



U.S. Department of the Interior
Bureau of Land Management

Application for Permit to Drill

APD Package Report

Date Printed:

APD ID:	Well Status:
APD Received Date:	Well Name:
Operator:	Well Number:

APD Package Report Contents

- Form 3160-3
- Operator Certification Report
- Application Report
- Application Attachments
 - Well Plat: 1 file(s)
- Drilling Plan Report
- Drilling Plan Attachments
 - Blowout Prevention Choke Diagram Attachment: 4 file(s)
 - Blowout Prevention BOP Diagram Attachment: 3 file(s)
 - Casing Design Assumptions and Worksheet(s): 2 file(s)
 - Hydrogen sulfide drilling operations plan: 1 file(s)
 - Proposed horizontal/directional/multi-lateral plan submission: 6 file(s)
 - Other Facets: 3 file(s)
 - Other Variances: 2 file(s)
- SUPO Report
- SUPO Attachments
 - Existing Road Map: 1 file(s)
 - New Road Map: 1 file(s)
 - Attach Well map: 1 file(s)
 - Production Facilities map: 2 file(s)
 - Water source and transportation map: 1 file(s)
 - Well Site Layout Diagram: 3 file(s)
 - Recontouring attachment: 1 file(s)
- PWD Report
- PWD Attachments
 - None
- Bond Report

- Bond Attachments
 - None

Form 3160-3
(October 2024)

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2027

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input type="checkbox"/> DRILL <input type="checkbox"/> REENTER 1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other 1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		5. Lease Serial No. 6. If Indian, Allottee or Tribe Name 7. If Unit or CA Agreement, Name and No. 8. Lease Name and Well No.
2. Name of Operator		9. API Well No. 30-025-56074
3a. Address	3b. Phone No. (include area code)	10. Field and Pool, or Exploratory
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface At proposed prod. zone		11. Sec., T. R. M. or Blk. and Survey or Area
14. Distance in miles and direction from nearest town or post office*		12. County or Parish 13. State
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

25. Signature	Name (Printed/Typed)	Date
Title		
Approved by (Signature)	Name (Printed/Typed)	Date
Title		Office

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
 Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.



(Continued on page 2)

*(Instructions on page 2)

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM connects this information to a new evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Connection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

Additional Operator Remarks

Location of Well

0. SHL: SESE / 463 FSL / 641 FEL / TWSP: 19S / RANGE: 33E / SECTION: 36 / LAT: 32.610659 / LONG: -103.610279 (TVD: 0 feet, MD: 0 feet)

PPP: SWSE / 100 FSL / 660 FEL / TWSP: 19S / RANGE: 33E / SECTION: 36 / LAT: 32.609662 / LONG: -103.610344 (TVD: 8771 feet, MD: 8950 feet)

PPP: SENE / 2640 FNL / 659 FEL / TWSP: 19S / RANGE: 33E / SECTION: 25 / LAT: 32.631155 / LONG: -103.610279 (TVD: 9370 feet, MD: 11957 feet)

BHL: NENE / 100 FNL / 660 FEL / TWSP: 19S / RANGE: 33E / SECTION: 25 / LAT: 32.638134 / LONG: -103.610257 (TVD: 9370 feet, MD: 19807 feet)

BLM Point of Contact

Name: JANET D ESTES

Title: ADJUDICATOR

Phone: (575) 234-6233

Email: JESTES@BLM.GOV

CONFIDENTIAL

Eastwood 36 25 FEDERAL COM 404H

APD - Geology COAs (Potash or WIPP)

- For at least one well per pad (deepest well within initial development preferred) the record of the drilling rate (ROP) along with the Gamma Ray (GR) and Neutron (CNL) well logs run from TVD to surface in the vertical section of the hole shall be submitted to the BLM office as well as all other logs run on the full borehole 30 days from completion. Any other logs run on the wellbore, excluding cement remediation, should also be sent. Only digital copies of the logs in .TIF or .LAS formats are necessary; paper logs are no longer required. Logs shall be emailed to blm-cfo-geology@doimspp.onmicrosoft.com. Well completion report should have .pdf copies of any CBLs or Temp Logs run on the wellbore.
- Exceptions: In areas where there is extensive log coverage (in particular the salt zone adjacent to a pad), Operators are encouraged to contact BLM Geologists to discuss if additional GR and N logs are necessary on a pad. Operator may request a waiver of the GR and N log requirement due to good well control or other reasons to be approved by BLM Geologist prior to well completion. A waiver approved by BLM must be attached to completion well report to satisfy COAs.
- The top of the Rustler, top and bottom of the Salt, and the top of the Capitan Reef (if present) are to be recorded on the Completion Report.
- H2S has been reported within one mile of the proposed project. Measurements up to 300 ppm were recorded.

Drilling COAs within Known Potash Leasing Area:

Any oil and gas well operator within the KPLA must notify both potash operators as soon as possible if any of the following conditions are encountered during oil and gas operations: (1) Indication of any well collision event, (2) Suspected well fluid flow (oil, gas, or produced water) outside of casing, (3) Sustained annulus pressure between the 1st intermediate and next innermost casing string in excess of 500 psi above the baseline pressure of the well, or above 1500 psi total, (4) Increasing pressure buildup rates (psi/day) across multiple successive bleed-off cycles on the annulus between the 1st intermediate and next innermost casing during well production, or (5) Sustained losses in excess of 50% through the salt interval during drilling.

Questions? Contact Thomas Evans, BLM Geologist at 575-234-5965 or tvevans@blm.gov

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	COTERRA ENERGY OPERATING CO
LEASE NO.:	NMNM135249
COUNTY:	Lea County, New Mexico

Wells:

Eastwood 36-25 Pad

Eastwood 36-25 FEDERAL COM 353H

Surface Hole Location: 463 feet FSL and 661 feet FEL, Section 36, T. 19 S., R. 33 E.

Bottom Hole Location: 100 feet FNL and 1980 feet FEL, Section 25, T. 19 S, R 33 E.

Eastwood 36-25 FEDERAL COM 404H

Surface Hole Location: 463 feet FSL and 641 feet FEL, Section 36, T. 19 S., R. 33 E.

Bottom Hole Location: 100 feet FNL and 660 feet FEL, Section 25, T. 19 S, R 33 E.

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1. SPECIAL REQUIREMENTS

2.3 WILDLIFE

2.3.1 Lesser Prairie Chicken

2.3.1.1 Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken:

Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

2.3.1.2 Timing Limitation Exceptions:

The Carlsbad Field Office will publish an annual map of where the LPC timing and noise stipulations and conditions of approval (Limitations) will apply for the identified year (between March 1 and June 15) based on the latest survey information. The LPC Timing Area map will identify areas which are Habitat Areas (HA), Isolated Population Area (IPA), and Primary Population Area (PPA). The LPC Timing Area map will also have an area in red crosshatch. The red crosshatch area is the only area where an operator is required to submit a request for exception to the LPC Limitations. If an operator is operating outside the red crosshatch area, the LPC Limitations do not apply for that year and an exception to LPC Limitations is not required.

2.3.1.3 Ground-level Abandoned Well Marker to avoid raptor perching:

Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at BLM_NM_CFO_Construction_Reclamation@blm.gov.

2.3.3 Dunes Sagebrush Lizard

- Pre-construction contact with a BLM wildlife biologist is required within 5 days before any ground disturbing activities associated with the project occurs.
- Successful completion of the BLM Trench Stipulation Workshop is required for a non-agency person to be approved as a monitor.
- Any trench left open for (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, an agency approved monitor shall walk the entire length of the open trench and remove all trapped vertebrates. The bottom surface of the trench will be disturbed a minimum of 2 inches in order to arouse any buried vertebrates. All vertebrates will be released alive at least 100 yards from the trench.
- For trenches left open for eight (8) hours or more the following requirements apply:
 - Earthen escape ramps and/or structures (built at no more than a 30-degree slope and spaced no more than 500 feet apart) shall be placed in the trench. Metal structures will not be authorized. Options will be discussed in detail at the required Trench Stipulation Workshop.
 - One approved monitor shall be required to survey up to three miles of trench between the hours of 11 AM-2 PM. A daily report (consolidate if there is more than one monitor) on the vertebrates found and removed from the trench shall be provided to the BLM (email/fax is acceptable) the following morning.
 - Prior to backfilling of the trench all structures used as escape ramps will be removed and the bottom surface of the trench will be disturbed a minimum of 2 inches in order to

arouse any buried vertebrates. All vertebrates will be released alive a minimum of 100 yards from the trench.

- This stipulation shall apply to the entire length of the project in the DSL habitat polygon regardless of land ownership or CCA/CCAA enrollment status.
- A project closeout will be required within three business days of the completion of the project.

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Coterra Energy Operating Co
LOCATION:	Section 36, T.19 S., R.33 E., NMPM
COUNTY:	Lea County, New Mexico

WELL NAME & NO.:	Eastwood 36-25 Federal Com 353H
ATS/API ID:	ATS-26-379
APD ID:	10400108157
Sundry ID:	N/a

WELL NAME & NO.:	Eastwood 36-25 Federal Com 404H
ATS/API ID:	ATS-26-381
APD ID:	10400108158
Sundry ID:	N/a

COA

H2S	<input type="text" value="Yes"/>		
Potash	<input type="text" value="R-111-Q"/>	<input type="text" value="Figure E"/>	
Cave/Karst Potential	<input type="text" value="Low"/>		
Cave/Karst Potential	<input type="checkbox"/> Critical		
Variance	<input type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input type="text" value="Conventional and Multibowl"/>		
Other	<input checked="" type="checkbox"/> 4 String <input type="checkbox"/> 5 String	Capitan Reef <input type="text" value="Int 2"/>	<input type="checkbox"/> WIPP
Other	Pilot Hole <input type="text" value="None"/>	<input checked="" type="checkbox"/> Open Annulus	
Cementing	Contingency Squeeze <input type="text" value="None"/>	Echo-Meter <input type="text" value="Prod"/>	Primary Cement Squeeze <input type="text" value="None"/>
Special Requirements	<input type="checkbox"/> Water Disposal/Injection	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit
Special Requirements	<input type="checkbox"/> Batch Sundry	Waste Prevention <input type="text" value="Waste MP"/>	
Special Requirements Variance	<input type="checkbox"/> BOPE Break Testing <input type="checkbox"/> Offline BOPE Testing	<input type="checkbox"/> Offline Cementing	<input type="checkbox"/> Casing Clearance

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H₂S) Drilling Plan shall be activated 500 feet prior to drilling into the **Delaware** formation. As a result, the Hydrogen Sulfide area must meet **43 CFR part 3170 Subpart 3176** requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

Surface casing must be kept fluid filled to meet BLM minimum collapse requirement.

1. The **16 inch** surface casing shall be set at approximately **1545 feet** (a minimum of 70 feet into the Rustler Anhydrite and above the salt when present, and below usable fresh water) and cemented to the surface. The surface hole shall be **18 1/2 inch** in diameter.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **10-3/4 inch** intermediate casing shall be set at approximately **3250 feet** is:
 - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst, potash or capitan reef. Cement excess is less than 25%, more cement is required if washout occurs. Adjust cement volume and excess based on a fluid caliper or similar method that reflects the as-drilled size of the wellbore.**

3. The minimum required fill of cement behind the **8-5/8** inch intermediate casing shall be set at approximately **5275 feet** is:
- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst, potash or capitan reef. Cement excess is less than 25%, more cement is required if washout occurs. Adjust cement volume and excess based on a fluid caliper or similar method that reflects the as-drilled size of the wellbore.**
4. The minimum required fill of cement behind the **5-1/2** inch production casing is:
- The top of cement in the annulus between the 2st intermediate and the production casing strings shall stand un-cemented at least 500 feet below the 2st intermediate shoe. Zero percent excess shall be pumped on the production cement slurry.
 - After hydraulic fracturing operations have been concluded and no longer than 180 days after the well is brought online, the operator shall bradenhead cement at least **500 feet** tie-back into the previous casing but not higher than USGS Marker Bed No. 126. **(Squeeze 300 sxs Class C and 150 bbls Displacement Fluid)**
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst, potash or capitan reef.

Operator has proposed to pump down **8 5/8" X 5-1/2"** annulus post completion. Operator must run Echo-meter to verify Cement Slurry/Fluid top in the annulus or operator shall run a CBL from TD of the **8-5/8"** casing to surface to verify TOC. Adjust cement volume and excess based on a fluid caliper or similar method that reflects the as-drilled size of the wellbore. Report the amount of fluid utilized to pump the cement slurry and the calculated top of cement slurry to the BLM. Operator may conduct a negative and positive pressure test during completion to remediate sustained casing pressure and ensure cement tie-back requirement.

Operator has proposed an open annulus completion in R-111-Q. Submit results to the BLM. Pressure monitoring device and Pressure Safety Valves must be installed at surface on the **8 5/8" x 5-1/2"** annulus.

In the event of a casing failure during completion, the operator must contact the BLM at (575-706-2779) and (575-689-5981 Lea County).

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
- 2.

Option 1:

- a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi. **Annular which shall be tested to 2000 (2M) psi.**
- b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **10-3/4** intermediate casing shoe shall be **3000 (3M)** psi.
- c. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **8-5/8** inch intermediate casing shoe shall be **5000 (5M)** psi.

Option 2:

- a. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the **16** inch surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
 - e. Whenever any seal subject to test pressure is broken, all the tests in 43 CFR 3172.6(b)(9) must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- The operator will submit an as-drilled survey well plat of the well completion, but are not limited to, those specified in **43 CFR part 3170 Subpart 3171**
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,
(575) 689-5981

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per **43 CFR part 3170 Subpart 3172** as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends of both lead and tail cement, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Acceptable Method of Cement Verifications:
 - a. Observing cement circulated to surface.
 - b. Cement bond log (CBL).
 - c. Temperature log within 8-10 hours after completing the cement job.
 - d. Echometer (if a second-stage bradenhead squeeze is being used).
5. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
6. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
7. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
8. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
9. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in **43 CFR part 3170 Subpart 3172 and API STD 53 Sec. 5.3**.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Whenever any seal subject to test pressure is broken, all the tests in 43 CFR 3172.6(b)(9) must be followed.
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead cement), whichever is greater. However, if the float does not hold, cut-

off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the cement plug. The BOPE test can be initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)
 - c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to **43 CFR part 3170 Subpart 3172** with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for 8 hours or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
 - d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
 - e. The results of the test shall be reported to the appropriate BLM office.
 - f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
 - g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
 - h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per **43 CFR part 3170 Subpart 3172**.
- C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

Long Vo (LVO) 3/5/2026



Operator Certification Data Report

03/06/2026

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Operator

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: SHELLY BOWEN

Signed on: 11/04/2025

Title: Regulatory Analyst

Street Address: 6001 DEAUVILLE BLVD STE 300N

City: MIDLAND

State: TX

Zip: 79706

Phone: (432)620-1644

Email address: DL_PBUREGULATORY@COTERRA.COM

Field

Representative Name:

Street Address:

City:

State:

Zip:

Phone:

Email address:



Application Data

03/06/2026

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

APD ID: 10400108158	Submission Date: 11/18/2025	Highlighted data reflects the most recent changes Show Final Text
Operator Name: COTERRA ENERGY OPERATING CO		
Well Name: EASTWOOD 36-25 FEDERAL COM	Well Number: 404H	
Well Type: OIL WELL	Well Work Type: Drill	

Section 1 - General

APD ID: 10400108158	Tie to previous NOS? N	Submission Date: 11/18/2025
BLM Office: Carlsbad	User: SHELLY BOWEN	Title: Regulatory Analyst
Federal/Indian APD: FED	Is the first lease penetrated for production Federal or Indian? FED	
Lease number: NMNM135249	Lease Acres:	
Surface access agreement in place?	Allotted?	Reservation:
Agreement in place? NO	Federal or Indian agreement:	
Agreement number:		
Agreement name:		
Keep application confidential? Y		
Permitting Agent? NO	APD Operator: COTERRA ENERGY OPERATING CO	
Operator letter of		

Operator Info

Operator Organization Name: COTERRA ENERGY OPERATING CO		
Operator Address: 3001 DEAUVILLE BLVD SUITE 300 N	Zip: 79705	
Operator PO Box:		
Operator City: MIDLAND	State: TX	
Operator Phone: (432)620-1642		
Operator Internet Address:		

Section 2 - Well Information

Well in Master Development Plan? NO	Master Development Plan name:	
Well in Master SUPO? NO	Master SUPO name:	
Well in Master Drilling Plan? NO	Master Drilling Plan name:	
Well Name: EASTWOOD 36-25 FEDERAL COM	Well Number: 404H	
Field/Pool or Exploratory? Field and Pool	Field Name: APACHE RIDGE	Pool Name: Bone Spring

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Is the proposed well in a Helium production area? N Use Existing Well Pad? N New surface disturbance?

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name:
Eastwood 36-25 Federal Com

Number: E2E2 Pad

Well Class: HORIZONTAL

Number of Legs: 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 27 Miles

Distance to nearest well: 20 FT

Distance to lease line: 330 FT

Reservoir well spacing assigned acres Measurement: 640 Acres

Well plat: EASTWOOD_36_25_FEDERAL_COM_E2E2_404H_C102_11132025_20251117134900.pdf

Well work start Date: 01/15/2026

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number: 23782

Reference Datum: GROUND LEVEL

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this
SHL Leg #1	463	FSL	641	FEL	19S	33E	36	Aliquot SESE	32.610659	-103.610279	LEA	NEW MEXICO	NEW MEXICO	S	STATE	3606			Y
KOP Leg #1	100	FSL	660	FEL	19S	33E	36	Aliquot SWSE	32.609662	-103.610344	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-5165	8950	8771	Y
PPP Leg #1-1	100	FSL	660	FEL	19S	33E	36	Aliquot SWSE	32.609662	-103.610344	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-5165	8950	8771	Y

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

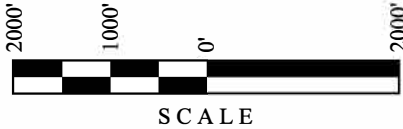
Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this
PPP Leg #1-2	2640	FNL	659	FEL	19S	33E	25	Aliquot SENE	32.631155	-103.610279	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 135249	-5764	11957	9370	Y
EXIT Leg #1	100	FNL	660	FEL	19S	33E	25	Aliquot NENE	32.638134	-103.610257	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 135249	-5764	19807	9370	Y
BHL Leg #1	100	FNL	660	FEL	19S	33E	25	Aliquot NENE	32.638134	-103.610257	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 135249	-5764	19807	9370	Y

Property Name EASTWOOD 36-25 FEDERAL COM	Well Number 404H	Drawn By T.I.R. 10-30-25	Revised By
---------------------------------------------	---------------------	-----------------------------	------------

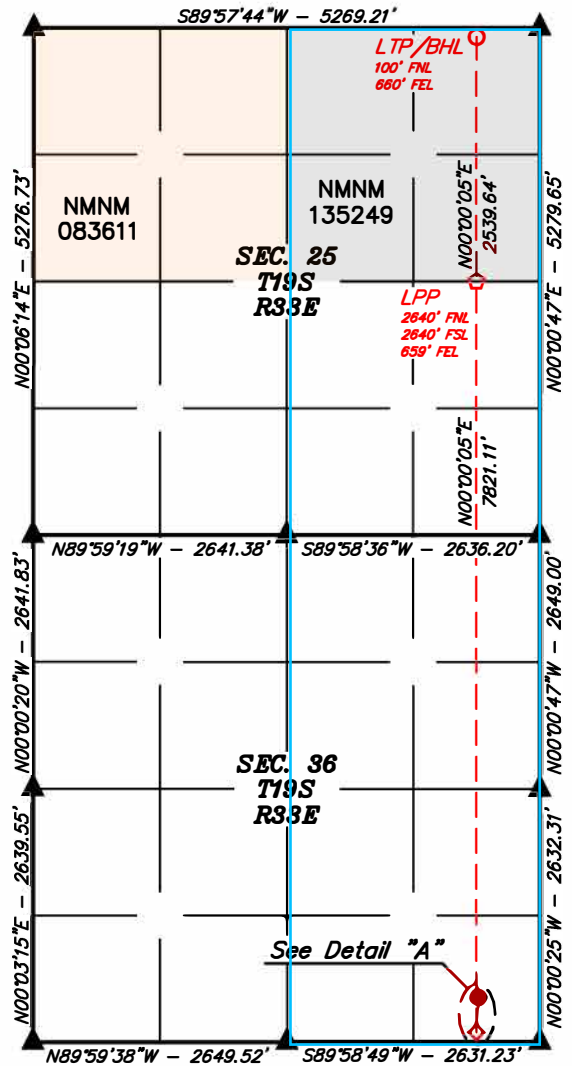
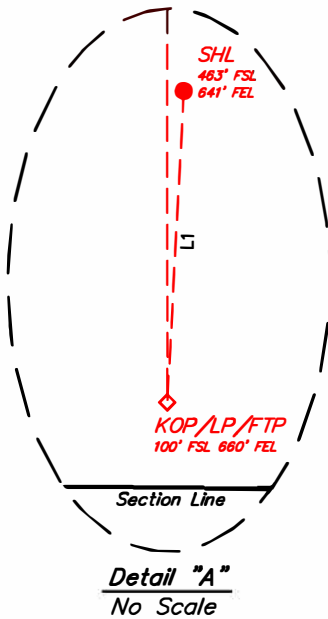
- = SURFACE HOLE LOCATION
- ◇ = KICK OFF POINT/LANDING POINT/FIRST TAKE POINT
- ◇ = LEASE PENETRATION POINT
- = LAST TAKE POINT/BOTTOM HOLE LOCATION
- ▲ = SECTION CORNER LOCATED

NOTE:

- Distances referenced on plat to section lines are perpendicular.
- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of W103°53'00" (NAD 83)
- Colored areas represent Federal oil and gas leases.



LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S03°01'25"W	363.65'



NAD 83 (SURFACE HOLE LOCATION)
LATITUDE = 32°36'38.37" (32.610659°)
LONGITUDE = -103°36'37.01" (-103.610279°)
NAD 27 (SURFACE HOLE LOCATION)
LATITUDE = 32°36'37.93" (32.610537°)
LONGITUDE = -103°36'35.23" (-103.609786°)
STATE PLANE NAD 83 (N.M. EAST)
N: 586645.83' E: 763979.91'
STATE PLANE NAD 27 (N.M. EAST)
N: 586582.95' E: 722799.50'

NAD 83 (KOP/LP/FTP)
LATITUDE = 32°36'34.78" (32.609662°)
LONGITUDE = -103°36'37.24" (-103.610344°)
NAD 27 (KOP/LP/FTP)
LATITUDE = 32°36'34.34" (32.609539°)
LONGITUDE = -103°36'35.46" (-103.609851°)
STATE PLANE NAD 83 (N.M. EAST)
N: 586282.67' E: 763962.27'
STATE PLANE NAD 27 (N.M. EAST)
N: 586219.80' E: 722781.85'

NAD 83 (LPP 1)
LATITUDE = 32°37'52.16" (32.631155°)
LONGITUDE = -103°36'37.00" (-103.610279°)
NAD 27 (LPP 1)
LATITUDE = 32°37'51.72" (32.631032°)
LONGITUDE = -103°36'35.22" (-103.609784°)
STATE PLANE NAD 83 (N.M. EAST)
N: 594102.35' E: 763929.36'
STATE PLANE NAD 27 (N.M. EAST)
N: 594039.25' E: 722749.16'

NAD 83 (LTP/BHL)
LATITUDE = 32°38'17.28" (32.638134°)
LONGITUDE = -103°36'36.93" (-103.610257°)
NAD 27 (LTP/BHL)
LATITUDE = 32°38'16.84" (32.638011°)
LONGITUDE = -103°36'35.15" (-103.609763°)
STATE PLANE NAD 83 (N.M. EAST)
N: 596641.52' E: 763918.66'
STATE PLANE NAD 27 (N.M. EAST)
N: 596578.35' E: 722738.54'



MODRALL SPERLING

LAWYERS

December 12, 2025

Deana M. Bennett
505.848.1834
dmb@modrall.com

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

**Re: APPLICATION OF COTERRA ENERGY
OPERATING CO. FOR COMPULSORY POOLING,
LEA COUNTY, NEW MEXICO**

CASE NO. 25805

**APPLICATION OF COTERRA ENERGY
OPERATING CO. FOR APPROVAL OF
A NON-STANDARD UNIT, COMPULSORY POOLING,
AND TO THE EXTENT NECESSARY,
APPROVAL OF AN OVERLAPPING SPACING UNIT,
LEA COUNTY, NEW MEXICO**

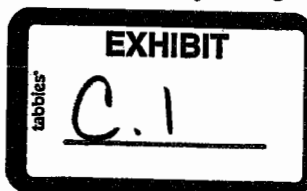
CASE NO. 25806

TO: AFFECTED PARTIES

This letter is to advise you that Coterra Energy Operating Co. ("Coterra") has filed the enclosed applications.

In Case No. 25805, Coterra seeks an order from the Division approving a non-standard spacing unit and pooling all uncommitted interests within a 640-acre, more or less, Wolfcamp horizontal spacing unit comprised of the E/2 of Sections 25 and 36, Township 19 South, Range 33 East, NMPM, Lea County, New Mexico. This spacing unit will be dedicated to the following wells: the **Eastwood Federal Com 36-25 #703H** well with a proposed surface hole location in the SE/4 SE/4 (Unit P) of Section 36 and a proposed last take point in the NW/4 NE/4 (Unit B) of Section 25; and the **Eastwood Federal Com 36-25 #404H, Eastwood Federal Com 36-25 #704H, and Eastwood Federal Com 36-25 #804H** wells with proposed surface hole locations in the SE/4 SE/4 (Unit P) of Section 36 and proposed last take points in the NE/4 NE/4 (Unit A) of Section 25. The wells will be drilled at orthodox locations. The completed interval for the **Eastwood Federal Com 36-25 #804H** well is expected to be less than 330 feet from the adjoining tracts thereby allowing for

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Roehl Harris & Sisk P.A.
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Albuquerque,
New Mexico 87103-2168
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www.modrall.com



Page 2

the inclusion of the proximity tracts within the proposed spacing unit under Rule 19.15.16.15(B)(1)(b) NMAC. Also to be considered will be the cost of drilling, completing, and equipping said wells, the allocation of these costs as well as the actual operating costs and charges for supervision while drilling and after completion, designation of Coterra Energy Operating Co. as operator of the wells, and a 200% charge for risk involved in drilling said wells. Said area is located approximately 28 miles west of Hobbs, New Mexico.

In Case No. 25806, Coterra seeks an order from the Division approving a non-standard spacing unit and pooling all uncommitted interests within a 640-acre, more or less, Bone Spring horizontal spacing unit comprised of the E/2 of Sections 25 and 36, Township 19 South, Range 33 East, NMPM, Lea County, New Mexico. This spacing unit will be dedicated to the following wells: **Eastwood Federal Com 36-25 #123H, Eastwood Federal Com 36-25 #153H, Eastwood Federal Com 36-25 #223H, and Eastwood Federal Com 36-25 #353H** wells with proposed surface hole locations in the SE/4 SE/4 (Unit P) of Section 36 and proposed last take points in the NW/4 NE/4 (Unit B) of Section 25; and **Eastwood Federal Com 36-25 #124H, Eastwood Federal Com 36-25 #154H, and Eastwood Federal Com 36-25 #224H** wells with proposed surface hole locations in the SE/4 SE/4 (Unit P) of Section 36 and proposed last take points in the NE/4 NE/4 (Unit A) of Section 25. The wells will be drilled at orthodox locations. Applicant also seeks, to the extent necessary, approval of an overlapping spacing unit. This proposed unit will partially overlap with the following existing spacing units:

- A 40-acre spacing unit dedicated to the Smith #001H (API No. 30-025-27705) located in the NW/4 SE/4 of Section 25, Township 19 South, Range 33 East and operated by Cimarex Energy Co. of Colorado;
- A 40-acre spacing unit dedicated to the Smith #002H (API No. 30-025-38952) located in the SE/4 SE/4 of Section 25, Township 19 South, Range 33 East and operated by Cimarex Energy Co. of Colorado;
- A 40-acre spacing unit dedicated to the Penzoil "36" State #002H well (API No. 30-025-35971) located in the NE/4 NE/4 of Section 36, Township 19 South, Range 33 East and operated by Cimarex Energy Co. of Colorado;
- A 40-acre spacing unit dedicated to the Penzoil "B" 36 State #002H well (API No. 30-025-38300) located in the NW/4 SE/4 of Section 36, Township 19 South, Range 33 East and operated by Cimarex Energy Co. of Colorado;
- A 40-acre spacing unit dedicated to the Penzoil "B" 36 State #004H well (API No. 30-025-38559) located in the SW/4 SE/4 of Section 36, Township 19 South, Range 33 East and operated by Cimarex Energy Co. of Colorado; and
- A 40-acre spacing unit dedicated to the Penzoil "B" 36 State #005H well (API No. 30-025-38560) located in the SE/4 SE/4 of Section 36,

Page 3

Township 19 South, Range 33 East and operated by Cimarex Energy Co. of Colorado.

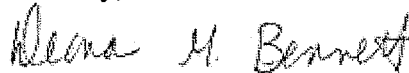
Also to be considered will be the cost of drilling, completing, and equipping said wells, the allocation of these costs as well as the actual operating costs and charges for supervision while drilling and after completion, designation of Coterra Energy Operating Co. as operator of the wells, and a 200% charge for risk involved in drilling said wells. Said area is located approximately 28 miles west of Hobbs, New Mexico.

The hearing is set for January 8, 2026 beginning at 9:00 a.m. The hearing will be conducted in a hybrid fashion, both in-person at the Energy, Minerals, Natural Resources Department, Wendell Chino Building, Pecos Hall, 1220 South St. Francis Drive, 1st Floor, Santa Fe, NM 87505 and via the WebEx virtual meeting platform. To participate in the electronic hearing, see the instructions posted on the docket for the hearing date: <https://www.emnrd.nm.gov/ocd/hearing-info/>.

As a party who may be affected by these applications, we are notifying you of your right to appear at the hearing and participate in these cases, including the right to present evidence either in support of or in opposition to the applications. Failure to appear at the hearing may preclude you from any involvement in these cases at a later date.

You are further notified that if you desire to appear in these cases, then you are requested to file a Pre-Hearing Statement with the Division at least four business days in advance of a scheduled hearing before the Division or the Commission, but in no event later than 5:00 p.m. mountain time, on the Thursday preceding the scheduled hearing date, with a copy delivered to the undersigned.

Sincerely,



Deana M. Bennett

Attorney for Applicant



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Drilling Plan Data Report

03/06/2026

APD ID: 10400108158

Submission Date: 11/18/2025

Highlighted data reflects the most recent changes

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Well Type: OIL WELL

Well Work Type: Drill

[Show Final Text](#)

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formatio
17600297	RUSTLER	0	1427	1427	ANHYDRITE, SANDSTONE	USEABLE WATER	N
17600298	TOP SALT	-1774	1774	1774	ANHYDRITE	NONE	N
17600292	BASE OF SALT	-3064	3064	3064	ANHYDRITE	NONE	N
17600291	YATES	-3184	3184	3184	ANHYDRITE, SANDSTONE	NONE	N
17600296	CAPITAN REEF	-4160	4160	4160	LIMESTONE	NONE	N
17600299	LAMAR	-5459	5459	5459	ANHYDRITE	NONE	N
17600300	BELL CANYON	-5555	5555	5555	SANDSTONE	NONE	N
17600301	CHERRY CANYON	-6129	6129	6129	SANDSTONE	NONE	N
17600302	BRUSHY CANYON	-6875	6875	6875	SANDSTONE	NONE	N
17600303	BONE SPRING LIME	-8289	8289	8289	LIMESTONE	NATURAL GAS, OIL	N
17600304	AVALON SAND	-8492	8492	8492	SHALE	NATURAL GAS, OIL	Y
17600305	BONE SPRING 1ST	-9378	9378	9378	SANDSTONE	NATURAL GAS, OIL	Y
17600306	BONE SPRING 2ND	-9892	9892	9892	SANDSTONE	NATURAL GAS, OIL	Y
17600307	BONE SPRING 3RD	-10653	10653	10653	SANDSTONE	NATURAL GAS, OIL	Y
17600295	WOLFCAMP	-10871	10871	21051	SHALE	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Operator Name: COTERRA ENERGY OPERATING CO**Well Name:** EASTWOOD 36-25 FEDERAL COM**Well Number:** 404H**Pressure Rating (PSI):** 10M**Rating Depth:** 20992

Equipment: A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Requesting Variance? YES**Variance request:** See attached.

Testing Procedure: 2. After running the first intermediate string of casing, a 10M BOP system with 5M annular will be installed. BOPs will be tested according to Onshore Order #2. BOPE will be tested to full rated pressure (10K for all BOPE except the annular, which is tested to 5K). For the low test, the system will be tested to 250 psi. 3. All BOP equipment will be tested utilizing a conventional test plug. 4. A remote kill line is included in the BOPE system 5. All casing strings will be tested per Onshore Order #2, to 0.22 psi/ft or 1,500 psi, whichever is greater, not to exceed 70% of casing burst. 6. If well conditions dictate, conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

10M_BOP_DIAGRAM_20250605071904.pdf

SDT_5883_2_20260205093134.pdf

IP1418_1_20260205093138.pdf

BOP Diagram Attachment:

10M_BOPE_BLM_SUBMISSION_REV.0_20250605071914.pdf

CHOKE_HOSE_M15486_20250605071931.pdf

Pressure Rating (PSI): 2M**Rating Depth:** 3250

Equipment: 1. The multi-bowl wellhead will be installed by a vendor representative. A copy of the installation instructions has been sent to the BLM field office. 2. A packoff will be installed after running and cementing the production casing. This packoff will be tested to 10K psi.

Requesting Variance? NO**Variance request:**

Testing Procedure: BOPE Additional Information & Testing 1. For the first intermediate hole section, a 2M ram and 2M annular BOP system will be utilized. This equipment will be high-tested to 100% working pressure and low-tested at 250 psi.

Choke Diagram Attachment:

2M_Choke_Diagram_20260210151214.pdf

BOP Diagram Attachment:

2M_BOPE_Diagram_20260210151220.pdf

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	18.5	16.0	NEW	API	N	0	1545	0	1545	3606	2061	1545	J-55	65	BUTT	1	3.4	BUOY	10.1 1	BUOY	10.1 1
2	INTERMEDIATE	14.75	10.75	NEW	API	N	0	3250	0	3250	3911	356	3250	J-55	45.5	BUTT	1.2	2.06	BUOY	4.84	BUOY	4.84
3	INTERMEDIATE	9.875	8.625	NEW	API	N	0	5275	0	5275	3911	-1669	5275	P-110	32	OTHER - MOXFL	1	1.08	BUOY	2.08	BUOY	2.08
4	PRODUCTION	8.75	5.5	NEW	API	N	0	20992	0	10775	3606	-7169	20992	P-110	20	BUTT	2.09	2.32	DRY	75.0 6	DRY	75.0 6

Casing Attachments

Casing ID: 1 **String** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

API_BTC_16.000_0.375_J55_Casing__02092026__1__20260210093917.pdf

404H_Casing_Assumptions_20260303142535.pdf

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Casing Attachments

Casing ID: 2 **String** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing ID: 3 **String** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing ID: 4 **String** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Section 4 - Cement

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead		0	0	0	0	0	0	0	0	0
PRODUCTION	Tail		7925	2099 2	1887	1.2	14.2	2264	0	50:50 Poz H	Salt, Bentonite, Fluid Loss, Dispersant
SURFACE	Lead		0	1244	552	1.72	13.5	949	50	Class C	Bentonite
SURFACE	Tail		1244	1545	88	1.34	14.8	117	50	Class C	LCM
INTERMEDIATE	Lead		0	4300	770	1.88	12.9	1447	50	35:65 (Poz:C)	Salt, Bentonite
INTERMEDIATE	Tail		4300	4484	623	1.34	14.8	834	50	Class C	LCM
INTERMEDIATE	Lead		0	4484	321	1.88	12.9	603	50	35:65 Poz C	Salt, Bentonite
INTERMEDIATE	Tail		4484	5200	158	1.2	14.8	189	50	Class C	LCM

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with 43 CFR 3172:

Diagram of the equipment for the circulating system in accordance with 43 CFR 3172:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs.

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
5275	2099 2	OIL-BASED MUD	9	9.5							
0	1545	OTHER : Fresh water	7.8	8.3							
1545	3250	OTHER : Brine Water	9.8	10.3							
3250	5275	OTHER : Fresh Water	7.83	8.33							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

Cement bond log, and temperature log will be run on this well.

List of open and cased hole logs run in the well:

DIRECTIONAL SURVEY, CEMENT BOND LOG, TEMPERATURE LOG,

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5322

Anticipated Surface Pressure: 3260

Anticipated Bottom Hole Temperature(F): 177

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations

H2S_PLAN_REV.0_20251118074958.pdf

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Proposal___Coterra_Eastwood_36_25_Federal_Com_404H_Rev1_kFc_07Nov25_20251118075018.pdf

WP___Coterra_Eastwood_36_25_Federal_Com_404H_Rev1_kFc_07Nov25_20251118075018.pdf

Proposal_100___Coterra_Eastwood_36_25_Federal_Com_404H_Rev1_kFc_07Nov25_20251118075018.pdf

3D_ACSummary_10___Coterra_Eastwood_36_25_Federal_Com_404H_Rev1_kFc_07Nov25_20251118075018.pdf

WELL_CONTROL_PLAN_REV.0_20251118075028.pdf

404H_Drilling_Plan_New_Mexico_4_String_03032026_20260303142607.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Eastwood_Rig_Layout_Plat_20251118075150.pdf

Eastwood_Location_Layout_Plat_20251118075150.pdf

Eastwood_404H_NGMP_20251118075203.pdf

Other Variance request(s)?: Y

Other Variance attachment:

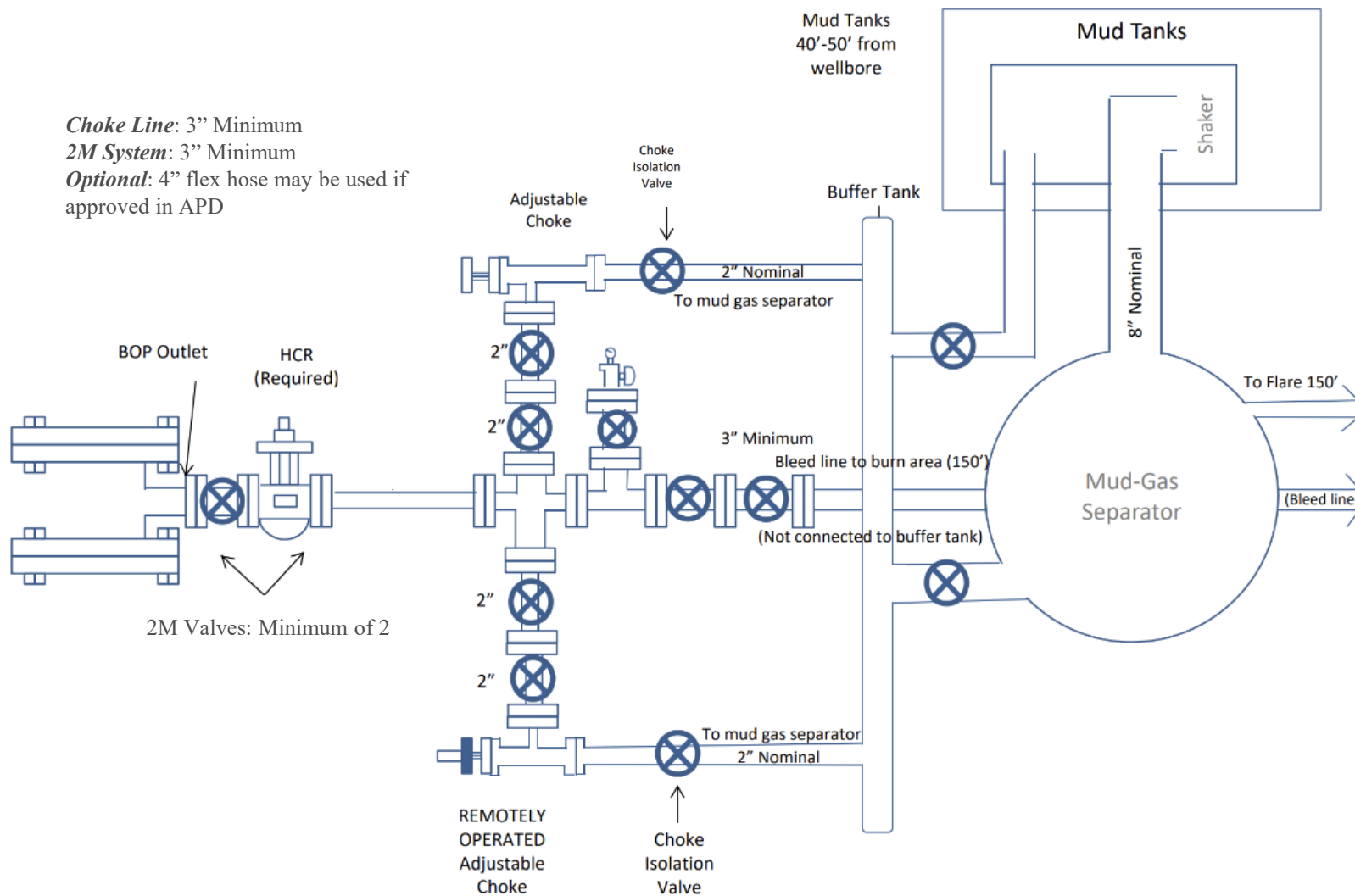
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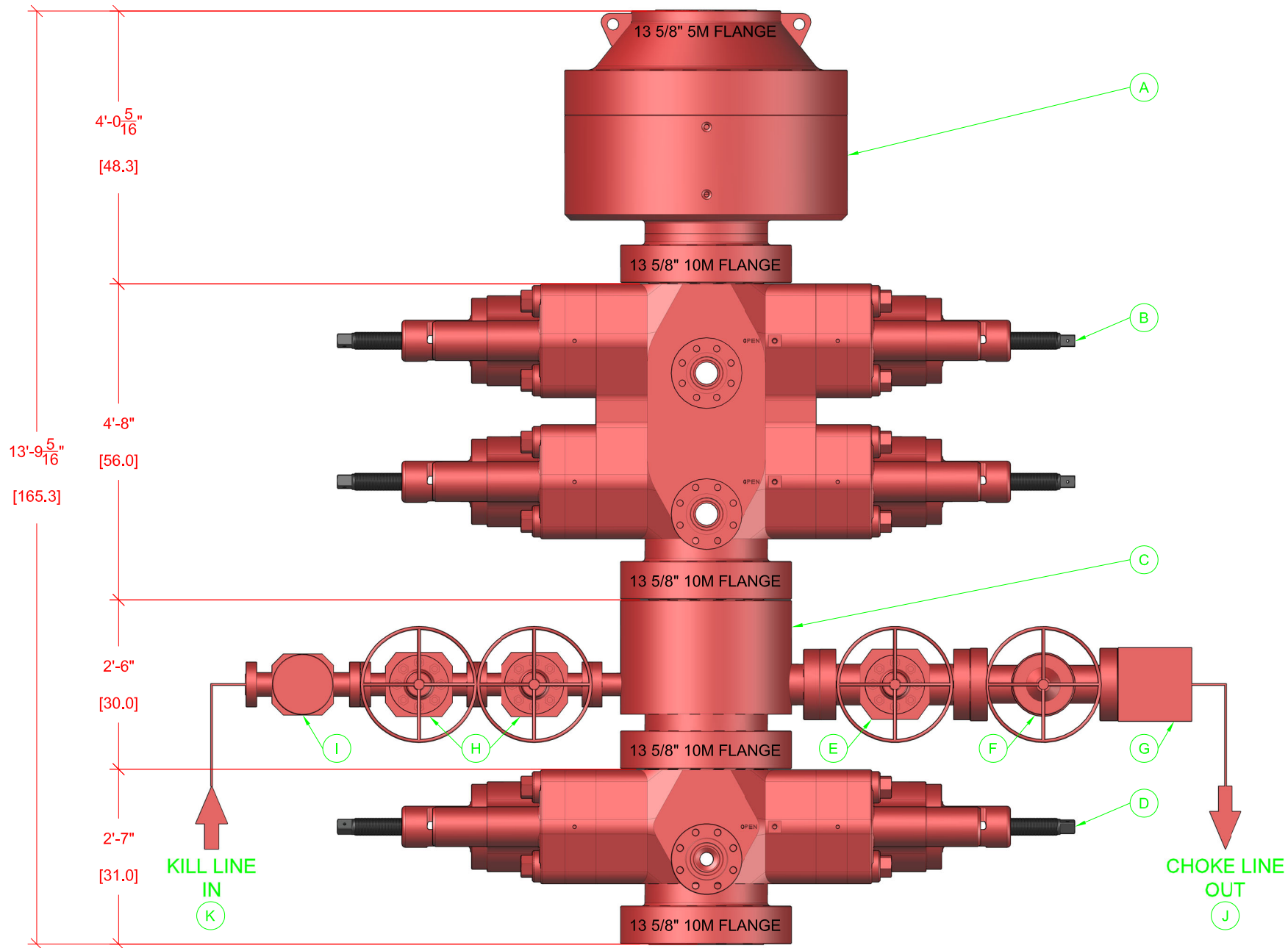
API_BTC_16.000_0.375_J55_Casing_02092026_1_20260210094548.pdf

R-111Q - 2M Choke Diagram

Coterra Energy Co.
Eastwood 353H & 354H
2M Choke Diagram
Lea Co., NM
14-3/4" Hole Section

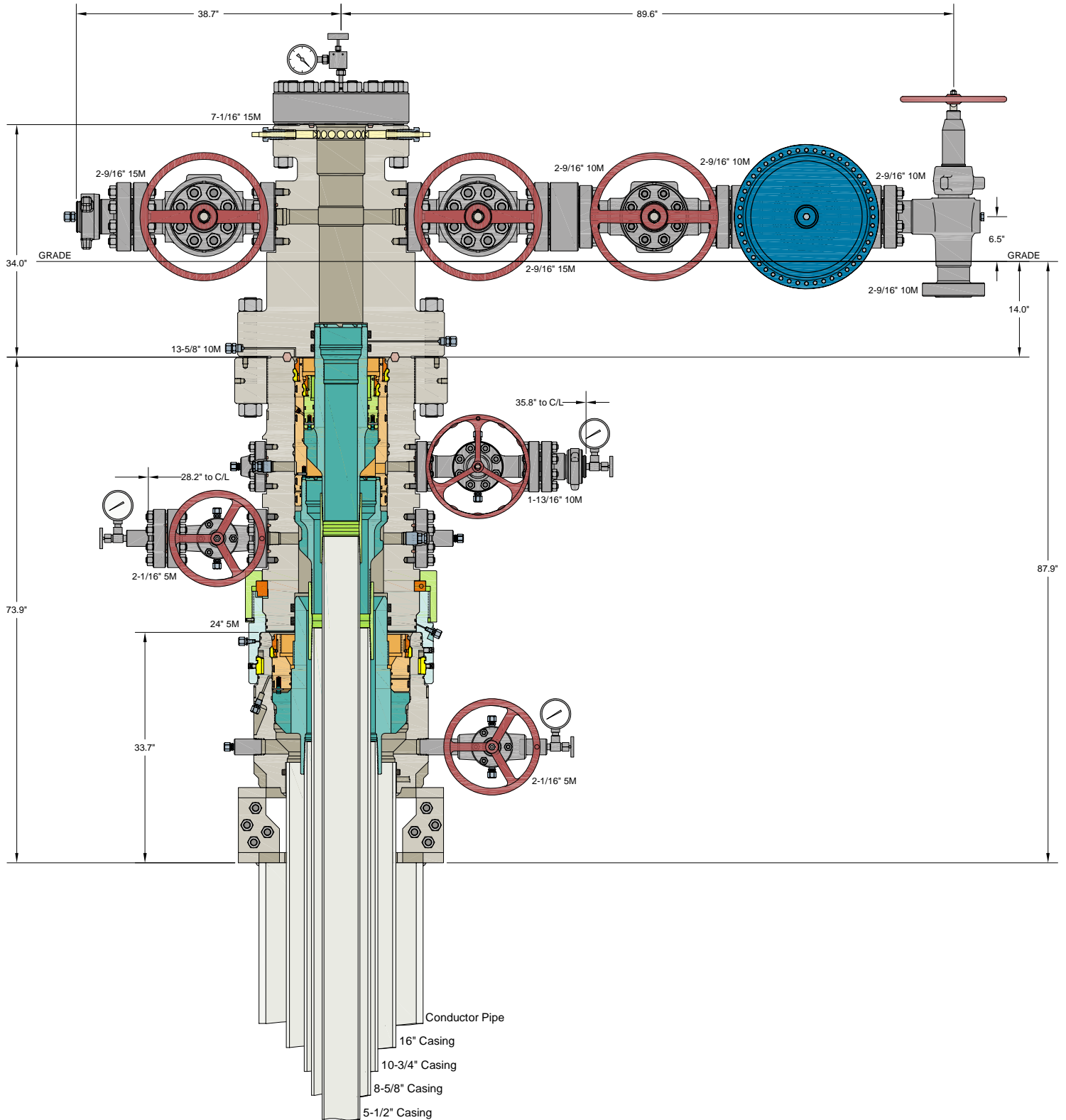
Choke Line: 3" Minimum
2M System: 3" Minimum
Optional: 4" flex hose may be used if approved in APD





BOP EQUIPMENT INFORMATION

DESCRIPTION	MODEL	QTY	ITEM	DESCRIPTION	MODEL	QTY
ANNULAR BOP	13 5/8" 5M	1	G	STUDDED BLOCK	4 1/2" 10M	1
DOUBLE RAM BOP	13 5/8" 10M TYPE-U	1	H	GATE VALE	2 1/2" 10M FC MANUAL	2
MUD CROSS	13 5/8" 10M	1	I	CHECK VALVE	2 1/2" 10M	1
SINGLE RAM BOP	13 5/8" 10M TYPE-U	1	J	CHOKE HOSE	4 1/2" 10M	1
GATE VALVE	4 1/2" 10M FC MANUAL	1	K	KILL HOSE	2 1/2" 10M	1
HCR VALVE	4 1/2" 10M HCR	1	L			



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ALL DIMENSIONS APPROXIMATE

CACTUS WELLHEAD LLC

COTERRA ENERGY INC
HOBBS, NM

16" x 10-3/4" x 8-5/8" x 5-1/2" CRC / MBU-3T-CFL Wellhead
With 13-5/8" 10M x 7-1/16" 15M CTH-DBLHPS-SB Tubing Head
And 10-3/4", 8-5/8" & 5-1/2" Mandrel Casing Hangers

DRAWN	VJK	02FEB26
APPRV		
DRAWING NO.	SDT-5883-2	



Installation Procedure Prepared For:

Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System
With CTH-DBLHPS-SB Tubing Head
And Option to Omit 9-5/8" Casing

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February 03, 2026

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Warning, Caution & Note Defined

WARNING:



Definition:

An operating or servicing procedure, practice, condition or statement, which if not strictly observed could result in environmental harm, serious injury or death to personnel or long term health hazards.

CAUTION:



Definition:

An operating or service procedure, practice, condition or statement, which if not strictly observed could result in damage to or destruction of equipment or rig down time.

NOTE:



Definition:

An operating procedure, condition or statement which is essential to highlight.

Reference Documents

Health, Safety and Environmental Handbook

Field Advisory, Toolbox Topics, and Quality Alerts

CAS-003

Assembly of Threaded Connections to Valves and Wellhead Equipment

CAS-004

Flange Bolting Torque Requirements

CAS-013

Torque-Seal Application - All Closure Bolting

Field Service Manual Sections 3 Page 3-4 - Lockscrews

(Lockscrew dimensions within this procedure are for reference only and not to be misconstrued as factual due to flange and lockscrew tolerances.)

Field Service Manual Sections 7 Service Tools

Field Service Manual Sections 9 - Quick Connects

Field Service Manual Sections 10 - Specifications

Flange Bolting/Torque Requirements, Tubing Specifications, and Casing Specifications

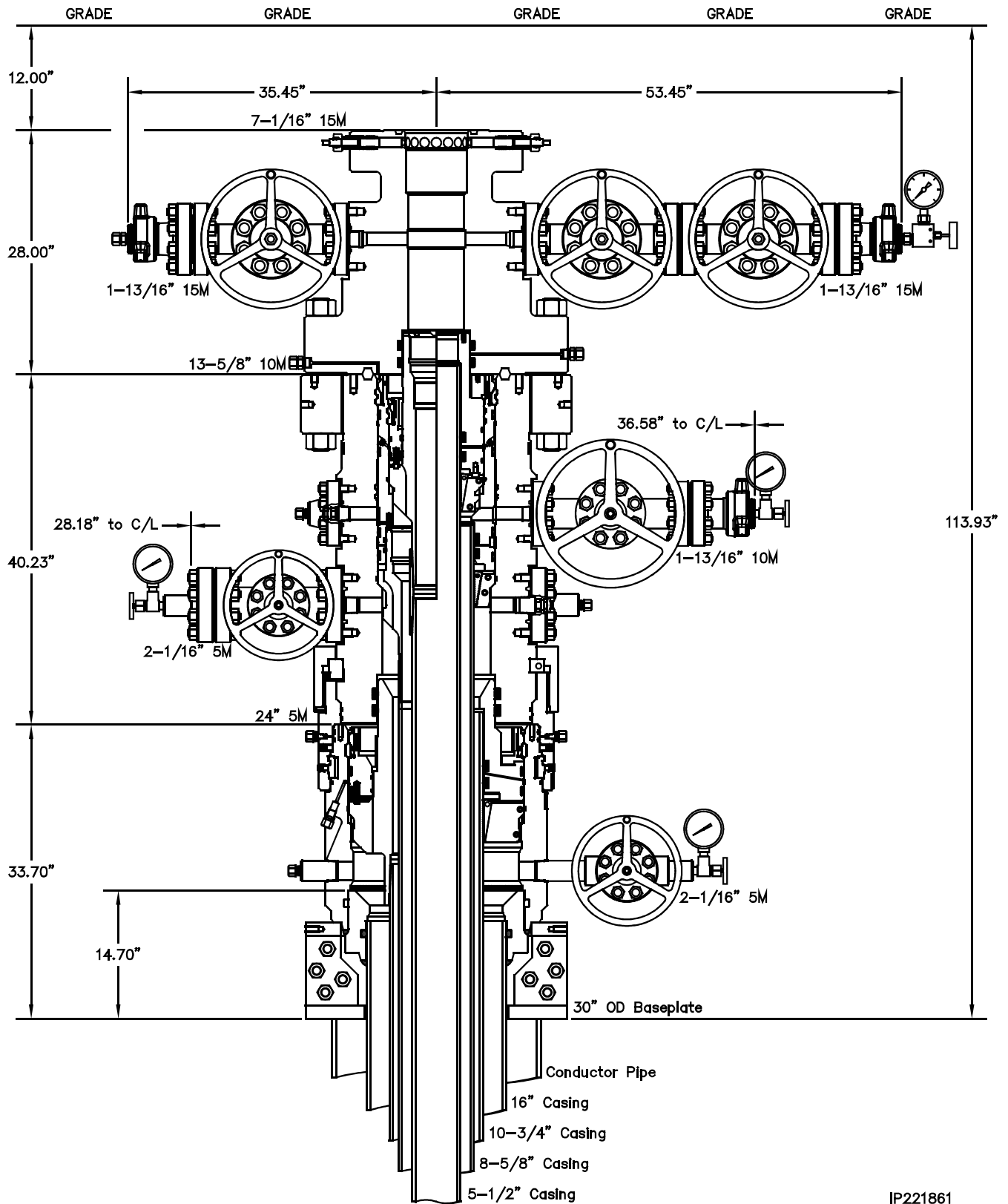


Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System

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System Drawing



IP221861

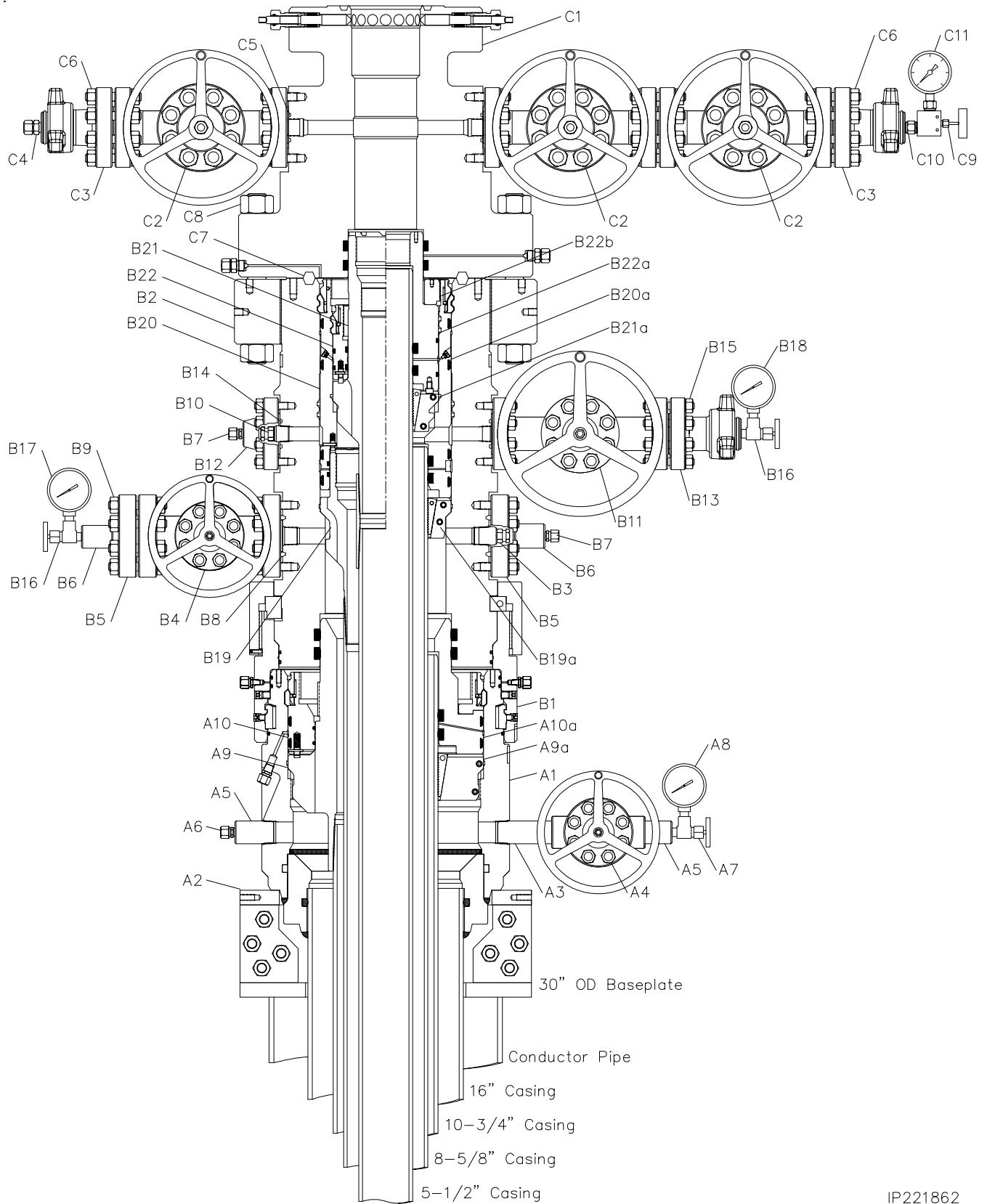
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Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System



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Bill of Materials



IP221862



Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System

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CRC CASING HEAD ASSEMBLY		
Item	Qty	Description
A1	1	Casing Head, CW, CRC, 24" 5M x 16" SOW, With Two 2" Line Pipe & O-ring, With 19.500" 2 Stub Acme 2G LH Thread, 15.25" Minimum Bore, Arranged For Landing Ring, Fabricated, Temperature PU, Material EE, PSL1, PR1 Part # 139029
A2	1	Baseplate Kit, Split, 30" O.D. x 16.5" I.D. x 11.0" Long, For 20" SOW & 21.38" Nose, With With 16" Reducer Bushing, With Four 3" Drill Holes & Four 5/8" 11 UNC 2B Lift Threads On Top Ring, Arranged For 24-28" Conductor, 1,500 KIP Capacity Part # 139158
A3	1	Nipple, 2" Line Pipe x 6" Long XXH, (1.50" I.D.), 5,000 PSI Max WP, 4130/4140, 75K Part # NP6A
A4	1	Gate Valve, Hand Wheel Operated, CW1, 2-1/16" 3/5M SE 2" Line Pipe (Temperature LU Material AA/DD-0,5 PSL1 PR2) Annex F Part # 610001
A5	2	Bull Plug, CW, 2" Line Pipe x 1/2" NPT, API 6A DD Part # BP2T
A6	1	Grease Fitting, Vented Cap, 1/2" NPT, 4140 -50°F With Electroless Nickel Coating Nace, K-Monel Ball, Inconel X-750 Spring Part # 100048
A7	1	Needle Valve, MFA, 1/2" NPT 10M Service Part # NVA

CRC CASING HEAD ASSEMBLY		
Item	Qty	Description
A8	1	Pressure Gauge, 5M, 4-1/2" Face, Liquid Filled, 1/2" NPT Part # PG5M
A9	1	Casing Hanger, CW, CRC-MBU-3T, Fluted, With Centralizer, 20" Nomial x 10-3/4" Buttress Box Bottom x 14.000" 2 Stub Acme 2G Left Hand Pin Top, With 13-3/8" O.D. Neck, With 10.00" Minimum Bore, 4140 110K, Temperature U, Material AA, PSL1, PR1 Part # 139137
A10	1	Packoff, CW, CRC, 20" Nominal, Arranged For 14.500" Seal Prep, With 17.750" 2 Stub Acme 2G Left Hand Box Top, Arranged For Landing On 45° Shoulder On Hanger, 5,000 PSI Max WP, Temperature PU, Standard Service, Non-Nace Part # 133098

MBU-3T HOUSING ASSEMBLY		
Item	Qty	Description
B1	1	Housing, CW, MBU-3T-CRC-DBLHPS-SF, 13-3/8", 13-5/8" 10M x 24" 5M CRC Box, With Two 1-13/16" 10M Studded Upper Outlets & Two 2-1/16" 5M Studded Lower Outlets, 12.410" Minimum Bore, Without 13-5/8" 10M Threaded Flange, Temperature PU, Material AA, PSL2, PR2 Part # 133217
B2	1	Threaded Flange, 13-5/8" 10M With 21.750" 2 Stub Acme 2G Left Hand Box Thread, 31.00" O.D., 4130 75K & I/T @ -75° F Part # 110578
B3	1	VR Plug, CW, 1-1/2" (1.900") Sharp Vee x 1-1/4" Hex, API 6A-DD Part # VR2
B4	1	Gate Valve, Hand Wheel Operated, AOZE, GEN, M-EXP-FB, 2-1/16" 3/5M Flanged End, (6A LU DD PSL2 PR1) QPQ Trim & 4130 Stem Part # 133772
B5	2	Companion Flange, CW, 2-1/16" 5M x 2" Line Pipe, 6A-KU-EE-1 Part # 200002
B6	2	Bull Plug, CW, 2" Line Pipe x 1/2" NPT, API 6A DD Part # BP2T
B7	2	Grease Fitting, Vented Cap, 1/2" NPT, 4140 -50°F With Electroless Nickel Coating Nace, K-Monel Ball, Inconel X-750 Spring Part # 100048
B8	3	Ring Gasket, R24, 2-1/16" 3/5M Part # R24
B9	8	Stud, All-Thread With Two Nuts, Black, 7/8" x 6-1/2" Long, API 20E BSL-1 ASTM A193 GR B7 All Thread Studs, With Two API 20E BSL-1 ASTM A194 GR 2H Heavy Hex Nuts, No Plating Part # 780067-20E1
B10	1	VR Plug, CW, 1-1/4" (1.660") Line Pipe x 1-1/4" Hex, API 6A-DD Part # VR1



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MBU-3T HOUSING ASSEMBLY		
Item	Qty	Description
B11	1	Gate Valve, Hand Wheel Operated, CW, SB100, 1-13/16" 10M Flanged End (API 6A LU BB/EE-0,5 PSL3 PR2) QPQ Trim, ANNEX F, (Bore Vent Hole) Part # 107412MV
B12	1	Blind Flange, 1-13/16" 10M x 1/2" NPT, Recessed For VR, 6A-LU-EE-3 Part # 129709
B13	1	Adapter, CFH, 1-13/16" 10M x 2" Figure 1502 x 1/2" NPT, Nace Service, 6A-PU-EE-2 Part # 122007
B14	3	Ring Gasket, BX151, 1-13/16" 10/15/20M Part # BX151
B15	8	Stud, All-Thread With Two Nuts, Black, 3/4" x 5-1/2" Long, API 20E BSL-1 ASTM A193 GR B7 All Thread Studs, With Two API 20E BSL-1 ASTM A194 GR 2H Heavy Hex Nuts, No Plating Part # 780080-20E1
B16	2	Needle Valve, MFA, 1/2" NPT 10M Service Part # NVA
B17	1	Pressure Gauge, 5M, 4-1/2" Face, Liquid Filled, 1/2" NPT Part # PG5M
B18	1	Pressure Gauge, 10M, 4-1/2" Face, Liquid Filled, 1/2" NPT Part # PG10M

MBU-3T HOUSING ASSEMBLY		
Item	Qty	Description
B19	1	Casing Hanger, CW, MBU-3T-LWR-TP8, Fluted, 13-5/8" x 8-5/8" (32#) Vam Sprint-FJ Pin Bottom x 10.250" 4 Stub Acme 2G Right Hand Box Top, With 11-1/2" O.D. Neck, 4140/4145M, 125K, Temperature U, Material AA, PSL2, PR2 Part # 137689
B20	1	Packoff, CW, MBU-3T, Mandrel, 13-5/8" Nested x 11", With 11.250" 4 Stub Acme 2G Left Hand Box Top, With Rupture Disk & Ribbed Energizing Ring, Temperature U, Material AA, PSL1, PR2 Part # 130632
B21	1	Casing Hanger, CW, MBU-3T-TP8-UPR, SN, 7-5/8", Fluted, 11" Nested x 5-1/2" (20#) HUNTING TEC-LOCK WEDGE Pin Bottom x 6.125" 4 Stub Acme 2G Right Hand Box Top & 5" HBPV Thread, Spec For Rotating Casing String, 4140 125K, Temperature U, Material AA, PSL2, PR2 Part # 134884
B22	1	Packoff, CW, CTF-MBU-3T, 11", Arranged For 7.75" Seal Prep, With 8.750" 4 Stub Acme 2G Left Hand Box Top, Arranged For Landing On 45° Shoulder On Hanger, 4130 80K, Nace Service, PSL2 Part # 115867

TUBING HEAD ASSEMBLY		
Item	Qty	Description
C1	1	Tubing Head, CW, CTH-DBLHPS-SB, 7-5/8", 13-5/8" 10M x 7-1/16" 15M, With Two 1-13/16" 15M Studded Outlets, With 6.375" Minimum Bore & 17-4PH Lock Down Screws, 216A-PU-EE-0,5-3-2 Part # 115302-21
C2	3	Valve, Hand Wheel Operated, CW, SB100, 1-13/16" 15M Flanged End, BB-EE-0,5, (API 6A LU BB/EE-0,5 PSL3 PR2F) QPQ Trim, API 6A PR2 Annex F (Bore Vent Hole) Part # 113880MV
C3	2	Adapter Flange, CFH, 1-13/16" 15M x 2" Figure 1502 x 9/16" Autoclave, 15,000 PSI Max WP, Standard Service, Non-Nace, PSL2 Part # 117166
C4	1	Grease Fitting, Vented Cap, 9/16" Autoclave, 17-4PH Body, 316SS Vent Cap, Inconel X-750 Spring & Tungsten Carbide Ball, 20,000 PSI Service Part # 100326
C5	5	Ring Gasket, BX151, 1-13/16" 10/15/20M Part # BX151
C6	24	Stud, All Thread With Two Heavy Hex Nuts, Black, 7/8" x 6", API 20E BSL-1 ASTM A193 GR B7 All Thread Studs, With Two API 20E BSL-1 ASTM A194 GR 2H Heavy Hex Nuts, No Plating Part # 105477-20E1
C7	1	Ring Gasket, BX159, 13-5/8" 10/15/20M Part # BX159
C8	20	Stud, All Thread With Two Nuts, Black, 1-7/8" x 17-3/4", B7/2H, No Plating Part # 102825
C9	1	Needle Valve, Two Way Angle, 9/16", 20KSI, Sour Service, Without Collars & Glands Part # 810023
C10	1	Autoclave Adapter, High Pressure, 9/16" Male x 9/16" Male, 316 Stainless Steel Part # 106012
C11	1	Pressure Gauge, 15M, 9/16" Autoclave, Liquid Filled Part # PG15M



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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RECOMMENDED SERVICE TOOLS		
Item	Qty	Description
ST1	1	Lift Ring, CW, 24" CRC Bottom x Four 1" 8UNC-2B Lift Threads, 21.25" I.D. (Max Load Capacity 40,000 Lbs) Part # 134688
ST2	1	Running Tool, CW, Casing Head, 24" CRC, 19.500" 2 Stub Acme 2G LH Pin Bottom x 16" BC Box Top, 15.25" Minimum Bore, Max Load Capacity 750K Part # 133358
ST3	1	Test Plug/Retrieving Tool, CW, Arranged For 20.12" Bowl x 4-1/2" IF NC50 Box Bottom & Top, With 1-1/4" Line Pipe Bypass & Spring Loaded Dogs, Fabricated Part # 104020
ST4	1	Wear Bushing, CW, CRC, 20.12" Bowl x 15.25" I.D. x 13.0" Long, Arranged For Two .275" O-ring, With 1/4" Drill Holes Part # 132751
ST5	1	Run Tool, CW, Casing Hanger, CRC, 10-3/4" Buttress Box Top x 14.000" 2 Stub Acme 2G Left Hand Box Landing Thread, 10.00" Bore, Max Load capacity 1400K Part # 139135
ST6	1	Wash Tool, CW, OMS, 20-3/4" & CTH, 20" x 10-3/4"/13-3/8"/14", With 4-1/2" IF NC50 Box Top Threads, Fabricated Part # 103367
ST7	1	Run Tool, CW, Packoff, CRC, 20", With 17.750" 2 Stub Acme 2G Left Hand Pin Bottom x 4-1/2" IF NC50 Box Top, With 3/8" Ball Bearings Part # 133107
ST8	1	Test Plug, CW, 13-5/8" Nominal x 4-1/2" IF NC50 Pin Bottom x 4-1/2" IF NC50 Box Top, With 1-1/4" Line Pipe Bypass Part # 116358

RECOMMENDED SERVICE TOOLS		
Item	Qty	Description
ST9	1	Run/Retrieval Tool, CW, Wear Bushing, 13-5/8", 4-1/2" IF NC50 Box Bottom & Top, With Spring Loaded Dogs, Configured From 104467 (Comb Test Plug Removed Seal Groove) Part # 104467G
ST10	1	Wear Bushing, CW, MBU-3T, Lower, 13-5/8" x 10.00" I.D. x 27.0" Long, With 3/8" Upper O-ring & Without 2.38" Groove Part # 122539
ST11	1	Casing Hanger Running Tool, CW, TP8, 13-5/8" x 8-5/8" (32#) Vam Sprint-FJ Box Top, 10.250" 4 Stub Acme 2G Right Hand Pin Bottom, 1000K Max Load Capacity, Max. Torque 48,000 Ft-Lb, Spec. For Rotating Casing String, 4140 125K Part # 137688
ST12	1	Torque Collar, CW, For Use With Running Tool, TP, 10.250 4 Stub Acme 2G RH Pin Bottom & Arranged For 11.50" O.D. x 5.00" Long Box Hanger Neck, 36,000 FT-LBS Max. Torque Part # 118906
ST13	1	Wash Tool, CW, MBU-3T-LR, MBS2 & Fluted, 13-5/8" x 4-1/2" IF NC50 Box Top Thread, With Brushes Part # 106277
ST14	1	Packoff Running Tool, CW, MBU-3T UPR, 13-5/8" Nested, With 11.250" 4 Stub Acme 2G LH Pin Bottom x 4-1/2" IF (NC-50) Box Top (Seal Sleeve Removed) Part # 117310, 1/4" Bearings Part # 123392, 3/8" Bearings OR Packoff Running Tool, CW, MBU-3T-UPR, 13-5/8" Stack With 11.250" 4 Stub Acme-2G LH Pin Bottom x 4-1/2" IF (NC50) Box Bottom And Top, With Ball Bearings Part # 116996, 1/4" Bearings Part # 119451, 3/8" Bearings

RECOMMENDED SERVICE TOOLS		
Item	Qty	Description
ST15	1	Test Plug, CW, MBU-3T Inner, 11" x 4-1/2" IF NC50 Box Bottom & Top, With 1-1/4" Line Pipe Bypass Part # 125190
ST16	1	Wear Bushing, CW, MBU-3T (-ONE), UPR, Nested, 13-5/8" x 11" x 8.00" I.D. x 20.0" Long, Arranged For 13-5/8" Retrieval Tool Part # 125346
ST17	1	Run Tool, CW, Casing Hanger, TP8, 6.125" 4 Stub Acme 2G Right Hand Pin Bottom x 5-1/2" (20#) HUNTING TEC-LOCK WEDGE Box Top, With 4.768" Min. Bore & Max Load Capacity 580K, Max Torque 40,000 Ft-Lbs, Spec For Rotating Casing String, 4140 125K <i>Note: Max Casing Connection Torque Per Threaders Spec</i> Part # 124324
ST18	1	Torque Collar, CW, Casing Hanger, For Use With 7.62" O.D. x 15.38" Long Box Hanger Neck And 10.83" O.D. Running Tool, Max. Torque 35,000 Ft-Lbs Part # 117319
ST19	1	Wash Tool, CW, Casing Hanger, MBU-2LR/MBS2-R (3T), Fluted, 11" x 4-1/2" IF NC50 Box Top Threads, Fabricated Part # 103164
ST20	1	Run Tool, CW, Packoff, MBU-3T-SN, 7-5/8", With 8.750" 4 Stub Acme 2G Left Hand Pin Bottom x 4-1/2" IF NC50 Box Top, With Ball Bearings Part # 117306
ST21	1	Sub, Crossover, CW, 5" HBPV Pin Thread Bottom x 4-1/2" IF NC50 Box Top, 18.0" Long, 4140 110K Part # 116240
ST22	1	BPV, Type H, 5" One Way, 4130, Hydro Tested & API Monogrammed Part # BPV5T



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RENTAL EQUIPMENT		
Item	Qty	Description
R1	2	Adapter, Drilling, CW, 24" CRC Box Bottom x 21-1/4" 2M Flange Top, 16.25" Long, With 21.25" Minimum Bore, Temperature Rating PU Part # 132608
R2	1	Adapter, Drilling, CW, 21-1/4" 2M Flange x 24" CRC Pin Top, 16.80" Long, With 21.25" Bore, 2,000 PSI Max WP, Temperature PU, Material EE, PSL1 Part # 134041
R3	1	Threaded Hub, CW, MBU-3T, 13-5/8" 10M, With 21.750" 2 Stub Acme 2G Left Hand Box Thread Part # 116992
R4	2	Adapter, Drilling, CW, MBU-3T, 13-5/8" 10M Quick Connect Bottom x 13-5/8" 10M Studded Top x 15.0" Long, Temperature Rating PU Part # 116966
R5	1	Spacer Spool, CW, 13-5/8" 10M Threaded Flange Bottom x 13-5/8" 10M Quick Connect Hub Top x 50.0" Long, With 13.62" Minimum Bore, 10,000 PSI Max WP, Temperature Rating PU Part # 127541
R6	1	TA Cap, CW, MBU-3T-HPS, 12-5/8", 13-5/8" 10M Quick Connect, With One 1-13/16" 10M Studded Outlets, VR Thread & 1/2" NPT Port, 6A-U-AA-1-1 Part # 122483
R7	1	Secondary Seal, CW, TA-HPS, 12-5/8" x 8-5/8", 6A-PU-DD-1-2 For Use TA Cap Only Part # 122272
R8	1	Blind Flange, AOZE, 7-1/16" 15M x 9/16" Autoclave, With Two 3/4" 10 UNC 2B Lift Threads, KU-EE-3-1 Part # 126594

EMERGENCY EQUIPMENT		
Item	Qty	Description
A9a	1	Casing Hanger, CW, CRC-C1, 20" x 10-3/4", Temperature PU, Material DD, PSL3, PR1 Part # 139150
A10a	1	Packoff, CW, CRC-SN, 13-3/8" Emergency, 20" x 10-3/4", With 17.750" 2 Stub Acme 2G Left Hand Box Top, 5,000 PSI Max WP, Temperature PU, Standard Service, Non-Nace Part # 139152
B19a	1	Casing Hanger, CW, MBU-3T-LWR, Emergency, 13-5/8" x 8-5/8", 6A-PU-DD-3-2 Part # 119743
B20a	1	Packoff, CW, MBU-3T, Emergency, 13-5/8" Nested x 11" x 8-5/8", With 11.250" 4 Stub Acme 2G Left Hand Box Top With Rupture Disk, 4140 110K, Standard Service, Non-Nace Part # 119526T
B21a	1	Casing Hanger, CW, MBU-3T, UPR/MBU-2LR, UPR, 11" x 5-1/2", 6A-PU-DD-3-2 Part # 108211
B22a	1	Packoff, CW, MBU-3T, Inner, Emergency, Nested, 11" x 5-1/2", With 7-5/8" Seal Neck, 5" HBPV Threads & 4.93" Minimum Bore, Arranged For Hold Down Ring, 4130 75K, Nace Service Part # 117298
B22b	1	Hold Down, Ring, For 22 Casing Hanger 11" x 4-1/2", Arranged For Packoff MBU-LR, 13-5/8" 10M, With 11.250" 4 Stub Acme 2G Left Hand Pin x 8.00" I.D. x 2.62" Long, 4140 110K Part # 116161



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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Stage 1 — Hang Off the 16" Casing

1. Drive or drill in the conductor pipe as required.
2. Cut the conductor pipe at 113.93" below grade. Grind the stub level with the horizon then place a 1/8" x 45° bevel on the I.D.
3. Drill and condition the 16" casing hole section.

NOTE: The 24" CRC x 16" SOW Casing Head with pup joint and running tool with landing joint may be shipped to location as a pre assembled riser. In the event it is not the following steps will detail the assembly of the CRC riser assembly.

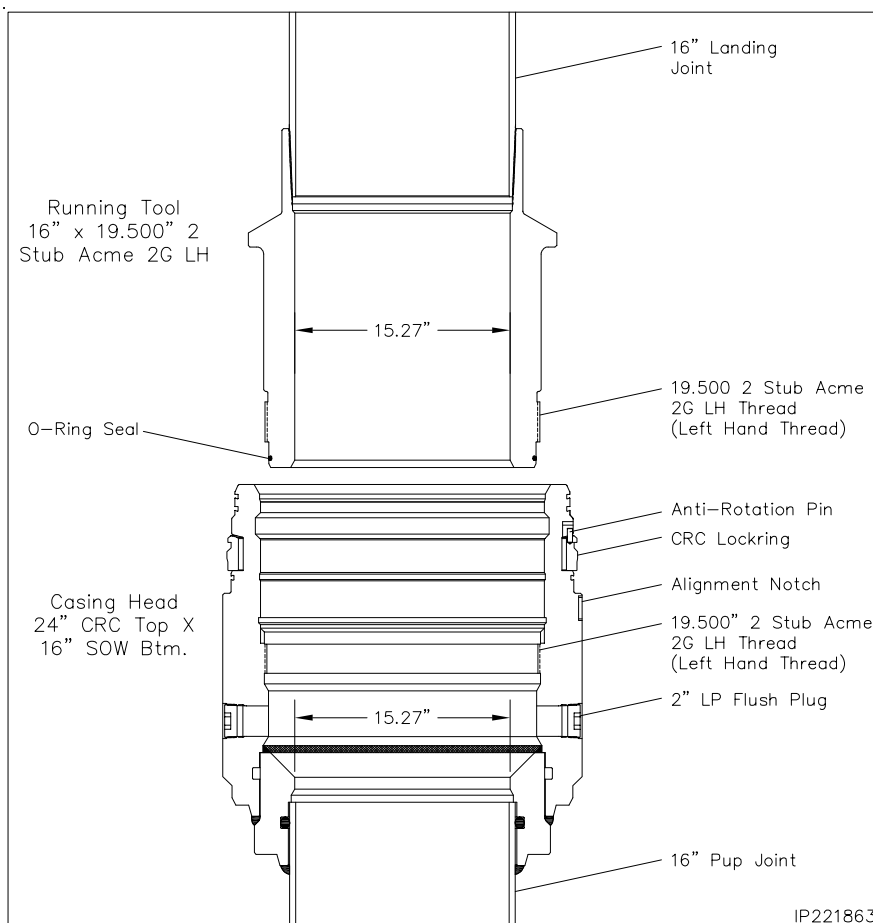
4. Examine the **16" BC x 19.500 2 Stub Acme Running Tool (Item ST2)**. Verify the following:
 - ID and OD threads are clean and in good condition
 - o-ring is in place and in good condition

5. Make up a joint of 16" casing in the top of the tool and tighten connection to thread manufacturer's maximum make up torque.

6. Pick up the assembly and stand it back in the derrick.

7. Examine the **24" CRC x 16" SOW Casing Head, (Item A1)**. Verify the following:

- bore is clean and free of debris
- lockring is in place with anti-rotation pin properly seated in its pocket
- 2" LP flush plugs are in place and tightened securely
- pup joint is in place and properly welded.
- buttress threads are clean and in good condition. Reinstall thread protector



8. Examine the **24" CRC Lift Ring (Item ST1)**. Verify the following:
 - four 1" lift threads and bore are clean and in good condition
 - drive screws are in place and retracted from the bore
 - 1" lift eyes are properly installed and in good condition
9. Slide the 24" CRC lift ring over the top of the lower drilling adapter assembly until it bottoms out on top of the pin top drilling adapter and the lockring snaps into the lift ring.
10. Install a weight rated pick up sling to the top of the 24" CRC lift ring and drilling adapter assembly.



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Stage 1 — Hang Off the 16" Casing

- Run the 16" casing to the required depth and set the casing in the floor slips.

WARNING: Keep body clear of all pinch points and suspended loads.

- Pick up the assembly and suspend it above the casing in the floor slips.

- Remove the pin thread protector and thoroughly clean the mating threads of the pup joint and the casing collar.

- Apply a coat of thread dope to the threads and then carefully lower the pup joint into the casing collar.

- Rotate the assembly by hand counter clockwise to locate the thread start and then clockwise to a positive stop.

- Using the rig tongs on the casing head pup joint, tighten the connection to thread manufacturer's optimum make up torque.

- Remove the pick up sling and the casing head protector cover.

- Inspect the head and lockring for any damage and repair as necessary.

- Ensure the lockring anti-rotation pin is properly seated and ring moves freely.

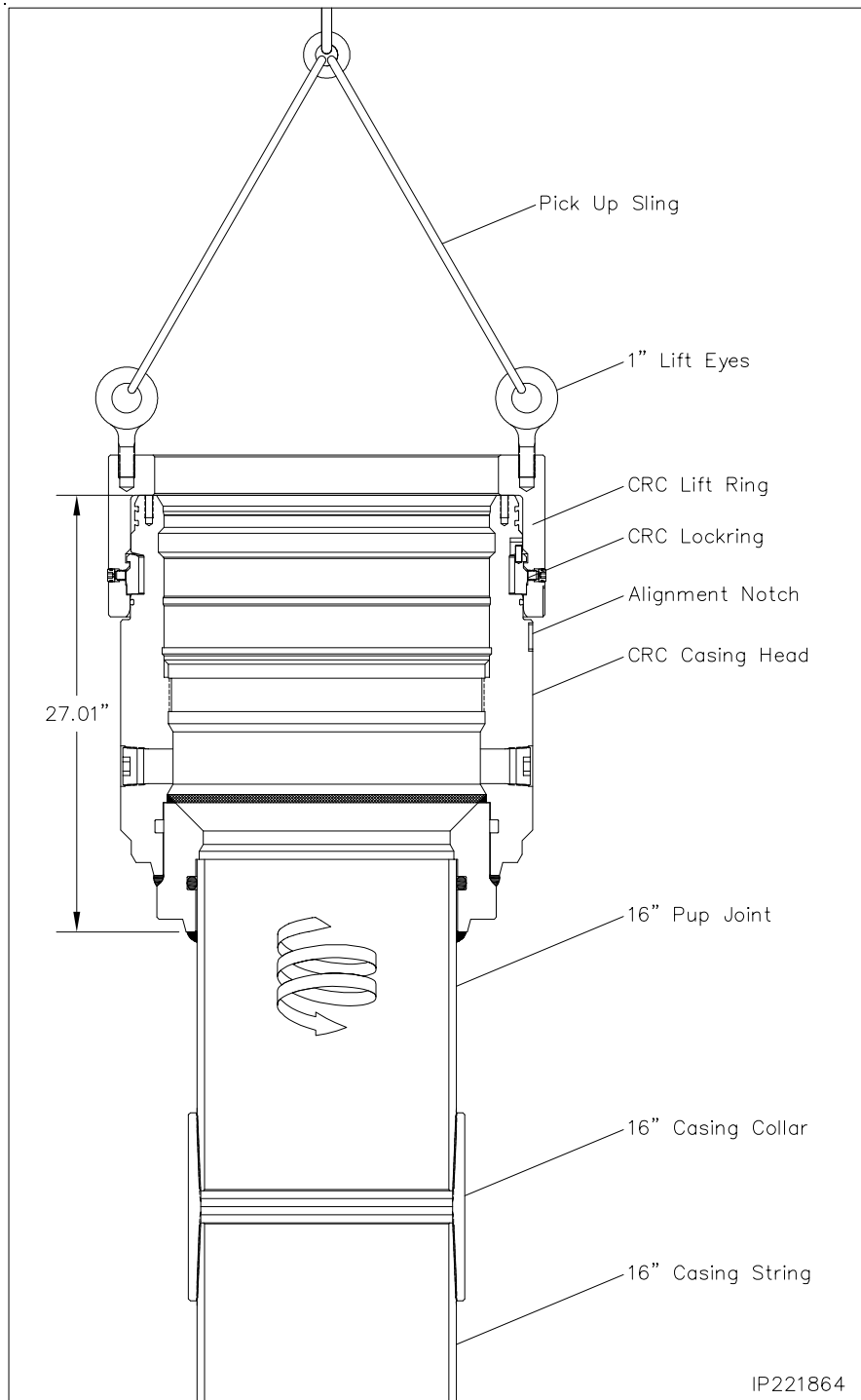
- Locate the first drive screw to the right of the lift ring alignment notch. Run the drive screw in to a positive stop.

- Locate the second drive screw to the left of the adapter alignment notch. Run the drive screw in to a positive stop.

- Continue around the adapter in an alternating **right to left pattern until all (10) drive screws are FULLY ENGAGED.**

NOTE: This will compress the CRC lockring and release the lift ring adapter.

- Remove the lift ring from the casing head and set aside.



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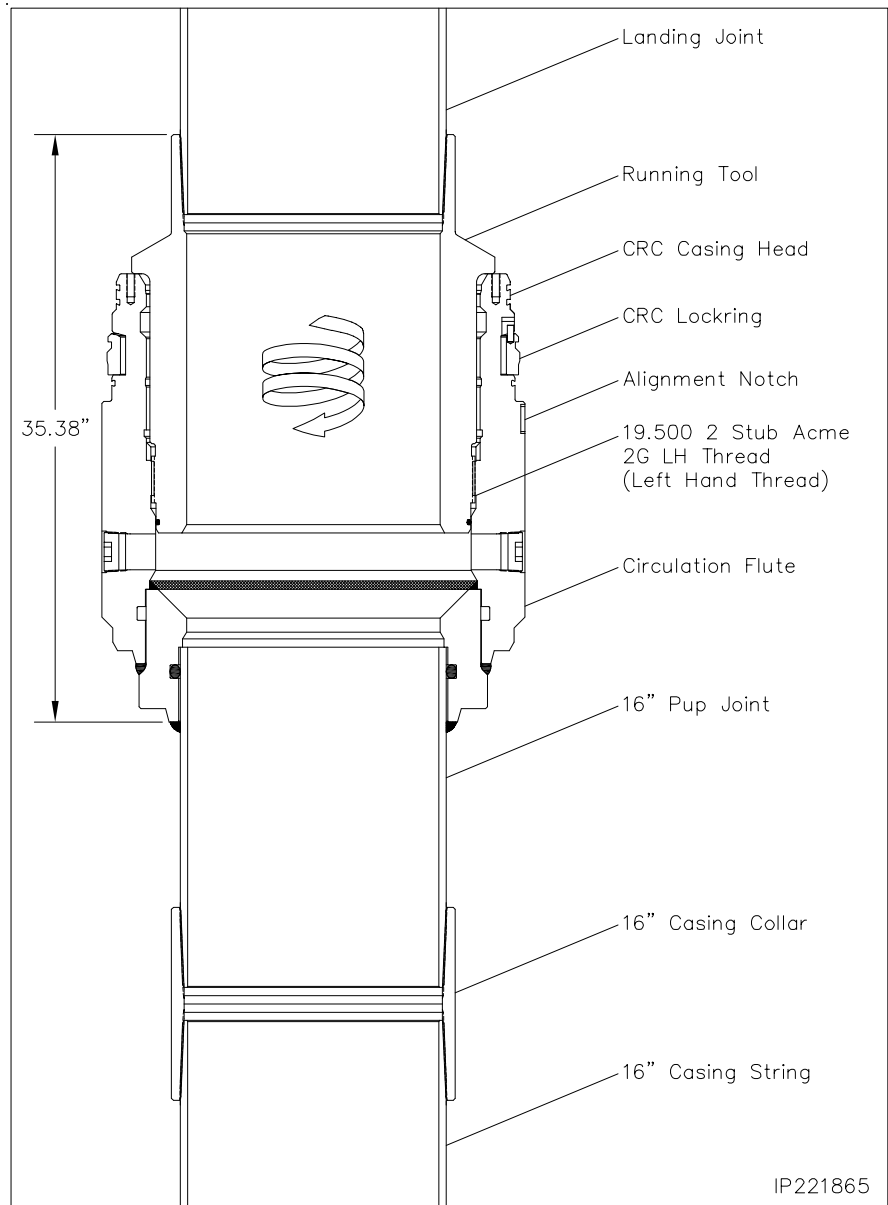


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Stage 1 — Hang Off the 16” Casing

24. Pick up the running tool/landing joint assembly and suspend it above the casing head.
25. Liberally lubricate the mating threads, seal areas and o-ring of the casing head and running tool with a oil or light grease.
26. **Using chain tongs only**, thread the Running Tool into the Casing Head, with left hand rotation, until it shoulders out on top of the casing head.

CAUTION: Do Not apply torque to the Casing Head/Tool connection.



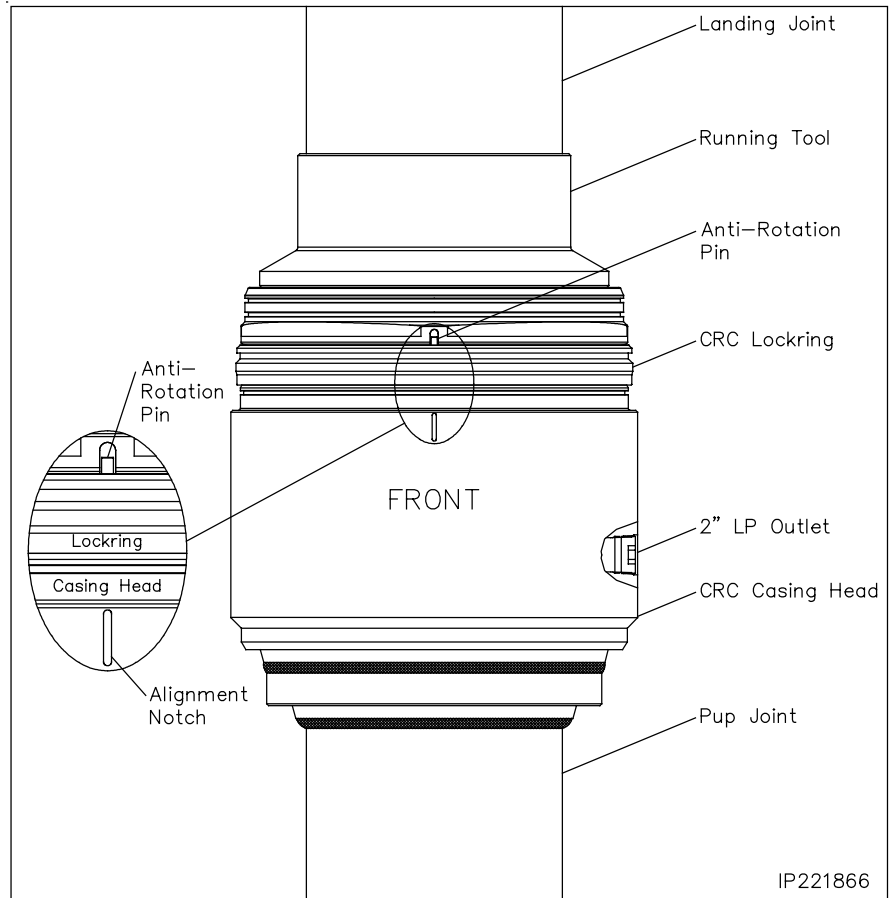
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Stage 1 — Hang Off the 16” Casing

CAUTION: Verify with the **SITE SUPERVISOR** the proper location of the casing head outlet valve in relation to the B Section upper outlet valve. The lower outlet valve will be installed on the right side of the casing head in relation to the **FRONT** of the wellhead assembly as indicated in IP Drawing #IP221866.

27. Pick up the casing head and remove the floor slips.

CAUTION: Rotate the casing head to the right or left to position the **Alignment Notch (FRONT of the wellhead)** and the outlet to the right is positioned in the direction indicated by **SITE SUPERVISOR**. **The position of the casing head will dictate the position of the balance of the wellhead system.**




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Stage 1 — Hang Off the 16" Casing

28. Examine the 30" O.D. Split Baseplate Assembly (Item A2).

Verify the following:

- baseplate assembly is clean and in good condition
- all gussets are properly welded
- baseplate halves are bolted together and bolts are tightened securely
- lift eyes are in place and tightened securely


 **WARNING:** Keep body clear of all pinch points and suspended loads.

29. Remove the 1" assembly bolting from the baseplate and separate the assembly halves.

30. Attach a suitable lifting device to the first baseplate half and position it on top of one side of the cellar.

31. Position the second half on the opposite side of the cellar.

32. Carefully lower the casing head assembly through the rig floor and position it approximately 14" above the conductor pipe stub.

 **WARNING:** Keep body clear of all pinch points and suspended loads.

33. Attach a suitable lifting device to one half of the baseplate and position it on top of the conductor pipe stub under the casing head.

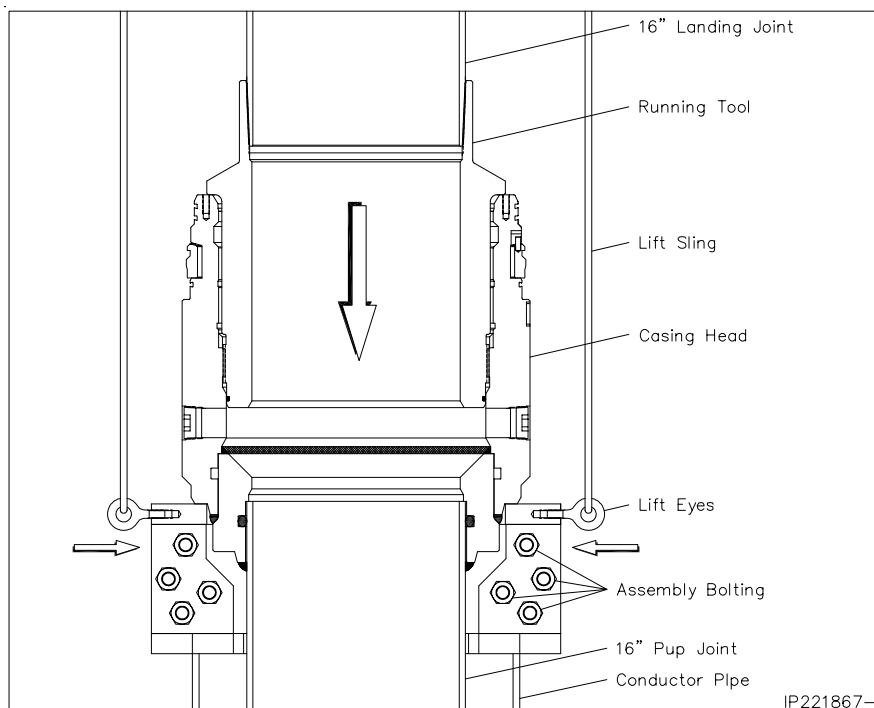
34. Pick up the second half and position it adjacent the first half.


35. Push the two halves together and secure with the 1" Assembly Bolting. Ensure all bolts are tightened securely and torqued to approximately 200 ft lb.

36. Carefully lower the casing head until it lands on top of the baseplate assembly and slack off all weight.

37. Rig up cementing equipment and establish circulation.


38. Cement casing as per program taking returns into the cellar and jetting them to the pits.



 **CAUTION:** Ensure the landing joint does not rotate during this process or difficulty may be encountered when removing the running tool.

39. With cement in place, remove the cementing equipment.

40. Using only chain tongs, rotate the landing joint to the clockwise (RIGHT) approximately 5 turns or until it comes free of the casing head.

 **CAUTION:** Ensure the landing joint remains concentric with the well bore while rotating to ensure additional torque is not encountered.

41. Retrieve the landing joint and running tool with a straight vertical lift.



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Stage 1 — Hang Off the 16" Casing

42. Remove the 2" LP flush plugs and the 1/2" flush plug from the test port.
43. Using a high pressure water hose, thoroughly clean the inside and outside of the casing head, removing all old grease and debris.

CAUTION: Ensure the CRC locking is in position, in good condition and there is no trapped debris behind the locking. The entire locking groove must be clean and free of debris.

44. Install the 2" LP nipple with 2" 5M Gate Valve in the outlet specified by the **SITE SUPERVISOR**. Ensure the valve handle faces forward when threads are fully made up.

45. Install the 2" LP Bull Plug in the opposite side outlet.

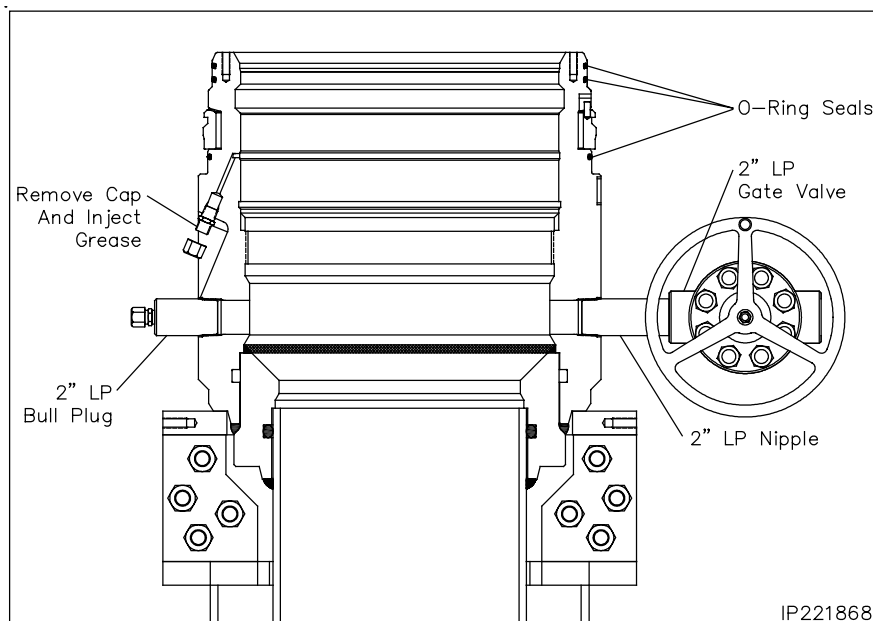
46. Install the 1/2" NPT grease fitting in the test port.

47. Attach a grease gun to the fitting and inject grease through the test port until it flows freely into the ID of the casing head.

48. Remove the grease gun and install the dust cap on the open fitting.

49. Thoroughly clean the O-ring grooves in the top of the casing head and install the (3) O-ring seals.

CAUTION: Prior to installing the BOP stack, ensure the wellhead is level using appropriate level.



IP221868



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Stage 2 — Install the 21-1/4" BOP Adapter

1. Examine the **24" CRC Box Bottom x 21-1/4" 2M Lower Drilling Adapter (Item R1) With 21-1/4" 2M x 24" CRC Pin Top Middle Drilling Adapter (Item R2)**. Verify the following:

- drive screws are in place and retracted from bore
- anti-rotation screws are in place and fully retracted from the bore
- bore is clean and free of debris
- locking is in place with anti-rotation pin is properly seated in its pocket
- o-ring seals are in place and in good condition
- flange connection has ring gasket and is made up properly

2. Examine the **24" CRC Lift Ring (Item ST1)**. Verify the following:

- four 1" lift threads and bore are clean and in good condition
- drive screws are in place and retracted from the bore
- 1" lift eyes are properly installed and in good condition

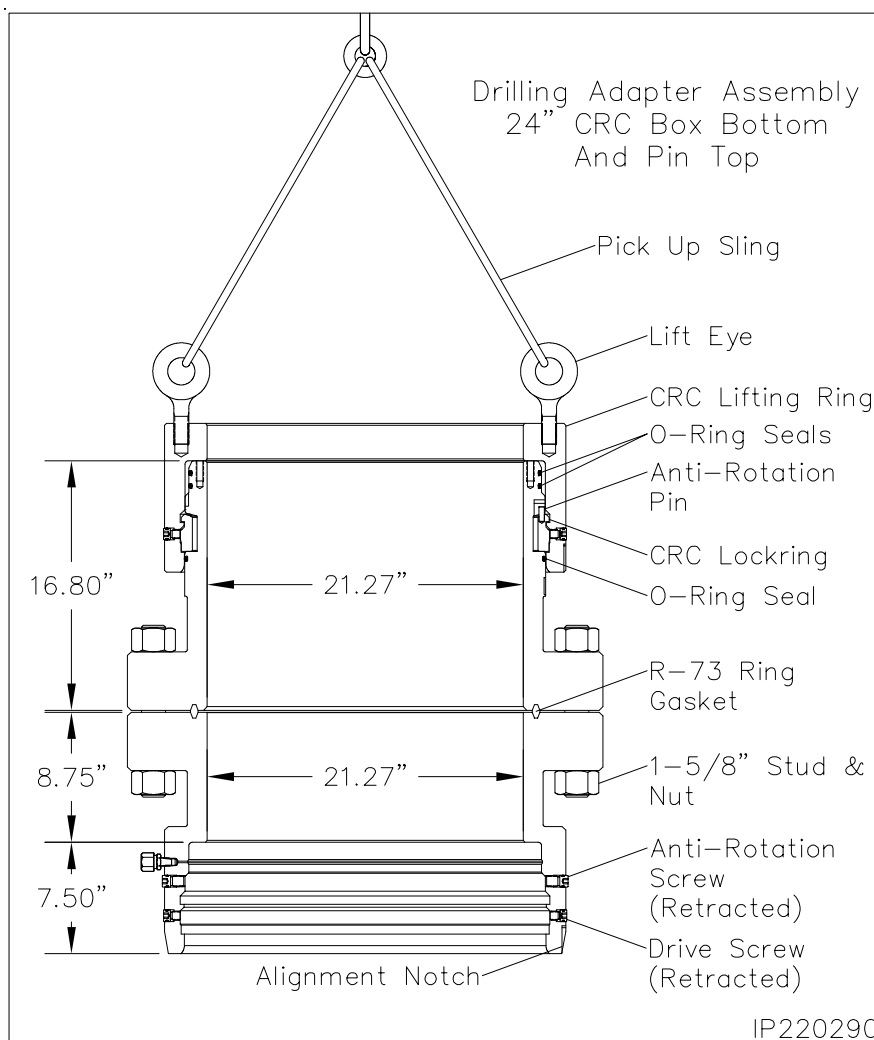
3. Slide the 24" CRC lift ring over the top of the lower drilling adapter assembly until it bottoms out on top of the pin top drilling adapter and the locking snaps into the lift ring.

4. Install a weight rated pick up sling to the top of the 24" CRC lift ring and drilling adapter assembly.

5. Inspect the casing head and locking for any damage and repair as necessary.

6. Ensure the locking anti-rotation pin is properly seated and ring moves freely.

7. Thoroughly clean and lightly lubricate the O.D. seals and locking of the casing head with oil or light grease.



8. Ensure the drive screws and anti-rotation screws are fully retracted from the adapter bore.
9. Thoroughly clean and lightly lubricate the CRC connection of the BOP adapter with oil or light grease.



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Stage 2 — Install the 21-1/4" BOP Adapter

WARNING: Keep body clear of all pinch points and suspended loads.

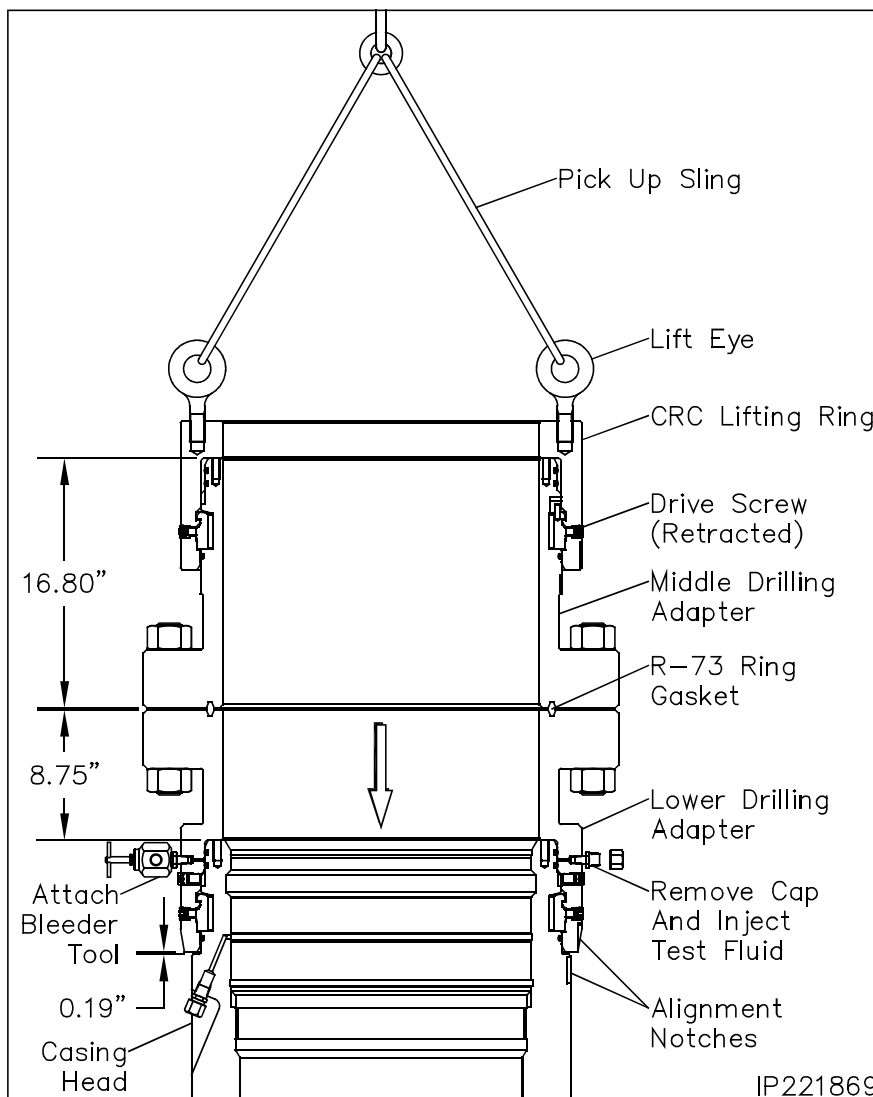
10. Pick up the adapter and suspend it above the casing head.
11. Align the alignment notch in the adapter with the mating notch in the casing head.
12. Carefully lower the adapter over the top of the casing head until the adapter bottoms out on the casing head and the locking snaps into its mating groove in the adapter.

