



# OPERATOR'S AND PARTS MANUAL

## 36" MULCHER



**PALADIN**  
LIGHT CONSTRUCTION GROUP



*The Power of Combined Excellence*



SERIAL NUMBER: \_\_\_\_\_

MODEL NUMBER: \_\_\_\_\_

Manual Number: OM767  
Part Number: 75667  
Rev.

## **READ ENTIRE OPERATOR'S & PARTS MANUAL BEFORE OPERATING!**

**DANGER!** ROTATING DRUM HAZARD! STAY BACK! OBJECTS CAN BE THROWN!  
DO NOT operate near bystanders.



**DANGER!** TO AVOID SERIOUS PERSONAL INJURY OR DEATH THE BRADCO  
MULCHER MUST NOT BE ATTACHED TO ANY POWER UNIT THAT  
DOES NOT HAVE A FORESTRY GUARD PACKAGE INSTALLED.



**DANGER!** FLYING DEBRIS HAZARD. CLEAR AREA OF BYSTANDERS AND LIVE-  
STOCK BEFORE OPERATING. THE MULCHER IS CAPABLE OF PRO-  
DUCING LARGE AMOUNTS OF FLYING DEBRIS IN ALL DIRECTIONS.



**WARNING!** Before leaving the operator's seat: Lower the attachment to the  
ground. Disengage auxiliary hydraulics. Engage the parking brake.  
Stop Engine. Remove the key.



**WARNING!** Use extreme caution when operating "over the side". Machine stability  
is greatly reduced during "over the side" operation of an attachment.



Do not operate the BRADCO Mulcher with a rotator option installed  
onto the excavator.

If there is any portion of this manual or function you do not understand, com-  
tact your local authorized dealer or the manufacturer.

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# PREFACE

## GENERAL COMMENTS

Congratulations on the purchase of your new BRADCO product! This product was carefully designed and manufactured to give you many years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all maintenance procedures and safety precautions in this manual and on any safety decals located on the product and on any equipment on which the attachment is mounted.

This manual has been designed to help you do a better, safer job. Read this manual carefully and become familiar with its contents.

**WARNING!**  Never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual. Always choose hard, level ground to park the vehicle on and set the brake so the unit cannot roll.

Unless noted otherwise, right and left sides are determined from the operator's control position when facing the attachment.

**NOTE:** The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the attachment as may be necessary without notification.

## BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure the equipment is operated only by trained individuals that have read and understand this manual. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer.

## SAFETY ALERT SYMBOL



This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

## SERVICE

When servicing your product, remember to use only manufacturer replacement parts. Substitute parts may not meet the standards required for safe, dependable operation.

To facilitate parts ordering, record the model and serial number of your unit in the space provided on the cover of this manual. This information may be obtained from the identification plate located on the product.

The parts department needs this information to insure that you receive the correct parts for your specific model.

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# SAFETY STATEMENTS



THIS SYMBOL BY ITSELF OR WITH A WARNING WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.



## DANGER

THIS SIGNAL WORD IS USED WHERE SERIOUS INJURY OR DEATH WILL RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.



## WARNING

THIS SIGNAL WORD IS USED WHERE SERIOUS INJURY OR DEATH COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.



## CAUTION

THIS SIGNAL WORD IS USED WHERE MINOR INJURY COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.

## NOTICE

NOTICE INDICATES A PROPERTY DAMAGE MESSAGE.

## GENERAL SAFETY PRECAUTIONS

### WARNING!

#### READ MANUAL PRIOR TO INSTALLATION



Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).**



#### READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to operating or working on this equipment. Know and obey all OSHA regulations, local laws, and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.



#### KNOW YOUR EQUIPMENT

Know your equipment's capabilities, dimensions, and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to ensure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued, or excessively worn parts. Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn or hard to read.

## GENERAL SAFETY PRECAUTIONS

### WARNING!



### PROTECT AGAINST FLYING DEBRIS

Always wear proper safety glasses, goggles, or a face shield when driving pins in or out, or when any operation causes dust, flying debris, or any other hazardous material.

### WARNING!



### LOWER OR SUPPORT RAISED EQUIPMENT

Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or on blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

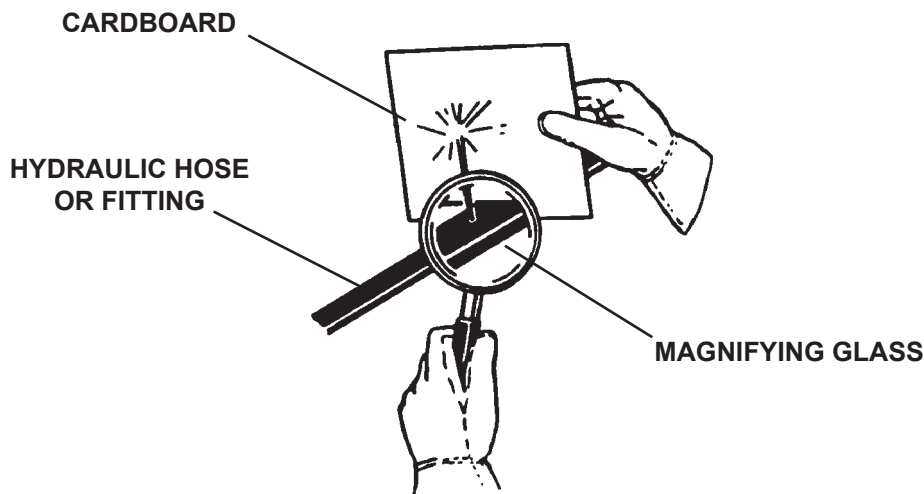
### WARNING!



### USE CARE WITH HYDRAULIC FLUID PRESSURE

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime mover's operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.
- If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS!** **SEE ILLUSTRATION.**





## GENERAL SAFETY PRECAUTIONS

### WARNING!



### DO NOT MODIFY MACHINE OR ATTACHMENTS

Modifications may weaken the integrity of the attachment and may impair the function, safety, life, and performance of the attachment. When making repairs, use only the manufacturer's genuine parts, following authorized instructions. Other parts may be substandard in fit and quality. Never modify any ROPS (Roll Over Protection Structure) or FOPS (Falling Object Protective Structure) equipment or device. Any modifications must be authorized in writing by the manufacturer.

### WARNING!



### SAFELY MAINTAIN AND REPAIR EQUIPMENT

- Do not wear loose clothing or any accessories that can catch in moving parts. If you have long hair, cover or secure it so that it does not become entangled in the equipment.
- Work on a level surface in a well-lit area.
- Use properly grounded electrical outlets and tools.
- Use the correct tools for the job at hand. Make sure they are in good condition for the task required.
- Wear the protective equipment specified by the tool manufacturer.



### SAFELY OPERATE EQUIPMENT

Do not operate equipment until you are completely trained by a qualified operator in how to use the controls, know its capabilities, dimensions, and all safety requirements. See your machine's manual for these instructions.

- Keep all step plates, grab bars, pedals, and controls free of dirt, grease, debris, and oil.
- Never allow anyone to be around the equipment when it is operating.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operator's position.
- Never leave equipment unattended with the engine running, or with this attachment in a raised position.
- Do not alter or remove any safety feature from the prime mover or this attachment.
- Know your work site safety rules as well as traffic rules and flow. When in doubt on any safety issue, contact your supervisor or safety coordinator for an explanation.

## EQUIPMENT SAFETY PRECAUTIONS

### WARNING!



#### KNOW WHERE UTILITIES ARE

Observe overhead electrical and other utility lines. Be sure equipment will clear them. When digging, call your local utilities for location of buried utility lines, gas, water, and sewer, as well as any other hazard you may encounter.

### WARNING!



#### EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.

It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

### WARNING!



#### REMOVE PAINT BEFORE WELDING OR HEATING

Hazardous fumes/dust can be generated when paint is heated by welding, soldering or using a torch. Do all work outside or in a well ventilated area and dispose of paint and solvent properly. Remove paint before welding or heating.

When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



#### OPERATING THE MULCHER

- Block off work area from bystanders, livestock, etc. Flying debris can cause severe injury or death. The mulcher is capable of producing large amounts of flying debris in all directions.
- Do NOT operate without a forestry guard package installed on prime mover.
- Operate only from the operator's station.
- Be aware when mulching standing trees, there is a danger of the treetop falling back onto the operator's cab.
- Do not contact tracks or boom during mulcher operation. It is recommended to maintain a minimum 90° angle between the boom and dipper to prevent the mulcher contacting the excavator.
- Do not engage or disengage the drum while the engine rpm's are above low idle.
- Do not operate the mulcher with a rotator option install on the excavator.
- Use extreme caution when operating "over the side". Machine stability is greatly reduced during "over the side" operation of an attachment.
- Do not lift loads in excess of the capacity of the excavator. Lifting capacity decreases as the load is moved further away from the unit.
- When operating on slopes, drive up and down, not across. Avoid steep hillside operation, which could cause the excavator to overturn. Avoid changing direction of travel on a slope. This could cause tipping or side slipping of the machine.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- An operator must not use drugs or alcohol, which can change his or her alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not he or she can safely operate equipment.
- Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover's engine and remove the key. 11378 2-2-09

# EQUIPMENT SAFETY PRECAUTIONS



## TRANSPORTING THE MULCHER

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- Watch for proper clearance of the boom and mulcher during transporting. Uneven ground can cause the boom to move in all directions.
- When driving on public roads use safety lights, reflectors, Slow Moving Vehicle signs etc., to prevent accidents. Check local government regulations that may affect you.
- Do not drive close to ditches, excavations, etc., cave in could result.
- Do not smoke when refueling the prime mover. Allow room in the fuel tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.



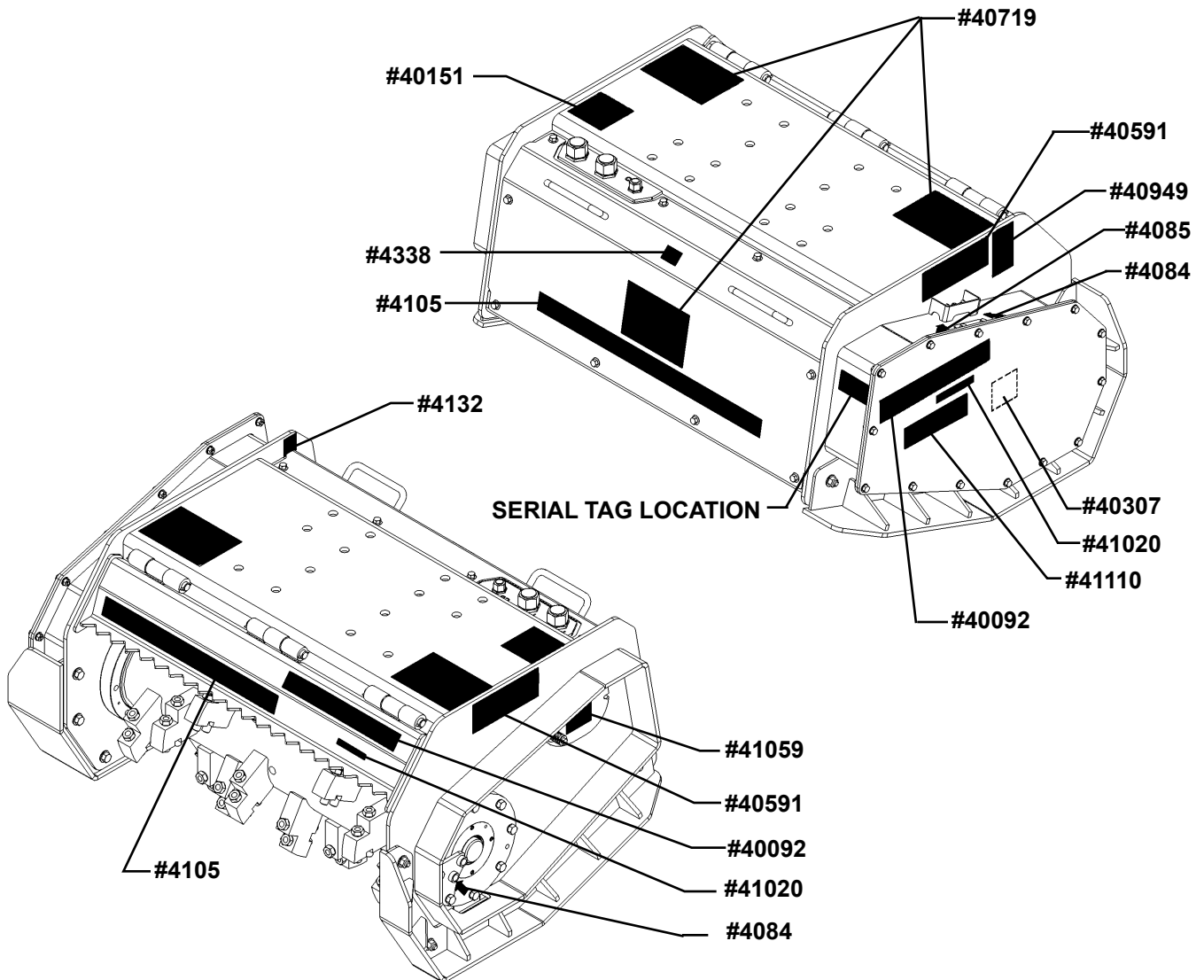
## MAINTAINING THE MULCHER

- Before performing maintenance, disengage auxiliary hydraulics, lower the attachment to the ground, apply the brakes, turn off the engine and remove the key.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator's manual before any repair is made. After completing maintenance or repair, check for correct functioning of the attachment. If not functioning properly, always tag "DO NOT OPERATE" until all problems are corrected.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from BRADCO.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.

