

OWNERS MANUAL



January 2011

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Warranty

We believe you have purchased the best floor removal machine available. The OPTimum Hybrid Bronco, battery powered machine is the next generation of the most popular floor removal machine on the market today.

The care you give to your Bronco Stripper will determine the satisfaction and service life you will obtain from it. Use this manual as your guide. By observing the instructions for operation and safety the Bronco will give you years of service.

If factory service is required, please call Taylor Tools at 303-371-7667 for a service center near you.

Note: The descriptions and specifications contained in this manual were in effect at the time the manual was approved for printing. Taylor Tools, reserves the right to modify or discontinue models without notice and without incurring obligation.

Warranty: The warranty will be valid only if the machine is maintained and operated as directed in this manual and the user of the machine has been properly trained by an authorized representative of Taylor Tools.

Rev: 5-2006

I. Safety Section

A. Important Safety Information

Most accidents involving product operation, maintenance, transportation, and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards, and use common sense. Persons must also have the necessary training, skills and tools before attempting to perform these functions.

Improper operation, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any maintenance or repair on this product until you have read and understood the operation, maintenance and repair information.

Do not operate this machine if it is in need of repair, defective or in anyway unsafe. Report all defects and unsafe conditions immediately. Do not attempt any adjustments or repairs unless trained and authorized to do so.

Safety precautions and warnings are provided in this manual and on the machine. If these hazard warnings are not heeded, bodily injury or death could occur to you or other persons.



WARNING

The meaning of this safety alert symbol is as follow:
Attention! Become Alert! Your Safety is Involved!

The message that appears under the warning, explaining the hazard, can be either written or pictorially presented.

Operations that may cause product damage are identified by NOTICE labels on the product and in this manual.

Taylor Tools cannot anticipate every possible circumstance that might involve a potential hazard, and common sense is always required. The warnings in this manual and on the product are therefore not all-inclusive. Before any tool, procedure, work method or operating technique not specifically recommended by Taylor Tools is used, you must be sure that it is safe for you and others.

You should also ensure that the product will not be damaged or made unsafe by the operation, maintenance, or repair procedures you choose.

The information, specifications, and illustrations in this manual are based on information available at the time it was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service given to the product. Obtain the complete and most current information before starting any job.

B. Warning Signs and Labels

There are several specific safety signs on your Bronco floor stripper. Their exact location and description of the hazard are reviewed in this section. Please take the time to familiarize yourself with these safety signs.

Make sure that you can read all warning and instruction labels. Clean or replace these labels if you cannot read the words or see the pictures. When cleaning the labels use a cloth, water and soap. Do not use solvent, gasoline, etc.

You must replace a label if it is damaged, missing or cannot be read. If a label is on a part that is replaced, make sure a new label is installed on the replaced part. See your Taylor Tools distributor for new labels.



WARNING

Improper operation or maintenance could result in injury or death. Do not operate or work on the Bronco floor stripper unless you are properly trained. Read and understand the Operation and Maintenance Manual. Additional manuals are available from Taylor Tool's Distributors.

C. General Warning Information

Only trained and authorized personnel may operate this machine. For safe operation, read and follow the Operation and Maintenance Manual furnished with this floor stripper and observe the following warnings:

1. Before starting the machine. Check all controls for proper operation (control levers should be in the neutral position).
2. Be sure operating surface can support the weight of the machine including operator.
3. *Do not smoke or expose to open flame or arc when operating or charging.*



4. Operators and support personnel in the immediate area require;

- ... Eye protection
- ... Dust mask
- ... Cut Resistant Gloves
- ... Hearing protection
- ... High visibility clothing
- ... In some environments a hard hat may be required.

5. Before starting the machine, check all fluid levels and fill if necessary.

6. Inspect the job site before floor removal. Identify low spots, uneven surfaces, holes, weak areas, expansion joint locations, obstacles in the floor and hazardous conditions.

7. Before starting the machine, make sure that the area is clear from obstacles and people.

8. Do not allow people other than the operator and support personnel near the equipment including the work area under demolition.

9. Check for oil leaks and repair as necessary.

10. Inspect the electrical cord for damage and replace or repair as necessary.

11. Operate the machine only on safe surfaces.

12. Always wear the seat belt when operating the machine.

13. Look for and keep away from hazards such as drop-offs.

14. Look behind when operating in reverse. Look for people and hazards.

15. Operate the machine from the operator seat only. The operator is the only person that should start the machine.

16. Do not operate on steep slopes.

17. Go slow on slick surfaces. Always keep a firm grip on the controls.

18. Before leaving the operator seat, make sure controls are in the neutral position, let it come to a complete stop and turn the motor off.

19. Never leave motor running when not occupied by the operator.

20. Attach a “Do Not Operate” or similar warning tag to start switch or controls before servicing or repairing the Bronco floor stripper.

21. Do not start or service the Bronco when a “Do Not Operate” or similar warning tag is attached to the start switch or controls.

22. The width of the machine is 29”. Use caution and proceed slowly when passing through narrow door openings or aisles.

23. Do not wear loose clothing or jewelry that can catch on controls or other parts of the floor stripper.

24. Know the appropriate work-site hand signals and who gives them. Accept signals from one person only.

25. Always be aware of personnel in the immediate area of operation. Do not operate the Bronco until all immediate personnel are aware of your presence and intended actions and have moved clear of the stripper in front and in back of the machine.

26. Do not allow unauthorized personnel to ride on or operate the Bronco at any time.

27. When working in a building, dock, or elevated floor, observe floor load limits.

28. Do not change any factory set adjustment values in the electronics unless you have both authorization and training.

29. Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California and other States to cause cancer and birth defects or other reproductive harm. *A material safety data sheet (MSDS) for lead acid batteries is included in this manual for distribution to any concerned party and should be read and understood by any person operating this machine. Wash hands after handling batteries.*

D. Operational Safety Information

1. Mount and dismount the Bronco carefully.

2. Clean your shoes and wipe your hands before mounting.

3. Do not try to climb on or off the Bronco when carrying tools or supplies.

4. Do not use any controls as handholds when mounting or dismounting.

5. Never get on or off the Bronco while it is moving.

6. Keep controls clean of sticky or slippery materials.

7. Do not start, operate or service this machine unless you have read and understood these instructions and received proper training.
8. Learn how to use the controls for steering, moving and stopping in an open area unobstructed by people and/or objects.
9. **NEVER PERMIT CHILDREN TO OPERATE OR BE IN THE IMMEDIATE AREA WHEN THE MACHINE IS RUNNING.**

II. Specification Section

A. Physical Measurements

1. Length: 56"
2. Width: 29"
3. Height: 53"
3. Gross weight: 2,200 lbs.
4. Surface feet / minute: 0-300 ft/min.

Note: Specified values are approximate and may change without notice.

