TWR-180
TWR-120

ROTARY CUTTER

Published 12/04

Part No. C314TG010C

OPERATOR'S MANUAL

This Operator's Manual is an integral part of the safe operation of this machine and must be maintained with the unit at all times. READ, UNDERSTAND, and FOLLOW the Safety and Operation Instructions contained in this manual before operating the equipment.

ATTENCIÓN! LEA EL INSTRUCTIVO

Si No Lee Ingles, Pida Ayuda a Alguien Que Si Lo Lea Para Que le Traduzca las Medidas de Seguridad.

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MEMBER OF THE ALAMO GROUP
ALWAYS ON THE CUTTING EDGE

$0.00

TO THE OWNER/OPERATOR/DEALER

All implements with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes the potential hazards and follows reasonable safety practices. The manufacturer has designed this implement to be used with all its safety equipment properly attached to minimize the chance of accidents.

BEFORE YOU START!! Read the safety messages on the implement and shown in your manual. Observe the rules of safety and common sense!

WARRANTY INFORMATION:

Read and understand the complete Warranty Statement found in this Manual. Fill out the Warranty Registration Form in full and return it to Alamo within 30 Days. Make certain the Serial Number of the Machine is recorded on the Warranty Card and on the Warranty Form that you retain.

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SAFETY SECTION

SAFETY

A safe and careful operator is the best operator. Safety is of primary importance to the manufacturer and should be to the owner/operator. Most accidents can be avoided by being aware of your equipment, your surroundings, and observing certain precautions. The first section of this manual includes a list of Safety Messages that, if followed, will help protect the operator and bystanders from injury or death. Read and understand these Safety Messages before assembling, operating or servicing this implement. This equipment should only be operated by those persons who have read the Manual, who are responsible and trained, and who know how to do so safely and responsibly.

The Safety Alert Symbol combined with a Signal Word, as seen below, is used throughout this manual and on decals which are attached to the equipment. The Safety Alert Symbol means: **"ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!"** The Symbol and Signal Word are intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this equipment..

Practice all usual and customary safe working precautions and above all---remember safety is up to YOU. Only YOU can prevent serious injury or death from unsafe practices.

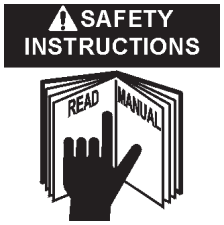
CAUTION! The lowest level of Safety Message; warns of possible injury. Decals located on the Equipment with this Signal Word are Black and Yellow.

WARNING! Serious injury or possible death! Decals are Black and Orange.

DANGER! Imminent death/critical injury. Decals are Red and White. (SG-1)

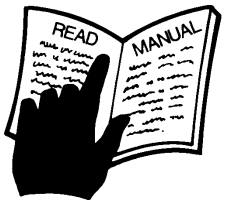
SAFETY

READ, UNDERSTAND, and FOLLOW the following Safety Messages. Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in the Safety Messages. Always use good common sense to avoid hazards. (SG-2)



PELIGRO!

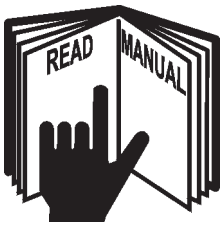
Si no lee Ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad. (SG-3)



¡LEA EL INSTRUCTIVO!

DANGER!

Never operate the Tractor or Implement until you have read and completely understand this Manual, the Tractor Operator's Manual, and each of the Safety Messages found in the Manual or on the Tractor and Implement. Learn how to stop the tractor engine suddenly in an emergency. Never allow inexperienced or untrained personnel too operate the Tractor and Implement without supervision. Make sure the operator has fully read and understood the manuals prior to operation. (SG-4)

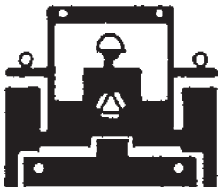


WARNING!

Always maintain the safety decals in good readable condition. If the decals are missing, damaged, or unreadable, obtain and install replacement decals immediately. (SG-5)

WARNING!

Make certain that the "Slow Moving Vehicle" (SMV) sign is installed in such a way as to be clearly visible and legible. When transporting the Equipment use the Tractor flashing warning lights and follow all local traffic regulations. (SG-6)



WARNING!

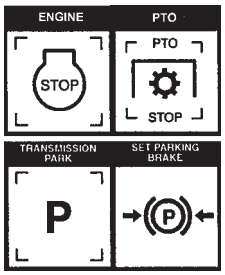
Operate this Equipment only with a Tractor equipped with an approved roll-over-protective system (ROPS). Always wear seat belts. Serious injury or even death could result from falling off the tractor--particularly during a turnover when the operator could be pinned under the ROPS. (SG-7)

WARNING!

Do not modify or alter this Implement. Do not permit anyone to modify or alter this Implement, any of its components or any Implement function. (SG-8)

DANGER!

BEFORE leaving the tractor seat, always engage the brake and/or set the tractor transmission in parking gear, disengage the PTO, stop the engine, remove the key, and wait for all moving parts to stop. Place the tractor shift lever into a low range or parking gear to prevent the tractor from rolling. Never dismount a Tractor that is moving or while the engine is running. Operate the Tractor controls from the tractor seat only. (SG-9)



SAFETY

DANGER!

Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)

DANGER!

Never allow children to operate or ride on the Tractor or Implement. (SGM-11)

WARNING!

Do not mount the Tractor while the tractor is moving. Mount the Tractor only when the Tractor and all moving parts are completely stopped. (SG-12)

DANGER!

Start tractor only when properly seated in the Tractor seat. Starting a tractor in gear can result in injury or death. Read the Tractor operators manual for proper starting instructions. (SG-13)

DANGER!

Never work under the Implement, the framework, or any lifted component unless the Implement is securely supported or blocked up to prevent sudden or inadvertent falling which could cause serious injury or even death. (SG-14)

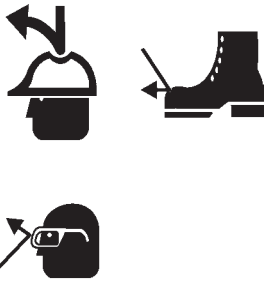
DANGER!

Do not operate this Equipment with hydraulic oil leaking. Oil is expensive and its presence could present a hazard. Do not check for leaks with your hand! Use a piece of heavy paper or cardboard. High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. If oil does penetrate the skin, have the injury treated immediately by a physician knowledge-able and skilled in this procedure. (SG-15)

SAFETY

WARNING!

The operator and all support personnel should wear hard hats, safety shoes, safety glasses, and proper hearing protection at all times for protection from injury including injury from items thrown by the equipment. (SG-16)



CAUTION!

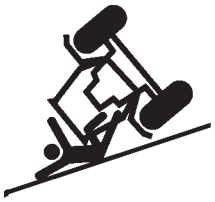
PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS! Tractors with or without an Implement attached can often be noisy enough to cause permanent hearing loss. We recommend that you always wear hearing protection if the noise in the Operator's position exceeds 80db. Noise over 85db over an extended period of time will cause severe hearing loss. Noise over 90db adjacent to the Operator over an extended period of time will cause permanent or total hearing loss. *Note:* Hearing loss from loud noise [from tractors, chain saws, radios, and other such sources close to the ear] is cumulative over a lifetime without hope of natural recovery. (SG-I7)

WARNING!

Transport only at safe speeds. Serious accidents and injuries can result from operating this equipment at unsafe speeds. Understand the Tractor and Implement and how it handles before transporting on streets and highways. Make sure the Tractor steering and brakes are in good condition and operate properly.

Before transporting the Tractor and Implement, determine the safe transport speeds for you and the equipment. Make sure you abide by the following rules:

1. Test the tractor at a slow speed and increase the speed slowly. Apply the Brakes smoothly to determine the stopping characteristics of the Tractor and Implement.
As you increase the speed of the Tractor the stopping distance increases. Determine the maximum safe transport speed for you and this Equipment.



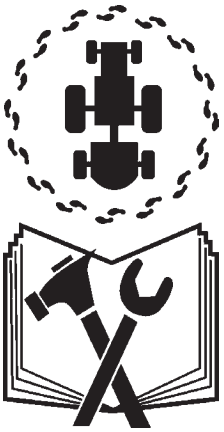
2. Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that it is safe to operate at a higher speed. Use extreme care and reduce your speed when turning sharply to prevent the tractor and implement from turning over. Determine the maximum safe turning speed for you and this equipment before operating on roads or uneven ground.
3. Only transport the Tractor and Implement at the speeds that you have determined are safe and which allow you to properly control the equipment.

Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes. When operating down a hill or on wet or rain slick roads, the braking distance increases: use extreme care and reduce your speed. When operating in traffic always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you andwatch out for the other guy. (SG-19)

SAFETY

WARNING! Never attempt to lubricate, adjust, or remove material from the Implement while it is in motion or while tractor engine is running. Make sure the tractor engine is off before working on the Implement! (SG-20)

WARNING! Periodically inspect all moving parts for wear and replace when necessary with authorized service parts. Look for loose fasteners, worn or broken parts, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this machine in good working order. (SG-21)



WARNING! Always read carefully and comply fully with the manufacturers instructions when handling oil, solvents, cleansers, and any other chemical agent. (SG-22)

DANGER! Never run the tractor engine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health. (SG-23)

DANGER! **KEEP AWAY FROM ROTATING ELEMENTS** to prevent entanglement and possible serious injury or death. (SG-24)

DANGER! Never allow children to play on or around Tractor or Implement. Children can slip or fall off the Equipment and be injured or killed. Children can cause the Implement to shift or fall crushing themselves or others. (SG-25)

WARNING! Do not exceed the rated PTO speed for the Implement. Excessive PTO speeds can cause Implement driveline or blade failures resulting in serious injury or death. (SG-26)

WARNING! Do not mow with two machines in the same area except with Cab tractors with the windows closed. (SGM-11)

SAFETY

DANGER!

NEVER use drugs or alcohol immediately before or while operating the Tractor and Implement. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the equipment safely. Before operating the Tractor or Implement, an operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the Equipment safely. **NEVER** knowingly allow anyone to operate this equipment when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol. (SG-27)

WARNING!

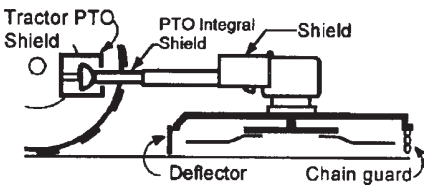
Mow only in conditions where you have clear visibility in daylight or with adequate artificial lighting. Never mow in darkness or foggy conditions where you cannot clearly see at least 100 yards in front and to the sides of the tractor and mower. Make sure that you can clearly see and identify passersby, steep slopes, ditches, drop-offs, overhead obstructions, power lines, debris and foreign objects. If you are unable to clearly see this type of items discontinue mowing. (SGM-1)

DANGER!

There are obvious and hidden potential hazards in the operation of this Mower. REMEMBER! This machine is often operated in heavy brush and in heavy weeds. The Blades of this Mower can throw objects if shields are not properly installed and maintained. Serious injury or even death may occur unless care is taken to insure the safety of the operator, bystanders, or passersby in the area. Do not operate this machine with anyone in the immediate area. Stop mowing if anyone is within 100 yards of mower. (SGM-2)

DANGER!

All Safety Shields, Guards and Safety devices including (but not limited to) - the Deflectors, Chain Guards, Steel Guards, Gearbox Shields, PTO integral shields , and Retractable Door Shields should be used and maintained in good working condition. All safety devices should be inspected carefully at least daily for missing or broken components. Missing, broken, or worn items must be replaced at once to reduce the possibility of injury or death from thrown objects, entanglement, or blade contact. (SGM-3)



DANGER!

The rotating parts of this machine have been designed and tested for rugged use. However, the blades could fail upon impact with heavy, solid objects such as metal guard rails and concrete structures. Such impact could cause the broken objects to be thrown outward at very high velocities. To reduce the possibility of property damage, serious injury, or even death, never allow the cutting blades to contact such obstacles. (SGM-4)

SAFETY

WARNING!

Extreme care should be taken when operating near loose objects such as gravel, rocks, wire, and other debris. Inspect the area before mowing. Foreign objects should be removed from the site to prevent machine damage and/or bodily injury or even death. Any objects that cannot be removed must be clearly marked and carefully avoided by the operator. Stop mowing immediately if blades strike a foreign object. Repair all damage and make certain rotor or blade carrier is balanced before resuming mowing. (SGM-5)

WARNING!

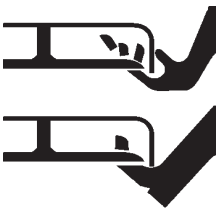
Many varied objects, such as wire, cable, rope, or chains, can become entangled in the operating parts of the mower head. These items could then swing outside the housing at greater velocities than the blades. Such a situation is extremely hazardous and could result in serious injury or even death. Inspect the cutting area for such objects before mowing. Remove any like object from the site. Never allow the cutting blades to contact such items. (SGM-6)

WARNING!

Mow at the speed that you can safely operate and control the tractor and mower. Safe mowing speed depends on terrain condition and grass type, density, and height of cut. Normal ground speed range is from 0 to 5 mph. Use slow mowing speeds when operating on or near steep slopes, ditches, drop-offs, overhead obstructions, power lines, or when debris and foreign objects are to be avoided. (SGM-7)

WARNING!

Avoid mowing in reverse direction when possible. Check to make sure there are no persons behind the mower and use extreme care when mowing in reverse. Mow only at a slow ground speed where you can safely operate and control the tractor and mower. Never mow an area that you have not inspected and removed debris or foreign material. (SGM-8)



WARNING!

Do not put hands or feet under mower decks. Blade Contact can result serious injury or even death. Stay away until all motion has stopped and the decks are securely blocked up. (SGM-9)

DANGER!

Replace bent or broken blade with new blades. NEVER ATTEMPT TO STRAIGHTEN OR WELD ON BLADES SINCE THIS WILL LIKELY CRACK OR OTHERWISE DAMAGE THE BLADE WITH SUBSEQUENT FAILURE AND POSSIBLE SERIOUS INJURY FROM THROWN BLADES. (SGM-10)

WARNING!

Mow only in conditions where you have clear visibilities in daylight or with adequate artificial lighting. Never mow in darkness or foggy conditions where you cannot clearly see at least 100 yards in front and to the sides of the Tractor and Mower. Make sure that you can clearly see and identify passersby, steep slopes, ditches, drop-offs, overhead obstructions, power lines, gas lines, debris, and foreign objects. If you do not have clear and safe visibility discontinue mowing. (SGM-11)

WARNING!

Mow at the speed that you can safely operate and control the Tractor and Mower. Safe mowing speed depends on terrain condition and grass type, density, and height of cut. Normal ground speed range is from 0 to 5 mph. Use slow mowing speeds when operating on or near steep slopes, ditches, drop-offs, overhead obstructions, power lines, gas lines or when debris, and foreign objects are to be avoided. (SGM-12)

WARNING!

Avoid mowing in the reverse direction when possible. Check to make sure there are no persons behind the mower and use extreme care when mowing in reverse. Mow only at a slow ground speed where you can safely operate and control the Tractor and Mower. Never mow an area in the reverse direction that you have not inspected and removed debris or foreign material. (SGM-13)

DANGER!

Rotary Mowers are capable under adverse conditions of throwing objects for great distances (100 yards or more) and causing serious injury or death. Follow safety messages carefully

STOP MOWING IF PASSERSBY ARE WITHIN 100 YARDS UNLESS:

- -Front and Rear Deflectors, Chain Guards, or Bands are installed and in good, workable condition;
- -Mower sections or Wings are running close to and parallel to the ground without exposed Blades;
- -Passersby are outside the existing thrown-object zone;
- -All areas have been thoroughly inspected and all foreign material such as rocks, cans, glass, and general debris has been removed.

NOTE: Where there are grass and weeds high enough to hide debris that could be struck by the blades, the area should be: inspected and large debris removed, mowed at an intermediate height, inspected, closely with any remaining debris being removed, and mowed again at desired final height. (This will also reduce power requiredto mow, reduce wear and tear on the Mower drivetrain, spread cut material better, eliminate streaking, and make the final cut more uniform.)

(SRM-1)

DANGER!

Always disconnect the main PTO Driveline from the Tractor before performing service on the Mower. Never work on the Mower with the tractor PTO driveline connected and running. Blades or Drivelines could turn without warning and cause immediate entanglement, injury or death. (SRM-3)

DANGER!

Do not turn so sharp or lift mower so high to produce a severe "knocking" of the Driveline which will cause accelerated wear and breakage of drive train components and could result inpossible injury from the separated Driveline sections. (SRM-4)

WARNING!

Do not let the Blades turn when the Mower Deck is raised for any reason, including clearance or for turning. Raising the Mower deck exposes the Cutting Blades which creates a potentially serious hazard and could cause serious injury or even death from objects thrown from the Blades. (SRM-7)

WARNING!

Never leave Tractor and Implemented unattended while the implement is in the lifted position. Accidental operation of lifting lever or a hydraulic failure may cause sudden drop of unit with injury or death by crushing. To properly park the implement when disconnecting it from the tractor, lower the stand and put the retaining pin securely in place, or put a secure support under the A-Frame. Lower the implement carefully to the ground. Do not put hands or feet under lifted components. (S3PT-1)

SAFETY

WARNING!

Use extreme care when lowering or unfolding the implement's wings. Make sure no bystanders are close by or underneath the wings. Allow ample clearance around the implement when folding or unfolding the wings. Use extreme caution around buildings or overhead power lines. (S3PT-5)

CAUTION!

To prevent tipping of implement when stored in folded position, use carrying wheels or adequate stands on center frame. (S3PT-6)

DANGER!

There are obvious and hidden potential hazards in the operation of this Implement as in all power-driven or pulled equipment. REMEMBER! This machine is often operated in rough terrain conditions that include tall grass, weeds, gullies, holes, slopes, hidden obstructions and the like. Serious injury or even death may occur unless care is taken to assure the safety of the operator and bystanders in the area. Do not operate this machine with anyone in the immediate area. (S3PT-7)

DANGER!

Make sure the PTO shield, integral driveline shields, and input shields are is installed when using PTO-driven equipment. Always replace any shield if it is damaged or missing. (S3PT-8)

WARNING!

Relieve hydraulic pressure prior to doing any maintenance or repair work on the Implement. Place the Implement on the ground or securely blocked up, disengage the PTO, and turn off the tractor engine. Push and pull the Remote Cylinder lever in and out several times prior to starting any maintenance or repair work. (S3PT-9)

WARNING!

The rotating parts of this machine continue to rotate even after the PTO has been turned off. The operator should remain in his seat for 60 seconds after the brake has been set, the PTO disengaged, the tractor turned off, and all evidence of rotation has ceased. (3PT-10)

"Wait a minute...Save a life!"

DANGER!

Be particularly careful when transporting the Implement using the tractor. Turn curves or go up or down hills only at a low speed and at a gradual steering angle. Make certain that at least 20% of the tractor's weight is on the front wheels to maintain safe steerage. Slow down on rough or uneven surfaces. (STI-1)

DANGER!

When the Wings are folded for transport, the center of gravity is raised and the possibility of overturn is increased. Drive slowly and use extremecaution when turning on hillsides. Overturning the Implement could cause the Implement to overturn the Tractor and vice versa resulting in serious injury or even death. Never fold wings on a hillside...the Implement may overturn. (STI-2)

DANGER!

DO NOT allow any person under a folded wing unless wing is securely locked up or supported. **DO NOT** approach the Implement unless the Tractor is turned off and all motion has ceased. Never work under the frame work, or any lifted component unless the implement is securely supported or blocked up. A sudden or inadvertent fall by any of these components could cause serious injury or even death. (STI-3)

SAFETY

WARNING!

Never unhitch without using the Tongue Jack. The Tongue is very heavy. Attempting to lift the Tongue without using the Tongue Jack could cause **strains or other injury.** Allowing the tongue to fall **suddenly and unexpectedly** could result in **crushing injury.** Use the Tongue Jack for **lifting the mower only.** Overloading the Tongue Jack can cause failure with possible **serious bodily injury or even death.** (STI-4)

CAUTION!

On a fully-assembled unit, do not remove the Wing Retaining Strap until hoses are attached to the tractor and the Wing Cylinders are filled with oil. Lower the Wings slowly and carefully. Keep bystanders away during operations. (STI-5)

WARNING!

Only tow the Implement behind a properly sized and equipped Tractor which exceeds the weight of the Implement by at least 20%. DO NOT tow the Implement behind a truck or other type of vehicle. Never tow the Implement and another Implement connected in tandem. Never tow the Implement at speeds over 20 MPH. (STI-6)

WARNING!

Follow these guidelines to reduce the risk of equipment and grass fires while operating, servicing, and repairing the Mower and Tractor:
-Equip the Tractor with a fire extinguisher in an accesible location.
-Do Not operate the Mower on a Tractor with an underframe exhaust.
-Do Not smoke or have an open flame near the Mower and Tractor.
-Do Not drive into burning debris or freshly burnt areas.
-Ensure slip clutches are properly adjusted to prevent excessive slippage and plate heating.
-Never allow clippings or debris to collect near drivelines, slip clutches, and gearboxes. Periodically shut down the Tractor and Mower and

PARTS INFORMATION

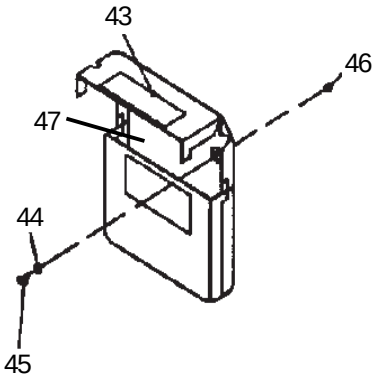
Tiger mowers use balanced and matched system components for blade carriers, blades, cuttershafts, knives, knife hangers, rollers, drivetrain components, and bearings. These parts are made and tested to Tiger specifications. Non-genuine "will fit" parts do not consistently meet these specifications. The use of “will fit” parts may reduce mower performance, void mower warranties, and present a safety hazard. Use genuine Tiger mower parts for economy and safety.

