

WATERS MANUFACTURING ASSEMBLY PROCEDURE

PAGE 1 OF 29
289006760 REV H

ITEM NUMBER
289006760

DESCRIPTION
ASSY, CARTRIDGE, CM, 18 KPSI

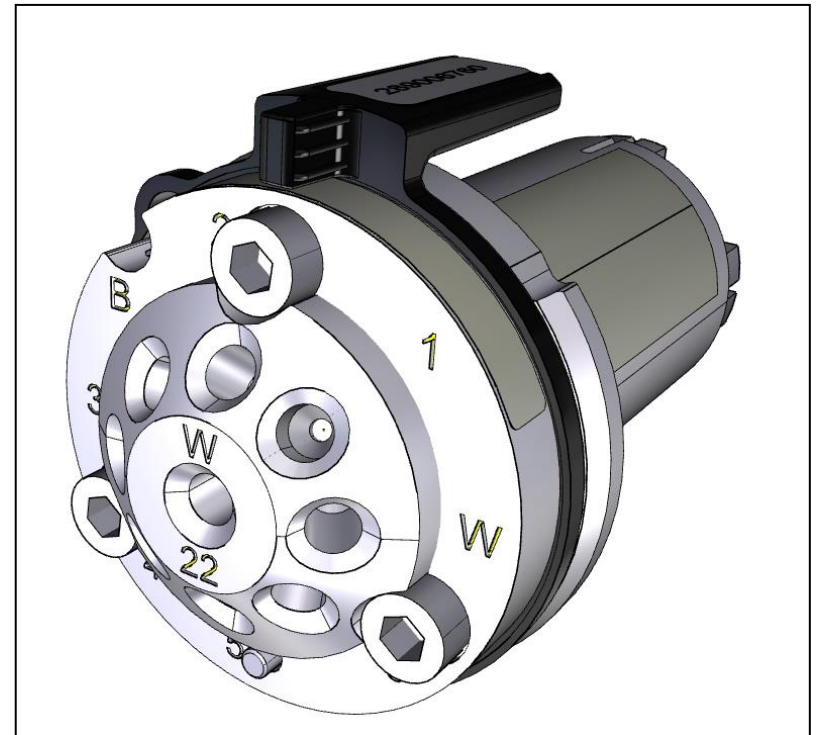
WRITTEN BY
DiLORENZO

DATE
JUNE 12, 2012

REVISION RECORD

<u>REV</u>	<u>AUTHORITY</u>	<u>NOTES</u>
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G	R. Poisson	ECR 9220842
H	R. Poisson	ECR 9222580

Pg 18 section 12.1 & PG 25 & 29 UPDATES.



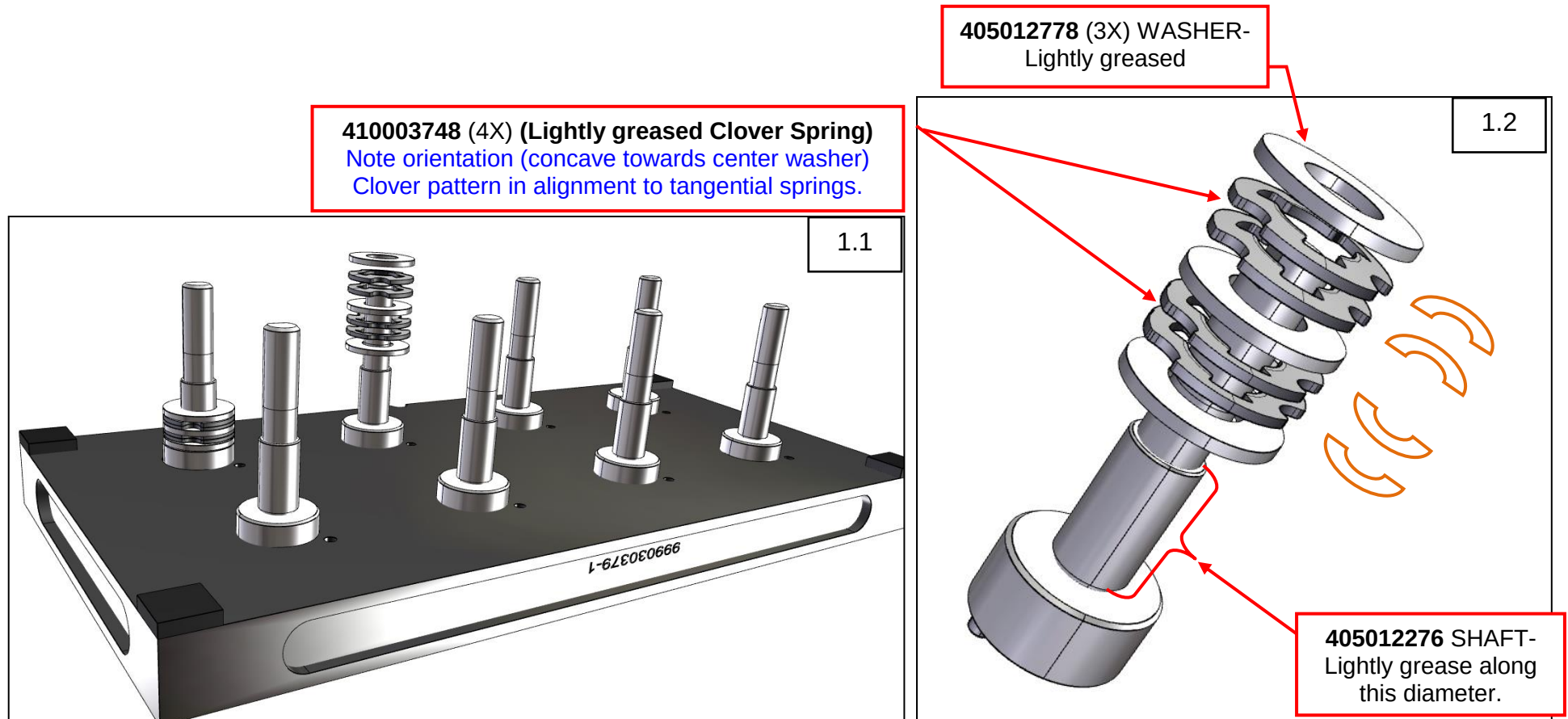
OPER OPERATION DESCRIPTION
1.0 PREP THE POD ASSEMBLY

TOOL NUMBER/DESCRIPTION
999030379-1 Base Support Fixture

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION AND HOW TO APPLY GREASE</u>
405012276	1	Shaft (lightly grease .375 dia only)
405012778	3	Washer, Hardened (lightly grease)
410003748	4	Spring, Clover (note orientation and lightly grease)
600000582	A/R	Grease (See 735002621)

1.1 Populate the Support Fixture (999030379-1) with Valve Shafts as shown.

1.2 Add Washers and Clover Springs to Shaft as shown in view.



OPER OPERATION DESCRIPTION
1.0 PREP THE POD ASSEMBLY, cont'd

TOOL NUMBER/DESCRIPTION
999030379-1 Base Support Fixture

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION AND HOW TO APPLY GREASE</u>
410001270	1	Thrust Bearing (pre-greased)
410001269	2	Washer, Bearing (lightly-greased)
405012272	1	Spacer (No Grease)
405011949	2	Shims, (.008 thick), (No Grease)

