



POWER HAWK[®]
RESCUE SYSTEMS

P-16 RESCUE SYSTEM



**Owner Operation &
Maintenance Manual**

GENERAL SAFETY INFORMATION

The Power Hawk® P-16 Rescue System is designed to provide safe operation. All users should read and be thoroughly familiar with the operating instructions and safety precautions contained in this manual. Operator safety depends on users being properly trained by the Authority having jurisdiction and using the tool for the purpose intended. The following safety precautions must be observed at all times. **FAILURE TO DO SO COULD RESULT IN SERIOUS PERSONAL INJURY AND/OR DAMAGE TO PROPERTY AND/OR EQUIPMENT.**

- The Power Hawk® P-16 Rescue System shall only be operated by persons authorized by the Authority having jurisdiction.
- Suitable protective equipment shall be worn as directed by the Authority having jurisdiction. At a minimum, this should include gloves, helmet, eye protection, and body protection – such as turnout gear.
- Prior to use, inspect all Power Hawk® P-16 Rescue System components for any signs of damage or fraying. Do not use damaged equipment.
- Stay alert. Do not operate tool when tired.
- The Power Hawk P-16 Rescue System has been third-party water tested in accordance with Standard IEC 529 (the Standard for Degrees of Protection Provided by Enclosures) and passed the highest water jet spray test requirements of Clause IPX6. If the tool, however, becomes completely submerged under water, contact the Factory or an Authorized Power Hawk® Service Center regarding the service necessary to remove any ingested water and to ensure proper re-lubrication of parts. Failure to do so could result in internal corrosion of parts that could lead to the tool not working properly.
- Use only Factory authorized service parts.
- This tool should only be used with accessories approved by Power Hawk Technologies, Inc. Use of unauthorized accessories can result in unpredictable and unreliable tool operation and is prohibited.



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SYSTEM DESCRIPTION

THE P-16 RESCUE TOOL

The Power Hawk® P-16 Rescue Tool utilizes aerospace gear technology, namely the Curtiss Wright Power Hinge™, to deliver high output forces to tool attachments such as spreaders and cutters. Tool attachments are quickly interchangeable using high-strength steel, ball detent pins. A variable 70° articulation of the power head and attachments allows greater versatility of access as compared to conventional hydraulic rescue tools. The P-16 Rescue Tool is powered solely by 12 volts DC. There are NO HYDRAULICS. The rear handle has a circular design to maintain identical trigger switch operation regardless of the tool's rotational position.



! WARNING

The P-16 Rescue Tool must be connected to the Power Hawk® PC-100 Controller Unit. Never attach the P-16 Rescue Tool directly to any other power source. Connection to an unauthorized power source will result in uncontrolled operation of the power head and attachments and create risk of serious personal injury and/or damage to property and/or equipment.

NOTE: The P-16 Rescue Tool and the PC-100 Controller Unit are serialized as a matched set, and should be used as such.

THE PC-100 CONTROLLER UNIT

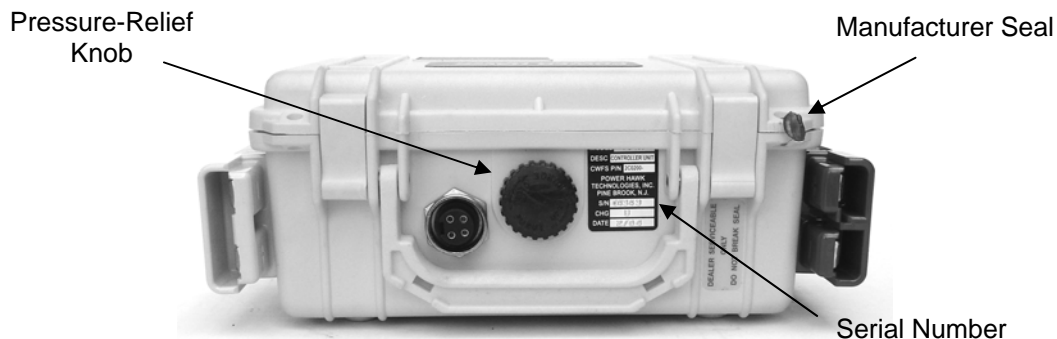
The “brain” of the Power Hawk® P-16 Rescue System is the PC-100 Controller Unit. The PC-100 receives input from the P-16 Rescue Tool trigger switch and allows 12 volts DC power to be delivered to the Rescue Tool for operation. Special electronics within the PC-100 sense electrical current and automatically cut power to the tool when maximum force is reached. When this happens, the user should reverse direction to relieve the load, then reposition the tool.

NOTE: The PC-100 Controller Unit and the P-16 Rescue Tool are serialized as a matched set, and should be used as such.



WARNING

The PC-100 is serviceable only by the Factory or an Authorized Power Hawk Service Center. Do not break the manufacturer seals. Do not loosen or remove the black pressure-relief knob. Internal access or disturbance of PC-100 components may result in uncontrolled operation of the P-16 Rescue Tool and create risk of serious personal injury and/or damage to property and/or equipment.



PREPARATION FOR OPERATION

STEP 1: INSPECTION

Remove P-16 Rescue System components and carefully inspect contents for any damage. If damage is found, contact your local Power Hawk® Dealer or the Factory for instructions.

P-16 Power Kit

- A. P-16 Rescue Tool
- B. AP-1600 Attachment Pin Set
- C. PC-100 Controller Unit
- D. CA-4M Power Cable Assembly
- E. PWR-3X12 Power Pack
- F. BC-U1 Battery Charger
- G. JC4-16 Jumper Cables

P-16 Attachments

- H. S-1601 Spreader Arm Set
- I. C-1601 Curved Cutter
- J. CS-1602 Power Blade

Accessories

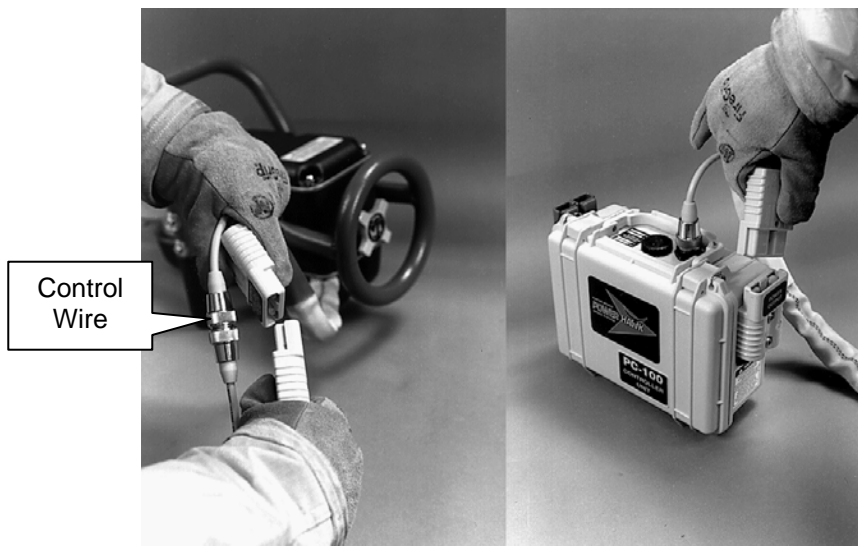
- K. LB-1204 Hawkeye Flood Light
- L. EC-16 Extension Cable, 16 Ft.
- M. VH4-4 Vehicle Harness Kit



STEP 2: P-16 RESCUE TOOL AND PC-100 CONTROLLER UNIT CONNECTIONS

Prior to making electrical connections, make sure all connectors are clean and free from dirt and debris. On the P-16 Rescue Tool cable and the CA-4M Power Cable Assembly, the “ribbed” side of the power cable must match with the negative terminal side of the yellow connector plugs.

