9" Disk Style Brush Chipper
Model 1790

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

**DANGER**

NEVER touch, 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!

**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.

**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.

**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.)
**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.

**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.

---

**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.
**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.

**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.

**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)

**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.

**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.
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.

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.
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

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

REFER TO MAINTENANCE SECTION

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.
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
CHIPPER LIMITED WARRANTY

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. 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.
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 institute 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
   disk to come to a complete stop (which will take several minutes); install cutter disk 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
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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.

Carlton® has the heaviest duty 9-inch capacity disk 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® 9” 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.

This manual was written based on a 9” chipper supplied with a Kubota engine. If your chipper was supplied with a different brand of engine, some of the controls and other equipment may look or be positioned differently. However, the basic procedures will be the same or similar; always read all materials supplied with your chipper and call if you have any questions.

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.
Available Machine Features:

- 50-100 HP diesel turbo charged engine
- Reversing auto feed
- Digital tachometer
- Direct drive hydraulic pump
- Hydraulic variable flow control
- Auto-Feed® Plus system
- Twin lift cylinders
- Hand crank adjustable height and swivel discharge
- Axle 7000# cap
- Nev-R-Lube axle bearings
- Lockable tanks
- Electric brakes
- Front jack stand – 7000# Cap, Screw type
- Rear jack stand
- AR400 anvil
- 16 ply tires, rated 5000 pounds
- Tapered roller bearings
- 1 1/2” thick cutter disk
- 2 knives – 10 3/16” x 4” x 1/2”
- 17” x 9” throat opening
- 48” wide feed intake opening
- Two 10 1/2” x 17” feed rollers
- Adjustable feed rate
- Key start
- High capacity battery
- Lockable, steel battery box
- Epoxy primer
- Dupont Imron® paint
- Double wire braid hoses

We Pride Ourselves in the strength and quality of each and every machine
## Carlton Model 1790HD Specifications

### General:

- **Weight:** 5360 Pounds
- **Length:** 186 inches
- **Height:** 93 inches
- **Tires:** 235/85R16 Ld Rng D3200 Pnd Cap @ 65PSI
- **Axle:** Dexter Torflex 8,000 Pound Cap
- **Brakes:** Electric with Breakaway Switch
- **Hitch:** Five Inch Height Adjustable Pintle
- **Fuel Capacity:** 24 Gallons
- **Battery:** 29HVD 650 CCA
- **Jack Stand:** 7000 # Cap Screw Type Swing Up

### Hydraulic System:

- **Hyd Pump Displcmnt:** Double Pump Two .4 Cu in
- **Hyd Pump Drv Systm:** Direct Drive off Engine Mount
- **System Relief:** Two Independent 2500 PSI
- **Oil Tank Capacity:** 9 Gallons
- **Oil Type:** AW32
- **Valve:** DO5 Electric Operated
- **Hose:** 16,000 PSI Burst - Exceeds SAE 100R2
- **Oil Filter:** 10 Micron Return with Suction Strainer

### Engine:

- **Manufacturer:** Kubota Turbo Charged Diesel V3300T
- **Number of Cylinders:** Four
- **Bore:** 3.86 Inches (98 mm)
- **Stroke:** 4.33 Inches (110 mm)
- **Displacement:** 202.53 Cubic Inches (3.3L)
- **Maximum RPM:** 2800 RPM
- **Horsepower:** 88 HP
- **Cooling Medium:** Liquid Water/Antifreeze Mixture
- **Air Cleaner:** Two Stage Dry Type
- **Oil Filter:** Full Flow Spin On
- **Oil Capacity:** 14 Quarts
- **Oil Type:** SAE 10W40 CD Grade or Higher
- **Electrical:** 12 Volt
- **Gauges:** Oil Pres, Water Temp, Amp, Digital Tach
- **Clutch:** Stein

### Drive System:

- **Engine Sheave:** 4/5V8.5
- **Jackshaft Sheave:** 4/5V14.0
- **Drive Belt:** 4/5V1000
- **Cutter Head Shaft:** 3 1/2 inches
- **Feed Motors:** Two 32 Cubic Inch Displacement
- **Flow:** 4.4 GPM to Each Motor Independently
- **Hydraulic Drive:** Live – Driven off engine
- **Autofeed:** Reversing, Digital, Fully Adjustable
- **Feed Rate:** 100 Feet Per Minute
- **Feed Rollers:** Two 10 ½” x 17”
- **Springs:** Two 19” Tight Wound Powder Coated
- **Slide Bearings:** Four 16” x 1” x 1” Ryertex
- **Lift Cylinders:** Two 2 x 10 with 1” attachments
- **Discharge:** Crank Adjustable Swivel and Height

### Frame:

- **Main Trailer Tongue:** 3”x 4” with 1/4” wall
- **Main Trailer Frame:** 2”x4” with 1/4” wall
- **Telescoping Tongue:** N/A
- **Engine Channel Mnts:** 4” Channel with 5/16”
- **Infeed Chute:** 10ga with 2”x2”x1/8” tube frame
- **Folding Infeed Tray:** 10ga with 4”x11/2”x3/16” bracing
- **Folding Tray Lock:** ¾” Spring Loaded Pin
- **Discharge Chute:** 10 gauge
- **Discharge Lock:** ¾” Spring Loaded Pin
- **Fuel Tank:** 10 gauge with baffles rubber mtd
- **Hydraulic Tank:** 10 gauge with baffles rubber mtd
- **Battery Box:** 10 gauge checker plate - lockable
- **Fenders:** 3/16” checker plate
- **Feeder Bar:** 1 ½” OD x 1/8” wall - removable
- **Radiator Guards:** 2”x4” with 3/16” wall
- **Light Brackets:** 3/16” with hidden wiring
- **Axle Mounts:**
- **Hitch Plate:** ¾” Plate adjustable 5” Up/Down

### Cutting Dimensions:

- **Throat Opening:** 9” x 17”
- **Infeed Hopper Opening:** 29” x 48”

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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
Be Safe and Practice Safe Operation using the following guidelines.

- **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.
- 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.
**SAFETY PRECAUTIONS**

**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 open the cutter disk hood while engine is running. After the engine is turned off, allow the cutter disk to come to a complete stop before opening the cutter disk hood. This will take several minutes.
- Never run the chipper or the engine with the cutter disk hood open or unlocked at any time or for any reason.
- If the cutter disk hood or hinge is damaged, replace immediately.

**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**

- KEEP CUTTER DISK HOOD CLOSED WHILE CHIPPER IS RUNNING. Always make sure the cutter disk hood latch pin is in place and locked securely using a padlock before starting chipper. The cutter disk hood must be locked using the factory issued lock pin and padlock.
- 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.

**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 disk takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter disk lock pin is installed in the disk 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 9” 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.)

**WARNING**

- 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 disk takes several minutes to come to a complete stop
- The cutter disk lock pin is installed in the disk 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 cutter disk
  ❖ Keep away from moving parts
  ❖ Only run in a well ventilated area because of carbon monoxide poisoning

• 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.

BECAUSE OF MACHINE VIBRATION, ALL EQUIPMENT ATACHED 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.
• Check tires air pressure. Inflate to tire manufacturers recommended maximum inflation pressure. Inspect tires for wear. Inspect axle caps, replace caps if necessary. Grease axles as suggested by manufacturer.

• Inspect hitch and hitch bolts. Make sure the tongue extension (if equipped) is properly bolted in place.

• Make sure all guards are in place and properly secured.

• Check tail and brake lights for proper operation.
• 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 9” chipper knife bolts and nuts (1/2”-13) are specially designed. Torque to 90 ft. lbs.

