

Service Manual

Minuteman[®]
Excellence Meets Clean

For the **E Ride 26**

For:
Training
Troubleshooting
Adjustments



Rev. 04/2013

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1. Cautions

- Caution:
- Disconnect the A.C. Cord from the outlet and and D.C. Cord from the battery pack before servicing the machine. Except for making voltage and current measurements.
- After any repair work test the machine for proper operation.
- When servicing the machine always observe the general safety and accident prevention guidelines.

2. Safety Information

Maintenance Precautions

- Maintenance and repairs must be performed by qualified personnel only. Maintain adjustments on machine pursuant to specifications noted in the service manual.
- Maintenance and repair work must be performed by using appropriate, undamaged tools.
- Spare and replacement parts must conform with factory machine specifications. Failure to do so may result in machine malfunctions. Genuine spare and replacement parts are highly recommended.



Switch off and remove the machine's key before inspecting the machine or performing and maintenance or repair work. Failure to do so may result in accidental machine activation and personal injury.



When performing maintenance or repair work on the machine's electrical system, be sure to disconnect the machine's battery plug first. Failure to do so could result in accidental machine activation and personal injury.

- Before commencing operation of the machine, check for obvious signs of loose parts, potential conditions indicative of malfunctions, etc. Any signs of potential problems must be remedied before actual operation commences.



Before commencing operation of the machine following maintenance or repair activities, check to ensure that all protective devices have been properly refitted and positioned, or other potential problems before actual operation commences, otherwise personal injury may occur.

- Only cleaning agents / detergents suitable for automatic machines (low foaming) should be used in the E Ride 26. Cleaning agents / detergents should be mixed with water in ratios established by product labels and or manufacturer recommendations. All safety precautions established by the cleaning agent / detergent's manufacturer (including, but not limited to, use of gloves and safety glasses) must be followed. These safety precautions can typically be found on the cleaning agent / detergent's product labels, accompanying collateral materials, and related Material Safety Data Sheets
- Used or spent mixtures of water and cleaning agents / detergents collected in the machine's recovery tank must be disposed of in accordance with applicable government regulations and or local permits obtained by the facility in which floor cleaning activities occur, if any. Violations of such government regulations and local permits can result in significant penalties.



Never dispose of the contents of the machine's recovery tank outdoors or into stormwater systems or basins!

3. Technical Data



	Disc brush deck		Cylindrical brush deck	
Machine length	60 in	152 cm	60 in	152 cm
Machine height	54 in	137 cm	54 in	137 cm
Machine width without Squeegee	28.9 in	73.4 cm	28.9 in	73.4 cm
Machine width with Squeegee	34 in	86 cm	34 in	86 cm
Working width	25 in	63.5 cm	25 in	63.5 cm
Squeegee width	36.75 in	93.3 cm	36.75 in	93.3 cm
Surface performance theoretical	33125 ft ² /h	3077 m ² /h	32490 ft ² /h	3018 m ² /h
Service voltage	36 V	36 V	36 V	36 V
Nominal power drive motor	600 W	600 W	600 W	600 W
Nominal power vacuum motor	660 W	660 W	660 W	660 W
Nominal power brush motor	960 W	960 W	2x600 W	2x600 W
Number of brushes	2 Qty.	2 Qty.	2 Qty.	2 Qty.
Diameter of brushes	13.0 in	33 cm	5.9 in	15 cm
Working speed	3,0 mph	5,0 km/h	3,0 mph	5,0 km/h
Solution tank	27 gal	122 L	27 gal	122 L
Recovery tank	31 gal	141 L	31 gal	141 L
Weight without batteries and solution	475 lb	215 kg	475 lb	215 kg
Weight with solution and batteries	1146 lb	520 kg	1146 lb	520 kg

3. Technical Data



Noise emission The sound pressure level measured under maximum conditions of use (LwA) according to DIN EN 60335-2-72 amounts to: The sound pressure level measured (at the ear of the driver) under normal conditions of use (LpA) according to DIN EN 60335-2-72 amounts to: Measurement inaccuracy (KpA):	dB (A) dB (A) dB (A)	83 72 1,8
Vibration The frequency weighted acceleration measured according to DIN EN ISO 5349 which have an effect upon the upper limbs (hand-arm-system) amounts under normal working conditions:	m/s ²	< 2,5

4. Maintenance Intervals

- In a modular structure, the Minuteman System Maintenance determines the specific technical procedures to be performed and sets the time interval between the two maintenance cycles.
- For each of the maintenance cycle, the replaceable parts are determined as well. Further details described in the specific chapters.
- Minuteman System Maintenance K:
To be performed by the customer (in daily or weekly intervals) according to the maintenance and care instructions as specified in the operating instructions.
The operator must be professionally instructed after delivery of the machine by selling dealer.
- Minuteman System Maintenance I: (after every 125 hours of operation)
To be performed by an authorized Minuteman Service Center in accordance with the machine-specific system maintenance.
- Minuteman System Maintenance II: (after every 250 hours of operation)
To be performed by an authorized Minuteman Service Center in accordance with the machine-specific system maintenance.
- Minuteman System Maintenance S: (after every 500 hours of operation, safety check) To be performed by an authorized Minuteman Service Center in accordance with the machine-specific system maintenance.

4.1 Maintenance Intervals



Record the maintenance intervals completed in the customers Operation Manual, located in the battery compartment of the machine.

<p>Handing over</p> <p>Upgrade Test drive Handing over to the customer Instruction carried out on: at _____ operating hours</p>	<p>System Maintenance I 125 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>	<p>System Maintenance II 250 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>	<p>System Maintenance I 375 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>
<p>System Maintenance S 500 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>	<p>System Maintenance I 625 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>	<p>System Maintenance II 750 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>	<p>System Maintenance I 875 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>
<p>System Maintenance S 1000 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>	<p>System Maintenance I 1125 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>	<p>System Maintenance II 1250 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>	<p>System Maintenance I 1375 operating hours Workshop stamp</p> <p>carried out on: at _____ operating hours</p>

4.2 Minuteman System Maintenance K



To Be Performed by Customer	Interval	
	Daily	Weekly
Perform the Minuteman System Maintenance K	0	
Fill the clean water tank and mix the proper amount and type of cleaning solution	0	
Charge the batteries	0	
Check the brush head. Clean, if needed with a damp cloth. Do not get water inside of motors.	0	
Check the squeegee, Clean if needed.	0	
Check the lid gasket on the recovery tank	0	
Empty and flush the recovery tank with clean water.	0	
Clean the vacuum filter on the top of the recovery tank.	0	
Inspect the hopper. Clean if needed (Cylindrical Deck models Only)	0	
Check water levels of all batteries. Add distilled water. Do not over fill. (Flooded batteries only)	0	
Check the brushes and pads for wear. Replace if needed.		0
Check the squeegee hose for clogs, damage and wear. Replace if needed.		0
Check the solution filter. Clean if needed.		0
Check the squeegee rubbers for wear and cuts. Flip the rubber blades over or replace.		0
Flush the clean water tank and system with warm water.		0
Test all the functions of the machine.		0

4.3 Minuteman System Maintenance I



To Be Performed By Authorized Service Center	Interval
	Every 125 hours of operation
Perform Minuteman System Maintenance I	o
Check the battery charger. Make sure it is functioning correctly.	o
Test the batteries	o
Check the recovery lid gasket. Replace if needed.	o
Lubricate the squeegee mechanism assembly with grease. Use a small brush.	o
Check for loose hardware, tighten if needed.	o
Check the batteries for proper water level. Flooded batteries only.	o
Check all the battery connections. Tighten or clean if needed.	o
Inspect the entire machine for wear or damage.	o
Inspect and test all static chains for wear and continuity.	o
Inspect all electrical connections	o
Test the machine for proper operation.	o

4.4 Minuteman System Maintenance II



To Be Performed By An Authorized Service Center	Interval
	Every 250 Hours of operation
Perform the Minuteman System Maintenance II	0
Inspect the caster wheels on the squeegee for wear and damage.	0
Inspect the recover hose and drain plug for damage and wear.	0
Inspect the recovery drain hose for wear or damage. Replace, if needed	0
Inspect the machine for damage.	0
Inspect the carbon brushes in the brush motor(s) for wear.	0
Blow the dust out the brush motors with compressed air.	0
Inspect the squeegees for wear, damage and proper adjustment. Repair if needed.	0
Inspect and test all static chains for continuity. Replace if needed.	0
Check all electrical connections	0
Test the machine for proper operation.	0

