PowerCut 10™
Abrasive Cut-Off Saw

Operation Manual

2376 E. Pacifica Place * Rancho Dominguez, CA 90220 * 310-635-2466
www.alliedhightech.com
07/12, Version 2.4
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Safety Precaution Sheet

WARNING!

Please read carefully before operating the machine.

1. All operators should be thoroughly trained in all aspects of machine operation, following the guidelines set forth in this manual, prior to use.

2. The machine should be placed on a stable, sturdy surface to allow for operation without hindrance to the controls.

3. Only consumables that are compatible with the operation of a sectioning machine should be used.

4. Any local machinery and occupational standards must be strictly observed.

5. The operator must ensure the samples being sectioned are properly secured in the selected fixture prior to machine operation.

6. The operator should not be wearing any loose clothing, ties or jewelry that can get caught in the machine during operation.

Note: It is the sole responsibility of the user for any damage(s) as a result of misuse, neglect, incorrect installation, unapproved alterations, incorrect feed voltage, or unauthorized/improper repair.

Safety Labels

Electrical
This sticker is located on the rear of the machine and indicates where the power cord is connected to the machine. Ensure all power to the machine is OFF when changing fuses or when performing any service.

Hand Entanglement
When the cover is open, a safety switch prevents the motor from powering on. Take extra caution when using the vise and clamps to avoid pinching and injuring oneself.

Protective Eyewear Recommended
It is recommended that protective eyewear be worn while operating the machine.
## Machine Details

<table>
<thead>
<tr>
<th>Model:</th>
<th>PowerCut 10™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Number:</td>
<td>#5-4000, #5-4000-415, #5-4000-480</td>
</tr>
<tr>
<td>Description:</td>
<td>Abrasive Cut-Off Saw</td>
</tr>
<tr>
<td>Serial Number:</td>
<td>PE10-064A-H12</td>
</tr>
<tr>
<td>Voltage:</td>
<td>230 V AC, 3-phase *</td>
</tr>
<tr>
<td></td>
<td>Note: Voltage for 380/415 and 480 machines remains 230 at the machine. A step-down transformer is provided for operation at a higher voltage supply.</td>
</tr>
<tr>
<td>Frequency:</td>
<td>Can operate at either 50 Hz or 60 Hz</td>
</tr>
<tr>
<td>Power:</td>
<td>3½ HP (2600 Watts)</td>
</tr>
<tr>
<td>Fuse(s):</td>
<td>(3) 5 A 250 V, (3) 20 A Time-Delay FNQ-20, (2) 15 A 250 V</td>
</tr>
<tr>
<td>Date of Manufacture:</td>
<td>30/11/2012 (dd/mm/yyyy)</td>
</tr>
<tr>
<td>Dimensions:</td>
<td>24” (610 mm) W × 29” (736 mm) D × 17” (431 mm) H</td>
</tr>
<tr>
<td>Weight:</td>
<td>168 lb. (76 kg)</td>
</tr>
<tr>
<td>Shipping Dimensions*:</td>
<td>34” (864 mm) x 34” (864 mm) x 28” (711 mm) and</td>
</tr>
<tr>
<td></td>
<td>24” (610 mm) x 21” (533 mm) x 15” (381 mm)</td>
</tr>
<tr>
<td>Shipping Weight*:</td>
<td>281 lb. (127 kg)</td>
</tr>
<tr>
<td></td>
<td>* Weight and total dimensions are only for the PowerCut 10™ and its recirculating coolant system. They do not include the cabinet, #5-4030.</td>
</tr>
</tbody>
</table>

### Operational Environmental Conditions:
- Recommended for indoor use only
- Temperature Range: 50° - 100° F (10° - 40° C)
- Humidity Range: None established. If operated in humid climates, steel components such as bearing and pump components can fail prematurely.
- Altitude: None established
- Pollution: Degree 2
- Mains Supply Voltage: Not to exceed ±10% of the nominal voltage
- Transient overvoltages according to overvoltage category II

### Operational Noise Levels
- 30 cm (1 ft.) from machine: 70 dB(A)
- 150 cm (5 ft.) from machine: 64 dB(A)
- 305 cm (10 ft.) from machine: 59 dB(A)
- If noise levels exceed these values, see the Maintenance section (page 12).

