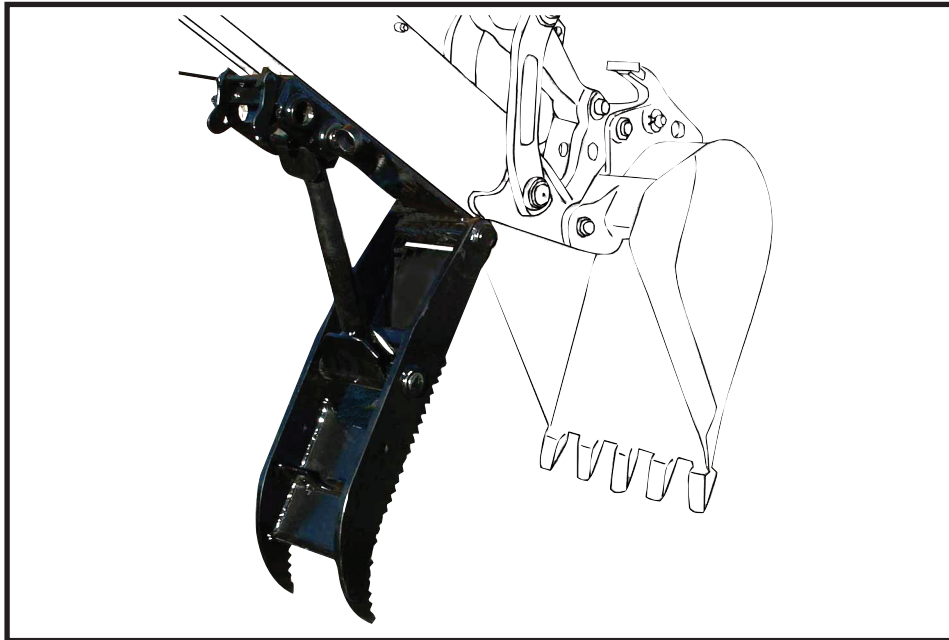


RANKIN

NORTHSTAR

UNIVERSAL THUMBS



OPERATOR'S MANUAL

**Models: UAT-50, UAT-100-R,
UAT-200 & UAT-300**

**RANKIN****NORTHSTAR**

LIMITED WARRANTY

RANKIN EQUIPMENT/NORTHSTAR ATTACHMENTS warrants each new RANKIN/NORTHSTAR product to be free from defects in material and workmanship for a period of twelve (12) months from date of purchase to the original purchaser. This warranty shall not apply to implements or parts that have been subject to misuse, negligence, accident, or that have been altered in any way.

Our obligation shall be limited to repairing or replacement of any part, provided that such part is returned within thirty (30) days from date of failure to RANKIN/NORTHSTAR through the dealer from whom the purchase was made, transportation charges prepaid.

This warranty shall not be interpreted to render us liable for injury or damages of any kind or nature, direct, consequential or contingent, to person or property. This warranty does not extend to loss of crops, loss because of delay in harvesting or any other expenses, for any other reasons.

RANKIN/NORTHSTAR in no way warrants engines, tires, or other trade accessories, since these items are warranted separately by these respective manufacturers.

RANKIN/NORTHSTAR reserves the right to make improvements in design or changes in specification at any time, without incurring any obligations to owners or units previously sold.

RANKIN EQUIPMENT/NORTHSTAR ATTACHMENTS
3205 BAY STREET
UNION GAP, WA 98903

Always refer to and heed machine operating warning decals on machine.

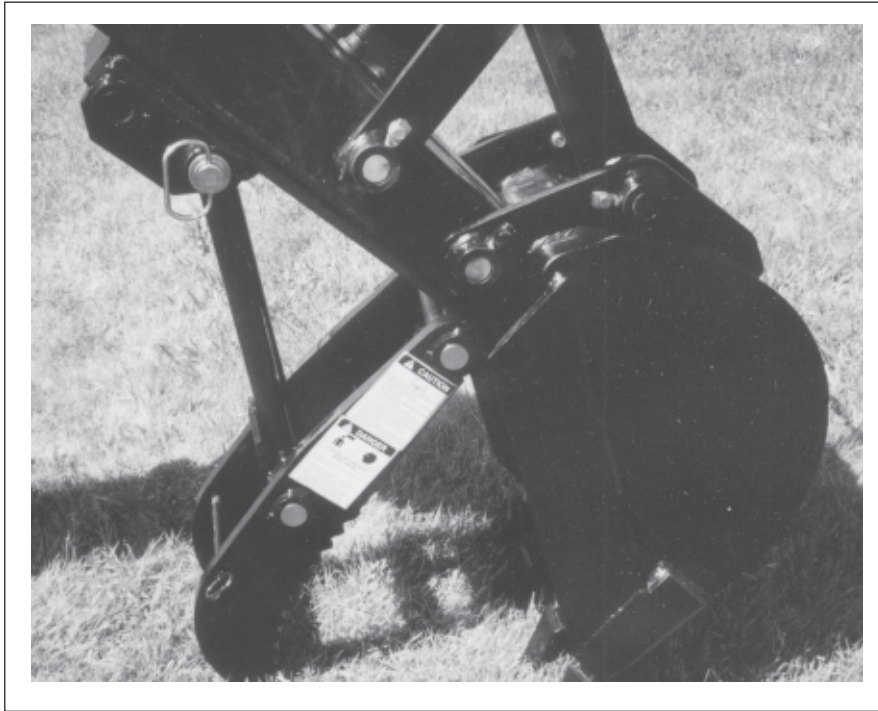
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SERIAL NUMBER LOCATION

Always give your dealer the serial number of your Rankin Universal Thumb when ordering parts or requesting service or other information.

The serial number plate is located where indicated. Please mark the number in the space provided for easy reference.



