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## OPERATIONS MANUAL

For parts and service (866) 283-2759



#### **MODEL BW-260**

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#### **LIMITED TWELVE (12) MONTH WARRANTY**

For a period of twelve (12) months or 1,000 hours whichever comes first, from the date of delivery of product to the original user, Broce Manufacturing of Dodge City, Kansas warrants each product to be free from manufacturing defects, subject to the limitations contained in this policy. This limited warranty covers parts and labor.

This warranty does not apply to defect caused, in whole or in part, by unreasonable use while in the possession of the user, including, but not limited to, failure to properly set up product, failure to provide reasonable and necessary maintenance, normal wear, routine tune ups of adjustments, improper handling, accidents, operation at speed of load conditions contrary to published specifications, improper of insufficient lubrication, or improper storage. This warranty is not a guarantee that the performance of each product will meet the expectations of the purchaser.

Broce Manufacturing shall not be liable for consequential damage of any kind, including, but not limited to: consequential labor costs of transportation charges in connection with the replacement of repair of defective parts, lost time or expense which may have accrued because of said defects. In no event shall Broce Manufacturing be liable for any compensatory of consequential damage. In no event shall Broce Manufacturing's total liability hereunder exceed the product purchase price.

Many components used by Broce Manufacturing are subject to the warranties of their respective manufacturers. These warranties will be considered void if the product is modified or repaired in any way not expressly authorized, or if closed components are disassembled prior to return. Closed components include, but not limited to gearboxes, hydraulic pumps, motors, cylinders and actuators.

Our obligation under the warranty is expressly limited, at our option, to the replacement or repair at Broce Manufacturing of Dodge City, Kansas or at a service facility designated by us. We are not responsible for unauthorized repairs of replacements. Any implied of statutory warranties, including any warranty of merchantability or fitness for a particular purpose, are expressly limited to duration of this written warranty. We make no other express warranty. This warranty cannot be extended, broadened, or changed except in writing by an authorized officer of Broce Manufacturing.

#### WARRANTY REGISTRATION

### Purchased from (Dealership) Company: \_\_\_\_\_ Address: City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_ Deliver Date to Dealer: \_\_\_\_\_ Unit Hours: \_\_\_\_ Model Number: \_\_\_\_\_ Serial Number: \_\_\_\_ Purchaser Company: Address: \_\_\_\_\_\_ City: \_\_\_\_ Zip: \_\_\_\_\_ Delivery Date to Owner: \_\_\_\_\_ Unit Hours: \_\_\_\_ Purchaser - Type of Business Municipality Construction/Highway Asphalt Contractor \_\_ Equipment Dealer Rental $\neg$ Other

- 1. The Purchaser has been instructed and/or has read the manual and understands proper preventive maintenance, operation and safety precautions.
- 2. The Warranty and Limitations of Liability are found in the Warranty pages enclosed in the Parts and Operators Manuals.
- 3. Broce Manufacturing reserves the right to make design changes or modifications to Broce products at any time without incurring any obligation to make similar changes of modifications to previously sold units.
- 4. If this Document is not signed and returned to Broce Manufacturing the warranty begins at the date of delivery to the Dealership.

I hereby acknowledge acceptance of above and conditions in the Warranty Policy.

Purchaser/Owner:		
Dealer Representative:		

#### **SPECIFICATION SHEET**

Engine Horsepower 24 H.P.

Machine Weight 3.100 LB

Machine Weight w/ Water System 3.700 LB

Brush Diameters 6 3/8 " ID X 24" OD

Broom Length Full 8 FT

Broom Drive Hydraulic Motor

Broom Angle Full 40 deg (both ways)

Steering 60 deg (both ways)

Fuel Capacity 11 GAL
Hydraulic Oil Capacity 11 GAL
Speed 10 mph
Inside Sweeping Radius 5 FT

Water System 72 GAL

#### **START UP & PROPELLING**

#### **CAUTION**

Persons should ride in the seat properly wearing their seat belt whenever the vehicle is moving or in the vicinity of other moving vehicles. Otherwise, they are much more likely to suffer serious bodily injury in the event of sudden braking or a collision.

