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The **RoadBlade**

Tire Shredding System

DC Portable RoadBlade Users Manual

Revision 2/17/06

This revision supersedes any previous versions.

Please Read User's Manual Before Installing or Operating Unit

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For additional information and questions,
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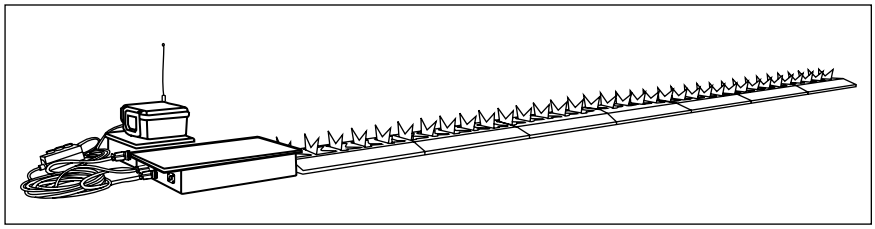
www.roadblade.com

Product Description

Contains:
1 - Control Box
1 - Wireless Remote Control
1 - Portable Power Supply
1 - DC Neoprene Power Cable
1 - AC Neoprene Power Cable
1 - Pendant Control
7 - 20 Inch Modules
2 - Mil-Standard Portable Cases



The RoadBlade tire shredding system

- Basic RoadBlade system is a modular system that starts at a basic length of 12 feet (3.6 meters) and can be extended to 25 feet (7.62 meters) per control box.
- Remote control upgrades available.
- The RoadBlade system can be placed on the road surface and not puncture tire of motoring traffic while in the passive mode. Once the blades are activated the RoadBlade will puncture tires from either traffic direction.
- The system is designed to handle multiple and heavy traffic loads.
- Upon activation and the primary target tires have been punctured, the system is still in full operation to prevent a secondary target from gaining access until the user deactivates the system.
- The RoadBlade system is designed for immediate deflation of tires.
- The basic system is standard wired for quick acceptance of upgrade to remote control.
- The control pendant has one activation button for up/down operations - the red light indicates up; the green light indicated down.
- 250 pound torque motor used to raise and lower the blades.
- The system is capable of being remotely activated by one person.
- The system is capable of being activated in a permanent up or down mode.
- The wireless remote add-on allows the user to operate the system from distances of 150 to 200 feet line of sight.

Electronics

- Power requirement
  120 Volts 3 Amps per system
  240 Volts 2 Amps per system
- 12 Volt DC battery back up is standard for each system.
- 12 Volt DC battery is capable of over 6,000 operations on a full charge.
- Battery housing has flanges for mounting to a wall or pole.
- Control cable wire - 7 strand 18 gauge with an outside diameter total of .510 inches.
- Power cable wire - 3 strand 12 gauge with an outside diameter total of .425 inches.
- System can be run off of either AC or DC power.
- MIL SPEC plugs are used to connect wires to the system.

Individual Module

- Individual modules are 20 inches long, 11 5/8 inches wide, and 1 1/4 inches high.

- Each module contains five individual retractable blades.
- Each module contains four 3/4-inch mounting holes.
- Each module will have two 3/4 inch locking connections to connect to the next module.
- Each module will be able to withstand over 52 tons of direct pressure when placed on a flat surface.
- Modules are powder coated to customers request; black color is standard when no request is made.
- Material of module casting is comprised of 356 T51 Aluminum, weighing 17 pounds.
- On the bottom of each module there are 5 tunnels to allow dirt and water to wash out from underneath.

Individual Blades

- Each blade is 2 3/4 inches high.
- Each blade is 3 7/8 inches wide.
- Each blade is mounted using two 1 1/8 inch mounting plates having 4 screws locking the blades in.
- When retracted each blade will sit recessed in the module to allow vehicles to pass over unharmed.
- When activated each blade will have 4-inch space between them.
- When activated vehicles will not be able to pass over the system without damage to its tires from either direction.
- Blades are field serviceable and replaceable.
- Blades are designed with 4 separate angles for insertion into a vehicles tires. The two outside angles are 77degrees and the two inside angles are 48.6 degrees.
- Blades are comprised of 17-4PH Stainless steel, CB7Cul, ASTM A747.
- Blades are then solution annealed and aged (H925 condition) to a hardness of RC38 Min.
- Measurement of connecting ears to shaft require a distance of .896” - .916”.
- Finish of blades are 125 RMS.
- Blades are powder coated to customers request; black color is standard when no request is made.

Miscellaneous

- Center shaft connecting the blades is comprised of stainless steel.
- Connecting 5/8 inch ball screws are stainless steel.
- Mil-standard portable cases are used for transportation and storage.

Safety Instructions

- During installation keep the area clear, particularly around the actuator box, of possible debris or even co-workers. There is the possibility of injury if accidentally activated.

- Keep pedestrians away from the RoadBlade while the blades are in the up position.

- Keep hands away from the modules while activating the system.

- Keep fingers away from the blades/modules when retracting the blades.

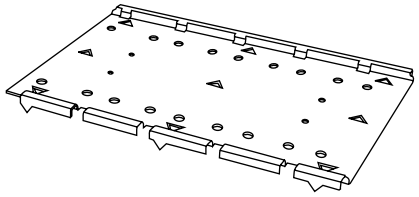
- The portable power supply should not sit directly on the ground surface where water can accumulate
- water
could get inside the box and possibly cause a shock hazard or damage.