Attach the CA-4M Power Cable connector with the decal “Connect to Power Hawk Tool” to the P-16 Rescue Tool cable connector. The small control wire connectors must be aligned, then screwed together by hand. The large connectors snap into place when properly attached.



Connect the other end of the CA-4M Power Cable Assembly to the PC-100 Controller Unit. The control wire connector must be aligned with the case-mounted receptacle, then tightened by hand. The power wire connector snaps into the case-mounted connector labeled “Power Output”.

HINT: Always connect the threaded control wire first before connecting the larger yellow connectors. This will make aligning the control wire tabs and screwing the connector together easier by not fighting the heavier wire.

The Power Hawk® P-16 Rescue System can be stored with the PC-100 Controller fully connected – this is recommended for faster on-scene response. The only further connection required on-scene is for the 12VDC power supplied to the controller as described in Step 3. See Storage Recommendations in the Maintenance section for more information.

NOTE

The Power Hawk® P-16 Rescue System power cable connectors are color-coded. YELLOW plugs are only used to deliver controlled 12 volts DC from the PC-100 Controller Unit to the P-16 Rescue Tool. RED plugs are used to supply 12 volts DC power to the PC-100 from a source such as a Power Hawk® power pack, direct vehicle hook-up, 12 VDC battery, 12 VDC generator, etc. The yellow and red connectors are configured differently and cannot be connected together. Do not attempt to attach different colored connectors.

STEP 3: POWER SOURCE SELECTION AND CONNECTIONS

The Power Hawk® P-16 Rescue Tool is powered using 12 volts DC which must be channeled through the Power Hawk® PC-100 Controller Unit. Power sources may include:

- Power Hawk® Power Packs such as the PWR-3X12
- Other 12 VDC batteries or battery packs
- Direct 12 VDC vehicle system hook-up
- 12 VDC generator
- 12 VDC converted power supply

It is recommended that back-up 12 volts DC power always be available on-scene when using the Power Hawk® P-16 Rescue System, especially when operating with consumable power sources such as the PWR-3X12 Power Pack.

NOTE

The 12 volts DC power source must be capable of delivering sufficient current to properly operate the P-16 Rescue Tool without causing damage to the power source itself. (See Specifications section of this manual for P-16 current requirements.)

PWR-3X12 Power Pack

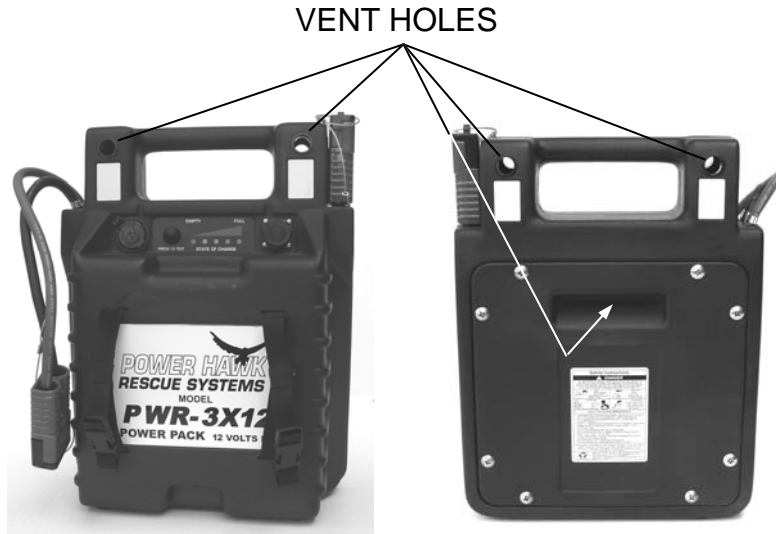
The PWR-3X12 Power Pack is a vented portable battery pack that utilizes a 33 amp-hour valve-regulated lead-acid battery. The PWR-3X12 Power Pack comes equipped with two red “Power Output” plugs which can provide power to two devices simultaneously, including the PC-100 Controller Unit for P-16 Rescue Tool operation or other accessories such as the Hawkeye flood light, Sawzall® reciprocating saw, blower fan, or winch. In addition, a “cigarette lighter” style power port is included to power auxiliary equipment such as cellular phones, floodlights, computers, etc. A charge indicator and test button are provided so that the user can visually check the charge state of the internal battery. The PWR-3X12 Power Pack includes a battery charger port for connection to the required battery charger (i.e. Model BC-U1) provided by POWER HAWK Technologies, Inc. (See Battery Charger Operation section of this manual.)



! WARNING

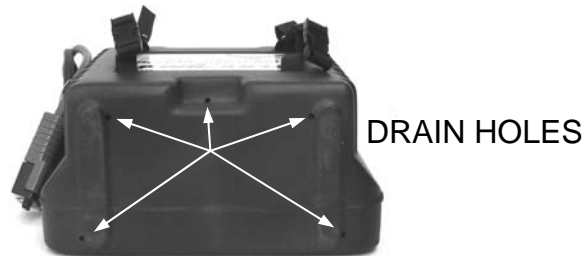
Do not make direct contact between battery positive and negative terminals as this can cause an explosion or fire. Keep the protective caps snapped in place over the red connector terminals, charger port, and cigarette lighter port when not in use.

The Power Hawk® PWR-3X12 Power Pack is vented to allow any hydrogen gas exhausted by the internal battery to safely diffuse out of the carrying case without dangerous build-ups. These vents include holes on the back panel, in the front bottom indent, on the handle stand-offs, oversized wire exit holes on the sides of the unit, and drain holes on the bottom of the unit.



! WARNING

Prior to charging, inspect case to ensure all vent and drain holes are clear and fully open. Do not plug vents. Inspect vents and drain holes after each use.



Prior to selecting the PWR-3X12 Power Pack, note the charge condition of the battery by depressing the test button located on the front of the unit. A fully charged battery is indicated by all five LEDs illuminated. As the charge on the battery is depleted, fewer LEDs will illuminate, indicating reduced battery capacity.



IMPORTANT: The LED indicator will show the proper voltage level ONLY when the battery is in its “settled” state. It will not indicate accurate state-of-charge under the following conditions:

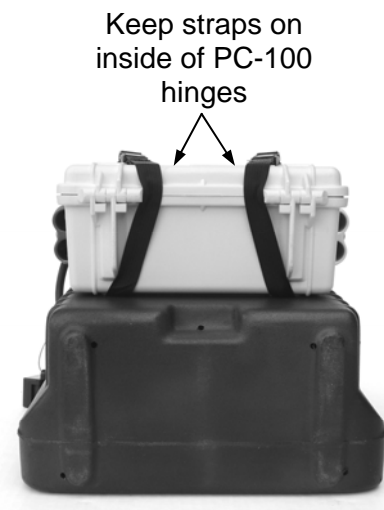
1. **During recharging**, all LEDs on the PWR-3X12 will illuminate, even if the battery is not yet fully charged. After disconnecting the charger from the battery pack, it may take up to 20 minutes for the battery to “settle” and for the LEDs to indicate the actual charge level. If the battery is being recharged, you **MUST** use the charger indicator lights to determine if the battery has reached its fully charged condition (see Battery Charger Operation section).
2. **During operation of the P-16 Rescue Tool**, the LEDs on the PWR-3X12 will indicate RED (or empty) even though there may be plenty of capacity remaining in the battery. This is because the LED indicator is sensing voltage and as amperage is being drawn by the P-16 Rescue Tool, the voltage of the battery drops naturally when under load. After operating the tool, it may take several minutes for the battery to “settle” and for the LEDs to indicate the actual charge level.