• Inspect cutter disk 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 Disk Section to change or sharpen knives and anvil.)

• Cutter disk must rotate freely. This will help ensure there are no foreign objects inside the cutting chamber and there is ample knife to anvil clearance. (The cutter disk lock pin will have to be pulled out of cutter disk to check rotation. Replace pin after checking rotation to perform further inspections.)

• When inspection of cutter disk is complete, close cutter disk hood, insert hood lock pin and padlock. Make sure hood will not open. Check cutter disk hood 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 DISK LOCK PIN MUST BE IN LOCK TUBE AND THE UPPER FEED WHEEL MUST BE RAISED AND BLOCKED WHEN INSPECTING THE ANVIL EDGE.

• 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 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.

• Inspect radiator screen. 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, 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. Do not fill tanks more than 7/8 full to allow for heat expansion. (See Service Hydraulics section for more information on hydraulic tank.)

NEVER REFUEL OR ADD OIL: WHILE ENGINE IS RUNNING, WHILE IN AN ENCLOSED AREA, OR WHILE ENGINE IS HOT.

• Inspect air filters for dirt and damage, clean or replace as necessary. DO NOT TAP ON GROUND OR BLOW OUT. REPLACE WITH MANUFACTURER RECOMMENDED AIR FILTERS ONLY.

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)

- 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.
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:

- Key Switch and Gauges are located in clear view on the engine housing.

**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.)

- Key switch has 3 positions
  - Off, Run and Start

- There is an emergency shutdown bypass switch, which must be held down during starting. (If the engine experiences low oil pressure or high temperatures when running, this switch will shut down the engine.)

- Also in the control box are the voltage meter, engine temperature, and oil pressure displays. The configuration at the right is typical but may vary depending on the exact engine supplied with your chipper.
• 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 hydraulic yoke lift or 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.

• A two-position throttle is located on the engine cowling. 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.
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 disk up to speed by controlling the engagement handle to slowly engage the clutch. If handle is bumped or released to quickly, the clutch will engage to fast and clutch damage could occur. The Stein clutch is a spring force clutch and does not take as much force as an over-center clutch.
  - The clutch is engage fully when the handle is in a vertical position.
  - New clutches or new facings require several frequent adjustments until the friction facings have “worn in”. (See the clutch section for information on making adjustments.)

CUTTER DISK HOOD SAFETY SWITCH

- The chipper is equipped with a cutter disk hood safety switch that will keep the engine from starting if the clip is not in position or if it is not correctly attached. The clip is attached to the cutter disk hood lock pin, which should also be locked with a padlock after insertion.
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 DISK 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
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
(OPTIONAL EQUIPMENT)

- The Carlton chipper may be 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.
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 and the rear jack stand must be used. The front jack stand can be attached to the tongue on either side of the machine. The jack stand can then be rotated up and stored on either side of the machine during transport.

REAR JACK STAND

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

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 handle on the clean out door, located behind the infeed chute under the machine, 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.
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.
• Two hydraulic valves control the winch on this chipper. The hydraulic winch 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 9” chipper winch selector valve is located on the hydraulic valve box. There is a decal that shows the proper operation (pictured at the right). Push the valve to the left to turn the feed wheels on and to the right to turn the winch on.

• The winch control lever is the right hand 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 counterclockwise 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.

• Read the winch manufacturer’s instruction manual for complete information.
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 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.

- 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 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 may be used on either the left or right sides of the machine and must be secured to the tongue for towing.

- Make sure the rear jack stand is raised and secured in the up position before towing the chipper.
- The chipper infeed tray must be closed and locked when towing.
- First, check the lock pins behind the infeed chute frame to make sure they are in their storage position.
- Then close the tray and make sure the spring lock pin is in position and the tray is secured.

- 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. Position the discharge flap in its lowest position so debris will not fly out of the discharge chute.

- 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 MACHINE IS RUNNING.
• NEVER REACH OR KICK INTO THE INFEED CHUTE FOR ANY REASON.
• KEEP CHIPPER HOOD CLOSED WHILE MACHINE IS RUNNING. ALWAYS MAKE SURE CUTTER DISK HOOD 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:
• Check all fluids before starting.
• Daily Checklist must be completed before starting.
• PTO/Clutch must be disengaged before starting.
• Cutter disk hood 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.
LOWER THE INFEED TRAY

- During transportation the infeed tray will be closed and locked using the spring lock pins attached. At the job site, release the lock pins and lower the tray.

- There are two removable lock pins located at the back of the infeed frame, there is a pin on each side of the frame. Once the tray is fully lowered, remove the pins and lock the tray into position as shown in these pictures. Make sure there is no brush or other obstruction between the tray and the hopper so that the tray will lower fully.
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 DISK IS SPINNING

- 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 DISK IS SPINNING

- 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 disk is running.
• 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 DISK IS SPINNING

START ENGINE

• Key Switch and Gauges are located in clear view on the engine housing
• Key switch has 3 positions
  - Off, Run and Start
• There is an emergency shutdown bypass switch, which must be held down during starting. (If the engine experiences low oil pressure or high temperatures when running, this switch will 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.)
• Start engine at idle speed and allow sufficient time for oil to circulate before proceeding. A two-position throttle is located on the engine cowling. 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.)

• 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.)
  – Pull feed control bar to the rear of the machine to test forward (pulling) feed wheel motion
  – Push feed control bar to the middle position to test off position (feed wheels should not turn at all)
  – Push feed control bar all the way toward the front of the machine to test the reverse feed wheel motion
TURN AUTO-FEED PLUS ON

- 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 disk up to speed by controlling the engagement handle to slowly engage the clutch. If handle is bumped or released to quickly, the clutch will engage to fast and clutch damage could occur. The Stein clutch is a spring force clutch and does not take as much force as an over-center clutch.
  - The clutch is engage fully when the handle is in a vertical position.
  - New clutches or new facings require several frequent adjustments until the friction facings have “worn in”. (See the clutch section for information on making adjustments.)

- 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 up to increase engine speed.
- The engine should always be run at high RPM while material is being chipped. This 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 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 9” 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.
The Carlton chipper may come 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 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.

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 rotate the winch selector valve counter-clockwise to engage 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. Rotate the winch selector valve back to the left (clockwise) 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 disk 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 disk and belts to come to a complete stop, which will take several minutes.
- **Remove the ignition key.**
• The chipper infeed tray must be closed and locked when towing. Make sure the spring lock pins are in position and the tray is secured. First the lock pins behind the infeed chute frame will have to removed and put back into their storage position. Make sure there is no other obstruction, such as limbs, bark, or leaves, in between the infeed chute and the tray.

• 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.

Remove the wheel chocks before moving the chipper.
ENGINE

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

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 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 disk takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter disk lock pin is installed in the disk 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.
• 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.

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. Clean fins from opposite direction of air flow. 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.

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.

DIESEL FUEL
• Check fuel level daily and replenish as necessary. Carlton chippers are equipped with lockable cap covers.
FUEL FILTER & FUEL/WATER SEPARATOR
Read the engine manual for special instructions about fuel filter cleaning and replacement. 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.**

COOLANT SYSTEM

![Coolant Filler Cap](image)

**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.
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**.
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.
- 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.

JACK STAND – REAR

- 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.
TIRE AND AXLES

- Check tires air pressure daily. Inflate tires as necessary. Keep tire 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

- Periodically 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.

