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verSI .050" [1.27mm] Open Pin Field
Please refer to this document for installation instructions and product specifications for the verSI 2X5 Series Open Pin Field connector family.

Component Assemblies
V2M Vertical Male
V2F Vertical Female

Cable Assemblies:
V2C Cable Assembly

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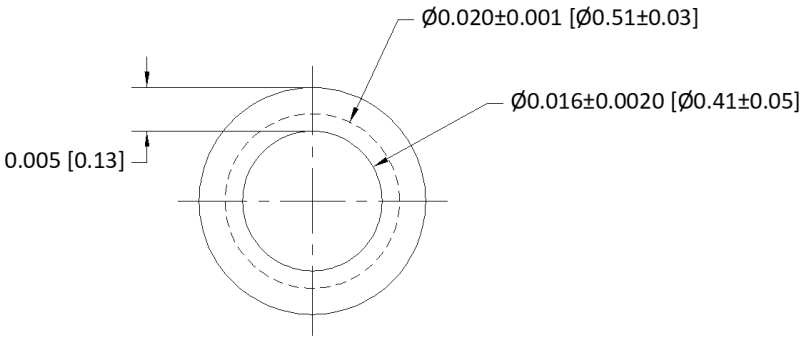
Press-Fit Technology

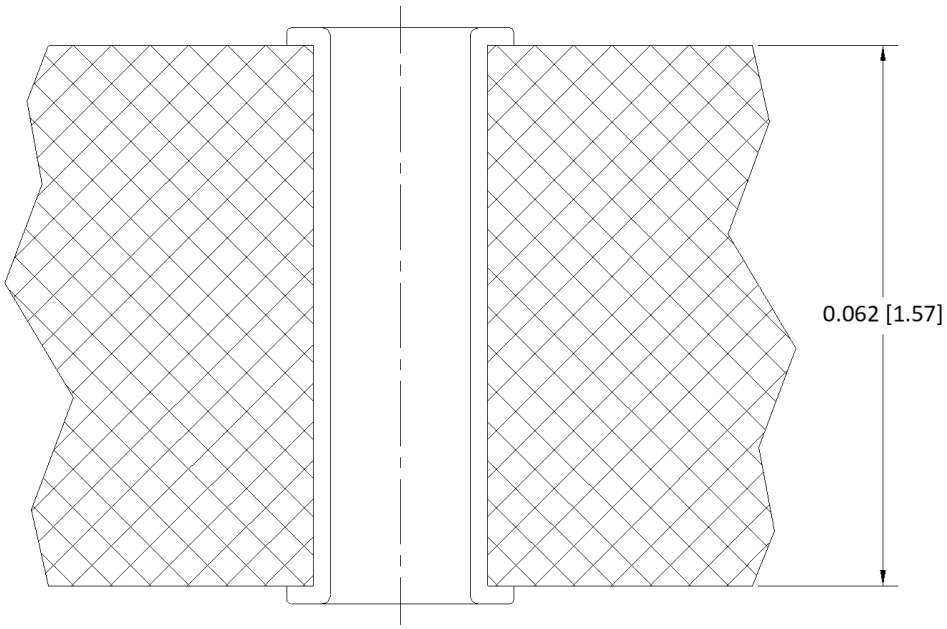
Recommended Hole Specification

Drill:	Ø.020±.001 [.050±0.02] thru
Finished Hole Size:	Ø.016±.002 [0.41±0.05]
Finish:	ENIG per IPC-4552
Annular Ring:	Ø 0.030 [0.76] to Ø.034 [0.86]
Minimum PCB Thickness:	0.062 [1.57]

Force Requirements

Maximum insertion force per contact in a Ø.014 hole = 4.0 lbs. [1814 grams]
Minimum retention force in a Ø.018 hole = .6 lbs. [272 grams]





Dimensions are shown in inches [mm]

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Press-Fit Technology

Installation Procedure

For the installation of press-fit verSI Series connectors, the following equipment is recommended:

- A hand operated press capable of supplying the required press-in force.
- A **CDLV01562** Press Tool that matches the component size by rows and columns (see table).

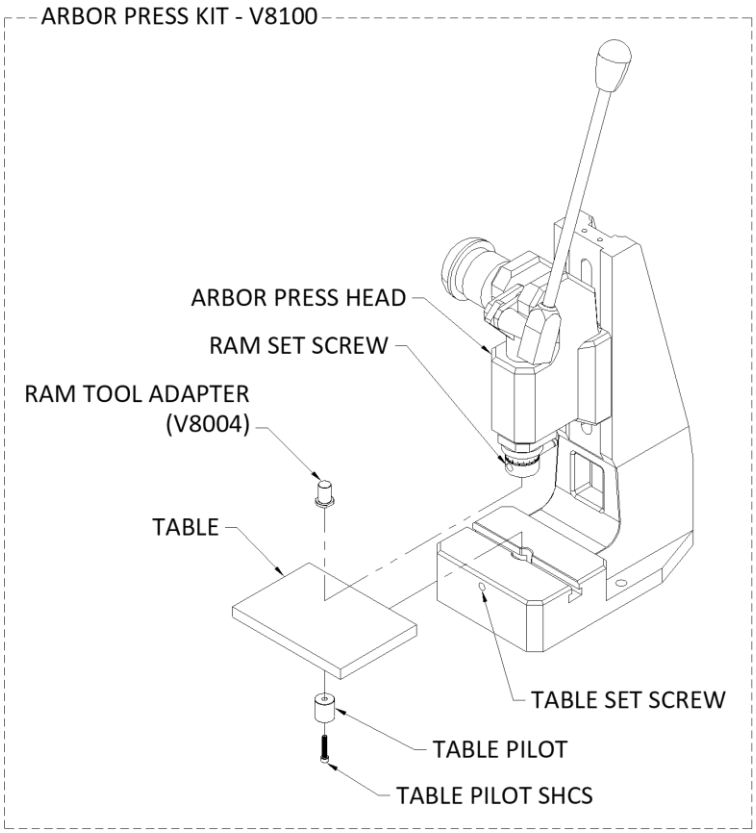
The following optional tools are recommended:

- **V8004** Ram Tool Adapter
- **V8100** Arbor Press Kit
  Kit includes arbor press and table.

Arbor Press Setup

Table:

Assemble the table pilot to the table plate with the socket head cap screw included with the arbor press kit. Insert the pilot into the arbor press table bore and ensure the bottom table surface is resting squarely on the surface of the arbor press. Align the table with the front of the press and tighten the set screw in the front of the arbor press base to lock the table in position.



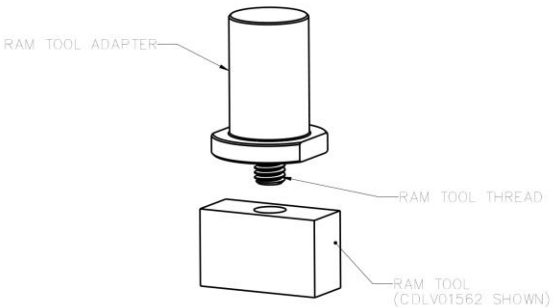
Ram Tool Adapter:

Thread ram tool to arbor press adapter hand tighten only. The thread in the adapter is locked in place and should not be removed.

Insert adapter with tool attached into arbor. Align to table and lock into position by tightening set screw in arbor press ram.

Press Head Height:

The arbor press head height should be adjusted so the tool is at the minimum allowable height with the assembly fully inserted into the PCB. This step will reduce the risk of insufficiently installed connectors or breakage due to any over-travel of the ram.



