertical at the touch of a button. This is an ideal feature for trimming limbs or cutting along fence



Plug & Play Hydraulic and Electric Connections
The RT Series comes standard with connecting hoses and couplers. The RT Series controls interface directly with the skid steer's existing hydraulic and electric connections.

Hybrid Herbicide Diesel Sprayer System
The RT Series comes standard with a sprayer system to treat stumps for regrowth. This system includes: a 5 gallon, ploy-urethane sprayer tank, a hybrid herbicide/diesel sprayer pump, and brass fittings and sprayer tip. All sprayer system components are housed safely inside the frame.

Brass Sprayer Tip
The elbow fittings and sprayer tip are made of corrosion resistant brass.

Universal Quick-Attach Mounting Bracket
The mounting bracket has been engineered with a generous roll back angle giving the operator the flexibility to reach difficult areas. The 7' boom allows for trimming up to 18' high, depending on the skid steer.

150° Blade Shield
A blade shield covers 150° of the blades circumference. This projects cut material away from the operator.

High-Speed Cutting Disc
The cutting disc on the Turbo Saw turns at 2,000 rpm allowing the Turbo Saw to cut brush as well as trees. Powering the cutting disc is a heavy-duty drive train consisting of a high volume hydraulic motor, spherical bearings, and a machined billet hub.

TORQUE SAW: TQ3000 TQ3000R

Hardened Skid Plate
A hardened steel skid plate is fasted to the cutting disc protecting its fasteners from ware. This makes it possible to cut below ground level.

V-Shield
Should a tree or branch falls in the direction of the skid loader, the V-shield deflects it to either side. The is especially useful when trimming limbs where the fall of the limb may be unpredictable.

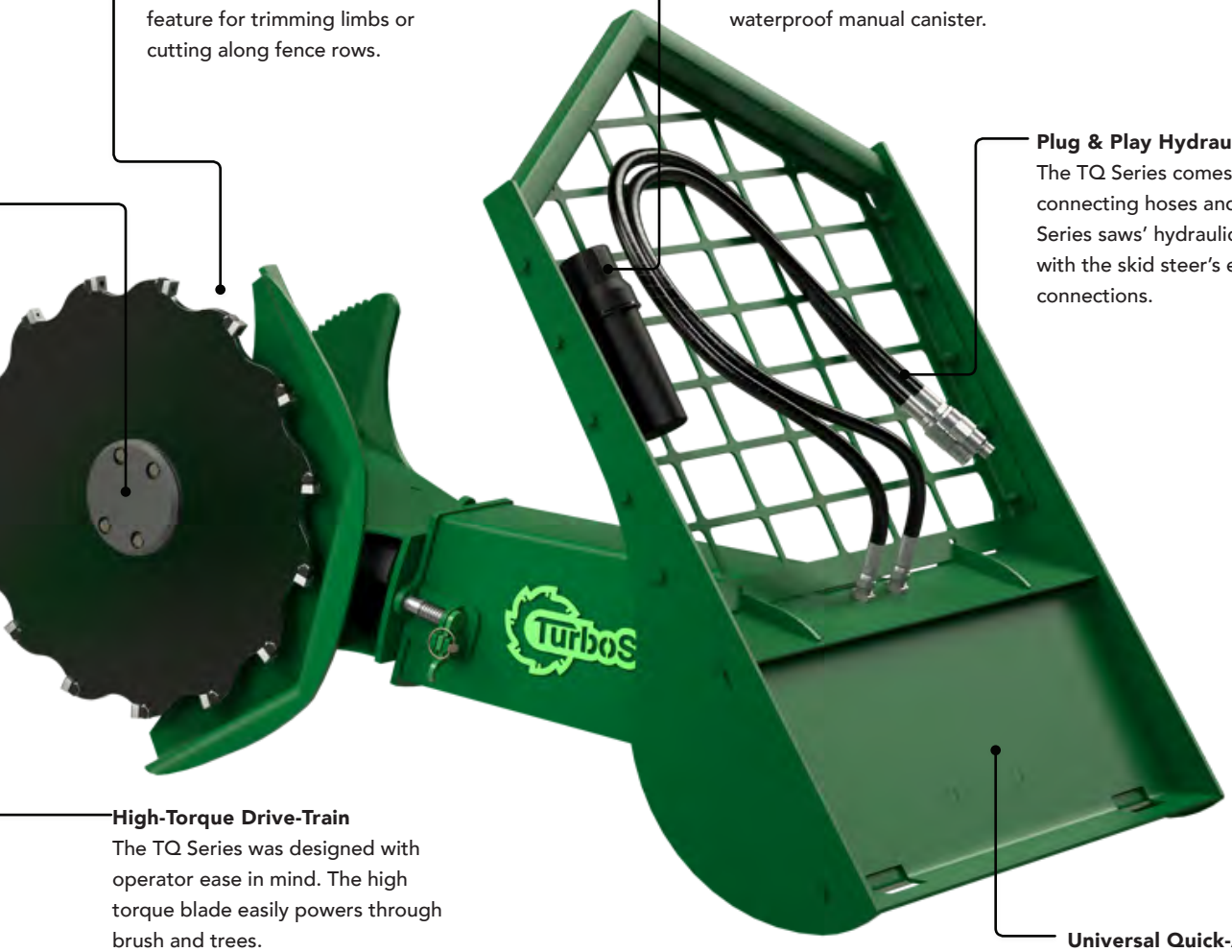
Full Mesh Shield
The mesh shield offers excellent visibility while operating the saw and provides protection from protruding branches.

Ingenuity in Frame Design
The frame has been designed to give the operator a 7' reach from the attachment plate to the tip of the blade. All the hydraulic components have been fitted inside the frame to protect them from operational hazards.

Rotating Cutting Head
The cutting head can be manually rotated from horizontal to vertical. This is an ideal feature for trimming limbs or cutting along fence rows.

Manual Canister
Safety is a primary concern at Dougherty Forestry Manufacturing. The operators manual is full of useful operating and safety tips and is readily available in a durable, waterproof manual canister.

Plug & Play Hydraulic Connections
The TQ Series comes standard with connecting hoses and couplers. The TQ Series saws' hydraulics interface directly with the skid steer's existing hydraulic connections.



High-Torque Drive-Train
The TQ Series was designed with operator ease in mind. The high torque blade easily powers through brush and trees.

TS3 Cutting Tooth System
The TS3's impact resistant carbide allows for ground contact and it can be rotated 3 times for up to 500 hours of life. Its durability lies in the unique bolt-on tooth design and a low profile bite.

Universal Quick-Attach Mounting Bracket
The mounting bracket has been engineered with a generous roll back angle giving the operator the flexibility to reach difficult areas. The 7' boom allows for trimming up to 18' high, depending on the skid steer.

WARRANTY

1 YEAR FRAME & COMPONENT WARRANTY POLICY

A. GENERAL PROVISIONS – The warranties described below are provided by Dougherty Forestry Manufacturing ("DFM") to the original purchasers of new Tree Clearing Equipment from DFM or authorized DFM dealers. Warranty begins on the date of product delivery to the original purchaser. Rental coverage is 90 days and begins upon date of initial rental. Under these warranties, DFM will repair or replace, at its option, any covered part which is found to be defective in material or workmanship during the applicable warranty term. Warranty service must be performed by a dealer or service center authorized by DFM to sell and/or service the type of product involved, which will use only new or remanufactured parts or components furnished by DFM. Warranty service will be performed without charge to the purchaser for parts or labor. The purchaser will be responsible, however, for any service call and/or transportation of product to and from the dealer's or service center's place of business, for any premium charged for overtime labor requested by the purchaser, and for any service and/or maintenance not directly related to any defect covered under the warranties below.

All claims for this warranty policy must be accompanied by a copy of the original sales receipt and must be made to dougherty forestry manufacturing in writing within eight (8) days after the occurrence. Any claim after the eight (8) days will automatically invalidate the warranty claim.

FRAME & COMPONENTS COVERAGE: Dougherty Forestry Manufacturing offers a twelve (12) month warranty from date of purchase by the original purchaser. Components may also be warranted by their original manufacturers which may vary from this warranty.

Coverage has the following exclusions: The original purchaser is responsible for and must bear the cost of: Normal maintenance of the machine such as greasing, minor adjustments, etc. Transportation of defective part(s) to and from Dougherty Forestry Manufacturing or such place where warranty work is being performed. This warranty does not cover any damage to the machine the DFM product is attached to nor subjected to falling trees or limbs, flying debris, hydraulic component damage.

B. WARRANTY COVERAGE: All metal housing, fabrication, and components of any new DFM product against manufactured defects and workmanship.

C. NON-WARRANTY COVERAGE: DFM is not responsible for the following: (1) Used Products: (2) Any product that

has been altered or modified in ways not approved by DFM (3) Depreciation or damage caused by normal wear and tear, lack of reasonable and proper maintenance, failure to follow operating instructions, damage due to improper use, abuse or neglect or conditions caused by abuse or neglect, misuse, lack of proper protection during storage, or accident (4) Normal maintenance parts and service. This warranty does not cover normal wear items. Such items would include, but not be limited to: blades, carbide inserts, backing blocks, bolts in wear areas, bearings or seals.