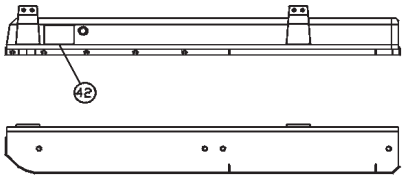
(SPTM-1)

SEE YOUR TIGER DEALER

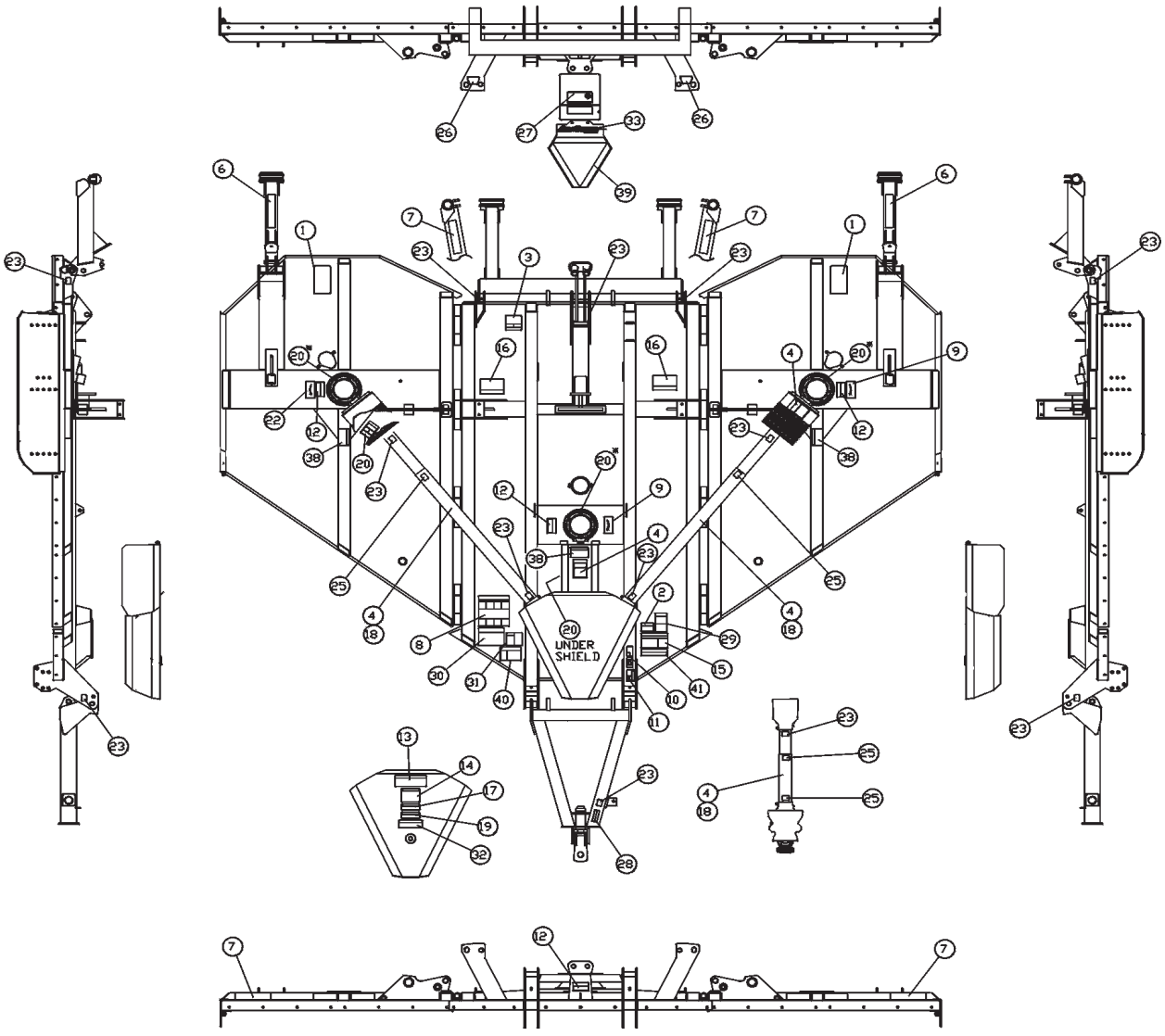
In addition to the design and configuration of this Implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the Tractor and Equipment Manuals. Pay close attention to the Safety Signs affixed to the Tractor and Equipment. **(SG-18)**

SAFETY





10' COUNTER WEIGHT



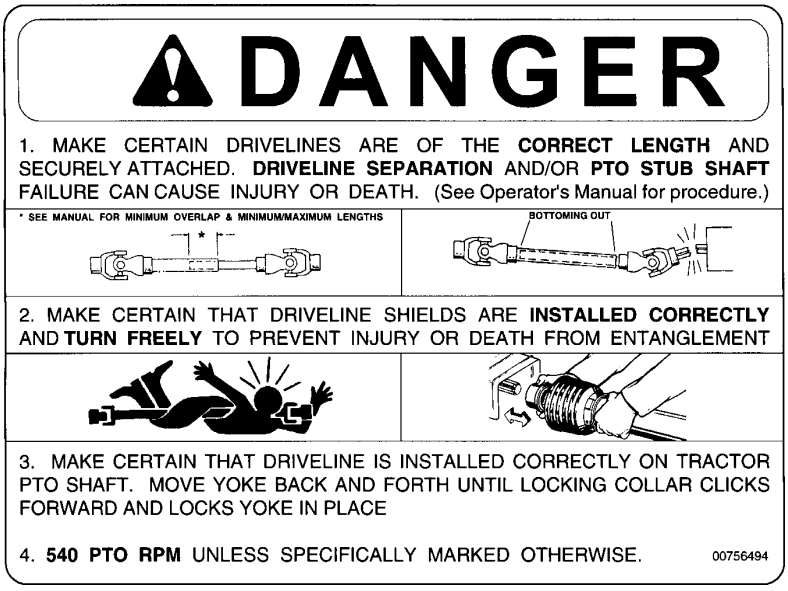
SAFETY

ITEM	PART NO.	QTY.	QTY.	DESCRIPTION
1	00769737	2	1	Rotating Blades
2	D114	1	1	1000 RPM Only
or	D103	1	1	540 RPM Only
3	226-148	1	1	Hydraulic Fluid Pressure
4	02978846	6	4	Rotating Driveline
6	02978848	2	2	Red Reflector
7	02978849	4	3	Amber Reflector
8	00749117	1	1	Multi Warning
9	D138	2	1	Blade Rotation, CW
10	02978851	1	1	Made in North America
11		1	1	Serial Plate
12	02978853	4	3	Check Oil Level
13	02978854	1	1	Lubrication Requirements
14	D102	1	1	Safety Chain/ Drawbar Adjustment
15	00769736	1	1	Failure to Maintain Shields
16	00753840	2	2	Stay Clear
17	00763613	1	1	Frozen Clutches
18	02978856	3	2	Shield Missing
19	00763977	1	1	Notice to Owner
20	02978843*	3	2	1000 RPM Logo
21	226-328	3	2	Do Not Operate If Guard Missing
22	D137	1	1	Blade Rotation, CCW
23	02978859	13	10	8 HR Greasing, Standard Hitch Units
25	02978861	4	3	4 HR Greasing
26	02978862	2	1	Transport Pin Locations
28	02978864	1	1	Grease Nipple Located On Underside
29	226-191	1	1	Read Manual - Spanish
30	00756494	1	1	Make Certain Driveline Length
31	00773723	1	1	Read Driveline Manual - Spanish
38	226-042	3	2	Slip Clutch Adjustment
39	03200347	1	1	SMV Emblem
40	00777394	1	1	Transport Speed
41	00777395	1	1	Keep Deck Clear
42	999403		1	10' Counterweight
43	02978516	1	1	Manual Canister
44	10058000	2	2	¼" Bolt
45	02962363	2	2	¼" Locknut
46	02978992C	1	1	Operators Manual

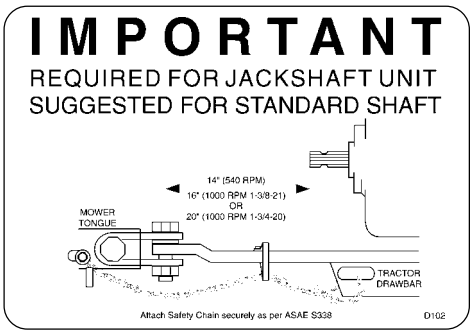
* On 1000 RPM Units Only
** Used on 10' Cutter Units Only

NOTE: Tiger supplies safety decals on this product to promote safe operation. Damage to the decals may occur while in shipping, use, or reconditioning. Tiger cares about the safety of its customers, operators, and bystanders, and will replace the safety decals on this product in the field, free of charge (Some shipping and handling charges may apply). Contact your Tiger dealer to order replacement decals.

4 - -02978846

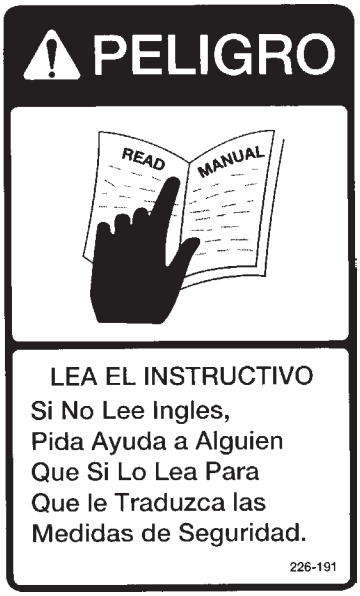


30- - 00756494



14- - D102

19- - 00763977



29 -- 226-191

3 -- 226-148

⚠ WARNING

OPERATE THIS MACHINE AT

540 RPM

TRACTOR PTO SPEED ONLY

Overspeeding PTO may cause component failure with resulting injury.

D103

2- - D103

⚠ WARNING

OPERATE THIS MACHINE AT

1000 RPM

TRACTOR PTO SPEED ONLY

Overspeeding PTO may cause component failure with resulting injury.

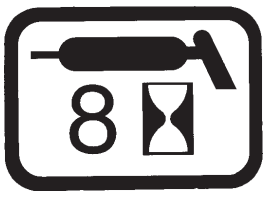
D114

2- - D114

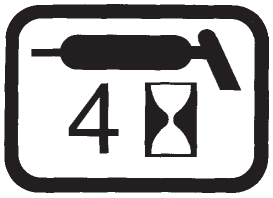
IMPORTANT

GREASE NIPPLE ON UNDERSIDE
REFER TO OWNER'S MANUAL

28 -- 02978864



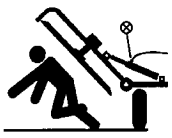
23 -- 02978859



25 -- 02978861

6- - 02978848 RED REFLECTOR
7 - - 02978849 YELLOW REFLECTOR
8 -- 00749117
SEE INSIDE FORNT COVER
11 - - SERIAL PLATE

⚠ DANGER



- Stay clear when removing transport strap and lowering or raising wing. • Component failure or accidental operation of controls may allow wing to fall suddenly and cause bodily injury or death.
- Cylinders with ⊗Restrictors installed must be filled with oil for wings to lower slowly & safely.
- Lock Wings up securely for transporting.

- Do not operate mower with wings raised with passersby in the area. • Contact with exposed rotating Blades and/or being hit by thrown objects may cause injury or death.

00753840

16 - - 00753840

ATTENTION!

Do not operate PTO until ALL Slip Clutches are properly adjusted and checked to make certain that NONE ARE FROZEN and that ALL WILL SLIP under excessive load. See Operator's Manual for complete instructions. 00763613

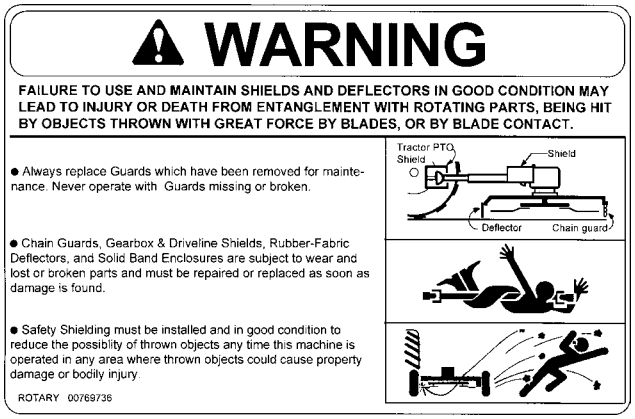
17- - 00763613

IMPORTANT

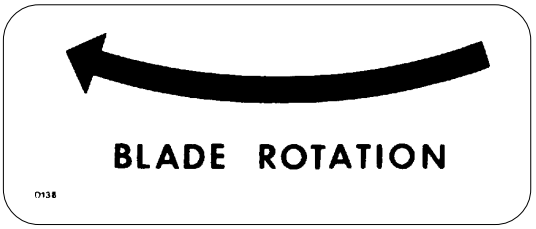
CHECK OIL LEVEL
IN ALL GEARBOXES
BEFORE OPERATION

12 -- 02978853

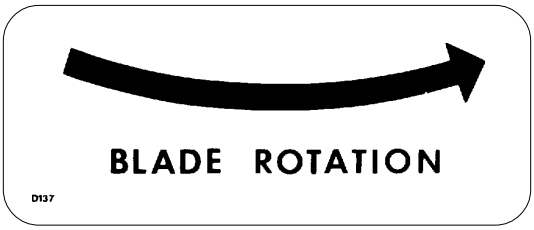
SAFETY



15 -- 00769736

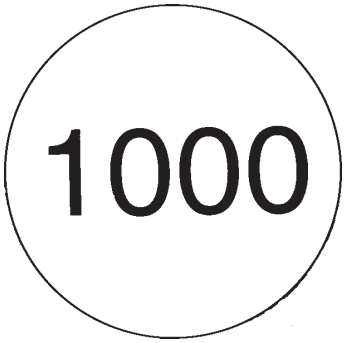


9- - D138

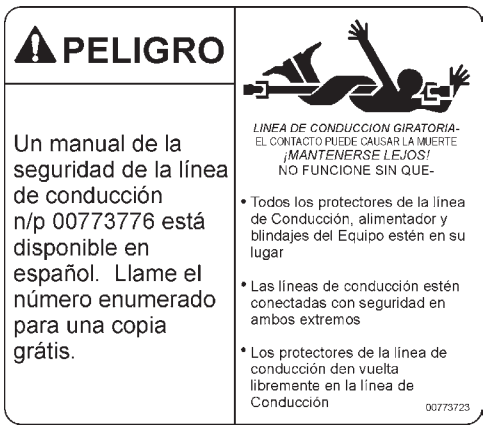


22- - D137

18-- 02978856



20 -- 02978843
(On 1000 RPM Units Only)



31 -- 00773723

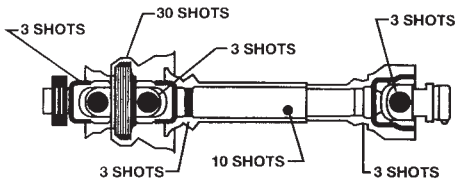
10 -- 02978851

IMPORTANT

MINIMUM LUBRICATION REQUIREMENTS

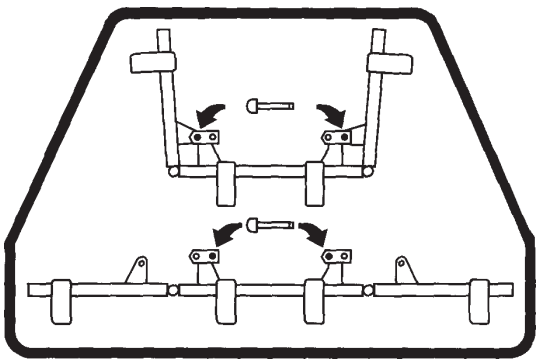
TO ENSURE MAXIMUM JOINT LIFE:

- LUBRICATE THE CENTRAL BODY WITH A MINIMUM OF 30 SHOTS OF GREASE EVERY 4 HOURS
- LUBRICATE TELESCOPING MEMBERS WITH 10 SHOTS OF GREASE EVERY 8 HOURS. SEPARATE AND CLEAN TELESCOPING MEMBERS EVERY 40 HOURS AND COMPLETELY COAT WITH GREASE. VERIFY THAT MEMBERS TELESCOPE FREELY.
- LUBRICATE CROSS KITS WITH 3 SHOTS OF GREASE EVERY 8 HOURS



FAILURE TO FOLLOW THESE INSTRUCTIONS WILL CAUSE DRIVELINE FAILURE AND POSSIBLE TRACTOR DAMAGE.

13 -- 02978854

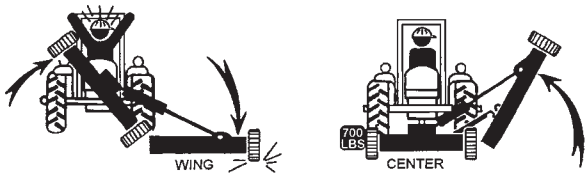


26 -- 02978862

⚠ DANGER

WITHOUT WEIGHT, CENTER MAY LIFT UP

WITH WEIGHT, WING FOLDS



1. Keep everyone clear when lifting, folding, and working under raised components. Block securely before working under mower.

2. Install Weight Box and Weight (Minimum of 700# Total) before operating to prevent turning over the center section which can cause **SERIOUS BODILY INJURY** or **DEATH**. Without weight, Do not fold wing.

3. Attach transport strap securely to prevent inadvertent dropping from the transport postition and possible **CRUSING INJURY** or **DEATH**.

999403

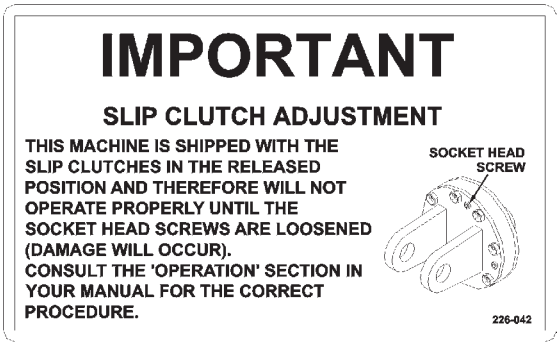
42 -- 999403
(On 10' Units Only)

SAFETY

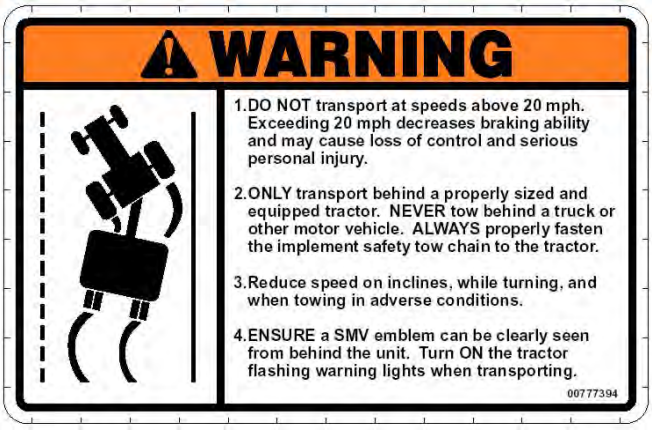
1- - 00769737

21- - 226-328

39- - 03200347



38- - 226-042



40- - 00777394

41- - 00777394

FEDERAL LAWS AND REGULATIONS

This section is intended to explain in broad terms the concept and effect of federal laws and regulations concerning employer and employee equipment operators. This section is not intended as a legal interpretation of the law and should not be considered as such.

Employer-Employee Operator Regulations
U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

This Act Seeks:
"...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources..."

DUTIES

Sec. 5 (a) Each employer-
(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
(2) shall comply with occupational safety and health standards promulgated under this Act.
(b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA Regulations
OSHA regulations state in part: "At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved."

