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The **RoadBlade**

Tire Shredding System

Permanent RoadBlade Users Manual

Revision 4/17/06

This revision supersedes any previous versions.

Please Read Manual Prior to Operating System

Index

For questions or additional information please contact:

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Product Description

The RoadBlade tire shredding system

Permanent RoadBlade package includes:

A) 1 - Pole Mount NEMA 4 rated outdoor box (PMB) containing the following:
- Power distribution breaker box for the RoadBlade and other accessories
- Electronics to operate the RoadBlade system
- 12-volt DC back-up power source
- Distribution blocks for all connections
- Two button pendant control for local operation while working on the RoadBlade system

B) 1 - Actuator box
C) 7 - 20 Inch cut modules
D) 4 - Prefabricated trenches
E) 1 - 2 Button Pendant
F) 1 - Power cable
G) 1 - Control cable
H) 14 - 3/8 - 16 Stainless Steel hex cap screws - 1 1/2
I) 2 - End Caps

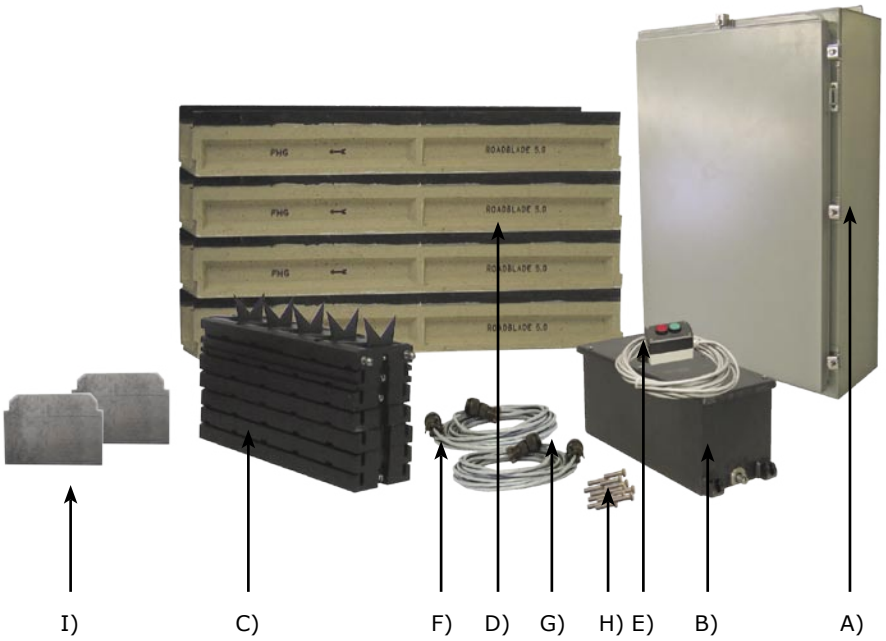


Figure 1

The RoadBlade is a modular system with a basic length of 12 feet (3.66M) and can be extended to 30 feet (9.14M) per actuator box. The actuator box raises and lowers the blades in the modules which are laid out to form 12 feet (3.66M) of retractable blade protection. The modules are pressure tested to withstand over 50 tons of force, so they can handle heavy and high traffic volumes. While the blades are in the up (active) position any vehicle passing over the blades in either direction, will have their tires punctured. This enables you to close down the perimeter where the RoadBlade is positioned. When the blades are in the down (passive) state, vehicles can safely pass over the system without harm. Due to the high-speed motor inside the actuator box, one complete cycle is completed in less than one second.

Pole Mount Box (PMB)

The PMB is a NEMA 4 rated box that houses all of the electronics to operate the RoadBlade system. The 30 x 24 x 10 box can be mounted to a pole or directly to a wall.
See page 27 for mounting details.

Inside the Pole Mount box

The electronics required to operate the RoadBlade system are located inside to prevent accidental damage or personal injury.

There is a Square D QO breaker box, a two button control for local operation while working on the system, system terminal blocks for connections, 12V DC backup power source, and the electronics to operate the RoadBlade system. If ordered, the optional heater thermostat and the connection terminals will be inside the box as well. System terminal blocks (illustration on page 29) are provided and marked to attach the corresponding cables for the system as well as options that may be added.
See page 28 for inside details.

Square D QO Breaker Box

The breaker box located in the PMB is pre-wired to the RoadBlade system, back-up power, and to other optional accessory items. The breaker box has three breakers that are pre-wired. One 20 amp breaker for the RoadBlade system and battery back-up, one 20 amp breaker for the optional heating elements, and one 20 amp breaker for any on site additions (such as larger indicator lights, arm barriers, convenience outlet, etc).

Two Button Pendant

A two button control is mounted inside the PMB. This allows for activation of the system during installation as well as maintenance on the system.

Actuator box

The watertight actuator box houses a 250 pound high speed torque motor which raises and lowers the blades on the system. Two waterproof proximity switches to activate and deactivate the motor are also located inside.

Individual Cut Modules

Each module is 20 inches (50.8 cm) long and 6 5/8 inches (16.83 cm) wide with a height of 1 ¾ inches (4.45 cm). It contains 5 retractable blades spaced 4 inches (10.16 cm) apart when in the up position. At the end of each module there are two ball connectors that are placed in the previous module's connector. On the top of each module there are 4 mounting holes for the user to anchor each module to the prefabricated trench. Each module is constructed to withstand over 50 tons of force enabling the RoadBlade system to handle heavy traffic volumes and weights without damaging the modules. If in the event a module were to need replacement, the user can simply remove the broken module and replace it with a new module.

