

**INSTALLATION PROCEDURE FOR THE 11" 5K X 11" 5K  
(20" X 9-5/8" X 7" X 4-1/2") "MLSS" SPLIT SPEED  
HEAD SYSTEM W/ BASEPLATE**

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Summary:

This document contains the installation procedure for the 11" 5K X 11" 5K (20" X 9-5/8" X 7" X 4-1/2") "MLSS" Split Speed Head system with a Baseplate.

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## Safety Notice

FalconView Energy Products recognizes product safety during assembly and testing as a primary objective. Therefore, the following safety instructions must be observed:

- All tests must be carried out within a test cell or a specifically designated, clearly identified test area. Controlled access to such areas is required to ensure safety.
- Caution must be exercised during assembly and testing to ensure that all fittings/hydraulic equipment are properly installed.
- Under no circumstances will a pressurized connection be adjusted. Pressure must be vented prior to adjustment.
- The specified test pressure should be approached in increments as follows:
  - 3,000 psi: 1,000 psi, 2,000 psi
  - 5,000 psi: 1,000 psi, 3,000 psi
  - 7,500 psi: 2,000 psi, 5,000 psi, 6,500 psi
  - 10,000 psi: 2,000 psi, 5,000 psi, 7,500 psi, 8,500 psi, 9,500 psi

**Hold each stage for approximately 1 minute before progressing to the next level. Pressure above 7,500 psi should be reached in increments of 1,000 psi.**

- Pressure must be stabilized prior to approaching equipment being tested.
- The test area being used must not be left unattended under any circumstances while the equipment is being pressurized.
- Extreme caution must be taken when lifting heavy items. Only certified lifting equipment will be used.
- Assemblies can be extremely heavy and shift unexpectedly causing injury. Extreme caution must be used.
- Should there be any doubt about the intent of this procedure at any time during testing, stop testing immediately and consult the engineering department.
- Proper PPE shall be worn during testing (safety glasses and protective footwear).



**Persons participating in the tests described in this document must read and understand this document in its entirety prior to testing.**

**WARNING**

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**Any visible defect or other non-conformance should be reported to QA for non-conformance reporting to generate an NCR. No further progress is allowed without engineering approval.**

**NOTE**

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## Abbreviations

The following abbreviations are used throughout this procedure.

Abbreviation	Description
NCR	Non-Conformance Report
ASSY	Assembly
P/N	Part Number
API	American Petroleum Institute
PSL	Product Specification Level
HPU	Hydraulic Power Unit
ID	Inner Diameter
OD	Outer Diameter
LP	Line Pipe
NPT	National Pipe Thread
CW	Clockwise
CCW	Counter-Clockwise
BOP	Blowout Preventer
RKB	Rotary Kelly Bushing
ESD	Emergency Shutdown
POOH	Pull Out Of Hole
RIH	Run In Hole
PSI	Pounds Per Square Inch

## 1.0 General Installation Guidelines

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Make sure you obtain and use all required personal protective equipment prior to beginning any of the procedures that follow.

### NOTE

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The following information is meant to be a generic installation guide. The procedures that are detailed in this section should be considered as general and specific only to this particular system. FalconView Energy Products recommends that a qualified FalconView Energy Products service representative always be called for any job pertaining to the FalconView Energy Products equipment.

### CAUTION

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### 1.1.1 Before Installation

1. Always make sure that all equipment that will be used in conjunction with FalconView Energy Products is compatible. This would include but would not be limited to the BOP stack, casing head, BOP test plugs, bowl protectors, running tools for each of the above items that are conventional wellhead related, etc.
2. Always make sure that spare parts are available for any item that may be damaged or destroyed during installation. Examples might be elastomer seals, ring gaskets, metal to metal seals, etc.
3. Make sure the proper number and type of ring gaskets, studs and nuts, are available for the particular job that may require them.
4. When possible, stack up the wellhead system in the shop prior to installation to assure correct fit and function.

## 1.2 Documentation

All pressure tests are to be documented and a copy of the documentation retained with the master copy of this procedure. **All hydrostatic and hydraulic pressure tests are to be documented with an accompanying strip chart record.**

**\*\* NOTES: A chart record of all pressure testing is required and will contain the following information as a minimum:**

- Part number and serial number
- Identification number for all pressure recording devices
- Signature of the person performing the test and date
- Location

### **1.3 General Notes**

1. Minimum hold period for hydrostatic primary body test is 3 minutes. Minimum hold period for hydrostatic secondary body test is 15 minutes.
2. **Acceptance Criteria Hydrostatic Test:** Acceptance criteria for hydrostatic tests shall be governed by “no visible leakage” and a strip chart record with a pressure “settling” rate not to exceed 5% of test pressure/hour and the final “settling” pressure shall not fall below the test pressure before the end of the test hold period.
3. If any of the tests cause mechanical damage, the equipment shall be repaired and test repeated. Handling damage to be reported to the Engineering and the decision will then be made to repair immediately or to complete the test and then repair.
4. All cavities to be tested must be evacuated of as much air as possible to ensure accurate pressure tests. When testing small volumes in an environment subject to temperature change, consideration should be given to using a chart recorder which records temperature across the hold period (this is optional and not a mandatory requirement). Interspaces and cavities adjacent to those being pressure tested must be vented to enable leak detection.



## 2.0 General Installation Procedures

### 2.1 Scope

This procedure details the necessary steps for an installation procedure for the 11" 5K X 11" 5K (20" X 9-5/8" X 7" X 4-1/2") "MLSS" Split Speed Head System covering the Drilling, Production, and Emergency Phases.

The Assembly drawings and Bill of Materials (BOM) contain all the necessary information to validate each particular part, assembly or sub-assembly. These documents should be read and fully understood before proceeding.

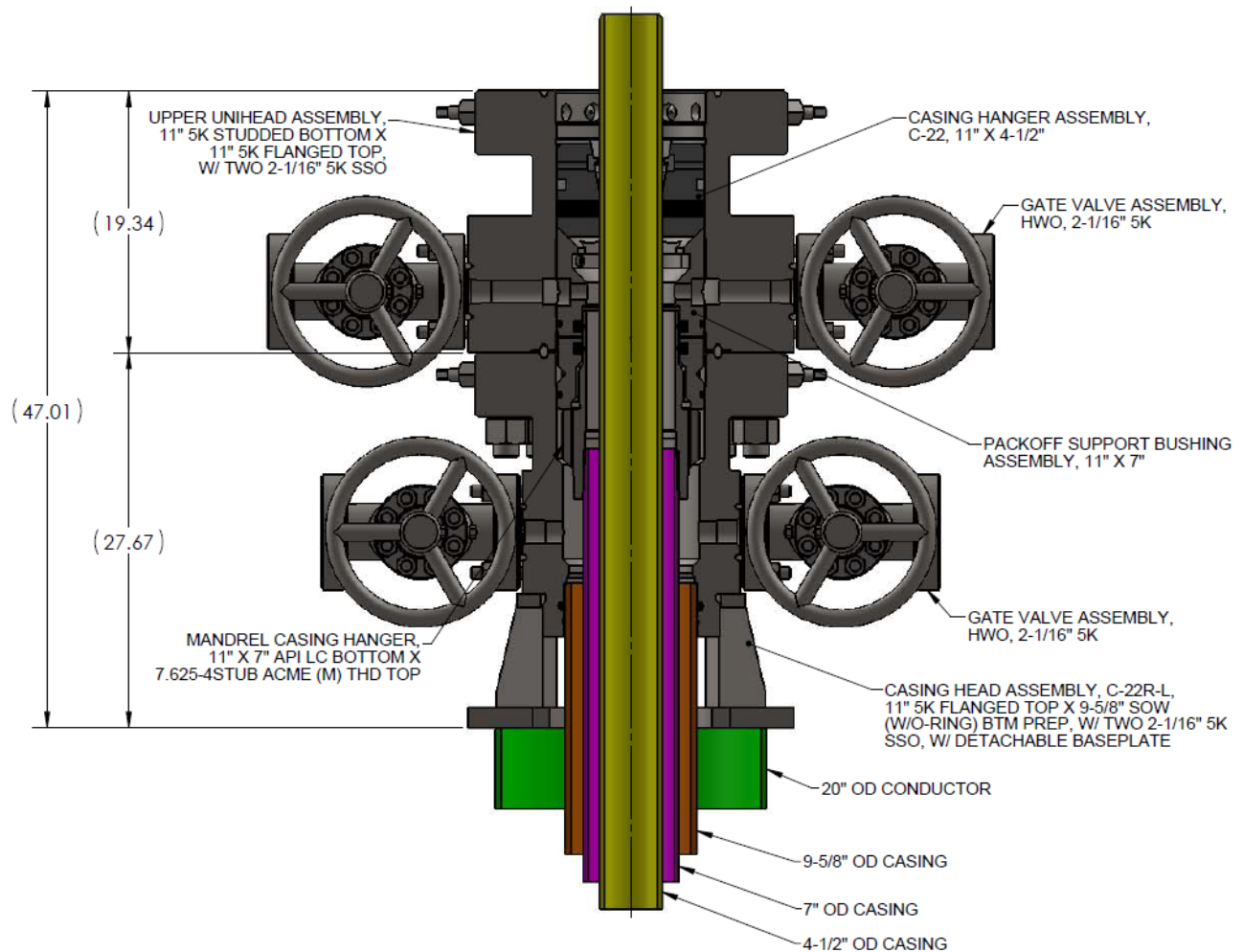
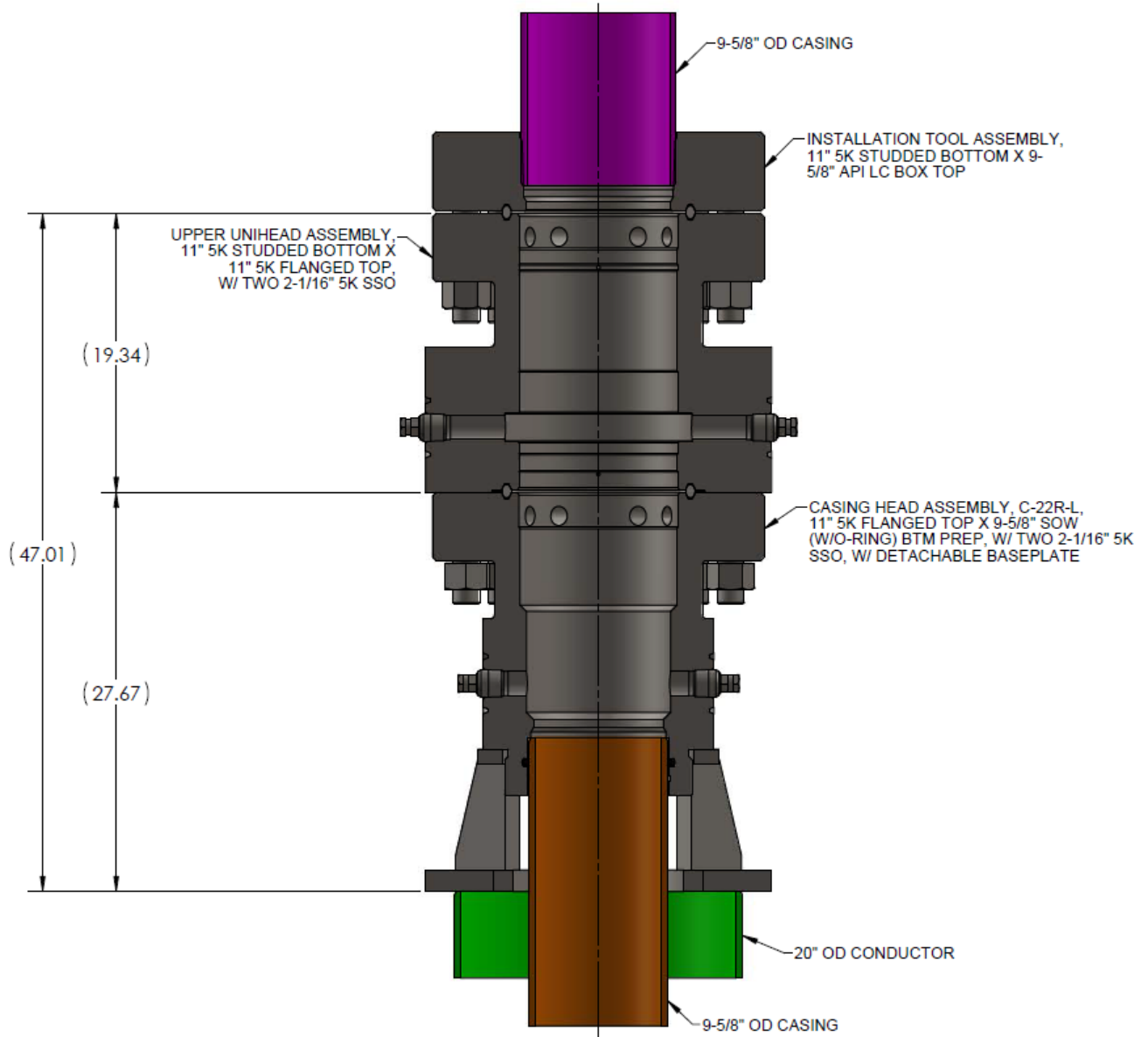


