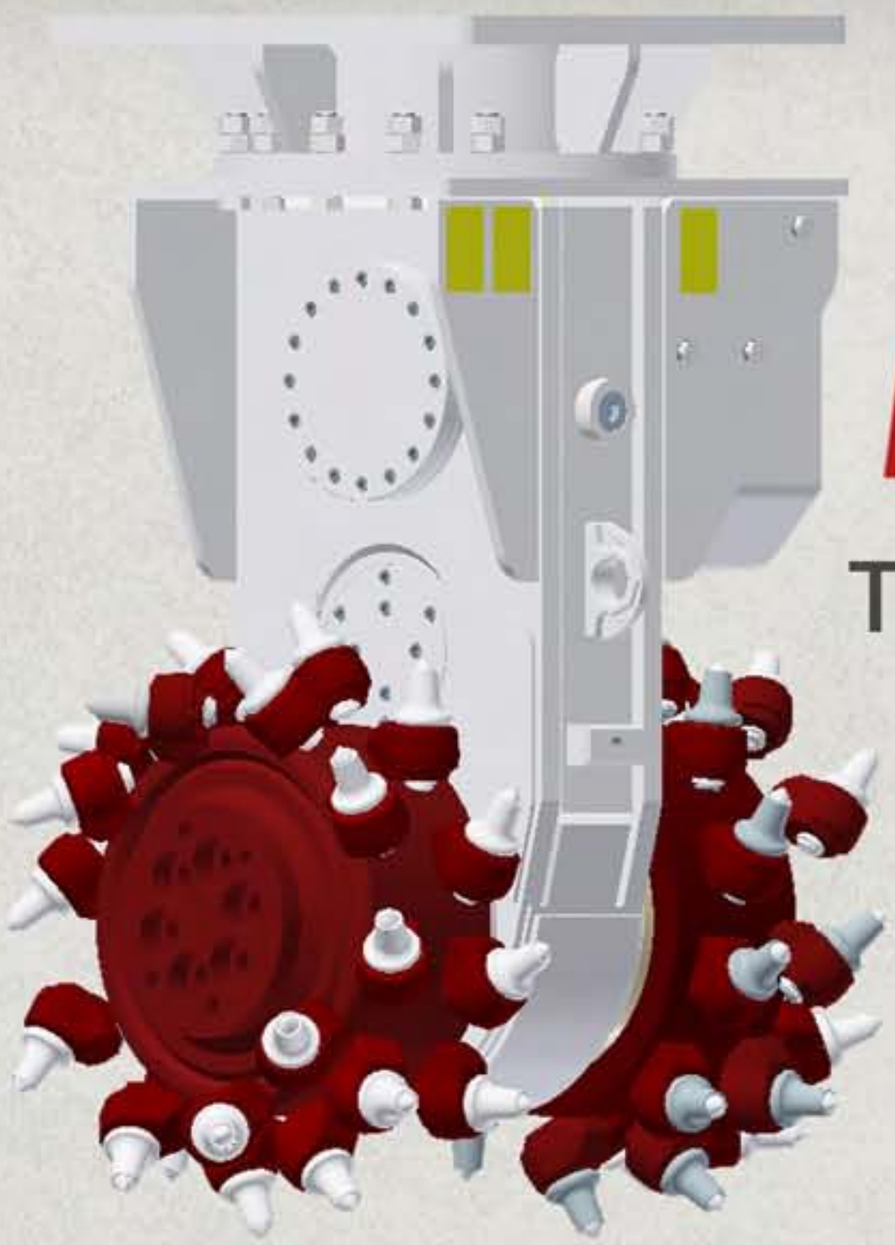


EXPERIENCED, INNOVATIVE AND RELIABLE

ANTRAQUIP®
CORPORATION

TRANSVERSE CUTTERS

MODELS AQ1S - AQ6

Read the manual prior to operating.

Technical Modification Reserved: September 2014

OPERATOR MANUAL

ANSI
CE

Table of Contents

1. GENERAL INFORMATION

This manual is for: Antraquip Transverse Cutters AQ1S, AQ1, AQ2, AQ3, AQ3XL, AQ4, AQ4HD, AQ4XL, AQ5, and AQ6.

Information used in these instructions was current at time of printing. However, due to Antraquip's ongoing product improvement, production changes may cause your equipment to appear slightly different in detail.

Antraquip Corporation reserves the right to change specifications or design without notice and without incurring obligation to install the same on equipment previously manufactured.

Your Antraquip equipment has been carefully designed to provide dependable operation in return for your investment.

This manual has been prepared to aid you in the operation and maintenance of the Transverse Cutter. It should be considered a permanent part of the machine and remain with the machine when you sell it.

SERIAL NUMBER

The serial number provides important information about your equipment and is required to obtain correct replacement parts.

Always provide model and serial number to your Antraquip Dealer when ordering parts or anytime correspondence is made with Antraquip Corporation.

Data Plate

2. SAFETY

It is the responsibility of the user to read and understand the Operator Manual in regards to safety, operation, lubrication and maintenance before operation of this equipment. It is the user's responsibility to inspect and service the machine routinely as directed in the Operator Manual.

We have attempted to cover all areas of safety, operation, lubrication and maintenance; however, there may be times when special care must be taken to fit your conditions.

Throughout this manual the symbol ⚠ and the words **DANGER**, **WARNING**, and **CAUTION** are used to call attention to safety information that if not followed, will or could result in death or injury. **NOTICE** and **NOTE** are used to call your attention to important information.

The definition of each of these terms follows:

⚠ DANGER

DANGER Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

NOTE: Special point of information or machine adjustment instructions.

2.1 General Safety Instructions

1. Read and understand instructions provided in this manual and warning labels. Review these instructions frequently!
2. Never allow equipment to be operated by anyone unfamiliar with operation of all functions of the unit. Operators must read and thoroughly understand all instructions given in this manual before operating or working on equipment.
3. Make sure equipment weight does not exceed capacity of prime mover, or exceed combined equipment bridge and road limits. This is critical to maintain safe control and prevent death or injury, or property and equipment damage.
4. Always wear protective clothing, shoes, gloves, hearing, and eye protection as applicable.
5. Prevent electrocution, other injuries, or property and equipment damage. Watch for obstructions such as wires, tree limbs, etc. when operating equipment. Be aware of clearances during turns and when moving equipment.
6. Reinstall all covers removed for maintenance activities. Never leave covers off during operation.
7. Use professional help if you are unfamiliar with working on hydraulic systems. Pressurized hydraulic fluid can penetrate body tissue and cause death, serious infection, or other injuries.
8. The machine is designed and built for mounting on a hydraulic excavator and other hydraulic carriers. Other uses are only approved by written agreement with Antraquip Corporation.
9. The transverse cutter is designed to cut:
    - Rock
    - Asphalt
    - Reinforced and non-reinforced concrete
    - Frozen ground
    - Ice
    - Wood
    - Soil remediation.
    - Numerous other specialty applications exist. Contact Antraquip for additional information.

NOTE: Always refer to hydraulic excavator operating manual when operating or working on the transverse cutter.

NOTE: Check compressive strength of rock when cutting with the transverse cutter.

⚠WARNING

Misuse of transverse cutting head or excavator can cause death, serious injury, and damage to property and equipment.

- **Do not use transverse cutter in areas at risk of explosion.**
- **Do not cut any materials other than those listed above.**
- **Do not perform impacting operations.**
- **Do not operate machine with any broken bits.**
- **Do not use machine for lifting personnel or materials.**
- **Do not use transverse cutter to carry or transport machinery, materials, or tools.**
- **Do not use transverse cutter to take weight of carrier vehicle.**

⚠WARNING

Hydraulic excavator exhaust can cause death or serious injury if not properly vented.

- **Properly vent exhaust gasses from buildings or tunnels using a ventilation system.**
- **Keep cabin doors closed on the hydraulic excavator.**

⚠WARNING

Lightning strikes during thunder storms can cause death or serious injury.

- **Do not operate machine during thunderstorms.**
- **Do not work on machine or stay in hydraulic excavator during thunder storms.**
- **Do not remain within 330 feet (100 meters) of hydraulic excavator after a lightning strike.**

⚠CAUTION

High noise levels can cause hearing loss. Always use hearing protection and stay away from hazardous work area.

⚠WARNING

Rotating equipment, parts, and machine motion can cause death or serious injury.

- **Always keep a safe distance of 50 feet (15 meters) when transverse cutter is operating.**
- **Do not reach into or touch moving parts.**
- **Do not open covers on transverse cutter during operation.**
- **Wear close fitting clothes with minimal tear strength when working in hazardous area.**

⚠CAUTION

Severe vibration can cause injury, chronic health conditions, or damage to equipment.

- **Operate machine with a constant load to minimize vibrations.**
- **Avoid sudden starting or stopping of cutting heads.**

⚠WARNING

High pressure hydraulic fluid leaks can cause death, loss off body parts, or serious injury.

- **Never place body parts or objects in hydraulic flow areas. Administer first aid and seek medical attention immediately if contact with hydraulic fluid under pressure occurs.**
- **Activate emergency stop immediately. Perform additional steps to reduce pressure and stop jet of hydraulic fluid.**
- **Contain hydraulic fluid and dispose of properly.**
- **Repair damaged or defective parts immediately.**

⚠WARNING

Hydraulic powered moving parts can cause death or serious injury.

- **Allow only qualified and trained personnel to work on hydraulic systems.**
- **Depressurize hydraulic system before performing any maintenance or repairs. Completely depressurize hydraulic accumulator.**
- **Do not reach into or touch moving parts during operation.**
- **Do not open covers on transverse cutter during operation.**
- **Wear close fitting clothes with minimal tear strength when working in hazardous area.**

⚠CAUTION

Cutter heads become very hot during operation and can cause severe burns.

- **Wear heat resistant gloves and clothing when working near hot surfaces.**
- **Make sure all transverse cutter surfaces are cool before working on machine.**

⚠CAUTION

Inhaled dust can cause lung damage or other illnesses. Harmful dust can be produced from material cut during operation.

