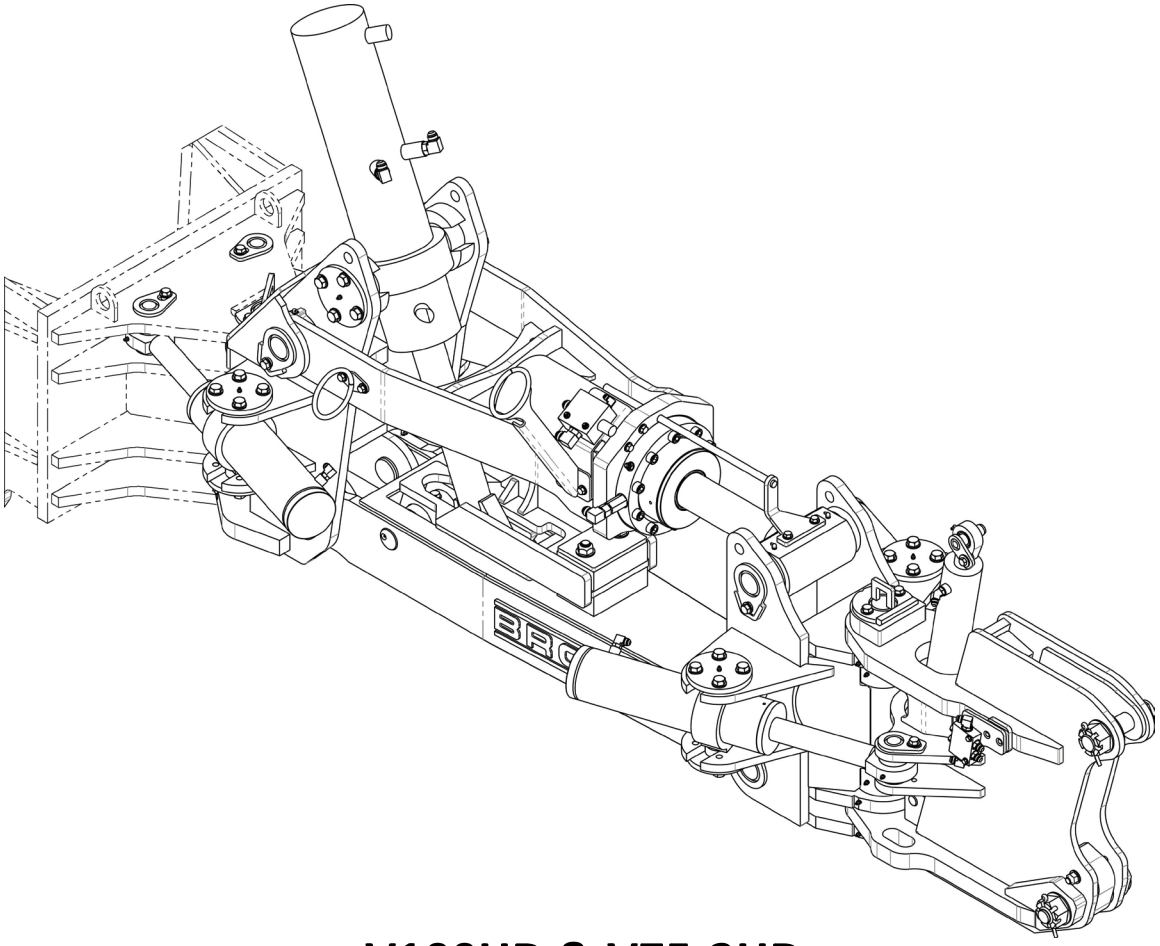
BRON HD VIBRATORY UTILITY PLOW & ACCESSORIES

OPERATOR'S MANUAL



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THESE **ORIGINAL INSTRUCTIONS** AS WELL AS ANY OTHER INFORMATION CONTAINED IN BRON PARTS AND OPERATOR'S MANUALS IS NOT TO BE REPRODUCED OR DISTRIBUTED TO ANY PERSON OTHER THAN THE INTENDED RECIPIENT

