Owner's Manual

Carlton PROFESSIONAL TREE EQUIPMENT

Drum Style Brush Chippers

Model 2015

Machine Serial #	_____
Engine Model & Spec #	_____
Engine Serial #	_____
PTO/Clutch Model & Spec #	_____
Clutch Serial #	_____
Purchase Date	_____
Dealer	_____

Carlton

J.P.Carlton Company
Div. D.A.F. Inc.
121 John Dodd Road
Spartanburg, SC 29303
Ph. (864) 578-9335
Fax (864) 578-0210
www.stumpcutters.com

DIESEL ENGINE EXHAUST WARNING

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 reproduction harm.

⚠ DANGER

NEVER TOUCH MOVING MACHINE PARTS!

0700301

⚠ DANGER

NEVER climb, ride on, or hang from this machine in any position or manner while it is in operation, running, or being transported.

PERSONAL INJURY IS PROBABLE!

0700303

⚠ DANGER

NEVER reach into this area with hands or other objects severe injury, including amputation, could occur.

NEVER attempt to service belts or other machine parts until all machine parts have come to a complete stop. ALWAYS REMOVE KEY BEFORE SERVICING MACHINE.

0700302

⚠ DANGER

AIRBORNE CHIPS DISCHARGED FROM MACHINE MAY BE HAZARDOUS

NEVER turn discharge spout in the direction of spectators or structures.
NEVER allow anyone to be in or in front of discharge area.
DISCHARGE SPOUT should be secured completely during transport or operation using clamps, pins, or bolts.

0700304

⚠ DANGER

DANGER - REACHING OR KICKING INTO THE FEED HOPPER AREA WHILE MACHINE IS RUNNING WILL CAUSE SEVERE INJURY OR DEATH!

DANGER - FEED ROLLERS PULL WOOD INTO CHIPPER CUTTING AREA AND CAN'T TELL A DIFFERENCE IN BODY PARTS AND WOOD!

NEVER PUSH OR LAY SHORT PIECES OF WOOD, BRANCHES, OR BRUSH INTO THE FEED ROLLER AREA WITH YOUR HAND OR FOOT. USE A WOODEN PADDLE TO PUSH SHORT PIECES OF MATERIAL INTO FEED WHEELS OR LAY IT ON TOP OF LARGER PIECES OF MATERIAL.

ALWAYS BE PREPARED TO STOP OR TO REVERSE THE FEED SYSTEM AND BE IN A POSITION TO DO SO.

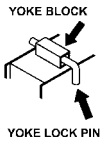
OSHA, ANSI AND THE MANUFACTURER HAVE SPECIFIC SAFETY AND OPERATION PROCEDURES - FOLLOW THEM TO PREVENT SEVERE INJURY OR DEATH!

ALL OWNERS AND OPERATORS MUST READ AND UNDERSTAND THE SAFETY AND OPERATING PROCEDURES PROVIDED ON OR WITH THIS MACHINE (DECALS, MANUALS, ETC.)

0700327

⚠ DANGER

NEVER perform service between feed wheels without upper feed wheel being raised, blocked, and chained. YOKE LOCK PIN MUST BE IN POSITION.

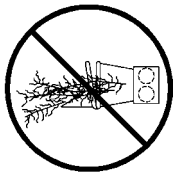


NEVER depend on the hydraulic cylinder to hold the upper feed wheel in raised position. The hydraulic cylinder is not a secure method to hold the wheel. Raise the upper feed wheel using the lift cylinder high enough to fit the yoke lock pin in the yoke block.

NEVER PERFORM SERVICE WITHOUT ENGINE TURNED OFF AND KEY REMOVED.

0700305

⚠ DANGER



MUST FOLLOW THESE GUIDELINES WHEN RUNNING VINE TYPE MATERIAL THROUGH CHIPPER!

NEVER lay vine type material in front of feed hopper!

NEVER allow yourself or your clothing to become tangled in or tripped by vine type material. SEVERE INJURY COULD OCCUR!

ALWAYS cut vine type material into shorter, easier to handle pieces, approximately 4 to 5 feet!

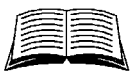
STOP automatic feed system and run short pieces of vine type material through chipper using manual start/stop controls and a wooden push paddle!

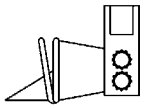
STAY ALERT! Stand near feed control handle and be prepared to use if necessary!

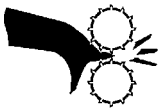
0700306

⚠ DANGER

INJURY OR DEATH CAN BE PREVENTED! OPERATE THIS MACHINE ONLY IF:





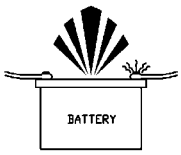


- All personnel are completely trained and understand the operating and shut down procedures.
- ANSI Z133 AND OSHA 29-1910 STANDARDS, concerning personal safety gear and proper clothing, are observed.
- Operators stay alert and are prepared to operate the feed control bar.
- Safety guards and covers are installed and tightened properly.
- Factory supplied or approved parts are installed.
- All safety and machine controls are fully functional.
- Operator reads and fully understands all decals.
- Decals are properly installed, visible, and readable.
- Chipper hood is not opened when machine is running.

BE SAFE! Always read and follow all safety instructions and operating procedures provided in manuals, on decals, video, and ANSI Z133 and OSHA 29-1910 standards. Always keep hands, feet and all other body parts out of feed hopper when feed wheels or machine are running .

0700307

⚠ WARNING



USE CAUTION IN EXTREME COLD! FROZEN BATTERY WILL EXPLODE!

NEVER JUMP START A BATTERY IN FREEZING TEMPERATURES. INSPECT BATTERY FOR SIGNS OF FROST BEFORE STARTING IN EXTREME COLD. MOVE EQUIPMENT TO A HEATED, WELL VENTILATED AREA TO ALLOW BATTERY TO THAW BUT NOT NEAR FIRE, SPARKS, OR OTHER SOURCES OF IGNITION.

BATTERY FUMES ARE EXPLOSIVE. NEVER USE JUMPER CABLES OR RECHARGE BATTERY UNLESS IN AN OPEN OR WELL VENTILATED AREA AND AWAY FROM ALL SOURCES OF IGNITION.
BATTERY ACID CAN CAUSE SEVERE BURNS. KEEP AWAY FROM EYES, SKIN, AND CLOTHING.
ALWAYS REMOVE BATTERY BEFORE WELDING ON EQUIPMENT. FOLLOW PROCEDURES FOR WELDING AND GROUNDING BEFORE STARTING TO WELD ON THIS MACHINE OR EQUIPMENT DAMAGE AND POSSIBLY SEVERE PERSONAL INJURY WILL OCCUR.

0700314

⚠ WARNING

LOUD NOISE! FLYING DEBRIS!

HEARING AND EYE PROTECTION MUST BE WORN WHILE IN OPERATION!

PROTECT YOUR HEARING AND SIGHT AND WEAR APPROVED SAFETY AND PERSONAL PROTECTION EQUIPMENT. OSHA AND ANSI SAFETY STANDARDS SHOULD BE FOLLOWED CLOSELY.

0700315

⚠ WARNING

SEVERE ENGINE DAMAGE **WILL** OCCUR IF THIS ENGINE IS OPERATED AT AN ANGLE GREATER THAN 25°

PROPER ENGINE OIL LEVEL MUST BE MAINTAINED TO ACHIEVE MAXIMUM ANGLE OF OPERATION OF 25°
(SEE ENGINE OWNER'S MANUAL FOR PROPER OIL LEVEL)

0700075A

⚠ WARNING

FLAMMABLE FUEL

THIS MACHINE USES DIESEL FUEL AND HYDRAULIC OIL.

NEVER FILL TANK WHILE ENGINE IS HOT, RUNNING, OR IN A CONFINED AREA. DANGER OF FIRE OR EXPLOSION EXIST.

LEAVE ROOM IN THE TANK FOR EXPANSION FROM HEAT - NEVER FILL TANK COMPLETELY FULL.

KEEP MACHINE AWAY FROM FIRE, SPARKS, AND OTHER SOURCES OF IGNITION DURING USE AND STORAGE.

NEVER PUT MACHINE IN STORAGE WITH FUEL IN THE TANK.

ALWAYS STORE FUEL IN APPROVED (RED) CONTAINERS AND AWAY FROM SOURCES OF IGNITION.

0700316

⚠ WARNING

KEEP AWAY FROM PRESSURIZED LEAKS

Pressurized leaks are not always visible. Check for pressurized leaks using cardboard or wood. Never use a finger, hand or other body part to check for leaks.

Injuries from pressurized leaks penetrating the skin will lead to serious health problems or death. CONSULT A PHYSICIAN IMMEDIATELY IF PENETRATION OCCURS, SURGICAL REMOVAL REQUIRED.

Release pressure from line before loosening, removing or replacing any hydraulic hoses or equipment.

0700317

NOTICE

REGULARLY ADJUST AND GREASE PTO/CLUTCH PER MANUFACTURER'S MANUAL

0700308

NOTICE

DECALS SHOULD BE PROPERLY MAINTAINED AND REPLACED. IT IS THE DUTY OF THE OWNER OF THIS EQUIPMENT TO KEEP DECALS IN GOOD CONDITION.

REPLACEMENT DECALS MAY BE PURCHASED FROM J. P. CARLTON CO.

0700309

NOTICE

NEVER ENGAGE OR DISENGAGE CLUTCH AT HIGH ENGINE SPEEDS IN EXCESS OF 1200 RPM!

FOLLOW PTO/CLUTCH MANUFACTURER'S MANUAL FOR PROPER MAINTENANCE PROCEDURES AND LUBRICATION SCHEDULES. DO NOT OPERATE THIS EQUIPMENT UNLESS PROPER SERVICE IS PERFORMED. BE SURE TO FOLLOW THE PROCEDURES FOR YOUR BRAND AND MODEL AS SERVICE AND OPERATION VARIES BY BRAND AND MODEL. NEW PARTS AND EQUIPMENT MAY REQUIRE SERVICE SOONER AND MORE OFTEN.

WELL TRAINED OPERATORS DON'T COST YOU MONEY!

POOR MAINTENANCE PRACTICES WILL COST YOU MONEY, MAKE SURE ANYONE WHO OPERATES THIS MACHINE IS FAMILIAR WITH THE MAINTENANCE AND LUBRICATION PROCEDURES. A WELL MAINTAINED AND CORRECTLY ADJUSTED CLUTCH SHOULD PROVIDE MANY YEARS OF SERVICE WITH LITTLE COST. LACK OF PROPER MAINTENANCE AND LUBRICATION WILL CAUSE THE CLUTCH TO FAIL PREMATURELY.

0700312

NOTICE

IMPORTANT MAINTENANCE

- **REPLENISH RADIATOR COOLANT DAILY WHEN ENGINE IS OFF AND COLD. KEEPING THE ENGINE COOL AIDES IN LONG ENGINE LIFE. READ AND FOLLOW ENGINE MANUAL FOR COOLANT TYPE AND OTHER ADDITIVES.**
- **CLEAN ENGINE COOLING SYSTEM REGULARLY. (SUCH AS COOLING FANS, AIR COOLED ENGINE SHROUD, AND FILTER SCREENS, ETC.)**
- **BLOCKED FINS WILL KEEP RADIATOR FROM COOLING ENGINE SUFFICIENTLY. PRESSURIZED WATER SHOULD BE USED ONCE OR TWICE DAILY TO CLEAN RADIATOR FINS COMPLETELY. ALL DEBRIS MUST BE REMOVED FROM FINS. USING AIR PRESSURE WILL NOT CLEAN COMPLETELY.**

ENGINE WILL OVERHEAT AND FAILURE WILL OCCUR IF RADIATOR AND COOLING EQUIPMENT ARE NOT MAINTAINED OR SERVICED CORRECTLY OR IF NEGLECTED.

0700328

NOTICE

LUBRICATION AND HYDRAULICS CHECKLIST

ONLY TEXACO STARPLEX II GREASE OR EQUIVALENT SHOULD BE USED.

FOLLOW THE GUIDELINES IN THE LUBRICATION SECTION AND CHART IN THE MANUAL.

PTO/CLUTCH AND ENGINE SHOULD BE SERVICED AS SPECIFIED IN THE OWNER'S MANUALS FOR EACH.

REPLACE HYDRAULIC FILTER AFTER FIRST 10 HOURS OF OPERATION AND EACH 400 HOURS AFTERWARD.

HYDRAULIC TANK SHOULD ALWAYS BE KEPT 7/8 FULL. INCORRECT OIL TEMPERATURE OR PRESSURE MAY CAUSE CAVITIES TO FORM IN PUMP THUS CAUSING FAILURE AND EXPENSIVE REPAIRS.

PREMATURE FAILURE MAY OCCUR IF HYDRAULICS ARE NOT ALLOWED TO CIRCULATE SLOWLY A MINIMUM OF 5 MINUTES TO WARM UP IN COLD WEATHER.

TIGHTEN BELTS PROPERLY, LOOSE BELTS CAUSE SLIPPING AND HYDRAULIC POWER LOSS AND OVERLY TIGHT BELTS CAUSE BROKEN PUMP SHAFTS. CHECK MANUAL FOR PROPER BELT TENSION.

FAILURE DUE TO POOR HYDRAULIC AND BEARING MAINTENANCE IS VISIBLE AND WILL VOID WARRANTY!

REFER TO MANUAL FOR MORE INFORMATION

0700310

NOTICE

SERVICING BELTS AND BEARINGS

ALWAYS TURN OFF ENGINE AND REMOVE KEY BEFORE SERVICING! ALLOW ALL PARTS TO COME TO A COMPLETE STOP AND COOL BEFORE TOUCHING!

- New belts stretch and get loose. After 2 hours of operation, check tension and tighten belts.
- Check tension and retighten every 4 hours of operation until tension stays consistent.
- See manual for instruction and proper tension.
- Thereafter, check belt tension every month until belts need replacing.

AT LEAST ONCE A MONTH:

- CHECK AND TIGHTEN BOLTS AND LOCK SETSCREWS ON ALL BEARINGS.
- CHECK AND TIGHTEN SCREWS ON ALL BELT PULLEY BUSHINGS.

REFER TO MAINTENANCE SECTION

0700311

NOTICE

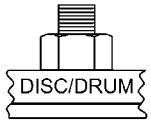
REPLACEMENT KNIFE AND HARDWARE SHOULD BE FACTORY APPROVED

ALWAYS use correct torque when retightening or replacing chipper knife or other hardware as specified in manual.

REPLACE chipper knife bolts and nuts that have been tightened numerous times - tighten no more than 5 times.

ALWAYS replace chipper knife, holders, bolts, and nuts with factory issued or approved parts for this machine (see manual).

ONLY resharpen chipper knife as specified in manual. Never go below minimum width.



INSTALL chipper knife hardware correctly. The nut goes next to the chipper disc/drum with the flat side of the nut next to the disc/drum.

0700313

CHIPPER LIMITED WARRANTY

J. P. Carlton Co. Inc., hereafter referred to as the "Manufacturer", warrants each new Carlton Chipper to be free of defects in workmanship and material for a period of one year.

This warranty takes effect upon delivery to the original retail purchaser. The manufacturer at its option will replace or repair at a point designated by the manufacturer, any parts which appear to have been defective in material or workmanship. The manufacturer is not responsible for consequential damages.

This warranty will be valid *only* if the chipper is operated in a manner recommended by the manufacturer. The following examples would void warranty:

1. The chipper has been abused. (Such as over extending size limits, not following routine maintenance recommendations, etc.)
2. The machine is involved in or damaged by an accident.
3. Repairs or attempted repairs were made without prior written authorization. Including, but not limited to, repairs made due to normal wear or not using manufacturer approved replacement parts.
4. Chipper damaged by foreign materials. (Such as wire, metals of any kind, etc.)

The owner is responsible for all regular maintenance as explained in the operator's manual. Neglect in regular maintenance or failure to replace normal wear items such as knives, anvil, lubrication oils, filters, belts, bearings, etc. may void warranty.

This warranty is expressly in lieu of any other warranties, expressed or implied, including any implied warranty or merchantability of fitness for a particular purpose and of any non-contractual liabilities including product liabilities based upon negligence or strict liability. J. P. Carlton Co. Inc. will not be liable for consequential damages resulting from breach of warranty.

IT IS NECESSARY TO RETURN THE WARRANTY VALIDATION FORM AND NOTIFY J. P. CARLTON CO. INC. IN WRITING WITHIN TEN (10) DAYS FROM DELIVERY DATE TO VALIDATE THIS WARRANTY.

NOTE: This warranty applies only to new and unused equipment or parts thereof manufactured by J. P. Carlton Co. Inc. ANY MACHINES USED FOR LEASE OR RENTAL – WARRANTY IS LIMITED TO 90 DAYS FROM FIRST DAY OF INITIAL SERVICE.

NOTICE: All power units and associated components are *NOT* warranted by J. P. Carlton Co. Inc. or their dealers. It is the customer's responsibility to return the machine to the local engine distributor.

Information phone numbers to find your local engine & parts service centers:

Honda 1-770-497-6400
Kohler Engines..... 1-800-544-2444
Briggs & Stratton Engines..... 1-800-233-3723
Lombardini 1-770-623-3554
Deutz Engines..... 1-800-241-9886
John Deere Engines 1-800-533-6446
Caterpillar..... 1-877-636-7658
Kubota 1-847-955-2500
Kawasaki Engines..... 1-616-949-6500
Wisconsin Engines 1-800-932-2858
Onan Engine 1-800-888-6626

In order to process any claims, it is the owner's responsibility to report claims properly to the manufacturer or the authorized dealer from whom the equipment was purchased. It is necessary to include the following information on any and all request for warranty:

1. Dealer from whom purchased
2. Date of delivery
3. Serial number of unit
4. Model number of unit
5. Engine make and serial number
6. Length of time in use
7. Date of failure
8. Nature of failure

EXPLANATION OF LIMITED WARRANTY

The manufacturer will not reimburse the customer or dealer labor cost incurred for installing “bolt-on” or “slip-on” items, such as pumps and motors, bearings, belts, pulleys, etc. The manufacturer will provide replacement parts at no cost to the customer for defective parts during the warranty period. Defective parts must be returned to J. P. Carlton Company. It will be the customer’s responsibility to install the replacement parts unless arrangements are made with the selling dealer.

The manufacturer will not reimburse travel cost to servicing dealer. It is the customer’s responsibility to deliver the machine to the dealer’s facility, unless other arrangements have been agreed to between the selling dealer and the customer.

The manufacturer may elect, at its discretion, to reimburse reasonable labor cost to customer or dealer for major defect repairs. Prior approval must be obtained from J. P. Carlton Company Inc.

IMPORTANT NOTICE

1. AIR FILTER MAINTENANCE IS CRITICAL ON CHIPPERS. DIRT INGESTION WILL NOT BE WARRANTED BY THE ENGINE MANUFACTURER OR BY J. P. CARLTON COMPANY.

2. OIL AND OIL FILTER MAINTENANCE ARE CRITICAL ON CHIPPERS.
   STARVING THE ENGINE FOR OIL WILL NOT BE WARRANTED BY THE ENGINE MANUFACTURER OR BY J. P. CARLTON COMPANY.

3. CLUTCH MAINTENANCE AND ADJUSTMENT ARE CRITICAL; FOLLOW THE CLUTCH MAINTENANCE AND ADJUSTMENT SECTIONS IN THIS MANUAL.
   J. P. CARLTON CO. DOES NOT WARRANT THE CHIPPER CLUTCH. READ THE CLUTCH MANUAL FOR THE MANUFACTURER’S WARRANTY.

Warranty Validation Form

Congratulations on your purchase of a Carlton Chipper. This product has been designed and manufactured to provide years of profitable service while minimizing maintenance and downtime. Please take the time now to complete this warranty validation form. This information is necessary for Carlton to instate your warranty.

Return Form To: J. P. Carlton Company, Div. D.A.F. Inc.
121 John Dodd Road; Spartanburg, SC 29303; Phone: 1-864-578-9335

Purchaser Information:

Company Name: _____ Street Address: _____
City: _____ State: _____ Zip Code: _____
Telephone: _____ Contact Name: _____

Machine Information:

Model Number: _____ Engine Model: _____
Serial Number: _____ Serial Number: _____

Dealer Information:

Dealer Name: _____ Street Address: _____
City: _____ State: _____ Zip Code: _____
Telephone: _____ Contact Name: _____

1. _____ Customer has been instructed on the operation and safety of this chipper.
2. _____ Customer understands it is the chipper owners' responsibility to train all operators on all aspects of operator safety and operation of this chipper.
3. _____ Customer has been instructed that every person within a 100 foot radius of the chipper while in operation must be wearing personal safety equipment as specified in the Safety Section of this manual.
4. _____ Customer has been instructed on positioning the discharge chute away from the direction of people and/or property because of the danger of airborne chips.
5. _____ Customer has been **warned that no one should ever reach, kick or lean into the feed intake chute**. Customer has been informed that at least one operator must be in position, at all times, to activate the feed control bar to shut down and reverse the feed wheels any time material is being fed or the feed wheels are running.
6. _____ Customer has been instructed to feed short brush or vine-like material on top of longer material or to use the push paddle, not to reach or kick this material into the chipper feed intake chute.
7. _____ Customer has been warned not to operate the chipper with the chipper hood open or unlocked. The chipper hood must be pad locked and must not be able to come open during operation.
8. _____ Customer has been instructed on the procedures to follow before performing maintenance of any kind on the chipper: turn engine off and remove ignition key; disconnect battery cable; allow the cutter drum to come to a complete stop (which will take several minutes); install cutter drum lock; and allow all parts to cool completely. If working between feed wheels, raise upper feed wheel using the hydraulic lift, insert yoke pin and put wooden block between feed wheels.
9. _____ Customer has been instructed on normal maintenance and lubrication schedules and procedures and has been advised that failure to perform periodic maintenance may void the warranty. Oil and air filters must be maintained properly or the warranty will be voided.
10. _____ Customer has been advised that the engine or power unit that is used on this machine is warranted by the engine manufacturer and **NOT J. P. Carlton Company**. All engine warranty issues should be addressed to the local engine dealer.
11. _____ Customer has been advised that maintenance and adjustment on the clutch are critical. Customer has been advised that J. P. Carlton Co. does not warrant the clutch and the only warranty that applies is in the clutch manufacturer's manual. Contact the clutch manufacturer with warranty issues.
12. _____ All operation and warning decals are properly displayed on equipment and have been reviewed with the customer. All safety devices have been inspected and found to be working properly at this time.
13. _____ Customer has received and reviewed all operators' manuals, warranties, safety instructions, and parts.
14. _____ Customer fully understands all information that has been provided, both written and verbal.

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

Date: _____ Signed: _____
Dealer Representative

The equipment has been thoroughly checked by the above named dealer, and I am satisfied with his instructions.

Date: _____ Signed: _____
Customer

TABLE OF CONTENTS

Congratulations on your purchase of a new Carlton® Professional Chipper! Carlton® has built its reputation on the superior performance and reliability of their stump grinders and you can be assured your new chipper has the same performance and reliability. A machine is not profitable if it's broken-down and we do our absolute best to help you avoid costly downtime. Each and every machine has been *over* designed and overbuilt to ensure years and years of trouble-free operation. In this, we take pride.

The Carlton® 15" chipper is the heaviest duty 15-inch capacity drum style chipper available. From the ground up, the components and weldments are the strongest on the market.

Read this manual carefully and TAKE RESPONSIBILITY for thoroughly familiarizing yourself with the controls and the concepts behind the operation of this machine before attempting to operate it. Slowly experiment with the controls and gradually work yourself up to the full capabilities of this machine. The Carlton® 15" chipper is a durable and profitable professional chipper. Read the chipper manual, the safety and operational decals on the chipper, and all other operation and safety materials provided for the engine and other components. Use proper safety precautions. Follow the instructions and use common sense and your "OX" will perform like its namesake. If getting more work done in a day, with less trouble, is your idea of good business, then you'll love your new Carlton® Chipper.

We welcome your suggestions on how we might better build our machines. We solicit any and all questions concerning the safe operation or proper servicing of your new chipper.

Please feel free to write to us with any comments.
We'll enjoy hearing from you!

The J. P. Carlton Company constantly strives to create the best professional tree equipment available in the industry. Therefore, the material in this manual is correct at the time of publication. Carlton® reserves the right to make improvements, modifications, and even discontinue features as we deem necessary to meet our goal. Carlton® also reserves the right to discontinue models without any prior notification or obligation.

Inspect your new Carlton® Chipper as soon as you receive it. Any damages incurred during shipment are not warranted and, therefore, are not covered repairs. You should have the truck driver verify or acknowledge any damages caused during shipment. If not, contact the truck lines as soon as possible with your complaint.

Any reference made to the right, left, front, or rear in relationship to the chipper is illustrated in the following pictures. Please refer to these any time you call your dealer or J. P. Carlton for parts or assistance.

Front

Left

Rear

Front

Right

Available Machine Features:

- Turbo charged diesel engine
- Auto-Feed® Plus system
- Reversing auto feed
- Digital tachometer
- Direct drive hydraulic pump
- Hydraulic variable flow control
- Adjustable feed rate
- Continuous feed switch
- Hand crank adjustable height and swivel discharge
- Tapered roller bearings
- AR400 anvil
- 2 knives
  10 ½" x 5 ½ "x 5/8"
- Massive 20" x 15" throat opening
- 54" wide feed intake opening
- Key start
- High capacity battery
- Lockable, steel battery box
- Lockable tanks w/gauges
- Axle 90000# cap
- Tires - Rated 4805 pounds @ 125 PSI
- Electric brakes
- Front jack stand – 10000# Cap
  Screw type
- Epoxy primer
- Dupont Imron® paint
- Double wire braid hoses
- Winch (optional)

We Pride Ourselves
in the strength and quality of each and every machine

Carlton Apache 2015 Specifications

General:

Weight:	6820 Pounds
Length:	211 inches
Height:	100 inches
Tires:	235/75R17.5 Ld Rng H 4805 # @125 PSI
Axle:	Dexter Torflex 8,000 Pound Cap
Brakes:	Electric with Breakaway Switch
Hitch:	Five Inch Height Adjustable Pintle
Fuel Capacity:	25 Gallons
Battery:	29HVD 950 CCA
Jack Stand:	10000 # Cap Screw Type Swing Up

Engine:

Manufacturer:	John Deere
Number of Cylinders:	Four
Bore:	4.19 Inches (106 mm)
Stroke:	5.0 Inches(127 mm)
Displacement:	276 Cubic Inches (4.5L)
Maximum RPM:	2400 RPM
Horsepower:	140HP
Torque:	367 Ft Lbs (498 NM)
Cooling Medium:	Liquid Water/Antifreeze Mixture
Air Cleaner:	Two Stage Dry Type
Oil Filter:	Full Flow Spin On
Oil Capacity:	13 Quarts
Oil Type:	John Deere
Electrical:	12 Volt
Gauges:	Powerview
Clutch:	Twin Disk 11 ½" Over Center

Bearings:

Drum Bearings:	2 15/16 inches Tapered Roller
Feed Roller Bearings:	2 inches Ball Bearing
Drum Shaft:	3 ½ inches
Feed Roller Shaft:	2 inches

web

Chipper Drum:

Drum Diameter:	24 inches
Drum Width w/Fans:	27 inches
Drum Balance:	Precision High Speed Balanced
Drum Speed:	1160 RPM
Number of Knives:	2
Knife Dimensions:	10 1/2" x 5 ½" x 5/8"
Anvil:	**3 1/2**" x 20" x ½" AR400
Drum Fans:	12 ¼" x 2 1/2" x 6.75"

Cutting Dimensions:

Throat Opening:	15" x 20"

Hydraulic System:

Hyd Pump Displcmnt:	1.5 in cu/rev total from 2 pumps
Hyd Pump Drv Systm:	Direct Drive off Engine Mount
Flow:	16 GPM Total Tandem Systems
System Relief:	2500 PSI
Oil Tank Capacity:	18 Gallons
Oil Type:	AW32
Valve:	DO5 Electric Solonoid
Hose:	16,000 PSI Burst - Exceeds SAE 100R2
Oil Filter:	10 Micron Return with Suction Strainer

Drive System:

Engine Sheave:	4/5V9.25
Jackshaft Sheave:	4/5V11.80
Drive Belt:	4/5V1120
Cutter Head Shaft:	3 ½ inches

Feed System:

Feed Motors:	Dual 46 In Cu Top 32 In Cu Bottom
Flow:	Separate Systems for Top/Btm Feed
Hydraulic Drive:	Live – Driven off engine
Autofeed:	Reversing, Digital, Fully Adjustable
Feed Rate:	110 Feet Per Minute
Feed Rollers:	Top: 15 ¾" Dia Bottom: 10 ½" Dia
Springs:	Two 30" Tight Wound Powder Coated
Feed Pivot Bearings:	Two 2" Tapered Roller
Lift Cylinders:	Two 2" x 16" with 1" attachments
Discharge:	Crank Adjustable Swivel and Height

Frame:

Main Trailer Tongue:	3"x 6" with 3/8" wall
Main Trailer Frame:	2"x6" with 3/16" wall
Telescoping Tongue:	N/A
Engine Channel Mnts:	4" Channel with 5/16"
Infeed Chute:	3/16" with 2"x2"x1/4" tube frame
Infeed Tray:	3/16" Plate w 2"x2" and 2" x 4" Tube
Folding Tray Lock:	N/A
Discharge Chute:	12 gauge
Discharge Lock:	¾" Spring Loaded Pin
Fuel Tank:	High Density Polyethylene
Hydraulic Tank:	10 gauge with baffles rubber mtd
Battery Box:	10 gauge - lockable
Fenders:	3/16" checker plate
Feeder Bar:	1 ½" OD x 1/8" wall - removable
Radiator Guards:	N/A
Light Brackets:	3/16" with hidden wiring
Hitch Plate:	¾" Plate adjustable 5" Up/Down

Before operating the chipper, read this manual, the engine manual, and all the safety decals on the machine. Know all parts of the machine and their functions, especially the shut down procedures in case of emergency. No inexperienced person may operate the chipper. Inexperience may cause injury. It is the owner's responsibility to ensure all operators are trained and fully understand all safety and operational aspects of the chipper.

This machine was built with safety in mind. The guards and other safety devices only work when kept in place and secured properly. Safety decals are placed on the machine as reminders of how to operate the machine safely, pay attention to the instructions.

SAFETY FIRST ALWAYS!

This is the **Safety-Alert Symbol**. This symbol is placed on the machine and in the manual to alert the operator to the potential for bodily injury or death. The operator should pay close attention to the instructions whenever they see this symbol.

The **Safety-Alert Symbol** will be accompanied by one of the following words:
DANGER, WARNING, or CAUTION

- A **DANGER** symbol means that if the instructions are not followed the possibility of serious personal injury or death is probable.
- A **WARNING** symbol means that if the instructions are not followed there is a possibility of serious personal injury or death.
- A **CAUTION** symbol means there is an unsafe condition or practice that may cause personal injury or property damage.

PERSONAL PROTECTION:

- **All personnel must wear eye and ear protection, hard hat, short fitted gloves without cuffs, long sleeve shirt, long pants without cuffs, and over the ankle work boots with skid resistant soles**
- **Do not wear loose-fitting clothing**
- **Tie long hair back**
- **Do not wear jewelry or long dangling clothing; i.e. neckties, long belts, or chains**
- **Stay away from feed wheels**
- **Keep away from moving parts**
- **Only run in a well ventilated area because of carbon monoxide poisoning**

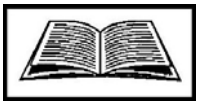
P/N 070000A

P/N 0700008

P/N 0700010

Be Safe and Practice Safe Operation using the following guidelines.

DANGER



- **Any** individual operating this chipper **must** first read and understand this manual, the engine and other component manuals supplied with the chipper, and all safety and operational decals on machine.
- DO NOT permit children to operate machinery or to play near machinery during operation.
- DO NOT allow spectators to stand and watch chipper in operation.
- DO NOT allow people to pass by discharge zone while chipper is in operation.
- Keep hands, feet, legs, clothing, hair and all other body parts away from feed intake wheels, chipper knives, and other moving parts.
- Do not hang from, ride, sit, stand, lay, or climb anywhere on this chipper while it is in operation, running, or being transported.
- Do not move, position, or transport this chipper with the engine running.
- Keep away from pressurized leaks. Never check for leaks using hand or finger, use cardboard or wood. Pressurized fluid can penetrate the skin and cause injury or even death. Seek immediate medical attention if penetration occurs. Always wear eye protection.
- DO NOT operate any machinery while under the influence of alcohol or drugs (prescription, over the counter, or otherwise).
- DO NOT modify or change any part without written approval from J. P. Carlton Company.

DANGER

- No one should ever reach, lean, or kick into the feed intake chute when the chipper or the engine is running. Feed wheels will pull in anything in the path of operation and **will** cause **severe** personal injury if a person is pulled into feed intake wheels.
- Always load shorter pieces of wood or brush on top of longer pieces or use push paddle, **never** reach into the feed intake chute to load these pieces.

- Stay clear of discharge zone when running chipper. Never allow anyone to stand near or to walk close to the discharge zone, even if being discharged into a bin or truck.
- Airborne debris may cause severe injury. If inspection of chipped material is required, shut down the chipper and the engine first.
- Discharge spout should not be pointed toward people, buildings, or other personal property that may be injured or damaged. Airborne debris is as dangerous as any powerful projectile.
- Never position, adjust, or move the discharge chute while the chipper or the cutter drum are running

⚠ DANGER

- Always have at least 2 operators at the job site running the chipper. One to load the brush into the feed wheels and the other to maintain the feed control bar in case of an accident.
- Always feed trees and brush butt end first and walking to the right side of the chipper, material being fed should be to the operator's left side. The material being fed tends to kick to the left and could injure anyone on that side.
- Never lean over material being loaded into the feed wheels; especially small diameter, short length material that is still long enough to be fed into the feed wheels alone. The material is not heavy enough to hold down when the feed wheels first grab it and will kick up hitting the operator in the chin or head causing injury.

⚠ DANGER

- Never lay vine type material in front of feed intake chute.
- Never allow yourself or your clothing to become tangled in or tripped by vine type material. SEVERE INJURY COULD OCCUR.
- Always cut vine type material into shorter, easier to handle pieces, approximately 4 to 5 feet.
- Don't feed the vines into the chipper unless they have been cut!!!
- STOP automatic feed system and run vine type material through using manual start/stop controls and a wooden push paddle.

⚠ DANGER

CUTTER DRUM DOOR

- KEEP CUTTER DRUM DOOR CLOSED WHILE CHIPPER IS RUNNING. Always make sure the cutter drum door latch pin is in place and locked securely using a padlock before starting chipper. The cutter drum door must be locked using the factory issued lock pin and padlock.
- Never open the cutter drum door while engine is running. After the engine is turned off, allow the cutter drum to come to a complete stop before opening the cutter drum door. This will take several minutes
- Never run the chipper or the engine with the cutter drum door open or unlocked at any time or for any reason.
- If the cutter drum door or hinge is damaged, replace immediately.

⚠ WARNING

- Always have the trees and brush cut to size for the chipper before the chipper arrives at the job site.
- It is very dangerous to run a chain saw and the chipper at the same time.
- If a tree gets jammed and has to be trimmed, shut down the chipper first.

⚠ DANGER

DO NOT PERFORM MAINTENANCE OF ANY KIND ON THIS MACHINE UNLESS:

- The engine is turned off
- The ignition key is removed
- Positive battery cable is disconnected
- The clutch is disengaged
- Feed control bar is in neutral
- All machine parts have come to a complete stop – NOTE: The cutter drum takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter drum lock pin is installed in the drum lock tube
- No operator is in position at the controls to accidentally start machine
- At least 2 people are at the site where maintenance is performed

More accidents occur while performing maintenance than any other time! Use extra caution.

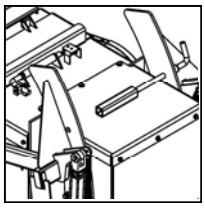
Never perform maintenance with the engine running, not even with the clutch disengaged. The pilot bearing could seize or freeze to the clutch shaft and permit the clutch to engage even though the operator thought the clutch had been disengaged.

ALWAYS REPLACE GUARDS AND OTHER PROTECTIVE EQUIPMENT BEFORE STARTING CHIPPER AFTER PERFORMING MAINTENANCE.

⚠ WARNING

- Keep a well-stocked First Aid Kit with the chipper at all times.
- Keep a full Fire Extinguisher with the chipper at all times.

⚠ DANGER



- YOKE LOCK PIN MUST BE IN POSITION before performing maintenance between the feed wheels. Use the hydraulic lift to raise upper feed wheel high enough to insert yoke lock pin as shown above.
- After the upper feed wheel has been raised and the lock pin is in position, place a block of wood 4" x 15" x 16" between feed wheels to keep wheel from coming down. See Maintenance Section for further instruction.

⚠ WARNING

- Stop engine, remove key, and disconnect battery cable when repairing or adjusting machine or drive belts.
- Keep engine in good condition, service as instructed in engine manual. Do not touch engine while running or hot (serious burns may result).
- Allow all machine parts to cool sufficiently before servicing or making adjustments. Hot machine parts can cause severe burns.

⚠ WARNING

- During operation of the chipper, all people within a 100-foot radius should wear protective equipment, including eye and ear protection and hard hats.
- If unusual noise or vibration occurs, stop engine immediately and correct the problem before continuing operation, consult authorized dealer if necessary.
- Keep all guards in place and properly secured during operation. Never operate the chipper with guards missing or loose.
- Keep all safety devices working properly and all other machine parts in good condition.
- Never leave the controls unattended while in operation. Be sure machine is not capable of operation when left unattended. Remove key and disconnect battery, if necessary.
- **DO NOT OPERATE THE ENGINE AT AN ANGLE GREATER THAN 25° OR SEVERE ENGINE DAMAGE WILL OCCUR.** PROPER ENGINE OIL LEVEL MUST BE MAINTAINED TO ACHIEVE MAXIMUM ANGLE OF OPERATION OF 25°. (See Engine Owner's Manual for proper oil level.)

⚠ CAUTION

- Do not operate chipper in dim lit, dark, or concealed areas. Do not operate or run machine or engine in enclosed area due to carbon monoxide poisoning hazard.
- Keep machine clean and clear of debris to eliminate fire hazard. It is especially important to clean any oil or fuel spills to prevent the danger of fire.
- Keep safety and instructional decals clean and replace any that are damaged, difficult to read, or missing. Decals may be purchased from J. P. Carlton or an authorized dealer.
- Remove all foreign objects from the chipper before starting, i.e. jackets, gloves, tools, etc.

- Gasoline, diesel fuel and their vapors are highly flammable and explosive. **Handle with care**. Only use approved (red) fuel containers for storage.
- Do not store machine with fuel inside tank or fuel containers near any open flames, sparks, or other sources of ignition.
- Do not store equipment with fuel in the tank for long periods.

- Battery fumes are explosive. Recharge battery in an open area away from fire, sparks, or other sources of ignition.
- Use caution in extreme cold! Frozen battery will explode! Allow battery to thaw in heated area away from fire or sparks.
- Battery acid can cause severe burns. Keep away from eyes, skin, and clothing.
- Remove battery before welding on equipment.

⚠ CAUTION

- If operating chipper uncoupled from tow vehicle, the tires and tongue must be blocked. Use but do not depend on jack stands to hold machine steady.
- Always store tools safely away from moving machine parts, especially the feed intake wheels.
- There should be no obstacles in the path of operation behind the chipper or around the chipper to allow trip free movement of all personnel.
- Keep unauthorized persons away from the chipper operation area.

It is vital that the owner and operators inspect the chipper each day before operation. This inspection will help identify potential problems that may arise during the workday. The operators must get in the habit of performing this inspection each and every day. By performing this inspection each day, the operators will help minimize downtime and costly repairs. This inspection will also help to minimize risks associated with the operation of this brush chipper.

SAFETY:

DO NOT PERFORM MAINTENANCE OF ANY KIND (including routine inspections) ON THIS MACHINE UNLESS:

- **The engine is turned off**
- **The ignition key has been removed**
- **The clutch is not engaged**
- **All moving parts have come to a complete stop – NOTE: The cutter drum takes several minutes to come to a complete stop**
- **The cutter drum lock pin is installed in the drum lock tube**
- **All machine parts have cooled completely**
- **There is no operator at the controls to accidentally start the machine**
- **At least 2 people are at the site where the maintenance is to be performed**

- **Inspect Decals making sure all are in place, secure, and legible.** (Not all decals are shown here just a small representation)

- Make sure all personnel are equipped with all applicable safety equipment:
  - Eye protection
  - Hearing protection
  - Hard hat
  - Short, fitted gloves
  - Long sleeve shirt
  - Long pants
  - Over the ankle work boots with skid resistant soles

PERSONAL PROTECTION:

- **All personnel must wear eye and ear protection, hard hat, short fitted gloves without cuffs, long sleeve shirt, long pants without cuffs, and over the ankle work boots with skid resistant soles**
- **Do not wear loose-fitting clothing**
- **Tie long hair back**
- **Do not wear jewelry or long dangling clothing; i.e. neckties, long belts, or chains**
- **Stay away from the cutter drum when the engine is running**
- **Keep away from moving parts**
- **Only run in a well ventilated area because of carbon monoxide poisoning**

BECAUSE OF MACHINE VIBRATION, ALL EQUIPMENT ATTACHED USING SCREWS OR BOLTS AND NUTS SHOULD BE CHECKED REGULARLY FOR TIGHTNESS. ALL SCREWS, BOLTS, AND NUTS NEED TO BE INSPECTED FOR TIGHTNESS AND WEAR. ALL SCREWS, BOLTS, AND NUTS THAT WON'T STAY TIGHTENED OR THAT HAVE WORN, CHIPPED, OR MISSING THREADS SHOULD BE REPLACED.

- Inspect bolts, hydraulic fittings, wiring harnesses, hoses, and equipment for tightness, wear, or leakage. Replace if necessary. DO NOT inspect for hydraulic leaks with your hand or finger.
- FLUID UNDER PRESSURE CAN PENETRATE THE SKIN AND CAUSE SEVERE INJURY. CHECK FOR LEAKS USING A BOARD OR CARDBOARD; DO NOT USE HAND OR FINGER. SEEK IMMEDIATE MEDICAL ATTENTION IF SKIN IS PENETRATED. ALWAYS WEAR EYE PROTECTION.

- Check tires air pressure. Inflate to tire manufacturers recommended maximum inflation pressure. Inspect tires for wear. Inspect axle caps. Replace tires and other parts when needed. Grease axles as suggested by manufacturer.

HITCH & HITCH BOLTS

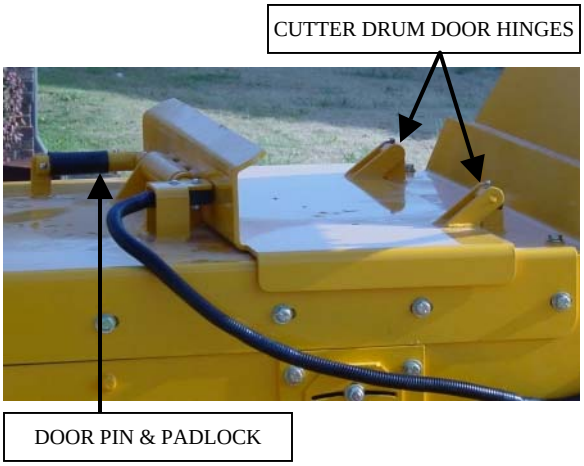
- Inspect hitch and hitch bolts. Replace bolts and nuts when worn, chipped, or when they won't stay tightened.

- Make sure all guards are in place and properly secured.
- Inspect belts for wear and proper tension. (See Servicing Belts section for further information.) New belts will stretch and become loose as machine runs. Check belt tension more often when belts are new.

- Check tail and brake lights for proper operation. Make any repairs that are necessary before towing the chipper.

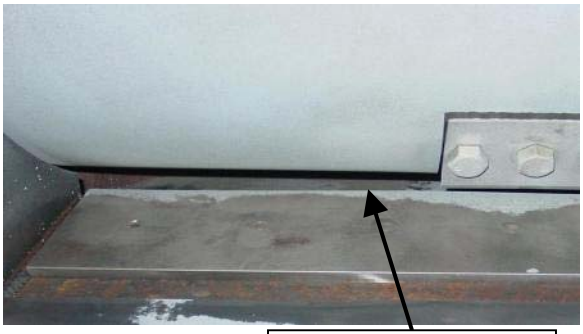
- Inspect knife bolts and nuts for tightness daily. It is very important to check knife bolts and nuts after first hour of operation for new bolts and nuts. It is not uncommon for bolts to loosen slightly during this time. The 15” drum chipper knife bolts and nuts (3/4"-10) are specially designed. Tighten and torque to 235 ft. lbs.
- Inspect cutter drum knives for wear. Do not operate the machine without a full set of undamaged knives in place. Worn or chipped knives will cause improper operation of the chipper. (See Servicing Cutter Drum Section to change or sharpen knives and anvil.)

- Cutter drum must rotate freely. This will help insure there are no foreign objects inside the cutting chamber and there is ample knife to anvil clearance. (The cutter drum lock pin will have to be pulled out of cutter drum to check rotation. Replace pin after checking rotation to perform further inspections.) **DO NOT ROTATE THE DRUM BY HAND ALWAYS USE A PRY BAR.**



- When inspection of cutter drum is complete, close cutter drum door, insert door lock pin and padlock. Make sure door will not open. Check cutter drum door hinges for damage and fit, replace immediately if there is any damage or misalignment.

- Inspect the anvil for wear by raising the upper feed wheel and blocking it as described in the Servicing Cutter System section of this manual. The anvil should be checked any time the knives are inspected. THE CUTTER DRUM LOCK PIN MUST BE IN LOCK TUBE AND THE UPPER FEED WHEEL MUST BE RAISED AND BLOCKED WHEN INSPECTING THE ANVIL EDGE.