Figure 1: 11" 5K X 11" 5K MLSS Speed System Layout

## 2.2 Installation of the Casing Head/Split Speed Head Assembly

1. Run the 20" casing as required.
2. Determine the correct elevation for the top of the Split Speed Head Assembly in relation to ground level. In most cases the top of the casing head (lower part of the Split Speed Head) will be level with the surface grade.
3. Cut the 20" at a predetermined elevation. Confirm that the casing cutoff is level. Check level 90 degrees apart.
4. Drill out for surface casing as required; ensuring enough rat hole exists for the 9-5/8" to land on top of the 20".
5. Examine the Split Speed Head Assembly, verify that:
  - The SOW pup joint is installed and welded into the bottom of the casing head.
  - The casing collar is installed onto the pin of the pup joint.
6. Remove all LDS assemblies from both 11" flanges and install the Dummy LDS plugs (with O-rings) into the flange connections.
7. Remove all body lube fittings, pipe nipples, and ball/gate valves from the Split Speed Head Assembly and install flush mounted plugs & VR plugs.
8. Install the Detachable baseplate over the 9-5/8" casing stub. Land the Detachable baseplate on top of the 20" conductor pipe.
9. Install and makeup the 9-5/8" landing joint with the Split Speed Head running/retrieval tool onto the Split Speed Head Upper Assembly. Torque to API specifications.
10. Pick up the Split Speed Head Assembly, remove protector collar, and screw the Split Speed Head Assembly with pup joint onto the makeup the threaded connection. Torque to thread vendor specifications.



**Figure 2: Installation of "MLSS" Speed System through Rig Floor**

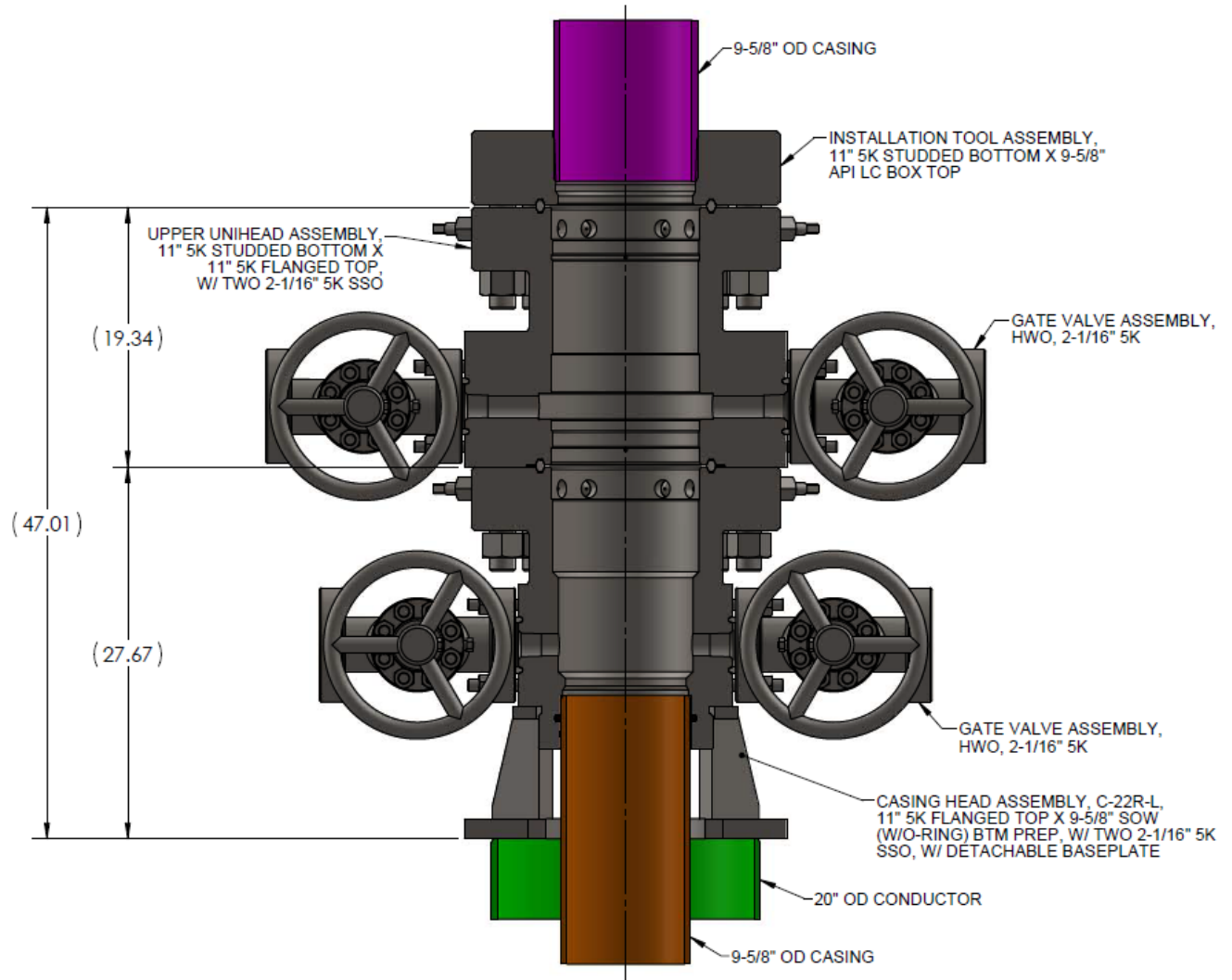
11. Pull slips, spider & master bushings from the rotary table and slowly lower the Split Speed Head Assembly through the rig floor and land the Split Speed Head Assembly onto the Detachable baseplate.
12. Check orientation is still acceptable and confirm that the Split Speed Head Assembly is level before cementing. Check level 90 degrees apart.
13. Chain down the cement head and cement as required.
14. Immediately after cementing, retrieve all flush mounted plugs and VR plugs.
15. Flush out the Split Speed Head Assembly and all openings to ensure all ports are free of cement/debris.
16. Remove landing joint and the Split Speed Head running/retrieval tool.
17. Remove Dummy LDS plugs and install “ET” style Lockdown Screw Assemblies in both 11” flanges. Install all body lube fittings and install ball/gate valves.



**NOTE**

**The Split Speed Head Assembly comes from the factory with a SOW (Slip On Weld) Connection. Field welding is required, and the Split Speed Head Assembly is to be tested to WP (Working Pressure) of the Head or 80% of the Casing Collapse, whichever is lowest.**

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**Figure 3: Installation of Gate Valves & LDS Assemblies**

## 2.3 Installation of the 11” 5K Split Speed Head Lower BOP Test Plug & Test the BOP Stack

1. Examine the BOP Test Plug/Running Tool. Verify that:
  - Elastomer seals are intact and in good condition.
  - Internal threads are clean and in good condition.
2. Orient the BOP Test Plug with the elastomer down and the J-slot lugs in the up position.
3. Make up a joint of drill pipe to the BOP Test Plug with rig tongs.
4. Lubricate the elastomer seal on the BOP Test Plug with a coat of light oil.
5. Fully retract the lockdown screws on the Split Speed Head Assembly (both lower and upper) by rotating them counter clockwise.

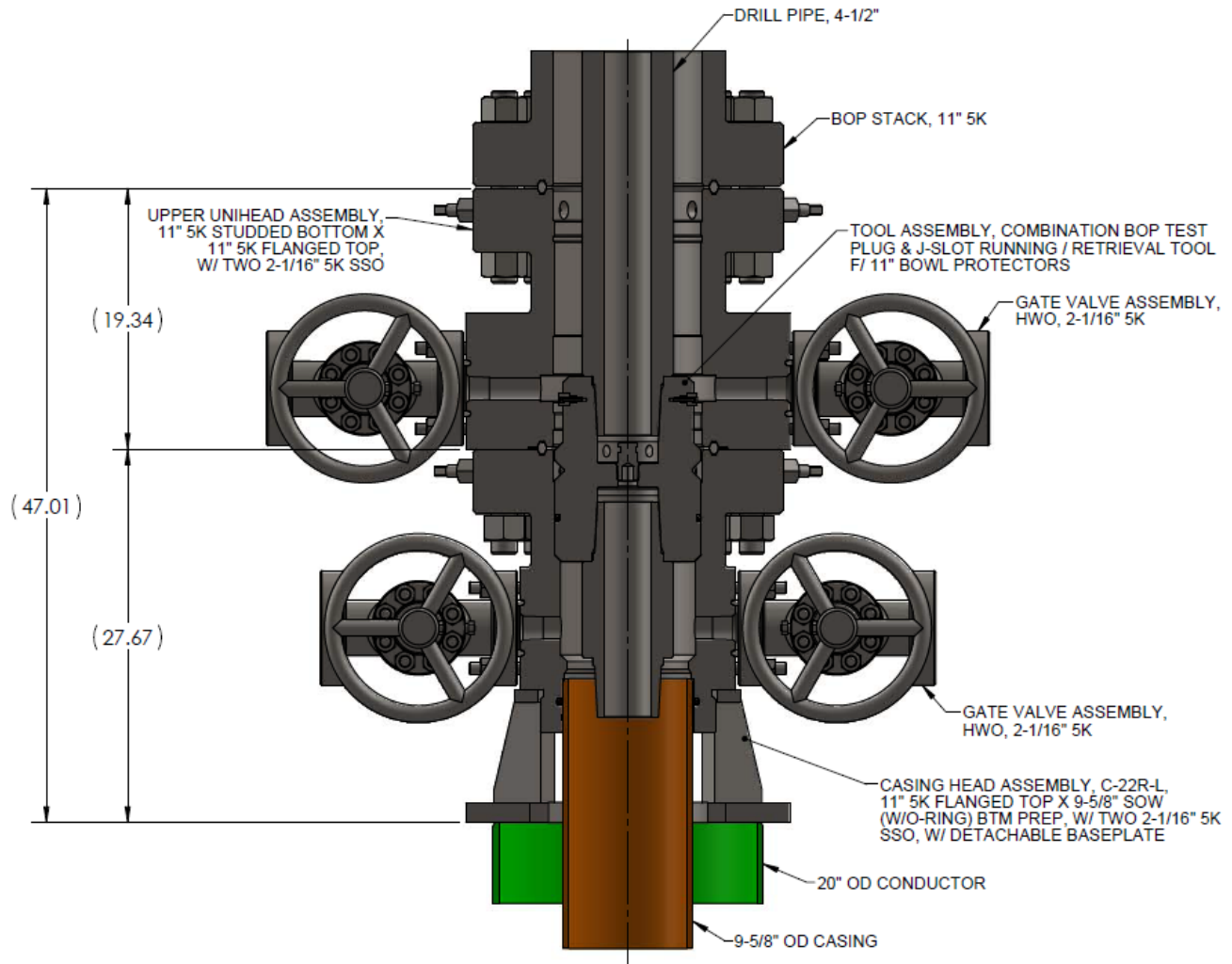


**The Lockdown screws assemblies are not to be removed from the Split Speed Head Assembly.**

### NOTE

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6. Lower the BOP Test Plug through the BOP stack until it lands on the 45° load shoulder in the Split Speed Head Assembly.
  7. Close the BOP Pipe rams on the drill pipe.
  8. The Ball/Gate Valves on the lower part of the Split Speed Head Assembly should be in the open position prior to test to prevent possible damage to the Surface Casing.
  9. Test the BOP to 5,000 psi maximum for 15 minutes or to the customer’s requirements.

