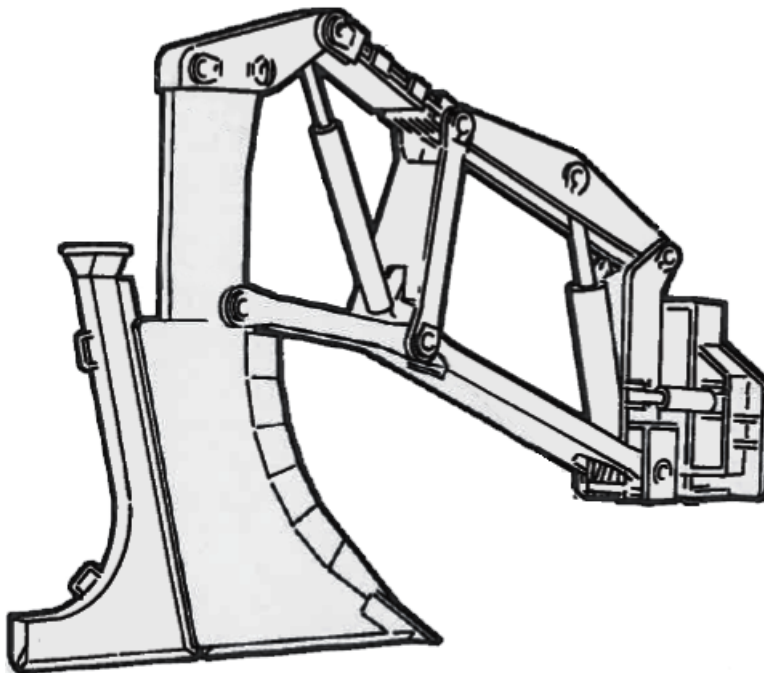


RWF BRON

KRAC KC-600 PLOW OPERATOR'S MANUAL



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OPERATOR'S MANUAL

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THE INFORMATION CONTAINED IN RWF BRON PARTS AND OPERATOR'S MANUALS IS NOT TO BE REPRODUCED OR DISTRIBUTED TO ANY PERSON OTHER THAN THE INTENDED RECIPIENT

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SAFETY

SAFETY SYMBOLS



This **safety-alert** symbol is used throughout the manual to call attention to areas in which carelessness or failure to follow specific procedures may result in personal injury, death, and/or component damage or malfunction. It is the obligation of the operator to make sure that all warning decals are in place on the machine and that they are readable. Accidents may occur.

DANGER



Identifies the most serious hazards where failure to follow listed procedures would result in a high probability of serious injury or death.

WARNING



Denotes a hazard exists which can result in serious injury or death if proper precautions are not taken.

CAUTION



Used where failure to follow procedures may cause injury, component damage or subsequent malfunction.

NOTE

Outline general safety rules or additional procedural guidelines which should be followed when checking and servicing the plow.

GENERAL SAFETY PRECAUTIONS

RWF Industries a Division of Roberts Welding & Fabricating Ltd.'s (RWF BRON) policy is to produce products that are safe and reliable. However, even when using well-engineered equipment, there will always be an element of risk in heavy-duty equipment operation. To minimize the risks and promote safety at all times, this manual details a number of safety rules, which should always be followed and obeyed. This manual should be accessible with the plow when in operation so it is available for all operators. Study all the safety messages in this manual and on the machine carefully. Any person, who does not follow the safety instructions or fails to read the warnings given in this manual, must make sure that his or her working method is safe. Otherwise there is risk of serious, even fatal, accidents. You must be fully trained to operate this equipment or similar equipment. Know the capabilities and the limitations of the equipment. Learn the most efficient operating techniques. Do not let an untrained person operate this plow.

NOTE

When it comes to safety, nothing will ever replace a careful operator.

These safety rules highlight both general and specific measures the operator should be familiar with and adhere to. More specific measures are illustrated with decals, which may also be attached to the plow in locations pertinent to their respective message. Keep safety signs and decals in good condition and repair or replace damaged signs/decals.