- Never remove the control box lid. This is sealed to reduce the remote possibility of water or other contaminants.

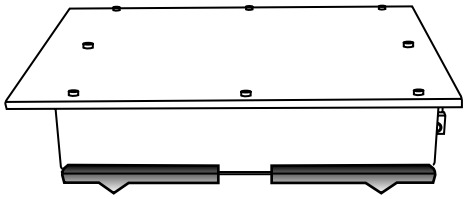
Deployment

Block or redirect traffic to allow deployment of the system. It is important to try to get the RoadBlade system 90 degrees perpendicular to the road.

Determine the location for the actuator box. Place the anchor plate in position so the teeth on the anchor plate grip into the dirt or asphalt surface. Holes are pre-drilled into the module anchor plates to allow the traction spikes to remain on the modules.



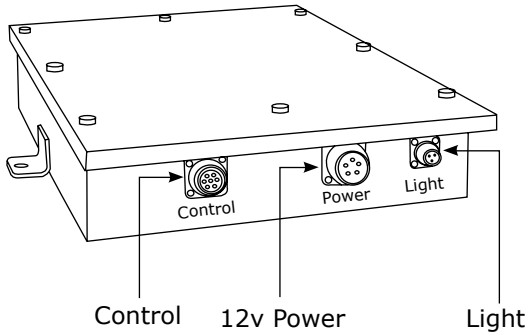
Module Anchor Plate



Anchor Plate
with Actuator Box

Once the actuator box is in its desired location, connect the proper Mil Spec plugs to the actuator box as follows:

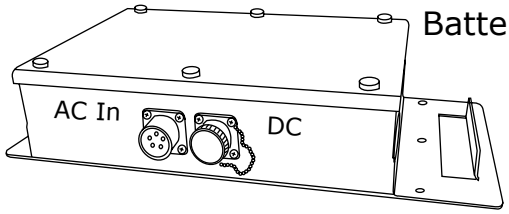
Actuator Box



Control plug - the 7-pin plug is the receptacle on the actuator box that is connected to either the pendant or the optional extra wire plug.

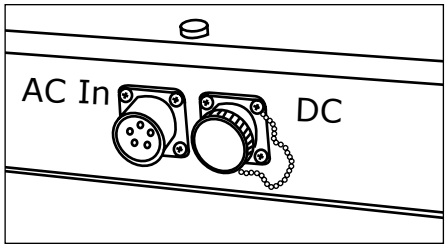
Power plug - provides power to the system from the RoadBlade battery only (unless AC upgrade is installed).

RoadBlade
Battery



Battery - The two 5-pin plugs located on the battery are wired parallel to allow ease of use. Screw on the DC power cable onto the left receptacle to provide power to the RoadBlade system. The receptacle with the screw on cap is used to charge the battery. Before screwing on the AC cable to the receptacle place the cap on the other receptacle to prevent accidental shock.

The battery can be charged while the system is being powered. Insert the DC cable first before inserting the AC charging cable. This will prevent any accidental shocks. They battery can be configured to 110V or 220V at the manufacturing facility.

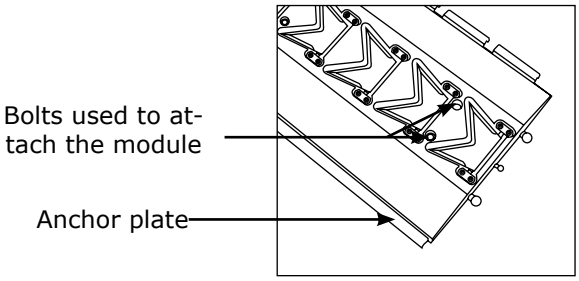


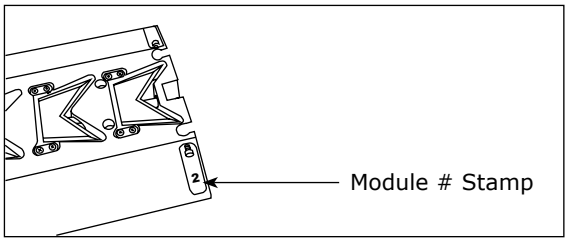
Important Safety Note*
A cap will cover one of the plugs to prevent electrical shock. If charging the battery be sure to cover the other plug due to the current running into it. The prongs located on the plug will be live ends.

If you do not want the RoadBlade battery directly on the road surface, place it on top of the actuator box.

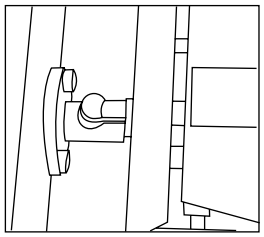
Once the actuator box is in place and all cables and the battery are connected, attach the individual modules to the RoadBlade system. Each module has an anchor plate attached to it using 4 bolts. Each anchor plate is milled to allow the traction spikes to screw into the underside of each module.

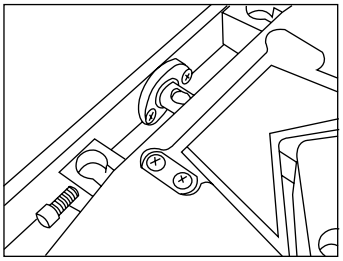
The modules are preset from the factory in numerical order for ease of setup and adjustments to the modules.The module numbered "1" is attached first to the control box, followed by module numbered "2", and so on. This process should be continued until all of the allocated modules for each system are in place.