10. After a satisfactory test, release pressure and open the rams, close the ball valves.
  
11. Retrieve the BOP Test Plug slowly to avoid damage to the seal.



**Figure 4: Installation of BOP Test Plug & BOP Test**

## 2.4 Installation of the 11” 5K Middle Bowl Protector

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### NOTE

Always use a Bowl Protector while drilling to protect the load shoulders and bowl from damage by the drill bit or rotating drill pipe. The Bowl Protector must be retrieved prior to running the casing. The elastomer seal on the OD of the Bowl Protector tool can be removed if need be for this sequence of operations.

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1. Examine the Bowl Protector. Verify that:
  - Internal bore is clean and in good condition.
  - Visually inspect the slots that the lugs lock into for damage
  - Drift Diameter is acceptable.
2. Examine Bowl Protector Running/Retrieving Tool Assembly. Verify that:
  - Pipe Connection threads are clean and undamaged.
  - Lugs are in good condition and functional.
3. Orient the Bowl Protector Running/Retrieving Tool Assembly with the lugs down and the elastomer up.
4. Make up the Bowl Protector Running/Retrieving Tool Assembly to a joint of drill pipe and tighten with rig tongs.
5. Apply light grease to the lugs.
6. Insure that all lockdown screws in the Split Speed Head Assembly are fully retracted (counter clockwise).
7. Lower the Bowl Protector Running/Retrieving Tool Assembly into the Long Bowl Protector and J-slot in place (clockwise).
8. Slowly lower the Bowl Protector Assembly through the BOP stack and land it on the 45° load shoulder of the Split Speed Head Assembly.



9. Fully run-in a minimum of two (2) of the upper set of lockdown screws clockwise (180 degrees apart) on the Split Speed Head Assembly. Snug tight with a 12" adjustable wrench to hold the Bowl Protector in place. Do not over torque by using larger wrench or cheater pipe Extension. Identify which lockdown screws were used.

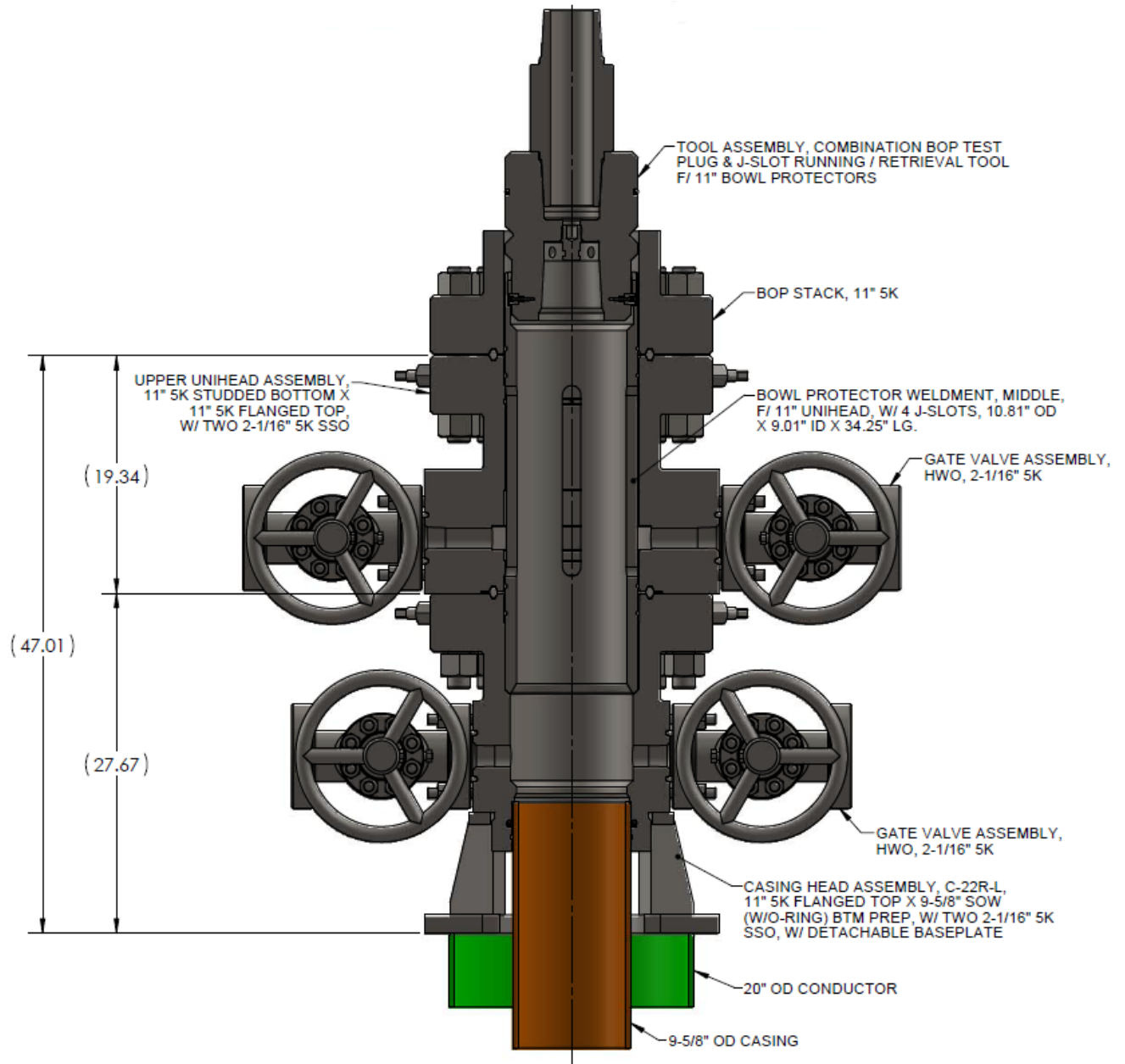


**Do not over tighten the lockdown screws by using full body weight or cheater pipe which could cause damage to the Bowl Protector by crushing it.**

**CAUTION**

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10. Retrieve the Bowl Protector Running/Retrieving Tool Assembly from the Bowl Protector by rotating counterclockwise to un-jay the Bowl Protector Running/Retrieving Tool Assembly from the Bowl Protector and then pull the tool straight up.
11. Continue drilling as required.



**Figure 5: Installation of Bowl Protector**

## 2.5 Retrieve the 11” 5K Middle Bowl Protector After Drilling

1. Orient the Bowl Protector Running/Retrieving Tool Assembly with the lugs down and the elastomer up.
2. Make up the Bowl Protector Running/Retrieving Tool Assembly to the drill pipe with rig tongs. Verify that:
  - Pipe Connection threads are clean and undamaged.
  - Lugs are in good condition and functional.
3. Apply light grease to the lugs of the Bowl Protector Running/Retrieving Tool Assembly.
4. Slowly lower the Bowl Protector Running/Retrieving Tool Assembly.
5. Rotate the Bowl Protector Running/Retrieving Tool Assembly clockwise to jay into the Long Bowl Protector.
6. Fully retract all of the upper set of lockdown screws in the Split Speed Head Assembly by rotating counter clockwise.



**Do not remove the Lockdown Screw Assemblies from the Split Speed Head Assembly.**

### NOTE

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7. Pull the Bowl Protector Running/Retrieving Tool Assembly straight up to verify it is latched in the Long Bowl Protector.
8. Slowly lift the Bowl Protector Running/Retrieving Tool Assembly and retrieve the Long Bowl Protector.
9. Remove the Bowl Protector Running/Retrieving Tool Assembly from the drill pipe and set aside.
10. Run the 7” casing as required.

## 2.6 Installation of the 11” X 7” Lower Mandrel Casing Hanger

Use this procedure only for landing the Lower Mandrel Casing Hanger. If the casing becomes stuck and the Lower Mandrel Casing Hanger cannot be properly landed, see Section 2.7 of this document.

1. Examine the Lower Mandrel Casing Hanger. Verify that:
  - Internal bore and threads are clean and in good condition.
  - OD threads of the Lower Mandrel Hanger are clean and undamaged.
  - Neck seal area is clean and undamaged.
2. Examine the Mandrel Casing Hanger Running/Retrieving Tool Assembly. Verify that:
  - Pipe Connection threads are clean and undamaged.
  - ID seals are clean, undamaged, and free from debris.
  - Lubricate seal area and threads with a non-metal based grease or hydraulic oil
3. Using chain tongs, make up the Mandrel Casing Hanger Running/Retrieving Tool Assembly to the Mandrel Casing Hanger on the pipe rack by threading the Stub ACME threads on the OD of the Lower Mandrel Casing Hanger by rotating the Mandrel Casing Hanger Running/Retrieving Tool Assembly approximately 4.25 turns counter-clockwise. The OD threads are a left-handed Stub ACME thread.



### CAUTION

**Do not use rig tongs, rotary table, and or top drive power to torque this Mandrel Casing Hanger Running/Retrieving Tool Assembly Connection. Torqueing of the Mandrel Casing Hanger Running/Retrieving Tool Assembly will cause damage by galling of the ACME thread.**

4. After the Mandrel Casing Hanger Running/Retrieving Tool Assembly shoulders out on the Lower Mandrel Casing Hanger, back off the Mandrel Casing Hanger Running/Retrieving Tool Assembly to line up the flutes in the Mandrel Casing Hanger and the Mandrel Casing Hanger Running/Retrieving Tool Assembly.

5. Install the two (2) Anti-rotation plates with the ½” socket head cap screws.
  6. Torque up casing string joints as required. Once completed, the Anti-rotation plates must be removed before running the Mandrel Casing Hanger downhole.
- 



**CAUTION**

**Steps 4, 5, & 6 are optional. The Anti-rotation plates are only to be installed if torque is to be transmitted through the running tool and casing hanger body to torque up the casing string. The Anti-rotation plates MUST be removed prior to running the Mandrel Casing Hanger downhole. Failure to do so will result in not allowing the Mandrel Casing Hanger Running/Retrieval Tool to be backed off the Mandrel Casing Hanger.**