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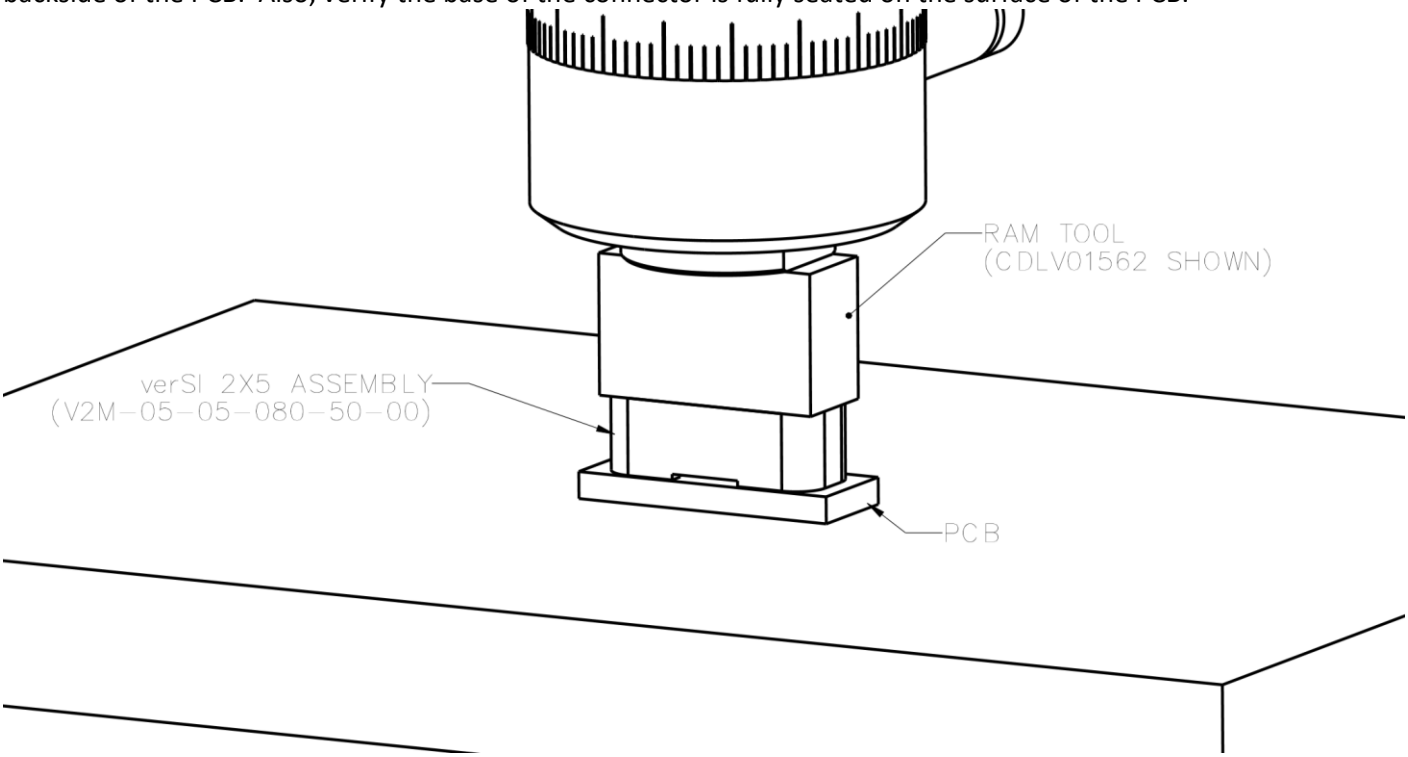
Press-Fit Technology

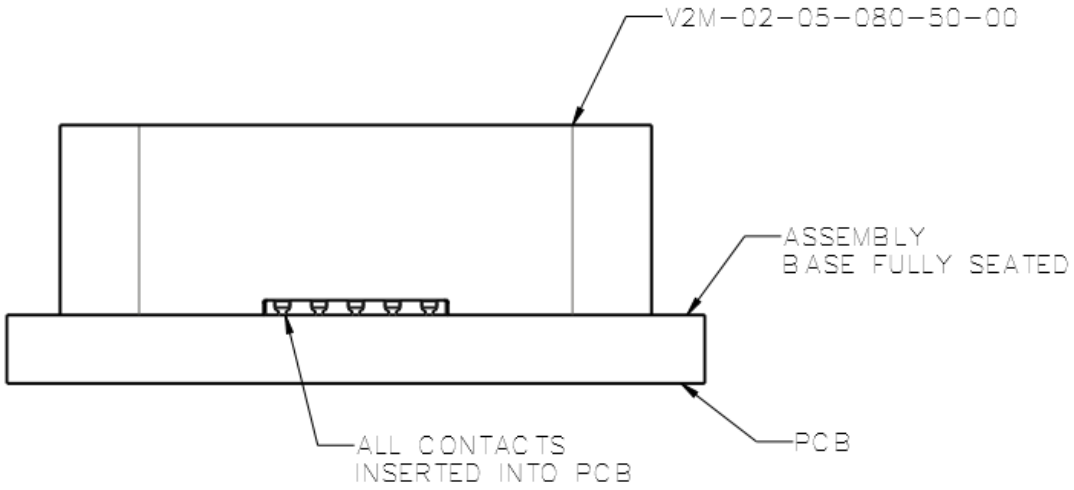
Installation

1. Correctly orient the connector to the PCB, do not force! The pins on the connector and PCB are polarized.
2. Verify that all contacts are lined up with PCB holes.
3. Lower the ram and carefully align the press tool with the connector housing.
4. Firmly depress the arbor press handle through full travel.

Inspection

Verify all contacts are inserted into the PCB. If possible, inspect the press-fit tails by looking in the PTH from the backside of the PCB. Also, verify the base of the connector is fully seated on the surface of the PCB.





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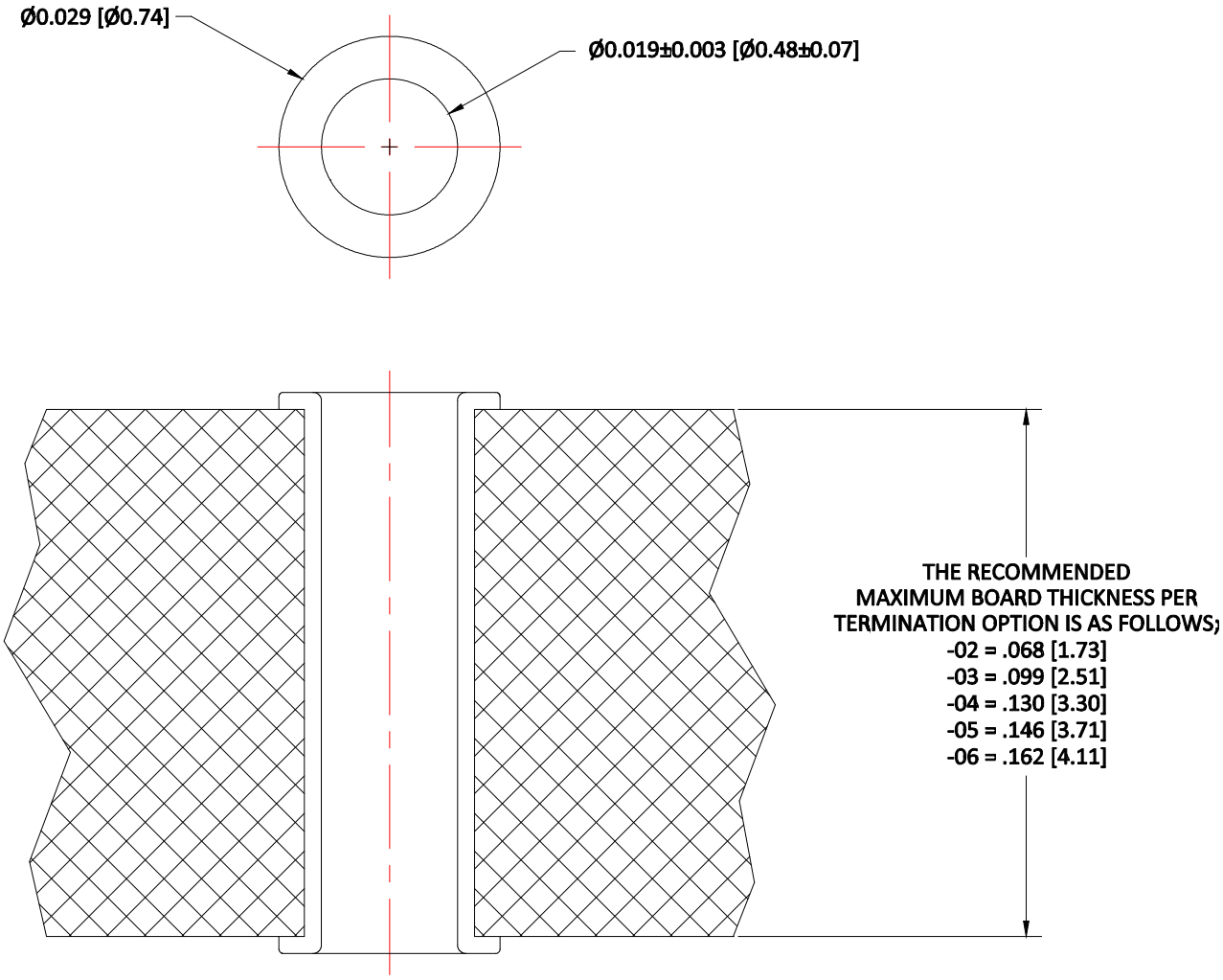
Plated-Through Hole Technology

Recommended Hole Specification

Finished Hole Size: Ø.019±.003 [.048±0.07]
Finish: ENIG per IPC-4552
Annular Ring Dia: Ø.029 [0.74] to Ø.033 [0.84]



Dimensions are shown in inches [mm]