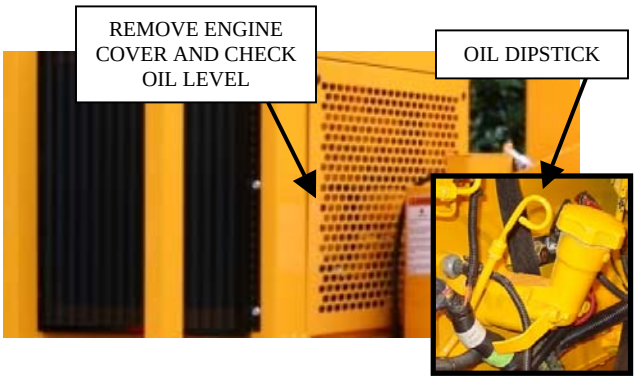


- Inspect the inside of the infeed chute. Check to make sure there are no foreign objects inside the infeed chute. Anything that is inside of the infeed chute may go through the chipper. There should never be anything or anyone inside the infeed chute when starting the chipper, damage or injury could occur.

- Check the feed control bar operation daily for correct operation of Forward, Reverse, and Off positions. Contact your local dealer or J. P. Carlton if operation is not correct.

- Inspect and clean radiator screen daily. This screen along with the radiator fins must be kept clean. Dust and debris can easily clog the screen and or radiator and cause overheating along with major engine damage. Inspect fan blades for wear or damage.

- Check and maintain proper engine oil (see warning decal), fuel, radiator coolant, and hydraulic oil levels. Make sure engine is cool before checking. Replenish engine oil, fuel, radiator coolant, and hydraulic oil every morning before starting the machine so there is no danger of fire from hot machine parts or sparks. See engine manual for special instructions. NEVER REFUEL OR ADD OIL: WHILE ENGINE IS RUNNING, WHILE IN AN ENCLOSED AREA, OR WHILE ENGINE IS HOT.



RADIATOR CAP ON TOP OF ENGINE

JOHN DEERE ENGINES REQUIRE A SPECIAL COOLANT ADDITIVE.

HYDRAULIC OIL SHOULD BE VISIBLE IN THE LEVEL/TEMP GAUGE, MAKE SURE THE OIL IS BETWEEN THE TOP BLACK LINE AND THE BOTTOM RED LINE (SEE SERVICING HYDRAULICS SECTION).

- Inspect air filters for dirt and damage, clean or replace as necessary. REPLACE WITH MANUFACTURER RECOMMENDED AIR FILTERS ONLY.

MAIN FILTER

SAFETY FILTER

The proper repair or replacement procedures, if required, are further illustrated in the Maintenance or Service Sections of this manual. Other periodic inspections and maintenance are covered in other sections of this manual.

WINCH
(OPTIONAL EQUIPMENT – LEVER STYLE SHOWN)

- Inspect winch rope daily. Replace rope if there is any wear, fraying, or cuts. See Machine Controls section for more information.
- Check rollers for burrs or sharp edges if rope is damaged in any way. Replace any damaged or worn rollers.
- Winch roller guides should be greased as necessary every 30-40 hours of operation. Use only Texaco® Starplex II grease.

OPTIONAL 2-SPEED

It is imperative that all operators are familiar with all controls of the chipper. This will make for a much more productive and safer work period. (The actual controls may differ depending on the engine supplied with your chipper.)

ENGINE CONTROLS:

- For the John Deere 140HP engine, the Key Switch and Gauges are located in a lockable panel at the rear of the engine. Always turn off the engine and remove the key from the switch before performing service or maintenance of any kind.

- The engine is supplied with a three-position key switch. Turn the key clockwise all the way to start the engine; always start the engine at idle. When the engine is running, release the key and it returns to the on (run) position. Turn the key counter-clockwise to shut down the engine.

  DO NOT OPERATE THE ENGINE AT AN ANGLE GREATER THAN 25° OR SEVERE ENGINE DAMAGE WILL OCCUR. PROPER ENGINE OIL LEVEL MUST BE MAINTAINED TO ACHIEVE MAXIMUM ANGLE OF OPERATION OF 25°. (See Engine Owner's Manual for proper oil level.)

Tier 3 Houston Street

- A throttle switch is located next to the key switch. The lower (idle) position is for starting the engine, low speed engine operation during warm up, clutch engagement/disengagement, and engine cool down. The upper position is for running the engine at full speed during chipping operations.

- Also in the control box is a diagnostic gauge/hour meter. The configuration at the right is typical for this engine; but may vary depending on the make and model of the engine supplied with your chipper. Read the engine manufacturer's manual to fully understand all the functions of this gauge.
- This gauge will show the engine speed, oil pressure and temperature, warning codes for engine problems, and the hours of operation.

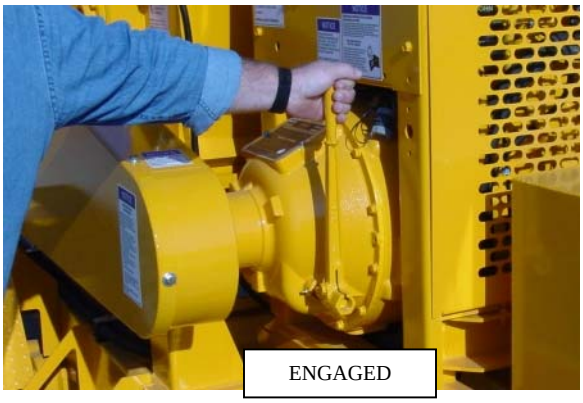
- The Auto-Feed Plus® monitors the engine RPM and controls the feed system based on this information. The Auto-Feed is calibrated when installed in the chipper with a high and low RPM setting for the feed wheels to operate. When the engine RPM is low and the Auto-Feed is on, the hydraulics will not work. If large diameter wood is being chipped and the engine RPM drops below the Auto-Feed Low setting, the Auto-Feed will stop the feed wheels. After the engine RPM is high enough to handle the force required to chip this material without causing the engine to lug down, the Auto-Feed restarts the feed wheels.
- The Auto-Feed Plus® control is calibrated to automatically come on when the chipper is started. If you need to turn on the Auto-Feed Plus® control, press and hold the right button down for 4 seconds and release.
- The Auto-Feed must be turned off to operate the hydraulics at low engine RPM or idle. When the Auto-Feed is on the hydraulics only work when the engine RPM is high. To operate the feed wheels at low engine RPM, turn off the Auto-Feed by pressing and holding the left button for 4 seconds and release.
- Read the Auto-Feed Plus® manual supplied at the end of this manual if programming is required.

CLUTCH ENGAGEMENT HANDLE

- The clutch is to be engaged and disengaged at low engine speeds only. NEVER ENGAGE OR DISENGAGE THE PTO/CLUTCH AT ENGINE SPEEDS IN EXCESS OF 1200 RPM. Engagement or disengagement of the clutch at elevated engine speeds can cause severe clutch damage. This is not warrantable. Please refer to clutch manufacturers' manual for clutch adjustment procedures.
- To engage the clutch:
  - Engine must be below 1200 RPM
  - Infeed chute must be clear of material
  - Feed control bar must be in the stop (middle) position
  - Bring the cutter drum up to speed by a series of short engagements and disengagements at intervals long enough to prevent excessive heat build up in the facings. UNDER NO CIRCUMSTANCES should the clutch be slipped without fully engaging or disengaging the clutch to permit it to cool.
  - Engage clutch fully. This should take a minimum of 100 lbs. of force to engage clutch on over center models (shown here), which will require most of the operators' strength. If the clutch engages with less force than this, it needs to be adjusted immediately! Clutches out of adjustment will slip and fail in a very short period of time. This type of failure is not covered by the warranty. (Please refer to clutch manufacturers' manual for clutch adjustment procedures.)
  - New clutches or new facings require several frequent adjustments until the friction facings have "worn in". (See the Twin Disc PTO/Clutch section to making adjustments or read the Twin Disc manual.)

CLUTCH ENGAGEMENT HANDLE

DISENGAGED



ENGAGED

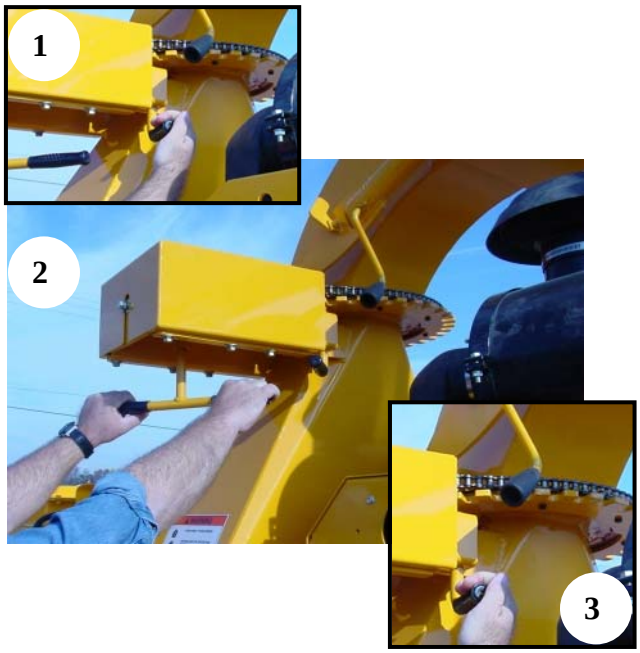
DISCHARGE FLAP

There is an adjustable flap on the end of the discharge chute. This flap is adjustable in the vertical direction to help control the height and distance of the chips being discharged. To adjust this flap pull down on the handle and rotate the flap up or down to desired position. NEVER ADJUST THIS FLAP WHILE THE CHIPPER IS IN OPERATION OR WHILE THE CHIPPER DRUM IS SPINNING!

HEIGHT ADJUSTABLE DISCHARGE

- Carlton Chippers are equipped with a height adjustable discharge chute. This allows the discharge chute to be adjusted for different truck heights and discharge angles.
- To adjust discharge chute height:
  - Flip retainer up out of the way of the crank handle
  - Crank height adjuster to adjust chute to desired height
  - Return retainer to original position securing crank handle

SWIVEL DISCHARGE

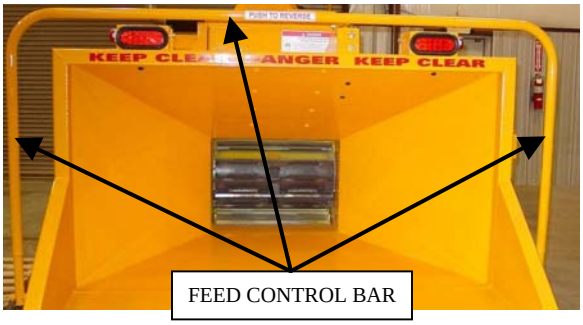


- Carlton Chippers are equipped with a rotating discharge chute. To rotate the chute to the desired position
  1. Pull down and unlock the rotation lock pin
  2. Turn the crank handle to rotate the discharge chute to desired position
  3. Release the lock pin making sure it engages in one of the lock locations on the discharge chute securing the chute in desired position.

ALWAYS MAKE SURE THE DISCHARGE IS POINTED IN A CLEAR DIRECTION FOR DISCHARGE OF CHIPS

FEED CONTROL BAR

- The feed control bar is located on three sides of the infeed chute; across the top and down each side.
- The feed control bar has three distinct positions
  - In the out position pulled towards the rear of the machine the bar is now in the feed position. In this position the feed wheels are engaged and will pull material into the chipper
  - In the middle position the bar is in the stop position. With the bar in this position the feed wheels are stopped and do not rotate.
  - In the in position pushed towards the front of the chipper the feed control bar is in the reverse mode. This position reverses the feed wheels and attempts to back material out of the chipper.
- ALWAYS VERIFY CORRECT FUNCTION OF THE FEED CONTROL BAR BEFORE BEGINNING TO CHIP MATERIAL
- **NO ONE SHOULD EVER REACH, LEAN, OR KICK INTO THE FEED INTAKE CHUTE WHEN MACHINE OR ENGINE IS RUNNING**



FEED CONTROL BAR


FEED CONTROL BAR - FORWARD FEED MODE


FEED CONTROL BAR - REVERSE FEED MODE

CONTINUOUS FEED SWITCH

- The Continuous Feed Switch allows the operator to override the feed control bar and the auto-feed. When the operator pushes the continuous feed switch, the feed wheels feed continuously until the switch is released. The switch is a momentary switch and works the same either up or down and goes back to off when released.

VARIABLE SPEED CONTROL

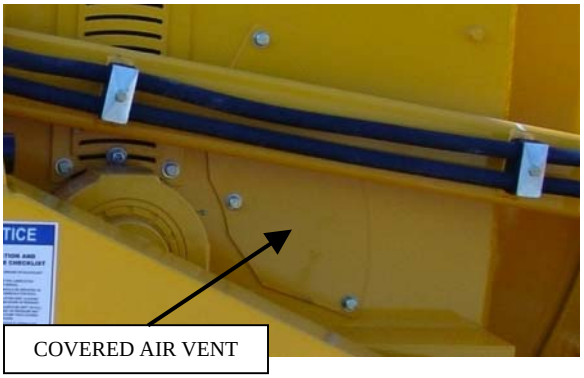
- The variable speed control valve controls the speed of the feed wheels. Turn the valve clockwise to make the feed wheels turn faster. Loosen the lock washer on the end of the control knob and adjust the wheels to the desired speed and then retighten the washer.

LIFT CYLINDER CONTROL VALVE

- The Carlton drum chipper is equipped with a hydraulic yoke lift, which allows the operator to hydraulically lift the top feed wheel. This can be of assistance when feeding large square-cut butt ends, which the feed wheels cannot ride up easily. The lift cylinders can also be used to provide positive down pressure on material being fed. This is useful when feeding extremely bushy material or material which the feed wheel cannot grab.
- The Lift cylinder control valve is located on the right rear of the infeed chute.
  - Push the valve in to raise the lift cylinder and top feed wheel
  - Pull the valve handle out to lower the lift cylinder and provide positive down pressure on the top feed wheel.

COVERED AIR VENTS

- There are two covered air vents that can be opened to allow air to circulate around drum, one on each side of the cutter drum. Remove the bolts to remove the cover if the chipper starts to lug down during chipping.



SLIDE AIR VENTS

- The drum chipper is equipped with two slide air vents, one on each side of the cutter drum. Open these vents to allow air to circulate if you are chipping material that is very fine. Fine material may cause clogging; opening the air vents will help to prevent that from happening.

AIR VENT CLOSED

AIR VENT OPEN

FRONT JACK STAND

- Use the front jack stand anytime the chipper is removed from the tow vehicle. Do not depend on this jack stand to support the machine for stand-alone operation by itself. The tires must be blocked using wheel chocks.
- Before towing the chipper, rotate the jack stand up for storage on the machine during transport.

FRONT JACK STAND

REAR JACK STAND
(OPTIONAL EQUIPMENT)

- If the chipper is equipped with a rear jack stand, use it for support when the chipper is uncoupled from the tow vehicle at the job site. The rear jack stand is used along with the front jack stand, and wheel chocks when using the chipper in stand-alone operation.

REAR JACK STAND
OPTIONAL

FEED WHEEL CLEAN OUT DOOR

- There is a drop-down door to clean excess debris out from under the bottom feed wheel. This will help to keep the chipper from getting clogged or stopped up. Use the handles, located on both sides behind the infeed chute, and drop the door down to remove debris, then close and secure the door. Should be cleaned frequently to prevent damage to clean out door and to prevent clogging the chipper. **DO NOT** open the clean out door until the chipper has been shut down and all parts have come to a complete stop, danger of flying debris could cause injury.

BRAKES & REAR LIGHTS

- The chipper's brakes and lights are connected to the tow vehicle actuator to be activated by the tow vehicle operation.

See the Machine Wiring section of this manual for wiring diagram.

BREAKAWAY SWITCH

- The breakaway switch is a safety device designed to activate the chipper brakes if it ever becomes uncoupled from the tow vehicle. A cable attached to the breakaway switch is attached to the tow vehicle so that the breakaway switch will separate and cause the brakes to be applied to slow the chipper.

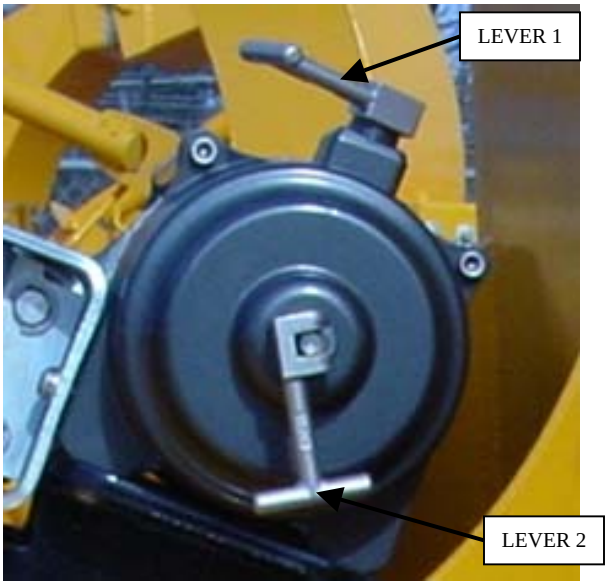
WINCH CONTROL VALVE
(OPTIONAL EQUIPMENT)

- Carlton Chippers may be equipped with a hydraulic winch. The winch is used to pull trees and brush that are too large to carry to the chipper and to assist in lifting the tree into the infeed tray.

⚠ CAUTION

ONLY USE THE WINCH TO DRAG MATERIAL TO THE CHIPPER THAT IS GOING TO BE CHIPPED. NEVER USE THE CHIPPER WINCH TO SECURE OR HOLD LOADS.

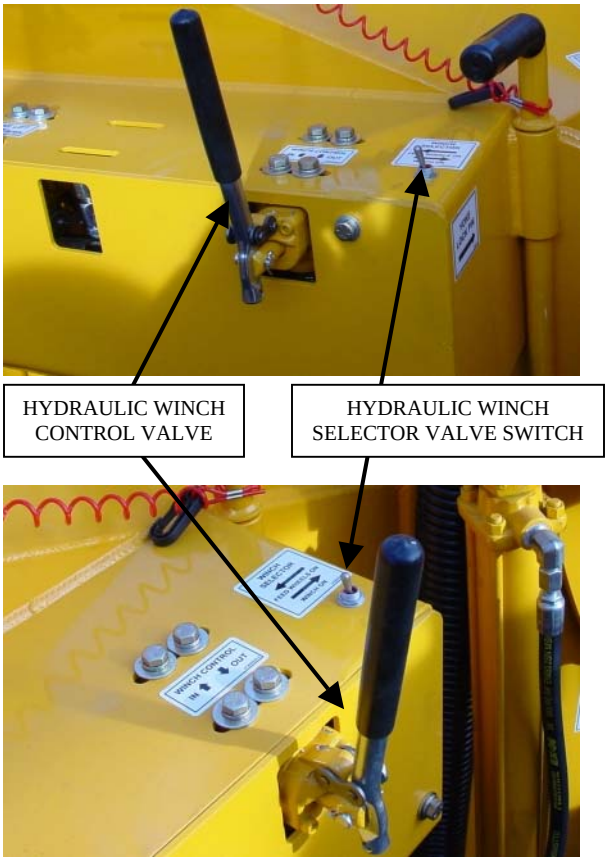
- The winch has control levers on the drum to put the winch in free spool, low speed, high speed, or to lock the winch. There is a decal on the side of the winch casing to illustrate this operation. For further information and service please read the winch instruction manual. (The levers may be in any position but the correct words must be facing away from the winch drum to perform the function.)
  - To pull the winch rope to the tree, put the winch in free spool by turning both levers to FREE. (Never put winch in free spool with a load on the rope.) **Always leave at least 5 wraps on the drum when unwinding the winch rope**.
  - To operate the winch at low speed, put Lever 1 in LOW and Lever 2 in FREE.
  - To operate the winch at high speed, put Lever 1 in FREE and Lever 2 in HIGH.
  - To lock the winch, put Lever 1 in LOW and Lever 2 in HIGH.



NOTE:
THERE IS TEXT ON BOTH SIDES OF EACH LEVER TO SET THE WINCH IN FREE SPOOL, LOW SPEED, HIGH SPEED, OR TO LOCK THE WINCH.

- Two hydraulic valves control the winch on this chipper. The hydraulic selector valve diverts hydraulic fluid from the feed roller circuit and enables the hydraulic winch circuit. Once the hydraulic winch circuit is enabled the winch control valve controls the hydraulic winch motor.

- The chipper winch selector switch is located on the hydraulic control lever panel. There is a decal that shows the proper operation (pictured at the right). Push the switch to the left to turn the feed wheels on and to the right to turn the winch on.
- The winch control lever is the third lever on the hydraulic control lever panel.
  - There is a decal next to the lever to show proper operation of the winch control. After the rope has been attached to the tree, push the lever in to pull the tree to the chipper. Also use this lever position to rewind the rope.
  - Pull the lever back to release the pressure on the rope to remove the rope from the tree once it has been pulled to the chipper and has been put into position to be run through the chipper.
  - After use of the winch is finished use the winch control lever to rewind and secure the rope before running the feed wheels. (The winch selector will have to be turned back to the Feed Wheels On position to feed the tree through the chipper.)



- NEVER ALLOW ANYONE TO OPERATE THE WINCH CONTROL VALVE WHILE AN OPERATOR IS IN THE VICINITY OF THE WINCH ROPE!!! ROPE BURNS OR OTHER INJURIES COULD OCCUR IF THE PERSON BECAME ENTANGLED OR TRIPPED BY THE ROPE.

- The winch drum rotates counter-clockwise when pulling in loads. If the rope needs to be replaced make sure it is started under the drum.
- Winding the rope over the top (clockwise) could cause the rope to rub on the encasement and wear the rope causing fraying and breakage. Always wind the rope under the winch drum.

ALWAYS WIND ROPE UNDER THE WINCH DRUM

- Read the winch instruction manual for complete information.

WINCH CONTROL VALVE
(OPTIONAL EQUIPMENT #2)

- There is a second option for the winch on the drum chipper. This winch has a different style spool. This style of winch uses the same hydraulic controls as the previous winch. The operation of the spool is different. The freewheel selector is located on the right side of the winch drum assembly.
  - Pull out the lock pin and push the freewheel bar down to put the winch in freewheel position. The operator can now pull out the rope. NEVER ALLOW ANYONE TO OPERATE THE WINCH CONTROL VALVE WHILE AN OPERATOR IS IN THE VICINITY OF THE WINCH ROPE!!!
  - Once the winch rope is attached to the material to be winched to the chipper, pull the freewheel bar back up engaging the winch drive motor to the winch drum.

- The winch drum rotates counter-clockwise when pulling in loads. If the rope needs to be replaced make sure it is started under the drum.
- Winding the rope over the top (clockwise) could cause the rope to rub on the encasement and wear the rope causing fraying and breakage. Always wind the rope under the winch drum as shown.

SAFETY:

- **NEVER ALLOW INEXPERIENCED DRIVERS TO TOW MACHINERY.**
- **ALWAYS MAKE SURE THE TRUCK HITCH AND THE CHIPPER HITCH ARE OF MATCHING STYLE AND SIZE.**
- **ALWAYS MAKE SURE THE TOW VEHICLE AND THE CHIPPER ARE ON LEVEL GROUND AND THE WHEELS ARE CHOCKED BEFORE CONNECTING OR DISCONNECTING THE CHIPPER.**
- **MAKE SURE THE TOW VEHICLE IS OF ADEQUATE SIZE AND HAS THE TOWING CAPABILITY TO SAFELY TOW THE CHIPPER.**
- **NEVER TOW A MACHINE WHILE IT IS RUNNING.**

- Make sure the truck hitch and the chipper hitch are of matching style and size and not worn.
- Check all hitch bolts to make sure they are tight on the chipper and the truck.
- Make sure the pintle ring on the chipper and the ball on the truck are greased for smoother pivots and to reduce the wear on both parts.
- Make sure the tow vehicle is of adequate size and has the towing capacity to safely tow the chipper. Make sure the truck hitch is heavy enough and built strong enough.

- Adjust both the truck hitch and chipper hitch so the chipper sits as close to level as possible when connected to the truck. A proper amount of tongue weight is required to allow the machine to tow properly. Too little tongue weight will result in wandering, fishtailing, or axle damage.

CHIPPER SHOULD RIDE AS CLOSE TO LEVEL AS POSSIBLE WHEN TOWING

- Connect safety chains to a secure position on the tow vehicle. Crisscross safety chains for support in the event of hitch failure. Chains may be twisted to shorten to compensate for excessive length. If the tongue should contact the ground at highway speeds, the machine may dig in and catapult the machine into traffic. **USE YOUR SAFETY CHAINS.**


CONNECT LIGHTS

- Connect chipper lights to the tow vehicle. Observe light operation to insure correct electrical connections.

- Attach the breakaway switch to the tow vehicle so that it will engage the switch and slow the chipper if the chipper should become uncoupled from the tow vehicle.

- Secure the front jack stand to the machine for towing. The jack stand is used on the right side of the machine and must be secured to the tongue for towing.

- Make sure the discharge chute is over the chipper for towing. Use the swivel handle to turn the discharge chute over the chipper with the end of the chute facing the front of the chipper. Use the height adjustment handle to return the discharge chute back to the lowest height for towing; don't take any chances with over head obstructions hitting the discharge chute.

- Always chock the wheels when the chipper is parked, even when attached to the tow vehicle. Make sure the chock blocks have been removed before towing the chipper.
- Towing will affect handling, allow for extra stopping distances.
- Start and stop gradually.
- Tow at a safe, reasonable speed. Obey posted speed limits.
- Slow down over rough terrain.

STARTING – READ THIS MANUAL, THE ENGINE OWNERS' MANUAL, THE CLUTCH MANUAL, AND ALL SAFETY DECALS ON CHIPPER BEFORE STARTING.

SAFETY:

- **DO NOT ALLOW CHILDREN OR OTHER SPECTATORS TO STAND AND WATCH THE CHIPPER IN OPERATION. ALL OPERATORS MUST WEAR RECOMMENDED PROTECTIVE EQUIPMENT.**
- **DO NOT ALLOW ANYONE TO BE IN CHIP DISCHARGE ZONE WHILE MACHIINE IS RUNNING.**
- **NEVER REACH OR KICK INTO THE INFEED CHUTE FOR ANY REASON.**
- **KEEP CHIPPER DOOR CLOSED WHILE MACHINE IS RUNNING. ALWAYS MAKE SURE CUTTER DRUM DOOR HAS LATCH PIN IN POSITION AND LOCKED WITH A PADLOCK, AND IS NOT CAPABLE OF BEING OPENED.**
- **AN OPERATOR MUST ALWAYS BE IN POSITION AND BE PREPARED TO OPERATE THE FEED CONTROL BAR TO REVERSE OR STOP THE FEED WHEELS IF NECESSARY.**
- **ALWAYS BE ATTENTIVE AND AWARE OF THE CHIPPERS OPERATION AND NEVER ALLOW YOURSELF OR ANYONE TO BECOME PULLED INTO THE FEED WHEELS.**
- **ALWAYS LOAD SHORT PIECES OF BRUSH ON TOP OF LONGER PIECES OF WOOD AND BRUSH. NEVER FEED LONG VINE TYPE MATERIAL INTO CHIPPER. ALWAYS CUT INTO SHORT PIECES TO FEED VINE TYPE MATERIAL. THIS MATERIAL COULD TANGLE AND WRAP AROUND SOMEONE OR SOMETHING AND PULL IT INTO THE CHIPPER.**
- **NEVER OPERATE MACHINERY WHILE UNDER THE INFLUENCE OF ALCOHOL OR DRUGS, (PRESCRIPTION, OVER THE COUNTER OR OTHERS).**

START-UP PROCEDURES:

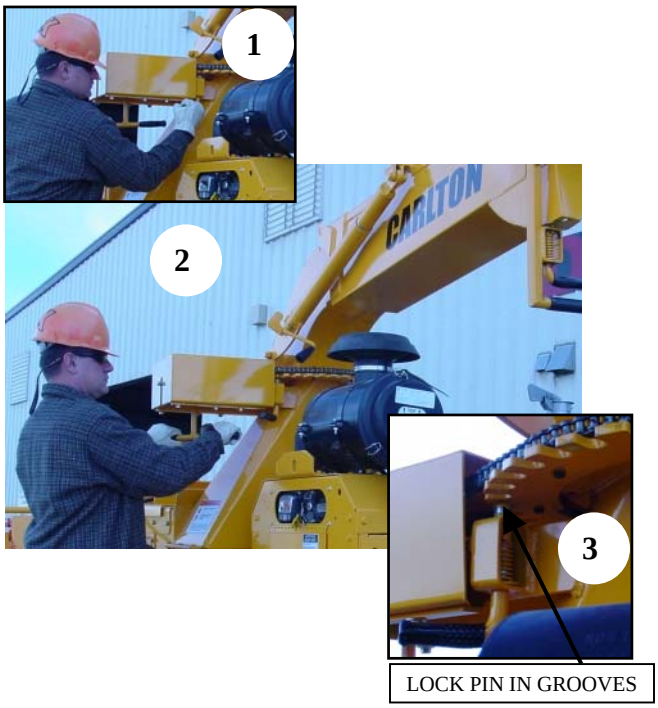
ALWAYS KEEP A FIRST AID KIT AND A FIRE EXTINGUISHER WITH CHIPPER

- Check all fluids before starting.
- Daily Checklist must be completed before starting.
- PTO/Clutch **must be disengaged** before starting.
- Cutter drum door and all other guards must be in place and secured properly before starting.
- All personnel must be wearing protective equipment: eye and ear protection; hard hat; short fitted gloves without cuffs; long sleeve shirt; long pants without cuffs; and over the ankle work boots with skid resistant soles.
- Use wheel chocks to block the chipper tires so that the chipper doesn't move, shift, or roll during operation.

AIM DISCHARGE CHUTE

- Carlton Chippers are equipped with a rotating discharge chute. To rotate the chute to the desired position
  1. Pull down and unlock the rotation lock pin
  2. Turn the crank handle to rotate the discharge chute to desired position
  3. Release the lock pin making sure it engages in one of the lock grooves on the discharge chute securing the chute in desired position.

ALWAYS MAKE SURE THE DISCHARGE IS POINTED IN A CLEAR DIRECTION FOR DISCHARGE OF CHIPS
NEVER ROTATE DISCHARGE CHUTE WHILE CHIPPER IS IN OPERATION OR WHILE THE CUTTER DRUM IS SPINNING



LOCK PIN IN GROOVES

- Stay clear of discharge zone when running chipper. Never allow anyone to stand near or to walk close to the discharge zone, even if being discharged into a bin or truck.
- Airborne debris may cause severe injury. If inspection of chipped material is required, shut down the machine first.
- Discharge spout should not be pointed toward people, buildings, or other personal property that may be injured or damaged. Airborne debris is as dangerous as any powerful projectile.
- Never position, adjust, or move the discharge chute while the chipper or the cutter drum is running

- There is an adjustable flap on the end of the discharge chute. This flap is adjustable in the vertical direction to help control the height and distance of the chips being discharged. To adjust this flap pull down on the handle and rotate the flap up or down to desired position.

NEVER ADJUST THIS FLAP WHILE CHIPPER IS IN OPERATION OR WHILE THE CUTTER DRUM IS SPINNING

- Carlton Chippers are equipped with a height adjustable discharge chute. This allows the discharge chute to be adjusted for different truck heights and discharge angles.
- To adjust discharge chute height:
  - Flip retainer up out of the way of the crank handle
  - Crank height adjuster to adjust chute to desired height
  - Return retainer to original position securing crank handle

NEVER ADJUST THE DISCHARGE CHUTE WHILE CHIPPER IS IN OPERATION OR WHILE THE CUTTER DRUM IS SPINNING

CHECK THE INFEED TRAY

- The infeed tray on the 15” chipper is fixed in the open position. Check to make sure there isn’t any material or other objects anywhere in the infeed tray before starting the chipper.

START ENGINE

- Key Switch and Gauges are located in a lockable panel at the rear of the engine.
- The engine is supplied with a three-position key switch. Turn the key clockwise all the way to start the engine; always start the engine at idle. When the engine is running, release the key and it returns to the on (run) position. Turn the key counter-clockwise to shut down the engine.

  DO NOT OPERATE THE ENGINE AT AN ANGLE GREATER THAN 25° OR SEVERE ENGINE DAMAGE WILL OCCUR. PROPER ENGINE OIL LEVEL MUST BE MAINTAINED TO ACHIEVE MAXIMUM ANGLE OF OPERATION OF 25°. (See Engine Owner’s Manual for proper oil level.)

CONTROLS MAY VARY DEPENDING ON ENGINE OPTION

- Start engine at idle and allow sufficient time for oil to circulate before proceeding. A two-position switch is located next to the key switch in the control panel. The lower (idle) position is for starting the engine, low speed engine operation during warm up, clutch engagement/disengagement, and engine cool down. The upper position is for running the engine at full speed during chipping operations. (See engine manual for further starting procedures. Be sure to follow the engine manual instructions for cold weather operation.)

THROTTLE SWITCH -HIGH

THROTTLE SWITCH – LOW (IDLE)

- Test the controls for proper operation, especially the feed control bar. (The engine speed must be high enough for the Auto-Feed® to engage the hydraulics or the Auto-Feed® must be off. Press down the left button and hold for 4 seconds to turn Auto-Feed® off.)
  - Push feed control bar to the rear of the machine to test forward (pulling) feed wheel motion
  - Pull feed control bar to the middle position to test off position (feed wheels should not turn at all)
  - Pull feed control bar all the way toward the front of the machine to test the reverse feed wheel motion

FEED CONTROL - FORWARD

FEED CONTROL - REVERSE

TURN AUTO-FEED PLUS ON

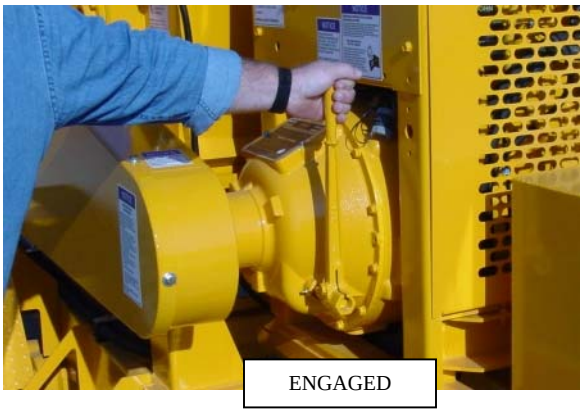
(CONTROLS MAY VARY DEPENDING ON AUTOFEED OPTION)

- The Auto-Feed Plus® monitors the engine RPM and controls the feed system based on this information. The Auto-Feed® is calibrated when installed in the chipper with a high and low RPM setting for the feed wheels to operate. When the engine RPM is low and the Auto-Feed® is on, the hydraulics will not work. If large diameter wood is being chipped and the engine RPM drops below the Auto-Feed® Low setting, the Auto-Feed® will stop the feed wheels. After the engine RPM is high enough to handle the force required to chip this material without causing the engine to lug down, the Auto-Feed® restarts the feed wheels.
- The Auto-Feed Plus® control is calibrated to automatically come on when the chipper is started. If for some reason you need to turn on the Auto-Feed Plus® control, press and hold the right button down for 4 seconds and release. (See Auto-Feed Plus® manual included in this chipper manual.)

CLUTCH ENGAGEMENT

- The clutch is to be engaged and disengaged at low engine speeds only. NEVER ENGAGE OR DISENGAGE THE PTO/CLUTCH AT ENGINE SPEEDS IN EXCESS OF 1200 RPM. Engagement or disengagement of the clutch at elevated engine speeds can cause severe clutch damage. This is not warrantable. Please refer to the clutch manufacturers' manual for clutch adjustment procedures.
- To engage the clutch:
  - Engine must be below 1200 RPM
  - Infeed chute must be clear of material
  - Feed control bar must be in the stop (middle) position
  - Bring the cutter drum up to speed by a series of short engagements and disengagements at intervals long enough to prevent excessive heat build up in the facings. UNDER NO CIRCUMSTANCES should the clutch be slipped without fully engaging or disengaging the clutch to permit it to cool.
  - Engage clutch fully. This should take a minimum of 100 lbs. of force to engage clutch on over center models (shown here), which will require most of the operators' strength. If the clutch engages with less force than this, it needs to be adjusted immediately! Clutches out of adjustment will slip and fail in a very short period of time. This type of failure is not covered by the warranty. (Please refer to the clutch manufacturers' manual for clutch adjustment procedures.)
  - New clutches or new facings require several frequent adjustments until the friction facings have "worn in".

* **CLUTCH MAINTENANCE AND ADJUSTMENT ARE CRITICAL; FOLLOW THE CLUTCH MAINTENANCE AND ADJUSTMENT SECTIONS IN THIS MANUAL.**
* **J. P. CARLTON CO. DOES NOT WARRANT THE CHIPPER CLUTCH. READ THE CLUTCH MANUAL FOR THE MANUFACTURER'S WARRANTY.**



INCREASE THROTTLE

- Once the clutch has been fully engaged the engine can be run at full speed. Push the throttle switch up to increase speed.
- The engine should always be run at high RPM while material is being chipped or the Auto-Feed Plus will stop the feed wheels until the RPM is above the minimum for your engine. Chipping at high RPM will help keep the discharge chute from clogging. High engine speed increases the throwing power.

PERSONAL SAFETY

- All personnel must be wearing protective equipment: eye and ear protection; hard hat; short fitted gloves without cuffs; long sleeve shirt; long pants without cuffs; and over the ankle work boots with skid resistant soles.

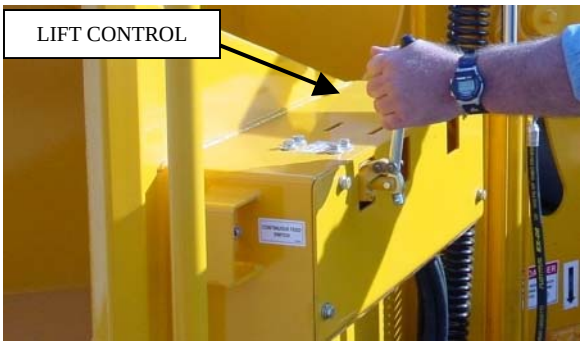
FEED MATERIAL

- You are now ready to start feeding material into the chipper.
- **Always have at least two operators at the job site.** One to load the trees and brush into the chipper and one to always stand and operate the feed control bar. It is imperative to have someone operate the feed control bar in case of an accident where someone is pulled into the feed wheels.
- Always have the trees and brush cut to size for the chipper before the chipper arrives at the job site.
- It is very dangerous to run a chain saw and the chipper at the same time.
- If a tree gets jammed and has to be trimmed, shut down the chipper.

ALWAYS FEED MATERIAL FROM THE RIGHT SIDE AND BUTT END FIRST

- Always feed trees and brush walking to the right side of the chipper, material being fed should be to the operators' left side. When the material is being fed into the feed wheels it tends to kick to the left and an operator could be injured if loading the material from the left side.
- Start feeding smaller diameter trees and brush first and work your way up to the full capacity of the chipper, which is 15" diameter material. Feed pieces long enough for the feed wheels to pick up without endangering yourself by reaching into the infeed chute. **No one should ever reach or kick into the infeed chute for any reason when the feed wheels or engine are running.** Feed shorter pieces of brush and limbs on top of longer material.
- Pay close attention to feeding the small diameter material that is long enough, 6' or shorter, to be fed into the feed wheels but doesn't have enough weight to be held down when the wheels first grab onto it. This material could kick straight up and hit the operator causing injury. Hold the material away from the body using both hands and never lean over the material in case the feed wheels cause it to kick up. Use the hydraulic lift cylinder to open the feed wheels when feeding this type of material.
- Do not hold onto or try to force the material through the chipper. Once the material has been grabbed by the feed wheels and is being chipped, release it and let the chipper do its job. When the chipper feed wheels are feeding the material, turn away from the material and walk away to get more material.
- There are two air vents on the drum chipper, one on each side of the drum. When chipping vine type material or very fine material, you may need to open these vents to allow air to circulate to prevent clogging. Open if the engine RPM starts to drop significantly.

- The Carlton drum chipper comes equipped with a hydraulic yoke lift, which allows the operator to hydraulically lift the top feed wheel. This can be of assistance when feeding large square cut butt ends, which the feed wheels cannot ride up easily. The lift cylinders can also be used to provide positive down pressure on material being fed. This is useful when feeding extremely bushy material or material which the feed wheels cannot grab.
- The Lift cylinder control valve is located on the right rear of the infeed chute.
  - Push the valve in to raise the lift cylinder also raising the top feed wheel
  - Pull the valve handle out to lower the lift cylinder and provide positive down pressure on the top feed wheel.



USING THE LIFT CYLINDER, LIFT UPPER FEED WHEEL & PUT LARGE DIAMETER WOOD INSIDE

THEN, LOWER UPPER FEED WHEEL BACK DOWN ONTO WOOD

- Keep an eye on the surrounding area and don't allow anyone to come up too close to the chipper or to be in the chip discharge area. Maintain a clear area of at least 100 ft. in every direction around the chipper.
- **Do not lean, reach, or kick past the safety zone when feeding material.**

WINCH OPERATION
(OPTIONAL EQUIPMENT)

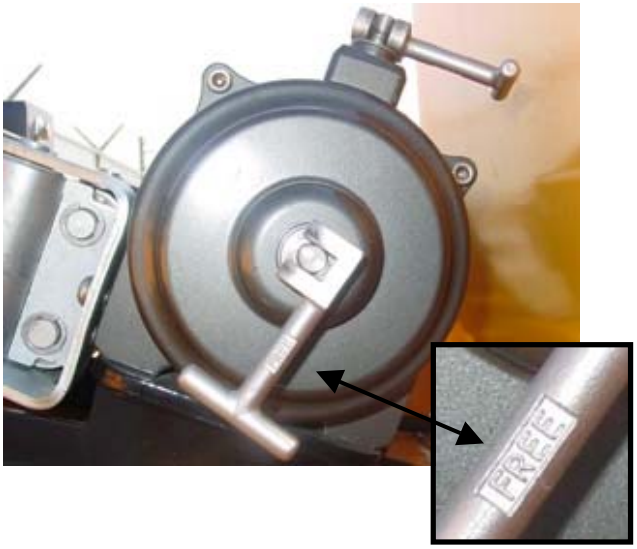
⚠ CAUTION

ONLY USE THE WINCH TO DRAG MATERIAL TO THE CHIPPER THAT IS GOING TO BE CHIPPED. NEVER USE THE CHIPPER WINCH TO SECURE OR HOLD LOADS.

When a tree is too large to carry to the chipper, use the winch to pull the tree into the infeed chute.

1. Put the feed control bar in the middle (stop) position and turn the WINCH SELECTOR switch from FEED WHEELS ON to WINCH ON engaging the winch circuit. The feed wheels should not turn when the winch circuit is engaged. DO NOT operate the winch if the feed wheels still turn. Contact J. P. Carlton or the local dealer for service.

2. Put the winch in free spool by putting both levers on the winch drum in FREE. (The levers may be in any position but the correct words must be facing away from the winch drum to perform the function. See Machine Control section or decal on chipper for lever operation.)



3. Pull the winch rope to the tree. Always wear leather gloves when handling winch rope. Broken wires will cause injuries.

4. Attach the winch rope to the tree.

5. Secure the winch rope through the loop never on the rope itself.

6. To operate the winch at low speed, put Lever 1 in LOW and Lever 2 in FREE. Or to operate the winch at high speed, put Lever 1 in FREE and Lever 2 in HIGH. (The levers may be in any position but the correct words must be facing away from the winch drum to perform the function. See Machine Control section or decal on chipper for lever operation.)

NEVER ALLOW ANYONE TO OPERATE THE WINCH CONTROL VALVE WHILE AN OPERATOR IS IN THE VICINITY OF THE WINCH ROPE!!! ROPE BURNS OR OTHER INJURIES COULD OCCUR IF THE PERSON BECAME ENTANGLED OR TRIPPED BY THE ROPE. ROPE COULD BREAK OR COME LOOSE AND WHIP AROUND AND CAUSE SEVERE INJURY. USE A LARGE BLANKET, JACKET, OR TOWEL TO WEIGHT THE ROPE WHEN REELING IN TO REDUCE RISKS IF THE ROPE COMES LOOSE OR BREAKS. For more information on correct operation of the winch, please read the winch operator's manual.

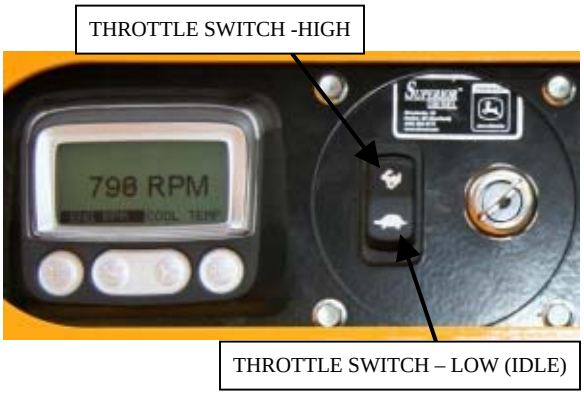
7. Pull the tree to the chipper using the winch control valve.

8. Pull the tree up into the chipper infeed chute.

9. When the tree is in the infeed chute, remove the winch rope. Switch the winch selector switch back to feed wheels and follow the standard operating procedures for chipping the material.

SHUT DOWN PROCEDURES

- With engine RPM still high, push the feed control bar to the middle (off) position. Feed wheels should not be turning.



