



BOOM ARM MOWER

Published 12/08

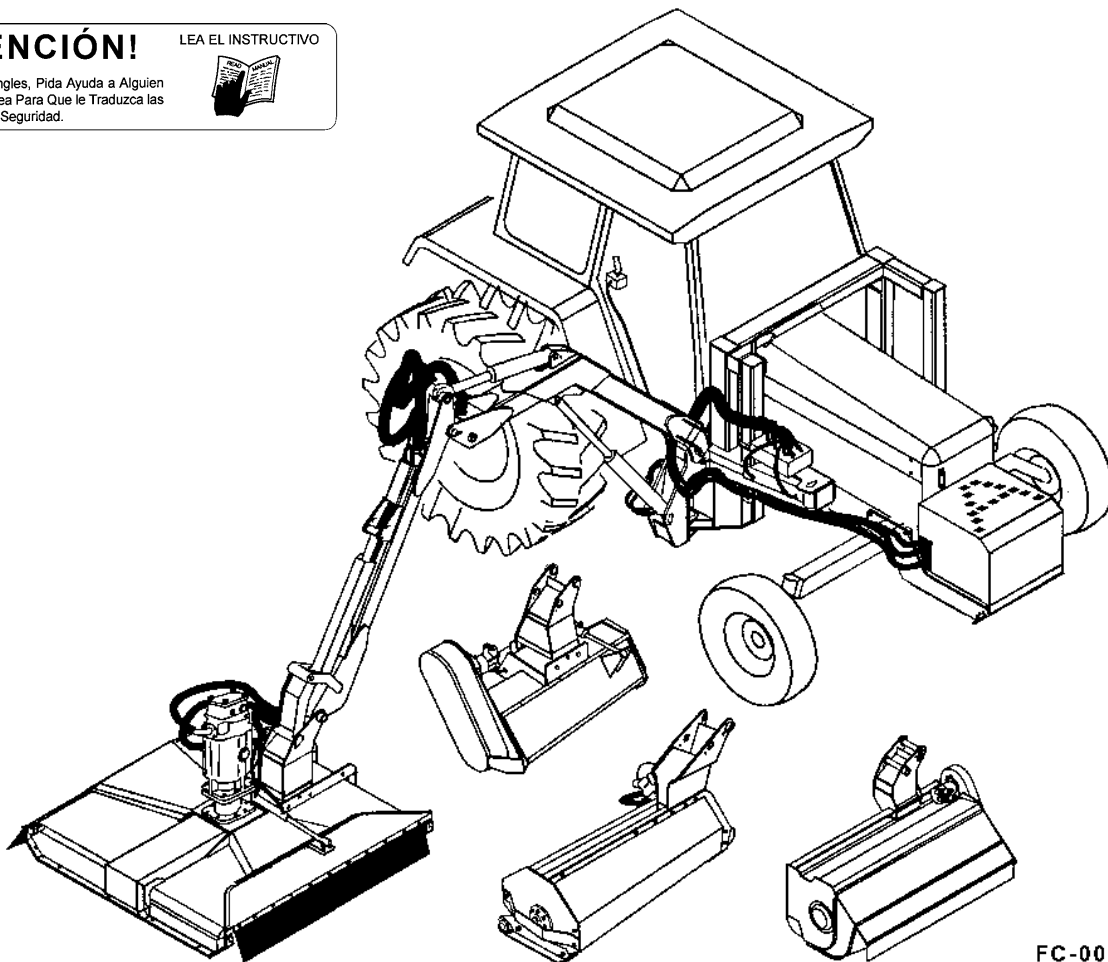
Part No. 02986950C

OPERATOR'S MANUAL

¡ATENCIÓN!

LEA EL INSTRUCTIVO

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



FC-0002

ALAMO INDUSTRIAL®

1502 E. Walnut

Seguin, Texas 78155

830-372-3551

Email: parts@alamo-industrial.com



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!

DANGER

FAILING TO FOLLOW SAFETY MESSAGES AND OPERATING INSTRUCTION CAN CAUSE SERIOUS BODILY INJURY OR EVEN DEATH TO OPERATOR AND OTHERS IN THE AREA.

<p>1. </p>	<p>2. NO RIDERS. NO CHILDREN OPERATORS </p>	<p>3. USE SAFETY SHOES, HARD HAT, SAFETY GLASSES, SEAT BELTS, ROPS & OPS. </p>	<p>4. BLOCK UP SECURELY BEFORE WORKING UNDER. </p>
------------	---	--	--

1. Study and understand Operator's Manuals, Safety Decals, and Instructional Decals for tractor and implement to prevent misuse, abuse, and accidents. Practice before operating in a confined area or near passersby.
 - Learn how to stop engine suddenly in an emergency. Be alert for passersby and especially children.
2. Allow no children on or near folding mower or tractor. Allow no riders on tractor or implement. Falling off may cause serious injury or death from being run over by tractor or mower or contact with rotating blades.
3. Operate only with tractor having Roll-Over Protective Structure (ROPS) and with seat belt securely fastened to prevent injury and possible death from falling off or tractor overturn.
 - Personal Protective Equipment such as Hard Hat, Safety Glasses, Safety Shoes, & Ear Plugs are recommended.
4. Block up or support raised machine and all lifted components securely before putting hands or feet under or working underneath any lifted component to prevent crushing injury or death from sudden dropping or inadvertent operation of controls. Make certain area is clear before lowering or folding.
5. Before transporting, put Lift Lever in detent or full-lift position. Install Transport Safety Devices securely on folding mowers. Put Booms securely in Transport Rest.
 - Folding and Boom Mowers have raised center of gravity. Slow down when turning and on hillsides.
6. Make certain that SMV sign, warning lights, and reflectors are clearly visible. Follow local traffic codes.
7. Never operate with Cutting Head or Folding Section raised if passersby, bystanders, or traffic are in the area to reduce possibility of injury or death from objects thrown by Blades under Guards or mower structure.
8. Before dismounting, secure implement in transport position or lower to ground.
 - Put tractor in park or set brake, disengage PTO, stop engine, remove key, and wait until noise of rotation has ceased to prevent crushing by entanglement in rotating parts which could cause injury or death.
 - Never mount or dismount a moving vehicle. Crushing from runaway may cause serious injury or death.

<p>5. TRANSPORT SAFELY, LOCK UP. </p>	<p>6. USE SMV, LIGHTS, & REFLECTORS. </p>	<p>7. DO NOT OPERATE WITH CUTTER OR WING RAISED </p>	<p>8. DO NOT MOUNT OR DISMOUNT WHILE MOVING. </p>
---------------------------------------	---	--	---

02967827

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 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.

Table of Contents

SAFETY SECTION	1-1
General Safety Instructions and Practices	1-2
Operator Safety Instructions and Practices	1-3
Connecting & Disconnecting Implement Safety Instructions & Practices	1-5
Equipment Operation Safety Instructions and Practices.....	1-6
Maintenance and Service Safety Instructions and Practices	1-11
Transporting Safety Instructions and Practices	1-14
Concluding Safety Instructions and Practices.....	1-16
Decal Location	1-17
Decal Description	1-26
Federal Laws and Regulations	1-40
INTRODUCTION SECTION.....	2-1
OPERATION SECTION	3-1
OPERATOR REQUIREMENTS	3-3
TRACTOR REQUIREMENTS.....	3-4
ROPS and Seat Belt	3-4
Operator Thrown Object Protection	3-4
Tractor Lighting and SMV Emblem	3-5
Tractor Ballast.....	3-6
GETTING ON AND OFF THE TRACTOR	3-6
Boarding the Tractor	3-7
Dismounting the Tractor.....	3-7
STARTING THE TRACTOR	3-8
CONNECTING ATTACHING HEADS TO THE BOOM.....	3-9
Connecting Mower Head Hydraulics.....	3-9
PRE-OPERATION INSPECTION AND SERVICE	3-10
Tractor Pre-Operation Inspection/Service.....	3-11
Boom Unit Pre-Operation Inspection and Service	3-11
Cutting Component Inspection.....	3-21
Blade Bolt Inspection	3-22
OPERATING THE BOOM JOYSTICK CONTROL.....	3-23
Mower Head Power	3-24
Swing	3-25
Lift	3-26
Dipper	3-27
Tilt	3-28
Door	3-29
DRIVING THE TRACTOR AND IMPLEMENT	3-30
Starting the Tractor	3-31
Brake and Differential Lock Setting.....	3-32
Driving the Tractor and Boom	3-33
OPERATING THE BOOM UNIT AND ATTACHED HEAD	3-34
Foreign Debris Hazards/Overhead Obstructions	3-35
Operating Speed and Ground Speed	3-36
Operating the Attached Mower Heads.....	3-37
Shutting Down the Attached Head.....	3-41
TRACTOR, BOOM, AND ATTACHED HEAD STORAGE	3-42

TRANSPORTING THE TRACTOR AND IMPLEMENT	3-42
Transporting on Public Roadways	3-44
Hauling the Tractor and Implement.....	3-46
TROUBLESHOOTING GUIDE	3-48

MAINTENANCE SECTION..... 4-1

LUBRICATION INFORMATION.....	4-2
HYDRAULIC OIL, FILTERS, AND COMPONENTS	4-3
BLADES	4-4
HARDWARE	4-5
PROPER TORQUE FOR FASTENERS	4-6
SERVICE OF SPINDLE HOUSING (FIGURE Mnt-0006)	4-7
START UP PROCEDURE	4-10
TIMBER CAT HEAD	4-11
BUZZBAR HEAD	4-12
FLAIL AXE HEAD	4-15
Grass Flail Head	4-16
General Information on Flail Mower Vibration.....	4-19
SPINDLE SERVICE PROCEDURE 02960553B and 02960553C	4-21
CLEANING.....	4-22
INSPECTION	4-22
ASSEMBLY.....	4-22

SAFETY SECTION

Safety Section 1-1

SAFETY

General Safety Instructions and Practices

A 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 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.



Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR VERY SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, MAY result in MINOR INJURY.



Identifies special instructions or procedures that, if not strictly observed, could result in damage to, or destruction of the machine, attachments or the environment.

NOTE: *Identifies points of particular interest for more efficient and convenient operation or repair.*(SG-1)

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)



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!



Engine Exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. (SG-30)

SAFETY



WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. (SG-31)

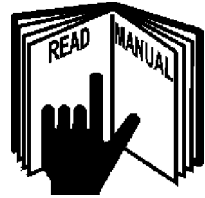
Operator Safety Instructions and Practices



DANGER

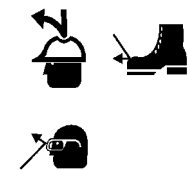
Never operate the Tractor or Implement until you have read and completely understand this Manual, the Tractor Operator's Manual, and each of the Safety Messages found in the Manual or on the Tractor and Implement. Learn how to stop the tractor engine suddenly in an emergency. Never allow inexperienced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

(SG-4)



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 that may be 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-17)



WARNING

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



DANGER

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



SAFETY

SAFETY



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)



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)



Prolonged operation may cause operator boredom and fatigue affecting safe operation. Take scheduled work breaks to help prevent these potentially impaired operating conditions. Never operate the Implement and Tractor in a fatigued or bored mental state which impairs proper and safe operation. (SG-32)



Use extreme caution when getting onto the Implement to perform repairs, maintenance and when removing accumulated material. Only stand on solid flat surfaces to ensure good footing. Use a ladder or raised stand to access high spots which cannot be reached from ground level. Slipping and falling can cause serious injury or death. (SG-33)



Avoid contact with hot surfaces including hydraulic oil tanks, pumps, motors, valves and hose connections. Relieve hydraulic pressure before performing maintenance or repairs. Use gloves and eye protection when servicing hot components. Contact with a hot surface or fluid can cause serious injury from burns or scalding. (SG-34)



DO NOT operate this Implement on a Tractor that is not properly maintained. Should a mechanical or Tractor control failure occur while operating, immediately shut down the Tractor and perform repairs before resuming operation. Serious injury and possible death could occur from not maintaining this Implement and Tractor in good operating condition. (SG-36)



Avoid contact with hot surfaces of the engine or muffler. Use gloves and eye protection when servicing hot components. Contact with a hot surface or fluid can cause serious injury from burns or scalding. (SG-38)



The rotating parts of this machine continue to rotate even after the Tractor 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. (SBM-5)

“Wait a minute...Save a life!”

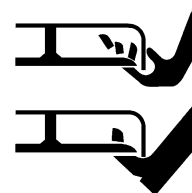
SAFETY



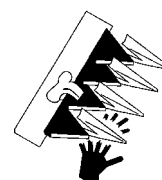
Do not put hands or feet under mower decks. Blade Contact can result in serious injury or even death. Stay away until all motion has stopped and the decks are securely blocked up. (SFL-2)



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



Do not put hands or feet near the cutter bar. Blade contact can result in serious injury. Stay away until all motion has stopped and the mower is securely blocked up. (SSM-1)



Do not operate the implement while wearing loose fitting clothing. Entanglement of the clothing with the rotating elements can result in serious injury or even death. Stay clear of all rotating elements at all times. (SSP-3)

Connecting & Disconnecting Implement Safety Instructions & Practices



Each Rear Wheel must have a minimum of 1500 pound contact with the surface to prevent lateral instability and possible tip-over which could result in serious bodily injury or even death. Widen the wheel tread and add weights if needed. Refer to the mounting instructions or call Customer Service if you need assistance with Counterweight Procedure. (SBM-11)



Do Not attempt to raise or lower the boom or mower head unless the Implement is securely attached to the Tractor. The Implement could tip over and cause equipment damage and possible serious injury or death. Do Not use the boom controls to assist in installing the implement on the tractor. Raise or Lower the boom and mower head only while seated in the Tractor operator's seat with the seat belt securely fastened. Inadvertent contact with the boom controls could allow a component to fall. A sudden or inadvertent fall by any of these components could cause serious injury or even death. (SBM-23)

SAFETY

SAFETY

Equipment Operation Safety Instructions and Practices



Never leave the Tractor and Implement 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)



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)



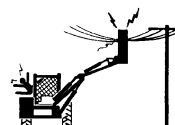
Use extreme caution when raising the Mower head. Stop the Blades from turning when the Mower Head is raised and passersby are within 100 yards. Raising the Mower head exposes the Cutting Blades which creates a potentially serious hazard and can cause serious injury by objects thrown from the Blades or by contact with the Blades. (SBM-2)



Never Leave the mower unattended while the head is in the raised position. The mower could fall causing serious injury to anyone who might inadvertently be under the mower. (SBM-4)



Always keep a careful lookout and use extreme care when working around overhead obstructions. Never allow the Mower head or boom within 10 feet of any power line. When working close to overhead power lines consult your electric company for a safe code of operation. (SBM-7)



The center of Gravity of Tractors equipped with a Rear-Mounted Boom Mower is shifted to the rear and removes weight from the front wheels. Add front ballast until at least 20% of the tractors weight is on the front wheels to prevent rearing up, loss of steering control, and possibly injury. (SBM-10)



The Mower shaft speed must not - **UNDER ANY CIRCUMSTANCES** - exceed 1800 RPM. (SBM-15)



Use extreme care and Safety Awareness when using the boom mower head to mulch loose brush or wood that has fallen on the ground from overhead trimming. **DO NOT** mulch this debris if bystanders, vehicles, livestock or buildings are within 300 feet of the mower. This cut debris can be thrown at great velocities and could result in serious injury or even death. (SBM-17)



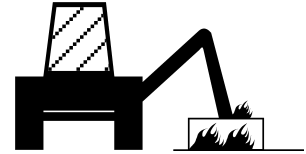
Do not back up this implement when the boom or mower head is extended. Backing could damage the machine or its components. (SBM-19)

SAFETY

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.
- Do Not attempt to mow or place the mower head close to burning debris.
- Never allow clippings or debris to collect near drivelines, gearboxes or hydraulic components such as valves, tanks, pumps and motors. Periodically shut down the Tractor and Mower and clean clippings and collected debris from the mower deck. (SBM-20)



WARNING

Do not operate Mower if excessive vibration exists. Shut down PTO and the Tractor engine. Inspect the Mower to determine the source of the vibration. If Mower blades are missing or damaged replace them immediately. Do not operate the mower until the blades have been replaced and the Mower operates smoothly. Operating the Mower with excessive vibration can result in component failure and 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 Mower to be operated with blades missing. (SFL-4)

DANGER

Flail 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;
- Passerby 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 required to mow, reduce wear and tear on the Mower drivetrain, spread cut material better, eliminate streaking, and make the final cut more uniform.) (SFL-6)

SAFETY

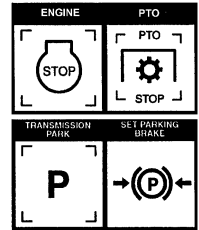
WARNING

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)



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)



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, ride on, or come close to the Tractor or Implement. Usually, 16-17 year-old children who are mature and responsible can operate the implement with adult supervision, if they have read and understand the Operator's Manuals, been trained in proper operation of the tractor and Implement, and are physically large enough to reach and operate the controls easily. (SG-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)



SAFETY

⚠ WARNING

Do not operate this Equipment with hydraulic oil or fuel leaking. Oil and fuel are explosive and their presence could present a hazard. Do not check for leaks with your hand! High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. To check for a hose leak, SHUT the unit ENGINE OFF and remove all hydraulic pressure. Wear oil impenetrable gloves, safety glasses and use Cardboard to check for evidence of oil leaks. If you suspect a leak, REMOVE the HOSE and have it tested at a Dealer. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure. (SG-15)



⚠ 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)

⚠ 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)

⚠ DANGER

Operate the Tractor and/or Implement controls only while properly seated in the Tractor seat with the seat belt securely fastened around you. Inadvertent movement of the Tractor or Implement may cause serious injury or death. (SG-29)

⚠ WARNING

In case of mechanical difficulty during operation, place the transmission in the park position, set the parking brake, shut down all power, including the PTO and the engine and remove the key. Wait until all rotating motion has stopped before dismounting. (SG-39)

⚠ WARNING

Do Not operate this equipment in areas where insects such as bees may attack you and/or cause you to lose control of the equipment. If you must enter in such areas, use a tractor with an enclosed Cab and close the windows to prevent insects from entering. If a tractor cab is not available, wear suitable clothing including head, face, and hand protection to shield you from the insects. Attacking insects can cause you to lose control of the tractor, which can result in serious injury or death to you or bystanders. Never dismount a moving tractor. (SG-40)

⚠ 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(90 m) 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 these type of items discontinue mowing. (SGM-1)

SAFETY

⚠ 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

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)

⚠ 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. The correct mowing speed depends on terrain condition and grass type, density, and height of cut. Normal ground speed range is from 2 to 5 mph(3-8 kph). 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 mow with two machines in the same area except with Cab tractors with the windows closed. (SGM-11)

SAFETY



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 clean clippings and collected debris from the mower deck. (SGM-12)



The Mower is designed for certain mowing applications and is rated to cut up to a specific size vegetation (see Mower Standard Equipment and Specifications). DO NOT use this mower to cut vegetation above the Mower's rated capacity or to cut any type of non-vegetative material. Only operate this Mower on a properly sized and equipped Tractor. Operating this Mower in an application for which it is not designed and/or operating the Mower with the wrong size Tractor can cause Mower component damage and equipment failure resulting in possible serious injury or death. (SGM-14)



Never leave the Implement and Power Unit unattended while the Implement is in the raised position. Accidental operation of a lifting lever or a hydraulic failure may cause the implement to suddenly fall causing serious injury or possible death to anyone who might inadvertently be under the Implement. Lower the implement carefully to the ground. Do not put hands or feet under lifted components. (SPU-3)



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)



Maintenance and Service Safety Instructions and Practices



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



Always disconnect the main PTO Driveline from the Tractor before performing service on the Implement. Never work on the Implement with the tractor PTO driveline connected and running. Rotating Parts, Blades or Drivelines could turn without warning and cause immediate entanglement, injury or death. (S3PT-11)

SAFETY



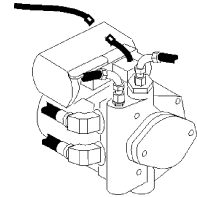
Never interfere with factory-set hydraulic calibrations. Any change in calibration could cause a failure of the equipment and may result in injury. (SBH-13)



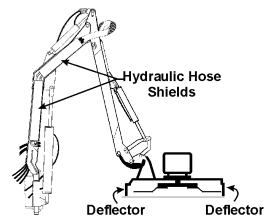
Relieve hydraulic pressure prior to doing any maintenance or repair work on the Implement. Place the Mower Head on the ground or securely supported on blocks or stands, disengage the PTO, and turn off the engine. Push and pull the control Levers or Joystick several times to relieve pressure prior to starting any maintenance or repair work. (SBM-6)



Always disconnect the wire leads from the mower pump solenoid before performing service on the Tractor or Mower. Use caution when working on the Tractor or Mower. Tractor engine must be stopped before working on Mower or Tractor. The Mower Blades could inadvertently be turned on without warning and cause immediate dismemberment, injury or death. (SBM-12a)



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. (SBM-18)



DO NOT allow any person under a raised boom or mower head unless it 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. Inadvertent contact with the controls could allow a component to fall. A sudden or inadvertent fall by any of these components could cause serious injury or even death. (SBM-22)



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



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)



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)



SAFETY



Never attempt to lubricate, adjust, or remove material from the Implement while it is in motion or while tractor engine is running. (SG-20)



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)



Do Not fill fuel tank while engine is running. Refuel only after engine has cooled down. If fuel is spilled, move machine away from the area of the spill and avoid creating any source of ignition until the gasoline has evaporated. (SG-28)



Perform service, repairs and lubrication according to the maintenance section. Ensure the unit is properly lubricated as specified in the lubrication schedule and all bolts and nuts are properly torqued. Failure to properly service, repair and maintain this Implement in good operating condition could cause component failure and possible serious injury or even death. (SG-35)



Use caution and wear protective gloves when handling sharp objects such as blades, knives, and other cutting edges. Be alert to worn component surfaces which have sharp edges. Sharp surfaces can inflict severe laceration injuries if proper hand protection is not worn. (SG-37)



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



DO NOT weld or repair rotating mower components. Welds and other repairs may cause severe vibration and/or component failure resulting in part being thrown from the mower causing serious bodily injury. See your Authorized Dealer for proper repairs. (SGM-13)

SAFETY

SAFETY

PARTS INFORMATION

Alamo Industrial 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 Alamo Industrial 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 Alamo Industrial mower parts for economy and safety. (SPRM-1)

SEE YOUR ALAMO DEALER

Transporting Safety Instructions and Practices



WARNING Be particularly careful when transporting the Implement with the Tractor. Turn curves or go up hills only at a low speed and using a gradual steering angle. Rear mounted implements move the center of gravity to the rear and remove weight from the front wheels. Make certain, by adding front ballast, that at least 20% of the tractor's weight is on the front wheels to prevent rearing up, loss of steering control or Tractor tip-over. Slow down on rough or uneven surfaces to prevent loss of steering control which could result in property damage or possible injury. Do not transport unless 3-Point lift lever is fully raised and in the latched transport position. Dropping implement in transport can cause serious damage to the tractor and/or Implement and possibly cause the operator or others to be injured or killed. (S3PT-2)



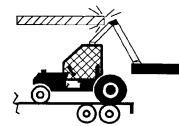
WARNING Allow sufficient clearance for the Implement to swing outward while turning. Implements carried behind the Tractor will swing outside the tire path when making turns. Contacting a solid object while turning will cause equipment damage and possible injury. (S3PT-20)



DANGER Be particularly careful in transport. The Mower has raised the center of gravity for the tractor and has increased the possibility of overturn. Turn curves or go up slopes only at low speed and using a gradual turning angle. Slow down on rough or uneven surfaces. (SBM-3)



DANGER When transporting Boom Mower on a truck or trailer, the height or width may exceed legal limits when the boom is in the transport position. Contact with side or overhead structures or power lines can cause property damage or serious injury or death. If necessary lower boom to reduce height and/or remove mowing head to reduce width to the legal limits. (SBM-8)



DANGER Never operate the Tractor and Mower Unit without an OPS (Operators Protective Structure) or Cab to prevent injury from objects thrown from ground or from overhead trimming. Stop mowing if workers or passersby are within 100 yards. (SBM-9)



WARNING The Joystick Master Control Switch must be OFF to prevent accidental movement of the boom and cutting head whenever the mower is not being operated. (SBM-16)

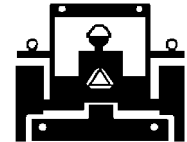
SAFETY

WARNING

Secure the boom and mower head in the transport position before traveling on public roads. Never transport on public roads with the boom and mower head extended. Always disengage and lock out the hydraulic controls for the boom mower before transporting. Inadvertent boom movement on public roads may contact with other vehicles resulting in serious bodily injuries or even death. (SBM-21)

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

Transport only at speeds where you can maintain control of the equipment. Serious accidents and injuries can result from operating this equipment at high 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 proper transport speeds for you and the equipment. Make sure you abide by the following rules:

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 transport speed not to exceed 20 mph (30 kph) for transporting this equipment.

Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that the equipment can be operated 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 turning speed for you and this equipment before operating on roads or uneven ground.

Only transport the Tractor and Implement at the speeds which allow you to properly control the equipment.

Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes or worn tires. 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 and watch out for the other guy. (SG-19)



WARNING

Your driving vision may be reduced or impaired by the tractor, cab, or implement. Before driving on public roadways identify any limited vision areas, and make adjustments to your operating position, mirrors, and the implement transport position so that you can clearly see the area where you will be traveling, and any traffic that may approach you. Failure to maintain adequate vision of the public roadway and traffic can result in serious injury or even death. (STI-10)

SAFETY

SAFETY

Concluding Safety Instructions and Practices

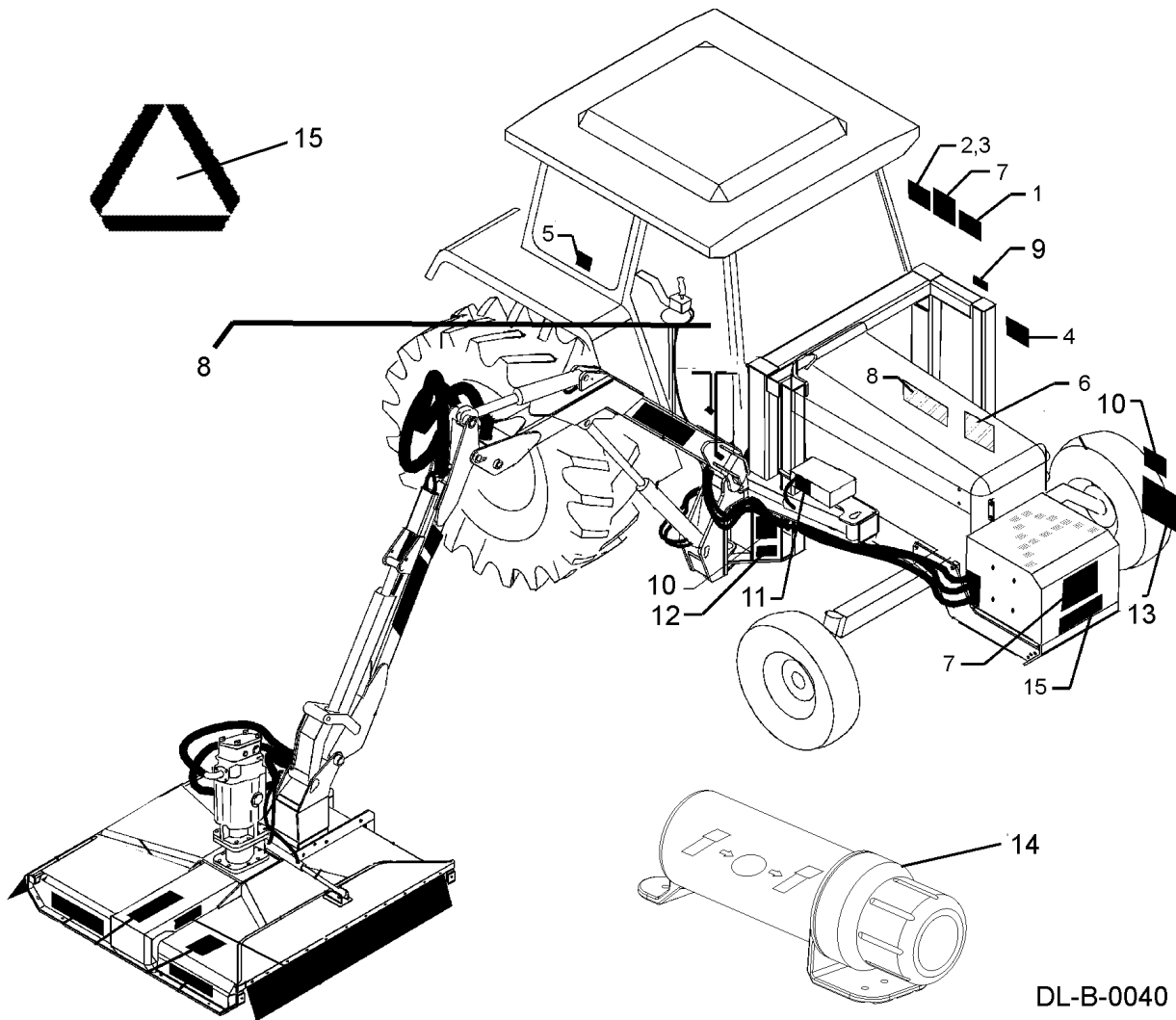
In addition to the design and configuration of this Implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the 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

SAFETY

Decal Location

NOTE: Alamo Industrial supplies safety decals on this product to promote safe operation. Damage to the decals may occur while in shipping, use, or reconditioning. Alamo Industrial 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 Alamo Industrial dealer to order replacement decals.



DL-B-0040

SAFETY

SAFETY

SAFETY

DECALS ON TRACTOR/MOUNT KIT/ COUNTERWEIGHT

ITEM	PART NO.	QTY.	TYPE	DESCRIPTION
1.	02958241	1	DANGER	Boom Mower Operators's Safety Decal (Front of Step Riser)
2.	02967827	{1}	DANGER	Multiple Hazard, Rotary (Rear of Top Step Riser)
3.	002369	{1}	DANGER	Multiple Hazard, Flail (Rear of Top Step Riser)
4.	03200285	1	CAUTION	Watch Your Step (Level w/ Top Wgt Cover on Rear Frm Tube)
5.	02965093	1	INSTRUCT	Do Not Over speed Engine (Cab Window or Fender)
6.	02960766	1	LOGO	ALAMO (4 x 5) (Left Hood of Tractor)
7.	001650	1	LOGO	ALAMO (7.26 x 7.5) (Front of Step Riser)
8.	D377	1	BOOKLET	Boom Safety Decal Booklet (Inside Cab)

DECALS ON MAIN FRAME

ITEM	PART NO.	QTY.	TYPE	DESCRIPTION
9.	00725746	1	PELIGRO	Translate Safety Material (Left Frame)
10.	02962765	1	DANGER	Pinch Point, Multiple (On Frame neat Swing Pin)
11.	02965262	1	DANGER	Leak Detection, Hose Burst (On Frame Near Swing Pin)
12.	nfs	1	SER PLT	Serial Plate (Boom Near Hitch Point)

DECALS ON TANK

ITEM	PART NO.	QTY.	TYPE	DESCRIPTION
13.	02971123	1	WARNING	Pressurized Tank (Left of Tank)
14.	00776031	1	-----	Canister, Operators Manual
15.	03200347	()	REFLECT	SMV Sign

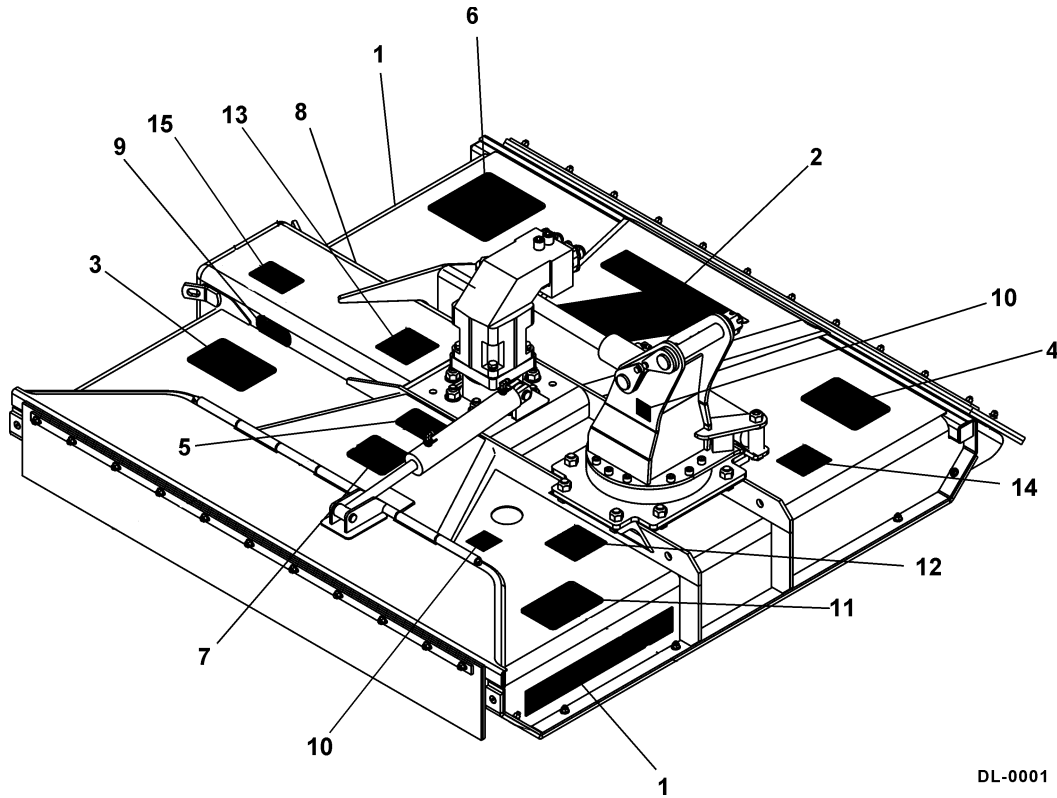
(()) Provided by Tractor Manufacturer

{ } Use One or the Other, whichever is appropriate

(*) Place in Highly Visible area, so they may be seen while mounting Tractor from the Left side. Typically attach

DECAL KIT - Step Riser Counterweight (if equipped, with this type), in this fashion. See the Illustration for general layout

SAFETY



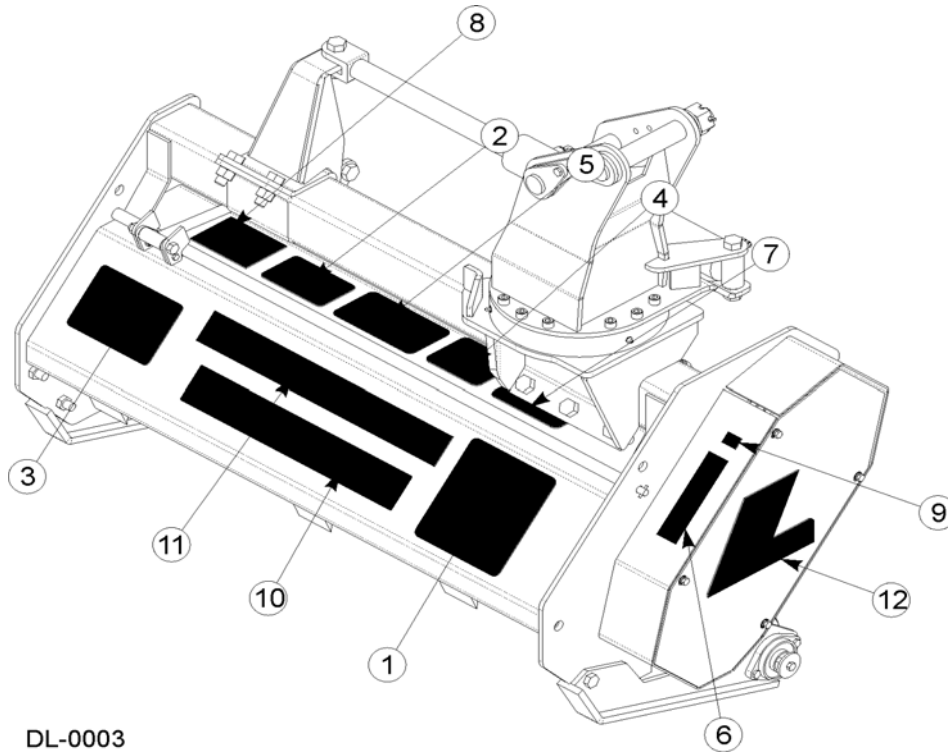
DL-0001

SAFETY

ITEM	PART NO.	QTY.	LEVEL	DESCRIPTION
	02983222	1	-	60" Rotary
	02983208	1	-	60" Rotary
	02985242	1	-	50" Rotary
	02985243	1	-	50" Rotary
1.	00757139	2	LOGO	Alamo Group
2.	00757140	1	LOGO	Alamo Industrial
3.	02958241	1	DANGER	Tractor Operator Safety
4.	02967668	1	DANGER	Thrown Objects
5.	02925100	1	IMPORTANT	Replacement Parts
6.	02967827	1	DANGER	Multi Hazard
7.	02967867	1	DANGER	Safety Shield
8.	2738332	1	REFLECT	Red Reflector
9.	2738333	1	REFLECT	Yellow Reflector
10.	02962764	2	WARNING	Pinch Points
11.	TB1011	1	WARNING	Do not Remove Shields
12.	24028	1	WARNING	Replace Worn Rubber Deflectors
13.	D138	1	INSTRUCT	CW Blade Rotation
14.	22839	1	CAUTION	Hand Gun Grease Only
15.	D375	1	WARNING	Replace Blades in Pairs

SAFETY

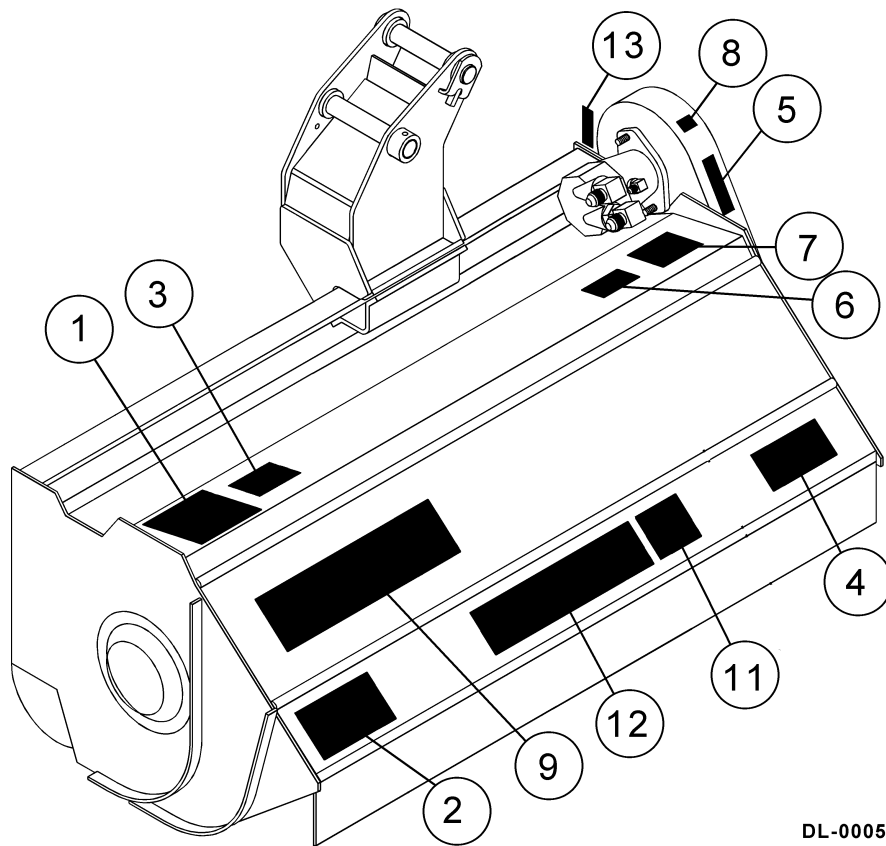
SAFETY



DL-0003

ITEM	PART NO.	QTY.	TYPE	DESCRIPTION
-	-	-	-	Flail Head (Flail-Axe)
1.	002369	1	DANGER	Multi-Hazard
2.	02965141	1	DANGER	Thrown Objects
3.	02967668	1	DANGER	Thrown Objects Safety Shields
4.	02967867	1	DANGER	Safety Shield
5.	00725739	1	WARNING	Shield and Guards
6.	00758194	1	WARNING	Belt Shield
7.	02925100	1	IMPORTANT	Replacement Parts
8.	000108	1	INSTRUCT	Flail Operation
9.	000678	1	INSTRUCT	Grease Fitting Inside
10.	00757139	1	LOGO	Alamo Industrial
11.	02970887	1	LOGO NAME	Flail Axe 48"
16.	02979551	1	LOGO	Alamo Industrial Square

SAFETY



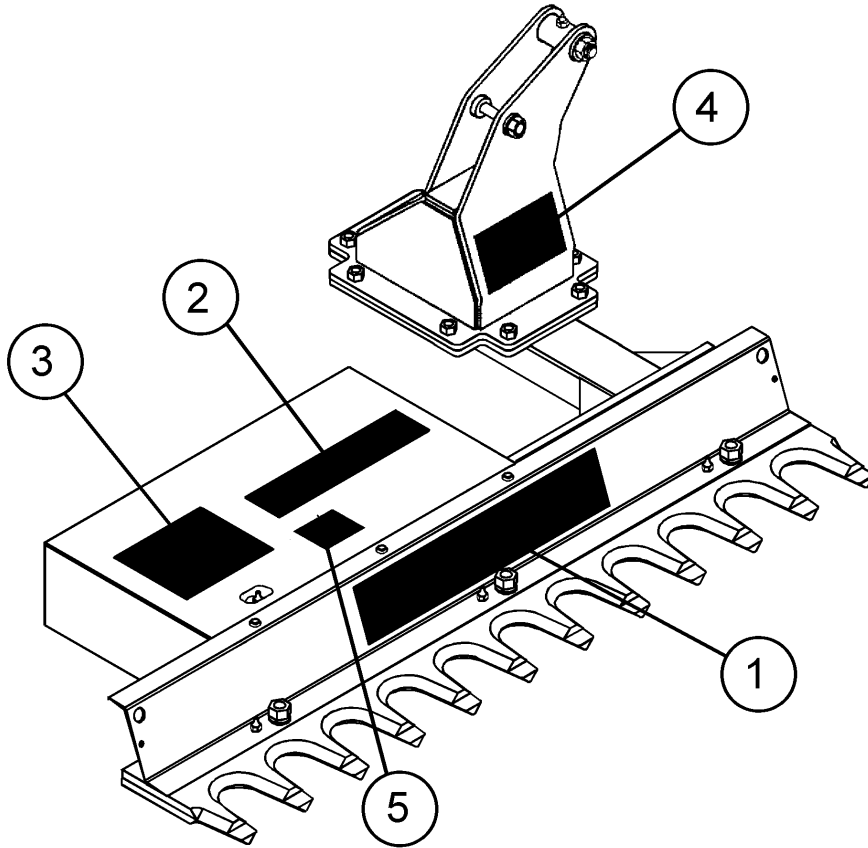
DL-0005

SAFETY

ITEM	PART NO.	QTY.	TYPE	DESCRIPTION
-	-	-	-	Flail Head
1.	002369	1	DANGER	Multi-Hazard
2.	02967668	1	DANGER	Cutting Blades/Thrown Objects
3.	02965141	1	DANGER	Boom Flails
4.	00725739	1	WARNING	Use/Repair Shields & Guards
5.	00758194	1	WARNING	Pinch Points
6.	02925100	1	IMPORTANT	Genuine Replacement Parts
7.	000108	1	INSTRUCT	Flail Operate
8.	000678	1	INSTRUCT	Grease Fitting
9.	00757139	1	LOGO	Alamo
10.	02970885	1	WIDTH	60
11.	02970896	1	WIDTH	48
12.	02970886	1	NAME	HDF Grass
13.	nfs	1	S/N PLT	Grass Serial Plate

SAFETY

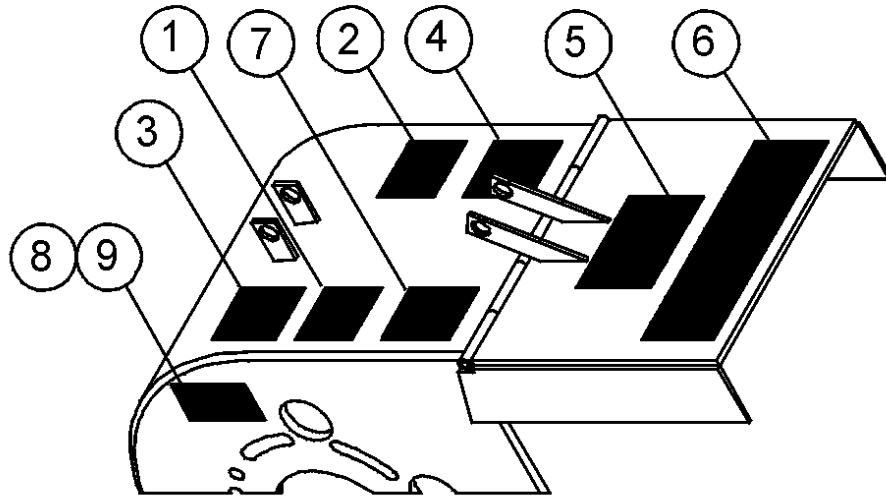
SAFETY



DL-0006

ITEM	PART NO.	QTY.	DESCRIPTION
		1	TIMBER CAT 5'
		1	TIMBER CAT 7'
1.	00757139	1	Decal - Alamo TK Logo
2.	02971931	1	Decal - Timber Cat
3.	00757140	1	Decal - Alamo Logo
4.	02973496	2	Keep Away - Amputation
5.	000678	1	Decal - Grease Fitting Inside

SAFETY



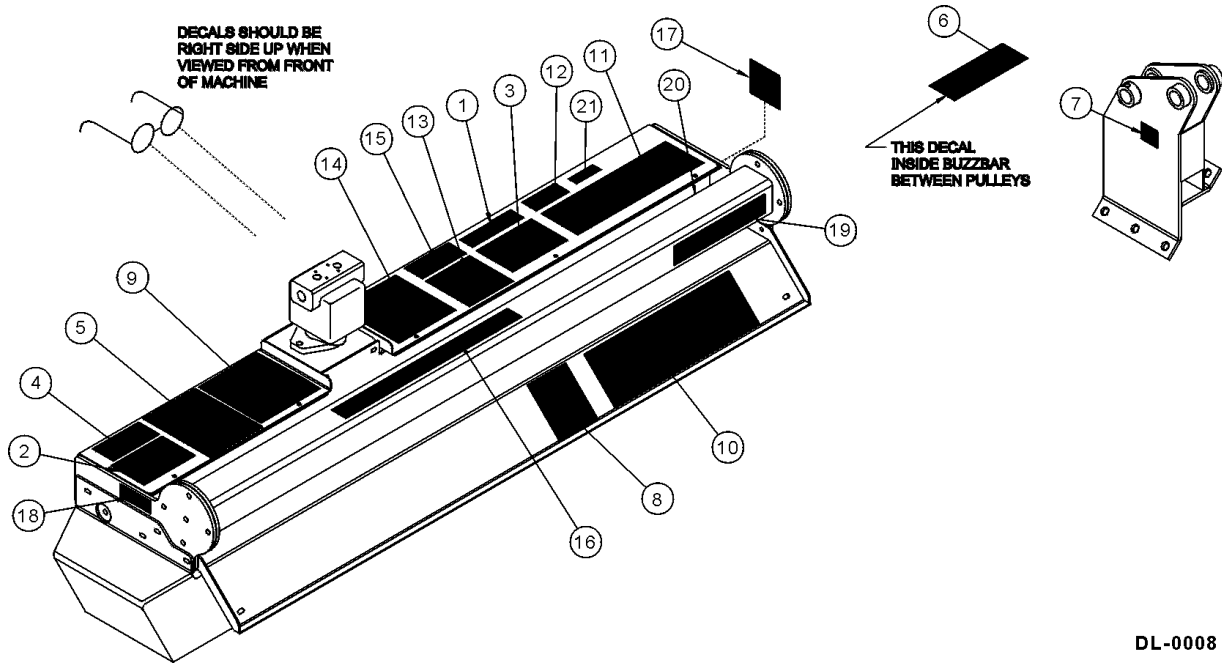
DL-0007

SAFETY

ITEM	PART NO.	QTY.	DESCRIPTION
1.	02967827	1	Danger - Multi Hazard
2.	00756059	1	Warning - Oil Leak
3.	00769736	1	Warning - Use/Repair Guards
4.	02925100	1	Important - Replacement Parts
5.	00757139	1	Logo - Alamo TK Product
6.	02970888	1	Logo - Boom Ditcher
7.	999204	1	Logo - Ditcher
8.	nfs	1	S/N Plate
9.	3710151	4	Metal Tacks

SAFETY

SAFETY

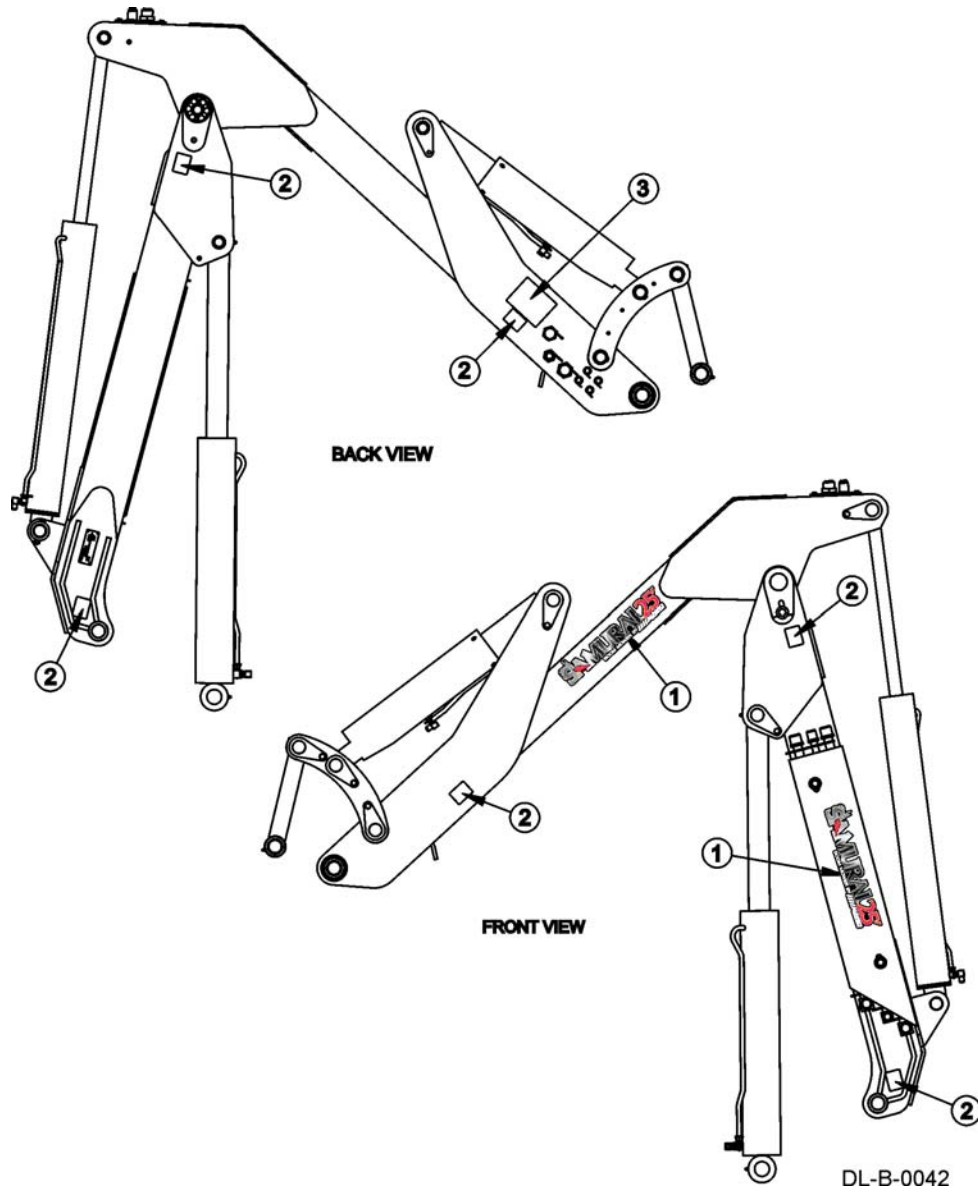


DL-0008

ITEM	PART NO.	QTY.	TYPE	DESCRIPTION
1.	00758194	1	WARNING	V-Belt Pinch
2.	00769736	1	WARNING	Use/Repair Shields
3.	00769737	1	DANGER	Cutting Blades
4.	02925100	1	CAUTION	Genuine Parts
5.	02958241	1	DANGER	Operator Safety
6.	02962764	1	DANGER	Pinch Point
7.	00756004	1	DANGER	Guard Missing
8.	02965262	1	DANGER	Leak/Hose Burst
9.	02967827	1	DANGER	Multi hazard Rotary
10.	00757139	1	LOGO	Alamo By Terrain King
11.	02974998	1	LOGO	Buzzbar
12.	D138	1	DECAL	Blade Rotation
13.	02975158	1	WARNING	Hearing Protection
14.	02975170	1	DANGER	Foot/Leg Contact
15.	02975515	1	WARNING	Disconnect Solenoid
16.	02975516	1	CAUTION	No Hitch Post Here
17.	02975514	1	-----	Pitch Adjust
18.	nfs	1	-----	Serial Plate
19.	1458392	1	REFLECT	Red Reflector
20.	1458393	1	REFLECT	Yellow Reflector
21.	02961134	1	-----	Patent Pending

SAFETY

SAFETY



ITEM	PART NO.	QTY.	DESCRIPTION
			Boom Assy
1.	02987466	2	LOGO Samurai Boom Length 18'
	02987467	2	LOGO Samurai Boom Length 22'
	02987468	2	LOGO Samurai Boom Length 25'
2.	02962764	6	Pinch Points
3.	02981987	1	Hose Connection

SAFETY

SAFETY

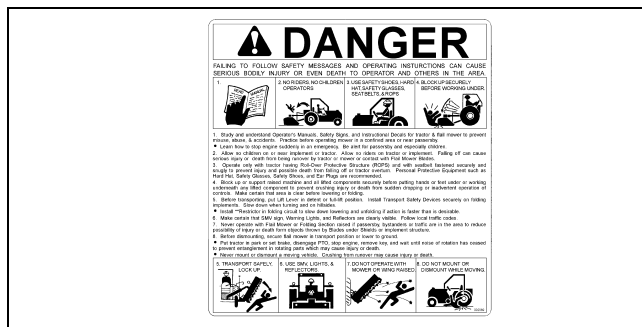
Decal Description

DANGER! - Multi Hazard - Failure to follow Safety Messages and Operating Instructions can cause serious bodily injury or even death to Operator and Others in area.