1.3 Continue component stack-up on Valve Shaft as shown below.

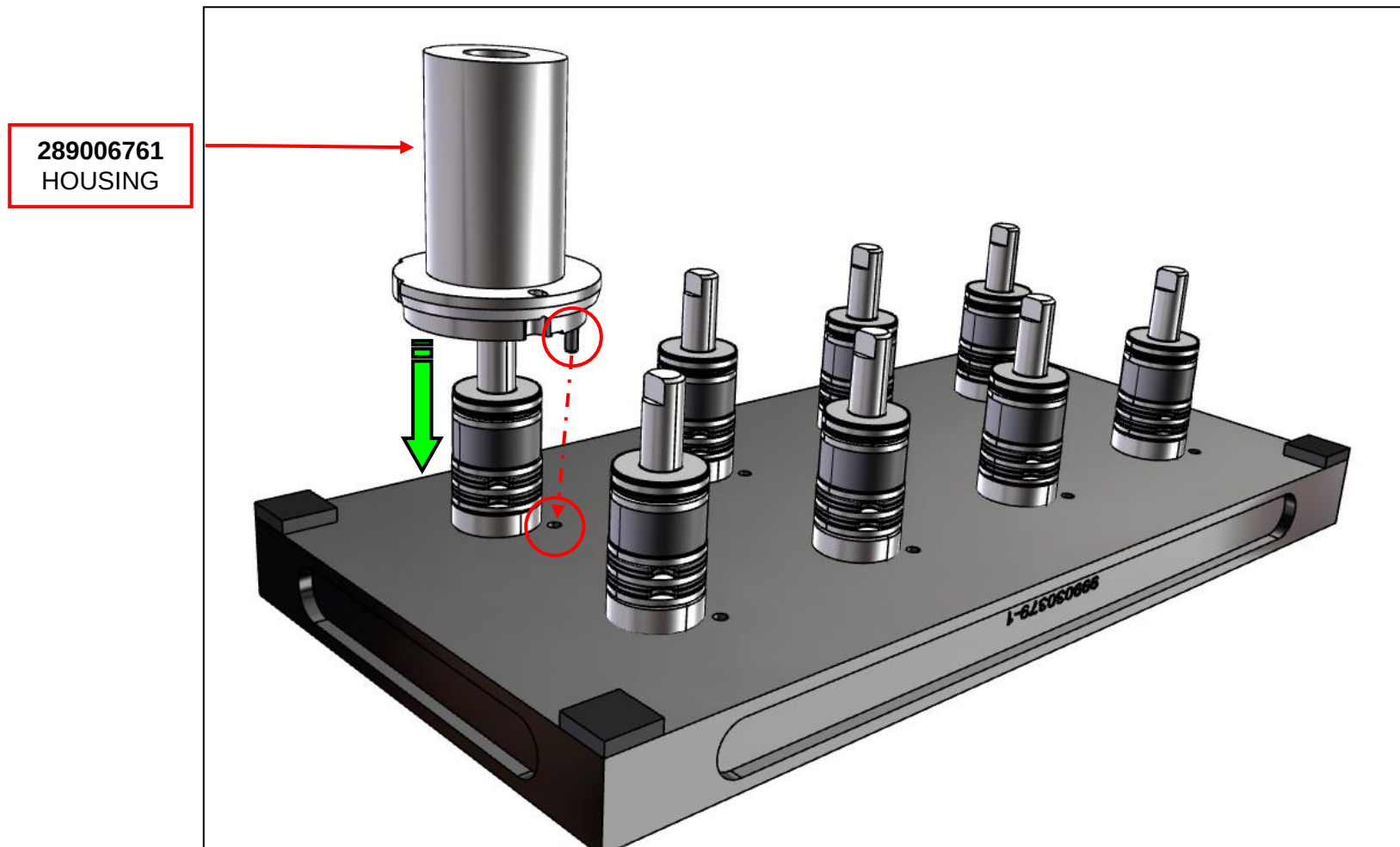


OPER
2.0 OPERATION DESCRIPTION
LOAD THE POD ASSEMBLY

TOOL NUMBER/DESCRIPTION
999030379-1 Base Support Fixture

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
289006761	1	Housing

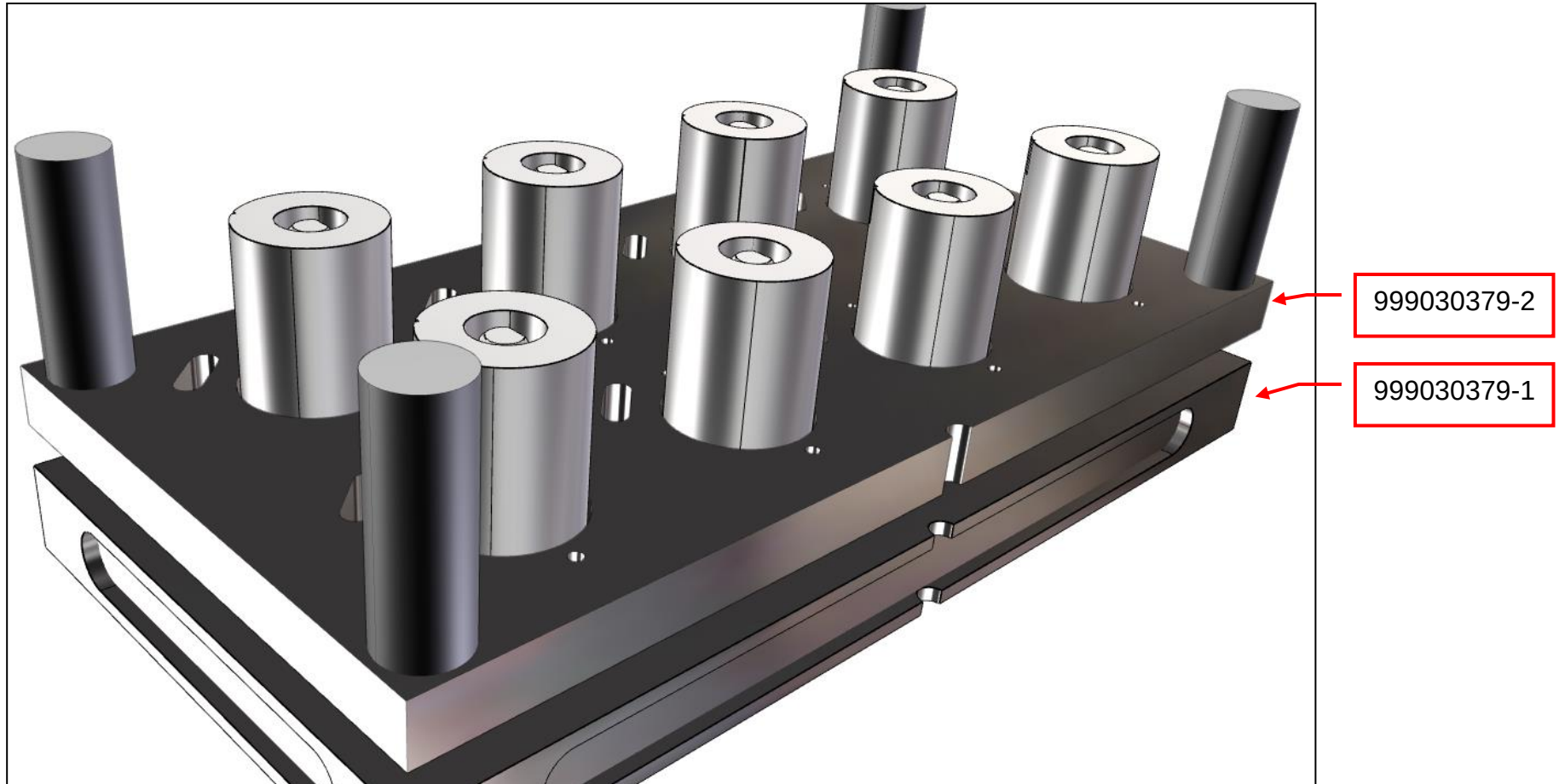
- 2.1 Assemble Housing onto each Shaft/ Washer assembly in fixture as shown. (Ensure the Alignment pin(s) are registered into the hole(s) in the fixture)
- (NOTE: Remove dirty gloves prior to assembling the Housings onto the Shaft stack-ups.)



<u>OPER</u>	<u>OPERATION DESCRIPTION</u>
2.0	CARTRIDGE ASSEMBLY, cont'd

<u>TOOL NUMBER/DESCRIPTION</u>
999030379-1 Base Support Fixture
999030379-2 ASSEMBLY TRAY

2.2 Place assembly tray fixture (999030379-2) over Housings as shown.



<u>OPER</u>	<u>OPERATION DESCRIPTION</u>
2.0	CARTRIDGE ASSEMBLY, cont'd

<u>TOOL NUMBER/DESCRIPTION</u>
999030379-1 Base Support Fixture
999030379-2 ASSEMBLY TRAY

- 2.3 Hold both fixtures together as a sandwich and flip tray 180 degrees.
- 2.4 Remove (999030379-1) Fixture from the assemblies as shown below.



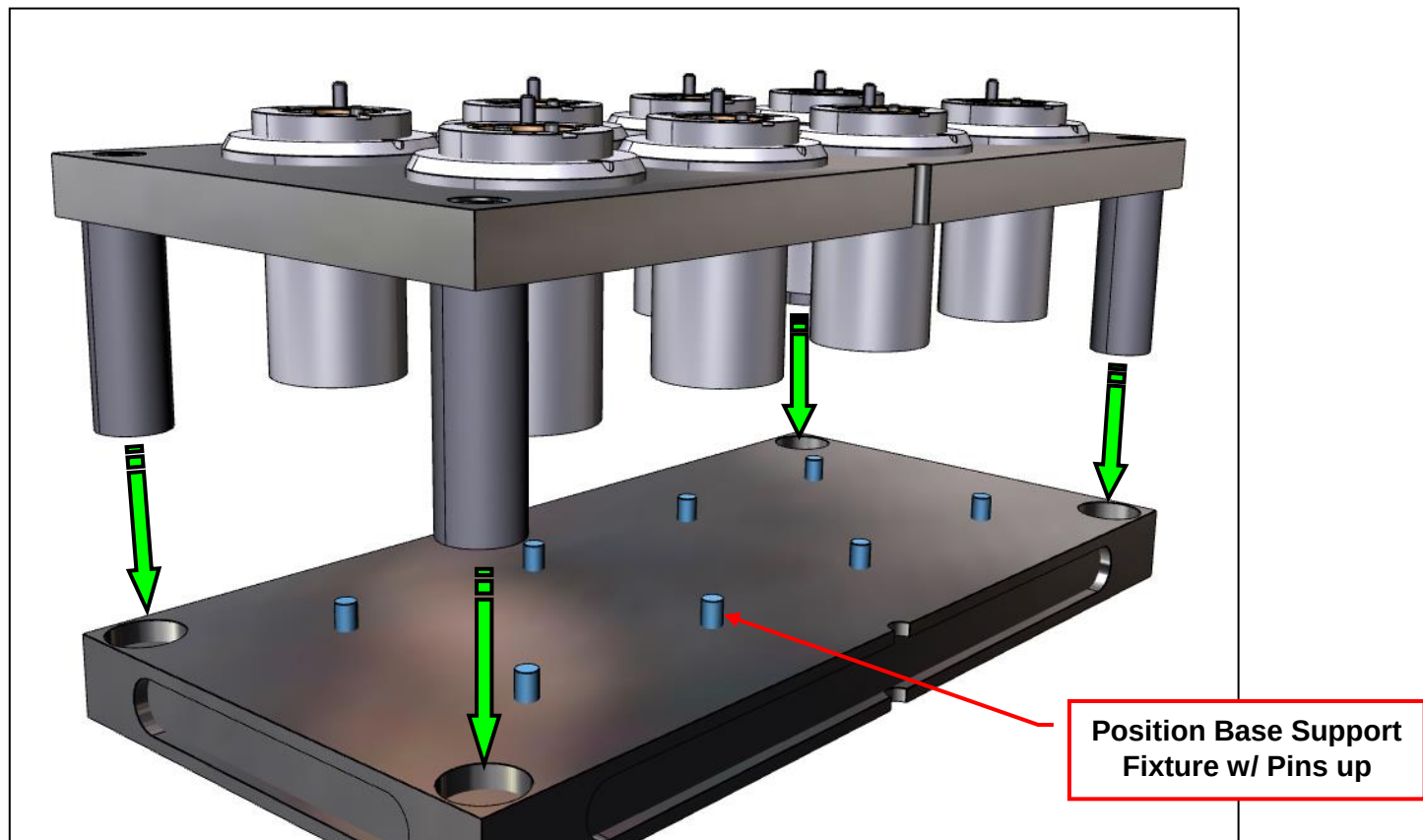
<u>OPER</u>	<u>OPERATION DESCRIPTION</u>
2.0	CARTRIDGE ASSEMBLY, cont'd

<u>TOOL NUMBER/DESCRIPTION</u>
999030379-1 Base Support Fixture
999030379-2 ASSEMBLY TRAY

2.5 Place Base Support Fixture (999030379-1) under the Assembly Tray with Pins facing up as shown.

2.6 Locate legs of Assembly Tray into recesses in Base Support fixture.

(NOTE: The Base Support Fixture pins will position the Shaft up, for ease in Rotor assembly)



