CS11
HYDRAULIC CHAIN SAW

Safety, Operation and Maintenance Manual

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helps you do things right

05427 2/94R

SAFETY PRECAUTIONS

Tool operators and maintenance personnel must always comply with the safety precautions given in this manual and on the stickers and tags attached to the tool and hose.

These safety precautions are given for your safety. Review them carefully before operating the tool and before performing maintenance or repairs.

Supervising personnel should develop additional precautions relating to the specific work area and local safety regulations. If so, place the added precautions in the space provided on page 6.

GENERAL SAFETY PRECAUTIONS

The CS11 Chain Saw will provide safe and dependable service if operated in accordance with the instructions given in this manual. Read and understand this manual and any stickers and tags attached to the saw and hose before operation. Failure to do so could result in personal injury or equipment damage.

- Operators must start in a work area without bystanders. Flying debris can cause serious injury.
- Establish a training program for all operators to ensure safe operation.
- The operator must be familiar with all prohibited work areas such as excessive slopes and dangerous terrain conditions.
- Do not operate the tool unless thoroughly trained or under the supervision of an instructor.
- Always wear safety equipment such as goggles, ear and head protection, leg protection, gloves, snug fitting clothing and safety shoes at all times when operating the saw.
- Do not overreach. Maintain proper footing and balance at all times.
- Do not inspect or clean the tool while the hydraulic power source is connected. Accidental engagement of the tool can cause serious injury.
- Always connect hoses to the tool hose couplers before energizing the hydraulic power source. Be sure all hose connections are tight.
- Do not operate the tool at oil temperatures above 140° F/60° C. Operation at higher temperatures can cause higher than normal temperatures at the tool which can result in operator discomfort.
- Do not rely exclusively upon the safety devices built into the saw. As a chain saw user, several steps must be taken to keep your cutting jobs free from accidents or injury.

1. With basic understanding of kickback, you can reduce or eliminate the element of surprise. Sudden surprise contributes to accidents.
2. Keep a good firm grip on the saw with both hands, the right hand on the rear handle and the left hand on the front handle when operating the saw. Use a firm grip with thumbs and fingers encircling the chain saw handles. A firm grip will help reduce kickback and maintain control of the saw. Do not let go.
3. Make sure that the area in which you are cutting is free of obstructions. Never allow the nose of the guide bar to contact the log, branch, or any obstruction that can be accidently hit while operating the saw.
4. Cut at rated operating speeds (gpm).

5. Do not overreach or cut above shoulder height.
6. Follow the manufacturer's sharpening and maintenance instructions for the saw chain.
7. Only use replacement bars and chains specified by Stanley or the equivalent.

- Always be well rested and mentally alert before operating the chain saw.
- Do not allow other persons to be near the chain saw when starting or cutting with the chain saw. Keep bystanders and animals out of the work area.
- Do not start cutting until you have a clear work area, secure footing and a planned escape path from a falling tree.
- Keep all parts of the body away from the saw chain during operation.
- Carry the saw with the unit deenergized and the bar and chain to the rear of your body.
- Do not operate a chain saw that is damaged, is improperly adjusted, or is not completely and securely assembled. Be sure that the chain stops moving when the control trigger is released.
- Use extreme caution when cutting small size brush and saplings. Twigs may catch the saw chain and be whipped toward the operator or pull the operator off balance.
- When cutting a limb that is under tension, be alert for springback so that you will not be struck when the tension on the limb is released.
- Keep the handles dry, clean and free of oil.
- Do not operate a chain saw while in a tree unless you have been specially trained to do so.
- When using tools near energized transmission lines, be sure to use only hoses labeled and certified nonconductive.
- Turn off the power unit or move the hydraulic control valve to neutral before setting the saw down.
- Use a guide bar scabbard when transporting the saw.
- Know the location of buried or covered electrical services before starting work.
- To avoid personal injury or equipment damage all tool repair, maintenance and service must only be performed by authorized and properly trained personnel.

ELECTRICAL HAZARDS

The following guidelines must be followed to prevent accidental contact with overhead electrical conductors and/or communication wires and cables. (ref. ANS Z133.1-1982)

⚠ WARNING

All overhead conductors and all communication wires and cables are considered to be energized with potentially fatal voltages and must never be touched either directly or indirectly. Accidental contact with any overhead conductors or communication wires and cables can result in death or serious injury.

1. A close inspection shall be made by the tool operator and by the tool operator's supervisor to determine whether an electrical conductor passes through the tree or passes within reaching distance of the tool operator.

2. Only qualified tool operators shall be assigned to the work if an electrical hazard exists.

3. A second qualified tool operator must be within normal voice communication during line clearing operations aloft when the tool operator approaches closer than 10 feet (3 m) to any conductor or electrical apparatus energized in excess of 750 volts, or when roping is required to remove the branches or limbs.

4. Tool operators must maintain the following clearances from energized conductors:

Voltage Range (phase-to-phase) (kV)	Minimum Working Distance
2.1 to 15.0	2 ft 0 in. (0.6 m)
15.1 to 35.0	2 ft 4 in. (0.7 m)
35.1 to 46.0	2 ft 6 in. (0.75 m)
46.1 to 72.5	3 ft 0 in. (0.9 m)
72.6 to 121.0	3 ft 4 in. (1.0 m)
138.0 to 145.0	3 ft 6 in. (1.05 m)
161.0 to 169.0	3 ft 8 in. (1.1 m)
230.0 to 242.0	5 ft 0 in. (1.5 m)
345.0 to 362.0	7 ft 0 in. (2.1 m)
500.0 to 552.0	11 ft 0 in. (3.35 m)
700.0 to 765.0	15 ft 0 in. (4.55 m)

All other tree workers must maintain a minimum clearance of 10 feet (3 m) from energized conductors rated 50 kV phase-to-phase or less. Conductors rated over 50 kV phase-to-phase require a minimum clearance of 10 feet plus 4/10 of an inch (3 m plus 10 mm) for each kilovolt over 50 kV.

5. When a lifting device contacts an electrical conductor, the truck supporting the device is considered to be energized and contact with the truck must be avoided except when emergency rescue procedures are being carried out. Emergency rescue should only be attempted by properly trained personnel familiar with electrical hazards.

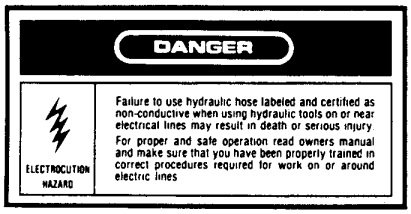
6. Storm work and emergency conditions create special hazards. During these conditions, only authorized tool operators shall perform any tree operation.

TOOL STICKERS AND TAGS

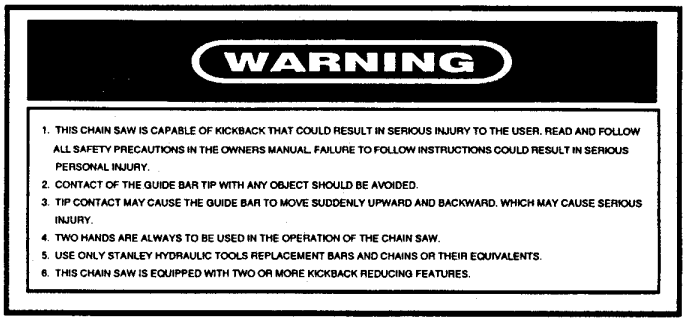
The safety related stickers attached to the pole chain saw prior to shipment from the factory are shown below.

The pressure and flow rates specified must never be exceeded. All stickers must be read and understood prior to operation of the tool.

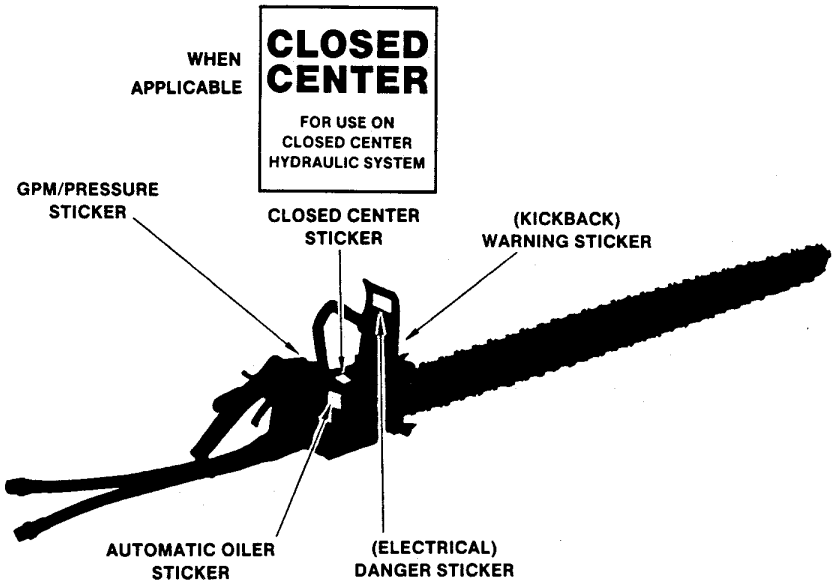
The information listed on each sticker must be legible at all times. Always replace stickers that have become worn or damaged. They are available from your local Stanley distributor.



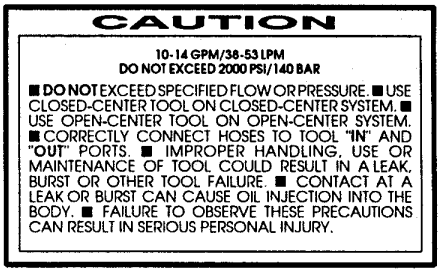
(ELECTRICAL)
DANGER STICKER



(KICKBACK) WARNING STICKER

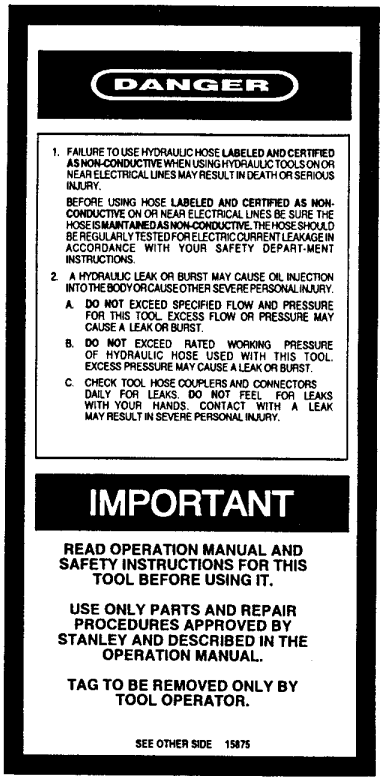


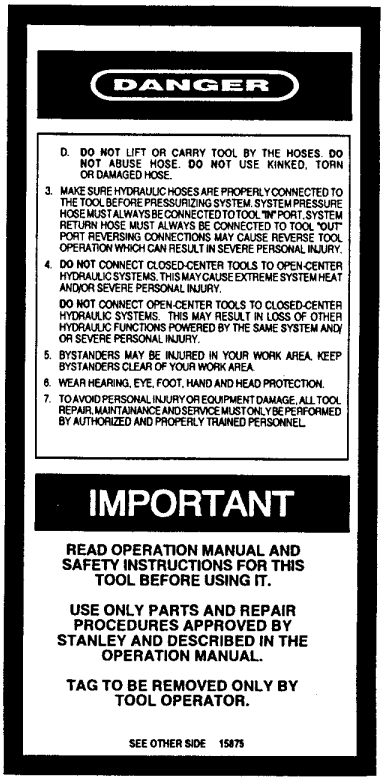
AUTOMATIC OILER
STICKER



GPM/PRESSURESTICKER

The safety tag at the right is attached to the chain saw when shipped from the factory. Read and understand the safety instructions listed on this tag before removal. We suggest you retain this tag and attach it to the chain saw when not in use.