Note: *When linking the first module to the control box, the first module's ball connector may not freely fall into place at the actuator box. This is due to proper adjustments that were made for the control box at the OEM's facility. Once the first module is in place, activate the system one time to drop the ball center*

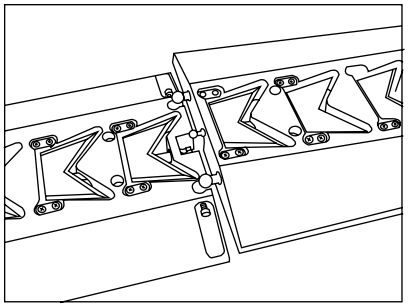

Place the first module
on the actuator box.


Activate the control box
to sink ball.

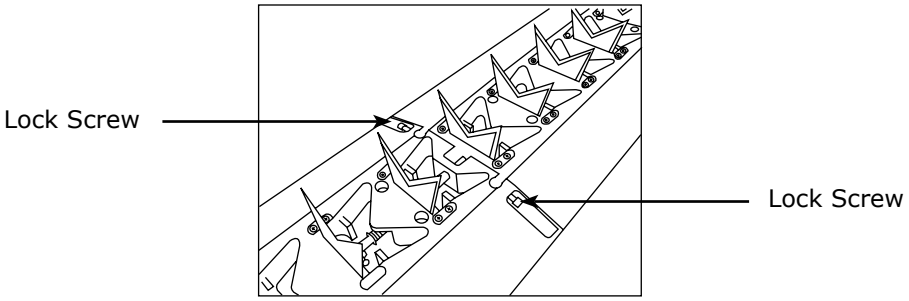
***It is best to attach one module at a time and then activate the RoadBlade system to ensure the blades are straight up.** This makes adjustments to the system easier, if needed. **It is strongly recommended that any adjustments to the blades be made as the individual modules are being installed.**

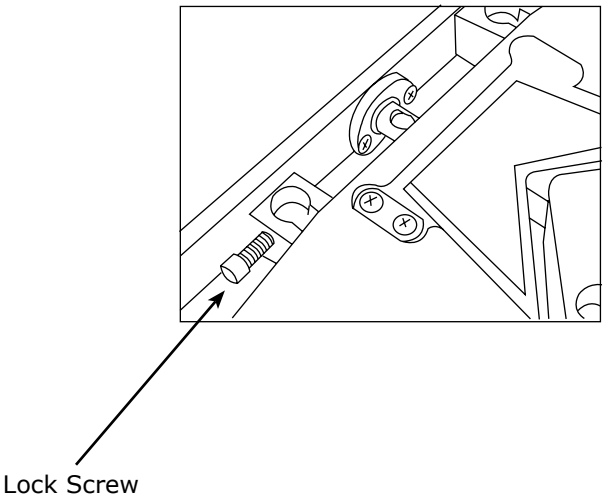
There should be some "give" (side to side movement) in each blade. This ensures that the activation motor in the control box has traveled to its full forward motion, allowing the system to not bind or cause the motor or circuits to fail.

If the blades need adjustments see "Adjusting the System" on page 7.



Once satisfied with the adjustments, lower the blades to allow the next module to connect with the previous module. Repeat this process until all of the modules for the RoadBlade system are attached. Lock the ball joints into the sockets using the 3/16” (4.762 mm) Allen wrench if the RoadBlade system is to be placed on the surface without anchoring. They are used to keep the system in a uniform manner.



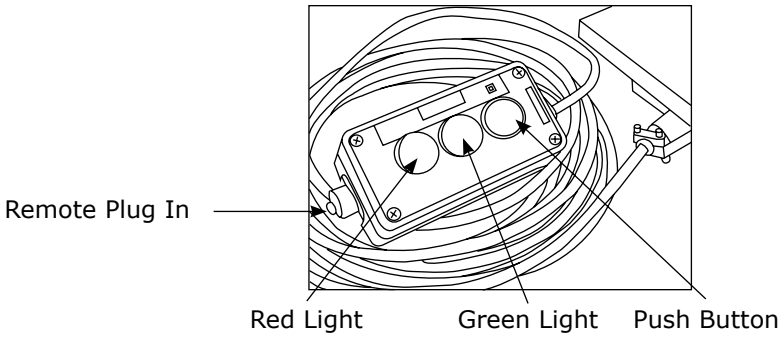


Activation

3 Button Pendant

The pendant control has a cable with a standard length of 30', but it can be made to a specific length when placing the order.

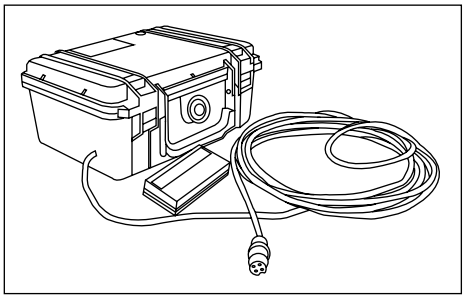
To activate the RoadBlade system, simply depress and release the black push button once. The blades will activate in approximately one second, raising the blades. The red light on the pendant will remain lit until the blades are lowered.



To lower the blades, depress the black button on the activation pendant again. The green light is now lit indicating it is safe for vehicles to pass over the system without harm to their tires. As long as the system is connected, the appropriate light will remain lit alerting the operator of the true status of the RoadBlade system.

Wireless Remote Control

The operator can also use the provided wireless remote to operate the RoadBlade system. By pressing the white button on the remote, the blades will raise.



Pressing the button a second time will lower the blades, allowing vehicles to pass safely over the RoadBlade system without harm to its tires.