B. Components

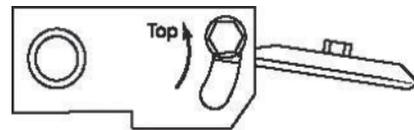
1. Batteries 12 volts, 16 each.
2. 48 Volts DC Power System
3. On Board Charger 110 Volts AC 14 Amps.
4. Hydraulic System, 5-30 Weight Full Synthetic Motor Oil.

III. Operation

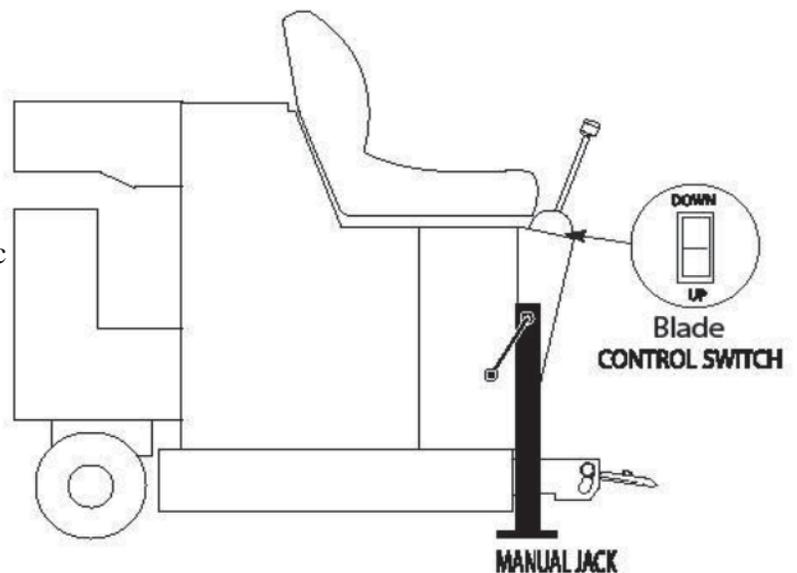
A. Transporting the Bronco

1. Always transport with equipment that is rated for or exceeds the weight of the machine. Loading and unloading of the machine can be done by a forklift, lift gate, or a ramp. Follow these directions when transporting in order to avoid damage to the machine and/or serious personal injury.
2. Prior to transporting the machine, always remove the blade and install the transportation wheel. To install the transportation wheel, follow these steps:

- a. Stop the machine and turn the motor off.
- b. In preparation for installing the transportation wheel and for the transportation wheel to rotate properly, adjust the blade holder angle to the top of the adjustment as shown below.



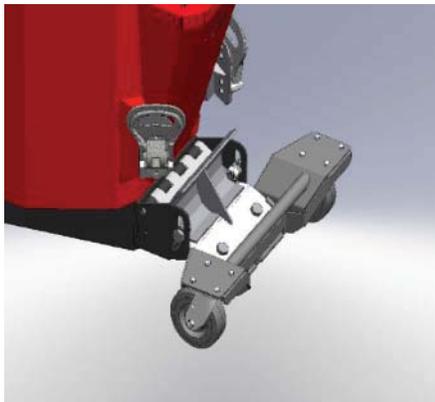
- c. Raise the blade holder high enough to install the transportation wheel. Operator must be off the machine when raising the machine.



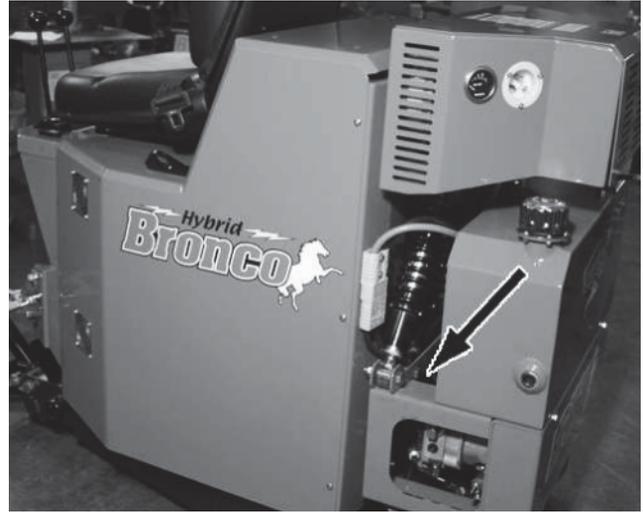
The manual jack can be attached to either side of the machine. Shown below, installed on the port (left) side of the machine. Always take the jack on the jobsite incase the blade holder needs to be lifted higer than the hydraulic cylinder can raise the blade holder.



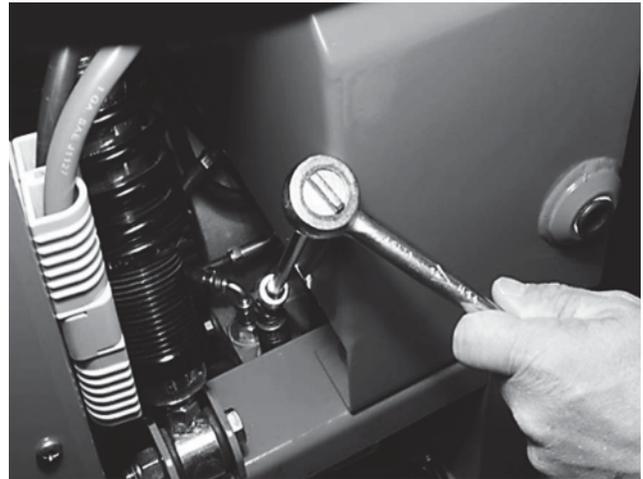
d. Loosen the blade clamp bolts and install the transportation wheel. Then secure the two bolts. The machine can now be driven to the loading location. If transporting to the loading location manually, follow the directions for disengaging the hydraulic drive (below).



3. To disengage the hydraulic drive for manual transportation locate the bypass valves (one on each side) as shown below, and follow these steps.



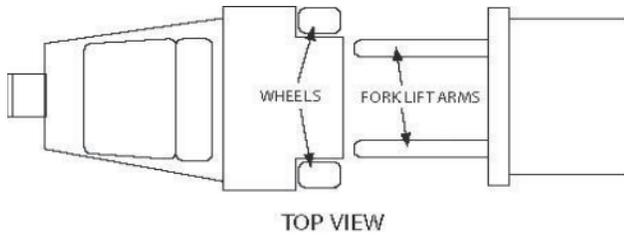
a. With the socket wrench provided in the tool kit, rotate the **bypass control nut** counterclockwise approximately one full turn on both the left (port) pump and on the right (starboard) pump.



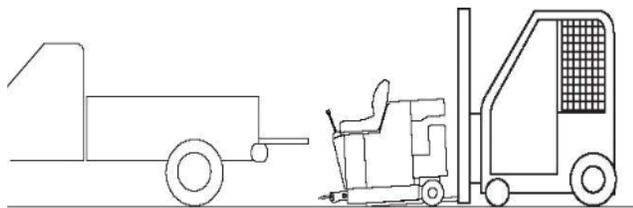
b. After the Bronco has been relocated (job site, truck, etc.) engage the hydraulic drive by turning the **bypass control nut** clockwise until closed. Do not over-tighten.