HYDRAULIC HOSE REQUIREMENTS

HOSE TYPES

Hydraulic hose types authorized for use with Stanley Hydraulic Tools are as follows:

1. Labeled and certified non-conductive
2. Wire braided (conductive)
3. Fabric braided (not certified or labeled non-conductive)

Hose 1 listed above is the only hose authorized for use near electrical conductors.

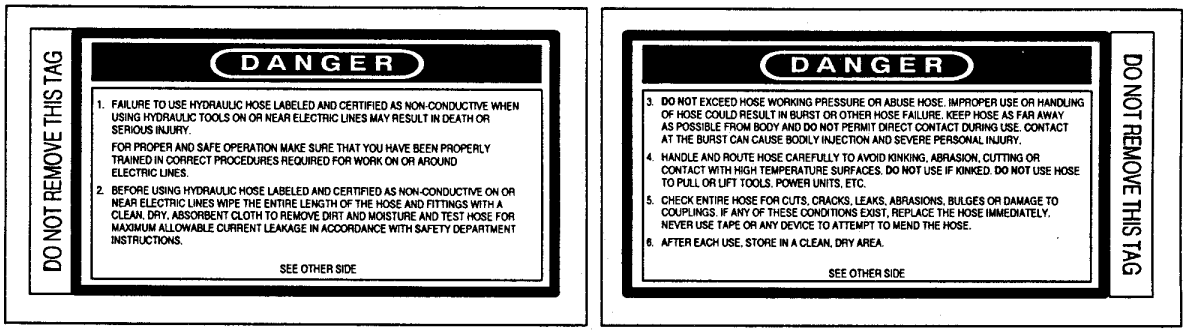
Hoses 2 and 3 listed above are conductive and must never be used near electrical conductors.

To help ensure your safety, the following DANGER tags are attached to all hoses purchased from Stanley Hydraulic Tools. DO NOT REMOVE THESE TAGS.

If the information on a tag is illegible because of wear or damage, replace the tag immediately. A new tag can be obtained at no charge from your Stanley distributor.

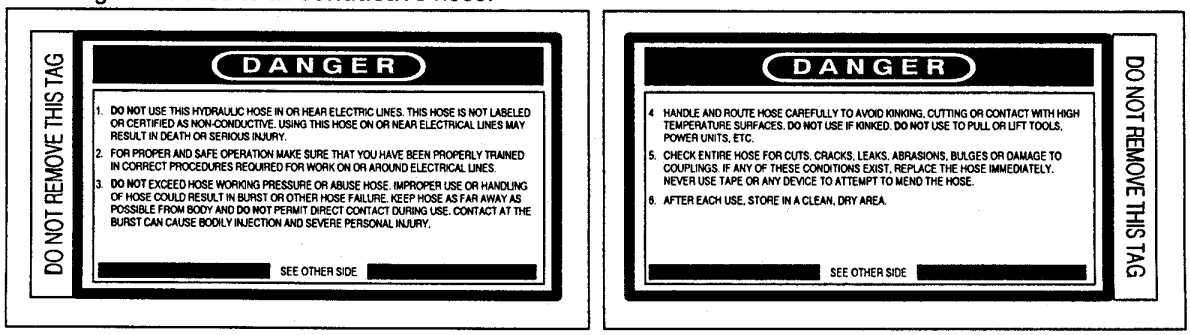
1 CERTIFIED NON-CONDUCTIVE HOSE

This tag is attached to all certified and labeled **non-conductive** hose.



2 AND 3 WIRE- AND FABRIC-BRAIDED (NOT CERTIFIED OR LABELED NON-CONDUCTIVE) HOSE

This tag is attached to all **conductive** hose.

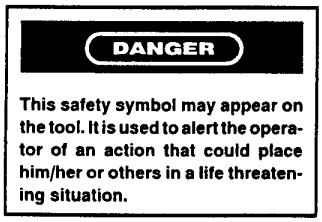


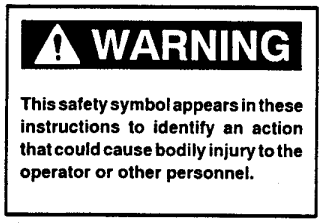
HOSE PRESSURE RATING

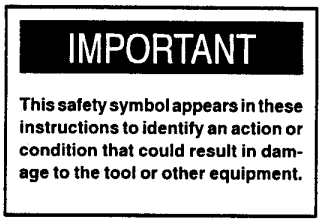
The rated working pressure of the hydraulic hose must be equal to or higher than the relief valve setting of the hydraulic system used to power the saw.

SAFETY SYMBOLS

Safety symbols are used to emphasize all operator, maintenance and repair actions which, if not strictly followed, could result in a life-threatening situation, bodily injury or damage to equipment.







Always observe safety symbols. They are included for your safety and for the protection of the tool.

LOCAL SAFETY REGULATIONS

Enter any local safety regulations here. Keep these instructions in an area accessible to the operator and maintenance personnel.

OPERATION

IMPORTANT

In addition to the Safety Precautions on pages 1 thru 6 of this manual, observe the following for equipment protection and care.

- Always store an idle saw in a clean dry space, safe from damage or pilferage.
- Keep chain sharp for maximum tool performance.
- Always keep critical tool markings, such as labels and warning stickers legible.
- Always replace hoses, couplings and other parts with replacement parts recommended by Stanley Hydraulic Tools. Supply hoses must have a minimum working pressure rating of 2500 psi/175 bar.
- All hoses must have an oil resistant inner surface and an abrasive resistant outer surface. Whenever near electrical conductors, use clean, labeled and certified non-conductive hoses.
- Tool repair should be performed by experienced personnel only.
- Make certain that the recommended relief valves are installed in the pressure side of the system.
- Make sure all couplers are wiped clean before connection. Use only lint-free cloth.
- The hydraulic circuit control valve must be in the "OFF" position when coupling or uncoupling hydraulic tools. Failure to do so may result in damage to the quick couplers and cause overheating of the hydraulic system.
- Do not use the tool for applications for which it was not designed. The saw chain is designed only to cut wood. Immediate cutter dulling occurs when the chain is allowed to penetrate dirt, sand, roots, or other foreign material.

HYDRAULIC SYSTEM REQUIREMENTS

- The hydraulic system should provide a flow of 10-14 gpm/38-53 lpm at an operating pressure of 1500-2000 psi/105-140 bar. Recommended relief valve settings are 2100-2250 psi/145-155 bar.
- The system should have no more than 250 psi/17 bar backpressure measured at the tool end of the operating hoses. The system conditions for measurement are at maximum fluid viscosity of 400 ssu/82 centistokes (minimum operating temperatures).
- The hydraulic system should have sufficient heat rejection capacity to limit the maximum oil temperature to 140° F/60° C at the maximum expected ambient temperature. The recommended minimum cooling capacity is 7 hp/5.22 kW at a 40° F/22° C difference between ambient temperature and oil temperature.
- The hydraulic system should have a minimum of 25 micron filtration. It is recommended that filter elements be sized for a flow of at least 30 gpm/114 lpm for cold temperature startup and maximum dirt holding capacity.
- The hydraulic fluid used should have a viscosity between 100 and 400 ssu/20 and 82 centistokes at the maximum and minimum expected operating temperatures. Petroleum base hydraulic fluids with antiwear properties and a viscosity index over 140 ssu/28 centistokes will meet the recommended requirements over a wide range of operating temperatures.
- The recommended hose size is .625-inch/16 mm I.D. up to 50 ft/15 m long and .750-inch/20 mm I.D. minimum up to 100 ft/30 m long.

PREOPERATION PROCEDURES

CHECK POWER SOURCE

1. Using a calibrated flowmeter and pressure gauge, check that the hydraulic power source develops a flow of 10-14 gpm/38-53 lpm at 1500-2000 psi/105-140 bar.

2. Make certain that the hydraulic power source is equipped with a relief valve set to open at 2100-2250 psi/145-155 bar.

CONNECT HOSES

1. Wipe all hose couplers with a clean lint-free cloth before making connections.

2. Connect the hoses from the hydraulic power source to the tool fittings or quick disconnects. It is a good practice to connect return hoses first and disconnect them last to minimize or avoid trapped pressure within the tool.

3. Observe the arrow on the couplers to ensure that the flow is in the proper direction. The female coupler on the tool hose is the inlet (pressure) coupler.

4. Move the hydraulic circuit control valve to the "ON" position to operate the tool.

Note: If uncoupled hoses are left in the sun, pressure increase inside the hose may make them difficult to connect. Whenever possible, connect the free ends of the hoses together.

OPERATING PROCEDURES

⚠ WARNING

The following are general wood cutting procedures and techniques. Differences in the terrain, vegetation, and type of wood will make this information more or less valid for particular areas. For advice on specific woodcutting problems or techniques for your area, consult your local Stanley representative or your county agent. They can often provide information that will make your work safer and more productive.

CUTTING TIPS

1. Check the lean of the tree. Tie a weight to a piece of string about 2-feet long. Hang the weight in your line of sight. The string is a good vertical line to help you judge the lean of the tree. The tree should fall the way it is leaning. Trees that are straight (leaning no more than 5 degrees) generally can be felled in any direction.

2. Avoid felling across another tree, log, rocks, gulley, or ridge. Do not fell straight uphill or downhill; fell the tree diagonally to the hill. Consider the wind direction and velocity. Do not attempt cutting in strong winds.

3. Check the weight distribution. A tree is heavier on the side with the most limbs. It will try to fall on its heavy side. Trim a few limbs to "balance" the tree.

4. Clear the work area. You need a clean area all around the tree for good footing. Get everything out of the area where the tree will fall. Do not cut trees near structures. Because of the danger of electrocution, use extreme care when cutting trees near power lines.

5. Before starting the cut, prepare your escape path. Make sure the escape path is clear of brush and branches. The escape path should be at an angle away from the direction of fall.

6. The saw chain should cut with very little pressure applied to the handle. If you have to force the saw to cut or if the cut is not straight, cease cutting immediately to prevent further saw chain and bar damage. See the Maintenance and Adjustments section of this manual for chain replacement or adjustment procedures.

