



**BUILT WITH QUALITY
AND DESIGN FIRST**

ATTENTION:

Depending on what replacement parts you are ordering, we will need the following information:

CHIPPER COMPONENTS

Serial Number
Model Number of Chipper

ENGINE COMPONENTS

Brand
Engine Serial Number
Engine Spec. Number

CLUTCH COMPONENTS

Brand
Serial Number
Assembly of Clutch

**WHOLE TREE CHIPPER
MODEL 2090
OPERATING & PARTS MANUAL**

Model No: **2090** _____

Serial No: _____

DEALER:

Name: _____

Address: _____

City/State: _____

Phone No: _____

Delivery Date: _____

Engine Make: _____

Serial No: _____

Clutch Make: _____

Model: _____ S/N _____



Copyright 12/06

MANUFACTURED BY
BANDIT INDUSTRIES, INC.
6750 Millbrook Road
REMUS, MICHIGAN, USA 49340
PHONE: (800) 952-0178 IN USA
PHONE: (989) 561-2270 OR 561-2272
FAX: (989) 561-2273 ~ SALES DEPT.
FAX: (989) 561-2962 ~ PARTS/SERVICE
E-MAIL: www.banditchippers.com

CALIFORNIA PROPOSITION 65

WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to:
www.P65warnings.ca.gov/diesel

ADVERTENCIA

Respirar gases de escape de motores diesel le expone a químicos conocidos por el estado de California como causales de cáncer y defectos congénitos u otros daños reproductivos.

- Siempre encienda y opere el motor en áreas bien ventiladas.
- Si está en un área cerrada, ventile escape hacia el exterior.
- No modifique ni altere el sistema de escape.
- No deje el motor en ralentí a no ser que sea necesario.

Para mayor información visite:
www.P65warnings.ca.gov/diesel

SPW-46 8/18

WARNING

ADVERTENCIA

**Cancer and
Reproductive
Harm**

**Cáncer y daño
reproductivo**

www.P65warnings.ca.gov

SPW-47 8/18

IT IS VERY IMPORTANT THAT THIS FORM IS FILLED OUT COMPLETELY & ACCURATELY. IF WE CANNOT READ THE PURCHASER'S INFORMATION OR IT IS INCORRECT, OUR CUSTOMER LIST WILL NOT BE ACCURATE.

**IMPORTANT - THIS FORM MUST BE RETURNED TO THE
CUSTOMER DATA DEPARTMENT WITHIN TEN (10)
DAYS IN ORDER TO VALIDATE WARRANTY**

**Customer Data Department
6750 Millbrook Road
Remus, MI, USA 49340
Phone: (800) 952-0178 in USA
Phone: (989) 561-2270
Fax: (989) 561-2273
E-mail: www.banditchippers.com**

WARRANTY VALIDATION FORM (WHOLE TREE & LOADER FED CHIPPER)

PURCHASER / OWNER INFORMATION:

Company Name _____ Contact Name _____
Mailing/Street Address _____ City _____
State _____ Zip Code _____ Country _____ Telephone Number (____) _____
E-mail _____ Machine Model No. _____ Date Put Into Service _____
Machine Serial No. _____ Machine Work Order No. _____ Machine Hours _____
Engine Make _____ Engine Serial No. _____ Machine Color _____

DEALER / SELLER INFORMATION:

Dealer/Seller Name _____ Contact Name _____
Mailing/Street Address _____ City _____
State _____ Zip Code _____ Country _____ Telephone Number (____) _____

1. _____ Customer has been instructed and understands operation and all safety aspects of operating the equipment.
2. _____ Customer has been instructed and understands that everyone within 100 feet (30 m) of machine must wear personal safety equipment (i.e. hard hat, face shield, safety glasses, gloves, ear protection, etc.)
3. _____ Customer has been instructed and understands equipment maintenance schedules, procedures, and that it is their responsibility to perform maintenance that includes periodic relief valve adjustments, retightening all fasteners as needed, periodic cleaning of flow divider, clutch and belt adjustments, etc.
4. _____ Customer has been advised and understands not to reach into the infeed hopper with hands or feet. The machine operators must always be located within easy reach of all feed control and shut down devices.
5. _____ Customer understands that this machine is designed to be "loader" fed and is to follow all feeding instructions in the manual. The customer understands that under no circumstances should the operator hand feed these machines or use anything other than a mechanical device, knuckle boom loader, or the machines loader to feed these machines.
6. _____ Customer understands the purpose of and how to operate any safety devices or guards and to never attempt to override any safety devices or guards.
7. _____ Customer has been instructed and understands to always remove the ignition key and completely disconnect battery from cables, wait for the chipper disc/drum to come to a complete stop, and to install the disc/drum lock before performing any type of maintenance on the machine. Allow all the time necessary for the disc/drum to come to a complete stop before opening the disc/drum housing or starting any maintenance or service procedures. Customer has been shown and understands the purpose of the beltshield inspection hole and to not attempt any maintenance until belts are visually confirmed to have come to a complete stop.
8. _____ Customer has been instructed and understands: To Not operate this machine without the factory approved hood pin assembly in place and padlocked. To Not operate this machine with any type of make shift hood pin. To Not operate this machine under any circumstances with the chipper hood open or unsecured.
9. _____ Customer has reviewed and understands limited warranty, and all written and visual instructions.
10. _____ Customer has received, been advised, and understands the manuals, and the Safety/Service video supplied with the chipper. A video is supplied for equipment models as available.
11. _____ All Danger, Warning and Operational decals are properly displayed on equipment and fully understood by customer.
12. _____ Customer has been instructed, understands, and agrees that all potential operators must: See the supplied video, be instructed on all the Danger, Warning and Operational decals, read the manual and follow the procedures.

I have inspected this equipment and find it in correct working condition. To the best of my knowledge, the customer and his/her personnel are aware of, and agree to the above procedures.

Signed: _____ **Date:** _____
(Dealer Representative)

The equipment has been thoroughly checked by the above named dealer representative, and I am satisfied with his/her instructions. I have also read, understand, and agree to reverse side of page.

Signed: _____ **Date:** _____
(Customer)

TO BE RETURNED AFTER THIRTY (30) DAYS OF OPERATION

Please return to: Customer Data Department
6750 Millbrook Road
Remus, MI 49340

PH: (800) 952-0178 in USA
PH: (989) 561-2270
FAX: (989) 561-2273
E-MAIL: www.banditchippers.com

DATE PURCHASED: _____

MODEL: _____

SERIAL NUMBER: _____

DEALER NAME: _____

EQUIPMENT QUALITY REPORT

All of the employees that build your equipment strive to manufacturer the **very best quality** product on the market. We would appreciate your efforts in letting us know how we are doing.

We would like you to operate your machine for thirty (30) days and then fill out this questionnaire and mail it to us. This will help us to keep producing a good product and improving our products through your recommendations.

1. Did your machine perform to your expectations? _____
2. Was the machine delivered on schedule? _____
3. Was the paint color and finish to your satisfaction? _____
4. Was machine equipment as ordered? _____
5. Did all welds appear to be of high quality? _____
6. Was the overall machine to your liking? _____
7. What problems have you experienced? _____
8. Have any components regularly loosened that caused problems? _____
9. Does the hydraulic system seem to have adequate power for feeding wood into the machine? _____
10. Is the machine manufactured to accommodate service in an adequate manner? If not, please explain:

11. General comments and/or suggestions: _____

12. Would you like to be contacted concerning more of our equipment? _____

YOUR COMPANY: _____

NAME: _____

ADDRESS: _____

CITY: _____

STATE & ZIP: _____

PHONE: (_____) _____

E-MAIL: _____

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NOTE - IF THE MACHINE HAS A LOADER OR TRACK UNDERCARRIAGE,
CONTACT DEALER OR MANUFACTURER FOR MORE INFORMATION.

NOTE - IF THE MACHINE HAS A LOADER OR TRACK UNDERCARRIAGE,
A SEPARATE (LOOSE) HYDRAULIC AND ELECTRIC SCHEMATIC IS
SUPPLIED WITH THE MACHINE.

NOTE - ANY PART, PORTION, DESIGN, NUMBER, SPECIFICATION, AND/OR
DIMENSION IN THIS MANUAL IS SUBJECT TO CHANGE WITHOUT
NOTICE BY THE MANUFACTURER.

INTRODUCTION

The purpose of this manual is to provide the user with specifications and procedures for the operation, maintenance and repair of this BANDIT product. As with any piece of equipment, safety should always be a constant thought while the machine is being operated, serviced or stored. In order to highlight this consideration, the material which addresses safety is preceded by the following signal words:

Signal Word	Likelihood of Occurrence	Degree of Potential Injury or Damage
 DANGER	Will occur if warning is ignored	Severe
 WARNING	Can occur if warning is ignored	Severe
 CAUTION	Will or can occur if warning is ignored	Minor to Severe
NOTICE	Important, but not hazard related	Minor

The equipment is designed and manufactured in accordance with the latest product industry standards. This alone does not prevent injury. It is the operator's responsibility to use good judgement and follow the warnings and instructions as indicated in this manual, on the machine and follow all safety standards per ANSI and OSHA instructions.

WARNING

Improper use of the product can result in severe personal injury. Personnel using the equipment must be qualified, trained and familiar with the operating procedures as defined in this manual, prior to operating the product.

WARNING

It is the responsibility of the owner or employer to insure that the operator is trained and practices safe operation while using and servicing the machine. It is also the owner's responsibility to provide and follow a regularly scheduled preventative maintenance and repair program on the product, using only factory approved replacement parts. Any unapproved repairs or modifications may not only damage the machine and its performance, but could result in severe personal injury. Unapproved repairs or modifications will void warranty and eliminate manufacturer of any liability claims. Consult the equipment manufacturer!!!

Each machine is shipped with a manual, a customer's check sheet on the product, and any available parts & service manuals on component parts not produced by this manufacturer. Additional copies of these manuals and check sheets can be purchased from the manufacturer, or through the dealer. Engine parts, service and maintenance manuals **MUST** be purchased through the engine manufacturer or their dealer.

NOTE - The producer of this Bandit product reserves the right to make any modifications or revisions to the design or specifications of its machine without advance notice. The producer also reserves the right to change machine and part prices as needed without advance notice.

Bandit

TYPICAL CHIPPER SERIAL NUMBER AND/OR WORK ORDER NUMBER LOCATIONS



1. Side of frame
2. Top of frame
3. Beltshield
4. W/O # on top of tongue

NOTE: The engine information is located on the engine block. The clutch information is located on the clutch plate.

SAFETY PROCEDURES

DANGER

The words  Danger,  Warning,  Caution, and Notice are used on the safety decals and throughout this manual, to make you aware of the safety procedures. These procedures are very important, read and obey them.

YOUR SAFETY IS VERY IMPORTANT TO US!

This machine is equipped with safety decals, guards and designs for your protection.

Don't ever take the machine for granted, always be cautious and careful when operating your equipment.

Read and follow all the instructions in your manual thoroughly. Your safety is dependent on your knowledge of how to operate and maintain this machine. You may obtain additional copies of this manual from your Bandit Dealer.

Before operating machine, you must have all potential operators; read and understand manuals and decals, watch the video and follow the recommendations.

Regardless of how hard a manufacturer tries to produce a safe machine, accidents still happen. Normally accidents are caused by people making mistakes. They do not read the manual, they ignore warning decals or do not use lockouts provided for their safety. This normally happens after the person has become accustomed to the machinery. In the initial start up and operation of the machinery, they are cautious, they are very careful because they do not understand the machine.

This equipment is intended for use by personnel who are experienced with similar equipment. Always operate safely. It is also recommended that someone else is present while operating or servicing in case an accident should occur. Never operate any machine while under the influence of drugs or alcohol.

Keep children, bystanders and animals clear of working area. Never operate equipment that is in need of repair or adjustment.

NOTICE

Striped reflective tape has been installed on the feed control handle of the machine. This tape is reflective, self adhesive and has contrasting colors. The tape helps make the feed control handle stand out more and it makes the rear of the machine more visible to a vehicle behind the machine while transporting. Striped tape can be obtained through your local Bandit Dealer.

DANGER

Before starting the machine, take a minute to check a few things. The machine should be in an area restricted from people passing by. This area around the machine must be free of all objects that can obstruct your movement when working with the machine. The machine should be checked for loose tools or foreign objects, especially in the infeed hopper area. All tools not in use should be secured in a tool box.

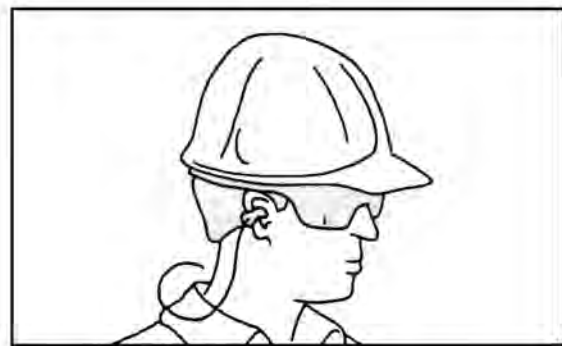
WARNING

Operators must at all times be located within easy reach of all feed control and shut-off devices when the unit is running. They must be attentive and prepared to activate the devices.

DANGER

Torn or loose clothing is more likely to get caught in moving machinery parts or tree branches. Keep such items as long hair, shirt sleeves, and shirt tails properly contained. Avoid wearing necklaces, rings, watches, and especially neckties while operating this machinery. Make sure the machine is in excellent condition, and all the guards are in place, tight and secure.

Wear all personal protection equipment and follow all safety standards per ANSI and OSHA instructions. Examples of equipment: hard hat, face shield, safety glasses, gloves, ear protection, etc. Do not wear gauntlet or secured fit gloves. Always keep a fully charged fire extinguisher with the machine while operating or servicing the machine.

**Bandit**

SAFETY PROCEDURES

DANGER

Always block the tires and the machine tongue whenever the machine is unhooked for operation. DO NOT rely on the tongue jack for operational stabilization.

DANGER

Pay attention to the direction of the discharge chute before chipping. Never stand in front of the chipper discharge chute. Never direct the chute towards anyone or anything that could cause an accident or problems. Always stop chipping and warn anyone that comes near the discharge area. Failure to do this could result in severe injury. Wood chips flying out of the discharge chute can be very dangerous!

DANGER

NEVER sit, stand, lay, climb or ride anywhere on this machine while it is running, operating, or in transit. You will be injured.

WARNING

It is very important after you have operated a new machine for approximately an hour to shut down the machine and recheck all nuts and bolts. It is normal for nuts and bolts to loosen once on a new piece of machinery. If you tighten them now, there is a good possibility they won't loosen again. Certain nuts and bolts should be checked periodically such as anvil and knife nuts and bolts, etc. for torque and fit.

Most of the nuts used on the machine are self locking. After a nut or bolt has been removed five times, it should be replaced to insure proper tightness. This is especially critical on the chipper knife nuts and bolts!

After the engine is started, let the chipper disc/drum turn at the lowest RPM's possible. Listen for any type of noise that is foreign. Any steel on steel noise is foreign. If you hear a noise, stop the engine, find the problem and fix it.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

DANGER

Never reach into the infeed hopper area of the machine, there is never any reason to. The feedwheel(s) are designed to pull trees and brush of any length into the machine. Pulling a hand, arm, foot or entire body through the machine is much easier than pulling a tree. Do not think you will be able to pull yourself free of the feedwheel(s), they will not let go. There is absolutely no reason to work inside of the infeed hopper. If the feedwheel(s) become tangled or clogged, stop the machine and wait several minutes before cleaning them out. If there are short pieces, or leaves and twigs, just leave them until feeding longer pieces. While the long pieces are feeding, simply toss the short pieces on top of them. The longer pieces will take them on into the machine.

This machine is not designed to be hand fed. A wooden push paddle has been provided to assist in the removal of smaller material after the machine has been shut down. It is the owner's and operator's responsibility to use and keep a wooden push paddle with the machine and to also secure it when transporting the machine. DO NOT use any body parts or any steel devices inside the infeed hopper area.

If there is larger diameter wood, try to feed it with smaller diameter wood. Start a small diameter limb which will partially open the feedwheel(s). Once the feedwheel(s) are partially open it is much easier to insert the larger diameter wood.

When feeding larger diameter wood, listen for the engine to possibly lug down. If it starts lugging down stop the feedwheel(s) by pulling the hydraulic control bar to off, and let the engine recover to full speed. If the machine is equipped with Autofeed and it is functioning properly, the feed system will automatically stop to let the engine recover. This will help stop the machine from plugging the discharge chute.

NOTICE

Do not attempt to start the engine or engage the engine PTO (power-take-off) system on this machine if the chipper disc/drum is jammed or frozen in place. If you do, you will damage or ruin the drive belts and/or the PTO which will not be covered under warranty and will cost you down time and money.

Bandit

SAFETY PROCEDURES

⚠ DANGER

DO NOT operate this machine indoors! Exhaust fumes can be fatal. Never refuel while the machine is running. Never refuel in the shop or building. Always refuel in a well ventilated area, away from sparks or open flames, DO NOT SMOKE. Extinguish all smoking materials. Wipe up all spilled fuel before restarting the engine. Do not fill above 1/2" (12.7mm) from top of tank.

To obtain the most from your machine, for the least amount of cost, it is a good practice to set up and follow a scheduled preventative maintenance program. It will eliminate many possible problems and down time.

⚠ WARNING

Never use jumper cables during freezing temperatures. Tow the machine inside and allow the battery time to warm up. If the machine must be started outside, inspect the battery acid for ice formation. Explosion will occur with a frozen battery. Never use jumper cables in a confined or unventilated area. Battery acid fumes are explosive. Never expose an open flame or spark near the battery.

⚠ DANGER

Before using the top feedwheel jack, if equipped, remove the yoke springs. Install the disc/drum lock pin in the mount tube before using hand jack to raise top feedwheel. Hand jack is only provided as a means of lifting the top feedwheel, not holding it up for service.

⚠ DANGER

Never feed any materials that might contain wires, stones, nails, or other metal objects which may damage the knives and become dangerous projectiles.

⚠ DANGER

Before attempting any type of maintenance disengage clutch, install clutch lock if equipped, turn off engine, wait for the chipper disc/drum to come to a complete stop, install the disc/drum lock pin, disconnect battery, and make sure the ignition key is in your possession.

ALWAYS install the disc/drum lock pin to prevent inadvertent rotation. On disc chippers insert lock pin through lock pin tube on the belly band under hood rest. On drum chippers insert lock pin through lock pin tube on side of drum housing.

Simply slide the lock pin into the disc/drum lock tube. This is to insure that the chipper disc/drum cannot be started while you are working inside the machine. If for some reason the chipper disc/drum would start to turn, it would simply hit the lock pin.

⚠ DANGER

DO NOT remove the hood pin until the chipper disc/drum has come to a complete stop. The chipper disc/drum will coast for several minutes after the engine is shut down. Always wait at least several minutes.

DO NOT operate this machine without the Hood Pin in place. Do not operate the machine with any type of makeshift hood pin or an improperly installed hood pin! The Hood Pin MUST be padlocked.

DO NOT operate the machine with the chipper hood open under any circumstances.

⚠ DANGER

DO NOT attempt to hand feed this machine. DO NOT operate the loader arm or chipper when anyone is standing or working in front of the chipper infeed opening. Failure to do this could result in serious injury or death.



Bandit

SAFETY PROCEDURES

⚠ WARNING

The machine was built with a chipper hood engine disable plug which disables the engine if it is not installed properly with the hood pin holding the chipper hood in the closed position. Correctly installed and maintained, the engine will not start or it will shut off if the chipper hood engine disable plug is disconnected. The chipper hood must **NEVER** be opened, or pushed closed if the chipper disc/drum is turning.

⚠ DANGER

DO NOT slam the chipper hood to the open position. This will cause damage to the hinge. If your hinge has become damaged by slamming the hood to the open position, Replace The Hinge Immediately! If the hinge has become damaged it will cause misalignment of the hood, the chipper disc/drum may then hit the hood and cause a serious accident! Lubricate the hood hinge daily.

⚠ DANGER

Do not work inside the mouth of the chipper or around the feedwheel(s), until you have installed the yoke lock pin completely and securely to help keep the top feedwheel in the raised position. Remove top wheel springs if equipped, block and chain top wheel up before doing any work inside throat.

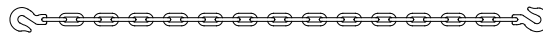
⚠ DANGER

Do not work on the machine if the engine is running with the clutch disengaged. A clutch can self engage if either the pilot or throw-out bearing happens to seize to the main output shaft.

There are various types of clutches (PTO's) available for this type of equipment. Make sure to study the original clutch manufacturer's manual that is provided with the machine and follow its instructions for operation, service, and adjustments. Some styles require clutch engagement to be maintained so that it takes a lot of force, others will require very little force, and some are push button, electric, manual lever, or hydraulic activation. Each different style clutch (PTO) is a very expensive item that will fail if not correctly maintained and adjusted. It will be quite costly if a few minutes are not taken daily, weekly, and monthly to keep the clutch serviced as required.

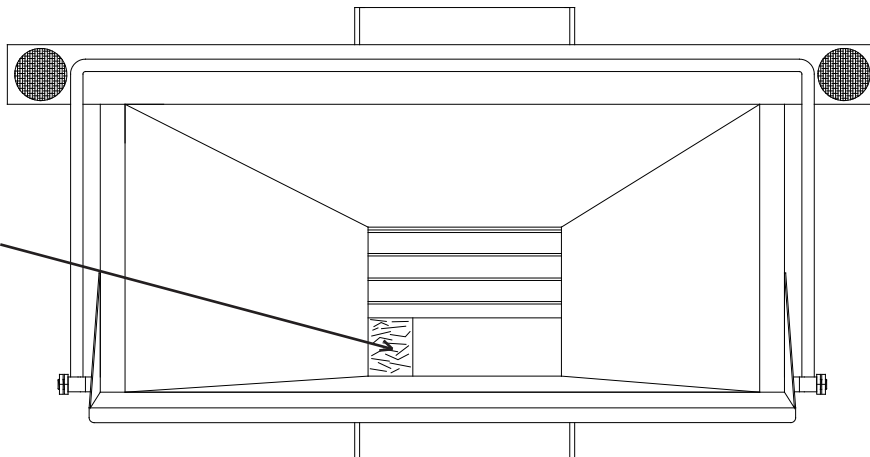
The operator must take care in the engagement and disengagement of the clutch, engine RPM should always be below 1000 RPM. When the engine has sufficiently warmed up, bump the clutch handle against engagement to start the chipper disc/drum turning. This will have to be repeated until the chipper disc/drum is turning at proper ratio with engine RPM. Then push the handle all the way in gear until it locks into position securely. After engagement raise engine RPM to full throttle. Engaging and disengaging the clutch at high engine RPM will quickly and excessively wear out clutch plates as well as bearings. Refer to clutch manufacturer's manual for proper service and operation.

Use Yoke Lock Pin



Use Chain

Use
Wooden
Block



Bandit

PROPER MAINTENANCE AND USE OF BOTTOM CLEAN-OUT DOOR

DANGER

There is never any reason to open the bottom clean-out door while the chipper is in operation. Opening and closing the bottom clean-out door should always be done after the chipper has been turned off and the feedwheels have stopped turning. The ignition key should be removed and in the operator's possession.

Never reach or kick underneath the chipper in the area of the feedwheel clean-out door. If your hand or foot comes into contact with the bottom feedwheel, serious injury could occur. Always turn off the chipper and make sure the feedwheels have stopped turning before performing any maintenance in the bottom clean-out door.

There is never any need to remove debris that collects underneath the chipper while the chipper is in operation. Make sure the chipper engine is off and the feedwheels have stopped turning before cleaning any debris from underneath the chipper, or simply move the chipper to assist with cleaning debris from underneath it.

The bottom clean-out door is located directly underneath the feedwheels. It is hinged to the chipper and can be secured in a closed position with spring-loaded pins. When the door is in the closed position, access is restricted to the bottom feedwheel from underneath the chipper. When in the closed position, the door keeps debris from piling on the ground. The door can be opened to perform maintenance to the bottom feedwheel or to assist with unclogging, should vine-like material become wrapped around the bottom feedwheel.

During chipping operations, the bottom clean-out door should be closed. It is intended to be open **ONLY** when materials that need to be placed into the chipper contain muddy gravel or rocks. If possible you should try to remove all gravel, mud, and rocks from the brush before feeding it into the chipper. By opening the bottom clean-out door, mud, and rocks are allowed to drop down onto the surface below, preventing damage to the knives and discharge chute which can cause damage to the chipper, as well as serious risk of injury. Stray rocks and gravel may damage or break the knives. Rocks and broken knives will be propelled out through the discharge chute, which could cause injury to anyone in the vicinity.

Never transport the chipper with the bottom clean-out door in the open position because it subjects the door to physical abuse and damage during transportation. This can damage the hinge and prevent the door from being properly closed during operation.

Once the bottom clean-out door has been opened to perform maintenance or prevent debris from damaging the chipper, the door should always be closed before continuing operations.

SAFETY PROCEDURES FOR OPERATING OPTIONAL HYDRAULIC WINCH

This Notice describes important safety information for all Brush Bandit wood chipper owners and operators. The information below is meant to provide you with notice of a potentially dangerous situation that can and should be avoided.

Everyone working around wood chippers should be well-trained to understand that ropes and cables commonly used at the job site can inadvertently be pulled into the chipper while feeding brush. This includes the cable on the optional hydraulic winch attached to the top of the infeed hopper. When the winch line is extended, the opportunity exists for brush or workers to become entangled in the winch line. Never place yourself between the brush and winch line. Feeding brush with the winch line extended or when other ropes are in the area of the infeed hopper can result in the line becoming entangled in the brush being fed into the chipper. If this happens, the winch line or rope will be pulled into the chipper. If any rope or cable becomes caught in the spinning knives, it could be pulled into the chipper at a high rate of speed and when a worker is in its path, there is little or no opportunity to avoid it. The result is serious injury or death.

Chipper owners and operators should not feed brush into the chipper while the winch line is extended. The intended use of the winch is to assist the operator in pulling large tree limbs to the wood chipper feedwheels without having to lift and carry. Never pull out the winch line while brush or limbs are feeding into the chipper. When you are not using the winch, ensure that it is retracted and stowed so that it cannot become tangled in brush and pulled into the chipper.

Make sure there is outbound tension on the winch line whenever the winch line is being powered out. Using the hydraulic control to power out the winch line rather than free spool the line out could result in the line becoming tangled around the spool and wind inward when the hydraulic lever is in the unwind position. If a worker is holding the winch line when this happens a potential nip point is created between the cable housing and hook and also the winch line and material.

⚠ DANGER

Brush being fed into the chipper infeed hopper can snag an extended winch line. The knives on the spinning disc/drum can grab and pull in the winch line at a high rate of speed resulting in serious injury or death to workers nearby.

⚠ DANGER

Climbers' ropes and other lines present at the work site can become entangled in brush being fed into the chipper. The knives on the spinning disc/drum can grab and pull in ropes at a high rate of speed resulting in serious injury or death to workers nearby.

⚠ DANGER

Never operate the hydraulic winch with the wood chipper detached from the towing vehicle. The load may move the wood chipper or pull the tongue off the support blocking.

⚠ DANGER

Never reach into the winch or winch roller area.

⚠ DANGER

Follow all winch operating procedures, if not followed severe injury or death can result.

- The intended use of the winch is to assist the operator with pulling large tree limbs to the wood chipper feedwheels without having to lift and carry.
- Pinch point hazards may develop during winching operations. The hydraulic controls are located on the side of the infeed hopper. Operating the winch is a one-man operation. Do not have one person operating the winch hydraulic control with another person operating or holding the winch line. The person holding the winch line could have his hand pinched when another person is operating the winch control.
- Winching large limbs to the wood chipper should be performed by one person.
- Stay clear when winching.
- Do not allow winch line or other ropes to be snagged and pulled into the chipper knives.
- Avoid becoming entangled in the winch line. Never place yourself between the brush and the winch line while using the winch line to pull large tree limbs toward the chipper.
- The metal hook at the end of the winch line entering the wood chipper could result in serious damage to the knives and other internal components causing the potential for injury to operators.
- When you are not using the winch, ensure that it is retracted and stowed so that it can not be pulled into the chipper.
- Never pull out the winch line while brush or limbs are feeding into the chipper.
- Never attach winch line to an installed choker if other limbs are feeding into the machine.
- Brush can snag winch line or climbers' ropes. Knives can grab and pull in line and anything attached to it at a high rate of speed.
- If you are in between the chipper and the winch line that is caught in the knives, the winch line will be pulled in at a very rapid speed and you will not have time to get out of its way. Death or serious injury may result.
- Do not overload the winch. The cable can break or the choker can come off and strike a worker.
- Be aware of the hazards of winch line breakage. Ensure that everyone remains clear of the recoil area in the event of load or cable breakage.
- Pull loads in a manner that avoids angles which could result in tipping or other unintended movement of the chipper and towing vehicle.

⚠ DANGER

Most winch lines contain a metal hook at the end. If the metal hook enters the infeed hopper, it could be ejected out of the discharge chute at a high rate of speed causing serious injury or death.

⚠ DANGER

Make sure there is outbound tension on the winch line whenever the winch line is being powered out. Using the hydraulic control to power out the winch line rather than free spool the line out could result in the line becoming tangled around the spool and wind inward when the hydraulic lever is in the unwind position. If a worker is holding the winch line when this happens a potential nip point is created between the cable housing and hook and also the winch line and material.

⚠ DANGER

The winch line is under tension at times and could suddenly release, snapping back into the operator causing serious injury or death.

SAFETY PROCEDURES

WARNING

DO NOT operate this machine unless all hydraulic control devices operate properly. They must function, shift and position smoothly and accurately at all times. Faulty controls can cause personal injury!

WARNING

It is very important after you have operated a new machine for approximately an hour to shut down the machine and recheck all hydraulic fittings. Retighten as needed.

DO NOT GO NEAR HYDRAULIC LEAKS! High pressure oil easily punctures skin causing serious injury, gangrene, or death. DO NOT use fingers or skin to check for leaks. Lower load or relieve hydraulic pressure before loosening fittings. Use a piece of cardboard to find leaks. Never use your bare hands.

In cold weather situations let your hydraulic system idle for approximately 15 minutes to allow the system to warm up to operating temperature.

DANGER

Before beginning to operate the loader make sure the loader is unhooked from the transport chains. Transport chains are stored in a safe place. Remove loader swing lock pin. DO NOT operate this machine or loader arm near power lines. Keep machine and loader arm, when fully extended up and out, at least 10' (3.0 m) away from all power lines. Failure to do this could result in serious injury or death.

DANGER

DO NOT operate this chipper or loader arm when anyone is performing any type of maintenance to the machine. Before attempting any type of maintenance disengage clutch, install clutch lock if equipped, turn off engine, wait for the disc/drum to come to a complete stop, install the disc/drum lock pin, disconnect battery, make sure the ignition key is in your possession, and the loader arm, if equipped, is positioned on the ground. Failure to do this could result in serious injury or death.

WARNING

Before you begin to transport your trailerized machine follow all of the transportation procedures on pages 35-37. Make sure that the tongue has been raised to the proper height and attach the machine securely to the towing vehicle. Once secured to vehicle, locate tongue jack and secure it in the transport position. Always hook safety chains to vehicle by crossing them under the tongue allowing enough slack to avoid binding when making turns. Check brakes and highway lights make sure that they are all operating properly. Check that the plug terminal functions match the towing vehicle for proper operation. Make sure that the discharge chute is in the transport position pointed over the tongue of machine and the transport bolt is securely in its place. Be sure to check tire pressure before you begin to transport the machine. Close the folding pan, if equipped for the infeed hopper and make sure spring latches are locked into place. If machine is equipped with a vise, make sure to secure in place and clamp jaws closed. Close and secure any of the following, if equipped: tool box, battery box, engine cowl doors and side panels, radiator debris screens, inspection doors, cabinet doors, housing covers, tank caps and covers, etc.

DANGER

Never turn the chipper disc/drum by hand always carefully use a pry bar or wood bar. This will help prevent the person turning the disc/drum from being injured should the disc/drum break loose.

A sight hole in the chipper belt shield has been provided. If chipper belts are moving do not open chipper hood. Do not stick fingers in sight hole.

DANGER

Chipper knives are sharp and can be dangerous. It is always necessary for your protection to be extra careful and wear leather gloves when handling knives.

DANGER

The knives must be securely fastened and torqued in position. If one comes loose or breaks during operation, someone or something may get injured.

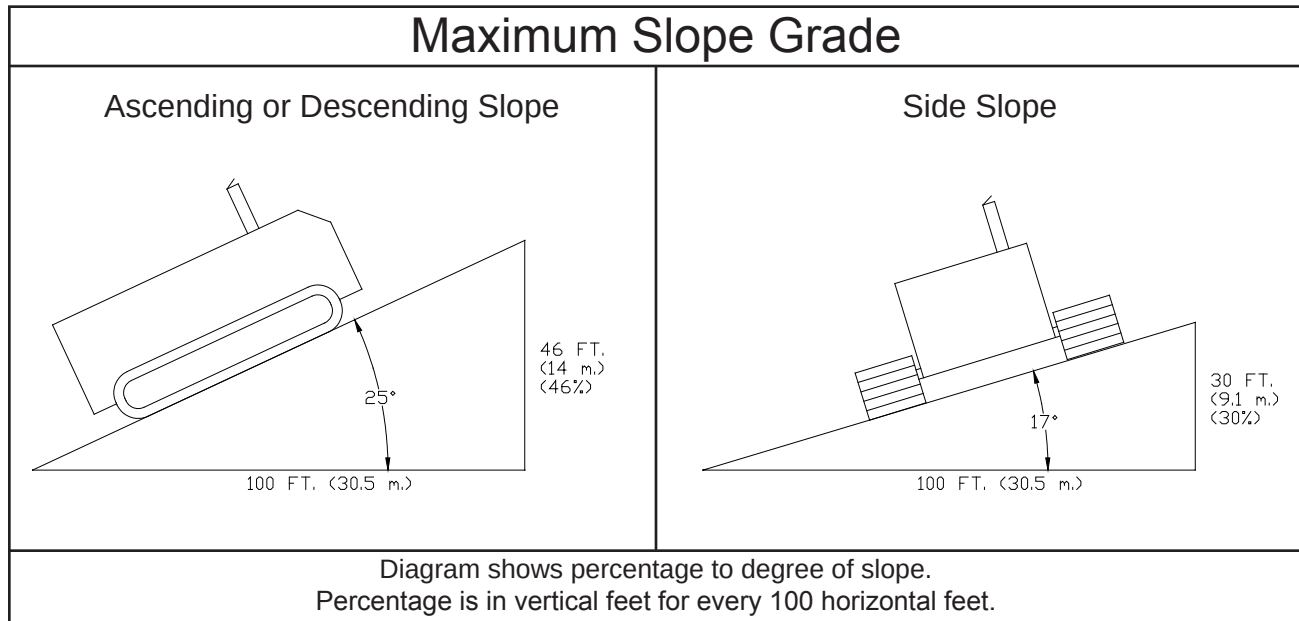
SAFETY PROCEDURES

IF MACHINE IS EQUIPPED WITH UNDERCARRIAGE TRACK

Machines equipped with undercarriage tracks are shipped with a manual from the track manufacturer. Refer to it for service, operation, and safety information.

WARNING

Do not attempt to operate the track machine on an ascending or descending slope of more than 25° or 46% or a side slope of more than 17° or 30%, it is Dangerous and could be Fatal. This is the maximum slope grade the machine can be operated on if the hydraulics, tracks, and engine are running at maximum performance and the tracks sustain good traction.



WARNING

Any increase from the specified maximum operating angles may cause loss of lubrication function and damage the engine.

DANGER

The track machine should never be parked on a slope at any time. The machine can coast or creep causing equipment and/or personal injury.

DANGER

Make sure everyone is clear of machine before moving the track machine. Stay clear of tracks when the machine is moving.

DANGER

DO NOT entangle feet or hands in undercarriage travel system.

DANGER

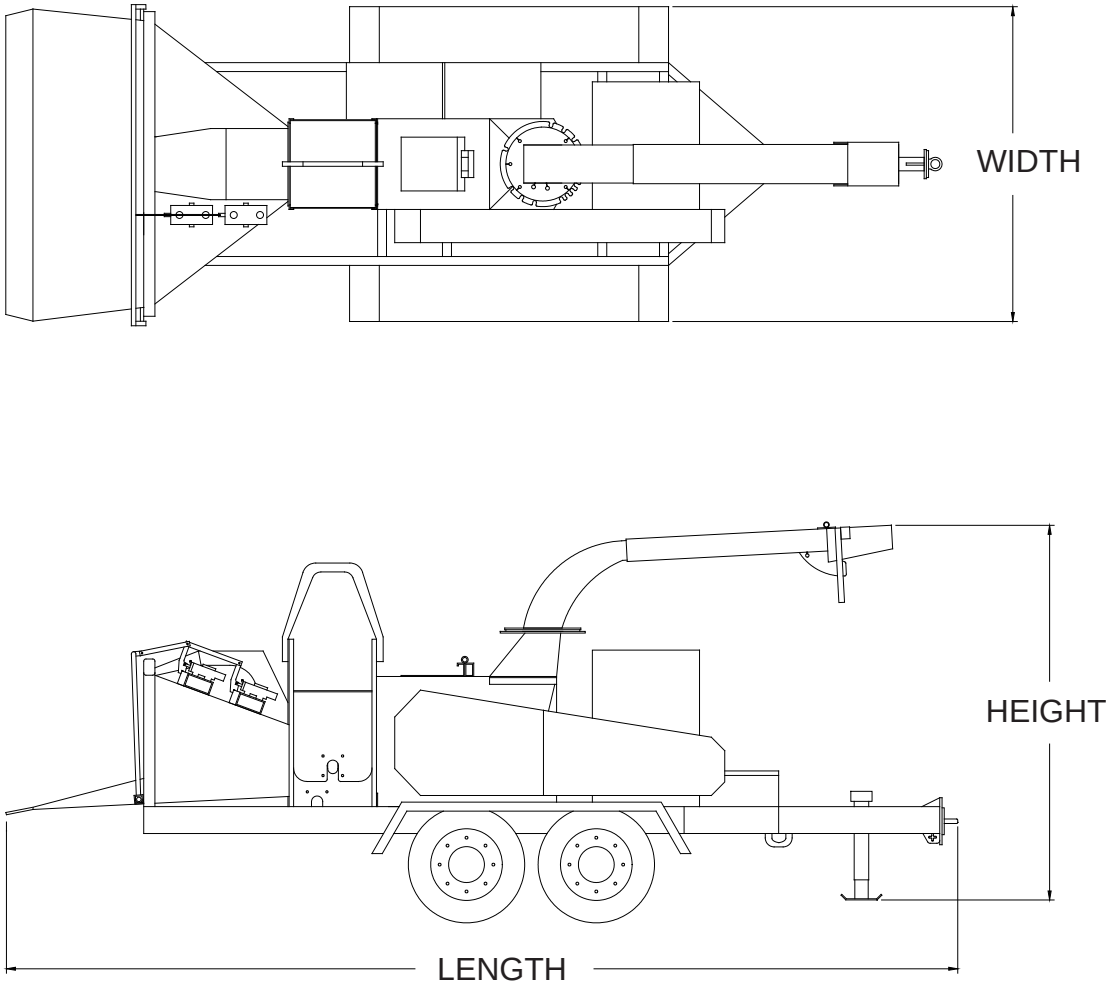
Use **EXTREME CAUTION** when traveling over non-level surface! This machine can tip over or tip backwards on non-level surface. You will cause engine damage, machine damage and possible personal injury!

DANGER

NEVER sit, stand, lay, climb or ride anywhere on this machine while it is running, operating, or in transit. You will be injured.

Bandit

EQUIPMENT SPECIFICATIONS



Approximate Dimensions & Weights

(Dimensions & weights will vary depending on optional equipment)

Approx. Weight:	Model 2090:	15,200 lbs. (6895 kg)
	Model 2090 w/ Loader:	21,000 lbs. (9525 kg) (Not Shown)
	Model 2090 Track:	31,000 lbs. (14,061 kg) (Not Shown)

(Approximate weights depending on engine and equipment options.)

Overall Dimension:	Model 2090:	Height: 11' (3.3 m),	Length: 21' 1" (6.4 m),	Width: 8' 6" (2.6 m)
	Model 2090 w/ Loader:	Height: 12' (3.7 m),	Length: 25' (7.6 m),	Width: 8' 6" (2.6 m) (Not Shown)
	Model 2090 Track:	Height: 11' 3" (3.4 m),	Length: 24' (7.3 m),	Width: 9' 7" (2.9 m) (Not Shown)

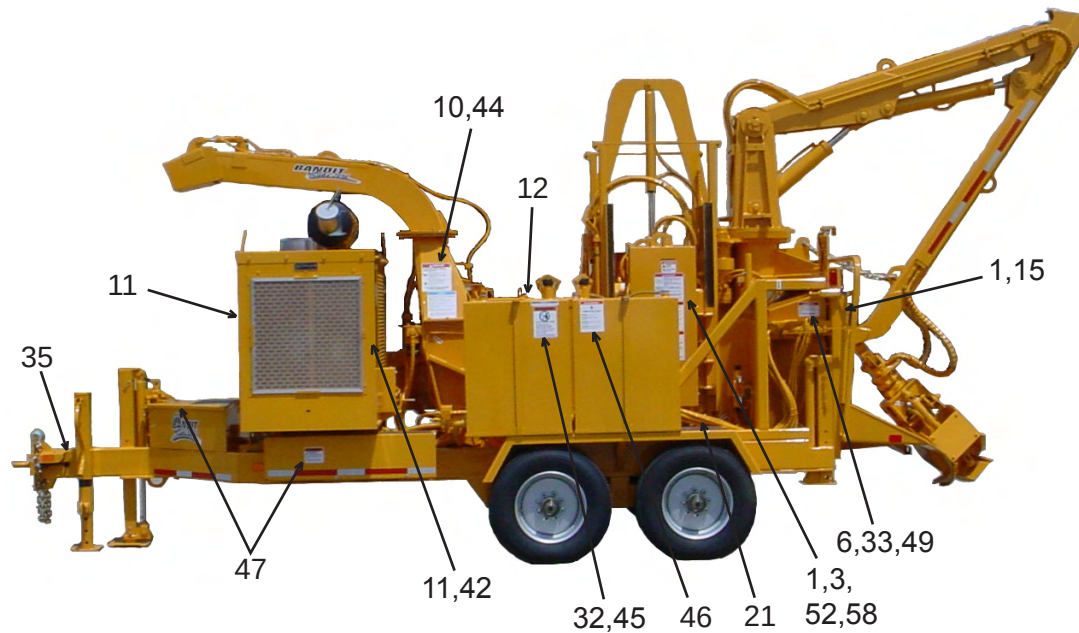
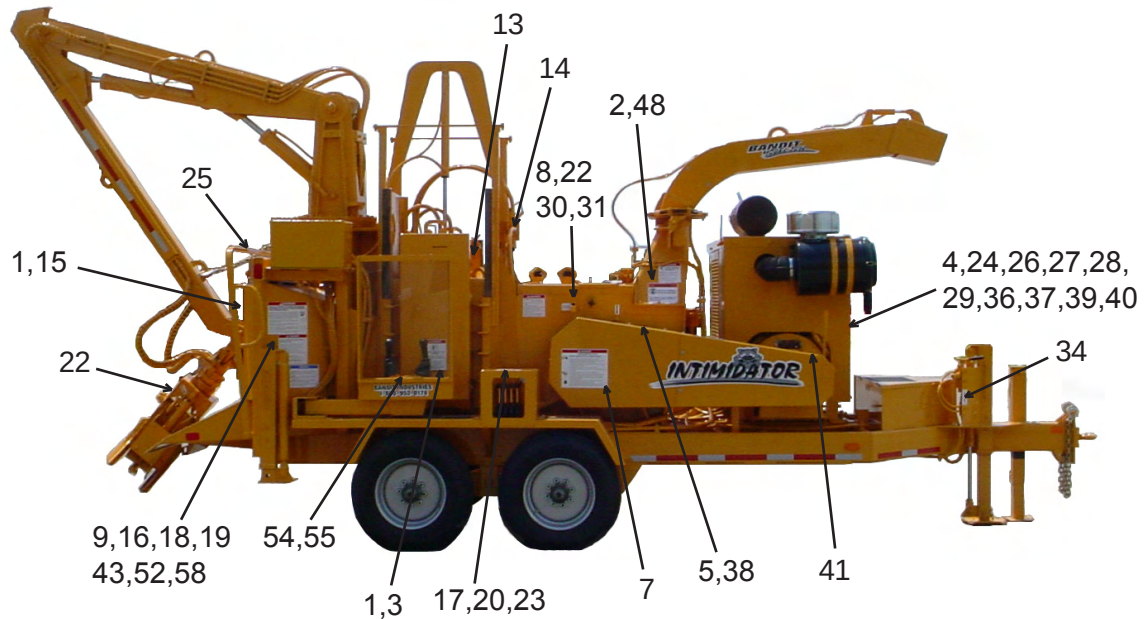
(NOTE: Measurements are to highest, longest, or widest points, not always as illustration is labeled.)

	<u>Model 2090 & 2090 w/Loader</u>	<u>Model 2090 Track</u>
Fuel Tank Capacity:	60 Gallons (227 L)	100 Gallons (379 L)
Hydraulic Tank Capacity:	60 Gallons (227 L)	75 Gallons (284 L)

(Approximate dimension depending on equipment options.)

DECAL LOCATIONS - MODEL 2090

Decal locations may vary, these are general locations.



DECAL LOCATIONS - MODEL 2090

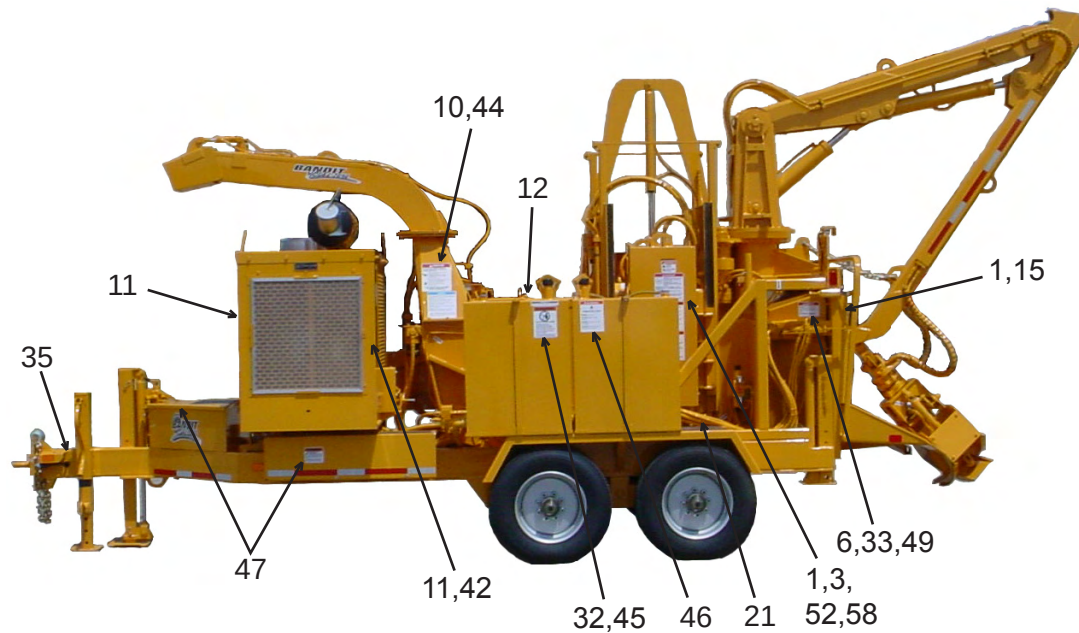
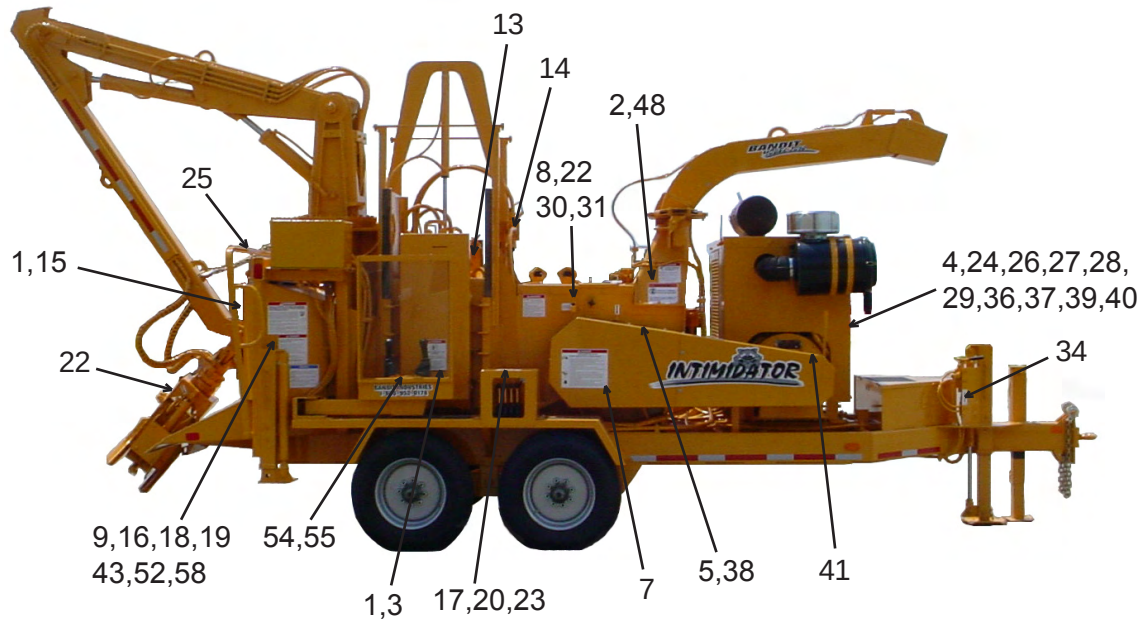
Modifications and/or additions of decals to this list will happen.
Consult chipper dealer or manufacturer for most current decal package.

LOCATION	NUMBER	DESCRIPTION
1.	SPD-02	Moving Parts...
2.	SPD-04	Flying Discharge Material...
3.	SPD-16	Do Not Hand Feed...
4.	SPD-18	Never Perform Maintenance...
5.	SPD-28	Do Not Insert Fingers
6.	SPD-30	Do Not Sit, Stand, Lay, Climb...
7.	SPD-32	Do Not Operate This Machine...
8.	SPD-33	Do Not Work Under...
9.	SPD-34	Brush Chippers Are Very Dangerous...
10.	SPD-37	Lockout All Energy Sources...
11.	ID-42	Bandit Industries Inc...USA
12.	INST-01	Remove To Check Torque...
13.	INST-02	Yoke Lock Hole
14.	INST-03	Yoke Lock Bar
15.	INST-04	Arrow
16.	INST-05	Yoke Lift Up / Down
17.	INST-07	Discharge Swivel Right / Left
18.	INST-08	Winch Control Out / In
19.	INST-09	Selector Winch / Feed
20.	INST-10	Stabilizer Down / Up
21.	INST-11	Motor Coupler Guard...
22.	INST-12	Grease Daily (Arrow)
23.	INST-15	Flipper Down / Up
24.	INST-16	Grease Weekly Arrow
25.	SPINST-25	Pull To Reverse
26.	INST-39	Oil Daily Arrow
27.	INST-43	Clutch Lock
28.	INST-44	California Proposition 65
29.	INST-46	Autofeed Basic Info...
30.	INST-48	Disc/Drum Lock Tube
31.	INST-49	Disc/Drum Lock Pin
32.	INST-53	Hydraulic Oil...Hydrex XV...
33.	INST-76	Yoke Lift Down / Up
34.	INST-90	Tongue Up / Tongue Down
35.	INST-95	Electric Plug-In Schematic
36.	INST-101	Canada Engine Decal

Note: Some decals are for optional equipment. Decal locations may vary, these are general locations. If any decals become damaged, replace immediately.

DECAL LOCATIONS - MODEL 2090

Decal locations may vary, these are general locations.



DECAL LOCATIONS - MODEL 2090

Modifications and/or additions of decals to this list will happen.
Consult chipper dealer or manufacturer for most current decal package.

LOCATION	NUMBER	DESCRIPTION
37.	N-02	Maintain Lubrication...
38.	N-03	Service Required Under Beltshield...
39.	N-05	Frequently Adjust...PTO...
40.	SPN-06	Decal Maintenance...
41.	N-07	Clutch Operation...
42.	N-08	Patents...
43.	N-09	Adjustable Feed Speed...
44.	SPN-11	Correct Knife And Hardware...
45.	SPW-01	Do Not Go Near Oil Leaks...
46.	SPW-02	Diesel Fuel Only...
47.	SPW-04	Frozen Battery Can Explode...
48.	SPW-08	Wear Personal Protection...
49.	SPW-10	Hydraulic Winch...
50.		Bandit Model 2090 Vinyl Decals
51.	Optional	Spanish/ English Decals

Additional Decals for Machine Equipped With A Loader - Consult dealer or manufacturer for general locations.

52.	SPD-15	Do Not Operate Loader Arm...
53.	SPD-17	Do Not Run Or Operate...
54.	INST-32	Joystick Controls
55.	INST-110	Window Washing Instructions...
56.	INST-125	Selector Winch / Feed
57.	INST-126	Winch In / Out
58.	N-10	Always Fold Loader...

Additional Decals for Machine Equipped With A Track Undercarriage - Consult dealer or manufacturer for general locations.

59.	SPD-19	...Minimum 10 Feet Away From Tracks...
60.	SPD-38	Do Not Entangle Feet...
61.	SPW-06	Do Not Attempt...Slope Of More Than...
62.	SPW-07	Do Not Move Machine...Horn Is Blown...
63.	SPW-11	Do Not Leave Unit Parked On A Slope...
64.		Bandit Track Vinyl Decals

Additional Decals for Machine Equipped With A Conveyor - Consult dealer or manufacturer for general locations.

65.	SPD-25	Stand Clear - Moving Conveyor
66.	SPD-29	NO Do not Climb...

Note: Some decals are for optional equipment. Decal locations may vary, these are general locations. If any decals become damaged, replace immediately.

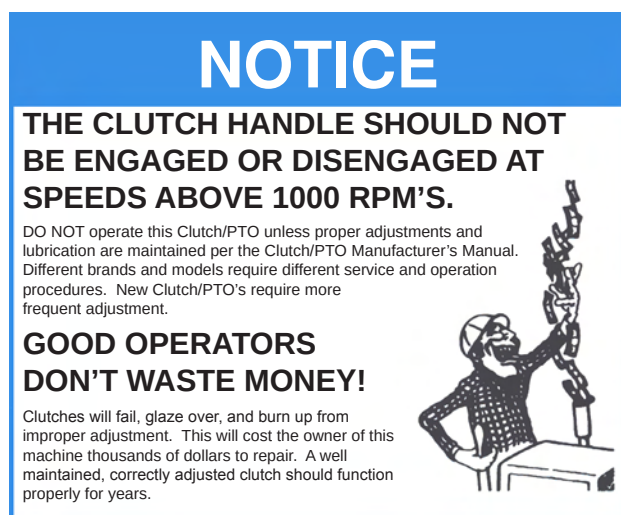
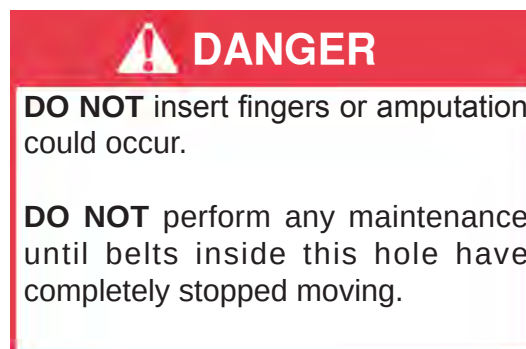
DECALS

Decals located on your Bandit equipment contain useful information to assist you in operating your equipment safely. Some of the decals on your machine and their location are shown in this section.

It is very important that all decals remain in place and in good condition on your machine. Please follow the care and instructions given below:

- 1) You should use soap and water to keep your decals clean. Never use mineral spirits or any other abrasive cleaners.
- 2) Replace immediately any missing or damaged decals. The location the decal is going to be applied to must be clean and dry, and at least 40° F (5°C) before applying decal.
- 3) When the need arises to replace a machine component with a decal attached, be sure and replace the decal.
- 4) Replacement decals are available, and can be purchased from the manufacturer or your Bandit Dealer.
- 5) Other language decals may be purchased. Spanish and other foreign language decals are available. Mail translated decals required to Bandit Industries, Inc.

EXAMPLES:



DANGER

AVOID INJURY OR DEATH! DO NOT OPERATE THIS MACHINE UNLESS:



- Only properly and fully trained people are used.
- Wearing clothing and personal protective equipment per ANSI Z133 and OSHA 29-1910 standards.
- Constantly prepared and positioned to activate the control and shut down devices.
- All guards and covers are secure and in place.
- Only factory approved pins, guards and replacement parts are used.



- All safety devices and controls are operational.
- Never allow hand, foot or body part to enter infeed area, conveyors or guards during operation or while running.
- All decals are legible, in place and operator thoroughly understands them.



- Never open guards, covers or inspection doors while disc/drum is turning or engine is running.
- Follow all safety and operational instructions per manuals decals, video, ANSI Z133 and OSHA 29-1910 standards.

WARNING



DO NOT GO NEAR LEAKS!

- Pressured oil easily punctures skin causing injury, gangrene or death.
- Seek immediate medical care.
- Do not use finger or skin to check for leaks.
- Remove hydraulic pressure or load before loosening fittings.

DANGER



DO NOT entangle feet or hands in undercarriage travel system

You MUST be minimum 10 feet away from tracks and/or tires when this machine is moving or operator is in cab.

WARNING



WEAR EYE & PERSONAL PROTECTION EQUIPMENT

Wear all personal protection equipment and follow all safety standards per ANSI and OSHA instructions.

Bandit

! DANGER**DO NOT HAND FEED THIS MACHINE!**

- This machine is designed to **ONLY** be fed by a mechanical log loader.
- Feeding material into this machine by hand is not permitted or authorized.

SEVERE INJURY OR DEATH CAN RESULT!

! DANGER**DO NOT OPERATE LOADER ARM OR CHIPPER UNLESS:**

- Loader booms are completely out of reach of power lines by minimum of 10 feet.
- Boom reach area and chipper infeed area are completely clear of people.
- Operator follows all ANSI and OSHA operating, protective equipment and safety standards.
- Operator follows manufacturers instructions (consult manuals, video, etc.)

SEVERE INJURY OR DEATH CAN RESULT!

AUTOFEED OPTIONS

AUTOFEED SYSTEM

Consult the original manufacturer's manual for your chippers
Autofeed operating and maintenance procedures

When processing material through the chipper, the feed system will automatically stop when the engine drops below a preset RPM point. The engine is constantly being monitored by an adjustable electronic speed switch. The switch can be adjusted so that at a given RPM, an electronic relay system will operate the hydraulic solenoid valves to stop the feedwheel(s) until the engine has recovered speed. The patented "Autofeed Plus" system will reverse the feedwheel(s) for a set period of time and then stop until the engine has recovered speed. Both autofeed systems will then automatically turn the feed on to resume feeding.

Due to required components and equipment options a machine may have various types or brands of autofeed systems. Each chipper is shipped with the original manufacturer's manual for the autofeed system it is equipped with.

For the approximate autofeed settings on all optional autofeed systems refer to page 24 of the chipper manual. For part numbers on the hydraulic portion of the autofeed systems refer to pages 106 & 107 of the chipper manual.

Do not power wash the digital tach hour meters. Pressure causes unwarranted damage. **Do not spray tach, this will void warranty.**

PART NUMBERS FOR AUTOFEED DIGITAL TACH HOUR METERS

ESI Intelli-Feed
 Part Number: 900-2908-11
 For Service Call
 1-815-985-0383



Electronic Solutions
 Part Number: 900-2904-85
 For Service Call
 1-866-736-6839



No longer
 used.

L.O.R. MFG.
 Part Number: 900-2906-82L
 For Service Call
 1-866-644-8622



Miratron Inc.
 Part Number: 900-2910-68
 For Service Call
 1-866-285-0132



No longer
 used.

AUTOFEED TERMINOLOGY

PPR	Pulses per revolution. On magnetic pick-up machines, this setting will be the number of teeth on the gear or sprocket it is reading. On alternator pick-up machines, the setting will need to be obtained from your local dealer or Bandit Industries.
Mag Pick-up	Magnetic pick-up, also called pick-up probe. This is normally located screwed into the flywheel housing on the engine block. It can also be found on the clutch housing or chipper shaft. See Figure 1.
Dump Block	This block is used in most cases. It is located near the fender on the frame of the chipper. An easy way to find it is by following the hydraulic hose from the pump. The block will be the first thing it is hooked into. This block also contains the main relief. When the solenoid is activated (indicated by the light in the connector) the feedwheel(s) are stopped by the autofeed system. See Figure 2.
Reverse Valve	Located on the infeed hopper of the chipper. It can be recognized by a valve with one solenoid bolted on a square block. The solenoid is approximately 2-1/2" (63.5mm) diameter x 2-3/4" (69.9mm) long. It will have two wires coming from it or on the newer machines it will have a connector with a light screwed to it. When the solenoid is activated (indicated by the light in the connector) the feedwheel(s) are reversed by the autofeed plus system. See Figure 3.
Dual Coil Reverse Valve	Normally seen on bigger machines such as 280, 1850, 1890, 1990, 2090, etc. and special options. This will normally be located on the infeed hopper of the machine. It can be recognized by a valve with two solenoids bolted on a square block. The solenoid is approximately 2-1/2" (63.5mm) diameter x 2-3/4" (69.9mm) long. It will have two wires coming from it or on the newer machines it will have a connector with a light screwed to it. The feed coil must have power (indicated by the light in the connector) for the feedwheels to feed and pull material in. See Figure 4.
Solenoid	Electronically activated to produce a magnetic pull which shifts the spool inside the hydraulic valve. Shifting of the spool changes oil flow direction from operating forward or dumping oil to tank.
High	High or HI is the setting when the feedwheels will turn back on (feeding operation).
Low	Low or LO is the setting when the autofeed will reverse (if equipped) the feedwheels and then turn the feedwheels off.
Back	Amount of time in seconds the feedwheels will back the wood away from the cutter disc/drum. Normally this will be set at .3 seconds.