<table>
<thead>
<tr>
<th>CARLTON PROFESSIONAL TREE EQUIPMENT – MODEL 1790</th>
<th>0 HRS</th>
<th>200 HRS</th>
<th>600 HRS</th>
<th>1000 HRS</th>
<th>SPECIAL COMMENTS</th>
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</thead>
<tbody>
<tr>
<td>FEED WHEELS ROLLER BEARINGS (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ONE PUMP OF GREASE DAILY ON EACH BEARING</td>
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<tr>
<td>FEED WHEELS CONTROL BAR (2)</td>
<td></td>
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<td></td>
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<td>GREASE AS NECESSARY</td>
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<tr>
<td>CUTTER DISK BEARINGS (2)</td>
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<td></td>
<td></td>
<td>PURGE BEARINGS, DAILY, UNTIL NEW GREASE IS SEEN</td>
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<tr>
<td>WHEEL AXLE BEARING (2)</td>
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<td></td>
<td>SEE OWNER INFORMATION FOR E-Z LUBE OR HEV-9-LUBE AXLES (INCLUDED IN MANUAL)</td>
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<tr>
<td>DISCHARGE CHUTE</td>
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<tr>
<td>SWIVEL PLATES (3)</td>
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<td></td>
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<td></td>
<td>EVERY 3 MONTHS GREASE THE SWIVEL PLATES</td>
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<tr>
<td>SWIVEL HANDLE (1)</td>
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<td>GREASE AS NECESSARY</td>
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<td>HEIGHT ADJUSTMENT (1)</td>
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<td>GREASE AS NECESSARY</td>
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<tr>
<td>PTO/CLUTCH – STEIN MFG. (IF EQUIPPED)</td>
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<tr>
<td>CROSS SHAFT (1)</td>
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<td></td>
<td></td>
<td></td>
<td>EVERY 200 HOURS OF OPERATION ADD 1 OR 2 PUMPS OF GREASE</td>
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<tr>
<td>BEARING (1)</td>
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<td></td>
<td>GREASE EVERY 100 HOURS OF OPERATION. 3-5 PUMPS WITH A HAND OPERATED GREASE GUN IS SUFFICIENT.</td>
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<tr>
<td>PTO/CLUTCH – TWIN DISC (IF EQUIPPED)</td>
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<tr>
<td>CROSS SHAFT (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EVERY 500 HOURS OF OPERATION ADD 1 OR 2 PUMPS OF GREASE</td>
</tr>
<tr>
<td>MAIN BEARING (1)</td>
<td></td>
<td></td>
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<td>ADD GREASE EVERY 500 HOURS OF OPERATION UNTIL GREASE IS FORCED OUT THE Labyrinth SEAL AROUND THE SHAFT. OBTURATE THE SHAFT BY HAND WHILE ADDING GREASE. DAILY ADD 1 TO 2 PUMPS – ROTATE SHAFT BY HAND WHILE ADDING GREASE</td>
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<tr>
<td>RELEASE BEARING (1)</td>
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<td>WINCH (OPTIONAL)</td>
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<tr>
<td>WINCH PLUNGERS (2)</td>
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<td></td>
<td>SPRAY LUBRICANT SUCH AS WD-40 TO KEEP FROM FREEZING UP</td>
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<tr>
<td>WINCH ROLLER GUIDES (4)</td>
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<td>GREASE AS NECESSARY</td>
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<tr>
<td>ENGINE</td>
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<td></td>
<td></td>
<td>REFER TO ENGINE MANUFACTURERS MANUAL FOR PROPER ENGINE SERVICING</td>
</tr>
</tbody>
</table>

1790-B_A (4/5/96)
CHIPPER – LEFT SIDE

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

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CHIPPER – RIGHT SIDE

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

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

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

- **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

- **CUTTER DISK BEARING**
  - GREASE FITTING
  - *(BELT SIDE)*
  - * PURGE BEARINGS DAILY, UNTIL NEW GREASE IS SEEN

- **CLUTCH ENGAGEMENT HANDLE (CROSS SHAFT)**
  - GREASE FITTING
  - * EVERY 200 HOURS OF OPERATION ADD 1-2 PUMPS OF GREASE

- **CUTTER DISK BEARING (BELT SIDE)**
  - GREASE FITTING
  - * PURGE BEARINGS DAILY, UNTIL NEW GREASE IS SEEN

- **PTO/CLOUTCH BEARING**
  - GREASE FITTING
  - * GREASE EVERY 50 HOURS OF OPERATION. 3-5 PUMPS WITH A HAND OPERATED GREASE GUN IS SUFFICIENT.

- **EQUIPPED WITH DEXTER AXLES, EITHER E-Z LUBE® OR NEV-R-LUBE® – SEE DEXTER INFORMATION ENCLOSED IN MANUAL**
CHIPPER – WINCH (OPTIONAL EQUIPMENT)

WINCH ROLLERS
GREASE FITTINGS
(2 ON TOP – 2 ON SIDE)
(4 TOTAL)
* GREASE AS NECESSARY EVERY 30-40 HOURS OF OPERATION

WINCH PLUNGERS
GREASE FITTINGS
* SPRAY LUBRICANT ON PLUNGERS EVERY 30-40 HOURS OF OPERATION
DO NOT PERFORM ANY INSPECTION OR SERVICE ON THE CHIPPER WITHOUT MAKING SURE: THE CUTTER DISK IS DIENGAGED AND HAS COME TO A COMPLETE STOP; THE CUTTER DISK 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.

<table>
<thead>
<tr>
<th>COMPLAINT</th>
<th>CAUSE</th>
<th>CORRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharged chips are not correct size: too large or too fine</td>
<td>• Knives have lost their edge&lt;br&gt;• Knife anvil worn&lt;br&gt;• Check for wear in the throat/base area (non-cutting areas)&lt;br&gt;• Knife angle is not correct&lt;br&gt;• Material being chipped is very small, dry or rotting</td>
<td>• DO NOT operate chipper with dull knives or with mismatched knives (see Servicing Cutter System section)&lt;br&gt;• Rotate, repair, or replace (see Servicing Cutter System section)&lt;br&gt;• Outer, non-cutting edges that are exposed to chipper knives must be built up with weld to maintain surface to original integrity&lt;br&gt;• Make sure knives are ground at correct angle (see Servicing Cutter System section)&lt;br&gt;• This type of material does not produce good chip quality</td>
</tr>
<tr>
<td>Cutter disk knife hits anvil</td>
<td>• Anvil to knife clearance is not correct&lt;br&gt;• Check the chipper bearing retainer cap for tightness</td>
<td>• See Servicing Cutter System section for adjustment&lt;br&gt;• Retighten bolts or setscrews as tight as possible</td>
</tr>
<tr>
<td>Discharge chute clogs or chips are not discharging properly</td>
<td>• Lugging engine on large material&lt;br&gt;• Obstruction in discharge chute&lt;br&gt;• Chipping rotting material that has little substance can also plug the discharge chute</td>
<td>• Keep engine speed up and use feed control bar to reverse material if engine lugs down&lt;br&gt;• Any object that protrudes inside the chute may cause clogging; replace discharge chute, if necessary&lt;br&gt;• Use care when running this type of material; “flush” the discharge chute with material that has more substance</td>
</tr>
<tr>
<td>COMPLAINT</td>
<td>CAUSE</td>
<td>CORRECTION</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Chipper bearings are overheating</td>
<td>• Bearings are dry</td>
<td>• Grease bearings daily using Texaco® Starplex II grease</td>
</tr>
<tr>
<td></td>
<td>• Check the chipper bearing retainer cap for tightness</td>
<td>• Retighten bolts or setscrews as tight as possible</td>
</tr>
<tr>
<td></td>
<td>• Bearings worn out</td>
<td>• Replace</td>
</tr>
<tr>
<td></td>
<td>• Setscrews on sheave side bearing not tight</td>
<td>• Tighten</td>
</tr>
<tr>
<td>Feeding material causes feed wheels to slow down or stop</td>
<td>• Dull knives</td>
<td>• Replace knives (see Servicing Cutter System section)</td>
</tr>
<tr>
<td></td>
<td>• Relief valve is worn or dirty</td>
<td>• Clean or replace; reset pressure</td>
</tr>
<tr>
<td></td>
<td>• Pump has excessive wear</td>
<td>• Replace</td>
</tr>
<tr>
<td></td>
<td>• Feed wheel motor(s) not working properly</td>
<td>• Check &amp; replace</td>
</tr>
<tr>
<td></td>
<td>• Feed wheel springs to tight</td>
<td>• Adjust</td>
</tr>
<tr>
<td>One or both feed wheels don’t turn or turn too slow to feed material</td>
<td>• Feed wheel motor(s) not working properly</td>
<td>• 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</td>
</tr>
<tr>
<td></td>
<td>• Relief valve opens too easily or stuck open</td>
<td>• Valve needs to be cleaned or replaced; reset pressure</td>
</tr>
<tr>
<td></td>
<td>• Feed wheel valve (control valve) worn &amp; leaking internally</td>
<td>• Check &amp; Replace</td>
</tr>
<tr>
<td></td>
<td>• Feed wheel relief pressure off</td>
<td>• Reset pressure to 2500 PSI</td>
</tr>
<tr>
<td></td>
<td>• One or more hoses may be crimped or leaking</td>
<td>• Replace (see Servicing Hydraulics section)</td>
</tr>
<tr>
<td></td>
<td>• Hydraulic oil level low</td>
<td>• Keep oil level about 7/8 full</td>
</tr>
<tr>
<td></td>
<td>• Pump has excessive wear</td>
<td>• Replace pump</td>
</tr>
<tr>
<td></td>
<td>• Feed wheels binding</td>
<td>• Check bearings, lubricate properly</td>
</tr>
<tr>
<td></td>
<td>• Control lever improperly shifting valve</td>
<td>• Readjust; valve must open completely</td>
</tr>
<tr>
<td></td>
<td>• Worn or dirty flow divider</td>
<td>• Clean or replace</td>
</tr>
</tbody>
</table>
## COMPLAINT

