15192 Triton Lane
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Perfect Point EDM, Inc.

Keyed Insert & Keyed Stud Removal Procedures.

Procedural Guide

Also applicable to Rosan Ring, Davis Nut and Flanged/Swaged nut applications.

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

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1.0	Warnings:	
	1.1	In order to minimize the likelihood of damage to expensive components, this procedure must only be carried out with genuine PPedm equipment, adapters and E-drill electrodes specifically designed for insert and stud removal. Attempted use of this procedure using any other device or electrode type will cause unexpected results, could damage engine structure or the E-drill system, and will invalidate the E-drill warranty.
	1.2	This procedure must only be used by PPedm E-drill Trained and Certified personnel.
	1.3	This procedure references Fastener Specific Kits (FSK's) and specific electrodes for different types and sizes of inserts and studs. The correct FSK should be used for fasteners. Please contact PPedm Sales or Customer Service Hotline for support (714-891-6522)

2.0	Tool Set Up: **Keyed Insert removal**		
	2.1	Keyed Inserts may be removed with the Standard E-drill system, EG hand-tool and Flush Head Locator (FHL) kit. This procedure also applies to other captive nut types, including Rosan, Swage, Davis etc.	
	2.2	PPedm offers Fastener Specific Kits (FSK's) for specific keyed insert sizes. For smaller inserts (3/8" diameter or less) the kit comprises a pack of electrodes, a guide pin, extractor plug, and if requested, a rear through-hole plug for through hole insert installs. Larger sizes of insert will also need a custom replacement front housing for the E-drill hand-tool.	

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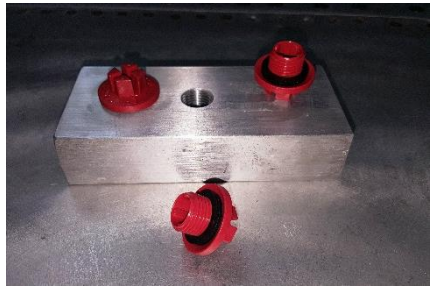
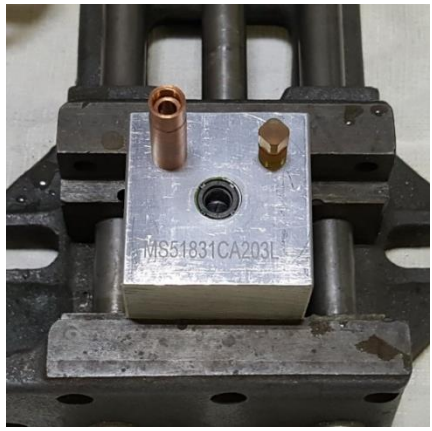
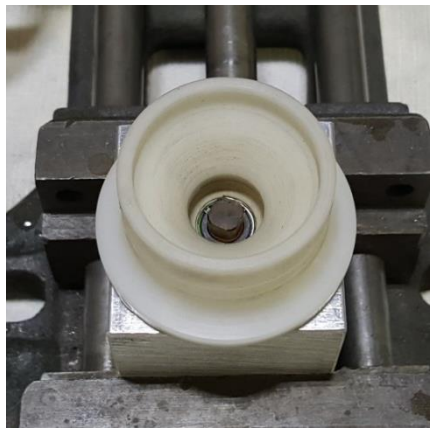
3.0	Procedure: **Keyed Insert removal**		
	3.1	Determine if the insert is installed in a through-hole or a blind hole. If installed in a through-hole then the rear of the hole needs to be plugged or sealed to stop water loss during cutting.	
	3.2	Install the guide pin into the insert with the square section protruding from the top of the insert. Select the correct cutting parameters from the Part Number Library for the insert being removed. Install the matching electrode onto the E-drill with the correct FHL adapter (an electrode guide is not required in the adapter for this operation).	
	3.3	Position the Flush Head Locator concentric with the insert and guide pin. Insert the hand tool taking care to slide the electrode over the outside of the guide pin. Holding the hand-tool perpendicular to the insert, squeeze the trigger until cutting is completed.	