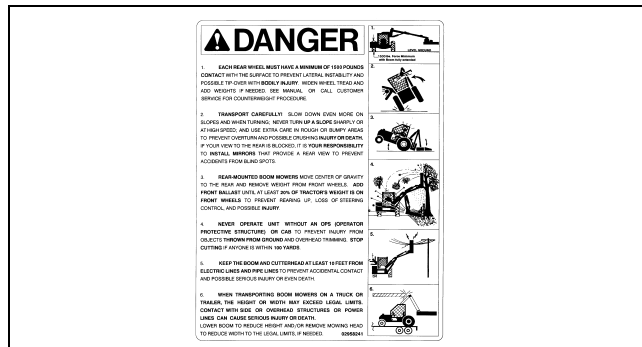
P/N 02967827

Danger! Multi-Hazard Warning. Failing to follow these Safety Messages and Operating Instructions can cause serious bodily injury or even death to operator and others in the area.



P/N 002369

DANGER! - Multi-Hazard Boom. Take precautions while transporting and operating Boom Unit.



P/N 02958241

CAUTION! Watch your step.

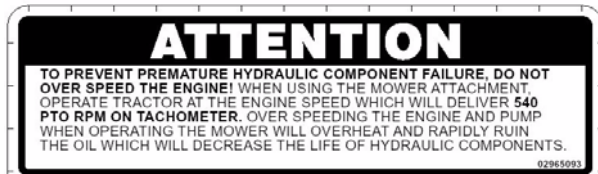


P/N 03200285

SAFETY

INFORMATION - To prevent premature hydraulic component failure, do not over speed the engine. When using the mower attachment, operate tractor at the engine speed which will deliver 540 PTO RPM on Tachometer. Over speeding the engine and pump when operating the mower will overheat and rapidly ruin the oil which will decrease the life of the hydraulic components.

P/N 02965093



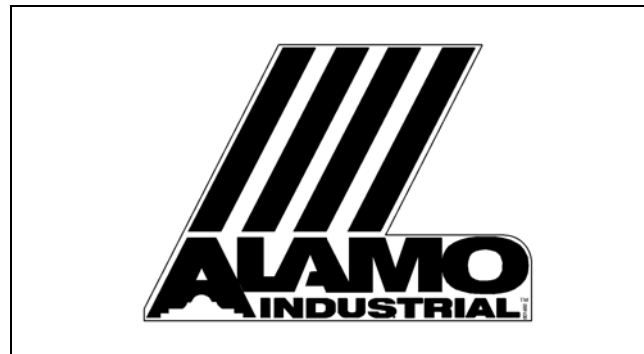
NAME LOGO - Alamo Industrial

P/N 02960766



ALAMO NAME LOGO.

P/N 001650



Peligro Translation, If you do not know how to read English, please find someone who knows how to read English.

P/N 00725746



SAFETY

SAFETY

SAFETY

DANGER! Crushing and Pinch Points.

Moving machinery parts can pinch or crush or fall-which may cause injury or death.

P/N 02962765



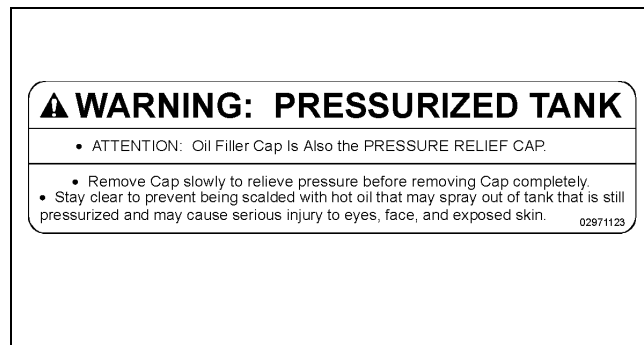
WARNING! Failure to INSPECT and REPAIR or REPLACE Hoses may allow worn Hoses to rupture SUDDENLY and VIOLENTLY with resulting serious BODILY INJURY from SCALDING or FIRE with resulting BURN INJURY or DEATH.

P/N 02965262



ADVERTENCIA! Tanque Sobrepresion. Slowly open cap to relieve pressure before completely removing cap. Stay clear to prevent being scalded with hot oil which may cause serious injury to eyes, face and exposed skin.

P/N 02971123



INSTRUCT - Service hydraulic system with AW ISO VG 100 hydraulic oil.

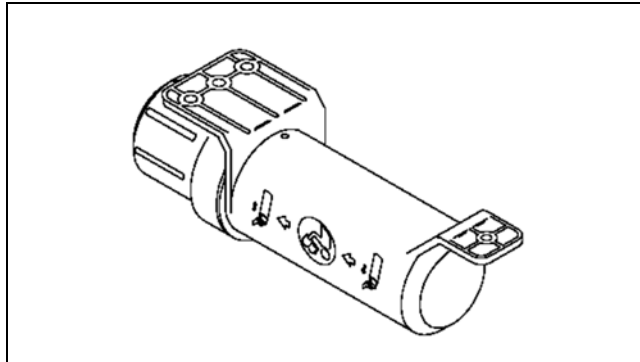
P/N 02979473



SAFETY

Read Operator's Manual! The operator's manual is located inside this canister. If the manual is missing order one from your dealer.

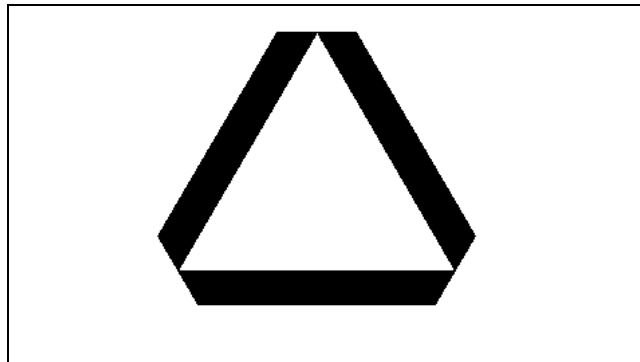
P/N 00776031



Slow Moving Vehicle Decal. Keep SMV reflector clean and visible. DO NOT transport or operate without the SMV.

Provided by Tractor Manufacturer. Replace if missing on tractor.

P/N 03200347



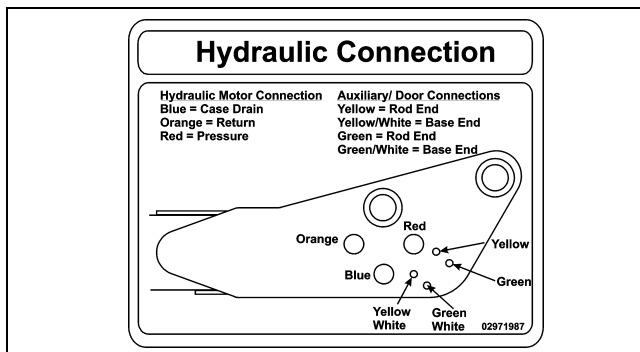
WARNING! Pinch Points

P/N 02962764



INSTRUCT - Hydraulic connection

P/N 02981987



SAFETY

SAFETY

Name LOGO - Alamo Industrial



P/N 00757139

WARNING! Maintain shields and deflectors in good condition. Failure to do so may lead to injury or even death.



P/N 00769736

DANGER! Keep Away Thrown Objects. Inspect the area before mowing and remove foreign material that could become mower thrown objects.



P/N 00769737

IMPORTANT - Use only Genuine Alamo Industrial replacement parts.



P/N 02925100

SAFETY

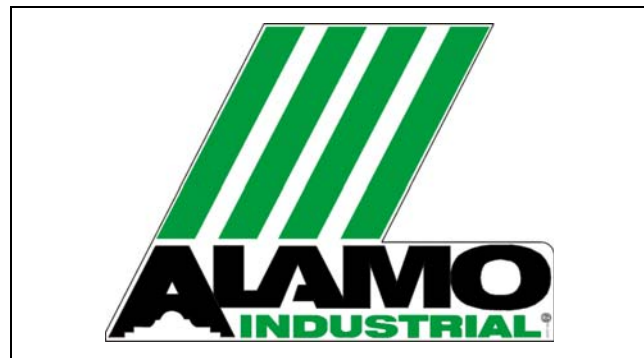
SAFETY

DANGER! - Multi Hazard - Failure to follow Safety Messages and Operating Instructions can cause serious bodily injury or even death to Operator and Others in area.

P/N 02967867

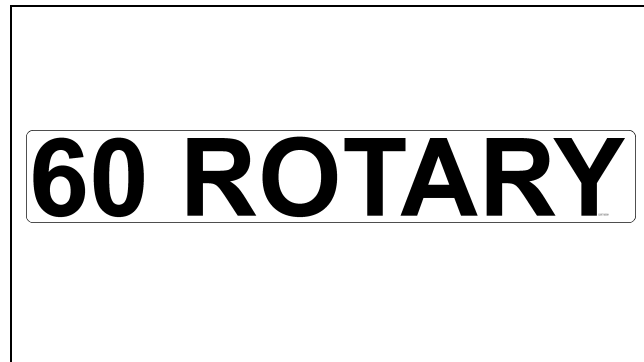


Name LOGO - Alamo Industrial



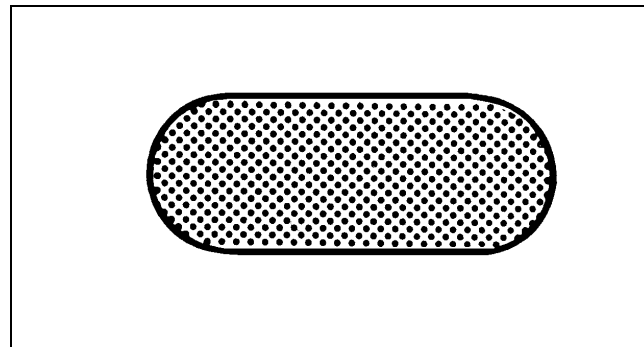
P/N 00757140

NAME DECAL



P/N 02970889

Red Reflectors



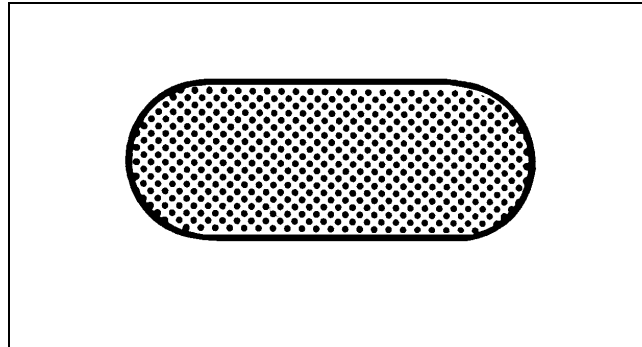
P/N 2738332

SAFETY

SAFETY

SAFETY

Yellow Reflectors



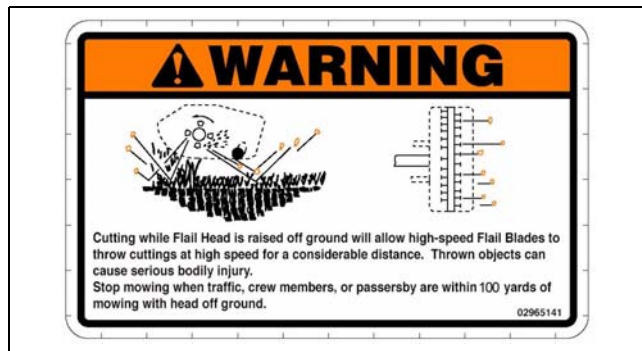
P/N 2738333

Name LOGO - Alamo Industrial



P/N 02979551

WARNING! - Cutting while Flail Head is raised off ground will allow high-speed Flail Blades to throw cuttings at high speed for a considerable distance. Thrown objects can cause serious bodily injury. Stop mowing when traffic, crew members, or passerby are within 100 yards of the mowing with head off ground.



P/N 02965141

DANGER! - Keep Away - Thrown Objects. Inspect area before mowing. Do not let rotating blades contact solid objects. Operate only if all Guards - Deflectors are in place. Do not operate with Mower or Wing raised off the ground. Stop mowing if Passerby enter the area. Stay away from rotating blades. Keep hands and feet away from rotating blades. Do not approach mower until all movement has stopped.



P/N 02967668

SAFETY

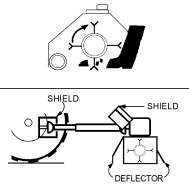
WARNING! Failure to use and maintain shields and deflectors in good condition may lead to injury or death from entanglement with rotating parts, being hit by objects thrown with great force by blades, or by blade contact.

P/N 00725739

WARNING

FAILURE TO USE AND MAINTAIN SHIELDS AND DEFLECTORS IN GOOD CONDITION MAY LEAD TO INJURY OR DEATH FROM ENTANGLEMENT WITH ROTATING PARTS, BEING HIT BY OBJECTS THROWN WITH GREAT FORCE BY BLADES, OR BY BLADE CONTACT.

- Always replace Guards which have been removed for maintenance. Never operate with guard missing or broken.
- Chain Guards, Gearbox, Driveline Shields, Rubber-fabric Deflectors, and solid Band enclosures are subject to wear and lost or broken parts and must be repaired or replaced as soon as damage is found.
- Safety Shielding must be installed and in good condition to reduce the possibility of thrown objects any time this machine is operated in any area where thrown objects could cause injury.



00725739

WARNING! Do not operate with Belt Shield removed. Finger(s) may be pinched off if get caught between V-Belt and Pulley.

P/N 00758194

WARNING

DO NOT OPERATE WITH BELT SHIELD REMOVED. FINGER(S) MAY BE PINCHED OFF IF CAUGHT BETWEEN V-BELT AND PULLEY.



00758194

Instructions to properly lubricate and check mower for potential problems prior to operation.

P/N 000108

OPERATING INSTRUCTIONS

This Mower will give long satisfactory service with a minimum of upkeep cost if the following procedure is followed:

1. **KEEP PROPERLY LUBRICATED**
 - a. **BEARINGS** - Use a lithium-based #2 Bearing Grease such as Shell Alvania #2, Sinclair Litholene, Mobil BRB, Texaco Marfak #2, Standard Stanolith #57, etc.
 - b. **GEARBOX** - Use SAE EP90 oil.
2. **KEEP FASTENERS TIGHTENED**
 - a. Normally, if Fasteners loosen after being properly tightened, the Mower is vibrating more than is acceptable and permanent damage can occur rapidly.
 - b. See Bolt Chart for proper tightening torque.
3. **KEEP THE MOWER RUNNING SMOOTHLY AND QUIETLY.**
 - a. After hitting any obstruction and at the first sign of any unusual vibration or noise, STOP THE MOWER, and do not operate again until the problem is found and corrected. VIBRATION CAN DESTROY THE ENTIRE MOWER IN A SHORT TIME.
 - b. Inspect for broken or missing Knives, Knives restricted from swinging freely, worn Bearings, a bent Shaft, or other conditions causing out-of-balance rotation.
 - c. See Operators Manual for details on causes and correction of vibration of Flail Mowers.

NOTICE: Warranty does not cover damage resulting from the failure to observe these reasonable procedures.

000108

Information that Grease Fitting is present and must apply grease.

P/N 000678

GREASE FITTING INSIDE

SAFETY

SAFETY

NAME DECAL

FLAIL AXE 48

P/N 02970887

WARNING! Never use your hand to check for oil leaks. Always use paper or cardboard.



P/N 00756059

Operator's Manual (with repair parts) and warranty was attached to this implement during final inspection.



P/N 00763977

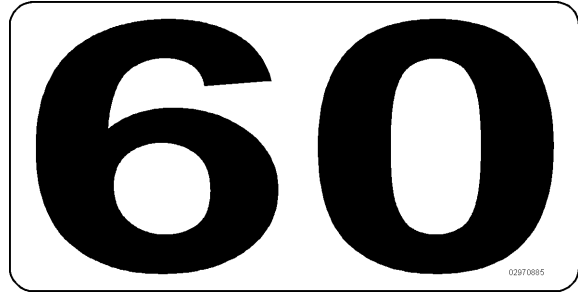
IMPORTANT - Use ALAMO Genuine Flail Parts.



P/N 03200432

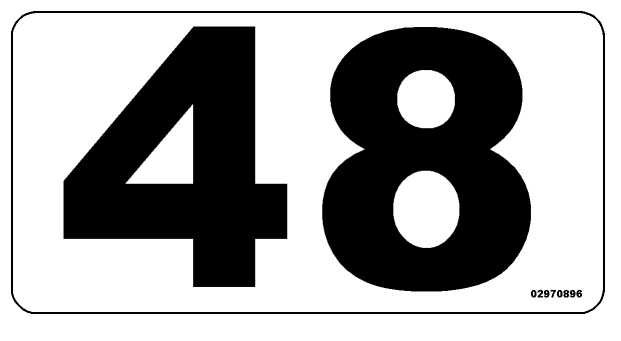
SAFETY

NAME DECAL



P/N 02970885

NAME DECAL



P/N 02970896

NAME DECAL



P/N 02970886

NAME LOGO



P/N 02971931

SAFETY

SAFETY

DANGER! KEEP AWAY! Sickle Blades are guarded only by remote location. Keep all persons away from cutting Blades to prevent amputation of contacted body parts.



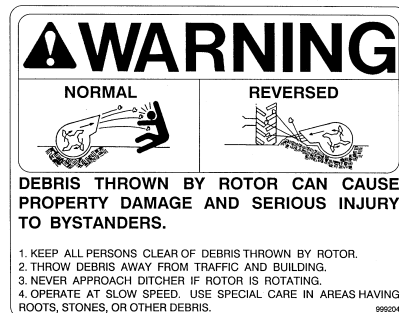
P/N 02973496

NAME DECAL

BOOM DITCHER

P/N 02970888

WARNING- Debris from rotor can cause property damage and serious injury to bystanders.



P/N 999204

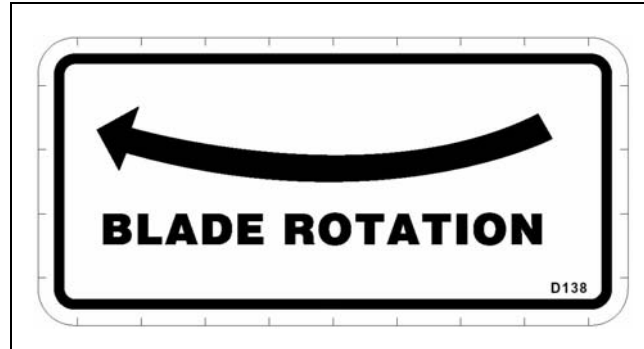
LOGO NAME BUZZBAR.



P/N 02974998

SAFETY

Blade Rotation Clockwise.



P/N D138

WARNING- Hearing Protection is required when working within 100 yards of this machine.



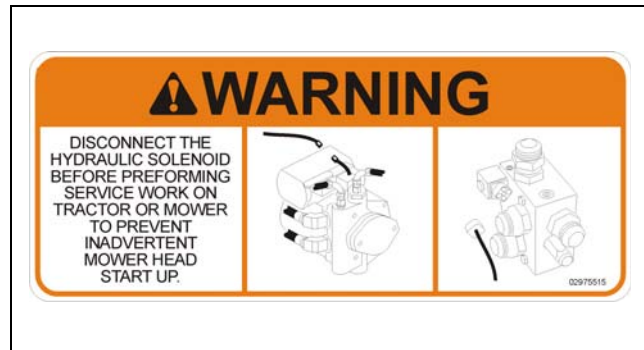
P/N 02975158

DANGER- Keep away rotating blades.



P/N 02975170

WARNING- Disconnect the hydraulic solenoid before performing service work on tractor or mower.



P/N 02975515

SAFETY

SAFETY

SAFETY

INSTRUCT- Do not locate hitch post in this area

DO NOT LOCATE HITCH POST IN THIS AREA

P/N 02975516

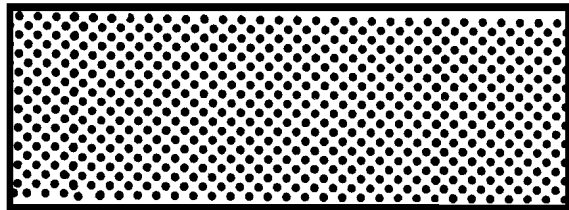
INSTRUCT- Pitch Adjust

USE THESE HOLES
TO PITCH HEAD
DOWN WHEN USING
SWINGING BLADES.

USE THESE HOLES
TO LEVEL HEAD
WHEN USING
SAW BLADES

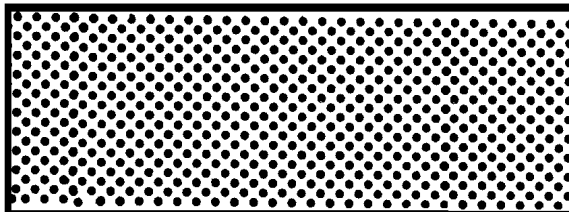
P/N 02975514

Red Reflector. Keep reflectors clean and visible.



P/N 1458392

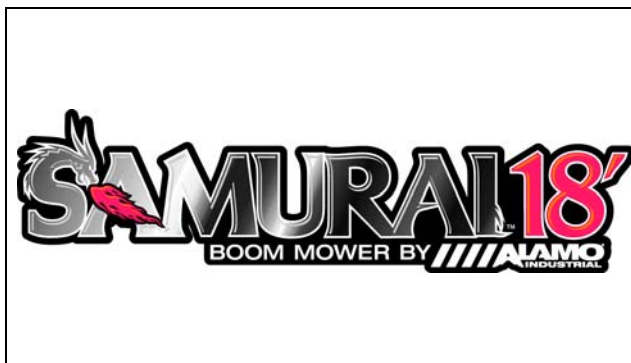
Amber Reflector. Keep reflectors clean and visible.



P/N 1458393

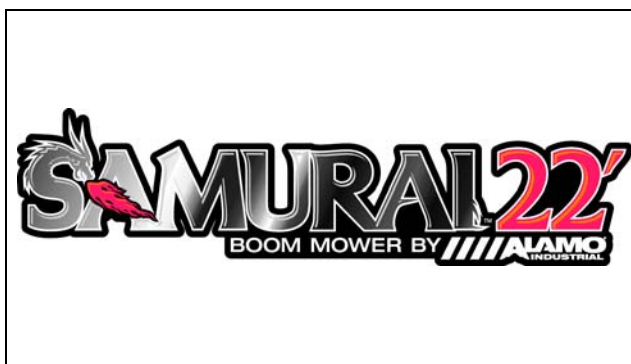
SAFETY

NAME LOGO - SAMURAI 18'



P/N 02987466

NAME LOGO - SAMURAI 22'



P/N 02987467

NAME LOGO - SAMURAI 25'



P/N 02987468

SAFETY

SAFETY

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 operation if bystanders or passersby come within 25 feet.

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 Section 2-1

INTRODUCTION

This Boom Mower is designed with care and built with quality materials by skilled workers. Proper assembly, maintenance, and operating practices, as described in this manual, will help the owner/operator get years of satisfactory service from the machine.

The purpose of this manual is to familiarize, instruct, and train. The Assembly Section instructs the owner/operator in the correct assembly of the Mower using standard and optional equipment. The Parts Listing section is designed to familiarize the owner/operator with replaceable parts on the Mower. This section provides exploded assembly drawings of each mower component illustrating each piece and the corresponding part number.

Careful use and timely service saves extensive repairs and costly downtime losses. The Operation and Maintenance Sections of the manual train the owner/operator how to work the Mower correctly and attend to appropriate maintenance. The Trouble Shooting Guide helps diagnose difficulties with mower and offers solution to the problems.

Safety is of primary importance to the owner/operator and to the manufacturer. 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. Many of the Safety Messages will be repeated throughout the manual. The owner/operator/dealer should know these Safety Messages before assembly and be aware of the hazards of operating this mower during assembly, use, and maintenance. The Safety Alert Symbol combined with a Signal Word, as seen below, is intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this machine.



Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR VERY SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, MAY result in MINOR INJURY.



Identifies special instructions or procedures that, if not strictly observed, could result in damage to, or destruction of the machine, attachments or the environment.

