OPERATION MANUAL

MULTIQUIP®

MQ MULTIQUIP WHITEMAN SERIES

MODEL
WBH-16BAT
POWER BUGGY

(VANGUARD 48 V LITHIUM-ION BATTERY)

Revision #0 (04/22/25)

To find the latest revision of this publication or associated parts manual, visit our website at:
www.multiquip.com

THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.


WARNING
CANCER &
REPRODUCTIVE HARM
www.P65Warnings.ca.gov
P/N 38707

WBH16BAT Power Buggy

Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.

SAFETY MESSAGES

The four safety messages shown below will inform you about potential hazards that could injure you or others. The safety messages specifically address the level of exposure to the operator and are preceded by one of four words: **DANGER, WARNING, CAUTION** or **NOTICE.**

SAFETY SYMBOLS

DANGER

Indicates a hazardous situation which, if not avoided, **WILL** result in **DEATH** or **SERIOUS INJURY.**

WARNING

Indicates a hazardous situation which, if not avoided, **COULD** result in **DEATH** or **SERIOUS INJURY.**

CAUTION

Indicates a hazardous situation which, if not avoided, **COULD** result in **MINOR** or **MODERATE INJURY.**

NOTICE

Addresses practices not related to personal injury.

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety messages.

Symbol	Safety Hazard
	Explosive fuel hazards
	Burn hazards
	Rotating parts hazards
	Hydraulic fluid hazards

GENERAL SAFETY

⚠ CAUTION

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.

- Avoid wearing jewelry or loose fitting clothes that may snag on the controls or moving parts as this can cause serious injury.
- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.

- **NEVER** operate this equipment under the influence of drugs or alcohol.

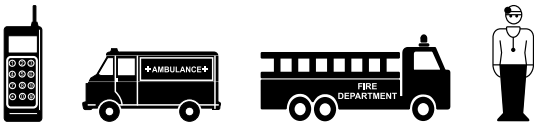
- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.
- No one other than the operator is to be in the working area when the equipment is in operation.
- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.

NOTICE

- This equipment should only be operated by trained and qualified personnel 18 years of age and older.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
- **ALWAYS** know the location of the nearest **fire extinguisher.**

- **ALWAYS** know the location of the nearest **first aid kit.**

- **ALWAYS** know the location of the nearest phone or **keep a phone on the job site.** Also, know the phone numbers of the nearest **ambulance, doctor** and **fire department.** This information will be invaluable in the case of an emergency.



POWER BUGGY SAFETY

⚠ DANGER

- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death.**

⚠ WARNING

- **NEVER** use your hand to find hydraulic leaks. Use a piece of wood or cardboard. Hydraulic fluid injected into the skin must be treated by a knowledgeable physician immediately or severe injury or death can occur.

- Accidental starting can cause severe injury or death. **ALWAYS** place the ON/OFF switch in the OFF position.

- **NEVER** disconnect any **emergency or safety devices.** These devices are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these devices will void all warranties.
- **NEVER** approach power lines with any part of the buggy unless all local, state/provincial and federal (OSHA) required safety precautions have been taken. Use extreme caution when approaching high voltage power lines.

⚠ CAUTION

- **ALWAYS** inspect the surface over which you will travel. Look for holes, drop-offs and obstacles. Look for rough and weak spots on docks, ramps or floor. Look for oil spills, wet spots and slippery surfaces. Look for soft soil, deep mud and standing water. Watch for anything that might make you lose control or cause the power buggy to tip over.
- **ALWAYS** clear away trash and debris. Pick up anything that might puncture the tires.
- **ALWAYS** make sure aisles, ramps, doorways and passages are clear.
- **ALWAYS** plan your work. Make sure you know where you will make your pickups, dumps and turns. Before you take a load, know where you will place it.
- **NEVER** operate the power buggy facing backwards. In a backwards position, the operator cannot properly activate the manual brake, emergency switch, grip the handles or steer the machine. **ALWAYS** face in the direction of the bucket.
- **DO NOT** operate the power buggy on unsafe haul roads, load areas, and dump areas.
- **DO NOT** operate power buggy on excessive slopes with a grade higher than 10% (6°), forward and backward.
- **DO NOT** operate power buggy on extremely uneven surfaces.
- **NEVER** allow riders other than the operator on the power buggy.
- **ALWAYS** secure the step plate (platform) in the upright position when using the power buggy over rough terrain.
- **DO NOT** stand on the power buggy step plate (platform) when walking in rough terrain. Walk behind the power buggy.
- **DO NOT** touch, lean on or reach through the dump mechanism or permit others to do so. **NEVER** climb on the power buggy or dump mechanism.
- **DO NOT** operate the power buggy at excessive speeds. Reckless operation may cause accidents and severe injury. Slow down when approaching people, wet areas, and going up and down grades. It is the responsibility of the operator to adjust speed, as necessary, depending on the conditions of the road or path.
- **ALLOW** extra time to stop when operating the power buggy ion wet surfaces or loosely graded materials.
- **DO NOT** dump materials that are large and chunky. These types of material may shift causing the power buggy to tip and throw the operator off the machine. The power buggy is intended for dumping free-flowing and loose materials such as dry soil, slag, and wet concrete.
- **DO NOT** dump materials from bucket while the power buggy is moving.
- For walk behind operation, the operator platform must be stowed and locked in the up position. The speed should also be reduced to 3 mph (4.8 kph) or slower.

NOTICE

- **ALWAYS** ensure power buggy is **securely** placed on appropriate blocks or jackstands when performing maintenance requires elevation of the buggy.
- **ALWAYS** make sure the power buggy's brakes are working properly. **NEVER** operate the power buggy with a defective braking system.
- When parking on a slope, position the power buggy at a right angle to a slope. Ensure the power buggy is turned off to activate the brakes. Chock wheels.
- When filling or dumping **DO NOT** exceed payload capacity of power buggy.
- **ALWAYS** be aware of traveling conditions. Reduce load if necessary.
- **DO NOT** activate dump mechanism (tub) if buggy is facing a downhill slope.
- **DO NOT** stand in front or along side the buggy when discharging a load.
- **ALWAYS** block the power buggy with appropriate blocks when leaving the power buggy parked on a slope.
- To prevent unexpected loss of control, **DO NOT** start machine on a sloping surface.
- Ensure that the speed control lever works freely and returns to the closed position. **DO NOT** start machine unless speed control linkage is working properly.
- **NEVER** operate the power buggy with bad or worn tires. **ALWAYS** replace defective tires with new ones.
- **ALWAYS** make sure the dumping mechanism of the tub is working properly.
- Avoid sudden stops and starts and changes in direction. Operate the controls smoothly. **DO NOT** jerk the steering or any other controls.
- **NEVER** attempt to work the control except from the operator's position.
- **NEVER** drive or tow the power buggy in traffic or on public roads.
- **ALWAYS** keep the machine in proper running condition.
- Fix damage to machine and replace any broken parts immediately.
- The entire power buggy (tub, step plate, shroud, wheels, etc.) should be cleaned after every use. Make sure there is no buildup of concrete, grease, oil or debris on the machine.
- **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.

BATTERY SAFETY

⚠ DANGER

- **NEVER** disassemble, crush or puncture the battery.
- **NEVER** expose the battery to fire or water to prevent potential hazards such as explosion, damage, or injury due to chemical reaction or short circuits.

⚠ WARNING

- **ALWAYS** wear safety glasses when handling the battery to avoid eye irritation. The battery contains electrolytes that can cause injury to the eyes and skin.

- Use well-insulated gloves when picking up the battery.
- **ALWAYS** keep the battery charged.
- **DO NOT** charge battery if frozen. Battery can explode. When frozen, warm the battery to at least 61°F (16°C).
- Use and keep battery in an area with good airflow, away from sparks, open flames, or excessive heat.
- Do not use machine if battery is submerged in water or water goes into the battery connectors.

⚠ CAUTION

- **DO NOT** hit the battery. Keep the battery away from hard objects.
- **ALWAYS** keep battery cables in good working condition. Repair or replace all worn cables.

NOTICE

- **DO NOT** attempt to modify or tamper with the battery or its components. Any modifications will void warranty.
- **DO NOT** discharge the battery to very low levels. Deep discharges can reduce the life span of lithium-ion batteries.
- **DO NOT** expose the battery to extreme temperatures, either too hot or too cold. Safe storage/charging temperatures range from 115° F (46° C) ~ 40° F (4° C).
- **DO NOT** store battery in fully discharged state. It may permanently destroy the battery.
- **ONLY** use OEM type battery charger.
- **ALWAYS** inspect battery for signs of physical damage. **DO NOT** operate machine if bulging or swelling is present on battery.
- **NEVER** spray battery with water.

LIFTING SAFETY

⚠ CAUTION

- **NEVER** allow any person or animal to stand underneath the equipment while lifting.

NOTICE

- When lifting of the power buggy is required, use a properly rated forklift. Forklift pockets are provided on the power buggy's frame. Make sure the forklift arms are insert into the power buggy's fork lift pockets a minimum of 24-inches. Before lifting, make sure that the lifting bale is not damaged.
- **DO NOT** lift machine to unnecessary heights.
- **NEVER** lift the equipment while the machine is running.
- **ALWAYS** use ramps capable of supporting the weight of the power buggy and the operator to load and unload the power buggy.

TRANSPORTING SAFETY

NOTICE

- **ALWAYS** shutdown machine before transporting.
- When transporting of the power buggy is required, place the power buggy on a flat bed truck or equivalent and tie down securely.
- **ALWAYS** make sure all tie-downs and block are in place and the bucket is completely lowered in the flat (horizontal) position and securely latched.
- Place ***chock blocks*** underneath wheel to prevent rolling.
- When transporting the power buggy on a truck or trailer, know the overall height to avoid contacting overhead obstructions such as bridges and power lines. Check the truck and ramp capacities.

ENVIRONMENTAL SAFETY/DECOMMISSIONING

NOTICE

Decommissioning is a controlled process used to safely retire a piece of equipment that is no longer serviceable. If the equipment poses an unacceptable and unrepairable safety risk due to wear or damage or is no longer cost effective to maintain (beyond life-cycle reliability) and is to be decommissioned (demolition and dismantlement),be sure to follow rules below.

- **DO NOT** pour waste or oil directly onto the ground, down a drain or into any water source.
- Contact your country's Department of Public Works or recycling agency in your area and arrange for proper disposal of any electrical components, waste or oil associated with this equipment.

- When the life cycle of this equipment is over, remove battery (if equipped) and bring to appropriate facility for reclamation. Use safety precautions when handling batteries that contain sulfuric acid.
- When the life cycle of this equipment is over, it is recommended that the unit frame and all other metal parts be sent to a recycling center.

  Metal recycling involves the collection of metal from discarded products and its transformation into raw materials to use in manufacturing a new product.

  Recyclers and manufacturers alike promote the process of recycling metal. Using a metal recycling center promotes energy cost savings.

WORK SAFELY!

WARNING

Failure to comply with these lifting instructions may result in **lifting equipment failure** and **severe personal injury or death**.

Only **qualified personnel** with proper training should perform this procedure. Follow all rigging and lifting safety rules when performing this procedure.

LIFTING SAFETY

CAUTION

- **NEVER** allow any person to stand underneath the equipment while lifting.
- Power buggies are very heavy and awkward to move around. **ALWAYS** use proper heavy-lifting procedures.
- **NEVER** lift the equipment with the operator on the machine.

NOTICE

- **ALWAYS** make sure any lifting device has been properly secured to the lift loops of the buggy.
- **DO NOT** lift the equipment to unnecessary heights.
- **ALWAYS** shut down the machine before transporting.

LIFTING EQUIPMENT INSPECTION

ALWAYS perform a thorough inspection of lifting chains, hooks, or slings **before each use**. All lifting equipment and procedures must comply with **Occupational Safety and Health Administration (OSHA) Regulation 29 CFR Part 1926.251**.

Chain Inspection

The Occupational Safety and Health Administration (OSHA) Regulation 29 CFR Part 1926.251 (b)(5) — *Removal from service* requires that steel chains used for lifting be inspected prior to each use, and **removed from service immediately** whenever wear at any point of any chain link exceeds that shown in Table A.

Table A. Maximum Allowable Wear at Any Point of Chain Link

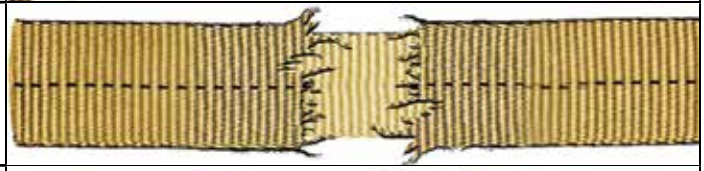
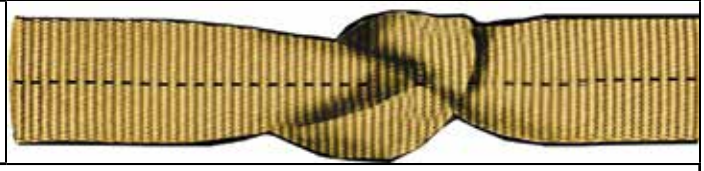
Chain Size (Inches)	Maximum Allowable Wear (Inch)
1/4	3/64
3/8	5/64
1/2	7/64
5/8	9/64
3/4	5/32
7/8	11/64
1	3/16
1 1/8	7/32
1 1/4	1/4
1 3/8	9/32
1 1/2	5/16
1 3/4	11/32

WARNING

ALWAYS check Rated Capacity tags on lifting chains before use. **DO NOT** use chains with missing or illegible Rated Capacity tags. **ALWAYS** make sure the rated capacity of the lifting equipment is sufficient for the load being lifted.

Sling Inspection

The Occupational Safety and Health Administration (OSHA) Regulation 29 CFR Part 1926.251 (e)(8) — *Removal from service* requires that lifting slings be inspected prior to each use, and **removed from service immediately** if any of the conditions listed in Table B are found.

Table B. Conditions for Removal of Lifting Slings from Service	
■ Holes, tears, cuts, or snags ■ Embedded particles ■ Abrasive wear that exposes core fibers	
■ Missing or unreadable Rated Capacity tags ■ Melting, charring, weld spatter, or chemical burns	
■ Broken or worn stitching that exposes the core fibers	
■ Knots	
■ Any other condition which may cause doubt as to the strength of the sling	

LIFTING PROCEDURE

Use the correct lifting slings or chains for the weight of your buggy in accordance with Occupational Safety and Health Administration (OSHA) Regulation 29 CFR Part 1926.251 — *Rigging equipment for material handling*.

⚠ WARNING

ALWAYS inspect the lifting equipment (slings, chains, etc.) **before each use**.

NOTICE

MAKE SURE the lifting device has adequate lifting capacity to lift the buggy.

1. Make sure the tub is completely empty. **DO NOT** lift while the tub is loaded.
2. Raise the tub as shown in Figure A.
3. Turn the engine **OFF**.
4. Place the foot plate in the **down** position.
5. Attach three lifting chains or nylon slings to the three lifting points shown in Figure A. Make sure the chains or slings are rated for a minimum load capacity of 2,600 pounds (1,180 kg).
6. Adjust slack in the chains or straps so that the buggy will remain level when lifted.
7. Lift the buggy using an appropriate crane or equivalent lifting device capable of lifting a minimum of 2,600 pounds (1,180 kg).