Comprised of 356 T51 Aluminum, each cut module weighs 17 pounds.

Individual Blade Specifications:

- 2 3/4 inches (6.99 cm) high.
- 3 7/8 inches (9.84 cm) wide.
- Mounted to the module using two 1 7/8 inches (2.86 cm) 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 inches (2.28 - 2.33 cm)
- Finish of blades is 125 RMS.
- Powder coat finish to resist corrosion.

Prefabricated Trenches

The prefabricated trenches were developed to make installation of the RoadBlade system easier. The trenches provide stable support for the modules and have mounting receptacles pre installed to enable the installers to bolt the modules to the trenches for stability. Each trench is designed to support two modules. At the end of each trench there is a male and female end to allow the trenches to butt up against each other during installation. At the bottom of each trench there is a 3 inch (7.62 cm) knock out provided to allow a drain pipe to be inserted to allow the water and dirt to accumulate in the trench and wash away. This allows many choices of drainage schemes.

Manual Actuator Box (optional back up)

The manual actuator box is a manual back up should power all power options for the RoadBlade fail to operate. As it implies the manual box will require personnel to physically actuate the system until the proper power source is restored.

SAFETY* When using the manual box always activate the system from behind the box (other side of the modules). The box is spring loaded and the handle will move in a rapid manner toward the user and stop at 90 degrees to the box. Standing too close to the handle will result in possible injury.

Operating the System

Operation of the system is enabled by any of the following methods:

1 - Pole mount box (main connection point)
2 - 2 button pendant control
3 - Junction box (optional)
4 - Wireless remote (optional)
5 - Preexisting security system
6 - Manual actuator box (optional back up)

1 - ***Pole Mount Box (PMB)***
The PMB must be located near the actuator box. Inside the PMB there is a two-button control to raise and lower the RoadBlade system. The red button raises the blades and the green button lowers the blades. The two button control allows personnel to activate the blades while they are installing the system or doing periodic maintenance.

Figure 2

2 - ***2 Button Pendant Control***
The remote pendant control enables the user to activate the RoadBlade system from a different location other than the PMB. This option is ideal for watchtower locations. Various configurations can be accommodated at time of order. Remote pendant controls can be placed up to 800 feet (243.84M) away from the PMB.
Standard 30 foot (9.1M) pendant control.

Figure 3

3 - ***Junction Box (optional)***
The junction box is incorporated to operate multiple systems from one location. If for instance you need to control an inbound and an outbound lane system from one location the junction box is the answer. The major advantage of the junction box is the centralization of multiple controls in one location.
One junction box can operate a maximum of 4 separate RoadBlade systems simultaneously. A control cable for each system must be routed to the junction box.

Figure 4

4 - ***Wireless Remote (optional)***
The wireless remote option can be installed in the junction box to allow users to operate the system without being limited to one location. The wireless remote may allow the operator a range of 150 feet (45.72M) to 200 feet (61M) line of sight from the junction box. If operating multiple RoadBlade systems from the Junction Box, separate receivers will be required, but a multi-channel transmitter is available to operate the separate receivers.
The wireless remote weighs 3.25 pounds.

Figure 5

5 - ***Preexisting security systems***
The RoadBlade can be integrated with other security systems that may be in place. For example, if you presently have an arm barrier or keypad input device, with the use of dry contacts from those devices, they can send a signal to the RoadBlade to activate the systems to operate in unison.
This provides you with a semiautomatic system.

6 - ***Manual Actuator box (optional back up)***

If power were to become unavailable for an extended period, the manual actuator box can replace the actuator box to raise and lower the blades on the RoadBlade system. The box is designed to be activated hands free. A foot pedal is located at the bottom of the handle and is spring loaded. The foot pedal and the handle are used jointly to deactivate the blades.

Figure 5

The RoadBlade is electrically powered by two options:

1 - Direct AC Current
2 - Back up DC Current

1 -AC power source drives the RoadBlade from a 120 volts or 240 volts. Input power is connected to the breaker box in the PMB. At the time of order 110V or 220V power must be specified.

2 - Back up power: A 12V 17AMP battery is include to provide power to the system should your facility lose AC power. The battery, when fully charged, can provide 8 to 10 hours of operation. A charging system is included to maintain battery condition. It is recommended that the battery be changed yearly for optimum performance.

Optional Accessory Items

Wireless Remote Control

Enables the users to roam from the pendant control or junction box and allows for quicker reaction time to raise the blades. (See page 7 for additional information.)

Stop/Go Light

This item alerts traffic to the status of the blades. When the blades are up, the stop-go light indicates red, when the blades are down it indicates green. This informs operators of the RoadBlade and motoring traffic the status of the blades.

Multi Unit Junction Box

Allows multiple units to be activated by one control. (See page 7 for additional information.)

Extra Cable

While the system comes standard with 30 feet (9.1M) of cable, some installations require more. The maximum length of cable is 500 feet (152M).