Figure 1



Figure 2

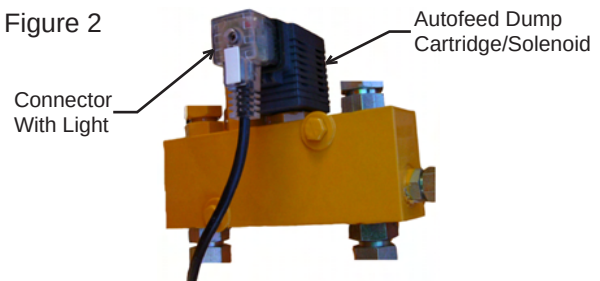


Figure 3

Connector With Light

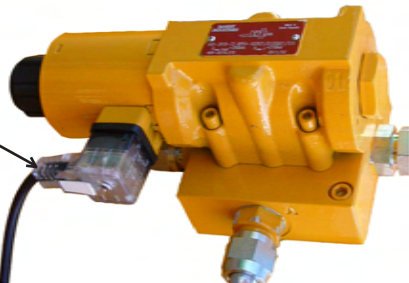
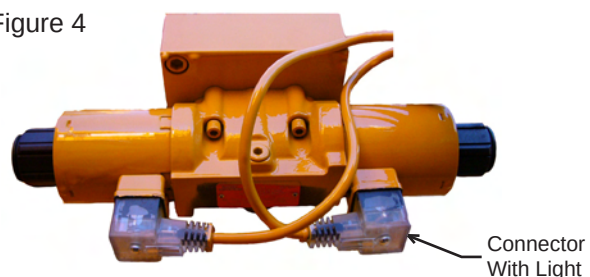


Figure 4



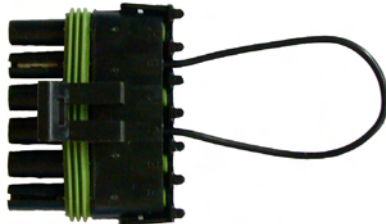
TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	SOLUTION
No Display	-Gauge not getting power.	-Check continuity of Red wire to a clean power source. -Check 7.5 amp fuse. -Check connection at engine disable plug at hood pin. -Check key switch for switched power in and out.
	-Gauge not properly grounded.	-Check continuity of Black wire to ground connection.
	-Dead Battery.	-Charge or replace.
Feedwheels Do Not Stop (Autofeed Doesn't Activate)	-Loose chipper belts.	-Tighten or replace per manual specifications.
	-Clutch slipping.	-Adjust per clutch manufacturer's recommendations.
	-Sticky dump cartridge.	-Lightly tap on dump block to free up. -Take cartridge out and clean free of debris. -Replace solenoid and/or cartridge.
	-No power to dump valve solenoid.	-Check fuse on dump valve signal wire (if equipped). -Check continuity on the dump valve wire (normally green wire).
	-Faulty tach.	-Check autofeed tachometer settings.
	-Low or "LO" setting wrong.	-Check autofeed tachometer settings.
Feedwheels Do Not Re-engage	-Engine RPM not reaching HI set point on tach.	-Check for stretched or out of adjustment throttle cable. This would not engine reach full RPM. -Check HI RPM setting on gauge to make sure it is not set too close to full RPM of engine. HI setting should be 150 to 200 RPM below full engine RPM.
	-Sticky dump cartridge.	-Lightly tap on dump block to free up. -Take cartridge out and clean free of debris. -Replace solenoid and/or cartridge.
	-System pressure.	-Check and readjust per manual specifications.
	-Faulty tach.	-Consult local dealer or Bandit Industries.
No Signal	-Engine not running.	-Normal operating condition.
	-Bad signal wire.	-Check continuity on the signal wire (white wire in autofeed harness).
	-No signal from alternator.	-Check for at least 3.5 VAC output at idle and 10-12 VAC at HI RPM.
	-No signal from mag pick-up.	-Check for approx. 2-7 VAC at idle and approx. 14-20 VAC at HI RPM. Testing must be done at the two wires coming out of mag pick-up after disconnecting. Remove and clean off magnet at end. Reinstall by turning it in until it bottoms out. Then back off approx. 1/2 a turn. Lock with jam nut.
	-Bad mag pick-up.	-Replace mag pick-up.
Gauge Jumped Program	-Low voltage to tach.	-Check engine disable plug at hood. Clean and check for tight connection. Re-install using dielectric grease.
	-Shorts in wire harness.	-Check for possible worn wires or loose connections.
	-Faulty ground.	-Check black wire for a good ground.
	-Faulty tach.	-Consult local dealer or Bandit Industries.

TROUBLE SHOOTING GUIDE cont.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Feedwheels Run In Reverse From Normal	-Backup time set wrong.	Reset backup time. Normal setting is .3 seconds.
	-Sticking reverse valve.	-Check solenoid operation. -Override cartridge manually by sticking a small allen wrench in the end of the solenoid. -Replace solenoid and/or cartridge.
	-Type settings programmed wrong.	-Reprogram or consult local dealer or Bandit Ind.

NOTE: Autofeeds with dump blocks can be unplugged and run manually. Autofeeds with dual output block will need a jumper plug. This can be a good test to determine if you problem is hydraulic or electronic.

LOR Jumper Plug Part No.: 900-2913-51 	ESI Jumper Plug Part No.: 900-2914-09 
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**APPROXIMATE DIGITAL AUTOFEED SETTINGS
(FOR ALL AUTO FEED SYSTEMS - REFERENCE ONLY)**

NOTE: Refer to the Completion/Check Sheet, that is shipped with the machine for the correct engine rpm. If needed, contact your local dealer or Bandit Industries.

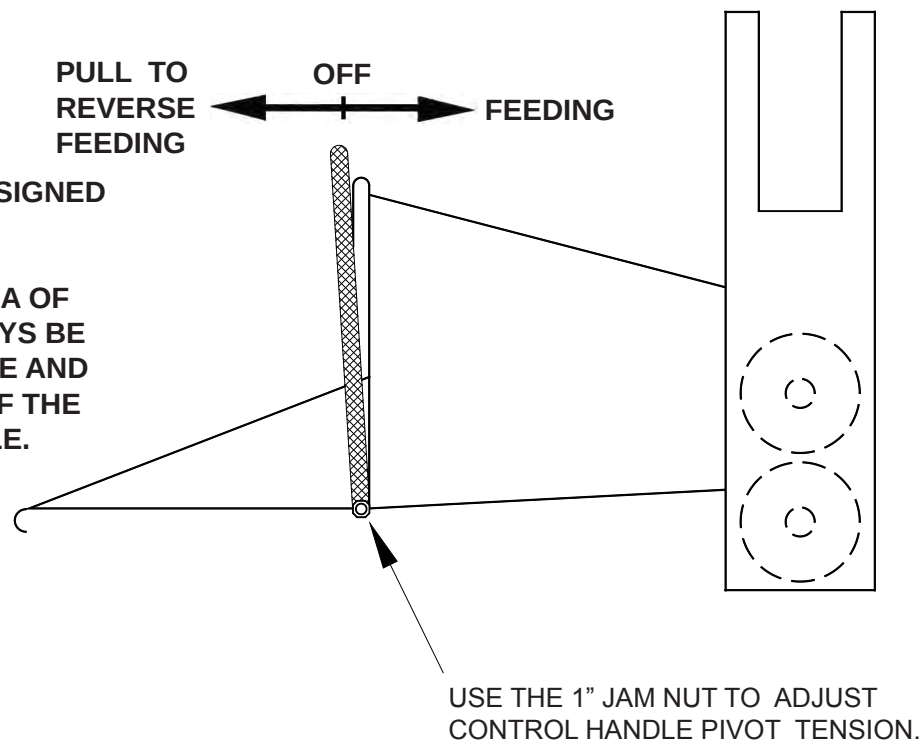
Some Current Engine Types	Maximum RPM	Alternator PPR	Magnetic Pick-Up PPR	High RPM	Low RPM	ALR (LOR only)	Feed Reverse Time
CAT 3126 - 250 Hp (Tier 2)	2200	N/A	156	2100	1750	N/A	.3
CAT C9 - 350 Hp (Tier 3)	2200	N/A	113	2100	1750	N/A	.3
Cummins QSL9L - 330 Hp (Tier 2)	2100	N/A	159	1900	1650	N/A	.3
Cummins QSL - 325 Hp (Tier 3)	2100	N/A	158	2000	1650	N/A	.3
Cummins QSB5.9 - 275 Hp (Tier 2)	2500	N/A	159	2350	2150	N/A	.3
Cummins QSC6.7 - 275 Hp (Tier 3)	2500	N/A	128	2400	2150	N/A	.3
John Deere 6081 - 250 Hp (Tier 2)	2200	N/A	129	2050	1750	N/A	.3
John Deere 6081 - 275 Hp (Tier 2)	2200	N/A	129	2050	1750	N/A	.3
John Deere 6090 - 325 Hp (Tier 3)	2200	N/A	30	2050	1750	N/A	.3
Some Prior Engine Types							
Cummins 6BTA - 200 Hp	2500	17	159	2400	2150	N/A	.3
Cummins 6CTA - 250 Hp	2200	20	N/A	2150	1775	N/A	.3
John Deere 6068 - 200 Hp	2400	N/A	129	2250	2050	N/A	.3

CONTROLS

CORRECT OPERATION OF FEED CONTROL HANDLE

FOR ALL CHIPPERs DESIGNED TO BE "LOADER FED".

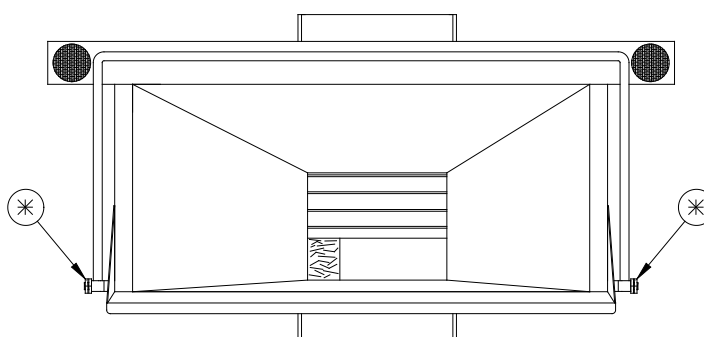
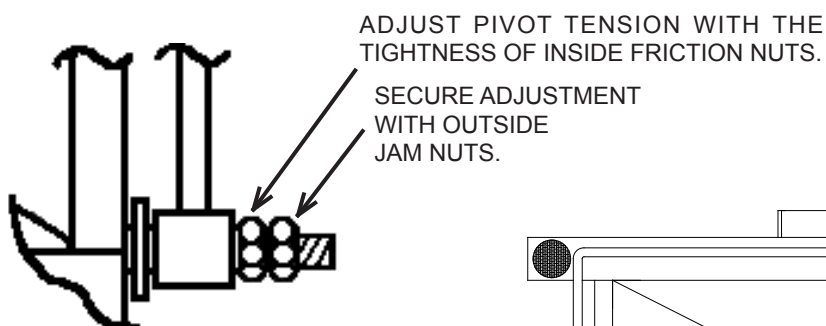
IF YOU ARE IN THE AREA OF INFEED HOPPER, ALWAYS BE PREPARED TO OPERATE AND WITHIN EASY REACH OF THE FEED CONTROL HANDLE.



ADJUSTING TENSION FOR CONTROL HANDLE PIVOT.

NORMAL WEAR REQUIRES PERIODICAL ADJUSTMENT OF PIVOT TENSION.

FEED CONTROL HANDLE SHOULD PIVOT WITH LITTLE EFFORT, BY HAND. LUBRICATE PIVOT POINTS OF FEED CONTROL HANDLE WEEKLY.



CONTROLS

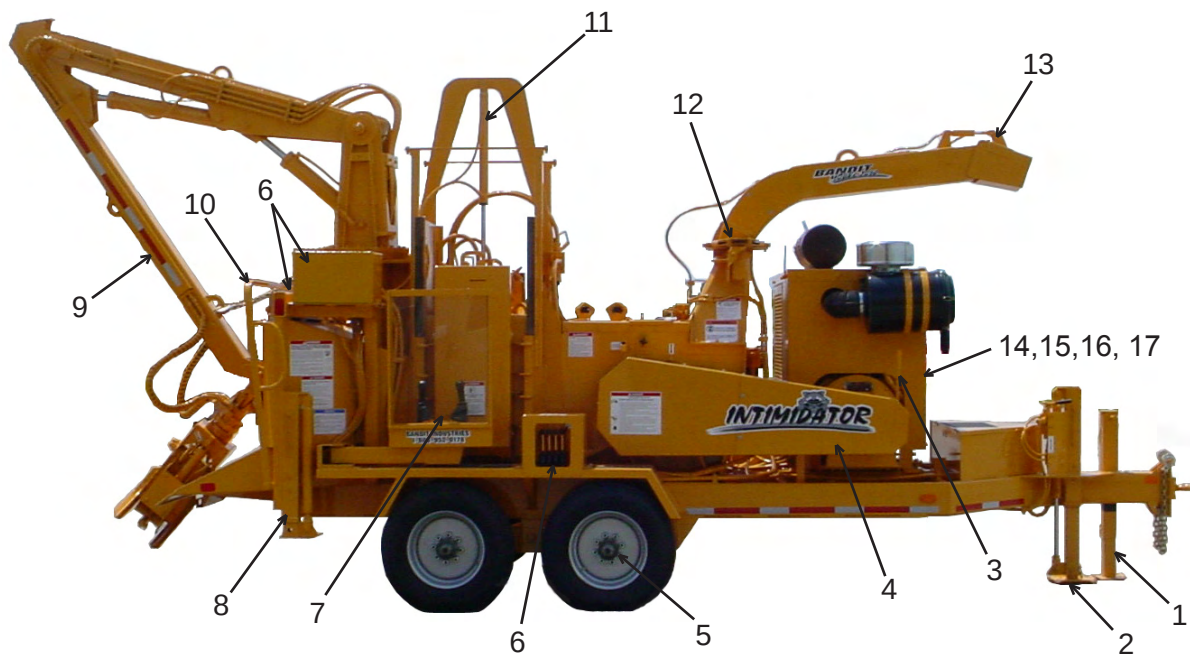
Model 2090 Basic Location of Controls and Adjustments

LOCATION SHOWN

1. Foot Pad Jack
2. Hydraulic Tongue Jack "Optional"
3. Clutch Handle
4. Chipper Belts / Pump Belts
5. Lug Nuts
6. Hydraulic Control Valves
7. Loader Controls "Optional"
8. Rear Stabilizer "Optional"
9. Loader "Optional"
10. Feedwheel Control Bar
11. Yoke Lift Cylinder
12. Swivel Discharge
13. Discharge Hydraulic Flipper
14. Autofeed Controls
15. Engine Controls, Adjusters
16. Electric Engine Throttle Adjuster (if equipped)
17. "Bandit" Lever Throttle Adjuster (if equipped)

NOT SHOWN

Knives & Hardware
 Wooden Push Paddle
 Feedwheel Motor Coupler
 Hydraulic Winch Area "Optional"



Bandit

CONTROL OPERATING PROCEDURES

Feedwheel Control Bar:

The feedwheel control bar operates the feedwheel(s). This machine is NOT designed or authorized to be hand fed! To make the feedwheel(s) operate so they are pulling material into the machine, push the control handle towards the machine. To make the feedwheel(s) operate so they are pushing material out of the machine, away from the chipper disc/drum, the control handle should be pulled away from the chipper. The control bar is in the off position when it is in the center location.

Yoke Lift Control Valve:

The yoke lift control valve operates the top yoke lift cylinder. To lower the yoke, push the yoke lift control valve handle towards the tongue of the machine. To raise the yoke, push the yoke lift control valve handle towards the infeed hopper of the machine. The yoke lift control valve handle is in the flotation position when it is in the center location.

Selector Control - Optional:

The selector control allows the operator to change the operation function from the feed function to the winch function or from the winch function to the feed function. The feedwheel(s) will not operate when the selector control is in the winch function and the winch will not work while the selector control is in the feed function. To have the feedwheel(s) operate the selector control valve needs to be pushed in, away from the operator. To operate the winch the selector control valve needs to be pulled out, towards the operator. Note: If the selector control is an electric switch, pull the switch down for the feed function and push the switch up for the winch function.

Winch Control - Optional:

The winch control operates the winch option. To make the winch reel out push the winch control valve handle in, away from the operator. To make the winch pull material in retract the winch clutch lock pin, pull the clutch handle up, and pull the winch control valve handle out, towards the operator. The winch also has a spool rotation lock, make sure this is disengaged to free wheel cable out of the spool. Note: If the winch control is an electric switch, push the switch out towards the material to make the winch reel out and push the switch away from the material to make the winch pull material in.

Discharge Hydraulic Swivel Control:

NOTE: Remove transport bolt and/or lock pin BEFORE operating this function.

The discharge hydraulic swivel control operates the discharge rotate. To make the discharge swivel to the right push the discharge swivel control valve handle down, towards the ground. To make the discharge swivel to the left pull the discharge swivel control valve handle up, away from the ground. The discharge swivel control valve handle is in the off position when it is in the center location. Do not use the hydraulics to secure the discharge when transporting the chipper. Make sure to install the lock bolt and nut before transporting.

Discharge Hydraulic Flipper Control:

The discharge hydraulic flipper control operates the discharge flipper cylinder. To make the discharge flipper rotate up pull the discharge hydraulic flipper control valve handle up, away from the ground. To make the discharge flipper rotate downward push the discharge hydraulic flipper control valve handle down, towards the ground. The discharge hydraulic flipper control valve handle is in the off position when it is in the center location.

Hydraulic Tongue Jack Control:

NOTE: Remove lock pin BEFORE operating this function.

The hydraulic tongue jack control operates the hydraulic tongue jack cylinder. To raise the front of the machine pull the hydraulic tongue jack control valve handle up, away from the ground. To lower the front of the machine push the hydraulic tongue jack control valve handle down, towards the ground. The hydraulic tongue jack control valve handle is in the off position when it is in the center location. Install the lock pin at the desired tongue height.

CONTROLS

Basic Location Of Cab Controls And Adjustments For Model 2090 Trailerized With A Cab

- | | |
|-------------------------------------|---------------------------------|
| 1. Feedwheel Control Switch | 4. Road Side Stabilizer Control |
| 2. Joystick Console Adjustment Knob | 5. Discharge Swivel Control |
| 3. Curb Side Stabilizer Control | 6. Flipper Control |

FEEDWHEEL CONTROL SWITCH (#1):

To make the feedwheels rotate so that they are pulling material into the chipper, pull the switch backwards toward the operator. To turn the feedwheels off, push or pull the switch to the center position. To make the feedwheels rotate so that they are pushing material out of the chipper, push the switch forward away from the operator.

JOYSTICK CONSOLE ADJUSTMENT KNOB (#2):

To move the joystick console, pull the adjustment knob up and then the joystick console can move closer or further from the operator's seat.

STABILIZER CONTROL (#3 & #4):

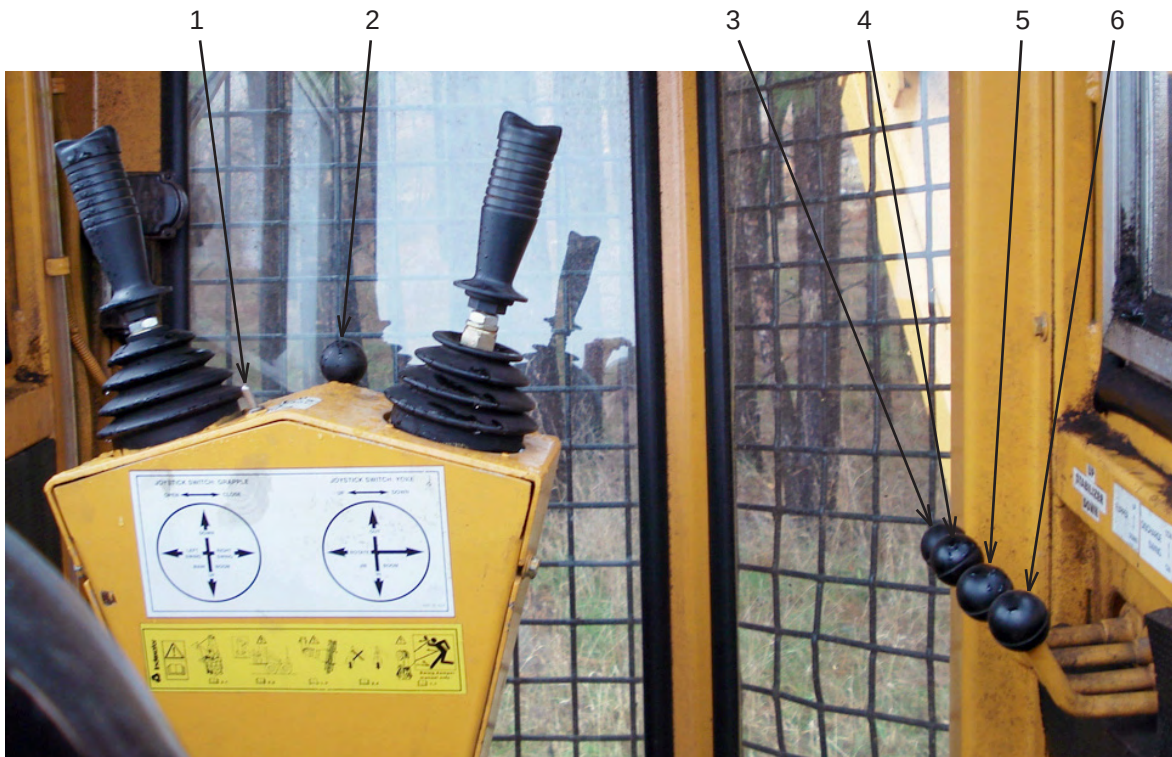
To make the stabilizer raise up push the stabilizer control handle up. To make the stabilizer extend push the stabilizer swivel control handle down.

DISCHARGE SWIVEL CONTROL (#5):

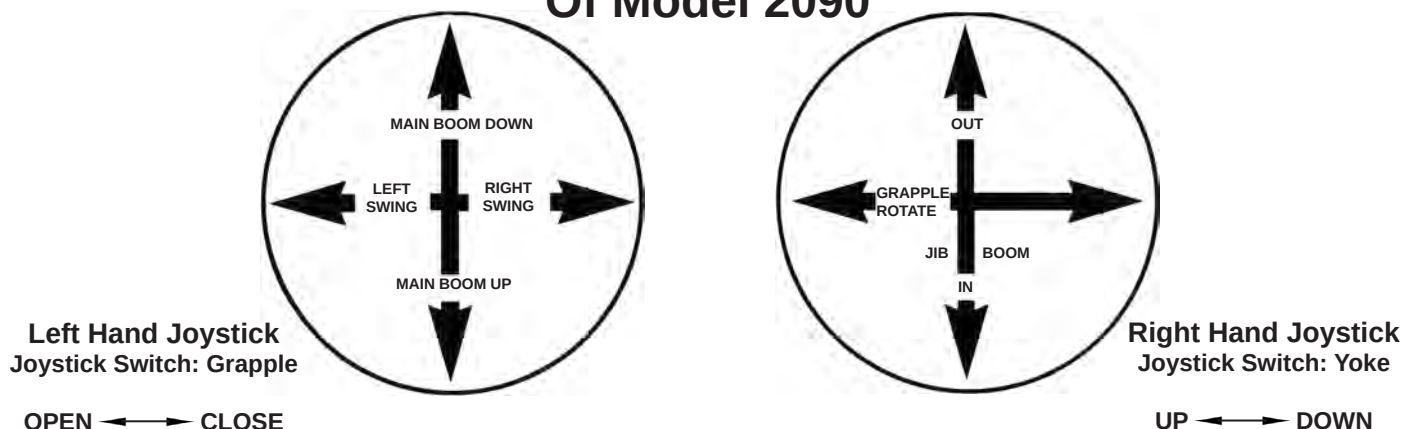
To make the discharge swivel to the right push the discharge swivel control handle up. To make the discharge swivel to the left push the discharge swivel control handle down.

FLIPPER CONTROL (#6):

To make the flipper go up push the flipper control handle up. To make the flipper go down push the flipper control handle down.

**Bandit**

Joystick Application For The Loader Function Of Model 2090



JOYSTICK OPERATING PROCEDURES LOADER OPERATION

Before beginning to operate the machine make sure you are seated comfortably and are seat belted into the seat.

WHEN OPERATING THE LOADER, THE JOYSTICKS OPERATE IN THE FOLLOWING MANNER:

LEFT HAND JOYSTICK:

The left hand joystick operates the main boom, swing, and the grapple open and close functions. To make the main boom move in an upward motion pull the joystick backwards, toward the operator. To make the main boom move in a downward motion push the joystick forward, away from the operator. To make the loader swing to the left push the joystick to the left. To make the loader swing to the right push the joystick to the right. The grapple open/close switch is located on top of the left hand joystick. To make the grapple open push the switch on the left side. To make the grapple close push the switch on the right side.

RIGHT HAND JOYSTICK:

The right hand joystick operates the jib boom, grapple rotate, and the yoke functions. To make the jib boom move in an outward motion, away from the chipper, push the joystick forward, away from the operator. To make the jib boom move in an inward motion, towards the chipper, pull the joystick backwards, toward the operator. To make the grapple rotate to the left push the joystick to the left. To make the grapple rotate to the right push the joystick to the right. The yoke up/down switch is located on top of the right hand joystick. To make the yoke go up push the switch on the left side. To make the yoke go down push the switch on the right side.

TRACK OPERATION

Before beginning to operate the machine make sure you are seated comfortably and are seat belted into the seat.

WHEN OPERATING THE LOADER, THE JOYSTICKS OPERATE IN THE FOLLOWING MANNER:

Note: Flip the "function switch" from loader to track.

LEFT HAND JOYSTICK:

The left hand joystick operates the left side track. To move the left track forward, push the joystick forward, away from the operator. To reverse the left side track, pull the joystick backwards, toward the operator.

RIGHT HAND JOYSTICK:

The right hand joystick operates the right side track. To move the right track forward, push the joystick forward, away from the operator. To reverse the right side track, pull the joystick backwards, toward the operator.

HIGH/LOW SPEED SWITCH:

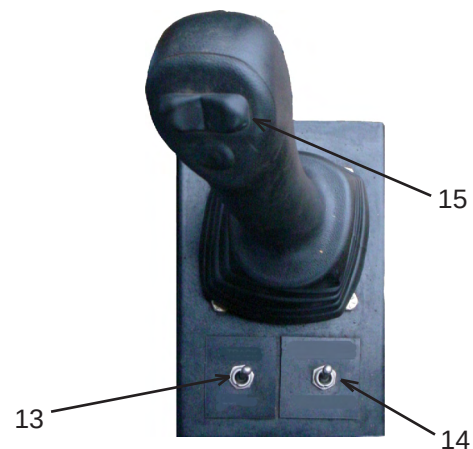
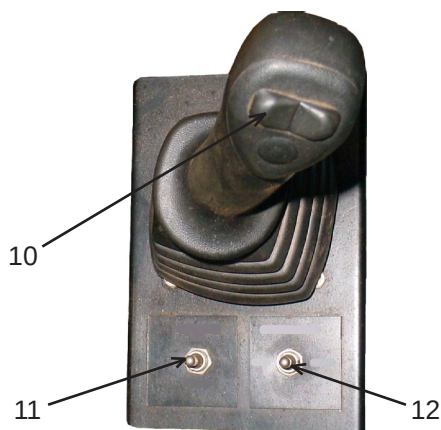
Located on the left joystick console is the High/Low Speed Switch. The switch operates the High and Low speeds for the motors. High speed is for traveling between piles and Low speed is for more torque. When turning, you should be in Low speed.

Bandit

CONTROLS

Basic Location Of Cab Controls And Adjustments For Model 2090 Track

- | | |
|--------------------------------|---------------------------------------|
| 1. Autofeet Tach | 10. Grapple Switch |
| 2. Horn Switch | 11. Function Switch (Loader or Track) |
| 3. Air Conditioning Control | 12. High/Low Speed Switch (Tracks) |
| 4. Heater Conditioning Control | 13. Discharge Swivel Switch |
| 5. Work Light Switch | 14. Flipper Switch |
| 6. Throttle Switch | 15. Yoke Switch |
| 7. Engine Kill Switch | |
| 8. Engine Diagnostic Switch | |
| 9. Engine Diagnostic Plug | |



CONTROL OPERATING PROCEDURES

HORN SWITCH (#2):

The horn switch is located on the gauge panel. To sound the horn push the horn switch in.

THROTTLE (#6):

The throttle is located on the gauge panel. Depending on the type of throttle your machine is equipped with, to increase the engine throttle, twist the knob counter-clockwise, push the switch right, or push the switch up. To decrease the engine throttle, twist the knob clockwise, push the switch left, or push the switch down.

ENGINE SHUT-DOWN SWITCH (#7):

The engine shut-down switch is located on the gauge panel. To kill the engine push the engine kill switch in.

ENGINE DIAGNOSTIC SWITCH (#8):

The engine diagnostic switch has to be flipped if running an engine diagnostic in the plug next to it.

ENGINE DIAGNOSTIC PLUG (#9):

The engine diagnostic can be performed here.

GRAPPLE OPEN / CLOSE BUTTONS (#10):

The grapple open and close buttons are located on the top of the left hand joystick. To make the grapple open, push the left button down. To make the grapple close, push the right button down.

DISCHARGE SWIVEL SWITCH (#13):

The discharge swivel switch is located on the right joystick console. To make the discharge swivel to the right push the switch right. To make the discharge swivel to the left push the switch left.

FLIPPER SWITCH (#14):

The flipper switch is located on the right joystick console. To make the flipper go up push the flipper switch forward. To make the flipper go down push the switch backwards.

YOKE UP / DOWN BUTTONS (#15):

The yoke up and down buttons are located on top of the right hand joystick. To make the yoke go up push the left button down. To make the yoke go down push the right button down.



WINCH OPERATING PROCEDURES

Figure 1

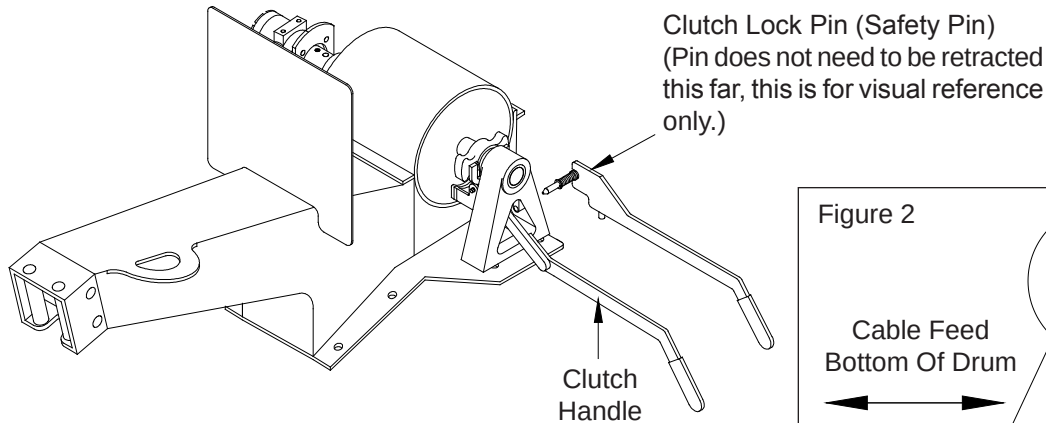
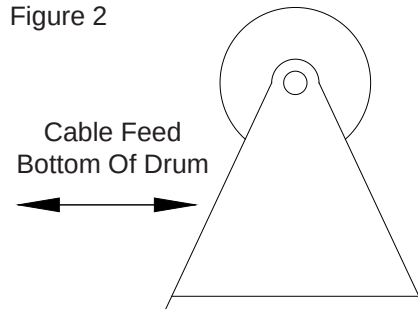


Figure 2



⚠ WARNING

HYDRAULIC WINCH OPERATION PER WINCH MANUFACTURER!

Install 5/16" (7.9 mm) diameter cable to pull and feed from the bottom of the winch drum (See figure 2). Remove excess bolt length on cable bolts after cable is secured to the spool.

⚠ DANGER

Never reach into the winch or winch roller area.

OPERATING PROCEDURE

1. Winch operation is a one person job. This means the person who hooks the winch to the wood material is the same person who engages the winch.
2. Place the feedwheel control bar in the off position. Make sure chipper and towing vehicle are blocked or anchored in a solid location.
3. Locate the selector valve and engage it to the winch position. The feed system should not operate with selector in winch mode.
4. Make sure the winch clutch is disengaged and pull the cable to the material to be reeled in. Attach cable securely to wood material that you want pulled to chipper.
5. Make sure everyone is clear and then retract the clutch lock pin and then pull the clutch handle up to engage the winch clutch (See Figure 1). Make sure handle is locked in position.
6. Use the winch control valve or the radio remote control (if applicable) to now pull the wood material towards the machine.
7. Once the wood material is pulled to the machine, unhook it from the winch and make sure the cable is completely reeled back in and out of the way. Attach cable to keeper loop. Make sure the cable is clear of the feedwheel(s) or severe damage can occur if the cable should enter the chipper.
8. Reengage selector valve to feed position.
9. Engage the feedwheel(s) and begin feeding wood material.

Bandit

WINCH OPERATING PROCEDURES

DANGER

Brush being fed into the chipper infeed hopper can snag an extended winch line. The knives on the spinning disc/drum can grab and pull in the winch line at a high rate of speed resulting in serious injury or death to workers nearby.

DANGER

The winch line is under tension at times and could suddenly release, snapping back into the operator causing serious injury or death.

DANGER

Never operate the hydraulic winch with the wood chipper detached from the towing vehicle. The load may move the wood chipper or pull the tongue off the support blocking.

DANGER

Climbers' ropes and other lines present at the work site can become entangled in brush being fed into the chipper. The knives on the spinning disc/drum can grab and pull in ropes at a high rate of speed resulting in serious injury or death to workers nearby.

DANGER

Follow all winch operating procedures, if not followed severe injury or death can result.

- The intended use of the winch is to assist the operator with pulling large tree limbs to the wood chipper feedwheels without having to lift and carry.
- Pinch point hazards may develop during winching operations. The hydraulic controls are located on the side of the infeed hopper. Operating the winch is a one-man operation. Do not have one person operating the winch hydraulic control with another person operating or holding the winch line. The person holding the winch line could have his hand pinched when another person is operating the winch control.
- Winching large limbs to the wood chipper should be performed by one person.
- Stay clear when winching.
- Do not allow winch line or other ropes to be snagged and pulled into the chipper knives.
- Avoid becoming entangled in the winch line. Never place yourself between the brush and the winch line while using the winch line to pull large tree limbs toward the chipper.
- The metal hook at the end of the winch line entering the wood chipper could result in serious damage to the knives and other internal components causing the potential for injury to operators.
- When you are not using the winch, ensure that it is retracted and stowed so that it can not be pulled into the chipper.
- Never pull out the winch line while brush or limbs are feeding into the chipper.
- Never attach winch line to an installed choker if other limbs are feeding into the machine.
- Brush can snag winch line or climbers' ropes. Knives can grab and pull in line and anything attached to it at a high rate of speed.
- If you are in between the chipper and the winch line that is caught in the knives, the winch line will be pulled in at a very rapid speed and you will not have time to get out of its way. Death or serious injury may result.
- Do not overload the winch. The cable can break or the choker can come off and strike a worker.
- Be aware of the hazards of winch line breakage. Ensure that everyone remains clear of the recoil area in the event of load or cable breakage.
- Pull loads in a manner that avoids angles which could result in tipping or other unintended movement of the chipper and towing vehicle.

DANGER

Most winch lines contain a metal hook at the end. If the metal hook enters the infeed hopper, it could be ejected out of the discharge chute at a high rate of speed causing serious injury or death.

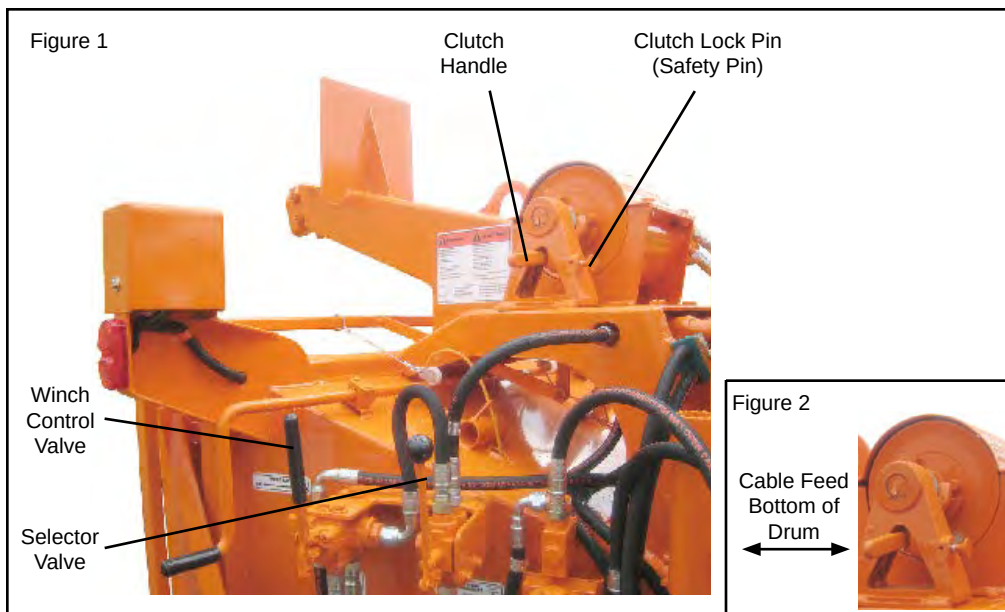
DANGER

Make sure there is outbound tension on the winch line whenever the winch line is being powered out. Using the hydraulic control to power out the winch line rather than free spool the line out could result in the line becoming tangled around the spool and wind inward when the hydraulic lever is in the unwind position. If a worker is holding the winch line when this happens a potential nip point is created between the cable housing and hook and also the the winch line and material.

NOTICE

Before operating machine, you must have all potential operators; read and understand manuals and decals, watch the video and follow the recommendations.

WINCH OPERATING PROCEDURES



⚠ WARNING

HYDRAULIC WINCH OPERATION PER WINCH MANUFACTURER!

Install the cable to pull and feed from the bottom of the winch drum (see Figure 2). Remove excess bolt length on cable bolts after cable is secured to the spool.

⚠ DANGER

Never reach into the winch or winch roller area.

OPERATING PROCEDURE

1. Winch operation is a one person job. This means the person who hooks the winch to the wood material is the same person who engages the winch.
2. Place the feedwheel control bar in the off position. Make sure the chipper and towing vehicle are blocked or anchored in a solid location.
3. Locate the selector valve and engage it to the winch position. The feed system should not operate with the selector valve in this mode.
4. Make sure the winch clutch is disengaged and pull the cable to the material to be reeled in. Attach cable securely to the wood material that you want pulled to the chipper.
5. Make sure everyone is clear and then retract the clutch lock pin and then pull the clutch handle up to engage the winch clutch (see Figure 1). Make sure the handle is locked in position.
6. Use the winch control valve or the radio remote control (if applicable) to now pull the wood material towards the machine.
7. Once the wood material is pulled to the machine, unhook it from the winch and make sure the cable is completely reeled back in and out of the way. Attach the cable to the keeper loop. Make sure the cable is clear of the feedwheel(s) or severe damage can occur if the cable should enter the chipper.
8. Reengage the selector valve to the feed position.
9. Engage the feedwheel(s) and begin feeding wood material.

CHIPPER HOOD ENGINE DISABLE PLUG OPERATION

This chipper hood engine disable plug is installed for safety purposes. It is designed to shut down the engine if the hood pin is not properly in place holding the chipper hood in the closed position. The system must be correctly maintained and operative at all times. If the plug connector is not correctly installed the engine will not start or run.

The chipper hood engine disable plug is located on top of the chipper hood (see figure 1). The chipper engine disable plug is made up of two parts: an electric socket and a plug connector (see figure 2). The electric socket is bolted to the chipper engine disable plug mount bracket (see figure 3) and the plug connector is attached by a cable to the hood pin (see figure 4).

If the chipper engine disable plug is not properly installed then the engine will not start or run. If the chipper engine disable plug becomes disconnected while the chipper engine is running the engine will be shut down or be disabled from running. This is for safety purposes, to ensure that the hood pin is not removed and the chipper hood is not opened while the engine is running.

The chipper engine disable plug is wired to shut down the chipper engine. When the plug connector is pulled out of the electric socket the electric circuit is broken, disabling the engine.

NOTICE

The engine disable plug has a circuit fuse. If the engine will not start or run, check the fuse first before consulting the engine manufacturer's manual. Circuit fuse locations: CAT / Perkins- located at the "BATT" wire near the ignition switch, Cummins- located by engine manufacturer near the starter (wires labeled "POW"), John Deere- located by engine manufacturer "Short Stop" circuit breaker by the ignition switch on the instrument panel or fuse by the ECM, and Deutz, Hatz, Honda, Kohler, and Robin- located at the battery post on the starter.

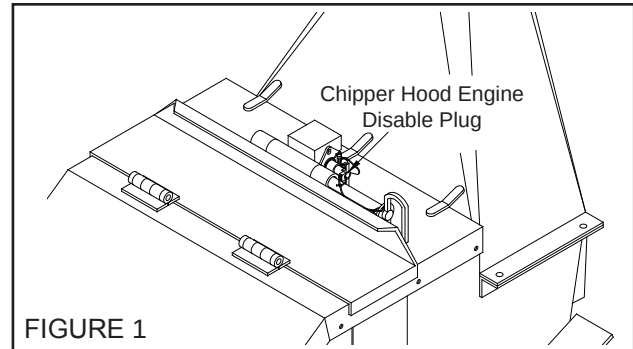


FIGURE 1

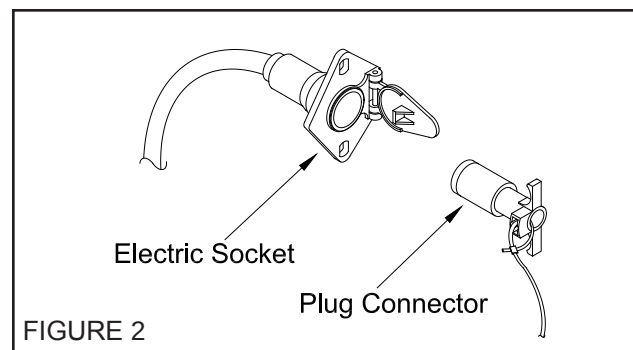


FIGURE 2

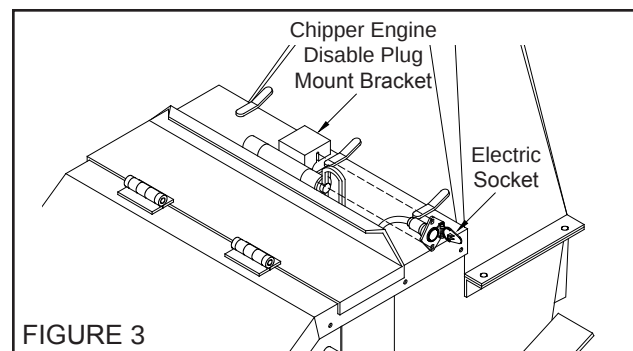


FIGURE 3

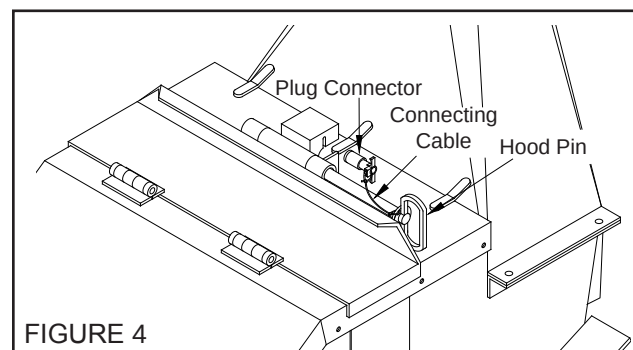
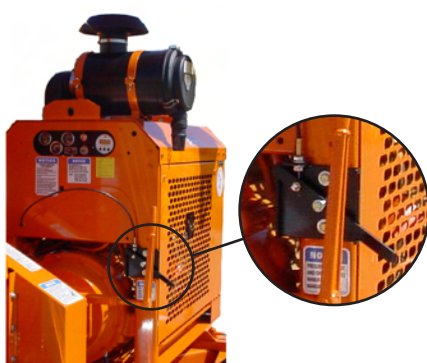


FIGURE 4

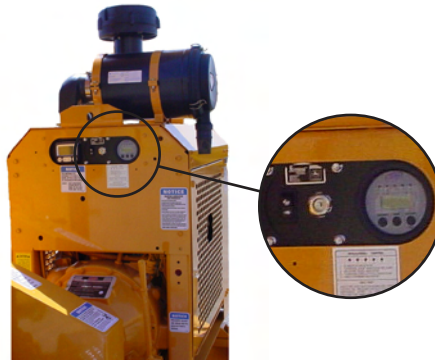
CONSULT THE ENGINE MANUFACTURER'S MANUAL FOR SPECIFIC CONTROLS, OPERATION, & MAINTENANCE FOR TYPICAL ENGINES

- 1) **Ignition Switch:**
Turn the ignition switch key clockwise one stop (on position) to turn the electrical system on. The key should remain in the on position while the engine is running. Turn the key fully clockwise (start position) this will start the engine. To shut off the engine, return the key to the off position.
- 2) **On/Off Switch - Push Button Start:**
Some gasoline engines may have a Toggle Switch or an On/Off Switch combined with a push button to start the engine. First turn the On/Off Switch or Toggle Switch to the on position, then depress and hold the Push Button Start until the engine starts, then release the button. To shut off the engine, return the On/Off Switch or Toggle Switch to the off position.
- 3) **Ignition Switch With Preheat:**
The typical diesel engine may have a preheat system to assist in starting the engine during cold weather. To activate the preheat system, continue to hold the ignition key in the preheat position for 15 to 20 seconds, then attempt to start the engine. If the engine fails to start within 15 seconds, return the key to the preheat position, hold 10 seconds, and try starting again.
- 4) **Choke Adjustment (if equipped):**
Some gasoline engines may have a choke adjustment, pull the choke lever out to choke the engine. Push the choke lever in for normal engine operations.
- 5) **Throttle Adjustment (if equipped):**
Some engines may have a knob or a handle for the throttle adjustment. Typically you would pull the knob out, or turn the handle to increase the engine R.P.M.'s. To decrease you would push in the knob or turn the handle the opposite way.
- 6) **"Bandit" Lever Lock Cable Throttle System (if equipped):**
The Bandit throttle system has (2) positions, HIGH and LOW. Engine R.P.M. is controlled by moving the lever from one position to the other.
- 8) **Push Button Or Electric Throttle System (if equipped):**
Some engines may have a push button or electric throttle adjustment. Engine R.P.M. is controlled by pushing a button or switch to raise or lower the R.P.M.
- 9) **Alternator Warning Light:**
This light will glow when the alternator is not charging, or when the ignition switch is turned on and the engine is not running.
- 10) **Oil Pressure Warning Light:**
This light will glow when the oil pressure is to low, or when the ignition switch is turned on and the engine is not running.
- 11) **Engine Temperature Warning Light:**
This light will glow when the engine, or engine coolant, is above normal operating temperature. If this occurs allow the engine temperature to cool down. If the engine is overheating because of a loss of coolant, or a broken fan belt, shut the engine off immediately.

TYPICAL DIESEL ENGINES



BANDIT THROTTLE SYSTEM

PUSH BUTTON OR ELECTRIC
THROTTLE SYSTEMTYPICAL GASOLINE
ENGINE**Bandit**

Transportation Procedures

WARNING

BEFORE TRANSPORTING THE MACHINE THE FOLLOWING MUST BE COMPLETED.

- 1) Idle engine, disengage clutch, and install clutch lock if equipped.
- 2) Make sure the feedwheel is in the lowered position.
- 3) Place all hydraulic controls in the "off" position.
- 4) Turn off engine, wait for the chipper disc/drum to come to a complete stop and you must have the ignition key in your possession.
- 5) Remove all excess debris. Remove any wood or debris which may have collected.
- 6) Return wooden push paddle to the mount and secure for transportation. Store all tools in the tool box and make sure all boxes and cabinets are closed and secured.
- 7) If equipped, close the folding infeed pan for the infeed hopper and make sure the spring latches are locked into place.
- 8) Raise the front of the machine or transport trailer with the tongue jack and remove the stabilization blocks used. If the machine is equipped with a hydraulic tongue jack, remove the lock pin before raising the front of the machine.
- 9) Couple machine or transport trailer to transport vehicle by lowering the machine onto the hitch. Make sure the hitch matches the coupling size. Then secure hitch and lock it.
- 10) Place the tongue jack in the transport position. If the machine is equipped with a hydraulic tongue jack, lift the foot pad to the transport position and install the lock pin.
- 11) Attach the safety chains by crossing them under hitch, make sure to allow the proper amount of slack in chains to avoid binding or dragging the ground when making turns.
- 12) Connect the brake breakaway cable (if equipped) and plug in the electrical connection for the lights on the machine or transport trailer.
- 13) Check running lights, turn signals, and brake lights. All must be operating properly before transporting the machine. Also check brakes (if equipped) to make sure they are operating correctly.
- 14) Do not transport unless discharge is clamped, pinned and bolted securely into place in the transport position pointed over the tongue.
- 15) Check tires for correct pressure, cuts or damaged rims.
- 16) Check lug nuts and retorque if necessary. Check new units before operation, check again after 20-25 miles (32-40 km) and regularly check at least weekly.
- 17) Inspect and replace any axle dust caps that are damaged or leaking.
- 18) Check wheel bearings and grease or oil axles per axle manufacturer's manual.
- 19) Walk around the machine to confirm that everything is secure and that there is not anything loose that could fall off during transport. Look under machine to ensure nothing is dragging. Look down both sides of the machine for anything sticking out that may become damaged during transport.
- 20) If machine is equipped with a vise, make sure to secure in place and clamp jaws closed.
- 21) Close and secure any of the following, if equipped: engine cowl doors and side panels, radiator debris screens, inspection doors, housing covers, tanks caps and covers, etc.
- 22) If the machine is self propelled and on a transport trailer, make sure the trailer has the correct load capacity, the machine is positioned on the trailer for correct weight distribution, and the machine is securely bound down to the trailer bed per your States binding requirements. Make sure the loading ramps are securely stored for transport. (See Loading & Unloading Self-Propelled Machines page.)
- 23) The machine is now ready for transport. Make sure to obey all local regulations and laws regarding the transporting of this type of machine.
- 24) Do not drive too fast for road conditions or exceed speed regulations for equipment towing. Machine must be hauled level and the towing vehicle must be sized to handle hitch weight, towing weight, and braking requirements.

Loader Transportation Procedures

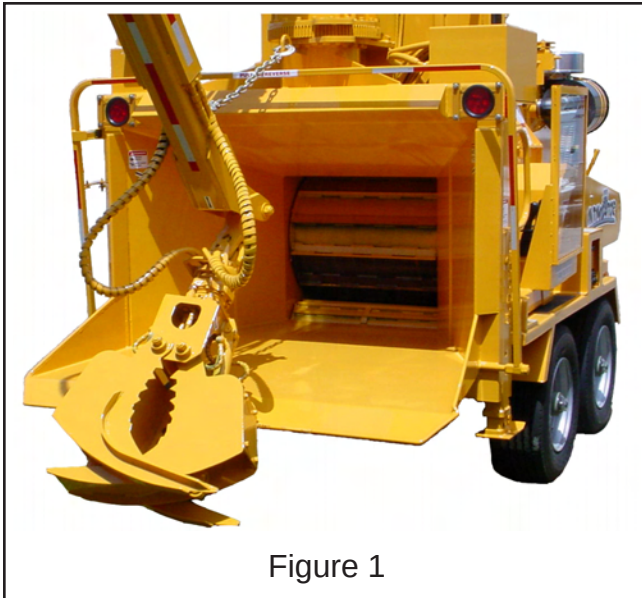


Figure 1

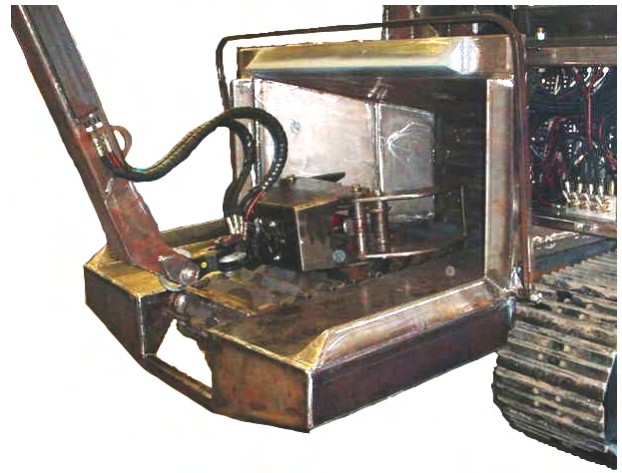


Figure 2

⚠ WARNING

IF EQUIPPED WITH LOADER OPTION, BEFORE TRANSPORTING THE MACHINE THE FOLLOWING MUST BE COMPLETED ALONG WITH THE MACHINE TRANSPORTATION PROCEDURES.

- 1) Idle engine, disengage clutch, and install clutch lock if equipped.
- 2) Close the jaws on the grapple.
- 3) Swing the loader to the center from side to side and install the loader swing lock pin.
- 4) Tuck grapple onto infeed hopper as shown in Figure 1 to help prevent damage to the hydraulic hoses and fittings. If the machine is equipped with a conveyor option, tuck grapple onto infeed hopper as shown in Figure 2. Make sure the fittings and hoses are not in a pinched or wear position for transportation.
- 5) Securely attach transport chain to the jib boom as shown in Figure 1.
- 6) Lower the main boom and jib boom until the transport chain is tight.
- 7) Place all hydraulic controls in the "off" position.
- 8) Turn off engine, wait for the chipper disc/drum to come to a complete stop and you must have the ignition key in your possession.
- 9) Place the joystick swing out in the transport position, if equipped.
- 10) Make sure running lights, turn signals, and brake lights are visible when loader is in the transport position.
- 11) Make sure all reflectors and/or lights are in proper place and in working order on the loader per Federal and your States' Department of Transportation Code of Regulations.
- 12) With the machine in the transport position, measure the overall height and width to make sure the machine is within the highway clearance regulations of the Department of Transportation.

Loading & Unloading Self-Propelled Machines

WARNING

BEFORE ATTEMPTING TO USE A TRAILER FOR TRANSPORT, MAKE SURE THE TRAILER TOWING VEHICLE IS APPROPRIATE FOR THE TASK.

- 1) The trailer has a cargo weight rating capacity for the weight of the machine. The combined weight of the trailer and the machine can not exceed the load capacity of the tires, axles, hitch coupler system or the GVWR (Gross Vehicle Weight Rating) of the trailer.
- 2) The trailer must have a lighting system and a braking system to match and perform correctly off the towing vehicle's system. You must meet the Federal and your States' Department of Transportation Code of Regulations concerning lights, brakes, and highway transit.
- 3) Make sure the towing vehicle has the hauling and hitch capacity ratings for the trailer and machine combination. The towing vehicle must be mechanically sound and capable of handling the towing job.
- 4) The trailer should be constructed with appropriate chain down positions for the specific sized machine. You must have binders that will withstand the strain of the machine trying to move while it is being transported.
- 5) When the machine is positioned on the trailer bed, there should be about 15% of the total trailer package weight on the tongue or hitch.
- 6) The loading ramps or loading gate of the trailer must be constructed to withstand the weight and forces involved in loading and unloading the machine.

WARNING

BEFORE LOADING OR UNLOADING THE MACHINE INSPECT AND CONFIRM THE FOLLOWING STEPS: When loading or unloading the self-propelled machine on the trailer, use care and caution. The maneuvering of the equipment must be slow, smooth, and intentional, not fast and jerky.

- 1) Make sure the trailer and towing vehicle are parked on a flat surface. They must be stable on the surface with the brakes locked and/or the wheels chocked to avoid unwanted movement.
- 2) Position the loading ramps or loading gate securely between the trailer and the ground level. Have them located so that they are in line with the tires or tracks of the machine when it moves.
- 3) Remove and store the chains and binders used for transporting.
- 4) Confirm that there are not any obstacles on the trailer bed, around the trailer that may cause restricted movement of the machine or the operator.
- 5) The only person in the area should be the one that is operating the machine controls, and he/she should be very experienced with the controls on this machine.
- 6) If you are on streets, roads or public areas, position the warning cones etc, per your company's safety policy.
- 7) Follow all pre-startup instructions for the machine.
- 8) Typically, the engine end of the machine should be positioned so that it is toward the tongue of the trailer, during transport.
- 9) Align the machine with the trailer bed, and the loading ramps. The only equipment movement should be slowly, straight on or straight off the trailer.
- 10) With the engine and the machine at as low a speed as possible, move the machine toward the ramp system. Make sure the alignment is correct throughout the travel.
- 11) Properly secure the equipment and the area to avoid any possible accidents or dangers.

MAINTENANCE SECTION

The Bandit is a very simple machine to maintain. If you will follow a regular scheduled preventative maintenance program you should have years of trouble free operation.

DANGER

Before attempting any type of maintenance disengage clutch, install clutch lock if equipped, turn off engine, wait for the disc/drum to come to a complete stop, install the disc/drum lock pin, disconnect battery, and make sure the ignition key is in your possession.

DANGER

Do not let anyone operate or maintain this machine until they have thoroughly read this manual, reviewed the equipment decals, watched the equipment video, and has been properly trained. You can purchase additional Bandit manuals, decals and videos for a nominal fee.

NOTICE

Consult your engine manual for proper break-in procedures. Various engines require somewhat different procedures, but basically the engines need to operate at lower R.P.M.'s and loads for a specific time.

NOTICE

Failure to properly break-in your engine may result in poor bearing and piston ring surfaces.

NOTICE

The Bandit has only been run for a short time to test proper hydraulic pressures, possible leaks, etc. The fuel tank will be empty. Fuel is provided through a small auxiliary tank for testing. This immensely helps maintain safety in our manufacturing facility and while shipping.

NOTICE

Expensive damage to the Bandit will occur if proper preparation is not taken before welding on the machine. Be sure to disconnect both battery cables and the engine ECM (engine control module) before welding. Follow the specific Engine MFG. instructions for proper welding and grounding procedures, before attempting to weld on the machine. If welding on the machine, do not ground the welder through the machine bearings, ground near work to be performed.

DAILY START UP & MAINTENANCE

1) Check the safety decals and engine gauges:
Replace any missing or damaged decals and/or engine gauges.

2) Check all safety equipment:
Check for proper operation. Repair or replace as needed.

3) Check entire machine for loose bolts, nuts, parts, or components:
Check entire machine for any loose parts or components. Check for loose nuts or bolts. Torque, tighten, or replace any of the loose components. See page 42 for specific bolt torques.

4) Check all guards:
Check to make sure all guards are in place and installed correctly. Make sure they are secure.

5) Check chipper hood hinge:
Make sure the hood hinge operates correctly, and is lubricated. Must replace hinge if damaged.

6) Checking for foreign objects:
Before opening the hood make sure the clutch is disengaged, clutch lock installed if equipped, the engine off, the disc/drum lock pin is installed, battery is disconnected, and also make sure the ignition key is in your possession. Remove the hood pin padlock, disconnect the chipper hood engine disable plug, suppress the spring lock for hood pin on disc chippers, and then remove the hood lock pin. Look for any foreign objects inside the chipper housing. Remove any foreign objects found.

Bandit

DAILY START UP & MAINTENANCE (cont.)

7) Check chipper drum assembly:

Check for the condition of knife bolt threads, secure welds, torqued bolts, excessive wear and impact cracks. If a problem is found contact the chipper manufacturer or an authorized Bandit dealer. Also check the chipper housing at this time. Check the chipper base, belly band, and hoods for wear or damage. Also inspect the chipper bearings.

8) Check chipper disc/drum to turn:

Very carefully, manually with a pry bar or wood bar, turn the chipper disc/drum a full revolution. This is to ensure the anvil and knives have proper clearance. If the chipper disc/drum is jammed with debris or frozen in place, DO NOT attempt to start the engine and engage clutch until the chipper disc/drum rotates freely.

9) Check the condition of your fan blades, knives, anvil, and attaching hardware:

Grind, file, or replace your knives to keep them sharp. Check the fan blades, anvil, and attaching hardware for the knives and anvil. Replace if necessary.

10) Properly torque the knife mounting hardware:

All knife mounting hardware must be factory approved. Knife mounting hardware must be replaced after maximum of 4-5 knife rotations/changes to insure safe clamping ability.

Torque set, AT ALL TIMES to:

See TORQUE CHART on page 42.

11) Hood lock pin and padlock:

After closing chipper hood, reinsert the hood pin and padlock, make sure pin is tight and secure. If worn replace immediately. Don't use a worn or makeshift hood pin. Make sure the spring lock for the hood pin is in the correct position on disc chippers. Make sure the chipper hood engine disable plug is installed correctly and that it is also operating properly.

12) Grease all feedwheel and chipper bearings daily:

Use an EP-2 Lithium type grease only for all bearings. Purge chipper bearings with grease. You can not over grease these bearings. Grease feedwheel bearings with one shot of grease. Both types of bearings are designed with a relief system that will not allow over greasing. In other words, you can not hurt the bearing seals by pumping in too much grease. Most of the failures related to bearings are diagnosed as "Contamination". Contamination is caused by improper lubrication. Wipe off excess grease. **Excessive grease will attract dirt.**

13) Grease loader (if equipped):

Grease all loader and grapple pins and bushings with 1 to 2 shots of an EP-2 Lithium type grease. Wipe off excess grease. **Excessive grease will attract dirt.** NOTE: May accept grease easier after the loader has been operated.

14) Check chain drive tension:

Check tension on all chain drives and tighten as necessary.

15) Check / adjust the chipper drive belt tension:

The belts will need to be tightened several times in the first few days of operation. A loose belt will slip and then glaze over. Once they slip you must replace them. Check hydraulic pump drive belts also if equipped. See pages 46-47 for procedures.

16) Check the hydraulic pump and motor shafts:

Check the hydraulic pump and hydraulic motor shafts for fit and tightness.

17) Check hydraulic oil level:

The hydraulic oil reservoir tank level should always remain at 7/8 full. Remember to check DAILY to avoid excessive heat build up.

18) Check for any fluid leaks:

Inspect for any oil, fuel, hydraulic oil, or engine coolant leaks. Check all hoses, fittings, lines, and tanks. DO NOT use fingers or skin to check for hydraulic leaks. Repair or replace any damaged or leaking components.

19) Check hydraulic control valves:

Inspect all hydraulic control valves and insure they operate smoothly and shift correctly.

20) Check the fuel level:

Check the fuel level, running out and repriming is time consuming. Do not over fill, and you must leave fuel expansion space in the top of the tank.

21) Check engine oil and coolant level:

Follow the engine manufacturer manual recommendations for fluid levels. You MUST follow specific ENGINE MFG. manual recommendations for radiator coolant, additives, lubrication, correct engine speed, ETC.

DAILY START UP & MAINTENANCE (cont.)

22) Check radiator, debris screen:

Thoroughly clean radiator fins at least once a day and twice in excessive conditions. Make sure debris is not packed between fins. Use pressurized water spray to clean. Do not rely on air pressure. The radiator will only appear to be clean. A partially plugged radiator will not allow the engine to cool properly. Clean cooling fan, shroud on air cooled engines, and the debris screen (if so equipped). Improper service, maintenance, or neglect will cause overheating problems and engine failure.