PART NUMBER: 151902 **VERSION: 1.2**

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INTRO & GENERAL DESCRIPTION

BRON OFFSETTING VIBRATORY PLOWS

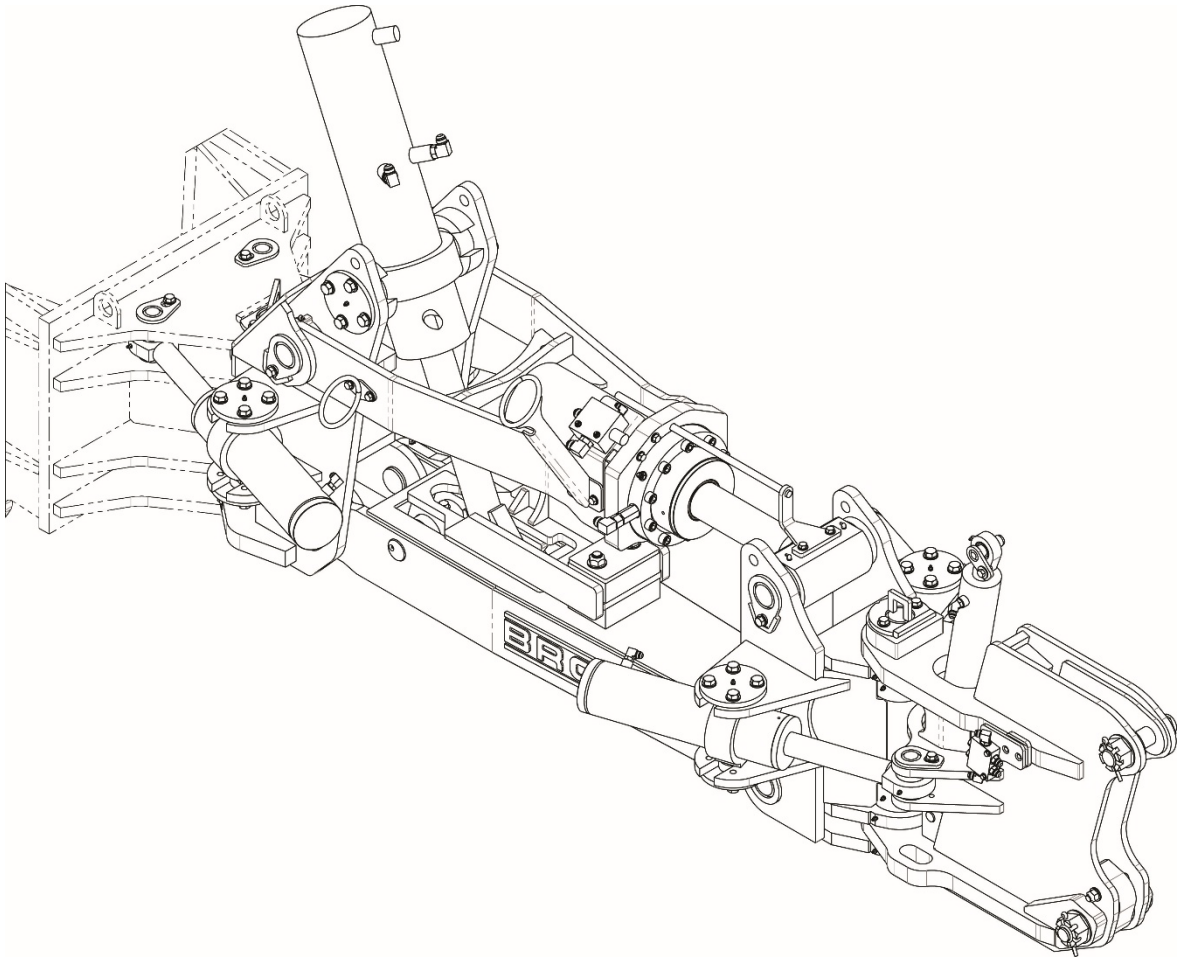
General Description

BRON offsetting HD vibratory plows are designed for the installation of fibre optics, copper cable, conduit, and pipe at working depths up to 66”. HD vibratory plows are ideal for installations in all conditions or where tractive power is limited.

HD vibratory plows can be used as a static plow when ground conditions permit. BRON vibratory plows are field-proven in thousands of installations worldwide.

Standard Features

Standard features include front and rear, main lift, attitude, and blade height adjustment cylinders to maintain plowing integrity in the toughest conditions.



BRON VIBRATORY PLOW WARRANTY

BASE WARRANTY (6 months or 600 hours):

RWF Industries a Division of Roberts Welding & Fabricating Ltd. (RWF) warrants that the new BRON **Plow** sold by RWF will be free from defects in material or workmanship for a period of 6 months or 600 operating hours, whichever occurs first, starting from the date of delivery to the first user.

THIS WARRANTY DOES NOT APPLY TO:

HYDRAULIC and MOUNTING INSTALLATION KIT PARTS, HOSES, OR REPLACEMENT PARTS, which are covered by other warranties

RWF RESPONSIBILITY:

RWF will, at its option, repair or replace with a new or reconditioned part, any warranted part that fails by reason of defective material or workmanship, free of charge delivered at a place of business of an RWF Dealer. Note: parts replaced under warranty become the property of RWF. During the 6 month or 600 hour BASE WARRANTY period, RWF will pay the reasonable cost of labor that is necessary to install any repaired or replacement part during normal working hours. Overtime rates and travel expenses will not be reimbursed.

USER RESPONSIBILITY:

- The installer, operator, or service person, assumes responsibility to read, understand and comply with RWF's written INSTALLATION, OPERATOR, SERVICE AND WELDING INSTRUCTIONS
- All costs associated with transporting the attachment and/or equipment to an authorized location.
- RWF is not responsible for any expense incurred in field repair.
- Supplying a hydraulic oil sample from the carrier machine based on the following schedule:
  - 1st SAMPLE at the 100 HOUR SERVICE (break-in period)
  - 2nd SAMPLE at the 3 MONTH period (±4 weeks)
  - 3rd SAMPLE at the 6 MONTH period
- All warranty claims must be submitted within sixty (60) days of the repair date. Claims submitted after this period will not be accepted.

THESE WARRANTIES DO NOT COVER FAILURES RESULTING FROM:

- Installation, alteration, operation, maintenance, repair or storage which RWF judges improper.
- Not performing DAILY VISUAL INSPECTIONS AND RETIGHTENING as specified in RWF Manuals.
- Not following RWF's recommended welding procedure.
- Operation after discovery of defective or worn parts.
- Unreasonable delay in making a repair after being notified of a potential problem.
- Acts of God, war, vandalism, riot, theft, explosion, and any other act of nature or man

THESE WARRANTIES SPECIFICALLY EXCLUDE:

- Installations not approved by RWF.
- Hardface welding to build up wear on surfaces.
- Replacement due to wear.
- Ground engaging tools. Points, guards, blades etc
- Repairs by other than an authorized RWF Dealer.
- Any alteration to BRON products.
- Use of parts not sold by RWF.
- Labor charges deemed excessive by RWF.
- Parts shipping charges in excess of those, which are usual and customary.
- Duty and local taxes.

LIMITATIONS AND EXCLUSIONS:

Violation of any federal, provincial, state or local laws, ordinances, rules or regulations, or removal or alteration of product serial numbers void RWF's written product warranties. The written product warranties made by RWF set forth RWF's only obligations with respect to any claims of failure, defects or deficiencies in products sold by RWF. RWF MAKES NO OTHER WARRANTIES OR REPRESENTATIONS WHATSOEVER, EXPRESS OR IMPLIED, OF THE QUALITY, PERFORMANCE, DURABILITY, MATERIALS, WORKMANSHIP, SUITABILITY, CONDITION, DESIGN OR UTILITY OF PRODUCTS SOLD BY RWF, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OR MERCHANT ABILITY AND FITNESS. ALL SUCH OTHER WARRANTIES AND REPRESENTATIONS BEING HEREBY EXPRESSLY EXCLUDED. RWF SHALL NOT BE LIABLE FOR SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING WITHOUT LIMITATION, COSTS, LOSSES, OR LIABILITIES ON ACCOUNT OF DELAY OR DOWNTIME.

DISCLAIMER REGARDING OTHER REPRESENTATIONS OR WARRANTIES:

No person is authorized to grant any other warranties or to assume any other liability on RWF's behalf unless made or assumed in writing by an officer of RWF. No person to grant any warranties or to assume any liabilities on the seller's behalf unless made or assumed in writing by the seller. As used in this warranty the term RWF means, RWF Industries, a division of Roberts Welding and Fabricating Ltd, Woodstock, Ontario, Canada.