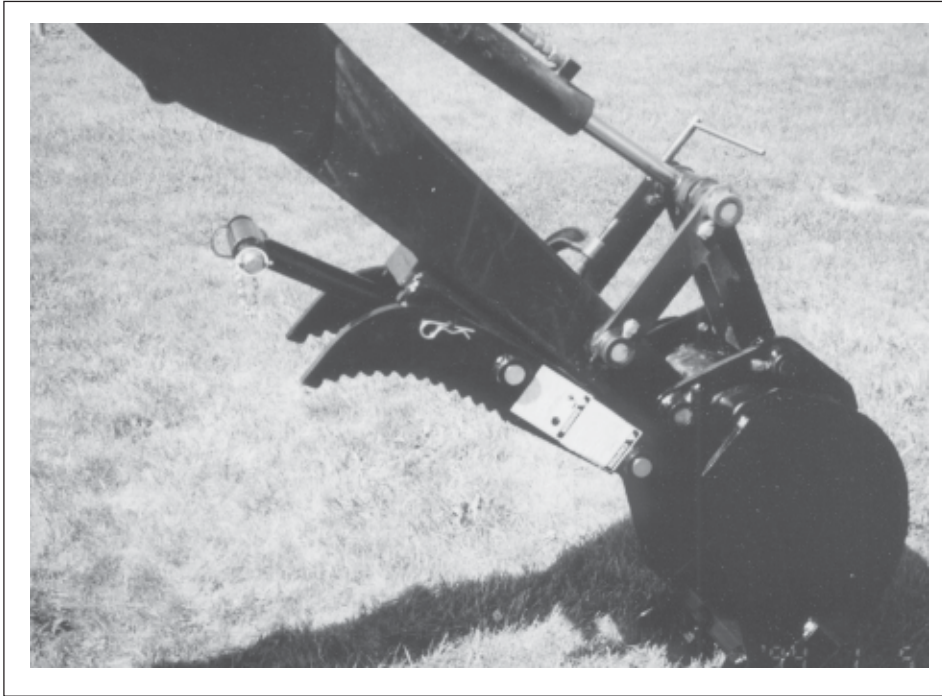
Model Number _____

Serial Number _____

1 INTRODUCTION

Congratulations on your choice of a Rankin Universal Thumb to complement your landscaping or contracting operation. This equipment has been designed and manufactured to meet the needs of a discriminating buyer for the efficient lifting and moving of objects with a backhoe or mini-excavator.

Safe, efficient and trouble free operation of your Universal Thumb requires that you and anyone else who will be operating or maintaining the machine, read and understand the Safety, Operation, Maintenance and Trouble Shooting information contained within the Operator's Manual.



This manual covers the Universal Thumb Models UAT-50, UAT-100-R, UAT-200 and UAT-300 manufactured by Rankin Equipment. Differences are explained where appropriate. Use the Table of Contents and Index as a guide to locate required information.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Rankin dealer or distributor if you need assistance, information or additional copies of the manuals.

OPERATOR ORIENTATION - The directions left, right, front and rear, as mentioned throughout this manual, are as seen from the driver's seat and facing in the direction of the boom.

2 SAFETY

SAFETY ALERT SYMBOL

This Safety Alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



The Safety Alert symbol identifies important safety messages on the Rankin Universal Thumb and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons

Accidents Disable and Kill
Accidents Cost
Accidents Can Be Avoided

SIGNAL WORDS:

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

SI NO LEE INGLES, PIDA AYUDA A AIGUIEN QUE SI LO LEA PARA QUE LE TRADUZCA LAS MIDIDAS DE SEGURIDAD.

DANGER - Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

WARNING - Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION - Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer or Rankin Equipment Co., P.O. Box 168, Yakima, WA, 98907-0168. (Telephone) 509-453-8271, (FAX) 509-457-2456.

SAFETY

YOU are responsible for the **SAFE** operation and maintenance of your Universal Thumb. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Thumb be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating the Thumb.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Thumb owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.
- The most important safety feature on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow these. Most accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.

2.1 GENERAL SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining or adjusting the Universal Thumb.



2. Have a first-aid kit available for use should the need arise and know how to use it.



3. Have a fire extinguisher available for use should the need arise and know how to use it.

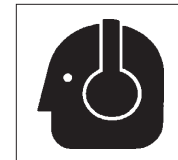


4. Wear appropriate protective gear. This list includes but is not limited to:



- A hard hat
- Protective shoes with slip resistant soles
- Protective goggles, glasses or face shield
- Heavy gloves
- Protective clothing

5. Install and secure all guards before starting.
6. Do not allow riders.
7. Wear suitable ear protection for prolonged exposure to excessive noise.



8. Lower boom/thumb to the ground, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting and repairing.
9. Clear the area of people, especially small children, before starting.
10. Review safety related items annually with all personnel who will operating or maintaining the Universal Thumb.

2.2 EQUIPMENT SAFETY GUIDELINES

1. Safety of the operator and bystanders is one of the main concerns in designing and developing a machine. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury or death, study the following precautions and insist those working with you, or for you, follow them.
2. In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.
3. Replace any safety sign or instruction sign that is not readable or is missing. Location of such safety signs is indicated in this manual.
4. Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.
5. **Under no circumstances should young children be allowed to work with this equipment. Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works.** Review the safety instructions with all users annually.
6. This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible, properly trained and physically able person familiar with machinery and trained in this equipment's operations. If the elderly are assisting with work, their physical limitations need to be recognized and accommodated.
7. Use a power unit equipped with a Roll Over Protective Structure (ROPS) and a seat belt.
8. Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question - **DON'T TRY IT.**
9. Do not modify the equipment in any way. Unauthorized modification result in serious injury or death and may impair the function and life of the equipment.
10. In addition to the design and configuration of this implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the power unit and machine Manuals. Pay close attention to the Safety Signs affixed to the power unit and the machine.

2.3 SAFETY TRAINING

1. Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.
2. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.

3. It has been said, "The best safety feature is an informed, careful operator." We ask you to be that kind of an operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Accidents can be avoided.



4. Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your power unit, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than yourself, or is loaned or rented, it is the machine owner's responsibility to make certain that the operator, prior to operating:
 - a. Reads and understands the operator's manuals.
 - b. Is instructed in safe and proper use.
5. Know your controls and how to stop tractor, backhoe, mini-excavator, engine, and machine quickly in an emergency. Read this manual and the one provided with your tractor, backhoe or mini-excavator.
6. Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will operate the machinery. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death. If the elderly are assisting with the work, their physical limitations need to be recognized and accommodated.

2.4 SAFETY SIGNS

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety signs are available from your authorized Distributor or Dealer Parts Department or the factory.

How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Determine exact position before you remove the backing paper. (See Section 3).
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

2.5 PREPARATION

1. Never operate the thumb and machine until you have read and completely understand this manual, the Tractor, Backhoe or Mini-Excavator Operator's Manual, and each of the Safety Messages found on the safety signs on the tractor and machine.

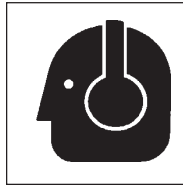
2. Personal protection equipment including hard hat, safety glasses, safety shoes, and gloves are recommended




during assembly, installation, operation, adjustment, maintaining, repairing, removal, or moving the implement. Do not allow long hair, loose fitting clothing or jewellery to be around equipment.

3. **PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!**

Tractors with or without equipment attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a full-time basis if the noise in the Operator's position exceeds 80db. Noise over 85db on a long-term basis can cause severe hearing loss. Noise over 90db adjacent to the Operator over a long-term basis may cause permanent, total hearing loss. **NOTE:** Hearing loss from loud noise (from tractors, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.



4. Operate the machine only with a power unit equipped with an approved Roll-Over-Protective Structure (ROPS). Always wear your seat belt. Serious injury or even death could result from falling off the tractor ---particularly during a turnover when the operator could be pinned under the ROPS or the tractor.
- 
5. Clear working area of stones, branches or hidden obstacles that might be hooked or snagged, causing injury or damage.
 6. Keep boom/thumb away from overhead power lines. Electrocutation can occur without direct contact with an overhead power line.
 7. Operate only in daylight or good artificial light.
 8. Be sure machine is properly mounted, adjusted and in good operating condition.
 9. Before starting, give the machine a "once over" for any loose bolts, worn parts, cracks, leaks, frayed hoses and make necessary repairs. Always follow maintenance instructions.
 10. Ensure that all safety shielding and safety signs are properly installed and in good condition.
 11. Check that mounting pins are in good condition and all locking pins are installed.
 12. Move wheels or tires to their widest position for maximum stability.
 13. Add wheel ballast or rear weight for maximum stability.
 14. Always extend stabilizers before starting to work.

2.6 OPERATING SAFETY

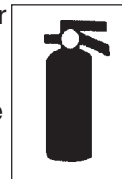
1. Please remember it is important that you read and heed the safety signs on the Tractor, Backhoe and Mini-Excavator. Clean or replace all safety signs if they cannot be clearly read and understood. They are there for your safety, as well as the safety of others. The safe use of this machine is strictly up to you, the operator.
2. All things with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes potential hazards and follows reasonable safety practices. The manufacturer has designed this Thumb to be used with all its safety equipment properly attached, to minimize the chance of accidents. Study this manual to make sure you have all safety equipment attached.
3. Practice raising, lowering and swinging unit and its load when learning to operate boom, bucket and thumb. Become familiar with controls before operating.
4. If a safety shield or guard is removed for any reason, it must be replaced before the machine is again operated.
5. Keep the boom, bucket and thumb at a low position when moving and when working on inclines.
6. Do not operate near the edge of drop-offs or banks.
7. Do not operate at an angle on steep slopes. Drive up or down but not across. Keep bucket and boom low.
8. Make allowances for increased length and weight of boom and bucket during operation and moving.
9. Remove all sticks, stones, roots, and wires from working area before starting. Take care not to contact overhead obstructions during operation.
10. Never operate controls from the ground. Operate only from the operators seat to prevent unexpected boom and bucket movement that can lead to crushing between frame members.
11. Use extra care when handling large round loads or other shiftable objects unless bucket and boom are equipped with an attachment designed to secure objects.
12. Keep boom/bucket and load away from overhead power lines. Electrocution can occur without direct contact with an overhead power line.
13. Do not exceed machine lift capacity. Overloading can cause structural damage and lead to unsafe operating conditions.
14. Never carry, lift or move people on boom or bucket. Do not use machine as a work platform.
15. Always use two people to handle heavy, unwieldy components during assembly, installation, removal or moving.
16. Never place any part of your body where it would be in danger if movement should occur during assembly, installation, operation, maintaining, repairing, removal or moving.
17. Do not walk or work under a raised boom or bucket unless it is securely blocked or held in position. Keep others away. Do not depend on the hydraulic system to hold the machine or attachment in place.
18. Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.
19. Do not allow riders on the machine or tractor at any time. There is no safe place for any riders.
20. Always extend stabilizers before starting to work.
21. Before you operate the machine, check over all pins, bolts, and connections to be sure all are securely in place. Replace any damaged or worn parts immediately.
22. Review safety instructions annually.

2.7 TRANSPORT SAFETY

1. Comply with state and local laws governing highway safety and movement of machinery on public roads.
2. The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements.
3. At all times, when driving the tractor and equipment on the road or highway under 20 mph (32 kph) use flashing amber warning lights and a slow moving vehicle (SMV) identification emblem. Do not exceed 20 mph (32 kph). Reduce speed on rough roads and surfaces.
4. Keep tractor in gear to provide engine braking when going downhill. Do not coast.
5. Plan your route to avoid heavy traffic.
6. Do not drink and drive.
7. Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc. Watch for traffic when operating near or crossing roadways.
8. Turn into curves or go up or down hills only at a low speed and at a gradual steering angle. Make certain that at least 20% of the tractor's weight is on the front wheels to maintain safe steering. Slow down on rough or uneven surfaces.
9. Keep boom in a low position when traveling. Remember, the higher the loader, the higher the center of gravity with increased risk of the unit upset.
10. Never allow riders on either tractor or machine.