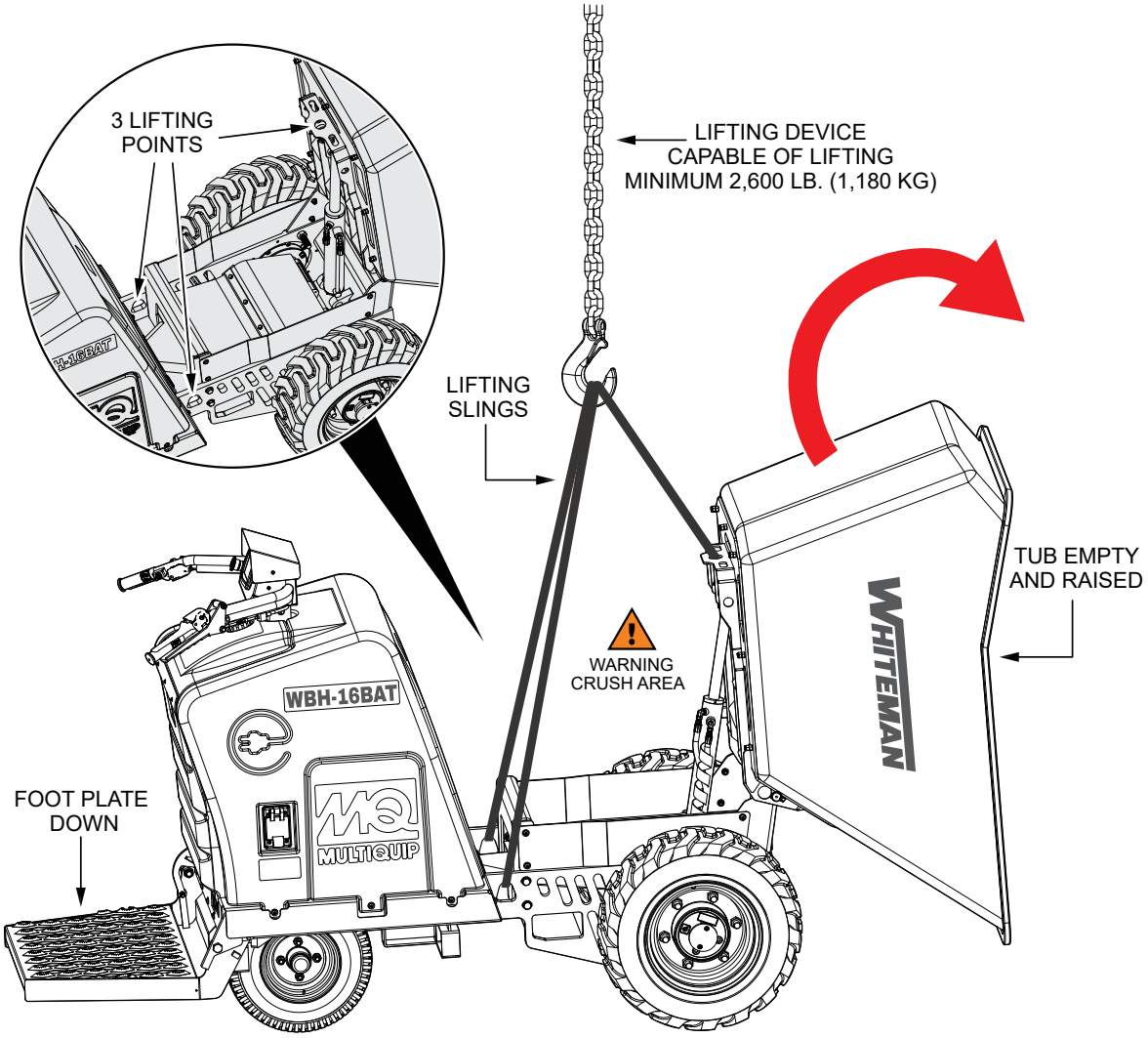
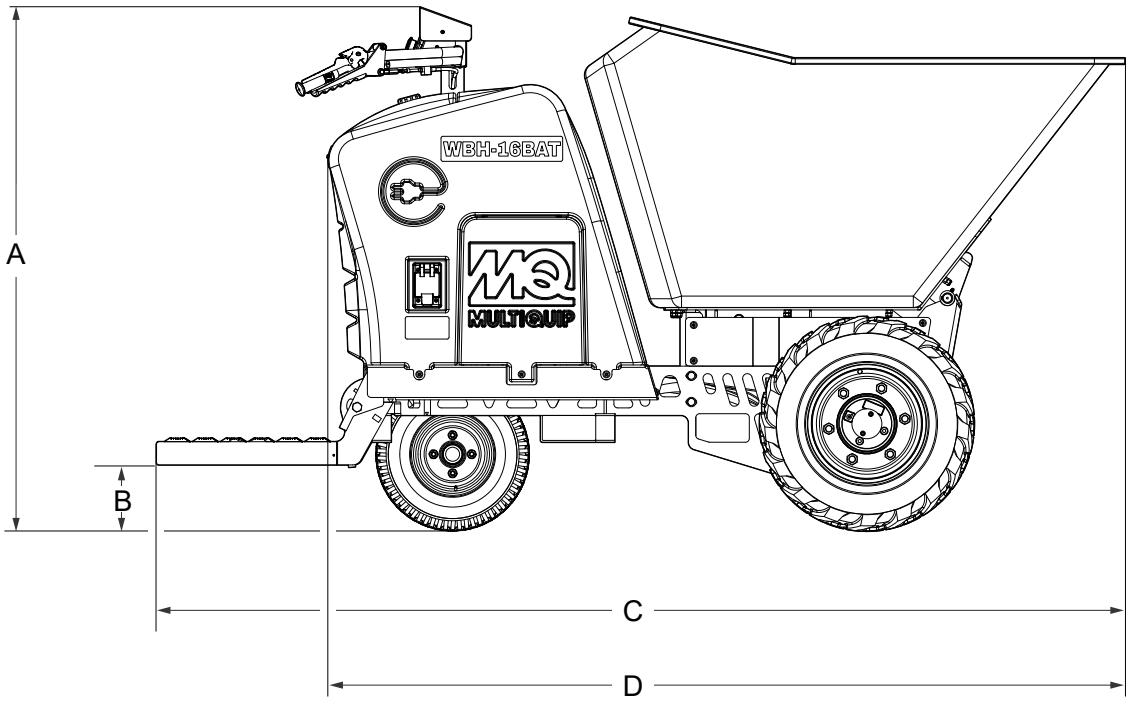


Figure A. Lifting Procedure

Table 1. Specifications (Power Buggy)	
Models	WBH-16BAT
Payload	2,500 lbs. (1,134 kg)
Weight (Empty)	1,475 lbs. (669 kg.)
Bucket/Tub Capacity	16 cu. ft. (.59 cu. yd.)
Bucket/Tub Material	Polyethylene
Drive	Electric
Speed	low - 0 to 3.0 mph (0 to 4.83 km/h) high - 0 to 6.0 mph (0 to 9.65 km/h)
Steering	Handle Bars To Rear Wheels
Parking Brake (Drive Wheels)	Electric
Dump Control	Hydraulic Dump and Return
Dump Angle	88°
Discharge Height	8.0 in. (203.2 mm)
Ground Clearance	4.5 in. (114.3 mm)
Gradeability	6° or 10%
Drive Motor	Highly-efficient dual electric drive motors
Foam Filled Tires (Front Wheels)	23-8.50 x 12 inch implement 6 ply
Foam Filled Tires (Steering)	4.9-8 x 4 Knobby
Run Time	Full load continuous operation - 6.5 hours Typical - 8 hours
Monitor	4.3 inch digital color display

Table 2. Specifications (Battery)	
Model	Vanguard
Type	48 V, 7 kWh, 134.6 Ah lithium-ion battery
Charge Time	8 hours - board battery charger 115 V 60 Hz works on 15 A conventional outlet
Charge Voltage	58.6 V
Nominal Voltage	51.7 V
Operating Temperature	-4° to 140° F
Warranty	8-year Vanguard Warranty

SIDE VIEW



REAR VIEW

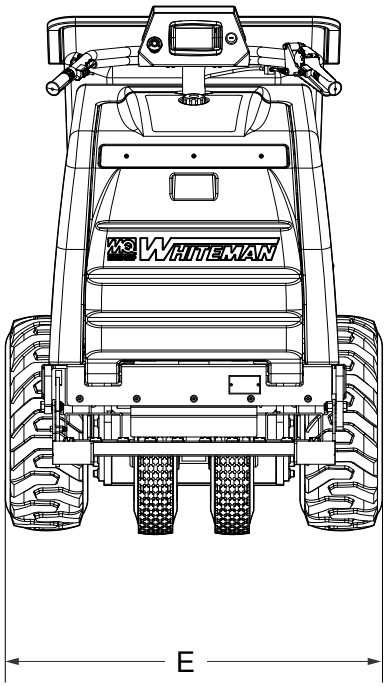


Table 3. Dimensions	
Reference Letter	Dimension in. (mm)
A	55.13 (1,400)
B	8.0 (203.2)
C	100.0 (2,540)
D	83.0 (2,108.2)
E	40.0 (1,016)

Figure 1. WBH16BAT Dimensions

The MQ Whiteman Power Buggy Model WBH-16BAT is a battery-powered machine that comes with zero emissions and ultra-quiet operation, making it the go-to solution for interior demolition and environmentally sensitive job sites.

Designed for non-stop performance, it has 8-hours of battery life and a 16 cu. ft. capacity payload to handle your toughest workloads with ease. Dual drive motors ensure superior traction and control, while the hydraulic dump system allows for quick, effortless unloading.

The WBH-16BAT delivers durability, with the added benefit of cleaner, quieter, and sustainable performance.

The WBH-16BAT features:

- A long-lasting Vanguard 48V 7kWh lithium-ion battery which offers up to 8-hours of run time
- Dual drive motors for superior traction, efficiency, and performance
- Convenient, user-friendly 4.3-inch digital display monitor to keep operators informed
- Onboard battery charger
- Travel speeds up to 6 mph for faster job site movement
- 16 cu. ft. polyethylene tub with a robust 2,500 lb payload capacity
- Hydraulic dump system with a rapid 7.42-second discharge and retract cycle
- 88-degree dump angle for complete material clearing

⚠ CAUTION

DO NOT attempt to operate the power buggy until the Safety Information, General Information, and Inspection section of this manual have been ***read and thoroughly understood.***

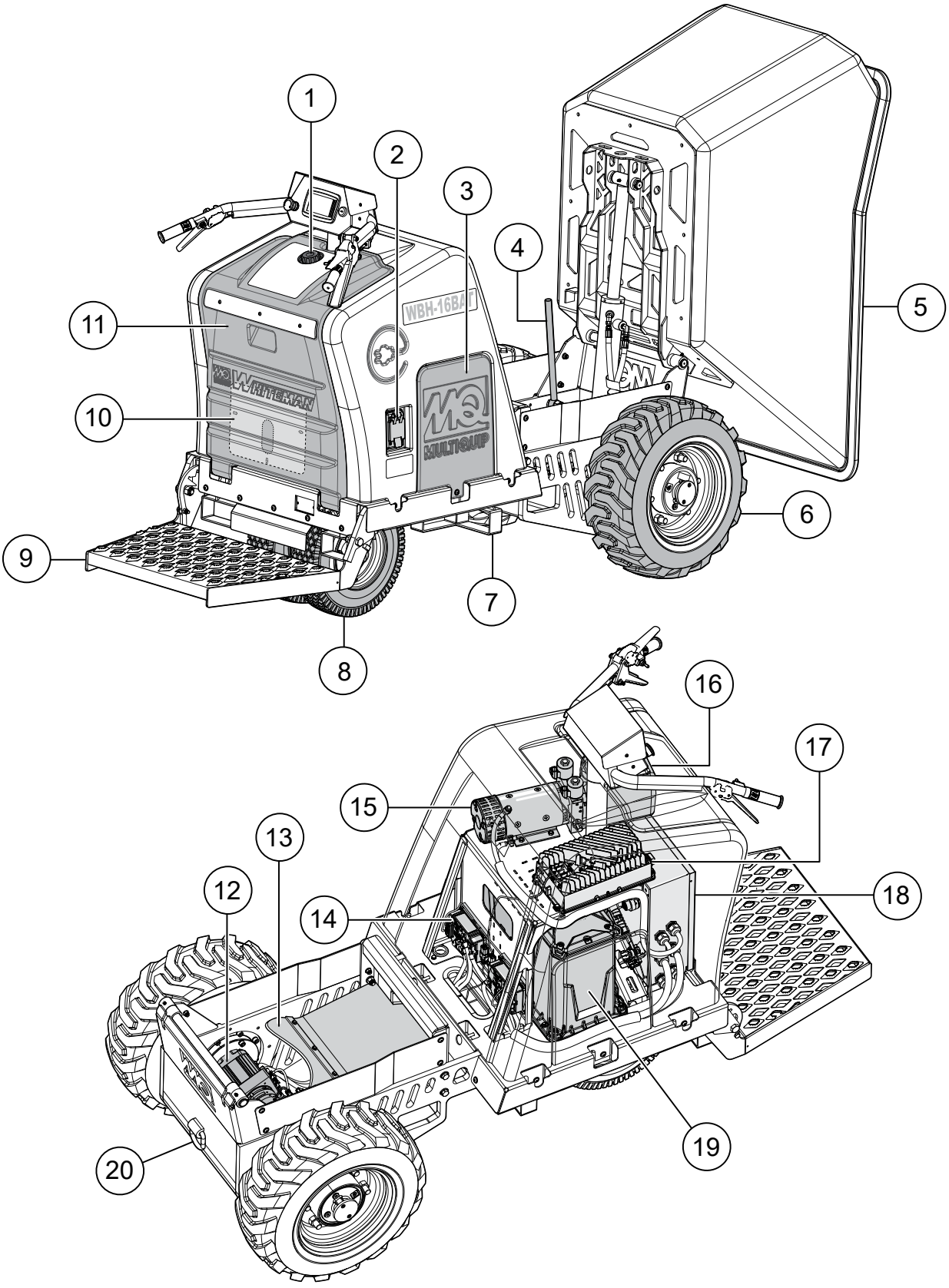


Figure 2. WBH16BAT Power Buggy Components

1. **Access Knob** — Turn counterclockwise to unlock the access cover of the machine.
2. **Battery Charger Connector** — Plugs to a 120 VAC, 15 amp outlet to start battery charging.
3. **Battery Access** — Gives access to battery for connection and maintenance.
4. **Safety Latch** — Holds the tub in place when in vertical position to prevent tub from moving.
5. **Tub or Bucket** — Used for the transportation of material. Tub holds approximately 16 cubic feet (0.59 cubic yards) of various materials.
6. **Front Tires** — Foam-filled tires for front wheels.
7. **Forklift Pockets** — Use these fork lift pockets to lift the power buggy with a forklift. Remember to insert the forks of the fork lift a minimum of 24 inches (610 mm) into power buggy's fork lift pockets.
8. **Rear Tires** — Foam-filled rear tires for steering.
9. **Operator Platform** — When the buggy is in use, the operator shall ALWAYS stand on this platform while holding onto the handle bar (steering).
10. **Documentation Pocket** — Store and maintain Operation and Parts manuals in this pocket at all times.
11. **Access Cover** — Allows access to the manuals, battery charger and hydraulic tank and to the rear panel cover.
12. **Electric Motor** — Runs the machine.
13. **Rubber Flaps** — Covers the electric motors to prevent debris and excess cement from causing damage.
14. **Inverter**— Inverts 48 VDC to 48 VAC to operate electric motors.
15. **Hydraulic Power Pack**— Self-contained system that generates hydraulic power to lift tub.
16. **Hydraulic Tank/Cap** — Remove this cap to add hydraulic oil up to the designated limit. **DO NOT** over fill.
17. **Battery Charger** — Charges the battery when plugged into a 120VAC power outlet.
18. **Electrical System Panel** — Remove 2 screws holding the panel to access the electrical system.
19. **Battery** — Powers the buggy. Always use gloves and eye protection when handling the battery.
20. **Towing Hook** — Use this hook to tow the buggy if it gets stuck. This hook is **NOT** intended for towing the buggy on public roads at high speeds.