# DECAL PLACEMENT

## GENERAL INFORMATION

The diagrams on this page shows the location of the decals used on the BRADCO Mulcher. The decals are identified by their part numbers, with reductions of the actual decals located on the following pages. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the attachment. They contain information you need to know for both safety and longevity.



**IMPORTANT:** Keep all safety signs clean and legible. Replace all missing, illegible, or damaged safety signs. When replacing parts with safety signs attached, the safety signs must also be replaced.

**REPLACING SAFETY SIGNS:** Clean the area of application with nonflammable solvent, then wash the same area with soap and water. Allow the surface to fully dry. Remove the backing from the safety sign, exposing the adhesive surface. Apply the safety sign to the position shown in the diagram above and smooth out any bubbles.

11380 2-2-09

# DECALS



**DANGER! FLYING DEBRIS**  
PART #40719



**WARNING! HIGH PRESSURE FLUID**  
PART #40151



**DANGER! ROTATING DRUM**  
PART #40591



**WARNING! GUARDS**  
PART #40949



**DANGER! STAND CLEAR**  
PART #4105

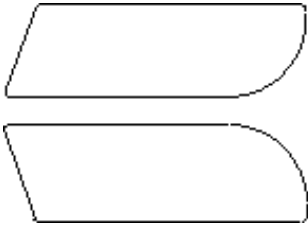


**DANGER! GUARD MISSING**  
PART #40307



**CAUTION! CHECK BACK PRESSURE**  
PART #41078  
(LOCATED ON HYDRAULIC MOTOR)

# DECALS



**BRADCO LOGO**  
PART #40092

# BRADCO

# MULCHER

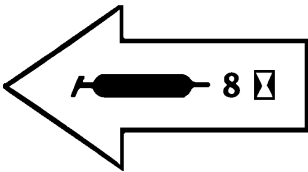
**MULCHER LOGO**  
PART #41020



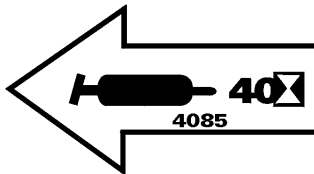
**MADE IN U.S.A.**  
PART #4338

# MM36

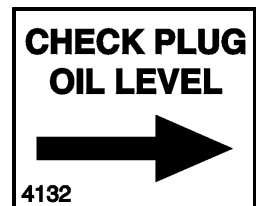
**MODEL NUMBER**  
PART #41110



**GREASE EVERY 8 HOURS**  
PART #4084



**GREASE EVERY 40 HOURS**  
PART #4085



**CHECK OIL LEVEL**  
PART #4132



**MANUAL STORAGE INSIDE**  
PART #41059

# SET-UP

## MOTOR DISPLACEMENT

Due to the range of excavators the BRADCO mulcher is designed for, the motor displacement is adjustable to various GPM and rotor RPM to give you optimum productivity for your particular application. The displacement must be adjusted and then “locked in” to create a “fixed” displacement motor that will continue to allow your unit to determine its own load capacity.

For optimum productivity and proper operation the displacement on the mulcher motor needs to be adjusted for the “ACTUAL” GPM of your excavator and the desired RPM of the mulcher rotor. With the engine at full throttle, set the rotor RPM between 1800 - 2000 RPM. (Factory settings are 40 CC on the 112630 mulcher and 50 CC on the 112705 mulcher.)

**NOTICE:** *Insufficient RPM (below 1800) will greatly reduce the productivity of your unit while overspeeding (above 2000) can cause serious damage to the motor and hammers.*

See the charts on the following page for correct adjustment of the limit screw for the motor minimum displacement.

### To Adjust Minimum Limit Screw:

**Loosen and hold the locking nut while turning the minimum limit screw to the desired dimension and then hold the limit screw while turning the locking nut and therefore locking it in place.**

It is recommended that the drum RPM be checked with a tachometer after adjustments have been completed. To increase RPM, increase “X” dimension. To decrease RPM decrease the “X” dimension.

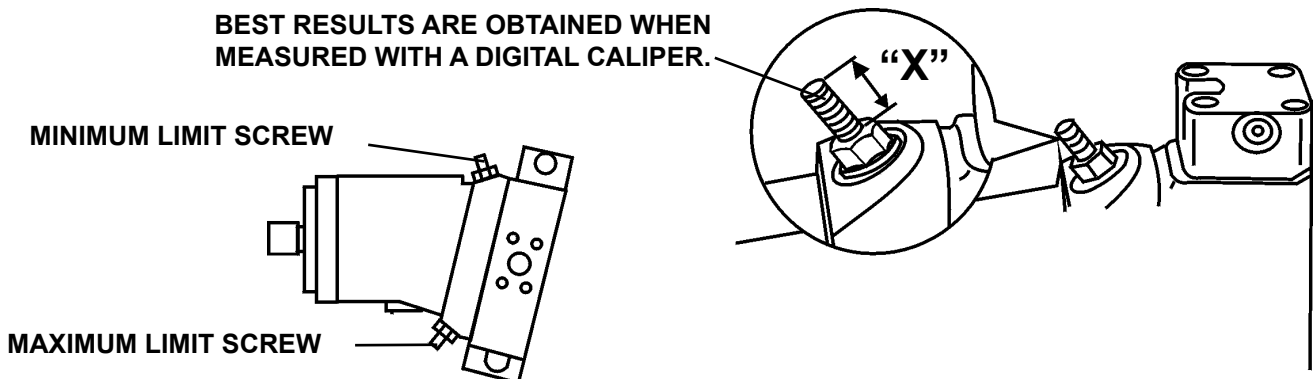
Once the minimum limit screw has been adjusted for the GPM of your machine and the rotor RPM required for optimum productivity, the maximum displacement limit screw must also be adjusted.

### To Adjust Maximum Limit Screw:

**Completely loosen the locking nut on the maximum limit screw. Turn the limit screw in, by hand, until it bottoms out. (Verify that the locking nut does not make contact with the motor before the limit screw bottoms out on the swash plate.) Then HOLD the limit screw while turning the locking nut and therefore locking the motor displacement.**

**NOTE:** To change the displacement and lower the RPM you will be required to back off on the maximum limit screw before any re-adjustments can be made.

**IMPORTANT:** Prime mover must be at operating temperature prior to adjustment.



The 55CC motor (#112700) includes a 5mm allen wrench and 17mm wrench to adjust the displacement screws. The 80CC motor (#107251) includes a 6mm allen wrench and 19mm wrench to adjust the displacement screws.

11401 2-18-09

## SET-UP

112630 HYDRAULIC MOTOR (28-41 GPM)						
	1800 ROTOR RPM		1900 ROTOR RPM		2000 ROTOR RPM	
GPM	DISPLACEMENT (CC)	SCREW (M10X90) DIMENSION X (IN)	DISPLACEMENT (CC)	SCREW (M10X90) DIMENSION X (IN)	DISPLACEMENT (CC)	SCREW (M10X90) DIMENSION X (IN)
28	35.3	.97	33.5	1.02	31.8	1.07
29	36.6	.93	34.7	.99	32.9	1.04
30	37.9	.90	35.9	.95	34.1	1.00
31	39.1	.86	37.1	.92	35.2	.97
32	40.4	.83	38.3	.88	36.3	.94
33	41.6	.79	39.4	.85	37.5	.91
34	42.9	.75	40.6	.82	38.6	.87
35	44.2	.72	41.8	.78	39.7	.84
36	45.4	.68	43.0	.75	40.9	.81
37	46.7	.64	44.2	.71	42.0	.78
38	47.9	.61	45.4	.68	43.2	.75
39	49.2	.57	46.6	.65	44.3	.71
40	50.5	.54	47.8	.61	45.4	.68
41	51.7	.50	49.0	.58	46.6	.65
42	---	---	50.2	.54	47.7	.62
43	---	---	51.4	.51	48.8	.58
44	---	---	---	---	50.0	.55
45	---	---	---	---	51.1	.52
46	---	---	---	---	52.2	.49

112705 HYDRAULIC MOTOR (42-60 GPM)						
	1800 ROTOR RPM		1900 ROTOR RPM		2000 ROTOR RPM	
GPM	DISPLACEMENT (CC)	SCREW (M12X100) DIMENSION X (IN)	DISPLACEMENT (CC)	SCREW (M12X100) DIMENSION X (IN)	DISPLACEMENT (CC)	SCREW (M12X100) DIMENSION X (IN)
42	53.0	1.01	50.2	1.08	47.7	1.13
43	54.3	.99	51.4	1.05	48.8	1.11
44	55.5	.96	52.6	1.02	50.0	1.08
45	56.8	.93	53.8	1.00	51.1	1.06
46	58.0	.90	55.0	.97	52.2	1.03
47	59.3	.87	56.2	.94	53.4	1.01
48	60.6	.84	57.4	.92	54.5	.98
49	61.8	.81	58.6	.89	55.6	.95
50	63.1	.79	59.8	.86	56.8	.93
51	64.4	.76	61.0	.83	57.9	.90
52	65.6	.73	62.2	.81	59.1	.88
53	66.9	.70	63.4	.78	60.2	.85
54	68.1	.67	64.6	.75	61.3	.83
55	69.4	.64	65.7	.73	62.5	.80
56	70.7	.62	66.9	.70	63.6	.77
57	71.9	.59	68.1	.67	64.7	.75
58	73.2	.56	69.3	.65	65.9	.72
59	74.4	.53	70.5	.62	67.0	.70
60	75.7	.50	71.7	.59	68.1	.67

11402 2-11-09



# INSTALLATION

## GENERAL INFORMATION

The BRADCO Mulchers were designed to be easy to use and maintain. They are operated by the excavator's auxiliary hydraulics. Due to the various different excavators that this attachment can be mounted on, the mulchers are shipped without hydraulic hoses and couplers. These can be purchased from your local dealer.