CAUTION: A partially discharged battery will shorten the operational time of the P-16 Rescue Tool. Keep the PWR-3X12 Power Pack fully charged when not in use. Recharge at least once a month to avoid reduced battery capacity due to self-discharging. Charge the PWR-3X12 Power Pack using only the Power Hawk® Battery Charger Model BC-U1 (or previous Model 2C0810-2).

To facilitate one-person portability when using the PWR-3X12 Power Pack, assemble the straps provided to harness the PC-100 Controller Unit to the PWR-3X12 Power Pack as shown below.



Hint: With the power pack lying on its back, set the “button” feet on the back of the PC-100 into the slight depression around the PWR-3X12’s product label. Then connect and tighten the straps.



Supply power to the PC-100 Controller Unit by connecting the short “pigtail” cable from the PWR-3X12 Power Pack to the red connector labeled “12 Volt Power Input.” The red plugs will snap into place when properly connected.

JC4-16 Jumper Cables



Power may be supplied by a charged automobile battery at the scene by using the JC4-16 Jumper Cables. Connect the Jumper Cable clips to the appropriate battery terminals. For operation, connect the red plug of the Jumper Cable to the PC-100 Controller Unit via the red plug labeled “12 Volt Power Input.”

Make note of proper polarity connections to ensure proper tool operation:

RED Jumper Cable clip connects to POSITIVE battery terminal

BLACK Jumper Cable clip connects to NEGATIVE battery terminal

WARNING

Do not make direct contact between battery positive and negative terminals as this can cause an explosion or fire. Keep the protective caps snapped in place over the red connector terminals when not in use.



VH4-4 Vehicle Harness with EC4-16 Extension Cable



Using the VH4-4 Vehicle Harness Kit and EC4-16 Extension Cable, power may be supplied from a vehicle at the scene without opening its hood. Install the Vehicle Harness Kit by mounting the red plug to a desired location on the vehicle (i.e. front grill) and routing and connecting the wires to the proper battery terminals. Make sure the protective terminal cap is secured to the red plug and kept snapped in place when not in use.

Make note of proper polarity connections to ensure proper tool operation:

RED Jumper Cable clip connects to POSITIVE battery terminal

BLACK Jumper Cable clip connects to NEGATIVE battery terminal

WARNING

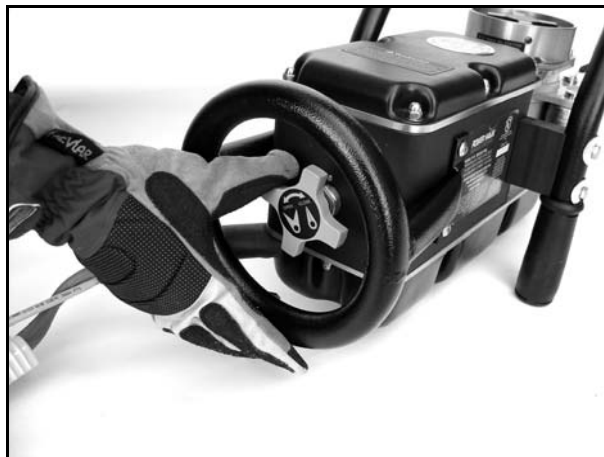
Do not make direct contact between battery positive and negative terminals as this can cause an explosion or fire. Keep the protective caps snapped in place over the red connector terminals when not in use.

For operation, connect the plugs of the harness and the EC4-16 Extension Cable. Then connect the Extension Cable to the PC-100 Controller Unit via the red plug labeled “12 Volt Power Input.”

NOTE

The PC-100 Controller Unit is designed so that if polarity is accidentally reversed, the P-16 Rescue Tool will not operate, remaining unharmed. If the P-16 Rescue Tool does not operate, check cable connections for proper polarity.

Test the connections by momentarily turning the P-16 Rescue Tool trigger switch. The tool should energize and move the powerhead output lugs. If the tool does not operate, see the Troubleshooting section of this manual.






STEP 4: TOOL ATTACHMENT SELECTION AND INSTALLATION

The P-16 Rescue Tool is designed to change from spreading to cutting in seconds using interchangeable tool attachments such as the S-1601 Spreader Arms, the C-1601 Curved Cutter, and the CS-1602 Power Blade. These attachments are safely secured to the P-16 powerhead lugs through the use of special-grade steel pins. Use only Power Hawk Technologies, Inc. authorized attachments with the Power Hawk® P-16 Rescue System.



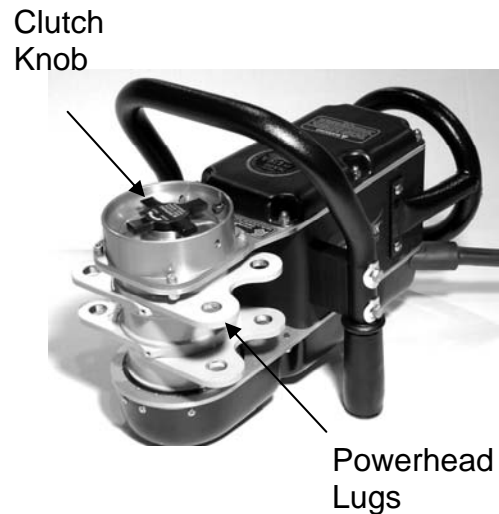
Tool Attachment Selection Guide

Tool Attachment	Operations
<p>S-1601 Spreader Arms</p> 	<p>SPREADING: Opening vehicle doors & hoods. Pushing and moving material</p> <p>CRUSHING: Pinching pipes to restrict flow</p>
<p>C-1601 Curved Cutter</p> 	<p>CUTTING: Door & windshield posts, car hinges, pipe, dashboard-roll relief cuts</p>
<p>CS-1602 Power Blade</p> 	<p>SPREADING: Opening vehicle doors & hoods Breaking locks</p> <p>CUTTING: Vehicle roofs & panels, steel plate, steel bar</p> <p>← Cross-over of blades leaves a large opening in the material for continuous cutting. Creates its own purchase point by engaging cutter points in tight (less than 1/4 inch) seams and closing blades. Will grab material at serrations.</p>

Installing P-16 Tool Attachments...

General

- Tool attachments have “left” and “right” designations. The sides are different sizes, and cannot be installed incorrectly.
- The attachment pins are also left and right side specific. The left pins are longer and have a larger diameter than the right pins. For clarity during use, the right pin set has a red ribbon attached to it – **remember Red = Right**.
- Loosen the clutch and rotate the powerhead as necessary for better accessibility to the pins. **Be sure to re-tighten the clutch prior to operation.**
- Attachment pins must be completely inserted. Check by lightly pulling up on the pins to ensure the ball detents are below the bottom lugs on the powerhead.



! WARNING

Pins not properly locked in place can cause uneven loading and tool failure, which may cause serious personal injury and/or damage to property and/or equipment.



Installing Spreader Arms

- Note decals indicating “Left” (thicker) and “Right” (thinner) sides of the spreader arm set. Align the holes in the arms to those on the powerhead. Insert the correct attachment pins. If the holes do not line up, you may need to operate the trigger switch of the P-16 Rescue Tool in the direction that will allow hole alignment.



HINT: Use your thumb over the top of the pin to facilitate insertion.