4.5 Minuteman System Maintenance S



(Safety Check)

To Be Performed By An Authorized Service Center	Interval
	Every 500 Hours of operation
Perform the Minuteman System Maintenance S	0
Inspect carbon brushes in the vacuum motor	0
Inspect the carbon brushes in the brush motor(s) for wear.	0
Blow the dust out the brush motors with compressed air.	0
Test the machine for proper operation.	0

5. Squeegee Lift Mechanism

Side to Side Adjustment

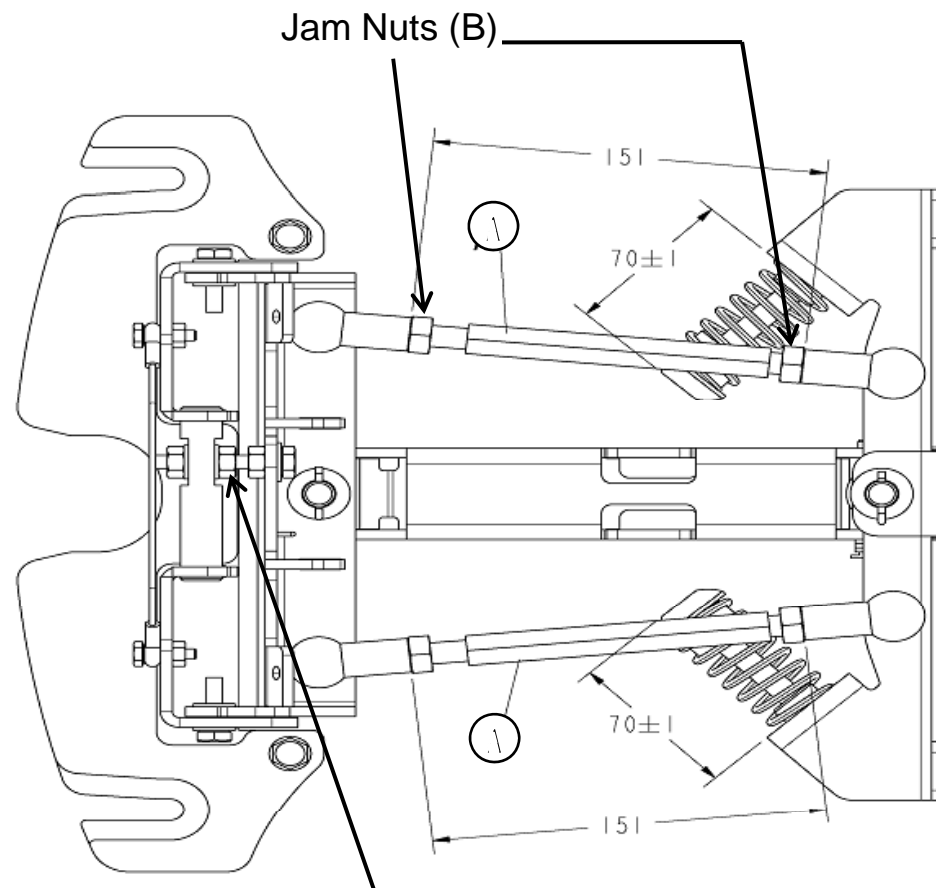
The squeegee lift mechanism lifts and lowers the squeegee assembly, controls the parallel motion and pitch.

Pre-adjust the bars (A) to 151mm, if parts are being replaced. Loosen the jam nuts (B) when adjusting the bar (A). Tighten the jam nuts when done.

Make sure the squeegee lies evenly on the floor. It should not tilt to one side. Fine tune the bars (A) if necessary.

Pitch Adjustment (C)

Loosen jam nut and turn adjustment bolt to set the pitch of the squeegee. The rear squeegee blade should fold evenly all the way across the bottom edge.



Pitch Adjustment (C)

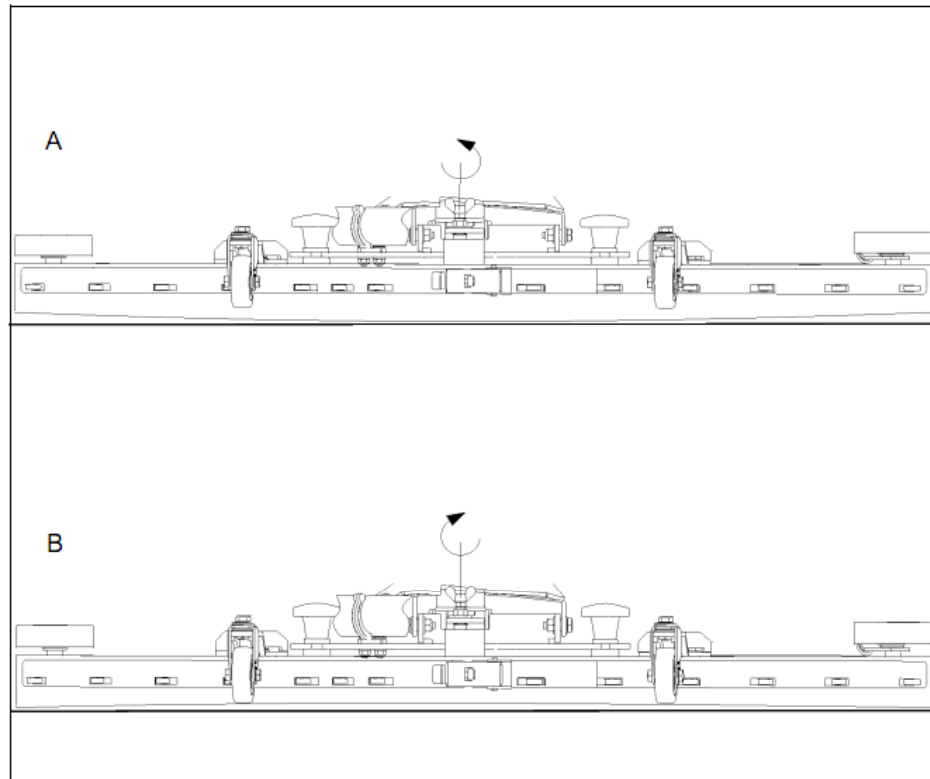
5.1 Squeegee Adjustment

Adjusting the Blades

Angle Adjustment

The angle adjustment is critical for insuring that the squeegee blades lie evenly on the floor.

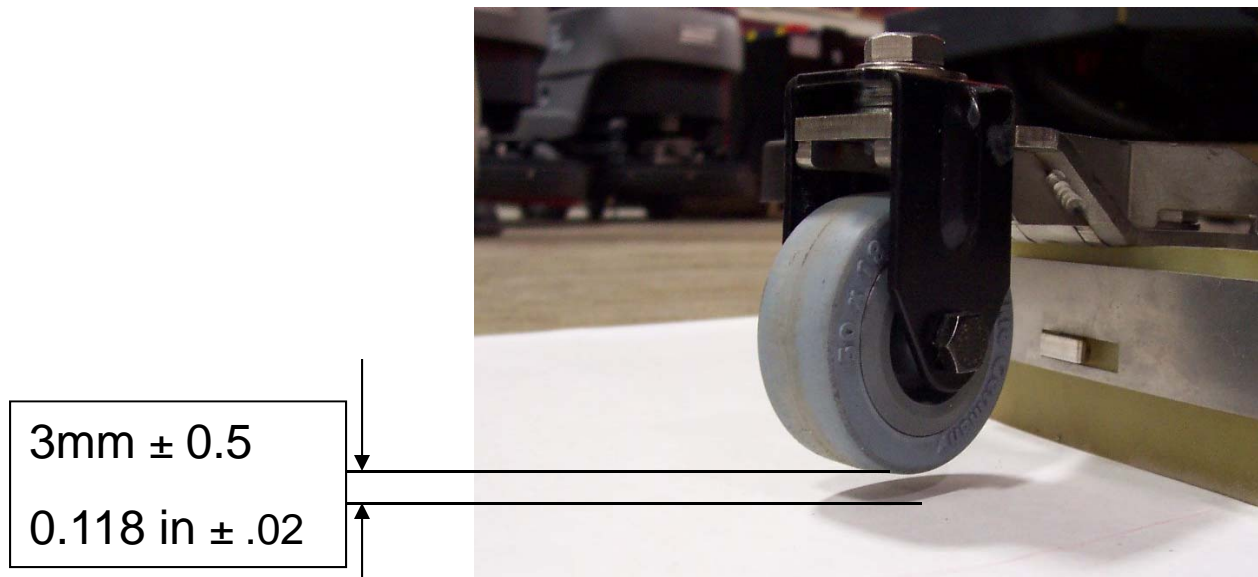
1. Place the machine in the vacuum mode and park the machine on a level surface.
2. Turn the machine off, while it is in vacuum mode.
3. Loosen the jam nut on the adjustment screw.
 - Note: Turning the screw counter clockwise (Fig. A) will raise the ends and turning it clockwise (Fig. B) will lower the center.
4. Adjust the squeegee using the adjusting screw until the rear squeegee rubber rests evenly on the floor all the way across the floor.
5. Tighten the jam nut.