General Operation

- Operate the plow only when physically fit and not under the influence of alcohol or drugs.
- Inspect the plow daily for signs of damage, unusual wear, fluid leaks, or faulty operation.
- Do not operate the plow with any devices removed.
- Consult and understand the manufacturer's instructions and/or labels before you start any job using hazardous chemicals.
- When moving the plow, watch that enough clearance is available on both sides and above the attachment. Extra clearance may be required, particularly where the ground is uneven.
- Approach an area where electrical power lines are present with extreme caution. Serious injury or death by electrocution can result if the plow is not kept a safe distance from these lines. Maintain a distance of 10' (3 m) between the plow and any power line carrying up to 50,000 volts or less. Power lines carrying more than 50,000 volts require a safety distance of 10' (3 m) plus ½" (12.7 mm) for each additional 1,000 volts above the 50,000 volt level. If state/province, local or job site regulations require even greater safety distances than stated above, adhere strictly to those regulations for your own protection.
- Comply with the instructions in this manual and your company's regulations for the operation of this plow. Should there be any information or instructions in this manual that are not in compliance with local laws and regulations in place in the country or region where this equipment is operated, the local laws and regulations must take precedence.
- As the owner/maintainer, ensure that you become familiar with all of the occupational safety regulations pertaining to this equipment. Observe the instructions in this manual and all hazard decals on the equipment.

Protective Clothing

- Wear close fitting clothing and safety equipment appropriate to the job.
- Long hair should be tied behind your head.
- All jewellery, including rings, should be removed to prevent entanglement in moving parts.



**Head
Protection**



**Foot
Protection**



**Eye
Protection**



**Hearing
Protection**

WARNING



Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating the plow.

Starting Precautions

Walk around the plow. Check for loose or missing parts, excess wear, trash build-up, and fluid leaks. Visually inspect the condition of other items such as:

- Hose, cylinders, controls, and instruments
- Safety equipment
- Hydraulic system

Report any leaks, wear or damage. If any of these conditions exist, fasten a 'DO NOT OPERATE' or similar warning tag to a suitable location on the equipment. Prior to using the plow, check for the 'DO NOT OPERATE' or similar warning tags. Never start or continue to operate a plow knowing an unsafe condition exists, always check the proper function or controls prior to starting work.

Stopping Precautions

- Stop at a reasonable distance from other equipment.
- Park the machinery that the plow is affixed to in a safe position.
- Lower all equipment to the ground.
- Stop the engine of the machinery that the plow is affixed to.
- Always park the equipment completely off of highways and roads.
- Set up safety cones, red flags, red lights, or flares if parking near traffic areas is necessary.

PROTECT AGAINST INJURY

Pay Attention to Bystanders

- Operate the plow only when physically fit and not under the influence of alcohol or drugs.
- Before you move the plow, always look around and use a signal person where necessary.

Protect Against Flying Debris

When driving connecting pins in or out, guard against injury from flying pieces of metal or debris. Always wear goggles or safety glasses.

Avoid Hot Parts

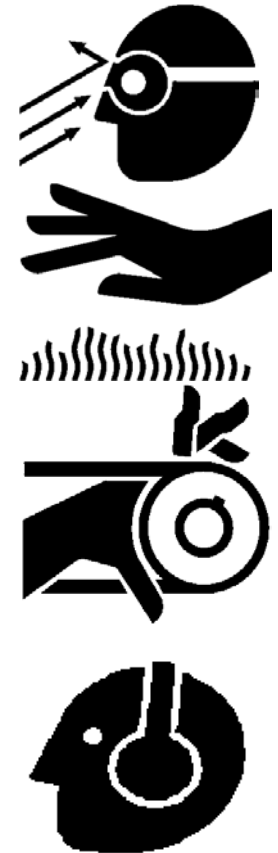
Skin contact with hot hydraulic cylinders, hydraulic pumps and lines, or any other hot compartments should be avoided.