- Push the throttle down into the low position so that the engine can slow down (idle) and the clutch can be disengaged.

- Once the engine has had time to slow down below 1200 RPM, disengage the clutch by pulling back on the clutch engagement handle. NEVER ENGAGE OR DISENGAGE THE CLUTCH AT ENGINE SPEEDS OVER 1200 RPM.

CAUTION: Chipper drum will continue to spin even though it is disengaged!

- Allow the engine to idle for 5 minutes. This allows the engine to cool.
- When the clutch has been fully disengaged and the engine has had time to cool down, you can turn the ignition key to the off position.
- Allow the cutter drum and belts to come to a complete stop, which will take several minutes.
- **Remove the ignition key.**

- Secure the discharge chute. Rotate the discharge chute back over the chipper and lock the swivel releasing the lock pin into one of the lock grooves. Make sure the height adjustment is at the lowest position so that the chute will not be high enough to hit any overhead obstructions and secure the handle. The flap on the end of the discharge chute needs to be lowered as far as possible so that no debris comes out during travel.

ROTATE CHUTE

Remove the wheel chocks before moving the chipper.

⚠ DANGER

DO NOT PERFORM MAINTENANCE OF ANY KIND ON THIS MACHINE UNLESS:

- The engine is turned off
- The ignition key has been removed
- The positive battery cable has been disconnected
- The clutch is disengaged
- Feed control bar is in neutral
- All machine parts have come to a complete stop – NOTE: The cutter drum takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter drum lock pin is installed in the drum lock tube
- No operator is in position at the controls to accidentally start machine
- At least 2 people are at the site where maintenance is performed

More accidents occur while performing maintenance than any other time! Use extra caution.

Never perform maintenance with the engine running, not even with the clutch disengaged. The pilot bearing could seize or freeze to the clutch shaft and permit the clutch to engage even though the operator thought the clutch had been disengaged.

ALWAYS REPLACE GUARDS AND OTHER PROTECTIVE EQUIPMENT BEFORE STARTING CHIPPER AFTER PERFORMING MAINTENANCE.

ENGINE

- The air filters, the radiator screens and fans, and the oil and fuel filters are extremely important in chipper operation. (For all other engine maintenance follow the engine manufacturer's manual.)

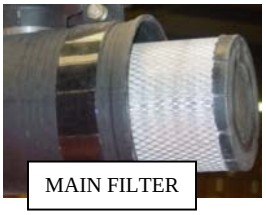
AIR FILTERS – MAIN & SAFETY

- Inspect the main and safety air filters daily.
- Do not tap or hit the main air filter to clean it. Do not wash the main air filter. Follow the engine manual for cleaning the main air filter. Replace the air filter when it cannot be cleaned or after cleaning six times or if damaged.

NOTICE

Never run the engine without the air filter installed or with a damaged air filter. Replace air filters if there is damage to the pleats, gaskets, or seals. The air filter is used to prevent airborne debris from getting into the engine. If dirt is allowed to get into the engine it will greatly reduce engine life and/or cause damage.
Never service the air cleaner with the engine running.

- Do not clean the safety filter. Replace the safety filter if dirty or when the main air filter has been **cleaned** 3 times.
- When cleaning or changing the air filters, place tape over the air inlet hole to reduce the chance of any dirt getting inside the engine. Use a clean dry cloth to wipe down the inside of the air cleaner housing and cover.
- Check the general condition of the air cleaner housing and components. Make sure there are no dents, cracks, or other damage to these parts that could allow unfiltered air to enter the engine.


MAIN FILTER


SAFETY FILTER

RADIATOR SCREEN & FAN

- Inspect the radiator for dirt, insects, leaves, oil, and other debris that can clog the radiator screen and fins. The radiator screen and fins should be cleaned using pressurized air from the backside of the radiator. For further cleaning instructions refer to the engine owner's manual.
- Inspect for damaged or bent fins, fan blades, and for corrosion. Inspect the welds, mounting brackets, connections, clamps, air hoses, and seals for damage or breakage. Repair or replace any damaged parts.


RADIATOR SCREEN


CLEAN FROM THIS SIDE

OIL & OIL FILTER

- Change engine oil and filter every 250 hours of operation or 3 months. Follow the engine manufacturer owner's manual for changing the oil & filter. Only use engine manufacturer recommended oil filter. Some engine manufacturers require special break-in oil to be run for a certain period of time. Refer to engine manual supplied with your chipper.

ENGINE OIL FILTER

DIESEL FUEL

- Check fuel level daily and replenish as necessary. Carlton chippers are equipped with fuel level indicators and lockable cap covers.

FUEL FILTER & FUEL/WATER SEPARATOR

Replace the fuel filter every 500 hours of operation or 6 months. Follow the engine owner's manual on how to remove the filters and to drain the fuel/water separator. Only use engine manufacturer approved fuel filters. Make sure to clean the area around the fuel filter before removing any parts; do not take a chance on contaminating the fuel line. Do not leave spilled fuel on the machine; spilled fuel on hot engine parts can cause fires.

FUEL/WATER SEPARATOR

COOLANT SYSTEM

⚠ WARNING

Pressurized System: Hot coolant can cause serious burns. To open the cooling system filler cap, stop the engine and wait until the coolant system components are cool. Loosen the cooling system pressure cap slowly in order to relieve the pressure.

- Check the coolant level daily when the engine is off and all parts are cool. Remove the coolant filler cap slowly to relieve built up pressure.
- When adding coolant to the tank, leave at least 1/2" between the coolant and the bottom of the filler pipe. Anti-freeze ratio to water must be 50/50, never use 100% anti-freeze.
- Clean the coolant filler cap and check the caps' gaskets for damage. Replace the cap if the gaskets are damaged.
- Inspect the coolant system for leaks. (For other service on the coolant system refer to the engine owner's manual.)
- Be sure to replace the filler cap before starting the engine.
- John Deere engines require a special coolant additive. Read your engine owner's manual for additional coolant information.

COOLANT FILLER CAP

FEED CONTROL BAR

- Before starting to chip any wood, always test the feed control bar. Make sure the reverse, stop, and forward feed positions work properly.
- Contact Carlton or an authorized dealer immediately if the control bar doesn't work properly in any of the three positions.

- **ALWAYS VERIFY CORRECT FUNCTION OF THE FEED CONTROL BAR BEFORE BEGINNING TO CHIP MATERIAL**
- **NO ONE SHOULD EVER REACH, LEAN, OR KICK INTO THE FEED INTAKE CHUTE WHEN THE MACHINE OR THE ENGINE IS RUNNING**

- Grease the feed control bar every 30-40 hours of operation as needed. There is a grease fitting on the end of each side of the feed control bar.

- Apply a light coating of oil to the feed control linkage **weekly**.

FEED WHEEL TENSION SPRINGS

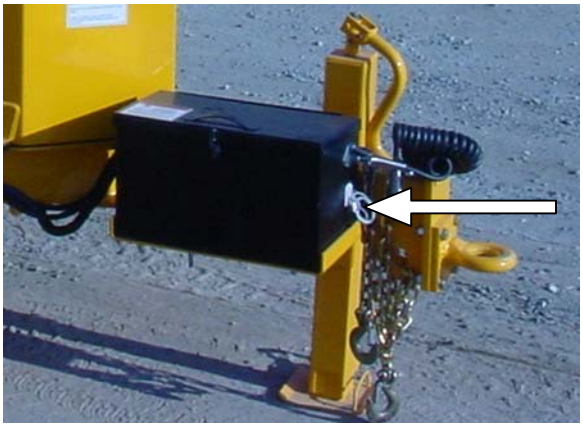
- The upper feed wheel has two tension springs. These springs should only be tight enough to keep the feed wheel teeth from slipping on the material. DO NOT OVER TIGHTEN! If the springs are overly tight, it will over work the hydraulic system and make it difficult to feed large material. The springs can be adjusted using the nuts on the bolt at the bottom of the spring.

HITCH

- Make sure the bolts on the chipper hitch are tightened. If not, tighten to the specified torque for the bolts size. Also, make sure the hitch bolts on the tow vehicle are tightened properly.
- Check the bolts and nuts for wear. If bolt or nut threads are chipped or worn down, or if the bolts and nuts won't stay tight after tightening them, the bolts and nuts need to be replaced. Check the bolt holes for wear also. If the holes are stretched or distorted, the hitch will need to be replaced.
- Keep the Pintle ring on the chipper greased. This will keep the wear between the two metal surfaces down to a minimum and will make your hitch last longer.
- If the Pintle ring is worn and does not fit the hitch on the tow vehicle properly, replace it as soon as possible. The loose fit between the two surfaces may cause the chipper to swerve in traffic and possibly even come uncoupled from the tow vehicle. Also check the hitch on the tow vehicle for wear for the same reasons.

LIGHTS WIRING

- Check lighting wire connections for damage, and loose or broken wires.
- Make sure the lights are working properly at all times when towing.
- See the Machine Wiring section of this manual for wiring diagram.

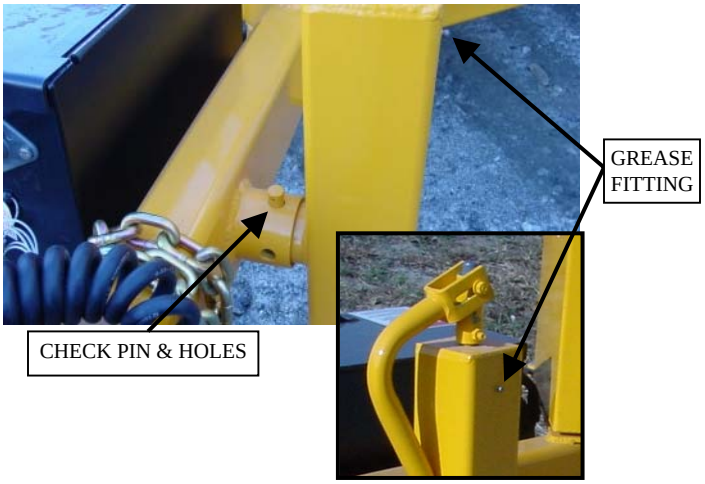


BREAKAWAY SWITCH

- Check to make sure the breakaway switch is working properly. This switch activates the brakes if the chipper ever becomes uncoupled from the tow vehicle. When the switch separates, power is sent to the brakes. Check the wiring for any loose or broken wires. Replace or rewire if necessary.

JACK STAND – FRONT

- Check the lock pins to make sure they are fitting properly and in good shape. Replace any pins that are worn, bent or damaged in any way. Make sure holes for lock pins are not worn or stretched.
- Check general condition of the jack stand. Make sure the holes are not worn or elongated. Check the bottom of the jack to make sure it will sit level on level ground. Replace the jack stand if it is warped, has unusual wear, or if it won't hold position when supporting the chipper.
- Grease the jack stand as necessary. See Lubrication section of manual.



JACK STAND – REAR
(OPTIONAL)

- Check the lock pins to make sure they are fitting properly and in good shape. Replace any pins that are worn, bent or damaged in any way.
- Check general condition of the jack stand. Make sure the holes are not worn or elongated. Check the bottom of the jack to make sure it will sit level on level ground. Replace the jack stand if it is warped, has unusual wear, or if it won't hold position when supporting the chipper.
- Grease the jack stand as necessary.

TONGUE EXTENSION
(OPTIONAL)

- Check all bolts and nuts on the tongue extension, if equipped. Replace any bolts and nuts that have worn, chipped or missing threads or that won't stay tightened.
- Check holes in the tongue extension mounting plate and on the machine tongue mounting plate. Make sure the holes are round and not distorted. If holes are distorted replace the mounting plates as soon as possible.

GENERAL INSPECTION

- Check all screws, bolts, and nuts on the chipper at least once a month unless otherwise specified. Check for tightness and wear. Replace any that won't stay tightened or that have missing or chipped threads. Check holes for wear or distortion and replace any parts necessary.
- All guards and covers must be in place and in good condition without any gaps or openings. Replace any bent or damaged guards or covers immediately.
- Check condition of springs. Replace any that have gaps or overlapped coils.

TIRES AND AXLES

- Check tires air pressure daily. Inflate tires as necessary. Keep tires air pressure adjusted based on the temperature and the load.
- When towing, make sure the chipper is sitting as close to level as possible to ensure proper tire wear and axle alignment.
- Check lug nuts for proper tightness. Tighten when necessary. Replace lug nuts if the threads are worn, chipped, or missing.
- Check tire rims for damage that could cause improper air pressure. If rims are damaged beyond repair, replace.
- See Dexter information for E-Z Lube® or Nev-R-Lube® Axles supplied in this manual. Remember to inspect axles regularly.
- Check and replace dust caps as needed.

FRAME

- At least once a month, check the chipper frame and other permanent parts for cracks, bends, failed welds, or other damage that needs repair. Repair as necessary or contact an authorized dealer.

- All of Carlton’s machines are built to be rugged performers. Our design goals are sturdiness, simplicity and reliability.
- A regularly scheduled maintenance program will pay big dividends in machine life, performance, and avoided downtime.
- Check grease fittings regularly and replace any that are clogged or missing.
- Below you will find a Lubrication Schedule that will give you the recommended frequency for lubrication.
- Next you will find specific locations of the grease points.
- Use a hand operated grease gun.

Lubrication Schedule

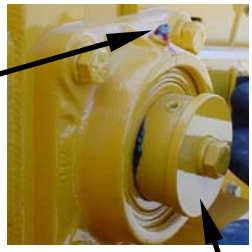
- **Use Texaco® Starplex II grease.**

- **Always clean tip of grease gun fitting and grease fitting on machine before attaching hose to prevent dirt from being forced into machine parts.**

IF THE BEARINGS ON YOUR CHIPPER DON’T LOOK LIKE THE ONES SHOWN IN THE FOLLOWING PICTURES, PLEASE CONTACT J. P. CARLTON OR A LOCAL DEALER FOR LUBRICATION INFORMATION.

CHIPPER – LEFT SIDE

YOKE LIFT ARM BEARING GREASE FITTING
* 1-2 PUMPS OF GREASE WEEKLY ON EACH BEARING



CUTTER DRUM BEARING GREASE FITTING
GREASE DAILY

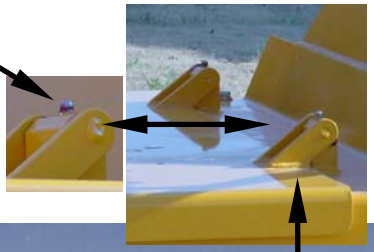
EQUIPPED WITH DEXTER AXLES, EITHER E-Z LUBE® OR NEV-R-LUBE® – SEE DEXTER INFORMATION ENCLOSED IN MANUAL

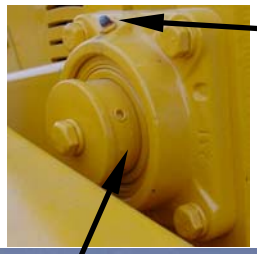
FEED WHEEL BEARING GREASE FITTING (2 PLACES)
* 1 PUMP OF GREASE DAILY ON EACH BEARING

FEED CONTROL BAR GREASE FITTING
* GREASE AS NECESSARY EVERY 30-40 HOURS OF OPERATION

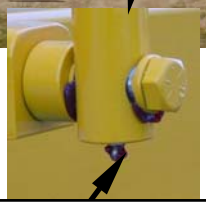
CHIPPER – RIGHT SIDE

CUTTER DRUM DOOR HINGES
GREASE FITTING
(2 PLACES)
* 1-2 PUMPS OF GREASE WEEKLY ON EACH





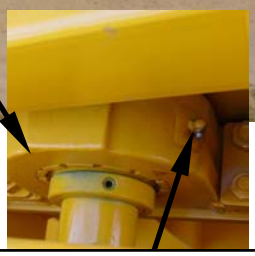
YOKE LIFT ARM
BEARING
GREASE FITTING
* 1-2 PUMPS OF GREASE WEEKLY ON EACH BEARING



FEED CONTROL BAR
GREASE FITTING
* GREASE AS NECESSARY EVERY 30-40 HOURS OF OPERATION

FEED WHEEL
BEARING
GREASE FITTING
(2 PLACES)
* 1 PUMP OF GREASE DAILY ON EACH BEARING

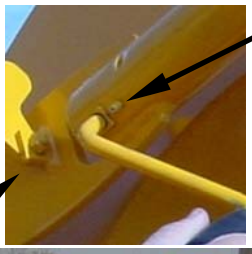
EQUIPPED WITH DEXTER AXLES, EITHER E-Z LUBE® OR NEV-R-LUBE® – SEE DEXTER INFORMATION ENCLOSED IN MANUAL



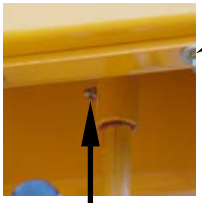
CUTTER DRUM BEARING
GREASE FITTING
GREASE DAILY

CHIPPER – RIGHT SIDE CLOSE-UP

DISCHARGE SWIVEL PLATE (3 PLACES) GREASE FITTING * GREASE EVERY 3 MONTHS, APPROX. 300 HOURS OF OPERATION



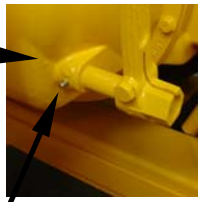
DISCHARGE HEIGHT ADJUSTMENT GREASE FITTING * GREASE AS NECESSARY EVERY 100 HOURS OF OPERATION

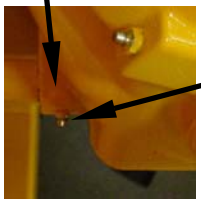


DISCHARGE SWIVEL HANDLE GREASE FITTING * GREASE AS NECESSARY EVERY 30-40 HOURS OF OPERATION

PTO/CLUTCH RELEASE BEARING GREASE FITTING * GREASE DAILY ADD 1-2 PUMPS - ROTATE THE SHAFT BY HAND WHILE ADDING GREASE

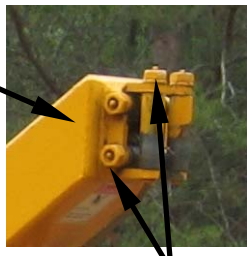
PTO/CLUTCH MAIN BEARING GREASE FITTING * ADD GREASE EVERY 100 HOURS OF OPERATION UNTIL GREASE IS FORCED OUT OF THE LABYRINTH SEAL AROUND THE SHAFT. ROTATE THE SHAFT BY HAND WHILE ADDING GREASE.



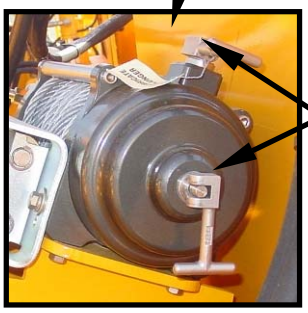


CLUTCH ENGAGEMENT HANDLE (CROSS SHAFT) GREASE FITTING (2 PLACES) * EVERY 500 HOURS OF OPERATION ADD 1-2 PUMPS OF GREASE

CHIPPER – WINCH (OPTIONAL EQUIPMENT)



GREASE FITTINGS
(4 PLACES)
* EVERY 30-40 HOURS OF OPERATION
GREASE AS NECESSARY
(SAME FOR BOTH STYLES)

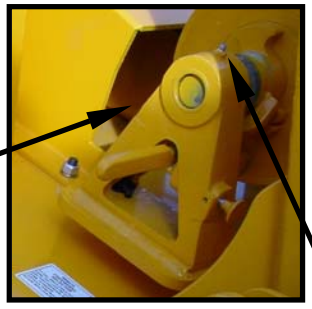


WINCH PLUNGERS

* SPRAY LUBRICANT ON PLUNGERS
EVERY 30-40 HOURS OF OPERATION

LEVER STYLE

FREEWHEEL STYLE



WINCH DRUM
GREASE FITTING
(2 PLACES)
(1 EACH SIDE OF CHIPPER)
* GREASE AS NECESSARY EVERY 30-40 HOURS OF OPERATION

DO NOT PERFORM ANY INSPECTION OR SERVICE ON THE CHIPPER WITHOUT MAKING SURE: THE CUTTER DRUM IS DISENGAGED AND HAS COME TO A COMPLETE STOP; THE CUTTER DRUM LOCK PIN IS INSTALLED; THE ENGINE HAS BEEN TURNED OFF, THE IGNITION KEY HAS BEEN REMOVED AND THE BATTERY CABLE HAS BEEN DISCONNECTED; THE FEED WHEELS HAVE BEEN RAISED, THE YOKE LOCK PIN IS IN POSITION, AND THE WHEELS HAVE BEEN BLOCKED; AND THERE ARE AT LEAST TWO OPERATORS AT THE SITE.

FOLLOW PROPER MAINTENANCE PROCEDURES IN SERVICE SECTIONS TO REPAIR OR REPLACE PARTS OR CONTACT YOUR DEALER.

COMPLAINT	CAUSE	CORRECTION
Discharged chips are not correct size: too large or too fine	• Knives have lost their edge	• DO NOT operate chipper with dull knives or with mismatched knives (see Servicing Cutter System section)
	• Knife anvil worn	• Rotate, repair, or replace (see Servicing Cutter System section)
	• Check for wear in the throat/base area (non-cutting areas)	• Outer, non-cutting edges that are exposed to chipper knives must be built up with weld to maintain surface to original integrity
	• Knife angle is not correct	• Make sure knives are ground at correct angle (see Servicing Cutter System section)
	• Material being chipped is very small, dry or rotting	• This type of material does not produce good chip quality
Cutter drum knife hits anvil	• Anvil to knife clearance is not correct	• See Servicing Cutter System section for adjustment
Discharge chute clogs or chips are not discharging properly	• Lugging engine on large material	• Keep engine speed up and use feed control bar to reverse material if engine lugs down, check Auto-Feed Plus setting and adjust (see Auto-Feed Plus Manual)
	• Obstruction in discharge chute	• Any object that protrudes inside the chute may cause clogging; replace discharge chute, if necessary
	• Chipping rotting material that has little substance can also plug the discharge chute	• Open air vents on sides of chipper drum • Use care when running this type of material; "flush" the discharge chute using other material with more substance

COMPLAINT	CAUSE	CORRECTION
Auto-Feed not working properly or at all	• Faulty or broken wiring • Settings not correct	• Repair or replace wires – wiring diagram enclosed in this manual • Reset following Auto-Feed/Houston street manual instructions enclosed in this manual
Chipper bearings are overheating	• Bearings are dry • Bearings worn out • Setscrews on bearings not tight	• Grease bearings daily using Texaco® Starplex II grease • Replace • Tighten
Feeding material causes feed wheels to slow down or stop	• Dull knives • Relief valve is worn or dirty • Hydraulic pump has excessive wear • Feed wheel motor(s) not working properly • Feed wheel springs to tight	• Replace knives (see Servicing Cutter System section) • Clean or replace; reset pressure • Replace • Check & replace • Adjust
One or both feed wheels don't turn or turn too slow to feed material	• Feed wheel motor(s) not working properly • Safety switch not in position • Relief valve opens too easily or stuck open • Feed wheel valve (control valve) worn & leaking internally • Feed wheel relief pressure off • One or more hoses may be crimped or leaking • Hydraulic oil level low • Pump has excessive wear • Feed wheels binding • Control lever improperly shifting valve • Worn or dirty flow divider	• Reverse hoses at flow divider - if same motor still doesn't turn, motor is probably bad; if other motor is now the one not turning, the flow divider is probably bad. Repair or replace • Make sure the safety switch is attached properly • Valve needs to be cleaned or replaced; reset pressure • Check & Replace • Reset pressure to 2500 PSI for bottom feed wheel or 2000 PSI for top feed wheel • Replace (see Servicing Hydraulics section) • Keep proper oil level per gage • Replace pump • Check bearings, lubricate properly • Readjust; valve must open completely • Clean or replace

COMPLAINT	CAUSE	CORRECTION
Engine won't turn over	• Battery is dead • Clutch is engaged • Cutter drum hood safety switch is not in position	• Recharge or replace battery • Disengage the clutch • Cutter drum hood lock pin and safety switch must be in position for the engine to start
Hydraulic oil overheating and causing chipper to operate slower than normal	• Hydraulic pump has excessive wear or not working properly • Hose crimped or leaking • Relief valve opens too easily or stuck open • Feed wheels binding • Hydraulic tank oil level is too low, hydraulic oil is contaminated, or hydraulic filter is dirty • Hydraulic oil viscosity is wrong for atmospheric temperature	• Check & replace pump, if necessary • Replace (see Servicing Hydraulics section) • Valve needs to be cleaned or replaced; reset pressure • Check feed wheel bearings, lubricate properly • Keep oil tank about 7/8 full; follow proper maintenance schedule and change oil and filter as suggested (see Servicing Hydraulics section) • Contact JP Carlton or local dealer for recommended oil type for the situation
Hydraulic pump making loud noise or a lot of noise (pump is cavitated)	• Hydraulic oil viscosity is wrong for atmospheric temperature • Oil operating temperature too low • Pump has excessive wear	• Contact JP Carlton or local dealer for recommended oil type for the situation • Allow system to warm up • Replace pump

Any other problems, please contact your local dealer or J. P. Carlton Co.

ONLY USE QUALIFIED PERSONNEL TO WORK ON HYDRAULIC SYSTEMS FOR REPAIRS OR REPLACEMENT OF PARTS!!

DANGER

DO NOT PERFORM MAINTENANCE OF ANY KIND ON THIS MACHINE UNLESS:

- The engine is turned off
- The ignition key has been removed
- The positive battery cable has been disconnected
- The clutch is disengaged
- Feed control bar is in neutral
- All machine parts have come to a complete stop – NOTE: The cutter drum takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter drum lock pin is installed in the drum lock tube
- No operator is in position at the controls to accidentally start machine
- At least 2 people are at the site where maintenance is performed

More accidents occur while performing maintenance than any other time! Use extra caution.

Never perform maintenance with the engine running, not even with the clutch disengaged. The pilot bearing could seize or freeze to the clutch shaft and permit the clutch to engage even though the operator thought the clutch had been disengaged.

ALWAYS REPLACE GUARDS AND OTHER PROTECTIVE EQUIPMENT BEFORE STARTING CHIPPER AFTER PERFORMING MAINTENANCE.

WARNING:

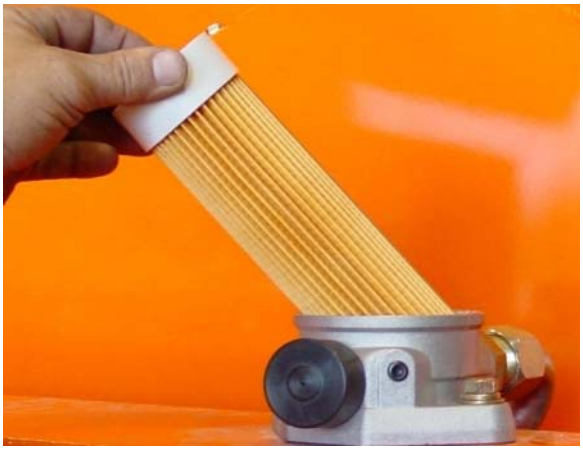
- **RELEASE HYDRAULIC PRESSURE BEFORE PERFORMING ANY SERVICE TO HYDRAULIC LINES OR OTHER COMPONENTS.**
- **FLUID UNDER PRESSURE CAN PENETRATE THE SKIN AND CAUSE SEVERE INJURY. SEEK IMMEDIATE MEDICAL ATTENTION IF SKIN IS PENETRATED. CHECK HOSES AND FITTINGS USING A BOARD OR CARDBOARD; DO NOT USE HAND OR FINGER. ALWAYS WEAR EYE PROTECTION.**

HYDRAULIC OIL & FILTER

- This Carlton chipper has an in-tank hydraulic filter and a level/temp gauge. Check hydraulic oil daily, before and during use. Refill with AW-32 hydraulic oil, same as supplied by the manufacturer.
-

Check hydraulic oil level daily. This Carlton chipper is equipped with a gauge that shows the level of oil and the temperature of the oil. When filling the tank with oil, the window of the gauge will also fill with oil as the level gets higher in the tank. Never fill the oil tank above the BLACK line at the top of the gauge. Do not run the machine with the oil level below the RED line at the bottom of the gauge.

- On a new chipper, change the hydraulic oil filter when the chipper has been operating for 10 hours. Replace with the same type of in-tank filter element supplied originally, available through Carlton or Carlton dealers. From this point on, change the filter every 200 hours of operation.
- Drain and replace the hydraulic oil every 500 hours of operation or once a year depending on use. Flush the hydraulic tank when changing the hydraulic oil. Replace oil if it has a burnt odor or if it is contaminated. Replace oil if the chipper has been stored for a long period of time (all winter).
- Drain the hydraulic tank using the drain plug located on the bottom of the tank. Dispose of used oil according to state regulations.



HYDRAULIC OIL COOLER

- There is a hydraulic oil cooler on this Carlton chipper to keep the hydraulic oil from over heating. There is a temp sensor in the bottom of the oil cooler and if the oil temperature rises to 140° or higher the fan comes on to cool the oil. The fan may go on and off as the temperature of the oil changes depending on the environment and the chipper operation.
- Keep the fins clean. Use a garden hose and a mild detergent. Do not use a power washer as it may cause the fins to bend. Do not use an industrial strength detergent that may cause the metal to deteriorate.

THE OIL COOLER ON THE 15" DRUM CHIPPER IS LOCATED BESIDE THE ENGINE AS SHOWN HERE

HOSES AND FITTINGS

- Inspect hoses and fittings for leaks, tightness, wear, or damage. Replace any hoses and fittings that need replacing.
- FLUID UNDER PRESSURE CAN PENETRATE THE SKIN AND CAUSE SEVERE INJURY. CHECK HOSES AND FITTINGS USING A BOARD OR CARDBOARD; DO NOT USE HAND OR FINGER. SEEK IMMEDIATE MEDICAL ATTENTION IF SKIN IS PENETRATED. ALWAYS WEAR EYE PROTECTION.

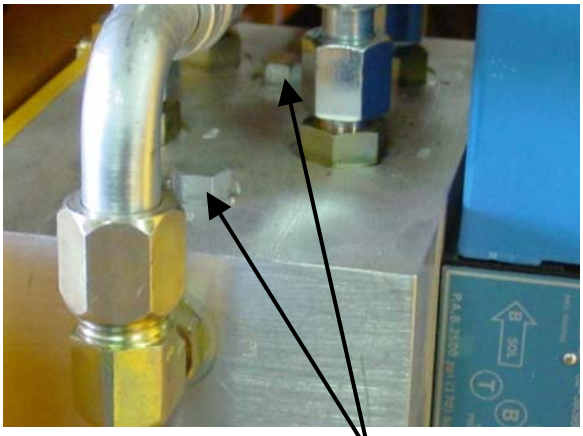
HYDRAULIC PRESSURE

⚠ CAUTION

DO NOT UNDER ANY CIRCUMSTANCES SET THE HYDRAULIC PRESSURES ABOVE THE FACTORY SETTINGS; COMPONENT PART AND HYDRAULIC SYSTEM DAMAGE WILL OCCUR AND POSSIBLY PERSONAL INJURY.

- If feed wheels start to run slow when engine RPM is high, check hydraulic pressure.
- Remove the plugs in the top of the hydraulic block, holes marked "G1" and "G2", and install a pressure gauge in each hole.
- Test the hydraulic pressure. With the engine at idle and with the **clutch disengaged**, put a log between the feed wheels and butt it against the cutter drum. Turn Auto-Feed off to operate feed wheels with engine at idle, see Machine Controls section. Check the pressure reading.

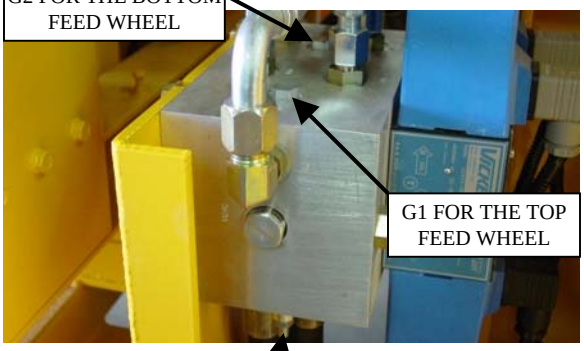
- The hydraulic pressure setting is 2000 PSI for the top feed wheel (G1) and 2500 PSI for the bottom feed wheel (G2), preset at the factory, and should remain set at these pressures.

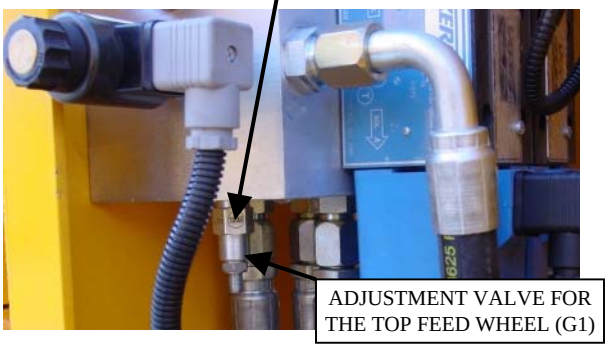


REMOVE PLUGS AND INSTALL PRESSURE GAUGES

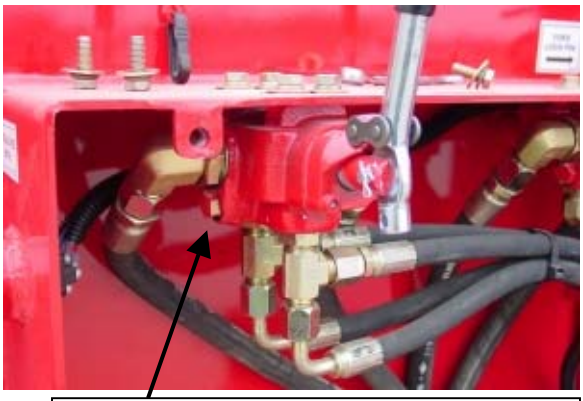
HYDRAULICS

- The plugs on top of the block are marked G1 for the top feed wheel and G2 for the bottom feed wheel. The pressure adjustment valves are below each plug on the bottom of the block.
- Adjust pressure only if necessary and after testing with a pressure gage. To increase pressure turn clockwise until it bottoms out. Recheck pressure. Contact J. P. Carlton or your dealer for more information.





- The hydraulic yoke lift pressure setting is 900 PSI, set at the factory and should remain set at that pressure.
- If equipped with the hydraulic winch, the pressure setting is 2000 PSI, set at the factory and should remain set at that pressure.
- If the pressure needs adjusting for either the hydraulic yoke lift or the hydraulic winch, remove the plug and turn the slotted screw clockwise to increase pressure.



ONLY USE QUALIFIED PERSONNEL TO WORK ON HYDRAULIC SYSTEMS FOR REPAIRS OR REPLACEMENT OF PARTS!!

DANGER

DO NOT PERFORM MAINTENANCE OF ANY KIND ON THIS MACHINE UNLESS:

- The engine is turned off
- The ignition key has been removed
- The positive battery cable has been disconnected
- The clutch is disengaged
- Feed control bar is in neutral
- All machine parts have come to a complete stop – NOTE: The cutter drum takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter drum lock pin is installed in the drum lock tube
- No operator is in position at the controls to accidentally start machine
- At least 2 people are at the site where maintenance is performed

More accidents occur while performing maintenance than any other time! Use extra caution.

Never perform maintenance with the engine running, not even with the clutch disengaged. The pilot bearing could seize or freeze to the clutch shaft and permit the clutch to engage even though the operator thought the clutch had been disengaged.

ALWAYS REPLACE GUARDS AND OTHER PROTECTIVE EQUIPMENT BEFORE STARTING CHIPPER AFTER PERFORMING MAINTENANCE.

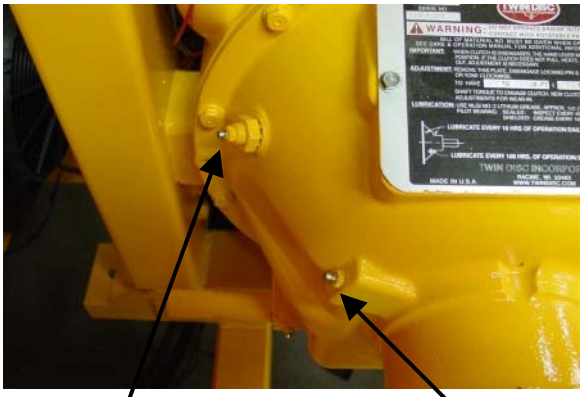
PTO/CLUTCH

A good maintenance program is imperative for the PTO/Clutch. Read the PTO/Clutch owner's manual before performing any service to your PTO/Clutch. NEVER ENGAGE OR DISENGAGE THE PTO/CLUTCH AT ENGINE SPEEDS IN EXCESS OF 1200 RPM. Always disengage the clutch before performing any type of service. Follow the Twin Disc Inc. PTO Service Manual for servicing the PTO/Clutch. (The following instructions came from the Twin Disc manual.)

LUBRICATION

To lubricate the bearings in the PTO/Clutch USE ONLY NGLI (National Grease and Lubrication Institute) APPROVED High grade, lithium base #2, short fiber grease with an EP (extreme pressure) additive recommended for use in high-speed roller bearings operating at 200°F (93.3°C). Carlton uses TEXACO® STARPLEX II grease. Listed below are the manufacturer's suggested guidelines for lubrication:

1. Release Bearing – using a hand-operated grease gun, add 1 or 2 pumps of grease per 8 to 10 hours of operation (or add grease until grease begins to weep from the ID of the bearing and from the release sleeve and the shaft). Rotate the shaft manually (by hand) while adding grease. **DO NOT OVER GREASE!**
2. Main Bearings – grease every 100 hours of operation. Add grease until grease is forced out of the labyrinth seal(s) around the shaft. Manually (not by starting the engine) rotate the shaft while adding grease.
3. PTO cross shaft (engagement linkage) – grease every 500 hours of operation. Add 1 or 2 pumps of grease using a hand operated grease gun.



CLUTCH ADJUSTMENT

The clutch in this machine **does not** automatically adjust to compensate for wear of the clutch facing(s) and therefore must be manually adjusted. **Maintaining the correct engagement pressure is the responsibility of the owner/operator. The owner/operator must periodically adjust the clutch to ensure correct clutch operation. The clutch requires frequent adjustments when parts are new to prevent slipping, overheating, and failure.**

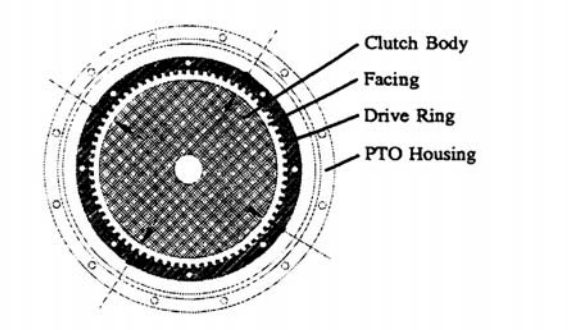
MEASURING ENGAGEMENT FORCE

The clutch should be adjusted if the force required for engaging the clutch drops by 10 to 15 percent of the specified force. Destructive damage may have already occurred if engagement force is allowed to diminish to the point where the clutch fails to carry the load (slippage) or facing(s) have overheated.

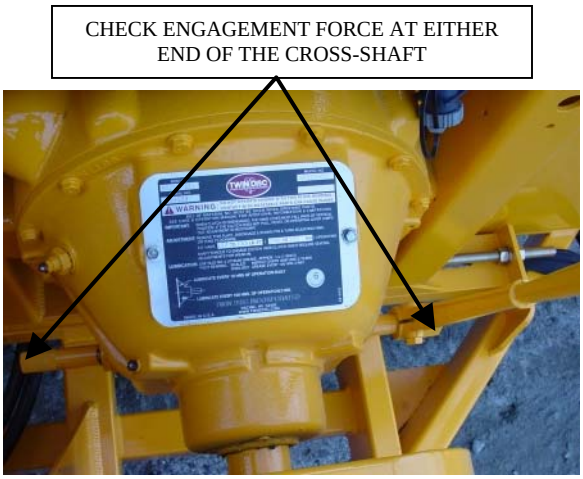
CLUTCH ENGAGEMENT

NOTE:

- New clutches or new facings usually require several frequent adjustments until the friction facing surfaces have "worn in". The clutch friction facing plates will become glazed and possibly permanently damaged if the clutch is permitted to slip excessively.
- If the facings have been slipped excessively, and enough heat was generated that the facings began to smoke, the clutch material may have been destroyed. Excessive heat normally destroys the friction material. Therefore, further clutch adjustment will not remedy the slippage problems. Replace "burned" facing plates.

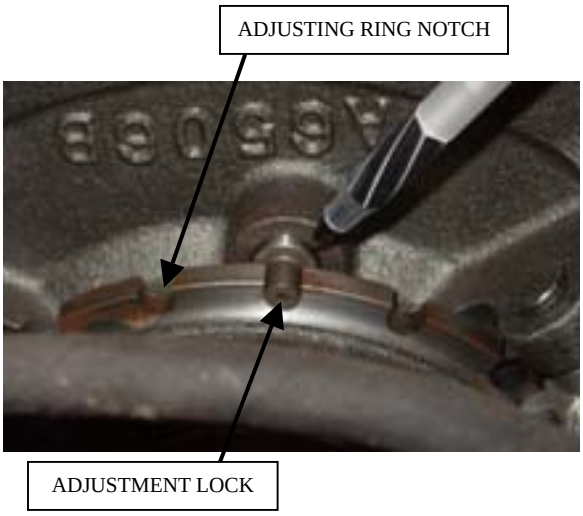


The preferred method of checking the force required to engage the clutch is using a torque wrench to check the foot-pounds required to engage the clutch. The torque wrench should be used at the cross shaft to measure engagement force. For the clutch used in this machine, the reading should be between 108-115 ft-lbs. The clutch should ENGAGE within this torque reading range. An adapter, Twin Disc, Inc. part number 02036484, may be obtained to provide a 1 1/2" hex nut at the end of the cross shaft. The adapter may be used in place of the standard handle for the purpose of checking clutch adjustment with a torque wrench or it may be installed on the end of the cross shaft. (Most PTOs have serrations on both ends of the cross shaft.) Another method for checking engagement force is the spring scale method, which is covered in the PTO/Clutch manual.



CLUTCH ADJUSTMENT PROCEDURE

If the clutch requires adjustment, remove the PTO nameplate and disengage the clutch. Push the adjustment lock pin in and rotate the adjustment ring. Rotate the adjusting ring clockwise to tighten the clutch. (Rotating the adjusting ring counter-clockwise will further loosen the clutch.) Check with the torque wrench, as described earlier, and continue to adjust until the handle engagement force is within the range of 108-115 ft-lbs. When clutch is properly adjusted, replace the PTO nameplate.



DANGER

DO NOT PERFORM MAINTENANCE OF ANY KIND ON THIS MACHINE UNLESS:

- The engine is turned off
- The ignition key has been removed
- The positive battery cable has been disconnected
- The clutch is disengaged
- Feed control bar is in neutral
- All machine parts have come to a complete stop – NOTE: The cutter drum takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter drum lock pin is installed in the drum lock tube
- No operator is in position at the controls to accidentally start machine
- At least 2 people are at the site where maintenance is performed

More accidents occur while performing maintenance than any other time! Use extra caution.

Never perform maintenance with the engine running, not even with the clutch disengaged. The pilot bearing could seize or freeze to the clutch shaft and permit the clutch to engage even though the operator thought the clutch had been disengaged.

ALWAYS REPLACE GUARDS AND OTHER PROTECTIVE EQUIPMENT BEFORE STARTING CHIPPER AFTER PERFORMING MAINTENANCE.

INSPECT/CHANGE KNIVES

- Cutter drum knives need to be kept sharp and free of chips to keep the chipper running smoothly. Visually inspect knives daily for dull edges, chips, and other damage. Dull or chipped knives do not cut well adding stress to the engine and requiring more power to cut through the wood. This can cause heat to build up and cause knife failure.
- Check the knives if the wood chips are too large, if the material will not feed properly, or if the engine lugs down.
- **Always wear leather gloves when handling knives. Edges are extremely sharp and could cause severe injury.**

DANGER: MAKE SURE THE IGNITION KEY HAS BEEN REMOVED AND MACHINE CAN'T BE STARTED BEFORE SERVICING ANY PART OF THE CHIPPER.

DANGER: Do not open the cutter drum door until the cutter drum has come to a complete stop. Do not perform service on the cutter drum or knives without installing the drum lock pin.

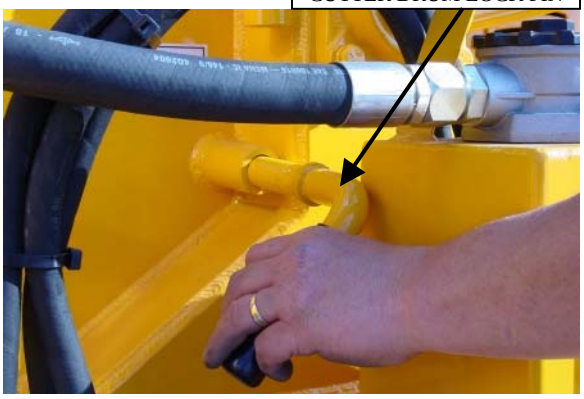
- Remove the padlock and lock pin from the cutter drum door and open.
- The cutter drum lock pin will have to be removed to rotate the cutter drum and inspect the knives. Use extra care when rotating the cutter drum to prevent injury. Rotate the drum fully to check for any obstructions or binding. If any problems are found, correct them before proceeding. **DO NOT ROTATE THE DRUM BY HAND ALWAYS USE A PRY BAR**. **Always wear leather gloves when performing any service on the cutter drum system.**

CUTTER DRUM DOOR LOCK PIN

DANGER – KNIVES ARE EXTREMELY SHARP

- Inspect all knives. If knives are still in good shape, proceed with other inspections or maintenance. To change knives, follow these procedures.
- Install the cutter drum lock pin. Rotate the cutter drum slowly to line up and insert the pin.
- Remove the six bolts and nuts holding each knife in place on the cutter drum.
- Inspect the bolts and nuts carefully for worn, chipped, or stripped threads.
- Do not remove and replace knife bolts and nuts more than 5 times before replacing with new bolts and nuts.
- **Nuts are security lock nuts. DO NOT USE ANY OTHER STYLE OF NUTS. You must purchase these nuts from Carlton or an authorized dealer.**

CUTTER DRUM LOCK PIN



- After knives have been removed, clean the pocket to remove any debris that may keep the knife from seating properly.