23) Check oil cooler (if equipped):

Thoroughly clean cooler fins at least once a day and twice in excessive conditions. Make sure debris is not packed between fins. Use pressurized water spray to clean. Do not rely on air pressure. The oil cooler will only appear to be clean.

24) Check air cleaner or precleaner:

Clean or replace element following engine manual recommendations.

25) Check clutch:

Check for proper lubrication, and engagement tension adjustment, frequently adjust and lubricate per PTO clutch manufacturers manual. Bandit Industries, Inc. does not warranty clutch failures.

26) Check tires (if equipped):

Check tires for wear, weather checking and damage. Replace if damaged.

27) Inspect axle dust caps (if equipped):

Inspect axle dust caps and replace if damaged or leaking.

28) Inspect, adjust, and lubricate tracks (if equipped):

Inspect, adjust, and lubricate tracks as needed per track MFG. manual.

29) Check the infeed hopper:

Check in the infeed hopper for any foreign objects and around the entire machine for tools, cans, saws, etc. All tools not in use should be stored in a tool box.

30) Block the tires and tongue (if applicable):

Before operation block the tires and tongue for stability. Do not rely on tongue jack for operational stabilization.

31) Check the discharge direction:

Remove transport bolt and nut, then make sure the discharge is pointed in a safe direction and locked into place.

32) Remove transport chain on loader (if equipped):

Remove the transport chain on the loader and store in a tool box.

33) Review all safety procedures on decals, from manual, and from video.**34) Make sure all safety equipment is being worn:**

Hard hat, gloves, eye protection, ear protection, etc.

35) Remember to check EVERYTHING on the checklist.

WEEKLY MAINTENANCE

1) Check anvil clearance, tightness, and wear:

Measure the anvil clearance. The clearance should be .120" (3 mm) from highest knife. Check the anvil hardware, make sure the bolts are at the proper tightness. The anvil is a normal wear item, if it is worn you can rotate it to a new working edge. Refer to page 45 for the exact checking of anvil clearance procedure.

2) Check alternator and fan belts on engine:

As applicable adjust and maintain per the engine manufacturer's manual.

3) Check wheel lug nuts (if equipped):

Keep lug nuts tight, retorque, replace if needed.

4) Check and retighten tank mount bolts:

Check and retighten the fuel tank and hydraulic tank mount bolts.

5) Lubricate all pivoting and hinged areas:

Lubricate all pivoting and hinged areas on the machine (i.e. control handle, discharge flipper, etc.)

6) Lube chain driven components:

Use a dry lube on any chain driven components: hydraulic swivel discharge, chain driven feedwheels, etc.

7) Check and oil feedwheel slide box:

Check that feedwheel slide box is working smoothly, oil with 10W/30 type motor oil. Especially new machines need oiling to ensure correct operation during break-in.

8) Check fluid level in pump bearing block(s) (if equipped):

Keep the fluid level in the pump bearing block(s) full, use an 80W/90 type gear lube.

Bandit

MONTHLY MAINTENANCE

1) Check towing hitch:

Check for excessive damage or wear. Replace if needed. Keep pintle ring greased to reduce wear.

2) Check discharge and infeed hopper wear:

Check for wear on discharge, infeed hopper, and discharge direction adjustor; build up, repair or replace as needed.

3) Inspect feedwheel motor connections:

Check and maintain correct torque, on feedwheel motor connections. See page 48.

4) Check feedwheel teeth for sharpness:

Replace if needed.

5) Check chipper bearings and chipper sheave:

Check, retighten all bearing bolts, bearing lock collars, and also belt sheave bushings to correct torques.

6) Tire air pressure (if equipped):

Fill each tire to rated capacity on tire.

7) Check hydraulic pressures on the feedwheel system:

Check, reset and maintain all hydraulic feedwheel pressure settings to a maximum of the specified P.S.I. (bar). This will give you the best performance from the hydraulic feed system.

8) Check wheel bearings (if equipped):

Check and grease or oil wheel bearings per axle manufacturer's instructions.

9) Check and adjust brakes (if equipped):

Check and adjust brakes as needed per axle MFG. manual.

10) Lubricate "Bandit" lever throttle cable (if equipped):

If the machine is equipped with a "Bandit" lever throttle system, lubricate inner throttle cable and cable ends with a cable lube or SAE 10W/30 oil. Replace throttle cable if it doesn't operate smoothly.

3 MONTH MAINTENANCE

1) Hydraulic oil filter(s):

Must be replaced after FIRST 10 HOURS OF OPERATION, USE A 10 MICRON FILTER, then quarterly or every 400 hours afterwards.

3) High pressure oil filter(s) (if equipped):

Must be replaced after FIRST 10 HOURS OF OPERATION, then quarterly or every 400 hours afterwards.

2) Grease discharge swivel plates:

Grease swivel plates for discharge as needed.

6 MONTH MAINTENANCE

1) Pump bearing block(s) (if equipped):

Pack the female splines of the bearing block(s) every 6 months or every 100 hours with an EP-2 Lithium type grease. See page 49.

2) Planetary speed reducer (if equipped):

Change gear lube after first 50 hours and 100 hours, then every 6 months or every 100 hours afterwards. Requires 40 oz. (1.2 L) of 80W/90 gear lube, keep full.

YEARLY MAINTENANCE

1) Hydraulic oil:

Change hydraulic oil and flush the hydraulic reservoir tank.

2) Hydraulic suction screen(s):

Change hydraulic suction screen(s) yearly or every 2000 hours.

MAINTENANCE SECTION

BOLT TORQUE CHART

(THESE TORQUES ARE BASED ON DRY, CLEAN THREADS)

DESCRIPTION	BOLT SIZE	TORQUE (FT.-LBS.)	TORQUE (Nm)
Chipper Bearing Bolts	3/4" - 10 NC	220	298
Drum Head Shaft Bushing "4040"	5/8" - 11 NC	142	193
Drum Head Shaft Bushing "5050"	7/8" - 9 NC	258	350
Anvil	1/2" - 13 NC	75	102
Knife Bolts	5/8" - 11 NC	180	245
Feedwheel Bearing Bolts	5/8" - 11 NC	80	108
Feedwheel Bearing Set Screws	3/8" - 24 NF	20	27
Grip-Tight Feedwheel Bearing Set Screws		2	3
Engine Hold Downs	5/8" - 11 NC	125	169
"DT" Hydraulic Feedwheel Motor Shaft Nut	1 1/8" - 20 NEF	340	461
Engine Sheave Bushing "E"	1/2" - 13 NC	60	81
Engine / Chipper Sheave Bushing "F"	9/16" - 12 NC	75	102
Chipper Sheave Bushing "J"	5/8" - 11 NC	135	183
Feedwheel Motor Sprocket Bushing "Q2"	3/8" - 16 NC	30	41
Feedwheel Motor Sprocket Bushing "R1"	3/8" - 16 NC	30	41
Quad Feedwheel Sprocket Bushing "Q1"	3/8" - 16 NC	30	41
Autofeed Cartridge Nut		4 - 6	5 - 8
Autofeed Plus Solenoid Retainer Nut		4 - 6	5 - 8
Hitch Mount Bolts	5/8" - 11 NC	220	298

Before tightening bolts be sure you have the correct size bolt for the correct amount of torque.
Use only factory approved knives and hardware.

BASIC WHEEL TORQUE REQUIREMENTS (per mfg.)

KEEP LUG NUTS PROPERLY TIGHTENED, CHECK NEW UNIT BEFORE OPERATION, CHECK AGAIN AFTER 20-25 MILES (32-40 km) AND REGULARLY CHECK AT LEAST WEEKLY.

5 & 6 Lug Hubs (1/2" - 20 Studs)	90 - 120 ft.-lbs. Torque	(122 - 163 Nm)
8 Lug Hubs (1/2" - 20 Studs)	90 - 120 ft.-lbs. Torque	(122 - 163 Nm)
8 Lug Hubs (9/16" - 18 Studs)	110 - 120 ft.-lbs. Torque	(149 - 163 Nm)
8 Lug Hubs (5/8" - 18 Studs)	190 - 210 ft.-lbs. Torque	(258 - 285 Nm) (Cone Nut)
8 Lug Hubs (5/8" - 18 Studs)	275 - 325 ft.-lbs. Torque	(373 - 441 Nm) (Flange Nut)
10 Lug Hubs (3/4" - 16 Studs)	450 - 500 ft.-lbs. Torque	(610 - 678 Nm)

(Consult axle manufacturers manual shipped with each machine for specific axle-stud-wheel combination lug nut torques.)

WARNING



**WEAR EYE & PERSONAL
PROTECTION EQUIPMENT**

Wear all personal protection equipment and follow all safety standards per ANSI and OSHA instructions.

Bandit

DAILY START UP & MAINTENANCE CHECK LIST

Each day before starting your machine these checks must be made:

	O.K.	Repaired
1) Check the safety decals and engine gauges, replace if damaged.	☐	☐
2) Check, maintain, and service all safety equipment for proper operation: engine disable plug, control bar, hood pin, spring lock for hood pin (disc chippers only), pusher tool, etc.	☐	☐
3) Check entire machine for loose nuts, bolts, and components.	☐	☐
4) Check all guards to make sure they are tight and securely in place.	☐	☐
5) Make sure hood hinge operates correctly, is not damaged, and is lubricated.	☐	☐
6) Open chipper hood and check for any foreign objects.	☐	☐
7) Check the condition of chipper disc/drum assembly.	☐	☐
8) Carefully rotate the chipper disc/drum with a pry bar or wood bar to insure proper anvil clearance. If chipper disc/drum is jammed with debris or frozen in place, do not attempt to start engine and engage clutch until chipper disc/drum rotates freely.	☐	☐
9) Check the condition of your fan blades, knives, anvil, and attaching hardware.	☐	☐
10) Properly torque knife mounting hardware.	☐	☐
11) After closing chipper hood, reinsert the hood pin and padlock, make sure the hood pin is tight and secure. Make sure the hood lock pin is firmly in place, the spring lock for hood pin springs back into position on disc chippers, and the chipper hood engine disable plug is installed correctly.	☐	☐
12) Grease chipper bearings (purge) and feedwheel bearings (1 shot) daily.	☐	☐
13) Grease loader and grapple pins and bushings (1 - 2 shots) (if equipped).	☐	☐
14) Check and/or adjust all chain tensions.	☐	☐
15) Check and/or adjust belt tension on chipper and hydraulic pump belt drives.	☐	☐
16) Check hydraulic pump and motor shafts for fit and tightness.	☐	☐
17) Check and always maintain hydraulic level at 7/8 full.	☐	☐
18) Check all hoses, fittings, lines, and tanks for damage and fluid leaks.	☐	☐
19) Check hydraulic control valves and insure they operate and shift correctly.	☐	☐
20) Check fuel level. (Running out and repriming is time consuming).	☐	☐
21) Check engine oil, coolant levels, and correct engine speed. Follow ENGINE MANUFACTURER'S manual specs.	☐	☐
22) Check radiator and debris screen. Clean as necessary. Clean cooling fan and shroud on air cooled engines.	☐	☐
23) Check oil cooler (if equipped). Clean as necessary.	☐	☐
24) Check air cleaner and precleaner. Clean as necessary.	☐	☐
25) Check clutch for proper engagement tension and lubrication, frequently adjust and grease per PTO manufacturer's manual recommendations.	☐	☐
26) Check condition of the tires (if equipped).	☐	☐
27) Inspect and replace any axle dust caps that are damaged or leaking (if equipped).	☐	☐
28) Inspect, adjust, and lubricate tracks per manufacturer's manual recommendations (if equipped).	☐	☐
29) Check infeed hopper and around the entire machine for any foreign objects, tools, cans, saws, etc.	☐	☐
30) Block tires and tongue for stability before operation (if equipped). Do not rely on tongue jack.	☐	☐
31) Remove transport bolt and nut, then make sure discharge is pointed in safe direction and locked into place.	☐	☐
32) Remove transport chain on loader and store in tool box (if equipped).	☐	☐
33) Review all safety procedures on decals, from manual, and from video.	☐	☐
34) Wear all applicable safety equipment: hard hat, gloves, eye protection, ear protection, etc.	☐	☐
35) Remember to check EVERYTHING on the checklist.	☐	☐

Bandit

WEEKLY CHECK LIST

	O.K.	Repaired
1) Check anvil clearance, tightness, and wear.	☐	☐
2) Check alternator and fan belts on engine.	☐	☐
3) Check and retighten wheel lug nuts (if equipped).	☐	☐
4) Check and retighten fuel tank and hydraulic tank mount bolts.	☐	☐
5) Lubricate pivoting and hinged areas (i.e. control handle, discharge flipper, etc.)	☐	☐
6) Use a dry lube on any chain driven component.	☐	☐
7) Check feedwheel slide box is working smoothly and oil.	☐	☐
8) Keep pump bearing block(s) full of gear lube (if equipped).	☐	☐

MONTHLY CHECK LIST

	O.K.	Repaired
1) Check towing hitch for wear, keep pintle ring greased.	☐	☐
2) Check discharge, and infeed hopper for wear.	☐	☐
3) Inspect feedwheel motor connection.	☐	☐
4) Check feedwheel teeth for sharpness.	☐	☐
5) Check, retighten all bearing and chipper sheave bolts.	☐	☐
6) Check and fill tires to rated pressure (if equipped).	☐	☐
7) Check hydraulic pressure on the feedwheel system. Set to specified PSI (bar).	☐	☐
8) Check and grease wheel bearings, follow axle MFG. instructions.	☐	☐
9) Check and adjust brakes, follow axle MFG. instructions (if equipped).	☐	☐
10) Lubricate "Bandit" lever throttle cable (if equipped).	☐	☐

3 MONTH CHECK LIST

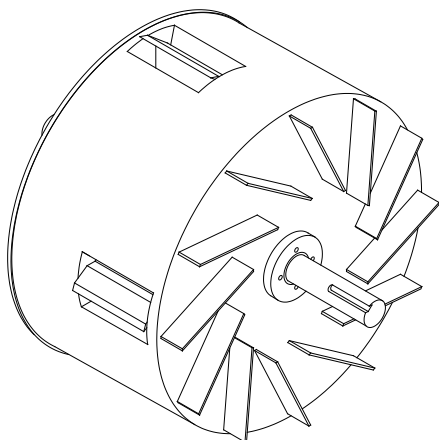
	O.K.	Repaired
1) Replace hydraulic filter(s) after first 10 hours then quarterly or every 400 hours.	☐	☐
2) Grease swivel plates for discharge as needed.	☐	☐
3) Replace high pressure oil filter(s) (if equipped) after first 10 hours then quarterly or every 400 hours.	☐	☐

6 MONTH CHECK LIST

	O.K.	Repaired
1) Pack the female splines of the bearing block(s) with grease.	☐	☐
2) Change gear lube in planetary speed reducer after first 50 hours and 100 hours, then every 6 months or every 1000 hours afterwards.	☐	☐

YEARLY CHECK LIST

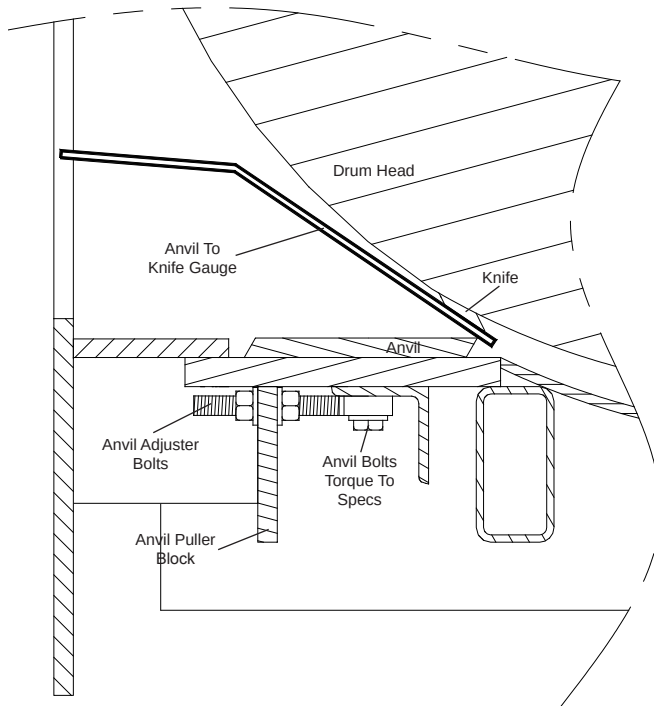
	O.K.	Repaired
1) Change hydraulic oil and flush the hydraulic tank.	☐	☐
2) Replace hydraulic suction screen(s) annually or every 2000 hours.	☐	☐

**WARNING****WHEN YOU CHANGE CHIPPER KNIVES**

CHECK CHIPPER DRUM ASSEMBLY FOR CONDITION OF KNIFE BOLT THREADS, SECURE WELDS, TORQUED BOLTS, EXCESSIVE WEAR AND IMPACT CRACKS. IF PROBLEM FOUND CONTACT CHIPPER MANUFACTURER, OR AUTHORIZED CHIPPER DEALER.

Bandit

ANVIL ADJUSTMENT

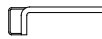


⚠ DANGER

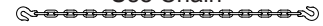
Before attempting any type of maintenance disengage clutch, install clutch lock if equipped, turn off engine, wait for the drum to come to a complete stop, install the drum lock pin, disconnect battery, and make sure the ignition key is in your possession.

Before working inside the infeed hopper or under the top feedwheel remove the easy climb springs from the top yoke, raise the yoke, install the yoke lock pin, safety chain the yoke in the raised position, and insert a wooden block to assist in holding the yoke in the raised position.

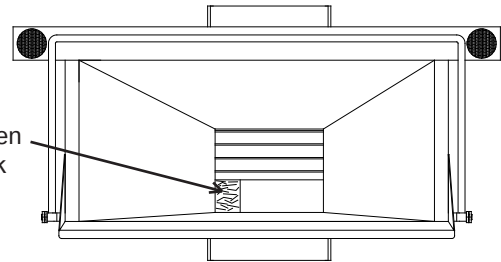
Use Yoke Lock Pin



Use Chain



Use Wooden Block



Check the Anvil to Knife Clearance

This clearance should be checked on a weekly basis or as knives are changed. To check the anvil clearance the above safety procedures must be taken. Once all safety procedures are completed the anvil to knife clearance can be checked. In order to check the clearance one person will need to climb into the infeed hopper. Use a feeler gauge or the anvil to knife gauge supplied by Bandit to check the clearance of the first knife to the anvil. Check the clearance at the left and right sides of the knife. Once that knife has been checked climb back out of the infeed hopper, remove the drum lock pin, and very carefully rotate the chipper drum so the other knives can be checked.

⚠ DANGER

Do Not under any circumstance attempt to rotate the chipper drum while someone is inside the infeed hopper. They may become seriously injured, Do Not Do This!

Once the drum has been rotated, reinstall the drum lock pin, and then check the clearance between the next knife. Once all knives have been checked adjust the anvil according to the closest knife. The anvil to knife clearance should be .120 inches (3 mm). Set the closet knife to this distance.

Anvil Adjustment Procedure

(Refer to above Figure)

To adjust the anvil first loosen two of the hex nuts on either the inside or outside of the anvil puller block. If the anvil needs to be adjusted closer to the drum, loosen the outside hex nuts. If the anvil needs to be adjusted away from the drum, loosen the inside hex nuts. Next loosen the anvil clamp bolts from underneath the machine. Once the components have been loosened, move the anvil to the correct clearance using the adjuster bolts and hex nuts. Once the knife is set to the correct clearance, .120 inches (3 mm), retighten all components. Make sure bolts are torqued to their specific bolt torques refer to bolt torques on page 42. Carefully rotate the chipper drum to make sure all the knives clear the anvil.

Bandit

BELT TENSION

GENERAL RULES FOR TENSIONING

1. Check tensioning during the first 2 through 48 hours of run-in operation especially.
2. Over tensioning or under tensioning shortens belt and bearing life.
3. Keep belts free from foreign materials that may cause the belt to slip.
4. Make V-drive belt inspection on a periodic basis. Never use belt dressing as this will damage the belt and cause early failure.
5. Belts should never be forced over the sheave. Allow enough room for the belts to slip on.
6. Always make sure sheaves are aligned properly.

TENSIONING PROCEDURES

Main Drive Belts

Follow all pre-maintenance shut down procedures. Locate the inspection slot in the beltshield at the center of the belt span between the sheaves. Push or pull on the belt until the belt has deflected 3/8" (9.5 mm) for the machines through 275 Hp and 7/8" (22 mm) for machines 300 Hp and up. Record the push or pull force. The force should be 22 to 24 lbs./belt (10 - 11 kg/belt) for machines through 275 Hp and 28 lbs./belt (13 kg/belt) for machines 300 Hp and up. Adjust the belt tension if the force falls outside of this range. If the belts are not properly adjusted belts will slip, glaze over, and be ruined. This is NOT covered by warranty.

- 1) Remove beltshield.
- 2) To adjust the belt tension, loosen the four engine mounting bolts and the jam nuts on the engine adjuster on the radiator end of the engine.
- 3) Adjust the belt tension with the engine adjuster on the clutch end of the engine. If you have to push the engine with the adjuster, the belts will tighten slightly after the engine is realigned.
- 4) Use the engine adjuster on the radiator end of the engine to realign the engine, so the engine sheave and chipper sheave are aligned. The sheaves can be checked with a string or straight edge.
- 5) Torque the two engine mounting bolts (see Torque Chart for the correct torque) on the opposite side of the engine from the engine adjusters.
- 6) Loosen the jam nuts on the engine adjuster on the radiator end of the engine.
- 7) Torque the engine mount bolt and then tighten the engine adjuster jam nuts on the radiator end.
- 8) Hand tighten the remaining engine mount bolt and loosen the engine adjuster jam nut on the clutch end half a rotation. Loosen the engine adjuster jam nuts all the way and torque the engine mount bolt.
- 9) Tighten the engine adjuster jam nuts on the clutch end.
- 10) Recheck the belt tension and alignment, if readjustment is needed go back to step 2.
- 11) Reinstall beltshield.

NOTE: lbs./belt (kg/belt) is per 1 belt. If equipped with the 4 groove poly band belt, lbs./belt must be multiplied by 4. If equipped with two 3 groove poly band belt, lbs./belt must be multiplied by 3 for each poly band belt.

NOTE: It is a good practice to rotate the belts during tensioning. Then recheck deflections. The belts may need to be tightened again.

Pump Drive Belts (if equipped)

- 1) Locate the center of the span between sheaves.
- 2) Push or pull down on the belt until the belt has deflected 1/8" (3.2 mm).
- 3) Record push or pull down force. The force should be 25 lbs (11.3 kg).
- 4) Adjust the belt tension if the force falls outside of this range.

Do not over tighten the hydraulic pump belt. For best results use a good belt tension tester. Most all pump failures result from too much side load on the pump shaft. Too much belt tension is very easy to detect inside a failed pump. Pumps with this condition will not be covered under warranty.

DO NOT IGNORE THIS MAINTENANCE RULE!

New belts stretch very soon and must be adjusted several times in the first few hours of operation. Adjust after one hour of operation, then every four hours until the belts quit stretching.

Failure to do this will cause the belts to burn and fly off. **THIS FAILURE IS NOT COVERED BY WARRANTY!**

Bandit

BELT TENSION

FIGURE 1

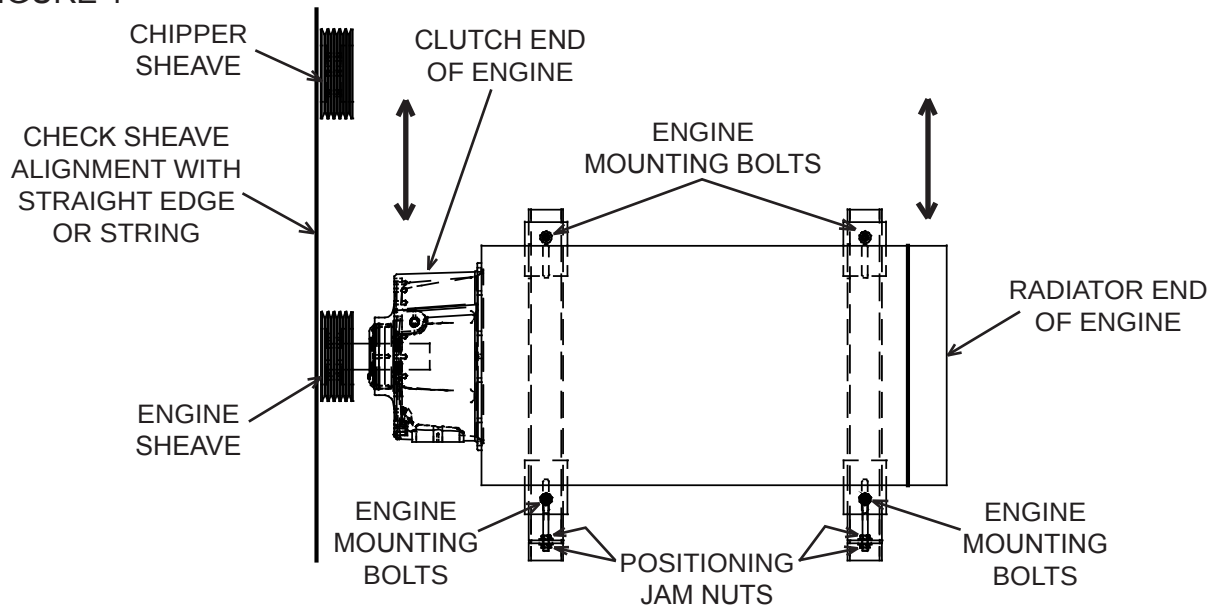
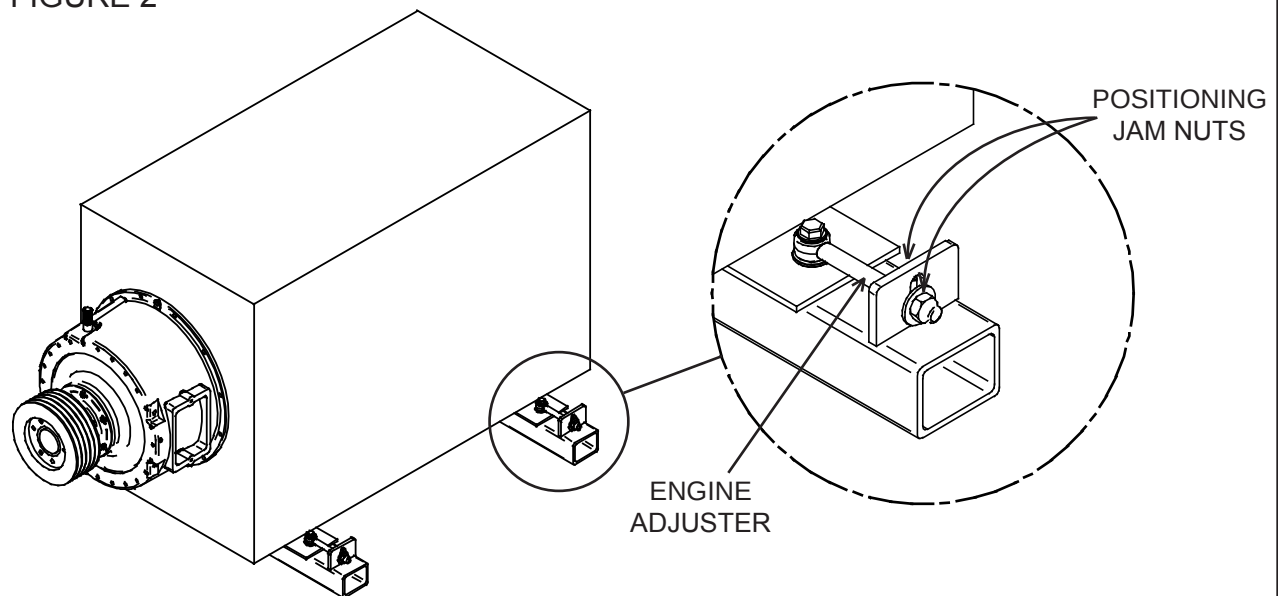
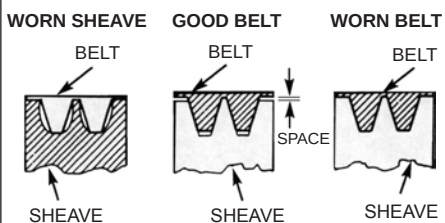


FIGURE 2

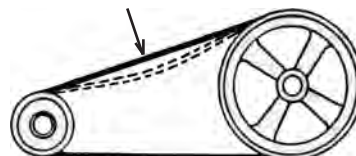


Worn or misaligned belts and sheaves in the power train causes belt slippage, thus power loss. Keep the power train working for you, not against you, by checking for needed adjustment or replacement.



Main Drive belts maximum of $\frac{3}{8}$ " deflection with 22 to 24 lbs. of force up through 275 Hp.
Main Drive belts maximum of $\frac{7}{8}$ " deflection with 28 lbs. of force for 300 Hp and up.

Pump Drive belts maximum of $\frac{1}{8}$ " deflection with 25 lbs. of force.



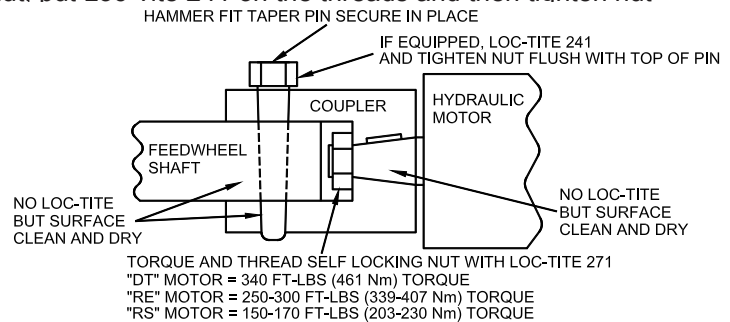
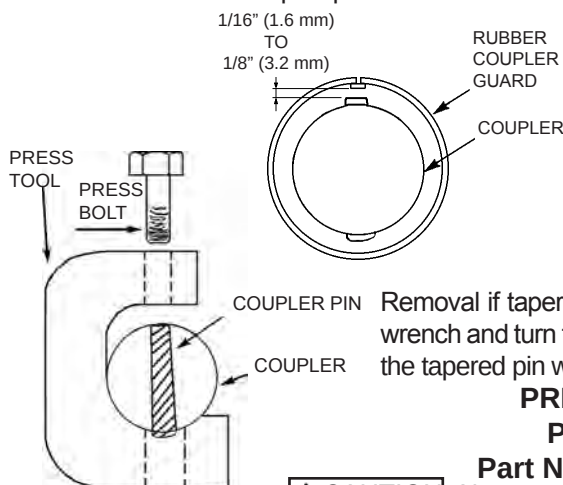
PROPER PROCEDURE FOR INSTALLATION AND REMOVAL OF J.B. COUPLERS AND TAPERED FEEDWHEEL MOTORS

A. Proper Equipment Needed:

1. Feedwheel motor with tapered shaft.
2. 5/16" x 9/32" x 1 1/4" long key (900-3937-23) for "DT" motor.
5/16" x 9/32" x 15/16" long key (900-3934-06) for "RE" motor.
3/16" x 3/16" x 3/4" long key (900-3937-03) for "RS" motor.
3. Correct feedwheel shaft, coupler and taper pin ass'y
4. Loc-Tite 271 (red).
5. Loc-Tite 241 (blue).
6. Emery cloth and/or a file.
7. A degreaser agent.
8. Self locking nut.
9. Hammer.
10. Torque wrench and
1 5/8" socket for "DT" motor.
1 3/8" socket for "RE" motor.
1 3/16" socket for "RS" motor.
11. 1 1/16" hand wrench for "RE" motor.
7/8" hand wrench for "RS" motor.

B. Installation Procedure

1. Remove any sharp edges on the coupler bores or the motor shaft.
Example: Emery cloth or file for burrs on keyways or shafts.
2. Clean the coupler bores and motor shaft with a degreasing solvent.
3. Install the correct key in the feedwheel motor shaft.
4. Slide the coupler onto the motor shaft, making sure that the two mate tightly.
Example: The coupler does not rock or slop on the shaft.
5. Install the self locking nut with Loc-Tite 271 on the threads.
6. Tighten to the correct torque, 340 ft.-lbs. (461 Nm) for "DT" motor, 250-300 ft.-lbs. (339-407 Nm) for "RE" motor, & 150-170 ft.-lbs. (203-230 Nm) for "RS" motor.
7. Slightly tap with a hammer on the coupler face to insure proper seating.
8. Retorque self locking nut.
9. Deburr and degrease the feedwheel shaft.
10. Install the motor and coupler assembly onto the feedwheel shaft.
11. Install the correct tapered pin through the coupler and feedwheel shaft.
12. If coupler pin is threaded and is equipped with a nut, make sure the nut is flush with top of pin.
13. Hammer the pin into the coupler to secure the coupler and feedwheel shaft. If the pin is threaded and has a nut do not hammer the pin directly, use a piece of wood as a buffer.
14. If the tapered pin is equipped with a nut, put Loc-Tite 241 on the threads and then tighten nut flush with top of pin.



Removal if tapered pin is equipped with a nut to assist in pin removal: Use a hand wrench and turn the tapered pin nut clockwise, half a turn and then hit the small end of the tapered pin with a hammer and punch. Repeat this process until pin is removed.

PRESS TOOL FOR COUPLER PIN REMOVAL

Part Number 981-0501-66 for "DT" Motor

Part Number 981-0501-61 for "RE" and "RS" Motor

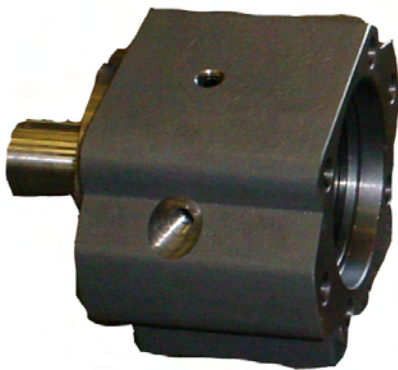


Always wear proper safety equipment and take caution with tapered pin when attempting to remove. The use of this tool will assist in the removal of the tapered pin in the feedwheel coupler. Lubricate end of bolt and threads with grease. Position the press tool so that it cradles the coupler, with the large end of the tapered pin at the side opposite the press bolt. You may want to remove yoke springs to get easier access to coupler. Set the tool as described and hand tighten press bolt to snug tool against coupler. Make sure press bolt is set on small end of tapered pin, and that pin will go through hole in tool without interference. Use of a 1/2" impact wrench is recommended. Run impact on bolt to start pin removal, then usually a good hit with hammer on the end of bolt will knock out the pin. You may have to run impact on bolt and hit with hammer a few times to remove pin. Do not spend excessive time trying to remove the pin and coupler. If problems occur during pin and coupler removal, contact your nearest dealer or Bandit Industries.

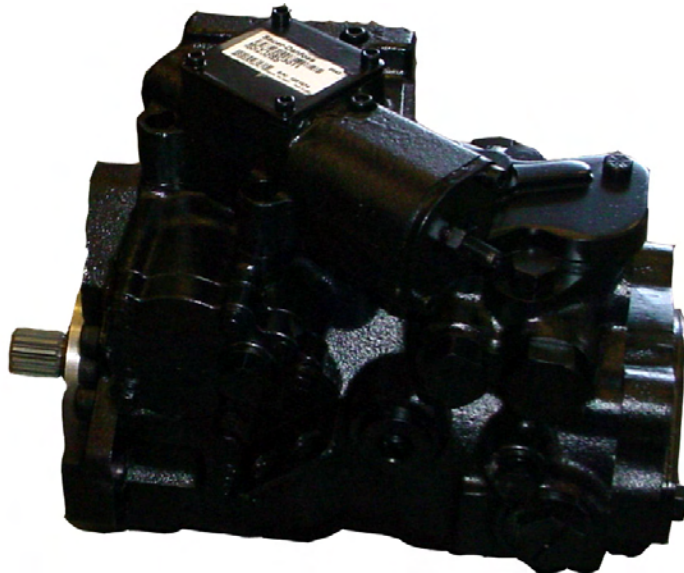
Bandit

SERVICING BEARING BLOCK

Your machine maybe equipped with bearing block(s) and hydraulic pump(s) that are belt driven. The female splines in the bearing block need to be packed with an EP-2 Lithium type grease every six months. To do this, unbolt the hydraulic pump from the bearing block and slide the hydraulic pump out of the bearing block. There is no need to loosen or remove the drive belts or hydraulic lines. Once the hydraulic pump is removed from the bearing block, inspect the internal splines of the bearing block and the external splines of the hydraulic pump. The tops of the splines should be flat. If the splines are pointed, they are wore and need to be replaced. If the splines are good, pack the internal splines of the bearing block with an EP-2 Lithium type grease, reinstall the hydraulic pump, and bolt the hydraulic pump to the bearing block.

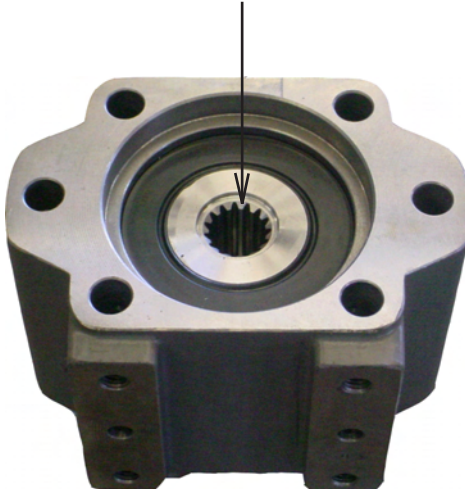


BEARING BLOCK

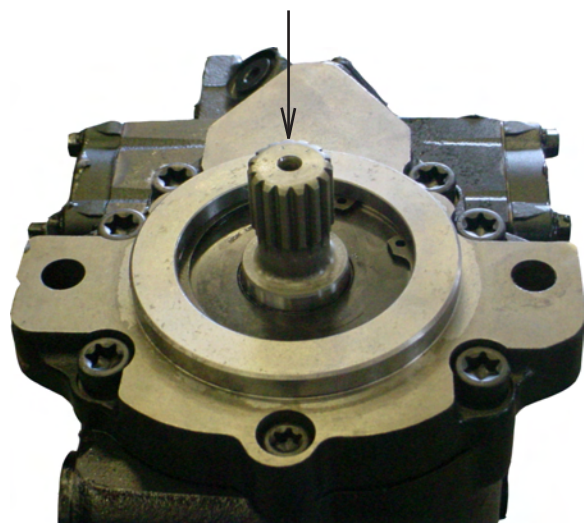


HYDRAULIC PUMP

INTERNAL SPLINES OF
THE BEARING BLOCK



EXTERNAL SPLINES OF
THE HYDRAULIC PUMP



SERVICING / CHANGING FEEDWHEEL BEARING (WITH THE GRIP TIGHT BEARING BEHIND FEEDWHEEL MOTOR)

Your Bandit Chipper maybe equipped with a tapered lock style (Grip Tight) feedwheel bearing on the hydraulic motor side of the feedwheel and a conventional (set screw) style on the opposite side. With the Grip Tight bearing this gives a very positive locking system to the feedwheel shaft. The set screws on both bearings should still be checked as part of normal maintenance.

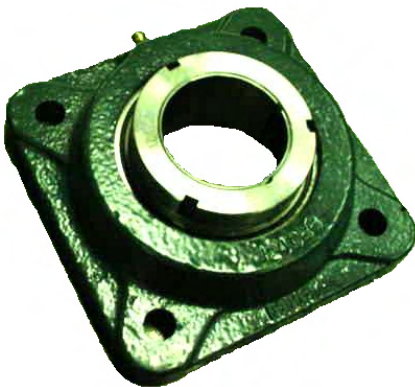
A few simple rules and installation instructions must be followed if the bearings ever need to be replaced or removed during service.

The machine is set up with one set screw bearing and one Grip Tight bearing because the one Grip Tight bearing is all that is needed to securely hold the feedwheel shaft (along with the set screws on the opposite bearing). This also makes for very easy assembly. **When installing the bearing it is very important to install and lock the Grip Tight bearing first with the set screw bearing done after.** This is to keep the bearings from being put into a side load which will lead to premature failure.

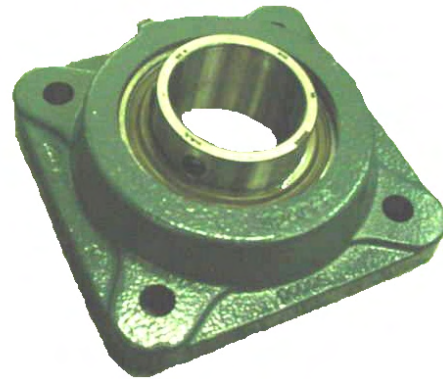
Installation procedure:

- 1) Clean the feedwheel shaft of all debris, use a degreaser.
- 2) Install both feedwheel bearings on the feedwheel shaft with the Grip Tight bearing on the hydraulic motor side and the set screw bearing on the opposite side. **Do not lock the bearings on the shaft at this time, allow the feedwheel to shift freely for installation.**
- 3) Position the feedwheel in the yoke mount and install all (8) feedwheel bearing bolts using Loc-Tite 271. These are completely tightened and torqued at this time (refer to bolt torque chart).
- 4) The feedwheel then needs to be centered in the yoke and then it must be off set 3/16" (4.8 mm) towards the set screw bearing side (away from the hydraulic motor). The weight of the feedwheel needs to be taken off the bearings also.
- 5) First the Grip Tight bearing lock nut must be tightened by hand as tight as possible (in a clock wise direction). This is the zero reference point. Scribe a line on the lock nut above the adapter slot.
- 6) Using a spanner wrench or drift pin and hammer, lock the bearing to the shaft by tightening the lock nut in a clock wise direction. Tighten 3/4 to 1 full turn (you may need to block the feedwheel from turning at this time). Now you can tighten the set screws on the Grip Tight bearing. Note: the set screw is only to be tightened to 25 in.-lbs. (2 ft.-lbs.) (2.7 Nm).
- 7) Now tighten the set screws on the set screw bearing at 20 ft.-lbs (27 Nm).

Grip Tight Bearing



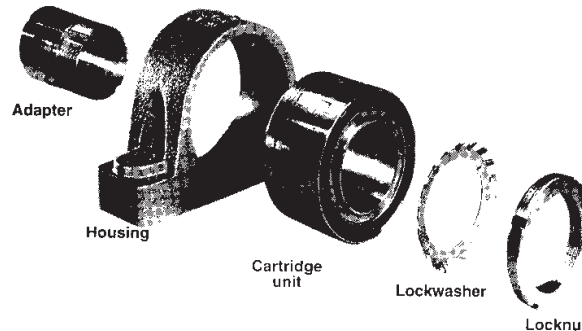
Set Screw Bearing



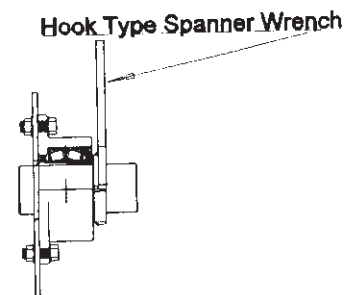
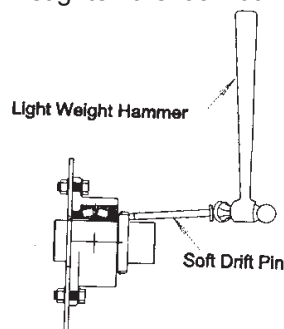
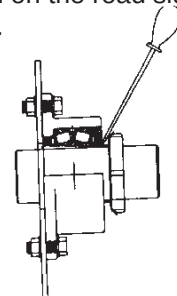
SERVICING / CHANGING CHIPPER BEARING (FOR LINK BELT PB22600 SERIES)

NOTE: Proper installation is critical to bearing life. Improper installation could cause premature or immediate failure. Particular care must be taken not to create a preload on the bearings while tightening the locknut. Use of a good quality torque wrench is also important to your safety as well as proper bearing installation.

1. Clean the shaft so that it is free from burrs and rust. Do not coat the chipper shaft or the bore of the bearing adapter with a preservative or lubricant.
2. Remove the bearing adapter and apply a light weight oil to the outer surface and threads. Reassemble the adapter in the bearing with about 1/4" (6.4 mm) if clearance between the bearing face and lockwasher. Repeat the process to the other bearing.



3. Center the chipper drum inside the base and bolt the bearing down on the road side of the machine and tighten the four bearing bolts to 220 ft. lbs. (298 Nm) of torque.
4. Keeping the drum centered, take a large flat blade screwdriver to wedge between the bearing's face and lockwasher on the road side of the machine. Use the screwdriver to draw the adapter through the bearing until there is a snug fit between the adapter and chipper drum shaft. Finger tighten the locknut, then use a hook type spanner wrench to bring the locknut to a snug fit.
5. Mark the locknut and chipper drum shaft with a grease pencil or a dark marker. Use a soft steel drift pin and a hammer to drive against the face in a circular movement of the locknut as shown in the following picture. Retighten the locknut with a spanner wrench and repeat procedure until 7/8 of a turn is achieved.



6. Find the tang of the lockwasher that is in line with a slot in the locknut and bend it over into the slot. If needed tighten the locknut slightly until one of the slots line up.
7. Offset the bearing on the curb side of the machine about 1/8" to 3/16" (3.2 - 4.8 mm) away from the drum housing, so that when the bearing is tightened up on the shaft, the bolt holes will line up. The bearing housing should not be wedged up against the base, if it is the bearing will have a preload.
8. Repeat steps 4 through 6 to tighten the curb side bearing on the shaft.
9. Loosen all the bearing bolts to release the preload on the bearings if there is any. Bolt both bearings down and torque the bolts to 220 ft. lbs (298 Nm).
10. If the drum head does not spin freely, there is a preload on the bearings and steps 7 through 9 need to be repeated.

Bandit

MAINTENANCE

PROCEDURE FOR UNPLUGGING YOUR CHIPPER

If your chipper is plugging, it is usually caused by allowing the engine to drop below required R.P.M.'s. This can be resolved by simply shutting the feedwheel(s) off when the engine begins to lug down. Operating the engine at speeds lower than full R.P.M.'s causes your chipper to plug. **Always run the chipper at full engine speed.** If your chipper is equipped with the optional autofeed feature, make sure it is set correctly. The setting for the low R.P.M. stop must be high enough not to allow the chipper discharge to plug. Dull chipper knives also contribute to chipper plugging. Dull knives can create slivers and chunks, causing the engine to lug excessively. Both of the aforementioned conditions cause a plugging situation.

STEPS TO FOLLOW WHEN UNPLUGGING YOUR CHIPPER

1. Before attempting any type of maintenance disengage clutch, install clutch lock if equipped, turn off engine, wait for the disc/drum to come to a complete stop, install the disc/drum lock pin, disconnect battery, and make sure the ignition key is in your possession.
2. Make sure the chipper disc/drum is **NOT** turning and then open the hinged portion of the chipper hood.
3. Using gloved hands and some type of raking tool, dig the chips out of the chipper housing.
4. If the discharge chute is plugged, use a raking tool to pull the majority of chips out of the open outlet end of the chute. Then, two people must remove the chute. Do not attempt this with one person, because the chute can fall causing injury. If used properly, a hoist can be used to assist in the removal of the chute.
5. Never allow one person to turn the chipper disc/drum when someone else is working inside the chipper housing. More than likely, the chipper disc/drum will turn hard then loosen causing it to turn faster. If another person is anywhere near the chipper disc/drum, they may be injured.
6. Never turn the chipper disc/drum by hand. Always use a pry bar. This will prevent the person turning the disc/drum from being injured should the disc break loose.
7. Reinstall the discharge chute, mount securely and point it in a safe direction away from anything.
8. Never leave the chipper hood open and try to start the engine in order to engage the chipper disc/drum to blow chips out of the housing, this is very hard on the P.T.O. of the chipper and may burn clutch plates. Also, the flying debris is very dangerous. An exposed chipper disc/drum turning very fast creates an unsafe condition. In other words, **DO NOT** start the chipper with the hood open because it is just too dangerous.
9. Once the disc/drum turns freely, close the chipper hood, insert the hood pin, install the padlock in the hood pin, reinstall the chipper hood engine disable plug, make sure the spring lock for hood pin springs back to the correct operating position on disc chippers, start engine, properly engage clutch and throttle to full speed. Insert a small branch into the feedwheel(s). If the chips discharge properly, the chipper is clear and normal operation may resume.

PAINT CARE

To help keep up the appearance of your Bandit Equipment and reduce the possibility of surface rust follow these steps:

- 1) The machine should be washed on a regular basis with a non-abrasive mild detergent and then rinsed thoroughly. Do not pressure wash sensitive areas like: decals, gauges, electronic devices, autofeed control, etc.
- 2) If a stone chip, paint scratch, or paint crack occurs - it should be repaired immediately. Simply sand the edges of the damaged paint area, mask off the surrounding area and apply primer and paint to the dry, clean, and warm surface. This will help keep the damaged area from spreading or getting worse.
- 3) If you are unable to sand and mask the area, there are containers of primer and paint available. A small brush can be used to touch up the area.
- 4) Also, primer and most colors of paint are available in aerosol spray cans to simply spray over the effected area after it is cleaned, dry, and warmed. This method is not as reliable as the process in step #2.

It is also reported that some equipment owners polish their machine at least yearly, and keep good mud flaps on their towing trucks.

 **DANGER**

**LOCK OUT ALL ENERGY SOURCES
BEFORE SERVICING OR REMOVING
GUARDS OR HOODS!**



1. Shut off engine/motor. Key in pocket.
2. Disengage pto/clutch.
3. Wait for cutter disc/drum to come to a **COMPLETE STOP** (takes at least several minutes).
4. Install disc/drum lock pin.
5. Loader arm (if equipped) securely on ground and hydraulic pressure released.



6. Unplug engine disable plug.
7. Remove padlock from hood pin.
8. Retract hood pin.

**DO NOT RESTART UNTIL ALL GUARDS
AND HOODS ARE SECURELY AND
PROPERLY REINSTALLED**

TIRE WEAR DIAGNOSTIC CHART

Wear Pattern		Cause	Action
	Center Wear	Over Inflation	Adjust pressure to particular load per tire catalog
	Edge Wear	Under Inflation	Adjust pressure to particular load per tire catalog
	Side Wear	Not Hauling Trailer Level Bent Axles Wide Tires Wheel Bearings	Must be hauled parallel to ground Replace as needed Characteristic of wide flotation tires Adjust or replace
	Cupping	Out-Of-Balance Wheel Bearings	Check bearing adjustment and balance tires Adjust or replace
	Flat Spots	Wheel Lock Up & Tire Skidding	Avoid sudden stops when possible and adjust brakes.

The wear pattern and tread life of tires involves many variables that the user has control of, but **DOES NOT** fall under faulty manufacture or design.

The following is a list of some causes supplied by tire suppliers and axle manufacturers:

- Misalignment - from rough roads, pot holes, excessive speeds and hitting curbs.
- Tire Width - the wider the tire for flotation, the more uneven the tire wear.
- Tire Air Pressure - too much or too little, for the load.
- Vehicle Hitch Height - if trailer is not level with ground, axle camber is misaligned.
- Maintenance - wheel bearing lubrication and adjustment. Follow axle MFG. instructions.
- Brakes - uneven or misadjusted brakes cause irregular brake activation.

RECOMMENDED BRAKE ADJUSTMENT PROCEDURE PER AXLE MANUFACTURER.

The proper clearance between the shoe and drum surfaces will be set up initially from our factory to assure proper operation during the normal break in period. No further adjustment will be necessary until the vehicle completes the recommended break in period of 200 miles (322 km).

Since all brakes of this type must be burnished or "run in" before their full effectiveness can be achieved, the MFG. maintenance manuals call for readjustment after the first 200 miles (322 km) of operation. This usually allows ample time for the burnishing to take place. Readjustments are not necessary for brakes fitted with self-adjustment features although periodic inspection is suggested.

The following shows the correct adjustment for the MFG. brakes of 12 1/4" diameter.

NOTICE: Clearances that are too small will result in excessive drag and overheating while too much clearance can render the brake nonfunctional.

AXLE SIZE	SIZE	TYPE	DIAMETRICAL CLEARANCE	CLICKS TO BACK OFF
8000 LBS.	12 1/4" X 3.38"	Elec. or Hyd.	.040" (1 mm)	AUTOMATIC ADJUSTING
10,000 LBS.	12 1/4" X 3.38"	Elec. or Hyd.	.040" (1 mm)	AUTOMATIC ADJUSTING
12,000 LBS.	12 1/4" X 5"	Elec. or Hyd.	.040" (1 mm)	AUTOMATIC ADJUSTING

For additional brake adjustment procedures consult the axle manufacturer manual.

HYDRAULIC SECTION

WARNING

DO NOT GO NEAR HYDRAULIC LEAKS!

High pressure oil easily punctures skin causing serious injury, gangrene, or death. If injured, seek emergency medical help. Immediate surgery is required to remove oil. DO NOT use fingers or skin to check for leaks. Lower load or relieve hydraulic pressure before loosening fittings.

DO NOT operate this machine unless all hydraulic control devices operate properly. They must function, shift and position smoothly and accurately at all times. Faulty controls can cause personal injury!

Hydraulic Fluid Requirements

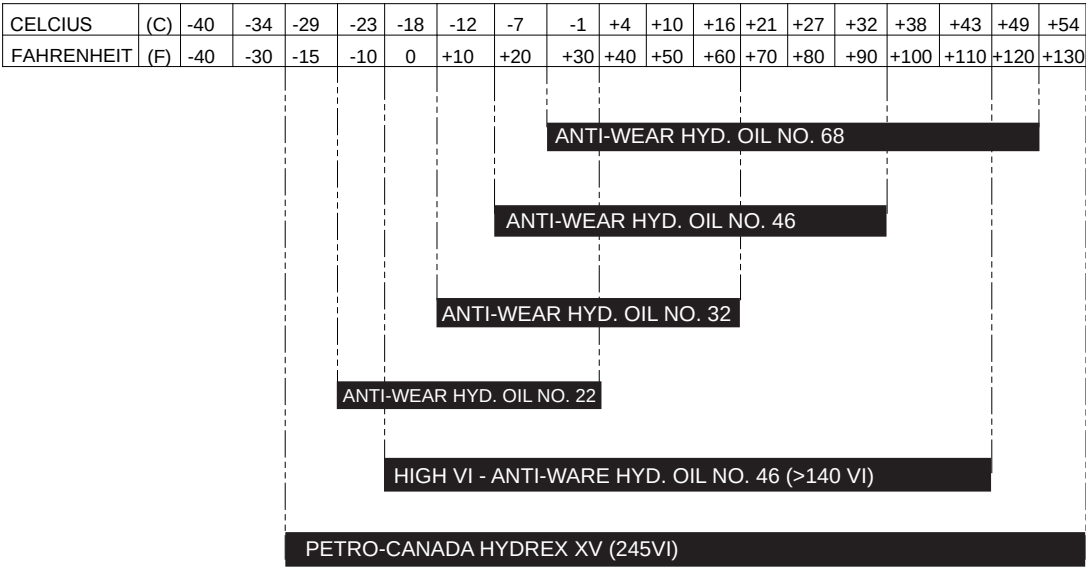
This machine is equipped with “Petro-Canada Hydrex XV” hydraulic fluid. It is recommended to replace with the same. “Petro-Canada Hydrex XV” is an all season hydraulic fluid. This is a premium performance, long life anti-wear, hydraulic fluid, designed for all season use in heavy duty hydraulic systems. “Petro-Canada Hydrex XV” allows year round use under wide extremes of temperature. It allows the hydraulic system to start at temperatures as low as -40°C/-40°F, under no load conditions and it improves lubrication of hydraulic components at high operating temperatures. It will also help protect against hydraulic failures during the wide temperature swings of spring and fall. To find the closest “Petro-Canada Hydrex XV” dealer call 1-888-284-4572.

Multi Viscosity motor oils are not recommended to mix with “Petro-Canada Hydrex XV” hydraulic oil. AW oils may mix with “Petro-Canada Hydrex XV” hydraulic oil. The following are specifications and authorizations of compatible oils. Only a high quality anti-wear (AW) hydraulic oil containing foam, corrosion, rust and oxidations inhibitors should be used. This viscosity grade depends on the oil temperature in service, based on the climate and operating conditions.

	Hydrex XV	ISO 22, AW	ISO 32, AW	ISO 46, AW	ISO 68, AW	ISO 100, AW
Viscosity Index	>235	>95	>95	>95	>95	>95
Flash Point	>240°C /464°F	>200°C /395°F	>210°C /410°F	>220°C /430°F	>220°C /430°F	>240°C /464°F
Oxidations Stability (ASTM D0943)	>9,000 Hours	>3,000 Hours	>3,000 Hours	>3,000 Hours	>3,000 Hours	>3,000 Hours
Cold Start-up, No Load, Max	-40°C/-40°F	-34°C/-29°F	-26°C/-14°F	-19°C/-3°F	-9°C/16°F	-4°C/24°F

HYDRAULIC SECTION

Alternate hydraulic oils are available, but they do not equal the performance or longevity of the “Hydrex XV” oil. Consult the following information supplied by the oil distributor.



Note: The above chart is a suggested guide for viscosity of hydraulic fluids at start up ambient temperature. The load, demand, and cleanliness of the equipment will affect actual oil temperatures which can increase dramatically above ambient air temperatures during operation. The actual viscosity needed is based on oil temperature during operation and not air temperature. Compare your fluid specifications with the specifications below to verify compliance.

When choosing a hydraulic fluid - these maximum and minimum specifications must be met:

Minimum Viscosity during operation = 12 cSt
Maximum No-Load Viscosity at start-up = 2000 cSt

Hydraulic fluids vary in their resistance to oxidation at elevated temperatures, their ability to protect against metal-to-metal contact under increasing temperature, and their ability to separate water from the fluid. Viscosity is temperature dependant. Fluids with high viscosity-index (VI) will thin out slower at higher temperature and thicken slower at colder temperatures allowing a wider operating range. Choose a fluid that has test results in these areas for best results.

Based on the varying temperatures of the area where Bandit equipment is used, and the high demand and loads placed on this equipment, Bandit has filled each hydraulic system with Petro-Canada’s Hydrex XV All Season Hydraulic Fluid for maximum protection and performance.

Contact Petro Canada at (888) 284-4572 to find a dealer near you.

Note: Some equipment and components such as fluid engagement clutch’s (PTO’s) have their own lubrication requirements. Consult their manufactures manual for that information.

**TYPICAL HYDRAULIC RELIEF PRESSURE SETTINGS
TYPICAL HYDRAULIC FLOWS AND RPM SETTINGS
(Approximate, For Reference Only, Engine At Full RPM)**

Right Track, Jib Boom, Loader Swing, Grapple Rotate, Discharge - GPM (LPM)	26.7 (101)
Left Track, Main Boom, Grapple, Yoke, Flipper - GPM (LPM)	26.7 (101)
Top Feedwheels - GPM (LPM)	25.9 (98)
Bottom Feedwheel - GPM (LPM)	10.9 (41.3)
Joystick - GPM (LPM)	.75 - 2.0 (2.8 - 7.6)
Track Relief - PSI (BAR)	4300 (296)
Top Feedwheel Relief - PSI (BAR)	2300 (159)
Bottom Feedwheel Relief - PSI (BAR)	2300 (159)
Loader Swing Relief - PSI (BAR)	2000 - 1600 (138 - 110)
Main Boom Up Relief - PSI (BAR)	2200 - 2000 (152 - 138)
Main Boom Down Relief - PSI (BAR)	800 - 300 (55 - 21)
Jib Boom Up Relief - PSI (BAR)	2300 - 2200 (159 - 152)
Jib Boom Down Relief - PSI (BAR)	2200 (152)
Grapple Rotate Relief - PSI (BAR)	2200 (152)
Grapple Open & Close Relief - PSI (BAR)	2200 (152)
Yoke Lift Up Relief - PSI (BAR)	2000 - 1700 (138 - 117)
Yoke Lift Down Relief - PSI (BAR)	1000 (69)
Swivel Discharge Relief - PSI (BAR)	800 (55)
Discharge Flipper - PSI (BAR)	800 (55)
Tongue Jack Relief - PSI (BAR)	2000 (138)
Rear Stabilizer Relief - PSI (BAR)	2000 (138)
Winch - PSI (BAR)	2300 (159)
Joystick Relief - PSI (BAR)	400 - 250 (28 - 17)

NOTICE

DO NOT UNDER ANY CIRCUMSTANCES OVER-SET THESE RELIEF PRESSURES, BECAUSE IT WILL CAUSE DAMAGE TO COMPONENT PARTS AS WELL AS HYDRAULIC PARTS.

NOTE: These Typical Hydraulic Flows And Relief Pressure Settings Are With The Engine At Full RPM. All Settings Are Subject To Change!

Bandit

HYDRAULIC SECTION

THE BANDIT HYDRAULIC SYSTEM

The Bandit is equipped with a very efficient, simple hydraulic system. Each component is capable of withstanding a specified PSI (bar) and still operate for a very long time.

If the simple rules mentioned below are followed, the hydraulic components will last for years:

- Avoid hydraulic pump cavitation. Low oil levels or cold start-ups will cause the hydraulic pump to cavitate. Cavitation will ruin the pump and possibly the entire hydraulic system. Cavitation only has to happen once. This will start the pump on its way to ruin. Allow hydraulic system to turn slowly for several minutes in cold weather in order for hydraulic system to warm up. Cavitation is not covered under warranty.
- Do not increase the feedwheel relief valve setting beyond specified PSI (bar). This will cause damage to hydraulic components. Do not set any other hydraulic component past it's specified pressure or this will cause damage to the hydraulic components.
- Keep hydraulic oil clean. Dirty oil will cause excessive wear and loss of feedwheel power. Replace spin on filter per maintenance chart.
- Replace the hydraulic oil filter(s) after first 10 hours and with each 400 hours of operation or 3 months thereafter. See pages 55 - 56 for hydraulic oil requirements.
- Replace hydraulic oil & suction screen once yearly. This is also a very good time to flush and clean the tank. Replace hydraulic oil immediately if it is contaminated or looks "milky".
- Replace hydraulic oil & suction screen once yearly. This is also a very good time to flush and clean the tank. Replace hydraulic oil immediately if it is contaminated or looks "milky".
- If the Bandit's hydraulic system is kept clean and the feedwheel hydraulic pressure is not increased beyond specified PSI (bar), the maximum use and life should be received from the Bandit chipper hydraulic system.
- If a problem is encountered, it will more than likely be located in the relief valve or something as simple as belts slipping, check these first.
- Only use the optional adjustable flow control when chipping large diameter trees. Do not leave the speed adjustment partially open for long periods of time. This will cause excessive heat to the hydraulic system! Excessive heat will cause low feedwheel power and premature failure of all hydraulic components. Always operate system at full oil flow unless chipping large diameter trees!
- Do not close the optional hydraulic shut-off valve for more than 3 to 4 seconds. Hydraulic shut-off valve handle must be completely turned on (in line with hose) at all times unless checking hydraulic pressure. Pressure gauge should be safely stored and installed only when checking pressure. Follow above instructions or this will cause unwarranted damage to the hydraulic components.
- Never close the ball valves on the hydraulic tank suction ports (if equipped) while the machine is running, this will ruin the hydraulic pump and components.