NOTE: When fully landed out the gap between the bottom of the adapter and the leading edge on the casing head will be 0.19" as indicated.

CAUTION: Ensure the alignment notches are aligned.

Lower Seal Test

13. Locate the CRC "SEAL TEST" fittings on the O.D. of the adapter and remove the dust cap from both fittings.
14. Attach a bleeder tool to one of the open fittings and open the tool.
15. Attach a test pump to the remaining open fitting and pump clean test fluid between the seals until a continuous stream flows from the open bleeder tool.
16. Close the tool and continue pumping fluid until a stable test pressure of **2,000 psi** is achieved.
17. Hold the test pressure for 15 minutes or as required by the drilling supervisor.
18. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the bleeder tool and re-install the dust cap on the open fittings.



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Stage 2 — Install the 21-1/4” BOP Adapter

19. Ensure the alignment notches are in line with each other.
20. Locate **ONLY** the anti-rotation screws (upper set of screws) on the O.D. of the adapter and run in all 8 screws to a positive stop. Tighten screws to approximately 100 ft-lbs.

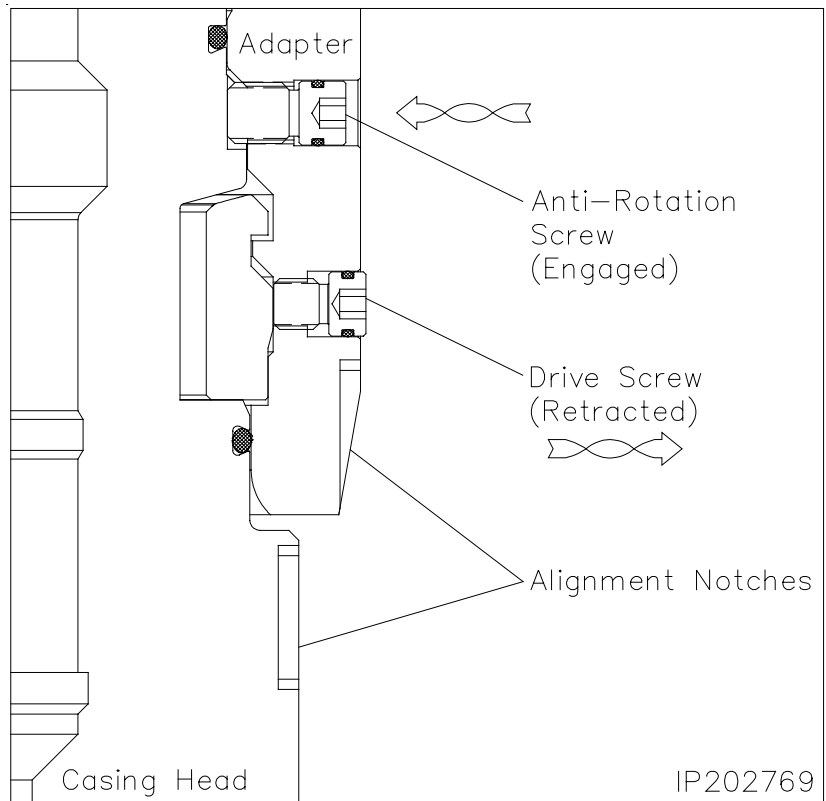
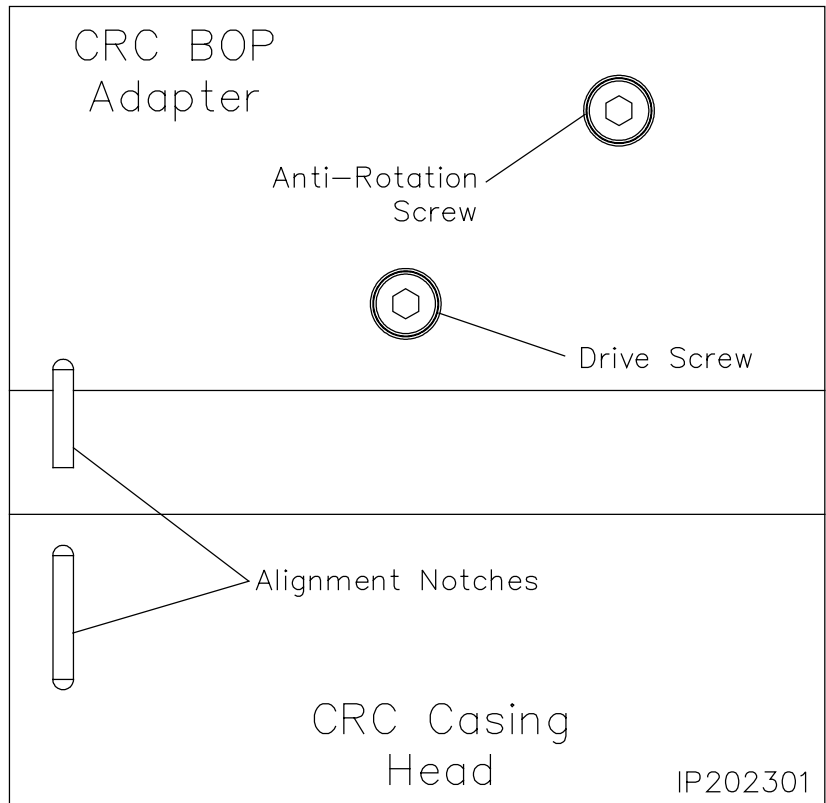
CAUTION: Locate the drive screws and ensure the screws are loose and rotate freely. Do not remove the drive screws.

CAUTION: Do **Not** engage the drive screws (lower set of screws) at any time during operations. Doing so will disengage the CRC lockring and cause the connection to fail.

21. Locate the alignment notches in the middle drilling adapter and the lift ring. Make sure the lift ring alignment notch aligns with the drilling adapter notch.
22. Locate the first drive screw to the right of the lift ring alignment notch. Run the drive screw in to a positive stop.
23. Locate the second drive screw to the left of the adapter alignment notch. Run the drive screw in to a positive stop.
24. Continue around the adapter in an alternating **right to left pattern until all (10) drive screws are FULLY ENGAGED.**

NOTE: This will compress the CRC lockring and release the lift ring adapter.

25. Remove the lift ring from the drilling adapter and set aside.
26. Inspect the middle drilling adapter and lockring for any damage and repair as necessary.
27. Ensure the locking anti-rotation pin is properly seated and ring moves freely.
28. Ensure the o-ring seals are clean and in good condition.



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Stage 2 — Install the 21-1/4” BOP Adapter

29. Thoroughly clean the mating ring groove of the BOP and the upper drilling adapter.



WARNING: Keep body clear of all pinch points and suspended loads.

30. Make up the remaining **24” CRC Box Bottom x 21-1/4” 2M Upper Drilling Adapter (Item R1)** to the bottom of the BOP stack using a new R-73 ring gasket.

31. Thoroughly clean and lightly lubricate the O.D. seals and locking of the middle drilling adapter with oil or light grease.

32. Ensure the drive screws and anti-rotation screws are fully retracted from the upper drilling adapter bore.

33. Thoroughly clean and lightly lubricate the CRC connection of the upper drilling adapter with oil or light grease.

34. Pick up the BOP and suspend it above the middle drilling adapter.

35. Align the alignment notch in the upper drilling adapter with the mating notch in the middle drilling adapter.

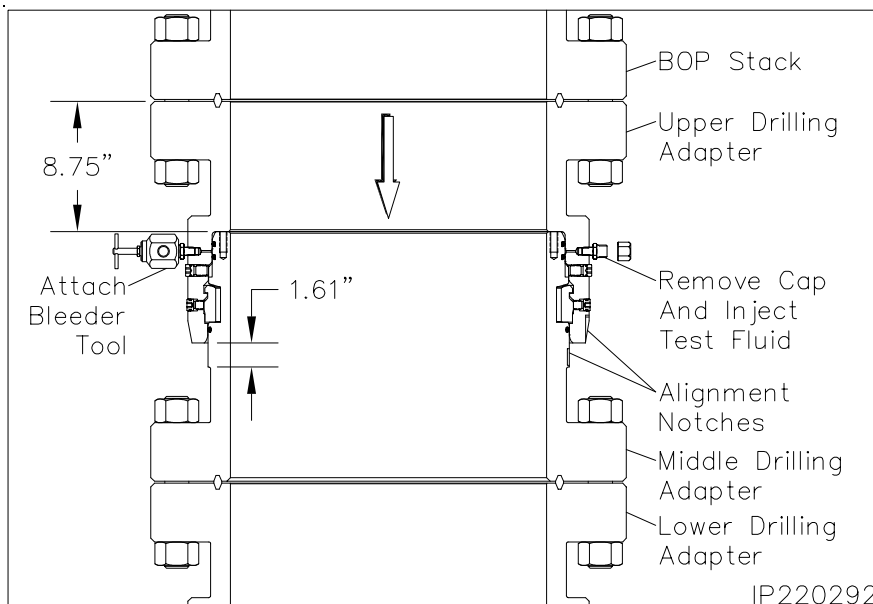
36. Carefully lower the upper drilling adapter over the top of the middle drilling adapter until the upper drilling adapter bottoms out on the middle drilling adapter and the locking snaps into its mating groove in the adapter.



NOTE: When fully landed out the gap between the bottom of the upper drilling adapter and the leading edge on the middle drilling adapter will be 1.61” as indicated.



CAUTION: Ensure the alignment notches are aligned.



Upper Seal Test

37. Locate the CRC “SEAL TEST” fittings on the O.D. of the adapter and remove the dust cap from both fittings.
38. Attach a bleeder tool to one of the open fittings and open the tool.
39. Attach a test pump to the remaining open fitting and pump clean test fluid between the seals until a continuous stream flows from the open bleeder tool.
40. Close the tool and continue pumping fluid until a stable test pressure of **2,000 psi** is achieved.
41. Hold the test pressure for 15 minutes or as required by the drilling supervisor.
42. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the bleeder tool and re-install the dust cap on the open fittings.



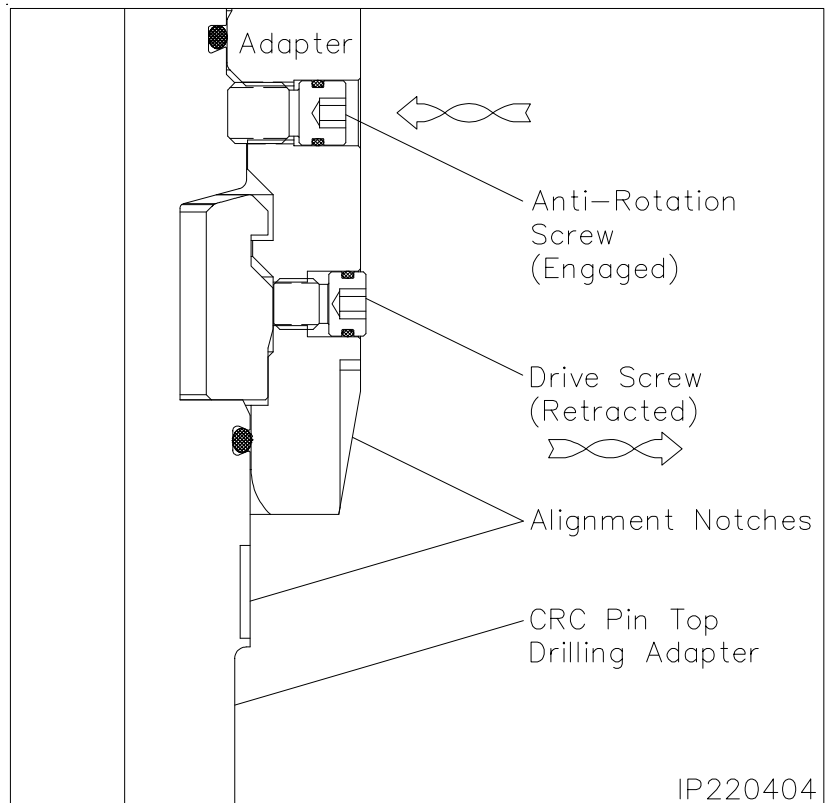
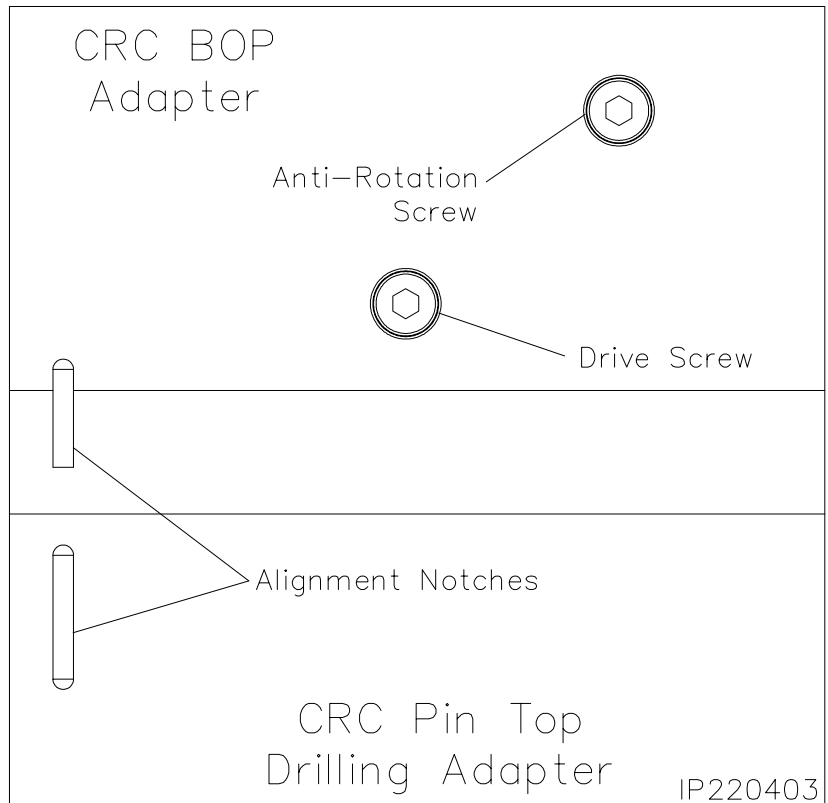
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Stage 2 — Install the 21-1/4” BOP Adapter

- 43. Ensure the alignment notches are in line with each other.
- 44. Locate **ONLY** the anti-rotation screws (upper set of screws) on the O.D. of the adapter and run in all 8 screws to a positive stop. Tighten screws to approximately 100 ft-lbs.

CAUTION: Locate the drive screws and ensure the screws are loose and rotate freely. Do not remove the drive screws.

CAUTION: Do Not engage the drive screws (lower set of screws) at any time during operations. Doing so will disengage the CRC lockring and cause the connection to fail.



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Stage 3 — Test the 21-1/4” BOP Riser

Immediately after making up the BOP stack and periodically during the drilling of the well for the next casing string the BOP stack (connections and rams) must be tested.

1. Examine the **20” Nominal x 4-1/2” IF (NC50) CW Test Plug/Retrieving Tool (Item ST3)**. Verify the following:
 - 1-1/4” VR plug and weep hole plug are in place and tightened securely
 - elastomer seal is in place and in good condition
 - retractable lift lugs are in place, clean, and free to move
 - drill pipe threads are clean and in good condition

CAUTION: Prior to running or retrieving the test plug, ensure the rig is properly aligned and centered over the wellhead.

2. Position the test plug with the elastomer seal down and the lift lugs up, then make up the tool to a joint of drill pipe.

CAUTION: Ensure the lift lugs are up and the elastomer seal is down.

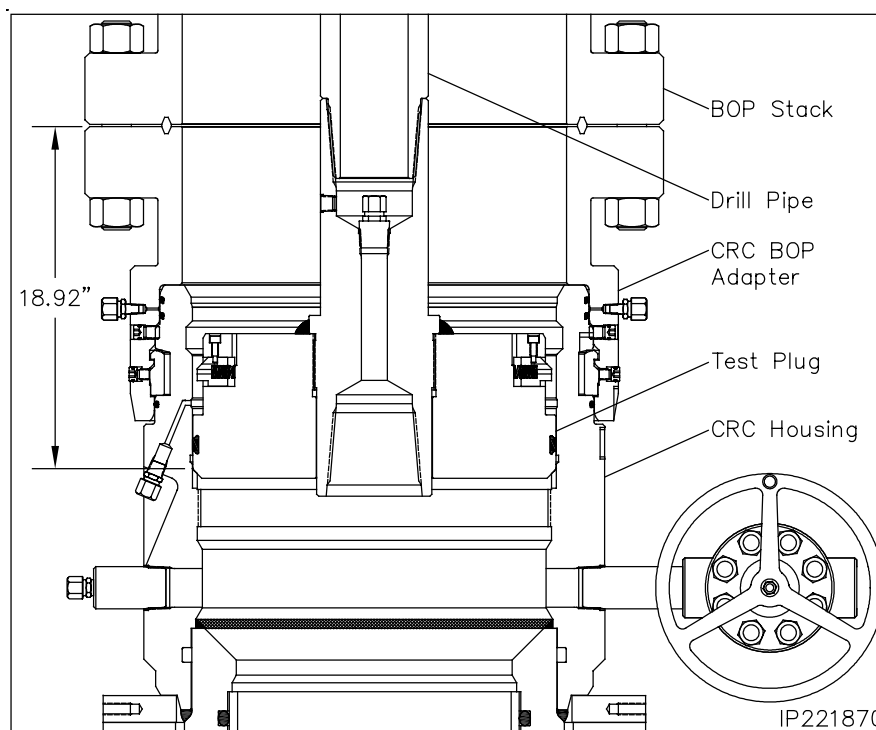
3. Remove the 1/2” NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

4. Open the casing head side outlet valve.

5. Lightly lubricate the test plug seal with oil or light grease.

6. Carefully lower the test plug through the BOP and land it on the load shoulder in the casing head, 18.92” below the top of the lower drilling adapter.



7. Close the BOP annular on the pipe and test the BOP to **2,000 psi** or as required by site supervisor.

NOTE: Any leakage past the test plug will be clearly visible at the open side outlet valve.

CAUTION: When performing the BOP blind ram test it is highly recommended to suspend a stand of drill pipe below the test plug to ensure the plug stays in place while disconnecting from it with the drill pipe.

8. After a satisfactory test is achieved, release the pressure and open the rams.
9. Remove as much fluid as possible from the BOP stack. Retrieve the test plug with a straight vertical lift.
10. Close all open valves.
11. Repeat this stage as required during the drilling of the hole section.



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Stage 4 — Install 20” Nominal Wear Bushing

CAUTION: Always use a wear bushing while drilling to protect the load shoulders from damage by the drill bit or rotating drill pipe. The wear bushing **must be retrieved** prior to running the casing.

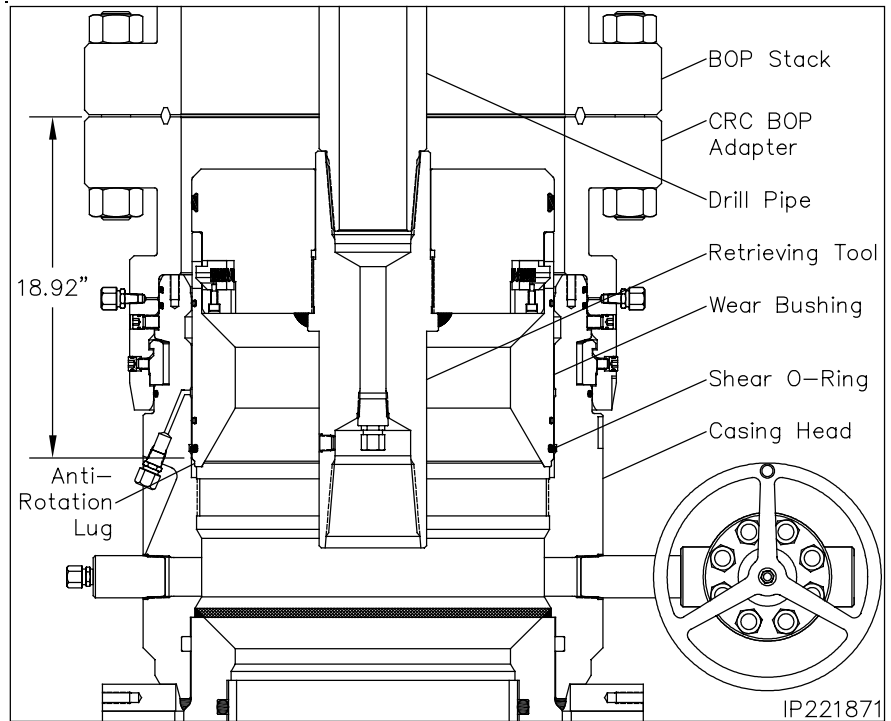
1. Examine the **20” Nominal CRC Wear Bushing (Item ST4)**. Verify the following:
 - internal bore is clean and in good condition
 - upper trash o-ring is in place and in good condition
 - shear o-ring cord is in place and in good condition
 - paint anti-rotation lugs white and allow paint to dry

Run the Wear Bushing Before Drilling

2. Orient the **20” Nominal x 4-1/2” IF (NC50) CW Test Plug/Retrieving Tool (Item ST3)**, with lift lugs down and drill pipe connection up.
3. Make up the retrieving tool to a joint of drill pipe.
4. Align the retractable lift lugs of the tool with the retrieval holes of the bushing and carefully lower the tool into the wear bushing until the lugs snap into place.

NOTE: If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

5. **Apply a heavy coat of grease, not dope, to the O.D. of the bushing.**
6. Slowly lower the tool/bushing assembly through the BOP stack and land it on the load shoulder in the casing head, 18.92” below the top of the BOP adapter.
7. Rotate the drill pipe clockwise (right) to locate the stop lugs in their mating notches in the head. When properly aligned the bushing will drop an additional 1/2”.



NOTE: The shear o-ring on bottom of the bushing will locate in a groove above the load shoulder in the head to act as a retaining device for the bushing.

8. Remove the tool from the wear bushing by rotating the drill pipe counter clockwise (left) 1/4 turn and lifting straight vertical.
9. Drill as required.

CAUTION: It is highly recommended to retrieve, clean, inspect, grease, and reset the wear bushing each time the hole is tripped during the drilling of the hole section.

Retrieve the Wear Bushing After Drilling

10. Make up the retrieving tool to the drill pipe.
11. Slowly lower the tool into the wear bushing.
12. Pick up and balance the riser weight and rotate the retrieving tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.
13. Retrieve the wear bushing to the rig floor. Remove it and the retrieving tool from the drill string.



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Stage 5 — Hang Off the 10-3/4" Casing

i **NOTE:** If the 10-3/4" casing becomes stuck and the mandrel casing hanger cannot be landed, refer to **Section 2: Stage 5A** for the emergency procedure.

i **NOTE:** The 10-3/4" CRC-MBU-3T casing hanger and running tool are made up to a joint of casing and tested prior to shipment. In the event they are not, follow steps 1 - 5 for casing hanger/running tool assembly.

1. Examine the **20" Nominal x 10-3/4" Box Bottom x 14.000" 2 Stub Acme 2G LH CRC-MBU-3T Casing Hanger (Item A9)**. Verify the following:

- external and internal threads are clean and in good condition
- bore is free of debris
- seal area is clean and undamaged

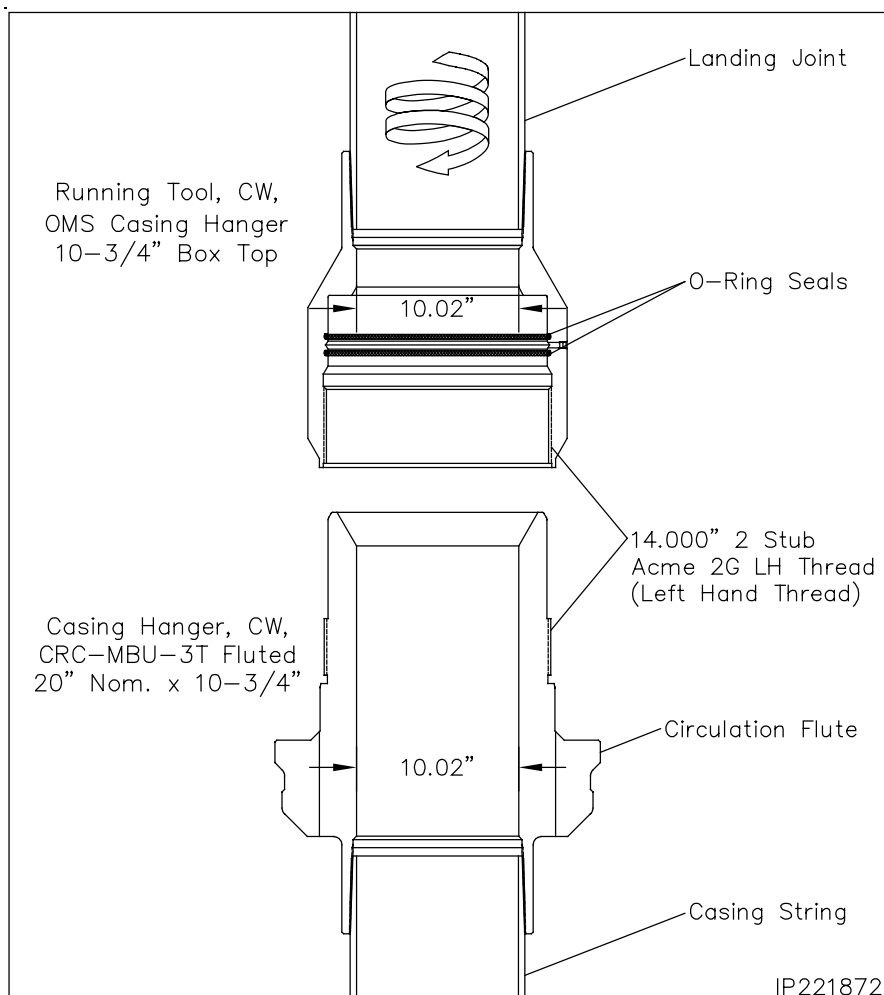
2. Examine the **10-3/4" OMS Casing Hanger Running Tool (Item ST5)**. Verify the following:

- internal threads are clean and in good condition
- bore is free of debris
- o-rings are in place and undamaged

3. Lightly lubricate the casing hanger seal area, threads, and the running tool o-rings with oil or light grease.

! **CAUTION:** Excessive oil or grease may prevent a good seal from forming.

4. Make up a joint of casing to the running tool and torque the connection to the thread manufacturer maximum torque.



5. On the pipe rack, thread the casing hanger into the running tool by first rotating the running tool to the right, to locate the thread start, then to the left to a positive stop (approximately 7 turns).

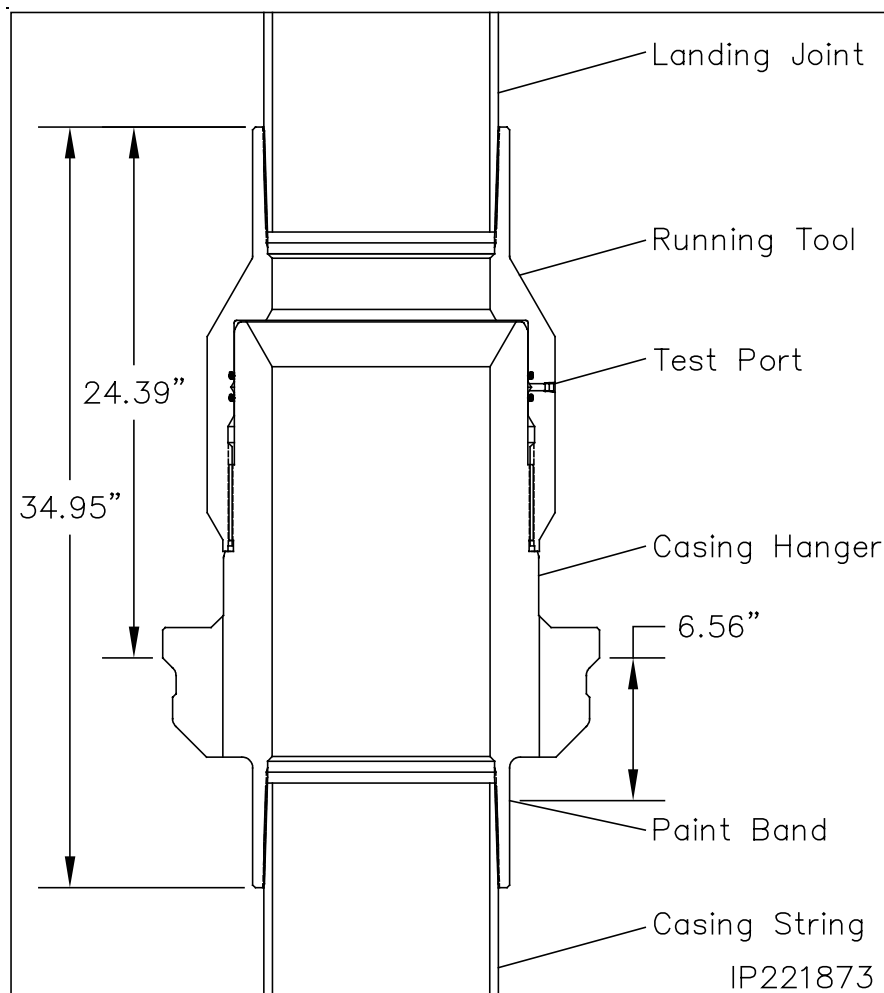
i **NOTE:** If steps 1 through 5 were done prior to being shipped to location, the running tool should be backed off 1 turn and made back up to ensure it will back off freely.



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Stage 5 — Hang Off the 10-3/4" Casing

6. Remove the 1/8" LP flush fitting Allen head pipe plug from the O.D. of the running tool and attach a test pump.
7. Apply hydraulic test pressure to **5,000 psi** and hold for 15 minutes or as required by drilling supervisor.
8. Upon completion of a successful test, bleed off pressure through the test pump. Remove the pump. Reinstall the pipe plug in the open port and tighten securely.
9. Place a paint band around the hanger tong neck (6.56" from the bottom of the hanger load shoulder) as indicated.
10. Run the 10-3/4" casing to the required depth and space out for the mandrel casing hanger and landing joint.



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Stage 5 — Hang Off the 10-3/4" Casing

Landing The Casing Hanger

1. Suspend the last joint of casing run in slips. Make up the casing hanger/running tool assembly in the casing string and torque connection to thread manufacturer's recommended optimum torque.
2. Slowly and carefully lower the casing hanger/running tool through the BOP stack. Land it on the load shoulder in the casing head 18.92" below the top of the BOP adapter. Place a paint mark on the landing joint level with the rig floor.

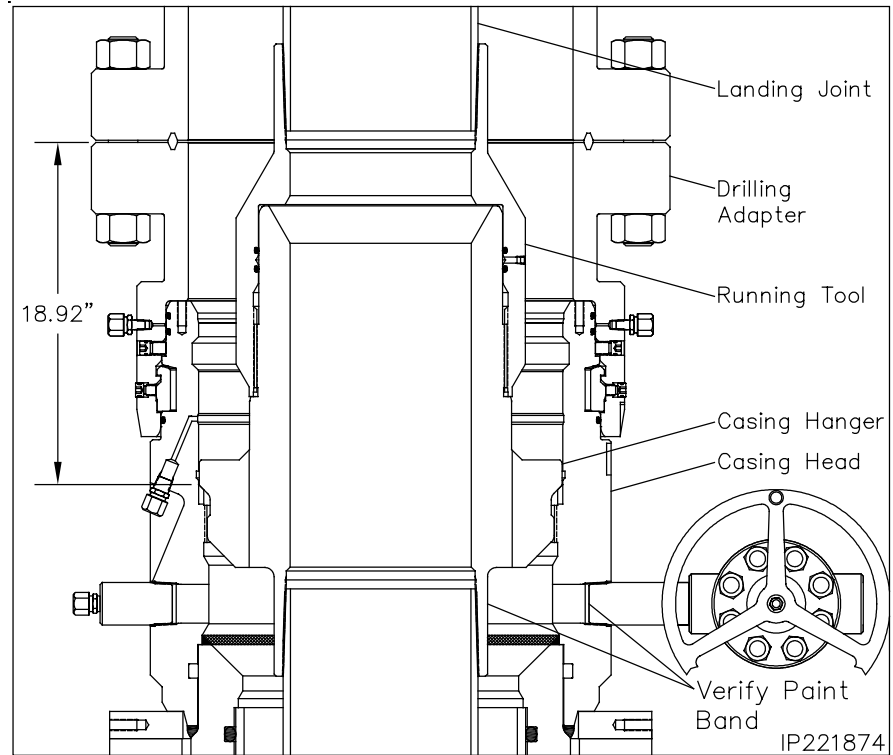
WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

3. Open the casing head side outlet valve and drain the BOP stack. Sight through the open valve. The paint band on the hanger tong neck should be clearly visible in the center of the outlet. Close the valve.

4. Cement the casing as required.

NOTE: Returns may be taken through the circulation slots and out the BOP or out the side outlets on the housing.

NOTE: If the casing is to be reciprocated during cementing, it is advisable to pick up the casing hanger a minimum of eight feet above the landing point. Place a mark on the landing joint level with the rig floor, then reciprocate above that point. If at any time resistance is felt, re-land the casing hanger immediately.



5. With cement in place, bleed off pressure and remove the cement head.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the casing head side outlet valve and drain the BOP stack.

7. **Using chain tongs only, located 180° apart**, retrieve the running tool/landing joint by rotating the landing joint to the right approximately 7 turns, or until it comes free from the casing hanger. A straight lift will retrieve the running tool/landing joint.



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Stage 5 — Hang Off the 10-3/4" Casing

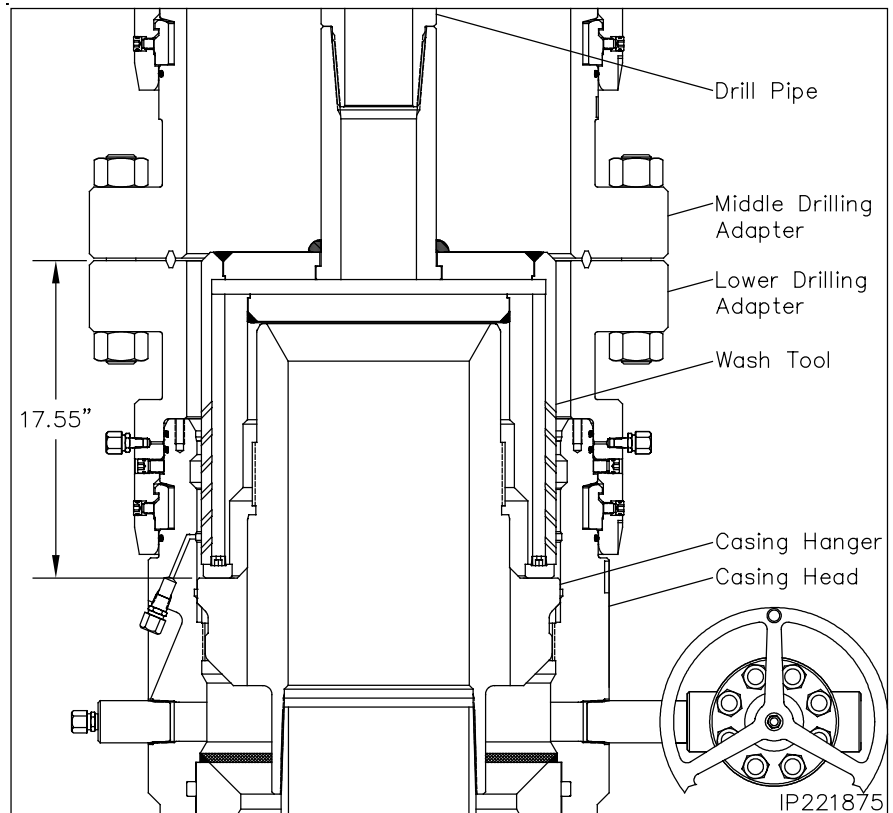
Running the 20" Wash Tool

1. Examine the **20" x 4-1/2" IF (NC50) Wash Tool (Item ST6)**. Verify the following:
 - drill pipe threads and bore are clean and in good condition
 - all ports are open and free of debris
2. Orient the wash tool with drill pipe box up. Make up a joint of drill pipe to the tool.
3. Carefully lower the wash tool through the BOP and land it on top of the 10-3/4" casing hanger, 17.55" below the top of the lower drilling adapter.
4. Place a paint mark on the drill pipe level with the rig floor.
5. Using chain tongs, rotate the tool clockwise (right) approximately 6 turns to loosen any debris that may be on top of the hanger flutes.



WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the upper side outlet valve and drain the BOP stack.
7. Attach a high pressure water line or the top drive to the end of the drill pipe. Pump water (up to a max of 200 psi) through the tool and up the BOP stack.
8. Pick up on the tool approximately 1" and slowly rotate the drill pipe approximately 20 RPM.
9. While flushing, raise and lower the tool the full length of the wellhead and BOP stack. Thoroughly wash the inside of the housing and BOP stack to remove all caked on debris.
10. Once washing is complete, land the wash tool on the hanger flutes.
11. Shut down pumps and observe the returns at the open lower outlet for debris.



12. Reengage the pump and fully wash the inside of the wellhead and the entire BOP one additional cycle, ensuring the stopping point is with the wash tool resting on top of the hanger flutes.
13. Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.
14. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
15. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure there are no dark areas on top of the painted flutes of the hanger.



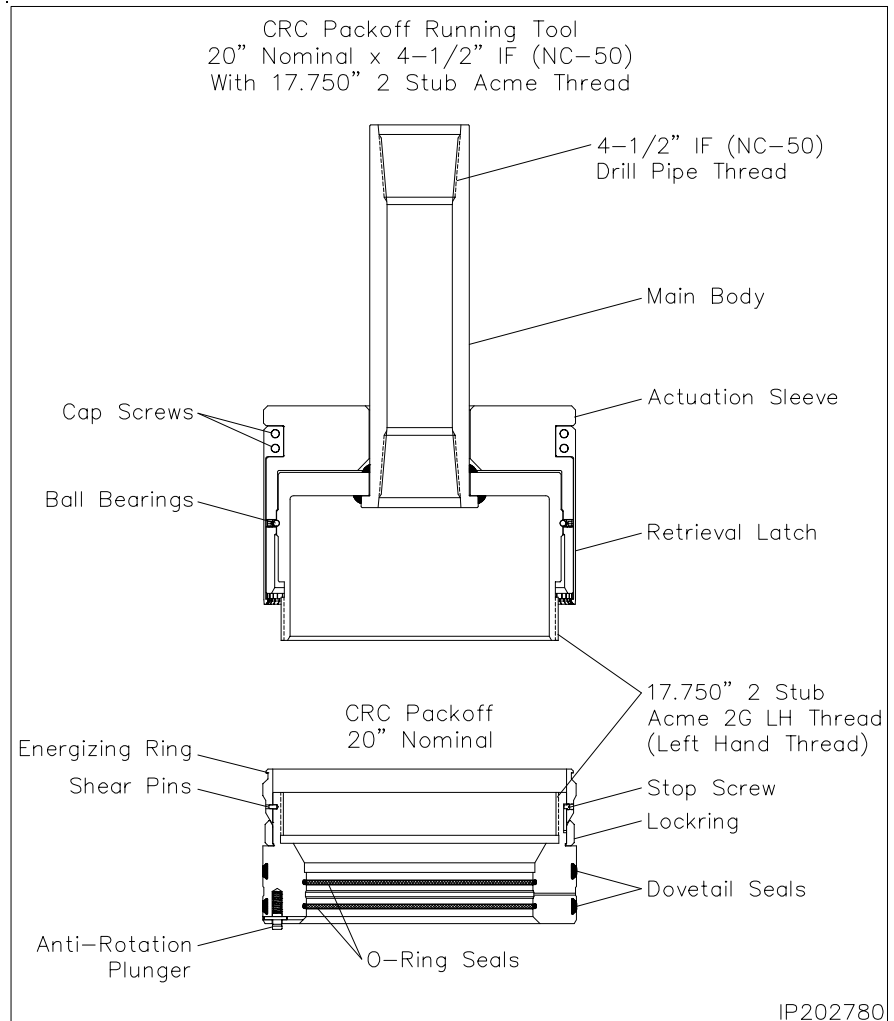
CAUTION: Continue washing until all debris is removed.



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Stage 6 — Install the CRC Mandrel Hanger Packoff

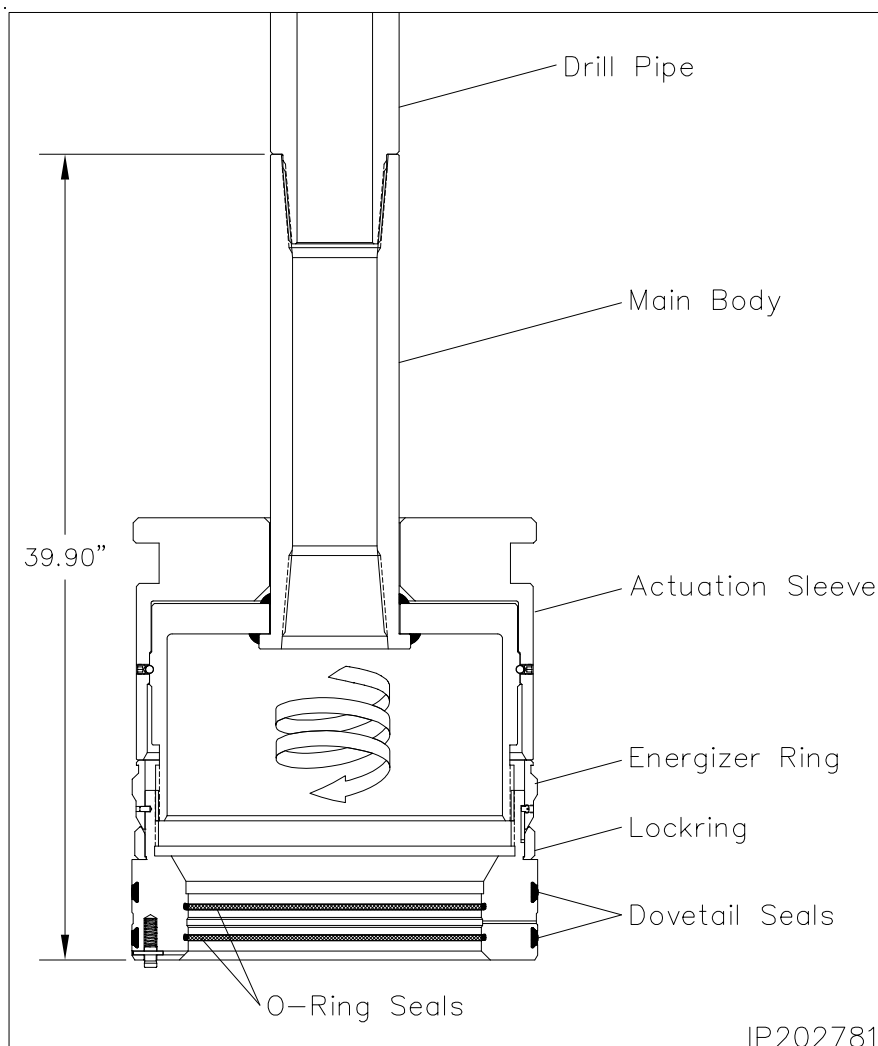
- Examine the **20" x 17.750" 2 Stub Acme 2G LH Box Top CRC Packoff (Item A10)**. Verify the following:
 - all elastomer seals are in place and undamaged
 - internal bore and ports are clean and in good condition
 - lockring is fully retracted
 - energizing ring is in its upper most position and retained with shear pins
 - guide screws are in place and back off 1/4 turn
 - anti-rotation plungers are in place, free to move
- Inspect the I.D. and O.D. seals for any damage and replace as necessary.
- Examine the **20" Nominal x 17.750" 2 Stub Acme 2G LH, CRC Packoff Running Tool (Item ST7)**. Verify the following:
 - Acme threads are clean and in good condition
 - retrieval latch is in position and retained with cap screws
- Remove the retrieval latch and set aside.
- Make up the running tool to 4-1/2" IF (NC-50) drill pipe and torque the connection to optimum make up torque.



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Stage 6 — Install the CRC Mandrel Hanger Packoff

6. Pick up the running tool with landing joint and suspend it above the packoff.
7. Thoroughly clean and lightly lubricate the mating Acme threads of the tool and the packoff with oil or a light grease.
8. Carefully lower the tool into the packoff and thread them together by first rotating the tool clockwise (RIGHT) to locate the thread start and then counter clockwise (LEFT) until the tool actuation sleeve makes contact with the packoff energizing ring. Approximately 2 turns.
9. Pick up the assembly and thoroughly clean and lightly lubricate the packoff I.D. o-ring seals and the O.D. dovetail seals with oil or light grease.
10. Locate the "SEAL TEST" fitting on the O.D. of the casing head and remove the dust cap from the fitting.
11. Attach a test pump to the fitting and pump clean test fluid through the port to dislodge any old grease and trapped debris.
12. Remove the test pump and reinstall the fitting dust cap.



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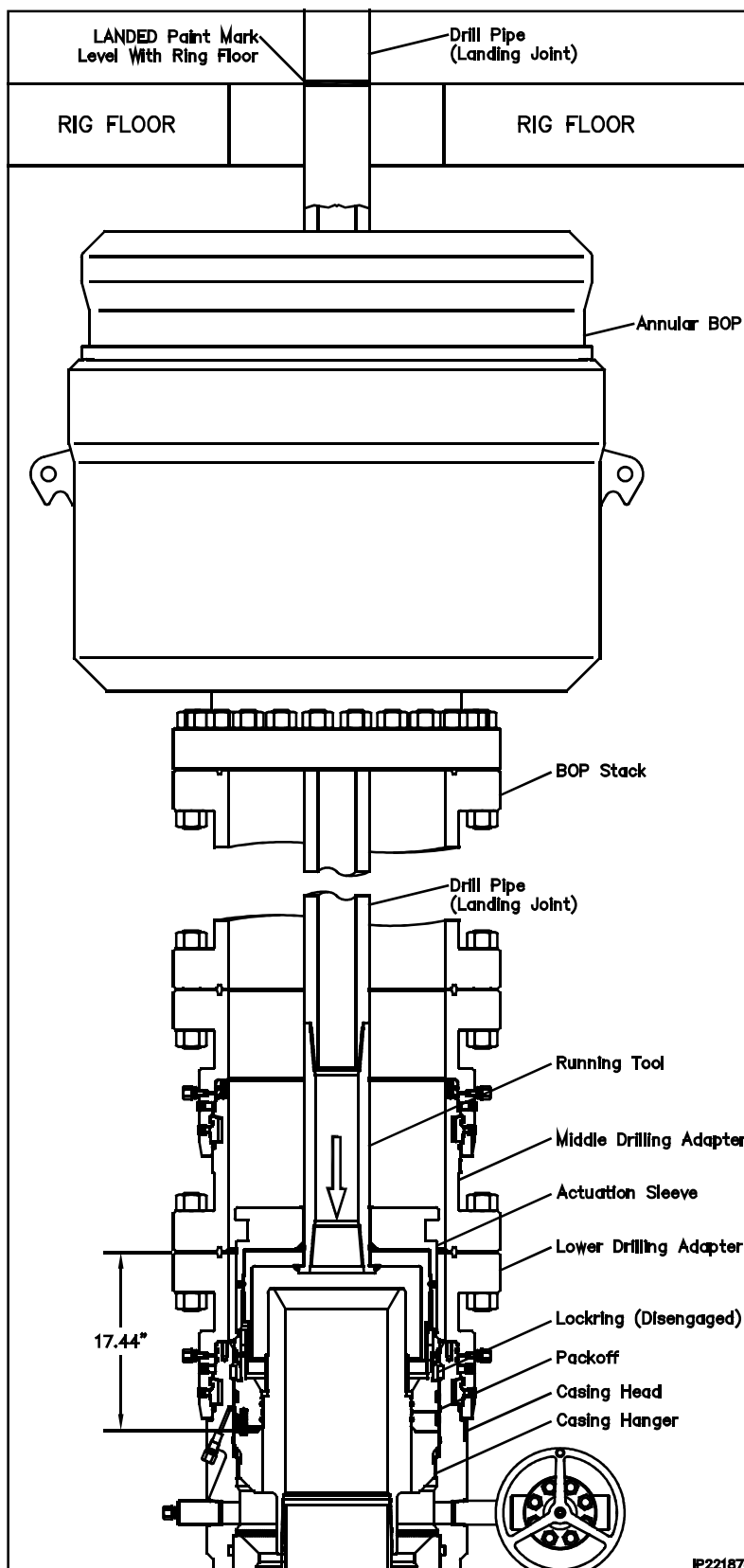


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Stage 6 — Install the CRC Mandrel Hanger Packoff

Landing the Packoff

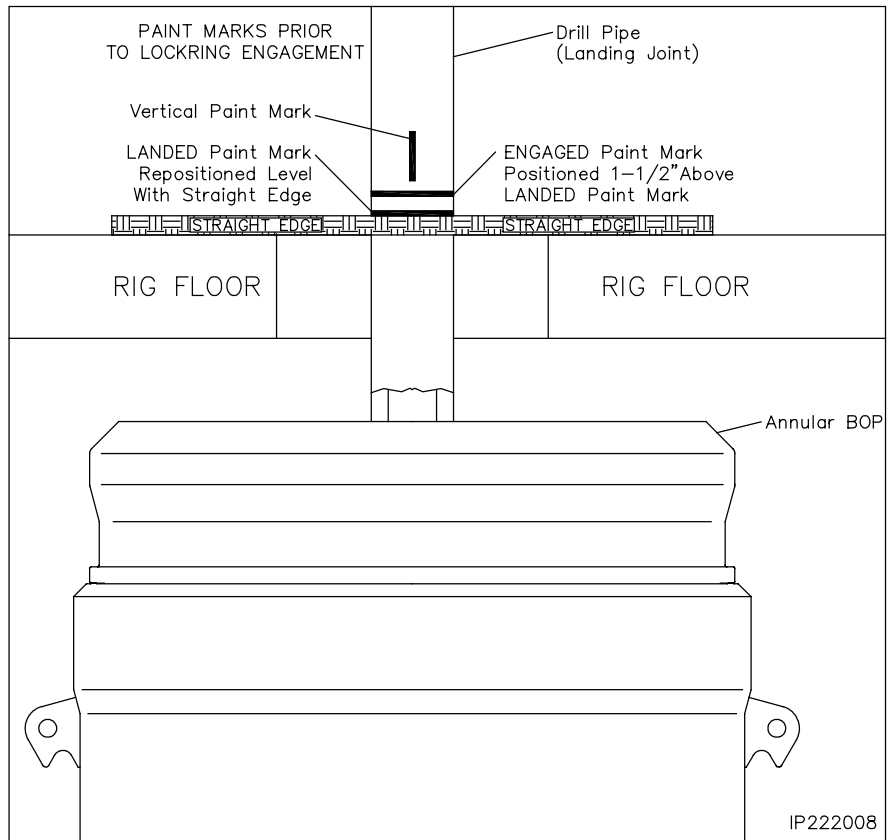
13. Remove the hole cover.
14. Measure up 5 foot from the paint mark on the O.D. of the packoff and place a paint mark on the drill collar.
15. Pick up the packoff/running tool assembly and carefully lower the assembly through the BOP, marking the landing joint every five feet until the calculated dimension is reached.
16. Place a paint mark on the drill pipe at that dimension and mark **LANDED**.
17. Continue lowering the packoff until it passes over the neck of the hanger and lands on the casing hanger flutes, 17.44" below the top of the drilling adapter.
18. Confirm that the **LANDED** paint mark is level with the rig floor.
19. If not it is likely that there is debris on top of the casing hanger.
20. Remove the packoff and further wash the casing hanger and housing I.D. Also reverify the landing dimension.
21. Re land the packoff and verify the **LANDED** paint mark is level with the rig floor.



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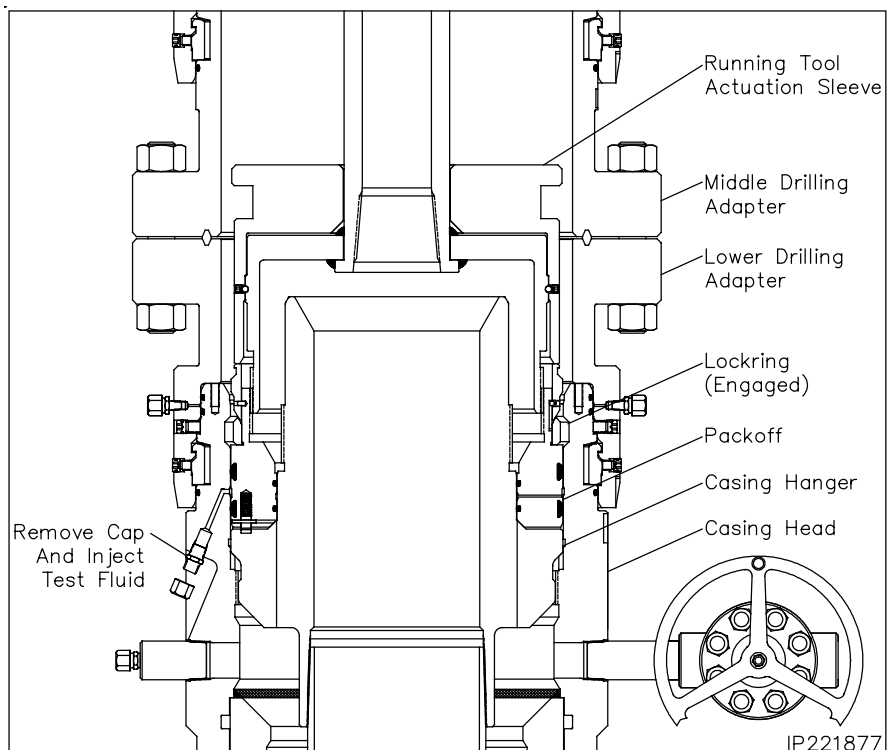
Stage 6 — Install the CRC Mandrel Hanger Packoff

22. With the packoff properly landed the **LANDED** paint mark is removed from the landing joint.
23. Place a straight edge across the rotary table as indicated.
24. Place a paint mark on the landing joint level with the top of the straight edge and label it **LANDED**.
25. Measure up 1-1/2" above the landed mark and place another paint mark on the landing joint. Label this mark **ENGAGED**.
26. Place a **Vertical** paint mark on the landing joint and a corresponding paint mark on the rig floor to visually count the turns of the landing joint.



Seal Test

27. Locate the "SEAL TEST" fitting on the O.D. of the casing head and remove the dust cap from the fitting.
28. Attach a test pump to the open fitting and pump clean test fluid between the seals until a stable test pressure of **3,000 psi** is achieved.
29. Hold test pressure for 15 minutes or as required by drilling supervisor.
30. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
31. After satisfactory test is achieved, bleed off the test pressure but leave the test manifold in place.



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Stage 6 — Install the CRC Mandrel Hanger Packoff

Engaging the Lockring

32. **Using chain tongs only, located 180° apart**, slowly rotate the drill pipe counter clockwise until the anti-rotation plungers align with the slots in the top of the hanger. Expect torque of approximately 400 ft-lbs to rotate the packoff.

33. **Using chain tongs only**, rotate the landing joint approximately 3 turns counter clockwise to engage the packoff locking in its mating groove in the bore of the casing head.

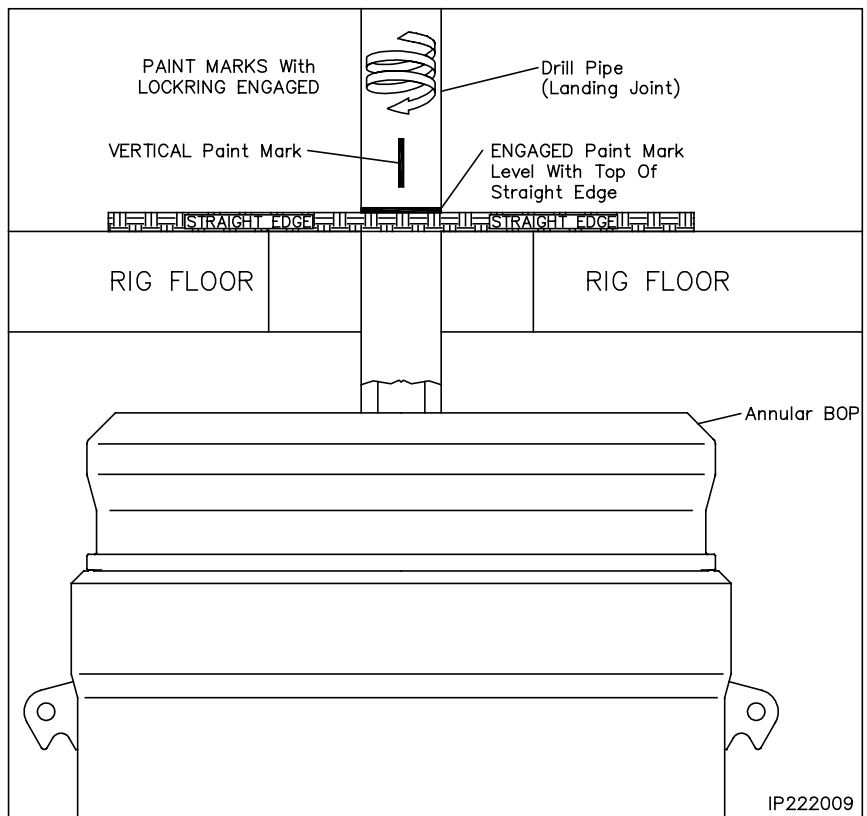
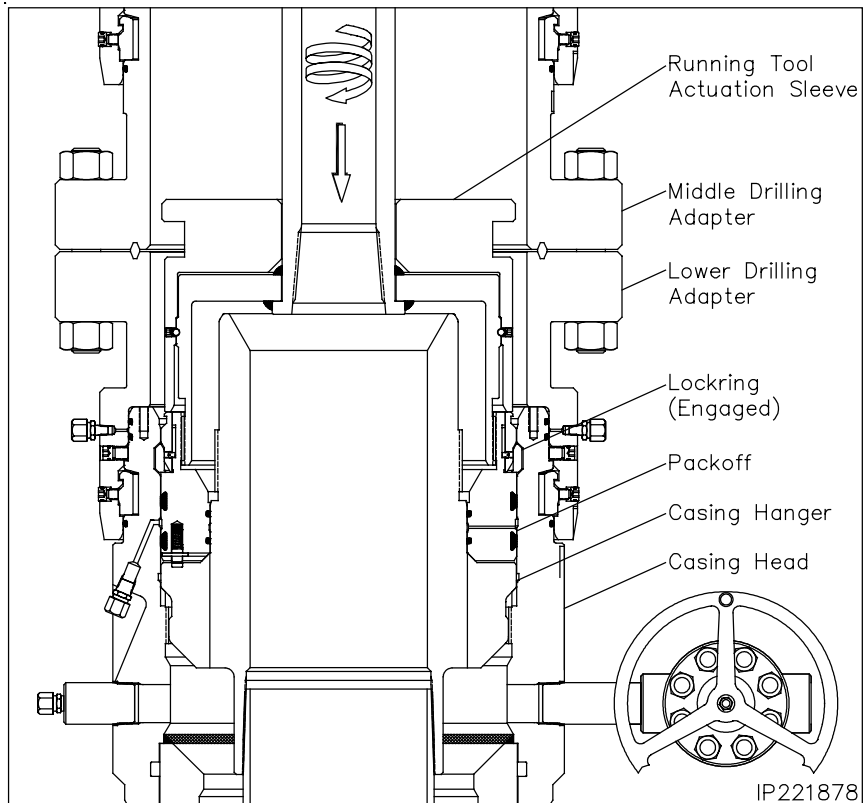
NOTE: Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the locking out. A positive stop will be encountered when the locking is fully engaged.

CAUTION: It is imperative that the drill pipe landing joint remain concentric with the well bore when rotating to engage the locking. This can be accomplished with the use of the air hoist.

34. To confirm all 3 turns of the landing joint are achieved, place the straight edge back across the rotary table adjacent the landing joint.

CAUTION: When the locking is properly engaged the **ENGAGED** paint mark on the landing joint will be level with the top of the straight edge. **VERIFY PAINT MARKS.**

CAUTION: If the required turns to engage the locking are not met or the paint marks do not align properly or excessive torque is encountered, remove the packoff. First call local branch. If further assistance is required then call Houston Engineering.



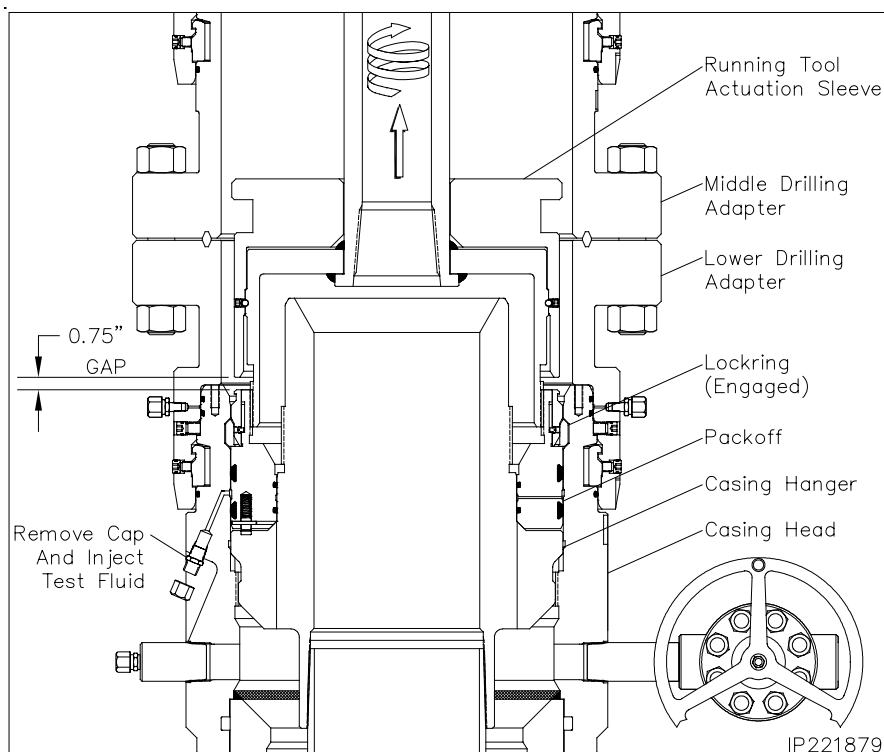
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Stage 6 — Install the CRC Mandrel Hanger Packoff

35. Back off the landing joint/running tool approximately 3/4 turn. Using the top drive, exert a 40,000 lbs pull on the landing joint. Hold test for 15 minutes or as required by drilling supervisor. After satisfactory test, slack off all weight.
36. Reattach the test pump to the open test manifold and retest the packoff seals as previously outlined. This will also verify that the packoff is in place.
37. After satisfactory test is achieved, bleed off all pressure. Remove the test pump and manifold and install the dust cap.
38. **Using chain tongs only**, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 5 turns), then retrieve the tool with a straight vertical lift.
39. Locate the anti-rotation screws in the O.D. of the adapter and back all (8) of them off a minimum of two turns each.

CAUTION: There are (10) drive screws that are used to compress and release the 24" CRC locking. They must be engaged in a specific pattern to properly release the locking.

40. Locate the alignment notches on the **FRONT** of the casing head and BOP adapter.
41. Locate **#1 Drive Screw** to the right of the adapter alignment notch. Run the drive screw in to a positive stop.
42. Locate **#2 Drive Screw** to the left of the adapter alignment notch. Run the drive screw in to a positive stop.
43. Continue around the adapter in an alternating **right to left pattern until all (10) Drive Screws are FULLY ENGAGED.**
44. Pick up the BOP stack and adapter with a straight vertical lift.



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Stage 6 — Install the CRC Mandrel Hanger Packoff

NOTE: In the event the packoff is required to be removed after the locking is engaged the following stage is to be followed.

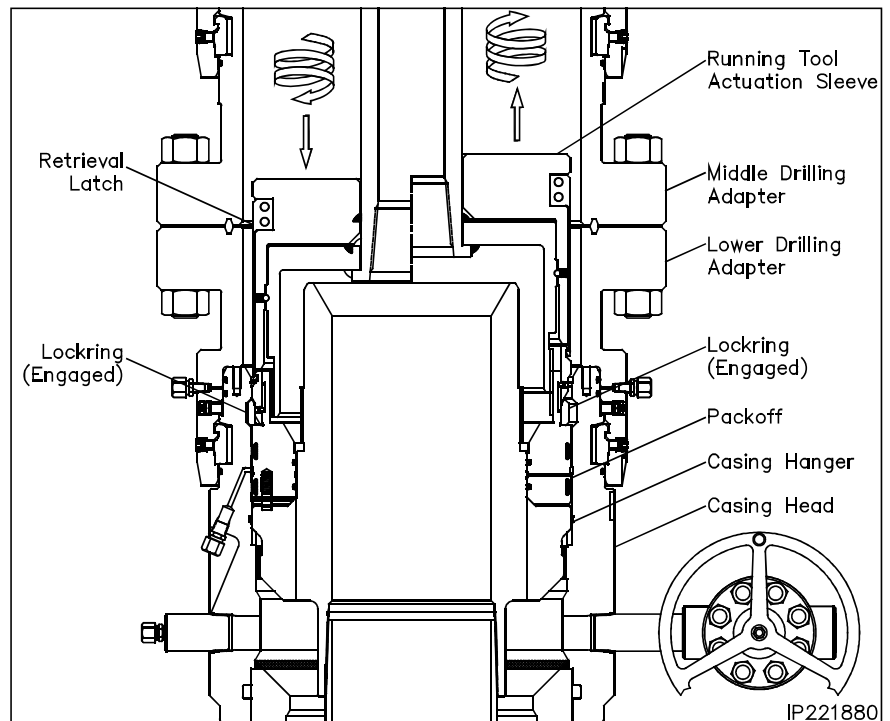
Retrieving the Packoff

1. Position the retrieval latch so the latch finger extend from the bottom of the running tool actuation sleeve.
2. Reinstall the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool body.
4. Carefully lower the running tool through the BOP stack and into the packoff.
5. Rotate the drill pipe clockwise (Right) to locate the thread start, then counter clockwise (Left) (approximately 3 turns) to a positive stop.

NOTE: At this point the retrieval latches will have passed over the energizing ring and snapped into place.

6. Rotate the drill pipe clockwise (right) approximately 3 turns to a positive stop. The drill pipe should rise approximately 1-1/2".

CAUTION: Do Not exceed the 6 turns or the packoff may be seriously damaged.



7. Carefully pick up on the drill pipe and remove the packoff from the wellhead with a straight vertical lift.
8. Rotate the packoff 1/4 turn clockwise to relax the retrieval latch.
9. Remove the (4) 1/2" cap screws and remove the latch assembly.
10. Redress the packoff and reset as previously outlined.
11. Once the packoff is properly set, reinstall the retrieval latch on the tool.



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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

1. Using a high pressure water hose, thoroughly clean the top of the casing head, packoff, casing hanger neck or casing stub, removing all old grease and debris.
2. Examine the **13-5/8" 10M MBU-3T-CRC-DBLHPS Wellhead Assembly (Item B1)**. Verify the following:
 - Acme threads are clean and in good condition
 - bore and all internal seal areas are clean and undamaged
 - anti-rotation screws and drive screws are in place and fully retracted
 - valves are intact and in good condition
 - 'HPS' seals are in place and in good condition

NOTE: If the threaded hub has been pre-installed in the shop, skip steps 3 through 10.

3. Examine the **13-5/8" 10M x 21.750" 2 Stub Acme Threaded Hub (Item R3)**. Verify the following:
 - Acme threads are clean and in good condition
 - remove the (4) retainer set screws and place them in a safe place

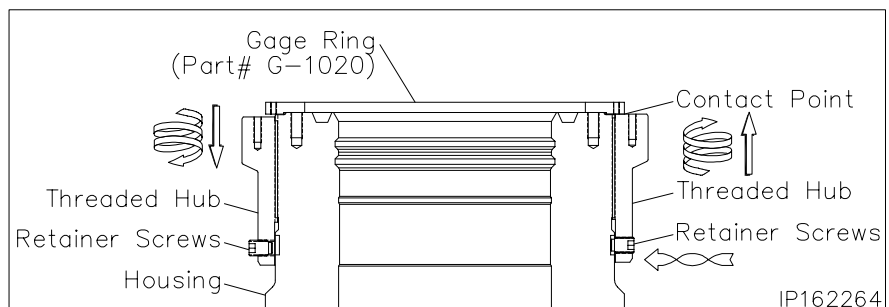
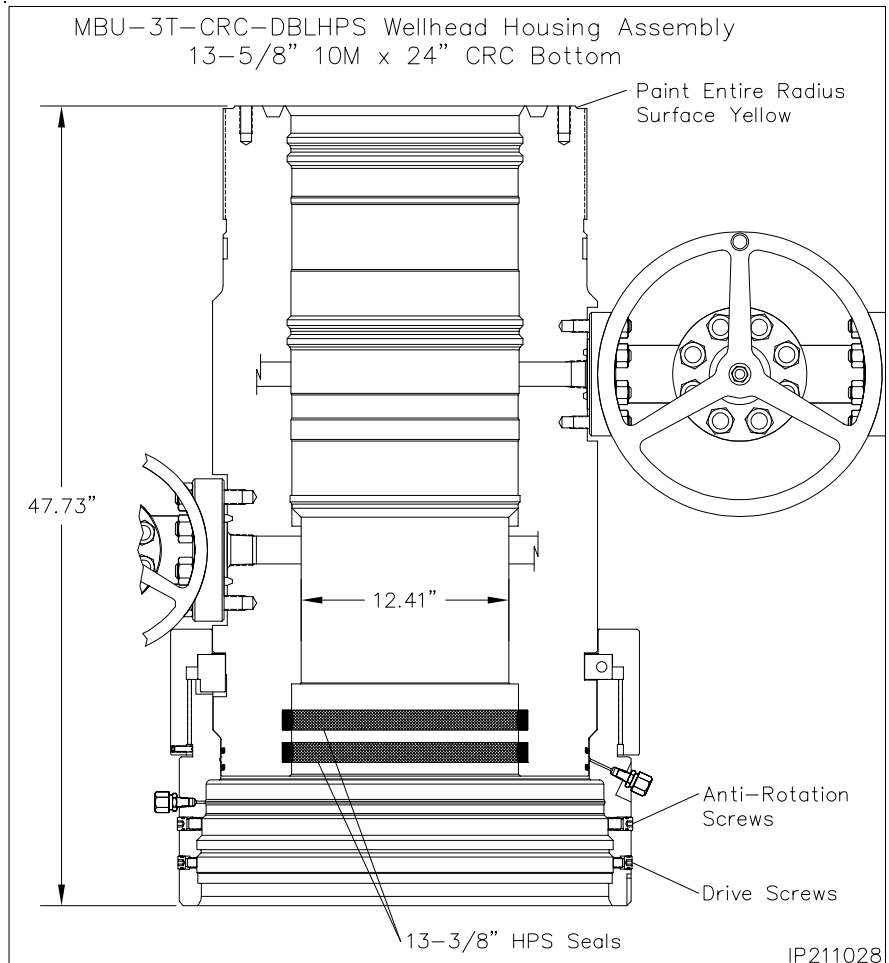
4. Thoroughly clean and lightly lubricate the mating threads of the housing and the threaded hub with copper coat or never seize.

5. Pick up the hub and carefully thread it onto the top of the housing with counter clockwise rotation until the top of the ring is approximately a 1/4" below the top of the housing.

6. Position the hub gage ring on top of the housing with the counter bore down as indicated. Ensure the gage ring is level and straight.

7. Rotate the hub clockwise (UP) until it contacts the gage ring.

CAUTION: Do Not off seat the gage ring.



8. Locate the retainer screw holes in the threaded hub.
9. Rotate the hub up or down to align the holes in the hub with the notches in the housing.
10. Install the set screws and tighten securely. (Do not over tighten) Remove gage ring.

NOTE: Using a yellow paint stick, paint the top of the housing where indicated for verifying level and adapter make up.



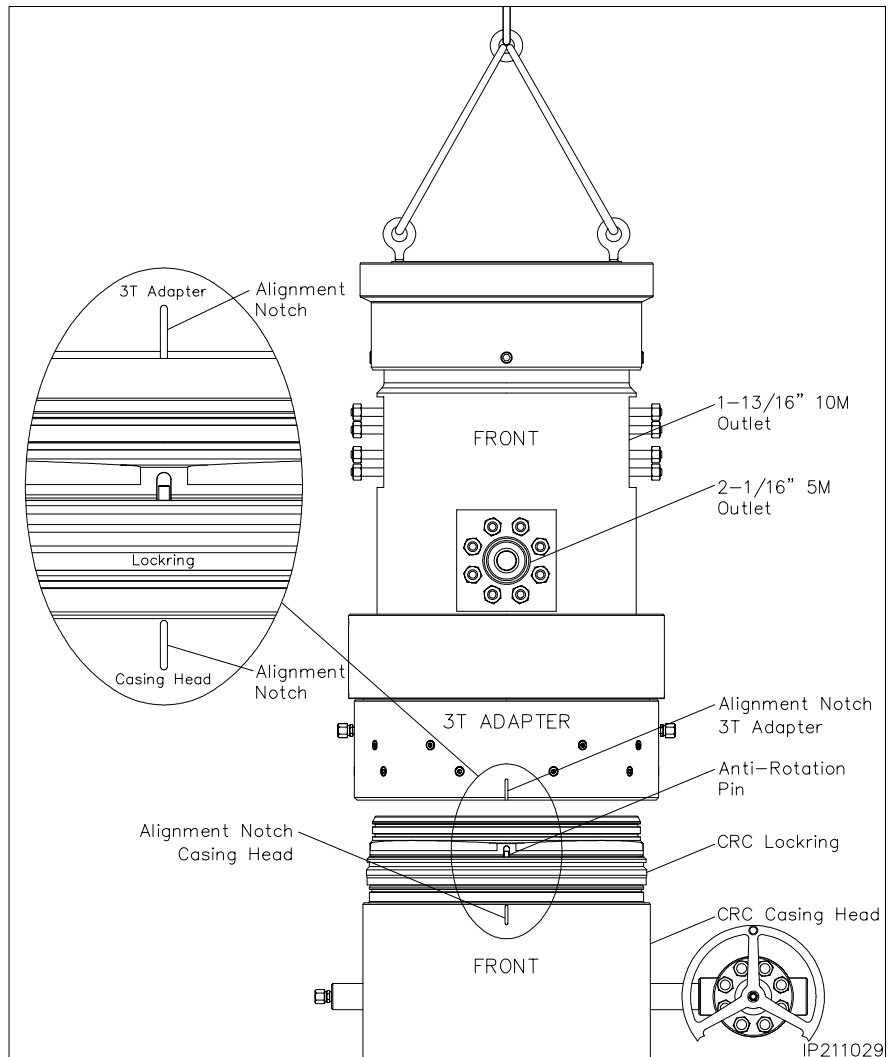
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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

11. Thoroughly clean and lightly lubricate the mating seal surfaces of the hanger neck or casing stub and the housing with oil or light grease.
12. Inspect the casing head and locking for any damage and repair as necessary.
13. Install a new set or o-ring seals on the top neck of the casing head.
14. Ensure the locking anti-rotation pin is properly seated and ring moves freely.
15. Thoroughly clean and lightly lubricate the O.D. seals and locking of the casing head with oil or light grease.
16. Fill the void area above the packoff with clean test fluid to the top of the casing head.
17. Ensure the drive screws and anti-rotation screws are fully retracted from the housing adapter bore.
18. Thoroughly clean and lightly lubricate the 'HPS' seals and the CRC connection of the housing adapter with oil or light grease.

WARNING: Keep body clear of all pinch points and suspended loads.

19. Pick up the housing and suspend it above the casing head.
20. Align the alignment notch in the housing (FRONT) with the mating notch in the casing head (FRONT).

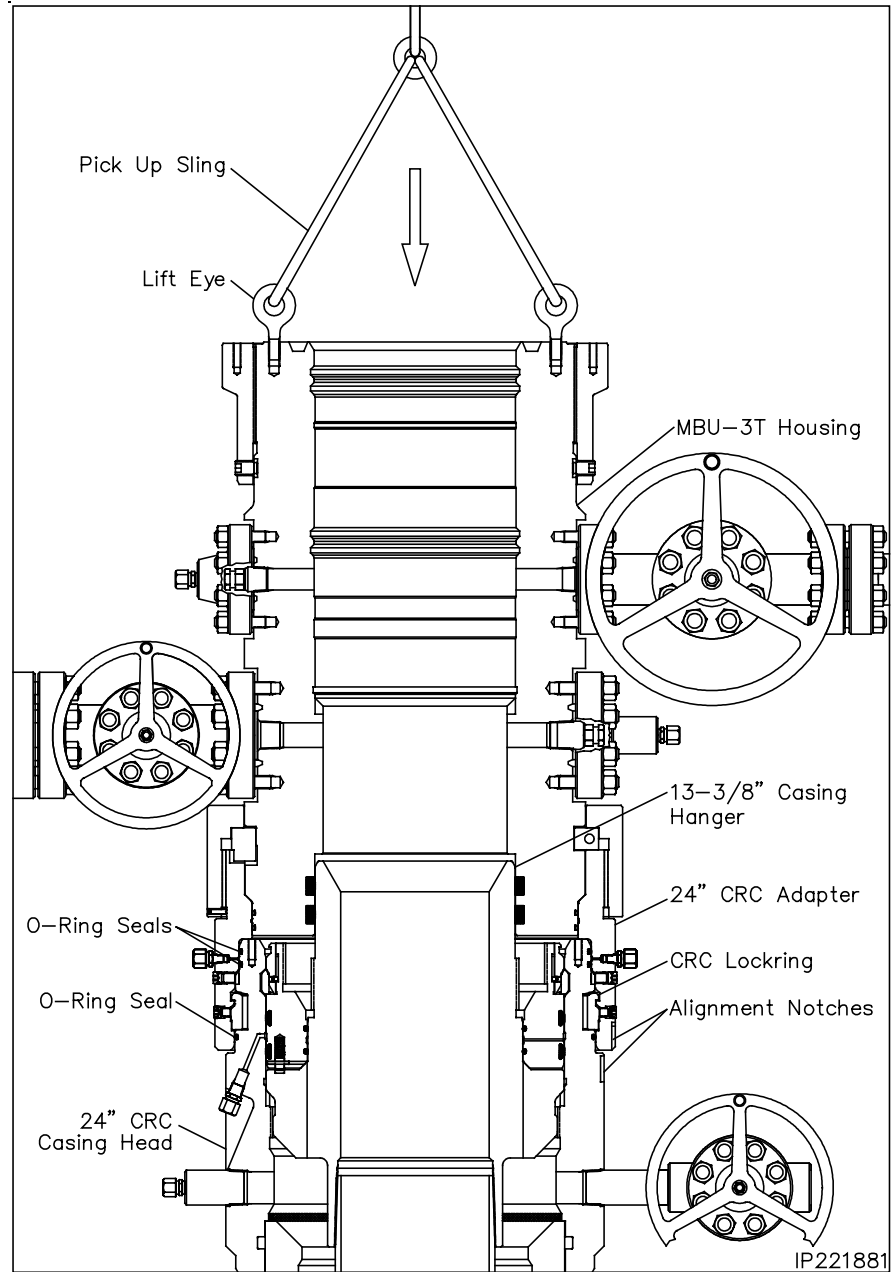


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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

21. Carefully lower the housing over the top of the casing head until the adapter bottoms out on the head and the locking snaps into its mating groove in the housing adapter.

CAUTION: Ensure the alignment notches are aligned.



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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

HPS Seal Test

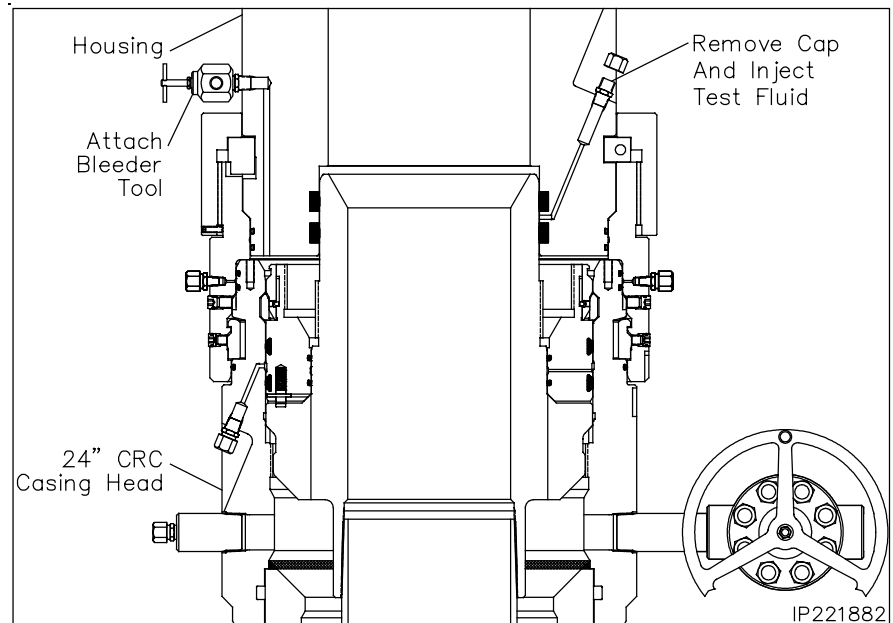
1. Locate the "LOWER SEAL TEST" fitting and one "FLG TEST" fitting on the lower O.D. of the housing and remove the fitting dust caps.
2. Attach a bleeder tool to the open "FLG TEST" fitting and open the tool.
3. Attach a hydraulic test pump to the open "LOWER SEAL TEST" fitting and inject test fluid between the 'HPS' seals until a stable test pressure of **5,000 psi** is achieved.

NOTE: If the emergency hanger was set, the test pressure is **5,000 psi or 80% of casing collapse - whichever is less.**

4. Hold test pressure for 15 minutes or as required by drill supervisor.

CAUTION: Do Not over pressurize!

5. If pressure drops one or both of the 'HPS' seals may be leaking. Pick up the housing and replace the leaking 'HPS' seals.
6. Repeat steps 2 - 4 until a satisfactory test is achieved.
7. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the test pump and re-install the dust cap on the open fitting.

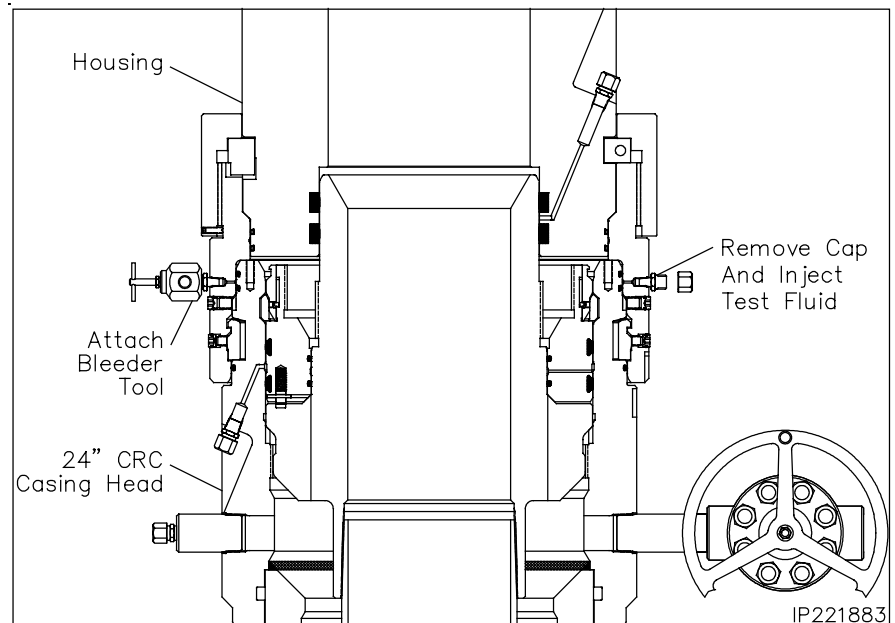


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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

CRC Housing Seal Test

8. Locate the CRC "Seal Test" fittings on the lower O.D. of the MBU-3T-CRC adapter and remove the dust cap from both fittings.
9. Attach a bleeder tool to one of the open fittings and open the tool.
10. Attach a test pump to the remaining open fitting and pump clean test fluid between the seals until a continuous stream flows from the open bleeder tool.
11. Close the tool and continue pumping fluid until a stable test pressure of **5,000 psi** is achieved.
12. Hold test pressure for 15 minutes or as required by drill supervisor.
13. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the test pump and bleeder tool and re-install the dust cap on the open fittings.



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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

CRC Connection Test

14. Locate the remaining “FLG TEST” fitting on the lower O.D. of the housing body and remove the dust cap from the fitting.
15. Attach a test pump to the open fitting and pump clean test fluid between the seals until a continuous stream flows from the open bleeder tool.
16. Close the tool and continue pumping fluid until a stable test pressure of **5,000 psi** is achieved.

NOTE: If the emergency hanger was set, the test pressure is **5,000 psi or 80% of casing collapse - whichever is less.**

17. Hold test pressure for 15 minutes or as required by drill supervisor.

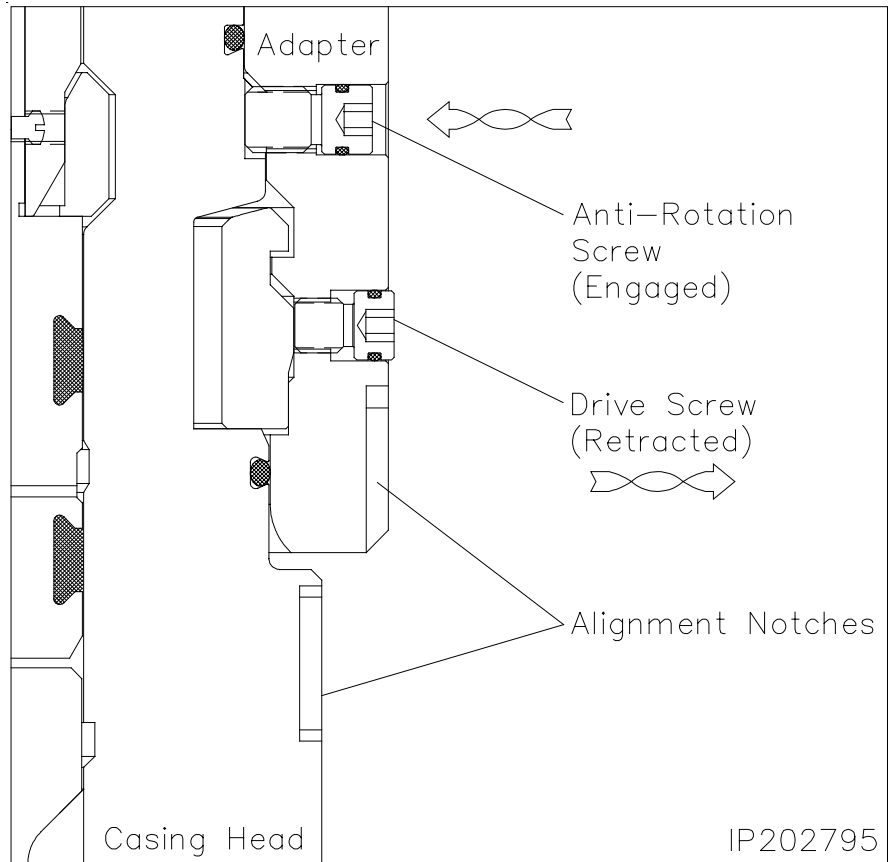
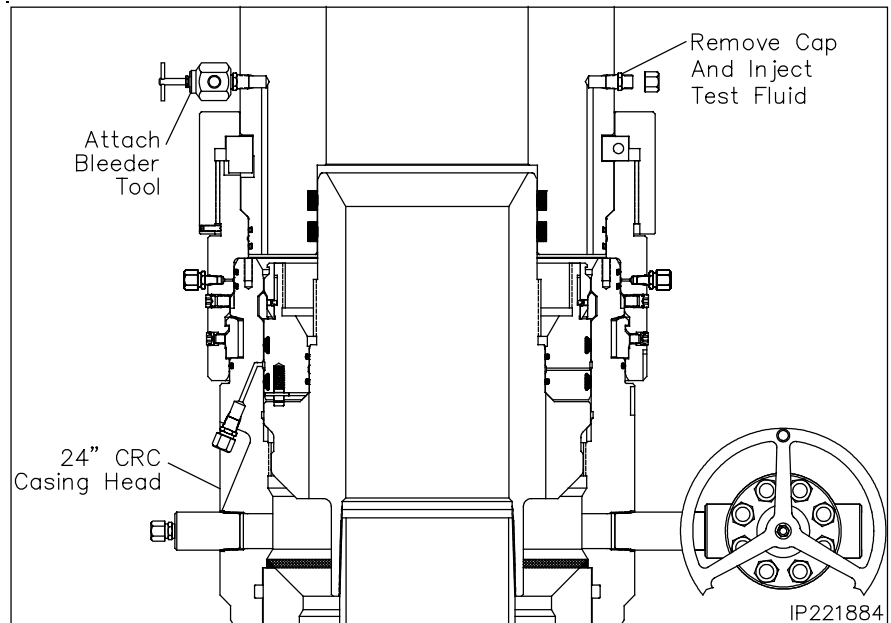
18. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the test pump and bleeder tool and re-install the dust cap on the open fittings.

19. Ensure the alignment notches are in line with each other.

20. Locate **ONLY** the anti-rotation screws on the O.D. of the MBU-3T-CRC housing adapter and run in all 8 screws to a positive stop. Tighten screws to approximately 100 ft-lbs.

CAUTION: Locate the drive screws and ensure the screws are loose and rotate freely. Do not remove the drive screws.

CAUTION: Do Not engage the drive screws (lower set of screws) at any time during operations. Doing so will disengage the CRC locking and cause the connection to fail.



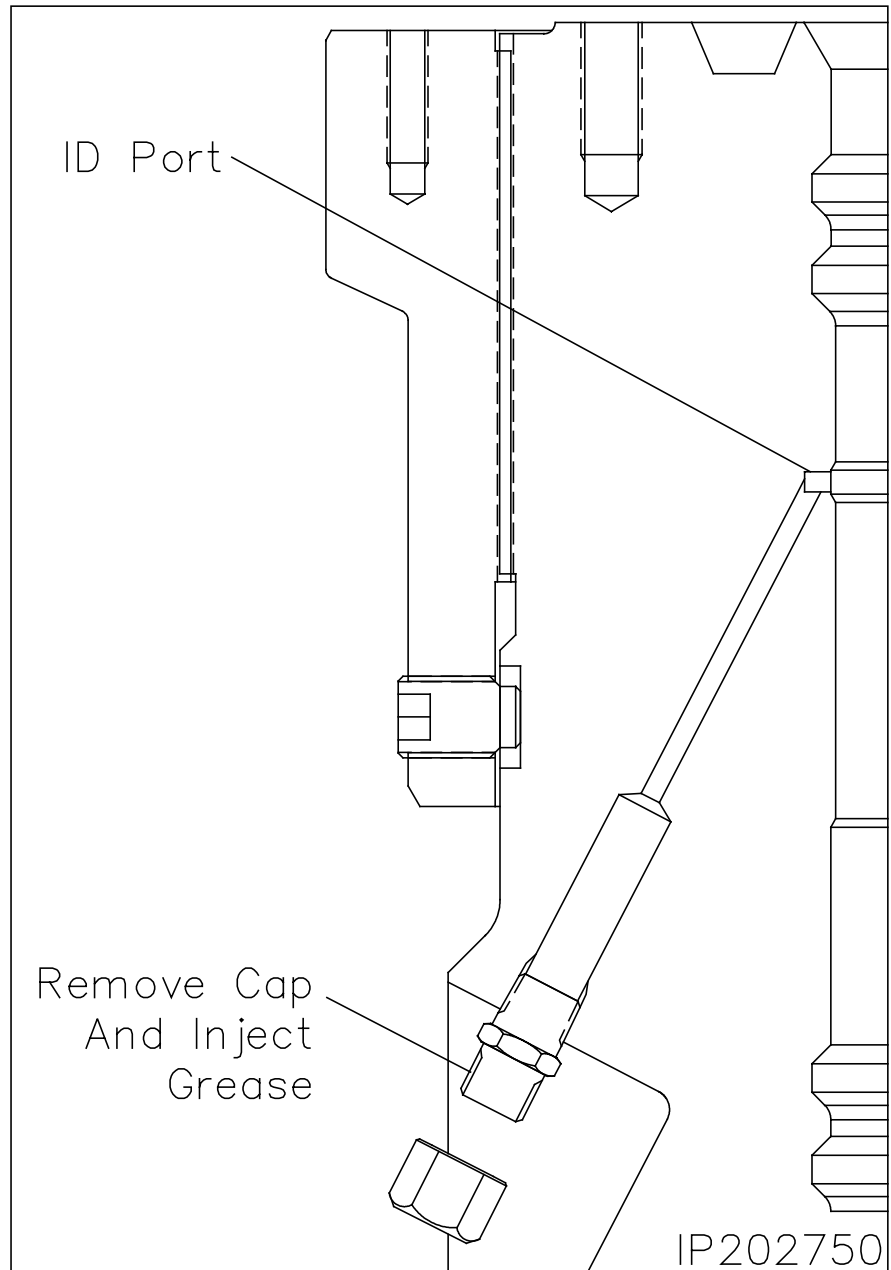
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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

1. Locate the upper test fitting on the O.D. of the housing and remove the dust cap.
2. Attach a grease gun to the open fitting and inject a water resistant grease into the test port until it flows freely into the I.D. of the housing.
3. Remove the grease gun and reinstall the dust cap on the open fitting.

CAUTION: Prior to installing the BOP stack, ensure the wellhead is level using appropriate level.

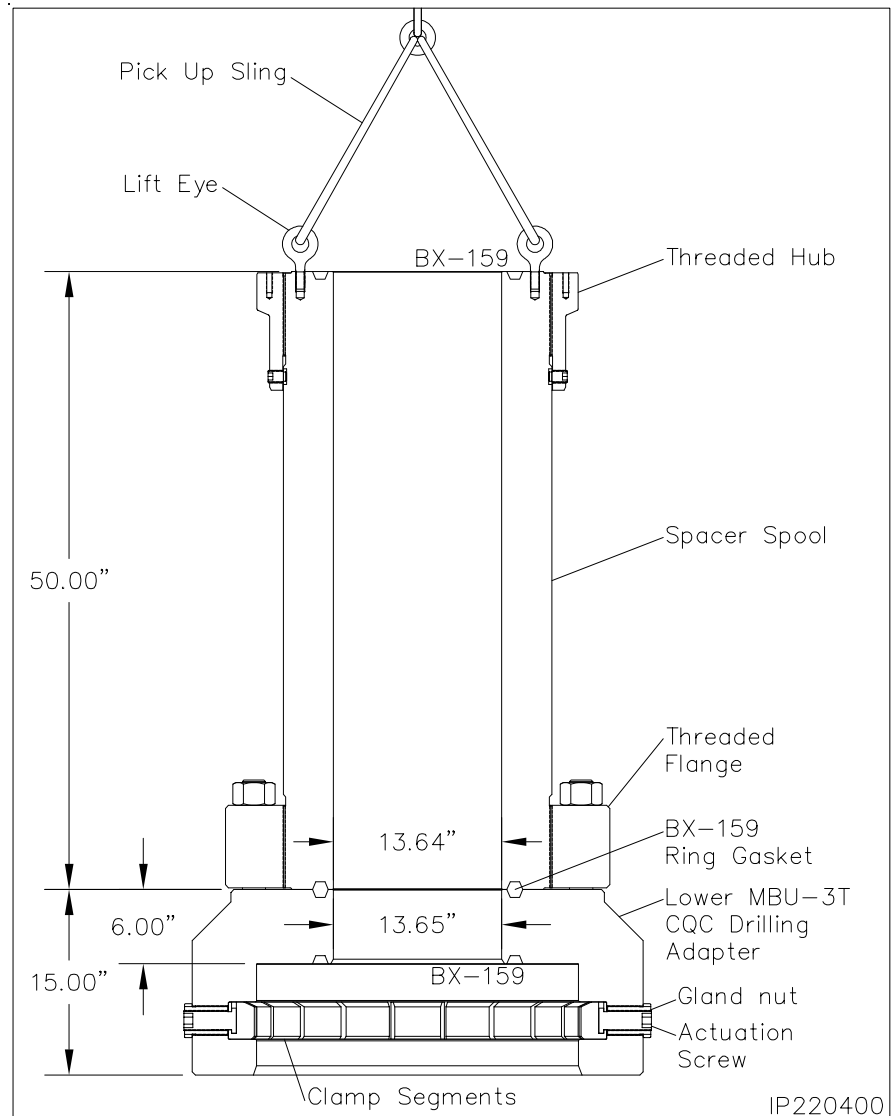
NOTE: Prior to installing the BOP it is recommended to attain an accurate RKB dimension for future use for accurately landing test plugs and casing hangers. This dimension is attained by dropping a tape measure from the rig floor to the top of the wellhead flange. Pull tape taut and record the dimension from the wellhead to the top of the rig floor or kelly bushings. Ensure this dimension is placed on the BOP board in the dog house and on the drillers daily report sheet.



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Stage 8 — Install the Drilling Riser Assembly

- Examine the **13-5/8" 10M Studded x 13-5/8" 10M Lower Quick Connect Drilling Adapter (Item R4) With 50.0" Spacer Spool With Threaded Hub and Flange (Item R5)**. Verify the following:
 - bores are clean and free of debris
 - ring grooves are clean and undamaged
 - (20) drive screws and clamp segments are properly installed and fully retracted
 - lift eyes are installed and tightened securely
 - threaded hub is installed properly and secured with set screws
- Thoroughly clean all ring grooves in the riser assembly removing all old grease and debris.
- Ensure both bolted connections are level and made up to proper torque.
- Attach a suitable 4 point lifting device to the 4 point pick up sling and pick up the assembly.



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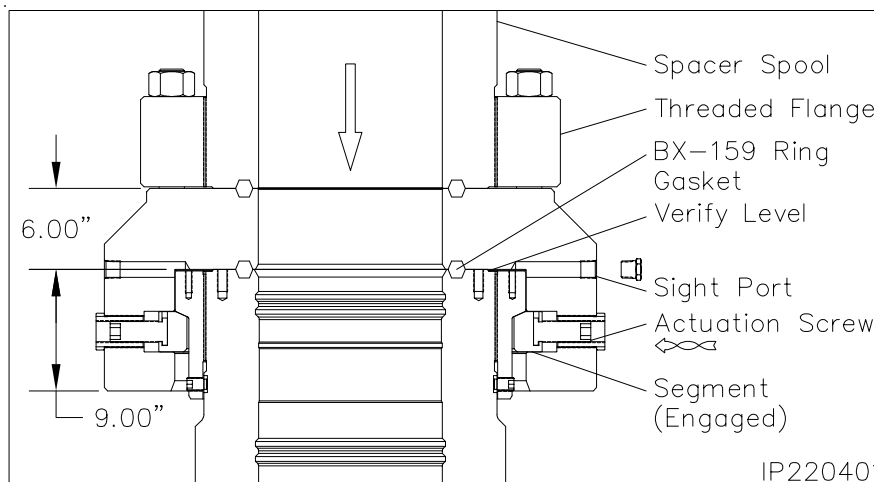
Stage 8 — Install the Drilling Riser Assembly

5. Thoroughly clean the clamp segments and ring groove of the quick connect drilling adapter removing all grease and debris.
6. Install a new BX-159 ring gasket into the ring groove of the housing.



WARNING: Keep body clear of all pinch points and suspended loads.

7. Carefully lower the adapter over the top of the housing with threaded hub and land the adapter on the ring gasket.
8. Remove the (4) 1" sight port pipe plugs and sight through each port to verify the drilling adapter with BOP is level and hub standoff is consistent.
9. Carefully run in all of the drive screws of the adapter to contact point.
10. Ensuring the assembly remains level, using the hand torque wrench, run in one actuation screw and torque to 100 ft-lbs.
11. Locate the screw 180° from the first and torque it to 100 ft-lbs.
12. Locate the screws 90° to the right and left and torque them to 100 ft-lbs.
13. Position the second 4 point sequence 45° from the first and torque each screw to 200 ft-lbs with the hand torque wrench.
14. Run in all remaining screws to contact, then torque each screw in the same sequence to 400 ft-lbs with the Rad Gun.



15. Using the Rad Gun, make one additional round until a stable torque of 700 ft-lbs on all screws is achieved.
16. Sight through the 4 sight ports to confirm that the adapter and housing are face to face on all sides and the BOP is level. Reinstall the sight port plugs and tighten securely.
17. Remove the pick up slings and lift eyes.



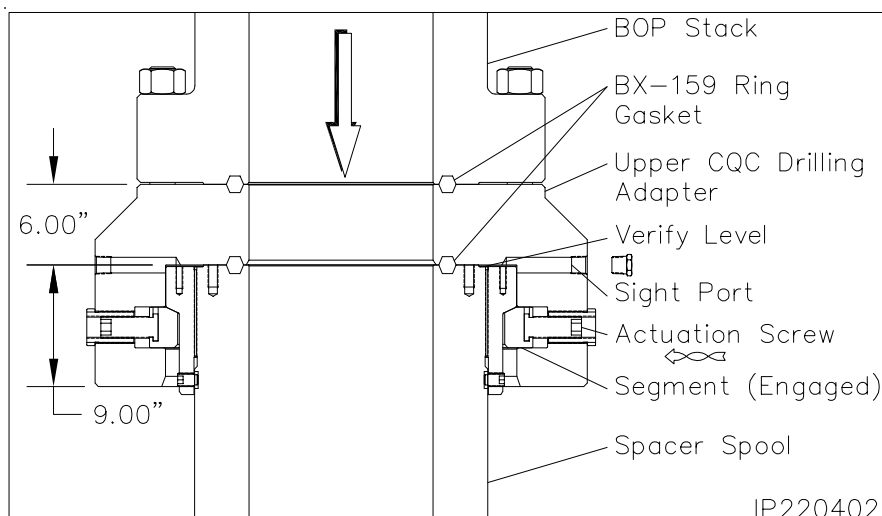
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Stage 8 — Install the Drilling Riser Assembly

18. Make up the **13-5/8" 10M Quick Connect x 13-5/8" 10M Studded Upper Adapter (Item R4)** to the bottom of the BOP stack using a new BX-159 ring gasket.
19. Thoroughly clean the 25.3" spacer spool hub, ring groove and the mating clamp segments and ring groove of the upper adapter attached to the BOP stack.
20. Install a new BX-159 ring gasket into the ring groove of the spacer spool.



WARNING: Keep body clear of all pinch points and suspended loads.



21. Carefully lower the adapter over the top of the housing with threaded hub and land the adapter on the ring gasket.
22. Remove the (4) 1" sight port pipe plugs and sight through each port to verify the drilling adapter with BOP is level and hub standoff is consistent.
23. Carefully run in all of the drive screws of the adapter to contact point.
24. Ensuring the assembly remains level, using the hand torque wrench, run in one actuation screw and torque to 100 ft-lbs.
25. Locate the screw 180° from the first and torque it to 100 ft-lbs.
26. Locate the screws 90° to the right and left and torque them to 100 ft-lbs.
27. Position the second 4 point sequence 45° from the first and torque each screw to 200 ft-lbs with the hand torque wrench.
28. Run in all remaining screws to contact, then torque each screw in the same sequence to 400 ft-lbs with the Rad Gun.
29. Using the Rad Gun, make one additional round until a stable torque of 700 ft-lbs on all screws is achieved.
30. Sight through the 4 sight ports to confirm that the adapter and housing are face to face on all sides and the BOP is level. Reinstall the sight port plugs and tighten securely.



Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System

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Stage 9 — Test the BOP Stack

Immediately after making up the BOP stack and periodically during the drilling of the well for the next casing string the BOP stack (connections and rams) must be tested.

1. Examine the **13-5/8" Nominal x 4-1/2" IF (NC50) CW Test Plug (Item ST8)**. Verify the following:
 - 1-1/4" VR plug and weep hole plug are in place and tightened securely
 - elastomer seal is in place and in good condition
 - drill pipe threads are clean and in good condition

CAUTION: Prior to running or retrieving the test plug, ensure the rig is properly aligned and centered over the wellhead.