* The PowerCut 10™ operates ONLY on 230 V 3-phase AC power. A step-up or -down transformer can be used for other operating voltages. Please contact Allied for more information. If less than 230 V AC power is supplied to the PowerCut 10™, it will result in a reduction in power and overall performance. Furthermore, the braking used to quickly bring the blade to a stop will not properly function, creating a potential safety hazard.
Warranty

Thank you for choosing Allied High Tech!

This product is warranted by Allied High Tech Products, Inc., to be free of defects in material and workmanship for two (2) years from date of original purchase. This warranty does not cover damage from abuse, neglect, negligence, accidental breakage, improper use or failure to exercise reasonable care and maintenance in accordance with the instructions accompanying this product.

To obtain warranty support or spare parts please contact your Product Application Specialist or Allied Technical Support at (310) 635-2466, M-F, 8:00 – 5:00 PM PT. Please be prepared to supply the serial number for the product you are calling about; this will help our staff confirm warranty eligibility and provide you with thorough, timely assistance.

At your discretion, in consultation with your Allied Product Application Specialist or an Allied Technical Services representative, we will be happy to send you replacement parts, at no charge, or have you send the product to Allied for warranty repair. Most Allied products are designed for ease of parts replacement, so customer repairs, with no-charge parts from Allied, are often the quickest and easiest way to return a product to active service.

If you wish to return a product to Allied for warranty repair, you must first obtain a Return Equipment Authorization (REA) number. An REA may be obtained from your Product Application Specialist, or from a member of our Technical Services staff. Please ensure that your REA number is referenced prominently on your shipping paperwork as outlined below. Please prepay shipping “to” Allied and provide an address and phone number for return shipping, which is paid for by Allied during the warranty period.

Please return your product to:

Allied High Tech Products, Inc.
REA#: ______________________
2376 East Pacifica Place
Rancho Dominguez, CA 90220 USA
P: (310) 635-2466

Please Note: Damage to products during transit to/from Allied, or resulting from improper inbound packaging, will not be the responsibility of Allied. Therefore, please ensure that your product is securely boxed or packaged. It is further recommended that you insure your shipment for the full value of the product. Should damage occur during inbound shipment, we will be happy to provide you with a formal quotation estimating the cost of materials and labor necessary to repair such damage. A Purchase Order will be required to make these repairs.
Repairs for Products No Longer Under Warranty

Allied will be happy to make repairs to products no longer under warranty. For these products we will be pleased to provide you with an estimate of the costs (materials and labor) necessary to make requested repairs. For non-warranty repairs, customer is responsible for inbound (to Allied) and outbound (from Allied to customer) shipping and handling costs. Non-warranty repairs are made with the same attention to detail and commitment to quality workmanship that is provided to “in” warranty customers.

Thank you for choosing Allied, and please let us know if you have comments or questions about these warranty provisions.
Installation

Once the machine has been removed from its shipping container, the unit should be placed on a sturdy, clean, dry surface with the control panel facing toward the operator. It is recommended the saw be located close to a sink/faucet or cleaning basin so cleaning the samples is convenient. Leave about 6" (150 mm) behind the machine for electrical and coolant connections, and for the rear-tilting cover. See the Dimensional Layout View of the PowerCut 10™ on page 14 for information regarding the dimensions and spacing requirements.

Lifting/Moving the Machine

This machine weighs 168 lb. (76 kg), and it must be lifted and moved with caution. Use 2-3 people to lift the machine according to proper practices (lift with the knees and do not bend over with your back), and place the machine on top of the surface on which it will be operated. The front control panel should be facing toward the operator.