Heating Elements

Heating elements are incorporated for freezing temperature climates. An adjustable thermostat is located in the PMB. This enables the user to adjust the temperature to the weather conditions. These elements are not meant to thaw a completely frozen system, but rather to prohibit freezing from initially occurring. They help the modules to prevent ice from building up. The power requirement for the heating elements is 120 VAC. They are custom made for each RoadBlade system. Each system will require three heating elements. Two will control the temperature of the modules in the trench. The third heating cable is self regulating to prevent ice build up in the trench itself, as well as help the flow of build up out of the trench through the drain.

A-Frame Alert Sign

This movable sign creates a barricade while displaying your message. It is quick to set-up and folds easily for convenient storage. This heavyweight plastic A-frame sign can be filled with sand to help withstand the elements. Size: 24 x 45 inches (60.96 - 111.76 cm)

Stainless Steel Arm Extensions

The stainless steel arm extensions are used to connect the manual actuator box to the first module of the RoadBlade system. When mounted in a flush position, it raises the manual actuator box above the trench by ½ an inch (1.27 cm) to allow water and dirt to pass under the manual actuator box and into the trench. The stainless steel arm extension weighs 3.95 pounds.

Safety Instructions

- During installation keep the area clear of debris, installation material, and nonessential personnel. 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 PMB should not be opened during inclement weather conditions - if needed protect the inside components as best as possible.

- Separate breaker for heaters - safely.

- When working on electric components inside of the Pole Mount Box remove power to prevent shock hazard.

Activating the RoadBlade System

The RoadBlade system can be activated using several different devices. They include: the two button pendant, wireless remote control, junction box, and the manual actuator box.

2 Button Pendant

The pendant control has a cable with a standard length of 30', however, it can be made to a specific length at the time of order.

To activate the RoadBlade system, simply depress and release the red push button once. The blades will activate in approximately one second. To lower the blades, depress the green button on the activation pendant again. It is now safe for vehicles to pass over the system without harm to their tires.

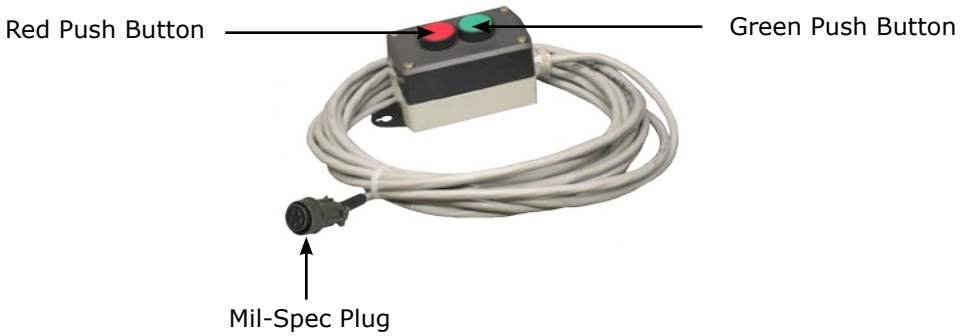


Figure 6

Wireless Remote Control (optional)

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.

Figure 7

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.

Junction Box (optional)

The junction box is incorporated to operate multiple systems from one location. If for instance you need to control an inbound and an outbound lane system from one location the junction box is the answer. The major advantage of the junction box is the centralization of multiple controls in one location. One junction box can operate a maximum of 4 separate RoadBlade systems simultaneously. A control cable for each system must be routed to the junction box.

Figure 8

Manual Actuator Box (optional back up)

The manual actuator box can be used as a back-up method of activation in the case of a power outage because it has no power requirements; however, it will operate the ***RoadBlade system only***. To activate the RoadBlade, step on the foot pedal. A spring will release and the blades will be active. To deactivate the blades, pull back on the handle until it locks in place. The blades will go down and vehicles can proceed without tire damage.

Figure 9

Optional Access Control Systems

PMG carries a line of access control systems that can be incorporated to operate in conjunction with the Permanent RoadBlade system. They can be used with the RoadBlade or independently. This allows you to customize a system that fits your specific needs for your facility.

Arm Barriers

When incorporated with the Permanent RoadBlade, arm barriers serve as an effective visual deterrent. The barrier will be activated using the same controls for the RoadBlade system. For example, should an authorized user press the green button on the two button pendant, the blades will go down and the arm on the barrier will raise simultaneously, allowing the vehicle to safely pass without tire damage.

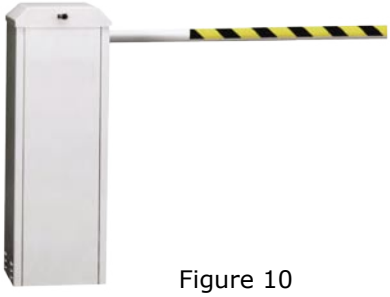


Figure 10

Access systems

Optional plug-in modules allow for a keypad, key chain remotes, proximity card readers or cameras. This system will keep a log of who enters/exits and at what gate. Authorized personnel can use the keypad to enter their pass code to enter/exit the facility. Visitors can call in to personnel to verify their identification. Once authorization is granted the blades will go down and the vehicle may proceed safely. If an arm barrier is also installed, the arm will raise when the blades go down. Anyone attempting to flee will receive severe tire damage.

Figure 11

Radio-Controlled Access

Allow you to move away from the system while maintaining the capability to activate the Permanent RoadBlade and/or the arm barrier.

Figure 12

Key Card Entry Systems

Use either the keypad to enter a pass code or use the built-in proximity card reader. Key chain remote controls can also be equipped with a proximity card for speed and convenience. All of these options will activate the Permanent RoadBlade and/or the arm barrier.