DANGER – KNIVES ARE EXTREMELY SHARP

- Inspect both edges of knives; **wear leather gloves while handling knives**. If knives still have one good edge, rotate each knife and reassemble. Knives must match in distance from center of hole to outside edge.
- Inspect knife bolt holes for cracks or distortion; replace knives if any problems are found.
- If both edges are worn or chipped, have knives ground to sharpen.
- **Never** use knives that are below 2 ½” from center of hole to outside edge of knife. Keep sets of knives together that are ground to the same distance from center of hole to outside edge. This will keep the cutter drum balanced reducing chipper vibration and improving cutting. A set is four knives.
- **ONLY have knives sharpened by an authorized dealer using the proper equipment.**
- **Improper sharpening may affect knives hardness resulting in knife failure.**
- If knives are too narrow to grind, replace with a complete set of new knives.
- Knives are hardened steel made to Carton’s specifications. Use only Carlton chipper knives as replacements.

- Reassemble knives in the pocket making sure they seat flat.
- Tighten knife bolts (3/4"-10) and nuts. Torque to 235 ft. lbs.
- Do not over tighten knife bolts. Torque only to the recommended amount. Knives that are overly tight can crack or bow around the hole. This could cause chipped material to pack between the knife and cutter drum causing knife failure. Check knife for distortion using a straight edge and a light, replace the knife if distorted.

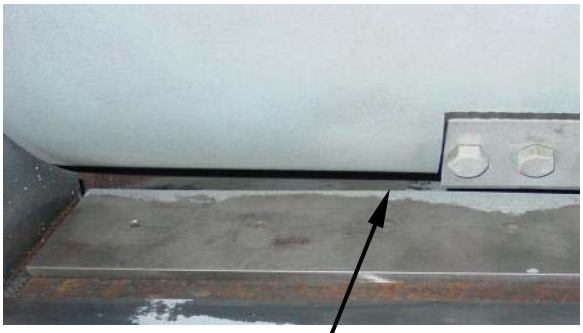
CHECK/ADJUST CLEARANCE

ALWAYS CHECK AND SET KNIFE TO ANVIL CLEARANCE AFTER REMOVING AND REPLACING KNIVES OR ANVIL.

- Raise and block upper feed wheel. Use the hydraulic lift to raise the upper feed wheel. Insert the yoke lock pin into the yoke lock tube.
- Place a block of wood 4" x 15" x 16" between the feed wheels.

FEED WHEEL RAISED & LOCK PIN INSERTED

- Inspect the anvil working edge for wear or damage before you check the clearance. If the anvil needs to be changed to a new work surface or to be replaced, follow the instructions in Anvil Replacement later in this section. The anvil has four working edges that can be used before replacing.



ANVIL WORKING EDGE

- Check the clearance between the knives and the anvil. The clearance for the knife to anvil should be between .070" and .090" (1.78 – 2.29 mm). Use a feeler gage that measures within that range. The gage should fit easily between the knife and the anvil without force and without too much free space on either side. Check clearance at each corner of the knife. Check each knife.

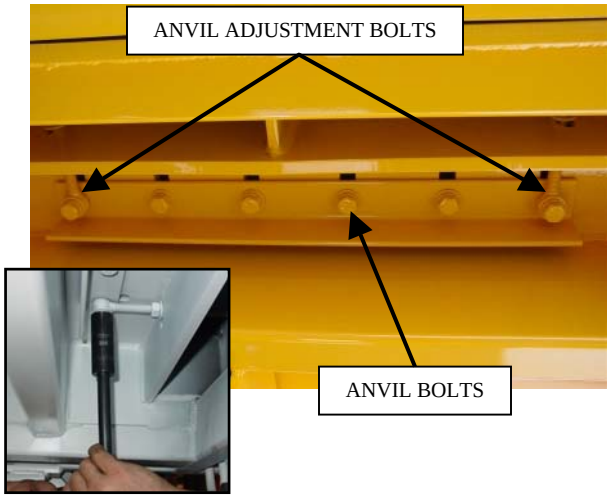
CHECKING CLEARANCE AT BOTTOM OF KNIFE ASSEMBLY

FEELER GAGE

- One person will need to be in the infeed chute area to check the clearance on the anvil and the knives; **but not while the drum is being rotated**. Another person will be under the chipper to make adjustments. A third person will need to rotate the drum to the next knife. The drum will have to be rotated fully to check all knife settings. **DO NOT ROTATE THE DRUM BY HAND USE A PRY BAR.**
- **This is one time the cutter drum lock pin will not be in position so extreme care needs to be taken for safety. DO NOT allow anyone in the infeed chute area, until you make sure there is no obstruction or binding in the cutter drum by turning it around completely first. If the cutter drum does not turn freely, find and remove the obstruction and then proceed.**
- **UPPER FEED WHEEL MUST BE RAISED, HAVE YOKE LOCK PIN IN POSITION, AND BE BLOCKED WHEN WORKING BETWEEN FEED WHEELS.**

UPPER FEED WHEEL MUST BE RAISED, PINNED, AND BLOCKED

- Checking and setting the clearance by the knife that is the closest to the anvil will be the best place to start.
- If clearance needs to be adjusted, loosen the six anvil bolts; just loose enough to be able to move the anvil with the adjuster bolts.



- To move the anvil closer to the knife, loosen the nuts on the adjustment bolts that are on the far side of the plate (see the picture on the right). There are two adjustment bolts as shown above.
- Using the nuts on the inside of the plate, turn the nuts counterclockwise to move the anvil closer to the knife. This will shorten the clearance if it was too wide. Make slight adjustments on each bolt and recheck the clearance before making more adjustments. When the clearance has been set, recheck clearance on the other knives.
- If the clearance is too narrow for the feeler gage to go in easily, you will need to loosen the nuts on the inside of the plate and turn the outside nuts clockwise. This will move the anvil farther away from the knife. Make slight adjustments on each bolt and recheck the clearance before making more adjustments. When the clearance has been set, recheck clearance on the other knives.

LOOSEN THE OUTSIDE NUTS

TIGHTEN THE INSIDE NUTS TO SHORTEN THE CLEARANCE BETWEEN THE KNIFE AND ANVIL

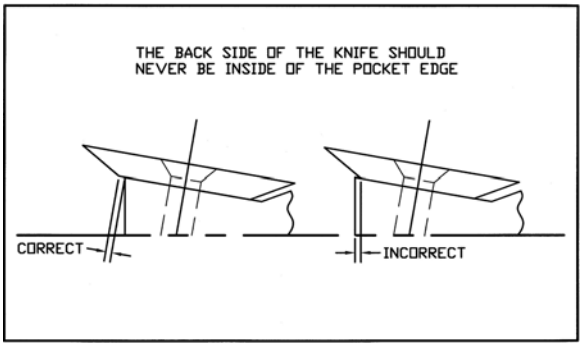
- After the clearance has been set, tighten the anvil bolts (1/2”-13) and torque to 75 ft. lbs.
- Retighten the nuts on the adjustment bolts that were loosened earlier.
- Recheck the anvil/knife clearance to make sure nothing changed when tightening the bolts.
- Clearance should be .070” and .090” (1.78 – 2.29 mm).

- **ALWAYS REMEMBER TO CLOSE THE CUTTER DRUM DOOR AFTER SERVICING CUTTER DRUM.**
- **INSTALL THE DOOR LOCK PIN AND PADLOCK.**
- Check condition of cutter drum door. Make sure the hinges are not damaged and that the door closes completely with no gaps or openings; check both sides. If there are any problems go to Servicing Cutter Drum Door later in this section.

NO GAPS OR OPENINGS AROUND DOOR

SHARPEN KNIVES

- Have knives ground by a qualified grinder.
- Grind knives at 29° to 31°.
- Before and after grinding the knife-edge, check the width of the knife from the center of the hole to the sharp edge of the knife. Never use a knife with this measurement below 2 1/2”.



- **Three factors for a good cutting system are:**

    1. **Never use a knife with the distance from the cutting edge to the center of the bolt hole less than 2 1/2”.**
    2. **Always use knives in sets of four with the dimension from the cutting edge to the center of the bolt hole as close as possible to each other.**
    3. **Never use a knife if the back edge is inside the knife pocket edge.**

KNIVES

PART NO	DESCRIPTION	QTY
0900144	Knife – 5/8” x 5 1/2” x 10-1/2”	2
12A-1222ZI	HEX C/S 3/4”-10 X 2 3/4” UNC GR8 Z&Y	8
0900131	3/4” Security Lock Nuts – Purchase from JP Carlton or Dealer	8

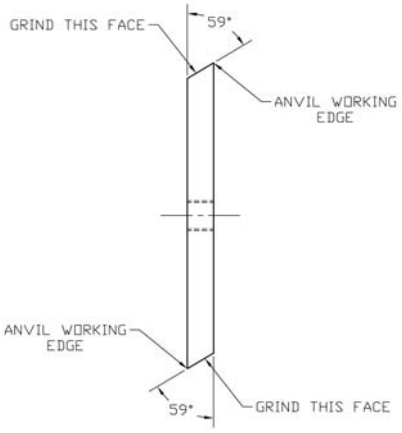
DANGER:

- **TURN ENGINE OFF**
- **REMOVE IGNITION KEY**
- **DISENGAGE CLUTCH**
- **PUT FEED CONTROL BAR IN NEUTRAL**
- **ALLOW CUTTER DRUM TO COME TO A COMPLETE STOP**
- **ALLOW ALL PARTS TO COOL COMPLETELY**
- **INSTALL CUTTER DRUM LOCK PIN**

DANGER: MAKE SURE THE IGNITION KEY HAS BEEN REMOVED AND MACHINE CAN'T BE STARTED BEFORE SERVICING ANY PART OF THE CHIPPER.

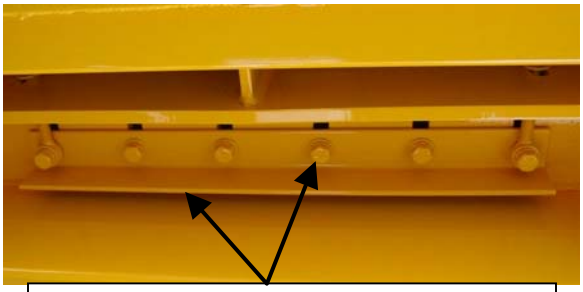
ANVIL REPLACEMENT

- Check the anvil for wear when knives have been changed and clearance is being set. The anvil has two working edges that can be used. Rotate the anvil to a new working edge unless both edges are worn and the anvil needs to be ground or replaced.
- The edge of the anvil can be ground to get more use. The angle on the end of the anvil is 59° maintain this angle when grinding. DO NOT grind the anvil to the point that all the adjustment capability is gone, replace with a new anvil. DO NOT grind more than 1/8" per side.
- The anvil is hardened steel made to Carton's specifications. Use only Carlton anvils as replacements or damage may occur. Purchase the new anvil from Carlton or an authorized dealer.



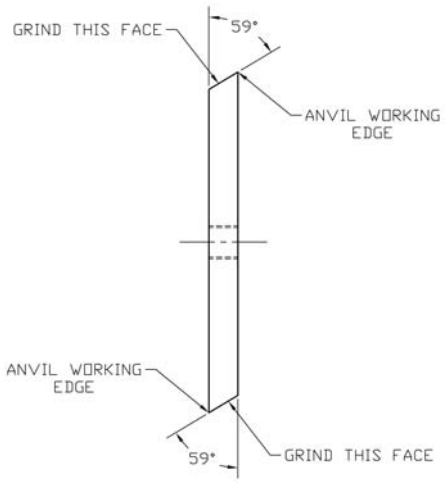
- To rotate or replace the anvil, remove the anvil bolts and washers. There are six anvil bolts, each with a flat washer and a lock washer.
- There are two adjuster eyebolts that two of the anvil bolts go through.
- Loosen the nuts on the inside of the bracket on each adjuster bolt.
- Remove the nut on the outside of the bracket on each adjuster bolt.

- The angle support for the bolts will also come off when the anvil bolts are removed. Keep all parts together to reassemble later. Inspect all parts and replace any that are damaged.



KEEP ANGLE, BOLTS, AND WASHERS TOGETHER

- The working edge of the anvil is the top edge closest to the drum. Use gloves and be careful when lifting the anvil, as the edges are very sharp. Lift the anvil out of the pocket and inspect the other working edge. If the other edge is still good, flip the anvil over and put it back in the pocket. Make sure the sharp edge is on top and toward the drum.
- The edge of the anvil can be ground to get more use. The angle on the end of the anvil is 59°; maintain this angle when grinding. DO NOT grind the anvil to the point that all the adjustment capability is gone, replace with a new anvil. DO NOT grind more than 1/8" per side.
- The anvil is hardened steel made to Carton's specifications. Use only Carlton anvils as replacements or damage may occur. Purchase the new anvil from Carlton or an authorized dealer.



- When the anvil has been replaced, replace the angle and the bolts that were removed earlier. Be sure to replace the lock washers closest to the head of the hex bolts and the flat washers next.
- Screw in the four short bolts first in the positions shown at the right. Leave the anvil bolts slightly loose to adjust the clearance.

SCREW THE FOUR SHORT BOLTS IN FIRST

- Replace the two eyebolts on each end of the anvil. Put the eyebolts on the two long bolts after the washers are on.
- The adjuster eyebolts must be inserted through the slot provided to make clearance adjustments. A flat washer goes between the nut on the adjuster bolt and the plate.

- Leave the anvil bolts slightly loose to adjust the clearance. Put a flat washer and a nut back on the outside of each adjuster bolt. Do not tighten the nut until clearance has been set.
- ALWAYS CHECK & SET KNIFE TO ANVIL CLEARANCE AFTER REMOVING AND REPLACING KNIVES OR ANVIL.
- Go back to the Check/Adjust Clearance earlier in this section.
- After the clearance has been set, tighten the anvil bolts (1/2”-13) and torque to 75 ft. lbs.
- Either the outside or the inside nuts will be tight after adjusting the clearance. Tighten the nuts on the adjuster bolts that are still loose.

- **ALWAYS REMEMBER TO CLOSE THE CUTTER DRUM DOOR AFTER SERVICING CUTTER DRUM.**
- **INSTALL THE DOOR LOCK PIN AND PADLOCK.**
- Check condition of cutter drum door. Make sure the hinges are not damaged and that the door closes completely with no gaps or openings; check both sides. If there are any problems go to Servicing Cutter Drum Door later in this section.

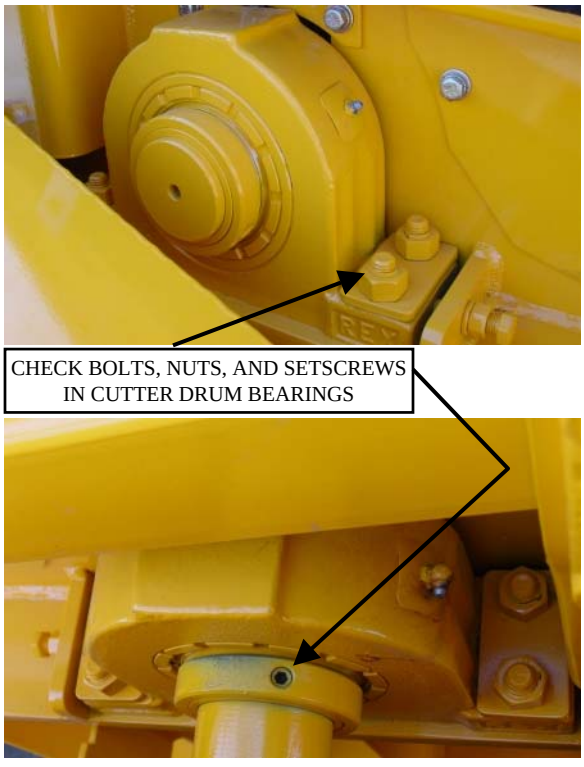
SERVICING CUTTER DRUM DOOR

- Inspect cutter drum door for fit and damage daily. Check for cracks around welds.
- Check door hinges making sure door closes completely with no gaps or openings; check both sides.
- Cutter drum door lock pin must go through locking plates easily and completely allowing room for padlock. Check pin for distortion and cracks.
- If any problems are discovered, contact Carlton or your local dealer for repair or replacement.

THE CUTTER DRUM DOOR IS ONE OF THE MOST IMPORTANT PIECES OF SAFETY EQUIPMENT ON THIS CHIPPER. MAKE SURE IT IS KEPT IN GOOD WORKING CONDITION.

CUTTER DRUM BEARINGS

- Check cutter drum bearing bolts and nuts **weekly** for tightness and wear. The nuts on the bearings are security lock nuts. If they are loose, torque them to 250 ft. lbs. Replace any bolts and nuts that won't stay tight or have worn, chipped, or missing threads. Contact J. P. Carlton Co. or an authorized dealer for replacement parts.
- Inspect setscrews in bearing collars for tightness and wear. Replace if threads are worn, chipped or missing. The setscrew in the bearing collar seats in a drill point in the cutter drum shaft. If you remove the setscrew, make sure you line the collar up with that drill point and retighten the setscrew. You should also put LocTite® 242 on the threads.
- If cutter drum bearings need to be replaced contact J. P. Carlton Co. or an authorized dealer.



CHECK BOLTS, NUTS, AND SETSCREWS IN CUTTER DRUM BEARINGS

DANGER

DO NOT PERFORM MAINTENANCE OF ANY KIND ON THIS MACHINE UNLESS:

- The engine is turned off
- The ignition key has been removed
- The positive battery cable has been disconnected
- The clutch is disengaged
- Feed control bar is in neutral
- All machine parts have come to a complete stop – NOTE: The cutter drum takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter drum lock pin is installed in the drum lock tube
- No operator is in position at the controls to accidentally start machine
- At least 2 people are at the site where maintenance is performed

More accidents occur while performing maintenance than any other time! Use extra caution.

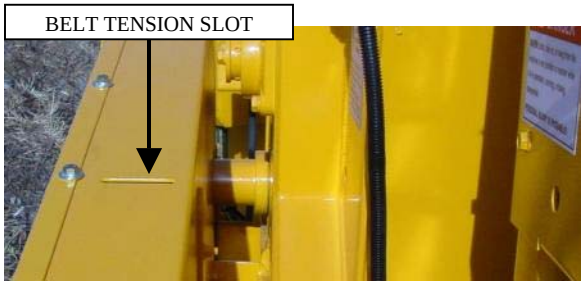
Never perform maintenance with the engine running, not even with the clutch disengaged. The pilot bearing could seize or freeze to the clutch shaft and permit the clutch to engage even though the operator thought the clutch had been disengaged.

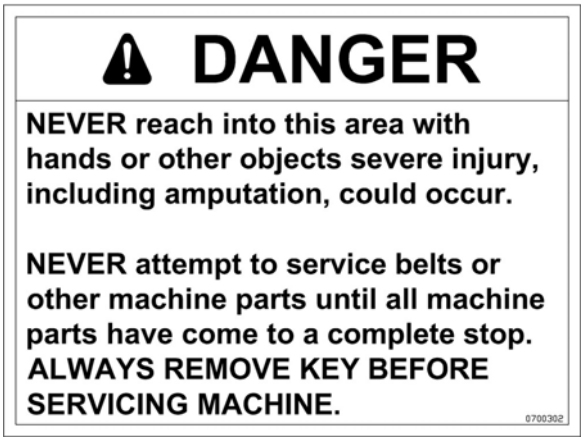
ALWAYS REPLACE GUARDS AND OTHER PROTECTIVE EQUIPMENT BEFORE STARTING CHIPPER AFTER PERFORMING MAINTENANCE.

BELT TENSION

CHECK BELT TENSION

- The new belt will stretch and become loose as the machine runs. Check the belt tension often when the belt is new.
- The belt should deflect 3/4” when a force of 22-24 ft. lb. is applied to a new belt or 20-22 ft. lb. to a used belt. Check tension through the slot on the belt guard.





V-BELT

ENGINE MUST BE OFF AND IGNITION KEY REMOVED BEFORE CHECKING BELT TENSION. ALL PARTS MUST BE COMPLETELY STOPPED. ALLOW ALL PARTS TO COOL COMPLETELY TO PREVENT BURNS. CLUTCH MUST BE DISENGAGED.

- Insert a screwdriver or metal bar (a metal ruler would be good) through the slot to check belt tension.
- Make a mark on the screwdriver or metal when it touches the belt without any force applied and then apply force and make another mark.
- Measure the distance between the two marks. If the measurement is more than 3/4", the belt tension needs to be adjusted. If the measurement is much less than 3/4", the belt tension is too tight and needs to be adjusted.
- **Do not** over tighten the engine belt. An overly tight belt will cause damage to PTO/clutch bearings and to cutter drum bearings.

ADJUST BELT TENSION

- There are four engine slide bolts (3/4") mounting the engine to the frame. There are also two eyebolts for adjustment, which are mounted to the two engine slide bolts at the front of the machine to move the engine and adjust the belt tension.
- Loosen all four of the engine slide bolts enough to be able to move the engine but don't remove the bolts. The bolts are secured through a block under the frame and will require only one wrench to loosen.

ENGINE SLIDE BOLTS - 2 AT FRONT OF ENGINE

ENGINE SLIDE BOLTS - 2 AT BACK OF ENGINE

ADJUSTMENT EYEBOLT

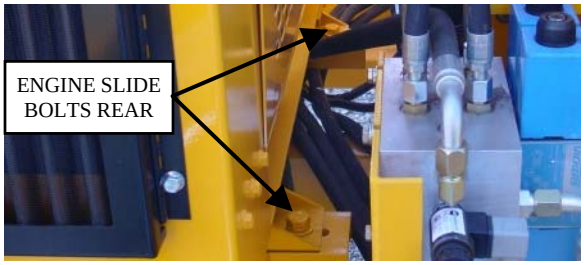
V-BELT

- Loosen the inside jam nuts on the adjustment eyebolts.
- Turn the outside jam nuts clockwise, moving the engine closer to the front of the machine and tightening the belt. Make only slight adjustments at a time and recheck tension. Make equal adjustments to both eyebolts to keep sheaves aligned. Keep making slight adjustments and rechecking tension until correct tension is achieved.
- **Do not** over tighten the engine belt. An overly tight belt will cause damage to PTO/clutch bearings and to cutter drum bearings. To loosen belt tension, loosen the outside jam nut and turn the inside jam nut counter-clockwise making slight and equal adjustments as with tightening the belt tension.
- Replace the belt when worn or when repeated adjustments are necessary. A belt should never get so loose that all of the adjustment capability is used.

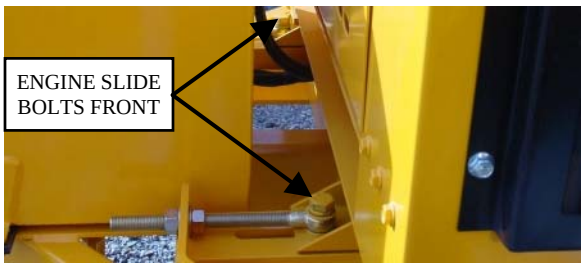
LOOSEN INSIDE JAM NUTS ON ADJUSTMENT EYEBOLTS

TURN OUTSIDE JAM NUTS CLOCKWISE TO TIGHTEN BELT

- When tension is correct, retighten the engine slide bolts at the rear of the engine first.



- Then, loosen the outside jam nuts and tighten the front engine slide bolts. If you don't loosen the outside jam nuts before tightening the front engine slide bolts, the eyebolt will be at an angle. This will cause the threads on the eyebolt to be damaged.



- Retighten both jam nuts on each eyebolt. Tighten the outside jam nut on each eyebolt first and then the inside jam nuts.
- Torque all four engine slide bolts (3/4") to 175 ft lbs.

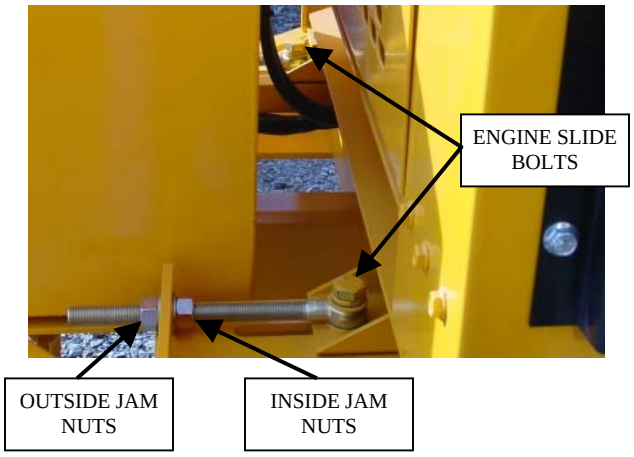
CHECK BELT GUARDS

- Check and retighten bolts daily.
- Check condition of bolt threads when belt guards are removed or if a bolt won't tighten or won't stay tightened.
- Replace any bolts that are worn or damaged. Replace bolts and/or nuts with stripped threads.
- NEVER RUN MACHINE WITHOUT ALL GUARDS IN PLACE AND SECURED. ROTATING PARTS ARE DANGEROUS AND COULD CAUSE SEVERE INJURY.

REPLACING V-BELT

- **Follow all safety precautions at the beginning of this section and make sure the clutch is disengaged.**
- Replace the belt when it is worn or regularly needs adjustment.
- Remove belt guard bolts and remove belt guard cover.

- Loosen all four engine slide bolts as described earlier.
- Loosen outside jam nuts (two places) and turn inside jam nuts counter-clockwise to move engine back and loosen the belt enough to remove over sheaves**.** Turn jam nuts on both of the eyebolts the same amount to keep from twisting the engine. Turn the jam nuts only a slight amount at a time and work back and forth from one bolt to the other until the belt will come off easily.

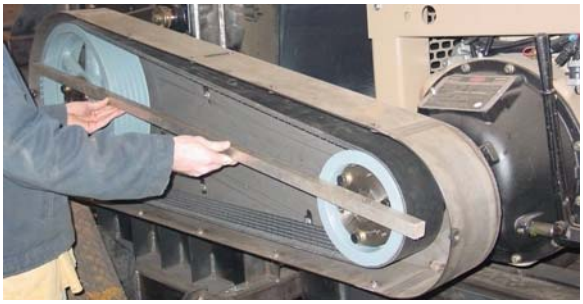


- The cutter drum lock pin should be removed to allow the sheaves to turn in removing the belt. DO NOT HAVE CUTTER DRUM DOOR OPEN.
- Remove the belt.

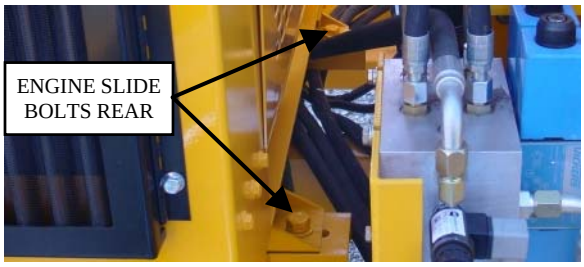
- Install the new belt using the same procedure only in reverse. Put the belt on the cutter drum sheave first and then the engine sheave.
- Never pry the new belt onto the sheave! Move the engine back further if needed.

- Once the belt has been replaced, you will need to loosen the inside jam nuts and tighten the outside jam nuts on the eyebolts.
- When the belt starts getting tight, check tension. (See Check Belt Tension and Adjust Belt Tension earlier in this section.)

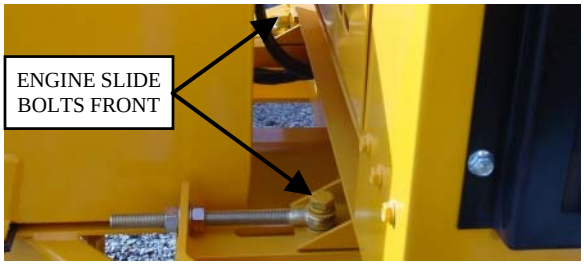
- Check sheave alignment and make adjustments using engine slide adjustment (jam) nuts. Make slight adjustments until sheaves are aligned and tension is correct.



- When tension is correct, retighten the engine slide bolts at the rear of the engine first.



- Then, loosen the outside jam nuts and tighten the front engine slide bolts. If you don't loosen the outside jam nuts before tightening the front engine slide bolts, the eyebolt will be at an angle. This will cause the threads on the eyebolt to be damaged.



- Retighten both jam nuts on each eyebolt. Tighten the outside jam nut on each eyebolt first and then the inside jam nuts.
- Then torque all four engine slide bolts (3/4") to 175 ft lbs.

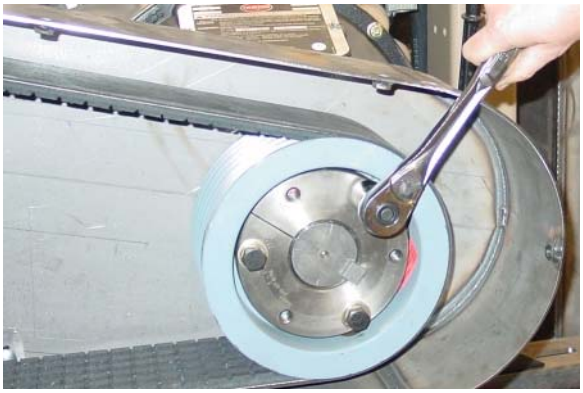
- Replace the belt guard cover and tighten bolts.
- **NEVER RUN MACHINE WITHOUT ALL GUARDS IN PLACE AND SECURED. ROTATING PARTS ARE DANGEROUS AND COULD CAUSE SEVERE INJURY.**

REPLACING SHEAVE OR BUSHING

- If it becomes necessary to replace a sheave or bushing, replace only one at a time. Never remove both sheaves at the same time.
- This section covers removing and replacing the engine sheave and bushing. Follow the same procedure for removing the cutter drum sheave and bushing.
- Remove belt guard bolts and remove guard.

- Remove the belt as described in Replacing V-Belt section.

- Remove bolts from the bushing and screw each bolt into the threaded holes to push sheave off bushing. Screw bolts in equally to prevent damaging the bushing or the sheave, especially if you plan to use either one again.



- When the sheave is loose on the bushing, remove the setscrew in the bushing.
- Remove the bushing from the shaft and from the sheave.

- Remove the sheave and replace with new sheave.

- Insert old or new bushing, lining up keyway with the keyway on the shaft. Make sure the key is in position.
- Replace bolts in the sheave and tighten until bushing is flush with the engine shaft.

- Go to Replacing V-Belt section to replace the belt and adjust tension. Make sure sheaves are aligned when retightening the belt to the proper tension.

- Replace the belt guard cover and tighten bolts.
- **NEVER RUN MACHINE WITHOUT ALL GUARDS IN PLACE AND SECURED. ROTATING PARTS ARE DANGEROUS AND COULD CAUSE SEVERE INJURY.**

FEED WHEEL MOTOR

DANGER

DO NOT PERFORM MAINTENANCE OF ANY KIND ON THIS MACHINE UNLESS:

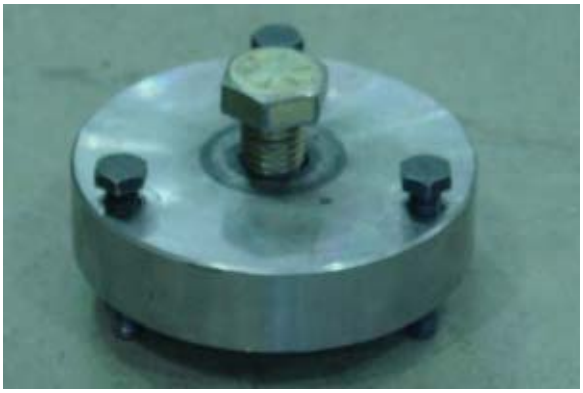
- The engine is turned off
- The ignition key has been removed
- The positive battery cable has been disconnected
- The clutch is disengaged
- Feed control bar is in neutral
- All machine parts have come to a complete stop – NOTE: The cutter drum takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter drum lock pin is installed in the drum lock tube
- No operator is in position at the controls to accidentally start machine
- At least 2 people are at the site where maintenance is performed

More accidents occur while performing maintenance than any other time! Use extra caution.

Never perform maintenance with the engine running, not even with the clutch disengaged. The pilot bearing could seize or freeze to the clutch shaft and permit the clutch to engage even though the operator thought the clutch had been disengaged.

ALWAYS REPLACE GUARDS AND OTHER PROTECTIVE EQUIPMENT BEFORE STARTING CHIPPER AFTER PERFORMING MAINTENANCE.

There is a special tool required to separate the motor and coupling once it is off the machine, contact J. P. Carlton or your local dealer to purchase the puller.



PULLER

CHANGE MOTORS ONE AT A TIME.

- The following instructions are for the lower feed wheel motor but the upper feed wheel motor has the same configuration. The only difference is the design and direction of the torque arm.

FEED WHEEL MOTOR

WARNING:

- **RELEASE HYDRAULIC PRESSURE BEFORE PERFORMING ANY SERVICE TO HYDRAULIC LINES OR OTHER COMPONENTS.**
- **FLUID UNDER PRESSURE CAN PENETRATE THE SKIN AND CAUSE SEVERE INJURY. SEEK IMMEDIATE MEDICAL ATTENTION IF SKIN IS PENETRATED. CHECK HOSES AND FITTINGS USING A BOARD OR CARDBOARD; DO NOT USE HAND OR FINGER. ALWAYS WEAR EYE PROTECTION.**

- Remove the rubber guard that covers the feed wheel coupling and bushing by removing the two 3/8" bolts. Be sure to keep all parts and hardware together to make reassembly easier.

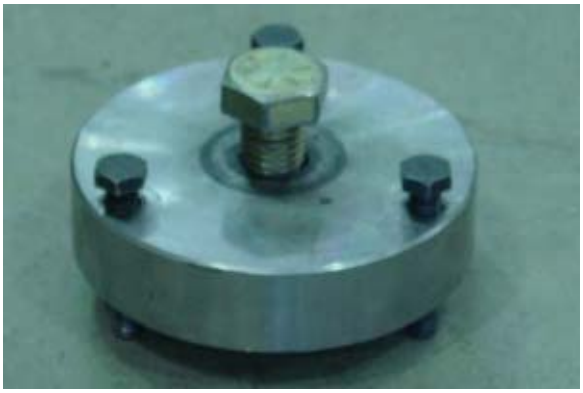
- Before changing the feed wheel motor, release the hydraulic pressure. Mark the location of each hose, possibly with an R and L for right and left hoses. Then disconnect the hydraulic hoses and cap the ends of hoses and the connections on the motor.

- Remove the three bolts (3/8") from the bushing and screw these bolts back into the three threaded holes in the bushing to push the motor assembly off the bushing. Screw these bolts in a little at a time to take the assembly off without applying more pressure to one side than the other.

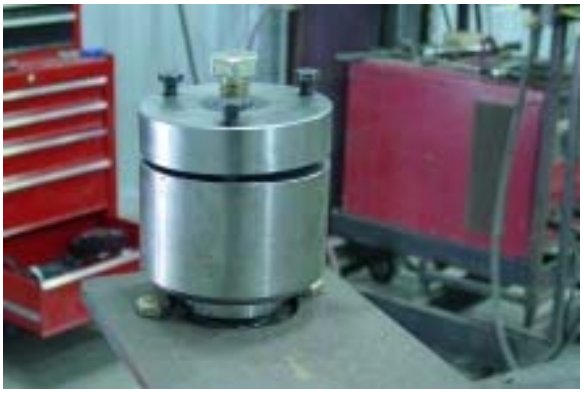
FEED WHEEL MOTOR

- When the motor assembly is off the machine, move it to a workbench for easier access. Then, remove the 1" nut that is inside the coupling. You may need to use a vise to hold the motor steady while you break the nut loose since it was put on with LocTite® 262 and then tightened to 150 ft. lbs. **CAUTION: Always wear eye protection when working on hydraulic components.**

- **There is a special tool required to separate the motor and coupling once it is off the machine, contact J. P. Carlton or your local dealer to purchase the puller.**



- Attach the separating tool to the coupler as shown and screw the three bolts from the bushing into the tool in the outside holes. Screw the bolts into the coupling as far as they will go. Now turn the bolt in the center of the tool to pull the coupling off the feed wheel motor.



- Remove the torque arm held on with two 1/2" bolts. (The torque arm looks slightly different on the upper feed motor, but is still held on with two bolts.)

FEED WHEEL MOTOR

- Replace with new motor. Clean the threads on the motor, the 1" nut, and the coupling with degreaser before beginning to replace all the parts.

LINE UP KEY WITH KEYWAY ON COUPLING

- Attach the torque arm to the new motor using the 1/2" bolts that were removed. Tighten the bolts and torque to 120 ft. lbs. (The torque arm looks slightly different on the upper feed motor, but is still held on with two bolts.)

- Put the coupling onto the motor and line up key and keyway – always use new key. Use a rubber mallet to seat the coupling. Strike the coupling a couple of times. Apply LocTite 262 (red) to the 1" nut and screw in place. Torque the nut to 150 ft. lbs. Strike the coupler again a couple of times with the rubber mallet to finish seating and torque the nut to 150 ft. lbs. again.

STRIKE THE COUPLING WITH RUBBER MALLET TO SEAT

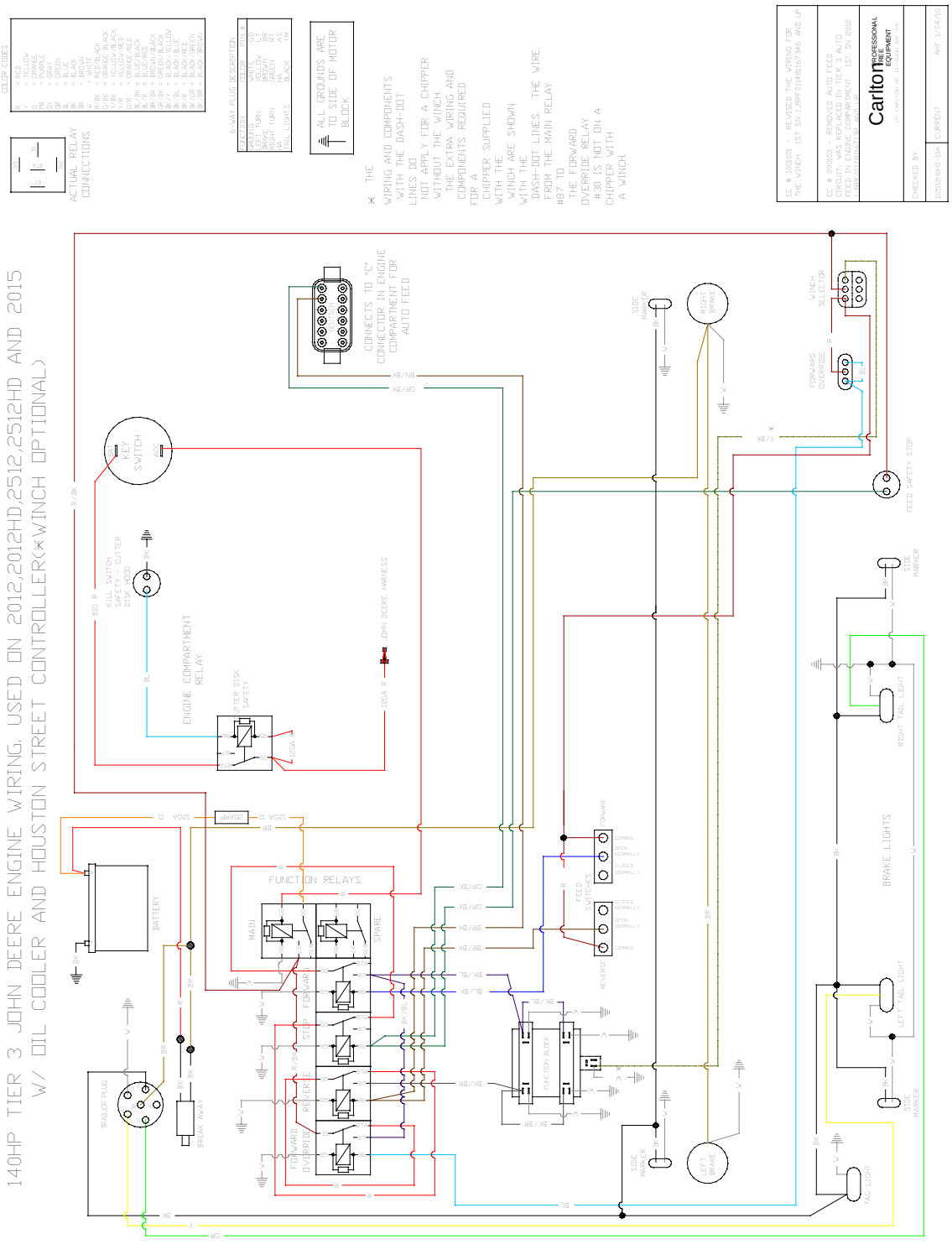
FEED WHEEL MOTOR

- Return the feed wheel motor assembly to the machine and tighten the bolts in the bushing. Tighten each bolt a little at a time to pull the coupling into place as straight as possible. Try not to pull one side on faster than the other or damage may occur to the bushing and the coupling. When bolts are screwed in all the way, torque the bolts to 35 ft. lbs.

- Reconnect the hydraulic hoses making sure to connect them in the right order, see markings made when hoses were removed. If hoses are reversed, the feed wheels will work in reverse. Change hoses if this happens to make feed wheels turn correctly.

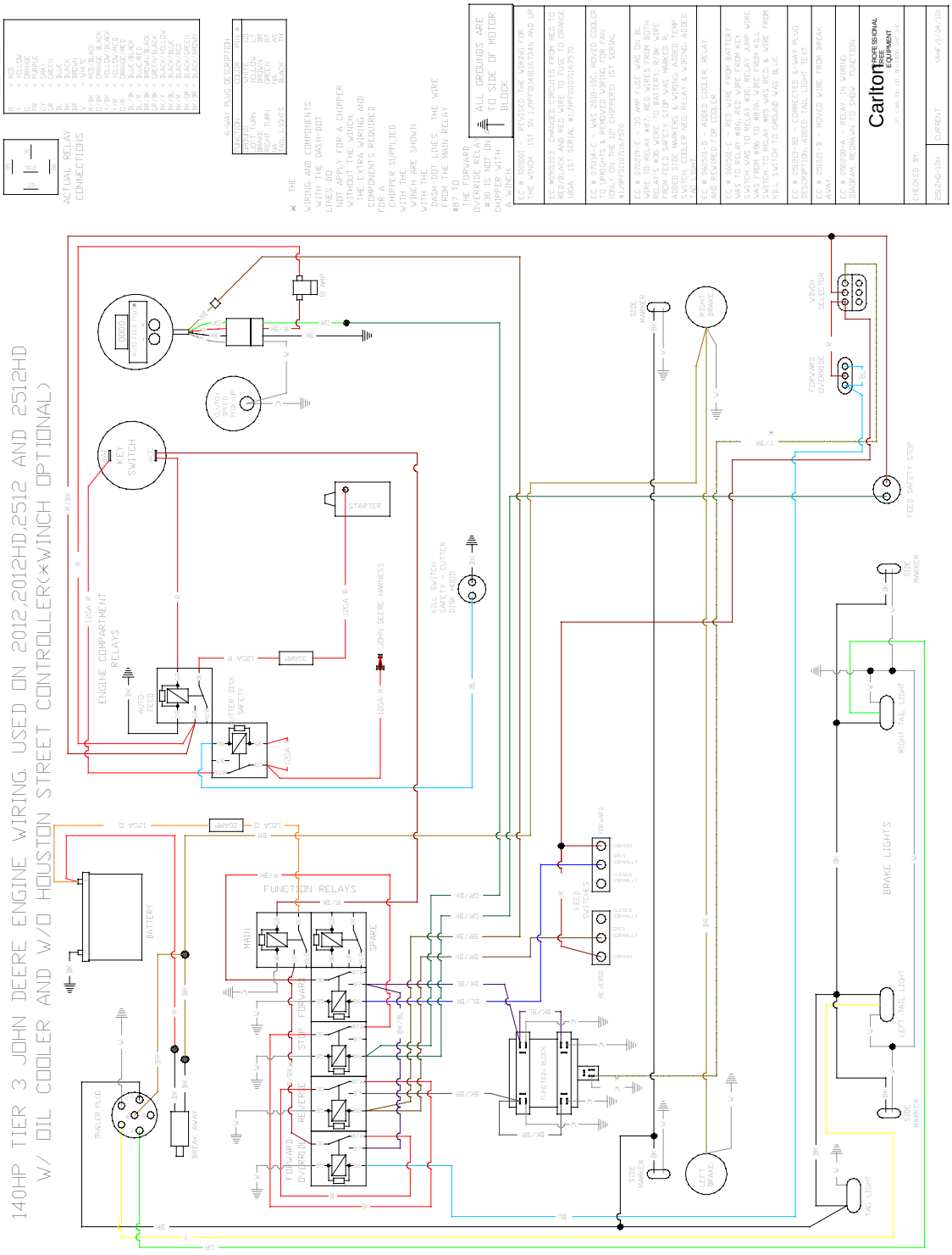
- Replace the rubber guard and bolt into place using the two 3/8" bolts that were removed. Tighten the bolts.