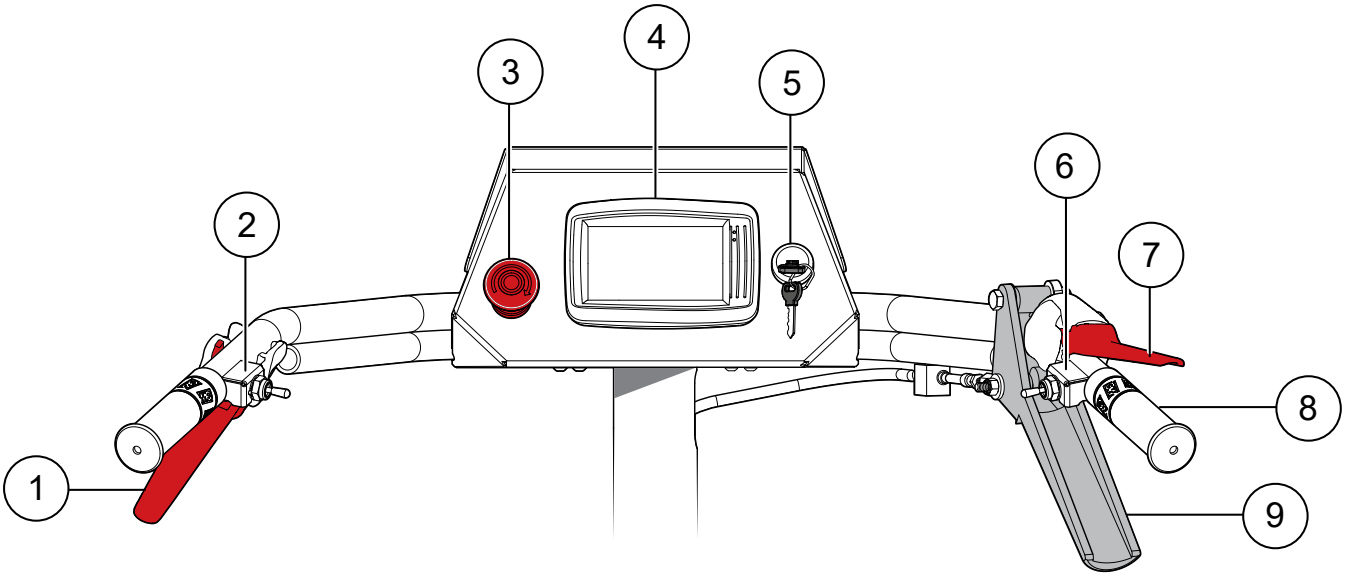


Figure 3. Handle Components

1. **Reverse Control Lever** — In combination with travel and deadman lever, moves the buggy in reverse direction
2. **Dump Control Switch** — Push switch upward to place the tub in the dump position (vertical). Push the switch downward to return the tub to travel position (horizontal).
3. **Emergency Stop Switch** — In the event of an emergency, press this button to stop the machine.
4. **Digital Display** — Keeps operator informed of battery charge, hours, speed, tub position,drive status, and faults while machine is in operation.
5. **Ignition Switch** — Starts the machine and enables the digital display.
6. **High/Low Speed Switch** — Selects desired speed. Switch down for low (0 to 3mph) and up for high speed (0 to 6 mph).
7. **Deadman Lever** — Used with travel and reverse levers to move buggy. When released, machine stops immediately.
8. **Handle Bar (Steering)** — This handle bar is used to steer the buggy. When driving the buggy, use both hands and hold onto both handle bar grips.
9. **Speed Control Lever** — When the lever is pressed with the deadman lever, the buggy will travel in the forward direction.The harder travel lever is pressed, the faster the speed is (within the selected speed range).

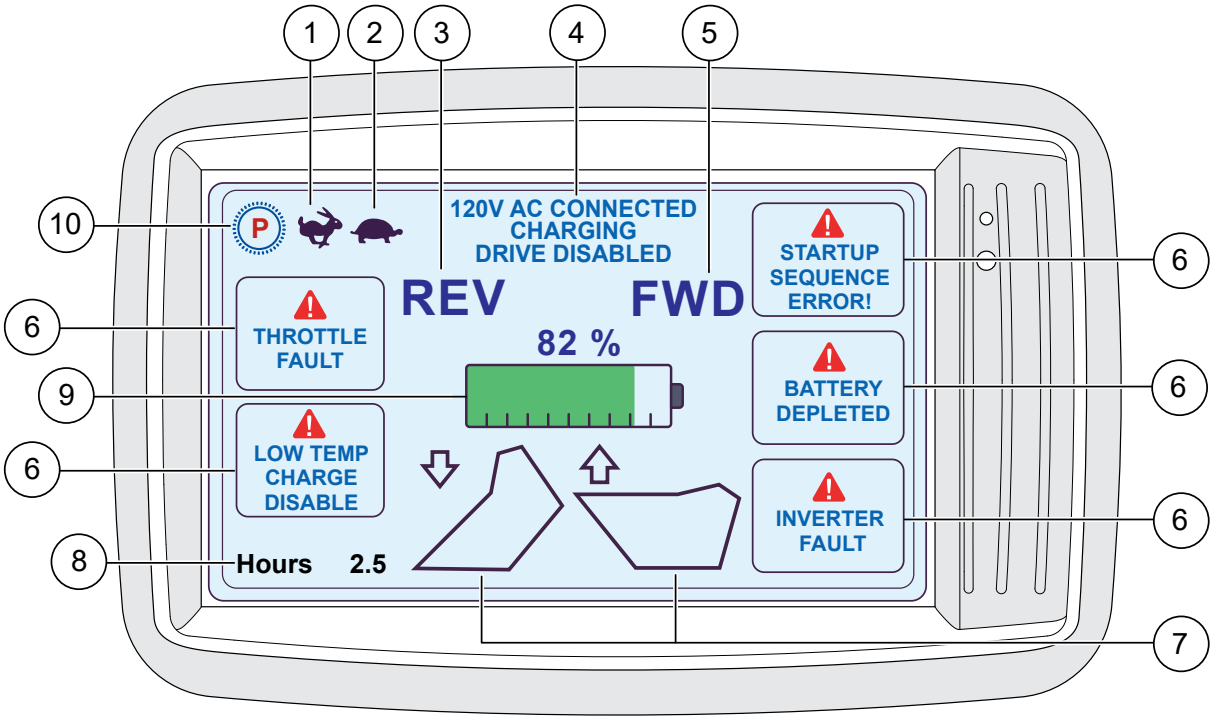


Figure 4. Handle-Mounted Digital Display

The 4.3-inch digital display (Figure 4) shows the following status, indicators, and icons when applicable:

1. **High Speed Indicator** —.Indicates that the buggy is set at fast speed mode (0 to 6 mph).
2. **Low Speed Indicator** —.Indicates that the buggy is set at slow speed mode (0 to 3 mph).
3. **REV Indicator** — Indicates that the buggy is in the reverse mode.
4. **Status Information** — Indicates the status of the machine.
5. **FWD Indicator** — Indicates that the buggy is in the forward mode.
6. **Error Message Display** — When lighted, indicated error should be addressed.
7. **Tub Dump/Retract Icon** — Indicates the position of the tub, whether dump or retract.
8. **Machine Hours** — Indicates the total number of hours that the buggy has been in operation.
9. **Battery Charge Status** — Shows the percentage of battery charge available.
10. **Parking Brake Icon** — When lit, indicates that the parking brake is on.

BEFORE STARTING

1. Read all safety instructions at the beginning of manual.
2. Clean the unit, removing dirt and dust.
3. Check fastening nuts and bolts for tightness.

BATTERY CONNECTION

1. **ALWAYS** be sure the battery cables (Figure 5) are properly connected to the battery terminals as shown below. Make sure bolts are torqued to 4 -5 ft lbs.

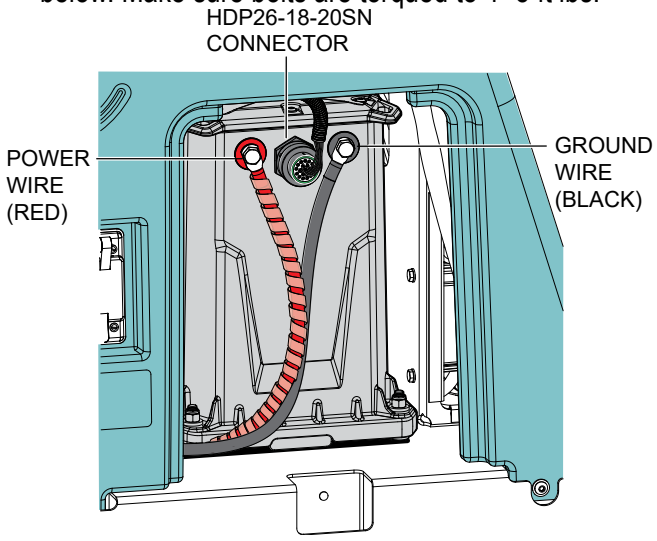


Figure 5. Battery Connections

When connecting battery do the following:

1. **NEVER** connect the battery cables to the battery terminals when the ignition is in the **ON** position.
2. **DO NOT** overtighten cable connections. This could damage internal circuitry. Bolts should be torqued to 4-5 ft lb.

BATTERY CHARGE

1. Make sure that battery is fully charged by checking display.
2. If battery charge is low, charge battery before using machine. See Maintenance section for procedure.

PARKING BRAKE CHECK

1. Check the brakes by turning off the machine.
2. Inspect for any movement that indicates brake is not working properly.

STEERING CHECK

1. Check and make sure that the power buggy's steering turns freely and that there is no binding.
2. Make sure that the zerk fitting for the steering has been lubricated.

DUMP CYLINDER CHECK

1. Check the power buggy's dump cylinder as outlined in the operation section of this manual.
2. Make sure that both zerk fittings for the dump cylinder have been lubricated.

HYDRAULIC OIL CHECK

1. Ensure the tub is fully retracted prior to checking oil level. Oil level is decreased as tub cylinder is extended.
2. Visually check the hydraulic oil level (Figure 6). Hydraulic oil should be at marked level on container or higher.

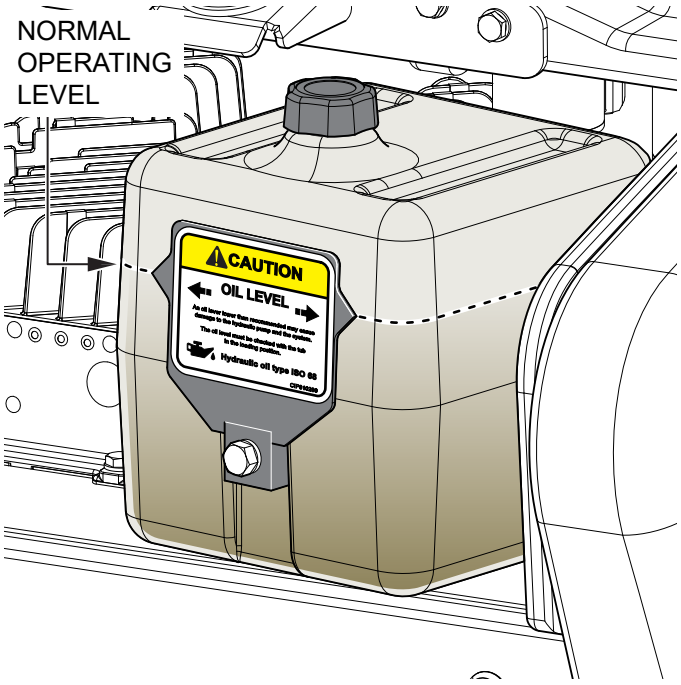


Figure 6. Hydraulic Oil Check

3. If the hydraulic oil is low, add enough hydraulic oil (Type ISO 68) to bring oil level to a normal safe operating level. See Maintenance section for procedure.

CAUTION

DO NOT attempt to operate the power buggy until the Safety Information, General Information, and Inspection sections of this manual have been ***read and thoroughly understood.***

STARTING

The following steps outline the procedure for starting the electric power buggy.

1. Located to the left of the digital control, is the ***emergency stop*** switch (Figure 7). Pull this button outward to enable starting of the electric motor.

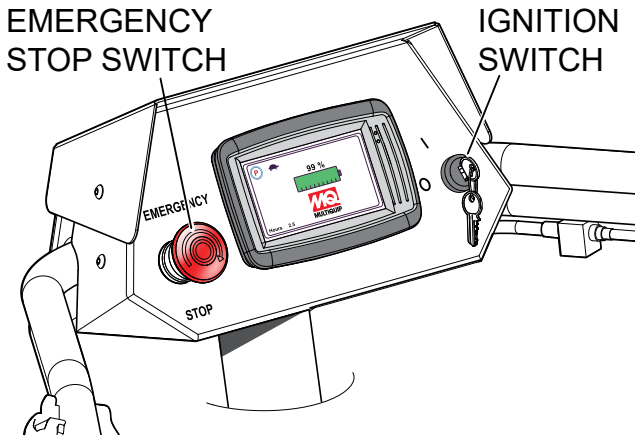


Figure 7. Emergency Stop Switch and Ignition Key

2. Place the ignition key (Figure 7) in the **ON** position. Verify that the digital display turns on. Check battery charge level on the display (See Figure 8 for different levels and color of indicator). See Table 5 for battery level indicators.

