Hydraulic Shear
PSS230

Operation & Maintenance Manual

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■ Preface

WARNING!

It is very important for you to read and undertand this manual before operating and to keep the instructions provided herewith. Do not operate the shear until you have read and fully understand these instructions.

This manual contains instructions and information on safe and correct use of YONIL shears.

- Please read and understand this manual before operation, inspections and maintenance of the shears.
- Keep this manual with your equipment all the time for your quick and easy reference, and read it regularly.
- Do not operate the shears until you have been trained in the use of all operating controls and understand the hydraulic shears operation.
- Get a replacement manual from YONIL dealer if you lost it.
- If you transfer the shears to the other, do transfer this manual as well.
- The figures in this manual are for better understanding and may not correspond exactly to the shears. For exact shape, refer to the parts list or ask YONIL.
- For the purpose of constant product improvement, some parts of this manual may be changed. If you found the parts unclear or not corresponding to the shears, call and consult YONIL dealer or service center.
- Important information on safety is described in the safety information chapter of this book. Be familiarized with the instructions on the safe operation and observe the instructions before and during operation.
- Injury, death or damage caused by unauthorized product modifications and operation under un-allowed application will not be responsible by YONIL. Consult YONIL for such modifications and applications.
- Use YONIL genuine parts. YONIL takes no responsibility for damages caused by use of non- YONIL spare parts.
- For warranty, we refer you to the warranty conditions provided separately.

We always exert all our efforts for your satisfaction, and promise you quick and constant service.

We thank you for using YONIL shears and wish you a good luck in every your job,

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* Specifications and features presented in this document are subject to change without notice.

1. Safety Information

This manual describes correct use of the product and safety messages. Important or certain instructions in this manual are marked with ⚠ symbol. When you see this symbol provided in the manual or on the product, be alert to the possibility of personal injury or death. Be sure to observe the instruction in the safety message. The safety messages in this manual do not describe all the possibilities of personal injury or death or of damages to the product. This safety manual and the marks with symbols are intended to provide some of basic instructions for safe operation, inspection and maintenance. It is operator's responsibility to observe the safety instructions and regulations though this manual does not include all the possible situations.

Remember! Safety is up to you

■ Safety Alert Symbol

The Safety Alert Symbol represents that **ATTENTION** is involved.
If you see the mark in this manual or on the products, never fail to read and observe the instructions for safe operation.

■ Signal Words

The words "**DANGER**", "**WARNING**", "**CAUTION**" and "**IMPORTANT**" appeared with the above **Safety Alert Symbol** indicate degree of risk of hazards or unsafe practices. All four degrees of risk indicate that safety is involved. Observe precautions indicated whenever you see the **Safety Alert Symbol**, no matter which signal word appears next to the "Exclamation Point" symbol.

⚠ **DANGER!**	Indicates imminent hazard of a situation that, if not avoided, is very likely to cause death or extremely serious injury. It may also be used to alert against product that may exploded or detonate if handled or treated carelessly.
⚠ **WARNING!**	Indicates potential of a hazardous situation that, if not avoided, could result in serious injury or death. It may also be used to alert against a highly unsafe practice.
⚠ **CAUTION!**	Indicates potential of a hazardous situation that, if not avoided, could result in minor or moderate injury. It may also be used to alert against a general unsafe practice.
⚠ **IMPORTANT!**	Indicates potential of damages that, if not avoided, could cause to the product or shorten the product life.

1.1. Basic safety information

WARNING!

The following instructions are those that should never be fail to observe in operation of construction equipment.

■ Know yourself

All the operators and service men must wear safety equipment required, hearing protection, respirator, hard hat, safety shoes, eye protection glass, heavy gloves and other necessary equipment. Wearing loose clothing or any accessories such as flopping cuffs, dangling neckties and scarves, untied shoe-laces, rings, wrist watches and long hair could be the cause of personal injury or death.

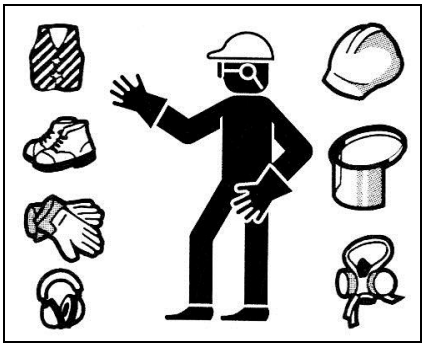

Figure 1

Use the proper tools for inspection or maintenance work, which must be carried out after ensuring the equipment stops completely and is placed stably in the safe place

■ Know your equipment

Never fail to read and understand the safety messages, operation manual and maintenance manual before installation and operation of the shears. The operator who has been trained and licensed should only operate the carrier and the shears. Familiarize yourself with the operating especially safety related devices such as safety lock, emergency stop and the others.