2.8 MAINTENANCE SAFETY

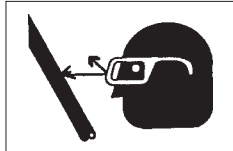
1. Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.
2. Follow good shop practices.
 - Keep service area clean and dry.
 - Be sure electrical outlets and tools are properly grounded.
 - Use adequate light for the job at hand.
3. Make sure there is plenty of ventilation. Never operate the engine in a closed building. The exhaust fumes may cause asphyxiation.
4. Before working on this machine, lower boom and bucket to the ground, shut off the engine, set the brakes, and remove the ignition key.
5. Never work under equipment unless it is blocked securely.
6. Use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance work.
7. Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.
8. A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
9. Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to ensure unit is in a safe condition.
10. When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.



2.9 HYDRAULIC SAFETY

1. Make sure that all the components in the hydraulic system are kept in good condition and are clean.
2. Replace any worn, cut, abraded, flattened or crimped hoses and metal lines.
3. Relieve pressure before working on hydraulic system.
4. Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tapes, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

5. Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.



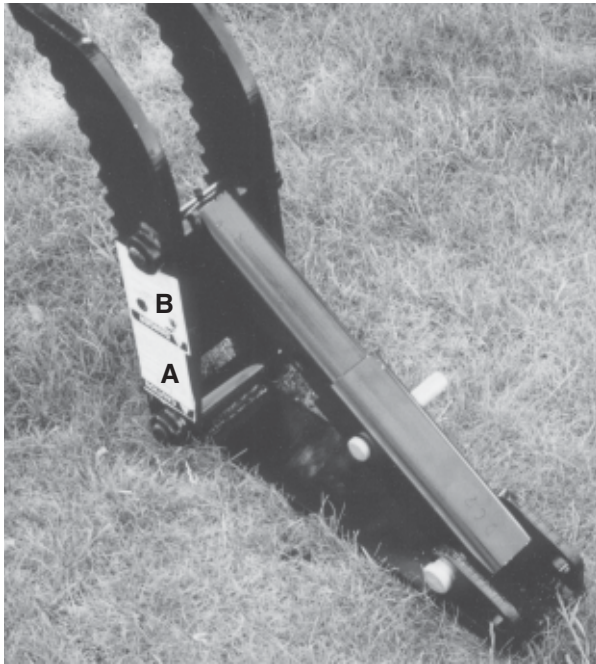
6. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.
7. Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are not damaged.
8. When disconnecting hydraulic lines, shut off hydraulic supply and relieve hydraulic pressure.

2.10 STORAGE SAFETY


1. Store the unit in an area away from human activity.
2. Do not permit children to play on or around the stored machine.
3. Store the unit in a dry, level area. Support the frame with planks if required.

3 SAFETY SIGN LOCATIONS

The types of safety signs and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize yourself with the various safety signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.




A



CAUTION

- Read Thumb and Backhoe/Excavator Manuals before starting.
- Follow all Backhoe/Excavator instructions during operation.
- Do not exceed lift capacity specifications of Backhoe/Excavator.
- Lower machine to ground, place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or cleaning.
- Lift in the center of load to maintain balance and control.
- Use a spotter to guide the operator with long, unwieldy and hard to control loads.
- Keep everyone out of working area.
- Review safety instructions annually.

B



DANGER

**OVERHEAD HAZARD
KEEP AWAY**

To prevent serious injury or death from overhead hazards:

- Keep away from boom, bucket, thumb and load when lifting or moving machine. Keep others away.
- Lower unit to the ground, place controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or cleaning.

REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without signs, new signs must be applied. New signs are available from your authorized dealer.

4 OPERATION



OPERATING SAFETY

1. Read Operator's Manual.
2. Lower boom/bucket to the ground, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting and repairing.
3. Do not carry people in bucket or on frame.
4. Add weight to rear of frame to balance machine load.
5. Stay away from overhead power lines. Electrocutation can occur without direct contact.
6. Widen wheels or tires to prevent tipping. Extend stabilizers before starting to work.
7. Use only with a unit with ROPS and a seat belt.
8. Carry load close to the ground when moving.
9. Do not go under raised bucket. Keep others away.
10. Review safety instructions.

4.1 TO THE NEW OPERATOR OR OWNER

Rankin Universal Thumbs are designed to mount on a dipper stick next to the bucket to provide a backstop for the bucket on a backhoe or mini-excavator. Universal Thumbs will increase the productivity of your bucket mounted equipment and material handling needs.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the worksite. Untrained operators are not qualified to operate the machine.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum field efficiency. By following the operating instructions in conjunction with a good maintenance program, your Universal Thumb will provide many years of trouble-free service.

4.2 MACHINE COMPONENTS

The Rankin Universal Thumb is attached to the dipper stick of a backhoe or mini-excavator next to the bucket.

- A Base**
- B Claw**
- C Support Rod**

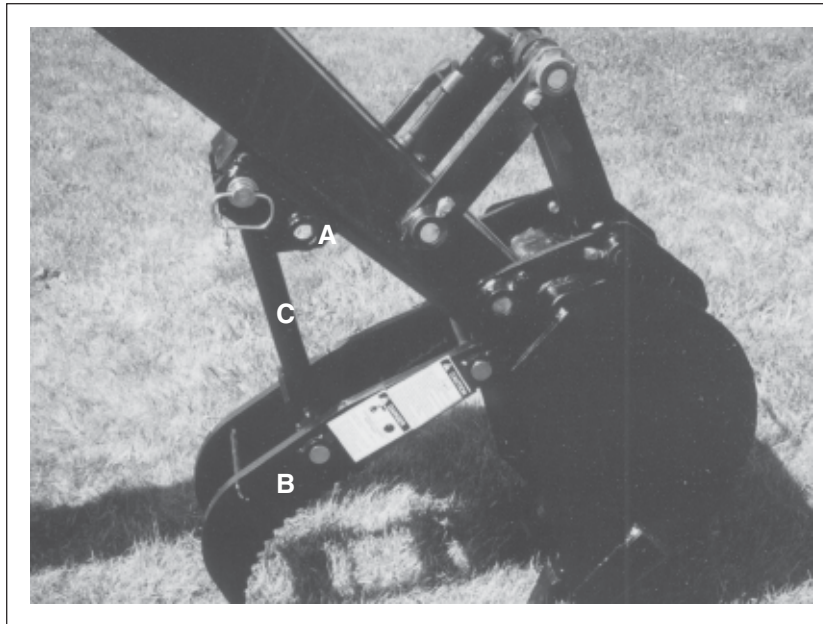


Fig. 1 MACHINE COMPONENTS (TYPICAL)

4.3 MACHINE BREAK-IN

Although there are no operational restrictions on the Universal Thumb when used for the first time, it is recommended that the following mechanical items be checked:

A. After Operating For 1 and 5 Hours:

1. Check all nuts, bolts and other fasteners. Tighten to their specified torque level.
2. Check that all structural components are in good condition.

