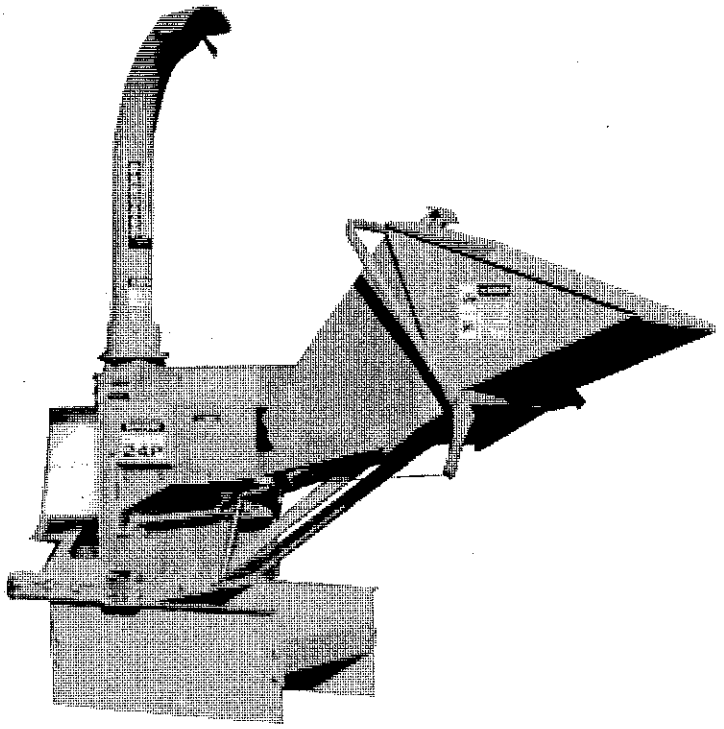
DANUSER

DANUSER COMMERCIAL

500 East Third Street
Fulton, MO 65251
573-642-2246

All Models

COMMERCIAL CHIPPER / MULCHER



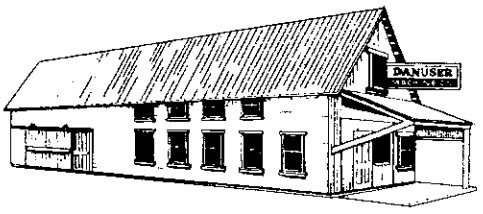
Si no entiende ingles, se prefiere que busque a alguien que interpede las instrucciones para usted

Si vous ne liser pas l'anglais et ne comprener pas les instructions, trouvez quelqu'un pour vous les traduire avant l'utilisation

Owner's Manual

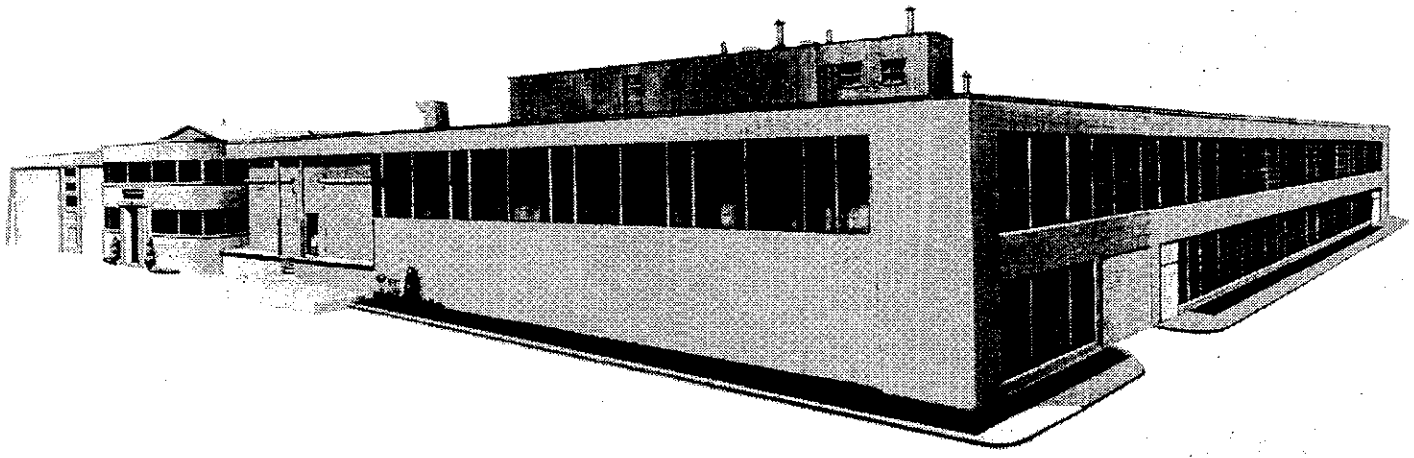
Danuser Machine Company, Inc., 500 East Third Street
Fulton, Missouri 65251-0368
Phone 573-642-2246 • Fax 573-642-2240
E-mail sales@danuser.com
Web site www.danuser.com

5/98



My grandfather, K. B. Danuser, began building wagons and repairing all types of machinery in a small shop in Fulton, Missouri in 1910. With pride in his Swiss craftsmanship, he established one policy for his concern which is the hallmark of Danuser Machine Company to this day—"the job has to be right."

Since 1910



Today, a new, modern plant built by my father, Henry Danuser, is located on the original site. This building and those who work in it are dedicated to the tradition of fine craftsmanship and to the production of better machines for American fields. The challenge of changing economic conditions is being met with improved manufacturing methods to hold the price standards which are an integral part of Danuser Machine Company. From this sound growth will come new products, designed to better serve agriculture and industry.

Jerry Danuser

Foreword

•Introduction
•Symbols

Please read this manual thoroughly!

Before you assemble or operate your Danuser Commercial Chipper / Mulcher, read and understand this manual. If there is anything you do not understand, contact your dealer, or call the factory direct at 573-642-2246 before proceeding. Powered equipment can be dangerous if it is not assembled and used properly.

Warranty registration

Your warranty registration form serves two purposes: it provides dating information for warranty coverage; and it allows Danuser to notify you, the owner, of improvements to the equipment or of new safety features that may be retrofitted to previously sold Danuser Chipper / Mulchers. Limited warranty is 30 days for commercial use. Limited warranty is 90 days for farm use. Farm users may extend their warranty to a one year limited warranty if Danuser Machine Company has recieved the WARRANTY REGISTRATION FORM & INSPECTION REPORT (completed by dealer) AND the WARRANTY EXTENSION COUPON on page 6A (completed by customer).

SYMBOLS

Symbol	*Meaning*
NOTE	This is important information for proper use of this system or equipment. Failure to comply may lead to premature equipment failure.
⚠ CAUTION!	Failure to follow these instructions may cause damage to the implement or the tractor, or minor personal injury.
⚠ WARNING!	Failure to follow these instructions may result in personal injury or death.
⚠ DANGER	Immediate hazard! Failure to understand and obey this warning is likely to result in personal injury or death.

Table of Contents

Preparation

•Package Inspection
•Component Identification

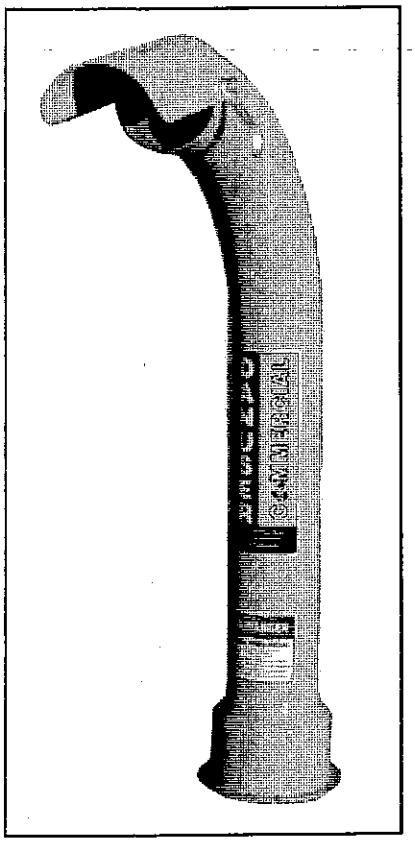


FIG. 1 - DISCHARGE CHUTE

FIG. 2 - SHIPPING LOCATION OF OWNER'S MANUAL

Check for shipping damage immediately, and verify that all components have been received.

Report all shipping damage to the carrier immediately.

Before you begin assembly, open all packaging. Compare the contents to shipping lists below to ensure that you have all of the components. On PTO models, the chipper is shipped completely assembled, except for the discharge chute. (Refer to Figure 1.) The PTO shaft and discharge chute are banded to pallet. (Refer to Table 1.) The trailer body is shipped with the chipper and motor assembled. Trailer components and the discharge chute are secured to the shipping pallet with bolts, lags, and ties. (Refer to Table 2.) A box containing assembly hardware and smaller components is shipped within the hopper of the chipper. (Refer to Table 3.) A battery and battery bracket is not shipped with the trailer model. Use the *Decal and Safety Sign* section and exploded views within the *Parts* section of this manual to make sure your unit has all of the safety guards and safety signs required by current production safety standards. Clean or replace all safety signs that cannot be clearly read and understood. An Owner's Manual has been shipped with your chipper. (Refer to Figure 2.) If your unit does not comply or does not have an Owner's Manual , contact Danuser Machine Co., Inc., IMMEDIATELY at 573-642-2246.

Table 1: Shipping List of PTO Models

	Item	Shipping Location
1.	Chipper	Lagged to Pallet
2.	Discharge Chute	Banded to Pallet
3.	PTO Shaft	Banded to Pallet
4.	Owner's Manual	On flywheel housing

Table 2: Shipping List of Trailer Model

	Item	Shipping Location
1.	Trailer Body	Lagged to Pallet
2.	Discharge Chute	Banded to Trailer
3.	Axle	Bolted to Pallet
4.	Two Wheels with Tires	Bolted to Pallet
5.	Ten Lug Nuts	On Axle
6.	Trailer Tongue	Banded to Trailer
7.	Jack Stand	Banded to Trailer
8.	Parts Box	Within Hopper
9.	Owner's Manual	On Flywheel Housing

Table 3: Contents of Hardware Box Shipped with Trailer

	Item	Quantity
1.	Bolt (1/2" x 3 1/2" UNC, Gr. 5)	1
2.	Washer (1/2" SAE)	2
3.	Nylok ® Nut (1/2")	1
4.	Bolt (9/16" x 1 1/2" UNC)	4
5.	Washer (9/16")	4
6.	Nut (9/16")	4
7.	Bolt (1/4" x 3 1/2" UNC, Gr. 5)	1
8.	Washer (5/16" SAE))	2
9.	Nylok ® Nut (1/4")	1
10.	Safety Chain	2
11.	Chain Connector	2
12.	Jack Stand Pin	1
13.	Battery Cable (negative)	1

Safety

This SAFETY ALERT symbol identifies important safety warning messages. Carefully read each warning message that follows. Failure to understand and obey a safety warning, or recognize a safety hazard, could result in injury or death to you or others around you. The operator is ultimately responsible for the safety of himself, as well as others, in the operating area of the chipper.

WARNING !

IMPORTANT

Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your tractor, before assembly or operating, to acquaint yourself with the machines. It Is The Chipper Owner's Responsibility, If This Machine Is Used By Any Person Other Than Yourself, Is Loaned Or Rented, To Make Certain That The Operator, Prior To Operating:

1. Reads And Understands The Owner's Manual
2. Is Instructed In Safe And Proper Use

- All things with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes potential hazards and follows reasonable safety practices. Always ensure that the safety guards, access doors, discharge chute, and chip deflector are installed properly **before** operating the chipper. Always use, and maintain in place, safety guards furnished with the chipper. Study this manual to make sure you have all safety equipment attached.
- Please remember it is important that you read and heed the safety signs on the chipper, and the safety rules set forth. Clean or replace all safety signs if they cannot be clearly read and understood. They are there for your safety as well as the safety of others. The safe use of this machine is strictly up to you, the operator. The factory will furnish new safety signs upon request at no charge.
- Never leave the chipper running unattended. The use of this equipment is subject to certain hazards, which cannot be protected against by mechanical means or product design. All operators of this equipment must read and understand this entire manual, paying particular attention to safety and operating instructions, prior to using. If there is something in this manual or anything about safe operation of this machine you do not understand, ask your supervisor or your dealer to explain it to you.
- Do not attempt repairs or adjustments while the flywheel is turning. Always disengage the PTO and shut off the tractor (on PTO models) or shut off engine (on trailer model), then put the keys in your pocket. Allow a minimum of thirty (30) seconds for the flywheel to stop its rotation. Listen for the flywheel to stop. Always immobilize the flywheel with the safety lock pin provided before opening the flywheel housing top cover or working on knives or bed knife.
- Point the discharge chute away from doorways, sidewalks, or any area where your view is obstructed. The chute should be pointed downwind when possible so that chips and dust will blow away from you.
- Most accidents occur because of neglect or carelessness. Keep everyone, especially children, away from the area of operation. Anyone who has not read this manual and has not received instructions from a qualified person should not be in the area.
- When the use of hand tools are require to perform any part of assembly, installation, adjustment, maintaining, repairing, removal, or moving the chipper, be sure the tools used are designed and recommended by the tool manufacturer for that specific task.
- Personal protection equipment recommended is safety glasses, earplugs, work gloves, sturdy footwear, snug long pants, and a long sleeved shirt with the cuffs buttoned. No Loose Clothing Should Be Worn Around the Chipper. Do not allow hands, feet, long hair, loose fitting clothing or jewelry to be around moving parts.
- This chipper was designed for one man operation. It is the responsibility of the operator to see that no one is within the chipper operating area.
- Never place any part of your body where it would be in danger if movement should occur during assembly, installation, operation, maintaining, repairing, removal, or moving the chipper.
- Never place yourself between the tractor and chipper while operating.

- Do not walk under or in front of the discharge chute or work under a raised chipper. Do not depend on the tractor hydraulic system to hold the chipper in place. The chipper must be sitting level on the ground when operating.
- Keep the chipper as close to the tractor as possible. On PTO models, operate chipper only on the ground. PTO operating angle (amount u-joint deviates from straight while operating) should not exceed fifteen degrees (15°). If mounted to Category II tractors, the chipper may need to be set on blocks to straighten PTO. The PTO shaft must be the proper length. If you have to shorten the PTO shaft, follow the instructions provided in this manual. (Refer to *Shortening PTO Shaft* within the *Assembly / Installation* section of this manual.)
- Never move the tractor or trailer while the flywheel is turning or damage will result.
- A heavy load can cause instability of the tractor. Use extreme care during travel. Slow down on turns and watch out for bumps. Take care when crossing ditches or going up inclines. The tractor may need front counterweight to counterbalance the weight of the chipper mounted to the three-point hitch.
- Remove the chipper when operating front mounted attachments.
- A chipper is precision equipment that can be mis-aligned or damaged by rough travel. Make sure flywheel rotates clear of obstructions, before starting chipper after transporting.
- 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.
- Do not allow riders on the chipper or tractor at any time. There is no safe place for any riders.
- Before you operate the chipper, check all pins, hoses, bolts and connections to be sure all are securely in place. Replace any damaged or worn parts immediately. After the first four (4) hours of operation, check all bolts to make sure they are properly tightened.
- Do not allow anyone who is unfamiliar with the safety rules and operation instructions to use this chipper.
- Never allow children to operate or be around this chipper.
- Use stabilizer bars, adjustable sway chains, or sway blocks on your tractor lift arms to keep the chipper from swinging side to side when mounted to three-point hitch. Adjust as tightly as practical for best performance.
- Operate chipper only when sitting level on ground. For trailer models, be sure jack stand is down and secure (if not attached to a vehicle) and that wheels are blocked.
- Never replace bolts with anything other than factory specified bolts.
- Clear the work area of objects which might be tripped over or thrown into or entangled in the chipper (i.e. rocks, nails, rope, twine, loose branches, etc.)
- Make sure that the wood being chipped does not contain nails, spikes, or rocks. This will result in damage to the chipper and possible injury or death.
- Never remove or adjust the chip deflector, discharge chute, safety guards, or access doors while chipper is running.
- Always use care when operating a chipper.