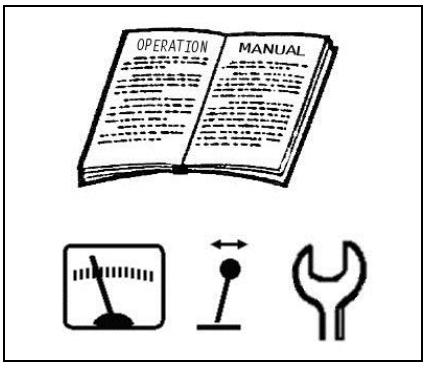

Figure 2

■ Know the work site

Before beginning operation, check in and around the work site for any unusual conditions that could be dangerous and prepare the appropriate warnings for safe work.

Be careful, especially when work in the vicinity of electric power line, buried gas lines or oil tank. And pay your careful attention to the people and the cars reside and passing near to the work site. Prepare for every possible injury and damages.

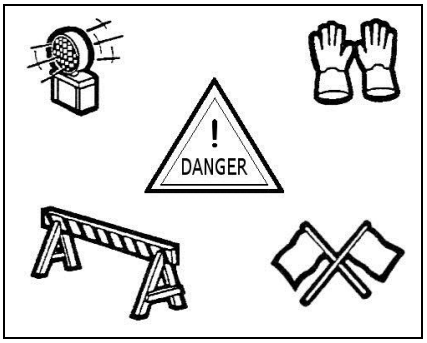

Figure 3

■ Know the rules

Every people who operate or maintain the equipment should know the meaning, rules and laws in terms of equipment handling. They should know also the traffic rules, fire service act, emergency measures and where the relief equipment is.

Keep the fire extinguisher and the first aid case in the operator's cabin for emergency use.

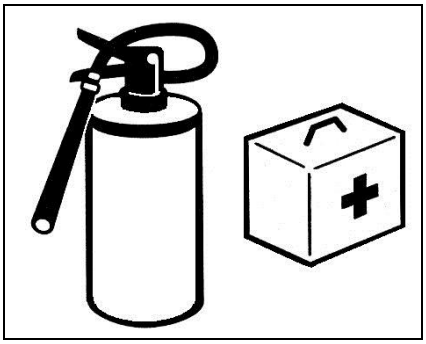

Figure 4

1.2. Preparation for safe operation

WARNING!

Read and observe the following instructions on safety.

■ Install the shears on the suitable carrier

The suitable carrier must be selected taking the weight and hydraulic system of the shears into consideration. The carrier may fall over if the shears is installed on the carrier, which does not fit the shears. All hydraulic lines for the shears use must satisfy the specification and quality provided in page 11, "Requirements on the carrier".

■ Protect the operator from the flying splinters

To protect the operator from the heavy concrete elements falling down when the shears is working on the tall columns, supports and brick, the carrier should be equipped with the cab protector strong enough for the falling elements. For more information on the cab protector, please consult carrier manufacturer or YONIL dealer.

■ Safety instructions on the shears installation

When insert the mounting pin to install the shears on the carrier, the pin holes in the carrier's arm must be flush with those in the mounting adapter of the shears. For this job, a carrier operator and an assistant should be careful and agree on the hand signals beforehand. Your finger or hand must not use to check whether the holes are flush. Once the mounting pins are inserted, lock the pins so that they are not taken off.

If quick coupler is used, be sure clamping is completed. When you connect the hose, tighten the connectors with prescribed torques.

And make sure of complete connection when you open the stop valve. It may cause personal injury if the incorrectly connected hose is pressurized. When connecting the hose, be careful not to have the O-ring damaged or missed, and keep all the connectors clean.

■ Check the shears and carrier

Please check every necessary parts of the shears and the carrier before starting operation. Referring to check points in the manuals of the shears and carrier, check any damages, breakage, crack, wear, deformation, connections, oil leak and the safety related points.

For the shears, check carefully crack in the welded parts of shears body, bolt and nut, pin, oil leak on the cylinder and hose. Do not operate in case any damages or failure is found until it is fixed. In case such trouble is found, put the warning tag like the picture. It is good to let the same person remove the tag after trouble shooting. (Figure 5)

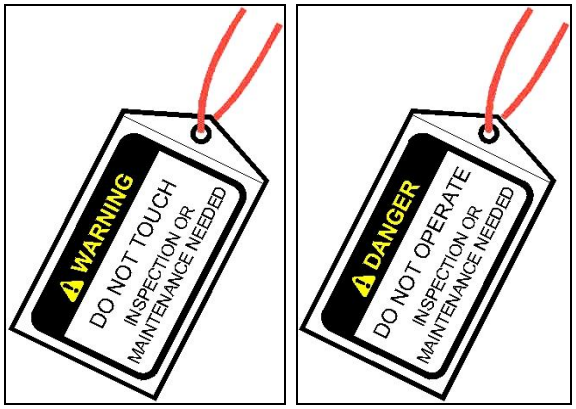

Figure 5

■ Check safety in work site

Check if the building has a sufficient load capacity to bear the weight of the carrier in case it is necessary to work on the roof or ceiling of the building.