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7. Using a Hand Pump, pressure test to 5,000 psi through the 1/4” NPT Test port on the Mandrel Casing Hanger Running/Retrieving Tool Assembly to test the seals. Hold for 15 minutes. After a satisfactory test, bleed off pressure and reinstall the 1/4” plug with Teflon tape.
  8. Make a mark vertically on the Mandrel Casing Hanger Running/Retrieving Tool to Mandrel Casing Hanger. This will allow you to check and confirm of no movement (unthreading).
  9. Drain the stack and Split Speed Head through the Ball/Gate Valves on the lower Split Speed Head side outlets. (OPTIONAL) The Lower Mandrel Casing Hanger has flutes to allow flow-by.
  10. Using a high pressure water hose flush out the ID of the stack and the OD of the casing until clean returns are seen. (OPTIONAL, depending on step 4).
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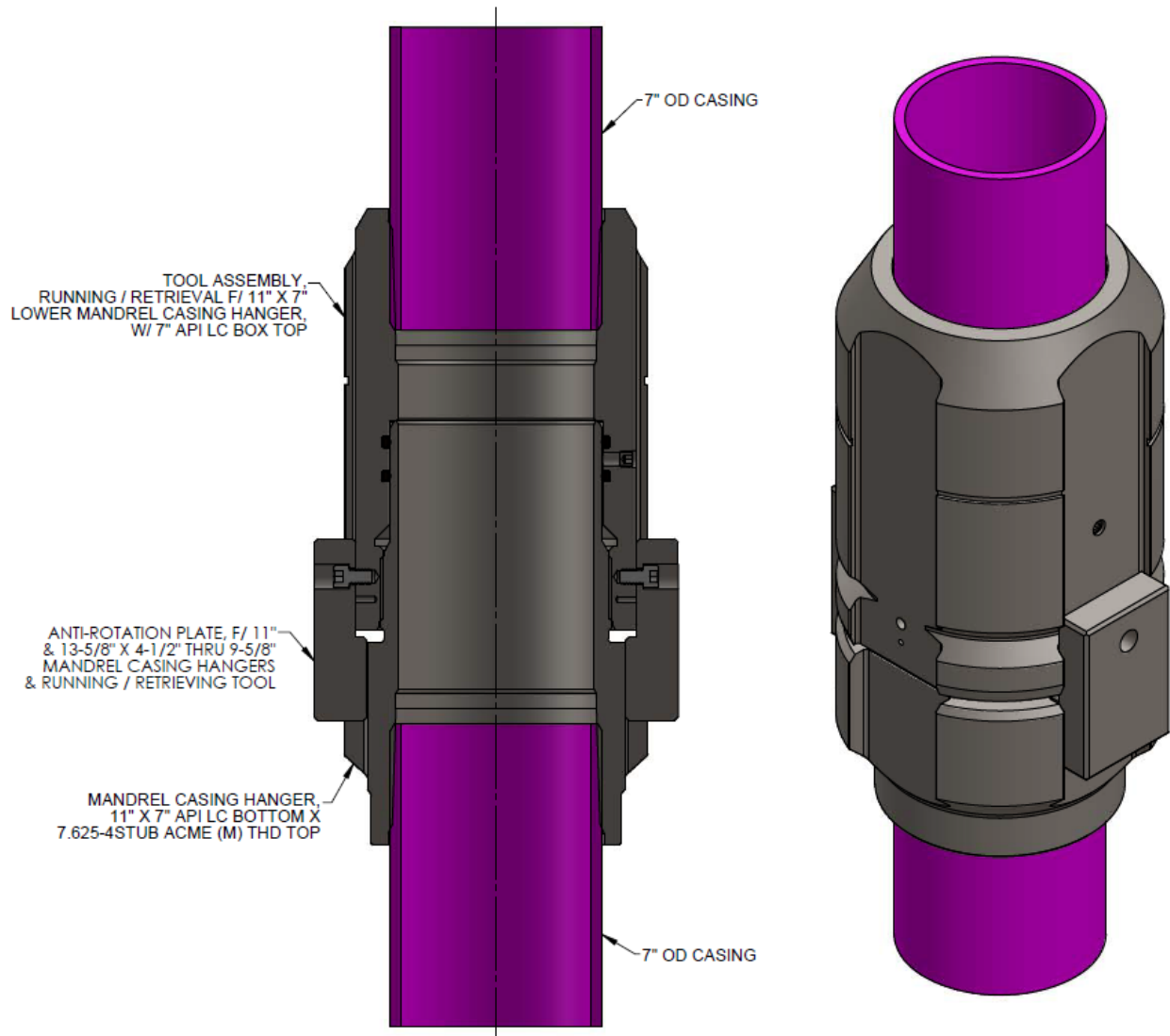


**NOTE**

**It is important that the inside of the stack is clean and free of all debris.**

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11. Make up the Lower Mandrel Casing Hanger to the last joint of the 7” casing run and apply proper torque to tong area on casing.



**Figure 6: Installation of Anti-Rotation Plates – Mandrel Casing Hanger**



The casing weight and grade will determine the torque to use.

**NOTE**

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**Do not tong on the upper part of the Lower Mandrel Casing Hanger body or it may be damaged.**

**CAUTION**

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12. Slack elevators off casing and watch vertical line on the Mandrel Casing Hanger Running/Retrieving Tool to Mandrel Casing Hanger for movement. If movement occurs, realign mark.



**Measure the distance from the rig floor to the load shoulder in the Split Speed Head bowl. Mark the same distance from the load shoulder to the landing joint in Five Foot increments. When the hanger is completely down the last mark should line up with the RKB (Rotary Kelly Bushing).**

**NOTE**

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13. Paint the lockdown pin groove on the OD of the Mandrel Casing Hanger Running/Retrieving Tool to identify/confirm when the Mandrel Casing Hanger is fully landed.
14. Pick up the 7" casing and Lower Mandrel Casing Hanger and remove the floor slips and Kelly bushings as required.
15. Slowly lower the Lower Mandrel Casing Hanger through the BOP stack until it lands on the 45° load shoulder in the Split Speed Head Assembly.

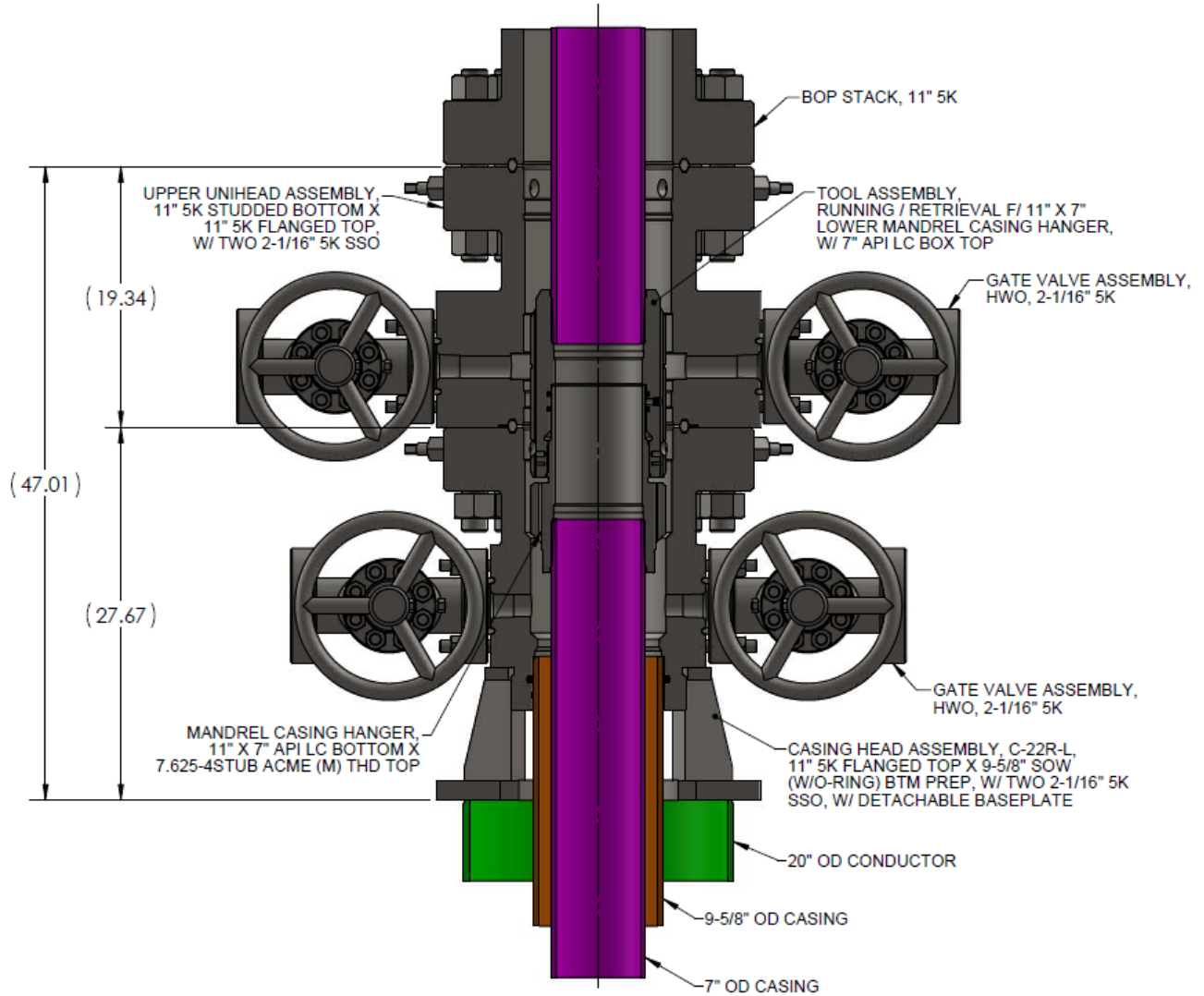


**Watch the weight indicator to verify that the hanger is properly landed on load shoulder in the Split Speed Head bowl. When the hanger is completely down the last mark on the landing joint it should line up with the RKB (Rotary Kelly Bushing).**

**CAUTION**

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16. Slack off all weight on the casing.



**Figure 7: Installation of Mandrel Casing Hanger**





**NOTE**

The Lower Mandrel Casing Hanger has flutes which allow cement to be circulated without lifting the Lower Mandrel Casing Hanger off the 45° load shoulder. It is recommended to not lift the Lower Mandrel Casing Hanger during the cementing process.

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**CAUTION**

Once the Lower Mandrel Casing Hanger is landed on the shoulder in the Casing Head, it is recommended to lock the Lower Mandrel Hanger & Running/Retrieving tool in place during cementing and cement curing.

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17. Once landed, confirm that the Mandrel Casing Hanger is fully landed by identifying the painted groove on the Mandrel Casing Hanger Running/Retrieving Tool visually through the lockdown screw pin hole.
18. Once confirmed, lock in the Lower Mandrel Hanger & Running/Retrieving tool by running all of the lockdown screws in the Casing Head Assembly in a clockwise direction. Reference section 3.0 in this procedure for operation of the lockdown screws.
19. Make an indicator mark on the landing joint level with the rig floor. Chain down the cement head as backup.
20. Cement the 7" casing as required.
21. Ensure the BOP stack is flushed through the A-section wing with sugar water back out the flowline.
22. Fully retract all of the lockdown screws counterclockwise in the A-section.
23. Retrieve the Mandrel Casing Hanger Running/Retrieving Tool Assembly by rotating it clockwise approximately 4.25 turns and lift free.