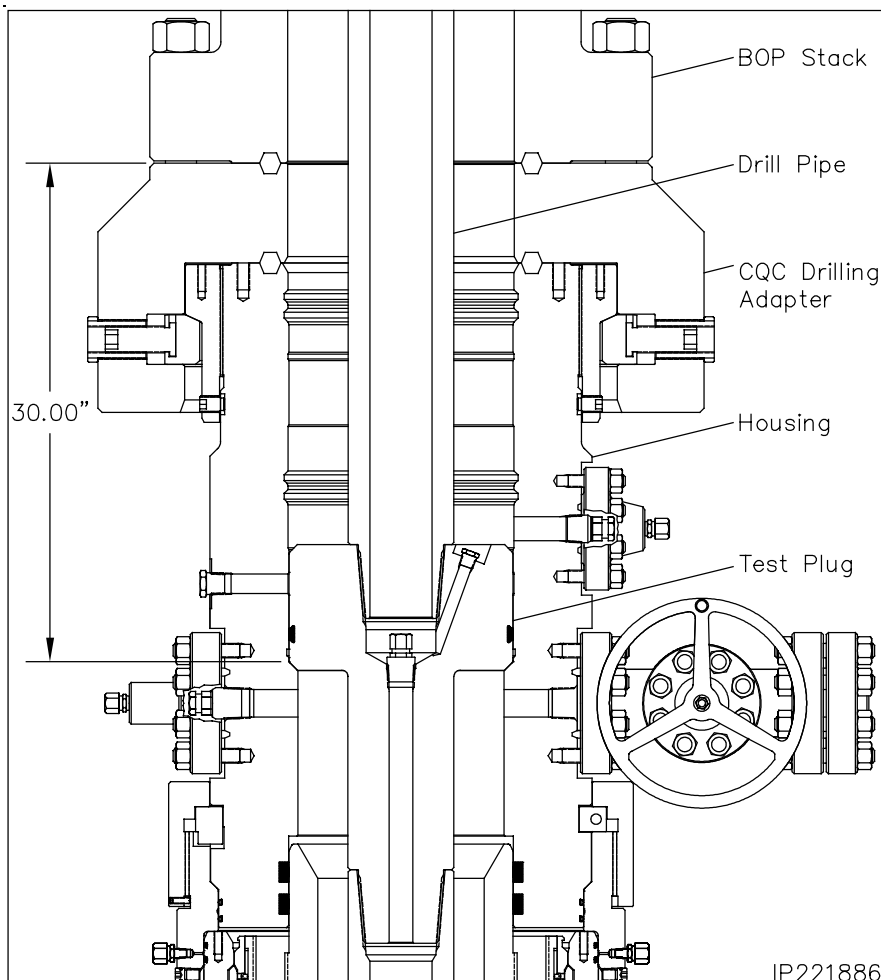
2. Position the test plug in the rotary table with the pin end down and make up the tool to a joint of drill pipe. Rack back assembly with the drill pipe in derrick.

CAUTION: Ensure that the pin thread is facing down.

3. Run in the hole with one or more stands of drill pipe and set the last joint in the floor slips.
4. Pick up the test plug with landing joint and make it up in the drill string.
5. Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the housing lower side outlet valve.
7. Lightly lubricate the test plug seal with oil or light grease.
8. Carefully lower the test plug through the BOP and land it on the load shoulder in the housing, 30.00" below the top of the lower drilling adapter.



9. Close the BOP rams on the pipe and test the BOP to **10,000 psi** or as required by drilling supervisor.

NOTE: Any leakage past the test plug will be clearly visible at the open side outlet valve.

CAUTION: When performing the BOP blind ram test it is highly recommended to suspend a stand of drill pipe below the test plug to ensure the plug stays in place while disconnecting it from the drill pipe.

10. After a satisfactory test is achieved, release the pressure and open the rams.
11. Remove as much fluid as possible from the BOP stack. Retrieve the test plug with a straight vertical lift.
12. Close all open valves.
13. Repeat this stage as required during the drilling of the hole section.



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Stage 10 — Run the Lower Wear Bushing

CAUTION: Always use a wear bushing while drilling to protect the load shoulders from damage by the drill bit or rotating drill pipe. The wear bushing **must be retrieved** prior to running the casing.

- Examine the **13-5/8" Nominal MBU-3T-LWR Wear Bushing (Item ST10)**. Verify the following:
 - internal bore is clean and in good condition
 - upper trash o-ring is in place and in good condition
 - shear o-ring cord is in place and in good condition
 - paint anti-rotation lugs white and allow paint to dry

Run the Wear Bushing Before Drilling

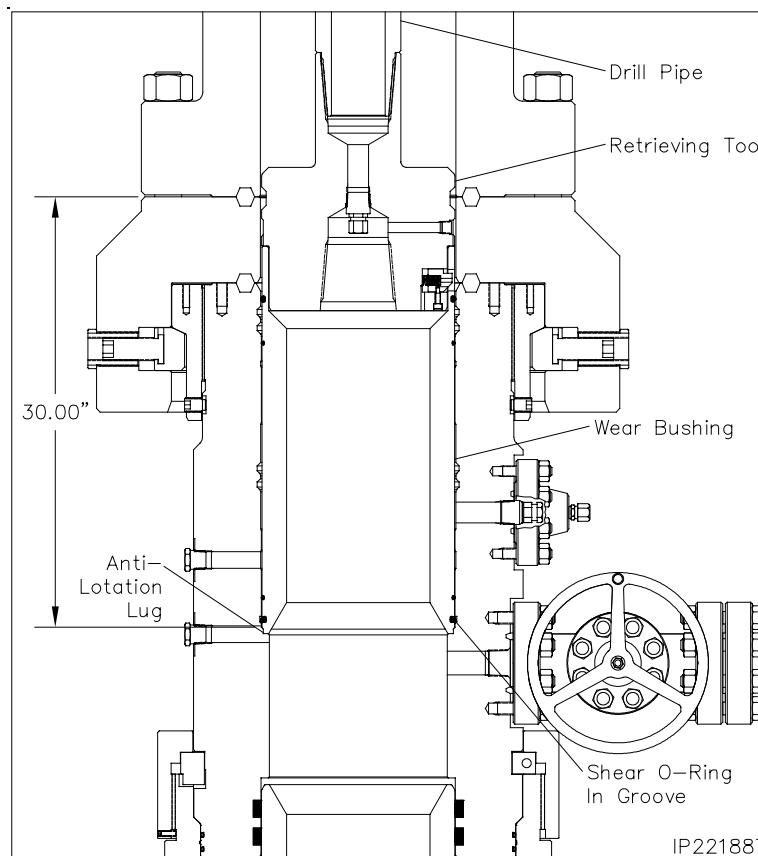
- Orient the **13-5/8" Nominal x 4-1/2" IF (NC50) CW Retrieving Tool (Item ST9)** with lift lugs down and drill pipe connection tong neck up.
- Make up the retrieving tool to a joint of drill pipe.
- Align the retractable lift lugs of the tool with the retrieval holes of the bushing and carefully lower the tool into the wear bushing until the lugs snap into place.

NOTE: If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

- Apply a heavy coat of grease, not dope, to the O.D. of the bushing.
- Slowly lower the tool/bushing assembly through the BOP stack and land it on the load shoulder in the housing, 30.00" below the top of the lower drilling adapter.
- Rotate the drill pipe clockwise (right) to locate the stop lugs in their mating notches in the head. When properly aligned the bushing will drop an additional 1/2".

NOTE: The shear o-ring on bottom of the bushing will locate in a groove above the load shoulder in the head to act as a retaining device for the bushing.

- Remove the tool from the wear bushing by rotating the drill pipe counter clockwise (left) 1/4 turn and lifting straight vertical.
- Drill as required.



CAUTION: It is highly recommended to retrieve, clean, inspect, grease, and reset the wear bushing each time the hole is tripped during the drilling of the hole section.

Retrieve the Wear Bushing After Drilling

- Make up the retrieving tool to the drill pipe.
- Slowly lower the tool into the wear bushing.
- Pick up and balance the riser weight and rotate the retrieving tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.
- Retrieve the wear bushing to the rig floor. Remove it and the retrieving tool from the drill string.

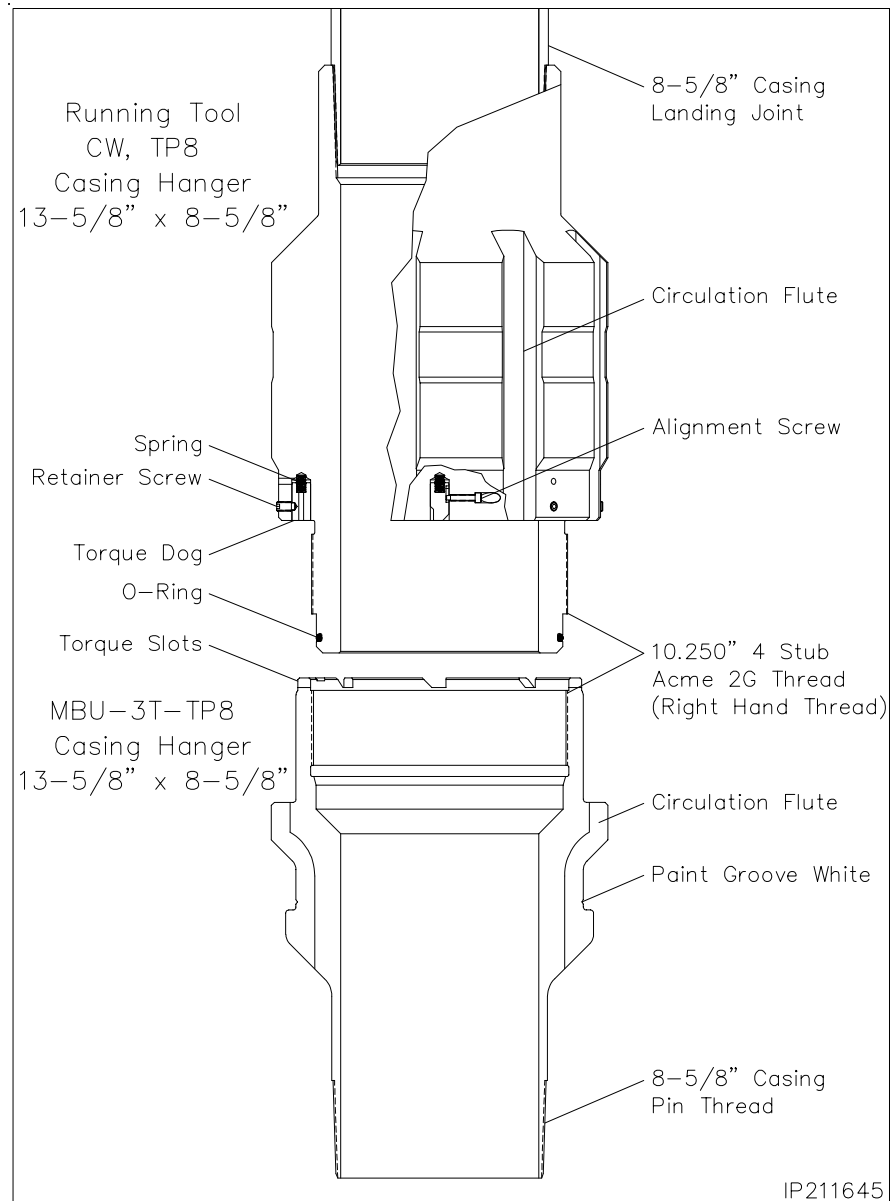


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Stage 11 — Hang Off the 8-5/8" Casing

NOTE: If the 8-5/8" casing becomes stuck and the mandrel casing hanger cannot be landed, refer to **Section 2: Stage 11A** for the emergency procedure.

- Examine the **13-5/8" x 8-5/8" CW-TP8 Casing Hanger Running Tool (Item ST11)**. Verify the following:
 - internal bore and threads are clean and in good condition
 - o-ring seal is clean and in good condition
 - torque dogs are in place, in upper most position and retainer set screws are tightened securely
- Make up a landing joint to the top of the running tool and torque connection to thread manufacturer's maximum make up torque.
- Lay down the landing joint on the pipe rack.
- On the pipe rack, examine the **13-5/8" x 8-5/8" CW-MBU-3T-LWR-TP8 Mandrel Casing Hanger (Item B19)**. Verify the following:
 - internal bore and threads are clean and in good condition
 - neck seal area is clean and undamaged
 - torque slots are clean and in good condition
 - pin threads are clean and in good condition. **Install thread protector**
 - paint indicator groove white as indicated and allow paint to dry



- Liberalily lubricate the mating threads, seal areas and o-ring of the hanger and running tool with a oil or light grease.
- Using chain tongs only**, thread the running tool into the hanger, with right hand rotation, until it shoulders out on the hanger body.

CAUTION: Do Not apply torque to the hanger/tool connection.

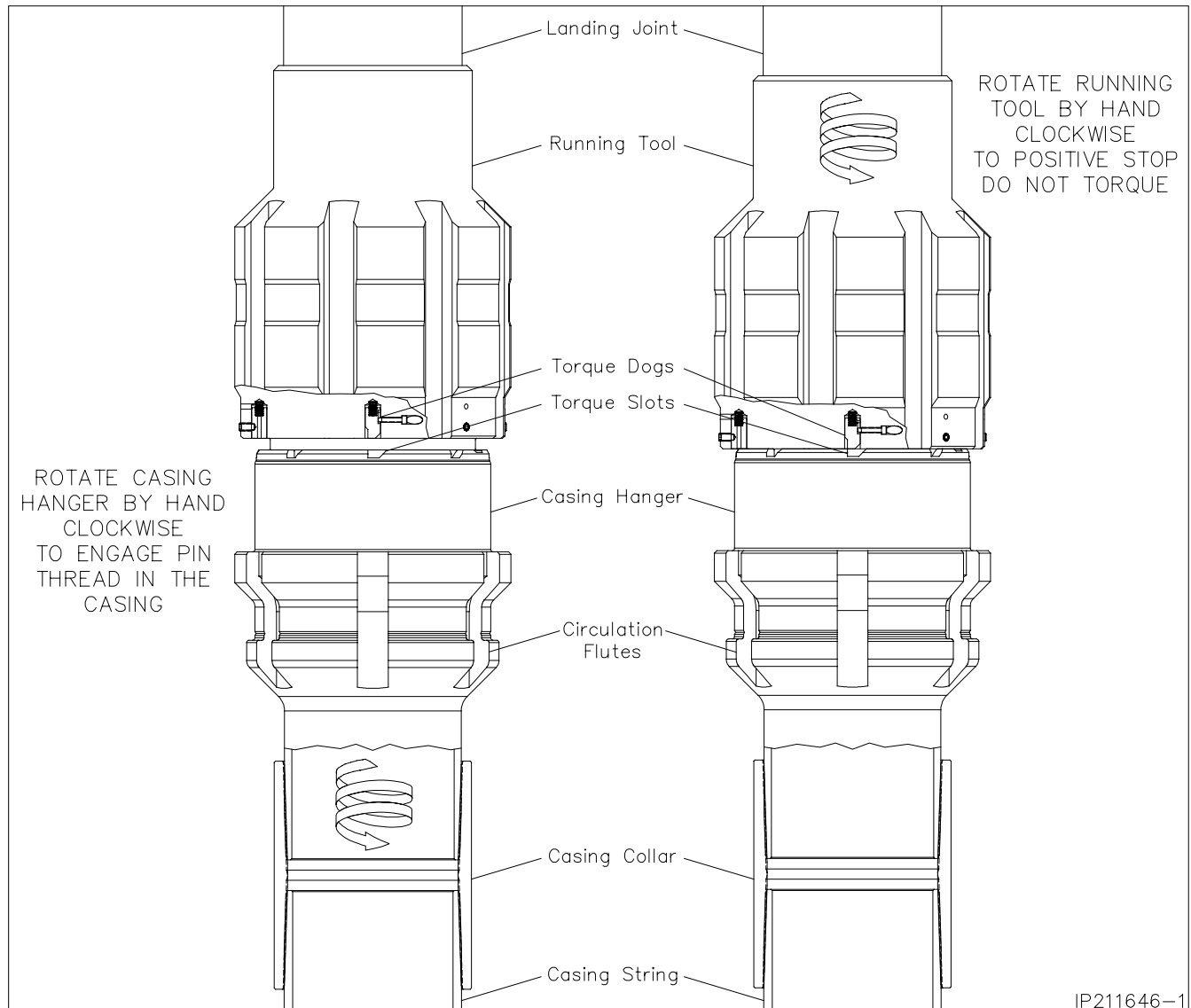
NOTE: If steps 1 through 6 were done prior to being shipped to location, the running tool should be backed off 1 turn and made back up to ensure it will back off freely.

- Calculate the total landing dimension by adding the previously determined RKB dimension and 30.00", the depth of the wellhead.
- Starting at the top of the 45° angle load shoulder of the casing hanger measure up the landing joint and place a paint mark on the joint. Mark **HANGER LANDED**.
- Place a second mark 30" below the first and mark **STOP ROTATING**.



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Stage 11 — Hang Off the 8-5/8" Casing



10. Run the 8-5/8" casing as required and space out appropriately for the mandrel casing hanger.
11. Pick up the casing hanger/running tool joint assembly.
12. Remove the casing hanger thread protector and carefully thread the hanger into the last joint of casing ran. Rotate the hanger clockwise, by hand, to a positive stop.
13. Rotate the running tool clockwise by hand to a positive stop.



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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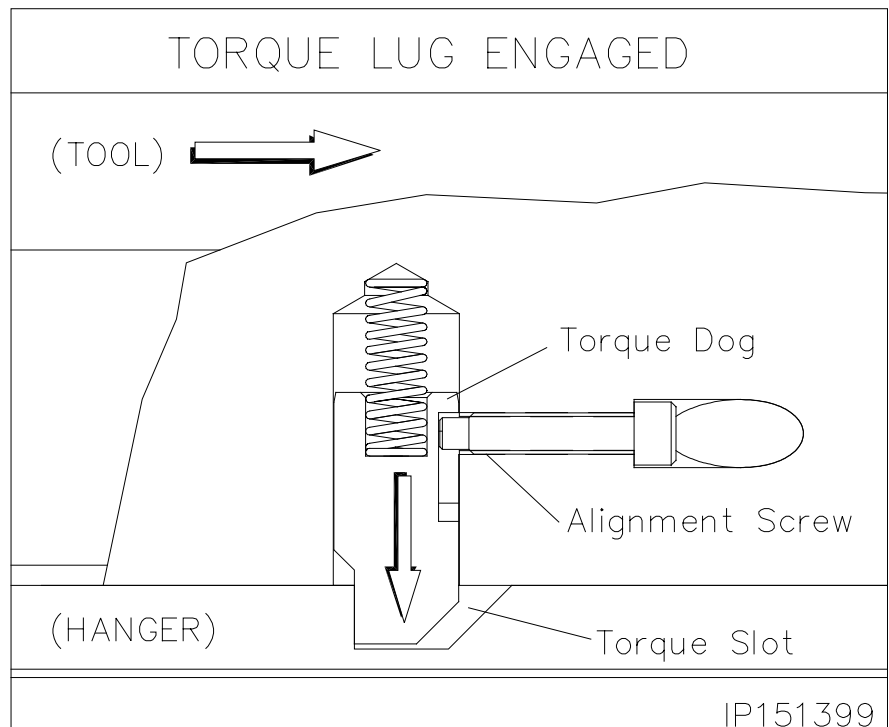
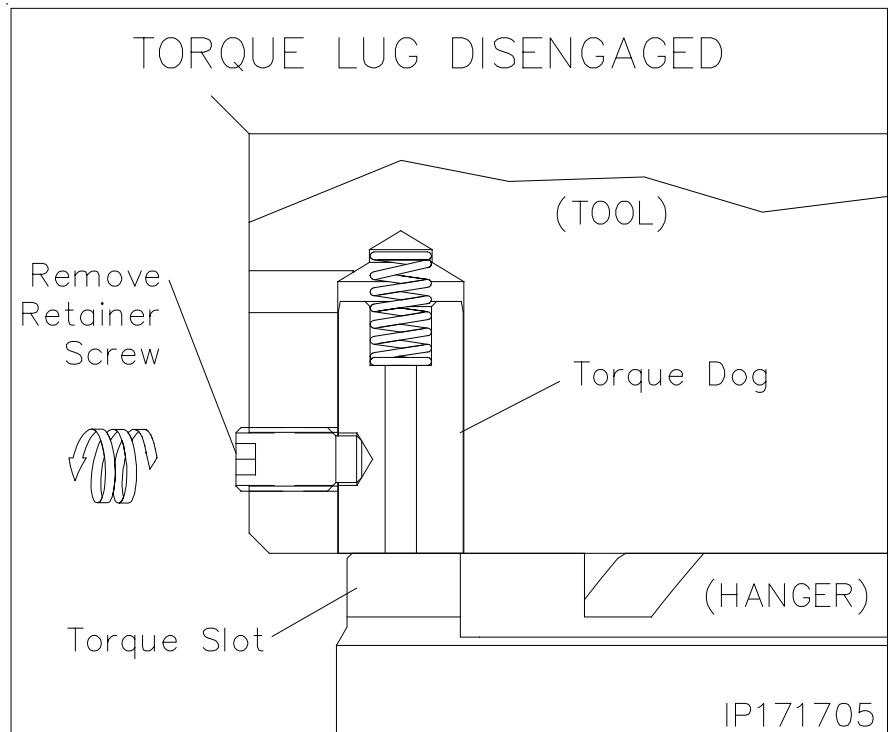
Stage 11 — Hang Off the 8-5/8” Casing

14. Locate the (4) 3/8” socket head set screws in the side of the hanger running tool and remove the screws. This will release the running tool torque dogs allowing them to move downward.

NOTE: Place the screws in a safe place to reinstall in the tool when the job is completed.

15. **Using chain tongs only**, rotate the running tool to the left to allow the torque dogs to engage the torque slots in the top of the hanger.

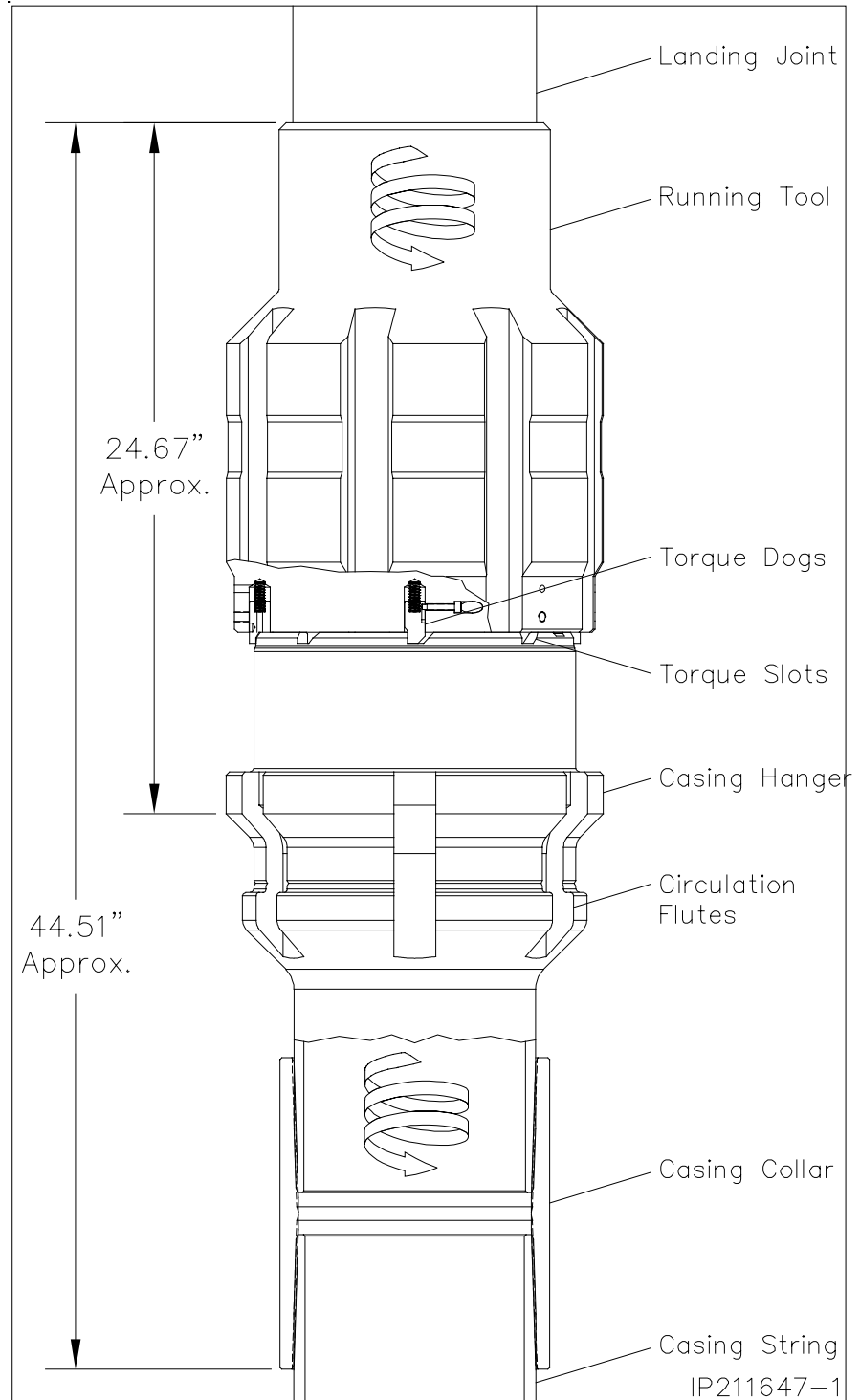
CAUTION: Do Not rotate the running tool more than 1/4 turn to the left. Doing so will decrease the torque dog engagement.



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Stage 11 — Hang Off the 8-5/8” Casing

- 16. Engage the CRT tool on the landing joint and torque the casing hanger in the casing string to thread manufacturer's maximum make up torque.



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

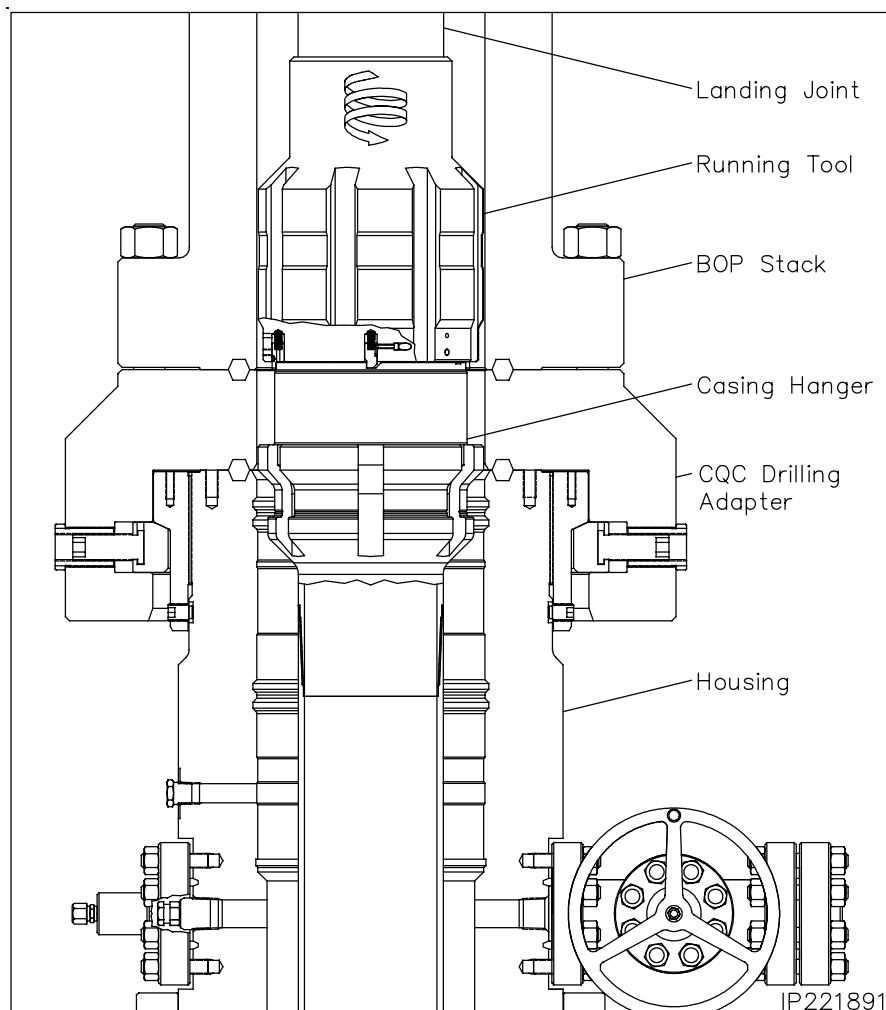
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Stage 11 — Hang Off the 8-5/8" Casing

17. Pick up the casing string and remove the floor slips and rotary bushings.
18. Carefully lower the hanger completely through the BOP annular and then engage the top drive to allow the casing to be rotated clockwise.
19. While rotating the casing clockwise, carefully lower the casing string until the **STOP ROTATING** mark on the landing joint is level with the rig floor.

NOTE: The torque dogs have a maximum rated capacity. Please reference the **Recommended Service Tools** section in the BOM for maximum torque allowed.



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Stage 11 — Hang Off the 8-5/8” Casing

CAUTION: Torque wrap can build in the casing string as it is rotated. Ensure the string comes to a neutral position, by allowing it to back off slowly counter clockwise, before the casing hanger is fully landed.

20. Cease rotation and continue carefully lowering the hanger through the wellhead and land it on the load shoulder in the housing, 30.00” below the top of the lower drilling adapter.

21. Slack off all weight on the casing and verify that the **HANGER LANDED** paint mark has aligned with the rig floor.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

22. Open the housing lower outlet valve and drain the BOP stack.

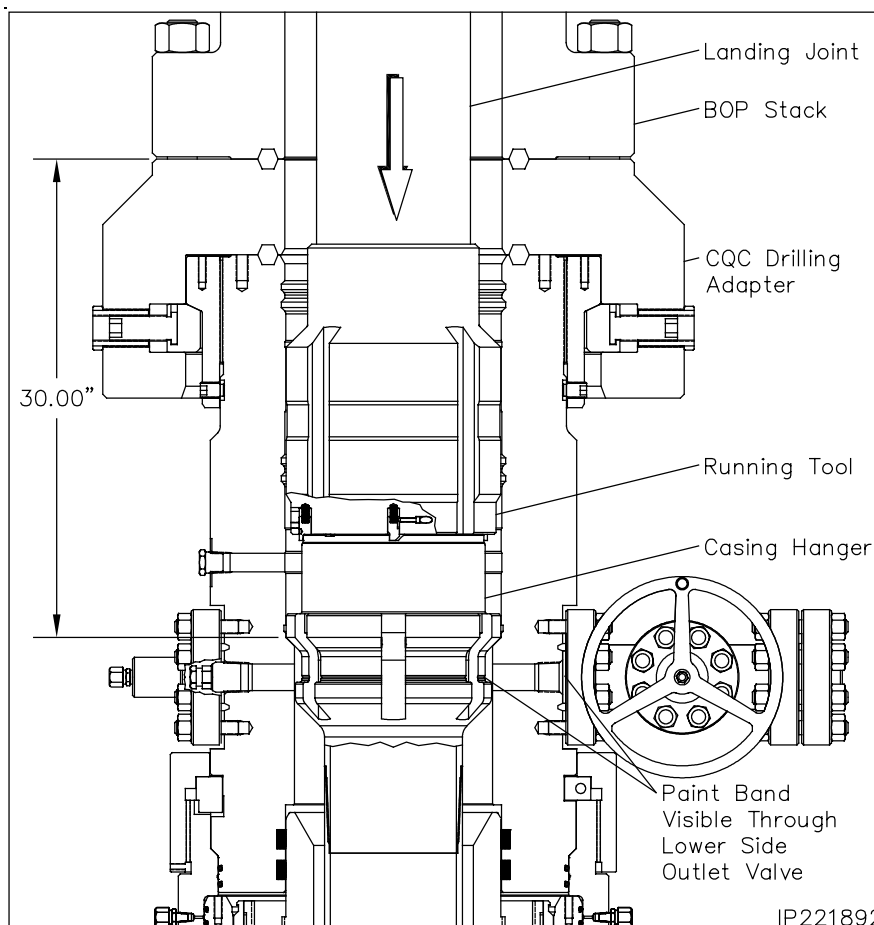
23. Sight through the valve bore to confirm the hanger is properly landed. The white painted indicator groove will be clearly visible in the center of the open outlet valve.

24. Close the open valve and place a vertical paint mark on the landing joint to verify if the casing string rotates during the cementing process.

25. Cement the casing as required.

NOTE: Returns may be taken through the circulation slots and out the BOP or out the side outlets on the housing.

26. With cement in place, bleed off all pressure and remove the cementing head.



27. **Using chain tongs only, located 180° apart**, retrieve the running tool and landing joint by rotating the landing joint counter clockwise (left) approximately 13 turns or until the tool comes free of the hanger.

CAUTION: The rig floor tong may be used to break the connection but **under no circumstances is the top drive to be used to rotate or remove the casing hanger running tool.**



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Stage 11 — Hang Off the 8-5/8" Casing


Running the 13-5/8" Wash Tool

1. Examine the **13-5/8" x 4-1/2" IF (NC50) Wash Tool (Item ST13)**.

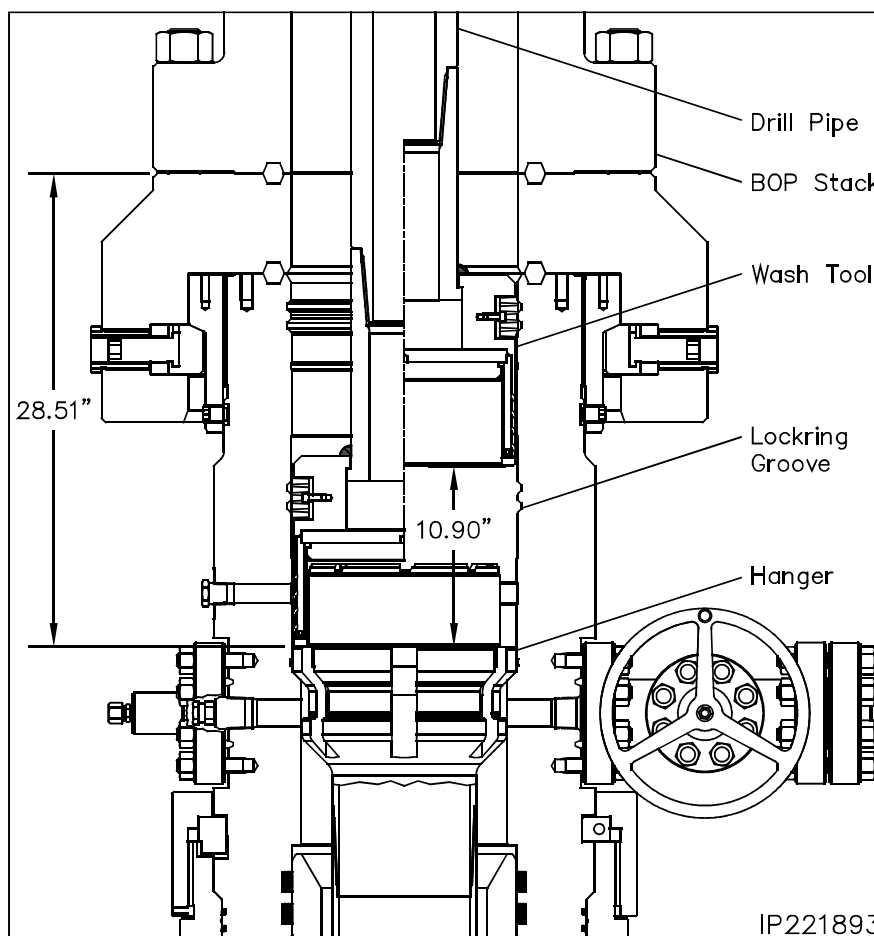
Verify the following:

- drill pipe threads and bore are clean and in good condition
- all ports are open and free of debris
- brushes are securely attached and in good condition

2. Orient the wash tool with drill pipe box up. Make up a joint of drill pipe to the tool.
3. Carefully lower the wash tool through the BOP and land it on top of the casing hanger, 28.51" below the top of the lower drilling adapter.
4. Place a paint mark on the drill pipe level with the rig floor.
5. Using chain tongs, rotate the tool clockwise (right) approximately 6 turns to loosen any debris that may be on top of the hanger flutes.

 **WARNING:** Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the lower side outlet valve and drain the BOP stack.
7. Attach a high pressure water line or the top drive to the end of the drill pipe. Pump water (up to a max of 200 psi) through the tool and up the BOP stack.
8. Pick up on the tool approximately 1" and slowly rotate the drill pipe approximately 20 RPM.
9. Pick up the tool a total of 10.90" and rotate the tool to brush the upper locking groove free of debris.
10. While flushing, raise and lower the tool the full length of the wellhead and BOP stack. Thoroughly wash the inside of the housing and BOP stack to remove all caked on debris.



11. Once washing is complete, land the wash tool on the hanger flutes.
12. Shut down pumps and observe the returns at the open lower outlet for debris.
13. Reengage the pump and fully wash the inside of the wellhead and the entire BOP one additional cycle, ensuring the stopping point is with the wash tool resting on top of the hanger flutes.
14. Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.
15. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
16. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure there are no dark areas on top of the painted flutes of the hanger.



CAUTION: Continue washing until all debris is removed.



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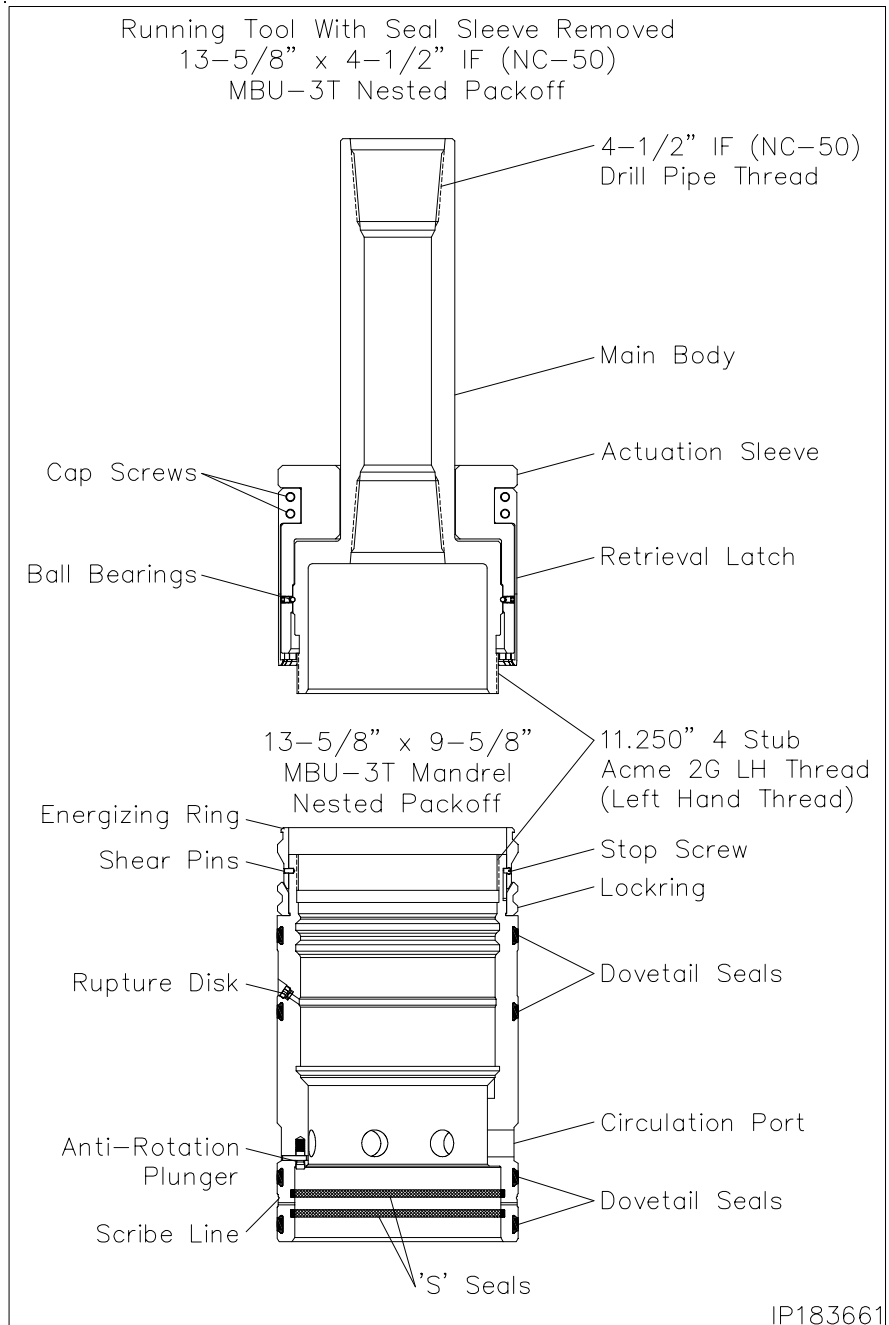
Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

NOTE: The following steps detail the installation of the MBU-3T nested packoff assembly for the mandrel hanger. If the casing was landed using the emergency slip hanger, skip this stage and proceed with **Section 2: Stage 12A** for installing the emergency MBU-3T nested packoff.

- Examine the **13-5/8" x 11.250" 4 Stub Acme 2G LH Box Top MBU-3T Mandrel Hanger Nested Packoff Assembly (Item B20)**. Verify the following:
 - all elastomer seals are in place and undamaged
 - internal bore, and ports, are clean and in good condition
 - locking is fully retracted
 - rupture disc is in place and tightened securely
 - energizing ring is in its upper most position and retained with shear pins
 - guide screws are in place and back off 1/4 turn
 - anti-rotation plungers are in place, free to move
- Inspect the I.D. and O.D. seals for any damage and replace as necessary.
- Examine the **13-5/8" Nominal x 11.250" 4 Stub Acme 2G LH, MBU-3T Nested Packoff Running Tool (Item ST14)**. Verify the following:
 - Acme threads are clean and in good condition
 - retrieval latch is in position and retained with cap screws
 - remove seal sleeve protector and seal sleeve

NOTE: Alternate tool may also be used.

- Remove the retrieval latch and set aside.
- Make up the running tool to 4-1/2" IF (NC-50) drill pipe and torque the connection to optimum make up torque.



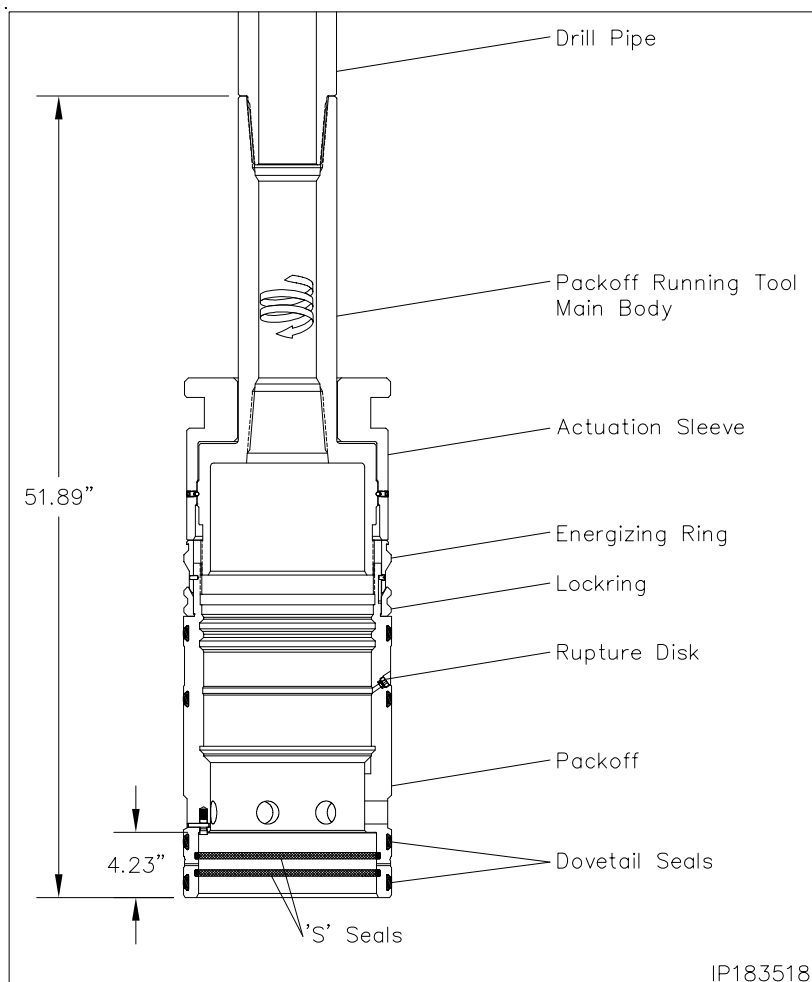
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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

6. Pick up the running tool with landing joint and suspend it above the packoff.
7. Thoroughly clean and lightly lubricate the mating Acme threads of the tool and the packoff with oil or a light grease.
8. Carefully lower the tool into the packoff and thread them together by first rotating the tool clockwise (RIGHT) to locate the thread start and then counter clockwise (LEFT) until the tool upper body makes contact with the packoff energizing ring. Approximately 4 turns.

CAUTION: Ensure the rupture disc is in place and tightened securely.

9. Pick up the assembly and thoroughly clean and lightly lubricate the packoff I.D. 'S' seals and the O.D. dovetail seals with oil or light grease.
10. Locate the upper and lower "SEAL TEST" fittings on the O.D. of the housing and remove the dust cap from the fittings.
11. Attach a test pump to both fittings and pump clean test fluid through the ports to dislodge any old grease and trapped debris.
12. Remove the test pump and reinstall the fitting dust caps.



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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

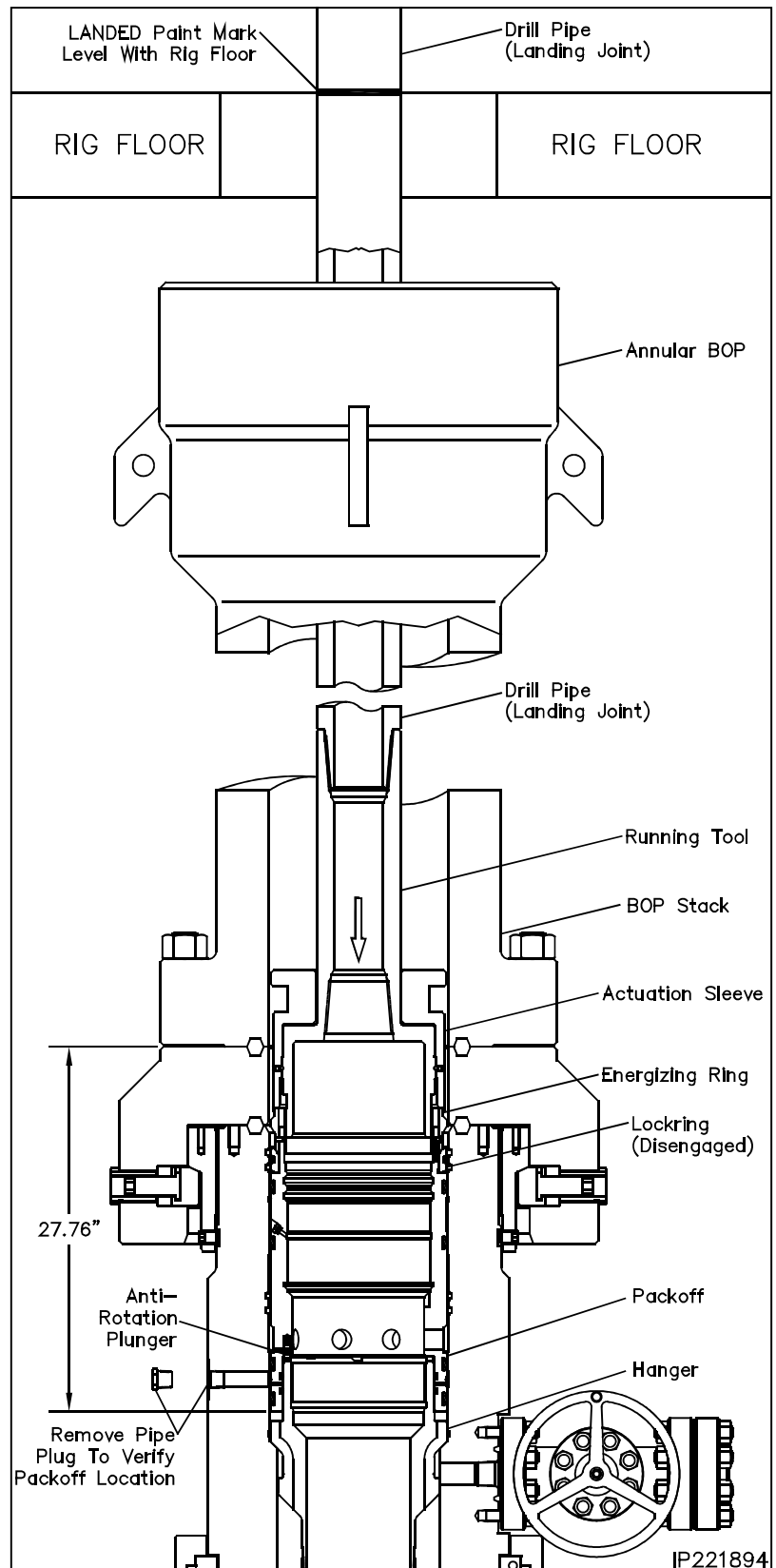
Landing the Packoff

13. Remove the hole cover.
14. Measure up 5 foot from the paint mark on the O.D. of the packoff and place a paint mark on the drill collar.
15. Pick up the packoff/running tool assembly and carefully lower the assembly through the BOP, marking the landing joint every five feet until the calculated dimension is reached.
16. Place a paint mark on the drill pipe at that dimension and mark **LANDED**.
17. Continue lowering the packoff until it passes over the neck of the hanger and lands on the casing hanger flutes, 27.76" below the top of the drilling adapter.
18. Confirm that the **LANDED** paint mark is level with the rig floor.
19. If not it is likely that there is debris on top of the casing hanger.
20. Remove the packoff and further wash the casing hanger and housing I.D. Also reverify the landing dimension.
21. Re land the packoff and verify the **LANDED** paint mark is level with the rig floor.



WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

22. Locate the upper 1" sight port pipe plug and remove the plug.
23. Look through the port to verify the packoff is properly landed. The white paint scribe line will be clearly visible in the center of the open port.
24. When landing is verified, reinstall the pipe plug and tighten securely.



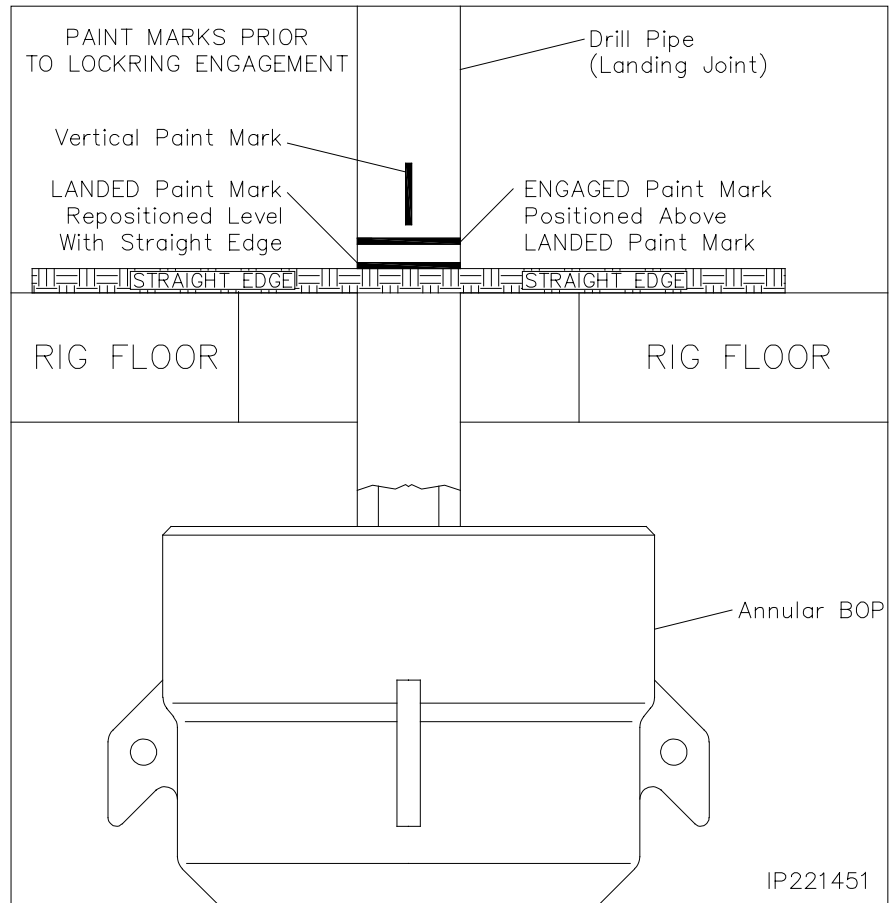
Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

- 25. With the packoff properly landed the **LANDED** paint mark is removed from the landing joint.
- 26. Place a straight edge across the rotary table as indicated.
- 27. Place a paint mark on the landing joint level with the top of the straight edge and label it **LANDED**.
- 28. Measure up 1-1/2" above the landed mark and place another paint mark on the landing joint. Label this mark **ENGAGED**.
- 29. Place a **Vertical** paint mark on the landing joint and a corresponding paint mark on the rig floor to visually count the turns of the landing joint.

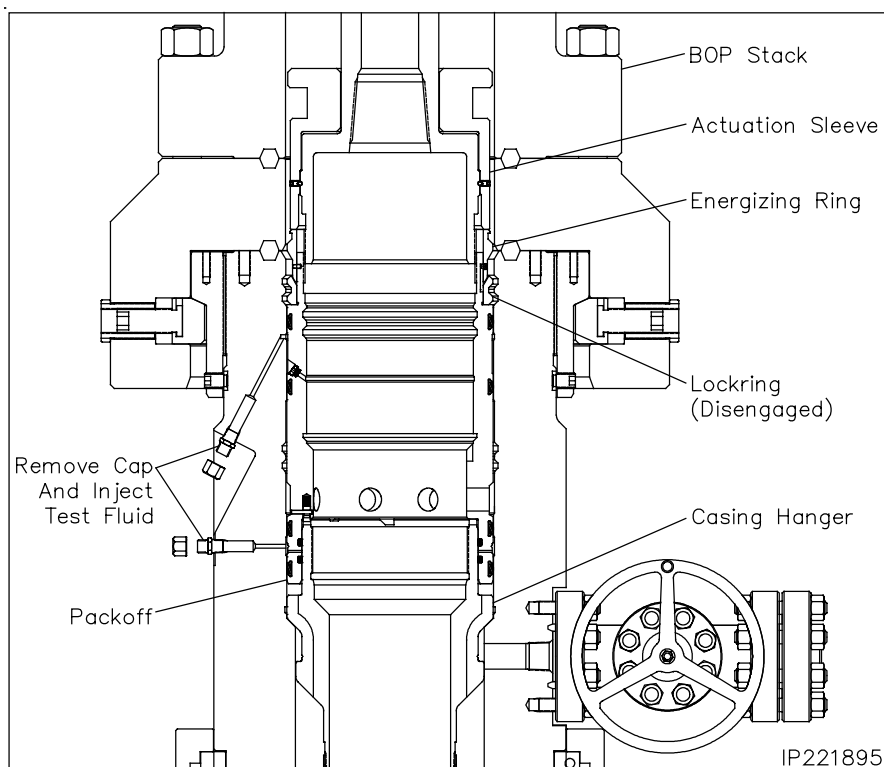


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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

Seal Test

30. Locate the upper and lower "SEAL TEST" fittings on the O.D. of the upper housing and remove the dust caps from the fittings.
31. Attach a test pump to the open lower fitting and pump clean test fluid between the seals until a stable test pressure of **5,000 psi** is achieved.
32. Hold the test pressure for 15 minutes or as required by drilling supervisor.
33. If a leak develops, bleed off test pressure. Remove the packoff from the wellhead and replace the leaking seals.
34. Repeat steps 31 through 33 for the remaining upper fitting and test the upper seals to **10,000 psi**.
35. After satisfactory tests are achieved, bleed off the test pressure but leave the test manifolds in place.



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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

Engaging the Lockring

36. **Using chain tongs only, located 180° apart**, slowly rotate the packoff assembly counter clockwise (left) until the anti-rotation plunger aligns with one of the circulation flutes of the hanger. Expect torque of approximately 400 ft-lbs to rotate the packoff.

37. **Using chain tongs only**, rotate the landing joint approximately **6 turns counterclockwise (1-1/2" of downward travel)** to engage the packoff locking in its mating groove in the bore of the MBU-3T nested packoff.

NOTE: Use the **Vertical** paint mark to count the turns of the landing joint.

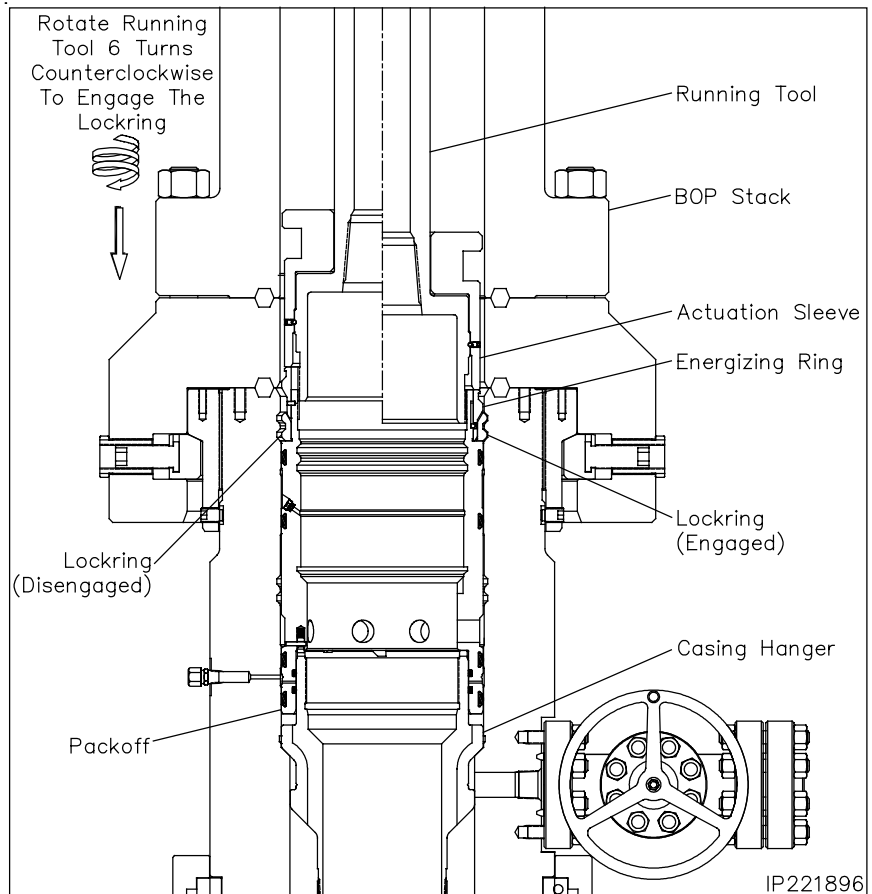
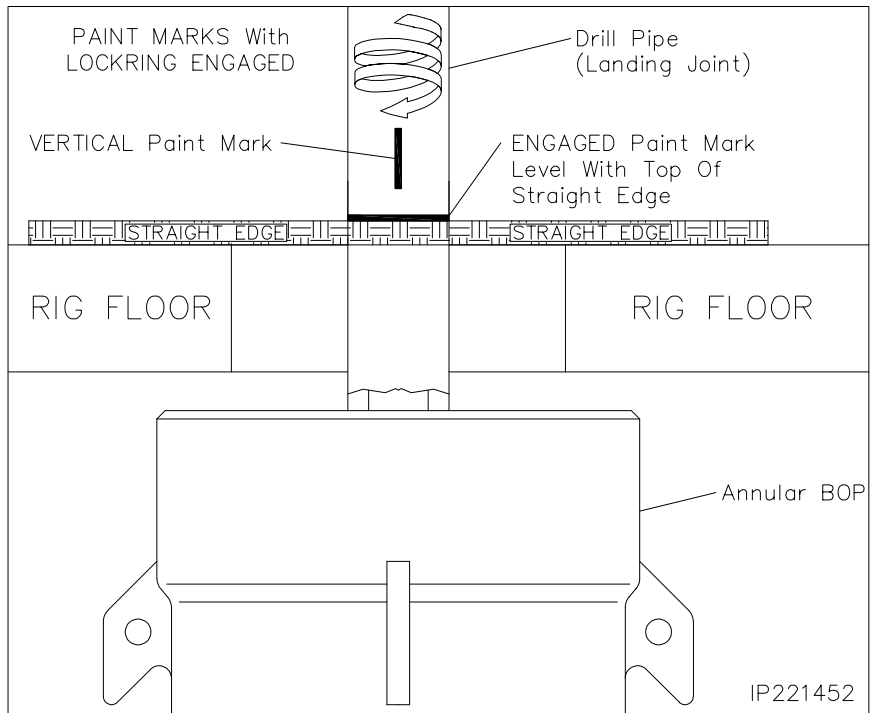
NOTE: Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the locking out. A positive stop will be encountered when the locking is fully engaged.

CAUTION: It is imperative that the drill pipe landing joint remain concentric with the well bore when rotating to engage the locking. This can be accomplished with the use of the air hoist.

38. To confirm all 6 turns of the landing joint are achieved, place the straight edge back across the rotary table adjacent the landing joint.

CAUTION: When the locking is properly engaged the **ENGAGED** paint mark on the landing joint will be level with the top of the straight edge. **VERIFY PAINT MARKS.**

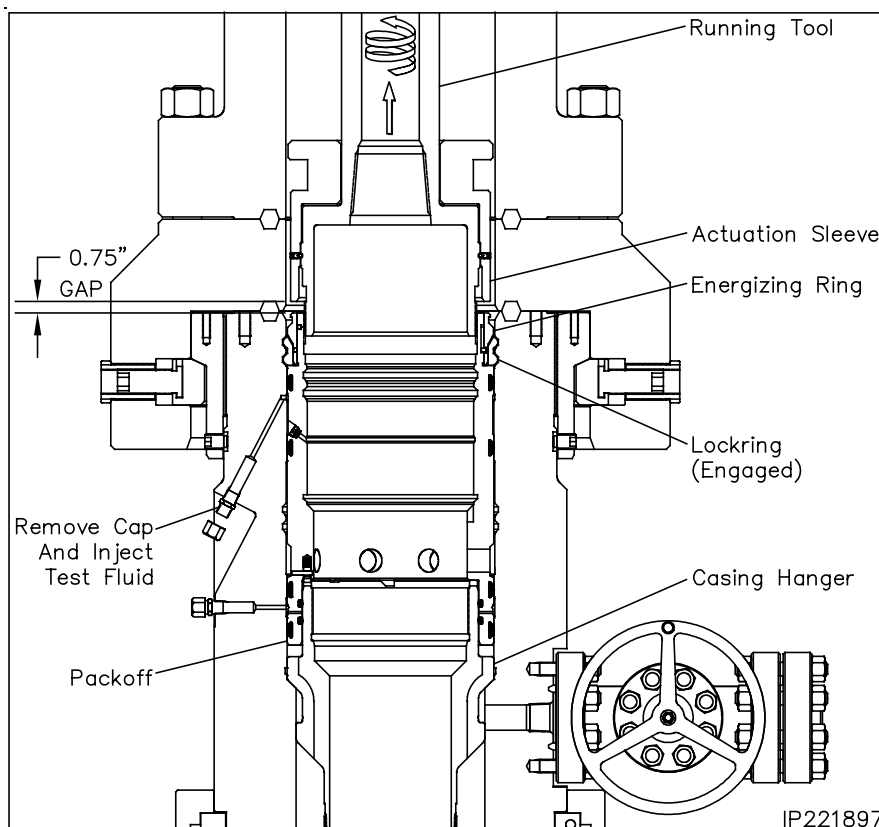
CAUTION: If the required turns to engage the locking are not met or the paint marks do not align properly or excessive torque is encountered, remove the packoff. First call local branch. If further assistance is required then call Houston Engineering.



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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

39. Back off the landing joint/running tool approximately 3 turns. Using the drill pipe elevators, exert a 40,000 lbs pull on the landing joint. Hold pull for 15 minutes minimum. After satisfactory test, slack off weight.
40. Reattach the test pump to the open test manifolds and retest the packoff seals to **10,000 psi** for 15 minutes. This will also verify that the packoff is in place.
41. After satisfactory test is achieved, increase the injection pressure to **11,500 psi** on the **Upper Seal Test Fitting** to burst the rupture disk in the packoff.
42. Remove test pump and attach a grease gun to the open upper fitting.
43. Pump grease through the fitting and port until it flows into the I.D. of the packoff.
44. Remove the grease gun and reinstall the dust cap on the open fittings.
45. **Using chain tongs only**, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 6 turns). Retrieve the tool with a straight vertical lift.



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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

NOTE: In the event the packoff is required to be removed after the lockring is engaged the following stage is to be followed.

Retrieving the Packoff

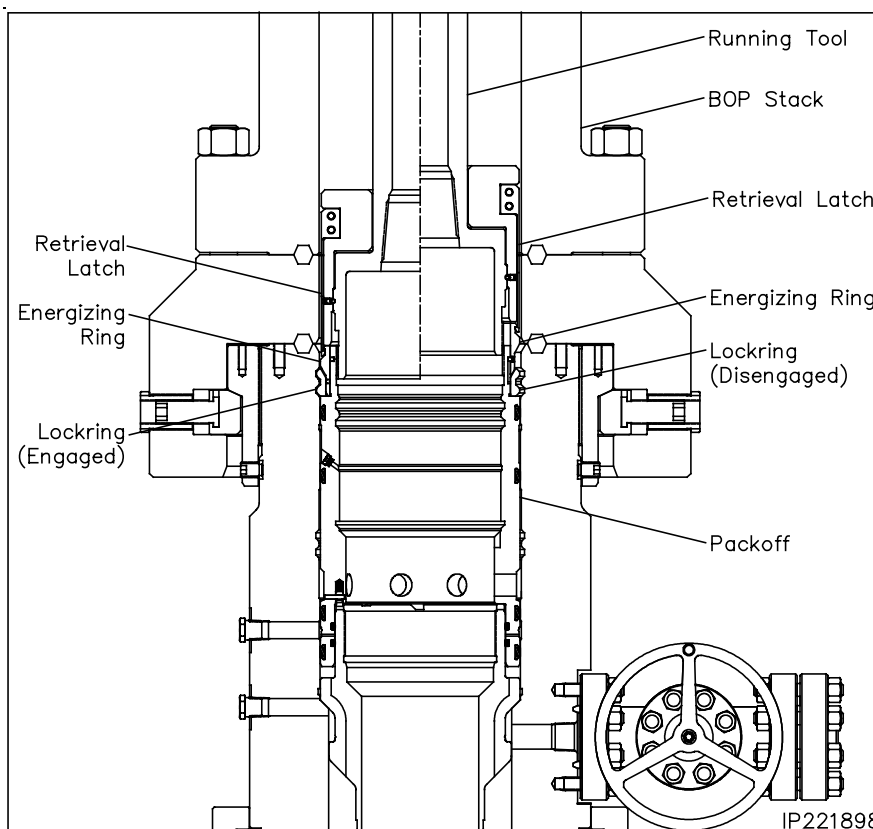
1. Position the retrieval latch so the latch finger extend from the bottom of the running tool body.
2. Reinstall the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool body.
4. Carefully lower the running tool through the BOP stack and into the packoff.
5. Rotate the drill pipe clockwise (Right) to locate the thread start and then counter clockwise (Left) (approximately 9 to 9-1/2 turns) to a positive stop.

NOTE: At this point the retrieval latches will have passed over the energizing ring and snapped into place.

6. Rotate the drill pipe clockwise (right) approximately 6 turns to a positive stop. The drill pipe should rise approximately 1-1/2".

CAUTION: Do Not exceed the 6 turns or the packoff may be seriously damaged.

7. Carefully pick up on the drill pipe and remove the packoff from the wellhead with a straight vertical lift.
8. Rotate the packoff 1 turn clockwise to relax the retrieval latch.
9. Remove the (4) 1/2" cap screws and remove the latch assembly.
10. Redress the packoff and reset as previously outlined.
11. Once the packoff is properly set, reinstall the retrieval latch on the tool.



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Stage 13 — Test the BOP Stack

Immediately after making up the BOP stack and periodically during the drilling of the well for the next casing string the BOP stack (connections and rams) must be tested.

1. Examine the **11" Nominal x 4-1/2" IF (NC-50) CW Test Plug (Item ST15)**. Verify the following:
 - 1-1/4" VR plug and weep hole plug are in place and tightened securely
 - elastomer seals are in place and in good condition
 - drill pipe threads are clean and in good condition

CAUTION: Prior to running or retrieving the test plug during the drilling rig is properly aligned and centered over the wellhead.

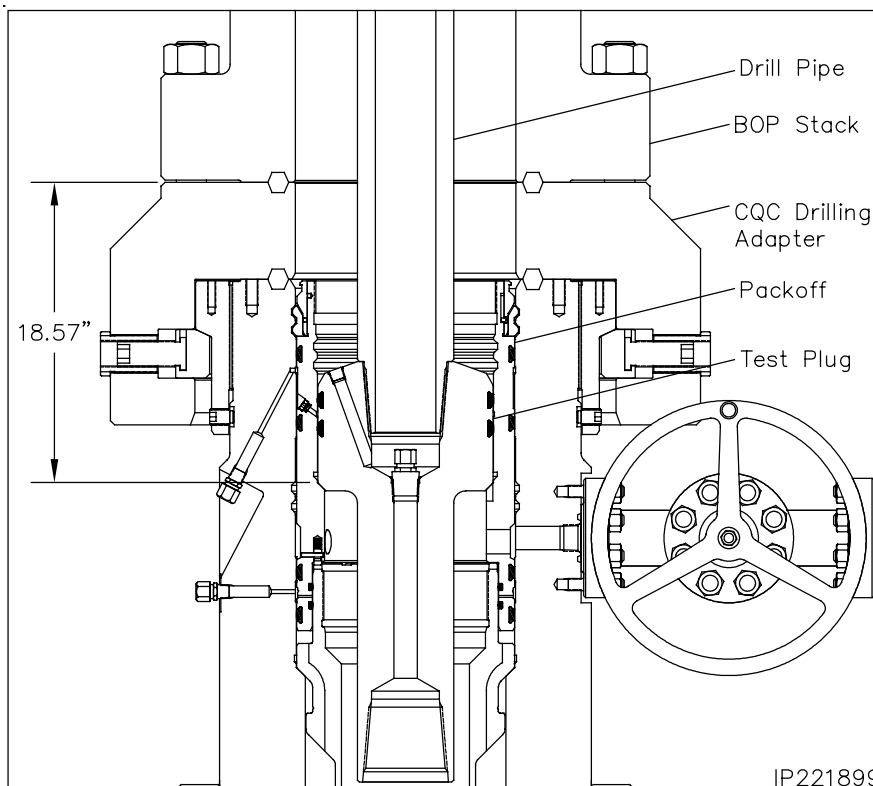
2. Position the test plug with the elastomer seal down and the lift lugs up and make up the tool to a joint of drill pipe.

CAUTION: Ensure the lift lugs are down and the elastomer seal is up.

3. Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

4. Open the housing upper side outlet valve.
5. Lightly lubricate the test plug seal with oil or light grease.
6. Carefully lower the test plug through the BOP and land it on the load shoulder in the packoff, 18.57" below the top of the lower drilling adapter.



7. Close the BOP rams on the pipe and test the BOP to **10,000 psi**.

NOTE: Any leakage past the test plug will be clearly visible at the open side outlet valve.

CAUTION: When performing the BOP blind ram test it is highly recommended to suspend a stand of drill pipe below the test plug to ensure the plug stays in place while disconnecting from it with the drill pipe.

8. After a satisfactory test is achieved, release the pressure and open the rams.
9. Remove as much fluid as possible from the BOP stack. Retrieve the test plug with a straight vertical lift.
10. Close all open valves.
11. Repeat this stage as required during the drilling of the hole section.



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Stage 14 — Run the Upper Wear Bushing

CAUTION: Always use a wear bushing while drilling to protect the load shoulders from damage by the drill bit or rotating drill pipe. The wear bushing **must be retrieved** prior to running the casing.

1. Examine the **13-5/8" x 11" x 9.00" I.D. MBU-3T-UPR Wear Bushing (Item ST16)**. Verify the following:
 - internal bore is clean and in good condition
 - o-ring is in place and in good condition
 - shear o-ring cord is in place and in good condition

Run the Wear Bushing Before Drilling

2. Orient the **13-5/8" Nominal x 4-1/2" IF (NC-50) CW Retrieving Tool (Item ST9)** with drill pipe connection up.
3. Attach the retrieving tool to a joint of drill pipe.

CAUTION: Ensure the lift lugs are down.

4. Align the retractable lift lugs of the tool with the retrieval holes of the bushing and carefully lower the tool into the wear bushing until the lugs snap into place.

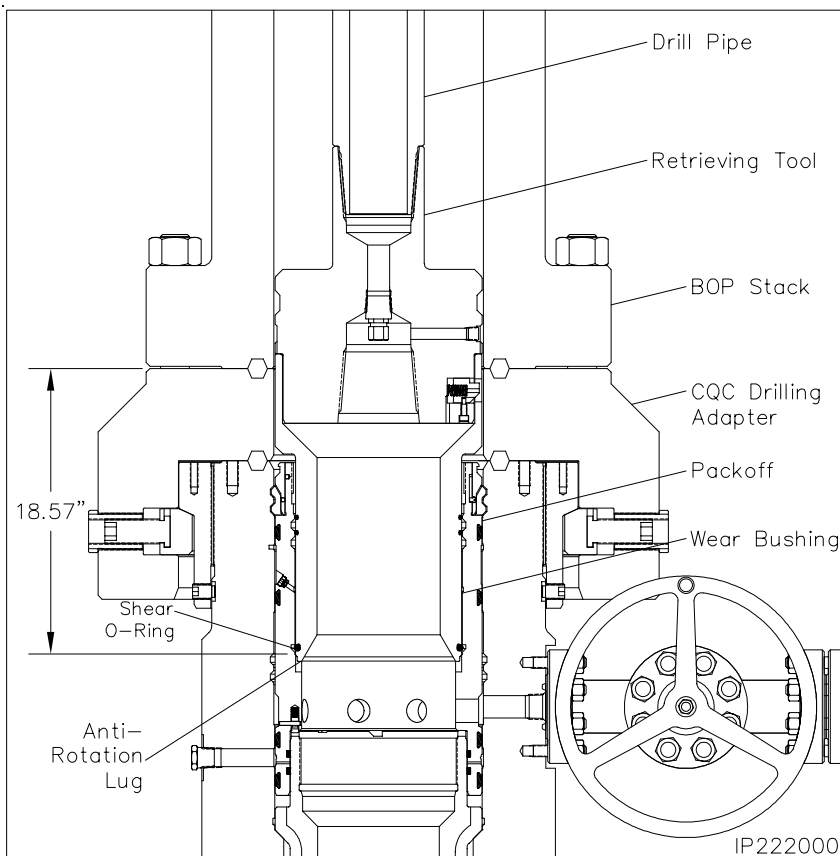
NOTE: If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

5. **Apply a heavy coat of grease, not dope, to the O.D. of the bushing.**

6. Ensure the BOP stack is drained and free of any debris from previous test.

7. Slowly lower the tool/bushing assembly through the BOP stack and land it on the load shoulder in the housing, 18.57" below the top of the lower drilling adapter.

8. Rotate the drill pipe clockwise (right) to locate the stop lugs in their mating notches in the head. When properly aligned the bushing will drop an additional 1/2".



NOTE: The shear o-ring on bottom of the bushing will locate in a groove above the load shoulder in the head to act as a retaining device for the bushing.

9. Remove the tool from the wear bushing by rotating the drill pipe counter clockwise (left) 1/4 turn and lifting straight vertical.
10. Drill as required.

CAUTION: It is highly recommended to retrieve, clean, inspect, grease, and reset the wear bushing each time the hole is tripped during the drilling of the hole section.

Retrieve the Wear Bushing After Drilling

11. Make up the retrieving tool to the drill pipe.
12. Slowly lower the tool into the wear bushing.
13. Rotate the retrieving tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.
14. Retrieve the wear bushing to the rig floor. Remove it and the retrieving tool from the drill string.



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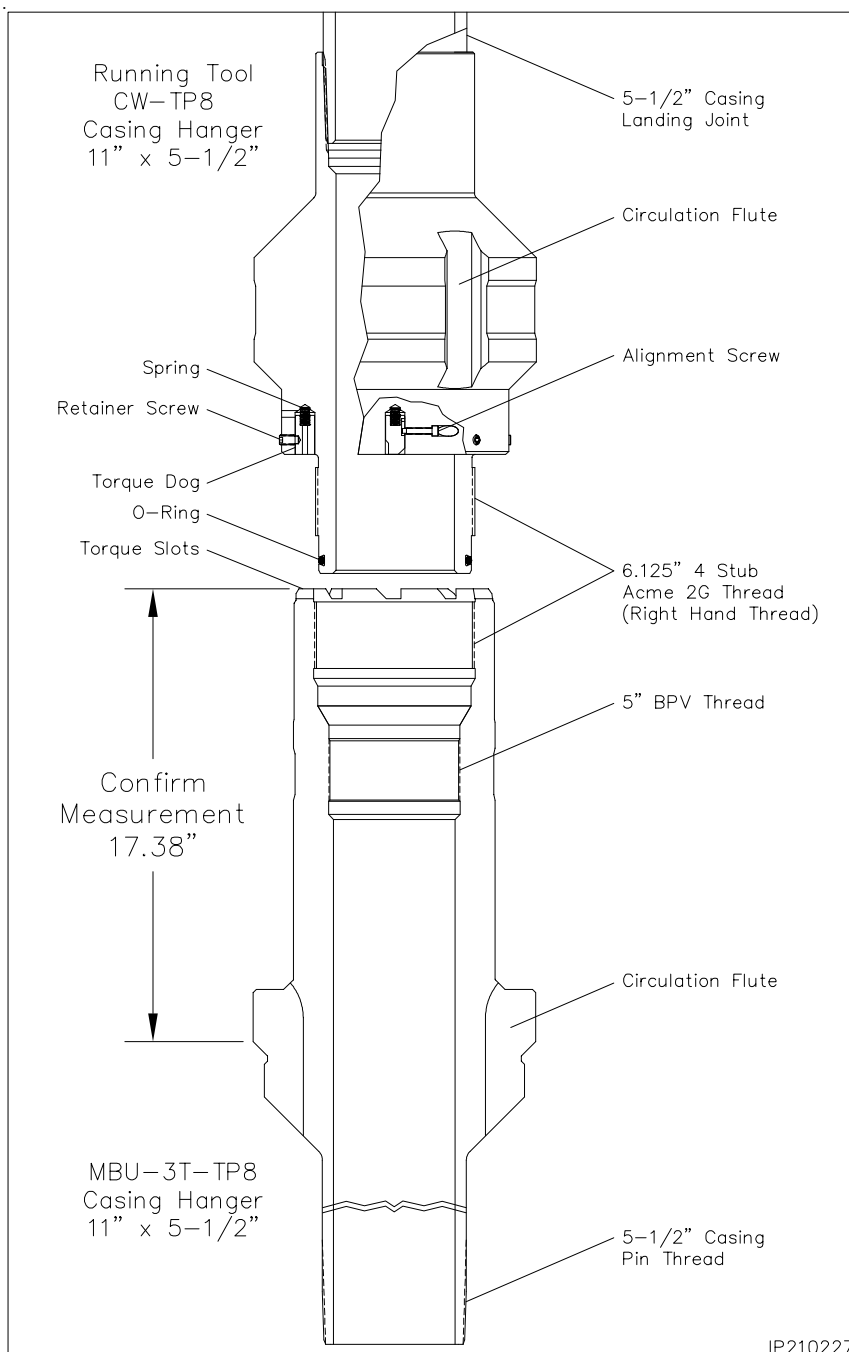
Stage 15 — Hang Off the 5-1/2” Casing

NOTE: If the 5-1/2” casing becomes stuck and the mandrel casing hanger cannot be landed, refer to **Section 2: Stage 15A** for the emergency slip casing hanger procedure.

1. Examine the **11” x 5-1/2” CW-TP8 Casing Hanger Running Tool (Item ST17)**. Verify the following:
 - internal bore and threads are clean and in good condition
 - o-ring seal is clean and in good condition
 - torque dogs are in place, in upper most position and retainer hex head screws are tightened securely
2. Make up a landing joint to the top of the running tool and torque connection to thread manufacturer’s maximum make up torque.
3. Lay down the landing joint on the pipe rack.
4. On the pipe rack, examine the **11” x 5-1/2” CW, MBU-3T-TP8 Mandrel Casing Hanger (Item B21)**. Verify the following:
 - internal bore and threads are clean and in good condition
 - neck seal area is clean and undamaged
 - torque slots are clean and in good condition
 - pin threads are clean and in good condition. **Install thread protector**
5. Liberally lubricate the mating threads, seal areas and o-ring of the hanger and running tool with a oil or light grease.
6. **Using chain tongs only**, thread the running tool into the hanger, with right hand rotation, until it shoulders out on the hanger body.

CAUTION: Do Not apply torque to the hanger/tool connection.

NOTE: If steps 1 through 6 were done prior to being shipped to location, the running tool should be backed off 1 turn and made back up to ensure it will back off freely.

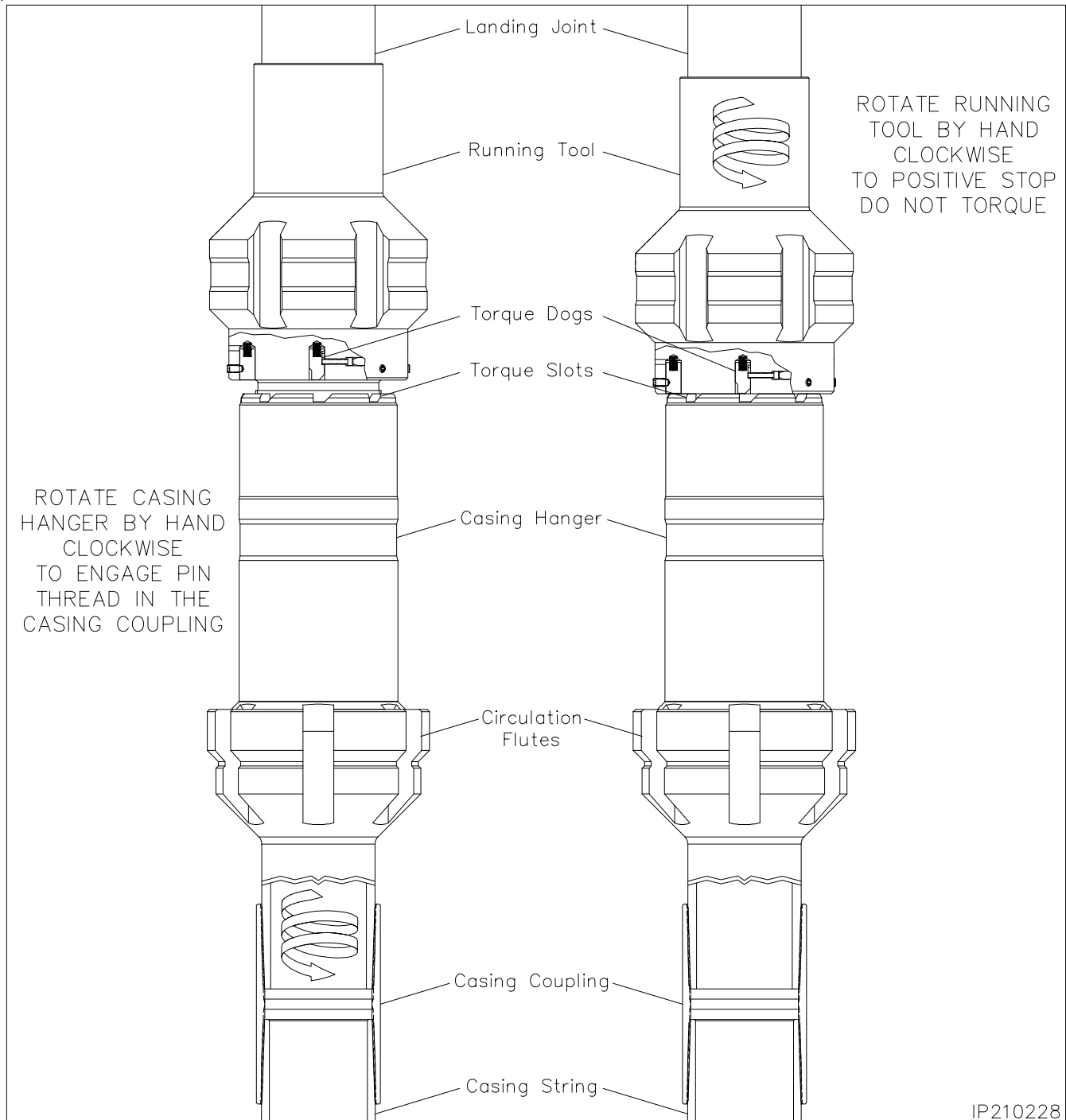


7. Calculate the total landing dimension by adding the previously determined RKB dimension and 18.57”, the depth of the wellhead.



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Stage 15 — Hang Off the 5-1/2" Casing



8. Starting at the top of the 45° angle load shoulder of the casing hanger measure up the landing joint and place a paint mark on the joint. Mark **HANGER LANDED**.
9. Place a second mark 20.00" below the first and mark **STOP ROTATING**.
10. Run the 5-1/2" casing as required and space out appropriately for the mandrel casing hanger.
11. Pick up the casing hanger/running tool joint assembly.
12. Remove the casing hanger thread protector and carefully thread the hanger into the last joint of casing ran. Rotate the hanger clockwise, by hand, to a positive stop.
13. Rotate the running tool clockwise by hand to a positive stop.



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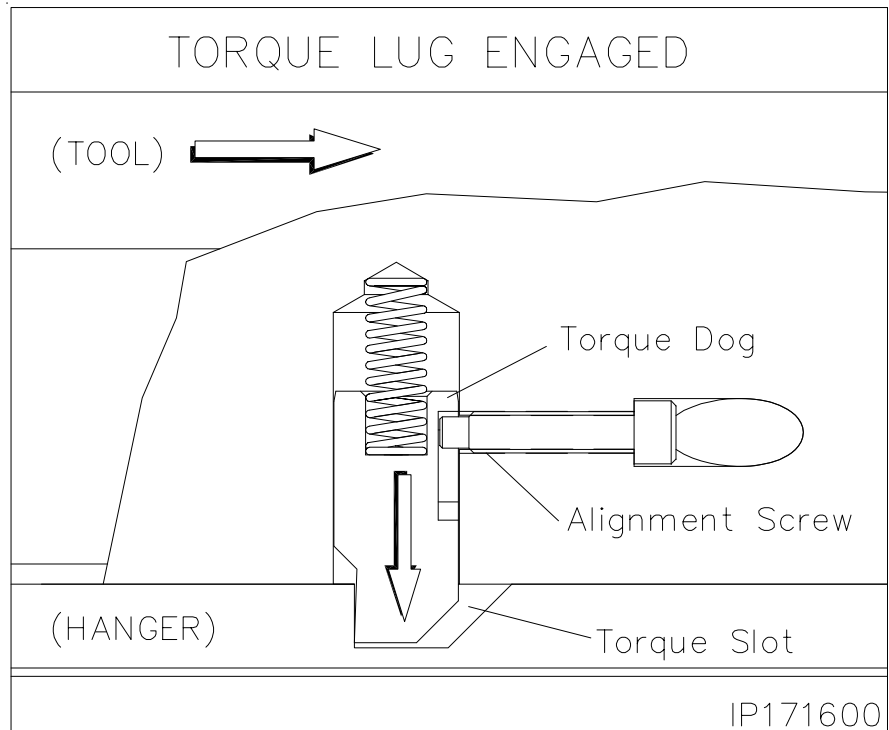
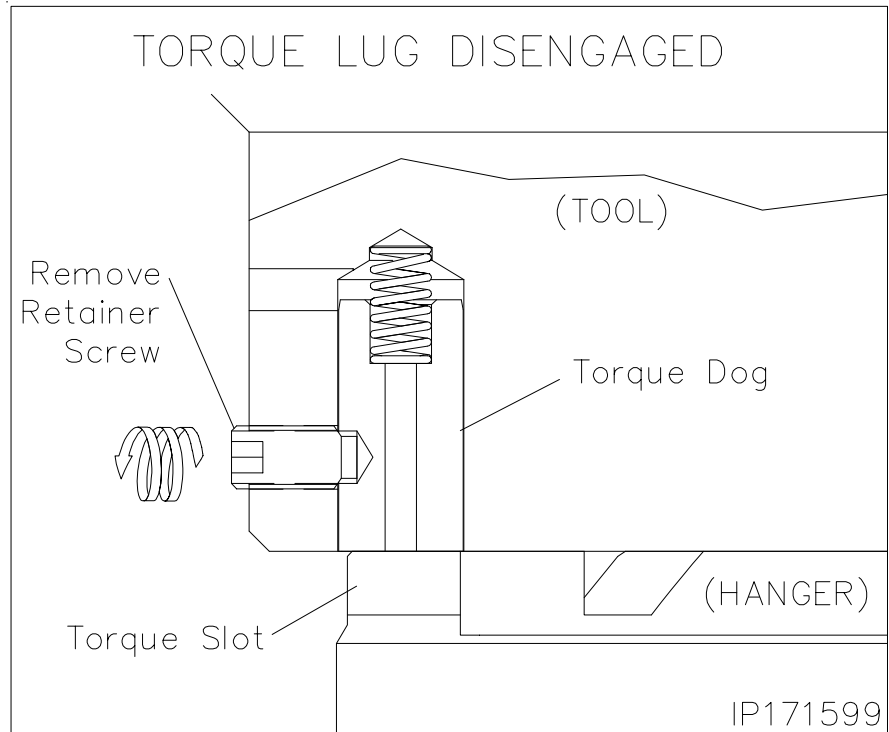
Stage 15 — Hang Off the 5-1/2” Casing

14. Locate the socket head set screws in the side of the hanger running tool and remove the screws. This will release the running tool torque dogs allowing them to move downward.

NOTE: Place the screws in a safe place to reinstall in the tool when the job is completed.

15. **Using chain tongs only**, rotate the running tool to the left to allow the torque dogs to engage the torque slots in the top of the hanger.

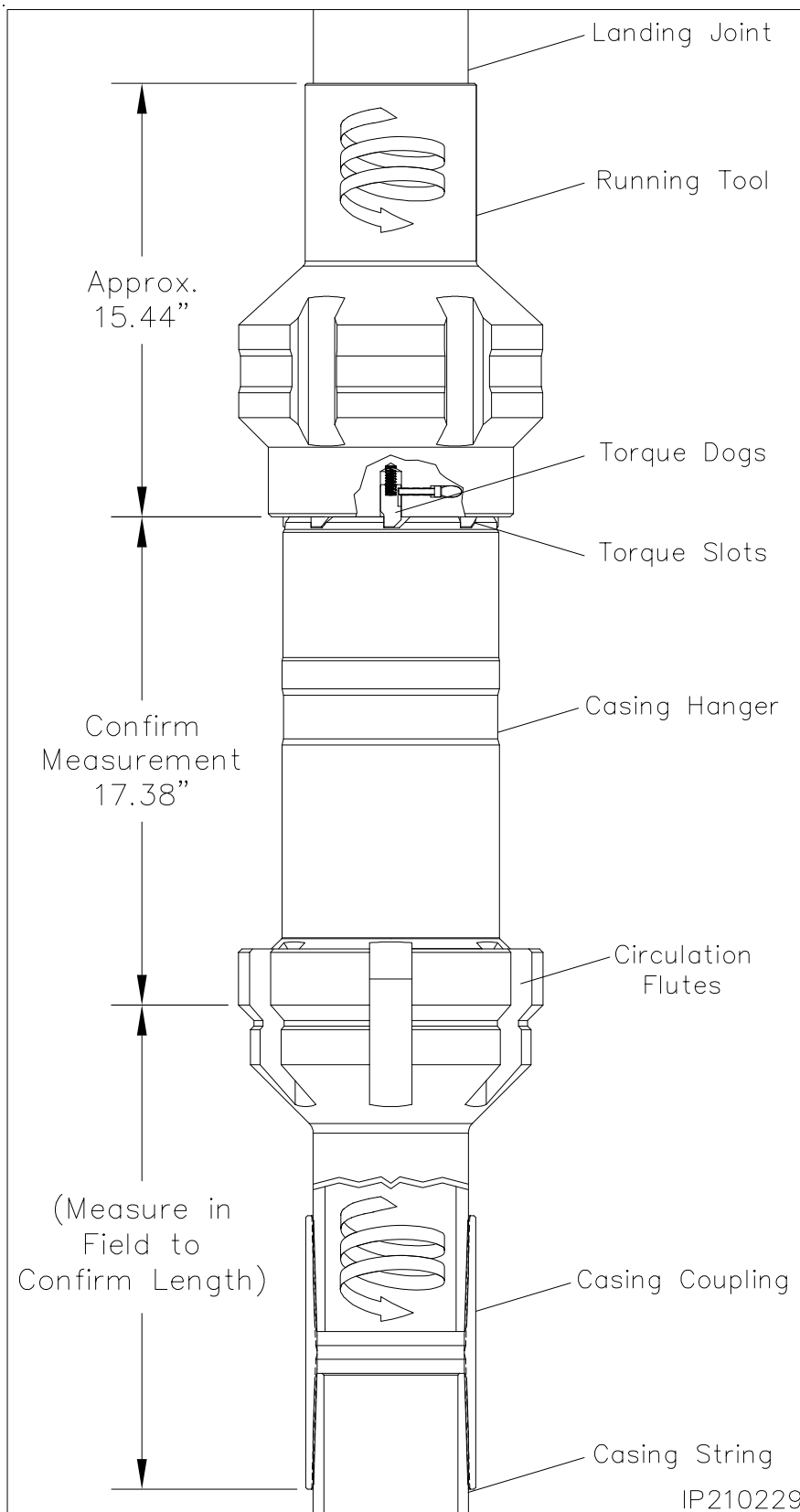
CAUTION: Do Not rotate the running tool more than 1/4 turn to the left. Doing so will decrease the torque dog engagement.



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Stage 15 — Hang Off the 5-1/2” Casing

- 16. Engage the CRT tool on the landing joint and torque the casing hanger in the casing string to thread manufacturer's maximum make up torque.

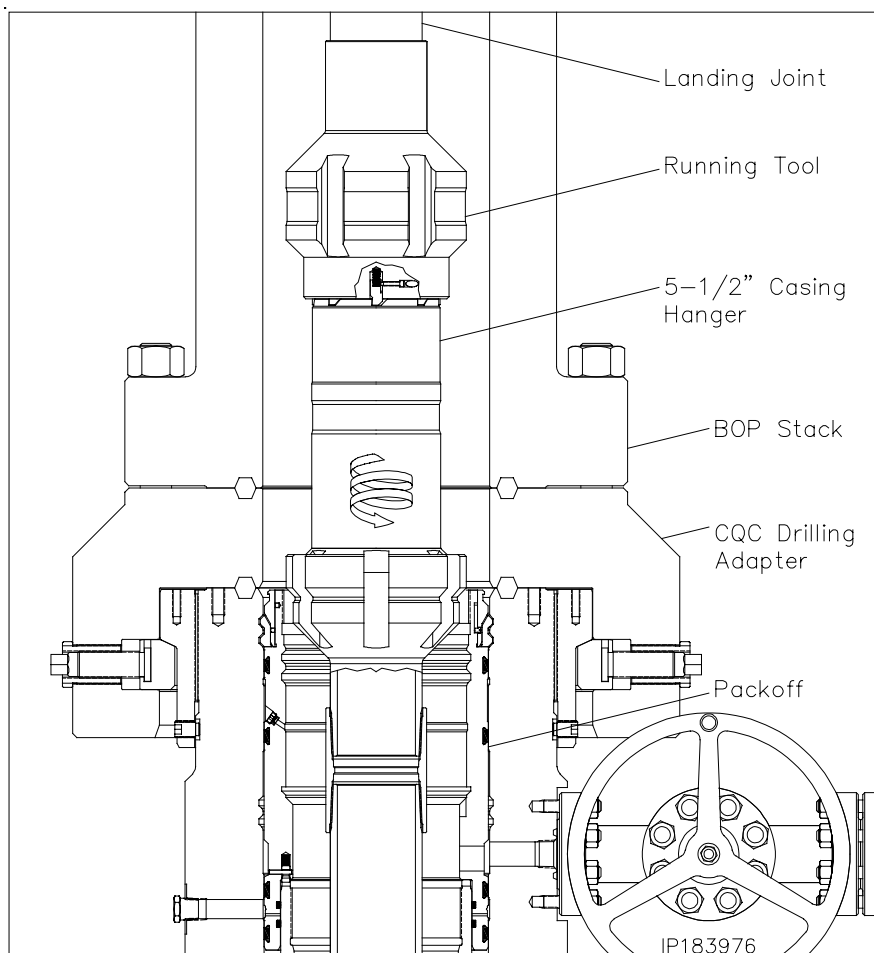


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Stage 15 — Hang Off the 5-1/2" Casing

17. Pick up the casing string and remove the floor slips and rotary bushings.
18. Carefully lower the hanger completely through the BOP annular and then engage the top drive to allow the casing to be rotated clockwise.
19. While rotating the casing clockwise, carefully lower the casing string until the **STOP ROTATING** mark on the landing joint is level with the rig floor.

i **NOTE:** The torque dogs have a maximum rated capacity. Please reference the **Recommended Service Tools** section in the BOM for maximum torque allowed.



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
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Stage 15 — Hang Off the 5-1/2" Casing

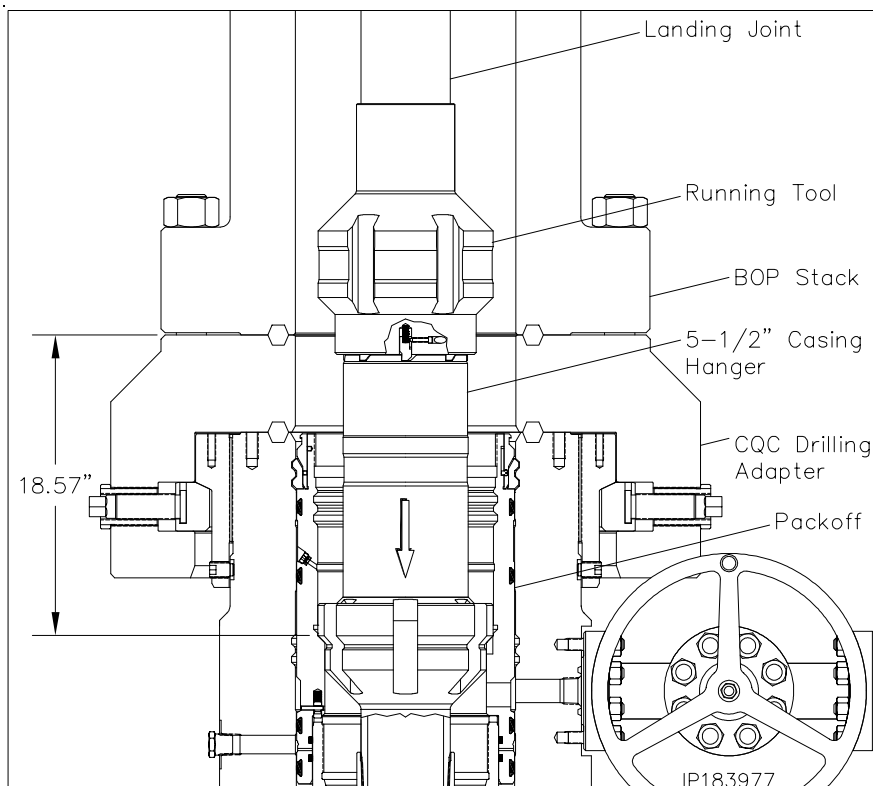
CAUTION: Torque wrap can build in the casing string as it is rotated. Ensure the string comes to a neutral position, by allowing it to back off slowly counter clockwise, before the casing hanger is fully landed.

20. Cease rotation and continue carefully lowering the hanger through the wellhead and land it on the load shoulder in the MBU-3T nested packoff, 18.57" below the top of the drilling adapter.
21. Slack off all weight on the casing and verify that the **HANGER LANDED** paint mark has aligned with the rig floor.
22. Place a vertical paint mark on the landing joint to verify if the casing string rotates during the cementing process.
23. Cement the casing as required.

NOTE: Returns may be taken through the circulation slots and out the BOP or out the side outlets on the housing.

24. With cement in place, bleed off all pressure and remove the cementing head.
25. Using chain tongs only, located 180° apart, retrieve the running tool and landing joint by rotating the landing joint counter clockwise (left) approximately 11 turns or until the tool comes free of the hanger.

CAUTION: The rig floor tong may be used to break the connection but **under no circumstances is the top drive to be used to rotate or remove the casing hanger running tool.**

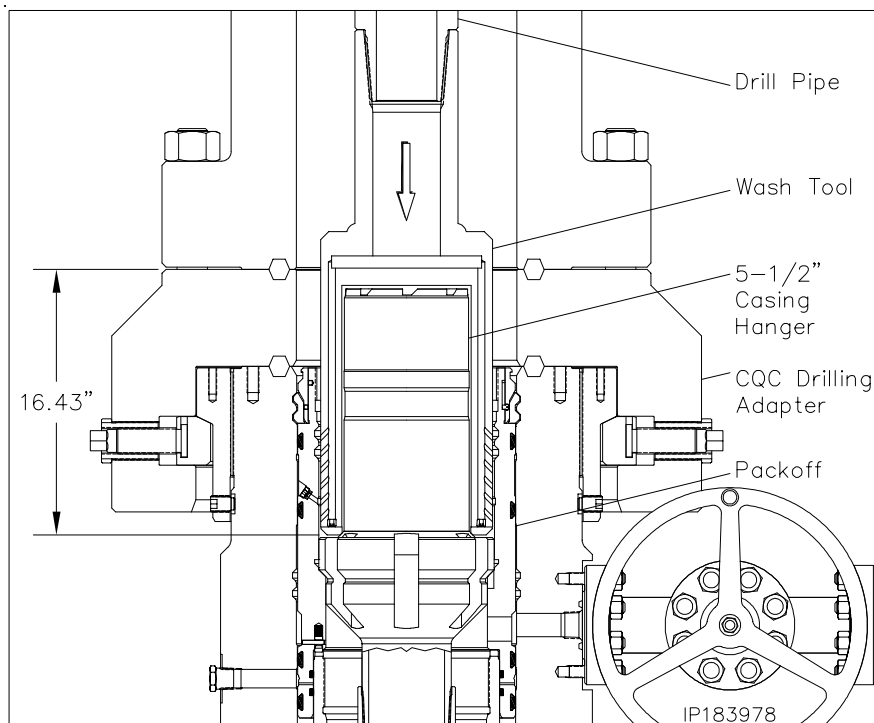


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Stage 15 — Hang Off the 5-1/2" Casing

Running the 11" Wash Tool

1. Examine the **11" x 4-1/2" IF (NC-50) Wash Tool (Item ST19)**. Verify the following:
 - drill pipe threads and bore are clean and in good condition
 - all ports are open and free of debris
2. Orient the wash tool with drill pipe box up. Make up a joint of drill pipe to the tool.
3. Carefully lower the wash tool through the BOP and land it on top of the 5-1/2" casing hanger, 16.43" below the top of the drilling adapter.
4. Place a paint mark on the drill pipe level with the rig floor.
5. Using chain tongs, rotate the tool clockwise (right) approximately 6 turns to loosen any debris that may be on top of the hanger flutes.



WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the upper side outlet valve and drain the BOP stack.
7. Attach a high pressure water line or the top drive to the end of the drill pipe. Pump water (up to a max of 200 psi) through the tool and up the BOP stack.
8. Pick up on the tool approximately 1" and slowly rotate the drill pipe approximately 20 RPM.
9. While flushing, raise and lower the tool the full length of the wellhead and BOP stack. Thoroughly wash the inside of the housing and BOP stack to remove all caked on debris.
10. Once washing is complete, land the wash tool on the hanger flutes.
11. Shut down pumps and observe the returns at the open lower outlet for debris.
12. Reengage the pump and fully wash the inside of the wellhead and the entire BOP one additional cycle, ensuring the stopping point is with the wash tool resting on top of the hanger flutes.
13. Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.
14. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
15. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure there are no dark areas on top of the painted flutes of the hanger.



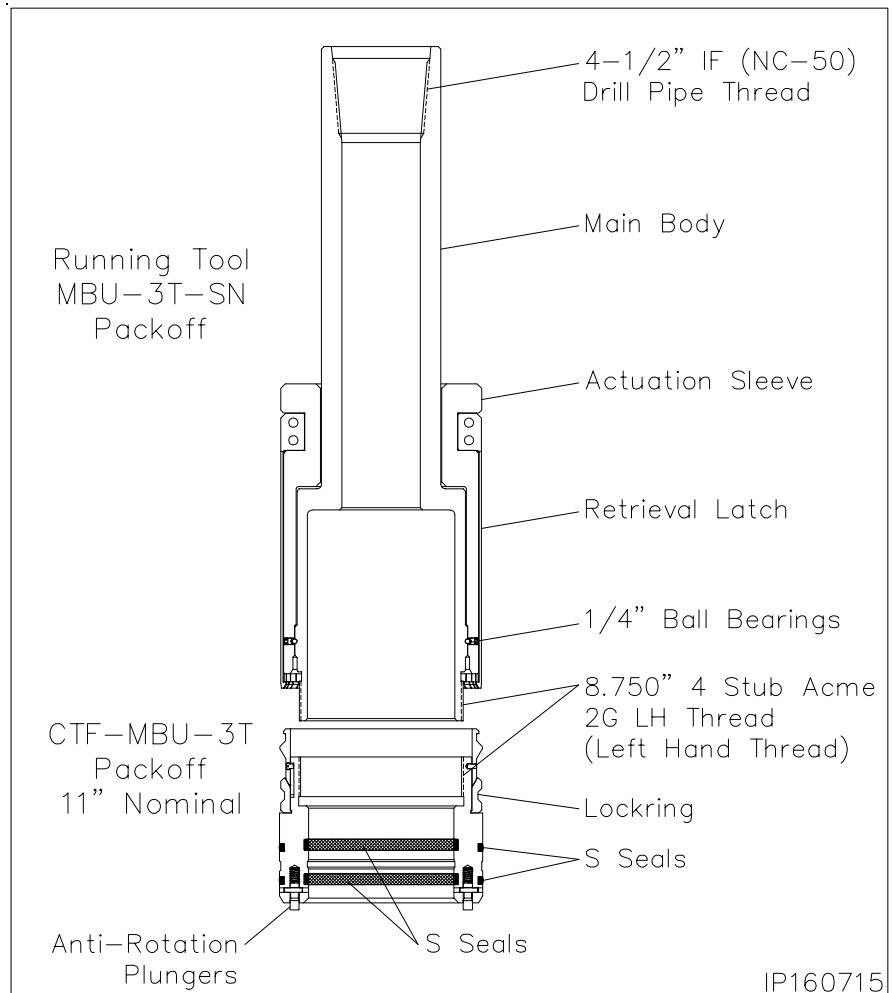
CAUTION: Continue washing until all debris is removed.