5.2 Squeegee Adjustment

The clearance between the support roller and floor with squeegee unfolded (Factory setting) is: 0.1181099 Inches \pm 0.01968498 inches (3 mm \pm 0.5).

Note: Some floor surfaces may require adjusting the caster washers for optimum performance. See following page.



5.2 Rear Squeegee Adjustment

Height Adjustment

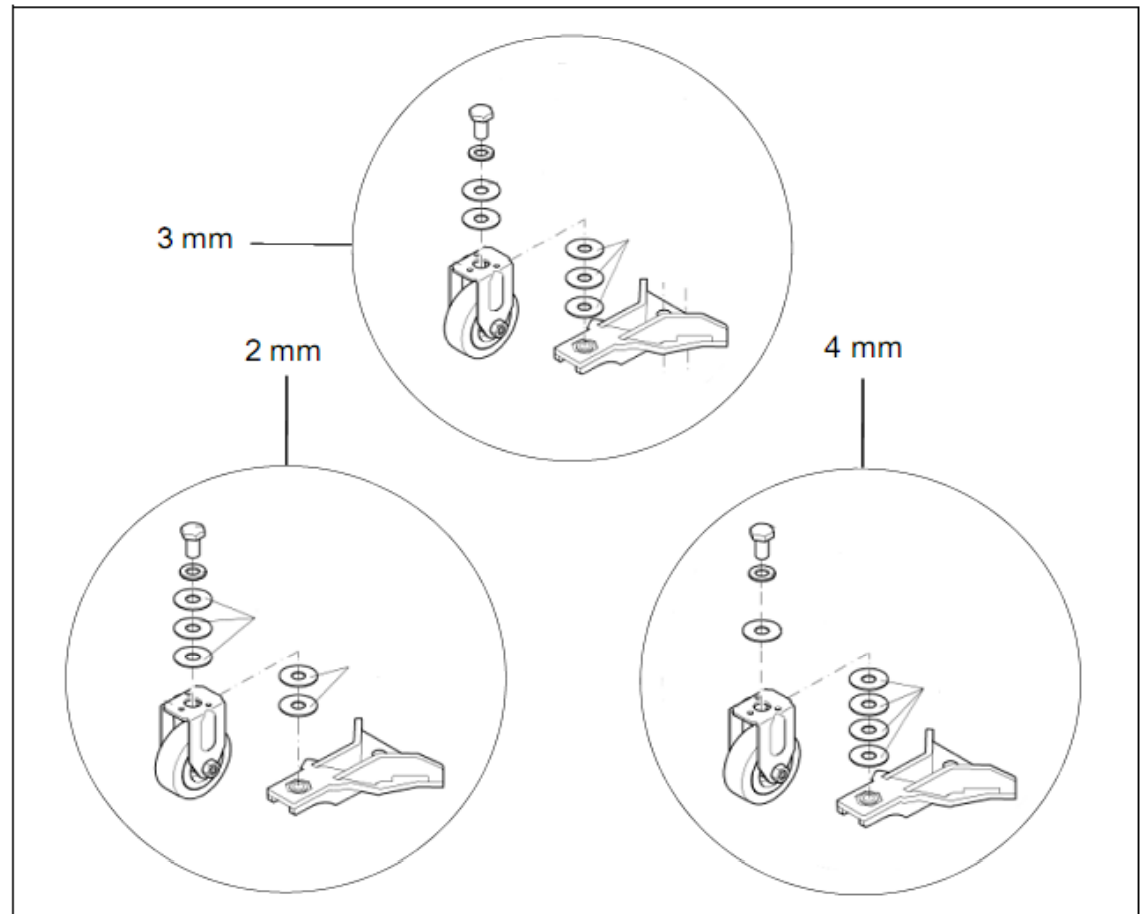
The height adjustment is set to 3 mm at the factory. If streaks are produced, despite an optimum angle adjustment, the clearance between the casters and floor must be adjusted by changing the number of washers on the holder.

In cases of very smooth floors, e.g. finished floors, PVC, linoleum, etc. Number of washers = 2. This corresponds to a clearance of approx. 2 mm.

In cases of very uneven floors, e.g. poorly laid tiles (water does not run off) Number of washers = 4. This corresponds to a clearance of approx. 4 mm.



The Squeegee 110 cm (7569) is equipped with two additional rollers which are adjusted at the factory to a distance of 10 mm to the floor by means of spacers.



7. Side Squeegee Adjustment

Step 1: Lower Scrub deck by placing positioning arrow on “Double Scrub”

Double Scrub



Side Squeegee is flush with floor surface



7. Side Squeegee Adjustment (Disk Models)



Step 2: Loosen both front and rear plastic knobs.



7. Side Squeegee Adjustment (Disk Models)



Step 3: Lower Side squeegee so the squeegee blade flairs at the bottom around the bend and down the straight edge.

- See the picture.

Step 4: Re-Tighten Plastic Knobs.

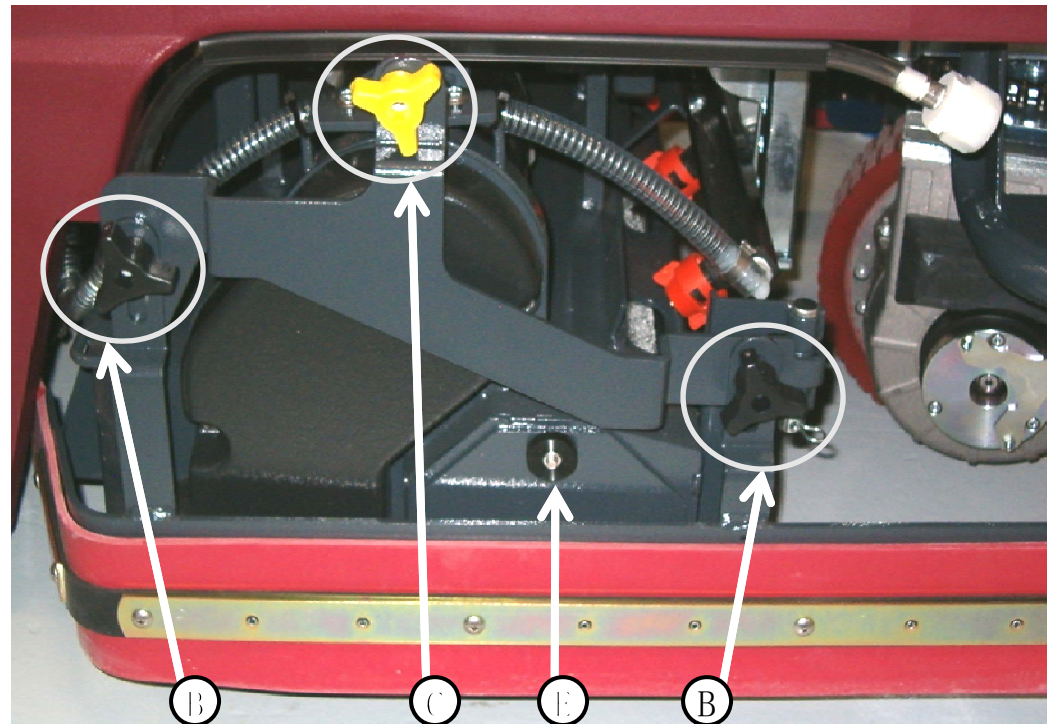


7. Side Squeegee Adjustment (Cyl. Models)

Cylindrical Models

Side Squeegees Adjustment

- Place the machine in the “Double Scrub” mode.
- Loosen the two black knobs (B).
- The blade should be adjusted so that it flairs on the bottom around the corner and along the straight edge.
- The side squeegees should also flair outward when traveling straight forward.
- Tighten the black plastic knobs.