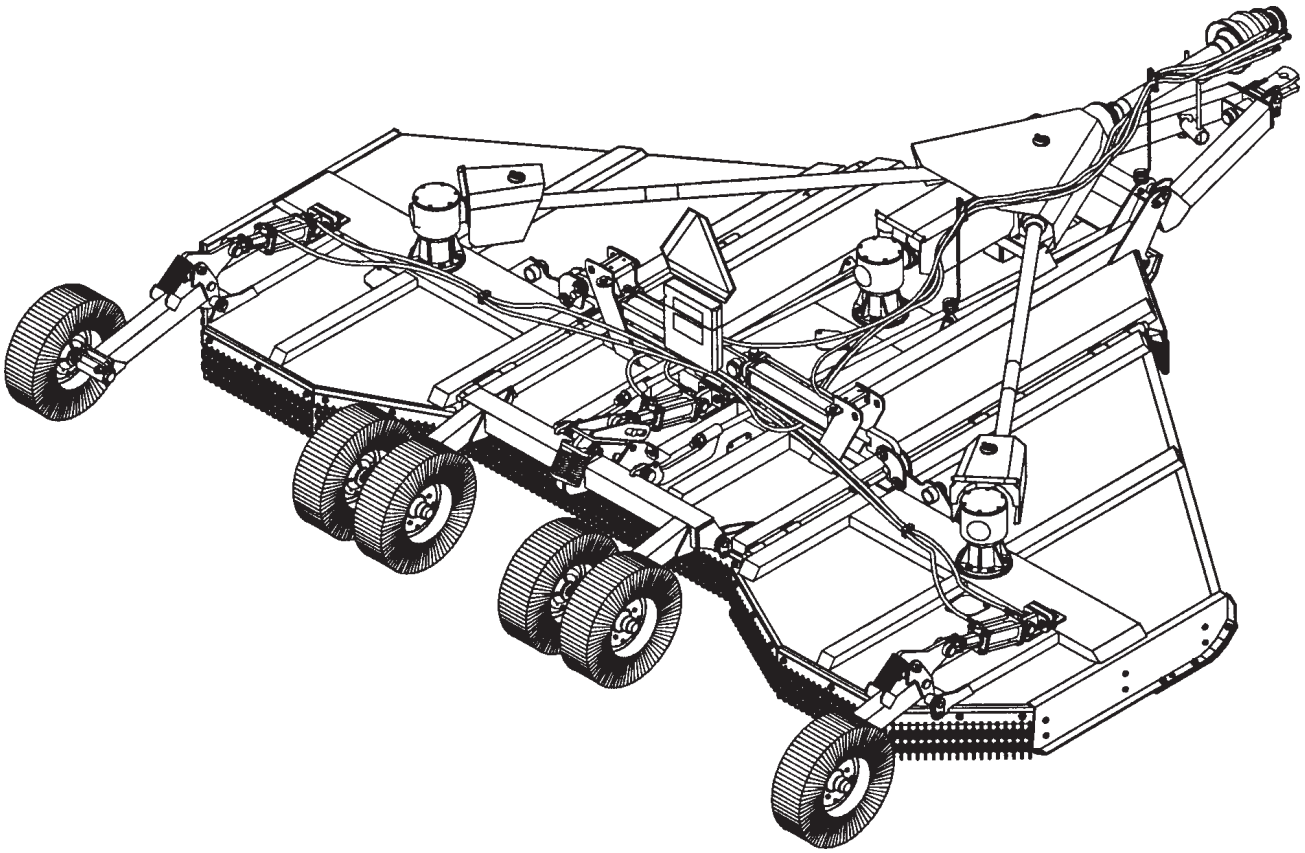
Employer Responsibilities:
To ensure employee safety during Tractor and Implement operation, it is the employer's responsibility to:

1. Train the employee in the proper and safe operation of the Tractor and Implement.
2. Require that the employee read and fully understand the Tractor and Implement Operator's manual.
3. Permit only qualified and properly trained employees to operate the Tractor and Implement.
4. Maintain the Tractor and Implement in a safe operational condition and maintain all shields and guards on the equipment.
5. Ensure the Tractor is equipped with a functional ROPS and seat belt and require that the employee operator securely fasten the safety belt and operate with the ROPS in the raised position at all times.
6. Forbid the employee operator to carry additional riders on the Tractor or Implement.
7. Provide the required tools to maintain the Tractor and Implement in a good safe working condition and provide the necessary support devices to secure the equipment safely while performing repairs and service.
8. Require that the employee operator stop mowing if bystanders or passerbys come within 100 yards.

Child Labor Under 16 Years of Age
Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

INTRODUCTION SECTION

INTRODUCTION



Your heavy-duty Cutter is designed primarily for weeds, grass, and brush up to 2" in diameter. With proper maintenance as described in this manual, your Cutter will provide you with years of dependable service with a minimum of repairs.

It is required that all operators of this implement read this manual or be instructed of its contents as to safety, proper operation, and maintenance before beginning operation.

Your Cutter has been assembled for operation with a tractor PTO input speed of either 540 or 1000 RPM. Should you desire to change PTO input speed, contact your local Tiger dealer who will assist you in performing the necessary modifications.

When ordering parts for the Gearboxes and the Drivelines, be sure to specify the serial number. The serial number is located outside of the right Tongue attaching Plate on the center Mainframe section.

Chain Guards, Driveline Integral Shields, and Gearbox Shields are standard equipment and are to be used at all times.

To place the warranty into effect, fill out the warranty card in full, giving all the requested information, and mail promptly. Be sure to give the serial number of this Cutter.

ASSEMBLY SECTION

ASSEMBLY

General

IMPORTANT: Check oil level in all gearboxes before operation. Refer to the 'Lubrication' section of this manual for recommended oil type and viscosity.

Lubricate all grease fittings. Refer to the grease schedule in this manual. Check that all nuts and bolts are in place and properly tightened. Refer to the 'Maintenance' section of this manual for required bolt grades and torques.

Check that all tires are inflated to proper specifications. Refer to the 'Maintenance' section of this manual for required tire pressures.

Connection to Tractor

Wind the jack to raise the hitch clevis to line up with the tractor drawbar. A screw driver may be inserted into the hole in the side of the swivel hitch to keep the hitch clevis level while connecting to the tractor drawbar. See "Connection to Tractor - Equal Angle Hitch" for instructions to attach the equal angle hitch the tractor.

WARNING! NEVER STAND BETWEEN THE TRACTOR AND THE ROTARY CUTTER WHILE THE TRACTOR IS BEING BACKED TO THE HITCH

Connect the hydraulic hoses to the remote outlets on the tractor. Adjust the hoses in the hose organizer to allow sufficient slack for turning. Ensure the hoses will not contact the driveline or can become pinched.

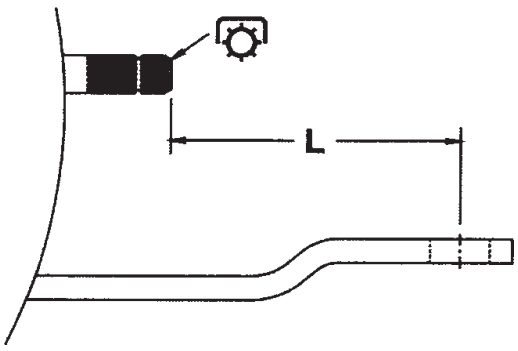
The wing lift cylinders should be cycled several times to remove air from the system. The S150/S100 requires single acting remote outlet for each wing and one single remote outlet for the center section.

Driveline Attachment

Pivot the divider gearbox shield back, and out of the way. Remove any tape from the gearbox shafts, and any booklets from the driveline. Slide the clamp collar end of the tractor shaft onto the gearbox shaft. Insert the tapered pin/ bolt into the yoke. Push the yoke until the groove of the shaft lines up with the hole, and the pin extends through. Tighten the locknut to squeeze the yoke onto the shaft.

Connect the universal joint assembly to the tractor PTO. Align the quick disconnect yoke splines with the tractor PTO splines. Compress the lock collar spring and slide the yoke into place. Release the spring to lock onto the PTO shaft.

IMPORTANT: Pull and push on the quick disconnect yoke several times to ensure that the yoke is connected to the PTO shaft.



IMPORTANT: Adjust tractor drawbar length so distance from end of PTO shaft to pin hole on drawbar is as follows:

540 RPM PTO - 1-3/8" 6 Spline: **L**= 14" [356 mm]

1000 RPM PTO - 1-3/8" 21 Spline: **L** = 16" [406 mm]

1000 RPM PTO - 1-3/4" 20 Spline: **L**= 20" [508 mm]

Incorrect drawbar length will change angle of driveline causing possible damage to constant velocity joint. Do not use PTO adaptors. PTO adaptors will invalidate your warranty. See your tractors operator's manual for drawbar adjustment procedures.

WARNING! BE SURE THAT THE TRACTOR PTO SPEED (540 or 1000 RPM) MATCHES THE ROTARY CUTTER GEARBOX SPEED.

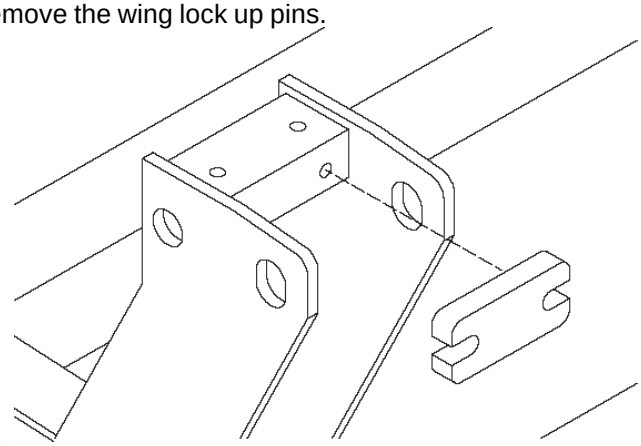
Lowering Wings

IMPORTANT: If the rotary cutter has been supplied to you already assembled it is possible that the wing lift hydraulic cylinders are not completely filled with oil. An indication of this will be that the wing lift lock up pins cannot be removed freely.

WARNING! NEVER FORCE THE WING LIFT LOCK PINS OUT OF THEIR LOCK POSITION AS THE WINGS MAY SUDDENLY DROP CAUSING INJURY OR DEATH.

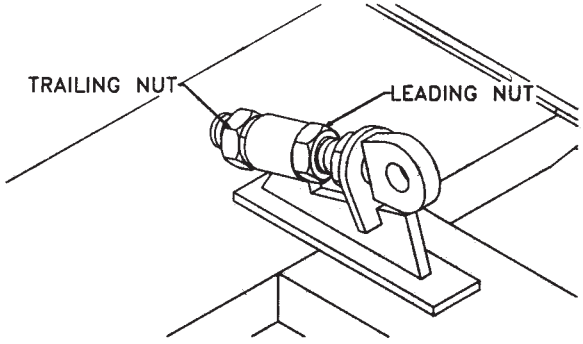
First fully retract the hydraulic wing lift cylinders then remove the wing lock up pins.

Wing Lift Spacer Plates
For shipping purposes, the wing lift spacer plates may be mounted to the top of the angle bracket on the wing lift towers. Before operation, be sure the plates are mounted to the outer set of holes.



IMPORTANT: Ensure that both level rods are adjusted evenly.

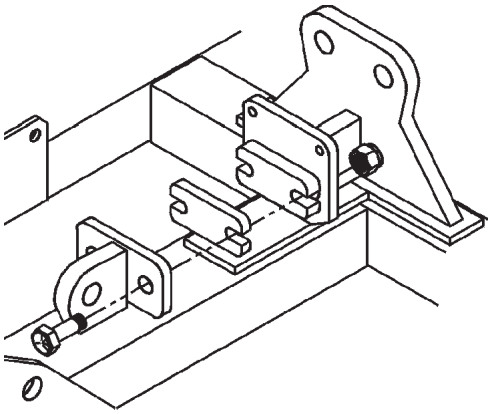
Adjust the 1-1/4" threaded rod on the wing adjustment assembly to level the wings of the cutter with the center section. To raise or lower wing, back off the trailing nut first then adjust the leading nut. Retighten the trailing nut and lock washer after adjustment. To raise the wing, extend the threaded rod. To lower the wing, retract the threaded rod.



ASSEMBLY

Center Wheel Standard Spacer Plates

On the center section, spacer plates are required between the cylinder lug and its mount plate. The spacer plates allow the transport and cut heights to remain consistent between tire sizes and or blade configurations. Spacers are be preset at the factory, however if blade type or tire type change, so may the spacers. Consult the following chart:



Tire Type / Blade Type	Light Truck Tires	Solid Laminated/ Aircraft Tires
Pans	1 X 1" spacer	2 X 1" spacers
Shredder Bars	1 X 1" spacer and 1 X 5/8" spacer	2 X 1" spacers and 1 X 5/8" spacers

Driveline Shield Chains

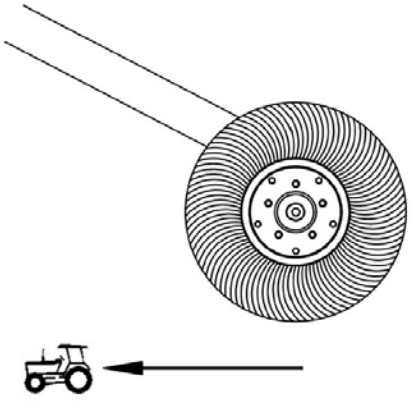
Attach CV shield chain to tractor or cutter hitch allowing sufficient slack for turning.

IMPORTANT: OSHA, ASAE, and SAE standards require that all rotating shafts be guarded against contact. The unchained plastic shields can rotate with the driveline but must stop when they contact another object, (Note: these shields may also be chained.)

The shields **must** be regularly greased and checked that they rotate freely on the driveline. Refer to the Lubrication section for greasing intervals.

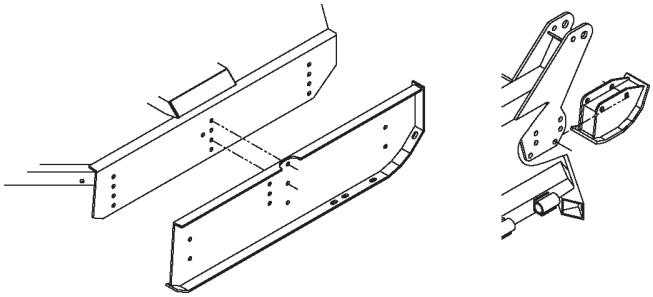
Laminated Tires

To reduce the possibility of the laminations separating, the laminated tires should be installed with the laminations oriented as shown.



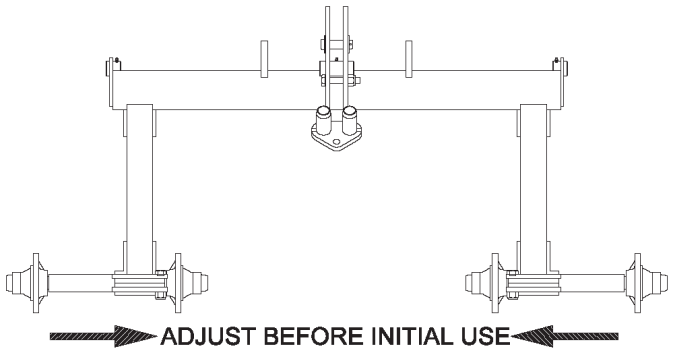
Adjustable Skids

When installing the material distribution kit, the adjustable skids on the center frame and the wing frames should be set in the lowest positions.



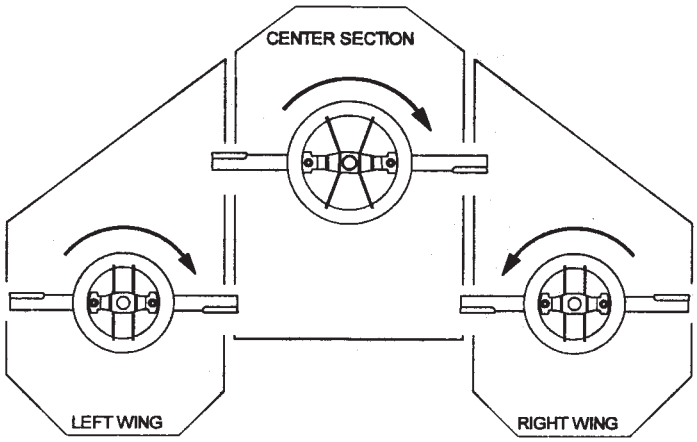
Center Section Wheel Standards

For shipping purposes, the axle assemblies on the center section wheel standard may be set outwards. To avoid the tires contacting the frame, offset the axle assemblies inwards enough to stop contact before initial use.

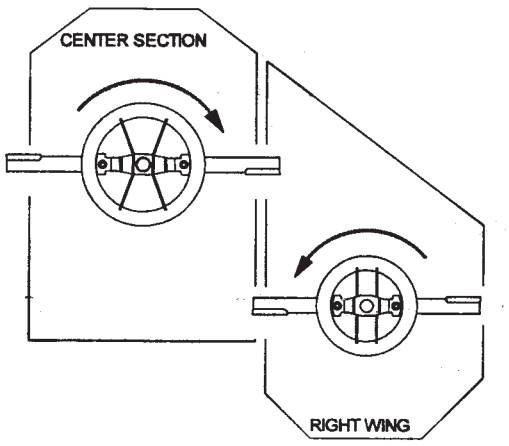


Blade Rotations

TWR-180



TWR-120



Transport Light Kit

CAUTION! Use **FLASHING WARNING LIGHTS** when traveling on public roads day or night, unless prohibited by law.

If the rotary cutter obscures the tractor warning or tail lights, the rotary cutter **MUST** be equipped with a transport light kit.

Check local highway regulations concerning moving machinery on highways.

Installation of Lights

Secure the cutter into transport position. Mount the brackets to the center beam as shown in the illustration, using the supplied 3/8" U-bolts. The two 4" x 4-3/4" U-bolts are needed for the TWR-180/TWR-120 kit, and the two 5" x 6" U-bolts can be discarded.

Align the outside edge of the brackets with the end caps on either side of the beam. Tighten into place. Using the 5/16" bolts, mount the lights to the brackets with the red and amber lenses facing to the rear, and the amber in the outer-most left and right positions. When the cutter is in transport position, the light assemblies should be sitting vertical on the center beam.

Wiring Harness

The seven pin plug and wiring harness is pre-wired with the 7' leg to attach to the left hand light assembly and the 4' leg to attach to the right hand light assembly. Left and right hand is determined by standing at the rear of the cutter looking in the direction of normal forward travel. The wiring harness plugs are colored coded for connection to the appropriately colored lamp.

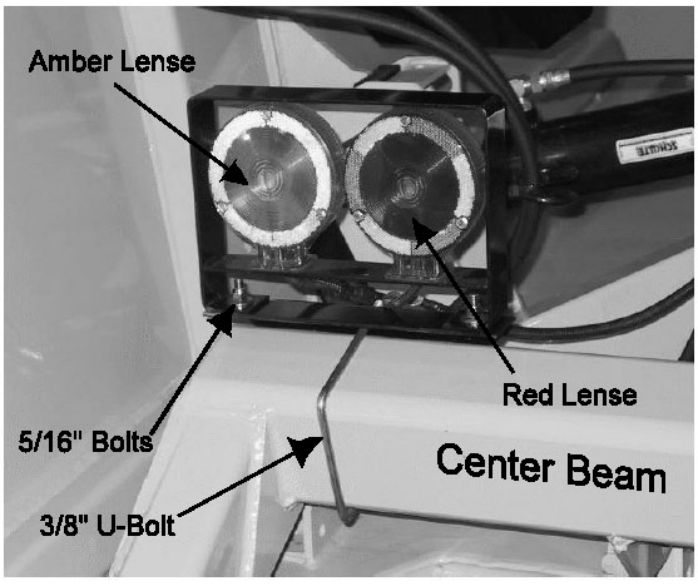
Using the cable ties, route the harness along the hydraulic hoses to the front of the cutter Allow enough slack in the harness for the up and down movement wings. There should be approximately 5' to 6' of harness extending past the hitch point for connection to the tractor.

Circuit Testing

The seven pin plug is wired as follows:

The lights should operate in unison with your tractor lights.

Terminal 1 Ground
Terminal 3 LH Turn & Flash
Terminal 5 RH Turn & Flash
Terminal 6 Tail Lamps



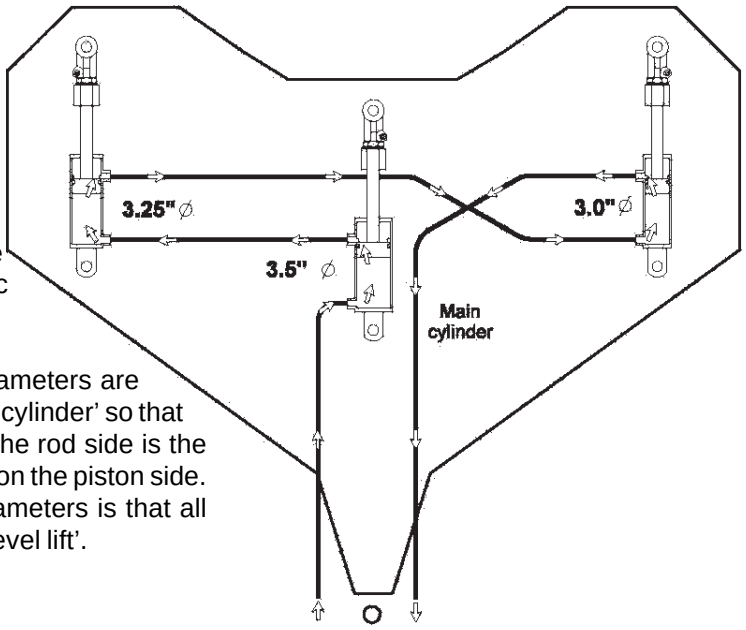
The hydraulic phasing cylinder kit requires one double acting hydraulic circu it for operation. The system is comprised of three hydraulic cylinders with depth stop collars, and allow s all wheels to be raised and lowered simultaneously.

Before operation all air must be purged from the hydraulic lift circuit. Fully raise the cutter and hold the tractor's hydraulic control lever forward for 5 minutes to allow oil to fully circulate through the phasing cylinder circuit.