HYDRAULIC COMPONENTS

Feedwheel hydraulic motor(s):

These hydraulic motor(s) are attached to the feedwheel(s) by a tapered feedwheel motor connection or by a clamp style connection.

Hydraulic pump(s):

The hydraulic pump(s) could be bolted directly to the engine, or may be driven by a sheave/belt combination off of the engine.

Suction strainer(s):

The strainer(s) stops contaminants from reaching the hydraulic pump. The suction strainer(s) should be replaced at least once yearly or every 2000 hours.

Hydraulic tank:

This tank must be kept clean and filled minimum 7/8 full. Clean tank yearly.

Filter(s):

The cartridge filter(s) must be replaced per maintenance schedule.

Filter mount:

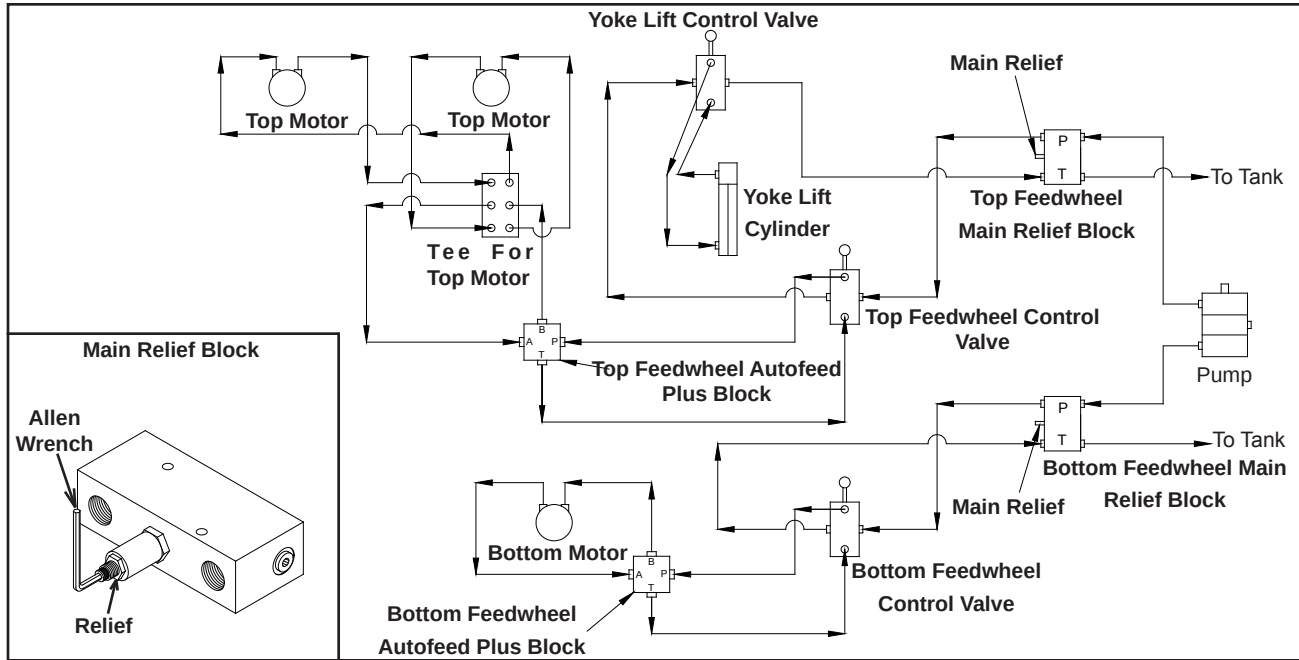
The filter is tightened on or inside the filter mount.

Feedwheel valve(s):

The valve(s) is actuated by the control bar. The valve(s) actuates the feedwheel for forward, off or reverse. It may also contain an adjustable relief valve.

Bandit

HYDRAULIC PRESSURE ADJUSTMENT PROCEDURE

**PROCEDURE FOR MODEL 2090****⚠ WARNING**

Before attempting any hydraulic pressure settings, make sure engine is shut off, engine key removed and in your possession, hydraulic oil is clean, hydraulic tank is 7/8 full, and the machine has been pre-run to warm the hydraulic oil. To correctly check relief valve pressure, gauge MUST be installed correctly.

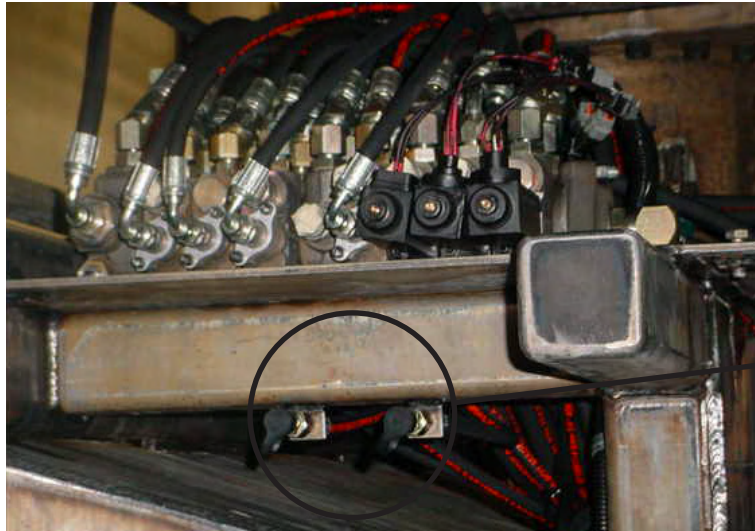
1. First put control handle in off position.
2. Install pressure gauge in the port on the end of the main relief block for the top feedwheel.
3. Start engine and adjust engine to full throttle.
4. Close the ball valve on the top feedwheel main relief block that you are checking to activate a reading on the pressure gauge.
5. Pressure gauge should read maximum of specified PSI (bar).
ONLY LEAVE BALL VALVE CLOSED FOR 4-5 SECONDS TO SET PRESSURE OR YOU MAY DAMAGE HYDRAULICS.
6. Use an allen wrench to readjust relief pressure setting if needed, and then retighten jam nut.
7. Repeat steps 1 through 6 for the bottom feedwheel main relief block.
8. Check for hydraulic leaks.
9. Relief valve pressure should be checked and/or readjusted every month for best performance.

MAINTAIN FEEDWHEEL HYDRAULIC PRESSURE AT SPECIFIED PSI (bar).

Bandit

HYDRAULIC PRESSURE ADJUSTMENT PROCEDURE

VALVE BANK



TEST PORTS



PROCEDURE FOR MODEL 2090 WITH LOADER OR TRACKS

WARNING

Before attempting any hydraulic pressure settings, make sure engine is shut off, engine key removed and in your possession, hydraulic oil is clean, hydraulic tank is 7/8 full, and the machine has been pre-run to warm the hydraulic oil. To correctly check relief valve pressure, gauge MUST be installed correctly.

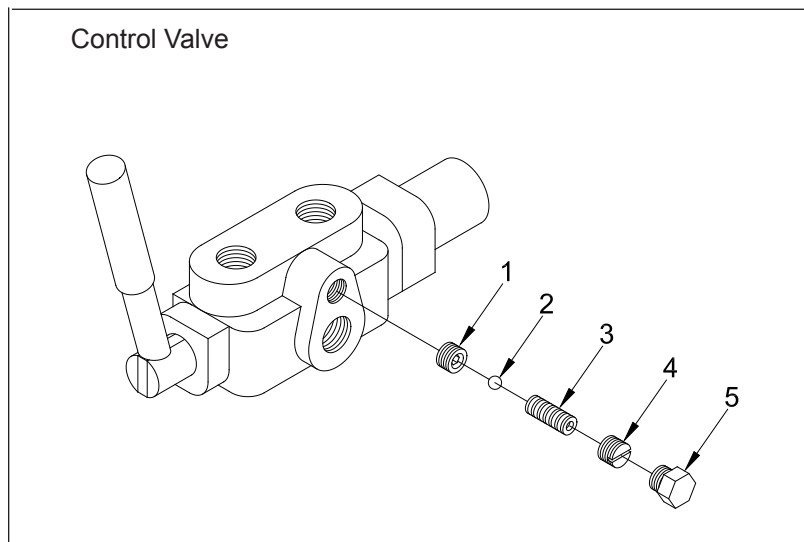
1. First put control handle in off position.
2. Install pressure gauge in the test port of the valve bank of the function you want to check. One of the test ports will be for the valve bank and other test port will be for pilot pressure.
3. The machine is equipped with main relief blocks and if that is the pressure to be checked, see page 57.
4. Start engine and adjust engine to full throttle.
5. When checking one of the valve bank functions you will need to bottom out the cylinder or stop the motor from turning to activate a reading on the pressure gauge. Pilot pressure for joysticks should be present at all times.
6. Pressure gauge should read maximum of specified PSI (bar).
ONLY LEAVE VALVE FUNCTION ACTIVATED FOR 4-5 SECONDS TO SET PRESSURE OR YOU MAY DAMAGE HYDRAULICS.
7. Use an allen wrench to readjust relief pressure setting if needed, and then retighten jam nut.
8. Check for hydraulic leaks.
9. Relief valve pressure should be checked and/or readjusted every month for best performance.

MAINTAIN FEEDWHEEL HYDRAULIC PRESSURE AT SPECIFIED PSI (bar).

Bandit

PROCEDURE FOR CHECKING OPTIONAL HYDRAULIC COMPONENTS**FOR MODEL 2090 HYDRAULIC COMPONENT OPTIONS**

The relief valve is typically located internally in the control valve. Do not adjust this relief valve above the specified PSI (bar). The relief valve system is a simple spring tension design but small pieces of debris can stick the valve partially open which weakens the feedwheel power. The relief as well as hydraulic oil, and screen must be kept clean.

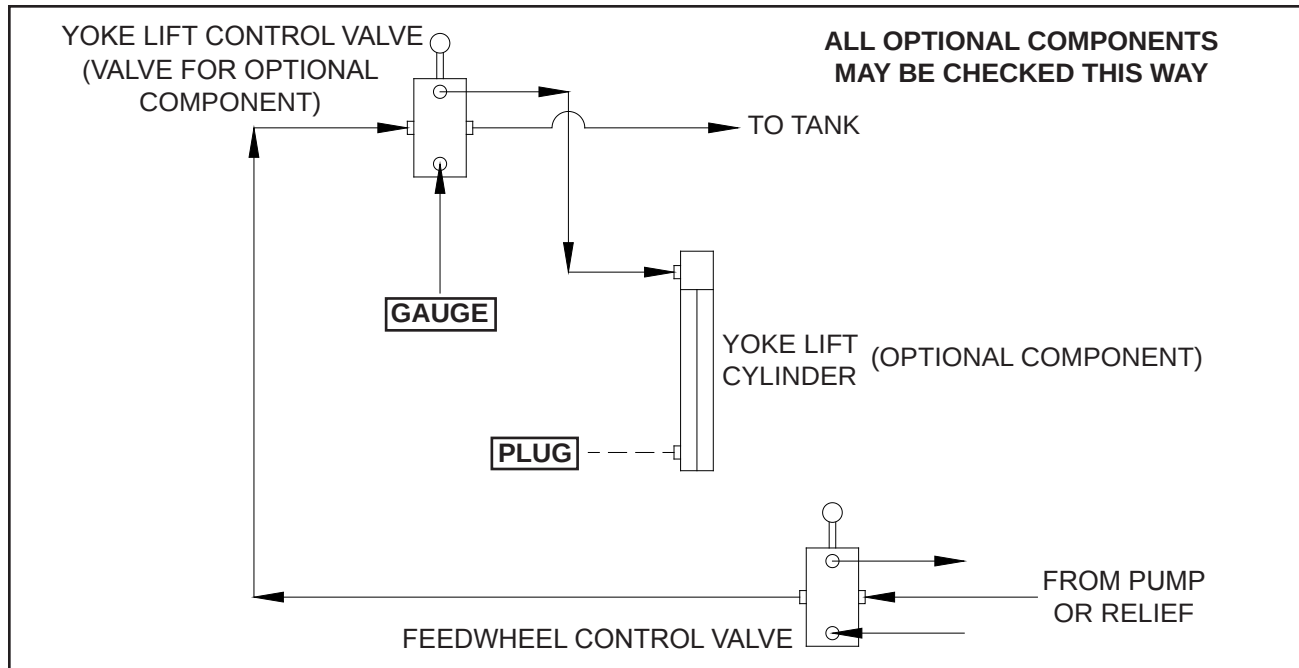


1. **VALVE SEAT:**
The springs push the relief valve ball against it, until pressure builds.
2. **POPPIT VALVE:**
This ball opens and closes to relieve excess pressure on hydraulic system.
3. **RELIEF SPRING:**
This spring tensions the amount of pressure required to open the relief valve ball. This spring weakens and must be checked and/or readjusted every month for best performance.
4. **SLOTTED SET SCREW:**
Turn clockwise to increase pressure, but do not surpass maximum of the specified PSI (bar).
5. **HEX HEAD PLUG:**
Remove to access the relief valve.

MAINTAIN FEEDWHEEL HYDRAULIC PRESSURE AT SPECIFIED PSI (bar).

Bandit

PROCEDURE FOR CHECKING OPTIONAL HYDRAULIC COMPONENTS



⚠ WARNING

MODEL 2090 PROCEDURE

Before attempting any hydraulic pressure settings, make sure engine is shut off, the ignition key is removed and in your possession, hydraulic oil is clean, hydraulic tank is 7/8 full, and the machine has been pre-run to warm the hydraulic oil. To correctly check relief valve pressure, the pressure gauge **MUST** be installed correctly.

1. First put control handle in off position.
2. Disconnect hose coming out of the port farthest from the handle of the control valve from the optional motor or cylinder, and plug the hose.
3. Leave all other hydraulic hoses connected.
4. Install pressure gauge in the valve port which had the hose of the optional motor or cylinder disconnected.
5. Start engine and adjust engine to full throttle to activate reading on pressure gauge.
6. Only operate the valve for that component to activate pressure gauge. Pressure gauge should read the maximum specified PSI (bar) for that component, see page 57.
ONLY RUN ENGINE FOR 4-5 SECONDS TO SET PRESSURE OR YOU MAY DAMAGE HYDRAULICS.
7. Readjust relief pressure setting if needed, if not needed, shut off engine and remove plug and pressure gauge. Reassemble control valve to optional motor or cylinder.
8. Check for hydraulic leaks.
9. Relief valve pressure should be checked and/or readjusted every month for best performance.

MAINTAIN HYDRAULIC PRESSURE TO THE SPECIFIED PSI (bar).

Bandit

HYDRAULIC SYSTEM TROUBLE SHOOTING

Before attempting any type of maintenance disengage clutch, install clutch lock if equipped, turn off engine, wait for the disc/drum to come to a complete stop, install the disc/drum lock pin, disconnect battery, and make sure the ignition key is in your possession!

PROBLEM	POSSIBLE CAUSE	SOLUTION
Feedwheel(s) turn at normal speed but does not chip wood properly	1. Dull Knives 2. Worn feed teeth 3. Low feedwheel relief valve setting 4. Worn pump 5. Feedwheel springs too loose	1. Replace knives 2. Replace 3. Readjust to specified PSI (bar) 4. Replace 5. Adjust
Feedwheel(s) slow or stop when feeding	1. Dull knives 2. Relief valve is worn or dirty 3. Pump is worn 4. Motor is worn 5. Feedwheel springs too tight 6. Feedwheel slide box sticking or hanging up	1. Replace knives 2. Clean, reset or replace 3. Replace 4. Replace 5. Adjust 6. Lubricate
Feedwheel(s) turn slowly or not at all	1. Relief valve stuck open 2. Worn hydraulic motor 3. Pump worn 4. Feedwheel Relief pressure off 5. Pinched or damaged hydraulic hose 6. Feedwheel valve (control valve) worn & leaking internally 7. Low hydraulic oil level 8. Plugged oil screen 9. Binding such as worn bearings, etc. 10. Control lever improperly shifting valve	1. Clean or replace 2. Replace 3. Replace 4. Reset to specified PSI (bar) 5. Replace 6. Replace 7. Fill 7/8 full minimum 8. Replace 9. Repair 10. Readjust, valve must open completely
Hydraulic oil very hot, causing system to operate slowly	1. Dull knives 2. Low oil level 3. Worn pump 4. Relief valve stuck open or opens easily 5. Damaged hose 6. Oil suction screen or filter plugged 7. Oil cooler plugged, if equipped 8. Worn motor 9. Binding 10. Operator running oil over relief too much	1. Replace knives 2. Fill 7/8 full minimum 3. Replace 4. Clean, reset or replace 5. Replace 6. Clean or replace 7. Clean 8. Replace 9. Repair 10. Don't

MAINTAIN FEEDWHEEL HYDRAULIC PRESSURE AT SPECIFIED PSI (bar).

Follow typical hydraulic flow and relief settings on pages 57 - 62.

Follow proper hydraulic oil requirements on pages 55 - 56.

CORRECTING HYDRAULIC PROBLEMS

Before attempting any type of maintenance disengage clutch, install clutch lock if equipped, turn off engine, wait for the disc/drum to come to a complete stop, install the disc/drum lock pin, disconnect battery, and make sure the ignition key is in your possession!

COMPONENT	PROCEDURE
Checking relief valve setting	Refer to the hydraulic pressure adjustment procedure section of the manual to find the correct procedure for checking relief valve setting. (pgs. 59 - 62)
Adjusting relief valve setting	Refer to the hydraulic pressure adjustment procedure section of the manual to find the correct procedure for adjusting relief valve pressure settings. (pgs. 59 - 62)
Cleaning relief valve of hydraulic components (with engine shut off)	1. Remove plug from feedwheel valve (control valve), see illustration of relief valve components. (pg. 61) 2. Unscrew slotted set screw completely out of the valve. 3. Remove poppit spring. 4. Remove poppit ball. 5. Clean all parts, inspect for damage and blow out relief hole with air. 6. Reassemble, set and maintain feedwheel hydraulic pressure at specified PSI (bar).
Checking for defective pump	1. See pages 66 - 67 on how to check a hydraulic pump.
Checking for defective motor	1. If everything checks out as correct, it may be time to check the hydraulic motor. 2. If your machine has Live Hydraulics, see page 65 on how to check a hydraulic motor. 3. If your machine does not have Live Hydraulics, contact your local dealer or Bandit Industries for instructions.

NOTE: When returning hydraulic components for warranty make sure to box up all warranted parts to avoid additional damage while shipping. **Do not disassemble any hydraulic components which are to be warranted.** Anything which has been disassembled or tampered with will not be warranted. Items being returned must be clean. All hydraulic components must have all hosing ports plugged. Failure to plug ports will allow debris to enter components which will void warranty.

MAINTAIN FEEDWHEEL HYDRAULIC PRESSURE AT SPECIFIED PSI (bar).

Follow typical hydraulic flow and relief settings on pages 57 - 62.

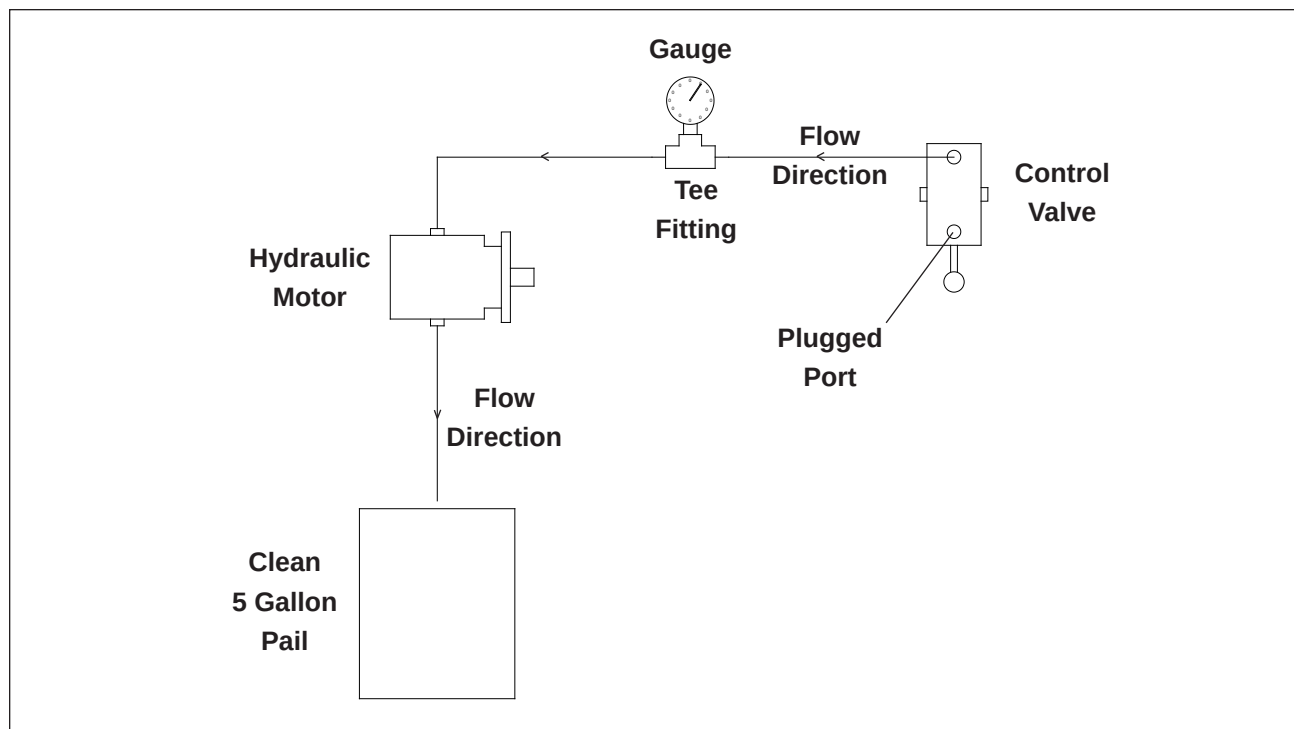
Follow proper hydraulic oil requirements on pages 55 - 56.

HYDRAULIC MOTOR CHECK OUT

HYDRAULIC MOTOR CHECK OUT FOR MACHINES WITH LIVE HYDRAULICS

To check out a hydraulic motor the mechanic will need a pressure gauge capable of reading 3000 p.s.i. (207 bar), a Tee fitting to install in the control valve, a plug fitting to install in the control valve and a clean 5 gallon (19L) pail.

- 1) The following instructions are for machines with Live Hydraulics, for machines without Live Hydraulics contact your local dealer or Bandit Industries.
- 2) In order to check out a hydraulic motor, it is necessary to mechanically stop the motor from turning while under load. The hydraulic pump needs to be driven without turning the chipper disc/drum (Live Hydraulics). Feed a reasonably large size log into the machine until it contacts the stationary disc/drum. This should stall the hydraulic motor(s). It may also be necessary to apply down pressure by operating the yoke control valve (if equipped).
- 3) With the feedwheel(s) mechanically locked as described and the engine turned off, unhook the hose going from the hydraulic motor back to the control valve at the valve. Some machines will be equipped with a flow divider between the hydraulic motor and the control valve.
- 4) Place the end of the hose in a clean 5 gallon (19L) pail.
- 5) Plug the open port in the control valve.
- 6) Unhook the other hose in the control valve and install a Tee fitting into the control valve and attach the hose to the Tee fitting.
- 7) Install a pressure gauge in the other port in the Tee fitting to monitor hydraulic pressure.
- 8) Put the infeed control valve in the center position and start the engine.
- 9) Increase the engine speed slowly to full rpm.
- 10) Operate the infeed control valve to feed the log into the stationary disc/drum. If the feedwheel(s) try to turn, apply down pressure by using the yoke control valve (if equipped).
- 11) Providing the pump and the relief are functioning properly, the pressure gauge should read the specified main relief setting.
- 12) Observe the amount of hydraulic fluid coming from the hose into the pail. The amount of leakage should not be more than about 1 g.p.m. (3.8 L.p.m.) into the pail.

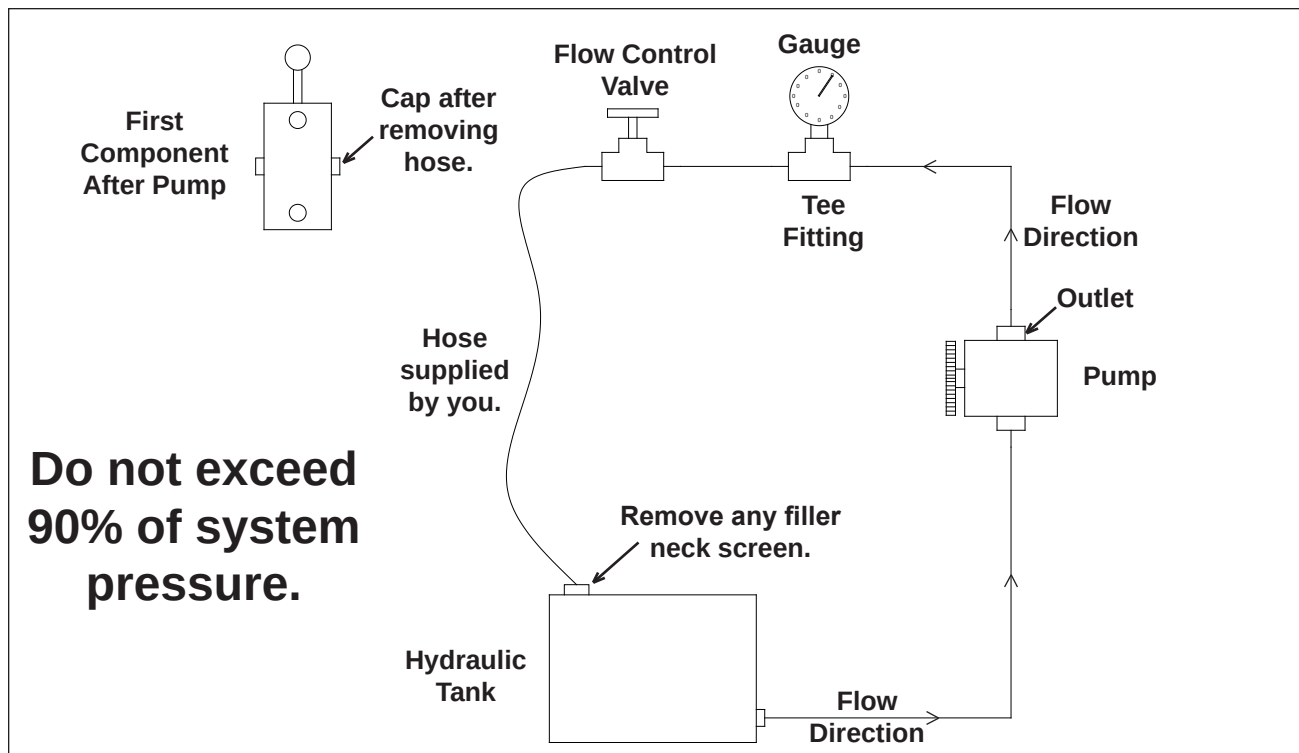


HYDRAULIC PUMP CHECK OUT

HYDRAULIC PUMP CHECK OUT WITHOUT USING A FLOW METER

To check out the hydraulic pump the mechanic will need a needle type flow control valve, a pressure gauge capable of reading 3000 psi (207 bar) and a long enough hose that will span between the pump and the hydraulic tank.

- 1) Disconnect the pressure line going from the pump at the first component and cap the fitting at the component.
- 2) Attach a Tee fitting to the end of the pressure hose (which was removed from the component) and install the Tee fitting and gauge.
- 3) Attach the hydraulic flow control valve to the Tee fitting and the hose (you supply) to the outlet port of the flow control valve.
- 4) **Make sure the pressure gauge is installed up stream from the flow control valve. Failure to do this will cause serious damage to the hydraulic pump when testing.**
- 5) If the hydraulic oil tank is equipped with a mesh strainer in the fill neck, remove it and place the open end of the hose (you supply) into the tank fill neck.
- 6) **MAKE SURE THAT THE FLOW CONTROL VALVE IS FULLY OPEN SO AS TO ALLOW UNRESTRICTED FLOW TO PASS THROUGH IT.**
- 7) Start the engine to engage the pump, the clutch may have to be engaged if the pump is belt driven.
- 8) Have a second person lift the hydraulic hose far enough out of the tank inlet to observe the flow of oil going into the tank. Observe the pressure gauge reading to make sure a high pressure does not exist.
- 9) Increase the engine speed slowly to full rpm and at the same time observe the pressure. This should still remain low.
- 10) **SLOWLY** turn the needle valve on the flow control in and observe the pressure increase on the pressure gauge.
- 11) Continue closing the flow control valve until the pressure gauge reading reaches 90% of the normal relief valve setting (example: if system operates at 2500 psi (172 bar), do not exceed 2250 psi (155 bar). **Never allow the pressure to go more than 90% of the main relief pressure.**
- 12) If the pump is good there should be no noticeable decrease in the flow rate coming out of the hose and into the hydraulic tank.
- 13) If 90% of the main relief pressure can not be obtained and/or the flow rate of the hose is considerably less, then the pump is worn or damaged.

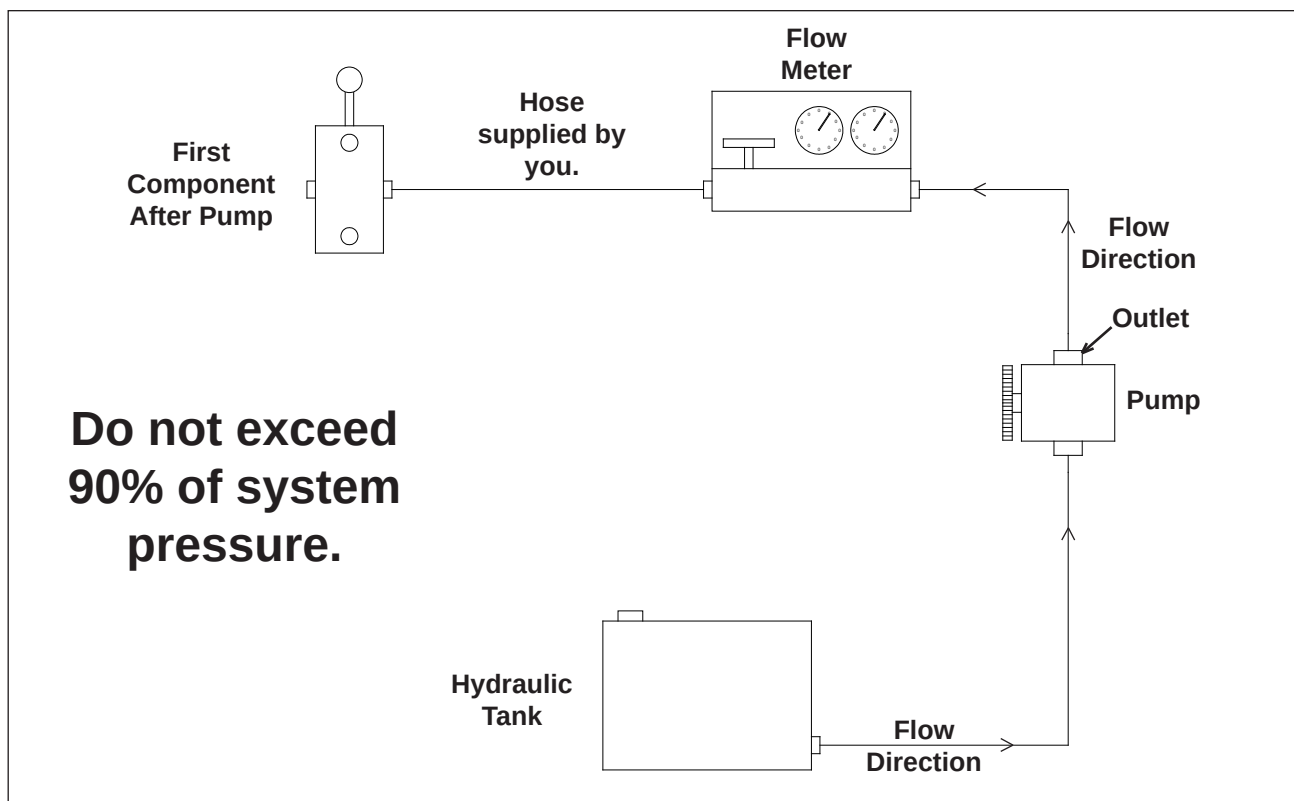


HYDRAULIC PUMP CHECK OUT

HYDRAULIC PUMP CHECK OUT USING A FLOW METER

To check out the hydraulic pump the mechanic will need a needle type flow meter capable of reading 3000 psi (207 bar) and a long enough hose that will go from the flow meter back to the first component.

- 1) Disconnect the pressure line going from the pump at the first component.
- 2) Attach the flow meter to the end of the pressure hose (which was removed from the component).
- 3) Attach the hose you supplied to the outlet of the flow meter and run the hose back to the first component. **MAKE SURE THE HOSES ARE ON THE CORRECT SIDES OF THE FLOW METER.**
- 4) **Make sure the pressure gauge is installed up stream from the flow control valve.**
Failure to do this will cause serious damage to the hydraulic pump when testing.
- 5) **MAKE SURE THAT THE FLOW CONTROL VALVE IS FULLY OPEN SO AS TO ALLOW UNRESTRICTED FLOW TO PASS THROUGH IT.**
- 6) Start the engine to engage the pump, the clutch may have to be engaged if the pump is belt driven.
- 7) Observe the flow rate through the meter and pressure gauge reading to make sure a high pressure does not exist.
- 8) Increase the engine speed slowly to full rpm and at the same time observe the pressure and flow rate. The pressure should still remain low. Make a note of the flow rate (gpm or Lpm) at full engine rpm.
- 9) **SLOWLY** turn the needle valve on the flow control in and observe the pressure increase on the pressure gauge.
- 10) Continue closing the flow control valve until the pressure gauge reading reaches 90% of the normal relief valve setting (example: if system runs at 2500 psi (172 bar), do not exceed 2250 psi (155 bar).
Never allow the pressure to go more than 90% of the main relief pressure.
- 11) If the pump is good, you should have at least 80% of the flow rate (gpm or Lpm) passing through the flow meter as noted at low pressure and full rpm (example: 10 gpm (38 Lpm) and low pressure = 8 gpm (30 Lpm) at 90% pressure).
- 12) If 90% of the main relief pressure can not be obtained and/or the flow rate passing through the meter is considerably less, then the pump is worn or damaged.



CONTROL VALVE DETENT ASSEMBLY AND O-RING REPLACEMENT

Tools Required:

- Small amount of clean hydraulic oil
- Clean working area, free of debris and shop rags
- 3/16" Tee handle hex driver
- 1/2" drag link drive socket
- Jawed vice

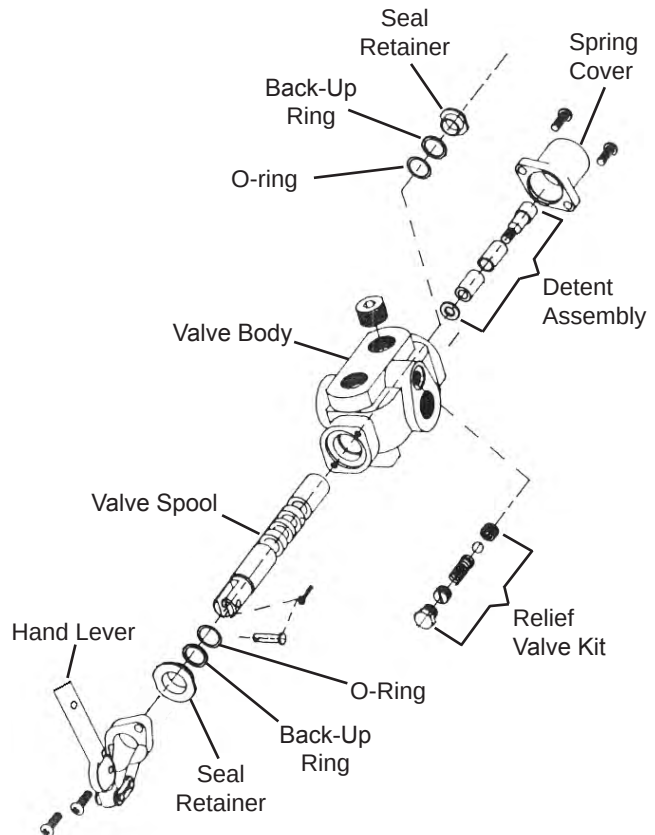
1/2" Drag Link
Drive Socket



General Procedure:

Disassembly:

- 1) Secure valve in vice or suitable method to firmly hold valve.
- 2) Note the orientation and placement of all components during disassembly.
- 3) Using the 3/16" Tee handle hex driver, remove (2) two socket head cap screws which hold the spring cover to the valve body. Set aside for re-use.
- 4) The detent assembly is now visible. Insert the 1/2" drag link drive socket blade into slot of retaining screw. Loosen and remove the retaining screw along with the entire detent assembly.
- 5) With the 3/16" Tee handle hex driver, remove (2) two socket head cap screws that hold the control lever assembly to the valve body.
- 6) Detach hand lever from spool. Carefully remove valve spool from valve body. Take care not to scratch, dent, or nick the spool. Note the orientation of handle attachment point on spool. Set aside for re-use.
- 7) Remove (2) seal retainers, o-rings, and back-up rings from both ends of the valve.
- 8) Inspect and replace o-ring and back-up ring if cut, or if leak is suspected.



Assembly:

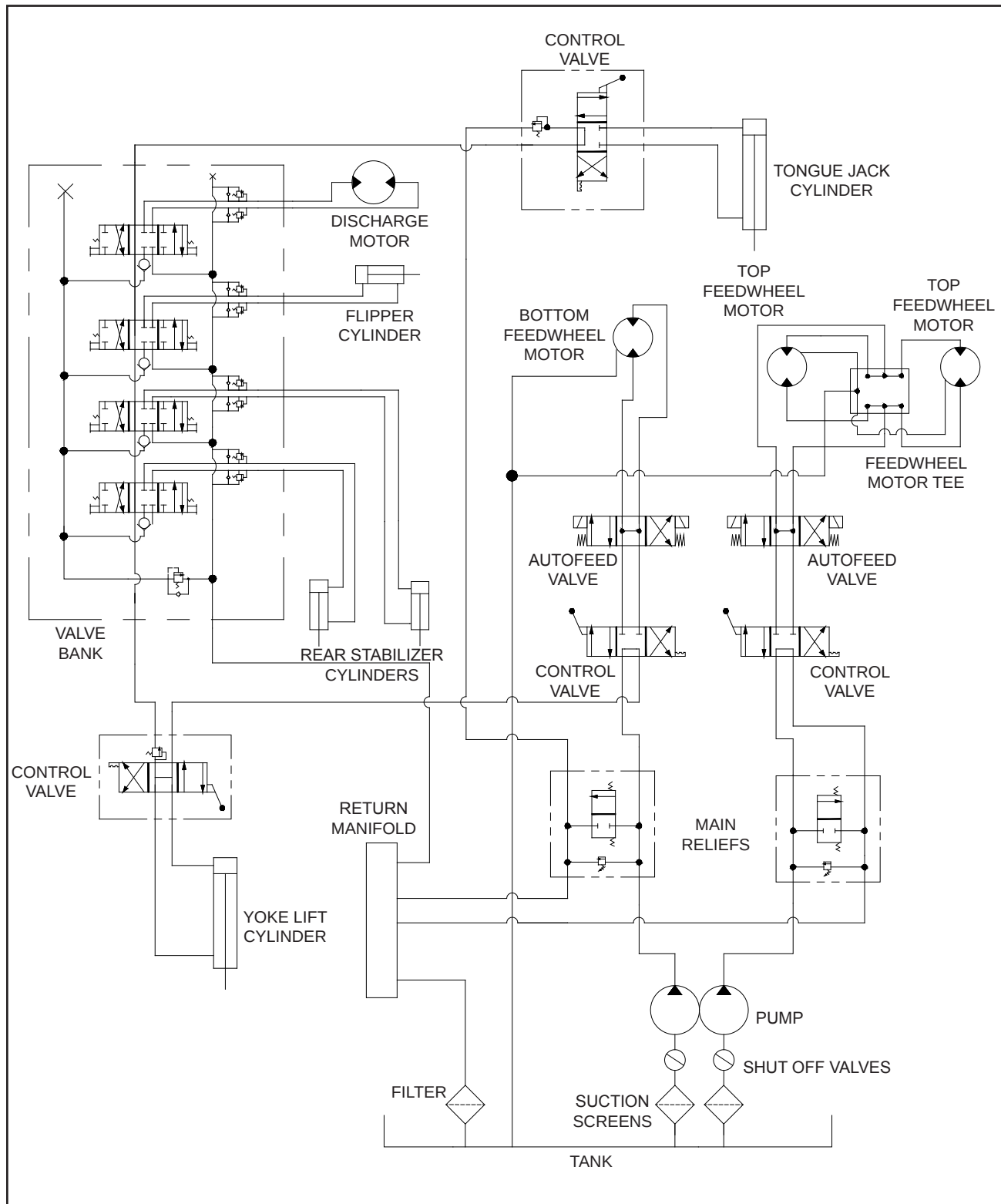
- 1) Lubricate spool, o-rings, and back-up rings with clean oil. Insert spool and center it in the valve body.
- 2) Place the new o-rings and back-up rings over spool ends and seat them into the valve body. Seat the seal retainer onto back-up ring making sure not to pinch the o-ring or back-up ring against the valve body.
- 3) Re-attach the hand lever to the spool. Mount control lever assembly onto the valve body using the (2) two socket head cap screws.
- 4) Thread a new detent assembly onto the spool end and hand tighten with the 1/2" drag link drive socket blade. No additional lubricant is required.
- 5) Mount the spring cover and the (2) socket head cap screws.
- 6) Hand tighten all (4) four socket head cap screws with the 3/16" Tee handle hex driver.
- 7) Shift valve with hand lever to assure operation. With some effort, the hand lever should move between three positions. The detent will hold the hand lever in the three positions.

Instructions and illustrations provided by component manufacturer.

Bandit

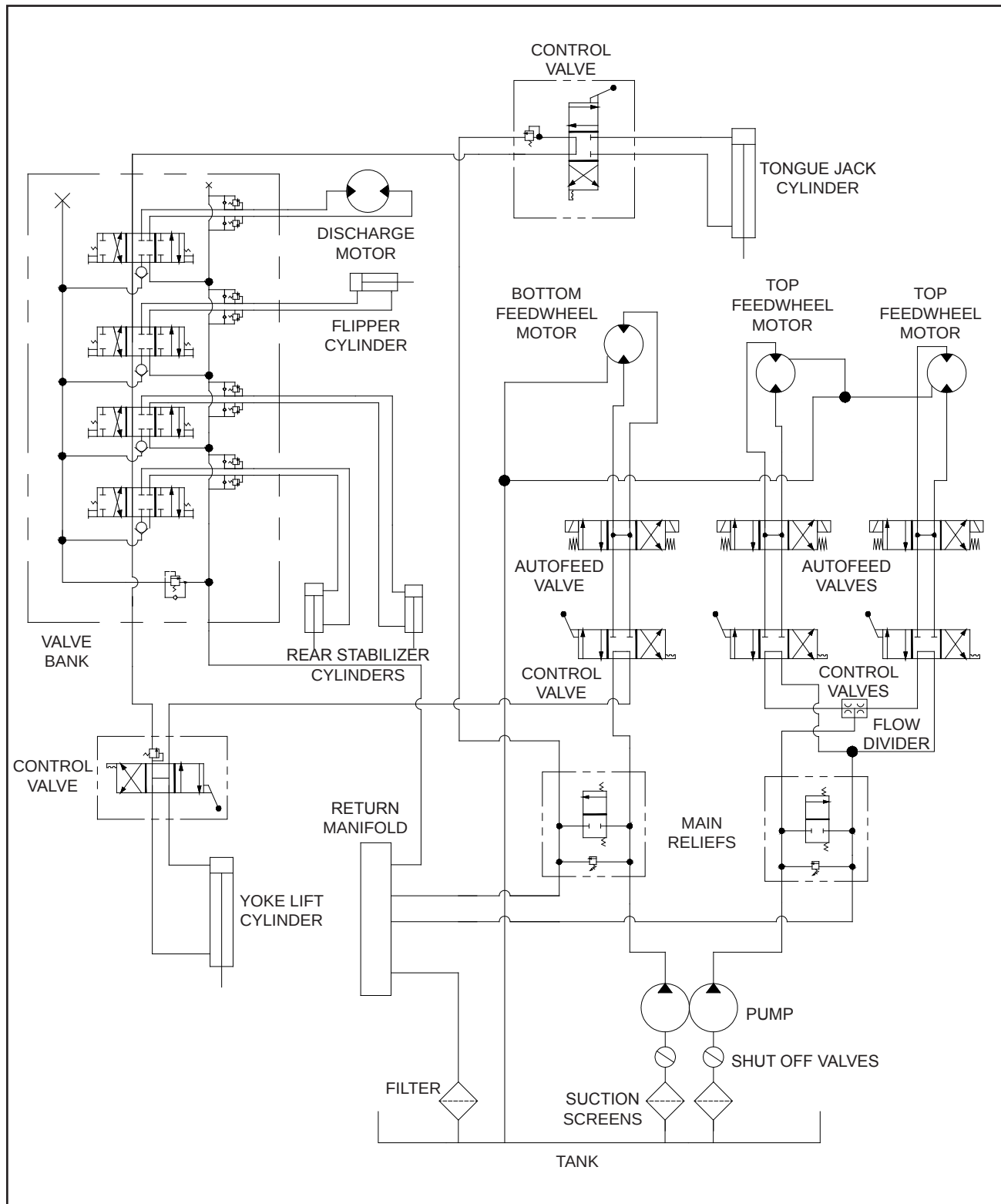
2090 (Start 1/04)

SPECIFIC SCHEMATIC FUNCTION MAY VARY DEPENDING
ON OPTIONS OR COMPONENT MANUFACTURE.
WITH OPTIONAL REAR STABILIZERS



2090 (Pre 1/04)

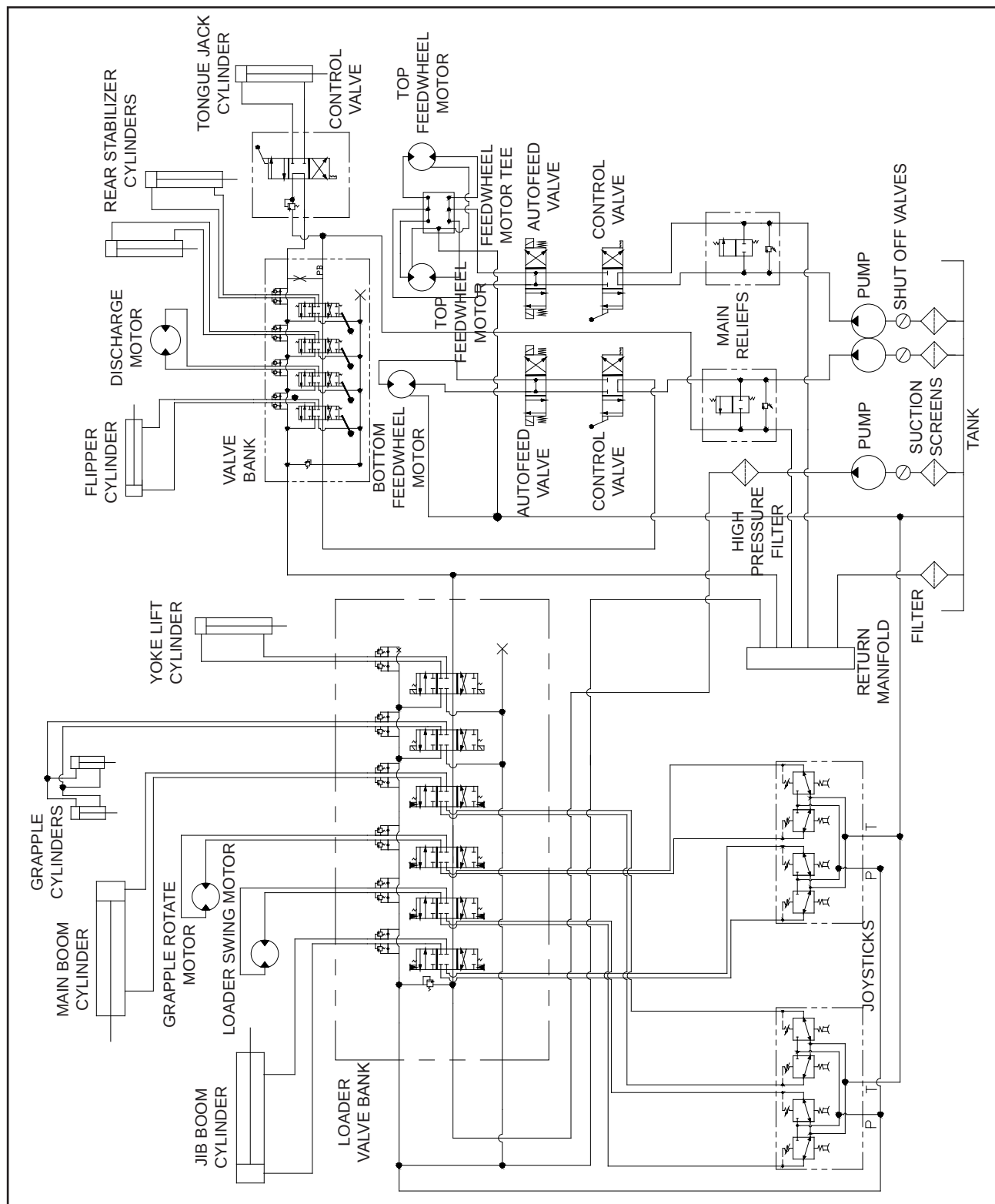
SPECIFIC SCHEMATIC FUNCTION MAY VARY DEPENDING
ON OPTIONS OR COMPONENT MANUFACTURE.
WITH OPTIONAL REAR STABILIZERS



2090 With Loader (Start 4/04)

SPECIFIC SCHEMATIC FUNCTION MAY VARY DEPENDING
ON OPTIONS OR COMPONENT MANUFACTURE.

WITH MODEL 1700 LOADER & OPTIONAL REAR STABILIZERS

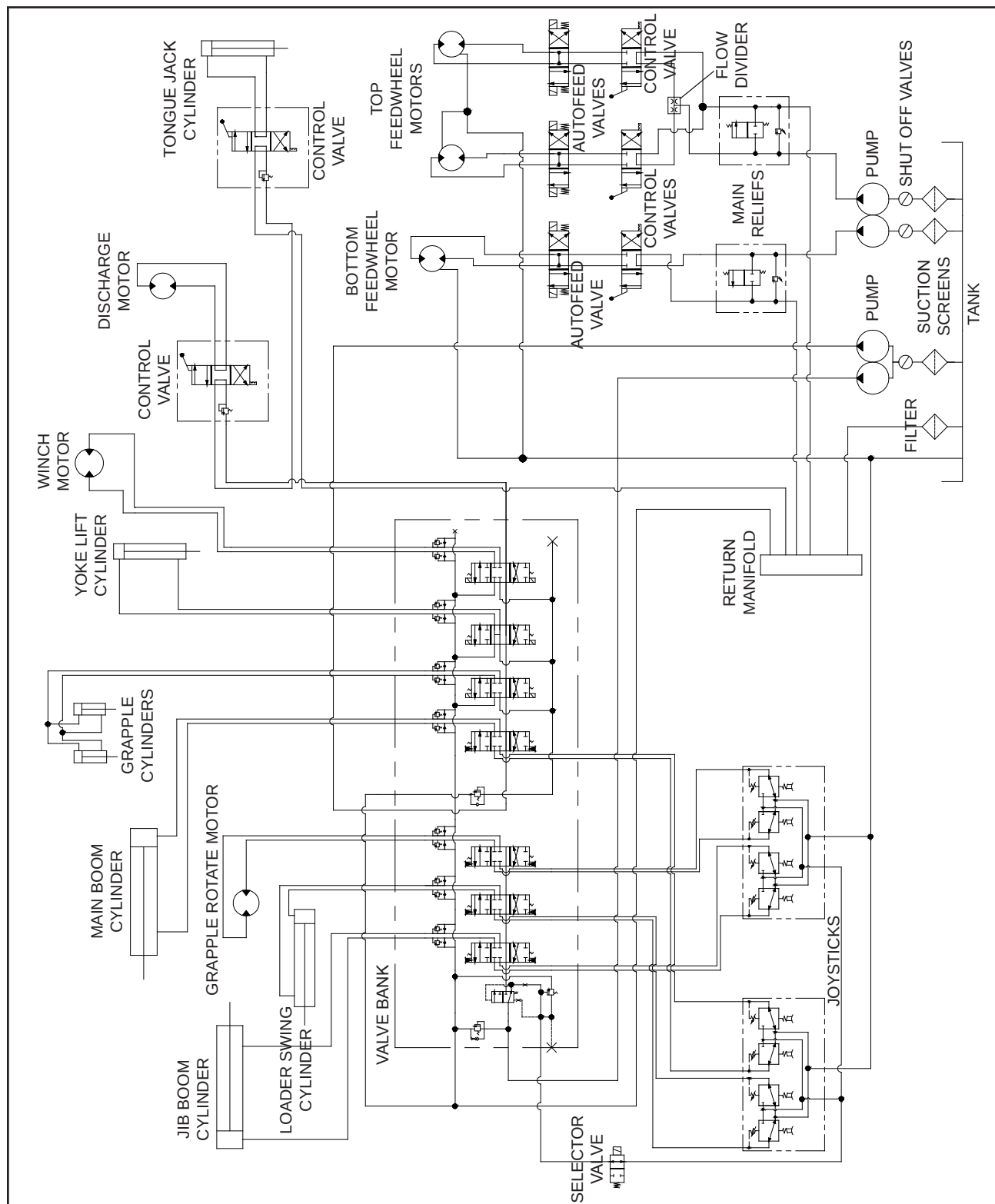


Bandit

2090 With Loader (Pre 4/04)

SPECIFIC SCHEMATIC FUNCTION MAY VARY DEPENDING
ON OPTIONS OR COMPONENT MANUFACTURE.

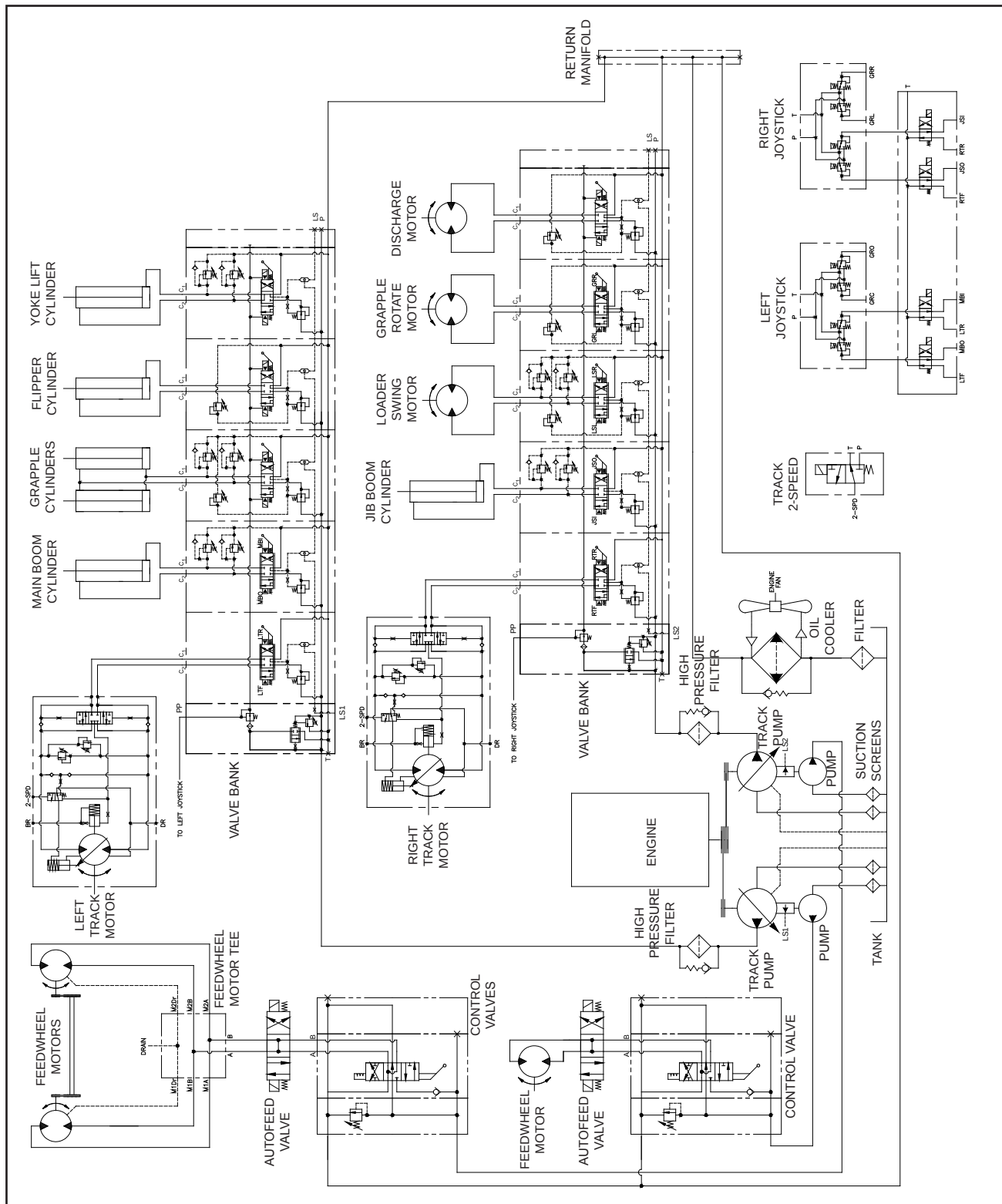
WITH MODEL 75 LOADER & OPTIONAL REAR STABILIZERS



Bandit

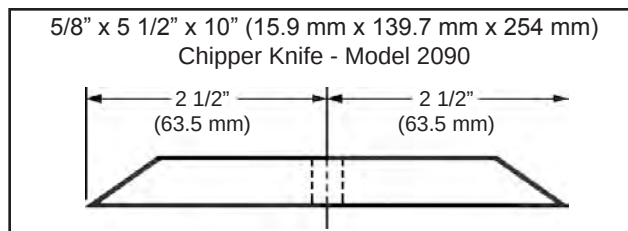
2090 Track

SPECIFIC SCHEMATIC FUNCTION MAY VARY DEPENDING
ON OPTIONS OR COMPONENT MANUFACTURE.


Bandit

CHIPPER SECTION

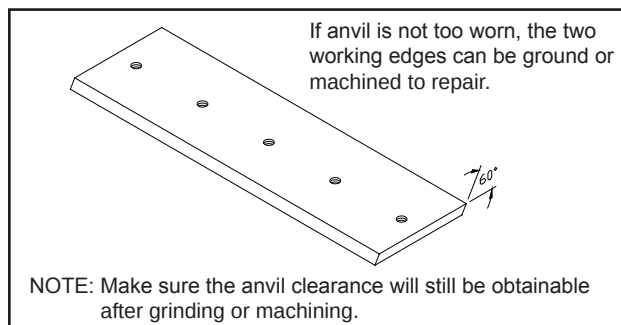
Knives should be replaced in sets. These sets are determined by the amount of resharpening done to the knives. It should be reinstalled with another knife of comparable usage. It helps to keep the disc/drum balanced, and it helps maintain chip quality. **NEVER** allow these knives to wear beyond absolute specified minimum distance from the center line of bolt.



TROUBLE SHOOTING CHIPPER PROBLEMS

1) Chipper Makes Poor Quality Chips or Does Not Feed Properly.

- A. Knives have lost their edge. File, grind or replace knives. **DO NOT** operate the Bandit with dull knives.
- B. Knife anvil worn or needs adjustment. Rotate, repair or replace (see below).
- C. Feedwheel is not operating correctly. (SEE HYDRAULIC TROUBLE SHOOTING).
- D. The throat/base opening is a high-wear area. The feed plate anvil takes much of this wear but other areas wear as well. Attention must be paid to any areas where outer, noncutting edges of chipper knife are exposed. These areas must be built up with weld to maintain the original integrity.
- E. Knives are at the wrong angle. Knives must be ground at a 30° to 30 1/2° angle.
- F. Feedwheel teeth worn (REPLACE).
- G. Material being chipped is very small, dry or rotting. This type of material does not produce good chip quality.



2) Chipper Knife Hits Anvil.

- A. Check the anvil clearance at both sides of the knife by using a feeler gauge, the clearance should be approximately .120" (3 mm) from the highest knife.
- B. Check the chipper bearing bolts for tightness (SEE TORQUE CHART).

3) Discharge Plugs or Does Not Throw Chips Properly.

- A. Lugging engine on large material - keep engine RPM up.
- B. Knives are dull or worn to minimum size.
- C. Obstruction in discharge chute. Patches welded into the chute can cause obstruction of chip flow. Anything causing an obstruction will cause the chute to plug.
- D. Chipping rotting material that has little substance can also plug the discharge chute.
- E. Worn fan blades.

4) Chipper Bearings Running Too Hot.

- A. Improper lubrication - purge bearings once a day with EP-2 Lithium type grease.
- B. Chipper drum operating at too high RPM's. **DO NOT** exceed recommended RPM's.
- C. Bearings worn out (REPLACE).
- D. Bearing locknut is loose.

Bandit

KNIFE GRINDING AND FILING

Only Bandit knives and hardware are recommended for use in your Bandit chippers. Only then can you be assured of a quality product that fits and performs the best to the standards of excellence that is expected from the Bandit chipper.

Chipper knives **MUST** be kept sharp at all times for the ultimate chipper and knife performance. The main cause of poor cutting performance is dull knives.

Dull Knives Cause:

- Excessive waste of engine horsepower
- Bad quality chips; chunks, slivers, etc.
- Excessive strain on knives and knife mounting hardware
- Excessive strain on chipper disc/drum bearings and total machine
- Excessive chipping vibration damaging the machine
- Excessive strain on drives, PTO's, engines, etc.
- Increases the probability of the discharge plugging and decreases the throwing distance
- Loss of time and money

The Dulling Of Chipper Knives Is Caused By:

- Poor quality knives
- Improper anvil to knife clearance
- Force feeding wood faster than chipper will accept
- Dirt, grit, or foreign material on the wood
- Chipper knives ground at wrong angle
- Improper care of knives and knife hardware

These are just a few factors, there are other situations that can lead to the dulling of chipper knives.

NOTICE

Many times a chipper knives cutting edge/point can be brought back to a good edge with a #10 Flat Bastard Mill File. This can reduce the amount of regrinding.

Typical Knife Grinding Angles:

"Bolt-In" Knives = 30° to 30 1/2° Angle

Knives should be replaced in sets. These sets are determined by the amount of resharpening done to the knives (knife width). Regrinding knives reduces the width of the knife. Knife replacement should be done in sets of the same width knives. That will reduce chipping vibration and increase chipping performance.