The remote control enables the system to be operated remotely. It allows the operator more freedom to move around without being limited to the pendant. The remote control range is approximately 150' - 200' (45.72 m - 60.96 m).

Caution when using single button remote transmitter:
Because the remote control is connected to the pendant, multiple users can operate the RoadBlade system. Proper instruction should be performed to prevent multiple operators from executing opposing actions.

For example:
An operator at the pendant may activate the system to raise the blades. If the second operator with the remote transmitter does not look and verify the state of the blade system and depress the transmitter button, that operator will then deactivate the blades.

Adjusting the RoadBlade system

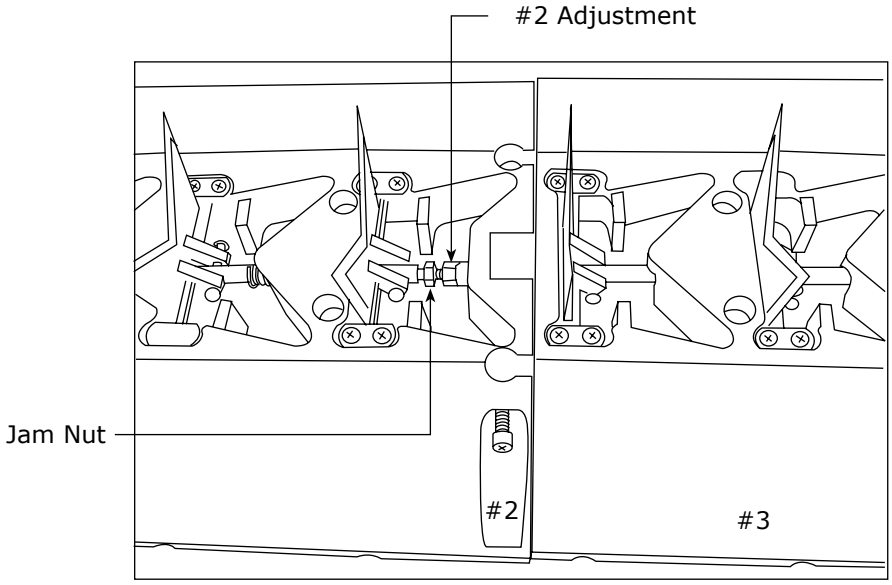
All RoadBlade units are aligned and tuned to proper blade travel on a flat surface in the OEM's facility. Due to variances of different locations and road surfaces, some minor adjustments may be needed prior to installation of the next module. If they are not made after installation, the system may not function properly. ***Important*** - before modifying adjustments make sure the number sequence is correct.

For example:
To adjust the third module, the adjustment on module #2 needs to be set accordingly to raise the blades approximately to a 90 degree angle after these adjustments are made, the jam nut needs to be retightened and the remaining installation can be completed.

**Please note that because all modules are set accordingly that if any major adjustments are made, all succeeding modules will need to be adjusted. For example, if module #3 is adjusted, #'s 4, 5, 6, etc. may have to be modified due to different tensions.*

To adjust the blades:

A. Raise the blades in their full up position.
B. Locate the 2" (50.8 mm) adjustment nut and adjust it using the 7/16" open-end (11.112 mm) wrench until the proper blade adjustment is made.



C. Once the proper adjustments are made, use the 7/16" open wrench on the 2" long nut and the other 7/16" open-end wrench on the jam nut.
D. Tighten the jam nut until it is firm against the 2" adjustment nut. When the blades are in the up position, grab a blade and move it back and forth. There should be some "give" in each blade. This ensures that the activation motor has traveled to its full forward motion and therefore is activating properly. If necessary, proceed using the previous steps to adjust other modules that are out of alignment.

* Do not adjust blades so that they are tight and have no movement.

Note: Adjustments made on one module will affect the modules that follow it. Therefore it is recommended that blade adjustments start at the module closest to the control box and proceed toward the end as modules are added.

Storing the RoadBlade system

Make sure the RoadBlade system is in the passive mode (blades down).

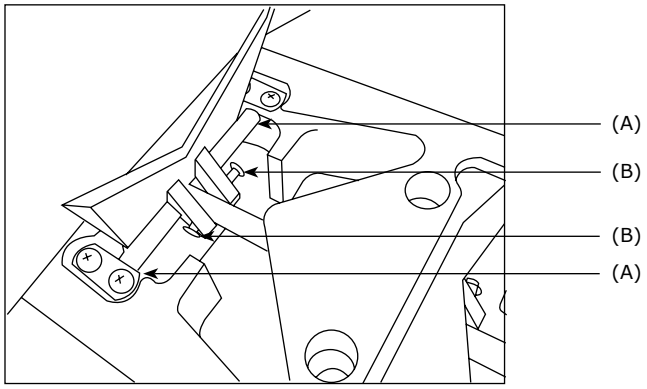
Disconnect all power and unplug all cords to prevent injuries.

To remove the RoadBlade system from the road, block traffic to prevent injury. Starting from the last module away from the control box, retrieve the modules one by one, placing them inside the portable case. Place the control box, battery and cables inside the case.

RoadBlade battery systems:
During storage it is recommended that the AC power cord be plugged into an appropriate AC power supply. If
being stored for lengthy periods of time, the battery should be plugged in to prevent it from being discharged due to lack of use.