Accessing the Brushes

- Remove the yellow knob (C). The squeegee assembly will hinge open.
- The brush access plate (E) is now accessible.

8. Cylindrical Brushes

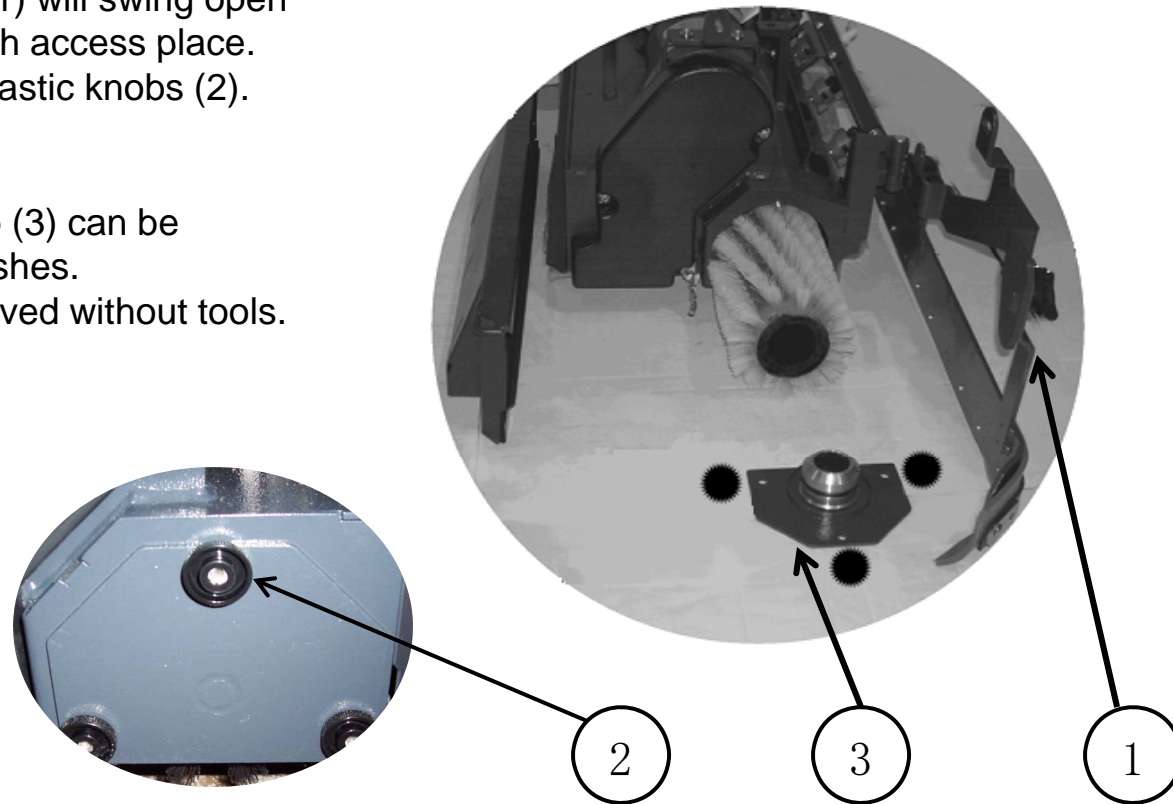
Side Squeegee Pivot

- Once the yellow knob has been removed.
- The side squeegee pivot (1) will swing open allowing access to the brush access place.
- Remove the three black plastic knobs (2).

Cylindrical Brush Hub

- The access plate/Idler hub (3) can be removed to access the brushes.
- The brushes may be removed without tools.

Brush access plate/idler hub (3)



8.1 Cylindrical Brush

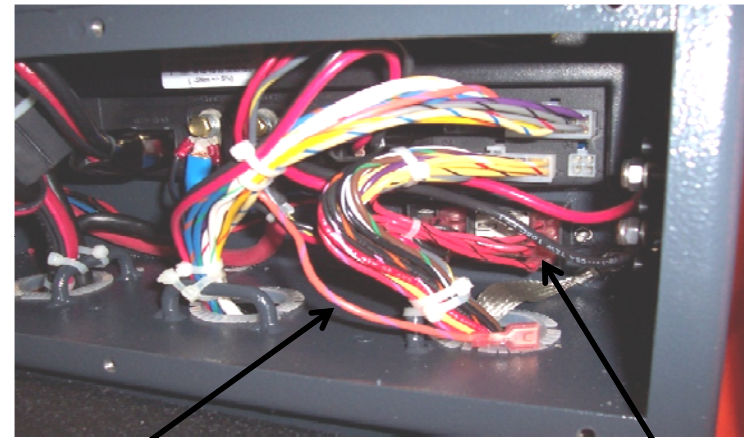
Replacing the Cylindrical Brush

- Remove the access plate hub from the old brush.
- Discard the old brush.
- Stand the new brush on end with the slots on the bottom.
- Press the Idler hub into the top end of the new cylindrical brush.
- Slide the slotted the end of the brush deck first.
- Align the slots of the brush with the drive pin and push into the brush deck.
- Install the three plastic nuts.
- Rotate the brushes by hand, before tightening the plastic nuts, to prevent the bristles from getting caught between the housing and idler hub plate.
- Tighten the three plastic nuts.
- Close the squeegee pivot weldment and install the yellow knob.
- Repeat the process on each side.



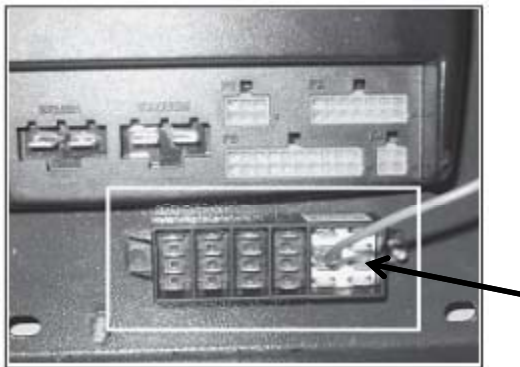
9. Brush Pressure Settings

- The brush pressure range can be changed when changing the type of deck on the ER26 models.
- Connect the orange/violet wire into the terminal block with red/black wire group for cylindrical decks and unplug it for the disk or plate decks.
- The terminal block is located below the controller on the operators left side and below the seat behind the metal panel.



Orange/Violet wire

Terminal Block



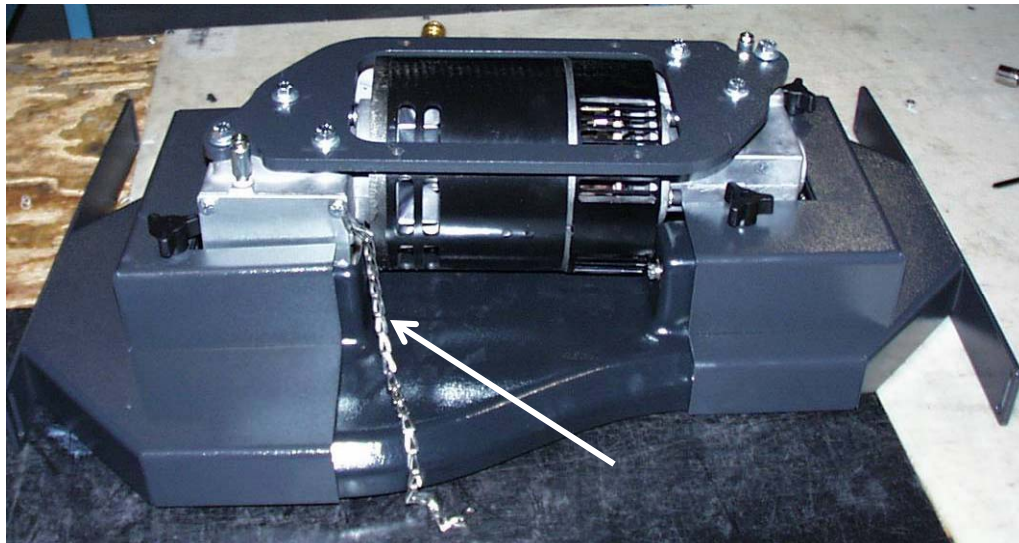
Connect the orange/violet wire to this group with the red/black wires when using the cylindrical brush decks.