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Stage 16 — Install the CTF-MBU-3T Packoff

- Examine the **11" Nominal x 4-1/2" IF (NC-50) x 8.750" 4 Stub Acme 2G LH Pin Bottom MBU-3T-SN Mandrel Packoff Running Tool (Item ST20)**. Verify the following:
 - Acme threads are clean and in good condition
 - actuation sleeve is in place and rotates freely
 - retrieval latch is removed and stored in a safe place
- Make up the running tool to 4-1/2" (NC50) drill pipe and torque the connection to optimum make up torque.
- Examine the **11" Nominal x 7-5/8" x 8.750" 4 Stub Acme 2G LH Box Top MBU-3T Packoff Assembly (Item B22)**. Verify the following:
 - all elastomer seals are in place and undamaged
 - internal bore, and ports, are clean and in good condition
 - locking is fully retracted
 - energizing ring is in its upper most position and retained with shear pins
 - guide screws are in place and back off 1/4 turn. Ensure they do not protrude beyond the O.D. of the energizing ring
 - anti-rotation plungers are in place, free to move



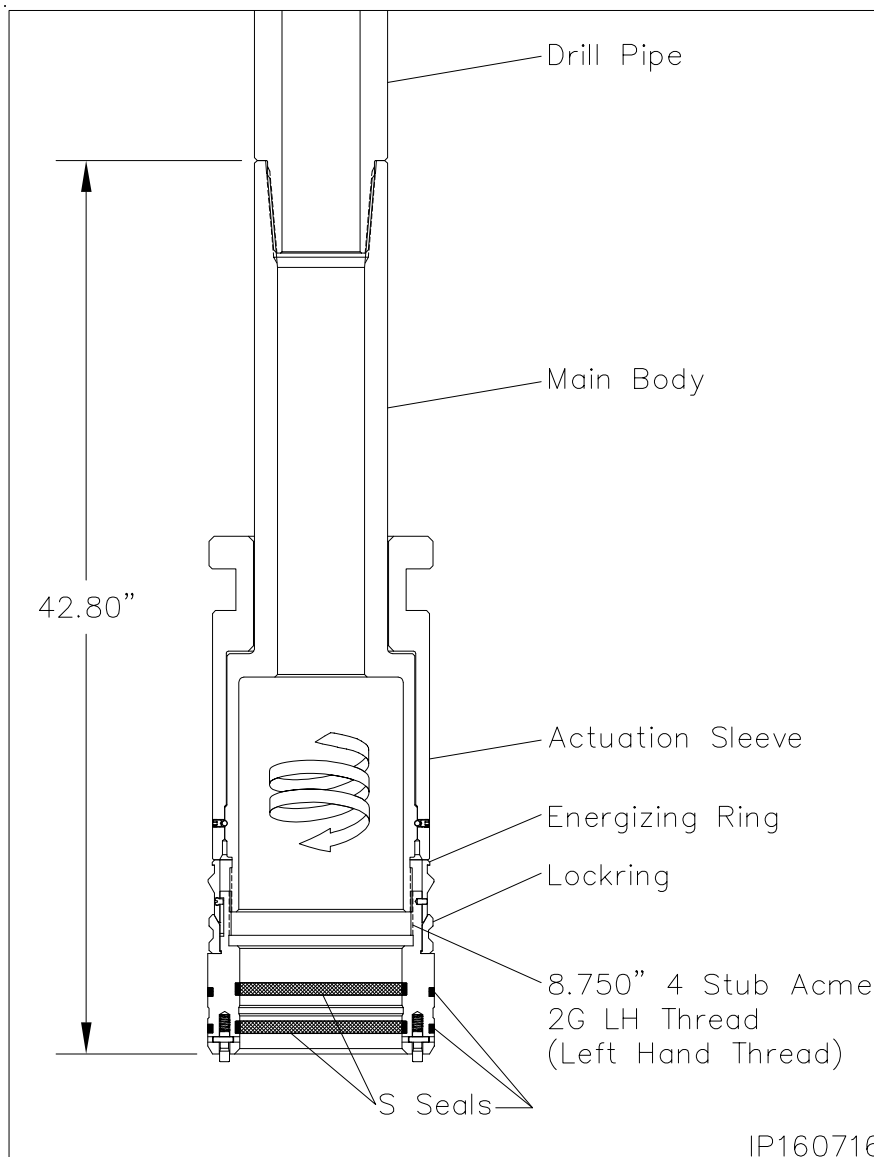
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Stage 16 — Install the CTF-MBU-3T Packoff

4. Thoroughly clean and lightly lubricate the mating Acme threads of the running tool and packoff with oil or light grease.
5. Pick up the running tool assembly with landing joint and suspend it above the packoff.
6. Carefully lower the tool into the packoff and thread them together by first rotating the tool clockwise (RIGHT) to locate the thread start and then counter clockwise (LEFT) approximately 4 turns until the tool actuation sleeve makes contact with the packoff energizing ring.

CAUTION: Do Not back off the running tool.

7. Pick up the assembly and thoroughly clean and lightly lubricate the packoff I.D. and O.D. 'S' seals with oil or light grease.
8. Locate the upper "SEAL TEST" fitting on the O.D. of the housing and remove the dust cap from the fitting.
9. Attach a test pump with test manifold to the open fitting and pump clean test fluid through the fitting and port to dislodge any old grease and trapped debris.
10. Remove the test pump with test manifold and reinstall the fitting dust caps.



IP160716



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

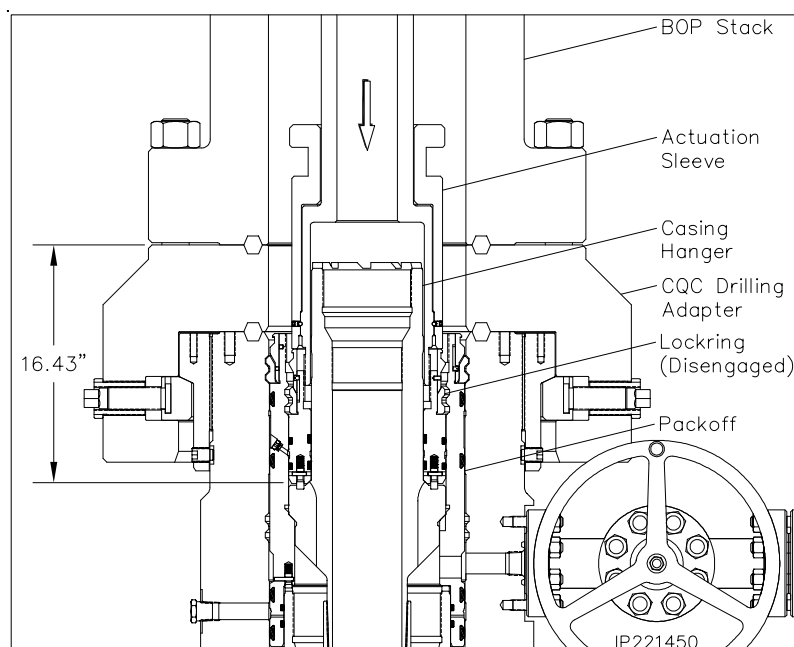
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Stage 16 — Install the CTF-MBU-3T Packoff

Landing the Packoff

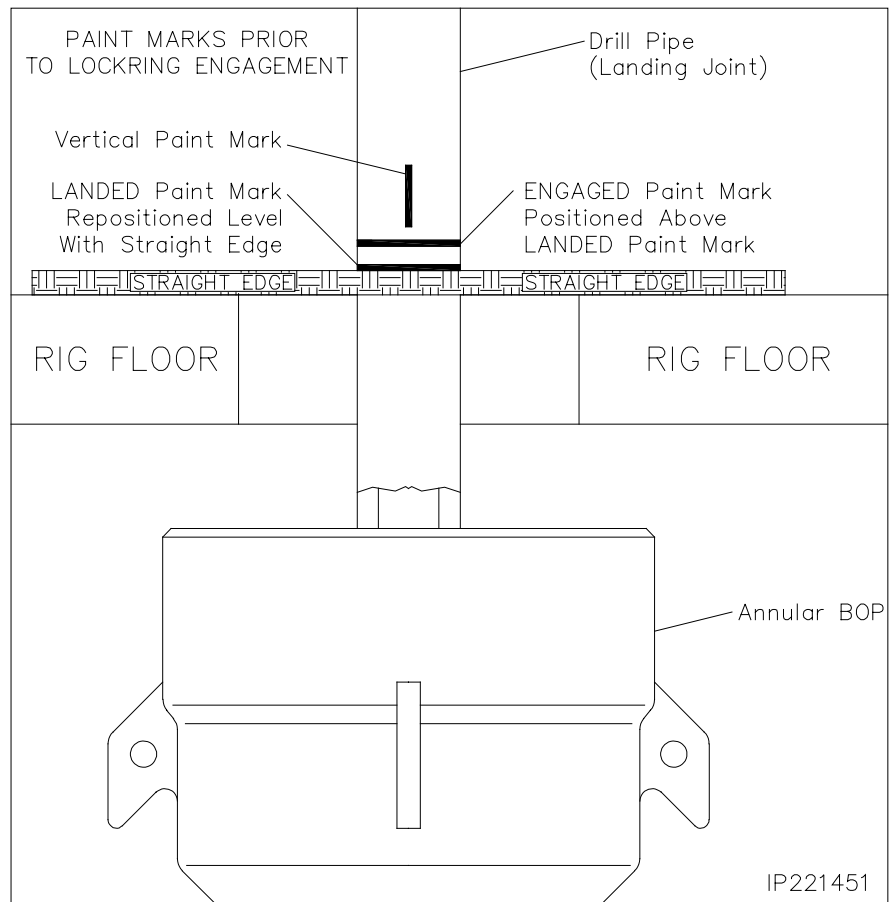
11. Calculate the total landing dimension by adding the previously attained RKB dimension and 16.43", the depth of the wellhead.
12. Remove the hole cover.
13. Measure up 5 feet from the bottom of the packoff and place a paint mark on the drill pipe landing joint.
14. Pick up the packoff/running tool assembly and carefully lower the assembly through the BOP marking the landing joint every five feet until you reach the calculated dimension.
15. Place a paint mark on the drill pipe at that dimension and mark **LANDED**.
16. Continue lowering the packoff until it passes over the neck of the hanger and lands on top of the casing hanger load shoulder, 16.43" below the top of the drilling adapter.
17. Confirm that the **LANDED** paint mark is level with the rig floor.
18. If not it is likely that there is debris on top of the casing hanger.
19. Remove the packoff and further wash the casing hanger and housing I.D. Also reverify the landing dimension.
20. Re land the packoff and verify the **LANDED** paint mark is level with the rig floor.



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Stage 16 — Install the CTF-MBU-3T Packoff

- 21. With the packoff properly landed the **LANDED** paint mark is removed from the landing joint.
- 22. Place a straight edge across the rotary table as indicated.
- 23. Place a paint mark on the landing joint level with the top of the straight edge and label it **LANDED**.
- 24. Measure up 1-1/2" above the landed mark and place another paint mark on the landing joint. Label this mark **ENGAGED**.
- 25. Place a **Vertical** paint mark on the landing joint and a corresponding paint mark on the rig floor to visually count the turns of the landing joint.



Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System

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Stage 16 — Install the CTF-MBU-3T Packoff

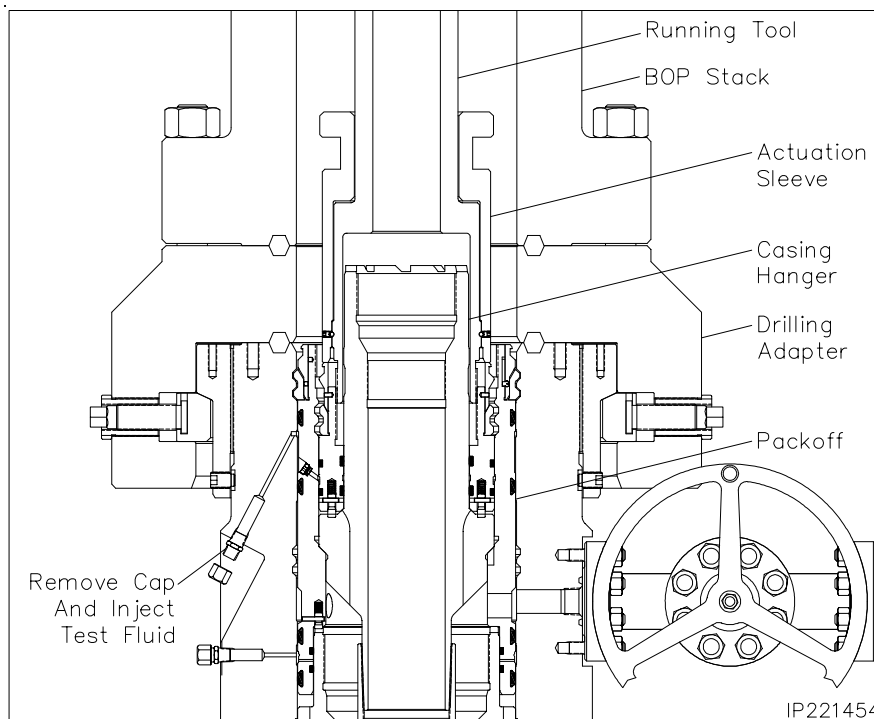
Seal Test

26. Locate the upper "SEAL TEST" fitting on the upper O.D. of the housing and remove the dust cap from the fitting.
27. Attach a test pump with test manifold to the open fitting and pump clean test fluid between the packoff seals until a stable test pressure of **10,000 psi** is achieved.

NOTE: It may be required to pressure up and bleed off test pressure several times to evacuate all air from the test area in order to attain a stable test pressure.

28. Hold test pressure for 15 minutes or as required by drilling supervisor.
29. If pressure drops a leak has developed, remove the packoff and replace leaking seals.
30. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold.
31. Attach a bleeder tool to the open fitting and open the tool to bleed off any trapped pressure between the packoff seals.

NOTE: The bleeder tool will remain in place and in the open position during the over pull.



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Stage 16 — Install the CTF-MBU-3T Packoff

Engaging the Lockring

32. **Using chain tongs only, located 180° apart**, slowly rotate the packoff assembly counter clockwise (left) until the anti-rotation plunger aligns with one of the circulation flutes of the hanger. Expect torque of approximately 400 ft-lbs to rotate the packoff.

33. **Using chain tongs only**, rotate the landing joint approximately **6 turns counterclockwise (1-1/2" of downward travel)** to engage the packoff locking in its mating groove in the bore of the MBU-3T nested packoff.

NOTE: Use the **Vertical** paint mark to count the turns of the landing joint.

NOTE: Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the locking out. A positive stop will be encountered when the locking is fully engaged.

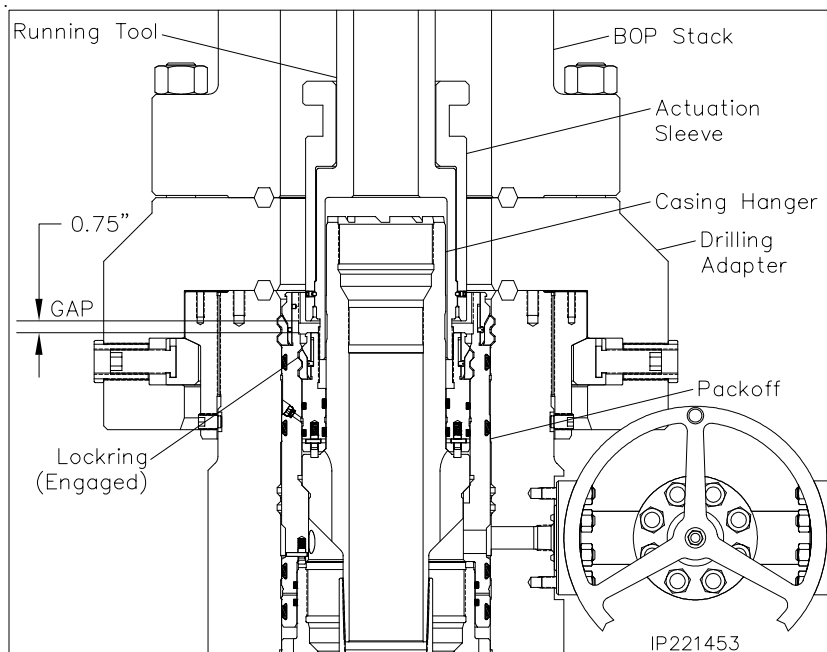
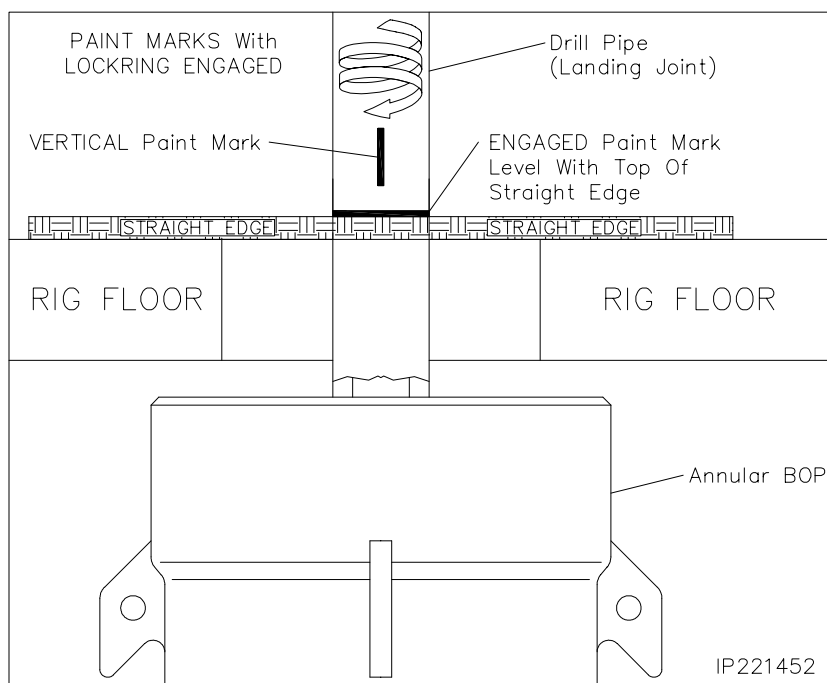
CAUTION: It is imperative that the drill pipe landing joint remain concentric with the well bore when rotating to engage the locking. This can be accomplished with the use of the air hoist.

34. To confirm all 6 turns of the landing joint are achieved, place the straight edge back across the rotary table adjacent the landing joint.

CAUTION: When the locking is properly engaged the **ENGAGED** paint mark on the landing joint will be level with the top of the straight edge. **VERIFY PAINT MARKS.**

CAUTION: If the required turns to engage the locking are not met or the paint marks do not align properly or excessive torque is encountered, remove the packoff. First call local branch. If further assistance is required then call Houston Engineering.

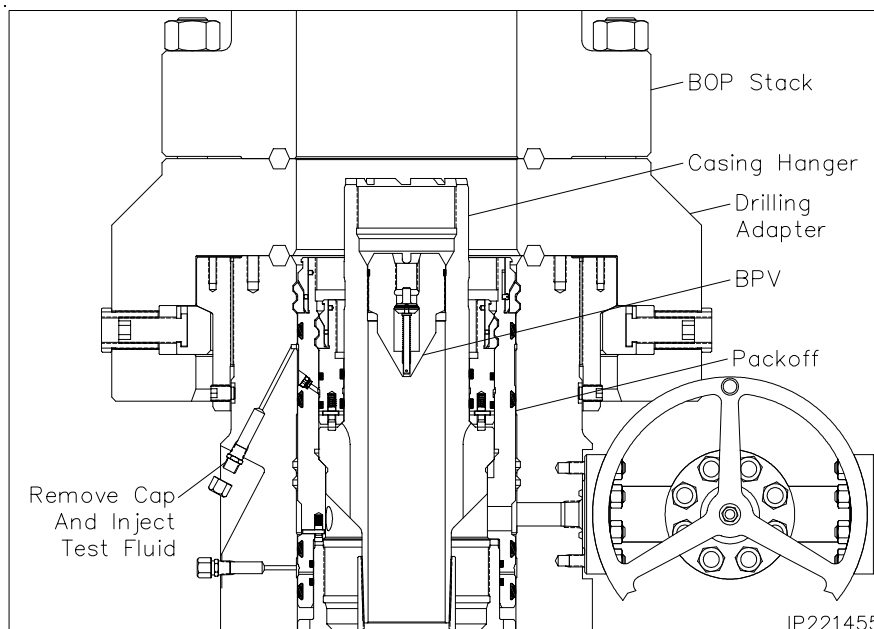
35. Back off the landing joint/running tool approximately 3 turns. Using the drill pipe elevators, exert a 40,000 lbs pull on the landing joint. Hold pull for 15 minutes minimum. After satisfactory test, slack off weight.



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Stage 16 — Install the CTF-MBU-3T Packoff

36. Remove the bleeder tool.
37. Reattach the test pump to the open test manifold and retest the packoff seals to **10,000 psi** for 15 minutes. This will also verify that the packoff is in place.
38. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold. Reinstall the dust cap on the open fitting.
39. **Using chain tongs only**, rotate the landing joint clockwise (right) until the tool comes free of the packoff (approximately 7 turns) and then retrieve the tool with a straight vertical lift.
40. Using a dry rod, set the **5" Type H One-Way BPV (Item ST22)** in the bore of the hanger. Ensure that the BPV makes a minimum of 6 turns before final make up and break out. Nipple down and remove the BOP stack.



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Stage 16 — Install the CTF-MBU-3T Packoff

NOTE: In the event the packoff is required to be removed after the locking is engaged the following stage is to be followed.

Retrieving the Packoff

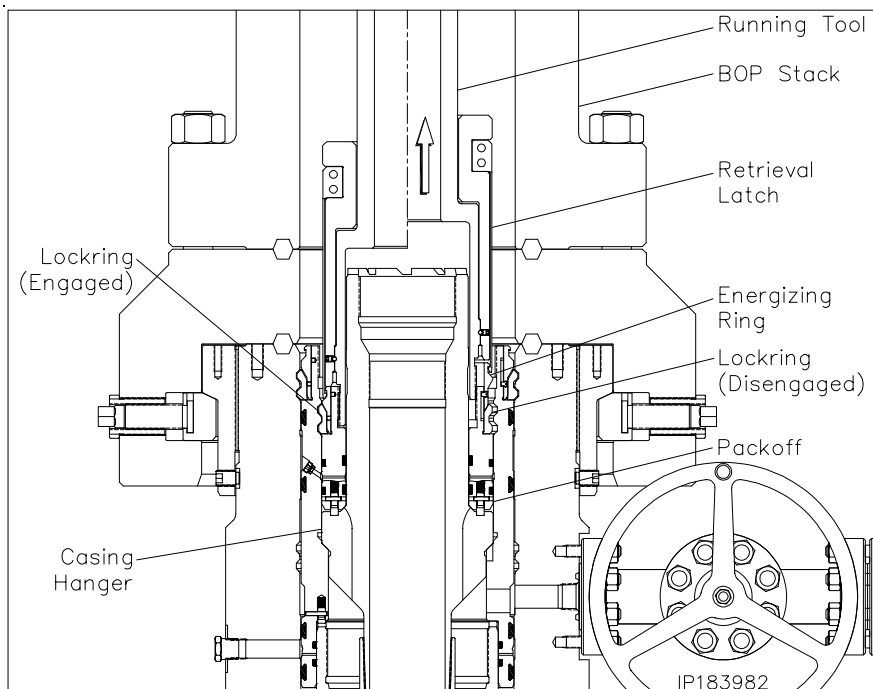
1. Locate the retrieval latch assembly with (4) 3/8" cap screws.
2. Install the retrieval latch onto the running tool with the latch fingers facing down. Install the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool actuation sleeve.
4. Carefully lower the running tool through the BOP stack and tag the top of the packoff assembly.
5. Carefully rotate the drill pipe clockwise to locate the thread start and then counter clockwise (left) approximately 10 turns to a positive stop.

NOTE: At this point the retrieval latches will have passed over the energizing ring and snapped into place.

6. Rotate the drill pipe clockwise (right) approximately 6 turns to a positive stop. The drill pipe should rise approximately 1-1/2".

CAUTION: Do Not exceed the 6 turns or the packoff may be seriously damaged.

7. Carefully pick up on the drill pipe and remove the packoff from the wellhead with a straight vertical lift.
8. Redress the packoff and reset as previously outlined.



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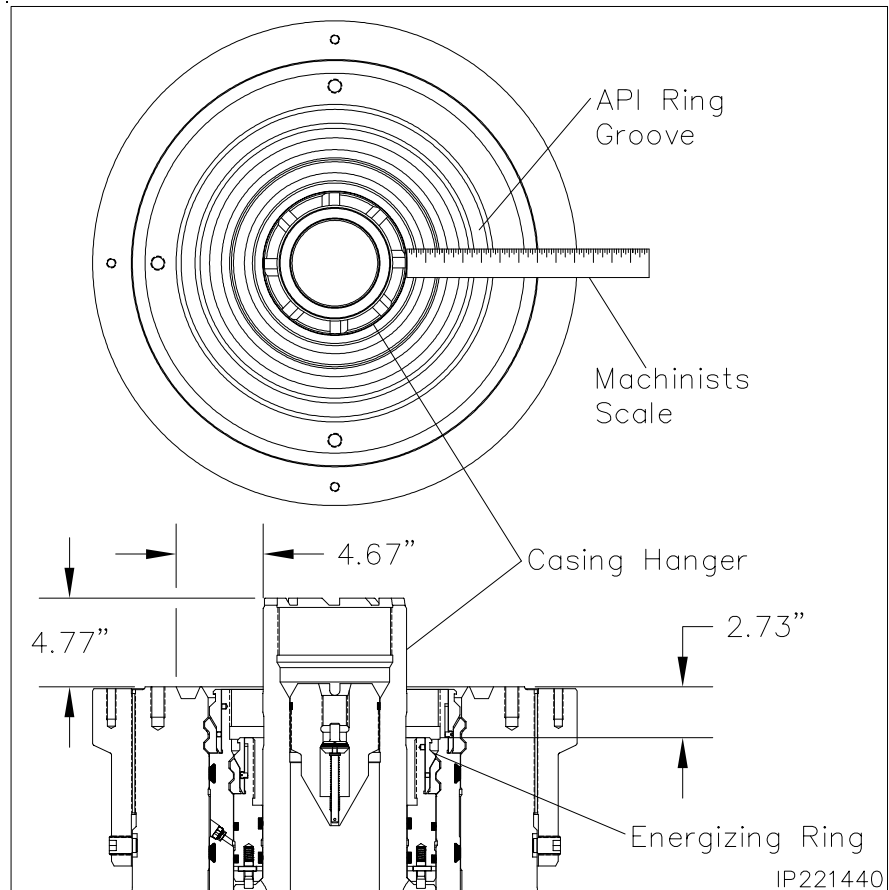
Stage 16 — Install the CTF-MBU-3T Packoff

CAUTION: Prior to installing the TA Cap the following dimensions are to be obtained to determine whether the hanger is fully landed and concentric with the wellbore.

1. Using a high pressure water hose, thoroughly clean the top of the housing, hanger and both internal packoffs and blow dry with compressed air.
2. Take several pictures of the 11" packoff installed and the location of the top of the packoff energizing ring.
3. Using a machinists scale measure the distance from the O.D. of the casing hanger neck to the O.D. of the API Ring Groove in 4 places 90° apart. This dimension should be 4.67" This will determine if the hanger is concentric with the well bore. Record all 4 dimension on the service ticket.
4. Measure the stick up of the casing hanger above the top of the housing. This dimension should be 4.77" If taller the hanger is not fully landed.
5. Measure the distance from the top of the 11" Packoff Energizing Ring to the top of the housing. This dimension should be 2.73". If less the packoff lockring may not be fully engaged.

NOTE: ALL DIMENSIONS are to be recorded on the service ticket.

CAUTION: If any of the dimensions taken are not as indicated contact **Service Manager and Cactus Houston Engineering** to determine action to be taken before proceeding to install the TA Cap.



IP221440



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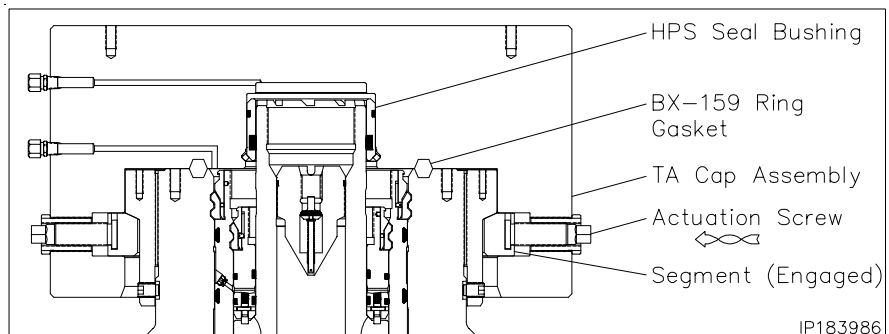
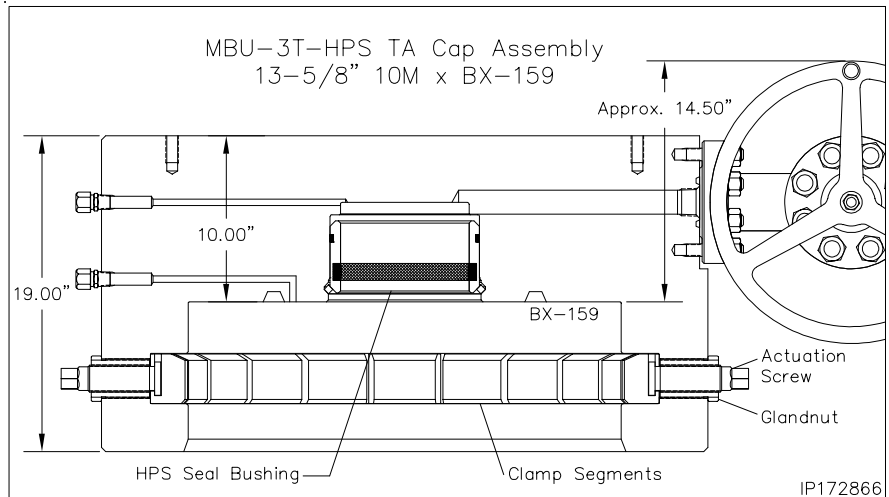
Stage 17 — Install the Quick Connect TA Cap

- Examine the **13-5/8" 10M Quick Connect TA Cap Assembly (Item R6)**. Verify the following:
 - bore is clean and free of debris
 - ring groove is clean and undamaged
 - (16) drive screws and clamp segments are properly installed and fully retracted
 - 7-5/8" HPS Seal Bushing (Item R7)** is in place and properly retained with the square snap wire
- Thoroughly clean the top of the housing, threaded hub, and the mating seal surfaces of the TA cap.
- Apply a light coat of grease to the contact ramp of the threaded hub.
- Install a new BX-159 ring gasket into the ring groove of the housing.
- Install the lift eyes in the top of the TA cap.



WARNING: Keep body clear of all pinch points and suspended loads.

- Using a suitable 4 point lifting device with weight rated slings, pick up the TA cap assembly. Carefully lower it over the hanger or packoff neck and land it on the ring gasket.
- Carefully run in all of the drive screws of the TA cap to contact point.
- Ensuring the assembly remains level, using the hand torque wrench, run in one actuation screw and torque to 100 ft-lbs.
- Locate the screw 180° from the first and torque it to 100 ft-lbs.
- Locate the screws 90° to the right and left and torque them to 100 ft-lbs.
- Position the second 4 point sequence 45° from the first and torque each screw to 200 ft-lbs with the hand torque wrench.
- Run in all remaining screws to contact, then torque each screw in the same sequence to 400 ft-lbs with the Rad Gun.
- Using the Rad Gun, make one additional round until a stable torque of 700 ft-lbs on all screws is achieved.

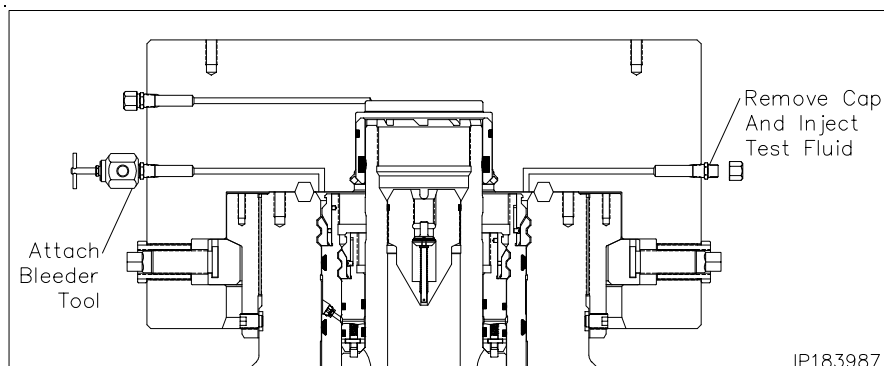


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Stage 17 — Install the Quick Connect TA Cap


Connection Test

1. Open the TA cap gate valve and the housing upper side outlet valve to monitor leakage.
2. Locate the two test fittings marked "FLG TEST" and remove the dust caps from the fittings.
3. Attach a bleeder tool to one of the open fittings and open the tool.
4. Attach a test pump with test manifold to the remaining open fitting and pump clean test fluid into the void area until a continuous stream flows from the open bleeder tool.
5. Close the tool and continue pumping fluid until a stable test pressure of **10,000 psi**.
6. Hold test pressure for 15 minutes or as required by drilling supervisor.
7. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold and bleeder tool.
8. Reinstall the dust caps on the open fittings.
9. Close all open valves.

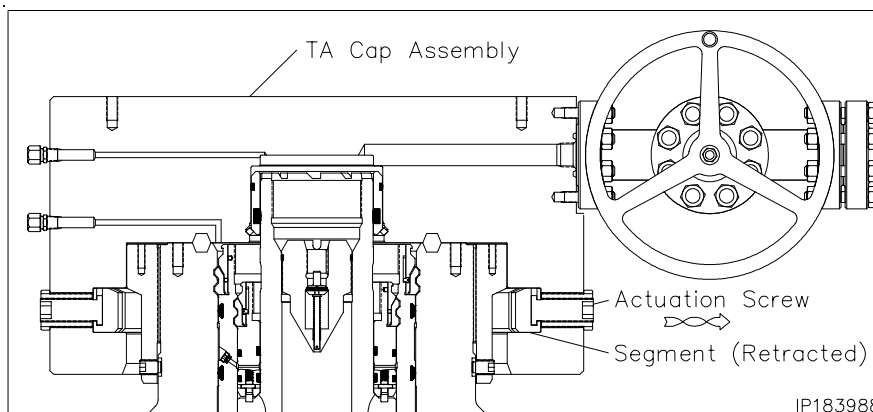



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Stage 18 — Remove the Quick Connect TA Cap

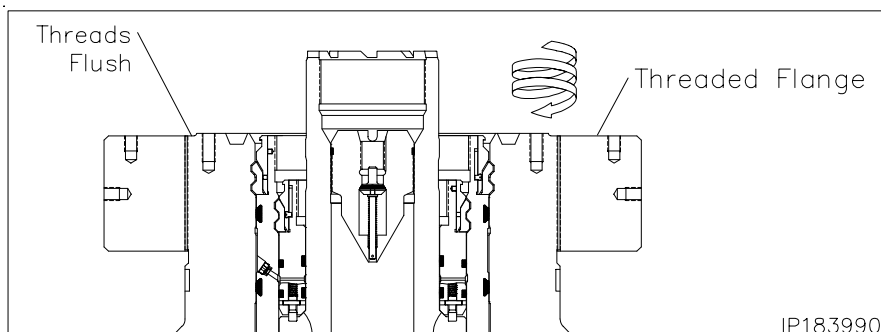
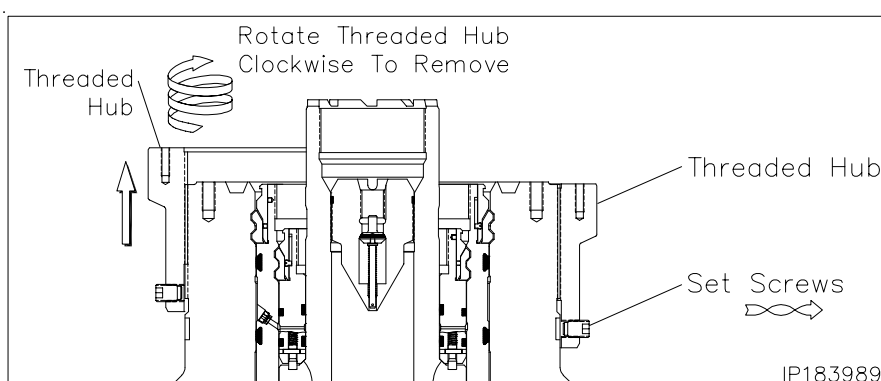
 **WARNING:** Confirm with Drilling Supervisor that well bore conditions are safe.

1. Open the outlet valve on the TA cap to check for trapped pressure above the BPV.
2. Locate the actuation screws on the O.D. of the TA cap assembly.
3. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the gland nuts.



 **WARNING:** Keep body clear of all pinch points and suspended loads.

4. Using a suitable 4 point lifting device with weight rated slings, pick up the TA cap assembly.
5. Remove the threaded hub set screws.
6. Remove the threaded hub from the top of the housing with clockwise rotation.
7. Examine the **13-5/8" 10M Threaded Flange (Item B2)**. Verify the following:
 - Acme thread are clean and in good condition
8. Thoroughly clean and lightly lubricate the mating threads of the housing and the threaded flange with copper coat or never seize.
9. Pick up the flange and carefully thread it onto the top of the housing with counter clockwise rotation until the top of the flange is level with the top of the Acme thread of the housing.
10. Rotate the flange in either direction to two hole.
11. Prepare to install the tubing head.



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Stage 19 — Install the Tubing Head

- Examine the **13-5/8" 10M x 7-1/16" 15M CTH-DBLHPS-SB Tubing Head (Item C1)**. Verify the following:
 - seal area and bore are clean and in good condition
 - 'HPS' seals are in place and in good condition
 - all peripheral equipment is intact and undamaged
 - all lockscrews are in place and fully retracted
- Clean the mating ring grooves of the housing and tubing head assembly.
- Lightly lubricate the I.D. 'HPS' seals and the casing hanger or packoff neck with a light grease.

CAUTION: Excessive grease may prevent a good seal from forming!

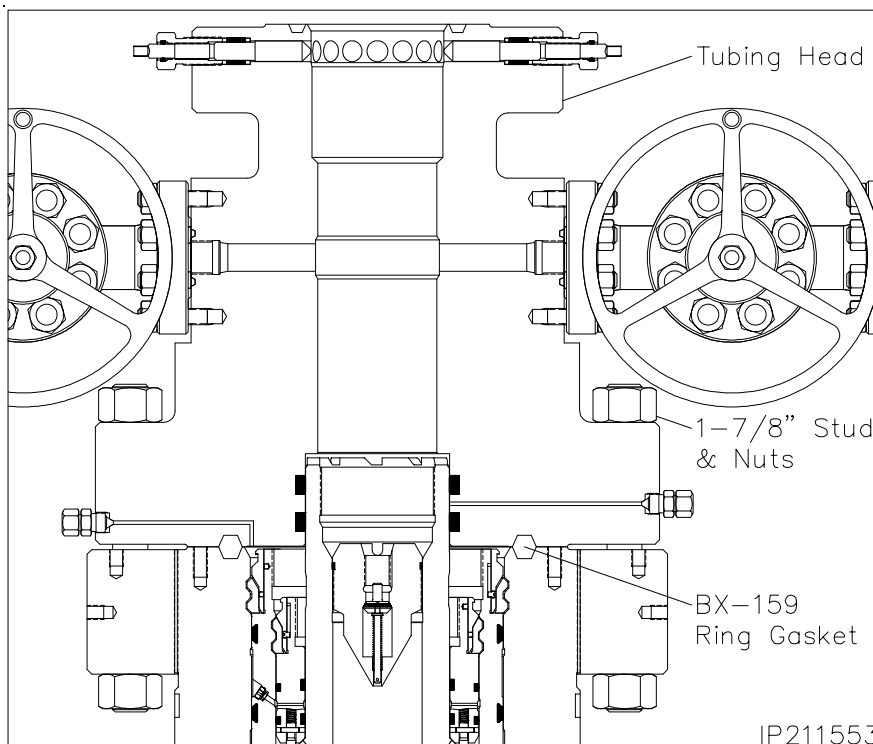
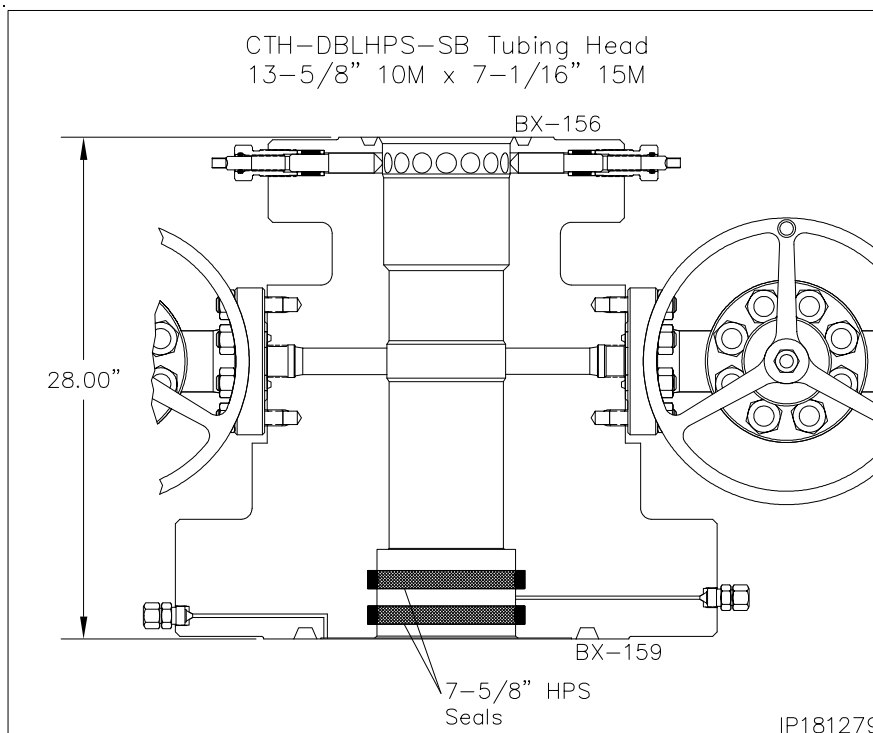
- Install a new **BX-159 Ring Gasket (Item C7)** in the ring groove of the housing.

WARNING: Keep body clear of all pinch points and suspended loads.

- Orient the tubing head so the outlets are in the proper position and then carefully lower the tubing head over the casing hanger or packoff neck and land it on the ring gasket.

CAUTION: Do Not damage the 'HPS' seal elements or their sealing ability will be impaired!

- Make up the flange connection using the appropriate size **Studs and Nuts (Item C8)**, tightening them in an alternating cross pattern.

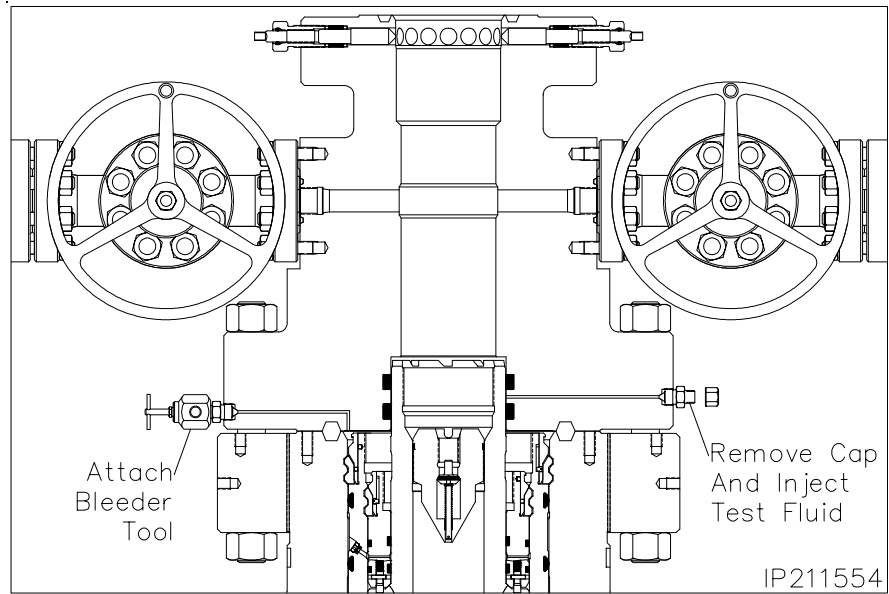


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Stage 19 — Install the Tubing Head

Seal Test

1. Locate the "SEAL TEST" fitting and one "FLG TEST" fitting on the tubing head lower flange and remove the dust cap from both fittings.
2. Attach a bleeder tool to one of the open "FLG TEST" fittings and open the tool.
3. Attach a test pump with test manifold to the "SEAL TEST" fitting and pump clean test fluid between the 'HPS' seals until a test pressure of **15,000 psi**.
4. Hold test pressure for 15 minutes or as required by drilling supervisor.
5. If pressure drops, a leak has developed. Bleed off test pressure and take the appropriate action in the adjacent table.
6. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold.
7. Reinstall the dust cap on the open fitting.



Seal Test	
Leak Location	Appropriate Action
Open bleeder tool - Lower 'HPS' seal is leaking	Remove tubing head and replace leaking seals.
From open tubing head outlet valve - Upper 'HPS' seal is leaking	Re-land and retest seals

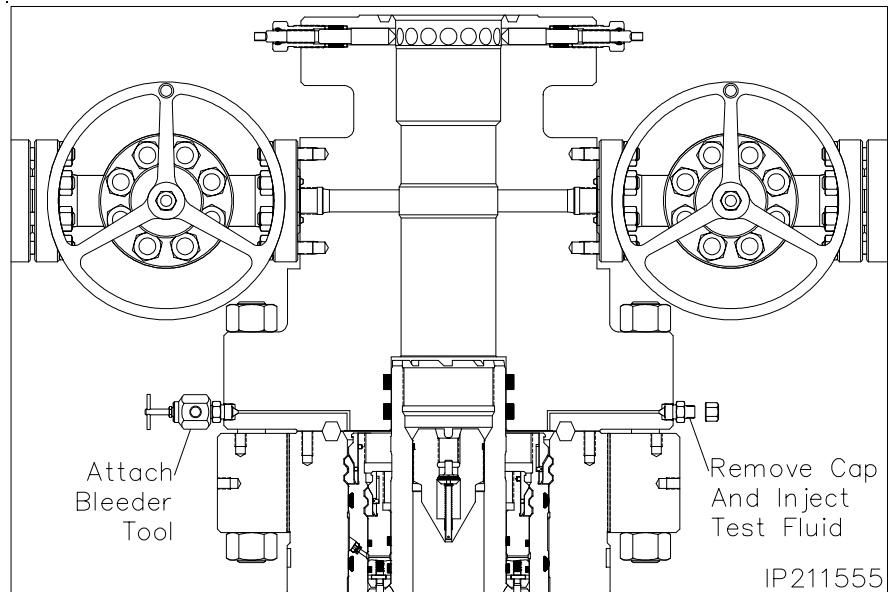


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Stage 19 — Install the Tubing Head

Flange Test

1. Locate the remaining "FLG TEST" fitting on the tubing head lower flange and remove the dust cap from the fitting.
2. Attach a test pump with test manifold to the open "FLG TEST" fitting and inject test fluid into the flange connection until a continuous stream flows from the opposite "FLG TEST" bleeder tool.
3. Close the bleeder tool and continue to pumping test fluid to **10,000 psi**.
4. Hold test pressure for 15 minutes or as required by drilling supervisor.
5. If pressure drops a leak has developed. Take the appropriate action from the adjacent chart.
6. Repeat steps 2 - 5 until a satisfactory test is achieved.
7. Once a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold and bleeder tool.
8. Reinstall the dust caps on the open fittings.
9. Remove the dust cap from the blind flange bleeder fitting. Attach a bleeder tool to the open fitting and open the tool.



Flange Test	
Leak Location	Appropriate Action
Between flanges - Ring gasket is leaking	Further tighten the flange connection



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SECTION 2: EMERGENCY EQUIPMENT



Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System

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Stage 5A — Hang Off the 10-3/4" Casing (Emergency)

NOTE: If the 10-3/4" casing was hung off using the fluted mandrel hanger, skip this stage.

1. Run the 10-3/4" casing to the required depth and cement casing as required.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

2. Drain the diverter through the casing head side outlet valve.
3. Fully retract all (8) anti-rotation screws.

CAUTION: There are (10) drive screws that are used to compress and release the 24" CRC locking. They must be engaged in a specific pattern to properly release the locking.

4. Locate the alignment notches on the **FRONT** of the casing head and BOP adapter.

5. Locate **#1 Drive Screw** to the right of the adapter alignment notch. Run the drive screw in to a positive stop.

6. Locate **#2 Drive Screw** to the left of the adapter alignment notch. Run the drive screw in to a positive stop.

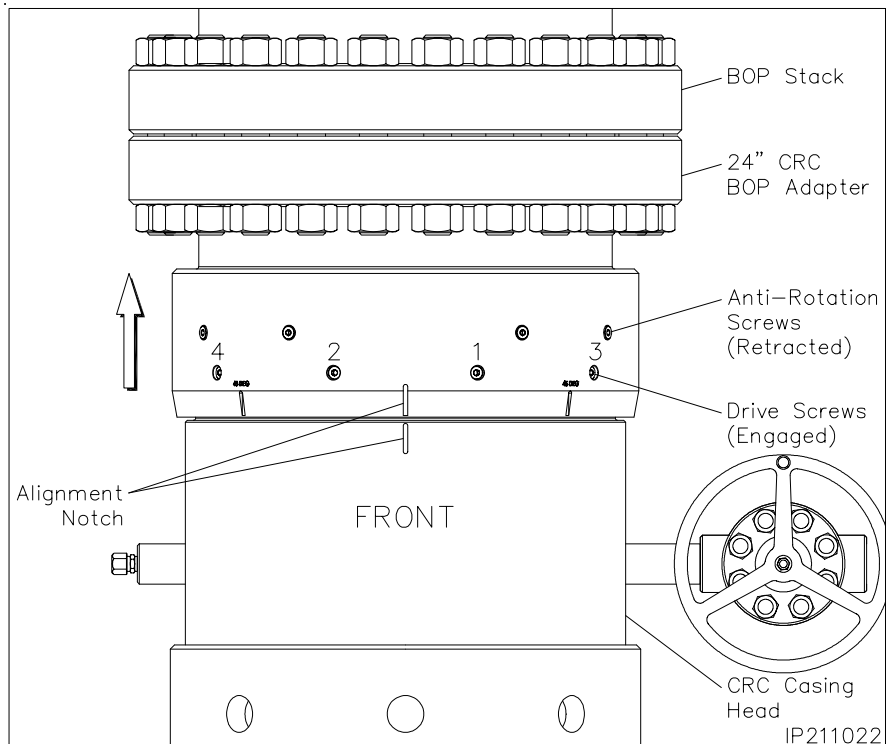
7. Continue around the adapter in an alternating **right to left pattern** until all (10) Drive Screws are **FULLY ENGAGED**.

WARNING: Keep body clear of all pinch points and suspended loads.

8. Separate the lower drilling adapter from the casing head and lift the diverter approximately 19.50" above the casing head. Secure diverter with safety slings.

9. Using a fresh water hose, thoroughly wash out the casing head.

NOTE: Side outlet valve to remain open while setting the casing hanger.



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Stage 5A — Hang Off the 10-3/4" Casing (Emergency)

10. Examine the **20" x 10-3/4" CRC-C1 Slip Casing Hanger (Item A9a)**.

Verify the following:

- slips and internal bore are clean and in good condition
- all screws are in place
- packoff rubber is in good condition

11. Remove the latch cap screws and open the hanger.

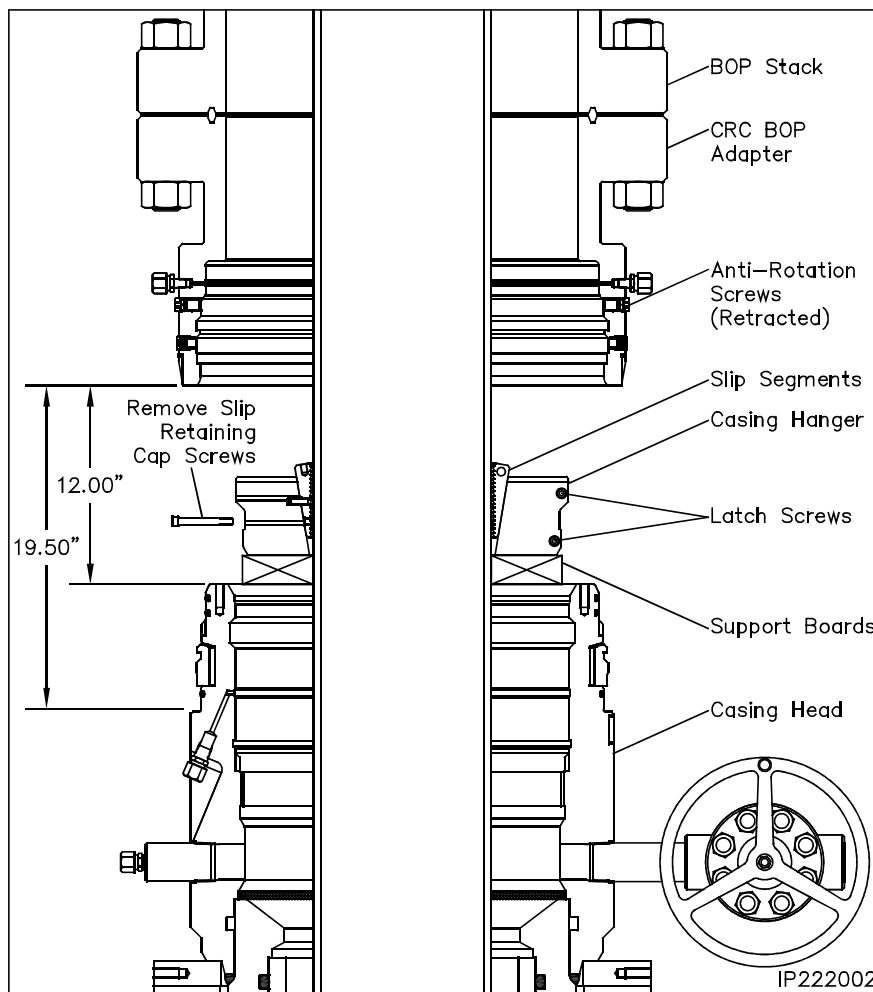
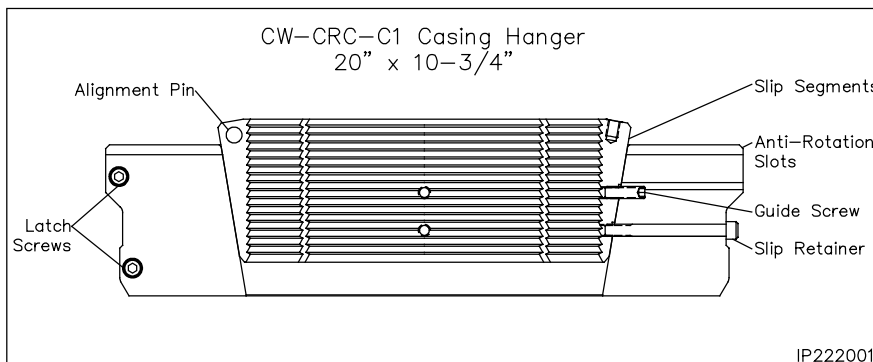
12. Place two boards on the housing flange against the casing to support the hanger.

13. Pick up the hanger and place it around the casing and on top of the support boards. Replace the latch screws.

14. Prepare to lower the hanger into the housing bowl.

CAUTION: Do Not drop the casing hanger!

15. Grease the casing hanger body and remove the slip retaining cap screws.



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Stage 5A — Hang Off the 10-3/4" Casing (Emergency)

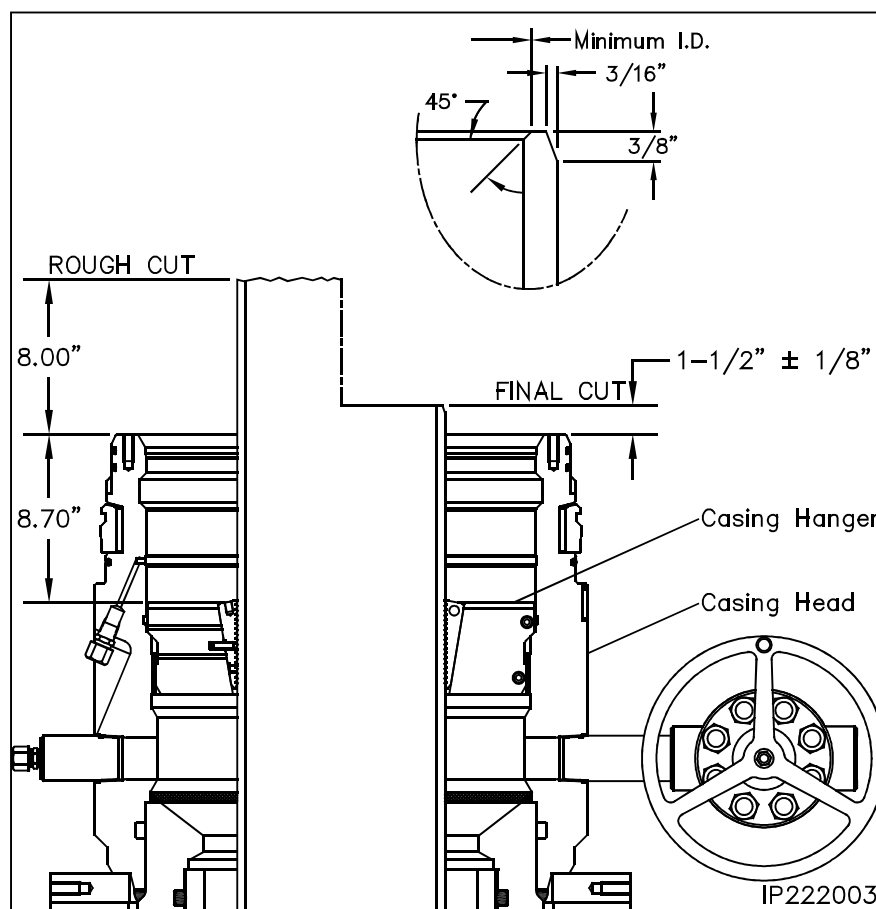
16. Remove the boards and allow the hanger to slide into the casing head. When the hanger is down, the top of the hanger body will be 8.70" below the top of the casing head.
17. Pull tension on the casing to the desired hanging weight and slack off.

NOTE: A sharp decrease on the weight indicator will signify that the hanger has taken weight. If this does not occur, pull tension again and slack off once more.

WARNING: Due to the potential fire hazard and the risk of loss of life and property, it is highly recommended to check the casing annulus and pipe bore for gases, with an approved sensing device, prior to cutting the casing. If gas is present, do not use an open flame torch to cut the casing. It will be necessary to use an air driven mechanical cutter which is spark free.

18. Rough cut the casing approximately 8" above the casing head flange and move the excess casing and BOP out of the way.
19. Final cut the casing at 1-1/2" ± 1/8" above the top of the casing head.
20. Grind the casing stub level, then place a 3/16" x 3/8" bevel on the O.D. and an I.D. chamfer to match the minimum bore of the upper housing to be installed.
21. Using a high pressure water hose, thoroughly clean the top of the casing head, casing hanger, and casing stub. Blow dry with compressed air. Ensure all cutting debris are removed.

CAUTION: Do Not reinstall the BOP stack. The emergency packoff is installed open hole and not through the BOP stack.



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Stage 6A — Install the CRC Emergency Packoff

NOTE: Only use this stage if the 10-3/4" casing becomes stuck and the mandrel casing hanger cannot be landed. If the mandrel hanger has been set then skip this stage.

1. Examine the **20" x 17.750" x 2 Stub Acme 2G LH Box Top CRC Emergency Packoff (Item A10a)**.

Verify the following:

- all elastomer seals are in place and undamaged
- internal bore and ports are clean and in good condition
- locking is fully retracted
- energizing ring is in its upper most position and retained with shear pins
- guide screws are in place and back off 1/4 turn
- anti-rotation plungers are in place, free to move

2. Inspect the I.D. and O.D. seals for any damage and replace as necessary.

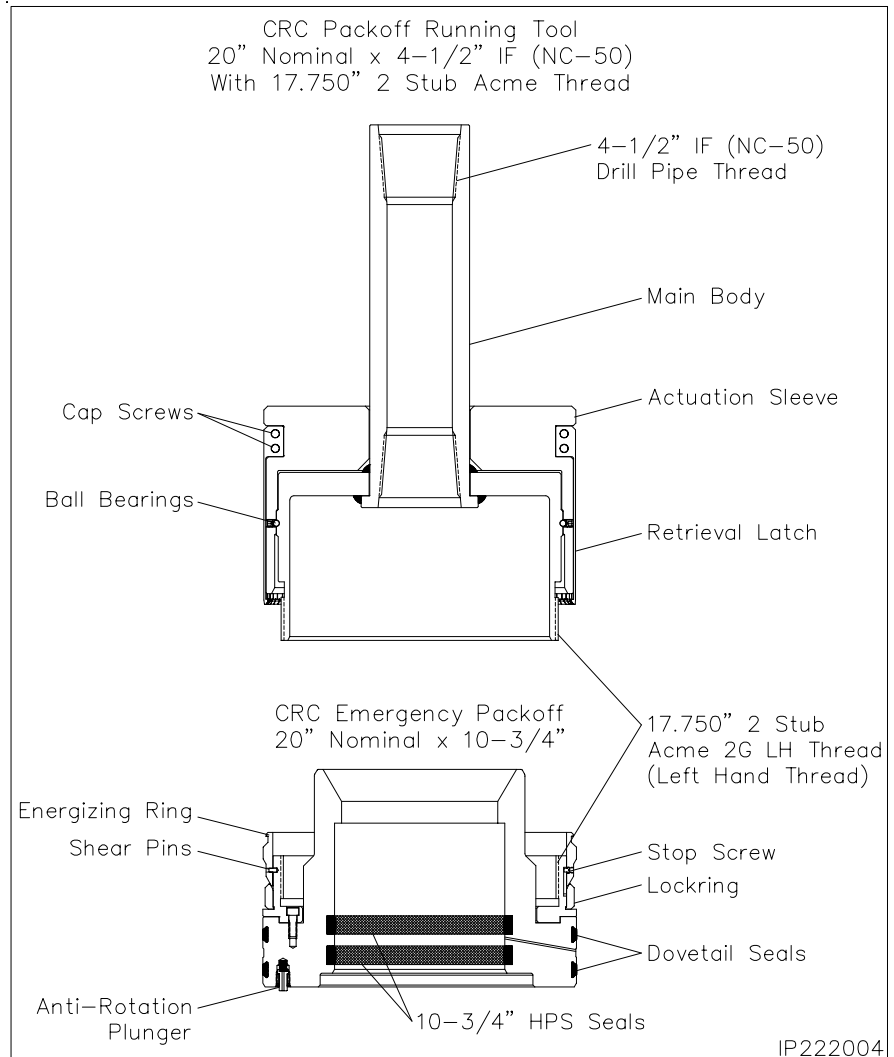
3. Examine the **20" Nominal x 17.750" 2 Stub Acme 2G LH, CRC Packoff Running Tool (Item ST7)**.

Verify the following:

- Acme threads are clean and in good condition
- retrieval latch is in position and retained with cap screws

4. Remove the retrieval latch and set aside.

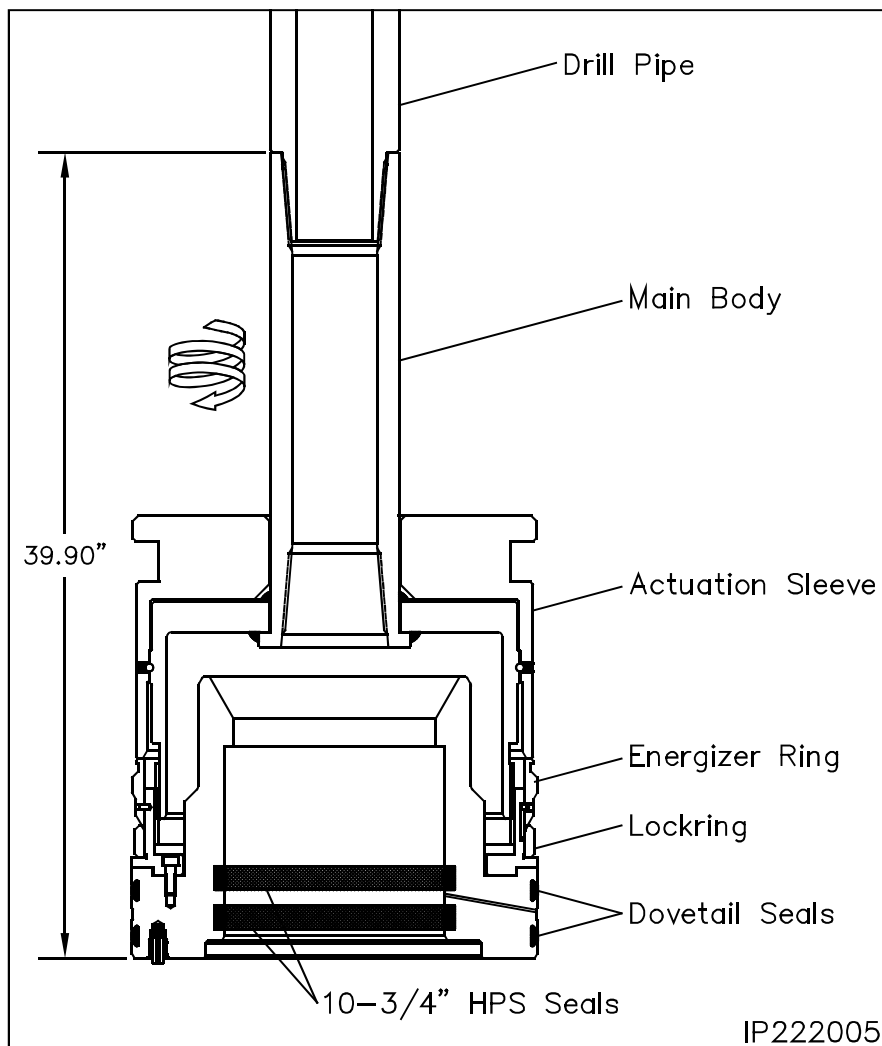
5. Make up the running tool to 4-1/2" IF (NC-50) drill pipe and torque the connection to optimum make up torque.



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Stage 6A — Install the CRC Emergency Packoff

6. Run in the hole with two stands of drill pipe and set in floor slips.
7. Pick up the packoff and carefully pass it over the drill pipe and set it on top of the floor slips.
8. Pick up the running tool with landing joint and make up the running tool to the drill pipe in the floor slips using the appropriate length pin x pin sub.
9. Pick up the packoff and thread it onto the running tool with clockwise (Right) rotation until the energizing ring makes contact with the lower body of the tool. (Approximately 3 turns).
10. Thoroughly clean and lightly lubricate the packoff I.D. 'HPS' seals and the O.D. dovetail seals with oil or light grease.
11. Locate the "SEAL TEST" fitting on the O.D. of the casing head and remove the dust cap from the fitting.
12. Attach a test pump to the fitting and pump clean test fluid through the port to dislodge any old grease and trapped debris.
13. Remove the test pump and reinstall the fitting dust cap.



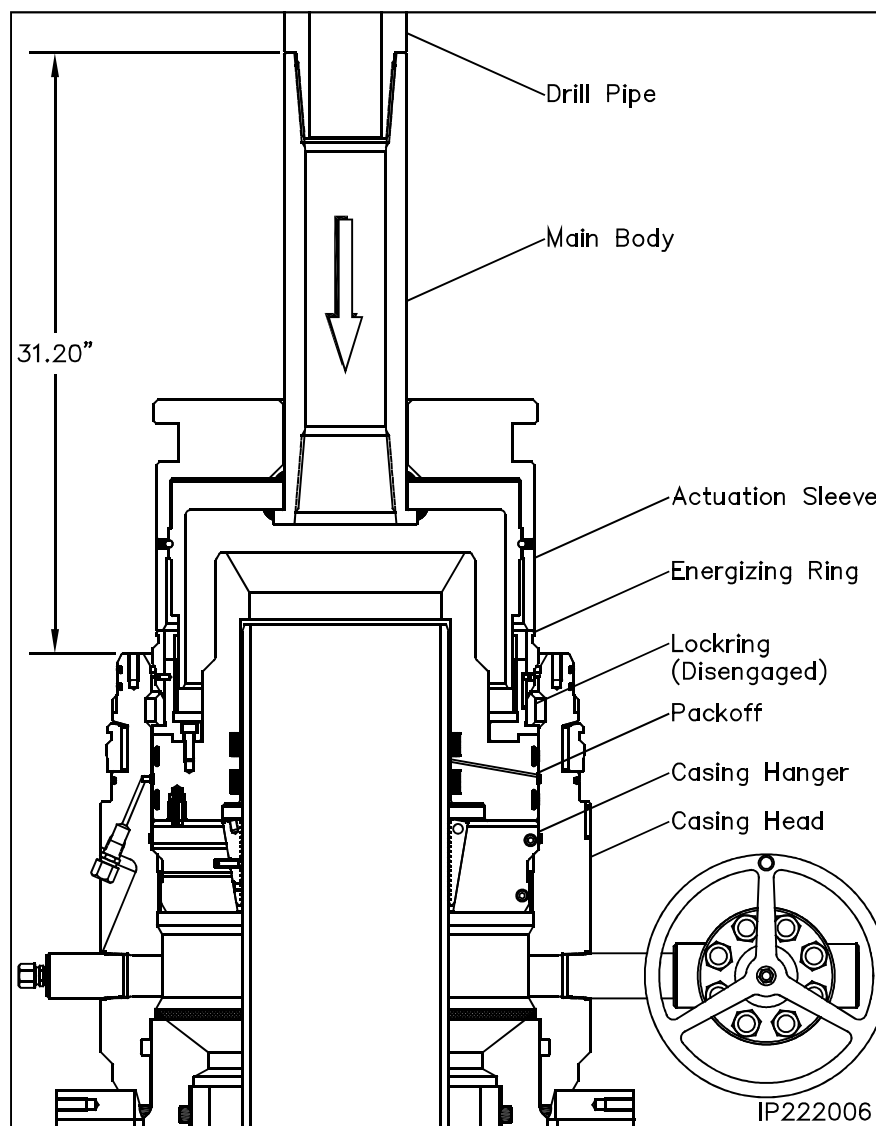
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Stage 6A — Install the CRC Emergency Packoff

Landing the Packoff

14. Pick up the drill string and remove the floor slips.
15. Carefully lower the packoff through the rig floor and position it just above the housing.
16. Carefully lower the packoff into the housing until it lands on top of the slip hanger.

i **NOTE:** When properly positioned the top of the running tool will be approximately 31.20" above the top of the CRC casing head.



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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Stage 6A — Install the CRC Emergency Packoff

Seal Test

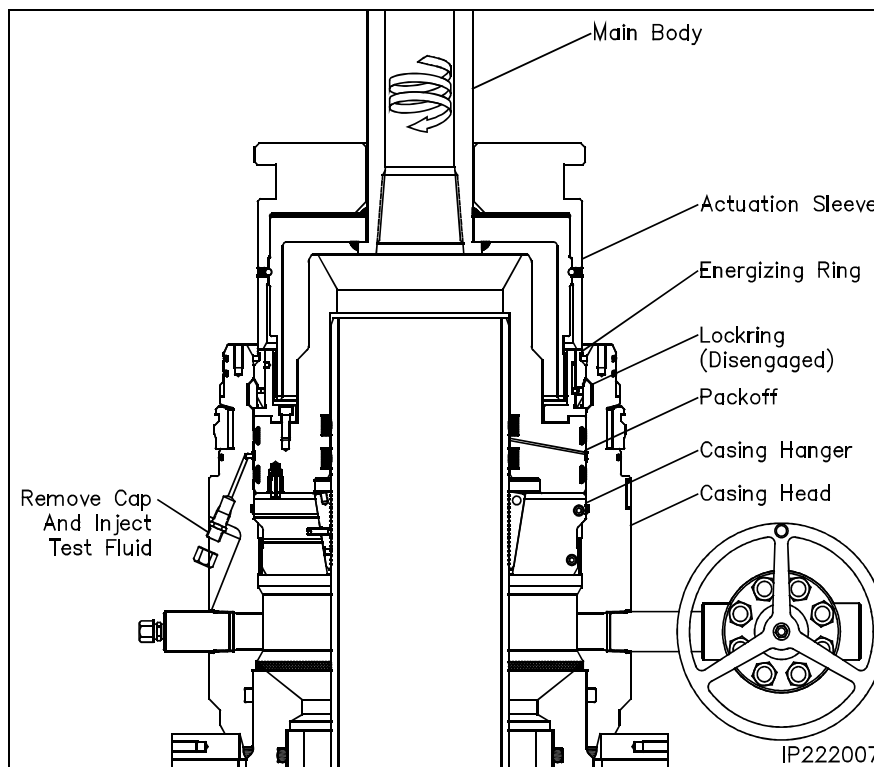
17. Locate the "SEAL TEST" fitting on the O.D. of the casing head and remove the dust cap from the fitting.
18. Attach a test pump to the open fitting and pump clean test fluid between the seals until a stable test pressure of **3,000 psi or 80% of casing collapse - whichever is less.**
19. Hold test pressure for 15 minutes or as required by drilling supervisor.
20. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
21. After satisfactory test is achieved, bleed off the test pressure but leave the test manifold in place.

Engaging the Lockring

22. **Using chain tongs only**, rotate the landing joint approximately 3 turns counter clockwise to engage the packoff lockring in its mating groove in the bore of the CRC casing head.

NOTE: Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the lockring out. A positive stop will be encountered when the lockring is fully engaged.

CAUTION: It is imperative that the landing joint remain concentric with the well bore when rotating to engage the lockring. This can be accomplished with the use of the air hoist.



CAUTION: If the required turns to engage the lockring are not achieved or excessive torque is encountered, remove the packoff and first call local branch and then Houston Engineering.

23. Back off the landing joint/running tool approximately 1 turn. Using the top drive, exert a 40,000 lbs pull on the landing joint. Hold test for 15 minutes or as required by drilling supervisor. After satisfactory test, slack off all weight.
24. Reattach the test pump to the open test manifold and retest the packoff seals as previously outlined. This will also verify that the packoff is in place.
25. After satisfactory test is achieved, bleed off test pressure. Remove the test pump and manifold and install the dust cap.
26. **Using chain tongs only**, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 5 turns), then retrieve the tool with a straight vertical lift.



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Stage 11A — Hang Off the 8-5/8" Casing (Emergency)

1. Cement the hole as required.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

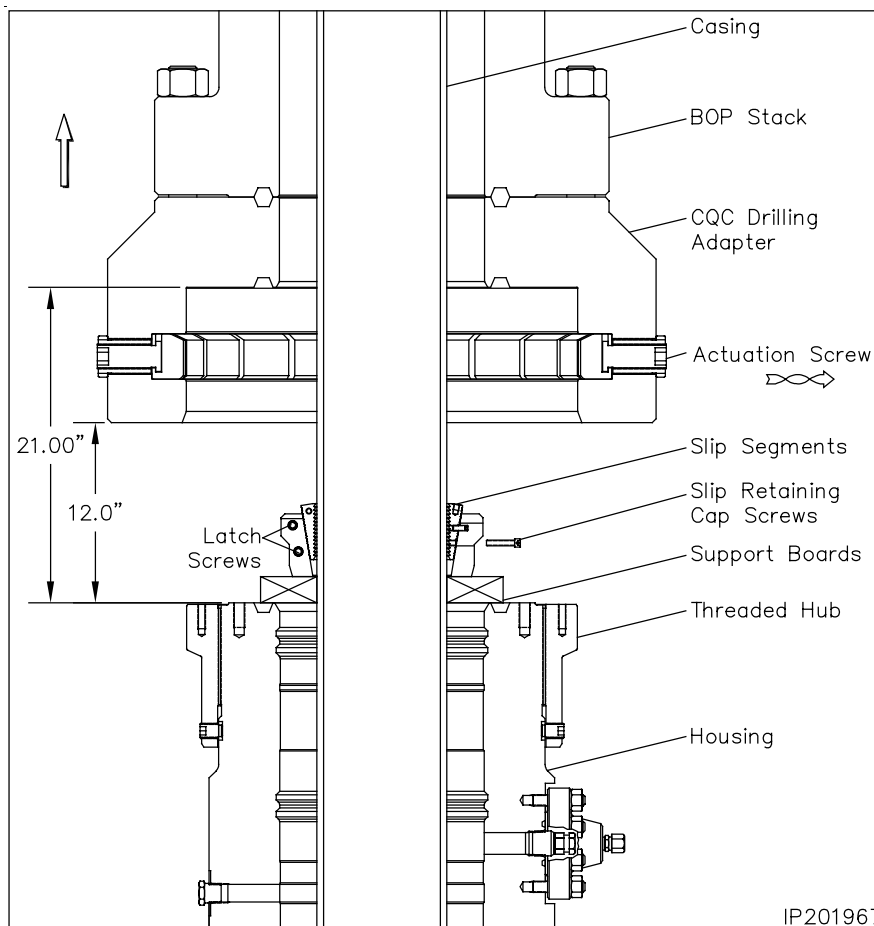
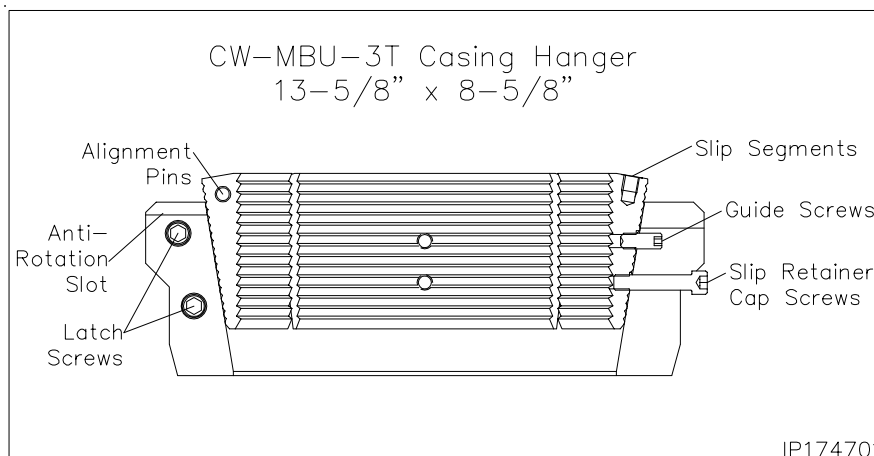
2. Drain the BOP stack through the housing lower side outlet valve.
3. Locate the actuation screw on the O.D. of the drilling adapter.
4. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the gland nuts.

WARNING: Keep body clear of all pinch points and suspended loads.

5. Pick up on the BOP stack a minimum of 12" above the housing and secure with safety slings.
6. Washout as required.
7. Examine the **13-5/8" x 8-5/8" MBU-3T Slip Casing Hanger (Item B19a)**. Verify the following:
 - slips and internal bore are clean and in good condition
 - all screws are in place
8. Remove the latch cap screws and open the hanger.
9. Place two boards on the housing flange against the casing to support the hanger.
10. Pick up the hanger and place it around the casing and on top of the support boards. Replace the latch screws.
11. Prepare to lower the hanger into the housing bowl.

CAUTION: Do Not drop the casing hanger!

12. Grease the casing hanger body and remove the slip retaining screws.



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Stage 11A — Hang Off the 8-5/8" Casing (Emergency)

13. Remove the boards and allow the hanger to slide into the housing bowl. When properly positioned the top of the hanger will be approximately 22.56" below the top of the housing.

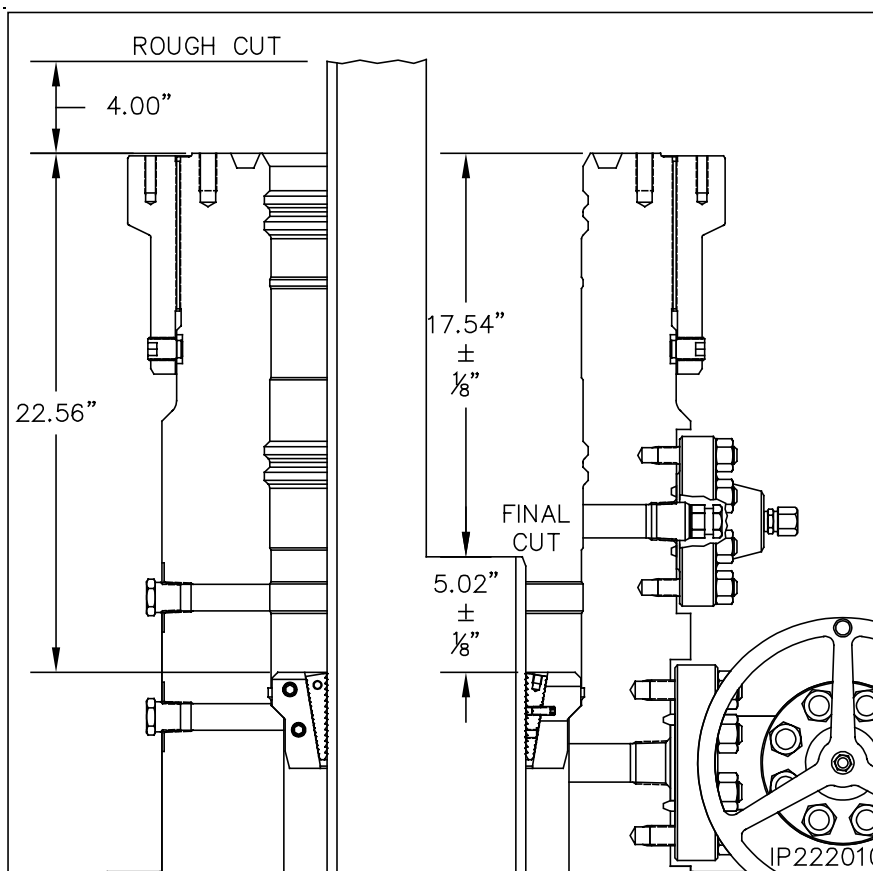
14. Pull tension on the casing to the desired hanging weight and then slack off.

NOTE: A sharp decrease on the weight indicator will signify that the hanger has taken weight. If this does not occur, pull tension again and slack off once more.

WARNING: Due to the potential fire hazard and the risk of loss of life and property, it is highly recommended to check the casing annulus and pipe bore for gases, with an approved sensing device, prior to cutting the casing. If gas is present, do not use an open flame torch to cut the casing. It will be necessary to use an air driven mechanical cutter which is spark free.

15. Rough cut the casing approximately 4" above the top of the housing and move the excess casing out of the way.

16. Using the internal casing cutter, final cut the casing at 17.54" \pm 1/8" below the top of the lower adapter or 5.02" \pm 1/8" above the hanger body.



17. Remove the internal casing cutter assembly and reconfigure the assembly to bevel the casing. Reinstall the cutter assembly, then place a 3/16" x 3/8" bevel on the O.D. and an I.D. chamfer to match the minimum bore of the packoff to be installed.

CAUTION: There must not be any rough edges on the casing or the seals of the packoff will be damaged.

18. Thoroughly clean the housing bowl, removing all cement and cutting debris.

CAUTION: Do Not reinstall the BOP stack. The emergency packoff is installed open hole and not through the BOP stack.



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Stage 12A — Install the MBU-3T Emergency Packoff

NOTE: Only use this stage if the 8-5/8" casing becomes stuck and the mandrel casing hanger cannot be landed. If the mandrel hanger has been set then skip this stage.

1. Examine the **13-5/8" 10M x 8-5/8" x 11.250" 4 Stub Acme 2G LH Box Top MBU-3T Emergency Nested Packoff Assembly (Item B20a)**.

Verify the following:

- all elastomer seals are in place and undamaged
- internal bore, and ports, are clean and in good condition
- locking is fully retracted
- rupture disk is in place and tightened securely
- energizing ring is in its upper most position and retained with shear pins
- guide screws are in place and back off 1/4 turn
- paint scribe line white and allow paint to dry

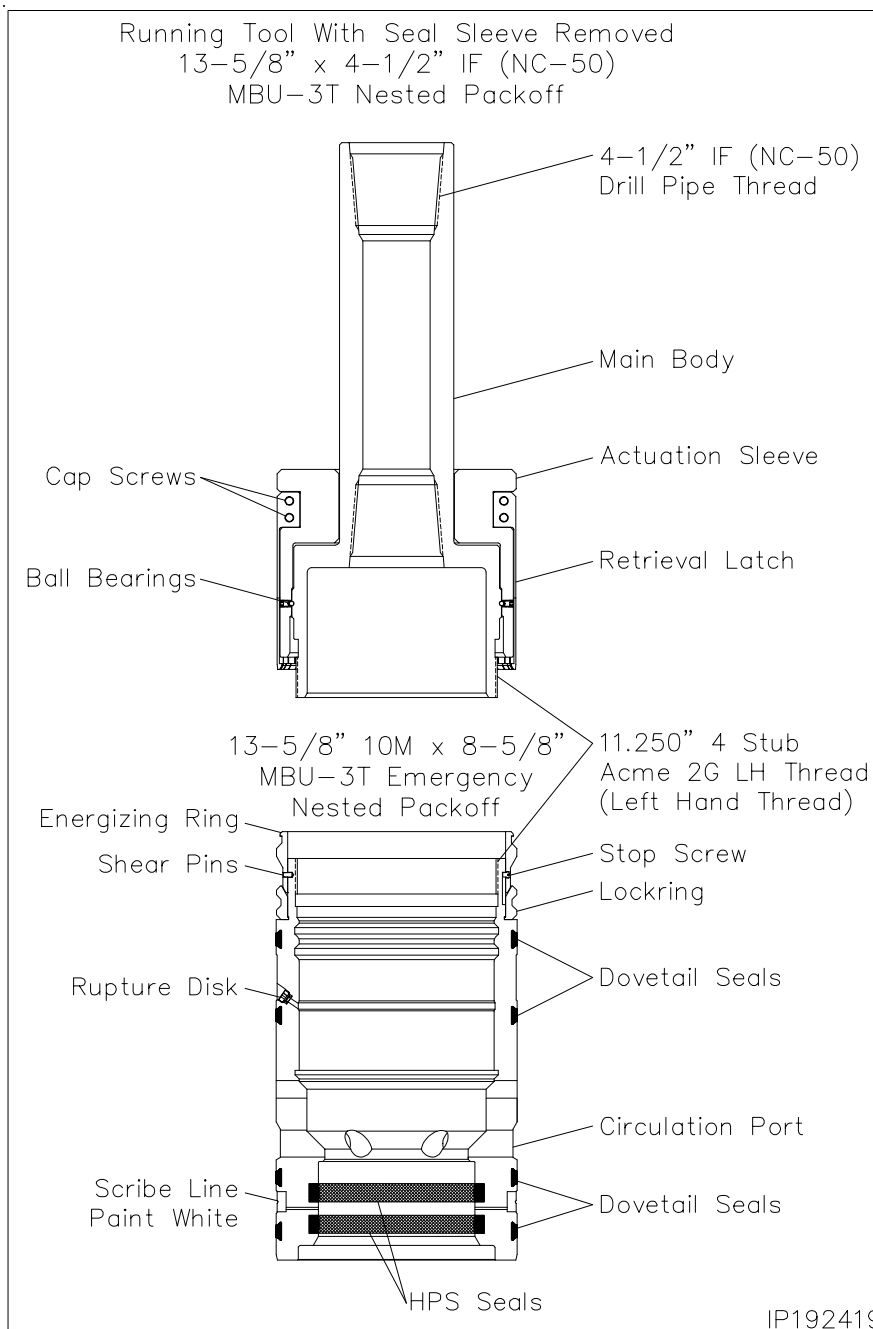
2. Inspect the I.D. and O.D. seals for any damage and replace as necessary.

3. Examine the **13-5/8" Nominal x 11.250" 4 Stub Acme 2G LH, MBU-3T Nested Packoff Running Tool (Item ST14)**. Verify the following:

- Acme threads are clean and in good condition
- retrieval latch is in position and retained with cap screws
- seal sleeve is removed

NOTE: Alternate tool may also be used.

4. Make up a joint 4-1/2" IF (NC-50) drill pipe to the top of the running tool and tighten connection to thread manufacturer's maximum make up torque.



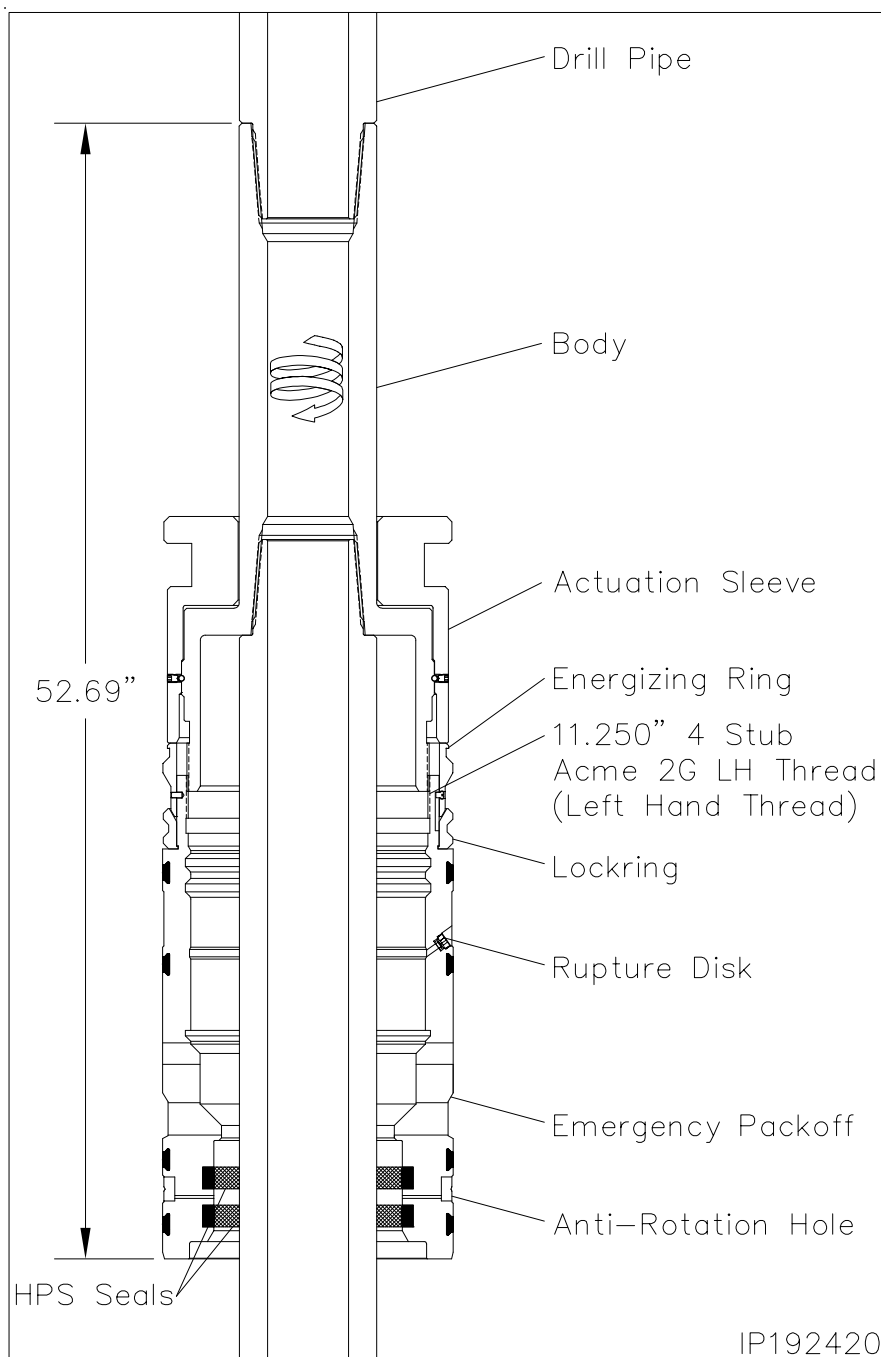
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Stage 12A — Install the MBU-3T Emergency Packoff

5. Run in the hole with two stands of drill pipe and set in floor slips.
6. Pick up the packoff and carefully pass it over the drill pipe and set it on top of the floor slips.
7. Pick up the running tool with landing joint and make up the running tool to the drill pipe in the floor slips using the appropriate length pin x pin sub.
8. Pick up the packoff and thread it onto the running tool with clockwise (Right) rotation until the energizing ring makes contact with the lower body of the tool. (Approximately 3 turns).

CAUTION: Ensure the rupture disc is in place and tightened securely.

9. Thoroughly clean and lightly lubricate the packoff I.D. 'HPS' seals and the O.D. dovetail seals with oil or light grease.
10. Locate the upper and lower "SEAL TEST" fittings on the O.D. of the housing and remove the dust cap from the fittings.
11. Attach a test pump to both fittings and pump clean test fluid through the ports to dislodge any old grease and trapped debris.
12. Remove the test pump and reinstall the fitting dust caps.



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Stage 12A — Install the MBU-3T Emergency Packoff

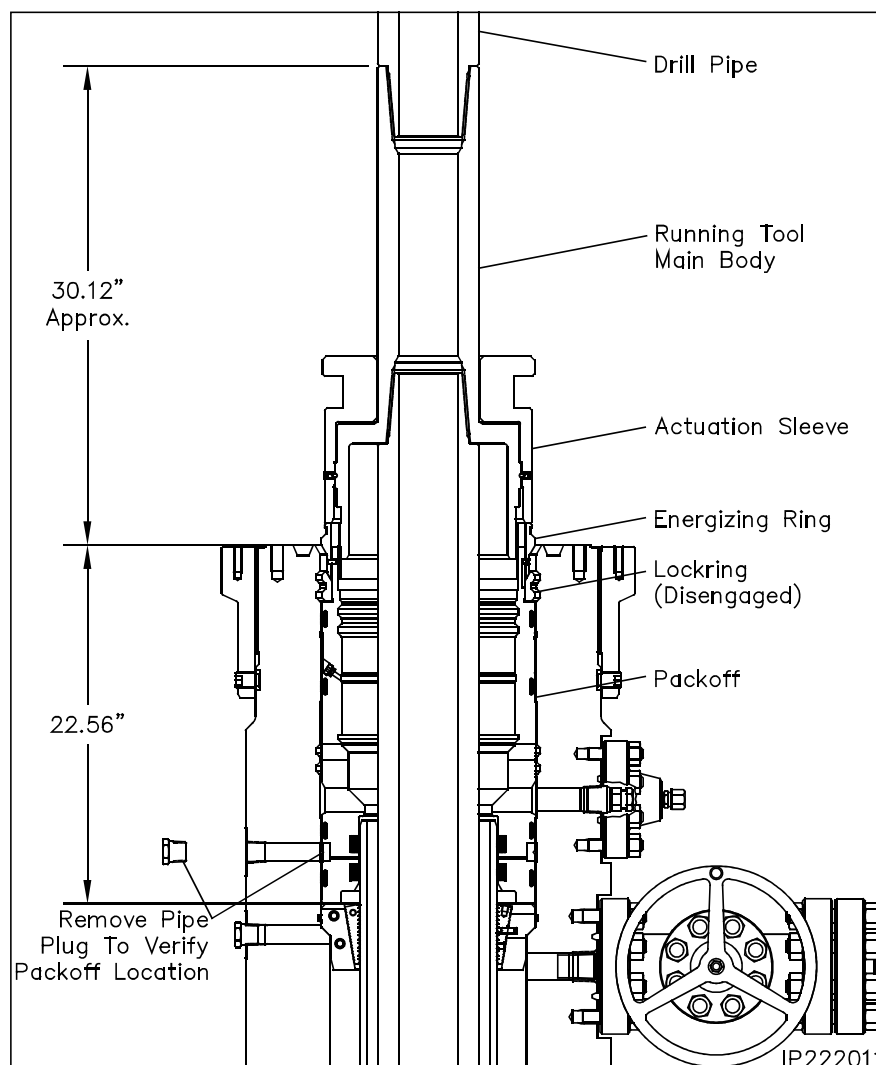
Landing the Packoff

13. Pick up the drill string and remove the floor slips.
14. Carefully lower the packoff through the rig floor and position it just above the housing.
15. Carefully lower the packoff into the housing until it lands on top of the slip hanger.

i NOTE: When properly positioned the top of the running tool will be approximately 30.12" above the top of the housing.

16. Remove the upper 1" LP pipe plug from the sight port to verify the packoff is properly landed. The 5/16" scribe line should be clearly visible in the center of the port.

17. With landing verified, reinstall the pipe plug and tighten securely.



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

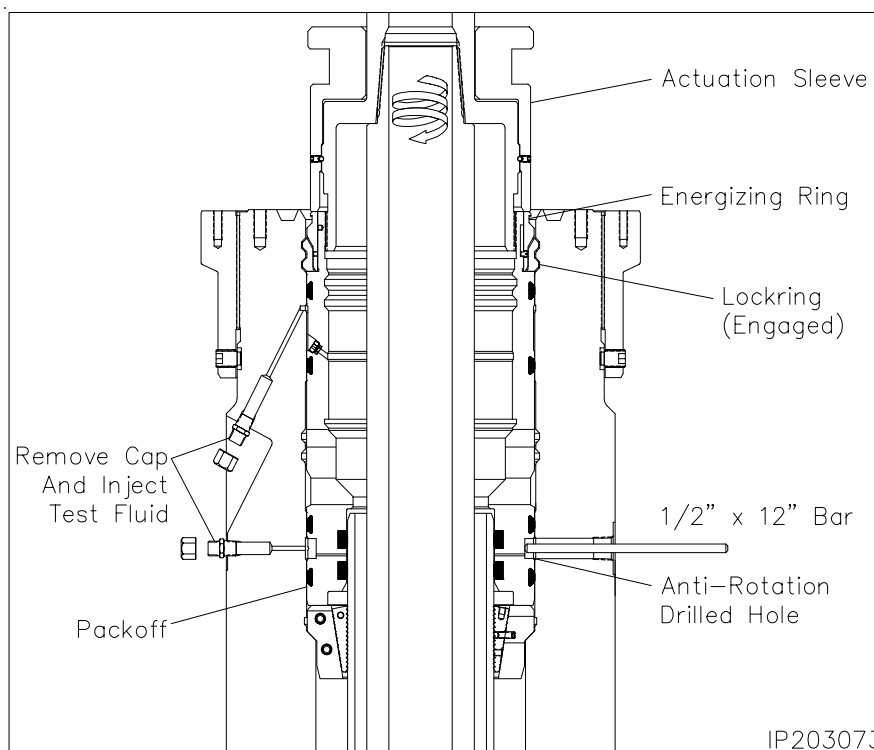
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Stage 12A — Install the MBU-3T Emergency Packoff

Seal Test

18. Locate the upper and lower "SEAL TEST" fittings on the O.D. of the housing and remove the dust cap from the fittings.
19. Attach a test pump to the open lower fitting and pump clean test fluid between the seals until a stable test pressure of **10,000 psi or 80% of casing collapse - whichever is less is achieved.**
20. Hold test pressure for 15 minutes or as required by the drilling supervisor.
21. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
22. Repeat steps 19 through 21 for the remaining upper test port. Test to **10,000 psi.**
23. After satisfactory test is achieved, bleed off the test pressure but leave the test manifold in place.



IP203073

CAUTION: It is imperative that the drill pipe landing joint remain concentric with the well bore when rotating to engage the locking. This can be accomplished with the use of the air hoist.

Engaging the Lockring

24. Remove the 1" sight port pipe plug and set aside.
25. Pass a anti-rotation bar through the open port and hold inward pressure on the bar.
26. **Using chain tongs only,** rotate the landing joint approximately 6 to 6-1/2 turns counter clockwise (Left) to engage the packoff locking in its mating groove in the bore of the housing.

CAUTION: If the required turns to engage the locking are not met or excessive torque is encountered, remove the packoff. First call local branch. If further assistance is required then call Houston Engineering.

NOTE: Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the locking out. A positive stop will be encountered when the locking is fully engaged.

27. Back off the landing joint/running tool approximately three turns.
28. Remove the anti-rotation bar from the sight port and reinstall the pipe plug in the port.
29. Using the top drive, exert a 40,000 lbs pull on the landing joint. After satisfactory test. Hold test for 15 minutes or as required by drilling supervisor. After satisfactory test, slack off all weight.
30. Reattach the test pump to the to the upper and lower test fittings and retest the seals as previously outlined.
31. After a satisfactory tests are achieved, increase the injection pressure on the upper test fitting to **11,500 psi** to burst the rupture disc in the packoff. This will open the test port passage for the upper mandrel packoff.
32. Remove test pump and attach a grease gun to the open upper fitting.
33. Pump grease through the fitting and port until it flows into the I.D. of the packoff. Remove the grease gun and reinstall the dust cap on the open fittings.
34. **Using chain tongs only,** rotate the landing joint clockwise until the tool comes free of the packoff (approximately 6 to 6-1/2 turns), then retrieve the tool with a straight vertical lift. Reinstall and nipple up the BOP stack.



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Stage 15A — Hang Off the 5-1/2” Casing (Emergency)

NOTE: The following stage should be followed **ONLY** if the 5-1/2” casing should become stuck in the hole. If the casing did not get stuck and is hung off with the mandrel casing hanger, skip this stage.

1. Cement the hole as required.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

2. Drain the BOP stack through the housing upper side outlet valve.

3. Locate the actuation screw on the O.D. of the drilling adapter.

4. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the gland nuts.

WARNING: Keep body clear of all pinch points and suspended loads.

5. Pick up on the BOP stack a minimum of 12” above the housing hub and secure with safety slings.

6. Using a fresh water hose, thoroughly wash out the packoff bowl.

7. Examine the **11” x 5-1/2” MBU-2LR Slip Casing Hanger (Item B21a)**. Verify the following:

- slips and internal bore are clean and in good condition
- all screws are in place

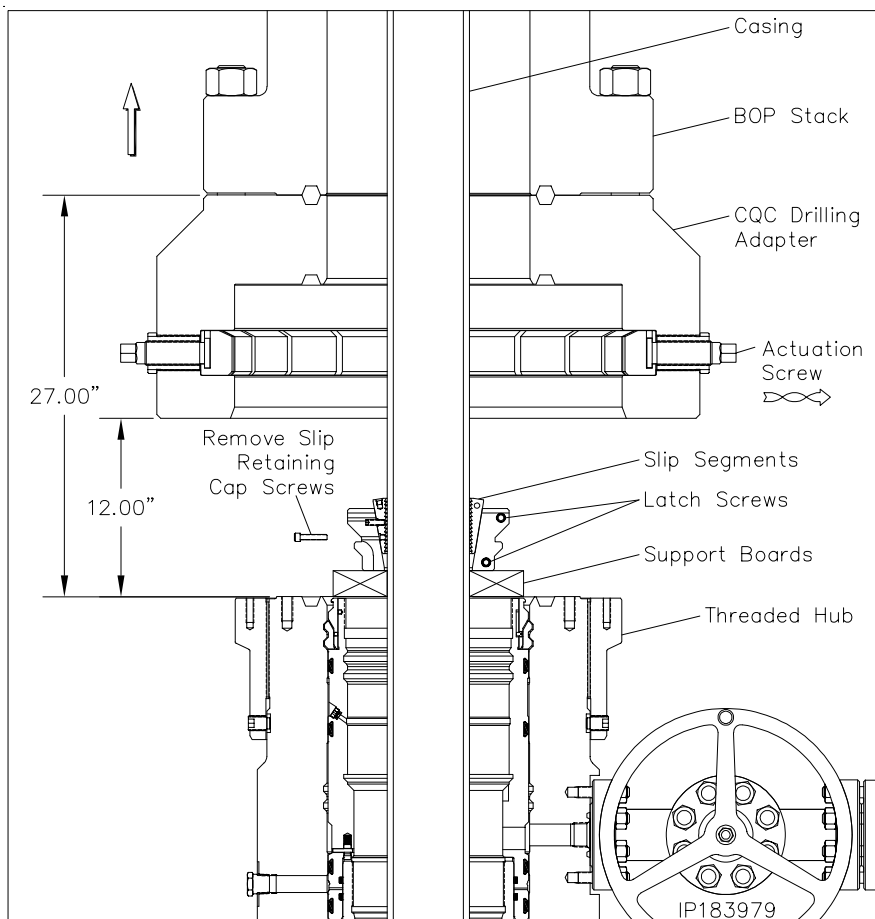
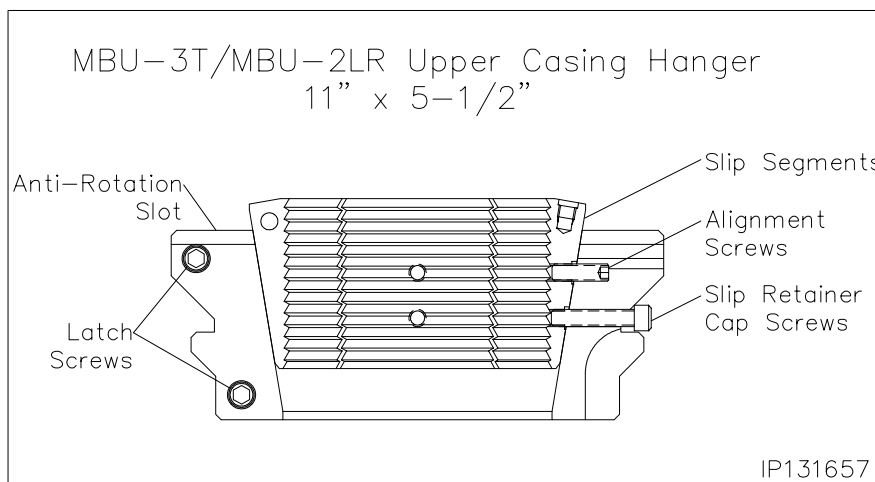
8. Remove the latch cap screws and open the hanger.

9. Place two boards on the housing flange against the casing to support the hanger.

10. Pick up the hanger and place it around the casing and on top of the support boards. Replace the latch screws.

11. Prepare to lower the hanger into the housing bowl.

CAUTION: Do Not drop the casing hanger!



12. Grease the casing hanger body and remove the slip retaining screws.



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Stage 15A — Hang Off the 5-1/2" Casing (Emergency)

13. Remove the boards and allow the hanger to slide into the housing bowl. When properly positioned the top of the hanger will be approximately 11.58" below the top of the housing.
14. Pull tension on the casing to the desired hanging weight and then slack off.