CHIPPER WIRING DIAGRAM – JOHN DEERE ENGINE



WIRING MAY BE DIFFERENT DEPENDING ON ENGINE SUPPLIED WITH THE CHIPPER. IF YOU HAVE A CHIPPER WITH AN ENGINE OTHER THAN CATERPILLAR OR JOHN DEERE, CONTACT J. P. CARLTON, FOR THE WIRING DIAGRAM. **SEE THE ENGINE OWNER'S MANUAL FOR THE ENGINE WIRING DIAGRAM**

CHIPPER WIRING DIAGRAM – JOHN DEERE ENGINE

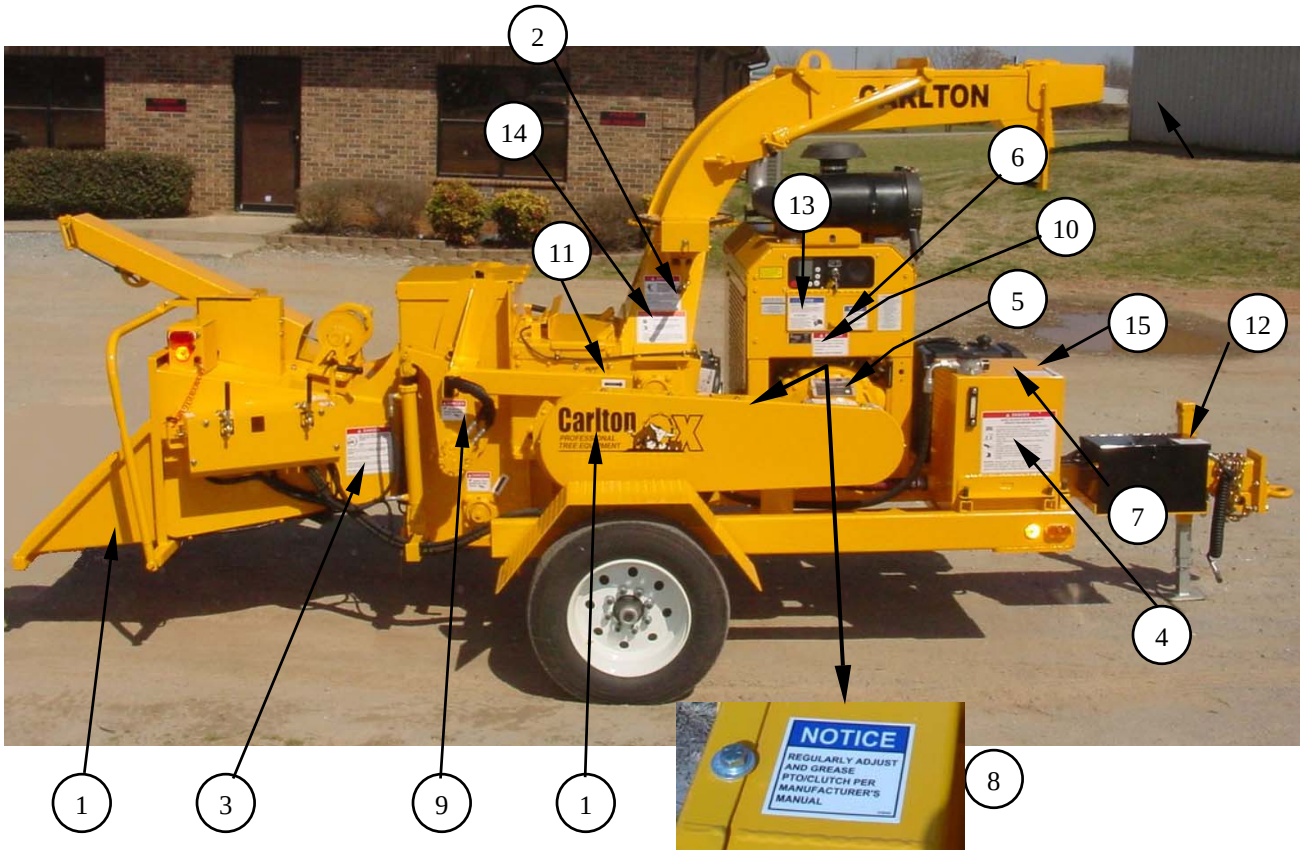


WIRING MAY BE DIFFERENT DEPENDING ON ENGINE SUPPLIED WITH THE CHIPPER. IF YOU HAVE A CHIPPER WITH AN ENGINE OTHER THAN CATERPILLAR OR JOHN DEERE, CONTACT J. P. CARLTON, FOR THE WIRING DIAGRAM. **SEE THE ENGINE OWNER’S MANUAL FOR THE ENGINE WIRING DIAGRAM**

CHIPPER – LEFT SIDE

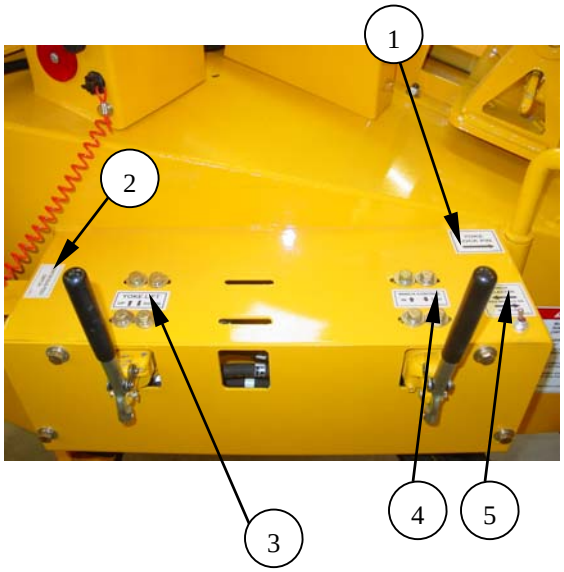
ITEM #	PART #	DESCRIPTION
1	0700313A	NOTICE – CHIPPER KNIFE
2	0700327	DANGER – FEED HOPPER
3	0700317	WARNING – PRESSURE LEAKS
4	0700301	DANGER – MOVING PARTS
5	0700323-1	DISK/DRUM LOCK TUBE
6	0700326	MOTOR COUPLER GUARD
7	0700328	NOTICE – RADIATOR MAINTENANCE

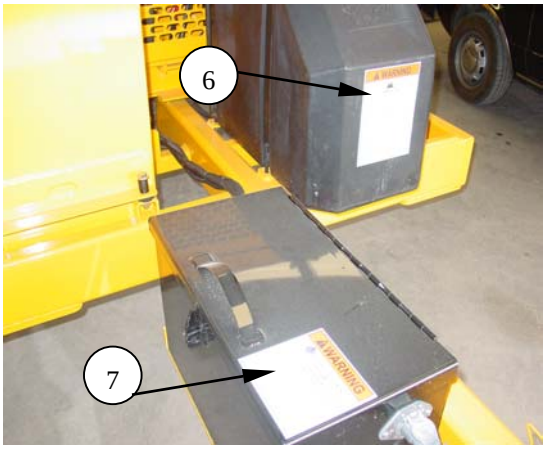
CHIPPER – RIGHT SIDE

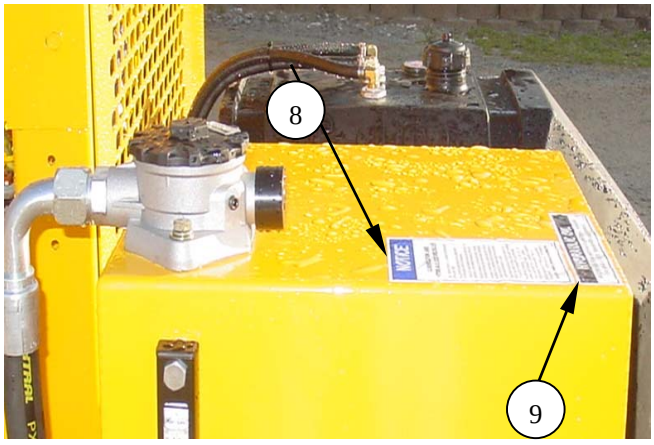


ITEM #	PART #	DESCRIPTION
1	0700060	CARLTON OX DECAL
2	0700304	DANGER – AIRBORNE CHIPS
3	0700306	DANGER – VINE TYPE MATERIAL
4	0700307	DANGER – INJURY/DEATH
5	0700308	NOTICE – ADJUST PTO/CLUTCH
6	0700309	NOTICE – DECAL MAINTENANCE
7	0700310	NOTICE – HYDRAULICS/LUBRICATION
8	0700311A	NOTICE – BELT/BEARING MAINTENANCE
9	0700301	DANGER – MOVING PARTS
10	0700303	DANGER – NEVER RIDE ON, ETC.
11	0700321A	GREASE DAILY
12	0700314	WARNING – FROZEN BATTERY
13	0700312A	NOTICE CLUTCH MAINTENANCE
14	0700315	WARNING – HEARING/EYE PROTECTION
15	0700319	NOTICE – HYDRAULIC OIL

CHIPPER – RIGHT SIDE
AUXILIARY VIEWS

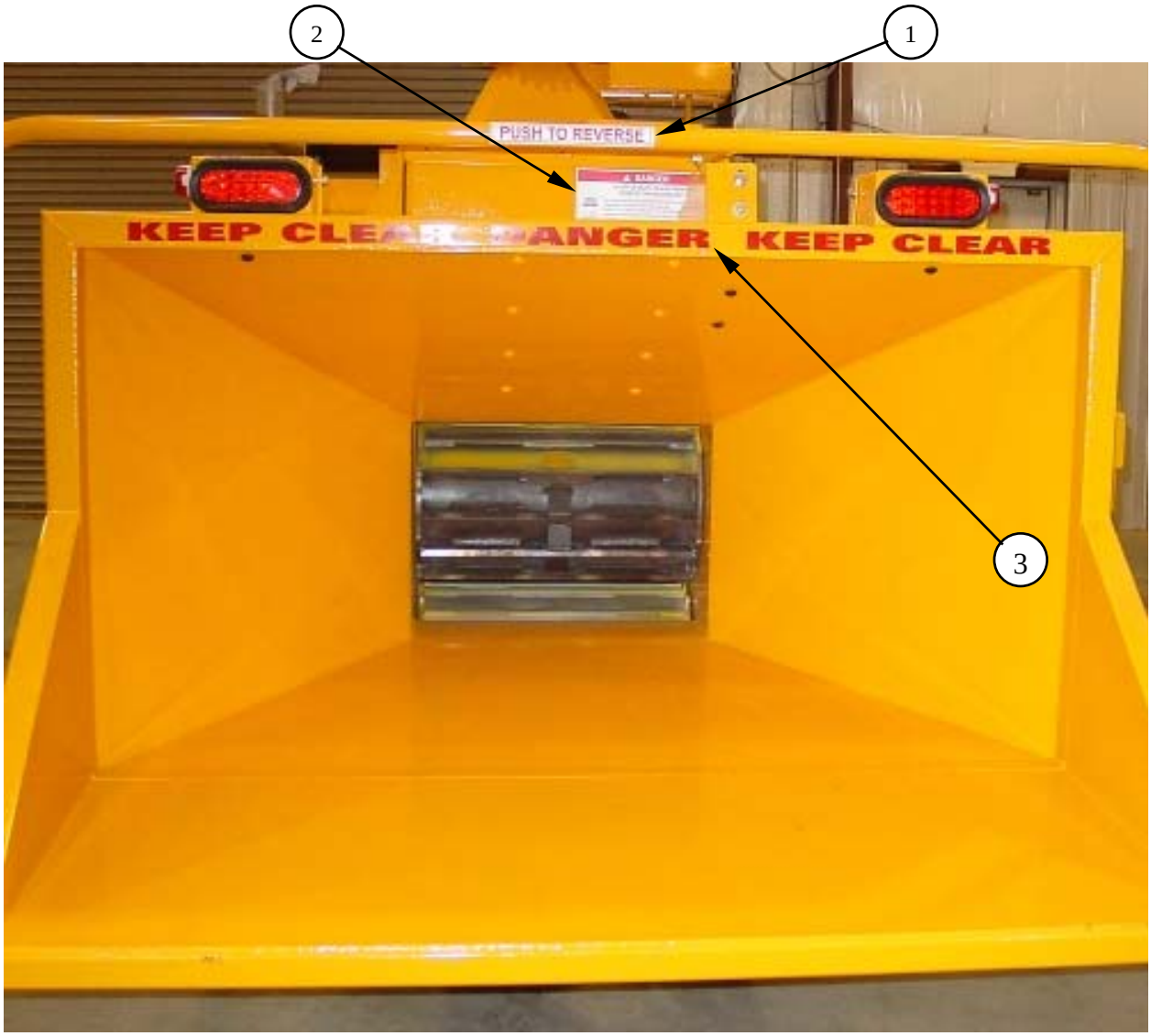






ITEM #	PART #	DESCRIPTION
1	0700324-1	YOKE LOCK PIN
2	0700332	CONTINUOUS FEED
3	0700324-3	YOKE LIFT
4	0700329-3	WINCH CONTROL – IN/OUT
5	0700329-1	WINCH SELECTOR – FEED WHEELS ON/WINCH ON
6	0700316	WARNING – DIESEL FUEL
7	0700314	WARNING – FROZEN BATTERY
8	0700310	NOTICE – HYDRAULICS/LUBRICATION
9	0700319	NOTICE – HYDRAULIC OIL

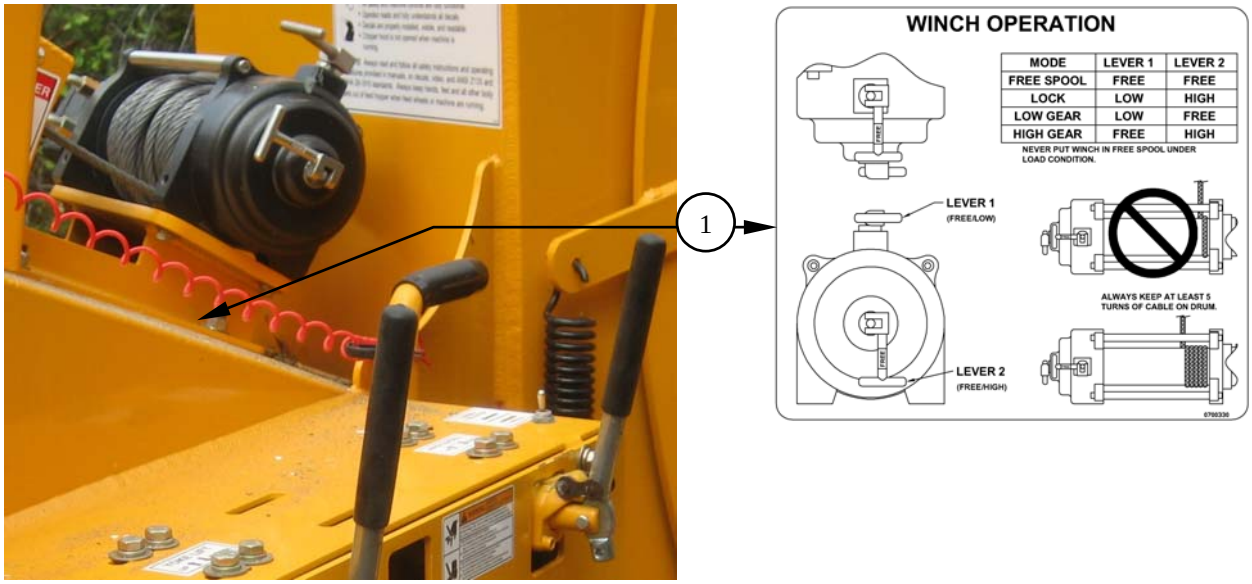
CHIPPER – REAR



ITEM #	PART #	DESCRIPTION
1	0700318	PUSH - REVERSE
2	0700307	DANGER – INJURY/DEATH
3		DANGER – KEEP CLEAR

CHIPPER – WINCH (OPTIONAL)

LEVER STYLE WINCH



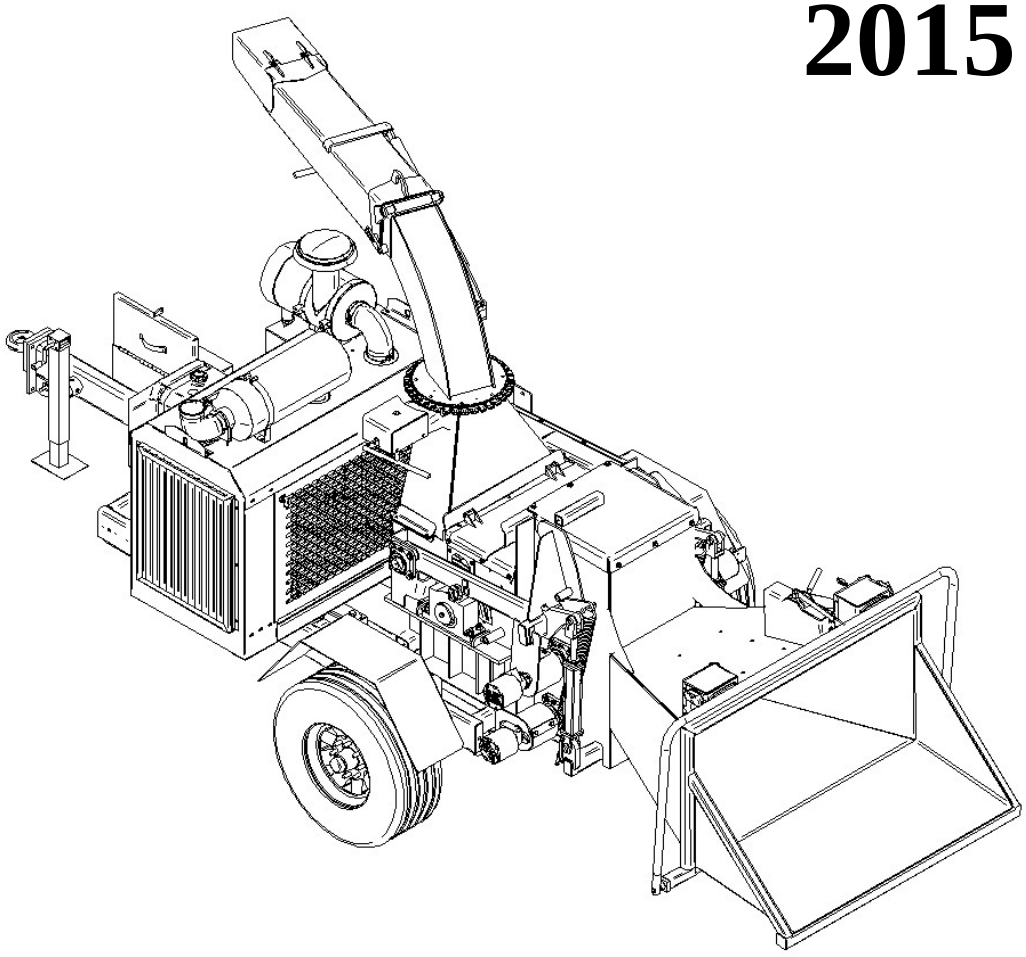
ITEM #	PART #	DESCRIPTION
1	0700330	WINCH OPERATION (for lever style only)

Parts Book

Carlton

PROFESSIONAL
TREE EQUIPMENT

2015



Carlton

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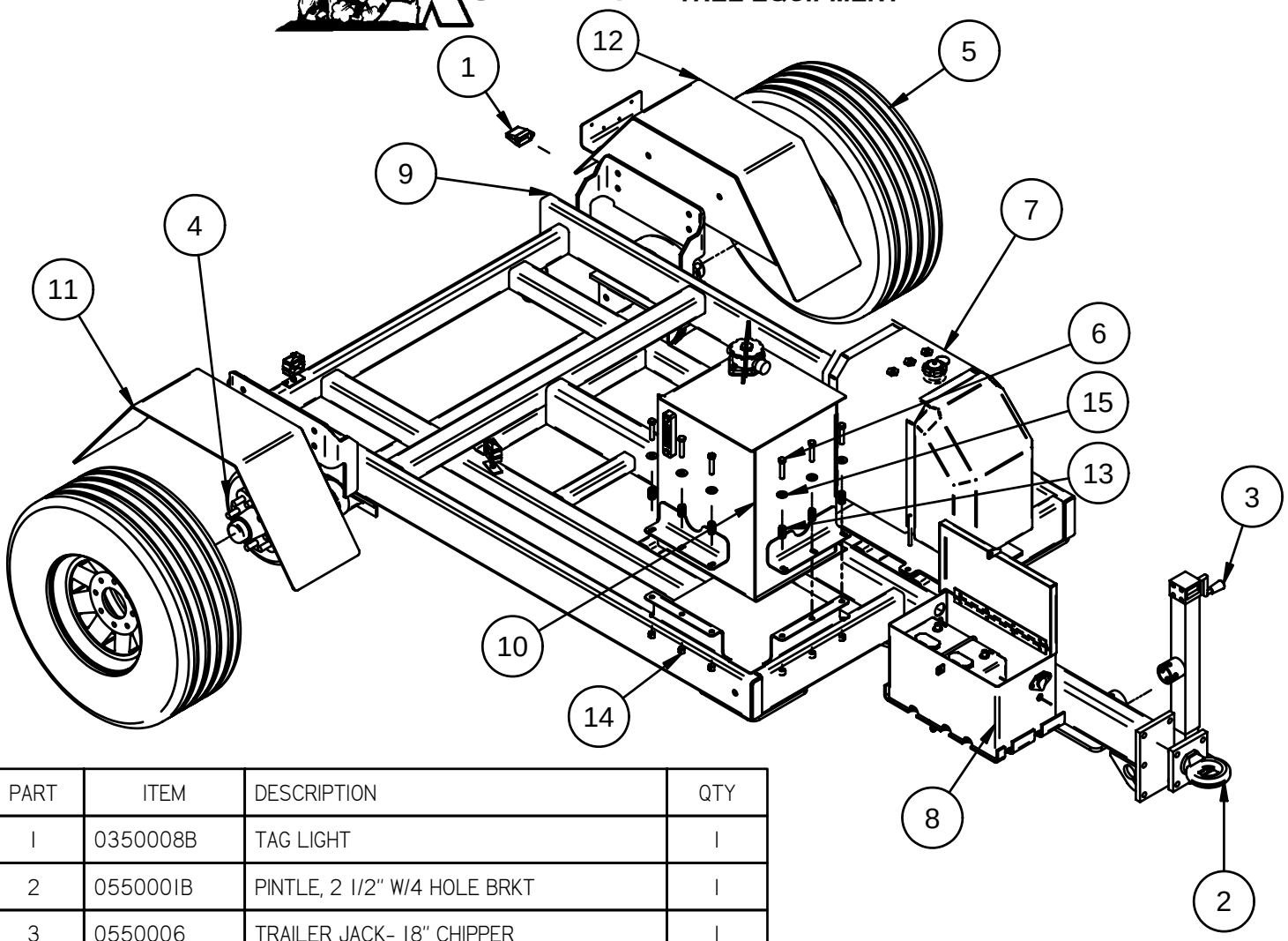
www.stumpcutters.com

Carlton PROFESSIONAL TREE EQUIPMENT

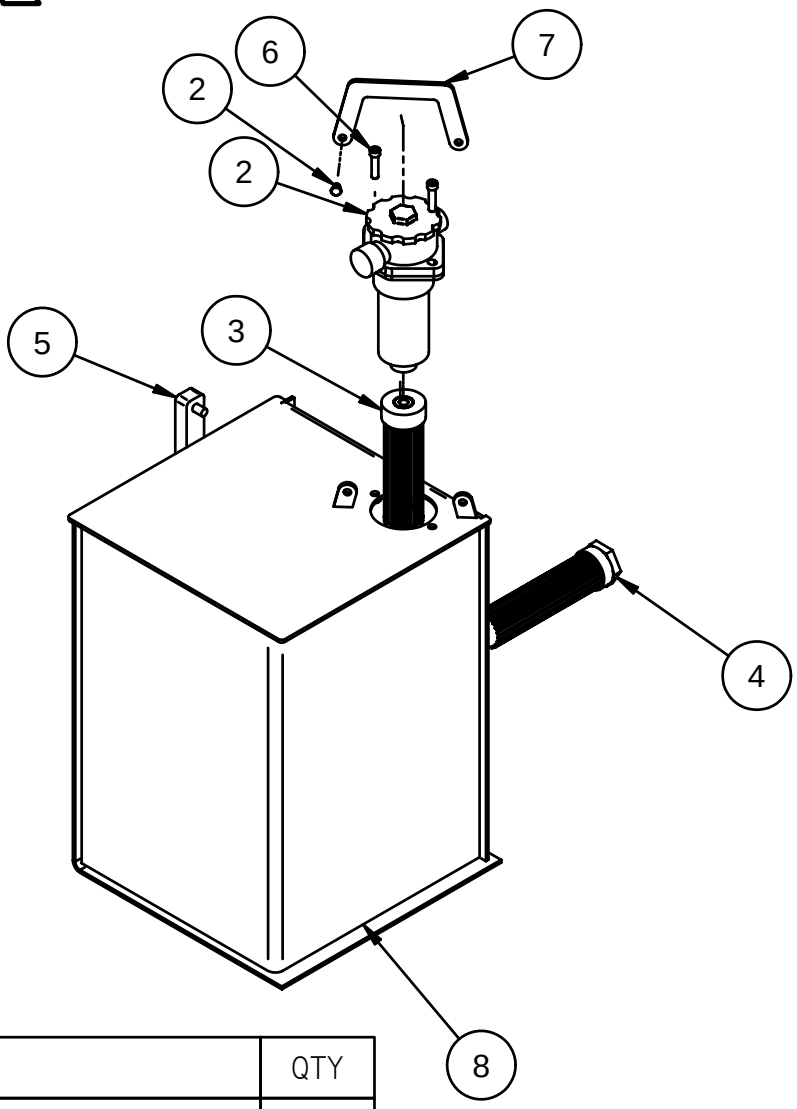


PART	ITEM	DESCRIPTION	QTY
1	0350008B	TAG LIGHT	1
2	0550001B	PINTLE, 2 1/2" W/4 HOLE BRKT	1
3	0550006	TRAILER JACK- 18" CHIPPER	1
4	0550250GI	#13 TORFLEX - 2012/2512 CHIPPER	1
5	0550254	215/75R 17.5 TIRE - 12" CHIPPER	2
6	12A-0820ZI	HEX C/S 1/2-13 x 2 1/2 UNC GR 8	6
7	17510002	ASSY,FUEL TANK	1
8	21220044	INST,BATTERY,FRONT MOUNT	1
9	21510001	WELDMENT,FRAME	1
10	21510003	ASSY,HYDRAULIC TANK	1
11	21610053	WELDMENT,FENDER,WIDE,RH	1
12	21610054	WELDMENT,FENDER,WIDE,LH	1
13	21840064	SPRING,FEED CONTROL LINKAGE	6
14	29A-08	NUT,STOVER LOCK, 1/2-13 UNC GR8	6
15	31A-08ZI	FLAT WASHER 1/2 USS GR 8 Z&Y	6

FUCTION GROUP	1 FRAME AND TANKS
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF011X81167139
DESCRIPTION	AXLE, TIRES AND RIMS
ISSUE	R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT

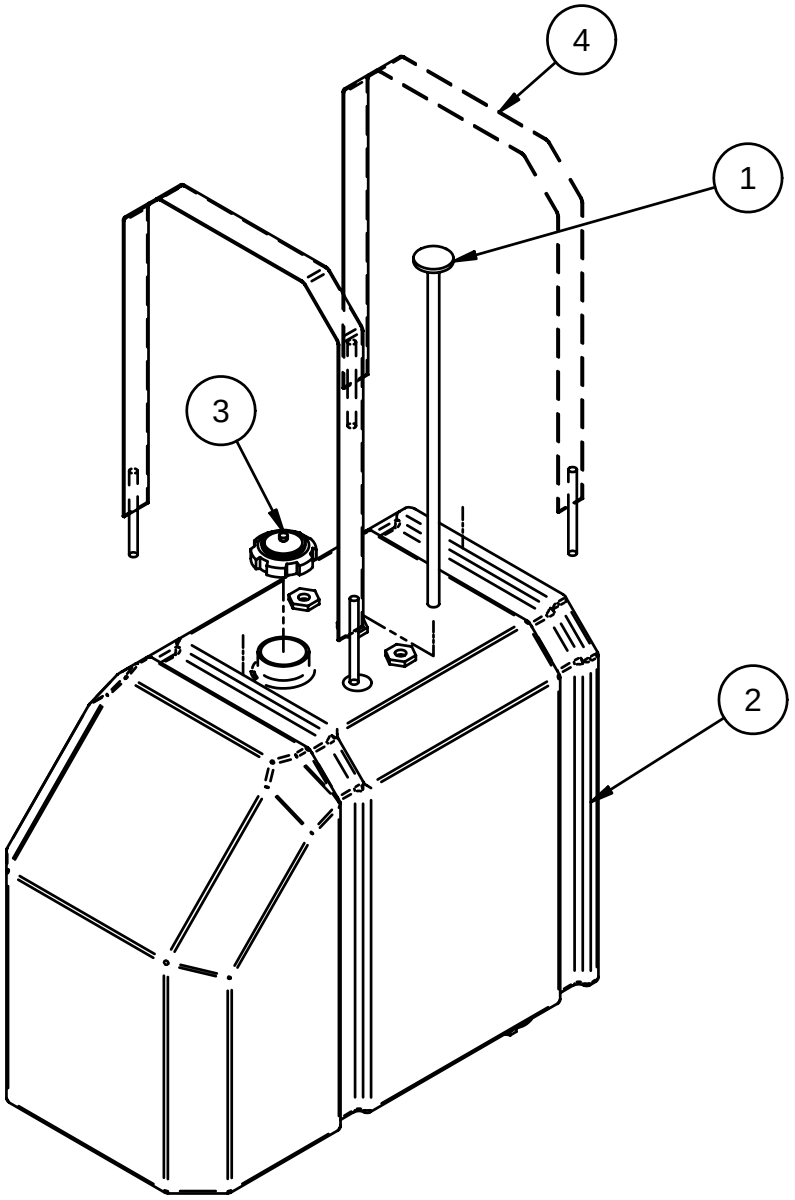


PART	ITEM	DESCRIPTION	QTY
1	.375 MACHINED PIN	PIN,MACHINE 3/8"X13/32 LONG	1
2	0300135E	HYDRAULIC IN TANK FILTER STF	1
3	0300135F	HYDRAILIC IN TANK FILTER ELEME	1
4	0300169A	STRAINER, HYDRAULIC TANK	1
5	0300266A	HYDRAULIC SITE GAUGE W/TEMP	1
6	12D-0612	SHCS 3/8 X 1-1/2 NC GR 8	2
7	21210154	BRACKET,VANDADLISM,HYRDRUALIC TANK	1
8	21510005	WELDMENT,HYDRAULIC TANK	1

FUCTION GROUP	1 FRAME AND TANKS
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF011X81167139
DESCRIPTION	HYDRAULIC TANK
ISSUE	R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT

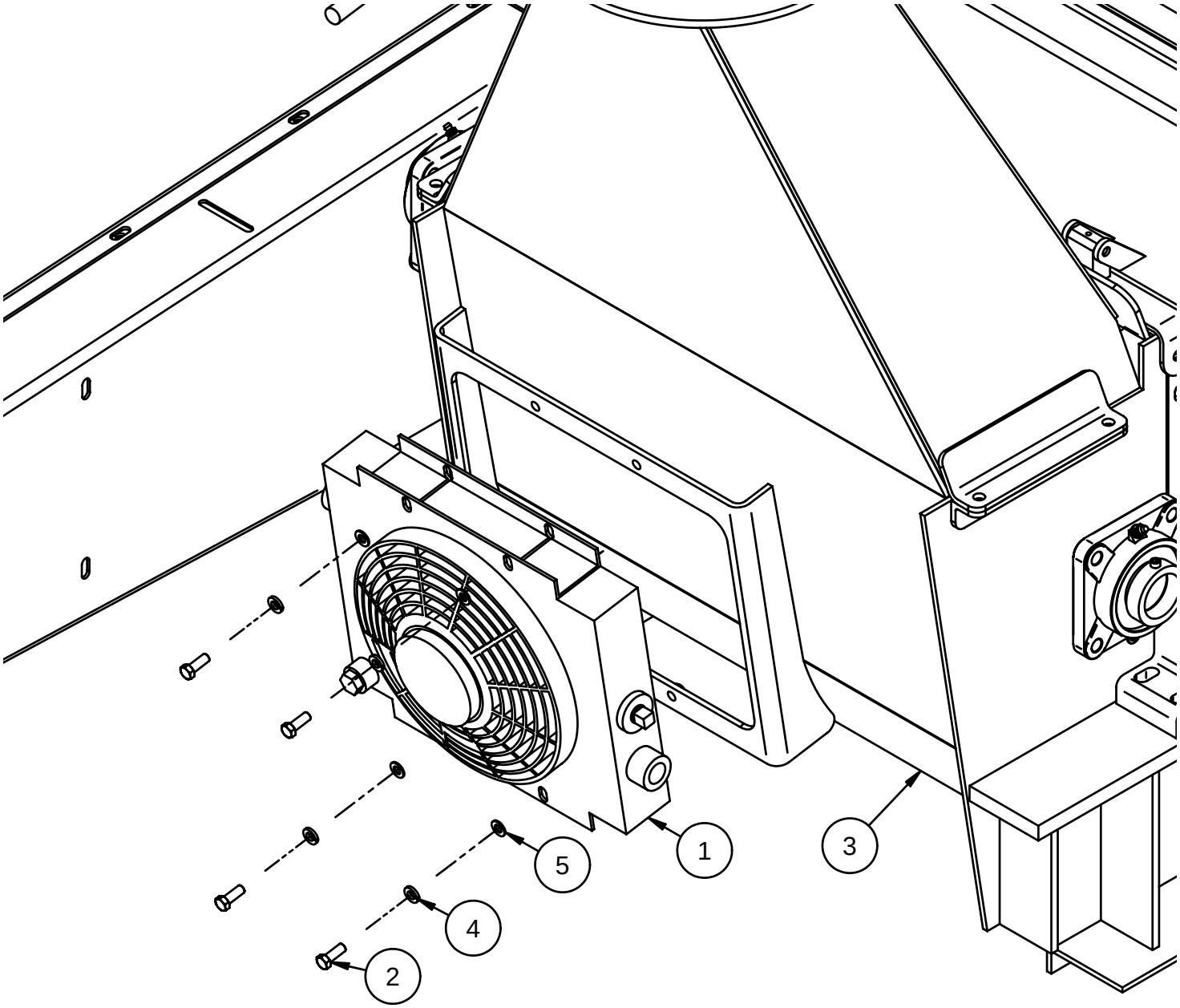


PART	ITEM	DESCRIPTION	QTY
1	0200009	Fuel Gauge - 25 Gallon	1
2	0200007	TANK,FUEL	1
3	0200008	Fuel Cap - Plastic Tank	1
4	17510003	WELDMENT,FUEL TANK STRAP	2

FUCTION GROUP	1 FRAME AND TANKS
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF011X81167139
DESCRIPTION	FUEL TANK
ISSUE	R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT



PART	ITEM	DESCRIPTION	QTY
1	0300166	HYDRAULIC OIL COOLER MA-18	1
2	12A-0608	HEX C/S 3/8-16 x 1" UNC GR 8	4
3	21530002	WELDMENT,BASE	1
4	30A-06	LOCKWASHER, 3/8" USS GR8	3
5	31B-06ZI	FLAT WASHER 3/8 USS GR 8 Z&Y	4

FUCTION GROUP
1 FRAME AND TANKS

BUINESS LINE
CHIPPERS

OWNER DOMAIN
J.P. CARLTON COMPANY DIV. DAF INC.

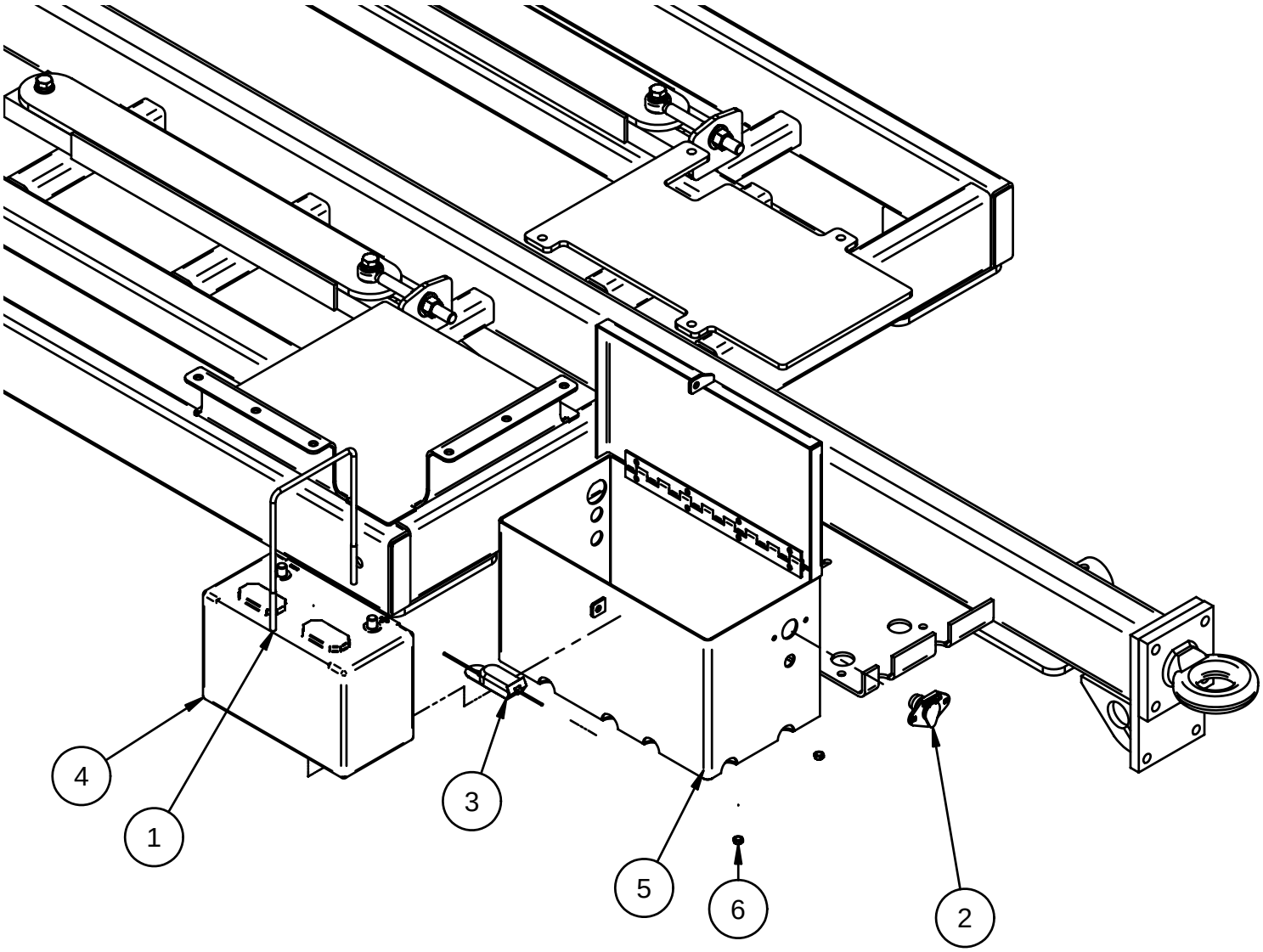
SERIAL NUMBERS
1J9XF011X81167139

DESCRIPTION
INST, HYDRAULIC COOLER

ISSUE
R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT

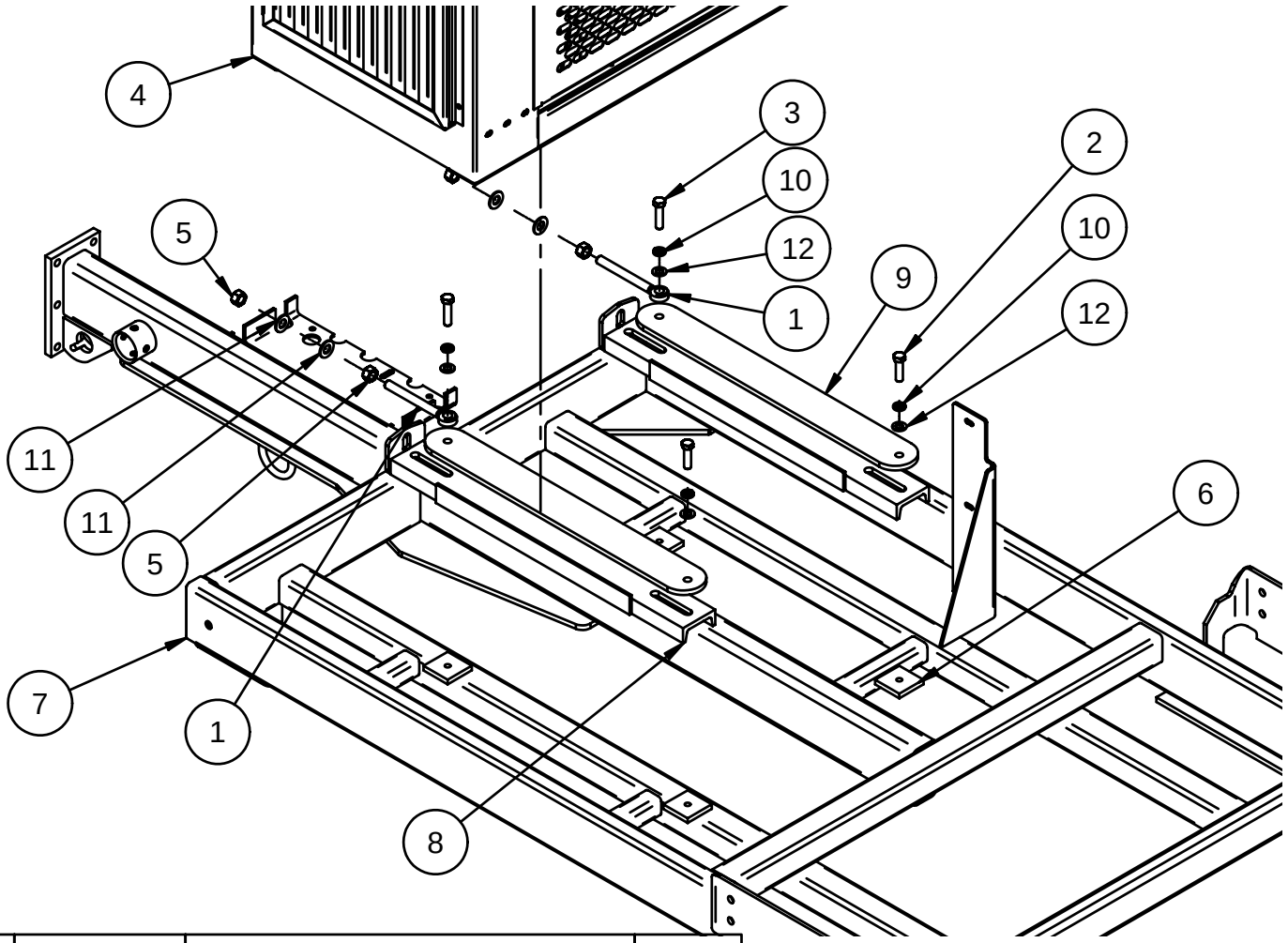


PART	ITEM	DESCRIPTION	QTY
1	01505081	BATTERY BRACKET 3/8 X 7 X 10.5	1
2	0350001B	6-WAY CONNECTOR PLUG - 11-605	1
3	0550050F	TEKONSHA BREAKAWAY SWITCH	1
4	21220041	BATTERY,12V/950 CCA	1
5	21220045	WELDMENT,BATTERYBOX/FRONT MOUNT	1
6	29A-06	NUT,STOVER LOCK, 3/8-16 UNC GR8	2

FUCTION GROUP	2 ENGINE /ELECTRICAL
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF011X81167139
DESCRIPTION	BATTERY INSTALLATION
ISSUE	R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT

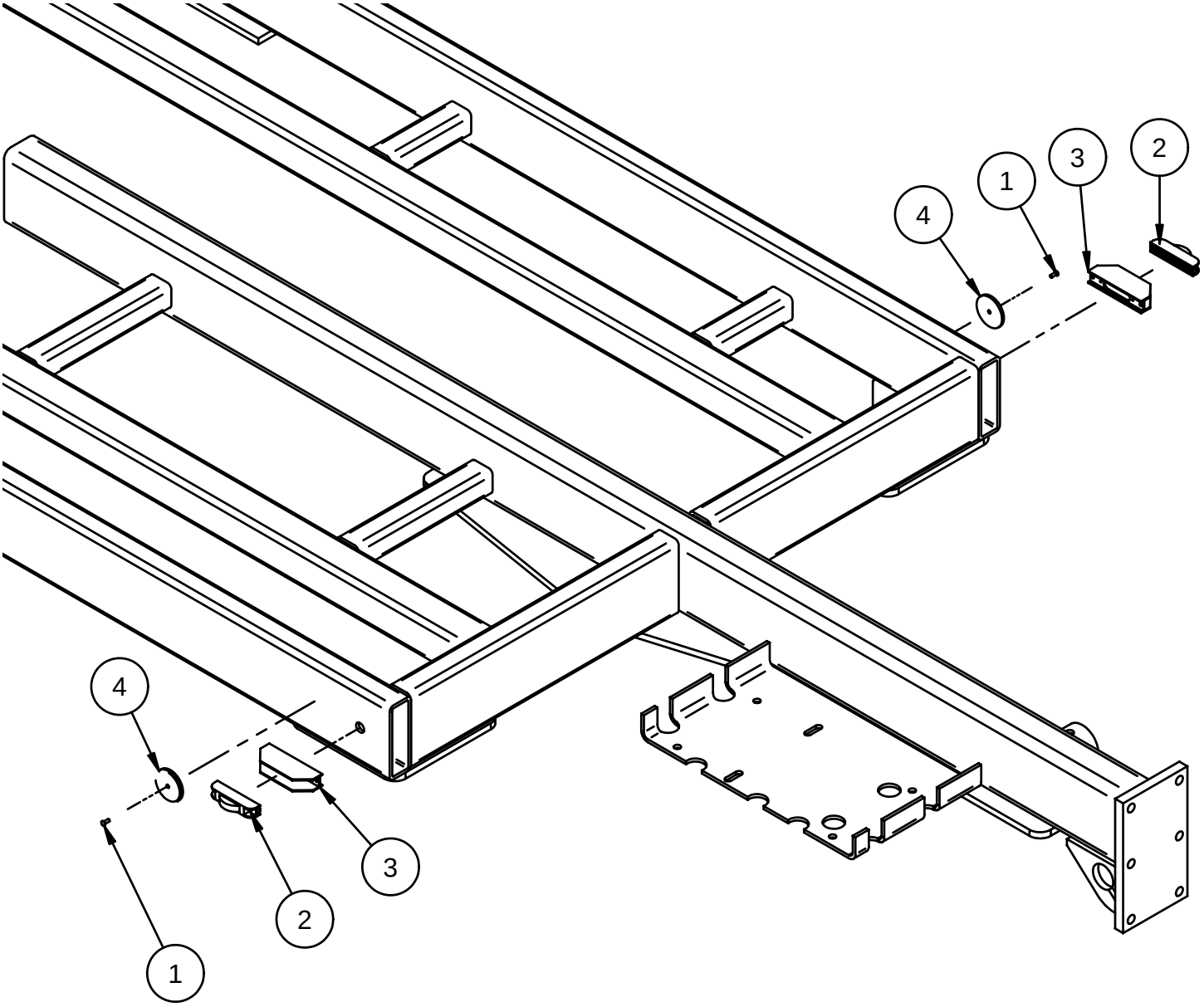


PART	ITEM	DESCRIPTION	QTY
1	0150633	EYE BOLT,3/4-10 x 7-1/2" LONG	2
2	12A-1018	HEX C/S 5/8-11 x 2-1/4 UNC GR 8 Z&Y	2
3	12A-1020	HEX C/S 5/8-11 x 2-1/2 UNC GR 8 Z&Y	2
4	140 hp JD	JOHN DEERE ENGINE 140hp	1
5	20A-12	NUT,HEX ,3/4-10 UNC GR8	4
6	21220009	PLATE,ENGINE SLIDE	4
7	21510001	WELDMENT,FRAME	1
8	21520003	WELDMENT,JD 140HP ADJUST	2
9	21520005	PLATE,ENGINE MNT	2
10	30A-10	LOCKWASHER 5/8" USS GR8 ZINC	4
11	31A-12ZI	FLAT WASHER 3/4" USS GR 8 Z&YL	4
12	31B-10ZI	FLAT WASHER 5/8 USS NARROW GR 8 Z&Y	4

FUCTION GROUP	2 ENGINE/ELECTRICAL
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF011X81167139
DESCRIPTION	ENGINE MOUNTING
ISSUE	R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT

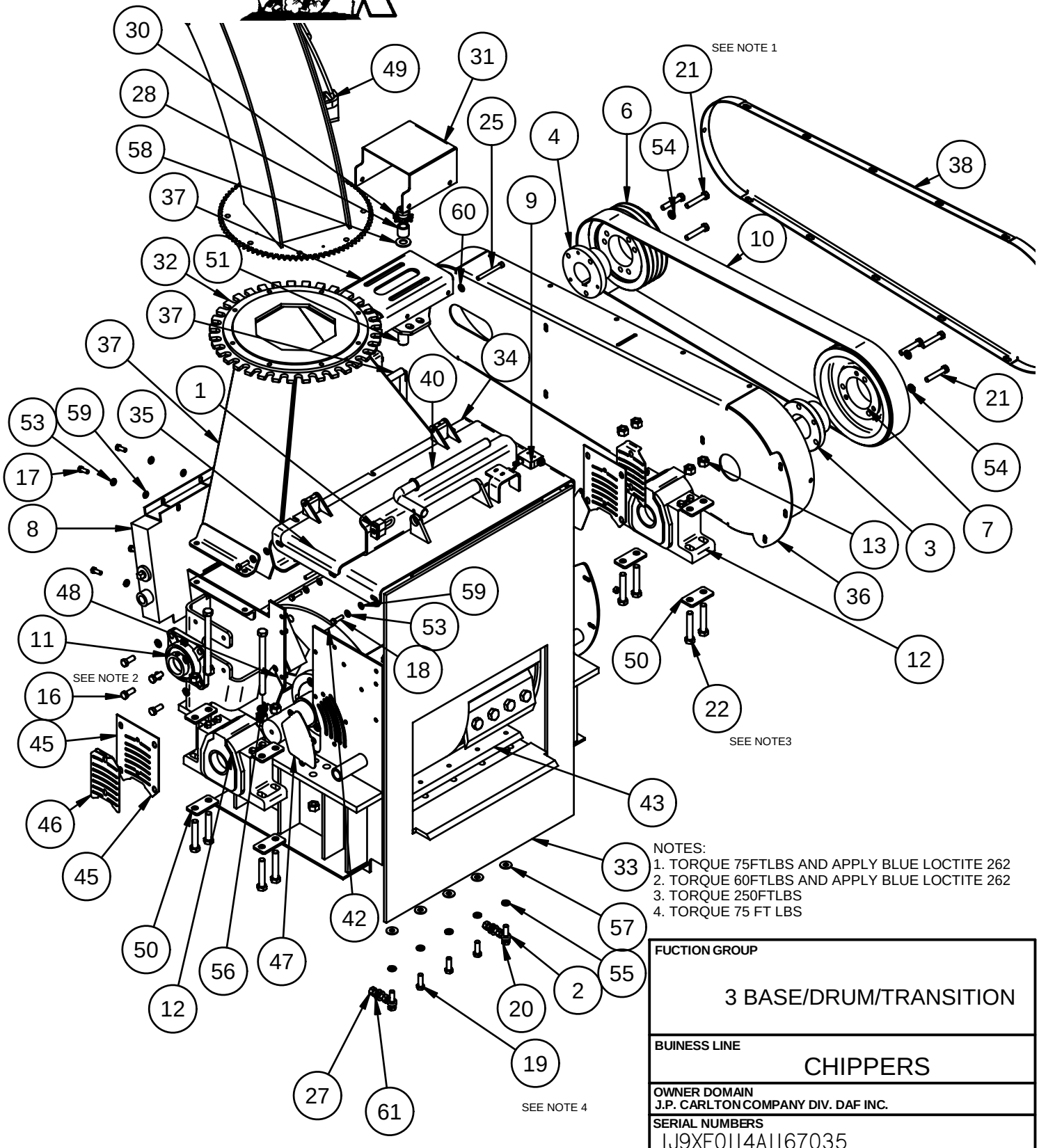


PART	ITEM	DESCRIPTION	QTY
1	0150414	RIVET-ALUMINUM W STEEL MANDREL	2
2	0350054R1	LIGHT,MARKER,AMBER	2
3	0350054R1A	MOUNT,ALUM MARKER LIGHT	2
4	0350057	REFLECTOR- AMBER 2 3/8"	2

FUCTION GROUP	2 ENGINE/ELECTRICAL
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF0119A1167218
DESCRIPTION	INSTALL MARKER LIGHTS AND REFLECTORS
ISSUE	R2

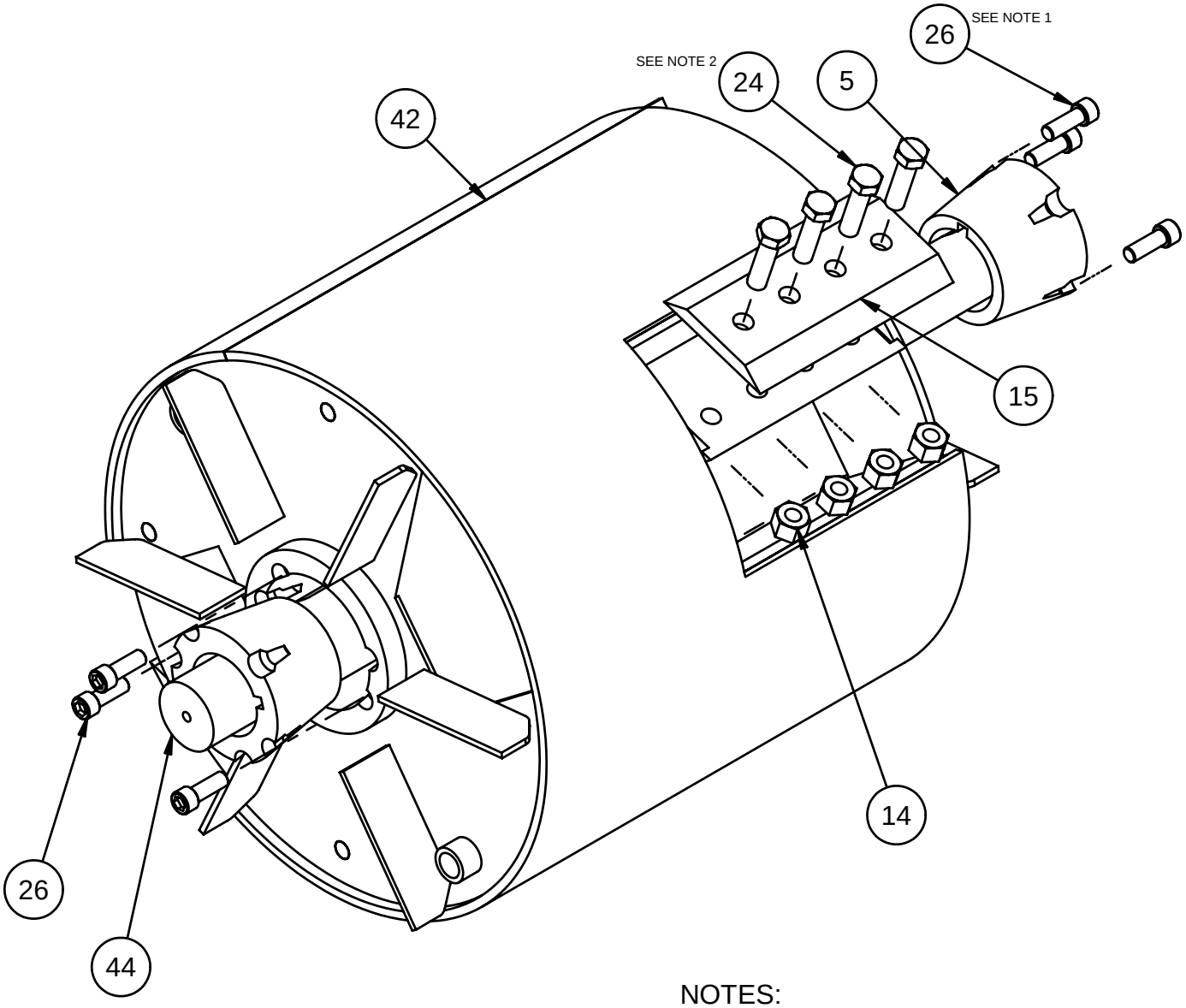
Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT



FUCTION GROUP	3 BASE/DRUM/TRANSITION
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	IJ9XF0114AI167035
DESCRIPTION	BASE TRANSITION
ISSUE	R2

Revised 3.15.05



NOTES:
1. TORQUE 143FTLBS AND APPLY BLUE LOCTITE 262
2. TORQUE 235FTLBS.

FUCTION GROUP	
3 BASE/DRUM/TRANSITION	
BUINESS LINE	
CHIPPERS	
OWNER DOMAIN J.P. CARLTON COMPANY DIV. DAF INC.	
SERIAL NUMBERS 1J9XF0114A1167035	
DESCRIPTION	ISSUE
BASE TRANSITION	R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT

PART	ITEM	DESCRIPTION	QTY
33	21530002	WELDMENT,BASE	1
34	21530004	WELDMENT,DOOR MOUNT	1
35	21530005	WELDMENT,DOOR	1
36	21530007	WELDMENT,BELT GUARD BACK	1
37	21530008	WELDMENT,TRANS	1
38	21530010	WELDMENT,BELT GUARD COVER	1
39*	21530011	WELDMENT,DRUM,2 KNIVES	1
40	21530012	WELDMENT,LOCK PIN,DOOR	1
41*	21530013	WELDMENT,AIR RESTRICTOR,RH	1
42	21530014	WELDMENT,AIR RESTRICTOR,LH	1
43	21530037	ANVIL	1
44*	21530050	SHAFT,DRUM	1
45	21530060	PLATE,VENT SLIDE MOUNT	2
46	21530061	PLATE,VENT SLIDE	2
47	21530062	COVER,VENT,FRT	2
48	21530087	COVER,VENT,REAR	2
49	21560001	ASSEMBLY,DISCHARGE SYSTEM	1
50	21630022	WASHER,DRUM BEARING	8
51	21830107	WELDMENT,MANUAL DISCHARGE ADJUST MOUNT	1
52*	29A-06	NUT,STOVER LOCK, 3/8-16 UNC GR8	4
53	30A-06	LOCKWASHER, 3/8" USS GR8	11
54	30A-08	LOCKWASHER 1/2"	6
55	30A-08ZI	LOCK WASHER,1/2" USS GR8 Z&Y	13
56	30A-10	LOCKWASHER 5/8" USS GR8 ZINC	4
57	31A-08ZI	FLAT WASHER 1/2 USS GR 8 Z&Y	5
58	31A-12ZI	FLAT WASHER 3/4" USS GR 8 Z&YL	1
59	31B-06ZI	FLAT WASHER 3/8 USS GR 8 Z&Y	10
60	34A-06	FLAT WASHER, 3/8 SAE GR8	1
61	34A-08	FLAT WASHER, NARROW 1/2 SAE GR8	4

PART	ITEM	DESCRIPTION	QTY
1	0150608	MASTER LOCK	1
2	0150630A	1/2-13 x 3" ROD END, YELL	2
3	0250183	BUSHING,QD INTERCHANGEABLE,E 2-15/16"	1
4	0250183E	BUSHING,QD INTERCHANGEABLE, E 2-1/2"	1
5*	0250329A	BUSHING,TAPER LOCK	2
6	0250336	SHEAVE,ENGINE,4/5V9.25	1
7	0250337	SHEAVE,DRUM,4-5V11.8	1
8	0300166	HYDRAULIC OIL COOLER MA-18	1
9	0350130	SWITCH,LIMIT	1
10	0400152	BELT,15 DRUM	1
11	0500152	FB 2" LINKBELT-FEEDWHEEL, CHIP	2
12	0500170	BEARING,DRUM,USAF	2
13	0900129	CHIPPER KNIFE BOLT NUT - 5/8"	12
14*	0900132	3/4" SECURITY LOCK NUTS	8
15*	0900144	KNIFE,10.5X5.5X.625	2
16	10A-08102I	BOLT,HEX C/S 1/2-13 x 1-1/4 UNC GR8 Z&Y	8
17	12A-0608	HEX C/S 3/8-16 x 1" UNC GR 8	4
18	12A-0610ZI	HEX C/S 3/8-16 x 1-1/4" UNC GR 8 ZINC	6
19	12A-0812ZI	HEX C/S 1/2-13 x 1-1/2 UNC GR 8 Z&Y	3
20	12A-0816ZI	BOLT,HEX C/S 1/2-13 x 2 UNC GR8 Z&Y	2
21	12A-0822ZI	HEX C/S 1/2-13 x 2 3/4 UNC GR 5	6
22	12A-1028ZI	HEX C/S 5/8-11 x 3-1/2 UNC GR 8 Z&Y	8
23*	12A-1064ZI	HEX C/S 5/8-11 x 8 UNC GR 8 Z & Y	4
24*	12A-1222ZI	HEX C/S 3/4-10 x 2-3/4 UNC GR8 Z&Y	8
25	12D-0628	SOC HD C/S 3/8 X 3.5 NC GR 8 BLCK	1
26*	12D-1014	SOC HD C/S 5/8-11 X 1-3/4" UNC BLCK	6
27	20A-08	NUT,HEX,1/2-13 UNC GR8	4
28	21230080	BUSHING,DISCHARGE ADJUST	1
29*	21230116	WELDMENT,DISCHARGE ADJUST,HANDLE	1
30	21230127	SPROCKET, DISCHARGE ADJUST	1
31	21230138	WELDMENT,DISCHARGE ADJUST COVER	1
32	21260043	WELDMENT,DISCHARGE ADJUST SPROCKET	1

FUCTION GROUP
3 BASE/DRUM/TRANSITION

BUINESS LINE
CHIPPERS

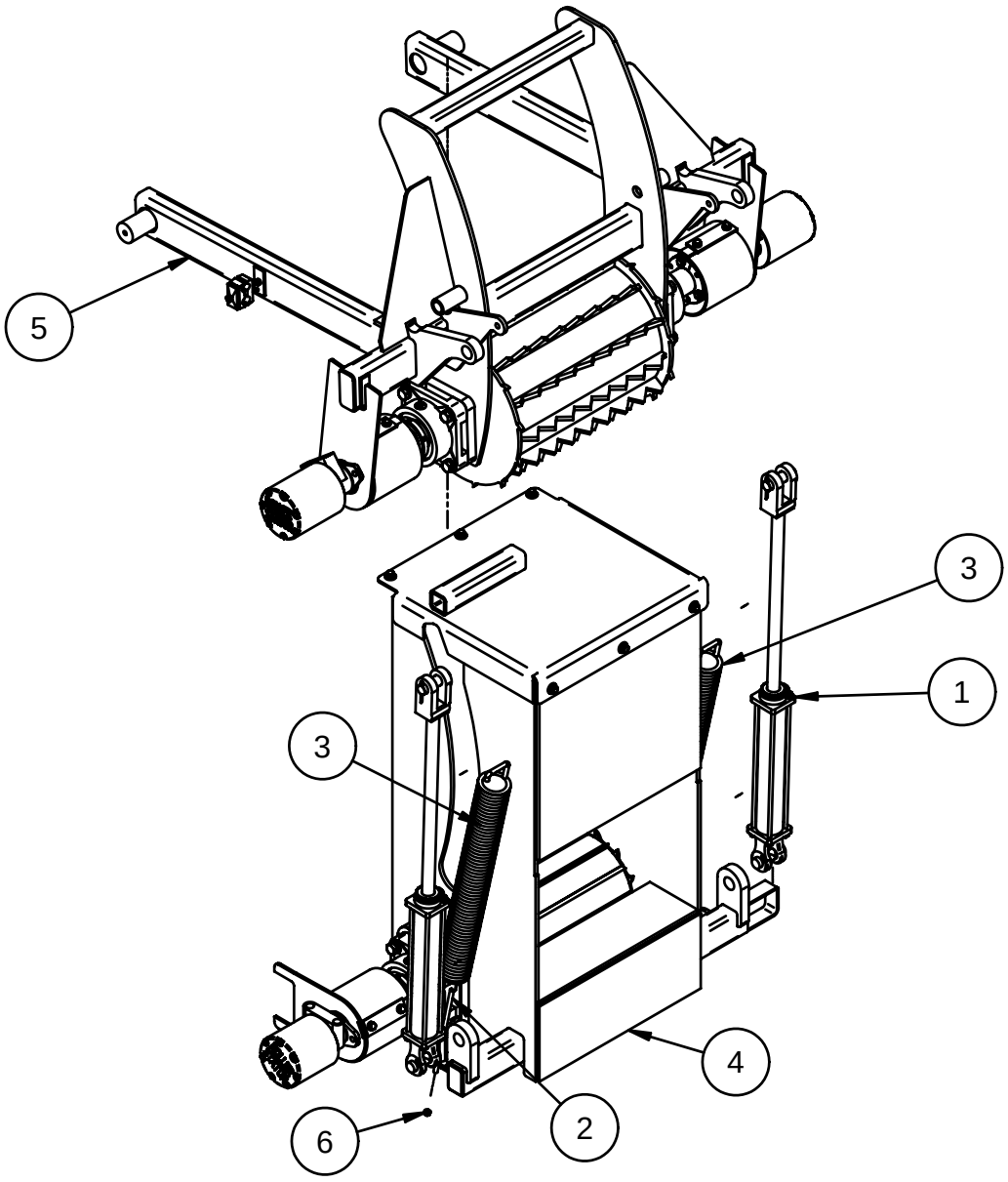
OWNER DOMAIN
J.P. CARLTON COMPANY DIV. DAF INC.

SERIAL NUMBERS
1J9XF0114A1167035

DESCRIPTION	ISSUE
BASE TRANSITION	R2

Revised 3.15.05

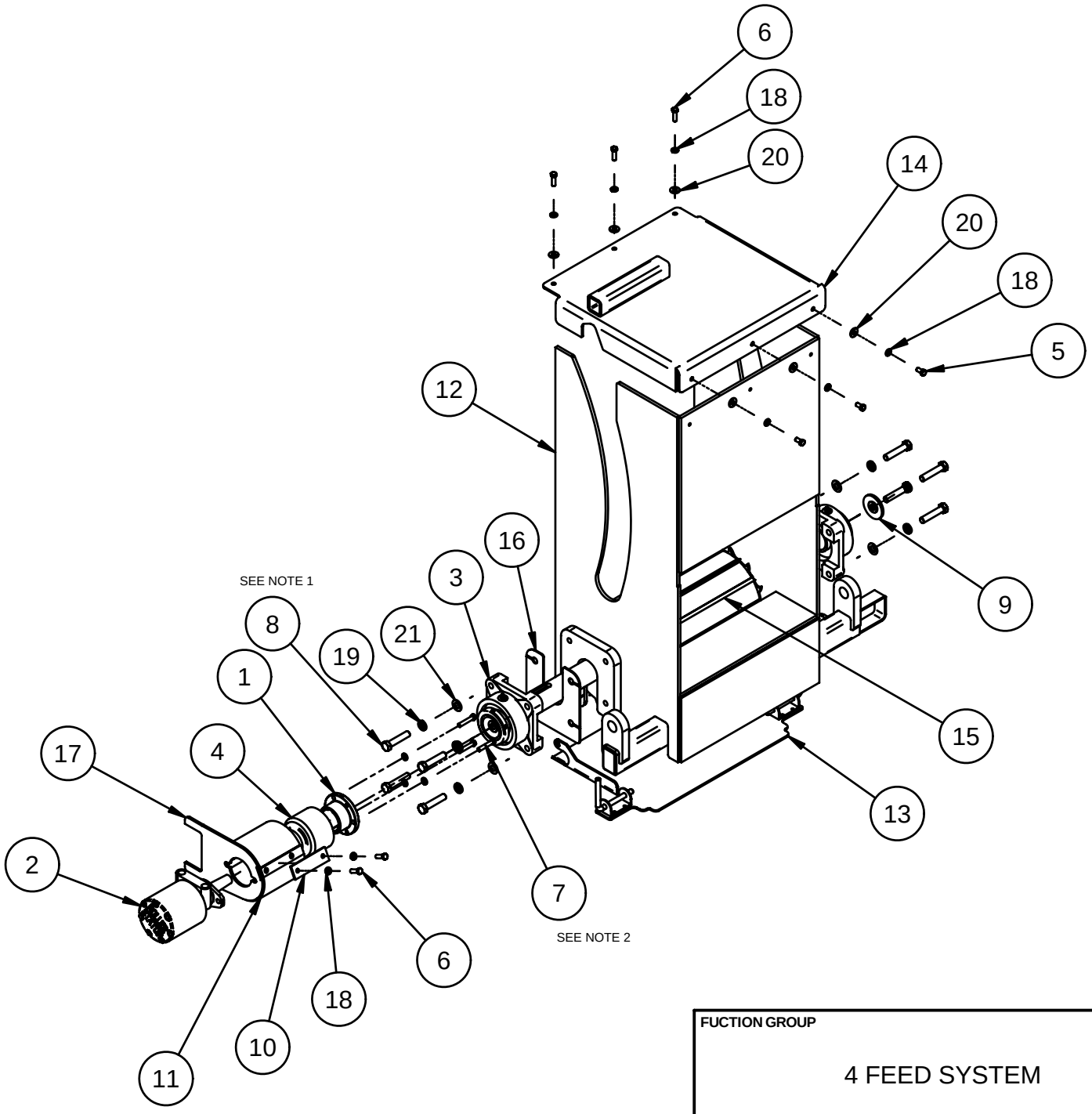
Carlton PROFESSIONAL TREE EQUIPMENT



PART	ITEM	DESCRIPTION	QTY
1	0300106C	Cylinder 2015- Chipper Lift	2
2	0900104	SPRING TIGHTENER FOR 250	1
3	0900110C	SPRING,LIFT	2
4	21540001	ASSEMBLY,FEED SYSTEM,BOTTOM	1
5	21540002	ASSEMBLY,TOP FEED SYSTEM	1
6	29A-06	NUT,STOVER LOCK, 3/8-16 UNC GR8	2

FUCTION GROUP	4 FEED SYSTEM
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF0111A1167259
DESCRIPTION	ASSY,FEED SYSTEM
ISSUE	R2

Revised 3.15.05



NOTES:
1. APPLY BLUE LOCTITE 242 TYP FOR ITEM #8 (13A-1024ZI) AND TORQUE 215 FT/LBS .
2. ITEM(S) #7 (12A-0616) TO BE TORQUED @ 47 FT/LBS.

FUCTION GROUP	4 FEED SYSTEM
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF0111A1167259
DESCRIPTION	ASSY BTM FEED ENCLOSURE
ISSUE	R2

Revised 3.15.05

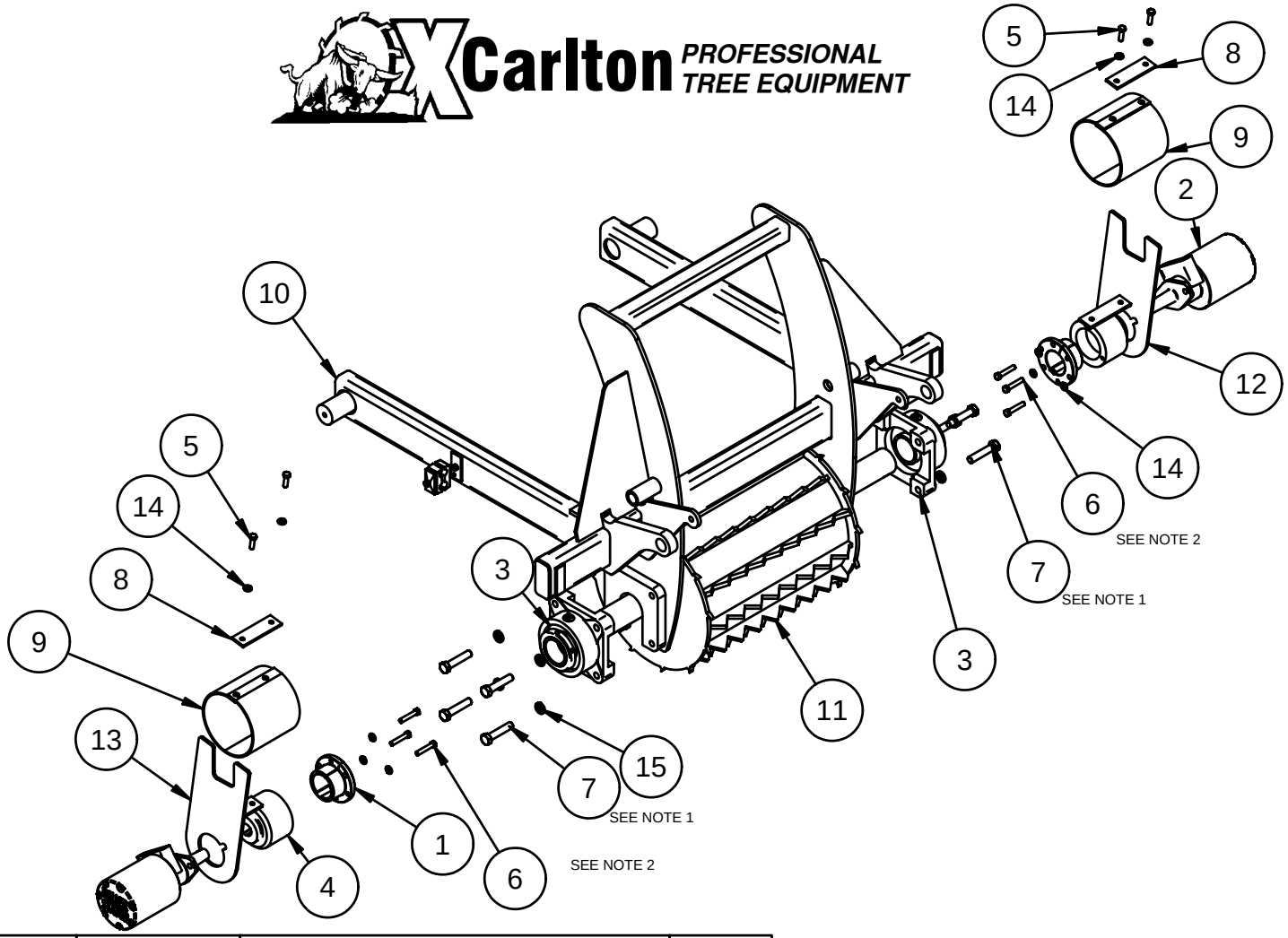
Carlton PROFESSIONAL TREE EQUIPMENT

PART	ITEM	DESCRIPTION	QTY
1	0250125	BUSHING,75 CW - F 2 7/16"	1
2	0300038	Bottom Feed Wheel Motor	1
3	0500172	BEARING,FEED WHEEL 2-7/16	2
4	1200188	COUPLER, FEED WHEEL HUB	1
5	12A-0606ZI	HEX C/S 3/8-16 x 3/4" UNC GR 8 ZINC	3
6	12A-0610ZI	HEX C/S 3/8-16 x 1-1/4" UNC GR 8 ZINC	5
7	12A-0616	HEX C/S 3/8-16 x 2 UNC GR 8	3
8	13A-1024ZI	HEX C/S 5/8-18 x 3 UNF GR 8 Z & Y	8
9	21240075	WASHER,FEED WHEEL BEARING	1
10	21240090	WASHER,FEED WHEEL COUPLER COVER MOUNT	1
11	21240091	COVER,PVC,FEED WHEEL COUPLER	1
12	21540003	WELDMENT, FEED ENCLOSURE, BTM	1
13	21540008	WELDMENT,TRAP DOOR	1
14	21540009	WELDMENT,FEED ENCLOSURE COVER	1
15	21540029	WELDMENT,FEED WHEEL/BTM	1
16	21540031	SPACER,FEED WHEEL BEARING	2
17	21540037	WELDMENT,BTM FEED WHEEL MOTOR STOP	1
18	30A-06	LOCKWASHER, 3/8" USS GR8	11
19	30A-10	LOCKWASHER 5/8" USS GR8 ZINC	8
20	31A-06	FLAT WASHER, 3/8 USS GRD 5	6
21	31B-10ZI	FLAT WASHER 5/8 USS NARROW GR 8 Z&Y	8

FUCTION GROUP	4 FEED SYSTEM
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF0111A1167259
DESCRIPTION	ASSY BTM FEED ENCLOSURE
ISSUE	R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT

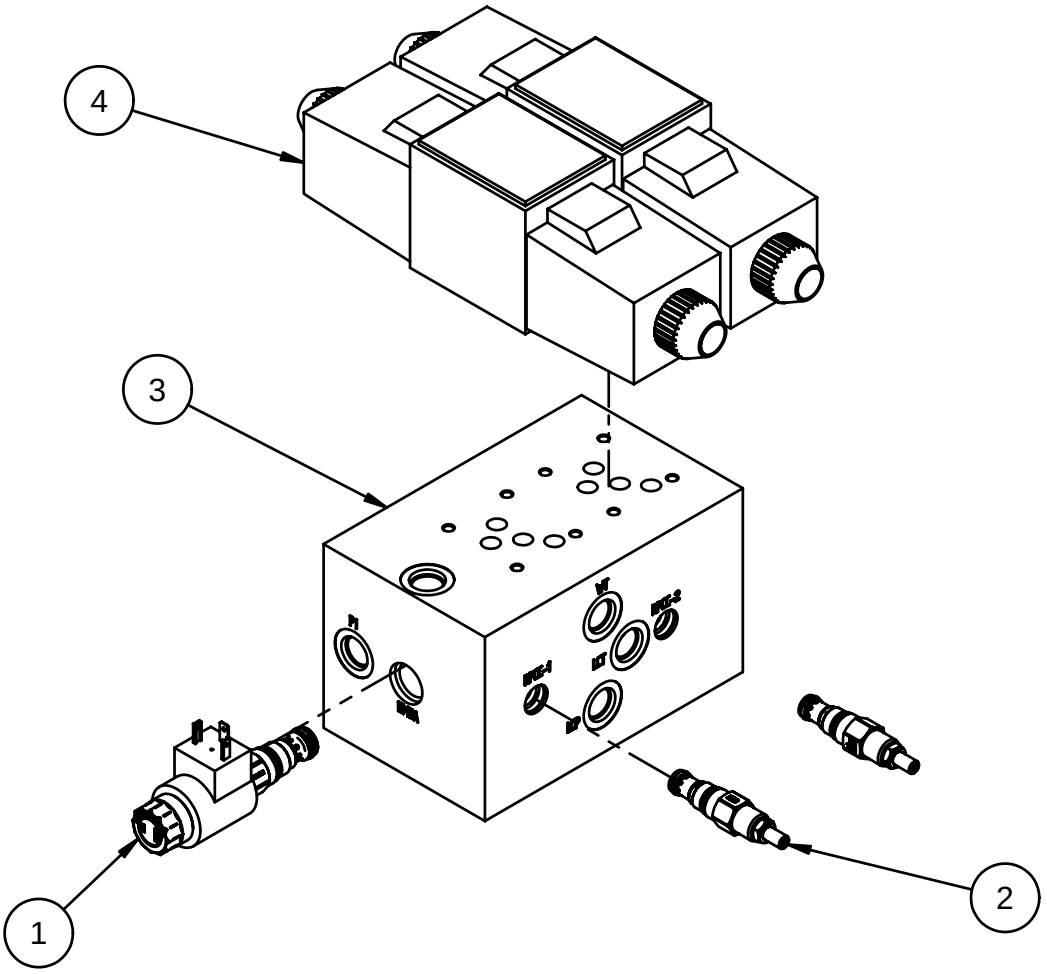


PART	ITEM	DESCRIPTION	QTY
1	0250125	BUSHING,75 CW - F 2 7/16"	2
2	0300042A	Top Feed Wheel Motor	2
3	0500172	BEARING,FEED WHEEL 2-7/16	2
4	1200188	COUPLER, FEED WHEEL HUB	2
5	12A-0610ZI	HEX C/S 3/8-16 x 1-1/4" UNC GR 8 ZINC	4
6	12A-0616	HEX C/S 3/8-16 x 2 UNC GR 8	6
7	13A-1024ZI	HEX C/S 5/8-18 x 3 UNF GR 8 Z & Y	8
8	21240090	WASHER,FEED WHEEL COUPLER COVER MOUNT	2
9	21240091	COVER,PVC,FEED WHEEL COUPLER	2
10	21540004	WELDMENT,TOP FEED ENCLOSURE	1
11	21540005	WELDMENT,FEED WHEEL/TOP	1
12	21540010	WELDMENT,FEED WHEEL MOTOR STOP,RH	1
13	21540011	WELDMENT,FEED WHEEL MOTOR STOP,LH	1
14	30A-06	LOCKWASHER, 3/8" USS GR8	10
15	30A-10	LOCKWASHER 5/8" USS GR8 ZINC	8

NOTES:
1. APPLY BLUE LOCTITE 242 TYP FOR ITEM #7 (13A-1024ZI) TORQUE 215 FT/LBS .
2. ITEM(S) #6 (12A-0616) TO BE TORQUED @ 47 FT/LBS.

FUCTION GROUP	4 FEED SYSTEM
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF0111A1167259
DESCRIPTION	ASSY TOP FEED ENCLOSURE
ISSUE	R2

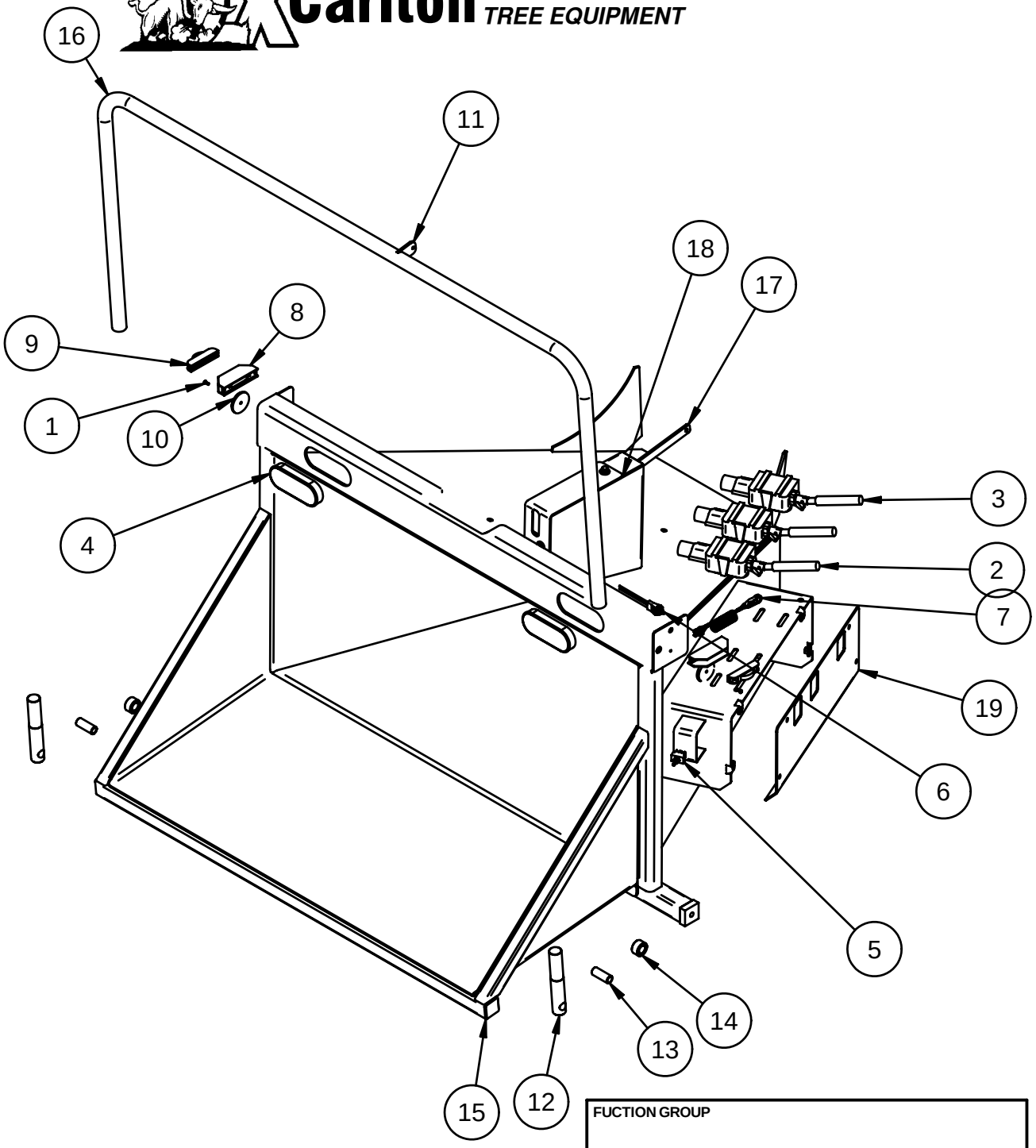
Revised 3.15.05



PART	ITEM	DESCRIPTION	QTY
1	0300121A	SOLENOID VALVE- REV. DMDA-XAN	1
2	0300121D	PISTON RELIEF VALVE- RPCC-LAN	2
3	0300153	18" CHIPPER MANIFOLD ASSEMBLY	1
4	0300158	VICKERS SOLENOID VALVE D05	2

FUCTION GROUP	4 FEED SYSTEM
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF011X81167139
DESCRIPTION	ASSY,FEED CONTROL VALVE BLOCK
ISSUE	R2

Revised 3.15.05



FUCTION GROUP	5 INFEED SYSTEM
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF0111A1167259
DESCRIPTION	INFEED CHUTE ELECTRONIC FEED CONTROLS
ISSUE	R2

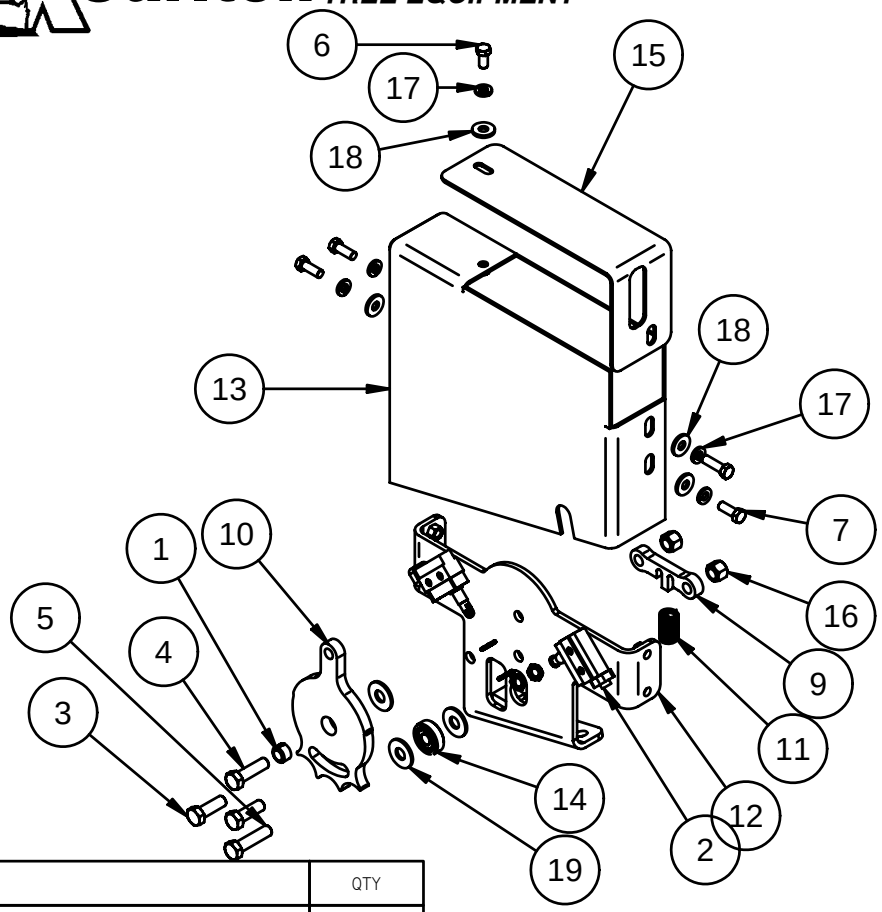
Revised 3.15.05

PART	ITEM	DESCRIPTION	QTY
1	0150414	RIVET-ALUMINUM W STEEL MANDREL	2
2	0300036	VALVE,CONTROL	1
3	0300037	VALVE,CONTROL	2
4	0350008A1	TAIL LIGHT - 12" CHIPPER	2
5	0350011A	SWITCH,ON-OFF	1
6	0350012	SWITCH - LANYARD - CLOSED	1
7	03500121	LANYARD ONLY FOR SWITCH	1
8	0350054R1A	MOUNT,ALUM MARKER LIGHT	2
9	0350055R1	LIGHT,MARKER,RED	2
10	0350056	REFLECTOR - RED 2 3/8"	2
11	21250093	MOUNT,FEED WHEEL CONTROL,LINKAGE	1
12	21250097	MOUNT,CONTROL BAR,64"	2
13	21250098	BUSHING,CONTROL BAR	2
14	21250099	SPACER,CONTROL ARM	2
15	21550002	WELDMENT,INFEED	1
16	21550024	TUBING,CONTROL BAR	1
17	21650012	FLATBAR,ELECTRONIC ENGAGE LINKAGE	1
18	21840075	ASSY,ELECTRONIC CONTROL LINKAGE	1
19	21850029	PLATE,VALVE BOX,FRONT.AUS	1

FUCTION GROUP	5 INFEED SYSTEM
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF0111A1167259
DESCRIPTION	INFEED CHUTE ELECTRONIC FEED CONTROLS
ISSUE	R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT

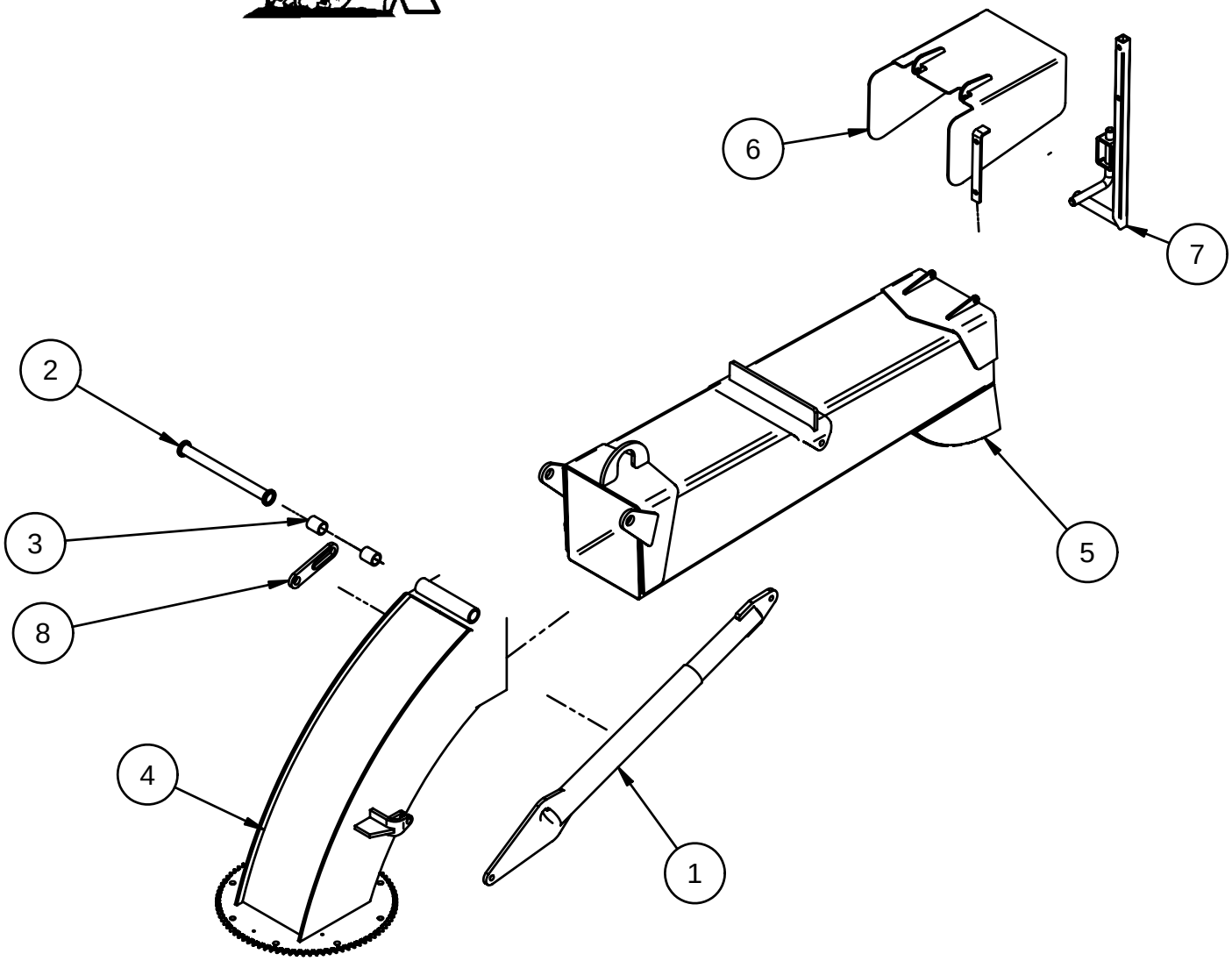


PART	ITEM	DESCRIPTION	QTY
1	0150807	HARDENED SPRING BUSHING-1/2"	1
2	0350130	LIMIT SWITCH- OMRON	2
3	10A-0812ZI	BOLT,HEX C/S 1/2-13 x 1-1/2 UNC GR8 Z&Y	2
4	10A-0814ZI	BOLT,HEX C/S 1/2-13 x 1-3/4 UNC GR8 Z&Y	1
5	10A-0816ZI	BOLT,HEX C/S 1/2-13 x 2 UNC GR8 Z&Y	1
6	12A-0606ZI	HEX C/S 3/8-16 x 3/4" UNC GR 8 ZINC	1
7	12A-0608ZI	HEX C/S 3/8-16 x 1" UNC GR 8 ZINC	3
8*	12A-0610ZI	HEX C/S 3/8-16 x 1-1/4" UNC GR 8 ZINC	1
9	21840060	MOUNT,FEED CONTROL LINKAGE SPRING	1
10	21840061	PLATE,FEED CONTROL LINKAGE	1
11	21840064	SPRING,FEED CONTROL LINKAGE	1
12	21840076	WELDMENT,ELECT. CNTRL. LINKAGE MOUNT	1
13	21840087	WELDMENT,ELECTRONIC LINKAGE COVER	1
14	21840088	BUSHING,SCHA BEARING A3248,ELECTRONIC LINKAGE	1
15	21840093	PLATE,ELECTRONIC LINKAGE COVER,TOP	1
16	29A-08	NUT,STOVER LOCK, 1/2-13 UNC GR8	2
17	30A-06	LOCKWASHER, 3/8" USS GR8	5
18	31A-06	FLAT WASHER, 3/8 USS GRD 5	5
19	34B-08	FLAT WASHER 1/2" SAE-W GR8	3

FUCTION GROUP	
5 INFEED SYSTEM	
BUINESS LINE	
CHIPPERS	
OWNER DOMAIN	
J.P. CARLTON COMPANY DIV. DAF INC.	
SERIAL NUMBERS	
1J9PF0117A1167136	
DESCRIPTION	**ISSUE**
ELECTRONIC FEED CONTROL	R2

Revised 3.15.05

Carlton PROFESSIONAL TREE EQUIPMENT

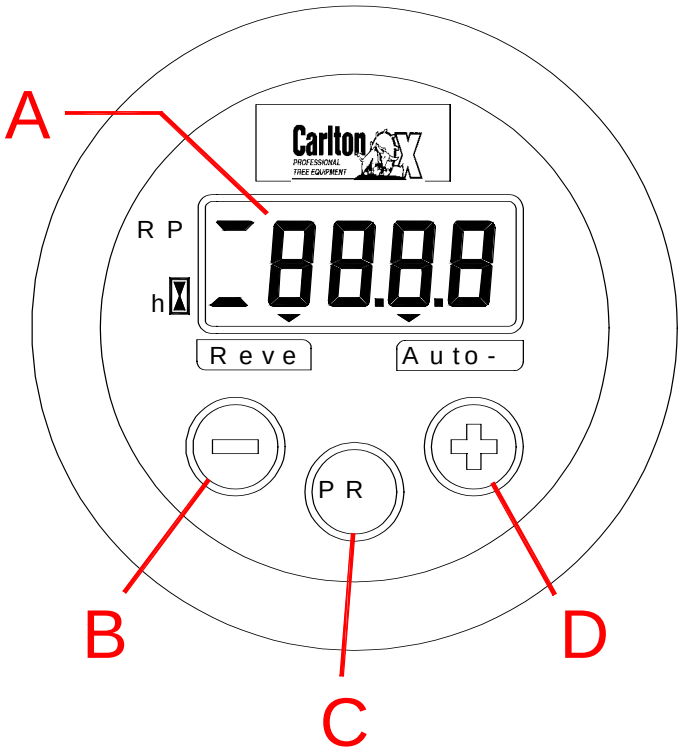


PART	ITEM	DESCRIPTION	QTY
1	21260021	WELDMENT,REAR JACK	1
2	21260032	WELDMENT,DISCHARGE ELBOW/DN ROD	1
3	21260036	BUSHING,DISCHARGE	2
4	21560002	WELDMENT,DISCHARGE ELBOW	1
5	21660003	WELDMENT,DISCHARGE NECK	1
6	21660004	WELDMENT,DISCHARGE CHIP REFLECTOR	1
7	21660006	WELDMENT,DISCHARGE ADJUST HANDLE	1
8	21860020	STOP,DISCHARGE JACK	1

FUCTION GROUP	6 DISCHARGE SYSTEM
BUINESS LINE	CHIPPERS
OWNER DOMAIN	J.P. CARLTON COMPANY DIV. DAF INC.
SERIAL NUMBERS	1J9XF011X81167139
DESCRIPTION	DISCHARGE SYSTEM
ISSUE	R2

Revised 3.15.05

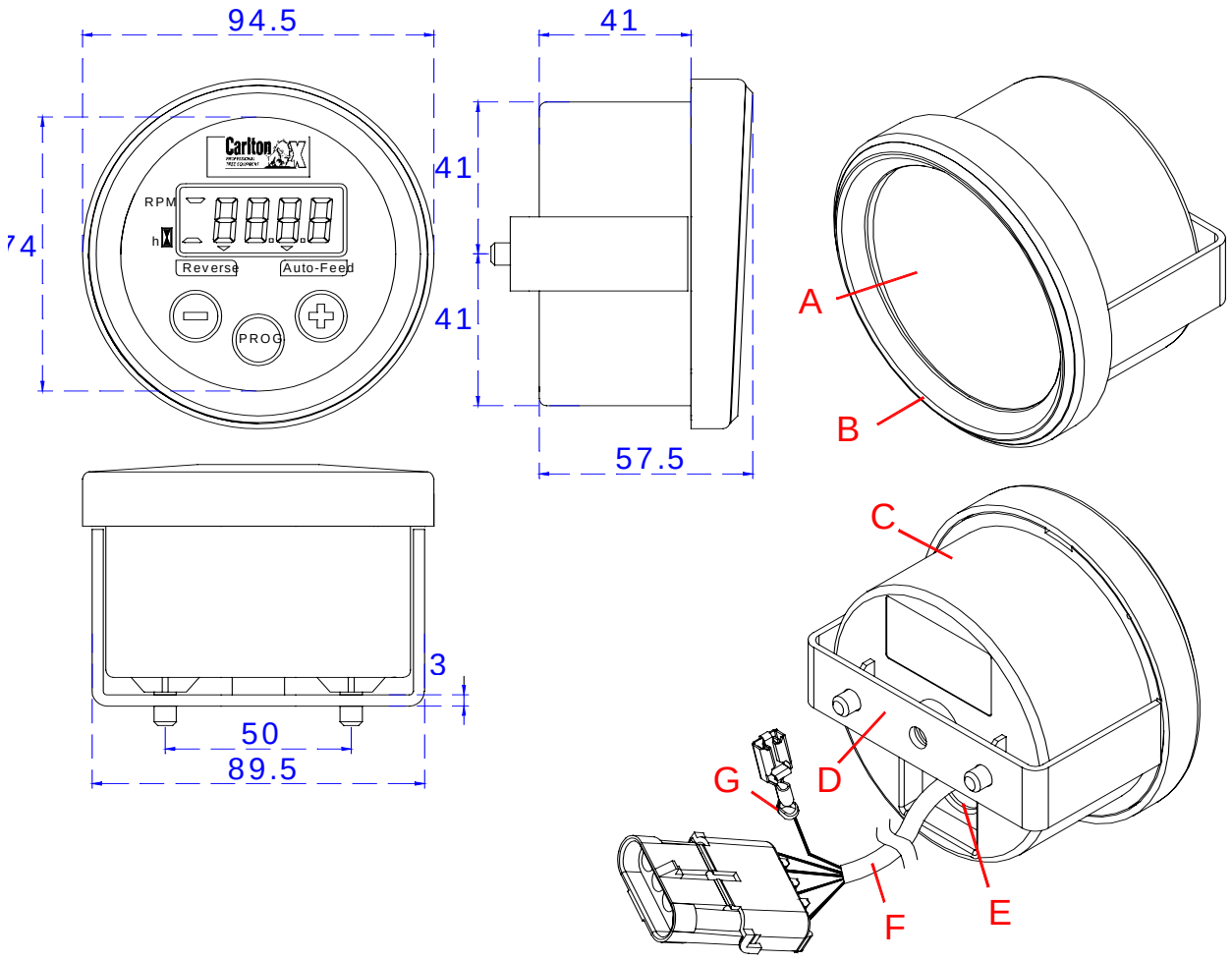
1. Panel description and electrical pinout



Ref.	Description	Signal type INput/OUTput	Pinout 4-way Delphi connector
A	Back-lit display for visualizing:		
	Heat engine RPM	IN (PNP NO, can be set to NPN) max. input frequency: 10KHz(1)	A
	Working hours	-	-
	“auto-feed” function ON	-	-
	“reverse” status ON	-	-
B	Setting key: it allows to decrease the value of the parameter being set	-	-
C	Setting key: to enter the parameters setting	-	-
	Positive output – EVS solenoid valve power supply	OUT (+V b*) 3A max	D
	Positive output – EVR solenoid valve power supply	OUT (+V b*) 3A max	Faston female single
	Positive input - monitor power supply(2)	IN (+Vb*)	C

	Ground input – monitor power supply	IN (GND)	B

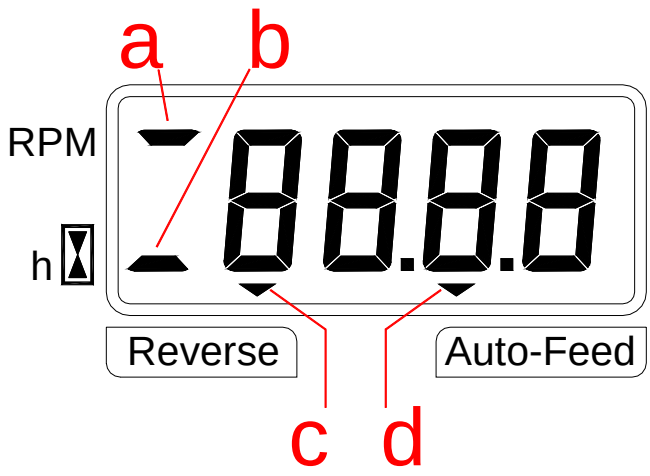
*



A	Silk-screened front panel in polyester
B	Front frame in black ABS
C	Housing in black ABS
D	Black metal supporting bracket
E	Black rubber fairlead-ring
F	Grey multipolar wiring 5x0.75mm^2, L = 250mm with 4-way Delphi connector, male contacts (cod. 12010974).
G	Wiring for EVR solenoid valve, with single female faston connector AMP cod. 160759-3 or 160773-3

2. Operating

After turning on the monitor, a 2 seconds test is automatically carried out: all display segments are on; after such a test, working hours are displayed for about 3 seconds, then engine RPMs are displayed and the other display indicators show the working status:



Picture A

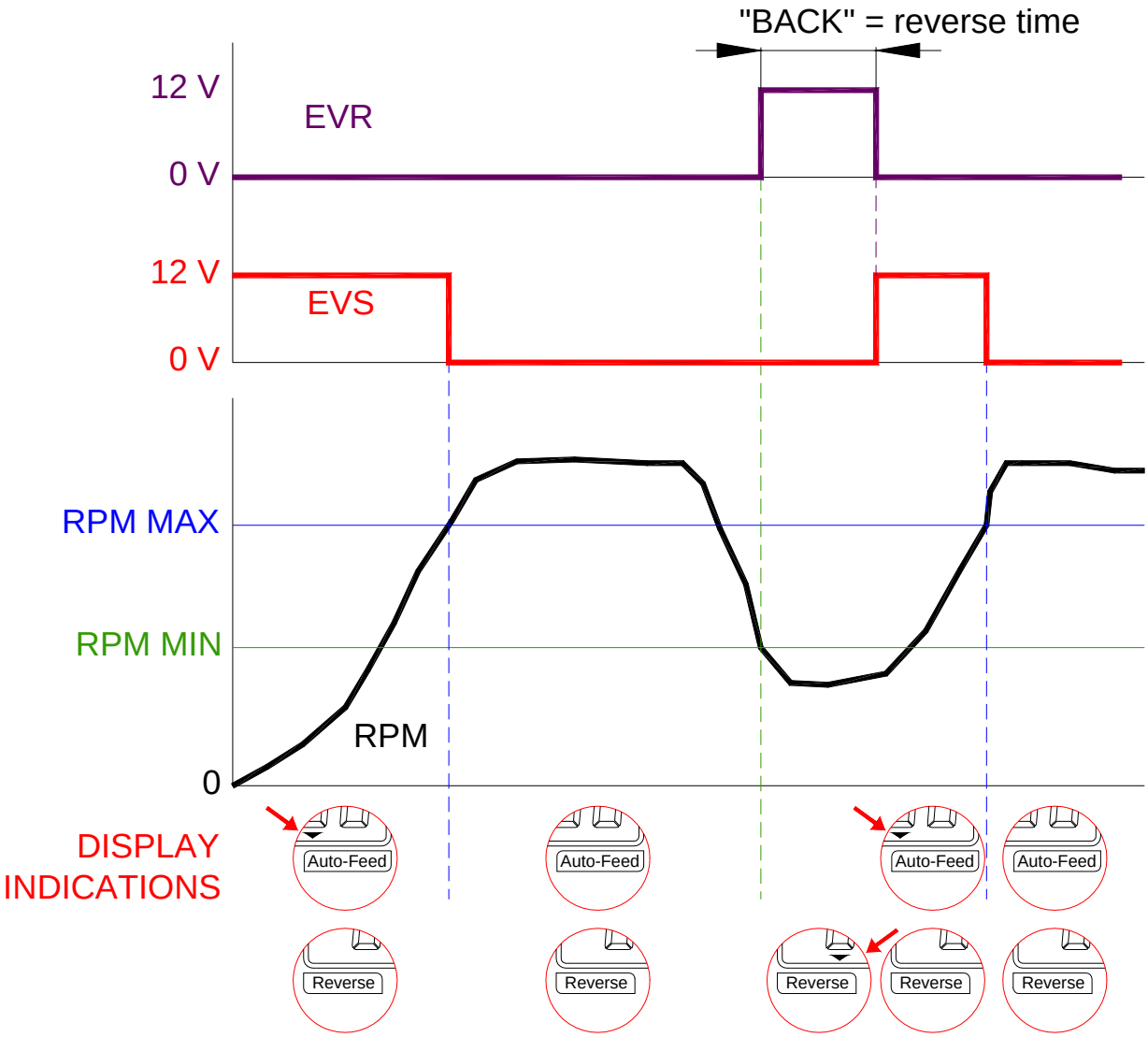
a) if ON, engined RPMs are displayed;
b) if ON, working hours are displayed;
c) if ON, reverse phase is currenlty ongoing (emergency condition)
d) if ON, “auto-feed” procedure is currently ongoing (emergency condition).

During standard operation the monitor detects engine RPMs. In case they go below the minimum programmed value, the monitor enables one of the emergency procedures listed below. All emergency procedures are back off, after the RPMs are restored over the maximum programmed value. The monitor is now back in standard working condition.

Emergency procedures are different depending on the "type" parameter programmed.

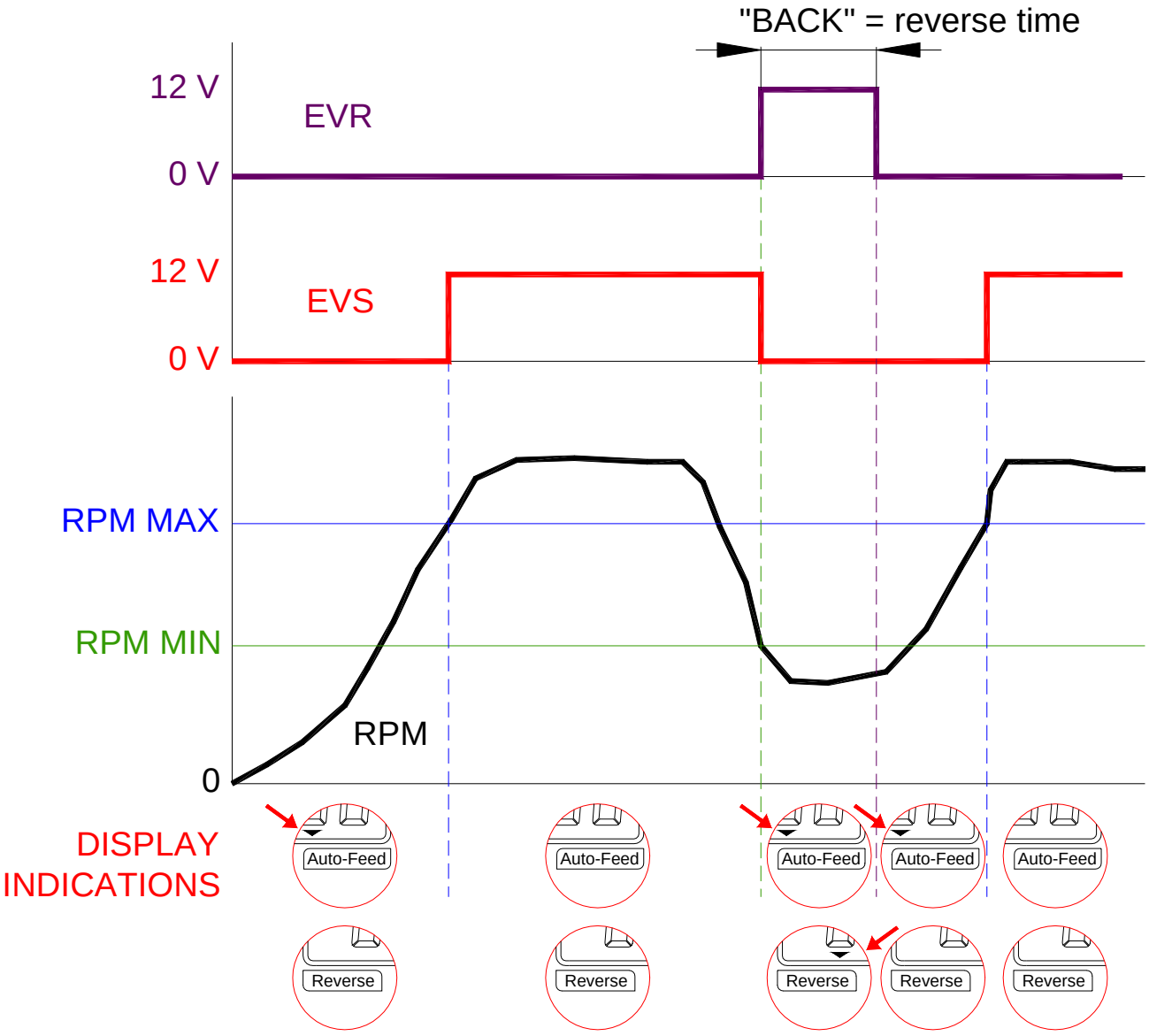
3. Emergency procedure “type 0”

This procedure is applied on those machines only where the ACTIVATION of the solenoid valves allows to protect the engine against excessive stress.

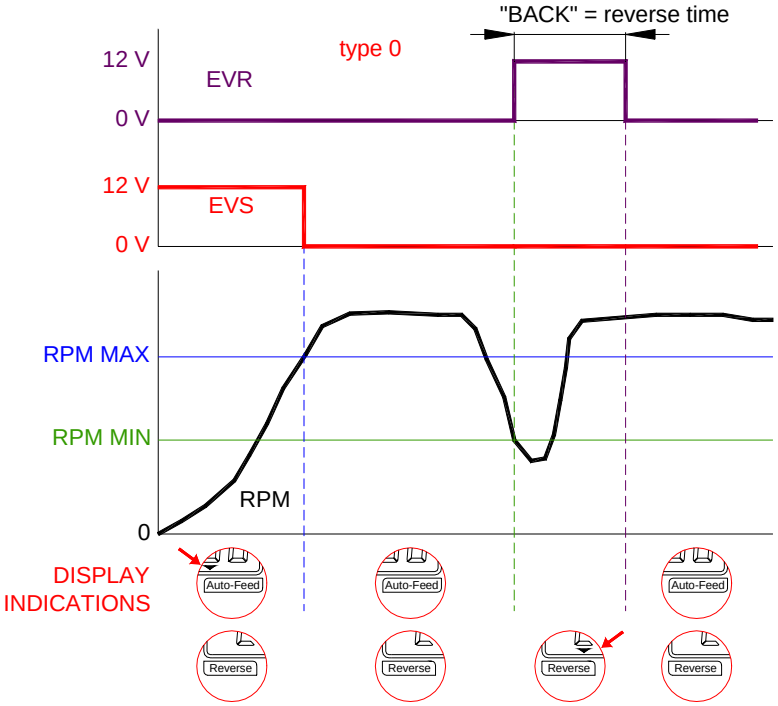


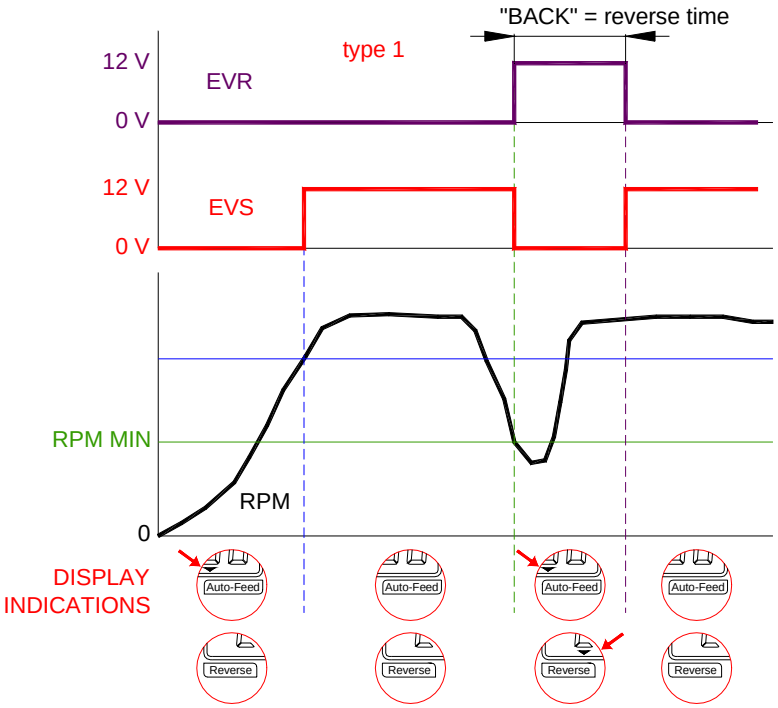
4. Emergency procedure “type 1”

This procedure is applied on those machines only where the DE-ACTIVATION of the solenoid valves allows to protect the engine against excessive stress.



In case RPMs exceed the RPM maximum value during the reverse interval (back), the activation sequence shall be as shown below:





During operation, working hours can always be displayed by switching for a BRIEF INTERVAL key (+) or (-). The display shows now the ref. indicator “b” on page 7 and working hours are displayed for 3 seconds. During this interval the EVS solenoid valve is energized or de-energized by the monitor (according to what programmed in “type” parameter) only if the “auto-feed” function has been enabled (see chapter 5.3), whereas the EVR solenoid valve is never energized.

5. Range of parameters displayed

Description	Range
Engine RPMe	0 ÷ 9990 steps of 10 RPMs
Working hours	0.0 ÷ 999.9 hours, steps of 0.1 hour (6 minutes); once 999.9 are reached, then steps of 1 hour until 9999 hours. **Working hours increase only if RPMs > 500.**

6. Setting

The device has two setting phases: “user” setting and "manufacturer" setting. Both programming phases can be carried out with the engine operating (RPMs > 500). The operator shall complete the procedure for each phase by confirming all parameters at a time to allow all modified parameters are stored. Otherwise, if the operator is within one programming phase and no key is selected for an interval of 7 seconds, the monitor quits the phase WITHOUT storing any executed changes.

The “user” phase permits programming of the following parameters:

- Minimum value for RPMs
- Maximum value for RPMs
- Machine type selection (with or without reverse)
- Reverse time (not used if the reverse valve is not present).

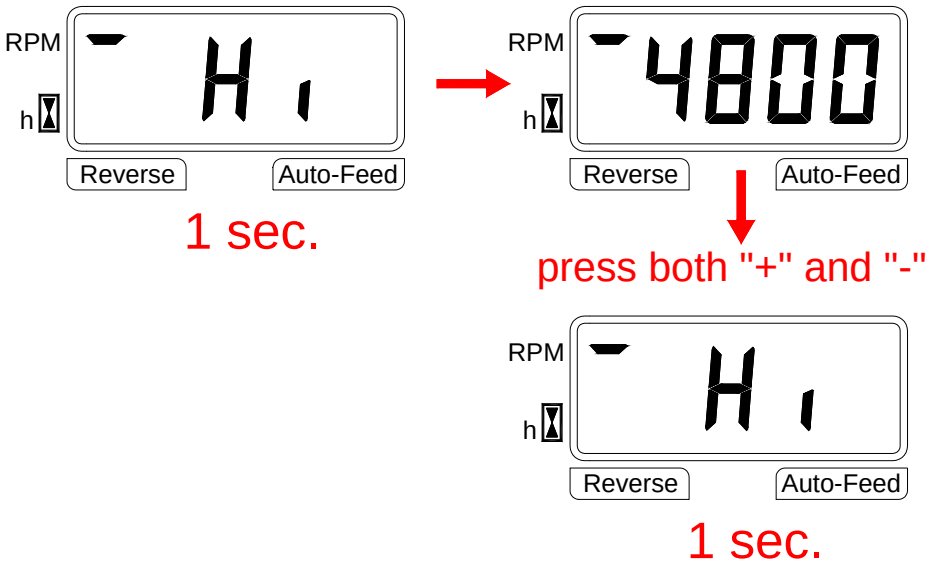
The “manufacturer” setting allows programming of the following parameter:

- Pulses/revolution for engine RPMs counting (Set By Factory)

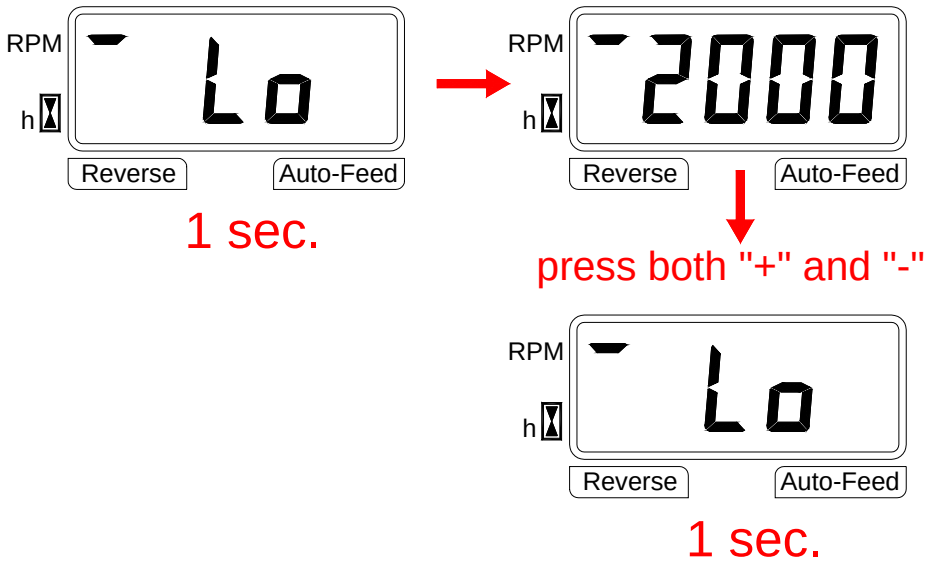
NOTES: the parameter value is kept displayed during each programming phase; the parameter name is displayed only while going from one parameter to the next one or when keys + (plus) and (-) minus are simultaneously pressed.
For safety purposes, the EVS solenoid valve is energized or de-energized (according to what programmed in “type” parameter) by the monitor each time a programming phase is entered only if the “auto-feed” function has been enabled (see par. 5.3), whereas the EVR solenoid valve is never energized.

7. “User” setting

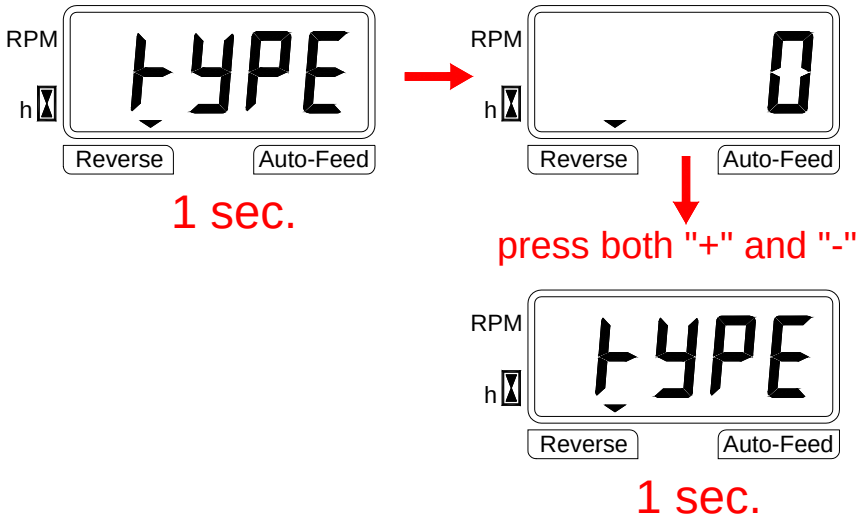
To enter the “user” programming phase, with the monitor ON keep key PROG pressed for at least 2 seconds and until the first parameter "HI" (i.e. RPMs minimum permitted value) is displayed. After an interval of 1 second the current programmed value is displayed (es. 4800RPM).



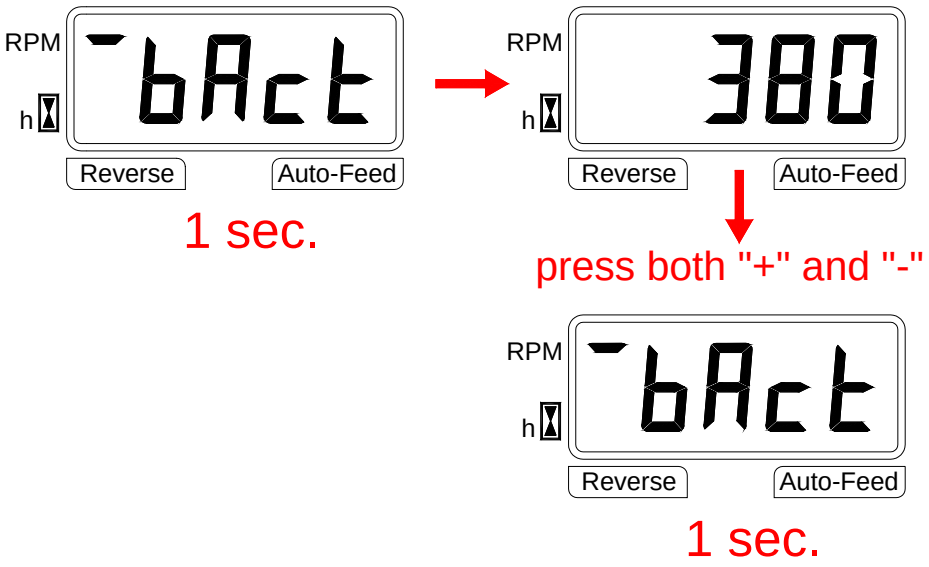
The parameter is changed by using key “+” or “-“; switching key “PROG” allows to go to next parameter “LO” (i.e. RPMs minimum permitted value). It is displayed with same procedure.



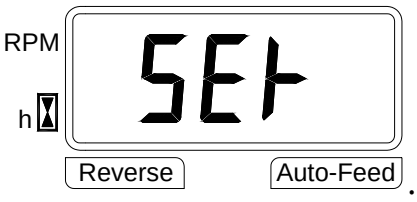
The parameter is changed by using key “+” or “-“; switching key “PROG” allows to go to next parameter “TYPE” (i.e. machine with reverse solenoid valve or without reverse valve). It is displayed with same procedure.



The parameter is changed by using key “+” or “-“; switching key “PROG” allows to go to next parameter “BACK” (i.e. activation time of the reverse solenoid valve, in ms). It is displayed with same procedure.



The parameter is changed by using key “+” or “-“; switching key “PROG” allows to store all data entered and quit setting - the display will show for 1 second following indication:



How to activate and de-activate the “auto-feed” function

The device has a further programming phase, meant for activating and de-activating the “auto-feed” function. This function includes the emergency procedures previously described.
NOTE: when the “auto-feed” function is de-activated, the monitor features exclusively revolution counter function and hours counter function; the reverse solenoid valve EVR is always de-energized and the EVS safety valve can be de-energized (if “type 0” operation type is selected) or energized (if “type 1” operation type is selected). The monitor is supplied as a standard with the “auto-feed” function enabled; in fact, when the monitor is switched-on with engine off (RPM =0), the ref. indicator "d" picture "A" pag. 7 is on.
Press key (-) minus for at least 3 seconds to de-activate the “auto-feed” function and until the sequence below is displayed:

Once the sequence has been completed, engine RPMs are displayed but the ref. indicator "d" picture "A" page 7 is off; to activate again the “auto-feed” function press key (+) plus for at least 3 seconds until the sequence below is displayed:

Once the sequence has been completed, engine RPMs are displayed and the ref. indicator "d" picture "A" page 7 is on.

8. Range of programmable parameters

Description	Programmable range	Default values
LOW (Minimum RPM value permitted)	500 ÷ 2700 (*) RPM, steps 10RPM	2240
HIGH (Maximum RPM value permitted)	2000(*) ÷ 5000 RPM, steps 10RPM	2440
BACK (reaction time for reverse valve)	0 ÷ 2500ms, steps 10ms	300
PULSES (number of pulses/revolution for RPM)	2.0 ÷ 200.0 pulse/rev, steps 0.1 pulse/rev	129.0
TYPE (reverse function is ON)	ON or OFF	ON

(*) LOW value shall never exceed HIGH value (and vice versa), and priority shall be given to the LOW value with 20RPMs hysteresis; e.g: if a LOW value is programmed equal to 1980RPM, the HIGH value shall not be lower than 2000RPM;

Now, by releasing all keys, the monitor operates under standard condition and the initial test is carried out again.

7. Technical features

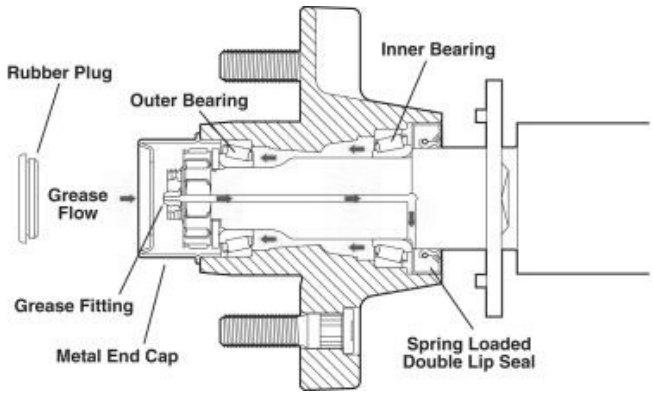
Supply voltage	10 ÷ 16 Vdc
Max. current absorption at 16 Vdc (excluding outputs)	200 mA
Protection degree	IP 66
Operating temperature range	-20 / +70 °C
Storage temperature range	-25 / +85 °C
Mechanical vibrations resistance	2 g random
Reference standards for the project	MC14982

Autofeed Settings for Carlton Chippers

Engine Make	Engine Model	HP Rating	High Setting	Low Setting	CAL
Vanguard	Big Block V Twin	35 HP	3360	3060	98
Kubota	D1105T	33 HP	2300	2000	12
Kohler	CH740	27HP	3330	2900	97.4
Kubota	V3300T	88 HP	2300	2150	12
Kubota	V3800T	99HP	2300	2150	12
John Deere		99 HP	2440	2240	129
John Deere		140 HP	2440	2240	129
John Deere	6068T	173 HP	2440	2370	129
John Deere	6068H	250 HP	2440	2370	129
John Deere III		140 HP	2200	2000	129
John Deere III	6068T	173 HP	2200	2000	129
John Deere III	6068H	250 HP	2200	2000	129

DEXTER AXLE

E-Z LUBE™
BEARING LUBRICATION SYSTEM



Axles equipped with Dexter's E-Z Lube feature can be periodically lubricated without removing the hubs from the axle. This feature consists of axle spindles that have been specially drilled and assembled with grease fittings in their ends. When grease is pumped into the fitting, it is channeled to the inner bearing and then flows back to the outer bearing and eventually back out the grease cap hole.

1. Remove the rubber plug from the end of the grease cap.
2. Place a standard grease gun onto the grease fitting located in the end of the spindle. Make sure the grease gun nozzle is fully engaged on the fitting.
3. Pump grease into the grease fitting. The old, displaced grease will begin to flow back out the cap around the grease gun nozzle.
4. When the new, clean grease is observed, remove the grease gun, wipe off any excess, and replace the rubber plug in the cap.

The E-Z Lube feature is designed to allow immersion in water. Axles not equipped with E-Z Lube are not designed for immersion and bearings should be repacked after each immersion. If hubs are removed from an axle with an E-Z Lube feature, it is imperative that the seals be replaced before bearing lubrication. Otherwise, the chance of grease getting on brake linings is greatly increased.

NOTE: The convenient lubrication provisions of the E-Z Lube must not replace periodic inspection of the bearings.

DEXTER AXLE

CAUTION

Do not mix Lithium, calcium, sodium or barium complex greases due to possible compatibility problems. When changing from one type of grease to another, it is necessary to insure all the old grease has been removed.

If your axles are equipped with oil-lubricated hubs, then your lubrication procedure is to periodically fill the hub with high quality hypoid gear oil to the level indicated on the clear plastic oil cap. The oil can be filled through the rubber plug hole in the cap.

Recommended Wheel Bearing Lubrication Specifications

Grease:

Thickener Type	Lithium Complex
Dropping Point	230°C (446°F) minimum
Consistency	NLGI No. 2
Additives	EP, Corrosion & Oxidation Inhibitors
Base Oil	Solvent Refined Petroleum Oil
Base Oil Viscosity	@40°C (104°F) 150cSt(695 SUS) Min.
Viscosity Index	80 Minimum
Pour Point	-10°C (14°F) Minimum

Approved Sources:

Mobil Oil	Mobilgrease HP
Exxon/Standard	Ronex MP
Kendall Refining Co.	Kendall L-427
Ashland Oil Co.	Valvoline Val-plex EP Grease
Pennzoil Prod. Co.	Premium Wheel Bearing Grease 707L

Oil:

SAE 90 Hypoid Gear (Hypoid Rear Axle Oil)

Use only with hubs equipped with oil option.

Approved Sources:

Union Oil Co.	Union MP, Gearlube - LS
Exxon Co. USA	Gear Oil GX 80W-90
Mobil Oil Corp..	Mobilube SHC 75W-90
Pennzoil Prod. Co.	Multipurpose Gear Lubricant 4092,
	Multipurpose Gear Lubricant 4096

H30-0014 User Manual

Houston Street Technologies

Houston Street Technologies

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www.houstonst.com

Specifications

Environmental Protection:	IP65 (w/Connectors A, B and C plugged)
Operating Voltage:	8-32VDC
Operating Temperature:	-20° to +70°C (-4 to +158°F)
Storage Temperature:	-30° to +80°C (-22 to +176°F)
Display:	FSTN, LED Backlit, 240 X 320 Pixels, 3.9" Diagonal, Full Monochrome Graphics
Housing Connectors:	(1) Deutsch DT04-12PA, (1) Deutsch DT04-12PB, (1) Deutsch DT04-12PC
Mating Connectors:	(1) Deutsch DT06-12SA, (1) Deutsch DT06-12SB, (1) Deutsch DT06-12SC
Digital Outputs:	(3) Dedicated SPST, 10 Amp Relays and (4) Programmable SPST, 3 Amp Relays
Digital Inputs:	(8) Common Ground, Digital Inputs
Analog Inputs:	(4) Programmable 4-20 mA, 0-5 VDC or Resistive Inputs (1) Magnetic Pickup Input
Standard Communications:	J1939 CAN bus, RS232
Optional Communications:	Cellular

!!!!!! WARNING !!!!!!

- DISCONNECT ALL ELECTRICAL POWER TO THE MACHINE PRIOR TO INSTALLATION
- DISCONNECT ALL WIRES FROM THE H30 PRIOR TO WELDING ON THE MACHINE
- FOLLOW ALL MACHINE MANUFACTURER'S SAFETY WARNINGS
- READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS
- INSTALLATION BY QUALIFIED TECHNICIAN ONLY

User Interface

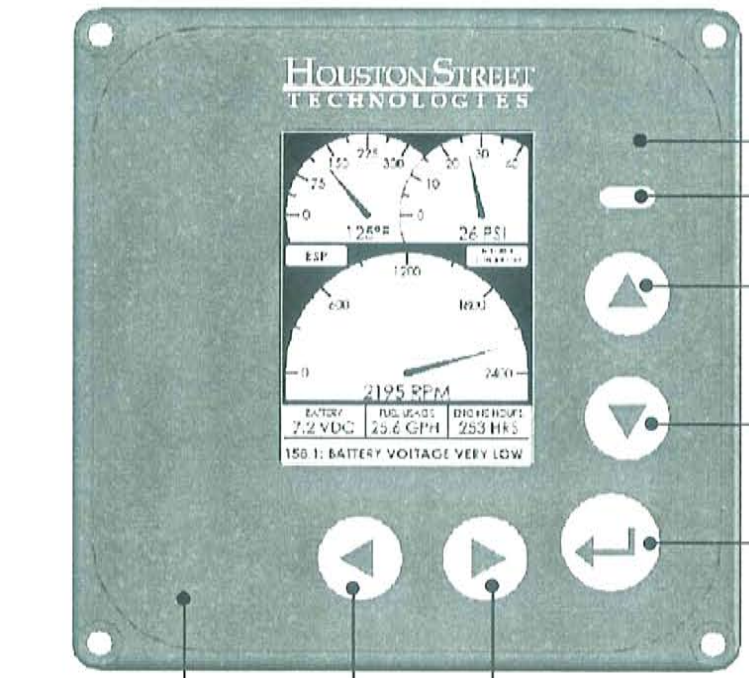
The H30's monochrome graphical LCD display is used as a visual interface for the operator. The H30's primary screen is the Operation Screen (shown below), which displays user-defined operating parameters on three analog gauge faces as well as scrolling text for a total of six parameters in addition to any active fault codes being broadcast by the engine ECU.

The power button is used to regulate power to the H30 and stop the engine from running. The engine can only be started when the H30 is powered and displaying the Operation Screen. The engine can be shutdown by pressing the power button when the engine is running.