## HOSE REQUIREMENTS:

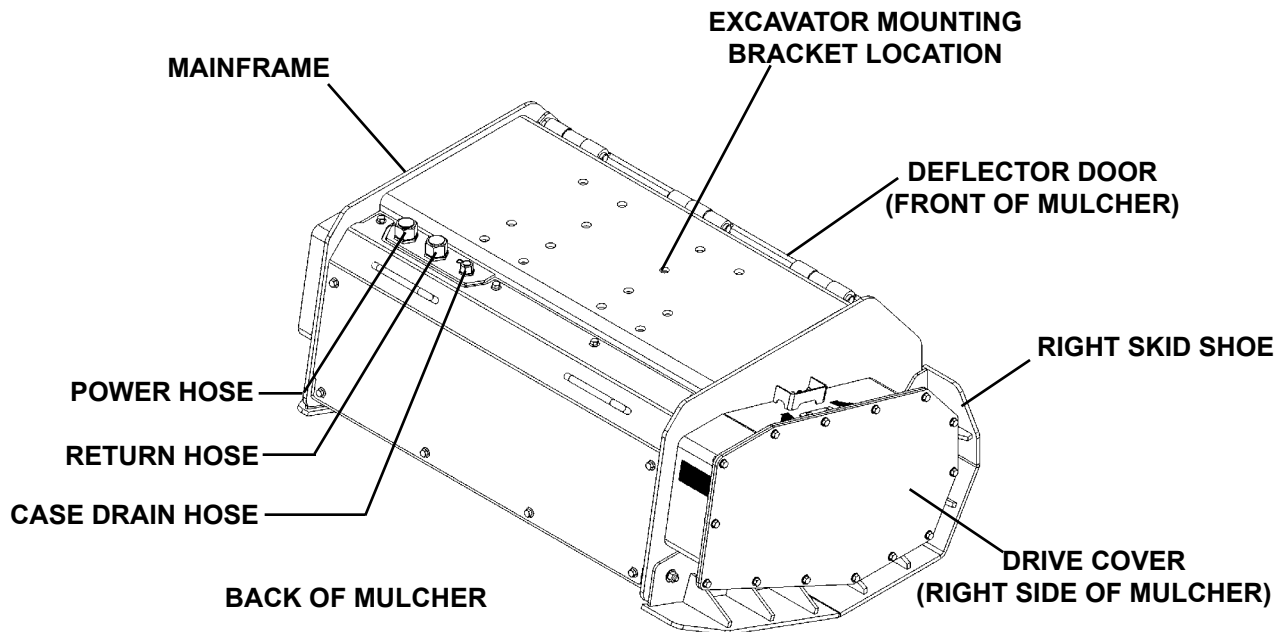
Power and return hoses and couplers along with a case drain hose and coupler must be purchased from your dealer to install the mulcher onto your excavator. The hoses must be long enough not to bind or pinch during operation and the power and return hoses must be rated for the maximum hydraulic pressure of your excavator's hydraulic system. Hose diameter should be such to prevent pressure drop on the oil entering the attachment and backpressure on the oil returning to the excavator.

Case drain line must be hooked up to the excavator hydraulic tank with less than 50 psi. During installation the case drain line must be connected first followed by the power and return hoses.

**NOTICE:** *The mulcher requires 28-60 GPM for productive operation.*

## NOMENCLATURE

Throughout this manual, reference is made to various mulcher components. Study the following diagram to acquaint yourself with the various names of these components. This knowledge will be helpful when reading through this manual or when ordering service parts. There is a complete parts breakdown for the mulcher at the back of this manual.



# INSTALLATION

## ATTACHING

A separate mounting kit is required to install the BRADCO Mulcher onto your excavator. Install the mounting bracket to the mulcher mounting plate and then install the mulcher to your excavator by following your power unit operator's manual for proper installation of an attachment. When attaching the hoses to the excavator, the case drain line must be connected first, then the power and return hoses. When disconnecting the hoses, it is recommended to disconnect the case drain line last. This will prevent any over pressurization of the motor case on the mulcher head. NOTE: The case drain line must be installed from the mulcher head to the excavator hydraulic tank. The case drain line must be unrestricted all the way to the tank.

**IMPORTANT: Check hoses for kinks or pinching. Reroute if necessary. Oil leaking from the atmospheric relief on motor is caused by improper connection, obstruction or damaged coupler on the case drain line. Make any necessary adjustments before operating.**

**WARNING!** To Avoid Serious Personal Injury, make sure the mulcher is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the attachment from the unit.



**Clear the area of all bystanders during installation.**

## DETACHING

On firm, level ground. Lower the mulcher to the ground.

Move the control levers back and forth to relieve pressure in the line.

Disconnect couplers. (When disconnecting the hoses, it is recommended to disconnect the case drain line last. This will prevent any over pressurization of the motor case on the mulcher head.)

**NOTE: Connect couplers together or install dust caps and plugs to prevent contaminants from entering the hydraulic system.**

Follow your power unit operator's manual for detaching (removing) an attachment.

**WARNING!** Clear the area of all bystanders during removal.



**IMPORTANT: DISENGAGE THE AUXILIARY HYDRAULICS, STOP THE ENGINE, ENGAGE PARKING BRAKE AND REMOVE KEY BEFORE LEAVING THE OPERATOR'S STATION.**

# OPERATION

## PREOPERATION

To determine if the BRADCO mulcher will operate efficiently on your excavator, engage your auxiliary hydraulics and check to make certain you still have complete functionality of the boom, dipper and bucket tilt hydraulic circuits.

**NOTICE:** *Your excavator application may require that a flow divider be added to the auxiliary circuit so that the auxiliary hydraulic oil flow can be divided and a percentage diverted back to the excavator during mulcher operation. This will insure that when the mulcher is engaged you still have the ability to operate the boom, dipper and bucket tilt functions on your excavator.*

## GENERAL INFORMATION

The BRADCO 36" Mulcher is perfect for clearing tall weeds, heavy brush and hardwood tree's up to 6" in diameter. There are two 36" mulchers available, one is for use on excavators with 28-41 GPM or 42-60 GPM. Thorough knowledge of the excavator is necessary for machine operation. Read and understand your power unit's operator's manual before attempting to use the mulcher.

Follow the installation instructions for installing the mulcher onto your excavator.

**WARNING!** Block off the work area from bystanders and livestock. Flying debris can cause severe personal injury or death.



Do not operate without a forestry guard package on your prime mover.

Do not engage or disengage the drum while the engine rpm's are above a low idle.

**WARNING!** Before exiting the prime mover, lower the attachment to the ground, disengage auxiliary hydraulics, apply the brakes, turn off the engine and remove the key.



## CASE DRAIN

The case drain hose coming from the mulcher to the power unit must never become pinched, removed from the machine while in operation, or have any type of restriction at any time. Any quick connect fitting used on the case drain line should be bi-directional, with no check valve or flow restrictions. Any type of restriction in this line will cause severe hydraulic system damage and could void warranty. When connecting the mulcher onto your unit you should always connect the case drain line first, and when disconnecting the mulcher you should always disconnect the case drain line last.

**NOTICE:** *Oil leaking out of the atmospheric relief on your motor is a result of excessive case drain pressure. This is caused by improper connection, obstruction or damaged coupler on the case drain line. Make any necessary adjustments before operating the mulcher.*

# OPERATION

## OPERATION

**DANGER!** To avoid serious personal injury or death the BRADCO mulcher must not be attached to any power unit that does not have a forestry guard package installed.



Read and understand all warnings and precautions in this manual and on the machine before operating the mulcher. The Bradco mulcher is relatively simple to use, and with the help of the information in this manual and a little practice you should become proficient in its operation and able to develop procedures suitable to your particular situation.

### Starting The Mulcher

1. Start the attachment with the engine at an idle only.

**NOTE:** The rotor will only turn in one direction. If rotor is not turning check for proper hydraulic hose hook up. If you have the correct hydraulic hook up and rotor is still not turning, idle the engine all the way down as far as it will go and disengage the auxiliary hydraulics. Check for proper flow direction and repair or correct. (You must never change the direction while the rotor is in motion.) Failure to follow this shut down and restart procedure will cause severe damage to the hydraulic system of the attachment and void all warranties.

2. Position the prime mover, check that all personnel and bystanders are out of the area, start rotor and increase engine speed.

**WARNING!** Block off work area. Flying debris can cause severe injury or death. This mulcher is capable of producing large amounts of flying debris in all directions.



5. Be sure the mulcher is operating smoothly at full throttle and then start mulching operation. **NOTE:** All mulching operations must be done with the excavator stationary. Do not mulch while the excavator is in motion.

**NOTICE:** Continual monitoring of hydraulic oil temperature and water temperature of the prime mover is required during mulcher operation. If temperature rises too high the mulcher must be removed from the brush/debris and the prime mover returned to an idle until it has cooled down sufficiently to continue operation.

### Stopping The Rotor

Disengage the rotor by first idling the engine all the way down and allow the rotor to slow down as far as it will go and then disengage the auxiliary hydraulics. Failure to follow this shut down procedure will cause severe damage to the hydraulic and drive system of the attachment.

# OPERATION

## GENERAL OPERATING TIPS

**STALLING:** If the attachment stalls, the operator will have to stop and remove the mulcher from the material and allow the rotor to regain speed. Reduce the load on the mulcher to prevent further stalling.

**JAM:** When a jam occurs, shut off the hydraulics. Move the mulcher to a clear area. Set the rotor on a log or tree trunk. Apply down pressure and slide the mulcher backwards to force the drum to rotate without hydraulics and therefore discharging the jam.

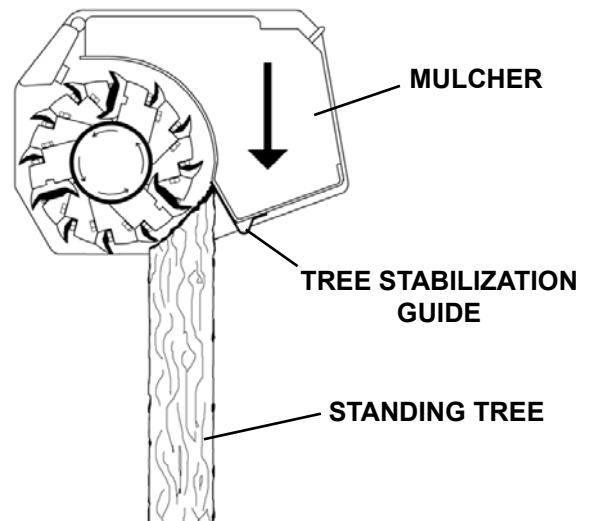
**BRUSH:** When clearing brush, start at the top and using a sweeping action, swing the unit back and forth through the brush while lowering at a pace that will not decrease the rotor rpm. Once you are completely through the brush, continue sweeping, this will re-mulch the brush and produce a more finished surface.

**NOTE:** Swinging the mulcher too fast will not properly mulch the material.

**CAUTION!** Take extra care when mulching dead standing trees. There is a danger of the tops falling back onto the operator's cab, causing injury or property damage.



**STANDING TREES:** Start at a safe operating height for your prime mover and cut off the top of the tree. Position the mulcher over the tree in such a way that the tree stabilization guide will support the tree and guide it into the rotor, therefore limiting tree deflection and enhancing control and increasing productivity.



**GROUND MULCHING / MIXING:** The mulcher head is capable of mulching and mixing debris approximately 1.50" below ground level. Keep in mind that excessive ground engaging will rapidly decrease the life of the cutting hammers, sometimes up to as much as 50%. When doing excessive ground engaged mulching, inspect the cutting hammers more often to prevent wearing the cutters into the holders.

# MAINTENANCE

## GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to the absolute minimum. However, it is very important that these maintenance functions be performed as described below.

### DAILY

- Check all bolts and nuts for tightness.
- Replace any missing bolts or nuts with approved replacement parts.
- Check hydraulic system for hydraulic oil leaks. See procedure below.
- Visually inspect the machine for worn parts or cracked welds, and repair as necessary.
- Visually inspect the machine for worn, broken or missing teeth. Repair or replace as necessary.
- Lubricate grease fittings on both ends of the rotor.
- Clean rotor of any accumulated debris and dirt.

### EVERY 40 HOURS

- Lubricate grease fitting on the upper bearing housing. Located on the right side of the unit. (Use a hand gun and approximately 2 pumps of grease.)

### BREAKIN PERIOD

- Check drive belt tension at 40 hour intervals for the first 120 hours.

### EVERY 100 HOURS

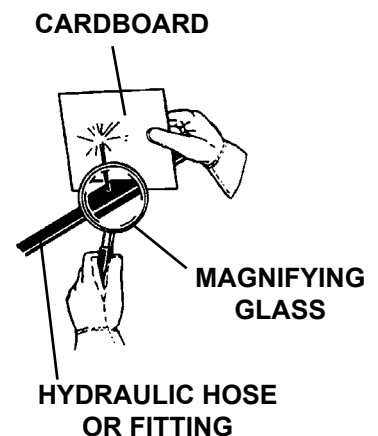
- Check drive belt tension.

**WARNING!** Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.



Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.

If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.



**IMPORTANT:** When replacing parts, use only factory approved replacement parts. Manufacturer will not claim responsibility for use of unapproved parts or accessories, and/or other damages as a result of their use.

## MAINTENANCE & SERVICE

**WARNING!** Before performing maintenance or service lower the attachment to the ground, disengage auxiliary hydraulics, apply the brakes, turn off the engine and remove the key.