Table 5. Battery Charge Level	
% Charge	Battery Indicator Color
21 to 100	Green
11 to 20	Yellow
5 to 10	Red
4 and lower	Red ("low battery, speed reduced" appears on screen)

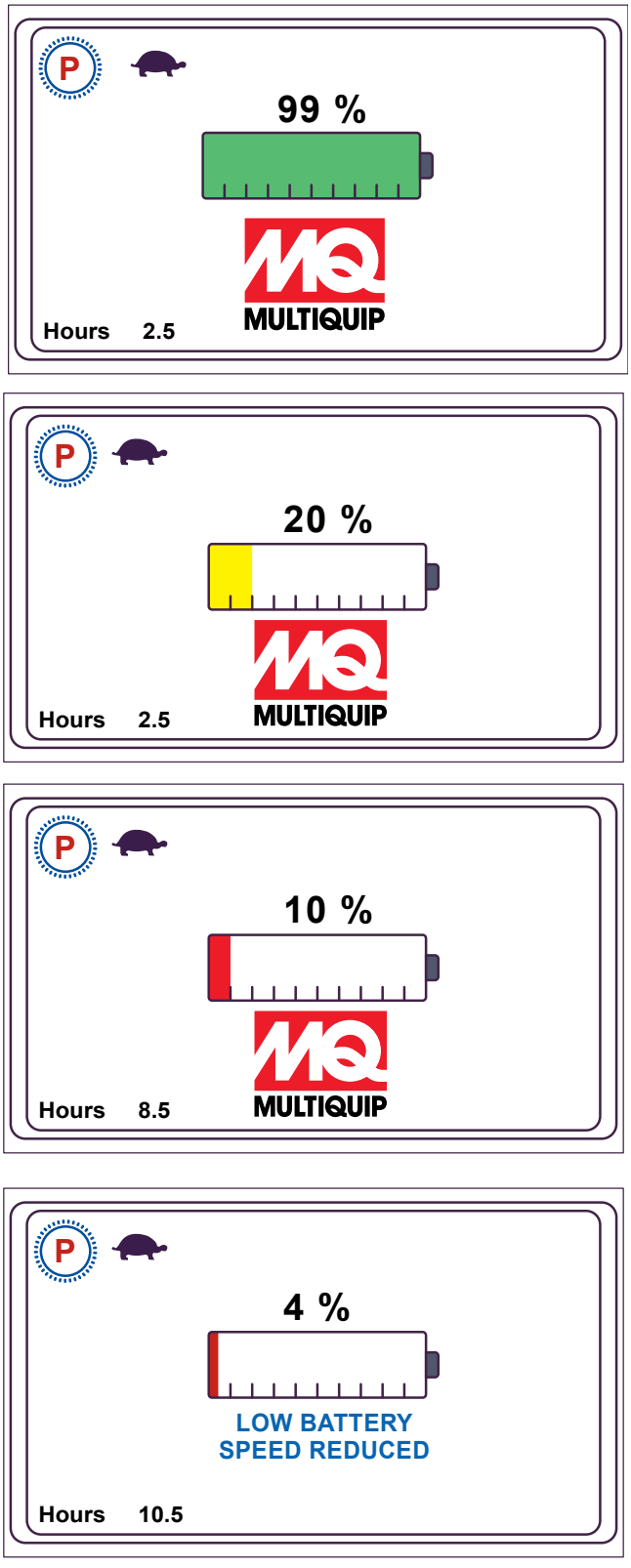


Figure 8. Battery Charge Display

3. If charge is low, recharge battery.

4. Select the speed range desired with the speed switch (Figure 9). Select low speed (0 to 3.0 mph) or high speed (0 to 6 mph).

⚠ WARNING

For safety, first-time operators should use turtle mode (3 mph). Always use turtle mode when operating in tight spaces or turning corners to maintain control and avoid accidents

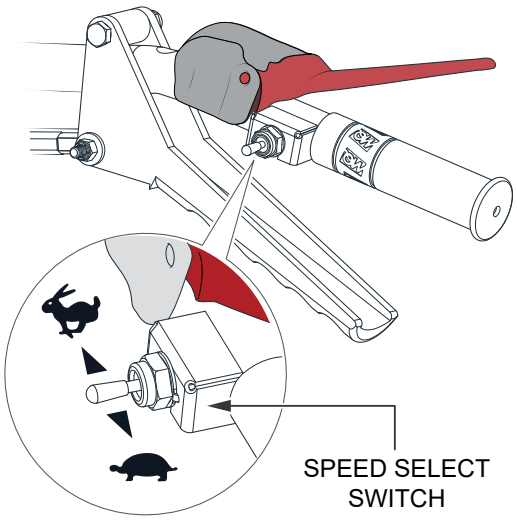


Figure 9. Selecting Speed

TRAVELING

5. With the machine running, fully squeeze the **RED** deadman lever (Figure 10) and hold down. When the lever is held down, a signal is sent to the motor controller to release the brake.

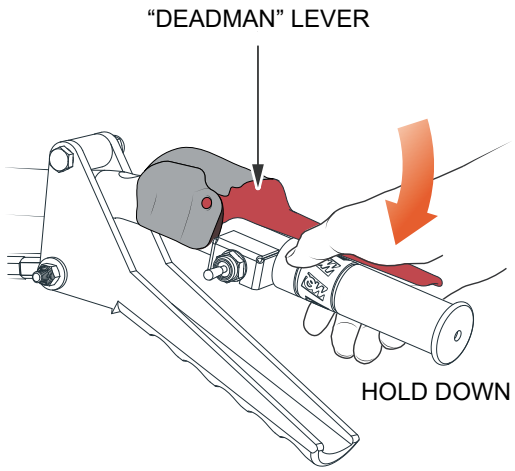


Figure 10. Deadman Lever

6. While keeping the deadman lever squeezed, slightly squeeze the speed control lever (Figure 11) until the buggy begins to move in a ***forward*** direction.

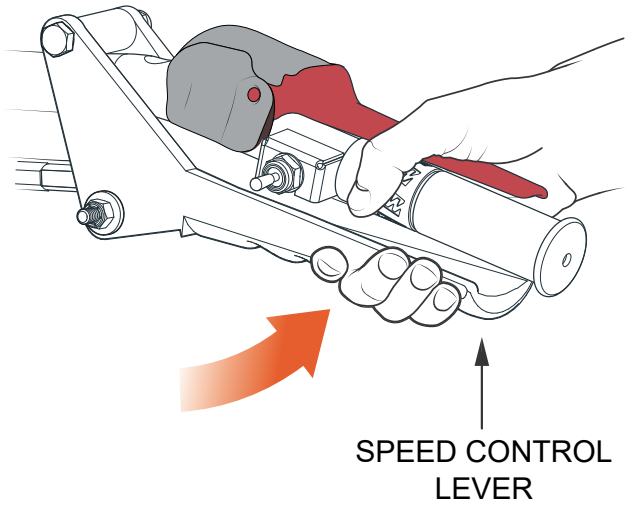


Figure 11. Speed Control Lever

7. On the opposite side of the handle bar is the reverse control lever. Squeeze the ***reverse*** control lever (Figure 12) and hold down.

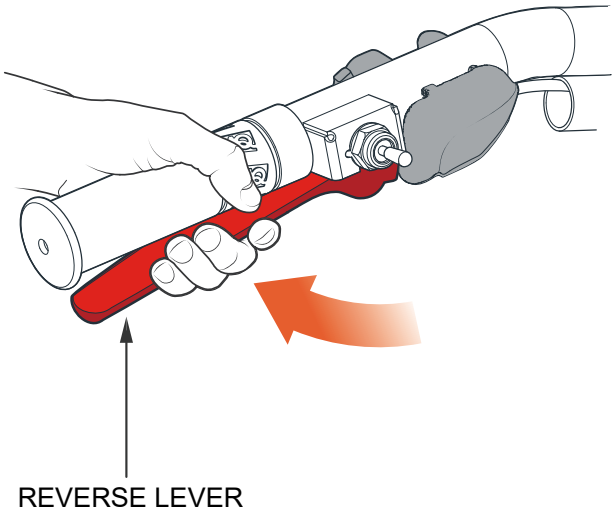


Figure 12. Reverse Control Lever

8. Slightly squeeze the speed control lever (Figure 11) until the buggy begins to move in a ***reverse*** direction.

STEERING

To steer the buggy, use the handle bar in front of the operator platform.

1. To turn left when traveling in the forward direction, turn the handle bar clockwise (Figure 13).

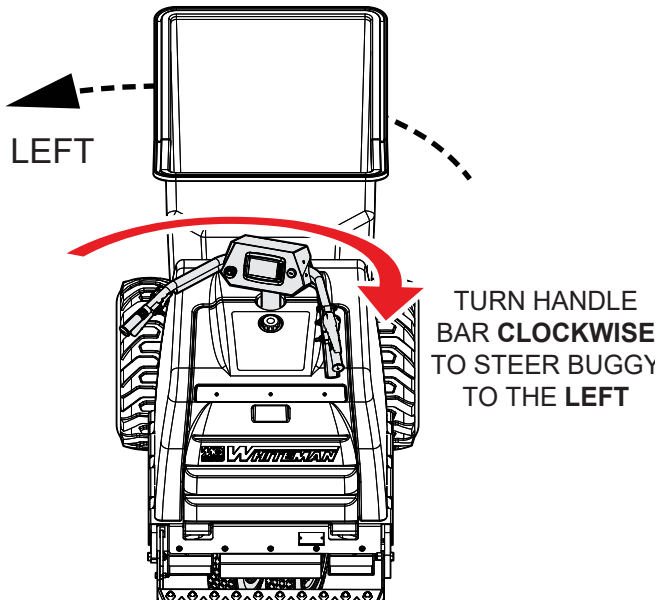


Figure 13. Steering the Buggy to the Left

2. To turn right when traveling in the forward direction, turn the handle bar in the counterclockwise direction (Figure 14).

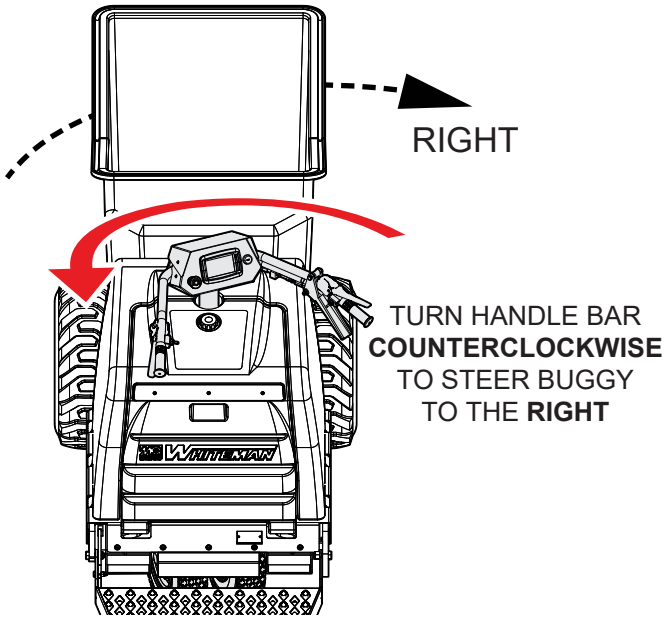


Figure 14. Steering the Buggy to the Right

CAUTION

Avoid sudden and quick turns. When steering, turn the handle bar slowly. Always face the controls when traveling.

TRAVELING ON A SLOPE

1. When traveling on a slope, it is necessary to determine the grade of the path. The WBH16BAT can travel up, down on a maximum grade of 10% (6°). **DO NOT** travel on steeper slopes.

   To determine the % grade of your path of travel, use the formula and graph in Figure 15.

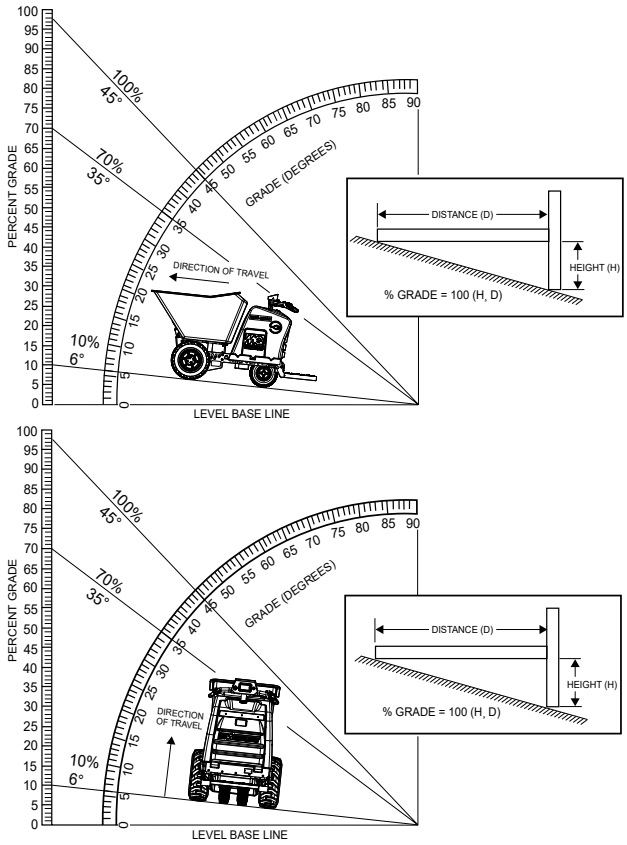


Figure 15. Determining Grade of Slope

NOTICE

When traveling on slopes with a loaded tub, ensure the tub is positioned on the ***uphill*** end of the buggy, and the operator is on the ***downhill*** end of the buggy (Figure 16).

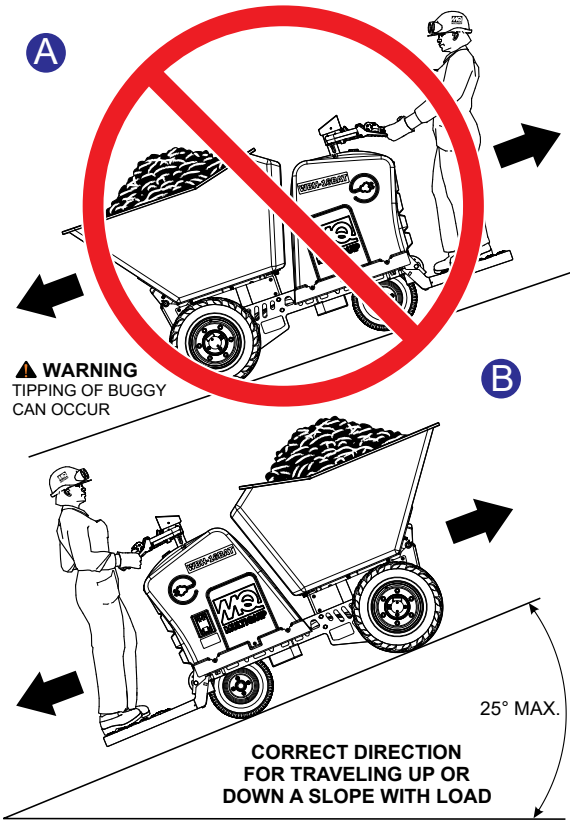


Figure 16. Slope Travel Direction

⚠ CAUTION

DO NOT steer the buggy left or right when traveling up or down on a grade. Travel in a straight path.

