



# **MSV BOOM**

**FOR BELOS  
TRACTORS**



**PARTS LISTING WITH OPERATION & MAINTAINANCE**

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# 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.

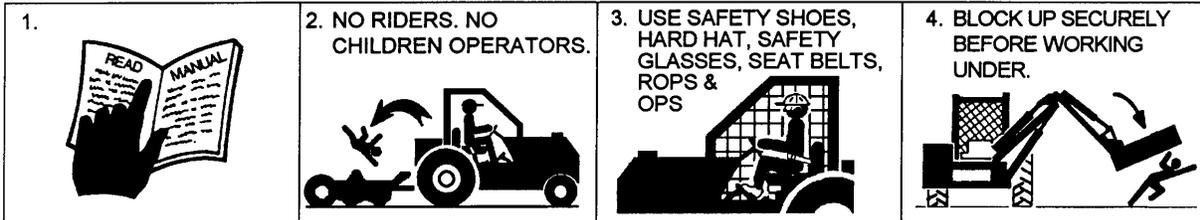
**BEFORE YOU START!!** Read the safety messages on the implement and shown in this manual. Observe the rules of safety and use common sense!

**READ AND UNDERSTAND THIS MANUAL! Non-English speaking operators will need to GET THE MANUAL TRANSLATED as needed!**



# DANGER

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



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.

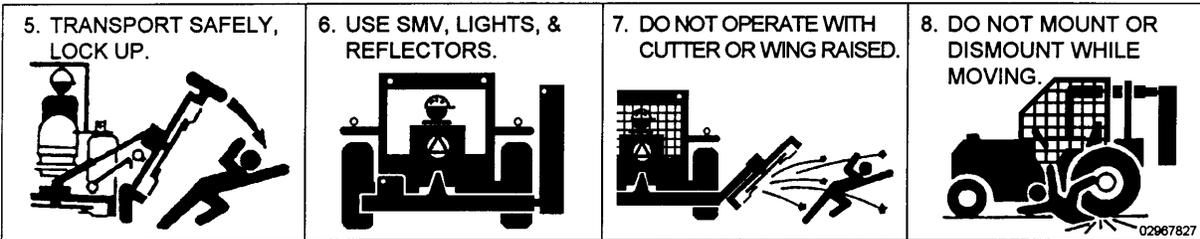
- Folding and Boom Mowers have raised center of gravity. Slow down when turning and on hillsides.

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.

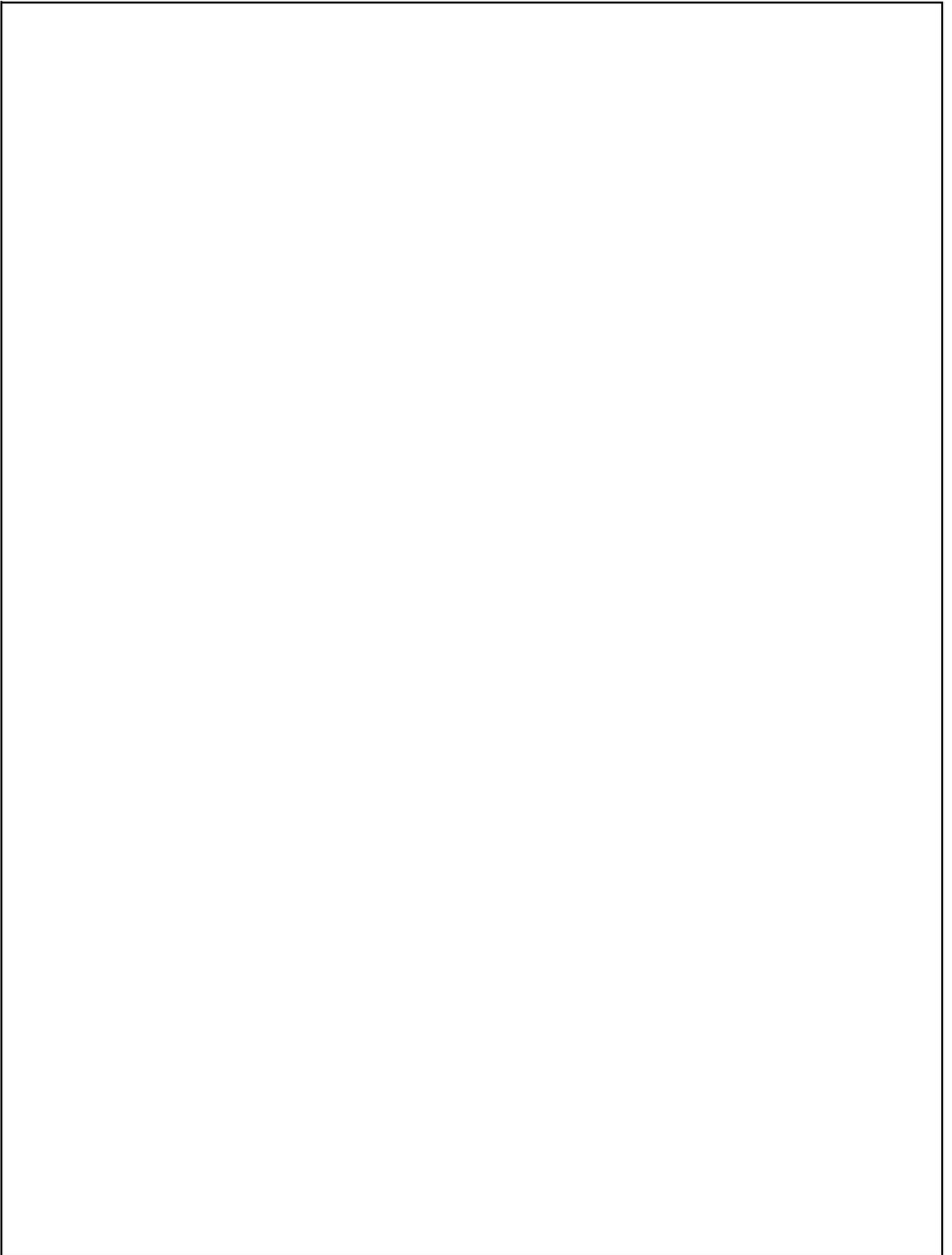
- Put tractor in park or set brake, disengage PTO, stop engine, remove key, and wait until noise of rotation has ceased to prevent crushing by entanglement in rotating parts which could cause injury or death.
- Never mount or dismount a moving vehicle. Crushing from runover may cause serious injury or death.



**Warranty Information:** Read and understand the complete Warranty Statement found in this manual. Fill out the Warranty Registration form in full and return it within 90 days. Make certain the Serial Number of the machine is recorded on the Warranty Card, and form that you retain.

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# **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.

**Important**

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)

**SAFETY INSTRUCTIONS**



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!**



# SAFETY



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)



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



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 or Implement without supervision. Make sure the operator has fully read and understood the manuals prior to operation. (SG-4)



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)



**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)



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



# SAFETY



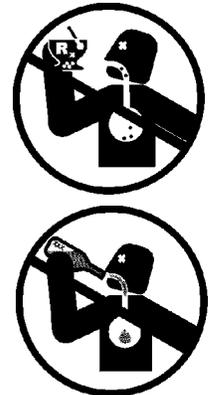
KEEP AWAY FROM ROTATING ELEMENTS to prevent entanglement and possible serious injury or death. (SG-24)



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)

# SAFETY



Never crawl under a raised Implement supported solely by the Tractor 3-Point hitch. Release of the control lever or mechanical failure will result in the Implement falling and possible injury or death. Always securely block up the Implement before crawling underneath to perform repairs and service. (S3PT-19)



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!”**



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 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-03)

SAFETY

## Connecting & Disconnecting Implement Safety Instructions & Practices



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



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



When attaching the Implement input driveline to the Tractor PTO, it is important that the connecting yoke spring activated locking collar slides freely and the locking balls are seated securely in the groove on the Tractor PTO shaft. Push and pull the driveline back and forth several times to ensure it is securely attached. A driveline not attached correctly to the Tractor PTO shaft could come loose and result in personal injury and damage to the Implement. (S3PT-17)

# SAFETY

**WARNING**

Before operating the Implement, check to make sure the Implement input driveline will not bottom out or become disengaged. Bottoming out occurs when the inner shaft penetrates the outer housing until the assembly becomes solid-it can shorten no more. Bottoming out can cause serious damage to the Tractor PTO by pushing the PTO into the Tractor and through the support bearings or downward onto the PTO shaft, breaking it off. A broken driveline can cause personal injury. (S3PT-18)

**DANGER**

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)



**DANGER**

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)

## Equipment Operation Safety Instructions and Practices

**WARNING**

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)

**DANGER**

This Implement may be 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)

**DANGER**

Use extreme caution when raising the Mower head. Stop the Blades from turning when the Mower Head is raised and passersby are within 300 feet. 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)

**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)



# SAFETY

## **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)



## **DANGER**

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)



## **DANGER**

The Mower shaft speed must not - **UNDER ANY CIRCUMSTANCES** - exceed 1800 RPM.