CAUTION: Engine manufacturer recommendations should always be followed when shutting down the engine.

On the face of the controller an amber LED is used as an active warning fault indicator, while a red LED is used as a derate or shutdown indicator.

The six tactile push buttons on the face of the H30 have the following general functions:



RED LED

AMBER LED

UP: Increase RPM, Scroll Menu Lists

DOWN: Decrease RPM, Scroll Menu Lists

ENTER: Press/Release to Access Main Menu, Select Highlighted Menu Item, **Hold** to Crank Engine (non-Keyed Application Only)

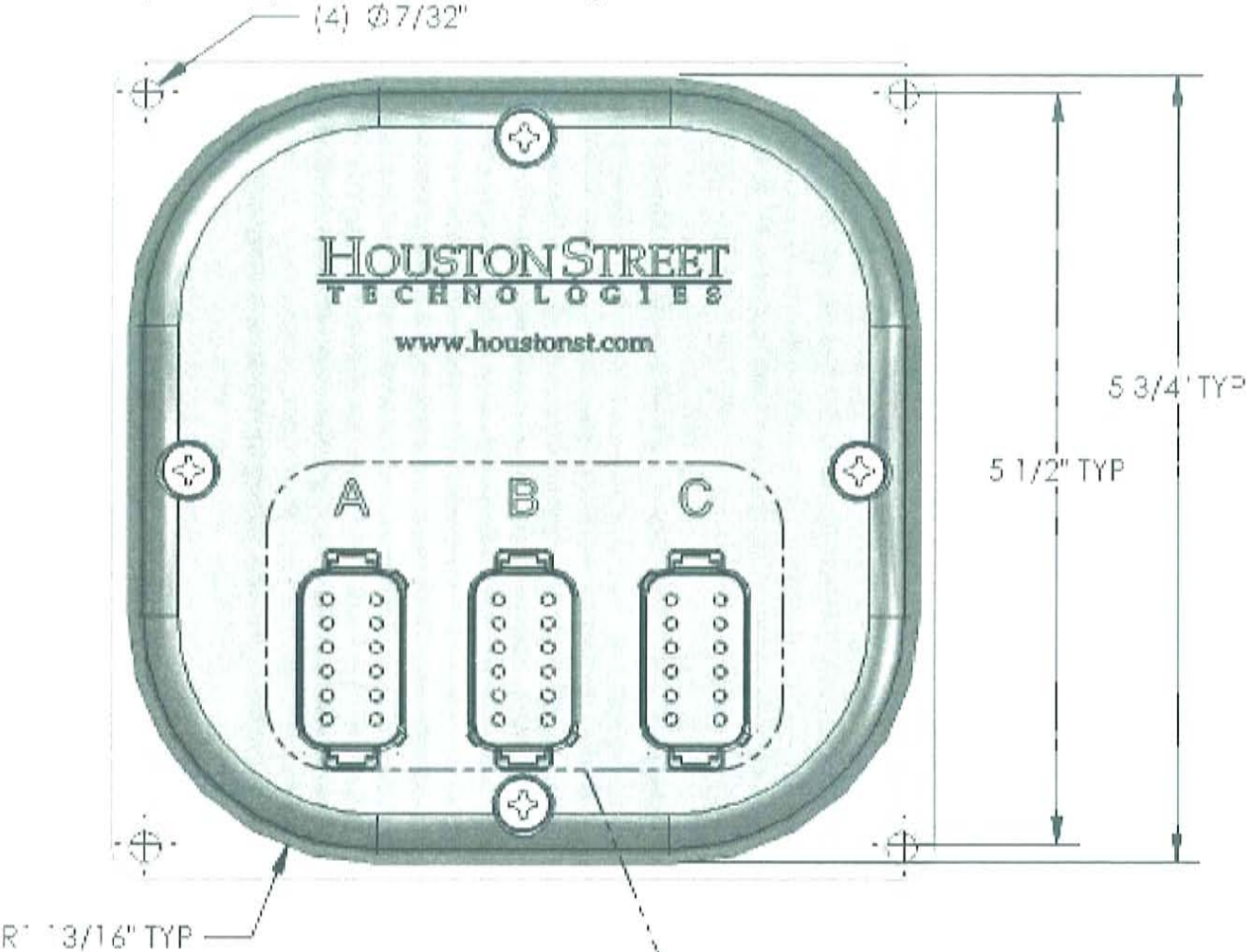
POWER BUTTON

RIGHT: Increase Highlighted Menu Item, Scroll Operation Screen Engine Parameters

LEFT: Decrease Highlighted Menu Item, Scroll Operation Screen Engine Parameters

Installation

The cutout pattern required for surface mounting the H30 is shown below:



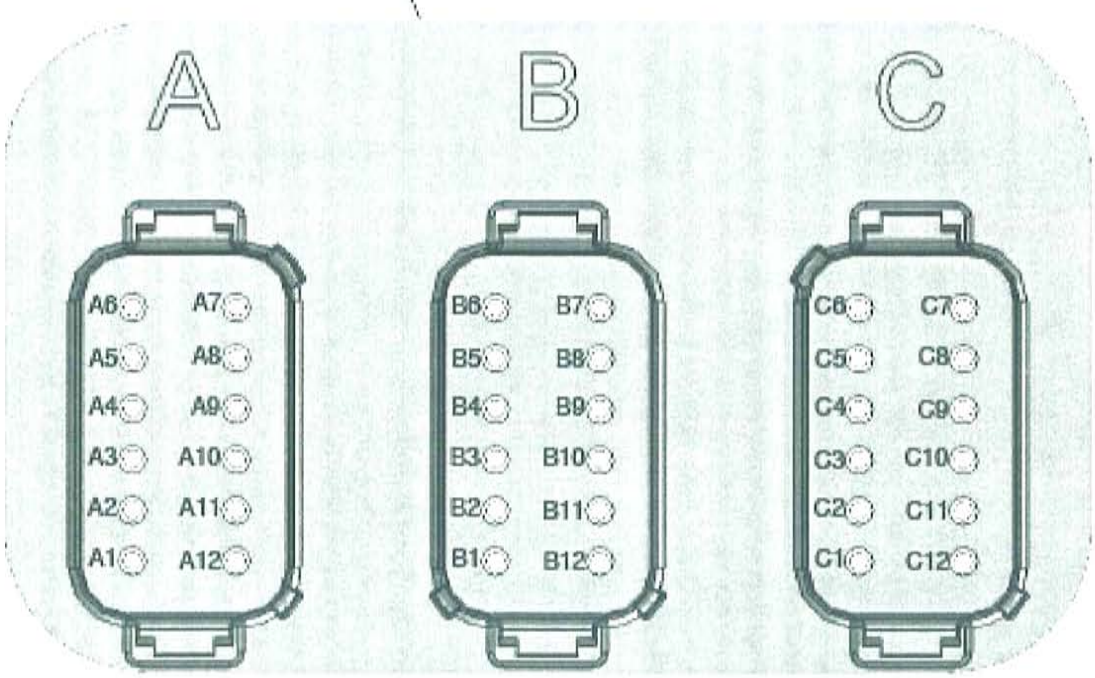
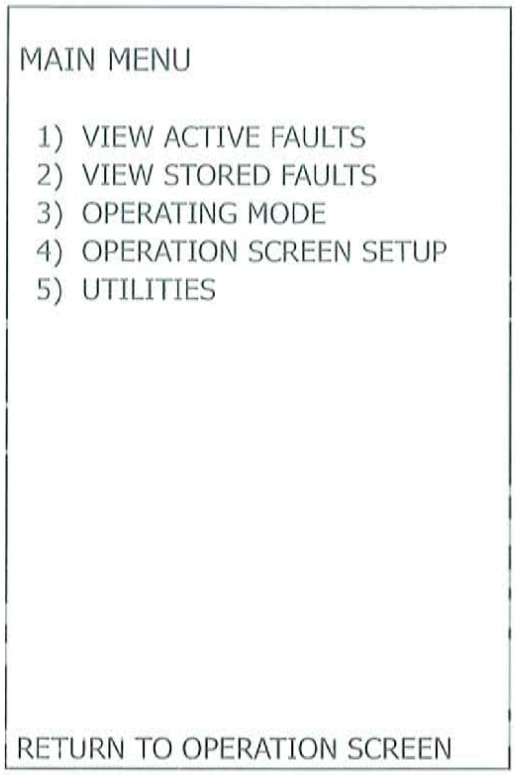


Table of Contents

CAUTION: Outputs at pins A4 & A5 should be protected with a 10 Amp fuse or circuit breaker.

CONNECTOR/ PIN NO.	DESCRIPTION
A1	GROUND
A2	ECU POWER SUPPLY INPUT
A3	ALTERNATOR EXCITE OUTPUT
A4	START RELAY, 10A OUTPUT
A5	ECU POWER, 10A OUTPUT
A6	CAN SHIELD
A7	CAN LO
A8	CAN HI
A9	UNUSED
A10	UNUSED
A11	DIGITAL OUTPUT POWER SUPPLY INPUT
A12	H30 POWER & START RELAY SUPPLY INPUT
B1	UNUSED
B2	UNUSED
B3	UNUSED
B4	UNUSED
B5	UNUSED
B6	UNUSED
B7	UNUSED
B8	UNUSED
B9	UNUSED
B10	UNUSED
B11	DIGITAL OUTPUT #1
B12	DIGITAL OUTPUT #2
C1	UNUSED
C2	UNUSED
C3	UNUSED
C4	UNUSED
C5	DIGITAL OUTPUT #3
C6	DIGITAL OUTPUT #4
C7	UNUSED
C8	UNUSED
C9	UNUSED
C10	UNUSED
C11	RS232 Tx
C12	RS232 Rx

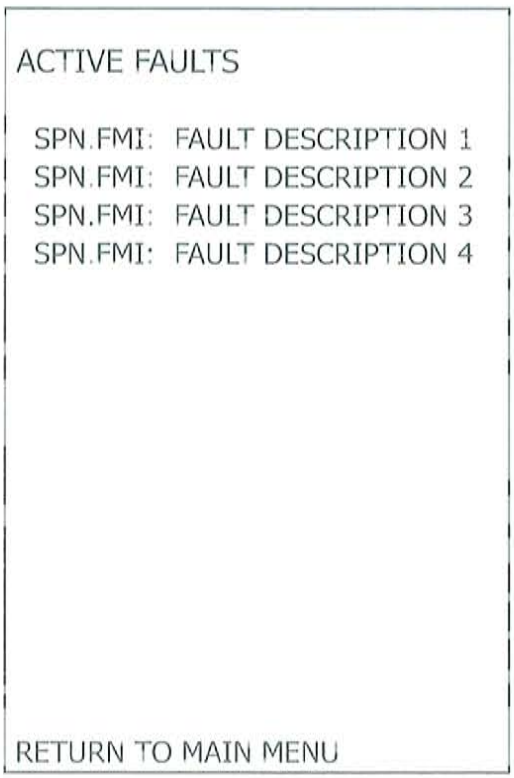
Screen Detail



MAIN MENU

Up/Down Button: Scroll the Main Menu
Left/Right Button: Not used
Enter Button: Make selection of highlighted item

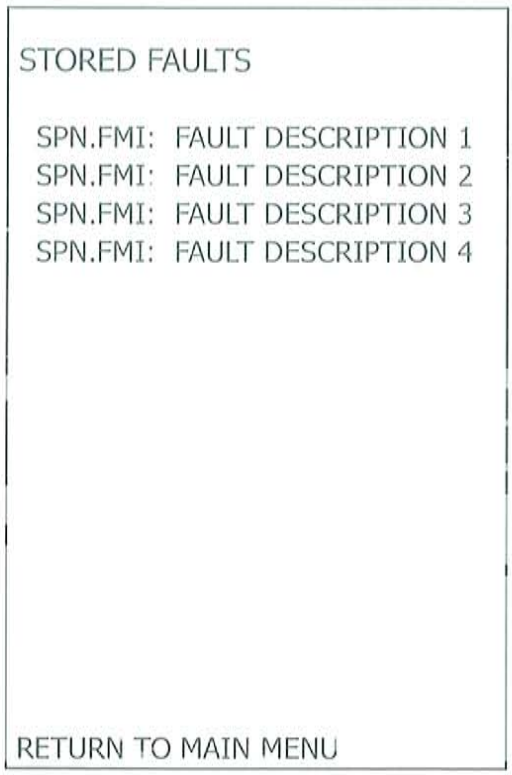
Access: Press and release enter button while at the Operation Screen



ACTIVE FAULTS

Up/Down Button: Scroll the Active Fault List
Left/Right Button: Not used
Enter Button: Make selection of highlighted fault to view more detailed description

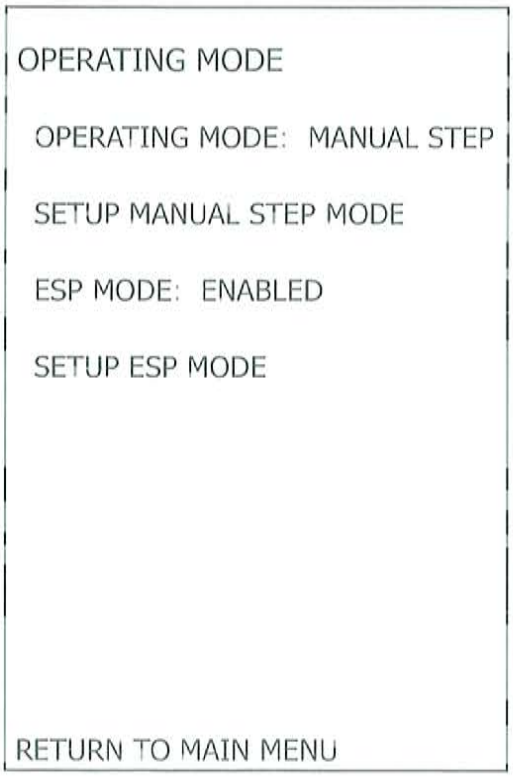
Access: Main Menu...View Active Faults



STORED FAULTS

Up/Down Button: Scroll the Stored Fault List
Left/Right Button: Not used
Enter Button: Make selection of highlighted fault to view a more detailed description

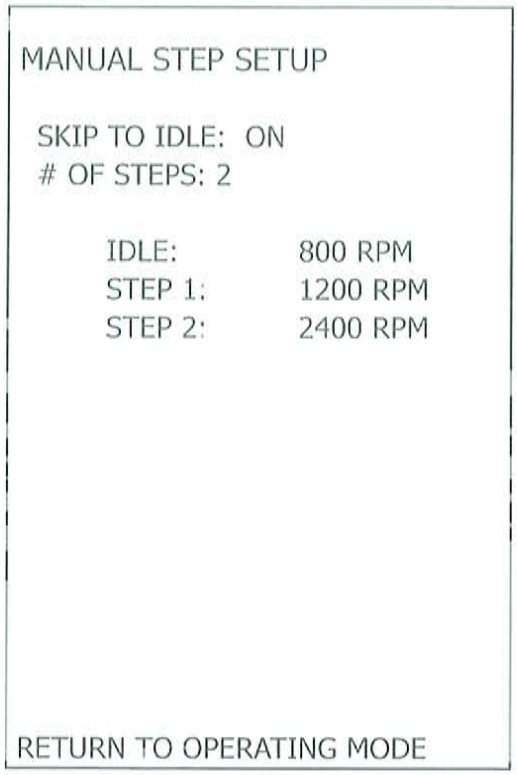
Access: Main Menu...View Stored Faults



OPERATING MODE

Operating Mode: Manual Step
Setup Manual Step Mode: Select to configure Manual Step settings
Up/Down Button: Scroll the screen
Left/Right Button: Change highlighted parameter
Enter Button: Make selection

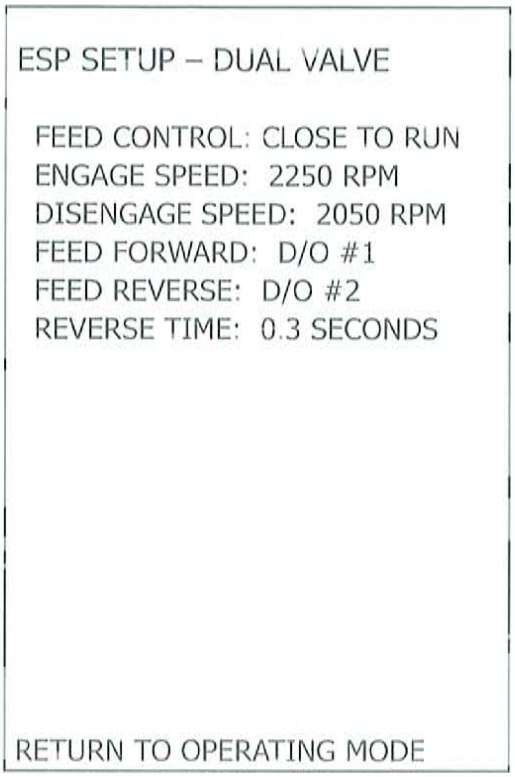
Access: Main Menu...Operating Mode



MANUAL STEP SETUP

Skip to Idle: option to have the controller skip intermediate steps and return directly to idle during shutdown
 # Of Steps: Set the number of steps (10 maximum)
Idle: Engine speed at startup
Step #: Engine speed at designated step number
Up/Down Button: Scroll the screen
Left/Right Button: Decrease/increase highlighted parameter
Enter Button: Return to Operating Mode Screen (when highlighted)

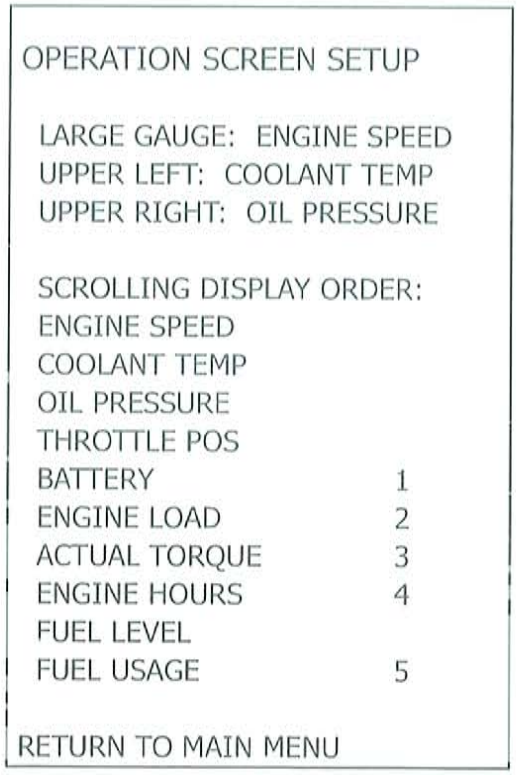
Access: Main Menu...Operating Mode...Setup Manual Step Mode (Manual Step Mode must be the selected Operating Mode)



ESP DUAL VALVE SETUP

Feed Control: Determined by the type of solenoid used to drive forward rollers. Close to run is used on active type solenoids while open to run is used on inactive type solenoids.
Engage Speed: Engine speed that the feed rollers will feed forward
Disengage Speed: Engine speed that the feed rollers will stop feeding forward (and reverse, if enabled)
Feed Forward: Digital output used to power the feed forward solenoid
Feed Reverse: Digital output used to power the feed reverse solenoid
Reverse Time: The length of time the feed rollers will reverse
Up/Down Button: Scroll the screen
Left/Right Button: Change highlighted parameter
Enter Button: Return to Operating Mode screen (when highlighted)

Access: Main Menu...Operating Mode...Setup ESP Mode



OPERATION SCREEN SETUP

Large Gauge: Used to set the large gauge on the Operation Screen to the desired engine parameter

Upper Left: Used to set the upper left gauge of the Operation Screen to the desired engine parameter

Upper Right: Used to set the upper right gauge of the Operation Screen to the desired engine parameter

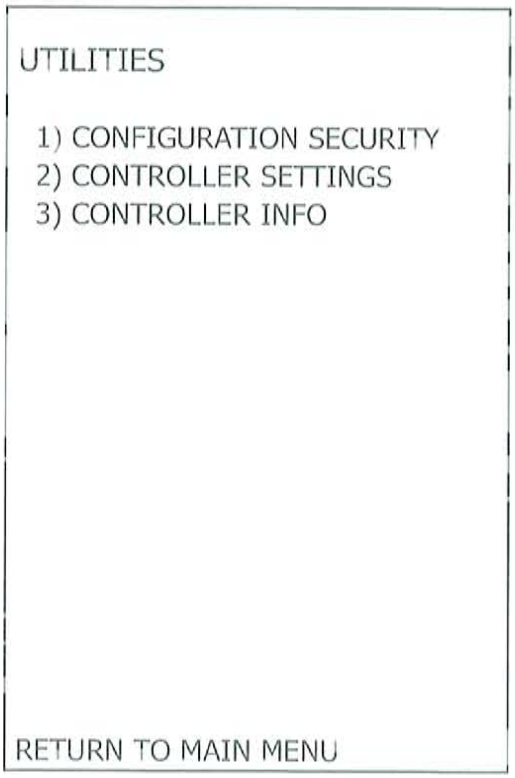
Scrolling Display Order: Set the order of the text parameter displayed below the large gauge

Up/Down Button: Scroll the screen

Left/Right Button: Change highlighted parameter

Enter Button: Return to Main Menu (when highlighted)

Access: Main Menu...Operation Screen Setup



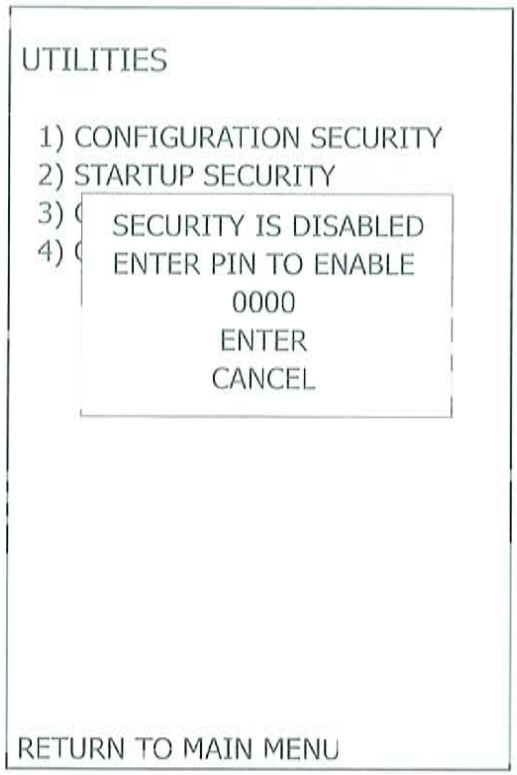
UTILITIES MENU

Up/Down Button: Scroll the Utilities Screen

Left/Right Button: Not use

Enter Button: Make selection of highlighted item

Access: Main Menu...Utilities

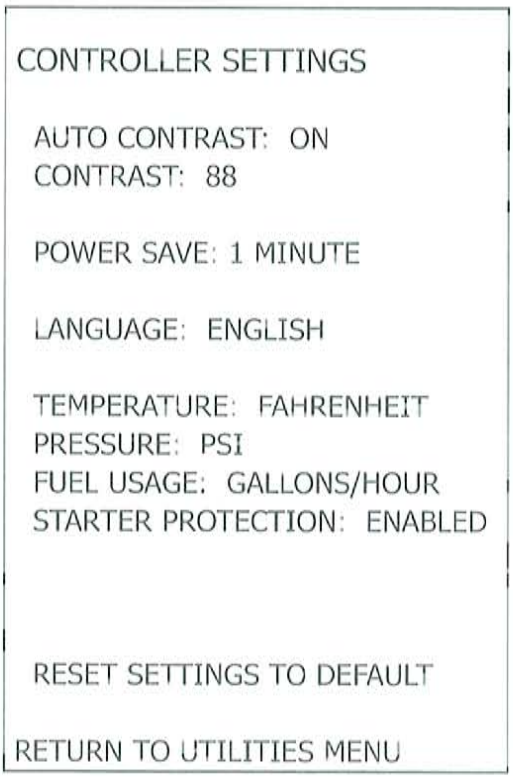


CONFIGURATION SECURITY

Up/Down Button: Change pin numbers
Left/Right Button: Select pin number or enter/cancel
Enter Button: Makes selection of highlighted parameter

Access: Main Menu...Utilities...Configuration Security

Notes: To disable Configuration Security, enter the same pin numbers used to enable security



CONTROLLER SETTINGS

Auto Contrast: Turn auto contrast feature on or off
Contrast: Set the screen contrast higher (darker) or lower (lighter)
Power Save: Set time increment that the H30 will wait while no button is pressed and the engine is not running until entering sleep mode. Setting range 1 - 20 minutes.
Language: Select desired language
Temperature: Select between Fahrenheit or Celsius
Pressure: Select between psi or kpa
Fuel Usage: Select between gallons/hour or liters/hour
Starter Protection: Enable or disable a maximum crank time and forced crank delay between manual crank attempts
Reset Settings: Reset controller configuration settings to default factory settings. This feature is not available when the configuration or startup security is active
Up/Down Button: Scroll adjust contrast screen
Left/Right Button: Change the highlighted parameter
Enter Button: Return to the Utilities Menu (when highlighted)

Access: Main Menu...Utilities...Controller Settings

CONTROLLER INFO

ENTER BUTTON: RETURN TO UTILITIES MENU

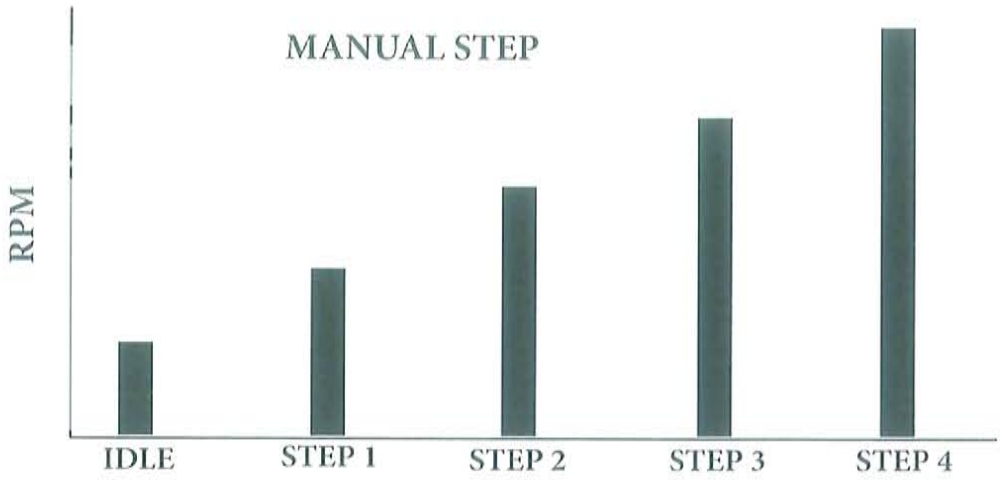
ACCESS: MAIN MENU...UTILITIES...CONTROLLER INFO

NOTE: BOTTOM OF THE SCREEN CONTAINS THE CONTROLLER MODEL NUMBER, HARDWARE AND SOFTWARE VERSION NUMBERS. THIS INFORMATION MAY BE USED FOR TROUBLE SHOOTING PURPOSES.

Manual Operation Mode

MANUAL STEP

When in MANUAL STEP mode the engine will operate within a range of low and high RPM values, increasing and decreasing speed in set increments. A maximum of (10) steps can be used to quickly (or slowly) increase or decrease engine speed with each press of the UP or DOWN button.



To access the MANUAL STEP SETUP screen:

1) Press ENTER while at the Operation Screen to access the Main Menu.
2) Use U/D buttons to highlight OPERATING MODE and press ENTER.
3) Use L/R buttons to change the Operating Mode to MANUAL STEP.
4) Use U/D buttons to highlight MANUAL STEP SETUP and press ENTER.

Engine Stall Protection (ESP)

When **ENGINE STALL PROTECTION (ESP)** is enabled, the H30 can be used to engage and disengage feed rollers that may be overloading the engine, causing it to stall. One of the H30's digital outputs can be configured to engage the feed forward solenoid at a set RPM limit, while a second digital output can be used to reverse the feed direction for a set amount of time (0.1 to 5.0 seconds) when a low RPM limit is reached. Reversing the feed direction is optional, the H30 can be configured to simply stop feeding until the engine RPM's increase to a minimum threshold speed and then re-engage the feed forward solenoid.

ESP - DUAL VALVE

A dual-valve feed system is comprised of two valves that each use a single solenoid to either allow or stop hydraulic flow. The first valve is considered the feed forward valve (CLOSE TO RUN indicates the valve must be energized to feed forward, OPEN TO RUN indicates the valve must be de-energized to feed forward), the second valve controls feed direction (when energized the feed wheels will reverse, when de-energized the feed wheels will feed forward).

FEED CONTROL	Determined by the type of solenoid used to drive the feed system
ENGAGE SPEED	Minimum engine RPM at which the feed rollers will begin feeding forward
DISENGAGE SPEED	Engine RPM that the feed rollers will stop (and reverse if enabled)
FEED FORWARD	The digital output used to control the feed forward solenoid
FEED REVERSE	The digital output used to control the feed reverse solenoid
REVERSE TIME	Length of time the feed rollers will be reversed

ESP SETUP – DUAL VALVE

FEED CONTROL: CLOSE TO RUN
ENGAGE SPEED: 2250 RPM
DISENGAGE SPEED: 2050 RPM
FEED FORWARD: D/O #1
FEED REVERSE: D/O #2
REVERSE TIME: 0.3 SECONDS

RETURN TO OPERATING MODE

To enable/disable **ESP**:
1) Press ENTER while at the Operation Screen to access the Main Menu.
2) Use U/D buttons to highlight OPERATING MODE and press ENTER.
3) Use U/D buttons to highlight ESP MODE.
4) Use L/R buttons to ENABLE or DISABLE.

ESP settings can be configured by highlighting SETUP ESP MODE.

ESP DISABLE

When ESP is DISABLED in the Operating Mode screen the outputs assigned to FEED FORWARD and FEED REVERSE are set to an open state. The result will differ depending on the type of solenoids used to drive the feed system. If the FEED FWD TYPE is OPEN TO RUN then the rollers will continuously feed forward. If the FEED FWD TYPE is CLOSE TO RUN then the rollers will remain stationary.

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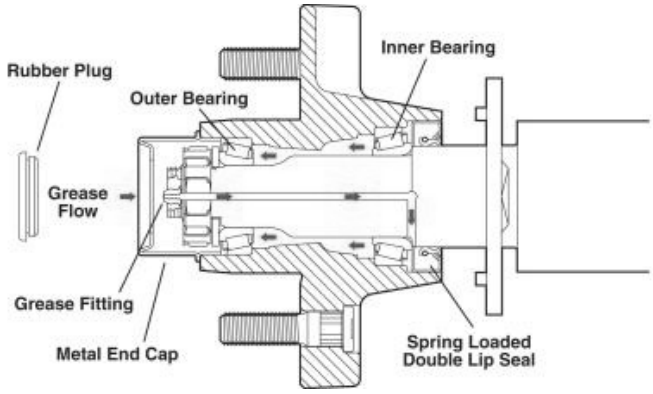
DEXTER AXLE

E-Z LUBE™
BEARING LUBRICATION SYSTEM



Axles equipped with Dexter's E-Z Lube feature can be periodically lubricated without removing the hubs from the axle. This feature consists of axle spindles that have been specially drilled and assembled with grease fittings in their ends. When grease is pumped into the fitting, it is channeled to the inner bearing and then flows back to the outer bearing and eventually back out the grease cap hole.

1. Remove the rubber plug from the end of the grease cap.
2. Place a standard grease gun onto the grease fitting located in the end of the spindle. Make sure the grease gun nozzle is fully engaged on the fitting.
3. Pump grease into the grease fitting. The old, displaced grease will begin to flow back out the cap around the grease gun nozzle.
4. When the new, clean grease is observed, remove the grease gun, wipe off any excess, and replace the rubber plug in the cap.

The E-Z Lube feature is designed to allow immersion in water. Axles not equipped with E-Z Lube are not designed for immersion and bearings should be repacked after each immersion. If hubs are removed from an axle with an E-Z Lube feature, it is imperative that the seals be replaced before bearing lubrication. Otherwise, the chance of grease getting on brake linings is greatly increased.

NOTE: The convenient lubrication provisions of the E-Z Lube must not replace periodic inspection of the bearings.

DEXTER AXLE

CAUTION

Do not mix Lithium, calcium, sodium or barium complex greases due to possible compatibility problems. When changing from one type of grease to another, it is necessary to insure all the old grease has been removed.

If your axles are equipped with oil-lubricated hubs, then your lubrication procedure is to periodically fill the hub with high quality hypoid gear oil to the level indicated on the clear plastic oil cap. The oil can be filled through the rubber plug hole in the cap.

Recommended Wheel Bearing Lubrication Specifications

Grease:

Thickener Type	Lithium Complex
Dropping Point	230°C (446°F) minimum
Consistency	NLGI No. 2
Additives	EP, Corrosion & Oxidation Inhibitors
Base Oil	Solvent Refined Petroleum Oil
Base Oil Viscosity	@40°C (104°F) 150cSt(695 SUS) Min.
Viscosity Index	80 Minimum
Pour Point	-10°C (14°F) Minimum

Approved Sources:

Mobil Oil	Mobilgrease HP
Exxon/Standard	Ronex MP
Kendall Refining Co.	Kendall L-427
Ashland Oil Co.	Valvoline Val-plex EP Grease
Pennzoil Prod. Co.	Premium Wheel Bearing Grease 707L

Oil:

SAE 90 Hypoid Gear (Hypoid Rear Axle Oil)

Use only with hubs equipped with oil option.

Approved Sources:

Union Oil Co.	Union MP, Gearlube - LS
Exxon Co. USA	Gear Oil GX 80W-90
Mobil Oil Corp..	Mobilube SHC 75W-90
Pennzoil Prod. Co.	Multipurpose Gear Lubricant 4092,
	Multipurpose Gear Lubricant 4096

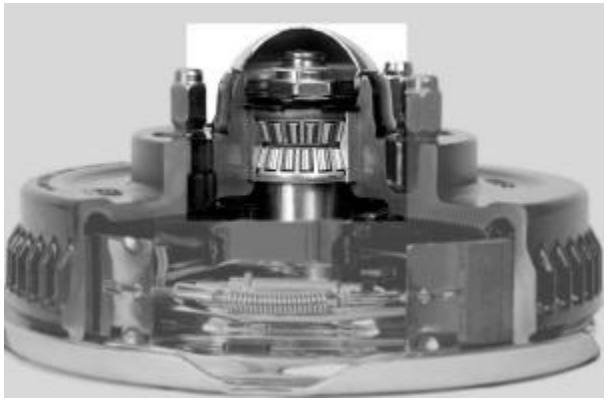
DEXTER AXLE

Maintenance Schedule

Item	Function Required	Weekly	3 Months or 3000 Miles	6 Months or 6000 Miles	12 Months or 12000 Miles
Brakes	Test that they are operational.	*At Every Use*			
Brake Adjustment	Adjust to proper operating clearance.		●		
Brake Magnets	Inspect for wear and current draw.			●	
Brake Linings	Inspect for wear or contamination.				●
Brake Controller	Check for correct amperage & modulation.			●	
Brake Cylinders	Check for leaks, sticking.				●
Brake Lines	Inspect for cracks, leaks, kinks.				●
Camshaft Bushings	Check for wear and breakage.			●	
Anchor Pins & Rollers	Lubricate with approved grease.			●	
Slack Adjuster Lubrication	Lubricate with approved grease.			●	
Trailer Brake Wiring	Inspect wiring for bare spots, fray, etc.				●
Breakaway System	Check battery charge and switch operation.	*At Every Use*			
Hub/Drum	Inspect for abnormal wear or scoring.				●
Wheel Bearing & Cups	Inspect for corrosion or wear. Clean & repack..				●
Seals	Inspect for leakage. Replace if removed.				●
Springs	Inspect for wear, loss of arch.				●
Suspension Parts	Inspect for bending, loose fasteners, wear.			●	
Hangers	Inspect Welds.				●
Wheel Nuts and Bolts	Tighten to specified torque values.		●		
Wheels	Inspect for cracks, dents or distortion.			●	
Tire Inflation Pressure	Inflate tires to mfg's. specifications.	●			
Tire Condition	Inspect for cuts, wear, bulging, etc.		●		

DEXTER AXLE

NEV-R-LUBE™
SEALED CARTRIDGE BEARING SYSTEM



Product Features

- No need to pull the hubs to repack the bearings OR replace the seals when checking the brakes.
- Pre-set adjustment means installation is easy and human error is virtually eliminated in bearing adjustment.
- Pre-lubricated at the bearing factory providing resistance to contamination.
- Sealed for life, which means increased durability and reliability and no more bearing maintenance.
- 5 year or 100,000 mile warranty against defects in material and workmanship.

WINCH INFORMATION

WARNING – 70 SERIES WINCH

1. Make sure clutch is totally engaged before starting any winch operation.
2. Never disengage clutch under load.
3. Stay clear and away from raised loads.
4. Stay clear of cable while pulling! Do not guide cable.
5. Do not exceed maximum line pull ratings.
6. Do not use winch to lift, support, or otherwise transport personnel.
7. A minimum of five wraps of cable around the drum barrel is necessary to hold the load. Cable clamp is not designed to hold load!

2-SPEED WINCH OPERATION

Unwinding Winch Cable

To unwind cable by hand, turn top lever to "FREE" (free spool). Turn side lever to "FREE" (free spool). Both levers should be in "FREE" positions to unwind cable.

WARNING

- Wear leather gloves when handling winch cable. Do not handle cable with bare hands. Broken wires cause injuries.
- When fully extending winch cable, make sure that five wraps of winch cable remain on drum at all times. Failure to do this may cause serious injury.
- Pull off cable by hand to desired length. Connect to load leaving one foot of slack in cable.

Pulling load

1. Turn top lever to "LOW" (lock low gear). Leave the side lever at "FREE" (free spool). This will engage the winch into low gear.

WARNING

- Direct all personnel to stand clear of winch cable during winch operation. A snapped winch cable will cause serious injury or death.
- Do not activate winch electric connector when engine is OFF with a LOAD on cable. This can put the winch into a retarded free spool mode.

2. Operate remote control switch to "IN" or "OUT" until load has been retrieved. Secure winch after operation.

CAUTION

- Winch cable must be wound onto the drum under a load of at least 500 lbs. or outer wraps will draw into the inner wraps and damage the winch cable.

OPERATION OF HIGH GEAR

Turn top lever to "FREE." Turn side lever to "HIGH" (lock high gear).

WINCH INFORMATION

GENERAL OPERATION

The vehicle's hydraulic pump is used to power the winch. The engine must be running for winch operation. The winch has maximum pulling capabilities at engine idle.

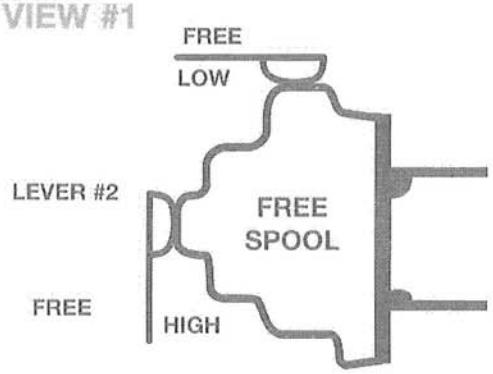
The winch is operated by an electrically activated hydraulic switching valve.

- Wear leather gloves when handling winch cable. DO NOT handle cable with bare hands as broken wires can cause injuries.
- When extending winch cable, ensure that at least five wraps of cable remain on drum under load. Serious personal injury or property damage may result.
- Ensure that all persons stand well clear of winch cable and load during winch operation, 1.5 times the cable length is recommended. If a cable pulls loose or breaks under load it can lash back and cause serious personal injury or death.
- Draping a heavy blanket or similar object over the extended winch cable is recommended as it will dampen any lash back should a failure occur.
- Ensure rated "D" or bow shackles are used in conjunction with an approved tree trunk protector to provide a safe anchor point.
- DO NOT operate the winch control when the engine is OFF and a load remains on the cable. This may put the winch into freespool mode when not required, therefore not holding the load.
- Ensure the winch clutch is totally engaged before starting any winch operation. When engaging or disengaging the clutch it may be necessary to rotate the drum by hand to align the clutch pin.
- NEVER disengage the winch clutch under load.
- Store the winch with clutch lever function in the HIGH GEAR position.
- The maximum winch capacity is available on the first layer of rope on the bare winch drum. During all winching operations it is recommended to unspool the rope back to the first layer so as to provide maximum capacity and avoid rope damage. Ensure that at least five wraps of cable remain on the drum at all times.
- The winch is a 2-speed unit, low speed for vehicle recovery winching and high speed for line retrieval.
- DO NOT use the winch to lift, support or otherwise transport personnel.
- DO NOT drive your vehicle to assist the winch in any way. Vehicle movement in combination with winch operation may overload the cable, the winch itself, or cause damaging shock loads.
- Shock loads when winching are dangerous! A shock load occurs when an increased force is suddenly applied to the cable. A vehicle rolling back on a slack cable may induce a damaging shock load.

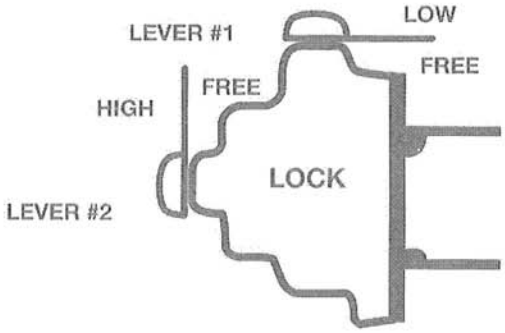
WINCH INFORMATION

HYDRAULIC 2-SPEED WINCH LEVER POSITIONS

VIEW #1

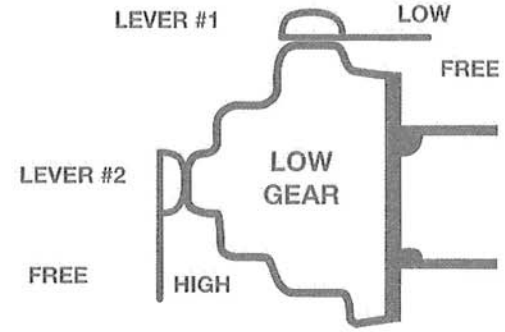


VIEW #2

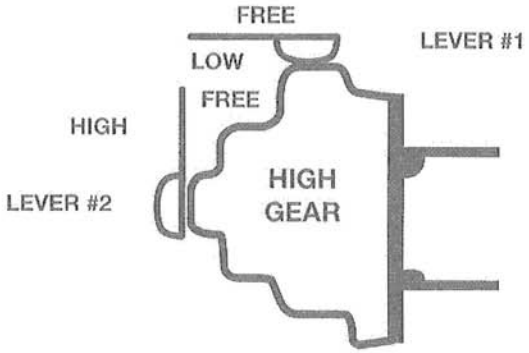


WARNING
DO NOT MOVE SHIFT LEVERS WITH LOAD ON WINCH CABLE!!

VIEW #3



VIEW #4



WARNING
DO NOT MOVE SHIFT LEVERS WHEN POWERING WINCH IN OR OUT!
LEVER POSITIONS AND WINCH MODES:

LEVER #1	LEVER #2	MODE	VIEW #
FREE	FREE	FREE SPOOL	1
LOW	HIGH	LOCK	2
LOW	FREE	LOW GEAR	3
FREE	HIGH	HIGH GEAR	4

PROFESSIONAL TREE EQUIPMENT

MODEL	TYPE	ENGINE	HP	FUEL	CUTTING DEPTH	CUTTING HEIGHT	CUT SWING	NO. TEETH	WHEEL DIA.	WHEEL THICKNESS	TONGUE EXTENSION	WEIGHT (lbs.)
900H	Walk-Behind	Honda	13	Gas	9"	21"	N/A	12	12.25"	.5"	N/A	220
SP2000	Walk-Behind	Kohler	27	Gas	24"	27"	N/A	16	19"	.5"	N/A	695
SP4012	Self-Propelled	Kohler	27	Gas	13"	34"	40" arc	20	21"	1"	30"	1,550
	Self-Propelled	Briggs-Vanguard	35	Gas	13"	34"	40" arc	20	21"	1"	30"	1,650
	Self-Propelled	Kubota	33	Diesel	13"	34"	40" arc	20	21"	1"	30"	1,650
SP7015	Self-Propelled	Deutz Turbo	60	Diesel	15"	43"	70" arc	32	26.5"	1"	N/A	3,500
SP7015TRX	Track-Mounted	Deutz Turbo	60	Diesel	15"	43"	70" arc	32	26.5"	1"	N/A	4,300
SP8018 TRX	Track-Mounted	Deutz Turbo	78	Diesel	18"	43"	80" arc	32	26.5"	1"	N/A	5,420
HURRICANE RS	Track-Mounted	John Deere Turbo	140	Diesel	25"	53"	360°	48	31"	1.5"	N/A	8,500
HURRICANE TRX	Track-Mounted	John Deere Turbo	140	Diesel	25"	72"	360°	64	36"	1.5"	N/A	12,000
	Track-Mounted	John Deere Turbo	175	Diesel	25"	72"	360°	64	36"	1.5"	N/A	12,000
	Track-Mounted	John Deere Turbo	250	Diesel	25"	72"	360°	64	36"	1.5"	N/A	12,000
3500D	Tow-Behind	Deutz Turbo	60	Diesel	15"	40"	80" arc	32	26.5"	1"	48"	2,900
7500	Tow-Behind	Deutz Turbo	78	Diesel	24"	46"	92" arc	48	31"	1.5"	60"	4,400

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15" Drum Chipper
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