D. SECURING WARRANTY SERVICE: To secure warranty service, the purchaser must (1) Report the product defect to an authorized dealer and request repair within the applicable warranty term, (2) Present evidence of the warranty start date, and (3) Make the product available to the dealer or service center within a reasonable period of time.

G. LIMITATION OF IMPLIED WARRANTIES AND OTHER REMEDIES: DFM's Tree Clearing Equipment, to the extent permitted by law, neither DFM nor any company affiliated with it makes any warranties, representations or promises as to the quality, performance or freedom from defect of DFM's Tree Clearing Equipment covered by this warranty. Implied warranties or merchantability and fitness for a particular purpose, to the extent applicable, shall be limited in duration to the applicable period of warranty set forth on this page. The purchaser's only remedies in connection with the breach or performance of any warranty on the DFM Tree Clearing Equipment are those set forth on this page. In no event will the dealer, DFM, or any company affiliated with DFM be liable for incidental or consequential damages. (Note: some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages so the above limitations and exclusions may not apply to you.) This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

H. NO DEALER WARRANTY: The selling dealer makes no warranty of its own and the dealer has no authority to make any representation or promise on behalf of DFM, or to modify the terms or limitations of this warranty in any way.

This warranty does not cover damage caused by the operator due to improper use of the turbo saw or by using the attachment in a manner other than recommended in the operator's manual.

INTRODUCTION

PLEASE READ THE TURBO SAW SKID STEER SAW OPERATOR'S MANUAL BEFORE OPERATING THE SKID STEER SAW. THIS MANUAL MUST ACCOMPANY YOUR TURBO SAW UNIT AT ALL TIMES.

SAFETY IS THE FOREMOST PRIORITY OF DOUGHERTY FORESTRY MANUFACTURING.
Turbo Saws have been designed with operator safety in mind and we have specific guidelines to ensure that safety. Please read the Turbo Saw Skid Steer Saw operator's manual before operating the skid steer saw. Safety depends upon the operator thoroughly reading, understanding, and using the techniques and maintenance requirements specified in the Turbo Saw Skid steer saw operator's manual. This manual shows proper techniques and precautions for the skid steer saw. The skid steer saw must always be operated by the instructions outlined in this manual. The operator must always act responsibly. Dougherty Forestry Manufacturing can not be held liable for an operator's carelessness, recklessness, or misuse of its products. Do not use this product if it has been modified in any manner. If a skid steer saw owner has additional questions about operating or maintaining their skid steer saw, please contact our service center at (405) 542 3520.

Disclaimer: This manual is intended as a basic outline for safely operating the Turbo Saw tree cutting attachment, the practices within this manual are intended as a reference, and are not to be a substitute for conventional safety practices. DFM assumes no liability for any damage to persons or property as a result of misuse of its products. DFM assumes no liability for damage to persons or property due to lack of adherence to conventional safety practices in the Turbo Saw's intended field of use. Owner/operator assumes all liability when operating this product in its intended use as outlined buy this manual. The Owner/Operator of this product is strongly discouraged from operating this product outside of its intended use as outlined by this manual. DFM encourages owner/operator to fully read and understand this manual before attempting to use this product. Owner/operator should be aware of all risks in the forestry and land clearing industries before using this product.

SAFETY

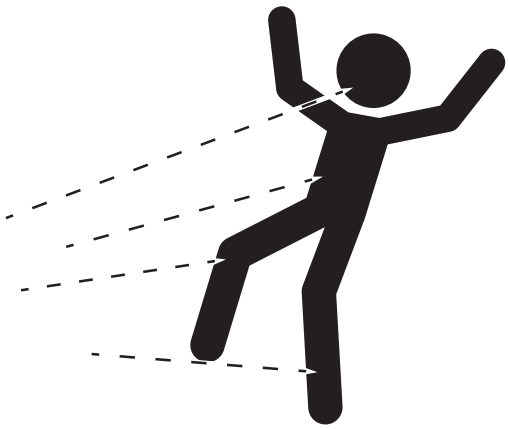
FOLLOW SAFETY INSTRUCTIONS
Carefully read all safety instructions in this manual and on your attachment prior to operation. Learn how to operate the machine and how to use your machines controls properly. Do not let anyone operate without instruction. Keep your machine in proper working condition. Do not operate a modified Turbo Saw attachment. If you do not understand any part of this manual and need assistance, contact your Turbo Saw dealer.

RECOGNIZE SAFETY INFORMATION
A signal word-DANGER, WARNING, or CAUTION are used along with the Safety Alert Symbol to alert you to important details.

DANGER
Immediate danger which, if not avoided will result in injury or death.

WARNING
Potential hazard which, if not avoided, could result in injury or death.

CAUTION
If not avoided could result in minor injuries or property damage.



PROTECT BYSTANDERS
Never operate the Turbo Saw near people or animals. Debris can be thrown hundreds of feet. Flying debris can cause serious injury or death. Never operate a modified Turbo Saw. The Turbo Saw must have its protective features intact. DO NOT allow children to operate the Turbo Saw attachment. Keep bystanders 500 feet away from machine.

Never operate when impaired!

ENVIRONMENT & LOCATION
Be aware of your environment and location. Do not cut trees in unsafe weather conditions. Rain, snow, wind, and other weather variables can cause vehicles, attachments, and cut material to behave uncontrollably. Do not cut trees near electrical lines. A cut tree could fall, break an electrical line, and cause serious injury or death. Do not cut near cliffs, canyons, or other dangerous terrain. A collapsed embankment could result in a fatal rollover. Avoid uneven terrain and steep slopes as these could result in a fatal rollover.

WEAR APPROPRIATE CLOTHING
1. Wear a mask to prevent inhalation of dust during operation. Wear a mask during maintenance to prevent inhalation of potentially hazardous fumes.
2. Wear safety goggles during operation and maintenance to prevent injury from dust and flying debris.
3. Wear welding goggles if welding. Only a licensed welder should perform welds on any Turbo Saw units.
4. Wear earmuffs during operation and maintenance since sudden or prolonged exposure to loud noise can cause impairment or loss of hearing.
5. Wear gloves, boots, hard hat, and safety vest if operation or maintenance job requires it.

GENERAL SAFETY

SAFETY REQUIRES AN ATTENTIVE AND KNOWLEDGEABLE OPERATOR.
Operators should be aware of their surroundings, equipment gauges, and controls. Radios and music headphones should not be turned on during maintenance and operation. Read the Turbo Saw manual before operating or maintaining your Turbo Saw.

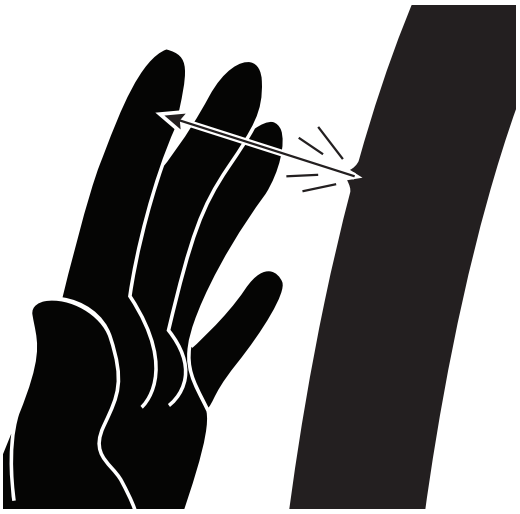
BE PREPARED
- Be prepared if a fire starts.
- Keep a first aid kit and fire extinguisher handy.
- Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

ATTENTION OPERATORS
NO PASSENGERS. Passengers may impair or distract the operator, resulting in unsafe operation. Passengers may also fall out of off the skid steer and be put in extreme danger. DO NOT OPERATE NEAR BYSTANDERS. Flying debris, falling limb, trees, and heavy machinery can cause serious injury or death. NEVER OPERATE HEAVY EQUIPMENT WHEN IMPAIRED!