RoadBlade system Maintenance

When retrieving the modules visually inspect the underside of the module and remove any debris that may have collected. Debris usually will fall off when you lift the modules off the road. Turn the module so that the blades are facing up and push the main shaft ball (located between the two connecting ball connectors) to raise the blades. The blades should move up and down in a manner that when you release the main shaft the blades should snap down - if they do, the particular module is operating correctly. If for any reason the blades do not snap down, use a spray lubricant in each of the following locations for each individual blade.



Spray the lubricant at the location where the blade inserts into the main module (A) and where the pin holds the blade to the main shaft (B).

Repeat until all the modules for the system you have are complete. After the module is lubricated the next items to examine are the ball connectors at the end of each module. If they are loose and you can turn them with your hand, they need to be tightened. Use the supplied Hex Key and insert it into the end of the ball connector and retighten.

Troubleshooting the RoadBlade system

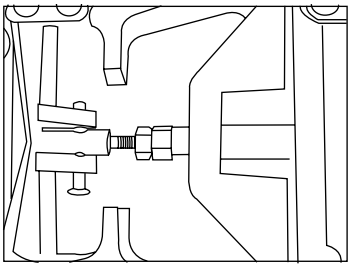
Blades will not go up or down:
Make sure the all cables are properly connected.
Make sure the battery is charged.
Check the power connection from the battery to the actuator box.

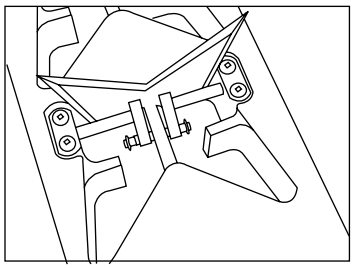
The blades do not come straight up:
See adjusting the system.

The blades do not go down flush:
During adjustment, did you adjust one module in the string before starting the adjustment from the actuator box? If so, simply loosen the 2” nut on the module before the problem module.

The system is acting “sluggish”:
This may be a sign that the battery needs recharged.

To replace a broken blade:
Raise the blades up. With a screwdriver, push the “c” clip off the 3/16” retaining pin that holds the blade to the main shaft. Remove the 3/16” blade retaining pin from the main shaft.





With the T-handle Hex Key unscrew the 4 mounting screws that hold the retaining plate against the blade’s rotating arm. Insert a replacement blade. Replace the retaining plate and screw the 4 mounting screws back in.

Raise the blade and align the oval slot with the hole in the main shaft. Insert the 3/16” retaining pin though the holes. Reattach the “c” clip to prevent the 3/16” retaining pin from getting lose.

Note: Do not touch the adjustment nut when replacing a broken blade. This ensures that the adjustments remain the same.

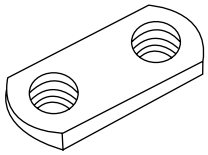
Periodically check and replace any worn spikes underneath the modules.

Note: The actuator box should never be opened. It is sealed to be water resistant at the manufacturing facility. Breaking the seal without PMG’s permission will void any warranty claims. There are no maintenance issues inside the actuator box.

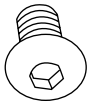
The battery has a located inside that may need to be changed. There is a spare fuse included in the accessory pack. Please recheck all other plugs and power supplies before opening this unit. The battery is also sealed to be water resistant from the manufacturing facility. If opened it will need to be resealed with a high temperature
sealant.

Replacement Parts and Tools

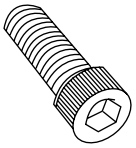
These items are included in the accessories pack:



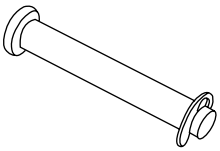
4 - Retaining Plates
RB 0102



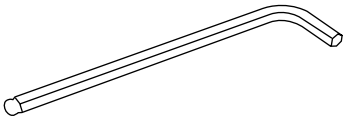
8 - Mounting Screws
RB 0101



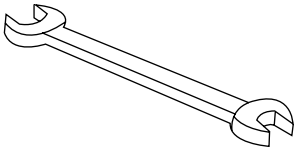
2 - Lock Down Screws
RB 0106



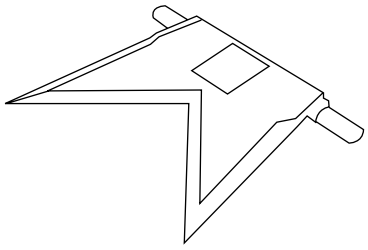
2 - Clevis Pins
RB 0105



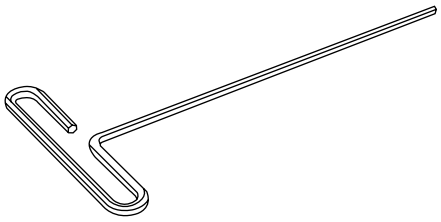
1 - 3/16” Allen Wrench
RB 0122



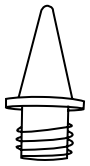
2 - 7/16” Open End
Wrench
RB 3099



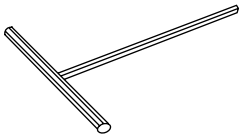
2 - Spare Blades
RB 0104



1 - 1/8” Allen Wrench
RB 0121

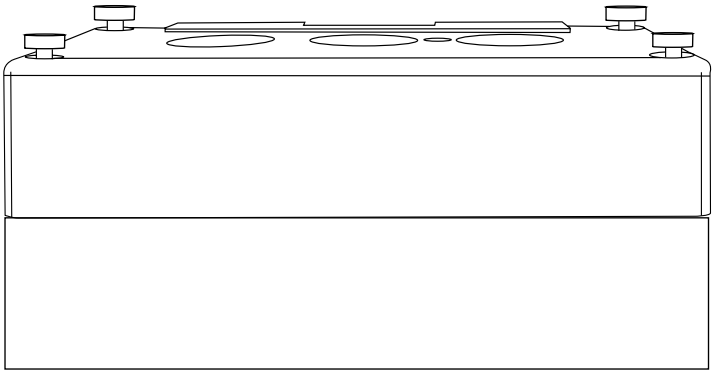


Replacement
Traction Spikes

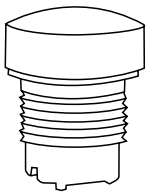


1 - Traction Spike Tool

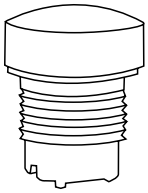
Pendant Control Parts List



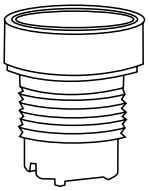
RB 2023



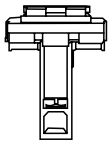
RB 2034



RB 2033



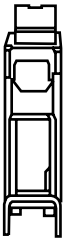
RB 2032



RB 2029

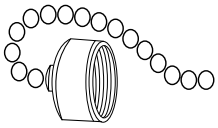
RB 2060 LED G

RB 2060 LED R

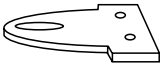


RB 1027

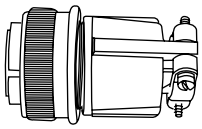
RB 2064



RB 2126

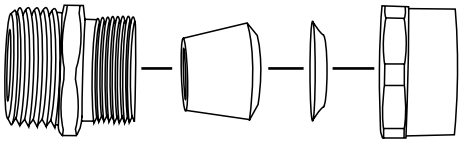


RB 3008



RB 3073

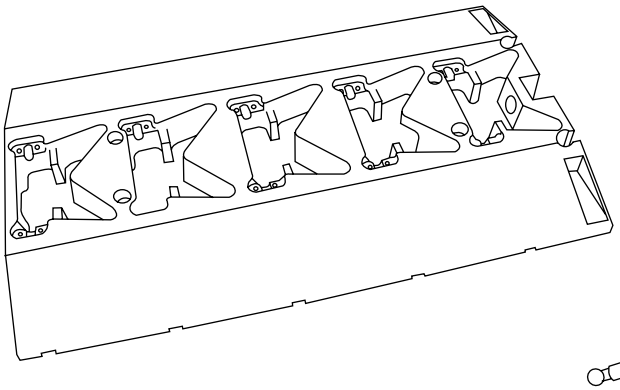
RB 2056



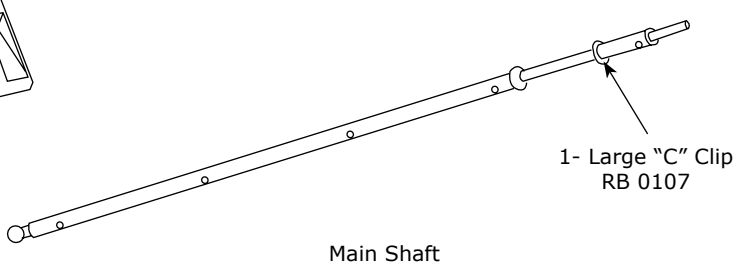
RB 2026

Part Number	Description	Quantity
RB 1027	N.O. Contact Block	1
RB 2023	3 Hole Pendant Box	1
RB 2026	Strain Relief .250/.312	1
RB 2029	Pilot Lite Module Socket	2
RB 2032	Push Button Operator	1
RB 2033	Green Len	1
RB 2034	Red Len	1
RB 2056	16g./7 Cond Wire in Rubber Sleeve	30'
RB 2060	Lamp Bulb #1815 14 VDC Long Life	2
RB 2064	4 Pin Chassis Mount Connector	1
RB 2126	Type 97-60-10 Dust Cap	1
RB 3008	Hook Bracket	1
RB 3073	MIL-SPEC 7 Pin Plug	1

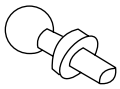
Module Parts List



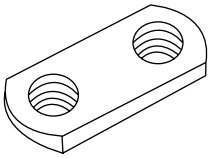
1 - Main Module Body
RB 0103



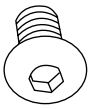
Main Shaft
RB 0005



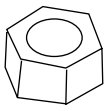
2 - Ball Connectors
RB 0008-A



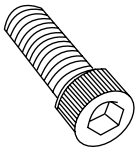
10 - Retaining Plates
RB 0102



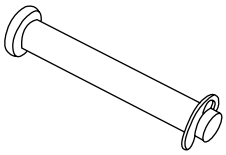
20 - Mounting Screws
RB 0101



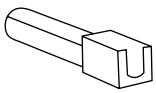
1 - Jam Nut
RB 0109



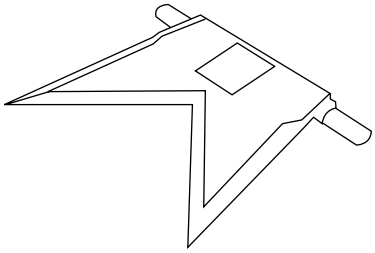
2 - Lock Down Screws
RB 0106



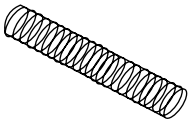
5 - Clevis Pin with
"C" clip assembly
RB 0105