Figure 13

Adjusting the RoadBlade system

All RoadBlade units are aligned and tuned for proper blade operation in the manufacturing facility. Due to variances of different locations and road surfaces, some minor adjustments may be needed prior to installation of the next module. If adjustments are not made after installation, the system may not function properly. ***Important*** - before making any adjustments make sure the numerical sequence is correct.

For example:
To adjust the third module, the adjustment on module #2 needs to be set properly in order the blades to be activated to an approximate 90 degree angle after the adjustments have been made. The jam nut needs to be retightened and the remaining installation can be completed.

NOTE Because all modules are preset at the manufacturing facility, if any major adjustments are made, all succeeding modules will need to be adjusted. Making adjustments to one module effects the tension on the remaining modules.

For example:
If module #3 is adjusted, then #'s 4, 5, 6, etc. may have to be modified due to the tension being adjusted on module #3.

To adjust the blades:

A. Raise the blades in their full up (active) position.
B. Locate the 2" (50.8 mm) adjustment nut and adjust it using the 7/16" open-end (11.12 mm) wrench until the necessary adjustment is made.

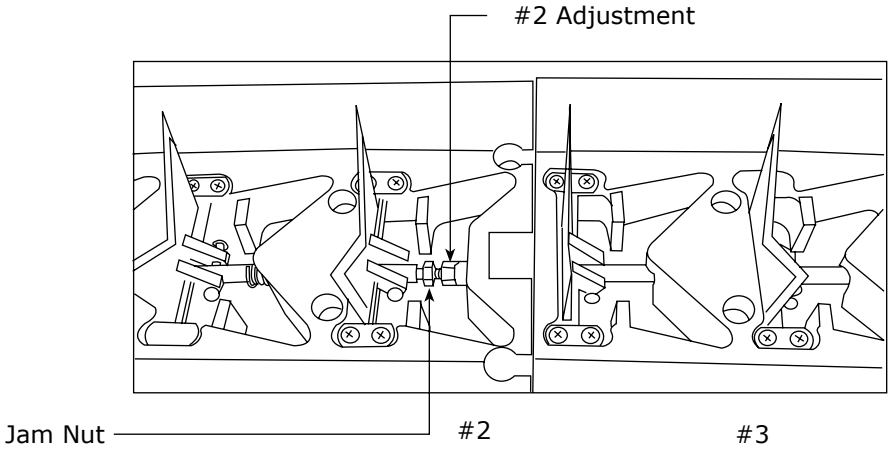


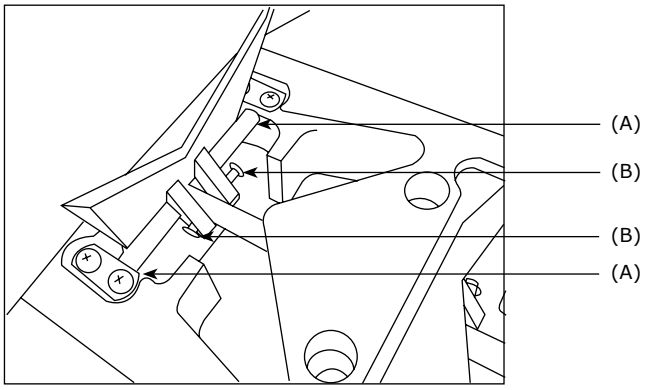
Figure 14

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 actuator box and proceed toward the end as modules are added.

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.