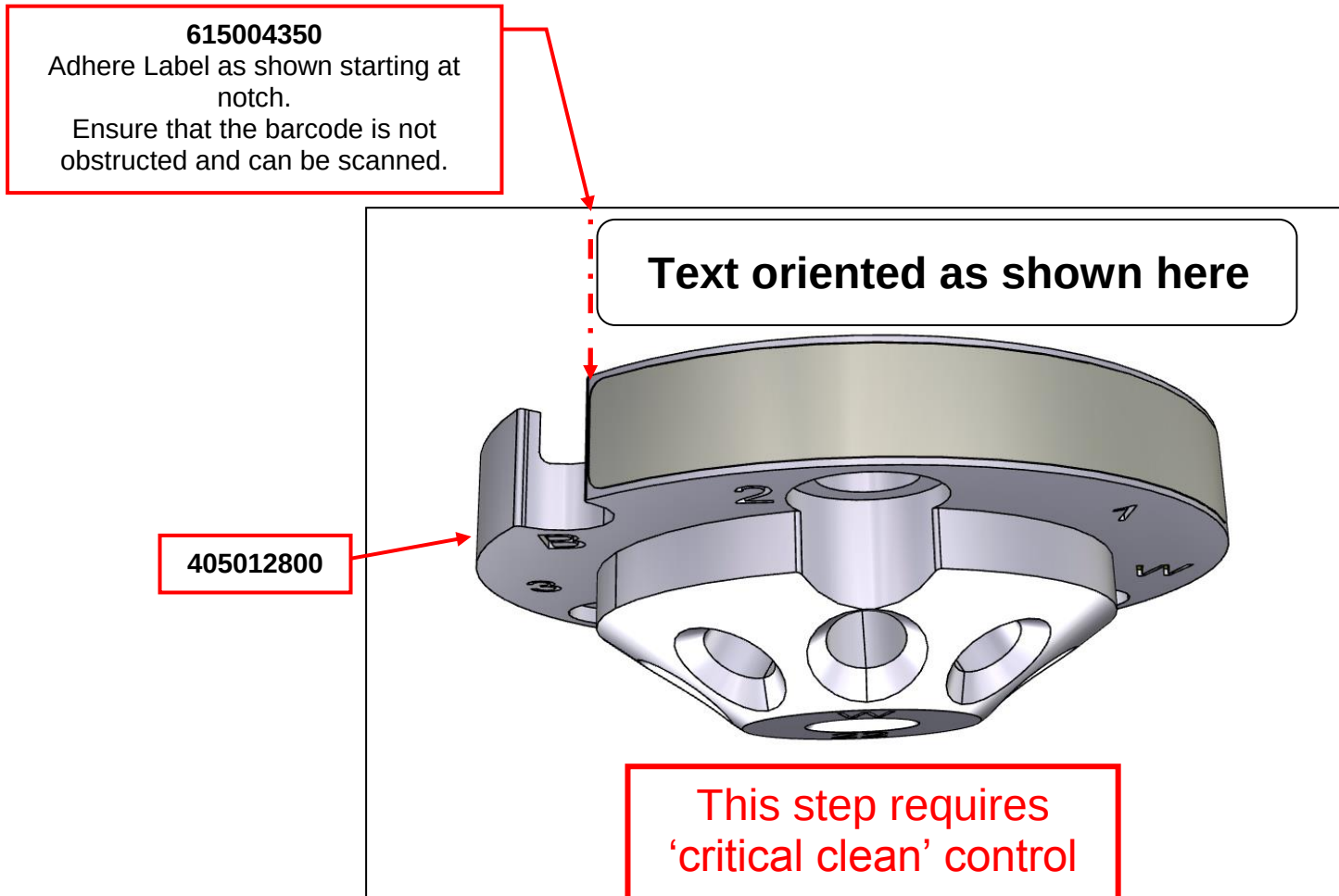
<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
3.0	SCAN STATOR LOT CODE AND LABEL INTO SIGMASURE PER 735002132.	N/A

Select Top Level Product: **"289006760 ASSY, CARTRIDGE, CM, 18 KPSI"**.

Note: completed genealogy records must be imported daily.

<u>OPER</u> 4.0	<u>OPERATION DESCRIPTION</u> APPLY GENEALOGY LABEL TO STATOR	<u>TOOL NUMBER/DESCRIPTION</u> N/A
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<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
405012800	1	STATOR, VALVE, CM, 18 KPSI
615004350	1	LABEL, S/N, GENEALOGY, 18 KPSI CM CART



<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
5.0	APPLY LABEL TO RETAINING RING	N/A

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
615004273	1	LABEL, CART, 9 PORT CM, 289006760
405013266	1	RETAINING RING, VALVE, 1.125 DIA, CM



<u>OPER</u>	<u>OPERATION DESCRIPTION</u>
6.0	ROTOR ASSEMBLY

<u>TOOL NUMBER/DESCRIPTION</u>
999030379-1 Base Support Fixture
999030379-2 ASSEMBLY TRAY

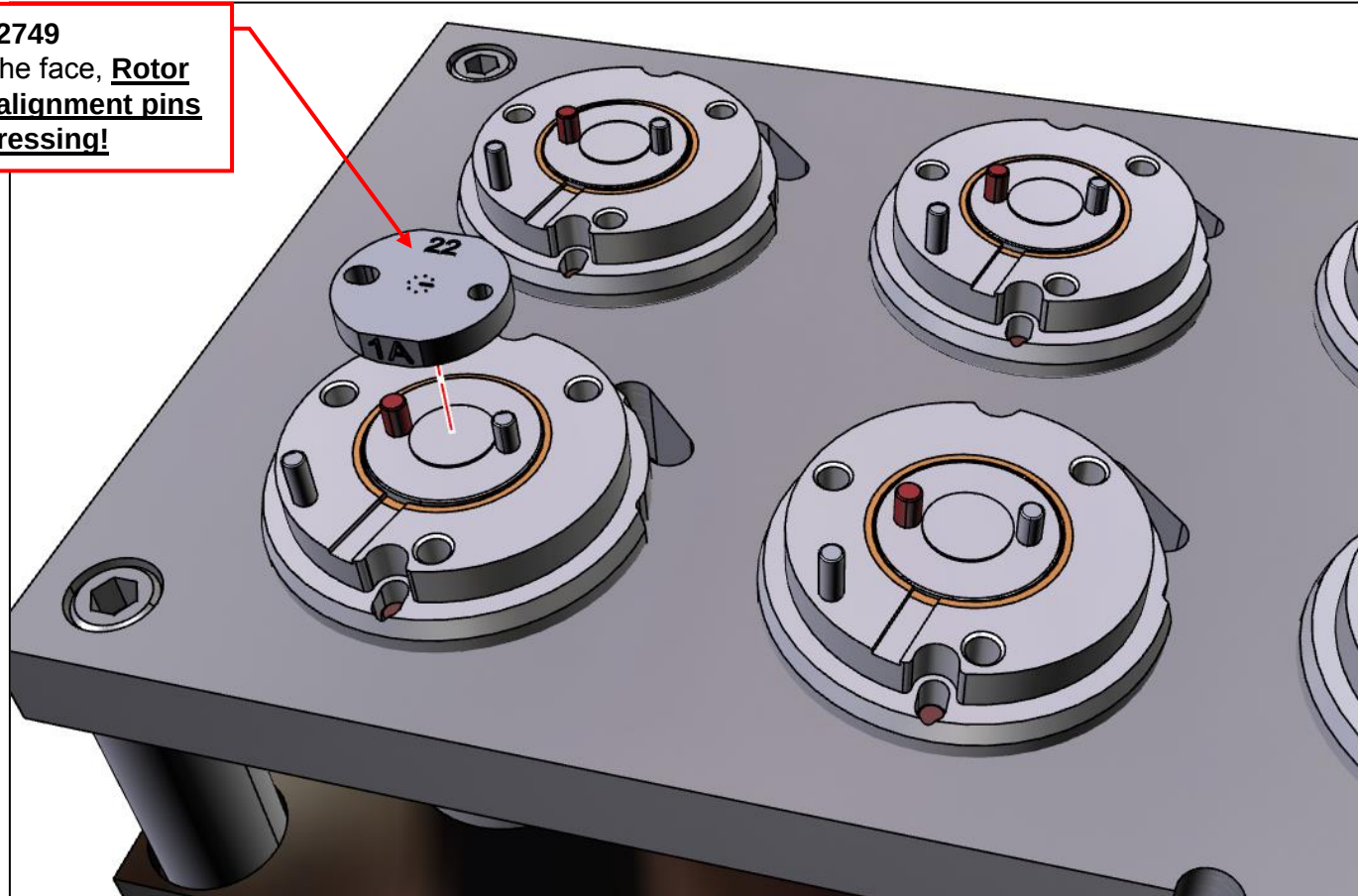
<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
405012749	1	Rotor

6.1 Assemble Rotor(s) onto the Shaft alignment pins with "22" facing up as shown.

(NOTE: After Rotor assembly is complete, lift 999030379-2 Assembly Tray off of Base Support Fixture and set on bench.)

This step requires
'critical clean' control

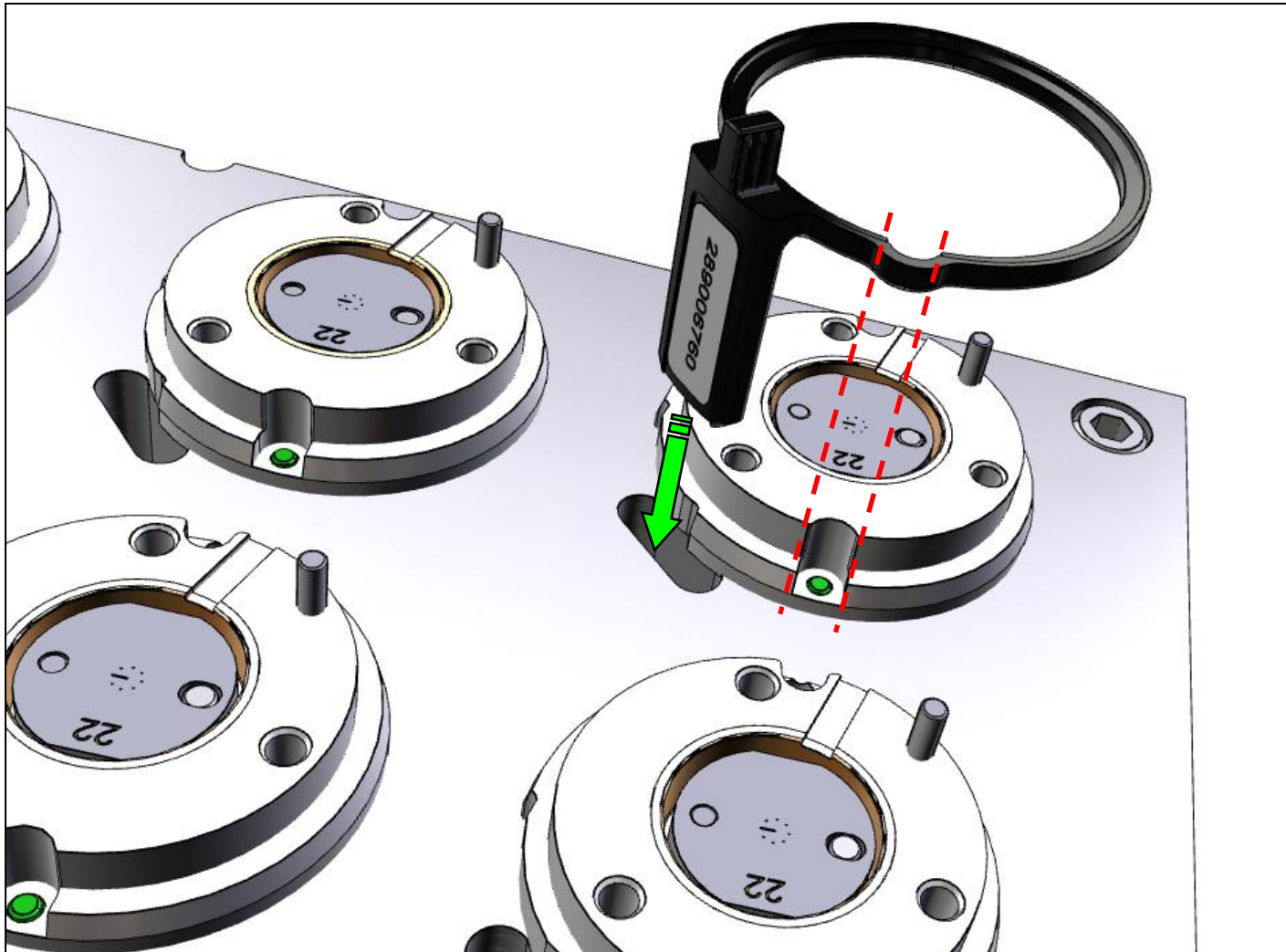
405012749
Verify '22' is on the face, Rotor
must slide over alignment pins
without pressing!