- **Wear light respiratory protection when working near operating machine.**
- **Keeps doors of excavator closed during operation.**

⚠WARNING

Inoperative safety devices can cause death, serious injury, and damage to property and equipment.

- **Check all safety devices are operating properly before starting work.**
- **Never turn off or disable safety devices.**
- **Make sure all safety devices are readily accessible.**
- **Refer to hydraulic excavator manual for safety device operating instructions.**

NOTICE

Improper handling and disposal of environmentally harmful substances can cause damage to the environment.

2.2 Operator Responsibilities

⚠WARNING

Allowing unqualified and untrained personnel to operate, perform maintenance, or work in vicinity of machine can result in death, serious injury, and damage to property and equipment.

- **Only allow qualified personnel to perform any work.**
- **Keep unqualified personnel away from hazardous areas of machine.**
- **Stop work if any unqualified or unauthorized persons are in hazardous areas.**

An Operator is the person who operates the machine for commercial or financial purposes, or who commissions a third party to operate the machine and bears legal product responsibility for the Health and Safety protection of the user, personnel, or third parties during its operation.

1. Machine is used in commercial applications. Operator is subject to all legal obligations pertaining to industrial safety.
2. In addition to the safety instructions contained in this manual, follow all required safety, accident prevention, and environmental regulations.
3. Know applicable industrial safety regulations and determine any additional risks specific to working conditions at the job site. These risks should be recorded in a Risk Assessment and comply with instructions contained in this manual.
4. Check all operating instructions are current in accordance with the latest regulations, and adjust when necessary.
5. Regulate and designate responsibilities for installation, removal, operation, troubleshooting, maintenance, and cleaning.
6. Ensure all personnel read and understand this manual. Train personnel every six months Maintain training records for future accountability.
7. Required Personal Protection Equipment (PPE) is available and personnel are instructed to use them.
8. Hazardous areas in direct vicinity of machine are secured against access before operating machine.
9. Attach a sign to hydraulic excavator boom instructing personnel to wear hearing protection.
10. Check all safety equipment regularly for functionality and completeness.
11. Suitable protection measures are implemented in the event of severe dust (e.g. water sprinkling or use of dust protection masks).
12. Ensure carrier vehicle is suitable for connection with the transverse cutter
13. Hydraulic oil must not enter the environment. Hydraulic oil can have longer-term damaging effects once in the water system. Disposal must be carried out by a hazardous material disposal company.

2.3 Personal Protective Equipment

Personal Protective Equipment (PPE) protects personnel against dangers which may affect their health or safety during work. Follow instructions PPE posted in the work area.

Protective Work Clothing
Tight-fitting work clothing with low resistance to tearing, with tight sleeves and without projecting parts. It primarily protects against entanglement by moving machine parts. Do not wear rings, chains, or other jewelry.

Hearing Protection
Protects against hearing damage.

Light Respiratory Protection
Protection from hazardous dusts.

Protective Goggles
Protects eyes from flying debris, dust, and fluids.

Protective Gloves
Protects hands from friction, abrasion, puncture wounds, burns, or more serious injuries.

Safety Helmet
Protection from falling and flying parts and materials.

Safety Footwear
Protection from heavy falling parts and prevents slipping on slippery surfaces.

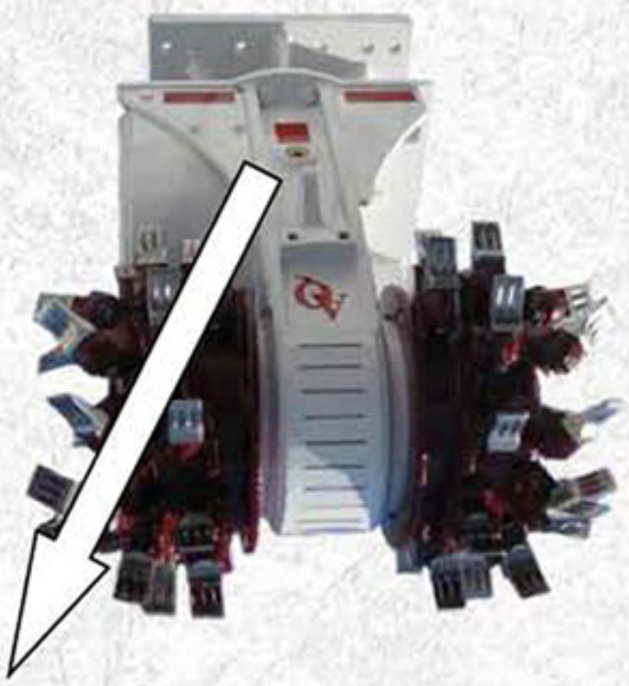
2.4 Transverse Cutter Decals

⚠WARNING

Illegible decals and symbols can result in failure to recognize hazards and can cause death, serious injury, or damage to property and equipment. Labels and signs can become dirty or illegible from wear or other causes.

- **Keep all safety, maintenance, and operating instructions highly legible at all times.**
- **Replace damaged labels and signs immediately.**

Location of transverse cutter decals are shown in the following illustration:



SAFETY REGULATIONS

Before operating your excavator outfitted with the Antraquip transverse cutter you MUST carefully read the Operators Manual that came with the attachment.

It is especially important that you:

1. BEFORE switching on the hydraulic power supply you must make sure that no one is anywhere within 15 meters (50 feet) of the Antraquip transverse cutter.
2. While they are operating DO NOT TOUCH either the excavator or the transverse cutter.
3. Before inspecting or changing the cutting tools (cutter bits) make ABSOLUTELY CERTAIN that the ENGINE of the excavator (or other carrier unit) is SWITCHED OFF.
4. NEVER start up the transverse cutter without making certain that the hydraulic motor has first been filled up to the top with oil.
5. CHECK YOUR HOSES from and to the excavator and transverse cutter for any damage PRIOR to start up of the Antraquip transverse cutter.
6. AT ALL TIMES when cutting or trenching make certain that no cutting material can enter the excavator cab. When cutting material above excavator cab level standard overhead cutting SAFETY requirements MUST be followed.

SAFETY REGULATIONS

Before operating your excavator fitted with the Antraquip transverse cutter you MUST read the Operators Manual that came with the attachment.

It is especially important that:

1. BEFORE switching on hydraulic power supply make sure no one is within 50 feet (15 meters) of the Antraquip transverse cutter.

2. DO NOT TOUCH the excavator or transverse cutter When they are operating.

3. Before inspecting or changing cutter bits make ABSOLUTELY CERTAIN the ENGINE of the excavator (or other carrier unit) is SWITCHED OFF.

4. NEVER start transverse cutter without making certain the hydraulic motor is filled with oil following procedures in transverse cutter Operator's Manual.

5. CHECK HYDRAULIC HOSES to and from the excavator and transverse cutter for any damage before startup of the Antraquip transverse cutter.

6. AT ALL TIMES when cutting or trenching make certain no cutting material can enter the excavator cab. Standard overhead cutting SAFETY requirements MUST be followed when cutting above excavator cab.

3. TECHNICAL DATA

3.1 Weight

Model	Weight (Lbs)	Weight (Kg)
AQ1S	230	105
AQ1	506	230
AQ2	1012	460
AQ3	2035	925
AQ3XL	2310	1050
AQ4	4125	1875
AQ4HD	4730	2150
AQ4XL	4950	2250
AQ5	7260	3300
AQ6	13200	6000

3.2 Excavator Weight Ratio

Model	Weight (t)	
AQ1S	1-3	
AQ1	3-6	
AQ2	6-15	
AQ3	10-20	
AQ3XL	15-25	
AQ4	20-40	
AQ4XL	30-50	
AQ5	45-85	
AQ6	80-160	

3.2 Operating Parameters

Ambient Temperature Range	Maximum Time of Operation
-13 to +122° F (-25 to +50° C)	24 Hours Continuous

3.3 Hydraulic Operating Parameters

Model	GPM	L/m
AQ1S-1	5-8	19 – 30
AQ1S-2	6-12	23 – 45
AQ1-2	10-18.5	40 – 70
AQ1-3	13-21	50 – 80
AQ1-4	16-24	60 – 90
AQ2-2	13-24	50 – 90
AQ2-3	16-26	60 – 100
AQ2-4	18-26	70 – 100
AQ3-1	32-45	120 – 170
AQ3-2	34-45	130 – 170
AQ3XL-1	32-48	120 – 180
AQ3XL-2	40-53	150 – 200
AQ3XL-3	45-58	170 – 220
AQ3XL-0 P	26-32	100 – 120
AQ3XL-1 P	40-45	150 – 170
AQ4-0	45-76	170 – 290
AQ4-1	53-85	200 – 320
AQ4-2	64-85	240 – 320
AQ4-3	66-85	250 – 320
AQ4XL-1	78-106	300 – 400
AQ4XL-2	90-106	340 – 400
AQ4XL-3	95-108	360 – 410
AQ5-1	92-120	350 – 450
AQ5-2	106-132	400 – 500
AQ5-3	120-132	450 – 500
AQ6-1	185-238	700 – 900
AQ6-2	210-265	800 – 1000
AQ6-3	238-265	900 – 1000