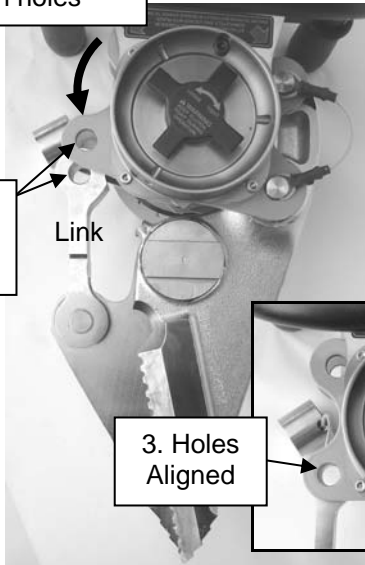
Installing Cutters

- Install the left (thicker) side of the cutter first, aligning the holes and using the long pins.



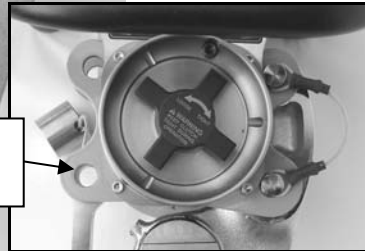
2. Operate trigger switch to move powerhead lugs to align holes

1. Holes NOT aligned

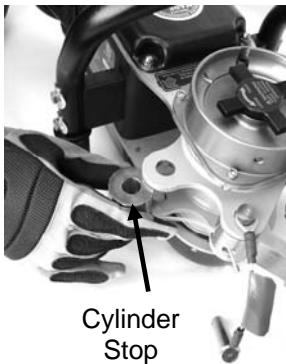


- Align the hole in the cutter link with the front right hole in the powerhead lug and insert pin. If the holes do not line up, operate the trigger switch of the P-16 Rescue Tool in the direction that will move the hole in the powerhead lug toward the hole in the cutter link.

3. Holes Aligned



- Install the tethered cylinder stop in the right rear of the powerhead lug using the remaining pin.



CAUTION: Failure to install the Cylinder Stop could result in the cutter link hitting the Powerhead, causing serious damage to the P-16 Rescue Tool.

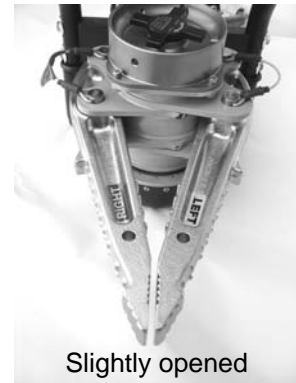
Removing P-16 Tool Attachments...

General and Spreader Arms

- Relieve tool load prior to removing tool attachment. Spreader arms should be at least slightly open. Failure to relieve load will prevent removal of attachment pins.
- Use the coated steel cable between the pins as an aid when pulling up pins. Pins should remove easily. If not, verify tool load is relieved.



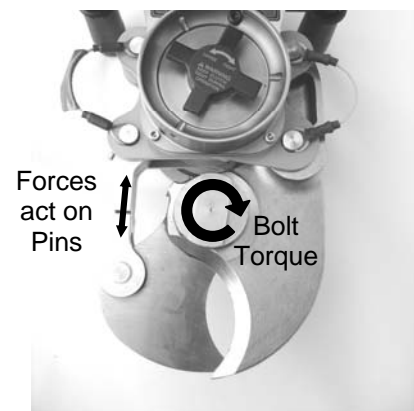
- Loosen the clutch and rotate the powerhead as necessary for better accessibility to the pins. **Be sure to re-tighten the clutch prior to operation.**



HINT: After removing Pins, drape them over each handle bracket to prevent losing them.

Cutters

- All Power Hawk cutter blades are held together with a special-steel bolt and nut that is tightened to approximately 150 ft.-lbs. of torque. As the cutter is operated to open or close, there exists a natural load on the pins as the blades “push through” the friction induced by the high torque of the bolt. **To relieve this load, simply operate the tool in one direction by depressing the trigger switch, then “jog” the switch (split-second “on” then “off”) in the opposite direction.** This will relieve the load and free the attachment pins for removal.

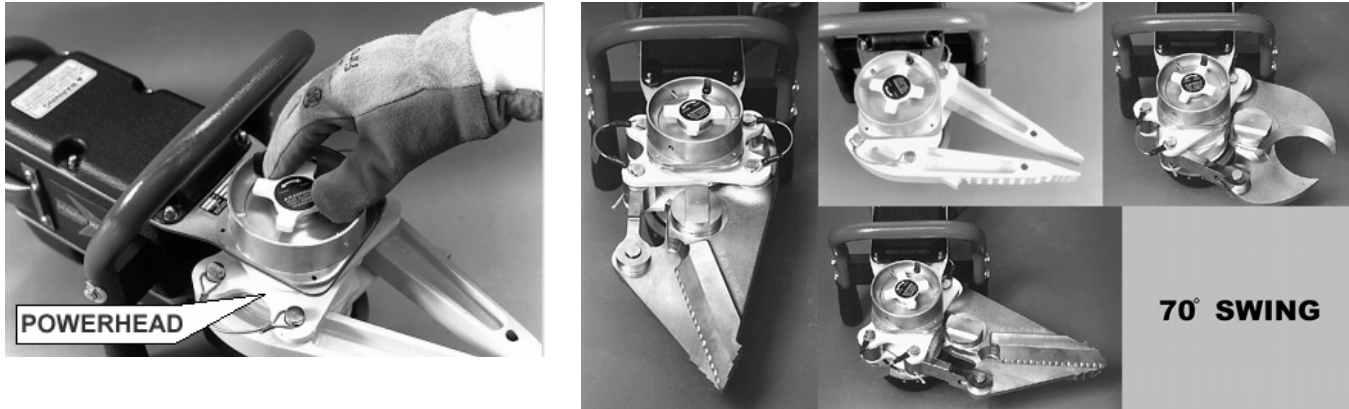


WARNING

The attachment pins supplied with the P-16 Rescue Tool are made from special-grade steel. Use only pins supplied by Power Hawk Technologies, Inc. Use of unauthorized pins can result in product malfunction causing serious personal injury and/or damage to property and/or equipment.

STEP 5: POWERHEAD 70° VARIABLE POSITIONING

The P-16 Rescue Tool is designed with a pivoting powerhead to provide greater access and versatility of the attachment. The powerhead is capable of rotating 70° to the left relative to the tool body when upright. During operation, the powerhead is held in place by a clutch located directly above the powerhead. To pivot the head, loosen the clutch knob, swing the powerhead and attachments to the desired position, then retighten the clutch knob. To swing an attachment to the right, simply use the tool upside down



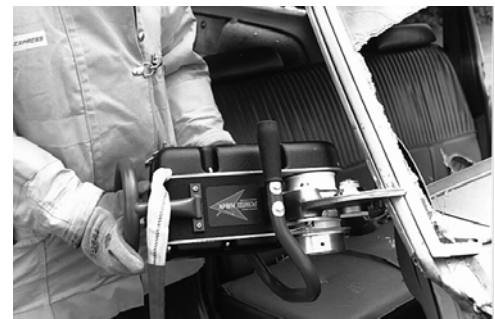
NOTE

To prevent debris from entering the clutch housing and causing damage, do not remove the clutch knob.