Brush current Settings

Setting	Disk Light Pressure	Amps	Orange/violet Wire
1	Light Disk	23	Not connected
2	Double Both	28	Not connected
3	Heavy Disk	28	Not connected
4	Light Cylindrical	23	Connected
5	Heavy Cylindrical	26	Connected

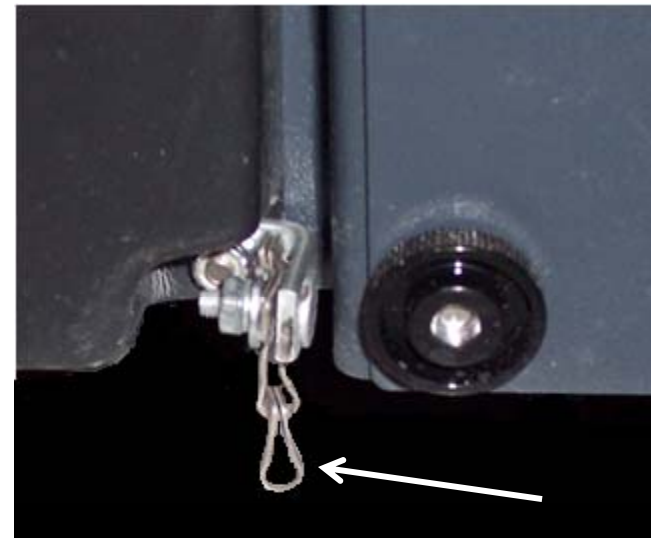
10. Static Chains

Static chains on the decks, must touch the floor, when the brush deck is in the down position. They should be tested for continuity to the frame at each service interval. Replace, if worn or damaged. Failure to maintain the static chains may cause damage to the electronic controller.



Disk Decks

The static chain is attached to the motor and hangs off the rear side of the brush deck.



Cylindrical Decks

The static chain on the cylindrical deck is mounted on the side between the belt cover and the brush access plate.

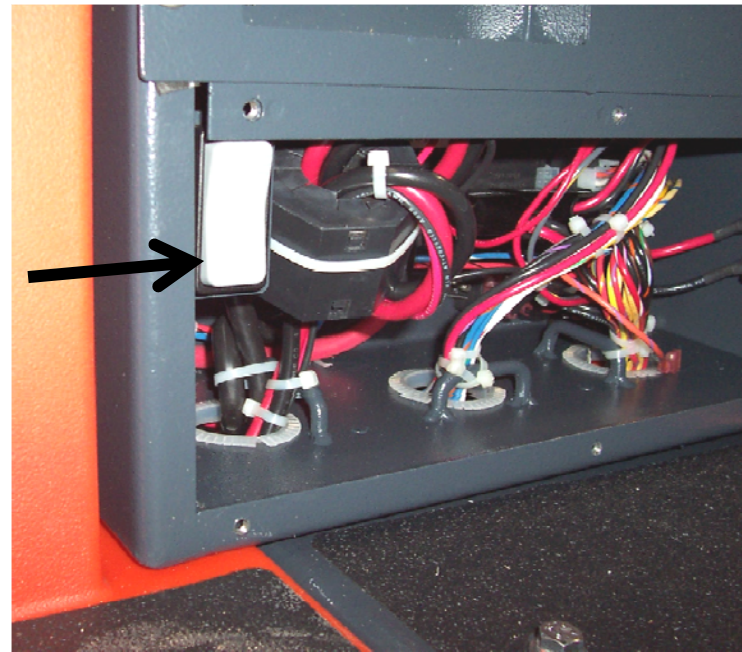
10.1 Static Chain

- **The Rear Static Chain** is located between the two rear wheels.
- It should be present and must always drag on the floor.
- It should have continuity to the frame.



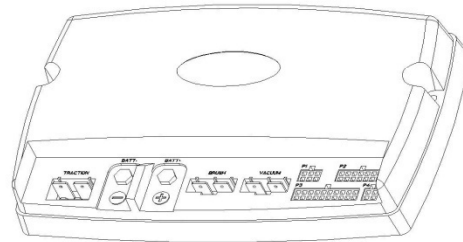
11. Service Mode

- The Service mode switch is located on the operators right side behind the metal panel below the seat.
- The Service mode switch can be used to lower the deck when servicing the brush deck assembly.
- Press and hold the lower side of the switch for 15 seconds. The deck will lower. Pressing the upper side will raise the deck.
- The brush deck may be removed, when it's down for easier servicing.
- The controller will go back to normal operation by turning the key switch off .



12. Changing Battery Types

- When changing from the wet lead acid type to gel or agm batteries. The trio controller will need to be replaced with part number 748270, in order to obtain maximum run time. Gel batteries can discharged to a lower voltage level than wet lead acid batteries.

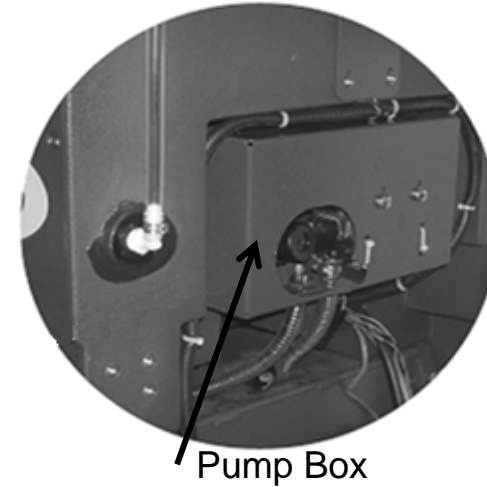


Trio Controller

- When changing from gel or agm to the wet lead acid batteries The trio controller will need to be replaced with part number 748271, in order to obtain maximum life of the battery. Wet lead acid batteries should not be discharged as low as gel and agm types.
- The battery charger must match the type batteries that are being used.

13. Solution Control

- The pump box is located in the lower rear area of the solution tank.
- Drain the recovery (dirty water) tank.
- Release the rubber latches on the recover tank and tilt back to access the pump box.
- The pump box includes the solution filter, electric water solenoid and the water pump.
- The water volume is regulated by the controller. The controller does this by adjusting the voltage to the pump.
- The operator can adjust the water level with the 5k potentiometer on the dash board.



14. Trouble Shooting (Electrical)

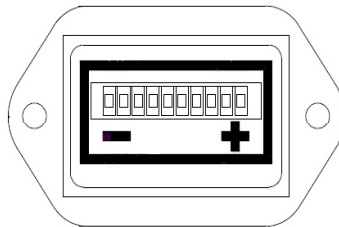
Trouble Shooting Electrical Problems on the E Ride 26

- The E Ride uses a state of the art electronic circuitry with several diagnostic features. The battery indicator serves two purposes.
- They are:
 - a. To display the charge status of the batteries on the LED display. This uses 10 LED bars, for example: 10-lighted LED bars indicates a fully charged battery, 5-lighted LED bars, indicates batteries are discharged 50%, 1-lighted LED indicates the batteries are discharged and so on.
 - b. To display error codes for easier diagnosis of electrical problems. These are displayed by flashing a quantity of LED bars in different sequences. The deferent flash sequences are as follows:

Rippling: One LED bar lighted, then two LEDS, then three LEDS and so on until all ten LEDS are lighted. Then it starts over.

Flashing Steadily: Flashing a set amount of LEDS for each error code on and off steadily. The number of LEDS lighted indicates the type of error detected.

Flashing in Sequence: Flashing a set amount of LEDS for each error Code in a pulse sequence. Example: The four LEDS flashes two times then pauses, then it repeats itself.