3.3 Hydraulic Performance

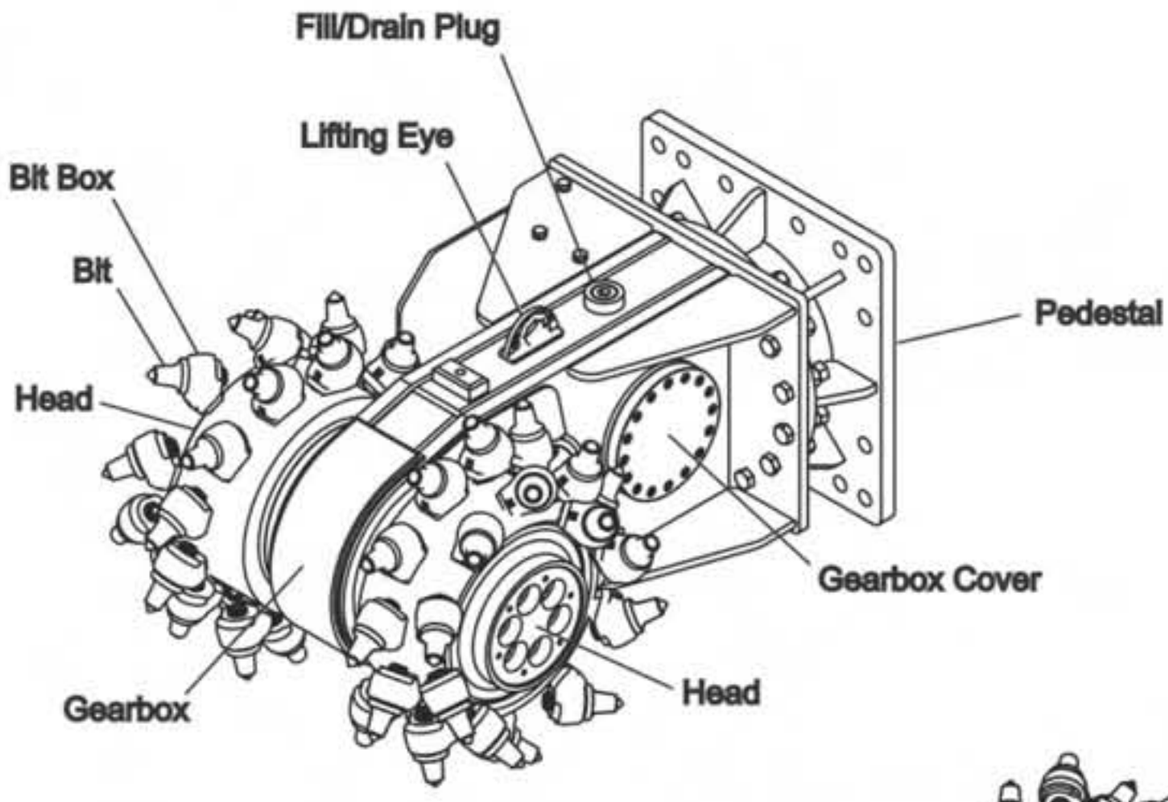
Model	HP	Kw
AQ1S	24	20
AQ1	40	30
AQ2	60	45
AQ3	86	56
AQ3XL	120	90
AQ4	162	120
AQ4XL	215	160
AQ5	270	200
AQ6	475	350

3.4 Maximum Compression Strength (Rock)

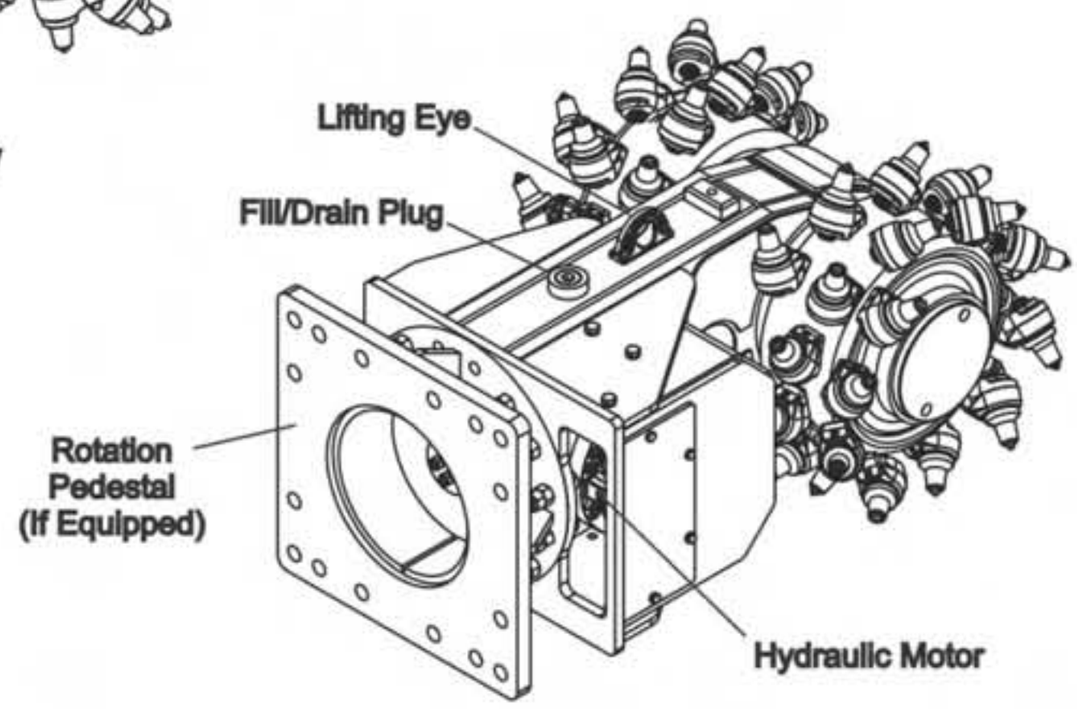
NOTE: Contact Antraquip before cutting reinforced concrete.

Model	psi	MPa
AQ1S	5080	35
AQ1	5800	40
AQ2	7300	50
AQ3	9400	65
AQ3XL	11600	80
AQ4	14500	100
AQ4XL	17400	120
AQ5	20300	140
AQ6	26100	180

3.5 Overview



Top View



Bottom View

Transverse Cutter Main Components

4. Installation and Startup

4.1 Hydraulic Excavator Minimum Requirements

NOTICE

Failure to meet basic hydraulic excavator specifications for the specific model transverse cutter can cause serious damage to equipment. Make sure hydraulic excavator is suitable for attaching your model of transverse cutter.

1. Complete hydraulic hammer or shear line running to end of excavator arm.
2. Motor high-pressure supply line set to maximum 350 bar.
3. Return line pressure minimum 72 psi (5 bar) above case drain pressure.
4. Case drain pressure maximum 43 psi (3 bar) during operation.
5. Excavator cab protected against flying debris.
6. Excavator must provide adequate view of work area.
7. Minimum 14 Lumens/sq-ft (150 Lux) protected lighting.
8. E-Stop functional at operating and driving positions highly recommended.
9. Audible warning signal.
10. All controls at operating and driving positions should have a “dead man’s” switch.
11. All replacement parts must meet OEM specifications.

WARNING

Old parts can fail and cause death, serious injury, and damage to property and equipment. Never reuse old parts. Use only original equipment parts.

4.2 Mounting

The drum cutter is supplied with a pedestal for mounting to a quick-coupler or adaptor plate. Mating areas of connector plates must be flat and smooth (Roughness Ra 12.5 max – surface deviation 0.5 mm).

Quick Coupler Installation

4.2.1 Quick Coupler

NOTE: Refer to hydraulic excavator operating manual for installing quick coupler to excavator.

1. Mount quick coupling to hydraulic excavator.
2. Attach quick coupler adapter plate to excavator arm.
3. Set drum cutter on assembly stand.
4. Guide excavator arm and adapter plate to drum cutter.
5. Place excavator arm with adapter plate on pedestal bracket of transverse cutter. Line up bolt holes.
6. Prevent adapter plate and pedestal from sliding with two mandrels.
7. Switch the hydraulic excavator off and safeguard against being switched on again.
8. Install two bolts. Do not tighten.
9. Remove mandrels.
10. Install remaining bolts.
11. Tighten all bolts in an alternate horizontal pattern.

Note: Refer to Torque Tables in back of this manual.

4.3 Hydraulic Installation

⚠WARNING

Incorrect installation of hydraulic circuit can cause death, serious injury, and damage to property and equipment.

- **Only allow qualified personnel to work on hydraulic systems.**
- **Fully depressurize hydraulic system and hydraulic accumulators before working on hydraulic system.**
- **Make sure work area is clear and environment is clean.**
- **Wear close fitting clothes with minimum tear strength and all proper personal Protective Equipment.**
- **Always install hydraulic hoses with protection against mechanical or thermal damage.**

The transverse cutter is supplied with three pre-installed hydraulic hoses: Return, Case Drain, and Pressure.

Hydraulic Installation

NOTICE: Installation of hydraulic circuit for operating transverse cutter on an excavator is responsibility of the operator. Refer to hydraulic excavator operating manual for safety and installation requirements.

1. Clean area around ball valve (left side) on excavator arm.
2. Remove end cap from ball valve.
3. Unscrew end cap from supply hose.
4. Attach supply hose to ball valve fitting. Tighten nut.
5. Clean area around ball valve (right side) on the excavator arm.
6. Remove end cap from ball valve of excavator arm.

NOTICE

Removing check valve from return line of hydraulic hammer systems will cause catastrophic transverse cutter hydraulic motor failure. Never remove return line check valve on hydraulic hammer systems.

7. Unscrew end cap for return hose.
8. Attach return hose to ball valve on the opposite side to supply hose. Tighten nut.
9. Position oil receiver tank beneath case drain line of transverse cutter.
10. Fill hydraulic oil using a funnel until it overflows into case drain line.
11. Connect and screw case drain hose from transverse cutter on separate drain line on hydraulic excavator.

4.3.1 Case Drain Line

A separate case drain line including oil filter must be installed from the all valve on the excavator arm to the excavator hydraulic tank. Operator must install a suitable connection on excavator hydraulic tank for the case drain line.

1. Install a separate case drain line along the excavator arm and secure with cable ties.
2. Connect case drain line with oil filter to connection on the hydraulic tank of the excavator vehicle.
3. Attach case drain line to connection on the oil tank on hydraulic excavator.
4. Install case drain oil filter at an appropriate location on case drain line.

Supply and Return Hoses

4.4 Initial Startup

Note: Adjustments to hydraulic flow and pressure settings on the excavator are the responsibility of the operator.

1. Check all fastenings, hoses, and couplings.
2. Check the hydraulic oil level and shut-off valves.
3. Check all hydraulic connections for leaks/tightness.
4. Switch on motor.
5. Bring motor slowly up to normal operating conditions (oil volume, oil pressure).