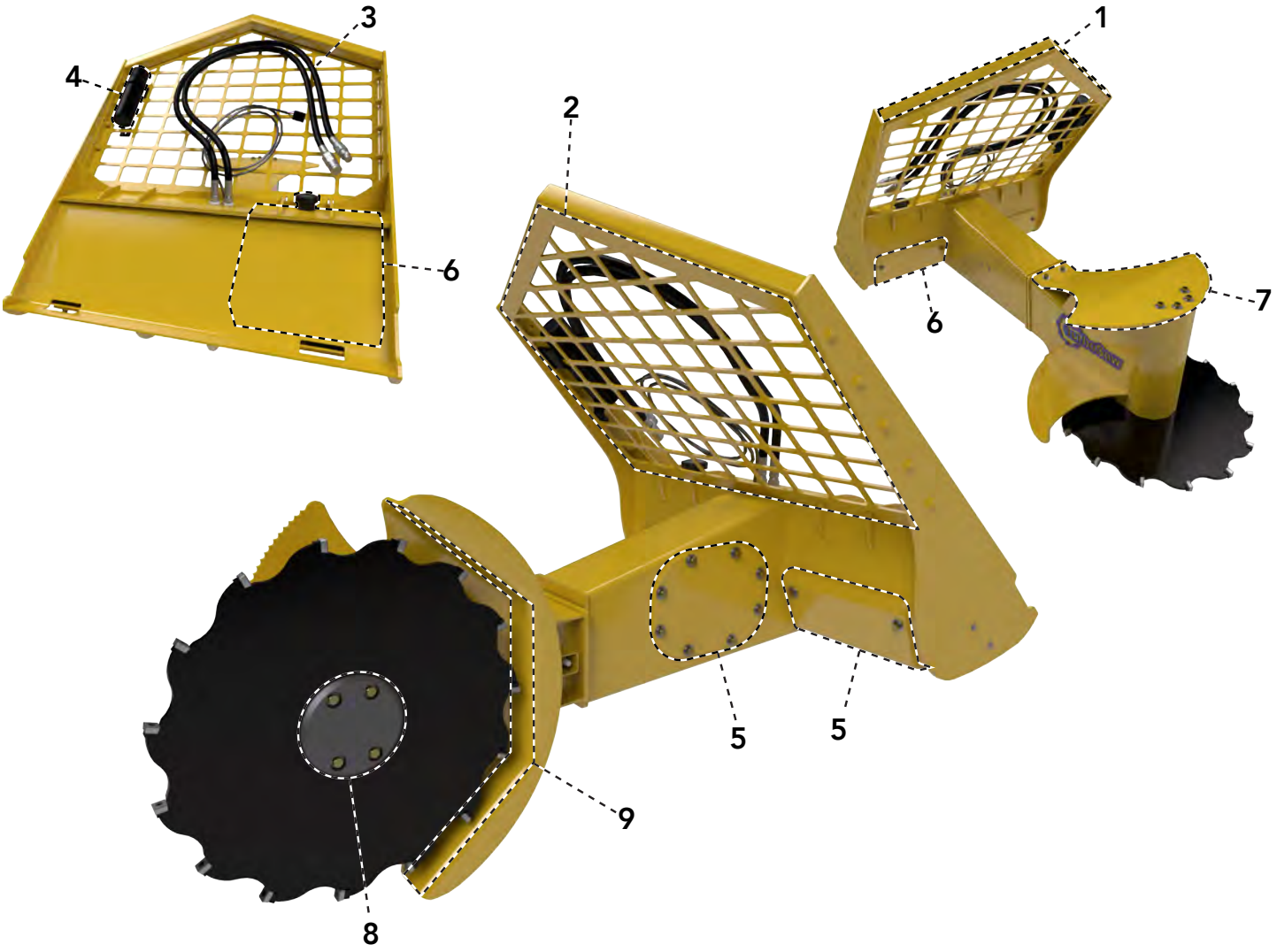
The Turbo Saw attachments are designed for a single operator: no passengers. They impair and distract the operator, resulting in unsafe operation. No riders or by-standards: flying debris, falling limb, trees, and heavy machinery could cause life threatening injuries. Keep bystanders 500 feet away from machine. Never operate when impaired!

HYDRAULIC PRESSURE
Hydraulic motors, lines, and machines can build up and carry high volumes of pressure. Hydraulic pressure can cause serious injury. Turn off skid steer before hydraulic maintenance. Relieve pressure before unhooking hydraulic lines. Tighten all connections before applying pressure.

Any fluid injected into the skin must be surgically removed immediately by a medical profession familiar with this type of injury.
Keep all guards in place and do no not operate a saw that has been altered in any way.



SAFETY FEATURES



1. Limb Deflector: Helps deflect limbs away from cab.
2. Limb Shield: Prevents limbs and debris from entering the cab.
3. Hydraulic Hose Sleeve: Protects hydraulic hoses and in case of a leak, defuses the hydraulic stream before it can cause injury.
4. Manual Canister: Houses manual in a waterproof canister.
5. All hydraulic components (motor, hoses, solenoid and valves) are protected inside the frame.
6. Sprayer System: All sprayer system components are also protected inside the frame.
7. Pushing Guard: Helps guide the directional fall of cut material.
8. Skid Plate: Protects the cutting disc fasteners during ground contact.
9. Blade Shield: Helps deflect thrown objects and cutting debris away from the operator.

- Hydraulic Shutdown Valve: All high-flow saws are equipped with case drain and a hydraulic pop-off valve which relieves hydraulic pressure should the system exceed maximum operating pressure to ensure no hydraulic components are damaged. The case drain must be plugged in during operation!

If any of these safety features are altered or rendered inoperable DO NOT OPERATE the ATTACHMENT! The operator is the primary safety feature of any machine.

OPERATION

FOREWORD FOR OPERATING THE TURBO SAW

Cutting brush and trees has inherent risks and hazards. To reduce those risks and hazards read the operator's manual, follow the safety precautions, and appropriately operate your Turbo Saw attachment. The methods and techniques in the operator's manual are designed to maximize your protection while cutting brush and trees.

Before starting your attachment, be familiar with your skid steer & Turbo Saw attachment's basic operating controls. Each model of skid steer has unique operating controls that activate and utilize your Turbo Saw's capabilities. Your Turbo Saw service specialist should have shown you how to properly operate your attachment. If you have any question regarding this, or any other Turbo Saw related question, please contact your Turbo Saw specialist.

PRE-OPERATIONS CHECK LIST

Perform the following inspection before operating the Turbo Saw. Check the Turbo Saw for any structural damage: fix or replace damaged parts. Do not use damaged parts or accessories of the Turbo Saw.

- Check the limb shield, limb de lector, blade shield, and the rest of the frame for bends, breaks, cracks or excessive wear.
- Inspect the cutting disc for wear, cracks damage, bending, or warping.
- Inspect all the teeth and backing blocks. Make sure all teeth are securely fastened. If a tooth is worn or chipped, rotate or replace it. If a backing block damaged, it will need ground off and a new one welded on.
- If the blade can be moved 1/8" up or down, the bearings may worn and need to be replaced, or the blade fasteners may be loose. DO NOT ALLOW BEARINGS TO EXCEED SERVICE LIMIT, DAMAGE TO DRIVE-TRAIN MAY RESULT
- Inspect the skid plate for excessive wear and insure that all fasteners are tight. (If fasteners are loose, re-tighten the bolts and lock-washers)
- Make a visual inspection of the hydraulic components
- Check decals for readability.
- If you plan to use the sprayer system, insure that the nozzle works and is free of debris and that there are no leeks in the tank or lines. Do an auditory inspection of the pump to insure it is functioning.
- Remember! Follow all of your safety precautions!

OPERATE THE TURBOSAW ATTACHMENT SAFELY

Turbo Saw units are designed with operator safety in mind. Please familiarize yourself with Turbo Saw operator instructions and safety precautions. Become familiar with all controls. Keep the skid steer saw free of debris. Only operate with a skid steer that has a glass or Plexiglas cab. Travel cautiously near large objects or ditches in your machine's path.

TRANSPORTING A SAW SAFELY

The skid steer saw must be disengaged and lowered in the upright horizontal position. DO NOT LEAVE THE BLADE ENGAGED WHILE TRANSPORTING OVER LONG DISTANCES. Proceed with caution. Anything the spinning blade contacts will be severely damaged. The saw blade should be sufficiently elevated above the terrain to prevent equipment damage. Reflectors should be clean and visible. PROCEED WITH CAUTION. Be aware of oncoming vehicles, and move slowly through uneven surfaces. Follow your typical safety precautions when driving a skid steer. Do not exceeded skid steers' balance ratio which could result in flipping your machine. When transporting the skid steer saw be aware of the total length the attachment adds to your machine.

EXITING
Lower the attachment to the ground.
Engage skid steer parking brake or place transmission in "Park".
Shut off engine and remove key.
Make certain cutting disc has completely stopped before exiting the cab of your machine.

SPRAYER TANK
5 gallon polyurethane sprayer tank with 12 volt electric pump can be equipped on all saws

An adjustable spray tip is located behind the blade shield. The spray tip is recessed into the frame to limit damage.

WARNING

- Do not allow the blade to contact gravel, rocks or metal. The carbide inserts will be damaged if the blade comes in contact with anything other than wood. Contacting materi-al other than wood can cause severe injury or death.
- When the blade is turning there should not be excessive vibration. If excessive vibration occurs, turn off the saw immediately, follow safety precautions, and look for possible causes.
- If the hydraulic blade malfunctions (does not stop the disc in 3-4 seconds), do not operate the Turbo Saw until the problem has been fixed.
- Do not force the blade into a tree. If the blade does not remove enough wood as it cuts, damage to the drive train could occur.
- Do not exit the vehicle until the blade has come to a complete stop.
- Always have an exit strategy when cutting trees. Do not box yourself into a corner. When you cut, make sure you have a clear path to exit afterward.
- Do not exceed the rated gpm hydraulic flow for your Turbo Saw model. Exceeding the recommended hydraulic flow rate may damage hydraulic components.