1.3. Safety information for operating the shears

WARNING!

The following instructions are on safety in operation with shears. Read, understand and observe the instructions. More information is provided in page14, “Operation”.

■ Never operate in un-allowed applications

Operation in applications not allowed by the manufacturer must not be carried out. Refer to page14, “Operation” for such applications.

■ Operate from the top downwards

Heavy broken concrete elements may fall down and damage the hydraulic shears and the carrier, therefore, columns and supports must be broken from the top downwards.

■ Never use for transportation purpose

Lifting and transporting loads such as concrete columns, steel beams or pipes on the shears may result in accident. There is a risk of shearing or cutting during the transportation.

■ Never use for hammering or ramming

Hammering or ramming with the shears may cause serious damage to the shears.

■ Prepare an escape for the carrier

Never fail to prepare a escape for the carrier for emergency. The direction needs to be opposite to the object of shearing and it should be straight way.

■ Stop operation on finding uncertainties

Never fail to stop the operation if an uncertain noise or vibration is detected during the operation and check the condition of the carrier and the shears.

■ Pay attention during operation

Do not read, do not listen to music, do not talk over the cell phone during the operation. Do not operate the shears as well as the carrier carelessly.

1.4. Safety information for maintenance of the shears

■ Follow the manual

Follow the instructions described in the manual when performing maintenance work on the Shears. Pay your careful attention to all relevant safety regulations. Do not hurry. Most of accidents occur when the instructions are not observed.

Figure 6

Use proper tools

The proper tools should be used for the maintenance work. Use of improper tools may cause personal injury or damage to the parts of the Shears. Wear the eye protective glasses especially when removing and replacing the cutter blades because the metal chips may fly off and cause injury if they are struck with a hand hammer made of steel.

Use only the lug provided and sufficiently powerful lifting equipment when lifting the Shears. Lug and ropes must be in good condition.

■ Ensure that the shears and carrier stop completely

Maintenance work should be performed with the shears jaw completely closed. Make sure to shut-off the stop valve of the hydraulic line for the shears or to use a support to sustain the opened jaw if maintenance work should be carried out with the jaw opened.

Place the carrier on the firm and flat ground with all the control levers or switches in a safe position.

■ Pay attention to hot oil and high pressure in hydraulic system

Special attention is required when performing maintenance of hydraulic system. Never disassemble the Shears as soon as the Shears has been stopped because the hydraulic system is still in high pressure. Follow the instructions and release the residual pressure in the system. Pressure may remain in the speed up valve, and it may be burst if it is disassembled with the pressure inside.

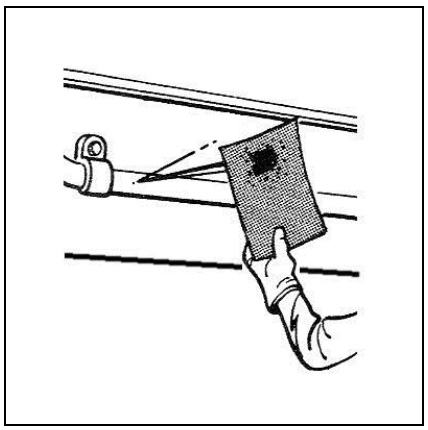

Figure 7

Oil running out from the crack or small hole on hydraulic system may cause personal injury. The hydraulic oil becomes very hot. And compressed air in the oil tank may cause oil spouting when disconnecting the line. Bleed off the compressed air by opening slowly the filer cap of the oil tank.

■ Wet ground may be slippery

The oil wet on the ground may be very slippery. Collect any oil and dispose it correctly.

■ Do not alter or modify

Unauthorized alteration or modification of the shears shall not be guaranteed by YONIL.

2. Configuration and ordering information

2.1. Main components

- Designed to prevent outward slipping & jamming of the object while jaw is closing, and increased the durability by adopting a gun drill type cylinder. The shear consists of five main parts as like below decal. And want to know more detailed, kindly refer to the parts list.