4. When Transporting manually make sure the wheels are adjusted level. This will ensure that the casters are able to swivel easily.

5. The bottom of the Bronco is designed smooth in order to be picked up from underneath by a forklift. Forklifts should pick up from the back of the machine with the forks spread as far apart as the Bronco's rear wheels will allow.

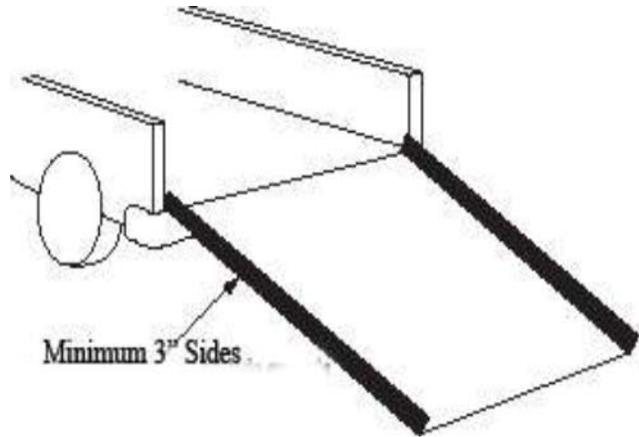


6. Do not elevate the Bronco until it is in position to be loaded on the vehicle.

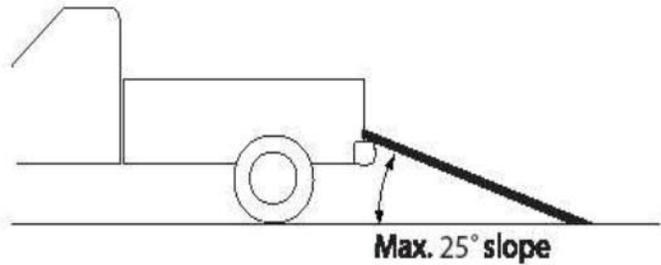


7. If using a lift gate, the gate must be of sufficient length, width and load capacity to safely support the Bronco. Manually move the Bronco from the lift gate into the vehicle or on to the ground. **Do not drive the Bronco on or off of the lift gate.**

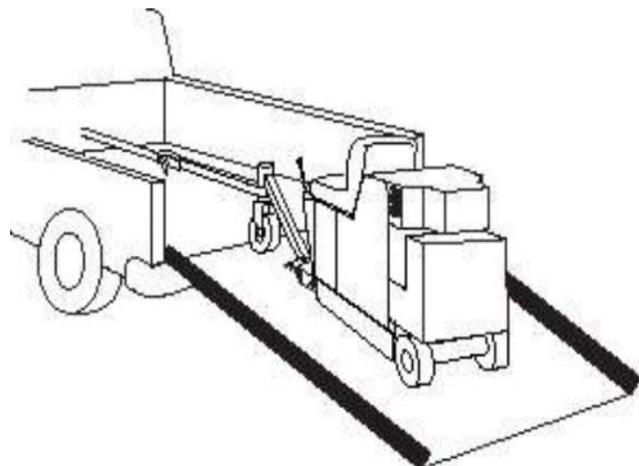
8. When using a transition ramp, the ramp should have side guards and be rated for a minimum of 2,500 lbs. The ramp should be properly secured to the tailgate of the vehicle or trailer.



9. The ramp should be long enough to not exceed a 25 degree slope when spanning the rear of the vehicle and the ground.

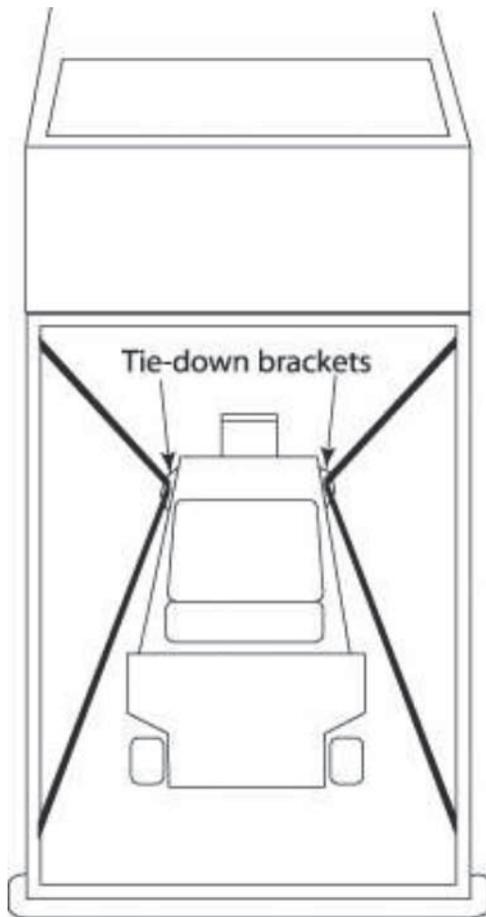


10. A winch should be used to move the Bronco up or down elevated ramps. **Never Drive a Bronco Up or Down an elevated Ramp.**



11. When loaded on a truck, remove the transportation wheel, and lower the blade holder to the floor of the vehicle (wooden floor surface recommended) **making sure that the Bronco's hydraulic drive is re-engaged!**

12. There are two tie down brackets; one on each side of the seat. Use tie down straps rated for 3,000 lbs. each. Use two straps to secure the forward motion and two straps to secure backward motion as shown below. Never secure the machine to the control levers, or similar items.



TOP VIEW-TRUCK

B. Operational Use:

1. Pre-Start

When starting on a job site, have a fully charged battery whenever possible, (see battery charging section).

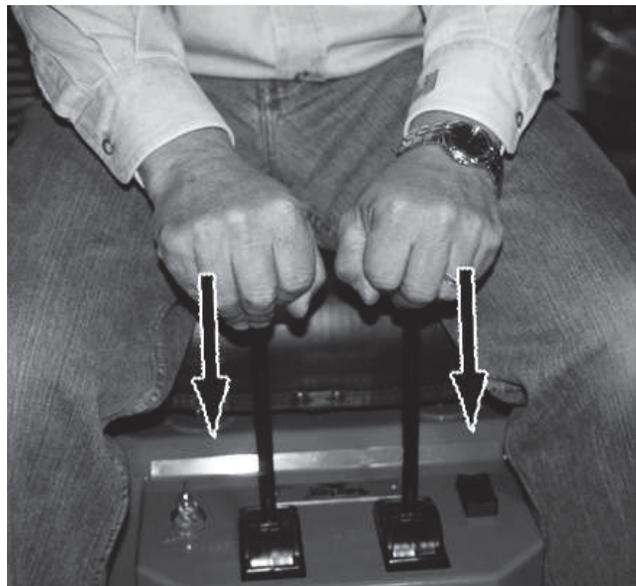
- a. Before starting the machine check the hydraulic fluid level and fill if necessary.
- b. Check for oil leaks and repair as necessary.
- c. Inspect the electrical cord for damage and replace or repair as necessary.
- d. Operate the machine only on safe surfaces.
- e. Look for and keep away from hazards such as drop-offs.
- f. Look behind when operating in reverse. Look for people and hazards.
- g. Operate the machine from the operator seat only. The operator is the only person that should start the machine.
- h. Do not operate on steep slopes.