NOTE: A sharp decrease on the weight indicator will signify that the hanger has taken weight. If this does not occur, pull tension again and slack off once more.

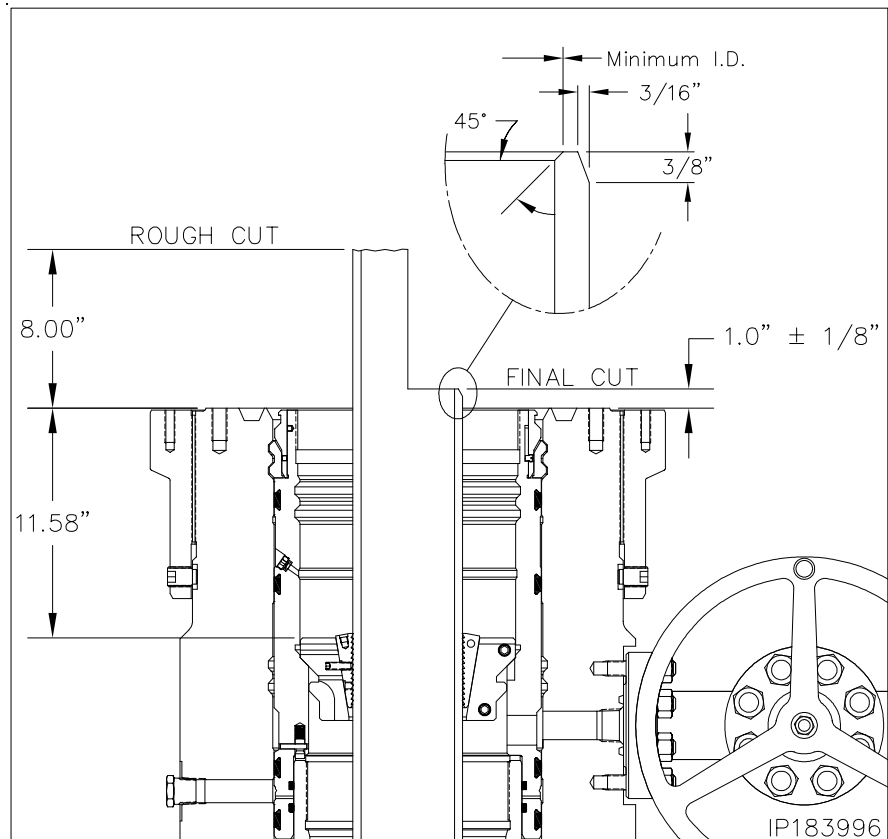
WARNING: Due to the potential fire hazard and the risk of loss of life and property, it is highly recommended to check the casing annulus and pipe bore for gases, with an approved sensing device, prior to cutting the casing. If gas is present, do not use an open flame torch to cut the casing. It will be necessary to use an air driven mechanical cutter which is spark free.

15. Rough cut the casing approximately 8" above the top flange and move the excess casing out of the way.
16. Final cut the casing at 1" \pm 1/8" above the top of the housing.
17. Grind the casing stub level and then place a 3/16" x 3/8" bevel on the O.D. and a I.D. chamfer to match the minimum bore of the packoff to be installed.

CAUTION: There must not be any rough edges on the casing or the seals of the packoff will be damaged.

18. Thoroughly clean the housing bowl, removing all cement and cutting debris.

CAUTION: Do Not reinstall the BOP stack. The emergency packoff is installed open hole and not through the BOP stack.



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Stage 16A — Install the MBU-3T Emergency Packoff

1. Examine the **11" x 5-1/2" x 5" H BPV Thread MBU-3T Inner Emergency Packoff (Item B22a)**.

Verify the following:

- bore and internal seal area are clean and in good condition
- I.D. and O.D. seals are in place and in good condition
- I.D. BPV threads are clean and in good condition

2. Thoroughly clean the I.D. and O.D. of the packoff removing all old grease and debris.

3. Carefully inspect the seals for and damage and replace if necessary.

4. Examine the **4-1/2" IF (NC-50) x 5" H BPV Thread MBU-3T Emergency Packoff Installation Tool (Item ST21)**. Verify the following:

- bore and threads are clean and in good condition

5. Make up the running tool to a joint of drill pipe.

6. Lightly lubricate the mating threads of the tool and the packoff with oil or a light grease.

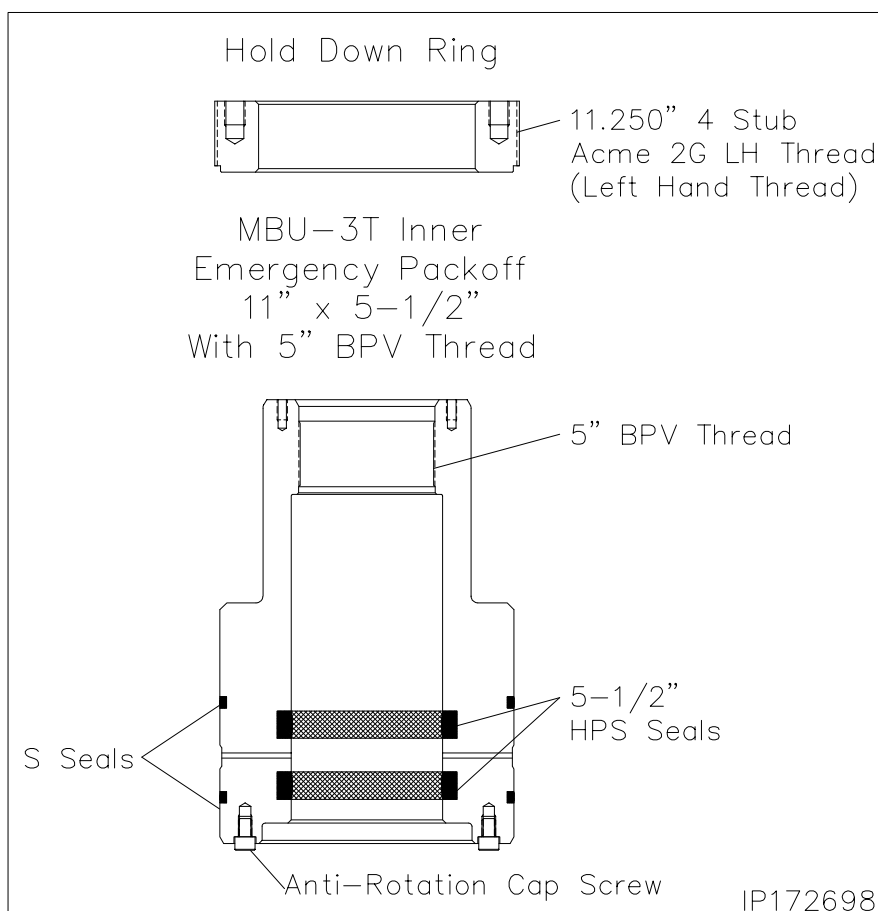
7. Thread the running tool into the top of the hanger with left hand rotation to a positive stop.

8. Thoroughly clean and lightly lubricate the I.D. and O.D. seals of the packoff with oil or light grease.

9. Locate the upper "SEAL TEST" fitting on the O.D. of the housing and remove the dust cap from the fitting.

10. Attach a test pump with test manifold to the open fitting and pump clean test fluid through the fitting and port to dislodge any old grease and trapped debris.

11. Remove the test pump with test manifold and reinstall the fitting dust caps.



IP172698



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Stage 16A — Install the MBU-3T Emergency Packoff

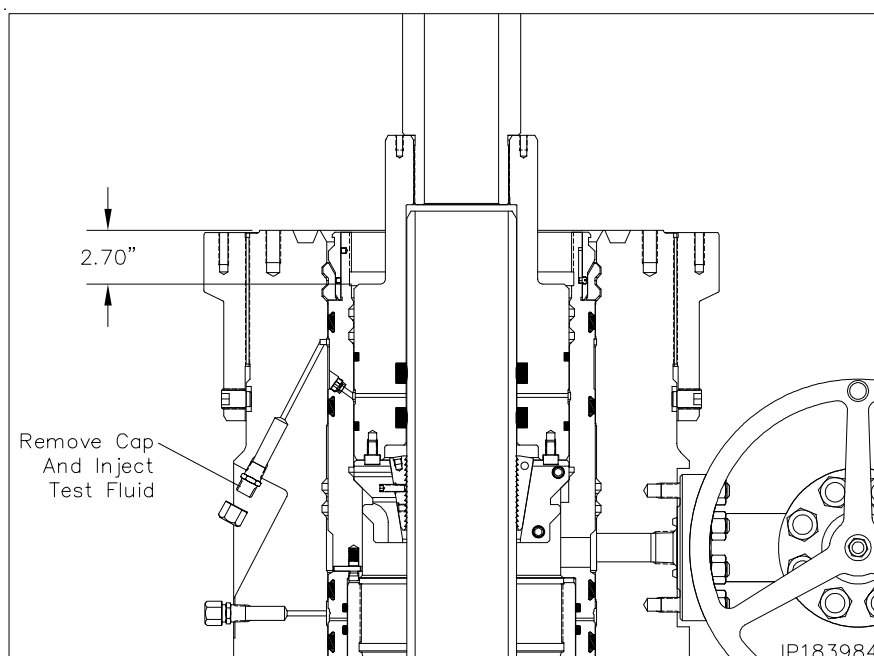
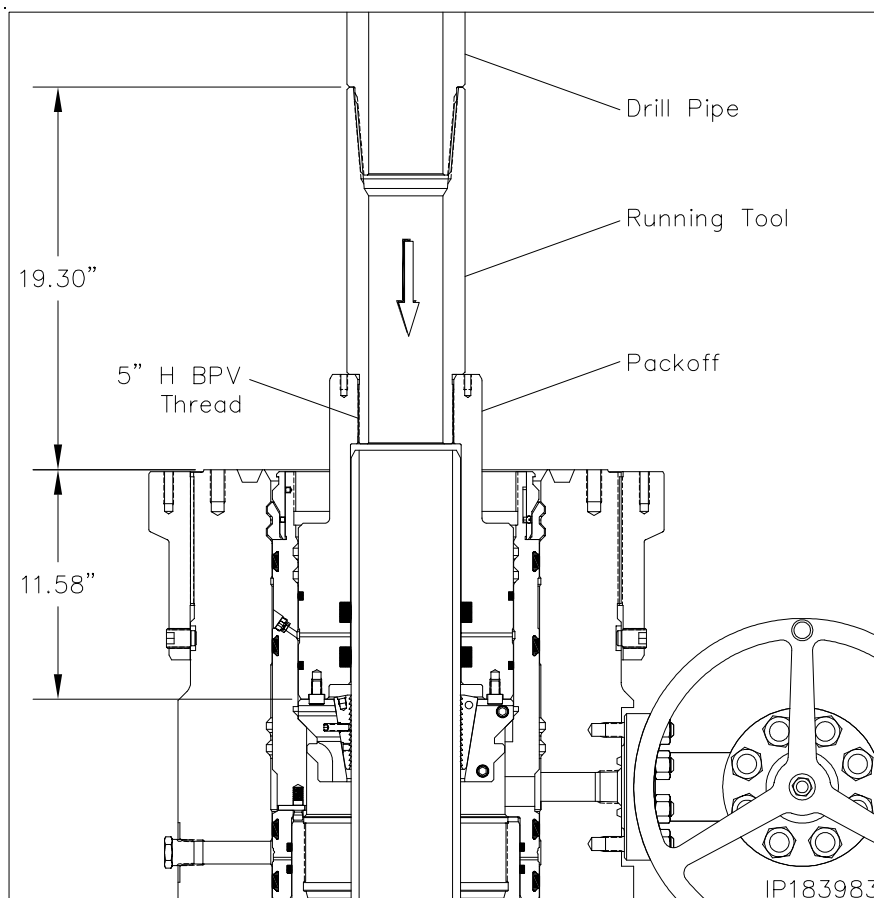
12. Pick up the packoff with running tool and position it over the casing stub.
13. Align the anti-rotation cap screws with the mating slots in the top of the slip bowl.
14. Carefully lower the packoff over the casing stub and push it into the 9-5/8" packoff until it bottoms out on the slip hanger body.

NOTE: When properly positioned the top of the running tool will be approximately 19.30" above the top of the housing.

NOTE: When properly positioned, the main body of the packoff will be 2.70" below the top of the housing flange as indicated.

Seal Test

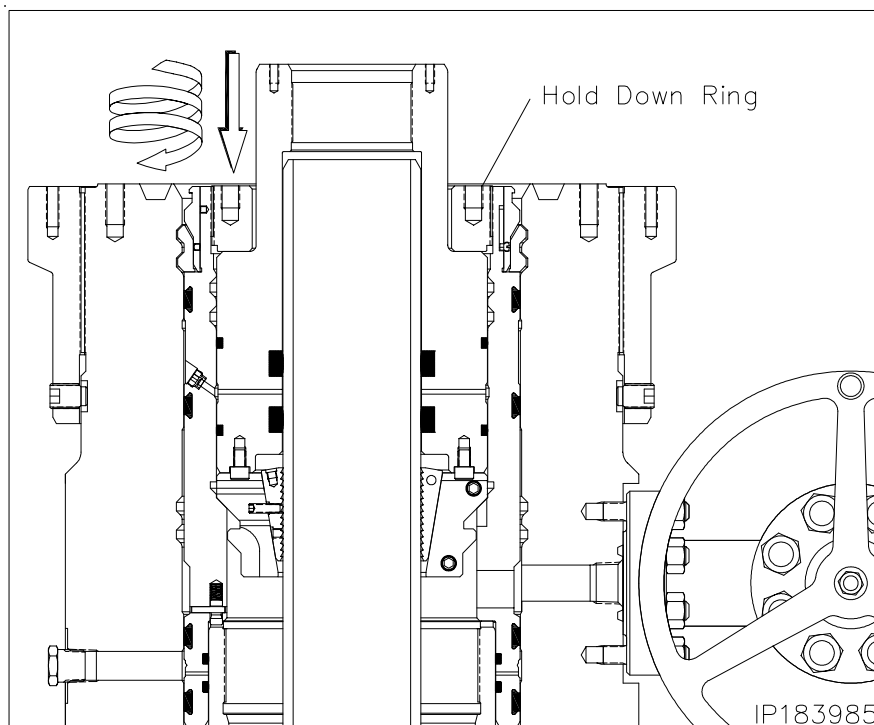
15. Locate the upper "SEAL TEST" fitting on the O.D. of the housing and remove the dust cap from the fitting.
16. Attach a test pump with test manifold to the open fitting and pump clean test fluid between the seals until a stable test pressure of **10,000 psi or 80% of casing collapse - whichever is less** is achieved.
17. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
18. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold.
19. Reinstall the dust cap on the open fitting.



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Stage 16A — Install the MBU-3T Emergency Packoff

20. Thoroughly clean and lightly lubricate the mating Acme threads of the MBU-3T packoff and the packoff **Hold Down Ring (Item B22b)**.
21. Thread the ring into the 9-5/8" packoff with counter clockwise rotation to a positive stop on top of the slip hanger.
22. Using a dry rod, set the **5" Type H One-Way BPV (Item ST22)** in the bore of the packoff. Ensure that the BPV makes a minimum of 6 turns before final make up and break out.

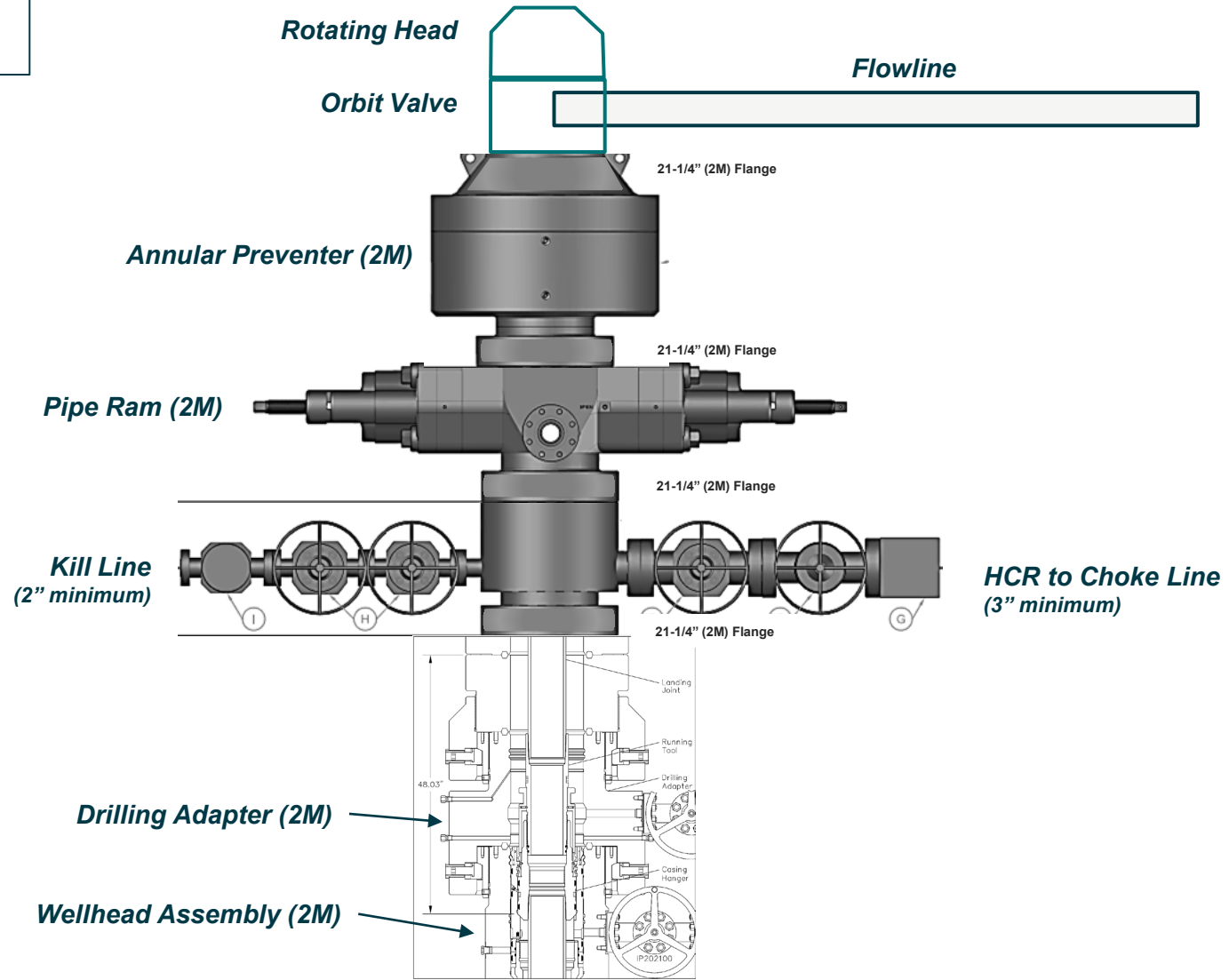


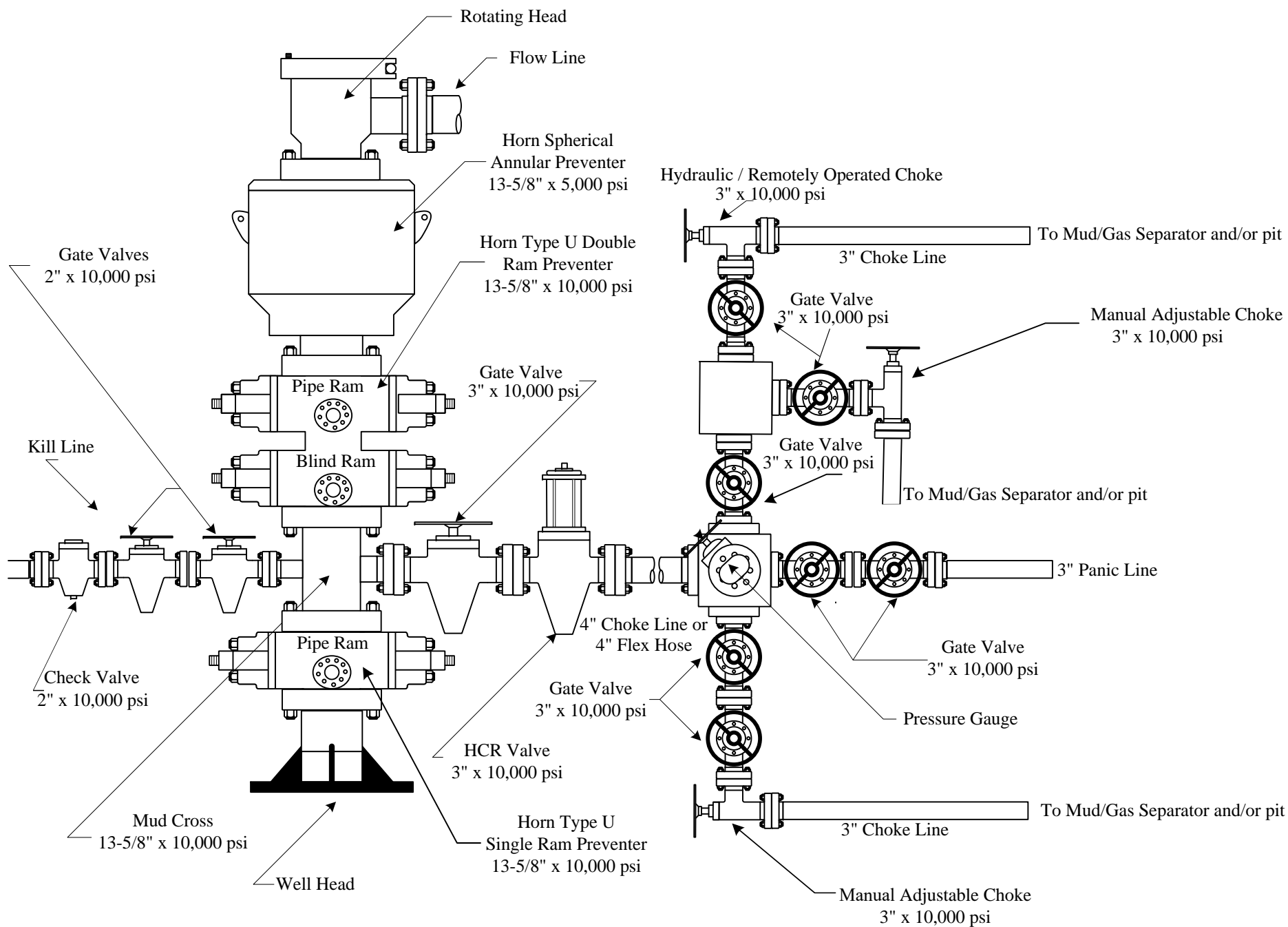
Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

IP1418-1
 Rev. 0
 Page 101

R-111Q - 2M BOPE For First Intermediate

Coterra Energy Co.
Eastwood 353H & 354H
2M BOP
Lea Co., NM
14-3/4" Hole Section







CERTIFICATE OF QUALITY

LTYQ/QR-5.7.1-19B

No: LT2024-156-001


Customer Name			
Product Name	Choke And Kill Hose		
Product Specification	3"×10000psi×35ft (10.67m)	Quantity	1PCS
Serial Number	VTC-7660257	FSL	FSL3
customer number	PO890145-001	Standard	API Spec 16C 3 rd edition
Temperature Range	-29℃ ~+121℃	Inspection date	2024.09.03

Inspection Items	Inspection results
Appearance Checking	In accordance with API Spec 16C 3 rd edition
Size and Lengths	In accordance with API Spec 16C 3 rd edition
Dimensions and Tolerances	In accordance with API Spec 16C 3 rd edition
End Connections: 4-1/16"×10000psi Integral flange for sour gas service	In accordance with API Spec 6A 21 st edition
End Connections: 4-1/16"×10000psi Integral flange for sour gas service	In accordance with API Spec 17D 3 rd edition
Hydrostatic Testing	In accordance with API Spec 16C 3 rd edition
product Marking	In accordance with API Spec 16C 3 rd edition

Inspection conclusion	The inspected items meet standard requirements of API Spec 16C 3 rd edition
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Remarks	16C-0403 
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Approver	Jane C	Auditor	Alice D	Inspector	Leo W
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LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD	
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HYDROSTATIC TESTING REPORT

LTYT/QR-5.7.1-28

No: 24090301

Product Name	Choke And Kill Hose	Standard	API Spec 16C 3 rd edition
Product Specification	3"×10000psi×35ft (10.67m)	Serial Number	VTC-7660257
Inspection Equipment	MTU-BS-1600-3200-E	Test medium	Water
customer number	PO890145-001	Inspection Date	2024.08.30

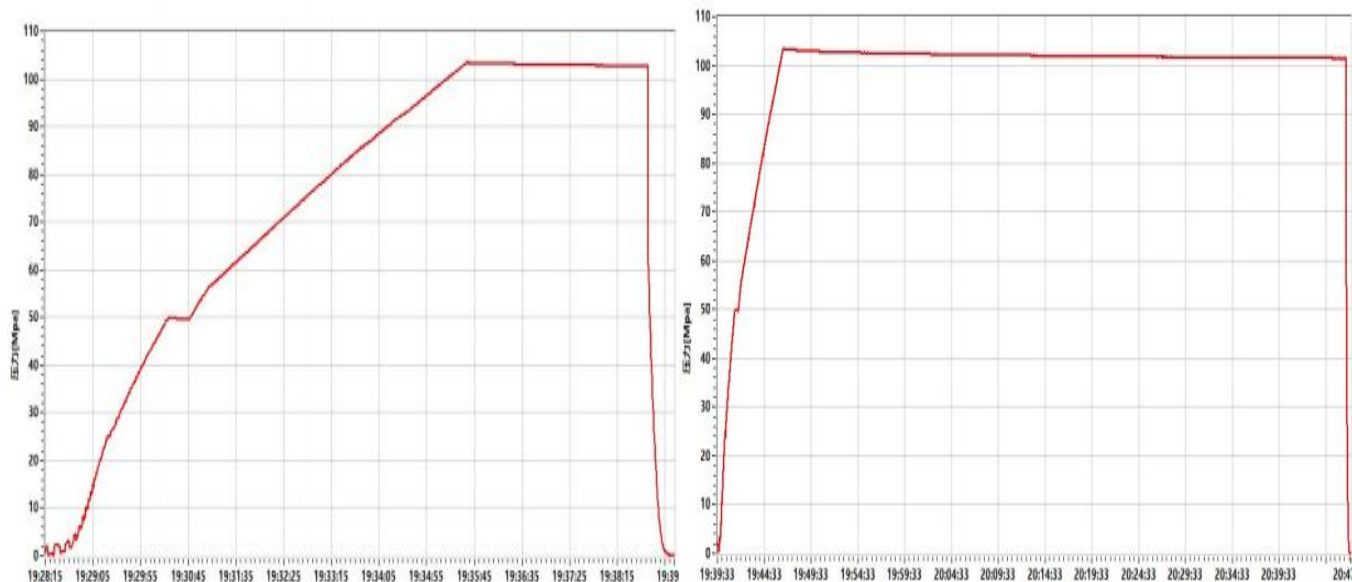
Rate of length change

Standard requirements	At working pressure ,the rate of length change should not more than ±2%
Testing result	10000psi (69.0MPa) ,Rate of length change 0.6%

Hydrostatic testing

Standard requirements	At 1.5 times working pressure, the initial pressure-holding period of not less than three minutes, the second pressure-holding period of not less than one hour, no leakage.
Testing result	15000psi (103.5MPa), 3 min for the first time, 60 min for the second time, no leakage

Graph of pressure testing:



Conclusion	The inspected items meet standard requirements of API Spec 16C 3 rd edition		16C-0403	
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Approver	Jane C	Auditor	Alice D	Inspector	Leo W
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LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD	
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CERTIFICATE OF CONFORMANCE

№:LT24090307

Product Name: Choke And Kill Hose

Product Specification: 3"×10000psi×35ft (10.67m)

Serial Number: VTC-7660257

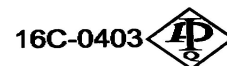
customer number: PO890145-001

End Connections: 4-1/16"×10000psi Integral flange for sour gas service

The Choke And Kill Hose assembly was produced by LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD.in Sep,2024, and inspected by LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD. according to API Spec 16C 3rd edition on Sep 3, 2024. The overall condition is good. This is to certify that the Choke And Kill Hose complies with all current standards and specifications for API Spec 16C 3rd edition .

QC Manager: Jane C

Date:Sep 3, 2024



LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD	
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API BTC

Coupling	Pipe Body
Grade: J55 (Casing)	Grade: J55 (Casing)
Body: Bright Green	1st Band: Bright Green
1st Band: White	2nd Band: -
2nd Band: -	3rd Band: -
3rd Band: -	4th Band: -

Outside Diameter	16.000 in.	Wall Thickness	0.375 in.	Grade	J55 (Casing)
Min. Wall Thickness	87.50 %	Pipe Body Drift	API Standard	Type	Casing
Connection OD Option	Regular				

Pipe Body Data

Geometry				Performance	
Nominal OD	16.000 in.	Drift	15.062 in.	SMYS	55,000 psi
Wall Thickness	0.375 in.	Plain End Weight	62.64 lb/ft	Min UTS	75,000 psi
Nominal Weight	65 lb/ft	OD Tolerance	API	Body Yield Strength	1012 x1000 lb
Nominal ID	15.250 in.			Min. Internal Yield Pressure	2260 psi
				Collapse Pressure	630 psi
				Max. Allowed Bending	16 °/100 ft

Connection Data

Geometry		Performance	
Thread per In	5	Joint Strength	1031 x1000 lb
Connection OD	17 in.	Coupling Face Load	892 x1000 lb
Hand Tight Stand Off	0.875 in.	Internal Pressure Capacity	2260 psi

Notes

For products according to API Standards 5CT & 5B; Performance calculated considering API Technical Report 5C3 (Sections 9 & 10) equations. For geometrical and steel grades combinations not considered in the API Standards 5CT and/or 5B; Performance calculations indirectly derived from API Technical Report 5C3 (Sections 9 & 10) equations. Couplings OD are shown according to current API 5CT 10th Edition.

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1. Geological Formations

TVD of target 10874
MD at TD 20992

Pilot Hole TD N/A
Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	1427	N/A	
Top of Salt	1774	N/A	
Base of Salt	3064	N/A	
Yates	3184	N/A	
Top of Capitan Reef	4160	N/A	
Base of Capitan Reef	5275	N/A	
Lamar/Base Anhydrite	5459	N/A	
Top of Delaware Sands/Bell Canyon	5555	N/A	
Cherry Canyon	6129	N/A	
Brushy Canyon	6875	N/A	
Basal Brushy Canyon	7907	N/A	
Bone Spring Lime	8289	N/A	
Leonard/Avalon Sand	8492	N/A	
Avalon Shale	9054	N/A	
1st Bone Spring Sand	9378	Hydrocarbons	
2nd Bone Spring Sand	9892	Hydrocarbons	
3rd Bone Spring Carb	10347	Hydrocarbons	
3rd Bone Spring Sand	10653	Hydrocarbons	
Wolfcamp	10871	Hydrocarbons	
Wolfcamp X - Target	10874	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1545	1540	16"	65.00	J-55	BT&C	0.95	3.40	10.11
14 3/4	0	3250	3250	10-3/4"	45.50	J-55	BT&C	1.20	2.06	4.84
9 7/8	0	5275	5275	8-5/8"	24.00	K-55	ST&C	0.48	1.08	2.08
8 3/4	0	10348	10304	5-1/2"	20.00	P-110	BT&C	2.18	2.43	2.97
8 3/4	10348	20992	10775	5-1/2"	20.00	P-110	BT&C	2.09	2.32	68.05
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance 43 CFR 3172.

Coterra: H2S Plan



H2S Drilling Operations Plan

Training

All company and contract personnel admitted on location must be trained by a qualified H2S safety instructor to do the following:

1. Characteristics of H2S
2. Physical effects and hazards
3. Principle and operation of H2S detectors, warning system, and briefing areas
4. Evacuation procedure, routes and first aid
5. Proper use of safety equipment & life support systems
6. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

H2S Detection and Alarm Systems

1. H2S sensors/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may be placed as deemed necessary
2. An audio alarm system will be installed on the derrick floor and in the top doghouse

Windsock and/or wind streamers

1. Windsock at mudpit area should be high enough to be visible
2. Windsock on the rig floor and / or top of doghouse should be high enough to be visible

Condition Flags & Signs

1. Warning signs on access road to location
2. Flags are to be displayed on sign at the entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates

Coterra: H2S Plan

danger (H2S present in dangerous concentration). Only H2S trained and certified personnel admitted to location.

Well Control Equipment

1. See the pressure control section of this submission.

Communication

1. While working under masks, chalkboards will be used for communication
2. Hand signals will be used where chalk board is inappropriate.
3. Two way radio will be used to communicate off location in case emergency help is required. In most cases, cellular telephones will be available at most drilling foreman's trailer or living quarters.

Drillstem Testing

1. No DSTs or cores are planned at this time
2. Drilling contractor supervisor will be required to be familiar with the effects that H2S has on tubular goods and other mechanical equipment.
3. If H2S is encountered, mud system will be altered if necessary to maintain control of the well. A mud gas separator will be brought into service along with H2S scavenger if necessary.

Coterra: H2S Plan

H2S Contingency Plan

Emergency Procedures

In the event of an H2S release, the first responder(s) must:

1. Isolate the area and prevent entry by other persons into the 100 PPM ROE.
2. Evacuate any public places encompassed by the 100 PPM ROE.
3. Be equipped with H2S monitors and air packs in order to control the release.
4. Use the buddy system
5. Take precautions to avoid personal injury during this operation
6. Contact operator and/or local officials to aid in operation. See list of emergency contacts attached.
7. Have received training the detection of H2S, measures for protection against the gas, and equipment used for protection and emergency response

Ignition of the Gas Source

1. Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO₂). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas

Contacting Authorities

1. Coterra personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours.
2. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. Coterra's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER).

Coterra: H2S Plan

Emergency Contacts

Coterra Energy

Charlie Pritchard: Drilling Operations Manager: 432 – 238 – 7084

Darrell Kelly: Vice President EHS: 281 – 589 – 5795

Third Party

PERMIAN REGION CONTACT NUMBERS					
CALL 911					
Air Ambulance Services					
Reeves County Medical - Pecos, TX		432-447-3551			
Aero Care - Midland, TX		800-627-2376			
Tri State Care Flight- Artesia, NM		800-800-0900			
Air Methods - Hobbs, NM		800-242-6199			
Fire / Police / Medical Care					
Sheriff's Office		Fire Departments		Hospital / Medical Care Facilities	
Andrews County	432-523-5545	Andrews	432-523-3111	Permian Regional Med.	432-523-2200
Reagan County	325-884-2929	Big Lake	325-884-3650	Reagan Memorial Hosp.	325-884-2561
Howard County	432-264-2244	Big Springs	432-264-2303	Scenic Mountain Med Ctr	432-263-1211
Terry County	806-637-2212	Brownfield	806-637-6633		
Crane County	432-558-3571	Crane	432-558-2361	Crane Memorial Hosp.	432-558-3555
Val Verde County	830-774-7513	Del Rio	830-774-8648	Val Verde Regional Med.	830-775-8566
		Denver City	806-592-3516	Yoakum County Hospital	806-592-2121
Pecos County	432-336-3521	Ft Stockton	432-336-8525		
Glasscock County	432-354-2361	Garden City			
Winkler County	432-586-3461	Kernit	432-586-2577	Winkler County Memorial	432-586-5864
		McCamey	432-652-8232	McCamey Hospital	432-652-8626
Loving County	432-377-2411	Mentone			
Irion County	325-835-2551	Mertzton			
Ward County	432-943-6703	Monahans	432-943-2211	Ward Memorial Hospital	432-943-2511
Ector County	432-335-3050	Odessa	432-335-4650	Odessa Regional Hosp.	432-582-8340
Crocket County	325-392-2661	Ozona	325-392-2626		
Reeves County	432-445-4901	Pecos	505-757-6511	Reeves County Hospital	432-447-3551
Yoakum County	806-456-2377	Plains	806-456-2288		
Garza County	806-495-3595	Post			
Upton County	432-693-2422	Rankin			
Coke County	915-453-2717	Robert Lee			
		Roscoe	325-766-3931		
Hockley County	806-894-3126	Levelland	806-894-3155	Covenant Health	806-894-4963
Tom Green County	325-655-8111	San Angelo	325-657-4355	San Angelo Comm. Med.	325-949-9511
Gaines County	432-758-9871	Seminole	432-758-3621	Memorial Hospital	432-758-5811
Terrell County	432-345-2525	Sanderson			
Scurry County	325-573-3551	Snyder	325-573-3546	DM Cogdell Memorial	325-573-6374
Sterling County	325-378-4771	Sterling City			
Nolan County	325-235-5471	Sweetwater	325-235-8130	Rolling Plains Memorial	325-235-1701
Culberson County	432-283-2060	Van Horn		Culberson Hospital	432-283-2760
New Mexico					
Lea County	505-396-3611	Knowles	505-392-7469	Lea Reg Med Ctr	575-492-5000
Eddy County	575-887-7551	Carlsbad	575-885-3125	Carlsbad Medical	575-887-4100
		Artesia	575-746-5050	Artesia Hospital	575-748-3333
Roosevelt County	575-356-4408				
Chaves County	575-624-7590				
Ground Ambulance Services					
Reeves County Medical		Pecos, TX		432-447-3551	



Coterra Eastwood 36-25 Federal Com 404H Rev1 kFc 07Nov25 Proposal
Geodetic Report

Def Plan

Report Date:	November 07, 2025 - 02:49 PM (UTC 0)	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Coterra	Vertical Section Azimuth:	359.760 °(GRID North)
Field:	NM Lea County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Coterra - Eastwood 36-25 Federal Com Pad / Eastwood 36-25 Federal	TVD Reference Datum:	RKB
Well:	Eastwood 36-25 Federal Com 404H	TVD Reference Elevation:	3629.400 ft above MSL
Borehole:	Eastwood 36-25 Federal Com 404H	Seabed / Ground Elevation:	3606.400 ft above MSL
UBHI / API#:	Unknown / Unknown	Magnetic Declination:	6.105°
Survey Name:	Coterra Eastwood 36-25 Federal Com 404H Rev1 kFc 07Nov25	Total Gravity Field Strength:	998.5092mgm (9.80665 Based)
Survey Date:	November 07, 2025	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	102.342 ° / 10722.918 ft / 6.326 / 0.886	Total Magnetic Field Strength:	47423.659 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	60.324°
Location Lat / Long:	32°36'38.37421"N, 103°36'37.00501"W	Declination Date:	November 07, 2025
Location Grid N/E Y/X:	N 586645.830 RUS, E 763979.910 RUS	Magnetic Declination Model:	HOGM 2025
CRS Grid Convergence Angle:	0.39°	North Reference:	Grid North
Grid Scale Factor:	0.99996586(Applied)	Grid Convergence Used:	0.39°
Version / Patch:	2025.1.0.1	Total Corr Mag North->Grid North:	5.716°
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (RUS)	Easting (RUS)	Latitude (°)	Longitude (°)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)
SHL [463FSL, 641FEL]	0.00	0.00	0.00	0.00	-3,629.40	0.00	0.00	0.00	586,645.83	763,979.91	32.61065950	-103.61027919			
Nudge, Build 2"/100ft	2,500.00	0.00	182.78	2,500.00	-1,129.40	0.00	0.00	0.00	586,645.83	763,979.91	32.61065950	-103.61027919	0.00	0.00	0.00
Hold	2,799.92	6.00	182.78	2,799.37	-830.03	-15.66	-15.67	-0.76	586,630.16	763,979.15	32.61061946	-103.61026200	2.00	2.00	0.00
Drop 2"/100ft	5,979.12	6.00	182.78	5,961.17	2,331.77	-347.43	-347.51	-16.88	586,298.34	763,963.03	32.60070472	-103.61034167	0.00	0.00	0.00
Hold	6,279.04	0.00	182.78	6,260.54	2,631.14	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60968168	-103.61034449	2.00	-2.00	0.00
KOP, Build 10"/100ft	10,304.04	0.00	182.78	10,285.54	6,656.14	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60968168	-103.61034449	0.00	0.00	0.00
Build 5"/100ft	11,054.04	75.00	359.76	10,838.97	7,209.57	61.57	61.49	-19.42	586,707.32	763,960.49	32.61082886	-103.61034089	10.00	10.00	0.00
Landing Point	11,360.84	90.34	359.76	10,878.00	7,248.60	364.95	364.87	-20.69	587,010.69	763,959.22	32.61168271	-103.61033831	5.00	5.00	0.00
	11,460.84	90.34	359.76	10,877.41	7,248.01	464.95	464.87	-21.11	587,110.68	763,958.80	32.61193755	-103.61033747	0.00	0.00	0.00
	11,461.10	90.35	359.76	10,877.41	7,248.01	465.22	465.13	-21.11	587,110.94	763,958.80	32.61193827	-103.61033746	2.00	1.94	-0.50
Eastwood 36-25 Federal Com 404H - BHL [100FNL, 660FEL]	20,992.28	90.35	359.76	10,820.00	7,190.60	9,996.22	9,996.05	-81.25	586,641.52	763,918.66	32.63813393	-103.61025722	0.00	0.00	0.00

Survey Type: Def Plan
Survey Error Model: ISCVSA Rev 4 *** 3-D 95 % Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Code	Vendor / Tool	Borehole / Survey
	1	0.000	10,300.000	1/100.000	12.25 - 8.75 - 6	9.625 - 7 - 4.5		A001Mb_MWD		Eastwood 36-25 Federal Com 404H / Coterra East
	1	10,300.000	20,992.263	1/100.000	6	4.5		A008Mb_MWD+FR1+MS		Eastwood 36-25 Federal Com 404H / Coterra East

EOU Geometry:

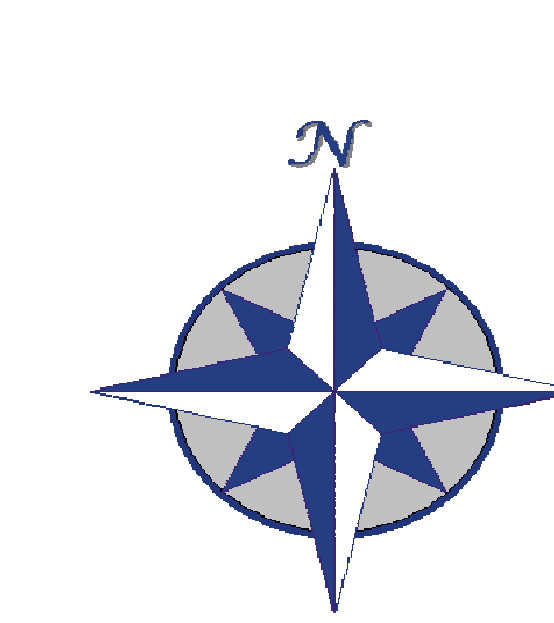
End MD (ft)	Hole Size (in)	Casing Size (in)	Name
1,182.400	17.500	13.375	
5,899.921	12.250	9.625	
7,800.902	8.750	7.000	
20,992.283	6.000	4.500	



Borehole: Eastwood 36-25 Federal Com 404H	Well: Eastwood 36-25 Federal Com 404H	Field: NM Lea County (NAD 83)	Structure: Coterra - Eastwood 36-25 Federal Com Pad
-----------------------------------------------------	-------------------------------------------------	-----------------------------------------	---------------------------------------------------------------

Gravity & Magnetic Parameters		Surface Location		NAD83 New Mexico State Plane, Eastern Zone, US Feet		Miscellaneous	
Model: HDGM 2025	Dip: 60.324°	Date: 07-Nov-2025	Lat: N 32 36 38.37	Northing: 586645.83ftUS	Grid Conv: 0.3897°	Slot: Eastwood 36-25	TVD Ref: RKB (3629.400 ft above MSL)
MagDec: 6.105°	FS: 47423.659NT	Gravity FS: 998.509mgn (9.80665 Based)	Lon: W 103 36 37.01	Easting: 763979.91ftUS	Scale Fact: 0.99996586	Plan: Eastwood 36-25 Federal Com 404H Coterra Eastwood 36-25 Federal Com 404H Rev1 kFc 07Nov25	

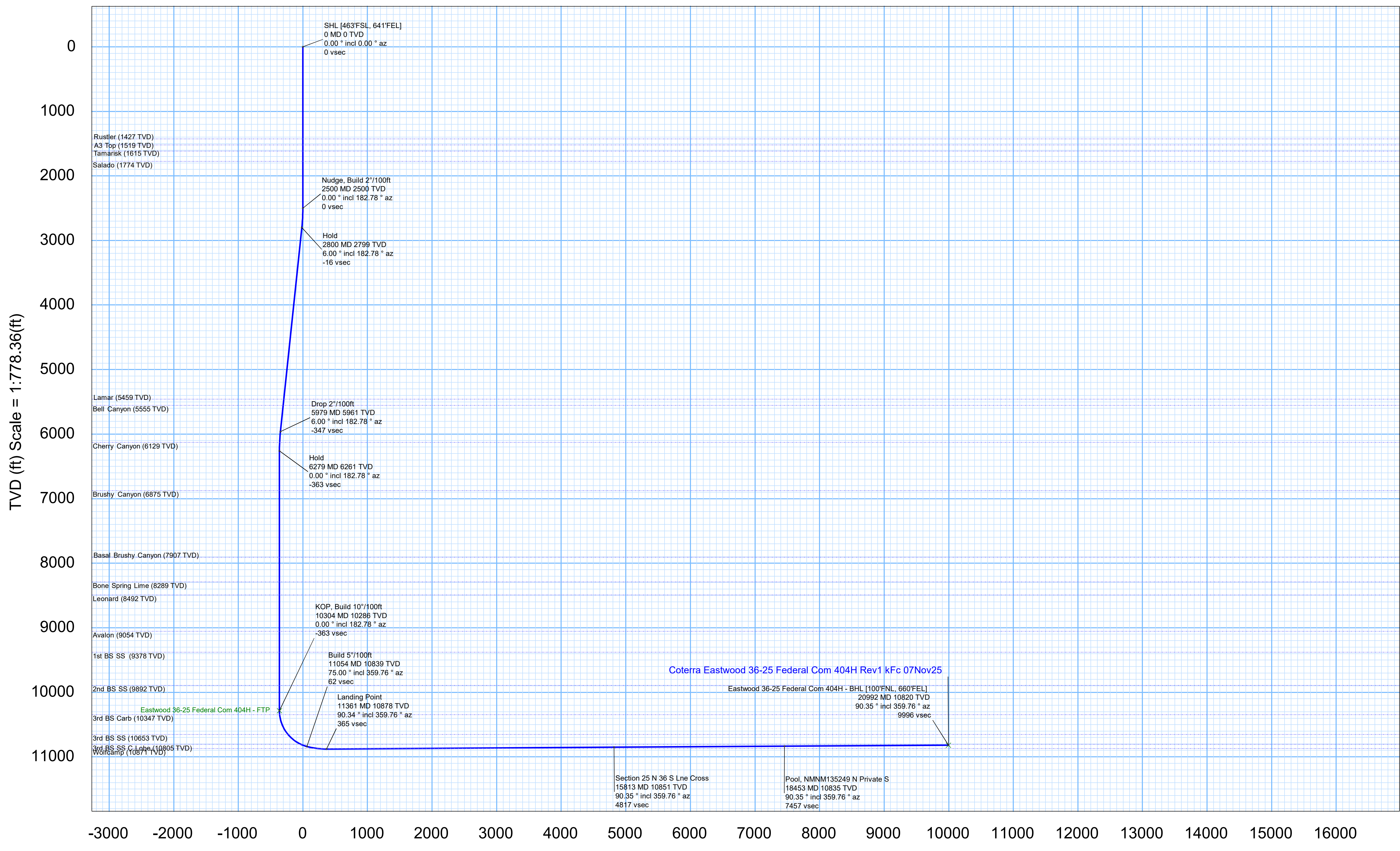
Critical Point	Critical Points							DLS
	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	
SHL [463FSL, 641FEL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler	1427.00	0.00	182.78	1427.00	0.00	0.00	0.00	0.00
A3 Top	1519.00	0.00	182.78	1519.00	0.00	0.00	0.00	0.00
Tamarisk	1615.00	0.00	182.78	1615.00	0.00	0.00	0.00	0.00
Salado	1774.00	0.00	182.78	1774.00	0.00	0.00	0.00	0.00
Nudge, Build 2"/100ft	2500.00	0.00	182.78	2500.00	0.00	0.00	0.00	0.00
Hold	2799.92	6.00	182.78	2799.92	-15.66	-15.67	-0.76	2.00
Lamar	5474.19	6.00	182.78	5459.00	-294.74	-294.80	-14.32	0.00
Bell Canyon	5570.72	6.00	182.78	5555.00	-304.81	-304.88	-14.81	0.00
Drop 2"/100ft	5979.12	6.00	182.78	5961.17	-347.43	-347.51	-16.88	0.00
Cherry Canyon	6147.46	2.63	182.78	6129.00	-360.08	-360.16	-17.49	2.00
Hold	6279.04	0.00	182.78	6260.54	-363.10	-363.17	-17.64	2.00
Brushy Canyon	6893.50	0.00	182.78	6875.00	-363.10	-363.17	-17.64	0.00
Basal Brushy Canyon	7925.50	0.00	182.78	7907.00	-363.10	-363.17	-17.64	0.00
Bone Spring Lime	8307.50	0.00	182.78	8289.00	-363.10	-363.17	-17.64	0.00
Leonard	8510.50	0.00	182.78	8492.00	-363.10	-363.17	-17.64	0.00
Avalon	9072.50	0.00	182.78	9054.00	-363.10	-363.17	-17.64	0.00
1st BS SS	9396.50	0.00	182.78	9378.00	-363.10	-363.17	-17.64	0.00
2nd BS SS	9910.50	0.00	182.78	9892.00	-363.10	-363.17	-17.64	0.00
KOP, Build 10"/100ft	10304.04	0.00	182.78	10285.54	-363.10	-363.17	-17.64	0.00
3rd BS Carb	10365.62	6.16	359.76	10347.00	-359.79	-359.87	-17.65	10.00
3rd BS SS	10702.96	39.89	359.76	10653.00	-229.74	-229.82	-18.20	10.00
3rd BS SS C Lobe	10954.48	65.04	359.76	10805.00	-31.89	-31.97	-19.03	10.00
Build 5"/100ft	11054.04	75.00	359.76	10838.97	61.57	61.49	-19.42	10.00
Wolfcamp	11227.13	83.65	359.76	10871.00	231.50	231.42	-20.13	5.00
Landing Point	11360.84	90.34	359.76	10878.00	364.95	364.87	-20.69	5.00
Wolfcamp	11460.84	90.34	359.76	10877.41	464.95	464.87	-21.11	0.00
	11461.10	90.35	359.76	10877.41	465.22	465.13	-21.11	2.00
Wolfcamp	12524.66	90.35	359.76	10871.00	1528.65	1528.65	-25.59	0.00
Section 25 N 36 S Lne Cross	15813.45	90.35	359.76	10851.19	4817.48	4817.36	-39.44	0.00
Pool, NMNM135249 N Private S	18452.96	90.35	359.76	10835.29	7456.94	7456.80	-50.56	0.00
Eastwood 36-25 Federal Com 404H - BHL [100°FNL, 660°FEL]	20992.28	90.35	359.76	10820.00	9996.22	9996.05	-61.25	0.00



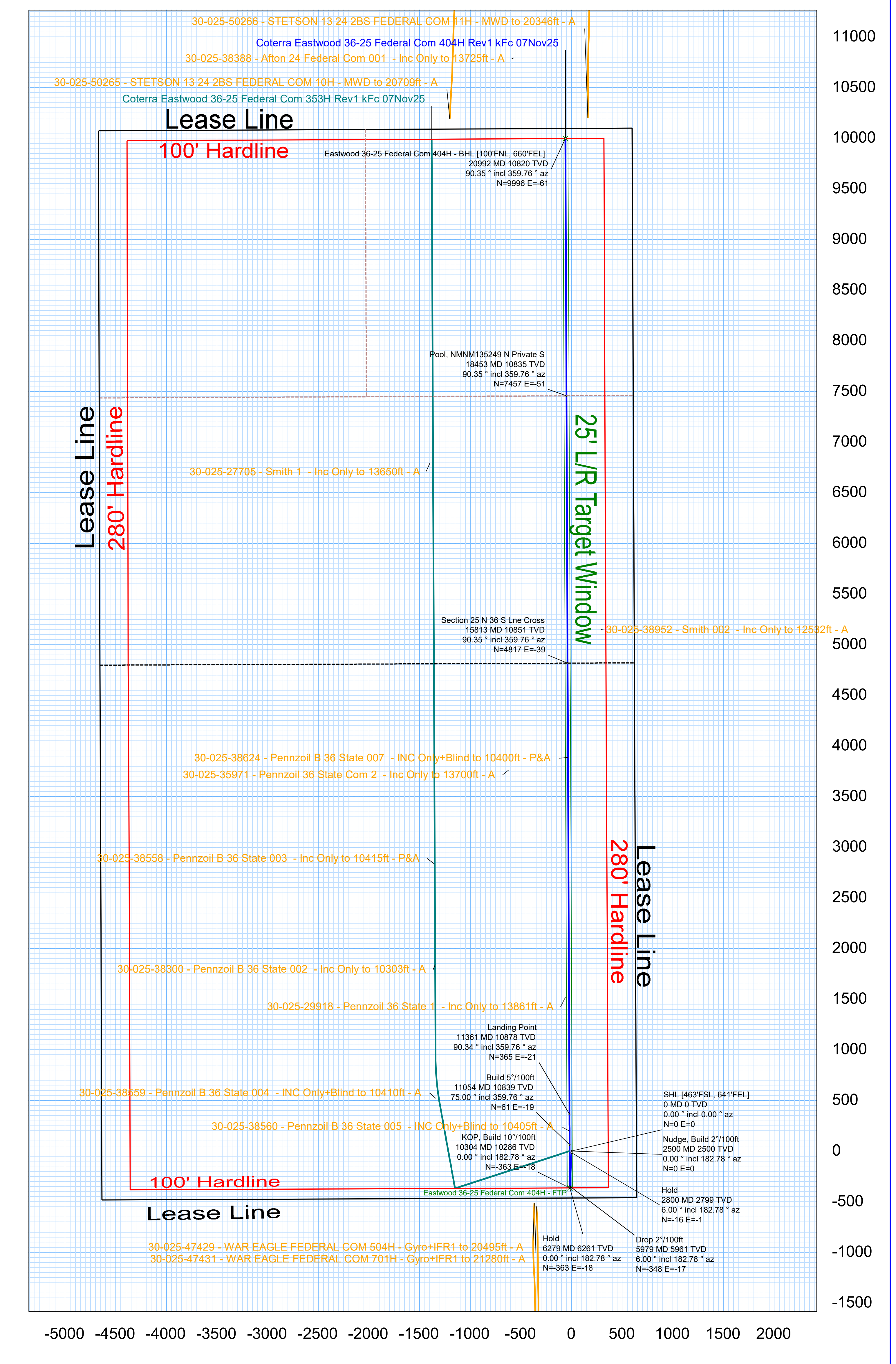
Grid
True
Mag

Grid North
Tot Corr (M->G 5.716°)
Mag Dec (6.105°)
Grid Conv (0.390°)

CONTROLLED	
Plan ref	Coterra Eastwood 36-25 Federal Com 404H Rev1 kFc 07Nov25
Drawing ref	
Copy number	of 3
Date	07-Nov-2025
1 Client	
2 Client	
3 Office	
4 Office	
Copy number	for



NS (ft) Scale = 1:550.00(ft)



EW (ft) Scale = 1:550.00(ft)



Coterra Eastwood 36-25 Federal Com 404H Rev1 kFc 07Nov25 Proposal

Geodetic Report

Def Plan

Report Date: November 07, 2025 - 02:46 PM (UTC 0)
Client: Coterra
Field: NM Lea County (NAD 83)
Structure / Slo: Coterra - Eastwood 36-25 Federal Com Pad / Eastwood 36-25 Federal
Well: Eastwood 36-25 Federal Com 404H
Borehole: Eastwood 36-25 Federal Com 404H
UBH / API#: Unknown / Unknown
Survey Name: Coterra Eastwood 36-25 Federal Com 404H Rev1 kFc 07Nov25
Survey Date: November 07, 2025
Tort / AHD / DDI / ERD Ratio: 102.342' / 10722.918 ft / 6.326 / 0.986
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: 32°36'38.37421"N, 103°30'37.06507"W
Location Grid NE YX: N 886645.830 RUS, E 763979.910 RUS
CRS Grid Convergence Angle: 0.39°
Grid Scale Factor: 0.99998586(Applied)
Version / Patch: 2025.1.0.1

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359.760 (GRID North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3629.400 ft above MSL
Seated / Ground Elevation: 3806.400 ft above MSL
Magnetic Declination: 6.105°
Total Gravity Field Strength: 998.5002mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47423.659 nT
Magnetic Dip Angle: 60.324°
Declination Date: November 07, 2025
Magnetic Declination Model: HDGM 2025
North Reference: Grid North
Grid Convergence Used: 0.39°
Total Corr Mag North-Grid North: 5.716"
Local Coord Referenced To: Well Head

Table with columns: Comments, MD (ft), Incl (°), Azim (°), TVD (ft), TVD50 (ft), VSEC (ft), NS (ft), EW (ft), Northing (RUS), Easting (RUS), Latitude (°), Longitude (°), DLS (ft/100ft), BR (ft/100ft), TR (ft/100ft). Rows include SHL [463FSL, 641FEL], Rustler, A3 Top, Tamarisk, Salado, Nudge, Build 2'100ft, Hold, Lamar, Bell Canyon, Drop 2'100ft, Cherry Canyon, Hold, Brushy Canyon, Basal Brushy Canyon, Bone Spring Line, and Leonard.

Comments	MD (ft)	Incl (°)	Azimuth (°)	TVD (ft)	TVSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (RUS)	Easting (RUS)	Latitude (°)	Longitude (°)	DLS (#100ft)	BR (#100ft)	TR (#100ft)
Avalon	8,900.00	0.00	182.78	8,881.50	5,252.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,000.00	0.00	182.78	8,981.50	5,352.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,072.50	0.00	182.78	9,054.00	5,424.60	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,100.00	0.00	182.78	9,081.50	5,452.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,200.00	0.00	182.78	9,181.50	5,552.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,300.00	0.00	182.78	9,281.50	5,652.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,396.50	0.00	182.78	9,378.00	5,749.60	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,400.00	0.00	182.78	9,381.50	5,752.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,500.00	0.00	182.78	9,481.50	5,852.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,600.00	0.00	182.78	9,581.50	5,952.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,700.00	0.00	182.78	9,681.50	6,052.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,800.00	0.00	182.78	9,781.50	6,152.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,900.00	0.00	182.78	9,881.50	6,252.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	9,974.50	0.00	182.78	9,922.00	6,282.60	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	10,000.00	0.00	182.78	9,981.50	6,352.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	10,100.00	0.00	182.78	10,081.50	6,452.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	10,200.00	0.00	182.78	10,181.50	6,552.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	10,300.00	0.00	182.78	10,281.50	6,652.10	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	10,304.04	0.00	182.78	10,285.54	6,656.14	-363.10	-363.17	-17.64	586,282.67	763,962.27	32.60966168	-103.61034449	0.00	0.00	0.00
	10,365.62	6.16	359.76	10,347.00	6,717.60	-359.79	-359.87	-17.65	586,285.98	763,962.26	32.60967077	-103.61034446	10.00	10.00	0.00
	10,400.00	0.00	182.78	10,381.05	6,751.65	-355.08	-355.16	-17.67	586,290.24	763,962.24	32.60966371	-103.61034442	10.00	10.00	0.00
	10,500.00	0.00	359.76	10,477.70	6,848.30	-329.89	-329.99	-17.64	586,315.85	763,962.78	32.60967529	-103.61034421	5.00	5.00	0.00
	10,600.00	0.00	359.76	10,568.51	6,938.11	-288.34	-288.42	-17.95	586,357.42	763,961.96	32.60968714	-103.61034386	10.00	10.00	0.00
	10,700.00	39.60	359.76	10,650.72	7,021.32	-231.64	-231.71	-18.19	586,414.12	763,961.72	32.61002299	-103.61034337	10.00	10.00	0.00
	10,702.96	39.89	359.76	10,653.00	7,023.60	-229.74	-229.82	-18.20	586,416.02	763,961.71	32.61002019	-103.61034336	10.00	10.00	0.00
	10,800.00	49.60	359.76	10,721.84	7,092.44	-161.52	-161.59	-18.49	586,484.24	763,961.43	32.61021572	-103.61034278	10.00	10.00	0.00
	10,900.00	59.60	359.76	10,779.70	7,150.30	-80.11	-80.19	-18.83	586,565.64	763,961.08	32.61043946	-103.61034209	10.00	10.00	0.00
	10,954.48	59.54	359.76	10,805.00	7,175.60	-30.91	-30.97	-19.03	586,616.20	763,960.86	32.61057200	-103.61034168	10.00	10.00	0.00
	11,000.00	69.60	359.76	10,822.55	7,191.15	10.11	10.12	-20.20	586,675.85	763,959.20	32.61177033	-103.61034132	10.00	10.00	0.00
	11,054.04	75.00	359.76	10,838.97	7,209.57	61.57	61.49	-19.42	586,707.32	763,960.49	32.61028886	-103.61034089	10.00	10.00	0.00
	11,100.00	77.30	359.76	10,849.98	7,220.58	106.19	106.11	-19.61	586,751.93	763,960.30	32.61095149	-103.61034051	5.00	5.00	0.00
	11,200.00	82.30	359.76	10,867.68	7,238.28	204.58	204.49	-20.02	586,850.32	763,959.89	32.61122191	-103.61033967	5.00	5.00	0.00
	11,227.13	83.65	359.76	10,871.00	7,241.60	231.50	231.42	-20.13	586,877.24	763,959.78	32.61129591	-103.61033945	5.00	5.00	0.00
	11,300.00	87.30	359.76	10,876.75	7,247.35	304.13	304.05	-20.44	586,948.87	763,959.48	32.61149554	-103.61033883	5.00	5.00	0.00
	11,360.84	89.24	359.76	10,878.00	7,248.60	360.95	360.87	-20.89	587,019.62	763,959.22	32.61166271	-103.61033821	5.00	5.00	0.00
	11,400.00	90.34	359.76	10,877.77	7,248.21	404.11	404.03	-20.85	587,049.84	763,959.06	32.61177033	-103.61033777	5.00	5.00	0.00
	11,460.84	90.34	359.76	10,877.41	7,248.01	464.95	464.87	-21.11	587,110.68	763,958.80	32.61193755	-103.61033747	5.00	5.00	0.00
	11,461.10	90.35	359.76	10,877.41	7,248.01	465.22	465.13	-21.11	587,110.94	763,958.80	32.61193827	-103.61033746	2.00	1.94	-0.50
	11,500.00	90.35	359.76	10,877.17	7,247.77	504.11	504.02	-21.27	587,149.84	763,958.64	32.61204517	-103.61033714	0.00	0.00	0.00
	11,600.00	90.35	359.76	10,876.57	7,247.17	604.11	604.02	-21.70	587,249.83	763,958.22	32.61232001	-103.61033630	0.00	0.00	0.00
	11,700.00	90.35	359.76	10,875.97	7,246.57	704.11	704.02	-22.12	587,349.82	763,957.79	32.61259486	-103.61033545	0.00	0.00	0.00
	11,800.00	90.35	359.76	10,875.36	7,245.96	804.11	804.02	-22.52	587,449.82	763,957.37	32.61286970	-103.61033461	0.00	0.00	0.00
	11,900.00	90.35	359.76	10,874.75	7,245.36	904.11	904.01	-22.96	587,549.81	763,956.95	32.61314454	-103.61033377	0.00	0.00	0.00
	12,000.00	90.35	359.76	10,874.16	7,244.76	1,004.10	1,004.01	-23.38	587,649.81	763,956.53	32.61341938	-103.61033293	0.00	0.00	0.00
	12,100.00	90.35	359.76	10,873.56	7,244.16	1,104.10	1,104.01	-23.80	587,749.80	763,956.11	32.61369422	-103.61033209	0.00	0.00	0.00
	12,200.00	90.35	359.76	10,872.96	7,243.56	1,204.10	1,204.01	-24.22	587,849.79	763,955.69	32.61396907	-103.61033125	0.00	0.00	0.00
	12,300.00	90.35	359.76	10,872.35	7,242.95	1,304.10	1,304.00	-24.64	587,949.79	763,955.27	32.61424391	-103.61033041	0.00	0.00	0.00
	12,400.00	90.35	359.76	10,871.75	7,242.35	1,404.09	1,404.00	-25.06	588,049.78	763,954.85	32.61451875	-103.61032957	0.00	0.00	0.00
	12,500.00	90.35	359.76	10,871.15	7,241.75	1,504.09	1,504.00	-25.49	588,149.77	763,954.43	32.61479359	-103.61032873	0.00	0.00	0.00
	12,524.66	90.35	359.76	10,871.00	7,241.60	1,504.09	1,504.00	-25.49	588,149.77	763,954.43	32.61479359	-103.61032873	0.00	0.00	0.00
	12,600.00	90.35	359.76	10,870.55	7,241.15	1,604.09	1,604.00	-25.91	588,249.77	763,954.00	32.61506844	-103.61032789	0.00	0.00	0.00
	12,700.00	90.35	359.76	10,869.94	7,240.54	1,704.09	1,703.99	-26.33	588,349.76	763,953.58	32.61534328	-103.61032704	0.00	0.00	0.00
	12,800.00	90.35	359.76	10,869.34	7,239.94	1,804.09	1,803.99	-26.75	588,449.75	763,953.16	32.61561812	-103.61032620	0.00	0.00	0.00
	12,900.00	90.35	359.76	10,868.74	7,239.34	1,904.08	1,903.99	-27.17	588,549.75	763,952.74	32.61589296	-103.61032536	0.00	0.00	0.00
	13,000.00	90.35	359.76	10,868.14	7,238.74	2,004.08	2,003.98	-27.59	588,649.74	763,952.32	32.61616780	-103.61032452	0.00	0.00	0.00
	13,100.00	90.35	359.76	10,867.53	7,238.13	2,104.08	2,103.98	-28.01	588,749.74	763,951.90	32.61644265	-103.61032368	0.00	0.00	0.00
	13,200.00	90.35	359.76	10,866.93	7,237.53	2,204.07	2,203.97	-28.43	588,849.73	763,951.48	32.61671749	-103.61032284	0.00	0.00	0.00
	13,300.00	90.35	359.76	10,866.33	7,236.93	2,304.08	2,303.98	-28.86	588,949.72	763,951.06	32.61699233	-103.61032200	0.00	0.00	0.00
	13,400.00	90.35	359.76	10,865.73	7,236.33	2,404.08	2,403.97	-29.28	589,049.72	763,950.63	32.61726717	-103.61032116	0.00	0.00	0.00
	13,500.00	90.35	359.76	10,865.13	7,235.73	2,504.07	2,503.97	-29.70	589,149.71	763,950.21	32.61754201	-103.61032032	0.00	0.00	0.00
	13,600.00	90.35	359.76	10,864.52	7,235.12	2,604.07	2,603.97	-30.12	589,249.70	763,949.79	32.61781686	-103.61031947	0.00	0.00	0.00
	13,700.00	90.35	359.76	10,863.92	7,234.52	2,704.07	2,703.97	-30.54	589,349.70	763,949.37	32.61809170	-103.61031863	0.00	0.00	0.00
	13,800.00	90.35	359.76	10,863.32	7,233.92	2									

Comments	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	Northing (RUS)	Easting (RUS)	Latitude (°)	Longitude (°)	DLS (7100ft)	BR (7100ft)	TR (7100ft)
	20,300.00	90.35	359.76	10,824.17	7,194.77	9,303.95	9,303.79	-58.34	595,949.28	763,921.58	32.63623125	-103.61026306	0.00	0.00	0.00
	20,400.00	90.35	359.76	10,823.57	7,194.17	9,403.95	9,403.78	-58.76	596,049.27	763,921.15	32.63650609	-103.61026222	0.00	0.00	0.00
	20,500.00	90.35	359.76	10,822.96	7,193.56	9,503.95	9,503.78	-59.18	596,149.27	763,920.73	32.63678093	-103.61026137	0.00	0.00	0.00
	20,600.00	90.35	359.76	10,822.36	7,192.96	9,603.94	9,603.78	-59.60	596,249.26	763,920.31	32.63705577	-103.61026053	0.00	0.00	0.00
	20,700.00	90.35	359.76	10,821.76	7,192.36	9,703.94	9,703.78	-60.02	596,349.26	763,919.89	32.63733061	-103.61025969	0.00	0.00	0.00
	20,800.00	90.35	359.76	10,821.16	7,191.76	9,803.94	9,803.77	-60.44	596,449.25	763,919.47	32.63760545	-103.61025884	0.00	0.00	0.00
	20,900.00	90.35	359.76	10,820.56	7,191.16	9,903.94	9,903.77	-60.86	596,549.24	763,919.05	32.63788029	-103.61025800	0.00	0.00	0.00
Eastwood 36-25 Federal Com 40-	20,992.28	90.35	359.76	10,820.00	7,190.60	9,996.22	9,996.05	-61.25	596,641.52	763,918.66	32.63813393	-103.61025722	0.00	0.00	0.00

Survey Type: Def Plan

Survey Error Model: ISOWSA Rev 4 *** 3-D 95 % Confidence 2.7955 sigma

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (dgs)	Survey Tool Code	Vendor / Tool	Borehole / Survey
	1	0.000	10,300.000	1/100.000 - 12.25 - 8.75 - 6 - 9.625 - 7 - 4.5				A001Mb_MWD		Eastwood 36-25 Federal Com 404H / Coterra Eastv
	1	10,300.000	20,992.263	1/100.000	6	4.5		A008Mb_MWD+IFR1+MS		Eastwood 36-25 Federal Com 404H / Coterra Eastv

EOU Geometry:

End MD (ft)	Hole Size (in)	Casing Size (in)	Name
1,182.400	17.500	13.375	
5,899.921	12.250	9.625	
7,800.902	8.750	7.000	
20,992.283	6.000	4.500	



Coterra Eastwood 36-25 Federal Com 404H Rev1 kFc 07Nov25 Anti-Collision Summary Report

Analysis Date-24hr Time: November 07, 2025 - 02:47 PM (UTC 0)
Client: Coterra
Field: NM Lea County (NAD 83)
Structure: Coterra - Eastwood 36-25 Federal Com Pad
Slot: Eastwood 36-25 Federal Com 404H
Well: Eastwood 36-25 Federal Com 404H
Borehole: Eastwood 36-25 Federal Com 404H
Scan MD Range: 0.00ft ~ 20992.28ft

Analysis Method: 3D Least Distance
Reference Trajectory: Coterra Eastwood 36-25 Federal Com 404H Rev1 kFc
Depth Interval: Every 10.00 Measured Depth (ft)
Rule Set: NAL Procedure: D&M AntiCollision Standard S002
Min Pts: Absolute minima indicated.
Engine Version: 2025.1.0.1
Database \ Project: Eastwood 36-25 Federal Com 404H-Coterra

Trajectory Error Model: ISCWSA Rev 4 *** 3-D 95 % Confidence 2.7955 sigma

Offset Trajectories Summary

Offset Selection Criteria

Bounding box scan: minimum Ct-Ct separation <= 2000ft
 Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive plans
 Selection filters: - All Non-Def Surveys when no Def-Survey is set in a borehole - All Non-Def Plans when no Def-Plan is set in a borehole

15 out of 16 are selected

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Breaking Rule	Reference Trajectory		Risk Level			Alert
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	

Results highlighted in red: Sep-Factor <= 1.5

Result highlighted in boxed, red and bold: all local minima indicated.

30-025-29918 - Pennzoil 36 State 1 - Inc Only to 13861ft - A (DefinitiveSurvey) - Fail Major

1522.28	32.81	1518.89	1489.47	1074.87			0.00	0.00				Surface
1522.22	32.81	1518.83	1489.41	1074.79			23.00	23.00				WRP
1522.22	136.42	1430.68	1385.80	16.94			2500.00	2500.00				MinPt-CiCt
1524.72	143.96	1428.16	1380.76	16.06			2620.00	2619.96				MinPt-EOU
1527.85	147.74	1428.77	1380.12	15.68			2680.00	2679.88				MinPt-ADP
1884.67	566.92	1506.22	1317.75	5.00		OSF 5.00	8640.00	8621.50	OSF<=5.00			Enter Alert
718.01	720.70	237.05	-2.69	1.49		OSF 1.50	11800.00	10875.36		OSF<=1.50		Enter Minor
478.45	720.62	-2.46	-242.17	0.99		OSF 1.00	12040.00	10873.92			OSF<=1.00	Enter Major
35.23	721.76	-446.44	-686.53	0.07		OSF 1.00	12517.16	10871.05				MinPts
474.14	720.32	-6.57	-246.17	0.99		OSF 1.00	12990.00	10868.20			OSF>1.00	Exit Major
713.70	720.24	233.04	-6.54	1.49		OSF 1.50	13230.00	10866.75		OSF>1.50		Exit Minor
2393.06	719.83	1912.67	1673.23	4.99		OSF 5.00	14910.00	10856.63	OSF>5.00			Exit Alert
8475.04	719.38	7994.96	7755.67	17.71			20992.28	10820.00				TD

30-025-38560 - Pennzoil B 36 State 005 - INC Only+Blind to 10405ft - A (DefinitiveSurvey) - Fail Major

199.73	32.81	196.35	166.93	140.95			0.00	0.00				Surface
198.19	32.81	194.79	165.38	138.37			20.00	20.00				MinPt-SF
198.13	32.81	194.73	165.32	138.58			23.00	23.00				WRP
198.11	60.69	157.07	137.43	5.00		OSF 5.00	1200.00	1200.00	OSF<=5.00			Enter Alert
198.11	140.01	104.19	58.11	2.13		OSF 5.00	2500.00	2500.00				MinPt-CiCt
201.03	148.44	101.48	52.59	2.04		OSF 5.00	2630.00	2629.96				MinPt-EOU
205.02	153.05	102.40	51.97	2.02		OSF 5.00	2700.00	2699.84				MinPt-ADP
209.78	157.14	104.43	52.64	2.01		OSF 5.00	2760.00	2759.64				MinPt-SF
213.65	159.92	106.45	53.73	2.01		OSF 5.00	2800.00	2799.45				MinPt-SF
257.19	191.71	128.80	65.48	2.02		OSF 5.00	3220.00	3217.15				MinPt-SF
510.30	369.14	263.62	141.16	2.08		OSF 5.00	5650.00	5633.85				MinPt-SF
560.30	560.89	185.87	-0.59	1.50		OSF 1.50	8630.00	8611.50	OSF<=1.50			Enter Minor
560.30	849.17	-6.31	-288.87	0.99		OSF 1.00	10080.00	10061.50		OSF<=1.00		Enter Major
529.41	1462.57	-446.14	-933.16	0.54		OSF 1.00	10500.00	10477.70				MinPt-ADP
524.50	1456.58	-447.05	-932.08	0.54		OSF 1.00	10520.00	10496.42				MinPt-EOU
510.04	1426.09	-441.19	-916.05	0.54		OSF 1.00	10580.00	10550.95				MinPt-SF
437.12	665.35	-6.94	-228.22	0.98		OSF 1.00	10990.00	10818.98			OSF>1.00	Exit Major
432.00	450.31	131.30	-18.30	1.44		OSF 1.50	11060.00	10840.50		OSF>1.50		Exit Minor
431.19	354.69	194.23	76.51	1.82		OSF 5.00	11090.00	10847.73				MinPt-CiCt
434.34	141.25	339.68	293.09	4.65		OSF 5.00	11160.00	10861.63	OSF>5.00			Exit Alert
444.39	153.03	341.87	291.36	4.38		OSF 5.00	11230.00	10871.31	OSF<=5.00			Enter Alert
476.13	492.73	147.14	-16.60	1.45		OSF 1.50	11350.00	10878.01		OSF<=1.50		Enter Minor
538.08	815.02	-5.77	-276.94	0.99		OSF 1.00	11490.00	10877.23		OSF<=1.00		Enter Major
632.68	1040.34	-61.38	-407.66	0.91		OSF 1.00	11640.00	10876.33				MinPt-SF
646.88	1062.83	-62.18	-415.95	0.91		OSF 1.00	11660.00	10876.21				MinPt-EOU
722.01	1155.38	-48.75	-433.37	0.94		OSF 1.00	11760.00	10875.61				MinPt-ADP
819.21	1233.24	-3.45	-414.03	1.00		OSF 1.00	11880.00	10874.88		OSF>1.00		Exit Major
1389.28	1393.06	460.07	-3.79	1.50		OSF 1.50	12510.00	10871.09		OSF>1.50		Exit Minor
4875.06	1463.98	3898.57	3411.08	5.00		OSF 5.00	16050.00	10849.77	OSF>5.00			Exit Alert
9806.83	1469.17	8826.88	8337.66	10.02			20992.28	10820.00				TD

30-025-38952 - Smith 002 - Inc Only to 12532ft - A (DefinitiveSurvey) - Fail Major

5157.04	32.81	5153.64	5124.23	3644.55			0.00	0.00				Surface
5157.03	32.81	5153.61	5124.22	3589.57			23.00	23.00				WRP
5157.03	136.76	5065.27	5020.27	57.28			2500.00	2500.00				MinPt-CiCt
5160.45	147.02	5061.85	5013.43	53.27			2640.00	2639.94				MinPt-EOU
5167.93	156.38	5063.09	5011.55	50.12			2750.00	2749.68				MinPt-ADP
5218.70	211.69	5076.98	5007.00	37.28			3240.00	3237.04				MinPt-ADP
2218.20	669.10	1771.63	1549.10	4.98		OSF 5.00	13950.00	10862.42	OSF<=5.00			Enter Alert
670.11	670.75	222.45	-0.64	1.50		OSF 1.50	15960.00	10852.72		OSF<=1.50		Enter Minor
447.89	673.90	-1.88	-226.01	1.00		OSF 1.00	15840.00	10851.03		OSF<=1.00		Enter Major
329.23	679.55	-124.30	-350.32	0.73		OSF 1.00	16143.67	10849.20				MinPts
449.70	675.07	-0.85	-225.37	1.00		OSF 1.00	16450.00	10847.36			OSF>1.00	Exit Major
663.73	671.74	215.41	-8.00	1.48		OSF 1.50	16720.00	10845.73		OSF>1.50		Exit Minor
2220.83	668.69	1774.54	1552.14	4.99		OSF 5.00	18340.00	10835.97	OSF>5.00			Exit Alert
4859.69	668.40	4413.59	4191.29	10.93			20992.28	10820.00				TD

Coterra Eastwood 36-25 Federal Com 353H Rev1 kFc 07Nov25 (DefinitivePlan) - Fail Minor

20.00	16.47	16.26	3.53	7.64		CiCt 15.00m	0.00	0.00		CiCt<=15.00m		Enter Alert
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Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Breaking Rule	Reference Trajectory		Risk Level			Alert
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	
20.00	16.47	16.26	3.53	7.64		CtCt 15.00m	23.00	23.00				WRP
20.00	17.18	8.12	2.82	1.77		OSF 5.00	1090.00	1090.00				MinPts
20.00	20.11	6.26	-0.11	1.49		OSF 1.50	1310.00	1310.00			OSF<=1.50	Enter Minor
20.00	24.26	3.50	-4.26	1.23		OSF 1.50	1590.00	1590.00				MinPt-CtCt
20.16	24.84	3.27	-4.68	1.21		OSF 1.50	1630.00	1630.00				MinPts
20.28	24.99	3.29	-4.71	1.21		OSF 1.50	1640.00	1640.00				MinPt-ADP
20.74	27.25	8.25	-0.51	1.47		OSF 1.50	1800.00	1800.00			OSF>1.50	Exit Minor
110.40	34.13	87.31	76.26	4.95		OSF 5.00	2330.00	2330.00		OSF>5.00		Exit Alert
1133.46	153.98	1030.48	979.48	11.10			10250.00	10231.50				MinPt-EOU
1133.53	154.07	1030.49	979.47	11.10			10260.00	10241.50				MinPt-ADP
1134.13	154.45	1030.84	979.68	11.08			10304.04	10285.54				MinPt-SF
1320.61	368.85	1074.39	951.76	5.38			20992.28	10820.00				MinPts
30-025-35971 - Pennzoil 36 State Com 2 - Inc Only to 13700ft - A (DefinitiveSurvey) - Fail Minor												
3815.23	32.81	3811.83	3782.42	2695.91			0.00	0.00				Surface
3815.23	32.81	3811.82	3782.42	2672.80			23.00	23.00				WRP
3815.23	136.60	3723.57	3678.62	42.42			2500.00	2500.00				MinPt-CtCt
3817.68	143.77	3721.25	3673.91	40.31			2620.00	2619.96				MinPt-EOU
3821.38	148.19	3722.00	3673.19	39.13			2690.00	2689.86				MinPt-ADP
2250.25	677.70	1797.95	1572.55	4.99		OSF 5.00	12590.00	10870.61		OSF<=5.00		Enter Alert
677.29	681.04	222.77	-3.75	1.49		OSF 1.50	14420.00	10859.58		OSF<=1.50		Enter Minor
583.89	683.27	127.88	-99.38	1.28		OSF 1.50	14763.21	10857.52				MinPts
679.11	682.37	223.70	-3.26	1.49		OSF 1.50	15110.00	10855.43		OSF>1.50		Exit Minor
2253.70	677.73	1801.38	1575.97	5.00		OSF 5.00	16940.00	10844.41		OSF>5.00		Exit Alert
6256.26	677.20	5804.29	5579.06	13.88			20992.28	10820.00				TD
30-025-38559 - Pennzoil B 36 State 004 - INC Only+Blind to 10410ft - A (DefinitiveSurvey) - Fail Minor												
1439.13	32.81	1435.74	1406.33	1016.22			0.00	0.00				Surface
1438.91	32.81	1435.51	1406.10	1015.82			20.00	20.00				MinPt-SF
1438.90	32.81	1435.50	1406.09	1015.85			23.00	23.00				WRP
1438.89	144.05	1342.27	1294.85	15.15			2500.00	2500.00				MinPt-CtCt
1557.00	394.37	1293.51	1162.64	5.94			5460.00	5444.89				MinPt-EOU
1573.89	417.28	1295.12	1156.61	5.68			5790.00	5773.08				MinPt-ADP
1591.84	478.88	1272.05	1112.96	5.00		OSF 5.00	6770.00	6751.50		OSF<=5.00		Enter Alert
1591.84	1598.15	525.91	-6.31	1.49		OSF 1.50	10210.00	10191.50		OSF<=1.50		Enter Minor
1392.28	1959.80	85.25	-567.52	1.07		OSF 1.50	11525.52	10877.02				MinPt-CtCt
1392.29	1959.82	85.24	-567.53	1.07		OSF 1.50	11530.00	10876.99				MinPts
2013.44	2018.85	667.04	-5.41	1.50		OSF 1.50	12980.00	10868.26		OSF>1.50		Exit Minor
6876.89	2064.30	5500.19	4812.59	5.00		OSF 5.00	18260.00	10836.46		OSF>5.00		Exit Alert
9568.59	2066.55	8190.39	7502.04	6.95			20992.28	10820.00				TD
30-025-47429 - WAR EAGLE FEDERAL COM 504H - Gyro+IFR1 to 20495ft - A (DefinitiveSurvey) - Warning Alert												
10256.65	248.24	10090.50	10008.41	62.46			0.00	0.00				Surface
10233.70	248.33	10067.48	9985.37	62.30			23.00	23.00				WRP
837.67	253.86	667.93	583.81	4.97		OSF 5.00	9510.00	9491.50		OSF<=5.00		Enter Alert
381.90	265.58	204.34	116.32	2.16		OSF 5.00	10255.55	10237.05				MinPt-CtCt
381.92	265.64	204.33	116.28	2.16		OSF 5.00	10260.00	10241.50				MinPts
795.33	240.03	634.81	555.30	4.99		OSF 5.00	10920.00	10789.52		OSF>5.00		Exit Alert
10533.14	173.90	10416.71	10359.25	91.63			20992.28	10820.00				TD
30-025-38624 - Pennzoil B 36 State 007 - INC Only+Blind to 10400ft - P&A (DefinitiveSurvey) - Warning Alert												
3887.79	32.81	3884.40	3854.98	2747.22			0.00	0.00				Surface
3887.78	32.81	3884.37	3854.97	2709.70			23.00	23.00				WRP
3887.78	140.54	3793.50	3747.24	42.00			2500.00	2500.00				MinPt-CtCt
3889.89	147.03	3791.28	3742.86	40.15			2610.00	2609.97				MinPt-EOU
3892.82	150.59	3791.84	3742.23	39.22			2670.00	2669.90				MinPt-ADP
2723.60	818.91	2177.16	1904.69	5.00		OSF 5.00	12200.00	10872.96		OSF<=5.00		Enter Alert
625.94	582.17	237.32	43.77	1.61		OSF 5.00	14450.00	10859.40				MinPt-SF
619.01	575.44	234.88	43.57	1.61		OSF 5.00	14460.00	10859.34				MinPt-ADP
560.82	504.09	224.26	56.73	1.67		OSF 5.00	14550.00	10858.80				MinPt-EOU
449.51	137.82	357.14	311.70	4.93		OSF 5.00	14860.00	10856.93		OSF>5.00		Exit Alert
448.74	131.95	360.27	316.79	5.14			14886.38	10856.78				MinPt-CtCt
448.95	135.75	357.94	313.19	5.00		OSF 5.00	14900.00	10856.69		OSF<=5.00		Enter Alert
559.17	513.74	216.17	45.43	1.63		OSF 5.00	15220.00	10854.77				MinPt-EOU
617.10	584.70	226.80	32.40	1.58		OSF 5.00	15310.00	10854.22				MinPt-ADP
624.01	591.38	229.26	32.63	1.58		OSF 5.00	15320.00	10854.16				MinPt-SF
2730.74	822.44	2181.95	1908.30	4.99		OSF 5.00	17580.00	10840.55		OSF>5.00		Exit Alert
6122.37	831.79	5567.34	5290.58	11.06			20992.28	10820.00				TD
30-025-47431 - WAR EAGLE FEDERAL COM 701H - Gyro+IFR1 to 21280ft - A (DefinitiveSurvey) - Warning Alert												
10918.91	32.81	10915.52	10886.10	7718.10			0.00	0.00				MinPts
10918.92	32.81	10915.52	10886.11	7718.09			23.00	23.00				WRP
842.65	255.98	671.49	586.66	4.96		OSF 5.00	10270.00	10251.50		OSF<=5.00		Enter Alert
582.50	243.20	419.87	339.31	3.61		OSF 5.00	10670.00	10627.12				MinPt-SF
576.25	239.19	416.29	337.06	3.63		OSF 5.00	10710.00	10658.37				MinPt-ADP
575.46	238.11	416.22	337.35	3.64		OSF 5.00	10720.00	10665.91				MinPt-EOU
574.84	235.88	417.09	338.96	3.67		OSF 5.00	10739.81	10680.49				MinPt-CtCt
672.04	205.35	534.64	466.68	4.93		OSF 5.00	11000.00	10822.55		OSF>5.00		Exit Alert
10549.08	176.08	10431.20	10373.01	90.63			20992.28	10820.00				TD
30-025-38388 - Afton 24 Federal Com 001 - Inc Only to 13725ft - A (DefinitiveSurvey) - Warning Alert												
10808.90	32.81	10805.31	10776.10	6672.22			0.00	0.00				Surface
10808.90	32.81	10804.96	10776.10	5500.75			23.00	23.00				WRP
10808.90	140.32	10714.77	10668.58	116.99			2500.00	2500.00				MinPt-CtCt
10811.40	147.54	10712.46	10663.87	111.23			2620.00	2619.96				MinPt-EOU
10815.85	152.94	10713.30	10662.91	107.30			2700.00	2699.84				MinPt-ADP
2064.85	623.15	1648.92	1441.70	4.98		OSF 5.00	19790.00	10827.24		OSF<=5.00		Enter Alert
945.83	633.30	523.13	312.53	2.24		OSF 5.00	20992.28	10820.00				MinPts
30-025-50266 - STETSON 13 24 2BS FEDERAL COM 11H - MWD to 20346ft - A (DefinitiveSurvey) - Warning Alert												
14169.21	199.97	14035.24	13969.24	107.33			0.00	0.00				Surface

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Breaking Rule	Reference Trajectory		Risk Level			Alert
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	
	14153.26	199.88	14019.35	13953.38	107.26		23.00	23.00				WRP
	12495.60	181.16	12374.24	12314.44	104.46		2620.00	2619.96				MinPt-SF
	10562.04	163.29	10452.68	10398.75	97.91		9850.00	9831.50				MinPt-CiCt
	10562.18	163.72	10452.53	10398.46	97.65		9910.00	9891.50				MinPt-EOU
	10562.30	163.87	10452.56	10398.43	97.56		9930.00	9911.50				MinPt-ADP
	1128.49	341.42	900.37	787.06	4.97	OSF 5.00	20690.00	10821.82	OSF<=5.00			Enter Alert
	1028.30	369.01	781.79	659.28	4.19	OSF 5.00	20992.28	10820.00				MinPts
30-025-50265 - STETSON 13 24 2BS FEDERAL COM 10H - MWD to 20709ft - A (DefinitiveSurvey) - Warning Alert												
	14428.25	203.79	14291.74	14224.47	107.23		0.00	0.00				Surface
	14412.10	203.71	14275.63	14208.39	107.15		23.00	23.00				WRP
	12631.36	186.65	12506.34	12444.71	102.46		2799.92	2799.37				MinPt-SF
	12238.03	181.03	12116.75	12056.99	102.36		3640.00	3634.85				MinPt-SF
	10621.94	176.99	10503.45	10444.95	90.78		10160.00	10141.50				MinPt-CiCt
	10622.06	177.37	10503.32	10444.69	90.59		10210.00	10191.50				MinPt-EOU
	10622.25	177.59	10503.35	10444.65	90.47		10240.00	10221.50				MinPt-ADP
	1569.83	472.31	1254.46	1097.52	5.00	OSF 5.00	20360.00	10823.81	OSF<=5.00			Enter Alert
	1343.56	541.51	982.05	802.05	3.73	OSF 5.00	20992.28	10820.00				MinPts
30-025-27705 - Smith 1 - Inc Only to 13650ft - A (DefinitiveSurvey) - Warning Alert												
	6933.46	32.81	6930.07	6900.65	4900.45		0.00	0.00				Surface
	6933.46	32.81	6930.04	6900.65	4815.57		23.00	23.00				WRP
	6933.46	140.89	6838.95	6792.57	74.73		2500.00	2500.00				MinPt-CiCt
	6935.90	147.99	6836.65	6787.91	71.13		2620.00	2619.96				MinPt-EOU
	6938.94	151.60	6837.28	6787.33	69.44		2680.00	2679.88				MinPt-ADP
	2182.09	657.19	1743.46	1524.90	4.99	OSF 5.00	16080.00	10849.59	OSF<=5.00			Enter Alert
	1352.47	671.72	904.15	680.74	3.02	OSF 5.00	17792.44	10839.27				MinPt-CiCt
	1352.49	671.76	904.15	680.73	3.02	OSF 5.00	17800.00	10839.23				MinPts
	1352.58	671.81	904.21	680.77	3.02	OSF 5.00	17810.00	10839.17				MinPt-SF
	2201.86	663.90	1758.76	1537.96	4.98	OSF 5.00	19530.00	10828.81	OSF>5.00			Exit Alert
	3473.87	659.04	3034.01	2814.83	7.92		20992.28	10820.00				TD
30-025-38558 - Pennzoil B 36 State 003 - Inc Only to 10415ft - P&A (DefinitiveSurvey) - Warning Alert												
	3138.12	32.81	3134.72	3105.31	2217.25		0.00	0.00				Surface
	3138.05	32.81	3134.65	3105.24	2216.72		23.00	23.00				WRP
	3138.05	140.52	3043.78	2997.53	33.90		2500.00	2500.00				MinPt-CiCt
	3141.06	149.36	3040.90	2991.70	31.90		2640.00	2639.94				MinPt-EOU
	3144.82	153.78	3041.72	2991.04	31.01		2710.00	2709.81				MinPt-ADP
	3224.90	224.70	3074.51	3000.19	21.69		3590.00	3585.13				MinPt-ADP
	2481.42	747.73	1982.44	1733.69	4.98	OSF 5.00	11780.00	10875.49	OSF<=5.00			Enter Alert
	1388.88	726.90	903.78	661.98	2.87	OSF 5.00	13836.32	10863.10				MinPt-CiCt
	1388.88	726.92	903.77	661.97	2.87	OSF 5.00	13840.00	10863.08				MinPts
	1388.95	726.95	903.81	661.99	2.87	OSF 5.00	13850.00	10863.02				MinPt-SF
	2504.14	752.87	2001.72	1751.26	5.00	OSF 5.00	15920.00	10850.55	OSF>5.00			Exit Alert
	7289.50	762.34	6780.77	6527.16	14.37		20992.28	10820.00				TD
30-025-38300 - Pennzoil B 36 State 002 - Inc Only to 10303ft - A (DefinitiveSurvey) - Warning Alert												
	2280.71	32.81	2277.32	2247.90	1611.12		0.00	0.00				Surface
	2280.58	32.81	2277.19	2247.78	1610.92		20.00	20.00				MinPt-SF
	2280.58	32.81	2277.19	2247.77	1610.93		23.00	23.00				WRP
	2280.58	134.66	2190.22	2145.92	25.72		2500.00	2500.00				MinPt-CiCt
	2283.24	142.76	2187.48	2140.49	24.27		2640.00	2639.94				MinPt-EOU
	2286.01	146.09	2188.03	2139.92	23.74		2700.00	2699.84				MinPt-ADP
	2455.12	281.07	2267.15	2174.95	13.18		4750.00	4738.78				MinPt-ADP
	2532.06	355.26	2294.64	2176.80	10.74		5650.00	5633.85				MinPt-ADP
	2189.39	659.01	1749.55	1530.38	4.99	OSF 5.00	11180.00	10864.83	OSF<=5.00			Enter Alert
	1427.11	631.93	1005.33	795.19	3.39	OSF 5.00	12845.71	10869.07				MinPt-CiCt
	1427.12	631.94	1005.33	795.18	3.39	OSF 5.00	12850.00	10869.04				MinPts
	1427.18	631.98	1005.37	795.21	3.39	OSF 5.00	12860.00	10868.98				MinPt-SF
	2199.97	662.79	1757.62	1537.19	4.99	OSF 5.00	14520.00	10858.98	OSF>5.00			Exit Alert
	8270.62	682.22	7815.31	7588.41	18.22		20992.28	10820.00				TD

Coterra: Well Control Plan



Well Control Plan

Warning Signs of a Kick

If a kick is ever suspected, perform flow check.

While Drilling:

1. Drilling break or increase in penetration rate
2. Increase of flow
3. Pit gain
4. Flow without pumping
5. Circulating pressure decrease and/or spm increase
6. Increase in gas cutting at the shakers
7. Decrease in cuttings at shakers

While Tripping:

1. Hole not taking the proper fill on trip out of hole
2. Hole returns too much mud on trip in hole
3. Flow without pumping

While Out of the Hole:

1. Flow
2. Pit gain

Well Control Procedures with Diverter

A TIW valve in the open position must be on the rig floor at all times.

If rotating head is installed:

1. Perform flow check.
2. If well is flowing, divert flow down flow line and through separator, before returning across shakers.
3. Swap to 10 ppg brine and circulate around. Notify superintendent.

Coterra: Well Control Plan

4. If well becomes uncontrollable, close annular, which will open HCR to divert flow away from rig.

If rotating head is not installed:

1. Perform flow check.
2. If well is flowing uncontrollably, close annular, which will open HCR to divert flow away from rig.
3. Swap to 10 ppg brine and circulate around. Notify superintendent.
4. After 10 ppg is circulated around shut pumps off and perform flow check.

Well Control Procedures

Coterra follows a hard shut-in procedure. Choke will be in the closed position.

General Well Control

1. If in doubt, secure the well first, then inform your supervisor.
2. Never wait for approval to shut in the well.
3. Verify that the mud pump is off before you close the BOP.
4. Always check and verify the well is properly secured after shut in.
5. Always install TIW valve in the open position.
6. If TIW valve is installed and then closed, apply estimated DP shut-in pressure above valve before opening.
7. The weak link in the mud system and mud lines is the pressure relief valve or pop off valve on the mud pump.
8. Keep the TIW valve wrench in a designated location on the rig floor and in the open position.
9. Use a drill string float above the bit. Don't perforate or disable the float.
10. In the event wellbore pressure encroaches to the maximum rated pressure of the annular, primary pressure control will be switched to the higher rated components (i.e., switch from annular to pipe rams) – upper pipe rams will be closed, and the annular opened in order to not exceed maximum rated pressures.

Hard Shut-In

1. Remote choke is closed.
2. Stop pumping and space out.
3. Check for flow.
4. To shut in, close annular or pipe ram if no annular is present.
5. Open the HCR valve.
6. Check systems, bump float. Record Initial Shut in Drill pipe pressure and Initial shut in casing pressure.

Coterra: Well Control Plan

Flow Check when on Bottom

1. Alert crew & stop rotating
2. Pick up and space out
3. Shut down pumps
4. Observe well for flow
5. Shut-in if flowing

Shutting in while Drilling

1. After flow has been detected via flow check, kill pumps, shut in well and open HCR
2. Verify well is shut-in and flow has stopped
3. Notify supervisory personnel
4. Record data
5. Begin go forward planning

Flow Check while Tripping

1. Alert crew & pick up / space out
2. Stop pipe movement. Set slips with tool joint accessible at rotary table
3. Install open TIW safety valve and close valve
4. Observe well for flow
5. Shut-in if flowing

Shutting in while Tripping

1. Install open TIW safety valve and close valve
2. Shut-in the well
3. Verify well is shut-in and flow has stopped
4. Install IBOP
5. Notify supervisory personnel
6. Record data; SICP, shut-in time, kick depth, and pit gain
7. Begin go forward planning

Shutting in while Out of Hole

1. Sound alarm
2. Shut-in well: close blind rams.
3. Verify well is shut-in and monitor pressures.
4. Notify supervisory personnel
5. Record data; SICP, shut-in time, kick depth, and pit gain
6. Begin go forward planning

Information to Record while Shut-In

1. Shut in drill pipe pressure every 5 minutes

Coterra: Well Control Plan

2. Shut in casing pressure every 5 minutes
3. Pit gain
4. Total volume in pit system
5. Mud weight in suction pit
6. Current depth
7. Total depth
8. Time the well is shut in

H2S with Annular Diverter:

1. Kill Pumps, close annular, which will open HCR, to divert flow away from rig.
2. Muster and take head count.
3. Call ASSI to check location for H2S. Call Coterra superintendent.
4. After ASSI has checked for H2S the path forward will be decided from Coterra superintendent.

H2S with BOP's:

1. Kill pumps
2. Shut in annular with HCR open and chokes closed.
3. Muster and take head count.
4. Call ASSI to check location for H2S. Call Coterra superintendent.
5. After ASSI has checked for H2S. discuss path forward with Coterra superintendent

Procedure for Closing Blind Rams

- Open HCR valve (visually check that the HCR valve is open – stem in the valve is open, stem out the valve is closed).
- Verify all circulating pumps are off (mud pumps, trip tank pump, etc.)
- Ensure that the hydraulic choke is in the closed position.
- Close the blind rams and place the “blind rams closed, bleed pressure and remove hole cover before opening” sign on the console.
- Monitor the shut in casing pressure gauge periodically while the blinds are closed to ensure that wellbore pressure isn't building. If pressure build up is observed, monitor the shut in casing pressure more frequently & document. Notify rig management and Coterra representative of the pressure build up.
- Ensure that the inner bushings are locked into the master bushings if applicable.
- Install hole cover.

Procedure for Opening Blind Rams

- Make sure choke manifold is aligned correctly.
- Open the hydraulic choke to bleed any trapped pressure that may be under the blind rams. (Even if the casing pressure gauge is reading zero).

Coterra: Well Control Plan

- Confirm that no flow is discharging into the trip tank or possum bellies of the shale shaker (wherever the separator is discharging into).
- Remove hole cover.
- Confirm that the inner bushing are locked into the master bushings if applicable.
- Clear all personnel from the rig floor.
- Remove sign and open blind rams.
- Return the BOPE to its original operating alignment.

BOP Drills

- Drilling crews should conduct BOP drills weekly from BOP nipple up to TD for reaction time to properly simulate securing the well. Record BOP drills on that day's report.
- Standard precautions such as checking the accumulator for proper working pressure, function testing rams, and recording slow pump rates are performed on a daily basis or on trips..
- All supervisory personnel onsite need to be properly trained and currently hold certification from an approved blowout prevention school. Any deviation from this needs to be discussed prior to spud.
- Drillers should always notify the tool pusher and the drilling foreman before performing a blowout drill.

Choke Manifold Freeze Prevention

- When possible, blow out the choke & kill lines as well as the choke manifold with rig air to remove water based fluids.
- When clear water is being placed into the choke & kill line as well as the choke manifold, make sure that the water has a mixture of 30% methanol added.
- When applicable, choke & kill lines as well as choke manifold needs to be pumped through with the rig pump by the driller to ensure that the lines aren't plugged with settling barite or solids.

1. Geological Formations

TVD of target 10874
MD at TD 20992

Pilot Hole TD N/A
Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	1427	N/A	
Top of Salt	1774	N/A	
Base of Salt	3064	N/A	
Yates	3184	N/A	
Top of Capitan Reef	4160	N/A	
Base of Capitan Reef	5275	N/A	
Lamar/Base Anhydrite	5459	N/A	
Top of Delaware Sands/Bell Canyon	5555	N/A	
Cherry Canyon	6129	N/A	
Brushy Canyon	6875	N/A	
Basal Brushy Canyon	7907	N/A	
Bone Spring Lime	8289	N/A	
Leonard/Avalon Sand	8492	N/A	
Avalon Shale	9054	N/A	
1st Bone Spring Sand	9378	Hydrocarbons	
2nd Bone Spring Sand	9892	Hydrocarbons	
3rd Bone Spring Carb	10347	Hydrocarbons	
3rd Bone Spring Sand	10653	Hydrocarbons	
Wolfcamp	10871	Hydrocarbons	
Wolfcamp X - Target	10874	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1545	1540	16"	65.00	J-55	BT&C	0.95	3.40	10.11
14 3/4	0	3250	3250	10-3/4"	45.50	J-55	BT&C	1.20	2.06	4.84
9 7/8	0	5275	5275	8-5/8"	24.00	K-55	ST&C	0.48	1.08	2.08
8 3/4	0	10348	10304	5-1/2"	20.00	P-110	BT&C	2.18	2.43	2.97
8 3/4	10348	20992	10775	5-1/2"	20.00	P-110	BT&C	2.09	2.32	68.05
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance 43 CFR 3172.

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	Y
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	Y
If yes, does production casing cement tie back a minimum of 50' above the Reef?	Y
Is well within the designated 4 string boundary.	Y
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	N
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	N
Is 2nd string set 100' to 600' below the base of salt?	N
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	N
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	N
Is AC Report included?	Y

3. Cementing Program

Casing	#sks	Wt. lb/gal	Yld ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	552	13.50	1.72	9.33	7.1	Lead: Class C + Bentonite
	88	14.80	1.34	6.4	4.40	Tail: Class C + LCM
Intermediate 1	770	12.90	1.88	12.7	8.15	Lead: 35:65 Poz:C + Salt + Bentonite
	623	14.80	1.34	6.4	4.40	Tail: Class C + LCM
Intermediate 2	321	12.90	1.88	12.7	8.15	Lead: 35:65 Poz:C + Salt + Bentonite
	158	14.80	1.20	6.4	4.40	Tail: Class C + LCM
Production	1887	14.20	1.20	5.31	4.10	Tail: 5050 Poz:H + Salt + Bentonite + Fluid Loss + Dispersant

Squeeze Cement: 13.2 5050 Poz:H + Salt + Bentonite + Fluid Loss + Dispersant

Volume: 290 sks x 1.88 = 545.2

Displacement: 151 bbls

Top of Squeeze: 4775' (TOC = 500' inside 8 5/8 shoe)

All cement tops to be verified by Cement Bond Log

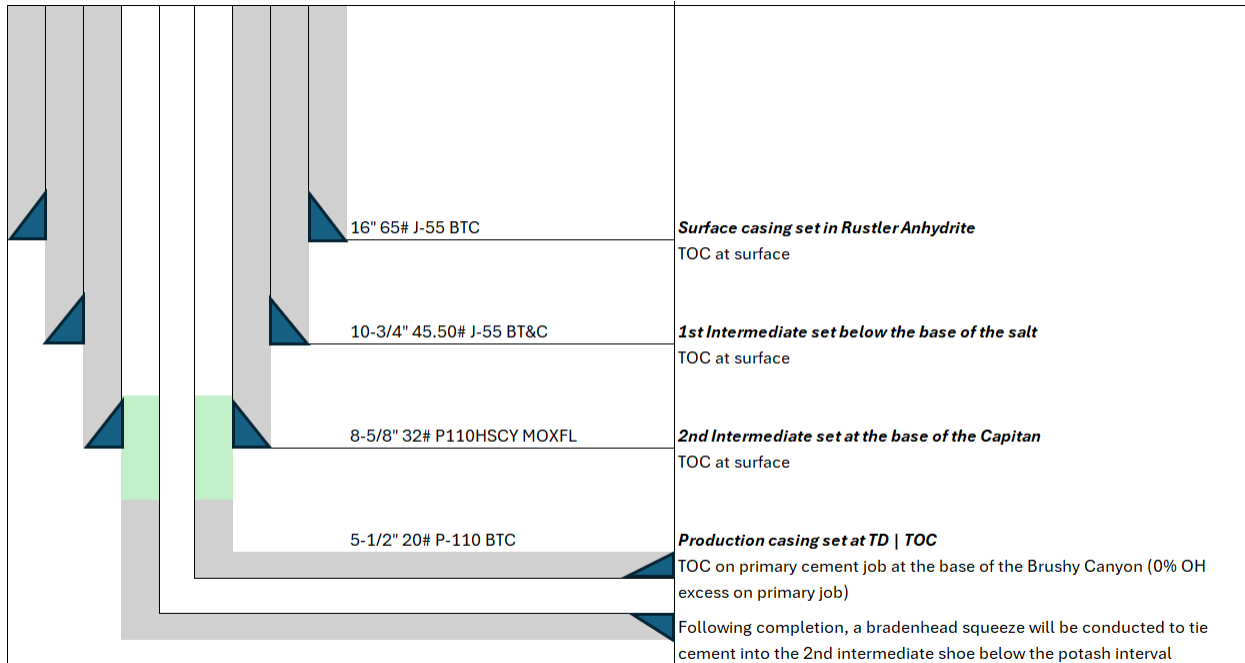
Casing String	TOC	%Excess
Surface	0	50
Intermediate	0	50
Intermediate 2	0	50
Production	7925	0

Cementing and Control Measures

- All surface and intermediate strings will be kept full while running to prevent from approaching collapse pressure.
- Surface casing will circulate cement to the surface to protect freshwater zones.
- First Intermediate casing will be set below the base of the salt and the Second Intermediate casing will be set at the base of the Capitan Reef.
- Both intermediates will be cemented to surface to prevent fluid migration behind casing, providing a continuous cement column through the salt and potash depths.
- WOC > 8 hours & >500psi strength will be observed before drilling ahead.
- Drilling fluids will be compatible with salt/potash, to contain saturated salts to reduce dissolution, to be no >3%calcium chloride. Cement slurries may be adjusted to minimize dissolution of soluble salts.
- Production cement will be raised to the base of the Brushy Canyon to allow a pressure relief zone in the event the production casing bursts during completion.
- The production casing annulus will be monitored continuously during completion.