**Do not use rig tongs; use chain tongs located 180° apart.**

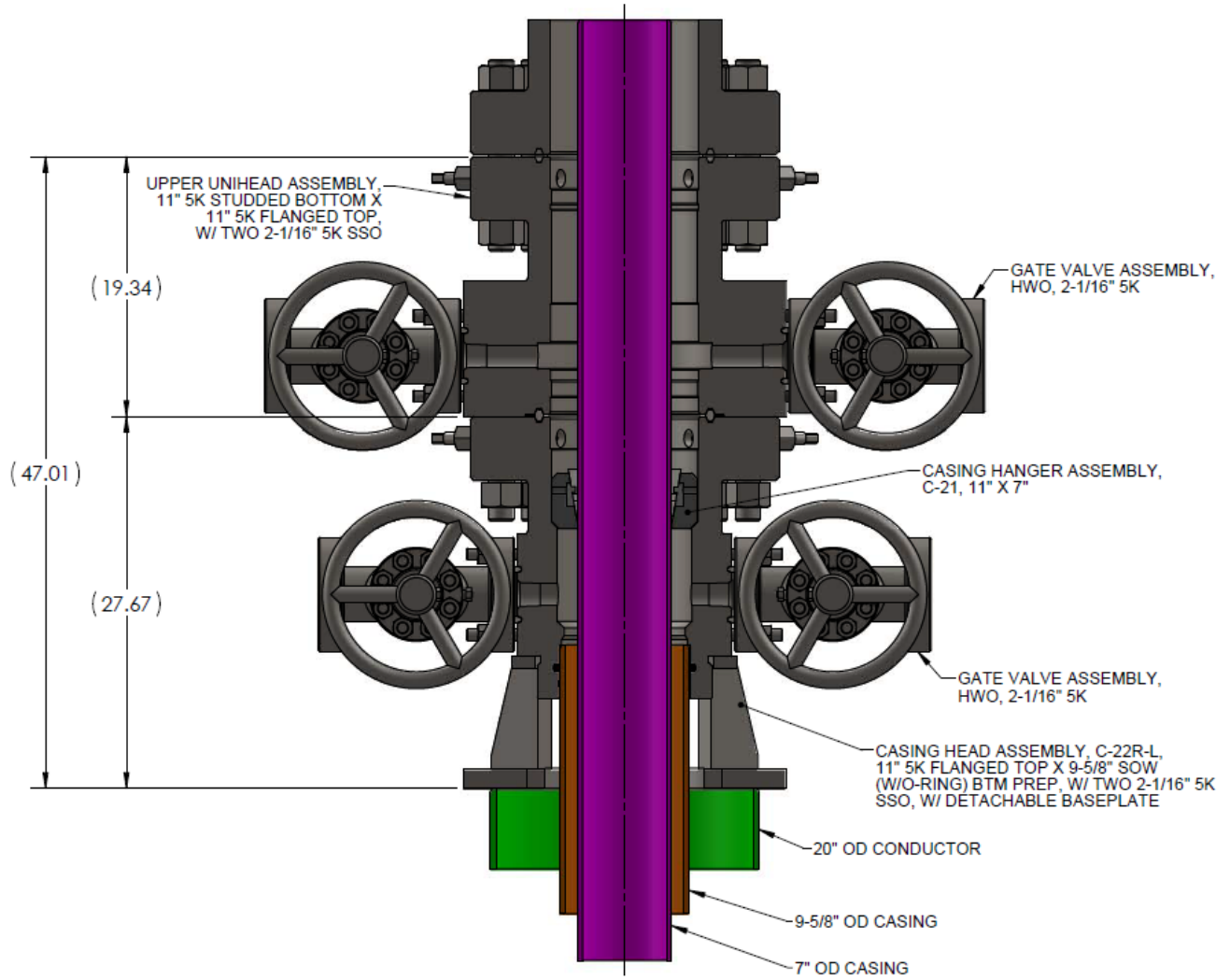
**NOTE**

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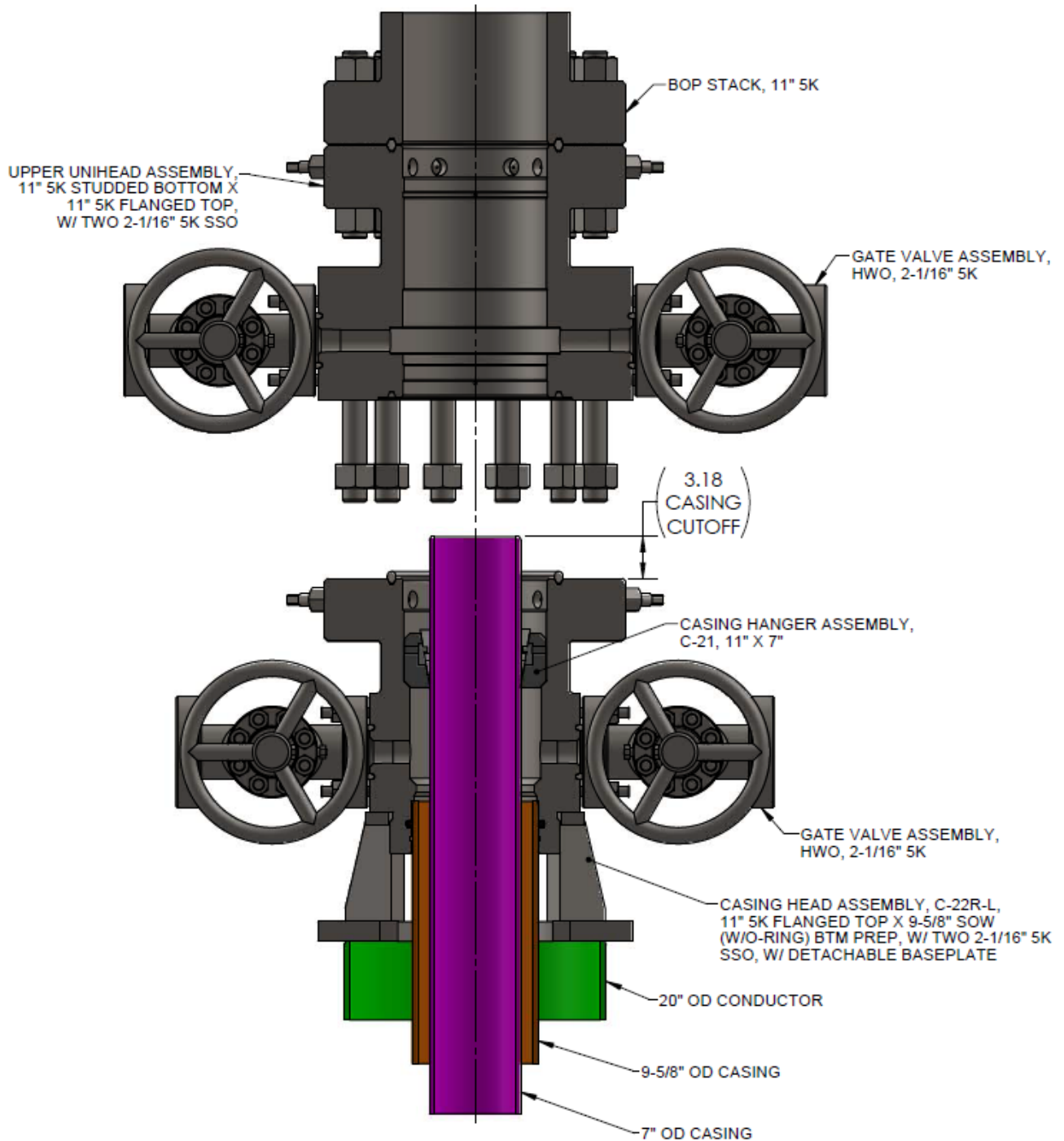
## **2.7 Installation of the 11" X 7" C-21 Emergency Slip Casing Hanger Assembly**

This Procedure is only used in the event of stuck casing.

1. Disconnect the upper part of the Split Speed Head Assembly by removing the flange bolting on the Split Speed Head at the Casing Head/Tubing Head connection.
2. Lift and suspend the BOP's and the upper part of the Split Speed Head with the BOP stack.
3. Make up the C-21 Emergency Slip Casing Hanger Assembly around the 7" production casing.
4. Slowly lower the C-21 Emergency Slip Casing Hanger Assembly until it lands on the 45° load shoulder of the Casing Head.
5. Pull tension and slack off 7" production casing to set slips.
6. Make a rough cut approximately 12" on the 7" production casing above the top of the Casing Head body.
7. Set aside the BOP stack and upper part of the Split Speed Head assembly.
8. Make a final cut of 3.18" above the top of the Casing Head Top Flange and bevel the 7" production casing on the ID & OD.
9. Make up the BOP Stack and upper part of the Split Speed Head Assembly. Torque the studs and nuts to API specifications.



**Figure 8: Installation of C-21 Emergency Casing Hanger**



**Figure 9: Installation of C-21 Emergency Casing Hanger – Casing Cutoff**

## 2.8 Installation of the 11” 5K X 7” Lower Pack-off Support Bushing Assembly

The Lower Pack-off Support Bushing Assembly is the same for use with the Mandrel Casing Hanger and the C-21 Assembly. Therefore, the procedures for the installation of the Lower Pack-off Support Bushing Assembly are the same.

1. Examine the Lower Pack-off Support Bushing Assembly. Verify that:
  - Internal bore and seals are clean and in good condition.
  - ID J-slots are clean and undamaged.
2. Examine the Pack-off Support Bushing Running/Retrieving Tool Assembly. Verify that:
  - OD ACME threads are clean and undamaged.
  - OD lugs are clean and undamaged.
3. Drain the stack and Split Speed Head through the Gate Valves on the upper Split Speed Head side outlets.
4. Apply a light coat of non-metal based grease or hydraulic oil to lubricate the ID & OD seals on the Lower Pack-off Support Bushing Assembly.
5. Using a high pressure water hose flush out the ID of the stack and the OD of the casing until clean returns are seen.



**It is important that the inside of the stack is clean and free of all debris.**

### NOTE

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6. With the Mandrel Casing Hanger Running/Retrieving Tool still on the casing string, using chain tongs, makeup the Pack-off Support Bushing Running/Retrieving Tool Assembly into the bottom of the Mandrel Casing Hanger Running/Retrieving Tool

by threading the Stub ACME threads on the OD of the Pack-off Support Bushing Running/Retrieving Tool Assembly by rotating in a counterclockwise direction. The threads are a left-handed Stub ACME thread.

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**CAUTION**

**Do not use rig tongs, rotary table, and or top drive power to torque this Mandrel Casing Hanger Running/Retrieving Tool Assembly Connection. Torqueing of the Mandrel Casing Hanger Running/Retrieving Tool Assembly will cause damage by galling of the ACME thread.**

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**NOTE**

**Measure the distance from the rig floor to the load shoulder (the Lower Mandrel Casing Hanger load shoulder or the top of the C-21 Emergency Slip Casing Hanger Assembly). Mark the same distance from the load shoulder to the landing joint in Five Foot increments. When the Lower Pack-off Support Bushing Assembly is completely down the last mark should line up with the RKB (Rotary Kelly Bushing).**

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7. After the Pack-off Support Bushing Running/Retrieving Tool Assembly shoulders out in the Mandrel Casing Hanger Running/Retrieving Tool, back off the Pack-off Support Bushing Running/Retrieving Tool Assembly to line up the flutes in the Mandrel Casing Hanger Running/Retrieving Tool Assembly and the Pack-off Support Bushing Running/Retrieving Tool Assembly.
  8. Install the two (2) Anti-rotation plates with the ¼” socket head cap screws.
  9. These two Anti-rotation plates **MUST** stay installed when running/retrieving the Pack-off Support Bushing Assembly.
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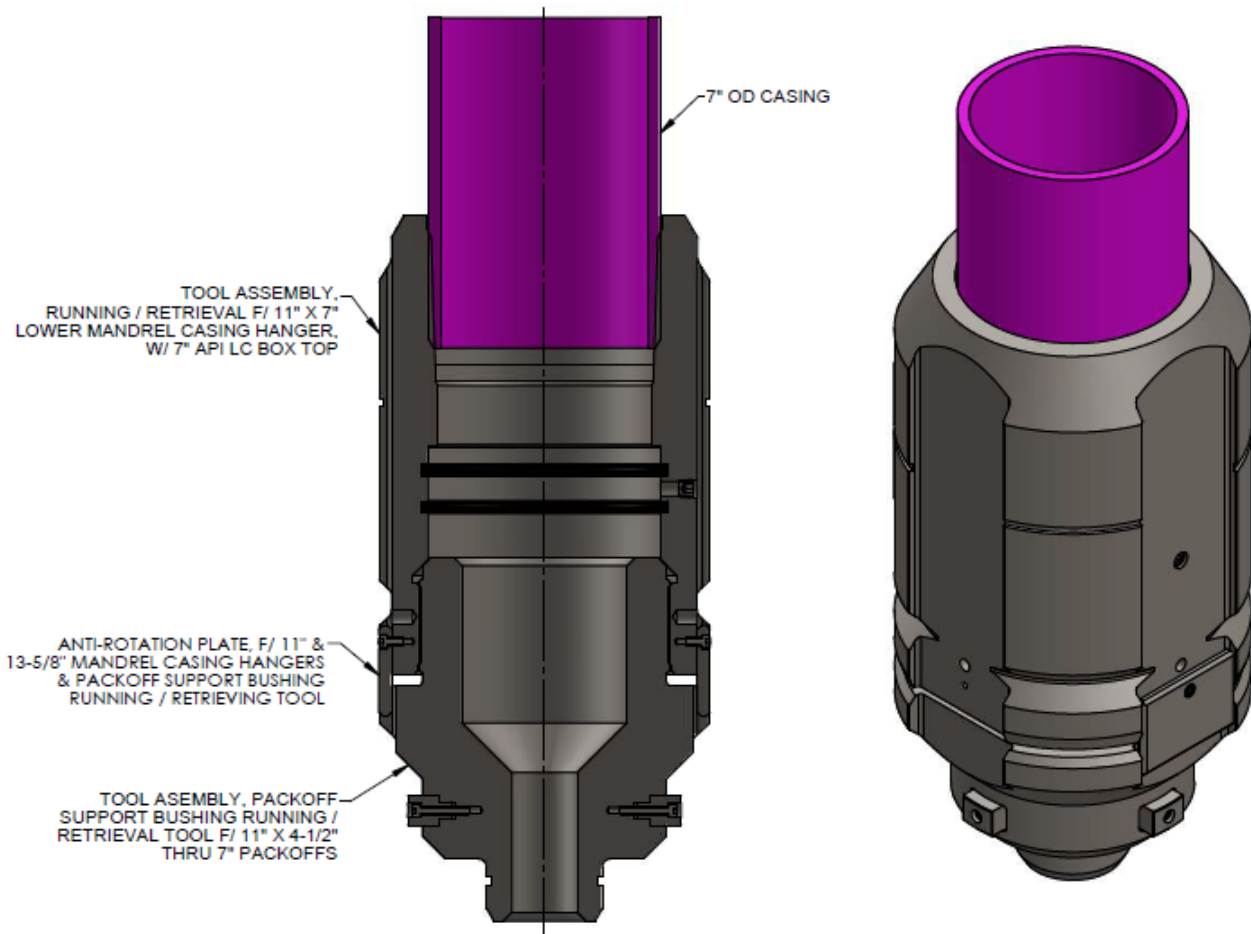
**CAUTION**

**The Anti-rotation plates **MUST** be installed when running/retrieving the Pack-off Support Bushing Assembly. Failure to do so can result in unthreading the Pack-off Support Bushing Running/Retrieving Tool Assembly from the Mandrel Casing Hanger Running/Retrieving Tool Assembly.**

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10. Make up the Pack-off Support Bushing Running/Retrieving Tool Assembly onto the Lower Pack-off Support Bushing Assembly by aligning the lugs on the tool with the J-slots on the Lower Pack-off Support Bushing Assembly and jay into the Lower

Pack-off Support Bushing Assembly by rotating clockwise until it stops.