(SBM-15)

## **WARNING**

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)

## **CAUTION**

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

## **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)



SAFETY

# SAFETY

**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 (300 feet or more) and causing serious injury or death. Follow safety messages carefully.



STOP MOWING IF PASSERSBY ARE WITHIN 300 FEET 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;
- 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)

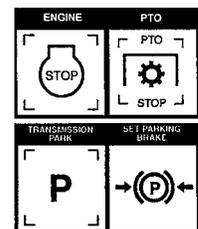
**WARNING**

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 set the parking 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)



# SAFETY

## **⚠ 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 or dismount 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)



## **⚠ 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)

SAFETY

# SAFETY

**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 300 feet (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)

**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 300 feet of mower. (SGM-02)



**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-05)



# SAFETY

## **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-06)

## **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-07)

## **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-08)

## **WARNING**

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

## **DANGER**

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)

### Maintenance and Service Safety Instructions and Practices

## **DANGER**

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)



## **DANGER**

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)

## **WARNING**

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)

# SAFETY



**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)



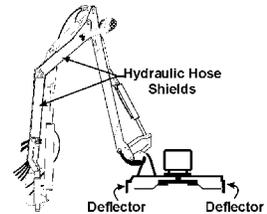
**DANGER**

Always disconnect the wire leads from the mower valve 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-12)



**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. (SBM-18)



**DANGER**

**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)



**WARNING**

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)



**WARNING**

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



**WARNING**

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

# SAFETY



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 POSSIBLY CAUSE 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)

## PARTS INFORMATION

Tiger mowers use balanced and matched system components for blade carriers, blades, cuttershafts, knives, knife hangers, rollers, drivetrain components, and bearings. These parts are made and tested to Tiger specifications. Non-genuine "will fit" parts do not consistently meet these specifications. The use of "will fit" parts may reduce mower performance, void mower warranties, and present a safety hazard. Use genuine Tiger mower parts for economy and safety. (SPTM-1)

**SEE YOUR TIGER DEALER**

Transporting Safety Instructions and Practices

Safety Section 1-13

SAFETY

# SAFETY

**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-02)

**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 300 feet. (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)

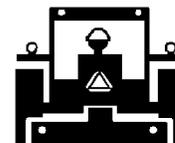
**WARNING**

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)

# SAFETY



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)



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)



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)

## Storage and Parking Safety Instructions and Practices



A rear Implement can fall if not properly supported. Always use the stand on the front hitch (if equipped) or block up securely to prevent falling and possible crushing injury and/or other injury from holding or lifting heavy components. Use the stand to stabilize the implement during storage. (S3PT-3)

# SAFETY



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

## 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

## FEDERAL LAWS AND REGULATIONS

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

### Employer-Employee Operator Regulations

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

#### This Act Seeks:

“...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources...”

#### DUTIES

Sec. 5 (a) Each employer-

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

#### OSHA Regulations

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

#### Employer Responsibilities:

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

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

#### Child Labor Under 16 Years of Age

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



# MSV BOOM

# OPERATION SECTION



# OPERATION PREPERATION

**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 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 injury possible during operation.

DANGER!



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

WARNING!



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

CAUTION!



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

**IMPORTANT!**

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

CAUTION!



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

## Before any operation of tractor and mower

The user should read and understand the safety and operating instructions for both the tractor and the mower. The user should also be familiar with the location and functions of the units instruments and controls. Being familiar with the machine and it's controls will increase efficiency and reduce possibility of serious injury or damage to the unit. The operator should work slowly and carefully until he feels comfortable with the machine. Speed and skill will be attained much easier if the necessary time is spent to familiarize yourself with the machine and its operations. Since tractor makes and models vary, we recommend reading and following the operators manual provided by the manufacturer pertaining to your particular unit.



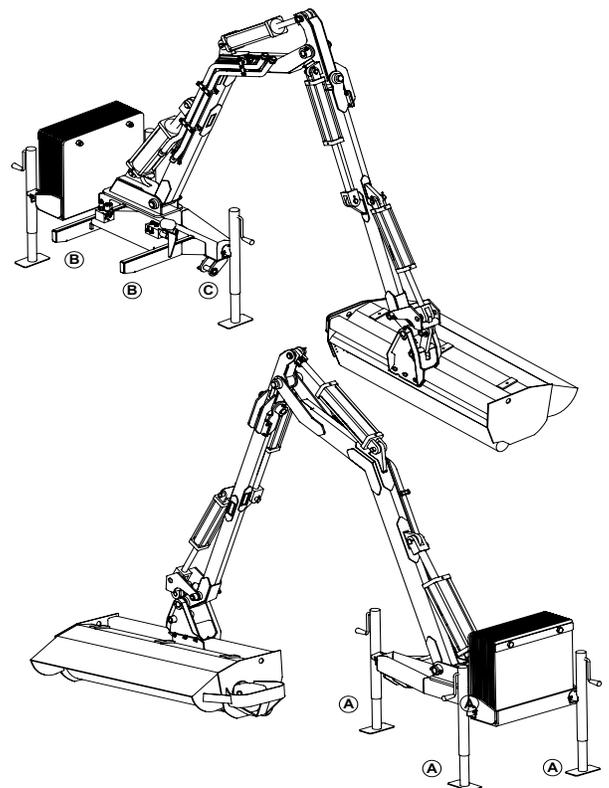
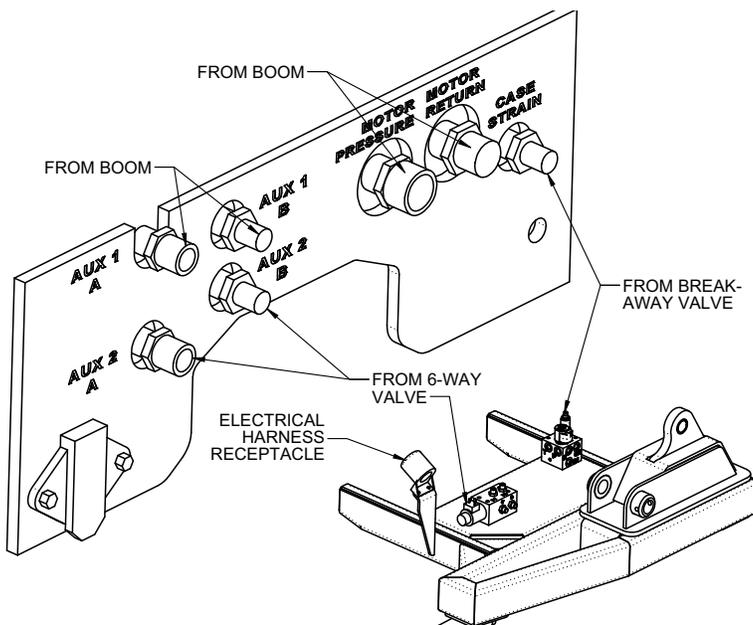
# MOWER MOUNT AND DISMOUNT

## MOUNTING MOWER

- 1 Area must be level and free of debris, inspect boom stand to make sure it is level. Adjust jacks (A) if needed to make sure mounting arms (B) will engage tractor mounting pockets properly.
- 2 Unlock and open the tractor hooks on the lower 3 point arms, then lower arms enough to clear the stand mount pins. (C)
- 3 Drive into stand slowly, centering mounting arms on the tractor mounting pockets. When the mower is fully engaged the stops will be contacted.
- 4 Raise the 3 point arms slowly to engage the pins (C) Lock the hooks on the pins.
- 5 Remove and store jack stands. (A)
- 6 As shown below, attach the electrical harness and hydraulic hoses.