NOTE: *Identifies points of particular interest for more efficient and convenient operation or repair.*

INTRODUCTION

Your Boom Mower is designed for heavy-duty cutting in limited access areas such as highway, park, and rural roadsides, overhead growth, ditches, levees, and other such grass and limb control uses in generally hard-to-reach areas. Your Boom can be equipped with a variety of cutting heads designed for specific cutting needs.

The Rotary Head: Rotary unit, 60" & 50" wide cut, up to 5" vegetation, front safety gate.

The Flail Axe Head: Flail unit, 48" wide cut, up to 5" vegetation.

The Buzzbar; Flail unit, 48", 63" and 90" cutting width, up to 6" diameter

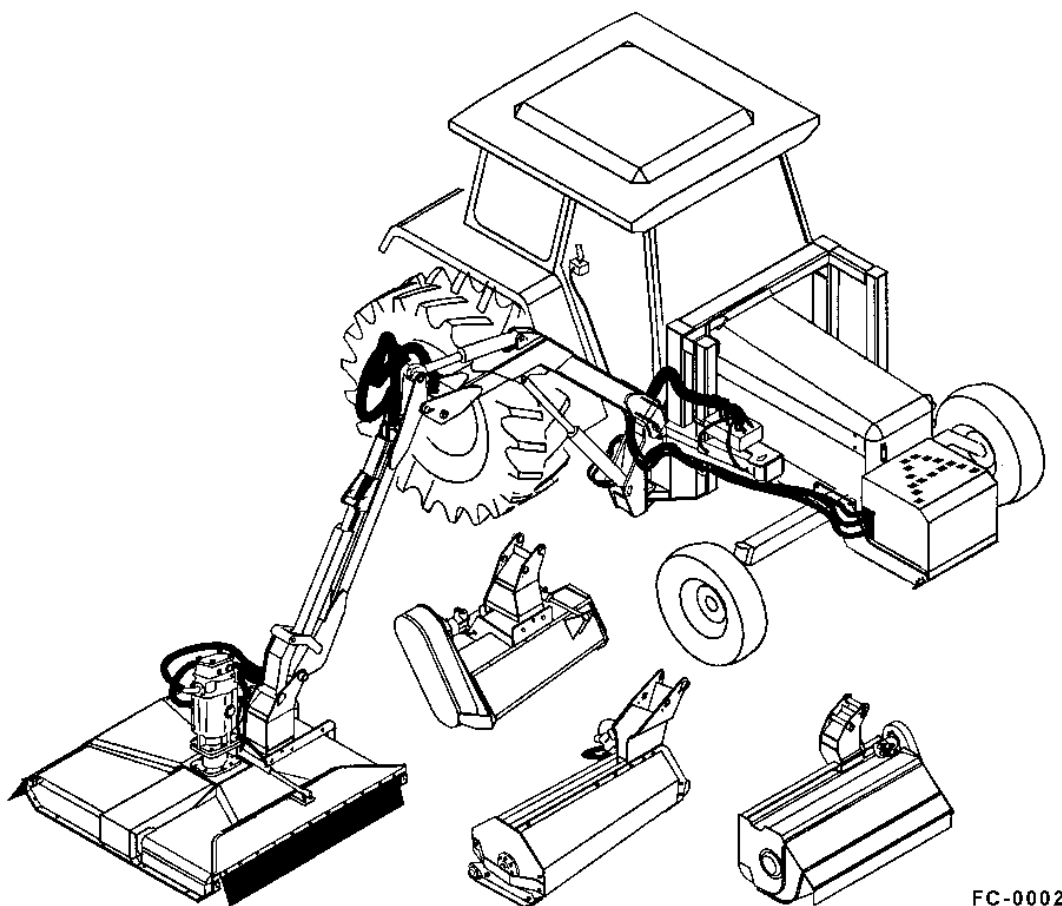
Grass Flail; Flail unit, 60" cutting width, up to 2" vegetation

Timbercat: Limb cutter, 5' & 7' cutting lengths, up to 4" diameter limbs

Ditcher; Ditch unit, 20" cutting width

DIRECTION

Throughout this Manual front and rear, left and right are determined by the normal direction of travel, the same as driving an automobile. Front and rear, and left and right are determined by the normal direction of travel (the same as on your automobile).



INTRODUCTION

Attention Owner/Operator

BEFORE OPERATING THIS MACHINE:

1. Carefully read the Operator's Manual, completely understand the Safety Messages and instructions, and know how to operate correctly both the tractor and implement.
2. Fill out the Warranty Card in full. Be sure to answer all questions, including the Serial Number of the implement. Mail within 30 days of delivery date of this implement.

NOTE: Warranties are honored only if completed "Owner Registration and Warranty" forms are received by Alamo Group within thirty days of delivery of the implement.

3. Record the Blade Model and Serial Numbers on the Warranty page at the front of the Operator's Manual. Keep this as part of the permanent maintenance file for the implement.

IMPORTANT

For your safety and to guarantee optimum product reliability, always use Genuine ALAMO INDUSTRIAL replacement parts. The use of inferior "will-fit" parts will void Warranty of your ALAMO INDUSTRIAL implement and may cause premature or catastrophic failure which can result in serious injury or death. If you have any questions concerning the repair parts you are using, contact ALAMO INDUSTRIAL, 1502 E. Walnut Seguin, TX 78155 (830) 372-3551.

///ALAMO
INDUSTRIAL

02925100

OPERATION SECTION

Operation Section 3-1

OPERATION

ALAMO INDUSTRIAL SAMURAI BOOM MOWER OPERATING INSTRUCTIONS

Alamo Industrial SAMURAI Booms are manufactured with quality material by skilled workers. The SAMURAI Boom is designed to attach to a tractor and operate various heads for a wide range of vegetative maintenance applications. The boom and heads are equipped with safety warning decals, protective deflectors, shields, and other safety features to provide operator and passerby protection, however, no shielding is 100% accurate. ALL safety equipment and safety warning decals must be maintained on the unit in good operational condition at all times.

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 boom unit, tractor or a thrown object. Do not operate the boom and attached head if bystanders, passersby, pets or livestock are within 300 feet of the unit.

This section of the Operator's Manual is designed to familiarize, instruct, and educate operators to the safe and proper use of the boom and attached head. Pictures contained in this section are intended to be used as a visual aid to assist in explaining the operation of a SAMURAI Boom and are not specific to a SAMURAI Boom. Some pictures may show shields removed to enhance visual clarity. NEVER operate the boom unit without all safety equipment in place and in good operational condition. The operator must be familiar with the boom unit and tractor operation and all safety practices before beginning operation. Proper operation, as detailed in this manual, will help ensure years of safe and satisfactory use of the SAMURAI Boom.

READ AND UNDERSTAND THE ENTIRE OPERATING INSTRUCTIONS AND SAFETY SECTION OF THIS MANUAL AND THE TRACTOR MANUAL BEFORE ATTEMPTING TO USE THE TRACTOR AND IMPLEMENT. 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 implement and tractor. *OPS-U-0001*

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)



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



OPERATION

1. OPERATOR REQUIREMENTS

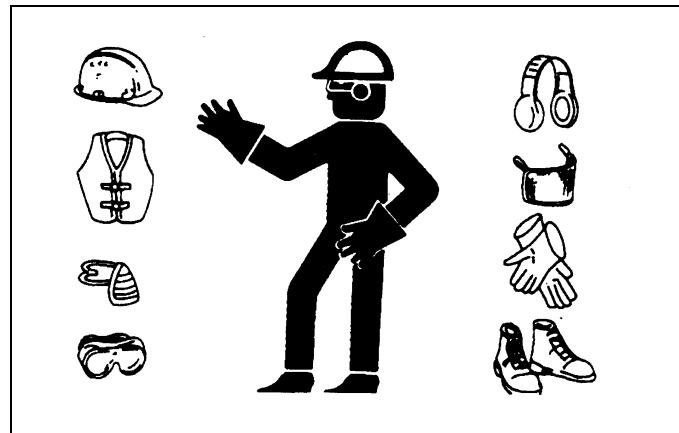
Safe operation of the unit is the responsibility of a qualified operator. A qualified operator has read and understands the implement and tractor Operator's Manuals and is experienced in implement and tractor operation and all associated safety practices. In addition to the safety messages contained in this manual, safety signs are affixed to the implement and tractor. If any part of the operation and safe use of this equipment is not completely understood, consult an authorized dealer for a complete explanation.

If the operator cannot read the manuals for themselves or does not completely understand the operation of the equipment, it is the responsibility of the supervisor to read and explain the manuals, safety practices, and operating instructions to the operator.

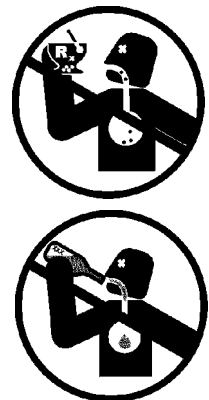
Safe operation of equipment requires that the operator wear approved Personal Protective Equipment (PPE) for the job conditions when attaching, operating, servicing, and repairing the equipment. PPE is designed to provide operator protection and includes the following safety wear:

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Protective Eye Glasses, Goggles, or Face Shield
- Hard Hat
- Steel Toe Safety Footwear
- Gloves
- Hearing Protection
- Close Fitting Clothing
- Respirator or Filter Mask (depends on operating conditions) OPS-U- 0002



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)



OPERATION

2. TRACTOR REQUIREMENTS

In addition to tractor horsepower and size required to operate the boom unit, the tractor must also be properly equipped to provide operator protection, to alert approaching vehicle drivers of the tractor's presence, and to ensure tractor stability when mowing with the boom fully extended.

Tractor Requirements and Capabilities

- ASAE approved Roll-Over Protective Structure (ROPS) or ROPS cab and seat belt.
- Operator Protection Tractor must be equipped with protective structure such as operator cage or lexan window to protect operator from thrown object and falling objects
- Tractor Safety Devices Slow Moving Vehicle (SMV) emblem, lighting,
- Tractor Ballast As required to maintain at least 1500 lbs. on left rear tire

2.1 ROPS and Seat Belt

The tractor must be equipped with a Roll-Over-Protective-Structure (ROPS) (tractor cab or roll-bar) and seat belt to protect the operator from falling off the tractor, especially during a roll over where the driver could be crushed and killed. Only operate the tractor with the ROPS in the raised position and seat belt fastened. Tractor model not equipped with a ROPS and seat belt should have these life saving features installed by an authorized dealer. OPS-U- 0003



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 Operator Thrown Object Protection

The tractor must be equipped with protective equipment to shield the operator from falling and thrown objects. For cab tractors, the tractor must be equipped with an operator safety screen on its right side or the right side windows must be fitted with a shatter proof safety window. For non-cab tractors, the tractor must be equipped with a ROPS and operator protective safety cage that provides protection to the right and above the operator seat. DO NOT remove the ROPS from non-cab tractors to equip a safety cage.

OPS-B- 0001



OPERATION

⚠ DANGER

Never operate the Tractor and Mower Unit without an OPS (Operators Protective Structure) or Cab to prevent injury from objects thrown from ground or from overhead trimming. Stop mowing if workers or passersby are within 100 yards. (SBM-9)



2.3 Tractor Lighting and SMV Emblem

If the tractor will be operated near or traveled on a public roadway it must be equipped with proper warning lighting and a Slow Moving Vehicle (SMV) emblem which are clearly visible from the rear of the unit. Most tractor's have different settings for operating and transporting lighting. Refer to the tractor operator's manual for using the tractor's light switch and operating the turn signals.

OPS-B- 0017



OPERATION

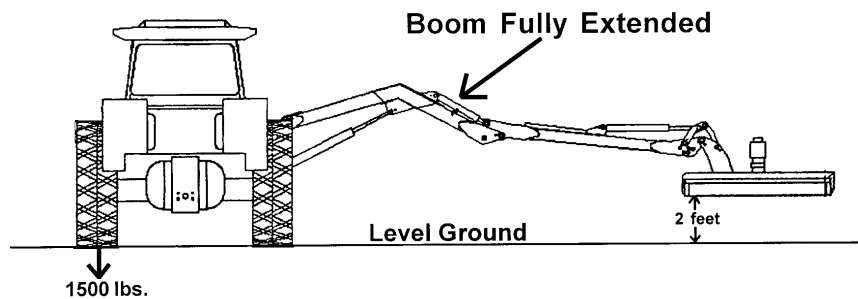
OPERATION

OPERATION

2.4 Tractor Ballast

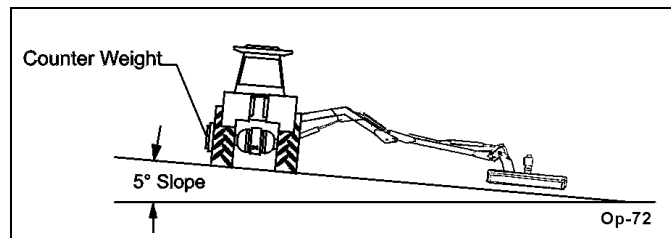
To ensure tractor stability when operating on flat surfaces the left rear tractor tire MUST exert a minimum down force (weight) of 1500 lbs. on the ground when the tractor is on level ground, its boom is fully extended and the mower head is horizontal and two feet above the ground. For units which have the ability to operate on either side of the tractor, these requirements must also be met for the right side tire when the boom is extended to the left side as described above. A tractor that does not meet this criteria is DANGEROUS and should not be operated as upset of the unit can occur resulting in possible serious injury and property damage. NOTE: All factory mounted units are tested and meet the ballast requirement before shipment; further testing is not required unless the unit is operated in a manner other than what is considered standard operating conditions.

For additional information on properly ballasting the tractor, refer to Alamo Industrial Tractor and Mower Stability Pamphlet P/N #02959010



Op-71

If the unit is operated on slopes greater than 5°, additional counterweight will be required. Operation of the unit on slopes greater than 11 percent (6.4 degrees) is not recommended under any circumstances. On a tractor with a 96" outside to outside tire spread, an 11 percent (6.4 degrees) slope occurs when one rear tractor tire is about 8" lower than the other rear tire. OPS-B- 0018



3.GETTING ON AND OFF THE TRACTOR

Before getting onto the tractor, the operator must read and completely understand the implement and tractor operator manuals. If any part of either manual is not completely understood, consult an authorized dealer for a complete explanation. OPS-U- 0007



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)



OPERATION

3.1 Boarding the Tractor

Use both hands and equipped handrails and steps for support when boarding the tractor. Never use control levers for support when mounting the tractor. Seat yourself in the operator's seat and secure the seat belt around you.

Never allow passengers to ride on the tractor or attached equipment. Riders can easily fall off and be seriously injured or killed from falling off and being ran over. It is the operator's responsibility to forbid all extra riders at all times. *OPS-U- 0008*



Never allow children to operate, ride on, or come close to the Tractor or Implement. Usually, 16-17 year-old children who are mature and responsible can operate the implement with adult supervision, if they have read and understand the Operator's Manuals, been trained in proper operation of the tractor and Implement, and are physically large enough to reach and operate the controls easily. (SG-11)



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



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)



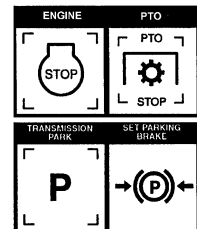
3.2 Dismounting the Tractor

Before dismounting the tractor, idle the tractor engine down, disengage the head and retract the boom arm to the transport position. Park the tractor on a level surface, set the transmission in park or neutral and apply the parking brake. Shut down the tractor engine, remove the key, and wait for all motion to come to a complete stop before exiting the operator's seat. NEVER leave the seat until the tractor, its engine, and mower head movement have come to a complete stop.

Use hand rails and extra steps when exiting the tractor. Be careful of your step and use extra caution when mud, ice, snow, and other matter has accumulated on the steps and handrails. Never rush or jump off the tractor. *OPS-B- 0002*



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)



OPERATION

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 ignition key/switch
- Locate the engine shut off control
- Locate the hydraulic control levers
- Locate the light control lever
- Locate the brake pedals and clutch
- Locate the PTO control
- Locate the 3 point hitch control lever
- Locate the boom operating controls (joystick or valve bank)

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 tractor transmission levers are in park or neutral.
- The boom operating controls are in the neutral and off position.
- The PTO control lever is disengaged.
- The hydraulic remote control levers are in the neutral position.

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. *OPS-B- 0003*



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



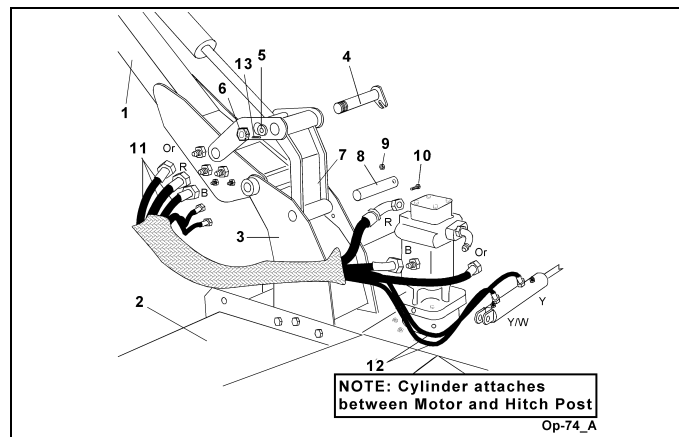
Start tractor only when properly seated in the Tractor seat. Starting a tractor in gear can result in injury or death. Read the Tractor operators manual for proper starting instructions. (SG-13)



OPERATION

5.CONNECTING ATTACHING HEADS TO THE BOOM

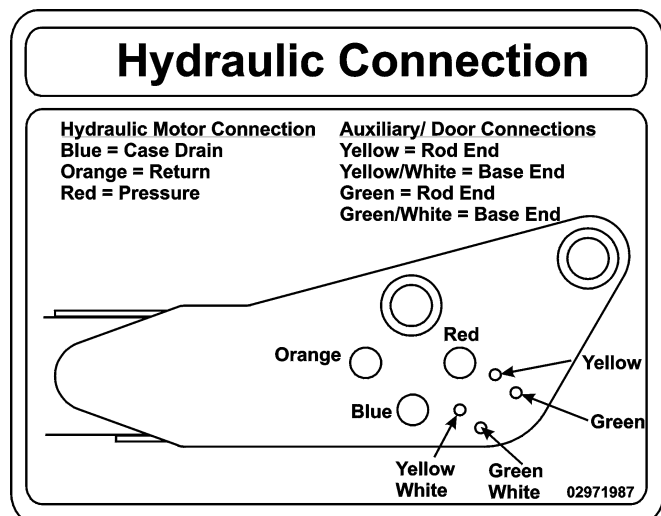
1. Start by using a hoist to lower the boom(1) down to the Machete head(2). Align the Boom with the Machete Head Hitch Post(3), insert the upper hitch pin(4) through the Dipper end of the boom and the Machete Head Upper Hitch Post. Attach with washer(5), nut(6) , and cotter pin(13).
2. Then align the lower linkage(7) of the Boom and insert the lower hitch pin(8) through hitch post. Attach with nut(9) and bolt(10).
3. Finally make sure all bolts, nuts, and pins are tightened to recommended torque. OPS-B- 0004



5.1 Connecting Mower Head Hydraulics

1. Follow hydraulic connections according to the Hydraulic Connection Decal on boom. Attach the Mower Hydraulics to the Boom and the Motor according to the colors specified on decal. Then attach the door cylinder hoses from the boom to the Machete Heads Door Cylinder according to the colors specified on decal.
2. When connecting the mower head hydraulic lines to the boom, keep the hose, quick couplers, and swivels free of dirt and other contaminants. Wipe all dirt and other contaminants from the hydraulic remote ports and mower hydraulic hose coupler with a clean cloth before connecting.

NOTE: The Buzzbar and the Flail Axe are attached in the same fashion as the Machete Head, however the Flail-Axe does not have Auxiliary/Door Connections(Yellow/Yellow and White Hoses) keep these sealed off. OPS-B- 0019_D



Avoid contact with hot surfaces including hydraulic oil tanks, pumps, motors, valves and hose connections. Relieve hydraulic pressure before performing maintenance or repairs. Use gloves and eye protection when servicing hot components. Contact with a hot surface or fluid can cause serious injury from burns or scalding. (SG-34)

OPERATION

WARNING

Do not operate this Equipment with hydraulic oil or fuel leaking. Oil and fuel are explosive and their presence could present a hazard. Do not check for leaks with your hand! High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. To check for a hose leak, SHUT the unit ENGINE OFF and remove all hydraulic pressure. Wear oil impenetrable gloves, safety glasses and use Cardboard to check for evidence of oil leaks. If you suspect a leak, REMOVE the HOSE and have it tested at a Dealer. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure. (SG-15)

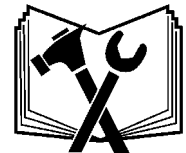


6. PRE-OPERATION INSPECTION AND SERVICE

Before each use, a pre-operation inspection and service of the implement 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 unit 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. OPS-U-0029

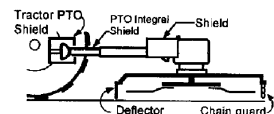
WARNING

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)



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)



OPERATION

6.1 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 the manufacturers recommendations. The following are some of the items that require daily service and 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 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 *OPS-U-0030*

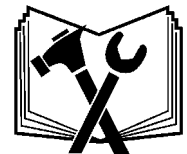
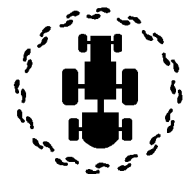
6.2 Boom Unit Pre-Operation Inspection and Service

Inspect and service the boom arm and head prior to operation. Damaged and/or broken parts should be repaired and/or replaced immediately. To ensure the unit is ready for operation, conduct the following:

OPS-B- 0020



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)



OPERATION

The operator's manual and safety signs affixed on the unit contain important instructions on the safe and proper use of the equipment. Maintain these important safety features on the implement in good condition to ensure the information is available to the operator at all times.

- Ensure the manual canister is secured to the equipment with the operator's manual inside.
- Ensure all safety signs are in place and legible. Replace missing, damaged, and illegible decals. *OPS-U-0011*



FRAME ASSEMBLY

- Inspect condition of mounting frame weldment.
- Inspect condition of King Post frame.
- Ensure all bolts and screws are in position and are properly torqued.
- Ensure all pins are in place and fastened with screws.
- Ensure frame is properly mounted to tractor and hardware is properly installed and tightened. *OPS-B-0021*



WARNING

Relieve hydraulic pressure prior to doing any maintenance or repair work on the Implement. Place the Mower Head on the ground or securely supported on blocks or stands, disengage the PTO, and turn off the engine. Push and pull the control Levers or Joystick several times to relieve pressure prior to starting any maintenance or repair work. (SBM-6)

WARNING

Never Leave the mower unattended while the head is in the raised position. The mower could fall causing serious injury to anyone who might inadvertently be under the mower. (SBM-4)



OPERATION

BOOM ARM ASSEMBLY

- Inspect condition of each arm section weldment
- Ensure all pins are in place.
- Ensure all bolts and screws are properly installed.
- Check condition of teflon bushings at boom pivot points.
- 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 properly. OPS-B- 0022



Never attempt to lubricate, adjust, or remove material from the Implement while it is in motion or while tractor engine is running. (SG-20)

HYDRAULIC LINE INSPECTION

- Check for hydraulic leaks along hoses, cylinders and fittings. **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.
- Inspect the condition of the valve weldment.
- Ensure fitting is properly connected
- Inspect condition of nylon bushings. OPS-B- 0023



Do not operate this Equipment with hydraulic oil or fuel leaking. Oil and fuel are explosive and their presence could present a hazard. Do not check for leaks with your hand! High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. To check for a hose leak, SHUT the unit ENGINE OFF and remove all hydraulic pressure. Wear oil impenetrable gloves, safety glasses and use Cardboard to check for evidence of oil leaks. If you suspect a leak, REMOVE the HOSE and have it tested at a Dealer. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure. (SG-15)



OPERATION

OPERATION

HYDRAULIC PUMP/OIL RESERVOIR

- Check oil reservoir level and oil condition. (Add specific type oil if low)
- Change hydraulic oil filter and hydraulic oil according to maintenance schedule.
- Ensure there are no oil leaks and fittings are properly connected
- Inspect overall condition of hydraulic pump.
- Inspect pump drive shaft.



Check the fluid level in the Hydraulic Tank on the Tractor, and add oil if required. As the air has been forced out of the Cylinders and Hoses, it goes into the Hydraulic Tank and reduces the volume of oil. Maintain the oil level within the sight gauge located on the side of the reservoir. Never fill the tank above the sight gauge to allow for the expansion of the oil. The tank maintains pressure after the mower has been run. Stand off to one side when removing the breather cap element to prevent possible injury. To relieve pressure remove the breather cap element and depress the spring loaded pressure valve to release any excess air. *OPS-B- 0024_A*

WARNING

Attention: Oil Filler Cap is also the Pressure Relief Cap.