**WARNING!** Never perform any work on this attachment unless you are authorized and qualified to do so. Always read the operator's manuals before any repair is made. After completing maintenance or service, check for correct functioning of the attachment. If not functioning properly, always tag "DO NOT OPERATE" until all problems are corrected.



### REPLACING TEETH

Worn, broken or missing teeth will cause excessive machine vibration and reduce productivity.

It is important that all teeth are attached properly. Reversible hammer teeth and claw teeth can be rotated when worn or if points are broken or missing.

1. Remove existing tooth.
2. Check to make sure the mounting surface and bolt holes are clean and free of debris. (Any accumulation of debris can cause the tooth not to seat properly in the slot resulting in unsafe operation.)
3. Position the new tooth onto the holder and after both bolts have been started, push the tooth up into the mounting slot and tighten with an impact wrench. Torque to 150 ft. lbs.

**NOTE:** Replace any damaged bolts or washers. Install washers with the side that is higher in the center towards the bolt head.

**NOTICE:** Failure to start both bolts into the tooth first before tightening one bolt, can bind the other bolt, and damage the bolt and possibly the cutting tooth, rendering the bolt and tooth unusable.

**WARNING!** Improper mounting can void warranty and cause serious injury and/or death  
Use only manufacturer replacement parts.



### DRIVE BELT TENSIONING AND/OR REMOVAL

**WARNING!** Before performing maintenance or service lower the attachment to the ground, disengage auxiliary hydraulics, apply the brakes, turn off the engine and remove the key.



## MAINTENANCE & SERVICE

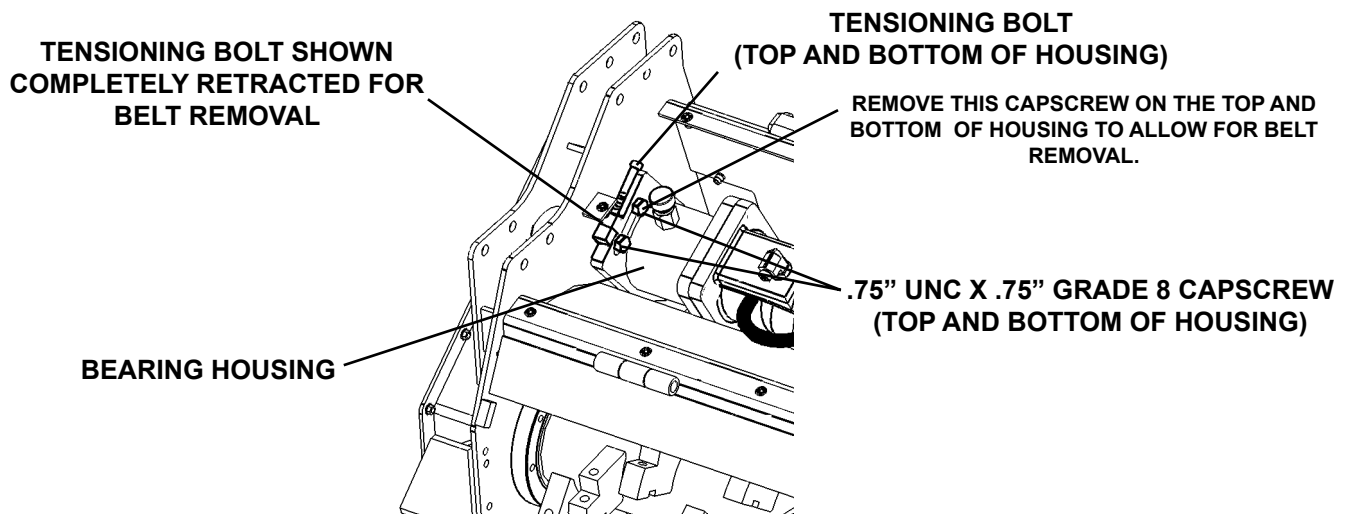
1. Remove the drive cover and the rear compartment cover on the back of the mulcher.
2. Test the tension of the belt by checking the deflection in the belt halfway between the two pulleys. When properly adjusted a used belt should require approximately 44-48 lbs. of force to deflect the belt .31" while a new belt should require approximately 55-59 lbs of force to obtain the same .31" deflection. The belt should not move more than .31" or be so tight that you cannot move it at all.
3. Loosen the four .75" grade 8 capscrews that secure the bearing housing to the frame to allow the housing to slide in the slots.

**NOTE: The two back capscrews will have to be removed to release belt tension enough to allow for belt removal.**

4. The two tensioning bolts take a .38" allen wrench to adjust. Adjust the belt tensioning bolts alternately until the proper tension is achieved.

**NOTE: Retracting the two tensioning bolts will release the tension on the belt and allow for BELT REMOVAL.**

5. Retighten the .75" grade 8 bolts securing the bearing housing to the frame. Torque to 350 ft. lbs.
6. Recheck belt tension and check pulley's for alignment. (See Pulley Installation)
7. Install drive cover and rear compartment cover using existing hardware.



**NOTE: Belt damage can occur if belt is too loose, too tight, mis-aligned or if debris is present. Do not operate without drive cover installed.**



# MAINTENANCE & SERVICE

## SPROCKET (PULLEY) REMOVAL AND INSTALLATION

**WARNING!** Before performing maintenance or service lower the attachment to the ground, disengage auxiliary hydraulics, apply the brakes, turn off the engine and remove the key.

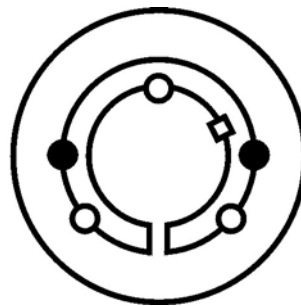
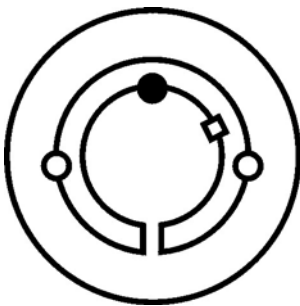


### TAPER LOCK BUSHING IDENTIFICATION AND ORIENTATION

When replacing sprockets, it is recommended to update both sprockets at the same time.

TAPER LOCK BUSHING  
#113720 & #113757

TAPER LOCK BUSHING  
#113594



● “JACK SCREW HOLES”  
○ “HALF THREADED HOLES”

### Removal

1. Remove the drive belt. See “**DRIVE BELT TENSIONING AND/OR REMOVAL**”
2. Loosen the taper lock assembly (bushing) in the sprocket by removing all mounting screws.
3. Insert screws into all jack screw holes indicated in the diagram for the Taper Lock Bushing for your mulcher.
4. Loosen the bushing by alternately tightening the screws in small but equal increments until the taper sprocket and bushing surfaces disengage.

### Installation

1. Tighten the .75” grade 8 capscrews on the upper bearing housing to ensure proper alignment of the shaft and housing.

**NOTE: The housing must be properly seated flat against the frame of the mulcher for proper alignment of the sprockets. If there are any gaps along this surface, remove the housing and clean any debris from the surface. Reinstall and tighten.**

2. The taper lock bushing assembly needs to be reassembled for proper installation. DO NOT use “Never Seize” on bushing or bolts.
3. Clean the shaft, bore of bushing, outside of bushing and the sprocket hub bore of all oil, paint and dirt. File away any burrs. **NOTE: The use of lubricants can cause sprocket breakage. USE NO LUBRICANTS IN THIS INSTALLATION.**
4. Insert the bushing into the sprocket hub. Match the hole pattern, not the threaded holes (each complete hole will be threaded on one side only.)
5. LIGHTLY oil the set screws and thread them into the half-threaded holes indicated on the diagram. **NOTE: Do not lubricate the bushing taper, hub taper, bushing bore, or the shaft. Doing so could result in sprocket breakage.**

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## MAINTENANCE & SERVICE

6. With the key in the shaft keyway, position the assembly onto the shaft allowing for small axial movement of the sprocket which will occur during the tightening process. Make certain the shaft is completely through the bushing.

**NOTE: If the locking assembly will not slide onto the shaft, you have the locking assembly too tight.**

7. Alternately tighten the set screws until the sprocket and taper lock bushing are seated together. Do not apply enough torque to the set screws that the sprocket and taper lock bushing will not slide on the shaft for alignment purposes.

**NOTE: Do not use worn hex key wrenches. Doing so may result in a loose assembly or may damage screws.**

8. If both sprockets were removed, install the second one using the same procedure.  
 9. Align the sprockets using a straight edge. The outside edge of both sprockets must be aligned. Torque the set screws to approximately one-half of the recommended torque to lock the bushings onto the shaft. See torque table below.

**NOTICE: Failure to align the sprockets correctly will decrease the life of the belt.**

10. Install the drive belt and tension just enough to prevent the sprockets from rotating.

**NOTICE: Never force the belt over the sprocket flange as internal damage to the belt will occur.**

11. Continue to alternate tightening of the capscrews on the bushings to the recommended torque value shown in table.  
 12. To increase the bushing gripping force, hammer the face of the bushing using a drift or sleeve (do not hit the bushing directly with the hammer).  
 13. Re-torque the bushing screws after hammering.  
 14. Recheck all screw torque values after the initial drive run-in, and periodically thereafter. Tighten as required.  
 15. Follow instructions for re tensioning the drive belt and cover installation. See “**DRIVE BELT TENSIONING AND/OR REMOVAL**”.

BUSHING	BOLTS		TORQUE WRENCH	
PART NUMBER	QTY	SIZE	LBS - FT.	LBS - IN.
113720	2	.50" UNC X 1.00"	35.8	430
113757	2	.62" UNC X 1.25"	66.7	800
113594	3	.50" UNC X 1.50"	83.3	1000

**NOTICE: Excessive bolt torque can cause sprocket and/or bushing breakage.**  
**NOTE: To insure proper bushing/sprocket performance, full bushing contact on the shaft is recommended.**

### REPLACING THE LOWER BEARINGS

**WARNING!** Before performing maintenance or service lower the attachment to the ground, disengage auxiliary hydraulics, apply the brakes, turn off the engine and remove the key.



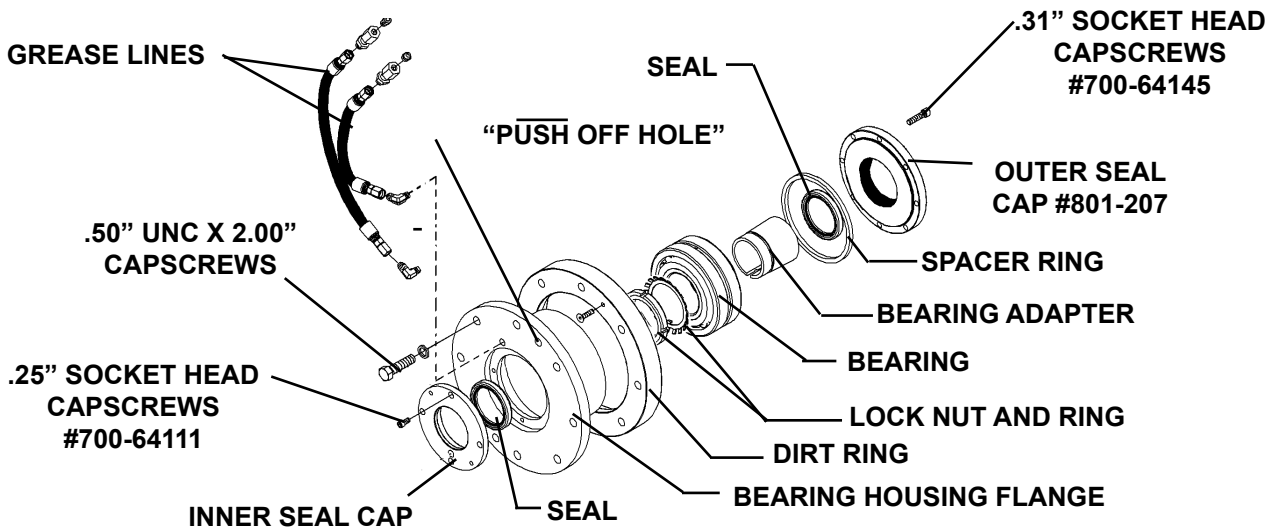
## MAINTENANCE & SERVICE

1. Remove the drive belt. (Right side bearing only.) See “**DRIVE BELT TENSIONING AND/OR REMOVAL**”
2. Remove the lower pulley. (Right side bearing only.) See “**PULLEY REMOVAL AND INSTALLATION**”.
3. Tag and disconnect grease lines and plug or cap fittings and hoses to prevent contaminants from entering the lubricating system. (Right side bearing only.)
4. Remove the four socket head capscrews #700-64111 and remove the outside inner seal cap #801-206. (You may have to install two .25” x 1.00” capscrews into the push off holes to remove the inner seal cap.)
5. Loosen the lock nut and ring on the bearing adapter.