During operation the phasing cylinders should periodically be phased. The hydraulic lever should only have to be held for 10-15 seconds to ensure system is phased.

Hydraulic Phasing Cylinders

A hydraulic phasing cylinder system works by synchronizing the operation of a number of hydraulic cylinders so that they extend and retract at exactly the same rate. This allows a multi-section machine such as a rotary cutter to be raised and lowered evenly across its width. Because a hydraulic cylinder has a 'cylinder rod' attached to the 'piston' the effective area on the rod side of the cylinder is less than the basic effective area of the cylinder.

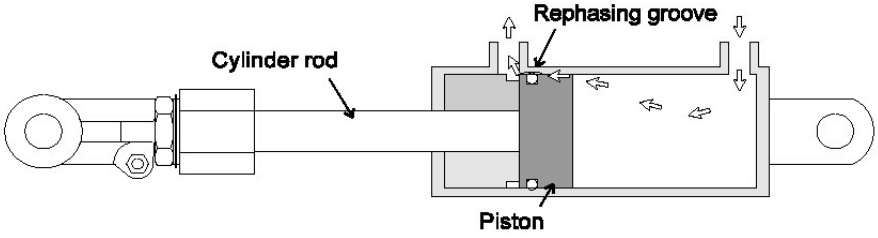


In order to achieve synchronization cylinder diameters are reduced as cylinders are connected to the 'main cylinder' so that the effective area of the upstream cylinder on the rod side is the same effective area of the downstream cylinder on the piston side. The result of this stepping down of cylinder diameters is that all cylinders move at the same rate resulting in a 'level lift'.

Rephasing Groove

Hydraulic oil moves from one cylinder to the next through and indentation in the cylinder wall known as a 'rephasing groove'. When the cylinder is fully extended this groove creates a bypass over the piston main seal, allowing oil to flow to the next cylinder in the set. Since these grooves are quite small it will often take a number of minutes for oil to completely circulate through the set of cylinders.

On initial startup of a phasing cylinder system it may take a number of minutes to force oil through the system and purge out any air in the hydraulic lines. During normal operation small amounts of oil may leak past piston seals causing cylinders to fall out of synchronization. Synchronization can be restored by fully extending cylinders and holding the circuit open for period of time.



Spool Valve Kit

This kit allows the Rotary Cutter to be operated on tractors which are equipped with only one hydraulic circuit. The kit allows independent raising and lowering of the wings and control of the phasing system.

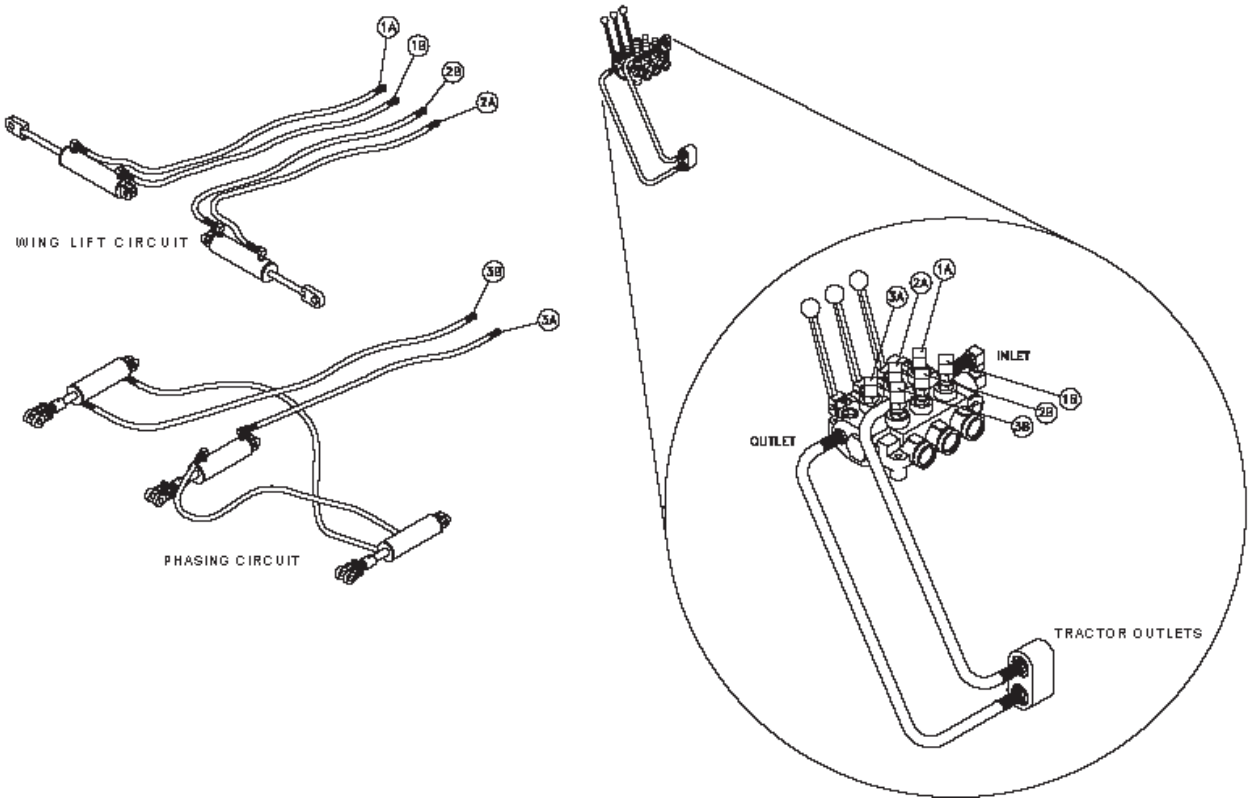
Refer to the 'Parts' section for a complete list of the components supplied with the kit.

WARNING! ENSURE THAT THE UNIT IS PROPERLY BLOCKED AND ALL PRESSURE RELIEVED FROM THE HYDRAULIC SYSTEM BEFORE WORKING ON UNIT.

Remove the four existing hydraulic hoses which run to the tractor. Install hydraulic hoses to thecylinders, as indicated in the 'Parts' section and connect the hoses to the valve bank as shown in the following illustration.

On the 10' model, hoses 1A and 1B are not required and the corresponding outlets on the valve will be plugged.

Spool Valve Kit - Cylinder to Valve Connections



OPERATION SECTION

TIGER ROTARY MOWER OPERATION INSTRUCTIONS

Tiger rotary mowers are manufactured with quality material by skilled workers. These mowers are designed to cut grass, weeds, crop stalks, brush and other vegetation up to 2" diameter. The mower is equipped with protective deflectors and/or chain guards to prevent objects being thrown from the mower by the blades, however, no shielding is 100% effective. All shields, guards, deflectors, and chains equipped on the unit must be maintained on the mower in good operational condition.

It is the operator's responsibility to be knowledgeable of all potential operating hazards and to take every reasonable precaution to ensure oneself, others, animals, and property are not injured or damaged by the mower, tractor, or a thrown object. Do not operate the mower if passersby, pets, livestock, or property are within 300 feet of the unit.

This section of the Operator's Manual is designed to familiarize, instruct, and educate safe and proper mower use to the operator. Pictures contained in this section are intended to be used as a visual aid to assist in explaining the operation of a flex-wing rotary mower and are not necessarily of a Tiger cutter. Some pictures may show shields removed for picture clarity. NEVER OPERATE this implement without all shields in place and in good operational condition. The operator must be familiar with the mower and tractor operation and all associated safety practices before operating the mower and tractor. Proper operation of the mower, as detailed in this manual, will help ensure years of safe and satisfactory use.

IMPORTANT: To avoid mower damage, retorque all bolts after the first 10 hours of operation.

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READ AND UNDERSTAND THE ENTIRE OPERATING INSTRUCTIONS AND SAFETY SECTION OF THIS MANUAL AND THE TRACTOR MANUAL BEFORE ATTEMPTING TO USE THE TRACTOR AND MOWER. If you do not understand any of the instructions, contact your nearest authorized dealer for a full explanation. Pay close attention to all safety signs and safety messages contained in this manual and those affixed to the cutter and tractor.

DANGER!

READ, UNDERSTAND, and FOLLOW the following Safety Messages. Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in the Safety Messages. Always use good common sense to avoid hazards. (SG-2)

PELIGRO!

Si no lee Ingles, pida ayuda a alguien que si lo lea para que le traduzca las medias de seguridad. (SG-3)

!LEA EL INSTRUCTIVO!

Mower Standard Equipment And Specifications

General Data	TWR-180		TWR-120
Cutting width:	180"		126"
Overall width:	190"		136"
Overall length:	196"		196"
Transport width below wing tires:	96"		90"
Transport height:	84"		84"
Approximate weight, with all options:	4400 lbs		4200 lbs
Hitch load, transport:	1500 lbs		1360 lbs
Cutting height:	1-1/2" - 15"		
Ground clearance, transport:	13-1/2"		
Cutting capacity:	2" material		
Minimum tractor HP:	65 HP		50 HP
Recommended tractor HP:	85 HP		75 HP
Tractor hydraulics, minimum:	3 single acting circuits @ 1750 psi		
Tractor hydraulics, phasing:	1 double acting circuit @ 1750 psi 2 single acting circuits @ 1750 psi		
Blade speed, 540 rpm	Center:	810 rpm	15,268 ft/min tip speed
	Wing:	984 rpm	15,457 ft/min tip speed
Blade speed, 1000 rpm	Center:	800 rpm	15,702 ft/min tip speed
	Wing:	1000 rpm	15,708 ft/min tip speed
Working range of wings:	24° down to 85° up		
Blade overlap:	6"	[153 mm]	

Note: The mower must be equipped with either single or double chain guards at all times. Alamo Industrial recommends mowers be equipped with double chain guards for all mowing purposes. Single chain guards may be used for agriculture purposes only and are specifically not recommended for highway, right-of-way, parks or greenbelt mowing.

1. OPERATOR REQUIREMENTS

Safe operation of the rotary mower is the responsibility of a qualified operator. A qualified operator has read and understands both the mower and tractor Operator Manuals and is experienced in tractor and mower operations and all associated safety practices. In addition to the safety messages contained in this manual, safety message decals are affixed to the mower and tractor. If any part of the operation and safe use of the mower and tractor is not completely understood, consult an authorized dealer for a full explanation.

Safe mower operation requires that the operator wear approved Personal Protective Equipment (PPE) for the job conditions while connecting, operating, servicing and repairing the mower and tractor. PPE is designed to provide operator protection from bodily injury and includes the following:

Personal Protective Equipment (PPE)

- Protective eye glasses, goggles, or face shield
- Hard hat
- Steel toed safety footwear
- Gloves
- Hearing protection
- Close fitting clothing
- Respirator or filter mask

DANGER!

NEVER use drugs or alcohol immediately before or while operating the Tractor and Implement. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the Equipment safely. Before operating the Tractor or Implement, an operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the Equipment safely. NEVER knowingly allow anyone to operate this Equipment when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol. (SG-27)

2. TRACTOR REQUIREMENTS

The tractor used to operate the mower must have the power capacity to lift, pull, and operate the Power Take Off (PTO) at the mower's rated speed while traveling at a ground speed between 2 and 5 MPH. Operating the mower with a tractor that does not meet the following requirements may cause tractor or mower damage and be a potential danger to the operator and passersby.

Tractor Requirements and Capabilities

- ASAE approved Roll-Over Protective Structure (ROPS) or ROPS cab and seat belt.
- Tractor Safety Devices..... Slow Moving Vehicle (SMV) emblem, lighting, PTO master shield
- Tractor Horsepower -Minimum .....TWR-180 65 HP; TWR-120 50 HP
  -Recommended.....TWR-180 85 HP; TWR-120 75 HP
- Drawbar..... Set length according to operating speed and driveline type, rated to carry weight of the mower, safety chain attachment point
- Hydraulics -Minimum..... 3 single acting circuits @ 1750 psi
  -Phasing.....1 double acting circuit and 2 single acting circuits @ 1750 psi
- Front End Weights..…….....…..... As needed to maintain 20% weight on front axle
- Power Take Off..... Operating speed and shaft size depends on operating speed and driveline type of the mower.
- Tire Spacing..... Set tires minimum width of 60" inside to inside of tires.

2.1 ROPS and Seat Belt

A Roll-Over-Protective-Structure (ROPS) and seat belt are essential to protect the operator from falling off the tractor, especially during a roll over where the driver could be crushed and killed. The ROPS and seat belt must be used in conjunction with one another. Only operate the tractor with the ROPS in the raised position and seat belt fastened. Tractor models not equipped with a ROPS and seat belt should have these life saving features installed by an authorized tractor dealer.

WARNING!

Operate this Equipment only with a Tractor equipped with an approved roll-over-protective system (ROPS). Always wear seat belts. Serious injury or even death could result from falling off the Tractor--particularly during a turnover when the operator could be pinned under the ROPS. (SG-7)

2.2 Tractor Safety Devices

If transporting or operating the tractor and mower near a public roadway, the tractor must be equipped with proper warning lighting and a Slow Moving Vehicle (SMV) emblem which are clearly visible from the rear of the unit. Lights and a SMV emblem must be equipped directly on implements if the visibility of the tractor warning signals are obscured.

Maintain all manufacturer equipped safety shields and guards. Always replace shields and guards that were removed for access to connect, service, or repair the tractor or mower. Never operate the tractor PTO with the PTO master shield missing or in the raised position.

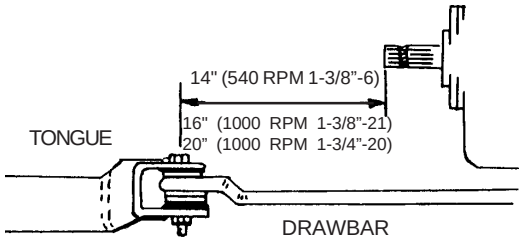
2.3 Tractor Horsepower

The horsepower required to operate the mower depends on several operating factors including the vegetation to be cut, terrain condition, operator experience, condition of the mower and tractor, and other factors. The recommended tractor HP for the TWR-180 is 85 HP, minimum 65 HP. The recommended tractor HP for the TWR-120 is 75 HP, minimum 50 HP. Operating the mower with a tractor that does not have enough power will produce a less desirable cut and may cause tractor engine damage.

2.4 Drawbar

Position the length of the drawbar from the end of the tractor PTO shaft to the drawbar hitch hole according to the operating speed of the mower. If the mower is a 540 RPM unit, position the drawbar length from shaft end to hitch hole at 14". For 1000 RPM mowers, set the drawbar length at 16" for 21 spline 1-3/8" mowers and at 20" for 1-3/4" 20 spline mowers.

Tractor Drawbar Length
(Based on Mower Operating Speed)



2.5 Tractor Hydraulics

The mower deck and wings are raised and lowered with hydraulic cylinders operated by the tractor hydraulic pump. There are several ways to configure the mower hydraulics depending on the number of tractor selective control valves and if they are single or double acting. The mower can be operated on a tractor with a minimum of three single acting circuits. One double acting and two single acting cylinders or a three spool control valve must be used to operate the mower equipped with hydraulic phasing cylinders.

Refer to the assembly and parts section of this manual for hydraulic system set-up or contact an authorized dealer for the best configuration depending on your tractor hydraulic capabilities and your intended mower use.

2.6 Front End Weight

A minimum of 20% total tractor weight must be maintained on the tractor front end at all times. Front end weight is critical to maintain steering control and to prevent the tractor from rearing up while driving. If the front end is too light, add weight until a minimum of 20% total weight is reached on the front tires. Front weights and weight carriers can be purchased through an authorized tractor dealership.

2.7 Power Take Off (PTO)

Depending on the unit, the mower is designed to operate at a PTO speed of 540 or 1000 RPM. Most tractors operate at either 540, or a combination of 540 and 1000 RPM PTO speeds. The operating speed of the mower and tractor can be determined by the number of splines on the driveline yoke and PTO output shaft. Those operating at 540 RPM will have a 1-3/8" diameter 6-spline shaft and those operating at 1000 RPM will have a 1-3/8" 21-spline shaft or a 1-3/4" 20 spline shaft. Refer to the tractor owner's manual for instructions to change PTO speeds on models that operate at more than one speed.

If operating an older model tractor where the tractor's transmission and PTO utilize one master clutch, an over-running clutch must be used between the PTO output shaft and the driveline of the mower. An authorized tractor dealer can provide the over-running clutch and its installation if needed.

WARNING!

DO NOT use a PTO adapter to attach a non-matching Implement driveline to a Tractor PTO. Use of an adapter can double the operating speed of the Mower resulting in excessive vibration, thrown objects, and blade and mower failure. Adapter use will also change the working length of the driveline exposing unshielded driveline areas. Serious bodily injury and/or equipment failure can result from using a PTO adapter. Consult an authorized dealer for assistance if the Implement driveline does not match the Tractor PTO. (S3PT-14)

WARNING!

Never operate the Tractor and Mower if the Mower main driveline is directly connected to the Tractor transmission. Tractor braking distances can be substantially increased by the momentum of the rotating Mower blades driving the Tractor transmission even though the Tractor clutch has been engaged. Install an over running clutch between the Tractor PTO and the Mower driveline to prevent this potentially dangerous situation.

2.8 Tire Spacing

Tractor tires should be set a minimum of 60" apart measured from inside of tire to inside of tire. Refer to the tractor Operator's Manual or consult an authorized dealer for instructions to change tractor tire spacing.

3. GETTING ON AND OFF THE TRACTOR

Before getting onto the tractor, the operator must read and completely understand the mower and tractor operator manuals. If any part of either manual is not completely understood, consult an authorized dealer for a complete explanation.

WARNING!

Do not mount the Tractor while the tractor is moving. Mount the Tractor only when the Tractor and all moving parts are completely stopped. (SG-12)

3.1 Boarding the Tractor

Use both hands and equipped handrails and steps for support when getting on the tractor. Never use tractor control levers for support when mounting the tractor. Always seat yourself in the operator's seat and fasten the seatbelt. Only operate the tractor and mower with the ROPS in the raised position.

Never allow passengers to ride on the tractor or mower. Riders can easily fall off and be seriously injured or killed from being ran over by both the tractor and mower. It is the operator's responsibility to forbid riders.

DANGER!

Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)

DANGER!

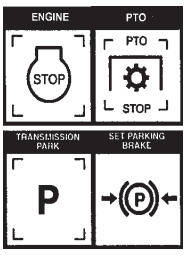
Never allow children to operate or ride on the Tractor or Implement. (SG-11)

3.2 Dismounting the Tractor

Before dismounting, park the tractor and mower on a reasonably level surface, apply the parking brake, idle the engine down, disengage the PTO, and lower the mower to the ground. Shut down the tractor engine according to the operator's manual, remove the key, and wait for all motion to completely stop. Never leave the seat until the tractor, its engine and all moving mower parts are completely stopped.

DANGER!

BEFORE leaving the Tractor seat, always engage the brake and/or set the Tractor transmission in parking gear, disengage the PTO, stop the engine, remove the key, and wait for all moving parts to stop. Place the Tractor shift lever into a low range or parking gear to prevent the Tractor from rolling. Never dismount a Tractor while it is moving or while the engine is running. Operate the Tractor controls from the Tractor seat only. (SG-9)



Use hand rails and steps when exiting the tractor. Be careful of your step and use extra caution when mud, ice, snow or other matter has accumulated on the steps or hand rails. Use all handrails and steps for support and never rush or jump off the tractor.

4. STARTING THE TRACTOR

The operator must have a complete understanding of the placement, function, and operational use of all tractor controls before starting the tractor. Review the tractor operator's manual and consult an authorized dealer for tractor operation instructions if needed.

Essential Tractor Controls:
- Locate the light control lever
- Locate the engine shut off control
- Locate the brake pedals and the clutch
- Locate the PTO control
- Locate the 3 point hitch control lever
- Locate the hydraulic remote control levers

Before starting the tractor ensure the following:
- Conduct all pre-start operation inspection and service according to the tractor operator's manual.
- Make sure all guards, shields, and other safety devices are securely in place.
- The parking brake is on.
- The PTO control lever is disengaged.
- The 3-point hitch control lever is in the lowered position.
- The hydraulic remote control levers are in the neutral position.
- The tractor transmission levers are in park or neutral.

Refer to the tractor owner's manual for tractor starting procedures. Only start the tractor while seated and belted in the tractor operator's seat. Never bypass the ignition switch by short circuiting the starter solenoid.

After the tractor engine is running, avoid accidental contact with the tractor transmission to prevent sudden and unexpected tractor movement.

DANGER!

Never run the Tractor engine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health. (SG-23)

DANGER!

Start the Tractor only when properly seated in the Tractor seat. Starting a Tractor in gear can result in injury or death. Read the Tractor operator's manual for proper starting instructions. (SG-13)

5. CONNECTING THE MOWER TO THE TRACTOR

Use extreme caution when connecting the mower to the tractor. The mower should be securely resting at ground level or on blocks. Place a block in front of and behind the center section wheels to prevent the mower from moving. Keep hands and feet out from under the mower and clear of pinch points between the tractor and mower.

DANGER!