TUB (BUCKET) DUMPING

The tub can be controlled by the dump switch.

1. To place the tub in the dump (vertical) position (Figure 17), push the dump switch upward. The tub will move to the vertical position as long as switch is in the upward position.

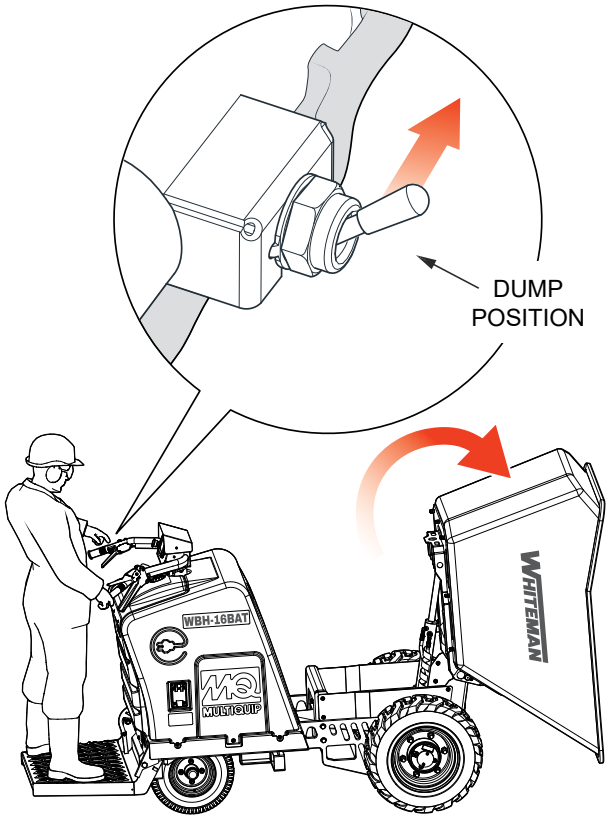


Figure 17. Vertical Tub Position

NOTICE

DO NOT activate dump mechanism (tub/bucket) if buggy is facing down hill. The possibility exist of the buggy tipping over causing equipment damage and severe bodily harm.

NOTICE

Pushing the dump switch downward dump control lever or pedal) before dump is completed, will cause the tub to return to the horizontal position.

2. To return the tub to the travel (horizontal) position (Figure 18), push the dump switch downward.

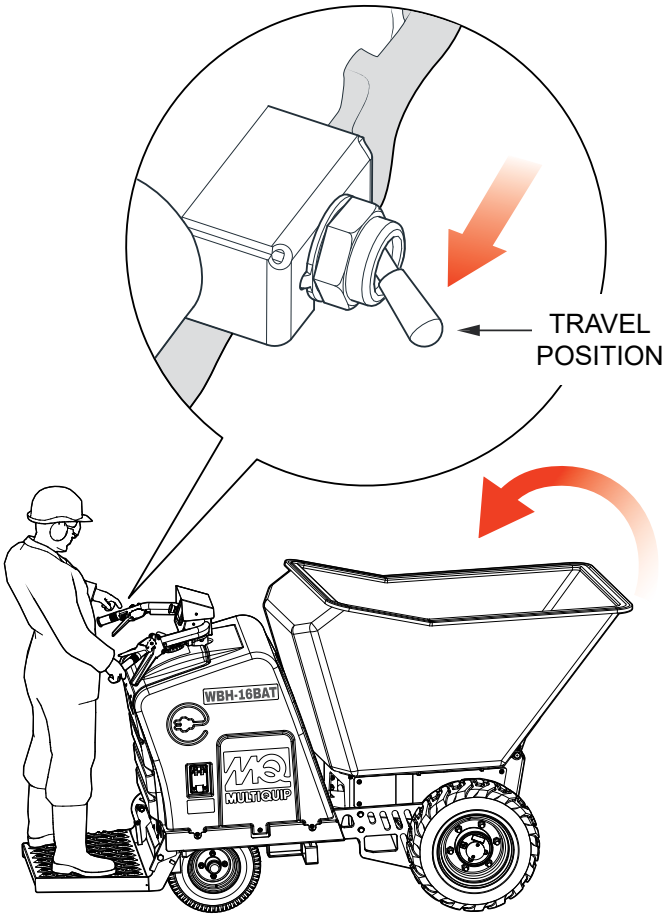


Figure 18. Horizontal Tub Position

SHUTDOWN (NORMAL)

Correct shutdown is important to safe operation. Follow these general steps:

1. Come to a full stop.
2. Place the speed switch in the slow position.
3. Place the ignition switch key in the **OFF** position.
4. Remove ignition key.
5. Block wheels if on a slope or incline.

EMERGENCY SHUTDOWN

This power buggy is equipped with an emergency stop switch. This switch is located on the left side of the digital display.

1. Push the emergency stop switch inward (Figure 19) and listen for the machine to stop.

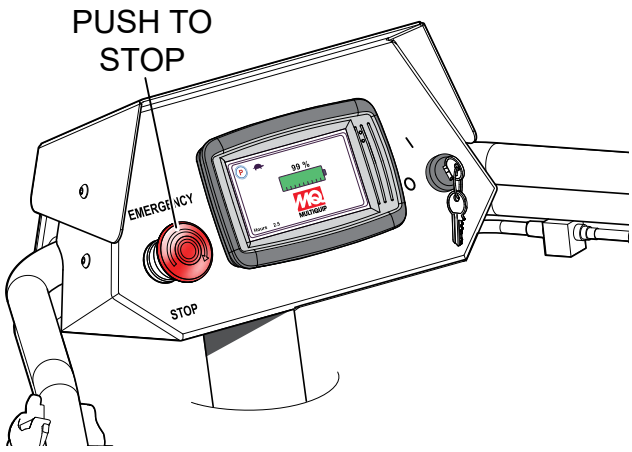


Figure 19. Emergency Stop Switch

2. Place the ignition switch key in the **OFF** position.

Table 6. Power Buggy Maintenance Schedule								
Check Item	OPERATION	DAILY	Periodic Maintenance Interval					
			Every 25 Hrs	Every 50 Hrs	Every 100-125 Hrs	Every 200 Hrs	Every 500 Hrs	Every 4000 Hrs
Dump Cylinder	Grease		X					
Steering Bearing Flange	Grease		X					
Tub Bearing Pivot Block	Grease		X					
Tub	Clean	X			X			
Tub For Cracks/Deformations	Check			X				
Tires For Severe Cuts/Wear	Check	X						
Hydraulic Oil Level	Check	X				X		
Hydraulic Oil	Replace						X	
Front Wheel GEAC Motors	Check						X	
Front Wheel GEAC Motors	Replace							X
Hydraulic Oil System	Check	X			1st time	X		
Brakes	Check	X						
Fasteners	Check	X						

When performing any maintenance on the power buggy, follow all safety messages and rules for safe operation stated at the beginning of this manual.

HYDRAULIC OIL FILLING

1. To gain access to the hydraulic tank, turn the access knob counterclockwise. The access cover can now be easily opened (Figure 20).

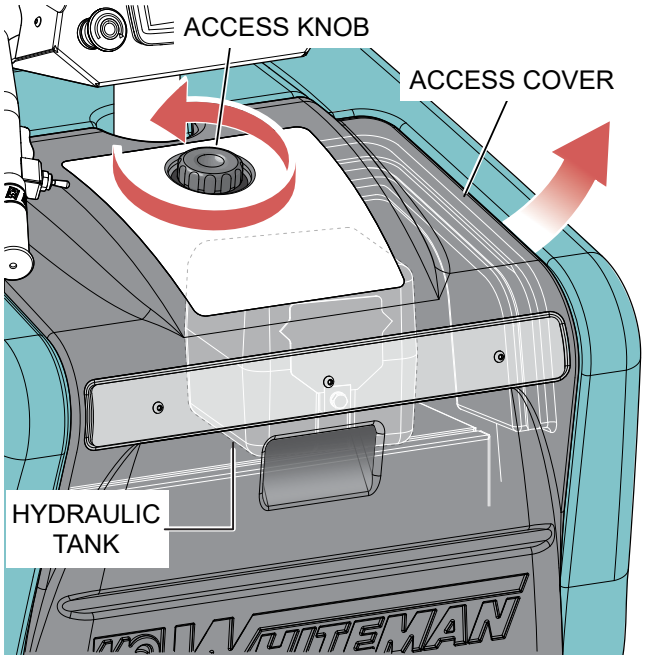


Figure 20. Accessing Hydraulic Tank

2. Check the hydraulic oil level marked on the hydraulic oil tank (Figure 21).

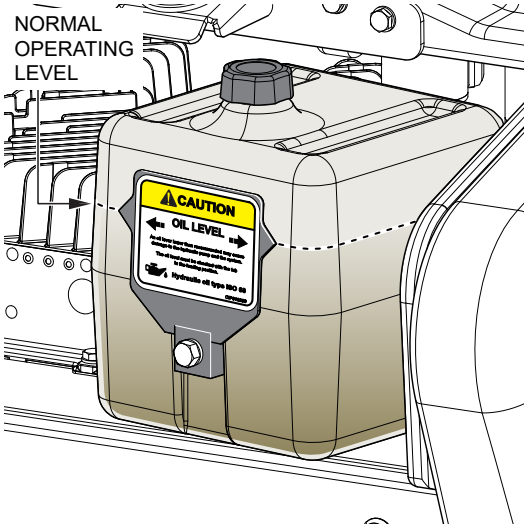


Figure 21. Hydraulic Oil Level

3. If the hydraulic oil level is low, fill to the proper level with type ISO 68 oil (Figure 22).

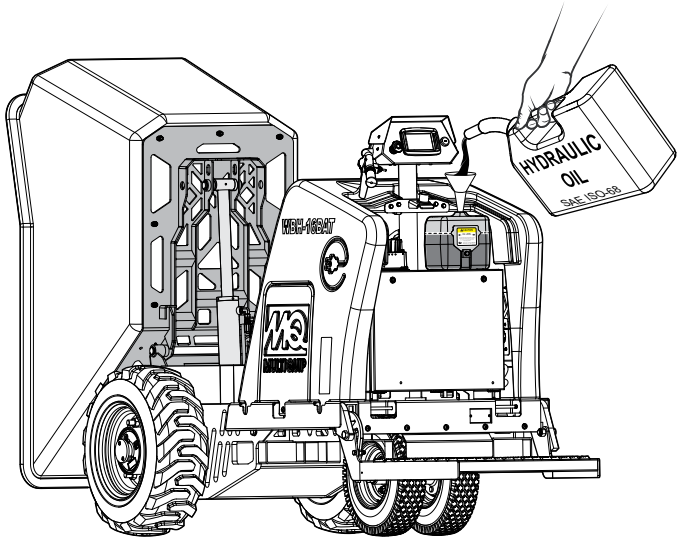


Figure 22. Hydraulic Oil Fill

HYDRAULIC OIL REPLACEMENT

Replace hydraulic oil after every 500 hours of operation.

1. Use oil suction gun to extract oil from reservoir (Figure 23).

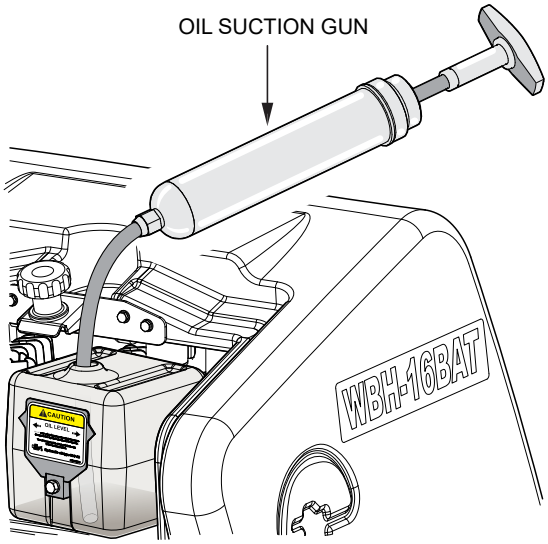


Figure 23. Extracting Used oil

2. Fill the reservoir to level line while the cylinder (tub) is retracted (Figure 24).

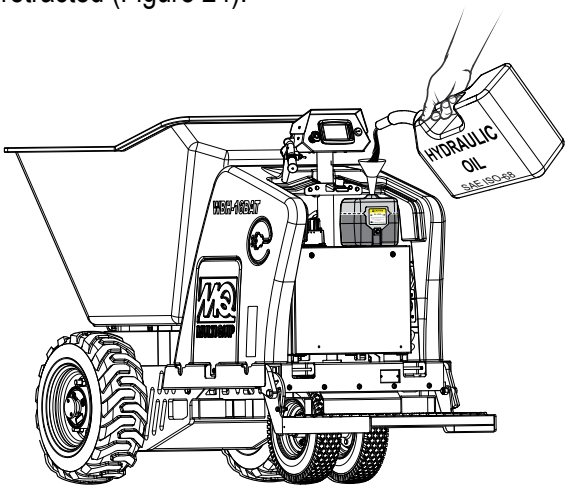


Figure 24. Filling Oil to Level Line

3. Activate the dump cylinder in short increments while increasing the length with each successive stroke (Figure 25). Retract the tub, and inspect the oil level.

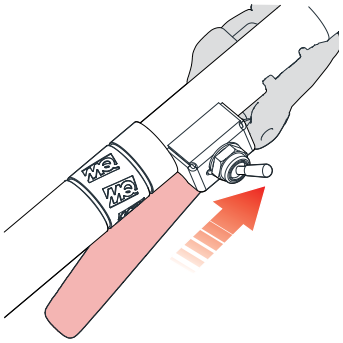


Figure 25. Activating Dump Cylinder

CHASSIS LUBRICATION

This power buggy is equipped with ***five*** zerk fittings (Figure 26). Lubricate these zerk fittings each day before operating the buggy.

1. Lubricate with high grade chassis lubricant at all lubricating points listed below:
   - Dump Cylinder Pivots - Two zerk fittings
   - Tub Bearing Pivot Blocks (Underside of Tub) - Two zerk fittings.
   - Steering Bearing Flange (Front Side of Handle Bar) - One zerk fitting.
2. Remove rear wheel hubs and repack bearings after every 400 hours of operation.