When using the seat belts, observe the following:

- Be careful not to damage the belt webbing or hardware. Take care that they do not get caught or pinched in the seat.
- Inspect the belt system periodically. Check for cuts, fraying, and loose parts. Damaged parts should be replaced. Do not disassemble or modify the system.
- Replace entire belt assembly (including bolts) if it has been used in a severe impact.
- Replace belt assembly after 3 years of use and 5 years of manufacture.

This model of broom is hydrostatically driven. Motion is achieved by depressing the foot pedal on the floor board to the right of center. Letting the foot pedal up will result in a braking action caused by the hydraulic system. This is the proper method for braking on this machine. The brake pedal on the left side of the floor board should not have to be used except in cases where the engine has died or there is a problem with the hydraulic system. To maintain operability, occasional use of brake system is advised to prevent rusting and seizure of components in place.

#### **WARNING**

BEFORE STARTING ENGINE, BE SURE PARKING BRAKE IS SET, LEFT FOOT IS ON THE BRAKE PEDAL AND RIGHT FOOT DOES NOT CONTACT THE CONTROL PEDAL. FAILURE TO DO SO COULD CAUSE UNINTENDED MOVEMENT OF VEHICLE RESULTING IN INJURY OR DEATH.

#### **START UP & PROPELLING**

- 1. Turn the key switch to the start position, all the way to the right. Add fuel is necessary using the hand operated locking throttle. Release the key switch when the engine starts. Do not use ether (STARTING FLUID) in this engine, severe engine damage will occur.
- 2. Use the foot pedal on the floor board to choose the direction of forward or reverse.
- 3. After the desired direction has been selected, raise engine R.P.M. to about half throttle. Release parking break. Slowly depress control pedal and adjust the engine to the desired travel speed. Speed can also be varied by the distance the control pedal is depressed.
- 4. To stop the engine, turn the key back to the center position. The parking brake must be set prior to leaving the operator's seat.

#### **NOTICE**

DO NOT REVERSE THE DIRECTION OF TRAVEL WHILE THE BROOM IS IN MOTION. THIS WILL DAMAGE THE DRIVE COMPONENTS AND VOID THE WARRANTY. THIS TYPE OF OPERATION IS CONSIDERED ABUSE.

#### **TOWING PROCEDURES**

- 1. Before towing this machine check the following:
  - a. The tires should be inflated to 32 PSI and be in good condition.
  - b. Any loose items on the machine should be removed or secured.
  - c. Check to see that all the lug nuts/bolts are tight on the wheels and that the wheel are in good condition.
- 2. The parking brake must always be set before starting to hook up the machine to a towing vehicle. The parking brake must also be set before starting to unhook the machine from a towing vehicle.
- 3. Drive the broom behind the vehicle. Leave about 5' between vehicle and broom.
- 4. Lower hitch on to the ball. Have one person guide you if possible.
- 5. Unlock hubs on the rear wheels of the machine so that it will roll freely without turning the hydraulic motors.
- 6. Open ¼" ball valve on hitch for brakes.
- 7. Hook up the lights and make sure they are in good working order.
- 8. Hook up tow chain.
- 9. Release the parking brake. Pull the machine a short distance and make sure the machines brakes are not dragging. If they are, adjust and/or repair them so that they will work effectively when needed.
- 10. Reverse procedure for unhooking.

**Note:** When the machine is to be unhooked from the towing vehicle, set the parking brake and proceed to unhook the machine in the same manner as it was hooked up, except in reverse order.

**Note:** The speed at which this machine is towed depends on conditions and the personal judgment of the individual in charge but must not exeed 45 mph. Broce Manufacturing Co. will not be responsible for neglect or poor judgment at any time during machine operation and/or towing of the machine.

#### **OPERATION OF THE SWEEPING CORE**

All broom functions are hydraulically operated. The control levers are located on the dash on the right and left side of the steering wheel. The joystick located on the right side of dash controls the core height up down and the right and left angle of Broom. The handle on the left turns on and off broom rotation.



#### RAISE / LOWER / FLOAT DETENT

To raise the core, move the joystick to the back, "Raise," position until the core is raised all the way. The handle will return to the hold position and core height will be maintained. To lower the core during normal sweeping conditions, move the joystick to the front, "Float position. The "Float" position will allow the core to maintain the ideal contact while allowing it to float over bumps or contours in the surface. To adjust the core height downward, slowly move the handle from the hold position to the lower position. The core will begin to move downward. Release the handle when the desired height has been achieved.