WARNING

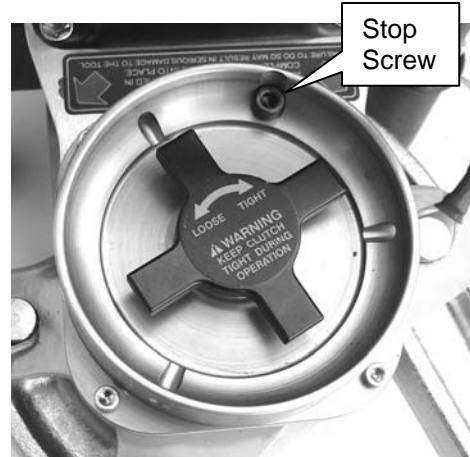
The clutch knob must be tightened prior to engaging and loading the P-16 Rescue Tool. Failure to do so may result in sudden movement of the tool and attachments, which may cause personal injury and/or damage to property and/or equipment.

The clutch is intended to secure the position of the attachments. It has been designed, however, so that if the body of the tool (handles, covers, etc.) should become jammed against other objects and loaded during operation, the clutch will slip within the 70° rotation limits to prevent tool damage, even with the clutch knob tight. There will be times when, in order to prevent the P-16 tool body from jamming against other objects, the tool should be used **UPSIDE DOWN** and the attachments repositioned. Lower handle grips are provided on the tool for this purpose.



NOTE

The 70°-rotation limits of the P-16 powerhead is maintained through the use of a stop screw. To protect the tool from serious damage, the stop screw is designed to shear should the tool body become jammed against other objects and loaded during operation with no more rotational freedom of the powerhead. If this happens, the tool, though still operational, has lost its safety stop positioning and must be repaired by replacing the stop screw (See Maintenance section). This condition will be apparent since the P-16 attachments will be capable of swinging beyond 70° and making contact with the carrying handle when the clutch is loose.



⚠ WARNING

Do not load the P-16 Rescue Tool such that the body becomes jammed against other objects and is loaded. Shearing of the stop screw causes loss of the 70° safety stops. Operating the tool in this condition may result in serious personal injury and/or damage to property and/or equipment.

OPERATION

THE POWER HAWK® P-16 RESCUE SYSTEM SHALL BE OPERATED ONLY BY THOSE TRAINED AND AUTHORIZED BY THE AUTHORITY HAVING JURISDICTION.

Before operating the Power Hawk® P-16 Rescue Tool, make sure that the clutch knob directly above the P-16 powerhead is tight and the quick-change attachment pins are firmly seated in place. Do not attempt to adjust the position of the clutch while the arms or cutters are under load (including attachments being fully opened or closed). Remove tension on the attachments before loosening the clutch. This will allow positioning in the complete 70° range of motion.

The Power Hawk® P-16 Rescue Tool is operated by turning the trigger switch at the back of the unit. Turning the switch to the left (counter-clockwise) will open the attachments. Turning the switch to the right (clockwise) will close the attachments.

The P-16 Rescue Tool is designed to shut off automatically when it reaches maximum force. When this occurs, reverse direction to relieve load and reposition the tool. After the tool has shut off automatically, DO NOT continue to move the attachments in the same direction without first reversing direction to relieve the load, then reposition the tool.



WARNING

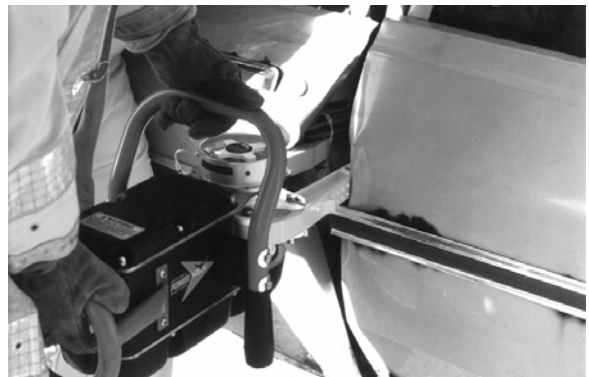
Continued loading of the P-16 Rescue Tool in the same direction after it has automatically shut off, without first relieving the load, can result in over-stressing and breakage of rescue tool components which may cause serious personal injury and/or damage to property and/or equipment.

WARNING

Never use the tool while holding the cutting or spreading attachments. To avoid risk of serious personal injury, do not under any circumstances place hands or other body parts on or near Power Hawk® attachments when in operation.

Do not carry or hold the tool by the trigger switch. Hold the handles and operate the trigger switch with a finger. The round handle is designed to allow easy grasp of the tool and operation of the trigger switch when held in any position.

**Remember:
One hand on each handle at all times!**



Helpful Hints: When cutting, keep in mind that the greatest cutting forces are available at the base of the cutter (point closest to the cutter bolt). When possible, begin cut as close to the base of the cutter as conditions will allow.

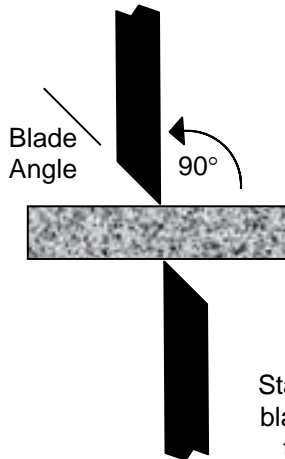
When spreading, forces are greater near the base of the arms than near the tip. Additionally, tool forces increase as the spreader moves from the closed position to the fully opened position due to mechanical advantage. You can use this knowledge to your advantage when performing an operation.

OPERATING SAFETY INFORMATION

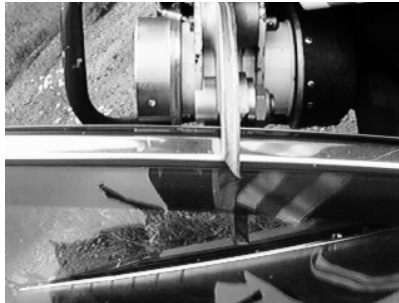
- Never use the tool while holding the cutting or spreading attachments. Hold the tool only by the black handles when operating. To avoid risk of serious personal injury and/or damage to property and/or equipment, do not under any circumstances place hands or other body parts on or near Power Hawk® attachments when in operation.
- Operate the tool only with the clutch knob tightened. The clutch is intended to secure the position of the attachments. Failure to do so may result in personal injury due to sudden movement of the tool and/or attachments.
- When spreading with Power Hawk® spreader attachments, make sure objects being spread are stabilized and operator(s) and patient(s) are shielded from any loose debris.
- When stabilizing, use proper cribbing methods.
- Power Hawk® cutter attachments are designed to cut a variety of materials such as door and windshield posts, pipe, sheet metal, steel plate, rebar, etc. Do not attempt to cut hardened metal, such as steering columns, nader pins, seat belt bolts, lock hasps, etc., as this action may result in blade damage.
- When cutting with the Power Hawk® cutting attachments, make sure the object being cut is anchored on both sides and the tool is held firmly.
- Make sure the cutter bolt is tight. The cutter nut should be torqued to 150 foot-pounds.
- Make sure the cutter-link spiral rings are secure.
- Position the blades so that the material being cut is perpendicular and do not allow the blades to twist so that they separate while cutting. Failure to do so may result in component breakage, causing serious personal injury and/or damage to property and/or equipment.



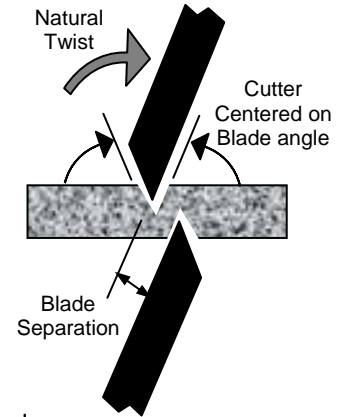
HINT: Traditional cutting methods teach you to BEGIN your cut perpendicular to the material. This will actually lead to greater blade separation due to the natural twist created by the angle in the cutter blades (see below).