Externals structure

① Body ② Mounting Bracket ③ Cylinder ④ Jaw

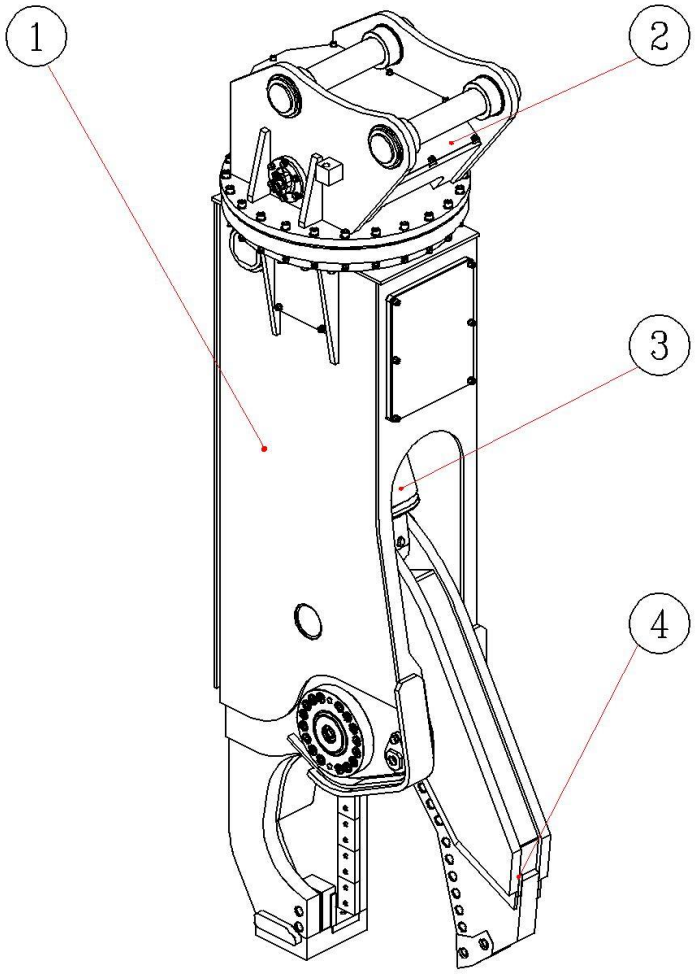

Figure 8

3. Installation

3.1. Lifting the shears

DANGER!

Be sure of observing the instructions below because they are related to safety

- Move the shears with the jaw completely closed and hydraulic lines plugged.
- When lifting the shears, use sufficiently powerful lifting equipment.
- Ropes and lugs must be in good condition.

3.2. Requirements on the carrier

WARNING!

Be sure of observing the instructions because they are related safety and the life of the shears.

YONIL hydraulic shears, YSR-series is designed to be used with a hydraulic excavator. Refer to the following points when deciding an excavator for the shears.

- **Carrier weight**
  - ✓ The excavator may fall over if the capacity is not good enough to use the shears or if it is equipped with a long boom and/or a long reach arm. Proper excavator should be decided for use with the shears or such long boom and arm.
- **Hydraulic system**
  - ✓ The hydraulic system of the carrier must be suitable for the shears. Low flow rate and pressure results in slow working speed and low shearing force respectively. Check the specification of the carrier.

- ✓ Generally speaking the hydraulic oil originally recommended for the carrier can be used for the YONIL hydraulic shears. However, since working with the hydraulic shears will heat the oil much more than the usual excavation work, the viscosity of the oil must be checked. When the shears is used continuously, the viscosity of the hydraulic oil should be 15~100 cSt at the whole operating temperature range. For more details about hydraulic oil, refer to page 20, Chapter “5.5. Hydraulic oil”

- ✓ When installing the shears with no pre-filled oil in it, the shears cylinders need a lot of oil. So you must fill the oil by the proper level in oil tank after operating the shears two or three times.

- ✓ Hydraulic system must have a proper cooling system in order the temperature of the hydraulic oil not to exceed 90 °C (194 °F) which may cause damage to the shears as well as the carrier. If the carrier’s oil cooler is too small either the original cooler must be replaced with a larger one or an auxiliary cooler must be installed.

Retrofitting from breaker piping to shears piping :

- ✓ When retrofitting the breaker piping lines to shears piping lines, take the return line of the existing breaker piping lines for the jaw closing lines of the shears. If the return line of the existing breaker lines is also installed for low pressure only, we recommend you to replace all the piping lines with the adequate piping lines as required above and make the lines both supply and return lines to high pressure lines. If the breaker supply line is taken for the jaw opening line, relief valve on the breaker supply line does not need to be reset.

- ✓ For more detailed information, refer to YONIL service center.

4. Operating the shears

4.1. Preparation for safe and correct operation

After whole installing procedure as described in the previous chapter, the shears is ready to operate. However, before starting up the shears, please make sure the following :

- ✓ mechanical connection between the shears and the carrier.
- ✓ locking status of the mounting pins.
- ✓ hydraulic connections between the shears and the carrier.
- ✓ exact setting of the relief pressure.
- ✓ no oil leaks from the hydraulic connections and any parts of the shears.
- ✓ no defective or loosened parts of the shears.
- ✓ cracks, wear, loss, etc.