**Figure 10: Installation of Anti-Rotation Plates – Packoff Support Bushing**

11. Verify that both sets of lockdown screws are fully retracted in the Split Speed Head Assembly (counterclockwise).
12. Slowly lower the Lower Pack-off Support Bushing Assembly and Pack-off Support Bushing Running/Retrieving Tool Assembly through the BOP stack until it lands on the Lower Mandrel Casing Hanger load shoulder or the top of the C-21 Emergency Slip Casing Hanger Assembly.



**CAUTION**

**Watch the weight indicator to verify that the Lower Pack-off Support Bushing Assembly is properly landed on Load Shoulder (the Lower Mandrel Casing Hanger load shoulder or the top of the C-21 Emergency Slip Casing Hanger Assembly). When the Lower Pack-off Support Bushing Assembly is completely down the last mark on the landing joint it should line up with the RKB (Rotary Kelly Bushing).**

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13. Drain the BOP stack and then visually confirm the Pack-off Support Bushing Assembly is fully landed by looking through the lower annulus wing valve outlets with a mirror. There should be a visible white painted mark on the tool and body that should be centered in the outlet hole.
14. Once land out is confirm, secure the Lower Pack-off Support Bushing Assembly by running in the lower set of lockdown screws in an alternating pattern (clockwise).
15. Using a Hand Pump, pressure test to 5,000 PSI or 80% of collapse of the casing, whichever is less, through the 1/2" NPT Test port on the side of the Upper Split Speed Head Assembly to test the seals. After a satisfactory test, bleed off pressure.
16. Retrieve the Pack-off Support Bushing Running/Retrieving Tool Assembly from the Lower Pack-off Support Bushing Assembly by rotating counterclockwise to un-jay the tool and then pull the tool straight up.

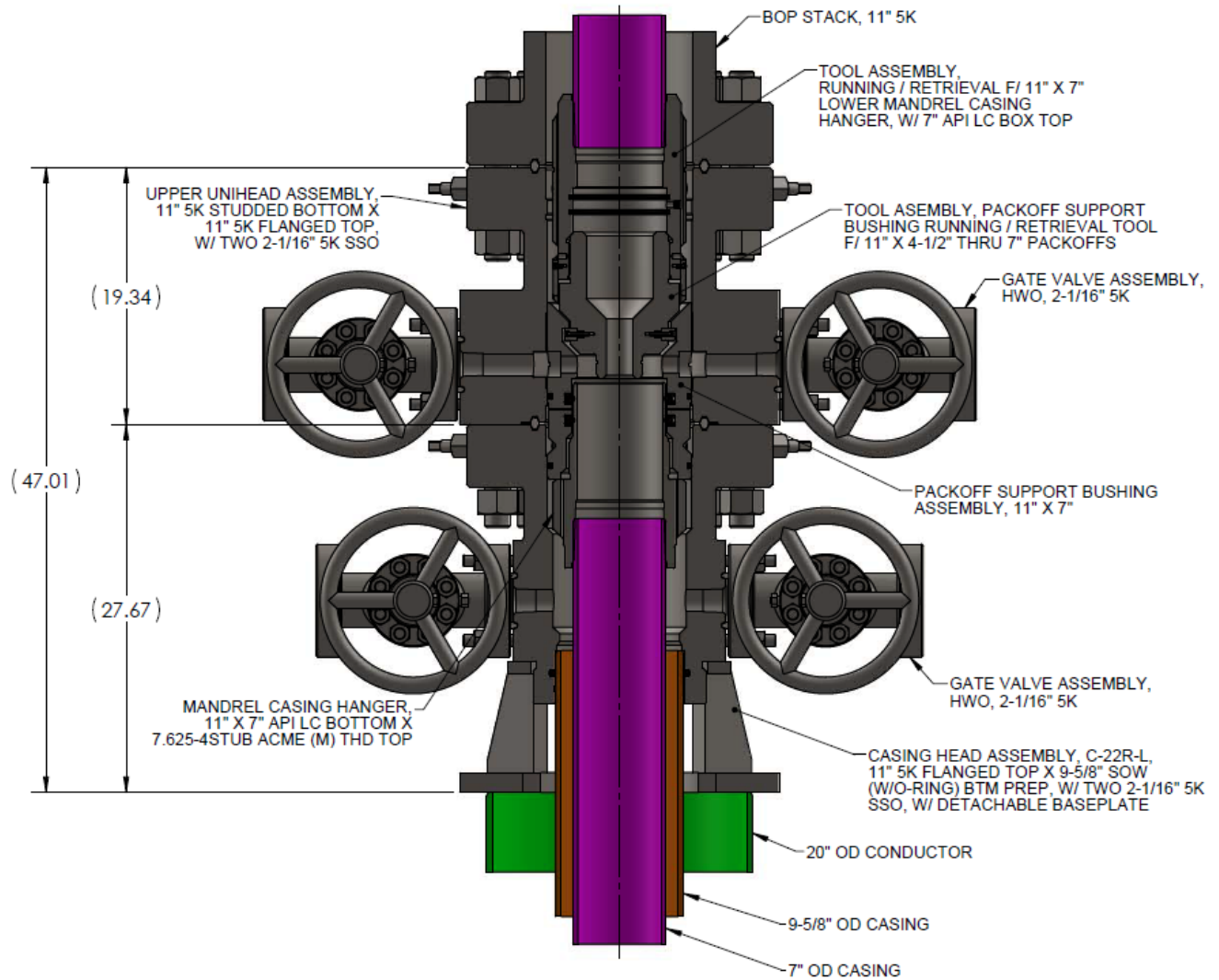


**NOTE**

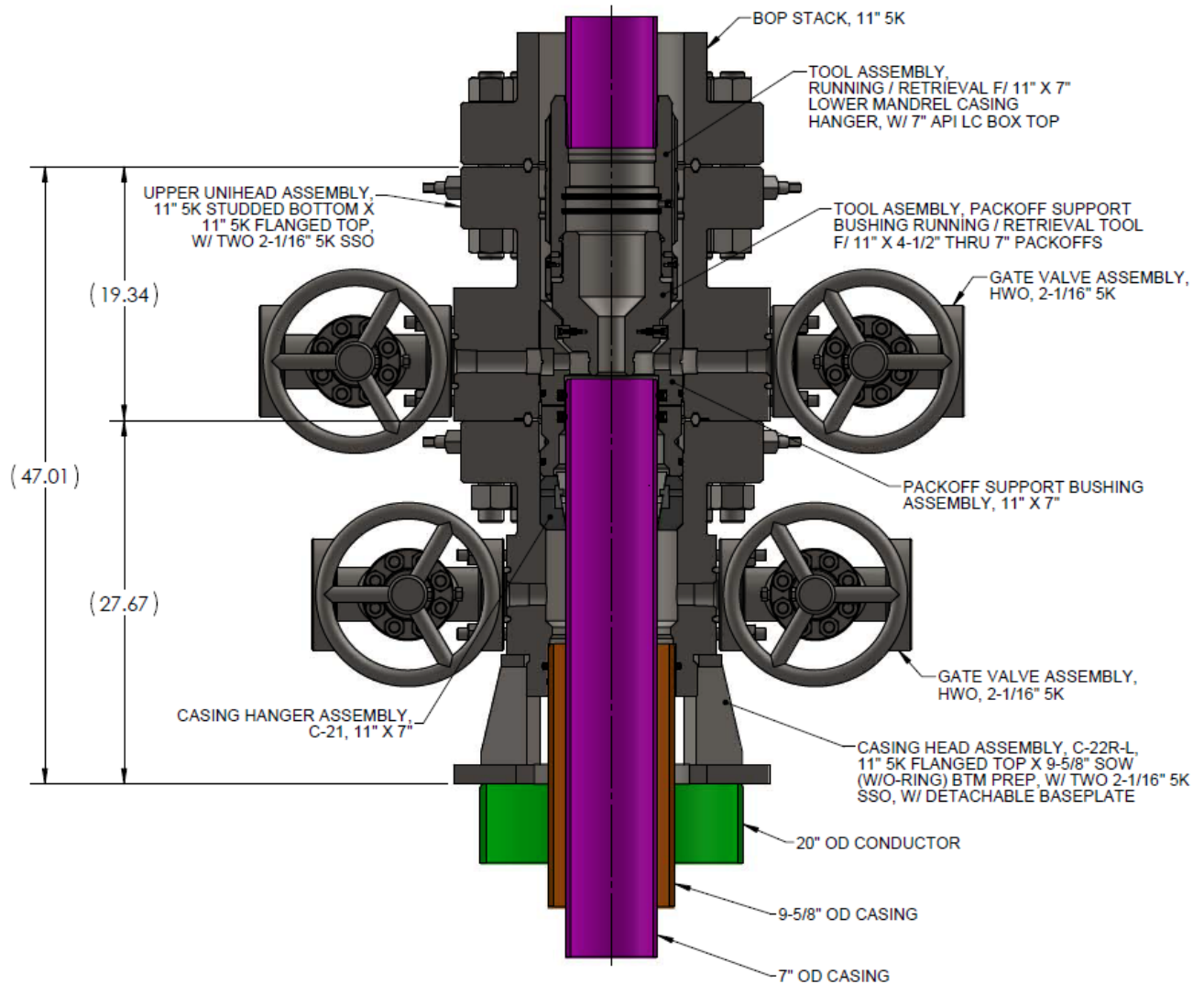
**Do not use rig tongs; use chain tongs located 180° apart.**

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**Figure 11: Installation of the Packoff Support Bushing - Primary**



**Figure 12: Installation of the Packoff Support Bushing - Emergency**

## 2.9 Installation of the 11” 5K Split Speed Head Upper BOP Test Plug & Test the BOP Stack

The section only applies if the BOP stack was removed to install the Emergency C-21 Slip Casing Hanger.

1. Examine the BOP Test Plug/Running Tool. Verify that:
  - Elastomer seals are intact and in good condition.
  - Internal threads are clean and in good condition.
2. Orient the BOP Test Plug with the elastomer down and the J-slot lugs in the up position.
3. Make up a joint of drill pipe to the BOP Test Plug with rig tongs.
4. Lubricate the elastomer seal on the BOP Test Plug with a coat of light oil.
5. Fully retract all of the upper lockdown screws on the Split Speed Head Assembly by rotating them counter clockwise.