## DISMOUNTING MOWER

1. Area must be level and free of debris
2. Extend boom out so that mower head is clear of stand and lower mower head onto the ground.
3. Detatch the electrical harness and hydraulic hoses and cover with caps.
4. Install jack stands (A) and extend down until they touch the ground, do not extend to lift unit.
5. Unlock and open the tractor hooks on the lower 3 point arms.
6. Lower arms to clear the boom mount pins (C) and back tractor away from boom stand slowly.
7. If boom stand does not dettach, adjust jack stands (A) until boom frame is loose in tractor and repeat step 6.
8. Cover hose ends with plastic caps.



# STARTING TRACTOR AND MOWER

Check the operators manual received from the tractor manufacturer, for their recommendation and procedures pertaining to your particular make and model.

When rotating parts are in motion, serious injury may occur if caution is not used or danger is not recognized. Never allow bystanders within 300 feet of the machine when mower is in operation.

**WARNING!**



Check to make sure mower switch is in the "OFF" position. The unit is designed not to start if the switch is in the "on" position. If tractor starts with switch on, turn off tractor and contact your local Tiger dealership for assistance.

**WARNING!**



Start the tractor and allow the instruments to stabilize. Without starting the mower, practice positioning the boom and deck. Remember, speed and skill will be attained easier if the necessary time is spent familiarizing yourself with the machine and its operations. When you feel comfortable at controlling the position of the mower, return the mower to the travel position, and transport the mower to the desired mowing location.

If mowing for the first time with a Tiger Boom Mower, we recommend choosing a ditch or area relatively flat with a minimum of sign posts, guard rails, etc. As always, you should inspect the area for other objects that can cause potential hazards.

Hydraulically driven mower heads must operate at 2,800 RPMs. Hydraulic flow to the motor should be 18.5 GPM, operating at a higher rate could result in damage to mower system.

## MOWER OPERATION

**WARNING!**



When rotating parts are in motion, serious injury may occur if caution is not used or danger is not recognized. Never allow bystanders within 300 feet of the machine when in operation. Extreme care should be taken when operating near loose objects – such as gravel, rocks and debris. These conditions should be avoided.

**WARNING!**



The rotating parts in this machine have been designed and tested for rugged use. However, they could fail upon impact with heavy solid objects – such as steel guard rails, concrete abutments, etc., causing them to be thrown at a very high velocity. Never allow cutter head to contact such objects. Inspecting the cutting area for such objects prior to mowing can help eliminate these potential hazards.



# MOWER OPERATION

## Mower Operation Continued

Once on location, lower the mower deck slightly above the material to be cut, so the mower does not have to start under a load.

When cutting small shrubs or brush, begin each pass at the top of the material and work down with each consecutive pass. Use a low speed to allow the cutting blades time to mulch as well as cut the foliage. When the initial pass has been made, disengage the mower and return the mower to the travel position. Return to the starting point and make next pass, etc. The flail head is not intended for cutting heavy brush, or for continually cutting brush. Wear or damage of the blades will occur rapidly when the flail cutter is used this way.

The mower will operate more efficiently in tougher conditions and with less power if the knives are kept sharp. If the mower begins to vibrate, stop the tractor, check for wire wrapped in the spindle or damaged knives. When replacing knives, replace all knives with new knives to ensure proper balance so the mower will not vibrate. Severe vibration will result, if knives with unequal wear are used. Follow the instructions in the maintenance section closely when replacing knife blades.

If bystanders approach within 300 feet while mower is in operation turn mower switch "OFF" immediately! After shutdown, never leave the tractor or allow bystanders to approach within **300 FEET** of the unit until all motion stops completely.

When encountering a very severe condition which causes the tractor to stall, disengage mower, start tractor, raise the mower from the cut. Set mower head on the ground for inspection. Never walk under a raised boom. Shut tractor off and inspect the mower, blades and cuttershaft for damage before engaging mower again.

If the blades jam or stop, raise the head slightly or back the tractor up. Normally, this will clear the cutter head. If not, shut off the mower(s), raise the cutter heads, turn off the tractor and set the parking brake. After all motion stops completely, leave the tractor and clear the cutting heads manually.

**After the first day of operation, all bolts should be checked and tightened securely.**

This should be done periodically to ensure the bolts do not become loose and cause damage to the tractor or mower, or injury to the operator.



# BREAKAWAY

## BREAKAWAY INSTALLATION & OPERATION

Add an auxiliary switch in the armrest as shown below. This switch must be connected to a 12 volt keyed-hot wire. Route this wire from the switch to the breakaway manifold Tiger P/N 06502110.

To straighten the boom after breakaway, index the switch on the armrest and lift the main boom simultaneously. *(ASM-MSV-0001)*



# TRANSPORTING MOWER

Transporting under the units own power:

When transporting between job sites or between cutting passes, the following procedure should be followed: Shut off the power to the cutting head(s) and allow all motion to come to a complete stop. Raise the mower head to it's highest position. The unit is now in position for self transportation.

Transporting unit by flatbed trailer:

One of the following procedures must be followed.

1: Transporting with mower attached: Use a loading dock or ramp to load tractor onto the trailer. Center the tractor with the mowers attached between the sides of the trailer. Make sure the head is fully raised and secured. Secure the tractor and mower to the trailer with chains. Check the tractor operators manual for any tractor requirements to transport by flatbed trailer.

2: Transporting with mower removed: Refer to tractor manual.

If any part of this operating section, or any other section of this manual is not completely understood, contact your Tiger dealer or the address on the cover of this manual for assistance!

CAUTION!



The next page is a pre-operation inspection sheet, please make photocopies available to all operators before each use of the mower.



# INSPECTION CHECKLIST



Tractor ID# \_\_\_\_\_ Make \_\_\_\_\_

Date: \_\_\_\_\_ Shift \_\_\_\_\_

Before conducting the inspection, make sure the Tractor engine is off, all rotation has stop and the tractor is in the Park with the parking brake engaged. The Mower head is resting on the ground (or is securely blocked up and supported) and all hydraulic pressure has been relieved.

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 Hitch connection bolts & pins are tight		
There are no cracks in Hitch		
There mower deck is clear of cut grass and debris		
The Thrown object Guards/Deflectors are in place		
There Guards/Deflectors are in good condition		
Blades are not broken, chipped, cracked or bent		
Blade shackles are in good condition with no cracks		
The Blade pins are properly retained		
The Skid shoes are in good condition & tight		
The Rear Roller is in good condition and turns freely		

Operator Signature: \_\_\_\_\_

**DO NOT OPERATE AN UNSAFE TRACTOR OR MOWER!**



# MSV BOOM

# MAINTENANCE SECTION



# MAINTENANCE PRECAUTIONS

Tiger Mowers are designed for high performance and rugged durability, yet with simplified maintenance. The purpose of this section of the manual is to help the operator in the regular servicing of the mower. Regular maintenance at the intervals mentioned will result in the maximum efficiency and long life of the Tiger Mower.

When you purchase a Tiger Mower you also acquire another valuable asset, Tiger's parts organization. Our rapid and efficient service has guaranteed the customer satisfaction for many years. Tiger parts keep up with the demands for efficiency, safety and endurance expected of the Tiger Mower.

## MAINTENANCE PRECAUTIONS

- Be sure end of grease gun and zerks are clean before using. Debris injected into bearings, etc. with grease will cause immediate damage.
- DO NOT use a power grease gun to lubricate bearings. These require very small and exact amounts of lubrication. Refer to the detailed maintenance section for specific lubrication instructions. Do Not over-grease bearings.
- Lexan windows should be washed with mild soap or detergent and luke warm water, using a soft clean sponge or **soft cloth**. DO NOT use abrasive or alkaline cleaners or metal scrapers on lexan windows!
- Be alert to maintenance indicators such as the in-tank filter pressure gauge, hydraulic reservoir sight gauge, etc. Take the required action to correct any problems immediately.
- Release of energy from pressurized systems may cause inadvertent actuation of cylinders, or sudden release of compressed springs. Refer to the tractor manual for procedure to relieve hydraulic pressure.

### WARNING!



**DO NOT** use hands to check for suspected leaks in hydraulic hoses!

Hydraulic fluid escaping under pressure can have sufficient force to penetrate skin and cause serious injury. If fluid is injected into skin, it must be surgically removed within a few hours or gangrene may result. Use a small piece of wood or cardboard, not hands, to search for pin hose leaks. Be sure all pressure is relieved whenever disconnecting lines. Be sure all connections are tight and hoses and lines are not damaged before applying pressure.