NOTICE

- Keep knives sharp.
- Keep knife angle correct when grinding.
- Do not over grind so knife is narrower than allowed width, or you will pack wood and break knives.
- Use correct knife size, knife quality, knife mounting hardware, and torque knife mounting hardware to the specified torque.
- Replace knife mounting hardware after (5) times of tightening.

NOTICE

USE CORRECT KNIFE HARDWARE

DO NOT use a size or style chipper knife, bolt or nut other than factory approved for this chipper - see manual.

DO NOT over torque or under torque knife bolts and nuts - see manual.

DO NOT resharpen knife more than minimum width - see manual.

DO NOT use a knife bolt or nut which has been tightened over (5) times - replace.



DO NOT improperly install the knife nuts. Flat surface of nut goes toward the chipper disc.

Bandit

KNIFE CHANGING PROCEDURE

Only Bandit knives and hardware are recommended for use in your Bandit chippers. Only then can you be assured of a quality product that fits and performs the best to the standards of excellence that is expected from the Bandit chipper.

DANGER

Chipper knives are sharp and can be dangerous. It is always necessary for your protection to be extra careful and wear leather gloves when handling knives. Before changing knives make sure all shut down procedures are followed.

1. Before attempting any type of maintenance disengage clutch, install clutch lock if equipped, turn off engine, wait for the disc/drum to come to a complete stop, install the disc/drum lock pin, disconnect battery, and make sure the ignition key is in your possession.
2. Disconnect the chipper hood engine disable plug.
3. Remove the padlock from the hood pin.
4. On disc chippers, recess the spring lock for the hood pin and retract the hood pin. On drum chippers, retract the hood pin.
5. Carefully open the hinged part of the chipper hood. Do not slam the chipper hood to the open position. This will cause damage to the hinge. If the hinge becomes damaged by slamming the hood open, replace the hinge immediately! If the hinge has become damaged, it will cause misalignment of the hood, the chipper disc/drum may hit the hood and cause a serious accident!
6. Changing the chipper knives is a two person job. One person, using a wooden block, holds the chipper knife in place while the other person removes the chipper knife hardware. Remove all of the knives in each pocket.
7. Once the knives have been removed, inspect the knife pocket. Check for secure welds, excessive wear, impact cracks, and elongated bolt holes on disc chippers or the condition of the knife bolt threads on drum chippers. If a problem is found, contact your local dealer or Bandit Industries.
8. Clean out the knife pocket at this time. Remove all debris from the pocket and knife bolt holes.
9. Sharpen, rotate, or replace the chipper knife. Knives should be professionally ground, maintaining angle and dimensional specifications. Knives should be replaced in sets. These sets are determined by the amount of resharpening done to the knives. It should be reinstalled with another knife of comparable usage. It helps to keep the disc/drum balanced, and it helps maintain chip quality. Do not allow the knives to wear beyond the absolute minimum specified distance from the center line of the bolt hole. Reinstall the chipper knives. Make sure to properly torque the knife hardware, see Bolt Torque Chart. Knife mounting hardware must be replaced after maximum of 4 - 5 knife rotations/changes to insure safe clamping ability. All knives and knife mounting hardware must be factory approved.
10. Remove the disc/drum lock pin. Very carefully, manually with a bar, turn the chipper disc/drum to the next knife pocket. Reinstall the disc/drum lock pin.
11. Repeat steps 6 through 10, for each knife pocket.
12. Once the knives have been changed or rotated, check the anvil clearance. Make sure the clearance is maintained to the specified distance from the highest knife. Do Not under any circumstance attempt to rotate the chipper disc/drum while someone is inside the infeed hopper. They may become seriously injured, Do Not Do This!
13. Close the hinged part of the chipper hood and reinstall the hood pin, hood pin padlock, chipper hood disable plug, and on disc chippers make sure the spring lock for the hood pin springs back into position.

LUBRICATION & COOLANT

1) Engine:

Follow original equipment manufacturer's requirements for both changing oils and filters, refer to engine manual specifications.

2) Engine Coolant:

Refer to engine manufacturer's manual specifications.

3) Clutch:

Follow original equipment manufacturer's requirements for both greasing and adjusting. Frequently, adjust and lubricate per PTO manufacturer's manual.

4) Wheel Bearings (if equipped):

Follow axle manufacturer's instructions for greasing wheel bearings.

5) Tracks (if equipped):

Follow track manufacturer's instructions for specific track lubricating procedures.

6) Hydraulic Reservoir Tank:

Completely change hydraulic oil, suction screen(s), and flush the tank annually. Change hydraulic oil filter(s) AFTER FIRST 10 HOURS OF OPERATION. Then change hydraulic oil filter(s) every 3 months or 400 hours thereafter. Maintain hydraulic oil level 7/8 full. See hydraulic oil requirements below. Check hydraulic oil level in tank daily.

7) High Pressure Filter(s) (if equipped):

If machine is equipped, change high pressure oil filter(s) AFTER FIRST 10 HOURS OF OPERATION. Then change high pressure oil filter(s) every 3 months or 400 hours thereafter.

8) Hydraulic Fluid Requirements:

See pages 55 - 56 for hydraulic fluid requirements.

9) Discharge Swivel:

Grease swivel plates for discharge as needed.

10) Hood Hinge:

Make sure the hood hinge operates correctly, and is lubricated. Must replace hinge if damaged.

11) Pivoting And Hinged Areas:

Lubricate all pivoting and hinged areas weekly. (i.e. control handle, discharge flipper, etc.)

12) Pintle Eye Ring:

Keep greased to reduce wear and extend the normal life of your pintle eye ring.

13) Chain Operated Components:

Use a dry lubricant on any chain driven components weekly. (i.e. hydraulic swivel discharge, chain driven feedwheels, etc.)

14) Chipper & Feedwheel Bearings:

Use an EP-2 Lithium type grease only for all bearings. Purge chipper bearings with grease you can not over grease these bearings. Grease feedwheel bearings with one shot of grease. Both types of bearings are designed with a relief system that will not allow over greasing. In other words, you can not hurt the bearing seals by pumping in too much grease. Wipe off excess grease. **Excessive grease will attract dirt.**

Most of the failures related to bearings are diagnosed as "Contamination". Contamination is caused by improper lubrication.

Especially important is proper lubrication when the chipper is setting idle. The bearings must be fully purged when shut down. Then the bearings must be again fully purged each thirty (30) days and the machine allowed to run for approximately 10 minutes. Then fully purged again before the machine is put back into operation. Failure to do this will ruin the bearings. Bearings corrode when the machine is setting idle.

The second largest cause of bearing failure is operating them at high speeds when the grease is cold. This causes the bearing race to turn on the shaft. Naturally this ruins the bearing as well as the shaft. Allow the bearings to turn at slower speeds for at least five minutes. Also check the bearing lock collar set screws or bearing locknut for tightness each 30 days. Loose set screws or locknut allows the race to turn on the shaft. Failed bearings diagnosed as contamination or cold starts at high speed are not covered by warranty of the bearing manufacturer.

15) Feedwheel Slide Box:

Check that feedwheel slide box is working smoothly, oil with 10W/30 type motor oil. Especially new machines need oiling to ensure correct operation during break-in.

16) "Bandit Lever Throttle Cable (if equipped):

If the machine is equipped with a "Bandit" lever throttle system, lubricate inner throttle cable and cable ends with a cable lube or SAE 10W/30 oil every month. Replace throttle cable if it doesn't operate smoothly.

17) Loader (if equipped):

Grease all pins and bushings on loader and grapple daily. Use 1 or 2 shots of EP-2 Lithium type grease. Wipe off excess grease. **Excessive grease will attract dirt.** NOTE: will take grease easier after the loader has been operated.

18) Planetary Speed Reducer (if equipped):

Change gear lube after first 50 hours and 100 hours, then every 6 months or every 1000 hours afterwards. Requires 40 oz. (1.2 L) of 80W/90 type gear lube, keep full.

19) Pump Bearing Block(s) (if equipped):

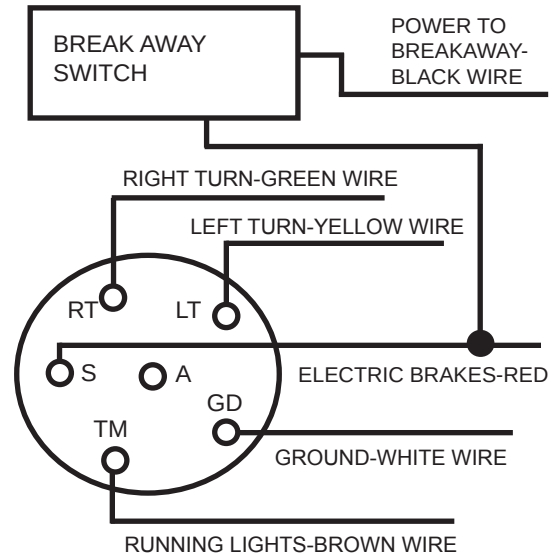
Check and keep the fluid level in the pump bearing block(s) full weekly, use an 80W/90 type gear lube. Pack the female splines of the bearing block(s) every 6 months or every 1000 hours with an EP-2 Lithium type grease.

Bandit

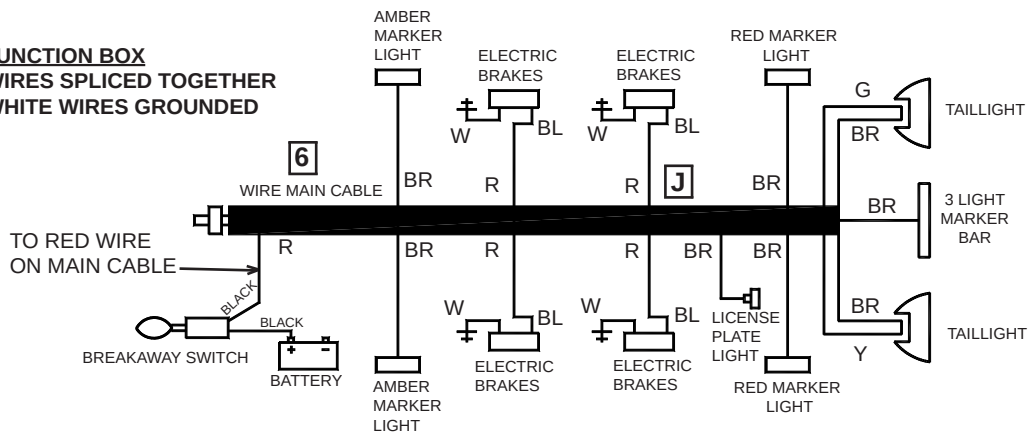
TYPICAL ELECTRICAL WIRING DIAGRAMS

WIRING FOR STANDARD 6 PRONG PLUG AND 6 WIRE MAIN
CABLE EFFECTIVE ON MACHINES BUILT AFTER 11/01/04

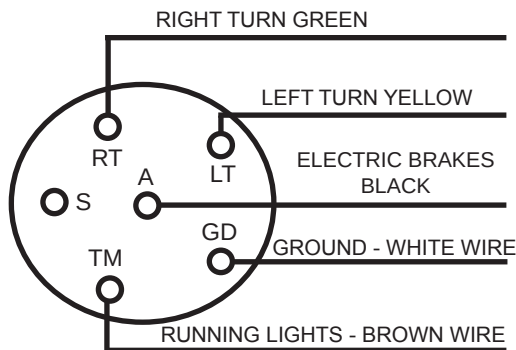
6 Wire Main Cable Color Code
Red R (Brakes & Breakaway Switch)
White W (Ground)
Green G (Right Turn)
Yellow Y (Left Turn)
Brown BR (Running Lights)
Black BL (Power to Breakaway Switch)



J JUNCTION BOX
WIRES SPliced TOGETHER
WHITE WIRES GROUNDED



6 WIRE MAIN CABLE COLOR CODE (OLD STYLE)



OLD STYLE

6 Wire Main Cable Color Code

Black BL (Brakes)
White W (Ground)
Green G (Right Turn)
Yellow Y (Left Turn)
Brown BR (Running Lights)
Red R (Breakaway Switch)

REPLACEMENT PARTS SECTION

Depending on what replacement parts you are ordering
the following information will be needed:

CHIPPER COMPONENTS

Serial Number
Model Number of Chipper

ENGINE COMPONENTS

Brand
Engine Serial Number
Engine Spec. Number

CLUTCH COMPONENTS

Brand
Serial Number
Assembly Number of Clutch

NOTE

When ordering any replacement parts you should have the serial number (S/N) and model of the machine to ensure that you receive the correct replacement part. See page 6 for typical serial number & work order number locations.

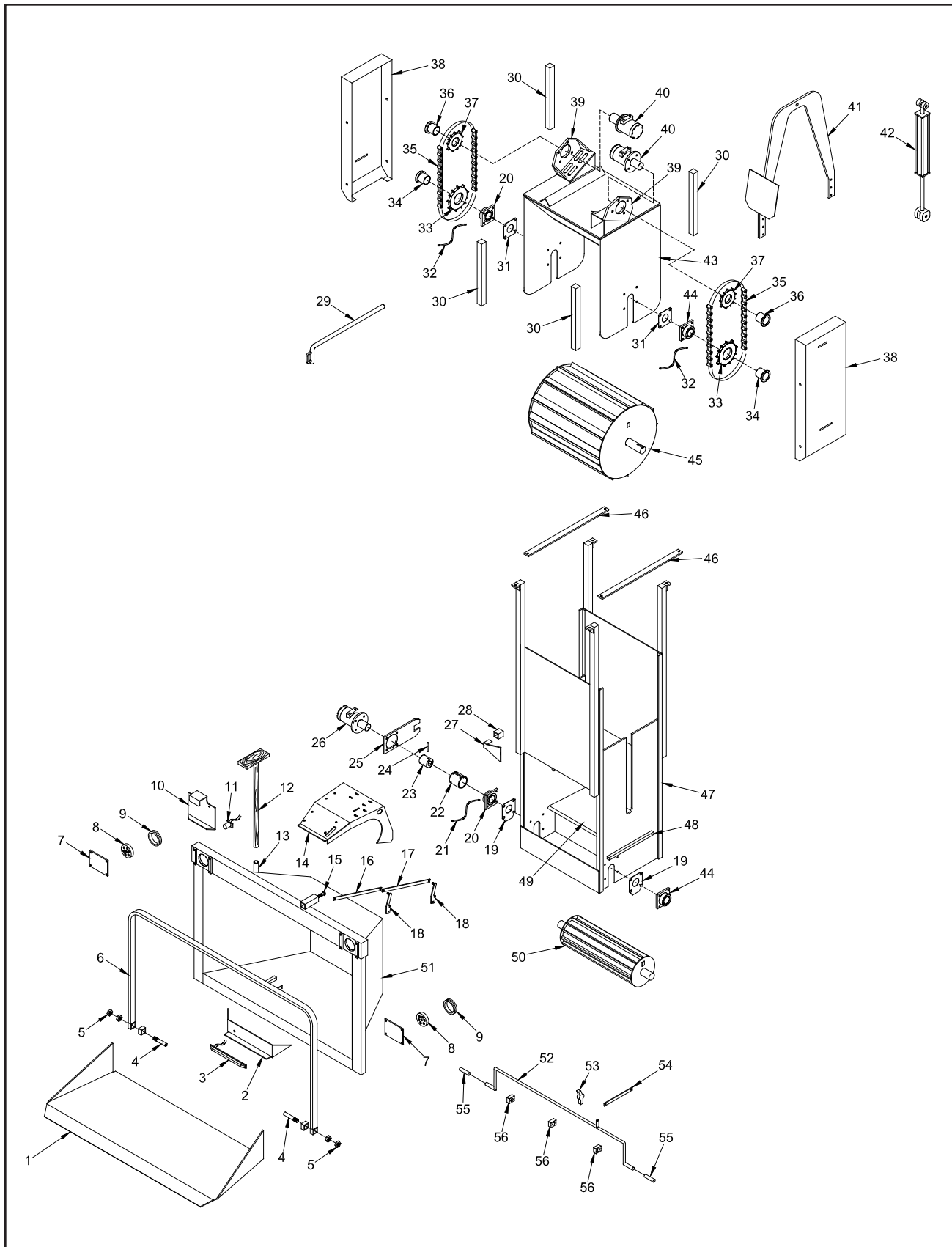
NOTE

All nuts, bolts, washers, and many other components can be ordered by physical description.

NOTE

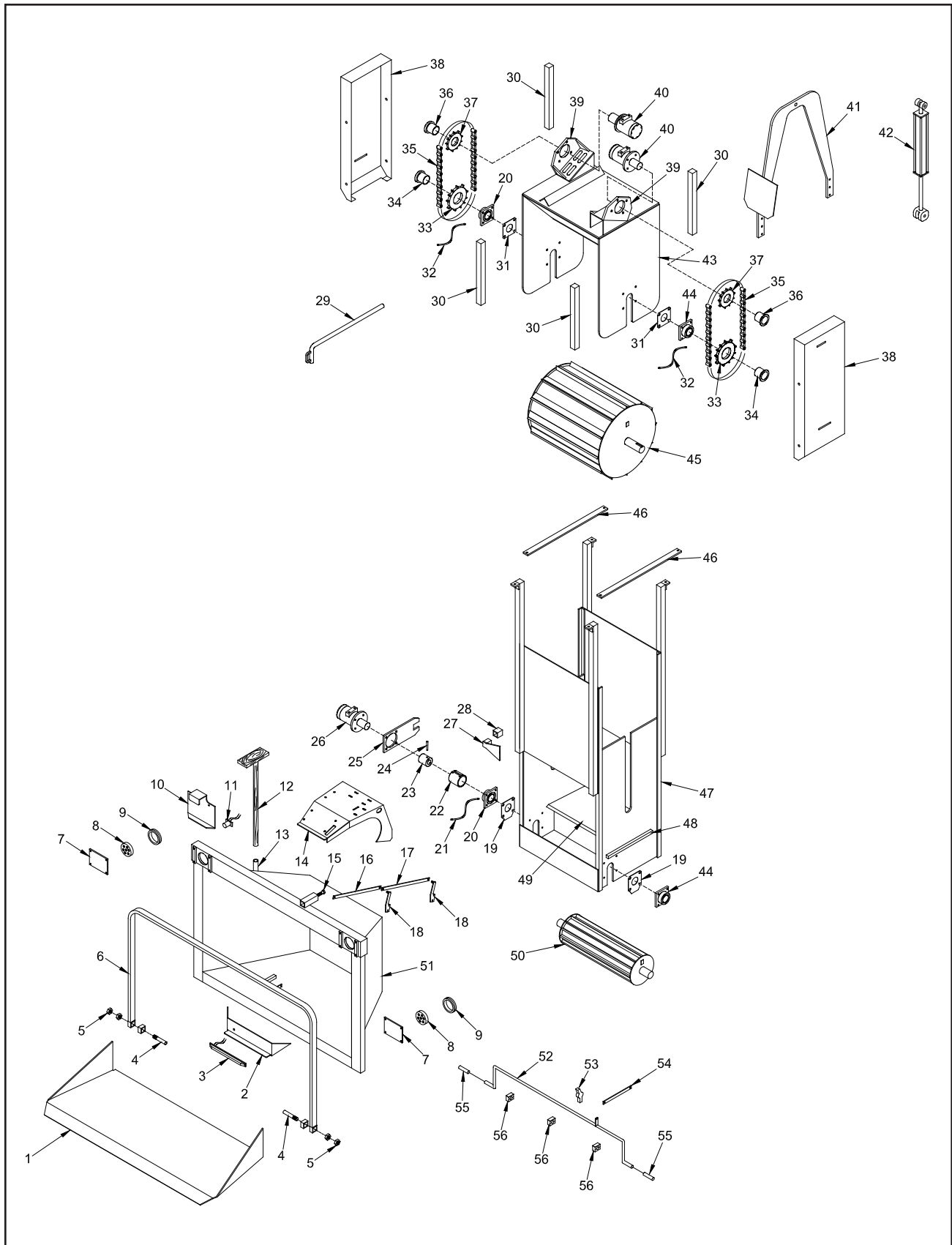
Some of the components shown in this section are for optional equipment and may not apply to every machine.

Bandit Industries Inc. reserves the right to make changes in models, size, design, installations and applications on any part without notification.



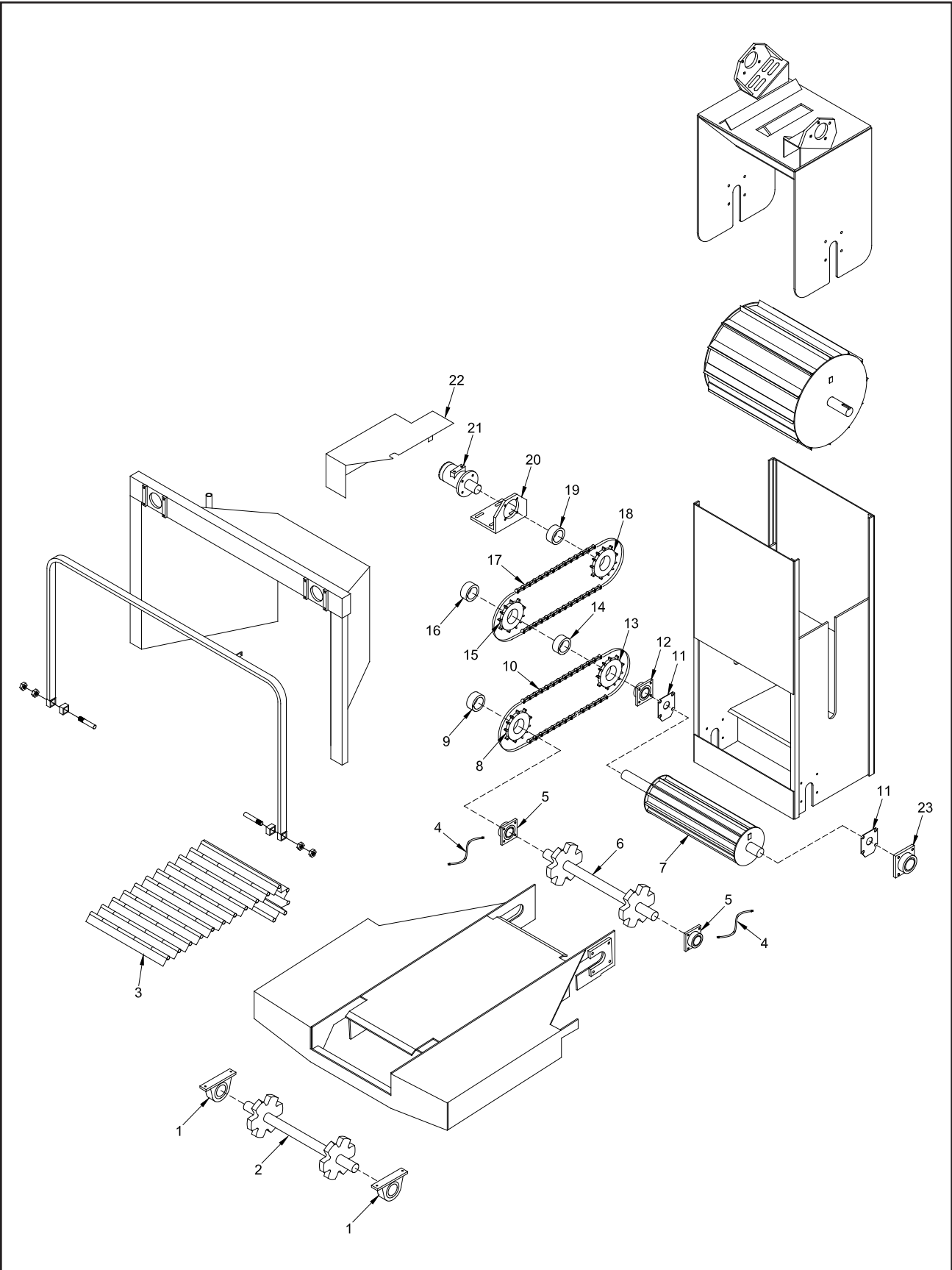
NOTE: Parts may not be exactly as shown.

LOCATION	PART NUMBER	DESCRIPTION
1.	937-1007-93	Weld On Pan For Infeed Hopper
2.	980-300169	Mount For LED 3 Light Bar
3.	900-2909-93	LED 3 Light Bar
4.	955-1016-49	Pivot Pin
5.	900-4900-44	Pivot Pin Jam Nut
6 a.	920-300015	Control Handle - Without Loader
b.	920-300061	Control Handle - With Loader
7.	955-1017-72	Clear Tail Light Cover
8 a.	900-2908-76	LED Tail Light
b.	900-2908-74	Adapter Wire for LED Tail Light (Not Shown)
9.	900-2908-75	Rubber Grommet for LED Tail Light
10.	980-300181	License Plate and Light Mount
11.	900-2900-07	License Plate Light
12.	980-200147	Wooden Push Paddle
13.	980-0122-55	Wooden Push Paddle Mount
14.	955-300392	Winch and Valve Mount
15 a.	900-4912-80	Bolt For Control Handle Stop - 3/4"-10NC x 4"
b.	900-4910-19	Jam Nut For Control Handle Stop - 3/4"-10NC
16.	920-300302	Hydraulic Control Arm - 6 1/2"
17 a.	955-300054	Hydraulic Control Arm Between Valves - 2 Valves (Start 1/04)
b.	937-1009-49	Hydraulic Control Arm Between Valves - 3 Valves (Pre 1/04)
18 a.	980-0125-74	Feedwheel Control Valve Linkage
b.	937-1012-42	Feedwheel Valve Coupler - Cross Valve (1/04 To 6/05)
19 a.	960-0015-09	Bottom Feedwheel Bearing Backer Plate (Start 12/04)
b.	955-1002-14	Bottom Feedwheel Bearing Backer Plate (Pre 12/04)
20 a.	900-1900-34	Feedwheel Bearing (Start 12/04)
b.	900-1904-07	Feedwheel Bearing (Pre 12/04)
c.	900-4900-19	Feedwheel Bearing Bolt
21.	900-3921-02	Grease Line - 13"
22 a.	937-1004-97	Rubber Coupler Guard - 18"
b.	937-1009-94	Coupler Guard Mount (Not Shown)
23.	937-1004-32	Coupler With Motor Nut and Taper Pin
24.	900-4905-56	Taper Pin Only
25 a.	955-300103	Bottom Torque Arm 15 3/4" Long
b.	955-1014-00	Bottom Torque Arm 10" Long
26 a.	900-3917-18	Bottom Feedwheel Hydraulic Motor
b.	500018254	Lock Nut For Feedwheel Hydraulic Motor
27 a.	937-1004-71	Bottom Torque Arm Stop
b.	937-300316	Torque Arm Cushion Mount (Start 4/06)
c.	955-1014-01	Torque Arm Stop Block (Pre 4/06)
28.	937-900009	Torque Arm Cushion (Start 4/06)
29.	937-1005-51	Yoke Lock Pin
30 a.	937-300285	Yoke Slide - 2" x 2" x 24" (Start 9/05)
b.	955-300405	Yoke Slide - 1" x 1" x 24" (2/03 To 9/05)
c.	980-0510-10	Yoke Roller Assembly - Specify Right Or Left Hand (Not Shown) (Pre 2/03)
31.	955-1002-13	Top Feedwheel Bearing Backer Plate - Optional
32.	900-3921-02	Grease Line - 13"



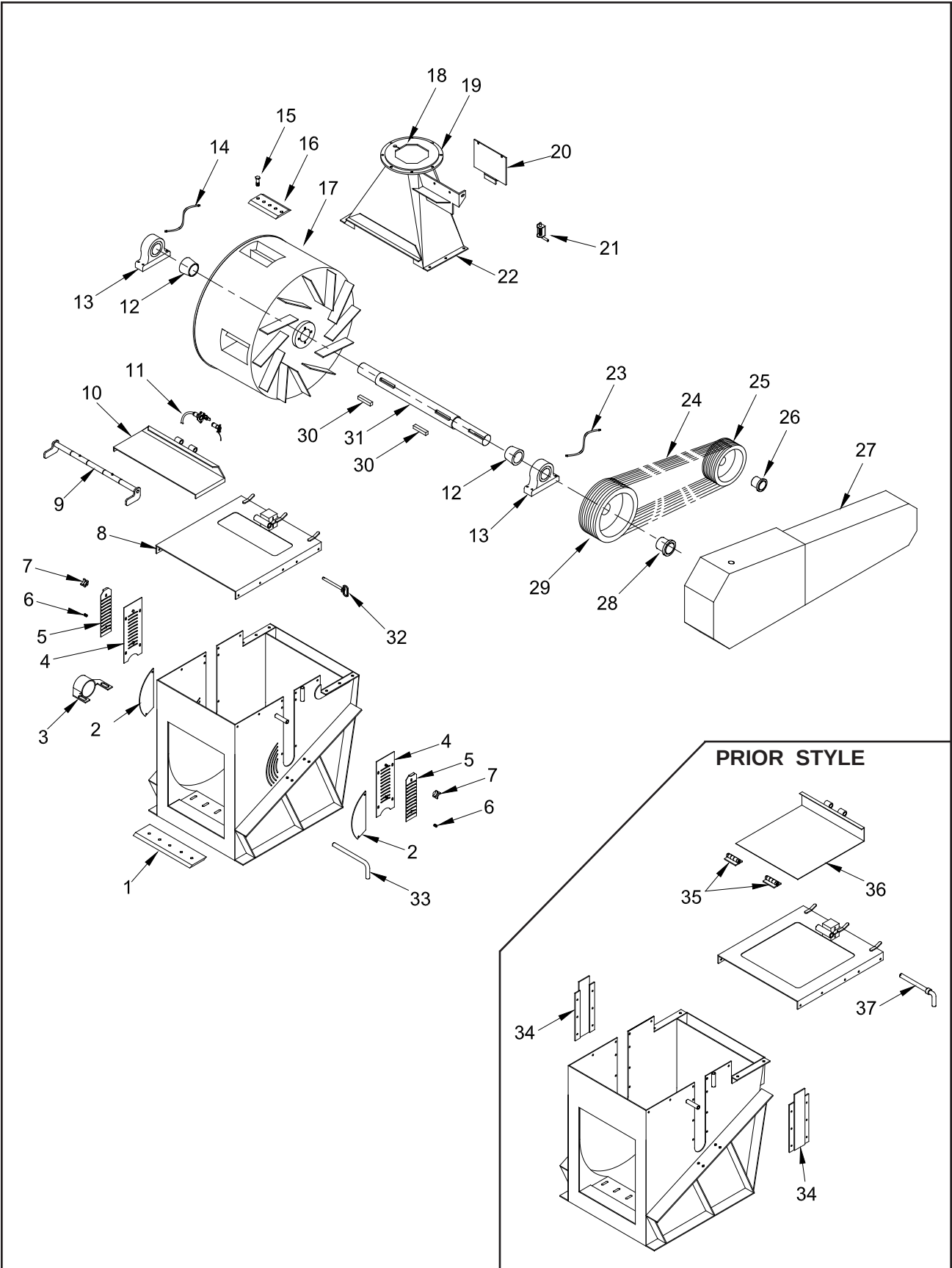
NOTE: Parts may not be exactly as shown.

LOCATION	PART NUMBER	DESCRIPTION
33.	900-1906-99	Top Feedwheel Sprocket (48 Teeth)
34.	900-1900-08	Top Feedwheel Bushing
35 a.	900-1901-39	Top Feedwheel Drive Chain (80-2) - 91" (Start 9/05)
b.	900-1901-39	Top Feedwheel Drive Chain (80-2) - 83" (4/03 To 9/05)
c.	900-1901-39	Top Feedwheel Drive Chain (80-2) - 108" (Pre 4/03)
d.	900-1905-62	Master Link (Not Shown)
e.	900-1905-61	Half Link (Not Shown)
36.	900-1901-36	Top Feedwheel Hydraulic Motor Bushing
37.	900-1901-35	Top Feedwheel Hydraulic Motor Sprocket (14 Teeth)
38 a.	937-300291	Top Feedwheel Chain Guard (Start 9/05)
b.	937-1011-42	Top Feedwheel Chain Guard (4/03 To 9/05)
c.	937-0501-54	Top Feedwheel Chain Guard (Pre 4/03)
d.	937-0501-44	Top Feedwheel Chain Guard (S/N 1403 & 1414 Only)
39.	955-0500-72	Mount For Top Feedwheel Hydraulic Motor
40.	900-3906-29	Top Feedwheel Hydraulic Motor
41 a.	937-300284	Yoke Lift Lug (Start 4/03)
b.	937-1007-07	Yoke Lift Lug (Pre 4/03)
c.	937-1009-79	Yoke Lift Rubber Guard (Pre 4/03) (Not Shown)
42 a.	900-3925-07	Yoke Lift Cylinder-Welded
b.	900-3917-55	Yoke Lift Cylinder-Tie Rod Ends
c.	904-0007-14	Pin For Welded Cylinder (Not Shown)
d.	900-4913-23	Rubber Washer - Top Of Cylinder (Not Shown)
43 a.	920-200022	Top Yoke Assembly (Start 9/05)
b.	937-0501-83	Top Yoke Assembly (4/03 To 9/05)
c.	937-0501-22	Top Yoke Assembly (Pre 4/03)
44 a.	900-1900-34	Feedwheel Bearing (Start 12/04)
b.	900-1904-07	Feedwheel Bearing (Pre 12/04)
c.	900-4900-19	Feedwheel Bearing Bolt
45 a.	937-0501-24	Top Feedwheel Assembly
b.	937-1007-63	Top Feedwheel Tooth
c.	937-1008-38	Top Feedwheel Shaft
46.	937-1011-04	Yoke Support Strap
47 a.	920-200021	Feedwheel Slide Box Assembly (Start 9/05)
b.	937-0502-22	Feedwheel Slide Box Assembly (4/03 To 9/05)
c.	937-0501-23	Feedwheel Slide Box Assembly (Pre 4/03)
48.	937-1006-36	Yoke Stop Block
49.	920-300016	Bottom Feedwheel Scraper Bar
50 a.	937-0501-09	Bottom Feedwheel Assembly
b.	937-1007-50	Bottom Feedwheel Tooth
c.	937-0501-07	Bottom Feedwheel Shaft & Coupler Assembly
51.	920-200056	Infeed Hopper Assembly
52.	980-300065	Dual Yoke Lift Control Bar
53.	900-3930-96	Short Valve Handle - Lift Cylinder Control Linkage
54.	980-300157	Control Arm - Dual Yoke Lift - 12 1/2"
55.	900-7900-96	Rubber Cap - Dual Yoke Lift Control Bar
56.	900-3914-02	Clamp - Lift Control Bar



NOTE: Parts may not be exactly as shown.

LOCATION	PART NUMBER	DESCRIPTION
1.	900-1906-33	Infeed Conveyor Tail Shaft Bearing
2.	955-0501-65	Infeed Conveyor Tail Shaft Assembly
3 a.	955-0501-68	Infeed Conveyor Complete Chain Assembly
b.	900-0501-47	Infeed Conveyor Single Chain Assembly
c.	955-1013-25	Pin (Not Shown)
d.	900-4904-51	Set Screw (Not Shown)
4.	900-3921-02	Grease Line - 13"
5 a.	900-1900-34	Bearing For Infeed Conveyor Head Shaft (Start 2/06)
b.	900-1904-07	Bearing For Infeed Conveyor Head Shaft (Pre 2/06)
6.	955-300504	Infeed Conveyor Head Shaft Assembly
7 a.	920-200011A	Bottom Feedwheel Assembly With Conveyor
b.	937-1007-63	Bottom Feedwheel Tooth
c.	920-300078	Bottom Feedwheel Shaft
8.	900-1907-97	Infeed Conveyor Sprocket
9.	900-1900-08	Infeed Conveyor Bushing
10 a.	900-1909-78	Infeed Conveyor Drive Chain
b.	900-1910-16	Master Link (Not Shown)
c.	900-1910-15	Half Link (Not Shown)
11 a.	960-0015-09	Bottom Feedwheel Bearing Backer Plate (Start 12/04)
b.	955-1002-14	Bottom Feedwheel Bearing Backer Plate (Pre 12/04)
12 a.	900-1900-34	Feedwheel Bearing (Start 12/04)
b.	900-1909-64	Feedwheel Bearing (Grip-Tight Style) (Pre 12/04)
c.	900-1904-07	Feedwheel Bearing (Set Screw Style) (Pre 12/04)
d.	900-4900-19	Feedwheel Bearing Bolt (Not Shown)
13.	900-1907-97	Bottom Feedwheel Sprocket - Conveyor Drive
14.	900-1900-08	Bottom Feedwheel Bushing - Conveyor Drive
15.	900-1907-97	Bottom Feedwheel Sprocket - Feedwheel Drive
16.	900-1900-08	Bottom Feedwheel Bushing - Feedwheel Drive
17 a.	900-1909-78	Bottom Feedwheel Drive Chain
b.	900-1910-16	Master Link (Not Shown)
c.	900-1910-15	Half Link (Not Shown)
18.	900-1907-97	Bottom Feedwheel Motor Sprocket
19.	900-1900-08	Bottom Feedwheel Motor Bushing
20.	955-0500-72	Bottom Feedwheel Motor Mount
21.	900-3906-29	Bottom Feedwheel Motor
22.	920-200023	Chain Guard - Bottom Feedwheel & Conveyor Drive
23 a.	900-1900-34	Feedwheel Bearing (Start 12/04)
b.	900-1904-07	Feedwheel Bearing (Set Screw Style) (Pre 12/04)
c.	900-4900-19	Feedwheel Bearing Bolt (Not Shown)



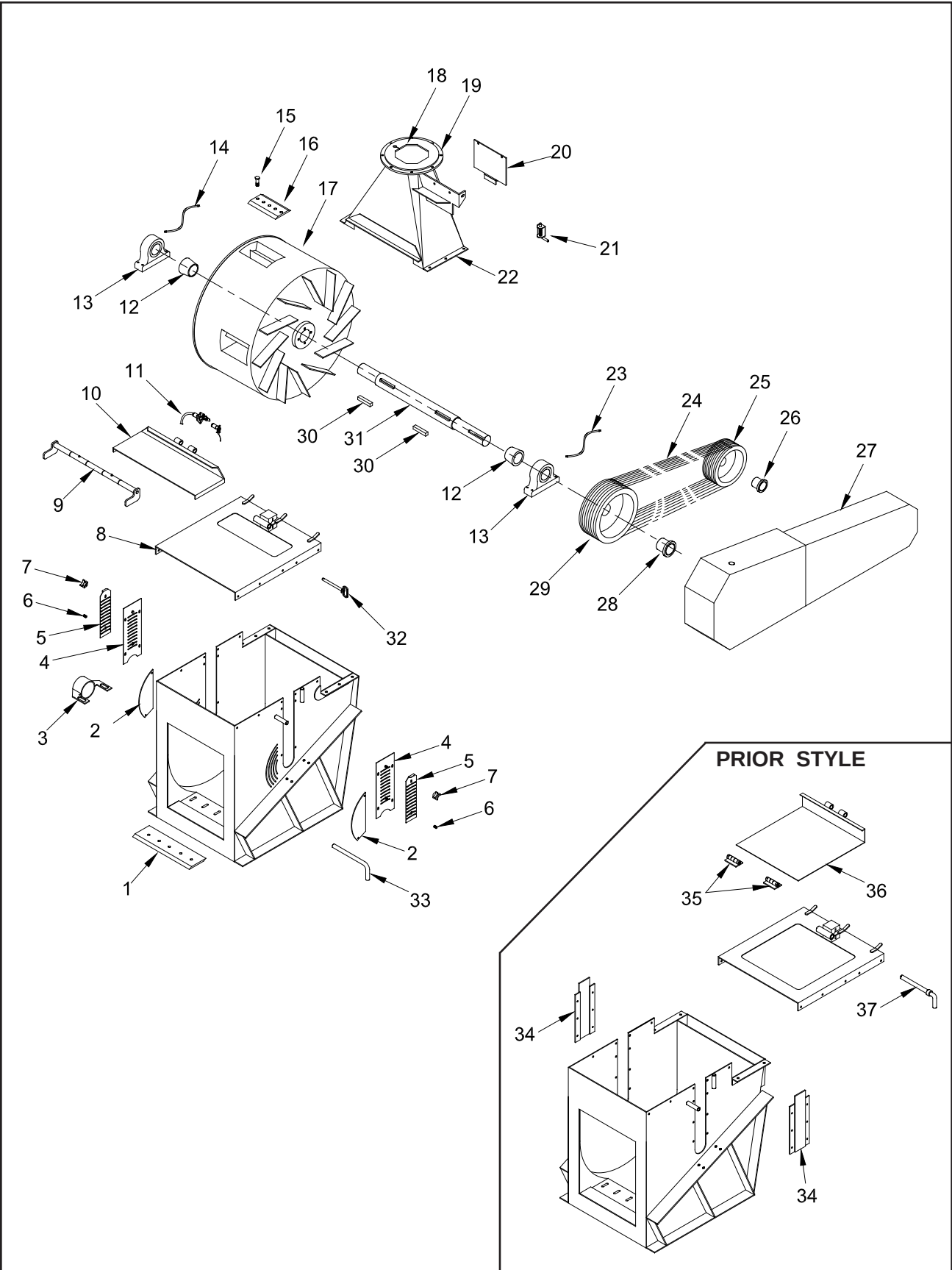
NOTE: Parts may not be exactly as shown.

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LOCATION	PART NUMBER	DESCRIPTION
1.	See Page 91	Anvil
2.	911-1001-88	Vent Cover
3.	920-200033	Drum Shaft Bearing Cover
4 a.	937-1012-38	Base Slot Cover (Up through 250 Hp)
b.	920-300066	Base Slot Cover (275 Hp and over)
5 a.	937-300007	Air Vent Cover - Steel
b.	937-300008	Air Vent Cover - Aluminum
c.	937-100001	Air Vent Cover Kit - Steel (Includes Two Pieces Of 5,6,7)
d.	937-100000	Air Vent Cover Kit - Aluminum (Includes Two Pieces Of 5,6,7)
6.	900-4908-33	Spring For Vent Cover
7.	900-4908-29	Plastic Knob For Vent Cover
8 a.	937-1011-77	Base Top
b.	920-300026	Base Top (2090 Track)
9 a.	937-200086	Hood Door Hinge Kit (Includes 9b - 9f) (Start 8/06)
b.	937-300304	Pin For Hood Door Hinge
c.	937-300301	Side Mount For Hood Door Hinge
d.	937-300302	Tube For Hood Door Hinge
e.	937-300307	Tube With Grease Zerk Hole For Hood Door Hinge
f.	900-4911-84	Grease Zerk For Hood Door Hinge
10 a.	937-300032	Hood Door
b.	920-300025	Hood Door (2090 Track)
11 a.	980-0509-04	Chipper Hood Engine Disable Plug Ass'y
b.	900-2904-13	6-Prong Female Plug Only
c.	980-100083	6-Prong Male Plug With Wire Loop & Crimp Sleeves
12 a.	900-1906-32	Chipper Drum Bearing (Up through 250 Hp)
b.	900-1906-51	Chipper Drum Bearing (275 Hp and over)
c.	900-1905-97	Chipper Drum Bearing (S/N 1403 Only)
d.	900-4910-41	3/4"-10NC x 5" Bolt - Chipper Drum Bearing Road Side Only (Not Shown)
e.	900-4910-34	3/4"-10NC x 4 1/2" Bolt - Chipper Drum Bearing Curb Side Only (Not Shown)
f.	900-4903-21	3/4" Mill Carb Washer - Chipper Drum Bearing (Not Shown)
g.	900-4910-19	3/4"-10NC Jam Nut - Chipper Drum Bearing Road Side Only (Not Shown)
h.	900-4901-23	3/4"-10NC Nut - Chipper Drum Bearing (Not Shown)
13 a.	900-1907-17	Drum Head Bushing (Up through 250 Hp)
b.	900-1911-83	Drum Head Bushing (275 Hp and over)
c.	900-1906-26	Drum Head Bushing (S/N 1403 Only)
14.	900-3934-25	Chipper Bearing Grease Line - Road Side
15.	See Page 90	Chipper Knife Bolt
16.	See Page 90	Chipper Knife
17 a.	937-0501-62	Chipper Drum Head Assembly With Shaft (Up through 250 Hp)
b.	920-200034	Chipper Drum Head Assembly With Shaft (275 Hp and over)
c.	937-0500-40	Chipper Drum Head Assembly With Shaft (S/N 1403 Only)
d.	937-200035	Chipper Drum Head Assembly With Shaft (2090 Track, S/N 1744 Only)
18.	937-1005-63	Bottom Swivel Flange
19 a.	980-0128-24	Bottom Swivel Ring For Manual Swivel Discharge
b.	980-0128-23	Bottom Swivel Ring For Hand Crank Swivel Discharge
c.	980-0122-18	Bottom Swivel Ring For Hydraulic Swivel Discharge
20.	937-0501-31	Optional Clean Out Door Assembly

NOTE: Nuts, bolts, washers, and all other components can be ordered by physical description.

**** Components vary with engine options order by physical description or machine S/N.**

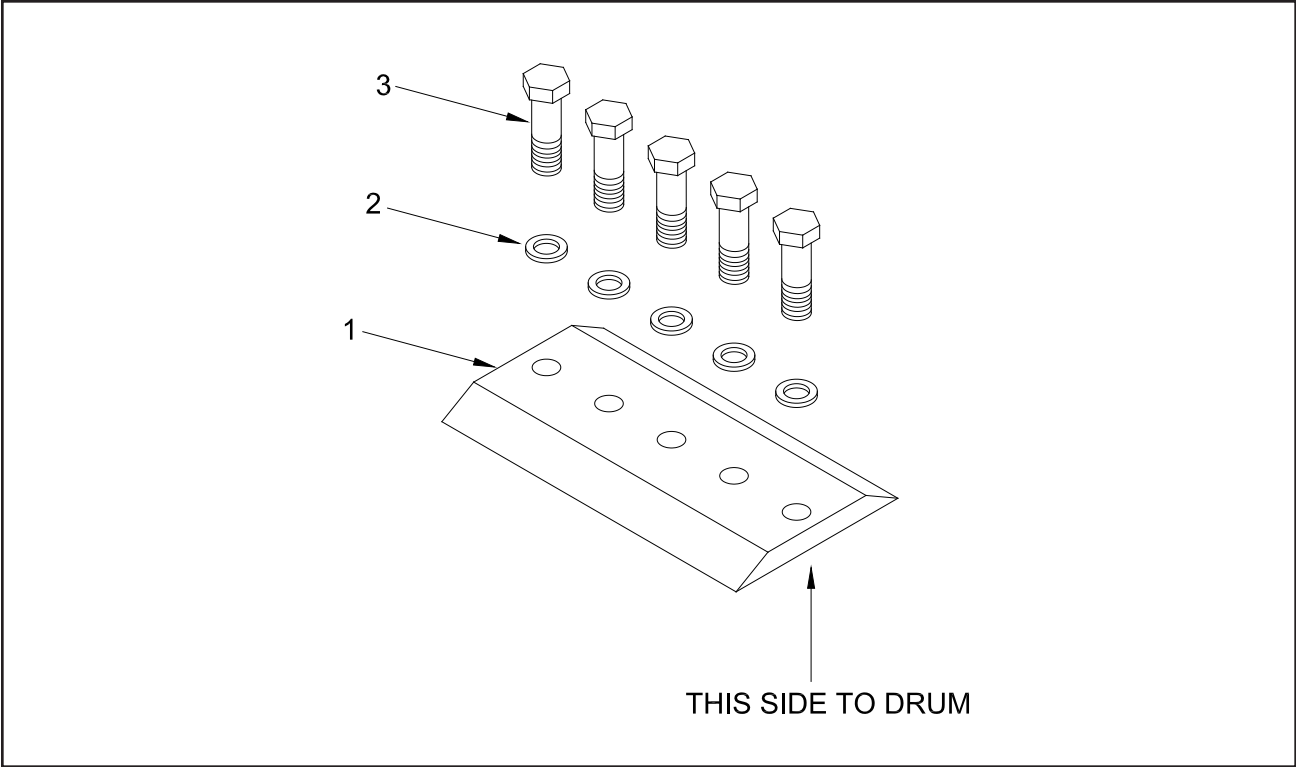


NOTE: Parts may not be exactly as shown.

LOCATION	PART NUMBER	DESCRIPTION
21 a.	900-4904-90	Discharge Spring Lock
b.	900-7900-96	Rubber Cap (Not Shown)
22.	937-0500-41	Transition Assembly (Specify Discharge Swivel Type)
23.	900-3921-02	Chipper Bearing Grease Line - Curb Side
24.	**	Chipper Belts
25.	**	Engine Sheave
26.	**	Engine Sheave Bushing
27 a.	920-200032	Beltshield Assembly (Up through 275 Hp)
b.	920-200031	Beltshield Assembly (300 Hp and over)
c.	937-0501-68	Beltshield Assembly (S/N 1403 & 1415 Only)
d.	920-200029	Beltshield Engine Sheave Half (Up through 275 Hp)
e.	920-200028	Beltshield Engine Sheave Half (300 Hp and over)
f.	920-200030	Beltshield Chipper Sheave Half
28.	**	Chipper Sheave Bushing
29.	**	Chipper Sheave
30 a.	900-1907-51	Key For Drum Head Shaft (Up through 250 Hp)
b.	920-300064	Key For Drum Head Shaft (275 Hp and over)
c.	937-1004-19	Key For Drum Head Shaft (S/N 1403 Only)
31 a.	937-1008-69	Drum Head Shaft (Up through 250 Hp)
b.	920-300184	Drum Head Shaft (275 Hp and over)
c.	937-1004-17	Drum Head Shaft (S/N 1403 Only)
d.	920-300065	Drum Head Shaft (2090 Track, S/N 1744 Only)
32 a.	911-100000	Hood Pin With Attaching Chain
b.	900-4902-20	Padlock For Hood Pin (Not Shown)
c.	P812	Key For Padlock (Not Shown)
33 a.	955-1003-94	Drum Lock Pin
b.	900-7900-96	Rubber Cap (Not Shown)
34.	937-0500-07	Base Strap (S/N 1403 - 1479)
35.	937-1002-82	Hood Door Hinge (Pre 8/06)
36.	937-1002-48	Hood Door (S/N 1403 - 1479)
37 a.	937-1002-79	Hood Pin (S/N 1403 - 1479)
b.	937-0502-42	Hood Pin, Attaching Chain, & Male Disable Plug (S/N 1403 - 1479)

NOTE: Nuts, bolts, washers, and all other components can be ordered by physical description.

**** Components vary with engine options order by physical description or machine S/N.**



KNIFE BOLTS MUST BE INSTALLED THROUGH KNIFE AS SHOWN

Part Numbers For Model 2090 Knives

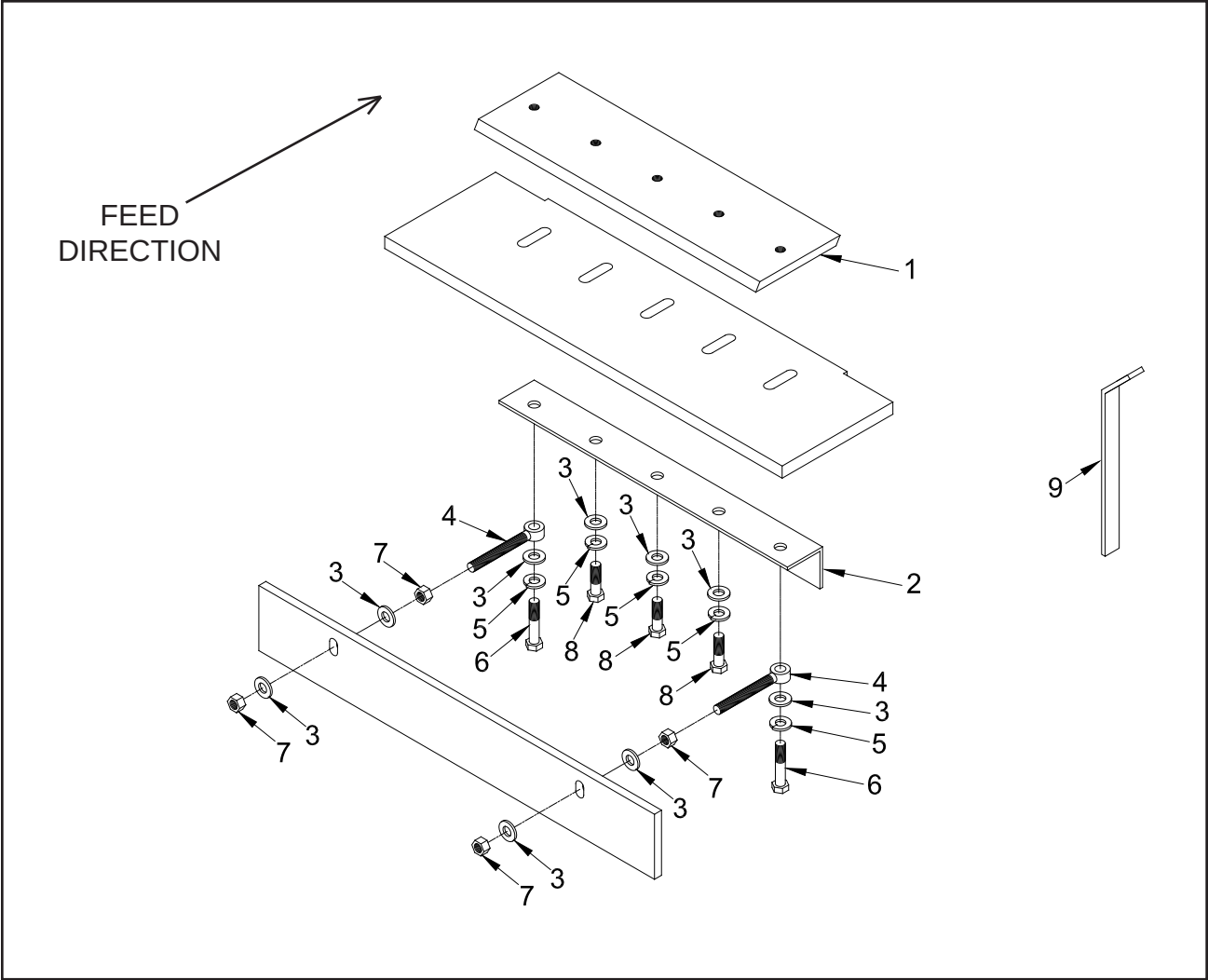
LOCATION	PART NUMBER	DESCRIPTION
1.	900-9902-27	5/8" x 5 1/2" x 10" Chipper Knife
2.	900-4901-32	5/8" Mill Carb Washer
3.	900-4900-20	5/8"-11NC x 2" Knife Bolt

NOTE: Torque Knife Bolts to 180 ft.-lbs. (245 Nm)

Part Numbers For Miscellaneous Knife Parts

LOCATION	PART NUMBER	DESCRIPTION
4.	900-9901-68	Knife Saver Kit (Not Shown)
5.	900-9901-65	File For Knife Saver Kit Only (Not Shown)
6.	900-9901-63	Replacement Blades For Knife Saver (Not Shown)

NOTE: Parts may not be exactly as shown.

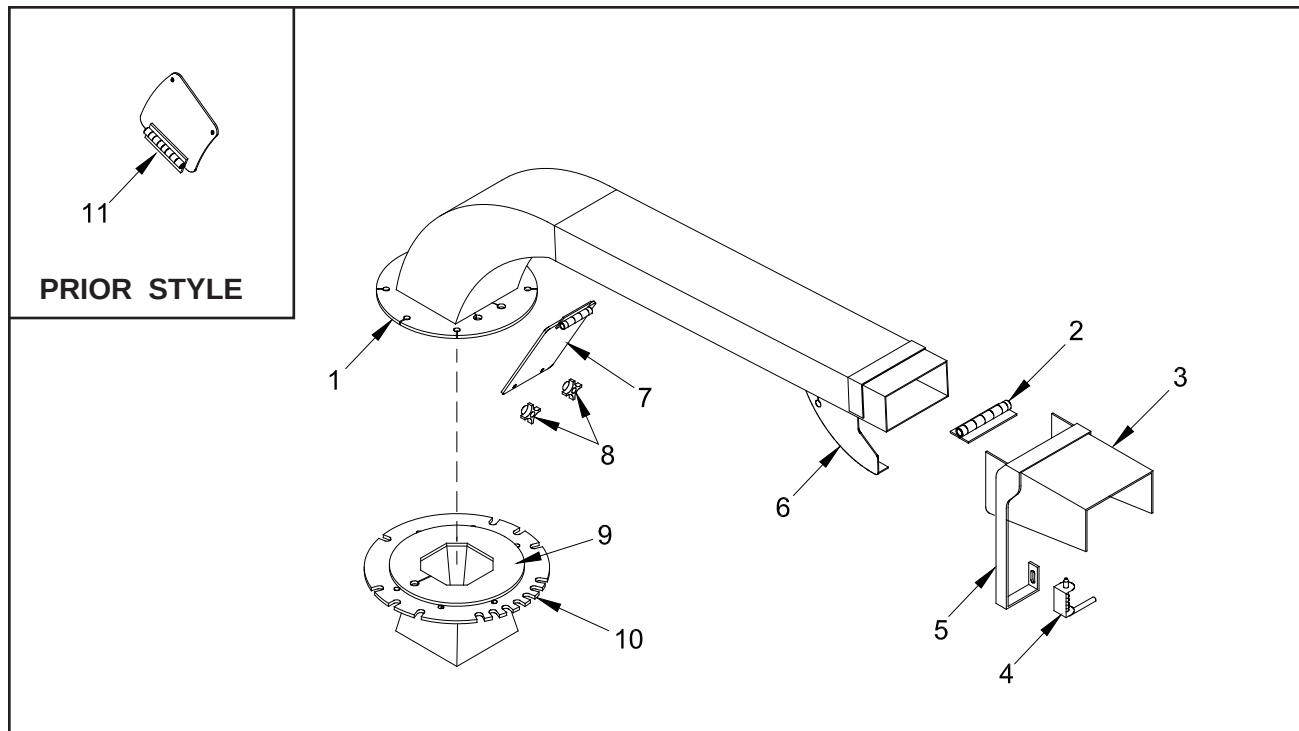


LOCATION	PART NUMBER	DESCRIPTION
1 a.	937-1001-72	Anvil Only
b.	937-1004-37	"AR" Anvil Only
2.	937-1001-74	Anvil Clamp Plate
3.	900-4909-18	1/2" Mill Carb Washer
4 a.	900-4907-91	Anvil Eye Bolt - 1/2"-13NC x 4 1/2" (Current)
b.	900-4902-73	Anvil Eye Bolt - 1/2"-13NC x 5 1/2" (Prior)
5.	900-4902-11	1/2" Lock Washer
6.	900-4903-17	1/2"-13NC x 2 1/2" Hex Head Bolt
7.	900-4900-45	1/2"-13NC Hex Nut
8.	900-4906-74	1/2"-13NC x 2" Hex Head Bolt
9.	981-1006-25	Anvil Gauge
10.	904-0003-90	Anvil Hardware Kit Only (Includes 3 - 8)
11.	937-0501-64	Anvil and Hardware Kit (Includes 1a & 3 - 8)

NOTE: Torque Anvil Bolts to 75 ft.-lbs. (102 Nm)

NOTE: Parts may not be exactly as shown.

STANDARD DISCHARGE



LOCATION	PART NUMBER	DESCRIPTION
1.	980-0127-33	Discharge Bottom Swivel Ring
2.	981-1001-63	Discharge Deflector Hinge
3 a.	937-1009-10	12" Discharge Deflector Assembly
b.	937-0502-24	12" Enclosed Discharge Deflector Assembly
c.	937-0501-63	12" Enclosed Discharge Flipper Assembly For Hydraulic Flipper
4.	900-4901-83	Discharge Deflector Adjusting Spring
5.	937-1009-14	Adjusting Spring Mount
6 a.	980-0510-23	Adjusting Spring Lock Plate Assembly For Standard Flipper
b.	980-0510-24	Adjusting Spring Lock Plate Assembly For Enclosed Flipper
7.	980-300616	Optional Clean Out Door (Optional On All Discharges)
8.	900-4908-29	Plastic Knob For Optional Clean Out Door
9.	980-300424	Bottom Swivel Ring
10.	937-1005-63	Bottom Swivel Flange
11.	980-0509-94	Optional Clean Out Door Assembly (Pre 9/06)
12 a.	900-4911-04	Discharge Transport Bolt - 5/8"-11NC x 1 1/2" (Not Shown)
b.	900-4903-25	Discharge Transport Nut - 5/8"-11NC (Not Shown)

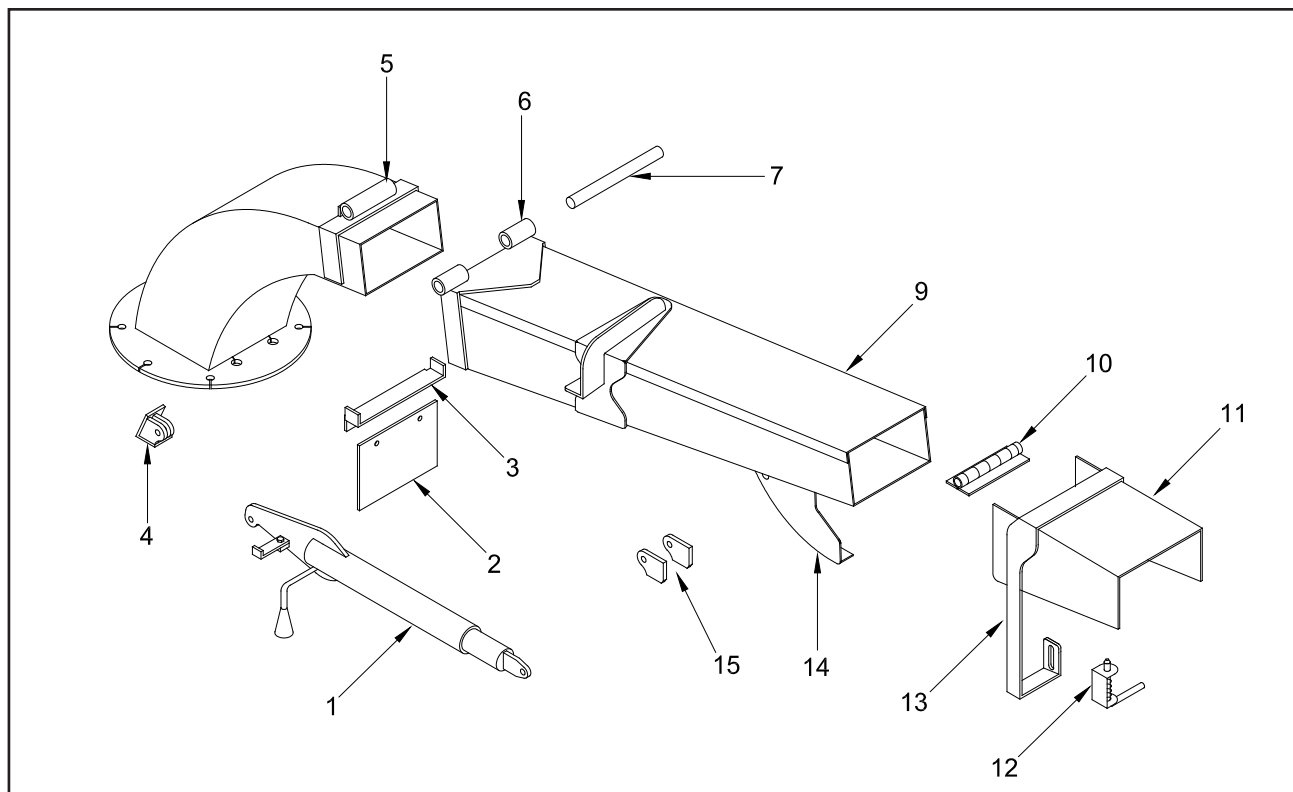
DISCHARGE ASSEMBLIES

LOCATION	PART NUMBER	DESCRIPTION
1.	937-0500-14	Standard Discharge Assembly
2.	937-0500-19	Hand Crank And Adjustable Height Discharge Assembly
3.	937-0500-16	Hand Crank Discharge Assembly
4.	937-0500-18	Hydraulic Swivel And Adjustable Height Discharge Assembly
5.	937-0500-15	Hydraulic Swivel Discharge Assembly
6.	937-0500-17	Adjustable Height Discharge Assembly

NOTE: Parts may not be exactly as shown.