4.4.1 Checks during initial operation

- All hydraulic connections are leak tight.
- Pressure in case drain line, maximum 3 bar in constant operation.
- Oil temperature, target value 50 degree Celsius to 80 degrees Celsius.

4.5 Remove Transverse Cutter

NOTICE

Hydraulic system contamination can damage equipment. Never leave hydraulic ports open. Always plug hydraulic ports and hoses when not in use.

1. Position transverse cutter on stand.
2. Loosen quick coupling device from excavator arm.
3. Switch off hydraulic excavator and safeguard against it being switched on again.
4. Depressurize entire hydraulic circuit.
5. Secure transverse cutter on assembly stand.
6. Position oil receiver tank beneath the hydraulic fittings.
7. Unscrew transverse cutter case drain line from hydraulic excavator case drain line.
8. Install end caps on lines.
9. Unscrew return hose from the valve fittings
10. Install end caps onto the openings of the loosened lines.
11. Unscrew supply lines from ball valve fitting on excavator upright.
12. Screw end caps on lines.
13. Store disassembled transverse cutter protected against damage.

5. Operation

- Make sure maintenance schedule has been followed before operating machine.
- Only trained personnel may maintain and operate the machine.
- Operate controls smoothly without jerking. If cutting unit stalls, back off cutter from work face. Do not overload cutter bits. Machine can be damaged.
- Cutting conditions are best if cutting heads move toward the carrier vehicle. If unit moves sideways to achieve a larger cutting area, ensure pressure on excavator's boom, arm, and cutting head bearing is not excessive.
- Periodically check cutting unit is clear of debris. This can affect cutting rate.
- Ensure cutting unit or any part of unit is correctly attached during any maintenance work.

NOTICE

- **Do not operate cutting unit at end of excavator hydraulic cylinder stroke.**
- **Do not use cutting head with damaged or missing bits. Vibration will damage unit or excavator.**
- **Do not Run cutter head in reverse.**
- **Do not cut while tracking excavator. This may damage unit.**
- **Do not place cutting unit against working surface before starting. This may damage unit. Unit should be running and fed into working surface at a rate that does not allow stalling.**

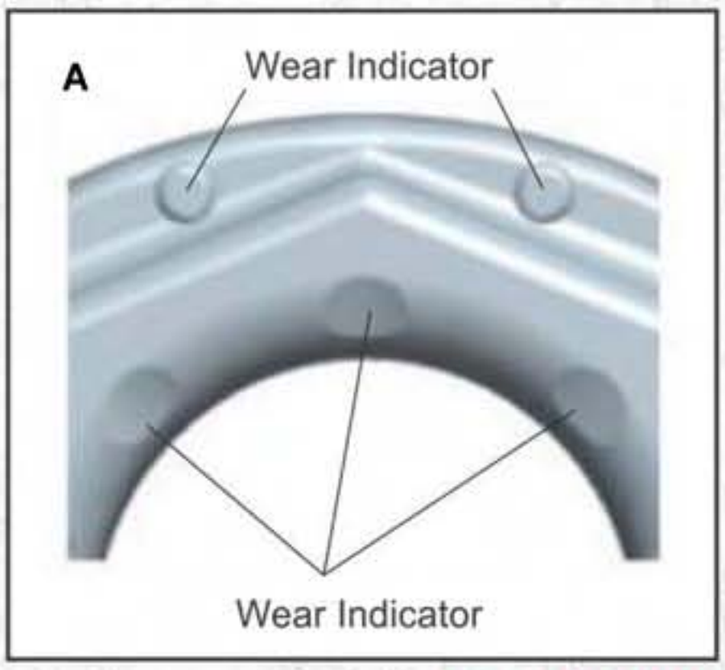
5.1 Lifting Eye

Note: lifting device must move freely within the lifting eye. When lifting device (sling chains) are hinged or unhinged; no pinching, shearing, or joint spots must occur during handling.

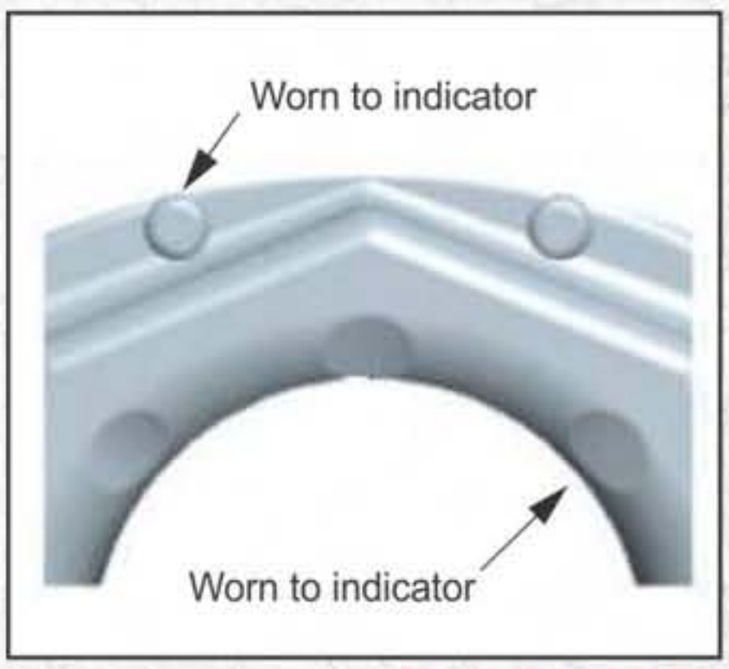
Inspect the following before each initial operation, at regular intervals, after assembly, and after special incidents:

- Material worn to wear indicators (if equipped).
- Lifting point completely intact
- Deformation at load bearing components such as base body
- Mechanical damage, like strong notches, especially in areas where tensile stress occurs
- Reduction of cross-section due to wear >10 %
- Corrosion (Pitting)
- Cracks
- Cracks or other damage at weld seam
- Avoid damage from sharp edges on lifting devices.

NOTE: Some transverse cutter lifting eyes may not have wear indicators. Check for obvious wear and thickness reduction of lifting eye.



Acceptable Wear



Replace Lifting Eye

5.2 Emergency Shutdown

In hazardous situations moving parts must be stopped as quickly as possible and power supply switched off.

1. Press emergency stop device in excavator.
2. If no danger to personal safety exists, remove other persons from hazardous area. Start first-aid if needed.
3. Call 911 or nearest emergency services.
4. Inform responsible parties at work site.
5. Switch off emergency stop and secure against being switched on again.
6. Keep access routes clear for rescue vehicles.
7. Inform proper authorities depending on seriousness of emergency situation.
8. Perform troubleshooting.
9. Check machine before restart and ensure all safety devices are installed and functional.

5.3 Before Use

Always perform the following before using the transverse cutter to prolong service life and maintain productivity.

5.3.1 Bits

NOTICE

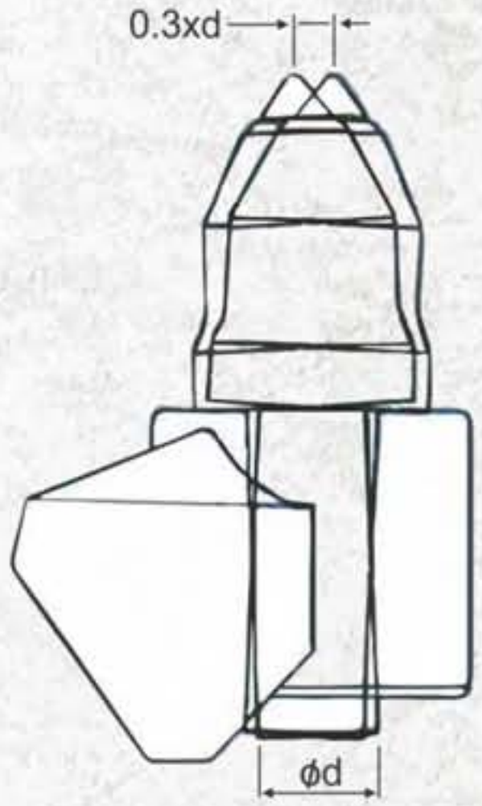
Unevenly worn bits can cause excessive vibration and damage equipment. Make sure bits are evenly worn.

Bits wear at different rates depending on material cut . A particularly high wear rate should be expected with:

- Reinforced concrete
- Rock with a high SiO2 content, when using spray water
- Hard rock such as granite, basalt

1. Check for wear and breakage.
2. Replace worn or damaged bits immediately.
3. Check for movement of bits in the bit boxes. If any bit has a play of more than 0.3 times bit shaft diameter, replace bit box or wear sleeve immediately.

NOTE: Wear sleeve and bit box replacement should only be done by the Antraquip.



Maximum Bit Movement

5.3.2 Pedestal (If Equipped)

1. Check bolts are tight.
2. Check for cracks and damage.

5.3.3 Main Housing

1. Check for cracks.
2. Check main housing for oil leaks.
3. Check bolts are installed and tight.

5.3.4 Hydraulic Motor

1. Check hydraulic motor for oil leaks.
2. Check bolts are installed and tight.

Hydraulic Hoses and Connectors

1. Check hydraulic hoses for oil leaks, damage, or worn areas.
2. Check hydraulic connections for oil leaks and tightness.
3. Check case drain line for contamination. Clean as needed.

5.4 Operating Instructions

- Never exceed cutting material maximum compressive strength.
- Do not activate transverse cutter when loading excavator.
- When working with transverse cutter, never fully extend or retract the jib lifting cylinder.
- Only switch on transverse cutter in a raised position without contacting cutting material.
- Apply transverse cutter to cutting material slowly to prevent stalling.
- When cutting, always apply transverse cutter slowly and ensure cutter heads do not stop rotating.
- Do not apply excessive force during lateral cutting with excavator arm extended.
- Never switch transverse cutter on or off when working at full capacity.
- Hydraulic oil temperature must not exceed 144° F (80° C). Check hydraulic oil temperature regularly when transverse cutter is operating for long periods of time.