### Hydraulic oil overheating and causing chipper to operate slower than normal
- 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

**Correction:**
- Check & replace pump, if necessary
- Replace (see Servicing Hydraulics section)
- Valve needs to be cleaned or replaced; reset pressure
- Check 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

**Correction:**
- Contact JP Carlton or local dealer for recommended oil type for the situation
- Allow system to warm up
- Replace pump

### Auto-Feed not working properly or at all
- Faulty or broken wiring
- Settings not correct
- All other problems contact your local dealer or J. P. Carlton Co.

**Correction:**
- Repair or replace wires – wiring diagram enclosed in this manual
- Reset following Auto-Feed manual instructions enclosed in this manual

### Chipper won’t start
- Chipper disk hood safety switch clip not in position

**Correction:**
- Check chipper disk hood safety switch to make sure clip is attached correctly and fully

---

**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 disk takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter disk lock pin is installed in the disk 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.
- Carlton chippers are equipped with lockable cap guards.
• 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.

• Change hydraulic oil every 500 hours of operation or at least 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. When the cooler is mounted as shown, the engine radiator fan keeps the oil cool.

• 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.
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

- If feed wheels start to run slow when engine RPM is high, check hydraulic pressure.
- Remove the plug in the top right rear corner of the hydraulic block, hole marked “G”, and install a pressure gauge.
- Test the hydraulic pressure. With the engine at idle and with the cutter disk disengaged, run a log between the feed wheels and butt it against the cutter disk. Turn Auto-Feed off to operate feed wheels with engine at idle, see Machine Controls section. Check the pressure reading.
- The overall hydraulic pressure setting is 2500 PSI, preset at the factory, and should remain set at that 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.
• Turn the feed wheel adjustment plug clockwise until it bottoms out, setting it at the maximum system pressure of 2500 PSI. Always check to make sure it is turned all the way in and then test and adjust the system pressure if the feed wheels turn too slow or don’t turn. Contact J. P. Carlton or your dealer for more information.

• Adjust pressure only if necessary and after testing with a pressure gage. The pressure adjustment is under the hydraulic block. To increase pressure turn clockwise and to decrease pressure turn counterclockwise. Recheck and adjust pressure until correct.

• If equipped with the hydraulic yoke lift, the 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 and counterclockwise to decrease pressure.

ONLY USE QUALIFIED PERSONNEL TO WORK ON HYDRAULIC SYSTEMS FOR REPAIRS OR REPLACEMENT OF PARTS!!
A good maintenance program is imperative for the PTO/Clutch. Read the Stein PTO/Clutch information supplied in this manual or read the Twin Disc manual supplied with the chipper depending on the engine and clutch supplied on your chipper. The PTO/clutch requires a maintenance plan that includes lubrication and adjustment to get the most service and use from the clutch.
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. The PTO bearing should be lubricated after each 50 hours of operation. 3-5 pumps with a hand operated grease gun is sufficient. DO NOT OVER GREASE!
2. PTO cross shaft (engagement linkage) – grease every 200 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.
**Operation of Clutch**

- Clutch Handle in Vertical Position...
- Clutch Disengaged
- Clutch Handle in Horizontal Position
- Clutch Engaged

**Note:** Care should be taken in engaging the clutch slowly enough to prevent stalling of power unit.

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**Adjustment of Clutch Linkage**

With the clutch in the engaged position (handle vertical) there should be approximately 1" to 1½" of free play at the end of the handle without pressure being applied to engage clutch. Without free play, premature failure of clutch throwout bearing will result.

To adjust clutch linkage, loosen the two ⅜" hex nuts as shown in the picture by arrow. Check to make sure the PTO turns freely in the disengaged (handle horizontal) position. If the PTO has resistance to turning, adjust the nuts out toward the clutch fork. Check again for free play in the handle vertical position. After adjustments are made, lock the two ⅜" hex nuts together.
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 disk takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter disk lock pin is installed in the disk 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.

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 counterclockwise 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.
Cutter disk 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.

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.
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 disk hood until the cutter disk has come to a complete stop. Do not perform service on the cutter disk or knives without installing the disk lock pin.

- Remove the padlock and lock pin from the cutter disk hood and open.
- The cutter disk lock pin will have to be removed to rotate the cutter disk and inspect the knives. Use extra care when rotating the cutter disk to prevent injury. Always wear leather gloves when performing any service on the cutter disk system.

DANGER – KNIVES ARE EXTREMELY SHARP

- Inspect knives. If knives are still in good shape, proceed with other inspections or maintenance. To change knives, follow these procedures.
- **Install the cutter disk lock pin.** Rotate the cutter disk slowly to line up and insert the pin.
- Remove the four bolts and nuts holding each knife in place on the cutter disk.
- Inspect the bolts and nuts carefully for worn, chipped, or stripped threads.
- Do not remove and replace knife bolts and nuts more than 3 times before replacing with new bolts and nuts.
- **Knife bolts are of a particular design and nuts are security lock nuts. DO NOT USE ANY OTHER STYLE OF BOLTS AND NUTS.** You must purchase these bolts and nuts from Carlton or an authorized dealer.
• 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. Make sure all knife edges line up in the set of four.

• 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 1 13/16" 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 disk balanced reducing chipper vibration and improving cutting. A set is two knives, a knife in each of two opposing pockets.