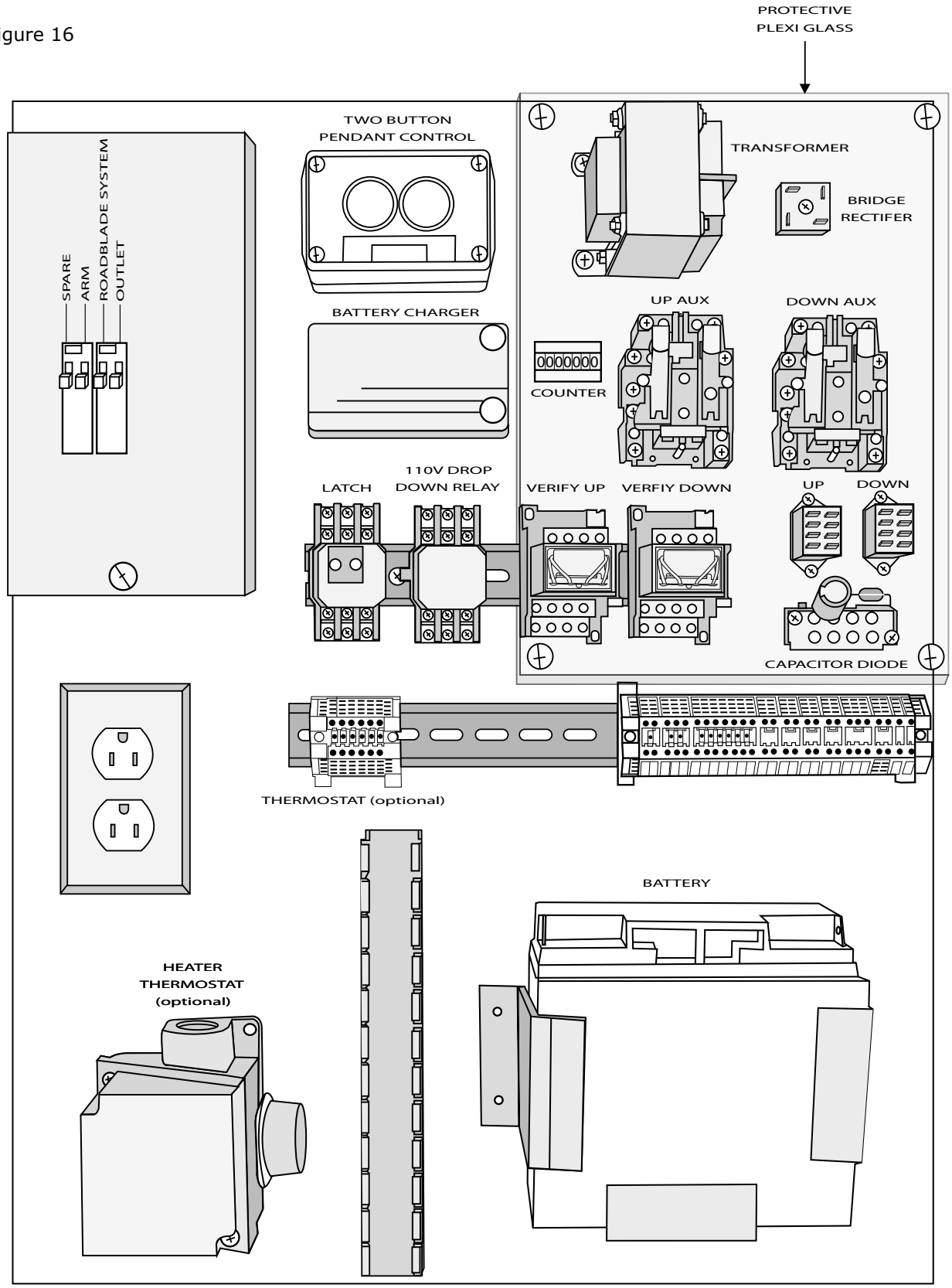
Spray the lubricant at the location where the blade inserts into the main module (A) and where the pin holds the blade to the main shaft (B).

Figure 15

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.

Inside the Pole Mount Box

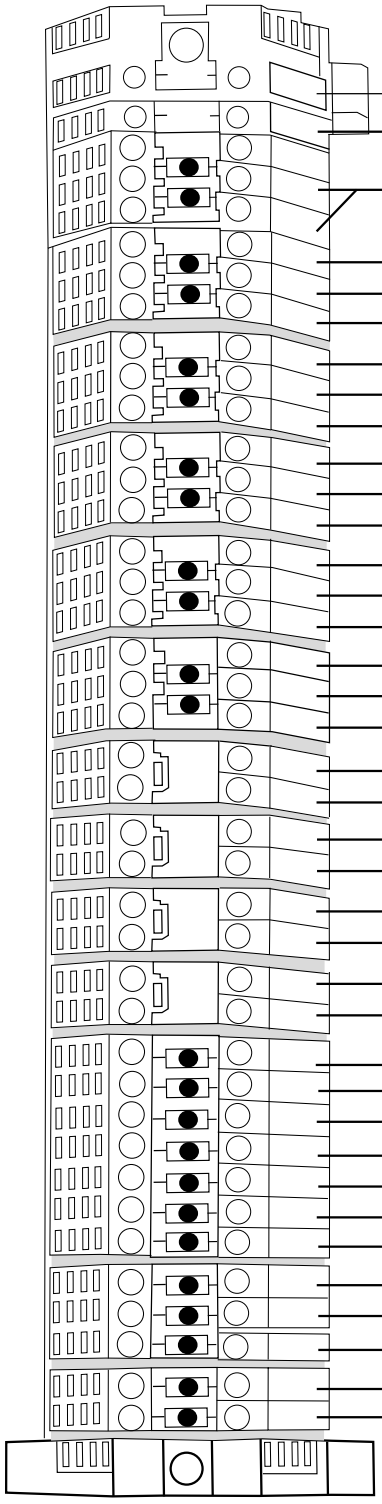
Figure 16



Distribution Blocks Inside Pole Mount Box

Figure 17

SYSTEM TERMINAL BLOCKS



PROXPLATPINOUT

PROXPLATPINOUT.TXT 9/1/05 PROXPLATE CONNECTIONS INFO.

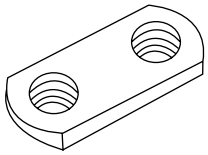
LINE 120 VAC	- BLACK
NEUTRAL 120 VAC	- WHITE
EARTH GROUND	- GREEN
VERIFY UP A NC	- 1
VERIFY UP A NO	- 3
VERIFY UP A COMMON	- 5
VERIFY UP B NC	- 2
VERIFY UP B NO	- 4
VERIFY UP B COMMON	- 6
VERIFY DOWN A NC	- 1
VERIFY DOWN A NO	- 3
VERIFY DOWN A COMMON	- 5
VERIFY DOWN B NC	- 2
VERIFY DOWN B NO	- 4
VERIFY DOWN B COMMON	- 6
UP RELAY NO	- 4 RED LIGHT
DOWN RELAY NO	- 4 GREEN LIGHT
12 VDC	