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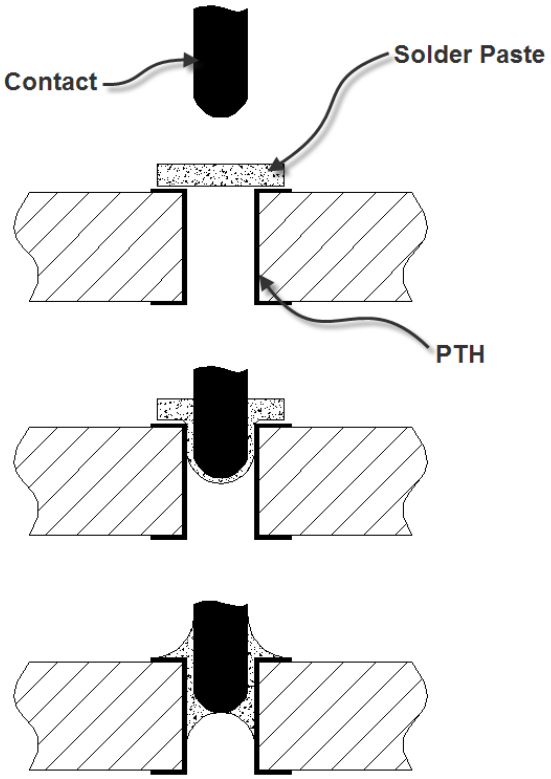
Paste-in-Hole Technology

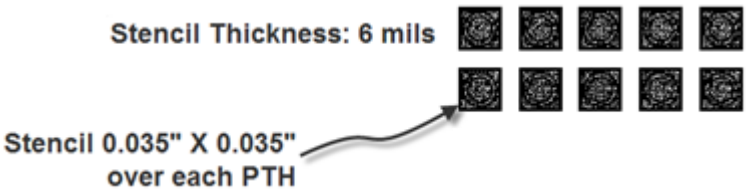
Overview

Paste-in-Hole technology (PIH), also known as intrusive reflow or pin-in-paste, is an SMT solder process that provides the robustness of a plated thru hole while allowing the user to process with conventional SMT equipment. PIH also provides the ability to inspect the solder joints visually without the need for costly X-Ray equipment.

Application

1. Stencil is placed on PCB.
2. Paste is applied using squeegee.
3. Stencil is removed.
4. Connector is placed onto the PCB and secured using appropriate hardware.
5. Solder is reflowed using SMT oven.





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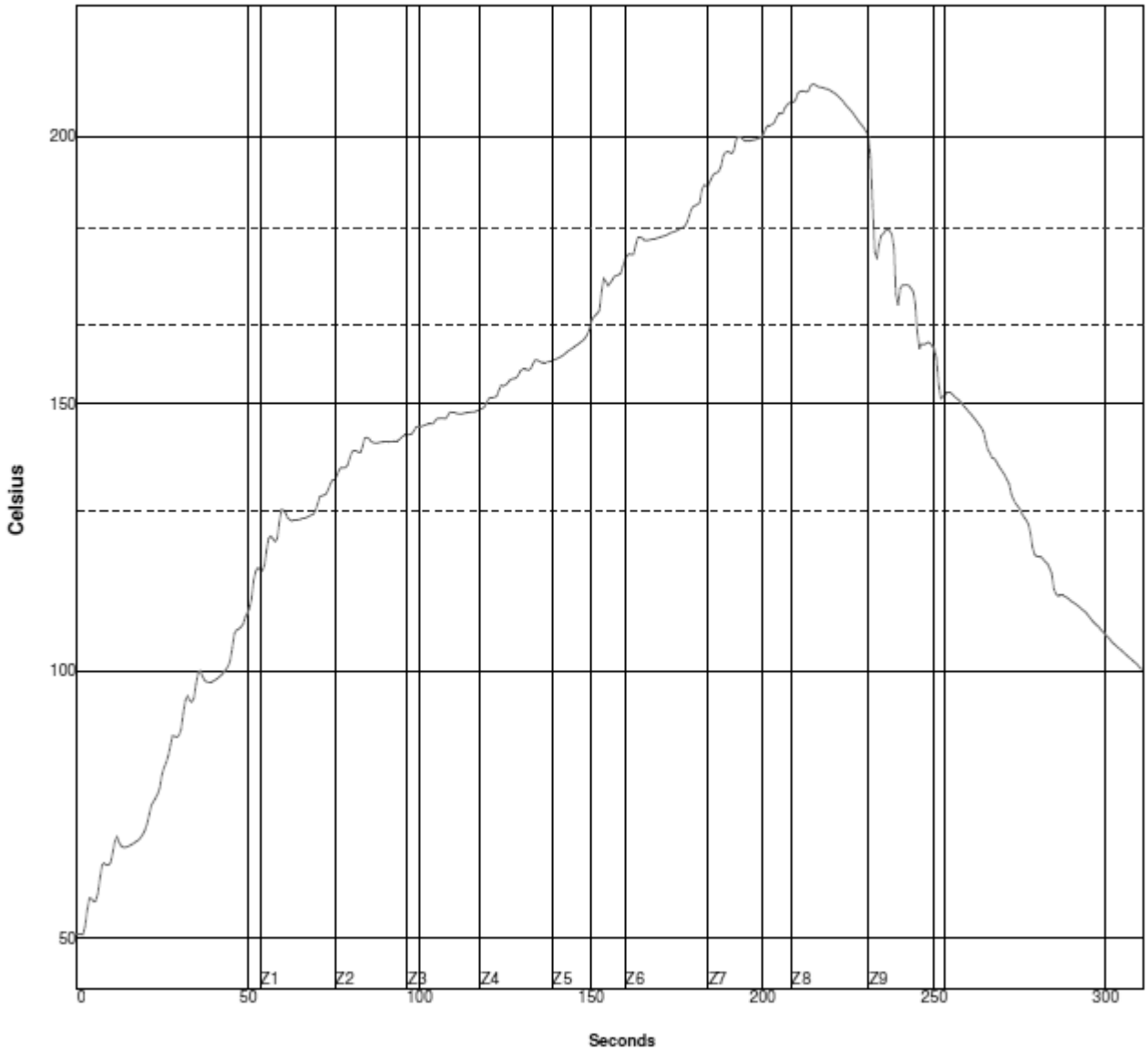
Paste-in-Hole Technology

Reflow Recommendations

Lead (Sn63Pb37)

- Max Rising Slope: 1.5-2.0°C /Sec.
- Soak: 130-165°C for 60 seconds
- Time Above Luquidous: 50-70 seconds

Setpoints (Celsius)									
Zone	1	2	3	4	5	6	7	8	9
Top	100	125	160	160	155	170	210	225	230
Bottom	100	125	160	160	155	170	210	225	230
Conveyor Speed (inch/min):	27.00								



PWI= 50%	Max Rising Slope		Soak Time 130-165C		Reflow Time /183C		Peak Temp	
Under Conn	1.63	9%	81.41	-29%	56.05	-13%	210.01	-50%

Example Lead (Sn63Pb37) Soak Reflow Profile

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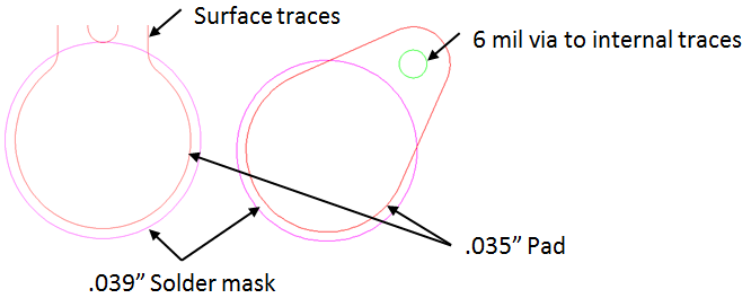
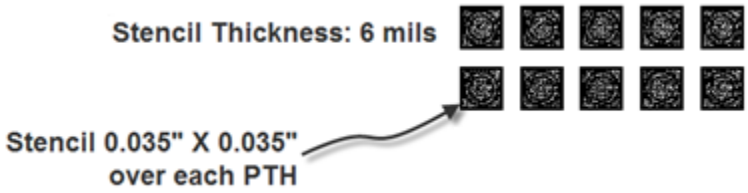
Surface-Mount Technology

Recommended PCB pad layout:

- .035” diameter pad with .039” diameter solder mask.
- Finish: ENIG



Stencil Aperture: .035”x.035” square
Stencil Thickness: 6 mil
Solder Paste: Sn63Pb37 (PN WS483) and 42Sn/57.6Bi/0.4Ag (PN ALPHA CVP-520)



Reflow profiles on subsequent pages.