<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
7.0	ASSEMBLE RETAINING RING TO CARTRIDGE	N/A

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
N/A	1	RETAINING RING WITH LABEL

7.1 Assemble Retaining Ring to the Valve Cartridge as shown.

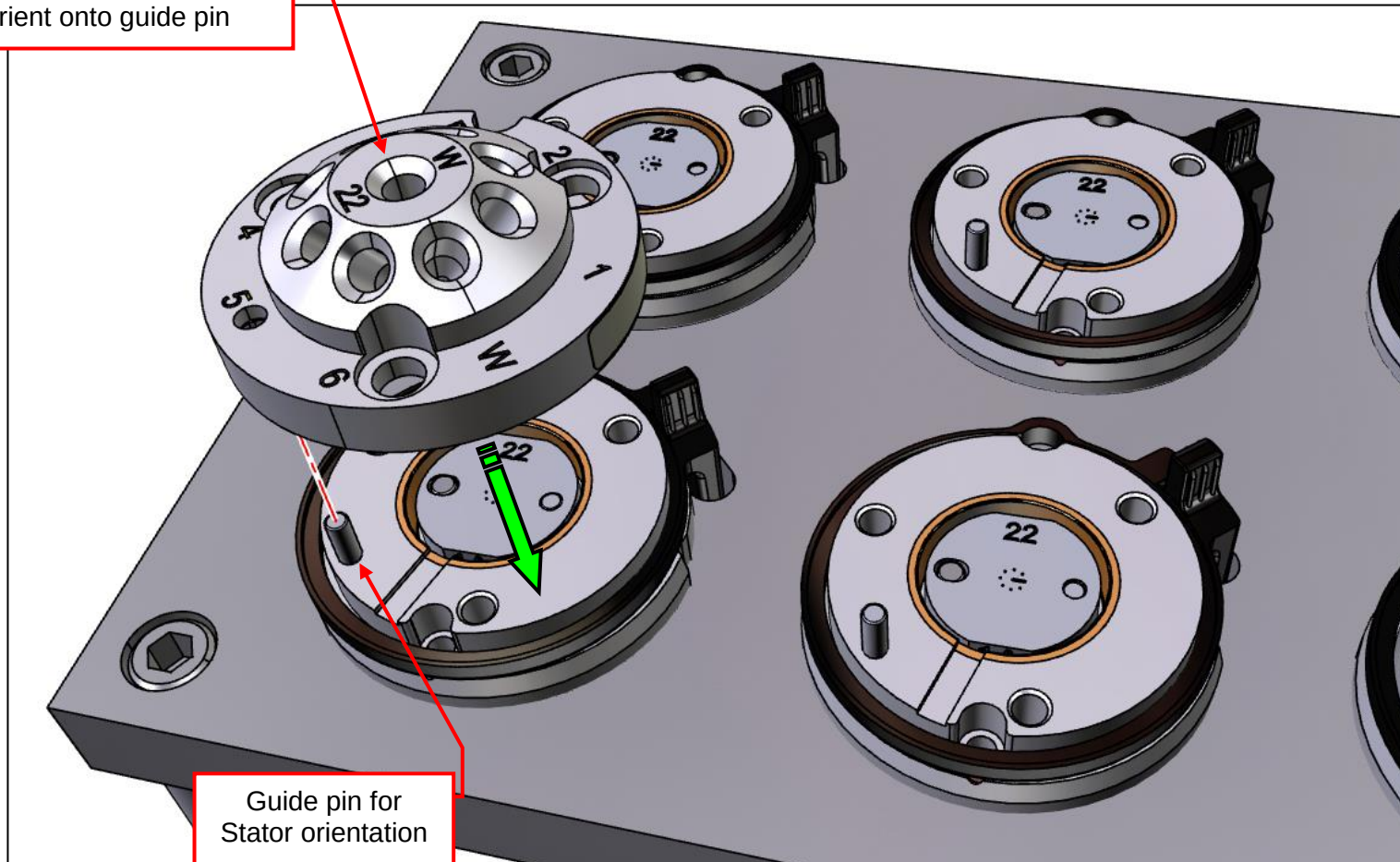


<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
8.0	PRE-ASSEMBLE STATOR ASSY	999030379-2 ASSEMBLY TRAY

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
N/A	1	STATOR ASSY

This step requires
'critical clean' control

Stator Assembly
Verify "W, 22" is on the
face,
orient onto guide pin



Guide pin for
Stator orientation

OPER OPERATION DESCRIPTION
9.0 ASSEMBLY AND ALIGN

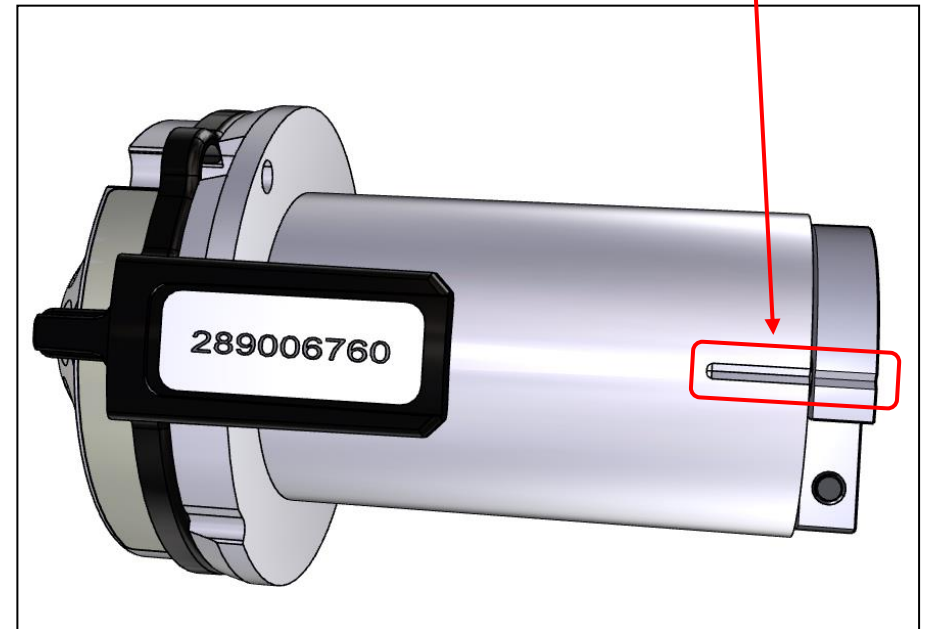
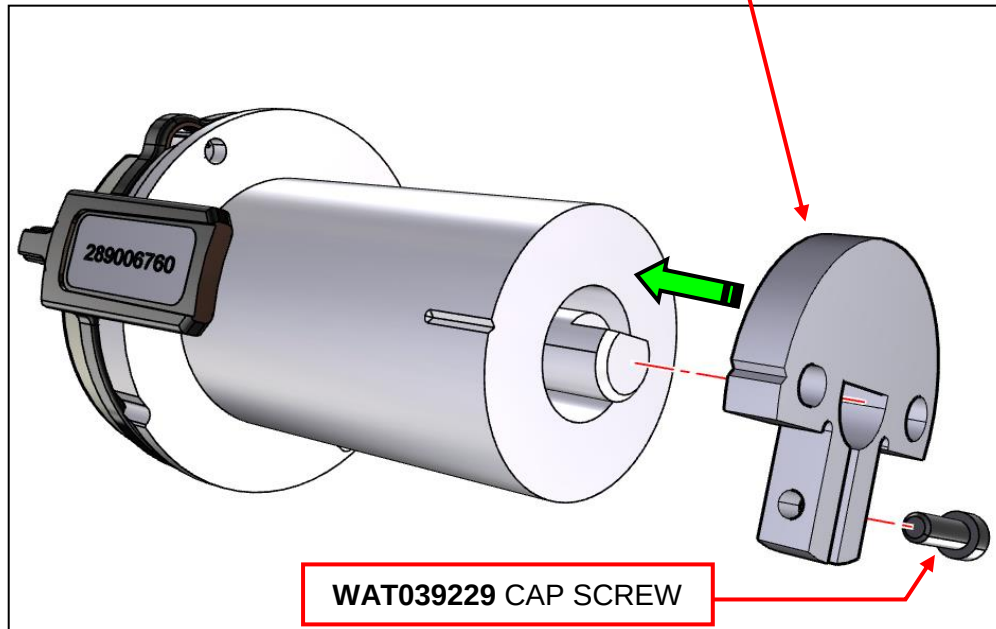
TOOL NUMBER/DESCRIPTION
3/32 INCH ALLEN WRENCH
999030379-2 ASSEMBLY TRAY

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
405004702	1	Drive Shaft Clamp
WAT039229	1	Socket Cap Screw

**This step requires
'critical clean' control**

- 9.1 Temporarily assemble the Drive Shaft Clamp onto the Shaft end to enable the alignment to the Housing. (**NOTE: Remove Clamp carefully not to change the alignment**)

NOTE: ALIGN MARKS ON CLAMP TO HOUSING. FAILURE TO DO SO WILL RESULT IN ROTOR DAMAGE! REMOVE CLAMP WITHOUT DISTURBING ALIGNMENT.