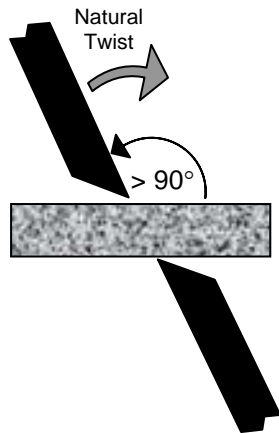
Starting cut with blades at 90° to the material being cut...



...the cutter will twist naturally to center the blade angle on the material and cause blade separation and poor cutting.

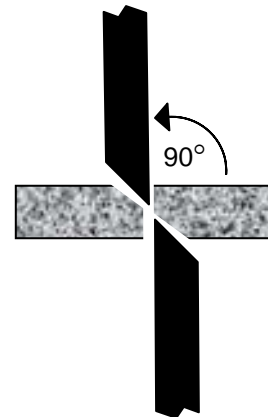


The goal is to COMPLETE your cut perpendicular to the material to avoid blade separation. To achieve this see below...



Start at an angle greater than 90° to the material being cut...

...and the cutter will twist naturally to finish the cut at 90°, with little blade separation. This allows the best cutting when the material is compressed and most difficult to cut.



BATTERY CHARGER OPERATION

Battery packs, such as the PWR-3X12 Power Pack, supplied by Power Hawk Technologies, Inc., utilize valve-regulated lead-acid batteries. These batteries require special chargers designed to properly charge and prevent overcharging conditions. Only chargers provided by Power Hawk Technologies, Inc. shall be used to recharge Power Hawk® battery packs.



Model BC-U1
Battery Charger

The Model BC-U1 Battery Charger (pictured left) is designed for use with valve-regulated lead-acid batteries. It is also designed to resist vibration and is suitable for installation onboard a vehicle. The battery charger supplies energy at rates that are best suited to recharge the battery and maintain its life. Once the battery reaches full charge, the BC-U1 charger automatically switches to “Float” mode, keeping the battery in the fully charged condition without overcharging. To ensure a fully charged battery for on-scene use, it is recommended that the

PWR-3X12 Power Pack stay connected to the BC-U1 Charger until the Power Hawk is taken out to be used.

To connect the charger to the power pack, align the tab and slot of the output connector to the mate found on the front face of the power pack. Press together.

The BC-U1 Charger has three lights (LED’s) that indicate the status of the recharge cycle.

- Red = Power On
- Yellow (Steady) = Charging
- Yellow (Flashing) = Fault
- Green = Ready (Fully Charged)



IMPORTANT:

- When recharging, ALWAYS use the indicator lights on the charger to determine the status of the battery, not the indicator on the power pack.
- Charge the PWR-3X12 Power Pack at ambient temperatures ranging from 32° to 104°F.
- Do not operate the P-16 Rescue Tool using the PWR-3X12 Power Pack while connected to the battery charger. The high amperage current draws of the P-16 Rescue Tool may cause the charger to blow a fuse.
- Make sure power switch on back of unit is turned “ON”. When “ON” fan will run.



Power Switch

BATTERY AND BATTERY CHARGING SAFETY INFORMATION

All batteries contain corrosive acids and produce explosive gases during recharging. Failure to follow the safety precautions below may result in acid burns and/or gas explosion, causing blindness, serious personal injury, and/or damage to property and/or equipment.

- Charge batteries in well-ventilated areas away from sparks, flames, and smoking.
- Only use chargers provided by Power Hawk Technologies, Inc. and follow charging instructions carefully.
- Prior to charging, ensure power pack vent holes are clear and fully open. Inspect vents after each use.
- Do not charge power packs upside down.
- Only charge batteries at ambient temperatures specified by the battery manufacturer.
- Do not make direct contact between battery positive and negative terminals as this may cause an explosion or fire.
- Batteries should not be stored discharged.
- Keep batteries and chargers away from children.
- Lead-acid batteries must be disposed of properly. They must be collected, recycled, or disposed of in an environmentally sound manner. It is unlawful to incinerate batteries, or discard them in municipal solid waste or landfill.

BATTERY MAINTENANCE INFORMATION

- 1. When recharging, use the indicator lights on the CHARGER to determine full charge, NOT the indicator on the battery pack.** Power Hawk chargers indicate a fully charged battery when the charger light switches from “Fast Charge” to “Float” or from “Charging” to “Ready”. Removing the charger prior to it reaching “Float” or “Ready” mode will leave the battery in a less than fully charged condition. A fully discharged battery could take up to 15 hours to become fully recharged, a partially discharged battery will take less time. Because the charger output voltages are higher than 100% of the battery pack indicator, the battery will take several minutes to “settle” back down (approx. 20 minutes) after being disconnected from the charger before the battery pack indicator will read its true state-of-charge. All Power Hawk chargers are designed to prevent overcharging and may remain connected to the battery pack, even after reaching the fully charged condition.
- 2. Charge prior to first use.** New battery packs may have been stored or in transit for extended periods of time and/or at temperatures that reduced the battery’s state-of-charge due to self-discharging. Charge new battery packs overnight, regardless of their indicator readings.
- 3. Recharge immediately after EACH use.** There is no “memory” problem to worry about. Recharge regardless of the battery’s state-of-charge. Storing a discharged battery can result in it becoming sulfated, which will reduce its capacity. (See “Sulfated Battery” below)
- 4. Recharge at least ONCE A MONTH when not in use.** The internal battery will self-discharge if stored without the Power Hawk charger connected. The self-discharge rate is approximately 3.5% per month @ 77°F and will double for each 15°F increase in battery storage temperature. A lower storage temperature will result in longer shelf life. (See “Battery and Battery Charging Safety Information” below for storage temperatures)
- 5. Disconnect ALL accessories** from the battery pack when not in use or when the battery pack’s indicator reaches 0% state-of-charge. Examples are lights, fans, saws, winches, cameras, etc. that are powered using the Power Hawk battery pack. Excessive deep discharging of the battery may cause it to sulfate, resulting in lost capacity. (See “Sulfated Battery” below). Note: Immediately after the battery delivers high amps, such as from using the P-16 Rescue Tool or other accessories, it will take several minutes for it to “settle” back up before the battery indicator will read its true state-of-charge. As a rule, always disconnect the battery pack from the PC-100 Controller Unit and any accessories when not in use and cap all live battery terminals.
- 6. Sulfated Battery.** If a battery is undercharged or excessively discharged, sulfating of the battery can occur, whereby a thick layer of lead sulfate remains on the internal positive and negative plates, which will reduce its capacity. A symptom of a significantly sulfated battery is shortened operational time and low performance even after proper recharging (Note: this is also the symptom of a naturally worn out battery). In this condition, the Power Hawk charger may indicate the battery is fully charged (“float” or “ready” mode) even though it is actually discharged. Sulfating is most commonly caused from storing a battery for excessive periods of time without being recharged or from discharging a battery below 0%

indicator reading. Excessive discharging can happen by leaving a light or other accessory plugged in and turned on. (Note: the P-16 Rescue Tool will stop operating before the battery becomes excessively discharged.) A sulfated battery will need to be replaced.

7. **“On-Board” Charging.** The Power Hawk chargers are designed to withstand vibration and are recommended for use onboard emergency vehicles. The Power Hawk chargers may be installed into a vehicle compartment and plugged into the shoreline circuit. All Power Hawk chargers are designed to prevent overcharging and may remain connected to the battery pack.