HYDRAULIC REQUIREMENTS

HYDRAULIC COMPONENTS
If the hydraulic lines are leaking during operation, follow your safe maintenance precautions and re-tighten or replace hoses and fittings.

DO NOT FORGET TO CONNECT THE CASE DRAIN LINE. Failure to connect the case drain line on high-flow skid loaders (24-41gpm) will result in a broken shaft seal, a leaking motor, and a voided warranty.

Make a visual inspection of the hydraulic lines and check for cuts, abrasions, and signs of wear.

*Remember! Follow all of your safety precautions.

HYDRAULIC REQUIREMENTS

Make sure your skid steer has the hydraulic requirements for your Turbo Saw unit.

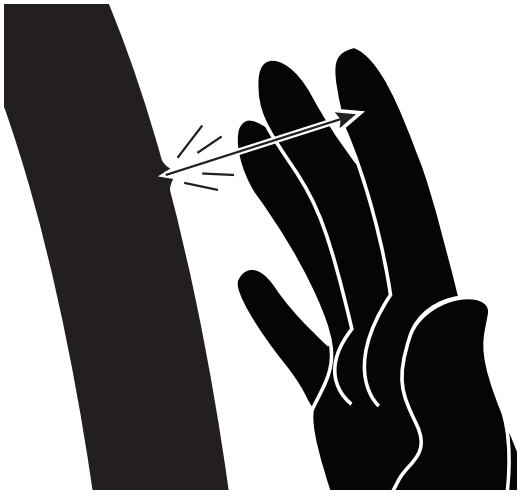
Do not exceed the rated hydraulic flow (GPM) for your Turbo Saw model. This would void your warranty, damage your unit, and endanger yourself.

Do not place your Turbo Saw on a different skid steer without consulting a Turbo Saw specialist first.

Do not operate a Turbo Saw that has been altered in any way. An altered unit may minimize & deactivate Turbo Saw's safety features and its performance.

HYDRAULIC REQUIREMENTS CHART

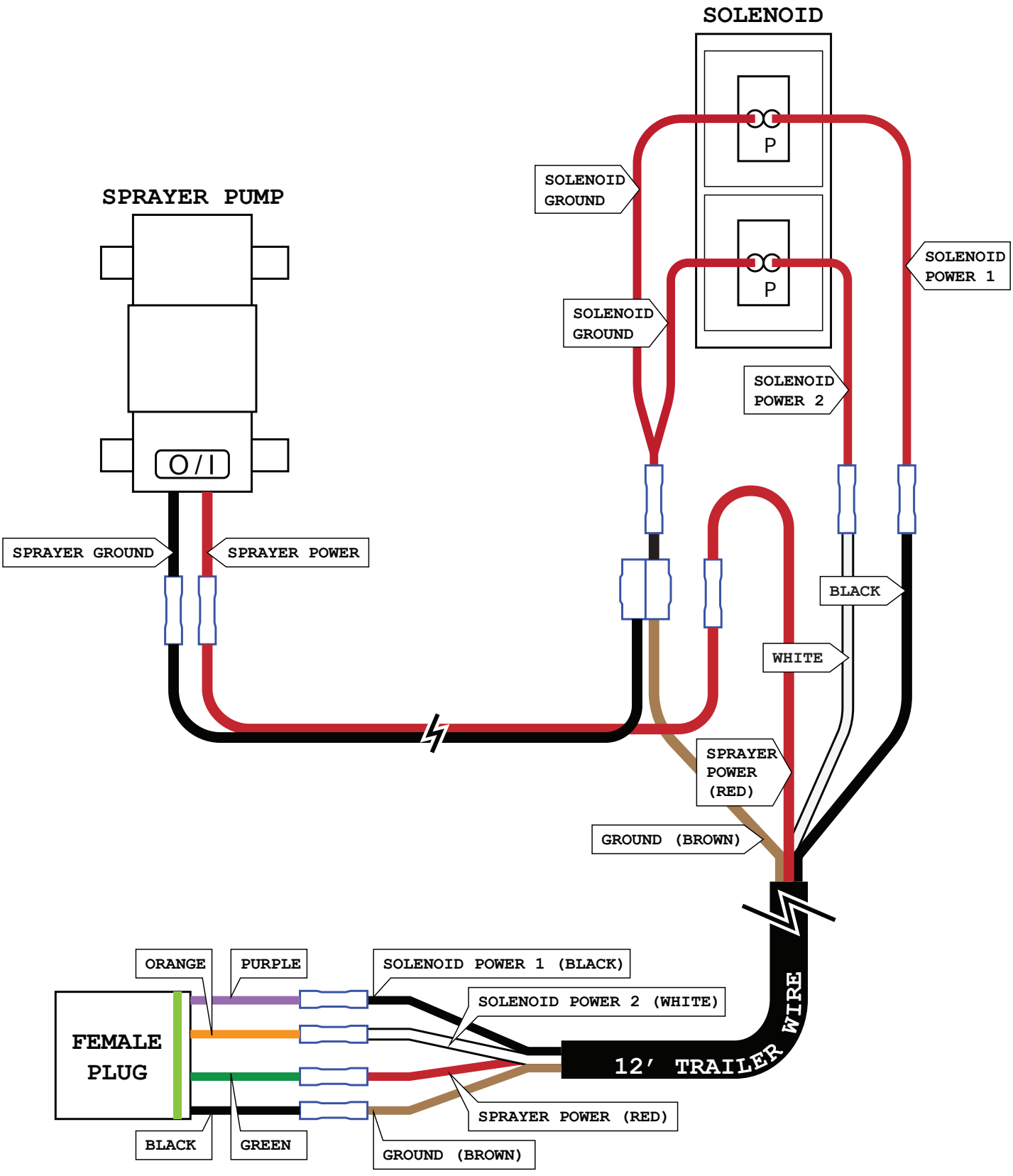
Turbo Saw Model	Minimum Hydraulic Requirement (Gallons Per Minute)	Maximum Hydraulic Requirement (Gallons Per Minute)
TQ3000 & TQ3000R	15	23
RT2600, RS2600 (legacy)	15	23
RT Series (current	15	45
RS series (current)	15	45



HYDRAULIC PRESSURE

Hydraulic motors, lines, and machines can build up and carry high volumes of pressure. Hydraulic pressure can cause serious injury. Turn off skid steer before hydraulic maintenance. Relieve pressure before unhooking hydraulic lines. Tighten all connections before applying pressure. Make sure all sleeves on external hoses are intact. Any fluid injected into the skin must be surgically removed immediately by a medical profession familiar with this type of injury. Keep all guards in place and do no not operate a saw that has been altered in any way.