**NOTE**: The operator must maintain continuous adjustment on the core while the down pressure option is being used. This feature does not allow the core to float over contours in the surface. Therefore, the operator must constantly make these adjustments. If the broom core is forced too close to the ground, the bristles will not have the "flicking" action which is necessary to do the proper sweeping job. This is why the float is recommended during all but the heaviest sweeping conditions.

**IMPORTANT:** OVER USE OF THE POSITIVE DOWN PRESSURE FEATURE WILL CAUSE EXCESSIVE WEAR AND SHORTEN THE LIFE OF THE BROOM.

#### Right / Left Angle

The core may be set at any angle from 40° left to 40° right. Move the joystick to the right and it moves the core towards the right rear wheel, likewise for the left. Release the handle when the desires angle is achieved.

#### Broom on / Broom off / Broom speed

The core motor is activated with the handle to the right and is moved to the front, "ROTATION ON" position and turned off when the handle is moved back, "ROTATION OFF" position. Turf Boss machines have variable brush speed controlled by a dial on the dash panel.

#### **SWEEPING TIPS**

- 1. If the broom starts to hop or bounce, the propelling speed is too high. Slow the machine down, but maintain high engine speed. This will allow you to do a good job on the first pass and you will not need to go over it again.
- 2. In areas where the dirt is caked, try to clean the sweeping surface by going over it a second or third time. If this does not clear the dirt, use the Positive Down Pressure feature, although in most cases, the float position will yield the best results.
- 3. When changing the direction of travel, for example, backing up to sweep a spost which was not cleared the first time, always allow the machine to come to a complete stop before moving the shift lever in the opposite direction. This will help eliminate break downs and costly down time.
- 4. If the dust cloud becomes so thick that your vision is obscured, use the water sprinkling system or stop the machine until the dust clears. If possible, angle the sweeper so that the dust and debris is swept downwind.
- 5. Always wear eye protection, hearing protection and dust mask for respiratory irritants.

#### **WARNING**

OPERATOR MUST BE AWARE OF ANY PEOPLE OR PROPERTY WHICH MAY BE IN THE PATH OF FLYING OBJECTS CAST BY THE ROTATING BRUSH. FLYING OBJECTS CAN CAUSE INJURY OR DEATH.

#### **EXTENDING BRUSH LIFE**

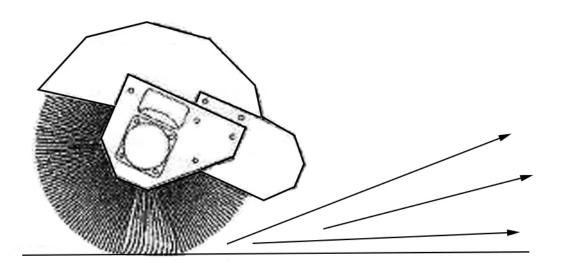
#### Brush down pressure

Most problems of rapid wear, bristle breakage and loss are attributed to excessive down pressure. If the proper down pressure is used, the sweeping efficiency will improve and bristle life will be extended considerably. More down pressure does not give a result of better sweeping. The broom gets its sweeping action by the flicking action of the bristles.

Broce Brooms are equipped with a float detent control valve. The function should be used as often as possible for optimum sweeping and longer brush life.

When too much down pressure is used, the side of the bristle is in contact with the working surface and very little flicking action is present to give a good clean sweep.

Set broom down pressure to maintain sweeping pattern as shown, approximately 5-6 inch width.



#### Keeping broom level

Running the broom core out of level will result in a poor sweeping job and a shortened wafer life. Check the broom core for levelness every day it is to be used.

There are three things to look for if the broom core is not level.

- 1. Make sure both of the rear tires are inflated to the same pressure. Both rear tires should be the same brand and size to help in keeping the machine level.
- 2. Check the frame and make sure it is not bent.
- 3. Make sure the hanger bearing hub bolts are tightened evenly and the hub bearings are adjusted properly.