Always shut the Tractor completely down, place the transmission in park, and set the parking brake before you or anyone else attempts to connect or disconnect the Implement and Tractor hitches. (S3PT-15)

5.1 Connecting the Mower Tongue to the Tractor

1. Ensure the tractor is equipped with the correct PTO shaft and the drawbar is set at the correct length.

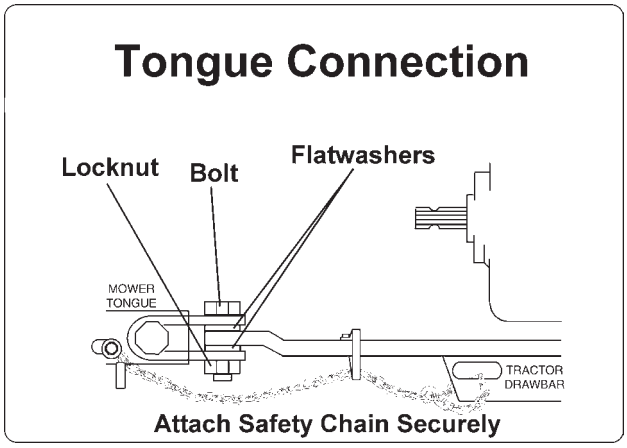
2. Using the parking jack, position the tongue clevis to the height of the tractor drawbar.

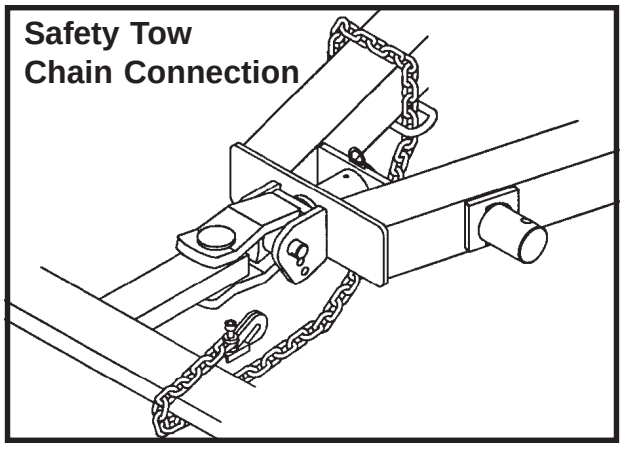
3. Board the tractor and start the engine. Back the tractor to the mower aligning the drawbar hitch hole with the mower tongue clevis. Turn off the tractor engine, place the tractor in park, and set the parking brake before dismounting.

4. To attach the mower, place two 1" flatwashers positioned under top lip of tongue clevis and to the top of drawbar. Add additional 1" flatwashers between the bottom of drawbar and bottom lip of clevis to fill open space. Insert a 1" diameter grade 5 or 8 bolt through clevis and drawbar and retain in position with a 1" locknut. Tighten the locknut securely but do overtighten which could spring or break the clevis. NEVER attach the mower to the tractor with a pin not having a nut.

5. Securely attach the mower safety chain to the tractor drawbar or drawbar support frame. Ensure the mower end is securely wrapped around the mower hitch "A" frame.

6. Lower the jack until the tongue is completely supported by the drawbar. Remove jack from the tongue and place on storage bracket of mower.





Safety Tow Chain

If the mower is towed on a public roadway, a safety chain with tensile strength equal to or greater than the gross weight of the mower must be connected between the tractor and mower. This will help control the implement in the event the tongue becomes disconnected from the drawbar. After connecting both ends of the safety chain, drive the tractor to the right and left to check for proper chain length. Adjust length as necessary and allow only enough slack in the chain to make a maximum turn in both directions.

5.2 Connecting Mower Hydraulic Lines to the Tractor

With the tractor shut down and secured in position, relieve hydraulic pressure from the tractor by moving the control levers back and forth several times or placing the levers in the float position. Keep mower hydraulic lines, hoses, quick couplers, and swivels free of contamination. Never leave a disconnected hose end open and cap the tractor hydraulic outlet ports when not in use. If the tractor ports or mower hydraulic hose ends become contaminated, wipe clean with a rag before connecting.

Hydraulic Line Support
After connecting the mower hydraulic lines to the tractor, support the hoses with the equipped brackets. Ensure that hoses do not contact the driveline, do not bind while turning, and do not become pinched or kinked.

Hydraulic Cylinder Priming
Hydraulic Cylinders must be filled with hydraulic oil before removing the wing transport pins to lower the mower wings and deck. Hydraulic cylinders and lines are filled by holding the valve control levers in the raised position until the cylinders fully retract (wing cylinders) and extend (center cylinder). Place control levers in the float position and repeat process several more times to purge all air from the system. Ensure wings are entirely supported by the cylinders before removing the transport pins. NEVER drive out pins and NEVER remove transport pins that have tension on them.

6. SETTING THE MOWER

Properly setting the cutting height is essential for efficient and safe operation. A properly set mower will make a more uniform cut, distribute clippings more evenly, require minimal tractor work, and follow the contour of uneven terrain. Note: Avoid very low cutting heights, striking the ground with the blades gives the most damaging shock loads and will cause damage to the mower and drive. Blades contacting the ground may cause objects to be thrown out from under the mower deck. Always avoid operating the mower at a height which causes the blades to contact the ground.

DANGER!

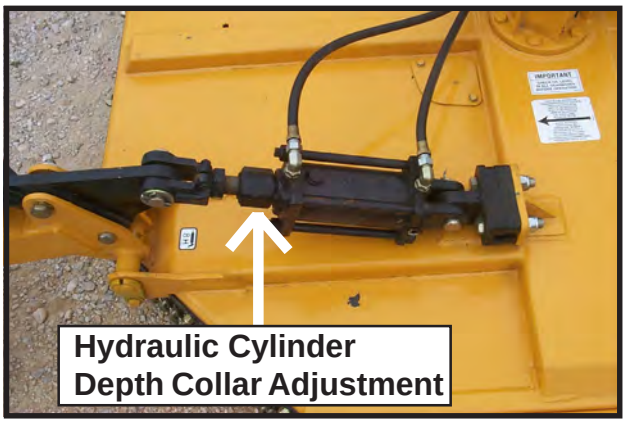
Never work under the Implement, the framework, or any lifted component unless the Implement is securely supported or blocked up to prevent sudden or inadvertent falling which could cause serious injury or even death. (SG-14)

6.1 SETTING CUTTING HEIGHT

The cut height for the center section is set by extending or shortening the depth collar located on the center lift cylinder. Cutting height for the wing cylinders will be automatically controlled by the hydraulic phasing system. Depth stops are also provided on the wing cylinders as back up for fine adjustments.

IMPORTANT: If depth control stops are not set at the same height as the center cylinder, internal damage may occur to the phasing cylinders.

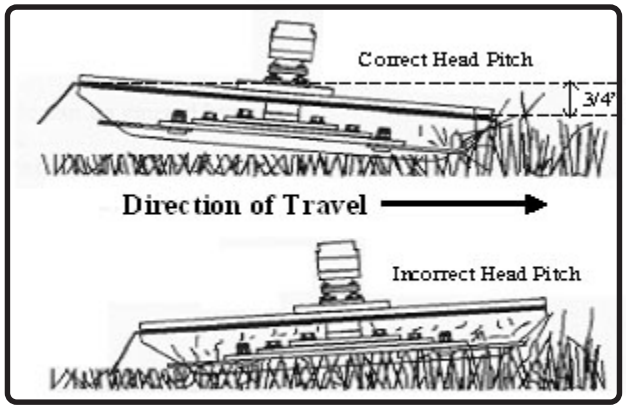
The cutter should always be operated in the highest position that will produce the desired cutting results. Operating at increased heights will minimize the chances of blades contacting the ground and discharging debris.



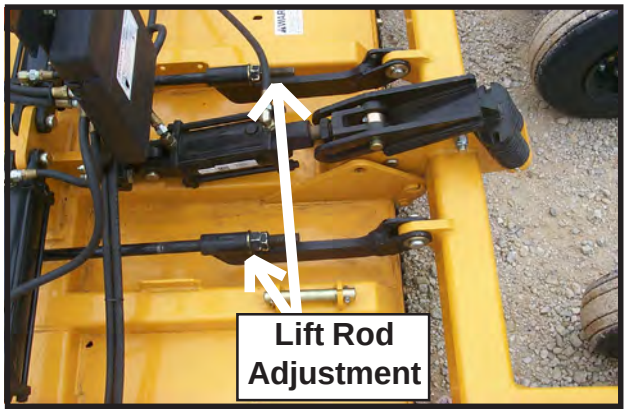
6.2 Setting Deck Pitch

To facilitate safe and efficient operation, the mower should be operated with the deck approximately 3/4" LOWER IN THE FRONT THAN THE REAR.

Operating the mower at this pitch will allow the mower to cut the grass only once and requires less work from the tractor. In addition, a more even distribution of the clippings from the rear of the mower will be achieved with this deck pitch.



Adjust the lift rods linking the tongue to the rear axle until the front of the mower is at least 3/4" lower in the front that than the rear. To lower the front, lengthen the lift rods and to raise the front shorten the rods. IMPORTANT: Adjust the lift rods the same amount and maintain equal tension in the rods. Improper adjustment may cause rods to snap or bend. Retighten the jamnuts after the deck pitch has been set.



7. DRIVELINE ATTACHMENT

The driveline yoke and tractor PTO shaft must be dirt free and greased for attachment.

To connect the mower driveline to the tractor PTO output shaft, twist driveline yoke collar and align the grooves and splines of the yoke with those of the PTO shaft. Push the driveline yoke onto the PTO shaft, release the locking collar, and position the yoke until the locking collar balls are seated onto the PTO shaft. Push and pull the driveline back and forth several times to ensure a secure attachment.

WARNING!

When attaching the PTO yoke to the Tractor PTO shaft, it is important that the spring activated locking collar slides freely and the locking balls are seated securely in the groove of the PTO shaft. A driveline not attached correctly to the Tractor PTO shaft could slip off and result in personal injury and damage to the cutter.

7.1 Driveline Length Check

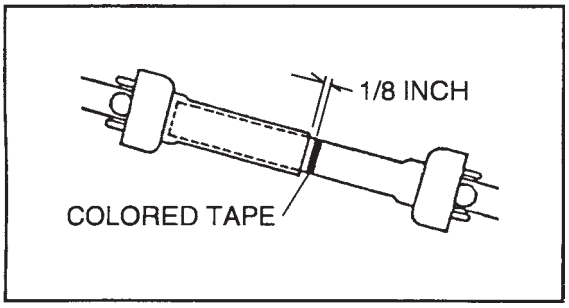
WARNING!

Before operating the Mower, check to make sure the driveline will not bottom out or become disengaged. Bottoming out occurs when the inner shaft penetrates the outer housing until the assembly becomes solid-it can shorten no more. Bottoming out can cause serious damage to the Tractor PTO by pushing the PTO into the Tractor and through the support bearings or downward onto the PTO shaft, breaking it off.

When fitting the mower to the tractor, the telescoping driveline must be inspected to ensure that at its most compressed position, the profiles do not “bottom out”, and when at its farthest extended position, there is sufficient engagement between the profiles to operate safely. At its shortest length, there must be at least a 1” clearance between each profile end and opposite profile universal joint. At its farthest operating extension, a minimum profile engagement of 12” must be maintained.

"Bottoming Out" Check Procedure

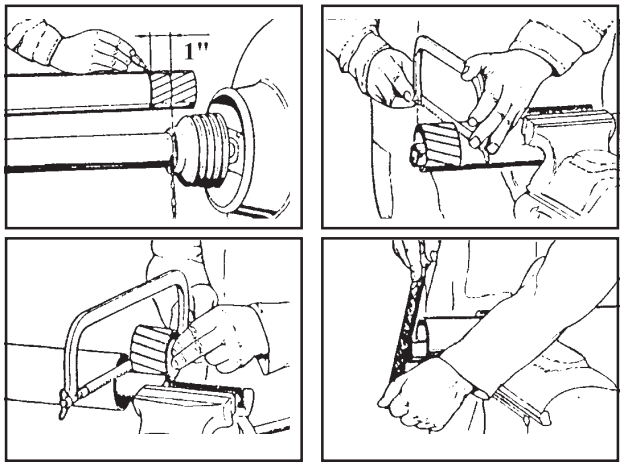
1. Disconnect driveline from the tractor and slide the profiles together until fully compressed.
2. Place a mark on the inner shield 1/8" from the end of the outer shield and reattach the driveline to the PTO shaft.
3. With the ***PTO NOT TURNING***, slowly drive the tractor with mower attached through the sharpest turn possible and watch shaft movement. With the ***PTO NOT TURNING***, slowly drive the tractor with the mower attached through the most severe terrain conditions expected and watch shaft movement.
4. If the distance between the mark and the outer shield becomes less than 2" at any point there is a potential problem bottoming out the driveline and the driveline should be shortened.



Driveline in maximum compressed position.

Shorten the driveline profiles as follows:

1. Remove the driveline from the tractor.
2. Position the mower to the point with the shortest distance between the tractor PTO shaft and cutter gearbox. Shut down the tractor and securely block the mower in this position.
3. Pull driveline apart and reattach yoke to PTO shaft.
4. Hold driveline sections parallel to one another and measure back 1" from yoke of each shaft and place mark on opposite section. Cut this length off with a saw.
5. Round off all sharp edges and debur.
6. Thoroughly grease then reinstall the driveline.
7. Recheck for proper operation.



Engagement Check Procedure

1. With the driveline attached, position the mower to the point where the telescoping driveline is at its maximum extension. Completely shut down the tractor and secure in position.
2. Mark the inner driveline shield 1/8" from the end of the outer shield.
3. Disconnect the driveline from the tractor and separate the two driveline halves.
4. Measure the distance from the mark to the end of the inner profile. This length is the amount the driveline profiles were engaged.
5. If the engaged length is less than 12", the shaft is considered too short and should be replaced with a longer shaft. Consult an authorized dealer to purchase the required driveline length.

NOTE: If the driveline cannot be shortened and still maintain the required profile engagement, the operator must be made aware of terrain conditions and avoid situations which pose a potential problem to avoid damaging the driveline.

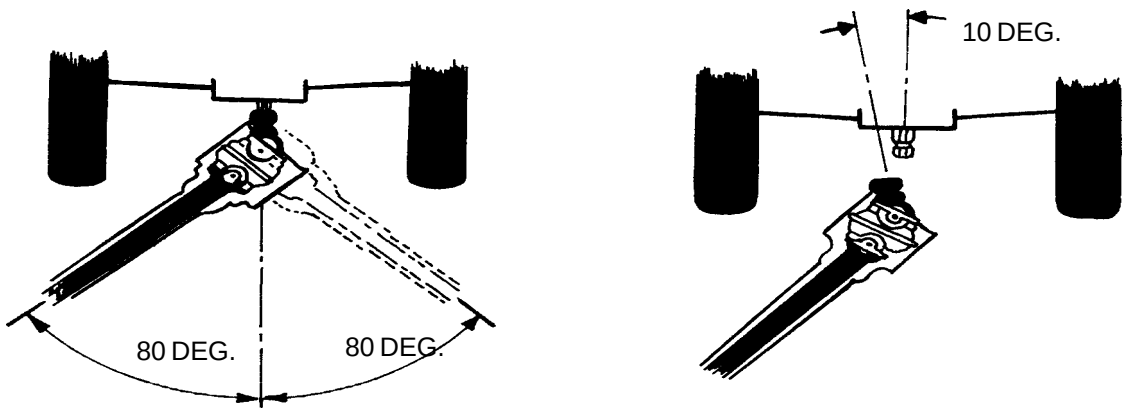
7.2 Constant Velocity (CV) Driveline

For mowers equipped with a Constant Velocity (CV) driveline, the maximum turning angle between the tractor and mower must be determined to ensure the joint angle does not over-extend which can cause CV joint damage. Constant Velocity joints enable the driveline to operate smoothly with no vibrations and clattering at angles up to 70°. Angles greater than 80° can result in mechanical damage to the CV joint and mower driveline.

The Constant Velocity joint must be lubricated every 8 hours of operation as specified in the Maintenance Section. Failure to properly lubricate the joint will result in accelerated wear and joint component failure.

CV Driveline Maximum Angle Check Procedure

1. With the **mower attached** to the tractor and the **driveline disconnected** from the tractor PTO stub make a hard left turn until there is approximately a 1" clearance between the left rear tractor tire and mower frame or tongue.
2. Stop and completely shut down the tractor. Place the tractor in Park and apply the Parking Brake before dismounting.
3. Check the CV joint at this maximum turning radius by holding the driveline yoke above the PTO shaft and then angle the CV joint to its maximum angle. A minimum difference of 10 degrees between the center line of the yoke and the PTO shaft must be maintained to ensure the joint will not be over angled. If the joint cannot be angled at least 10°, there is a potential problem of over-angling the joint while making sharp turns.
4. Solutions: To ensure the joint is not damaged, check the following:
   -Check the drawbar length to ensure that it is at the proper length for the RPM speed of the mower.
   -Move the tractor rear tires wider apart to limit the tractor turning radius.
   -Position the mower at multiple angles and perform the above procedure. Determine the sharpest turning radius that maintains a safe operating angle and note this position to the operator.



CONSTANT VELOCITY JOINT-MAXIMUM ANGLE CHECK

DANGER!

Do not turn so sharp or lift mower so high to produce a severe "knocking" of the Driveline which will cause accelerated wear and breakage of drive train components and could result in possible injury from the separated Driveline sections. (SRM-4)

8. PRE-OPERATION INSPECTION AND SERVICE

Before each use, a pre-operation inspection and service of the mower and tractor must be performed. This includes routine maintenance and scheduled lubrication, inspecting that all safety devices are equipped and functional, and performing needed repairs. Do not operate the mower and tractor if the pre-operation inspection reveals any condition affecting safe operation. Perform repairs and replacement of damaged and missing parts as soon as noticed. By performing a thorough pre-operation inspection and service, valuable down time and repair cost can be avoided.

DANGER!

Always disconnect the main PTO Driveline from the Tractor before performing service on the Mower. Never work on the Mower with the Tractor PTO driveline connected and running. Blades or Drivelines could turn without warning and cause immediate entanglement, injury or death. (SRM-3)

DANGER!

DO NOT allow any person under a folded wing unless wing is securely locked up or supported. DO NOT approach the Implement unless the Tractor is turned off and all motion has ceased. Never work under the frame work, or any lifted component unless the implement is securely supported or blocked up. A sudden or inadvertent fall by any of these components could cause serious injury or even death. (STI-3)

WARNING!

Periodically inspect all moving parts for wear and replace when necessary with authorized service parts. Look for loose fasteners, worn or broken parts, and leaking or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this Implement in good working order. (SG-21)

8.1 Tractor Pre-Operation Inspection/Service

Refer to the tractor operator's manual to ensure a complete pre-operation inspection and scheduled service is performed according to manufacturer recommendations. The following is a partial list of items requiring inspection:

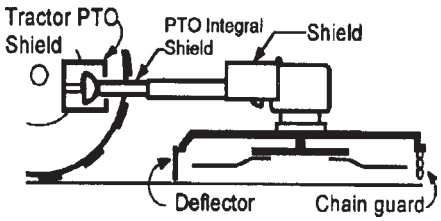
- Tire condition/air pressure
- Wheel lug bolts
- Steering linkage
- PTO shield
- SMV sign is clean and visible
- Tractor's lights are clean and functional
- Tractor Seat belt is in good condition
- Tractor cab or ROPS is in good condition
- ROPS is in the raised position
- No tractor oil leaks
- Radiator free of debris
- Engine oil level and condition
- Engine coolant level and condition
- Power brake fluid level
- Power steering fluid level
- Fuel condition and level
- Sufficient lubrication at all lube points
- Air filter condition

8.2 Mower Pre-Operation Inspection/Service

Before each mower use, a complete inspection and service is required to ensure the mower is in a good and safe working condition. Damaged and/or broken parts should be repaired and/or replaced immediately. To ensure the mower is ready for operation, conduct the following.

DANGER!

All Safety Shields, Guards and Safety devices including (but not limited to) - the Deflectors, Chain Guards, Steel Guards, Gearbox Shields, PTO integral shields, and the Retractable Door Shields should be used and maintained in good working condition. All safety devices should be inspected carefully at least daily for missing or broken components. Missing, broken, or worn items must be replaced at once to reduce the possibility of injury or death from thrown objects, entanglement, or blade contact. (SGM-3)



DANGER!

Replace bent or broken blades with new blades. NEVER ATTEMPT TO STRAIGHTEN OR WELD ON BLADES SINCE THIS WILL LIKELY CRACK OR OTHERWISE DAMAGE THE BLADE WITH SUBSEQUENT FAILURE AND POSSIBLE SERIOUS INJURY FROM THROWN BLADES. (SGM-10)

- Ensure that the Manual Canister is secured to the mower with the Operator's Manual inside.
- Ensure all decals are in place and legible. Replace missing, worn, and unlegible decals.

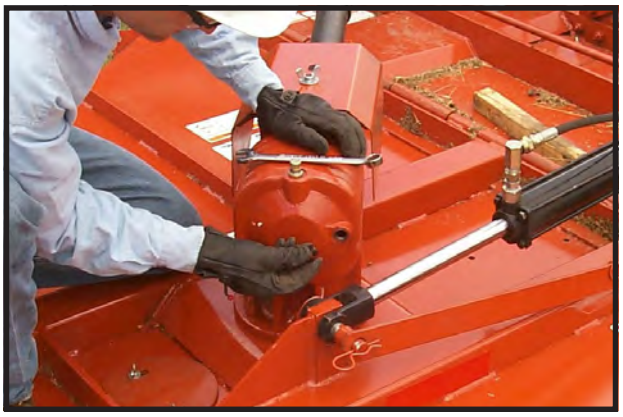
NOTE: The mower Operator's Manual and affixed Decals contain important instructions on the safe and proper use of the mower. Maintain these important safety features on the mower in good condition to ensure the information is available to the operator at all times.