Stay Clear of Moving Parts

- Entanglement in moving parts can cause serious injury.
- To prevent accidents, use extreme caution when working around rotating parts.
- Never operate the plow with missing, loose, damaged, or open shields or guards.

Protect Against Noise

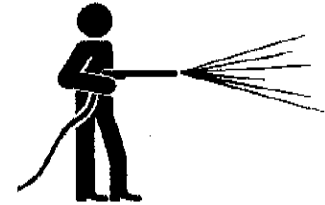
- Prolonged exposure to loud noise can cause impairment or loss of hearing.
- Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable and uncomfortably loud noises.



CLEANING SAFETY

Clean the Plow Regularly

- Remove any grease, oil or debris build-up to avoid possible injury or plow damage.



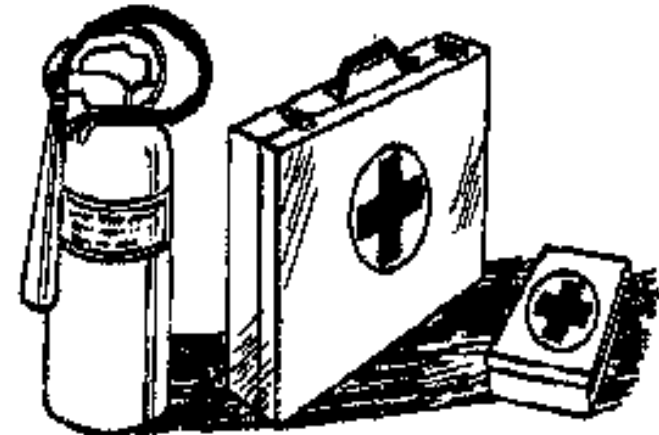
WARNING



NEVER use gasoline as cleaning solvent.

PREPARE FOR EMERGENCIES

- Be prepared if a fire starts.
- Keep a first aid kit and fire extinguisher handy.
- Keep emergency numbers for doctors, ambulance service, hospital, and fire department near or in your phone.



SAFE MAINTENANCE PRACTICES

Inspect Plow

- Inspect the plow carefully each day.
- Walk around it before you start using it.
- Ensure all maintenance schedules are followed to keep the plow running properly, safely, and efficiently.



Before Working on the Plow

- Park plow and machinery that plow is attached to on a level surface.
- Lower all attachments to the ground.
- Engage parking break of machinery that plow is attached to.
- Turn the key in the ignition switch to the off position to stop the engine, and remove the key of the machinery that the plow is attached to.

Warn Others of Service Work

- Unexpected plow movement can cause serious injury.
- Before performing any work on the plow, attach a “DO NOT OPERATE” tag to the dash of the machine it is attached to, to alert others of service work being performed.
- Remove the engine key and master key switch of the machinery that the plow is attached to.



Understand Service Procedures

- Keep the plow clean and dry. Remove any build-up of grease, oil, or debris.
- Never lubricate or service the plow while it is in use.
- Keep hands, feet, and clothing away from any power-driven parts.
- Lower equipment to the ground, stop the engine, remove the key, and allow the machinery to cool.
- Securely support any plow elements that must be raised for service work.
- Keep all parts in good condition and properly installed. Replace worn or broken parts immediately.
- Fix damage immediately
- Replace worn, damaged, or faulty parts only with components meeting the manufactures specifications.
- After a maintenance procedure, verify that any loosened or removed fasteners have been properly installed and tightened.

GENERAL MAINTENANCE

Welding & Grinding Work

WARNING



DO NOT WELD ON THE SHANK OR LINKAGES. (They are made from heat-treated alloy steel)

FLUID/CHEMICAL HANDLING

WARNING



Consult and understand the manufacturer's instructions and/or decals before you start any job using hazardous chemicals.

Handle Chemical Products Safely

WARNING



Direct exposure to hazardous chemicals can cause serious injury.