Safety is a primary concern in the design, manufacture, sale, and use of Danuser Commercial Chipper / Mulchers. As your supplier of chippers, we want to confirm to you, our customers, our concern for safety. As standard equipment, our current production machines include safety signs,driveline guards, and PTO input shield.

IT IS ESSENTIAL THAT EVERYONE INVOLVED IN THE ASSEMBLY, OPERATION, TRANSPORT, MAINTENANCE, AND STORAGE OF THIS EQUIPMENT BE AWARE, CONCERNED, PRUDENT, AND PROPERLY TRAINED IN SAFETY.

Assembly/ Installation

- •Description
- •PTO Models
- •Three-Point Hitch Adjustments
- •Shortening PTO Shaft
- •Trailer Model

PTO MODELS

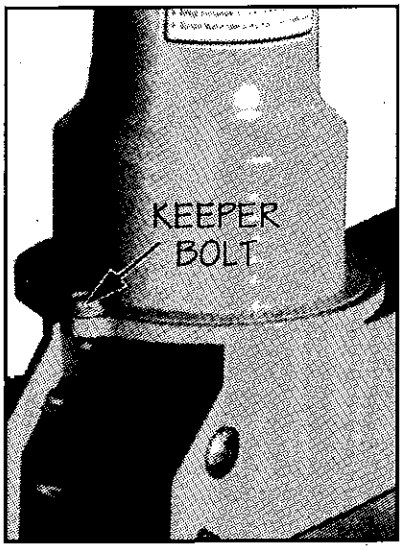


FIG. 3 - DISCHARGE CHUTE INSTALLATION

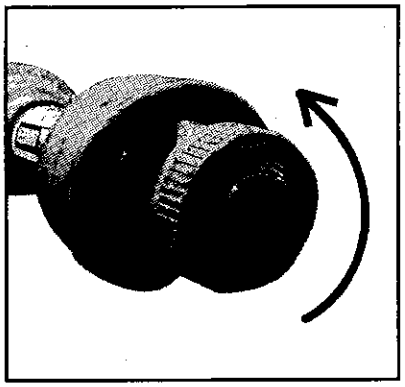


FIG. 4 - TWIST COLLAR FOR INSTALLATION

Danuser Commercial Chipper/Mulcher description

The Danuser Commercial Chipper / Mulcher is built to the exacting standards of high quality which have become synonymous with the word, "Danuser". The Danuser Commercial Chipper / Mulcher is a rotating disc flywheel and knife type of chipper, with two reversible (two way) chipper knives and one reversible (four way) bed knife. The knives actually chip the limbs as they are fed past the feed roll. In the gravity feed model, the knives, without a feed roll, serve to chip and process the limbs.

⚠ WARNING!

Serious injury or death can result from misuse of this equipment.

STEP 1: Discharge chute requires installation. The keeper bolts which secure the discharge chute are shipped in place. Remove the two keeper bolts. Place the discharge chute base in the ring and secure with keeper bolts. (Refer to Figure 3.)

STEP 2: Install PTO driveline to chipper. Key has been shipped taped to the jack shaft. Remove tape from jack shaft and back-out both set screws in PTO implement yoke. Slide PTO implement yoke onto the chipper jack shaft with the key in keyway. Position yoke flush with shaft and tighten set screws.

STEP 3: Slip tractor's lower link ball joints over the chipper's link pins and secure with the klik pins provided with your tractor hitch. Keep hands away from pinch points, while sliding components together.

⚠ CAUTION!

Sway stabilizers must be used with the chipper.

STEP 4: Connect the tractor's top link to chipper's top three-point hitch mount. Avoid pinch points around the pin during assembly.

⚠ WARNING!

To avoid personal injury, you must stop tractor engine, set brakes, remove the tractor key, and put keys in pocket before proceeding with the next step!

STEP 5 Make sure the tractor engine is shut off and tractor key is in your pocket, then connect the driveline to the tractor PTO. The twist collar locks the driveline onto the tractor. Twist the collar and slide the yoke onto PTO. (Refer to Figure 4.) When collar twists back to its original position, driveline is locked in place. With a solid tug, confirm the connection. Adjustments to chipper, three-point hitch, or PTO shaft may be needed for proper fit. Make recommended adjustments as instructed in STEP 6. If adjustments to the three-point hitch or chipper does not gain necessary clearances, shaft will need to be shortened as instructed in STEP 7.

THREE-POINT HITCH ADJUSTMENTS

STEP 6: PTO shaft must be the proper length. Shaft must not bottom-out or come apart as chipper is raised and lowered to maximum and minimum heights. Change the travel of the chipper and chipper's distance from the tractor by making adjustments to the three-point hitch. Keep the chipper as close to the tractor as possible. If you have to shorten the PTO shaft, follow instructions of STEP 7.

Chipper Adjustments (Refer to Figure 5.)

The lower three-point hitch points on chipper are on an adjustable bar. Loosen the two bolts on each side, position bars, and re-tighten bolts.

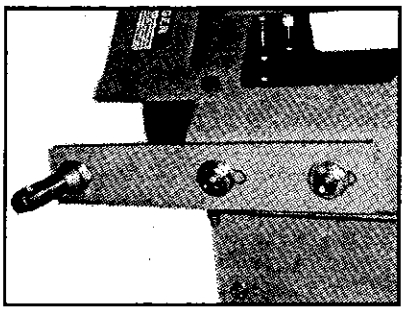


FIG. 5 - ADJUSTABLE LOWER PIN

Three-Point Hitch Adjustments (Refer to Figure 6 and Figure 7)

(a) Shorten or lengthen the top link or attach the top link to the tractor through a different hole in the upper link bracket to change pitch of chipper.

(b) Shorten or lengthen the lift links.

(c) Attach the lift links to different holes in the rockshaft lift arms. Rear holes increase chipper travel; front holes decrease it.

(d) Move the lift links to different holes in the lower links. Front holes usually increase travel; rear holes decrease travel.

(e) Attach the lower links to different forward pivot points. Lower points will raise the chipper; upper points will lower the chipper.

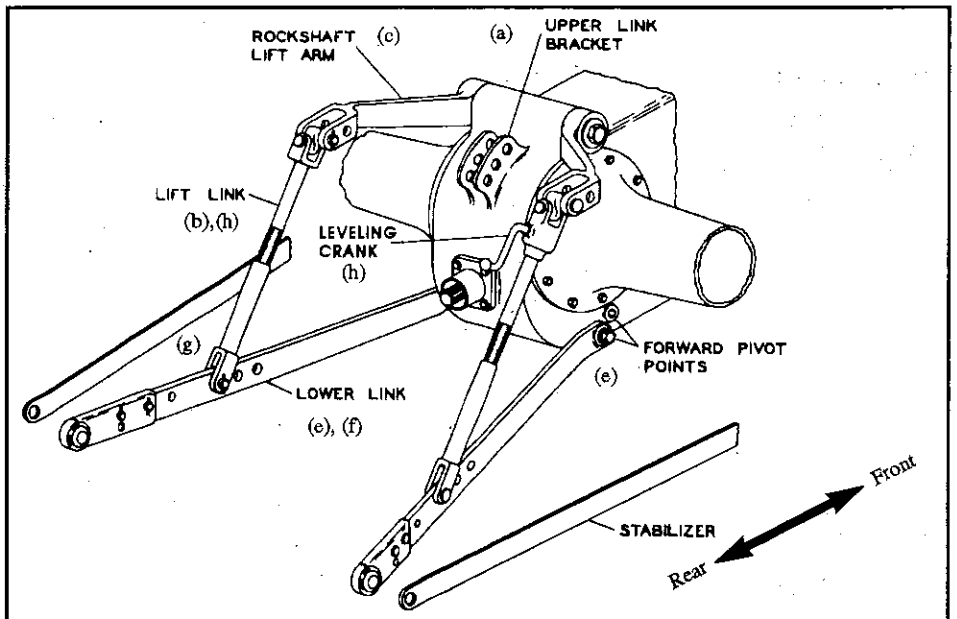
(f) Lengthen or shorten the lower links.

(g) Shift the rear ends of the lower links to a higher or lower position. Lowering them will lower the chipper; raising them will raise the chipper.

FIG. 6 - REPRESENTATIVE THREE-POINT HITCH CONFIGURATION

Vertical hang of chipper:

Raise the chipper off the ground. Turn the adjusting screw or leveling crank on the lifting link until the chipper appears vertical.



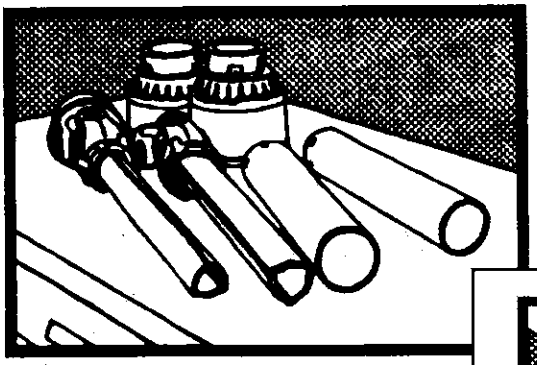
(Letters indicate areas of adjustment for procedures listed above)

FIG. 7 - ADJUSTMENT POINTS

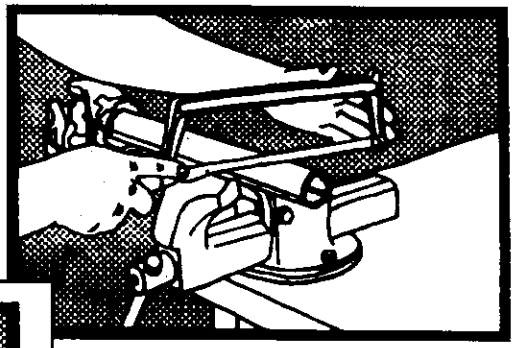
NOTE Refer to your tractor owner's manual for instructions on tractor operation, tire inflation, and safety when using a three-point mounted implement.

SHORTENING PTO SHAFT

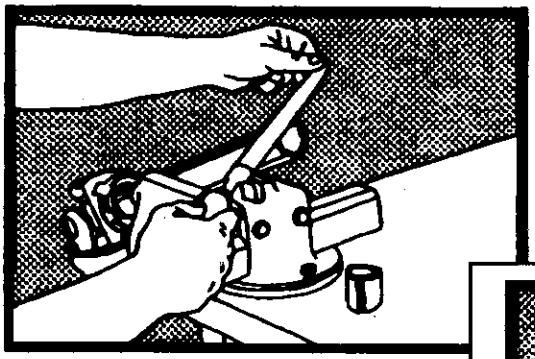
STEP 7: PTO should have one inch (1″) clearance from bottoming-out. If adjustments to the three-point hitch does not gain necessary clearance of PTO shaft, shaft will need to be shortened. Measure carefully and follow the following instructions.



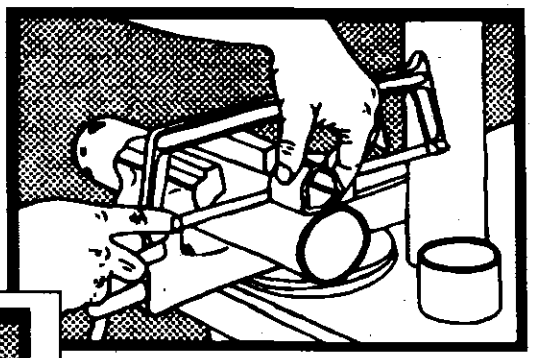
STEP A: Disassemble Shield



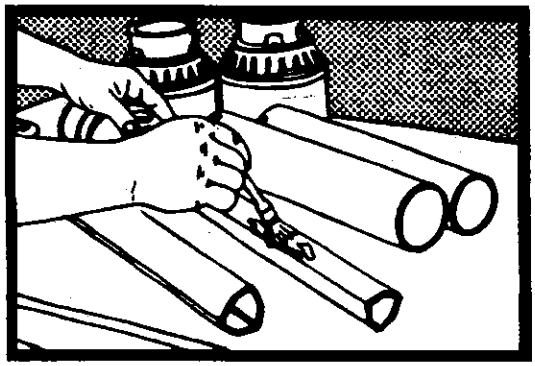
STEP B: Cut shaft tubes to required length.



STEP C: Debur tube ends and remove chips



STEP D: Shorten guard tubes to same length as shaft tubes



STEP E: Grease inner shaft tube and install shield.

STEP 8: Grease the two lube fittings at the driveline center crosses and the two lube fittings in driveline guards.

TRAILER MODEL

Table 4: Contents of Box
(sorted by instructional steps)

Item	Quantity
------ STEP 2 (TONGUE) ------	
Bolt (1/2" x 3 1/2" UNC, Gr. 5)	1
Washer (1/2" SAE)	2
Nylok ® Nut (1/2")	1
-------- STEP 3 (AXLE) --------	
Bolt (9/16" x 1 1/2" UNC)	4
Washer (9/16")	4
Nut (9/16")	4
---- STEP 5 (JACK STAND) -----	
Jack Stand Pin	1
--- STEP 6 (SAFETY CHAINS) ---	
Bolt (1/4" x 3 1/2" UNC, Gr. 5)	1
Washer (5/16" SAE))	2
Nylok ® Nut (1/4")	1
Safety Chain	2
Chain Connector	2
------ STEP 8 (GROUND) ------	
Battery Cable (negative)	1

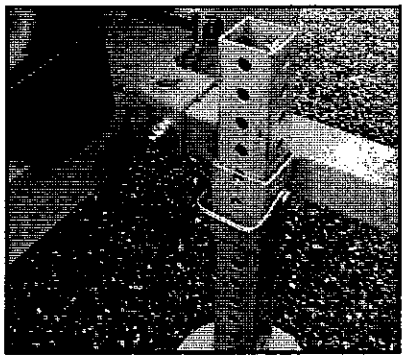


FIG. 8 - TONGUE INSTALLED AND JACK STAND LOCKED IN PLACE

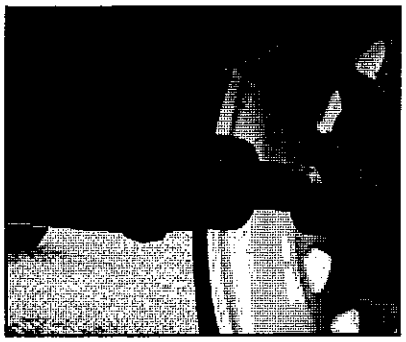


FIG. 9 - AXLE INSTALLED

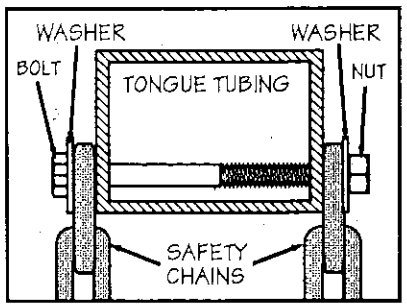


FIG. 10 - SAFETY CHAINS ON TRAILER TONGUE.