4.4 PRE-OPERATION CHECKLIST

Efficient and safe operation of the Rankin Universal Thumb requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section. A pre-operation checklist is provided for the operator. It is important for both the personal safety and maintaining the good mechanical condition of the Universal Thumb that this checklist is followed.

Before operating the Thumb and each time thereafter, the following areas should be checked off:

1. Use the thumb on a backhoe/mini-excavator unit with the appropriate lift capacity and size. Do not exceed thumb specifications.
2. Check that the anchor base is properly welded to the dipper frame. Be sure retainers are used on position pins.
3. Be sure extra weights are mounted on the backhoe/mini-excavator if required to balance the load.
4. Check the claws. Be sure they are not damaged or bent and are not badly worn. Repair or replace as required.
5. Check for entangled material. Remove this material.

4.5 FIELD OPERATION



OPERATING SAFETY

1. Read Operator's Manual.
2. Lower boom/bucket to the ground, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting and repairing.
3. Do not carry people in bucket or on frame.
4. Add weight to rear of frame to balance machine load.
5. Stay away from overhead power lines. Electrocutation can occur without direct contact.
6. Widen wheels or tires to prevent tipping. Extend stabilizers before starting to work.
7. Use only with a unit with ROPS and a seat belt.
8. Carry load close to the ground when moving.
9. Do not go under raised bucket. Keep others away.
10. Review safety instructions.

Rankin Universal Thumbs are designed to extend out from the dipper and set as a stop for the bucket to hold material. However the operator has the responsibility of being familiar with all operating and safety procedures and following them.

Each operator should review this section of the manual at the start of the season and as often as required to be familiar with the unit. When using, follow this procedure:

1. Review and follow the Pre-Operation Checklist.
2. Position the thumb into its desired configuration:
 - a. Lower bucket to the ground, place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before dismounting.
 - b. Remove position pin retainer.
 - c. Remove position pin.
 - d. Move claws to their desired position.
 - e. Install position pin and retainer.
3. Before going to the working area review Section 4.7 Transporting.

4. Drive to the working area and stop in the working area.
5. Check that there is sufficient space and clearance to pick-up, swing and unload/release.
6. When there is sufficient space, extend the stabilizer feet.

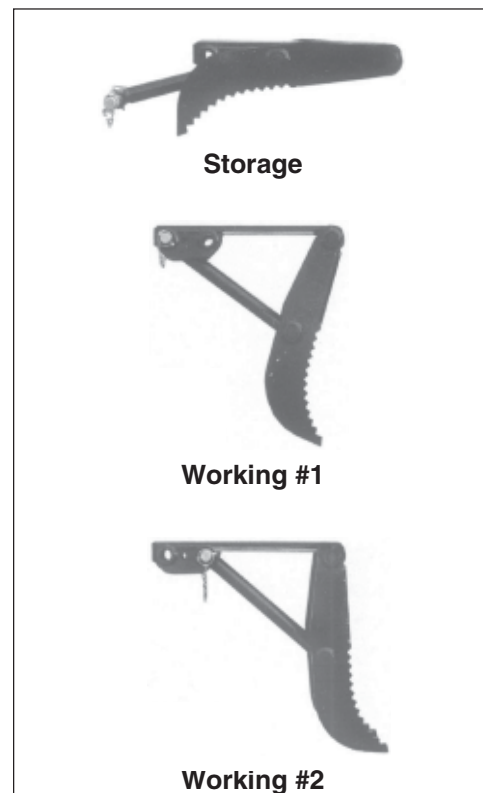


Fig. 2 CLAW POSITION

7. Be sure that there are no spectators or bystanders when you start to work.



Starting

8. Pick up the first load and carefully move it to the dump, release or unload position. Be sure there is sufficient space and clearance.



Swinging

9. Always center the load between the claws to reduce uneven loading.



Releasing

Fig. 3 LOADING

10. Place the Thumb into its storage position when it is not being used.

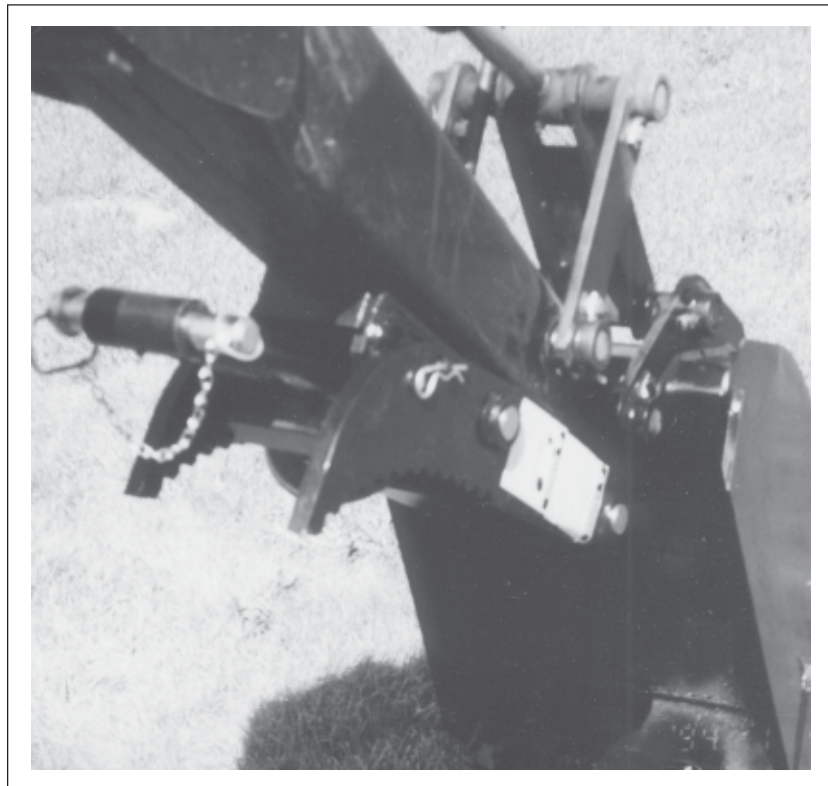
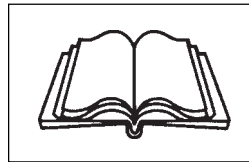