1 - Adjustment Nut
RB 0007

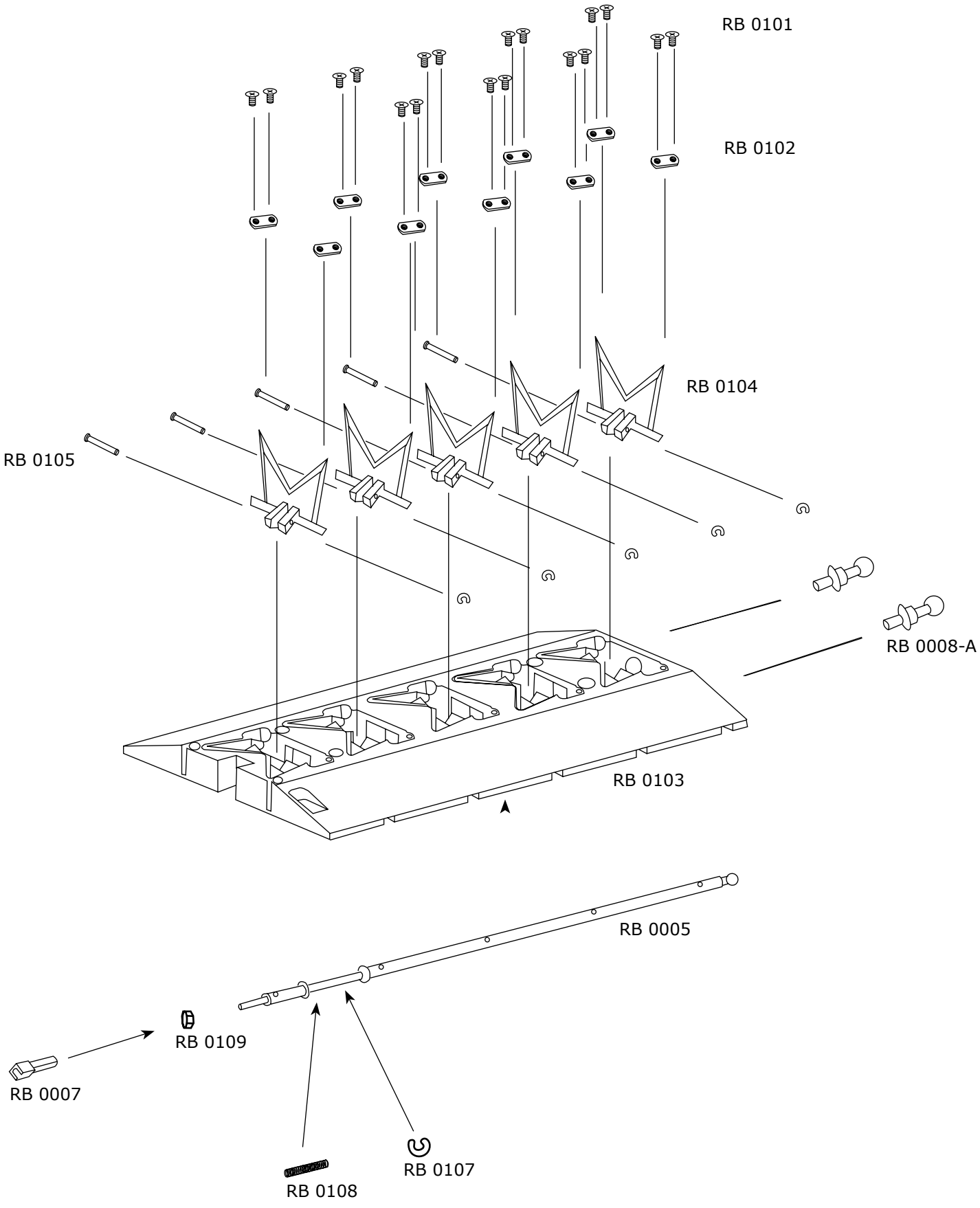


5 - Blades
RB 0104

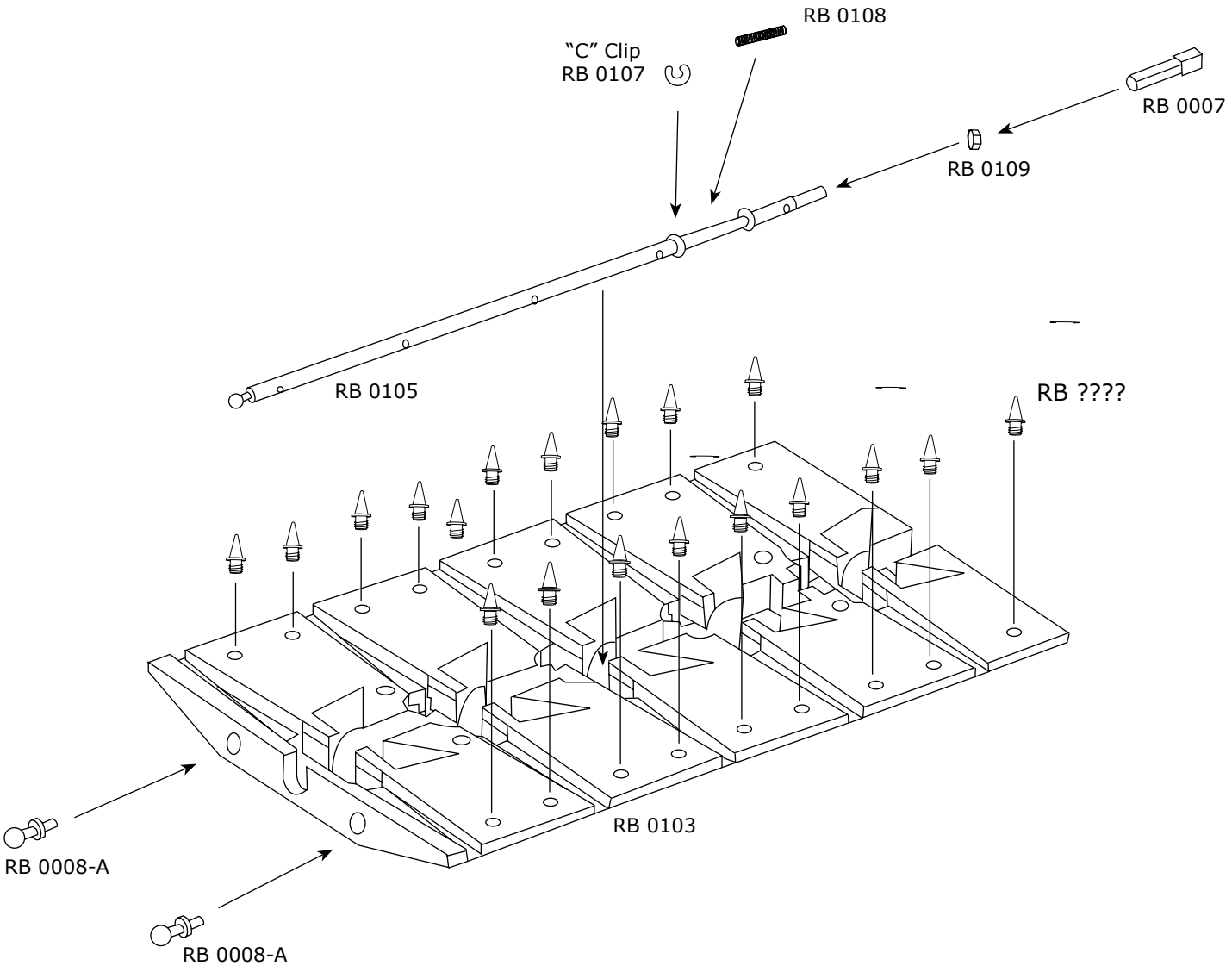


1 - Main Shaft Spring
RB 0108

Exploded View - Top of Module



Exploded View - Underside of Module



RoadBlade Specifications

- 250 pound torque motor used to raise and lower the blades.
- Capable of being deployed by one person.
- Power for battery specifications: 3 AMPS at 120 VOLTS
  2 AMPS at 220 VOLTS

Individual Modules
Each RoadBlade module is 20" (508 mm) long and 12" (304 mm) wide with a height of 1 3/4" (44.45 mm). They contain 5 retractable stainless steel blades spaced 4" (101 mm) apart when in the up position. At the end of each module there are two ball connectors that are placed in the previous modules' receptacles. This allows for modular construction and helps compensate for any crowning in the road surface. Underneath each module there are five tunnels to allow dirt, sand, and other debris to fall through and wash away. In addition, there is approximately 18 traction spikes, which hold the RoadBlade system in position on dirt or asphalt surfaces.

On each module, there are four mounting holes which allow the modules to be anchored to the ground surface. Again, the modules are constructed to withstand 50 tons of force enabling the RoadBlade system to handle heavy traffic volumes and heavy vehicles. In the event a module should break, the user can easily remove the broken module and replace it with a new one.

Module Specifications:
- Comprised of 356 T51 Aluminum, weighing 20 pounds.

Individual Blade Specifications:
- 2 ¾" high.
- 3 7/8" wide.
- Mounted to the module using two 1 1/8" mounting plates, each having 2 screws locking the blades in.
- When retracted, each blade sits flush with the module to allow vehicles to pass over unharmed.