STEP 1: Unpack the chipper and trailer components. The larger components are secured to the shipping pallet with bolts, lags, and ties. (Refer to Table 2 in *Preparation* section.) The unpainted angle pieces on the rear of the trailer are shipping brackets and should be removed. A box containing assembly hardware and smaller components is shipped within the hopper of the chipper. (Refer to Table 4.)

STEP 2: Mount tongue into rectangular tubing section on the front of the trailer. Secure the tongue with the 1/2 x 3 1/2 inch bolt, 1/2 inch Nylok® nut and a 1/2 inch SAE washers on each side. (Refer to Figure 8.) Pull the wiring harness through the tongue mount and tubing, before assembling.

STEP 3: Attach the axle to the underside of the trailer using four 9/16 x 1 1/2 inch bolts, four 9/16 inch washers, and four 9/16 inch nuts. (Refer to Figure 9.) Raise and block the trailer to gain access to the underside.

⚠ WARNING!

If a hoist , jack , or tractor front-end loader is used to lift trailer, make certain 1200 pounds does not exceed its rated capacity. Trailer must be stable on blocks, before installing axle.

STEP 4: Install wheels and lug nuts. Lug nuts are shipped on studs. With trailer on the ground, tighten lug nuts in a crisscrossing pattern. Check air pressure and compare to the recommended tire pressure on the side of tire.

STEP 5: The jackstand pin is part of the trailer's jack stand. Align holes in the jack stand tubing at the desired elevation and lock in place with the jackstand pin. (Refer to Figure 8.)

STEP 6: Fasten a safety chain to each side of the tongue using the 1/4 x 3 1/2 inch bolt, two 5/16 inch SAE washers, and a 1/4 inch Nylok ® nut. Secure the chains' top link along the bolt between a washer and the tongue tubing. (Refer to Figure 10.) The mounting hole for the safety chains is located behind the hitch receiver. Two connector are provided to attach the safety chains to your vehicle.

STEP 7: Place a battery on the trailer deck under the hopper, with the negative terminal to the rear of the trailer. Battery area is sized for a series 24, 12 volt, battery. Anchor the battery to the trailer with a battery bracket. Battery and bracket are not included with trailer.

STEP 8: Connect the positive terminal to the red cable and ground the negative terminal. Connect the trailer frame or flywheel housing to the battery's negative terminal using the supplied cable. A solid ground is important.

STEP 9: Install discharge chute. The keeper bolts which secure the discharge chute are shipped in place. Remove the two keeper bolts. Place the discharge chute base in the ring and secure with keeper bolts. (Refer to Figure 3 on page 7.)

STEP 10: Connect the trailer to the towing vehicle with a 2 inch ball coupling hitch. With trailer's hitch receiver firmly on the hitch ball, pull latch lever into the horizontal position and secure lever in this position with the cotter pin.

STEP 11: Secure safety chains to the towing vehicle. With the same small amount of slack in each chain, cross the chains under the hitch. Connector that resemble a chain link with a turnbuckle are provided to attach the safety chains.

STEP 12: Make the necessary electrical connections between the trailer and towing vehicle for proper tail light and signal operation. Install a wiring hook-up (plug) of your choice to the trailer's four wires. The green wire leads to the right turn signal, the yellow wire leads to the left turn signal, the brown wire leads to the tail lights, and the white wire is ground.

Operation

OPERATING CHECKLIST

Study this Owner's Manual carefully before attempting to operate or adjust the Danuser Commercial Chipper / Mulcher. You are responsible for furnishing this manual to others who may use the unit.

⚠ DANGER

Keep Bystanders and all other people out of the chipper operating area when chipper is operating or under power.

⚠ WARNING!

All things with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes potential hazards and follows reasonable safety practices.

√ **Flywheel rotates clear of obstructions.**

Re-check flywheel rotation after transporting chipper.

Turn the flywheel slowly before applying full power.

√ **All safety shields, access doors, and guards are in place.**

If the chip deflector, discharge chute, or any of the guards have been removed, be sure to replace them properly. Follow the assembly instructions in this manual.

Do not operate, or let anyone else operate the chipper, without the top cover, discharge chute, knife access door or clean out door properly in place. If these are not in place, the flywheel and knives are exposed and the flow of chips is not controlled, creating a safety hazard.

√ **All Bolts, set screws, and fastener are tight.**

Check after initial four hours of operation and then daily, thereafter.

See *Preventive Maintenance* within *Maintenance* section of this manual.

√ **Belts tension is correct.**

Check belt tension by pushing on belt at point halfway between the pulleys. It should deflect 1/3 to 1/2 the width of the belt.

See *Preventive Maintenance* within the *Maintenance* section of this manual for belt adjusting instructions.

√ **Once chipper is started, confirm safety bar is operative.**

If not working properly, feed roll clutch needs lightly lubricated or safety bar cable needs adjusted.

See *Lubrication* and *Safety Bar Cable* within the *Maintenance* section of this manual.

√ **The feed roll driveshaft, pivots, and tractor PTO driveline are properly lubricated.**

See *Lubrication* within the *Maintenance* section of this manual.

√ **The PTO will not bottom out or come apart while raising or lowering chipper.**

When changing from one tractor to another, be sure and check length again.

See *Assembly and Installation* section of this manual.

√ **Knives are sharp.**

Long slivers in chip pile are one of the best indications of dull knives.

Cut only clean material or knife life will be shortened.

See *Knife* within the *Maintenance* section of this manual for inspection and replacement procedure.

√ **Work area is clean and clear of obstructions.**

Clear loose branches or other objects that may be tripped over.

Clear rope, twine or other objects that could wrap around the PTO shaft.

Check for ditches, stumps, holes, or other obstacles that could cause the tractor to roll.

√ **Trailer model has fuel and engine oil.**

CHECKING FLYWHEEL

FIG. 11 - LARGE PULLEY

OPERATION

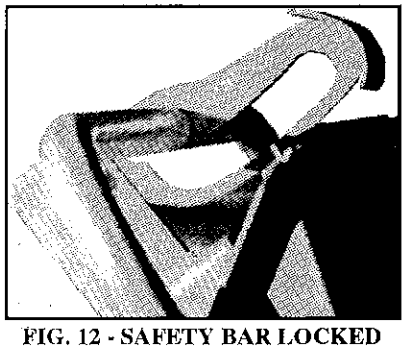


FIG. 12 - SAFETY BAR LOCKED

⚠ DANGER

Keep hands, feet, and clothing out of hopper. A stick or branch may be needed to push material through hopper or remove material out of hopper.

⚠ WARNING!

Personal protection equipment recommended is safety glasses, earplugs, work gloves, sturdy footwear, snug long pants and a long sleeved shirt with the cuffs buttoned. No Loose Clothing Should Be Worn Around the Chipper. Do not allow hands, feet, long hair, loose fitting clothing or jewelry to be around moving parts.

STEP 1: On PTO models, turn the flywheel over slowly with the tractor engine shut off by turning the large pulley by hand to make sure there are no obstructions. (Refer to Figure 11.) If an obstruction is present, correct before proceeding. Items in flywheel housing, bolt interferences, or knife contact with bed knife or flywheel housing are possible causes of obstruction.

On trailer models, check for flywheel obstructions with chipper engine at idle as instructed in STEP 5.

STEP 2: Point discharge chute away from buildings, sidewalks, or any area where your view is obstructed. If possible, direct discharge downwind. To adjust the discharge chute, loosen the two keeper bolts at the base of the chute, turn the chute, and re-tighten the bolts. The chip deflector, located at the top of chute, is also adjustable. Turn handle to loosen and tighten deflector.

STEP 3: Once the tractor is started, set tractor brakes and take tractor out of gear, to hold the tractor on location. Before starting trailer models, read the engine Owner's Manual and block trailer wheels.

STEP 4: On PTO models, operate chipper only on the ground. PTO operating angle (amount u-joint deviates from straight while operating) should not exceed fifteen degrees (15°). If mounted to Category II tractors, the chipper may need to be set on blocks to straighten PTO.

STEP 5: Set the engine speed to idle and engage the PTO. Start chipper slowly by releasing the PTO clutch slowly. Gradually speed up the unit. PTO must never exceed 540 RPM as indicated on tractor's tachometer. See your tractor's owner's manual for further explanation of 540 RPM indicator.

Trailer model, start engine and leave at idle to check for flywheel obstructions. Watch as flywheel turns slowly and listen for any knocking sounds. Chipper will automatically engage as motor RPM is increased. Operate trailer chipper with engine at full throttle.

STEP 6: Make sure the clutch will release when the safety bar is pushed toward the feed roll. If the feed roll continues to take in material, the feed roll clutch needs lightly lubricated or safety bar cable requires adjusting. (See *Lubrication* and *Safety Bar Cable* within the *Maintenance* section of this manual.) The safety bar locks in position with latch on top of hopper. (Refer to Figure 12.) Unlock by lifting up on latch.

STEP 7: Feed material into hopper, large end first. Stand to the side of the hopper when feeding. Do not stand in front of the hopper when feeding because longer branches or stray chips may hit you and branches may catch your clothing. The feed roll will fold branches back as they are pulled into the hopper. Adhere to the following advice to make the Chipper most effective.

- When cutting material for chipping, make larger butt end cuts at an angle. This will allow the feed roll to catch the material easily. Occasionally, a limb fork may have to be cut to feed properly.
- When chipping large diameter wood, the feed roll may need to be briefly stopped with the safety bar, until the chipper returns to full speed.
- If the material stops the feed roll, release the feed roll clutch by pushing on the safety bar. Pull the material out of the hopper. Release the safety bar and the feed roll will engage.

FREEING DISCHARGE BLOCKAGE

FIG. 13 - TOP CLEAN OUT DOOR

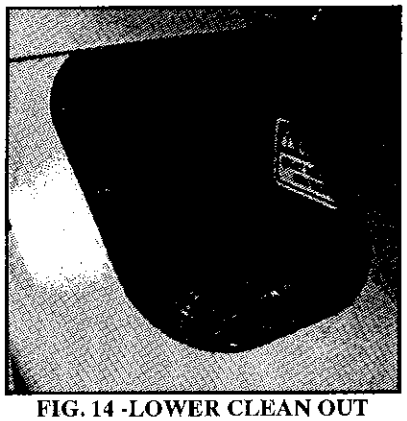


FIG. 14 -LOWER CLEAN OUT DOOR REMOVED (TRAILER MODEL SHOWN)

TRANSPORTING

STEP 8: Watch the discharge chute while operating the unit. If the chips stop flowing, take the following steps to free the blockage.

(a) Stop feeding material into the unit by pushing safety bar.

(b) Pull material from the hopper. All material must be out of the flywheel housing and feed roll or the unit could jam.

(c) If the unit slows down noticeably, disengage the PTO and shut off the tractor (on PTO models) or shut off engine (on trailer model), then put the keys in your pocket. Allow a minimum of thirty (30) seconds for the flywheel to stop its rotation. Listen for the flywheel to stop. Insert safety lock pin provided in flywheel when stopped.

(d) Unplug the chipper unit by first removing the discharge chute. The blockage will usually be located in the base of the discharge chute. Push obstruction back into the chipper.

(e) Keeping everyone clear, remove the safety lock pin from flywheel, engage the PTO and start the tractor (on PTO models) or start engine (on trailer model), and slowly bring the chipper up to speed, so that chips are blown out.

(f) If this unplugs the chipper, shut off the PTO power and then the tractor or shut off motor on trailer model. Put keys in pocket. Replace discharge chute.

If this fails to unplug the chipper, the top and lower clean out doors will need to be removed. (Refer to Figure 13 and Figure 14.) Shut down tractor or trailer (as instructed above), remove the clean out doors, and remove the chips. See *Access Doors* within the *Maintenance* section of this manual. Replace clean out doors, before restarting chipper.

Transporting Trailer Model

Shut off chipper motor. Damage to chipper will result, if chipper is transported while operating.

Connect trailer to a vehicle with a 2 inch ball hitch.

Fasten safety chains between trailer and vehicle.

Connect wiring harness for rear turn and stop lights.

Raise jack stand.

Remove blocks from trailer wheels.

Fold hopper extension up into travel position.

Take care when crossing ditches, traveling over curbs, or going up inclines.

Transporting PTO Power Models

Shut off the power to PTO. Damage to chipper will result, if chipper is transported while operating.

Raise chipper to allow adequate clearance.

If your tractor becomes too light in the front end, weight will need to be added to the front of tractor to counterbalance the weight of chipper.

Take care when crossing ditches, traveling over curbs, or going up inclines.

Remove the chipper when operating front mounted attachments. Tractor and chipper may bounce or highly flex causing a change in factory assembly clearances, safe operation, and warranty.

Fold hopper extension up into travel position.

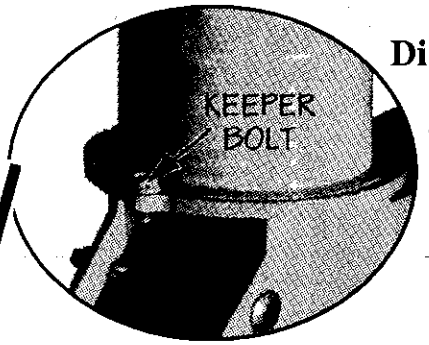
⚠ WARNING!

A chipper is precision equipment that can be mis-aligned or damaged by rough travel. Make sure flywheel rotation is clear of obstructions, before starting chipper after transporting.

Maintenance

- •Access Doors
- •Maintenance Schedule
- •Lubrication
- •Preventive Maintenance
- •Knives
- •Safety Bar Cable
- •Chipper Construction
- •Storage

Danuser Commercial Chipper / Mulcher has several access doors and removable guards to make servicing easier.

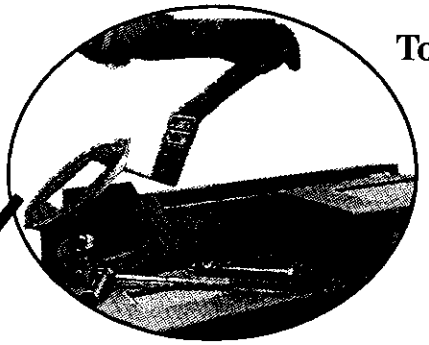


Discharge Chute

Access: Discharge plugs at chute base

Removal Instructions:

- Remove the two keeper bolts at the base of the chute with a 9/16 inch wrench.
- Lift chute off base.

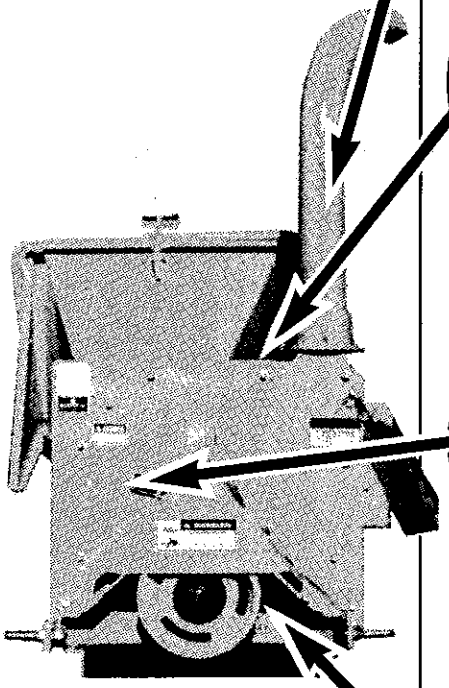


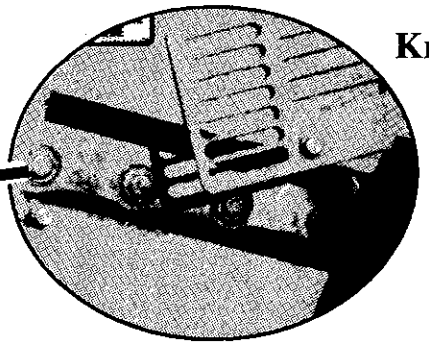
Top Clean Out Door

Access: Discharge plugs in flywheel housing.