7. Underwater models require daily preventive maintenance. See the Maintenance and Adjustments section of this manual for these maintenance procedures.

FELLING (CUTTING DOWN A TREE) (Figure 1)

1. Observe all safety precautions.

Notching or Undercutting

2. The notching or undercutting cut is made on the side you want the tree to fall. Place the saw so the hand guard is close to the tree trunk and the bucking cleat is dug in.

3. Start the cut horizontally. Pivot the nose of the bar in last. Cut to about one-quarter of the tree's diameter.

⚠ WARNING

Watch out for falling limbs.

4. Make a diagonal cut down to meet the horizontal cut and remove the wood from the notch.

Felling or Back Cut

5. The felling or back cut is made on the side opposite and at least 2-inches above the horizontal undercut (the felling cut is made higher as

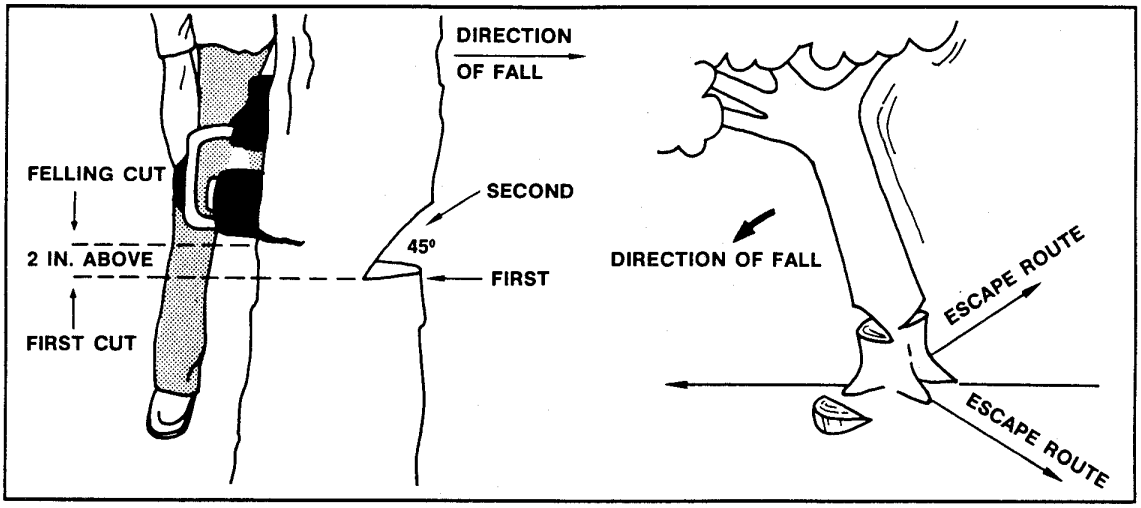


Figure 1. Felling a Tree.

the size of the tree increases). Place the saw so the hand guard is close to the tree trunk and the bucking cleat is dug in.

6. Start the cut horizontally. Pivot the bar in until the cut is being made parallel to the notch cut. Cut until the saw is about 1- or 2-inches from the notch. Do not cut through the notch.

Note: The uncut wood between the felling and notch cuts is called the hinge. The hinge controls the fall of the tree and should be of uniform thickness.

7. As the saw nears the back cut, watch the treetop and the cut for signs of movement. Be alert as soon as the tree starts to move, turn off the saw, pull it from the tree and move away quickly on your escape route.

8. For trees larger than bar length, make two felling cuts. Cut in as far as the bar will go, move to the other side and start the second cut in the same manner as the first while pivoting the saw to complete the felling cut.

BUCKING

Bucking is the sawing of a log or fallen tree into smaller pieces.

1. Observe all safety precautions.
2. Use both hands. Grip the saw firmly.
3. Stand uphill. A log that is cut loose may roll downhill.
4. Keep the chain out of the dirt. Dirt will dull the chain. A dull chain is unsafe.
5. Stand to the left of the saw.

CROSSCUTTING

Note: Before starting to cut through a log try to imagine what is going to happen. Look out for stresses in the log and cut through the log in such a manner that the guide bar will not get pinched.

Logs with Pressure on Top (Figure 2)

1. Observe all safety precautions.
2. Begin with an upper cut, down from the top. Do not cut too deeply. A cut of about one-third of the log diameter is enough.
3. Finish with a bottom cut. They should meet.

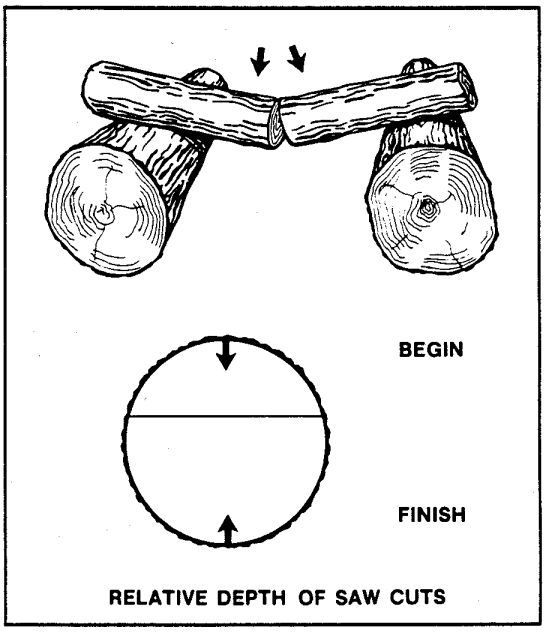


Figure 2. Crosscutting Logs with Pressure on Top.

Thick Logs Larger than Bar Length with Pressure on Top (Figure 3)

1. Observe all safety precautions.

2. Begin by cutting on the opposite side of the log.

3. Pull the saw towards you and cut from the top.

4. Cut from the bottom. Make a boring cut if the log is close to the ground.

5. Finish with a bottom cut.

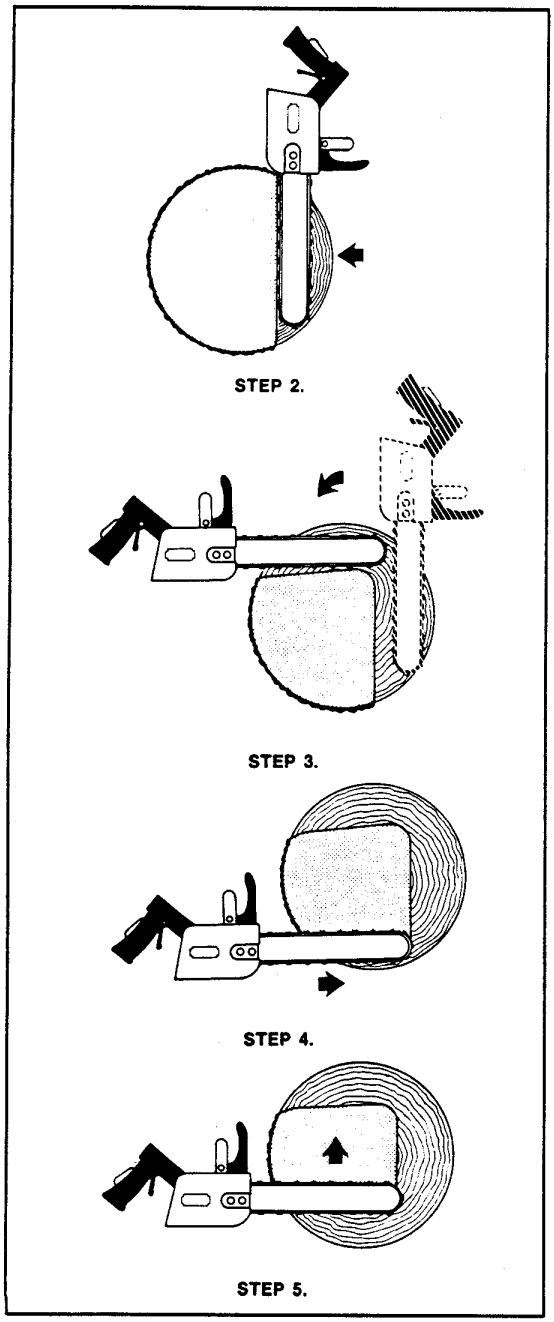


Figure 3. Crosscutting Logs Larger than Bar Length With Pressure on Top.

Logs/Limbs with Pressure on Bottom (Figure 4)

1. Observe all safety precautions.

2. Begin with a bottom cut. The depth of the cut should be about one-third of the log diameter.

3. Finish with an upper cut, down from the top. The saw cuts should meet.

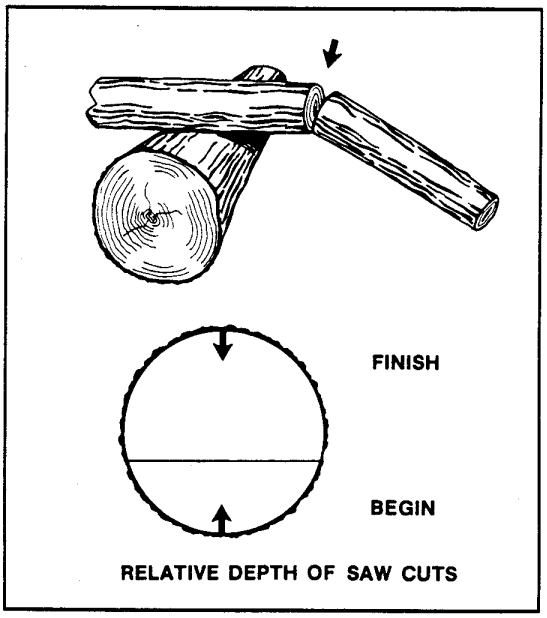


Figure 4. Crosscutting Logs/Limbs with Pressure on Bottom.