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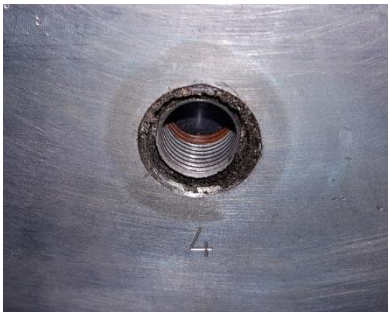
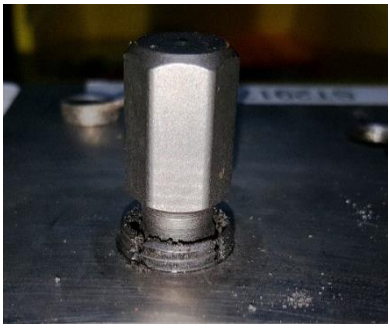
	3.4	After cutting the insert, the extraction procedure is as follows: 1. Blow off excess water and cut debris from cut area. 2. Remove guide pin. 3. Remove internal thread remnant with long-nosed pliers or plain bolt. 4. Dislodge keys towards the center of the fastener. Make sure all are moving before folding them in completely should a second cut be required. 5. Tap keys inward until they can be completely removed. 6. Once all keys are removed, insert the extractor counter-clockwise and remove the remains of the insert.	   

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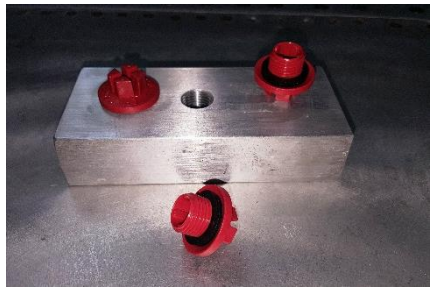
4.0	Tool Set Up: **Keyed Stud removal**	
	4.1	Stud removal may be achieved with the Standard E-drill system, and Long-Stroke hand-tool. Precision **Concentric** and **Co-axial** positioning must be achieved for successful stud removal, using either a PPedm vacuum locator device (a number of different configurations are available), or a custom locating device specific to the structure the stud is installed in.
	4.2	PPedm offers Fastener Specific Kits (FSK's) for specific keyed stud sizes. For smaller studs (3/8" diameter or less) the kit comprises a pack of electrodes, a flat-bladed screwdriver tip machined to fit the key slots, mechanical locator, and if requested, a rear plug for through-hole stud installs. Larger sizes of stud will need a custom replacement front housing for the E-drill hand-tool.

5.0	Procedure: **Keyed Stud removal**		
	5.1	Determine if the stud is installed in a through-hole or a blind hole. If installed in a through-hole, then the rear of the hole needs to be plugged or sealed to stop water loss during cutting.	
	5.2	Prior to removal, the stud has to be cut off, leaving 0.06-0.065" of boss to locate on. This is best achieved precisely using a Dremel, mounting foot, & cut-off wheel or similar. Select the correct cutting parameters from the Part Number Library for the stud being removed. Cut depth should equal the length of the stud thread plus 0.06". Install the matching electrode onto the E-drill with the correct adapter and guide.	

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	5.3	Once the stud excess nut thread is removed, the locating device is positioned using a mechanical locator with an insert bush which matches the OD of the remnant nut thread. In the example left an E-drill Vacuum Flush Head Locator is used to assist in locating concentric with the stud.	 
	5.4	Insert the Long-Stroke hand-tool with correct electrode and adapter configuration installed. Hold the hand-tool co-axially with the stud and squeeze the trigger until cutting is completed. Cutting will take from 30 seconds to 2 minutes approximately. Once cutting is complete, punch the core of the stud until it becomes loose. Recut if the core does not separate after cutting.	

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	5.5	After cutting the stud remnant, the extraction procedure is as follows: 1. Blow off excess water and cut debris from cut area. 2. Dislodge keys towards the center of the fastener. 3. Knock keys inward until they can be completely removed. 4. Once all keys are removed, insert the flat-bladed screwdriver to unscrew the stud remnant.