14.1 Error Code Decal



Diagnostic Codes

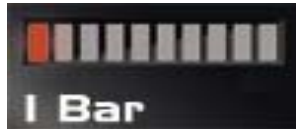
The number of flashing bars on the battery gauge represent fault codes as indicated below:

Low battery voltage <i>Check condition of battery and connections</i>	1
Traction Motor fault <i>Check all connections between the motor and control system</i>	2
Brush Motor fault <i>Check all connections between the motor and control system</i>	3
Actuator Fault <i>Reset Key</i>	4
Vacuum Motor fault <i>Check all connections between the motor and the control system</i>	5
Off-Aisle Wand Activated <i>Check Off-aisle wand switch position</i>	6
Throttle fault <i>May indicate incorrectly wired or faulty potentiometer</i>	7
Control system fault <i>Check all connections are secure</i>	8
Solution Tank Empty <i>Tank needs to be filled</i>	9
High battery voltage <i>Check condition of battery and connections</i>	10
Throttle Displaced on start up <i>Restart keyswitch-throttle was activated prior to ignition</i>	Ripple

Please refer to manual for detailed trouble shooting information

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14.2 Error Codes



Single flash Low Batteries- Charge the batteries



Single flash Traction drive motor disconnected



Single flash - Brush motor disconnected



Single flash - Brush actuator overload



Two flash – Squeegee actuator overload

14.2 Error Codes



Single flash – Vacuum motor disconnected



Single flash- Off Isle Wand Activated



Single flash- Potentiometer Fault



Single flash- Control fault check all connections to controller- see "Trouble Shooting the Code 8 Error"

14.2 Error Codes



Single flash- Solution tank empty- Riders only



Five flash-Electric brake circuit fault- Check all connections to the brake on the chassis drive.



Single flash- High battery voltage- Loose Connection
Check all connections between the batteries and the controller, including the circuit breaker.



Ripple-Throttle activated during start up. If throttle pedal was depressed during start up, release. If problem re-occurs: Check throttle return springs for breakage. Check potentiometer for fault or improper adjustment .

14.3 Code 8 Error

1. Check for loose or burnt connections on the controller, batteries, cables and the circuit breaker.
2. Make the sure the circuit breaker is not damaged.
3. Measure the total battery voltage at the batteries and at the battery connections on the controller. They should be exactly the same. A 1/10 of a volt or more difference would indicate a problem in the connections.
4. Check to see, if the operator has recently washed the machine down and got water inside of the brush motor or in the controller area.
5. Check for a disconnected or an open circuit or faulty potentiometer on the throttle or speed circuit. Controller may not be detecting it in the circuit. Perform a continuity test. See “Testing the Potentiometer” section.
6. Disconnect one motor connector from the Trio controller at a time and disconnect the batteries for 1 minute and restart the machine. If the code 8 disappears and is replaced by a different code, the circuit disconnected should be considered suspect. For example the brush was disconnected. The code 8 is replaced by code 3. Code 3 indicates the brush motor is disconnected.
7. Check for a loose or broken connection at the brush deck. Check to see if water has gotten inside the brush motor. Check for a shorted motor.
8. Static electricity. Check both the ground chains: there is one on the brush deck and one on the rear of the machine. They should be contacting the floor. The one on the scrub deck should touch the floor only when the deck is down. They also should have continuity between the end of the chain and the frame of the machine. Repair or clean, if needed.
9. If everything checks OK, replace the Trio Controller.

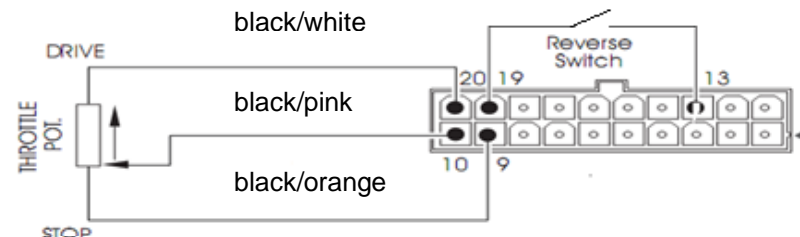
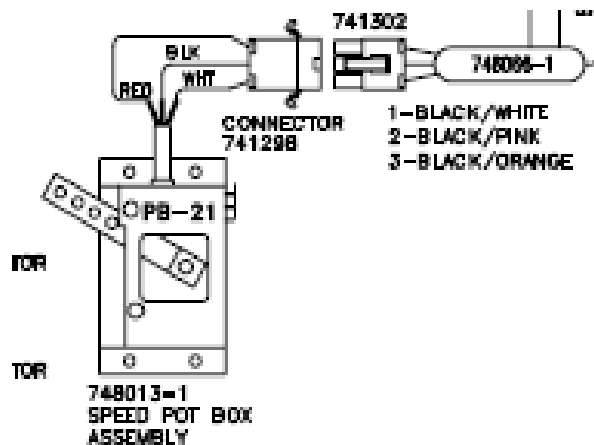
Note controllers can be damaged by loose connections on inputs and outputs, static electricity and water on electrical components such as on or in the controllers and motors.

14.4 Throttle Potentiometer

- Testing the Potentiometer
 1. The throttle potentiometer resistance can be measured with an ohmmeter.
 2. Unplug the throttle potentiometer at the connector next to it.
 3. Analog type meters are recommended for this test.
 4. Measuring across the black and white wires on the potentiometer, the resistance should be zero ohms with pedal on the riders in the neutral position in the full counterclockwise position. When the pedal is moved to the full throttle position, it should be a smooth resistance change without dropping out. It should measure 5K (5 thousand ohms) in the full position.
 5. Measuring across the black and the red wire the resistance should be approximately 5K ohms (5 thousand), when in the neutral position.
 6. When the pedal is at full throttle or the knob is full speed position, the resistance should drop to zero.
 7. Loosen the nut and screw on the throttle arm and adjust if needed.
 8. It can also be tested at the P3 connector on the controller to insure a good connection to the controller. Unplug the P3 connector from the controller. The throttle must be plugged into the harness while testing. See below.
- Note: when moving the throttle to the full position, the resistance should be smooth, without dropping out for both tests. If the resistance does not go to 5K during the test, the arm and the potentiometer may need to be adjusted to achieve it.

14.4 Potentiometer

- 8. If they do not find a problem here, have them retest at the connector at the Trio controller. Reconnect the plug at the throttle potentiometer.
- 9. Unplug the P3 connector (The large white connector) on the controller below the seat, behind the rear panel.
- 10. Locate the black/orange and the black/pink wire.
- 11. Measuring across the black/orange and black/pink wires the resistance should be zero ohms in the neutral position. It should be approximately 5k in the full throttle position. When the pedal is at full throttle the resistance should drop to zero.
- 12. Measure across the black/pink and the black/white wires. The resistance should be approximately 5K (5 thousand) in the neutral position.
- 13. It should drop to zero ohms with the throttle in the full position.
- 14. If your reading is different with this test check all the connections between the controller and the throttle control, including the seat switch.



14.5 Trouble Shooting (Mechanical Problems)



Problem	Possible Causes	Solution
The brush puts down too much pressure	Worn brushes	Replace the brushes if worn
The brush puts down too much pressure	The belt is slipping or broken (cylindrical models only)	Inspect the belt and bearings Replace the belt, if broken or slipping. Replace the bush bearings, if defective
The brush puts down too much pressure	Only one brush is turning (disk models)	Replace the motor with the gearbox
The brush puts down too much pressure	The deck is tilted	Replace the bent lift linkages
The brush deck will not lift	Broken linkage, pins missing, actuator is not working	Replace the defective or missing parts
The brush deck is tilted	Bent linkage	Replace the bent linkage
Cylindrical brushes are worn unevenly	Bent lift linkages or twisted brush weldment	Replace the defective part

15. Lubrication Points

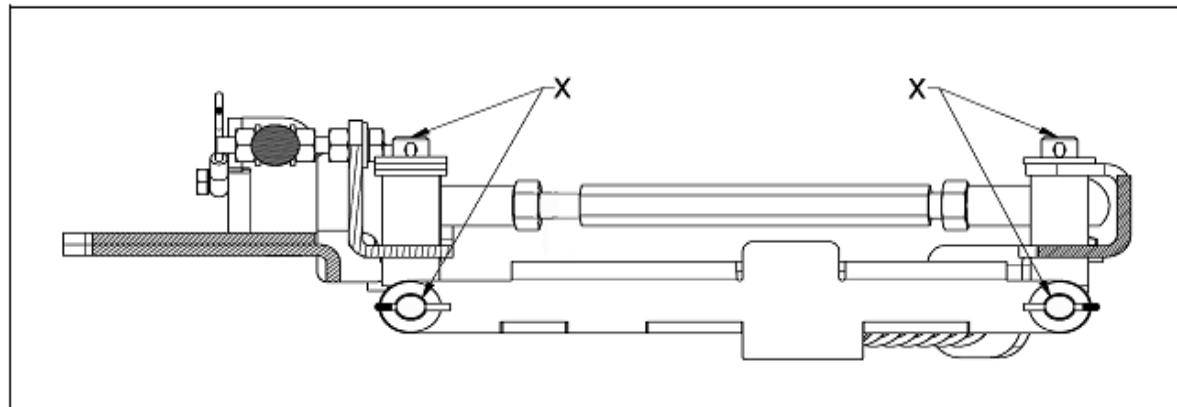
Lubrication

Regularly scheduled lubrication of certain machine parts should be performed to insure trouble-free operation of the machine. Apply a generous amount of grease into the fittings on the machine until grease seeps out around the bearings.

