Frac Isolation Sleeve Running Procedures

UNIVERSAL WELLHEAD SERVICES HOLDINGS, LLC.

Installation Procedure for Frac Isolation Sleeve

LICENSED UNDER API 6A

FRAC ISOLATION SLEEVE

Product Description

Frac Isolation Sleeves are available for casing sizes up to 5-1/2" OD. The sleeve is Xylan coated, and will remain rust free. It isolates 100% of the tubing head for fracturing pressures up to 10,000 psi. UWS Frac Isolation System arrives on location pre-assembled and pre-tested.

The System is compatible with standard TCM tubing heads. **Four Basic Components:**

- ☐ The tubing head assembly with a 7-1/16" 5K top flange.
- ☐ A modified secondary seal – accepts the bottom of the frac sleeve and seals over the production casing.
- ☐ A frac adapter – bolts to the top of the tubing head and has a 7-1/16" 10k top flange.
- ☐ The Frac Sleeve – extends from the top of the frac adapter down into the top of the secondary seal.

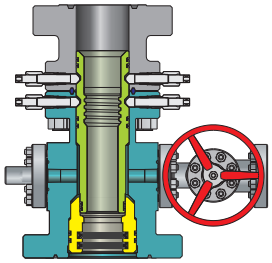
Removal can easily be accomplished in the field.

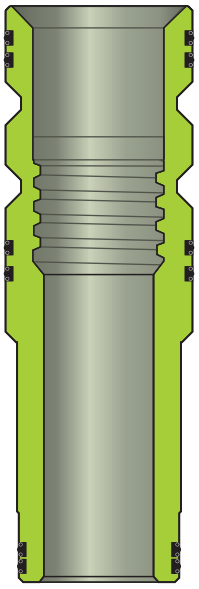
PURPOSE

The Frac Isolation System is used when fracturing pressures will exceed the rated working pressure of the Tubing Head.

Required Forms:

1. **DELIVERY TICKET**
2. **FIELD SERVICE ORDER**
3. **JSA**





Frac Sleeve
Cross Sectional View

SCOPE

These instructions cover running and retrieval. The sleeve can be removed on-location (by the customer) with no field service charges or special tools.

The sleeve can be removed under pressure with a Hydraulic Lubricator.

For complete instructions on Frac Sleeve removal with a Lubricator, See “Type-H Back Pressure Valve/2-Way Check Valve Installation and Retrieval Procedures”.

Required Equipment:

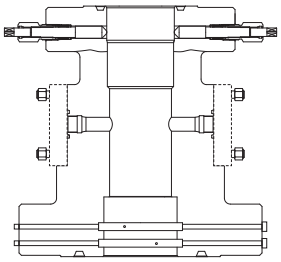
MAIN EQUIPMENT

FLUIDS

OTHER

Required Equipment *(Continued)*

TUBING HEAD	Qty.	Rated WP
☐ **Standard TCM**	1	3K btm X 5k top
No modifications required.		- or - 5K btm X 5k top
RING GASKET (UPPER)	1	
RING GASKET (LOWER)	1	



SECONDARY SEAL OPTIONS

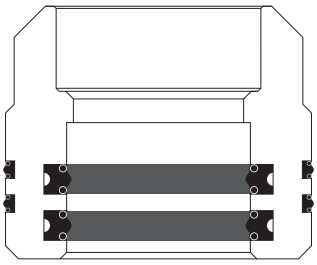
Two Different Secondary Seals Are Available For This System

☐ **IT-40**		10,000 psi
HNBR-90 O-rings (1/2")	2	
HNBR-90 O-rings	2	

● O-ring

☐ **IT-FS**		15,000 psi
HNBR-90 FS Seals	2	
HNBR-90 Springsele®	2	

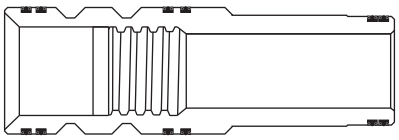
FS



IT-FS Secondary Seal
Cross Sectional View

FRAC SLEEVE

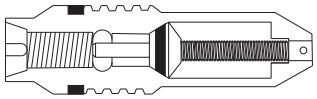
Springsele®		15,000 psi
HNBR, 90 durometer seals	6	



-17 deg. F to +410 deg. F

BPV / 2-WAY CHECK PROFILE

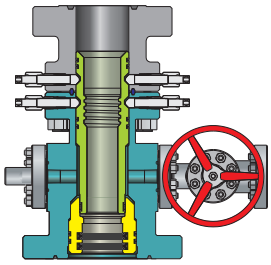
Standard 4" prep., – or –		
Standard 5" prep.		



LOCKDOWN PINS

Standard Lock-down pin engagement dimensions stenciled on the flanges.		