#### **EXTENDING BRUSH LIFE**

#### Proper ground speed

Rotary sweepers work best when they use a flicking action of the bristles. The broom can sweep debris to a depth of ½ the diameter of the brush or to the point where the frame or shield is in contact with the debris and causes a restriction in the natural sweeping process. If the ground speed is too fast the debris may build up in front of the brush causing a wind row effect. The wind row effect will put excessive side pressure on the bristles and they will break off at the metal ring that holds them in place.

Always sweep at a brush rotation speed that is high enough and a ground speed that is low enough to discharge the debris effectively and result in a clean sweeping job.

#### **MACHINE OPERATION AND SAFETY GUIDELINES**

- 1. Read all decals and manuals before starting and / or operating this machine.
- 2. Do not operate or make any adjustments or repairs to the machine if parking brake will not hold machine from rolling. If the parking brake will not keep the machine from rolling adjust, repair or replace it before operating, adjusting or repairing the machine.
- 3. Always set parking brake before starting and after stopping engine on the machine. The parking brake should be set each time in the operator disconnects his seat belt and leaves the operating position.
- 4. Always wear appropriate protective eye wear while operating, adjusting and servicing this machine and while working with 100' of this machine.
- 5. Do not operate this machine if any person is within operating range of this machine and if any person within 100' of the machine is not wearing appropriate eye protection and safety attire.
- 6. Always disengage both rear wheel lockouts before any adjustments or repairs are made and before towing machine.
- 7. Do not make operational adjustments or repairs to this machine with the machine running if the operator is not in the operator's seat with the seat belt fastened, with the parking brake set and with both rear wheel lockouts disengaged.
- 8. Before starting this machine, always check for any kind of maintenance problem that will damage machine while using.
- 9. Always follow industry accepted safety practices while operating or making any repairs and adjustments to this machine.
- 10. Do not tow this machine with any vehicle that does not meet or exceed all federal, state and local laws for vehicle GVW, trailer hitch and lighting requirements for all of the states in which you operate this machine.
- 11. Do not operate this machine when any person is within 100 feet of the discharge area of the sweeper broom.
- 12. Do not change direction of this machine from forward to reverse or reverse to forward before first coming to a complete stop.
- 13. Tow this machine only when the front wheel has sufficient clearance between the tire and the ground when hooked up to a towing vehicle. Be particularly cautious when going through dips and ditches.
- 14. Use and attach only those tow-bar safety chains as recommended by federal, state and local laws.
- 15. Do not start, service, operate or make any adjustments to this machine before you have read and fully understood this entire manual.
- 16. Familiarize yourself with all operation and safety decals before operating this machine.

#### **OPERATIONS & SAFETY DECALS**















#### **OPERATORS PLATFORM**

The brake pedal is on the left side on the platform and the forward and reverse pedals are on the right. Emergency brake controls are on the left side of seat.





#### **OPERATION CONTROLS**



#### **FUEL & HYDRAULIC FILL LOCATIONS**





#### **TOWING HITCH & HOOD LATCH LOCATIONS**





#### **MACHINE SERVICE & SAFETY GUIDELINES**

- 1. Read all decals and manuals before starting and operating this machine.
- 2. Do not operate or make any adjustments or repairs if the parking brake does not hold the machine. Repair the parking brake first, before making any other repairs or adjustments to this machine.
- 3. Always set parking brake before starting and stopping engine on this machine.
- 4. Do not operate this machine if any person is within operating range of machine and if any person within 100 feet of machine and is not wearing appropriate eye protection and safety attire.
- 5. Always disengage both rear wheel lockouts before making any adjustments or repairs to the machine and before towing machine.
- 6. Do not make operational adjustments or repairs to this machine with the machine running if the operator is not in the operator's seat with the seat belt fastened, with the parking break set and with both rear wheel lockouts disengaged.
- 7. Before starting this machine, always inspect both (2) variable-speed-pedal return springs located on the right side of the machine below the floorboard. Do not start or operate this machine if both (2) variable-speed-pedal return springs are not in place and functional.
- 8. When servicing any component of the engine starting circuit on this machine including the battery, always DISCONNECT THE NEGATIVE CABLE FIRST.
- 9. Always wear protective eye wear and safety attire when servicing battery.
- 10. When connecting battery cables always CONNECT THE POSITIVE CABLE FIRST.
- 11. Do not "JUMP START" this machine under any circumstances. If the batter power is low, remove the battery and replace it with a battery that has a full charge.
- 12. Under no circumstances is ether starting fluid to be used when trying to start the engine in this machine. Severe engine damage will occur if ether is used.
- 13. Always follow industry accepted safety practiced while operating or making any repair and adjustments to this machine.
- 14. Do not tow this machine with any vehicle that does not meet or exceed all federal, state and local laws for vehicle GVW, trailer hitch and lighting requirements for all of the areas in which you operate this machine.
- 15. Tow this machine only when the front wheel has sufficient clearance between the tire and the ground when hooked up to a towing vehicle. Be particularly cautious when going through dips and ditches.
- 16. Use and attach only those tow-bar safety chains as recommended by federal, state and local laws.
- 17. Do not start, service, operate or make any adjustments to the engine or the machine itself before you have read and fully understood all of the manuals.