Remove cap slowly to relieve pressure before removing cap completely. Stay clear to prevent being scalded with hot oil that may spray out of the tank that is still pressurized and may cause serious injury to eyes, face, and exposed skin. (Ops-0001-MISC)

WARNING

Avoid contact with hot surfaces including hydraulic oil tanks, pumps, motors, valves and hose connections. Relieve hydraulic pressure before performing maintenance or repairs. Use gloves and eye protection when servicing hot components. Contact with a hot surface or fluid can cause serious injury from burns or scalding. (SG-34)

OPERATION

ROTARY HEAD INSPECTION

- Inspect blades and blade bolts for looseness and excessive wear. Rotate to 90° to make for checking easier. 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.
- Ensure rubber deflectors are in position and not damaged. Replace worn, broken, and missing sections immediately.
- Ensure hydraulic lines are properly connected to the hydraulic motor. Check for hydraulic leaks along hoses and fittings. DO NOT use your hands to check for oil leaks. Use a piece of heavy paper or cardboard to check for hydraulic oil leaks.
- Inspect the condition of deck skid shoes and hardware. OPS-B- 0025



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



OPERATION

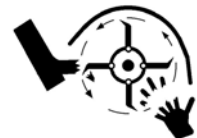
OPERATION

FLAIL HEAD INSPECTION

- Inspect blades and blade bolts for looseness and excessive wear. Rotate to 90° to make for checking easier. Replace damaged, worn, and missing blades as complete sets to maintain cuttershaft balance.
- Ensure rubber deflectors are in position and not damaged. Replace worn, broken, and missing sections immediately.
- Ensure the rollers are in good condition and rotate freely.
- Inspect that all bolts and screws are in position and are properly torqued.
- Ensure hydraulic lines are properly connected to the hydraulic motor. Check for hydraulic leaks along hoses and fittings. **DO NOT** use your hands to check for oil leaks. Use a piece of heavy paper or cardboard to check for hydraulic oil leaks.
- Inspect the condition of the drive belts.
- Ensure the drive belt shields are in place and in good repair.
- Remove any grass or other debris which may be wrapped around the cuttershafts ends.
- Inspect the condition of deck skid shoes and hardware. *OPS-B- 0026*



Do not put hands or feet under mower decks. Blade Contact can result in serious injury or even death. Stay away until all motion has stopped and the decks are securely blocked up. (SFL-2)



OPERATION

TIMBER CAT HEAD INSPECTION

- Inspect blade and bolts for looseness and excessive wear. Make sure the unit is securely blocked up when crawling underneath or set on ground before doing maintenance. Replace damaged and worn blade to keep unit operating properly.
- Ensure hydraulic cylinder is installed and retained correctly. Ensure the proper size pins are used to retain the cylinder in place and are secured with pins.
- Ensure hydraulic lines are properly connected to the hydraulic valve and cylinder. Check for hydraulic leaks along hoses and fittings. DO NOT use your hands to check for oil leaks. Use a piece of heavy paper or cardboard to check for hydraulic oil leaks. OPS-B- 0027

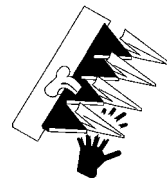


BUZZBAR HEAD INSPECTION

- Inspect the saw blades and spindle bolts for looseness and excessive wear. Make sure the unit is securely blocked up before doing maintenance. Replace damaged and worn saw blades as complete sets to maintain unit balance.
- Ensure hydraulic lines are properly connected to the hydraulic motor. Check for hydraulic leaks along hoses and fittings. DO NOT use your hands to check for oil leaks. Use a piece of heavy paper or cardboard to check for hydraulic oil leaks.
- Inspect the condition of the Micro V-belts.
- Ensure the drive belt shields are in place and in good repair. OPS-B- 0028



Do not put hands or feet near the cutter bar. Blade contact can result in serious injury. Stay away until all motion has stopped and the mower is securely blocked up. (SSM-1)



OPERATION

DITCHER HEAD INSPECTION

- Inspect blades and bolts on ditcher head assembly for looseness and excessive wear. Make sure the unit is securely blocked up before doing maintenance. Replace damaged and worn blades as complete sets to maintain unit balance.
- Ensure hydraulic lines are properly connected to the hydraulic motor. Check for hydraulic leaks along hoses and fittings. **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 rubber deflectors are in position and not damaged. Replace worn, broken, and missing sections immediately.
- Ensure hydraulic cylinder is installed and retained correctly. Ensure the proper size pins are used to retain the cylinder in place and are secured with pins. *OPS-B- 0029*



⚠ DANGER

Do not put hands or feet under mower decks. Blade Contact can result in serious injury or even death. Stay away until all motion has stopped and the decks are securely blocked up. (SFL-2)



⚠ DANGER

All Safety Shields, Guards and other safety devices including (but not limited to) - Deflectors, Steel Guards and Gearbox Shields must 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. (SSM-07)

OPERATION

Boom Mower PRE-OPERATION Inspection



Mower ID# _____ Make _____

Date: _____ Shift _____



Before conducting the inspection, make sure the tractor engine is off, all rotation has stopped and the tractor is in park with the parking brake engaged. Make sure the mower is resting on the ground or securely blocked up and all hydraulic pressure has been relieved.

OPERATION

Item	Condition at Start of Shift	Specific Comments if not O.K.
The Operator's Manual is in the canister on the mower		
All safety decals are in place and legible		
The Mounting frame bolts are in place and tight		
The Boom connection bolts & pins are tight		
There are no cracks in boom		
The Hydraulic Cylinders pins are tight		
The Hydraulic Pump hose connections are tight		
The Hydraulic Valve hose connections are tight		
The Hydraulic Valve controls function properly		
There are no leaking or damaged hoses		
The Hydraulic Oil level is full		
There is no evidence of Hydraulic leaks		
The Blades are not chipped, cracked or bent		
The Blade bolts are tight		
The Deflectors are in place and in good condition		
The Mower shields are in place and in good condition		
The Skid shoes are in good condition & tight		
There are no cracks or holes in mower deck		
The Hyd. motor mounting bolts are tight		
The mower head spindle housing is tight and lubricated		

Operator's Signature: _____

DO NOT OPERATE an UNSAFE TRACTOR or MOWER

OPERATION

Tractor PRE-OPERATION Inspection



Mower ID# _____ Make _____

Date: _____ Shift _____



Before conducting the inspection, make sure the tractor engine is off, all rotation has stopped and the tractor is in park with the parking brake engaged. Make sure the mower is resting on the ground or securely blocked up and all hydraulic pressure has been relieved.

OPERATION

Item	Condition at Start of Shift	Specific Comments if not O.K.
The flashing lights function properly		
The SMV Sign is clean and visible		
The tires are in good condition with proper pressure		
The wheel lug bolts are tight		
The tractor brakes are in good condition		
The steering linkage is in good condition		
There are no visible oil leaks		
The hydraulic controls function properly		
The ROPS or ROBS Cab is in good condition		
The seatbelt is in place and in good condition		
The 3-point hitch is in good condition		
The drawbar pins are securely in place		
The PTO master shield is in place		
The engine oil level is full		
The brake fluid level is full		
The power steering fluid level is full		
The fuel level is adequate		
The engine coolant fluid level is full		
The radiator is free of debris		
The air filter is in good condition		

Operator's Signature: _____

DO NOT OPERATE an UNSAFE TRACTOR or MOWER

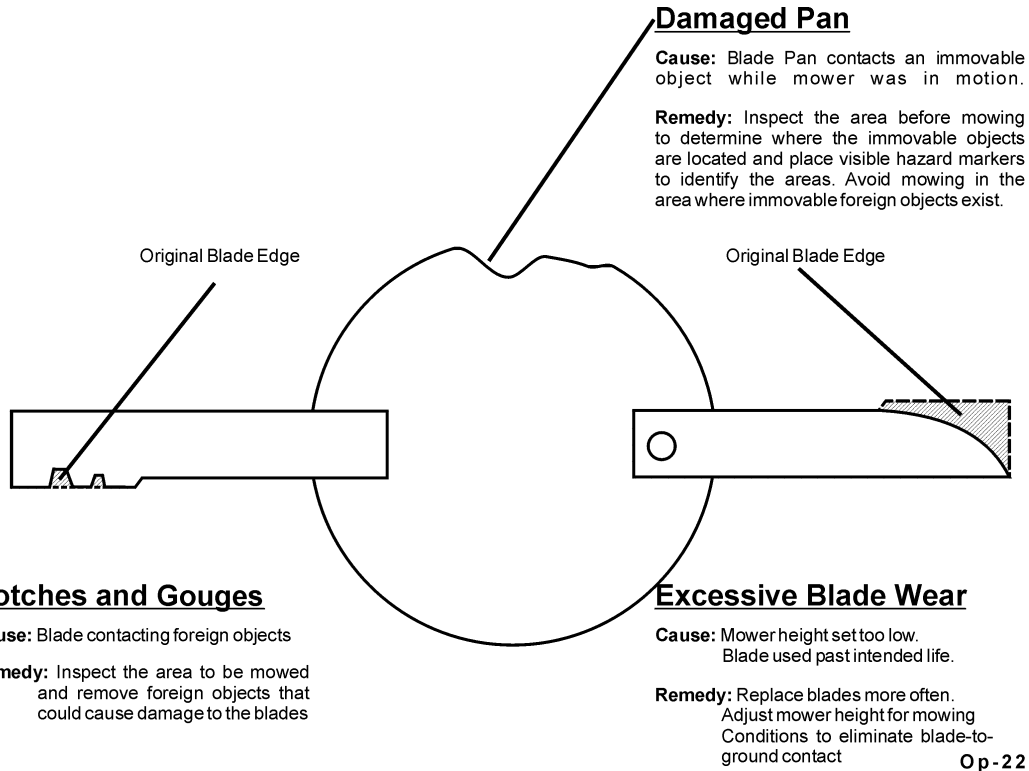
This Inspection Form may be freely duplicated for extra copies.

OPERATION

6.3 Cutting Component Inspection

Inspect blade pan and blade assembly for the following:

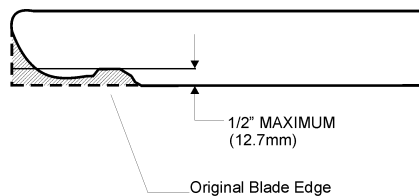
OPS-U-0031



Inspect the Blades daily for abnormal wear. REPLACE BOTH BLADES on that carrier IMMEDIATELY if either blade has:

- Become bent or deformed from it's original shape or
- Any cracks are visible, or
- Deep gouges in the blade's surface are present, or
- Gouges or chipped areas in the cutting edge are larger than 1/2"(12.7mm), or
- The material on the leading edge has been worn away by more than 1/2(12.7mm)"

Failure to replace abnormally worn blades may lead to catastrophic failure of the blades and ejection of the broken part with tremendous force which may cause serious bodily injury or death. OPS-U-0032



NOTE:
Replace Blades in pairs after no more than 1/2" (12.7mm) wear

Op - 23

OPERATION

OPERATION

6.4 Blade Bolt Inspection

Inspect Blade Bolt Head daily for wear as followed:

Excessive Blade Bolt Wear

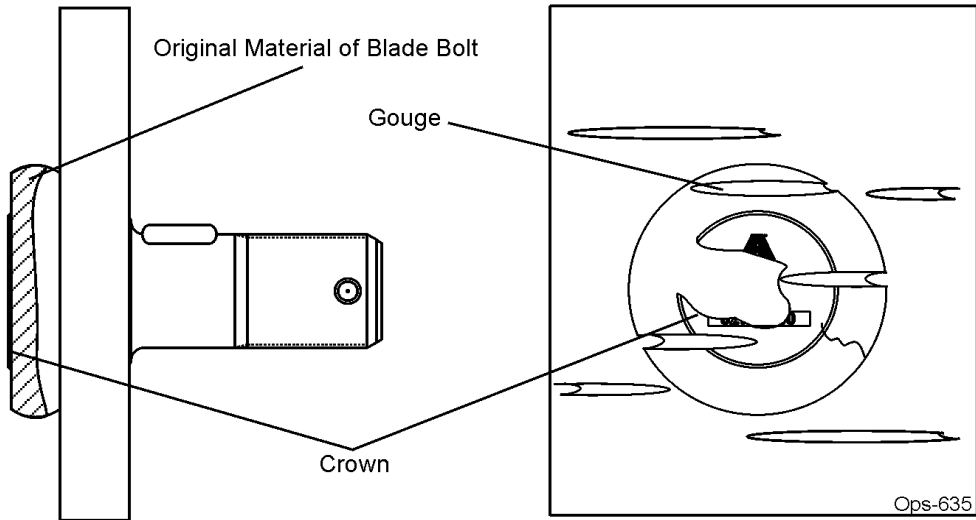
Cause: Blade Bolt contacts a foreign or solid object while Blade is in motion.

Remedy: Inspect the area before mowing to determine where the foreign objects are located and place visible hazard markers to identify the areas where immovable foreign objects exist, and avoid hitting the objects

Notches and Gouges

Cause: Blade Bolt contacting foreign objects

Remedy: Inspect area to be mowed and remove foreign objects that could cause damage to the blade bolts.



Inspect the Blade Bolt Heads daily for abnormal wear. REPLACE BOTH BLADE BOLTS on the Blades IMMEDIATELY if either blade bolts has:

- Visible cracks or
- If the blade bolt crown is worn off or
- If Blade Bolt has gouges or chipped areas.

Failure to replace abnormally worn blade bolts may lead to catastrophic failure of the blades and ejection of the broken part which may cause serious bodily injury or death.

Always replace Blade Bolts with new bolts whenever replacing the Blades. OPS-U-0037

OPERATION

7. OPERATING THE BOOM JOYSTICK CONTROL

Positioning the boom is performed with electronic valves controlled by the operator using a single joystick. The joystick controls five standard operations: Swing, Lift, Dipper, Head, Tilt, and Door. Of these five operations, the Swing, Lift, and Dipper functions are *proportional*; that is, when the joystick is moved a small amount, the cylinder moves slowly and as the joystick continues to be moved, the cylinder continually becomes faster. This allows very precise positioning of the boom. Using a single joystick, many of the functions can be operated simultaneously such as the Lift and Dipper for even greater speed at positioning of the boom.

For safe and efficient boom mower operation, it is critical that the operator be experienced and feel confident in using the joystick control to position the boom. New operator's should allowed ample time to practice using the joystick in an open area before entering the worksite. Before attempting to operate this equipment, read these instructions completely. If you have any questions concerning safety of operation, contact your dealer or ALAMO INDUSTRIAL.

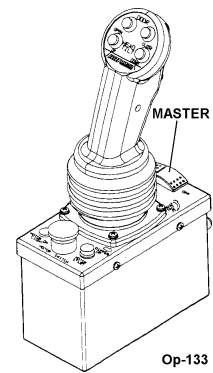
Each joystick control and responding boom action is covered in detail on the following pages. Read each explanation carefully then practice in a safe, level area, CLEAR of all people, animals, and any obstructions. As always, use extreme caution when using this machine.

Practice performing multiple functions simultaneously. With some practice, the joystick will become very easy to operate and will feel almost as it were an extension of your arm.

With the exception of the relief valves, which are preset at the factory, these are all the controls for operating the machine other than the controls on the tractor itself.

Master Switch

Operating any joystick function requires that the joystick Master Switch be ON. When ON the master switch indicator light will be illuminated. Turning off the master switch will deactivate all joystick controls. The master switch also serves as a safety device and will prevent the tractor from being started if the master switch is in the ON position.
OPS-B- 0030_A



Operate the Tractor and/or Implement controls only while properly seated in the Tractor seat with the seat belt securely fastened around you. Inadvertent movement of the Tractor or Implement may cause serious injury or death. (SG-29)

OPERATION

7.1 Mower Head Power

ON - OFF Switches (base of the JOYSTICK)

Before attempting to start the Tractor, make certain that the Motor Switch is pushed IN to the STOP position and the Master Switch is in the OFF position to ensure that the mower head is not engaged. As a safety device, the tractor can only be started with the Master Switch in the OFF position.

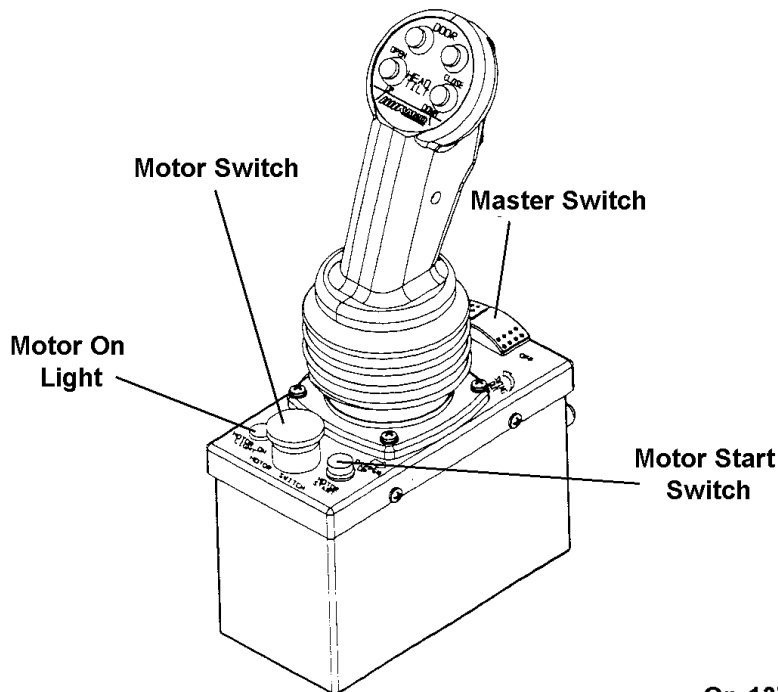
Starting

To Start the Motor on the Attached Head, Start the Tractor and Move the Master Switch to the ON position. Position the head in an area which is clear of any brush, grass, or any other obstruction. Pull the Motor Switch OUT until it snaps into the up position, and then press the Motor Start momentary switch to start the motor. Once the motor starts, release the momentary switch. Bring the Tractor's engine speed up to the normal operating speed of 540 PTO RPM. The motor on light will illuminate while the mower motor is on.

The attached head motor will continue to operate while the Master Switch and the Motor Switch are in the On positions. Pushing the Motor Switch in to the STOP position or switching the Master Switch to the OFF position will stop the attached head motor.

Stopping

To stop the motor on the mower head, lower the Tractor engine speed and push the Motor Switch IN to the STOP position. The mower will come to a complete stop in approximately 15 seconds. OPS-B- 0031_A

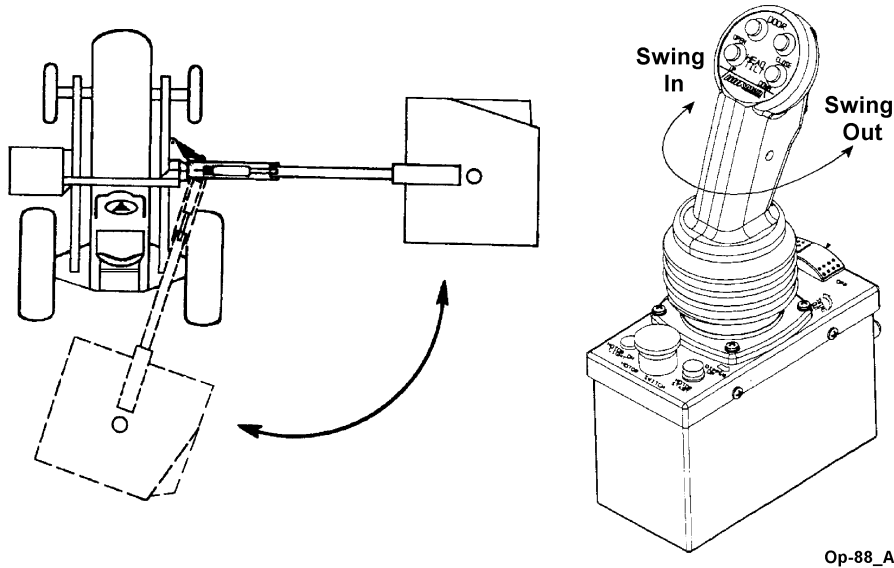


Op-137

OPERATION

OPERATION

7.2 Swing



The twisting motion of the Joystick, actuates the SWING cylinder.

Twisting the Joystick Counterclockwise admits hydraulic fluid to the Butt End of the SWING cylinder, causing the boom to swing out to the right side of the tractor (See Diagrams above).

When the Joystick is Released, the valve will automatically return to center, and the boom will be LOCKED in the current position.

Twisting the Joystick Clockwise admits hydraulic fluid to the rod end of the cylinder causing the boom to swing back toward the rear of the tractor. If the Joystick is continually held in this position pull in , the boom will continue to the left side of the tractor.

Again, if the Joystick is released, the valve will automatically return to center and the boom will be LOCKED in the current position.

BOOM SAFETY VALVE - If a rigid object (guard rail post, tree, etc.) is struck by the extended boom while the tractor is moving forward, the boom safety valve will allow the boom to swing rearward, and minimize the possibility of damage.

NOTICE: Mower heads are not designed to cut in reverse. OPS-B- 0032_A

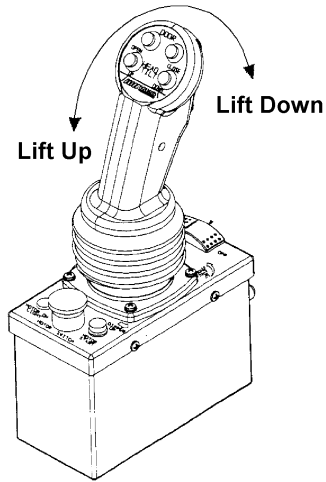
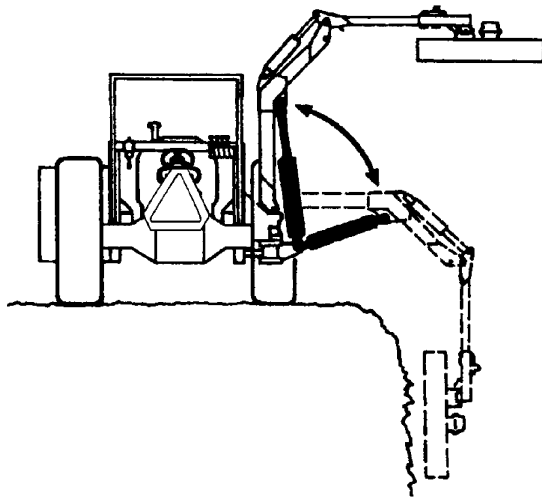


Make certain that the Boom swing path is clear of bystanders, powerlines, and obstructions to prevent injury, electrocution, and possible machine damage. Swing Boom SLOWLY AND CAREFULLY. Avoid sudden starting and stopping. (Ops-0002-MISC)

OPERATION

OPERATION

7.3 Lift



Op-89_A

The forward and back movement of the Joystick actuates the LIFT cylinder.

Pulling the Joystick toward the operator causes the boom LIFT cylinder to lift the boom arm up. Pushing the Joystick forward causes the LIFT cylinder to lower the Boom. If the Joystick is released, the Boom will LOCK in the position and the Joystick will return to the center position. OPS-B- 0033_A

⚠ DANGER

Make certain that you do not lift the head in such a fashion that you lift the left rear wheel off the ground. Install weight as needed to keep at least 1500 lb. on the ground under left rear wheel.

(Ops-0003-MISC)



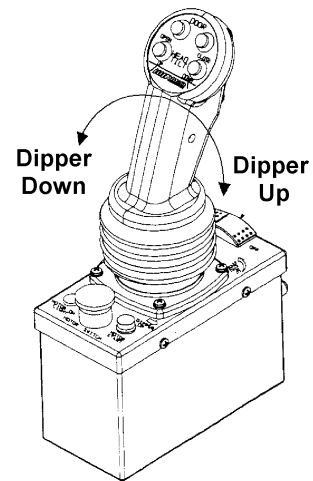
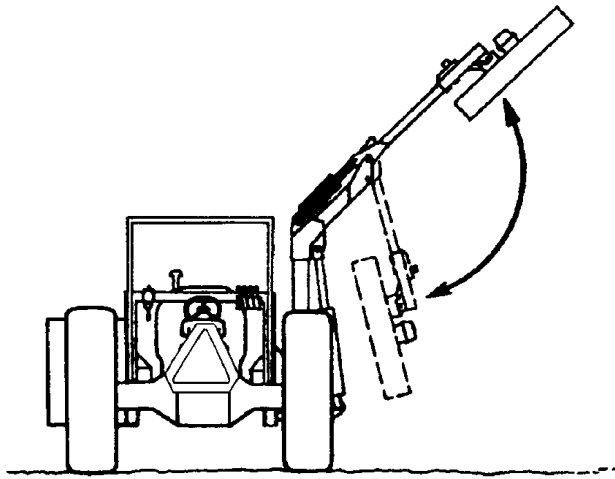
⚠ WARNING

Never Leave the mower unattended while the head is in the raised position. The mower could fall causing serious injury to anyone who might inadvertently be under the mower. (SBM-4)



OPERATION

7.4 Dipper



Op-90_A

The Left and Right movement of the Joystick actuates the DIPPER cylinder.

Pushing the Joystick lever to the RIGHT causes the boom DIPPER cylinder to LIFT the small boom UP.

If the Joystick is released, the valve will automatically return to center, and the boom will be LOCKED in position.

Pushing the Joystick to the LEFT will lower the boom.

Again, if the Joystick is released, the valve will automatically return to center and the boom will be LOCKED in the current place. OPS-B- 0034_A



Make certain that you do not lift the head in such a fashion that you lift the left rear wheel off the ground. Install weight as needed to keep at least 1500 lb. on the ground under left rear wheel.

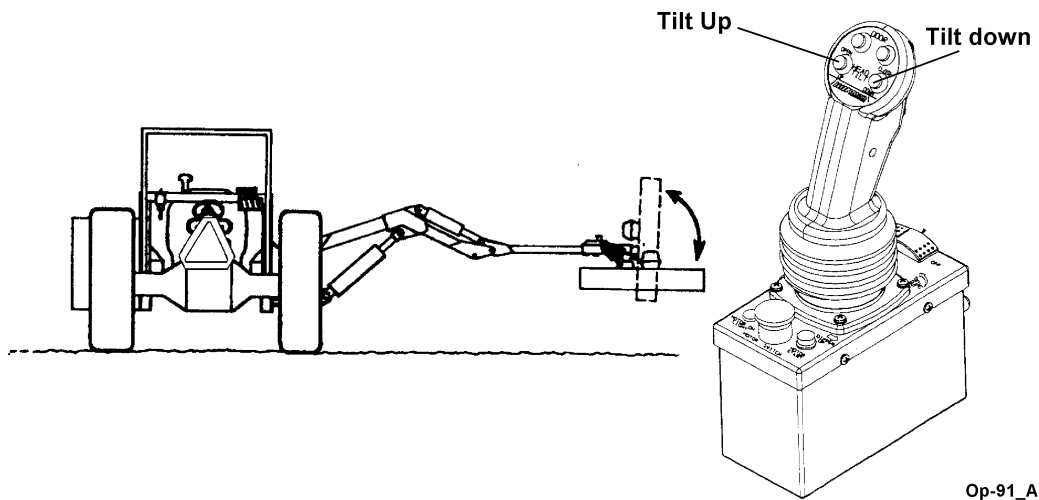
(Ops-0003-MISC)



Make certain that the Boom swing path is clear of bystanders, powerlines, and obstructions to prevent injury, electrocution, and possible machine damage. Swing Boom SLOWLY AND CAREFULLY. Avoid sudden starting and stopping. (Ops-0002-MISC)

OPERATION

7.5 Tilt



The two lower thumb buttons on the panel at the top of the joystick activates the TILT cylinder.

Pressing the left button will cause the head to tilt up.

Pressing the right button will cause the head to tilt down.