A. Installation Procedure:



The Frac Sleeve is installed in the tubing head "in-shop", and arrives on location pre-tested.

1 ☐ **The Lockdown pins will be properly engaged and should not be moved.**

2 ☐ Standard casing cut-off is **4.50 inches** from the casing head flange face.

☐ **a.** Always measure your cut-off as they vary with tubing heads. Allow the ring gasket spacing to be your buffer.

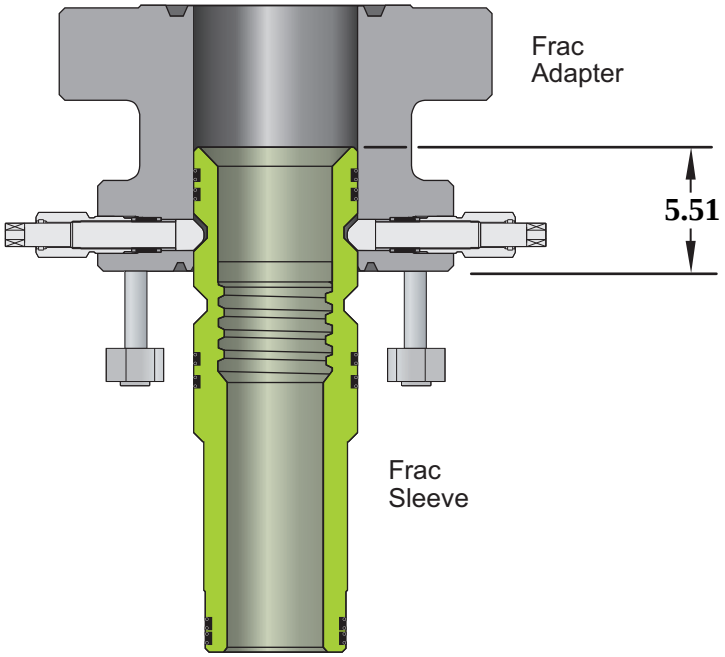
☐ **b.** There is a **1.20 inch** space between the upper FS seal and the shoulder where the pipe will stop.

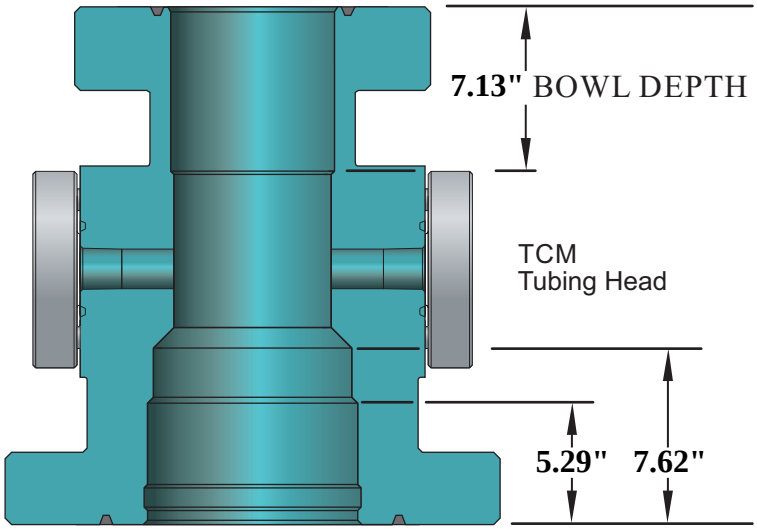
3 ☐ Bevel the OD of the casing with a 3/8" x 3/16" bevel.

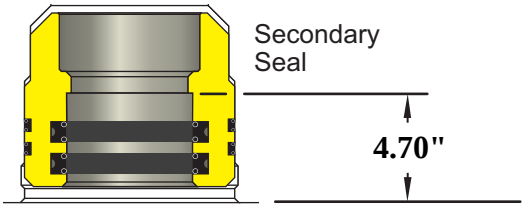
4 ☐ Bevel the ID of the casing with a 1/4" x 1/8" bevel.

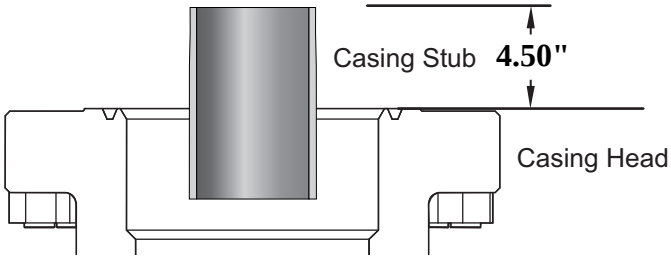
5 ☐ Clean the entire OD of the casing stub with a flapper wheel and inspect the casing for seams, burrs and defects.