- When activated, vehicles approaching the system in either direction will not pass over the system unharmed.
- Field serviceable and replaceable.
- Comprised of four separate angles for insertion into the vehicles tires. The two outside angles are 77 degrees and the two inside angles are 48.5 degrees.
- Constructed of 17-4PH Stainless steel, CB7Cul, ASTM A747.
- Solution annealed and aged (H925 condition) to a hardness of RC38 Min.
- Measurement of connecting ears to shaft require a distance of .896"
- .916" (22.758 mm - 23.2664 mm).
- Finish of blades is 125 RMS.
- Powder coat finish to resist corrosion.

Accessories
AC Add-on - the control box will be modified to accept AC power.

RoadBlade Warranty

1. Equipment supplied by PMG, Inc. is new and guaranteed to meet all published product specifications and to be free from defects in material and workmanship.

2. The company's liability under this warranty is limited to repairing and /or replacing defective parts of the system within one year from the date of receipt of the goods.

3. Equipment showing damage by misuse, abnormal operation or attempts to repair other than by authorized service personnel shall be excluded from this warranty.

4. PMG, Inc. shall in no event be responsible for incidental or consequential damages, including, without limitation, personal injury or property damage.

5. There are no warranties, expressed or implied, except as stated herein. This limitation on warranties shall not be modified by verbal representations.

6. PMG, Inc. reserves the right to change any specifications or withdraw any model without prior notice.

7. PMG, Inc. also reserves the right to make changes in the design of its equipment without incurring any obligation to make the same changes on models previously purchased.