5.4.1 Switching on

1. Switch on hydraulic excavator.
2. Raise transverse cutter.
3. Start hydraulic motor for transverse cutter.

5.4.2 Working with Transverse Cutter

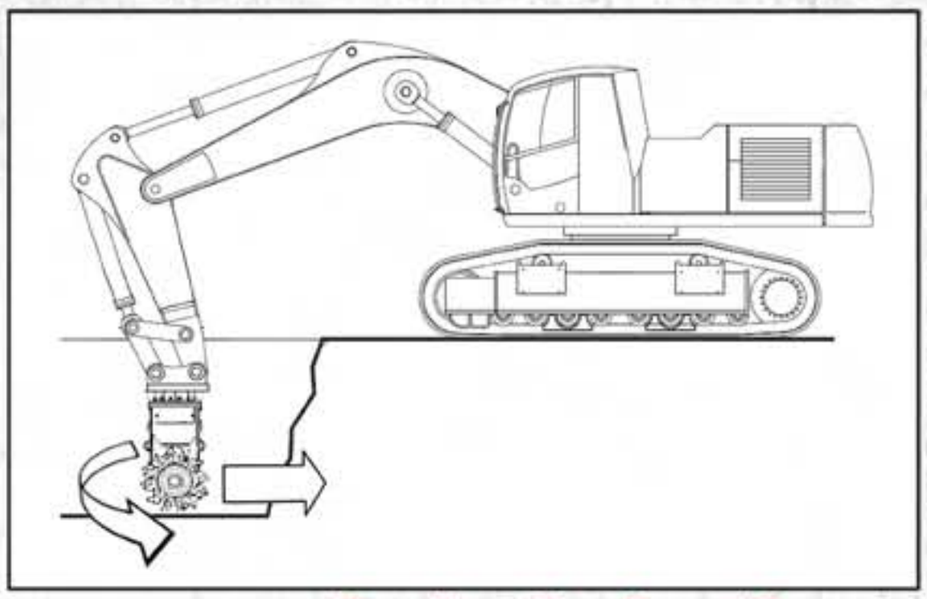
⚠CAUTION

Lateral cutting movements can cause extreme vibration and hydraulic excavator instability resulting in serious injury, and damage to equipment and property.

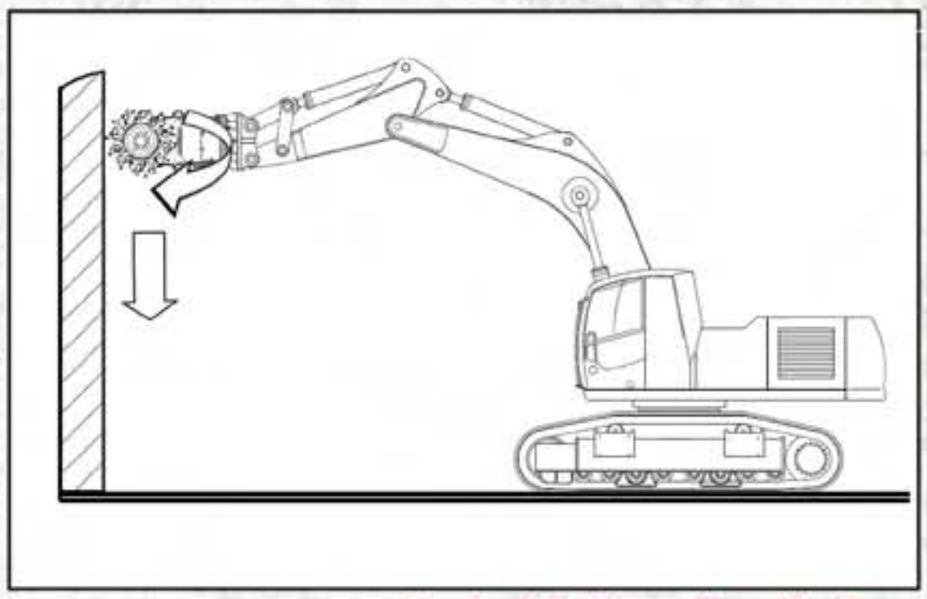
- **Do not expose hydraulic excavator to strong forces.**
- **Ensure hydraulic excavator keeps constant contact with ground during cutting operations.**
- **Make cutting movements slowly.**
- **Never start or stop transverse cutter in contact with cutting material.**

When cutting proceed as follows:

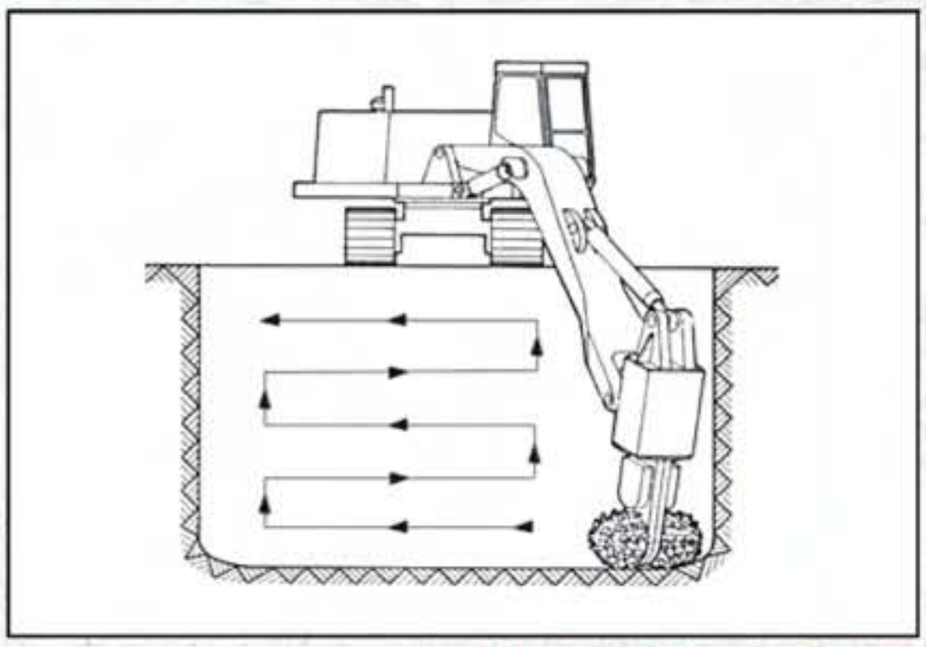
1. Raise transverse cutter.
2. Switch on transverse cutter and start up.
3. Slowly lower the rotating cutting heads onto the cutting material.
4. Slowly apply cutting heads and ensure cutting heads are not blocked.
5. Make cutting movements towards carrier vehicle or in both directions.
6. Make cutting movements in a horizontal or vertical direction. When making lateral cuts with the hydraulic excavator jib, do not exert excessive force to the hydraulic excavator.



Trenching - Move Toward Excavator



Vertical Cutting - Move Up Face



Side-to-Side Cutting Pattern

5.4.3 Switching Off

NOTICE

Switching off machine in contact with material can cause severe vibrations and damage equipment. Switch off drum cutter only in a raised position.

1. Raise lifting cylinder of jib until transverse cutter is above ground level and is no longer in contact with cutting material.
2. Switch off hydraulic motor.
4. Lower transverse cutter.
5. Switch off hydraulic excavator.

5.8 After Use

⚠WARNING

Working with damaged parts can cause death, serious injury, and damage to property and equipment.

- **Conduct regular visual inspections after use.**
- **Replace damaged or worn parts immediately.**
- **Tighten all loose connections.**
- **Eliminate oil leaks immediately.**
- **Replace worn or damaged hydraulic hoses.**

5.8.1 Cleaning

⚠CAUTION

Improper cleaning procedures can cause serious injury and damage to equipment.

- **Never hit bits, cutting heads, or gears with a hard object (i.e. hammer) to free them of trapped fragments or contamination.**
- **Do not damage safety labels with high pressure water jets.**

NOTICE

Make sure no residual contaminates such as concrete is left between bit a bit boxes. Contaminates could harden set bits in bit boxes.

Clean transverse cutter cutting head daily after use and check all parts for damage.

1. Areas to which safety stickers are adhered should be wiped clean using a cloth.
2. Clean all the other areas of the transverse cutting head thoroughly with water.
3. Free up the intermediate spaces between the round attack bits and bit boxes from contaminants.

5.8.2 General Inspection

- Check all threaded connections are tight.
- Check all hydraulic connections for leaks.
- Check all cutting heads for even wear.
- Check hydraulic hoses for damage or leaks.

5.9 Rotating Transverse Cutter (Pedestals Only)

NOTICE

Rotating transverse cutter creates higher force to the hydraulic excavator and can damage equipment if operated improperly. Transverse cutter component wear increases when working at an angle.

When carrying out certain works (e.g. tunnel boring) with the transverse cutter, it may be necessary to mount it at an angle on the hydraulic excavator.

1. Ensure transverse cutting head is connected to hydraulic excavator in accordance with specifications.
2. Position transverse cutter carefully on ground in a vertical position.
3. Loosen nuts and bolts on pedestal.
4. Slowly lift hydraulic excavator jib until transverse cutter is suspended slightly above ground.
5. Turn transverse cutter in desired direction.
6. Fix transverse cutter in required position with nuts and bolts.
7. Slowly lower transverse cutter to ground.
8. Bolt intermediate bracket back together with transverse cutter and torque to specifications.
9. Tighten jam nuts.

Note: Refer to Torque Tables in back of this manual.

6. Maintenance

⚠WARNING

Old parts can fail and cause death, serious injury, and damage to property and equipment. Never reuse old parts. Use only original equipment parts.

6.1 Maintenance Safety

Maintenance will be performed only by authorized and trained maintenance personnel.

6.2 Unauthorized Maintenance

Some maintenance activities must be done only by Antraquip or a service partner approved by Antraquip. If such maintenance is required, contact Antraquip to ensure they are done safely.