Repair any problems before proceeding.









B. Lower the Wellhead Assembly

6 ☐ Attach proper lifting chains to the Tubing Head assembly and center it over the casing stub.

Ensure the Tubing Head Assembly is level.

7 ☐ Clean the secondary seal in the Tubing Head and both mating ring grooves. Inspect for defects and repair before proceeding.

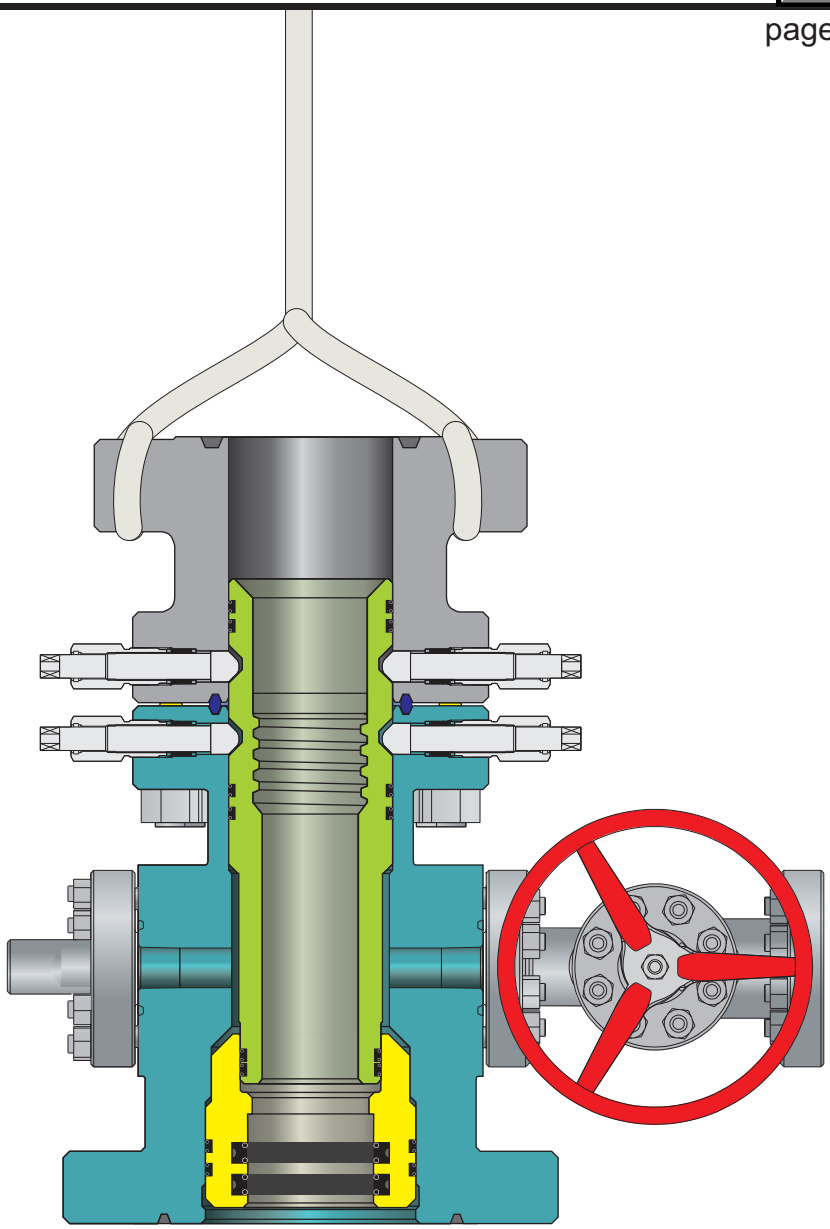
8 ☐ Install a new ring gasket in the casing head ring groove. Fill the void with oil, being careful not to let oil into the ring groove.

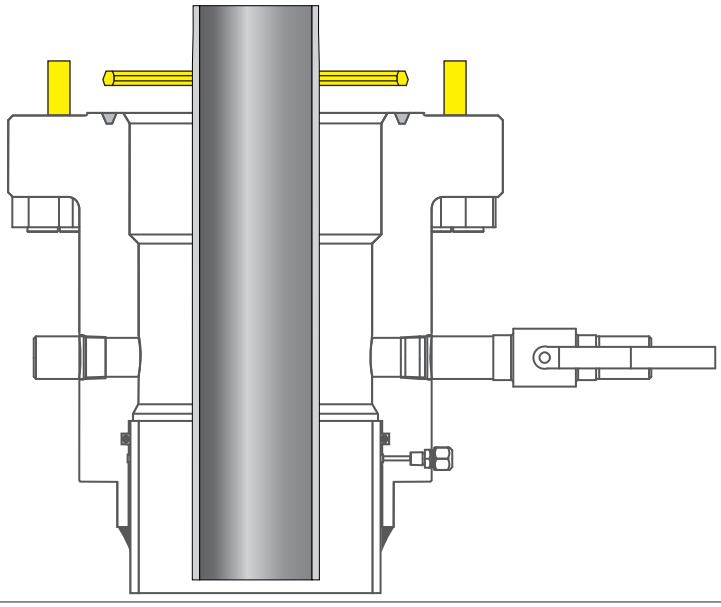
9 ☐ Apply a coat of oil to the casing stub and to the inside seals in the secondary seal.