Removal Instructions:

- Remove discharge chute.
- Remove the center bolt along the top of the flywheel housing with a 3/4 inch wrench.
- Loosen the surrounding flywheel housing bolts.
- Door is hinged at flywheel housing bolt under discharge chute.



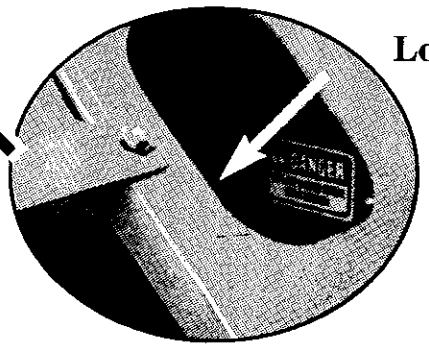


Knife Access Door

Access: Knife bolts.

Removal Instructions:

- Loosen both bolts on door with a 7/16 inch wrench.
- Slide door away from bottom bolt.
- Rotate door around top bolt.
- (Trailer model only) Main shaft guard will have to be removed to gain complete access to knife bolts.



Lower Clean Out Door

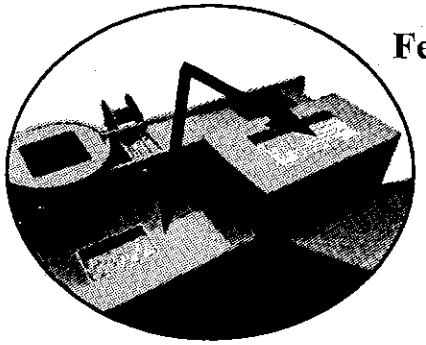
Access: Discharge plugs in flywheel housing

Removal Instructions:

- Remove bolts from each side of door with a 7/16 inch wrench.

⚠ WARNING!

Always ensure that the safety guards, access doors, discharge chute, and chip deflector are installed properly before operating the chipper.



Feed Roll Guard (n/a to 18G)

Access: Knives, safety bar cable, and feed roll components: bearings, driveline, gearbox, belt, and pulley

Removal Instructions:

- Remove the three Nylok ® nuts and bolts found along the bottom edges of the guard with two 7/16 inch wrenches.
- Pull up on guard to slide off flywheel housing.

MAINTENANCE SCHEDULE

WHAT TO DO (Read on for detailed instructions)	WHEN
Make sure knives and bed knife are free of cracks, knife and bed knife bolts are tight, and cutting edges are sharp.	Before operating, after first hour, and every four hours, thereafter
Sharpen knives or reverse knife to sharp edge.	As needed.
Check chipper for loose bolts, set screws, and fasteners.	After first four hours of initial use and daily, thereafter
Lubricate feed roll driveshaft (N/A to 18G Model)	After full day of use
Check for loose belts and broken pulleys.	After full day of use
Lubricate PTO shaft, on PTO powered models.	After full day of use
Lubricate feed roll pivot (N/A to 18G Model)	After two full days of use
Lubricate feed roll bearings (N/A to 18G Model)	Every 6 months
Lubricate main shaft bearings	Every 6 months
Lubricate jack shaft bearings, on PTO powered models.	Every 6 months
Lightly lubricate all bare metal surfaces	Before lengthy storage
Make sure bottom clean out door to allow water to drain.	Before lengthy storage

LUBRICATION

Proper lubrication is important to chipper's operation and longevity.

Feed Roll Driveshaft:

The grease fitting on the feed roll driveshaft lubricates both, the shaft slide and universal joints. After a full day of operation, add multi-purpose grease until grease shows at each universal joint. Occasionally remove the driveshaft and completely clean it with cleaning solvent. Remove by compressing the driveshaft spring until an end can be freed. Once clean, replace and re-lubricate driveshaft.

Tractor PTO Shaft:

Grease fittings on universal joints should be lubricated daily with multi-purpose grease. Lubricate guard fittings as needed for smooth operation.

Feed Roll Pivot:

Two grease fittings are located on the underside of inlet hopper. Lubricate with multi-purpose grease after two full days of operation. Dust or fine particles may cause pivot to bind. Clean pivots with cleaning solvents. Un-hook feed roll springs to move feed roll up and down, while cleaning. Return chipper to working order by wiping off pivots, re-lubricating, and replacing springs.

Feed Roll Clutch:

With chipper shut off, remove guard to access clutch. Separate clutch plates by pushing safety bar toward hopper and lightly lubricate inside surfaces with multi-purpose grease.

Feed Roll Gear Box:

No oil change is necessary for feed roll gear box. If gear box leaks oil, proper level will have to be maintained. Replace oil only when performing maintenance that requires disassembly of gear box. Use seven (7) ounces of Mobil SCH 634 wormgear lubricant or equivalent.

Feed Roll Bearings:

The two sealed ball bearings,one on each side of feed roll, need to be lubricated very sparingly every six months. Do not over lubricate or the seals will be damaged.

Main Shaft Bearings:

The two sealed ball bearings along flywheel shaft needs to be lubricated very sparingly every six months. Do not over lubricate or the seals will be damaged.

Jack Shaft Bearings:

The two sealed ball bearings along bottom shaft on PTO models need to be lubricated very sparingly every six months. Do not over lubricate or the seals will be damaged on these sealed ball bearings.

PREVENTATIVE MAINTENANCE

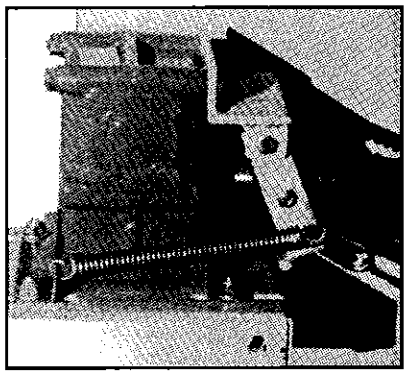


FIG. 15 - GEARBOX (WITH GUARD REMOVED)

FIG. 16 - ONE OF THE FOUR BOLTS TO LOOSEN TO ADJUST 3V BELTS

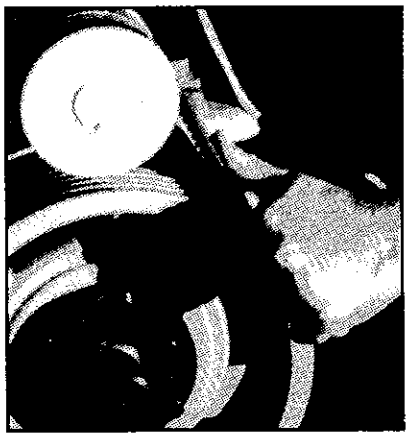


FIG. 17 - CHECK BELTS

To obtain the longest possible working life from your Danuser Commercial Chipper / Mulcher, you should read and follow the steps below. ON CERTAIN PREVENTATIVE PROCEDURES, FOOT · POUNDS OF TORQUE ARE INDICATED TO TIGHTEN BOLTS. If you do not own a torque wrench or do not have a working knowledge of this procedure, we suggest you ask your dealer to explain it.

CHECK ALL BOLTS AND SET SCREWS AND FASTENERS AFTER RUNNING THE FIRST FOUR HOURS AND ONCE PER DAY THEREAFTER.

Bolts:

The bolts in the flywheel housing are 1/2 - 13 x 5 1/2 inch, Grade 5,with Nylok ® nuts. This Nylok ® nut keeps the bolts from loosening. If you replace them, use the same combination. Grade 8 bolts with NC threads are used on all models for the flywheel, knives, main bearing,and bed knife. All other bolts are Grade 5. Use only factory recommended bolts for your safety.

Set Screws:

Set screws are located on PTO yoke, shaft bearings, and pulleys:

(2 set screws) 8 Groove Main Pulley (PTO Models)

(1 set screw) 8 Groove Jack Shaft Pulley (PTO Models)

(2 set screws) PTO Driveline (PTO Models)

(2 set screws) Jack Shaft Bearings (PTO Models)

(2 set screws) Main Shaft Bearings (All Models)

(1 set screw) Main Drive Pulley (Trailer Model).

CHECK FOR LOOSE BELTS, BROKEN PULLEYS, AND LOOSE SPRINGS AFTER A FULL DAY OF USE.

Feed Roll Belt (N/A to Model 18G):

The feed roll drive belt can be adjusted first by loosening the four bolts that hold the gear box to the base and adjusting the two tensioner bolts located to the rear of the gear box. (Refer to Figure 15.) Re-torque the bolts to 17 foot · pounds. Safety bar cable will require adjusting. (See *Safety Bar Cable* within the *Maintenance* section of this manual.)

Eight 3V Belts (PTO Models):

The eight 3V belts of the main drive should be checked after a full day of operation. Look for cracks, looseness, or other signs of deterioration. These belts must be replaced with a matched set of belts for best performance. The alignment of these eight belts is very critical. Be sure they are aligned both horizontally and vertically. The belts **need to be tight**. To tighten these belts, first loosen the four bottom nuts that hold the jack shaft pillow block bearings. (Refer to Figure 16.) Loosen them about three turns, then move the nuts on the top of the bearings down an equal amount. Keep the jack shaft parallel with the main shaft. Torque the bottom nuts to 100 foot · pounds. Belts are at the proper tightness when the belt can be depressed 1/3 to 1/2 thickness of the belt at a point halfway between the pulleys. (Refer to Figure 17.)

Main Drive Belt (Trailer Model):

To tighten belt, first loosen the four motor mount bolts about three turns, then tighten the two tension bolts at the side of the motor mount equal amounts. Keep the main drive pulley aligned with the motor clutch / pulley. Re-tighten motor mount bolts. Belt is at the proper tightness when the belt can be depressed 1/3 to 1/2 thickness of the belt at a point halfway between the pulleys.

Springs (N/A to Model 18G):

Under the feed roll guard, there is a spring along the feed roll driveline and another spring in the safety bar / clutch mechanism. (See *Safety Bar Cable* within the *Maintenance* section of this manual.) There are two feed roll tension spring, one on each side of hopper.

KNIVES

FIG. 18 -SAFETY LOCK PIN

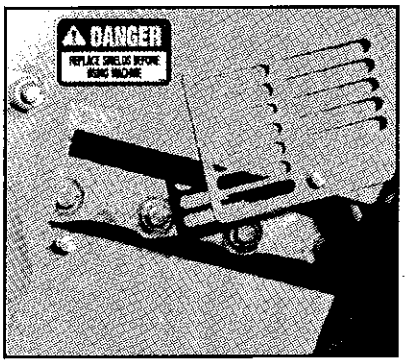


FIG. 19 -KNIFE ACCESS DOOR
(24″ CHIPPER SHOWN)

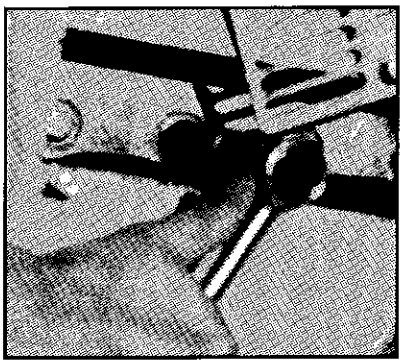


FIG. 20 - KNIFE BOLT REMOVAL
OR INSTALLATION
(24″ CHIPPER SHOWN)

FIG. 21 -KNIFE REMOVAL
OR INSTALLATION

MAKE SURE KNIVES AND BED KNIFE ARE FREE OF CRACKS, KNIFE AND BED KNIFE BOLTS ARE TIGHT, AND CUTTING EDGES ARE SHARP, BEFORE OPERATING THE CHIPPER, AFTER THE FIRST HOUR, AND EVERY FOUR HOURS THEREAFTER. SHARPEN KNIVES OR REVERSE KNIVES TO SHARP EDGES WHEN CHIPPER PERFORMANCE OR INSPECTION REVEALS WORN EDGES

Knife Inspection / Knife Replacement

Sharp knives are critical to the performance of the chipper. Each knife on flywheel has two useful edges. Bed knife has four useful edges. Knives and bed knife do not need removed from chipper to be inspected.

STEP 1: Disengage the PTO and shut off the tractor (on PTO models) or shut off engine (on trailer model), then put the keys in your pocket. Allow a minimum of thirty (30) seconds for the flywheel to stop its rotation. Listen for the flywheel to stop. Insert the safety lock pin provided. Slowly rotate the large pulley by hand while lightly pushing on safety lock pin. (Refer to Figure 18.) Safety lock pin will lock flywheel into the correct position to inspect or remove one of the two knives. STEP 1 will need to be repeated to lock other knife into the correct position to inspect or remove (as instructed in STEP 8).

STEP 2: Open knife access door by loosening both bolts and rotating door. (Refer to Figure 19.) On the trailer model, the shaft guard will need removed.

STEP 3: An inspection of the knife can be made through the knife access door. Inspect tightness of knife bolts. Knife edges and general condition is checked by reaching through chip slot in flywheel and carefully feeling along edge.

On feed roll models (18P, 24P, and 24T), further inspection of the knives can be made by removing feed roll guard (STEP 4) to access knife through hopper inlet.

On model 18G (gravity feed model), further inspection of the knives can be made by peering down hopper or by removing hopper (STEP 4).

If knife is in good condition, proceed to STEP 8.

STEP 4: Remove the feed roll guard. Feed roll guard is held in place by three 1/4 inch bolts with Nylok ® nuts.

On model 18G (gravity feed model), hopper will have to be removed to access knives by removing attaching bolts at base of hopper.

STEP 5: For easier removal of knife, one of the bolts will be used as a handle. Remove the knife bolt furthest from the center of flywheel and relocate it to the other side of the knife. Use 9/16 inch socket with a small extension to remove knife bolts. (Refer to Figure 20.) Bolts are screwed into tapped holes of the knives.

STEP 6: Remove knife by removing remaining bolts. Keep a hold of knife while removing last bolt. Grasping the temporary handle bolt, pass knife over the feed roll and through hopper opening. (Refer to Figure 21.)

STEP 7: Re-install a sharp knife to flywheel using the same methods described in STEP 6 and STEP 7. Reverse knife to a sharp edge or sharpen edges. (Instructions on sharpening edges follow.) **Use Grade 8 bolts and Grade 8 washers.** Be sure washers are properly seated. On 18″ chippers, torque the bolts to 35 foot · pounds. On 24″ chippers, torque the bolts to 45 foot · pounds.

STEP 8: Repeat the above steps to inspect / replace the other knife on flywheel. Then continue to next steps to inspect and adjust bed knife.

NOTE — If something has dropped inside chipper, it can be removed through the bottom clean out door.