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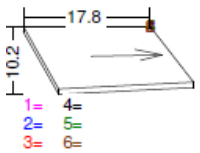
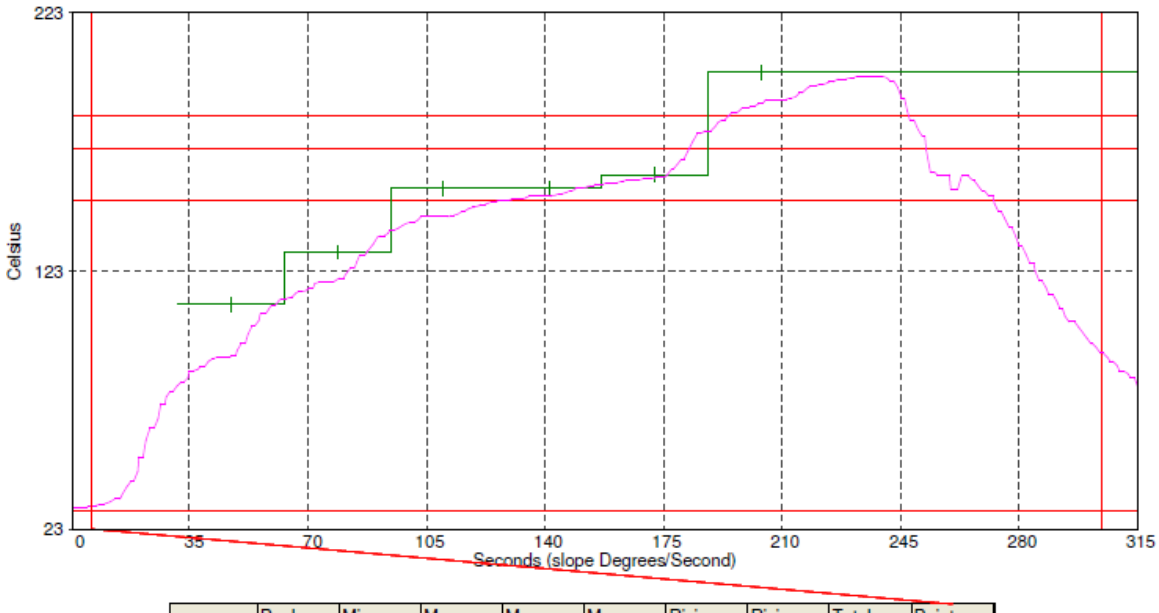
SMT Reflow Profile:

- Leaded Solder, 63Sn37Pb





	Peak	Min	Max Rising Slope	Max Falling Slope	Max Slope	Rising Time Above 30	Rising Time Between 150/170	Total Time Above 183	Pointer 5.8
1	198.2	31.4	3.79	-22.56	-22.56	232.14	56.13	53.09	31.9
2			0.00	0.00	0.00	0.00	0.00	0.00	
3			0.00	0.00	0.00	0.00	0.00	0.00	
4			0.00	0.00	0.00	0.00	0.00	0.00	
5			0.00	0.00	0.00	0.00	0.00	0.00	
6			0.00	0.00	0.00	0.00	0.00	0.00	
TC Mean	198.2	31.4	0.63	-3.76	-3.76	38.69	9.36	8.85	31.9
TC SD			1.55	9.21	9.21	94.77	22.92	21.67	
TC Range	0.0	0.0	3.79	22.56	22.56	232.14	56.13	53.09	0.0

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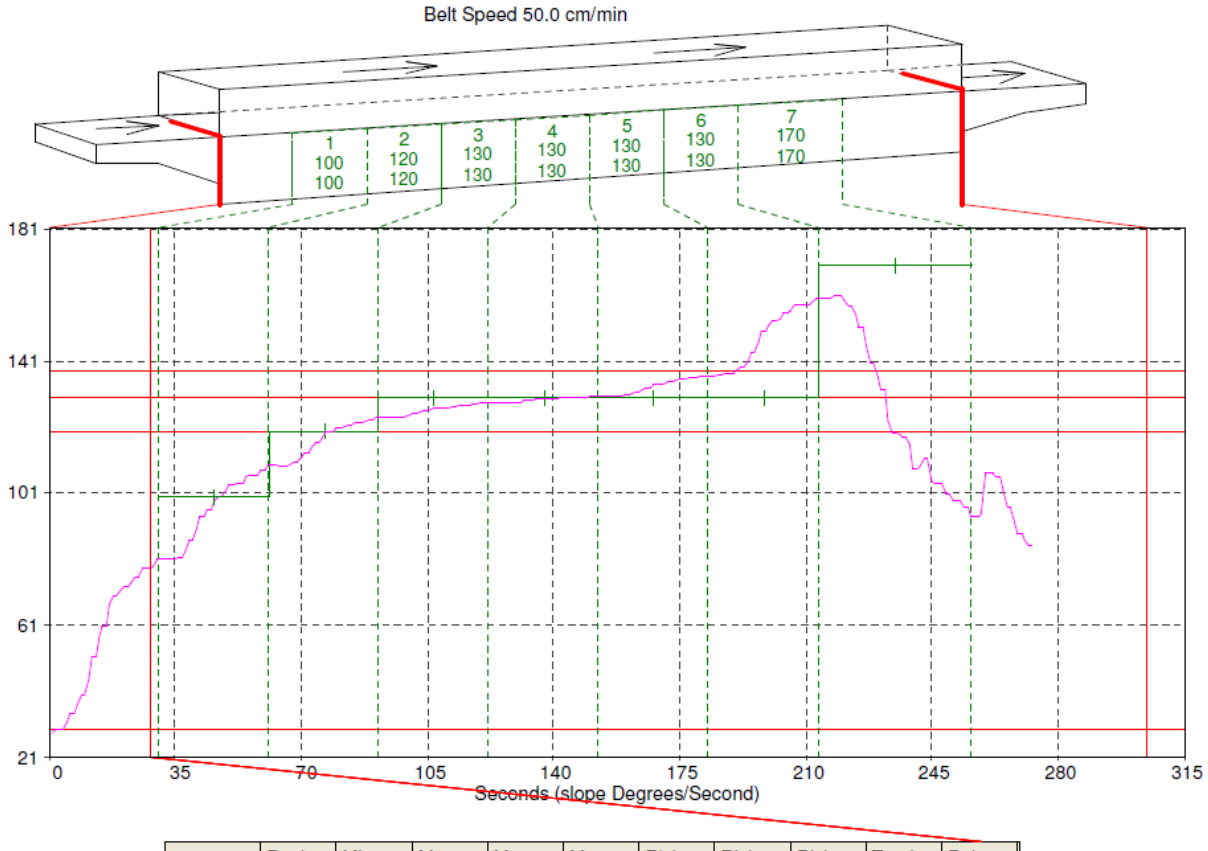
SMT Reflow Profile:

- Low Temp Lead-free Solder (Alpha CVP-520)



	Peak	Min	Max Rising Slope	Max Falling Slope	Max Slope	Rising Time Above 30	Rising Time Between 30/120	Rising Time Between 120/130	Total Time Above 138	Pointer 28.2
1	160.7	29.6	3.91	-4.01	-4.01	213.84	74.34	65.50	39.20	78.4
2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TC Mean	160.7	29.6	0.65	-0.67	-0.67	35.64	12.39	10.92	6.53	78.4
TC SD			1.60	1.64	1.64	87.30	30.35	26.74	16.00	
TC Range	0.0	0.0	3.91	4.01	4.01	213.84	74.34	65.50	39.20	0.0

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Guide Hardware

V2M and V2F

Installation

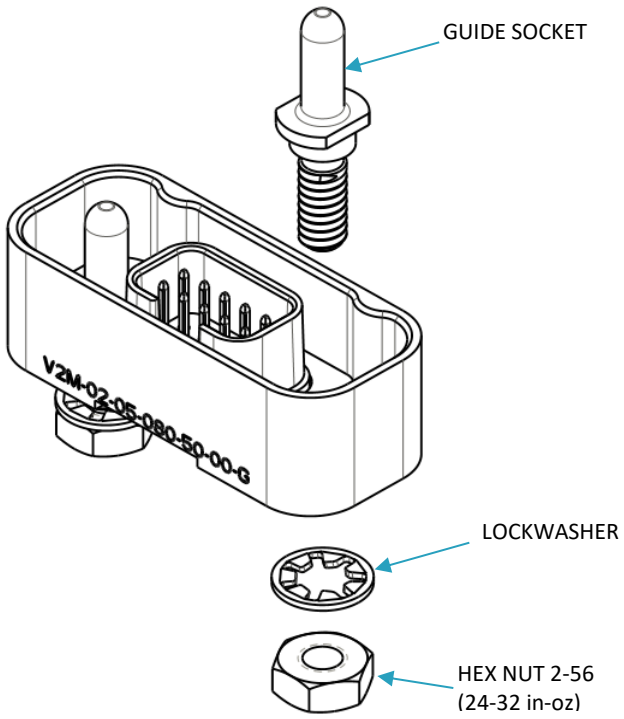
Note: Connector must be properly installed on PCB prior to installation of guide hardware.