#### **LUBRICATION & MAINTENANCE**

- 1. Grease two steering shaft bearings at the front of the machine every day.
- 2. The front wheel bearings should be cleaned and packed every six months.
- 3. The tires on the front and rear of the machine should be kept at 32 psi and should be checked on a daily basis. When a tire (or tires) needs to be replaced, make sure the replacement tire is the same type and height as the remaining tire (tires) on the machine. This will keep the sweeping core level.
- 4. The battery should be checked once a month. Use distilled water only to bring the fluid level up to the required height. Keep battery post and cables clean. Battery requirements are: 12v, 70AH or equivalent.
- 5. The radiator should be checked for dirt build up every 4 to 8 hours. Use water or compressed air directed from the engine side of the radiator to remove excess dirt. A mixture of 50% water and 50% permanent antifreeze should be used in the radiator thru the entire year. Check the mixture and fluid level at least once a week. The fluid level should be ½ full on the side of the over flow tank.
- 6. Engine oil should be checked once per day. Engine oil type should be: 10w30, MIL-L-21046, or CD (API specifications) equivalent or above. Oil pan capacity is 7 quarts. The oil and oil filter should be changed after the first 50 hours and every 150 hours thereafter. All other filters, air, spin-on fuel and in-line fuel should be changed every 150 hours. Pre-cleaner bowl at the top of the air inlet tube should be emptied and cleaned daily. Use only diesel fuel.
- 7. The fuel tank should be drained once a year. The fule tank drain is located in the back of the fuel tank.
- 8. The water system (for dust control) should be inspected daily. Clean the water filters, the spray nozzles and the screen inside the nozzle head daily. Empty tanks daily to prevent algae build up.
- 9. The wheel lock-out hub oil level should be checked every three months. Remove the female hex plug on front or back of the housing to check, the oil level should be up to this hole. If oil needs to be added use a 10w-40 non-detergent motor oil. Capacity of this hub is approximately ½ pint or 8 oz.
- 10. Hydraulic oil should be checked daily. This unit requires the hydraulic tank to be completely or nearly full for proper function. Oil should be at least to the full mark on the gauge at the right side of the hydraulic tank. Low hydraulic will result in hesitation of core function and possible plump cavitation. Change hydraulic oil every six months or as needed. Hydraulic oil type: Dyna-Plex 21C Curse or any Hydro-45 viscosity oil. Change both spin-on hydraulic filter (under good to the left of the engine) and the high pressure filter (under the hood, to the right and forward of the engine) every three months or every 500 hours, whichever comes first.

#### **BRAKE INSPECTION & SERVICE**

This machine is equipped with dynamic hydraulic braking, conventional hydraulic brakes and a mechanical parking brake.

The dynamic hydraulic braking will be in operation any time that the engine is running. When the foot pedal is released, the hydraulic system provides enough braking action that the conventional foot pedal break should not have to be used. If the dynamic braking is not sufficient to stop the machine, check for hydraulic leaks and low hydraulic fluid level.