- Potentially hazardous chemicals used with BRON plows include, but are not limited to, such items as lubricants, paints, and adhesives.
- Store chemicals away from the machine.
- Material Safety Data Sheets (MSDS) for products, purchasable from RWF Industries, can be requested from RWF Industries customer service.

- The MSDS will provide information about the chemical substances within the product you are using, the safe handling procedures, the first aid measures, and the procedures to be taken when the product is accidentally spilled or released and should be referenced before servicing the equipment.

Dispose of Waste Properly

- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with BRON® plows includes, but is not limited to, such items as oil, grease, and other fluids.
- Use leak proof containers when draining fluids. Do not use food or beverage containers to hold hazardous chemicals. This may mislead someone into drinking from them.
- Do not pour waste onto the ground, down a drain, or into any water source.
- Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling centre.

HIGH PRESSURE FLUIDS SAFETY

Avoid High-Pressure Fluids

- Escaping fluid under pressure can penetrate the skin causing serious injury.
- Avoid hazard by relieving pressure before disconnecting hydraulic or other lines.
- Please note that if your plow is equipped with an accumulator extra precaution is needed when relieving the hydraulic pressure.
- Tighten all connections before applying pressure.



WARNING



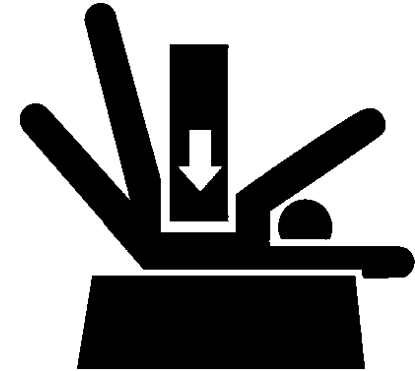
Never check for leaks with your hand or any other body part.

- Search for leaks with a piece of cardboard. Protect your hands and body from high-pressure fluids.
- If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury may call the Centers for Disease Control (CDC) 1-800-232-4636, or other knowledgeable medical sources.

PLOW HANDLING

Support Plow Properly

- Always lower the plow to the ground before you work on it. If you must work on a lifted plow, securely support it first.
- Do not support the plow on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a plow that is supported solely by a jack. Follow recommended procedures.



CAUTION



Hearing protection is required to operate this machine.

DANGER



Serious injury or death by electrocution can result if the plow is not kept a safe distance from power lines.

Maintain a distance of 10' (3 m) between the plow and any power line carrying up to 50,000 volts or less.

GENERAL

MOUNTING INSTRUCTIONS

1. The KRAC KC-600 Plow, if being mounted to a dozer, should be bolted to the rear gear case housing using each of the bolt holes provided in the backplate. The rear gear case housing should be clean and checked to see that all bolts or studs are removed. After removing these bolts, the threads of each of the holes should be inspected for thread quality. This is important because these bolts transmit all the drawbar pull to the plow.
2. Bolting the backplate on the rear housing requires using a suitable length of grade 8 bolt to pass through the backplate and thread into the full depth available in the gear case housing. All bolts after initial tightening to be torqued to manufacturer's specifications.
3. After completing mounting of the backplate, the hydraulic hoses can be connected to the cylinders. The tractor's hydraulics should be connected to the manual and solenoid valves; after completing this, the machine can be started. Check the operating pressure of the main relief valve so that it does not exceed 2000 PSI (plus or minus 200). Also, check for leaking hoses or fittings as valve functions are cycled.
4. The blade can now be raised into position vertically; using the hydraulics of the plow, align the links to insert the pins.

NOTE

Place a cable or chain around the rear top sliding link so that the rear lower link is supported during installation. When this method is used, be careful to protect the cylinder rod from damage.