The grease points are listed below:

- Rear squeegee caster axle (2)
- Rear squeegee caster stem (2)
- Steering wheel chain sprockets and idlers
- Squeegee lift mechanism joints and pivot points

Squeegee Mechanism Lubrication Points



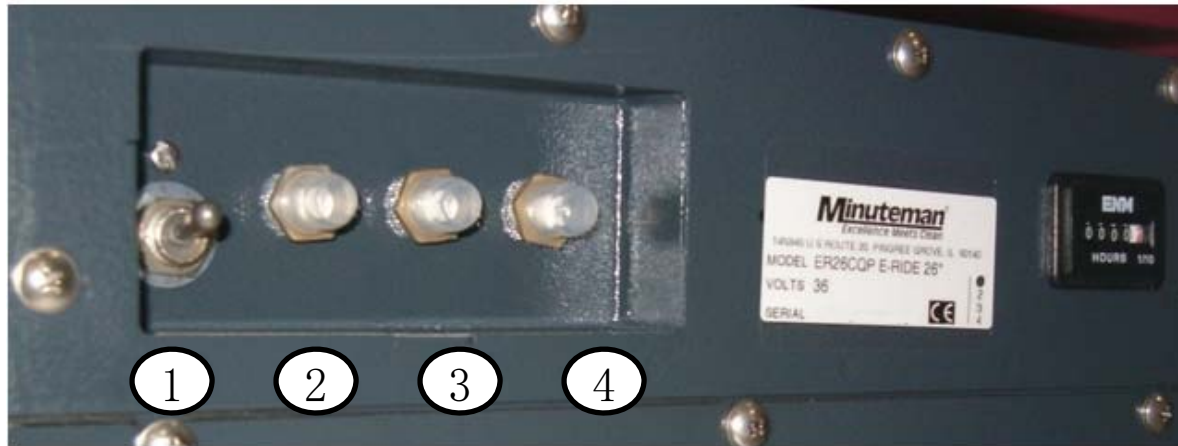
Apply lubricant or light machine oil to lubricate the:

- Rear squeegee general pivot points
- Scrub deck linkages
- Drive wheel assembly seals

16. Carbon Brushes

- Replace the carbon brushes on or before on the following:
- Vacuum Motor at 1000 hours of operation
- Brush Motors (all) at 2000 hours of operation
- Chassis Drive Motor 3000 hours of operation

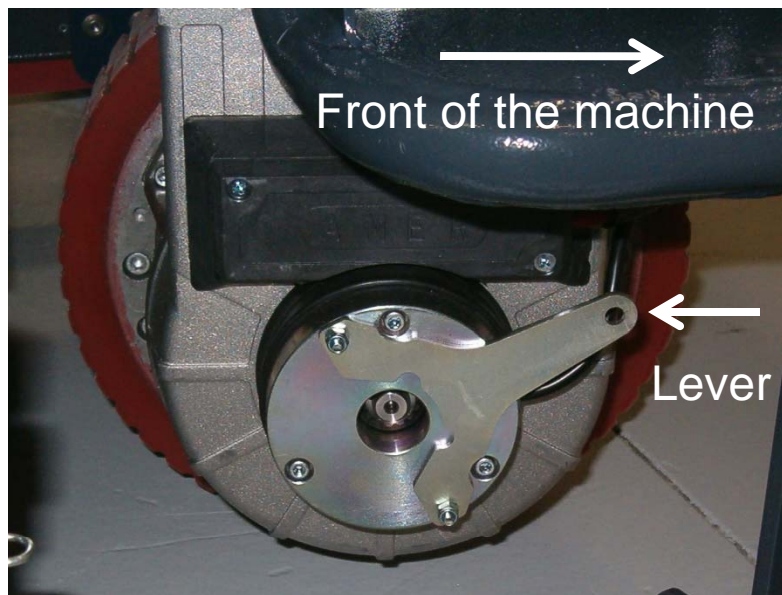
17. Circuit Breakers



Breaker #	Description
1	100 Amp Main Circuit Breaker
2	3 Amp for Accessories Only
3	18 Amp Brush Motor 1 Cylindrical Only
4	18 Amp Brush Motor 2 Cylindrical Only
Note	Disk models do not have circuit breakers 3 and 4

18. Electric Brake

- The chassis drive motor uses a electric brake system.
- The lever can be used to unlock the brake, in the event the machine can not move on it's own power. When the brake is released the machine will be easier to push.
- Pull lever away from the chassis drive motor to release. The lever will need to be wedged to hold the brake in the released position. See the following page.
- The brake will automatically lock the chassis drive, when the lever is released.
- The brake will be electronically released, when the drive system is activated.



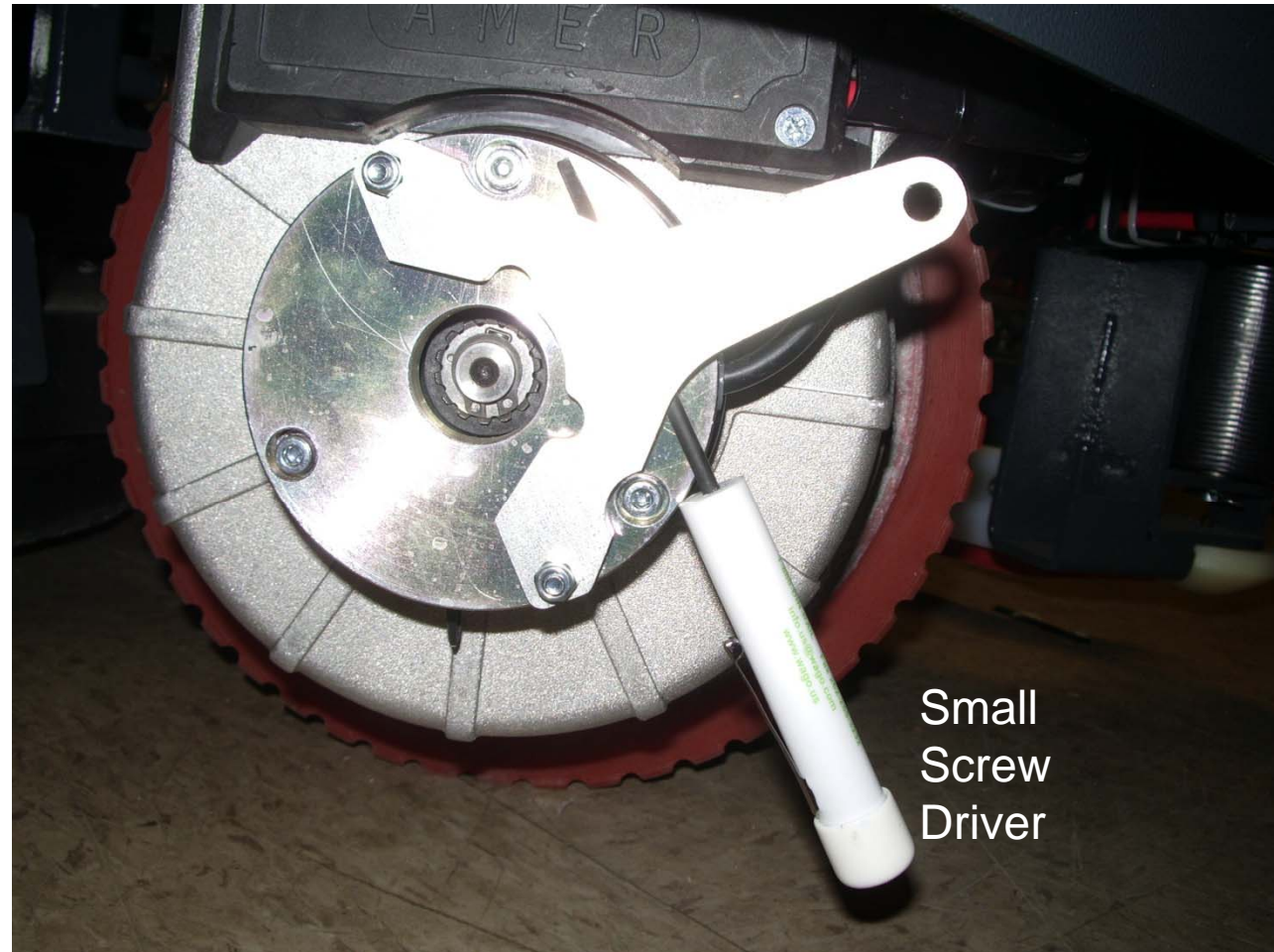
Pull the lever away from the motor to release and hold.