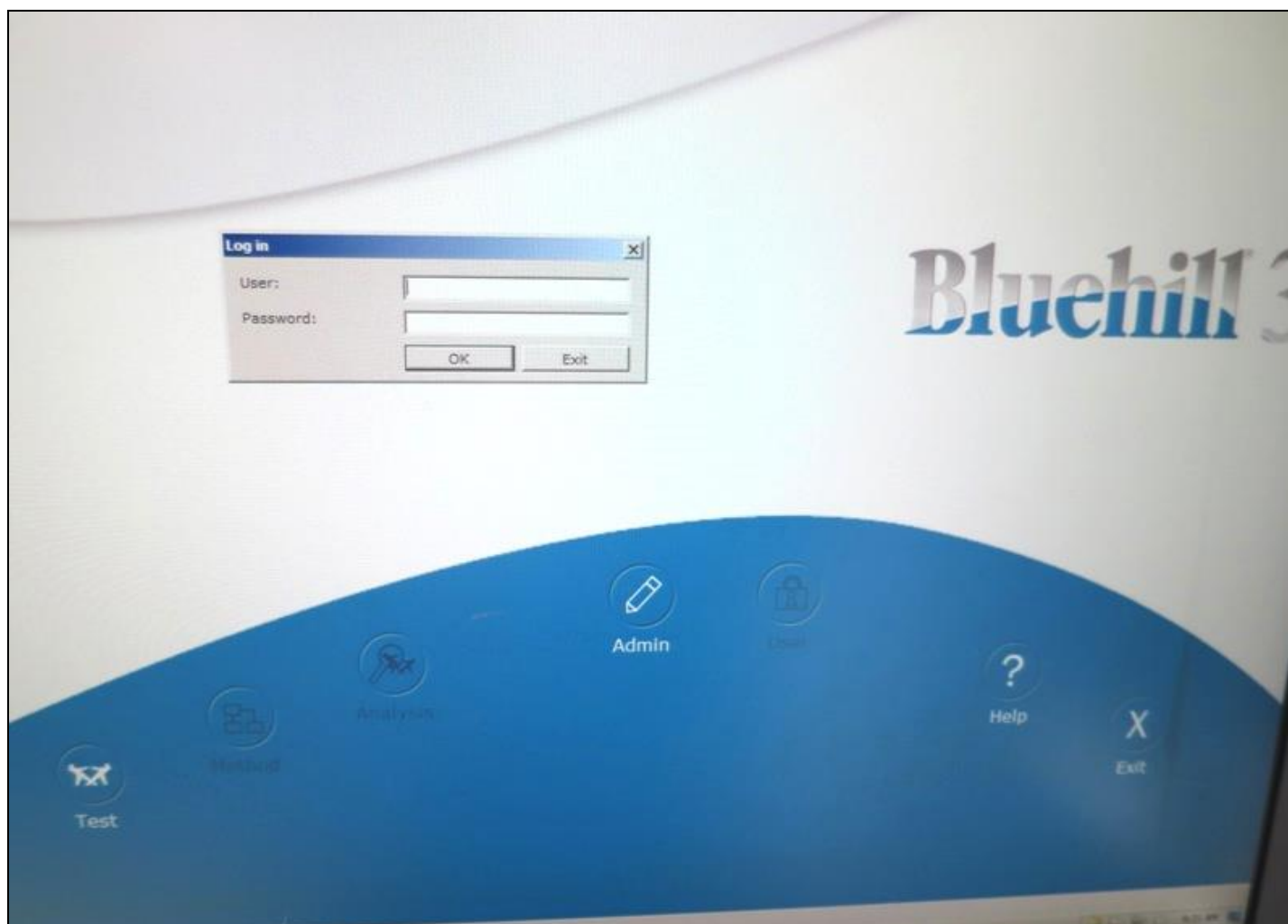


<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
10.0	OPERATING THE INSTRON FOR FINAL SHIMMING	N/A

10.1 Double-click on the “Bluehill 3” icon on the desktop as shown.

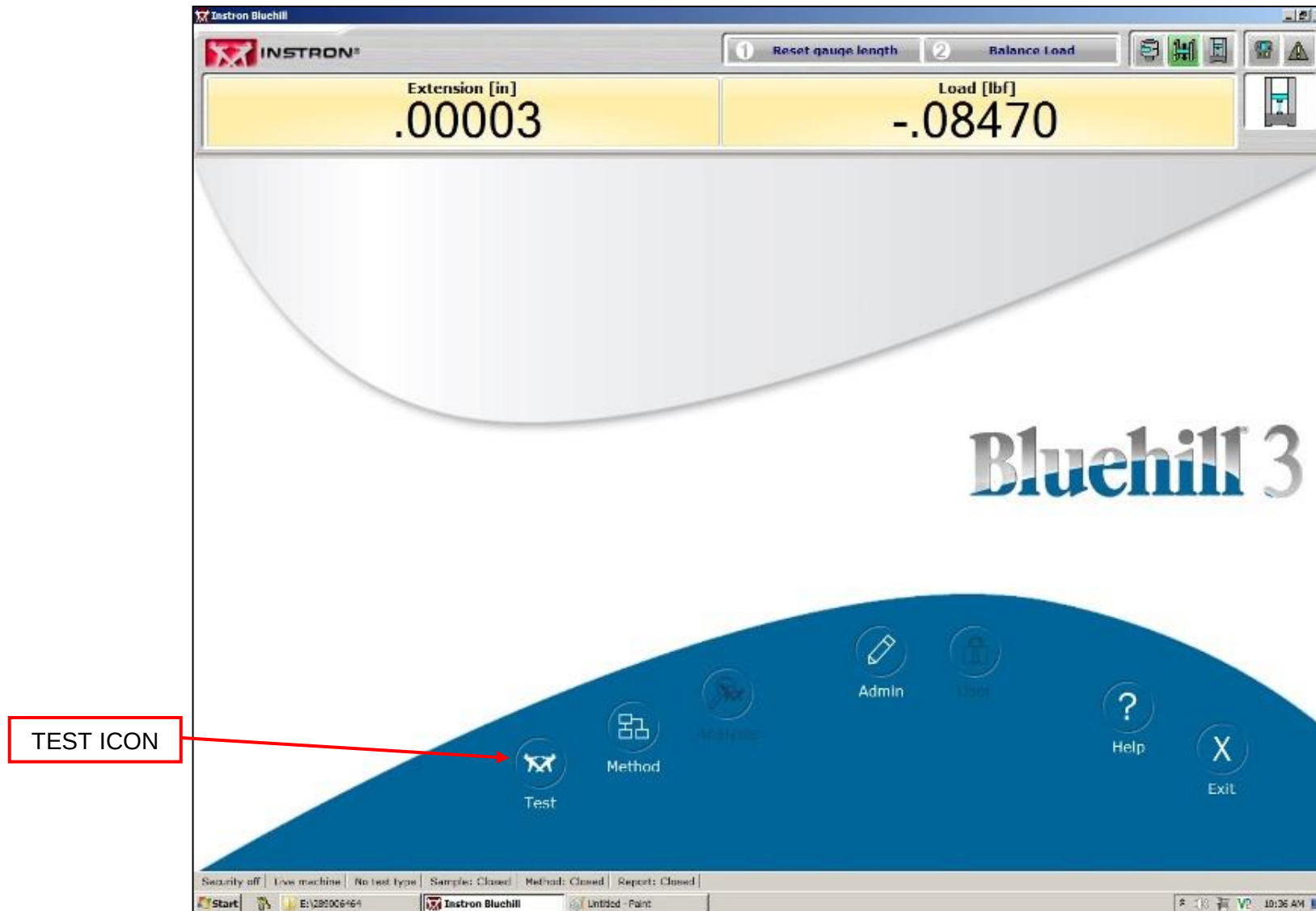


<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
10.0	OPERATING THE INSTRON FOR FINAL SHIMMING, cont'd	N/A
10.2	Enter User and Password names in the Login box as shown	
10.3	Click "OK" when finished.	



<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
11.0	BEGINNING THE INSTRON TEST	N/A

11.1 Click on the “Test” icon located at lower left side of screen.



OPER	OPERATION DESCRIPTION	TOOL NUMBER/DESCRIPTION
12.0	SELECTION OF METHOD	N/A
12.1	REFER TO PRELOAD SPECIFICATION PER DRAWING 289006760 , DOUBLE CLICK METHOD: "Column Manager 620 Preload.im comp".	

Instron Bluehill

INSTRON®

Extension [mm]
.00013

Bluehill Test

New Sample
Select Method
Continue Sample

Create a new sample

Step 1 of 2 – Choose an existing test method

a. Choose a recently used method or click **Browse...**
b. Verify the information in the Preview window.
c. Click **Next** to name the sample.

Method name: Column_Manager_620_Preload.im_comp Location: C:\Users

Most recently used methods:

Method name	Test type	Modified da
Column_Manager_620_PreloadFAST.im_comp	Compression method	2/18/2013
Valves_600_PreloadFAST.im_comp	Compression method	11/20/2013
Valves_550_Preload.im_comp	Compression method	5/28/2013
Column_Manager_620_Preload.im_comp	Compression method	3/25/2013
Valves_600_Preload.im_comp	Compression method	5/28/2013
CSC TENSION.im_tens	Tension method	5/31/2016
Valves_350_PreloadFAST.im_comp	Compression method	3/10/2017
MIXER_200_Preload.im_comp	Compression method	2/20/2015
CSC COMPRESSION.im_comp	Compression method	2/12/2014
CLOVER-SPRING_Preload.im_comp	Compression method	7/12/2012

METHOD:

"Column Manager 620 Preload.im
comp"

<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
12.0	SELECTION OF METHOD, cont'd	N/A
12.2	CLICK "NEXT" BUTTON ON SAMPLE SCREEN, REQUESTING SAMPLE NAME.	

Test

Name the new sample

Step 2 of 2 - Edit the sample settings

a. Enter a name in the Sample name field.
b. To change where a sample is stored, click **Browse...**
c. Click **Next** to proceed with testing.

Sample name: 1998_96
Do not use these invalid characters \ / : * ? " < > |

Location: C:\Users\Public\Documents\Instron\Bluehill3\Output
To choose a different sample location, click **Browse...**

Compression method: Valves_600_PreloadFAST.im_comp
To choose a different test method or method template, click **Back** to return to Step 1.

Next

Browse...