When the Joystick's Thumb lever is released, the thumb lever will return to the center position and lock the head in the current position. OPS-B- 0035_D

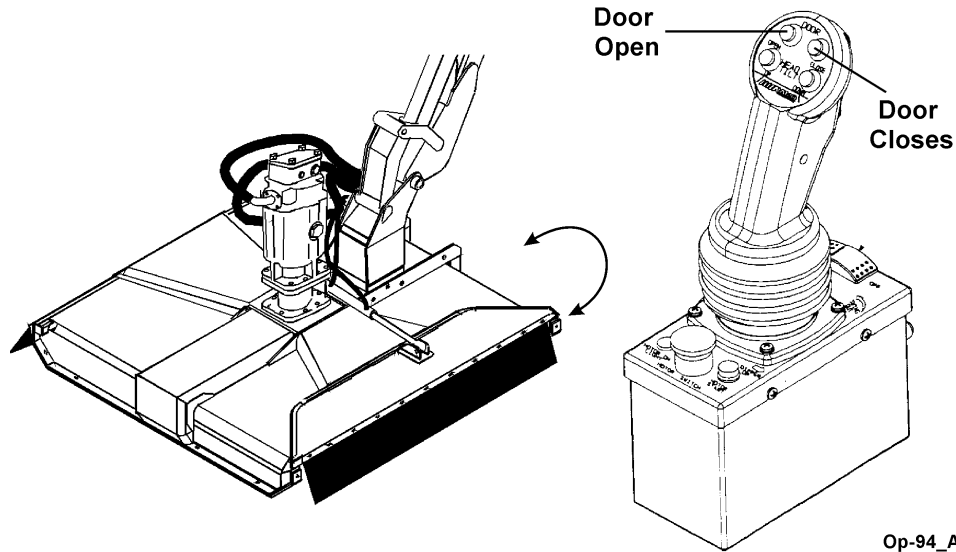


Make certain that you do not lift the head in such a fashion that you lift the left rear wheel off the ground. Install weight as needed to keep at least 1500 lb. on the ground under left rear wheel.

(Ops-0003-MISC)

OPERATION

7.6 Door



Op-94_A


The two upper thumb buttons on the panel at the top of the joystick actuates the door cylinders.

Pushing the left button opens the door.

Pushing the right button closes the door.

When the buttons are released, the door will lock in current position.

OPS-B- 0038_C

 DANGER	
SAFETY SHIELD & DEFLECTOR OPERATION	
 <p>SAFETY SHIELD</p> <p>DEFLECTOR</p>	<ul style="list-style-type: none">• Failure to close Safety Shield and Deflector may allow objects to be thrown outward with great force which can cause property damage, bodily injury, or death. <ol style="list-style-type: none">1. Keep Safety Shield and Deflector fully closed when cutting grass and weeds to reduce possibility of objects being thrown outward by the Blades if persons are in the area.2. Before Cutting brush, trimming limbs, or other such operations, raise the Deflector and Safety Shield fully to allow the blades to contact the material if area is clear of passerby. Operator must stop cutting and close shield if passerby enters the thrown objects area or blade contact area.3. Repair or replace Safety Shield and Deflectors as needed.4. Always transport with Safety Shield and Deflector closed.
<small>02967867</small>	

OPERATION

8.DRIVING THE TRACTOR AND IMPLEMENT

Safe tractor transport requires the operator to 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 boom and the tractor operating controls are set for safe transport. To ensure safety while driving the tractor with a boom, review the following.

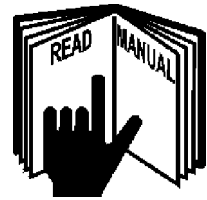
Read all safety instructions. Decals on the Boom warn you of particular and multiple hazards. Some decals are attached close to part of the Boom where there is a possible hazard. Read and make sure you understand the safety messages before you operate the implement. Keep all decals clean and readable. Replace lost or damaged decals, refer to safety section for more information.

Power for operating the mower is supplied from the tractor PTO. Refer to your tractor manual instructions for engaging and disengaging the PTO. Start the tractor and bring the engine speed up to normal operating speed of 540 PTO RPM. Always engage the PTO at low engine RPM and run the mower for a short period until all air is removed from the hoses. Keep all person's well clear of mower since blades can throw objects with great velocity for a considerable distance! KEEP CLEAR! OPS-B- 0005



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 to operate the Tractor and Implement without supervision. Make sure the operator has fully read and understood the manuals prior to operation.

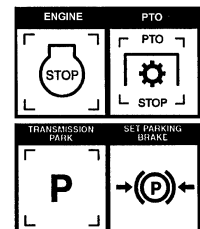
(SG-4)



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



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)



OPERATION

WARNING

Transport only at speeds where you can maintain control of the equipment. Serious accidents and injuries can result from operating this equipment at high 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 proper transport speeds for you and the equipment. Make sure you abide by the following rules:

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 transport speed not to exceed 20 mph (30 kph) for transporting this equipment.

Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that the equipment can be operated 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 turning speed for you and this equipment before operating on roads or uneven ground.

Only transport the Tractor and Implement at the speeds which allow you to properly control the equipment.

Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes or worn tires. 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 and watch out for the other guy. (SG-19)



OPERATION

8.1 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. OPS-U-0033

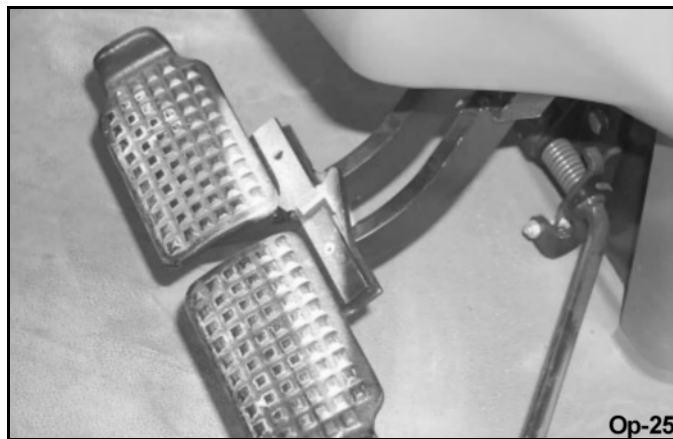


OPERATION

OPERATION

8.2 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 OPERATING CONDITIONS, THE BRAKE PEDALS SHOULD BE LOCKED TOGETHER TO PROVIDE THE MOST EFFECTIVE BRAKING ACTION.



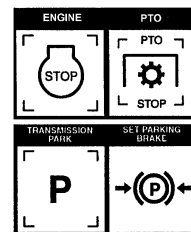
Always disengage the tractor differential lock when turning. When engaged the differential lock will prevent or limit the tractor from turning. During normal cutting conditions, locking the differential provides no benefit and should not be used.
OPS-U- 0013

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.

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)



OPERATION

8.3 Driving the Tractor and Boom

Start off driving at a slow speed and gradually increase your speed while maintaining complete control of the tractor. Never operate the tractor 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.

Perform turns with the tractor and mower at slow speeds to determine how the tractor with and attached implement handles a turn. Determine the safe speed to maintain proper control of the tractor when making turns. When turning with the implement the overall working length and width of the unit is increased. Allow additional clearance for the unit when turning or when passing large obstructions.

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. 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.

OPS-B- 0006_A



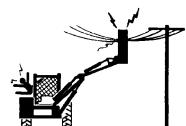
WARNING

Never Leave the mower unattended while the head is in the raised position. The mower could fall causing serious injury to anyone who might inadvertently be under the mower. (SBM-4)



DANGER

Always keep a careful lookout and use extreme care when working around overhead obstructions. Never allow the Mower head or boom within 10 feet of any power line. When working close to overhead power lines consult your electric company for a safe code of operation. (SBM-7)



OPERATION

OPERATION

9. OPERATING THE BOOM UNIT AND ATTACHED HEAD

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 this manual and the tractor operator's manuals. These manuals must be read and explained to any operator who cannot read. Never allow someone to operate the unit without complete operating instructions.

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

Only operate the mower head from the tractor operator's seat with the seatbelt securely fastened. Only operate a boom and equipped head on cabbed tractor that is equipped with a Lexan® protected right side window or a non cabbed tractor equipped with a ROPS and operator safety screen.

Avoid operating in the reverse direction when possible. In situations where the boom and mower must be backed to access areas to be cut, make sure there are no persons or other foreign debris behind the tractor. When backing, operate the tractor at a much reduced ground speed to ensure complete control of the unit is maintained. *OPS-B- 0007*



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



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 (90 m) 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 these type of items discontinue mowing. (SGM-1)



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)



Never operate the mower head tilted down where the operator can see the blades of the mower. The blade could throw an object toward the operator causing serious injury or death. Never operate the mower without an Operator Protective Structure. Always wear safety glasses and a hard hat. (Ops-0005-MISC)

OPERATION

9.1 Foreign Debris Hazards/Overhead Obstructions

An area to be cut must first be inspected for objects that could be thrown or that could damage the machine. Walk through the area looking for fences, boulder, rocks, culverts, stumps or metal objects. Mark the inspected area with flags. If the area is dense and cannot be walked thoroughly it may be necessary to inspect a smaller area as well as possible, then trim away the part that has been inspected and can safely be removed. Walk each new area again and repeat the inspection before cutting more away. Repeat as often as necessary until the area is cleared. It can be damaging and/or dangerous to work the cutter in an area that had not been visually inspected.

Place DANGER signs at least 300 feet beyond the perimeter of the area to be worked, not just 300 feet from where the machine started operating! It is convenient in many cases to work in 300 foot sections. Move the first Danger sign to the beginning of the freshly cleared area, place it, then take the first cutting area flag up to the end of the freshly cleared area 300 feet away. Walk and inspect the next 300 feet and place the second cutting area flag. Pick up the second DANGER sign, and take it a further 300 feet along the road or trail. Note that in many cases the DANGER area will extend in front of and behind the machine as well as along each side. Post signs accordingly. OPS-B- 0008



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)



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)



Mow at the speed that you can safely operate and control the tractor and mower. The correct mowing speed depends on terrain condition and grass type, density, and height of cut. Normal ground speed range is from 2 to 5 mph(3-8 kph). 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)

OPERATION



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 are installed and in good, working condition;

Mower Head is 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. (SBM-1)

9.2 Operating Speed and Ground Speed

Ground speed for mowing will depend upon the height, type, and density of vegetation to be cut. Do Not exceed 2 MPH while operating. 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 operating and desired ground speed. Make sure that the mower is operating at its full rated speed before entering the vegetation to be cut. Always start and stop cutting blades with engine near idle.

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 implement 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. OPS-B- 0009



Mow at the speed that you can safely operate and control the tractor and mower. The correct mowing speed depends on terrain condition and grass type, density, and height of cut. Normal ground speed range is from 2 to 5 mph(3-8 kph). 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)

OPERATION

9.3 Operating the Attached Mower Heads

The boom can attach to and operate multiple heads one at a time for a wide range of vegetation control applications. The attached heads are designed for different applications. The head should be selected based on the mowing application and the location that the unit is being operated.

Refer to the Assembly Section of this manual to ensure the head is properly attached to the boom hitch and hydraulic lines are properly connected. OPS-B- 0010



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)



Rotary Cutter

- The Rotary Cutting Head is rated to cut vegetation up to 5" in diameter.
- Objects tend to be thrown out from under the head in the direction of blade rotation and toward the raised edge of the shroud. Avoid cutting with the head tilted at an angle that objects would be thrown towards the unit operator position.
- When clearing brush and small trees, operate unit at 1 mph ground speed and position cutter head at an angle that will cut 2' to 3' into the growth. Make the first pass just above ground level. This will remove the low branches and allow operator a better view of the material to plan for the next pass. After repeated passes, each elevated approximately 4' above the last, the main trunks of the trees will be exposed and they can be cut as desired. This avoids clogging the head with cut and mulched material.
- Open the hydraulically operated door to allow blades to reach large diameter vegetation. Operate the mower with the door closed when cutting grass, weeds, and light brush to reduce thrown objects for safer mower operation.
- When operating near the ground or when mulching be particularly careful that there are no bystanders or animals within a 100 yards. Debris tends to fly out at great speed and can injure or even cause death.

OPS-B- 0039



OPERATION

Grass Flail

- The Grass Flail head is rated for cutting grass only.
- The Grass Flail operates attached to the boom arm, and is ideal for cutting hard to reach areas where a smooth cut is required.
- Cutting height ranges from 3/4" to 4" in vegetation. Cutting height is set by adjusting the height of the roller assembly.
- When operating near the ground or when mulching be particularly careful that there are no bystanders or animals within a 100 yards. Debris tends to fly out at great speed and can injure or even cause death.

OPS-B- 0040



FML 100 Shredder

- The FML 100 Severe-Duty Shredder is designed for cutting material up to 6" in diameter and then shredding the cut debris into 3/4" diameter chips.
- It has a cutting width of 3'2".
- Suggested cutting speed is 1st gear. Slow down for thick, dense, or hard material.
- Open the retractable hood when cutting large diameter vegetation to allow access to the cutting knives. Close the hood to cut fallen limbs into 3/4" mulch size pieces.
- When operating near the ground or when mulching be particularly careful that there are no bystanders or animals within a 100 yards. Debris tends to fly out at great speed and can injure or even cause death.
- Operate tractor in lowest gear to allow shredder time to mulch limbs.

OPS-B- 0041



OPERATION

Flail

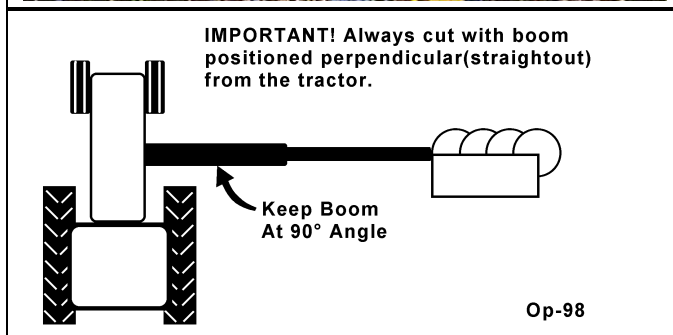
- The Flail Brush Cutter is rated to cut material up to 4" in diameter.
- Setting cutting height ranges from 3/4" to 6". Cutting height is set by adjusting the height of the roller assembly.
- Remove roller assembly when cutting limbs and other large diameter vegetation (greater than 2") to prevent damaging the roller assembly.
- When operating near the ground or when mulching be particularly careful that there are no bystanders or animals within a 100 yards. Debris tends to fly out at great speed and can injure or even cause death. OPS-B- 0042



BuzzBar® Tree Limb Cutter

- The BuzzBar Tree Limb Cutter is rated for material up to 4" in diameter.
- Suggested cutting Speed for the Buzzbar is 1st gear. Slow down for thick, dense, or hard material.
- Always cut with the boom positioned perpendicular to the limbs being cut (see diagram). Cutting with the boom swing backward or forward will cause the blades to warp from "raking" through the cut material.
- For maximum blade life, do not allow the blades to contact hard items such as the ground or metal objects.
- Check belt tension daily. If belts start to slip adjust tension soon. The more belt slippage, the more they will wear and looser they become.
- Grease bearings of saw blade spindles daily.
- Two pumps from hand grease gun.
- When operating the unit be sure there are no bystanders or animals within 100 yards of the unit.

OPS-B- 0043



OPERATION

Timber Cat

- The Timber Cat Sickle Bar Limb Cutter is rated for material up to 4" in diameter.
- The Timber Cat is operated attached to the boom arm and is ideal for trimming populated areas where a smooth cut is required.
- When operating the Timber Cat correctly the limbs fall straight down for easy disposal and clean-up.
- When operating the unit be sure there are no bystanders or animals within 100 yards of the unit.

OPS-B- 0044



Ditcher Head

- The Ditcher is designed to remove both debris and dirt from ditches.
- When operating, the Ditcher can reach from up to 12', and has a cutting width of 22".
- When operated in reverse rotation the spoil is deposited between the tractor and ditcher. When operated in forward the spoil is deposited away from the tractor.

NOTE: Creeper Gear Is Recommended! Operating with out Creeper Gear on tractor (1/4 mph) will not allow ditcher time to cut.

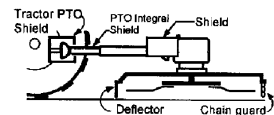
OPS-B- 0045



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)



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)



OPERATION



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)

9.4 Shutting Down the Attached Head

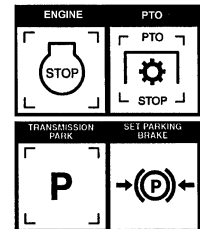
To shut down attached boom head, first bring the tractor to a complete stop. Keep the engine speed at normal operating speed of 540 RPM, and push the Motor Switch IN to the Stop position. The mower head will come to a complete stop with in 15 seconds.



Park the tractor on a level surface, place the transmission in park or neutral and apply the parking brake, shut down the engine, remove the key, and wait for all motion to come to a complete stop before exiting the tractor. OPS-B-0011_A



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)



OPERATION

10.TRACTOR, BOOM, AND ATTACHED HEAD STORAGE

Properly preparing and storing the unit 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:

- Thoroughly clean all debris from boom and head to prevent damage from rotting grass and standing water.
- Lubricate all grease points and fill oil levels according to the maintenance lubrication schedule.
- Tighten all bolts to the proper torque. Ensure all pins and other hardware are in place.
- Check the boom arm and head for worn and damaged parts. Perform repairs and make replacements so that the mower will be ready for use at the start of the next season.
- Store the unit in a clean and dry location.
- Use spray touch-up enamel where necessary on bare metal surfaces to prevent rust and to maintain the appearance of the mower.



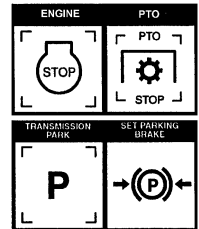
OPS-B- 0012_A



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)



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)



Perform service, repairs and lubrication according to the maintenance section. Ensure the unit is properly lubricated as specified in the lubrication schedule and all bolts and nuts are properly torqued. Failure to properly service, repair and maintain this Implement in good operating condition could cause component failure and possible serious injury or even death. (SG-35)

11.TRANSPORTING THE TRACTOR AND IMPLEMENT

Inherent hazards of operating the tractor and implement and the possibility of accidents are not left behind when you finish working in an area. Therefore, the operator must employ good judgement and safe operation practices when transporting the tractor and implement between locations. By using good judgement and following safe transport procedures, the possibility of accidents while moving between locations can be substantially minimized. OPS-U- 0017

OPERATION



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 tractor between locations, idle the tractor engine, disengage the attached head, and wait for all head motion to come to a complete stop. Place the boom in its storage cradle rest support and then turn the joystick master switch to the OFF position.



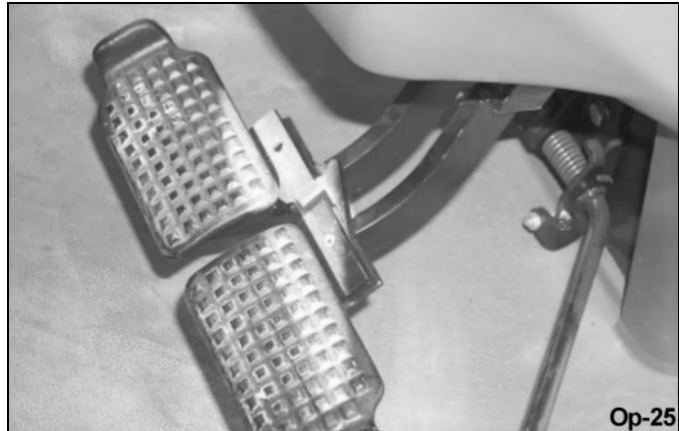
- Placing Boom Articulating Arm on Boom Arm Rest
- Extend the dipper section approximately half way out.
- Bring the Lift to its full height and carefully swing the boom back until it is just positioned over the Boom Rest. NOTE: There is a formed "V" plate on the dipper section that fits onto the boom arm rest.
- Lower the Lift until this "V" rest on the Boom Rest (this may take some re-adjustment of the dipper section).
- Place the Master Switch in to the OFF position.

The boom is now in the transport position. To remove the boom from the Boom Rest, pull the Lift back and raise the boom about 6 inches. Then Swing the boom around to the desired position.
OPS-B- 0013_A



OPERATION

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 implement at speeds greater than 20 MPH (25 kph). OPS-U- 0018

11.1 Transporting on Public Roadways

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. OPS-B- 0014

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 implement on a public roadway. Replace the SMV emblem if faded, damaged, or no longer reflective. OPS-U- 0020



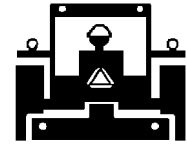
Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



OPERATION

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)



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. OPS-B-0015

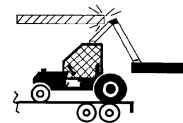


When operating on public roads, have consideration for other road users. Pull to the side of the road occasionally to allow all following traffic to pass. Do not exceed the legal speed limit set in your country for agricultural tractors. Always stay alert when transporting the tractor and mower on public roads. Especially in busy cities, the boom extends to right farther than the tractor's width, so be careful there are no bystanders, poles, large obstructions or any vehicles that may be in path of the mower head on boom. Use caution and reduce speed if other vehicles or pedestrians are in the area. OPS-B-0016



DANGER

When transporting Boom Mower on a truck or trailer, the height or width may exceed legal limits when the boom is in the transport position. Contact with side or overhead structures or power lines can cause property damage or serious injury or death. If necessary lower boom to reduce height and/or remove mowing head to reduce width to the legal limits. (SBM-8)



DANGER

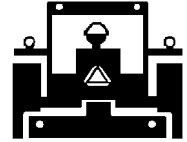
Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



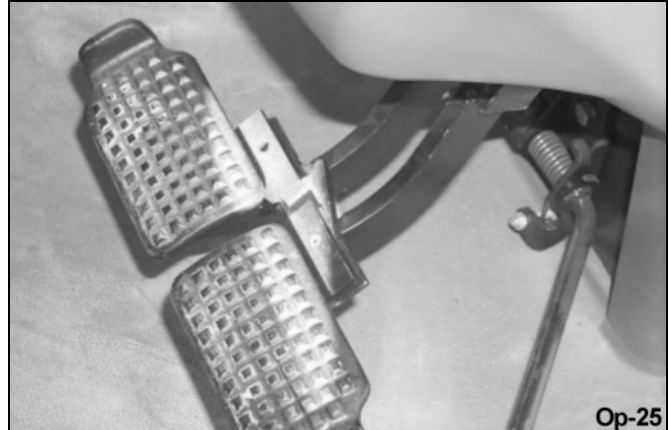
OPERATION

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)



Reduce speed before turning or applying the brakes. Ensure that both brake pedals are locked together when operating on public roads. OPS-U- 0023



OPERATION

11.2 Hauling the Tractor and Implement

Before transporting a loaded tractor and implement, 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. OPS-U- 0024



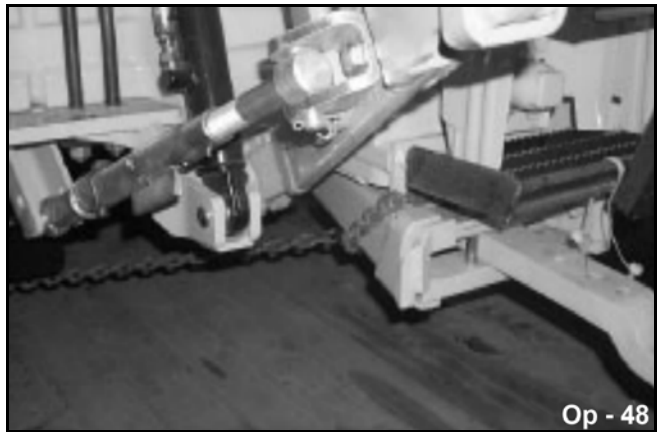
OPERATION

Use adequately sized and rated trailers and equipment to transport the tractor and implement. 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. *OPS-U- 0025*



Arrange the chains so that when tightened, the chains are pulling downward and against themselves. Carefully tighten the securing chains or other fasteners 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 implement, make occasional stops to check that the tractor and implement 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. *OPS-U- 0026*



OPERATION

OPERATION

12.TROUBLESHOOTING GUIDE

HYDRAULIC CYLINDER NOT WORKING - Check level of hydraulic fluid (see sight gauge on tank). Check to see if pump is functioning properly by attempting to use another cylinder or pressure gauge. If pump is working properly, check the pressure on the line. The relief valve may be by-passing fluid at too low pressures. If cylinder is still not functioning properly, check the line for stoppage. The pistons in hydraulic cylinders are virtually trouble-free, but occasionally one will have a scored wall and allow oil to flow around the piston. In this case, replace the cylinder.

NOTE: Refer to repair parts section on valve bank settings on individual relief cartridges.

HYDRAULIC MOTOR NOT WORKING - Check lines for kinks or pinched place. If the motor is "bogging down" under load, recheck the relief valve setting on the cutter valve - 2500 P.S.I.

HYDRAULIC VALVE - Failures in the hydraulic system are almost always caused by other elements in the system other than the valve; so the entire system should be checked before the valve is changed. A malfunction in any hydraulic valve section will require replacement of that section (but not the replacement of the valve bank) since the insides are honed to fit individually. Attachments such as the relief valves and detent may be serviced individually.

STRUCTURAL MEMBERS - Failure in structural members generally results from rough treatment. While they are constructed to withstand abuse, they cannot be made strong enough to withstand abnormal abuse. The factory does not warrant these parts to any extent other than in normal use in grass, weeds, brush, small bushes, and small trees which the unit is designed to cut.