2. Start Up

- a. To start the motor, the operator must be in the seat with the seat belt restraining system properly installed, and the controls in the neutral position.
- b. Turn the key clockwise to start the motor. The motor will start and the machine is ready for operation. To stop the motor turn the key counterclockwise and the motor will stop.

3. Driving

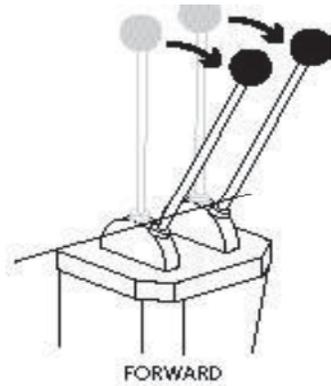
- a. To move the Bronco floor stripper forward or reverse, depress the control levers downward with the palm of your hands. This activates the operator present feature and allows the levers to move forward and backward. Keep depressing the levers at all times when operating the machine. The right lever controls the speed and direction of the right wheel and the left lever controls the speed and direction of the left wheel.



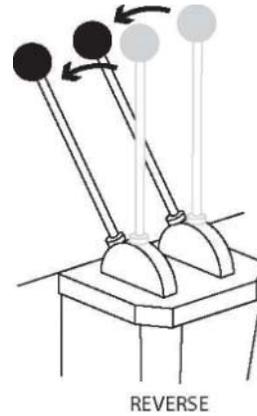
Do not use your thumbs to press the control levers down. This will cause fatigue, and possibly lock the control levers in the neutral position by mistake.



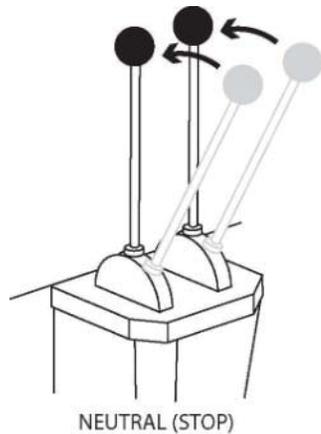
b. To move straight forward, push both levers simultaneously forward. **The further forward the levers are pushed forward the faster the machine will travel.**



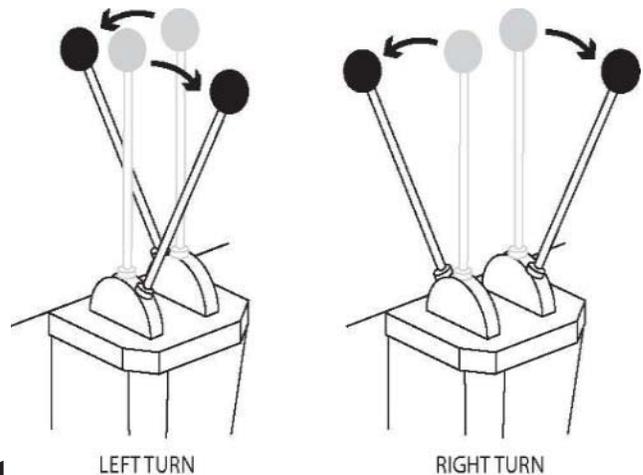
d. Pulling the levers toward the operator will reverse the machine. **The further the levers are pulled back, the faster the machine will travel.**



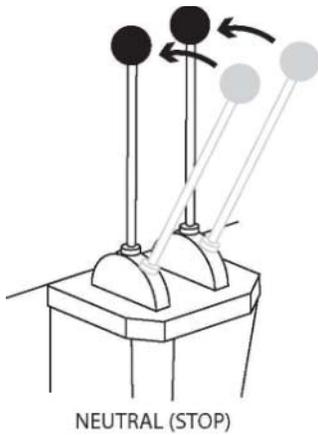
c. Bringing the levers back to center will stop the machine.



e. To turn right or left push the opposite lever forward. As shown below if a tighter turn is required pulling the other lever back while the other lever is forward will reduce the turning radius. Care must be taken when making tight turns as the further the levers are actuated the faster the turn will be. To stop bring the levers back to the center position.



f. Remember that the levers must always be depressed by the palm of your hand to keep the operator present feature engaged and the levers able to move from the neutral position.



g. Go slow on slick surfaces. Always keep a firm grip on the controls.

h. Before leaving the operator seat; Make sure controls are in the neutral position.

i. Turn the motor off, and let it come to a complete stop before dismounting.

j. Operators that are not familiar with the Bronco maneuvering controls should practice basic steering, starting and stopping in an open area free from any obstacles and personnel until proficient with the operation of the Bronco floor strip

For operator comfort, there are two adjustable foot rests; one on each side of the machine.

4. Blade Selection:

There are several blades that work well for each type of flooring material. Blades listed below are the most popular for each substrate. The Taylor Tools catalog has a complete list of available blades.

Carpet:

265.12.SD.....3x12x.083” Side Cutting

266.12.SD.....4x12x.083” Side Cutting

Ceramic:

167.04.....4x4x.125” Tool Steel

168.01.....1x4x.250” Tool Steel

Vinyl:

165-10.....3x10x.083” Most popular

165-07.....3x7x.083”

166-10.....4x10x.125”

166-07.....4x7x.125”

Wood:

167.04.....4x4x.125” Tool Steel

168.01.....1x4x.250” Tool Steel

5. Blade Installation:



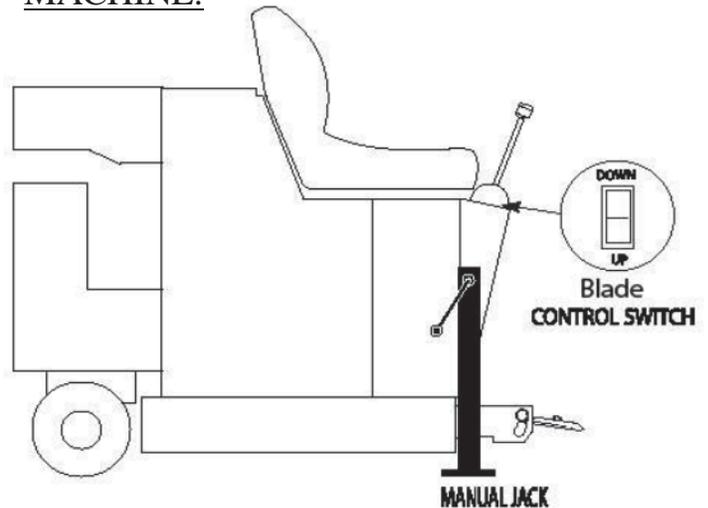
WARNING

Always wear cut resistant gloves when handling and changing the blade. The blades are razor sharp and can cause serious injury.

a. Stop the motor before changing the blade.

b. Always change or install the blade on a level floor.

c. Raise the blade holder by using the hydraulic blade control or the hand operated jack. Lift the blade holder to a height that will allow easy blade removal and installation. Note: NO-ONE MAY BE ON THE MACHINE WHEN LIFTING THE MACHINE.