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HAND CRANK ADJ. HEIGHT DISCHARGE

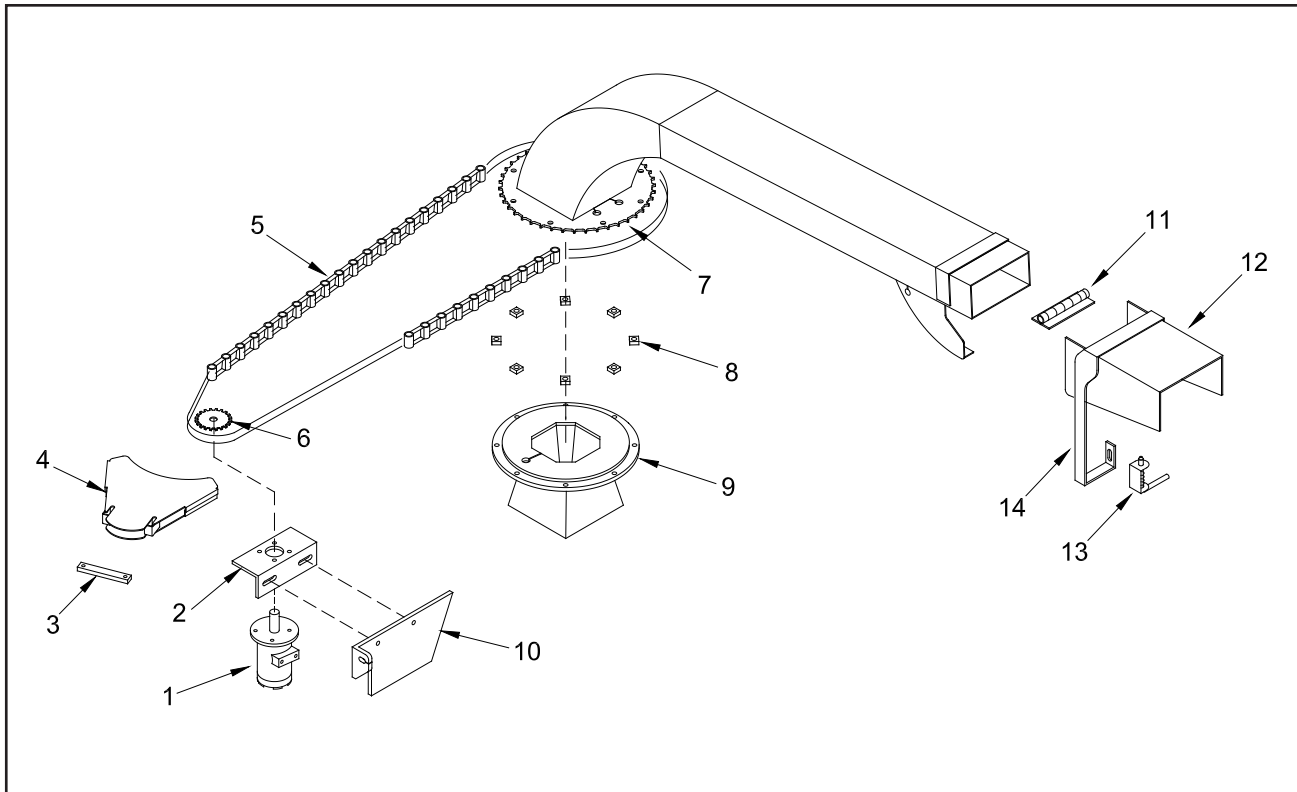


LOCATION	PART NUMBER	DESCRIPTION
1 a.	980-0510-86	Hand Crank For Adj. Height Discharge - Mounted On The Side
b.	980-0508-51	Hand Crank For Adj. Height Discharge - Mounted Underneath
2.	980-0126-12	Rubber Discharge Guard
3.	937-300318	Rubber Discharge Guard Mount
4.	980-300032	Hand Crank Adj. Height Mount Brackets
5.	980-300210	Hand Crank Adj. Height Hinge Large Hinge Tube
6.	980-300211	Hand Crank Adj. Height Small Hinge Tube
7.	980-300209	Hand Crank Adj. Height Hinge Pin
8.	980-200091	Hand Crank Adj. Height Hinge Assembly (Includes #'s 5 - 7)
9.	937-0501-65	Straight Section Hand Crank Adj. Height Discharge
10.	981-1001-63	Discharge Flipper Hinge
11 a.	937-1009-10	12" Discharge Flipper Assembly
b.	937-0502-24	12" Enclosed Discharge Flipper Assembly
c.	937-0501-63	12" Enclosed Discharge Flipper Assembly For Hydraulic Flipper
12.	900-4901-83	Discharge Flipper Adjusting Spring
13.	937-1009-14	Adjusting Spring Mount
14 a.	980-0510-23	Adjusting Spring Lock Plate For Standard Flipper
b.	980-0510-24	Adjusting Spring Lock Plate For Enclosed Flipper
15.	980-300032	Hand Crank Adj. Height Mount Brackets
16 a.	900-4911-04	Discharge Transport Bolt - 5/8"-11NC x 1 1/2" (Not Shown)
b.	900-4903-25	Discharge Transport Nut - 5/8"-11NC (Not Shown)

NOTE: Parts may not be exactly as shown.

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HYDRAULIC SWIVEL DISCHARGE

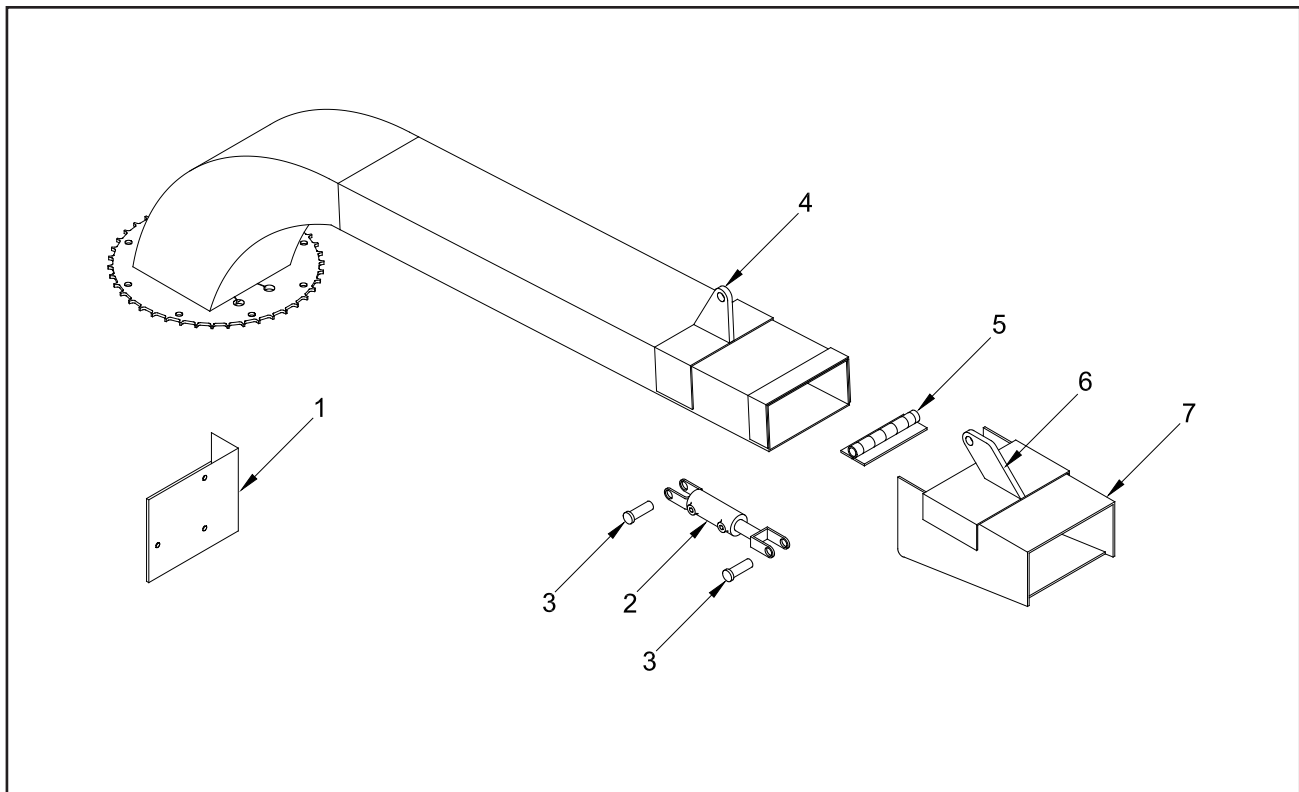


LOCATION	PART NUMBER	DESCRIPTION
1 a.	900-3921-57	Discharge Swivel Hydraulic Motor - SAE O-ring
b.	900-3902-14	Discharge Swivel Hydraulic Motor - Pipe Fitting
2.	980-0110-66	Hydraulic Swivel Mount
3.	937-1005-35	Chain Guard Mount
4.	937-200061	Hydraulic Swivel Chain Guard
5 a.	900-1901-20	#50 Roller Chain
b.	900-1901-18	Half Link- Chain (Not Shown)
c.	900-1901-19	Master Link - Chain (Not Shown)
6.	900-1901-21	Sprocket For Hydraulic Motor
7.	980-0110-63	Sprocket For Discharge (Weld On)
8.	900-4905-00	Spacer Washer
9.	980-0122-18	Bottom Swivel Ring
10.	937-1004-30	Hydraulic Swivel Motor Mount
11.	981-1001-63	Discharge Flipper Hinge
12 a.	937-1009-10	12" Discharge Flipper Assembly
b.	937-0502-24	12" Enclosed Discharge Flipper Assembly
c.	937-0501-63	12" Enclosed Discharge Flipper Assembly For Hydraulic Flipper
13.	900-4901-83	Discharge Flipper Adjusting Spring
14.	937-1009-14	Adjusting Spring Mount
15 a.	900-4911-04	Discharge Transport Bolt - 5/8"-11NC x 1 1/2" (Not Shown)
b.	900-4903-25	Discharge Transport Nut - 5/8"-11NC (Not Shown)

NOTE: Parts may not be exactly as shown.

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DISCHARGE WITH HYDRAULIC FLIPPER

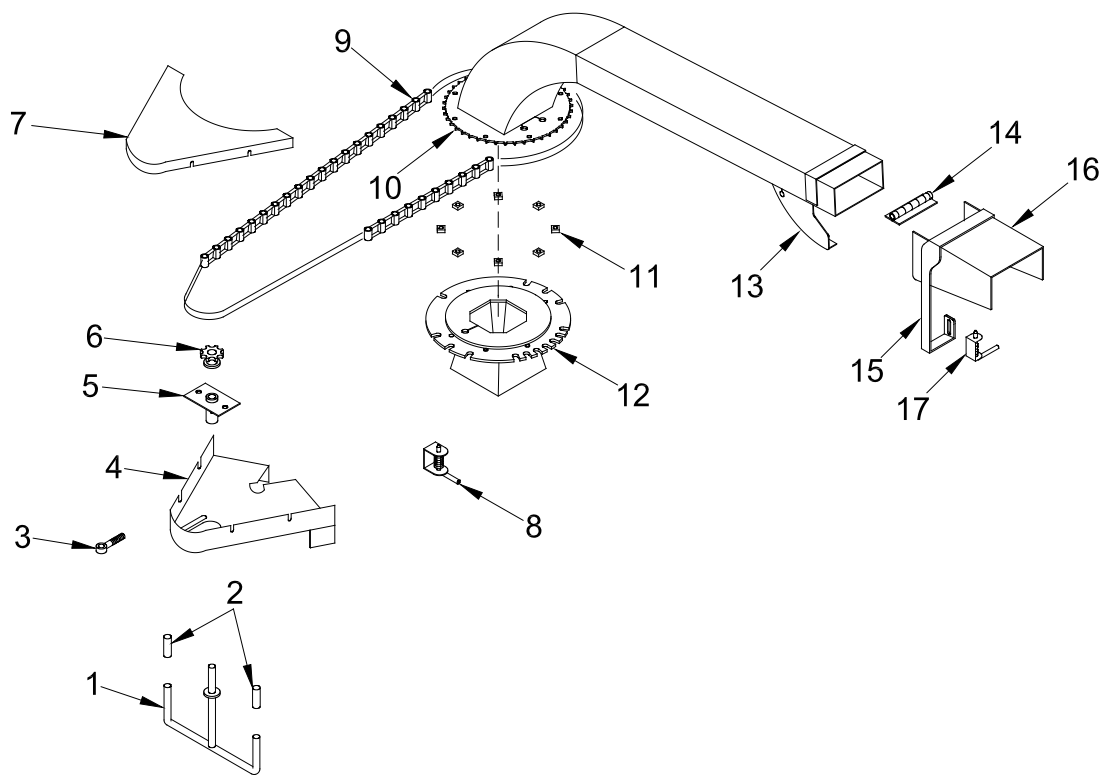


LOCATION	PART NUMBER	DESCRIPTION
1.	937-1003-30	Hydraulic Flipper Control Valve Mount Plate
2.	900-3928-16	Hydraulic Flipper Cylinder
3.	900-3930-71	Cylinder Lug Pin - 3/4" Dia. x 2 1/2" & Cotter Pin - 1/4" x 1 1/2"
4.	960-0006-42	Straight Section Cylinder Lug
5.	981-1001-63	Hydraulic Flipper Hinge
6.	980-0126-48	Flipper Lug
7.	937-0501-63	12" Hydraulic Flipper Assembly (Enclosed)
8.	900-3925-18	Check Valve (Not Shown)
9.	900-3916-62	Swivel Discharge & Discharge Flipper Control Valve (Not Shown)
10 a.	900-4911-04	Discharge Transport Bolt - 5/8"-11NC x 1 1/2" (Not Shown)
b.	900-4903-25	Discharge Transport Nut - 5/8"-11NC (Not Shown)

NOTE: Parts may not be exactly as shown.

Bandit

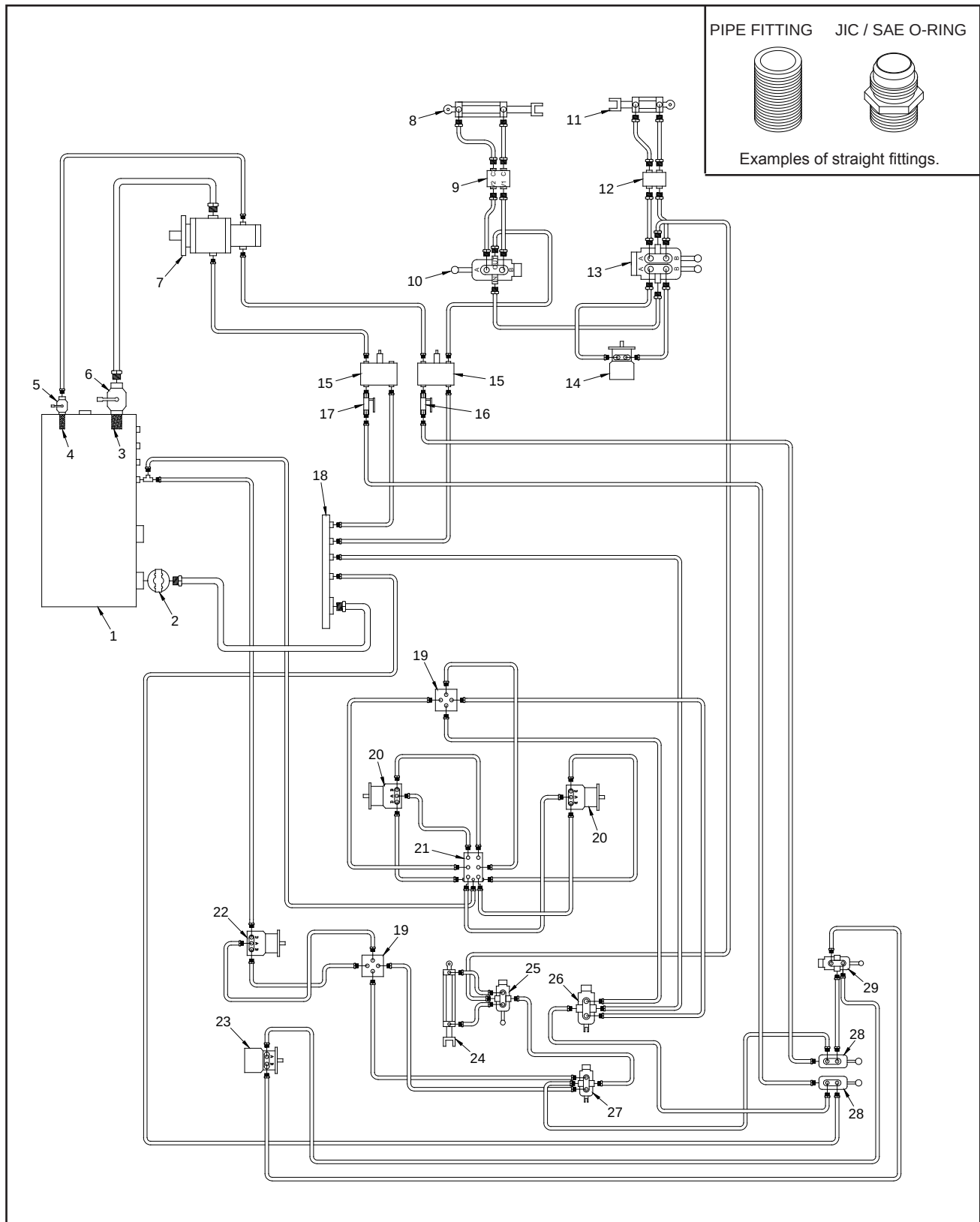
HAND CRANK SWIVEL DISCHARGE



NOTE: Parts may not be exactly as shown.

LOCATION	PART NUMBER	DESCRIPTION
1.	937-200064	T-Handle Assembly
2.	900-7900-96	Rubber Cap
3.	900-4905-43	Eye Bolt Adjuster For Hand Crank Swivel Discharge
4 a.	912-300040	Bottom Chain Guard - Rounded Style
b.	937-300002	Bottom Chain Guard - Square Style
5.	980-200006	Chain Adjuster Assembly
6 a.	900-1905-59	T-Handle Sprocket
b.	980-0125-82	Key For Sprocket (Not Shown)
7 a.	980-200108	Steel Top Chain Guard - Rounded Style
b.	900-9904-64	Plastic Top Chain Guard - Rounded Style
c.	980-0138-22	Steel Top Chain Guard - Square Style
8.	900-4904-90	Spring Plunger
9 a.	980-0128-74	#50 Roller Chain
b.	900-1901-18	Half Link - Chain (Not Shown)
c.	900-1901-19	Master Link - Chain (Not Shown)
10.	980-0127-32	Sprocket For Hand Crank Swivel Discharge (Weld On)
11.	980-0137-35	Spacers Blocks
12.	980-0128-23	Bottom Swivel Ring
13 a.	980-0510-23	Adjusting Spring Lock Plate Assembly For Standard Flipper
b.	980-0510-24	Adjusting Spring Lock Plate Assembly For Enclosed Flipper
14.	981-1001-63	Discharge Flipper Hinge
15.	937-1009-14	Adjusting Spring Mount
16 a.	937-1009-10	12" Discharge Flipper Assembly
b.	937-0502-24	12" Enclosed Discharge Flipper Assembly
c.	937-0501-63	12" Enclosed Discharge Flipper Assembly For Hydraulic Flipper
17.	900-4901-83	Discharge Flipper Adjusting Spring
18 a.	900-4911-04	Discharge Transport Bolt - 5/8"-11NC x 1 1/2" (Not Shown)
b.	900-4903-25	Discharge Transport Nut - 5/8"-11NC (Not Shown)

TYPICAL MODEL 2090 HYDRAULIC SCHEMATIC (Options May Vary)



NOTE: Parts may not be exactly as shown.

TYPICAL MODEL 2090
HYDRAULIC COMPONENTS (Options May Vary)

LOCATION	PIPE FITTING	SAE O-RING	DESCRIPTION
1.	See Pages 118-119	See Pages 118-119	Hydraulic Tank
2 a.	900-3910-18	900-3910-18	Filter Head
b.	900-3901-66	900-3901-66	Filter Cartridge
c.	900-3901-73	900-3901-73	Filter Gauge
3.	900-3912-51	900-3912-51	Hydraulic Tank Strainer - 2"
4.	900-3901-41	900-3901-41	Hydraulic Tank Strainer - 1"
5.	900-3920-12	900-3920-12	Shut Off Valve - 1"
6.	900-3920-14	900-3920-14	Shut Off Valve - 1 1/2"
7.	**	**	Hydraulic Pump
8 a.	900-3934-24	900-3934-24	Tongue Jack Cylinder - Welded
b.	900-3912-12	900-3912-12	Tongue Jack Cylinder - Tie Rod Ends
9.	N/A	900-3925-94	Tongue Jack Check Valve
10.	900-3901-42	900-3920-01	Tongue Jack Control Valve
11.	900-3928-16	N/A	Discharge Flipper Cylinder
12.	900-3925-18	N/A	Flipper Check Valve
13 a.	900-3916-62	900-3916-62	Swivel Discharge & Discharge Flipper Control Valve
b.	900-3901-42	900-3920-01	Swivel Discharge Control Valve Only (Not Shown)
c.	900-3934-68	900-3934-68	Swivel Discharge, Flipper, & Rear Stabilizer Valve (Not Shown)
14.	900-3902-14	900-3921-57	Swivel Discharge Hydraulic Motor
15.	See Pages 106-107	See Pages 106-107	Relief Block
16.	900-3926-11	900-3926-11	Ball Valve - 1/2"
17.	900-3932-09	900-3932-09	Ball Valve - 3/4"
18.	937-1009-36	937-1009-36	Return Manifold
19.	See Pages 106-107	See Pages 106-107	Reversing "Autofeed Plus" Valve
20.	900-3906-29	900-3906-29	Top Feedwheel Hydraulic Motor
21 a.	960-0020-89	960-0020-89	Top Feedwheel Tee Manifold (Start 1/04)
b.	See Pages 108-109	See Pages 108-109	Top Feedwheel Flow Divider (Pre 1/04)
22.	900-3917-18	900-3917-18	Bottom Feedwheel Hydraulic Motor
23.	900-3902-14	900-3921-57	Winch Hydraulic Motor - "RS" - Square Motor
24 a.	900-3925-07	900-3925-07	Yoke Lift Cylinder - Welded
b.	900-3917-55	900-3917-55	Yoke Lift Cylinder - Tie Rod Ends
c.	904-0007-14	904-0007-14	Pin - Welded Lift Cylinder (Not Shown)
d.	904-0006-90	904-0006-90	Seal Kit - Welded Lift Cylinder (Not Shown)
e.	900-3905-37	900-3905-37	Seal Kit - Tie Rod Ends Cylinder (Not Shown)
25 a.	N/A	900-3927-73	Yoke Lift Control Valve For Dual Control Yoke Lift
b.	900-3908-62	900-3920-09	Yoke Lift Control Valve
26 a.	900-3934-39	900-3934-39	Top Feedwheel Control Valve (Start 6/05)
b.	900-3925-26	900-3925-26	Top Feedwheel Control Valve (1/04 - 6/05)
c.	900-3914-47	900-3920-05	Top Feedwheel Control Valve Without Relief (Pre 1/04)
27.	900-3914-47	900-3920-05	Bottom Feedwheel Control Valve Without Relief
28 a.	900-3919-45	900-3919-45	Winch Selector Control Valve (Start 1/04)
b.	900-3913-41	900-3920-58	Winch Selector Control Valve (Pre 1/04)
29.	900-3901-42	900-3920-01	Winch Control Valve
30 a.	900-3934-24	900-3934-24	Rear Stabilizer Cylinder - Welded
b.	900-3912-12	900-3912-12	Rear Stabilizer Cylinder - Tie Rod Ends
31.	900-3917-15	900-3924-54	Variable Speed Control Valve (Not Shown)
32.	900-3906-90	900-3906-90	In-Line Pressure Check Gauge (Not Shown)

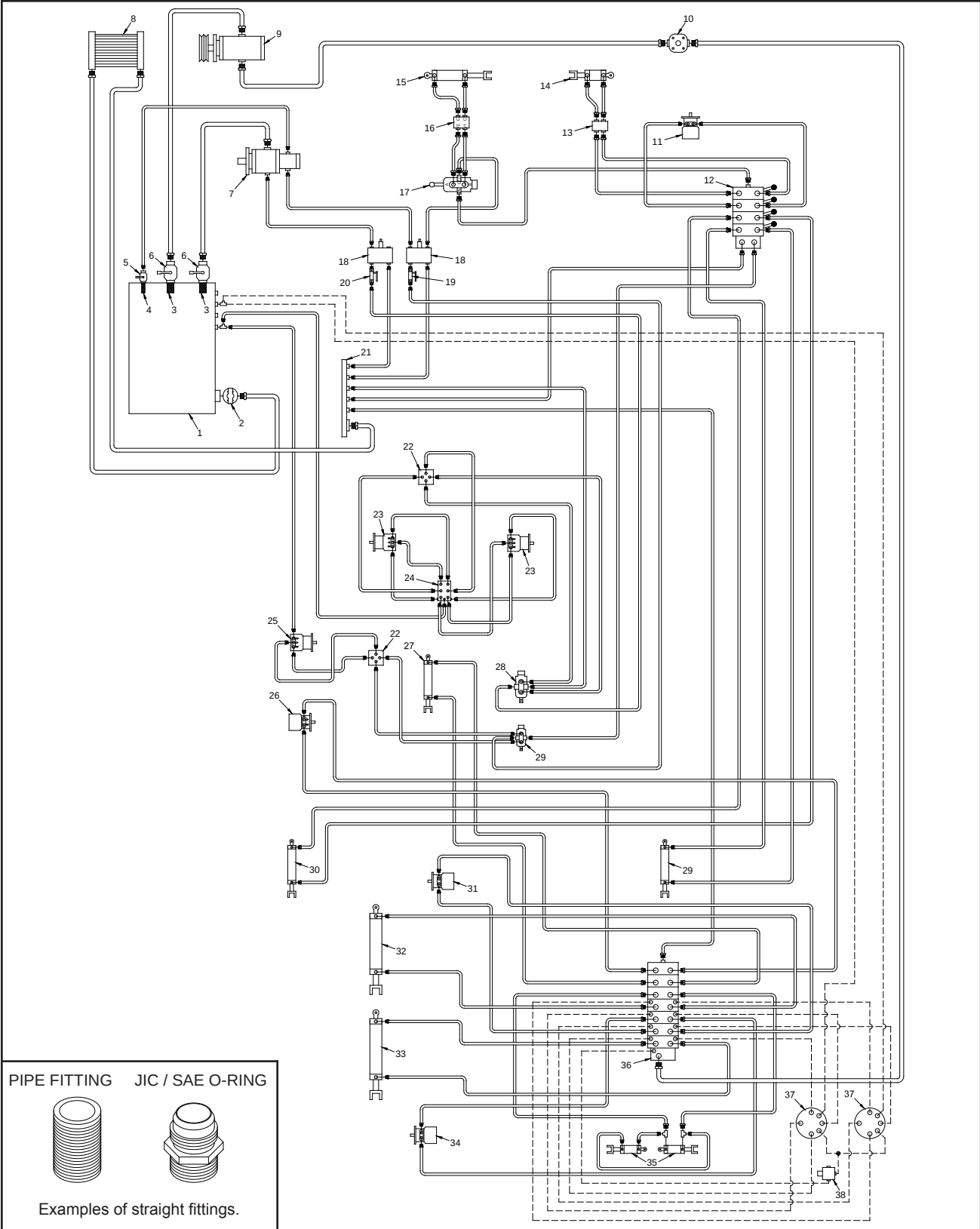
NOTE: Make sure to order components according to fitting type, fittings may vary on all components.

**** Hydraulic components need to be ordered by the serial number of machine.**

- Hydraulic components, fittings, hoses will vary depending on optional equipment. Order by physical description.

Bandit

TYPICAL MODEL 2090 WITH LOADER
HYDRAULIC SCHEMATIC (Options May Vary)



NOTE: Parts may not be exactly as shown.

Bandit

TYPICAL MODEL 2090 WITH LOADER
HYDRAULIC COMPONENTS (Options May Vary)

LOCATION	PIPE FITTING	SAE O-RING	DESCRIPTION
1.	See Pages 118-119	See Pages 118-119	Hydraulic Tank
2 a.	900-3910-18	900-3910-18	Filter Head - External
b.	900-3932-95	900-3932-95	Filter Head - Internal
c.	900-3901-66	900-3901-66	Filter Cartridge - External
d.	900-3931-34	900-3931-34	Filter Cartridge - Internal
e.	900-3901-73	900-3901-73	Filter Gauge
3.	900-3912-51	900-3912-51	Hydraulic Tank Strainer - 2"
4.	900-3901-41	900-3901-41	Hydraulic Tank Strainer - 1"
5.	900-3920-12	900-3920-12	Shut Off Valve - 1"
6.	900-3920-14	900-3920-14	Shut Off Valve - 1 1/2"
7.	**	**	Hydraulic Pump - Feed System
8.	900-3915-67	900-3915-67	Oil Cooler
9.	**	**	Hydraulic Pump - Loader
10.	900-3931-35	900-3931-35	High Pressure Filter (if equipped)
11.	900-3902-14	900-3921-57	Swivel Discharge Hydraulic Motor
12 a.	900-3934-68	900-3934-68	Swivel Discharge, Flipper, & Rear Stabilizer Valve
b.	900-3916-62	900-3916-62	Swivel Discharge & Flipper Control Valve (Not Shown)
13.	900-3925-18	N/A	Flipper Check Valve
14.	900-3928-16	N/A	Discharge Flipper Cylinder
15 a.	900-3934-24	900-3934-24	Tongue Jack Cylinder - Welded
b.	900-3912-12	900-3912-12	Tongue Jack Cylinder - Tie Rod Ends
16.	N/A	900-3925-94	Tongue Jack Check Valve
17.	900-3901-42	900-3920-01	Tongue Jack Control Valve
18.	See Pages 106-107	See Pages 106-107	Relief Block
19.	900-3926-11	900-3926-11	Ball Valve - 1/2"
20.	900-3932-09	900-3932-09	Ball Valve - 3/4"
21.	937-1009-36	937-1009-36	Return Manifold
22.	See Pages 106-107	See Pages 106-107	Reversing "Autofeed Plus" Valve
23.	900-3906-29	900-3906-29	Top Feedwheel Hydraulic Motor
24 a.	960-0020-89	960-0020-89	Top Feedwheel Tee Manifold (Start 1/04)
b.	See Pages 108-109	See Pages 108-109	Top Feedwheel Flow Divider (Pre 1/04)
25.	900-3917-18	900-3917-18	Bottom Feedwheel Hydraulic Motor
26.	900-3902-14	900-3921-57	Winch Hydraulic Motor - "RS" - Square Motor
27 a.	900-3925-07	900-3925-07	Yoke Lift Cylinder - Welded
b.	900-3917-55	900-3917-55	Yoke Lift Cylinder - Tie Rod Ends
c.	904-0006-90	904-0006-90	Seal Kit - Welded Lift Cylinder
d.	900-3905-37	900-3905-37	Seal Kit - Tie Rod Ends Cylinder
28 a.	900-3934-39	900-3934-39	Top Feedwheel Control Valve (Start 6/05)
b.	900-3925-26	900-3925-26	Top Feedwheel Control Valve (1/04 - 6/05)
c.	900-3914-47	900-3920-05	Top Feedwheel Control Valve Without Relief (Pre 1/04)
29.	900-3914-47	900-3920-05	Bottom Feedwheel Control Valve Without Relief
30 a.	900-3934-24	900-3934-24	Rear Stabilizer Cylinder - Welded
b.	900-3912-12	900-3912-12	Rear Stabilizer Cylinder - Tie Rod Ends

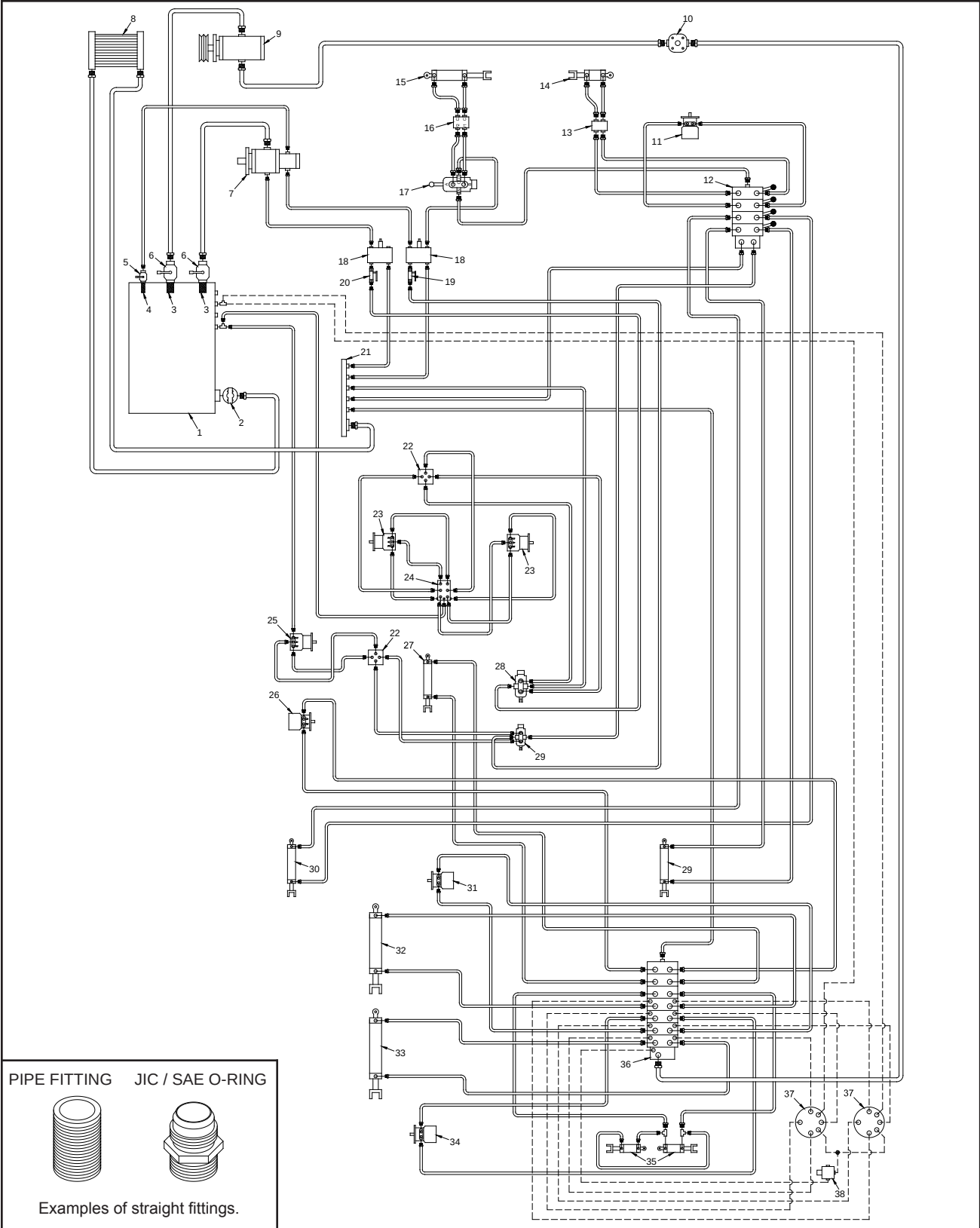
NOTE: Make sure to order components according to fitting type, fittings may vary on all components.

**** Hydraulic components need to be ordered by the serial number of machine.**

- Hydraulic components, fittings, hoses will vary depending on optional equipment. Order by physical description.

Bandit

TYPICAL MODEL 2090 WITH LOADER
HYDRAULIC SCHEMATIC (Options May Vary)



NOTE: Parts may not be exactly as shown.

TYPICAL MODEL 2090 WITH LOADER
HYDRAULIC COMPONENTS (Options May Vary)

LOCATION	PIPE FITTING	SAE O-RING	DESCRIPTION
31 a.	900-3901-57	900-3901-57	Swing Motor (Start 4/04)
b.	900-3903-01	900-3903-01	Swing Cylinder (Pre 4/04) - (Not Shown)
32 a.	900-3924-06	900-3924-06	Main Boom Cylinder (Start 4/04)
b.	900-3905-33	900-3905-33	Main Boom Cylinder (Pre 4/04)
33 a.	900-3924-07	900-3924-07	Jib Boom Cylinder (Start 4/04)
b.	900-3918-74	900-3918-74	Jib Boom Cylinder (Pre 4/04)
34.	See Pages 128-129	See Pages 128-129	Grapple Rotator Motor
35 a.	900-3933-18	900-3933-18	Grapple Cylinder - Welded - Dual Cylinder Grapple
b.	900-3917-21	900-3917-21	Grapple Cylinder - Tie Rod Ends - Dual Cylinder Grapple
c.	955-200027	955-200027	Grapple Cylinder - Single Cylinder Grapple (Not Shown)
36.	**	**	Valve Bank
37.	**	**	Joystick
38.	900-3926-69	900-3926-69	Selector Valve For Winch
39.	See Pages 108-109	See Pages 108-109	Flow Divider For Husco Loader Valve (Not Shown)
40.	900-3906-90	900-3906-90	In-Line Pressure Check Gauge (Not Shown)

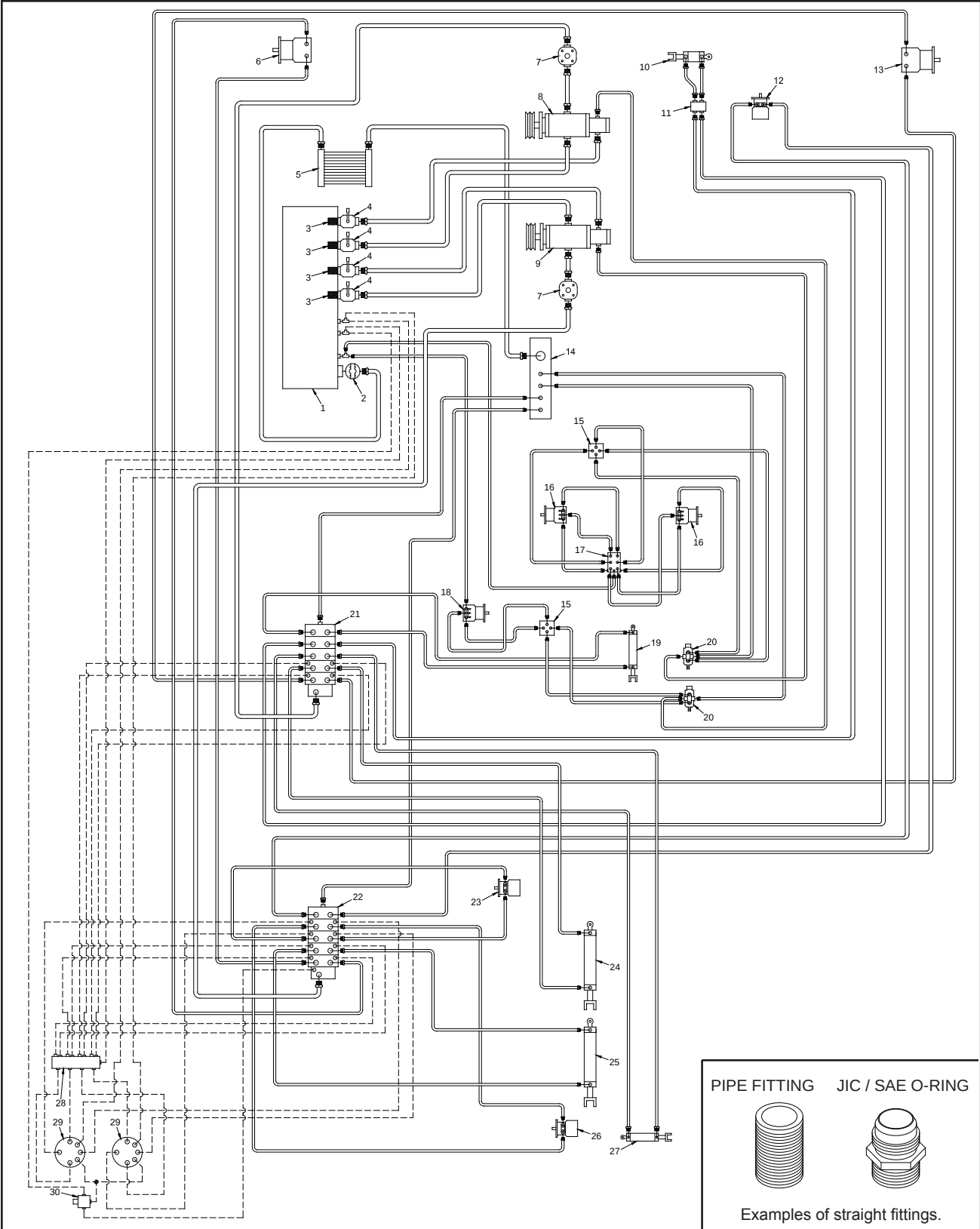
NOTE: Make sure to order components according to fitting type, fittings may vary on all components.

**** Hydraulic components need to be ordered by the serial number of machine.**

- Hydraulic components, fittings, hoses will very depending on optional equipment. Order by physical description.

Bandit

TYPICAL MODEL 2090 TRACK
HYDRAULIC SCHEMATIC (Options May Vary)



NOTE: Parts may not be exactly as shown.

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**TYPICAL MODEL 2090 TRACK
HYDRAULIC COMPONENTS (Options May Vary)**

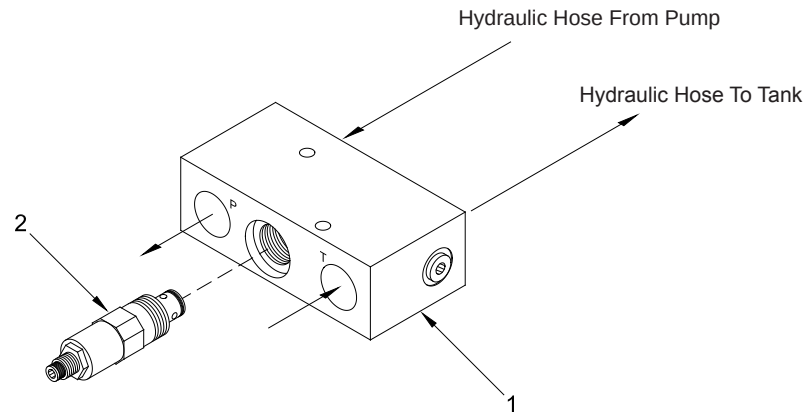
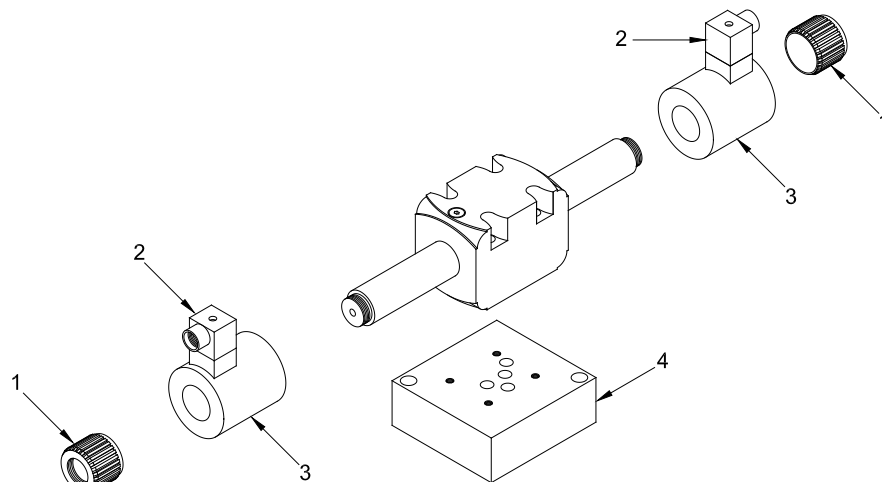
LOCATION	PIPE FITTING	SAE O-RING	DESCRIPTION
1.	See Pages 118-119	See Pages 118-119	Hydraulic Tank
2 a.	900-3932-95	900-3932-95	Filter Head - Internal
b.	900-3931-34	900-3931-34	Filter Cartridge - Internal
c.	900-3901-73	900-3901-73	Filter Gauge
3.	900-3912-51	900-3912-51	Hydraulic Tank Strainer - 2"
4.	900-3920-14	900-3920-14	Shut Off Valve - 1 1/2"
5.	**	**	Oil Cooler
6.	**	**	Track Motor - Right
7.	900-3931-35	900-3931-35	High Pressure Filter
8.	**	**	Hydraulic Pump - Left
9.	**	**	Hydraulic Pump - Right
10.	900-3928-16	N/A	Discharge Flipper Cylinder
11.	900-3925-18	N/A	Flipper Check Valve
12.	900-3902-14	900-3921-57	Swivel Discharge Hydraulic Motor
13.	**	**	Track Motor - Left
14.	920-200016	920-200016	Return Manifold
15.	**	**	Reversing "Autofeed Plus" Valve
16.	900-3906-29	900-3906-29	Top Feedwheel Hydraulic Motor
17.	960-0020-89	960-0020-89	Top Feedwheel Tee Manifold
18.	900-3917-18	900-3917-18	Bottom Feedwheel Hydraulic Motor
19 a.	900-3925-07	900-3925-07	Yoke Lift Cylinder - Welded
b.	900-3917-55	900-3917-55	Yoke Lift Cylinder - Tie Rod Ends
c.	904-0006-90	904-0006-90	Seal Kit - Welded Lift Cylinder
d.	900-3905-37	900-3905-37	Seal Kit - Tie Rod Ends Cylinder
20.	**	**	Feedwheel Control Valve
21.	**	**	Valve Bank - Left
22.	**	**	Valve Bank - Right
23.	**	**	Swing Motor
24.	900-3924-06	900-3924-06	Main Boom Cylinder
25.	900-3924-07	900-3924-07	Jib Boom Cylinder
26.	See Pages 128-129	See Pages 128-129	Grapple Rotator Motor
27.	955-200027	955-200027	Grapple Cylinder - Single Cylinder Grapple
28.	900-3915-64	900-3915-64	Joystick Control Manifold
29 a.	900-3934-36	900-3934-36	Joystick - Right
b.	900-3934-35	900-3934-35	Joystick - Left
30.	900-3926-69	900-3926-69	Two Speed For Track
31.	900-3906-90	900-3906-90	In-Line Pressure Check Gauge (Not Shown)
32.	900-3902-14	900-3921-57	Winch Hydraulic Motor - "RS" - Square Motor (Not Shown)

NOTE: Make sure to order components according to fitting type, fittings may vary on all components.

**** Hydraulic components need to be ordered by the serial number of machine.**

- Hydraulic components, fittings, hoses will vary depending on optional equipment. Order by physical description.

Bandit

RELIEF BLOCK**“AUTO FEED PLUS” SYSTEM
(DOUBLE SOLENOID)**

Torque Retainer Nut to a Maximum of 4 to 6 ft.-lbs. and Install Vibra Tite.
Over Torque Will Cause Damage and Will Also Void Warranty.

NOTE: Parts may not be exactly as shown.

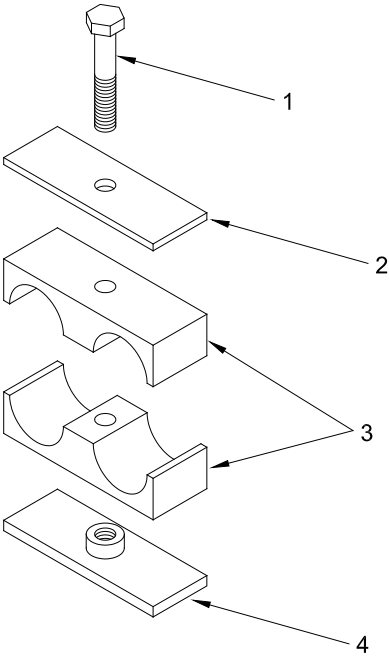
RELIEF BLOCK

LOCATION	PIPE FITTING	SAE O-RING	DESCRIPTION
1.	N/A	N/A	Main Relief Block Only
2 a.	900-3908-23	900-3908-23	Main Relief Only (Vickers)
b.	900-3919-96	900-3919-96	Main Relief Only (Danfoss)
3.	900-3909-05	900-3923-48	Main Relief Block Assembly (Includes #'s 1 & 2)

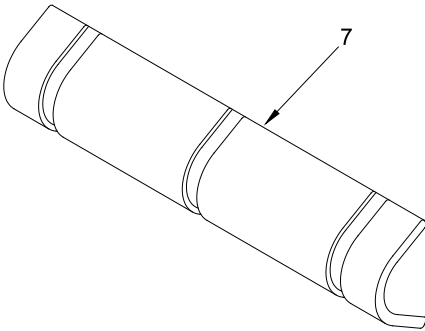
“AUTO FEED PLUS” SYSTEM (DOUBLE SOLENOID)

LOCATION	PART NUMBER	DESCRIPTION
1 a.	900-3920-20	Retainer Nut (Danfoss)
b.	900-3915-33	Retainer Nut and Sealing Ring (Aron)
2.	900-2909-55	Herschman Connector Only
3 a.	900-3920-19	Solenoid Only (Danfoss)
b.	900-3915-34	Solenoid Only (Aron)
4.	900-3918-38	Autofeed Plus Relief Block Subplate (DTS)
5 a.	900-3919-47	Solenoid Assembly (Danfoss Includes #'s 1,2,3, & 6)
b.	900-3918-37	Solenoid Assembly (Aron Includes #'s 1,2,3, & 6)
6.	900-3915-44	Seal Kit (Not Shown)
7 a.	900-3925-89	10' Cord and Molded Herschman Connector (Not Shown)
b.	900-3920-71	16' Cord and Molded Herschman Connector (Not Shown)
c.	900-3918-63	25' Cord and Molded Herschman Connector (Not Shown)

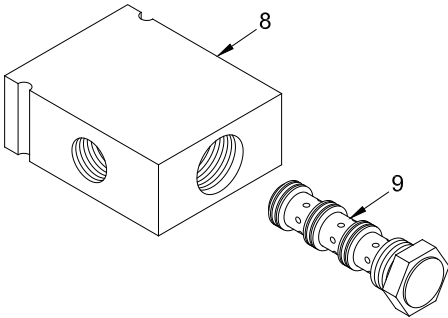
HOSE CLAMP



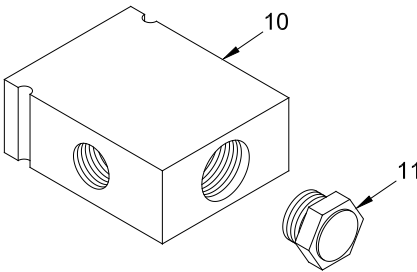
HOSE GUARD



FLOW DIVIDER FOR HUSCO
LOADER VALVE



FEEDWHEEL FLOW DIVIDER
(PRE 4/04)



NOTE: Parts may not be exactly as shown.

HOSE CLAMP

LOCATION	PART NUMBER	DESCRIPTION
1.	N/A	Bolt
2.	N/A	Locking Plate
3.	N/A	Plastic Clamp
4 a.	900-3914-09	Weld Plate for 1/4" Double Clamp
b.	900-3914-08	Weld Plate for 1/2" Double Clamp
c.	900-3926-47	Weld Plate for 3/4" Double Clamp
5 a.	900-3917-25	1/4" Double Clamp Assembly (Includes #'s 1-4)
b.	900-3926-44	3/8" Double Clamp Assembly (Includes #'s 1-4)
c.	900-3928-19	1/2" Single Clamp Assembly (Includes #'s 1-4)
d.	900-3914-02	1/2" Single Clamp Assembly For Steel Lines (Includes #'s 1-4)
e.	900-3915-61	1/2" Double Clamp Assembly (Includes #'s 1-4)
f.	900-3913-32	1/2" Double Clamp Assembly For Steel Lines (Includes #'s 1-4)
g.	900-3914-03	3/4" Single Clamp Assembly (Includes #'s 1-4)
h.	900-3914-07	3/4" Double Clamp Assembly (Includes #'s 1-4)
i.	900-3914-04	1" Single Clamp Assembly (Includes #'s 1-4)
j.	900-3914-05	1 1/4" Single Clamp Assembly (Includes #'s 1-4)
k.	900-3914-06	1 1/2" Single Clamp Assembly (Includes #'s 1-4)
6 a.	900-3914-10	Stacking Bolt for 1/2" Double Clamp (Not Shown)
b.	900-3920-11	Stacking Bolt for 3/4" Double Clamp (Not Shown)

HOSE GUARD

LOCATION	PART NUMBER	DESCRIPTION
7 a.	900-3934-76	Hose Guard - 4" Long
b.	900-3934-77	Hose Guard - 6" Long
c.	900-3934-78	Hose Guard - 8" Long

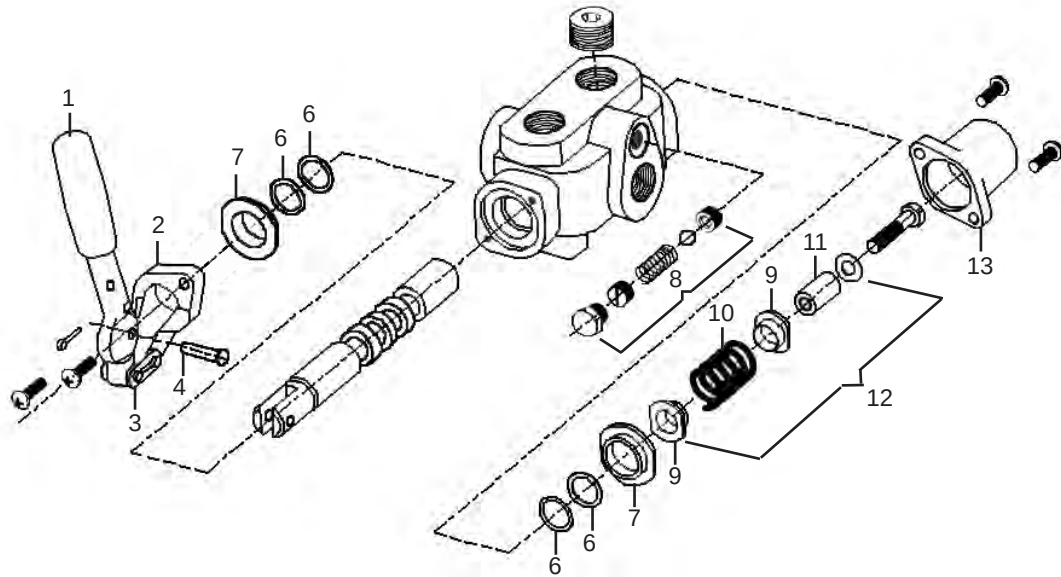
FLOW DIVIDER FOR HUSCO LOADER VALVE

LOCATION	PART NUMBER	DESCRIPTION
8.	900-3924-59	Flow Divider
9.	900-3924-18	Flow Divider Cartridge Only

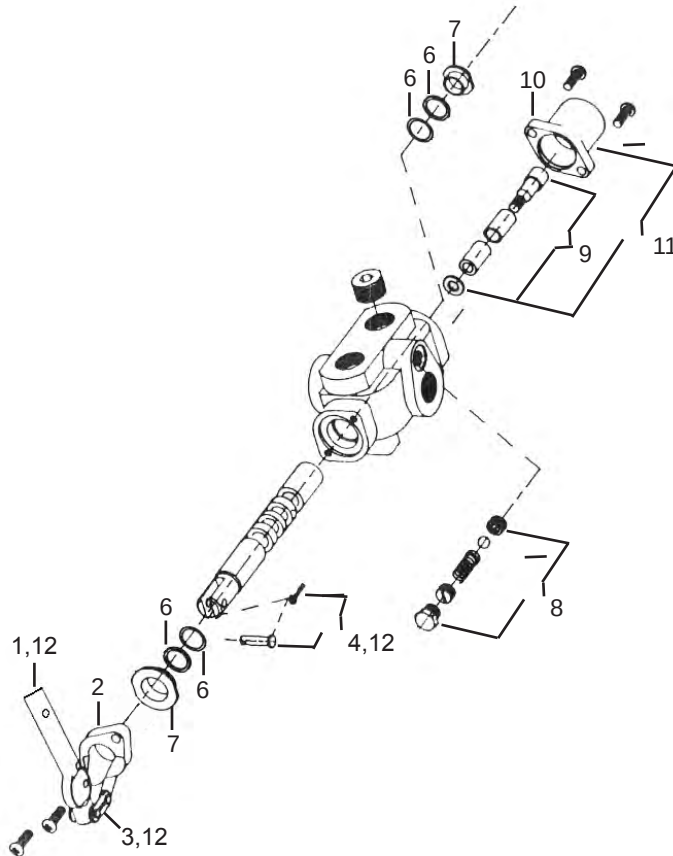
FEEDWHEEL FLOW DIVIDER (PRE 4/04)

LOCATION	PART NUMBER	DESCRIPTION
10.	900-3919-10	Flow Divider Body Only
11.	900-3919-11	Plug - #16 O-Ring

TYPICAL SPRING LOADED CONTROL VALVE



TYPICAL FEEDWHEEL CONTROL VALVES



NOTE: Parts may not be exactly as shown.