Thick Logs Larger than Bar Length with Pressure on the Bottom (Figure 5)

1. Observe all safety precautions.

2. Begin by cutting on the opposite side of the log.

3. Pull the saw towards you and cut from the top.

4. Cut from the bottom. Make a boring cut if the log is close to the ground.

5. Finish with a top cut.

PRUNING AND DEBRANCHING

1. Observe all safety precautions.

2. Use both hands. Keep a firm grip.

3. Be alert for kickback. Do not allow the tip of the bar to touch anything while the chain is in motion.

4. Do not cut overhead. Keep the saw below chest level. The chain is too close to your face in this position.

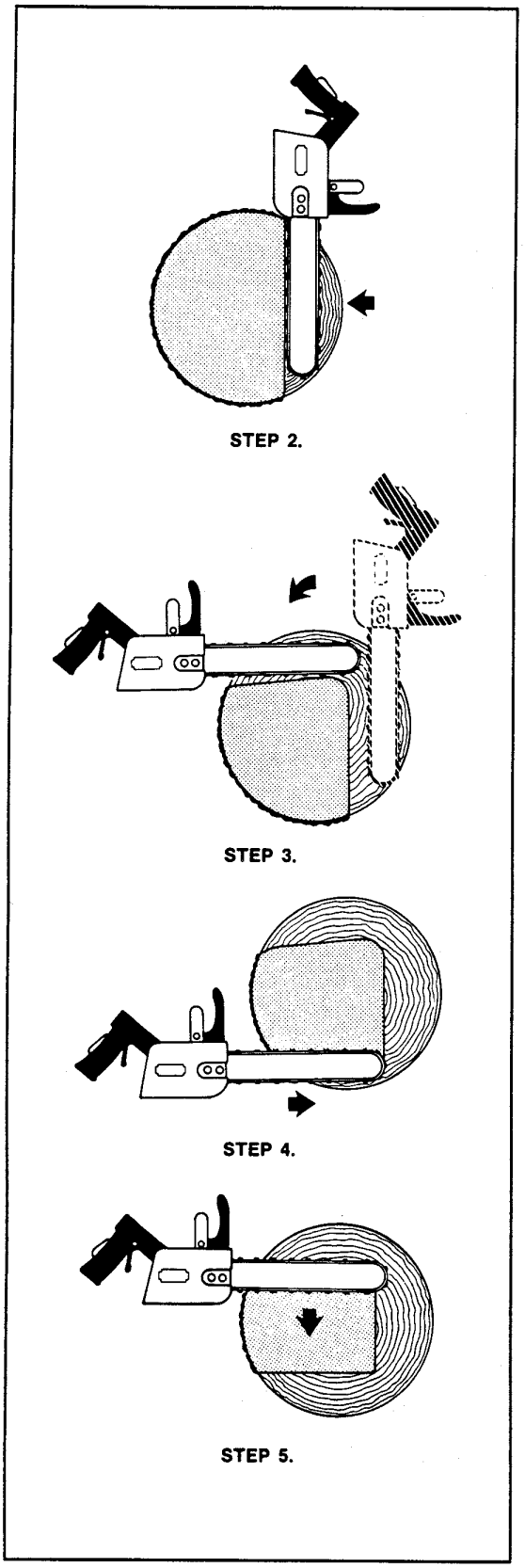


Figure 5. Crosscutting Logs Larger than Bar Length with Pressure on Bottom.

COLD WEATHER OPERATION

- If the saw is to used during cold weather, preheat the hydraulic fluid at low engine speed. When using the normally recommended oils, oil should be at or above 50° F/10° C (400 ssu/ 82 centistokes) before use.

Damage to the hydraulic system or saw can result from use with fluid that is too viscous or thick.

- Cutting frozen wood causes the cutters to wear, crack and break at the back rivet hole unless proper precautions are taken. To extend chain life when cutting in cold weather:

a. Be sure the oiler is working.

b. Keep the chain tensioned and check often.

c. Keep the cutters properly sharpened. Touch up at least every hour. Never force a dull chain to cut.

d. Clean out the bar groove and keep the oil hole open. Turn the bar over to equalize wear on the rails.

e. Always install a new sprocket with a new chain.

SERVICE INSTRUCTIONS

Good maintenance practice keeps the tool on the job and increase its service life.

The most important maintenance practice is to keep the hydraulic fluid clean at all times. Contaminated hydraulic fluid causes rapid wear and /or failure of internal parts.

Follow the procedure contained in the HYDRAULIC SYSTEM REQUIRMENTS section of this manual to ensure peak performance from the tool.

Never disassemble the tool unless proper troubleshooting procedures have isolated the problem to an internal part. Disassemble it only to the extent necessary to replace the defective part. KEEP CONTAMINANTS SUCH AS DIRT AND GRIT AWAY FROM INTERNAL PARTS AT ALL TIMES.

Always determine and correct the cause of the problem prior to assembly. Futher wear and tool failure can result if the original cause is not corrected.

PRIOR TO ASSEMBLY

- Clean exterior of the tool.
- Obtain the seal kit (P/N 21443 or 21444) so all seals exposed during disassembly can be replaced during assembly.
- Ensure that all seals that were exposed have been replaced with new parts.
- Apply clean grease or o-ring lubrication to all parts during reassembly.

Note: For orientation of parts identified in the following procedures, see the parts list exploded view illustration at the back of this manual.

1. Check all parts for evidence of excessive wear, scoring, or obvious damage. Pay particular attension to seal and other running surfaces, looking for scratches or other signs of fluid contamination caused defects. Dirty or water contaminated fluid can cause scratches on running component surfaces.

2. Examine all exposed seals and o-rings for worn spots or damage caused by overheating or ingestion of contaminants. Although all exposed o-rings and seals must be replaced during assembly of the unit, this inspection should be performed to help identify related faulty components and the cause of an experienced or potential malfuction.

3. All components exhibiting excessive wear or deep scratches can usually be touched up using an emery cloth. Thoroughly clean all parts before assembly.

4. Apply clean grease or o-ring lubricant to all close fitting parts and seals during assembly.

ON-OFF VALVE DISASSEMBLY AND REASSEMBLY

DISASSEMBLY

1. Drive out the 1/4-inch roll pin securing the trigger to the valve handle assembly. Depress the safety catch and remove the triggers through the bottom of the valve handle.

Note: It is not always necessary to drive the roll pins completely out of valve handle to allow removal of parts.

The safety catch can be removed at this time by driving out the 3/16-inch roll pin with a 3/16-inch/ 5 mm diameter punch. It is not necessary to remove the safety catch to service the on-off valve.

2. Remove the valve cap from the top of the handle. Remove the o-ring from valve cap bore.

3. Pull the on-off valve out through the top of the valve handle.

4. Remove the port plug from the bottom of the valve handle. The coil spring will drop out in your hand.

5. Clean and inspect the valve and its bore in the hand le carefully. The valve and bore should have a polished appearance without scoring or deep scratches. Excessive wear indicates contaminated oil in the system.

REASSEMB LY

1. Lubricate and install the o-ring in the valve cap bore.

2. Push the valve cap onto the valve stem, then thread the assembly into the top of the valve handle assembly.

3. Install the coil spring and the port plug into the bottom of the valve handle.

Note: Open and close center valves are interchangeable.

4. Replace the safety catch (if removed previously). Place the torsion spring on the boss of the safety catch with the spring tab on the top of and facing the back of the catch as shown in the parts list illustration.

5. Place the safety catch in the valve handle and align the holes using a 3/16-inch/5 mm diameter punch.

6. Install the 3/16 x 1 3/8-inch roll pin.

7. Push down on the spring tab until it snaps in place under the safety catch.

8. Depress the safety catch and slide the trigger through the bottom of the handle.

9. Line up the trigger and manual oiler trigger with the pivot by inserting a 1/4-inch/6 mm diameter punch to maintain alignment while driving the roll pin into the handle. Install the 1/4-inch roll pin in the trigger pivot hole.

10. Check the safety catch/trigger mechanism for proper operation. The trigger must not activate the tool without the operator first depressing the safety catch.

MANUAL OILER DISASSEMBLY AND REASSEMBLY

DISASSEMBLY

1. Perform step 1 of the ON-OFF VALVE DISASSEMBLY procedure to remove the trigger.

2. Using a 11/16- or 3/4-inch three-eighths drive socket, remove the manual oiler assembly from the top of the valve handle.

3. Using snap-ring pliers, remove the retaining ring, then remove the washer and coil spring. Push the plunger out of the oiler plug. Remove and discard all o-rings.

Note: The two holes in the small diameter section of the oiler plug should be open for proper oiler function.

REASSEMBLY

1. Lubricate and install the o-ring in the oiler plug bore.

2. Lubricate and install the o-ring on the plunger seat. Lubricate the plunger and push into the oiler plug from the end opposite the hex.

3. Install (in this order) the coil spring, washer, and retaining ring on that portion of the plunger protruding from the hex end.

4. Lubricate and install the two o-rings on the oiler plug. Install the manual oiler assembly in the valve handle using a 11/16-inch or 3/4-inch three-eighths drive socket.

5. Perform steps 6 through 11 of the ON-OFF VALVE REASSEMBLY procedure to install the trigger.

HYREVZ™ MOTOR REPAIR

REMOVAL

1. Remove the two bar clamping nuts and washers, chain guard, saw bar, and chain.

2. Remove the motor shaft jam nut (L.H thread) by clamping the drive sprocket so that it cannot rotate (a chain type vise grip works best).

3. Remove the sprocket, sprocket key and spacer.

4. Remove the four capscrews securing the chain saw adapter to the valve handle assembly separate these assemblies.

5. Insert a hooked instrument through the oil tubes and pull them out. Take care to avoid damaging the oil tube bores in the motor and valve handle.

6. Remove the two oval head machine screws to allow the motor to be withdrawn from the chain saw adapter assembly.

DISASSEMBLY

Note: The saw can have either a two- or three-piece Hyrevz™ Motor. Identify the motor used on your saw (see the PART LIST illustration).

1. Place the motor in a vise (with soft jaws or V-blocks) around the bearing end; output shaft down.

2. On three-piece motors, scribe assembly marks across the bearing retainers and the gear housing. Make sure that the marks will be visible during reassembly.

3. Remove the eight socket head capscrews securing the bearing retainers and the gear housing.

4. Pry the rear bearing retainers or gear housing away from the mating part. Be careful to lift the retainer or housing straight off. Use the inside groove provided at the split between parts to prevent scratches on the surfaces between the parts.

5. On three-piece motors, pry the gear housing assembly away from the front bearing housing in the same manner as described in step 4.

6. Remove the two gears, motor shaft key (or roller) and the idler shaft.

7. Remove the large face seal o-ring(s); being careful not to damage the o-ring grooves or surrounding surfaces.

8. To remove the motor shaft from the front bearing retainer or bearing housing, remove the large retaining ring securing the ball bearing(s). Place the retainer or housing on a flat surface with clearance for bearing removal. Push on the small end of the motor shaft until the shaft and bearing(s) slide free. Be careful not to bend the motor shaft.

9. The ball bearing(s) should be removed from the motor shaft only if they must be replaced because damage can occur during removal. To remove the bearings from the motor shaft, press on the threaded end of the motor shaft while supporting the outer race of the bearing(s). Discard the bearings.

10. Remove the retaining ring at the bottom of the ball bearing bore to service the motor shaft seal(s).

11. To remove the seal liner and associated parts on current two and three-piece motor assemblies, insert the small end of the motor shaft through the seal liner. Place a rag across the gear face of the front bearing retainer and blow air through the small diameter motor shaft bearing. Use a shop air nozzle to force the seal liner onto the motor shaft for removal.

12. To remove the seal from former two-piece motor assemblies, use appropriate o-ring service tools to pry it out of its bore. Take care to avoid damaging the seal surfaces. Note seal orientation.

13. To remove the needle bearings on three-piece motors, use Collet, part number 05871, and Actuator Pin, part number 05872, along with Slide Hammer, part number 11931. These tools are available in Bearing Puller Kit, part number 05064.

To remove the bushings on two-piece motors, use Collet, part number 11930, and Actuator Pin, part number 05067, along with Slide Hammer, part number 11931.