9. Following completion, a bradenhead squeeze will be performed to tie cement back from the stage 1 TOC to the Second Intermediate shoe (but below the potash interval).
10. CBL will be used to confirm TOC on the production casing.
11. Will remedially top out surface with 3/4" tubing.

Wellbore Diagram



4. Pressure Control Equipment

A variance is requested for the use of a diverter on the surface casing. See attached for schematic.					
BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
14 3/4	21	2M	Annular	2M	100% of working pressure
			Blind Ram		2M
			Pipe Ram	X	
			Double Ram		
			Other		
9 7/8	13 5/8	5M	Annular	5M	100% of working pressure
			Blind Ram		10M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	5M	Annular	5M	100% of working pressure
			Blind Ram		10M
			Pipe Ram	X	
			Double Ram	X	
			Other		

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
X	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
N	Are anchors required by manufacturer?

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 1545'	Fresh Water	7.83- 8.33	28	N/C
1545' to 3250'	Brine Water	9.80 - 10.30	30-32	N/C
3250' to 5275'	Fresh Water	7.83 - 8.33	28	N/C
5275' to 20992'	Oil Based Mud	9.00 - 9.50	50-70	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
---------------------------------------------------------	-----------------------------

6. Logging and Testing Procedures

Logging, Coring and Testing	
X	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test?
	Coring?

Additional Logs Planned	Interval

7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	5322 psi
Abnormal Temperature	No

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
X	H2S is present
X	H2S plan is attached

8. Other Facets of Operation

9. Wellhead


1. The multi-bowl wellhead will be installed by a vendor representative. A copy of the installation instructions has been sent to the BLM field office.
2. A packoff will be installed after running and cementing the production casing. This packoff will be tested to 10K psi.

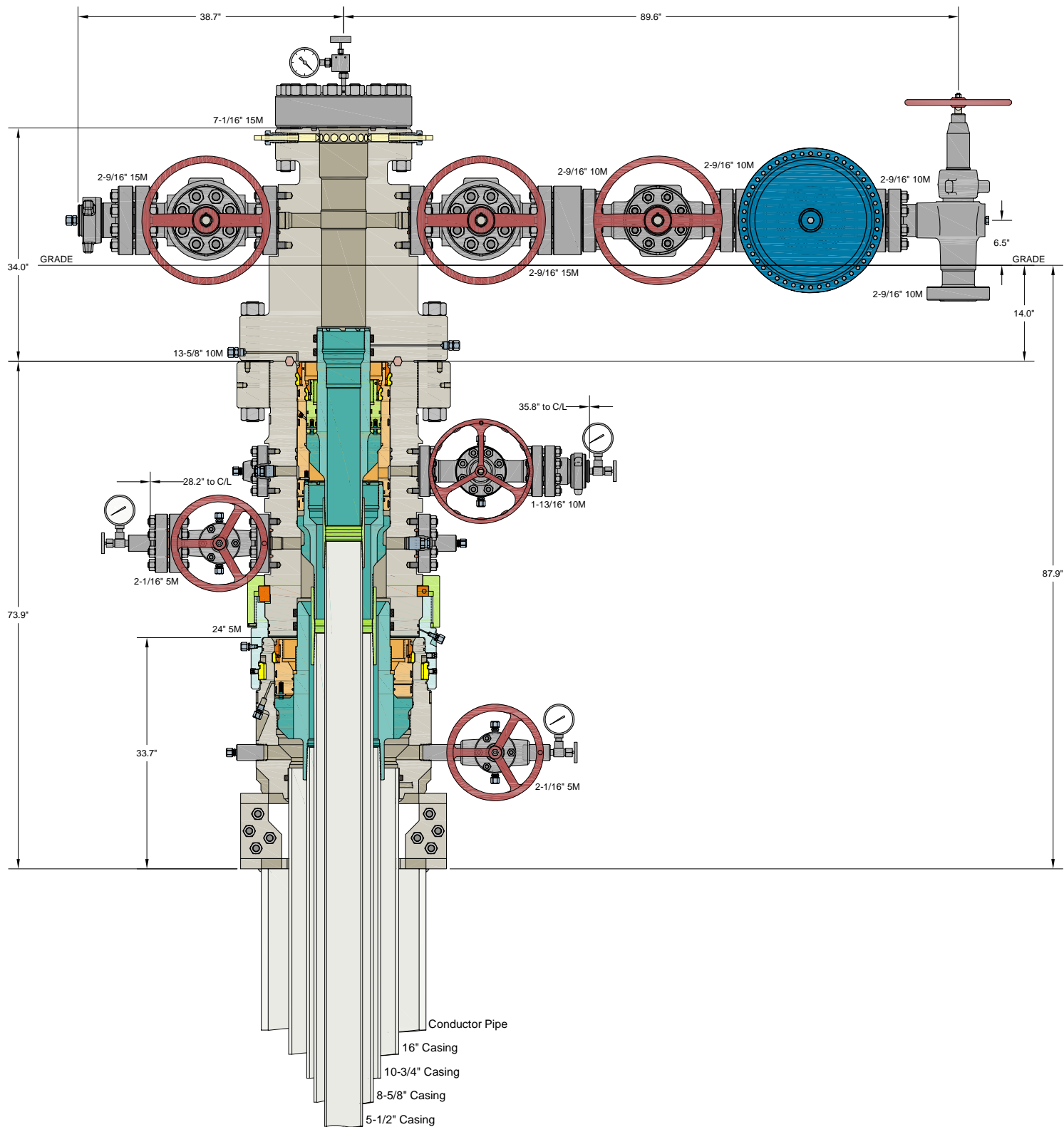
BOPE Additional Information & Testing

1. For the first intermediate hole section, a 2M ram and 2M annular BOP system will be utilized. This equipment will be high-tested to 100% working pressure and low-tested at 250 psi.
2. After running the first intermediate string of casing, a 10M BOP system with 5M annular will be installed. BOPs will be tested according to Onshore Order #2. BOPE will be tested to full rated pressure (10K for all BOPE except the annular, which is tested to 5K). For the low test, the system will be tested to 250 psi.
3. All BOP equipment will be tested utilizing a conventional test plug.
4. A remote kill line is included in the BOPE system
5. All casing strings will be tested per Onshore Order #2, to 0.22 psi/ft or 1,500 psi, whichever is greater, not to exceed 70% of casing burst.
6. If well conditions dictate, conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Additional Well Control Notes

1. In the event wellbore pressure encroaches to the maximum rated pressure of the annular, primary pressure control will be switched to the higher rated components (i.e., switch from annular to pipe rams) – upper pipe rams will be closed, and the annular opened in order to not exceed maximum rated pressures.

Metal One Corp.		MO-FXL		MO-FXL 8-5/8 32.0	
		*1 Pipe Body: BMP P110HSCY MinYS125ksi Special Drift 7.875"		CDS#	P110HSCY
				Date	27-Nov-23
Connection Data Sheet					
Geometry					
		<u>Imperial</u>		<u>S.I.</u>	
Pipe Body					
Grade *1		P110HSCY		P110HSCY	
MinYS *1		125 ksi		125 ksi	
Pipe OD (D)		8 5/8 in		219.08 mm	
Weight		32.00 lb/ft		47.68 kg/m	
Actual weight		31.10		46.34 kg/m	
Wall Thickness (t)		0.352 in		8.94 mm	
Pipe ID (d)		7.921 in		201.19 mm	
Pipe body cross section		9.149 in ²		5,902 mm ²	
Special Drift Dia. *1		7.875 in		200.03 mm	
-		-		-	
Connection					
Box OD (W)		8.625 in		219.08 mm	
PIN ID		7.921 in		201.19 mm	
Make up Loss		3.847 in		97.71 mm	
Box Critical Area		5.853 in ²		3686 mm ²	
Joint load efficiency		69 %		69 %	
Thread Taper		1 / 10 (1.2" per ft)			
Number of Threads		5 TPI			
Performance					
Performance Properties for Pipe Body					
S.M.Y.S. *1		1,144 kips		5,087 kN	
M.I.Y.P. *1		8,930 psi		61.59 MPa	
Collapse Strength *1		4,300 psi		29.66 MPa	
Note S.M.Y.S.= Specified Minimum YIELD Strength of Pipe body M.I.Y.P. = Minimum Internal Yield Pressure of Pipe body *1: BMP P110HSCY; MinYS125ksi, SD7.875, Collapse Strength 4,300psi					
Performance Properties for Connection					
Tensile Yield load		789 kips (69% of S.M.Y.S.)			
Min. Compression Yield		789 kips (69% of S.M.Y.S.)			
Internal Pressure		6,250 psi (70% of M.I.Y.P.)			
External Pressure		100% of Collapse Strength			
Max. DLS (deg./100ft)		29			
Recommended Torque					
Min.		13,600 ft-lb		18,400 N-m	
Opti.		14,900 ft-lb		20,200 N-m	
Max.		16,200 ft-lb		21,900 N-m	
Operational Max.		28,400 ft-lb		38,500 N-m	
Note : Operational Max. torque can be applied for high torque application					
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ALL DIMENSIONS APPROXIMATE

CACTUS WELLHEAD LLC

COTERRA ENERGY INC
HOBBS, NM

16" x 10-3/4" x 8-5/8" x 5-1/2" CRC / MBU-3T-CFL Wellhead
With 13-5/8" 10M x 7-1/16" 15M CTH-DBLHPS-SB Tubing Head
And 10-3/4", 8-5/8" & 5-1/2" Mandrel Casing Hangers

DRAWN	VJK	02FEB26
APPRV		
DRAWING NO.	SDT-5883-2	



Installation Procedure Prepared For:

Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System
With CTH-DBLHPS-SB Tubing Head
And Option to Omit 9-5/8" Casing

Publication # IP1418-1 Rev. 0

February 03, 2026

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Warning, Caution & Note Defined

WARNING:



Definition:

An operating or servicing procedure, practice, condition or statement, which if not strictly observed could result in environmental harm, serious injury or death to personnel or long term health hazards.

CAUTION:



Definition:

An operating or service procedure, practice, condition or statement, which if not strictly observed could result in damage to or destruction of equipment or rig down time.

NOTE:



Definition:

An operating procedure, condition or statement which is essential to highlight.

Reference Documents

Health, Safety and Environmental Handbook

Field Advisory, Toolbox Topics, and Quality Alerts

CAS-003

Assembly of Threaded Connections to Valves and Wellhead Equipment

CAS-004

Flange Bolting Torque Requirements

CAS-013

Torque-Seal Application - All Closure Bolting

Field Service Manual Sections 3 Page 3-4 - Lockscrews

(Lockscrew dimensions within this procedure are for reference only and not to be misconstrued as factual due to flange and lockscrew tolerances.)

Field Service Manual Sections 7 Service Tools

Field Service Manual Sections 9 - Quick Connects

Field Service Manual Sections 10 - Specifications

Flange Bolting/Torque Requirements, Tubing Specifications, and Casing Specifications

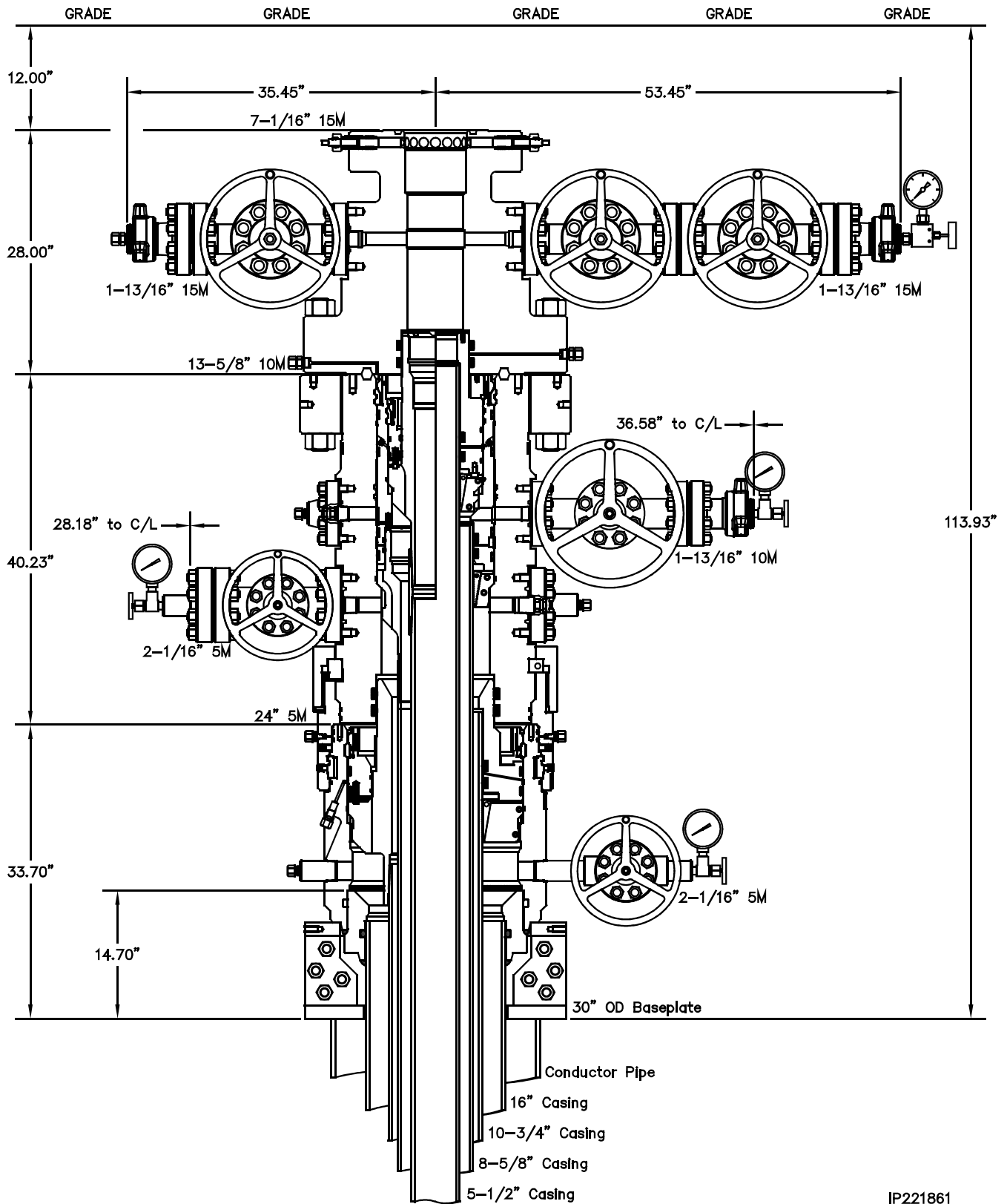


Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System

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System Drawing



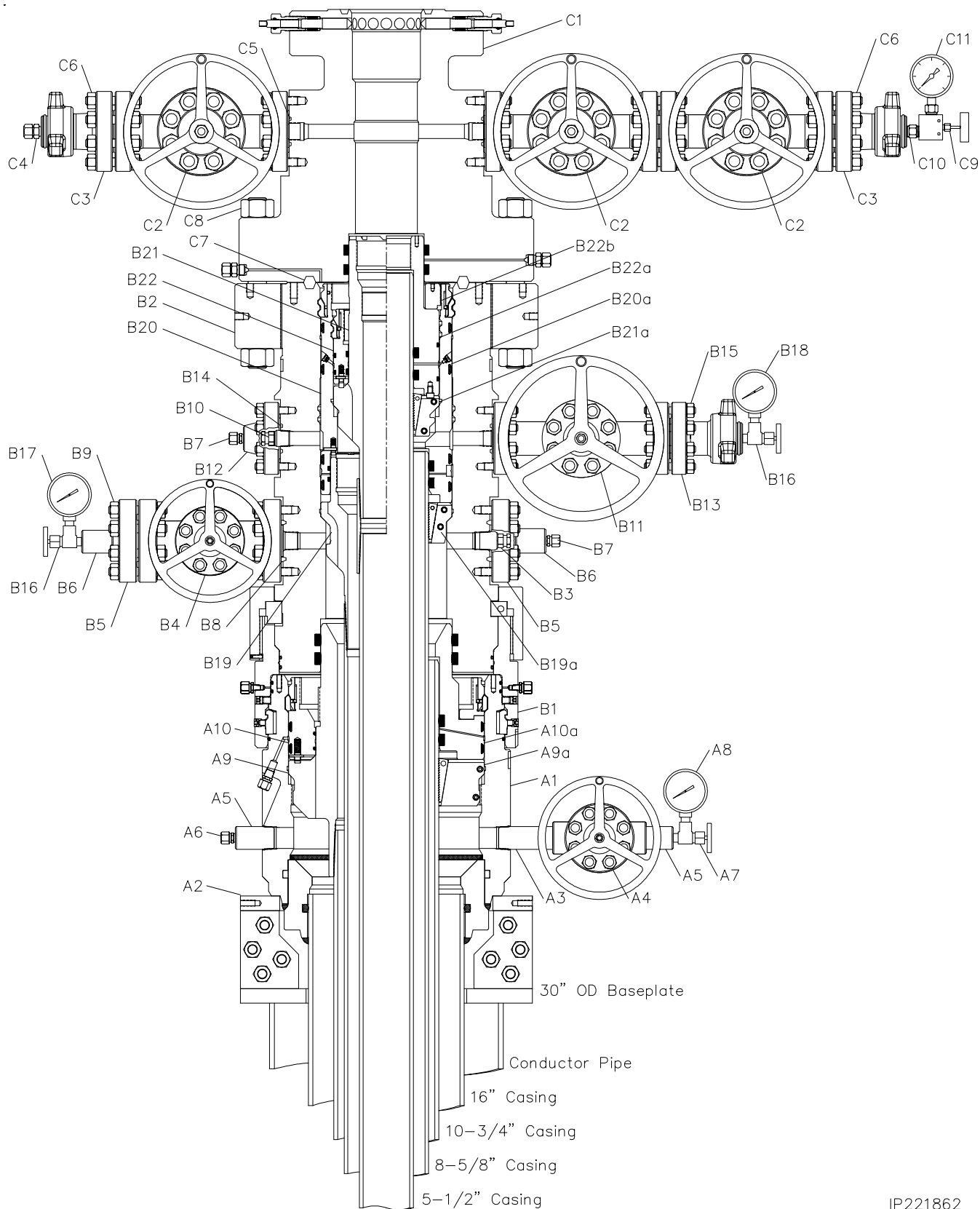
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Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System



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Bill of Materials



IP221862



Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System

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CRC CASING HEAD ASSEMBLY		
Item	Qty	Description
A1	1	Casing Head, CW, CRC, 24" 5M x 16" SOW, With Two 2" Line Pipe & O-ring, With 19.500" 2 Stub Acme 2G LH Thread, 15.25" Minimum Bore, Arranged For Landing Ring, Fabricated, Temperature PU, Material EE, PSL1, PR1 Part # 139029
A2	1	Baseplate Kit, Split, 30" O.D. x 16.5" I.D. x 11.0" Long, For 20" SOW & 21.38" Nose, With With 16" Reducer Bushing, With Four 3" Drill Holes & Four 5/8" 11 UNC 2B Lift Threads On Top Ring, Arranged For 24-28" Conductor, 1,500 KIP Capacity Part # 139158
A3	1	Nipple, 2" Line Pipe x 6" Long XXH, (1.50" I.D.), 5,000 PSI Max WP, 4130/4140, 75K Part # NP6A
A4	1	Gate Valve, Hand Wheel Operated, CW1, 2-1/16" 3/5M SE 2" Line Pipe (Temperature LU Material AA/DD-0,5 PSL1 PR2) Annex F Part # 610001
A5	2	Bull Plug, CW, 2" Line Pipe x 1/2" NPT, API 6A DD Part # BP2T
A6	1	Grease Fitting, Vented Cap, 1/2" NPT, 4140 -50°F With Electroless Nickel Coating Nace, K-Monel Ball, Inconel X-750 Spring Part # 100048
A7	1	Needle Valve, MFA, 1/2" NPT 10M Service Part # NVA

CRC CASING HEAD ASSEMBLY		
Item	Qty	Description
A8	1	Pressure Gauge, 5M, 4-1/2" Face, Liquid Filled, 1/2" NPT Part # PG5M
A9	1	Casing Hanger, CW, CRC-MBU-3T, Fluted, With Centralizer, 20" Nomial x 10-3/4" Buttress Box Bottom x 14.000" 2 Stub Acme 2G Left Hand Pin Top, With 13-3/8" O.D. Neck, With 10.00" Minimum Bore, 4140 110K, Temperature U, Material AA, PSL1, PR1 Part # 139137
A10	1	Packoff, CW, CRC, 20" Nominal, Arranged For 14.500" Seal Prep, With 17.750" 2 Stub Acme 2G Left Hand Box Top, Arranged For Landing On 45° Shoulder On Hanger, 5,000 PSI Max WP, Temperature PU, Standard Service, Non-Nace Part # 133098

MBU-3T HOUSING ASSEMBLY		
Item	Qty	Description
B1	1	Housing, CW, MBU-3T-CRC-DBLHPS-SF, 13-3/8", 13-5/8" 10M x 24" 5M CRC Box, With Two 1-13/16" 10M Studded Upper Outlets & Two 2-1/16" 5M Studded Lower Outlets, 12.410" Minimum Bore, Without 13-5/8" 10M Threaded Flange, Temperature PU, Material AA, PSL2, PR2 Part # 133217
B2	1	Threaded Flange, 13-5/8" 10M With 21.750" 2 Stub Acme 2G Left Hand Box Thread, 31.00" O.D., 4130 75K & I/T @ -75° F Part # 110578
B3	1	VR Plug, CW, 1-1/2" (1.900") Sharp Vee x 1-1/4" Hex, API 6A-DD Part # VR2
B4	1	Gate Valve, Hand Wheel Operated, AOZE, GEN, M-EXP-FB, 2-1/16" 3/5M Flanged End, (6A LU DD PSL2 PR1) QPQ Trim & 4130 Stem Part # 133772
B5	2	Companion Flange, CW, 2-1/16" 5M x 2" Line Pipe, 6A-KU-EE-1 Part # 200002
B6	2	Bull Plug, CW, 2" Line Pipe x 1/2" NPT, API 6A DD Part # BP2T
B7	2	Grease Fitting, Vented Cap, 1/2" NPT, 4140 -50°F With Electroless Nickel Coating Nace, K-Monel Ball, Inconel X-750 Spring Part # 100048
B8	3	Ring Gasket, R24, 2-1/16" 3/5M Part # R24
B9	8	Stud, All-Thread With Two Nuts, Black, 7/8" x 6-1/2" Long, API 20E BSL-1 ASTM A193 GR B7 All Thread Studs, With Two API 20E BSL-1 ASTM A194 GR 2H Heavy Hex Nuts, No Plating Part # 780067-20E1
B10	1	VR Plug, CW, 1-1/4" (1.660") Line Pipe x 1-1/4" Hex, API 6A-DD Part # VR1



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MBU-3T HOUSING ASSEMBLY		
Item	Qty	Description
B11	1	Gate Valve, Hand Wheel Operated, CW, SB100, 1-13/16" 10M Flanged End (API 6A LU BB/EE-0,5 PSL3 PR2) QPQ Trim, ANNEX F, (Bore Vent Hole) Part # 107412MV
B12	1	Blind Flange, 1-13/16" 10M x 1/2" NPT, Recessed For VR, 6A-LU-EE-3 Part # 129709
B13	1	Adapter, CFH, 1-13/16" 10M x 2" Figure 1502 x 1/2" NPT, Nace Service, 6A-PU-EE-2 Part # 122007
B14	3	Ring Gasket, BX151, 1-13/16" 10/15/20M Part # BX151
B15	8	Stud, All-Thread With Two Nuts, Black, 3/4" x 5-1/2" Long, API 20E BSL-1 ASTM A193 GR B7 All Thread Studs, With Two API 20E BSL-1 ASTM A194 GR 2H Heavy Hex Nuts, No Plating Part # 780080-20E1
B16	2	Needle Valve, MFA, 1/2" NPT 10M Service Part # NVA
B17	1	Pressure Gauge, 5M, 4-1/2" Face, Liquid Filled, 1/2" NPT Part # PG5M
B18	1	Pressure Gauge, 10M, 4-1/2" Face, Liquid Filled, 1/2" NPT Part # PG10M

MBU-3T HOUSING ASSEMBLY		
Item	Qty	Description
B19	1	Casing Hanger, CW, MBU-3T-LWR-TP8, Fluted, 13-5/8" x 8-5/8" (32#) Vam Sprint-FJ Pin Bottom x 10.250" 4 Stub Acme 2G Right Hand Box Top, With 11-1/2" O.D. Neck, 4140/4145M, 125K, Temperature U, Material AA, PSL2, PR2 Part # 137689
B20	1	Packoff, CW, MBU-3T, Mandrel, 13-5/8" Nested x 11", With 11.250" 4 Stub Acme 2G Left Hand Box Top, With Rupture Disk & Ribbed Energizing Ring, Temperature U, Material AA, PSL1, PR2 Part # 130632
B21	1	Casing Hanger, CW, MBU-3T-TP8-UPR, SN, 7-5/8", Fluted, 11" Nested x 5-1/2" (20#) HUNTING TEC-LOCK WEDGE Pin Bottom x 6.125" 4 Stub Acme 2G Right Hand Box Top & 5" HBPV Thread, Spec For Rotating Casing String, 4140 125K, Temperature U, Material AA, PSL2, PR2 Part # 134884
B22	1	Packoff, CW, CTF-MBU-3T, 11", Arranged For 7.75" Seal Prep, With 8.750" 4 Stub Acme 2G Left Hand Box Top, Arranged For Landing On 45° Shoulder On Hanger, 4130 80K, Nace Service, PSL2 Part # 115867

TUBING HEAD ASSEMBLY		
Item	Qty	Description
C1	1	Tubing Head, CW, CTH-DBLHPS-SB, 7-5/8", 13-5/8" 10M x 7-1/16" 15M, With Two 1-13/16" 15M Studded Outlets, With 6.375" Minimum Bore & 17-4PH Lock Down Screws, 216A-PU-EE-0,5-3-2 Part # 115302-21
C2	3	Valve, Hand Wheel Operated, CW, SB100, 1-13/16" 15M Flanged End, BB-EE-0,5, (API 6A LU BB/EE-0,5 PSL3 PR2F) QPQ Trim, API 6A PR2 Annex F (Bore Vent Hole) Part # 113880MV
C3	2	Adapter Flange, CFH, 1-13/16" 15M x 2" Figure 1502 x 9/16" Autoclave, 15,000 PSI Max WP, Standard Service, Non-Nace, PSL2 Part # 117166
C4	1	Grease Fitting, Vented Cap, 9/16" Autoclave, 17-4PH Body, 316SS Vent Cap, Inconel X-750 Spring & Tungsten Carbide Ball, 20,000 PSI Service Part # 100326
C5	5	Ring Gasket, BX151, 1-13/16" 10/15/20M Part # BX151
C6	24	Stud, All Thread With Two Heavy Hex Nuts, Black, 7/8" x 6", API 20E BSL-1 ASTM A193 GR B7 All Thread Studs, With Two API 20E BSL-1 ASTM A194 GR 2H Heavy Hex Nuts, No Plating Part # 105477-20E1
C7	1	Ring Gasket, BX159, 13-5/8" 10/15/20M Part # BX159
C8	20	Stud, All Thread With Two Nuts, Black, 1-7/8" x 17-3/4", B7/2H, No Plating Part # 102825
C9	1	Needle Valve, Two Way Angle, 9/16", 20KSI, Sour Service, Without Collars & Glands Part # 810023
C10	1	Autoclave Adapter, High Pressure, 9/16" Male x 9/16" Male, 316 Stainless Steel Part # 106012
C11	1	Pressure Gauge, 15M, 9/16" Autoclave, Liquid Filled Part # PG15M



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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RECOMMENDED SERVICE TOOLS		
Item Qty	Description	
ST1 1	Lift Ring, CW, 24" CRC Bottom x Four 1" 8UNC-2B Lift Threads, 21.25" I.D. (Max Load Capacity 40,000 Lbs) Part # 134688	
ST2 1	Running Tool, CW, Casing Head, 24" CRC, 19.500" 2 Stub Acme 2G LH Pin Bottom x 16" BC Box Top, 15.25" Minimum Bore, Max Load Capacity 750K Part # 133358	
ST3 1	Test Plug/Retrieving Tool, CW, Arranged For 20.12" Bowl x 4-1/2" IF NC50 Box Bottom & Top, With 1-1/4" Line Pipe Bypass & Spring Loaded Dogs, Fabricated Part # 104020	
ST4 1	Wear Bushing, CW, CRC, 20.12" Bowl x 15.25" I.D. x 13.0" Long, Arranged For Two .275" O-ring, With 1/4" Drill Holes Part # 132751	
ST5 1	Run Tool, CW, Casing Hanger, CRC, 10-3/4" Buttress Box Top x 14.000" 2 Stub Acme 2G Left Hand Box Landing Thread, 10.00" Bore, Max Load capacity 1400K Part # 139135	
ST6 1	Wash Tool, CW, OMS, 20-3/4" & CTH, 20" x 10-3/4"/13-3/8"/14", With 4-1/2" IF NC50 Box Top Threads, Fabricated Part # 103367	
ST7 1	Run Tool, CW, Packoff, CRC, 20", With 17.750" 2 Stub Acme 2G Left Hand Pin Bottom x 4-1/2" IF NC50 Box Top, With 3/8" Ball Bearings Part # 133107	
ST8 1	Test Plug, CW, 13-5/8" Nominal x 4-1/2" IF NC50 Pin Bottom x 4-1/2" IF NC50 Box Top, With 1-1/4" Line Pipe Bypass Part # 116358	

RECOMMENDED SERVICE TOOLS		
Item Qty	Description	
ST9 1	Run/Retrieval Tool, CW, Wear Bushing, 13-5/8", 4-1/2" IF NC50 Box Bottom & Top, With Spring Loaded Dogs, Configured From 104467 (Comb Test Plug Removed Seal Groove) Part # 104467G	
ST10 1	Wear Bushing, CW, MBU-3T, Lower, 13-5/8" x 10.00" I.D. x 27.0" Long, With 3/8" Upper O-ring & Without 2.38" Groove Part # 122539	
ST11 1	Casing Hanger Running Tool, CW, TP8, 13-5/8" x 8-5/8" (32#) Vam Sprint-FJ Box Top, 10.250" 4 Stub Acme 2G Right Hand Pin Bottom, 1000K Max Load Capacity, Max. Torque 48,000 Ft-Lb, Spec. For Rotating Casing String, 4140 125K Part # 137688	
ST12 1	Torque Collar, CW, For Use With Running Tool, TP, 10.250 4 Stub Acme 2G RH Pin Bottom & Arranged For 11.50" O.D. x 5.00" Long Box Hanger Neck, 36,000 FT-LBS Max. Torque Part # 118906	
ST13 1	Wash Tool, CW, MBU-3T-LR, MBS2 & Fluted, 13-5/8" x 4-1/2" IF NC50 Box Top Thread, With Brushes Part # 106277	
ST14 1	Packoff Running Tool, CW, MBU-3T UPR, 13-5/8" Nested, With 11.250" 4 Stub Acme 2G LH Pin Bottom x 4-1/2" IF (NC-50) Box Top (Seal Sleeve Removed) Part # 117310, 1/4" Bearings Part # 123392, 3/8" Bearings OR Packoff Running Tool, CW, MBU-3T-UPR, 13-5/8" Stack With 11.250" 4 Stub Acme-2G LH Pin Bottom x 4-1/2" IF (NC50) Box Bottom And Top, With Ball Bearings Part # 116996, 1/4" Bearings Part # 119451, 3/8" Bearings	

RECOMMENDED SERVICE TOOLS		
Item Qty	Description	
ST15 1	Test Plug, CW, MBU-3T Inner, 11" x 4-1/2" IF NC50 Box Bottom & Top, With 1-1/4" Line Pipe Bypass Part # 125190	
ST16 1	Wear Bushing, CW, MBU-3T (-ONE), UPR, Nested, 13-5/8" x 11" x 8.00" I.D. x 20.0" Long, Arranged For 13-5/8" Retrieval Tool Part # 125346	
ST17 1	Run Tool, CW, Casing Hanger, TP8, 6.125" 4 Stub Acme 2G Right Hand Pin Bottom x 5-1/2" (20#) HUNTING TEC-LOCK WEDGE Box Top, With 4.768" Min. Bore & Max Load Capacity 580K, Max Torque 40,000 Ft-Lbs, Spec For Rotating Casing String, 4140 125K <i>Note: Max Casing Connection Torque Per Threaders Spec</i> Part # 124324	
ST18 1	Torque Collar, CW, Casing Hanger, For Use With 7.62" O.D. x 15.38" Long Box Hanger Neck And 10.83" O.D. Running Tool, Max. Torque 35,000 Ft-Lbs Part # 117319	
ST19 1	Wash Tool, CW, Casing Hanger, MBU-2LR/MBS2-R (3T), Fluted, 11" x 4-1/2" IF NC50 Box Top Threads, Fabricated Part # 103164	
ST20 1	Run Tool, CW, Packoff, MBU-3T-SN, 7-5/8", With 8.750" 4 Stub Acme 2G Left Hand Pin Bottom x 4-1/2" IF NC50 Box Top, With Ball Bearings Part # 117306	
ST21 1	Sub, Crossover, CW, 5" HBPV Pin Thread Bottom x 4-1/2" IF NC50 Box Top, 18.0" Long, 4140 110K Part # 116240	
ST22 1	BPV, Type H, 5" One Way, 4130, Hydro Tested & API Monogrammed Part # BPV5T	



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RENTAL EQUIPMENT		
Item	Qty	Description
R1	2	Adapter, Drilling, CW, 24" CRC Box Bottom x 21-1/4" 2M Flange Top, 16.25" Long, With 21.25" Minimum Bore, Temperature Rating PU Part # 132608
R2	1	Adapter, Drilling, CW, 21-1/4" 2M Flange x 24" CRC Pin Top, 16.80" Long, With 21.25" Bore, 2,000 PSI Max WP, Temperature PU, Material EE, PSL1 Part # 134041
R3	1	Threaded Hub, CW, MBU-3T, 13-5/8" 10M, With 21.750" 2 Stub Acme 2G Left Hand Box Thread Part # 116992
R4	2	Adapter, Drilling, CW, MBU-3T, 13-5/8" 10M Quick Connect Bottom x 13-5/8" 10M Studded Top x 15.0" Long, Temperature Rating PU Part # 116966
R5	1	Spacer Spool, CW, 13-5/8" 10M Threaded Flange Bottom x 13-5/8" 10M Quick Connect Hub Top x 50.0" Long, With 13.62" Minimum Bore, 10,000 PSI Max WP, Temperature Rating PU Part # 127541
R6	1	TA Cap, CW, MBU-3T-HPS, 12-5/8", 13-5/8" 10M Quick Connect, With One 1-13/16" 10M Studded Outlets, VR Thread & 1/2" NPT Port, 6A-U-AA-1-1 Part # 122483
R7	1	Secondary Seal, CW, TA-HPS, 12-5/8" x 8-5/8", 6A-PU-DD-1-2 For Use TA Cap Only Part # 122272
R8	1	Blind Flange, AOZE, 7-1/16" 15M x 9/16" Autoclave, With Two 3/4" 10 UNC 2B Lift Threads, KU-EE-3-1 Part # 126594

EMERGENCY EQUIPMENT		
Item	Qty	Description
A9a	1	Casing Hanger, CW, CRC-C1, 20" x 10-3/4", Temperature PU, Material DD, PSL3, PR1 Part # 139150
A10a	1	Packoff, CW, CRC-SN, 13-3/8" Emergency, 20" x 10-3/4", With 17.750" 2 Stub Acme 2G Left Hand Box Top, 5,000 PSI Max WP, Temperature PU, Standard Service, Non-Nace Part # 139152
B19a	1	Casing Hanger, CW, MBU-3T-LWR, Emergency, 13-5/8" x 8-5/8", 6A-PU-DD-3-2 Part # 119743
B20a	1	Packoff, CW, MBU-3T, Emergency, 13-5/8" Nested x 11" x 8-5/8", With 11.250" 4 Stub Acme 2G Left Hand Box Top With Rupture Disk, 4140 110K, Standard Service, Non-Nace Part # 119526T
B21a	1	Casing Hanger, CW, MBU-3T, UPR/MBU-2LR, UPR, 11" x 5-1/2", 6A-PU-DD-3-2 Part # 108211
B22a	1	Packoff, CW, MBU-3T, Inner, Emergency, Nested, 11" x 5-1/2", With 7-5/8" Seal Neck, 5" HBPV Threads & 4.93" Minimum Bore, Arranged For Hold Down Ring, 4130 75K, Nace Service Part # 117298
B22b	1	Hold Down, Ring, For 22 Casing Hanger 11" x 4-1/2", Arranged For Packoff MBU-LR, 13-5/8" 10M, With 11.250" 4 Stub Acme 2G Left Hand Pin x 8.00" I.D. x 2.62" Long, 4140 110K Part # 116161



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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Stage 1 — Hang Off the 16" Casing

1. Drive or drill in the conductor pipe as required.
2. Cut the conductor pipe at 113.93" below grade. Grind the stub level with the horizon then place a 1/8" x 45° bevel on the I.D.
3. Drill and condition the 16" casing hole section.

NOTE: The 24" CRC x 16" SOW Casing Head with pup joint and running tool with landing joint may be shipped to location as a pre assembled riser. In the event it is not the following steps will detail the assembly of the CRC riser assembly.

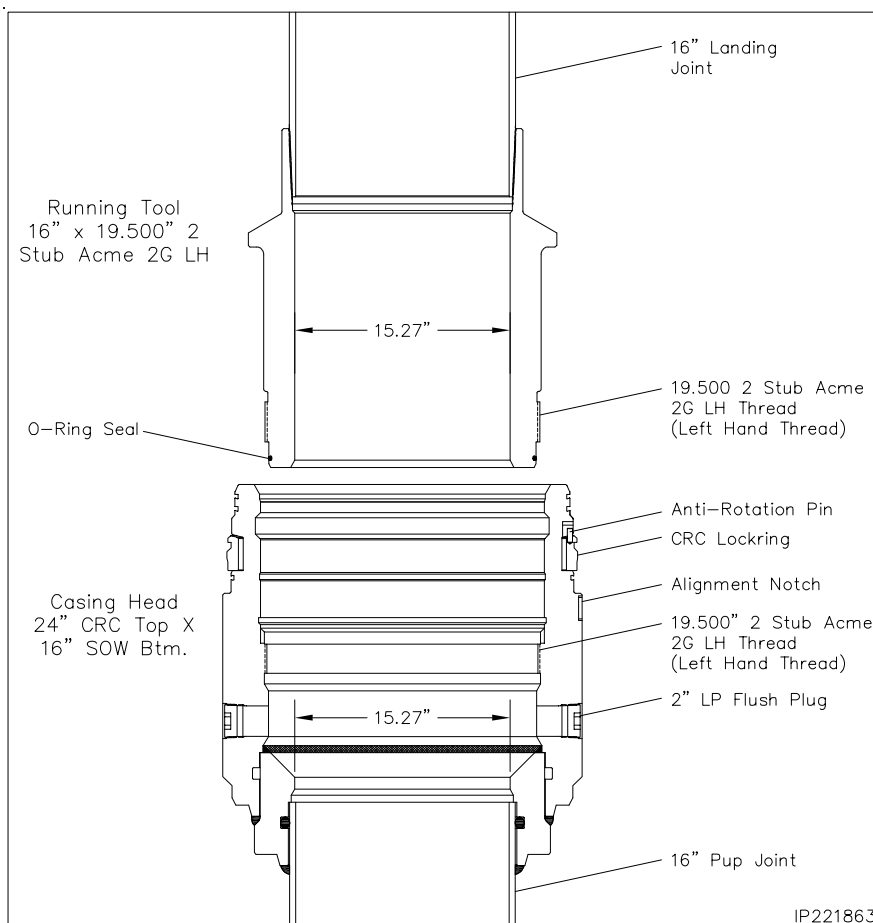
4. Examine the **16" BC x 19.500 2 Stub Acme Running Tool (Item ST2)**. Verify the following:
 - ID and OD threads are clean and in good condition
 - o-ring is in place and in good condition

5. Make up a joint of 16" casing in the top of the tool and tighten connection to thread manufacturer's maximum make up torque.

6. Pick up the assembly and stand it back in the derrick.

7. Examine the **24" CRC x 16" SOW Casing Head, (Item A1)**. Verify the following:

- bore is clean and free of debris
- lockring is in place with anti-rotation pin properly seated in its pocket
- 2" LP flush plugs are in place and tightened securely
- pup joint is in place and properly welded.
- buttress threads are clean and in good condition. Reinstall thread protector



8. Examine the **24" CRC Lift Ring (Item ST1)**. Verify the following:
 - four 1" lift threads and bore are clean and in good condition
 - drive screws are in place and retracted from the bore
 - 1" lift eyes are properly installed and in good condition

9. Slide the 24" CRC lift ring over the top of the lower drilling adapter assembly until it bottoms out on top of the pin top drilling adapter and the lockring snaps into the lift ring.

10. Install a weight rated pick up sling to the top of the 24" CRC lift ring and drilling adapter assembly.



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Stage 1 — Hang Off the 16" Casing

11. Run the 16" casing to the required depth and set the casing in the floor slips.

WARNING: Keep body clear of all pinch points and suspended loads.

12. Pick up the assembly and suspend it above the casing in the floor slips.

13. Remove the pin thread protector and thoroughly clean the mating threads of the pup joint and the casing collar.

14. Apply a coat of thread dope to thee threads and then carefully lower the pup joint into the casing collar.

15. Rotate the assembly by hand counter clockwise to locate the thread start and then clockwise to a positive stop.

16. Using the rig tongs on the casing head pup joint, tighten the connection to thread manufacturer's optimum make up torque.

17. Remove the pick up sling and the casing head protector cover.

18. Inspect the head and lockring for any damage and repair as necessary.

19. Ensure the lockring anti-rotation pin is properly seated and ring moves freely.

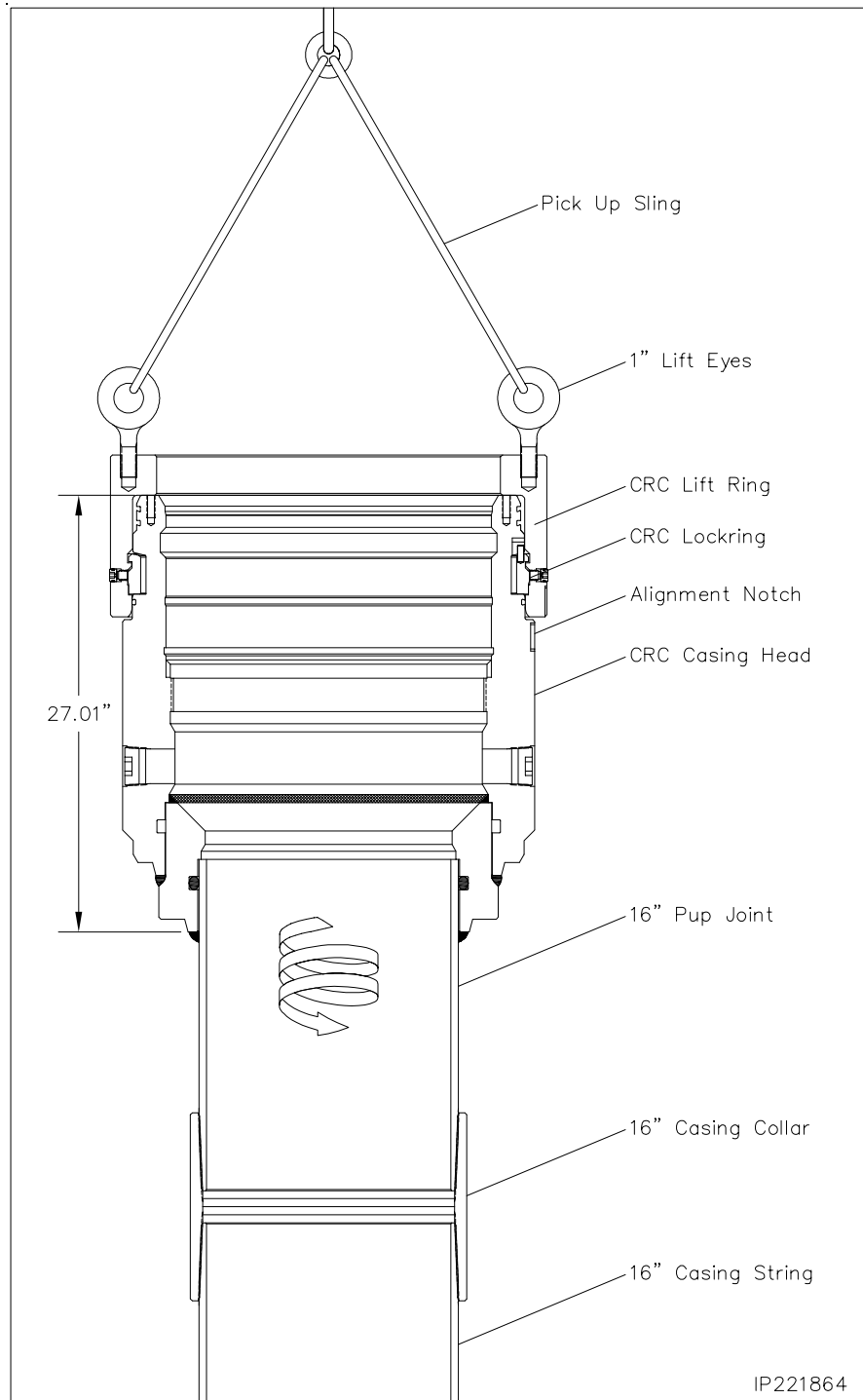
20. Locate the first drive screw to the right of the lift ring alignment notch. Run the drive screw in to a positive stop.

21. Locate the second drive screw to the left of the adapter alignment notch. Run the drive screw in to a positive stop.

22. Continue around the adapter in an alternating **right to left pattern until all (10) drive screws are FULLY ENGAGED.**

NOTE: This will compress the CRC lockring and release the lift ring adapter.

23. Remove the lift ring from the casing head and set aside.



IP221864



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

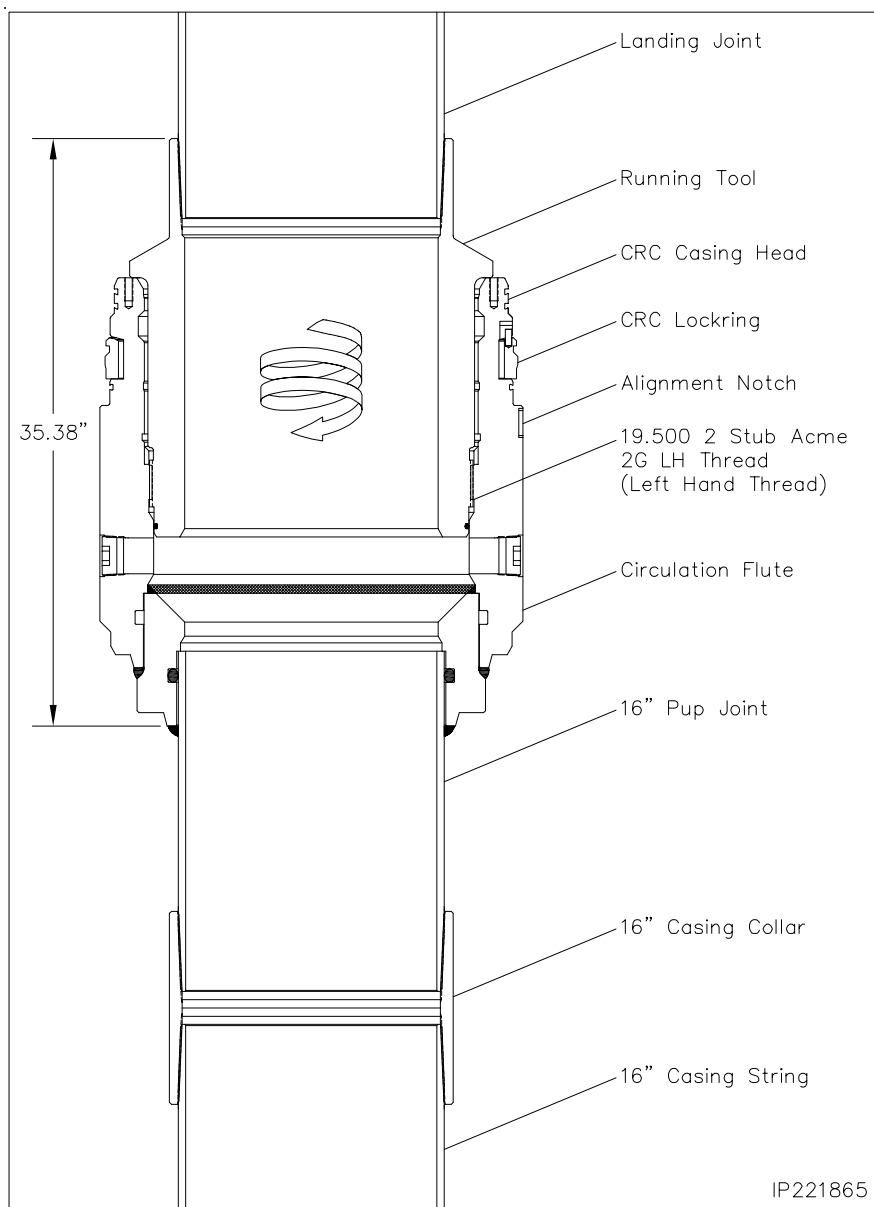
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Stage 1 — Hang Off the 16" Casing

24. Pick up the running tool/landing joint assembly and suspend it above the casing head.
25. Liberally lubricate the mating threads, seal areas and o-ring of the casing head and running tool with a oil or light grease.
26. **Using chain tongs only**, thread the Running Tool into the Casing Head, with left hand rotation, until it shoulders out on top of the casing head.

CAUTION: Do Not apply torque to the Casing Head/Tool connection.



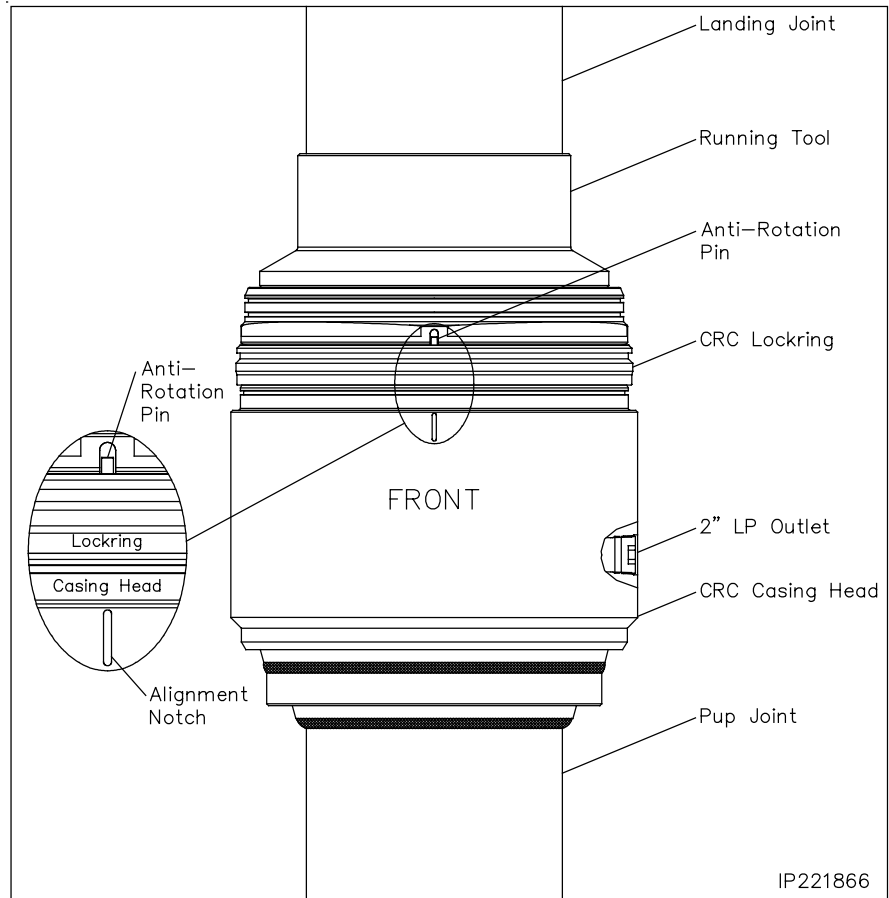
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Stage 1 — Hang Off the 16” Casing

CAUTION: Verify with the **SITE SUPERVISOR** the proper location of the casing head outlet valve in relation to the B Section upper outlet valve. The lower outlet valve will be installed on the right side of the casing head in relation to the **FRONT** of the wellhead assembly as indicated in IP Drawing #IP221866.

27. Pick up the casing head and remove the floor slips.

CAUTION: Rotate the casing head to the right or left to position the **Alignment Notch (FRONT of the wellhead)** and the outlet to the right is positioned in the direction indicated by **SITE SUPERVISOR**. **The position of the casing head will dictate the position of the balance of the wellhead system.**




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Stage 1 — Hang Off the 16" Casing

28. Examine the 30" O.D. Split Baseplate Assembly (Item A2).

Verify the following:

- baseplate assembly is clean and in good condition
- all gussets are properly welded
- baseplate halves are bolted together and bolts are tightened securely
- lift eyes are in place and tightened securely


 **WARNING:** Keep body clear of all pinch points and suspended loads.

29. Remove the 1" assembly bolting from the baseplate and separate the assembly halves.

30. Attach a suitable lifting device to the first baseplate half and position it on top of one side of the cellar.

31. Position the second half on the opposite side of the cellar.

32. Carefully lower the casing head assembly through the rig floor and position it approximately 14" above the conductor pipe stub.

 **WARNING:** Keep body clear of all pinch points and suspended loads.

33. Attach a suitable lifting device to one half of the baseplate and position it on top of the conductor pipe stub under the casing head.

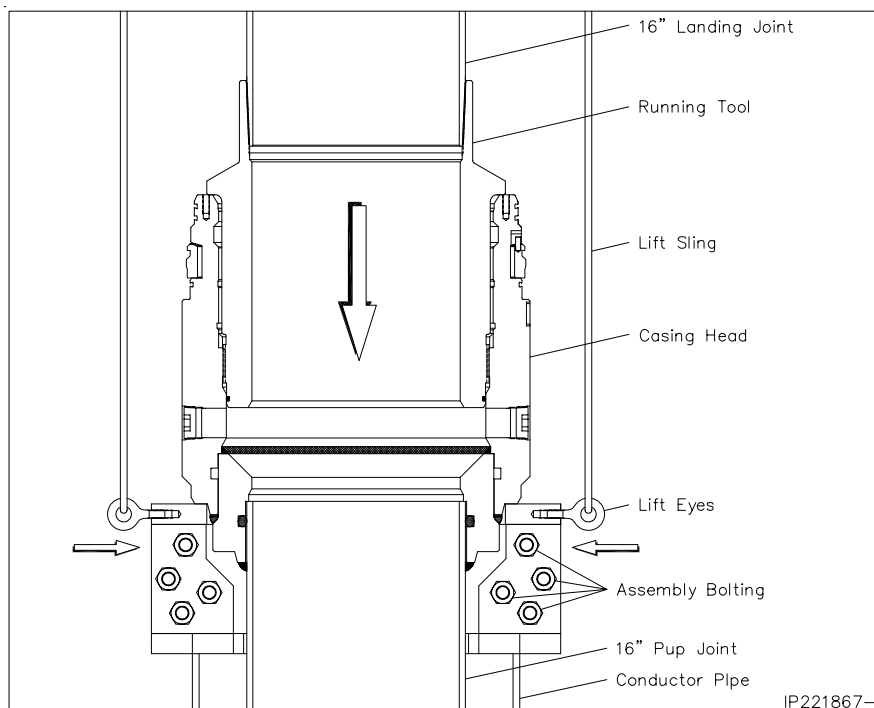
34. Pick up the second half and position it adjacent the first half.


35. Push the two halves together and secure with the 1" Assembly Bolting. Ensure all bolts are tightened securely and torqued to approximately 200 ft lb.

36. Carefully lower the casing head until it lands on top of the baseplate assembly and slack off all weight.

37. Rig up cementing equipment and establish circulation.


38. Cement casing as per program taking returns into the cellar and jetting them to the pits.



 **CAUTION:** Ensure the landing joint does not rotate during this process or difficulty may be encountered when removing the running tool.

39. With cement in place, remove the cementing equipment.

40. Using only chain tongs, rotate the landing joint to the clockwise (RIGHT) approximately 5 turns or until it comes free of the casing head.

 **CAUTION:** Ensure the landing joint remains concentric with the well bore while rotating to ensure additional torque is not encountered.

41. Retrieve the landing joint and running tool with a straight vertical lift.



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Stage 1 — Hang Off the 16" Casing

42. Remove the 2" LP flush plugs and the 1/2" flush plug from the test port.
43. Using a high pressure water hose, thoroughly clean the inside and outside of the casing head, removing all old grease and debris.

CAUTION: Ensure the CRC locking is in position, in good condition and there is no trapped debris behind the locking. The entire locking groove must be clean and free of debris.

44. Install the 2" LP nipple with 2" 5M Gate Valve in the outlet specified by the **SITE SUPERVISOR**. Ensure the valve handle faces forward when threads are fully made up.

45. Install the 2" LP Bull Plug in the opposite side outlet.

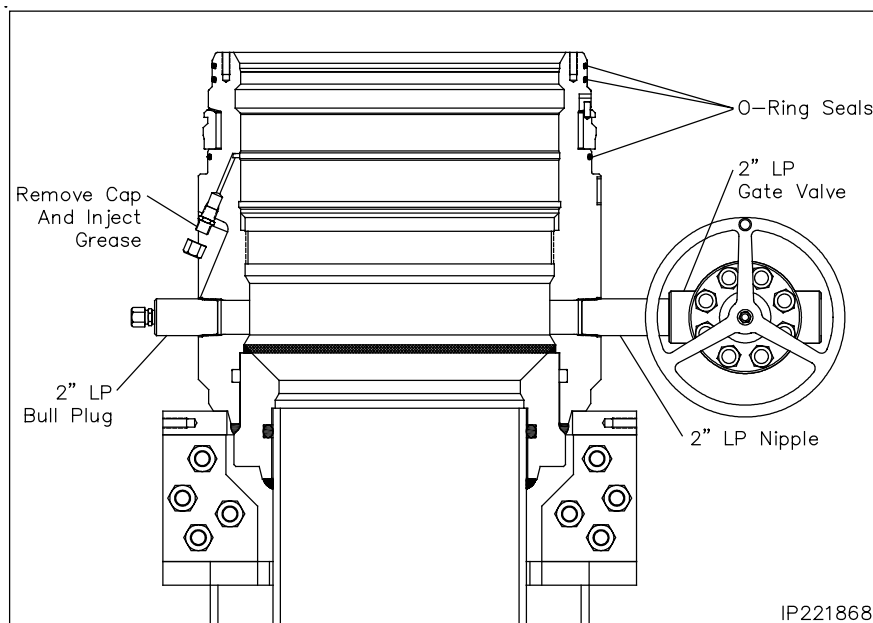
46. Install the 1/2" NPT grease fitting in the test port.

47. Attach a grease gun to the fitting and inject grease through the test port until it flows freely into the ID of the casing head.

48. Remove the grease gun and install the dust cap on the open fitting.

49. Thoroughly clean the O-ring grooves in the top of the casing head and install the (3) O-ring seals.

CAUTION: Prior to installing the BOP stack, ensure the wellhead is level using appropriate level.



IP221868



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Stage 2 — Install the 21-1/4” BOP Adapter

1. Examine the **24” CRC Box Bottom x 21-1/4” 2M Lower Drilling Adapter (Item R1) With 21-1/4” 2M x 24” CRC Pin Top Middle Drilling Adapter (Item R2)**. Verify the following:

- drive screws are in place and retracted from bore
- anti-rotation screws are in place and fully retracted from the bore
- bore is clean and free of debris
- locking is in place with anti-rotation pin is properly seated in its pocket
- o-ring seals are in place and in good condition
- flange connection has ring gasket and is made up properly

2. Examine the **24” CRC Lift Ring (Item ST1)**. Verify the following:

- four 1” lift threads and bore are clean and in good condition
- drive screws are in place and retracted from the bore
- 1” lift eyes are properly installed and in good condition

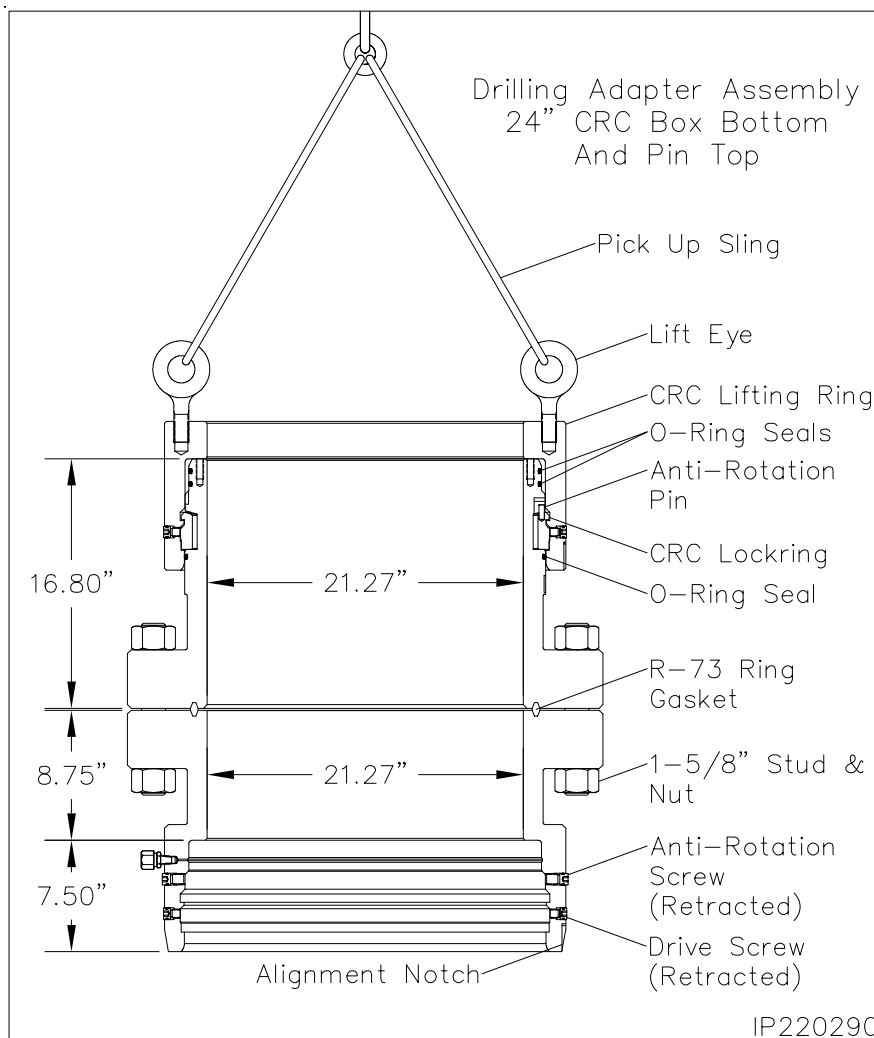
3. Slide the 24” CRC lift ring over the top of the lower drilling adapter assembly until it bottoms out on top of the pin top drilling adapter and the locking snaps into the lift ring.

4. Install a weight rated pick up sling to the top of the 24” CRC lift ring and drilling adapter assembly.

5. Inspect the casing head and locking for any damage and repair as necessary.

6. Ensure the locking anti-rotation pin is properly seated and ring moves freely.

7. Thoroughly clean and lightly lubricate the O.D. seals and locking of the casing head with oil or light grease.



8. Ensure the drive screws and anti-rotation screws are fully retracted from the adapter bore.
9. Thoroughly clean and lightly lubricate the CRC connection of the BOP adapter with oil or light grease.



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Stage 2 — Install the 21-1/4” BOP Adapter

WARNING: Keep body clear of all pinch points and suspended loads.

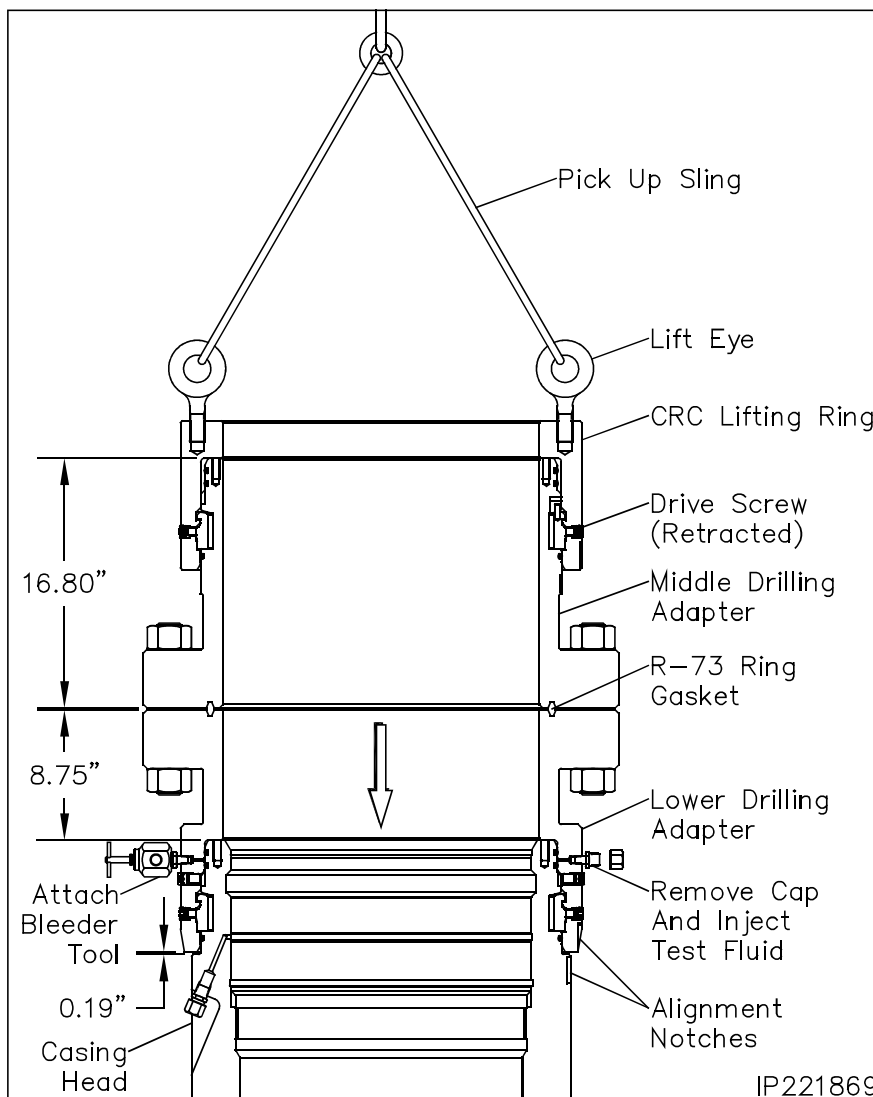
10. Pick up the adapter and suspend it above the casing head.
11. Align the alignment notch in the adapter with the mating notch in the casing head.
12. Carefully lower the adapter over the top of the casing head until the adapter bottoms out on the casing head and the locking snaps into its mating groove in the adapter.

NOTE: When fully landed out the gap between the bottom of the adapter and the leading edge on the casing head will be 0.19” as indicated.

CAUTION: Ensure the alignment notches are aligned.

Lower Seal Test

13. Locate the CRC “SEAL TEST” fittings on the O.D. of the adapter and remove the dust cap from both fittings.
14. Attach a bleeder tool to one of the open fittings and open the tool.
15. Attach a test pump to the remaining open fitting and pump clean test fluid between the seals until a continuous stream flows from the open bleeder tool.
16. Close the tool and continue pumping fluid until a stable test pressure of **2,000 psi** is achieved.
17. Hold the test pressure for 15 minutes or as required by the drilling supervisor.
18. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the bleeder tool and re-install the dust cap on the open fittings.



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Stage 2 — Install the 21-1/4” BOP Adapter

19. Ensure the alignment notches are in line with each other.
20. Locate **ONLY** the anti-rotation screws (upper set of screws) on the O.D. of the adapter and run in all 8 screws to a positive stop. Tighten screws to approximately 100 ft-lbs.

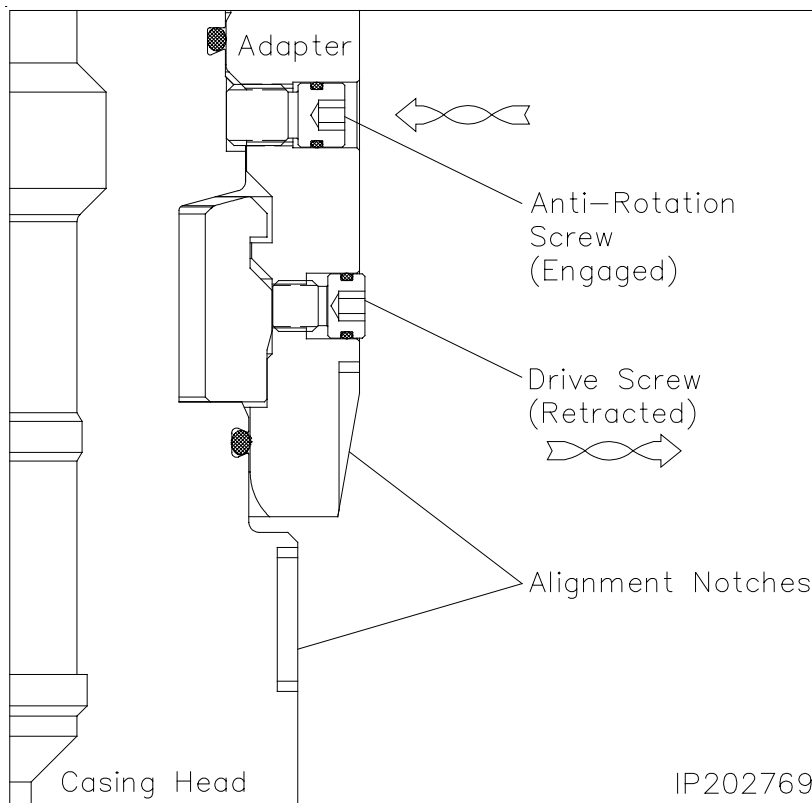
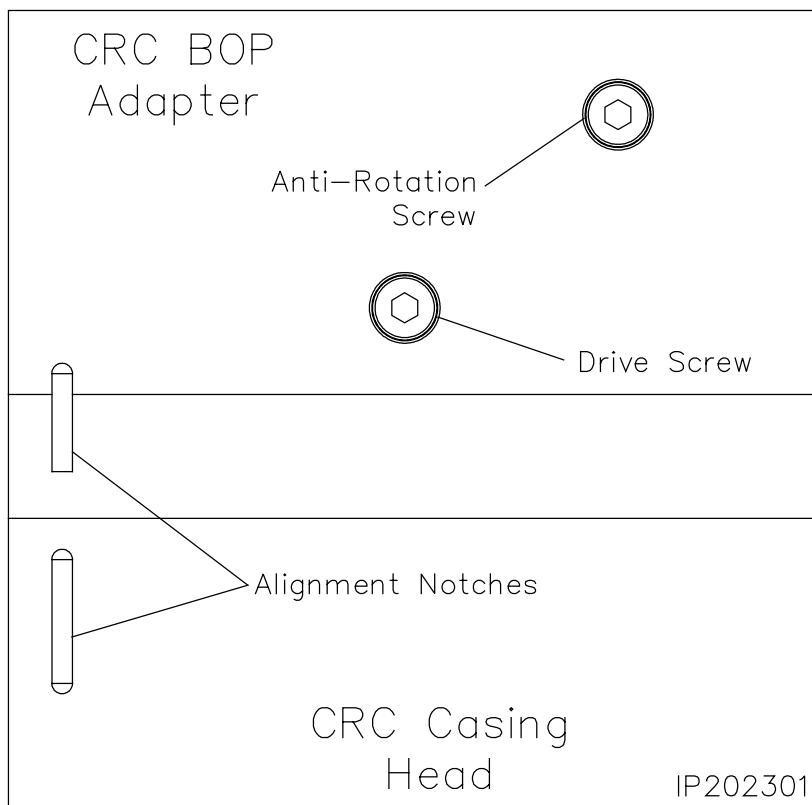
CAUTION: Locate the drive screws and ensure the screws are loose and rotate freely. Do not remove the drive screws.

CAUTION: Do **Not** engage the drive screws (lower set of screws) at any time during operations. Doing so will disengage the CRC lockring and cause the connection to fail.

21. Locate the alignment notches in the middle drilling adapter and the lift ring. Make sure the lift ring alignment notch aligns with the drilling adapter notch.
22. Locate the first drive screw to the right of the lift ring alignment notch. Run the drive screw in to a positive stop.
23. Locate the second drive screw to the left of the adapter alignment notch. Run the drive screw in to a positive stop.
24. Continue around the adapter in an alternating **right to left pattern until all (10) drive screws are FULLY ENGAGED.**

NOTE: This will compress the CRC lockring and release the lift ring adapter.

25. Remove the lift ring from the drilling adapter and set aside.
26. Inspect the middle drilling adapter and lockring for any damage and repair as necessary.
27. Ensure the lockring anti-rotation pin is properly seated and ring moves freely.
28. Ensure the o-ring seals are clean and in good condition.



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Stage 2 — Install the 21-1/4” BOP Adapter

29. Thoroughly clean the mating ring groove of the BOP and the upper drilling adapter.



WARNING: Keep body clear of all pinch points and suspended loads.

30. Make up the remaining **24” CRC Box Bottom x 21-1/4” 2M Upper Drilling Adapter (Item R1)** to the bottom of the BOP stack using a new R-73 ring gasket.

31. Thoroughly clean and lightly lubricate the O.D. seals and locking of the middle drilling adapter with oil or light grease.

32. Ensure the drive screws and anti-rotation screws are fully retracted from the upper drilling adapter bore.

33. Thoroughly clean and lightly lubricate the CRC connection of the upper drilling adapter with oil or light grease.

34. Pick up the BOP and suspend it above the middle drilling adapter.

35. Align the alignment notch in the upper drilling adapter with the mating notch in the middle drilling adapter.

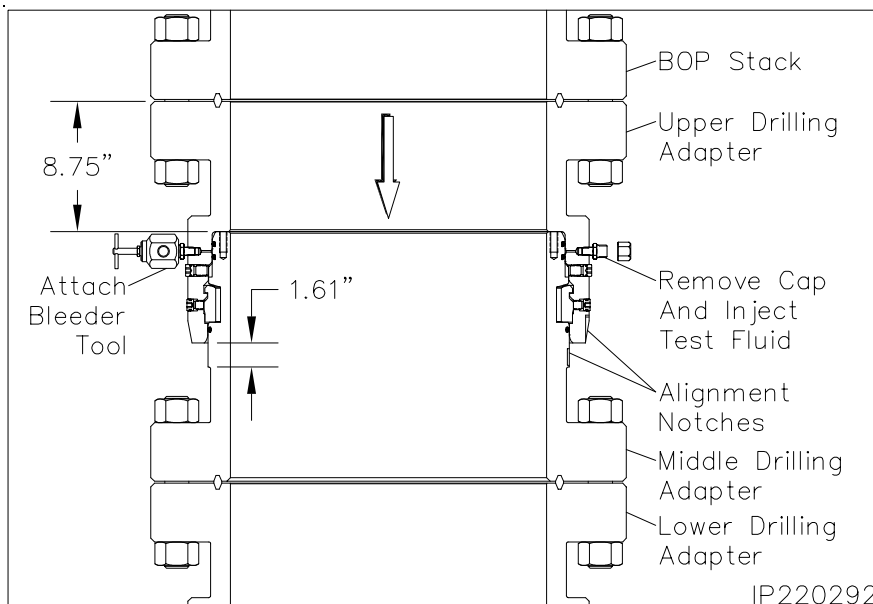
36. Carefully lower the upper drilling adapter over the top of the middle drilling adapter until the upper drilling adapter bottoms out on the middle drilling adapter and the locking snaps into its mating groove in the adapter.



NOTE: When fully landed out the gap between the bottom of the upper drilling adapter and the leading edge on the middle drilling adapter will be 1.61” as indicated.



CAUTION: Ensure the alignment notches are aligned.



Upper Seal Test

37. Locate the CRC “SEAL TEST” fittings on the O.D. of the adapter and remove the dust cap from both fittings.
38. Attach a bleeder tool to one of the open fittings and open the tool.
39. Attach a test pump to the remaining open fitting and pump clean test fluid between the seals until a continuous stream flows from the open bleeder tool.
40. Close the tool and continue pumping fluid until a stable test pressure of **2,000 psi** is achieved.
41. Hold the test pressure for 15 minutes or as required by the drilling supervisor.
42. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the bleeder tool and re-install the dust cap on the open fittings.



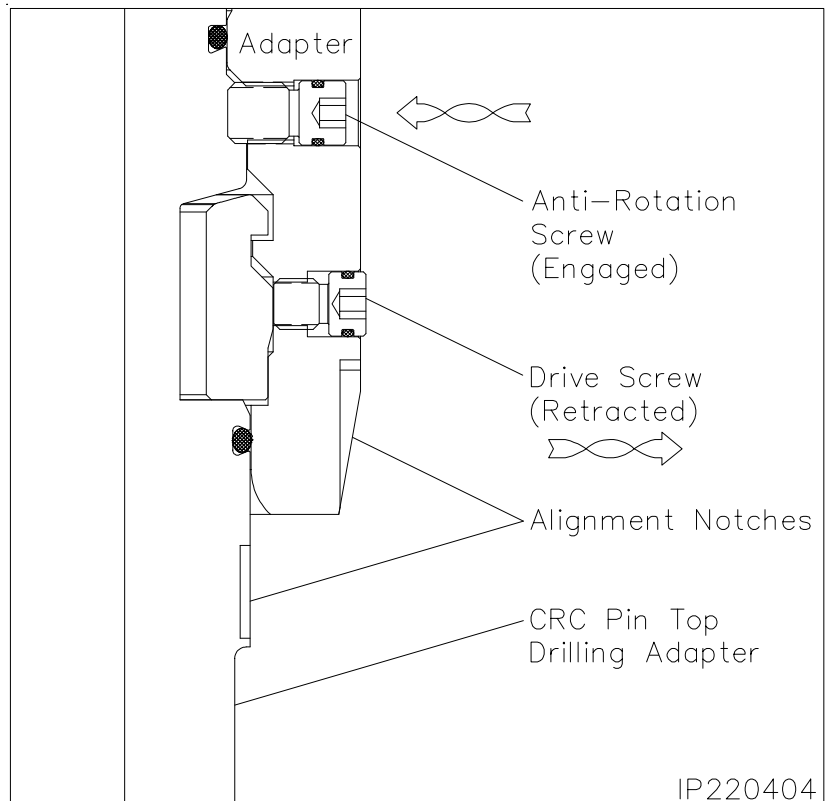
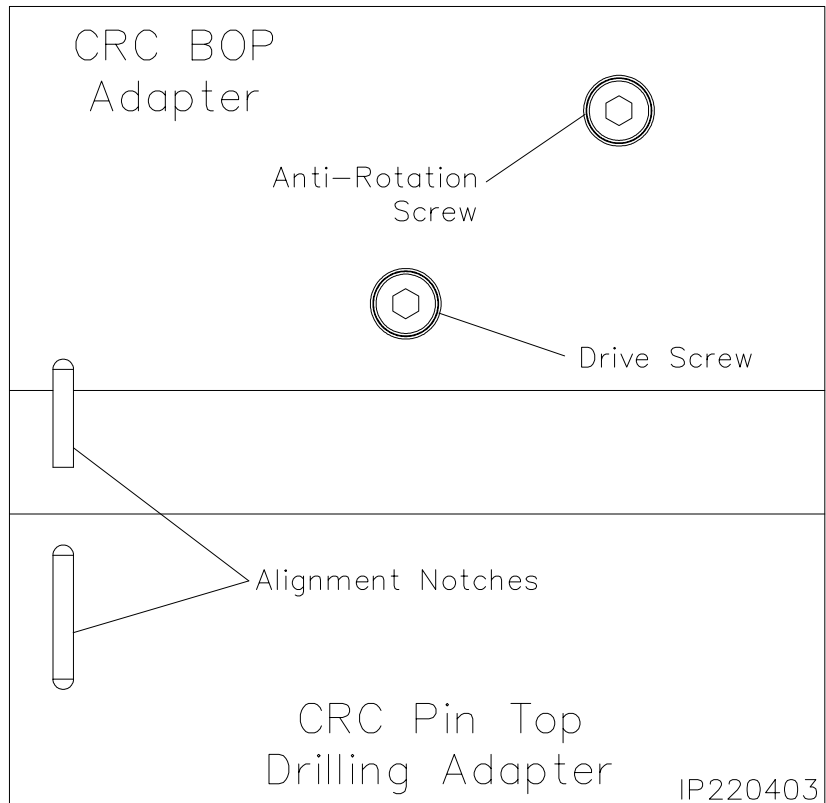
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Stage 2 — Install the 21-1/4” BOP Adapter

- 43. Ensure the alignment notches are in line with each other.
- 44. Locate **ONLY** the anti-rotation screws (upper set of screws) on the O.D. of the adapter and run in all 8 screws to a positive stop. Tighten screws to approximately 100 ft-lbs.

CAUTION: Locate the drive screws and ensure the screws are loose and rotate freely. Do not remove the drive screws.

CAUTION: Do Not engage the drive screws (lower set of screws) at any time during operations. Doing so will disengage the CRC lockring and cause the connection to fail.



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Stage 3 — Test the 21-1/4" BOP Riser

Immediately after making up the BOP stack and periodically during the drilling of the well for the next casing string the BOP stack (connections and rams) must be tested.

- Examine the **20" Nominal x 4-1/2" IF (NC50) CW Test Plug/Retrieving Tool (Item ST3)**. Verify the following:
 - 1-1/4" VR plug and weep hole plug are in place and tightened securely
 - elastomer seal is in place and in good condition
 - retractable lift lugs are in place, clean, and free to move
 - drill pipe threads are clean and in good condition

CAUTION: Prior to running or retrieving the test plug, ensure the rig is properly aligned and centered over the wellhead.

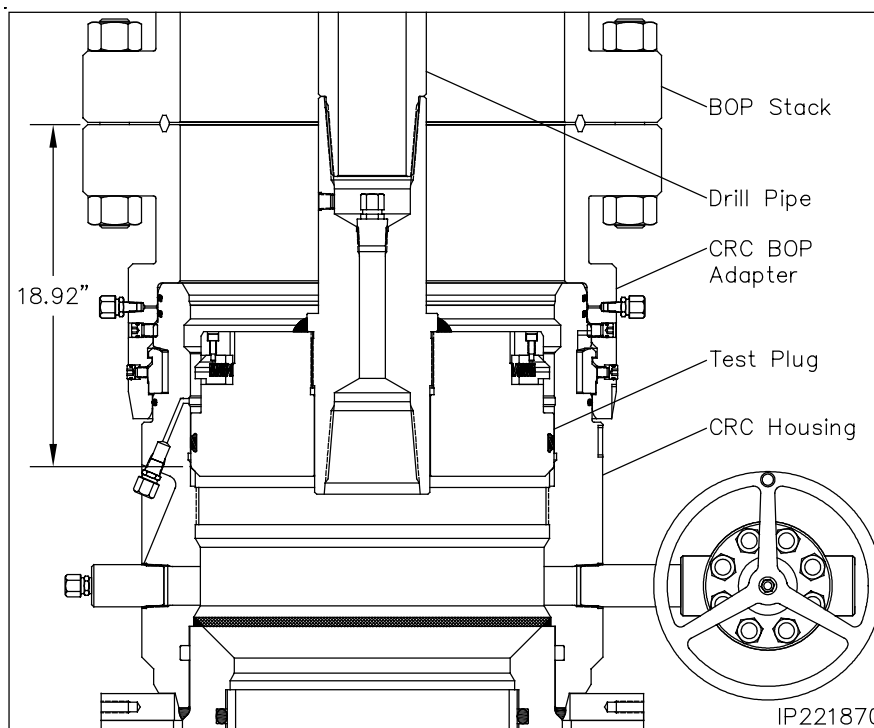
- Position the test plug with the elastomer seal down and the lift lugs up, then make up the tool to a joint of drill pipe.

CAUTION: Ensure the lift lugs are up and the elastomer seal is down.

- Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

- Open the casing head side outlet valve.
- Lightly lubricate the test plug seal with oil or light grease.
- Carefully lower the test plug through the BOP and land it on the load shoulder in the casing head, 18.92" below the top of the lower drilling adapter.



- Close the BOP annular on the pipe and test the BOP to **2,000 psi** or as required by site supervisor.

NOTE: Any leakage past the test plug will be clearly visible at the open side outlet valve.

CAUTION: When performing the BOP blind ram test it is highly recommended to suspend a stand of drill pipe below the test plug to ensure the plug stays in place while disconnecting from it with the drill pipe.

- After a satisfactory test is achieved, release the pressure and open the rams.
- Remove as much fluid as possible from the BOP stack. Retrieve the test plug with a straight vertical lift.
- Close all open valves.
- Repeat this stage as required during the drilling of the hole section.



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Stage 4 — Install 20” Nominal Wear Bushing

CAUTION: Always use a wear bushing while drilling to protect the load shoulders from damage by the drill bit or rotating drill pipe. The wear bushing **must be retrieved** prior to running the casing.

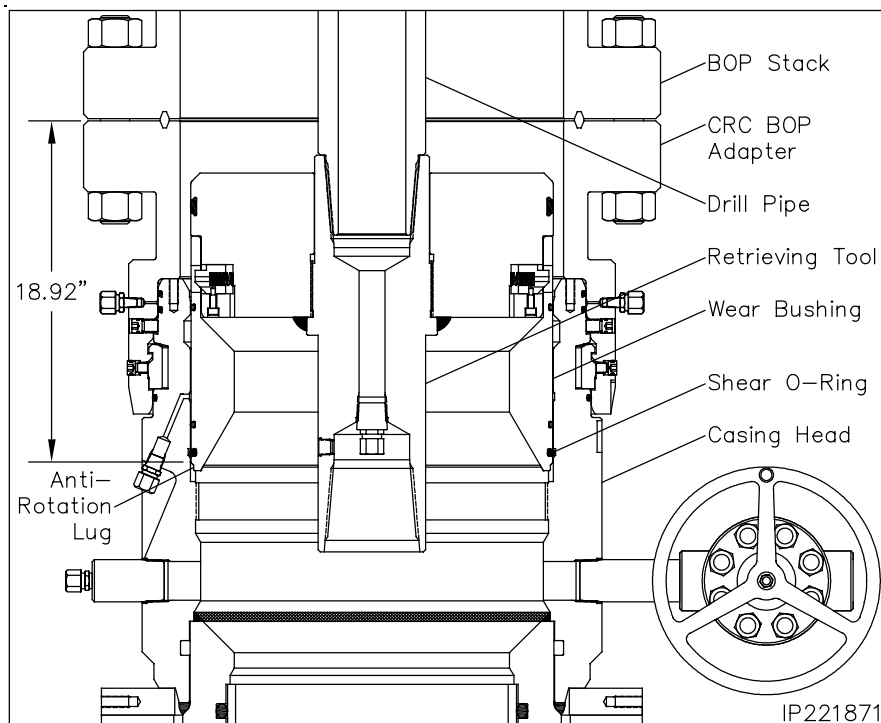
- Examine the **20” Nominal CRC Wear Bushing (Item ST4)**. Verify the following:
 - internal bore is clean and in good condition
 - upper trash o-ring is in place and in good condition
 - shear o-ring cord is in place and in good condition
 - paint anti-rotation lugs white and allow paint to dry

Run the Wear Bushing Before Drilling

- Orient the **20” Nominal x 4-1/2” IF (NC50) CW Test Plug/Retrieving Tool (Item ST3)**, with lift lugs down and drill pipe connection up.
- Make up the retrieving tool to a joint of drill pipe.
- Align the retractable lift lugs of the tool with the retrieval holes of the bushing and carefully lower the tool into the wear bushing until the lugs snap into place.

NOTE: If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

- Apply a heavy coat of grease, not dope, to the O.D. of the bushing.**
- Slowly lower the tool/bushing assembly through the BOP stack and land it on the load shoulder in the casing head, 18.92” below the top of the BOP adapter.
- Rotate the drill pipe clockwise (right) to locate the stop lugs in their mating notches in the head. When properly aligned the bushing will drop an additional 1/2”.



NOTE: The shear o-ring on bottom of the bushing will locate in a groove above the load shoulder in the head to act as a retaining device for the bushing.

- Remove the tool from the wear bushing by rotating the drill pipe counter clockwise (left) 1/4 turn and lifting straight vertical.
- Drill as required.

CAUTION: It is highly recommended to retrieve, clean, inspect, grease, and reset the wear bushing each time the hole is tripped during the drilling of the hole section.

Retrieve the Wear Bushing After Drilling

- Make up the retrieving tool to the drill pipe.
- Slowly lower the tool into the wear bushing.
- Pick up and balance the riser weight and rotate the retrieving tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.
- Retrieve the wear bushing to the rig floor. Remove it and the retrieving tool from the drill string.



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Stage 5 — Hang Off the 10-3/4" Casing

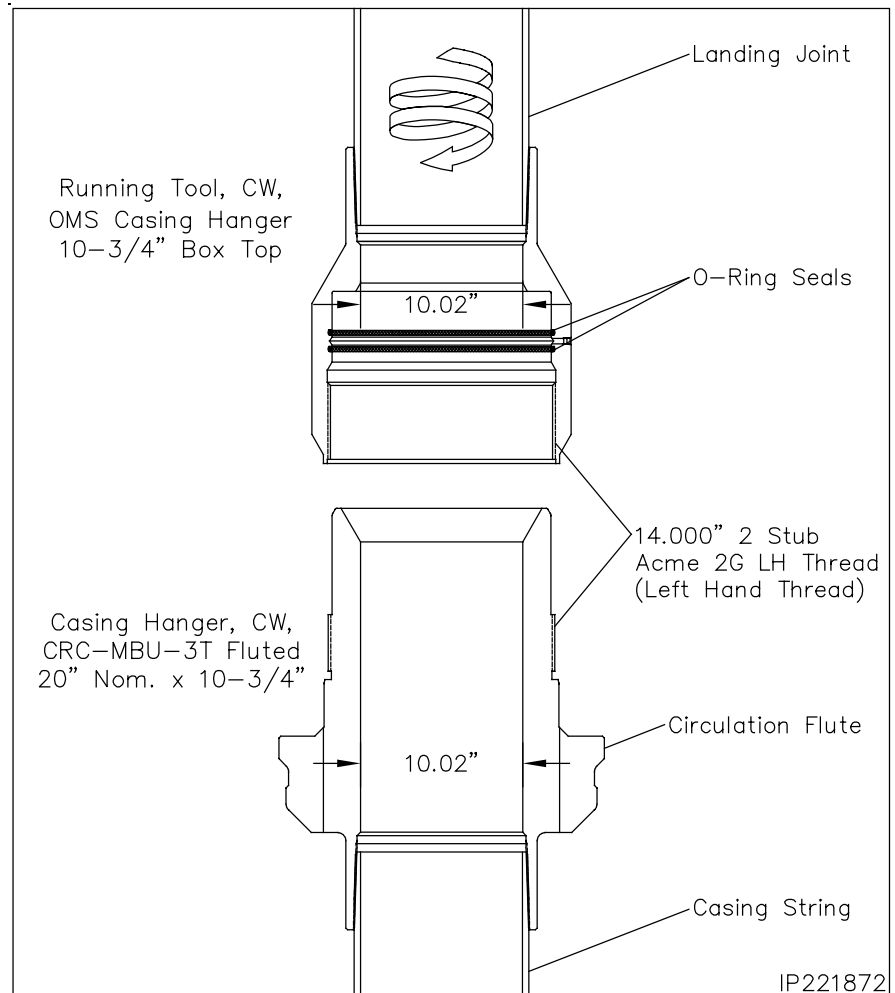
i **NOTE:** If the 10-3/4" casing becomes stuck and the mandrel casing hanger cannot be landed, refer to **Section 2: Stage 5A** for the emergency procedure.

i **NOTE:** The 10-3/4" CRC-MBU-3T casing hanger and running tool are made up to a joint of casing and tested prior to shipment. In the event they are not, follow steps 1 - 5 for casing hanger/running tool assembly.

- Examine the **20" Nominal x 10-3/4" Box Bottom x 14.000" 2 Stub Acme 2G LH CRC-MBU-3T Casing Hanger (Item A9)**. Verify the following:
 - external and internal threads are clean and in good condition
 - bore is free of debris
 - seal area is clean and undamaged
- Examine the **10-3/4" OMS Casing Hanger Running Tool (Item ST5)**. Verify the following:
 - internal threads are clean and in good condition
 - bore is free of debris
 - o-rings are in place and undamaged
- Lightly lubricate the casing hanger seal area, threads, and the running tool o-rings with oil or light grease.

! **CAUTION:** Excessive oil or grease may prevent a good seal from forming.

- Make up a joint of casing to the running tool and torque the connection to the thread manufacturer maximum torque.



- On the pipe rack, thread the casing hanger into the running tool by first rotating the running tool to the right, to locate the thread start, then to the left to a positive stop (approximately 7 turns).

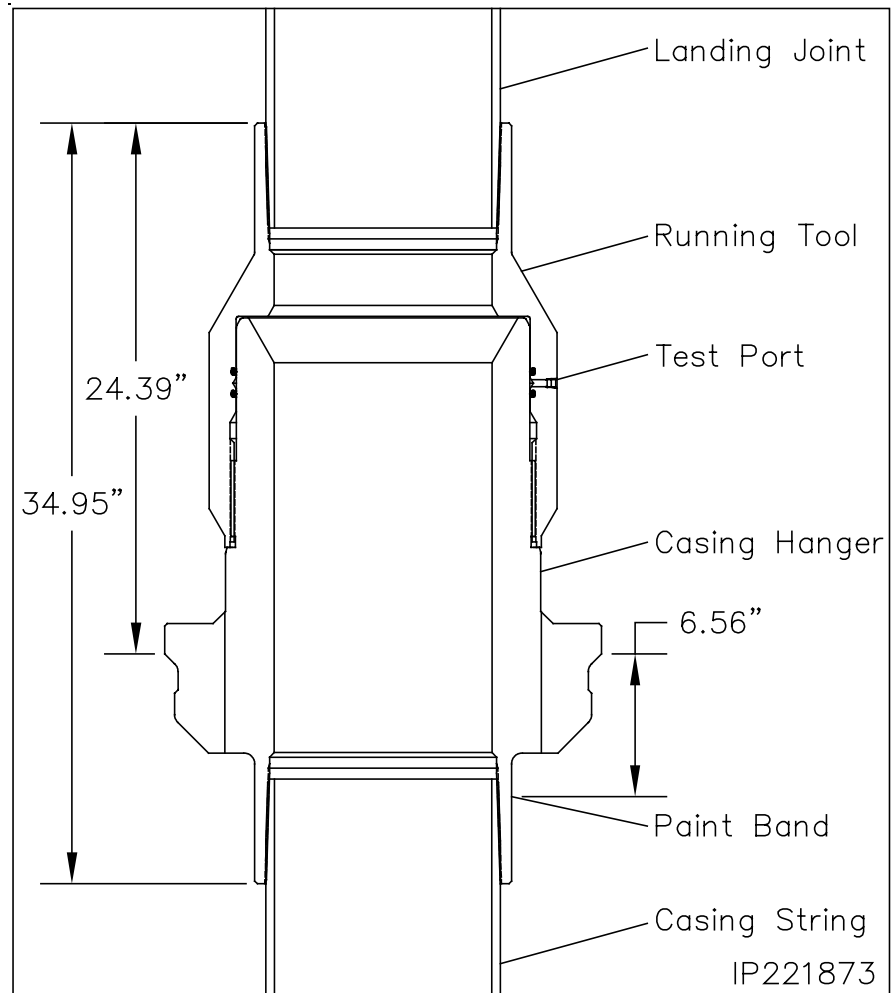
i **NOTE:** If steps 1 through 5 were done prior to being shipped to location, the running tool should be backed off 1 turn and made back up to ensure it will back off freely.



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Stage 5 — Hang Off the 10-3/4" Casing

6. Remove the 1/8" LP flush fitting Allen head pipe plug from the O.D. of the running tool and attach a test pump.
7. Apply hydraulic test pressure to **5,000 psi** and hold for 15 minutes or as required by drilling supervisor.
8. Upon completion of a successful test, bleed off pressure through the test pump. Remove the pump. Reinstall the pipe plug in the open port and tighten securely.
9. Place a paint band around the hanger tong neck (6.56" from the bottom of the hanger load shoulder) as indicated.
10. Run the 10-3/4" casing to the required depth and space out for the mandrel casing hanger and landing joint.



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Stage 5 — Hang Off the 10-3/4" Casing

Landing The Casing Hanger

1. Suspend the last joint of casing run in slips. Make up the casing hanger/running tool assembly in the casing string and torque connection to thread manufacturer's recommended optimum torque.
2. Slowly and carefully lower the casing hanger/running tool through the BOP stack. Land it on the load shoulder in the casing head 18.92" below the top of the BOP adapter. Place a paint mark on the landing joint level with the rig floor.



WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

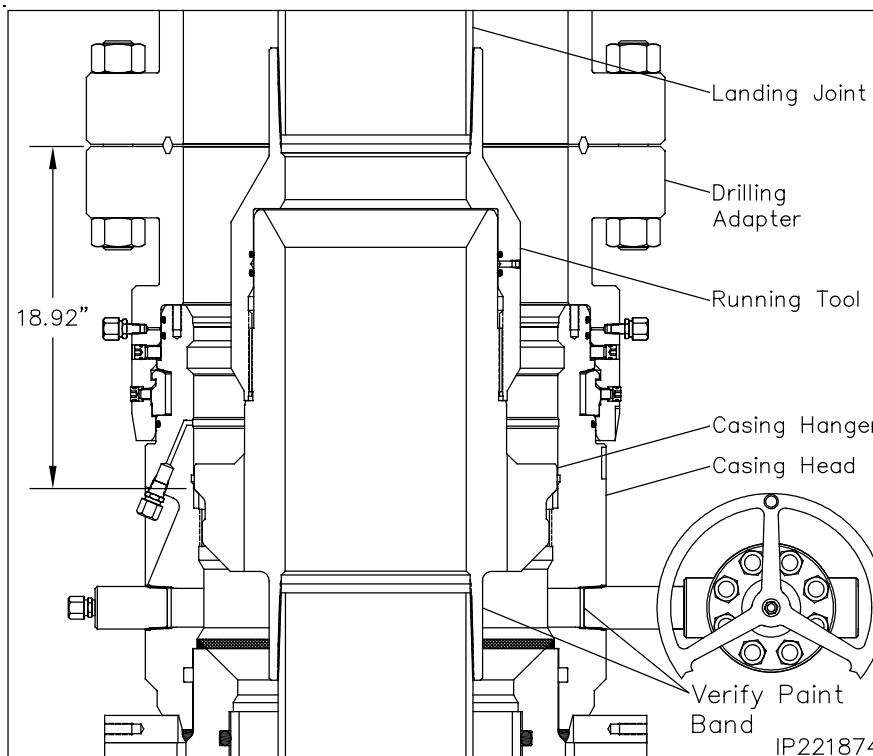
3. Open the casing head side outlet valve and drain the BOP stack. Sight through the open valve. The paint band on the hanger tong neck should be clearly visible in the center of the outlet. Close the valve.
4. Cement the casing as required.



NOTE: Returns may be taken through the circulation slots and out the BOP or out the side outlets on the housing.



NOTE: If the casing is to be reciprocated during cementing, it is advisable to pick up the casing hanger a minimum of eight feet above the landing point. Place a mark on the landing joint level with the rig floor, then reciprocate above that point. If at any time resistance is felt, re-land the casing hanger immediately.



5. With cement in place, bleed off pressure and remove the cement head.



WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the casing head side outlet valve and drain the BOP stack.
7. **Using chain tongs only, located 180° apart**, retrieve the running tool/landing joint by rotating the landing joint to the right approximately 7 turns, or until it comes free from the casing hanger. A straight lift will retrieve the running tool/landing joint.



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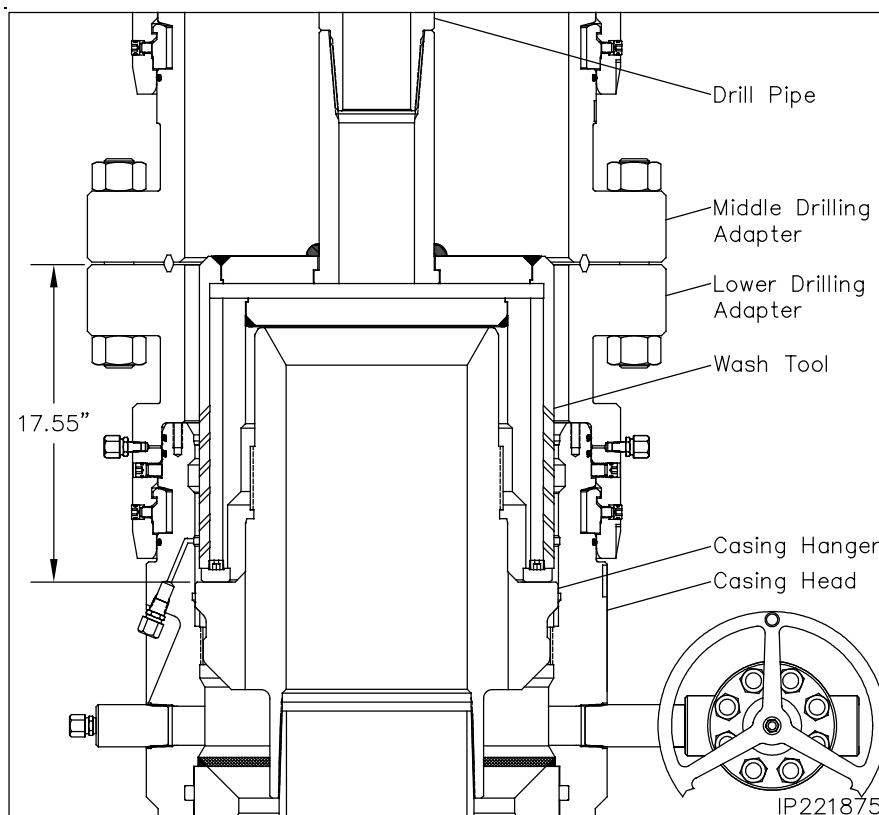
Stage 5 — Hang Off the 10-3/4" Casing

Running the 20" Wash Tool

1. Examine the **20" x 4-1/2" IF (NC50) Wash Tool (Item ST6)**. Verify the following:
 - drill pipe threads and bore are clean and in good condition
 - all ports are open and free of debris
2. Orient the wash tool with drill pipe box up. Make up a joint of drill pipe to the tool.
3. Carefully lower the wash tool through the BOP and land it on top of the 10-3/4" casing hanger, 17.55" below the top of the lower drilling adapter.
4. Place a paint mark on the drill pipe level with the rig floor.
5. Using chain tongs, rotate the tool clockwise (right) approximately 6 turns to loosen any debris that may be on top of the hanger flutes.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the upper side outlet valve and drain the BOP stack.
7. Attach a high pressure water line or the top drive to the end of the drill pipe. Pump water (up to a max of 200 psi) through the tool and up the BOP stack.
8. Pick up on the tool approximately 1" and slowly rotate the drill pipe approximately 20 RPM.
9. While flushing, raise and lower the tool the full length of the wellhead and BOP stack. Thoroughly wash the inside of the housing and BOP stack to remove all caked on debris.
10. Once washing is complete, land the wash tool on the hanger flutes.
11. Shut down pumps and observe the returns at the open lower outlet for debris.



12. Reengage the pump and fully wash the inside of the wellhead and the entire BOP one additional cycle, ensuring the stopping point is with the wash tool resting on top of the hanger flutes.
13. Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.
14. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
15. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure there are no dark areas on top of the painted flutes of the hanger.



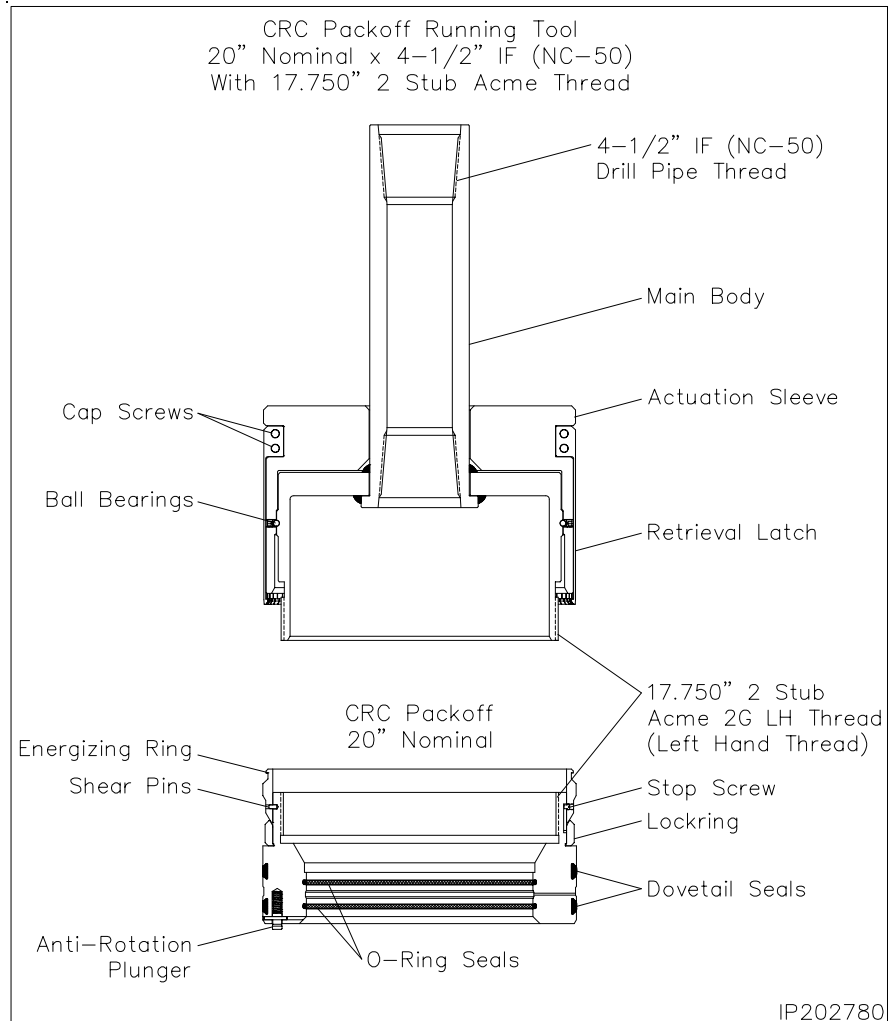
CAUTION: Continue washing until all debris is removed.