SOME ITEMS NOT COVERED BY WARRANTY:

Items and service related functions that are not covered by warranty include, but are not limited to:

- Issues resulting from misuse, negligence or accident.
- Issues arising from the use of non-approved parts.
- Repair or adjustment by other than RWF or its authorized dealers.
- Issues resulting from the installation of unauthorized attachments or modifications.
- Tightening of nuts, bolts, screws, etc. or adjustments.
- Natural wear or defects caused by natural wear.
- Issues due to use of improper oil, grease, or other lubricant.
- Daily allowances and overtime labor rates.
- Indirect damages such as loss of earning, etc.
- Normal maintenance services. Maintenance services not directly involved with defective parts are considered normal service and should be excluded from a claim.

CHAPTER 1: SAFETY

SAFETY SYMBOLS

Safety Alert Symbol

The **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.

Signal Words

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

Is used in areas where failure to follow listed 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 machine.

GENERAL SAFETY PRECAUTIONS

RWF Industries a Division of Roberts Welding & Fabricating Ltd's. (RWF) 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.

The Operators Manual should be kept with the machine at all times so it is available for use by 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 the machine.

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 machine in locations pertinent to their respective message. Keep safety signs and decals in good condition and repair or replace damaged signs.

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 electrical shorts and/or entanglement in moving parts.

CHAPTER 2: FIRE PREVENTION

WARNING

Prevent combustible debris from collecting in tight corners of the plow. This debris, in itself, may cause a fire; however, when mixed with fuel, oil, or grease in a hot or confined space, the danger of fire is very much increased.

Fire Prevention

To reduce the chance of a fire starting, follow these instructions:

- Clean dust, wood trash, and debris from the plow daily or as frequently as required.
- Clean the oil cooler (if equipped) regularly to ensure components are working efficiently.
- Inspect the plow daily for potential fire hazards and make any necessary repairs immediately.
- Inspect electrical wiring and connections, hydraulic hose runs to ensure they are secure and not rubbing against other components. Clean up any excess grease and oil accumulation and spillage immediately.
- If applicable, once per week, or as frequently as required, remove all access plates from the plow and clean all trash or debris from these areas.
- Use only non-flammable solutions for cleaning the plow or components.
- Store rags and other combustible materials in a safe, fireproof location.
- Before starting repair work, such as welding, the surrounding area should be cleaned and a fire extinguisher should be close by.
- If equipped, the fire extinguisher should be maintained and kept charged at all times; **KNOW HOW TO USE IT!**
- Store flammable fluids away from fire hazards. DO NOT incinerate or puncture pressurized containers.
- Allow a cool down period before fueling the equipment. DO NOT smoke when fueling the machine.

CHAPTER 3: INSTALLATION & COMPONENTS

INSTALLATION TO TRACTOR

Typical installation & connection to tractor

- The following pictures show the proper completed installation of pinned and bolted Add-On Plow Installations.

Plow Assembly to Tractor

A. Remove all attachments and studs / bolts from the rear of the transmission case.
B. Remove all paint (on the tractor) from the area to be covered by the plow's backplate. Grind off all burrs and rough spots.
C. Clean out tapped stud / bolt holes to remove any dirt or rust. If possible, run a tap into the holes to remove any burrs, or foreign material in the bottom of the threads.
D. Attach the plow's backplate to the housing using the correct length and diameter studs / bolts.
E. Studs should be threaded into the full depth available in the housing.

NOTE

Seal any openings in the transmission that are covered by backplate with silicone seal. This is to prevent water contamination in the transmission.

F. Hi-torque washers and Grade 8 nuts or equivalent should be used where required.
G. Apply Loctite to studs, bolts and hole threads.
H. Torque all studs, bolts and nuts according to the original tractor manufacturer's specifications.

The following torque chart may be used as an approximate guide.

Table 1 TORQUE CHART (guideline based on 151808_B)

Diameter	DRY - NC	DRY - NF	LUB - NC	LUB - NF
¾"	376	420	282	315
⅞"	606	669	455	502
1"	909	1020	681	765
1¼"	1817	2012	1363	1509
1½"	3162	3557	2371	2668

NOTE

Some tractor installations may have a pinned connection between the tractor and the plow's backplate. For this attachment, the backplate will be designed for same. Dealer supplied pins will be required in lieu of mounting.

CHAPTER 4: MAINTENANCE

SAFETY PRECAUTIONS FOR LOADING AND UNLOADING TO A TRAILER

Avoid Injury From: Loading Machine on a Trailer, Fastening Machine To a Trailer, and Unloading Machine From Trailer

- Always know and follow the recommended procedures for the machine. All machines are not loaded, fastened and unloaded the same way.
- Always keep bystanders clear of the area.
- To avoid injury. Keep trailer bed clean.
- Ensure that the transporting equipment is adequate to hold the weight and size of the machine.
- When transporting a machine clean all debris from the machine and make sure the undercarriage is clean.
- Ensure doors and hatches are locked during transporting.
- Park trailer on a firm, hard, level surface that will not give way under weight of machine.
- Ensure the machine is unloaded onto safe ground.
- Put chock blocks against truck wheels.
- Use a ramp or loading dock. Ramps must be strong enough to adequately handle the load and have a low angle and correct height.
- Fasten seat belt before starting engine.

- Fasten chains or cables to tie down points, if unsure of locations consult the manufacturer. DO NOT place chains or cables against hydraulic lines or hoses.
- Make sure overall height does not exceed local, provincial, or state height requirements.
- Observe any overhead restrictions prior to loading the machine.

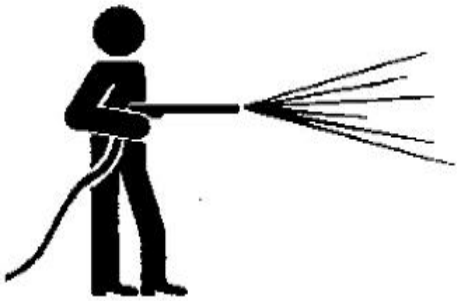
CLEANING SAFETY

Clean Trash from Machine

- Keep engine compartment, radiator, batteries, hydraulic lines, fuel tank, and operator's station clean.
- Temperature in engine compartment may go up immediately after engine is stopped. **BE ON GUARD FOR FIRES DURING THIS PERIOD.**

Clean the Machine Regularly

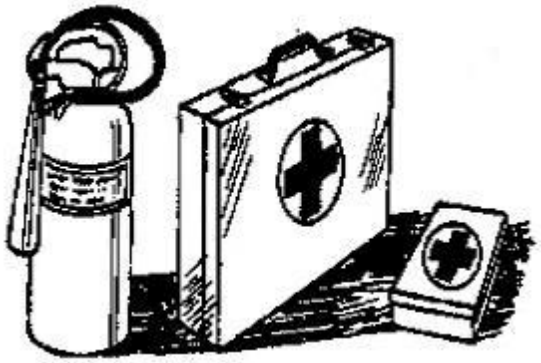
Remove any grease, oil, and debris build-up to avoid possible injury or machine damage.