RELAY TERMINALS

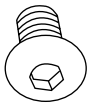
UP COMMAND	- BLUE
UP COMMAND	- BLUE
DOWN COMMAND	- ORANGE
DOWN COMMAND	- ORANGE
0 VDC	- WHITE
0 VDC	- WHITE
+12 VDC	- RED
+12 VDC	- RED

	PLUG PIN	***IN ACT. BOX COLOR***	***CABLE WIRE COLOR***
NC DOWN PROX	- G	WHITE	YELLOW
+12 VDC FILTERED	- F	BROWN	ORANGE
0 VDC	- E	BLUE	BLUE
NO VERIFY UP PROX	- D	BLACK	BLACK
NC UP PROX	- C	WHITE	WHITE
NO VERIFY DOWN PROX	- B	BLACK	RED
CHASSIS GROUND	- A	GREEN	GREEN
MOTOR	- B		BROWN
MOTOR	- C		BLACK
MOTOR CHASSIS GROUND	- E		GREEN
TO BATTERY PLUS			
TO BATTERY MINUS			

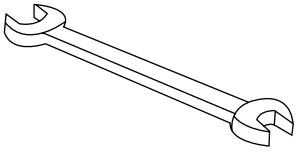
Replacement Parts and Tools



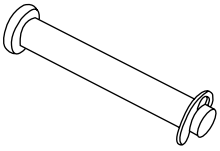
4 - Retaining Plates
RB 0102



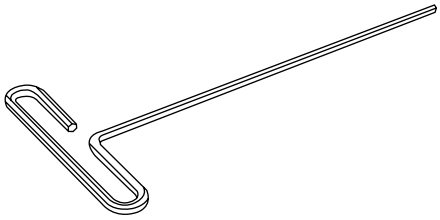
8 - Mounting Screws
RB 0101



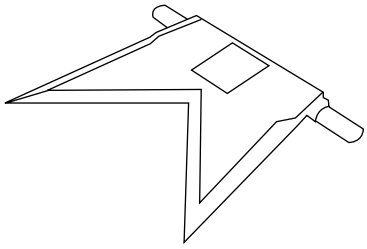
2 - 7/16” Open End
Wrench
RB 3099



2 - Clevis Pins
RB 0105

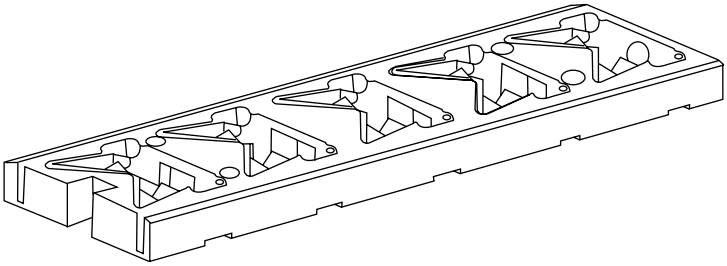


1 - 1/8” Allen Wrench
RB 0121

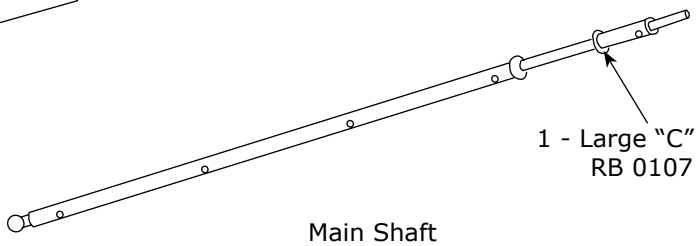


2 - Spare Blades
RB 0104

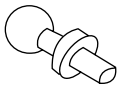
Individual Module Parts



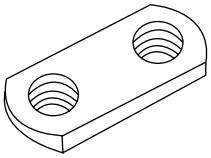
1 - Main Module Body
RB 0103



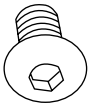
Main Shaft
RB 0005



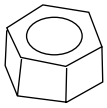
2 - Ball Connectors
RB 0008-A



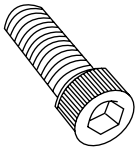
10 - Retaining Plates
RB 0102



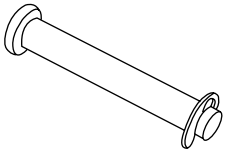
20 - Mounting Screws
RB 0101



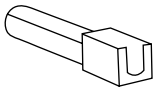
1 - Jam Nut
RB 0109



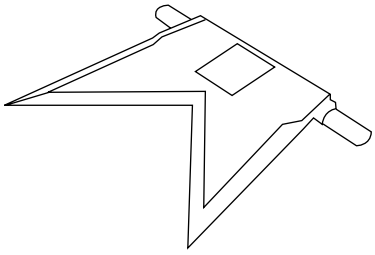
2 - Lock Down Screws
RB 0106



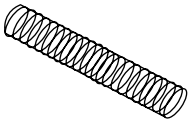
5 - Clevis Pins with "C"
Clip Assembly
RB 0105