• **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 and torque the nuts to 90 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 disk 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, if equipped, to raise the upper feed wheel. Insert the yoke lock pin into the yoke lock tube.
• Place a block of wood 4” x 9” x 16” between the feed wheels.

• 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.
• Check the clearance between the knives and the anvil. The clearance for the knife to anvil should be between .045” and .065” (1.14 – 1.65 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 the top and bottom of each knife assembly.

• One person will need to be in the infeed chute area to check the clearance between the anvil and the knives. While another person is outside to make the adjustments and to turn the cutter disk. The disk will have to be rotated fully to check both knife settings.

• This is one time that the cutter disk lock pin will not be in position so extreme care needs to be taken for safety. Before allowing anyone to be in the infeed chute, make sure there is no obstruction or binding in the cutter disk by turning it by hand from the outside first. If the cutter disk 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.

• If clearance needs to be adjusted, loosen the two anvil bolts; just loose enough to be able to move the anvil with the adjuster bolts.
• Loosen the nuts on the adjustment bolts that are on the far side of the plate (as shown). There are two adjustment bolts.
• Using the nuts on the inside of the plate, turn the nuts up toward the machine to move the anvil closer to the knife. This will shorten the clearance if it was too wide. Make slight adjustments as the clearance is being checked.
• Or, you will need to loosen the nuts on the inside of the plate and turn the outside nuts down if the clearance is too narrow for the feeler gage to go in easily. This will move the anvil farther away from the knife.

• 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.
• Checking and setting the clearance by the knife that is the closest to the anvil will be the best place to start. Check clearance at the top and bottom of all knives.
• Clearance should be .045” - .065” (1.14 – 1.65 mm).

• ALWAYS REMEMBER TO CLOSE THE CUTTER DISK HOOD AFTER SERVICING CUTTER DISK.
• INSTALL THE HOOD LOCK PIN AND PADLOCK.
• Check condition of cutter disk hood. Make sure the hinges are not damaged and that the hood closes completely with no gaps or openings; check both sides. If there are any problems go to Servicing Cutter Disk Hood later in this section.
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 1 13/16”.

- 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 1 13/16”.
  2. Always use knives in sets of two 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

<table>
<thead>
<tr>
<th>PART NO</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0900123</td>
<td>10 3/16” x 4” x 1/2” Knife 1790</td>
<td>2</td>
</tr>
<tr>
<td>0900125</td>
<td>1/2” Knife Bolt – Special Design – Purchase from JP Carlton or Dealer</td>
<td>8</td>
</tr>
<tr>
<td>0900126</td>
<td>1/2” Security Lock Nuts – Purchase from JP Carlton or Dealer</td>
<td>8</td>
</tr>
</tbody>
</table>
DANGER:
- TURN ENGINE OFF
- REMOVE IGNITION KEY
- DISENGAGE CLUTCH
- PUT FEED CONTROL BAR IN NEUTRAL
- ALLOW CUTTER DISK TO COME TO A COMPLETE STOP
- ALLOW ALL PARTS TO COOL COMPLETELY
- INSTALL CUTTER DISK LOCK PIN

ANVIL REPLACEMENT

- Check the anvil for wear when knives have been changed and clearance is being set. The anvil has four working edges that can be used before having to be replaced. Rotate the anvil to a new working edge unless all edges are worn and the anvil needs replacing.
- Do not grind the anvil to get more life. There is only a certain amount of adjustment available for clearance and if the anvil is ground you will lose that adjustment capability.
- 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 three anvil bolts, each with a square washer and a lock washer.
- There are two adjuster eyebolts that the anvil bolts go through.
- Remove the nut on the outside of each adjuster bolt.
• Use the handle on the anvil to rotate the anvil 90° and pull it through the slot.

• Remove the handle from the anvil and turn the anvil to a good working edge. The working edge that was being used is on the back opposite side from the handle.

• Replace the handle either in the same hole on the other side of the anvil or remove the setscrew and insert the handle in the hole on the opposite side of the anvil. Use LocTite® Red 262 on the handle when replacing and torque jam nut to 25 ft. lbs. (5/16”-18 bolt).

• A setscrew must always be in the hole next to the working edge to keep debris out of the hole (see picture at right). Insert the setscrew on the handle side of the anvil to prevent clogging the wrench slot. Use LocTite® Red 262 on the setscrew when replacing to keep the setscrew from working out of hole or damage will occur because of tight tolerances.

• Replace with a new anvil if all working edges are worn or damaged. Do not grind the anvil to get more life. There is only a certain amount of adjustment available for clearance and if the anvil is ground you will loose that adjustment capability.

• 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.
• Use the handle and put the anvil back through the slot. Rotate the anvil back 90° to insert the anvil bolts.
• Make sure the hardware is replaced in the correct order. The square washer has to be next to the machine. For both anvil bolts, the adjuster eyebolt would go on next. The lock washer will go closest to the head of the bolt on all bolts.
• The adjuster bolts 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.
• Tighten the anvil bolts loosely. 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 clearance has been set be sure to tighten the anvil bolts and torque to 75 ft. lbs.
• Tighten the nuts on the adjuster bolts.

• ALWAYS REMEMBER TO CLOSE THE CUTTER DISK HOOD AFTER SERVICING CUTTER DISK.
• INSTALL THE HOOD LOCK PIN AND PADLOCK.
• Check condition of cutter disk hood. Make sure the hinges are not damaged and that the hood closes completely with no gaps or openings; check both sides. If there are any problems go to Servicing Cutter Disk Hood later in this section.
SERVICING CUTTER DISK HOOD

- Inspect cutter disk hood for fit and damage daily. Check for cracks around welds.
- Check hood hinges making sure hood closes completely with no gaps or openings; check both sides.
- Hood 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 DISK HOOD IS ONE OF THE MOST IMPORTANT PIECES OF SAFETY EQUIPMENT ON THIS CHIPPER. MAKE SURE IT IS KEPT IN GOOD WORKING CONDITION.

CUTTER DISK BEARINGS

- Check cutter disk bearing bolts weekly for tightness. Replace any bolts that have worn, chipped, or missing threads.
- If bolts are loose and need tightening, use LocTite® 608 (Green) and torque the bolts to the normal spec listed in the torque wrench chart for the correct size and Grade 8 bolts.
- Remove the bearing cover on the right side of the chipper and check the retainer bolt. The bearing retainer bolt is a 3/4”-16 bolt on the end of the cutter disk shaft. Coat the bolt with LocTite® 680 (Red) and torque to the normal spec listed in the torque wrench chart for Grade 8 bolts to retighten.
BELT TENSION

CHECK BELT TENSION

- New belts will stretch and become loose as machine runs. Check belt tension often when belts are new.
- Belts should deflect 1/2" when a force of 8.5-9.5 lb. is applied to new belts or 7.5-8.5 lb. to used belts. Check tension through the slot on the belt guard.

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 disk takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter disk lock pin is installed in the disk 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 MUST BE OFF AND IGNITION KEY REMOVED BEFORE CHECKING BELT TENSION. ALL PARTS MUST BE COMPLETELY STOPPED.

- 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 belts 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 1/2”, the belts tension needs to be adjusted. If the measurement is much less than 1/2”, the belts tension is too tight.
- Do not over tighten the engine belts. Overly tight belts will cause damage to PTO/clutch bearings and to cutter disk bearings.

ADJUST BELT TENSION

- Loosen engine slide bolts (four places). Bolts are secured through a block under the frame and will require only one wrench to loosen the 5/8” bolts.
Loosen inside jam nuts on adjustment bolts (two places). Turn the outside jam nuts clockwise, moving the engine closer to the right side of the machine and tightening the belts. Make similar adjustments to both bolts to keep sheaves aligned.

