GLOBAL GRAB TECHNOLOGIES

YOUR COMPLETE SECURITY SOLUTIONS PARTNER

CATSCLAW

PERMANENT VEHICLE IMMOBILIZER SYSTEM

Manufactured by
Global GRAB Technologies

OPERATION & MAINTENANCE MANUAL

Revised January 24, 2020

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

CONTENTS

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

Catsclaw Limited Warranty

Catsclaw Americas, LLC, herein referred to as the "manufacturer", warrants the Catsclaw Tire Shredding Devices ("Product") to be free from defects in materials and workmanship for twelve (12) months from the date of purchase, under normal use and service. The sole and exclusive obligation of the manufacturer is to repair or replace, at its option, the defective products returned to the manufacturer at a facility of its choosing, free of charge for parts and labor, any part, which is defective in materials or workmanship under normal use and service. The manufacturer will use its best efforts to send advanced replacement (next business day) parts. All returns for credit are subject to inspection and testing at the manufacturer's facilities before actual determination is made to allow credit. This warranty is void if the Product is altered or repaired by anyone other than the manufacturer or as expressly authorized by the manufacturer in writing, or is serviced by anyone other than the manufacturer or a factory authorized service technician, or is used in a manner outside of its intended use. This warranty is may be void if there is a failure to maintain the Product and systems in accordance with manufacturer recommendations. In case of defect, a Return Authorization form must be secured from the manufacturer prior to returning the Product or any part of it. The defective Product should be returned, transportation prepaid, to the manufacturer's designated location. The manufacturer will assess the Product and contact the Party or repair the Product as applicable. The cost of the return shipment of the defective part/Product to the Party will be borne by the manufacturer.

This writing constitutes the only warranty made by the manufacturer with respect to its Product. The manufacturer does not represent that its product will prevent uncontrolled vehicle movement after tire shredding, or that its Product will in all cases provide the protection for which it is installed or intended. Buyer acknowledges that the manufacturer is not an insurer and assumes no risk of loss or damages or cost of any inconvenience, including but not limited to, collateral damage as a result of Product use or failure, failure of innocent parties to heed and/or obey any warning signs and/or audible and visible alerts as may be associated with the Product, transportation damage, misuse, abuse, accident or similar incident.

THE MANUFACTURER GIVES NO WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR OTHERWISE WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. UNDER NO CIRCUMSTANCES SHALL THE MANUFACTURER BE LIABLE FOR ANY LOSS OR DAMAGE TO PROPERTY, LOSS OF USE, LOST PROFITS, DIRECT, INCIDENTAL OR CONSEQUENTIAL, ARISING OUT OF THE USE OF, OR INABILITY TO USE THE PRODUCT. FURTHERMORE, THE MANUFACTURER SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY OR DEATH, WHICH MAY ARISE IN THE COURSE OF, OR AS A RESULT OF, PERSONAL, COMMERCIAL, INDUSTRIAL OR GOVERNMENTAL USE OF ITS PRODUCT.

This warranty replaces all previous warranties and is the only warranty made by the manufacturer with regards to this Product. No increase or alteration, written or verbal, of the obligation of this warranty is authorized.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

DESIGN PRINCIPLES

CATSCLAW PERMANENT IN-GROUND SYSTEM

The CATSCLAW PERMANENT IN-GROUND VEHICLE IMMOBILIZER SYSTEM employs a patented, specially designed blade that causes rapid deflation of pneumatic vehicle tires. This rapid deflation has the effect of severely limiting the mobility of the vehicle while allowing the operator to bring the vehicle to a safe and controlled stop.

- The knife like edge of the blade pierces deep into the tire.
- The top sharpened radius slashes a 3-4” long cut as the tire rolls over. These long cuts defeat most, if not all, “puncher proof” tires.
- The sharpened vertical edge of the blade slices outward as the tire tears away.
- In most cases, two blades enter each tire as it passes over.

Installed using simple civil engineering methods and procedures, the blade assemblies of the CATSCLAW PERMANENT SYSTEM are installed in a custom designed galvanized steel and concrete channel flush with the road surface. This installation places virtually no restriction to normal traffic while the system is in the dormant or “blades down” condition.

When activated, blades are raised to protrude from the surface of the stainless steel pads.

