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Perfect Point EDM, Inc.

E-drill preventative maintenance tips – Mobile Service Unit (MSU) and Hand Tools

Note: Due to continuous improvement, product images may deviate from this document

1.0	Warnings:	
1.1	The procedures in this document must only be used by PPedm E-drill Trained and Certified personnel.	
1.2	Only the maintenance procedures mentioned in the Product User Guides and in this document should be performed.	
1.3	The E-drill utilizes purified de-ionized water, which is prone to freezing and resulting damage. E-drill should always be operated and stored above freezing temperatures. If it is likely to be subjected to low temperatures in storage or transport, then it should be emptied and fully purged. Please contact the PPedm Customer Service Hotline (714.891.6533) for assistance.	
1.4	<p>Hand-tool service</p> <p>E-drill hand tools are the most complex part of the entire E-drill system. The combination of electrical demands, mechanical precision and DI fluid sealing requires meticulous and knowledgeable maintenance, and setup using specialized test equipment.</p> <p>For these reasons, there are no serviceable components inside the hand tool, and under no circumstances should the anti-tamper seal be damaged or removed and the unit disassembled.</p>	
1.5	<p>E-drill hand tool Factory Refurb. & Upgrade service</p> <p>It is critical to keep the hand-tool in peak condition. In common with other high-usage aerospace tools, E-drill hand-tools should be returned for factory service approximately every 12,000 cuts. The factory service comprises replacement of seals, bearings, motors, O-rings, shafts, or any other worn parts that are encountered.</p> <p>In addition, the factory service automatically includes any component or part upgrades which have occurred for that design since the unit was originally built. This may include upgraded circuit boards, seals, connectors, or even the outer case. Upgraded systems are rebuilt to the same specification as the current manufactured product.</p> <p>The hand-tool Factory Refurb service is order # CP1-SP-001, and may be found on the WWW.PPEDM.COM web site</p>	
1.6	<p>E-drill MSU service</p> <p>There are several service activities which may be performed on the MSU. Typically, the system will present a message if a service is required. Customer service tasks are simple and can be carried out without removing any of the covers.</p>	

		<p>Within the system there are high voltage and high current electrical circuits, both AC and DC. For this reason, there are no user serviceable parts inside the MSU, and the covers and anti-tamper seals should never be removed.</p>
	1.7	<p>E-drill MSU Factory Refurb. & Upgrade service</p> <p>The E-drill MSU does not need a recommended factory upgrade interval. The system is designed to provide many years of service with no additional tasks beyond the recommended user maintenance items. However, since the product was first introduced several improvements have been made and as a result a number of standard factory refurbishment and upgrade services are available, as well as system repair, should that be necessary.</p> <p>Please contact the Service Hotline for details of MSU Factory Refurb. and Upgrade options.</p>

2.0	Hand tool preventative Maintenance tips.	
	2.1	<p>Protect the mechanism.</p> <p>The hand-tool case is designed to withstand some degree of impact, but a hand-tool dropped on its electrode or drive tube mechanism can easily be damaged. It is always important to keep an electrode and adapter on the hand-tool, even when not in use.</p> <p>However, accidents do still happen. If a hand tool has been dropped, it is possible to check than nothing has shifted by measuring the protrusion of a new electrode from the mechanism (see photograph on right). A new electrode at the full forward position should protrude slightly under 1.5" from the front of the hand tool. If it does not, then at best electrode life and water seal will be poor, and at worst there is internal damage. See item 1.3 above.</p>



2.2 Don't overstrain the Strain Relief!

The E-drill hand tool is subject to continual abuse while in service. One of the parts that receives the most abuse is the rubber strain relief at the base of the grip. It is important not to stress the cable any more than necessary, but in addition the strain relief should regularly be inspected (and also tightness of the ground strap clamp and connector on an EG hand-tool).

The photo to the right shows a severely damaged strain relief. Ultimately this hand-tool will fail at the most critical time!