- Recheck tension after making a slight adjustment to both bolts.

- **Do not** over tighten the engine belts. Overly tight belts will cause damage to PTO/clutch bearings and to cutter disk bearings.

- Continue making slight adjustments and rechecking tension until correct tension is achieved.

- When tension is correct, tighten the inside jam nuts.

- Retighten the engine slide bolts and torque to 125 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.

- **ALWAYS REMEMBER TO REPLACE BELT GUARDS BEFORE STARTING MACHINE. ROTATING BELTS AND SHEAVES ARE DANGEROUS AND COULD SEVERELY INJURE SOMEONE.**
REPLACING BELTS

- Replace belts when they are worn or regularly need adjustment.
- Replace belts as a complete set. Old or worn belts will not tension the same as new belts.
- Remove belt guard bolts and remove belt guard.

- Loosen all four engine slide bolts.
- Loosen outside jam nuts (two places) and turn inside jam nuts counterclockwise to move engine back and loosen belts enough to remove over sheaves. **Clutch should be disengaged.**
- Jam nuts will only need to be turned a few turns to loosen belts.

- Cutter disk lock pin should be removed to allow the sheaves to turn in removing the belts. **DO NOT HAVE CUTTER DISK HOOD OPEN.**
- Remove all four belts. It may be a good idea to start removing 2 belts from each sheave as shown in the pictures to the right.

- Install new belts using the same procedure only in reverse.
- Never pry new belts onto the sheave!
• Once belts have been replaced, you will need to loosen the inside jam nuts and tighten the outside jam nuts.
• When belts start getting tight, check tension.

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

• Tighten outside jam nuts locking down the adjustment.
• Retighten the engine slide bolts and torque to 125 ft. lbs.

• ALWAYS REMEMBER TO REPLACE BELT GUARDS BEFORE STARTING MACHINE. ROTATING BELTS AND SHEAVES ARE DANGEROUS AND COULD SEVERELY INJURE SOMEONE.
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 cutter disk sheave and bushing. Follow the same procedure for removing the engine sheave and bushing.
• Remove belt guard bolts and remove guard.
• Mark position of bushing on shaft before removing for lining up bushing when replaced.

• Remove belts as described in Replacing Belts 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 at the location marked on the shaft earlier.

• Go to Replacing Belts section to replace belts and adjust tension. Make sure sheaves are aligned when retightening belts to the proper tension.

• ALWAYS REMEMBER TO REPLACE BELT GUARDS BEFORE STARTING MACHINE. ROTATING BELTS AND SHEAVES ARE DANGEROUS AND COULD SEVERELY INJURE SOMEONE.
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.

CHANGE MOTORS ONE AT A TIME.

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

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 disk takes several minutes to come to a complete stop
- All machine parts have had sufficient time to cool down
- The cutter disk lock pin is installed in the disk 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.

Before changing 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 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.

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.
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 lower feed motor, but is still held on with two bolts.)
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.

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 lower 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.
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.

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

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.
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CHIPPER – OPTIONAL WINCH

WINCH CONTROL

WINCH SELECTOR

WINCH OPERATION

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<td>HIGH GEAR</td>
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NEVER PUT WINCH IN FREE SPOOL UNDER LOAD CONDITION.

ALWAYS KEEP AT LEAST 5 TURNS OF CABLE ON DRUM.
CARLTON
J.P. Carlton Company
Div. D.A.F. Inc.
121 John Dodd Road
Spartanburg, SC 29303
Ph. (864) 578-9335
Fax (864) 578-02010
www.stumpcutters.biz
Due to continuous design improvements consult factory prior to ordering 1-800-243-9335.

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**FUNCTION GROUP**

1 FRAME AND TANKS

**BUSINESS LINE**

CHIPPERS

**OWNER DOMAIN**

J.P. CARLTON COMPANY DIV. DAF INC.

**SERIAL NUMBERS**

1JWF011581167027 & UP

**DESCRIPTION**

FUEL TANK/HYDRAULIC TANK

**ISSUE**

R1

DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.

Revised 3.15.05
DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.

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FUNCTION GROUP

1 FRAME AND TANKS

BUSINESS LINE

CHIPPERS

OWNER DOMAIN

J.P. CARLTON COMPANY DIV. DAF INC.

SERIAL NUMBERS

1J9WF011581167027 & UP

DESCRIPTION

assy, fuel tank

ISSUE

R1

Revised 3.15.05
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**FUNCTION GROUP**

1 FRAME AND TANKS

**BUSINESS LINE**

CHIPPERS

OWNER DOMAIN

J.P. CARLTON COMPANY DIV. DAF INC.

SERIAL NUMBERS

IJKWF011581167027 & UP

**DESCRIPTION**

ASSY, HYDRAULIC TANK

**ISSUE**

R1

Revised 3.15.05
DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.

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FUCTION GROUP

1 FRAME AND TANKS

BUSINESS LINE

CHIPPERS

OWNER DOMAIN

J.P. CARLTON COMPANY DIV. DAF INC.

SERIAL NUMBERS

J9WF011271167353 & UP

DESCRIPTION

HYDRAULIC OIL COOLER INST.

ISSUE

R1

---

Revised 3.15.05
Due to continuous design improvements consult factory prior to ordering 1-800-243-9335.

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DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.

### 2 ENGINE/ELECTRICAL

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DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.

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**FUCION GROUP**

2 ENGINE/ELECTRICAL

**BUSINESS LINE**

CHIPPERS

**OWNER DOMAIN**

J.P. CARLTON COMPANY DIV. DAF INC.

**SERIAL NUMBERS**

1J9P601I1167218 & UP

**DESCRIPTION**

INSTALL MARKER LIGHTS AND REFLECTORS

**ISSUE**

R1

Revised 3.15.05
NOTES:
1. APPLY GREEN LOCTITE 608 ON BEARING BOLTS & COLLAR SET SCREWS.
2. APPLY RED LOCTITE 680 TO SHAFT END BOLT.

DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.
ANVIL VIEW

NOTES:
1. BOLTS ARE TO BE TORQUE TO 90FT/LBS.

DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.
Due to continuous design improvements consult factory prior to ordering 1-800-243-9335.

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**FUNCTION GROUP**

3 CUTTER WHEEL/BASE/TRANSITION

**BUSINESS LINE**

CHIPPERS

**OWNER DOMAIN**

J.P. CARLTON/COMPANY DIV. DAF INC.