10 ☐ Install studs under both outlets in the Tubing Head Assembly.

11 ☐ Slowly lower the Tubing Head Assembly onto the Casing Stub – Keep the Tubing Head Assembly **LEVEL** at all times.

12 ☐ When the Tubing Head Assembly is all the way down, verify that both seals in the secondary seal have covered the casing stub by looking into the Tubing Head bore.





C. Torque and Test

13 ☐ Install the remaining studs and nuts and torque to API specifications.

Ensure that the studs have the proper lubricant on them before installing nuts.

14 ☐ Test the void to **80% of casing collapse but do not exceed the flange working pressure.**

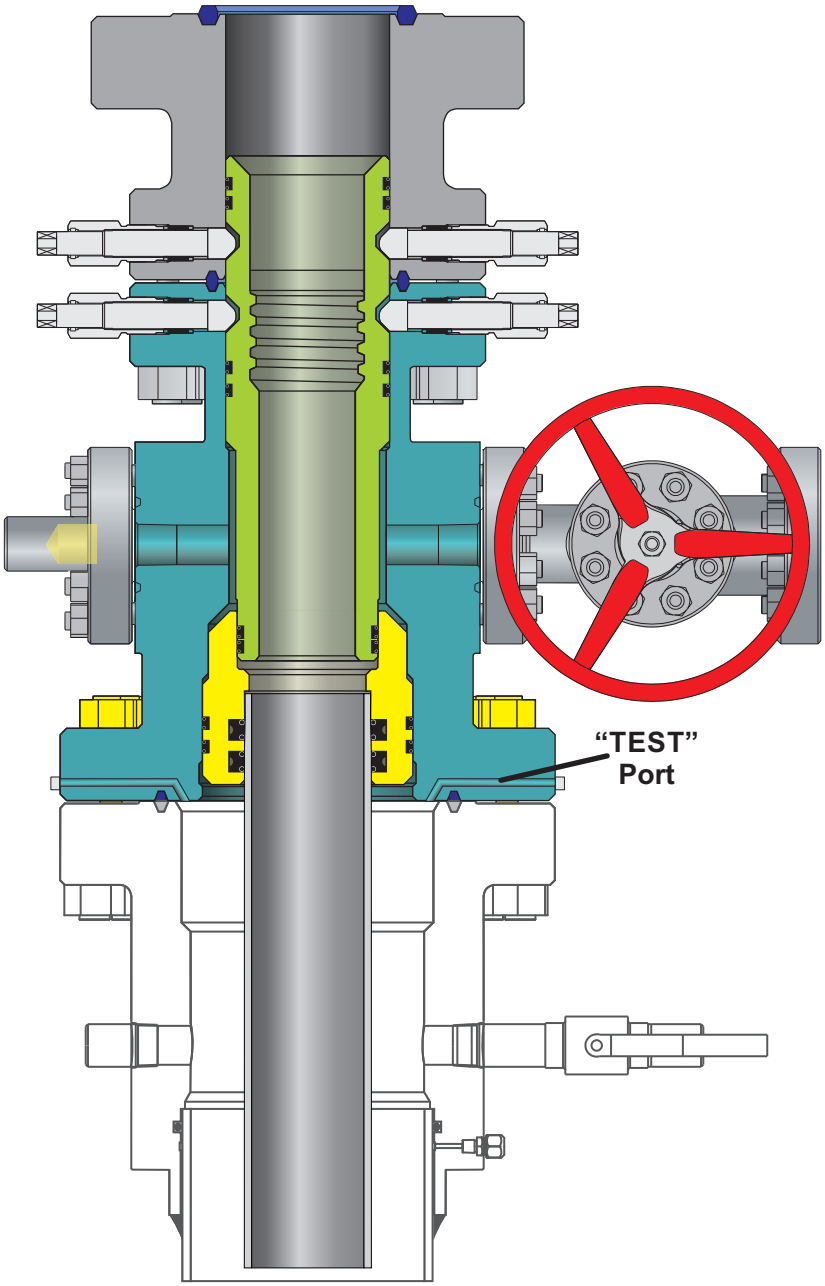
Hold the test **for 15 minutes** – or – until the Well Site Supervisor is satisfied.