RT Series (Hydraulic Rotator) Wiring Instructions



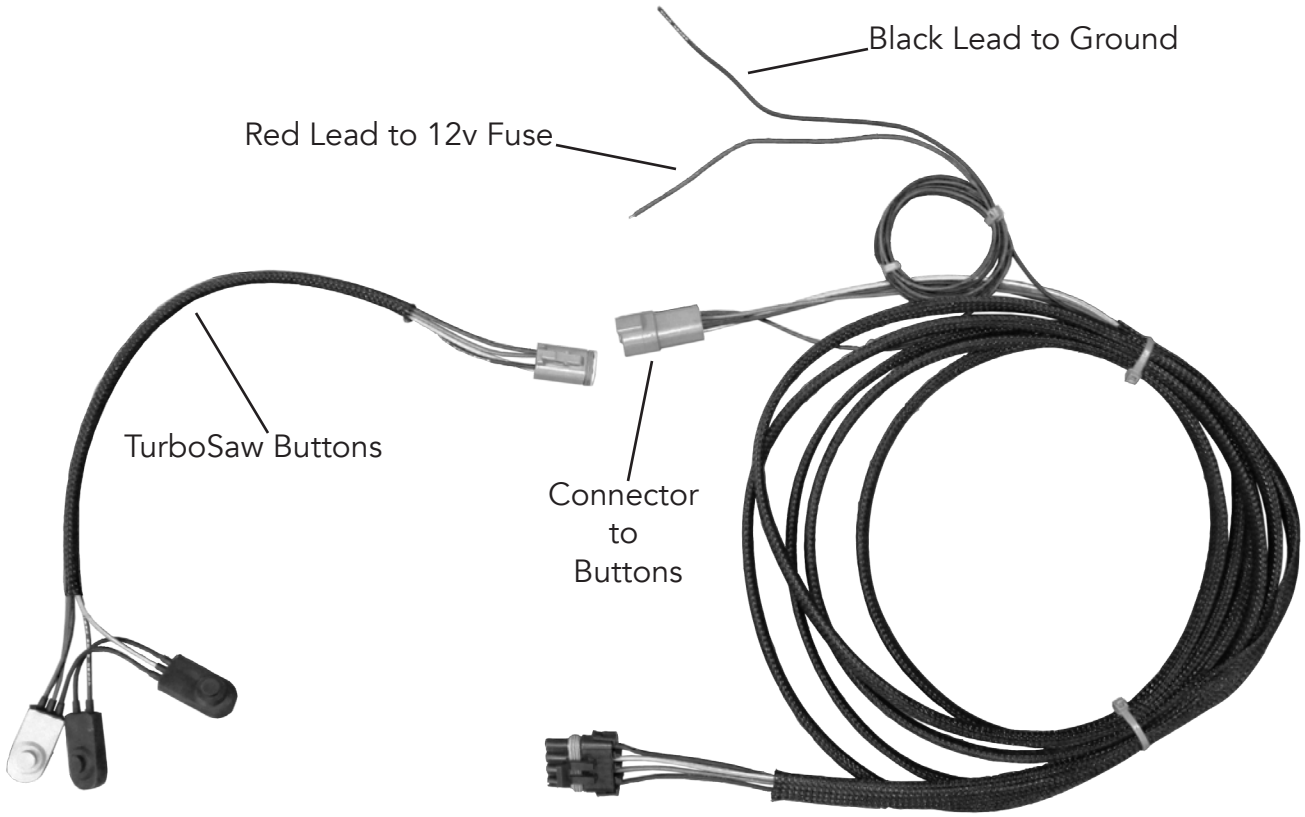
INSTALLATION & WIRING HARNESS DIAGRAM

RT Series (Hydraulic Rotator) Wiring Instructions

The wiring harness consists of the waterproof buttons and a harness to supply momentary 12 volt power to the sprayer pump and swing or rotate feature. The three buttons supply power when pressed and no power is supplied when they are not in use.

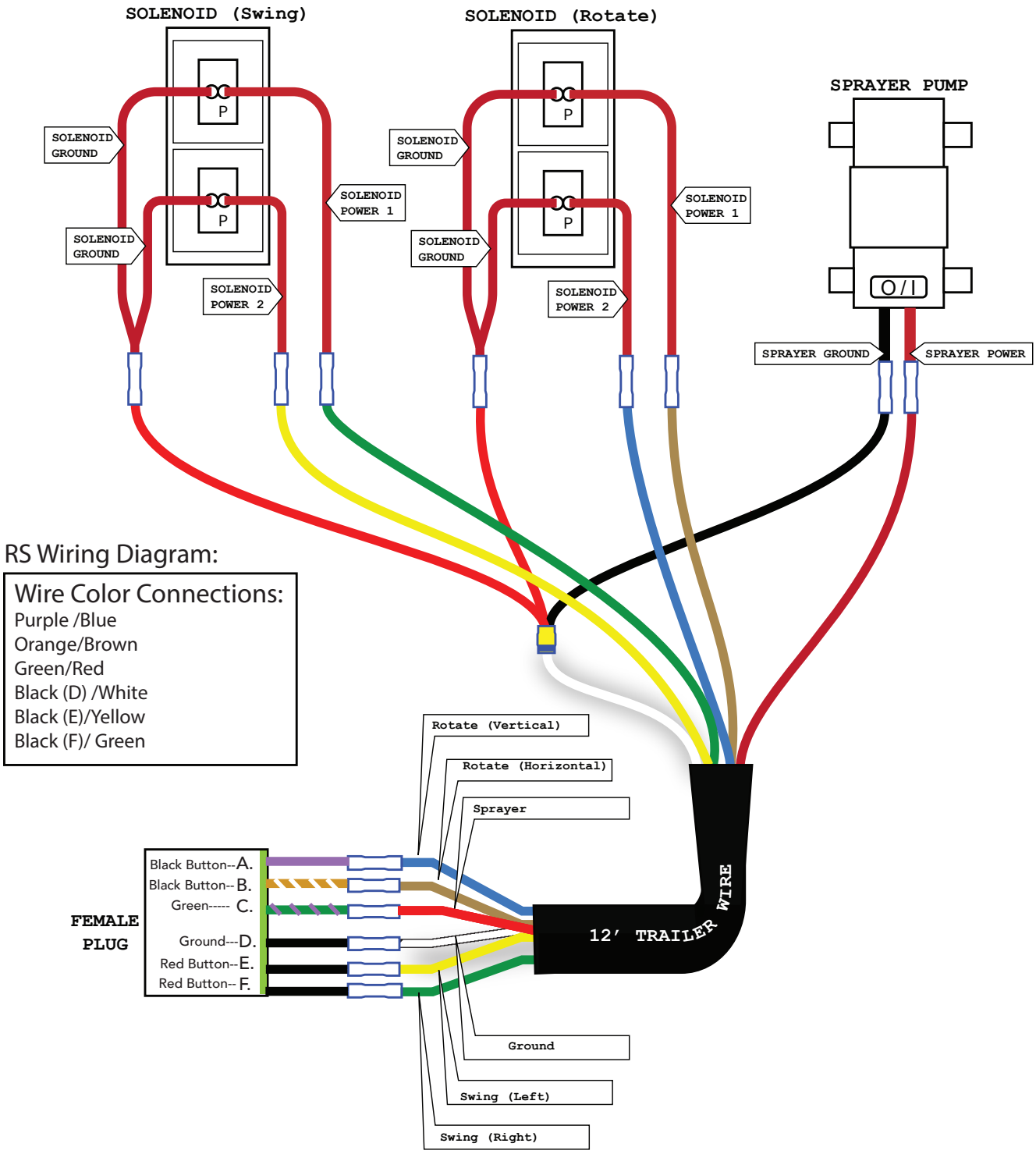
NOTE: The system does NOT have any built in fuses and must have a 15 amp fuse installed on the power line.

FROM		TO	TO	TO	TO
Harness Leads		TurboSaw Buttons	Caterpillar (8 Pin)	John Deere (14 Pin)	JCB
Black (Ground)	➡	Brown	A	A	B
Green (Sprayer)	➡	Red	B	F or G	H
Orange (Function)	➡	Black	D	D	E
Purple (Function)	➡	White	E	E	F



INSTALLATION & WIRING HARNESS DIAGRAM

RS Series (Hydraulic Rotate/ Swing) Wiring Instructions



ATTACHING / DETACHING

To mount the Turbo Saw to the skid loader, carefully read and understand following mounting instructions. Failure to follow these instructions may result in the unit disengaging from the skid loader, causing injury or death.

STEP 1: The Turbo Saw comes equipped with a universal mounting plate. To attach the unit:

- Drive the skid loader toward the plate & hook the plate with the skid loaders brackets.
- Roll the carriers brackets backwards.
- After the operator has successfully "hooked" the brackets onto the plate, the operator then engages the brackets lock function.
- The operator must then visually confirm the lock function has been successfully engaged.

STEP 2: The next step is to connect the hydraulic hoses from the unit to the skid loader auxiliary ports. Every DFM attachment ships with the correct hydraulics couplers for use on the carrier specified. Standard flow units make use of 2 hoses to operate; High Flow models require a 3rd hose, acting as a case drain to relieve excess back pressure:

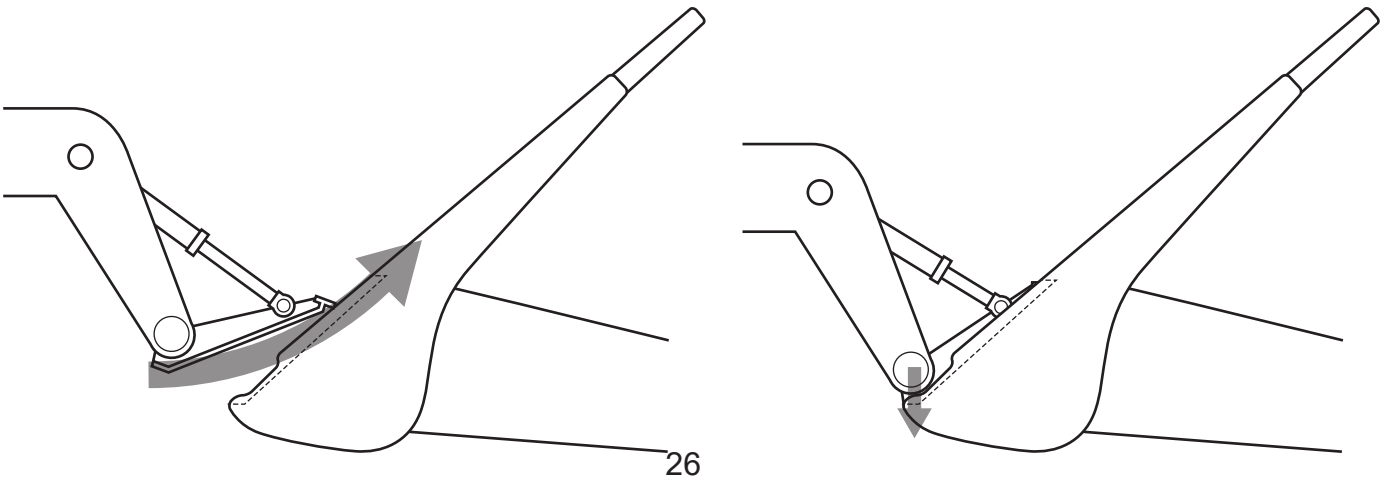
- The operator must line up the units couplers with the correct couplers on the carrier side, and snap them into place.
- The operator then rotates the couplers collar ¼ turn to engage the couplers lock function.
- The Operator should then visually confirm the couplers are all attached, and the lock functions have been engaged.