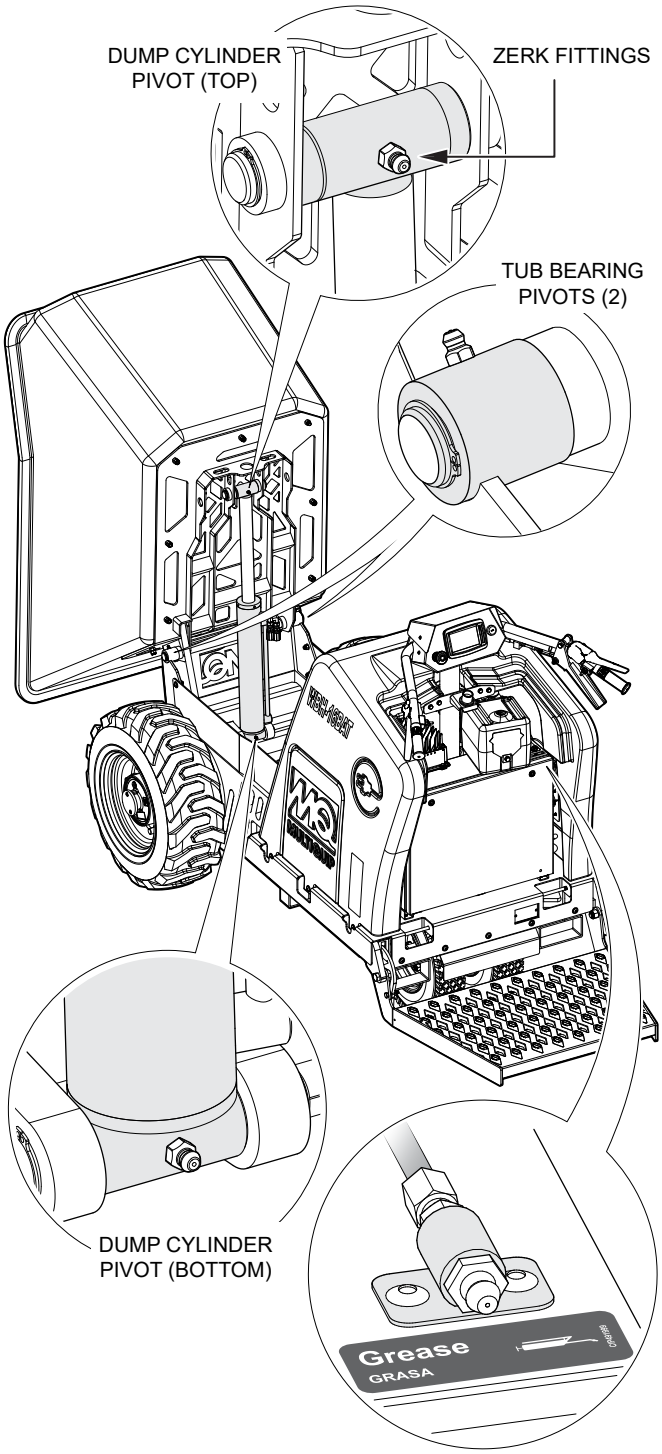


Figure 26. Lubrication Points

TIRES/WHEELS/LUG NUTS

Tires and wheels are very important and critical components of the buggy. When specifying or replacing the wheels, it is important that the wheels, tires, and axle are properly matched.

⚠ CAUTION

DO NOT attempt to repair or modify a wheel. If the rim is cracked, replace the rim immediately and inspect the tire for cuts, wear and deformations.

TIRE WEAR

The tires (Figure 27) used on this power buggy are foam filled and therefore do not have to be inflated. However the tires should be inspected for cuts, wear and deformity.

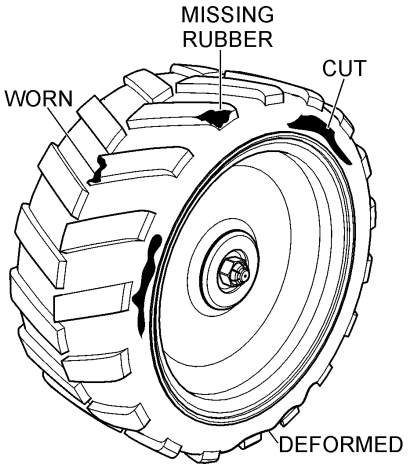


Figure 27. Tire Inspection

LUG NUT TORQUE REQUIREMENTS

It is extremely important to apply and maintain proper wheel mounting torque on the buggy. Be sure to use only the fasteners matched to the cone angle of the wheel. Proper procedure for attachment of the wheels is as follows:

1. Start all wheel lug nuts by hand.
2. Torque all lug nuts (Figure 28) in sequence. **DO NOT** torque the wheel lug nuts all the way down. Tighten each lug nut in 3 separate passes as defined by Table 7.

Table 7. Tire Torque Requirements

Tire	Wheel Size	First Pass FT-LBS	Second Pass FT-LBS	Third Pass FT-LBS
Steering	480 x 8 in.	20-25	35-40	50-65
Drive	23 x 8.5 in	40-56	60-76	80-86

3. After first road use, retorque all lug nuts in sequence Check all wheel lug nuts periodically (Figure 28).

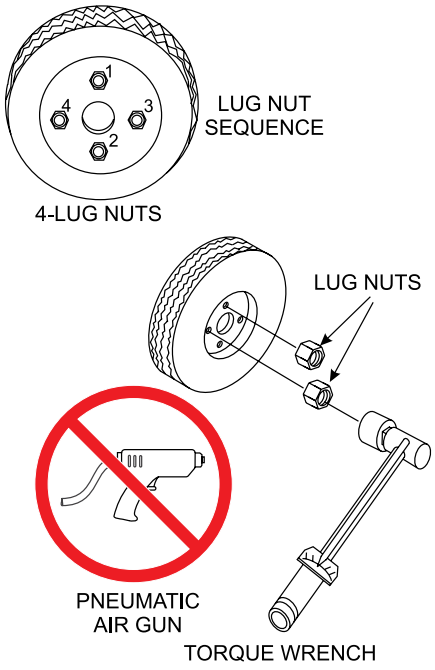


Figure 28. Lug Nut Torque Sequence

BATTERY REPLACEMENT

1. Turn off the ignition key and confirm that the digital display is off (Figure 29).

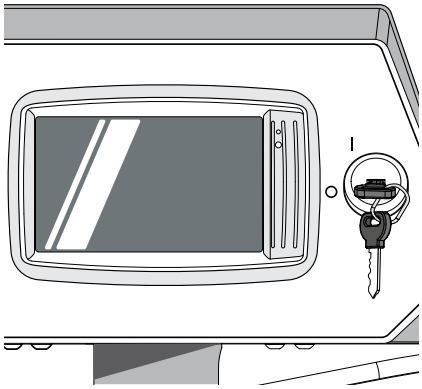


Figure 29. Turning off Machine

2. Remove the side doors of the buggy using a 3/16" allen wrench and a 1/2" wrench to remove the screws (Figure 30).

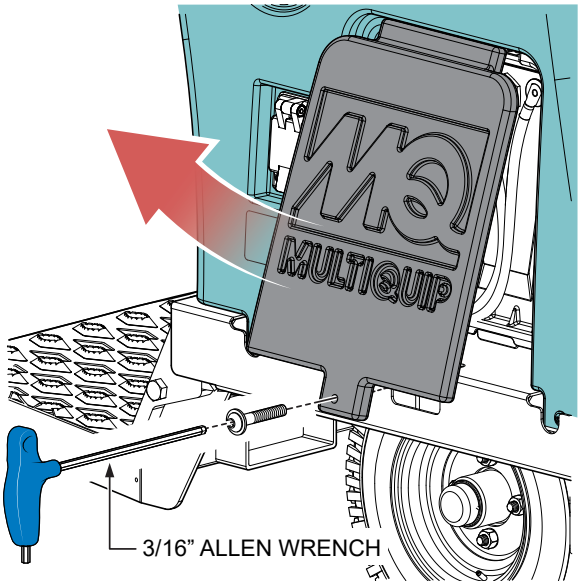


Figure 30. Removing Side Doors

3. Disconnect the HDP26-18-20SN connector by turning it counterclockwise (Figure 31).

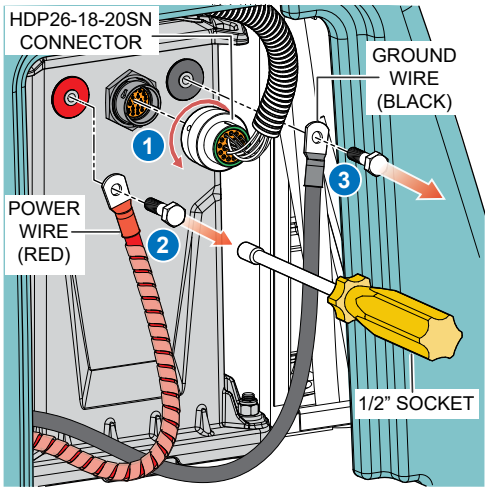


Figure 31. Disconnecting Old Battery

4. Remove the protective caps from the electrical terminals and unscrew the battery terminal screws.
5. Using a 1/2" socket disconnect the red power wire first, then the black ground wire second. Save the hardware.
6. Remove the 4 screws holding down the battery. Save the screws (Figure 32).

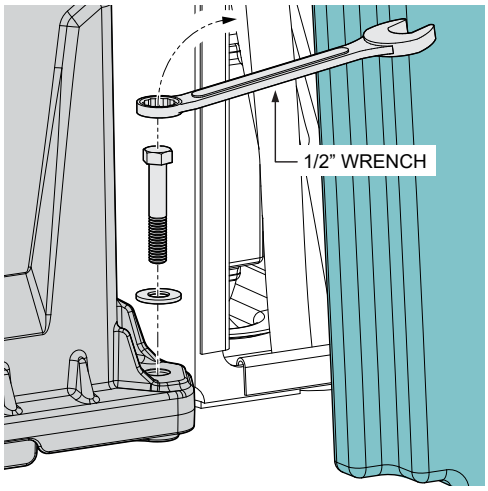


Figure 32. Detaching Old Battery

7. Slide the battery out in the direction of the battery terminals (Figure 33).

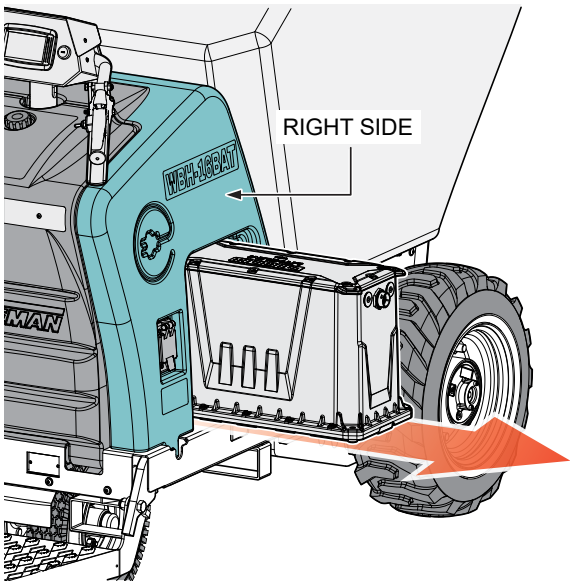


Figure 33. Removing Old Battery

8. Unpack the new battery and place it in the place where the old battery was removed (Figure 34).

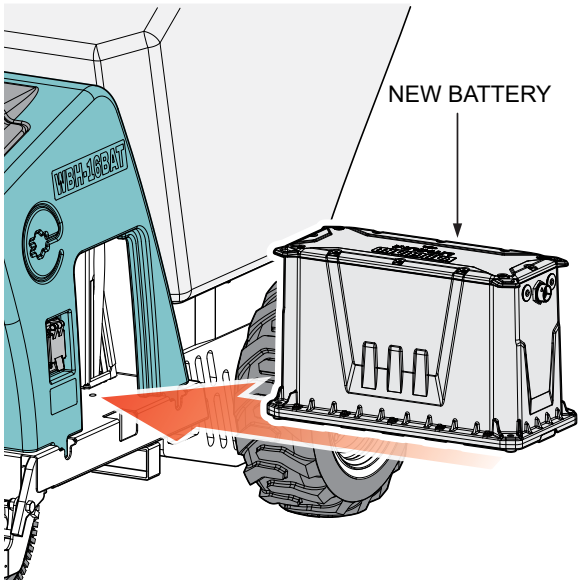


Figure 34. Replacing the Battery

9. Align the holes to insert the screws and tighten battery in place using the original screws (Figure 35).

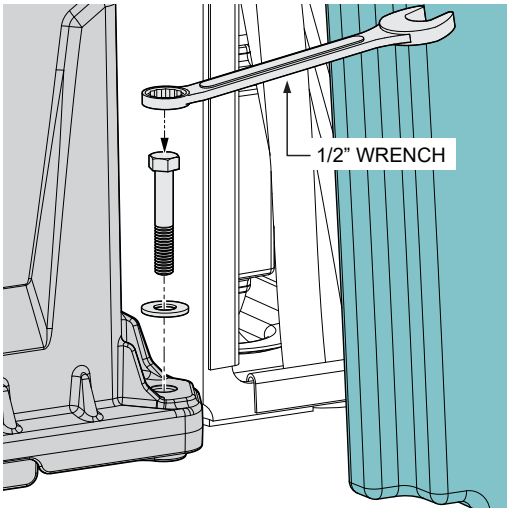


Figure 35. Attaching New Battery

10. Using a 1/2" socket connect the black ground wire first, then the red power wire second with the saved hardware (Figure 36).

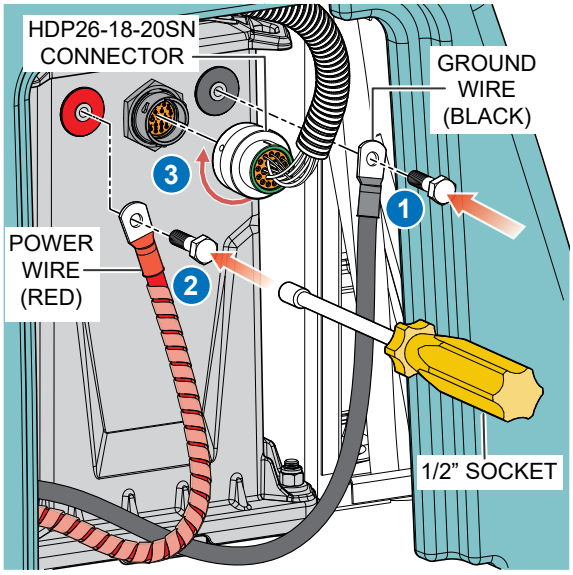


Figure 36. Connecting New Battery

11. Connect the HDP26-18-20SN connector by turning it clockwise.

12. Install the red and black protective caps to the red and black wires respectively (Figure 37).

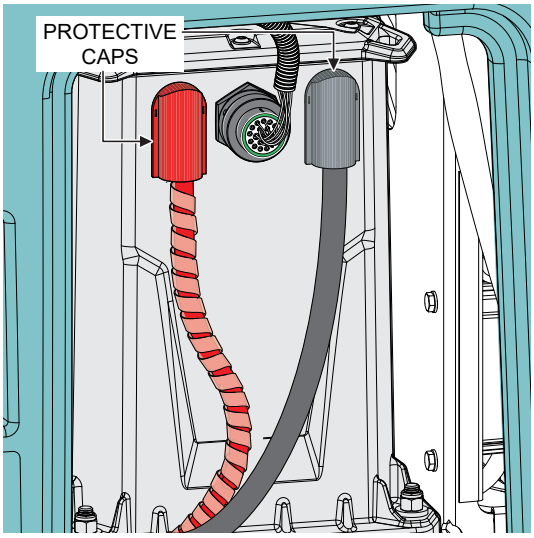


Figure 37. Installing Protective Caps

13. Turn on the ignition key and verify that the digital display shows the correct battery charge and verify that the operation is correct (Figure 38).