Check the followings moving the shears :

- ✓ corresponding the jaw movements and the rotating direction with the appropriate actuating switches in the carrier's cab.
- ✓ smooth opening and closing of the jaws.
- ✓ smooth rotating of the shears.
- ✓ no abnormal sound and no vibration during the operation.

WARNING!

Read carefully and follow all safety regulations concerned with the preparation for safe operation. Refer to page 6, "Preparation for safe operation".

4.2. Greasing

Apply grease to every grease nipple at the joint pins and slewing bearing of the shears using recommended greases.

- ■ Recommended greasing Interval : Every two hours
- ■ 4 ~ 5 strokes from a grease gun to each greasing nipples are sufficient in each case
- ■ Adapt greasing interval and amount of grease to working conditions
- ■ Insufficient greasing may cause abnormal wear of the joint pin or slewing bearing

- Grease with the following properties are recommended :

  - No dropping point (or very high, over 250 °C / 480 °F)
  - Max. working temperature over 150 °C / 300 °F
  - Min. working temperature under lowest ambient temperature
  - Additives : molybdenium disulphide (MoS_2), graphite or equivalent
  - Grade (thickness) NLGI 0~2
  - Water resistant

4.3. Operation

WARNING!

Read carefully and follow all safety regulations concerned with safe operation. Refer to page 7, “Safety information for operating the shears”.

Operating temperature :

The operating temperature of the shears is -20 ~ +90°C (-4 ~ +194°F).

If the ambient temperature is lower than -20°C(-4°F), the shears have to be warmed up before starting operation in the way described at the carrier’s manual. During operation, they will remain warm.

If the oil temperature exceeds +90°C(+194°F), please stop the carrier and wait until the oil has cooled to operating temperature range. For continuous operation with high duty, maximum oil temperature is recommended not to exceed +80°C(+175°F). An auxiliary oil cooler must be fitted if needed.

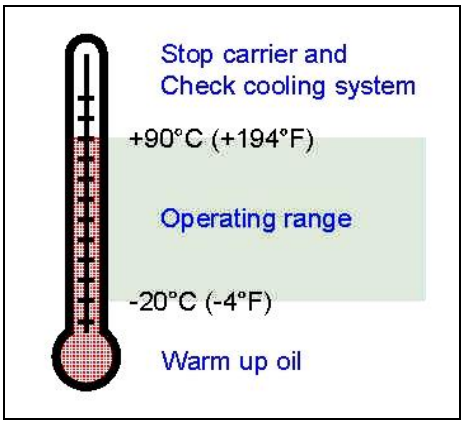

Figure 9

The oil temperature during operating the shears depends on ambient temperature condition, on cooling capacity of carrier's hydraulic system and on working duty for the shears. Use the hydraulic oils of high viscosity in high oil temperature.

IMPORTANT!

If the oil temperature exceeds +90°C(+194°F), please stop the carrier and wait until the oil has cooled to operating temperature range. Extreme oil temperature may cause serious damage on the seals in the carrier and shears.

Correct working method :

WARNING!

Stop operating immediately if anyone moves into the danger area, i.e. within a radius of at least 20 meters around the shears. Must be observant of other workers, bystanders and other equipments in the danger area.

WARNING!

Please do install the proper protection shield on the carrier's cab to prevent possible injury from flying pieces of broken rock or the cut steel pieces.

DANGER!

Improper operation of the shears could result in serious injury or death. Never operate the shears unless you are properly trained.

Read these notice before operation the shears.

	**WARING!** **Do not operate to either side of the carrier with the boom and arm extended.** This can make a danger of the carrier fall over.
	**DANGER!** **Make sure the strength of structure which supports the carrier.**
	**WARING! IMPORTANT!** **Do not use for transport purpose.**
	**IMPORTANT!** **Do not operate with the carrier's hydraulic cylinders fully extended or retracted.** Failure to do so will cause damage to the carrier's hydraulic cylinders.
	**IMPORTANT!** **Never use as a hammer.** Never attempt to use the shears as a hammer or ramming tool.
	**IMPORTANT!** **Never use as a lever..** Never attempt to use the shears as a lever or support.
	**IMPORTANT!** **Do not move the carrier while shearing is in progress.** This will cause serious damage to the shears.
	**IMPORTANT!** **Do not move the carrier while shearing is in progress.** This will cause serious damage to the shears.
	**IMPORTANT!** **Never pull at heavy elements.** This will cause serious damage both the shears and the mounting adapter.
	**IMPORTANT!** **Do not rotate the shears whole shearing is in progress.** This will cause damage to the shears and carrier's arm.