MOTOR INSPECTION AND CLEANING

Inspect and clean all parts as follows:

Cleaning

Clean all parts with a degreasing solvent. Blow dry with compressed air and wipe clean. Use only lint-free cloths.

Small Diameter Bearings/Bushings

On three-piece motors equipped with needle bearings, check to make sure all rollers are in place and not nicked or seized. If shaft wear is present, the bearing and shaft must be replaced.

- On two- or three-piece motors equipped with bushings, the inside of the bushing should be gray with some bronze showing through. If a significant amount of yellow-bronze shows, bushing replacement is required. Inspect motor shaft for corresponding wear and replace as required.

Gear Chamber

- The chamber bores and end faces around the bearing bores should be polished but not rough or grooved. The flat surfaces around the chamber and bolt holes should be flat and free of nicks or burrs that could cause misalignment or leaks.

Gears

- Both gears should have straight tips with-out nicks; square tooth ends and a smooth even polish on the teeth and end faces. Check for cracks between the drive gear keyway and gear tooth root. Discard the gear if cracks are present.

Motor End Housings/Retainers

- The gear face running surface should show two interconnecting polished circles without a step and should not be rough or grooved.

- The shaft seal bore should be smooth and free from nicks or scratches.

Shafts

- The shaft diameter at the bearing and seal locations must be smooth. Grooves, roughness or a reduced diameter indicate fluid contamination or damaged needle bearings. Grit particles may have been imbedded in the bushings grinding into the hardened shaft. If abnormal shaft wear as above occurs (in excess of normal polishing), both the shaft and associated bearings/bushings must be replaced.

REASSEMBLY

1. On current two and three-piece motors, assemble the seal liner assembly by installing the outside diameter o-ring, quad ring and (seal liner washer on 3 piece motors only) as shown on the parts location diagram. Place idler shaft through the seal liner; then loosely position the assembly in the seal bore of the front bearing retainer (quad ring side down). Place the seal liner washer over the shaft; then carefully push the seal liner into place. Install the retaining ring. Remove the idler shaft.

IMPORTANT

The graphite seal liner must not be forced, pried or pushed on directly because it can be easily damaged.

2. On former two-piece motors, carefully install the shaft seal with the lips facing the gear side. Replace the back-up washer and retaining ring.

3. To install the ball bearing(s) on the motor shaft; support the ball bearing inner race and press the motor shaft through the bearing inner race.

4. To install the needle bearings in three-piece motors, use Bearing Pusher, part number 11916.

To install the bushings on two-piece motors, use Bearing Pusher, part number 11918.

5. Place the front bearing retainer/front bearing housing assembly on a smooth clean arbor press surface (protected from damage) with the large bearing bore facing up. Position the piece so that a clearance hole exists for the insertion of the motor shaft.

6. Apply grease to the motor shaft and keyway, then insert it through the shaft seal. Using Bearing Pusher, part number 00850, or a sleeve/socket with a diameter slightly smaller than the outside diameter of the ball bearing, press the bearing assembly into place. Press only on the outer race. Install the ball bearing retaining ring.

7. Install the key (or roller) in the keyway of the motor shaft. Use a small amount of grease to keep the key or roller in place. Slide the drive gear over the key and shaft. Install the idler shaft and gear.

8. Apply grease to the face seal o-ring groove(s) then install the o-ring(s).

9. On three-piece motors, note the scribe marks made during disassembly; then align the scribe marks and carefully slide the gear chamber and rear bearing retainer into place.

Note: Make sure dowel pins and shafts are aligned during installation.

IMPORTANT

Do not force parts together.

On two-piece motors, note the screw hole pattern on both housings. They will only assemble one way. With all parts aligned, carefully slide the gear housing assembly over the gears until it contacts the front bearing housing assembly.

IMPORTANT

Do not force parts together.

10. Turn the motor shaft manually to check for free rotation. Install the capscrews, then recheck rotation.

11. When new parts are installed, it may be necessary to "break-in" the motor. After the saw has been reassembled without the guard, bar and chain, the motor may be broken-in as follows:

IMPORTANT

The following step can be hazardous. Failure to heed the instructions could result in serious injury.

12. Connect the saw to a hydraulic power source and check for proper operation. READ THE FOLLOWING CAREFULLY BEFORE PROCEEDING.

a. Make sure the hydraulic power source is running at the lowest gpm/lpm rate it can while still producing full pressure.

b. Grasp the saw firmly in a bench vise and place the correct size wrench on the 5/8-11 nut securing the sprocket.

c. Connect the hydraulic power source to the saw and turn the power source valve to the "ON" position.

d. With a firm grip on the saw and wrench, SLOWLY squeeze the trigger to activate the saw.

e. Turn the motor shaft both against and with the direction of rotation.

f. Release the trigger and remove the wrench.

g. Activate the saw to determine that the motor starts and runs freely.

h. If the motor is not starting or running freely, carefully repeat this procedure until the motor performs satisfactorily.

REPLACEMENT

1. Install the oil tubes in the valve handle; then push the motor into the chain saw adapter assembly.

2. Align the motor mounting holes and secure the motor using the two 5/16-18 x 3/4-inch oval head machine screws.

3. Align the oil tubes and press the chain saw adapter assembly against the valve handle assembly and secure using the four 5/16-18 x 3/4-inch capscrews. Tighten to 15 ft lb/20 Nm.

4. Install the saw chain on the saw bar; then place on the mounting studs in-line with the bar adjustment nut. (Observe orientation of the chain on the bar. The cutting edge of the cutter link on the top of the bar should travel towards the bar nose.)

5. Install the chain guard, two flat washers and two 3/8-16 hex nuts.

6. Perform CHAIN TENSION ADJUSTMENT procedure.

MAINTENANCE AND ADJUSTMENTS

GENERAL MAINTENANCE TIPS

There are many simple maintenance tasks which, if performed, can keep a chain saw operating at a high level of efficiency. Routine maintenance will also keep replacement costs down on the parts of the chain saw, which occasionally wear out.

Bar Groove Wear

The wear pattern of the bottoms of the chain cutters, tie straps, and drive lengths is a good indication of the condition of the bar.

1. If the bottoms of the drive links are worn flat, the groove is too shallow in the tail or flat section of the bar. The groove must be ground deeper by an authorized chain saw dealer or the bar replaced.

2. If the drive links are worn concave, the groove is shallow in the bar nose. It is possible that the armor-tip of the bar nose has worn off. The groove should be rebuilt, reground or the bar replaced.

In summary, the groove width should not allow the chain to wobble from side to side when moved with fingers. Groove depth should range between 5/16-inch/8 mm to a maximum of 7/16-inch/11 mm.

Bar Rail Wear

A quick check can be made to determine rail wear. Put a straight edge against the bar and the cutting edge (figure 6). Force the cutter sideways as far as it will go with the straight edge.There should be 1/16- to 1/8-inch/1.5 to 3 mm gap between the straight edge and the side of the bar. The chain should be supported squarely by the bar rails. If not, the bar is worn and the groove is sloppy. Authorized chain saw dealers have equipment to close the rails.

If the chain saw is used frequently, check the bar for flat and even rails.Rails must be flat and square with side of bar and the bar itself must be perfectly straight. If bows or bends are present in the bar, a dealer should attempt to remove them.

If the bar rails are uneven (stepped), the chain is leading off the cutter. The rails should be reground by an authorized dealer.

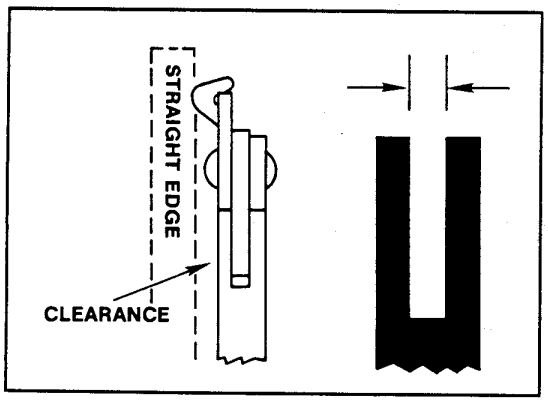


Figure 6. Rail Wear.

Chain Lubrication

Soak a new chain overnight in SAE 30 oil.

Before cutting, check to make sure that oil is being thrown from the nose of the bar.

Chain Tension

Correct chain tension is very important throughout the life of the chain. Check chain tension often during use (when the saw is stopped and the bar and chain are cool). The chain should move easily around the bar when pulled by hand. Watch tension and lubrication during prolonged cutting periods.

AUTOMATIC OILER ADJUSTMENT

1. Observe all safety precautions.

2. The automatic oiler adjustment plug is located in the top-forward portion of the valve handle assembly. The oil volume can be ad justed with a 3/16-inch allen wrench by turning the plug counterclockwise to increase out-put and turning clockwise to decrease output.

Note: Oil output will vary proportionally to load and operating pressure. It should be adequate for most operations as adjusted at the factory.

3. Initial oiler adjustment is made with the bar, chain, and chain guard removed.

⚠ WARNING

The following step can be hazardous. Failure to heed the instructions could result in serious injury

4. Connect the saw to a hydraulic power source and check for proper operation. READ THE FOLLOWING CAREFULLY BEFORE PRO-CEEDING.

a. Make sure the hydraulic power source is running at the lowest gpm/lpm rate it can while still producing full pressure.

b. Grasp the saw firmly in a bench vise and place the correct size wrench on the 5/8-11 motor shaft iam iut.

c. Connect the hydraulic power source to the saw and turn the circuit control valve to the "ON" position.

d. With a firm grip on the saw and wrench, SLOWLY squeeze the trigger to activate the saw.

e. Adjust the oiler for a flow of approximately one drop every one to two seconds.

f. Release the trigger and remove the wrench.

CHAIN TENSION ADJUSTMENT

1. Observe all safety precautions.

2. When the chain appears loose, lubricate it well and let it cool for a few minutes to allow for contraction of the chain. Disconnect the saw from its hydraulic power source.

Note: Perform steps 3 through 6 while holding the top end of the bar upward.

3. Loosen the two 3/8-16 bar stud nuts slightly.

4. Tighten the chain tension screw until the bottoms of the tie straps and cutters just touch the bar rails of the bottom of the bar. On sprocket nose and roller nose bars the chain must be slightly tighter.

5. Pull the chain around the bar by hand to be sure it fits the sprocket and bar properly. The chain should move easily.

6. Tighten the two 3/8-16 bar stud nuts.

7. Connect the saw to an hydraulic power source. Operate the chain at low speed (gpm) for a minute or two while pumping extra oil on the chain.

8. Stop the saw and check the tension. If it has loosened, disconnect the saw from the hydraulic power source and perform steps 3 through 6 again to tighten the chain to the correct tension.

9. Reconnect the saw to the hydraulic power source. Operate the saw and make a few easy

cuts. Check chain tension and readjust if necessary (disconnect the saw from the hydraulic power source and perform steps 3 through 6).

Note: Never break in a new saw chain under a heavy cutting load.