Bleed off all pressure after the test.

15 ☐ Install the capping flange or Frac Valve at this time and torque per customer specifications.

16 ☐ Leave the Frac Valve or capping flange bleed valve **OPEN** unless otherwise instructed by the Well Site Supervisor.

17 ☐ ***The integrity of the seals can be monitored during the frac job by placing a pressure gauge down-stream of the open casing valve.***



D. Testing The Lower Master Frac Valve Connection To The Tubing Head

1 ☐ After installing the lower master (or entire frac stack), **OPEN all valves** and ensure there is no pressure in the well bore.

2 ☐ Using a "Dry Rod" with the proper size 2-way check valve installed, lower the check valve through the frac stack.

Following proper UWS procedures
(see UWS BPV / 2-way Check Running Procedures)
Install the 2-way check into the frac sleeve.

3 ☐ Remove the Dry Rod and proceed with the frac stack test.

Removing the 2-way check valve:

4 ☐ Verify that the stack is fully **OPEN** and all pressure has been bled down.

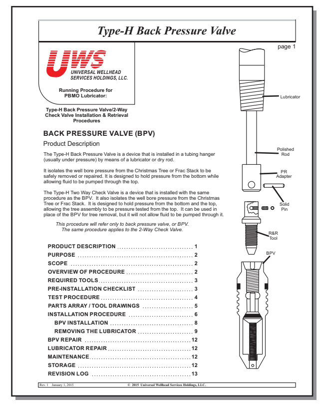
5 ☐ Using the Dry Rod, follow UWS procedures to remove the 2-way check.

Verify that there is no trapped pressure below the 2-way check valve before removing it.

UWS recommends the use of liquid on top of the check valve if gas is heard to determine if the well is pressured, or on a vacuum.

* A lubricator can be used to install or remove the 2-way check in the event there is well bore pressure.

See Running Procedure:


Type-H Back Pressure Valve
page 1
UWS UNIVERSAL WELLHEAD SERVICES HOLDINGS, LLC.
Running Procedure for PBMO Lubricator:
Type-H Back Pressure Valve/2-Way Check Valve Installation & Retrieval Procedures

BACK PRESSURE VALVE (BPV)
Product Description

The Type-H Back Pressure Valve is a device that is installed in a tubing hanger (usually under pressure) by means of a lubricator or dry rod.

It isolates the well bore pressure from the Christmas Tree or Frac Stack to be safely removed or repaired. It is designed to hold pressure from the bottom while allowing fluid to be pumped through the top.

The Type-H Two Way Check Valve is a device that is installed with the same procedure as the BPV. It also isolates the well bore pressure from the Christmas Tree or Frac Stack. It is designed to hold pressure from the bottom and the top, allowing the tree assembly to be pressure tested from the top. It can be used in place of the BPV for tree removal, but it will not allow fluid to be pumped through it.

This procedure will refer only to back pressure valve, or BPV. The same procedure applies to the 2-Way Check Valve.

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Follow proper UWS procedures:

"Type-H Back Pressure Valve / 2-way Check Valve Installation and Retrieval Procedures"

See pages 8, 9, and 10 for

Option 1	*Option 2*	*Option 3*

Frac Stack Removal Procedures

The upper portion of the frac stack can be removed in a pressure situation by installing the proper back pressure valve with a Lubricator. It can be retrieved through the Lower Master Valve or left in the well as a secondary barrier until you are ready to remove it.

Again, follow UWS Running Procedures for setting and removing back pressure valves.

E. Removal Procedures:

Option 1	*Option 2*	*Option 3*

Option 1: Remove the Sleeve and the Frac Adapter at the same time.

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1 ☐ After verifying that appropriate down-hole plugs are set and that all pressure has been bled down, remove the frac stack.

2 ☐ Verify that the lock down pins on the frac adapter are fully engaged.

Always verify lock-down pin engagement dimensions stenciled on the flange.

3 ☐ Completely back out the lock down pins on the tubing head flange.

Verify pin engagement dimension stenciled on the flange.