2.3 MSU connector also!

The hand tool connector at the MSU end should also be checked. The multi-pin connector should slide in smoothly when aligned carefully, and the detent should be felt when the bezel locks.

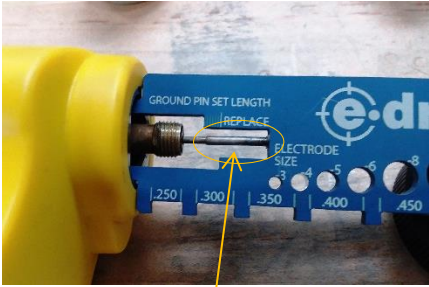
If the bezel doesn't lock or the connector doesn't assemble without considerable force, then there may be a problem. Also, the connector itself should be in good condition (see photo on right of a damaged connector).




2.4 Ground pin health tips (CG hand-tool)!



An item which can easily be broken or damaged on the CG hand-tool is the tungsten ground pin. Another reason why a hand-tool should always have an electrode and adapter installed – it protects the ground pin.


Ground pin protrusion should regularly be checked, and the existence of the clear insulator on the ground pin tip. Spare insulators are included in the standard kit.



Note highlighted insulating sleeve

2.5	<p>Storing the hand-tool</p> <p>If a hand-tool is to be stored for weeks or more, then it should be cleaned and drained, ESPECIALLY if the last job was steel fasters since the steel debris will rust.</p> <p>Disconnect the hand tool from the MSU, blow out the nose of the hand-tool with low pressure compressed air until water stops leaking out of the tubes. Lightly spray the inside of the nose with WD-40 or similar.</p>	
2.6	<p>Warning - Electrode guides wear!</p> <p>One of the keys to E-drill success is the ability to precisely cut concentric on the fastener. The colored electrode guide plays a role in achieving that. However, as plastic parts, electrode guides wear.</p> <p>The correct sized electrode should be a loose fit in its correct guide. If the next size up electrode also fits, then the guide is worn and should be replaced.</p>	

3.0	MSU Preventative maintenance tips.	
	<p>3.1 Filter and sediment bowl servicing.</p> <p>As stated previously, the MSU is a robust piece of equipment that rarely needs attention. Under normal conditions the unit will present messages when the DI water system needs service.</p> <p>DI servicing procedures are well documented in the User Guide, and detailed videos are also available on the PPedm web site.</p> <p>The notes below show some tips to watch out for.</p>	
	<p>3.2 Look after the seals!</p> <p>The large O-ring seals at the top of the filter and sediment bowls should always be excessively greased so they stay in-place during installation – no such thing as too much grease! Care should be taken that O-rings don't fall out or get trapped during installation. This is the #1 failure in DI system servicing.</p> <p>Replacing the O-rings regularly is also key, since they tend to stretch in use. PPedm filters are always provided with a replacement seal.</p>	
	<p>3.3 Don't clean your socks!</p> <p>In the sediment bowl, next to the pick-up tube, is a felt sock protecting the level sensor mechanism. This sock is not a user serviceable item and does not need to be disassembled or cleaned. Resist the urge!</p>	

3.4	<p>Misplaced pleated filter washers.</p> <p>When the system advises that the pleated filter should be replaced, it is false economy to try to make do. The filter not only helps performance, but also protects critical components downstream. Some replacement pleated filters have a separate seal washer located in the plastic end caps, that can become displaced during installation. PPedm recommends that if the washer is loose then it should be glued in-place before installation. Also return the filter bowl to its vertical position before fully tightening.</p>	
3.5	<p>Water conservation</p> <p>In a regularly used E-drill system there is no benefit to replacing the water. Indeed, when servicing the system, it is acceptable to re-use the water that was pumped out.</p> <p>However, on older systems it is possible that the water pumped out may smell or look dirty. If this is the case, then it is possible that the filtration system (not just the pleated filter) may need to be replaced by the factory. Please contact the hotline for more information.</p>	