10. Watch saw chain tension carefully for the first half-hour of cutting.

CHAIN SHARPENING (FIGURE 7) OREGON 72LG/72LP (3/8 PITCH) CHAIN

Note: Chain type stamped on drive link.

1. Observe all safety precautions.

2. Use OREGON file holder and the proper again to tighten the chain to the correct round file for the chain to be sharpened (see tension. SERVICE TOOLS). Press the file holder so it rides on both the cutter top plate and depth gauge with the guide marks in line with the

3. File all of the cutters on the side of the chain opposite yourself in the direction shown.

4. Hold the file handle down 10 degrees as you make a few firm strokes away from yourself while applying pressure against the cutting edge.

5. Move to the other side of the chain and file all of the cutters opposite to complete chain sharpening. File all of the cutters uniformily.

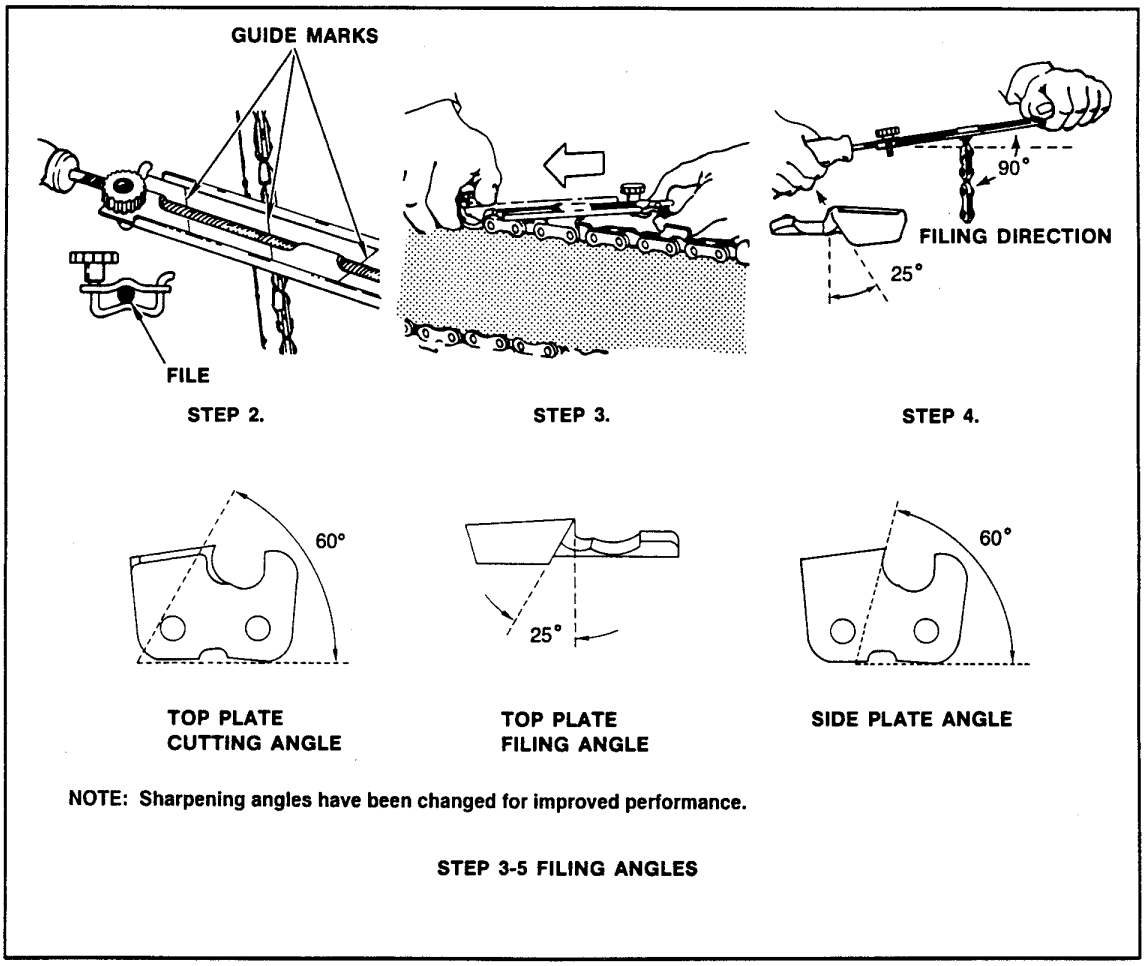


Figure 7. Chain Sharpening

SETTING THE DEPTH GAUGES (FIGURE 8)

1. Observe all safety precautions.

2. Place the OREGON Gaugit, OREGON part number 22290, on the chain after every third or fourth sharpening. If the depth gauges extend above the slot, file them level with a flat file. Depth gauge setting is .025-inch.

3. After lowering, round off the front edge to its original shape.

UNDERWATER MODEL PREVENTIVE MAINTENANCE

After each use, dip or spray the entire tool with a water displacing oil such as WD40. Pay particular attention to the on-off valve and trigger area of the valve handle (under the plug button), the drive sprocket, the chain, and the bar.

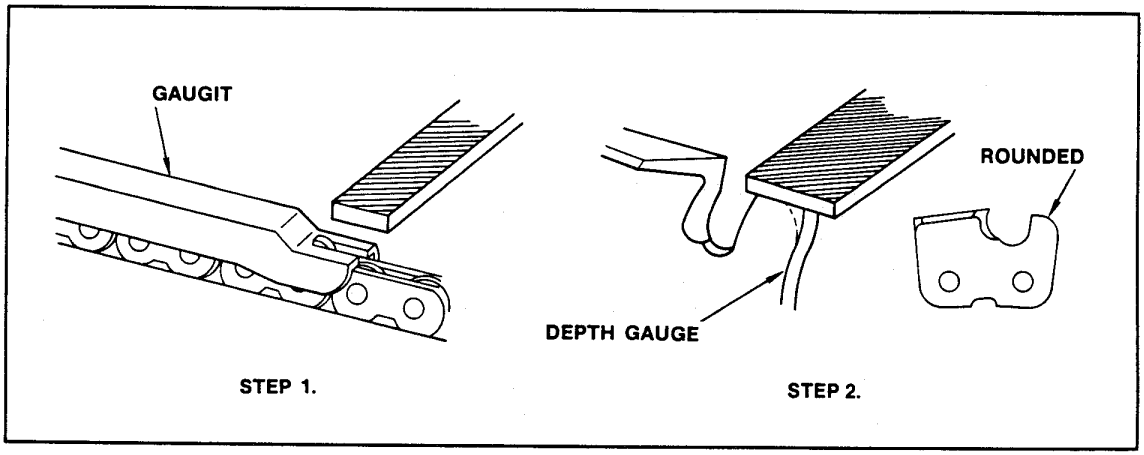


Figure 8. Setting Depth Gauge.

TROUBLESHOOTING

If symptoms of poor performance develop, the following chart can be used as a guide to correct the problem.

When diagnosing faults in operation of the saw, always make sure the hydraulic power source is supplying the coorect hydraulic flow and pressure to the saw as listed in the table. Use a flowmeter known to be accurate. Check the flow with the hydraulic fluid temperature at least 80°F/27°C.

PROBLEM	CAUSE	REMEDY
Cuts slow.	Insufficient fluid flow or low relief valve setting.	Adjust fluid flow to proper gpm. For optimum performance adjust relief valve to 2250 psi/155 bar.
	Chain dull.	Sharpen per instructions or replace.
	Backpressure too high.	Should not exeed 250 psi/17 bar at 14 gpm/53 lpm measured at the end of the tool operating hoses.
Bar turns color.	Insufficient oiler flow.	Use manual oiler during heavy cuts.
		Adjust oiler per service instructions.
Tool does not run.	Power unit not functioning.	Check power unit for proper flow and pressure (10 gpm/38 lpm at 1500 psi/104 bar minimum.
	Coupler or hoses blocked.	Remove obstruction.
	Mechanical failure.	Disassemble tool and inspect for damage.
Tool runs backwards.	Pressure and return reversed.	Connect for proper flow direction. Motor shaft rotates clockwise.
On-off trigger is hard to press.	Pressure and return reversed.	Correct for proper flow direction.
	Backpressure too high.	Should not exceed 250 psi/17 bar at 14 gpm/53 lpm measured at the end of the tool operating hoses.
Oil leakage around drive sprocket.	Motor shaft seal failure.	Replace as required. Make sure that oil present is not the result of exess oiler flow.
Oil leakage between rear gear housing and valve handle assembly.	Motor face seal failure.	Replace as required.
Chain continues to move after valve is shut off.	Chain is too loose.	Tighten chain.
	Input flow too high.	decrease flow.

SPECIFICATIONS

Capacity	24, 30, 36, and 43 inch/61, 76, 91, and 109 cm cut lengths
Weight	14 lb/6.3 kg
Length	17 inch/43 cm
Width	9 inch/23 cm
Pressure	1500-2000 psi/105-140 bar
Flow Range	10-14 gpm/38-53 lpm
Optimum Flow	14 gpm/53 lpm
Porting	8 SAE O-ring
Connect Size and Type	1/2-inch Male Pipe Hose End
Hose Whips	Yes
Motor	Hyrevz™
Kickback Reduction Features	Low Kickback saw chain, front hand guard, low inertia motor/drive system

NOTE

Weights, dimensions and operating specifications listed are subject to change without notice. Where specifications are critical to your application, please consult the factory.

ACCESSORIES

PART NO.	DESCRIPTION
01824	24-inch Saw Chain
02684	24-inch Sprocket Nose Bar
02938	Standard Sprocket for 0.375 Pitch Chain
03194	30-inch Saw Chain
03195	36-inch Saw Chain
03456	43-inch Saw Chain
05132	Grease Gun for Sprocket Nose Bars
05144	Chain/Bar Guard
06477	30-inch Sprocket Nose Bar
06478	36-inch Sprocket Nose Bar
06479	43-inch Sprocket Nose Bar
11299	File Guide with 7/32-inch File for 72/LG/72LP 3/8 Pitch Chain
04642	19-inch Sprocket Nose Bar
04643	19-inch Saw Chain

SERVICE TOOLS

PART NO.	DESCRIPTION
00850	Bearing Pusher
03325	Seal Kit 3 Pc P/N 03045 Motor
03326	Repair Kit
03327	Seal Kit Pc P/N 03272 Motor
03328	Repair Kit
04337	O-Ring Tool Kit
05044	Bearing Installation Tool
05064	Bearing Puller Kit
10569	Seal Kit 2 Pc P/N 21444 Motor/07363
10570	Repair Kit U/W
10571	Seal Kit 2 Pc P/N 21443 Motor/07361
10572	Repair Kit

WARRANTY

Hand held tools and their parts are warranted against defects in materials and workmanship for a period of 12 months from the date of purchase, except for cutting parts, steels and other parts not manufactured by Stanley (such as impact mechanisms, alternators, regulators and hoses), and parts subject to normal wear and tear (such as o-rings, saw blades, and other parts that become worn through normal use of the tool).