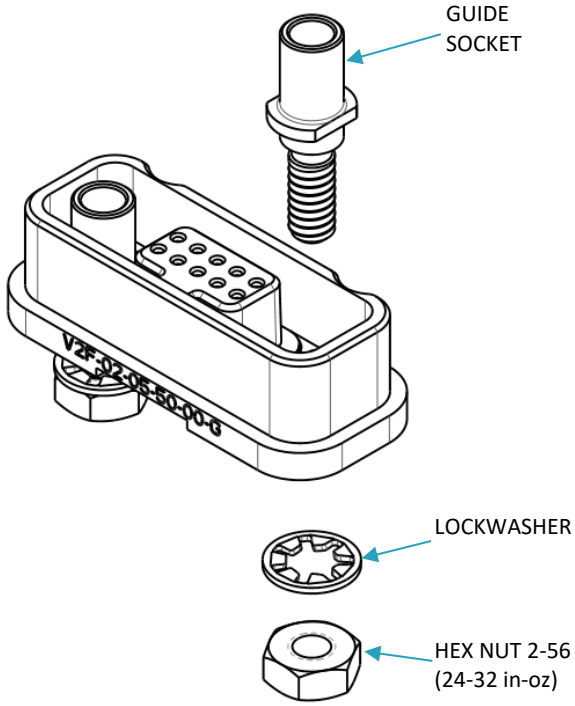
Torque Requirements

PCB mounting; apply a torque to hex nuts of: 24 to 32 in-oz (1.5 to 2.0 in-lb)

Available for purchase from factory to achieve proper PCB mounting torque;

- V8013 Adjustable Torque Screwdriver Handle
- V8014 Socket Adapter, ¼" Drive
- V8016 5/32 Socket for 2-56 Hex Nut





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Jacking and Locking Hardware

V2M and V2F

Installation

Note: Connector must be properly installed on PCB prior to installation of jacking / locking hardware.

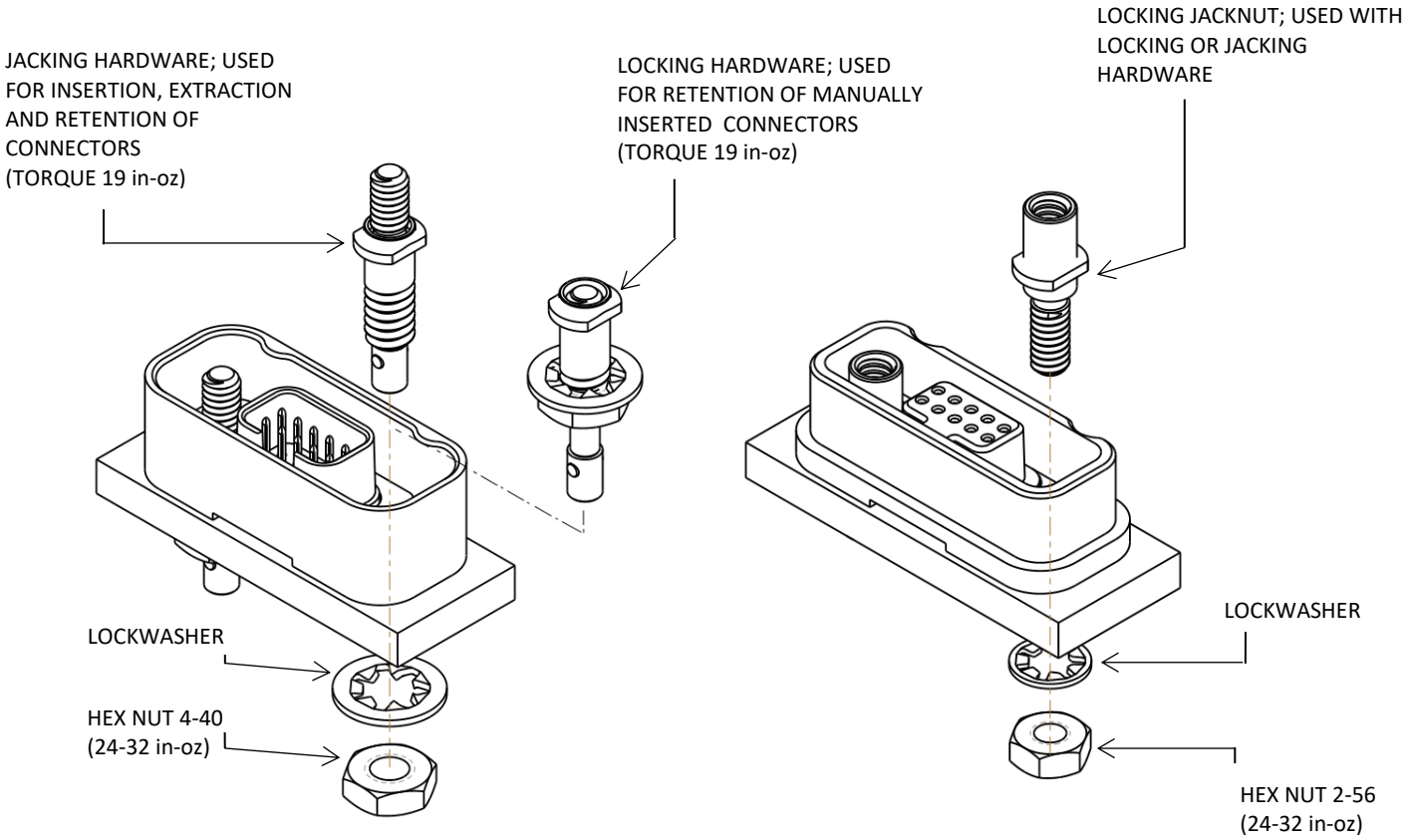
Torque Requirements

PCB mounting; apply a torque to hex nuts of: 24 to 32 in-oz (1.5 to 2.0 in-lb)
Available for purchase from factory to achieve proper PCB mounting torque;

- V8013 Adjustable Torque Screwdriver Handle
- V8014 Socket Adapter, ¼" Drive
- V8016 5/32 Socket for 2-56 Hex Nut
- V8030 3/16 Socket for 4-40 Hex Nut

Jacking / Locking hardware coupling; apply a torque of: 19 in. oz. maximum (1.2 in. lb.)
Available for purchase from factory to achieve proper jacking / locking torque;

- V8013 Adjustable Torque Screwdriver Handle
- V8017 Adapter, Micro Bit Holder
- V8031 Micro Bit, Hex Tip



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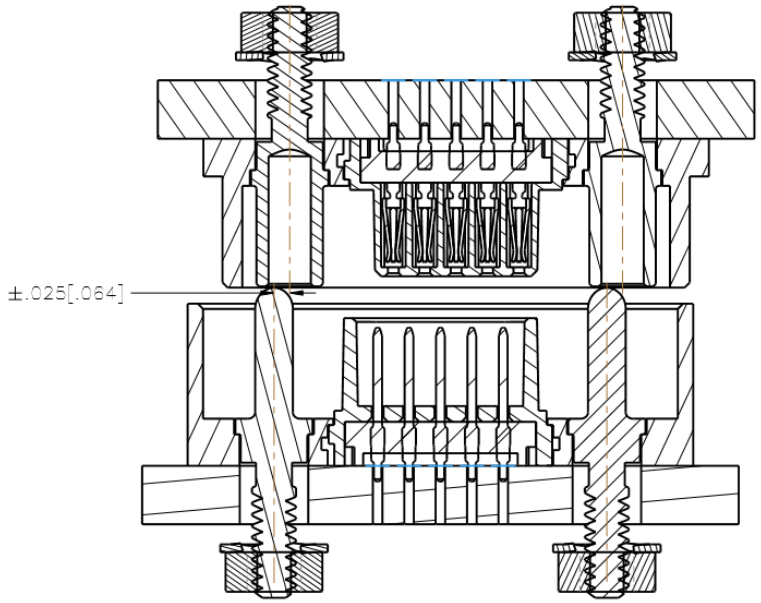
Mating Misalignment Tolerance for Guide Hardware

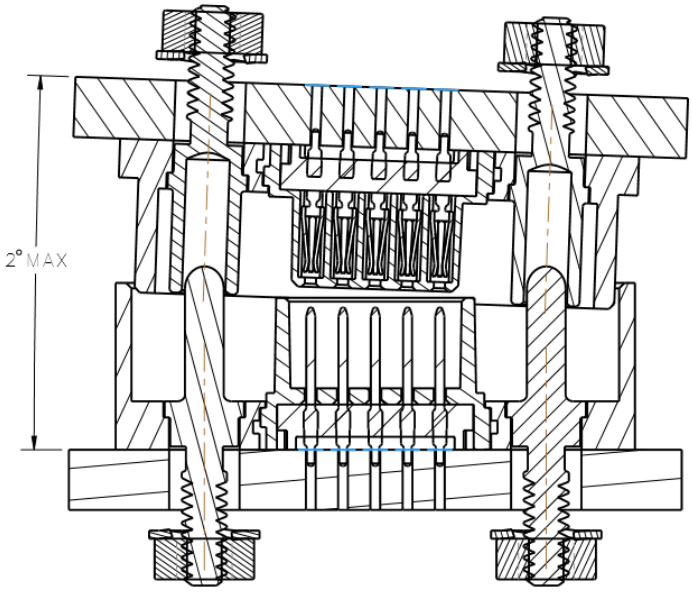
Linear

The maximum linear misalignment is ±.025 [0.64].