TYPICAL SPRING LOADED CONTROL VALVE COMPONENTS

LOCATION	PART NUMBER	DESCRIPTION
1.	904-0003-29	Handle Only (Long)
2.	900-3905-95	Valve Bracket Only With Screws
3.	904-0003-30	Master Link Only Control Valve
4.	904-0003-31	Pin And Cotter Key For Control Valve
5.	904-0003-32	Bracket, Handle And Chain Link
	NOTE: INCLUDES #'s 1, 2, 3, 4	
6.	980-3900-62	Seal Kit For Control Valve
7.	904-0003-33	Seal Retainer For Control Valve
	NOTE: NOT INCLUDED IN SEAL KIT	
8.	900-3901-12	Relief Valve Kit - Spring, Ball, Screw
	NOTE: SOLD ONLY AS A KIT	
9.	904-0003-34	Valve Spool Stop For Spring Loaded Valve
10.	904-0003-35	Valve Spool Spring
11.	904-0003-36	Valve Spacer For Yoke Lift Valve
12.	900-A-2941	Spring Center Kit For Spring Loaded Valve
13.	904-0003-37	Detent Cap Only For Spring Loaded Valve (Short)

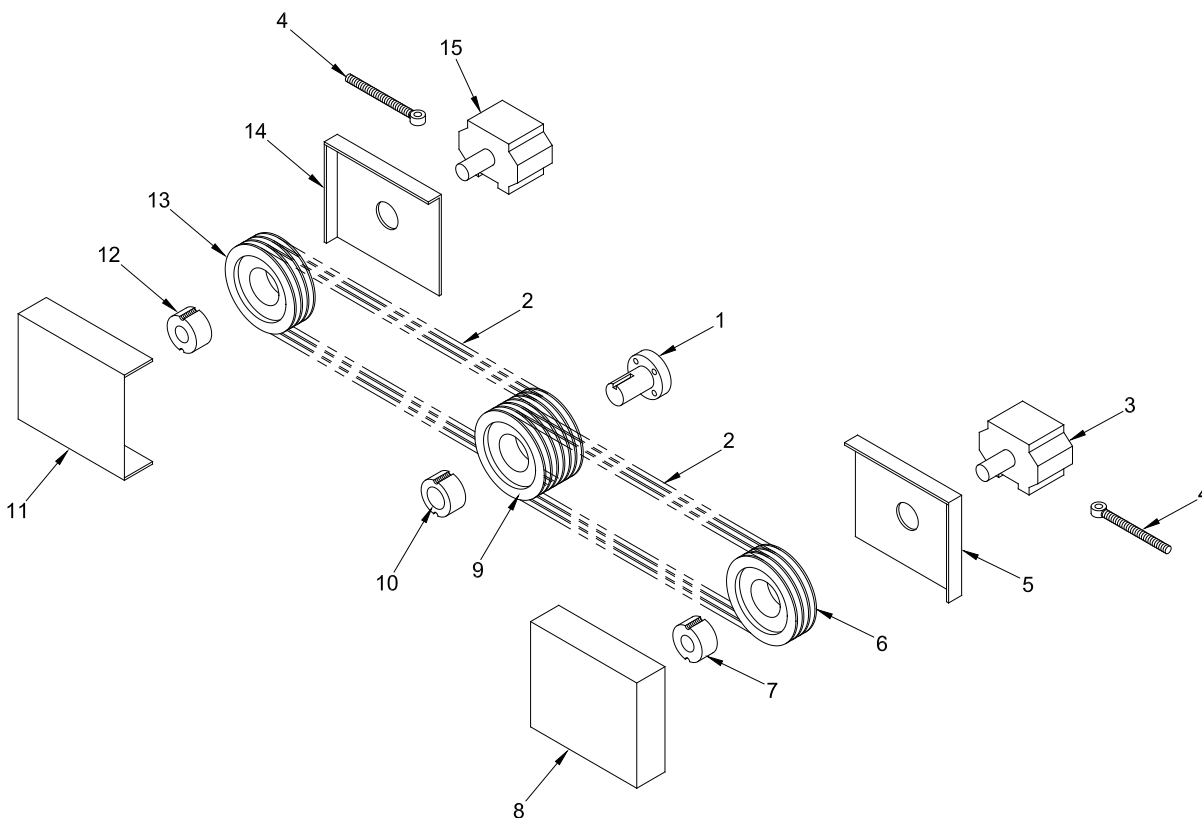
TYPICAL FEEDWHEEL CONTROL VALVE COMPONENTS

LOCATION	PART NUMBER	DESCRIPTION
1.	900-3905-95H	Handle Only (Short)
2.	900-3905-95	Valve Bracket Only With Screws
3.	904-0003-30	Master Link Only Control Valve
4.	904-0003-31	Pin And Cotter Key For Control Valve
5.	904-0003-32	Bracket, Handle And Chain Link
	NOTE: INCLUDES #'s 1, 2, 3, 4	
6.	980-3900-62	Seal Kit For Control Valve
7.	904-0003-33	Seal Retainer For Control Valve
	NOTE: NOT INCLUDED IN SEAL KIT	
8.	900-3901-12	Relief Valve Kit - Spring, Ball, Screw
	NOTE: SOLD ONLY AS A KIT	
9.	900-3900-71	Detent Kit For Feedwheel Control Valve
	NOTE: SOLD ONLY AS A KIT	
10.	900-390071C	Detent Cap Only With Screws (Long)
11.	900-3900-71E	Detent Kit With Cap And Screws
	NOTE: INCLUDES #'s 9 & 10	
12.	900-3905-59	Handle, Pin, and Link
	NOTE: INCLUDES #'s 1, 3, & 4	

CONTROL VALVES

LOCATION	PIPE FITTING	SAE O-RING	DESCRIPTION
1.	N/A	900-3927-73	Yoke Lift Control Valve for Dual Control Yoke Lift
2.	900-3908-62	900-3920-09	Yoke Lift Control Valve With Or Without Winch Option
3.	900-3901-42	900-3920-01	Winch, Hyd. Swivel Discharge, and Articulating Tongue
4.	900-3914-47	900-3920-05	Bottom Feedwheel Control Valve
5 a.	N/A	900-3934-39	Top Feedwheel Control Valve (Start 6/05)
b.	N/A	900-3925-26	Top Feedwheel Control Valve (1/04 - 6/05)
c.	900-3914-47	900-3920-05	Top Feedwheel Control Valve (Pre 1/04)

LOADER & TRACK PUMP DRIVES



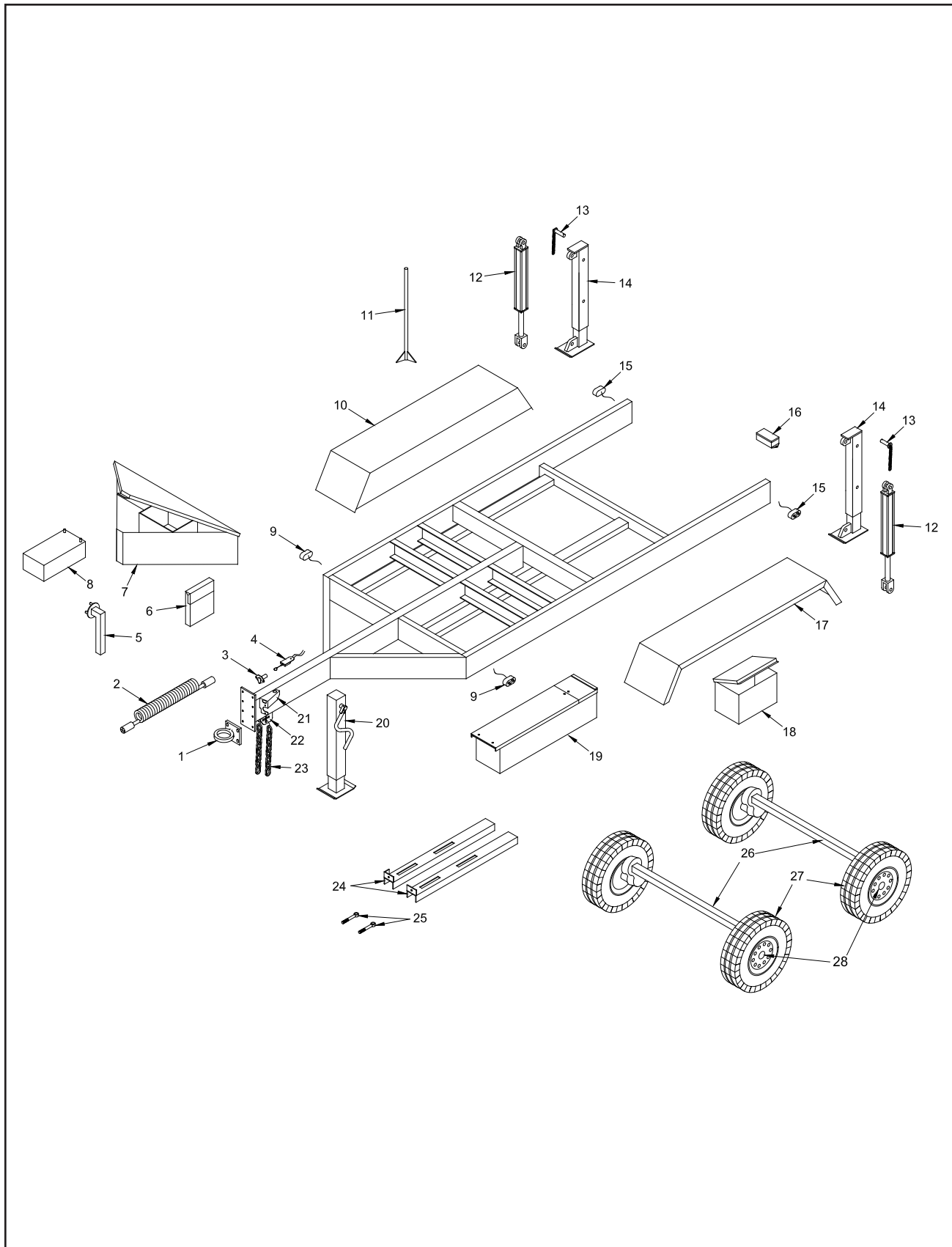
NOTE: Parts may not be exactly as shown.

LOADER & TRACK PUMP DRIVES

LOCATION	PART NUMBER	DESCRIPTION
1.	**	Stub Shaft For Engine
2.	**	Pump Belt
3 a.	900-3913-31	Pump Bearing Block (Trailerized Unit)
b.	900-3901-64	Pump Bearing Block (Track Unit)
4.	900-4902-75	Pump Belt Tension Adjuster
5.	955-1011-25	Sheave Guard Mount
6.	**	Pump Sheave
7.	**	Pump Bushing
8.	937-300387	Sheave Guard Cover
9.	**	Pump Sheave
10.	**	Pump Bushing
11.	960-0018-00	Sheave Guard Cover (Track Unit Only)
12.	**	Stub Shaft Bushing (Track Unit Only)
13.	**	Stub Shaft Sheave (Track Unit Only)
14.	960-0017-99	Sheave Guard Mount (Track Unit Only)
15.	900-3901-64	Pump Bearing Block (Track Unit)

**** Components will vary order by Serial Number of machine or physical description.**

**NOTE: Nuts, bolts, washers, and all other components
can be ordered by physical description.**



NOTE: Parts may not be exactly as shown.

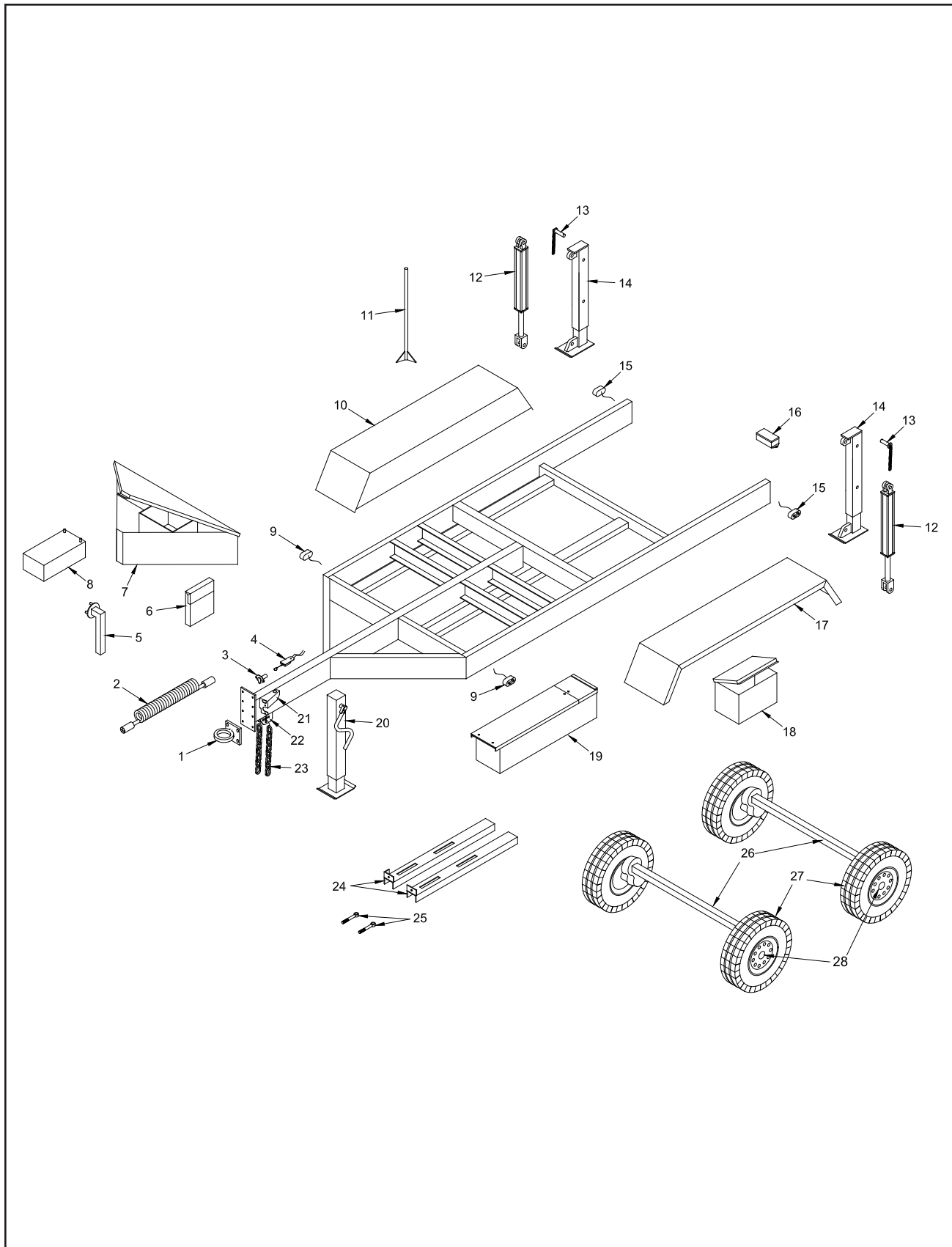
LOCATION	PART NUMBER	DESCRIPTION
1 a.	900-5900-13	2 1/2" Heavy Duty Pintle Ring Hitch
b.	900-5905-73	3" Heavy Duty Pintle Ring Hitch
c.	*-*	Other Hitch Options Available
2 a.	900-2911-26	Coil Cable Assembly With 6 Prong Plugs - 12'
b.	900-2904-12	6-Prong Trailer Plug Male Plug Only
3.	900-2904-13	6-Prong Trailer Plug Female Plug Only
4.	900-5900-09	Electrical Breakaway Switch
5.	980-0510-51	Optional Spare Tire Mount
6.	900-9902-07	Manual Holder
7 a.	937-0500-20	Steel Combination Battery And Tool Box
b.	937-0500-39	Aluminum Combination Battery And Tool Box
8.	900-6900-73	1000 CCA Battery
9.	900-2909-92	Amber Marker Light
10 a.	955-1015-73	16" Tandem Fender - Steel
b.	937-300211	16" Tandem Fender - Aluminum
11 a.	980-0508-30	Optional Cone Holder
b.	900-7900-86	Cap For Cone Holder (Not Shown)
12 a.	900-3934-24	Rear Stabilizer Cylinder - Welded
b.	900-3912-12	Rear Stabilizer Cylinder - Tie Rod Ends
c.	904-0007-14	Pin For Welded Cylinder (Not Shown)
13.	914-1000-38	Lock Pin
14 a.	955-0502-21	Rear Hydraulic Stabilizer Assembly
b.	980-0509-53	Inside Tube Assembly Only
c.	980-0506-88	Rear Manual Stabilizer (Not Shown)
15.	900-2909-91	Red Marker Light
16.	900-2902-41	Junction Box for Wiring
17 a.	955-1015-73	16" Tandem Fender - Steel
b.	937-300211	16" Tandem Fender - Aluminum
18 a.	900-7900-78	Aluminum Tool Box - 2090 Track
b.	980-0508-37	Steel Tool Box - 2090 Track
19.	960-0500-51	Battery Box Assembly (300 Hp and over, 2090 Track)
20 a.	900-5904-82	10,000 Lbs. Drop Leg Jack (Start 4/04)
b.	900-5903-78	8,000 Lbs. Drop Leg Jack (3/02 - 3/04)
c.	980-0127-45	Mount For 8,000 Lbs. Drop Leg Jack (3/02 - 3/04)
d.	980-0127-44	Pin For 8,000 Lbs. Drop Leg Jack (3/02 - 3/04)
e.	900-5903-86	5,000 Lbs. Side Crank Jack (Pre 2/02)
f.	900-5905-71	Pivot Mount For 5,000 Lbs. Jack (Pre 2/02)
21.	980-300106	Trailer Plug Receptacle Mount
22.	980-0121-31	Safety Chain Holder
23 a.	900-4912-71	Safety Chain W / Hooks and Spring Latches for Standard Tongue
b.	900-4905-77	Hook For Safety Chain

**** Order Brake Hub And Drum Assembly According To Axle Type.
(Grease Type, Oil Type, Never Lube Type).**

**** Engine Rails And Adjusters Will Vary Depending On Engine And Component Options.**

Order By Serial Number Of Chipper Or Physical Description.

NOTE: Other Fenders And Fender Stone Shields Are Optional.



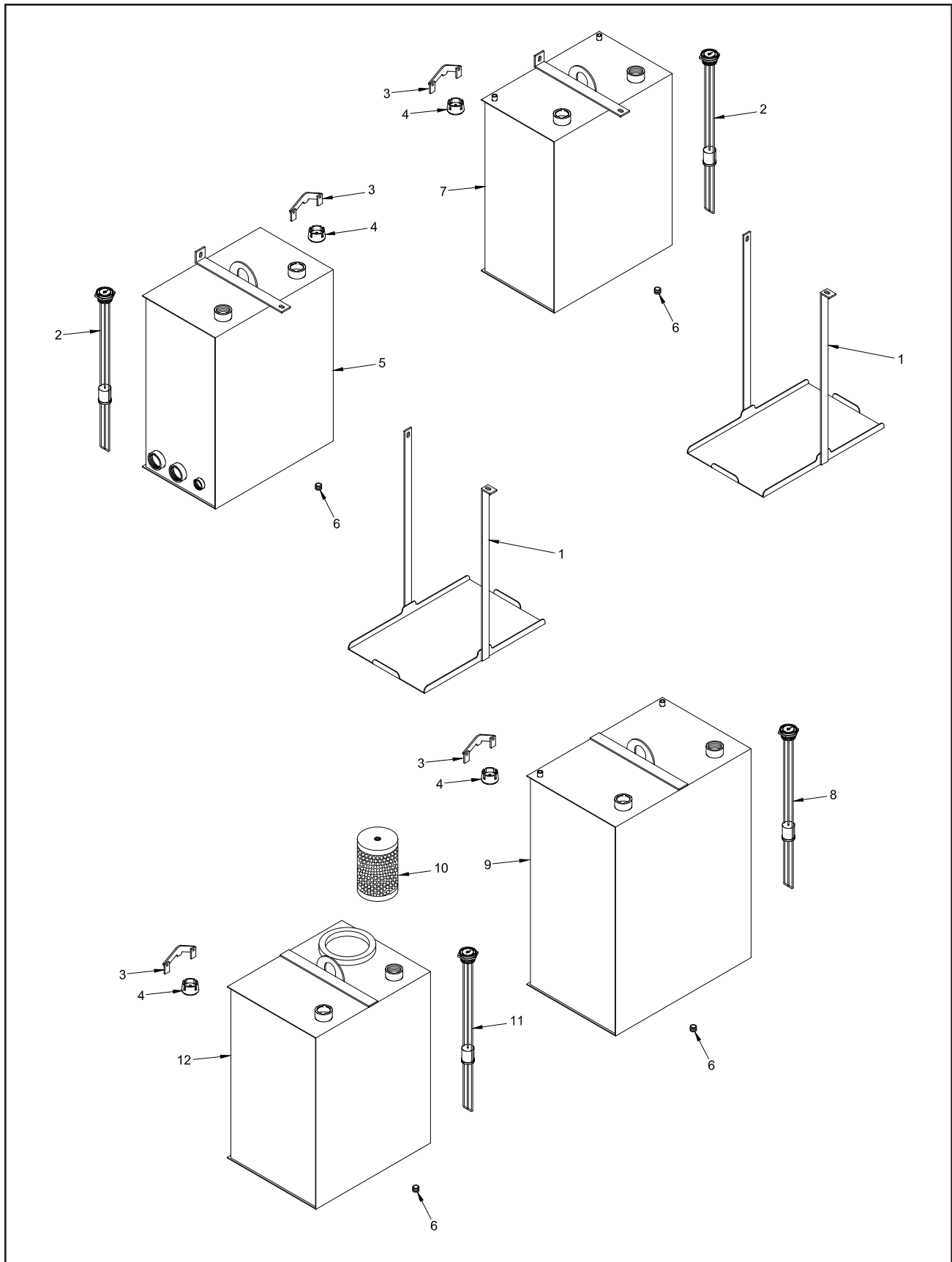
NOTE: Parts may not be exactly as shown.

LOCATION	PART NUMBER	DESCRIPTION
24.	*-*	Engine Rails
25.	900-4905-11	Engine Adjuster Rod End - 5/8"-11NC X 6"
26 a.	900-5904-83	8,000 Lb. Torflex Axle Assembly (Electric Brake)
b.	900-5904-39	10,000 Lb. Torflex Axle Assembly (Electric Brake)
c.	900-5904-06	12,000 Lb. Spring Axle Assembly (Electric Brake)
27 a.	900-5904-76	235/75R-17.5" Tire and Solid Gray, 8-Bolt Rim
b.	900-5904-48	235/75R-17.5" Tire Only
c.	900-5904-49	17.5" x 6.75" Solid Gray, 8-Bolt Rim Only
28.	**	Brake Hub and Drum Assembly
29 a.	980-0508-25	Optional Wheel Chock Holders Aluminum Bolt-On (Not Shown)
b.	980-0508-26	Optional Wheel Chock Holders Metal Weld-On (Not Shown)
30.	900-5902-32	Optional Rubber Wheel Chock (Not Shown)
31.	900-5900-62	Optional Safety Flags For Fenders (Not Shown)
32 a.	900-9902-83	Optional Vice (Not Shown)
b.	981-1007-02	Optional Weld-On Vice Mount (Not Shown)

**** Order Brake Hub And Drum Assembly According To Axle Type.
(Grease Type, Oil Type, Never Lube Type).**

***-* Engine Rails And Adjusters Will Vary Depending On Engine And Component Options.
Order By Serial Number Of Chipper Or Physical Description.**

NOTE: Other Fenders And Fender Stone Shields Are Optional.



NOTE: Parts may not be exactly as shown.

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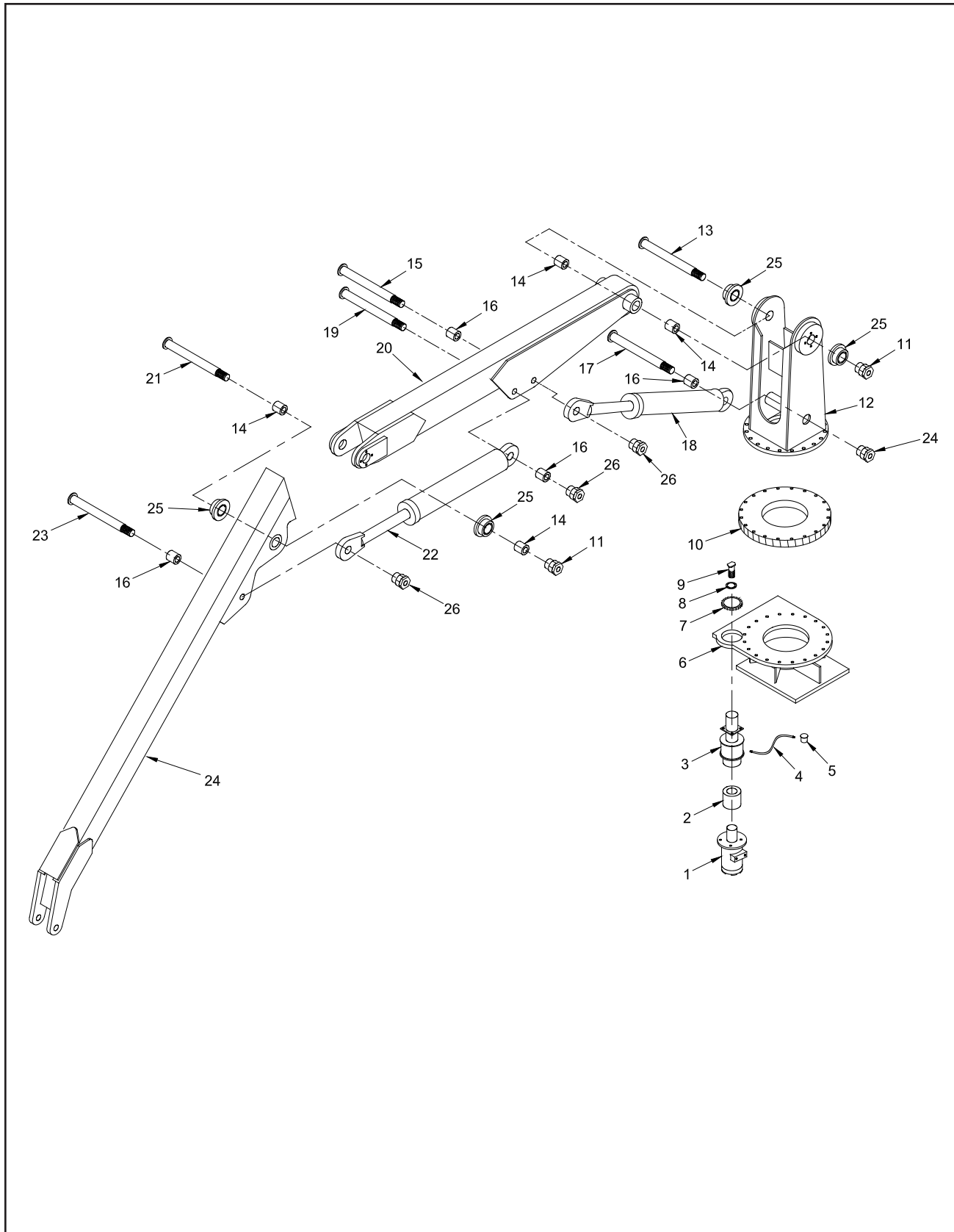
Bandit

LOCATION	PART NUMBER	DESCRIPTION
1 a.	955-0500-38	Tank Mount Tray For 60 Gallon Fuel Tank Or 60 Gallon Hydraulic Tank
b.	900-0104-95	Rubber Fuel Tank Pad (Not Shown)
2.	900-2904-14	Rochester Sight Gauge For 60 Gallon Fuel Tank Or 60 Gallon Hydraulic Tank
3.	980-0506-85	Fill Cap Lock Assembly For Steel Tank
4 a.	900-3917-71	Fill Cap Only No Dipstick (Steel Tank)
b.	900-3901-51	Fill Cap With Dipstick (Steel Tank)
5.	937-0501-33	60 Gallon Rectangle Hydraulic Tank Assembly
6.	900-3922-60	Magnetic Drain Plug
7.	914-0502-10	60 Gallon Rectangle Fuel Tank Assembly
8.	900-2923-28	Rochester Sight Gauge For 100 Gallon Rectangle Fuel Tank - 2090 Track
9.	920-200024	100 Gallon Rectangle Fuel Tank - 2090 Track
10.	900-3931-34	Hydraulic Filter Element (Internal) - 2090 Track
11.	900-2904-14	Rochester Sight Gauge For 75 Gallon Rectangle Hydraulic Tank - 2090 Track
12.	920-200025	75 Gallon Rectangle Hydraulic Tank - 2090 Track
13 a.	900-4912-40	Padlock For Tank With Short Shackle For Locking Cap (Not Shown)
b.	P812	Key For Padlock (Not Shown)

NOTE: Components vary with fuel type.
Specify gas or diesel when ordering fuel tank components.

NOTE: Tank assemblies vary with options.
Specify all options when ordering.

MODEL 1700 LOADER (START 4/04)



NOTE: Parts may not be exactly as shown.

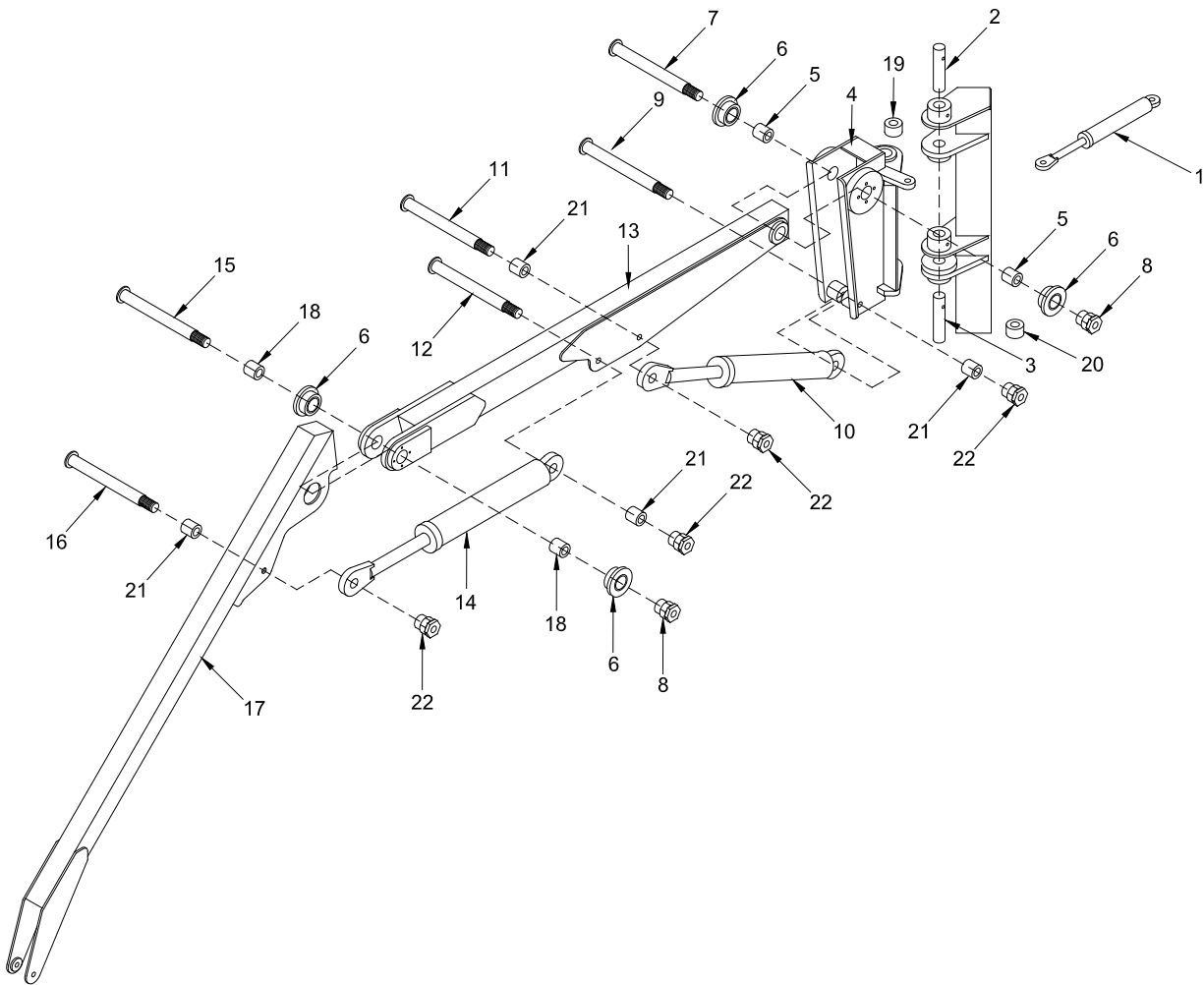
MODEL 1700 LOADER (START 4/04)

LOCATION	PART NUMBER	DESCRIPTION
1.	900-3901-57	Loader Swing Hydraulic Motor
2.	900-3901-59	Spline Adaptor
3.	900-3901-58	Planetary Speed Reducer
4.	900-3934-85	Oil Hose For Planetary Speed Reducer
5.	900-3904-42	Oil Cup For Planetary Speed Reducer
6.	955-0500-80	Pedestal Base Assembly
7.	900-1903-47	Turntable Pinion Gear
8.	900-4906-86	Pinion Cap Retainer Washer (1/2" Lock Washer)
9.	900-4900-60	Pinion Cap Retainer Bolt (1/2"-20NF x 1 1/2" Hex Head Bolt)
10.	900-1903-87	Turntable Bearing
11.	900-4901-10	Pivot Pin Lock Nut
12.	916-0500-90	Pedestal Assembly
13.	955-0500-87	Main Boom Pivot Pin
14.	900-9900-35	Split Steel Bushing
15.	955-0501-04	Rod Cylinder Pin On Main Boom
16.	900-1901-90	Spherical Bushing
17.	955-0501-03	Base End Cylinder Pin In Pedestal
18.	900-3924-06	Main Boom Cylinder
19.	955-0501-04	Loader Cylinder Pin On Main Boom
20.	916-0500-94	Main Boom Assembly
21.	955-0500-88	Jib Boom Loader Pivot Pin
22.	900-3924-07	Jib Boom Cylinder
23.	955-0501-02	Loader Cylinder Pin On Jib Boom
24.	955-0500-83	Jib Boom Assembly
25.	960-0011-67	Replaceable Steel Bushing
26.	900-4902-31	Cylinder Pin Nut
27.	955-0501-01	Pinion Retainer Cap
28.	955-1015-11	Jib Boom To Grapple Pin (Not Shown)
29.	900-4902-35	Loader Swing Lock Pin (Not Shown)
30 a.	900-4902-26	Loader Safety Chain (Not Shown - Specify Length)
b.	900-4905-77	Hook For Safety Chain (Not Shown)

**NOTE: Nuts, bolts, washers, and all other components
can be ordered by physical description.**

Bandit

MODEL 75 LOADER (PRE 4/04)



NOTE: Parts may not be exactly as shown.

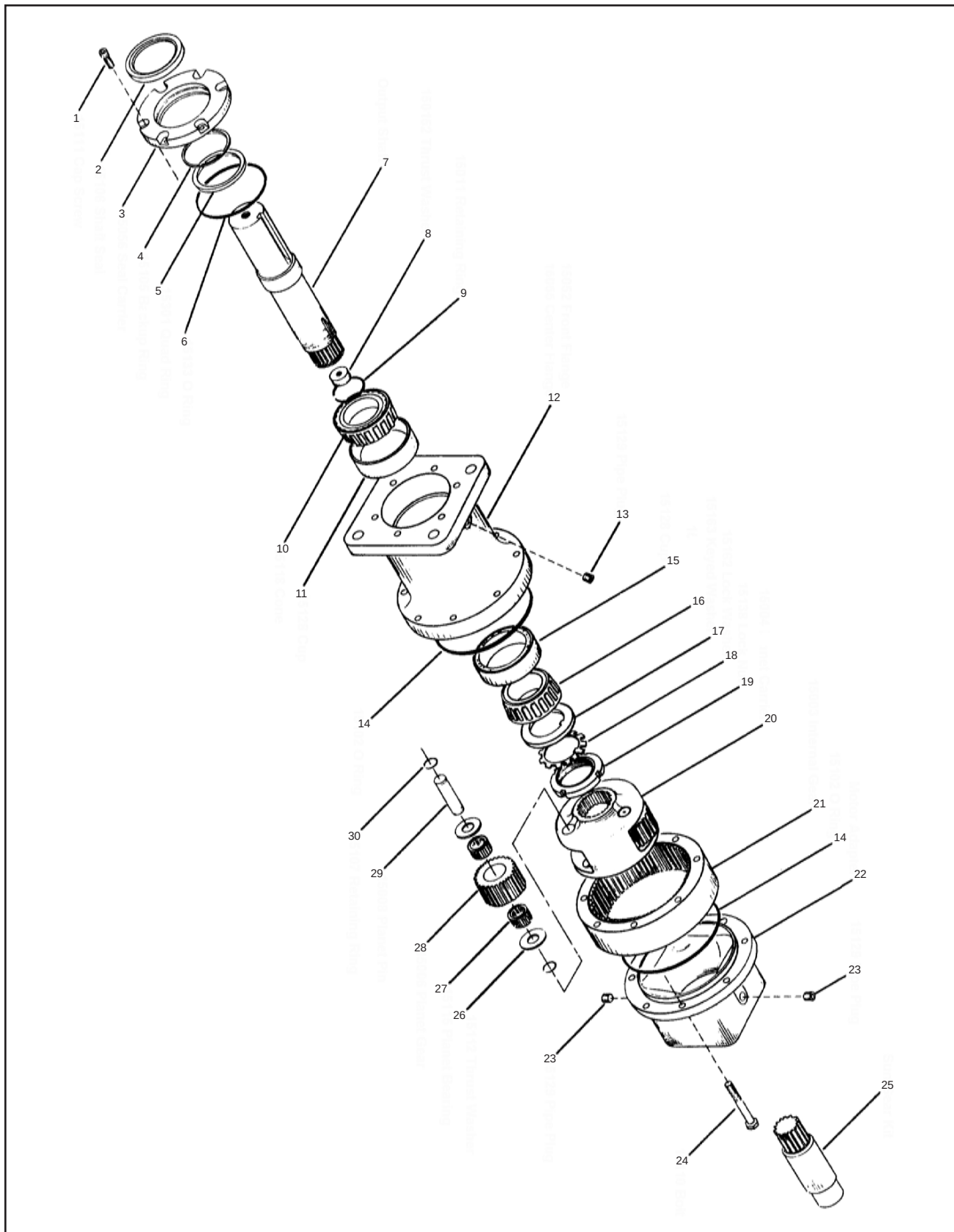
MODEL 75 LOADER (PRE 4/04)

LOCATION	PART NUMBER	DESCRIPTION
1.	900-3903-01	Loader Swing Cylinder
2.	914-1016-40	Top Pedestal Pin
3.	914-1016-41	Bottom Pedestal Pin
4.	914-0503-10	Pedestal Assembly
5.	900-9900-35	Split Bushing (Main)
6.	960-0011-67	Bushing
7.	914-1017-17	Main Boom To Pedestal Pin
8.	900-4901-10	1 3/4"-5NC Nut
9.	914-1016-98	Main Boom Cylinder To Pedestal Pin
10.	900-3905-33	Main Boom Cylinder
11.	914-1017-15	Main Boom Cylinder To Main Boom Pin
12.	914-1017-15	Jib Boom Cylinder To Main Boom Pin
13.	914-0502-96	Main Boom Assembly
14.	900-3918-74	Jib Boom Cylinder
15.	914-1017-16	Jib Boom To Main Boom Pin
16.	914-1017-13	Jib Boom Cylinder To Jib Boom Pin
17.	914-0502-97	Jib Boom Assembly
18.	900-1905-35	Split Bushing (Jib)
19.	900-1907-08	Split Bushing (Top Pedestal)
20.	900-9900-35	Split Bushing (Bottom Pedestal)
21.	900-1903-00	Split Bushing (Cylinder Lug)
22.	900-4903-70	1"-8NC Nut
23.	914-1017-14	Jib Boom To Grapple Pin (Not Shown)
24.	900-4902-35	Loader Swing Lock Pin (Not Shown)
25 a.	900-4902-26	Loader Safety Chain (Not Shown - Specify Length)
b.	900-4905-77	Hook For Safety Chain (Not Shown)

**NOTE: Nuts, bolts, washers, and all other components
can be ordered by physical description.**

Bandit

PLANETARY SPEED REDUCER



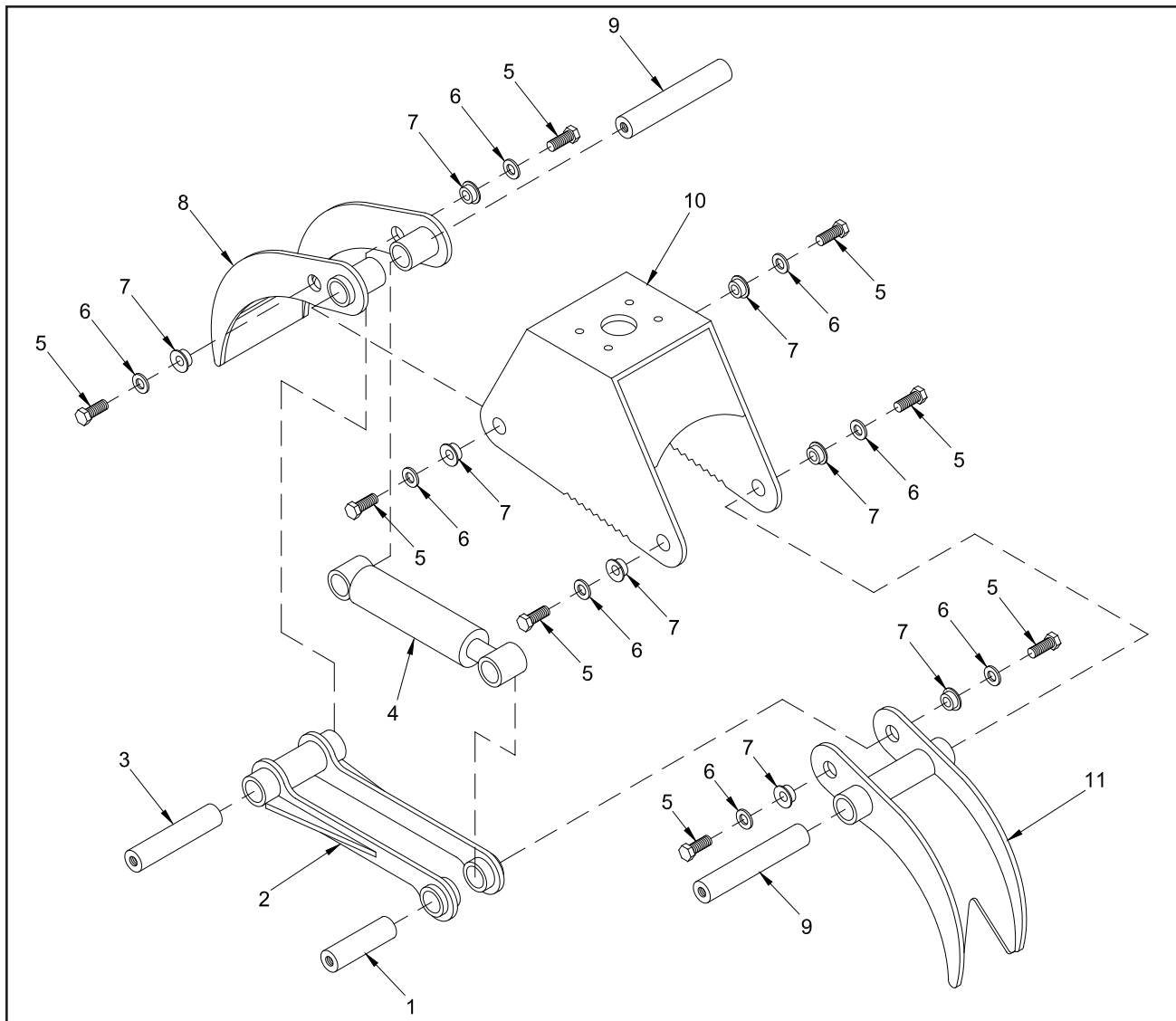
NOTE: Parts may not be exactly as shown.

PLANETARY SPEED REDUCER

LOCATION	PART NUMBER	DESCRIPTION
1.	15111	Cap Screw
2.	15106	Shaft Seal*
3.	15056	Seal Carrier
4.	15105	Backup Ring*
5.	15301	Quad Ring*
6.	15133	O-Ring*
7.		Output Shaft
	15053	2.25" Straight Keyed
	15054	2.25" Tapered
	15096	16T 8/16 Spline
	15057	4-Bolt Flange
	15224	5-Bolt Flange
8.	15015-2	Thrust Washer
9.	15011	Retaining Ring
10.	15118	Cone
11.	15128	Cup
12.		Bearing Housing
	15052	Front Flange
	15055	Center Flange
13.	15121	Pipe Plug
14.	15102	O-Ring*
15.	15128	Cup
16.	15118	Cone
17.	15163	Keyed Washer
18.	15162	Lock Washer
19.	15138	Lock Nut
20.	15004	Planet Carrier
21.	15003	Internal Gear
22.		Motor Adaptor
	15205	SAE A 2-Bolt
	15064	SAE B 2-Bolt
	15241	Ross MAB & MAE
23.	15129	Pipe Plug
24.	15110	Bolt
25.		Sun Gear - Order Sun Gear Kit
26.	15112	Thrust Washer
27.	15113	Planet Bearing
28.	15005	Planet Gear
29.	15008	Planet Pin
30.	15107	Retaining Ring
31 a.	15930	Seal Kit - Buna
b.	15932	Seal Kit - Viton
32.	900-3901-58	Entire Planetary Speed Reducer Assembly

NOTE: Seal kits include items indicated by *

SINGLE CYLINDER GRAPPLE



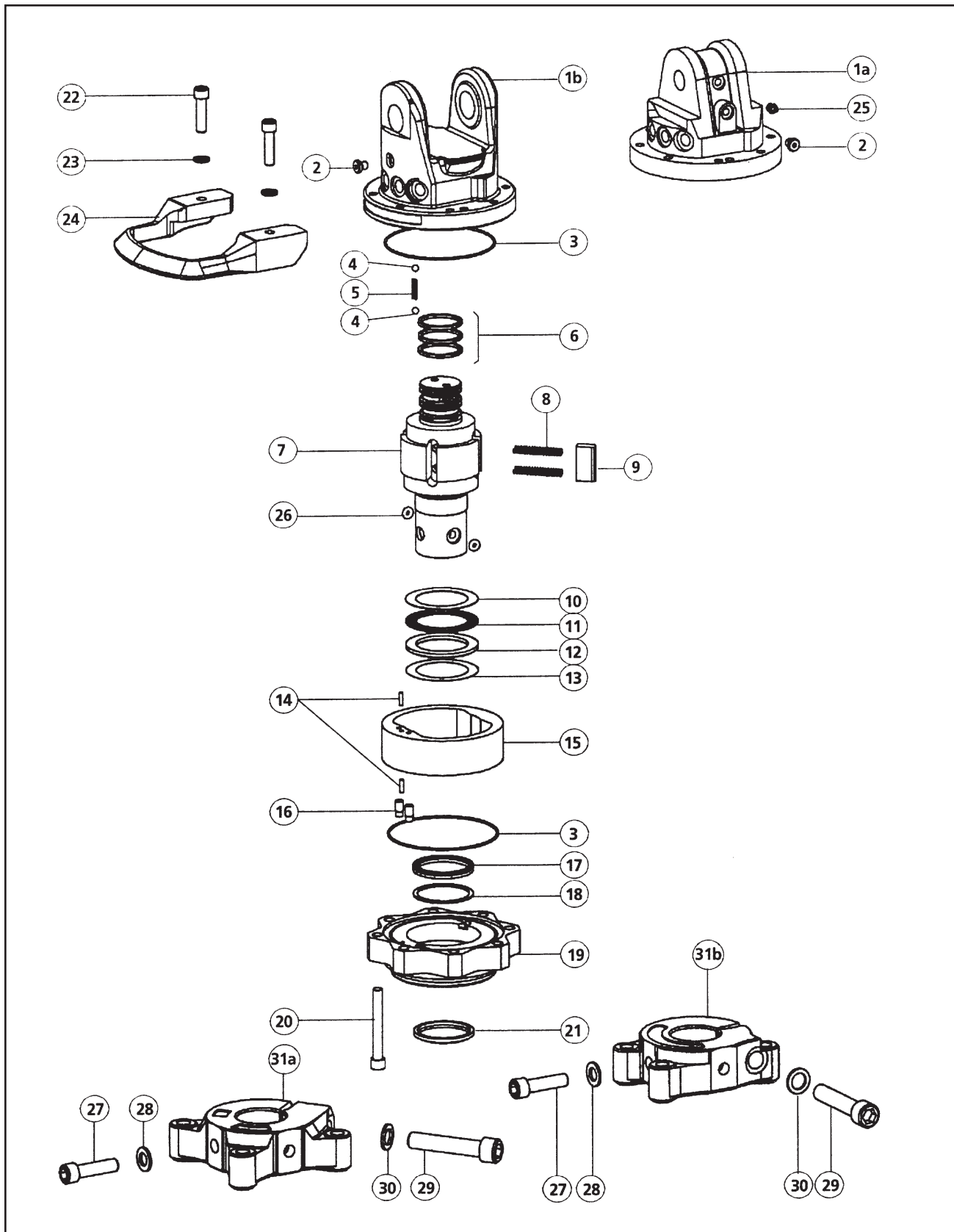
LOCATION	PART NUMBER	DESCRIPTION
1.	955-300043	Pivot Link Pin - 2" Diameter x 6 15/16"
2.	955-200026	Pivot Link Assembly
3.	955-300042	Pivot Link Pin - 2" Diameter x 9 1/2"
4.	955-200027	Cylinder Assembly
5.	900-4913-18	7/8"-9NC x 2 1/4" Hex Head Bolt
6.	900-4901-98	7/8" Mill Carb Washer
7.	938-300639	Bushing
8.	955-200023	Wide Jaw Assembly
9.	955-300044	Grapple Jaw Pin - 2" Diameter x 11 3/4"
10.	955-200021	Grapple Housing Assembly
11.	955-200024	Narrow Jaw Assembly
12.	955-200025	Grapple Assembly (No Cylinders or Rotator)

NOTE: Nuts, bolts, washers, and all other components can be ordered by physical description.

NOTE: Parts may not be exactly as shown.

Bandit

GRAPPLE ROTATOR



NOTE: Parts may not be exactly as shown.

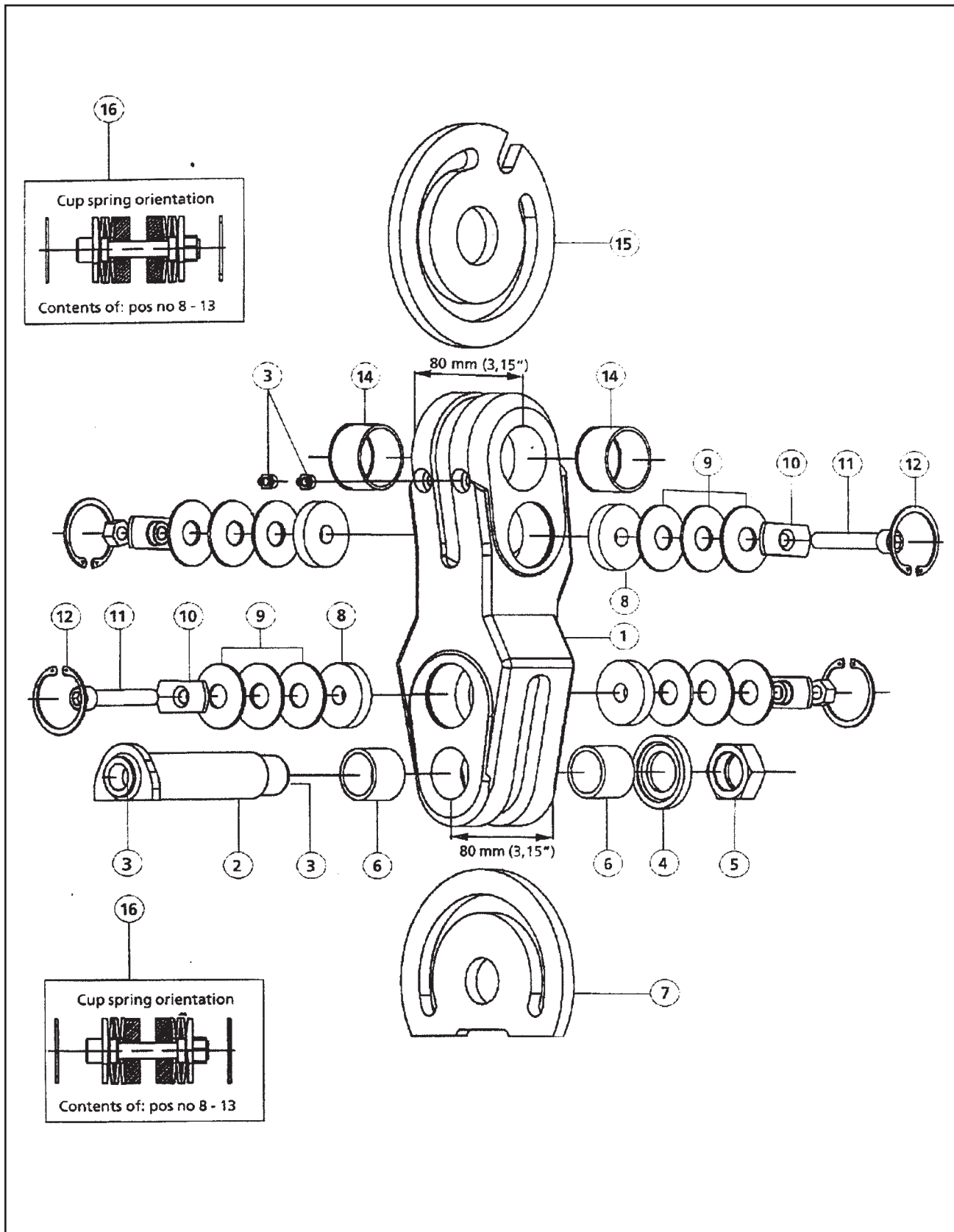
GRAPPLE ROTATOR

LOCATION	PART NUMBER	DESCRIPTION
1 a.	5002-508	Stator Plate, Upper (Pre 4/04)
b.	5002-603	Stator Plate, Upper (Start 4/04)
2.	5001-381	Plug
3.	1024-025	O-Ring
4.	1005-545	Ball
5.	1020-536	Spring
6.	1024-082	Glide Ring
7.	5002-513	Rotator Shaft
8.	5006-030	Spring
9.	5002-525	Vane
10.	1024-058	Washer
11.	1024-041	Axial Needle Bearing
12.	1024-033	Washer
13 a.	5002-575	Shim Set
b.	5002-546	Shim 0.100 mm
c.	5002-547	Shim 0.125 mm
d.	5002-548	Shim 0.150 mm
e.	5002-549	Shim 0.178 mm
14.	1013-580	Roll Pin
15.	5002-512	Stator Frame
16.	5011-105	Valve
17.	1024-066	Seal
18.	1024-074	Support Ring
19.	5002-514	Stator Plate, Lower
20.	1022-649	Screw
21.	1024-090	Wiper Seal
22.	1014-950	Screw
23.	1015-304	Washer
24.	900-3935-49	Hose Guard
25.	1001-825	Grease Nipple
26.	1024-017	O-Ring
27.	1002-153	Screw
28.	1020-890	Washer
29.	1019-488	Screw
30.	1019-496	Washer
31 a.	5002-523	Lower Link FK
b.	5002-524	Lower Link FI
32.	5002-522	Seal Kit (Includes 3,6,17,18,21, & 26)
33 a.	900-3910-19	Entire Rotator Assembly (Pre 4/04)
b.	900-3918-89	Entire Rotator Assembly (Start 4/04)

**NOTE: Nuts, bolts, washers, and all other components
can be ordered by physical description.**

Bandit

DUAL SWING BRAKE (START 4/04)



NOTE: Parts may not be exactly as shown.

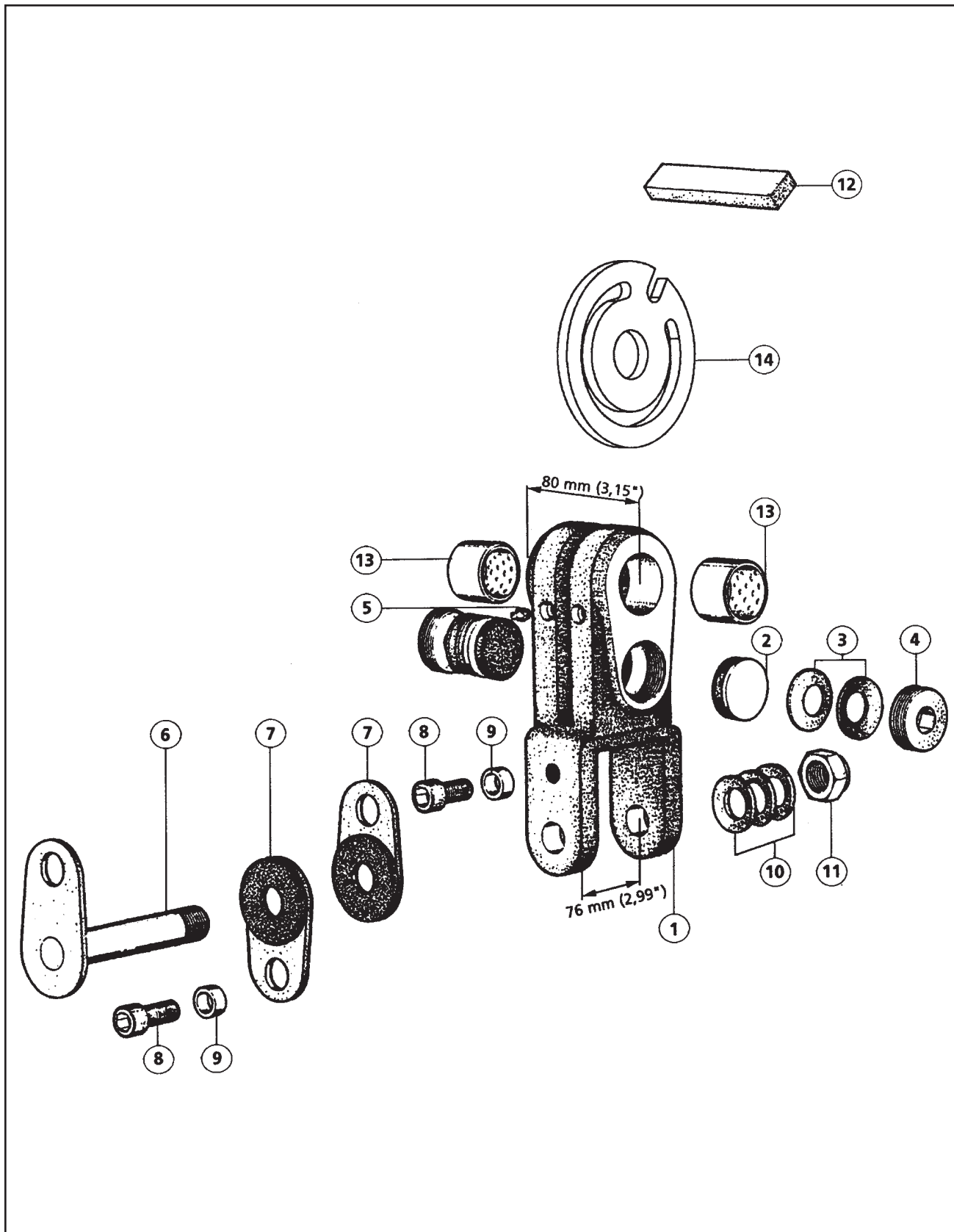
Bandit

DUAL SWING BRAKE (START 4/04)

LOCATION	PART NUMBER	DESCRIPTION
1.	5006-557	Dual Swing Damper Body
2.	900-4908-28	Pin - 35mm Diameter
3.	1001-825	Grease Nipple
4.	900-4908-31	Washer
5.	900-4908-30	Nut
6.	5006-670	Bushing - 35mm Diameter
7.	5016-274	Lower Brake Disc
8.	5016-125	Brake Block
9.	1026-616	Cup Spring
10.	5016-269	Positioning Flange
11.	1003-755	Socket Head Cap Screw
12.	1004-027	Retaining Ring
13.	1008-374	Lock Nut
14.	5002-429	Bushing - 30mm Diameter
15.	5016-276	Upper Brake Disc
16.	5006-650	Brake Kit (Includes 8 - 13) (2 Required Per Assembly)
17.	900-4908-32	Pin Kit (Includes 2, 4, & 5)
18.	900-4905-70	Dual Swing Brake Assembly
19.	1029-461	Users Manual

NOTE: Nuts, bolts, washers, and all other components
can be ordered by physical description.

SINGLE SWING BRAKE (12/01 - 4/04)



NOTE: Parts may not be exactly as shown.

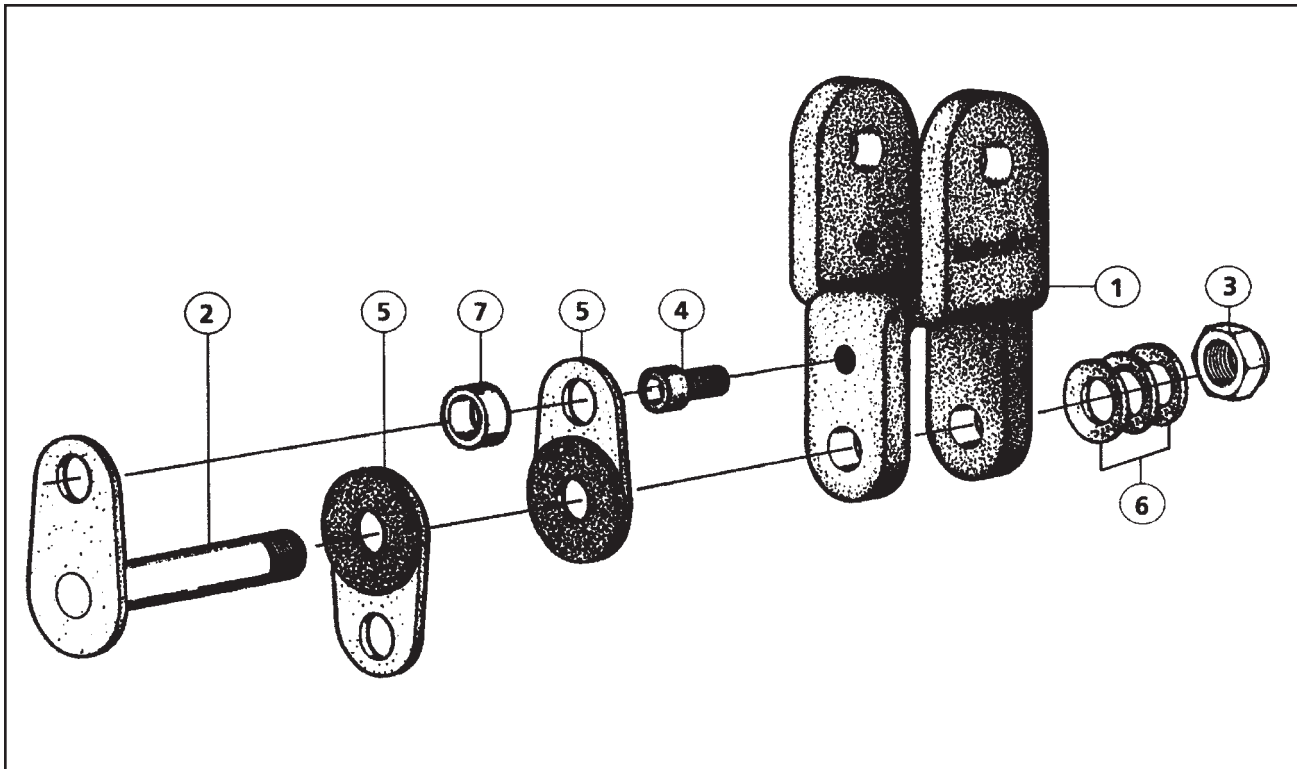
Bandit

SINGLE SWING BRAKE (12/01 - 4/04)

LOCATION	PART NUMBER	DESCRIPTION
1.	5002-384	Single Swing Damper Body
2.	5016-125	Brake Lining
3.	1026-616	Cup Spring
4.	5016-071	Screw
5.	1001-825	Grease Nipple
6.	5002-363	Pin
7.	900-4904-83	Brake Lining
8.	1017-839	Screw (M16 x 30)
9.	900-4904-82	Washer (24mm x 16mm x 5mm)
10.	1017-854	Cup Spring
11.	1005-594	Nut
12.	5006-514	Flat Bar
13.	5002-429	Bushing - 30mm Diameter
14.	5016-276	Brake Disc - 30mm Diameter
15.	900-4904-81	Pivot Kit With Brake (Includes 6 - 11)
16.	900-4905-69	Swing Brake Assembly

NOTE: Nuts, bolts, washers, and all other components
can be ordered by physical description.

KNUCKLE SWING BRAKE (PRE 12/01)

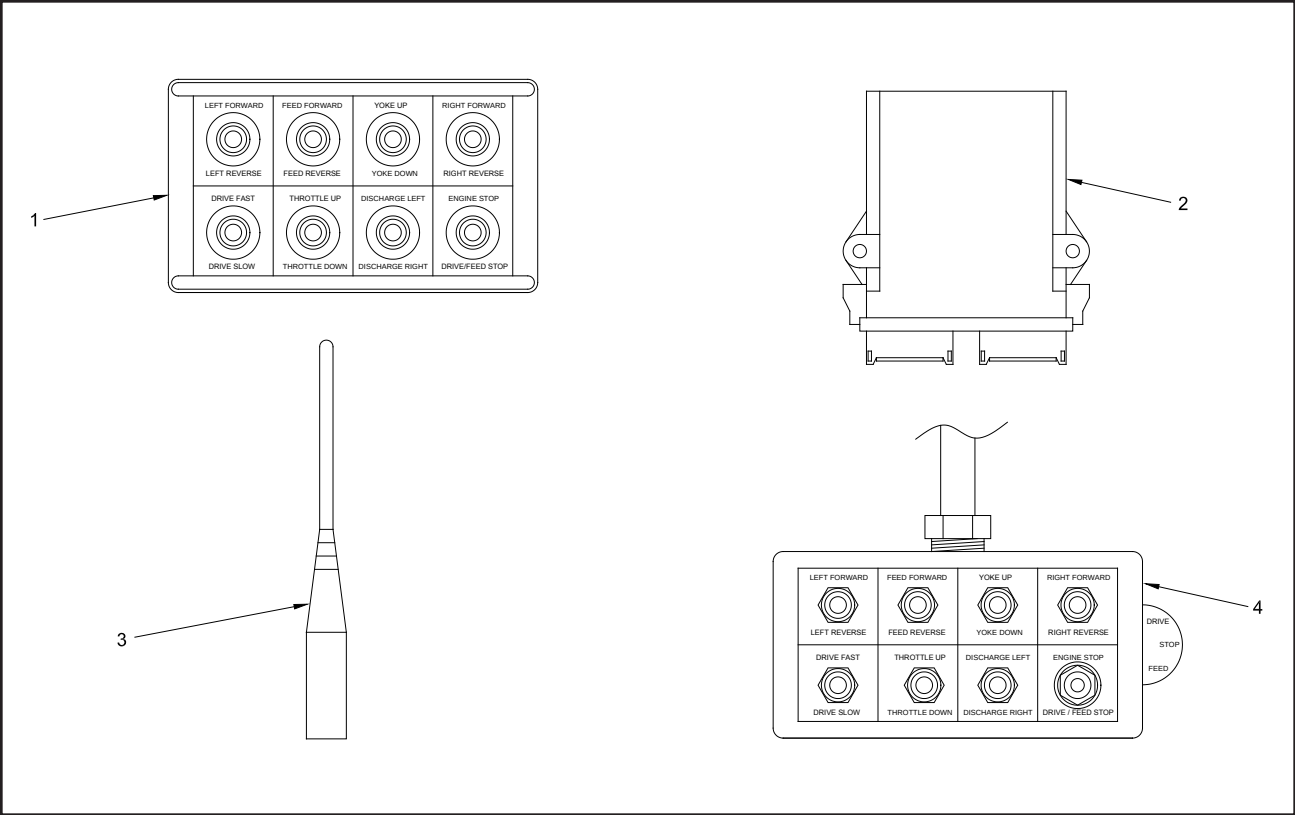


LOCATION	PART NUMBER	DESCRIPTION
1.	900-4904-80	Damper Link Body
2.	5002-363	Pin
3.	1005-594	Nut (M24)
4.	1017-839	Screw (M16 x 30)
5.	900-4904-83	Brake Lining With Disc (2 Required Per Assembly)
6.	900-4904-84	Cup Spring
7.	5002-275	Washer
8.	900-4904-81	Pivot Kit With Brake (Includes 2 - 7) (2 Required Per Ass'y)
9.	900-4904-89	Damper Link Kit Assembly

NOTE: Nuts, bolts, washers, and all other components can be ordered by physical description.