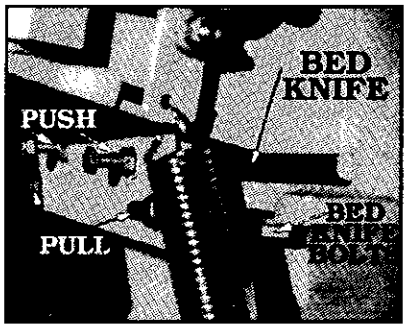


FIG. 22 - BED KNIFE
(24″ MODEL SHOWN)

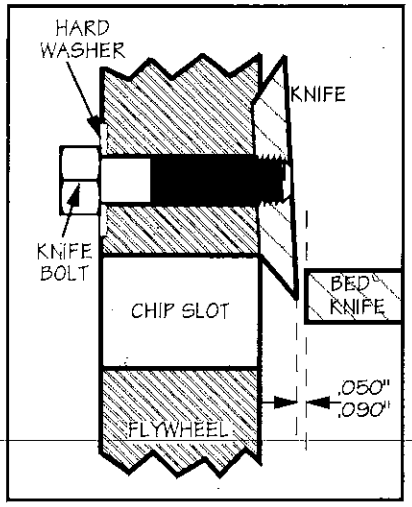


FIG. 23 - CROSS-SECTION OF KNIVES

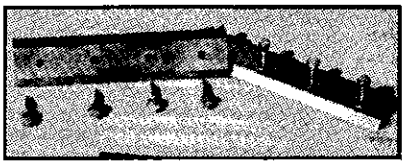


FIG. 24A - 24″ KNIFE KIT

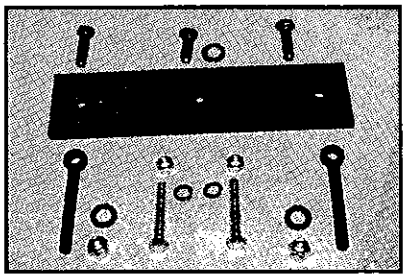


FIG. 24B - 24″ BED KNIFE KIT

STEP 9: Check bed knife. A single bed knife is mounted to front of the housing, directly under the hopper. Bolts and bed knife are visible from the outside of chipper. (Refer to Figure 22.) Further inspection of cutting edge can be made through the hopper inlet.

STEP 10: If new edge is required, remove bed knife bolts and adjust tensioner bolts, until bed knife is able to slide to the side for removal. Reverse knife to a sharp edge or sharpen edges. Re-install bed knife with bolts, but do not tighten until gap is set.

STEP 11: Adjust gap between bed knife and knives on flywheel. Use feeler gages to set a gap of .050 to .090 inch. Loosen the four nuts on the push and pull bolts under hopper. Position bed knife by moving bar in slots with the two push bolts. (Refer to Figure 22 and Figure 23.) Once gap is set, lock the push and pull bolts into place and torque the bed knife bolt to 35 foot · pounds.

STEP 12: Re-assemble chipper by replacing feed roll springs, guards, and knife access door. Tighten all bolts and nuts.

STEP 13: Turn flywheel over by hand to check for obstructions, before applying power.

NOTE

When knife work is completed, check flywheel housing for mislaid tools or parts. If something has dropped inside chipper, it can be removed through the bottom clean out door.

Sharpening Knives: Properly sharpened knives are critical to the performance of this machine. If you are uncertain of the sharpening procedure or do not have adequate tools to perform this procedure, secure the services of a professional. **Knives have been resharpened too frequent and need to be discarded when cutting edge does not protrude beyond the chip slot in the flywheel.** Replace knives with only factory approved knife kit which includes knives, Grade 8 bolts, and Grade 8 washers. Contact your dealer or the factory, if you have any questions.

Flywheel Knives: Maintain the original 35 degree angle from the back side of knife to the cutting edge. Only grind the face of the cutting edges. Do not grind any other surface of the knife.

Bed Knife: Maintain the square face of cutting edge. Only grind the face of the cutting edges. Do not grind any other surface of the knife.

Knives:

Replace knives with only factory approved knife kit which includes knives, Grade 8 bolts, and Grade 8 hard washers. There are two knife kits (an 18″ kit and a 24″ kit). (Refer to Figure 24A.)

Knife Bolts:

The 18″ chipper has three 3/8 -16 x 1 1/4 inch, Grade 8, bolts per knife torqued to 35 foot · pounds. The 24″ chipper has four 3/8 -16 x 1 1/2 inch, Grade 8, bolts per knife torqued to 45 foot · pounds.

Knife Washers:

3/8 inch, Grade 8, SAE washers accompany each knife bolt.

Bed Knife:

Replace bed knife with only factory approved bed knife kit which includes knife and bed knife bolts. There are two knife kits (an 18″ kit and a 24″ kit). (Refer to Figure 24B.)

Bed Knife Bolts:

The 18″ chipper has two 3/8 -16 x 1 inch, Grade 8, bed knife bolts. The 24″ chipper has two 3/8 -16 x 1 1/4 inch, Grade 8, and one 3/8 -16 x 1 inch, Grade 8, (with a flat washer) bed knife bolts. Torque to 35 foot · pounds. The position of the bed knife of the 18″ and 24″ chipper is held by four bolts that lock in place. The bed knife is pushed on by two 5/16 x 2 inch all-thread bolts installed with two 5/16 inch lock washers and two 5/16 inch nuts. The bed knife is pulled on by two 3/8 x 3 inch eye bolts installed with two 3/8 inch SAE washers and two 3/8 inch Nylock ® nuts.(Refer to Figure 22 and Figure 24B.)

SAFETY BAR CABLE

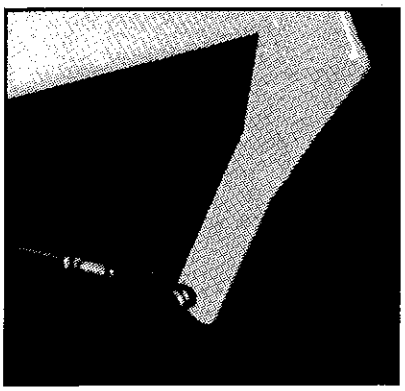


FIG. 26 - CABLE CONNECTION TO SAFETY BAR

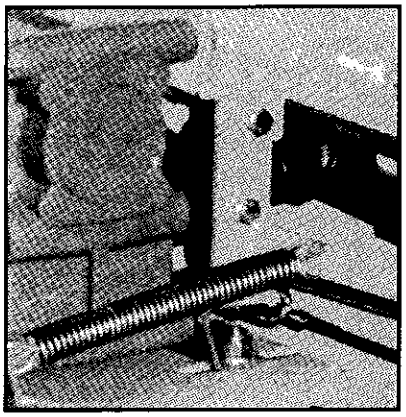


FIG. 27 - CLUTCH ENGAGED

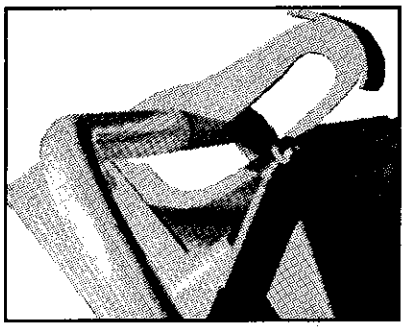


FIG. 28 - SAFETY BAR LOCKED

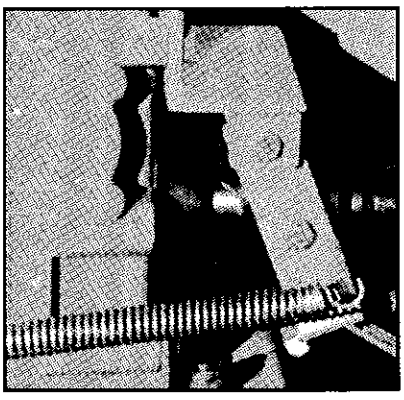


FIG. 29 - CLUTCH DISENGAGED

⚠ DANGER

Safety bar cable adjustment procedure is extremely important. Your safety depends upon proper adjustment and proper operation of safety bar.

STEP 1: Remove feed roll guard which is held in place by three 1/4 inch bolts.

STEP 2: Take the time to visually follow the route of the cable from the threaded yoke on the lower pivot end of the safety bar, through the pulley mounted on the housing, and ending at the release lever with a quick link. (Refer to Figure 25.)

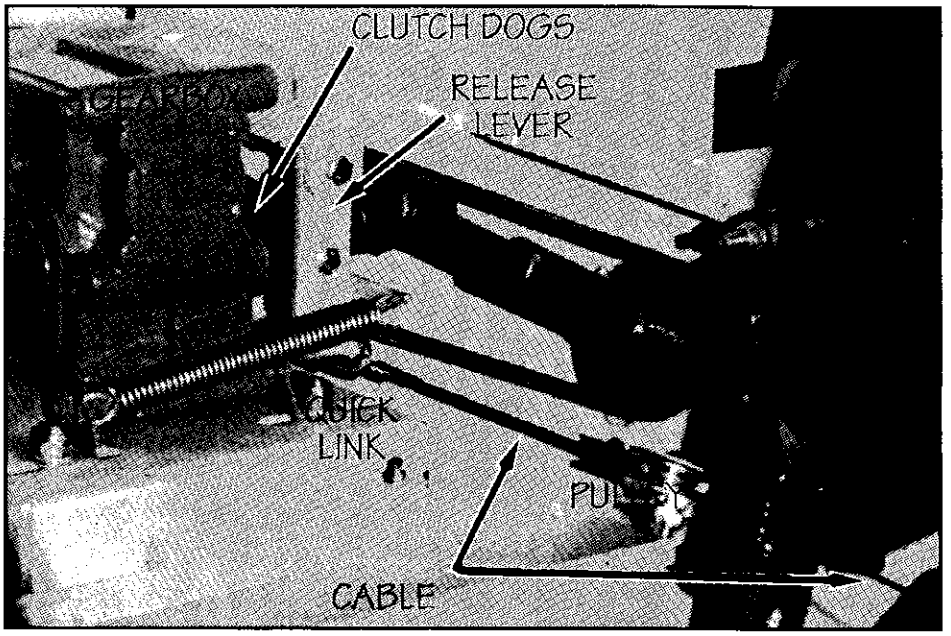


FIG. 25- SAFETY BAR CABLE COMPONENTS (FEED ROLL GUARD REMOVED)

STEP 3: Remove the yoke from the lower pivot of the safety bar by removing the cotter pin to free the pin. (Refer to Figure 26.)

STEP 4: Determine the normal operating position of the release lever. Release lever should be vertical with clutch fully engaged. (Refer to Figure 27.)

STEP 5: Hold the safety bar in the normal operating position (unlocked position). Pull top of safety bar as far away from hopper as possible.

STEP 6: With the release lever and the safety bar in normal operating positions (as described in above steps), adjust cable length by rotating the yoke on or off the threaded cable shank. While holding tension in the cable, align the holes in the yoke with the holes in the lower pivot end of the safety bar.

STEP 7: Attach cable to safety bar with pin. Check for proper adjustment and fine tune cable length, if necessary.

- With safety bar in normal operating position, clutch is to be fully engaged (refer to Figure 27.) with a sixteenth of an inch (1/16″) of play in the release lever and cable.
- With safety bar fully locked, the clutch dogs should clear each other by an eighth of an inch (1/8″). (Refer to Figure 28 and Figure 29.)

STEP 8: Secure the yoke to safety bar by reinstalling the cotter pin.

STEP 9: Tighten the jam nut on the threaded cable shank against the yoke.

STEP 10: Cycle the safety bar to confirm proper adjustment. (Refer to STEP 7.)

STEP 11: Replace the feed roll guard.

STEP 12: With the chipper operating, cycle the safety bar. Watch the feed roll to ensure it does in fact stop when the safety bar is locked in the safety catch. When certain the safety bar is operating correctly, the chipper is ready for use.

CHIPPER / MULCHER CONSTRUCTION

The Danuser Commercial Chipper / Mulcher is designed and manufactured for ease of maintenance and operation. Parts are available from the dealer. Removal and replacement of mechanical components require special attention to detail.

8 Groove Main Pulley (PTO Models):
The 8 belt pulley on the flywheel shaft (smaller driven pulley) is installed using double set screws to prevent loosening. To get to these set screws, the belts must be slackened and removed. Two pair of set screws are located to lock against the key. If there is a need to remove this pulley, be sure to replace both set screws in each hole. Run the first in and tighten. Then repeat with the second in each hole.

8 Groove Jack Shaft Pulley (PTO Models):
The large (drive) pulley on the jack shaft is kept in place with a tapered hub. This hub is installed using a single set screw into the key and the bolts on the tapered hub.

Main Drive Pulley (Trailer Models):
The pulley on the flywheel shaft is kept in place with a tapered hub. This hub is installed using a single set screw into the key and the bolts on the tapered hub.

Main Shaft Bearings:
The main shaft has been dimpled to receive the main bearing set screws. These screws are installed with Loctite ®. This keeps the flywheel centered in the flywheel housing. Please contact the factory for assistance when replacing main bearings. Critical alignment procedures must be followed to ensure safe operation of the chipper. If the main bearings are replaced, the set screw will need to be set and re-installed with Loctite ®. Metal pieces have been tack welded at bearing mount to prevent side movement.

Jack Shaft Bearings (PTO Models):
Set screws installed with Loctite ® hold jack shaft in position.

Anti-wrap Collar:
Your chipper has an anti-wrap collar, so stringy material should not wrap around the main shaft. This collar is bolted to the flywheel housing on the knife side of the flywheel. This should eliminate any main shaft wrapping problems. If for some reason you have to access this anti-wrap collar, you will have to remove the back half of the flywheel housing and hopper, or the gearbox pulley belt and main shaft drive pulley. The anti-wrap collar can be re-centered on the shaft by the two bolts.

Feed Roll Gearbox (N/A to 18G Model):
If you ever need to remove the gearbox, proper care should be taken to align sheaves (pulleys), when re-installing. Mis-aligned sheaves can cause excessive loads on gearbox shafts and bearings. Caution should be taken to locate sheaves as close to the gearbox housing as possible to minimize overhung loads. All components of the gearbox should be securely fastened in place after proper alignment and leveling of all elements. Safety bar cable will require adjusting. (Refer to *Safety Bar Cable* section.)

Decals and Safety Signs:
All decals and safety signs should be kept clean and legible. It is the operator's responsibility to replace as needed. The factory will furnish new safety signs upon request at no charge.

STORAGE

Before storing the chipper, spray some light oil on all metal surfaces to inhibit rust. The chipper should be kept under cover in a dry place if stored for any length of time. It is an excellent idea to service any machinery before prolonged storage.

Standing water in chipper may freeze and cause damage. The bottom clean out door has a drain hole that may become clogged. Before storing the chipper, make sure drain hole is clear of obstructions by removing lower clean out door. Disengage the PTO and shut off the tractor (on PTO models) or shut off engine (on trailer model), then put the keys in your pocket. Allow a minimum of thirty (30) seconds for the flywheel to stop its rotation. Listen for the flywheel to stop. Insert safety lock pin provided in flywheel when stopped. Clear debris from flywheel housing and drain hole. Replace lower clean out door.

Troubleshooting

Following table is a list of Danuser Commercial Chipper / Mulcher operation problems, along with advice on solving the problem. Follow repair procedures in *Maintenance* section.