## BREAK IN PERIOD

In addition to following the break in instructions for your particular tractor, re-torque wheel lugs after first five hours of operation and periodically thereafter. See torque specifications listed in the tractor's service manual for your particular model. **Wheel lugs must always be re-torqued whenever a wheel is removed and reinstalled.**

# MAINTENANCE WARNINGS

## DANGER!



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



## WARNING!



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

## 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)

## DANGER!



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)



# MAINTENANCE SCHEDULE

## REGULAR MAINTENANCE

The intervals at which regular servicing should be done are based on hours of operation. Use the tractors hour meter to determine when regular servicing is required. Refer to the detailed maintenance section for further instructions on greasing. Copy and use the Daily Maintenance sheet located at the end of this section.

## DAILY OR EVERY 8 HOURS

ITEM	SERVICE	COMMENTS
Hydraulic Fittings	Check for leaks	Tighten when needed. Do Not use hands to check for leaks, see maint. Precautions
Knives	Check	Inspect for missing or damaged knives, change or sharpen as needed
Cutter shaft mounting bolts (cutter shaft to deck)	Check	Re-torque per manual for flail mower head
Knife mounting bolts (knife to cutter shaft)	Check	Retorque to knife replacement specifications
Cutter Shaft and Ground Roller section	Lubricate	Grease as instructed in detailed maint.

## TROUBLESHOOTING

SYMPTOMS	CAUSE	REMEDY
<b>Vibration</b>	1. Loose bolts	Check all bolts and tighten to recommended torque specs.
	2. Cutter assembly	a. Check for damaged blades Unbalanced or cutter shaft. Replace if needed.  b. Check for wire, rope, etc. entangled in cutter assembly
<b>Mower will not lift</b>	1. Hyd. Fluid low	1. Check and refill Hyd Fluid
	2. Leaks in line	Tighten or replace fittings and hoses
	3. Kinked or blocked	Clean or replace lines
	4. Faulty cylinder	Inspect, repair or replace cylinder
<b>Mower will not start or run</b>	1. Low oil level	Check Hyd. tank and fill
	2. Line leak	Check all fittings and lines, re-tighten or replace



# TROUBLESHOOTING

## TROUBLESHOOTING

NOTE: If flow meter is available, check pressure and flow volume for all suspected hydraulic problems.

**If the solution to your problem cannot be found in this section, call the Technical Service representative at the number shown on the front cover of this manual.**

### NOTES:

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# TROUBLESHOOTING



# TORQUE SPECIFICATIONS

\* These are intended to be general specifications. See tractor operators or service manual for exact specifications for your unit.

### Torque for Standard Fasteners

Nominal Dia. (in)	Threads per inch	Grade 2			Grade 5			Grade 6			Grade 9		
		Tightening Torque			Tightening Torque			Tightening Torque			Tightening Torque		
		Lubed K = 0.15	Dry Plated K = 0.17	Dry plain K = 0.20	Lubed K = 0.15	Dry Plated K = 0.17	Dry plain K = 0.20	Lubed K = 0.15	Dry Plated K = 0.17	Dry plain K = 0.20	Lubed K = 0.15	Dry Plated K = 0.17	Dry plain K = 0.20
<b>Unified Coarse Thread Series</b>													
1/4	20	49 in-lbs	59 in-lbs	66 in-lbs	75 in-lbs	86 in-lbs	101 in-lbs	107 in-lbs	122 in-lbs	143 in-lbs	126 in-lbs	143 in-lbs	168 in-lbs
5/16	18	101	122	135	157	175	209	221	251	295	259	294	346
3/8	16	15 ft-lbs	18 ft-lbs	20 ft-lbs	23 ft-lbs	26 ft-lbs	31 ft-lbs	33 ft-lbs	37 ft-lbs	44 ft-lbs	38 ft-lbs	43 ft-lbs	51 ft-lbs
7/16	14	24	29	32	37	42	49	52	59	70	61	70	82
1/2	13	37	44	49	57	64	75	80	90	106	94	106	125
9/16	12	53	63	70	82	92	109	115	130	154	135	153	180
5/8	11	73	87	97	113	126	150	159	180	212	186	211	248
3/4	10	109	155	172	200	227	267	282	320	376	331	375	441
7/8	9	125	150	167	222	265	428	485	515	606	533	604	710
1	8	167	225	250	403	547	644	661	772	909	799	905	1065
1 1/8	7	266	319	354	595	675	794	865	1095	1266	1132	1283	1510
1 1/4	7	375	450	500	840	952	1121	1263	1545	1817	1597	1810	2130
1 1/2	6	652	783	869	1452	1657	1950	2371	2688	3162	2779	3150	3706
<b>Fine Thread Series</b>													
1/4	28	56 in-lbs	69 in-lbs	75 in-lbs	87 in-lbs	99 in-lbs	116 in-lbs	123 in-lbs	139 in-lbs	164 in-lbs	144 in-lbs	163 in-lbs	192 in-lbs
5/16	24	112	135	150	174	197	231	245	276	327	287	325	383
3/8	24	17 ft-lbs	20 ft-lbs	23 ft-lbs	26 ft-lbs	30 ft-lbs	35 ft-lbs	37 ft-lbs	42 ft-lbs	49 ft-lbs	43 ft-lbs	49 ft-lbs	58 ft-lbs
7/16	20	27	32	36	41	47	55	58	65	75	66	73	91
1/2	20	41	49	55	64	72	85	90	102	120	105	120	141
9/16	18	59	71	78	91	103	121	126	146	171	151	171	201
5/8	18	82	99	110	127	144	170	180	204	240	211	239	281
3/4	16	144	173	190	223	253	297	315	357	420	369	418	492
7/8	14	138	165	184	215	243	290	302	348	418	369	418	492
1	14	210	252	280	342	394	471	495	567	672	594	672	804
1 1/8	12	298	357	397	468	537	642	675	774	924	813	924	1104
1 1/4	12	415	498	551	650	741	882	927	1062	1272	1113	1272	1536
1 1/2	12	734	880	978	1165	1335	1608	1680	1944	2328	2040	2328	2808

Torque values for 1/8 and 5/16 in series are in inch-pounds. All other torque values are in foot-pounds. K = 0.15 for lubricated conditions. D = Nominal Diameter.  
 Torque values calculated from formula T=KDF, where K = 0.17 for zinc plated and dry conditions. F = Clamp Load.  
 K = 0.20 for plain and dry conditions.

### Torque-Tension Relationship for Metric Fasteners

Nominal Dia. (mm)	Pitch	Class 4.6			Class 6.8			Class 10.9			Class 12.9	
		Tightening Torque			Tightening Torque			Tightening Torque			Tightening Torque	
		Lubed K = 0.15 (ft-lbs)	Dry Plated K = 0.17 (ft-lbs)	Dry plain K = 0.20 (ft-lbs)	Lubed K = 0.15 (ft-lbs)	Dry Plated K = 0.17 (ft-lbs)	Dry plain K = 0.20 (ft-lbs)	Lubed K = 0.15 (ft-lbs)	Dry Plated K = 0.17 (ft-lbs)	Dry plain K = 0.20 (ft-lbs)	Lubed K = 0.15 (ft-lbs)	Dry plain K = 0.20 (ft-lbs)
3	0.5	0.28	0.32	0.38	0.73	0.82	0.97	1.0	1.2	1.4	1.2	1.6
3.5	0.6	0.44	0.50	0.59	1.1	1.3	1.5	1.6	1.9	2.2	1.9	2.5
4	0.7	0.66	0.74	0.87	1.7	1.9	2.3	2.4	2.7	3.2	2.8	3.8
5	0.8	1.3	1.5	1.8	3.4	3.9	4.5	4.8	5.5	6.5	5.7	7.6
6	1	2.3	2.6	3.0	5.8	6.6	7.7	8.3	9.4	11	9.7	13
6	1.25	2.1	2.3	2.7	5.3	6.0	7.0	7.6	8.6	10	8.8	12
7	1	3.8	4.3	5.0	9.7	11	13	14	16	19	18	22
8	1	5.9	6.8	7.8	15	17	20	22	24	29	25	34
8	1.25	5.5	6.2	7.3	14	16	19	20	23	27	24	31
10	1.25	11	13	15	29	33	39	42	48	56	49	66
10	1.5	11	12	14	28	32	37	40	45	53	47	62
12	1.25	21	23	28	53	60	71	76	86	101	89	119
12	1.5	20	22	26	51	58	68	73	82	97	85	113
12	1.75	19	21	25	49	55	65	70	79	93	81	108
14	1.25	26	29	34	66	75	89	95	108	127	111	146
14	1.5	26	32	37	72	82	98	103	117	138	121	161
14	2	30	34	40	78	88	104	111	126	148	130	173
16	1.5	50	57	67	129	146	171	184	208	245	215	287
16	2	47	53	62	121	137	161	173	196	230	202	269
18	1.5	73	82	97	187	212	248	266	303	357	313	417
18	2.5	65	73	86	167	189	222	238	270	318	279	372
20	2.5	91	104	122	236	267	314	337	383	449	394	525

Clamp load calculated as 75% of the proof load for specified bolts. K = 0.15 for lubricated conditions. D = Nominal Diameter.  
 All torque values are listed in foot-pounds. K = 0.17 for zinc plated, dry conditions. F = Clamp Load.  
 Torque values calculated from formula T=KDF, where K = 0.20 for plain and dry conditions.