MAINTENANCE SECTION

Maintenance Section 4-1

MAINTENANCE

MAINTENANCE

LUBRICATION INFORMATION

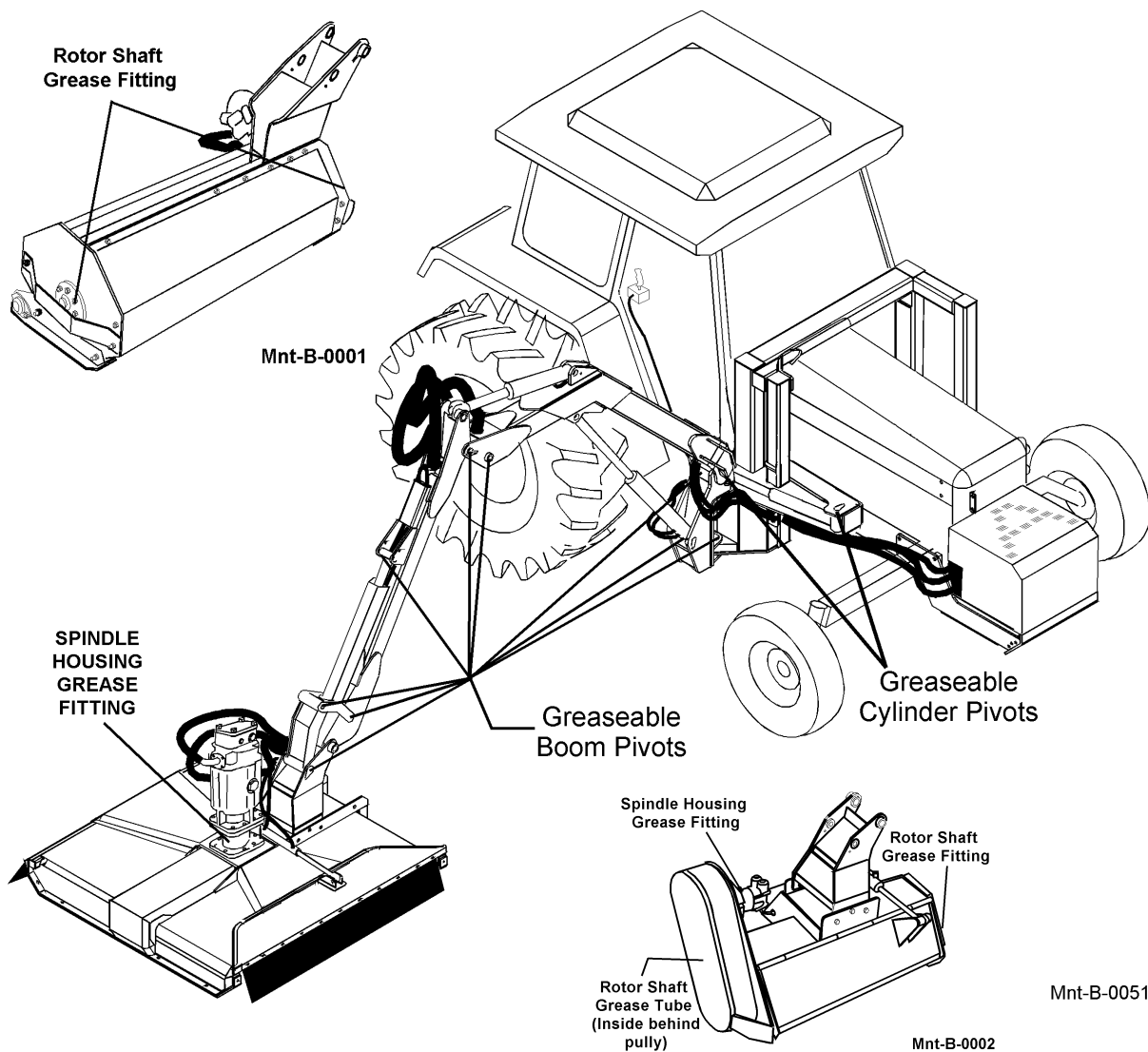
Before operating your Samurai, take the time to inspect and repair any damage to the machine or tractor. Only a minimum of time and effort is required to regularly maintain this machine to provide long life and trouble free operation.

BOOM ARM:

Your Samurai Boom uses Teflon bushings that need no lubrication.

MOWER HEAD:

The Spindle Housing on the Samurai Mower head should be serviced daily (every eight hours of operation) to achieve the best operation and the longest life. Fill with NLGI EP#2 Grease.



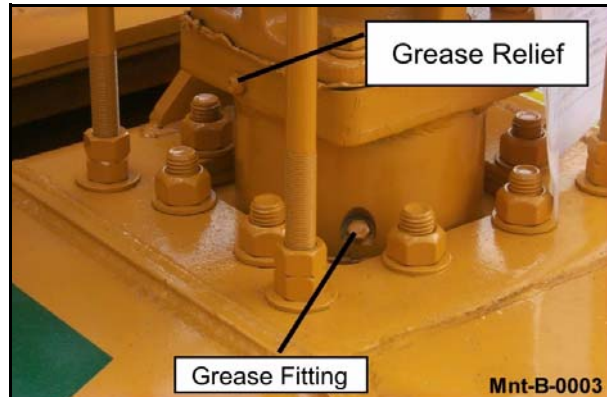
MAINTENANCE

If possible, it is best to check the spindle oil level after the machine has been operated. This will allow the oil to flow easier.

Position the head vertical as shown in **Figure MntP-B-0002**. Remove the breather/check plug from the square portion of the spindle housing. Remove the fill plug and fill with NLGI 000 grease (Alamo P/N 00765444) until it comes out of the breather/check hole in the square portion of the spindle housing. See **Figure MntP-B-0003**. Replace breather/check plug and fill plug.

FML 100 HEAD:

Position the head horizontal and lower to the ground. Remove the filler/breather from the top of the spindle housing. Remove the check plug from the side of the housing. Fill the spindle through the top hole until it comes out of the side check hole. Replace the filler/breather and check plug.



HYDRAULIC OIL, FILTERS, AND COMPONENTS

Filters and Oil - Change the Pressure Filter after the first 100 hours of operation. Change the filter again at 400 hours or every 12 months. Change the oil after the first 400 hours of operation. After that, the oil every 800 hours or every 12 months. Refer to decal for proper oil viscosity for operating conditions.

If the Mower head cuts off or loses power it may be an indication that the Pressure Filter needs to be changed

Change Filter element of filter on pressure port of valve when indicator is red in color. Indicator can be found on top of the filter housing. Replacement Filter element Part No. is 02976067.

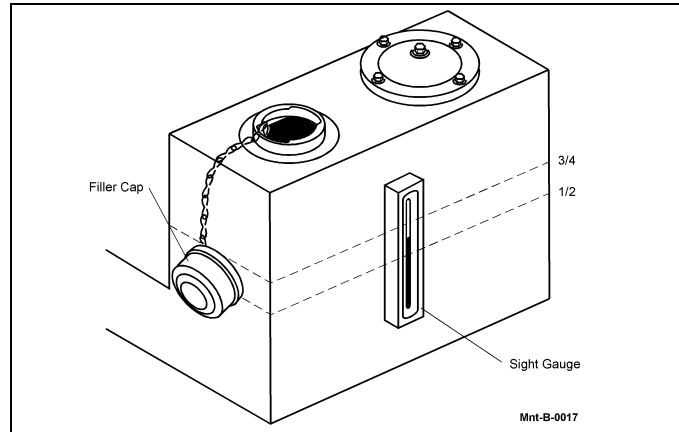
Keep all hoses and adapters tight. Repair any leaks immediately. Do not overtighten hose end fittings. Tighten to specifications only. (See Chart Below)

Check the hydraulic oil level daily.

MAINTENANCE

TANK FILL

Check the sight gauge and add hydraulic fluid (Refer to list of recommended fluids) to bring the level up between 1/2 to 3/4 on the gauge. See Figure MntP-0017.



RECOMMENDED HOSE END TORQUE VALUES FOR 37 DEGREE ANGLE STEEL HOSE END FITTINGS

DASH SIZE	NOMINAL SIZE (IN.O)	TORQUE (IN.LBS.)	VALUE* (FT.LBS.)
-4	1/4	140	12
-6	3/8	230	19
-8	1/2	450	38
-10	5/8	650	54
-12	3/4	900	75
-16	1	1200	100
-20	1-1/4	1600	133
-24	1-1/2	2000	167
-32	2	2800	233

* Straight threads do not always seal better when higher torques are used.
Too much torque causes distortion and may lead to leakage. Mnt-B-0004

BLADES

Check the Blades for cracks and wear and Blade Bolts for tightness, daily. Blades should be replaced when they are worn excessively, bent, deformed, or out of balance.



Blades should always be replaced in pairs. Blades of different weights can cause serious imbalance and damage to the machine and personnel. When replacing blades, take care to replace the blade bolts, nuts, and washers.

MAINTENANCE

HARDWARE

Most nuts and bolts will stay tight and therefore need only periodic checking. However, the following nuts and bolts are extremely important and should receive special attention:

Spindle Housing Bolts: Tighten to 400 Ft./Lbs. Torque

Blade Bolts: Tighten to 400 Ft./Lbs. Torque

Blade Bar To Spindle Bolts: Tighten to 400 Ft./Lbs. Torque



WARNING

Be certain to clamp or securely support the Spindle Housing and subassemblies to prevent injuries to hands and feet due to inadvertent dropping or falling over.



WARNING

Always wear safety glasses and gloves to prevent eye and hand injury when chiseling or hammering on metal components. Hardened metal will chip unexpectedly.



WARNING

An assembled spindle housing is quite heavy. Use a hoist or get help to handle them safely. Lift carefully and properly using your legs to lift - NOT YOUR BACK.

MAINTENANCE

MAINTENANCE




PROPER TORQUE FOR FASTENERS

The chart lists the correct tightening torque for fasteners. When bolts are to be tightened or replaced, refer to this chart to determine the grade of bolts and the proper torque except when specific torque values are assigned in manual text.





RECOMMENDED TORQUE IN FOOT POUNDS UNLESS OTHERWISE STATED IN THE MANUAL *

NOTE: These values apply to fasteners as received from supplier, dry or when lubricated with normal engine oil. They do not apply if special graphited or molydisulphide greases or other extreme pressure lubricants are used. This applies to both UNF fine and UNC coarse threads.

Proper Torque values for bolts that are measured in Inches

Bolt Diameter			
	Head Marking No Marks Grade Two	Head Marking Three Lines Grade Five	Head Marking Six Lines Grade Eight
	Pound - Foot Value Dry	Pound - Foot Value Dry	Pound - Foot Value Dry
1/4"	5.5	9	12.5
5/16"	11	18	26
3/8"	20	33	46
7/16"	32	52	75
1/2"	50	80	115
9/16"	70	115	160
5/8"	100	160	225
3/4"	175	280	400
7/8"	175	450	650
1"	270	675	975
1-1/8"	375	850	1350
1-1/4"	530	1200	1950
1-3/8"	700	1550	2550
1-1/2"	930	2100	3350

Proper Torque values for Metric bolts

Bolt Diameter				
	Head Marking 4.8	Head Marking 8.8 or 9.8	Head Marking 10.9	Head Marking 12.9
	Pound - Foot Value Dry	Pound - Foot Value Dry	Pound - Foot Value Dry	Pound - Foot Value Dry
6mm	4.5	8.5	12	14.5
8mm	11	20	30	35
10mm	21	40	60	70
12mm	37	70	105	120
14mm	60	110	165	190
16mm	92	175	255	300
18mm	125	250	350	410
20mm	180	350	500	580
22mm	250	475	675	800
24mm	310	600	850	1000
27mm	450	875	1250	1500
30mm	625	1200	1700	2000

To get Newton-Meters multiply pound-foot of torque by 1.356

Mnt-B-0005

MAINTENANCE

SERVICE OF SPINDLE HOUSING (FIGURE Mnt-0006)

Remove blade bar or pan.

Remove hydraulic motor.

Remove spindle housing from unit.

Drain remaining oil from housing.

Using a chisel, bend the tang on the lockwasher (6) until it is free from the slot in the nut (5).

Unscrew locknut and remove locknut and lockwasher, and second locknut.

The Spindle should now slide from the Spindle housing, so the Spindle can be removed from the Housing.

Remove the Seal (7) from the Housing

REMOVING BEARINGS:

If replacing bearings:

Remove the old bearings from the Spindle and Housing. Be careful not to damage either the Spindle or Housing in this process.

Turn the spindle housing over and from the bottom side of the spindle housing, using a punch, drive the remaining bearing cup out.

Clean spindle housing, spindle and bearings thoroughly.

When rebuilding the spindle housing assembly, always replace the locknuts, lockwasher, and seal.

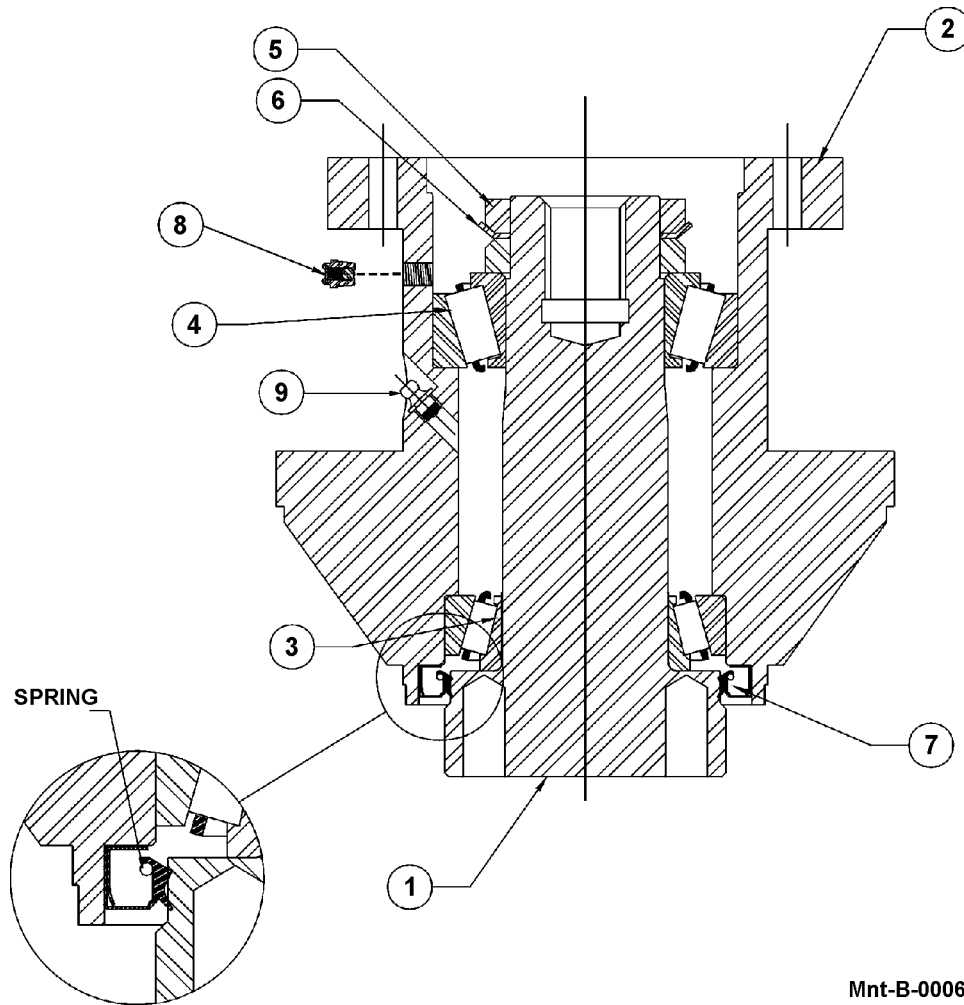
INSPECTION:

Bearing and cups:

Inspect bearings and bearing cups for nicks, pitting, discoloration and wear. If any exist, replace bearing and bearing cup.

MAINTENANCE

MAINTENANCE



Mnt-B-0006

ASSEMBLY

Make sure all parts are clean and free of any contamination

Install Bearing Cups (3 & 4) into Spindle Housing (2) using a suitable bearing driver to seat the cups. Caution must be taken not to damage the cup or spindle housing, cups must be fully seated. If Cups are damaged during installation or not fully seated, bearing and spindle assembly life are greatly reduced!

Never drive against bearing surface! Never used the mating bearing cone to seat the cup!

Once the Lower Cup is installed, the seal may be installed. The seal should be installed with the spring towards the inside Press seal (7) into spindle housing, make sure seal is fully seated. Be careful not to damage seal!

Press the Lower Cone (3) on the spindle shaft (1) use the proper tool when pressing the bearing onto the shaft, driving against the inner race and not the rollers or cage. Any damage to the bearing will cause premature failures of the bearing and spindle assembly.

MAINTENANCE

MAINTENANCE

Before installing the spindle (with the bearing pressed on it), lubricate the rubber portion of the seal. This will reduce the chance of the Seal being torn by the installation of the spindle and is a necessary step when setting the rolling Torque.

Turn the Spindle Housing Upside Down and insert the spindle (with the bearing pressed onto it) into the spindle housing until the bearing cone contacts the cup in the Housing. During this step take care not to damage the seal.

While supporting the Spindle and Housing turn the assembly over so that the assembly is setting on the spindle.

Install the upper bearing (4) on the spindle shaft (1).

After the Upper Bearing is installed, install the nut (5) with the chamfer facing up. Run the nut down against the bearing, but do not torque the nut at this time. Clamp the spindle Housing in a vise so that the spindle shaft can rotate. Tighten the nut until the spindle shaft has a rolling torque of 25 in-lbs (that is it takes 25 in-lbs to rotate the spindle shaft).

Install the tanged lockwasher (6) with the outside prongs facing upward.

Install the top nut (5) with the chamfer facing down. Block the spindle to keep it from rotating and torque the top nut to a minimum of 100 ft-lbs. Bend the tang of the lockwasher to fit into one of the grooves of the top nut.

Install vent plug (8) and Grease Fitting (9).

Fill spindle assembly with NLGI EP#2 Grease (Approx 22 oz.).

IMPORTANT

ALAMO GENUINE FLAIL PARTS

ALAMO INDUSTRIAL Flail Mowers use dynamically balanced and matched system components for Cutter Shafts, Knives, Knife Hangers, Rollers, Drivetrain components, Bearings, Belts, and Pulleys. ALAMO INDUSTRIAL parts are made and tested to meet close-tolerance specifications of balance, quality, and consistency that assure long, trouble-free service.

The use of inferior "will fit" parts will void warranty for your ALAMO INDUSTRIAL implement and may cause premature or catastrophic failure which can result in serious injury or death. If you have any questions concerning the repair parts you are using, contact ALAMO INDUSTRIAL 1502 E. Walnut Seguin, TX 78155 (830) 372-3551.



03200432

MAINTENANCE

START UP PROCEDURE

1. Read all safety instructions. Decals on the Samurai Boom warn you of particular and multiple hazards. Many decals are attached close to part of the Samurai Boom where there is a possible hazard. Read and make sure you understand the safety messages before you operate the Samurai Boom. Keep all decals clean and readable. Replace lost or damaged decals.
2. Before operating, read all the safety and operating instructions in the Operators Manual for both the tractor and mower.
3. When the hydraulic tank has been filled and the mower unit properly assembled, the unit should be started up. **NOTE:** Make sure that no materials, tools, or jacks, have been left under the mower head. Make sure the front and rear of the mower are properly guarded to prevent any foreign objects from being thrown by the mower. All other workers should be kept a safe distance from the unit before the mower is started.
4. Start the tractor and idle at a slow engine speed until oil is being pumped.
5. Engage the Cutter Control Valve at low engine rpm and run the mower slowly for a short period until all air is removed from the hoses. Keep all persons WELL CLEAR of mower since Blades can THROW OBJECTS with great velocity for a considerable distance! KEEP CLEAR!
6. With the area clear of any ground and overhead obstructions, work each cylinder on the boom one at a time, several times, to expel any air in the Hoses and Cylinders.
7. Run the Mower Head for 5 minutes. While the tractor is idling, blocked, wearing protective clothing and eye protection, **CAREFULLY** check for leaking hydraulic fittings, hoses and ports at this point with a piece of cardboard, **DO NOT USE YOUR HAND!** If any are found stop the tractor immediately and correct any leaky connections.
8. Check the fluid level in the Hydraulic Tank on the Tractor, and add oil if required. As the air has been forced out of the Cylinders and Hoses, it goes into the Hydraulic Tank and reduces the oil level. Check your Tractors Operators Manual for the proper level and type of oil to be used.

MAINTENANCE

MAINTENANCE

TIMBER CAT HEAD

Lubrication/Daily Checks (Figure Mnt-0007)

Lubricate the grease fittings on top of the blade bar every 4 hours. See **Figure Mnt-0007**.

Every 8 hours, lubricate the cylinder grease fitting through the top slot in the cover. See **Figure Mnt-B-0007**. Every 8 hours, check all bolts and nuts for proper tightness. Tighten any bolt or nut found to be loose. Periodically check the hydraulic connections for oil leaks. Visually inspect the hoses for damage and replace as necessary. Periodically inspect blade stroke adjustment by running the head at normal operating speed (540 PTO RPM)

and checking that the upper and lower blades line-up perfectly the instant of reversal (when they change direction).

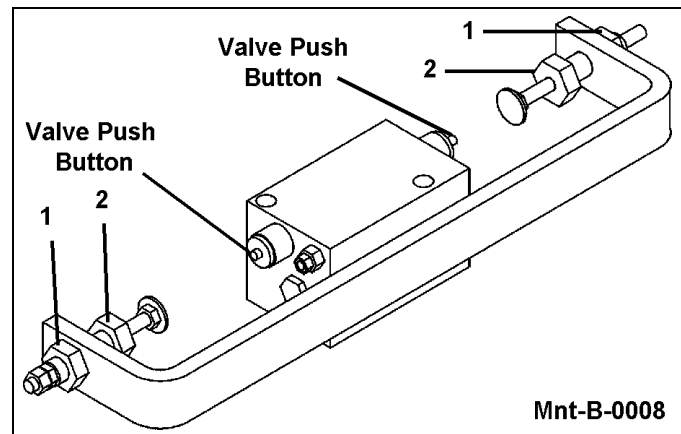
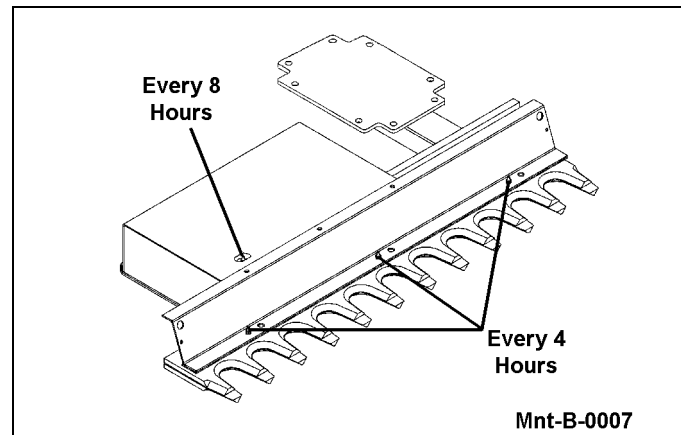
Improper adjustment is also indicated by an abnormally high shock load on the hydraulic system during blade reversal. This is due to the hydraulic cylinder reaching its stroke limit, causing the pressure relief reversing components to engage. Continuous operation in this mode will result in oil overheating and premature failure of components. If the unit is improperly adjusted, follow the stroke adjustment procedures below.

Stroke Adjustment (Figure Mnt-B-0008)

Position the head in a safe area for operation. If necessary, barricade the head to prevent contact while it is being operated.

Remove the cover and loosen the two jam nuts (Item 1). See **Figure Mnt-B-0008**. Screw the two spring bolt assemblies (Item 2) in toward the valve push buttons. Start the unit and bring the speed up to normal operating speed (540 PTO RPM). Check the blade overlap. Adjust the spring bolt assemblies (Item 2), one by one until the upper and lower blades perfectly align in the instant of reversal. Never adjust the bolt assemblies to a point where the hydraulic cylinder reaches its stroke limit!

This is indicated by an abnormally high shock load on the hydraulic system due to the pressure relief reversing components being engaged. Continuous operation in this mode will cause premature component failure and hydraulic oil overheat. Once proper adjustment has been achieved, tighten the jam nuts (Item 1) and replace cover.



MAINTENANCE

BUZZBAR HEAD

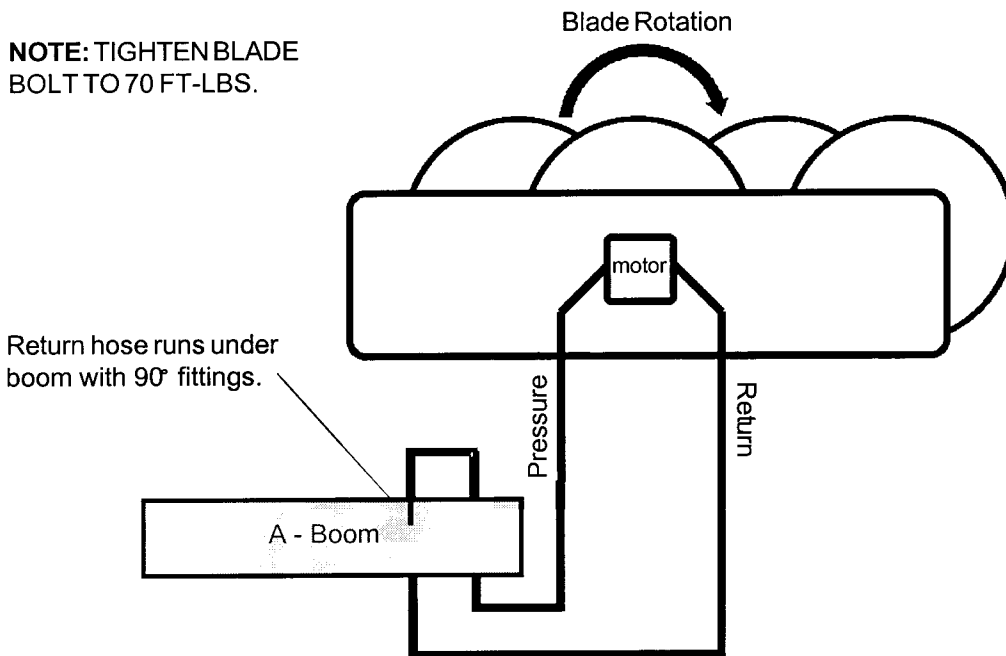
BLADES

For best performance, have blades set and sharpened when they begin to dull. Blades can be touched up with a grinder or file between sharpenings.

To extend the life of the blade, remove resin accumulations. When the resin builds up, the blades will "burn" in the cut, causing the blades to overheat and warp. When cutting some types of trees, blades will need to be cleaned every few hours. To remove the resin, use oven cleaner or lacquer thinner with a Scotch-Brite pad or steel wool. Apply these products carefully since many of them will remove paint from your BuzzBar. Always follow manufacturer's instructions for safe use.

Blades should turn clockwise when views from the top.

See illustration below for hose routing.



Mnt-B-0009

LUBRICATION

Grease each spindle with one pump of high quality lithium grease weekly. More than one pump is unnecessary and will cause extra grease to spill from the relief.

Grease fittings are located in front of the machine, just above the blades.

MAINTENANCE

MAINTENANCE

BELT TENSION ADJUSTMENT (Figure Mnt-B-0010)

Loosen nuts on the 4 studs and the jam nut.

Use a hand wrench or socket to tension the belts.