PROBLEM	POSSIBLE CAUSES	SOLUTIONS
Chipper RPM slows and tractor RPM does not	Main drive belts are slipping	Tighten belts
	Dull knives	Sharpen or reverse knives
Feed roll clutch kicking in and out, excessively. (feed roll models only)	Dull knives	Sharpen or reverse knives
	Material jammed in hopper	Release feed roll clutch by pushing on safety bar and pull material out of hopper. Trim off forks, before feeding material back into hopper
	Clutch is excessively lubricated	Remove excess lubrication from clutch plates
Safety bar / clutch not deactivating feed roll	Feed roll clutch needs lubricated	Lightly lubricate clutch plates
	Safety bar cable needs adjusted	Adjust safety bar cable
Not chipping clean or flywheel plugging	Dull knives	Sharpen or reverse knives
	Bed knife rounded	Sharpen or reverse bed knife
	Bed knife not adjusted properly	Adjust to .050 to .090 inch.
	Chipper flywheel turning too slowly	On PTO models, ensure 540 RPM. On trailer models, make sure engine is at full throttle (3600 RPM). Engine manufacture dealer is able to confirm correct engine speed at full throttle.
Unit will not feed.	Feed roll pivot dirty or dry	Clean and lubricate feed roll pivots
	Limb forks too wide	Remove from hopper and trim off forks
	Feed roll gear box belt loose	Tighten feed roll belt
	Feed roll tension springs stretched	Replace feed roll tension springs
Chipper vibrates.	Material balled up on the flywheel	Gain access to flywheel as instructed in Knife Replacement STEP 1, 2, and 4. Remove build-up with a sharp tool, putty knife, or screw driver.
	Broken or loose part	Gain access to flywheel as instructed in Knife Replacement STEP 1, 2, and 4 and remove top clean out. Inspect flywheel for loose or broken parts.

Dull knives cause many problems:

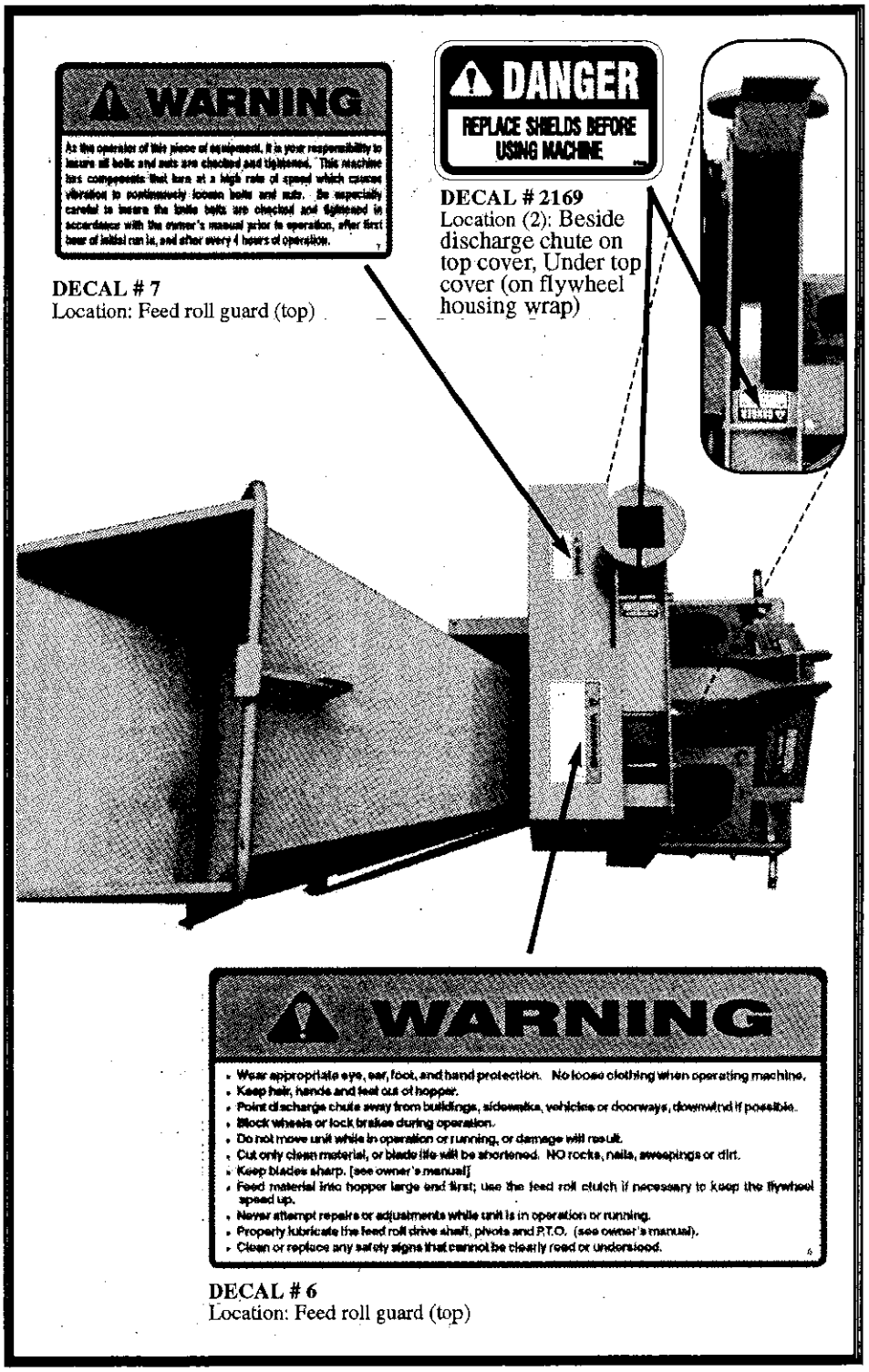
- seeming lack of power,
- plugging of discharge chute,
- rough cutting with more vibration than usual, and
- feed roll kicking out of gear and not feeding.

Parts

- Decals and Safety Signs
- Exploded view of chipper
- Exploded view of trailer

⚠ WARNING!
Clean or replace all safety signs if they cannot be read or understood.

DECALS AND SAFETY SIGNS - TOP OF CHIPPER



DECAL # 7
Location: Feed roll guard (top)

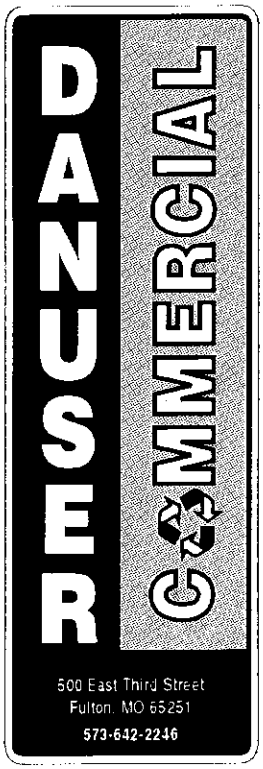
DECAL # 2169
Location (2): Beside discharge chute on top cover, Under top cover (on flywheel housing wrap)

DECAL # 6
Location: Feed roll guard (top)

DECAL #	PART #	DESCRIPTION	LOCATION	MODEL*
2169	60403	DANGER - Replace Shields	Beside discharge chute on top cover	PTO, T, G
2169	60403	DANGER - Replace Shields	Under top cover (on flywheel housing wrap)	PTO, T, G
-	-	-		-
6	60406	WARNING - Listing	Feed roll guard (top)	PTO, T
7	60407	WARNING - Responsibility	Feed roll guard (top)	PTO, T

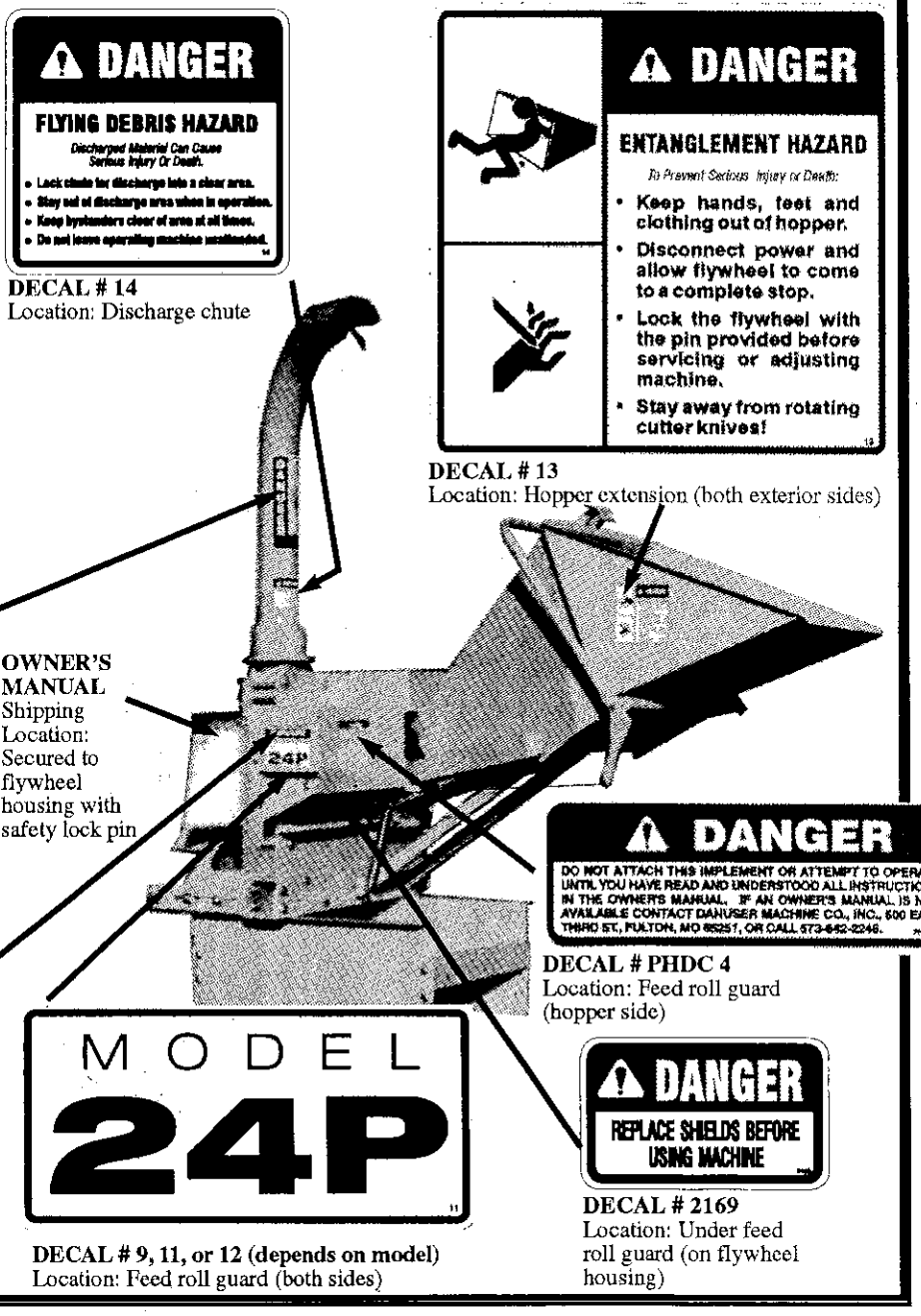
* Models key: PTO driven models with feed roll (PTO), trailer model (T), and gravity feed models (G)

DECALS AND SAFETY SIGNS - DISCHARGE CHUTE, HOPPER-END AND SIDE OF CHIPPER



DECAL # 21
Location: Discharge chute

DECAL # 22
Location: Feed roll guard (both sides)



DECAL # 14
Location: Discharge chute

DECAL # 13
Location: Hopper extension (both exterior sides)

OWNER'S MANUAL
Shipping Location: Secured to flywheel housing with safety lock pin

DECAL # PHDC 4
Location: Feed roll guard (hopper side)

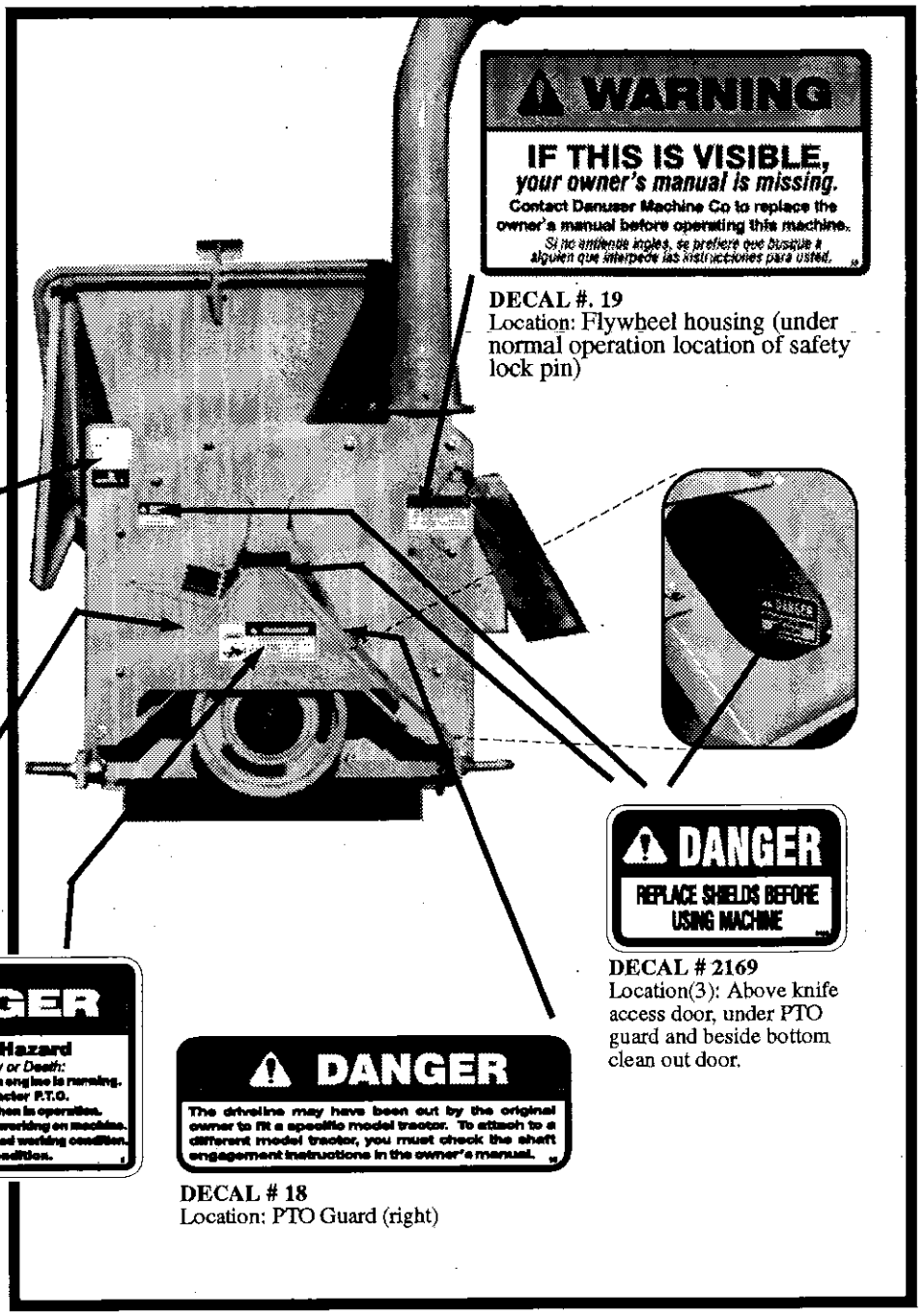
DECAL # 9, 11, or 12 (depends on model)
Location: Feed roll guard (both sides)