NOTE: The following maintenance activities are NOT authorized:

- **Gear repairs**
- **Replacing wear sleeves and bit boxes**
- **Welding on cutter heads**
- **Welding on gear housing**

6.3 Maintenance Intervals

Maintenance is necessary for optimum and fault free machine operation. Maintenance preserves the value and safety of the transverse cutter. Routine maintenance will prevent unplanned down time and help serve to aid safe work with the transverse cutter.

NOTE: If regular checks reveal a rapid wear rate, increase frequency of maintenance to match actual wear rate.

6.3.1 Daily

Item	Inspection	Action
Bit Boxes	Play in bit boxes allows movement of more than 0.3 times diameter of shaft or bearing surface is worn.	Replace
Bits	Tungsten carbide tip worn Bits are different lengths Cracks present between shaft and head	Replace
Cutter Heads	Bearing surfaces of bit boxes are worn Bit boxes worn in snap ring area Bit boxes broken Charging spiral cannot be repaired	Replace
Gear Housing Wear Plates	Plate thickness less than 3 mm. Weld seams cracked, deformed, or damaged.	Replace
Hydraulic Hoses	Outer layer damaged. Brittle or deformed. Hose fitting deformed or damaged. Fitting does not stay tight. Six years or older.	Replace

6.4. Lubrication

Gear oil is critical for service life of the gears. It is also important to use the correct type and quantity of gear oil for the transverse cutter.

6.4.1 Oil Specifications

Manufacturer	Temperature Range	
	-4 to 86 F (-20 to 30 C)	-15 to +40 C
ARAL	EP 80 Degol BG68	EP 90 Degol BG 68
BP	EP SAE 80 Energol GR XP 68	EP SAE 90 Energol GR XP 220
EXXON/ESSO	GPD 80 Spartan EP 100	GPD 90 Spartan EP 220
MOBIL	Mobil Gear 80 EP Mobilube GX 80	Mobil Gear GX 90 Mobilube GX 90
SHELL	Spirax 80 EP Omala Oil 100	Spirax 90 EP Omala Oil 220
TEXACO	Meropa 68 Universal Gear Lubricant EP 80	Meropa 220 Universal Gear Lubricant EP 90

6.4.2 Oil Capacity

Model	AQ1S	AQ1	AQ2	AQ3	AQ3XL	AQ4	AQ4XL	AQ5	AQ6
Gal	.6	1.5	6	4	4.75	8	12.5	16	24
L	2.4	2.75	10	15	18	30	47	60	90

6.4.3 Oil Change Interval

Operating Conditions	1st Interval	2nd Interval	Following Intervals
Normal Cutting	200 Hours	2000 Hours	Every 2000 Hours
Heavy Cutting (Reinforced Concrete, etc.)	100 Hours	1000 Hours	Every 1000 Hours

6.3.4 Change Gear Oil

⚠CAUTION

Failure to provide proper clearance when moving transverse cutter to perform oil change can cause serious injury and damage to property and equipment. Always check clearances before lifting or moving transverse cutter.

⚠CAUTION

Removing oil fill or drain plug without relieving gear case pressure can cause severe injuries.

- **Depressurize entire hydraulic system and lockout against restart before performing maintenance on transverse cutter.**
- **Slowly loosen oil fill and drain plugs and wait for pressure to drop before completely removing plugs.**

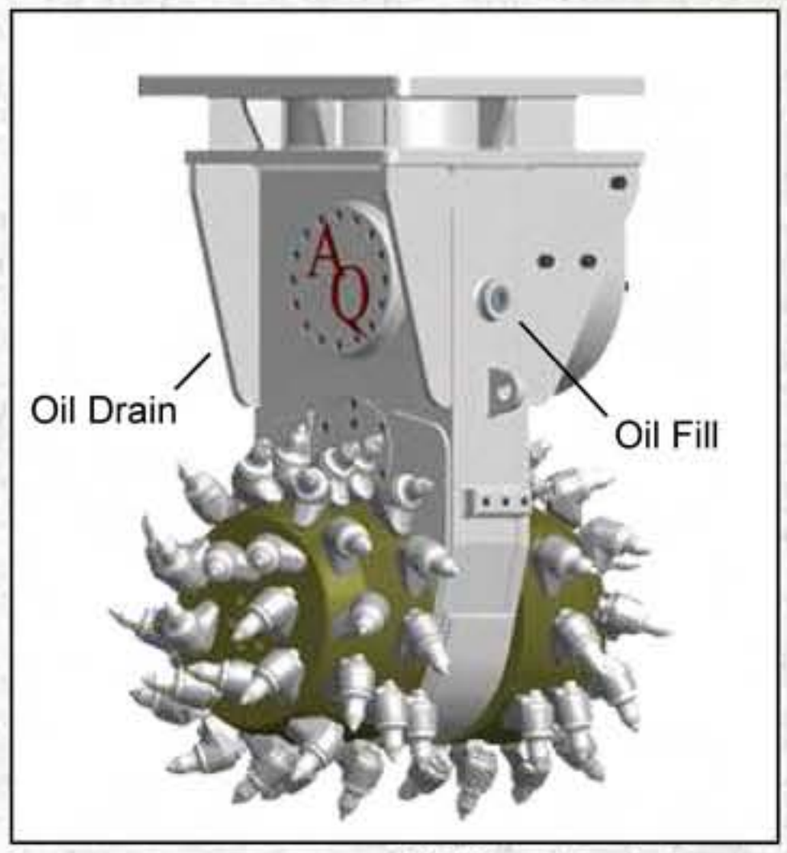
1. Position transverse cutter horizontally on assembly stand.
2. Lock out and tag power to transverse cutter.
3. Place waste oil container under oil drain plug.
4. Loosen oil fill plug and bleed off any pressure.

NOTE: Remove oil fill plug first to allow oil to drain more quickly and efficiently. Oil drain plug is on opposite side.

5. Remove oil fill plug.
6. Remove oil drain plug.
7. Allow oil to completely drain.

NOTE: Oil drain and fill plugs are fitted with a magnet to attract metal filings.

8. Clean oil drain plug and clean opening.
9. Check oil drain plug for metal filings, remove if necessary.
10. Install oil drain plug.
11. Clean oil filler opening with clean cloth.



Oil Fill and Drain Plugs

NOTICE

Low oil level can damage equipment and cause equipment failure. Place transverse cutter in a vertical position (cutting heads down) and fill oil level with oil fill plug opening. Always check system is properly filled when installed on excavator.

12. Reposition transverse cutter with cutting heads down. Fill gear oil per specifications.
13. Clean oil filler opening and fill plug.
14. Reinstall oil fill plug.
15. Clean transverse cutter.
16. Dispose of used oil in accordance with the applicable environmental regulations.

6.2 Replace Bits

6.2.1 Retaining Ring Type

1. Remove retaining rings from bit shaft in turn using long nose pliers.
2. Pull bits out of the bit box.
3. Clean dirt from box.
4. Insert new bit.
5. Place a new retaining ring on bit shaft and rotate retaining ring opening down.
6. Attach second retaining ring and rotate retaining ring opening up.

6.2.2 Clamping Ring Type

1. Place striking iron with semi-circular opening on clamping ring opening.
2. Strike clamping ring with a forceful impact.
3. Pull round shank chisel out of chisel bracket.
4. Clean dirt from bit box.
5. Insert new bit.
6. Place new clamping ring in striking iron.
7. Place striking iron with clamping ring on bit shaft.
8. Strike clamping ring on striking iron with forceful impact.

6.2.3 Clamping Sleeve Type

1. Slide open end of chisel taper key in notch in bit with impact surface pressing on surface of bit box.
2. Grip chisel taper key firmly.
3. Hit chisel taper key impact surface with a hammer.
4. Pull bit from bit box.
5. Clean dirt from bit box.
6. Place new bit in notch of chisel taper key. Tip of bit must point in direction of impact surface.
7. Place new bit in chisel taper key and place in opening of bit box.
8. 8. Give impact surface of the chisel taper keg a forceful strike with a hammer.
9. Bit is anchored in bit box by shaft clamping sleeve.

6.3.4 Quick Snap Ring Type

1. Place curved tip of draw hook in quick snap ring hole.
2. Grip draw arrow firmly and pull upwards.

3. Remove bit from box.

4. Clean dirt from bit box.
5. Slide new bit in bit box.
6. Position new quick snap ring with opening facing down on shaft of the round attack bit and apply firm pressure until clip snaps in place.

6.4 Replace Cutter Heads

6.4.1 Remove Cutter Heads

1. Remove transverse cutter from hydraulic excavator and place on a level work area with sufficient bearing strength.
2. Secure transverse cutter against failing using suitable lifting equipment and suspend on a crane. When doing so always observe weight
3. Keep lifting equipment tight.
4. Loosen cutter head threaded connections.
5. Screw in lifting bolts. Screwing in lifting bolts causes cutter heads to separate from drive shaft.
6. The cutter head, once loosened from the drive shaft, must be secured against rocking movements by the second person.
7. Carefully lift cutter head away from drive shaft and set down.
8. Remove clamping sleeves in drive shaft using special extractors.

6.4.2 Install Cutter Heads

1. Lay transverse cutter with disassembled cutter heads on side using an appropriately weight-rated lifting device.
2. Lift cutter head using suitable weight-rated lifting equipment.
3. Carefully set cutter head on drive shaft.
4. Insert clamping sleeves with opening (slit) opposite turning direction of cutter head.
5. Drive positioned clamping sleeves with mandrel until flush with bearing surface.
6. Insert special washers
7. Apply thread locking compound to bolt threads. Install bolts.
8. Install disassembly screws without thread locking compound.
9. Torque bolts in a diagonal sequence.

Note: Refer to Torque Tables in back of this manual.

10. Install bits.

6.5 Pedestal (If Equipped)

6.5.1 Disassemble Pedestal

1. Loosen screw connection from bolt adapter or quick coupler
2. Lift bolt adapter or quick coupler off transverse cutting head with suitable lifting equipment.
3. Attach lifting equipment to pedestal and put slight strain on line.
4. Loosen bolts on pedestal.
5. Loosen center bolt on pedestal.
6. Lift up pedestal and set down carefully.