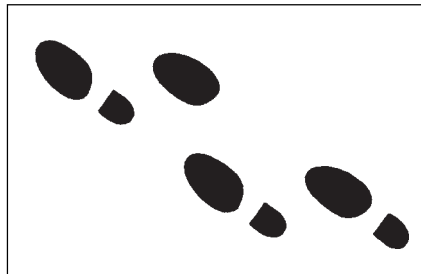
Fig. 4 STORAGE POSITION

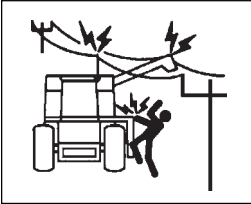
11. **Operating Hints:**

Most accidents can be avoided by reviewing instructions, reading the manuals of all machines involved with the work, reading and following safety signs and planning work to be done. Taking your time and planning ahead can save time, money, effort and make the work site a safe environment. Safe practices include but are not limited to:



- a. Review the work to be done. Plan the machine swing and movement before starting. Be familiar with where the load will be picked up, raised, swung and placed. Stay away from slopes, rough terrain, holes, ruts, ditches, curbs or other conditions. If these cannot be avoided, keep bucket and boom as low as possible and swing slowly. Be sure your backhoe and mini excavator is equipped with a ROPS and a seat belt. Always use the seat belt. Be sure surface can support the weight of the machine.



- b. Stay away from holes, banks, soft soil, deep mud, standing water, oil spills, ice, slopes and hillsides that can cause tipping or sliding when moving or positioning. Take another route to avoid these conditions.
- c. Large machines such as tractors, trucks and other equipment can interfere with or block visibility in all directions:
 - Be sure back-up alarms are working.
 - Do not raise or swing machine unless you know where everyone is.
 - In tight confined work areas, use a spotter to help with clearances. This is particularly important when handling long objects such as poles, pipes or other items.
- d. Always know the rules for moving equipment or loads at the work site:
 - Always maintain the proper clearances between your machine or load and others.
 - Always move slowly and sound your horn. Be sure others acknowledge your presence before proceeding or the pathway is clear.
 - Be sure there is adequate clearance when moving or swinging machine to prevent hitting people, buildings or other objects.
- e. Do not exceed the thumb/bucket/boom lift capacity. If the load is too large or heavy, break into two parts. Be sure load is stable on the claws.
- f. Always extend stabilizer feet before starting to work.
- g. Know the load:
 - Center the load between the claws to keep the boom/bucket in balance.
 - Do not try to lift too heavy a load.
 - Avoid lifting and moving loose material. Try to tie or strap them together before lifting.
- Avoid handling long poles or pipes unless they are tied together and spotters can help direct your while moving. Always center them in the claws.
- Use the spotter to guide you when placing the load or releasing the thumb/bucket. Be sure the load is stable.
- Use care when swinging a load. Its stability can change as it swings. Turn slowly and gradually. Always extend stabilizer feet before starting to work.
- h. Stay away from overhead power lines when lifting or swinging load. Electrocutation can occur without direct contact.
 
- i. Stay away from overhead obstructions such as tree branches, doors, etc. to prevent snagging and tipping. Keep the boom/load low or select another route.
- j. Do not use the boom/bucket as a man lift or people mover. They can fall off or be dumped and get injured.
- k. Always keep the boom low when swinging to maximize machine stability.
- l. Do not walk under the raised boom/bucket or load. Keep others away.
- m. Do not make sudden starts, stops or turns. Sudden motion can dislodge a load or cause instability.

- n. Use extra care when placing or stacking a load above ground level. When raising high, remember:
- Use extra care because there may be workers or others in the area that you cannot see.
 - Keep the load as low as possible while swinging the load into position.
 - Do not lift the load until the boom is as close as possible to the place where the load will go.
 - Do not raise the boom if the load is tilted to one side or not even between the bucket and thumb.
 - If your machine is equipped with outriggers or stabilizers, these should be lowered into position.
 - Use a signal person if necessary to help you safely place the load.
 - If there is any sign of instability, immediately lower the load and:
 - Take a new bite or break it down into smaller loads.
 - If necessary, move the machine to a more stable, level position.