DECAL # 2169
Location: Under feed roll guard (on flywheel housing)

DECAL #	PART #	DESCRIPTION	LOCATION	MODEL*
2169	60403	DANGER - Replace Shields	Under feed roll guard (on flywheel housing)	PTO, T
-	-	-		-
PHDC 4	60404	DANGER - Read Owner's Manual	Feed roll guard (hopper side)	PTO, T
9	60409	Model Number 18P	Feed roll guard (both sides)	18P
11	60411	Model Number 24P	Feed roll guard (both sides)	24P
12	60412	Model Number 24T	Feed roll guard (both sides)	24T
13	60413	DANGER - Keep Hands Out	Hopper extension (both exterior sides)	PTO, T
-	-	-		-
14	60414	DANGER - Flying Debris	Discharge chute	PTO, T, G
21	60421	Danuser / Commercial	Discharge chute	PTO, T, G
22	60422	Commercial	Feed roll guard (both sides)	PTO, T

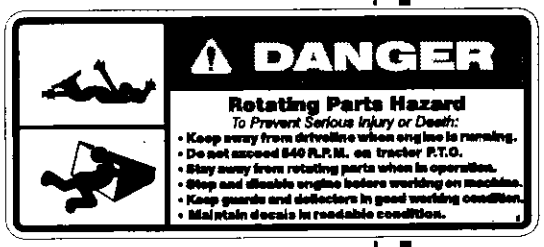
* Models key: PTO driven models with feed roll (PTO), trailer model (T), and gravity feed models (G)

DECALS AND SAFETY SIGNS - PULLEY-END OF CHIPPER



DECAL # 8
Location: Flywheel housing (upper left corner)

DECAL # 1
Location: PTO Guard (left)



DECAL #. 2
Location: PTO Guard (face)

DECAL #. 19
Location: Flywheel housing (under normal operation location of safety lock pin)

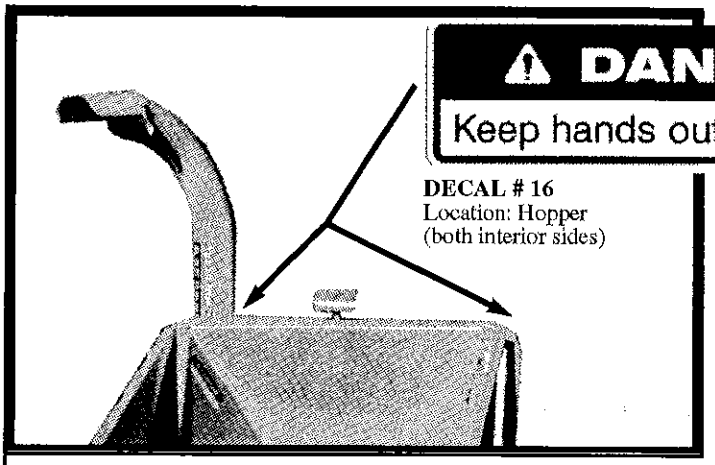
DECAL # 2169
Location(3): Above knife access door, under PTO guard and beside bottom clean out door.

DECAL # 18
Location: PTO Guard (right)

DECAL #	PART #	DESCRIPTION	LOCATION	MODEL*
2169	60403	DANGER - Replace Shields	Above knife access door	PTO,T ,G
2169	60403	DANGER - Replace Shields	Beside bottom clean out door	PTO,T ,G
2169	60403	DANGER - Replace Shields	Under PTO guard	PTO, G
1	60401	DANGER - 540 RPM	PTO guard (left)	PTO, G
2	60402	DANGER - Rotating Parts Hazard	PTO guard (face)	PTO, G
8	60408	Serial Number Manufacture Plate	Flywheel housing (upper left corner)	PTO, T, G
18	60418	DANGER - Possible Cut Driveline	PTO guard (right)	PTO, G
19	60419	WARNING - Missing Owner's Manual	Flywheel housing (under normal operation location of safety lock pin)	PTO, T
-	-			-

* Models key: PTO driven models with feed roll (PTO), trailer model (T), and gravity feed models (G)

DECALS AND SAFETY SIGNS - INSIDE HOPPER

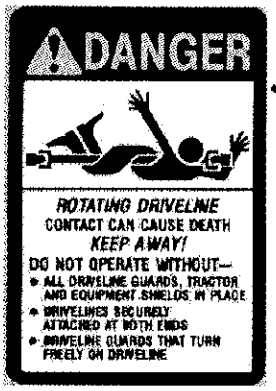


DECAL # 16
Location: Hopper
(both interior sides)

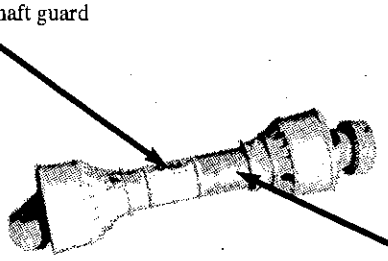
DECAL #	PART #	DESCRIPTION	LOCATION	MODEL*
16	60416	DANGER - Keep Hands Out	Hopper (both interior sides)	PTO, T

* Models key: PTO driven models with feed roll (PTO), trailer model (T), and gravity feed models (G)

DECALS AND SAFETY SIGNS - PTO DRIVELINE



PART # 13-10021
Location: PTO
shaft guard

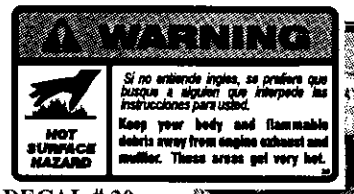


PART # 13-10022
Location: PTO
shaft (under guard)

DECAL #	PART #	DESCRIPTION	LOCATION	MODEL*
-	13-10021	DANGER - Rotating Driveline	PTO shaft guard	PTO, G
-	13-10022	DANGER - Guard Missing	PTO shaft (under guard)	PTO, G

* Models key: PTO driven models with feed roll (PTO), trailer model (T), and gravity feed models (G)

DECALS AND SAFETY SIGNS - ADDITIONAL SAFETY SIGNS ON TRAILER MODEL



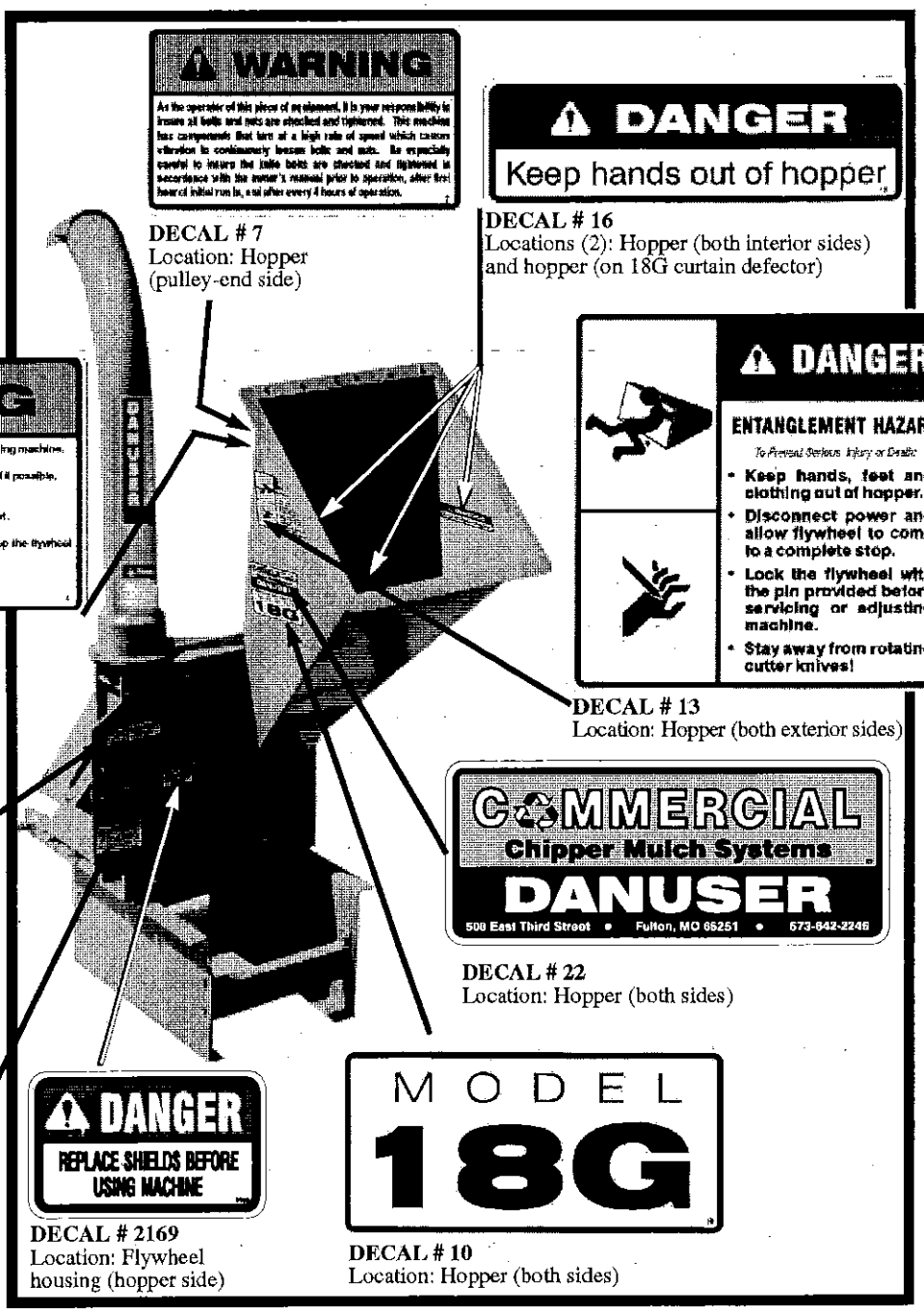
DECAL # 20
Location:
Main belt
drive guard
(near engine)

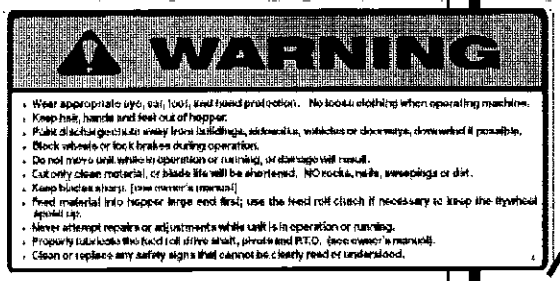
DECAL # 2169
Location (2): Under
main drive belt guard
(near big pulley) and
beside bearing guard

DECAL #	PART #	DESCRIPTION	LOCATION	MODEL*
2169	60403	DANGER - Replace Shields	Under main drive belt guard	T
-	-	-	(near big pulley)	-
2169	60403	DANGER - Replace Shields	Beside bearing guard	T
20	60420	WARNING - Hot	Main belt drive guard (near engine)	T

* Models key: PTO driven models with feed roll (PTO), trailer model (T), and gravity feed models (G)

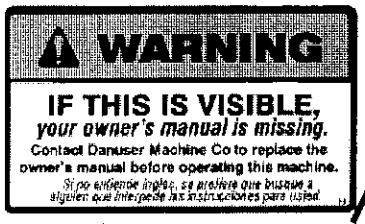
DECALS AND SAFETY SIGNS - UNIQUE SAFETY SIGN LOCATIONS OF GRAVITY FEED MODEL





DECAL # 6
Location: Hopper (pulley-end side)

DECAL # PHDC 4
Location: Flywheel housing (hopper side)



DECAL #. 19
Location: Flywheel housing (hopper side, under normal operation location of safety lock pin)

DECAL # 7
Location: Hopper (pulley-end side)

DECAL # 16
Locations (2): Hopper (both interior sides) and hopper (on 18G curtain defector)

DECAL # 13
Location: Hopper (both exterior sides)

DECAL # 22
Location: Hopper (both sides)

DECAL # 2169
Location: Flywheel housing (hopper side)

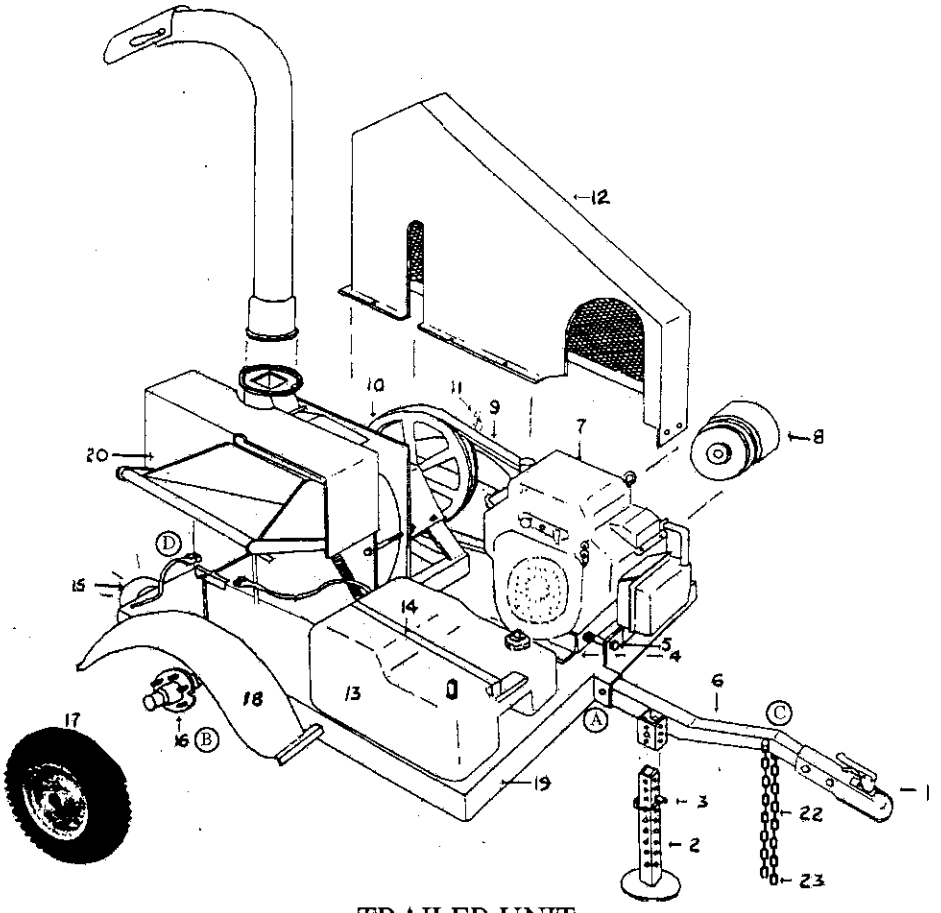
DECAL # 10
Location: Hopper (both sides)

DECAL #	PART #	DESCRIPTION	LOCATION	MODEL*
2169	60403	DANGER - Replace Shields	Flywheel housing (hopper side)	G
PHDC4	60404	DANGER - Read Owner's Manual	Flywheel housing (hopper side)	G
6	60406	WARNING - Listing	Hopper (pulley-end side)	G
7	60407	WARNING - Responsibility	Hopper (pulley-end side)	G
10	60410	Model Number 18G	Hopper (both exterior sides)	G
13	60413	DANGER - Keep Hands Out	Hopper (both exterior sides)	G
16	60416	DANGER - Keep Hands Out	Hopper (both interior sides)	G
16	60416	DANGER - Keep Hands Out	Hopper (on kick back defector)	G
19	60419	WARNING - Missing Owner's Manual	Flywheel housing (hopper side, under normal operation location of safety lock pin)	G
-	-			-
-	-	-		-
22	60422	Commercial	Hopper (both exterior sides)	G