Step 3: The 3rd step is to hookup the electrical system (if equipped). The RS and RT series Turbo Saw models make use of an electric over hydraulic circuits to engage certain valves required to function properly. These models will ship with one of two options:

Option 1: for carriers with a pin connection system the unit will ship with a pin connector, and will utilize the carriers own joystick buttons to operate. To hookup this option the operator will plug the pin connector into the carrier side socket.

Option 2: for units not equipped with pin connection system; the unit will ship with a wiring harness; this wiring harness will contain sealed buttons, connection plugs, and a length of electrical wire; to hookup this option the operator will need to tap into a 12volt source, as well as attach the supplied buttons in the cab of the machine in a convenient location.

The Turbo Saw is now completely mounted and ready for operation.



BASIC CUTTING
Position the saw horizontally with the rear of the unit 8" off the ground and the blade on the ground. Move forward slowly.

FEED RATE
Turbo Saw attachments' cutting discs must maintain speed to cut. Push the disc into the tree at a rate that the cutting disc maintains momentum. If the cutting disc is pushed into the tree too quickly, the cutting disc will loose momentum stall out. If this happens, pull the saw out and allow cutting disc to rebuild momentum.

NOTE: To cut dense materials, take small bites by cutting then pausing to allow the cutting dis to rebuild momentum.

NOTE: When making a cut, run the skid steer at full throttle to provide the Turbo Saw with maximum hydraulic volume. Then throttle down when the cut is finished.

NOTE: If the cutting disc is raised or lowered during the cut or the cutting disc enter a too extreme an angle the blade will stall out.

BELOW GROUND CUTTING
The best way to cut a tree without leaving a stump is the first cut the tree off at or just above ground level, then to angle the blade slightly downward and cut the stump off below the ground. Be aware that cutting in gravely or sandy terrain causes the teeth to where faster.

STUMP DIAMETER
The Turbo Saw is designed to cut brush and small to medium size trees and stumps. The Turbo Saw is not designed to cut large diameter trees. The maximum trunk diameter of a standing tree the Turbo Saw can safely cut depends on the size of skid steer it is attached to, the experience of the operator and the weight of the tree. On average, the Turbo Saw can cut 11" in a single pass and 30" with multiple passes.

THE OPERATOR MUST:
- Determine the diameter of the tree trunk
- Evaluate the surrounding terrain
- Establish an exit path in case the tree falls in the wrong direction

THE OPERATOR MUST NOT:
- Try to cut a tree too large to directionalize the fall
- Place the skid steer in danger from falling trees
- Operate the turbo saw in an unsafe manner

⚠ CAUTION

DO NOT LIFT YOUR BLADE WHILE CUTTING A TREE! Lifting a blade inside a tree will bend your blade and damage your drive-train; this may cause tree to fall unexpectedly and cause injury or death.
TAKE EXTRA PRECAUTIONS WHEN CUTTING DEAD MATERIAL. DEAD LIMBS MAY FALL WHILE CUTTING.

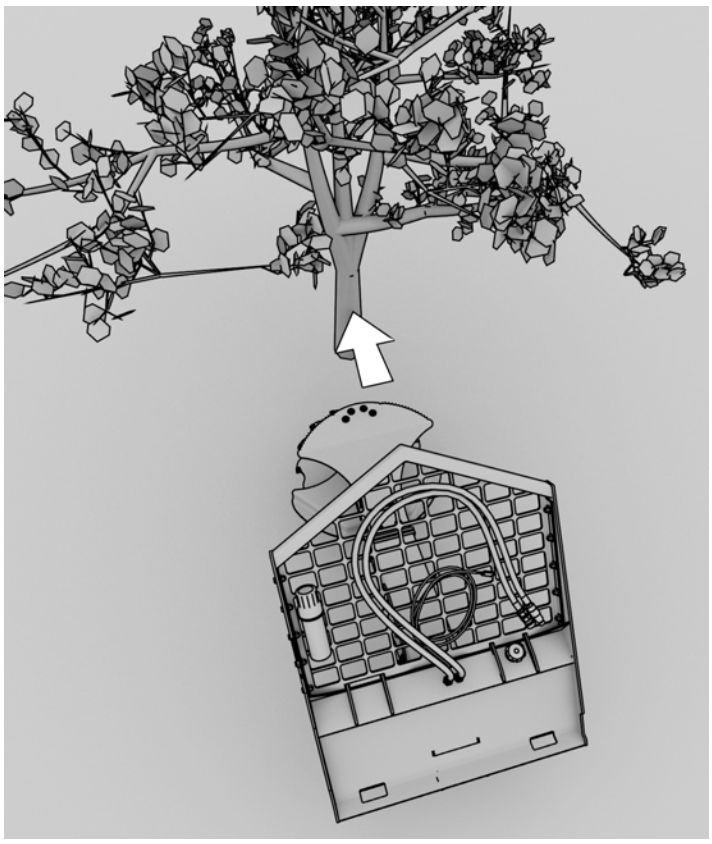
⚠ CAUTION

IN CASE OPERATOR CUTS MATERIAL OTHER THAN WOOD
If operator cuts material other than wood, the Turbo Saw must be evaluated and repaired for damages. Once all of the operators safety precautions have been met, examine the unit for damages. Note: If one tooth has been found to be damaged, then the blade could have sustained enough impact to damage or loosen all of the teeth.

DIRECTING THE FALL OF A TREE

PUSHING GUARD

The Turbo Saw is equipped with a pushing guard mounted above the disc. Smaller material is cut further to the right or left and larger material is cut closer to the center. The pushing must contact the tree before it is completely cut or it will be difficult to determine which direction the tree will fall. Only cut as much of the trunk as necessary to allow the tree to fall in a slow, controlled manner.

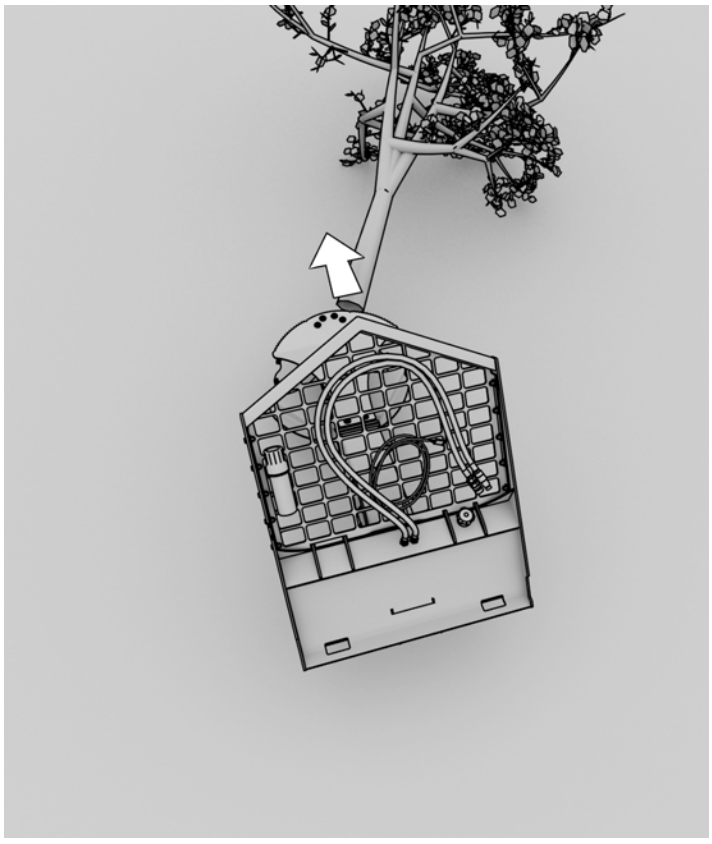


⚠ WARNING

THE PUSHING GUARD CAN ONLY ENCOURAGE THE DIRECTION OF FALL. The operator must always have an escape route in case the tree falls in the wrong direction.

⚠ WARNING

NEVER CUT OFF A TREE COMPLETELY WITHOUT THE PUSHING GUARD LEVERAGING AGAINST IT OR IT WILL BE DIFFICULT TO DETERMINE WHICH DIRECTION THE TREE WILL FALL.



⚠ WARNING

ALWAYS DIRECT THE TREE AWAY FROM THE OPERATOR.