- Ensure the mower hitch is securely attached to the tractor drawbar with a proper size bolt and secured nut.
- Ensure that a properly rated safety tow chain is equipped securing the mower to the tractor.
- Check that the main driveline is securely attached to the tractor and the locking collar is seated in the groove of the PTO shaft.
- Ensure the divider drivelines are secure at both ends

- Ensure chain guards are in position and not damaged. Replace worn, broken, and missing sections immediately.
- Ensure the driveline integral shields are in good condition and rotate freely.
- Inspect that all bolts and screws are in position and are properly torqued.

- Ensure the tractor PTO master shield is in place, lowered and in good condition.
- Ensure each mower slip clutch shield is secured in place and in good condition.
- Ensure the driveline slip clutches are properly adjusted and the friction plates are not frozen together. Reference the Maintenance Section for proper slip clutch maintenance.

- Perform scheduled lubrication as specified in the maintenance section.
- Inspect each gearbox oil level and replenish if needed. A low oil level is a warning sign that the gearbox may be cracked or its seal is damaged and needs to be replaced.
- Ensure all gearbox vents are in place and free from clogs.



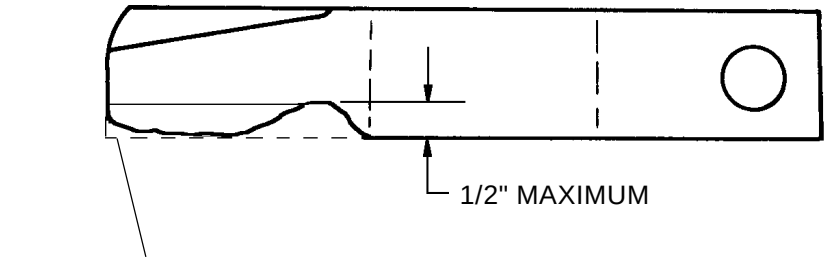
- Ensure each hydraulic cylinder is installed and retained correctly. Ensure the proper size pins are used to retain the cylinders in place and are secured with pins.
- Check for hydraulic oil leaks on the cylinders, along the hydraulic lines, and at tractor hydraulic ports.
  IMPORTANT: DO NOT use your hands to check for oil leaks. Use a piece of heavy paper or cardboard to check for hydraulic oil leaks.

- Ensure that the mower is equipped and secured with wing and center section transport lock pins.
- Check the condition of the wing hinge pins.
- Check the condition of the mower axle suspension spring.
- Inspect mower tire condition, wheel bearings, and lug nut torque.

- Inspect blades and blade bolts for looseness and excessive wear. Make sure the mower is securely blocked up before crawling beneath. Make sure that wing lock pins are installed before approaching a raised wing. Replace damaged, worn, and missing blades as complete sets to maintain rotary balance.
- Ensure carrier hub nuts are tightened with the cotter pin inserted and spread.
- Inspect the condition of the deck skid shoes and the skid shoe attaching hardware.

DANGER

Inspect Blades daily for abnormal wear. If Blades have a notch worn into the leading edge at the lower bend more than a **1/2" DEEP** (due to running in gravel and/or the ground), **REPLACE BOTH BLADES ON THAT CARRIER IMMEDIATELY**. Failure to replace such abnormally worn blades may lead to catastrophic failure of the blade and ejection of the broken part with tremendous force which may cause bodily injury or death!



NOTE: Replace Blades in pairs after no more than 1/2" notch wear!

9. DRIVING THE TRACTOR AND MOWER

Safe tractor transport requires the operator possess a thorough knowledge of the model being operated and precautions to take while driving with an attached implement. Ensure the tractor has the capacity to handle the weight of the mower and the tractor operating controls are set for safe transport. To ensure safety while driving the tractor with an attached mower, review the following.

WARNING!

Transport only at safe speeds. Serious accidents and injuries can result from operating equipment at unsafe speeds. Understand the Tractor and Mower and how it handles before transporting on streets and highways. Make sure the Tractor steering and brakes are in good condition and operate properly. Before transporting the Tractor and Mower, determine the safe transport speeds for you and the equipment. Make sure you abide by the following rules:

1. **Test the Tractor at a slow speed and increase the speed slowly. Apply the Brakes smoothly to determine the stopping characteristics of the Tractor and Mower. As you increase the speed of the Tractor the stopping distance increases. Determine the maximum safe transport speed for you and this Equipment.**
2. **Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that it is safe to operate at a higher speed. Use extreme care and reduce your speed when turning sharply to prevent the Tractor and Mower from turning over. Determine the maximum safe turning speed for you and this equipment before operating on roads or uneven ground.**
3. **Only transport the Tractor and Mower at the speeds that you have determined are safe and which allow proper control of the equipment.**

Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes. When operating down a hill or on wet or rain slick roads, the braking distance increases, use extreme care and reduce your speed in these conditions. When operating in traffic, always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you and watch out for the other guy. (SG-19)

DANGER!

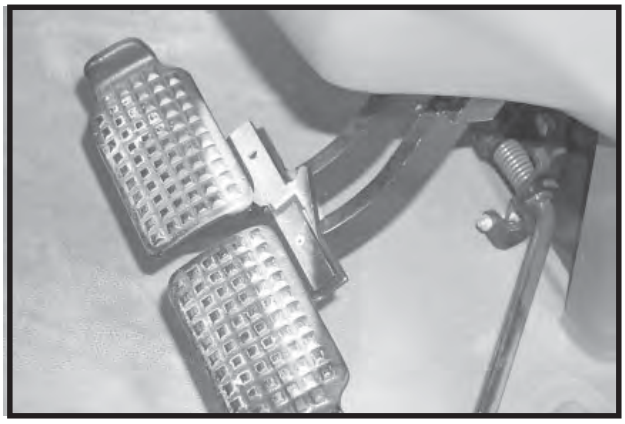
This Implement is wider than the Tractor. Be careful when operating or transporting this equipment to prevent the Implement from running into or striking sign posts, guard rails, concrete abutments or other solid objects. Such an impact could cause the Implement and Tractor to pivot violently resulting in loss of steering control, serious injury, or even death. Never allow the Implement to contact obstacles. (S3PT-12)

9.1 Starting the Tractor

The procedure to start the tractor is model specific. Refer to the tractor operator's manual for starting procedures for your particular tractor. Consult an authorized dealer if the starting procedure is unclear. Ensure the 3-point control lever is in the lowered position and the PTO is disengaged before starting the tractor.

9.2 Brake and Differential Lock Setting

Make sure the tractor brakes are in good operating condition. Tractor brakes can be set to operate independently allowing single rear wheel braking action or locked together to provide simultaneous rear wheel braking. FOR MOST DRIVING AND MOWING CONDITIONS, THE BRAKE PEDALS SHOULD BE LOCKED TOGETHER TO PROVIDE THE MOST EFFECTIVE BRAKING ACTION.



WARNING!

Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes. When operating down a hill or on wet or rain slick roads, the braking distance increases; use extreme care and reduce your speed in these conditions. When operating in traffic, always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you and watch out for the other guy.

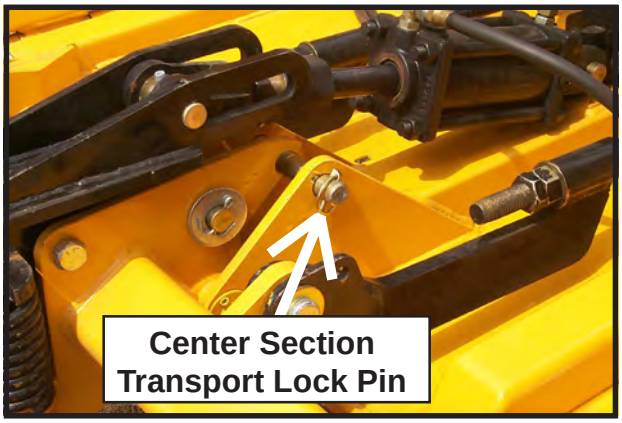
Always disengage the tractor differential lock when turning. When engaged the differential lock will prevent or limit the tractor from turning. During normal mowing conditions, locking the differential provides no benefit and should not be used.

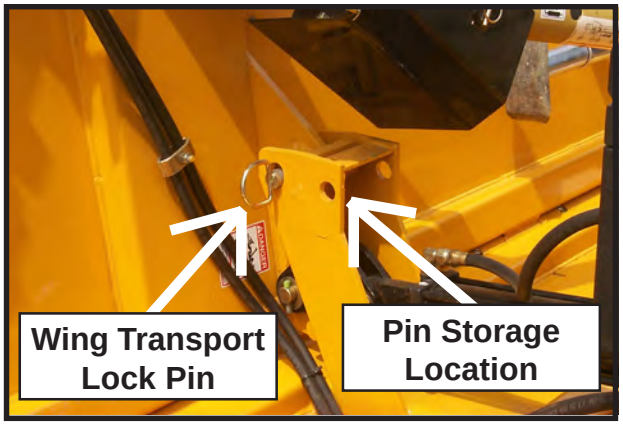
9.3 Operating the Mower Wings

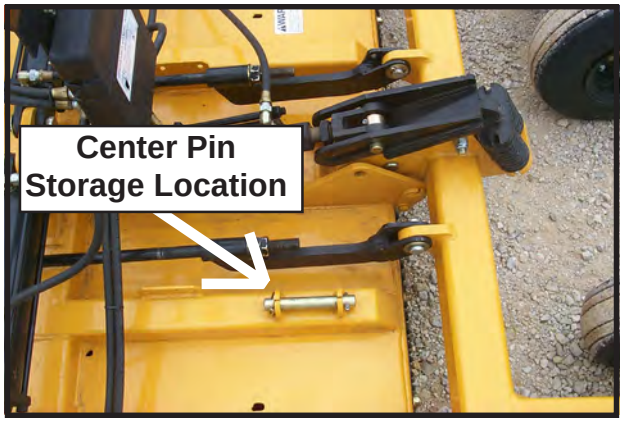
Wings are positioned with hydraulic cylinders. Ensure the hydraulic cylinders and lines are filled with oil by holding the valve control levers in the raised position until the cylinders fully retract (wings) and extend (center). Only operate the mower with both wings fully lowered, NEVER operate the mower with a raised wing. Wait until the blades are at a complete stop before raising wings.

Transport Position

To raise mower wings, drive the unit to a level area and retract the wing hydraulic cylinders. DO NOT raise wings with the mower positioned on an embankment or other inclined position to prevent overturning the mower. After the wings are fully raised, install transport lock pins to prevent the wings and center section from inadvertently falling.







DANGER!

When the Wings are folded for transport, the center of gravity is raised and the possibility of overturn is increased. Drive slowly and use extreme caution when turning on hillsides. Overturning the Implement could cause the Implement to overturn the Tractor and vice versa resulting in serious injury or even death. Never fold wings on a hillside...the Implement may overturn. (STI-2)

Operating Position

To lower the wings, remove the transport lock pins and secure pins at storage location. DO NOT drive out transport pins that have tension on them. After removing pins, extend wing hydraulic cylinders and fully lower wings.

Wing hydraulic control valves should be set in the float detent during operation to allow the mower to follow the contour of uneven terrain and to prevent the wings from creeping up. When extending a wing over a ditch for mowing, place the control valve lever detents in the center position for greater stability.

WARNING!

Use extreme care when lowering or unfolding the implement's wings. Make sure no bystanders are close by or underneath the wings. Allow ample clearance around the implement when folding or unfolding the wings. Use extreme caution around buildings or overhead power lines. (S3PT-5)

9.4 Driving the Tractor and Mower

Start off driving at a slow speed and gradually increase your speed while maintaining complete control of the tractor and mower. Moving slowly at first will also prevent the tractor from rearing up and loss of steering control. The tractor should never be operated at speeds that cannot be safely handled or which will prevent the operator from stopping quickly during an emergency. If the power steering or engine ceases operating, stop the tractor immediately as the tractor will be difficult to control.

Drive the tractor with the 3-Point lift arms in the raised position and lock the control lever in the transport detent position to prevent damage to the mower driveline and tongue when turning.

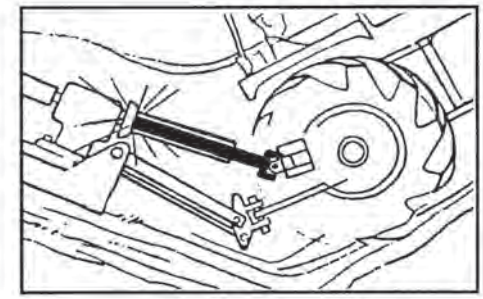
Perform turns with the tractor and mower at slow speeds to determine how the tractor with an attached mower handles a turn. Determine the safe speed to maintain proper control of the tractor when making turns. When turning with a towed implement, the overall working length of the unit is increased. Allow additional clearance for the mower when turning, especially if the wings are lowered.

To avoid overturns, drive the tractor with care and at safe speeds, especially when operating over rough ground, crossing ditches or slopes, and turning corners. Rear tractor tire spacing should be increased when working on inclines or rough ground to reduce the possibility of tipping.

Use extreme caution when operating on steep slopes. Keep the tractor in a low gear when going downhill. DO NOT coast or free-wheel downhill.

9.5 Crossing Ditches and Steep Inclines

When crossing ditches with steep banks or going up sharp inclines, it is possible that the main driveline inner profile will penetrate into the outer housing to its maximum depth until the assembly becomes solid (driveline is at its extreme shortest length). This type of abusive operation can cause serious damage to the tractor and mower drive by pushing the PTO into the tractor and through the support bearings or downward onto the PTO shaft, breaking it off.

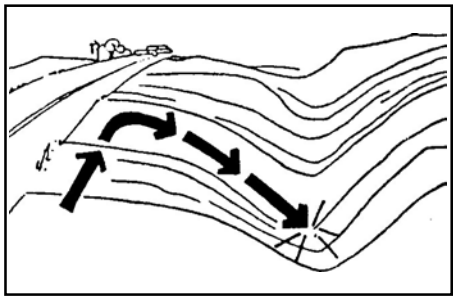


WARNING!

Damage resulting from over-collapse of the driveline's inner profile and its outer housing may allow the driveline to come loose from the Tractor which could cause bodily injury to the operator or bystanders and/or extensive damage to the Tractor or Implement

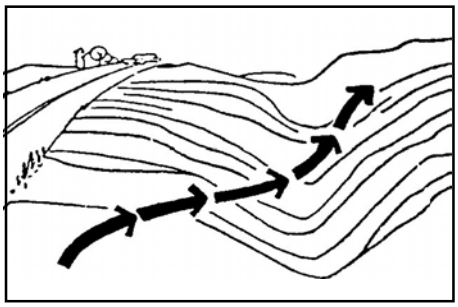
When confronted with an incline or ditch, do not approach from an angle which is perpendicular or straight on as damage to over collapse of the driveline may occur.

When crossing such terrain, the wings should be fully lowered for a lower center of gravity and added stability.



INCORRECT: DO NOT approach ditch straight on.

Inclines and ditches should be approached along a line which is at an angle as shown. This type of path will reduce the possibility of over-collapse of the driveline and resulting damage. If the gradient is so steep that such as approach increases the possibility of a tractor roll-over, select an alternate crossing path.



CORRECT: Approach ditch at an angle

When operating the tractor and mower across slopes and inclines, through ditches, and other uneven terrain conditions, it is important to maintain sufficient deck to ground clearance. Blade contact with the ground may cause soil, rocks and other debris to be thrown out from under the mower resulting in possible injury and/or property damage. Ground contact also produces a severe shock load on the mower drive and to the mower blades resulting in possible damage and premature wear.

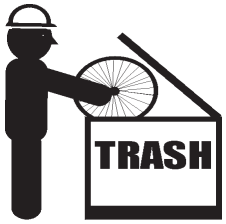
10. OPERATING THE TRACTOR AND MOWER

THE OPERATOR MUST COMPLETELY UNDERSTAND HOW TO OPERATE THE TRACTOR AND MOWER AND ALL CONTROLS BEFORE ATTEMPTING TO MOW. The operator must read and understand the Safety and Operation Sections of the mower and tractor operator's manuals. These manuals must be read and explained to any operator who cannot read. Never allow someone to operate the mower and tractor without complete operating instructions.

Before starting any mowing operation, the operator must become familiar with the area to be mowed and any obstacles and hazards contained within to ensure safety to the operator, bystanders, and equipment. Special attention should be paid to foreign debris, rough terrain, steep slopes, and passersby and animals in the area.

DANGER!

Extreme care should be taken when operating near loose objects such as gravel, rocks, wire, and other debris. Inspect the area before mowing. Foreign objects should be removed from the site to prevent machine damage and/or bodily injury or even death. Any objects that cannot be removed must be clearly marked and carefully avoided by the operator. Stop mowing immediately if blades strike a foreign object. Repair all damage and make certain the blade carrier is balanced before resuming mowing. (SGM-5)



DANGER!

Many varied objects, such as wire, cable, rope, or chains, can become entangled in the operating parts of the Mower head. These items could then swing outside the housing at greater velocities than the blades. Such a situation is extremely hazardous and could result in serious injury or even death. Inspect the cutting area for such objects before mowing. Remove any like object from the site. Never allow the cutting blades to contact such items. (SGM-6)

10.1 Foreign Debris Hazards

Before mowing, inspect the area to make sure there are no foreign objects that the mower blades could hit or become entangled with. Remove all foreign objects and debris. If objects are too big to remove, mark them clearly and be sure to prevent the mower blades from contacting them.

If you hit a solid object or foreign debris, stop the mower and tractor at once. Immediately idle the engine speed and disengage the PTO. Wait for all mower rotating motion to stop, then raise the mower and move the tractor and implement off the object. Inspect the area and remove, or mark the location of the debris. Inspect the condition of the mower and make any needed repairs immediately. Make sure the blades are not damaged and the carrier is balanced before resuming operation.

Always wear your seat belt securely fastened and only operate the tractor and mower with the ROPS in the raised position. If the tractor or mower hits a tree stump, rock, or bump, a sudden movement could throw you off of the seat and under the tractor and/or mower The seat belt is your best protection from falling off the tractor and the ROPS provides protection from being crushed during a tractor roll-over.

10.2 Bystander/Passersby Precautions

If a bystander comes within 100 yards of the tractor while the mower is being operated, stop the tractor at once, idle the engine and disengage the PTO. Do not engage the PTO again until all bystanders are well past the 100 yard distance.

DANGER!

Rotary Mowers are capable under adverse conditions of throwing objects for great distances (100 yards or more) and causing serious injury or death. Follow safety messages carefully.

STOP MOWING IF PASSERSBY ARE WITHIN 100 YARDS UNLESS:

-Front and Rear Deflectors, Chain Guards, or Bands are installed and in good, workable condition;
-Mower sections or Wings are running close to and parallel to the ground without exposed Blades;
-Passersby are outside the existing thrown-object zone;
-All areas have been thoroughly inspected and all foreign material such as rocks, cans, glass, and general debris has been removed.

NOTE: Where there are grass and weeds high enough to hide debris that could be struck by the blades, the area should be: inspected and large debris removed, mowed at an intermediate height, inspected closely with any remaining debris being removed, and mowed again at the desired final height. (This will also reduce power required to mow, reduce wear and tear on the Mower drivetrain, spread cut material better, eliminate streaking, and make the final cut more uniform.) (SRM-1)

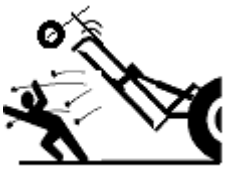
10.3 Engaging the Power Take Off (PTO)

Before engaging the PTO, make certain that the area is clear of bystanders and passersby. The mower wings must be completely lowered and the deck positioned at a safe mowing height. NEVER engage the PTO with the mower wings in the raised position.

Set the tractor engine speed at approximately 1,000 RPM before engaging the PTO. Shift the PTO control to the on position, and slowly increase the engine speed until the PTO is operating at the rated speed. If you hear unusual noises or see or feel abnormal vibrations, disengage the PTO immediately. Inspect the mower to determine the cause of the noise or vibration and repair the abnormality.

DANGER!

Do not let the Blades turn when the Mower deck is raised for any reason, including clearance or for turning. Raising the Mower deck exposes the cutting blades which creates a potentially serious hazard and could cause serious injury or even death from objects thrown from the blades. (SRM-7)



DANGER!

Do not put hands or feet under Mower decks. Blade contact can result in serious injury or even death. (SGM-9)

10.4 PTO RPM and Ground Speed

Ground speed for mowing will depend upon the height, type, and density of vegetation to be cut. Recommended speed for efficient mower performance is between 2 and 5 mph. Operate the mower at its full rated PTO speed to maintain blade speed for a clean cut. Refer to the tractor operator's manual or the tractor instrument panel for the engine speed and gear to provide the required PTO and desired ground speed. Make sure that the mower is operating at its full rated speed before entering the vegetation to be cut. If it becomes necessary to temporarily regulate engine speed, increase or decrease the throttle gradually.