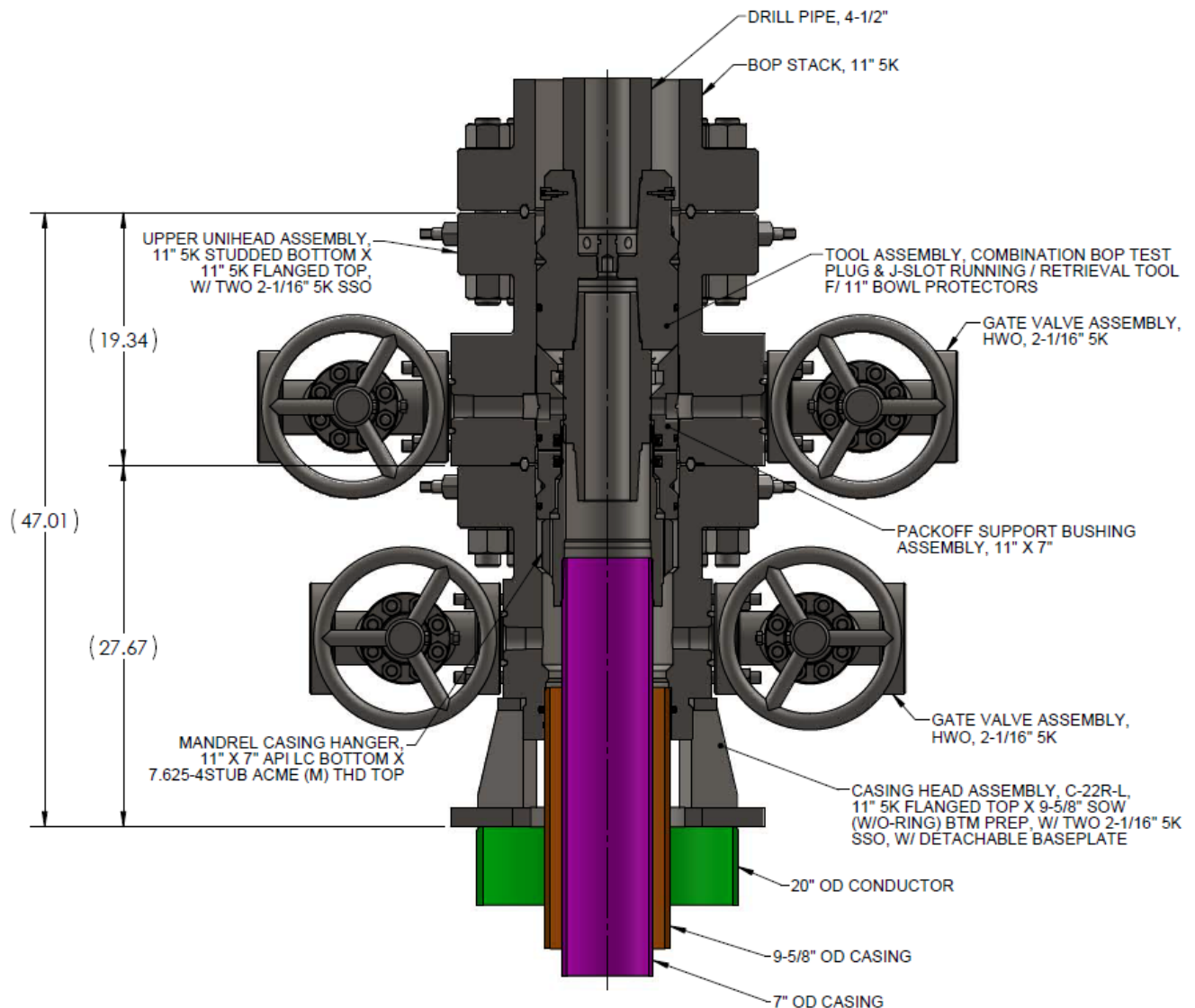
**The lockdown screws assemblies are not to be removed from the Split Speed Head Assembly.**

### NOTE

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6. Lower the BOP Test Plug through the BOP stack until it lands on the 45° load shoulder of the Lower Pack-off Support Bushing Assembly.
7. Close the BOP Pipe rams on the drill pipe.
8. The Gate Valves on the upper part of the Split Speed Head Assembly should be in the open position prior to test to prevent possible damage to the Intermediate Casing.

9. Test the BOP to 5,000 psi maximum for 15 minutes or to the customer's requirements.
10. After a satisfactory test, release pressure and open the rams, close the gate valves.
11. Retrieve the BOP Test Plug slowly to avoid damage to the seal.



**Figure 13: Installation of BOP Test Plug & BOP Test**

## 2.10 Installation of the 11” 5K Short Bowl Protector

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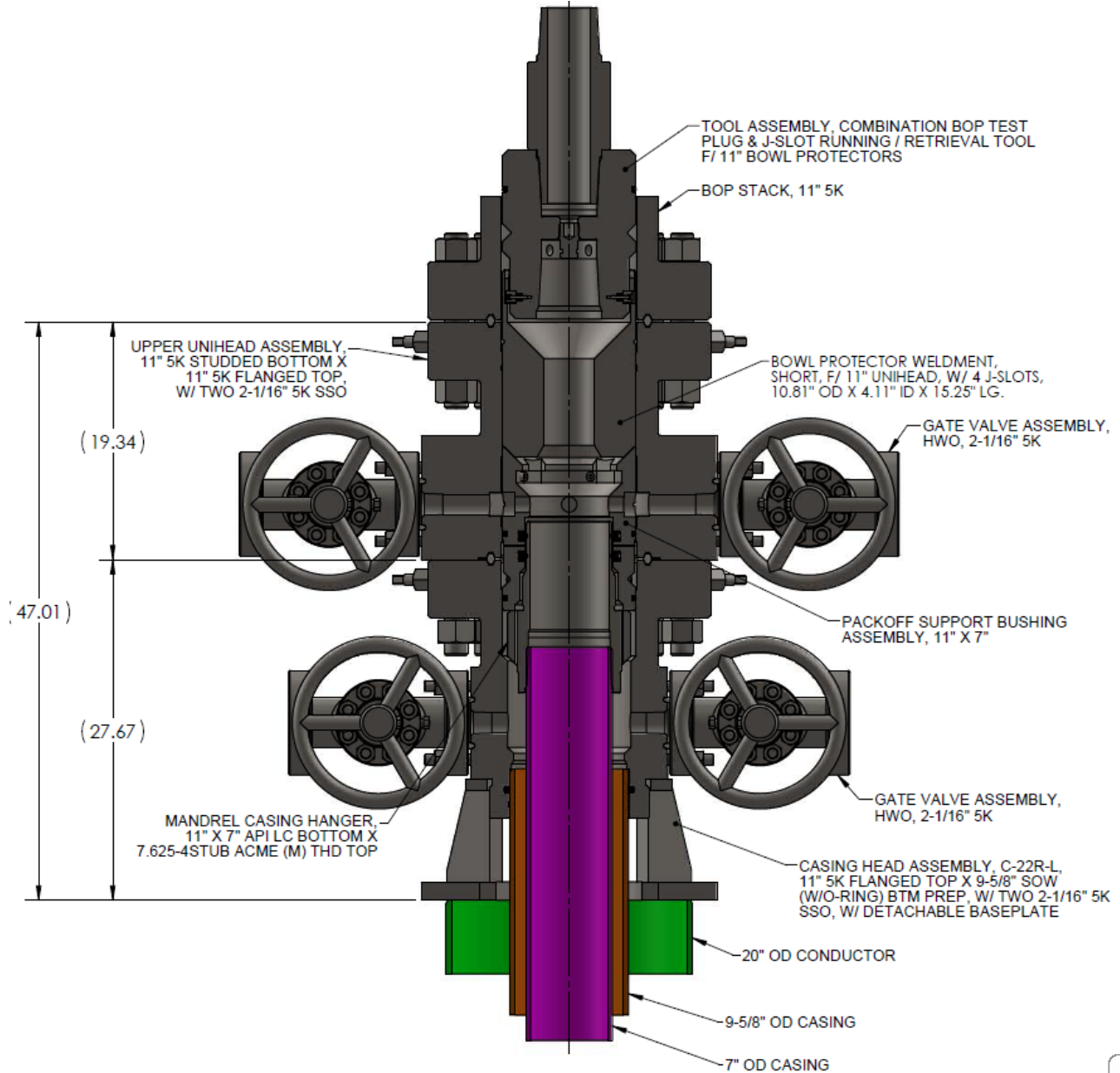
### NOTE

Always use a Bowl Protector while drilling to protect the load shoulders and bowl from damage by the drill bit or rotating drill pipe. The Bowl Protector must be retrieved prior to running the casing. The elastomer seal on the OD of the Bowl Protector tool can be removed if need be for this sequence of operations.

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1. Examine the Bowl Protector. Verify that:
  - Internal bore is clean and in good condition.
  - Visually inspect the slots that the lugs lock into for damage.
2. Examine Running/Retrieving Tool. Verify that:
  - Pipe Connection threads are clean and undamaged.
  - Lugs are in good condition and functional.
3. Orient the Bowl Protector Running/Retrieving Tool Assembly with the lugs down and the elastomer up.
4. Make up the Bowl Protector Running/Retrieving Tool Assembly to a joint of drill pipe and tighten with rig tongs.
5. Apply light grease to the lugs.
6. Insure that all of the upper lockdown screws in the Split Speed Head Assembly are fully retracted (counter clockwise).
7. Lower the Bowl Protector Running/Retrieving Tool Assembly into the Short Bowl Protector and J-slot in place.
8. Slowly lower the Bowl Protector Assembly through the BOP stack and land it on the 45° load shoulder of the Lower Pack-off Support Bushing Assembly.
9. Fully run-in a minimum of two (2) of the upper set of lockdown screws clockwise on the Split Speed Head Assembly. Snug tight with a 12” adjustable wrench to hold the Bowl Protector in place.

Do not over torque by using larger wrench or cheater pipe  
Extension. Identify which lockdown screws were used.



**Figure 14: Installation of Bowl Protector**



**Do not over tighten the lockdown screws by using full body weight or cheater pipe which could cause damage to the Bowl Protector by crushing it.**

**CAUTION**

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10. Retrieve the Running/Retrieving Tool from the Bowl Protector by rotating counterclockwise to un-jay the running tool from the Short Bowl Protector and then pull the tool straight up.
11. Continue drilling as required.

## **2.11 Retrieve the 11” 5K Short Bowl Protector After Drilling**

1. Orient the Bowl Protector Running/Retrieving Tool Assembly with the lugs down and the elastomer up.
2. Make up the Bowl Protector Running/Retrieving Tool Assembly to the drill pipe with rig tongs. Verify that:
  - Pipe Connection threads are clean and undamaged.
  - Lugs are in good condition and functional.
3. Apply light grease to the lugs of the Bowl Protector Running/Retrieving Tool Assembly.
4. Slowly lower the Bowl Protector Running/Retrieving Tool Assembly into the Short Bowl Protector.
5. Rotate the Bowl Protector Running/Retrieving Tool Assembly clockwise to jay into the Bowl Protector.
6. Fully retract all of the upper set of lockdown screws in the Split Speed Head Assembly by rotating counter clockwise.





**Do not remove the Lockdown Screw Assemblies from the Split Speed Head Assembly.**

**NOTE**

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7. Pull the Bowl Protector Running/Retrieving Tool Assembly straight up to verify it is latched in the Bowl Protector.
8. Slowly lift the Bowl Protector Running/Retrieving Tool Assembly and retrieve the Bowl Protector.
9. Remove the Bowl Protector Running/Retrieving Tool Assembly from the drill pipe and set aside.
10. Run the 4-1/2" casing as required.



## 2.12 Installation of the 11" X 4-1/2" C-22 Emergency Slip Casing Hanger Assembly

1. Drain the stack and Split Speed Head through the Gate Valves on the Split Speed Head side outlets.
2. Using a high pressure water hose flush out the ID of the stack and the OD of the casing until clean returns are seen. (OPTIONAL).