Back

OPER	OPERATION DESCRIPTION	TOOL NUMBER/DESCRIPTION
13.0	CALIBRATING THE INSTRON	N/A

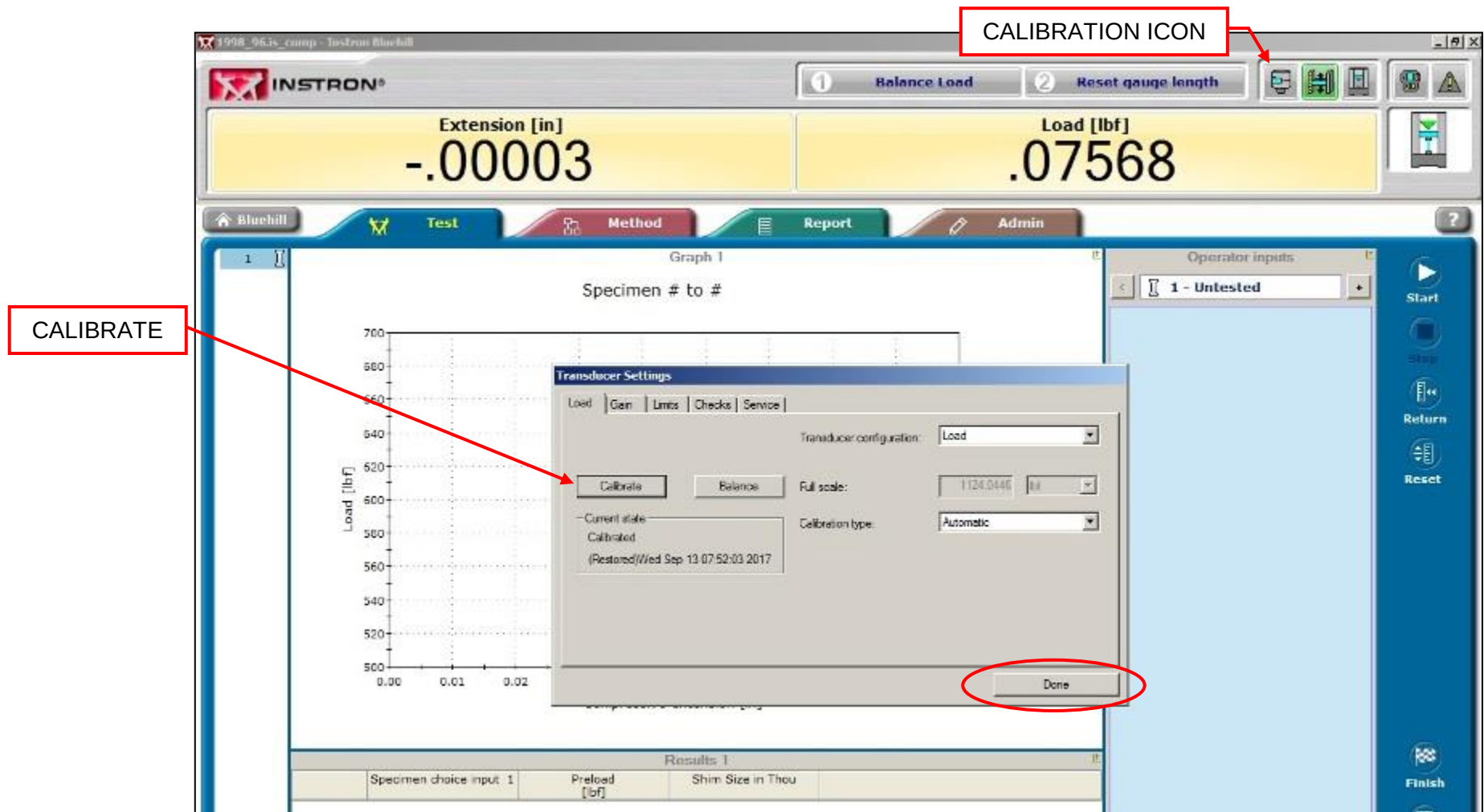
13.1 A CALIBRATION MUST BE DONE AT START OF SHIFT OR PRIOR TO FIRST CARTRIDGE PRESSING.

NOTE: MAKE SURE THAT THERE IS NO LOAD UNDER TEST BEFORE CALIBRATION.

13.2 CLICK THE CALIBRATION ICON ON TOP RIGHT OF SCREEN THEN CLICK CALIBRATE ON POP UP BOX.
A MESSAGE WILL APPEAR IN POPUP BOX WHEN CALIBRATION IS FINISHED.

13.3 CLICK "**DONE**"

NOTE: AN ERROR MESSAGE WILL OCCUR IF INSTRUMENT IS NOT IN CALIBRATION (SEE ENGINEER).



OPER OPERATION DESCRIPTION
14.0 PREPARE UNIT UNDER TEST

TOOL NUMBER/DESCRIPTION
(999035926) - NEST
(999035941) - RAM
(999038971) – V-BLOCK INSTRON

- 14.1 PLACE PREVIOUSLY ALIGNED VALVE CARTRIDGE INTO NEST RESTING ON INSTRON PLATEN WITH V-BLOCK AND CENTER CARTRIDGE UNDER RAM.
- 14.2 FOR CONSISTANCY PURPOSES, PLACE NEST (999035926) WITH ARROW FACING OPERATOR.
- 14.3 PLACE THE HOLE ON THE HOUSING (NOT SLOT) TOWARDS THE OPERATOR AS WELL.
- 14.4 POSITION RAM (999035941) CLOSELY OVER TOP OF STATOR.

**This step requires
'critical clean' control**

POSITION RAM WITHIN APPROXIMATLEY
.010 OVER TOP OF STATOR USING MANUAL
UP/DOWN SWITCH.



**NOTE: SCREW HOLE
(NOT SLOT) IN HOUSING
IS FACING OPERATOR.**

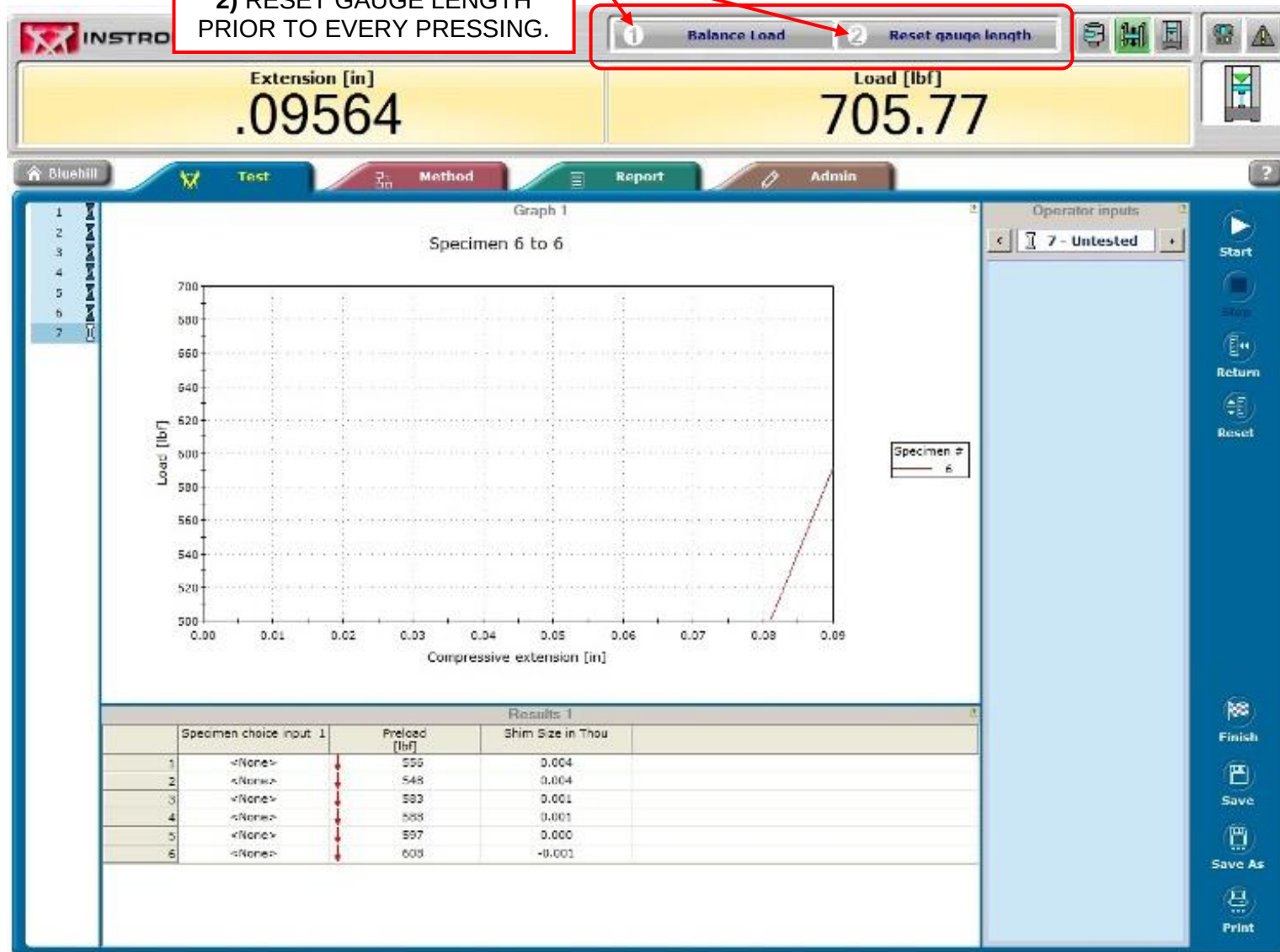
**NOTE: ARROW ON NEST
FACING TOWARD
OPERATOR.**