1 - Adjustment Nut
RB 0007



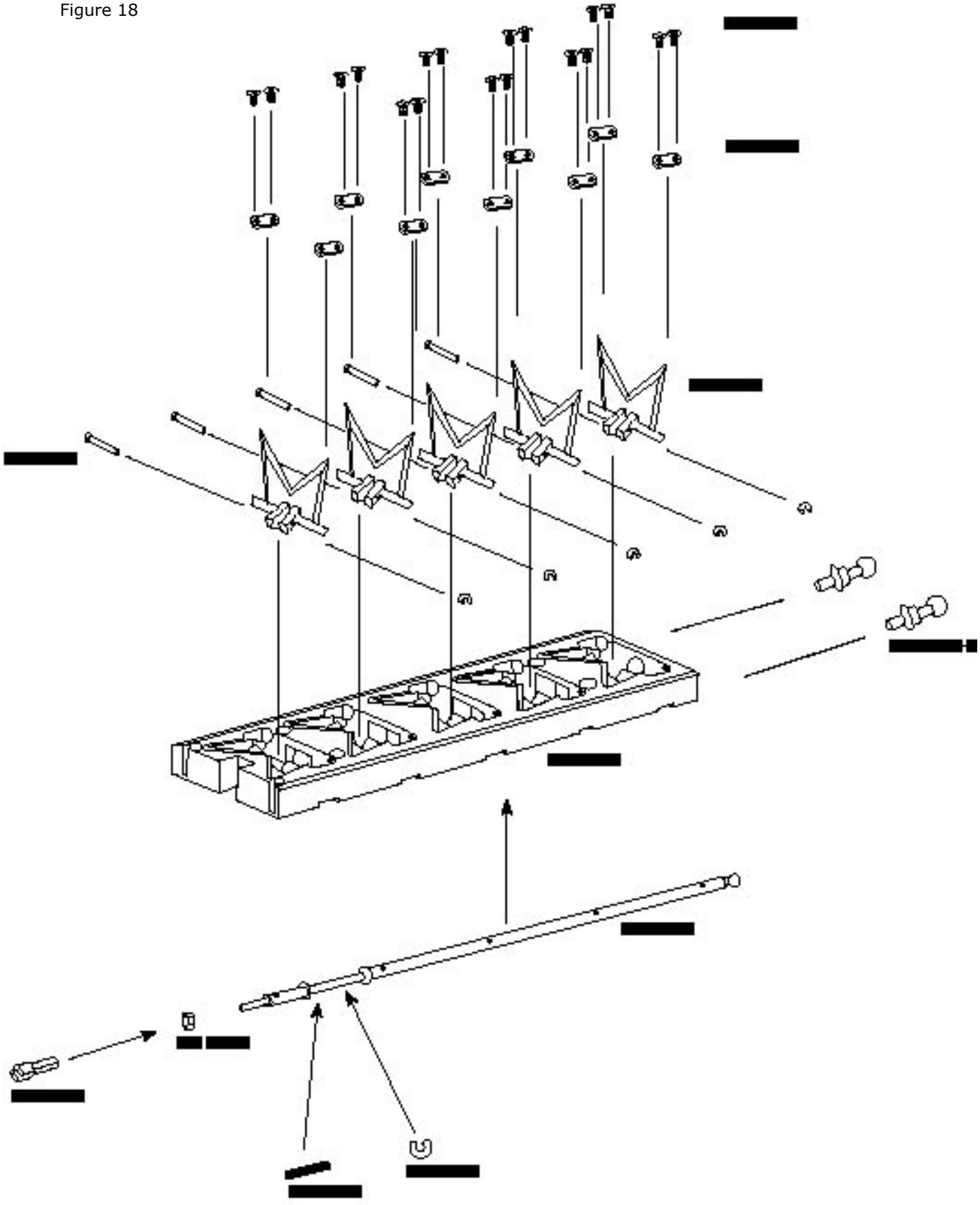
5 - Blades
RB 0104



1 - Main Shaft Spring
RB 0108

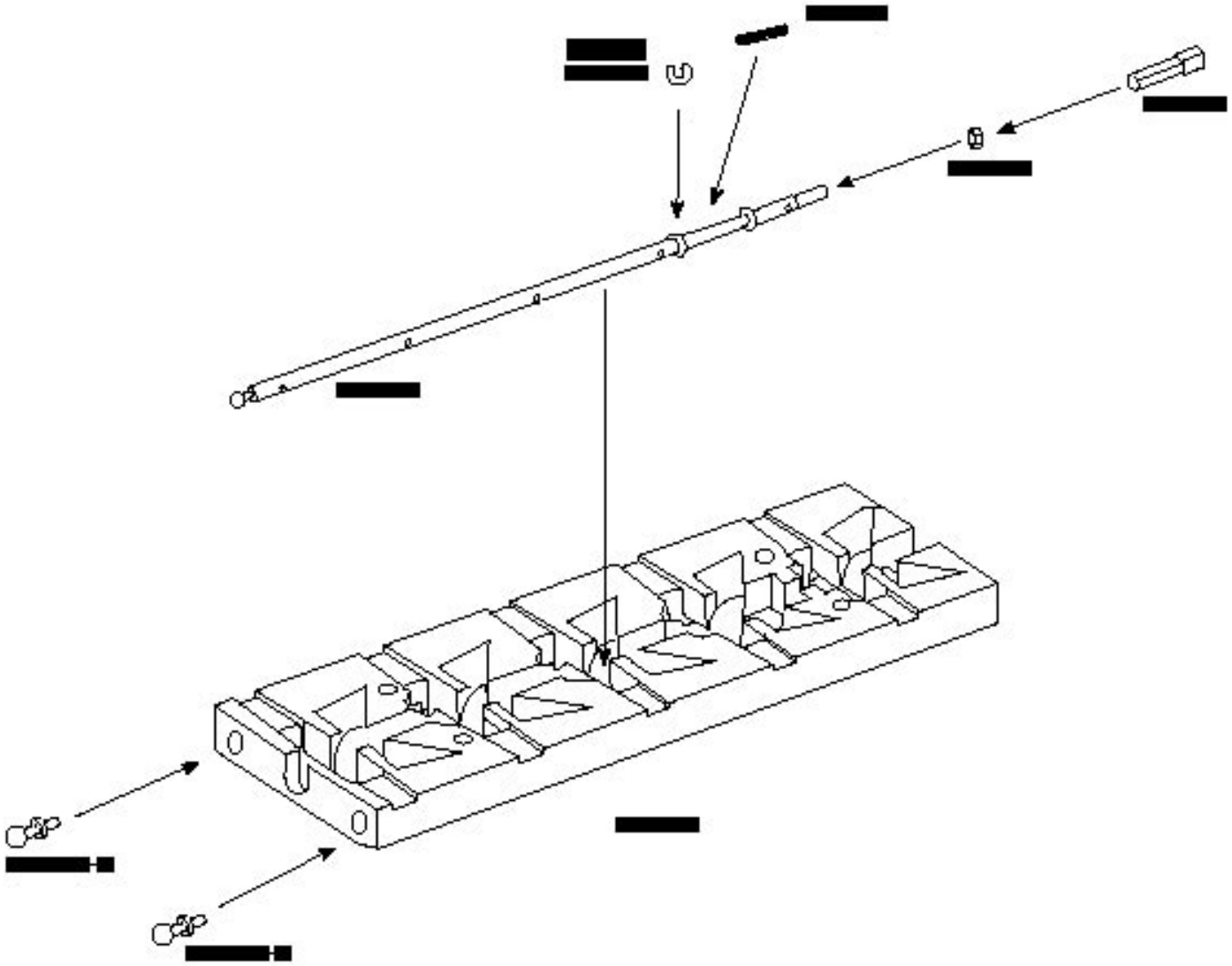
Exploded View - Cut Module

Figure 18



Exploded View - Underside of Cut Module

Figure 19



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.

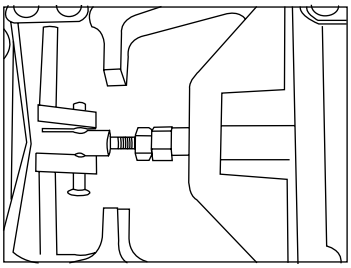


Figure 20

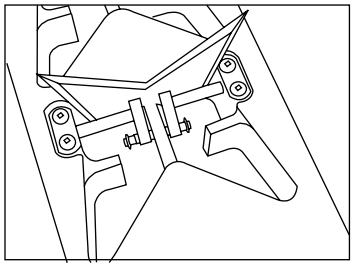


Figure 21

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 fuse 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.

Removing the Actuator Box