4.6 MOUNTING TO BUCKET

The Thumb will function well provided the base is installed properly to the dipper. Follow these instructions carefully during installation:

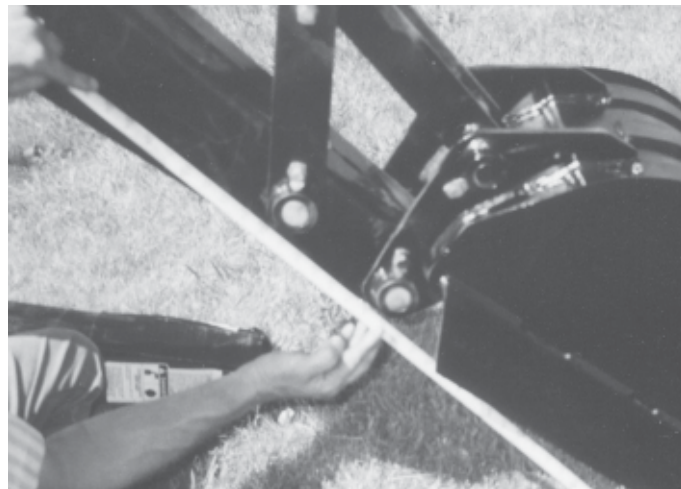
1. Clear the area of bystanders, especially small children.
2. Have the appropriate tools, hoists, welders, etc. for the job before starting.
3. Position the bucket with the cutting edge pointing down.
4. Stop the engine, set park brake, remove ignition key and wait for all moving parts to stop before dismounting.
5. Disconnect one of the battery cables.
6.
 - a. Clamp the Thumb base to the bottom of the dipper stick.
 - b. Some commercial and agricultural backhoes require one or more spacers (see clamping photo in Fig. 5) to give proper clearance when mounting the Universal Thumbs to the dipper stick. Contact your dealer for spacer material.
7. The Thumb base must be properly located on the dipper stick to provide an adequate stop for the bucket.
8. Measure from the upper end of the base to the bucket pivot. Use Table 1 as a guide to locate each base per the Thumb model.

Table 1 Base Dimension From Pivot Pin

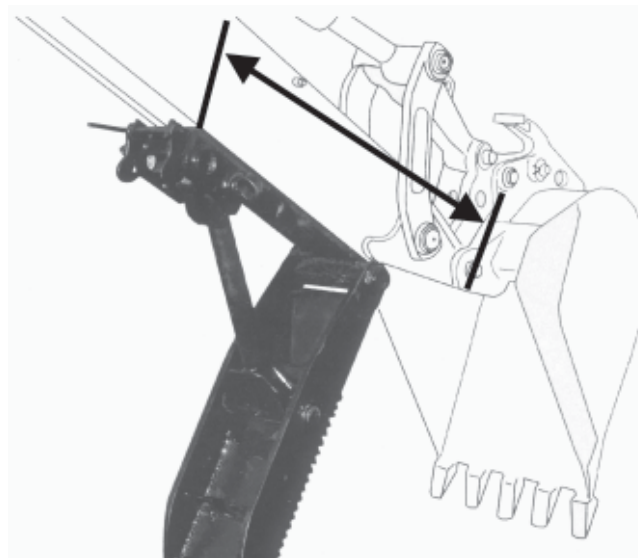
Model	Dimension
UAT-50	20 Inches
UAT-100-R	22 Inches
UAT-200	24 Inches
UAT-300	35 Inches



Clamping



UAT-200 (Measuring)



Schematic

Fig. 5 THUMB BASE DIMENSION (TYPICAL)

9. Clamp the base in position or support with blocks.
10. Have a certified welder weld the base to the dipper stick.



Clamps



Blocks

Fig. 6 BASE POSITIONED

11. Extend and retract the bucket to be sure the Thumb works as intended.



Fig. 7 MOUNTED

4.7 TRANSPORTING



TRANSPORT SAFETY

1. Make sure you are in compliance with all local regulations regarding transporting equipment on public roads and highways including lights, reflectors and the SMV.
2. Carry boom low when moving or transporting.
3. Do not allow anyone to ride on the mini-excavator or tractor during transport.
4. Do not exceed 20 mph (32 kph). Reduce speed on rough roads and surfaces.
5. Be sure locking latch is engaged on boom.
6. Always use hazard flashers on the tractor when transporting unless prohibited by law.

When transporting the machine, review and follow these instructions:

1. Be sure all bystanders are clear of the machine.
2. Be sure that the boom and bucket are locked.
3. Be sure you have raised and locked the stabilizer feet.
4. Clean the SMV emblem, lights and reflectors and be sure they are working. Comply with all local regulations.
5. Carry boom low when moving or transporting.
6. Stay away from overhead power lines. Electrocutation can occur without direct contact.
7. Be sure your machine can clearly be seen by overtaking and oncoming traffic.
8. Do not allow riders.
9. Always use hazard flashers on the tractor when transporting unless prohibited by law.

4.8 STORAGE



STORAGE SAFETY

1. Store the unit in an area away from human activity.
2. Do not permit children to play on or around the stored machine.
3. Store the unit in a dry, level area. Support the frame with planks if required.

After the season's use, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the start of next season. To insure a long, trouble free life, this procedure should be followed when preparing the unit for storage:

1. Clear the area of bystanders, especially small children.
2. Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris and residue.
3. Inspect the Thumb, bucket and boom for damage or entangled material. Repair or replace damaged parts. Remove all entangled material.
4. Touch up all paint nicks and scratches to prevent rusting.
5. Move to storage area.
6. Select an area that is dry, level and free of debris.
7. If the machine cannot be placed inside, cover with a waterproof tarpaulin and tie securely in place.
8. Store the machine in an area away from human activity.
9. Do not allow children to play on or around the stored machine.

5 SERVICE AND MAINTENANCE



MAINTENANCE SAFETY

- Follow ALL the operating, maintenance and safety information in the manual.
- Support the boom/bucket with blocks or safety stands when adjusting Thumb or working beneath boom.
- Follow good shop practices.
 - Keep service area clean and dry.
 - Be sure electrical outlets and tools are properly grounded.
 - Use adequate light for the job at hand.
- Use only tools, jacks and hoists of sufficient capacity for the job.
- Never work on boom, bucket, thumb or under the machine unless the tractor or mini-excavator engine is off.
- Make sure all guards are in place and properly secured when maintenance work is completed.
- Never wear ill-fitting, baggy or frayed clothing when working around or on any of the components.
- Before applying pressure to a hydraulic system, make sure all lines, fittings and couplers are tight and in good condition.
- Relieve pressure from hydraulic circuit before servicing or disconnecting.
- Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.

5.1 SERVICE

5.1.1 FLUIDS AND LUBRICANTS

1. **Grease:**
Use an SAE multipurpose high temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multipurpose lithium base grease.
2. **Storing Lubricants:**
Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

5.1.2 GREASING

Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.