5. Inspection and Maintenance

5.1. General information

Routine inspections and maintenance work must be carried out to keep the hydraulic shears in the best operating condition. The following sections list the inspection and maintenance intervals, check points over the shears and carrier.

WARNING!

Read carefully and follow all safety regulations concerned with maintenance of the shears. Refer to page 8, “Safety information for maintenance of the shears”.

Whenever maintenance work is carried out, keep always following instructions.

1. Park the carrier on a firm and flat ground
2. Close the jaws of the shears completely.
3. Lower the shears to ground and put the shears on a rigid and clean support.
4. Lower the engine speed to the lowest idle position.
5. Wait for at least 10 minutes to allow the residual pressure in the shears be released.
6. Turn the stop valves to “OFF” position.

DANGER!

Never put your body into the open jaws. ***Risk of death or serious injury!***

Followings are the basic inspections to be checked always :

- ✓ Check, whenever inspecting, if there is a crack at the welded part of the shears (visual inspection).
- ✓ Check, whenever inspecting, the wear and rounding of the jaws, cutter blades and teeth. Change worn blades and teeth in good time.
- ✓ Check, whenever inspecting, if there are oil leaks at the hydraulic components or the hydraulic connections of the shears.
- ✓ Check, whenever inspecting, if all fasteners such as bolts, nuts and snap-rings come loose, and retighten them to the prescribed tightening torque, if necessary. Broken parts must be replaced immediately.
- ✓ Check that the blade clearances. The blade clearance should not exceed 1 mm.
- ✓ Adjust the clearance of cutter blade according to the instructions, if necessary.

In order to prevent possible damages to the shears from un-allowed maintenance work, please keep following instruction :

- Absolute cleanliness and great care are basic and essential matters in handling of any hydraulic components. Dirt is the worst enemy in hydraulic system.

- Sealing components such as packings, O-rings and plugs in the hydraulic system should be oiled with very clean oil before assembly.

DANGER!

Never attempt to disassemble the hydraulic cylinder and the speed-up valve of the shears. High pressure can be maintained in these components long after the system has been shut down. This residual pressure can cause hydraulic oil or parts such as plugs to shoot out at high speed if the pressure is not released completely.
Please consult YONIL service for the maintenance of these components.

5.2. Maintenance intervals

- **Every two hours**

  - ✓ Grease the joint pins.

- **Daily**

  - ✓ Retighten loose components. Especially :
    - Bolts at the rotation bearing
    - Bolts in the cutter blades
  - ✓ Check the wear or breakage of the cutter blades.
  - ✓ Check if the hydraulic connection becomes loose.

- **Weekly**

  - ✓ Check the wear of the jaws and shears body.
  - ✓ Check carefully if there is a crack in the welded part of the shears.
  - ✓ Check the hydraulic components of the carrier.
  - ✓ Check abnormal sound or vibration during the jaw movements and rotation of the shears.

5.3. Changing the cutter blades

Change the cutter blades if there are the wear, breakage or any damage at the edge of cutter blade during the operation. When replacing the cutter blades, please observe the following instructions :

- Always wear the eye protective glasses and use a plastic or copper hammer when removing and inserting the cutter blades. Because the cutter blades are made of very hard material, the metal chips may fly off to eye and cause serious injury if they are struck with a steel hammer.

- Ensure that they are tightened correctly to the prescribed tightening torque.

- If the condition of the bolts and lock-washers is not good, always use new bolts and lock-washers when fitting new cutter blades.

- Make sure there is no particle at the contact surface between the jaw and blades. Cutter blades must contact the jaw completely.

- Replace the tip blade before it is worn as the “Figure 10”.

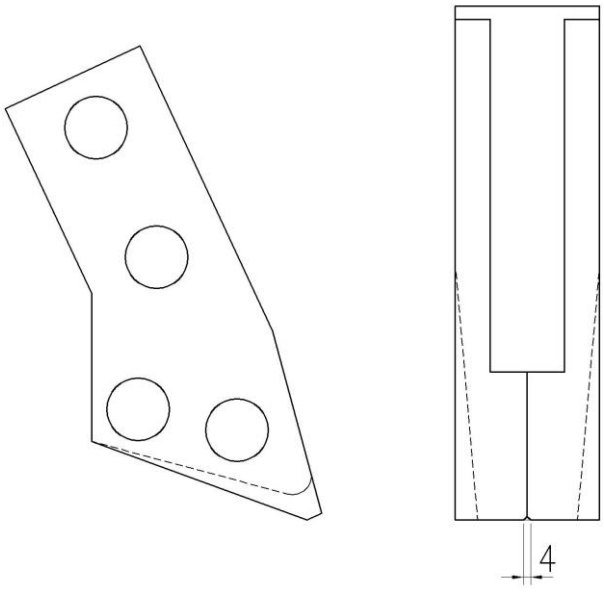

Figure 10

5.4. Check the slide puck

Check tolerances every eight hours of operation. Never over-tighten the slide puck against the wear surface. Perform slide puck maintenance before performing blade maintenance.