The unique design of CATSCLAW Systems ensures that all tires are destroyed and the vehicle comes to a halt in a straight line, minimizing the possibility of the driver losing control of the vehicle. After the target vehicle has been immobilized, the blades may be lowered and traffic flow returned to normal conditions.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

SYSTEM COMPONENTS

PERMANENT MOTOR DRIVE UNIT

The Permanent Motor Drive Unit (PMDU) contains the motor drive assembly and electrical components for raising and lowering the blades. The system operates on a 12 volt internal battery that is kept continuously charged by an internal battery charger. This design makes it possible for the system to continue working during loss of commercial AC power for up to 200 up/down blade cycles. The type and number of auxiliary devices installed (lights, sirens, etc.), ambient temperature and battery condition all affect the actual duty cycle while operating without AC power.

A shaft runs through the PMDU with a male and female connector on either side. The physical orientation of the PMDU depends on the primary direction of traffic control.

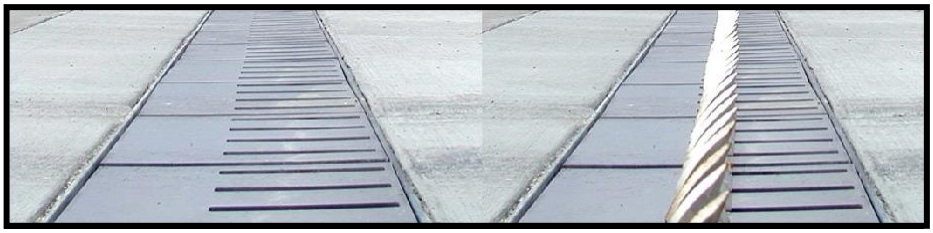
The PMDU has auxiliary relay contacts for controlling a limited number of external auxiliary signals such as traffic lights, signs, sirens, strobe lights, etc.

(Picture is typical. The PMDU installed at your location may be visually different, but functions as described in this manual.)

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

SYSTEM COMPONENTS

PERMANENT BLADE PADS



Blades Down Blades Up

The CATSCLAW Permanent Blade Pads are constructed of high quality stainless steel and nylon to provide many years of low maintenance service. The CATSCLAW blades are constructed of tempered steel, sharpened to a knife like edge and are nickel plated to minimize corrosion. The blades are specially designed to snap off, rather than bend, when impacted by a vehicle. This feature prevents physical jamming of the system and allows deferring repairs to a more convenient time. Blade replacement is accomplished in a matter of minutes with a simple hex wrench.

MASTER HARD WIRED CONTROL PANEL (shown with all options)

The Master Hard Wired Control Panel (HWCP) is typically located in the primary guardhouse or security checkpoint. Often, there is an optional Secondary Control Panel located inside the protected area for activation by an over-watch control operator in the event the primary location is damaged or a guard is incapacitated. The Control Panels are connected to the Motor Drive Unit by way of a multi-conductor stranded copper cable to minimize the possibility of electronic jamming. The Control Panel is equipped with recessed pushbuttons to reduce chances of accidental operation of the system(s) and LED indicators to provide a visual indication of the state of the system, i.e. “Blades Up” or “Blades Down”. Control Panels are capable of independently operating Inbound and Outbound systems. The Master Control Panel has complete system(s) control, including power on/off, alarm reset, turning optional control panels and reverse entry systems on and off. Custom Controls integrated with active vehicle barrier systems and detection systems are available upon request.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

SYSTEM COMPONENTS

WIRELESS RADIO REMOTE (optional)

The CATSCLAW PERMANENT SYSTEM may be equipped with an optional wireless remote transmitter and receiver. (This option is not recommended for locations where there is a high probability of high-powered radio transmissions in close proximity to the Motor Drive Unit. This includes most military installations.)

CUSTOM CONTROL PANELS AND INTEGRATION (optional)

As an option to the standard Hard Wired Control Panel (HWCP), the manufacturer will design and manufacture control panels to specific customer requirements, if requested and at additional cost.

The CATSCLAW PERMANENT SYSTEM may be integrated with virtually any control device capable of providing a momentary dry contact closure, including PLC devices, relay panels and security control consoles.

REVERSE ENTRY DETECTION AND ACTIVATION (optional)

Catsclaw systems may be equipped with an automatic Reverse Entry Detection and Activation System. This system is normally used only on the outbound lanes since these lanes are, in many cases, not actively monitored by security personnel. The system ignores normal outbound traffic, but automatically raises the blades if a vehicle attempts entry via the outbound lanes. An alarm is sounded to alert security personnel and the blades remain in the up position until the area is again secured and the blades lowered from one of the Control Panels.