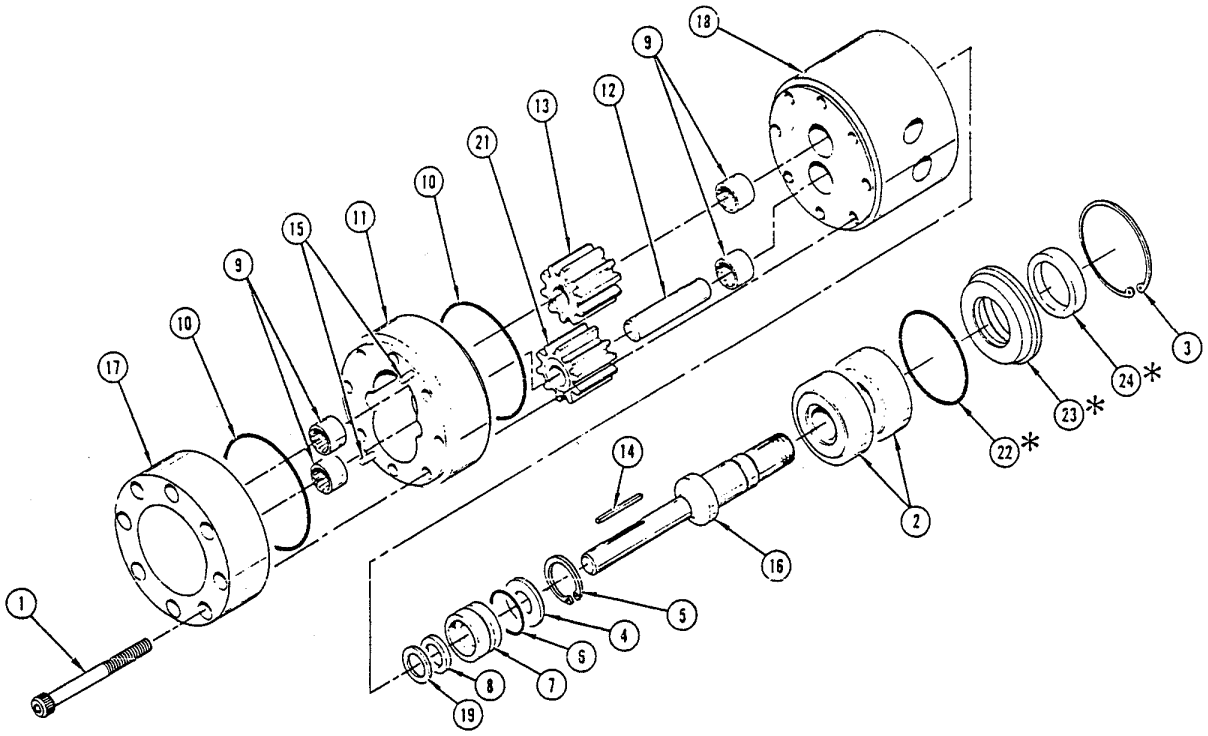
The Warranty Registration Card packed with the tool must be filled out and returned to Stanley upon receipt of the tool.

Stanley reserves the right to replace or repair only those parts which, under our examination, prove to have been defective at the time of purchase.

Shipping charges are prepaid by the customer unless otherwise authorized by Stanley.

The warranty is void if maximum flow and pressure ratings are exceeded.

There is no other warranty expressed or implied.



EARLY MODELS
HYDRAULIC MOTOR ASSEMBLIES
03045 LAND MODELS
03272 UNDERWATER MODELS

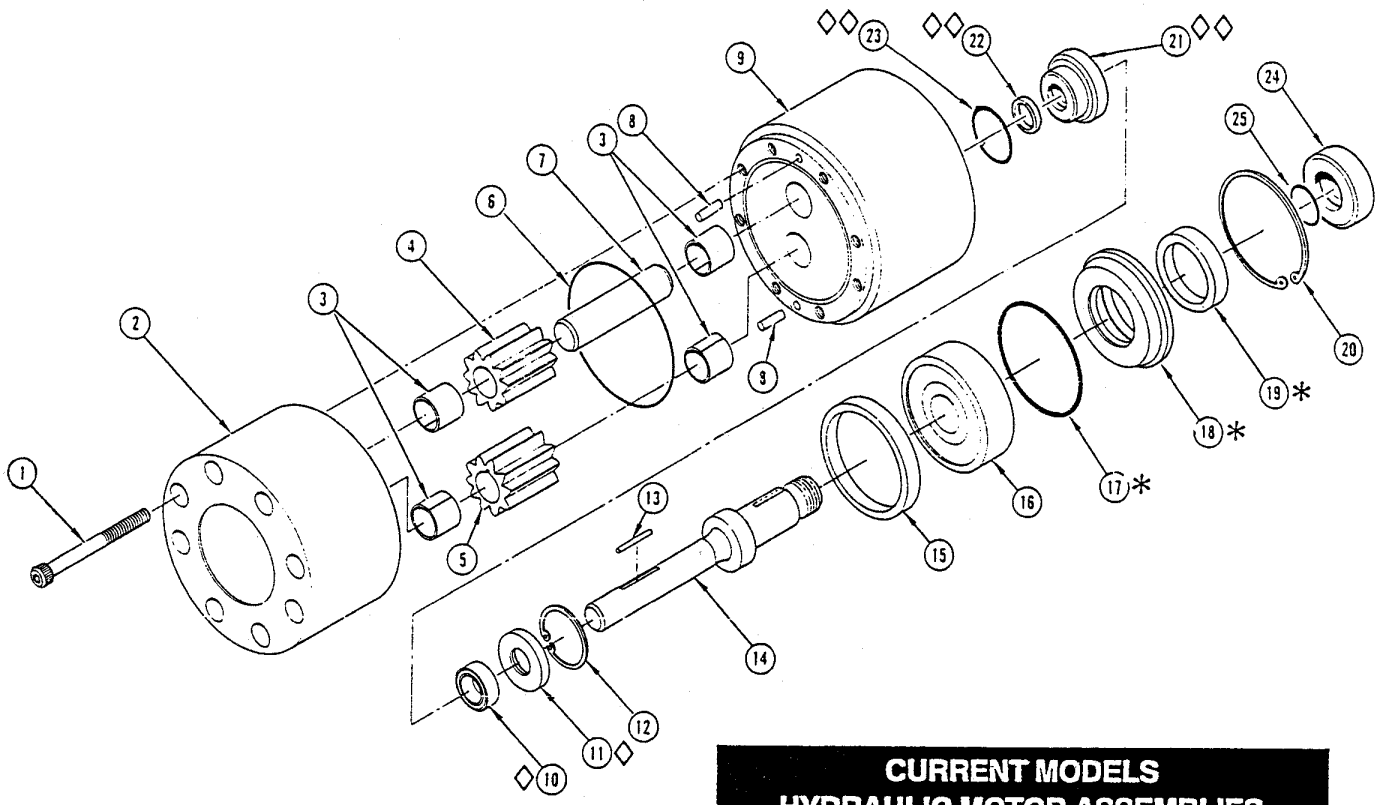
Item No.	Part No. 03272	Part No. 03045	Qty.	Description
1	03274	00494	8	Capscrew, Hex Soc Hd 1/4-20 x 2
2		00148	2	Bearing •
	03109		1	Bearing •
3	00633	00166	1	Retainer Ring
4	00169	C0169	1	Washer,Seal Liner
5	00170	00170	1	Retaining Ring
6	00171	00171	1	O-Ring, 11/16 x 13/16 x 1/16 ⊙
7	00172	00172	1	Seal Liner ⊙
8	00173	00173	1	Quad Ring, 3/8 x 1/2 x 1/16 ⊙
9	05459	05459	4	Bushing/Bearing
10	00178	00178	2	O-Ring, 2-1/8 x 2-1/4 x 1/16 •
11	00605	00605	1	Gear Housing
12	00606	00606	1	Idler Shaft
13	00608	00608	1	Gear w/Keyway
14	00609	00609	1	Key
15	00611	00611	2	Dowel Pin, 1/4 x 1-1/2
16	03268	02929	1	Motor Shaft
17	03405	03405	1	Rear Bearing Retainer Assy
18	03437	03436	1	Front Bearing Retainer Assy
19	01203	01203	1	Seal Washer
20	03790	03790	1	GPM Sticker (NOT SHOWN)
21	00607	00607	1	Gear
22	02905		1	O-Ring, 1-11/16 x 1-7/8 x 3/32 ⊙
23	03104		1	Keeper, Seal and Bearing
24	03110		1	Seal, Teflon •⊙

SEAL KIT DATA

Motor	03045	03272	07361	21443	07362	21444	Description
Kit	03325	03327	10571	10571	10569	10569	
Part No.	Qty.						
00018	1	1	1	1	1	1	O-Ring
00026	1	1	1	1	1	1	O-Ring
00171	1	1		1		1	O-Ring
00172	1	1					Seal Liner
00173	1	1				1	Quad Ring
00175	4	4	4	4	4	4	O-Ring
00178	2	2	1	1	1	1	O-Ring
00669			1	1	1	1	Quad Ring
00717	1	1	1	1	1	1	O-Ring
01211		1			1	1	O-Ring
01362	2	2	2	2	2	2	O-Ring
01411	1	1	1	1	1	1	O-Ring
01604	2	2	2	2	1	1	O-Ring
01605	2	2	2	2			O-Ring
02905		1			1	1	O-Ring
03110		1			1	1	Teflon Seal
05632	1	1	1	1	1	1	O-Ring
06315			1	1	1	1	Seal

NOTE: Use Part Number and Name when ordering.

- • Denotes Part in Repair Kit.
- ⊙ Denotes Part in Seal Kit.
- * Denotes Part in 03272 Motor only.