**NOTE: The locking tab must be bent out of the bearing lock nut prior to removal of the nut. Failure to bend out the locking tab can result in breaking the lock ring and/or destroying the threads on the bearing adapter inside the bearing.**

**NOTE: The bearing adapter may need to be released from the bearing by pushing it back, into the bearing.**

### LOWER RIGHT BEARING ASSEMBLY



6. Securely block the rotor up to prevent it from falling. Remove the eight .50” capscrews from the bearing housing flange and install two of them into the push off holes to release the housing from the shaft. Remove the bearing housing.
7. Remove the socket head capscrews from the inside outer seal cap #801-207 and remove the cap plate and spacer ring.
8. Slide the bearing out the back of the housing.
9. Inspect the inside of the bearing housing for defects before installing a new bearing. Replace bearing #600-158.
10. Reinstall the bearing with the smaller side of the taper to the outside of the housing. Apply force to the outer race of the bearing only. Ensure the bearing is properly seated against the shoulder in the bearing housing. Once the bearing is inside of the housing, remove the lock ring and lock nut from the bearing adapter and slide the adapter into the bearing. Loosely reinstall the lock ring and lock nut (installed with loctite) onto the bearing adapter and install the spacer ring into the housing.

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## MAINTENANCE & SERVICE

11. Install a new seal #600-159 into the seal cap and install onto the housing using the existing bolts.
12. Install the bearing housing, with bearings, onto the rotor shaft taking care not to damage the dirt ring.
13. Reinstall the eight .50" bolts into the bearing housing securing the housing to the frame. Torque to 106 ft. lbs.
14. Check to be certain the rotor is centered in the head and then tighten the bearing adapter. Torque to 250 ft. lbs.
15. Once the bearing is tight, check to be sure the rotor spins freely in the head.
16. After torquing the bearings to 250 ft. lbs, locate the locking tab on the lock ring and bend into a slot. If slots are not in alignment, tighten the lock nut to align a slot.
17. Reconnect the grease lines and pump grease into the line to be sure grease is coming out through the bearing. (Right side bearing only.)
18. Install inner seal cap onto the housing using the existing .25" socket head capscrews.
19. Grease the bearing. Reinstall the belt, sprocket and covers following the belt and sprocket installation procedure if replacing the right side bearing.

### REPLACING UPPER BEARINGS AND SEALS

**WARNING!** Before performing maintenance or service lower the attachment to the ground, disengage auxiliary hydraulics, turn off the engine, remove the key and apply the brakes.

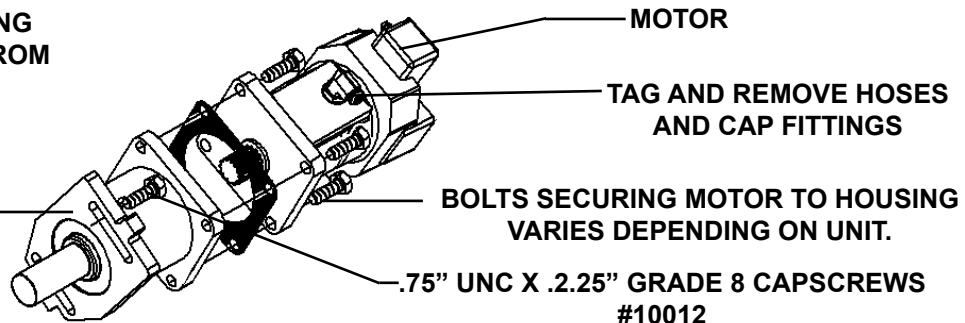


**NOTE:** An overhead hoist is recommended when removing the upper bearing assembly.

1. Remove the drive belt. See “**DRIVE BELT TENSIONING AND/OR REMOVAL**”
2. Securely attach hoist to the motor and upper bearing housing to support it for removal.
3. Remove the upper pulley. See “**PULLEY REMOVAL AND INSTALLATION**”.
4. Tag and remove hoses from the hydraulic motor.
5. Remove the four .75" grade 8 capscrews (#10012) securing the housing to the side of the mulcher frame.
6. Slide the motor and housing assembly out of the mulcher frame. Drain oil from housing by removing plug #3226. (See parts diagram for plug location.)

**REMOVE UPPER BEARING HOUSING AND MOTOR FROM MULCHER FRAME**

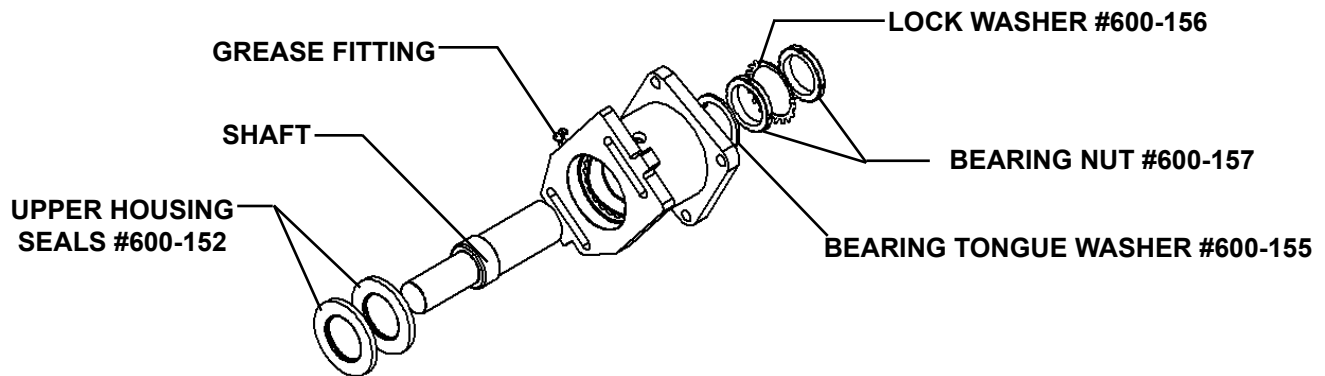
**UPPER BEARING HOUSING**



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## MAINTENANCE & SERVICE

- Place housing and motor assembly on a clean surface. Remove the bolts securing the motor to the housing and separate the housing from the motor. **NOTE: Bolts securing the motor to the housing varies depending on motor.**
- Bend tab up on lock washer #600-156 and remove the first bearing nut and washer. Loosen and remove the second bearing nut and the bearing tongue washer.



- Remove seals #600-152. Remove shaft.
- Remove and replace the bearings (cones #600-153 and cups #600-154). Ensure the bearing cones are properly seated against the shoulders of the upper bearing housing.
- Inspect the shaft for damage and either replace or reinstall the shaft into the housing using the existing washers and bearing nuts.
- Install the inside upper housing seal and press down until it is seated against the shoulder on the upper housing. Install the second upper housing seal and press into the housing until it is flush with the outside of the housing.
- Inspect motor shaft seal and replace if necessary. Replace the motor o'ring and reinstall the motor onto the housing using the existing hardware. Torque bolts to specification.
- Using the hoist, position the housing and motor assembly back into the mulcher frame and secure in place using two .75" grade 8 capscrews.
- Grease the upper housing seals using a hand gun and approximately two pumps of grease. (Grease every 40 hours.)
- Reconnect the hydraulic hoses and refill the housing assembly with premium gear oil 80W90. See "Checking and/or Adding Oil".
- Reinstall the belt, pulley and covers following the belt and pulley installation procedures.

### CHECKING AND/OR ADDING OIL

The upper bearing housing is filled with a premium gear oil 80W90. In the event that gear oil is needed, there is a fill level plug on the backside of the housing. (Remove the rear compartment cover on back of mulcher frame.)

#### To Fill Housing:

- Remove the plug and breather from the top of the housing.
- Fill the housing until there is oil coming out of the fill level hole.
- Replace the plug and the breather.

NOTE: This is a sealed system. If oil level is low check seals for damage.

# TROUBLESHOOTING

<b><u>PROBLEM</u></b>	<b><u>POSSIBLE CAUSE</u></b>	<b><u>POSSIBLE REMEDY</u></b>
<b>Rotor not turning.</b>	Auxiliary hoses not hooked up to the prime mover.	Check coupler engagement.
	Auxiliary hoses not hooked up to the prime mover correctly.	Reverse Power and return lines on the mulcher.
	Obstruction in hydraulic lines.	Remove obstruction and replace if necessary.
	Hydraulic motor damaged or seals blown.	Call Bradco service department for instructions.
	Auxiliary control valve not engaged.	Verify hydraulic flow using inline flow meter or other attachment.
	Rocks and debris caught between rotor and mainframe.	Remove debris. (See "General Operating Tips")
	Damaged quick coupler.	Replace if necessary
Drive belt broken.	Replace.	
<b>Rotor rotates sluggishly.</b>	Insufficient hydraulic flow from the prime mover.	Refer to prime mover owners manual and verify hydraulic flow using an inline flow meter or other attachment.
	Damaged quick coupler.	Replace if necessary.
	Hydraulic motor damaged or seals blown.	Call Bradco service department for instructions.
	Oil filter on prime mover needs replaced.	Refer to prime mover owners manual.
<b>Leaking Oil.</b>	Loose or damaged hydraulic line.	Tighten or replace.
	Upper bearing failure.	Replace as necessary
	O-Rings on fittings damaged.	Replace if necessary.
	Hydraulic motor damaged or seals blown.	Call Bradco service department for instructions.
	Fittings loose or damaged.	Tighten or replace.
	Case drain not properly connected or coupler damaged.	Engage coupler or replace.
<b>Insufficient power.</b>	Insufficient hydraulic flow from the prime mover.	Refer to prime mover owners manual and verify hydraulic flow using an inline flow meter or other attachment.
	Relief valve setting adjusted too low.	Refer to prime mover owners manual.
	Hydraulic motor damaged or seals blown.	Call Bradco service department for instructions.
	Oil filter on prime mover needs replaced.	Refer to owners manual.
	Incorrect motor displacement setting.	Reset motor displacement for your prime mover. See Set-Up Instructions.

# TROUBLESHOOTING

<u>PROBLEM</u>	<u>POSSIBLE CAUSE</u>	<u>POSSIBLE REMEDY</u>
<b>Excessive oil temperature.</b>	Hydraulic oil level too low.	Refer to prime mover owners manual
	Obstruction in hydraulic lines.	Remove obstruction and replace if necessary.
	Hydraulic oil or oil filter in prime mover needs replaced.	Refer to prime mover owners manual.
	Relief valve setting adjusted too low.	Refer to prime mover owners manual.
	Obstructed radiator/cooler on prime mover.	Clean radiator/cooler.
	Incorrect motor displacement setting.	Reset motor displacement for your prime mover. See Set-Up Instructions.
	Operating the mulcher at maximum pressure for an extended amount of time.	Slow down the speed and/or the down pressure on the mulcher until operating below maximum pressure.
<b>Excessive vibration during operation.</b>	Teeth are worn, broken or missing.	Inspect and replace as necessary.
	Bearing failure.	Inspect and replace as necessary.
	Rotor obstruction.	Clear all debris from rotor and hammer teeth. (See General Operating Tips)
<b>Excessive or uneven tooth wear on drive belt</b>	Incorrect tensioning of belt.	Retension belt. See Belt Tensioning.
	Belt misaligned.	Align sprockets using a straight edge.
	Sprockets worn.	Replace as necessary.
	Debris in drive assembly.	Remove debris and replace covers.
<b>Drive belt cracking.</b>	Excessive low temperatures.	Moderate temperatures, especially at start up.
	Exposed to oil solvents/chemicals.	Eliminate exposure to chemicals and shield drive.
	Belt misaligned.	Align sprockets using a straight edge.
	Incorrect tension on drive belt.	Retension belt. See Belt Tensioning.
<b>Drive belt skipping or ratcheting.</b>	Belt undertensioned.	Retension belt. See Belt Tensioning.
	Sprocket worn.	Replace worn sprocket.
	Debris in drive assembly.	Remove debris and replace covers.