AUDIBLE AND VISUAL ALERTS (optional)

TRAFFIC LIGHTS

Traffic lights are strongly recommended to warn drivers of the operation of the system to allow adequate time to stop and avoid damage to their vehicle tires. Custom light colors, sizes, and color combinations are available to meet individual customer requirements. Traffic lights powered by the Catsclaw system must be 12 volt DC, LED lights to minimize power consumption.

Strobe lights are available and are beneficial in directing the attention of security personnel to the threat area.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

AUDIBLE ALERTS (optional)

A wide range of sirens and horns may be integrated into the CATSCLAW PERMANENT SYSTEM. Audible alerts powered by the Catsclaw system must be low power consumption and operate on 12 volt DC.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

SAFETY

SERIOUS INJURY AND/OR PROPERTY DAMAGE MAY RESULT FROM IMPROPER USE OF THE CATSCLAW PERMANENT VEHICLE IMMOBILIZER SYSTEM.

REPAIRS TO THE CATSCLAW PERMANENT SYSTEM SHOULD NEVER BE ATTEMPTED BY ANYONE OTHER THAN A TRAINED CATSCLAW TECHNICIAN OR LICENSED ELECTRICIAN FAMILIAR WITH THE DESIGN AND OPERATION OF THE CATSCLAW SYSTEM.

WARNING: THE CATSCLAW SYSTEM OPERATES ON BATTERY POWER. TURNING OFF THE AC CIRCUIT BREAKER DOES NOT DISABLE THE SYSTEM. THE SYSTEM MUST BE TURNED OFF USING THE CONTROL PANEL KEY SWITCHES OR BY OPENING ALL FUSES AND CIRCUIT BREAKERS IN THE MOTOR DRIVE UNIT.

Proper training of security and maintenance personnel in the safe operation of the CATSCLAW PERMANENT SYSTEM is the responsibility of the owner(s) of the systems. The manufacturer has on-site training courses available at additional cost to train customer service personnel. The cost of these courses varies by location and number of personnel to be trained.

The CATSCLAW PERMANENT SYSTEM employs a series of knife like blades driven by a very powerful motor assembly and is capable of inflicting very serious personal injury and property damage if operated in an unsafe manner.

Particular care should be taken to ensure that ALL personnel working in the vicinity of the CATSCLAW system are familiar with its operation and safety.

It is recommended that a nominated person be placed in charge of the CATSCLAW system to ensure that:

- Personnel are instructed in the safe use of the system.
- System operation and components are routinely tested and inspected.
- Auxiliary equipment is routinely checked (Warning Lights, Sirens, and Control Panels).

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

DISCLAIMER

Careful consideration must be given to the proper design and location of any system that is designed to impede or prevent the normal flow of vehicular traffic. Warning signs, traffic signals, audible warning devices, strobe lights and rumble strips should be all considered in the overall plan to warn drivers of the potential danger. It is strongly recommended that an architect, traffic engineer, or safety engineer be consulted prior to the installation of the CATSCLAW PERMANENT SYSTEM. The manufacturer offers assistance in designing the installation, controls and optional equipment, but makes no claim to having expertise in the areas of civil, traffic or safety engineering.

This O&M Manual pertains only to Catsclaw Permanent In-Ground Vehicle Immobilizer Systems delivered in 8-AUG-2008. While most of the information contained herein can be applied to systems of an earlier design, there are no guarantees with regard to such application.

INTELLECTUAL PROPERTY, SPECIFICATIONS, DRAWINGS & TECHNICAL DATA

All documentation related to the CATSCLAW PERMANENT SYSTEM, including specifications, drawings and technical data remain the exclusive confidential property of Global GRAB Technologies unless otherwise noted. This information shall not be disclosed, reproduced or used for manufacture, design or construction without the express written authorization of Global GRAB Technologies. The recipient agrees by acceptance of this documentation the custody thereof and agrees not to allow the use of this documentation by any unauthorized person(s) and further agrees that reproduction or publication is not authorized without express written permission from Global GRAB Technologies.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

SYSTEM OPERATION

SAFETY

Only personnel who are familiar with the safety warnings and precautions associated with its use should operate the CATSCLAW PERMANENT SYSTEM. Particular care must be taken to prevent injury to personnel and damage to property that could be caused by activating the system.