Should the blades be stuck in the up position:

First, disconnect the two cords from the mil-spec plugs located on the actuator box.

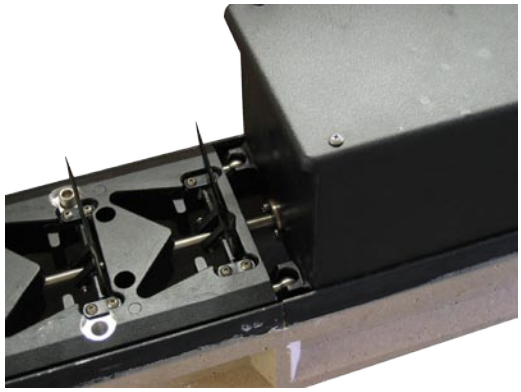


Figure 22

Next, tilt the actuator box toward the modules approximately 90 degrees. As the actuator box is tilited, the blades will go down.

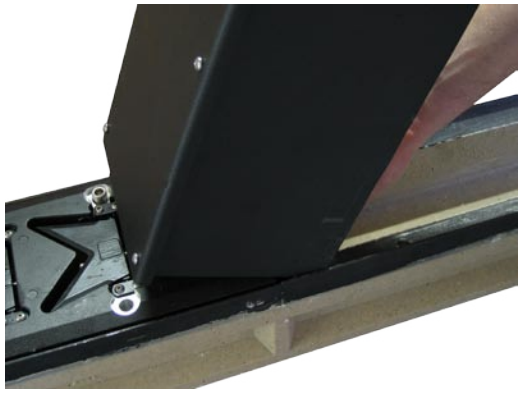


Figure 23

Finally, grab the bottom of the actuator box and pull it away from the modules.

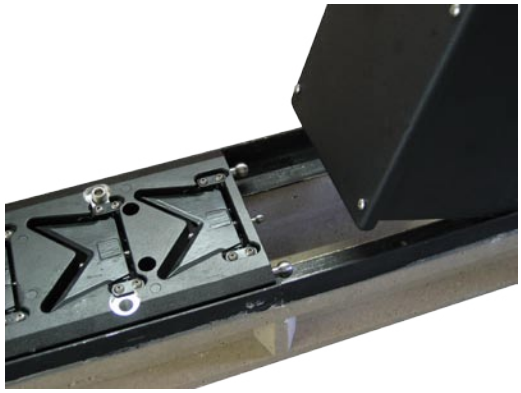


Figure 24

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.