⚠ WARNING

IF THE TREE IS LEANING IN ANY DIRECTION CUT IT SO IT WILL CONTINUE IN THAT DIRECTION.

⚠ WARNING

THE PUSHING GUARD WILL NOT WORK AS EFFECTIVELY ON A DEAD TREE AS A LIVE TREE

Limb Trimming with Rotate Function

Models: RS Series, RT Series, TQ Series

When the desired limb is chosen the skid loader should be aligned at a right angle to the limb, the cutting head of the attachment should at this time be placed in the vertical position. There are two ways to achieve the vertical head position:

Option 1: Units equipped with a hydraulic rotate function will engage the cutting disc and then press the rotate button.

Option 2: On units equipped with a manual rotate function, the operator will use the skid steer to roll back the Turbo Saw as far as possible while still allowing the operator to exit cab, this will take any weight off the head of the saw, and allow for manual rotation with little effort. The Operator will then turn the skid steer completely off and remove the key from the ignition. At this point the operator can safely exit cab and pull the spring loaded pin for manual rotation. Once rotation has been achieved, the operator should once again be safely seated in the skid loader with all necessary safety equipment in place.

1. The skid steer should be started and revved to maximum rpms.
2. At this point, the operator will raise the vertical blade as far up as required to begin the vertical cut from above the limb.
3. The operator will then use the skid steers forward roll on the machines hydraulic arms to lower the blade in a downward arch, cutting the limb in a safe and controlled manner.

Danger! Never cut limbs from the bottom to top.

INSTRUCTION TO MANUALLY ROTATE THE CUTTING HEAD (TQ3000R & EX2600R)

On units equipped with a manual rotate function, the operator will use the skid steer to roll back the Turbo Saw as far as possible while still allowing the operator to exit cab, this will take any weight off the head of the saw, and allow for manual rotation with little effort. The Operator will then turn the skid steer completely off and remove the key from the ignition. At this point the operator can safely exit cab and pull the spring loaded pin for manual rotation.

The EX2600R has 4 bolts for rotating the head. Remove the bolts, rotate the head to the vertical position, and then re-insert the bolts.

⚠ WARNING

DO NOT CUT LIMBS FROM BOTTOM TO TOP. ALWAYS CUT LIMBS TOP TO BOTTOM.

⚠ WARNING

DO NOT ANGLE THE CUTTING DISC DOWNWARD. The safety shield behind the blade is designed to protect the operator in either the horizontal position or with the disc pointed upward to trim limbs. Cutting with the cutting disc facing downward can bend the cutting disc and/or throw debris at the operator. The safety shield is not designed to protect the operator with the blade pointed downward.

TRIMMING LIMBS

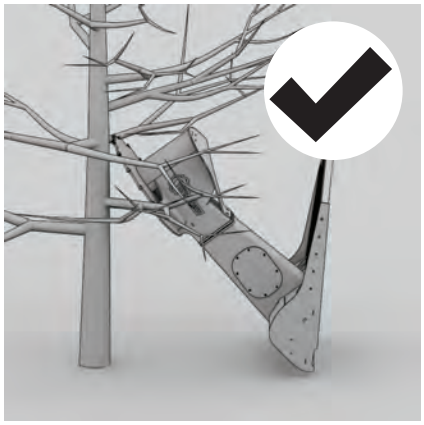
WARNING
Do not cut off a limb that exceeds the weight capacity of the skid loader including the weight of the Turbo Saw.

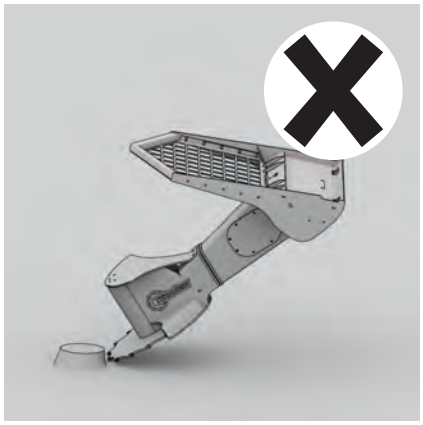
WARNING
Raising the loader arms on a skid loader changes the machine's center of gravity and can cause a rollover. Be aware of surrounding terrain.

WARNING
Do not cut a limb that is beyond the weight capacity of the skid loaders cab in case the limb lands on it.

WARNING
If using a rotating model, the head must be horizontal or vertical, not in-between. If the rotating head drifts while cutting, stop cutting and contact a service specialist.

DANGER
WATCH FOR POWER LINES
When trimming limbs, especially along roadsides and near houses, be aware of power lines. Do not cut a limb that is entangled or may fall on a power line.





GROUND LEVEL CUTTING with SWING FUNCTION
Models: RS Series

The operator should be safely seated in the skid loader with all necessary safety equipment in place:

1. The skid loader should be started and revved to maximum rpms.

2. When the desired tree is chosen the cutting head should be positioned beside the tree.

3. The Hydraulic system should then be engaged; upon engagement the cutting disk should be allowed
to spin up to the maximum rpms.

4. Once max rpms have been achieved the hydraulic swing feature can now be activated and cutting disc can now be fed into the tree at a controlled feed rate*

5. All RS models come equipped with a swing adjustment valve to adjust swing speed to match the saws optimum feed rate, and further prevent stalling**

*Note: The feed rate of the unit is based on many factors including carrier size, and hydraulic flow. The correct feed rate can only be determined by the operator.

STUMP GRINDING WITH ROTATE+SWING FUNCTION

For models equipped with a rotate and swing function, the operator can choose to stump grind for complete below ground tree removal.

The operator should be safely seated in the skid loader with all necessary safety equipment in place:

1. The Skid loader should be started and revved to maximum rpms.

2. When the desired stump is chosen the skid loader should be aligned in front of the stump, with the cutting head of the attachment should in the vertical position.

3. The operator then should raise and roll forward the loader arms until the operator has a clear and unobstructed view of the cutting disc from below.

4. At this time the operator should position the cutting disc directly in the top center of the stump.

5. The hydraulic system should then be engaged and the cutting disk should be allowed to spin up to the maximum rpms.

6. At this time the swing function should be engaged and the operator should begin making sweeping passes on the top of the stump.

7. As the cutting disc passes over the stump it will grind the wood into small chips.

8. After every pass the loader arms should lowered in increments*

9. Repeat the sweeping passes until the desired depth and level of stump removal is achieved.

*Note: The amount material that can be removed per pass varies based on machine, horsepower, and hydraulic flow.

SWING CONTROL VALVE for RS SERIES

The swing speed adjustment valve is located at the top left of the mounting plate.

To adjust: decrease swing speed by loosening the jam nut and turning clockwise. To increase the swing speed turn counter clockwise.

*Note: the feed rate of the unit is based on many factors including carrier size and hydraulic flow. The correct feed rate can only be determined by the operator.

*Note: proper swing speed adjustment is based on trail and error. The swing speed should be set slightly lower than the maximum stall-free feed rate.

PERFORMING MAINTENANCE

PERFORMING MAINTENANCE
Lower and detach the skid steer saw from your skid steer when performing any type of maintenance work. Slippage on attachments may occur. Always place unit on sturdy blocks or servicing stands when replacing the cutting disc. Do not use wheel supports which rotate and may cause heavy material to fall upon the maintenance worker.

PRACTICE SAFE MAINTENANCE
Always work in a clean and dry environment. Never work on a running machine or with a machine with moving parts. Disengage unit from skid steer; make sure machine is off, brake is engaged, and remove key. Lower skid steer saw to the ground, or place it upon service stands or blocks. Allow the skid steer saw to cool off before maintaining. Caution, parts may be hot, sharp, or hazardous. Follow guidelines on protective equipment and clothing.
*If you are not a licensed welder or hydraulic specialist call your Turbo Saw dealer for maintenance assistance.

Beware of toxic fumes when maintaining your skid steer saw. Weld, smolder, or torch in a well ventilated area. Metal, paint, and other materials can be toxic when heated. Please be mindful of your chemical environment and wear the proper equipment when maintaining your skid steer saw such as a breathing mask and/or welders mask.

ROTATING / CHANGING TEETH

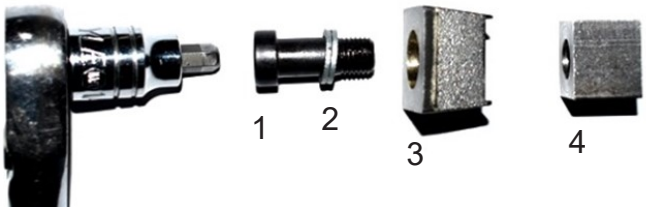
ROTATING AND CHANGING THE TEETH

The carbide teeth should be rotated every 125 hours or when cutting rate has noticeably decreased. Depending on cutting conditions, the teeth may need to be rotated sooner or later. Most wear occurs on the outside edge of the tooth. A tooth needs to be rotated when the cutting edge becomes rounded. Rotate them 90° so that the top edge faces out.