RAISING AND LOWERING THE BLADES

Operation of the CATSCLAW PERMANENT SYSTEM is extremely simple when using the standard HARD WIRE CONTROL PANEL or optional WIRELESS RADIO REMOTE.

- The System OFF/ON key switch(s) located on the Master Hard Wire Control Panel must be in the “ON” position.
- The **RED** button raises the CATSCLAW blades out of the slotted pad assembly and prepares the system to deflate the tires of any vehicle crossing the blades.
- The **GREEN** button lowers the CATSCLAW blades down into the slotted pad assembly and re-opens the roadway to normal traffic flow.
- Installations equipped with separate inbound and outbound systems may be equipped with an additional button or switch for EMERGENCY operation of both systems simultaneously.

Operating instructions using custom controls is outside the scope of this document and should be verified and coordinated with site specific control scheme design.

SYSTEM CHECKS

The blade pads should be visually checked at the beginning of every shift to ensure there are no obstructions or debris lodged in the blade pads. If any obstruction is observed, turn the system off with the key switch and carefully clear it. If the obstruction is not easily cleared, contact maintenance personnel for assistance. If the blades are down traffic may be allow to pass, but DO NOT turn the system back on until it is checked and cleared by maintenance personnel.

Check the status of the alarm indicator on the Master Control Panel. As steady **red** alarm light indicates AC power is not reaching the system and the battery is not being charged. Have an electrician test and restore AC power as quickly as possible. NOTE: The system(s) will continue to operate for several hours, but will eventually become inoperative when the battery voltage reaches critical level. This time varies with the type and number of auxiliary devices connected and the age and condition of the battery.

The system also has an integrated “System Malfunction Alarm”. Should the system fail to operate within 1.25 seconds of pressing the UP or DOWN button, the RED traffic light and RED button indicator will flash rapidly. Security forces should stop traffic immediately and visually check to see if the blades are up or down. If the blades are down, the system should be turned of with the key switch at the Master Control Panel and maintenance personnel notified immediately. Traffic may be allow to pass, but DO NOT turn the system back on until it is checked and cleared by maintenance personnel.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

Operation should be checked at least once every 24 hours by raising and lowering the blades several times to ensure they are operating freely. While performing this check, ensure that all signs, lights, sirens, etc. are working properly.

Maintenance personnel should carefully inspect the system after every tactical deployment involving a vehicle passing over the raised blades. Failure to perform this inspection and repair any damage could result in future failure of the system.

TACTICAL USE OF THE SYSTEM

Every installation has a unique set of rules, regulations and instructions regarding the tactical use of its security systems; therefore it is the responsibility of the owner(s) of the system to determine how and when to use these systems in defense of the installation. Owner assumes all responsible for deployment of the Catsclaw Systems and all liability associated with that deployment. The manufacturer accepts no responsibility for injury or property damage resulting from the use of the CATSCLAW PERMANENT SYSTEM.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

MAINTENANCE

ALERT SECURITY PERSONNEL

It is always a good idea to alert security personnel to your presence before starting any maintenance activity.