# SCHEDULE TEMPLATE

## DAILY MAINTENANCE SCHEDULE

The following services should be performed **daily** or every **8 hours** of service, following the detailed maintenance instructions in the operators manual.

\_\_\_\_\_ Pivot points: Inject grease until it appears at ends.

\_\_\_\_\_ Hydraulic fittings: Check for leaks with paper or cardboard. Tighten fittings or replace hoses immediately.

\_\_\_\_\_ Knives: Inspect for missing or damaged knives, change(only complete sets) as needed.

\_\_\_\_\_ Main Frame / Deck: Unless otherwise specified retorque bolts according to torque specifications in this section.

\_\_\_\_\_ Hydraulic Fluid Level: Add, if required, per fluid recommendations.

\_\_\_\_\_ Cutter Shaft and Ground Roller: Grease as instructed in the detailed maintenance section

**Service performed by:**\_\_\_\_\_ **Date:**\_\_\_/\_\_\_/\_\_\_ **Time:**\_\_\_\_\_ **Meter:**\_\_\_\_\_

**This page may be copied and used as part of the daily maintenance routine.**

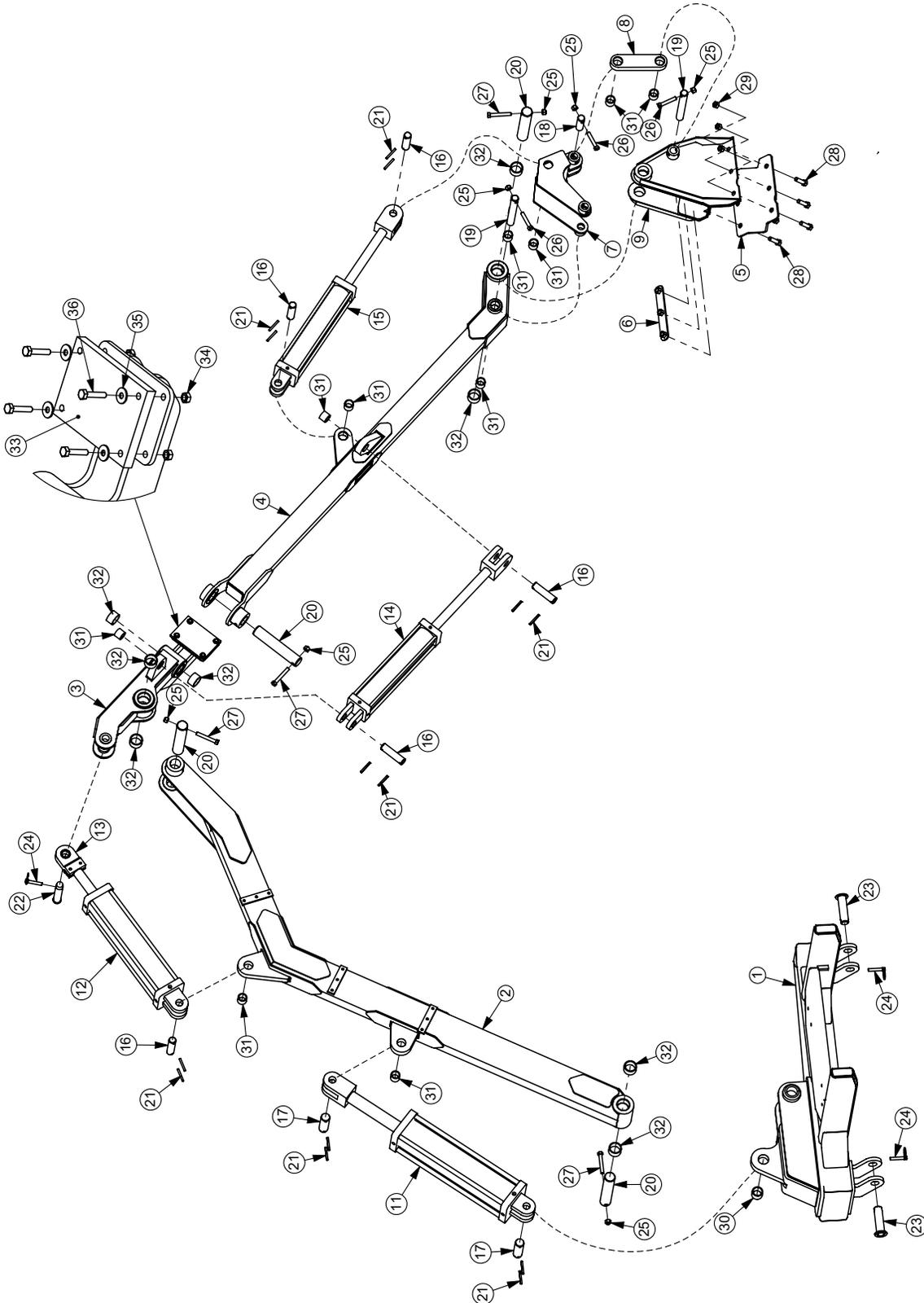


# MSV BOOM

# PARTS SECTION



# BOOM CYLINDERS, PINS & BEARINGS

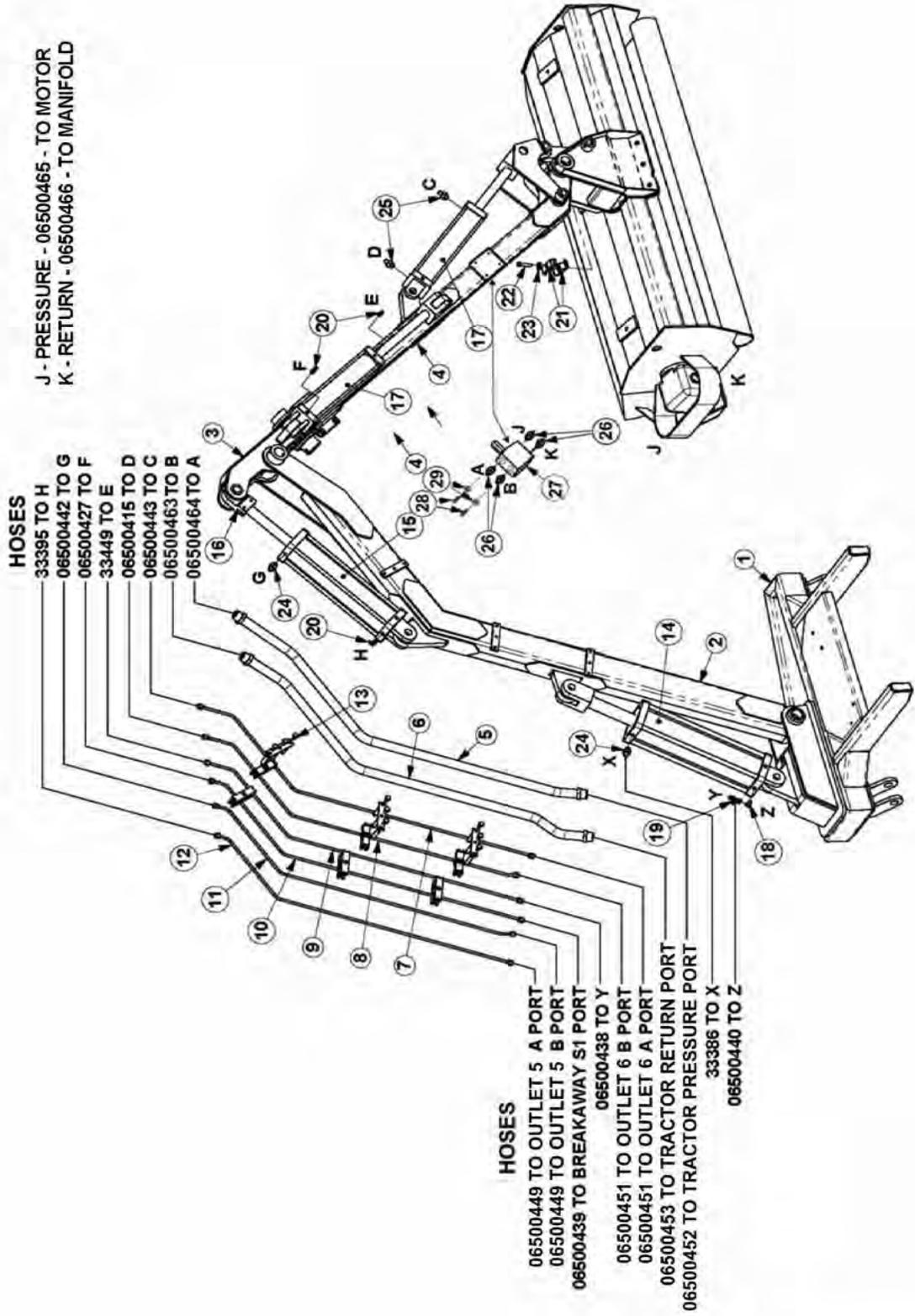


# BOOM CYLINDERS, PINS & BEARINGS

ITEM	P/N	QTY.	DESCRIPTION
1	06700142	1	MOUNT,BOOM,M SV,M B