6.5.2 Assemble Pedestal

1. Lift bolt adapter or quick coupler with a portal crane and place on cutting head.
2. Ensure hole patterns of intermediate brackets and transverse cutting head align with each other.
3. Attach center bolt and screw on.
4. Insert connection bolts from transverse cutter side and bolt together with pedestal.
5. Install lock nuts on bolts. Torque to specification.

Note: Refer to Torque Tables in back of this manual.

6.6 Replace Hydraulic Hoses

NOTICE

Hydraulic system contamination can damage equipment. Never leave hydraulic ports open. Always plug hydraulic ports and hoses during maintenance when not in use.

1. Clean area around hydraulic hose connections.
2. Loosen threaded connections on hydraulic hose fittings.
3. Loosen hose fitting on hydraulic excavator.
4. Remove hydraulic hose and insert end caps into all fitting openings.
5. Unscrew end cap from one side of new hydraulic hose.
6. Install new hydraulic hose on fitting.
7. Tighten hose.

6.7 Remove Dust and Contamination

1. Clean transverse cutter after all maintenance activities.

6.8 After Maintenance Inspections

2. Check all threaded connections are tight.
3. Check safety devices and covers are installed.
4. Ensure all tools, materials, and other equipment are removed from working area.
5. Clean working area and remove spilled substances such as liquids, processing materials, and similar items.
6. Ensure all safety devices on machine are fully functional.
7. Ensure hydraulic excavator startup checks are complete.

7. Troubleshooting

⚠WARNING

Moving components can cause death or serious injury. Switch machine off and lockout/tag-out to safeguard from being switched on during maintenance. Wait until all parts have stopped before attempting to work on machine. Wear proper clothing and protective equipment.

⚠WARNING

Improper troubleshooting can cause death, serious injury, and damage to property and equipment.

- **Make sure there is space for disassembly and assembly before starting work.**
- **Maintain order and cleanliness at work site. Poorly stacked or scattered parts and tools can cause accidents.**

Before restart:

- **Make sure all removed parts are correctly reinstalled and fasteners are torqued to specifications.**
- **Ensure all troubleshooting and work is completed following instructions in this manual.**
- **Make sure no one is in the hazardous area.**
- **Ensure all covers and safety devices are installed and functioning.**

Note: Refer to hydraulic excavator operating instructions when faults occur and during troubleshooting procedures. If actions listed in troubleshooting tables do not eliminate faults, contact Antraquip immediately.

Fault	Cause	Action
Cutting heads blocked/do not turn.	Material trapped between cutting head and gears.	Shut machine down. Relieve hydraulic pressure and lock out controls. Remove Trapped material. Run cutter briefly in reverse. Disassemble cutter heads.
	Hydraulic pump pressure too low.	Adjust valve. Increase pressure
	No oil pressure.	Check hydraulic pump and valves.
	Hydraulic motor damaged.	Flush case drain line. Contact Antraquip. Exchange hydraulic motor. Replace return line/case drain filter cartridge.
	Damage to gears.	Replace damaged parts. Contact Antraquip.
	Check valve installed reversed.	Install check valve correctly.

Fault	Cause	Action
Cutting heads turn slowly.	Hydraulic pump delivery volume too low.	Increase delivery volume. Replace hydraulic motor with a motor recommended by Antraquip with lower displacement volume.
	Poor hydraulic pump efficiency to hydraulic motor.	Replace hydraulic pump or motor.
	Oil leaks between hydraulic pump and hydraulic motor.	Replace damaged hydraulic hoses. Tighten connections.
Cutter stops moving with light pressure.	Excavator operating pressure too low.	Check operating pressure and adjust to recommended value.
Unusual vibration of cutting heads.	Bits worn, damaged, or uneven lengths.	Replace bits.
	Loose bolts on connection bracket, quick coupler.	Check bushings and bolts for play. Replace if needed.
Bits do not rotate.	Corrosion or debris between bit shaft and box.	Disassemble bits. Clean bit shafts after operation and treat with corrosion inhibitor. Contact Antraquip for assistance.
Loud gear noise.	Damage to internal parts.	Contact Antraquip. Replace Gears.
Loud hydraulic motor noise.	Air in hydraulic circuit or motor.	Bleed system.
	Low return line pressure.	Check hydraulic installation.
	Internal parts worn from foreign material.	Contact Antraquip. Flush return line. Replace return line filter.
Hydraulic motor overpressure cover deformed, oil leak at seal, pressure limiting valve leak.	Case drain pressure too high. Case drain improperly installed. Case drain filter needs servicing. Case drain shutoff valve closed. Coupling not properly seated.	Check hydraulic installation.

8. Storage and Transport

NOTICE

Hydraulic system contamination can damage equipment. Never leave hydraulic ports open. Always plug hydraulic ports and hoses during storage or when not in use.

8.1 Transport Inspection

Check delivery immediately upon receipt to ensure it is complete and identify any transport damage. In the event of visible transport damage proceed as follows:

- Reject delivery or accept it only with exceptions.
- Record damage on transport documents or shipper's delivery notes.
- Submit a complaint.

8.2 Packaging

Individual packed goods are packaged according to anticipated transport conditions.

Note: Packaging protects individual parts against transportation damage, corrosion, and other damage until installation. Do not destroy packaging. Remove it only before installation.

Dispose of packaging materials in accordance with legal requirements and local regulations.

8.3 Transport

⚠WARNING

Falling or swinging equipment can cause death, serious injury, and damage to property and equipment.

- **Never stand beneath or near swing range of a suspended load.**
- **Move equipment using safety spotters.**
- **Use only approved and weight rated lifting equipment.**
- **Lift only by installed and properly inspected lifting eyes.**
- **Do not use worn or abraded ropes, slings, chains, or other lifting devices.**
- **Do not place slings, chains, or other lifting equipment on sharp edges or corners. Never knot or twist lifting devices.**
- **Never leave suspended load unattended. Set load down in a vertical position.**

8.3.1 Crane or Hoist

The transverse cutter is equipped with a lifting lug for lifting by crane under the following conditions:

- Crane and lifting gear must be must be designed to hoist weight of transverse cutter.
- Operator must be certified to operate crane.
  1. Attach ropes, belts, or multi-point suspensions to transport lugs.
  2. Ensure transverse cutter hangs straight. If applicable, observe any eccentric center of gravity.
  3. Start transport.

8.3.2 Forklift

The transverse cutter can be transported using a forklift under the following conditions:

- Forklift must be designed for weight of transport object.
- Transverse cutter must be secured to assembly stand with tensioning belts or tensioning braces.
  1. Drive forklift truck with forks between or beneath bars of assembly stand.
  2. Drive in forks until they protrude on opposite side.
  3. Ensure assembly stand cannot tip with an eccentric center of gravity.
  4. Lift assembly stand with transverse cutter attached and start transport.

8.4 Storage

- Always store the transverse cutter on the assembly stand.
- Store dry, free of dust, and contamination.
- Avoid mechanical shocks.
- Store protected from mechanical damage.
- Check general condition of all parts and the packaging regularly.

Follow the table below to protect hydraulic motor internal parts during storage:

Climate	**Length of Storage**			
	3 Months	6 Months	12 Months	24 Months
Temperate	A	B	C	C
Tropical	B	C	D	D
Coastal	C	D	D	D

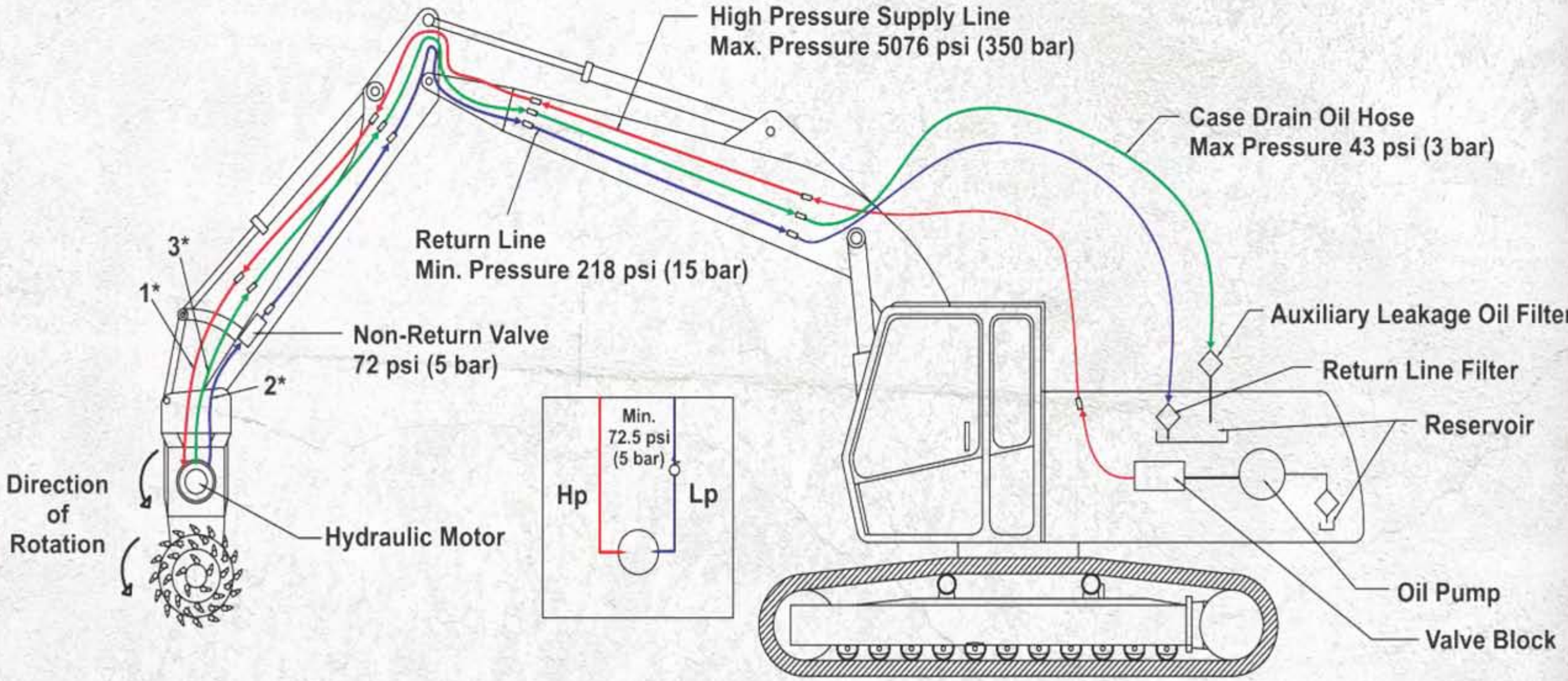
A. No special maintenance measures necessary. Install plugs and closures.
B. Fill hydraulic motor and hydraulic oil.
C. Rinse hydraulic motor with preservation agent.
D. Fill hydraulic motor with preservation agent.