WARNING: A previous Power Hawk Battery Charger - Model BC-124000 - is NOT designed for heavy vibration and MAY NOT be used onboard vehicles. Failure to comply may cause the charger to malfunction which could result in acid burns and/or gas explosion, causing blindness, serious personal injury or death, and/or damage to property and/or equipment.

8. **Always have back-up 12 volts DC power available.** It is recommended that you have spare battery packs (i.e. Model PWR-3X12), however, other back-up 12 Volts DC sources may be used. Although Power Hawk Technologies does not specifically endorse other 12 Volts DC source products, an automobile battery (using jumper cables Model JC4-16), direct vehicle hook-up (using Models VH4-4 Vehicle Harness Kit and EC4-16 extension cable), 12 Volts DC generator, and 12 Volts DC converted power supply, etc. are viable power source options.

9. **CHANGING THE INTERNAL BATTERY IN THE PWR-3X12 POWER PACK:**

IMPORTANT: When replacing the internal battery in *POWER HAWK* power packs, ALWAYS use the EXACT battery that is approved by POWER HAWK TECHNOLOGIES, Inc. *CAUTION: A battery supplier may recommend the same type and size battery for your Power Hawk power pack, however, performance varies greatly between manufacturers and therefore other batteries should not be used.* Contact the Factory if you plan to purchase a replacement battery locally to get the most up-to-date part number and local sources.



- Remove 8 screws to open back cover
- Slide battery out slightly to expose terminals
- Remove bolts and nuts on terminals to disconnect the red and black cables from the battery
- Remove battery and replace with new one
- Re-connect cables to battery terminals
- Re-assemble back cover

MAINTENANCE

MAINTENANCE AFTER USE:

- Recharge battery pack.
- Clean tool and all accessories. (Note: It is normal for small amounts of grease to leak from the powerhead. This requires no maintenance beyond periodic cleaning.)
- Check all parts for damage, wear, and/or fraying.
- Check that all hardware is securely fastened (i.e. handle bolts, etc.).
- Check cutting and spreading attachments for damage.
- Check P-16 to ensure 70° articulation and stop screw are functional.
- Check P-16 clutch for proper holding of the powerhead and attachments.
- Lubricate attachment pins and cutting blades with light machine oil or WD-40.
- Check that cutter nuts are tight. If blades can be moved by hand, or if blades display abnormal separation during cutting, the nut is loose. If loose, torque to 150 foot-pounds.
- Check proper installation of cutter-link spiral rings.

If service is required, contact your Power Hawk® dealer or the Factory for assistance.

MONTHLY MAINTENANCE AND INSPECTION:

- Check charge on battery.
- Inspect Power Hawk® P-16 Rescue System components for damage.
- Inspect cables and plugs for fraying, wear, cleanliness, or damage.
- Check switches for proper functioning.
- Lubricate attachment pins and cutting blades with light machine oil or WD-40.

If service is required, contact your Power Hawk® dealer or the Factory for assistance.

ANNUAL INSPECTION (PERFORMED BY FACTORY OR AUTHORIZED SERVICE CENTER):

- Test all cables for electrical integrity.
- Inspect all plugs and connections; replace as necessary.
- Perform load and amperage draw tests.
- Inspect blades and arms for damage and cracking.
- Replace safety labels as required.
- Inspect and replace fasteners as required.
- Clean and lubricate unit as required.
- Replace battery as required.

- Check torque on cutter nut. Torque to 150 foot-pounds.
- Inspect cutter-link spiral rings; replace as necessary.
- Check P-16 to ensure 70° powerhead articulation and safety stops are functional. Replace parts as necessary.
- Check covers and handles; replace as necessary.

To ensure **MAXIMUM PERFORMANCE** of your **POWER HAWK® P-16 Rescue System**, contact your Local Dealer or the Factory for information on **POWER HAWK** Maintenance Plans

STORAGE:

- Stow P-16 Rescue System with 12VDC power supply disconnected and all battery terminals covered. It is recommended that cables between the P-16 Rescue Tool and the PC-100 Controller Unit be left fully connected.
- Stow P-16 Rescue Tool with attachments relieved of any load (i.e. spreader tips slightly separated).
- Protect unit from moisture by stowing in a dry area.
- Stow securely to prevent damage from movement.

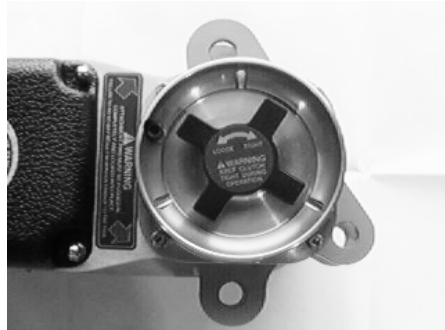
STOP SCREW REPLACEMENT:

Loosen the Clutch Knob so the powerhead swings freely. Rotate the powerhead to the position shown below left (approximately 30°).

Using a 3/16" hex key, remove the Stop Screw from the Clutch Housing as shown below right.

Screw the replacement Stop Screw (part number 2C0433-1) into the Clutch Housing.

Confirm that the powerhead rotation is limited to 70° to the left, by swinging the powerhead in each direction until it hits the stops.



TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Tool will not operate	Poor / loose / dirty electrical connections	Disconnect, clean, and reconnect cables.
	Battery discharged	Charge battery or connect an alternate 12 V DC power source.
	Polarity from 12 V DC power source is reversed	Reverse polarity at 12 V DC power source.
	Insufficient 12 V DC current is being supplied	Check amperage being delivered. Connect 12 V DC power source capable of supplying sufficient current.
Tool has low power	Poor / loose / dirty electrical connections	Disconnect, clean, and reconnect cables.
	Battery discharged	Charge battery or connect an alternate 12 V DC power source.
	Insufficient 12 V DC current is being supplied	Check amperage being delivered. Connect 12 V DC power source capable of supplying sufficient current.
P-16 Attachments swing uncontrolled when loaded	Clutch knob is loose	Tighten clutch knob.
P-16 Attachments will not swing when clutch knob is loosened	Attachment is under load	Tighten clutch, operate tool to remove load, loosen clutch, and then reposition Attachment.

If above does not correct problem, contact your authorized Power Hawk® Dealer or Factory at 1-800-PWR-HAWK (1-800-797-4295) or 973-627-4646 Fax: 973-627-4622

REPLACEMENT PARTS

Replacement parts for the *POWER HAWK*® P-16 Rescue System can be obtained from your authorized *POWER HAWK*® Dealer or by contacting the Factory at 1-800-PWR-HAWK (1-800-797-4295) or 973-627-4646 Fax: 973-627-4622

www.powerhawk.com

SPECIFICATIONS

P-16 Rescue Tool

Powerhead Output Torque	72,000 in-lbs (8135 N-m)
Input / Output Ratio	5958:1
Powerhead Articulation Angle	70°
Motor Type	12 Volts DC – Permanent Magnet
Motor Inrush Current	220 Amps
Motor Current @ No Load	23 Amps
Motor Current @ Max. Load	155 Amps
Pigtail Cable Length	12" (305 mm)

With No Attachments

Weight	32 lbs (14.5 kg)
Envelope (LxWxH)	17" x 10" x 12" (432 mm x 254 mm x 305 mm)