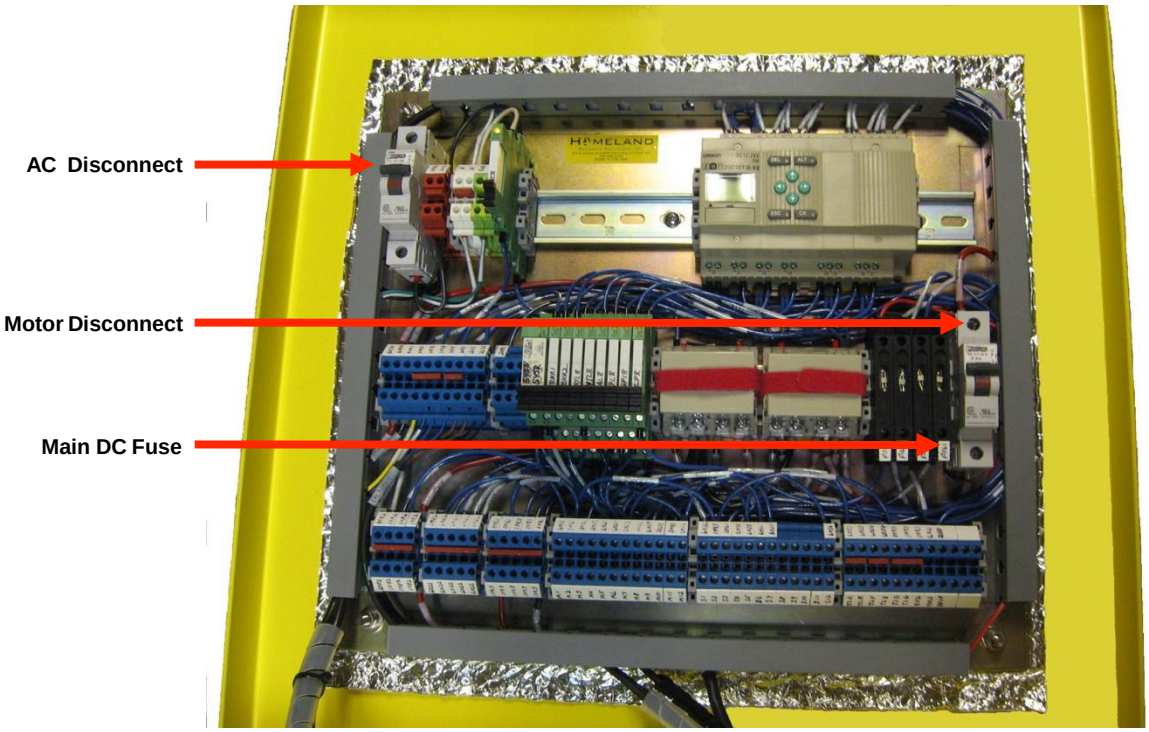
SAFETY

This section of the manual is intended for use by qualified maintenance personnel only. Repairs should **NEVER** be attempted by anyone not familiar with the safe operation and maintenance of the CATSCLAW PERMANENT SYSTEM.

ALWAYS secure the roadway and area around the blades before operating the system to raise the blades. After raising the blades, follow the safety instructions below to remove power from the system. **FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS COULD RESULT IN SERIOUS PERSONAL INJURY.**

NEVER attempt maintenance of the blades or blade pads with power applied to the system. Follow the safety precautions below **BEFORE** working on the blades or blade pads.

- Switch off and tag the AC power breaker in the commercial power panel.
- Switch off the AC and Motor Disconnects and DC Fuse inside the PERMANENT MOTOR DRIVE UNIT (PMDU)

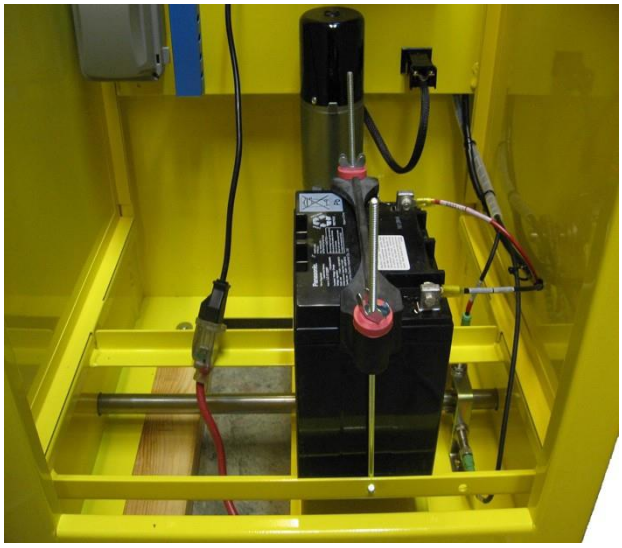


PERMANENT MOTOR DRIVE UNIT (PMDU)

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

BATTERY

Check the battery health at least once every three (3) months. The battery is located under the top cover and may be accessed by unlocking and opening the hinged cover on the PMDU. Battery health may be tested by turning the AC breaker off and measuring the battery voltage. The voltage should be above 11.5 volts. A battery that fails to hold a full charge should be replaced immediately.



DRIVE CHAIN

Be sure to turn off the motor disconnect and open the main DC fuse before working on the chain. Accidental operation of the system could result in serious personal injury.

Check the drive chain tension and condition at least once every three (3) months. The chain should have no more than 1/2" slack on either side. It is normal for the chain to be tight on one side or the other, depending on whether the blades are being raised or lowered. Use any commercially available chain lubricant as necessary to prevent the chain from becoming dry.