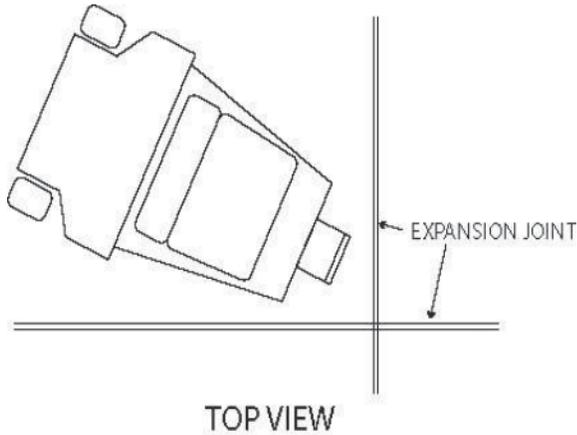


d. With the wrench provided with the Bronco, loosen the two bolts on the blade clamp and clean any debris under the clamp to ensure proper seating of the new blade.

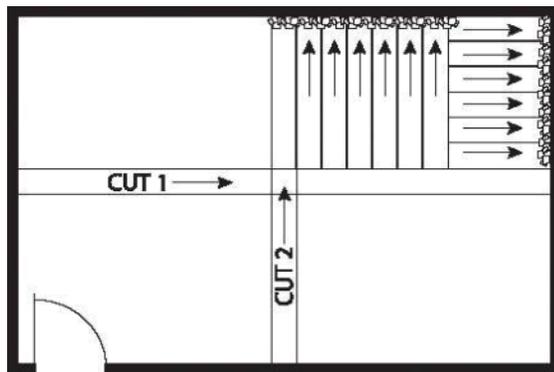
e. Tighten the two bolts securely with the blade in place. Always set blade angle as close to horizontal as possible (highest on the blade angle adjustment), without the machine disengaging from the substrate. If the machine disengages from the substrate increase the blade angle and or reduce the blade width. A slight change in blade angle makes a big difference in removal efficiency.

6. Substrate Removal

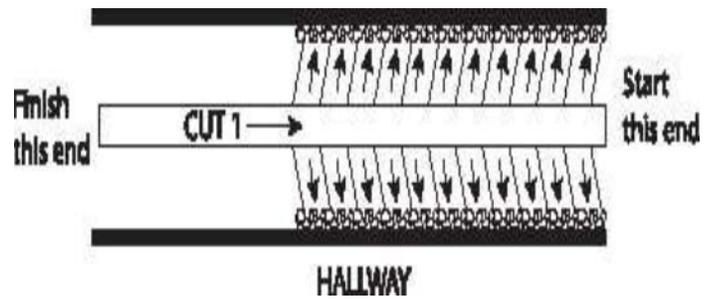
a. Inspect the floor prior to removal of any substrate for expansion joints, floor nails and bolts or any other obstructions such as electrical and gas outlets that may cause damage to the blade.



b. When expansion joints are identified and marked they should be navigated by a slight angle to prevent the blade from engaging them at right angles.



c. It is important to divide the room into sections and remove the substrate toward the walls. This will keep debris away from the material yet to be removed and reduce the build-up of scrap on the floor area that you are maneuvering on. Removal and clean up of the area will then be faster and easier.



c. Hallways are done in a manner that leaves the removed substrate at the end of the hall where the accumulated removal material will be removed from. Make your removal paths in a diagonal pattern. This will allow you to get close to the walls.



DANGER

NO SMOKING OR EXPOSURE TO OPEN FLAME WHILE CHARGING

Battery Charging: To charge the Bronco simply plug the extension cord provided with your Bronco into any 110 volt 15 + amp. outlet and plug the other end into the male panel plug provided on the side of the “On Board Charger” as shown below. Charging a run down battery to full charge requires 6-12 hours depending on how far down the batteries have been discharged. Partial charges are OK to do and do not create any memory issues with the batteries.

A full charge is 52 volts+ empty is 45 volts or when there is not enough power to do the work. Do not discharge below 42 volts.



This machine can be operated exclusively as a battery machine, or be simultaneously charged while operating, or quick charged after the battery has been run down. Charging overnight is also possible with the on-board charger. The on-board charger is a “smart charger.” The charger brings all batteries up to full charge and conditions them automatically. It will shut down automatically when a full charge has been reached.



CAUTION

No other charger can be used to charge the batteries of this machine. Doing so will reduce the life of the batteries and void the machine’s warranty.

Quick Charge a Run Down Battery: When your battery becomes discharged to the point that it will no longer remove substrate efficiently the machine can be plugged into a 15 + amp 110 volt outlet for 2-3 hours (without operation). After the dedicated charge the machine can operate as a corded machine. The sooner you plug the machine in the more extended battery life you will achieve. We recommend the corded mode as soon as you know that you will need to extend the operation time of the machine beyond the normal battery life. Additional run time results will vary depending on how well the substrate is adhered to the floor and at which point in the run down cycle you convert to the corded mode.

Battery Life : The fully charged battery will provide up to a full shift of unassisted power for floor removal. Battery life will vary depending on the material being removed. Always use a proper size extension cord when charging or operating in corded mode. The machine comes with a 100’ 10/3 extension cord. You can use up to 200’ of 10/3 size cord to charge and operate the Hybrid Bronco.

Prolonging Battery Charge: To extend the battery operating time plug the onboard charger into any 110 volt 15 amp+ outlet (with the extension cord provided) while on break, changing blades, or anytime that you find convenient during the job. Batteries do not have a memory and partial charges will not reduce battery life.

Extended Operating Time; In order to operate the machine for multiple shifts, start with a fully charged battery connected to a 110 volt 15 am+ outlet during operation. This technique will allow extended use for continuous operation on large jobs without interruption.

Tests have shown, that with this technique, the Bronco can remove well adhered substrates **for over 8 hours of continuous use.**



Battery charge level gauge: 52+ volts is a full charge, 45 volts is empty. Do not discharge lower than 42 volts.

Battery Care/Maintenance: The batteries are only serviceable by a qualified technician. For a location in your area, contact Taylor Tools, or a battery or fork lift company. **Disconnect battery from machine before servicing.**

When storing your machine, always fully charge batteries and do not store below 20 degrees Fahrenheit. Batteries that have been subject to freezing are not covered under the limited warranty.