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Stage 6 — Install the CRC Mandrel Hanger Packoff

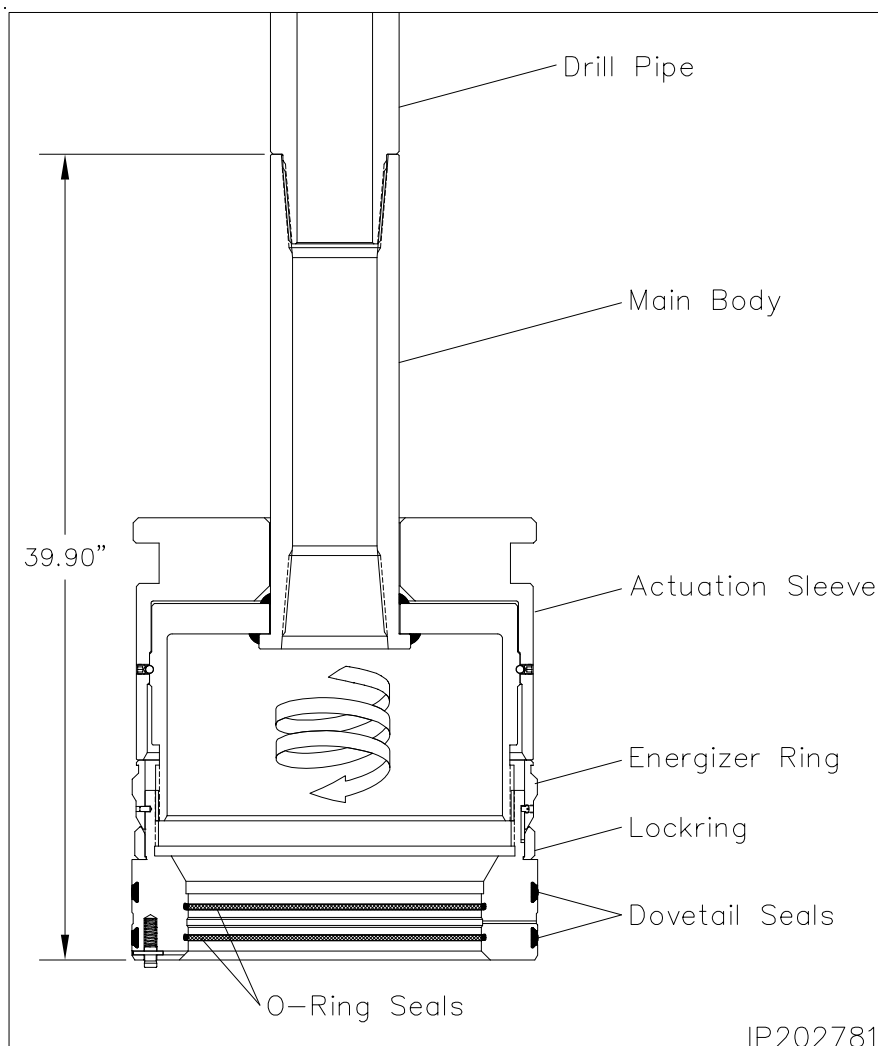
- Examine the **20" x 17.750" 2 Stub Acme 2G LH Box Top CRC Packoff (Item A10)**. Verify the following:
 - all elastomer seals are in place and undamaged
 - internal bore and ports are clean and in good condition
 - lockring is fully retracted
 - energizing ring is in its upper most position and retained with shear pins
 - guide screws are in place and back off 1/4 turn
 - anti-rotation plungers are in place, free to move
- Inspect the I.D. and O.D. seals for any damage and replace as necessary.
- Examine the **20" Nominal x 17.750" 2 Stub Acme 2G LH, CRC Packoff Running Tool (Item ST7)**. Verify the following:
 - Acme threads are clean and in good condition
 - retrieval latch is in position and retained with cap screws
- Remove the retrieval latch and set aside.
- Make up the running tool to 4-1/2" IF (NC-50) drill pipe and torque the connection to optimum make up torque.



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Stage 6 — Install the CRC Mandrel Hanger Packoff

6. Pick up the running tool with landing joint and suspend it above the packoff.
7. Thoroughly clean and lightly lubricate the mating Acme threads of the tool and the packoff with oil or a light grease.
8. Carefully lower the tool into the packoff and thread them together by first rotating the tool clockwise (RIGHT) to locate the thread start and then counter clockwise (LEFT) until the tool actuation sleeve makes contact with the packoff energizing ring. Approximately 2 turns.
9. Pick up the assembly and thoroughly clean and lightly lubricate the packoff I.D. o-ring seals and the O.D. dovetail seals with oil or light grease.
10. Locate the "SEAL TEST" fitting on the O.D. of the casing head and remove the dust cap from the fitting.
11. Attach a test pump to the fitting and pump clean test fluid through the port to dislodge any old grease and trapped debris.
12. Remove the test pump and reinstall the fitting dust cap.



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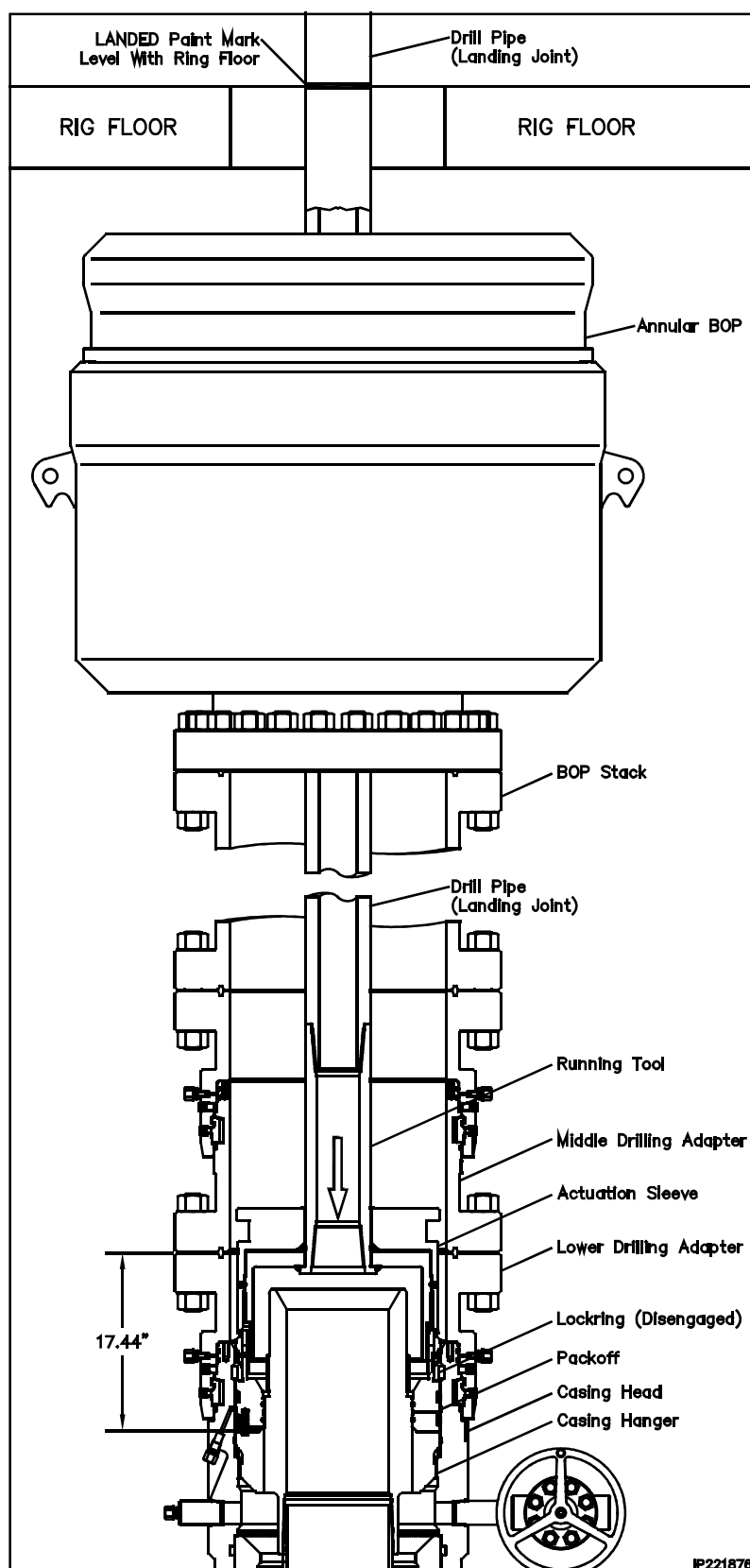


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Stage 6 — Install the CRC Mandrel Hanger Packoff

Landing the Packoff

13. Remove the hole cover.
14. Measure up 5 foot from the paint mark on the O.D. of the packoff and place a paint mark on the drill collar.
15. Pick up the packoff/running tool assembly and carefully lower the assembly through the BOP, marking the landing joint every five feet until the calculated dimension is reached.
16. Place a paint mark on the drill pipe at that dimension and mark **LANDED**.
17. Continue lowering the packoff until it passes over the neck of the hanger and lands on the casing hanger flutes, 17.44" below the top of the drilling adapter.
18. Confirm that the **LANDED** paint mark is level with the rig floor.
19. If not it is likely that there is debris on top of the casing hanger.
20. Remove the packoff and further wash the casing hanger and housing I.D. Also reverify the landing dimension.
21. Re land the packoff and verify the **LANDED** paint mark is level with the rig floor.



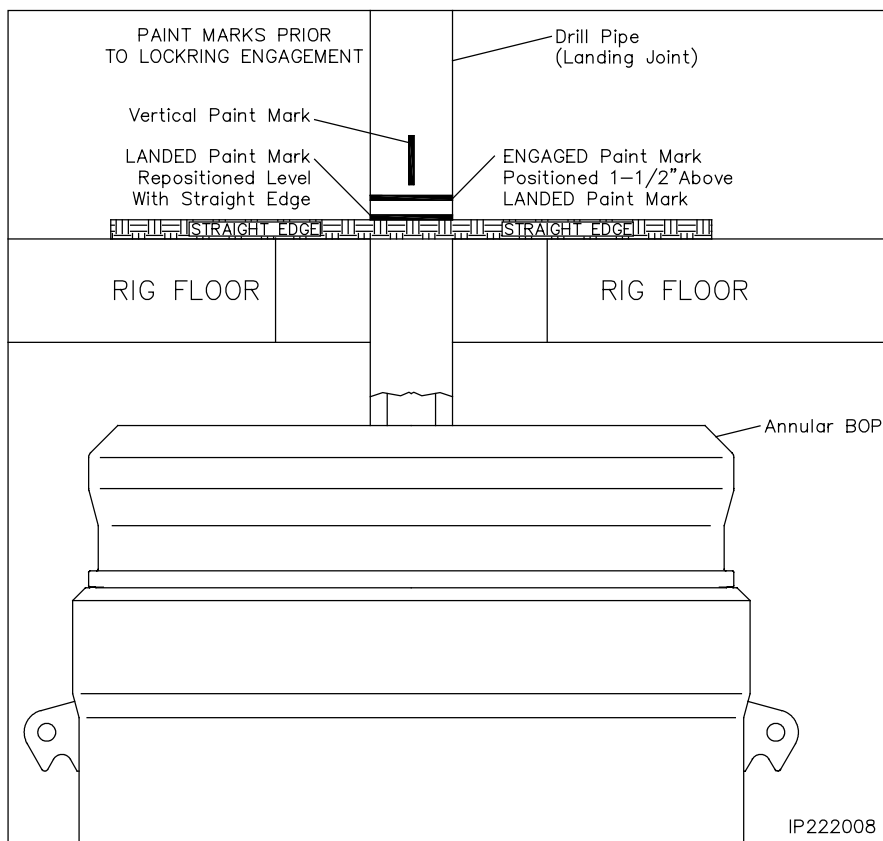
Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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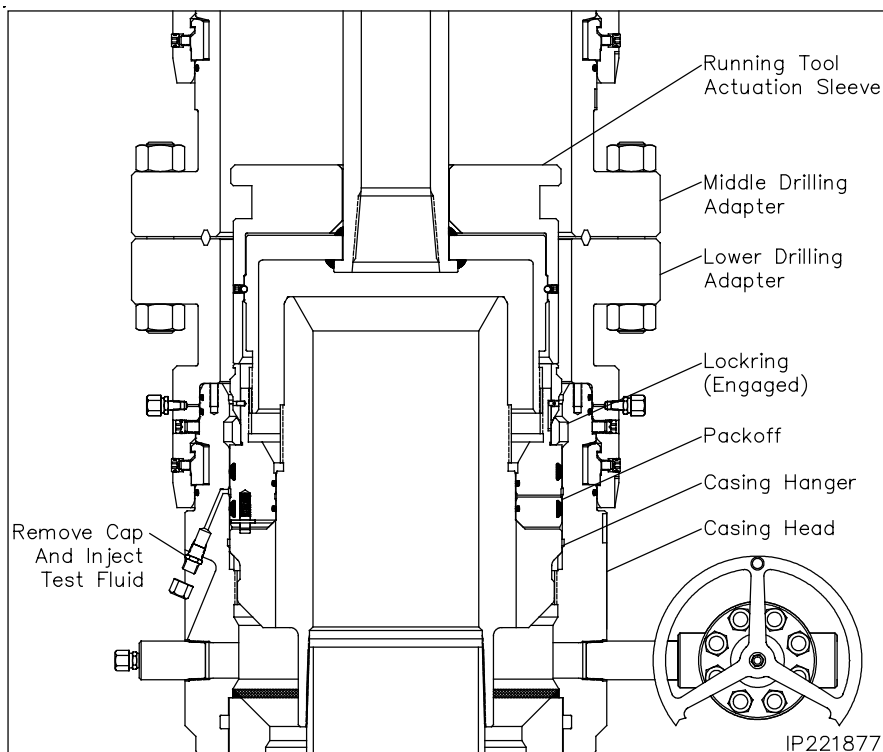
Stage 6 — Install the CRC Mandrel Hanger Packoff

22. With the packoff properly landed the **LANDED** paint mark is removed from the landing joint.
23. Place a straight edge across the rotary table as indicated.
24. Place a paint mark on the landing joint level with the top of the straight edge and label it **LANDED**.
25. Measure up 1-1/2" above the landed mark and place another paint mark on the landing joint. Label this mark **ENGAGED**.
26. Place a **Vertical** paint mark on the landing joint and a corresponding paint mark on the rig floor to visually count the turns of the landing joint.



Seal Test

27. Locate the "SEAL TEST" fitting on the O.D. of the casing head and remove the dust cap from the fitting.
28. Attach a test pump to the open fitting and pump clean test fluid between the seals until a stable test pressure of **3,000 psi** is achieved.
29. Hold test pressure for 15 minutes or as required by drilling supervisor.
30. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
31. After satisfactory test is achieved, bleed off the test pressure but leave the test manifold in place.



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Stage 6 — Install the CRC Mandrel Hanger Packoff

Engaging the Lockring

32. **Using chain tongs only, located 180° apart**, slowly rotate the drill pipe counter clockwise until the anti-rotation plungers align with the slots in the top of the hanger. Expect torque of approximately 400 ft-lbs to rotate the packoff.

33. **Using chain tongs only**, rotate the landing joint approximately 3 turns counter clockwise to engage the packoff locking in its mating groove in the bore of the casing head.

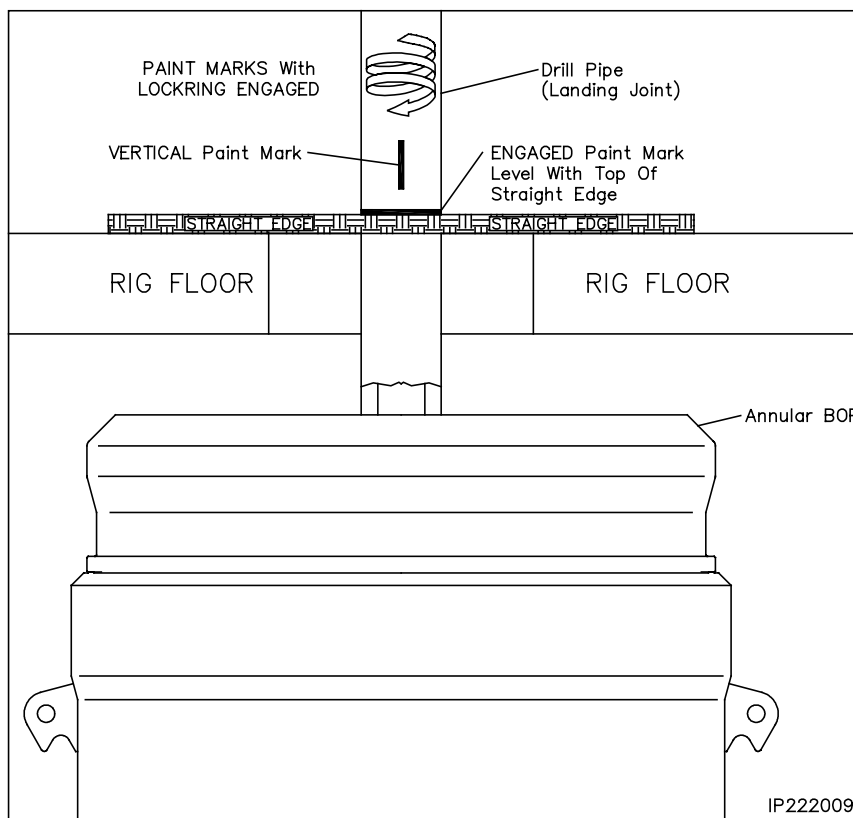
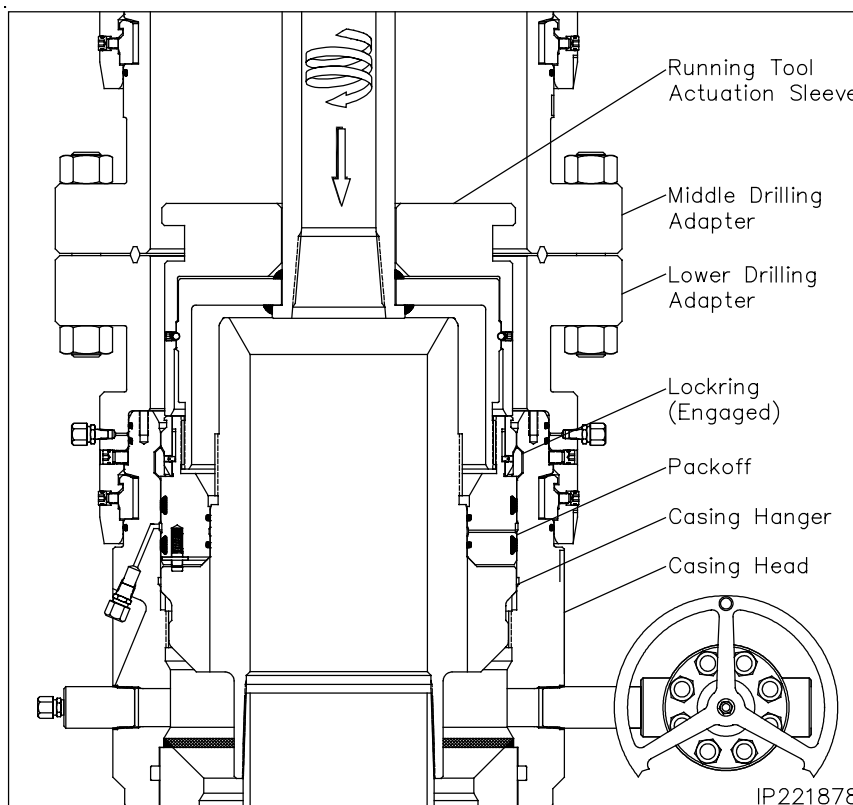
NOTE: Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the locking out. A positive stop will be encountered when the locking is fully engaged.

CAUTION: It is imperative that the drill pipe landing joint remain concentric with the well bore when rotating to engage the locking. This can be accomplished with the use of the air hoist.

34. To confirm all 3 turns of the landing joint are achieved, place the straight edge back across the rotary table adjacent the landing joint.

CAUTION: When the locking is properly engaged the **ENGAGED** paint mark on the landing joint will be level with the top of the straight edge. **VERIFY PAINT MARKS.**

CAUTION: If the required turns to engage the locking are not met or the paint marks do not align properly or excessive torque is encountered, remove the packoff. First call local branch. If further assistance is required then call Houston Engineering.



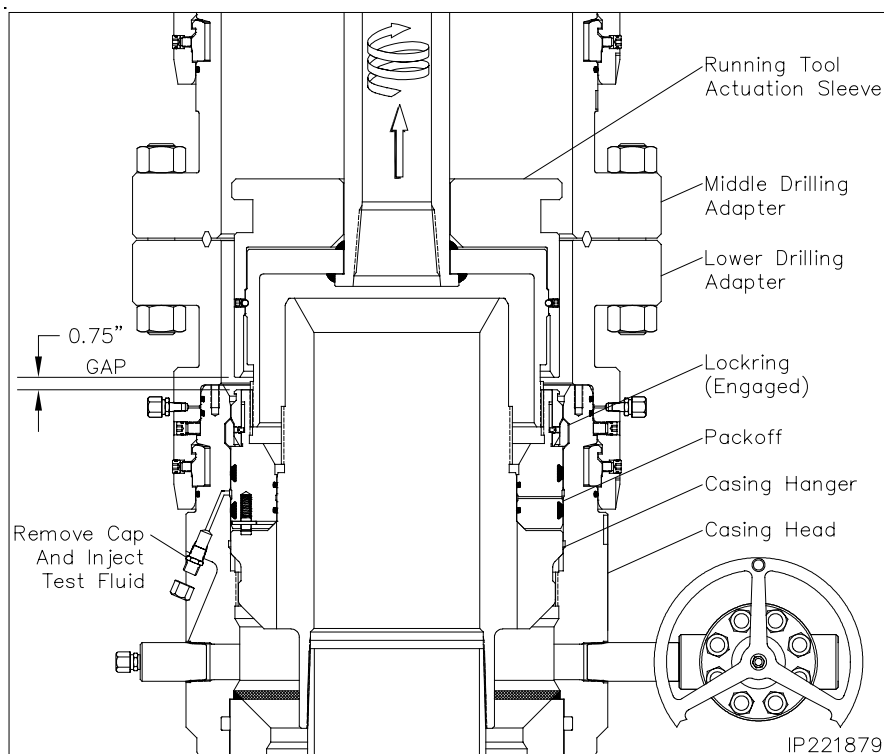
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Stage 6 — Install the CRC Mandrel Hanger Packoff

35. Back off the landing joint/running tool approximately 3/4 turn. Using the top drive, exert a 40,000 lbs pull on the landing joint. Hold test for 15 minutes or as required by drilling supervisor. After satisfactory test, slack off all weight.
36. Reattach the test pump to the open test manifold and retest the packoff seals as previously outlined. This will also verify that the packoff is in place.
37. After satisfactory test is achieved, bleed off all pressure. Remove the test pump and manifold and install the dust cap.
38. **Using chain tongs only**, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 5 turns), then retrieve the tool with a straight vertical lift.
39. Locate the anti-rotation screws in the O.D. of the adapter and back all (8) of them off a minimum of two turns each.

CAUTION: There are (10) drive screws that are used to compress and release the 24" CRC locking. They must be engaged in a specific pattern to properly release the locking.

40. Locate the alignment notches on the **FRONT** of the casing head and BOP adapter.
41. Locate **#1 Drive Screw** to the right of the adapter alignment notch. Run the drive screw in to a positive stop.
42. Locate **#2 Drive Screw** to the left of the adapter alignment notch. Run the drive screw in to a positive stop.
43. Continue around the adapter in an alternating **right to left pattern until all (10) Drive Screws are FULLY ENGAGED.**
44. Pick up the BOP stack and adapter with a straight vertical lift.



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Stage 6 — Install the CRC Mandrel Hanger Packoff

NOTE: In the event the packoff is required to be removed after the locking is engaged the following stage is to be followed.

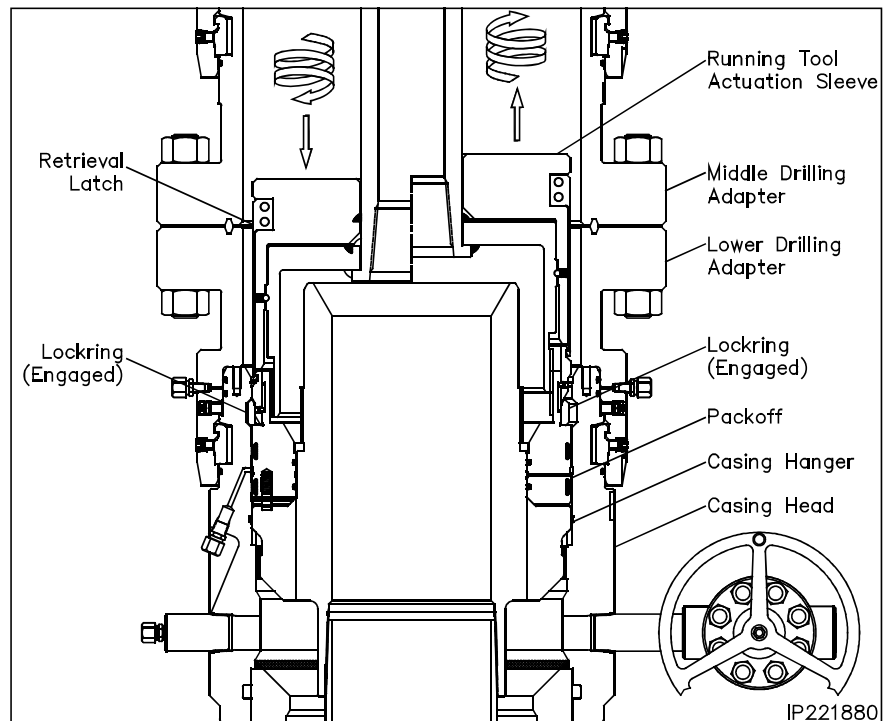
Retrieving the Packoff

1. Position the retrieval latch so the latch finger extend from the bottom of the running tool actuation sleeve.
2. Reinstall the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool body.
4. Carefully lower the running tool through the BOP stack and into the packoff.
5. Rotate the drill pipe clockwise (Right) to locate the thread start, then counter clockwise (Left) (approximately 3 turns) to a positive stop.

NOTE: At this point the retrieval latches will have passed over the energizing ring and snapped into place.

6. Rotate the drill pipe clockwise (right) approximately 3 turns to a positive stop. The drill pipe should rise approximately 1-1/2".

CAUTION: Do Not exceed the 6 turns or the packoff may be seriously damaged.



7. Carefully pick up on the drill pipe and remove the packoff from the wellhead with a straight vertical lift.
8. Rotate the packoff 1/4 turn clockwise to relax the retrieval latch.
9. Remove the (4) 1/2" cap screws and remove the latch assembly.
10. Redress the packoff and reset as previously outlined.
11. Once the packoff is properly set, reinstall the retrieval latch on the tool.



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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

1. Using a high pressure water hose, thoroughly clean the top of the casing head, packoff, casing hanger neck or casing stub, removing all old grease and debris.
2. Examine the **13-5/8" 10M MBU-3T-CRC-DBLHPS Wellhead Assembly (Item B1)**. Verify the following:
 - Acme threads are clean and in good condition
 - bore and all internal seal areas are clean and undamaged
 - anti-rotation screws and drive screws are in place and fully retracted
 - valves are intact and in good condition
 - 'HPS' seals are in place and in good condition

NOTE: If the threaded hub has been pre-installed in the shop, skip steps 3 through 10.

3. Examine the **13-5/8" 10M x 21.750" 2 Stub Acme Threaded Hub (Item R3)**. Verify the following:
 - Acme threads are clean and in good condition
 - remove the (4) retainer set screws and place them in a safe place

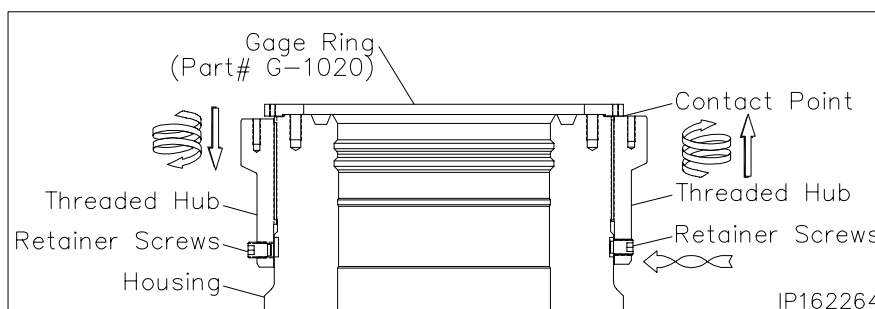
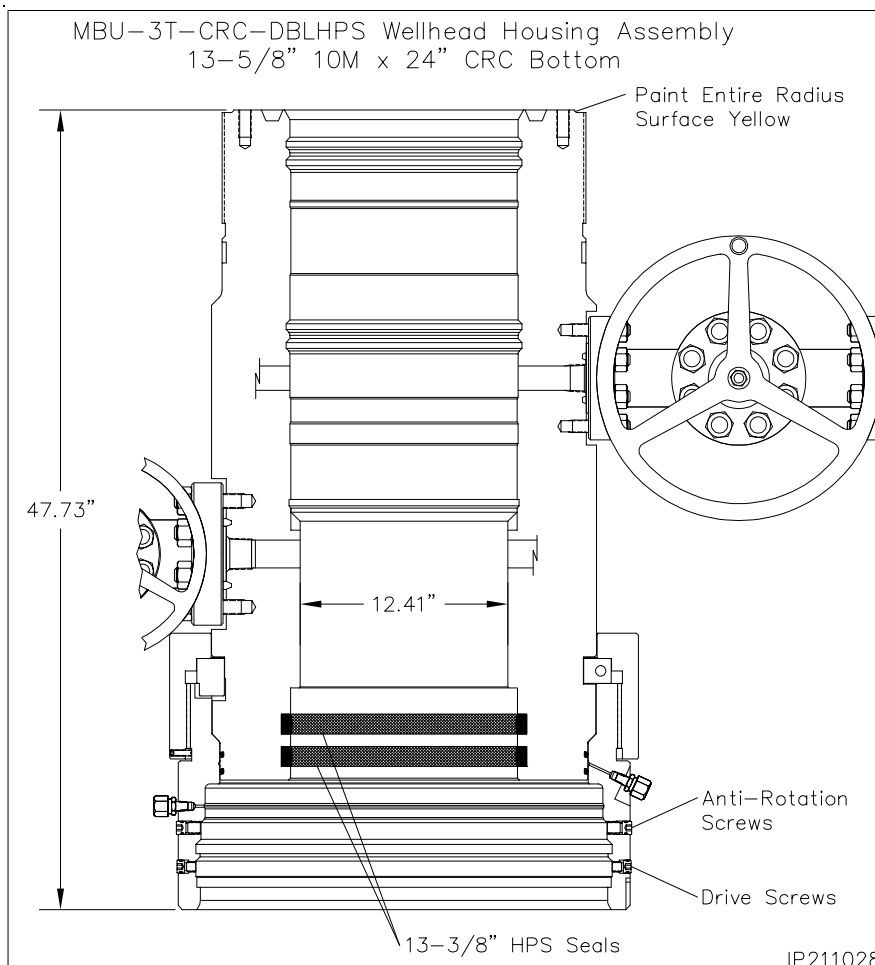
4. Thoroughly clean and lightly lubricate the mating threads of the housing and the threaded hub with copper coat or never seize.

5. Pick up the hub and carefully thread it onto the top of the housing with counter clockwise rotation until the top of the ring is approximately a 1/4" below the top of the housing.

6. Position the hub gage ring on top of the housing with the counter bore down as indicated. Ensure the gage ring is level and straight.

7. Rotate the hub clockwise (UP) until it contacts the gage ring.

CAUTION: Do Not off seat the gage ring.



8. Locate the retainer screw holes in the threaded hub.
9. Rotate the hub up or down to align the holes in the hub with the notches in the housing.
10. Install the set screws and tighten securely. (Do not over tighten) Remove gage ring.


NOTE: Using a yellow paint stick, paint the top of the housing where indicated for verifying level and adapter make up.



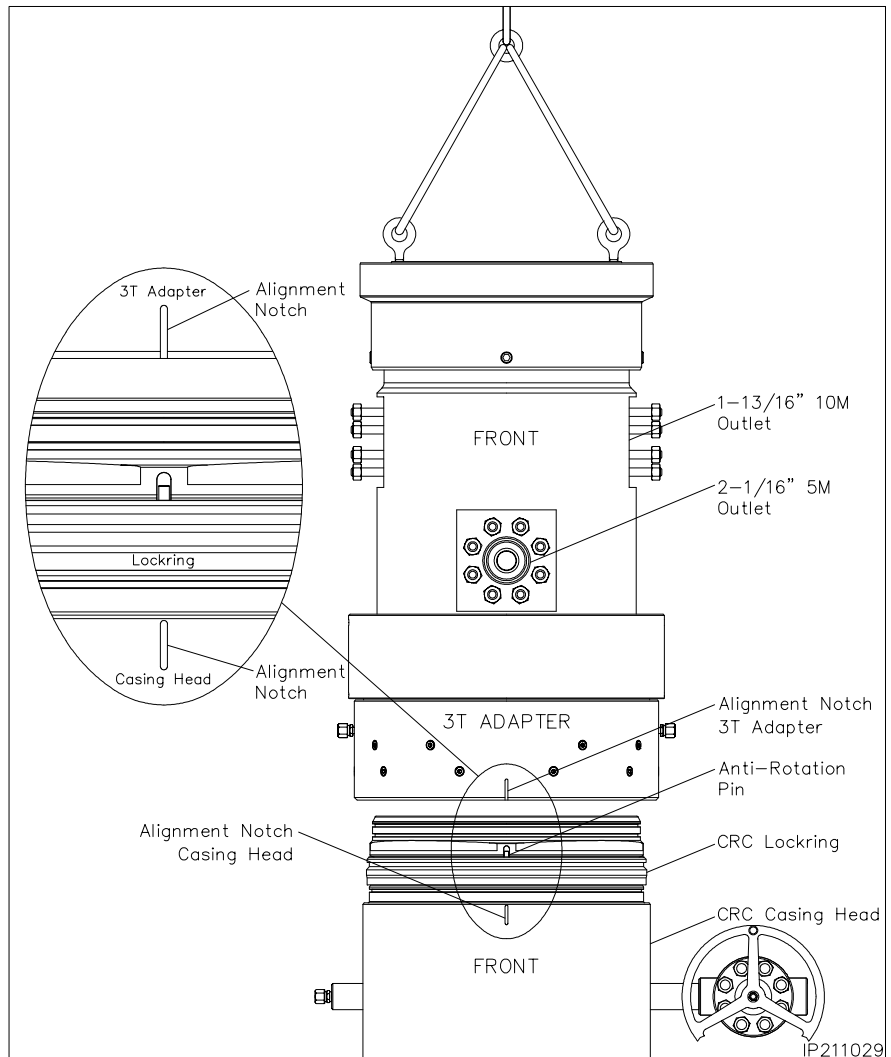
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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

11. Thoroughly clean and lightly lubricate the mating seal surfaces of the hanger neck or casing stub and the housing with oil or light grease.
12. Inspect the casing head and locking for any damage and repair as necessary.
13. Install a new set or o-ring seals on the top neck of the casing head.
14. Ensure the locking anti-rotation pin is properly seated and ring moves freely.
15. Thoroughly clean and lightly lubricate the O.D. seals and locking of the casing head with oil or light grease.
16. Fill the void area above the packoff with clean test fluid to the top of the casing head.
17. Ensure the drive screws and anti-rotation screws are fully retracted from the housing adapter bore.
18. Thoroughly clean and lightly lubricate the 'HPS' seals and the CRC connection of the housing adapter with oil or light grease.

 **WARNING:** Keep body clear of all pinch points and suspended loads.

19. Pick up the housing and suspend it above the casing head.
20. Align the alignment notch in the housing (FRONT) with the mating notch in the casing head (FRONT).

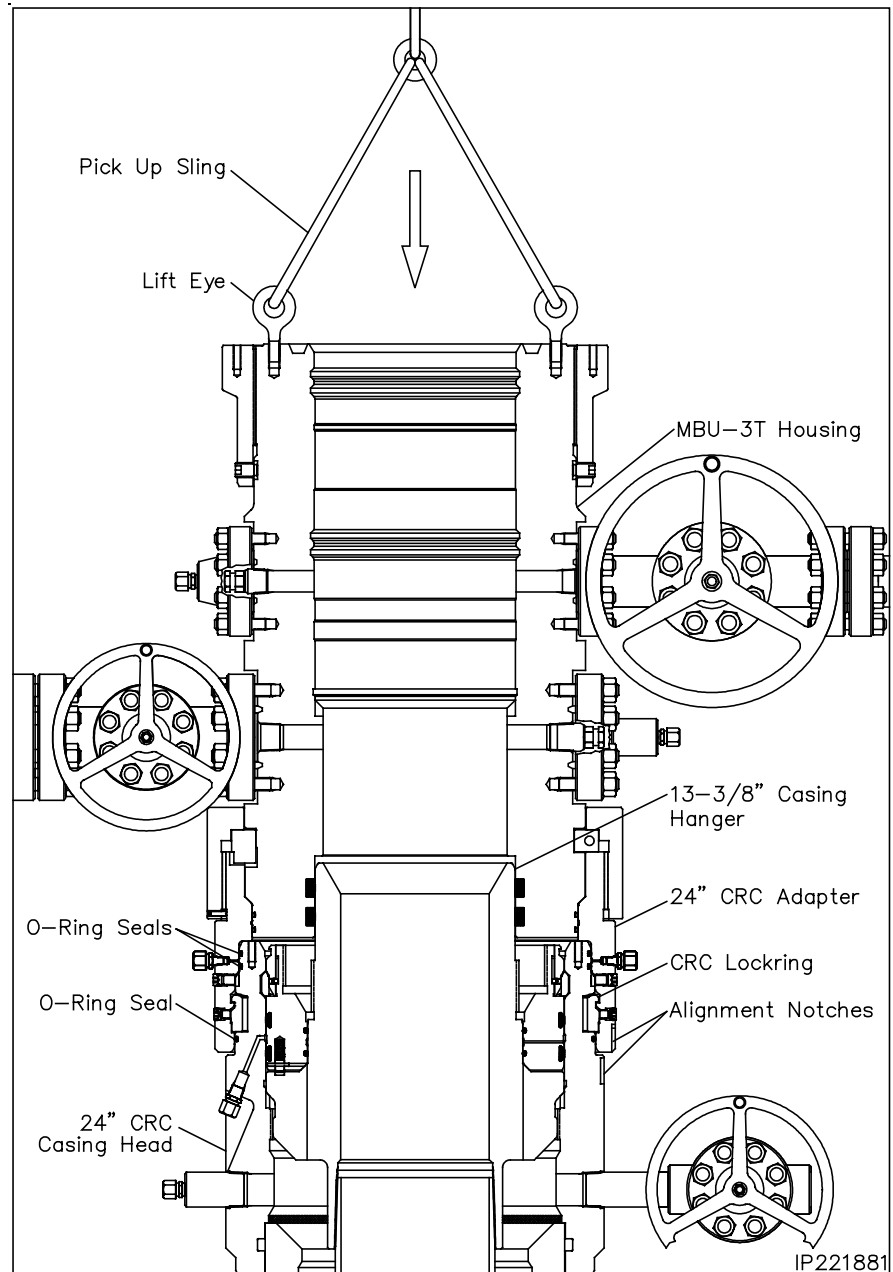


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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

21. Carefully lower the housing over the top of the casing head until the adapter bottoms out on the head and the locking snaps into its mating groove in the housing adapter.

CAUTION: Ensure the alignment notches are aligned.



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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

HPS Seal Test

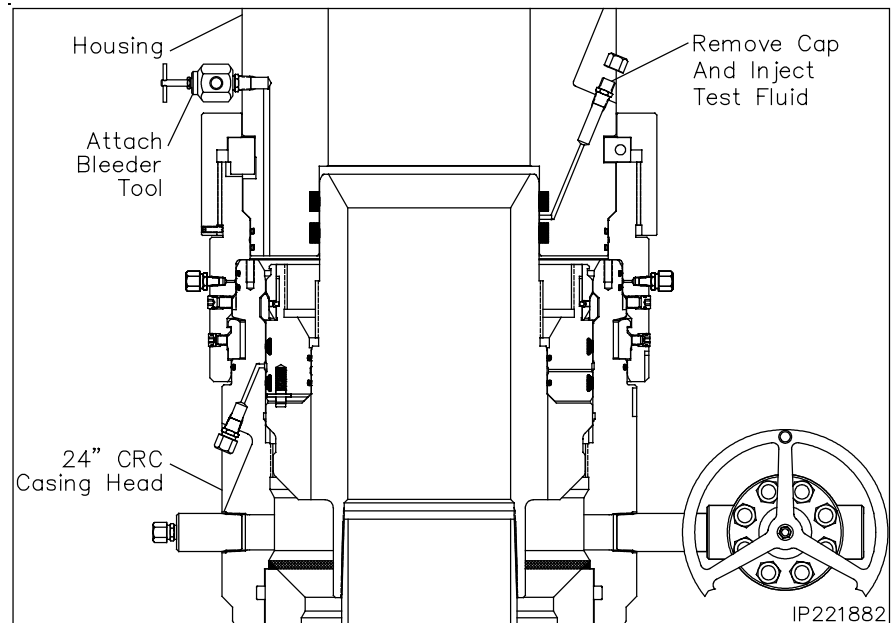
1. Locate the "LOWER SEAL TEST" fitting and one "FLG TEST" fitting on the lower O.D. of the housing and remove the fitting dust caps.
2. Attach a bleeder tool to the open "FLG TEST" fitting and open the tool.
3. Attach a hydraulic test pump to the open "LOWER SEAL TEST" fitting and inject test fluid between the 'HPS' seals until a stable test pressure of **5,000 psi** is achieved.

NOTE: If the emergency hanger was set, the test pressure is **5,000 psi or 80% of casing collapse - whichever is less.**

4. Hold test pressure for 15 minutes or as required by drill supervisor.

CAUTION: Do Not over pressurize!

5. If pressure drops one or both of the 'HPS' seals may be leaking. Pick up the housing and replace the leaking 'HPS' seals.
6. Repeat steps 2 - 4 until a satisfactory test is achieved.
7. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the test pump and re-install the dust cap on the open fitting.

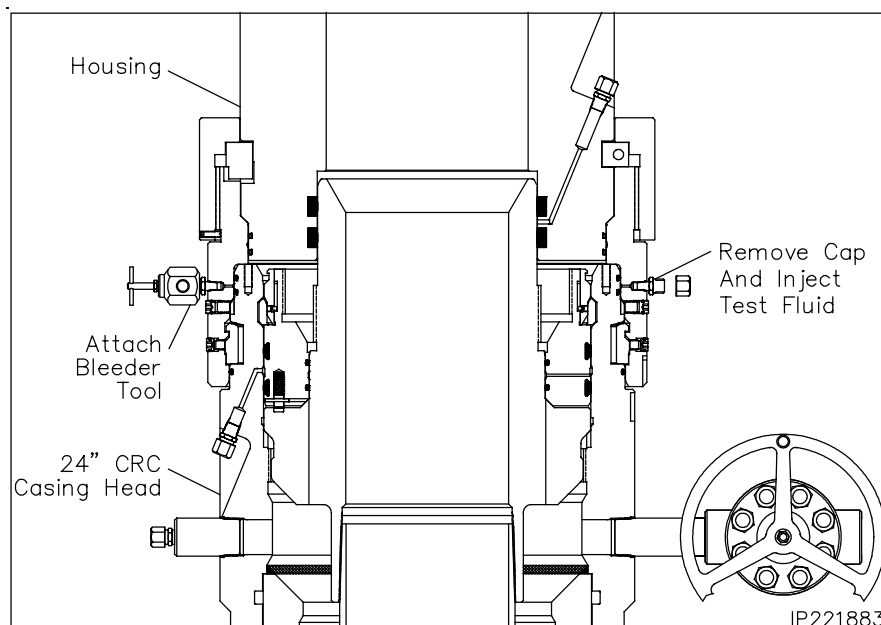


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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

CRC Housing Seal Test

8. Locate the CRC "Seal Test" fittings on the lower O.D. of the MBU-3T-CRC adapter and remove the dust cap from both fittings.
9. Attach a bleeder tool to one of the open fittings and open the tool.
10. Attach a test pump to the remaining open fitting and pump clean test fluid between the seals until a continuous stream flows from the open bleeder tool.
11. Close the tool and continue pumping fluid until a stable test pressure of **5,000 psi** is achieved.
12. Hold test pressure for 15 minutes or as required by drill supervisor.
13. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the test pump and bleeder tool and re-install the dust cap on the open fittings.



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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

CRC Connection Test

14. Locate the remaining “FLG TEST” fitting on the lower O.D. of the housing body and remove the dust cap from the fitting.
15. Attach a test pump to the open fitting and pump clean test fluid between the seals until a continuous stream flows from the open bleeder tool.
16. Close the tool and continue pumping fluid until a stable test pressure of **5,000 psi** is achieved.

NOTE: If the emergency hanger was set, the test pressure is **5,000 psi or 80% of casing collapse - whichever is less.**

17. Hold test pressure for 15 minutes or as required by drill supervisor.

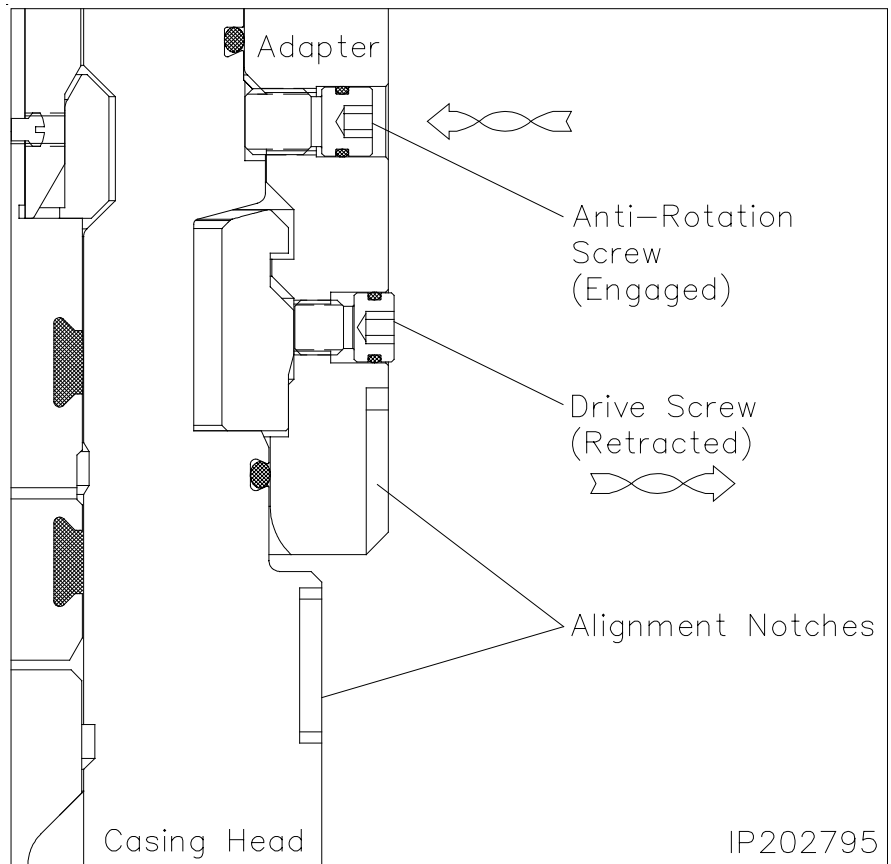
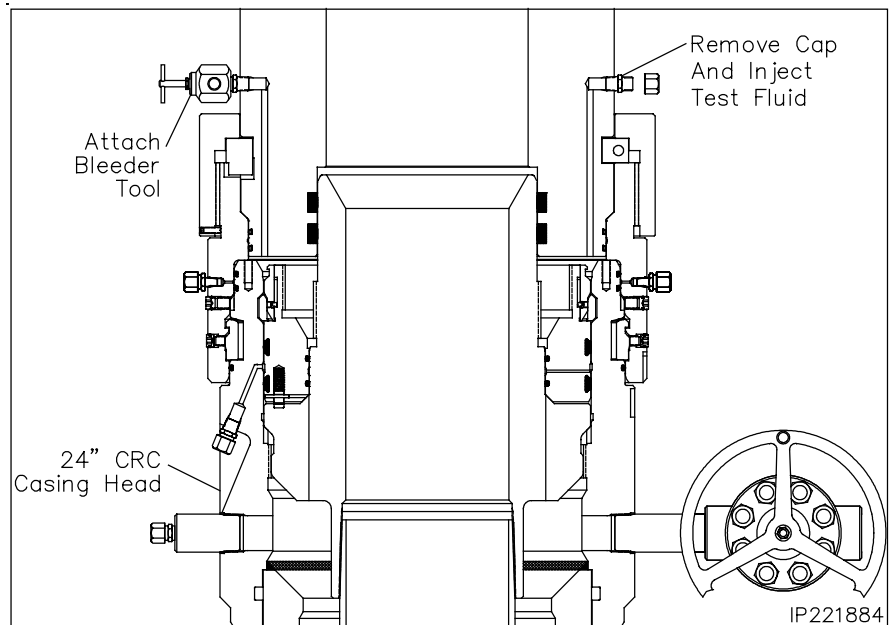
18. After a satisfactory test is achieved, bleed off the test pressure. Drain the fluid, remove the test pump and bleeder tool and re-install the dust cap on the open fittings.

19. Ensure the alignment notches are in line with each other.

20. Locate **ONLY** the anti-rotation screws on the O.D. of the MBU-3T-CRC housing adapter and run in all 8 screws to a positive stop. Tighten screws to approximately 100 ft-lbs.

CAUTION: Locate the drive screws and ensure the screws are loose and rotate freely. Do not remove the drive screws.

CAUTION: Do Not engage the drive screws (lower set of screws) at any time during operations. Doing so will disengage the CRC locking and cause the connection to fail.



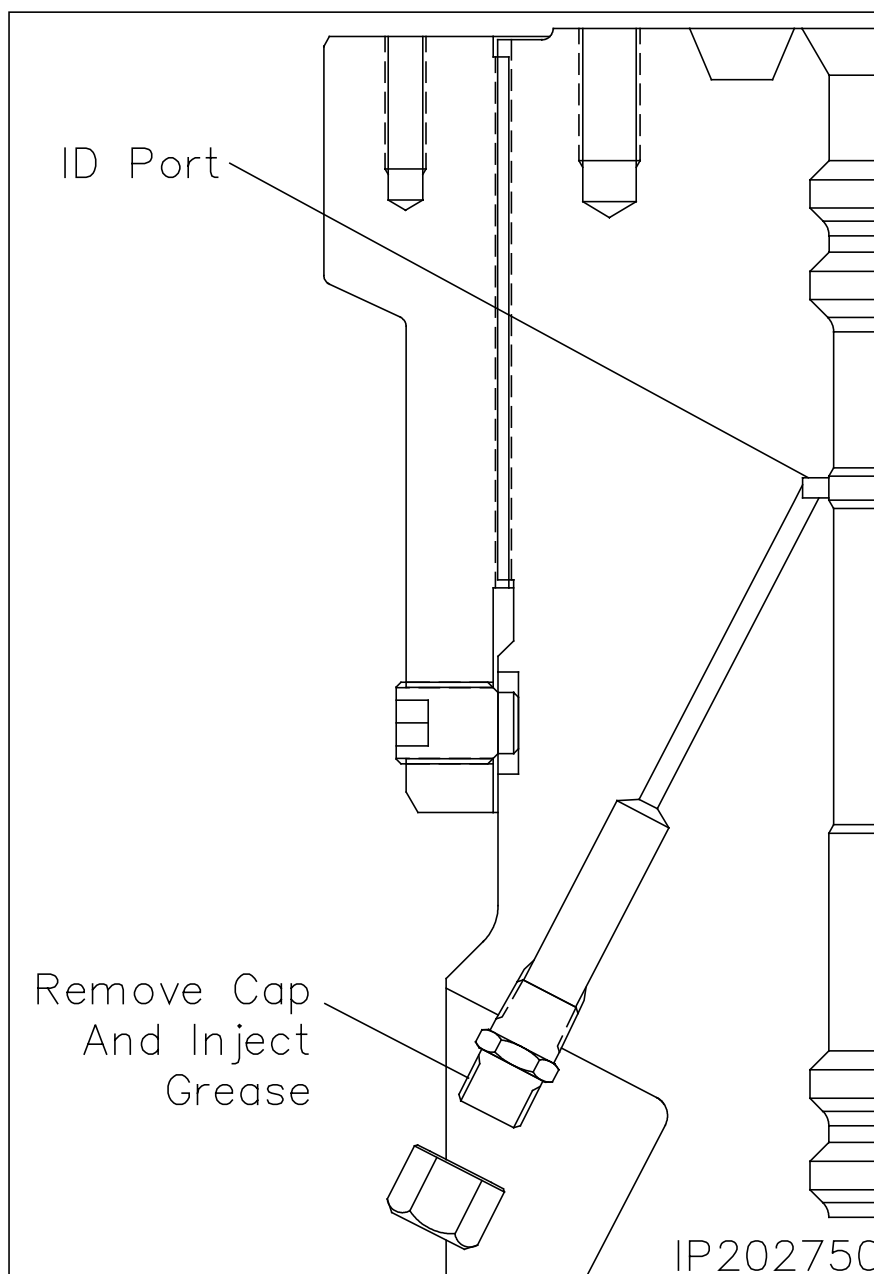
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Stage 7 — Install the MBU-3T-CRC-DBLHPS Housing

1. Locate the upper test fitting on the O.D. of the housing and remove the dust cap.
2. Attach a grease gun to the open fitting and inject a water resistant grease into the test port until it flows freely into the I.D. of the housing.
3. Remove the grease gun and reinstall the dust cap on the open fitting.

CAUTION: Prior to installing the BOP stack, ensure the wellhead is level using appropriate level.

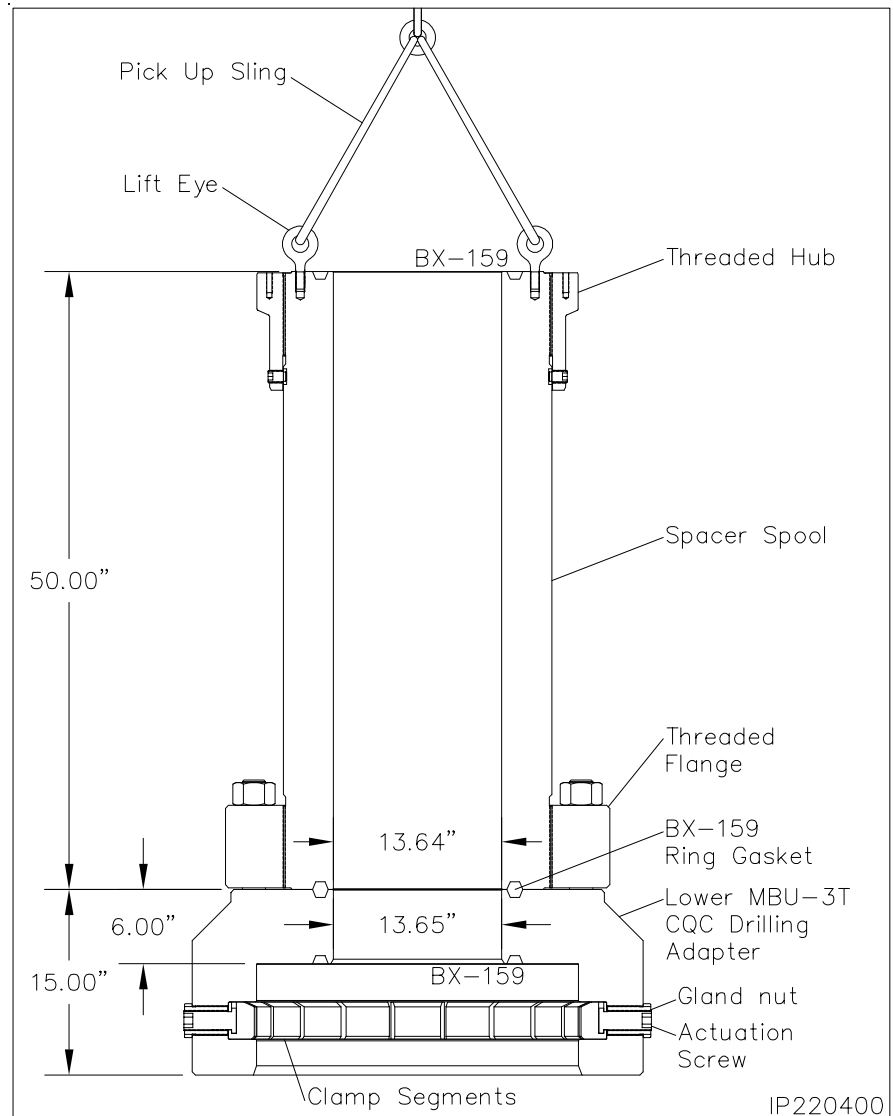
NOTE: Prior to installing the BOP it is recommended to attain an accurate RKB dimension for future use for accurately landing test plugs and casing hangers. This dimension is attained by dropping a tape measure from the rig floor to the top of the wellhead flange. Pull tape taut and record the dimension from the wellhead to the top of the rig floor or kelly bushings. Ensure this dimension is placed on the BOP board in the dog house and on the drillers daily report sheet.



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Stage 8 — Install the Drilling Riser Assembly

- Examine the **13-5/8" 10M Studded x 13-5/8" 10M Lower Quick Connect Drilling Adapter (Item R4) With 50.0" Spacer Spool With Threaded Hub and Flange (Item R5)**. Verify the following:
 - bores are clean and free of debris
 - ring grooves are clean and undamaged
 - (20) drive screws and clamp segments are properly installed and fully retracted
 - lift eyes are installed and tightened securely
 - threaded hub is installed properly and secured with set screws
- Thoroughly clean all ring grooves in the riser assembly removing all old grease and debris.
- Ensure both bolted connections are level and made up to proper torque.
- Attach a suitable 4 point lifting device to the 4 point pick up sling and pick up the assembly.




Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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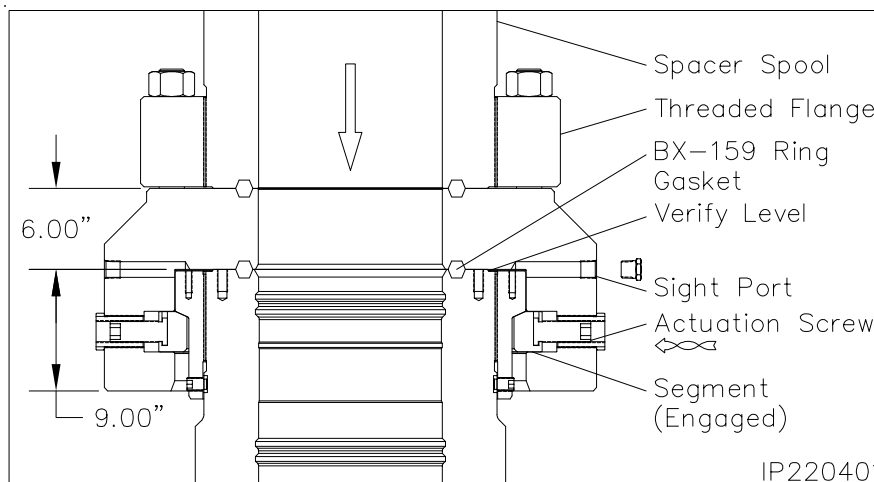
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Stage 8 — Install the Drilling Riser Assembly

5. Thoroughly clean the clamp segments and ring groove of the quick connect drilling adapter removing all grease and debris.
6. Install a new BX-159 ring gasket into the ring groove of the housing.

 **WARNING:** Keep body clear of all pinch points and suspended loads.

7. Carefully lower the adapter over the top of the housing with threaded hub and land the adapter on the ring gasket.
8. Remove the (4) 1" sight port pipe plugs and sight through each port to verify the drilling adapter with BOP is level and hub standoff is consistent.
9. Carefully run in all of the drive screws of the adapter to contact point.
10. Ensuring the assembly remains level, using the hand torque wrench, run in one actuation screw and torque to 100 ft-lbs.
11. Locate the screw 180° from the first and torque it to 100 ft-lbs.
12. Locate the screws 90° to the right and left and torque them to 100 ft-lbs.
13. Position the second 4 point sequence 45° from the first and torque each screw to 200 ft-lbs with the hand torque wrench.
14. Run in all remaining screws to contact, then torque each screw in the same sequence to 400 ft-lbs with the Rad Gun.




15. Using the Rad Gun, make one additional round until a stable torque of 700 ft-lbs on all screws is achieved.
16. Sight through the 4 sight ports to confirm that the adapter and housing are face to face on all sides and the BOP is level. Reinstall the sight port plugs and tighten securely.
17. Remove the pick up slings and lift eyes.

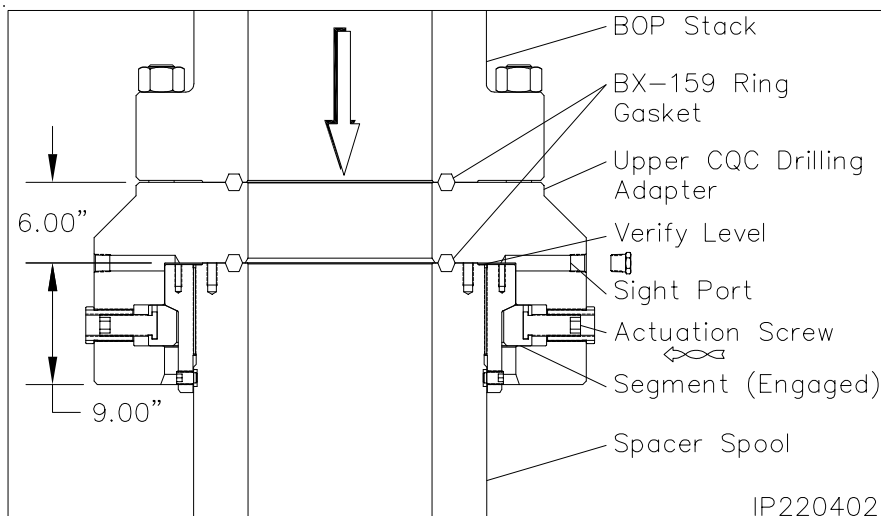


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Stage 8 — Install the Drilling Riser Assembly

18. Make up the **13-5/8" 10M Quick Connect x 13-5/8" 10M Studded Upper Adapter (Item R4)** to the bottom of the BOP stack using a new BX-159 ring gasket.
19. Thoroughly clean the 25.3" spacer spool hub, ring groove and the mating clamp segments and ring groove of the upper adapter attached to the BOP stack.
20. Install a new BX-159 ring gasket into the ring groove of the spacer spool.

 **WARNING:** Keep body clear of all pinch points and suspended loads.



21. Carefully lower the adapter over the top of the housing with threaded hub and land the adapter on the ring gasket.
22. Remove the (4) 1" sight port pipe plugs and sight through each port to verify the drilling adapter with BOP is level and hub standoff is consistent.
23. Carefully run in all of the drive screws of the adapter to contact point.
24. Ensuring the assembly remains level, using the hand torque wrench, run in one actuation screw and torque to 100 ft-lbs.
25. Locate the screw 180° from the first and torque it to 100 ft-lbs.
26. Locate the screws 90° to the right and left and torque them to 100 ft-lbs.
27. Position the second 4 point sequence 45° from the first and torque each screw to 200 ft-lbs with the hand torque wrench.
28. Run in all remaining screws to contact, then torque each screw in the same sequence to 400 ft-lbs with the Rad Gun.
29. Using the Rad Gun, make one additional round until a stable torque of 700 ft-lbs on all screws is achieved.
30. Sight through the 4 sight ports to confirm that the adapter and housing are face to face on all sides and the BOP is level. Reinstall the sight port plugs and tighten securely.



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Stage 9 — Test the BOP Stack

Immediately after making up the BOP stack and periodically during the drilling of the well for the next casing string the BOP stack (connections and rams) must be tested.

1. Examine the **13-5/8" Nominal x 4-1/2" IF (NC50) CW Test Plug (Item ST8)**. Verify the following:
 - 1-1/4" VR plug and weep hole plug are in place and tightened securely
 - elastomer seal is in place and in good condition
 - drill pipe threads are clean and in good condition

CAUTION: Prior to running or retrieving the test plug, ensure the rig is properly aligned and centered over the wellhead.

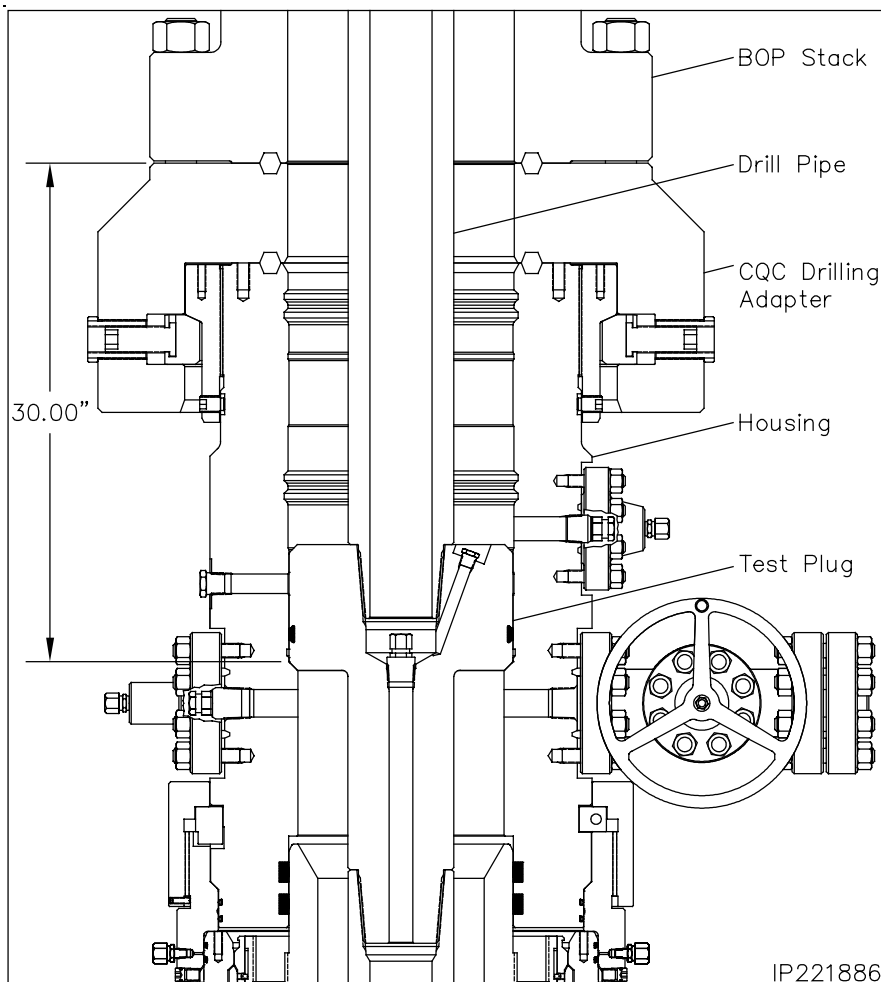
2. Position the test plug in the rotary table with the pin end down and make up the tool to a joint of drill pipe. Rack back assembly with the drill pipe in derrick.

CAUTION: Ensure that the pin thread is facing down.

3. Run in the hole with one or more stands of drill pipe and set the last joint in the floor slips.
4. Pick up the test plug with landing joint and make it up in the drill string.
5. Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the housing lower side outlet valve.
7. Lightly lubricate the test plug seal with oil or light grease.
8. Carefully lower the test plug through the BOP and land it on the load shoulder in the housing, 30.00" below the top of the lower drilling adapter.



9. Close the BOP rams on the pipe and test the BOP to **10,000 psi** or as required by drilling supervisor.

NOTE: Any leakage past the test plug will be clearly visible at the open side outlet valve.

CAUTION: When performing the BOP blind ram test it is highly recommended to suspend a stand of drill pipe below the test plug to ensure the plug stays in place while disconnecting it from the drill pipe.

10. After a satisfactory test is achieved, release the pressure and open the rams.
11. Remove as much fluid as possible from the BOP stack. Retrieve the test plug with a straight vertical lift.
12. Close all open valves.
13. Repeat this stage as required during the drilling of the hole section.



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Stage 10 — Run the Lower Wear Bushing

CAUTION: Always use a wear bushing while drilling to protect the load shoulders from damage by the drill bit or rotating drill pipe. The wear bushing **must be retrieved** prior to running the casing.

- Examine the **13-5/8" Nominal MBU-3T-LWR Wear Bushing (Item ST10)**. Verify the following:
 - internal bore is clean and in good condition
 - upper trash o-ring is in place and in good condition
 - shear o-ring cord is in place and in good condition
 - paint anti-rotation lugs white and allow paint to dry

Run the Wear Bushing Before Drilling

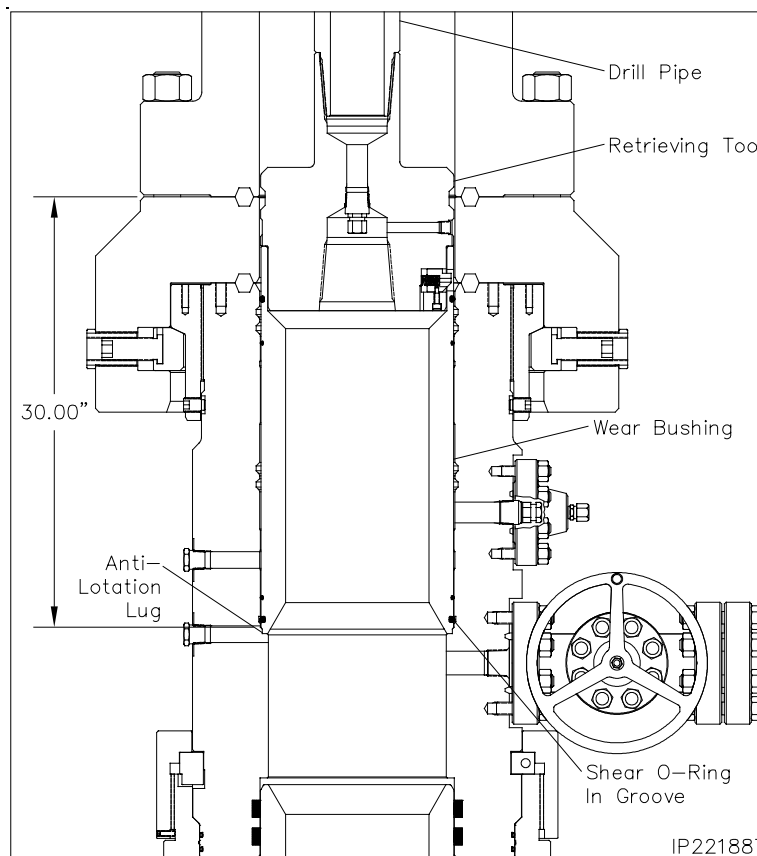
- Orient the **13-5/8" Nominal x 4-1/2" IF (NC50) CW Retrieving Tool (Item ST9)** with lift lugs down and drill pipe connection tong neck up.
- Make up the retrieving tool to a joint of drill pipe.
- Align the retractable lift lugs of the tool with the retrieval holes of the bushing and carefully lower the tool into the wear bushing until the lugs snap into place.

NOTE: If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

- Apply a heavy coat of grease, not dope, to the O.D. of the bushing.
- Slowly lower the tool/bushing assembly through the BOP stack and land it on the load shoulder in the housing, 30.00" below the top of the lower drilling adapter.
- Rotate the drill pipe clockwise (right) to locate the stop lugs in their mating notches in the head. When properly aligned the bushing will drop an additional 1/2".

NOTE: The shear o-ring on bottom of the bushing will locate in a groove above the load shoulder in the head to act as a retaining device for the bushing.

- Remove the tool from the wear bushing by rotating the drill pipe counter clockwise (left) 1/4 turn and lifting straight vertical.
- Drill as required.



CAUTION: It is highly recommended to retrieve, clean, inspect, grease, and reset the wear bushing each time the hole is tripped during the drilling of the hole section.

Retrieve the Wear Bushing After Drilling

- Make up the retrieving tool to the drill pipe.
- Slowly lower the tool into the wear bushing.
- Pick up and balance the riser weight and rotate the retrieving tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.
- Retrieve the wear bushing to the rig floor. Remove it and the retrieving tool from the drill string.

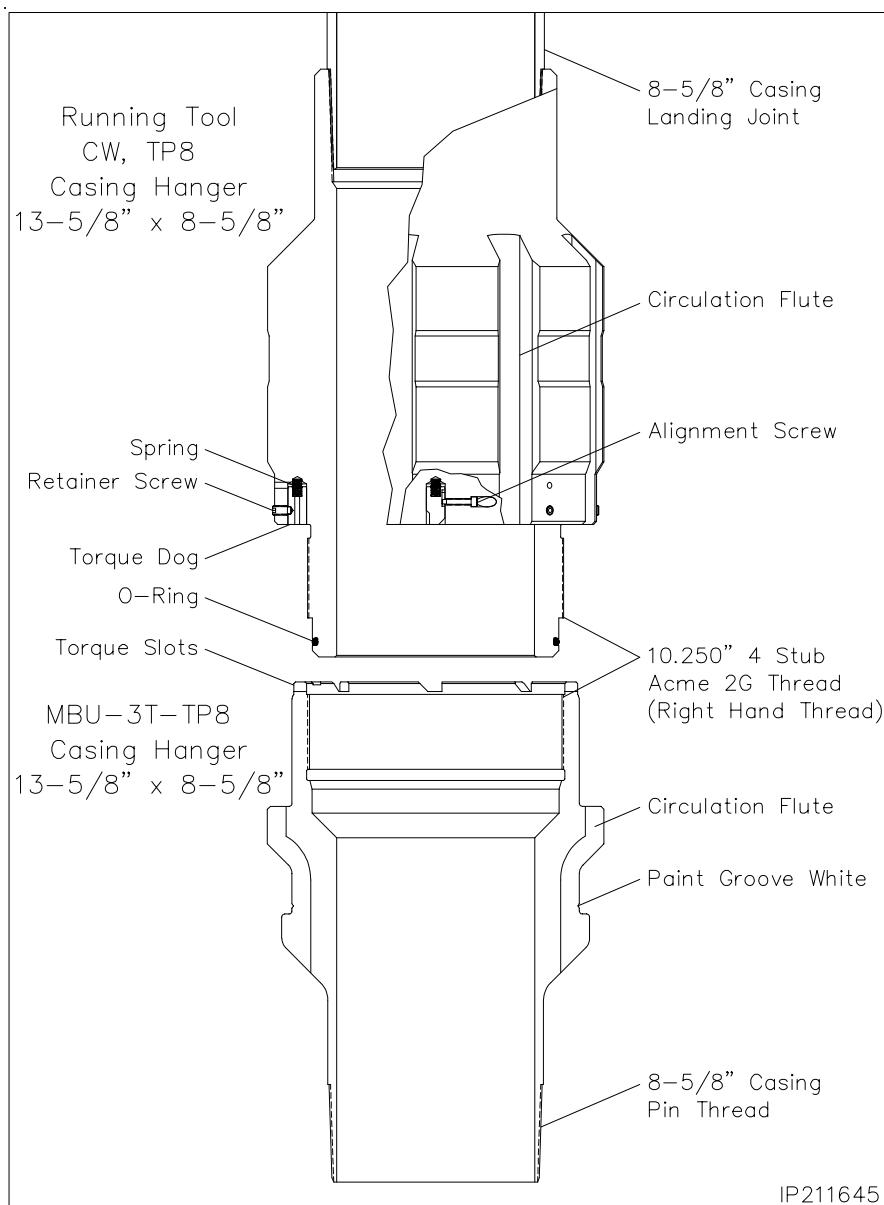


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Stage 11 — Hang Off the 8-5/8" Casing

NOTE: If the 8-5/8" casing becomes stuck and the mandrel casing hanger cannot be landed, refer to **Section 2: Stage 11A** for the emergency procedure.

- Examine the **13-5/8" x 8-5/8" CW-TP8 Casing Hanger Running Tool (Item ST11)**. Verify the following:
 - internal bore and threads are clean and in good condition
 - o-ring seal is clean and in good condition
 - torque dogs are in place, in upper most position and retainer set screws are tightened securely
- Make up a landing joint to the top of the running tool and torque connection to thread manufacturer's maximum make up torque.
- Lay down the landing joint on the pipe rack.
- On the pipe rack, examine the **13-5/8" x 8-5/8" CW-MBU-3T-LWR-TP8 Mandrel Casing Hanger (Item B19)**. Verify the following:
 - internal bore and threads are clean and in good condition
 - neck seal area is clean and undamaged
 - torque slots are clean and in good condition
 - pin threads are clean and in good condition. **Install thread protector**
 - paint indicator groove white as indicated and allow paint to dry



- Liberalily lubricate the mating threads, seal areas and o-ring of the hanger and running tool with a oil or light grease.
- Using chain tongs only**, thread the running tool into the hanger, with right hand rotation, until it shoulders out on the hanger body.

CAUTION: Do Not apply torque to the hanger/tool connection.

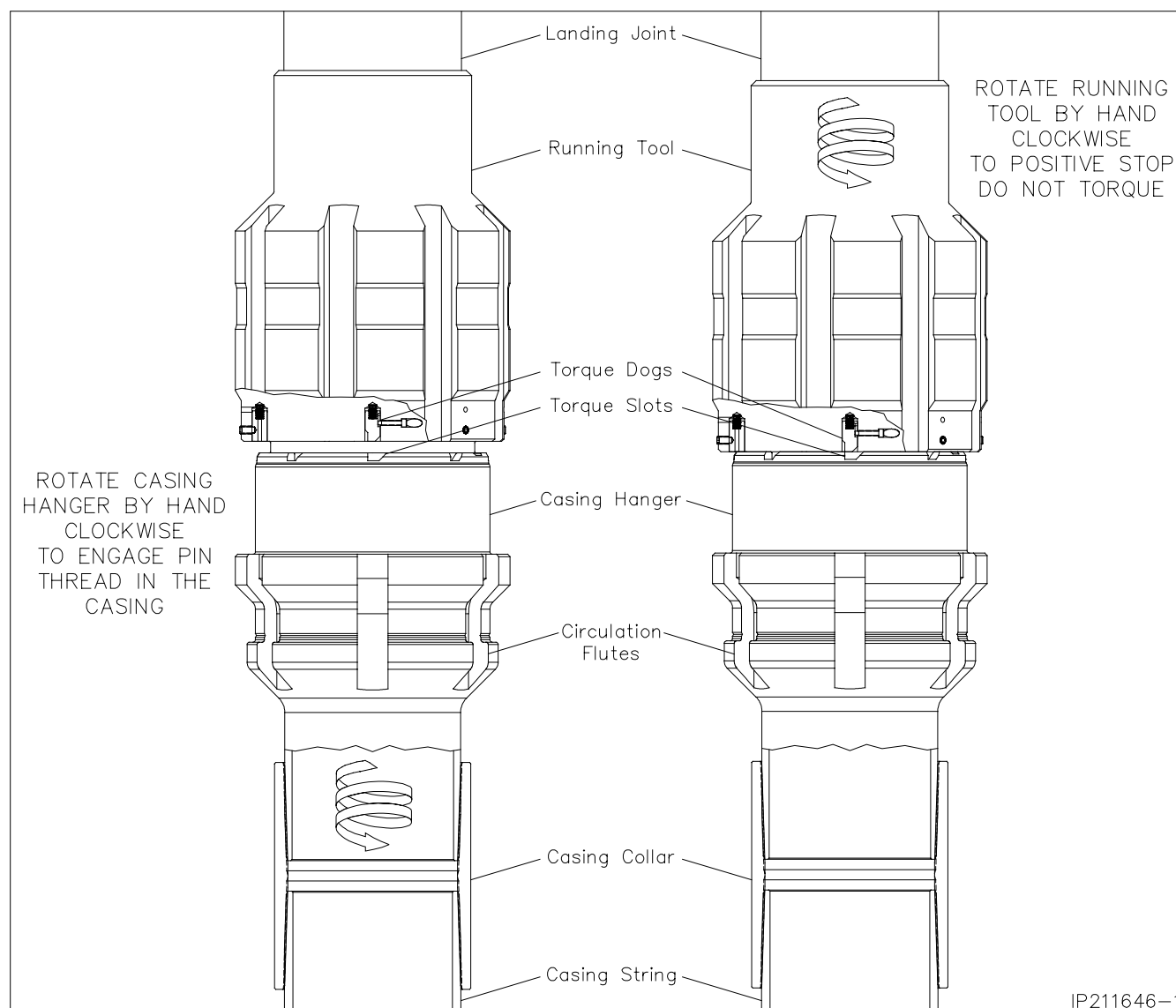
NOTE: If steps 1 through 6 were done prior to being shipped to location, the running tool should be backed off 1 turn and made back up to ensure it will back off freely.

- Calculate the total landing dimension by adding the previously determined RKB dimension and 30.00", the depth of the wellhead.
- Starting at the top of the 45° angle load shoulder of the casing hanger measure up the landing joint and place a paint mark on the joint. Mark **HANGER LANDED**.
- Place a second mark 30" below the first and mark **STOP ROTATING**.



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Stage 11 — Hang Off the 8-5/8" Casing



10. Run the 8-5/8" casing as required and space out appropriately for the mandrel casing hanger.
11. Pick up the casing hanger/running tool joint assembly.
12. Remove the casing hanger thread protector and carefully thread the hanger into the last joint of casing ran. Rotate the hanger clockwise, by hand, to a positive stop.
13. Rotate the running tool clockwise by hand to a positive stop.



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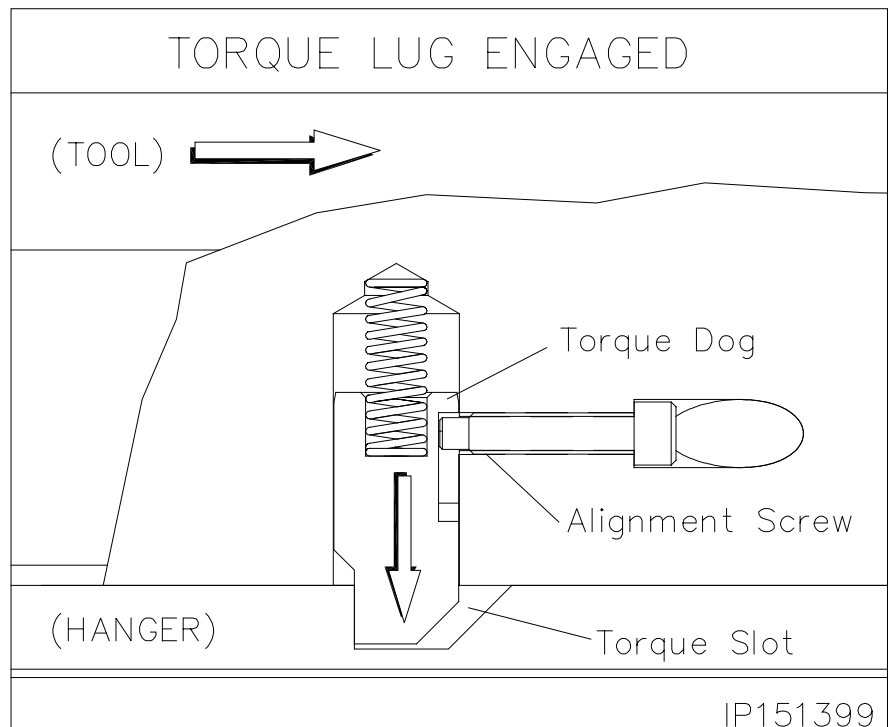
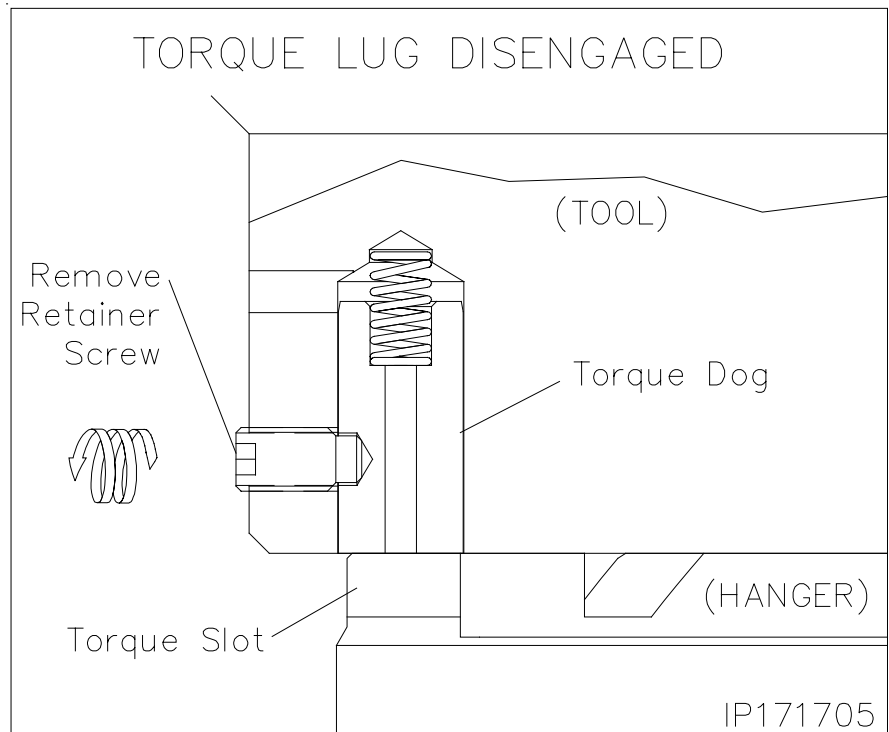
Stage 11 — Hang Off the 8-5/8” Casing

14. Locate the (4) 3/8” socket head set screws in the side of the hanger running tool and remove the screws. This will release the running tool torque dogs allowing them to move downward.

NOTE: Place the screws in a safe place to reinstall in the tool when the job is completed.

15. **Using chain tongs only**, rotate the running tool to the left to allow the torque dogs to engage the torque slots in the top of the hanger.

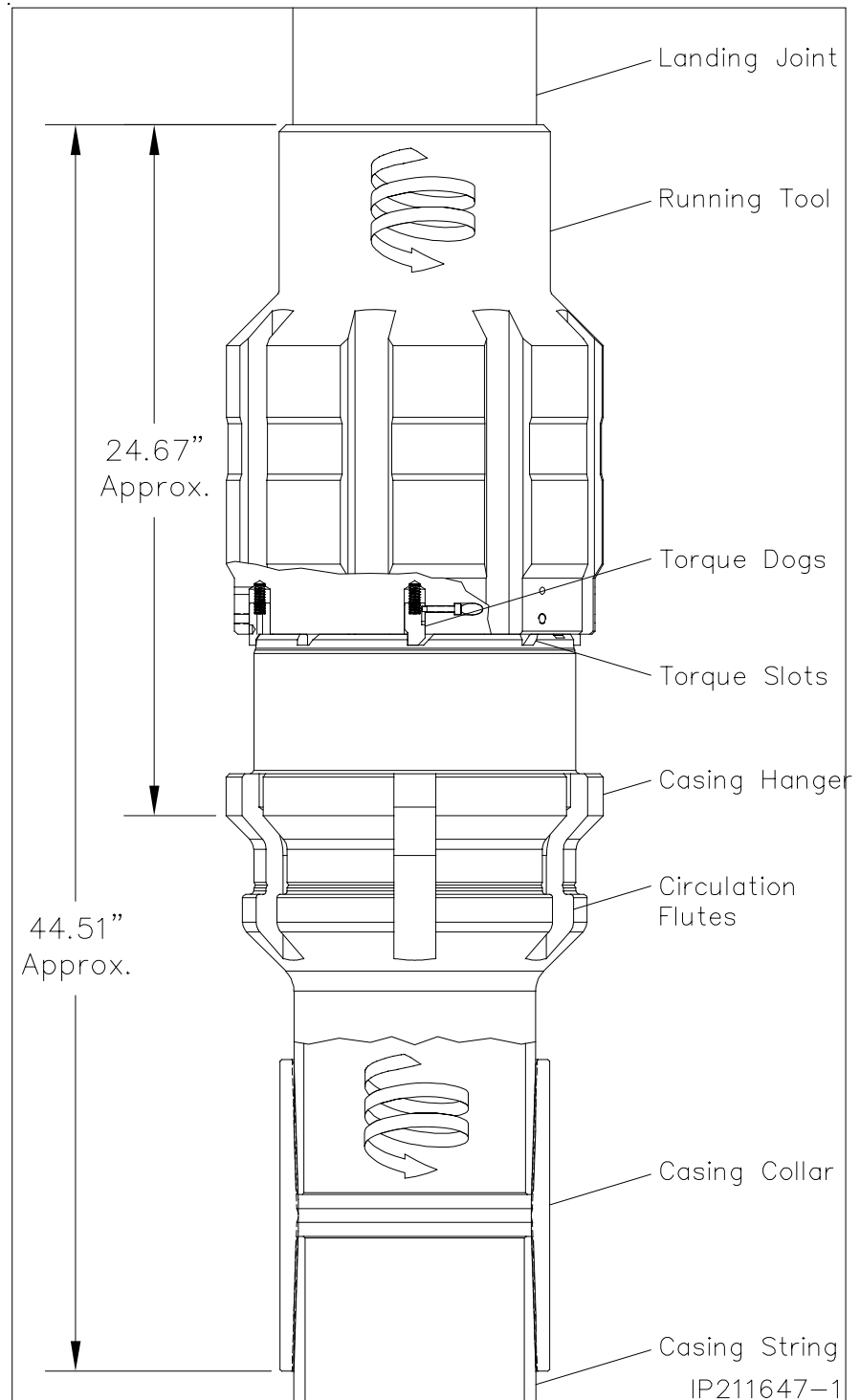
CAUTION: Do Not rotate the running tool more than 1/4 turn to the left. Doing so will decrease the torque dog engagement.



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Stage 11 — Hang Off the 8-5/8” Casing

- 16. Engage the CRT tool on the landing joint and torque the casing hanger in the casing string to thread manufacturer's maximum make up torque.

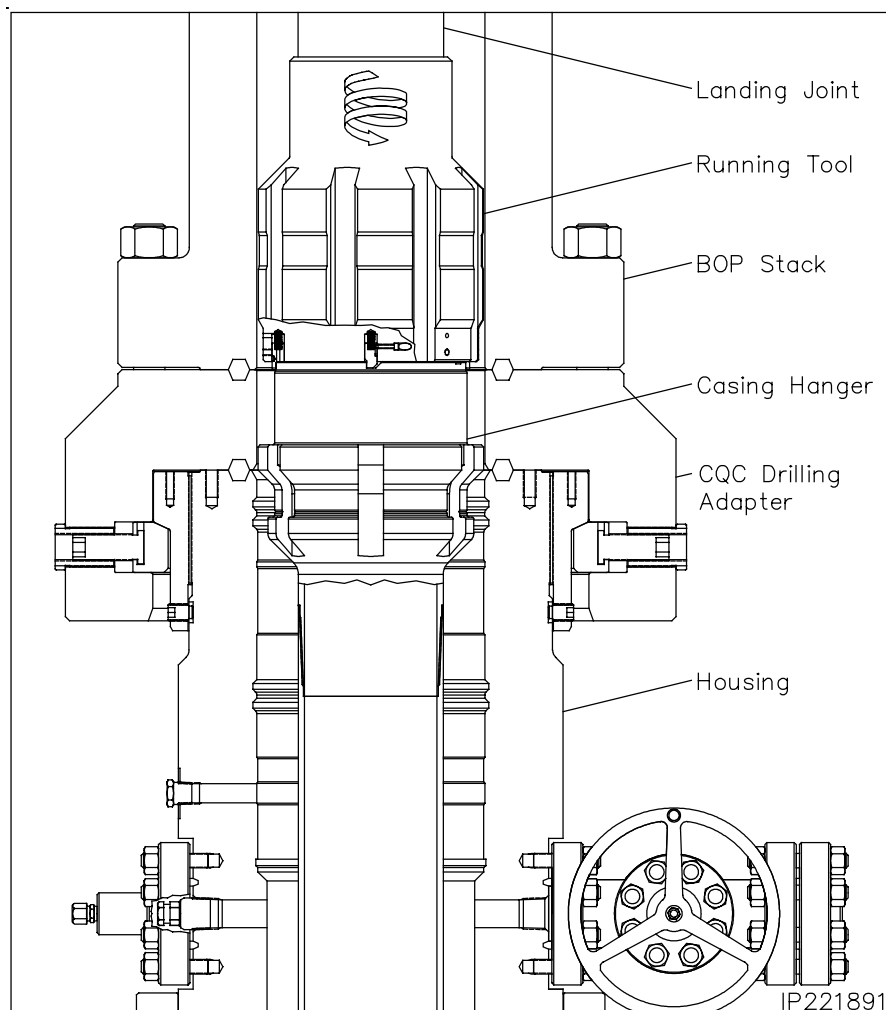


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Stage 11 — Hang Off the 8-5/8" Casing

17. Pick up the casing string and remove the floor slips and rotary bushings.
18. Carefully lower the hanger completely through the BOP annular and then engage the top drive to allow the casing to be rotated clockwise.
19. While rotating the casing clockwise, carefully lower the casing string until the **STOP ROTATING** mark on the landing joint is level with the rig floor.

NOTE: The torque dogs have a maximum rated capacity. Please reference the **Recommended Service Tools** section in the BOM for maximum torque allowed.



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Stage 11 — Hang Off the 8-5/8" Casing

CAUTION: Torque wrap can build in the casing string as it is rotated. Ensure the string comes to a neutral position, by allowing it to back off slowly counter clockwise, before the casing hanger is fully landed.

20. Cease rotation and continue carefully lowering the hanger through the wellhead and land it on the load shoulder in the housing, 30.00" below the top of the lower drilling adapter.

21. Slack off all weight on the casing and verify that the **HANGER LANDED** paint mark has aligned with the rig floor.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

22. Open the housing lower outlet valve and drain the BOP stack.

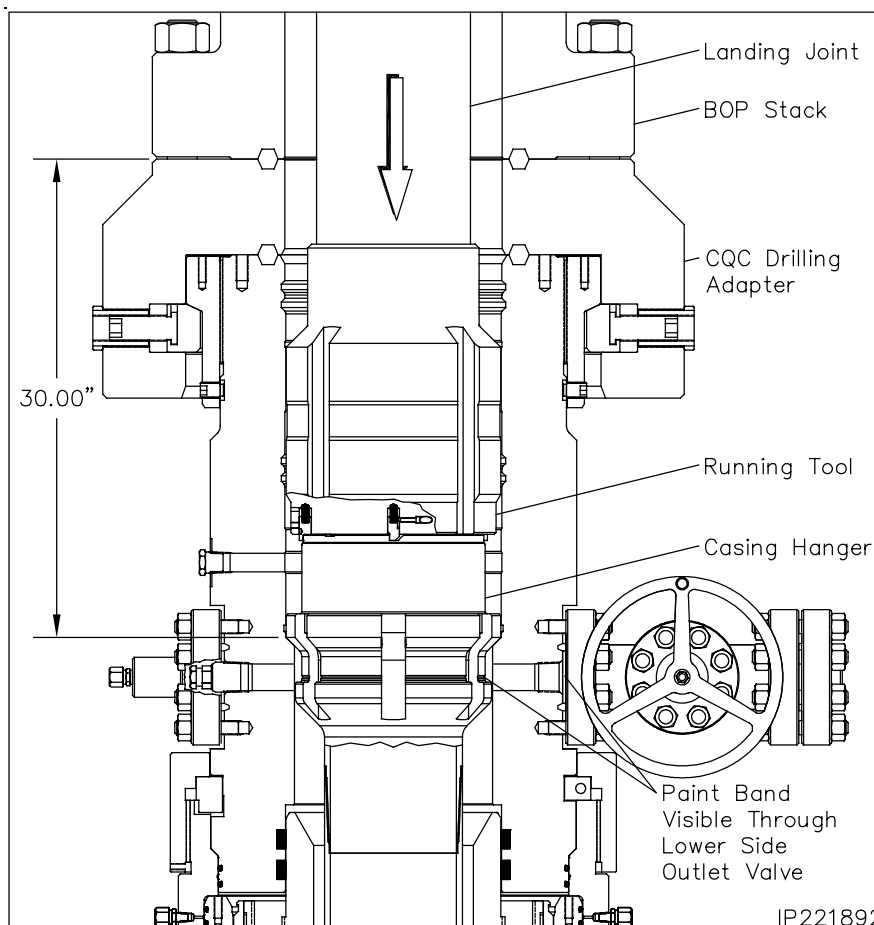
23. Sight through the valve bore to confirm the hanger is properly landed. The white painted indicator groove will be clearly visible in the center of the open outlet valve.

24. Close the open valve and place a vertical paint mark on the landing joint to verify if the casing string rotates during the cementing process.

25. Cement the casing as required.

NOTE: Returns may be taken through the circulation slots and out the BOP or out the side outlets on the housing.

26. With cement in place, bleed off all pressure and remove the cementing head.



27. **Using chain tongs only, located 180° apart**, retrieve the running tool and landing joint by rotating the landing joint counter clockwise (left) approximately 13 turns or until the tool comes free of the hanger.

CAUTION: The rig floor tong may be used to break the connection but **under no circumstances is the top drive to be used to rotate or remove the casing hanger running tool.**



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Stage 11 — Hang Off the 8-5/8" Casing

Running the 13-5/8" Wash Tool

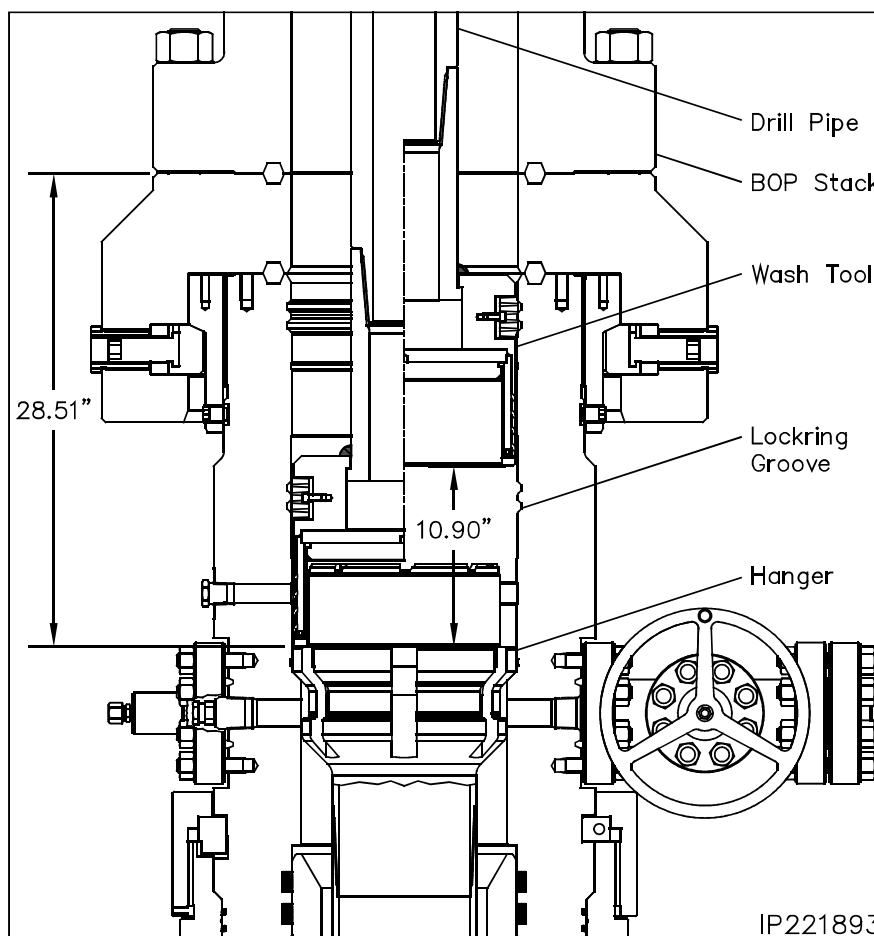
1. Examine the **13-5/8" x 4-1/2" IF (NC50) Wash Tool (Item ST13)**.

Verify the following:

- drill pipe threads and bore are clean and in good condition
 - all ports are open and free of debris
 - brushes are securely attached and in good condition
2. Orient the wash tool with drill pipe box up. Make up a joint of drill pipe to the tool.
 3. Carefully lower the wash tool through the BOP and land it on top of the casing hanger, 28.51" below the top of the lower drilling adapter.
 4. Place a paint mark on the drill pipe level with the rig floor.
 5. Using chain tongs, rotate the tool clockwise (right) approximately 6 turns to loosen any debris that may be on top of the hanger flutes.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the lower side outlet valve and drain the BOP stack.
7. Attach a high pressure water line or the top drive to the end of the drill pipe. Pump water (up to a max of 200 psi) through the tool and up the BOP stack.
8. Pick up on the tool approximately 1" and slowly rotate the drill pipe approximately 20 RPM.
9. Pick up the tool a total of 10.90" and rotate the tool to brush the upper locking groove free of debris.
10. While flushing, raise and lower the tool the full length of the wellhead and BOP stack. Thoroughly wash the inside of the housing and BOP stack to remove all caked on debris.



11. Once washing is complete, land the wash tool on the hanger flutes.
12. Shut down pumps and observe the returns at the open lower outlet for debris.
13. Reengage the pump and fully wash the inside of the wellhead and the entire BOP one additional cycle, ensuring the stopping point is with the wash tool resting on top of the hanger flutes.
14. Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.
15. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
16. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure there are no dark areas on top of the painted flutes of the hanger.



CAUTION: Continue washing until all debris is removed.



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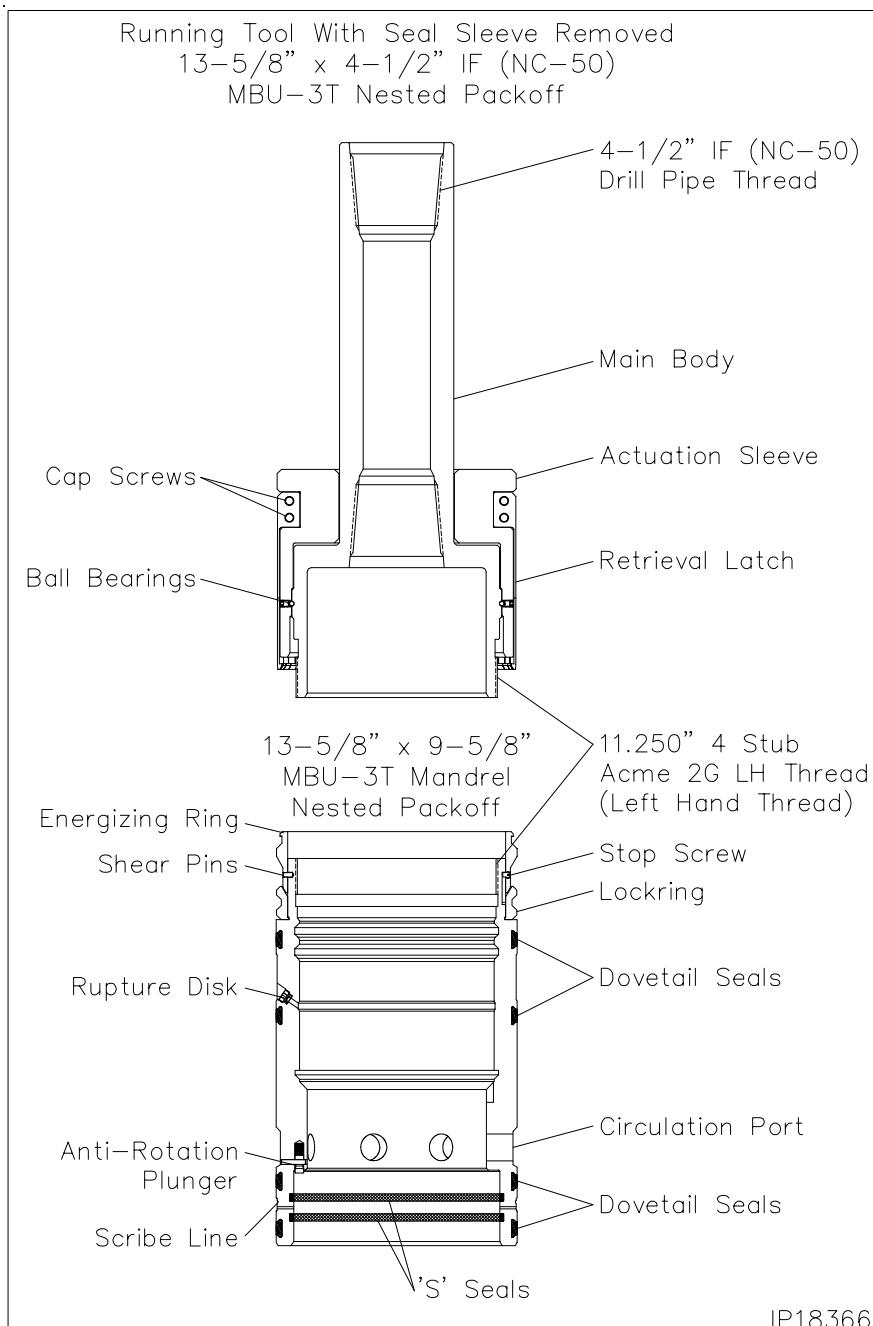
Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

NOTE: The following steps detail the installation of the MBU-3T nested packoff assembly for the mandrel hanger. If the casing was landed using the emergency slip hanger, skip this stage and proceed with **Section 2: Stage 12A** for installing the emergency MBU-3T nested packoff.