The chain may be adjusted by loosening the four (4) nuts holding the motor bracket to the PMDU base, adjusting the set screw located on the front of the bracket, and re-tightening the four (4) nuts. Over-tightening the chain will result in premature wear on the chain and sprockets.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

PERMANENT BLADE PADS – BLADE REPLACEMENT

With heavy use, the blades of the CATSCLAW PERMANENT SYSTEM may become broken or chipped. Replacement of these blades is simple, and should take no longer than 5 minutes per blade.

FOLLOW THE SAFETY PRECAUTIONS AT THE BEGINNING OF THIS SECTION OF BEFORE REPLACING BLADES.

- Operate the system to raise the blades and then switch off the motor disconnect and main DC fuse. (**FAILURE TO TURN OF DC POWER WHILE REPLACING THE BLADES COULD RESULT IN SERIOUS PERSONAL INJURY**)
- Using a hex wrench, remove the two M4 screws fastening the blade to the blade holder. Remove the old blade and locate the new blade over the two holes. Apply red thread locking compound to the two M4 screws. Insert & tighten the screws to hold the new blade in place. Check and replace blades as necessary at this time.
- Restore power to the system.
- Test the system by raising and lowering the blades several times.
- Lower the blades and reopen the roadway.
- Advise security personnel the system is back in service.

PERMANENT BLADE PADS – SERVICE CHECKS

It is recommended that the CATSCLAW PERMANENT SYSTEM pads be removed and serviced occasionally (minimum of once a year – depending on local conditions). To do so, follow these steps:

- **FOLLOW THE SAFETY PRECAUTIONS AT THE BEGINNING OF THIS SECTION.**
- With the blades in the DOWN position, remove all power from the system..
- Beginning with the pad farthest from the PMDU, lift all pads out of the channel and remove them to a safe location off the roadway for inspection.
- Use a shovel, brush, or broom to clean the drainage trench and steel channel.
- Check the heat trace cables (if provided) for wear or damage.
- Lay 10” x 3” timber in the channel so the road may be re-opened while the pads are being inspected.
- Replace any damaged pads with pads from the maintenance spares inventory. If no spares are available, repair the blade pads as required.
- When inspection and repairs are completed and blades ready to re-install
  - Stop traffic and secure the roadway.
  - Remove the timbers and replace the pads.
  - Restore power to the system.
  - Test the system by raising and lowering the blades several times.
- The roadway may now be re-opened.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

PERMANENT BLADE PADS – CLEANING

The Catsclaw Tire Shredder is an electro-mechanical system installed in a very harsh environment where it is exposed to all the elements of nature and roadway debris. While the system is manufactured with the finest materials available for use in this environment, it requires regular inspection and cleaning. It is the owner's responsibility to keep the system as clean as possible. Failure to properly clean the system could result in higher maintenance cost and could void the equipment warranty.

The blade pads should be checked at every security personnel shift change or at least once every day. Large stones or other obstructions lodged in the blades may cause the system to fail without warning and may cause internal damage to the Motor Drive Unit.

It is recommended that the blade pads be cleaned using high-pressure water at least once per month, or more often under very dirty conditions. This cleaning serves several purposes:

1) Removes the very fine and abrasive dirt from the shaft and bearings. This will prolong the life of the system and minimize long-term maintenance cost.

2) Flushes small debris into the trench below the blades and washes it out through the drain line.

3) Offers a perfect opportunity to check the proper operation of the drain system..

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

TECHNICAL SPECIFICATIONS

PERMANENT MOTOR DRIVE UNIT (PMDU)

Height – 25.25”
Width – 20”
Length – 20”
Weight – Approximately 165 pounds
AC Power Requirements – 120VAC, 15A, single phase
Operating voltage – 12VDC, 20A Motor Disconnect

Electric Motor
12 Volts DC
18.1 Amps
160 watts output
4000 rpm
Rating continuous

Worm gear drive box
Final Drive – 27 rpm
Torque – 30-00 NM
Ratio 148 – 1 EMC

Electromagnetic Brake
Brake is always on when the motor is not energized.

Recommended Battery
Sealed Lead-acid gel
12 volt, 24-28 amp hours
Float Charge at 13.8 Volts
CAUTION: Failure to use the recommended battery could cause damage to the internal charging system or ignite a fire within the Motor Drive Unit.