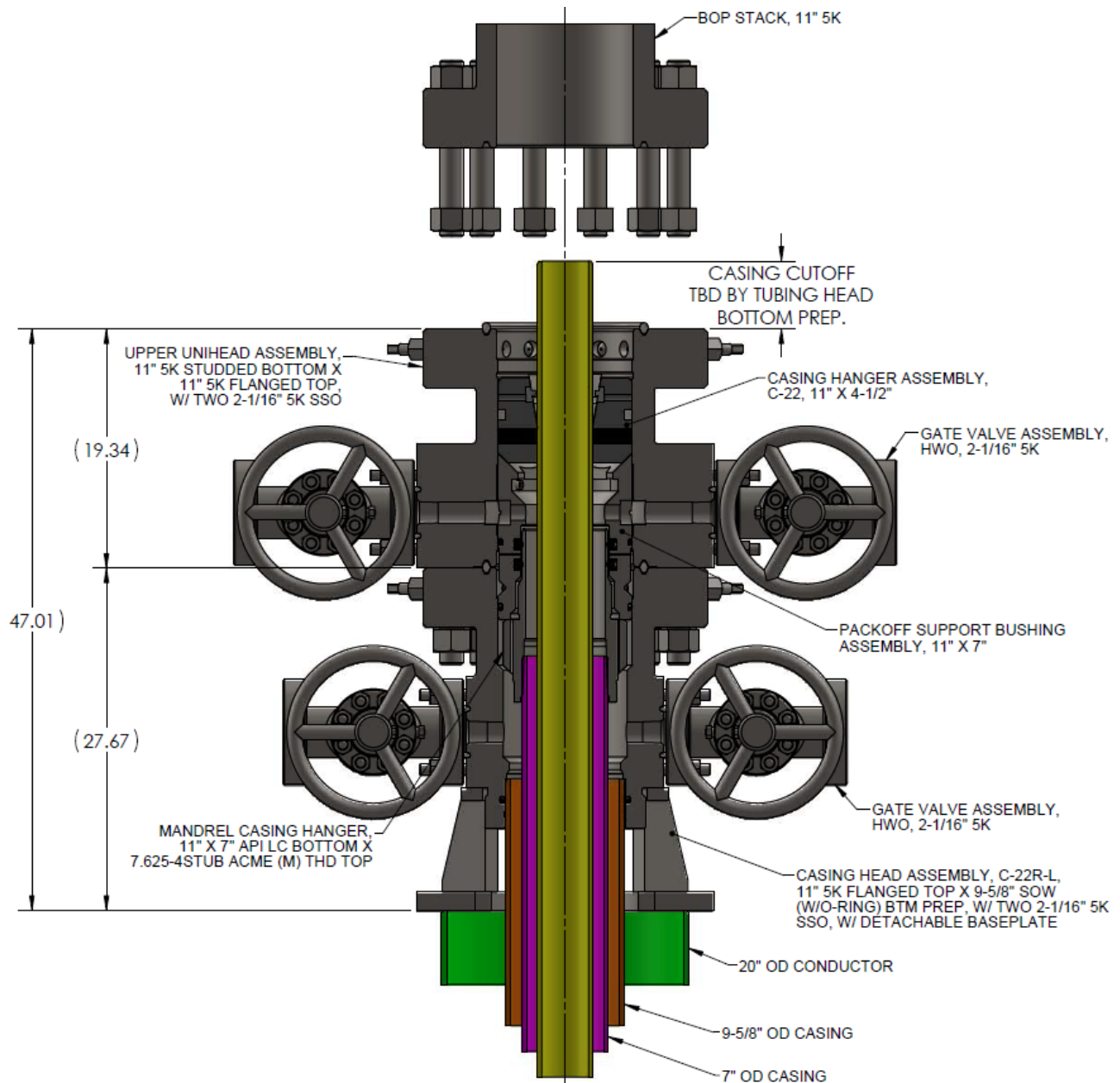
**It is important that the inside of the stack is clean and free of all debris.**

### NOTE

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3. Disconnect the BOP stack from the Split Speed Head Assembly by removing the flange bolting on the Split Speed Head at the BOP/Split Speed Head connection.
4. Lift and suspend the BOP stack.
5. Make up the C-22 Emergency Slip Casing Hanger Assembly around the 4-1/2" production casing.
6. Slowly lower the C-22 Emergency Slip Casing Hanger Assembly until it lands on the 45° load shoulder of the Lower Pack-off Support Bushing Assembly.
7. Pull tension and slack off 4-1/2" production casing to set slips.
8. Make a rough cut approximately 12" on the 4-1/2" production casing above the top of the Split Speed Head Assembly.
9. Set aside the BOP stack.
10. Make a final cut of 6.50" above the top of the Split Speed Head Assembly Top Flange and bevel the 4-1/2" production casing on the ID & OD. (The final casing cutoff MUST be determined by the bottom preparation of the Tubing Head that will be used.)

11. Install the 11" 5K night cap and torque flange connection to API 6A specifications (OPTIONAL).



**Figure 15: Installation of C-22 Slip Casing Hanger**

## **2.13 Installation of the 11” 5K X 7-1/16” 10K Production Tubing Head Assembly**

1. Inspect the ID and OD of the Production Casing above the Split Speed Head Assembly. Make sure it is clean and undamaged. If so, apply a coat of light oil to the OD of the casing.
2. Inspect the ID of the FS Seals in the bottom of the Tubing Head Assembly for any damage or debris, clean as necessary. Apply a coat of light oil to the ID of the FS-seals.
3. Install the Production Tubing Head Assembly using a new API ring gasket, orient as required and make up the flange bolting. Test the connection through the test port on the Tubing Head Assembly bottom flange to 5,000 psi or 80% of the casing collapse, whichever is less.

## **2.14 Installation of the 7-1/16” 10K X 2-3/8” Production Tubing Hanger Assembly & the 2-1/16” 5K Production Tree Assembly**

1. Examine the Tubing Hanger Assembly. Verify that:
  - Internal bore and threads are clean and in good condition
  - The neck area is clean and undamaged
2. Makeup a joint of 2-3/8” tubing to the Tubing Hanger Assembly top threads.
3. Apply pipe dope to the tubing collar and the tubing stub on the Tubing Hanger.
4. Pick-up the 2-3/8” tubing and the Tubing Hanger Assembly and remove the floor slips and Kelly Bushings.
5. Apply a light coat of hydraulic oil to the OD of the Tubing Hanger Assembly.
6. Slowly lower Tubing Hanger Assembly through the BOP stack until It lands on the load shoulder of the Tubing Head Assembly

7. Watch the weight indicator to verify that the Tubing Hanger Assembly is properly landed in the Tubing Head Assembly. Slack off all the weight on the tubing.
8. Fully run-in all lockdown screws in the Tubing Head Assembly to energize the Tubing Hanger Assembly Compression seal.
9. Retrieve the landing joint by rotating the landing joint to the left.
10. Run in and install the 2” CIW Type “H” BPV.
11. Disconnect the BOP stack from the Tubing Head Assembly.
12. Lift and suspend the BOP stack and set aside.
13. Clean the Tubing Hanger Assembly and Tubing Head Bowl to ensure no damage exists and all debris is removed.
14. Install a new API ring gasket in the Tubing Head Assembly top flange.
15. Verify that the ID of the Tubing Head Adapter bottom seal pocket is clean and apply a light coat of hydraulic oil to the seal pocket and the OD of the Tubing Hanger Assembly S-seals.
16. Slowly lower the Production Tree Assembly onto the Tubing Head Assembly and over the neck of the Tubing Hanger Assembly.
17. Land and orient the Production Tree Assembly onto the Tubing Head Assembly. Torque the studs and nuts to API specifications.
18. Test the connection through the test port on the Tubing Head Adapter Assembly bottom flange to 10,000 psi or to customer’s specifications.
19. After a satisfactory test, bleed off all pressure.

20. Open all valves on the Production Tree Assembly flow-bore and retrieve the BPV slowly and install the Tree Test Plug.
21. Test the Production Tree Assembly to 5,000 psi or to customer's specifications.
22. Retrieve the Tree Test Plug and close all valves on the Production Tree Assembly.

### 3.0 Appendix A – “ET” Style Lockdown Screw Procedure

This procedure is to be considered a generic operation procedure for all “ET” style lockdown screws regardless of flange size or pressure rating.



**Make sure all lockdown screws are retracted before installing a hanger, pack-off, or other device in the head or spool.**

#### NOTE

1. To properly operate the lock-screw, it is required to place a backup wrench on the gland nut, rotate the lock-screw in or out as required and not allowing the gland nut to move/rotate.
2. With the lockdown screws in the retracted position, measure the distance from the end of the lockdown screw to the flange, record this measurement and advise the drilling crew.
3. Always run in the lockdown screws in pairs, 180 degrees apart.



#### CAUTION

**Run in the first lockdown screw until it contacts the device in the head or spool. Do not tighten. Run in opposite screw until it contacts the device in head or spool. Do not tighten. Now run in the screw located halfway between the two original screws. Run in the opposite screw. Work the remaining lockdown screws in the same manner. This will keep the device in the head or spool straight. Rotating the lock-screw pin clockwise will travel the pin inward to the engage position, and counter-clockwise rotations will disengage the pin by traveling outward relative to the flange OD. The same directional rotations apply to the gland nut.**

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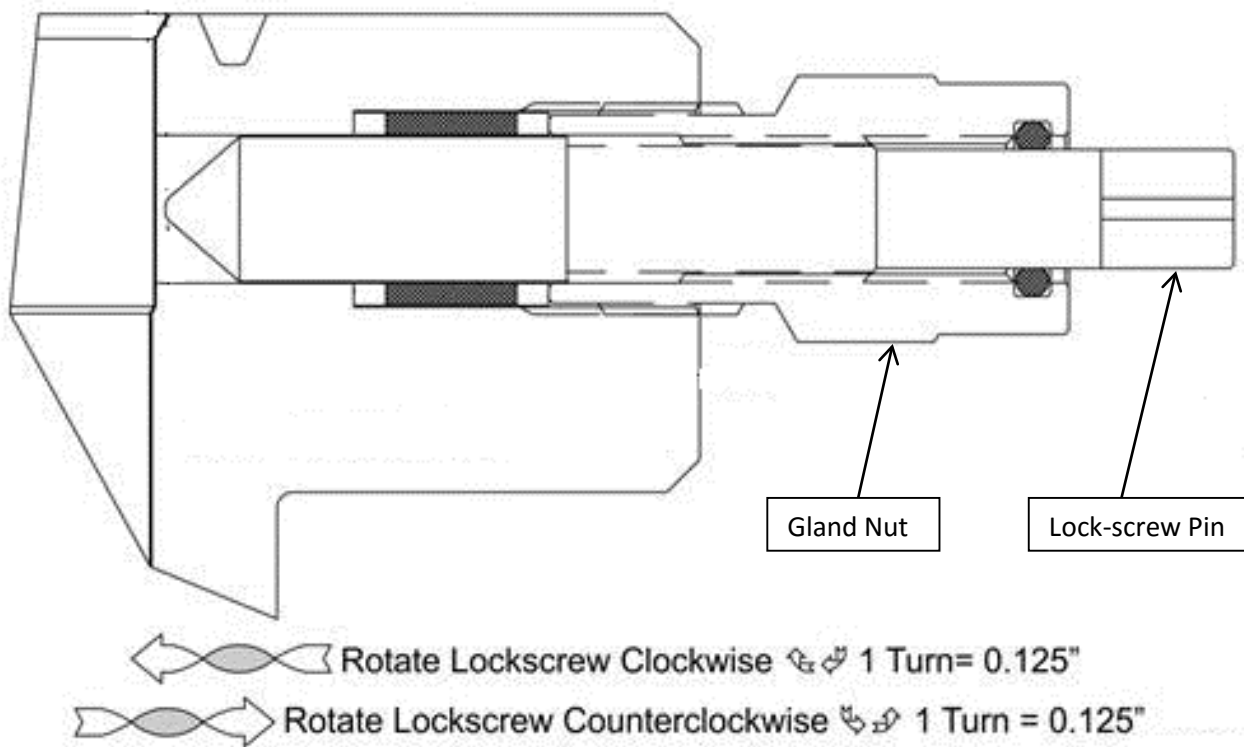


**NOTE**

**Use only two lockdown screws to secure bowl protectors. Mark these screws with paint, chalk or tape. These typically will not travel and engage fully as they would for hangers, pack-offs, etc.**

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4. Rotate each lockdown screw clockwise until they make light contact with device in the head or spool and reverse the screw about ½ turn to take load off each nose.
5. Tighten each outer gland nut fully to a torque of 450 ft-lbs. Never loosen any gland nuts.
6. Using a torque wrench, run the first lockdown screw in. Record the torque. Continue to rotate until it contacts the device in the head or spool, do not tighten.
7. Run the lockdown screw opposite (180 degrees) the one just ran until it contacts the device in the head or spool. Record its torque, again do not tighten.
8. Run in the lockdown screw located halfway between the two original screws recording each torque and again not tightening each one. This should keep the device in the head or spool centered.
9. Repeat the process for each lockdown screw using a torque of about 300 ft/lbs.
10. After the initial test is completed, re-torque each lockdown screw using the same procedure as referenced above.



## **4.0 Post Test Inspection**

Inspect equipment for damage and repair if necessary.





## 5.0 Reference Documents

- API 20<sup>th</sup> Edition