Electrical

From the back of the machine, there are two (2) power cords, one for the pump and one for the power. The main power cord is 4½' long and fitted with the following plug (pictured, right):

- Twist-Lock, 20 A, 250 V AC, 3 pole, 4 wire ground (male)

The power cord for the pump is fitted with a "female" connector (pictured, left) that accommodates a "male" connector like that shown in the photo to the right. The "male" connector from the PowerCut 10™ is fitted to the "female" connector from the pump. This connection should be made AFTER the reservoir is placed into the location where it will be stored during operation.

Note: Electrical codes governing the electrical connections for this type of equipment and power rating should be adhered to strictly. Some electrical/building codes require wiring the power cord directly to the panel.

Important Note:

The diagram inside the cutting compartment attached to the blade guard stand-offs provides valuable information about the wiring of the machine. It should be wired so the blade and pump rotate in the correct direction. The saw and pump are prewired at the factory so they rotate in the same direction when they are connected to the main power supply. No wiring changes are necessary to the pump. When wiring a 3-phase unit, mixing the wires will influence the direction of the blade. Since there is no way to anticipate how a facility is wired, a test should be performed to ensure the blade and pump rotate in the direction indicated on the diagram. See the Wiring Diagrams on pages 16 and 17 for more information.

Warning:

Disconnect the power cord before performing any electrical work!
Recirculating Coolant System

The recirculating coolant system features a pump, which pushes coolant (water and high speed cutting fluid) from a reservoir to the cutting compartment for wet cutting. The coolant returns through a drain back into the reservoir where it is filtered and recirculated to the cutting compartment. The reservoir and pump must be positioned below the base of the machine to allow proper drainage. Clogging of the drain and resulting damage are not covered under warranty.

If using the PowerCut 10™ with the #5-4030 cabinet, it should be placed in the cabinet on the sliding tray, with all the hoses and tubing run through the back and out of the way.

**Sump, Stainless Steel:** Inside the reservoir is a stainless steel sump used to collect cutting debris and keep the pump from clogging to allow efficient coolant flow to the blade. This sump should be cleaned regularly, dictated by frequency of use.

**Recommended Cutting Fluid:** Allied Lubri-Cut High Speed Cutting Fluid is recommended for use in the PowerCut 10™. This cutting fluid will extend the life of cut-off blades and reduce heat during sectioning. It is available in two different container sizes:

- #80-10135 – 32 oz. (950 ml)
- #80-10130 – 128 oz. (3800 ml)

A 128 oz. bottle of Lubri-Cut is included with the purchase of the PowerCut 10. Other high speed cutting fluids may be used; however, they should be solvent-free to prevent galvanic corrosion, damage to the machine components, and cracking of the splash shield.

The coolant reservoir will hold approximately 7 gallons (26.5 l) of liquid; to prepare it for use at a 2% mixing ratio, add 18 oz. (530 ml) of high speed cutting fluid, and fill the remainder with water until the water level is even with the top edge of the sump. A mixture of between 2% and 5% is recommended for optimum performance using Allied Lubri-Cut High Speed Cutting Fluid; if other cutting fluids are used, consult the corresponding mixing instructions.

Connect the drain hose using the supplied hose clamp. If the reservoir is positioned too far from the machine, a longer drain hose might be necessary and need to be purchased separately. Close the lid of the reservoir and insert the drain hose through the hole in the hinged access door until it reaches the bottom of the sump.

Connect the pump hose to the inlet connector at the back of the machine.

Activate the coolant system to test for leaks.

Upon activation, check the impeller direction on the top of the pump. It should be rotating in the direction of the arrow.

Check coolant flow to the blade, drainage, hose kinks and leaks. Adjust the Loc-Line coolant nozzles to the desired position (make sure the individual valves are fully open).