# BOLT TORQUE SPECIFICATIONS

## GENERAL TORQUE SPECIFICATION TABLES

Use the following charts when determining bolt torque specifications when special torques are not given. Always use grade 5 or better when replacing bolts.




## SAE BOLT TORQUE SPECIFICATIONS

**NOTE:** The following torque values are for use with extreme pressure lubricants, plating or hard washer applications. Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.

Bolt Size		SAE GRADE 5 TORQUE				SAE GRADE 8 TORQUE				Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		
Inches	Millimeters	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	
1/4	6.35	8	9	11	12	10	13	14	18	<p>GRADE 2</p>  <p>GRADE 5</p>  <p>GRADE 8</p> 
5/16	7.94	14	17	19	23	20	25	27	34	
3/8	9.53	30	36	41	49	38	46	52	62	
7/16	11.11	46	54	62	73	60	71	81	96	
1/2	12.70	68	82	92	111	94	112	127	152	
9/16	14.29	94	112	127	152	136	163	184	221	
5/8	15.88	128	153	174	207	187	224	254	304	
3/4	19.05	230	275	312	373	323	395	438	536	
7/8	22.23	340	408	461	553	510	612	691	830	
1	25.40	493	592	668	803	765	918	1037	1245	
1-1/8	25.58	680	748	922	1014	1088	1224	1475	1660	
1-1/4	31.75	952	1054	1291	1429	1547	1700	2097	2305	
1-3/8	34.93	1241	1428	1683	1936	2023	2312	2743	3135	
1-1/2	38.10	1649	1870	2236	2535	2686	3026	3642	4103	

## METRIC BOLT TORQUE SPECIFICATIONS

**NOTE:** The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.

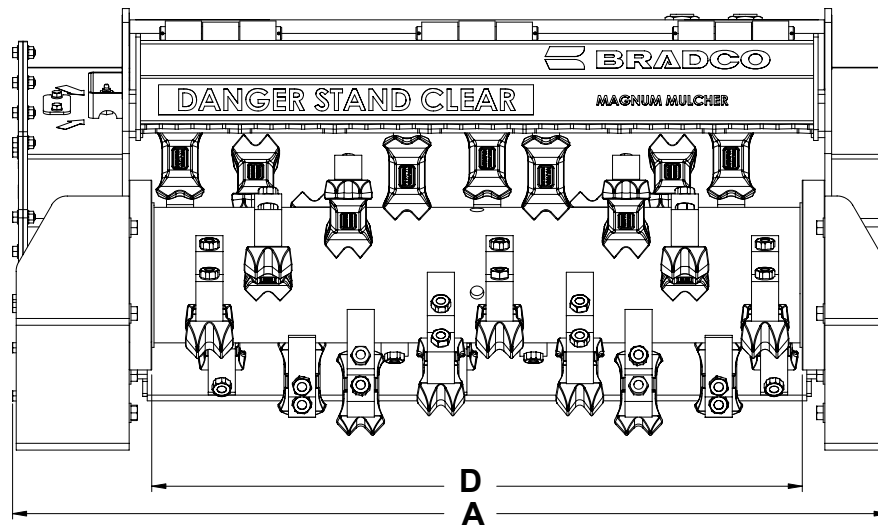
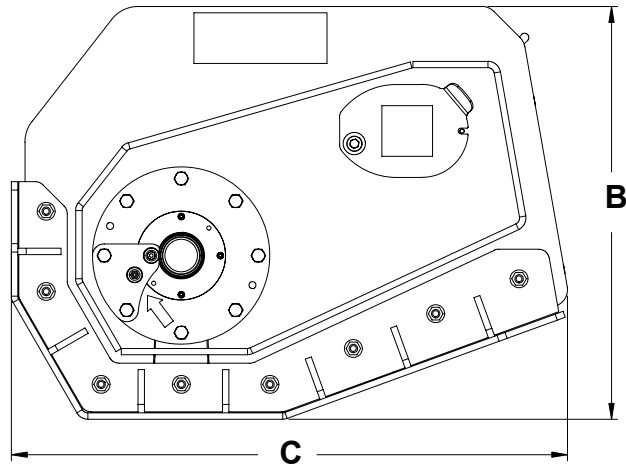
Bolt head identification marks as per grade.		
		

Size of Bolt	Grade No.	Pitch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	5.6	1.0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1.25	7.2-14	9.8-19	1.0	12-17	16.3-23
	8.8		17-22	23-29.8		19-27	25.7-36.6
	10.9		20-26	27.1-35.2		22-31	29.8-42
M10	5.6	1.5	20-25	27.1-33.9	1.25	20-29	27.1-39.3
	8.8		34-40	46.1-54.2		35-47	47.4-63.7
	10.9		38-46	51.5-62.3		40-52	54.2-70.5
M12	5.6	1.75	28-34	37.9-46.1	1.25	31-41	42-55.6
	8.8		51-59	69.1-79.9		56-68	75.9-92.1
	10.9		57-66	77.2-89.4		62-75	84-101.6
M14	5.6	2.0	49-56	66.4-75.9	1.5	52-64	70.5-86.7
	8.8		81-93	109.8-126		90-106	122-143.6
	10.9		96-109	130.1-147.7		107-124	145-168
M16	5.6	2.0	67-77	90.8-104.3	1.5	69-83	93.5-112.5
	8.8		116-130	157.2-176.2		120-138	162.6-187
	10.9		129-145	174.8-196.5		140-158	189.7-214.1
M18	5.6	2.0	88-100	119.2-136	1.5	100-117	136-158.5
	8.8		150-168	203.3-227.6		177-199	239.8-269.6
	10.9		175-194	237.1-262.9		202-231	273.7-313
M20	5.6	2.5	108-130	146.3-176.2	1.5	132-150	178.9-203.3
	8.8		186-205	252-277.8		206-242	279.1-327.9
	10.9		213-249	288.6-337.4		246-289	333.3-391.6



# SPECIFICATIONS

## MM36 MULCHER



DESCRIPTION	112630	112705
A. Overall Width.....	48.50"	48.50"
B. Overall Height.....	25.50"	25.50"
C. Overall Length.....	33.00"	33.00"
D. Cutting Width.....	36.00"	36.00"
Operating Pressure (PSI).....	5000	5000
Hydraulic Flow (GPM).....	28-41	42-60
Hammers.....	27	27
Weight (LBS).....	1450#	1470

Specifications and design are subject to change without notice and without liability therefor.

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# Limited Warranty

Except for the Excluded Products as described below, all new products are warranted to be free from defects in material and/or workmanship during the Warranty Period, in accordance with and subject to the terms and conditions of this Limited Warranty.

1. Excluded Products. The following products are excluded from this Limited Warranty:

(a) Any cable, part that engages with the ground (i.e. sprockets), digging chain, bearing, teeth, tamping and/or demolition head, blade cutting edge, pilot bit, auger teeth and broom brush that either constitutes or is part of a product.

(b) Any product, merchandise or component that, in the opinion of Paladin Light Construction<sup>1</sup>, has been (i) misused; (ii) modified in any unauthorized manner; (iii) altered; (iv) damaged; (v) involved in an accident; or (vi) repaired using parts not obtained through Paladin Light Construction.

2. Warranty Period. The Limited Warranty is provided only to those defects that occur during the Warranty Period, which is the period that begins on the first to occur of: (i) the date of initial purchase by an end-user, (ii) the date the product is first leased or rented, or (iii) the date that is six (6) months after the date of shipment by Paladin Light Construction as evidenced by the invoiced shipment date (the "Commencement Date") and ends on the date that is twelve (12) months after the Commencement Date.

3. Terms and Conditions of Limited Warranty. The following terms and conditions apply to the Limited Warranty hereby provided:

(a) Option to Repair or Replace. Paladin Light Construction shall have the option to repair or replace the product.

(b) Timely Repair and Notice. In order to obtain the Limited Warranty, (i) the product must be repaired within thirty (30) days from the date of failure, and (ii) a claim under the warranty must be submitted to Paladin Light Construction in writing within thirty (30) days from the date of repair.

(c) Return of Defective Part or Product. If requested by Paladin Light Construction, the alleged defective part or product shall be shipped to Paladin Light Construction at its manufacturing facility or other location specified by Paladin Light Construction, with freight PRE-PAID by the claimant, to allow Paladin Light Construction to inspect the part or product.

Claims that fail to comply with any of the above terms and conditions shall be denied.

## LIMITATIONS AND EXCLUSIONS.

**THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY BASED ON A COURSE OF DEALING OR USAGE OF TRADE.**

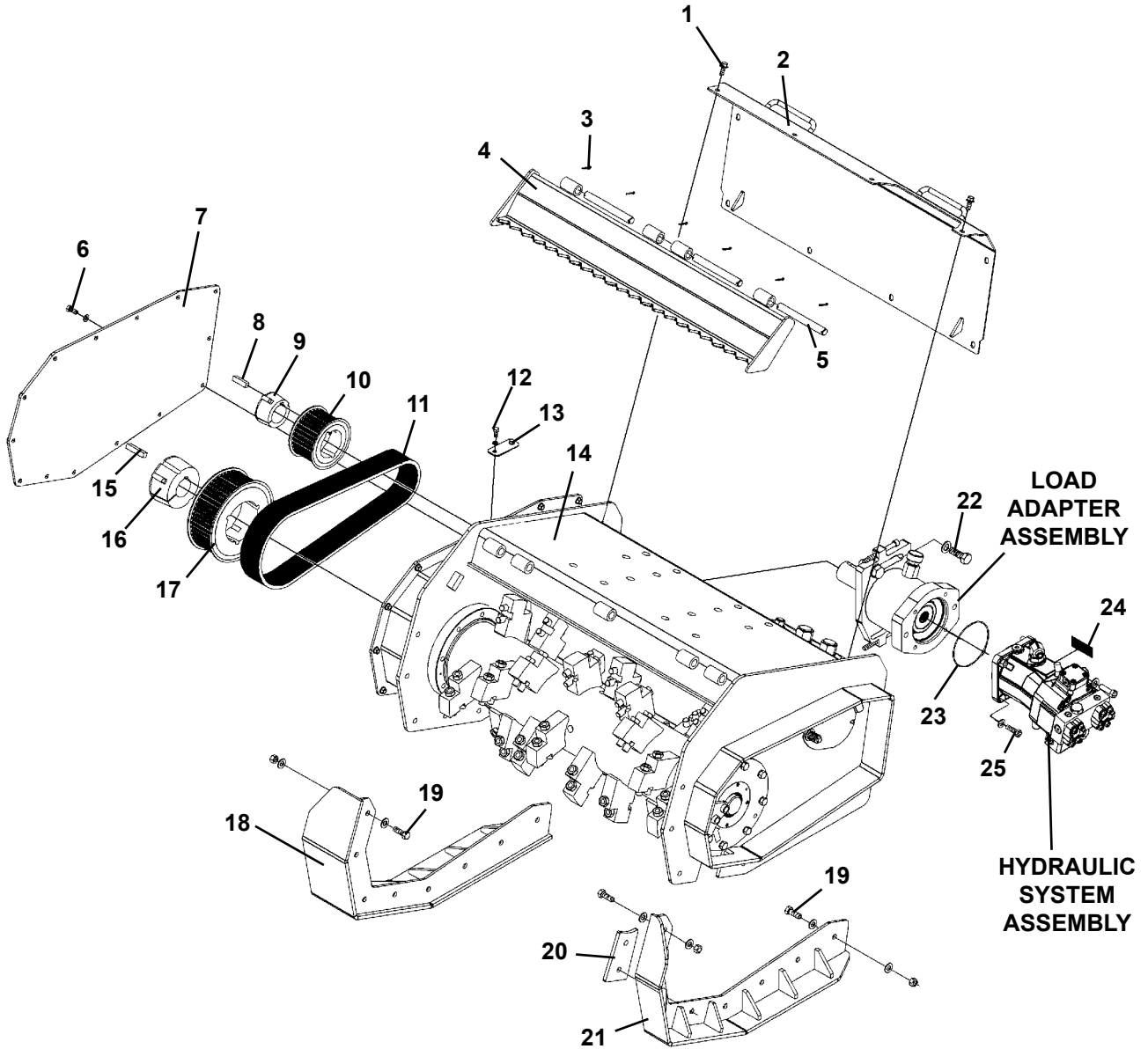
**IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES.**

**IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR ANY LOSS OR CLAIM IN AN AMOUNT IN EXCESS OF THE PURCHASE PRICE, OR, AT THE OPTION OF PALADIN LIGHT CONSTRUCTION, THE REPAIR OR REPLACEMENT, OF THE PARTICULAR PRODUCT ON WHICH ANY CLAIM OF LOSS OR DAMAGE IS BASED. THIS LIMITATION OF LIABILITY APPLIES IRRESPECTIVE OF WHETHER THE CLAIM IS BASED ON BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR OTHER CAUSE AND WHETHER THE ALLEGED DEFECT IS DISCOVERABLE OR LATENT.**

<sup>1</sup>Attachment Technologies Inc., a subsidiary of Paladin Brands Holding, Inc. (PBHI) is referred to herein as Paladin Light Construction.