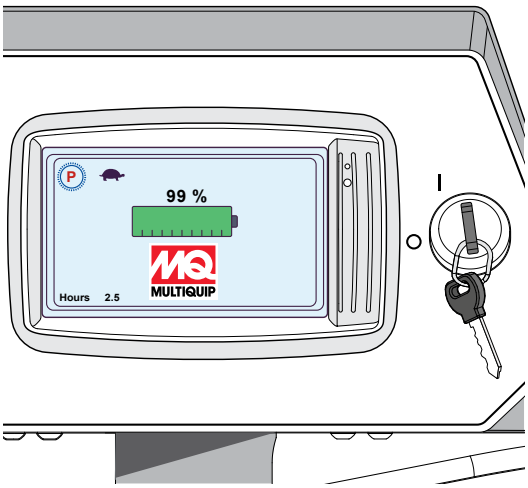


Figure 38. Turning On Machine

14. If everything checks out, install the side covers with the original hardware.

BATTERY CHARGING

1. Park the buggy in a location near a 120 V power outlet.
2. Plug the cord (NEMA 6-15 2P 3H female) into the buggy connector (Figure 39).
3. Plug the other end to the 120V power outlet.

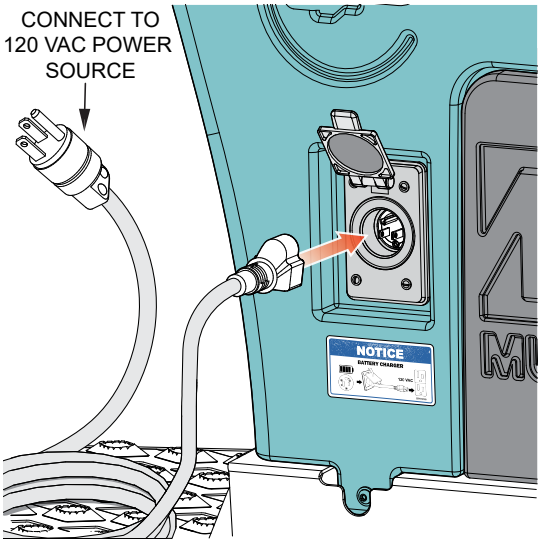


Figure 39. Charging the Battery

4. Confirm that the digital display indicates that the battery is charging (Figure 40).

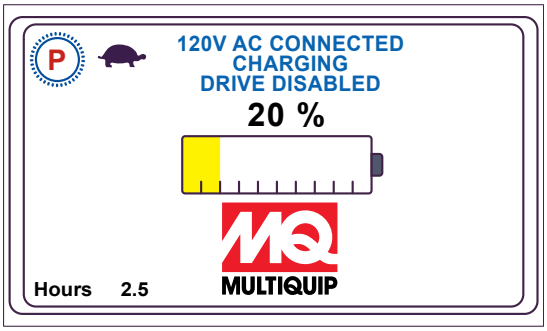


Figure 40. Charging Display

NOTICE

The drive system is disabled when the machine is connected to a power supply during charging.

5. Check the charging status on the battery charger (Figure 41).

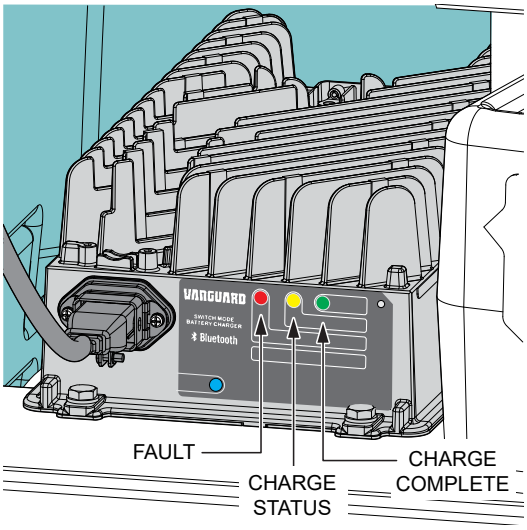


Figure 41. Charger Status LEDs

6. When the charge is complete and display shows 99 to 100%, disconnect the power cord from the power outlet and from the machine.

NOTICE

The drive system is enabled when the machine is disconnected from the power supply.

TRACTION MOTOR GEAR REDUCTION OIL LEVEL INSPECTION AND REPLACEMENT

The reservoir capacity is 0.2 gallon/0.8 liter.

1. To drain oil, rotate wheel to the orientation shown in Figure 42.

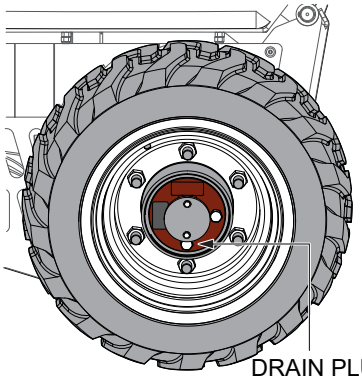


Figure 42. Draining Motor Oil

2. Unscrew drain plug and carefully drain oil into a suitable container.
3. To fill motor oil, rotate the wheel to the orientation shown in Figure 43.

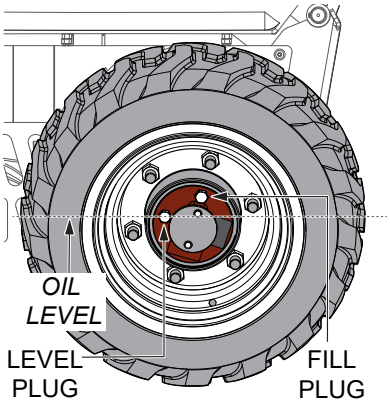


Figure 43. .Filling Motor Oil

4. Unscrew fill plug and fill with oil to the level shown in Figure 43. Use oil Type SAE 90.

FREEWHEEL - RELEASING THE WHEEL

1. Locate end cap on the wheel (Figure 44). Clean the area around cover and make sure it is free of debris.

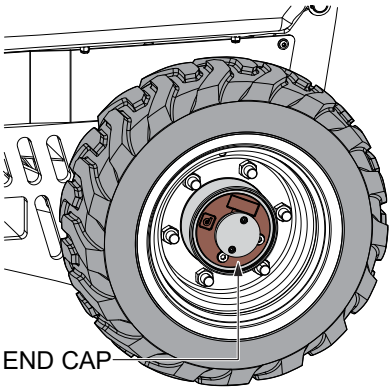


Figure 44. Location of End Cap

2. Loosen the two allen screws on the cap (4mm) and remove cap (Figure 45).

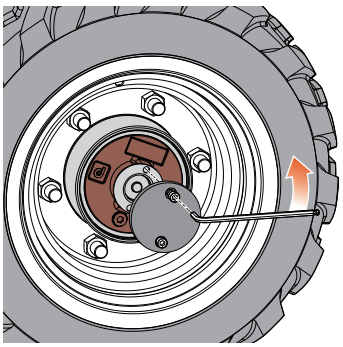


Figure 45. Removing Cap

3. Pull out plated cover with both hands. Save plated cover. The wheel is now free to rotate (Figure 46).

NOTICE

Protect center hub from dirt.

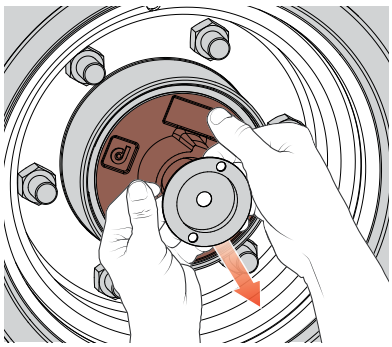


Figure 46. Pulling Out Plated Cover

FREEWHEEL - RELOCKING THE WHEEL

1. Reinstall the plated cover back onto center hub (Figure 47).

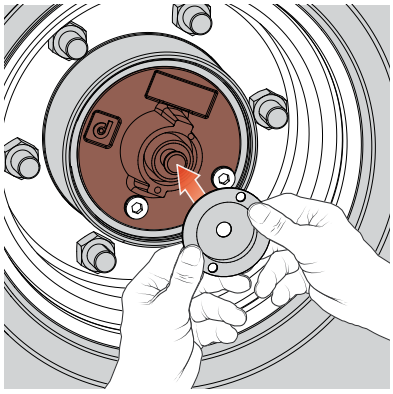


Figure 47. Reinstalling Plated Cover

2. Push cover plate over hub. Do not use hammer.
3. If cover is stuck in the middle, slightly rotate wheel and try again.
4. Install the cap and secure tightly with the allen screws (.

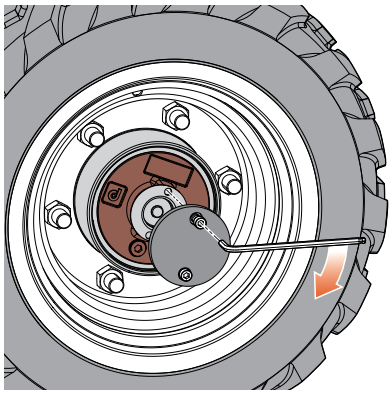


Figure 48. Securing Cap

THROTTLE CABLE AND LEVER ADJUSTMENT

1. Adjust the assembly distances of the speed cable on the bracket as shown in Figure 49. The cable must be exteded by the spring to the maximum stroke allowed.

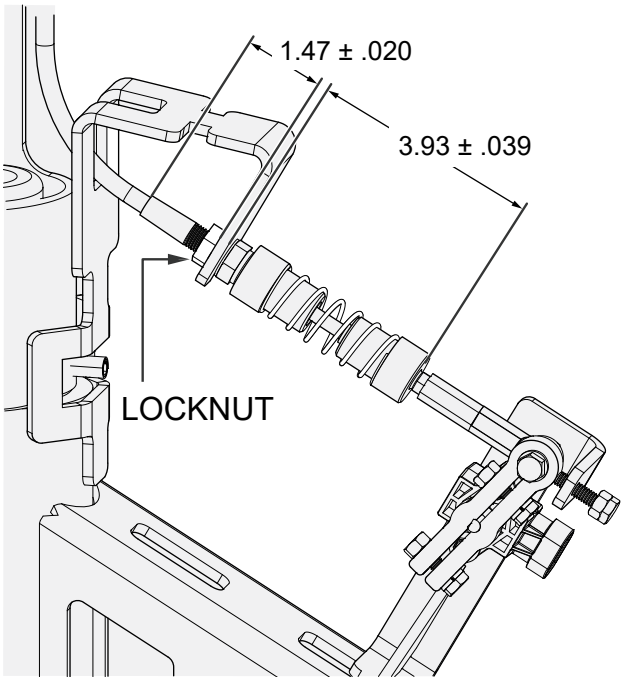


Figure 49. Speed Cable Adjustment

2. Assemble the ball joint and the potentiometer lever as shown in Figure 50. For potentiometer adjustment, contact Multiquip Technical Support.

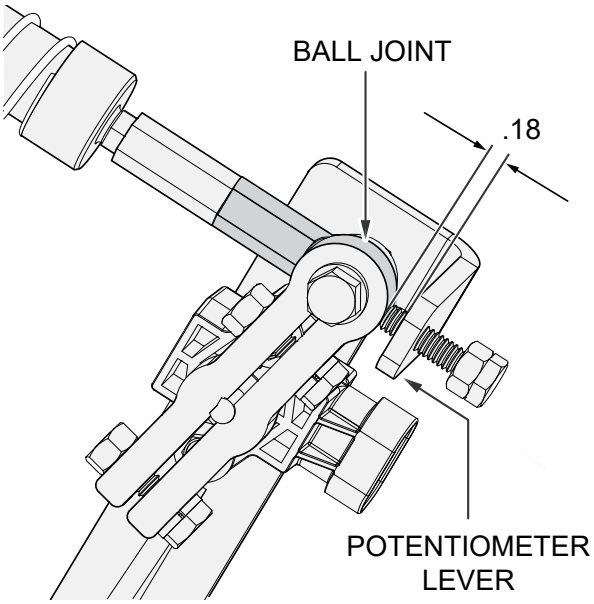


Figure 50. Potentiometer Lever Assembly

3. Adjust speed lever and speed cable to original dimensions as shown in Figure 51.

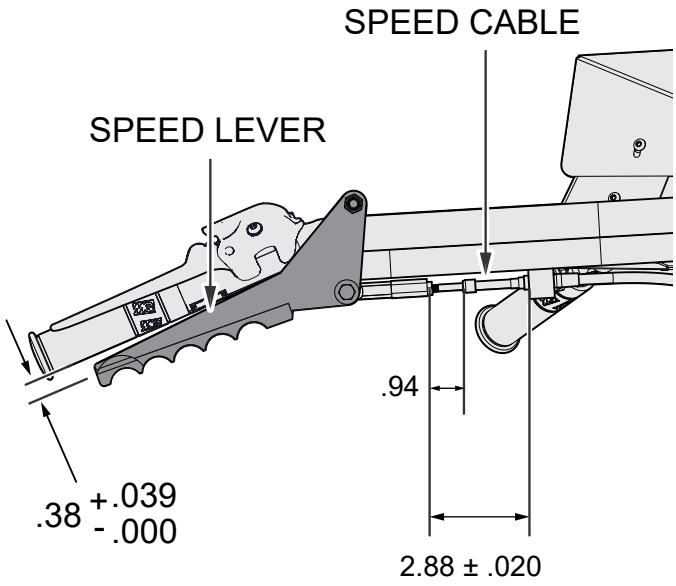


Figure 51. Speed Lever and Speed Cable Readjustment

4. Tighten both ball joints. See Figure 52.

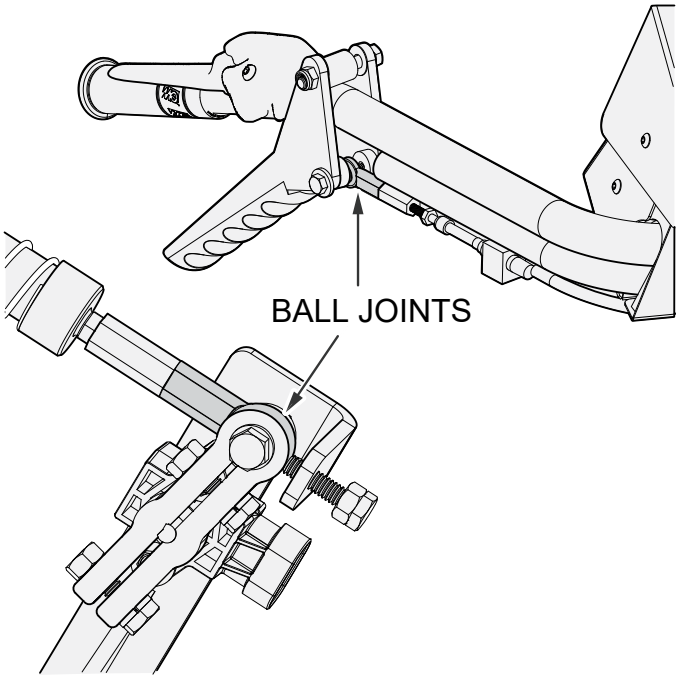


Figure 52. Ball Joints Tightening

LONG TERM STORAGE

- Disconnect the battery.
- Store unit covered with plastic sheet in moisture and dust-free location out of direct sunlight.