18. Electric Brake

Wedging the Brake

- If the machine needs to be moved manually.
- The brake can be disengaged by putting a wedge or a small screwdriver (shown) behind lever arm to hold it away from the brake body.
- Use caution not to force to the lever out to far. Damage may occur.
- Do not leave the lever permanently wedged.

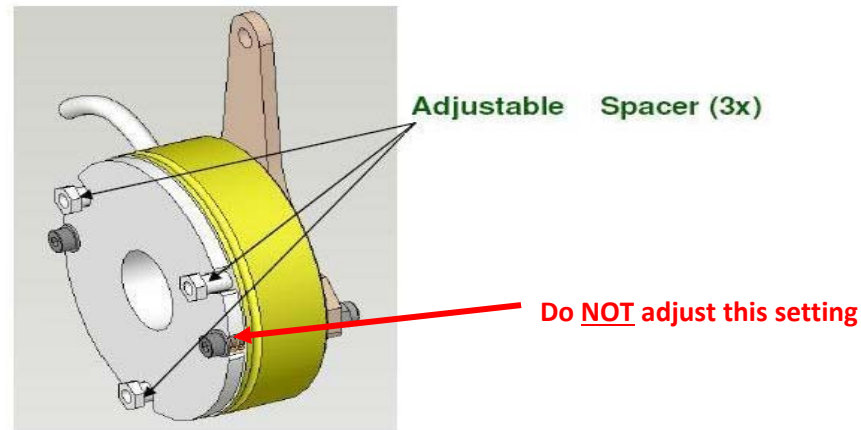
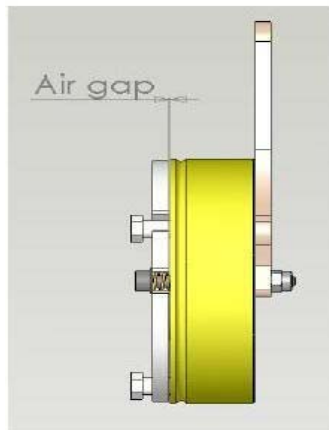


Small
Screw
Driver

•Note: It is also recommended to disconnect the traction harness from the controller when manually moving the machine.

18. Electric Brake Maintenance & Adjustment

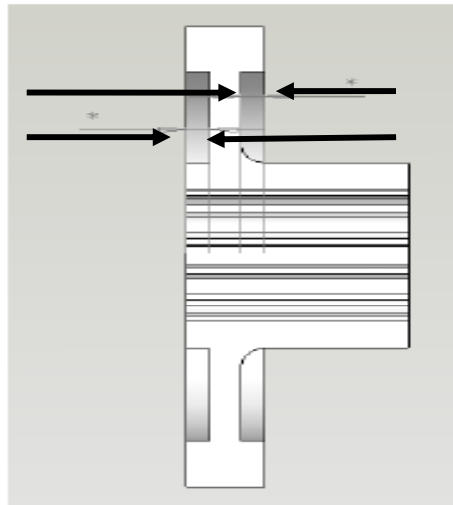
- The Electric brake must be checked periodically.
- Clean the electric brake by using high pressure air to remove dust and dirt.
- Verify the metal disk in the brake moves when pulling the arm away from the brake with a small amount of pressure.
- Verify that the air gap with the electric brake mounted and with nominal voltage directly applied to it. It must measure between 0.19 and 0.31mm.
- Use a feeler gauge to check the air gap at 120° intervals around the diameter of the brake.
- If the air gap needs adjustment: Remove the electric brake from the drive motor.
- Adjust the three adjustable spacers equally (shown below) as needed.
- Reinstall the brake and apply power to verify the air gap.
- Repeat the process as needed until the correct air gap is obtained.
- The electric brake will work properly up to 0.15mm minimum air gap.



18.1 Electric Brake Disk

Electric Brake Adjustment

The brake disk, named plastic rotor must be changed when it reaches 50% wear. (When new, the rotor has a thickness of 2+2 mm; must be changed when it reaches to 1+1 mm thickness.)

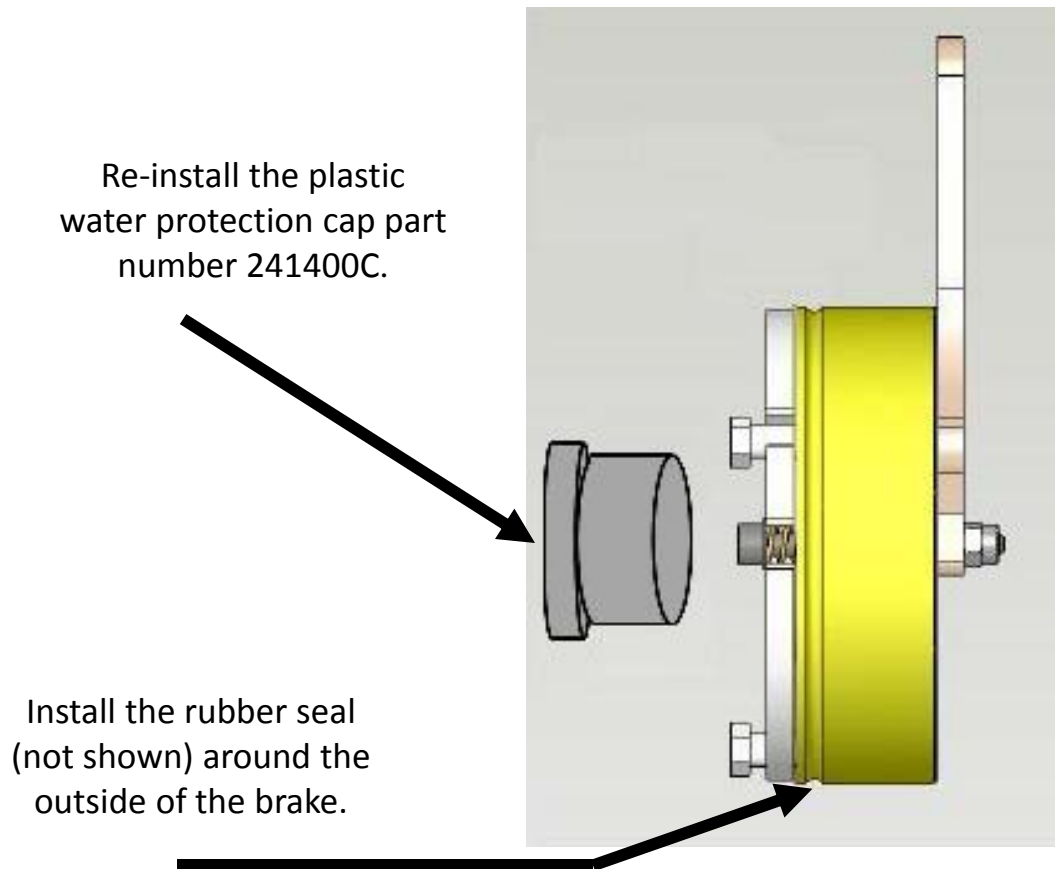


Note:

The electric brake will work at 70% of battery power (25.2 volts) and at 70°-80°C (158-176°F) electric brake working temperature. It shouldn't exceed an air gap of maximum gap of 0.45-0.5 mm to work properly at this temperature.

When operated at 100% battery power and at room temperature, the maximum air gap limit should not exceed 0.7mm.

18.2 Electric Brake Maintenance & Adjustment



19. Notes