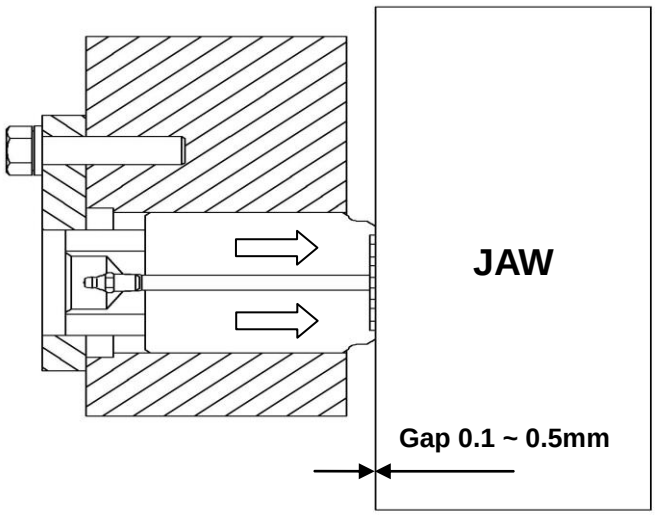

Figure 11

5.5. Adjustment blade gap

Adjust blade gap. Improper blade gap may cause jamming or blade breakage.

- Always wear the eye protective glasses and use a plastic or copper hammer when adjusting the blade gap.
- Ensure that they are tightened correctly to the prescribed tightening torque.

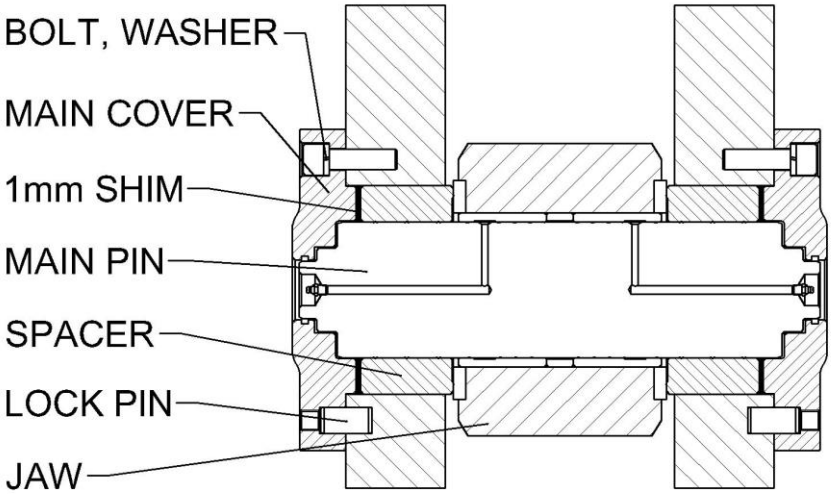

Figure 12

Followings are the blade gap adjustment method.

- ✓ Place the carrier on the firm and flat ground with the shears.
- ✓ Loosen blade bolt.
- ✓ Install shims between the blades and body plates as needed to bring into tolerance.(Max. 1.5mm)
- ✓ Torque blots and recheck the tolerance.

If the blade gad still exceeds 0.5 ~ 1mm, followings are the adjustment method.

- ✓ Loosen screw blots and remove main covers.
- ✓ Insert the 1mm shims into each side until blade gap is 0 ~ 0.5mm.
- ✓ Adhere the main cover closely and tighten bolts.
- ✓ Check the jaw operation.

5.6. Welding guide for the jaws and teeth

If there are serious wear at the hard-faced area and the teeth of the jaw, re-welding work can be carried out by the way of welding instruction as follows. However, in order to archive the best quality, working by a qualified welding expert is recommended.

When hard-facing the jaw, it is important to ensure that there is still a buffer layer on the base metal of the jaw. If this is not the case, the buffer layer should first be welded at target area before hard-facing the jaw.

Before welding, any fitted components such as cutter blades must be removed from the jaws.

5.7. Hydraulic oil

Generally speaking the hydraulic oil originally intended for the carrier can be also used in the hydraulic shears. However, since working with the hydraulic shears will heat the oil much more than the usual excavation work, the viscosity of the oil should be selected properly.

When the shears is used continuously, the temperature of the hydraulic oil normalizes at a certain level depending on working conditions and on the carrier's hydraulic system. At this temperature, the viscosity of the hydraulic oil should be 15 ~ 100 cSt.