**MANUAL UP/DOWN SWITCH -
USED TO POSITION RAM
CLOSELY OVER STATOR.**

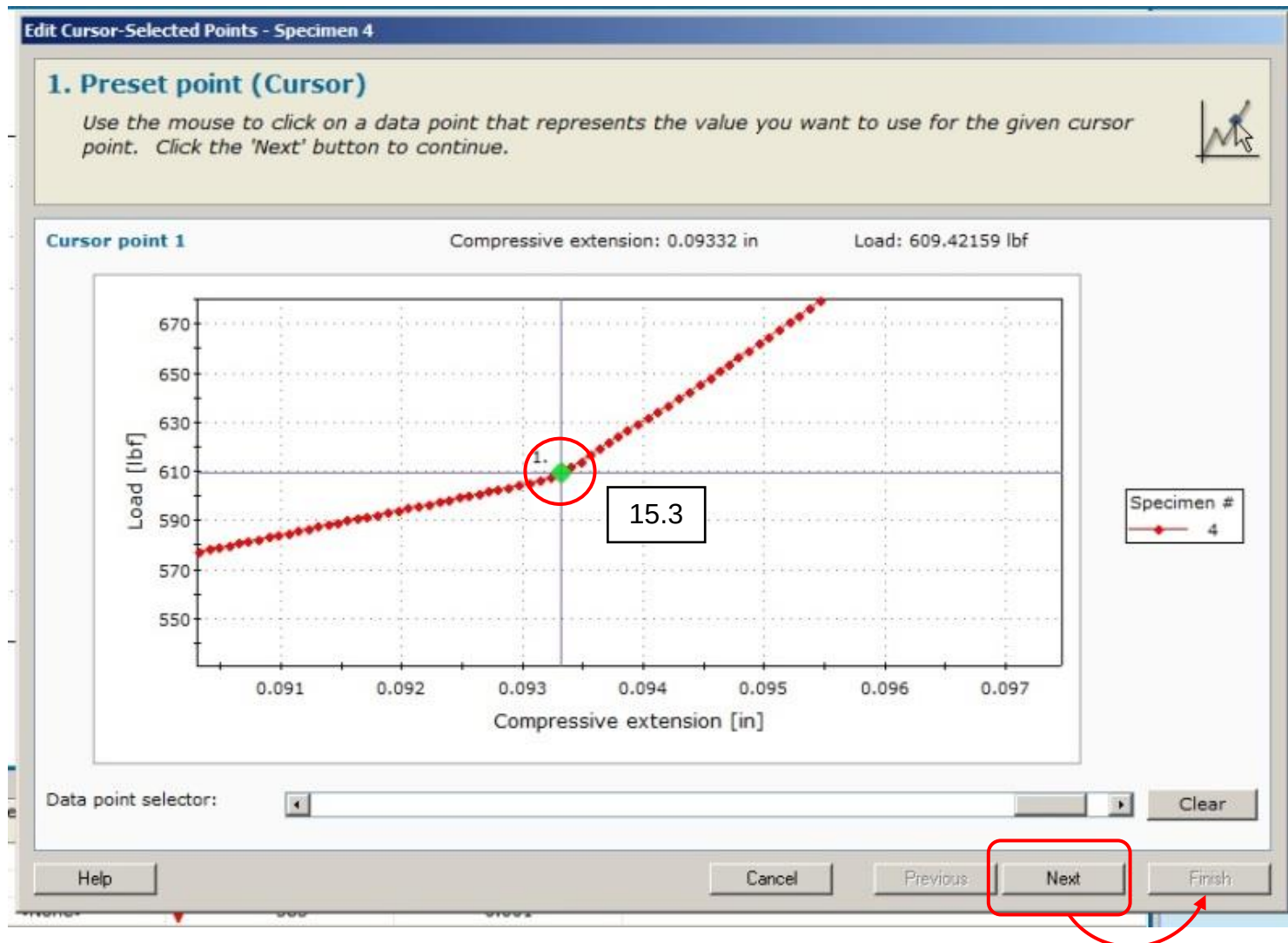


OPER
15.0OPERATION DESCRIPTION
PRESS TOGETHER USING THE INSTRONTOOL NUMBER/DESCRIPTION
N/A

- 1) BALANCE LOAD, THEN
- 2) RESET GAUGE LENGTH
PRIOR TO EVERY PRESSING.



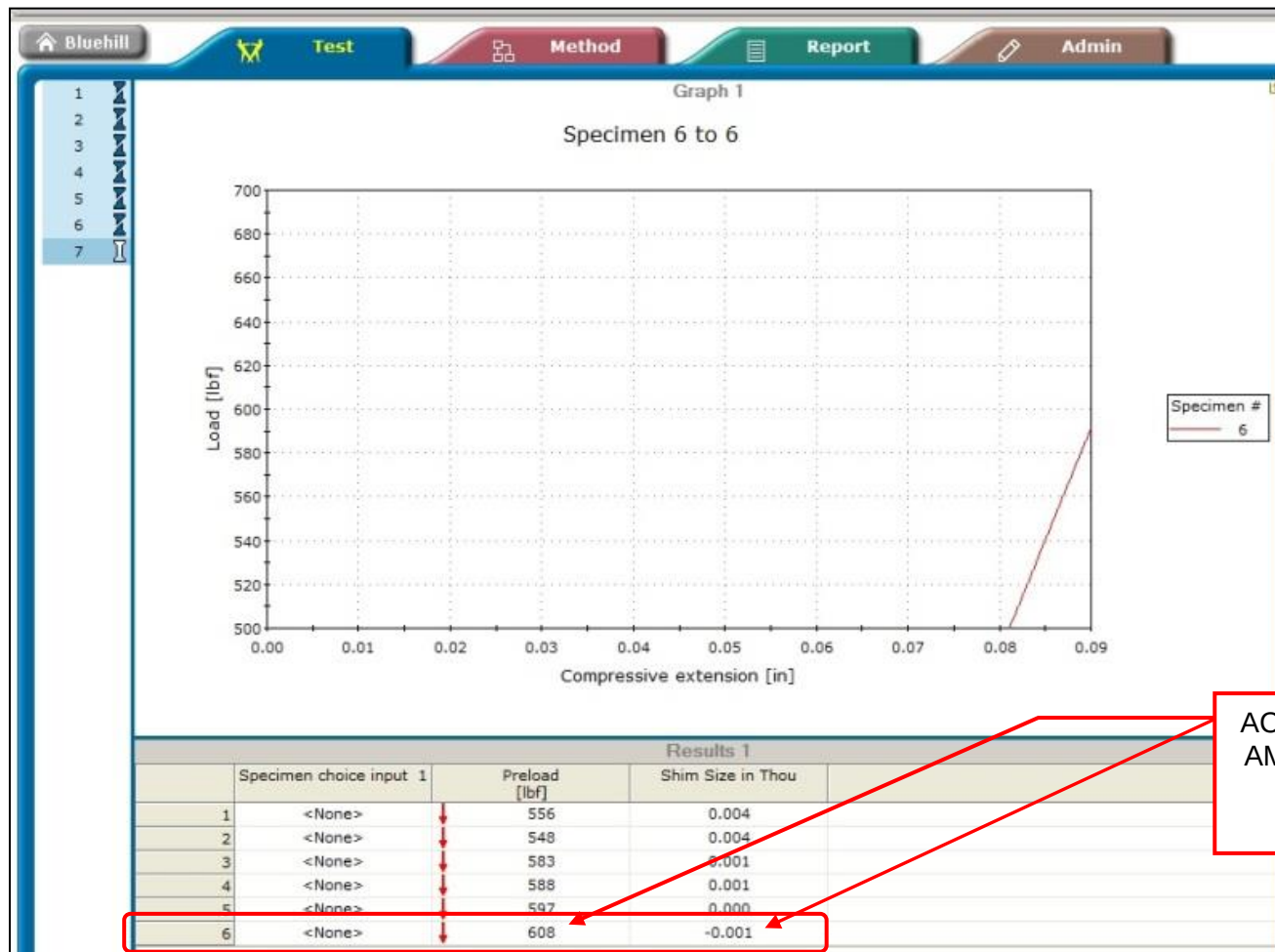
<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
15.0	PRESS TOGETHER USING THE INSTRON, cont'd	N/A
15.3	CLICK ON THE VERTEX OF THE ANGLE TRANSITION	
15.4	CLICK "NEXT" THEN "FINISH"	



OPER	OPERATION DESCRIPTION	TOOL NUMBER/DESCRIPTION
15.0	PRESS TOGETHER USING THE INSTRON, cont'd	N/A

- 15.5 ENGAGE PRESS **TWICE** AND READ SECOND RESULT.
- GO TO STEP 7.0 TO RE-PRESS.
 - GO TO STEP 1.0 IF RE-SHIMMING IS NECESSARY.
 - FIRST PRESSING IS TO SETTLE GREASE OUT OF ASSEMBLY.
 - RE-SHIM IF NECESSARY AND REPEAT PRESSING UNTIL RESULTING FORCE IS WITHIN SPECIFICATION PER **DRAWING 289006760**.

This step requires
'critical clean' control



ACTUAL PRELOAD AND
AMOUNT OF SHIMS TO
REACH SPEC. IS
DISPLAYED HERE

<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
15.0	PRESS TOGETHER USING THE INSTRON, cont'd	9/64 INCH ALLEN DRIVER (18 IN/LBS)

15.6 ONCE LOAD SPEC. IS ACHIEVED, TIGHTEN ALL THREE SCREWS TO (18IN/LBS), WHILE VALVE CARTRIDGE IS UNDER COMPRESSION.

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
WAT025247	3	8-32 Allen Cap crews