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 your telephone.

SAFE MAINTENANCE PRACTICES

Inspect Machine

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

Before Working on a Machine

- Park machine on a level surface.
- Lower all attachments to the ground.
- Run engine at idle with no load for three to five minutes to allow engine to properly cool.
- Engage parking break.
- Turn key in ignition switch off position to stop engine, then remove key.
- If maintenance requires the engine running, DO NOT leave machine unattended.
- Turn master disconnect switch to off position.
- Allow engine to cool.

Exhaust Fumes

Exhaust fumes contain carbon monoxide and inhalation of them can cause sickness, brain damage, or death. When working in an enclosed area is unavoidable, use proper ventilation such as a pipe extension or, if use of a pipe extension is not possible, open windows and doors.

Warn Others of Service Work

- Unexpected machine movement can cause serious injury.
- Before performing any work on the machine, attach a **"DO NOT OPERATE"** tag to the dash of machine to alert others of service work being performed.
- Remove engine key and master key switch.

Understand Service Procedures

- Keep area clean and dry.
- NEVER lubricate or service machine while it is running.
- Keep hands, feet, and clothing from power-driven parts.
- Disengage all power and operate controls to relieve pressure.
- Lower equipment to the ground, stop the engine, remove the key, and allow machine to cool.
- Securely support any machine elements that must be raised for service work.

CAUTION

If your machine is equipped with an accumulator extra precaution is needed when relieving the hydraulic pressure.

- Keep all parts in good condition and properly installed.
- Fix damage immediately.
- Replace worn or broken parts immediately.
- Remove any build-up of grease, oil, or debris.
- Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

NOTE

Master disconnect switch breaks circuit to ground.

- Replace worn, damaged, or faulty parts only with components meeting the manufacturer's specifications.
- If maintenance must be performed with engine running, DO NOT leave machine unattended.
- After a maintenance procedure, verify that any loosened or removed fasteners have been properly installed and tightened.

BATTERY SAFETY

NOTE
SAFETY DECALS found on or near battery, should not be removed from the machine.

DANGER

EXPLOSIVE GASES
Cigarettes, flares, sparks, and open flames could cause the battery to explode. Always shield eyes and face from battery. DO NOT charge, use booster cables, or adjust post connections without proper instructions and training. Keep vent caps tight and level.

WARNING

CAUSES SEVERE BURNS
Contains sulfuric acid. Avoid contact with skin, eyes, and clothing. Battery acid can cause burns or blindness and is poisonous when ingested.
• If battery acid is spilled on skin, flush with water and seek immediate medical attention.
• If battery acid is ingested, do not induce vomiting. Drink large amounts of water or milk and seek immediate medical attention.
• If battery acid is spilled on your eyes, flush your eyes with water for 10 to 15 minutes and seek immediate medical attention.
• Keep out of reach of children.

WARNING

Be aware that your tool may be a conductor.

- NEVER check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.
- DO NOT charge a frozen battery; it may explode. Warm battery to 16^{0}C (60^{0}F) before charging.
- NEVER lean over a battery during charging, testing or jump-starting operations.
- Be familiar with procedures for charging and testing a battery. Read and follow the manufacturer's instructions for the battery charger.
- Disconnect the positive cable first when removing a battery and connect it last when installing a battery.
- It is good practice to remove the battery from the machine to recharge it.

GENERAL MAINTENANCE

Welding and Grinding Work

NOTE

A fire extinguisher should be easily accessible during all welding, grinding, or cutting work.

Move the machine to a clean, safe area before welding, grinding or using an oxy/acetylene/propane torch on it. This type of work should only be done in a clean area and not in places that contain combustible liquids such as fuel tanks, hydraulic pipes or similar hazards.

- Disconnect the battery before performing any welding.
- Disconnect the engine control module (ECM) connector and the steering computer module before performing any work.
- The welder must be grounded close to the repair.
- Ground the part being welded.
- Work with extra care when welding, grinding or torch cutting near flammable objects.
- Welding on painted surfaces releases dangerous fumes and results in a poor weld joint that can result in failure and potential accidents. Always remove paint from areas to be welded. Do all work outside or in a well-ventilated area. Dispose of paint and solvent properly.

Work on Painted Surfaces

WARNING

Heated paint gives off poisonous gases.

Therefore, paint must be removed from an area within a radius of at least 4 in (10 cm) before carrying out welding, grinding or gas cutting. In addition to the health hazard, the weld will be of inferior quality and strength, which may cause the weld to eventually break.

Methods and precautionary measures when removing paint:

- **Blasting** – use respiratory protective equipment and protective goggles.
- **Paint remover or other chemicals** – use a portable air extractor, respiratory protective equipment and protective gloves.
- **Grinding** - use a portable air extractor, respiratory protective equipment, protective gloves and goggles.

If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from the area. Allow fumes to disperse at least 15 minutes before welding or heating.

FLUID/CHEMICAL HANDLING

WARNING

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

Handle Fuel Safely

WARNING

To prevent static electricity and sparks igniting the fuel vapours, make a good ground contact by keeping the fuel nozzle in constant contact with the fuel tank neck.

- Handle fuel with caution: it is highly flammable.
- DO NOT refuel the machine when near an open flame or sparks or when smoking.
- Always stop the engine before refueling the machine.
- Always fill the fuel tank outdoors.
- Clean up any spilled fuel immediately.
- DO NOT fill the fuel tank to full capacity, leave room for fuel expansion.
- DO NOT mix gasoline or any other non-specified material with diesel fuel. Highly combustible vapours may result.
- Install, tighten and lock the fuel tank cap. Should the fuel tank cap be lost, replace it only with the original manufacturers approved in pressurization of the fuel tank.
- Use the correct fuel grade for the operating season.

Handle Chemical Products Safely

WARNING

Direct exposure to hazardous chemicals can cause serious injury.