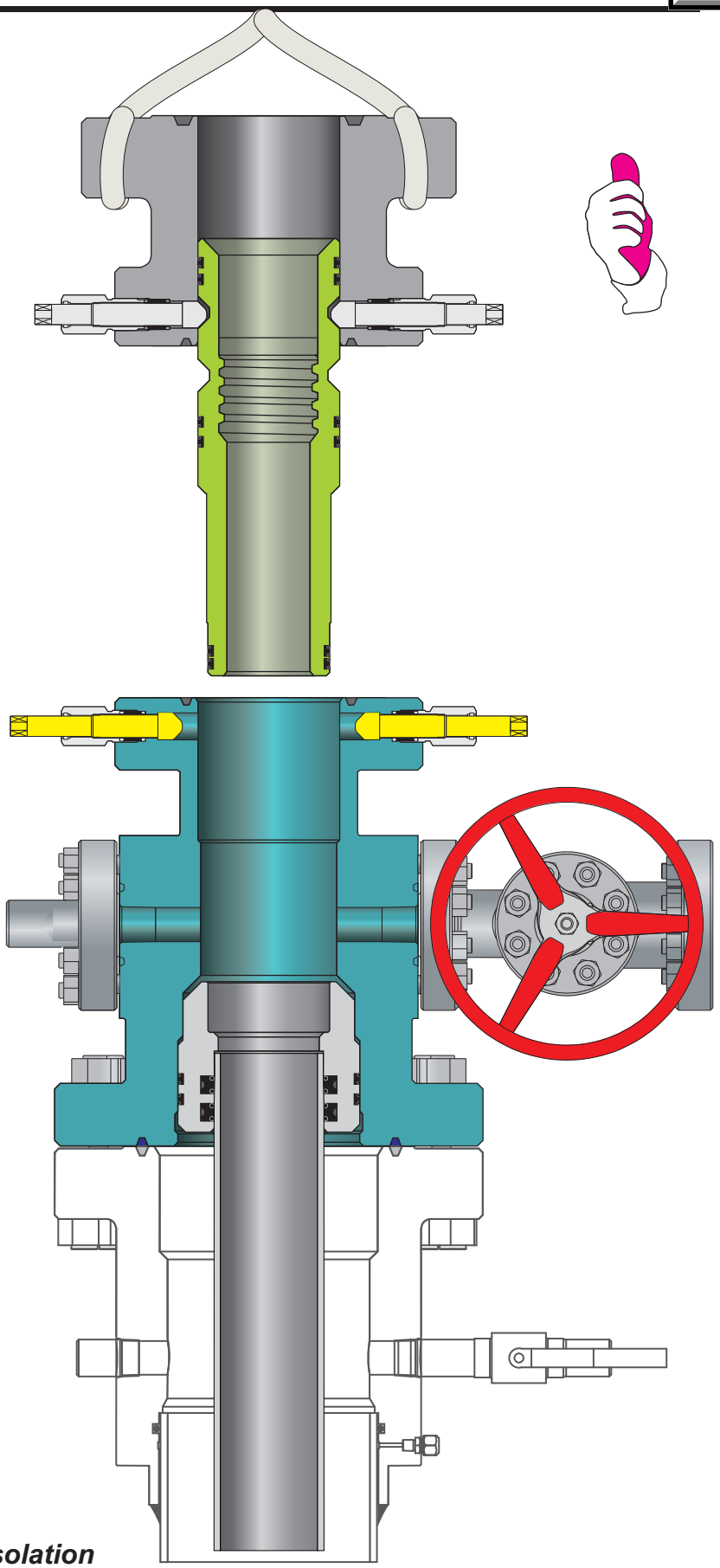
4 ☐ Fully open the casing valve and ensure there is no obstruction or trapped pressure.

5 ☐ Remove the nuts from the studs on the frac adapter's 7-1/16” 5k lower connection.

6 ☐ Using approved chains or slings, slowly lift the frac adapter.

Keep the adapter level at all times. The Isolation Sleeve with come up with the adapter.

7 ☐ ***Take care not to damage the isolation sleeve when setting it down.***



E. Removal Procedures *(Continued)*

Option 1	*Option 2*	*Option 3*

Option 2: Remove the Sleeve independently of the Frac Adapter.

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1 ☐ Verify that all pressure has been bled down and appropriate plugs set.

The sleeve can be pulled through the frac stack.

2 ☐ Make up a Lifting Tool to the Frac Sleeve ID.

The **Frac Sleeve** has internal:

5" Type-H BPV prep. –and–

5-1/2" 8rd LTC Casing Thd.