**This step requires
'critical clean' control**

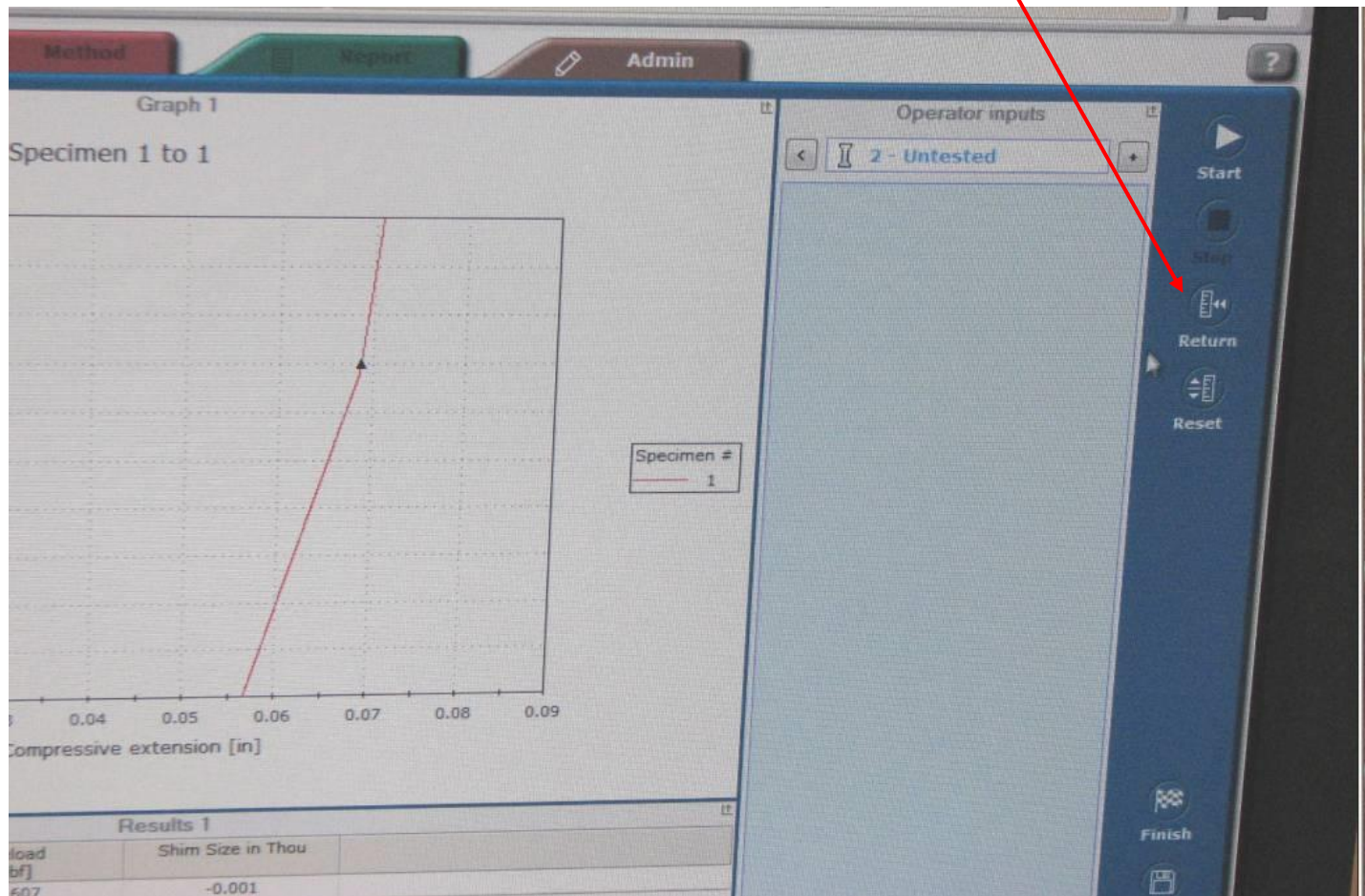


**WAT025247 (3X)
TIGHTEN TO 18 IN/LBS**

<u>OPER</u> 15.0	<u>OPERATION DESCRIPTION</u> PRESS TOGETHER USING THE INSTRON, cont'd	<u>TOOL NUMBER/DESCRIPTION</u> N/A
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This step requires
'critical clean' control

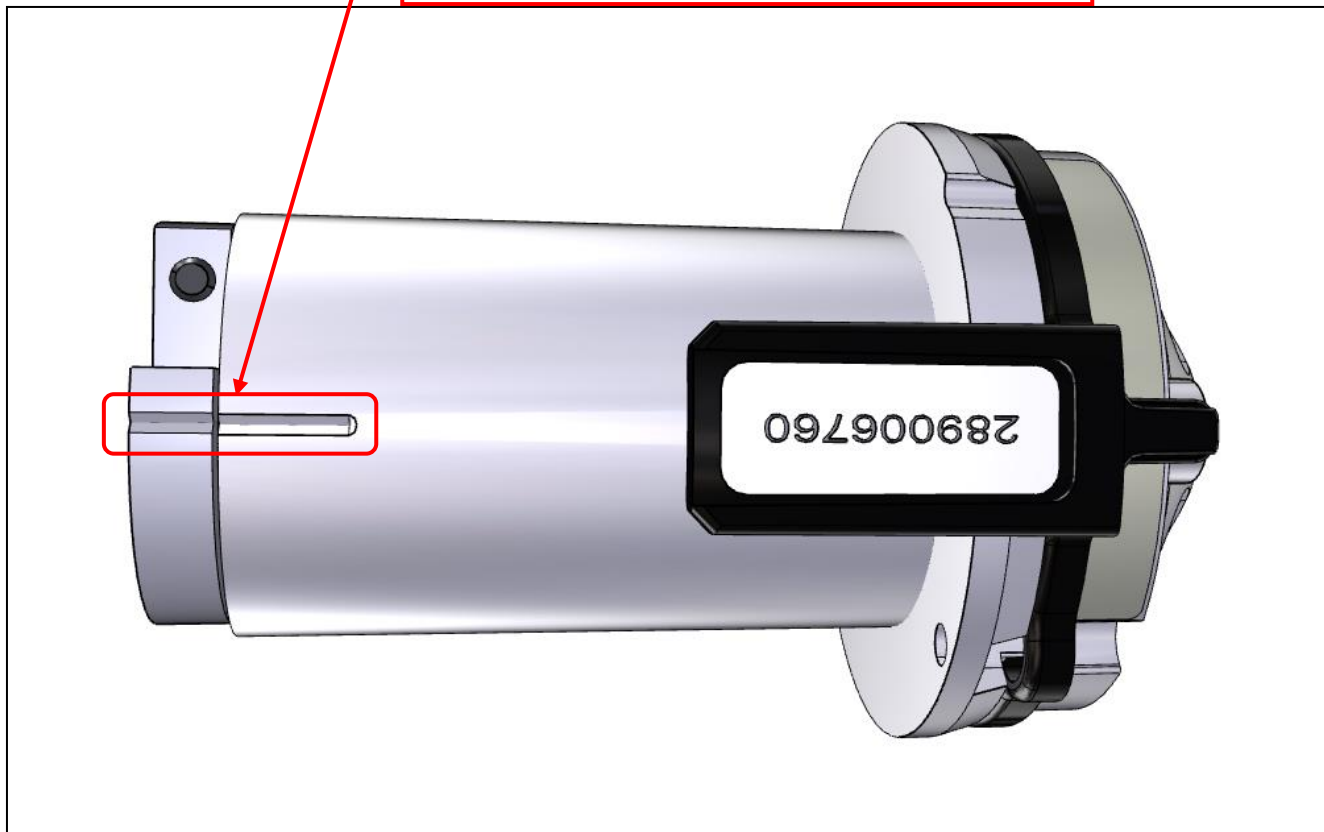
CLICK RETURN TO RELEASE
COMPRESSION AND
REMOVE CARTRIDGE



<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
16.0	PREPARE FOR LEAK TEST	3/32 INCH ALLEN TORQUE WRENCH (7 IN/LBS) 999028080 - ALIGNMENT TOOL
16.1	ASSEMBLE CLAMP (405004702) TO SHAFT AND TIGHTEN TO (7IN/LBS), VERIFY ALIGNMENT. CARTRIDGE IS NOW READY FOR FINAL LEAK TESTING.	

This step requires
'critical clean' control

NOTE: ALIGN MARKS ON CLAMP TO
HOUSING. FAILURE TO DO SO WILL RESULT
IN ROTOR DAMAGE!



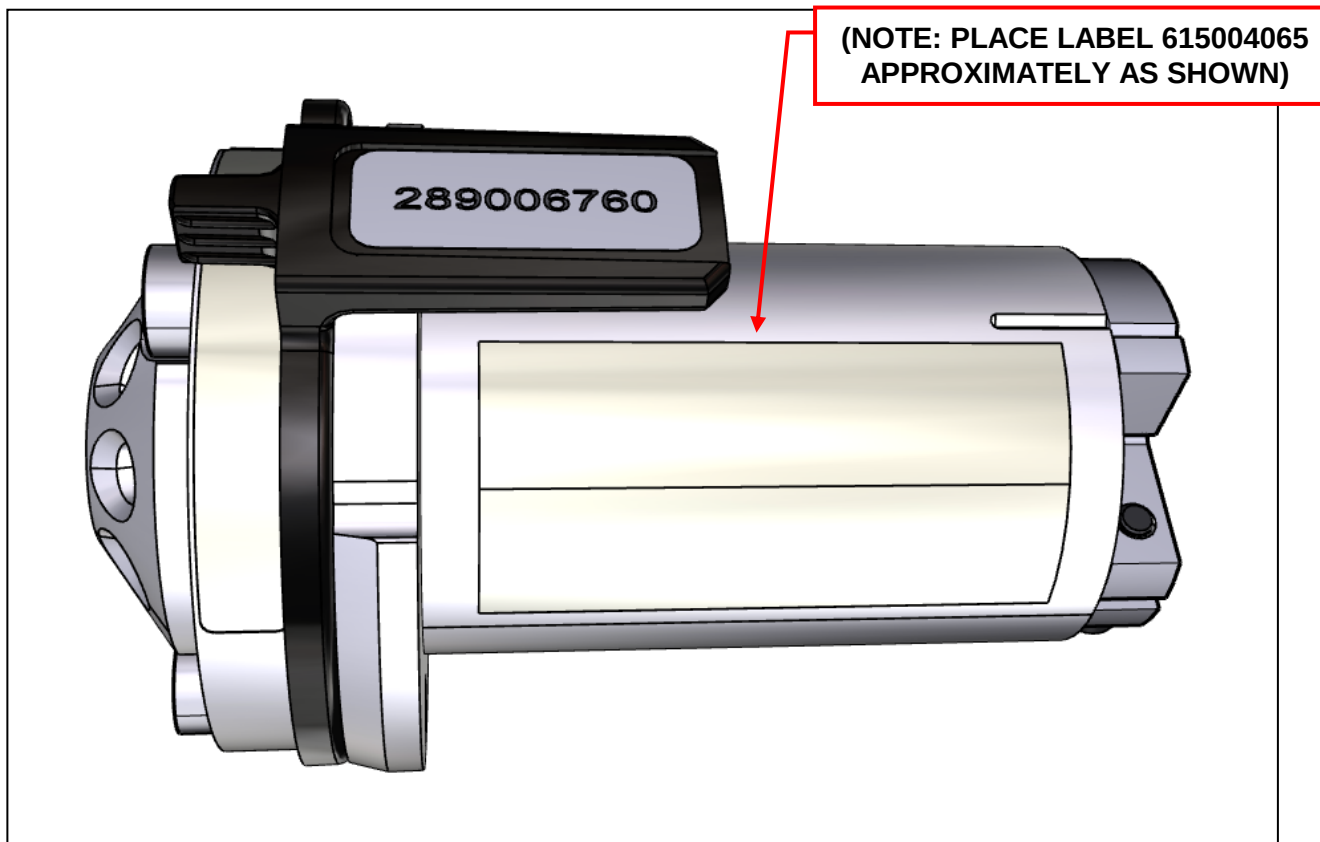
<u>OPER</u>	<u>OPERATION DESCRIPTION</u>	<u>TOOL NUMBER/DESCRIPTION</u>
17.0	TESTING	N/A

17.1 TEST ALL VALVES PER TEST SPEC. (USE CRITICAL CLEAN GLOVES DURING TESTING)

18.0 ATTACH LABEL TO HOUSING

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
615004065	1	Label, Do Not Disassemble

NOTE: (Refer to Routing for packaging instructions.)



END