- Potentially hazardous chemicals used with BRON® equipment include, but are not limited to, such items as lubricants, coolants, paints, adhesives and battery acid.
- 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 machine.

Handle Starting Fluids Safely (If Applicable)

NOTE

Only for models without a preheat device using starting fluid.

- Starting fluid is highly flammable. Handle with extreme caution.
- Keep all sparks and flame away when using it.
- Keep starting fluid away from batteries and cables.
- Remove container from machine if engine does not need starting fluid.
- To prevent accidental discharge when storing the pressurized can, keep the cap on the container, and store in a cool, protected location.
- DO NOT incinerate or puncture a starting fluid container.
- DO NOT use a starting aid if engine is equipped with a preheat device.

Rubber and Plastics

When heated, rubber and plastics can give off substances that are hazardous to personal health and the environment.

The Following Safety Instructions Must Be Followed:

- DO NOT weld or cut with a torch near polymer materials (plastics and rubber) without first protecting them from the heat.
- NEVER burn polymer materials. Dispose of them properly.
- Be careful when operating or working around machines that have been exposed to fire or other intense heat.

Avoid Potentially Hazardous Fumes

- Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.
- Ensure all work is done outside or in a well-ventilated area. Dispose of paint and solvent properly.
- Remove paint before welding or heating. Disconnect battery before performing any welding.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding.
- Remove solvent or paint stripper containers and other flammable material from the area. Allow fumes to disperse at least 15 minutes before welding or heating.

Air Conditioning System

Releasing Freon into the air/environment is against the law and can cause injury. You must have your air conditioning system serviced and repaired by properly trained and authorized personal.

Dispose of Waste Properly

- Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with BRON® equipment includes, but is not limited to, such items as oil, fuel, coolant, filters, batteries, and air conditioning refrigerants.
- 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

Service Cooling System Safely

- Explosive release of fluids from pressurized cooling system can cause serious burns.
- Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

Avoid High-Pressure Fluids

- Escaping fluid under pressure can penetrate the skin causing serious injury.
- Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines.
- Please note if your machine is equipped with an accumulator extra precaution is needed when relieving the hydraulic pressure.
- Tighten all connections before applying pressure.
- Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

WARNING

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

- 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.

Avoid Heating Near Pressurized Fluid Lines

- Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders.
- DO NOT heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials.
- Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

LUBRICATION POINTS

NOTE

Lubrication frequencies given below are minimums; the more you grease these joints the longer your components will last.

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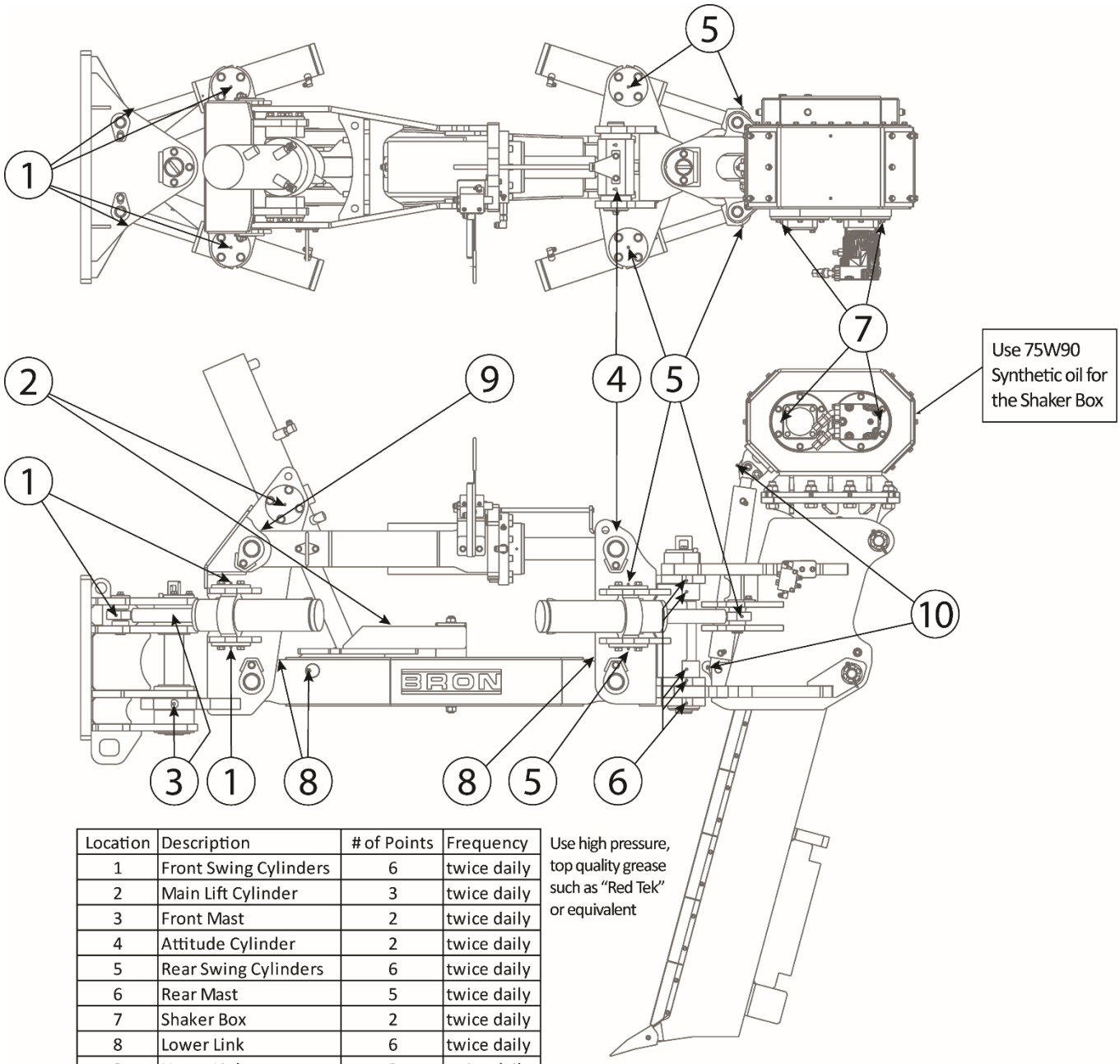
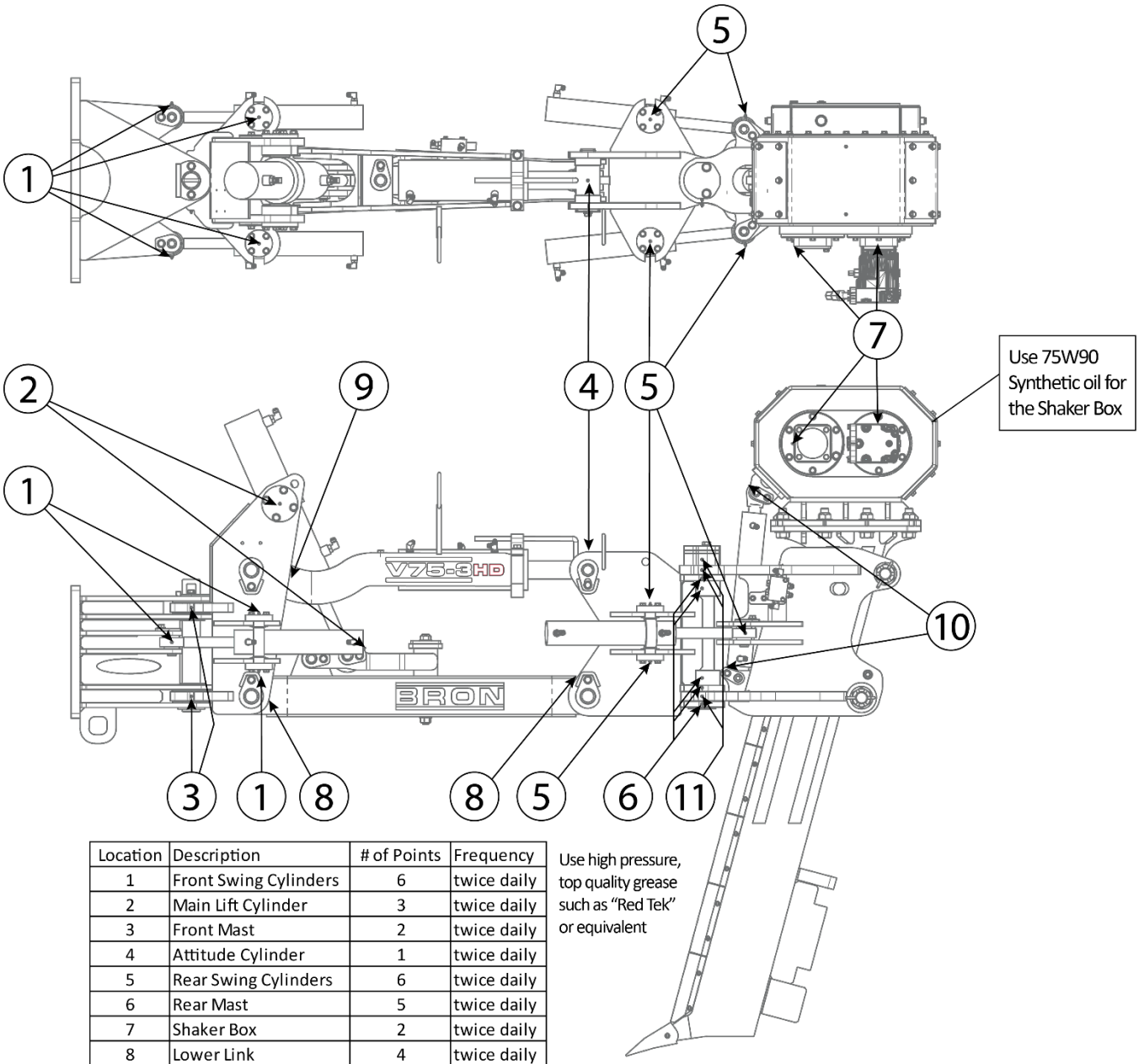