8.4.1 Cutter Heads

If cutter heads are stored for an extended period, remove bits and preserve cutter heads with oil.

8.4.2 Bits

If transverse cutter is stored for an extended period of time, remove bits. These can corrode with the cutting material and bond with bit boxes. Preserve bits with oil and store protected against contamination and mechanical damage.



1 - Supply (Red)
2 - Return (Blue)
3 - Case Drain (Green)

*Lines Supplied With Transverse Cutter to First Coupler on Excavator Arm Only.

Hydraulic Schematic

			Values for Zinc Yellow Chromate Fasteners									
			CLASS 8.8 METRIC (HEX/SOCKET HEAD) BOLTS CLASS 8 METRIC NUTS					CLASS 10.9 METRIC (HEX HEAD) BOLTS CLASS 10 METRIC NUTS CLASS 12.9 SOCKET HEAD CAP SCREWS M3 - M5*			
Size	PITCH	Tensile Stress Area	Clamp Load	Torque (Dry or Loctite® 263™)	Torque (Lub)	Torque (Loctite® 262™ OR Vibra-TITE™ 131)	Torque (Loctite® 242™ or 271™ OR Vibra-TITE™ 111 or 140)	Clamp Load	Torque (Dry or Loctite® 263™) K = 0.20	Torque (Lub OR Loctite® 242™ or 271™ OR Vibra-TITE™ 111 or 140) K= 0.18	Torque (Loctite® 262™ OR Vibra-TITE™ 131) K=0.15
		Sq mm	KN	[N.m]	[N.m]	[N.m]	[N.m]	KN	[N.m]	[N.m]	[N.m]
3	0.5	5.03	2.19	1.3	1.0	1.2	1.4	3.13			
3.5	0.6	6.78	2.95	2.1	1.6	1.9	2.3	4.22			
4	0.7	8.78	3.82	3.1	2.3	2.8	3.4	5.47			
5	0.8	14.20	6.18	6.2	4.6	5.6	6.8	8.85			
6	1	20.10	8.74	11	7.9	9.4	12	12.5			
7	1	28.90	12.6	18	13	16	19	18.0	25	23	19
8	1.25	36.60	15.9	26	19	23	28	22.8	37	33	27
10	1.5	58.00	25.2	50	38	45	55	36.1	70	65	55
12	1.75	84.30	36.7	88	66	79	97	52.5	125	115	95
14	2	115	50.0	140	105	126	154	71.6	200	180	150
16	2	157	68.3	219	164	197	241	97.8	315	280	235
18	2.5	192	83.5	301	226	271	331	119.5	430	385	325
20	2.5	245	106.5	426	320	383	469	152.5	610	550	460
22	2.5	303	132.0	581	436	523	639	189.0	830	750	625
24	3	353	153.5	737	553	663	811	222.0	1065	960	800
27	3	459	199.5	1080	810	970	1130	286.0	1545	1390	1160
30	3.5	561	244.0	1460	1100	1320	1530	349.5	2095	1885	1575
33	3.5	694	302.0	1990	1490	1790	2090	432.5	2855	2570	2140
36	4	817	355.5	2560	1920	2300	2690	509.0	3665	3300	2750
42	4.5	1120	487.0	4090	3070	3680	4290	698.0	5865	5275	4395

NOTES: 1. THESE TORQUE VALUES DO NOT APPLY TO CADMIUM PLATED FASTENERS
2. ALL TORQUE VALUES ARE STATIC TORQUE MEASURED PER STANDARD AUDIT METHODS TOLERANCE = ±10%

Torque Table 1 of 2

			Values for Magni Coated Fasteners							
			CLASS 8.8 METRIC (HEX/SOCKET HEAD) BOLTS CLASS 8 METRIC NUTS				CLASS 10.9 METRIC (HEX HEAD) BOLTS CLASS 10 METRIC NUTS CLASS 12.9 SOCKET HEAD CAP SCREWS M6 AND ABOVE*			
Size	PITCH	Tensile Stress Area	Clamp Load	Torque (Dry or Loctite® 263™) K=0.17	Torque (Loctite® 262™ OR Vibra-TITE™ 131) K=0.16	Torque (Loctite® 242™ or 271™ OR Vibra-TITE™ 111 or 140) K=0.15	Clamp Load	Torque (Dry or Loctite® 263™) K = 0.17	Torque (Lub OR Loctite® 242™ or 271™ OR Vibra-TITE™ 111 or 140) K= 0.16	Torque (Loctite® 262™ OR Vibra-TITE™ 131) K=0.15
		Sq mm	KN	[N.m]	[N.m]	[N.m]	KN	[N.m]	[N.m]	[N.m]
3	0.5	5.03	2.19	1.1	1.1	1.0	3.13			
3.5	0.6	6.78	2.95	1.8	1.7	1.5	4.22			
4	0.7	8.78	3.82	2.6	2.4	2.3	5.47			
5	0.8	14.20	6.18	5.3	4.9	4.6	8.85			
6	1	20.10	8.74	9	8.4	7.9	12.5	13	12	11
7	1	28.90	12.6	15	14	13	18.0	21	20	19
8	1.25	36.60	15.9	22	20	19	22.8	31	29	27
10	1.5	58.00	25.2	43	40	38	36.1	61	58	55
12	1.75	84.30	36.7	75	70	66	52.5	105	100	95
14	2	115	50.0	119	110	105	71.6	170	160	150
16	2	157	68.3	186	175	165	97.8	265	250	235
18	2.5	192	83.5	256	240	225	119.5	365	345	325
20	2.5	245	106.5	362	340	320	152.5	520	490	460
22	2.5	303	132.0	494	465	435	189.0	705	665	625
24	3	353	153.5	627	590	555	222.0	905	850	800
27	3	459	199.5	916	860	810	286.0	1315	1235	1160
30	3.5	561	244.0	1245	1170	1100	349.5	1780	1680	1575
33	3.5	694	302.0	1694	1595	1495	432.5	2425	2285	2140
36	4	817	355.5	2176	2050	1920	509.0	3115	2930	2750
42	4.5	1120	487.0	3477	3275	3070	698.0	4985	4690	4395

NOTES: 1. THESE TORQUE VALUES DO NOT APPLY TO CADMIUM PLATED FASTENERS
2. ALL TORQUE VALUES ARE STATIC TORQUE MEASURED PER STANDARD AUDIT METHODS TOLERANCE = ±10%

Torque Table 2 of 2

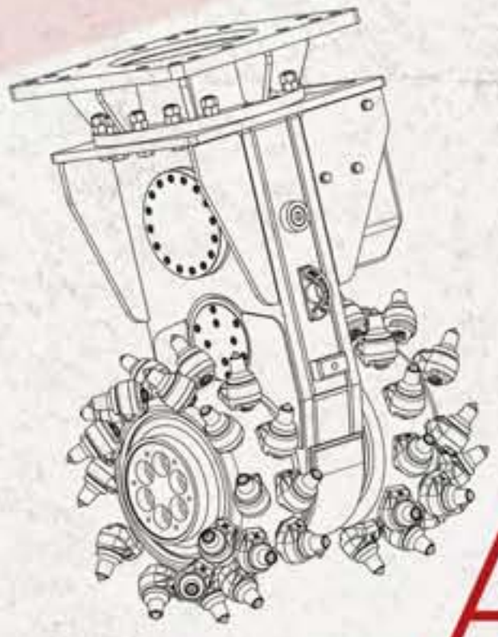
WARRANTY

The Antraquip Limited Warranty for your equipment is stated on the retail purchaser's copy of the Warranty And Delivery Receipt form. Additional copies of the Limited Warranty can be obtained through your Antraquip Dealer.

Warranty, within the warranty period, is provided as part of Antraquip's support program for registered Antraquip products which have been operated and maintained as described in this manual. Evidence of equipment abuse or modification beyond original factory specifications will void the warranty. Normal maintenance, service and repair is not covered by Antraquip warranty.

To register your Antraquip product for warranty, a Warranty And Delivery Receipt form must be completed by the Antraquip Dealer and signed by the retail purchaser, with copies to the Dealer, and retail purchaser. Registration must be completed and submitted to Antraquip Corporation within 5 business days of delivery of the Antraquip product to the retail purchaser. Antraquip Corporation reserves the right to refuse warranty on serial numbered products which have not been properly registered.

If service or replacement of failed parts which are covered by the Limited Warranty are required, it is the user's responsibility to deliver the machine along with the retail purchaser's copy of the Warranty And Delivery Receipt to the Antraquip Dealer for service. Antraquip warranty does not include cost of travel time, mileage, hauling or labor. Any prior arrangement made between the Dealer and the retail purchaser in which the Dealer agrees to absorb all or part of this expense should be considered a courtesy to the retail purchaser. Antraquip warranty does not include cost of travel time, mileage, hauling, or labor.



EXPERIENCED, INNOVATIVE AND RELIABLE

ANTRAQUIP® CORPORATION

AQ

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