**SERIAL NUMBERS**

1J9WF011781167238 & UP

**DESCRIPTION**

BASE/TRANSITION/ANVIL

**ISSUE**

R2

**DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.**

Revised 3.15.05
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DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.
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DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.
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<td>12D-0410</td>
<td>SOC HD C/S 1/4-20 X 1-1/4&quot; UNC</td>
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<tr>
<td>9</td>
<td>12D-0810</td>
<td>SOC HD C/S 1/2-13 X 1-1/4&quot; UNC BLCK</td>
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<tr>
<td>10</td>
<td>12D-0812</td>
<td>SOC HD C/S 1/2-13 X 1-1/2&quot; UNC BLCK</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>20940005</td>
<td>WELDMENT, TOP YOKE</td>
<td>1</td>
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<tr>
<td>12</td>
<td>20940008</td>
<td>WELDMENT, FEED WHEEL/TOP</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>20A-08</td>
<td>NUT, HEX, 1/2-13 UNC GR8</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>21240026</td>
<td>INSERT, PHENOLIC</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>21240075</td>
<td>WASHER, FEED WHEEL BEARING</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>21240090</td>
<td>WASHER, FEED WHEEL COUPLER COVER MOUNT</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>21240091</td>
<td>COVER, PVC, FEED WHEEL COUPLER</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>21240092</td>
<td>WELDMENT, FEED WHEEL BRKT, TOP</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>24D-04</td>
<td>NUT, ELASTIC STOP, 1/4-20 UNC</td>
<td>12</td>
</tr>
<tr>
<td>20</td>
<td>30A-06</td>
<td>LOCKWASHER, 3/8&quot; USS GR8</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>30A-08</td>
<td>LOCKWASHER 1/2&quot;</td>
<td>9</td>
</tr>
<tr>
<td>22</td>
<td>31A-06</td>
<td>FLAT WASHER, 3/8 USS GRD 5</td>
<td>2</td>
</tr>
</tbody>
</table>
DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.
DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.
<table>
<thead>
<tr>
<th>PART</th>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0150414</td>
<td>RIVET-ALUMINUM W STEEL MANDREL</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>0300036</td>
<td>ENERGY LIFT CYLINDER VALVE</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0350008A1</td>
<td>TAIL LIGHT - 12&quot; CHIPPER</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0350012</td>
<td>SWITCH - LANYARD - CLOSED</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>03500121</td>
<td>LANYARD ONLY FOR SWITCH</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>0350055</td>
<td>MARKER LIGHT- 4&quot; RED OVAL</td>
<td>2</td>
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<tr>
<td>7</td>
<td>0350056</td>
<td>REFLECTOR - RED 2 3/8&quot;</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>20650040</td>
<td>PLATE,LH TAIL/MARKER LIGHT COVER</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>20650041</td>
<td>PLATE,RH TAIL/MARKER LIGHT COVER</td>
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<tr>
<td>10</td>
<td>20950005</td>
<td>WELDMENT,INFEED CHUTE</td>
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<tr>
<td>11</td>
<td>20950036</td>
<td>TUBING,CONTROL BAR</td>
<td>1</td>
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<tr>
<td>12</td>
<td>21250093</td>
<td>MOUNT,FEED WHEEL CONTROL,LINKAGE</td>
<td>1</td>
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<tr>
<td>13</td>
<td>21250097</td>
<td>MOUNT,CONTROL BAR,64&quot;</td>
<td>2</td>
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<tr>
<td>14</td>
<td>21250098</td>
<td>BUSHING,CONTROL BAR</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>21250099</td>
<td>SPACER,CONTROL ARM</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>21250125</td>
<td>TUBING,LOCK PIN,FOLDING END TABLE</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>21840075</td>
<td>ASSY, ELECTRONIC CONTROL LINKAGE</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>21840085</td>
<td>FLATBAR ELECTRONIC ENGAGE LINKAGE</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>41E-04</td>
<td>GREASE FITTING 1/4-28 STRAIGHT</td>
<td>4</td>
</tr>
</tbody>
</table>

DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.
<table>
<thead>
<tr>
<th>PART</th>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0150807</td>
<td>HARDENED SPRING BUSHING-1/2”</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>10A-0812ZI</td>
<td>BOLT, HEX C/S 1/2-13 x 1-1/2 UNC GR8 Z&amp;Y</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>10A-0814ZI</td>
<td>BOLT, HEX C/S 1/2-13 x 1-3/4 UNC GR8 Z&amp;Y</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>10A-0816ZI</td>
<td>BOLT, HEX C/S 1/2-13 x 2 UNC GR8 Z&amp;Y</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>12A-0608ZI</td>
<td>HEX C/S 3/8-16 x 1” UNC GR 8 ZINC</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>21840060</td>
<td>MOUNT, FEED CONTROL LINKAGE SPRING</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>21840061</td>
<td>PLATE, FEED CONTROL LINKAGE</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>21840064</td>
<td>SPRING, FEED CONTROL LINKAGE</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>21840076</td>
<td>WELDMENT, ELECT. CNTRL. LINKAGE MOUNT</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>21840086</td>
<td>SWITCH, LIMIT</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>21840087</td>
<td>WELDMENT, ELECTRONIC LINKAGE COVER</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>21840088</td>
<td>BUSHING, SHA BEARING A3248, ELECTRONIC LINKAGE</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>29A-08</td>
<td>NUT, STOVER LOCK, 1/2-13 UNC GR8</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>30A-06</td>
<td>LOCK WASHER, 3/8&quot; USS GR8</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>31A-06</td>
<td>FLAT WASHER, 3/8 USS GRD 5</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>34B-08</td>
<td>FLAT WASHER 1/2&quot; SAE-W GR8</td>
<td>3</td>
</tr>
</tbody>
</table>

**FUNCTION GROUP**

5 INFEED SYSTEM

**BUSINESS LINE**

CHIPPERS

**OWNER DOMAN**

J.P. CARLTON COMPANY DIV. DAF INC.

**SERIAL NUMBERS**

1J9WF011981167225 & UP

**DESCRIPTION**

ELECTRONIC FEED CONTROLS

**ISSUE**

R4

DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.
DUE TO CONTINUOUS DESIGN IMPROVEMENTS CONSULT FACTORY PRIOR TO ORDERING 1-800-243-9335.

### PART 1 - ITEM 20960002
**DESCRIPTION**: WELDMENT, DISCHARGE ELBOW
**QTY**: 1

### PART 1 - ITEM 20960003
**DESCRIPTION**: WELDMENT, DISCHARGE NECK
**QTY**: 1

### PART 1 - ITEM 21260003
**DESCRIPTION**: WELDMENT, DISCHARGE CHIP REFLECTOR
**QTY**: 1

### PART 1 - ITEM 21260021
**DESCRIPTION**: WELDMENT, REAR JACK
**QTY**: 1

### PART 1 - ITEM 21260024
**DESCRIPTION**: STOP, DISCHARGE ELBOW
**QTY**: 1

### PART 1 - ITEM 21260032
**DESCRIPTION**: WELDMENT, DISCHARGE ELBOW/DN ROD
**QTY**: 1

### PART 1 - ITEM 21260036
**DESCRIPTION**: BUSHING, DISCHARGE
**QTY**: 2

### PART 1 - ITEM 21260037
**DESCRIPTION**: WELDMENT, DISCHARGE ADJUST HANDLE
**QTY**: 1

---

**FUNCTION GROUP**: 6 DISCHARGE SYSTEM

**BUSINESS LINE**: CHIPPERS

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

**SERIAL NUMBERS**: J9Q60114CI167554 & UP

**DESCRIPTION**: DISCHARGE SYSTEM

**ISSUE**: R1

**Revised**: 3.15.05
1. **Panel description and electrical pinout**

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

*A*

<table>
<thead>
<tr>
<th></th>
<th>Silk-screened front panel in polyester</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Front frame in black ABS</td>
</tr>
<tr>
<td>C</td>
<td>Housing in black ABS</td>
</tr>
<tr>
<td>D</td>
<td>Black metal supporting bracket</td>
</tr>
<tr>
<td>E</td>
<td>Black rubber fairlead-ring</td>
</tr>
<tr>
<td>F</td>
<td>Grey multipolar wiring 5x0.75mm², L = 250mm with 4-way Delphi connector, male contacts (cod. 12010974).</td>
</tr>
<tr>
<td>G</td>
<td>Wiring for EVR solenoid valve, with single female faston connector AMP cod. 160759-3 or 160773-3</td>
</tr>
</tbody>
</table>
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:

![Monitor Display](Picture A)

- a) if ON, engine RPMs are displayed;
- b) if ON, working hours are displayed;
- c) if ON, reverse phase is currently 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.