Location	Description	# of Points	Frequency
1	Front Swing Cylinders	6	twice daily
2	Main Lift Cylinder	3	twice daily
3	Front Mast	2	twice daily
4	Attitude Cylinder	2	twice daily
5	Rear Swing Cylinders	6	twice daily
6	Rear Mast	5	twice daily
7	Shaker Box	2	twice daily
8	Lower Link	6	twice daily
9	Upper Link	2	twice daily
10	Blade Lift Cylinder	2	twice daily

Use high pressure, top quality grease such as "Red Tek" or equivalent

V75-3HD



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3	Front Mast	2	twice daily
4	Attitude Cylinder	1	twice daily
5	Rear Swing Cylinders	6	twice daily
6	Rear Mast	5	twice daily
7	Shaker Box	2	twice daily
8	Lower Link	4	twice daily
9	Upper Link	2	twice daily
10	Blade Lift Cylinder	2	twice daily
11	Blade Holder	3	twice daily

Use high pressure, top quality grease such as "Red Tek" or equivalent

CHAPTER 5: OPERATION

General Operation

- Operate the machine 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 of the safety covers or other 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 overhanging electrical power lines are present with extreme caution. Serious injury or death by electrocution can result if the plow, or any of its attachments, are not kept a safe distance from these lines.
- Maintain a distance of 10 ft. (3 m) between the machine or attachment 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 ft. (3 m) plus ½ in (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 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 force in the country or region where this equipment is operated, the local laws and regulations must take precedence.

WARNING

Operating equipment safely requires the full attention of the operator. DO NOT wear radio or music headphones while operating machine.

As the owner/maintainer ensure that you become familiar with all occupational safety regulations pertaining to this equipment. Observe the instructions in this manual and hazard decals on the equipment

Radio Transmitter Usage

The use of any two-way communication device is strictly prohibited in or around the vehicle. In order to use such a device, it must be permanently installed in the vehicle with the antenna properly installed and grounded on the outside of the vehicle.

CAUTION

Mounting an antenna inside the cab can cause the electrical system to malfunction.

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.
- Engine compartment.
- 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 inside the cab. Remove and retain the ignition key. Turn master disconnect to off position.

- Prior to starting the plow, check for the 'DO NOT OPERATE' or similar warning tags.
- NEVER start engine while standing on the ground. Start engine only from operator's seat.
- 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 a reasonable distance from other machines.
- Park plow in a safe position.
- Allow proper cool down of the engine.
- Select level ground, when possible, to park plow.
- Lower all equipment to the ground.
- Stop the engine.
- Block all tracks if you must park on a grade. Position machine to prevent rolling.
- Always park the machine completely off highways and roads.
- Set up safety cones, red flags, red lights, or flares if parking near traffic areas is necessary.

WARNING

Falling is one of the major causes of personal injury.