Drive Chain
ANSI Chain Number – #35, 20”
ANSI Chain Master Link – #35

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

TECHNICAL SPECIFICATIONS

PERMANENT BLADE PADS

Height – 3”
Width – 11”
Length – 10”
Blade Pitch – 2.5” (Blade to Blade)
Blade Pad Housing – T304 Stainless Steel
Blade Holder – T304 Stainless Steel
Blade – Case hardened and Electroless Nickel Plated

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

TROUBLESHOOTING - MECHANICAL

SAFETY

FAILURE TO OBSERVE INDUSTRY SAFETY STANDARDS AND THE SAFETY PRECAUTIONS STATED IN THIS MANUAL MAY RESULT IN SERIOUS PERSONAL INJURY AND/OR PROPERTY DAMAGE.

The mechanical design of the system is very simple and straightforward. Most mechanical problems may be determined by visual inspection of the system.

BLADES DO NOT RAISE OUT OF THE PAD HOUSING

Isolate the problem to mechanical or electrical:

1. Confirm AC power is on.
2. Confirm the 20A Motor Disconnect Switch is on and ensure all DC fuses are good and the fuse holders are closed.
3. If the traffic lights and LED indicators are not lighted, go directly to TROUBLESHOOTING – ELECTRICAL.
4. If the motor does not run, go directly to TROUBLESHOOTING – ELECTRICAL.
5. If the motor runs and the blades do not move, remove power from the system, open the top and remove the side covers and check the chain.
6. Repair or replace the chain if necessary.
7. If some of the blades raise and others do not, check the connectors between the pads at the point where the fault occurs. Most like cause is broken hub screws caused by excessive side drag on the pads. This is most likely to occur where the pads are installed on a curve in the road or anywhere traffic is turning while crossing the pads.
8. Repair or replace the broken pad with a good one from the recommended maintenance spares kit or contact your CATSCLAW dealer for repair assistance.
9. If the shaft attempts to move when the system is operated, check for physical obstructions or a loose or missing screw on a blade or blade holder. Remove the obstruction or repair the problem and re-test the system.
   NOTE: A physical obstruction will cause the system to automatically shutdown and rapidly flash the red traffic light and Control Panel indicator. First, clear the obstruction, stop traffic, and then press the ALARM button on the Control Panel to reset the system.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

TROUBLESHOOTING - ELECTRICAL

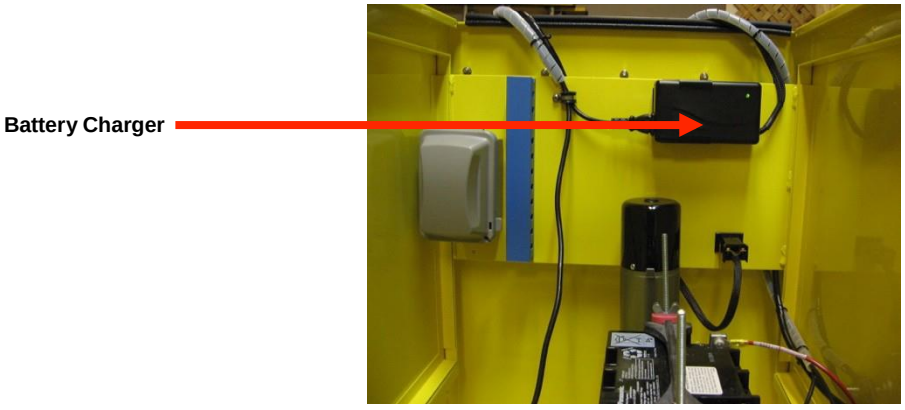
SAFETY

FAILURE TO OBSERVE INDUSTRY SAFETY STANDARDS AND THE SAFETY PRECAUTIONS STATED IN THIS MANUAL MAY RESULT IN SERIOUS PERSONAL INJURY AND/OR PROPERTY DAMAGE.

REPAIRS TO THE CATSCLAW PERMANENT SYSTEM SHOULD NEVER BE ATTEMPTED BY ANYONE OTHER THAN A TRAINED CATSCLAW TECHNICIAN OR LICENSED ELECTRICIAN FAMILIAR WITH THE DESIGN AND OPERATION OF THE CATSCLAW SYSTEM.