The hydraulic shears should not be started if the viscosity of the hydraulic oil is above 1000 cSt or operated when the viscosity of hydraulic oil is below 15 cSt.

In summer and hotter climates, oils of viscosity class HLP 68 (68 cSt at 40°C) or higher should be used.

Using the oil with higher viscosity (too thick) may cause :

- Stiff operation of the speed-up valve
- Risk of cavitation in the pumps and hydraulic motor
- Bypassing the filter, impurities in oil not filtered

Using the oil with lower viscosity (too thin) may cause :

- Efficiency losses (internal leaks)
- Damage to seals and oil leaks
- Accelerated wear in moving parts due to insufficient lubrication

● Hydraulic oil purity

No separate filter is required when the hydraulic shears is installed in the carrier. The hydraulic oil filter of the carrier will clean the oil flowing through the shears. The purpose of oil filter is to remove impurities from the hydraulic oil since they cause accelerated component wear, blockages and even seizure. Impurities also cause the oil to heat and deteriorate. Air and water are also impurities in oil. Not all impurities can be seen with the naked eye.

● Oil filter

In hydraulic shears work, the carrier's oil filter must fulfill the following specifications:

- The oil filter must allow maximum particle size of 25microns (0.025mm).
- The oil filter material must be fiber cloth or very fine metallic mesh to withstand pressure fluctuations.
- The oil filter must have a volume flow capacity of at least twice the shears maximum flow

In general, oil companies guarantee new oil to have a particle count of 40 microns maximum. When adding oil to existing tank, the oil must be filtered.

The impurities in the hydraulic oil can cause damages to the shears and carrier as follows :

- The working life of the hydraulic elements is significantly shortened
- Valves do not function properly due to spool stick
- Wear of cylinder rod and seals
- Shortened working life and reduced efficiency of hydraulic oil (overheats of oil, deteriorates of oil quality, electro-chemical changes in hydraulic oil)

We recommend replacing the hydraulic oil and oil filters at the intervals shown in the following table, which is based on the shears operating time.

Hydraulic Oil	Every 600 hours
Oil filters	Every 100 hours

● Oil cooling

The maximum permitted hydraulic oil temperature in continuous shears operation is 90 □C (194 □F). Therefore, a reliable hydraulic oil thermometer is necessary. If there is no thermometer on the carrier one must be installed. The temperature of hydraulic oil depends on ambient conditions, the cooling capacity of the carrier and on the oil flow through the shears.

When the hydraulic shears is used continuously it is necessary to have cooling system with extra cooling capacity compared with normal excavation work. The oil cooler of the carrier must have a oil flow capacity of at least twice the shears maximum oil flow. The cooler must stand the dynamic pressure of 20 bar.

6. Dismounting and Storing the shears

Dismount and store the shears according to following instructions :

- When dismounting the hydraulic shears from the carrier, put the shears on the firm and flat ground after check if there is no obstacle within the swing area of the carrier.
- Also the jaw of the shears must be kept completely close.
- Take care of the safety against the shears after dismounting so that it can't fall over.
- After turn stop valves to "OFF" position, disconnect hydraulic hoses from the stop valves.
- Apply end caps and plugs to hoses and stop valves to prevent contamination.
- The hydraulic shears recommended to be deposited for storage on a wooden support of sufficient size and strength.
- Also the jaw of the shears must be kept completely close.
- Collect any oil which runs out when the hydraulic hoses are disconnected and dispose of it correctly.

7. Trouble shooting

Trouble	Cause	Remedy
Shears does not run	The stop valves in the pipe line is locked	Open the stop valves.
	The hydraulic oil in oil tank is too small	Check the oil level in oil tank and fill the oil properly.
	Out of actuating switch	Replace solenoid of the switch.
The operation of jaw is not smooth or doesn't run suddenly	Speed-up valve defective	Contact YONIL service.
The shearing power is weak	Operating pressure is too low	Correct operating pressure.
The steels doesn't be cut very well	Cutter blade is worn or broken.	If necessary reset or replace cutter blade.
	Cutter blade clearance is too big	Adjust cutter blade clearance.
Shears can't rotated or abnormal noise during rotation	Hydraulic motor, pinion or slewing bearing are defective	Contact YONIL's service.
Operating temperature is too high	Pressure relief valve is defective	Replace the pressure relief valve.
	Oil level in tank too low	Fill hydraulic oil.
	Cooling capacity of the carrier's oil cooler is too small	Contact YONIL's service.
Oil leaks from the hydraulic connections	Connecting adapter is loose	Tighten adapter.
Abnormal noise at joint pin	Insufficient greasing	Apply grease

■ Consult the other troubles and more details with YONIL dealers or YONIL service center.