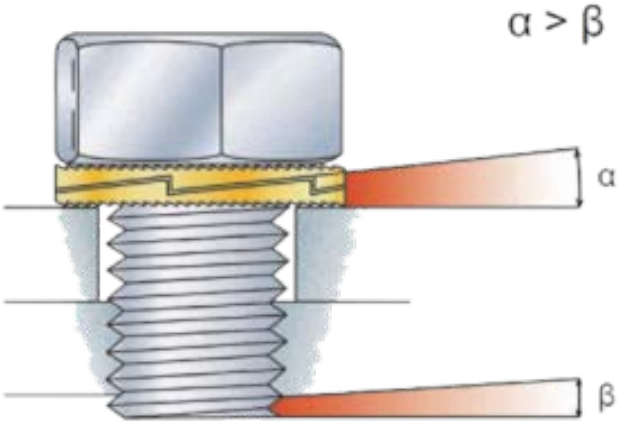
NOTE: When the tooth comes in contact with the ground, the bottom edge will wear as well. If both the bottom and outside edges of the tooth are worn, rotate the tooth 180°.
A 1/4" hex bit socket and a ratchet are needed to remove and fasten the teeth.

NOTE: Tighten to 30ft lbs Torque

Do not run a cutting disc with teeth missing or broken
The backing block behind the tooth will wear very quickly without a tooth in front of it. If the backing block becomes worn do to a missing tooth, it will have to be cut off and a new backing black welded on.



1) TS3 Bolt
2) Nordlock washer
3) TS3 Carbide Tooth
4) Backing Block



Note: Proper alignment of Nordlock washer

MAINTENANCE TOOLS & SKILL REQUIREMENTS

*Daily maintenance of your equipment requires basic tools, skill, and expertise.

Welding & hydraulic repair work should be done by a licensed professional. For a Turbo Saw maintenance specialist in your area please contact our service department at (405) 542-3520 or email contact@doughertymfg.com
ROUTINE MAINTENANCE

Every 8 Hours
- Check cutting disc condition.
- Check carbide inserts and make certain the set bolts are tight.

Every 125 Hours
- Rotate carbide inserts on cutting disc.

Every 200 Hours
- Check bolts/ connections on drive train.

Every 500 Hours
- Check/Replace teeth.

Every 1500 Hours
- Check/Replace skid plate.

DETACHING THE CUTTING DISC

The Turbo Saw's cutting disc weighs 80-150lbs. It is best to have assistance when removing and replacing it. Place the Skid steer Saw on sturdy blocks on solid ground (preferably paved or cement), or on a service stand. Do not use wheel supports which rotate and may cause heavy material to fall upon the maintenance worker.

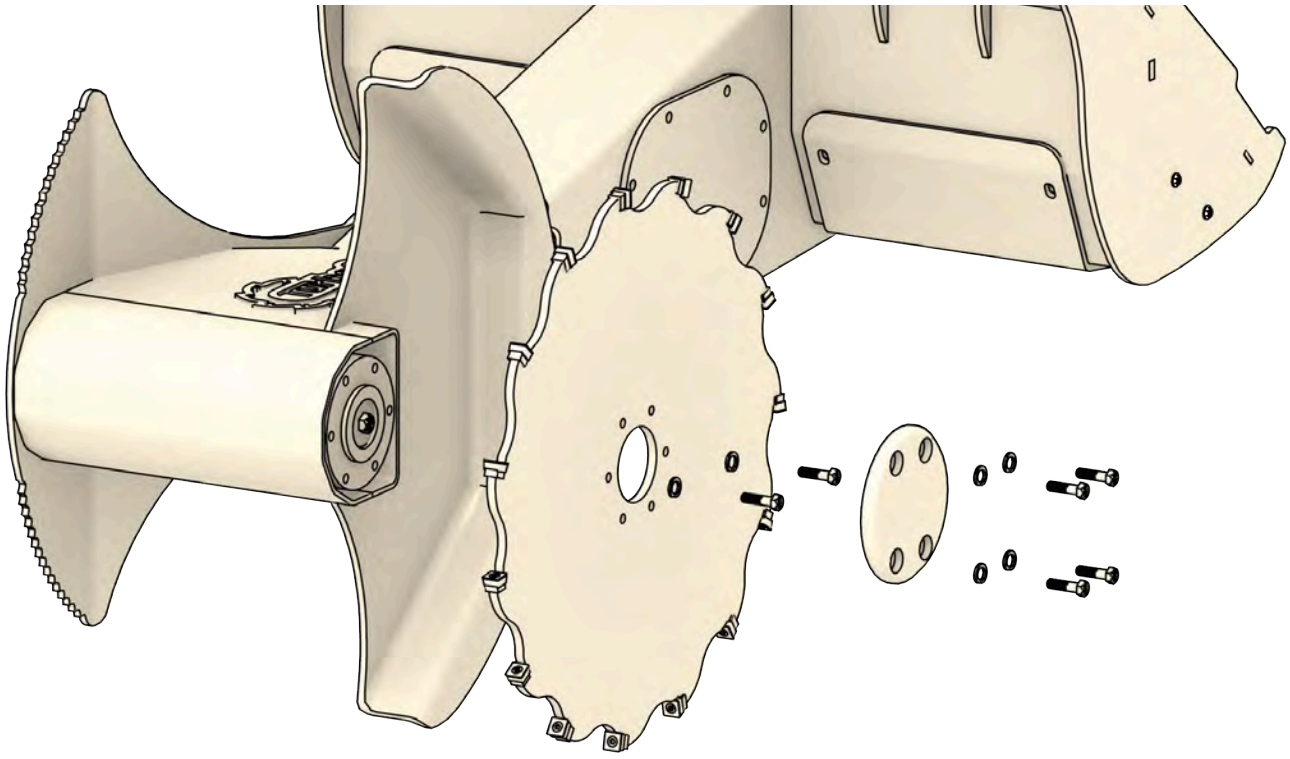
*If replacing the blade on a rotating saw (as pictured below) it is easiest to rotate the head to the 90° position

1. Place jacks, jack stands, or blocks under the cutting disc as close to the cutting disc as possible.

2. Remove the four bolts from the skid plate. Remove the skid plate.

3. Loosen the remaining bolts until the cutting disc rest on the jack stands. (Caution: The cutting disc is heavy and may immediately fall to the blocks.

4. Remove the cutting disc.



ATTACHING THE CUTTING DISC

5. Make certain that the bolts (1), lock washers (2), and skid plate (3) are in good condition. If not replace them.

6. Raise the cutting disc (with assistance or jacks) so that it mates to the hub. *The cutting disc rotation is counter-clockwise when viewed from above. DO NOT PUT THE CUTTING DISC ON BACKWARDS.

7. Tighten two bolts opposite each other with an impact wrench. (Make sure to include lock washers)

8. Place the skid plate flush against the cutting disc. And insert the four remaining bolts with lock washers.

Trouble Shooting Questions & Answers

Rotating Issue:

Question: Why will my Turbo Saw not rotate or swing?
Answer: First, check to make sure you are getting power to your solenoids.
• If the solenoid has power remove plunger from solenoid body and check for debris or damage as the solenoid/ components might need to replaced. •Check cylinder connectors and seals. • If it swings or rotates one direction, one of the two coils could be bad and therefore need replaced.

Increased Vibration:

Question: why would my unit have an increase in vibration?
Answer: Your bearings may be out. Please move the blade up and down for any play (approximately an 8th on an inch) which would indicate a bearing issue.
• You could have bent the blade by hitting a piece of metal or lifting up into a tree. • A missing tooth can cause vibration as well.

Blade Stopped Spinning

Question: why has my blade stopped turning even if it sounds like the motors still working?
Answer: The splines in the bearing block shaft have been stripped and the shaft needs to be replaced. • If oil is leaking between the bearing block and motor, the motor seals may need replaced.

Oil in Cutting Head

Question: Why is there oil in my cutting head?
Answer: If it is a highflow unit, it could be the popoff valve releasing pressure due to a faulty case drain connection. • It could be the motor seals.

Sprayer Pump Not Working

Question: Why has my sprayer pump not working?
Answer: Please check to see if you are getting power to your sprayer pump. • Check nozzle for being clogged with dirt & debris.

Bobcat and Low Power

Question: Why is my bobcat machine feel like it has low power?
Answer: On most bobcat machines the hydraulic fittings (exterior pressure and return) are opposite of other brands and you may need to swap your hydraulic couplers on your saw. The cutting blade allows spins counter clockwise. Please refer to image on page 40.

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Call 1.405.542.3520
Email: contact@doughertymfg.com

If you have any additional questions about TurboSaw'™ maintenance and operation please contact your local dealer, or contact a Turbo Saw service specialist at (405) 542-3520, e-mail contact@doughertymfg.com. We, at Dougherty Forestry Manufacturing, are dedicated to providing quality forestry products that we are proud to have the Dougherty name on. You are not just buying a tree saw, but a family owned business committed to your success.