2	06700135	1	BOOM,MAIN,M SV
3	06700136	1	BOOM,KNUCKLE,M SV
4	06700137	1	BOOM,SEC,M SV
5	33805	1	MOUNT,PLATE,TREE,TBFS-40H
6	33787	1	BAR,NUT PLATE
7	06700138	1	BOOM DOGLEG,M SV
8	06700139	1	BOOM,LINK,DOGLEG,M SV
9	06310103	1	TREE,FLAIL,M SV
10	90.473.14	1	HEAD,FLAIL,BOM FORD,50
11	33702	1	CYLINDER,4x14
12	33703	1	CYLINDER, 3 1/2X14,2,500 PSI
13	TB3033	1	CLEVIS,W/SPHERICAL BEARING
14	33704	1	CYLINDER,2 1/2x12
15	33704	1	CYLINDER,2 1/2x12
16	06420014	5	PIN,1.00x3.84,W/.22 HOLES,NITRIDE
17	06420100	2	PIN,1.25 x 3.69,NIT
18	06420122	1	PIN,1.00x3.13,W/.47 HOLE,NIT
19	33428	2	PIN,1.00x7.75,W/.47 HOLE,NIT
20	06420124	4	PIN,1.50x7.81,W/.47 HOLE,NIT
21	TB1023	14	ROLLPIN,7/32" X 2"
22	TB1036	1	PIN,SEC BOOM SWIV 1X4-11/16"
23	TF1120	2	PIN,(CAPPED),1-1/8" X 3-7/8"
24	TF1143	3	PIN, LYNCH, 7/16" x 2"
25	21677	7	NYLOCK NUT,7/16 NC
26	21685	3	CAPSCREW, 7/16 x 2 1/2,NC
27	21687	4	CAPSCREW, 7/16 x 3,NC
28	21732	6	CAPSCREW, 1/2 x 1 3/4,NC
29	31580	3	HEX NUT, 1/2" NC,GR 8
30	06499004	1	BEARING
31	06520076	10	BEARING
32	06520108	8	BEARING
33	06497004	1	PAD
34	21527	4	NYLOCK NUT, 1/4
35	22014	4	FLATWASHER, 1/4
36	21531	4	CAPSCREW,1/4 x 1 1/4



# BOOM PLUMBING

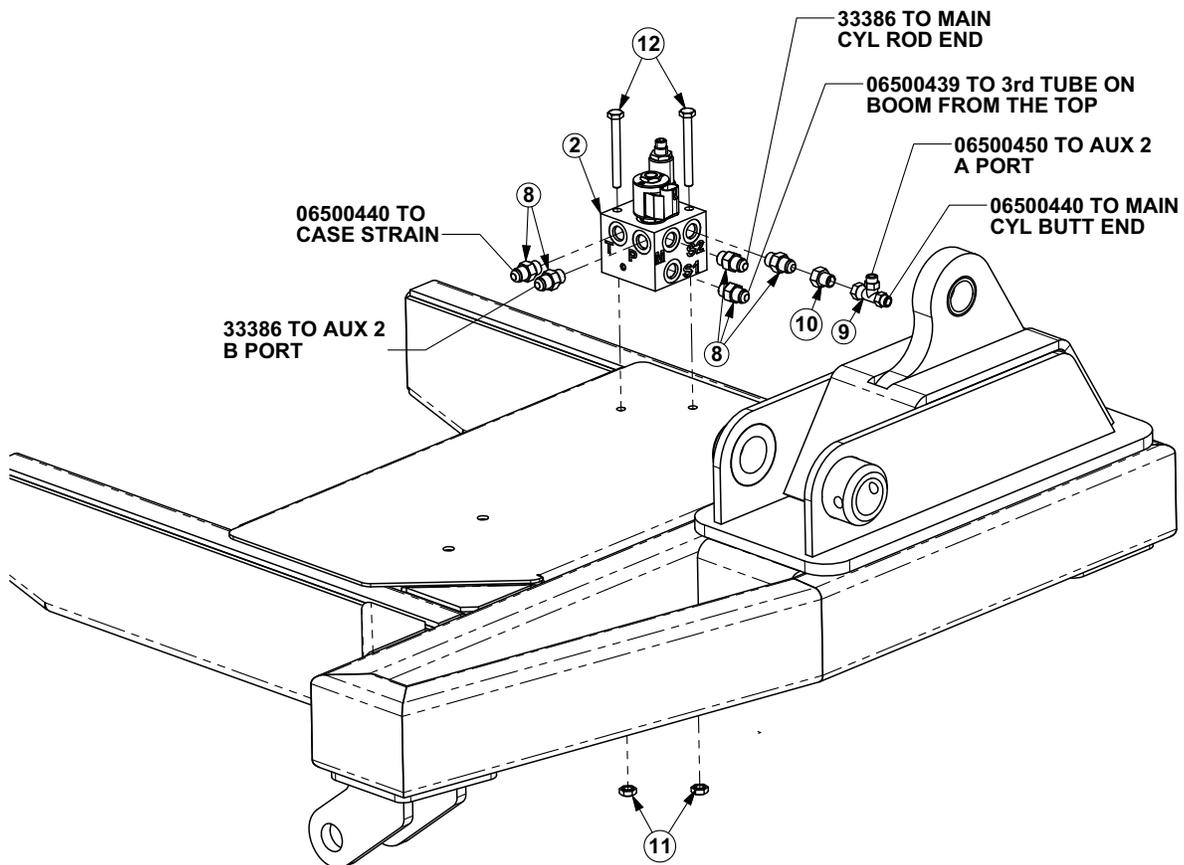
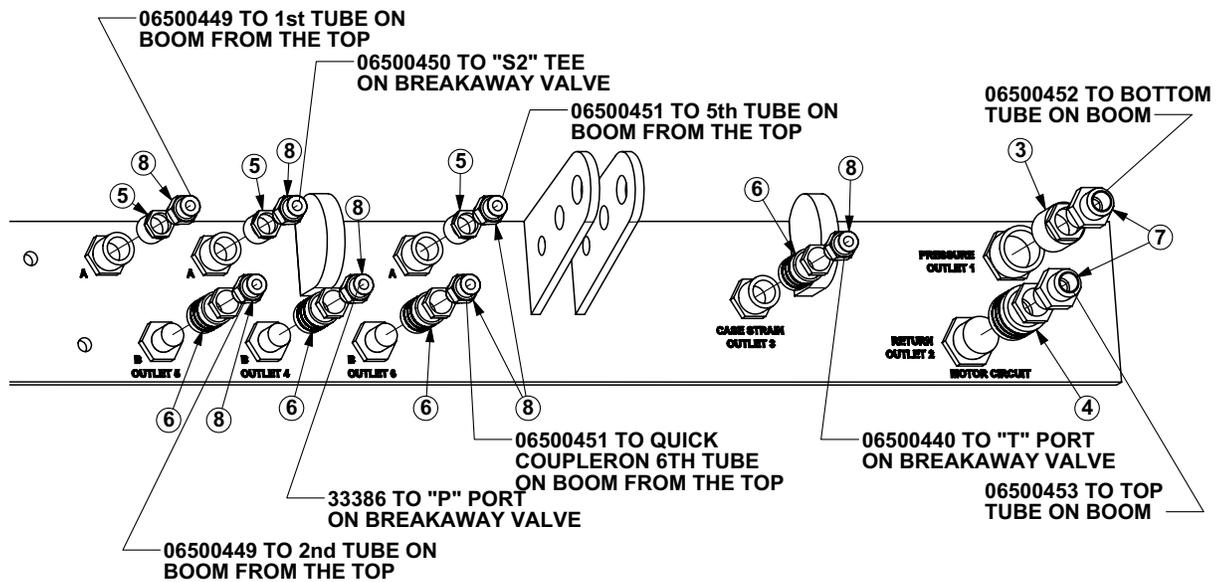