Ground speed is achieved by transmission gear selection and not by the engine operating speed. The operator may be required to experiment with several gear range combinations to determine the best gear and range which provides the most ideal performance from the mower and most efficient tractor operation. As the severity of cutting conditions increase, the ground speed should be decreased by selecting a lower gear to maintain the proper operating PTO speed.

WARNING!

Do not exceed the rated PTO speed for the Implement. Excessive PTO speeds can cause Implement driveline or blade failures resulting in serious injury or death. (SG-26)

WARNING!

Mow at the speed that you can safely operate and control the Tractor and Mower. Safe mowing speed depends on terrain condition and grass type, density, and height of cut. Normal ground speed range is from 2 to 5 mph. Use slow mowing speeds when operating on or near steep slopes, ditches, drop-offs, overhead obstructions, power lines, or when debris and foreign objects are to be avoided. (SGM-7)

10.5 Operating the Mower

Only operate the mower from the tractor operator's seat with the seatbelt securely fastened. The tractor must be equipped with a ROPS in the raised position or a ROPS cab.

The mower is designed to cut vegetation up to 2" in diameter. Sharp blades will produce a cleaner cut and require less power. Travel at a speed that allows the mower sufficient time to cut through the vegetation and maintain the PTO operating speed to prevent overloading the mower and tractor. Choose a driving pattern that provides the maximum pass length and minimizes turning.

Under certain conditions, tractor tires may roll some grasses down preventing them from being cut at the same height as the surrounding area. When this occurs, check to ensure that the tractor tires are spaced at least 60" apart measured from inside to inside of tires. Lower cutting heights in general will also increase cutting performance. Reducing the tractor ground speed while maintaining the operating speed of the mower may permit downed grasses to at least partially rebound and be cut. Taking a partial cut and/or reversing the direction of travel may also help produce a cleaner cut.

Avoid mowing in the reverse direction when possible. In situations where the mower must be backed to access areas to be cut, make sure there are no persons or other foreign debris behind the mower before mowing in reverse. When mowing in reverse, operate the tractor and mower at a reduced ground speed to ensure tractor and mower control is maintained.

WARNING!

Do not mow with two machines in the same area except with Cab tractors with the windows closed. (SGM-11)

DANGER!

Avoid mowing in reverse direction when possible. Check to make sure there are no persons behind the Mower and use extreme care when mowing in reverse. Mow only at a slow ground speed where you can safely operate and control the Tractor and Mower. Never mow an area in the reverse direction that you have not inspected and removed debris or foreign material. (SGM-8)

WARNING!

Follow these guidelines to reduce the risk of equipment and grass fires while operating, servicing, and repairing the Mower and Tractor:
-Equip the Tractor with a fire extinguisher in an accessible location.
-Do Not operate the Mower on a Tractor with an underframe exhaust.
-Do Not smoke or have an open flame near the Mower and Tractor.
-Do Not drive into burning debris or freshly burnt areas.
-Ensure slip clutches are properly adjusted to prevent excessive slippage and plate heating.
-Never allow clippings or debris to collect near drivelines, slip clutches, and gearboxes. Periodically shut down the Tractor and Mower and clean clippings and collected debris from the mower deck. (SGM-12)

DANGER!

Mow only in conditions where you have clear visibility in daylight or with adequate artificial lighting. Never mow in darkness or foggy conditions where you cannot clearly see at least 100 yards in front and to the sides of the Tractor and Mower. Make sure that you can clearly see and identify passersby, steep slopes, ditches, drop-offs, overhead obstructions, power lines, debris and foreign objects. If you are unable to clearly see this type of item discontinue mowing. (SGM-1)

Never raise the mower entirely while the blades are turning. If the mower must be raised higher than 12" from ground level, disengage the tractor PTO and wait for all mower rotation to come to a complete stop before proceeding to raise the mower. NEVER raise the mower wings while the blades are turning.

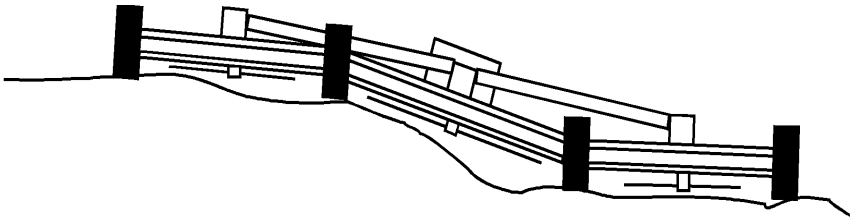
When turning, the angle between the tractor and mower should not be so great that a clattering of the U-joints occurs. Sharp turns can cause premature failure of the joints and place pressure on the tractor PTO shaft and could cause extensive mechanical damage to the mower and tractor.

WARNING!

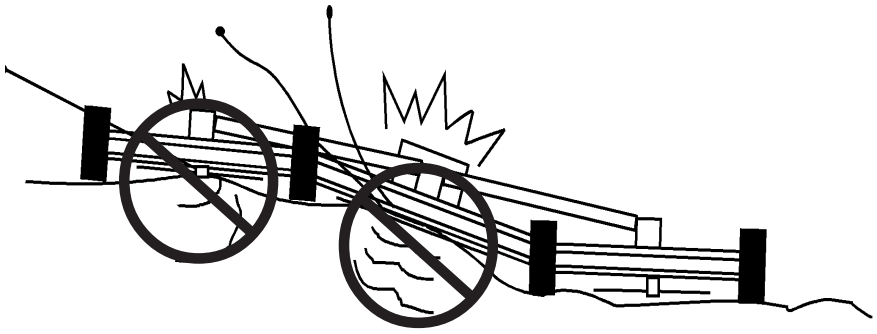
Do not let the Blades turn when the Mower Deck is raised for any reason, including clearance or for turning. Raising the Mower deck exposes the Cutting Blades which creates a potentially serious hazard and could cause serious injury or even death from objects thrown from the Blades. (SRM-7)

Stay alert and watch for trees, powerlines, posts, signs, and all other overhead and ground obstructions while you are mowing. Use extreme care to avoid hitting these types of obstructions.

When mowing across uneven areas such as road shoulders, ditch edges, and other uneven terrain, position mower so that one support wheel is near the highest point to prevent blades from cutting into gravel or dirt which can cause rapid blade wear and extremely severe shock loads on the drivetrain resulting in rapid wear or damage to these components. Blades contacting the ground may cause objects to be thrown out from under the mower deck. Always avoid operating the mower at a height or position which may cause the blades to contact the ground. Cutting into the berm or edge of the ditch will cause abnormal and accelerated blade wear and possible blade component failure.



Correct Mower Deck Positioning



Wrong Mower Deck Positioning

10.6 Shutting Down the Mower

To shut down the mower, first bring the tractor to a complete stop. Then slow down the mower by reducing the engine speed before disengaging the PTO. Wait for all rotating motion to stop before proceeding to drive or shut down the tractor.

Park the tractor on a level surface, place the transmission in park or neutral and apply the parking brake, lower the attached mower to the ground, shut down the engine, remove the key, and wait for all motion to come to a complete stop before exiting the tractor.

11. DISCONNECTING THE MOWER FROM THE TRACTOR

DANGER!

Always shut the Tractor completely down, place the transmission in park, and set the parking brake before you or anyone else attempts to connect or disconnect the Implement and Tractor hitches. (S3PT-15)

WARNING!

Never unhitch without using the Tongue Jack. The Tongue is very heavy. Attempting to lift the Tongue without using the Tongue Jack could cause strains or other injury. Allowing the tongue to fall suddenly and unexpectedly could result in crushing injury. Use the Tongue Jack for lifting the Implement only. Overloading the Tongue Jack can cause failure with possible serious bodily injury or even death. (STI-4)

Before disconnecting the mower, the PTO must be disengaged and blade rotation at a complete stop. Move the mower to a level storage location and lower the center section and both wings to the ground. If the mower will be stored with the wings in the raised position, install both wing and center section transport pins. If the mower is not resting securely on the ground, block the mower up securely before attempting to disconnect it from the tractor.

Use extreme care to keep feet and hands out from under the mower and clear of any pinch points when disconnecting the mower from the tractor.

1. When disconnecting the mower, the tractor should be completely shut down and secured in position. Relieve hydraulic pressure by moving the control levers back and forth several times.
2. Lower the parking jack and raise the mower until the tongue clevis is no longer resting on the tractor drawbar and is supported solely by the jack. Make sure the jack foot is securely resting at ground level or securely supported by a block before raising the mower.
3. Once the mower tongue is being supported entirely by the jack, remove the hitch bolt, locknut, and washers.
4. Remove the mower driveline from the tractor PTO shaft. Place the driveline in its storage bracket to prevent it from contacting mud or dirt which can contaminate the universal joint bearings and shorten the life of the driveline.
5. Remove the hydraulic hoses from the tractor and secure to the mower to prevent contact with dirt.
6. After the driveline has been removed from the tractor, place the PTO master shield back in the operating position.

12. MOWER STORAGE

It is recommended that the mower be stored with the center section and both wings fully lowered to ground level. If the mower is stored with the wings in the raised position, select a level area and install wing transport lock pins to prevent the wings from falling BEFORE disconnecting the mower hitch and hydraulic hoses from the tractor. Store the mower with the center section transport lock pin installed or with the mower fully lowered. Never store the mower with the center section or a raised wing supported by hydraulic pressure.

Properly preparing and storing the mower at the end of the season is critical to maintaining its appearance and to help ensure years of dependable service. The following are suggested storage procedures:

1. Thoroughly clean all debris off the mower to prevent damage from rotting grass and standing water.
2. Lubricate all mower grease points and fill gearbox oil levels as detailed in the maintenance section.
3. Tighten all bolts and pins to the recommended torque.
4. Check the mower for worn and damaged parts. Perform repairs and make replacements immediately so that the mower will be ready for use at the start of the next season.
5. Store the mower in a clean, dry place with the mower housing resting securely on blocks or at ground level.
6. Keep the driveline yoke from sitting in water, dirt and other contaminants.
7. Use spray touch-up enamel where necessary to prevent rust and maintain the appearance of the mower.

DANGER!

Never allow children to play on or around the Tractor and Implement. Children can slip or fall off the Equipment and be injured or killed. Children can cause the Implement to shift or fall crushing themselves and others. (SG-25)

It is critical that driveline clutches slip when an obstacle or heavy load is encountered to avoid mower and/or tractor damage. If the mower sits outside for an extended period of time or is exposed to rain and/or humid air, the clutch lining plates must be inspected to ensure they are not frozen together from rust or corrosion. If the mower has been exposed to such conditions, at the start of each mowing season, and any time it is suspected that the slip clutch plates may be frozen together, readjust the slip clutch as explained in the maintenance section of this manual

13. TRANSPORTING THE TRACTOR AND MOWER

Inherent dangers of operating the tractor and mower and the possibility of accidents are not left behind when you finish mowing an area. Therefore, the operator must employ good judgement and safe operation practices when transporting the tractor and mower between locations. By using good judgement and following safe transport procedures, the possibility of accidents while moving between locations can be substantially minimized.

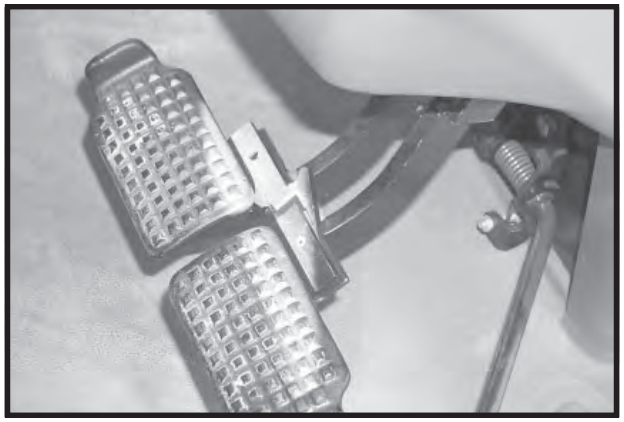
DANGER!

Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death.
(SG-10)

Before transporting the tractor and mower, idle the tractor engine, disengage the PTO and wait for all mower moving parts to come to a complete stop. Raise the mower wings and secure in position with transport lock pins. When transporting, only raise the center deck enough to clear ground obstacles to prevent tipping, especially when traveling through rough terrain.

If the tractor's hydraulic pump is not independent of the tractor PTO, or if the tractor PTO has to be run to have hydraulic power, disconnect the mower driveline from the tractor PTO output shaft. Secure the driveline to the mower deck to prevent driveline damage or loss during transport.

Before transporting the tractor on a public roadway or boarding a trailer for transport, the tractor brake pedals should be locked together. Locking the pedals ensures that both wheels brake simultaneously while stopping, especially when making an emergency stop.



Use extreme caution and avoid hard applications of the tractor brakes when towing heavy loads at road speeds. Never tow the mower at speeds greater than 20 MPH.

Tires and Wheels

Laminated Sectional Tires are designed for conditions where puncture proof performance is required and the mower will not be transported for long distances on roadways. Transport speed for laminated tires should not exceed 10 MPH. Excessive speed can cause damage to the machine and tire sections.

Foam Filled used Airplane Tires are ideal for conditions where a puncture proof tire is needed and the mower is frequently transported between locations.

P**neumatic Tires** (used airplane or implement tires) are ideal for frequent long distance towing, however, they are not puncture proof and are not recommended for mowing brushy areas or other conditions that could damage the tires. Maximum airplane tire inflation pressure is 50 PSI, minimum inflation pressure is 20 PSI. Inflate ribbed implement tires to manufacturer rated PSI as shown on the tire sidewall. DO NOT over-inflate.

13.1 Transporting on Public Roadways

WARNING!

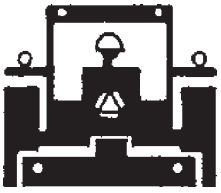
Only tow the Implement behind a properly sized and equipped Tractor which exceeds the weight of the Implement by at least 20%. DO NOT tow the Implement behind a truck or other type of vehicle. Never tow the Implement and another Implement connected in tandem. Never tow the Implement at speeds over 20 MPH. (STI-6)

DANGER!

Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)

WARNING!

Make certain that the "Slow Moving Vehicle" (SMV) sign is installed in such a way as to be clearly visible and legible. When transporting the Equipment use the Tractor flashing warning lights and follow all local traffic regulations. (SG-6)



Extreme caution should be used when transporting the tractor and mower on public roadways. The tractor must be equipped with all required safety warning features including a SMV emblem and flashing warning lights to alert drivers of the tractor's presence. Remember that roadways are primarily designed for automotive drivers and most drivers will not be looking out for you, therefore, you must look out for them. Check your side view mirrors frequently and remember that vehicles will approach quickly because of the tractor's slower speed. Be extremely cautious when the piece of equipment that you are towing is wider than the tractor tire width and/or extends beyond your lane of the road.

Make sure that a proper size safety tow chain is secured between the tractor and mower before entering a public road. Transport the mower with with wing and center section transport pins installed. Do not transport the mower supported by hydraulic pressure.

The SMV (Slow-Moving Vehicle) emblem is universal symbol used to alert drivers of the presence of equipment traveling on roadways at a slow speed. SMV signs are a triangular bright orange with reflective red trim for both easy day and night visibility. Make sure the SMV sign is clean and visible from the rear of the unit before transporting the tractor and mower on a public roadway. Replace the SMV emblem if faded, damaged, or no longer reflective.

Make sure that all tractor flashing warning lights, headlights, and brake/taillights are functioning properly before proceeding onto public roads. While newer model tractors have plenty of lighting to provide warning signals and operating lighting, most older models were only equipped with operating lights. Consult an authorized tractor dealer for lighting kits and modifications available to upgrade the lighting on older tractor models.

When operating on public roads, have consideration for other road users. Pull to the side of the road occasionally to allow all following traffic to pass. Do not exceed the legal speed limit set in your country for agricultural tractors. Always stay alert when transporting the tractor and mower on public roads. Use caution and reduce speed if other vehicles or pedestrians are in the area.

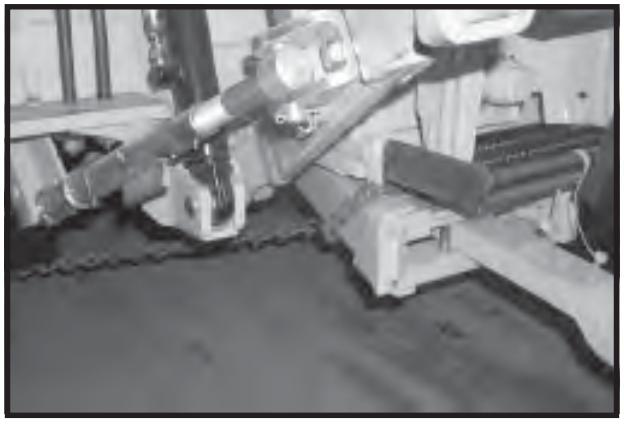
Reduce speed before turning or applying the brakes. Ensure that both brake pedals are locked together when operating on public roads.

13.2 Hauling the Tractor and Mower

Before transporting a loaded tractor and mower, measure the height and width dimensions and gross weight of the complete loaded unit. Ensure that the load will be in compliance with the legal limits set for the areas that will be traveled through.

Use adequately sized and rated trailers and equipment to transport the tractor and mower. Consult an authorized dealer to determine the proper equipment required. Using adequately sized chains, heavy duty straps, cables and/or binders, securely tie down both the front and rear of the tractor utilizing the proper tie down locations as specified by the tractor manufacturer.

Arrange the chains so that when tightened, the chains are pulling downward and against themselves. Carefully tighten the securing chains or other fasteners used as much as possible using boomers or binders to apply maximum tension. Use extreme care when attaching and removing the securing devices as the extreme tension involved when released has the potential to inflict serious injury.



While hauling the tractor and mower, make occasional stops to check that the tractor and mower have not moved or shifted and that the securing chains have maintained tension. If during transport a hard braking, sharp turning, or swerving action was performed, stop at the next safe location to inspect the security of the load.

14. TROUBLE SHOOTING GUIDE

Symptom	Problem	Correction
Not cutting clean	RPM too low	Use full PTO speed
	Improper blade for direction of rotation	Install blades so rotation is correct
	Mower not level	Adjust machine
	Ground speed too fast	Reduce ground speed
Blade wears too fast	Cutting in sandy or rocky conditions	Increase cutting height
Blade bolts working loose	Bolts not tightened sufficiently	Tighten bolts to correct torque
	Bolt hole elongated or oversized	Rebuild or replace blade carrier
	Lock nut worn out	Replace lock nut
Blades cutting too high	Blades bent	Replace blades, in sets
	Blade carrier bent	Straighten or replace blade carrier
	Blade bolts loose or worn	Retighten or replace blade bolt. Up and down drift in the blade should not exceed 1 1/2"
Cutter vibrates	Broken blade	Replace blades in sets
	Blade carrier bent	Replace carrier
	New blade used with a worn blade	Replace blades in sets
	Blades "locked" together	"Unlock" blades
Accelerated wear of universal joint cross	Inadequate greasing	Carefully follow greasing instructions
Accelerated wear of universal joint sliding members	Inadequate greasing	Carefully follow greasing instructions
Torque limiter slipping excessively	Excessive load	Machine is overloaded, reduce ground speed and material intake
	Improper adjustment	Adjust springs
	Friction plates worn	Replace plates
	Oil on friction plates	Replace plates

MAINTENANCE SECTION

DANGER! INSTALL TRANSPORT PINS FOR WINGS AND CENTER FRAMES BEFORE DOING ANY SERVICE OR REPAIR WORK ON THE CUTTER.

Failure of a hydraulic hose or cylinder seal could cause the wings or center section to drop rapidly causing injury or death. Refer to the “Operation - Transportation” section of this manual for transport pin locations.

Slip Clutches

Each of the drive shafts has a slip clutch

Disassembly

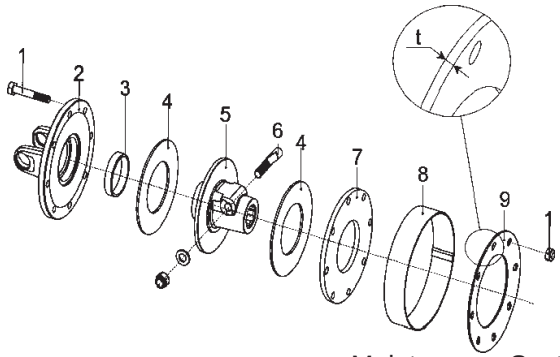
Fully loosen all four socket head screws
Remove the taper pin.

Loosen the bolts evenly and progressively (i.e. do not remove eachnut completely in sequence) to uniformly reduce the spring load.

Disassemble the clutch completely.

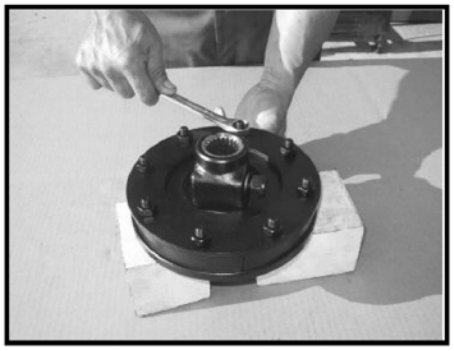
Check the condition of all components.

New friction linings are 3.2 mm thick. Replacement is recommended when linings wear below a thickness of 2 . 5 m m . Clean up the metal contact surfaces with brake cleaner and a wire b r u s h , i f necessary.