1. Use a hand-held grease gun for all greasing.
2. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

5.1.3 SERVICING INTERVALS

The period recommended is based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication or oil changes.

40 Hours or Weekly

- Grease the Pivot Pins (3 locations).

Annually

- Wash and clean Thumb.

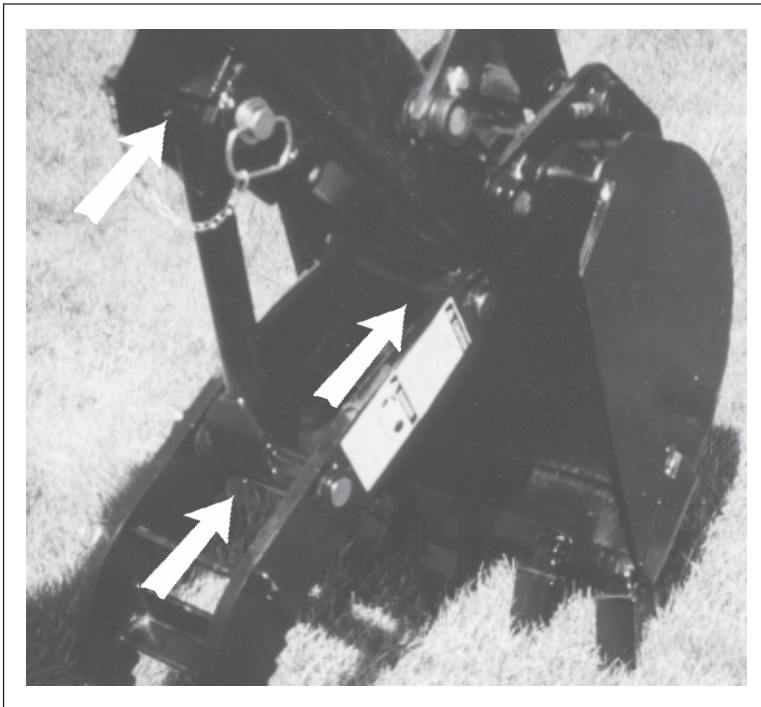


Fig. 8 PIVOT PINS

5.1.4 SERVICE RECORD

See Lubrication and Maintenance sections for details of service. Copy this page to continue record.

ACTION CODE: G GREASE CL CLEAN

MAINTENANCE	HOURS																	
	SERVICED BY																	
40 Hours or Weekly																		
G Pivot Pins (3)																		
Annually																		
CL Machine																		

6 TROUBLE SHOOTING

Rankin Universal Thumb consists of a set of pivoting claws that mount on a backhoe or mini-excavator dipper next to the bucket. It is a simple and reliable system that requires minimal maintenance.

In the following section, we have listed many of the problems, causes and solutions to the problems that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please call your local dealer, distributor or Rankin Equipment. Before you call, please have this Operator's Manual and the serial number from your Universal Thumb ready.

PROBLEM

CAUSE

SOLUTION

Cannot lift load.

Insufficient lift capacity.

Divide into more than one load.

Use larger capacity loader.

7 SPECIFICATIONS

7.1 MECHANICAL

UAT-50
1/2" X 3" x 16" Long-high strength T-1 Steel "Claws" with gripping teeth 5" thumb width 3 1/2" x 19" base mounting plate Telescoping support member: 2" x 1/4" inner x 2-1/2" x 1/4" outer tubing 1" diameter pivot pins Weight: 43 lbs.
UAT-100-R
5/8" X 3-3/4" x 19-1/2" Long-high strength T-1 Steel "Claws" with gripping teeth 5-1/4" thumb width 4" x 18" base mounting plate Telescoping support member: 2" x 1/4" inner x 2-1/2" x 1/4" outer tubing 1" diameter pivot pins Weight: 56 lbs.
UAT-200
3/4" X 4-1/2" X 24" Long-high strength T-1 Steel "Claws" with gripping teeth 7-1/2" thumb width 5" x 21" base mounting plate 1-3/4" diameter support rod 4140 high carbon steel 1-1/4" diameter pivot pins Weight: 110 lbs.
UAT-300
3/4" X 6" X 38" Long-high strength T-1 Steel "Claws" with gripping teeth 12" thumb width 7" x 30" base mounting plate 2-1/2" diameter support rod 4140 high carbon steel 2" diameter pivot pins Weight: 281 lbs.

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

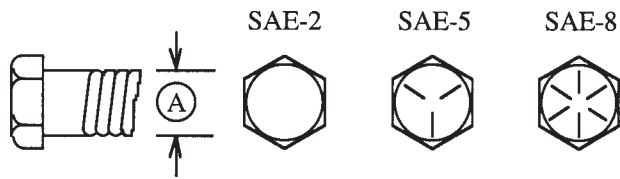
7.2 BOLT TORQUE

CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

ENGLISH TORQUE SPECIFICATIONS

Bolt Diameter "A"	SAE 2		Bolt Torque *		SAE 8	
	N.m	(lb-ft)	SAE 5 N.m	(lb-ft)	N.m	(lb-ft)
1/4"	8	(6)	12	(9)	17	(12)
5/16"	13	(10)	25	(19)	36	(27)
3/8"	27	(20)	45	(33)	63	(45)
7/16"	41	(30)	72	(53)	100	(75)
1/2"	61	(45)	110	(80)	155	(115)
9/16"	95	(70)	155	(115)	220	(165)
5/8"	128	(95)	215	(160)	305	(220)
3/4"	225	(165)	390	(290)	540	(400)
7/8"	230	(170)	570	(420)	880	(650)
1"	345	(225)	850	(630)	1320	(970)



Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

* Torque value for bolts and capscrews are identified by their head markings.

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**P.O. Box 168
Yakima, WA 98907-0168**

**Phone: 509.453.8271
Fax: 509.457.2456**

www.rankinequipment.com

**P.O. Box 1937
Yakima, WA 98907-1937**

**Phone: 509.452.1651
Fax: 509.457-6601**

www.northstarattachments.com

3205 Bay Street, Union Gap, WA 98903