# BOOM PLUMBING

ITEM	P/N	QTY.	DESCRIPTION
1	06700140	1	MOUNT,BOOM,MSV,MB
2	06700135	1	BOOM,MAIN,MSV
3	06700136	1	BOOM, KNUCKLE,MSV
4	06700137	1	BOOM,SEC,MSV
5	33183	1	TUBE,PREFORMED,1 1/4,CHEETAH
6	33182	1	TUBE,PREFORMED,1 1/4,CHEETAH
7	33180	1	TUBE,PREFORMED,5/16,CHEETAH
8	33179	1	TUBE,PREFORMED,5/16,CHEETAH
9	33177	1	TUBE,PREFORMED,5/16,CHEETAH
10	33178	1	TUBE,PREFORMED,5/16,CHEETAH
11	33176	1	TUBE,PREFORMED,5/16,CHEETAH
12	33175	1	TUBE,PREFORMED,5/16,CHEETAH
13	33440	3	CLAMP KIT,TUBE,1.25x2,.31x6,3PST
14	33702	1	CYLINDER,4x14
15	33703	1	CYLINDER, 3 1/2X14,2,500 PSI
16	TB3033	1	CLEVIS,W/SPHERICAL BEARING
17	33704	2	CYLINDER,2 1/2x12
18	33399	1	ELBOW,1/2MPX3/8MJ 90
19	06503048	1	RUN TEE,3/8MJ x 3/8FJX x 3/8MJ
20	32810	3	ELBOW, 1/2 X 3/8"
21	TF4700	2	CLAMP,TUBE,PRFMD,1.0
22	21634	1	CAPSCREW, 3/8 x 2,NC
23	22016	1	FLATWASHER,3/8",GR8
24	06503122	2	RSTRCTR.06,IN,1/2MBx3/8MJ
25	06503123	2	RSTRCTR.04,IN,1/2MBx3/8MJ
26	33555	4	ADAPTER,1MORBX1MJIC
27	06502114	1	MNFLD,RELIEF,ANTI-CAV,2500PSI
28	21579	4	CAPSCREW,5/16 X 3/4 NC
29	22015	4	FLATWASHER,5/16



# BELOS TRACTOR PLUMBING

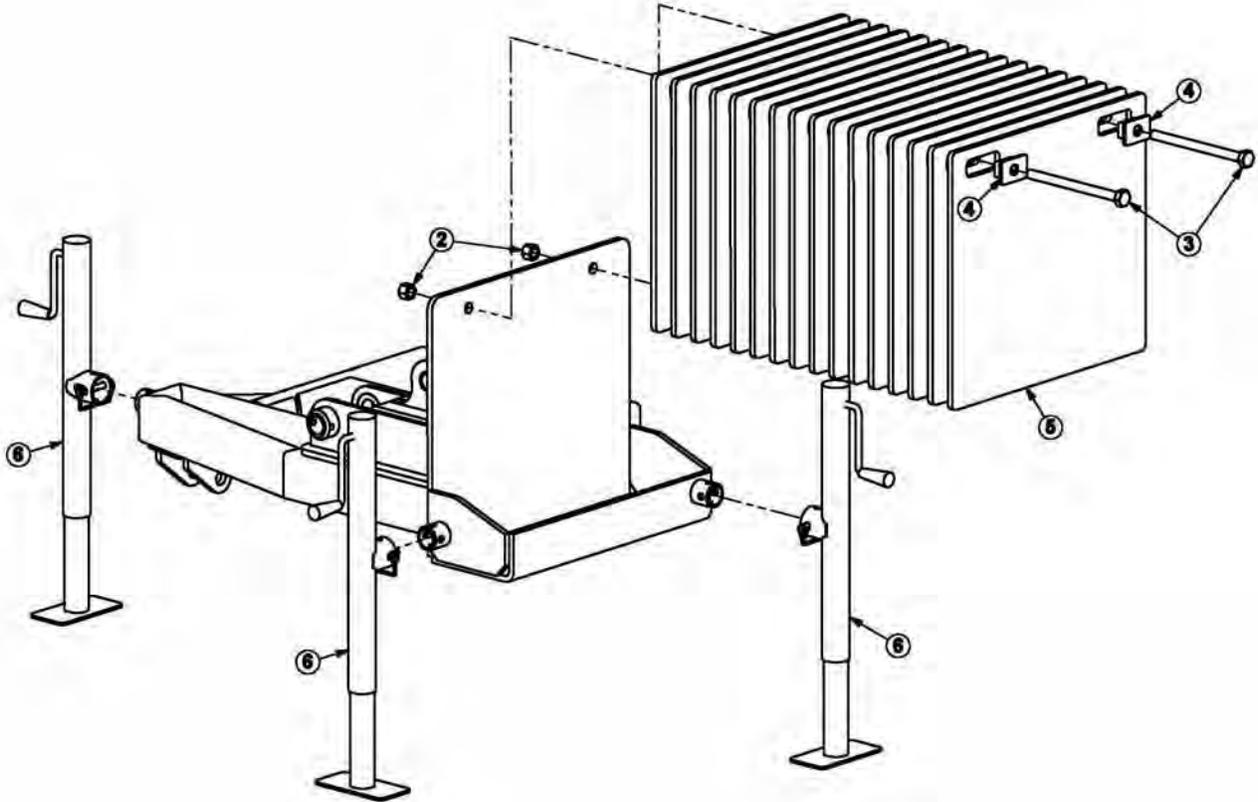


# BELOS TRACTOR PLUMBING

ITEM	P/N	QTY.	DESCRIPTION
1	06700142	1	MOUNT,BOOM,MSV,BELOS
2	06502110	1	MANIFOLD BLOCK
3	-----	1	QUIK CPLR,MALE *BELOS PART
4	-----	1	QUIK CPLR,FEM *BELOS PART
5	06503125	3	QCK CPLR,3/8,MALE,MSV,BELOS
6	06503126	4	QCK CPLR,3/8,FEM,MSV,BELOS
7	31974	2	FITTING,1 BSPP X 1 MJIC
8	32901	12	ADAPTER
9	06503048	1	RUN TEE,3/8MJ x 3/8FJX x 3/8MJ
10	06503117	1	UNION,3/8FJx3/8MJ,RSTRCTR,.03