Battery Disposal: When the batteries require replacement they must be disposed of according to local, state and federal law. Battery replacement must be done by a qualified battery company.

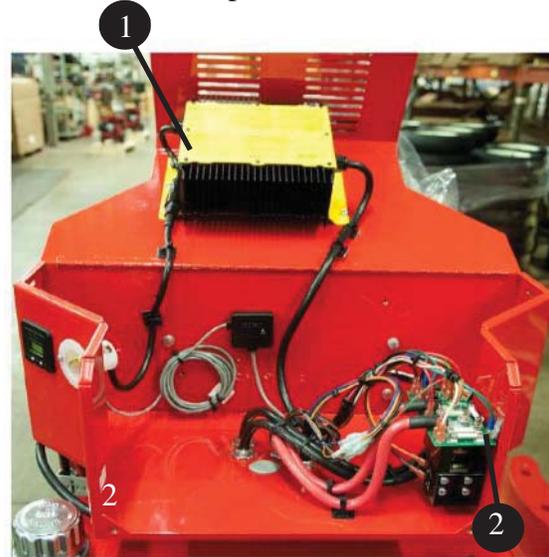
IV. Maintenance:

A. Electrical diagrams and components;

1. The electrical box shown below contains all of the control components for operation and charging. There are no customer service components. Any adjustments and or changes to the electrical system is dangerous and will void the machine's warranty. If service is required it should be done by a qualified electrician or battery professional.

Components:

1. Charger
2. Contactor and Fuse panel.



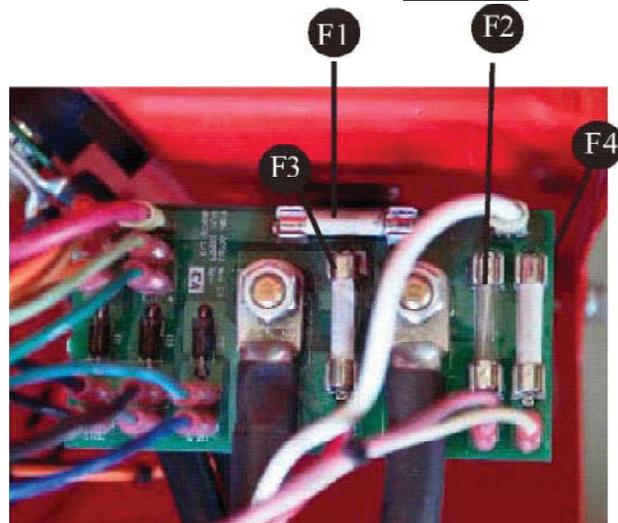
Fuses:

F1 = 30A 125V Slow Blow for **Charger**

F2 = 7A 250V Slow Blow for **Key Switch**

F3 = 15A 250V Slow Blow for **Blade Down**

F4 = 15A 250V Slow Blow for **Blade UP**



1 Year Limited Warranty

Roofing Equipment, Inc., a California corporation that does business under the name "Taylor Tools" (the "Company"), hereby warrants to the original purchaser, on and subject to the terms described herein, that the Product shall be free of defects in material and workmanship for a period of 1 year from date of purchase (the "Limited Warranty"). In the event the Company determines that a failure is related to defects in material or workmanship and the conditions of this Limited Warranty set forth below apply, the Company at its discretion will accept the responsibility to correct or replace the defect at its cost. Parts and labor will be free of charge for one (1) year from the date of purchase. The method of correction will be determined in the reasonable discretion of the Company and, where necessary, will include materials and labor provided by a dealer or a repair company designated by the Company.

Purchaser Responsibilities:

Purchaser shall provide maintenance and adjustments and shall have complied with the procedures and recommendations described in the Operators / Instruction Manual. The Company makes no representation or warranty with respect to the useful life of the Product which will depend on the manner in which it is used, something the Company cannot control. The Purchaser must understand that frequent heavy-duty use of the Product will shorten its useful life. Transportation charges to deliver the Product to and from the place where the warranty repair will be performed are the responsibility of the Purchaser.

The Limited Warranty:

This Limited Warranty contains all of the terms of the warranty being provided in connection with the Product. No person is authorized to make any changes or additions to the terms set forth herein unless they are set forth in writing and signed by an officer of the Company. The Product is sold as a business rather than as a consumer product. If there is a defect in the materials or workmanship covered by this Limited Warranty, the Company's sole obligation shall be repair and replacement as described herein. In no event will the Company be liable or responsible to the purchaser, other contractors on the job, or the owner or lender of the building for any damages in excess of the cost described herein. This limitation applies to damages of any kind, including any direct or indirect damages, lost profits, lost savings, lost of use or cost of capital, or other special, incidental, exemplary, punitive, or consequential damages whether for breach of contract, tort, or otherwise or whether arising out of the use of or the inability to use the product or system. This Limited Warranty runs only in favor of the original purchaser identified in a Product Registration card properly and timely sent to the Company and shall not apply to nor can it be enforced by any assignees, successors or subsequent purchasers of the product. **This Limited Warranty is limited; thus the terms and conditions of the Limited Warranty should be reviewed and understood before purchasing the Product.**

Notice of Claim:

In order to evaluate the likely cause of any claimed defect and, if the coverage provided herein applies, to correct any such defect, a claim under this Limited Warranty must be in writing and shall be sent to the Company at the address set forth below ("Notice of Claim") within thirty days from the date such defect or defective condition is first noticed or becomes apparent ("Claim Date"). A longer period of time elapsing between the Claim Date and the Notice of Claim may result in the inability of Company to determine the nature and extent of such defect, and the Company reserves the right to disallow any Notice of Claim not made within such period. Following receipt of the Notice of Claim, representatives of the Company shall be entitled to make such inspections and tests with the full cooperation of the original purchaser as may be necessary to determine the cause of the claimed defect. The right to inspect the product and the continued cooperation of those involved shall be necessary in order for coverage herein to apply.

This Limited Warranty requires timely written notification of any claimed defect or claim hereunder. Failure to notify the Company promptly of any such claim may void the coverage provided by this Limited Warranty. Notice of Claim should be sent or faxed to: Taylor Tools 5045 Paris Street, Denver, CO 80239, 303-371-7669.

Exclusions of Warranty:

No warranty is extended on any Product that has been altered, misused, mis-assembled, improperly adjusted, neglected or damaged by accident, shipping, handling, warehousing, lack of routine maintenance, or failure to follow the provisions and recommendations in the Instruction / Operating Manual. No warranty is extended for service completed by someone other than an Authorized Dealer designated by the Company. The Company reserves the right to incorporate any change in design into its products without obligation to make such changes on products previously manufactured.