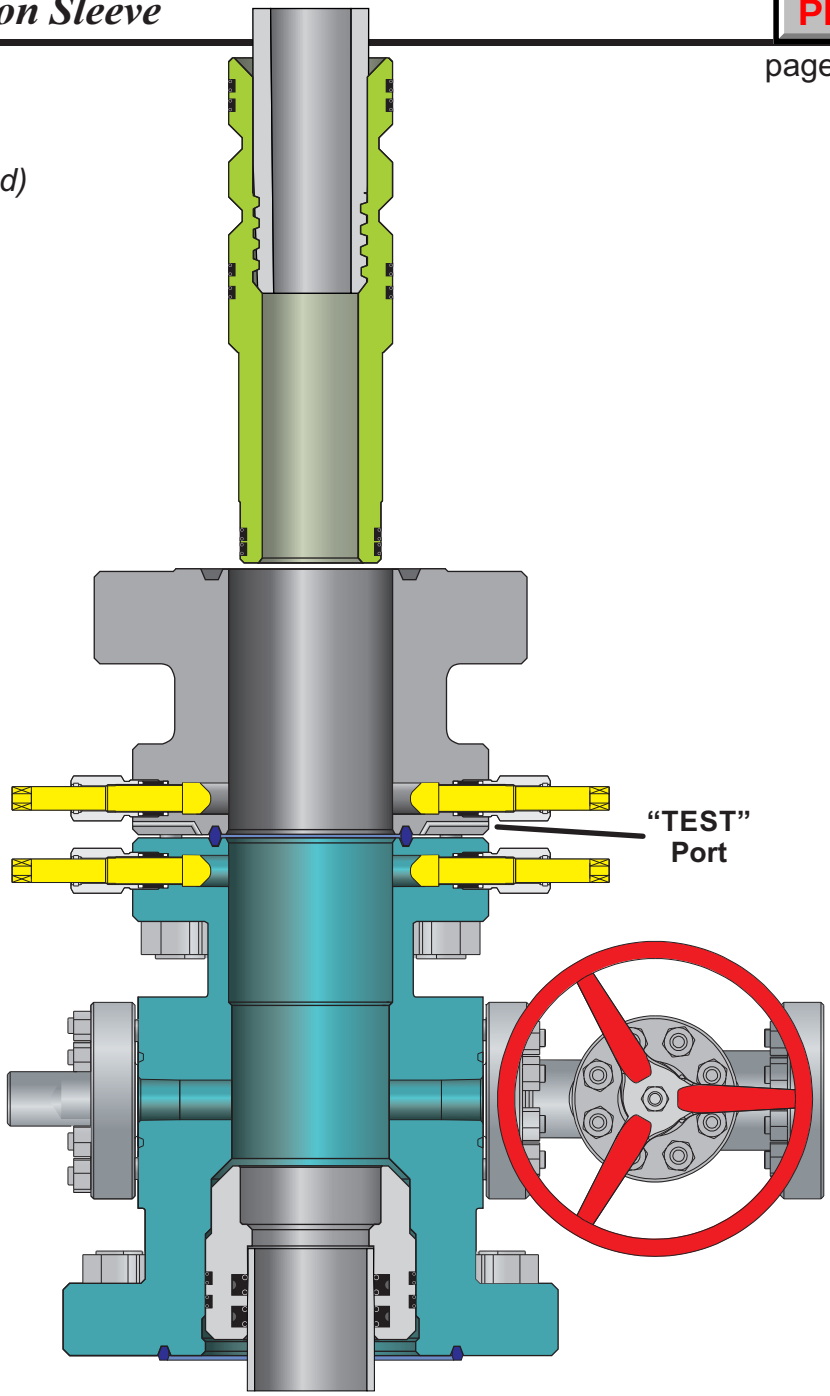
3 ☐ Fully open the casing valve and ensure there is no obstruction or trapped pressure.

4 ☐ Install a bleed fitting in the frac adapter test port and verify that there is no trapped pressure behind the sleeve.

Remove the bleed fitting and re-install the dust cap.

5 ☐ Completely back out **ALL of the lock down pins** on the **Tubing Head.**

Verify Pin engagement dimension stenciled on the tubing head flange.



6 ☐ Completely back out **ALL of the lock down pins** on the **Frac Adapter.**

Verify pin engagement dimensions stenciled on the adapter flange.

7 ☐ Pull the isolation tool straight up with a slow vertical lift.

E. Removal Procedures *(Continued)*

Option 1	*Option 2*	*Option 3*

Option 3: Remove the Sleeve with a Back Pressure Valve and Hydraulic Lubricator.

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1 ☐ Rig up a hydraulic lubricator with a 5" type-H BPV on top of the frac stack.

Ensure there is enough rod to go all the way through the stack.

Also verify that there is enough room to close the lower master after removing the sleeve.