Angular

The maximum angular misalignment is 2°.



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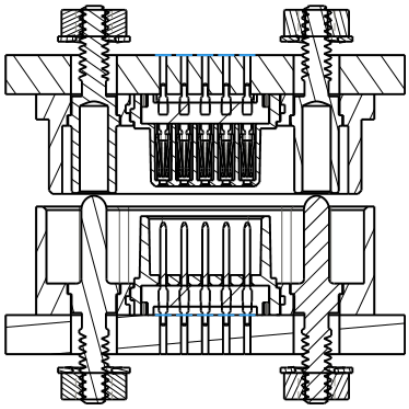
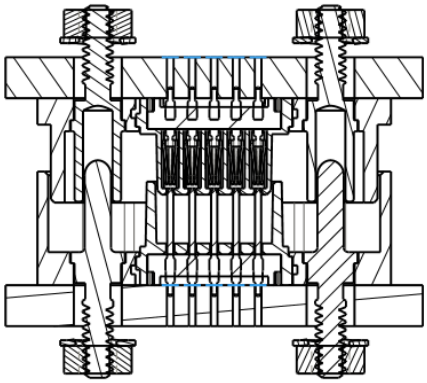
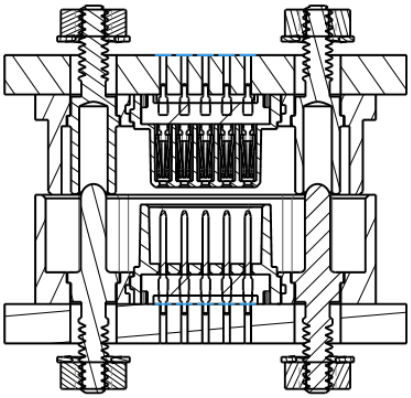
Mating Sequence for Guide Hardware



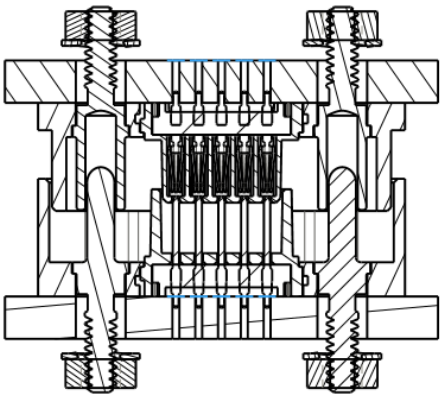
Mating Sequence Step 1:
Guide Hardware



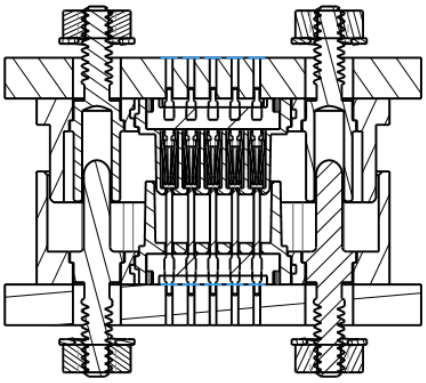
Mating Sequence Step 4:
Pin Contact to Socket Housing



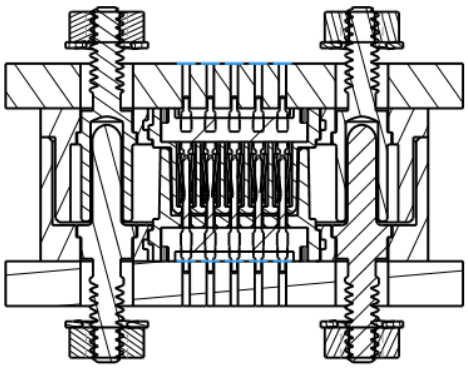
Mating Sequence Step 2:
Ruggedized Hoods



Mating Sequence Step 5:
Pin Contact to Socket Contact



Mating Sequence Step 3:
Pin Housing to Socket Housing



Mating Sequence Step 6:
Fully Seated

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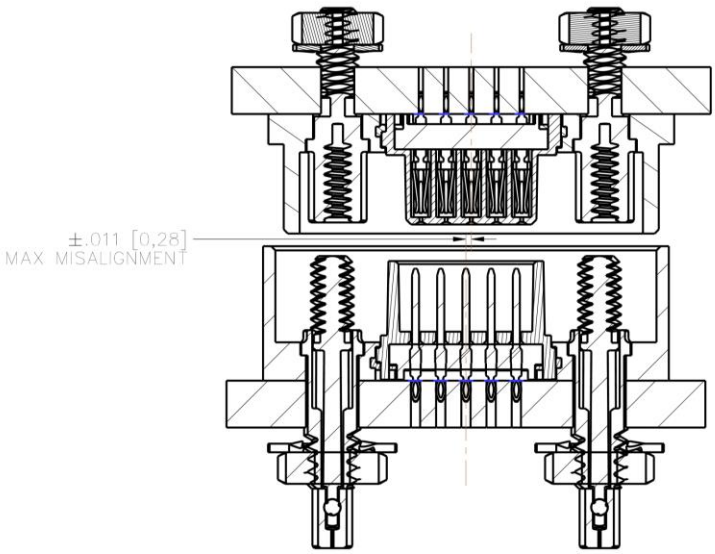
Mating Misalignment Tolerance for Jacking Hardware

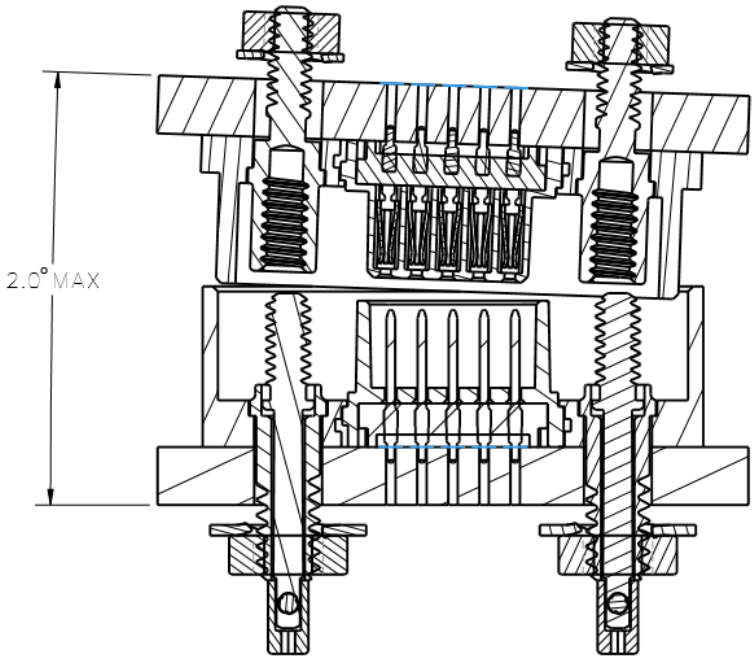
Linear

The maximum linear misalignment is ±.011 [0.28]



Angular

The maximum angular misalignment is 2 degrees.
It is recommended to turn jacking hardware 1 to 1-1/2 revolutions alternately per side until fully seated.



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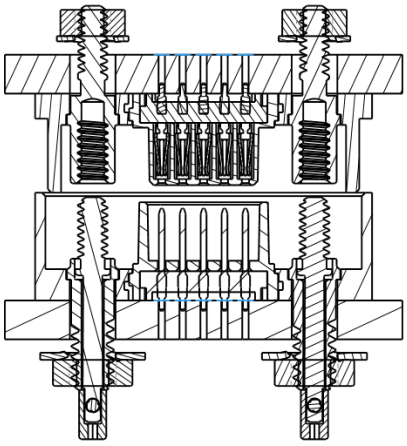
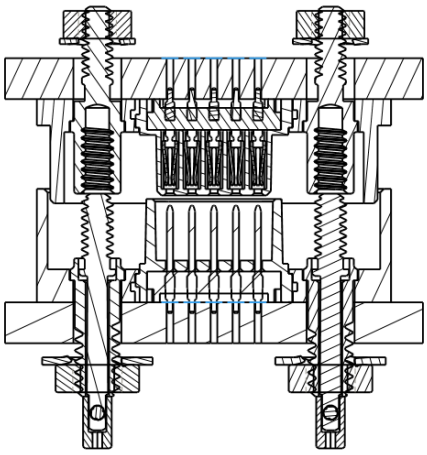
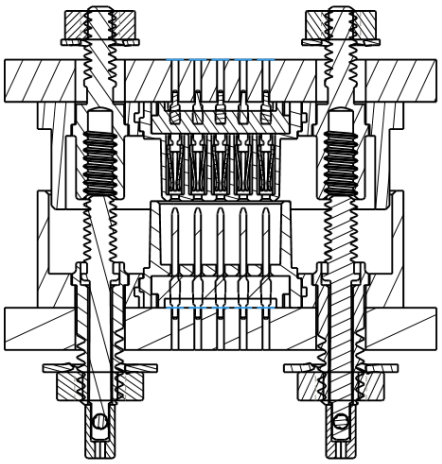
Mating Sequence for Jacking Hardware