During use, keep the water level above the base of the pump. Failure to do so will cause the pump to fail. If there are any questions, contact an Allied representative for assistance.
Operation

Vise: Inside the cutting compartment are two (2) T-slot tables. The table to the right of the blade secures a quick-slide stainless vise with grooved jaws to hold/fasten bar stock and to provide additional grip to odd-shaped samples. On the left T-slot table is a support block to prevent the unsupported side of the sample from falling downward as the cut nears completion, possibly causing the blade to break. This occurs only when the sample rests against the bottom of the vise and support block.

A second vise can be used to support both sides of a part, producing a burr-free surface.

The left-to-right position of the vise may be adjusted by moving the T-slot table(s). For instance, if the vise is too far from the blade, it can be moved closer to the blade by loosening the screw holding down the t-slot table to the base and moving it laterally. If using two vises, secure a rod tight in the vise jaws to align them parallel before they are tightened into place.

Loosen the vise jaw by rotating the handle counterclockwise, then lift the handle and pull it back. After positioning the sample against the front jaw, close the vise by sliding the handle back toward the part, taking care not to smash or crush your fingers. Set the threaded rod into the receiver and tighten by rotating it clockwise. Ensure that the vise jaw closes parallel; if it doesn’t, the jaw may jam, which could make it difficult to remove the sample after sectioning. The jaw may not close parallel if the sample does not extend past the center of the vise. Do not overtighten the jaw if the sample does not extend past the center of the vise; this could cause the vise to jam.

After sectioning the sample, it can be released from the vise by rotating the handle counterclockwise ¼ to ½ turn, followed by lifting the threaded rod out of the receiver and pulling it back. Do not try to release the sample or open the vise jaws by continuously unscrewing the threaded rod. It is a quick-release system where the threaded rod is meant to pop out of the receiver for quicker sample access.

Changing Blades: The spindle accepts blades that have either 1¼" or 32 mm diameter arbor holes, up to 10 inches in diameter. To install or change blades, use the box wrench and spindle-lock rod to loosen the nut securing the outer blade flange. The spindle-lock rod is used to lock the spindle so it does not rotate when loosening or tightening the flange retainer nut. The nut has a left-handed thread, so rotating it clockwise loosens it.

When the nut and flange are removed, place a blotter against the inner flange, and then place the blade on the arbor. Place another blotter on the spindle against the blade, install the outer flange and tighten the nut. The nut will self-tighten during cutting, so be sure not to over-tighten it against the flange.
**Interior Light:** An interior light is provided so the operator can easily see when or where the blade makes contact with the part. It also aids in seeing inside the compartment during use in darker areas.

**Basic Operation:** With the part properly secured in the vise(s), close the cover and activate the coolant. Activate blade rotation and examine the cutting compartment to be sure enough coolant is getting to the blade where it is contacting the part. Pull the arm slowly forward until the blade makes contact with the part. At this point the blade will need to seat itself into the part so it travels straight and does not wander off the intended path. If this occurs, too much pressure is being applied, which can lead to blade breakage, part damage, and/or an uneven cut, and it may pose a danger to the operator.

During the cut, examine the cutting compartment, look for sparks, and feel for feed rate. If it seems difficult for the blade to cut the part, stop cutting and examine the part for burning. If burning or premature blade wear occurs, a different blade may be necessary; consult an Allied representative or use the following chart as a guide:

<table>
<thead>
<tr>
<th>Application/Material</th>
<th>Abrasive</th>
<th>Bond</th>
<th>Thickness Inch (mm)</th>
<th>Unit</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tool Steels/Rc 60+</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Resin</td>
<td>.062&quot; (.16)</td>
<td>80</td>
<td>40000</td>
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</tr>
<tr>
<td><strong>Hardened Steels/ Super Alloys Rc 45-60</strong></td>
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<tr>
<td>Resin</td>
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<td>80</td>
<td>40010</td>
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<tr>
<td><strong>Carbon Steels/ Medium Hard Steels Rc 30-45</strong></td>
<td></td>
<td>10&quot;</td>
<td></td>
<td></td>
<td>40021*</td>
</tr>
<tr>
<td>Resin</td>
<td>.062&quot; (.16)</td>
<td>80</td>
<td>40022</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Delicate Cutting</strong></td>
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<td></td>
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</tr>
<tr>
<td><strong>Soft/Annealed Steels</strong></td>
<td></td>
<td>10&quot;</td>
<td></td>
<td></td>
<td>40025</td>
</tr>
<tr>
<td>Resin</td>
<td>.062&quot; (.16)</td>
<td>80</td>
<td>40025</td>
<td></td>
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</tr>
<tr>
<td><strong>Tough Non-Ferrous/ Titanium Alloys</strong></td>
<td></td>
<td>10&quot;</td>
<td></td>
<td></td>
<td>40040</td>
</tr>
<tr>
<td>Resin</td>
<td>.062&quot; (.16)</td>
<td>80</td>
<td>40040</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Soft Non-Ferrous/Al/Cu Alloys</strong></td>
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<td>10&quot;</td>
<td></td>
<td></td>
<td>40045</td>
</tr>
<tr>
<td>Resin</td>
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<td>80</td>
<td>40045</td>
<td></td>
<td></td>
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<tr>
<td><strong>Ceramics/Composites</strong></td>
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<td></td>
<td>40054</td>
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<tr>
<td>Resin</td>
<td>.062&quot; (.16)</td>
<td>80</td>
<td>40054</td>
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<tr>
<td><strong>Carbides/Fragile Non-Metallics</strong></td>
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<td>10&quot;</td>
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<td></td>
<td>40055</td>
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<tr>
<td>Resin</td>
<td>.062&quot; (.16)</td>
<td>80</td>
<td>40055</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hardened Steels/Rc 60+</strong></td>
<td></td>
<td>10&quot;</td>
<td></td>
<td></td>
<td>40060</td>
</tr>
<tr>
<td>Resin</td>
<td>.062&quot; (.16)</td>
<td>80</td>
<td>40060</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cutting Long Bar Stock:** Long bar stock that does not fit into the cutting chamber may be positioned through the side port to the left of the machine. The flexible rubber flap covering the port allows clearance for this application and keeps most of the coolant from splashing outside the machine.
Troubleshooting

Blade Breakage:
- Blade bond too hard
- Insufficient coolant flow
- Too much blade pressure applied to the part
- Sample not secured in vise
- Not using blotters supplied with the blades

Part Burning:
- Blade bond too hard
- Insufficient coolant flow
- Coolant not properly directed to cut
- Too much blade pressure applied to the part

Motor Does Not Turn On:
- Cover not closed
- Fuse blown
- Emergency stop switch is engaged
- Motor overload has tripped (reset by pressing the red switch on service panel labeled “Motor Reset”)

Pump Does Not Turn On:
- Pump not plugged into pump receptacle
- Emergency stop switch is engaged
- Pump overload has tripped (reset by pressing the red switch on service panel labeled “Pump Reset”)

Brake Does Not Stop Blade:
- Check fuse and replace if necessary
Maintenance

**Compartment Cleaning Hose:** There is a hose inside the cutting compartment to clean debris away from the moving parts inside the saw. The compartment should be wiped and flushed clean periodically to prevent clogging and excessive buildup of cutting debris. At the end of this hose is a valve used to open flow to the hose. Valves on the individual coolant nozzles to the blade should be closed while flushing.

**NOTE:** The valve should always be closed during cutting to maximize coolant flow to the blade.

**Lubrication:** The brackets holding the motor pivot rod have zerk fittings that should be lubricated with standard purpose grease every month or so to optimize performance and prevent corrosion.

**Storage:** After use, always leave the cover up and open to dry the cutting compartment to help inhibit corrosion and accumulation of mold or bacteria. Allied's high speed cutting fluid contains anti-bacterial/corrosion elements offering further protection.

**WARNING:** Corrosion protection using a “flammable” inhibitor (such as WD-40) is NOT RECOMMENDED and sparks generated during cutting may produce FIRE!