DISCLAIMER OF FURTHER WARRANTY

The Company makes no other warranty, express or implied, other than this Limited Warranty. The implied warranties of merchantability and fitness for particular purpose are limited to one (1) year as described herein, or, to the extent permitted by law, are hereby disclaimed. The repair or replacement of parts that prove to be defective in material or workmanship shall be the exclusive remedy for breach of this warranty. To the extent permitted by law, the Company shall not be liable for incidental or consequential damages including but not limited to damages for inconvenience, rental or purchase of replacement equipment, or for loss of profits or other commercial loss, resulting from a breach of this warranty. Some states do not allow limitation on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you. This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



Material Safety Data Sheet

VALVE REGULATED (VRLA) BATTERIES - ABSORBED ELECTROLYTE (AGM)

I. Product Identification and Company Identification

Chemical / Trade Name (Identity used on label) Absorbed Electrolyte Battery / HGL, DC, HGHL Sealed Valve Regulated Lead-Acid Battery Manufacturer's Name Fullriver Battery Manufacture Co. Ltd. Address P.O. Box 511475 Taishi Industrial Area, Yuwotou Town, Panyu Zone, Guangzhou, China	Chemical Family / Classification Electric Storage Battery Date Revised October 5th, 2010 Telephone 86-20-84916671 Web http://www.fullriverdcbattery.com
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II. Hazardous Ingredients / Identify Information

NOTE: Inorganic lead and electrolyte (water and sulfuric acid solution) are the primary components of every battery manufactured by Fullriver Technologies or its subsidiaries. Other ingredients may be present dependent upon battery type.

Materials / Components	% by Wt.	CAS Number	Exposure Limits		
			OSHA	ACGIH	NIOSH
Specific Chemical Identity / Common Name Inorganic Lead / Lead Compounds	88% - 79%	7439-92-1	50 µg/m ³	150 µg/m ³	100 µg/m ³
Specific Chemical Identity / Common Name Tin	<0.5%	7440-31-8	2000 µg/m ³	2000 µg/m ³	NA
Specific Chemical Identity / Common Name Calcium	<0.2%	7440-70-2	NA	NA	NA
Specific Chemical Identity / Common Name Sulfuric Acid (40%) / Battery Electrolyte (Acid)	16% - 21%	7664-93-9	1 mg/m ³	1 mg/m ³	1 mg/m ³
Specific Chemical Identity / Common Name Fiberglass Separator	8%	-	NA	NA	NA
Specific Chemical Identity / Common Name Acrylonitrile Butadiene Styrene (ABS)	8% - 10%	9008-88-9	NA	NA	NA

III. Fire and Explosion Hazard Data

Fire and Explosive Properties	Hydrogen Flash Point: N/A	Hydrogen Auto Ignition Point: 580°C
	Hydrogen Flammabl Limits in Air (% by Volume): LEL: 4.1	UEL: 74.2
	Low Explosion Limit (LEL), Upper Explosion Limit (UEL)	
Extinguishing Media	Dry Chemical, Foam, CO₂	
Special Fire Fighting Hazards	Use Positive Pressure, Self-Contained breathing apparatus.	
Unusual Fire and Explosion Hazards	<p>If AGM batteries are properly charged they will not release any flammable hydrogen gas. If they are excessively overcharged the safety relief valve can open and release flammable hydrogen gas. They must always be assumed to contain this gas which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instruction for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery.</p>	

IV. Health Hazard Information

Routes of Entry

Sulfuric Acid: Harmful by all routes of entry.

Lead Compounds: Hazardous exposure can occur only when product is heated, oxidized or otherwise processed or damaged to create dust, vapor or fumes.

Inhalation

Sulfuric Acid: Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation.

Lead Compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

Fiberglass Separator: Fiberglass is an irritant to the upper respiratory tract, skin and eyes. For exposure up to 10F°/use MSA Comfoll with type H filter. Above 10F° use Ultra Twin with type H filter. This product is not considered carcinogenic by NTP or OSHA.

Ingestion

Sulfuric Acid: May cause severe irritation of mouth, throat, esophagus and stomach.

Lead Compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea and severe cramping. This may lead rapidly to system toxicity and must be treated by a physician.

Skin Contact

Sulfuric Acid: Severe irritation, burns and ulceration.

Lead Compounds: Not absorbed through the skin.

Eye Contact

Sulfuric Acid: Severe irritation, burns, cornea damage, and blindness.

Lead Compounds: May cause eye irritation.

Effects of Overexposure - Acute

Sulfuric Acid: Severe skin irritation, damage to cornea, upper respiratory irritation.

Lead Compounds: Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability.

Effects of Overexposure - Chronic

Sulfuric Acid: Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes.

Lead Compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females.

Carcinogenicity

Sulfuric Acid: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category I carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist.

Lead Compounds: Lead is listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.

Medical Conditions Generally Aggravated by Exposure

Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions.

Contact of sulfuric acid with skin may aggravate diseases such as eczema and contact dermatitis.

Lead and its compounds can aggravate some forms of kidney, liver and neurologic diseases.

V. Emergency and First Aid Procedures

Inhalation

Sulfuric Acid: Remove to fresh air immediately. If breathing is difficult, give oxygen.

Lead Compounds: Remove from exposure, gargle, wash nose and lips; consult physician.

Ingestion

Sulfuric Acid: Give large quantities of water; do not include vomiting; consult physician.

Lead Compounds: Consult physician immediately.

Skin

Sulfuric Acid: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes.

Lead Compounds: Wash immediately with soap and water.

Eyes

Sulfuric Acid and Lead: Flush immediately with large amounts of water for a least 15 minutes; consult physician.

VI. Precautions For Safe Handling and Use

Handling and Storage

Store batteries in cool, dry, well-ventilated areas with impervious surfaces and adequate containment in the event of spills. Batteries should also be stored under roof for protection against adverse weather conditions. Separate from incompatible materials. Store and handle only in areas with adequate water supply and spill control. Avoid damage to containers. Keep away from fire, sparks and heat.

Precautionary Labeling

POISON - Causes severe burns DANGER - Contains Sulfuric Acid

Charging

There is a possible risk of electric shock from charging equipment and from strings of series connected batteries, whether or not being charged. Shut-off power to chargers whenever not in use and before detachment of any circuit connections. If batteries are properly charged they will not release any flammable hydrogen gas. If they are excessively overcharged the safety relief valve can open and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby. Wear face and eye protection when near batteries being charged.

Spill or Leak Procedures

Stop flow of material; contain/absorb small spills with dry sand, earth and vermiculite. Do not use combustible materials. If possible, carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, etc. Wear acid-resistant clothing, boots, gloves, and face shield. Do not allow discharge of un-neutralized acid to sewer.

Waste Disposal Method

Spent batteries: Send to secondary lead smelter for recycling.



LEAD - RETURN - RECYCLE

VII. Control Measures

Engineering Controls

Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant.

Work Practices

Handle batteries cautiously to avoid spills. Make certain vent caps are on securely. Avoid contact with internal components. Wear protective clothing when filling or handling batteries.

Respiratory Protection

None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed the PEL, use NIOSH or MSHA-approved respiratory protection.