REPAIR KIT DATA

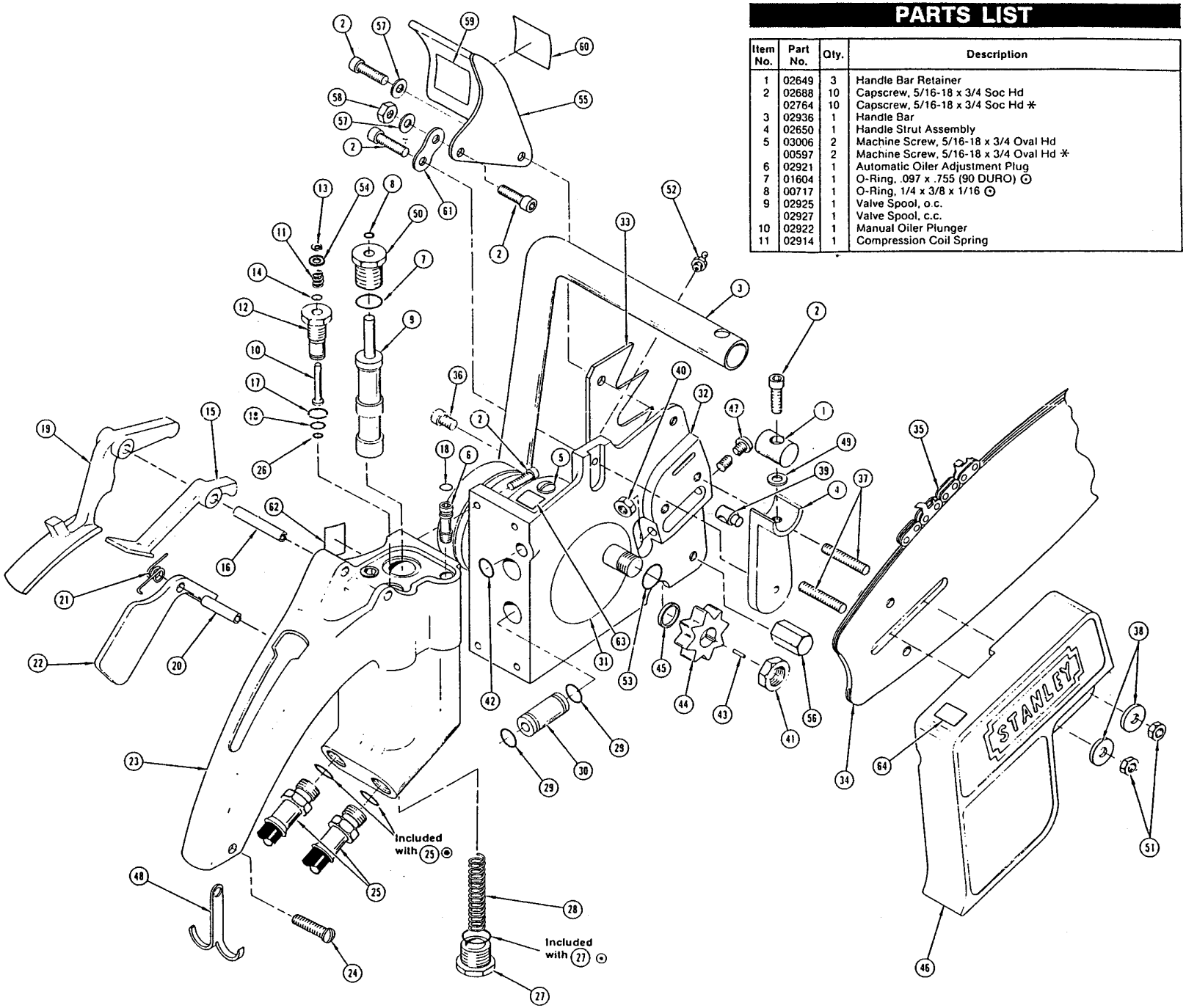
Motor	03045	03272	21443& 07361	21444& 07362	Description
Kit	03326	03328	10572	10570	
Part No.	Qty.				
00147	2		2		Hex Nut
00148	2		1	1	Bearing
00719	1	1	1	1	Lock Nut
00767		1			Grease Fitting
02648	1		1		Bar Adjustment
02687	1		1		Machine Screw
02765		1		1	Machine Screw
02938	1	1	1	1	Sprocket
03023	1	1	1	1	Key
03109		1			Bearing
03275		1		1	Bar Adjustment Nut
03276		2		2	Hex Nut
03325	1				Seal Kit
03327		1			Seal Kit
10569				1	Seal Kit
10571			1		Seal Kit

CURRENT MODELS HYDRAULIC MOTOR ASSEMBLIES 07361 and 21443 LAND MODELS 07362 and 21444 UNDERWATER MODELS

Item No.	Part No. 07361	Part No. 21443	Part No. 07362	Part No. 21444	Qty.	Description
1	00120	00120	00612	00612	8	Capscrew, Hex Soc Hd
					1	1/4-20 x 2 1/4
2	06866	06866	06866	06866	4	Gear Housing Assy
3	06316	06316	06316	06316	1	Bushing
4	06853	06853	06853	06853	1	Drive Gear
5	06855	06855	06855	06855	1	Idler Gear
6	00178	00178	00178	00178	1	O-Ring ⊙
7	06854	06854	06854	06854	2	Ider Shaft
8	00713	00713	00713	00713	1	Pin
9	07357	21436	07357	21436	1	Front Bearing Housing Assy
10	06315		06315		1	Seal ⊙
11	06304		06304		1	Seal Washer
12	00170	00170	00170	00170	1	Retaining Ring
13	06881	06881	06881	06881	1	Needle Roller
14	07358	07358	07359	07359	1	Motor Shaft
15	07360	07360		03280	1	Spacer
16	00148	00148	12119	12119	1	Bearing ●
17			02905		1	O-Ring ⊙
18			03104	03104	1	Keeper, Seal Bearing
19			03110	03110	1	Seal, Teflon® ⊙
20	00166	00166	00633	00633	1	Retaing Ring
21		19884		19884	1	Seal Gland
22		00669		00669	1	Quad Ring
23		00171		00171	1	O-Ring ⊙
24			03280	03280		Spacer Seal Ring
25			01211	01211		O-Ring

NOTE: Use Part Name and Part Number when ordering

- ● Denotes Part in Repair Kit.
- ⊙ Denotes Part in Seal Kit.
- * Denotes Part in 07362 Motor only.
- ◇ Used on 07361 and 07362 Motor only.
- ◇◇ Used on 21443 and 21444 Motor only.



PARTS LIST

Item No.	Part No.	Qty.	Description
1	02649	3	Handle Bar Retainer
2	02688	10	Capscrew, 5/16-18 x 3/4 Soc Hd
	02764	10	Capscrew, 5/16-18 x 3/4 Soc Hd *
3	02936	1	Handle Bar
4	02650	1	Handle Strut Assembly
5	03006	2	Machine Screw, 5/16-18 x 3/4 Oval Hd
	00597	2	Machine Screw, 5/16-18 x 3/4 Oval Hd *
6	02921	1	Automatic Oiler Adjustment Plug
7	01604	1	O-Ring, .097 x .755 (90 DURO) ⊙
8	00717	1	O-Ring, 1/4 x 3/8 x 1/16 ⊙
9	02925	1	Valve Spool, o.c.
	02927	1	Valve Spool, c.c.
10	02922	1	Manual Oiler Plunger
11	02914	1	Compression Coil Spring

PARTS LIST

Item No.	Part No.	Qty.	Description
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	02927	1	Valve Spool, c.c.
10	02922	1	Manual Oiler Plunger
11	02914	1	Compression Coil Spring
12	02932	1	Manual Oil Plug
13	03007	1	Retaining Ring, 5/32 E-Ring Ext
14	00026	1	O-Ring, 3/16 x 5/16 x 1/16 ⊙
15	02924	1	Manual Oil Trigger
16	03008	1	Roll Pin, 1/4 x 2-1/2
	03279	1	Roll Pin, 1/4 x 2-1/2 ⁎
17	01411	1	O-Ring, .078 x .468 ID ⊙
18	01362	2	O-Ring, 5/16 x 7/16 x 1/16 ⊙
19	02941	1	Trigger
20	03009	1	Roll Pin, 3/16 x 1-3/8
	03278	1	Roll Pin, 3/16 x 1-3/8 ⁎
21	02915	1	Torsion Spring
22	02943	1	Safety Catch
23	02945	1	Valve Handle Assembly
24	00165	1	Machine Screw, 1/4-20 x 1 Oval Hd
	00094	1	Machine Screw, 1/4-20 x 1 Oval Hd ⁎
25	06830	2	Pigtail Hose Assembly
26	05632	1	O-Ring, 3/32 x 7/32 x 1/16
27	03010	1	Hex O-Ring Port Plug, 5/8 Tube Size
28	02916	1	Compression Coil Spring
29	00175	4	O-Ring, 1/2 x 5/8 x 1/16 ⊙
30	02912	2	Oil Tube
31	21443	1	Motor Assembly
	21444	1	Motor Assembly ⁎
32	02947	1	Chain Saw Adapter Assembly
33	02913	1	Bucking Cleat
34	04642	1	Saw Bar, 19-in. Sprocket Nose
	02684	1	Saw Bar, 24-in. Sprocket Nose
	03192	1	Saw Bar, 30-in. Sprocket Nose
	03193	1	Saw Bar, 36-in. Sprocket Nose
	03457	1	Saw Bar, 43-in, Sprocket Nose
35	04643	1	Saw Chain, 19-in. Saw Bar 72LP-70
	01824	1	Saw Chain, 24-in. Saw Bar 72LP-82X
	03194	1	Saw chain, 30-in. Saw Bar 72LP-98X
	03195	1	Saw Chain, 36-in Saw Bar 72LP-117X
	03456	1	Saw Chain, 43-in. Saw Bar 75LP-135X
36	02449	1	Capscrew, 5/16-18 x 1 Soc Hd
37	02756	2	3/8-16 x 1-1/2 Stud
	03277	2	3/8-16 x 1-1/2 Stud
38	02690	2	3/8 Type A (W) Flat Washer
	02766	2	3/8 Type A (W) Flat Washer
39	02648	1	Bar Adjustment Nut ●
	3275	1	Bar Adjustment Nut ● ⁎
40	00719	1	Nut, 1/4-20 ESSNA ●
41	03012	1	Heavy Hex Jam Nut, 5/8-11 L.H. Thd
	03273	1	Heavy Hex Jam Nut, 5/8-11 L.H. Thd ⁎
42	00018	1	O-Ring, 7/16 x 9/16 x 1/16 (90 DURO) ⊙
43	03023	1	Key ●
44	02938	1	Sprocket ●
45	02910	1	Sprocket Spacer
	03280	1	Sprocket Spacer ⁎
46	02933	1	Chain Guard
47	02687	1	Machine Screw, 1/4-20 x 2-1/2 Fil Hd
	02765	1	Machine Screw, 1/4-20 x 2-1/2 Fil Hd
48	02911	1	Hose Clip
49	02643	3	Neoprene Washer, 5/16 x 3/4 x 1/16 (70 DURO)
50	02931	2	On-Off Valve Cap
51	00147	2	3/8-16 Hex Nut ●
	03276	1	3/8-16 Hex Nut ● ⁎
52	00767	1	Grease Fitting ● ⁎ ◇
53	01211	1	O-Ring, 5/8 x 3/4 1/16 ⊙ ⁎
54	04139	1	Washer
55	12171	1	Hand Guard
56	12174	2	Chain Stop
57	12175	1	Washer
58	09277	1	Nut
59	12412	1	Danger Sticker Electrical
60	13907	1	Warning Sticker Kickback
61	12248	1	Link Plate
62	03790	1	GPM Sticker
63	03693	1	Closed Center Sticker (C.C. Model)
64	04746		Auto Oiler Sticker

NOTE: Use Part Number and Part Name when ordering.

- ● Denotes Part in Repair Kit.
- ⊙ Denotes Part in Seal Kit.
- ⁎ Denotes Part in Underwater Model.
- ◇ Not Used in Current Production.

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