**Operational Noise Levels:** If the operational noise levels exceed the values listed in the Machine Details (page 4), the noise can be reduced by performing any of these actions:

- Change the type of blade (i.e. from a rubber bond to a resin bond, or from silicon carbide to aluminum oxide)
- Apply less force when pulling the lever arm down during sectioning
- Change the locations of the coolant nozzles to lubricate the sample more effectively
- Move the machine to a less acoustic environment (i.e. move it from a small, enclosed room to a more open space; set it on a solid, sturdy counter/table instead of on a hollow cabinet)

Please note that the sample type will also affect the noise levels; the saw may strain when sectioning large or very hard samples. If the machine is still outputting unacceptable noise levels after performing the above actions, contact Allied for additional troubleshooting.

**Lifting/Moving the Machine:** If the PowerCut 10™ needs to be moved, see “Lifting/Moving the Machine” on page 7.
**Changing Fuses:** Before changing ANY fuse, disconnect or turn off the main power to the saw.

**Main Motor:** At the back of the machine, the service panel can be removed to expose the main control board where the fuse holders are located. To access the main motor fuses, locate the holders and open them by pulling the doors downward.

Fuses labeled F1 through F5 are used for the control panel, pump and brake:

<table>
<thead>
<tr>
<th>F1-F3:</th>
<th>Pump</th>
<th>5 Amp, 250 Volt</th>
</tr>
</thead>
<tbody>
<tr>
<td>F4:</td>
<td>Control Panel</td>
<td>15 Amp, 250 Volt</td>
</tr>
<tr>
<td>F5:</td>
<td>DC Brake</td>
<td>15 Amp, 250 Volt</td>
</tr>
</tbody>
</table>
PowerCut 10™ Layout View
Faceplate Diagram

Spare Parts List

<table>
<thead>
<tr>
<th>Description</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>21-4601</td>
</tr>
<tr>
<td>Motor Spring</td>
<td>21-4629</td>
</tr>
<tr>
<td>Gas Shock</td>
<td>21-4618</td>
</tr>
<tr>
<td>Switch, shut-off for cover</td>
<td>21-4613</td>
</tr>
<tr>
<td>Light Fixture (complete)</td>
<td>21-4631</td>
</tr>
<tr>
<td>Light Bulb, Replacement</td>
<td>21-4632</td>
</tr>
<tr>
<td>Front Switch, Green</td>
<td>21-4620</td>
</tr>
<tr>
<td>Front Switch, Red</td>
<td>21-4621</td>
</tr>
<tr>
<td>Fuse, 5 A, 250 V AC, ¼&quot; x 1¼&quot;</td>
<td>25-FUS0001</td>
</tr>
<tr>
<td>Fuse, 15 A, 250 V AC, ¼&quot; x 1½&quot;</td>
<td>25-FUS0015</td>
</tr>
<tr>
<td>Fuse, 20 A, Time Delay, 13/32&quot; x 1½&quot;</td>
<td>21-FUS0120</td>
</tr>
<tr>
<td>Blade Retaining Nut</td>
<td>21-4634</td>
</tr>
<tr>
<td>&quot;Power On&quot; Light Bulb</td>
<td>31-LHT0050</td>
</tr>
<tr>
<td>Coolant Pump</td>
<td>30-4000-5</td>
</tr>
<tr>
<td>Coolant Delivery Fitting, Female</td>
<td>21-4637</td>
</tr>
<tr>
<td>Coolant Delivery Fitting (on cover), Male</td>
<td>21-4636</td>
</tr>
<tr>
<td>Polycarbonate Window</td>
<td>21-4536</td>
</tr>
<tr>
<td>Circuit Board</td>
<td>21-4600</td>
</tr>
<tr>
<td>Light Switch (for interior light)</td>
<td>21-4622</td>
</tr>
<tr>
<td>Flush Hose Stopcock/Valve</td>
<td>21-4646</td>
</tr>
</tbody>
</table>
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