# 36" MULCHER ASSEMBLY

28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705  
MAINFRAME



# 36" MULCHER ASSEMBLY

28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705  
MAINFRAME

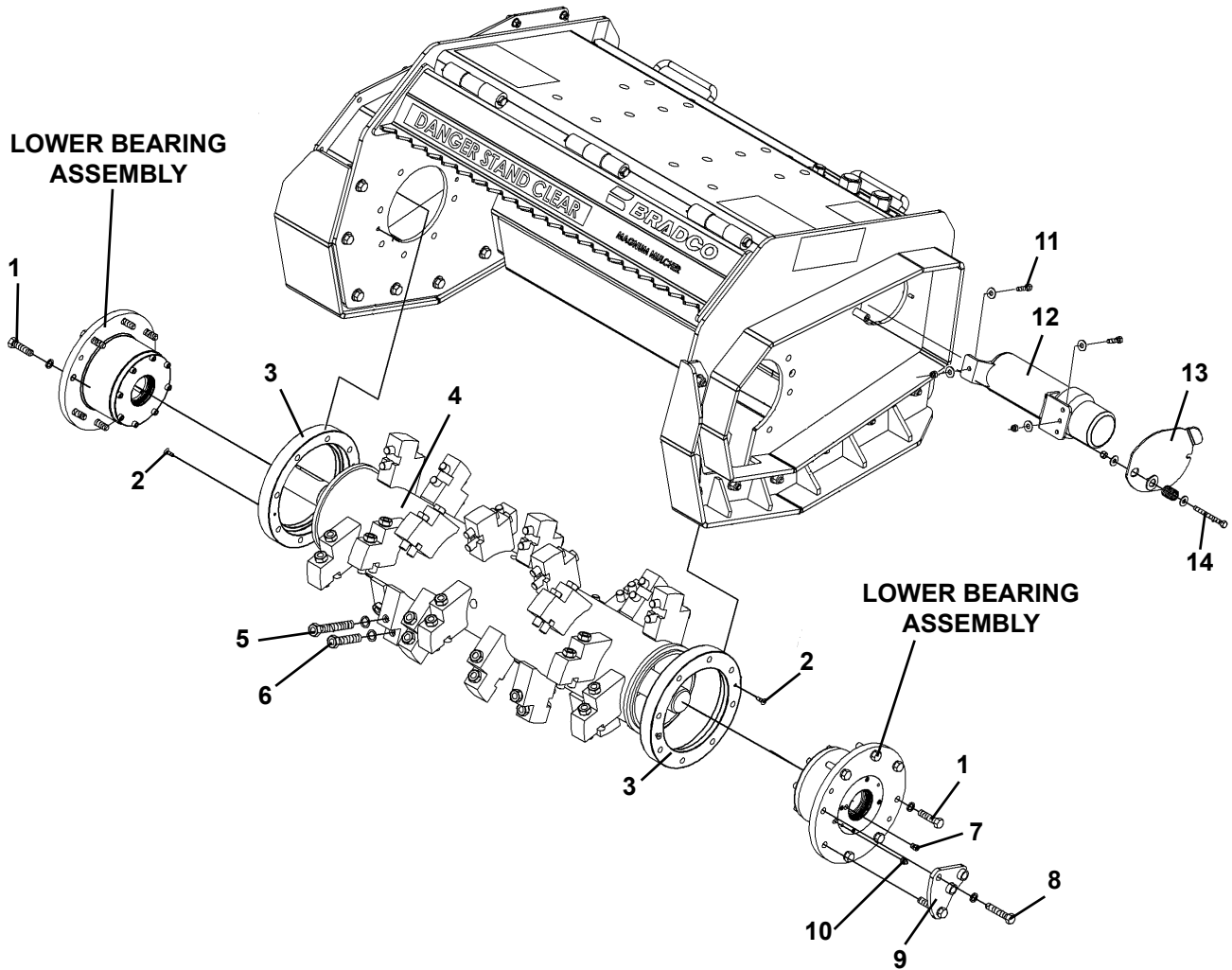
<u>ITEM</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	10	10218	.38" UNC X 1.00" Flange Head Capscrew
2	1	112656	Rear Compartment Cover
		112682	Rear Compartment Cover (Serial #228924 ONLY)
3	6	1616	Cotter Pin
4	1	112677	Deflector Door
5	3	801-244	Deflector Door Pin
6	14	1043	.38" UNC X 1.00" Hex Capscrew
	28	1525	.38" Flat Washer
	14	1837	.38" UNC Deformed Lock Nut
7	1	112693	Drive Housing Cover
8	1	53744	Key .50" X 1.88" (Early Production)
		53780	Key .50" X 2.50"
9	1	113720	Taper-Lock Bushing (Torque set screws to 36 ft. lbs.)
		113757	Taper-Lock Bushing (Torque set screws to 67 ft. lbs.) (Serial #228924 ONLY)
10	1	113839	30 Tooth Sprocket
		112704	37 Tooth Sprocket (Serial #228924 ONLY)
11	1	113762	Drive Belt
12	2	1021	.31" UNC X .75" Hex Capscrew
	2	1502	.31" Lock Washer
13	1	110175	Belt Tension Access Door
14	1	112631	Mainframe
15	1	53780	Key .50" X 2.50"
16	1	113594	Taper Lock Bushing (Torque set screws to 84 ft. lbs.)
		113757	Taper-Lock Bushing (Torque set screws to 67 ft. lbs.) (Serial #228924 ONLY)
17	1	113761	50 Tooth Sprocket
		113760	43 Tooth Sprocket (Serial #228924 ONLY)
18	1	112684	Right Skid Shoe
19	16	1090	.50" UNC X 1.50" Hex Capscrew
	32	1527	.50" Flat Washer
	16	1841	.50" UNC Deformed Lock Nut
20	1	112694	Left Side Filler Plate
21	1	112690	Left Skid Shoe
22	4	1649	.75" Hard Flat Washer
	4	10012	.75" UNC X 2.25" Hex Capscrew - GR8
23	1	22609	Motor O'Ring
24	1	41078	Back Pressure Decal
25	4	1646	.50" Hard Flat Washer
	4	1964	.50" UNC X 1.75 Hex Capscrew - GR8
	2	10215	.62" UNF X 2.25" Hex Capscrew - GR8
	2	1627	.62" Hard Flat Washer
<b>NOT SHOWN</b>			
	1	113897	17MM COMBINATION WRENCH (28-41 GPM ASSEMBLY)
	1	113898	5MM ALLEN WRENCH (28-41 GPM ASSEMBLY)
	1	110535	19MM COMBINATION WRENCH (42-60 GPM ASSEMBLY)
	1	110536	6MM ALLEN WRENCH (42-60 GPM ASSEMBLY)

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# 36" MULCHER ASSEMBLY

28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705

ROTOR / DRUM



## 36" MULCHER ASSEMBLY

28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705  
 ROTOR / DRUM

<u>ITEM</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	14	1092	.50" UNC X 2.00" Hex Capscrew (Install with Loctite.)
	14	700-58096	.50" NORD Lock Washer
2	4	1700	.25" UNC X .75" Fillet Head Screw
3	2	801-210	Dirt Ring
4	1	112670	Rotor - Balanced
5	27	10165	16mm Lock Washer
	27	700-111	M16 X 110mm Hex Capscrew 1.5 - GR10.9
6	27	10165	16mm Lock Washer
	27	700-114	M16 X 75mm Hex Capscrew 1.5 - GR10.9
7	1	700-97728	Grease Relief Vent
8	2	1094	.50" UNC X 2.50" Hex Capscrew
	2	700-58096	.50" NORD Lock Washer
9	1	112658	Guard
10	1	9371	Grease Fitting 2MP
11	2	1023	.31" UNC X 1.25" Hex Capscrew
	4	1513	.31" Flat Washer
	2	1753	.31" UNC Nylock Nut
12	1	25453	Manual Storage Tube
13	1	110284	Manual Access Door
14	1	1031	.31" UNC X 3.25" Hex Capscrew
	2	1513	.31" Flat Washer
	1	110724	Access Door Spring
	1	1528	.62" Flat Washer
	1	1753	.31" UNC Nylock Nut

### NOT SHOWN

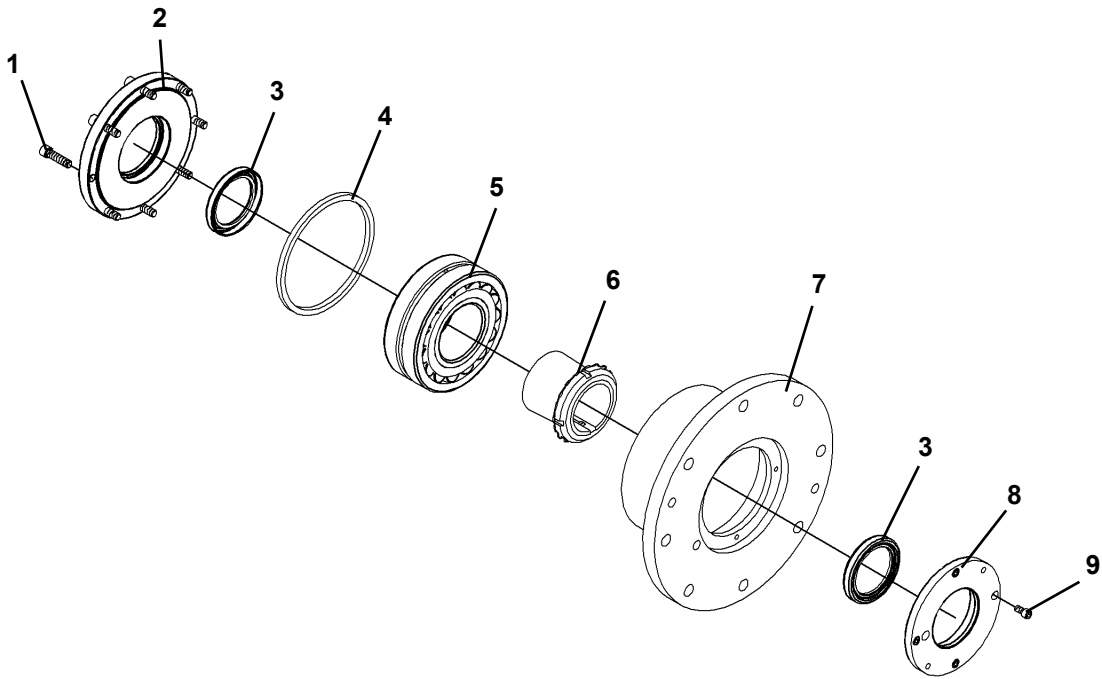
27	600-112-1	Single Side Hammer Tooth - Nonreversible (Kit #113936 includes 27 Single Sided Hammer Teeth - No hardware.)
27	600-168	Double Sided Hammer Tooth - Reversible (Kit #113937 includes 27 Double Sided Hammer Teeth - No hardware.)
27	111588	Claw Tooth - Reversible (Kit #113938 includes 27 Reversible Claw Teeth - No hardware.)