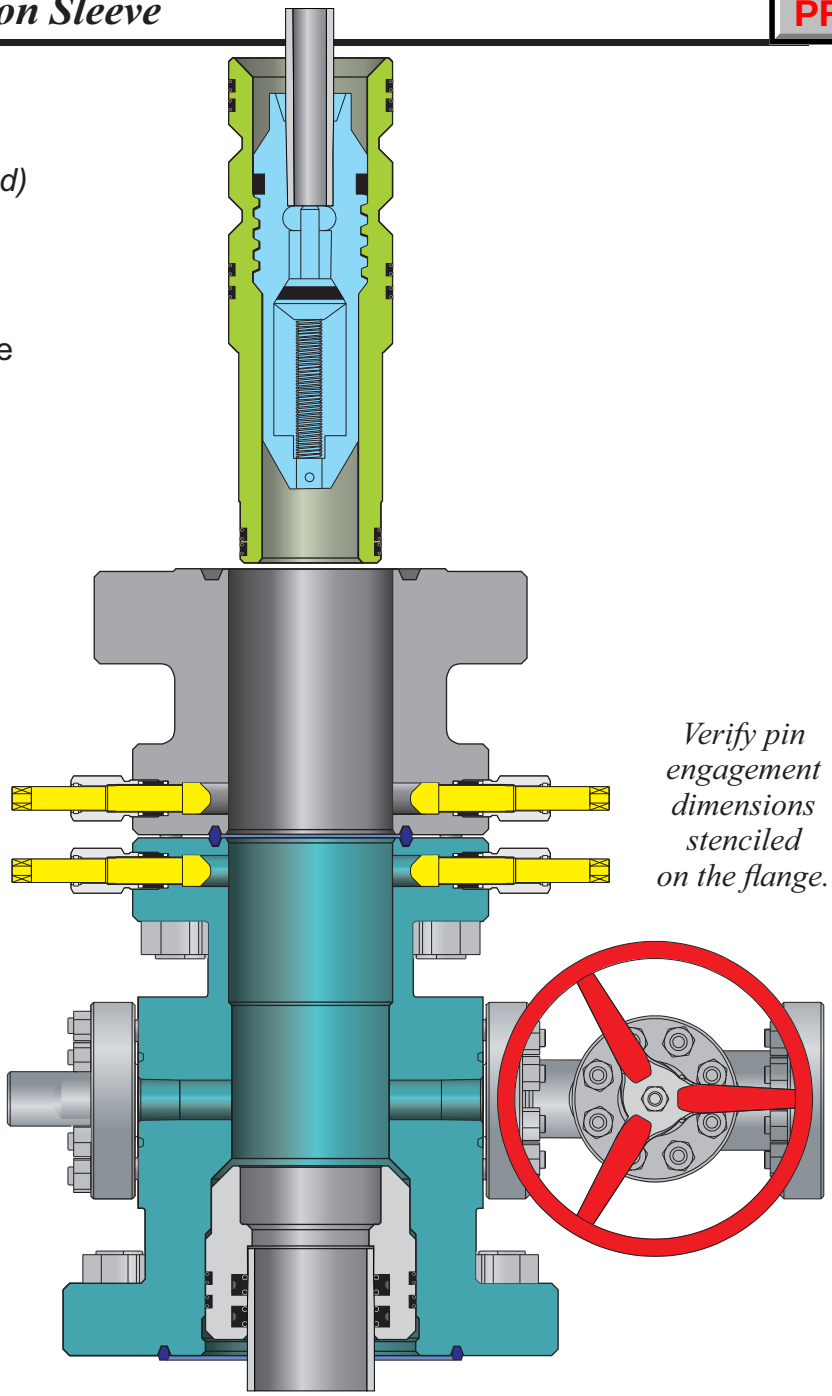
2 ☐ Equalize the lubricator and wellbore / frac stack.

3 ☐ Pressurize the upper lubricator barrel and drive down the BPV.

4 ☐ Ensure the Lock down pins in the tubing head are snug tight only.

5 ☐ Install a bleed fitting in the frac adapter test port and verify that there is no trapped pressure behind the sleeve. Remove the bleed fitting and re-install the dust cap.

6 ☐ Engage the **5" BPV** into the sleeve bore and turn to the right until the BPV is fully engaged and well bore pressure has equalized with the Lubricator.



Verify pin engagement dimensions stenciled on the flange.

7 ☐ Completely back out **ALL of the lockdown pins** on the **Tubing Head**.

8 ☐ Completely back out **ALL of the lockdown pins** on the **Frac Adapter**.

9 ☐ Pressurize the lower barrel and bleed off the upper barrel to remove the Sleeve.

10 ☐ Once the Sleeve has passed the lower master, close the gate and bleed down all pressure.

Revision Log

Revision	Date	Details
0	February 4, 2015	Field Procedure

ENGINEERING

Approval Log

Approved By: _____ *SIGNATURE*

_____ *PRINT NAME*

Revision	*REVIEWER* NAME	*REVIEWER* TITLE	DATE
0	Bob Allen	VP Operations	February 4, 2015

FIELD

Date of Printing ***10:19 pm, 02/07/2015*** *Please ensure the latest revision is in use.*

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