NOTE: Parts may not be exactly as shown.

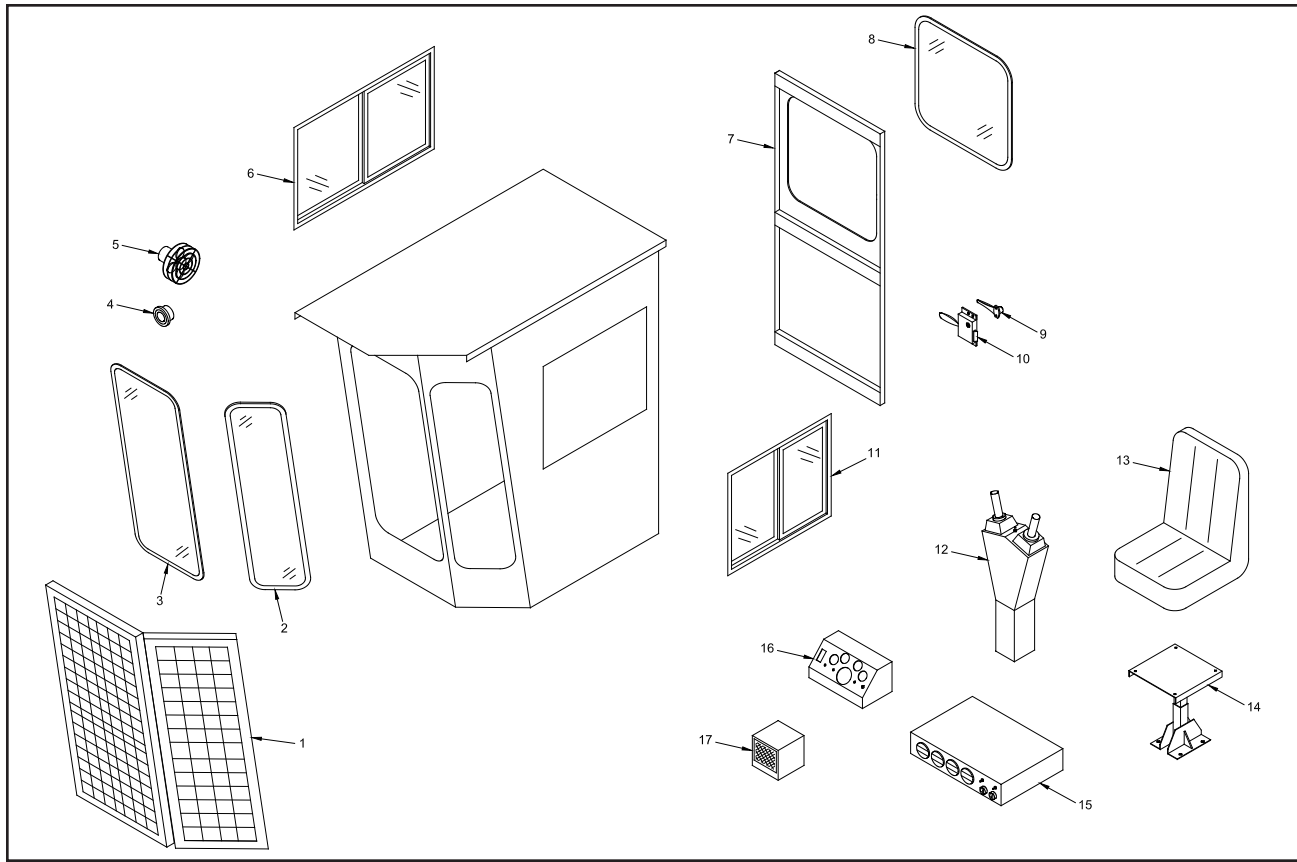
Bandit



LOCATION	PART NUMBER	DESCRIPTION
1.	900-2912-81	Radio Transmitter - Trailerized Unit
2.	900-2912-80	Radio Receiver - Trailerized Unit
3.	900-2912-66	Antenna
4.	900-2912-82	Tether Transmitter - Trailerized Unit
5.	900-2912-36	Harness - Track Units (Not Shown)
6.	900-2912-79	Radio Remote Kit - Trailerized Unit (Includes 1, 2, 3, 4)

NOTE: Parts may not be exactly as shown.

LOADER CAB



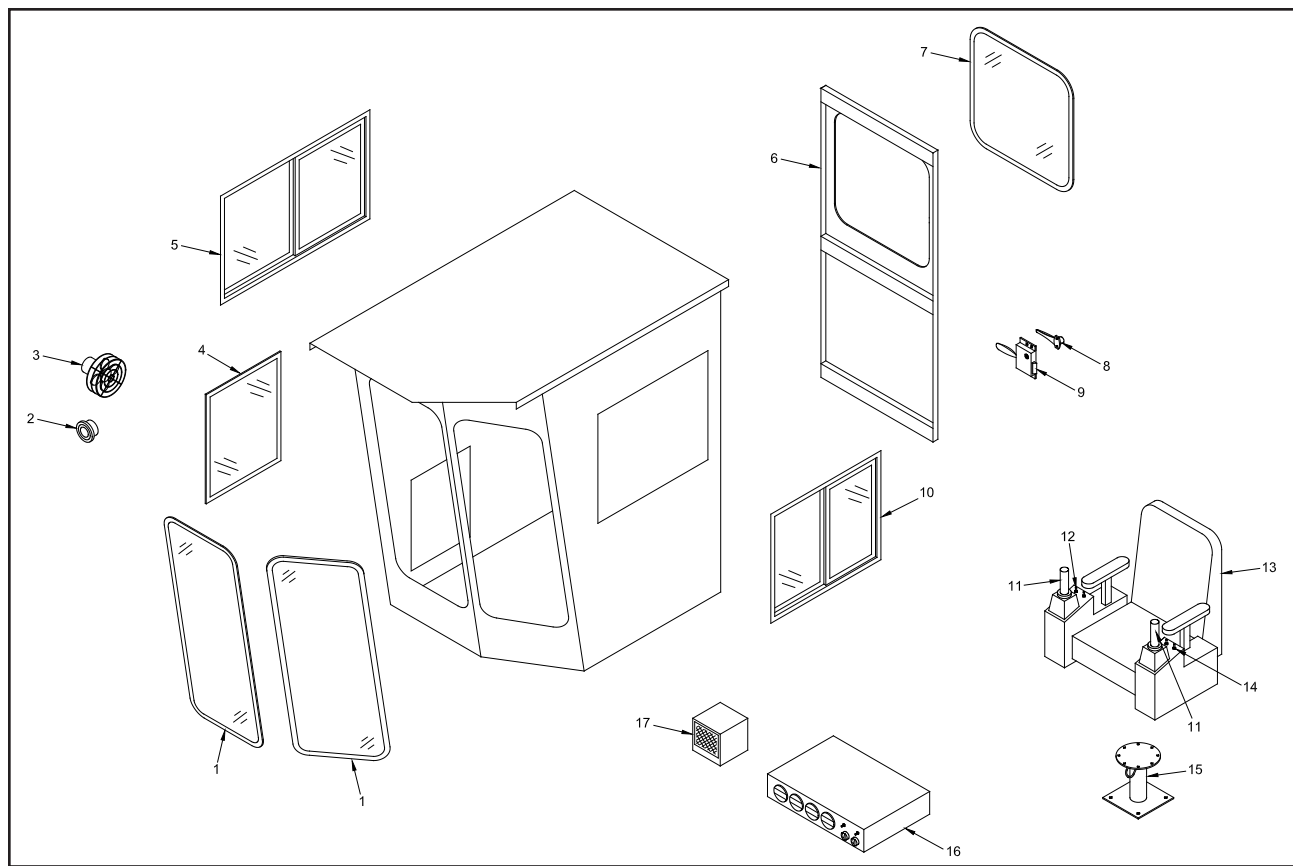
LOCATION	PART NUMBER	DESCRIPTION
1.	960-0500-94	Cab Window Guard - Front
2.	960-0004-01	Front / Side Window
3.	960-0003-99	Front Window
4 a.	900-2901-17	Horn - 12 Volt
b.	900-2914-19	Horn - 24 Volt
5 a.	900-2900-91	Cab Fan - 12 Volt
b.	900-2907-82	Cab Fan - 24 Volt
6.	960-0004-03	Side Sliding Window (Road Side)
7.	960-0500-75	Cab Door Assembly
8.	960-0003-98	Cab Door Window
9.	900-9900-29	Outside Door Handle
10.	900-9900-28	Inside Door Handle
11.	960-0004-04	Side Sliding Window (Loader Side)
12 a.	955-0501-22	Joystick Console
b.	**	Joystick
13 a.	900-9900-06	Operator's Seat
b.	900-9903-11	Seat Belt (Not Shown)
14.	914-0502-24	Seat Pedestal
15 a.	900-9904-12	A/C Unit - 12 Volt
b.	900-9904-31	A/C Unit - 24 Volt
16.	955-0501-20	Gauge Panel
17 a.	900-9901-09	Cab Heater - 12 Volt
b.	900-9900-53	Cab Heater - 24 Volt

**** Components will vary order by Serial Number of machine or physical description.**

NOTE: Parts may not be exactly as shown.

Bandit

TRACK CAB

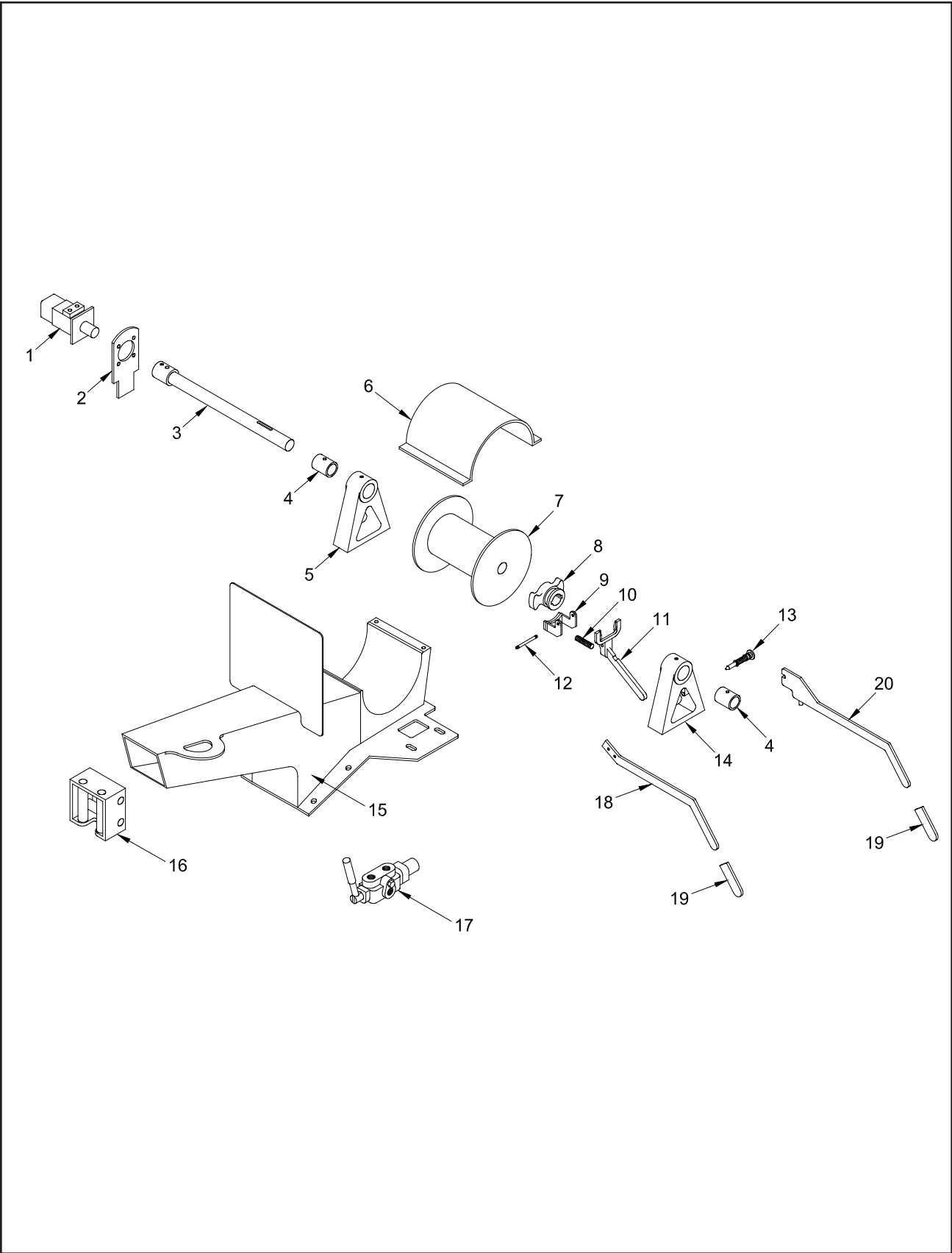


LOCATION	PART NUMBER	DESCRIPTION
1.	975-300212	Front Window
2 a.	900-2901-17	Horn - 12 Volt
b.	900-2914-19	Horn - 24 Volt
3 a.	900-2900-91	Cab Fan - 12 Volt
b.	900-2907-82	Cab Fan - 24 Volt
4.	975-300214	Bottom Side Window
5.	960-0004-03	Side Sliding Window (Road Side)
6.	960-0500-75	Cab Door Assembly
7.	975-300213	Cab Door Window
8.	900-9900-29	Outside Door Handle
9.	900-9900-28	Inside Door Handle
10.	960-0004-04	Side Sliding Window (Loader Side)
11.	**	Joystick
12 a.	900-2906-97	Discharge Swivel Switch
b.	900-2906-97	Flipper Up / Down Switch
13 a.	900-9903-44	Operator's Seat
b.	900-9903-11	Seat Belt
14 a.	900-2910-46	Function Switch (Track / Loader)
b.	900-2910-46	2 Speed Switch (High / Low)
15.	900-9903-45	Seat Pedestal
16 a.	900-9904-12	A/C Unit - 12 Volt
b.	900-9904-31	A/C Unit - 24 Volt
17 a.	900-9901-09	Cab Heater - 12 Volt
b.	900-9900-53	Cab Heater - 24 Volt

**** Components will vary order by Serial Number of machine or physical description.**

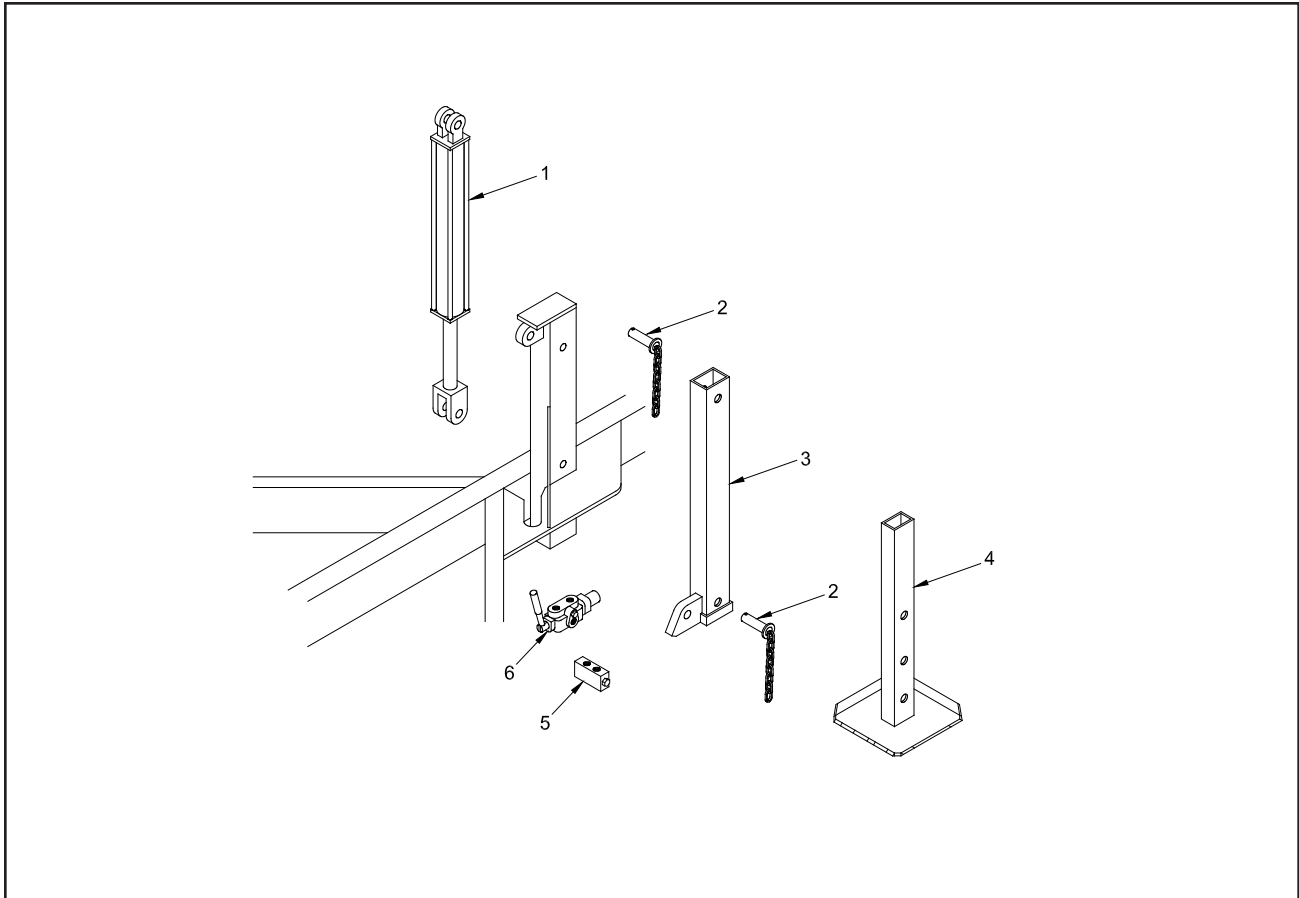
NOTE: Parts may not be exactly as shown.

Bandit



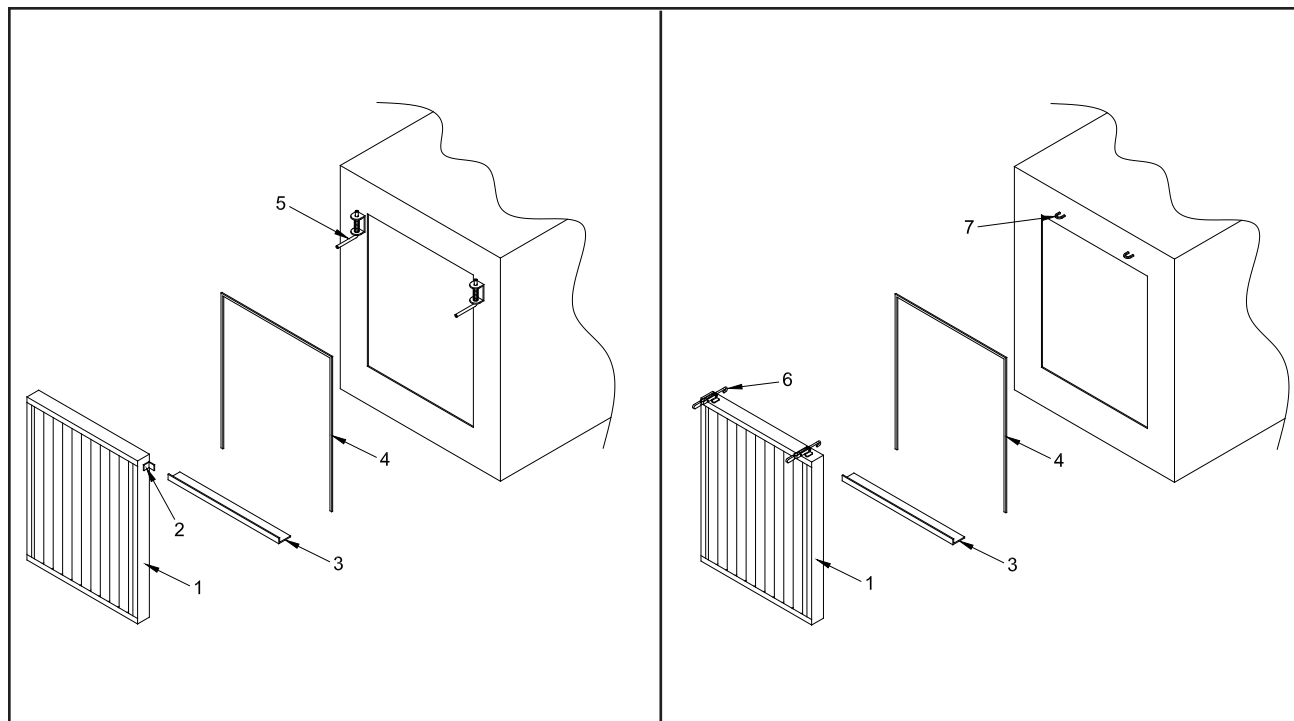
NOTE: Parts may not be exactly as shown.

LOCATION	PART NUMBER	DESCRIPTION
1 a.	900-3921-57	Winch Hydraulic Motor (SAE O-rings) "RS" - Square
b.	900-3902-14	Winch Hydraulic Motor (Pipe Fittings) "RS" - Square
c.	900-3924-39	Winch Hydraulic Motor (SAE O-rings) "RE" - Round
2 a.	981-1001-01	Winch Motor Torque Arm For "RS" Motor
b.	955-1011-71	Winch Motor Torque Arm For "RE" Motor
3 a.	43626	Winch Shaft Only
b.	900-3905-22	Winch Shaft With Keys
4.	40003	Winch Bushing For A Frame
5.	900-3905-21	Winch A Frame Arm (Also Includes # 4)
6.	980-300260	Winch Drum Cover
7.	900-3905-19	Winch Drum
8.	900-3905-17	Winch Clutch
9.	40473	Winch Brake Shoe Only
10.	40024	Winch Spring
11 a.	40469	Winch Shift Lever Only
b.	900-3905-16	Winch Shift Lever With #'s 9 & 10
12 a.	40025	Winch Pin For Brake Assembly
b.	41669	Winch Snap Ring For Winch Pin
13.	900-3905-14	Winch Release Lever Pin Assembly
14.	900-3905-18	Winch Arm (Includes #'s 4, 9 - 13)
15 a.	937-200077	Winch Tunnel Assembly
b.	920-200027	Winch Tunnel Assembly For Machine With Loader (Not Shown)
16 a.	980-0505-82	Winch Roller Assembly
b.	914-1004-18	Winch Roller Only
c.	914-1004-21	Winch Roller Bolt Only
17 a.	900-3920-01	Winch Valve (SAE O-rings)
b.	900-3901-42	Winch Valve (Pipe Fittings)
18.	955-300376	Winch Shift Lever Extension (If Applicable)
19.	900-9904-59	Vinyl Cap For Handle Extension (If Applicable)
20.	955-300377	Lock Pin Handle Extension (If Applicable)
21.	904-0002-60	Winch Kit (Includes #'s 1 - 17)



LOCATION	PART NUMBER	DESCRIPTION
1 a.	900-3934-24	Tongue Jack Cylinder - Welded
b.	900-3912-12	Tongue Jack Cylinder - Tie Rod Ends
c.	904-0007-14	Pin For Welded Cylinder (Not Shown)
2.	914-1000-38	Lock Pin
3.	980-0131-50	Inside Tube Assembly
4.	980-0509-53	Drop Leg Foot Pad Assembly
5.	900-3925-94	Check Valve
6 a.	900-3920-01	Tongue Jack Valve (SAE O-rings)
b.	900-3901-42	Tongue Jack Valve (Pipe Fittings)
7.	980-0509-00	Hydraulic Tongue Jack Kit (Includes #'s 1 - 6)

NOTE: Parts may not be exactly as shown.



LOCATION	PART NUMBER	DESCRIPTION
1.	980-0508-17	Bandit H.D. Foldaway Radiator Screen Ass'y (specify latch type)
2.	980-0122-86	Spring Lock Tab Foldaway Radiator Screen
3.	*_*	Mount Tray For Foldaway Radiator Screen
4.	900-7900-57	Weather Strip
5 a.	900-4901-83	Spring Lock Plunger
b.	900-7900-93	Rubber Cap For Spring Lock - 1/2" Diameter
6.	900-4901-61	Hook Pull Clamp
7.	980-0128-77	Lock Tab For Hook

**** Will Vary Depending On Engine And Component Options. Order By
Serial Number Of Chipper Or Physical Description.**

NOTE: Parts may not be exactly as shown.

CHIPPER SECTION

“CLAMP-IN” KNIFE HARDWARE

DANGER

Replace the bolts, nuts, knives, counter knives, clamps and holder when they need it. **DON'T** stretch it! You will pay for it either by damage to machine or possible damage to a person. Knife pocket nuts and bolts should be replaced after (5) uses.

Using a piece of wood and a screwdriver install the sharp babbitted knife and hold it firmly into position. The piece of wood will hold the knife back into pocket and the screwdriver must be used to raise the knife to the outer edge of pocket.

To retighten the knife clamp; first tighten center nut on clamp and then tighten the outside nuts. Clamp nuts must be torqued tight at 500 ft.-lbs.

Always check with a .002 to .005 feeler gauge to make sure the knife, counter knife and clamps are seated tight at all seams when done. There should not be any gap between the knife pocket pinch points in hardware.

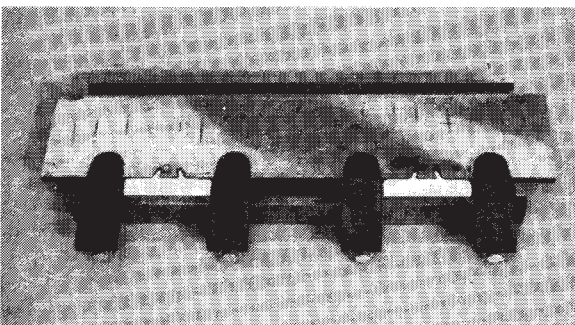
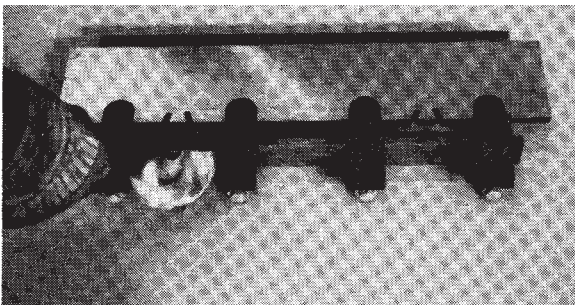
When changing “clamp-in” knives it is a must that one person be on each side of chipper disc to change knives.

To remove the dull knife have one person hold the knife in position carefully with leather gloves from infeed side of disc. Then the other person from engine side of disc can loosen the clamp nuts with a 6-point socket. They only need to be loosened enough to let knife slide out infeed side of chipper disc. Clean all debris out of the knife slot in hardware. Always visually check the counter knife for replacement wear.

KNIFE BABBITTING PROCEDURES

Insert the knives into the knife gauge and slide the spacers up tight to avoid overspill of the babbitt material.

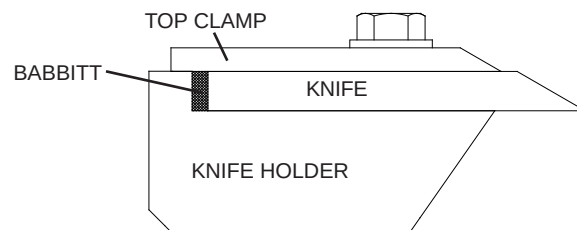
Heat the knife and knife gauge with a torch. This will prevent blow back which could occur if there were any moisture left in the fixture.



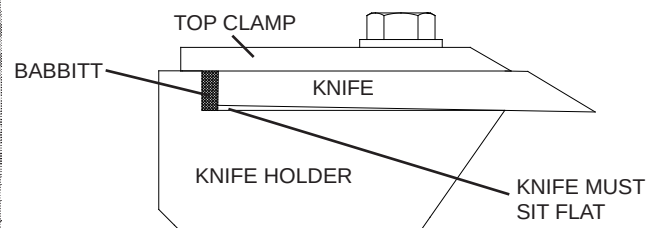
Pour babbitt slowly from the ladle on to knife gauge between steps gradually filling the cavity.

Once the babbitt has cooled remove the knife and place on a stand so the access babbitt can be filed away. Do not allow the babbitt to extend over the edges of the knife or serious damage will result to the components in the knife pocket.

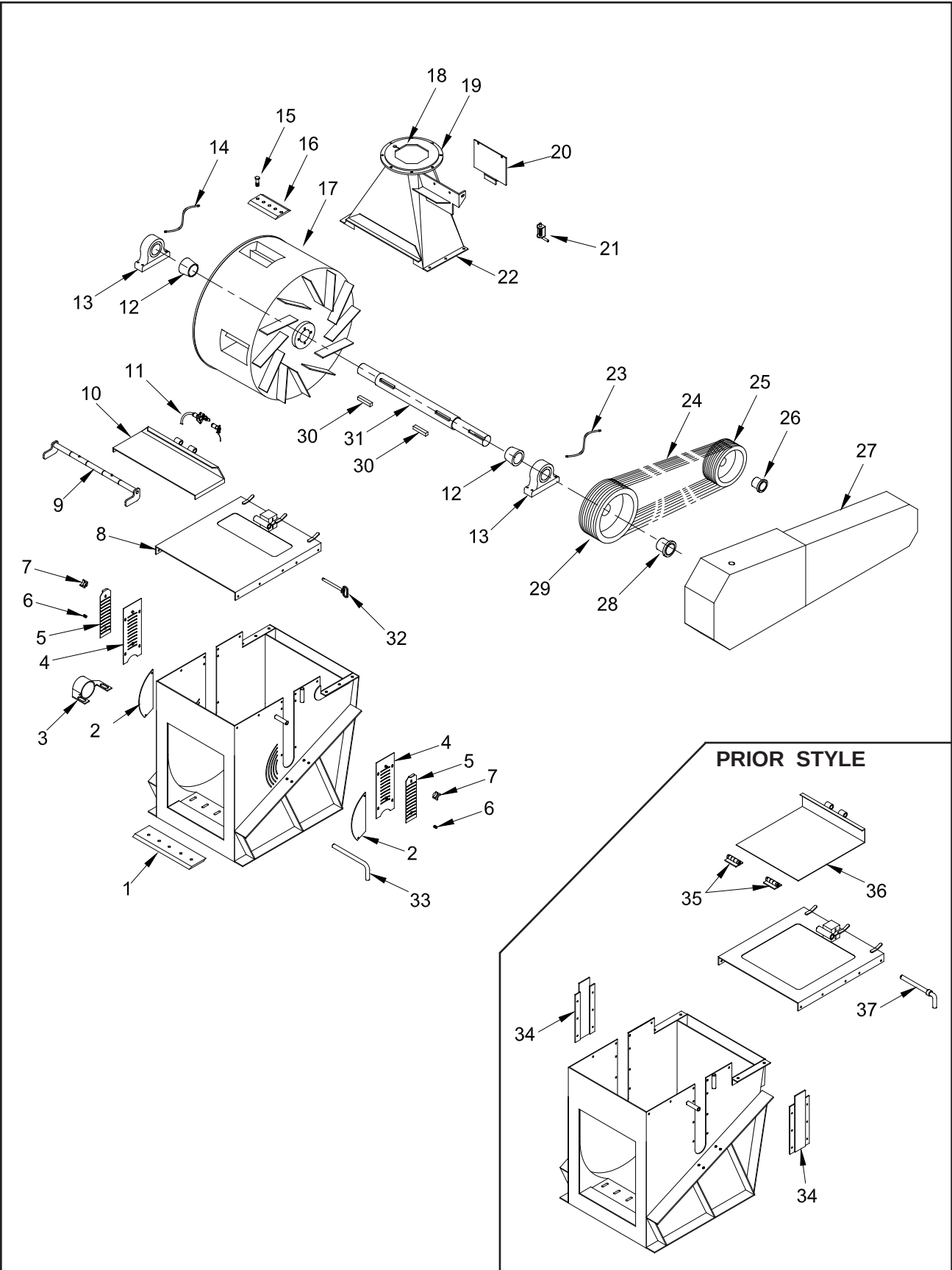
“PROPER” USE OF BABBITT ON CHIPPER KNIVES



“IMPROPER” USE OF BABBITT ON CHIPPER KNIVES



Bandit



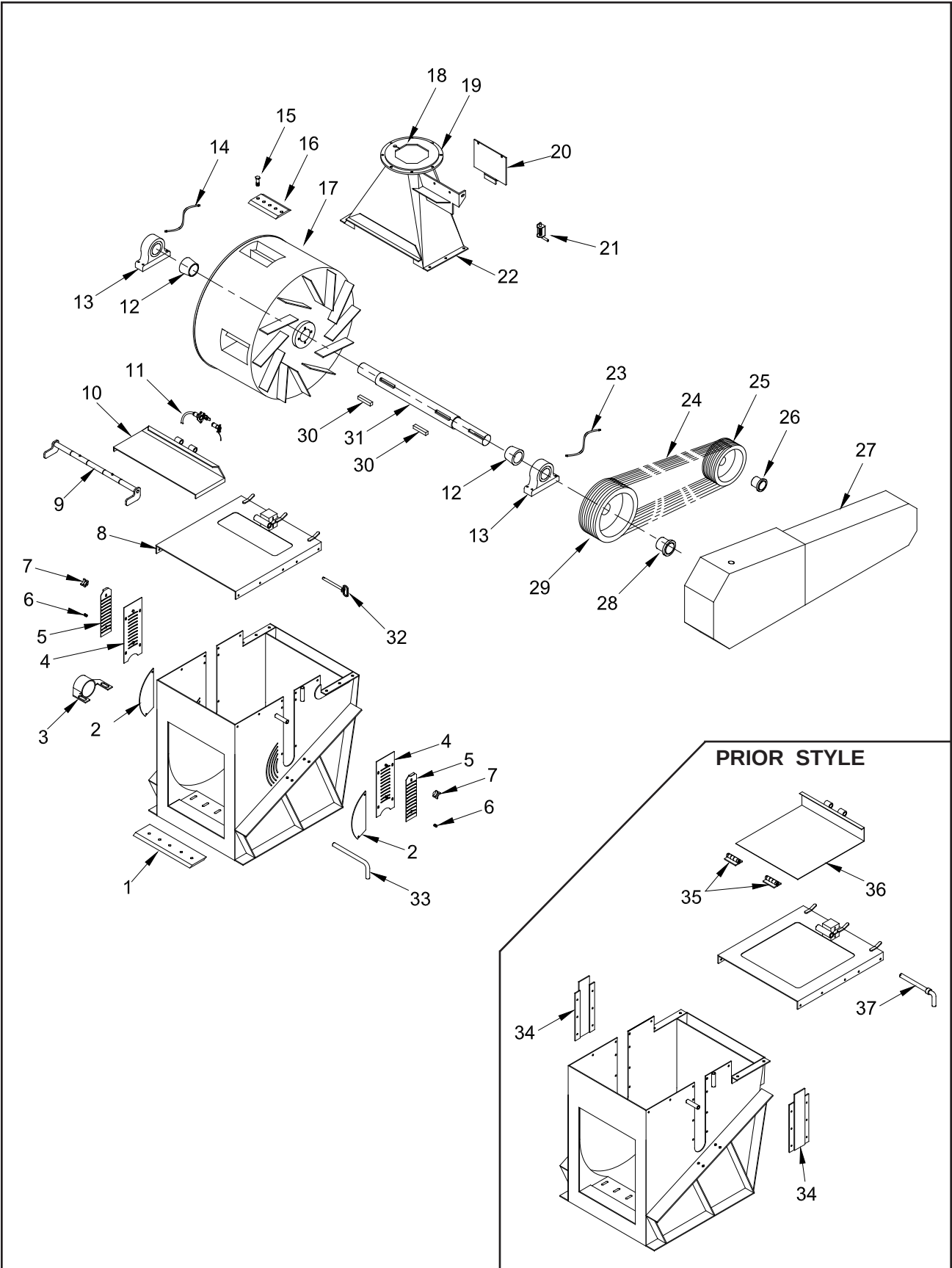
NOTE: Parts may not be exactly as shown.

LOCATION	PART NUMBER	DESCRIPTION
1.	See Page	Anvil
2.	911-1001-88	Vent Cover
3.	920-200033	Drum Shaft Bearing Cover
4 a.	937-1012-38	Base Slot Cover (Up through 250 Hp)
b.	920-300066	Base Slot Cover (275 Hp and over)
5 a.	937-300007	Air Vent Cover - Steel
b.	937-300008	Air Vent Cover - Aluminum
c.	937-100001	Air Vent Cover Kit - Steel (Includes Two Pieces Of 5,6,7)
d.	937-100000	Air Vent Cover Kit - Aluminum (Includes Two Pieces Of 5,6,7)
6.	900-4908-33	Spring For Vent Cover
7.	900-4908-29	Plastic Knob For Vent Cover
8 a.	937-1011-77	Base Top
b.	937-300165	Base Top For 24" Wide Drum (Up through 250 Hp)
c.	937-300297	Base Top For 24" Wide Drum (275 Hp and over)
d.	920-300026	Base Top (2090 Track)
9 a.	937-200086	Hood Door Hinge Kit (Includes 9c, 9e - 9g, & 9i) (Start 8/06)
b.	920-200078	Hood Door Hinge Kit For 24" Wide Drum (Includes 9d - 9f, 9h, & 9i) (Start 8/06)
c.	937-300304	Pin For Hood Door Hinge
d.	937-300300	Pin For Hood Door Hinge For 24" Wide Drum
e.	937-300301	Side Mount For Hood Door Hinge
f.	937-300302	Tube For Hood Door Hinge
g.	937-300307	Tube With Grease Zerk Hole For Hood Door Hinge
h.	937-300306	Tube With Grease Zerk Hole For 24" Wide Drum Hood Door Hinge
i.	900-4911-84	Grease Zerk For Hood Door Hinge
10 a.	937-300032	Hood Door
b.	937-300163	Hood Door For 24" Wide Drum (Up through 250 Hp)
c.	937-300310	Hood Door For 24" Wide Drum (275 Hp and over)
d.	920-300025	Hood Door (2090 Track)
11 a.	937-200133	Engine Disable Plug Kit (Includes Hood Pin & Mounts)
b.	900-2904-13	6-Prong Female Plug Only
c.	980-100083	6-Prong Male Plug With Wire Loop & Crimp Sleeves
12 a.	900-1907-17	Drum Head Bushing (Up through 250 Hp)
b.	900-1911-83	Drum Head Bushing (275 Hp and over)
c.	900-1906-26	Drum Head Bushing (S/N 1403 Only)
13 a.	900-1906-32	Chipper Drum Bearing (Up through 250 Hp)
b.	900-1906-51	Chipper Drum Bearing (275 Hp and over)
c.	900-1905-97	Chipper Drum Bearing (S/N 1403 Only)
d.	900-4910-41	3/4"-10NC x 5" Bolt - Chipper Drum Bearing Road Side Only (Not Shown)
e.	900-4910-34	3/4"-10NC x 4 1/2" Bolt - Chipper Drum Bearing Curb Side Only (Not Shown)
f.	900-4903-21	3/4" Mill Carb Washer - Chipper Drum Bearing (Not Shown)
g.	900-4910-19	3/4"-10NC Jam Nut - Chipper Drum Bearing Road Side Only (Not Shown)
h.	900-4901-23	3/4"-10NC Nut - Chipper Drum Bearing (Not Shown)
14.	900-3934-25	Chipper Bearing Grease Line - Road Side
15.	- - -	Chipper Knife Bolt
16.	- - -	Chipper Knife

NOTE: Nuts, bolts, washers, and all other components can be ordered by physical description.

**** Components vary with engine options order by physical description or machine S/N.**

Bandit

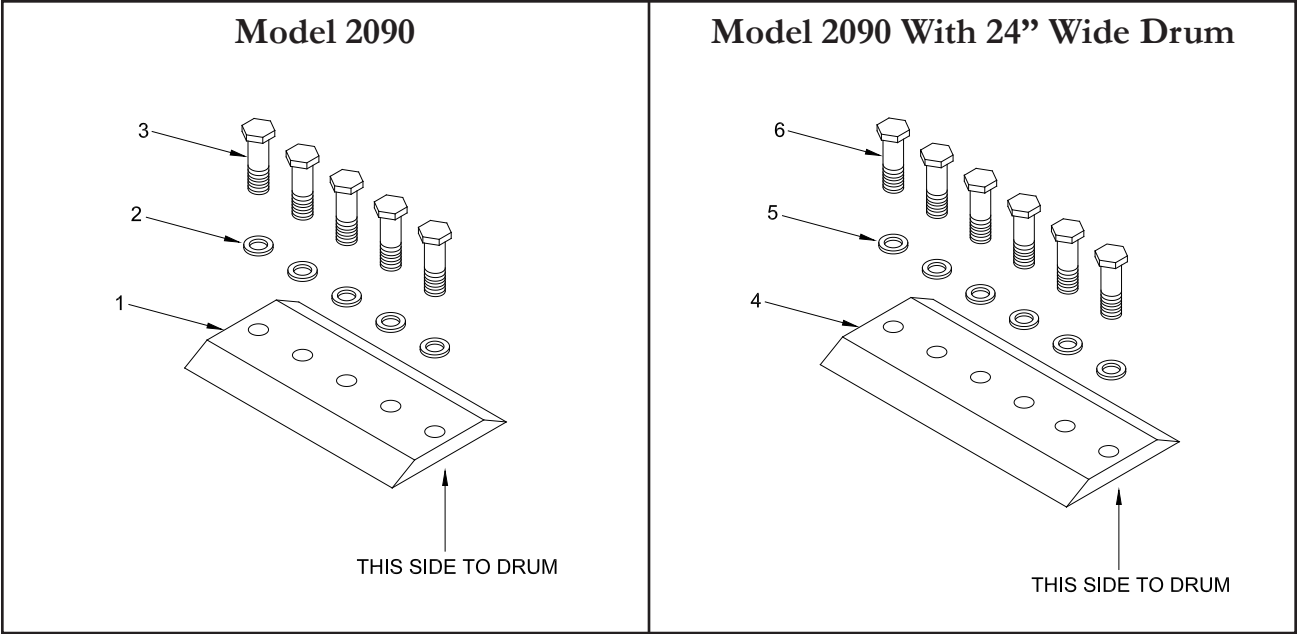


NOTE: Parts may not be exactly as shown.

LOCATION	PART NUMBER	DESCRIPTION
17 a.	937-0501-62	Chipper Drum Head Assembly With Shaft (Up through 250 Hp)
b.	920-200034	Chipper Drum Head Assembly With Shaft (275 Hp and over)
c.	920-200076	24" Wide Chipper Drum Head Assembly With Shaft (Up through 250 Hp)
d.	920-200077	24" Wide Chipper Drum Head Assembly With Shaft (275 Hp and over)
e.	937-0500-40	Chipper Drum Head Assembly With Shaft (S/N 1403 Only)
f.	937-200035	Chipper Drum Head Assembly With Shaft (2090 Track, S/N 1744 Only)
18.	937-1005-63	Bottom Swivel Flange
19 a.	980-0128-24	Bottom Swivel Ring For Manual Swivel Discharge
b.	980-0128-23	Bottom Swivel Ring For Hand Crank Swivel Discharge
c.	980-0122-18	Bottom Swivel Ring For Hydraulic Swivel Discharge
20.	937-0501-31	Optional Clean Out Door Assembly
21 a.	900-4904-90	Discharge Spring Lock
b.	900-7900-96	Rubber Cap (Not Shown)
22 a.	937-0500-41	Transition Assembly (Specify Discharge Swivel Type)
b.	937-200052	Transition Assembly For 24" Wide Drum (Specify Discharge Swivel Type)
23.	900-3921-02	Chipper Bearing Grease Line - Curb Side
24.	**	Chipper Belts
25.	**	Engine Sheave
26.	**	Engine Sheave Bushing
27 a.	920-200032	Beltshield Assembly (Up through 275 Hp)
b.	920-200031	Beltshield Assembly (300 Hp and over)
c.	937-0501-68	Beltshield Assembly (S/N 1403 & 1415 Only)
d.	920-200029	Beltshield Engine Sheave Half (Up through 275 Hp)
e.	920-200028	Beltshield Engine Sheave Half (300 Hp and over)
f.	920-200030	Beltshield Chipper Sheave Half
28.	**	Chipper Sheave Bushing
29.	**	Chipper Sheave
30 a.	900-1907-51	Key For Drum Head Shaft (Up through 250 Hp)
b.	920-300064	Key For Drum Head Shaft (275 Hp and over)
c.	937-1004-19	Key For Drum Head Shaft (S/N 1403 Only)
31 a.	937-1008-69	Drum Head Shaft (Up through 250 Hp)
b.	920-300184	Drum Head Shaft (275 Hp and over)
c.	920-300183	Drum Head Shaft For 24" Wide Drum (Up through 250 Hp)
d.	920-300331	Drum Head Shaft For 24" Wide Drum (275 Hp and over)
e.	937-1004-17	Drum Head Shaft (S/N 1403 Only)
f.	920-300065	Drum Head Shaft (2090 Track, S/N 1744 Only)
32 a.	911-100000	Hood Pin With Attaching Chain
b.	900-4902-20	Padlock For Hood Pin (Not Shown)
c.	P812	Key For Padlock (Not Shown)
33 a.	955-1003-94	Drum Lock Pin
b.	900-7900-96	Rubber Cap (Not Shown)
34.	937-0500-07	Base Strap (S/N 1403 - 1479)
35.	937-1002-82	Hood Door Hinge (Pre 8/06)
36.	937-1002-48	Hood Door (S/N 1403 - 1479)
37 a.	937-1002-79	Hood Pin (S/N 1403 - 1479)
b.	937-0502-42	Hood Pin, Attaching Chain, & Male Disable Plug (S/N 1403 - 1479)

NOTE: Nuts, bolts, washers, and all other components can be ordered by physical description.

**** Components vary with engine options order by physical description or machine S/N.**



KNIFE BOLTS MUST BE INSTALLED THROUGH KNIFE AS SHOWN

Part Numbers For Model 2090 Knives

LOCATION	PART NUMBER	DESCRIPTION
1.	900-9902-27	5/8" x 5 1/2" x 10" Chipper Knife
2.	900-4901-32	5/8" Mill Carb Washer
3.	900-4900-20	5/8"-11NC x 2" Knife Bolt
NOTE: Torque Knife Bolts to 180 ft.-lbs. (245 Nm)		

Part Numbers For Model 2090 With 24" Wide Drum Knives

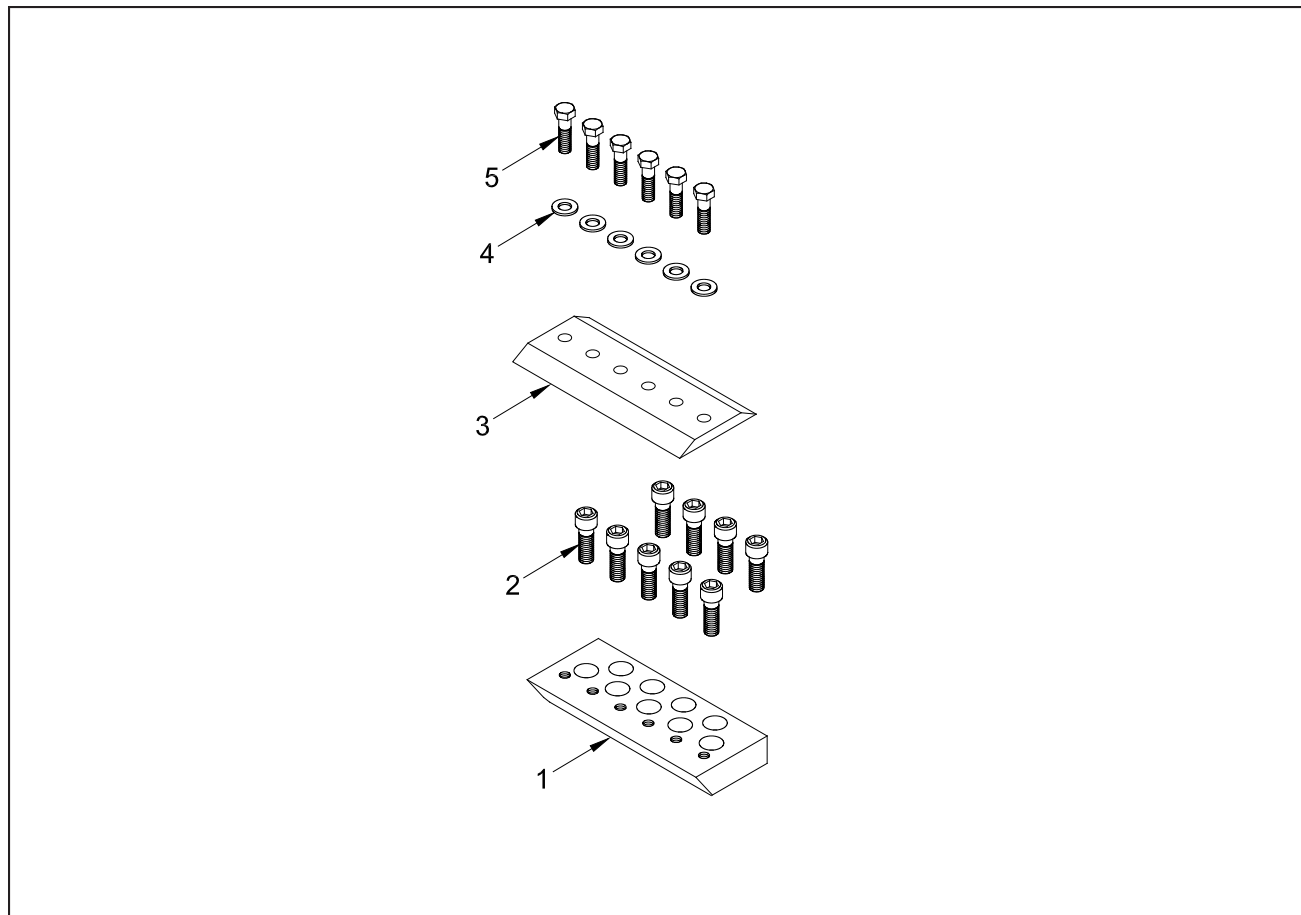
LOCATION	PART NUMBER	DESCRIPTION
4.	900-9904-38	5/8" x 5 1/2" x 12 1/8" Chipper Knife
5.	900-4901-32	5/8" Mill Carb Washer
6.	900-4900-20	5/8"-11NC x 2" Knife Bolt
NOTE: Torque Knife Bolts to 180 ft. lbs. (245 Nm)		

Part Numbers For Miscellaneous Knife Parts

LOCATION	PART NUMBER	DESCRIPTION
7.	900-9901-68	Knife Saver Kit (Not Shown)
8.	900-9901-65	File For Knife Saver Kit Only (Not Shown)
9.	900-9901-63	Replacement Blades For Knife Saver (Not Shown)

NOTE: Parts may not be exactly as shown.

Model 2090 With 24" Wide Drum & Replaceable Holder

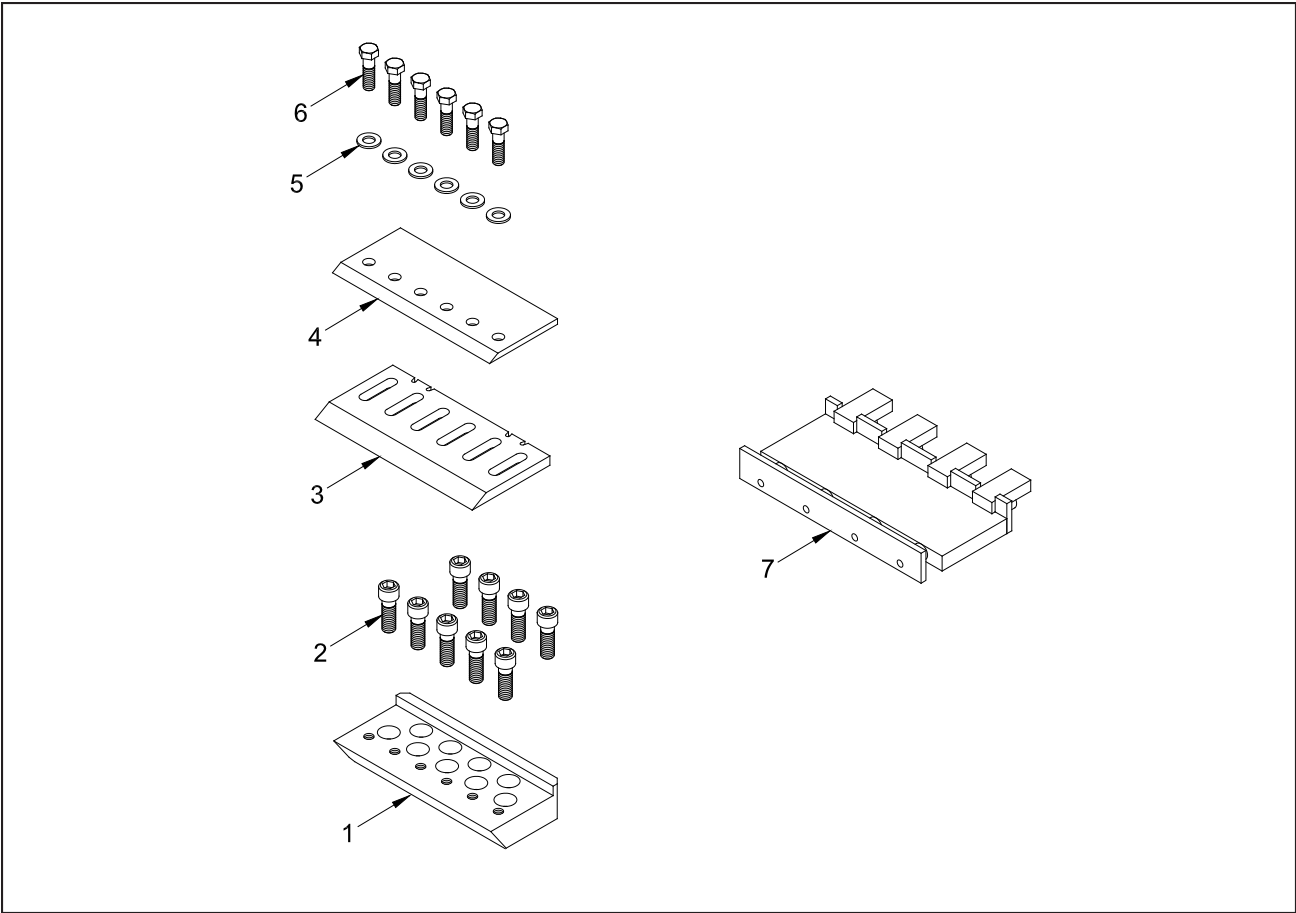


LOCATION	PART NUMBER	DESCRIPTION
1.	938-301104	Knife Holder
2.	900-4914-30	3/4"-10NC x 2 1/4" SHCS Knife Holder Bolt
3.	900-9904-38	Knife - Double Edge
4.	900-4901-32	5/8" Mill Carb Washer
5.	900-4913-99	5/8"-18NF x 2" Hex Head Knife Bolt

Torque Knife Bolt to 180 ft.-lbs. (245 Nm)
 Torque Knife Holder Bolt to 250 ft.-lbs. (339 Nm)

NOTE: Parts may not be exactly as shown.

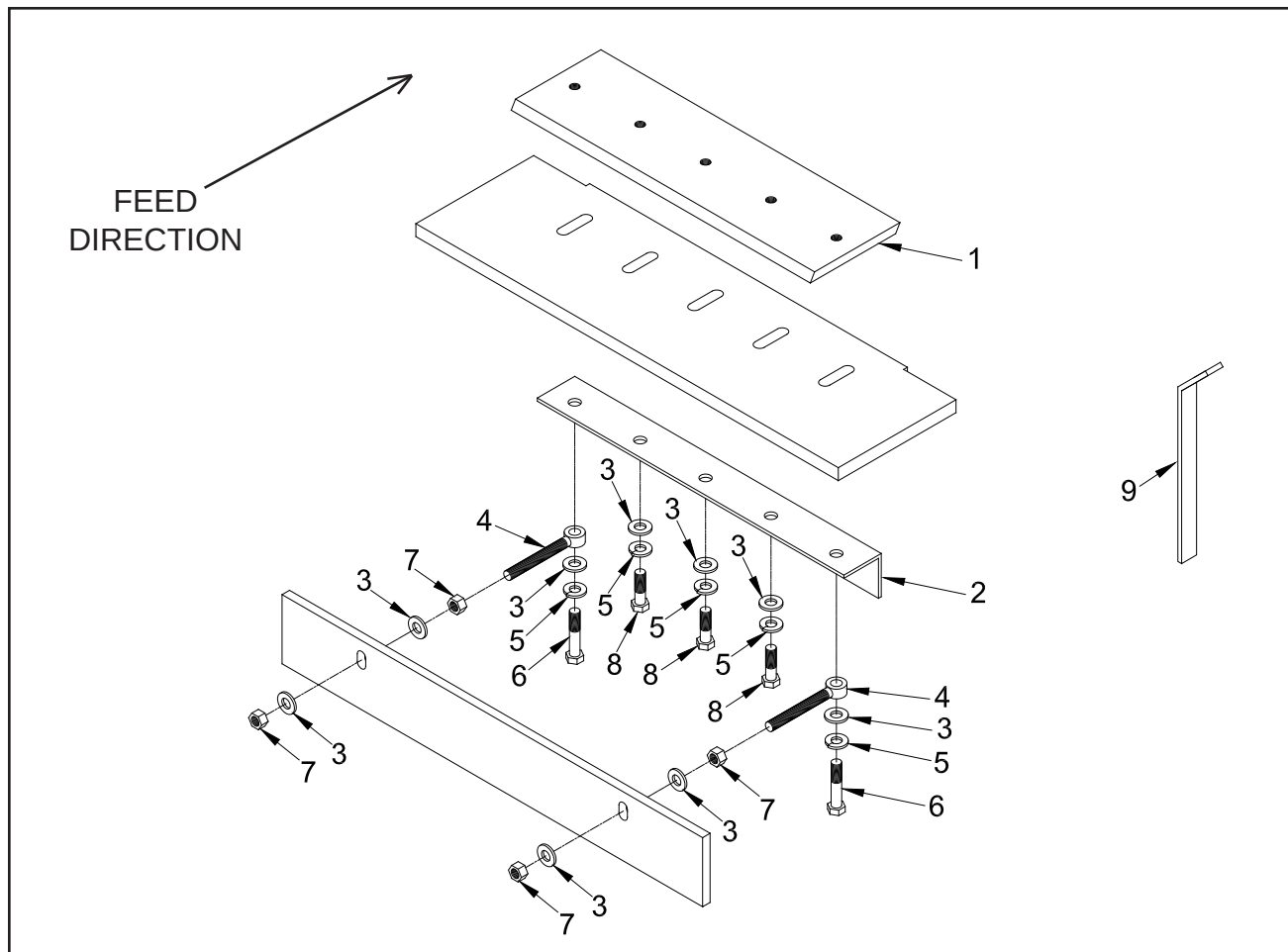
Model 2090 With 24” Wide Drum & Babbitted Knives



LOCATION	PART NUMBER	DESCRIPTION
1.	938-3013-36	Knife Holder
2.	900-4914-30	3/4"-10NC x 2 1/4" SHCS Knife Holder Bolt
3.	900-9906-73	Knife - Babbitt Style
4.	938-3013-37	Top Clamp
5.	900-4901-32	5/8" Mill Carb Washer
6.	900-4914-27	5/8"-18NF x 2 1/4" Hex Head Knife Bolt
7.	959-1000-02	Knife Gauge
8.	900-9906-90	Ladle (Not Shown)
9.	900-9900-60	1/2 Ball Of Babbitt

Torque Knife Bolt to 180 ft.-lbs. (245 Nm)
Torque Knife Holder Bolt to 250 ft.-lbs. (339 Nm)

NOTE: Parts may not be exactly as shown.



LOCATION	PART NUMBER	DESCRIPTION
1 a.	937-1001-72	Anvil Only
b.	937-1004-37	"AR" Anvil Only
c.	937-300159	Anvil Only For 24" Wide Drum
d.	937-300159A	"AR" Anvil Only For 24" Wide Drum
2 a.	937-1001-74	Anvil Clamp Plate
b.	937-300161	Anvil Clamp Plate For 24" Wide Drum
3.	900-4909-18	1/2" Mill Carb Washer
4 a.	900-4907-91	Anvil Eye Bolt - 1/2"-13NC x 4 1/2" (Current)
b.	900-4902-73	Anvil Eye Bolt - 1/2"-13NC x 5 1/2" (Prior)
5.	900-4902-11	1/2" Lock Washer
6.	900-4903-17	1/2"-13NC x 2 1/2" Hex Head Bolt
7.	900-4900-45	1/2"-13NC Hex Nut
8.	900-4906-74	1/2"-13NC x 2" Hex Head Bolt
9.	981-1006-25	Anvil Gauge
10.	904-0003-90	Anvil Hardware Kit Only (Includes 3 - 8)
11 a.	937-0501-64	Anvil & Hardware Kit (Includes 1a & 3 - 8)
b.	937-200031	Anvil For 24" Wide Drum & Hardware Kit (Includes 1c & 3 - 8)

NOTE: Torque Anvil Bolts to 75 ft.-lbs. (102 Nm)

NOTE: Parts may not be exactly as shown.

Bandit