Protective Gloves

Rubber or plastic acid-resistant gloves with elbow-length gauntlet.

Eye Protection

Chemical goggles or face shield.

Other Protection

Acid-resistant apron. Under severe exposure emergency conditions, wear acid-resistant clothing and boots.

Emergency Flushing

In areas where sulfuric acid is handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

VIII. Physical Data

Electrolyte:			
Boiling Point:	203-240°F	Specific Gravity (H₂O=1):	1.300-1.330
Melting Point:	N/A	Vapor Pressure (mm Hg):	10
Solubility in Water:	100%	Vapor Density (AIR = 1):	3.4
Evaporation Rate: (Butyl Acetate = 1)	Less than 1	% Volatile by Weight:	N/A
Appearance and Odor:	Manufactured article; no apparent odor. Electrolyte is a clear liquid with a sharp, penetrating, pungent odor.		

IV. Reactivity Data

Stability: Stable

Conditions to Avoid: High temperature, Sparks and other sources of ignition

Incompatibility (Materials to avoid)

Electrolyte (Water and Sulfuric Acid Solution): Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfuric trioxide gas, strong oxidizers, and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.

Reactivity Data Cont...

IV. Reactivity Data (Continued)

Incompatibility (Materials to avoid) Continued..

Lead Compounds: Avoid contact with strong acids, bases, halides, halogenated, potassium nitrate, permanganate, peroxides, nascent hydrogen, and reducing agents.

Hazardous Byproducts

Sulfuric Acid: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen.

Lead Compounds: High temperatures likely to produce toxic metal fume, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

X. Ecological Information

Lead and its compounds can pose a threat if released into the environment.

XI. Transport Information

All **Fullriver** AGM batteries, when transported by air, surface or by vessel are identified as "**Battery, Electric Storage, Wet, Nonspillable, Not Regulated**".

The battery(s) must be identified as above on the Bill of Lading and properly packaged with their terminals protected from short circuit. NA or UN numbers do not apply.

Fullriver AGM battery(s) warning label identifies each battery as NONSPILLABLE.

Fullriver AGM battery(s) preprinted cartons identify each battery as NONSPILLABLE.

Fullriver AGM battery(s) shipped without **Fullriver** cartons (bulk packed) need to be identified as NONSPILLABLE or NONSPILLABLE BATTERY on the outer packaging.

Air: **Fullriver** AGM batteries meet the conditions in IATA/ICAO Special Provision A67.

Surface: **Fullriver** AGM batteries meet the conditions for DOT Haz Mat Regulations CFR-Title 49 parts 171 - 189.

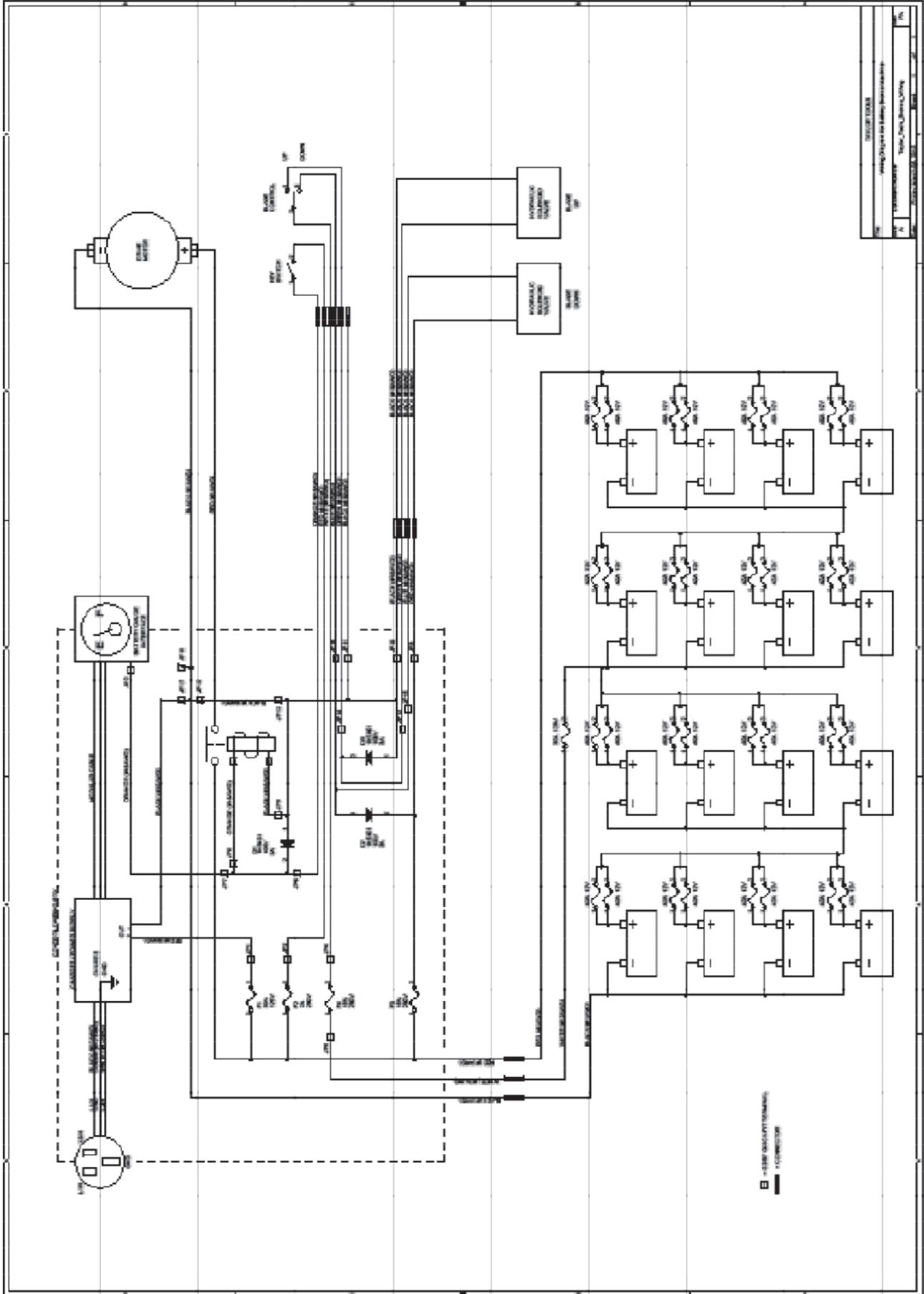
Vessel: **Fullriver** Batteries meet the conditions of IMDG.

XII. Regulatory Information

See 29 CFR 1910.268(b)(2)

XIII. Other Information

The information herein is given in good faith, but no warranty, expressed or implied, is made.



REV.	DESCRIPTION	DATE
1	INITIAL DESIGN	10/10/2023
2	REVISED FOR MANUFACTURING	11/05/2023
3	REVISED FOR TESTING	11/15/2023
4	REVISED FOR FINAL PRODUCTION	12/01/2023