Mounting and Dismounting

- Face the operator's platform when climbing in or out of the machine.
- Use the handholds and steps provided.
- DO NOT use any controls as handholds.
- Maintain three points of support. (i.e.: two hands and one foot or one hand and two feet).
- DO NOT mount or operate the machine with wet/greasy hands or muddy shoes/boots.
- DO NOT jump from the machine at any time.
- NEVER try to mount or dismount the machine while it is moving.
- Be careful of slippery conditions on platforms, steps, and rails when leaving the machine.

Prevent Machine Runaway

- NEVER leave a running machine unattended.
- Lower all equipment to the ground.
- Apply the parking brake.
- DO NOT start engine by shorting across starter terminals. Machine may start in gear if normal circuitry is by-passed.
- NEVER start engine while standing on the ground. Start engine only from operator's seat, with propel joystick(s) in neutral.

PROTECT AGAINST INJURY

Pay Attention to Bystanders

- Operate the machine only when physically fit and not under the influence of alcohol or drugs.
- Ensure the reverse warning system is in proper working condition.
- Before you move a machine, always look around and use a signal person.
- DO NOT remove any safety covers or protective devices while operating the machine. When driving the machine keep the doors closed.
- Keep the cab floor free from debris and ensure the windows are clean.

Ensure Safe Driving on Ice

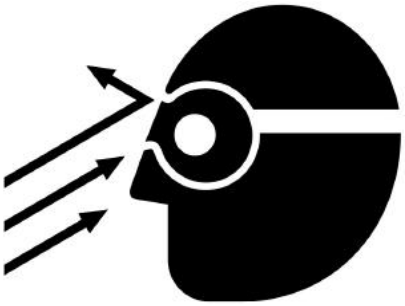
It is the responsibility of the operator to guarantee that ice covered water is strong enough to drive on. Be prepared for quick evacuation by knowing where the exits are in the cab.

CAUTION

DO NOT stop or park on ice.

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 engine parts, hydraulic cylinders, hydraulic pumps and lines, the exhaust system, or any other hot compartments should be avoided.

Stay Clear of Moving Parts

Entanglements in moving parts can cause serious injury. To prevent accidents, use extreme caution when working around rotating parts. NEVER operate machinery 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 objectionable uncomfortable loud noises.

Use Seat Belt to Minimize Chance of Injury from an Accident Such as an Overturn

NOTE

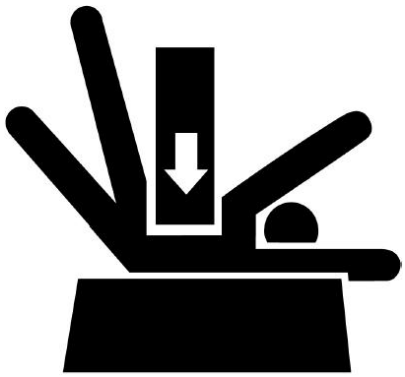
Complete seat belt assembly should be replaced after three years of usage, regardless of appearance.

Between replacement intervals:

- Carefully examine buckle, webbing, and attaching hardware.
- Be sure that attaching hardware is in place. Tighten, if necessary.
- Replace seat belt if it does not operate properly, or if it is damaged, worn, or deteriorated.
- Use and Maintain seat belt to minimize chance of injury from an accident such as overturn.
-

MACHINE HANDLING

Support Machine Properly



- Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.
- DO NOT support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. DO NOT work under a machine that is supported solely by a jack. Follow recommended procedures.

Keep Roll-over Protection Structure (ROPS) Installed Properly

Make certain all parts are reinstalled correctly if the ROPS is loosened or removed for any reason.

Adding Attachments/Accessories to ROPS

DO NOT add attachments or accessories to the ROPS without contacting your BRON® dealer for information. Improper attachments may impair the protection offered by the ROPS.

Maintenance of ROPS:

- Replace missing hardware using correct grade hardware.
- Check isolation mounts for damage or wear; replace them if necessary.
- Check hardware torque.
- Check ROPS for cracks or physical damage.

WARNING

Prevent possible injury from a damaged ROPS. The protection offered by ROPS will be impaired if ROPS is subjected to structural damage, is involved in an overturn incident, or is altered in any way, by welding, bending, drilling, or cutting. A damaged ROPS should be replaced, not reused.

AVOID INJURY FROM BACK-OVER ACCIDENTS

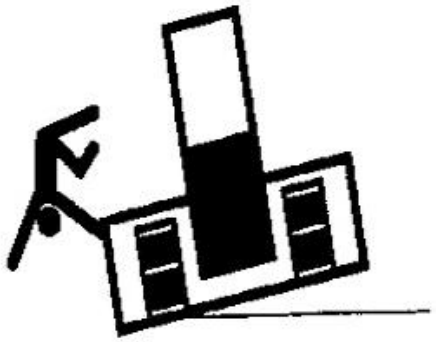
To Avoid Back-Over Accidents:

WARNING

Before moving machine, be sure all persons are clear of the area.
Always alert bystanders moving into the work area.
When using a signal person, keep person in view at all times, be sure signal person is clear before backing up.

- Always look around before you back up. Be sure that everyone is in the clear.
- Keep reverse warning alarm in working condition.
- Use a signal person when backing up if view is obstructed. Always keep signal person in view.
- If your vehicle is equipped with backup cameras, use them to ensure your path is clear.
- Dust, heavy rain, fog, etc., can reduce visibility. As visibility decreases, reduce speed.
- Learn the meaning of all flags, signs, and markings used on the job and who has the responsibility of signalling.
- Read and understand all operating instructions in the Operator's Manual.

Keep Riders off Machine



- Only allow the operator on the machine.
- Keep Riders Off.
- Riders on a machine are subject to injury such as being struck by foreign objects and being thrown off of the machine.
- Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.

AVOID ROLL–AWAY ACCIDENTS

WARNING

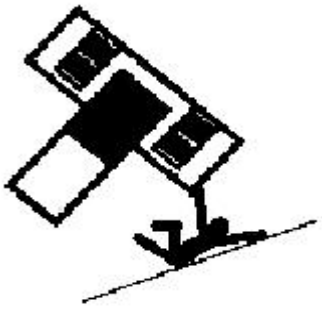
To prevent rollaway, always make sure machine is properly secured before leaving operator's seat.

Serious injury may result if you attempt to mount or stop a moving machine.