* Models key: PTO driven models with feed roll (PTO), trailer model (T), and gravity feed models (G)

EXPLODED VIEW OF TRAILER

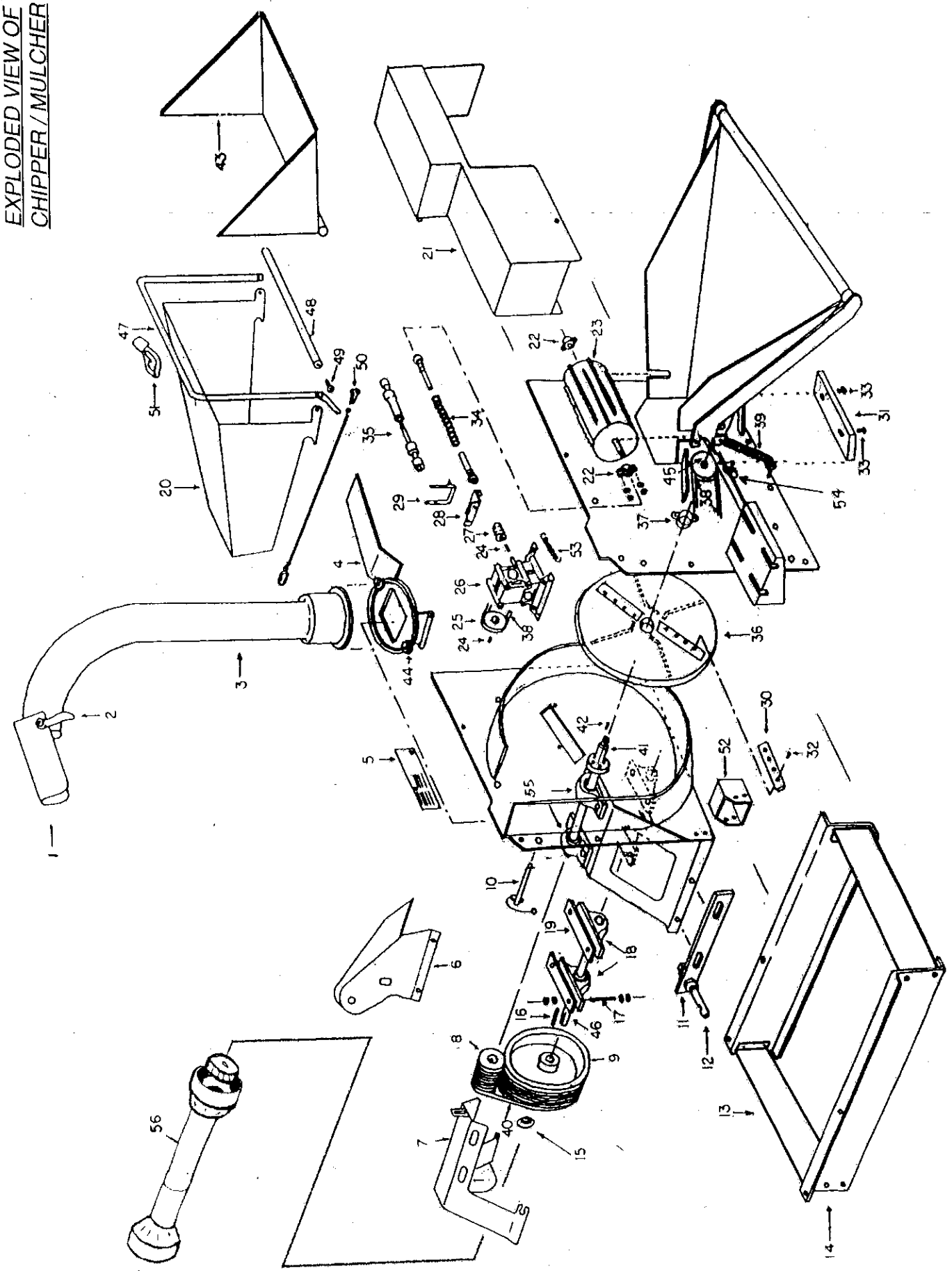
Assembly Hardware	
Item	Quantity
- - - - - - - A - (TONGUE) - - - - - - -	
Bolt (1/2" x 3 1/2" UNC, Gr. 5)	1
Washer (1/2" SAE)	2
Nylok ® Nut (1/2")	1
- - - - - - - - B - (AXLE) - - - - - - - -	
Bolt (9/16" x 1 1/2" UNC)	4
Washer (9/16")	4
Nut (9/16")	4
- - - C - (SAFETY CHAINS) - - -	
Bolt (1/4" x 3 1/2" UNC, Gr. 5)	1
Washer (5/16" SAE))	2
Nylok ® Nut (1/4")	1
- - - - - - D - (GROUND) - - - - - -	
Battery Cable (negative)	1



TRAILER UNIT

ID #	DESCRIPTION	PART #	QUANTITY
1	Receiver Hitch	60226	1
2	Jack Stand	60232	1
3	Jack Stand Pin	60219	1
4	Engine Mount	60256	1
5	Tensioner Bolt	60257	2
6	Trailer Tongue	60239	1
7	Engine	60243	1
8	Centrifugal Clutch	60024	1
9	Main Drive Belt	60026	1
10	Main Drive Pulley	60028	1
11	Taper Lock Bushing	60029	1
12	Guard	60269	1
13	Fuel Tank	60249	1
14	Fuel Tank Strap	60259	1
15	Tail Light	60225	2
16	Axle Assembly	60245	1
17	Wheel & Tire Assembly	60228	2
18	Trailer Fender	60223	2
19	Trailer Deck	60221	1
20	Chipper Assembly	See *Exploded View of Chipper*	1
21	Main Shaft Guard	60131	1
22	Safety Chain	60224	2
23	Connector	60247	2

EXPLODED VIEW OF CHIPPER / MULCHER



CHIPPER / MULCHER ASSEMBLY

ID #	DESCRIPTION	(QUANITY) PART NUMBER FOR EACH MODEL 18G	18P	24P	24T
1	Chip Deflector	(1) 60086	(1) 60086	(1) 60086	(1) 60086
2	Chip Deflector Handle	(1) 60087	(1) 60087	(1) 60087	(1) 60087
3	Discharge Chute	(1) 60088	(1) 60088	(1) 60088	(1) 60088
4	Top Clean Out Door	(1) 60275	(1) 60275	(1) 60276	(1) 60276
5	Knife Access Door	(1) 60067	(1) 60067	(1) 60077	(1) 60077
6	Top Three-Point HItch Mount	(1) 60127	(1) 60127	(1) 60127	N/A
7	Top Bearing Guard	(1) 60130	(1) 60130	(1) 60130	N/A
8	8 Groove Main Pulley	(1) 60018	(1) 60018	(1) 60018	N/A
9	8 Groove Jack Shaft Pulley	(1) 60022	(1) 60022	(1) 60022	N/A
10	Safety Lock Pin	(1) 60200	(1) 60200	(1) 60200	(1) 60200
11	Lower Three-Point Hitch Bar Set	(1) 60124	(1) 60124	(1) 60124	N/A
12	Three-Point Hitch Pin Set	(1) 60125	(1) 60125	(1) 60125	N/A
13	Base Stand Cross Brace Set	(1) 60183	(1) 60183	(1) 60184	N/A
14	Base Stand Set (Right & Left)	(1) 60186	(1) 60186	(1) 60187	N/A
15	Taper Lock Bushing	(1) 60020	(1) 60020	(1) 60020	N/A
16	Key - 3/8 x 3 3/4 inch	(1) 60059	(1) 60059	(1) 60059	N/A
17	Bearing Bolts (with Nuts) Set	(1) 60152	(1) 60152	(1) 60152	(1) 60152
18	Jack Shaft Bearing	(2) 60145	(2) 60145	(2) 60145	N/A
19	Jack Shaft Bearing Plate/Shim	(2) 60118	(2) 60118	(2) 60118	N/A
20	Hopper	(1)60133	(1) 60095	(1) 60108	(1) 60108
21	Feed Roll Guard	N/A	(1) 60179	(1) 60180	(1) 60180
22	Feed Roll Bearing	N/A	(2) 60146	(2) 60146	(2) 60146
23	Feed Roll	N/A	(1) 60009	(1) 60054	(1) 60054
24	Key	N/A	(1) 60021	(1) 60021	(1) 60021
25	Gearbox Pulley	N/A	(1) 60148	(1) 60159	(1) 60159
26	Gearbox	N/A	(1) 60147	(1) 60147	(1) 60147
27	Clutch Dog Assembly	N/A	(1) 60036	(1) 60036	(1) 60036
28	Clutch Bracket	N/A	(1) 60175	(1) 60175	(1) 60175

ID #	DESCRIPTION	(QUANITY) PART NUMBER FOR EACH MODEL 18G	18P	24P	24T
29	Release Lever	N/A	(1) 60171	(1) 60171	(1) 60171
30	Knife	----------SEE KNIFE KITS BELOW----------			
31	Bed Knife	----------SEE BED KNIFE KITS BELOW----------			
32	Knife Bolt, Grade 8	----------SEE KNIFE KITS BELOW----------			
33	Bed Knife Bolt, Grade 8	----------SEE BED KNIFE KITS BELOW----------			
34	Feed Roll Drive Shaft Spring	N/A	(1) 60041	(1) 60041	(1) 60041
35	Feed Roll Drive Shaft Assy.	N/A	(1) 60162	(1) 60162	(1) 60162
36	Flywheel Assy. (incl. Main Shaft)	(1) 60004	(1) 60004	(1) 60049	(1) 60049
37	Anti Wrap Collar	(1) 60207	(1) 60207	(1) 60207	(1) 60207
38	Gearbox Drive Belt	N/A	(1) 60149	(1) 60160	(1) 60160
39	Feed Roll Tension Spring	N/A	(2) 60044	(2) 60044	(2) 60044
40	8 Belt Set	(1) 60023	(1) 60023	(1) 60023	N/A
41	Main Shaft	----------SOLD ONLY WITH FLYWHEEL----------			
42	Key Feed Roll Drive Pulley	N/A	(1) 60021	(1) 60021	(1) 60021
43	Hopper Extension	N/A	(1) 60092	(1) 60107	(1) 60107
44	Keeper Bolt	(2) 60195	(2) 60195	(2) 60195	(2) 60195
45	Feed Roll Drive Pulley	N/A	(1) 60150	(1) 60159	(1) 60159
46	Jack Shaft	(1) 60002	(1) 60002	(1) 60002	N/A
47	Safety Bar	N/A	(1) 60082	(1) 60083	(1) 60083
48	Hinge Pipe Assembly	N/A	(1) 60097	(1) 60110	(1) 60110
49	Safety Bar Pivot	N/A	(1) 60278	(1) 60278	(1) 60278
50	Safety Bar Cable	N/A	(1) 60280	(1) 60279	(1) 60279
51	Safety Bar Latch	N/A	(1) 60100	(1) 60100	(1) 60100
52	Flywheel Housing Connector	(2) 60104	(2) 60104	(2) 60104	(2) 60104
53	Clutch Lever Return Spring	N/A	(1) 60172	(1) 60172	(1) 60172
54	Clutch Cable Pulley	N/A	(1) 60135	(1) 60135	(1) 60135
55	Main Shaft Bearing	(2) 60142	(2) 60142	(2) 60142	(2) 60142
56	PTO Driveline	(1) 60209	(1) 60209	(1) 60210	N/A
-	Deflector, 18G Curtain	60139	N/A	N/A	N/A

18" Knife kit (PN 60030)

ID #	DESCRIPTION	Quantity
30	Knife	2
32	Knife Bolt (3/8 - 16 x 1 1/4 inch, Grade 8)	6
32	Knife Washer (3/8 inch, Grade 8, SAE)	6

24" Knife kit (PN 60032)

ID #	DESCRIPTION	Quantity
30	Knife	2
32	Knife Bolt (3/8 - 16 x 1 1/2 inch, Grade 8)	8
32	Knife Washer (3/8 inch, Grade 8, SAE)	8

BED KNIFE KITS

ID #	DESCRIPTION	18" (PN 60031)	24" (PN 60033)
31	Bed Knife	1	1
33	Bed Knife Bolt (3/8 - 16 x 1 1/4 inch, Grade 8)	-	2
33	Bed Knife Bolt (3/8 - 16 x 1 inch, Grade 8)	2	1
33	Bed Knife Washer (3/8 inch, Grade 8, SAE)	-	1
-	Push Bolt,, and Nut (5/16 x 2 inch, all thread)	2	2
-	Lock Washer (5/16 inch)	2	2
-	Nut (5/16 inch)	2	2
-	Pull Bolt (3/8 x 3 inch, eyelet head)	2	2
-	Washer (3/8 inch,.SAE)	2	2
-	Nylock ® Nut (3/8 inch)	2	2

Warranty

DANUSER MACHINE COMPANY, INC.

SERVICE ADJUSTMENT POLICY

LIMITED WARRANTY

The Danuser Machine Company warrants this product to be free from defects in material and workmanship for a period of 30 days for commercial use or 90 days for farm use. Farm users may extend their warranty to a one year limited warranty if Danuser Machine Company has received the WARRANTY REGISTRATION FORM & INSPECTION REPORT (completed by dealer) AND the WARRANTY EXTENSION COUPON on page 6A (completed by customer). Start of warranty period is determined by purchase date. Proof of purchase is required.

1. Parts may not be returned without authorization by Danuser Machine Company.
2. All products returned under a warranty inspection claim must be returned PREPAID to our factory of origin. The freight charge will be credited back to you, if the product is determined by Danuser Machine Company to be defective.
3. To file a warranty inspection claim, your dealer must request from his Danuser Distributor a "SERVICE ADJUSTMENT REQUEST" which must be typed in triplicate. Forward the original and one duplicate through your dealer and distributor to DANUSER MACHINE COMPANY. If the return of the parts listed on your "SAR" is approved for warranty inspection, you will receive through your distributor and dealer the required "RETURN GOODS TAG(S)". You then attach the tag(s) and return the parts through your dealer and distributor. Shipments arriving at our factory of origin on a freight collect basis will be refused by our receiving department.
4. Our obligation under the above warranty is limited to repair or replacement at our factory of origin of any part or parts of Danuser products, which the Danuser Machine Company determines to be defective.
5. Products or parts thereof which, as determined by Danuser Machine Company's examination, show wear from normal use, have been improperly operated, damaged by accident or negligence, field repaired, or altered, are not considered defective and are not covered by this warranty.
6. Some purchased components, including, but not limited to, hydraulic motors, valves, bearings, clutch brakes, knives, and engines, are subject to the inspection and warranty of the respective manufacturer. Thus, delays in a warranty determination can be expected while we await their decisions. NOTE: Hydraulic valves, motors, and engines must arrive with all ports sealed from dirt and moisture. If they arrive with open ports, the warranty is void and no inspection will be made.
7. We reserve the right to change our specifications and design at any time.
8. This warranty shall not obligate Danuser Machine Company to bear any cost of labor for field replacement, testing, or adjustment.

DANUSER MACHINE COMPANY, INC.
500 E. Third St., Fulton Missouri 65251-0368
Phone 573-642-2246 • Fax 573-642-2240
E-mail sales@danuser.com
Web site www.danuser.com