"BACK" = reverse time
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

<table>
<thead>
<tr>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine RPMs</td>
<td>0 ÷ 9990 steps of 10 RPMs</td>
</tr>
<tr>
<td>Working hours</td>
<td>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. <strong>Working hours increase only if RPMs &gt; 500.</strong></td>
</tr>
</tbody>
</table>

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

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

(*) 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

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>$10 \div 16$ Vdc</td>
</tr>
<tr>
<td>Max. current absorption at 16 Vdc (excluding outputs)</td>
<td>200 mA</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP 66</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>$-20 / +70$ °C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>$-25 / +85$ °C</td>
</tr>
<tr>
<td>Mechanical vibrations resistance</td>
<td>2 g random</td>
</tr>
<tr>
<td>Reference standards for the project</td>
<td>MC14982</td>
</tr>
</tbody>
</table>

**Autofeed Settings for Carlton Chippers**

<table>
<thead>
<tr>
<th>Engine Make</th>
<th>Engine Model</th>
<th>HP Rating</th>
<th>High Setting</th>
<th>Low Setting</th>
<th>CAL</th>
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</thead>
<tbody>
<tr>
<td>Vanguard</td>
<td>Big Block V Twin</td>
<td>35 HP</td>
<td>3200</td>
<td>2400</td>
<td>98</td>
</tr>
<tr>
<td>Kubota</td>
<td>D1105T</td>
<td>33 HP</td>
<td>2440</td>
<td>2370</td>
<td>12</td>
</tr>
<tr>
<td>Kohler</td>
<td>CH740</td>
<td>27HP</td>
<td>3330</td>
<td>2900</td>
<td>97.4</td>
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<tr>
<td>Kubota</td>
<td>V3300T</td>
<td>88 HP</td>
<td>2440</td>
<td>2370</td>
<td>12</td>
</tr>
<tr>
<td>Kubota</td>
<td>V3800T</td>
<td>99HP</td>
<td>2440</td>
<td>2370</td>
<td>12</td>
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<tr>
<td>John Deere</td>
<td>6068T</td>
<td>99 HP</td>
<td>2440</td>
<td>2240</td>
<td>129</td>
</tr>
<tr>
<td>John Deere</td>
<td>6068H</td>
<td>140 HP</td>
<td>2440</td>
<td>2240</td>
<td>129</td>
</tr>
<tr>
<td>John Deere</td>
<td>6068T</td>
<td>173 HP</td>
<td>2440</td>
<td>2370</td>
<td>129</td>
</tr>
<tr>
<td>John Deere</td>
<td>6068H</td>
<td>250 HP</td>
<td>2440</td>
<td>2370</td>
<td>129</td>
</tr>
</tbody>
</table>
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.
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
## Maintenance Schedule

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

Clutch Handle in Vertical Position

Clutch Engaged

Clutch Handle in Horizontal Position

Clutch Disengaged

NOTE: Care should be taken in engaging the clutch slowly enough to prevent stalling of power unit.

ADJUSTMENT OF CLUTCH LINKAGE

With the clutch in the engaged position (handle vertical) there should be approximately 1" to 1 1/2" of free play at the end of the handle without pressure being applied to engage clutch. Without free play, premature failure of clutch throwout bearing will result.

To adjust clutch linkage, loosen the two 3/8" hex nuts as shown in the picture by arrow. Check to make sure the PTO turns freely in the disengaged (handle horizontal) position. If the PTO has resistance to turning, adjust the nuts out toward the clutch fork. Check again for free play in the handle vertical position. After adjustments are made, lock the two 3/8" hex nuts together.

Warranty

Stein Manufacturing, Inc. warranties the products it manufactures to be free from defects in materials and workmanship, for a one year period from date of sale to the original user. The warranty is valid provided written notice of the alleged defect is received by Stein Manufacturing, Inc. during said period and within ten days after its discovery.

If proven to our satisfaction that the product is defective as to material and workmanship, the necessary parts will be replaced and/or repaired, this being Stein Manufacturing, Inc.'s sole responsibility. Our obligation under this warranty is limited to repair or replacement of Stein product or part only and does not obligate Stein Manufacturing, Inc. to bear any other cost involved.

This warranty will apply only if the product has not been subject to misuse, neglect, misapplication, repair, or alteration.

Incoming freight should be prepaid. If the product is found to be within warranty, credit will be allowed on the incoming charges and return freight will be prepaid.

THE WARRANTY IN THE ABOVE STATEMENT BY STEIN MANUFACTURING, INC. IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED.
F1B—300 SERIES

CONTACT STEIN MANUFACTURING FOR PARTS
CONTACT STEIN MANUFACTURING FOR PARTS
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 retarred 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).
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 freewheel 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.
HYDRAULIC 2-SPEED WINCH LEVER POSITIONS

VIEW #1

LEVER #2
FREE
LOW
HIGH

FREE SPOOL

VIEW #2

LEVER #1
LOW
FREE

HIGH
FREE

LEVER #2

LOCK

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

VIEW #3

LEVER #1
LOW
FREE

LEVER #2
LOW GEAR
FREE
HIGH

VIEW #4

LEVER #1
LOW
FREE

LEVER #2
HIGH
FREE

HIGH GEAR

WARNING
DO NOT MOVE SHIFT LEVERS WHEN POWERING WINCH IN OR OUT!

LEVER POSITIONS AND WINCH MODES:

<table>
<thead>
<tr>
<th>LEVER #1</th>
<th>LEVER #2</th>
<th>MODE</th>
<th>VIEW #</th>
</tr>
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<tbody>
<tr>
<td>FREE</td>
<td>FREE</td>
<td>FREE SPOOL</td>
<td>1</td>
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<tr>
<td>LOW</td>
<td>HIGH</td>
<td>LOCK</td>
<td>2</td>
</tr>
<tr>
<td>LOW</td>
<td>FREE</td>
<td>LOW GEAR</td>
<td>3</td>
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<tr>
<td>FREE</td>
<td>HIGH</td>
<td>HIGH GEAR</td>
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<td>900H</td>
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<td>Kohler</td>
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<tr>
<td>SP4012</td>
<td>Self-Propelled</td>
<td>Kohler</td>
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<td></td>
<td>Self-Propelled</td>
<td>Briggs-Vanguard</td>
<td>35</td>
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<tr>
<td>SP7015</td>
<td>Self-Propelled</td>
<td>Lombardini</td>
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<td>SP7015TRX</td>
<td>Track-Mounted</td>
<td>Deutz Turbo</td>
<td>60</td>
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<tr>
<td>SP8018 TRX</td>
<td>Track-Mounted</td>
<td>Deutz Turbo</td>
<td>78</td>
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<tr>
<td>HURRICANE RS TRX</td>
<td>Track-Mounted</td>
<td>John Deere Turbo</td>
<td>140</td>
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<tr>
<td>HURRICANE TRX</td>
<td>Track-Mounted</td>
<td>John Deere Turbo</td>
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<td>HURRICANE TRX</td>
<td>Track-Mounted</td>
<td>John Deere Turbo</td>
<td>175</td>
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<td>HURRICANE TRX</td>
<td>Track-Mounted</td>
<td>John Deere Turbo</td>
<td>250</td>
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<td>3500D</td>
<td>Tow-Behind</td>
<td>Deutz Turbo</td>
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<tr>
<td>7500</td>
<td>Tow-Behind</td>
<td>Deutz Turbo</td>
<td>78</td>
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</tbody>
</table>

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CARLTON—QUALITY PRODUCTS AND EXCEPTIONAL SERVICE

Carlton Owner’s Manual
9” Disk Chipper

Revised: 07/2008