To Avoid a Roll-Away

- Select level ground when possible to park machine.
- Lower all equipment to the ground.
- Stop the engine.
- Engage parking break.
- Remove key.
- Block all tracks if you must park on a grade. Position machine to prevent rolling.
- Stop a reasonable distance from other machines.
- Read and understand the operating instructions in this operator's manual.

Operating on Slopes



- Avoid side slope travel whenever possible. The danger of tipping is always present.
- In a steep slope operation, DO NOT allow engine to over speed. Select proper speed before starting down slope.
- Grade of slope will be limited by such factors as ground condition, and load. Remember that new earth fills may give way under the weight of the machine.
- Keep all attachments close to the ground for optimum stability.

DANGER

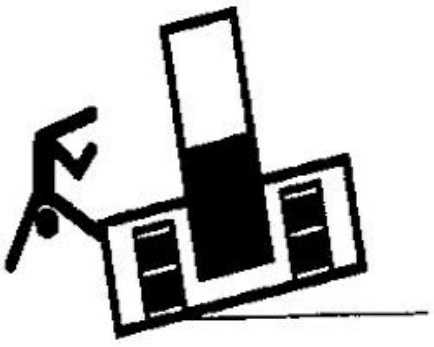
An extreme slope operation is anytime when the slope exceeds 25º or a grade of 47%. The maximum safe slope operation is 45º or a grade of 100%.

DANGER

DO NOT attempt to jump clear of tipping machine! Serious or fatal crushing injuries will result!
Machine will tip over faster than you can jump free.
Wear your seat belt!

AVOID INJURY FROM ROLLOVER ACCIDENTS

To Avoid Rollovers



- Be careful when operating on a slope.
- Balance load so weight is evenly distributed, and load is stable.
- Keep attachment close to ground to aid visibility and lower centre of gravity.
- Reduce speed before turning.
- Know capacity of machine. DO NOT overload.
- Be careful when operating near edge of an excavation, trench, drop-off, or trailer when loading or unloading.

- Read and understand operating instructions in the operator's manual.

ELECTRIC CONTROL BOX

PLOW LIFT

This proportional lever controls the main PLOW LIFT cylinder function on the plow. Pull the lever to raise the plow; push the lever to lower the plow.

FRONT SWING

This proportional lever controls the FRONT SWING cylinder function on the plow. Pull the lever to swing the plow to the left; push the lever to swing the plow to the right.

SWING IN FLOAT

This on/off toggle switch controls the front SWING IN FLOAT function on the plow. Push the switch up to turn on, pull it down to turn off. When the switch is in the on position, the FLOAT ON indicator will illuminate.

REAR SWING

This proportional lever controls the REAR SWING cylinder function on the plow. This section controls the parallel direction of the shank and chute. Pull the lever to swing the plow to the left; push the lever to swing the plow to the right. The shank and chute should be parallel to the tractor during plowing mode.

PLOW PITCH

This proportional lever controls the angle or attitude of the shank. If the shank point is angled toward the tractor, the shank will ride out of the ground. If the shank point is angled away from the tractor, the shank will plow deeper into the ground. Once the plow depth has been achieved, the shank attitude should only be used to maintain the desired depth.

POWER REWIND

This proportional lever controls the POWER REWIND function of the plow. The Power Rewind is used to turn the spool on the reel carrier in order to rewind the cable after bailing it out.

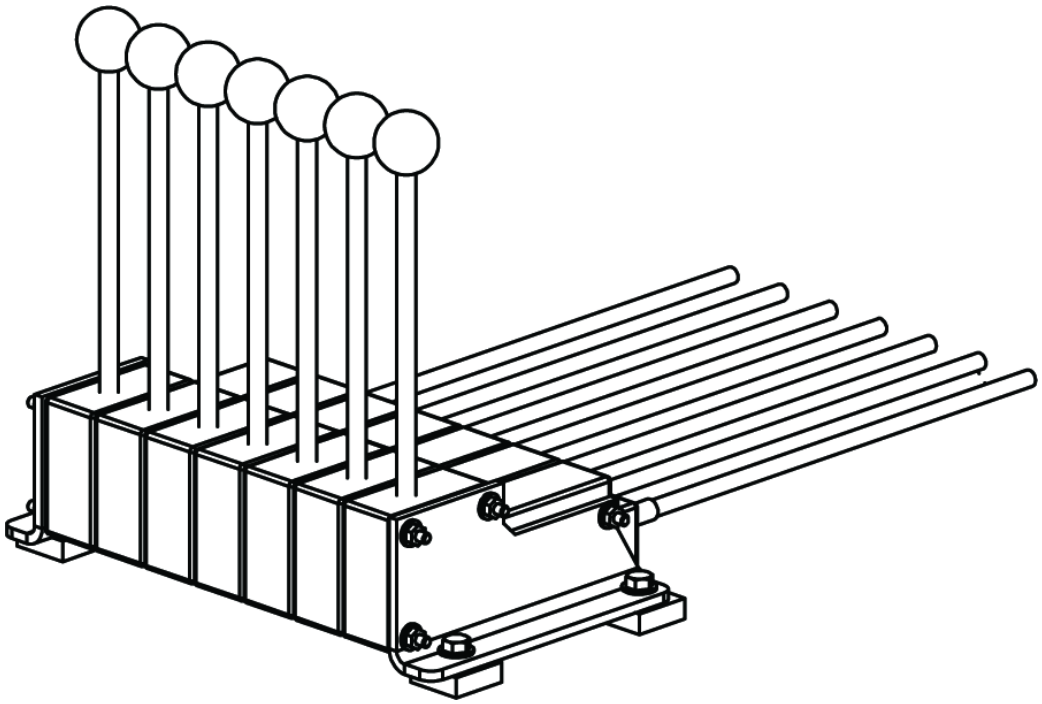
BLADE HEIGHT (BLADE LIFT)

This bidirectional on/off toggle switch controls the BLADE LIFT cylinder function on the plow. Pull the switch DOWN to lower the blade; push the switch UP to raise the blade.

SHAKER SPEED

This proportional dial controls the SHAKER SPEED function on the plow. Turn the dial clockwise to increase speed, and counter-clockwise to reduce speed; fully counter-clockwise to turn off.

CAPSTAN SPEED

This proportional dial controls the CAPSTAN SPEED function on the plow. Turn the dial clockwise to increase speed, and counter-clockwise to reduce speed; fully counter-clockwise to turn off.

CABLE CONTROLS