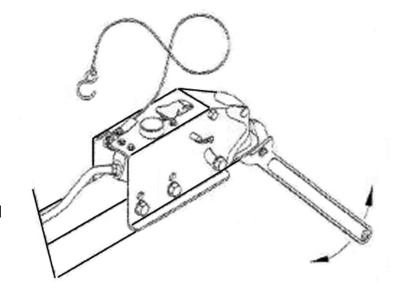
The parking break should be used every time the operator leaves the operators seat, whenever the machine is being started, when the machine is being prepared for towing and/or whenever any repairs or adjustments are being made.

When the machine is being towed, the coupler at the end of the hitch will activate the mechanical brakes anytime the driver of the towing vehicle applies his brakes.

The operation of the brakes should be tested daily. Daily before this machine is to be operated, check the feel of the brake pedal. The pedal should be firm when depressed, If the pedal feels spongy, there may be air in the system. If the brake pedal goes all the way to the mechanical stop, there is a leak in the system, the reservoir is low on fluid and brake shoes either need adjusting or

need to be replaced. If the brakes don't feel right or do not operate correctly they should be serviced before using this machine.

The location for checking and adding brake fluid is the coupler cylinder on the end of the tow hitch. When checking and adding brake fluid to the braking system, lower the tow hitch in front of the machine, as if you were preparing it to be towed. This will put the cylinder reservoir in the best posture for checking and filling brake fluid. Check the fluid level periodically, especially if the brake lines show signs of leakage. If it becomes necessary to add or change the brake fluid, use a fluid with a DOT3 rating. Inspect brake lines every 50 hours (maximum) for leaks and/or damage. Replace brake hoses every two years.



When checking the brakes fluid level or bleeding the brakes, do so at the end of the tow hitch. Lower the tow hitch in front of the machine, so that the reservoir in the ball coupler is relatively level. Use a wrench on the end of the ball coupler to pump fluid from the reservoir through the braking system. From here on follow the standard automotive procedures for bleeding brakes.

#### **ENGINE**

The normal engine operation and maintenance procedures are covered in a separate manual, which is furnished by the engine manufacturer. We do suggest, however, due to the dusty conditions in which these machines operate, that engine fan inspection and replacement should be accomplished more frequently than the engine manufacturer suggest. Inspect the fan every 300 to 400 hours. The dust in the air will eventually erode the fan blades to a condition that may cause a safety hazard or an operational failure. Replace the fan if it is deteriorated to the point that it may not provide enough air movement for cooling or when the blades become too sharp or too chipped to safely perform maintenance around. This erosion is considered to be a normal wear item on this type of machine.

#### **STORAGE**

The storage of this machine follows the pattern of any construction equipment. We do however recommend that when leaving a machine out in the weather that has wire as part of the core and it is exposed to the weather, a light spray of oil be applied to retard rusting.

Do not store polypropylene (poly) brushes in direct sunlight! Polypropylene is chemically affected in direct sunlight. After prolonged exposure to sunlight, the material can deteriorate and will greatly shorten the life of the bristle.

Do not let this machine sit with the sweeping core lowered with the weight on the brushes. This will cause a flat spot on the brush and make it bounce when in use. To avoid this, use the center "OFF" or core locked position on the dash mounted joystick mode switch.

To prevent rust on the hydraulic cylinder piston rods, store in the retracted position so the rods are not exposed to the elements.

#### **BROOM WAFERS**

Poly wafers are used in normal dry sweeping conditions: dirt, sand, leaves and other light debris. These types of jobs will give the wafers their longest lift. Poly is recommended for most applications due to their increased flicking ability and is more economical to replace.

A combination of ½ poly and ½ wire wafer is not recommended except in conditions where aggressive sweeping is needed. In most cases the standard all poly brush will be adequate. The wire wafers will wear faster than the poly and cost much more to replace. Wire has sharp tips for cutting action and can reach down into crack and crevasses better than poly. The sharp ends of the wire cut through ice and snow faster than poly wafers. We recommend no more than a 2" down pressure pattern to be used with wire wafers or a combination of poly and wire to prevent breakage of the bristles. If too much down pressure is exerted on the bristles they will flex too much and break off close to the wafer base, leaving the bristles on the pavement, Excessive down pressure reduces broom life considerably.

The life span of brush wafers is directly related to the way they are used. When properly used the brush wafer life can be extended by 50 to 100 hours.