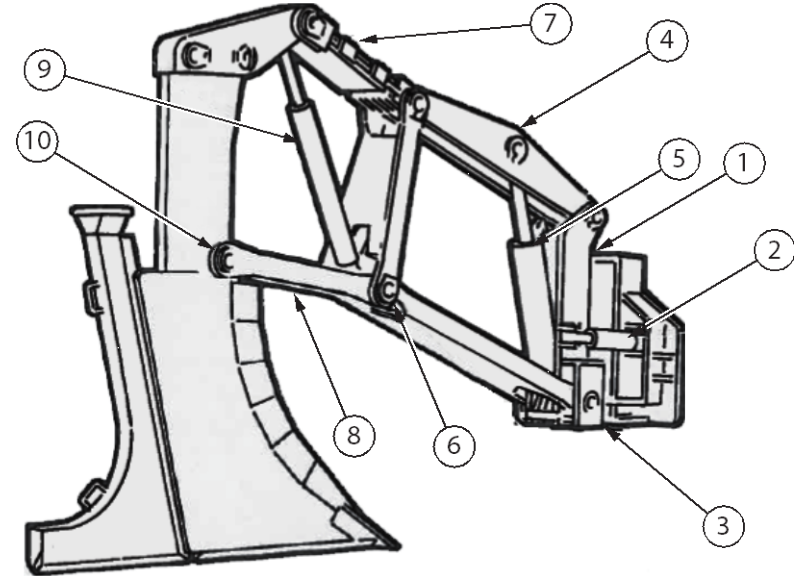
NOTE

For special mounting applications, consult RWF BRON for the approved installation method.

OPERATING INSTRUCTIONS

1. The operator should carefully review the manual and solenoid valve functions. Familiarization on which control handle performs which operation is important to operate the plow safely and efficiently. The basic controls are the manual control valve which has two levers and the electrical solenoid valve.
2. The solenoid valve is operated from the laser panel which normally has a combination switch (automatic and manual) on the panel. This manual function will allow raising and lowering functions of the main lift cylinder when not using the laser.
3. The manual valve, using levers, operates the rear lift cylinders mounted to the backplate. Applying smooth, constant pressure to the handles when operating will provide smoother operation as well as facilitate a maintenance free system.
4. If you're familiar with the controls, you can put the plow into operation! Placing the plow into operation requires adhering to one additional procedure; while each contractor may use slightly different methods when installing drainage, one major procedure remains the same which is that both the rear lift and swing cylinders must be free to float so that the plow will grade and tow properly.
5. To accomplish this, position both handles on the manual valve until they hold (detented) in one position without returning. This should be initiated as the plow pulls away from the drainage installation point. This procedure should be obeyed to prevent severe damage to the rear lift or swing cylinders.
6. These instructions cover the basic operating procedures for the KRAC KC-600; this manual should provide you with the information necessary to operate your plow for many years both economically and profitably.

MAINTENANCE CHART



MAINTENANCE CHART

		LUBRICATE	INSPECT	TORQUE BOLTS	HYDRAULICS
1	BACKPLATE – MOUNTING BOLTS & PINS	DAILY		MONTHLY	
2	SWING CYLINDERS & PINS	DAILY	WEEKLY		
3	FRONT LOWER LINK BEARINGS	WEEKLY	YEARLY		
4	FRONT TOP LINK BEARINGS	WEEKLY	YEARLY		
5	MAIN LIFT CYLINDER PINS / CLEVIS / BEARINGS	DAILY		WEEKLY	
6	VERTICAL LINK PINS			WEEKLY	
7	REAR TOP LINK – BEARINGS / BOLTS	WEEKLY		WEEKLY	
8	REAR LOWER LINK BEARINGS	WEEKLY	YEARLY		
9	REAR LIFT CYLINDER & PINS	DAILY		WEEKLY	
10	BLADE – BEARINGS & PINS	DAILY		WEEKLY	
11	LINKAGE / CUTTING EDGES / PINS		YEARLY		
12	CHECK HOSES & VALVES				YEARLY
13	REPLACE OIL FILTER (HYDRAULIC RESERVOIR)				MONTHLY