Troubleshooting (Power Buggy)		
Fault	**Possible Cause**	**Corrective Action**
Buggy Does Not Power Up	Battery Fully Discharged	Charge Battery
	Emergency Stop Activated, Disconnected Or Failed.	Inspect
	Key Switch Defective Or Disconnected	Inspect
	Vanguard battery - the 20-pin connector disconnected or not connected properly	Check connector position
	Battery terminal connection disconnected or loose	Inspect battery connections
	Battery control harness p/n 810161 damaged	Check harness connection points
	Black 12-pin connector on control panel damaged	Check connector terminals
	48 vdc to 12 vdc power supply converter may be damaged	Check output voltage terminals for 12 vdc reading
	F3 fuse damaged	Replace damaged fuse
	Main contactor cr2 defective	Replace
	12v relay defective	Replace relay
	Bad or damaged canbus connections	Verify connection points
	Danfoss module damaged	Check for module status green indicator light
	Vangaurd battery pack failure	Check output voltage at Vanguard battery terminals, if reading is less than 48 vdc refer to Vangaurd battery fault diagnostic procedure
	Readout screen will illuminate but machine does not operate	Inspect 10 amp fuses f1, f2, f3

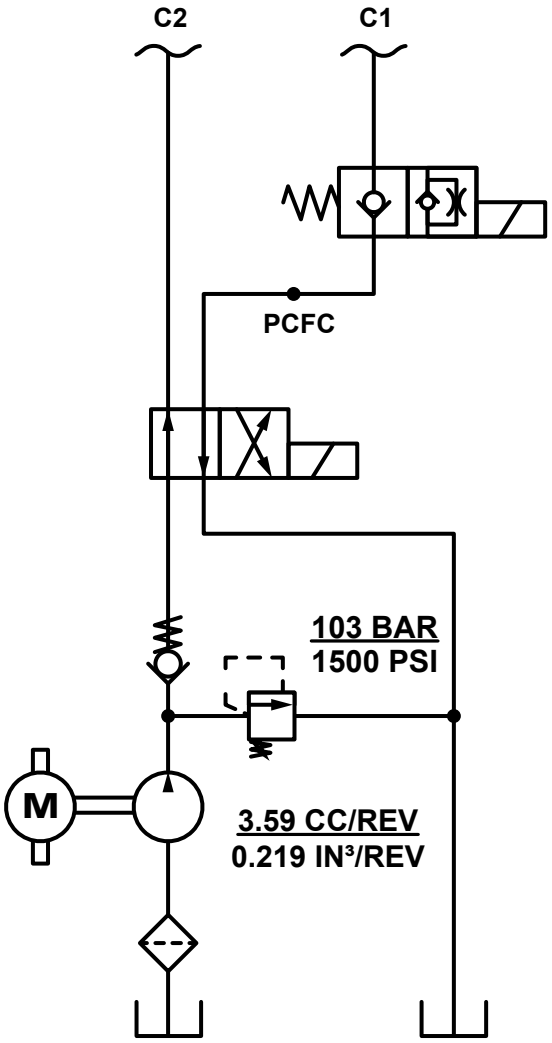
Troubleshooting (Power Buggy)		
Fault	**Possible Cause**	**Corrective Action**
Startup Sequence Error	Deadman lever activated during startup	Release lever
	Reverse lever activated	During machine start up do not activate reverse lever
	Deadman switch has loose electrical connectors	Inspect terminal connectors
	Loose reverse switch terminals	Check connectors inside reverse lever cover connected to switch (button) terminals
	Deadman lever harness is loose or not secured to plastic cover	Check the plastic safety strap located inside deadman lever cover
	Damaged reverse lever (button) switch	Verify that the lever (button) switch s in good working condition
	Damaged throttle potentiometer	Check physical state of the potentiometer and verify calibration
Inverter Fault	Damage to 36-pin aphenol receptacle (inmotion controller / inverter)	Inspect receptacle continuity
	Poor receptacle connection between ecu and motors (p/n 810160)	Verify connection continuity
	Traction motor connectors loose or disconnected	Verify that the connectors are correctly connected
	Traction motor connector terminals damaged	Inspect terminals
	Traction motors harness may be damaged (harness p/n 810160)	Inspect harness and terminals
	Brake receptacle connector has poor connection	Verify for proper continuity
	Brake receptacle incorrectly connected or terminals are damaged	Verify that the connectors are correctly connected
	Contactors # cr5 or # cr6 damaged	Replace
	Failure of inmotion traction motor	Follow traction motor failure diagnosis procedure
	Canbus system failure	Follow inmotion failure diagnosis procedure

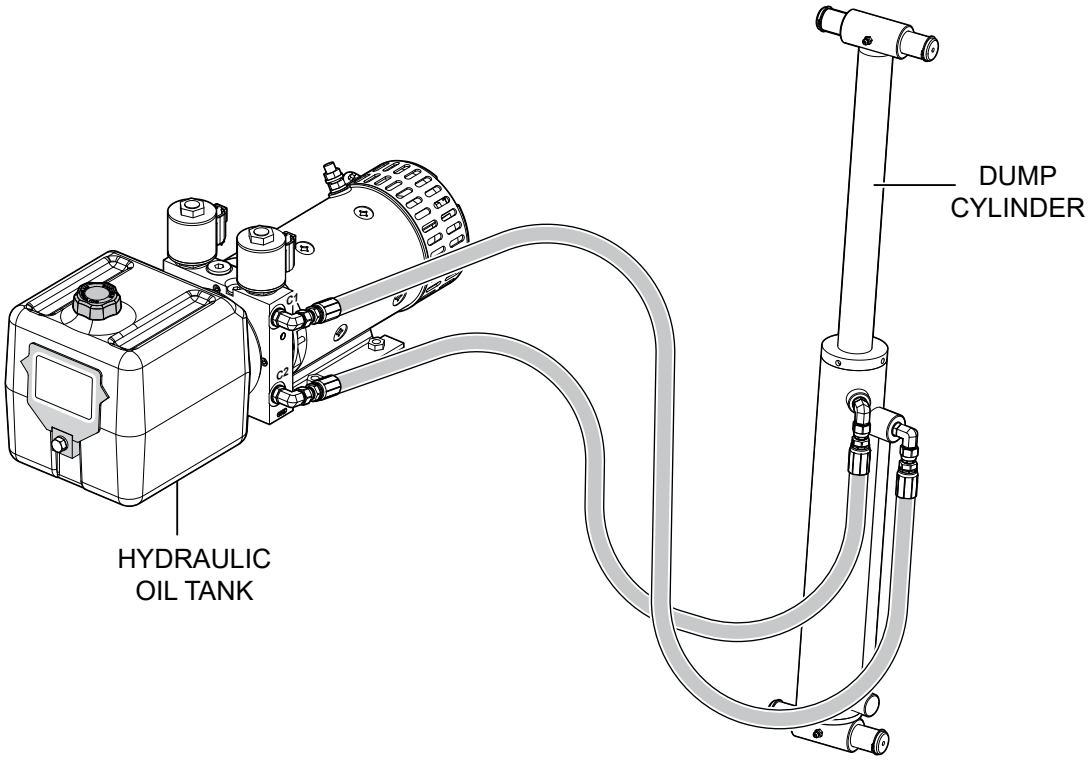
Troubleshooting (Power Buggy)		
Tub Does Not Extend or Retract	Power pack low on oil	Verify hydraulic oil level
	Power pack connector loose or has corroded terminals	Verify connection have good continuity
	Activation switch damaged	Replace
	Display / potentiometer harness terminals connected to up/down switch damaged	Check harness connections
	Fuse f6 (150 amp) open	Replace
	Hydraulic power pack solenoid not energizing	Inspected, replace if necessary
	Contactor # cr6 damaged	Inspect for continuity
	Tub is slow to retract or discharge	Verify power pack deadhead pressure 1500 psi
	Hydraulic power pack electric motor failed	Replace
Battery Does Not Charge	Battery does not charge	Inspect for charger led status – yellow indicates charging
	Battery does not charge	Inspect charger led status – red indicates fault – follow charger diagnostic procedure
	Charger power cable or receptacle is damaged	Inspect
	AC power supply amperage too low – less than 110 volts, 12 amps	Verify power source. Power cord may be too long or incorrect wire size
	Vanguard battery 20-pin round receptacle disconnected or terminals not making terminal contact	Verify terminal continuity
	Power diode on battery charging line shorted	Replace diode
	Damage to the 8-pin connector on the control panel	Verify connections
	Canbus communication line damaged	Inspect
	Battery-charger harness p/n 810221 damaged	Verify terminal continuity
	Charger connector damaged	Verify connection
	Charger harness p/n 810157 damaged	Inspect harness assembly
	Vanguard battery pack failure	Battery terminals, if reading is less than 48 vdc, recheck output voltage at Vanguard battery per Vanguard battery fault diagnostic procedure
	Vanguard charger failure	Refer to Vanguard charger fault diagnostic procedure
	Incorrect or outdated battery/ charger firmware	Check latest version firmware (to be checked by authorized Vanguard dealer)

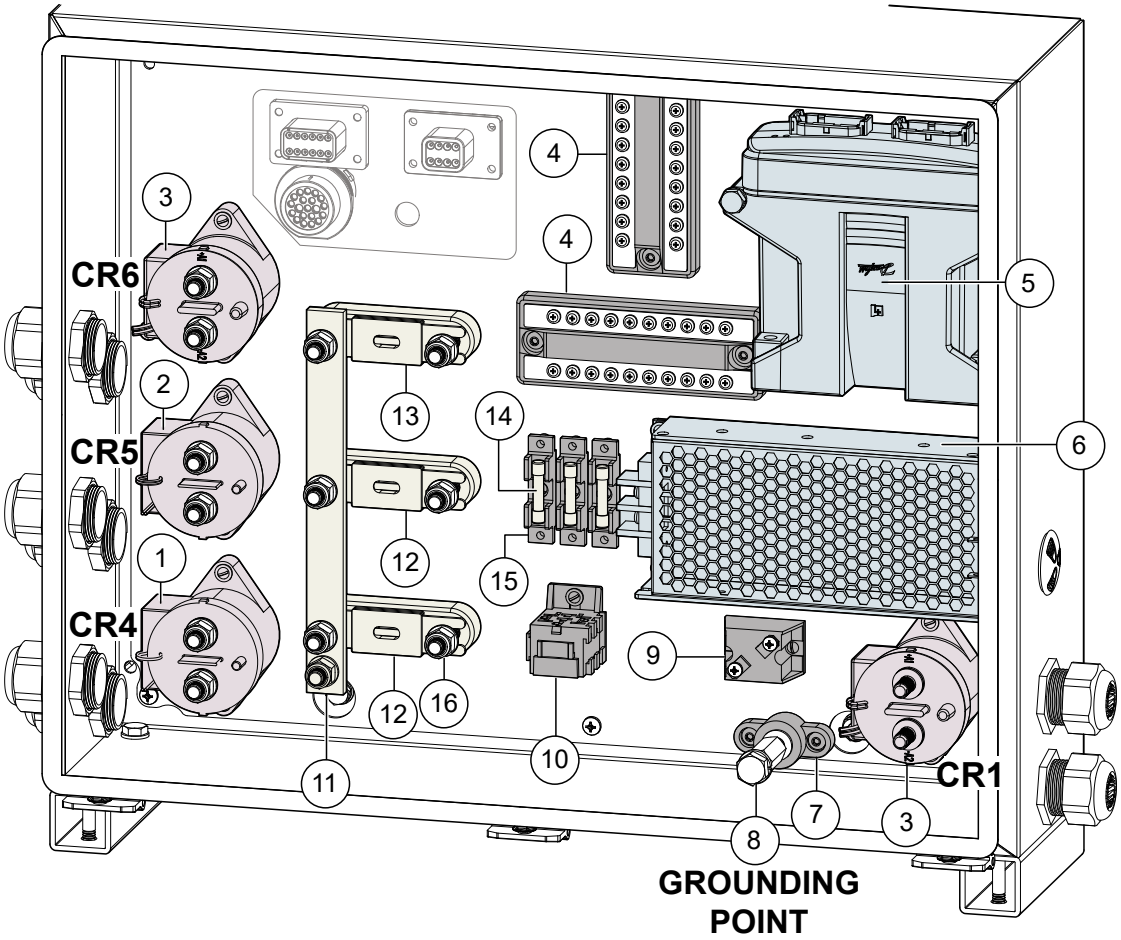
Troubleshooting (Power Buggy)		
Fault	**Possible Cause**	**Corrective Action**
Buggy Turns On, Readout Display Does Not Illuminate	Readout display connection	Inspect connections
	Canbus communication line damage	Inspect connections
	Damaged screen	Replace
	Danfoss module damaged	Check module status and indicator lights
Throttle Fault	Throttle activated during start up	When machine starting do not activate travel lever
	Potentiometer out of neutral position	Follow re-calibration procedure
	Potentiometer damaged	Replace
	Potentiometer out of neutral position	Follow re-calibration procedure

POWER PACK HYDRAULIC SYSTEM DIAGRAM

9/16-18 (SAE #6)




DUMP
CYLINDER
HYDRAULIC
OIL TANK



ITEMI	DESCRIPTION	QTY
1	48 VDC COIL, CONTACTOR	1
2	48 VDC COIL, CONTACTOR	1
3	12 VDC COIL, CONTACTOR	2
4	DUAL BUSBAR	2
5	MC024-120 CONTROLLER	1
6	SINGLE OUTPUT DC-DC CONVERTER	1
7	3/8" STUD, BLACK	1
8	NUT, 3/8" NC HEX. LONG. 1.1/8" G, GROUNDING POINT	1
9	POWER DIODE	1
10	12 VDC RELAY	1
11	FUSE UNION BAR	1
12	ANL FUSE, 130 AMP	2
13	ANL FUSE, 150 AMP	1
14	FUSE HOLDER	3
15	FUSE, 10 AMP TIME DELAY	3
16	ANN & ANL FUSE HOLDER	3

OPERATION MANUAL

HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL NUMBER ON-HAND WHEN CALLING

UNITED STATES

Multiquip Inc.

(310) 537- 3700
6141 Katella Avenue Suite 200
Cypress, CA 90630
E-MAIL: mq@multiquip.com
WEBSITE: www.multiquip.com

CANADA

Multiquip

(450) 625-2244
4110 Industriel Boul.
Laval, Quebec, Canada H7L 6V3
E-MAIL: infocanada@multiquip.com

UNITED KINGDOM

Multiquip (UK) Limited Head Office

0161 339 2223
Unit 2, Northpoint Industrial Estate, Globe Lane,
Dukinfield, Cheshire SK16 4UJ
E-MAIL: sales@multiquip.co.uk

This manual MUST accompany the equipment at all times. This manual is considered a permanent part of the equipment and should remain with the unit if resold.

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