With S-1601 Spreaders Attached

Weight	41 lbs (18.6 kg)
Envelope (LxWxH)	25" x 10" x 12" (635 mm x 254 mm x 305 mm)
Travel Distance	14" (356 mm)
Opening Time	16 Sec
Closing Time	19 Sec
Highest Spreading Force	
At tips (NFPA 1936, HSF)	9270 lbs (41.2 kN)
At back of arm	45,240 lbs (201.2 kN)
Lowest Spreading Force	
At tips (NFPA 1936, LSF)	6990 lbs (31.1 kN)
At back of arm	17,530 lbs (78.0 kN)

With C-1601 Curved Cutter Attached

Weight	44 lbs (20 kg)
Envelope (LxWxH)	24" x 10" x 12" (610 mm x 254 mm x 305 mm)
Cut Level Rating (NFPA 1936)	A3, B4, C3, D3, E4
Opening Distance	5" (127 mm)
Opening Time	18 Sec
Closing Time	21 Sec

With CS-1602 Straight Cutter Attached

Weight	47 lbs (21.3 kg)
Envelope (LxWxH)	27" x 10" x 12" (686 mm x 254 mm x 305 mm)
Cut Level Rating (NFPA 1936)	A3, B6, C3, D5, E6
Opening Distance	10" (254 mm)
Opening Time	17 Sec
Closing Time	20 Sec

PC-100 Controller Unit

Power Input	12 Volts DC
Case	Sealed
Weight	5 lbs (2.3 kg)
Envelope (LxWxH)	11" x 4.5" x 7.5" (279 mm x 114 mm x 190 mm)

CA-4M Power Cable Assembly

Cable Length	13 ft (4 m)
Weight	6.8 lbs (3.1 kg)

PWR-3X12 Power Pack

Battery Type	12 V, Valve-Regulated, Sealed, Lead-Acid
Battery Capacity	33 Ampere Hour
Case	Vented
Charge Indicator	5 LEDs
Charger Port	Special
Charger Required	Power Hawk® BC-U1 (NFPA Compliant) or Power Hawk® previous Model 2C0810-2 (Non-NFPA Compliant)
Charging Ambient Temperature	-4 to 122°F (-20 to 50°C)
Power Output Connectors	2 Red Connectors for Power Hawk® Accessories 1 "Cigarette Lighter" Style port for cellular phones, etc.
Weight	33 lbs (14.9 kg)
Envelope (LxWxH)	11.5" x 6.5" x 15.5" (343mm x 178mm x 368mm)

BC-U1 Battery Charger (UL 1012, NFPA-1936)

Input	
Line Voltage, Frequency	90-230 V AC (±10%), 50-60 Hz (±10%)
Maximum Input Current	0.70 A RMS (1.40 A Peak)
Input Fuse Type	5 x 20 mm, Glass Cartridge Type, Time Lag, (Slo-Blo®)
Input Fuse Value	2.5A, 250 V
Power Cord	SVT, VW-1, 18 AWG, 3 Conductor Detachable Power Supply Cord, 6 feet long with NEMA 5-15P Grounding Plug and IEC-320 Grounding Connector, rated 10 A
Output	
Charge Current	4 A Max. (± 5%)
Charge Voltage	14.8 ± .20 V DC
Output Fuse Type	Blade Type, Fast Acting, (MINI® Fuse) (SAE J2077)
Output Fuse Value	5 A, 32 V
Power Cord	SPT-2, VW-1, 18 AWG, 2 Conductor Fixed Power Cord, 6 feet long with special output connector
Weight	2.4 lbs (1.1 kg)
Envelope (LxWxH)	6.75" x 4.15" x 2.00" (172mm x 105mm x 51mm)
Operating Temperature	32° to 104° F (0° to 40° C)

WARRANTY

WARRANTY. Power Hawk Technologies, Inc. guarantees all gear parts in the *Power Hawk®* P-16 Rescue Tool, which comprise the vast majority of the value of the tool, against defects in material and workmanship for as long as owned by the original purchaser. All other *Power Hawk®* parts, equipment and accessories are guaranteed against defects in material and workmanship for a period of one (1) year from the date of purchase by the original purchaser. The identity of the original purchaser and the date of purchase shall be established in each case by the return of the properly completed Warranty Registration Card.

WARRANTY TERMS. The obligations of Power Hawk Technologies, Inc. under this warranty include free replacement of the necessary parts and the shipping costs to return the equipment to the user, provided the inspection of the equipment has proved that the parts were defective at the time of purchase or were improperly designed or manufactured. The warranty inspection can only be performed by a Power Hawk Technologies, Inc. service center or an official Power Hawk Technologies, Inc. factory-trained distributor, and shipping costs to a Power Hawk Technologies, Inc. service center or an official Power Hawk Technologies, Inc. factory-trained distributor will be for purchaser's account. Said warranty shall remain in effect only if (1) such goods are used normally and properly in accordance with Power Hawk Technologies, Inc. instructions as to maintenance and operation, whether given orally or set forth in manuals and instruction sheets furnished by Power Hawk Technologies, Inc. and (2) the purchaser gives prompt notice to Power Hawk Technologies, Inc. of any such defects and preserves and turns over all allegedly defective goods, parts or items.

EXCLUSIONS. This warranty covers all defects in material and workmanship except:

- Any damage occurring during shipments of the goods (for which claims shall be presented to the carrier).
- Normal wear and tear and deterioration.
- Damage caused by abuse, improper use, or corrosion
- Damage caused by repairs performed by persons other than a Power Hawk Technologies, Inc. service center or an official Power Hawk Technologies, Inc. factory-trained distributor, or damage resulting from the use of parts other than genuine Power Hawk Technologies, Inc. parts.
- Damage as a result of improper or neglected reasonable maintenance.

THIS WARRANTY STATED HEREIN IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WRITTEN OR ORAL, EXPRESS, STATUTORY OR IMPLIED, AND POWER HAWK TECHNOLOGIES, INC. EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES FOR MERCHANTABILITY, FITNESS, PERFORMANCE OR SUITABILITY FOR A PARTICULAR PURPOSE.

LIMITATION OF DAMAGES. Power Hawk Technologies, Inc.'s obligation under this warranty is limited to repair and/or replacement, at Power Hawk Technologies, Inc.'s option, of any defective Power Hawk Technologies, Inc. tool, part, accessory or item or other manufacturer's tool, part, accessory or item, and under no circumstances, whether due to a breach of any warranty hereunder or any other cause, and whether arising in contract or in tort (including negligence or strict liability) shall Power Hawk Technologies, Inc. be liable for (1) consequential or indirect loss or damage including, but not limited to, loss of profits, loss of

production, plant downtime, or liabilities to customers or other third parties, or (2) loss or damage arising out of the sale or contributory negligence of the purchaser, its employees or agents, or any third part, or (3) any special or punitive damages of any nature. If Power Hawk Technologies, Inc. determines, in its sole and final discretion, that the nature of the defect precludes remedy by repair and/or replacement Power Hawk Technologies, Inc. reserves the right to satisfy any warranty obligation by refunding the full purchase price, on return of all defective goods to Power Hawk Technologies, Inc., shipping cost prepaid. Any action for breach of warranty or other action must be commenced within one (1) year after such cause of action arises, except where applicable law would prohibit any such time restriction in bringing of such an action.

NOTICES. For all notices, information and inquiries concerning this warranty or Power Hawk Technologies, Inc. service centers and official Power Hawk Technologies, Inc. factory-trained distributors contact:

Power Hawk Technologies, Inc.,
300 Forge Way, Suite 2
Rockaway, New Jersey 07866 USA
Telephone: 973-627-4646 or 1-800-PWR-HAWK (1-800-797-4295)
Fax: 973-627-4622

www.powerhawk.com



Manufactured by

POWER HAWK TECHNOLOGIES, INC.

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