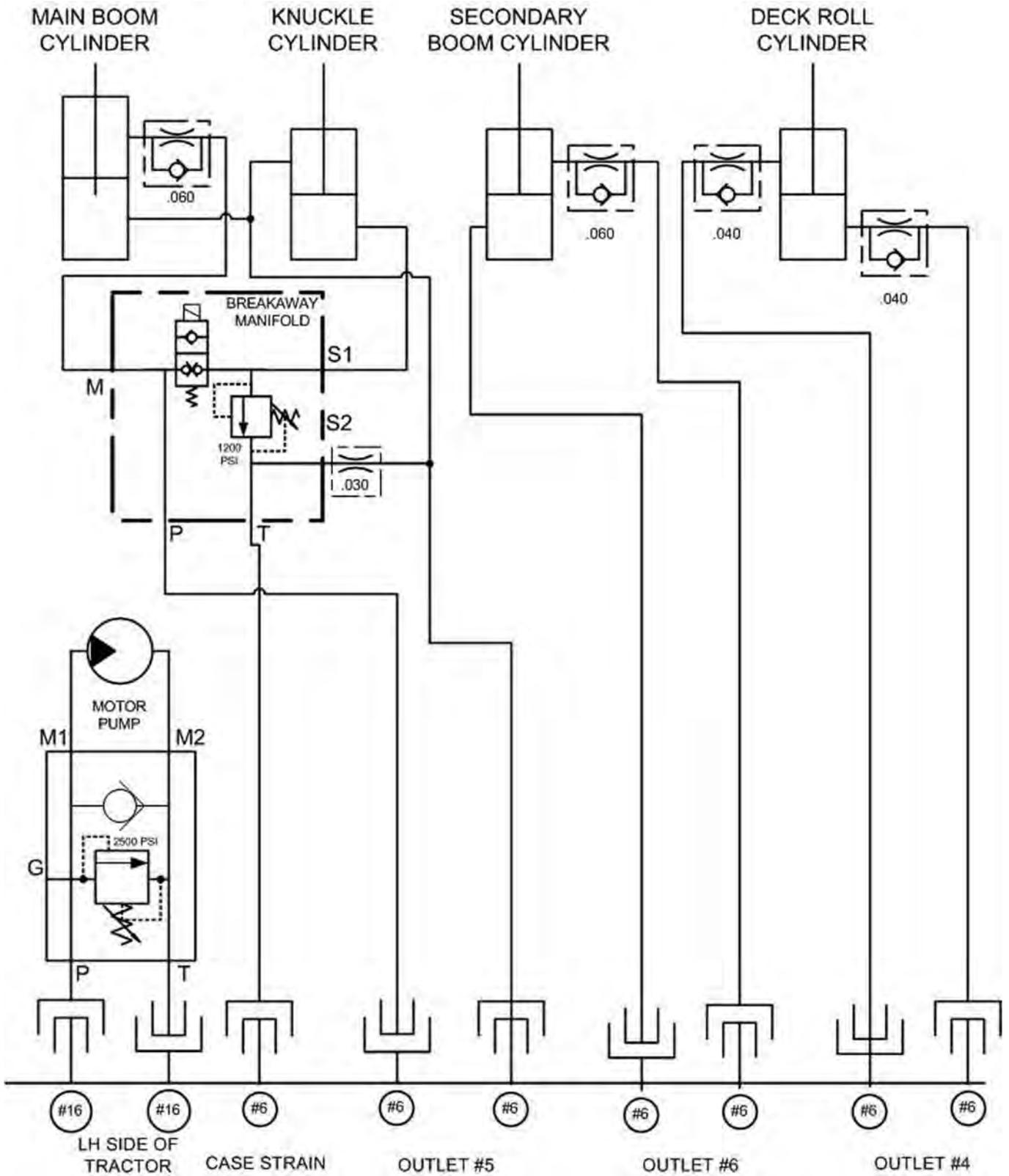
# COUNTERWEIGHT & JACKS



ITEM	P/N	QTY.	DESCRIPTION
1	06700140	1	MOUNT,BOOM,MSV,MB
2	21827	2	HEX NUT,3/4,NC,NYLOCK
3	21847	2	CAPSCREW, 3/4 x 10,NC
4	35252	2	TIE DOWN
5	35018	16	COUNTERWEIGHT,TRUKAT
6	23964	3	JACK,REAR VERSATILE T3F,SIDE

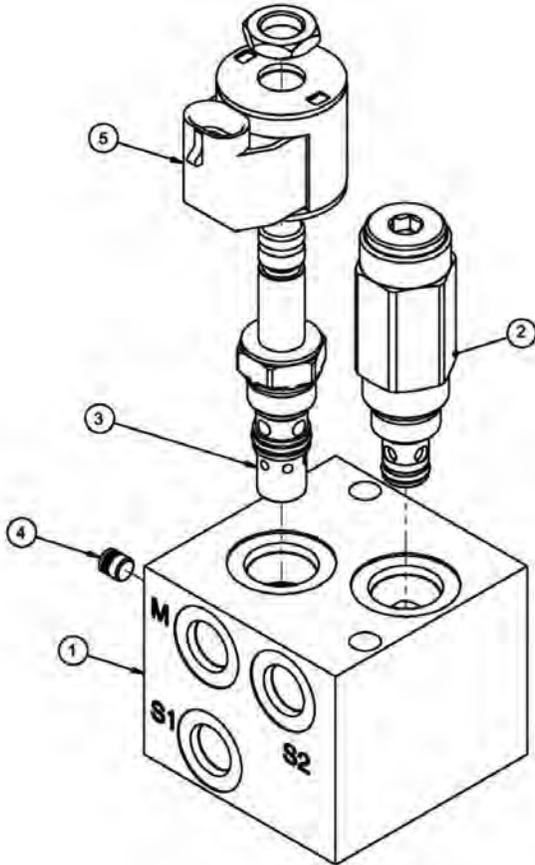


# HYDRO SCHEMATIC



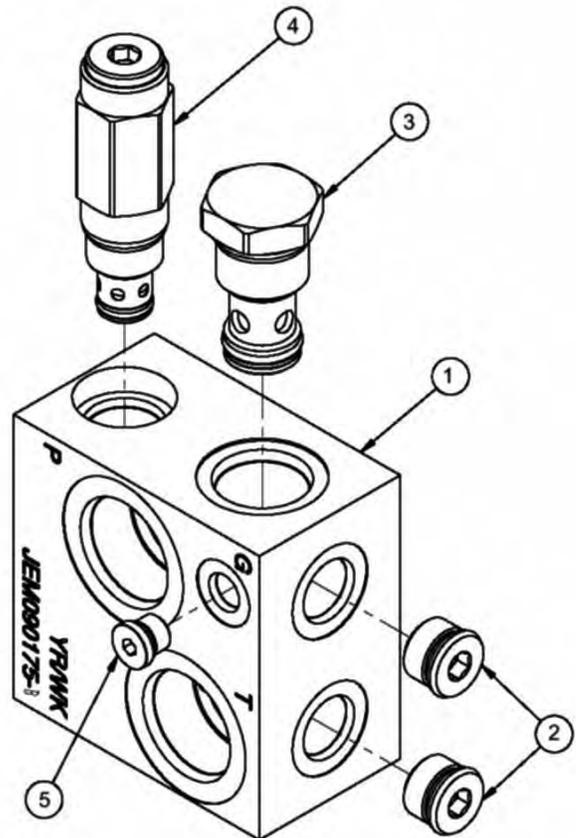
# VALVES 06502110 & 06502114 BREAKDOWNS

06502110



1	06505149	1	BLOCK,MNFLD,06502110
2	06505148	1	VLV,RELIEF,06502110
3	06505147	1	VLV,SOL.06502110
4	06505146	1	PLUG,EXP,7MM,06502110
5	06505145	1	COIL,12VDC,METRI150,06502110

06502114



1	06505154	1	BLOCK,MNFLD,06502112
2	06505153	2	PLUG,Z LEAK,SAE,06502112
3	06505152	1	VLV,CHECK,06502112
4	06505151	1	VLV,RELIEF,06502112
5	06505150	1	PLUG,SOCKET,SAE,06502112



## WARRANTY INFORMATION

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

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

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

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

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

### **THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THOSE EXPRESSED HEREIN.**

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

## ONE LAST WORD

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



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

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

## 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 and on the machine. The table of contents clearly identifies each section where you can easily find the information you need.

The Occupational Safety and Health Act (OSHA 1928.51 subpart C) makes the following minimum requirements for tractor operators.

### **OWNER REQUIREMENTS:**

1. Provide a Roll-Over-Protective Structure that meets the requirements of this Standard; and
2. Provide Seatbelts that meet the requirements of this Standard and SAE J3C; and
3. Ensure that each employee uses such Seatbelt while the tractor is moving; and
4. Ensure that each employee tightens the Seatbelt sufficiently to confine the employee to the protected area provided by the ROPS.

### **OPERATOR REQUIREMENTS:**

1. Securely fasten seatbelt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near steep 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 draw-bar and hitch points recommended by the tractor manufacturer.
9. When the tractor is stopped, set brakes securely and use park lock, if available



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