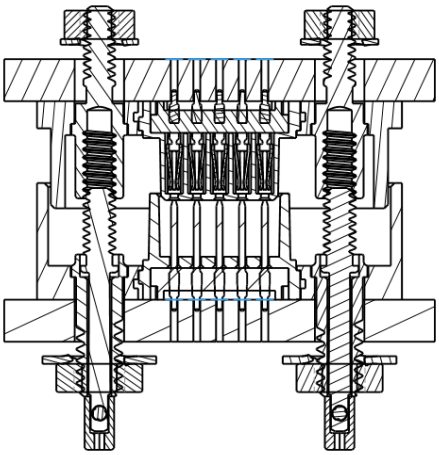
Mating Sequence Step 1:
Ruggedized Hoods



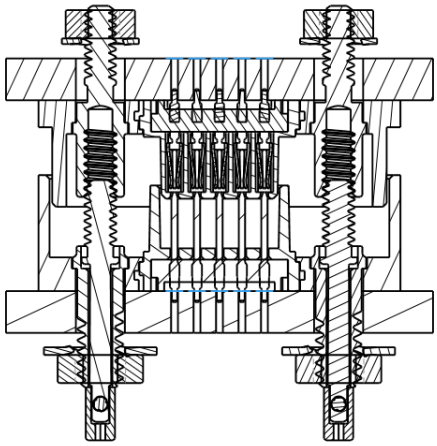
Mating Sequence Step 2:
Jacking Hardware



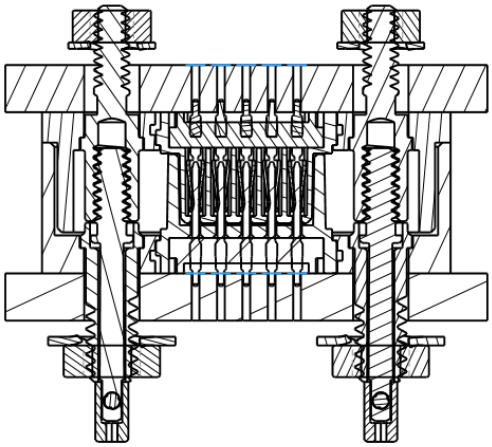
Mating Sequence Step 3:
Pin Housing to Socket Housing



Mating Sequence Step 4:
Pin Contact to Socket Housing



Mating Sequence Step 5:
Pin Contact to Socket Contact



Mating Sequence Step 6:
Fully Seated

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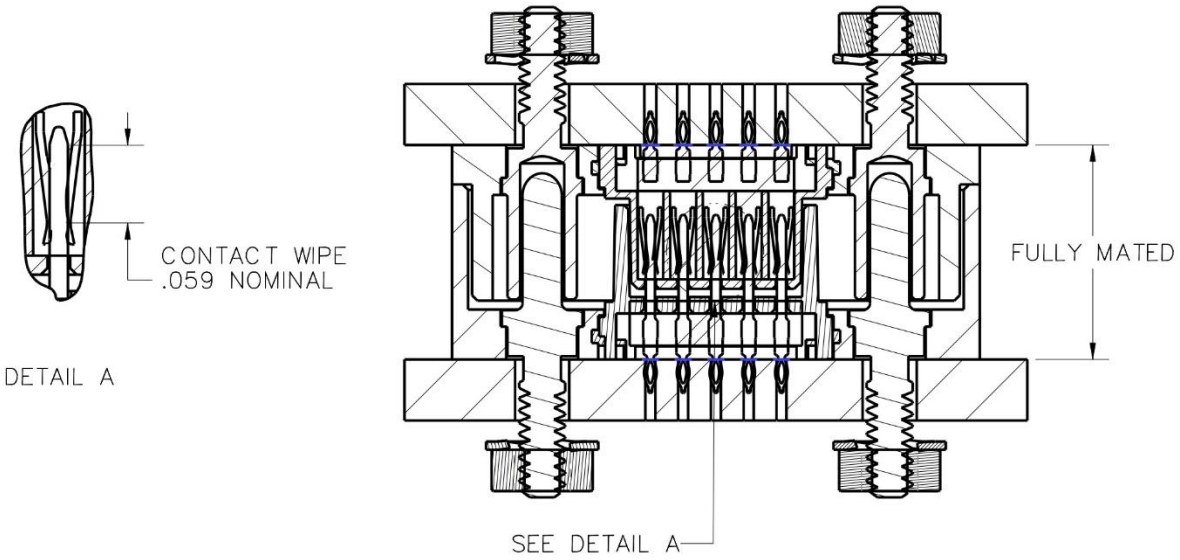
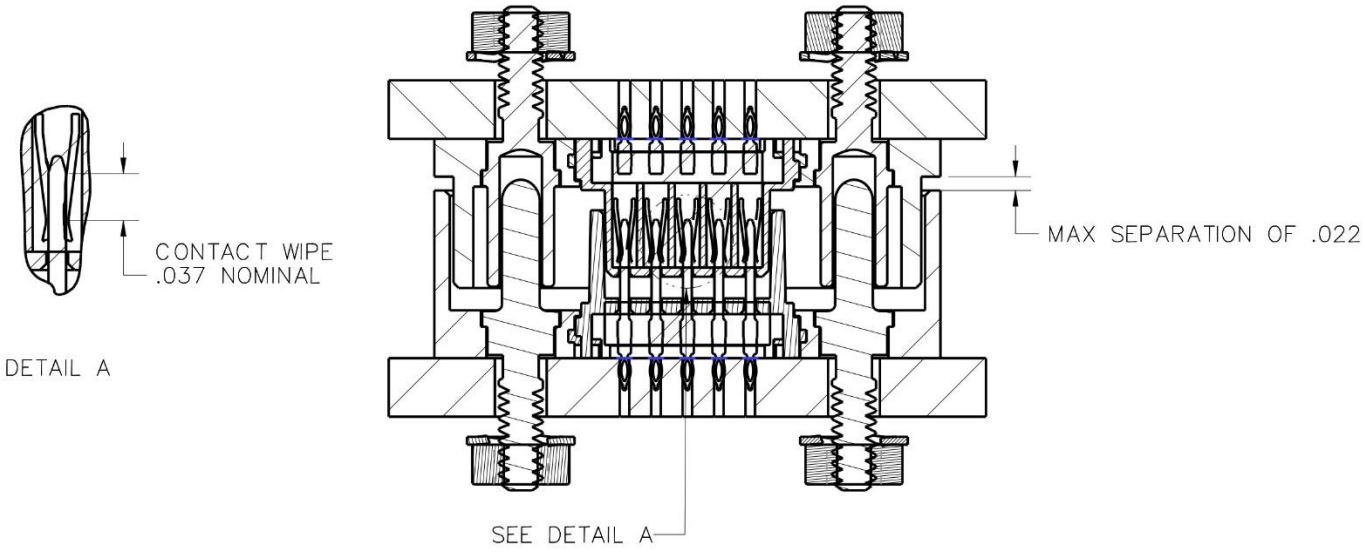
Contact Wipe

Nominal Contact Wipe when fully mated: .059”



Nominal Contact Wipe at Max Connector Separation of .022”: .037”



Solder cup kit

Solder cup option (guide hardware shown):

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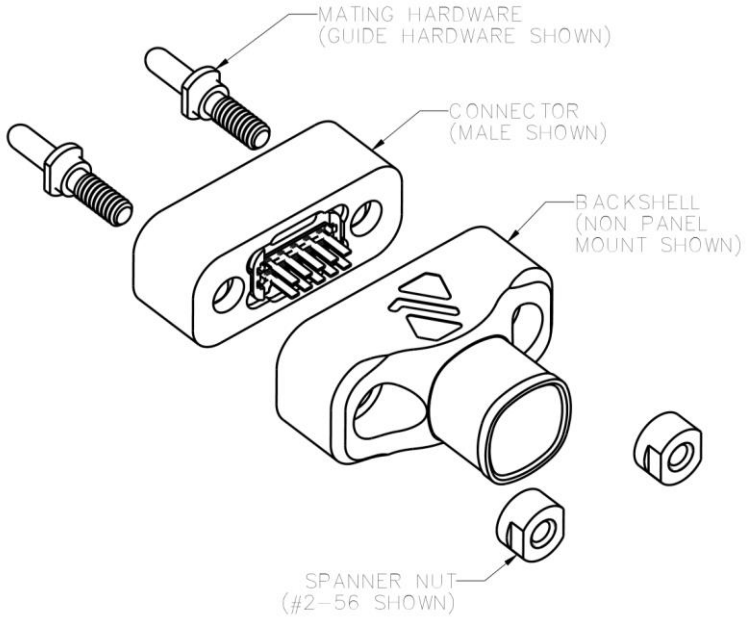