BLADES DO NOT RAISE OUT OF THE PAD HOUSING

1. Check the ALARM indicator on the Control Panel. A lighted ALARM light indicates loss of AC power to the Motor Drive Unit. Troubleshoot and restore AC power. If commercial AC power has been off for more than a few hours, allow the system to fully charge before further testing. THE SYSTEM WILL NOT RUN ON AC POWER. This takes about 10-12 hours, depending on the condition of the battery and how long the power was off.
2. Check the 20 amp motor disconnect breaker. If it is off or tripped, turn it back on. If the disconnect trips again, the most likely cause is a damaged motor. Replace the motor or contact CATSCLAW service personnel.
3. Check the battery voltage. If the voltage is below 12.5 volts, check the output voltage of the battery charger. When charging a fully discharged battery, the voltage will gradually increase over a period of a few hours until it reaches 13.8 volts. At this point, it should provide a continuous “float charge” to maintain a full charge on the battery. If this gradual increase does not occur, suspect a bad battery or charger.
4. Check all system fuses.



277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

TROUBLESHOOTING - ELECTRICAL

5. If the blade shaft fails to operate when the red or green buttons are pushed, the system will enter an ALARM condition. The cause of this condition could be mechanical or electrical. The most likely cause is an obstruction in one of the blade pads. Clear any obstructions and be certain the shaft operates by rocking the shaft with a pair of vise grip pliers. Other causes could be a broken chain or sprocket, defective proximity sensor, damaged cable or wiring. CAUTION: Stop traffic and alert service personnel before pressing the ALARM button on the Master Control Panel to reset the system. Depending on the state of the system when the alarm occurred, the blades may operate. Should this occur, simply press the green button to lower the blades. Operate the blades up and down a few times to ensure the problem has been corrected.
6. Troubleshooting beyond this point is outside the scope of this manual and should be done only by trained and experienced service personnel.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

GLOSSARY OF TERMS

AC – ALTERNATING CURRENT

DC – DIRECT CURRENT

EOB – EMERGENCY OPERATION BUTTON

HWCP – HARD WIRED CONTROL PANEL

LED – LIGHT EMITTING DIODE

MCP – MASTER CONTROL PANEL

MDU – MOTOR DRIVE UNIT

PLC – PROGRAMMABLE LOGIC CONTROL

PMDU – PERMANENT MOTOR DRIVE UNIT

RF – RADIO FREQUENCY

SCP – SECONDARY CONTROL PANEL

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com

MAINTENANCE ADDENDUM

RECOMMENDED INSPECTIONS & MAINTENANCE REQUIREMENTS

FREQUENCY	RECOMMENDATION
DAILY	Inspect the blade pads and remove obstructions
DAILY	Operate the system to ensure proper operation
DAILY	a. System should operate smoothly with no binding
DAILY	b. Check traffic lights & siren
DAILY	c. Check LED indicators on control panels
MONTHLY	Inspect the blade pads closely
MONTHLY	Check for and repair any loose blades or blade holders
MONTHLY	Check for physical damage caused by extreme loads, etc.
MONTHLY	Pressure wash the blade pads
MONTHLY	Check to ensure there is no build up of dirt or debris in the trench under the blade pads. If debris has accumulated and cannot be removed by pressure washing, the blade pads must be removed, the trench cleaned and the blade pads reinstalled.
MONTHLY	Inspect the operation of the drain line. Water should run freely through this line. If water backs up into the trench, the drain line must be cleaned.
MONTHLY	Operate the system to ensure proper operation
MONTHLY	a. System should operate smoothly with no binding
MONTHLY	b. Check traffic lights & siren
MONTHLY	c. Check LED indicators on control panels
ANNUALLY	**Perform the following in addition to the normal monthly inspection**
	a. Remove blade pads from the trench and pressure wash the pads and trench.
	b. Inspect all mechanical parts for damage and/or wear. Repair or replace any damaged or worn components.
	c. Remove the top and side covers from the Motor Drive Unit and clean the inside of the unit using a vacuum cleaner.
	d. Clean and lubricate the chain using any commercially available chain lubricant. Adjust the chain, if necessary. (ref page 13)
	e. Replace the side and top covers.
	f. Clean & wax the outside of the Motor Drive Unit to prolong the life of the paint. Use any commercially available automotive cleaner & wax.
	g. Reinstall all blade pads and check for proper operation of the system.

277 Mallory Station Road, Suite 112 Franklin, Tennessee 37067-8251
615-224-0400 • 877-260-4722 toll free • 615-224-0411 fax • www.grabglobal.com