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# 36" MULCHER ASSEMBLY

28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705

LOWER BEARING





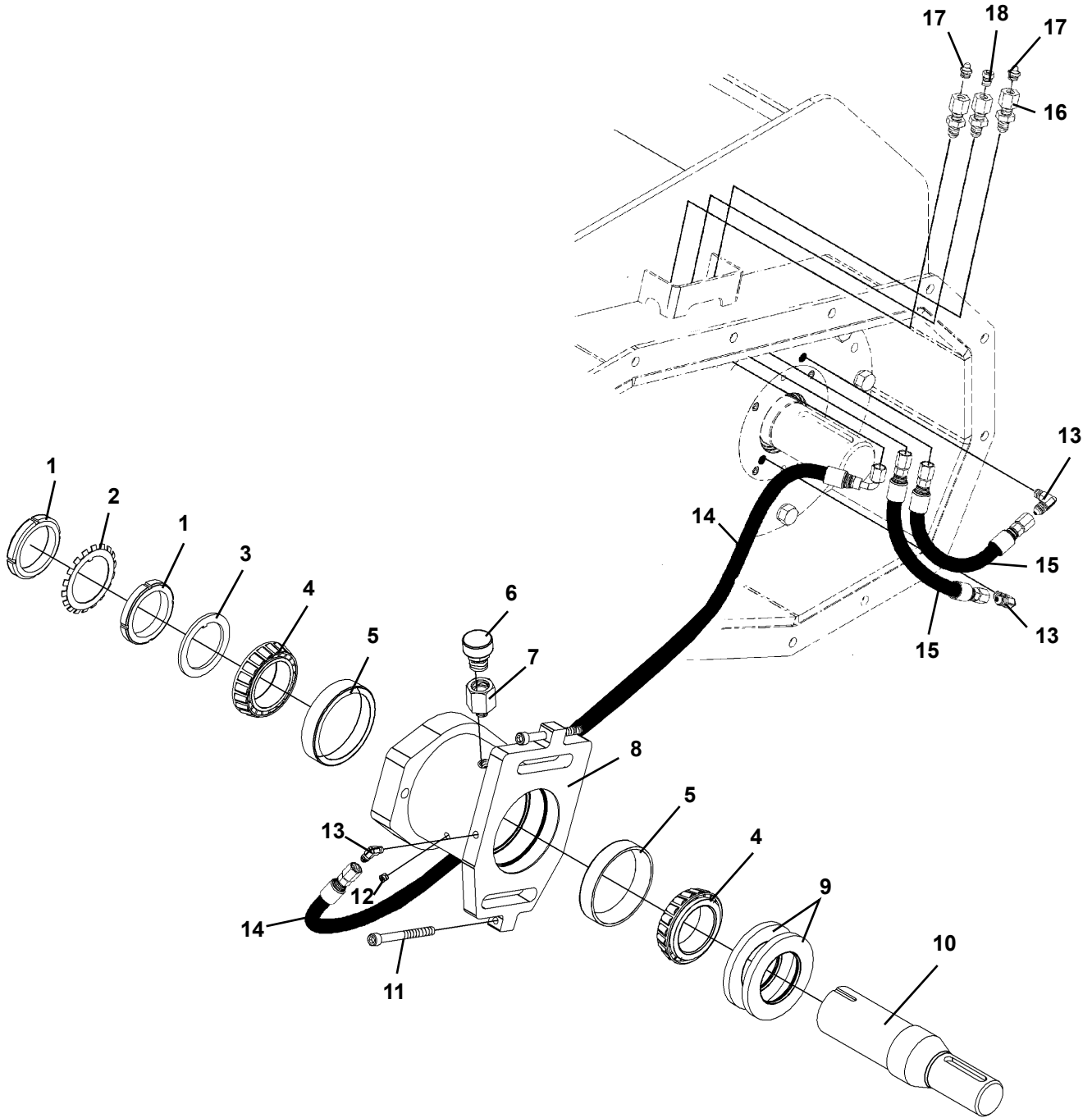
# 36" MULCHER ASSEMBLY

28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705  
LOWER BEARING

<u>ITEM</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	16	700-64145	.31" UNC X 1.25" Socket Head Capscrew - GR 8 (Install with Loctite.)
2	2	801-207	Inner Seal Cap
3	4	600-159	Rotor Shaft Seal
4	2	801-303	Bearing Spacer Ring
5	2	600-158	Spherical Roller Bearing (Torque to 250 ft. lbs.)
6	2	600-160	Tapered Bearing Adapter
		108949	Replacement Bearing Nut (Install with Loctite.)
		108950	Replacement Lock Washer
7	2	801-288	Lower Bearing Housing
8	2	801-206	Outer Seal Cap
9	8	700-64111	.25" UNC X .50" Socket Head Capscrew - GR 8 (Install with Loctite.)

# 36" MULCHER ASSEMBLY

28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705  
LOAD ADAPTER



# 36" MULCHER ASSEMBLY

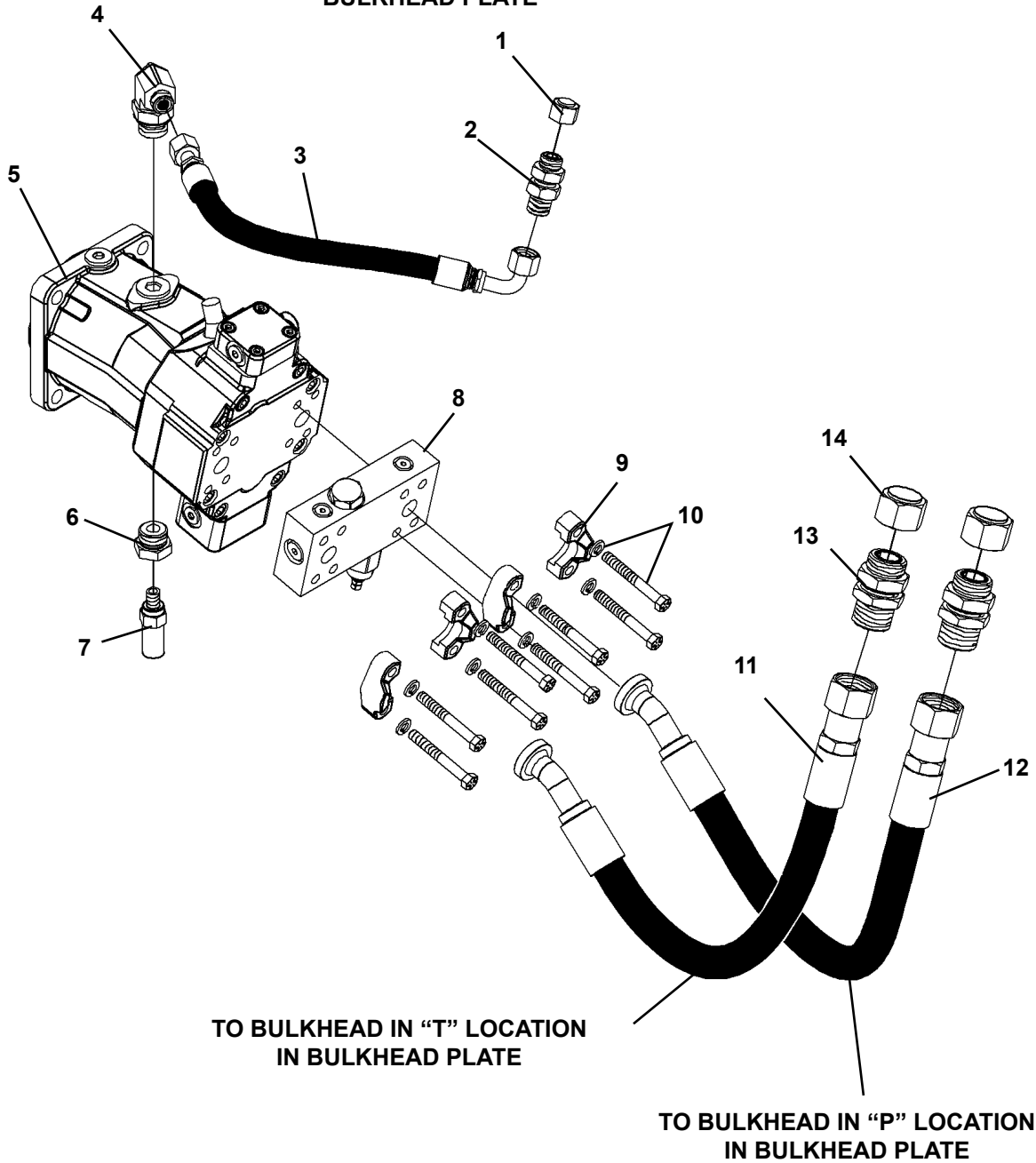
28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705  
LOAD ADAPTER

<u>ITEM</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	600-157	Special Bearing Nut
2	1	600-156	Bearing Lock Washer (Tab must be completely bent over in slots of special bearing nut.)
3	1	600-155	Bearing Tongued Washer
4	2	600-153	Upper Housing Bearing Cone
5	2	600-154	Upper Housing Bearing Cup
6	1	54645	Breather
7	1	201-366	Straight Connector 12FP-8MP
8	1	107774	Upper Bearing Housing (Fill housing grease cavity with grease prior to installing 90° elbow.)
9	2	600-152	Upper Drive Shaft Seal (Pack with grease prior to assembly.)
10	1	800A057	Drive Shaft
11	2	700-115	.44" UNC X 4.50" Socket Head Capscrew - GR8
12	1	3226	Socket Hex Plug 2MP
13	3	201-263	90° Elbow 2MP-4MJ
		6133	90° Grease Fitting (Into Upper Bearing Housing - Serial #228924 ONLY)
14	1	38635	Hose .25" X 23.25" 4FJX-4FJX 90° (Fill hose with grease prior to attaching to 90° elbow.)
15	2	203-112	Hose .25" X 12.50" 4FJX-4FJX
16	3	201-262	Straight Bulkhead Connector 2FP-4MJ
17	2	9371	Grease Fitting 2MP
18	1	113935	Grease Relief Vent

# 36" MULCHER ASSEMBLY

28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705  
HYDRAULIC SYSTEM

INSTALL BULKHEAD IN "CD" LOCATION IN  
BULKHEAD PLATE



## 36" MULCHER ASSEMBLY

28-41 GPM ASSEMBLY #112630 / 42-60 GPM ASSEMBLY #112705  
HYDRAULIC SYSTEM

<u>ITEM</u>	<u>REQ'D</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	30424	Cap 8FFS
2	1	30291	Straight Bulkhead Connector 8MFS
3	1	38636	Hose .50" X 18.50" 8FFS-8FFS 90°
		38645	Hose .38" X 22.50" 8FFS-8FFS 90° (Serial #228924 ONLY)
4	1	201-375	90° Elbow 8MFS-12 MBo
5	1	112700	Hydraulic Motor 55cc (28-41 GPM Assembly)
		46067	Replacement Shaft Seal (112700)
	1	107251	Hydraulic Motor 80cc (42-60 GPM Assembly)
		45987	Replacement Shaft Seal (107251)
6	1	3284	Straight Connector 8FP-12MBo
7	1	112703	Atmospheric Relief
8	1	112701	Motor Manifold Block (28-41 GPM Assembly)
	1	109542	Motor Manifold Block (42-60 GPM Assembly)
		45990	Replacement Anti-Cavitation Check Valve (112701 & 109542)
		46068	Replacement Pressure Relief Valve (112701 & 109542)
		30280	Replacement Plug - 4MBo (112701 & 109542)
9	2	30437	Clamp Assembly - Code 62 .75" (28-41 GPM Assembly)
	2	3428	Clamp Assembly - Code 62 1.00" (42-60 GPM Assembly)
10	8	10211	.38" UNC X 3.00" Hex Capscrew - GR8
	8	10189	.44" UNC X 3.25" Hex Capscrew - GR8
11	1	38638	Hose .75" X 22.62" 16FFS-12FLH30 (28-41 GPM Assembly)
	1	38640	Hose 1.00" X 22.75" 16FFS-16FLH30 (42-60 GPM Assembly)
		38644	Hose .75" X 36.50" 12FFS 45°-12FLH30 (Serial #228924 ONLY)
12	1	38637	Hose .75" X 28.12" 16FFS-12FLH30 (28-41 GPM Assembly)
	1	38639	Hose 1.00" X 28.00" 16FFS-16FLH22 (42-60 GPM Assembly)
		38643	Hose .75" X 34.75" 12FFS 90°-12FLH30 (Serial #228924 ONLY)
13	2	30447	Straight Bulkhead Connector 16MFS
		30387	Straight Bulkhead Connector 12MFS (Serial #228924 ONLY)
14	2	30448	Cap 16FFS
		30426	Cap 12FFS (Serial #228924 ONLY)