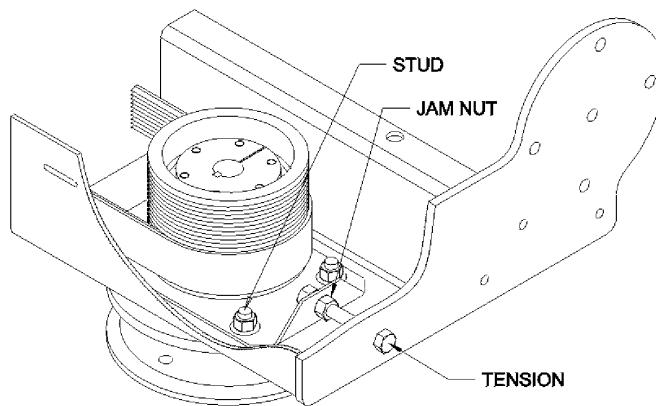
Never use power or air equipment to tighten belt! This could cause damage to belt, sheave, shaft and bearings

Once the belts begin to tighten, small adjustments will produce large changes in tension.

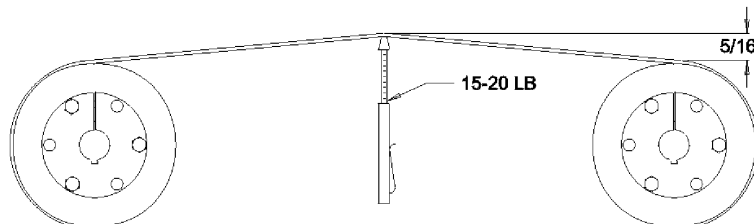
Belts should be tensioned 15-20 lbs of force for 5/16 inches deflection.

Tighten nuts on studs and jam nut to hold tension.

BELT TENSION ADJUSTMENT



**MEASURE FORCE AND DEFLECTION
WITH BELT TENSION METER**



Mnt-B-0010

MAINTENANCE

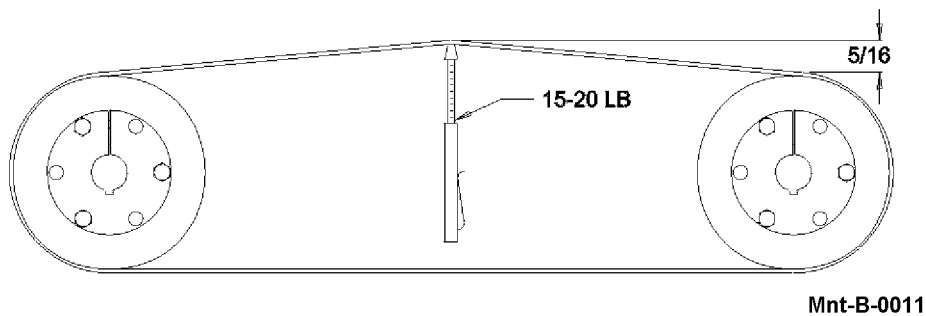
LUBRICATION

Grease each spindle with one pump of high quality lithium grease weekly. More than one pump is unnecessary and will cause a mess when extra grease squirts out of the relief.

Grease fittings are on front of machine, just above the blades.

Belts:

Check the belt tension daily. Your buzzbar is equipped with high performance Micro-V belts that run much tighter than regular V-belts. The belts should be tensioned to 15 to 20 lbs. of force for 5/16 of an inch of deflection.



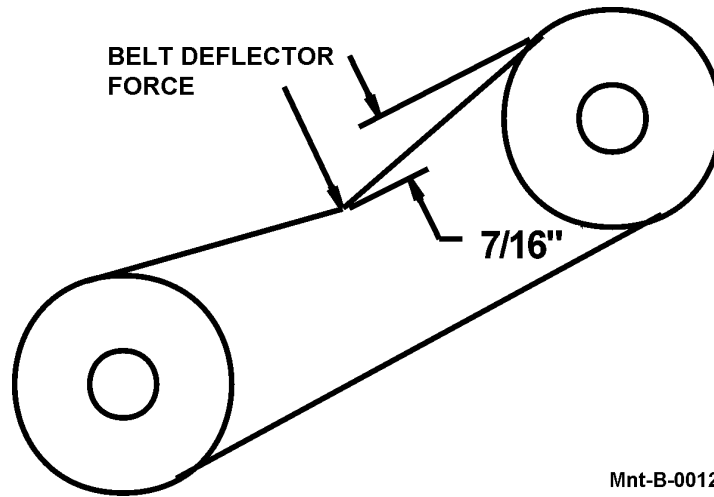
If belts begin to slip, check tension.

To tighten the belts, loosen the four nuts that hold the spindle to the body of the machine. Then use a hand wrench or socket to turn the bolt that tensions the belt. Never use power tools to tighten belt. Once the belts begin to tighten, small adjustments will produce large changes in belt tension.

Too much tension can cause premature bearing, sheave, and belt damage.

MAINTENANCE

FLAIL AXE HEAD



Mnt-B-0012

BELT TENSION

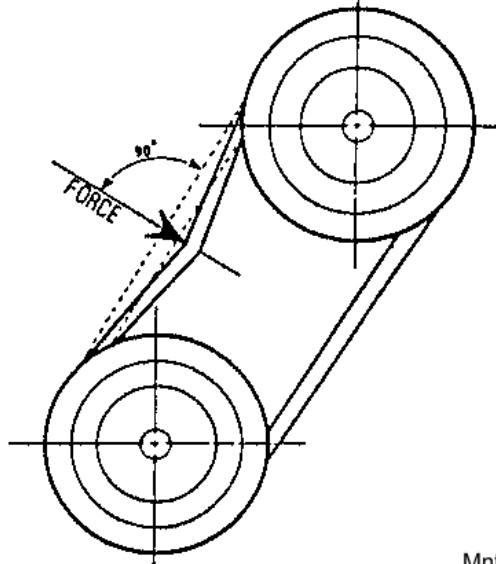
When installing new belts, tighten belts to obtain a 16 lb. Belt Deflector Force at 7/16" deflection. After a few hours of operation to allow the belts to seat into the sheave grooves recheck and adjust as needed to obtain an 8 to 12 lb. Belt Deflection Force at 7/16" deflection. Inspect belts and recheck belt tension periodically to maintain an 8 to 12 lb. Belt Deflection Force at 7/16" deflection.

MAINTENANCE

MAINTENANCE

MAINTENANCE

Grass Flail Head



Mnt-B-0049

Tensioning Drive Belts

The rotor shaft is driven from the gear motor via “V” belts which are adjustable for tension. After stopping the tractor engine, remove the drive guards to tighten the belts. Check the tension by applying a force of 6.17 - 7.72 lbs at right angles to the belt in the centre of the two pulleys. If the deflection is great than 1/4” then release the motor mounting plate screws and adjuster locknut and screw the adjuster to tighten the belts until the deflection is 1/4”. Then, tighten the locknut, recheck the belt tension, and replace the belt cover.

IMPORTANT: Do not overtighten belt as this may cause premature failure of the rotor shaft and motor bearings.

MAINTENANCE

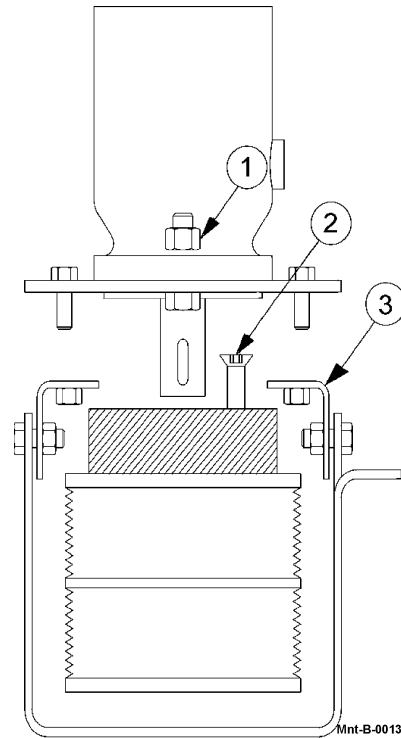
MOTOR & COUPLING INSTALLATION

Bolt motor to mount plate. Fully tighten bolt (Item 1).

Install flex coupler to the quick disconnect pulley hub using the countersunk socket head bolts (Item 2). Apply thread locking compound to the bolts. Tighten bolts to 45 FT-LB. Attach motor mount angle brackets, (Item 3) to the channel frame, leave bolts loose.

Insert motor shaft into flex coupling and allow motor to "find its center."

Adjust motor up as needed to provide ample clearance between the top of flex coupling and the motor. Bring angle brackets up to motor mount plate and tighten the bolts.

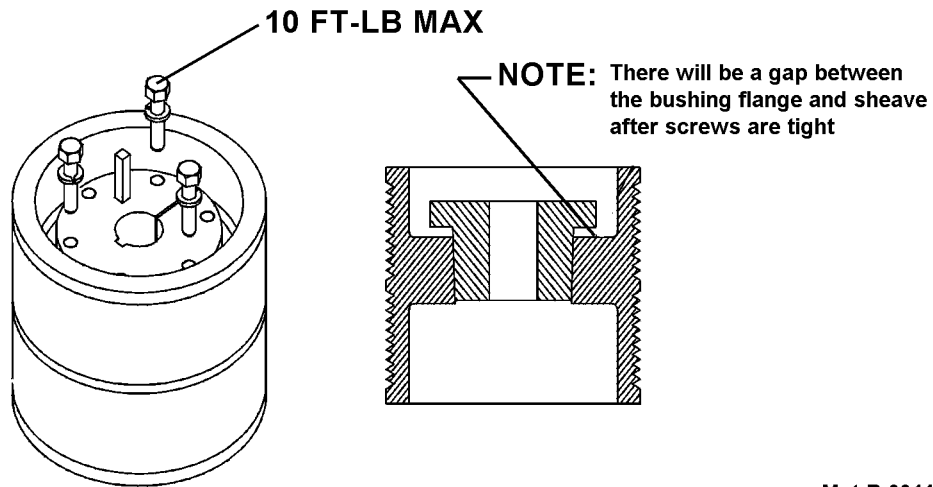


MAINTENANCE

MAINTENANCE

TAPER BUSHING & SHEAVE INSTALLATION

Do not use lubricants during installation as this may cause sheave breakage.



Mnt-B-0014

Make sure the bushing and bore of the sheave are free of dirt, paint, metal chips, etc.

Insert cap screws and lockwashers engaging only 2 or 3 threads.

With key in the keyway, slide the loosely assembled unit onto the shaft and position for good belt alignment. Temporary shimming under the pulley may make it easier to position.

Carefully tighten cap screws alternately and progressively until tapers are seated (about 5 FT-LB).

Check sheave alignment and runout (wobble).

Continue careful alternate and progressive tightening of cap screws to 10 FT-LB.

Maximum torque should be achieved on each individual bolt only two times.

MAINTENANCE

General Information on Flail Mower Vibration

FLAIL MOWERS INFORMATION BULLETIN NO. 5

EXCESSIVE VIBRATION

Vibration is a **MONSTER** and if allowed to continue unchecked, can cause the complete break-up of a machine in a very short time.

A properly operated Flail Mower will produce very little vibration. If vibration does occur, the mower should be stopped and the trouble corrected, as warranty does not cover failures resulting from continued operation after something happens to cause the mower to vibrate excessively.

Vibration is caused by a rotating part which is out of balance. This could be the cutter shaft or, on those models having a universal slip joint assembly drive shaft, from the drive shaft.

If the two extreme ends of the drive shaft, (the yoke splines which fit on the tractor power take off shaft and on the mower gear box driven shaft), are not parallel, vibration will be evident.

This is because of the mechanics of a universal drive wherein the rotational speed thru a universal joint is not uniform. If the ends of a universal drive shaft are parallel, the uneven rotation effect is cancelled out and the machine being driven will be driven at a uniform rate of speed. However, if the ends are not parallel, the uneven rotation effect may be multiplied, resulting in a speeding up and slowing down of the entire mower system (gear box, extension shaft, pulleys, belt, and cutter shaft) each revolution. This effect can be readily noticed if the mower, while running, is raised to an extreme height on the tractor lift.

For smoothest operation, the tilt of the mower should be adjusted (on a 3-point hitch, by adjusting the length of the top link between the tractor and the mower) so that the ends of the drive shaft are parallel when the mower is down in operating position. Raising the mower, while running, to extreme heights on the lift should be avoided.

To check where the vibration is originating, first be sure the ends of the universal drive shaft are parallel. Then, if vibration is still present, remove the drive belt and run the mower. If vibration is still present, it most likely is coming from and caused by a bent drive shaft. If so, the shaft should be replaced or straightened. If the vibration is gone - the drive portion of the mower is running smoothly - then the vibration is probably coming from the cutter shaft (it could be a pulley out of balance or a faulty belt with a varying cross section, but this is not likely).

MAINTENANCE

The cutter shaft will run out of balance if:

1. Wire, rope, string, rags, etc., around the cutter shaft, are holding the knives in a folded back position. Remove such foreign objects and be sure all knives are free to swing to the extended position.
2. Knives are missing or broken. Replace missing or broken knives.
3. Knife hanger lugs are broken off shaft. This condition usually results from continued operation in contact with large hard objects where the knife hanger lugs themselves are hitting the hard objects. Lugs should be replaced using arc welding equipment so as not to direct too much heat in one area of the shaft.
4. Cutter shaft ball bearings are worn enough to have radial "play" in them. Replace ball bearing and other worn parts to eliminate "play".
5. Shaft is bent. The shafts are straight within a couple of thousandths of an inch when they are made. It is possible that they will become bent in use, such as if the shaft is hooked on a stump while the tractor is moving forward at a good speed.
6. Shafts are operated at improper speed. Rotating shafts have what is known as a natural period of vibration. The same is true of the cutter shafts on the Flail Mowers.

The actual speed at which the harmonic will occur will vary with each mower and each installation. To avoid this harmonic vibration when operating the mower, it may be necessary to adjust the engine speed of the tractor up or down.

Some units have a harmonic which occurs below the nominal operating speed. On these units, it will be noticed that there is always a little vibration at a particular RPM as the mower is being sped up to operating speed. This occurs as the shaft passes through its normal harmonic vibration point. As long as the mower is opened at the proper speed, then harmonic vibration will not be an issue.



Be certain to clamp or securely support the Spindle Housing and sub-assemblies to prevent injuries to hands and feet due to inadvertent dropping or falling over.



Always wear safety glasses and gloves to prevent eye and hand injury when chiseling or hammering on metal components. Hardened metal will chip un-expected.



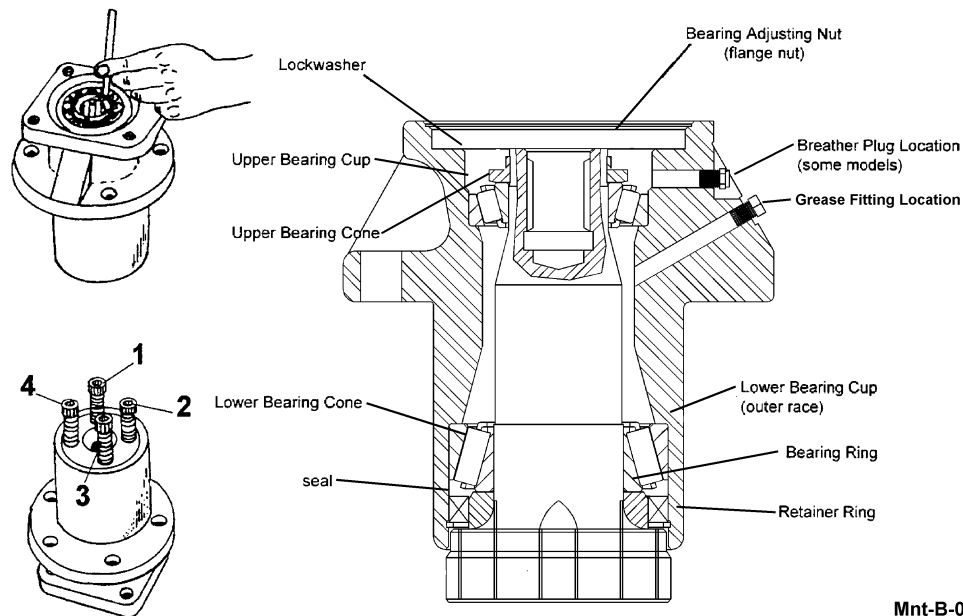
An assembled spindle housing is quite heavy. Use a hoist or get help to handle them safely. Lift carefully and properly using your legs to lift - NOT YOUR BACK.

MAINTENANCE

MAINTENANCE

SPINDLE SERVICE PROCEDURE 02960553B and 02960553C

1. Remove blade bar or pan.
2. Remove hydraulic motor.
3. Remove spindle assembly from mower deck.
4. Drain remaining lubricant from housing.



Mnt-B-0015

5. Using a 3/16" cape chisel, bend out the staking indentations on each side of the bearing adjusting nut. To do this, place the chisel in the groove and parallel to the shaft. Drive the chisel downward until the indentation is free of the shaft and threads (see Figure 1).
6. Using the same chisel, straighten the tang on the lockwasher (if equipped with a lockwasher).
NOTE: The lockwasher will not be installed during assembly if the spindle uses the staked adjusting nut.
7. Remove bearing adjusting nut and lockwasher (if equipped). Discard these parts. They are not re-usable. Install a new adjusting nut when assembling.
8. Screw the original blade bar bolts into the flange of the spindle shaft until they contact the bearing ring (see Figure 2).
9. In a clockwise pattern, rotate each bolt 1/4 turn (see Figure 3). Continue turning the bolts 1/4 turn at a time (maximum of 3 turns), until the special shanked bolts (P/N 02964353) will thread into the spindle.
10. Remove the original bolts and replace them with the shanked bolts. Screw the shanked bolts in until they contact the bearing ring.
11. In a clockwise pattern, rotate the bolts 1/4 turn at a time until the spindle is free from the housing.
12. Remove the seal retaining ring from the housing using a flat screwdriver or similar tool.
13. Remove the seal and bearing.
14. A punch or similar tool can be used to remove the bearing cups from the housing if the cups are not to be re-used.

MAINTENANCE

CLEANING

1. Clean housing and all related parts thoroughly and dry.
2. Protect parts from contamination.

INSPECTION

Bearings and cups: Inspect rollers, races, and cages for nicks, pitting, discoloration, and signs of excessive or unusual wear. Replace any worn or damaged parts.

Spindle shafts: Inspect the threads, internal splines, and bearing journals for damage or wear. Replace if damaged or worn.

Bearing ring: Inspect the ring for wear in the area of seal contact. Replace if a wear groove exists.

Housing: Inspect the bearing cup bores, ring grooves, etc. for wear or damage. Repair or replace if any damage is found.

ASSEMBLY

Tools needed:

Hand tools Hydraulic press, Inch pound torque wrench, Seal Installers, Bearing drivers (do not use punches to install bearings) Adjusting nut socket 2-3/4" ID x 8" long, 16 Ga. tubing

NOTE: *This procedure should not be attempted in the field due to the need for tools normally only found in the shop.*

1. Place upper bearing cones in bearing oven.
2. Seat bearing cups (outer races) in housing using a press and proper installation tools in good condition. CUPS MUST BE FULLY SEATED. If bearing cup cocks in bore and seizes, do not continue to assemble spindle.
3. Lubricate lower bearing cone with LPS.
4. Coat the outside of the seal with silicone and install the lower bearing, seal, and retaining ring into the housing, using the correct seal installer.
5. Place a light film of silicon or permatex on the inside diameter of the bearing ring and seat the ring on the spindle shaft, using the proper tool and press.
6. Lightly lubricate the lip of the seal.
7. Using the 2-3/4" tubing to prevent the cup and cone from contacting each other, press the spindle shaft through the lower bearing and seal. Make sure the bearing is seated against the bearing ring.
8. Place Loctite on threads of the bearing adjusting nut (flange nut).
9. Using gloves, install the heated upper bearing cone on the shaft immediately and push it all the way against the cup. Lubricate the bearing with LPS.
10. Install the bearing adjusting nut. Tighten the nut until the spindle shaft can not be turned. Loosen the nut 1/4 turn. Place a soft, clean cloth over the top of the spindle assembly. Place an aluminum block over the end of the spindle shaft and strike the block with a hammer to loosen the bearing.

MAINTENANCE

11. Remove the cloth, being careful not to allow any contamination into the spindle. Tighten the nut until a rolling torque of 16-21 inch-pounds is reached. (If the seal was not lubricated, add 10 inch-pounds).
12. Stake the nut with a blunt, round nosed punch. Do not tear the nut.
13. Install the grease fitting into the hole in the center of the housing (between the bearings) and fill the housing with EP#2 grease, stopping when the lubricant covers the upper bearing (approximately 11 oz.).
14. Install the breather plug in the top hole.
15. Install spindle in mower deck and assemble in reverse order. Torque the blade bar or pan bolts to 400 ft-lbs. Torque motor to spindle bolts to 85 ft-lbs. Torque spindle to deck bolts at 175 ft-lbs.

MAINTENANCE

ALAMO-INDUSTRIAL

LIMITED WARRANTY

1. LIMITED WARRANTIES

- 1.01. Alamo Industrial warrants for one year from the purchase date to the original non-commercial, governmental, or municipal purchaser ("Purchaser") and warrants for six months to the original commercial or industrial purchaser
- 1.02. Manufacturer will replace for the Purchaser any part or parts found, upon examination at one of its factories, to be defective under normal use and service due to defects in material or workmanship.
- 1.03. This limited warranty does not apply to any part of the goods which has been subjected to improper or abnormal use, negligence, alteration, modification, or accident, damaged due to lack of maintenance or use of wrong fuel, oil, or lubricants, or which has served its normal life. This limited warranty does not apply to any part of any internal combustion engine, or expendable items such as blades, shields, guards, or pneumatic tires except as specifically found
- 1.04. Except as provided herein, no employee, agent, Dealer, or other person is authorized to give any warranties of any nature on behalf of Manufacturer.

2. REMEDIES AND PROCEDURES.

- 2.01. This limited warranty is not effective unless the Purchaser returns the Registration and Warranty Form to Manufacturer within 30 days of purchase.
- 2.02. Purchaser claims must be made in writing to the Authorized Dealer ("Dealer") from whom Purchaser purchased the goods or an approved Authorized Dealer ("Dealer") within 30 days after Purchaser learns of the facts on which the claim is based.
- 2.03. Purchaser is responsible for returning the goods in question to the Dealer.
- 2.04. If after examining the goods and/or parts in question, Manufacturer finds them to be defective under normal use and service due to defects in material or workmanship, Manufacturer will:
 - (a) Repair or replace the defective goods or part(s) or
 - (b) Reimburse Purchaser for the cost of the part(s) and reasonable labor charges (as determined by Manufacturer) if Purchaser paid for the repair and/or replacement prior to the final determination of applicability of the warranty by Manufacturer.

The choice of remedy shall belong to Manufacturer.

- 2.05. Purchaser is responsible for any labor charges exceeding a reasonable amount as determined by Manufacturer and for returning the goods to the Dealer, whether or not the claim is approved. Purchaser is responsible for the transportation cost for the goods or part(s) from the Dealer to the designated factory.

3. LIMITATION OF LIABILITY.

- 3.01. MANUFACTURER DISCLAIMS ANY EXPRESS (EXCEPT AS SET FORTH HEREIN) AND IMPLIED WARRANTIES WITH RESPECT TO THE GOODS INCLUDING, BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- 3.02. MANUFACTURER MAKES NO WARRANTY AS TO THE DESIGN, CAPABILITY, CAPACITY, OR SUITABILITY FOR USE OF THE GOODS.
- 3.03. EXCEPT AS PROVIDED HEREIN, MANUFACTURER SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO PURCHASER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS, OR DAMAGE CAUSED OR ALLEGED TO BE CAUSED DIRECTLY OR INDIRECTLY BY THE GOODS INCLUDING, BUT NOT LIMITED TO, ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES RESULTING FROM THE USE OR OPERATION OF THE GOODS OR ANY BREACH OF THIS WARRANTY. NOT WITHSTANDING THE ABOVE LIMITATIONS AND WARRANTIES, MANUFACTURER'S LIABILITY HEREUNDER FOR DAMAGES INCURRED BY PURCHASER OR OTHERS SHALL NOT EXCEED THE PRICE OF THE GOODS.
- 3.04. NO ACTION ARISING OUT OF ANY CLAIMED BREACH OF THIS WARRANTY OR TRANSACTIONS UNDER THIS WARRANTY MAY BE BROUGHT MORE THAN TWO (2) YEARS AFTER THE CAUSE OF ACTION HAS OCCURRED.

4. MISCELLANEOUS.

- 4.01. Proper Venue for any lawsuits arising from or related to this limited warranty shall be only in Guadalupe County, Texas.
- 4.02. Manufacturer may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.
- 4.03. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.
- 4.04. Applicable law may provide rights and benefits to purchaser in addition to those provided herein.

KEEP FOR YOUR RECORDS

ATTENTION: Purchaser should fill in the blanks below for his reference when buying repair parts and/or for proper machine identification when applying for warranty.

Servis-Rhino Implement Model _____ Serial Number _____
Date Purchased _____ Dealer _____

ATTENTION: _____

READ YOUR OPERATOR'S MANUAL

ALAMO INDUSTRIAL
An Alamo Group Company
Post Office Drawer 549
Seguin, Texas 78156
830-379-1480





TO THE OWNER/OPERATOR/DEALER

To keep your implement running efficiently and safely, read your manual thoroughly and follow these directions and the Safety Messages in this Manual. The Table of Contents clearly identifies each section where you can easily find the information you need.

The OCCUPATIONAL SAFETY AND HEALTH ACT (1928.51 Subpart C) makes these minimum safety requirements of tractor operators:

REQUIRED OF THE OWNER:

1. Provide a Roll-Over-Protective Structure that meets the requirements of this Standard; and
2. Provide Seat belts that meet the requirements of this paragraph of this Standard and SAE J4C; and
3. Ensure that each employee uses such Seat belt while the tractor is moving; and
4. Ensure that each employee tightens the Seat belt sufficiently to confine the employee to the protected area provided by the ROPS.

REQUIRED OF THE OPERATOR

1. Securely fasten seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going - especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by the tractor manufacturer.
9. When the tractor is stopped, set brakes securely and use park lock, if available.

- Keep children away from danger all day, every day...
- Equip tractors with rollover protection (ROPS) and keep all machinery guards in place...
- Please work, drive, play and live each day with care and concern for your safety and that of your family and fellow citizens.



BC-0001