Soldering

1) Solder at 700°F-800°F for less than 2 seconds per joint
2) For joint dimension information see V2C product drawing

Solder cup tooling

Solder cup tool:

Torque using CDLV01529 wrench to 24-32 in-oz

Assembly:

1) Disassemble connector from backshell
2) Slide backshell over wire/cable
3) Solder wires to tabs attached on the connector
4) Insert mating hardware from connector side
5) Install spanner nuts onto hardware from backshell side (Torque to 24-32 in-oz)
6) Fully pot backshell with encapsulate (Frey Engineering CF-3003-80 epoxy recommended)

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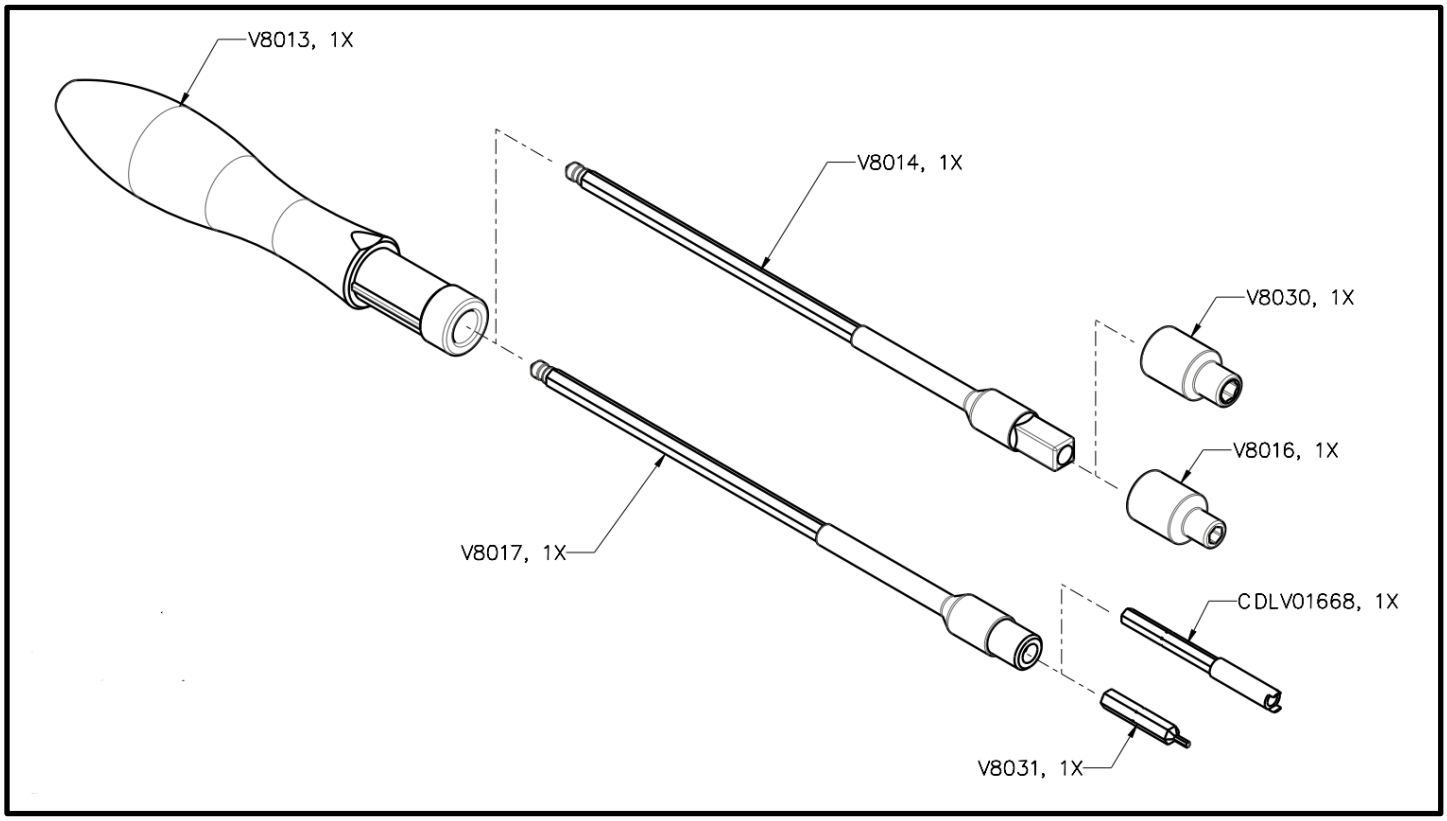
2X5 Hardware Tooling: CDLV01529 Torque Wrench Kit



*Individual pieces can be purchased separately from CDLV01529 kit, see next page (21) for configurations and intended use.

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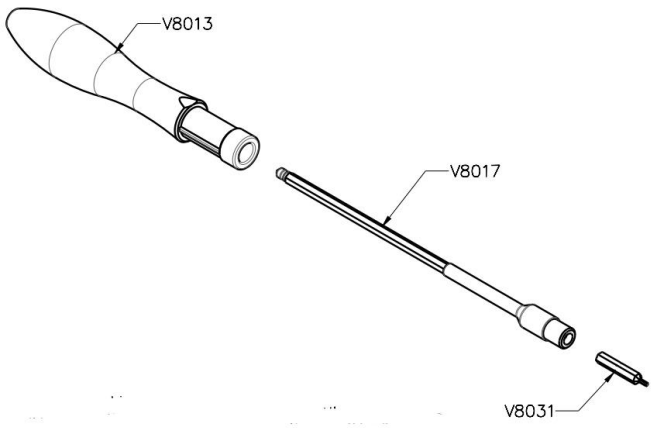
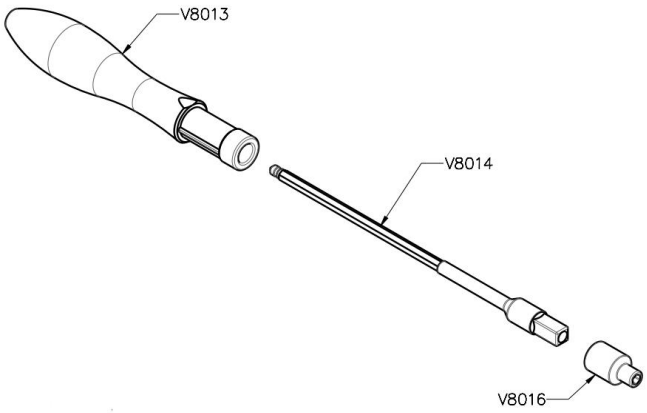
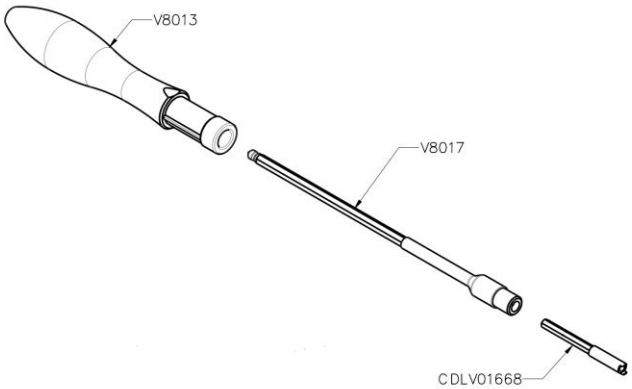
2X5 Hardware Tooling: Torque Wrench Configurations



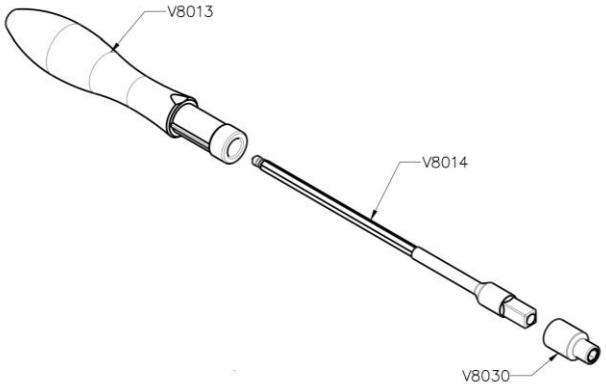
Used For Torqueing Locking and Jacking Screws



Used For Torqueing #2-56 Nut on Guide and Jacknut Hardware



Used For Torqueing Spanner Nut on V2C Cables



Used For Torqueing #4-40 Nut on Jacking and Locking Hardware

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