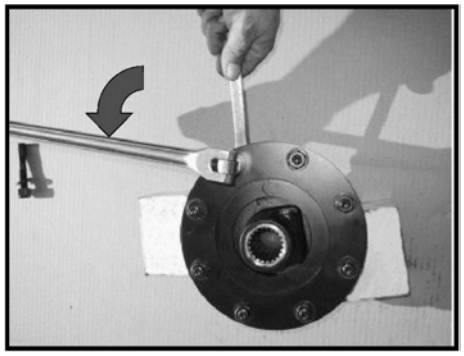
Install the bushing (3) in the flange yoke (2). Assemble the other parts of the clutch as shown in the previous diagram. Avoid contamination of the surfaces with any oil or grease.

Fully loosen the four socket head screws.



Install the eight bolts. Tighten the bolts progressively, and in an alternating pattern in order to compress the spring uniformly.

Tighten the bolts to 27 Nm (20 ft.lbs).



Back each nut off by 1/4 turn. The spacer ring (8) should rotate freely.

If spacer ring does not rotate freely, back each nut off an additional 1/8 turn. Continue backing each nut off 1/8 turn until spacer ring rotates freely.

Re-insert the taper pin into the hub.

After new linings are installed, the torque setting will be low until the linings “seat” against the metal plates. After the first few slips, the torque should rise to the nominal setting.

At the end of the season or before any long period of non-use, fully tighten the socket head screws to relieve the pressure on the linings. For best performance, store the clutch in a dry place to prevent sticking.

The FT clutch utilizes a Belleville spring to provide a consistent torque setting during the life of the friction lining. The spacer ring ensures the accuracy of the spring tension setting.

The clutch torque setting is stamped on the face of the flange yoke between the bolts.

Nuts and Bolts

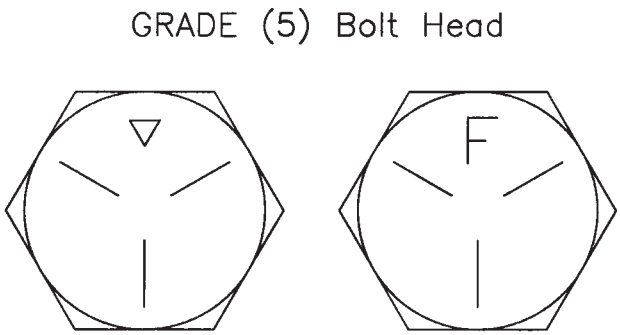
Check all nuts and bolts for tightness after the first 8 hours of operationthen weekly. Check the condition of cotter pins, roll pins and other fasteners weekly and replace if necessary.

Bolt Grades and Torque

When replacing damaged bolts use only plated Grade 5 bolts unless otherwise specified. Use only bolts of the correct length [Refer to the "Parts" section]. Do not replace lock nuts with nuts and lock washers. Use only original equipment lock nuts.

Recommended Torques in foot pounds for SAE Grade 5 bolts, based on dry assembly:

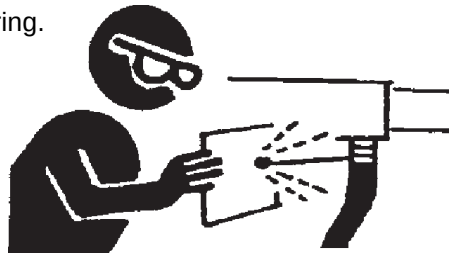
Size	UNC	UNF
1/4"	8	10
5/16"	17	19
3/8"	31	35
7/16"	49	55
1/2"	75	85
5/8"	150	170
3/4"	269	297
1"	644	704
1 1/4"	1255	1380



Hydraulics

Periodically clean dirt and debris from the bottom side of the depth stop ring.

Inspect hydraulic hoses, fittings and cylinders for wear or leaks. Use a piece of cardboard or wood rather than hands to search for suspected leaks. Replace if necessary.



Before applying pressure to the hydraulic system, be sure all connections are tight and that the hoses are not damaged.

DANGER!

Do not operate this Equipment with hydraulic oil leaking. Oil is expensive and its presence could present a hazard. Do not check for leaks with your hand! Use a piece of heavy paper or cardboard. High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. If oil does penetrate the skin, have the injury treated immediately by a physician knowledge-able and skilled in this procedure. (SG-15)

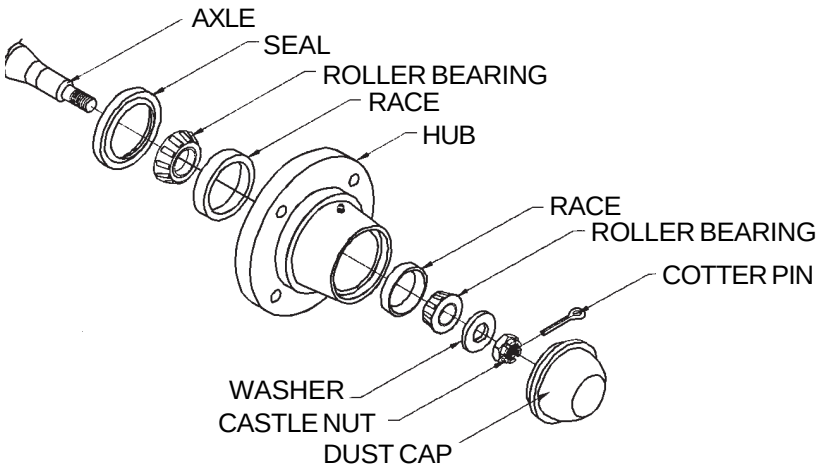
Hubs and Spindles

Greasing and Installation

It is recommended that hubs are dismantled, cleaned and repackede every year. Use the diagram and following instructions for maintaining the wheel hubs. Whenever a worn or damaged seal is replaced the bearing assembly should be cleaned and repacked with a good grade of wheel grease.

Always wear protective gloves when handling grease.

CAUTION!



1. Using a grease packer, pack both roller bearings with a good grade of wheel grease. The bearings should be thoroughly coated with grease. Spread grease on the outside of the bearing with your gloved finger. Ensure that no dirt or filings contact the grease or the bearings.

2. Pack the inside of the hub with grease. Grease needs to cover complete surface area inside hub but does not need to fill cavity.

3. Smear grease on both races.

4. Install the large bearing into the back of the hub and rotate the bearing several times.

5. Install the dust/grease seal using the right size seal driver. Spread a film of grease on the dust seal rubber and on the axle where the seal fits.

6. Position the hub on the axle and firmly push into place then pull hub towards you about 1". Slowly rotate hub while gently pushing the hub back onto the axle.

7. Check dust seal to ensure seal rubber is positioned correctly.

8. Install the small or outer bearing.

Tightening Instructions for 517 & 511 Hubs

Proper setting for the tapered roller bearings is described in the following procedure. Always use a new cotter pin when making adjustments to the hubs.

1. Tighten the castle nut to 20 foot pounds while turning hub. Then back the nut off 1/2 of a turn. Spin the hub 2 or 3 times. While slowly turning hub clockwise, finger tighten the castle nut until castle nut notch lines up with hole in axle. If notch will not line up, back off nut to next notch.

2. Put the cotter pin in the axle hole. Before bending the cotter pin, spin the hub. The hub should free wheel from 1 to 2 full turns.

3. If the hub spins the right amount, finish installing the cotter pin by bending the ends.

4. Coat the inside of the dust cap with a thin coat of grease by using your finger. Then install on hub using the right dust cap driver.

5. Wipe off all excess grease from hub and axle.

IMPORTANT: There should not be any drag noticed when spinning a tire installed on a hub. If the axle nut is too tight, the rollers of the wheel bearings will remove the grease from the bearing races, decreasing the life of the bearings.

Tires

Periodically check tire pressure. Aircraft tires should be inflated to 42 PSI. Light truck tires should be inflated to 50 PSI.

To remove tires for repair or replacement, lower the wings to the ground and install the center transport lock pin. Relieve hydraulic pressure Shut off tractor, apply parking brake and disengage PTO. Loosen the wheel bolts with wrench. DO NOT remove them. Use a hydraulic jack to lift the back end of the cutter frame near the wheel standard. Securely block the wheel standard so the tire can spin freely before removing the wheel bolts.

WARNING! AVOID PERSONAL INJURY. DO NOT work under cutter without support blocks to keep the frame from falling.

Blade Servicing

Inspect blades daily. Blades should be free of deep chips, cracks or abnormal bends.

DANGER! 

Blades should always be replaced in pairs. Blades of different weights may cause serious imbalance which can result in damage to the gearbox. Damage caused by unbalanced blades can make the machine dangerous to operate, increasing the risk of a broken gearbox lower shaft. Never weld or modify blades. Welding and other modifications such as straightening the blade after it has been bent can severely reduce the strength of the blade, increasing the likelihood that a piece breaks and can be thrown from the machine.

DANGER! 

DO NOT SHARPEN BLADES. Sharpening blades can reduce the strength of the blade, increasing the likelihood that a piece breaks and can be thrown from the machine. Should the blades become dull, replace them. Blades should always be replaced in pairs.

Blade Removal

To remove blades for replacement, remove the bolt access cover plate on the deck of cutter near each gearbox. Remove lock nut from blade bolt. It is recommended to change blade bolts and locknuts **every time** the blades are replaced . Inspect the condition of the blade bolt bushing and contact your dealer if keyway is worn or damaged.

WARNING! 

AVOID PERSONAL INJURY. Blade and/or blade carrier removal should be done only with the tractor engine shut off, key removed, in neutral, parking brake on, PTO disengaged, PTO input shaft removed, and the cutter blocked in the raised position.

Blade Installation

When installing blades, use new blade bolts and blade nuts. Always replace blades in matched sets. A 1-5/8" socket can be used to torque blade bolts to 600 foot pounds dry assembly. You will need at least 3 feet of leverage to be able to do this. Check blade bolt torque after the first 10 hours of operation.

WARNING! 

Use only original equipment blades on this cutter. They are made of special heat treated alloy steel. Substitute blades may not meet specifications and may be dangerous.

Retighten blade bolts daily. Cover plates are provided on the deck of the cutter to facilitate this.

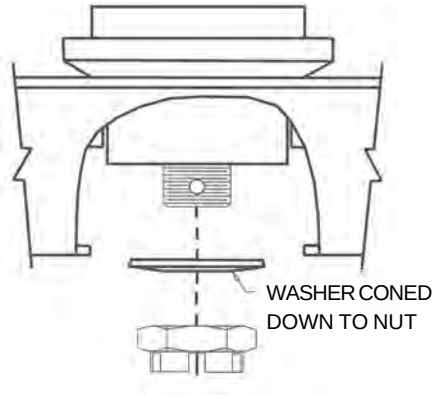
After installing new blades or blade bolts ensure that blades are free swinging and that there is 1" to 1-1/2" of free up and down motion at the tip of the blade.

Blade Carrier Removal

Remove cotter pin and loosen slotted nut on gearbox shaft. Loosen but do not remove the nut until the blade carrier is loosened. Use a suitable two-jaw gear puller to pull carrier off tapered gearbox shaft. If gear puller is not available use a long bar inserted through the bolt access hole, striking the long bar with a sledge hammer. Rotate blade carrier 180o and repeat process until the blade carrier is loosened.

Blade Carrier Installation

Clean the taper and splines on both the blade carrier and output shaft. Castle nuts and cotter pins are used to tighten the cutter pans to the splined shaft on the cutter gearboxes. A cone washer is used between the nut and the gearbox main shaft. The washer must cone down towards the nut.



A 1-13/16" socket can be used to torque the M30 nut to 600 ft/lbs dry assembly. Strike the carrier on the hub several times with a heavy hammer to seat the hub. Use a suitable spacer over the nut to prevent damage to the nut and threads. Retighten the nut to 600 ft/lbs dry assembly. Install new cotter pins when retightening these nuts.

It is important that the retaining nut be checked after a few hours of operation then periodically. Retightened if necessary.

WARNING! AVOID PERSONAL INJURY. DO NOT work under cutter without support blocks to keep the frame from falling.

LUBRICATION

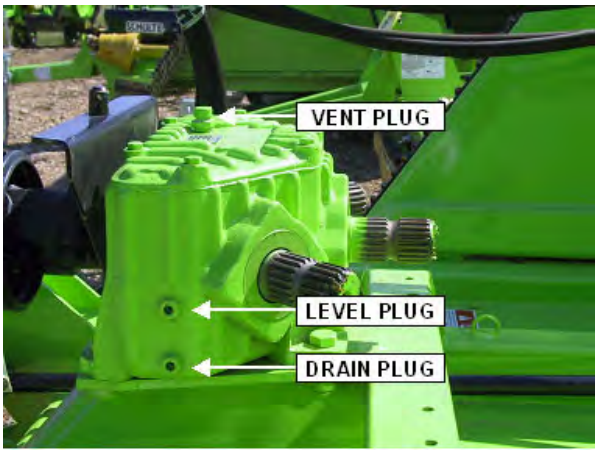
Gearboxes

Replace oil in gearboxes after the first 50 hours of operation then yearly.

Check gearbox oil level frequently. Steady loss of oil will indicate damaged seals, which should be replaced immediately to prevent ruining the gearbox.

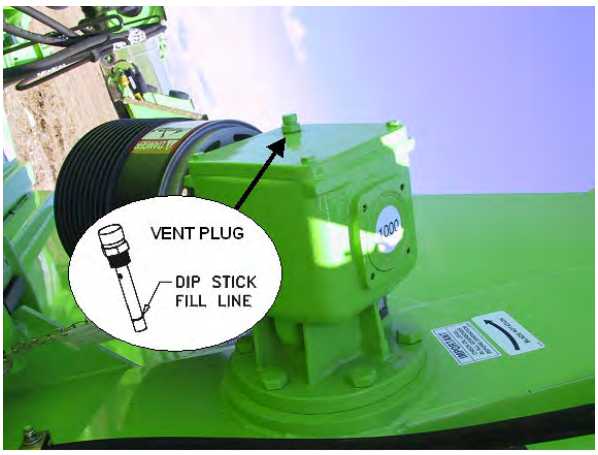
Procedure for refilling the splitter gearbox:

1. Park unit on a level surface
2. Remove drain plug and drain out oil
3. Reinstall drain plug
4. Remove vent plug and level plug
5. Fill gearbox until oil runs out the level plug hole
6. Reinstall vent plug and level plug
7. Dispose of old oil in accordance with the local regulations



Procedure for refilling right angle gearboxes:

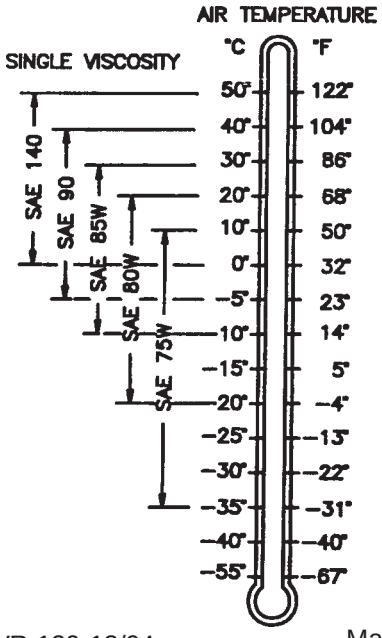
1. Park unit on a level surface and lower the wings
2. Remove top cap and use oil/grease pump to suck out oil
3. Replace top cap
4. A dipstick is provided on the vent plug. Fill gearbox until oil level reaches the fill line on dipstick. Do not screw in dipstick when checking oil level
5. Reinstall vent plug/ dipstick
   Dispose of old oil in accordance with the local regulations



Gearbox oil should meet the following specifications:

-API Service Classifications GL-5
-Military Specification MIL-L-2105C

Consult the following chart for the oil viscosity recommendations:

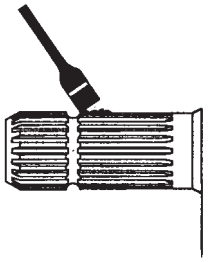


NOTE: Use SAE 80-90Gear Oil

Decal # **226-085** Location: Splitter Shield

Grease Schedule

Grease should meet the following recommendations:



-SAE Multi-purpose grease
-SAE Multi-purpose grease containing 3 to 5 percent molybdenum disulfide

Use SAE (NLGI) #2

IMPORTANT: Before attaching the driveline, clean and grease the tractor PTO and the Implement shaft.

Universal Joint Assemblies.

-Type of Grease: A good quality NLGI #2 EP grease, lithium soap base should be used to grease the needle bearings in cross journals, shield bearings, telescoping members and CV centeringmechanism. For heavy duty applications a compatible grease with 3 to 5% molybdenum disulfide additive may be used.

-Cross Journals: Every 8 hours.
Lubricate until grease purges from underneath all four needle bearing caps.

-Shield Retaining Bearings: Every 8 hours.
The shield bearings are greased by a fitting molded into the shielding bell. Three pumps are required.

IMPORTANT: Check that the driveline shielding is not damaged and rotates freely on the driveline.

-Constant Velocity Body: Every 4 hours.
The housing for the CV body serves as a reservoir for the lubrication of the centering mechanism. Approximately 30 pumps are required every 4 hours.

-Telescoping Tubes: Every 4 hours. Apply grease to the collar located at the middle of the shaft. The grease fitting on this collar will come exposed when the cutter wings are laying flat.
Occasionally (monthly) pull the universal joint halves apart and apply grease to all sides of the slip shaft. At least once per year (more often in dusty or dirty conditions) the shielding should be removed and the old grease removed with a solvent. A fresh coat of grease should then be applied to the entire surface of the inner tube.

IMPORTANT: If the universal joint sliding members are allowed to dry out to the point where two halves cannot slip freely, damage to the rotary cutter or tractor may occur.

-Rapid Fit Yoke: Every 2 days.

Cutter Frame

-Frame Pivot Points: Every 8 hours, locations listed below:

(1) Hitch swivel (1) Main lift
(2) Hitch Frame(4) Wheel Standards
(1) Equal angle hitch vertical pivot
(1) Equal angle hitch horizontal pivot
(1) Equal angle hitch swivel yoke

-Wheel Hubs: Every 50 hours, 6 locations. Fill until grease is seen purging at the pivot bearing seals.

STORAGE

Clean any dirt or debris off the mower deck.

Scrape any accumulated cuttings off the under side of the deck. Coat the deck underside and any other exposed metal surfaces with oil to prevent rusting.

If the mower is left unused for an extended period of time, install the transport pins. Disconnect the hydraulic cylinders at the rod end retract the rods for storage. Retracting the cylinder rods will prevent rusting, ensure that the cylinders are full of oil, and relieve pressure in the hydraulic circuit. If the cylinder rods are not retracted smear grease over exposed hydraulic cylinder rods.

Apply grease to exposed threaded adjustment screws. These include the cylinder depth stop collar and the frame leveling rod.

Spring adjustable slip clutches should be removed from the machine and stored inside.

Install the hitch jack on the jack mount located on the outer hitch frame.

When disconnecting from the tractor for a short period of time, swing the PTO support upright and lay the PTO driveline into the cradle. When storing the mower for an extended period of time, it is recommended the driveline be removed from the machine and stored inside.When connecting the mower to the tractor, ensure the PTO support is swung down, and out of the way.

WARRANTY INFORMATION

TIGER

Tiger Corporation, 3301 N. Louise, Sioux Falls, South Dakota, warrants to the original Retail Customer, the new Tiger equipment is free of defects in material and workmanship. Any part of said equipment that in Tiger's adjustment, show evidence of such defects will be repaired or replaced without charge, provided that the failure of part(s) shall have occurred within twelve (12) months from the date of delivery of said equipment to the Retail Customer. Expendable components such as knives, oil, chain sprockets, skid shoes, knife mounting disks and the like are excluded but not limited to this warranty.

The Retail Customer must pay the transportation cost to and from the Tiger Dealer's service shop for warranty service. Warranty service will be performed by the Tiger Dealer from whom the equipment was purchased, in his service shop and during his regularly scheduled days and hours of operation.

All Tiger obligation under this warranty shall be terminated if the equipment is modified or altered in ways not approved in writing by Tiger, if repair parts other than genuine Tiger repair parts have been used, or if the equipment has bee subject to misuse, neglect, accident, improper maintenance or improper operation.

Tiger Corporation reserves the right to make improvements in design or changes in specification at any time without incurring any obligation to owners of equipment previously sold.

No agent or person has authority to alter, add to or waive the above warranties which are agreed to be in the only warranties, representations or promises, expressed or implied, as to the quality or performance of the products covered and which do not include any implied warranty of merchantability or fitness. In no event will Tiger be liable for incidental or consequential damages or injuries, including, but not limited to, loss of profits, rental or substitute equipment or other commercial loss.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THOSE EXPRESSED HEREIN.

It is the Purchasers obligation to sign the warranty registration form **AFTER** he / she has Read and Understands the Operation and Safety Instructions stated within this manual.

ONE LAST WORD

This manual cannot possibly cover all of the potentially hazardous situations you will encounter. By being familiar, though, with the safety rules, operating and maintenance instructions in this manual you can help prevent accidents. The objective of this manual is to help make you a better operator. Remember, **SAFETY IS YOU!**

Your safety and the safety of those around you depends on **YOU**. Common sense should play a large role in the operation of this machine.

Since we at Tiger Corporation are constantly striving to improve out products, we reserve the right to change specifications or design at any time.

TWR-180-/TWR-120 12/04 P/N C314TG010C
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