- Examine the **13-5/8" x 11.250" 4 Stub Acme 2G LH Box Top MBU-3T Mandrel Hanger Nested Packoff Assembly (Item B20)**. Verify the following:
 - all elastomer seals are in place and undamaged
 - internal bore, and ports, are clean and in good condition
 - locking is fully retracted
 - rupture disc is in place and tightened securely
 - energizing ring is in its upper most position and retained with shear pins
 - guide screws are in place and back off 1/4 turn
 - anti-rotation plungers are in place, free to move
- Inspect the I.D. and O.D. seals for any damage and replace as necessary.
- Examine the **13-5/8" Nominal x 11.250" 4 Stub Acme 2G LH, MBU-3T Nested Packoff Running Tool (Item ST14)**. Verify the following:
 - Acme threads are clean and in good condition
 - retrieval latch is in position and retained with cap screws
 - remove seal sleeve protector and seal sleeve

NOTE: Alternate tool may also be used.

- Remove the retrieval latch and set aside.
- Make up the running tool to 4-1/2" IF (NC-50) drill pipe and torque the connection to optimum make up torque.



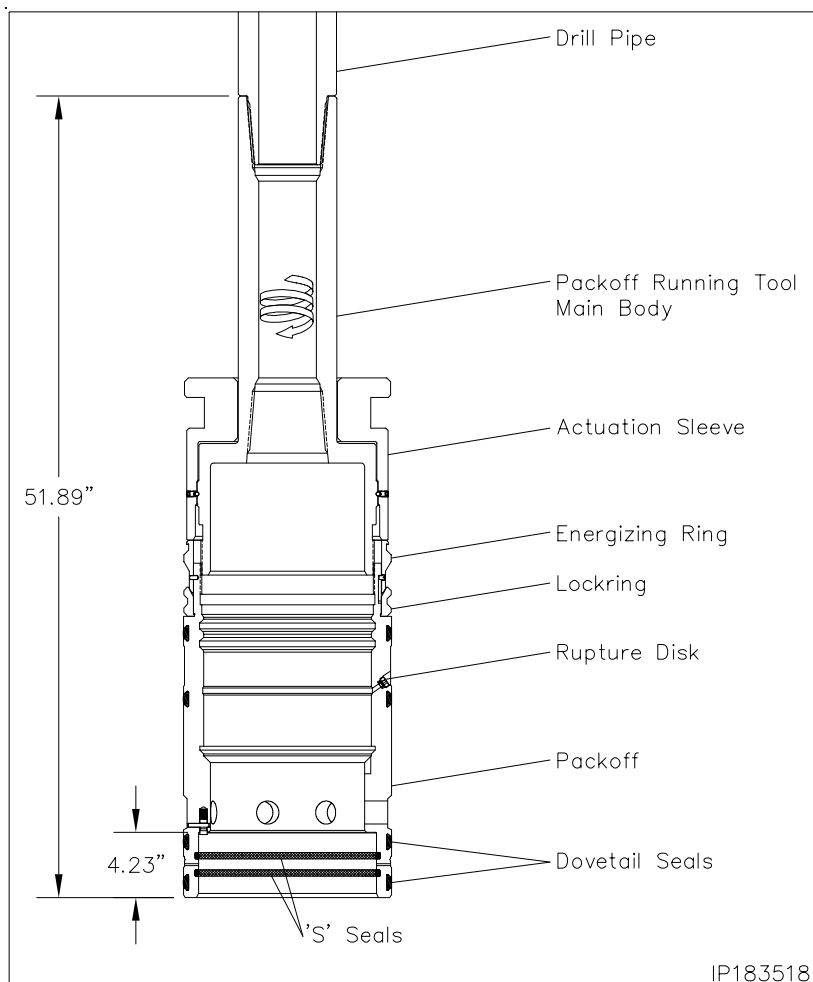
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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

6. Pick up the running tool with landing joint and suspend it above the packoff.
7. Thoroughly clean and lightly lubricate the mating Acme threads of the tool and the packoff with oil or a light grease.
8. Carefully lower the tool into the packoff and thread them together by first rotating the tool clockwise (RIGHT) to locate the thread start and then counter clockwise (LEFT) until the tool upper body makes contact with the packoff energizing ring. Approximately 4 turns.

CAUTION: Ensure the rupture disc is in place and tightened securely.

9. Pick up the assembly and thoroughly clean and lightly lubricate the packoff I.D. 'S' seals and the O.D. dovetail seals with oil or light grease.
10. Locate the upper and lower "SEAL TEST" fittings on the O.D. of the housing and remove the dust cap from the fittings.
11. Attach a test pump to both fittings and pump clean test fluid through the ports to dislodge any old grease and trapped debris.
12. Remove the test pump and reinstall the fitting dust caps.




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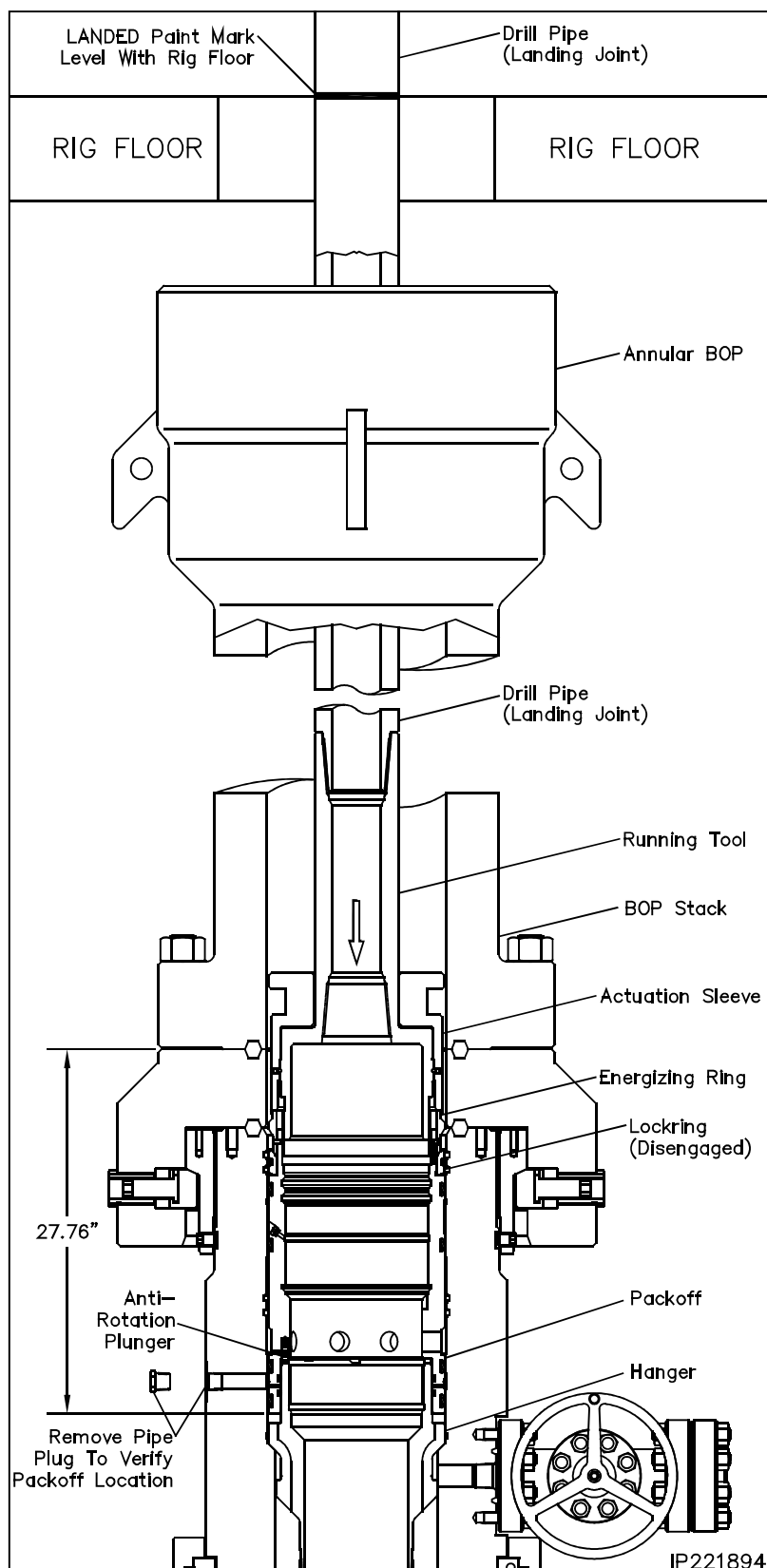
Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

Landing the Packoff

13. Remove the hole cover.
14. Measure up 5 foot from the paint mark on the O.D. of the packoff and place a paint mark on the drill collar.
15. Pick up the packoff/running tool assembly and carefully lower the assembly through the BOP, marking the landing joint every five feet until the calculated dimension is reached.
16. Place a paint mark on the drill pipe at that dimension and mark **LANDED**.
17. Continue lowering the packoff until it passes over the neck of the hanger and lands on the casing hanger flutes, 27.76" below the top of the drilling adapter.
18. Confirm that the **LANDED** paint mark is level with the rig floor.
19. If not it is likely that there is debris on top of the casing hanger.
20. Remove the packoff and further wash the casing hanger and housing I.D. Also reverify the landing dimension.
21. Re land the packoff and verify the **LANDED** paint mark is level with the rig floor.

 **WARNING:** Confirm with Drilling Supervisor that well bore conditions are safe.

22. Locate the upper 1" sight port pipe plug and remove the plug.
23. Look through the port to verify the packoff is properly landed. The white paint scribe line will be clearly visible in the center of the open port.
24. When landing is verified, reinstall the pipe plug and tighten securely.



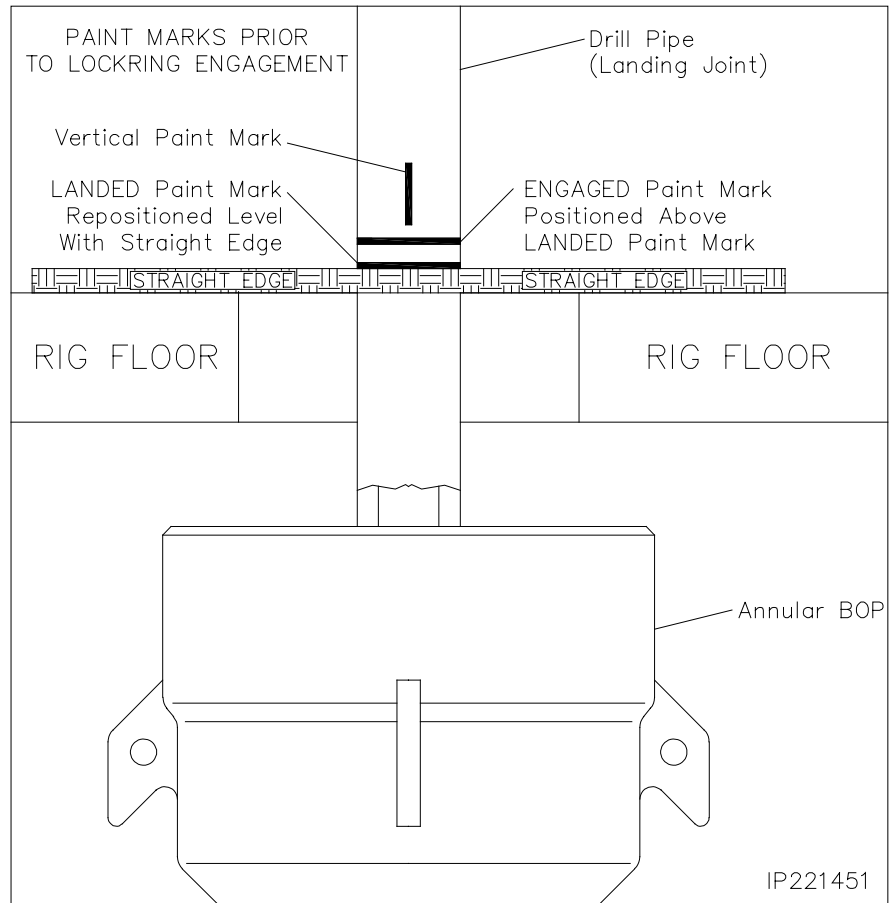
Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

- 25. With the packoff properly landed the **LANDED** paint mark is removed from the landing joint.
- 26. Place a straight edge across the rotary table as indicated.
- 27. Place a paint mark on the landing joint level with the top of the straight edge and label it **LANDED**.
- 28. Measure up 1-1/2" above the landed mark and place another paint mark on the landing joint. Label this mark **ENGAGED**.
- 29. Place a **Vertical** paint mark on the landing joint and a corresponding paint mark on the rig floor to visually count the turns of the landing joint.

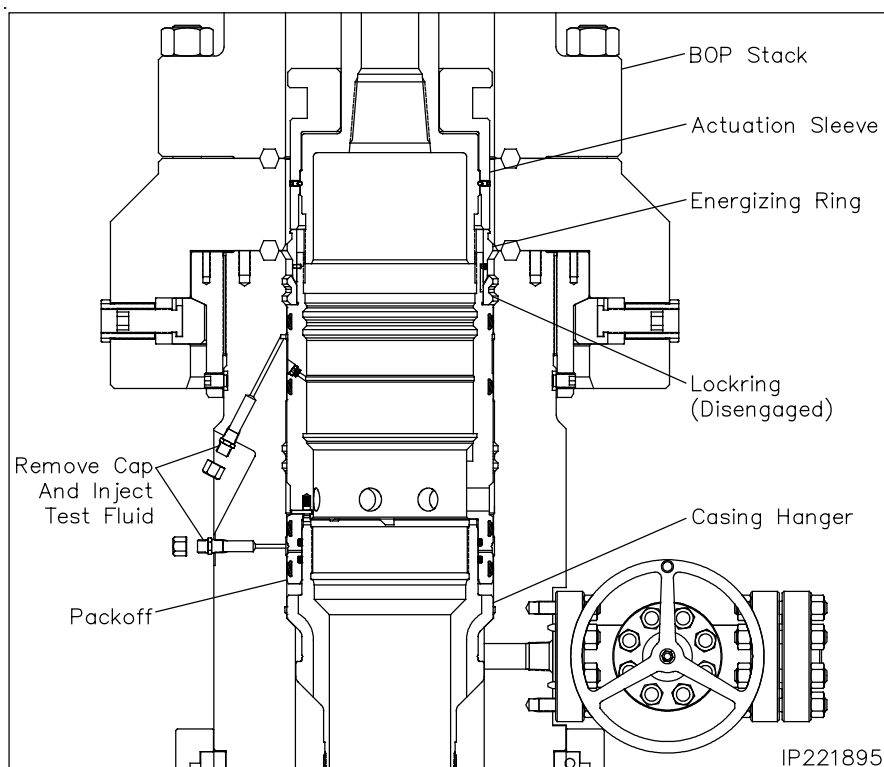


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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

Seal Test

30. Locate the upper and lower "SEAL TEST" fittings on the O.D. of the upper housing and remove the dust caps from the fittings.
31. Attach a test pump to the open lower fitting and pump clean test fluid between the seals until a stable test pressure of **5,000 psi** is achieved.
32. Hold the test pressure for 15 minutes or as required by drilling supervisor.
33. If a leak develops, bleed off test pressure. Remove the packoff from the wellhead and replace the leaking seals.
34. Repeat steps 31 through 33 for the remaining upper fitting and test the upper seals to **10,000 psi**.
35. After satisfactory tests are achieved, bleed off the test pressure but leave the test manifolds in place.



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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

Engaging the Lockring

36. **Using chain tongs only, located 180° apart**, slowly rotate the packoff assembly counter clockwise (left) until the anti-rotation plunger aligns with one of the circulation flutes of the hanger. Expect torque of approximately 400 ft-lbs to rotate the packoff.

37. **Using chain tongs only**, rotate the landing joint approximately **6 turns counterclockwise (1-1/2" of downward travel)** to engage the packoff locking in its mating groove in the bore of the MBU-3T nested packoff.

NOTE: Use the **Vertical** paint mark to count the turns of the landing joint.

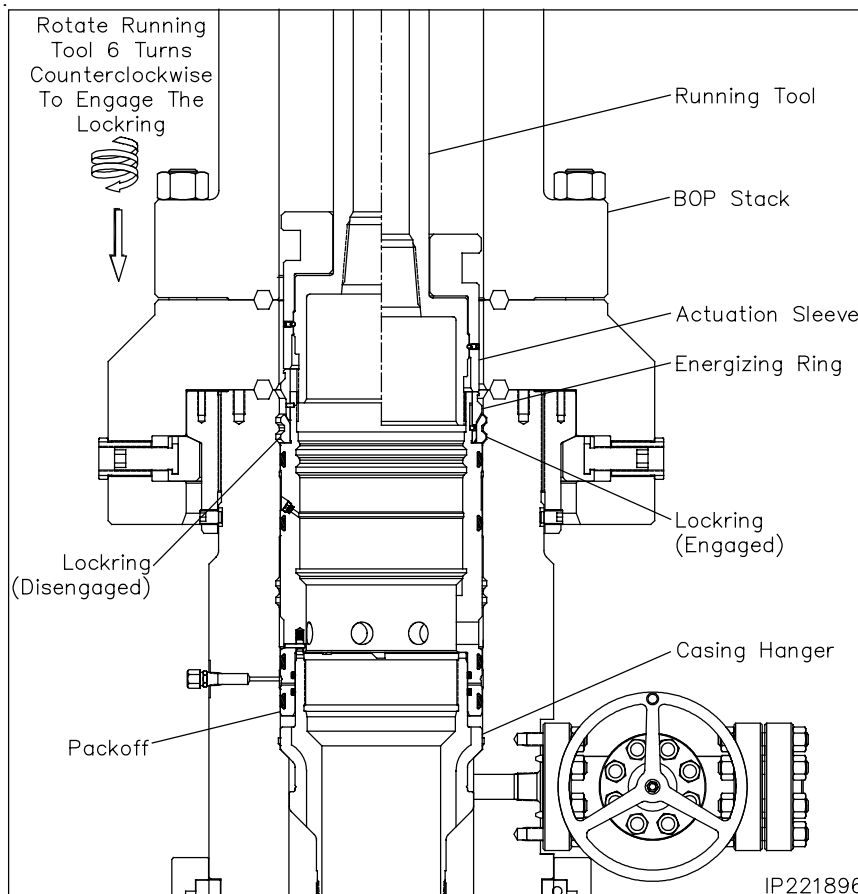
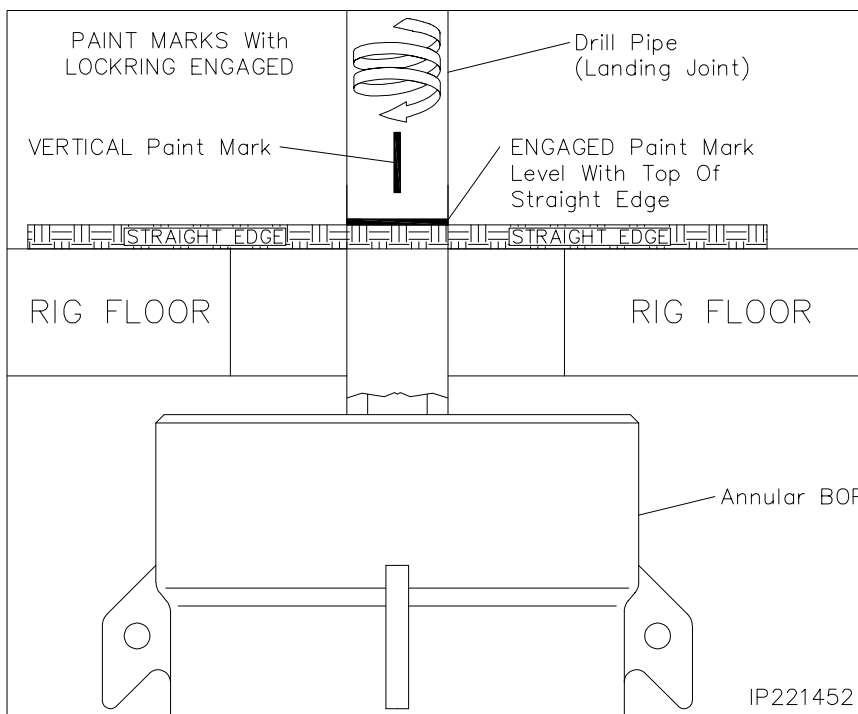
NOTE: Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the locking out. A positive stop will be encountered when the locking is fully engaged.

CAUTION: It is imperative that the drill pipe landing joint remain concentric with the well bore when rotating to engage the locking. This can be accomplished with the use of the air hoist.

38. To confirm all 6 turns of the landing joint are achieved, place the straight edge back across the rotary table adjacent the landing joint.

CAUTION: When the locking is properly engaged the **ENGAGED** paint mark on the landing joint will be level with the top of the straight edge. **VERIFY PAINT MARKS.**

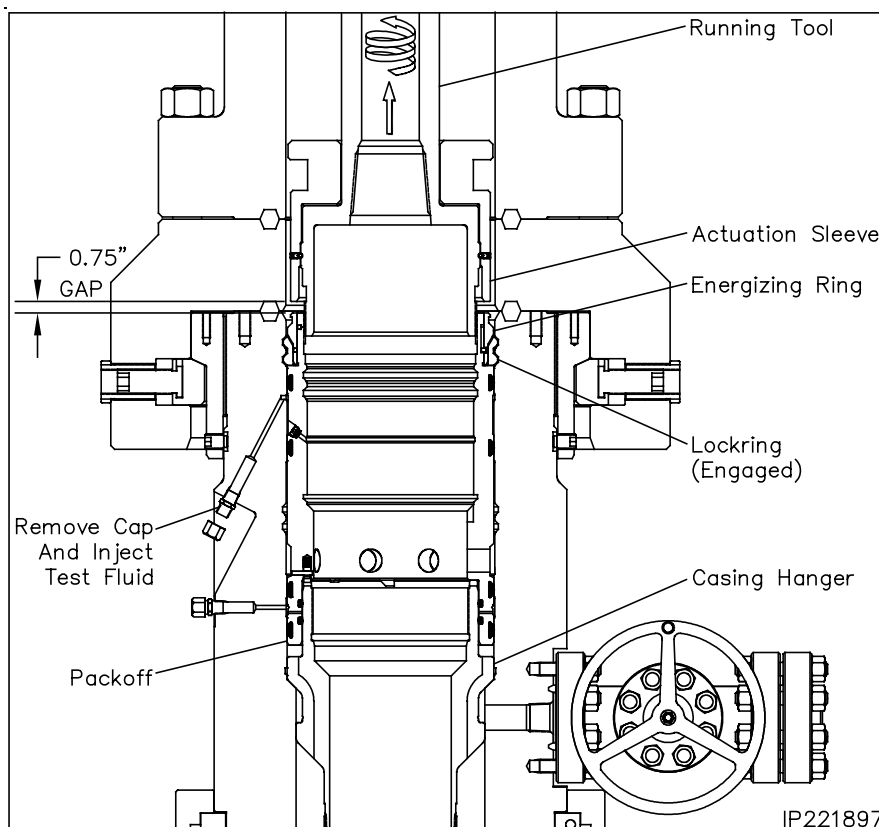
CAUTION: If the required turns to engage the locking are not met or the paint marks do not align properly or excessive torque is encountered, remove the packoff. First call local branch. If further assistance is required then call Houston Engineering.



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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

39. Back off the landing joint/running tool approximately 3 turns. Using the drill pipe elevators, exert a 40,000 lbs pull on the landing joint. Hold pull for 15 minutes minimum. After satisfactory test, slack off weight.
40. Reattach the test pump to the open test manifolds and retest the packoff seals to **10,000 psi** for 15 minutes. This will also verify that the packoff is in place.
41. After satisfactory test is achieved, increase the injection pressure to **11,500 psi** on the **Upper Seal Test Fitting** to burst the rupture disk in the packoff.
42. Remove test pump and attach a grease gun to the open upper fitting.
43. Pump grease through the fitting and port until it flows into the I.D. of the packoff.
44. Remove the grease gun and reinstall the dust cap on the open fittings.
45. **Using chain tongs only**, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 6 turns). Retrieve the tool with a straight vertical lift.



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

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Stage 12 — Install the MBU-3T Mandrel Hanger Packoff

NOTE: In the event the packoff is required to be removed after the lockring is engaged the following stage is to be followed.

Retrieving the Packoff

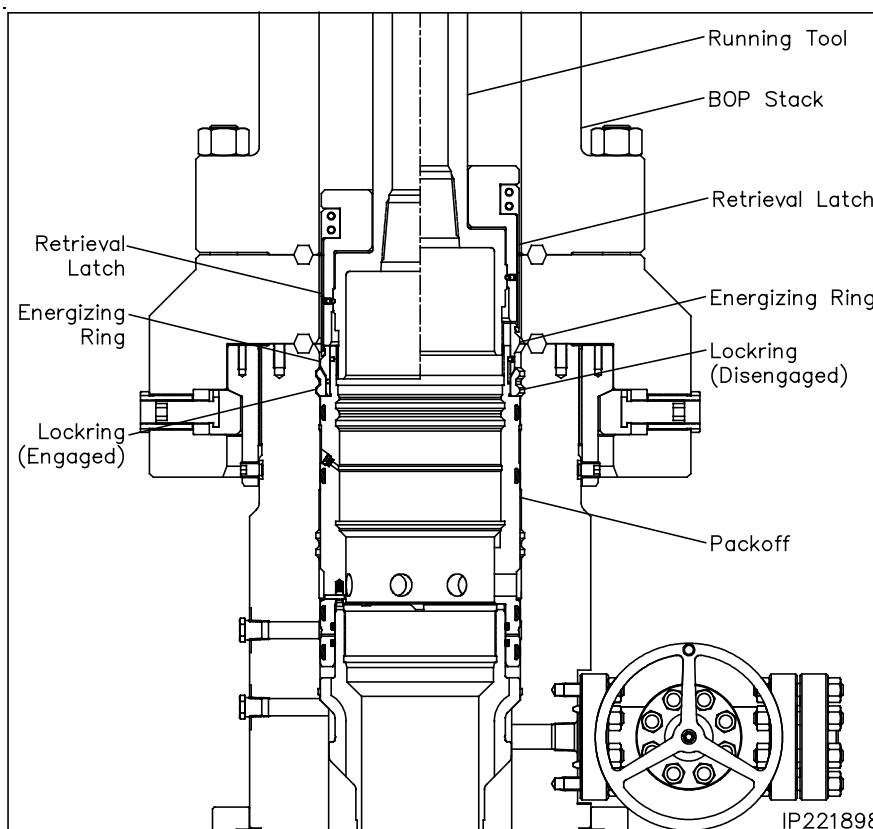
1. Position the retrieval latch so the latch finger extend from the bottom of the running tool body.
2. Reinstall the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool body.
4. Carefully lower the running tool through the BOP stack and into the packoff.
5. Rotate the drill pipe clockwise (Right) to locate the thread start and then counter clockwise (Left) (approximately 9 to 9-1/2 turns) to a positive stop.

NOTE: At this point the retrieval latches will have passed over the energizing ring and snapped into place.

6. Rotate the drill pipe clockwise (right) approximately 6 turns to a positive stop. The drill pipe should rise approximately 1-1/2".

CAUTION: Do Not exceed the 6 turns or the packoff may be seriously damaged.

7. Carefully pick up on the drill pipe and remove the packoff from the wellhead with a straight vertical lift.
8. Rotate the packoff 1 turn clockwise to relax the retrieval latch.
9. Remove the (4) 1/2" cap screws and remove the latch assembly.
10. Redress the packoff and reset as previously outlined.
11. Once the packoff is properly set, reinstall the retrieval latch on the tool.



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Stage 13 — Test the BOP Stack

Immediately after making up the BOP stack and periodically during the drilling of the well for the next casing string the BOP stack (connections and rams) must be tested.

1. Examine the **11" Nominal x 4-1/2" IF (NC-50) CW Test Plug (Item ST15)**. Verify the following:
 - 1-1/4" VR plug and weep hole plug are in place and tightened securely
 - elastomer seals are in place and in good condition
 - drill pipe threads are clean and in good condition

CAUTION: Prior to running or retrieving the test plug during the rig is properly aligned and centered over the wellhead.

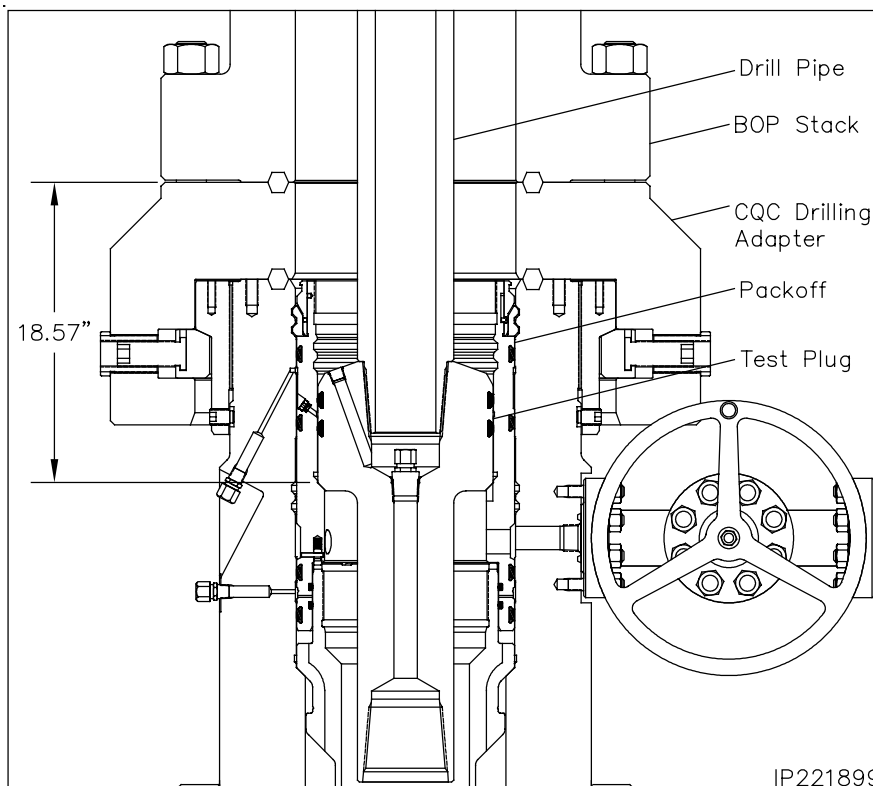
2. Position the test plug with the elastomer seal down and the lift lugs up and make up the tool to a joint of drill pipe.

CAUTION: Ensure the lift lugs are down and the elastomer seal is up.

3. Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

4. Open the housing upper side outlet valve.
5. Lightly lubricate the test plug seal with oil or light grease.
6. Carefully lower the test plug through the BOP and land it on the load shoulder in the packoff, 18.57" below the top of the lower drilling adapter.



7. Close the BOP rams on the pipe and test the BOP to **10,000 psi**.

NOTE: Any leakage past the test plug will be clearly visible at the open side outlet valve.

CAUTION: When performing the BOP blind ram test it is highly recommended to suspend a stand of drill pipe below the test plug to ensure the plug stays in place while disconnecting from it with the drill pipe.

8. After a satisfactory test is achieved, release the pressure and open the rams.
9. Remove as much fluid as possible from the BOP stack. Retrieve the test plug with a straight vertical lift.
10. Close all open valves.
11. Repeat this stage as required during the drilling of the hole section.



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Stage 14 — Run the Upper Wear Bushing

CAUTION: Always use a wear bushing while drilling to protect the load shoulders from damage by the drill bit or rotating drill pipe. The wear bushing **must be retrieved** prior to running the casing.

1. Examine the **13-5/8" x 11" x 9.00" I.D. MBU-3T-UPR Wear Bushing (Item ST16)**. Verify the following:
 - internal bore is clean and in good condition
 - o-ring is in place and in good condition
 - shear o-ring cord is in place and in good condition

Run the Wear Bushing Before Drilling

2. Orient the **13-5/8" Nominal x 4-1/2" IF (NC-50) CW Retrieving Tool (Item ST9)** with drill pipe connection up.
3. Attach the retrieving tool to a joint of drill pipe.

CAUTION: Ensure the lift lugs are down.

4. Align the retractable lift lugs of the tool with the retrieval holes of the bushing and carefully lower the tool into the wear bushing until the lugs snap into place.

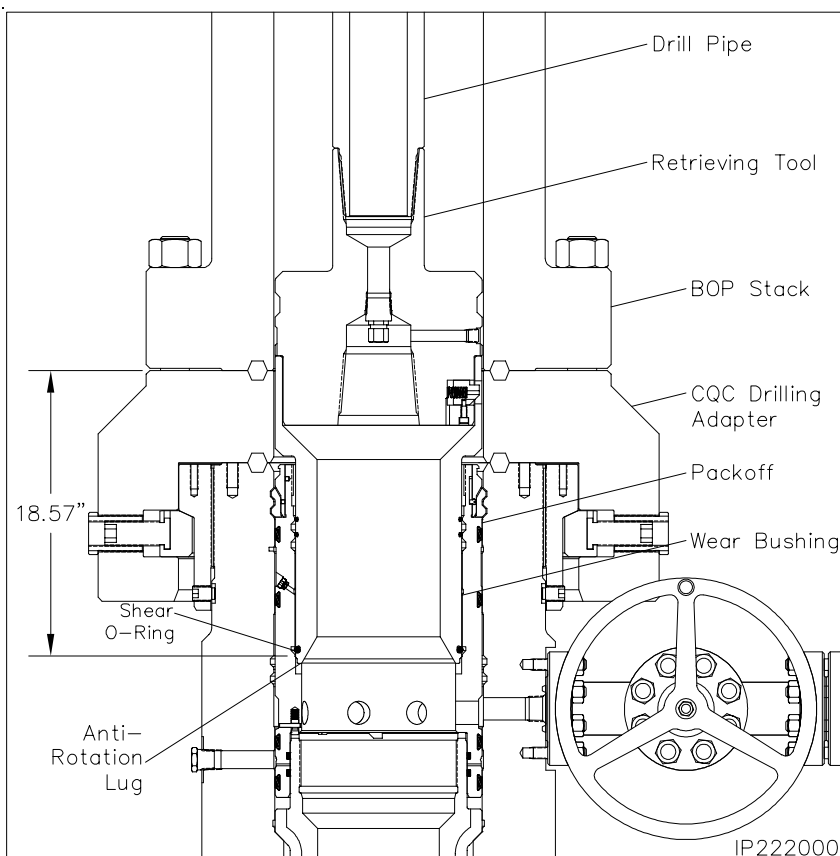
NOTE: If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

5. **Apply a heavy coat of grease, not dope, to the O.D. of the bushing.**

6. Ensure the BOP stack is drained and free of any debris from previous test.

7. Slowly lower the tool/bushing assembly through the BOP stack and land it on the load shoulder in the housing, 18.57" below the top of the lower drilling adapter.

8. Rotate the drill pipe clockwise (right) to locate the stop lugs in their mating notches in the head. When properly aligned the bushing will drop an additional 1/2".



NOTE: The shear o-ring on bottom of the bushing will locate in a groove above the load shoulder in the head to act as a retaining device for the bushing.

9. Remove the tool from the wear bushing by rotating the drill pipe counter clockwise (left) 1/4 turn and lifting straight vertical.
10. Drill as required.

CAUTION: It is highly recommended to retrieve, clean, inspect, grease, and reset the wear bushing each time the hole is tripped during the drilling of the hole section.

Retrieve the Wear Bushing After Drilling

11. Make up the retrieving tool to the drill pipe.
12. Slowly lower the tool into the wear bushing.
13. Rotate the retrieving tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.
14. Retrieve the wear bushing to the rig floor. Remove it and the retrieving tool from the drill string.



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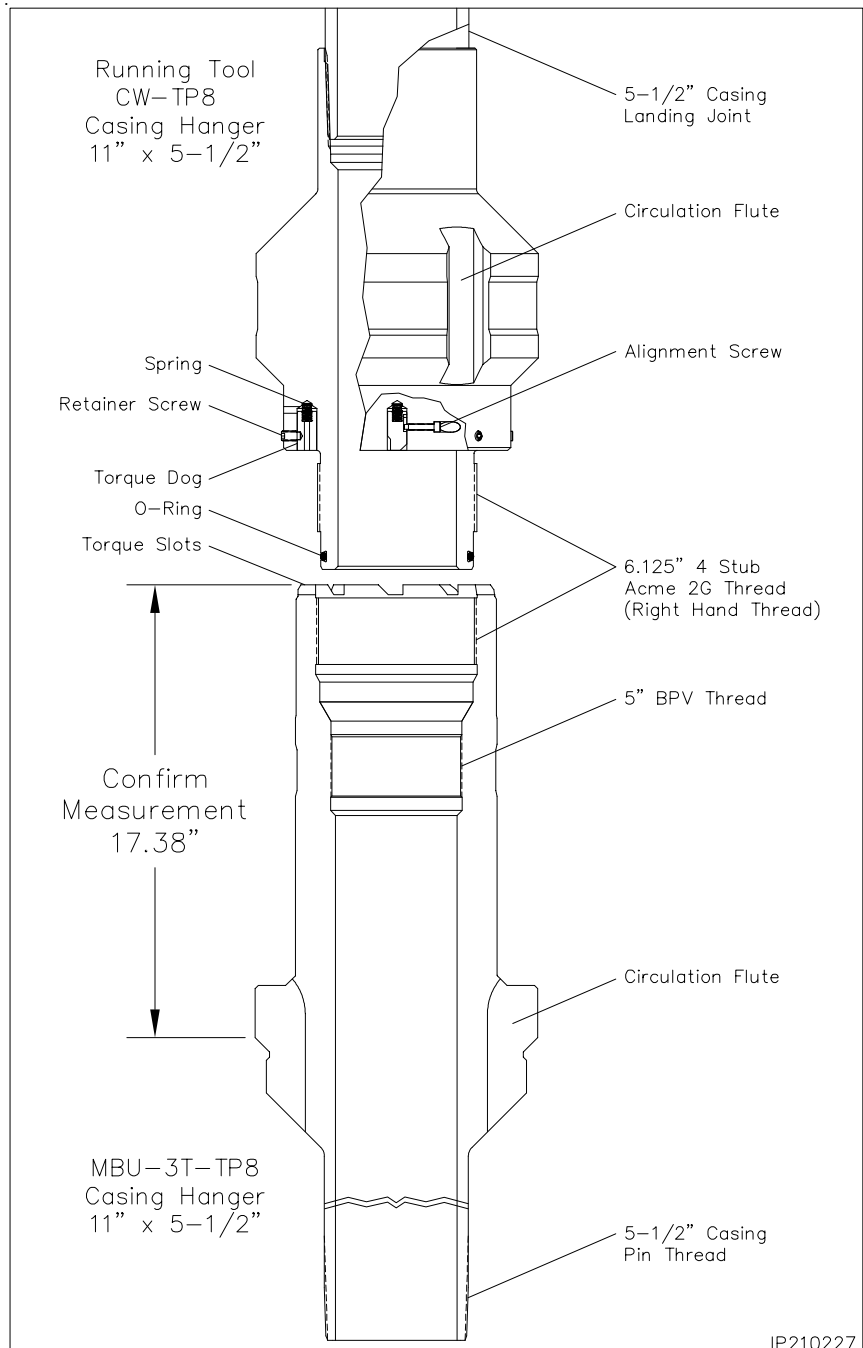
Stage 15 — Hang Off the 5-1/2" Casing

NOTE: If the 5-1/2" casing becomes stuck and the mandrel casing hanger cannot be landed, refer to **Section 2: Stage 15A** for the emergency slip casing hanger procedure.

- Examine the **11" x 5-1/2" CW-TP8 Casing Hanger Running Tool (Item ST17)**. Verify the following:
 - internal bore and threads are clean and in good condition
 - o-ring seal is clean and in good condition
 - torque dogs are in place, in upper most position and retainer hex head screws are tightened securely
- Make up a landing joint to the top of the running tool and torque connection to thread manufacturer's maximum make up torque.
- Lay down the landing joint on the pipe rack.
- On the pipe rack, examine the **11" x 5-1/2" CW, MBU-3T-TP8 Mandrel Casing Hanger (Item B21)**. Verify the following:
 - internal bore and threads are clean and in good condition
 - neck seal area is clean and undamaged
 - torque slots are clean and in good condition
 - pin threads are clean and in good condition. **Install thread protector**
- Liberalily lubricate the mating threads, seal areas and o-ring of the hanger and running tool with a oil or light grease.
- Using chain tongs only**, thread the running tool into the hanger, with right hand rotation, until it shoulders out on the hanger body.

CAUTION: Do Not apply torque to the hanger/tool connection.

NOTE: If steps 1 through 6 were done prior to being shipped to location, the running tool should be backed off 1 turn and made back up to ensure it will back off freely.

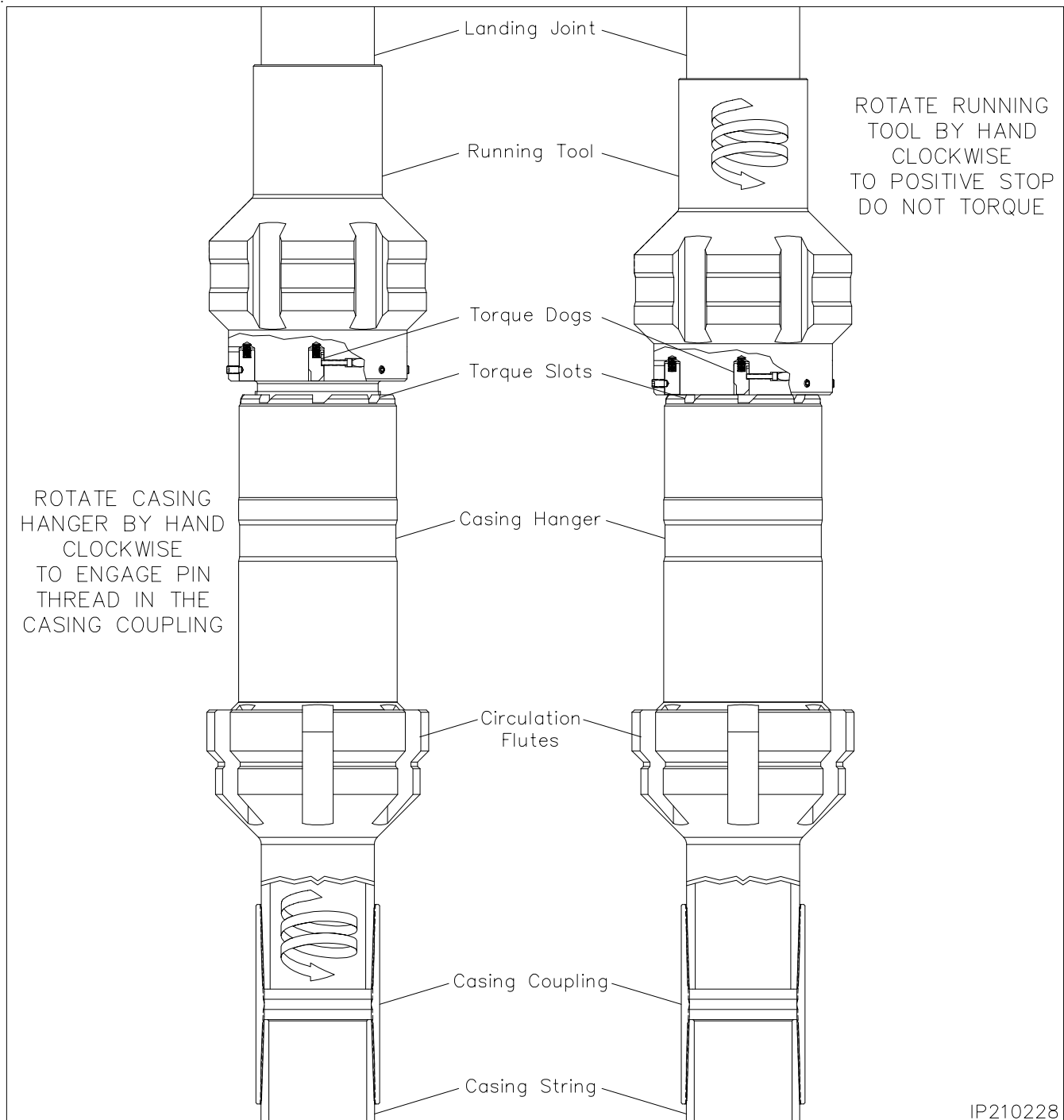


- Calculate the total landing dimension by adding the previously determined RKB dimension and 18.57", the depth of the wellhead.



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Stage 15 — Hang Off the 5-1/2" Casing



8. Starting at the top of the 45° angle load shoulder of the casing hanger measure up the landing joint and place a paint mark on the joint. Mark **HANGER LANDED**.
9. Place a second mark 20.00" below the first and mark **STOP ROTATING**.
10. Run the 5-1/2" casing as required and space out appropriately for the mandrel casing hanger.
11. Pick up the casing hanger/running tool joint assembly.
12. Remove the casing hanger thread protector and carefully thread the hanger into the last joint of casing ran. Rotate the hanger clockwise, by hand, to a positive stop.
13. Rotate the running tool clockwise by hand to a positive stop.



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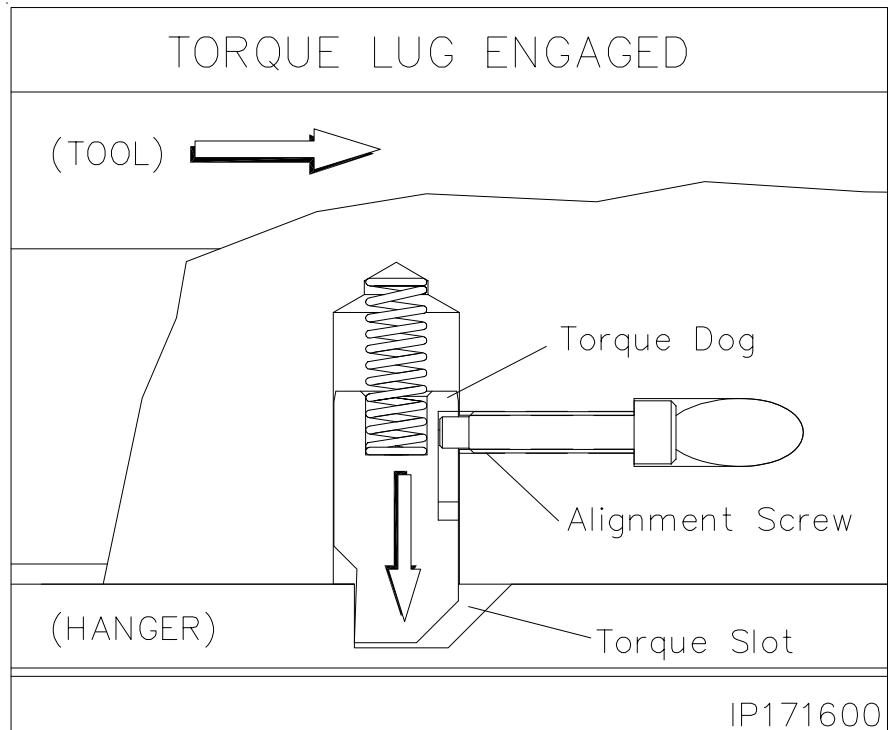
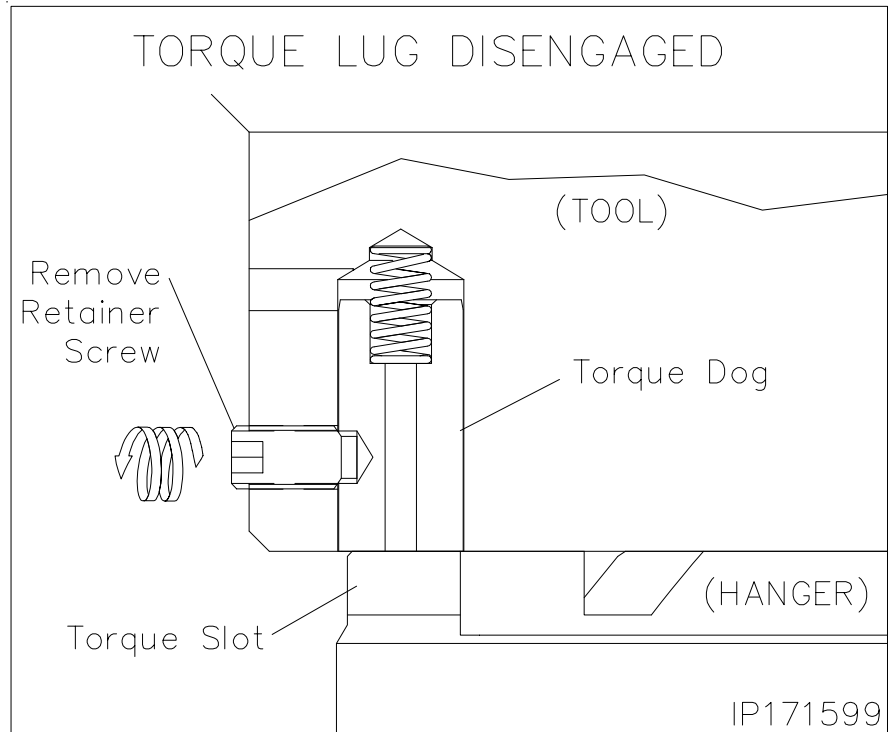
Stage 15 — Hang Off the 5-1/2” Casing

14. Locate the socket head set screws in the side of the hanger running tool and remove the screws. This will release the running tool torque dogs allowing them to move downward.

NOTE: Place the screws in a safe place to reinstall in the tool when the job is completed.

15. **Using chain tongs only**, rotate the running tool to the left to allow the torque dogs to engage the torque slots in the top of the hanger.

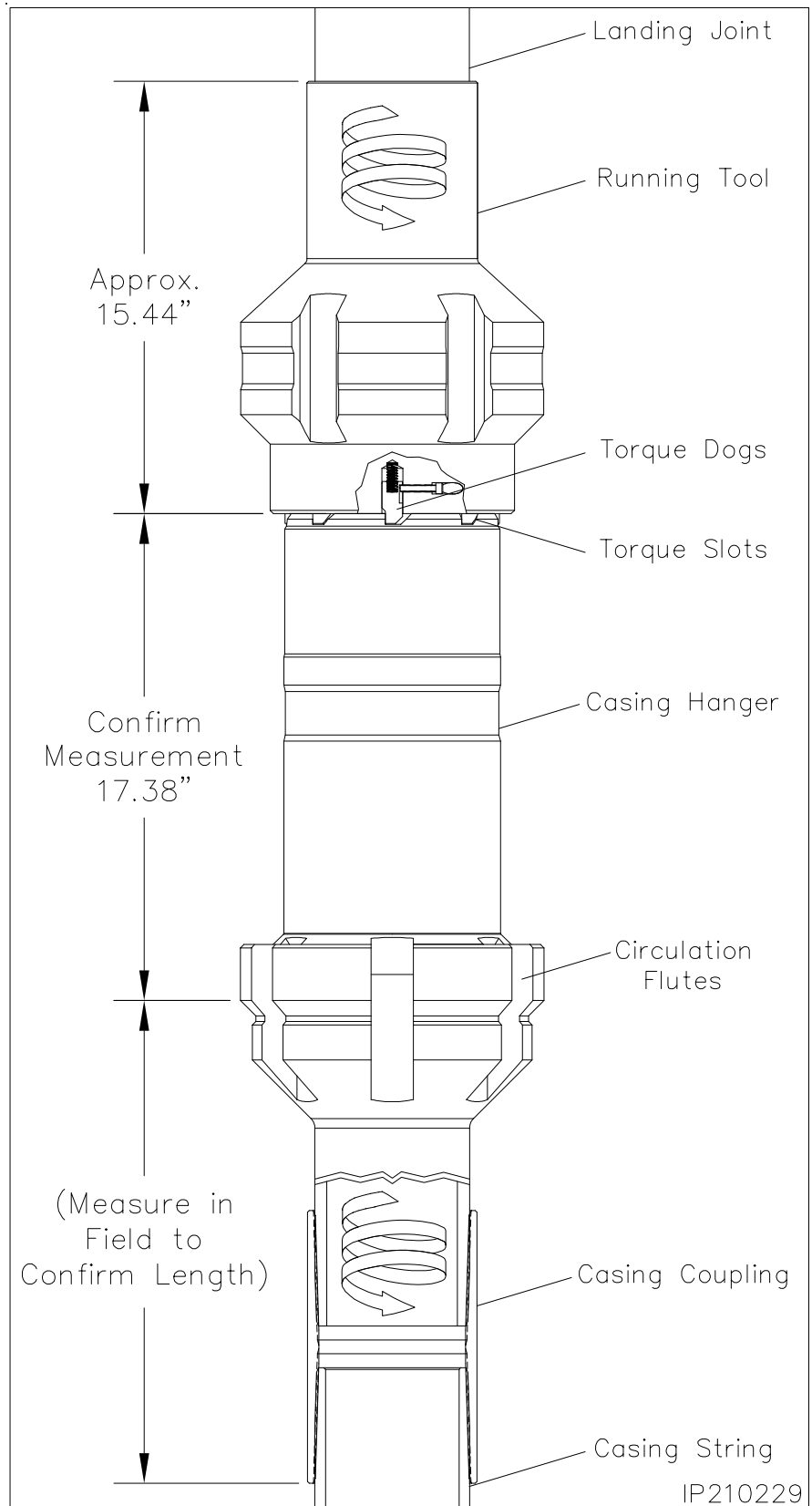
CAUTION: Do Not rotate the running tool more than 1/4 turn to the left. Doing so will decrease the torque dog engagement.



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Stage 15 — Hang Off the 5-1/2” Casing

- 16. Engage the CRT tool on the landing joint and torque the casing hanger in the casing string to thread manufacturer's maximum make up torque.

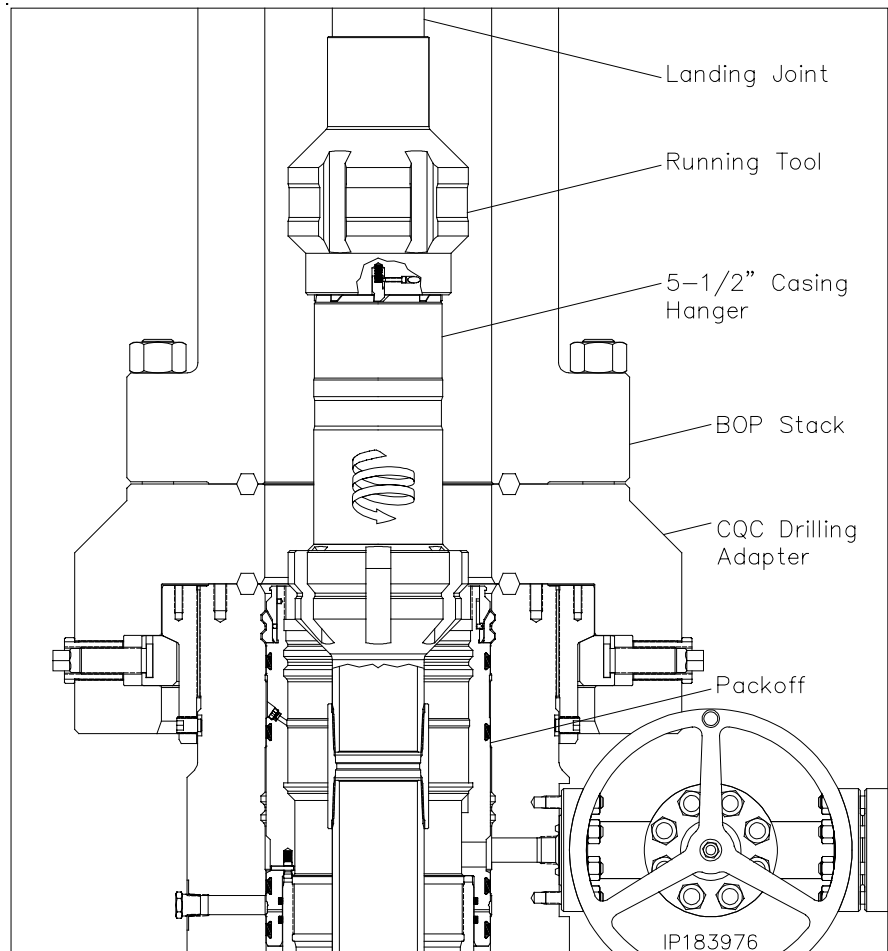


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Stage 15 — Hang Off the 5-1/2" Casing

17. Pick up the casing string and remove the floor slips and rotary bushings.
18. Carefully lower the hanger completely through the BOP annular and then engage the top drive to allow the casing to be rotated clockwise.
19. While rotating the casing clockwise, carefully lower the casing string until the **STOP ROTATING** mark on the landing joint is level with the rig floor.

i **NOTE:** The torque dogs have a maximum rated capacity. Please reference the **Recommended Service Tools** section in the BOM for maximum torque allowed.



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
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Stage 15 — Hang Off the 5-1/2" Casing

CAUTION: Torque wrap can build in the casing string as it is rotated. Ensure the string comes to a neutral position, by allowing it to back off slowly counter clockwise, before the casing hanger is fully landed.

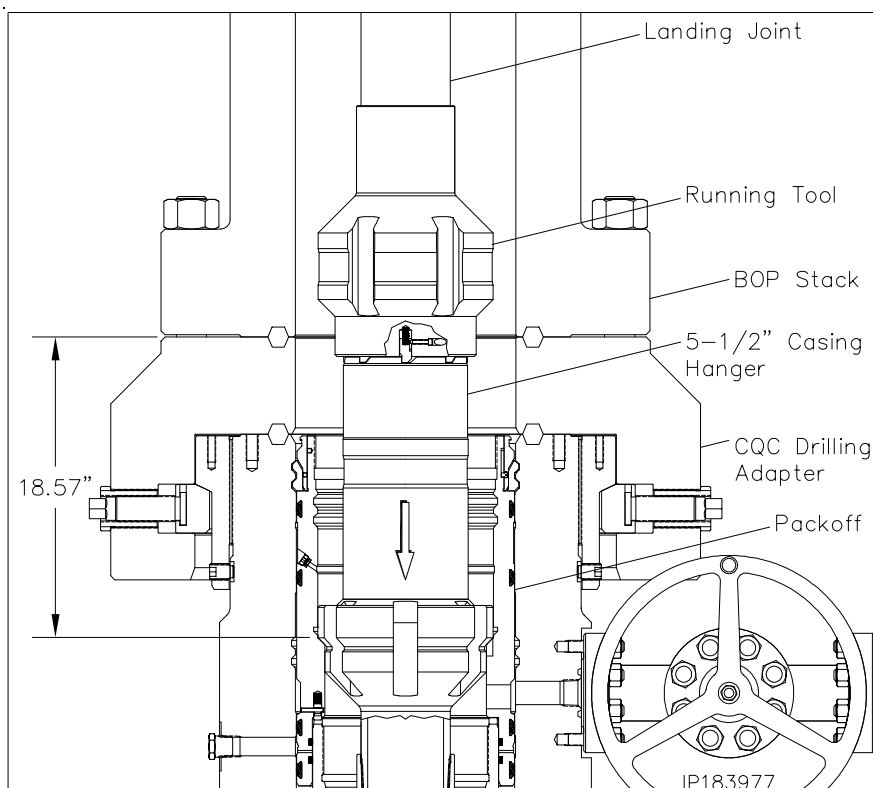
20. Cease rotation and continue carefully lowering the hanger through the wellhead and land it on the load shoulder in the MBU-3T nested packoff, 18.57" below the top of the drilling adapter.
21. Slack off all weight on the casing and verify that the **HANGER LANDED** paint mark has aligned with the rig floor.
22. Place a vertical paint mark on the landing joint to verify if the casing string rotates during the cementing process.
23. Cement the casing as required.

NOTE: Returns may be taken through the circulation slots and out the BOP or out the side outlets on the housing.

24. With cement in place, bleed off all pressure and remove the cementing head.

25. Using chain tongs only, located 180° apart, retrieve the running tool and landing joint by rotating the landing joint counter clockwise (left) approximately 11 turns or until the tool comes free of the hanger.

CAUTION: The rig floor tong may be used to break the connection but **under no circumstances is the top drive to be used to rotate or remove the casing hanger running tool.**

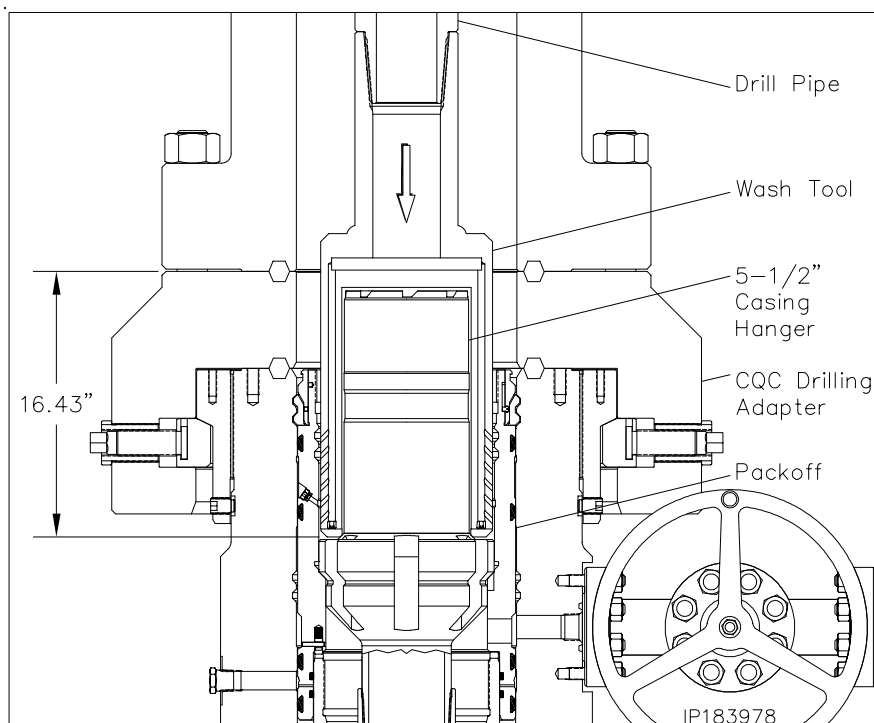


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Stage 15 — Hang Off the 5-1/2" Casing

Running the 11" Wash Tool

1. Examine the **11" x 4-1/2" IF (NC-50) Wash Tool (Item ST19)**. Verify the following:
 - drill pipe threads and bore are clean and in good condition
 - all ports are open and free of debris
2. Orient the wash tool with drill pipe box up. Make up a joint of drill pipe to the tool.
3. Carefully lower the wash tool through the BOP and land it on top of the 5-1/2" casing hanger, 16.43" below the top of the drilling adapter.
4. Place a paint mark on the drill pipe level with the rig floor.
5. Using chain tongs, rotate the tool clockwise (right) approximately 6 turns to loosen any debris that may be on top of the hanger flutes.



WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

6. Open the upper side outlet valve and drain the BOP stack.
7. Attach a high pressure water line or the top drive to the end of the drill pipe. Pump water (up to a max of 200 psi) through the tool and up the BOP stack.
8. Pick up on the tool approximately 1" and slowly rotate the drill pipe approximately 20 RPM.
9. While flushing, raise and lower the tool the full length of the wellhead and BOP stack. Thoroughly wash the inside of the housing and BOP stack to remove all caked on debris.
10. Once washing is complete, land the wash tool on the hanger flutes.

11. Shut down pumps and observe the returns at the open lower outlet for debris.
12. Reengage the pump and fully wash the inside of the wellhead and the entire BOP one additional cycle, ensuring the stopping point is with the wash tool resting on top of the hanger flutes.
13. Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.
14. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
15. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure there are no dark areas on top of the painted flutes of the hanger.



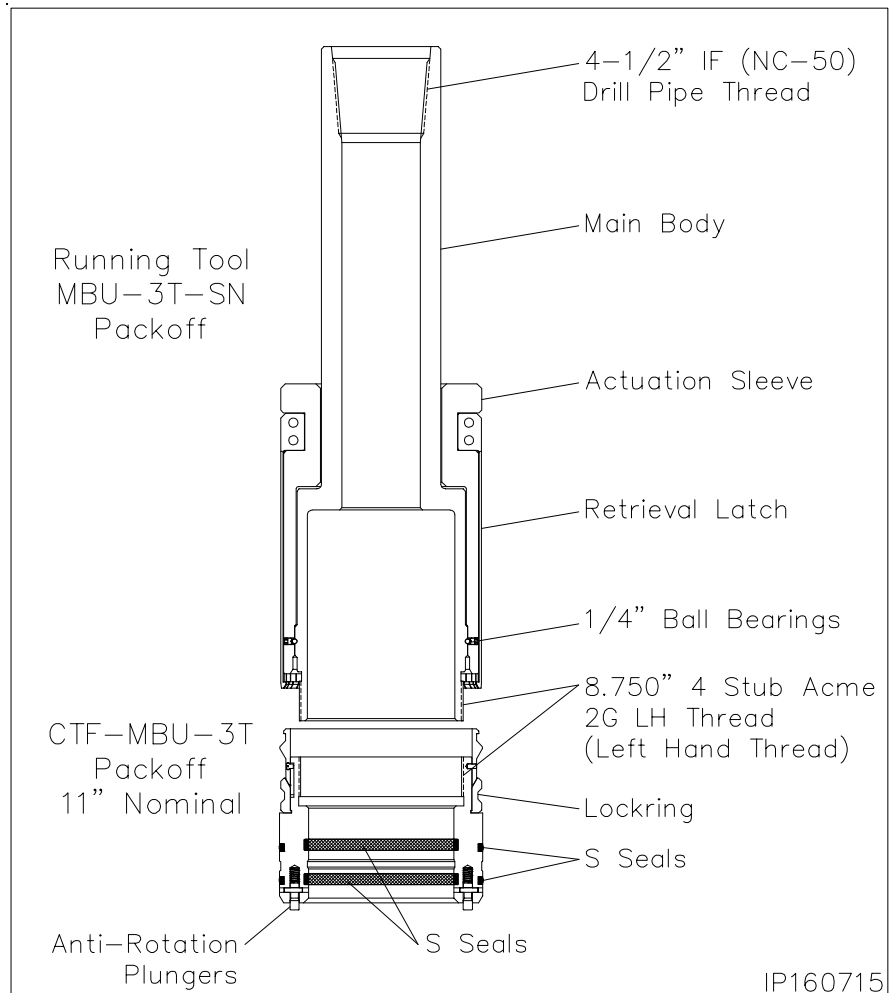
CAUTION: Continue washing until all debris is removed.



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Stage 16 — Install the CTF-MBU-3T Packoff

- Examine the **11" Nominal x 4-1/2" IF (NC-50) x 8.750" 4 Stub Acme 2G LH Pin Bottom MBU-3T-SN Mandrel Packoff Running Tool (Item ST20)**. Verify the following:
 - Acme threads are clean and in good condition
 - actuation sleeve is in place and rotates freely
 - retrieval latch is removed and stored in a safe place
- Make up the running tool to 4-1/2" (NC50) drill pipe and torque the connection to optimum make up torque.
- Examine the **11" Nominal x 7-5/8" x 8.750" 4 Stub Acme 2G LH Box Top MBU-3T Packoff Assembly (Item B22)**. Verify the following:
 - all elastomer seals are in place and undamaged
 - internal bore, and ports, are clean and in good condition
 - locking is fully retracted
 - energizing ring is in its upper most position and retained with shear pins
 - guide screws are in place and back off 1/4 turn. Ensure they do not protrude beyond the O.D. of the energizing ring
 - anti-rotation plungers are in place, free to move



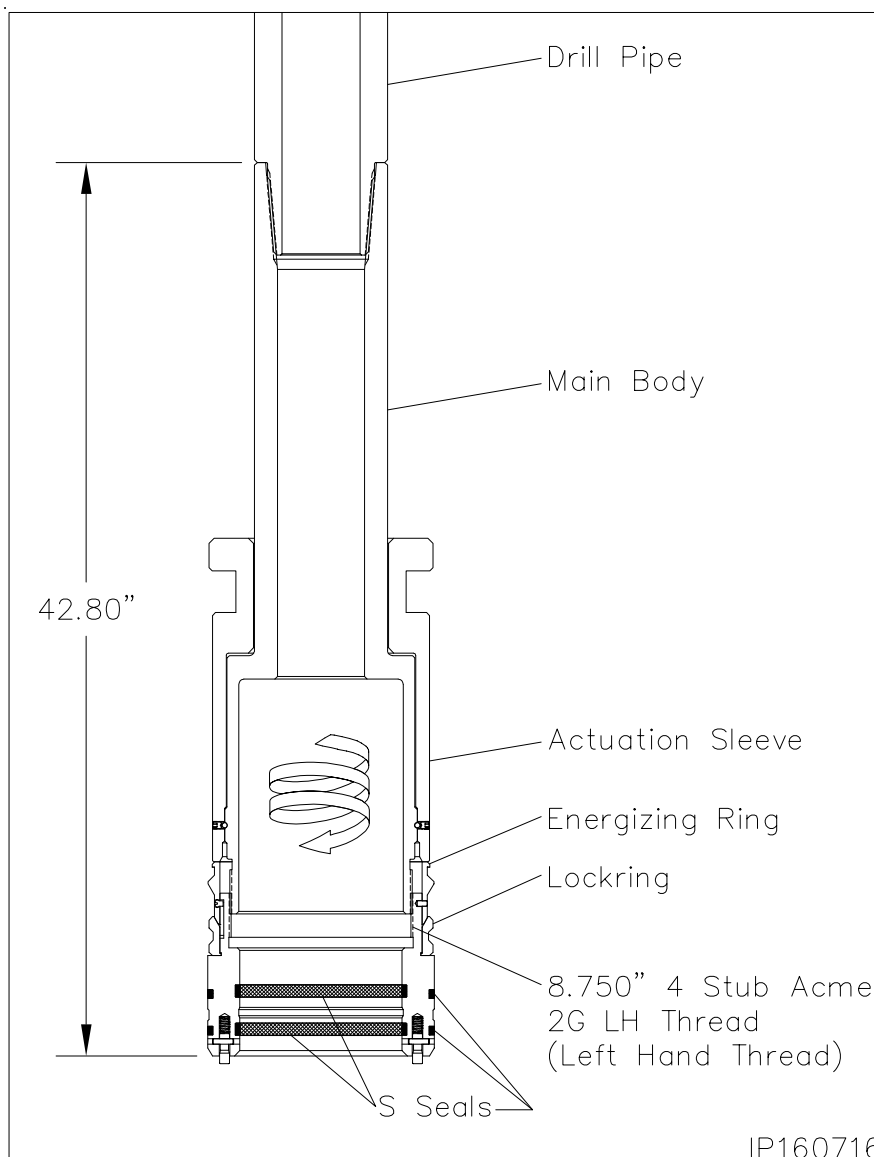
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Stage 16 — Install the CTF-MBU-3T Packoff

4. Thoroughly clean and lightly lubricate the mating Acme threads of the running tool and packoff with oil or light grease.
5. Pick up the running tool assembly with landing joint and suspend it above the packoff.
6. Carefully lower the tool into the packoff and thread them together by first rotating the tool clockwise (RIGHT) to locate the thread start and then counter clockwise (LEFT) approximately 4 turns until the tool actuation sleeve makes contact with the packoff energizing ring.

CAUTION: Do Not back off the running tool.

7. Pick up the assembly and thoroughly clean and lightly lubricate the packoff I.D. and O.D. 'S' seals with oil or light grease.
8. Locate the upper "SEAL TEST" fitting on the O.D. of the housing and remove the dust cap from the fitting.
9. Attach a test pump with test manifold to the open fitting and pump clean test fluid through the fitting and port to dislodge any old grease and trapped debris.
10. Remove the test pump with test manifold and reinstall the fitting dust caps.



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Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

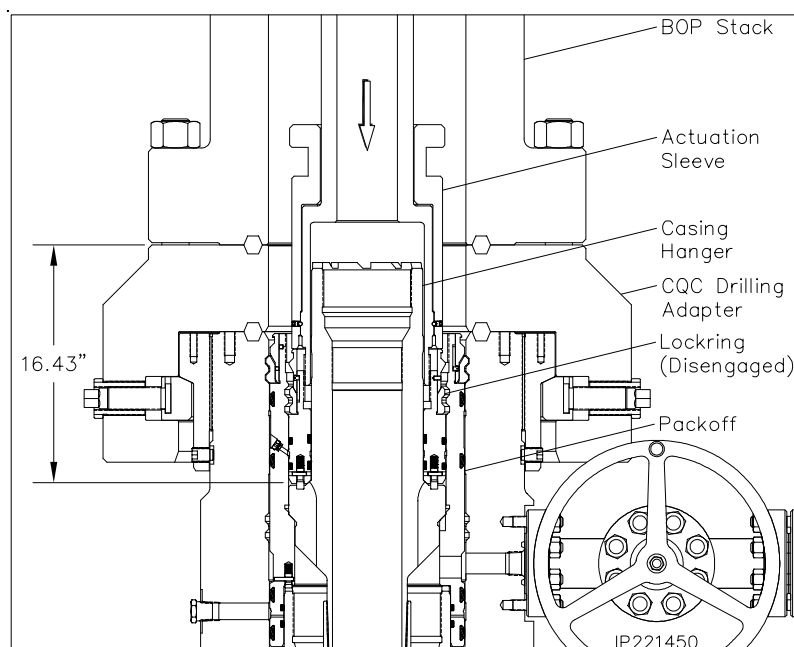
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Stage 16 — Install the CTF-MBU-3T Packoff

Landing the Packoff

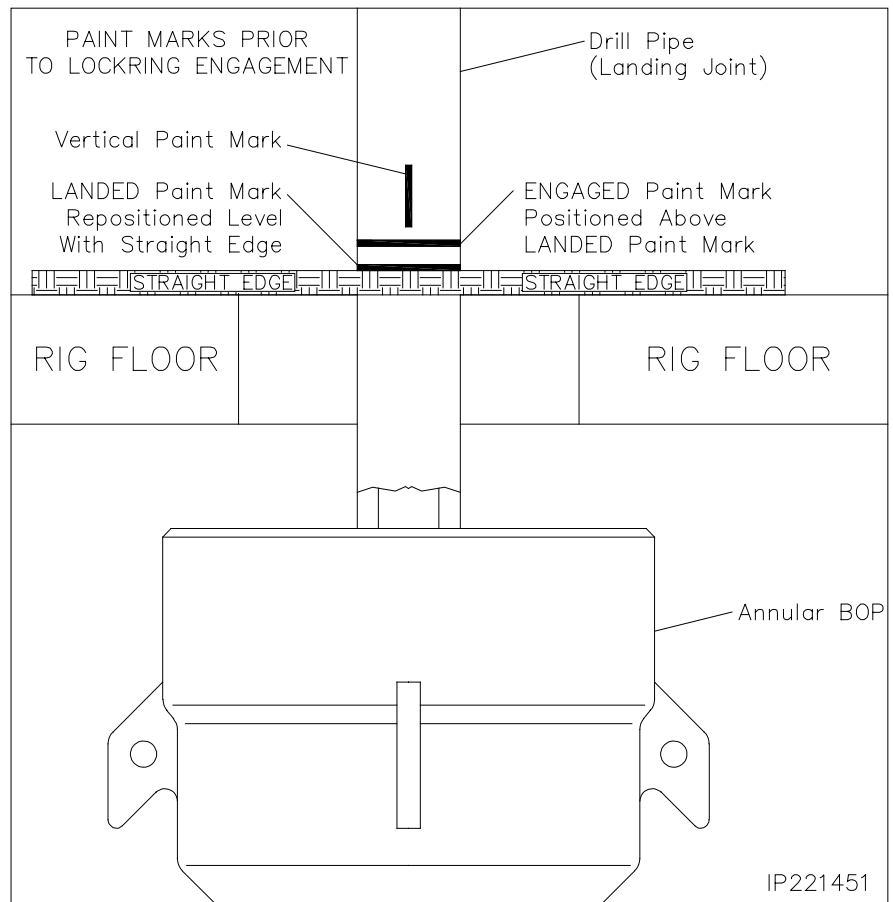
11. Calculate the total landing dimension by adding the previously attained RKB dimension and 16.43", the depth of the wellhead.
12. Remove the hole cover.
13. Measure up 5 feet from the bottom of the packoff and place a paint mark on the drill pipe landing joint.
14. Pick up the packoff/running tool assembly and carefully lower the assembly through the BOP marking the landing joint every five feet until you reach the calculated dimension.
15. Place a paint mark on the drill pipe at that dimension and mark **LANDED**.
16. Continue lowering the packoff until it passes over the neck of the hanger and lands on top of the casing hanger load shoulder, 16.43" below the top of the drilling adapter.
17. Confirm that the **LANDED** paint mark is level with the rig floor.
18. If not it is likely that there is debris on top of the casing hanger.
19. Remove the packoff and further wash the casing hanger and housing I.D. Also reverify the landing dimension.
20. Re land the packoff and verify the **LANDED** paint mark is level with the rig floor.



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Stage 16 — Install the CTF-MBU-3T Packoff

- 21. With the packoff properly landed the **LANDED** paint mark is removed from the landing joint.
- 22. Place a straight edge across the rotary table as indicated.
- 23. Place a paint mark on the landing joint level with the top of the straight edge and label it **LANDED**.
- 24. Measure up 1-1/2" above the landed mark and place another paint mark on the landing joint. Label this mark **ENGAGED**.
- 25. Place a **Vertical** paint mark on the landing joint and a corresponding paint mark on the rig floor to visually count the turns of the landing joint.



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
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Stage 16 — Install the CTF-MBU-3T Packoff

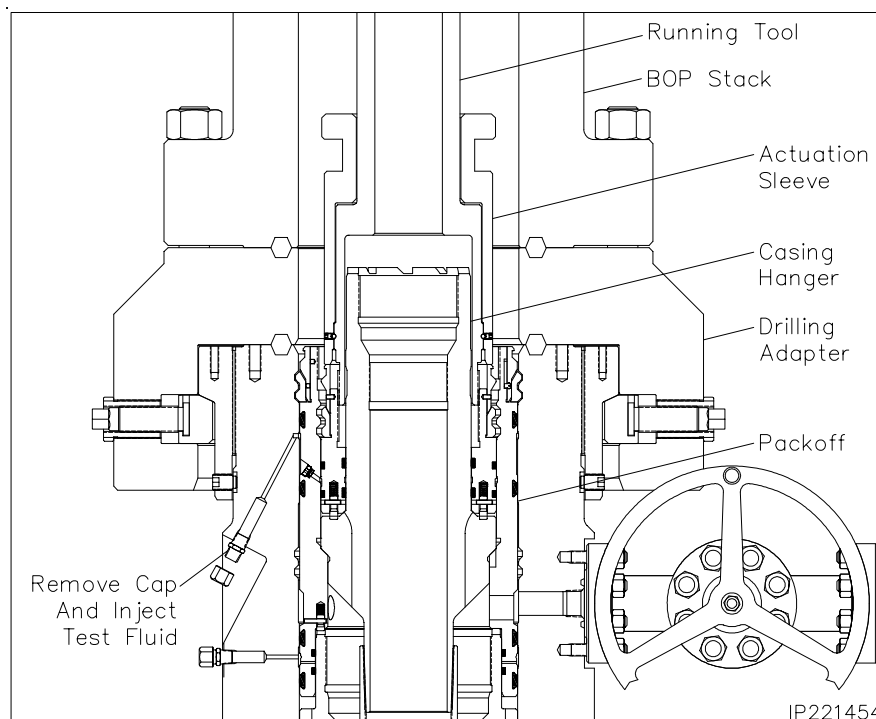
Seal Test

26. Locate the upper "SEAL TEST" fitting on the upper O.D. of the housing and remove the dust cap from the fitting.
27. Attach a test pump with test manifold to the open fitting and pump clean test fluid between the packoff seals until a stable test pressure of **10,000 psi** is achieved.

NOTE: It may be required to pressure up and bleed off test pressure several times to evacuate all air from the test area in order to attain a stable test pressure.

28. Hold test pressure for 15 minutes or as required by drilling supervisor.
29. If pressure drops a leak has developed, remove the packoff and replace leaking seals.
30. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold.
31. Attach a bleeder tool to the open fitting and open the tool to bleed off any trapped pressure between the packoff seals.

NOTE: The bleeder tool will remain in place and in the open position during the over pull.



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Stage 16 — Install the CTF-MBU-3T Packoff

Engaging the Lockring

32. **Using chain tongs only, located 180° apart**, slowly rotate the packoff assembly counter clockwise (left) until the anti-rotation plunger aligns with one of the circulation flutes of the hanger. Expect torque of approximately 400 ft-lbs to rotate the packoff.

33. **Using chain tongs only**, rotate the landing joint approximately **6 turns counterclockwise (1-1/2" of downward travel)** to engage the packoff locking in its mating groove in the bore of the MBU-3T nested packoff.

NOTE: Use the **Vertical** paint mark to count the turns of the landing joint.

NOTE: Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the locking out. A positive stop will be encountered when the locking is fully engaged.

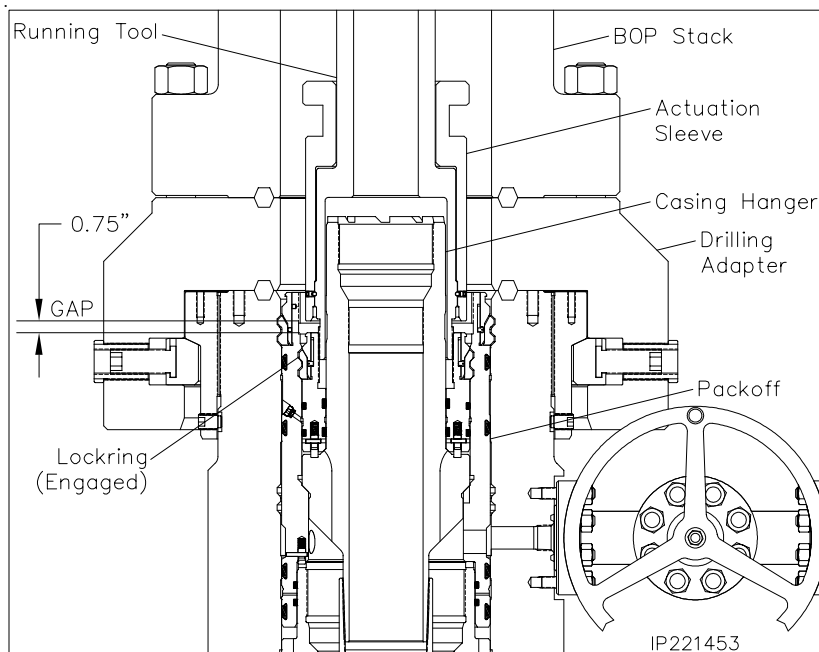
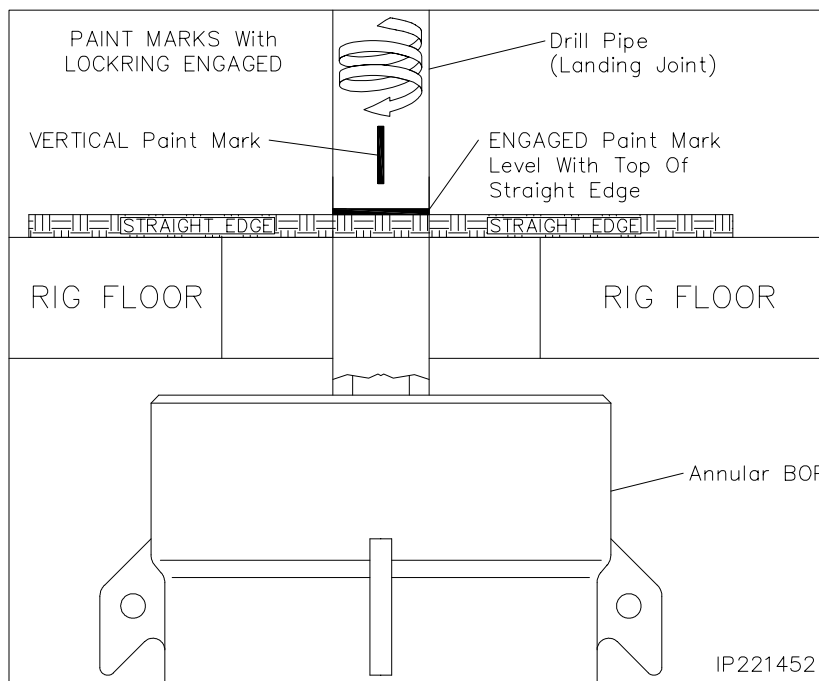
CAUTION: It is imperative that the drill pipe landing joint remain concentric with the well bore when rotating to engage the locking. This can be accomplished with the use of the air hoist.

34. To confirm all 6 turns of the landing joint are achieved, place the straight edge back across the rotary table adjacent the landing joint.

CAUTION: When the locking is properly engaged the **ENGAGED** paint mark on the landing joint will be level with the top of the straight edge. **VERIFY PAINT MARKS.**

CAUTION: If the required turns to engage the locking are not met or the paint marks do not align properly or excessive torque is encountered, remove the packoff. First call local branch. If further assistance is required then call Houston Engineering.

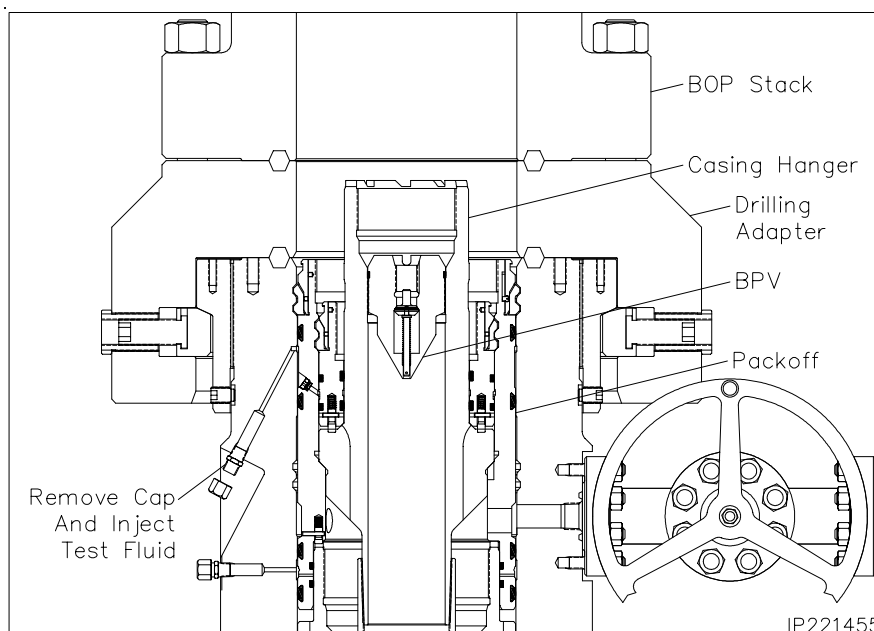
35. Back off the landing joint/running tool approximately 3 turns. Using the drill pipe elevators, exert a 40,000 lbs pull on the landing joint. Hold pull for 15 minutes minimum. After satisfactory test, slack off weight.



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Stage 16 — Install the CTF-MBU-3T Packoff

36. Remove the bleeder tool.
37. Reattach the test pump to the open test manifold and retest the packoff seals to **10,000 psi** for 15 minutes. This will also verify that the packoff is in place.
38. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold. Reinstall the dust cap on the open fitting.
39. **Using chain tongs only**, rotate the landing joint clockwise (right) until the tool comes free of the packoff (approximately 7 turns) and then retrieve the tool with a straight vertical lift.
40. Using a dry rod, set the **5" Type H One-Way BPV (Item ST22)** in the bore of the hanger. Ensure that the BPV makes a minimum of 6 turns before final make up and break out. Nipple down and remove the BOP stack.



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Stage 16 — Install the CTF-MBU-3T Packoff

NOTE: In the event the packoff is required to be removed after the locking is engaged the following stage is to be followed.

Retrieving the Packoff

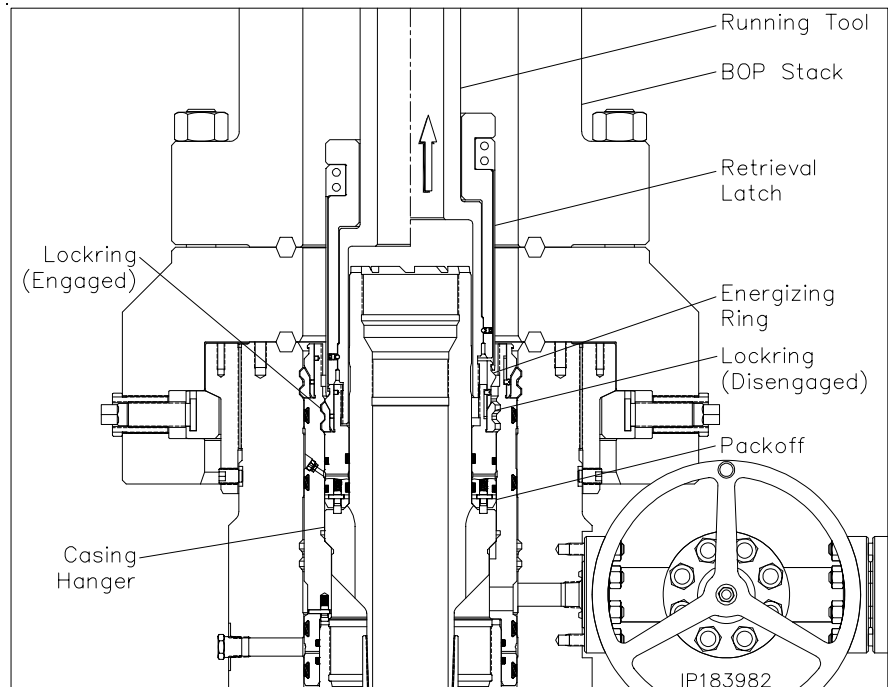
1. Locate the retrieval latch assembly with (4) 3/8" cap screws.
2. Install the retrieval latch onto the running tool with the latch fingers facing down. Install the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool actuation sleeve.
4. Carefully lower the running tool through the BOP stack and tag the top of the packoff assembly.
5. Carefully rotate the drill pipe clockwise to locate the thread start and then counter clockwise (left) approximately 10 turns to a positive stop.

NOTE: At this point the retrieval latches will have passed over the energizing ring and snapped into place.

6. Rotate the drill pipe clockwise (right) approximately 6 turns to a positive stop. The drill pipe should rise approximately 1-1/2".

CAUTION: Do Not exceed the 6 turns or the packoff may be seriously damaged.

7. Carefully pick up on the drill pipe and remove the packoff from the wellhead with a straight vertical lift.
8. Redress the packoff and reset as previously outlined.



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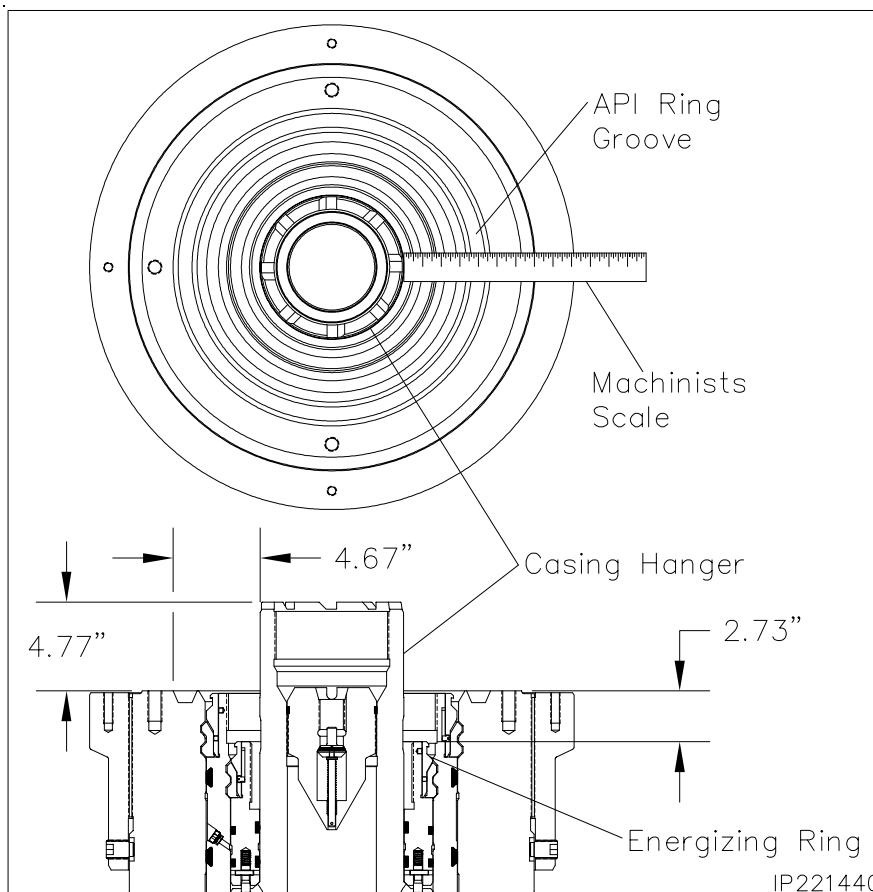
Stage 16 — Install the CTF-MBU-3T Packoff

CAUTION: Prior to installing the TA Cap the following dimensions are to be obtained to determine whether the hanger is fully landed and concentric with the wellbore.

1. Using a high pressure water hose, thoroughly clean the top of the housing, hanger and both internal packoffs and blow dry with compressed air.
2. Take several pictures of the 11" packoff installed and the location of the top of the packoff energizing ring.
3. Using a machinists scale measure the distance from the O.D. of the casing hanger neck to the O.D. of the API Ring Groove in 4 places 90° apart. This dimension should be 4.67" This will determine if the hanger is concentric with the well bore. Record all 4 dimension on the service ticket.
4. Measure the stick up of the casing hanger above the top of the housing. This dimension should be 4.77" If taller the hanger is not fully landed.
5. Measure the distance from the top of the 11" Packoff Energizing Ring to the top of the housing. This dimension should be 2.73". If less the packoff lockring may not be fully engaged.

NOTE: ALL DIMENSIONS are to be recorded on the service ticket.

CAUTION: If any of the dimensions taken are not as indicated contact **Service Manager and Cactus Houston Engineering** to determine action to be taken before proceeding to install the TA Cap.



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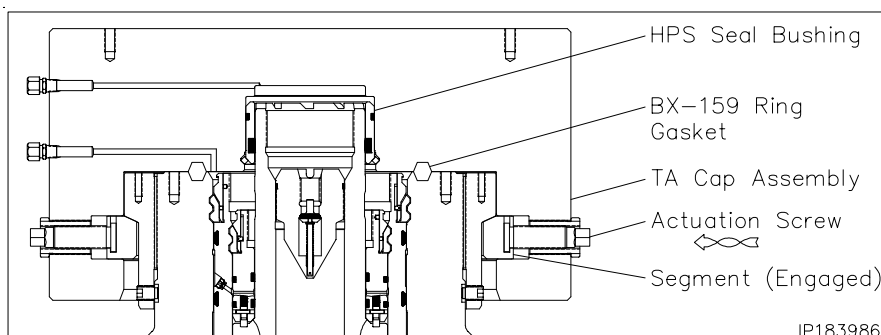
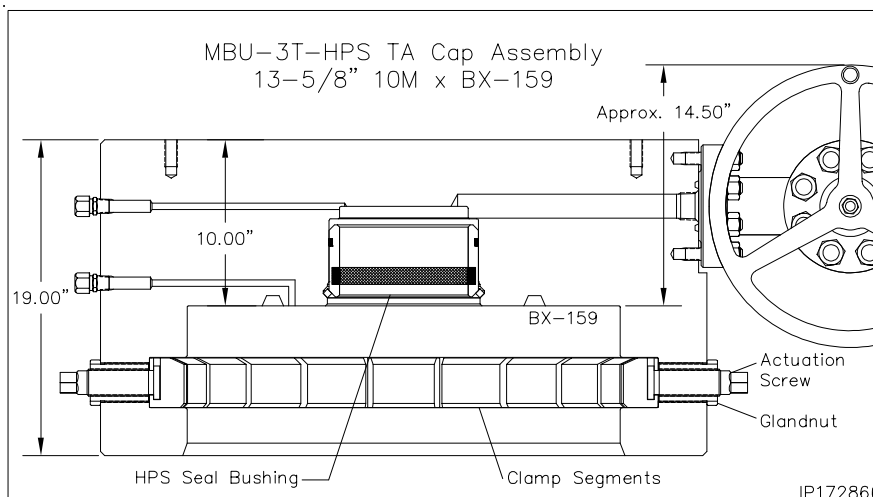
Stage 17 — Install the Quick Connect TA Cap

- Examine the **13-5/8" 10M Quick Connect TA Cap Assembly (Item R6)**. Verify the following:
 - bore is clean and free of debris
 - ring groove is clean and undamaged
 - (16) drive screws and clamp segments are properly installed and fully retracted
 - 7-5/8" HPS Seal Bushing (Item R7)** is in place and properly retained with the square snap wire
- Thoroughly clean the top of the housing, threaded hub, and the mating seal surfaces of the TA cap.
- Apply a light coat of grease to the contact ramp of the threaded hub.
- Install a new BX-159 ring gasket into the ring groove of the housing.
- Install the lift eyes in the top of the TA cap.



WARNING: Keep body clear of all pinch points and suspended loads.

- Using a suitable 4 point lifting device with weight rated slings, pick up the TA cap assembly. Carefully lower it over the hanger or packoff neck and land it on the ring gasket.
- Carefully run in all of the drive screws of the TA cap to contact point.
- Ensuring the assembly remains level, using the hand torque wrench, run in one actuation screw and torque to 100 ft-lbs.
- Locate the screw 180° from the first and torque it to 100 ft-lbs.
- Locate the screws 90° to the right and left and torque them to 100 ft-lbs.
- Position the second 4 point sequence 45° from the first and torque each screw to 200 ft-lbs with the hand torque wrench.
- Run in all remaining screws to contact, then torque each screw in the same sequence to 400 ft-lbs with the Rad Gun.
- Using the Rad Gun, make one additional round until a stable torque of 700 ft-lbs on all screws is achieved.

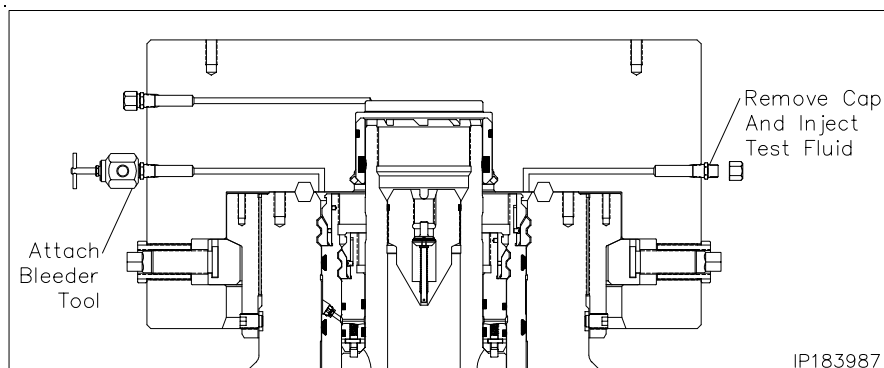


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Stage 17 — Install the Quick Connect TA Cap


Connection Test

1. Open the TA cap gate valve and the housing upper side outlet valve to monitor leakage.
2. Locate the two test fittings marked "FLG TEST" and remove the dust caps from the fittings.
3. Attach a bleeder tool to one of the open fittings and open the tool.
4. Attach a test pump with test manifold to the remaining open fitting and pump clean test fluid into the void area until a continuous stream flows from the open bleeder tool.
5. Close the tool and continue pumping fluid until a stable test pressure of **10,000 psi**.
6. Hold test pressure for 15 minutes or as required by drilling supervisor.
7. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold and bleeder tool.
8. Reinstall the dust caps on the open fittings.
9. Close all open valves.

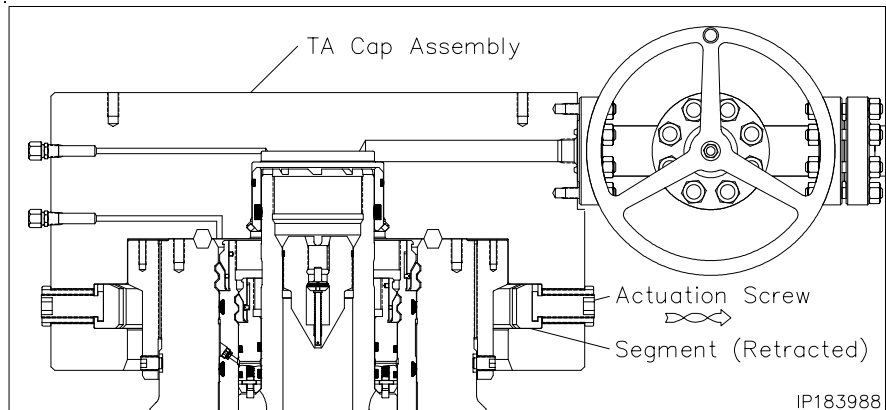



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Stage 18 — Remove the Quick Connect TA Cap

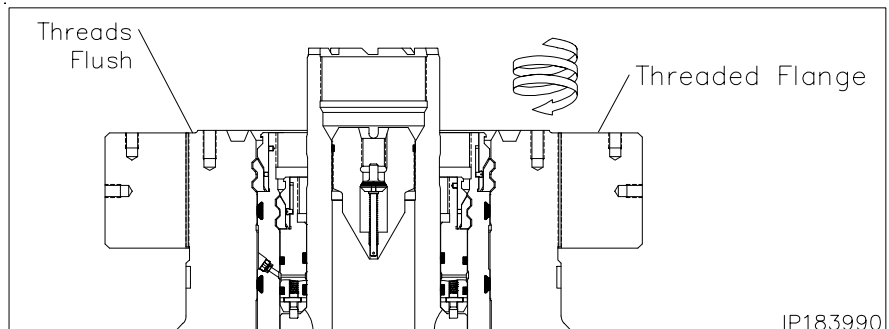
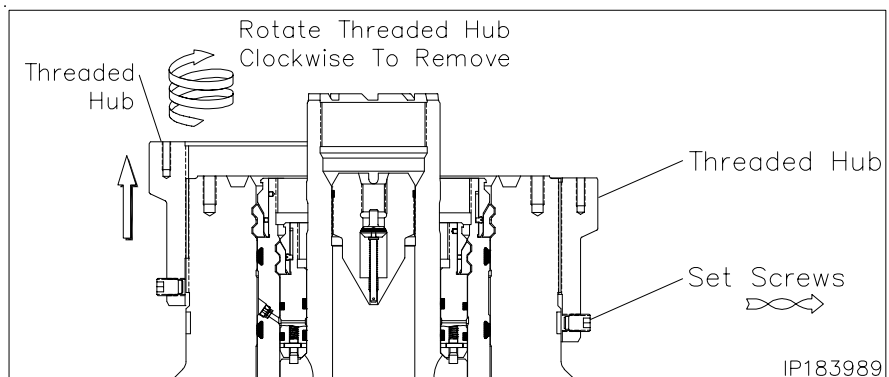
 **WARNING:** Confirm with Drilling Supervisor that well bore conditions are safe.

1. Open the outlet valve on the TA cap to check for trapped pressure above the BPV.
2. Locate the actuation screws on the O.D. of the TA cap assembly.
3. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the gland nuts.



 **WARNING:** Keep body clear of all pinch points and suspended loads.

4. Using a suitable 4 point lifting device with weight rated slings, pick up the TA cap assembly.
5. Remove the threaded hub set screws.
6. Remove the threaded hub from the top of the housing with clockwise rotation.
7. Examine the **13-5/8" 10M Threaded Flange (Item B2)**. Verify the following:
 - Acme thread are clean and in good condition
8. Thoroughly clean and lightly lubricate the mating threads of the housing and the threaded flange with copper coat or never seize.
9. Pick up the flange and carefully thread it onto the top of the housing with counter clockwise rotation until the top of the flange is level with the top of the Acme thread of the housing.
10. Rotate the flange in either direction to two hole.
11. Prepare to install the tubing head.



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Stage 19 — Install the Tubing Head

- Examine the **13-5/8" 10M x 7-1/16" 15M CTH-DBLHPS-SB Tubing Head (Item C1)**. Verify the following:
 - seal area and bore are clean and in good condition
 - 'HPS' seals are in place and in good condition
 - all peripheral equipment is intact and undamaged
 - all lockscrews are in place and fully retracted
- Clean the mating ring grooves of the housing and tubing head assembly.
- Lightly lubricate the I.D. 'HPS' seals and the casing hanger or packoff neck with a light grease.

CAUTION: Excessive grease may prevent a good seal from forming!

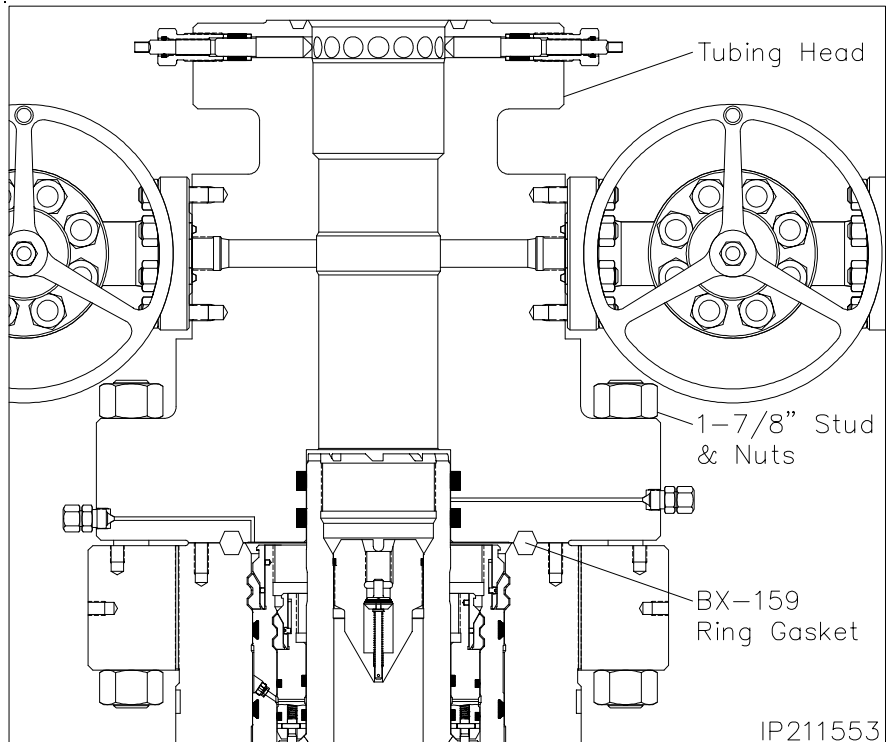
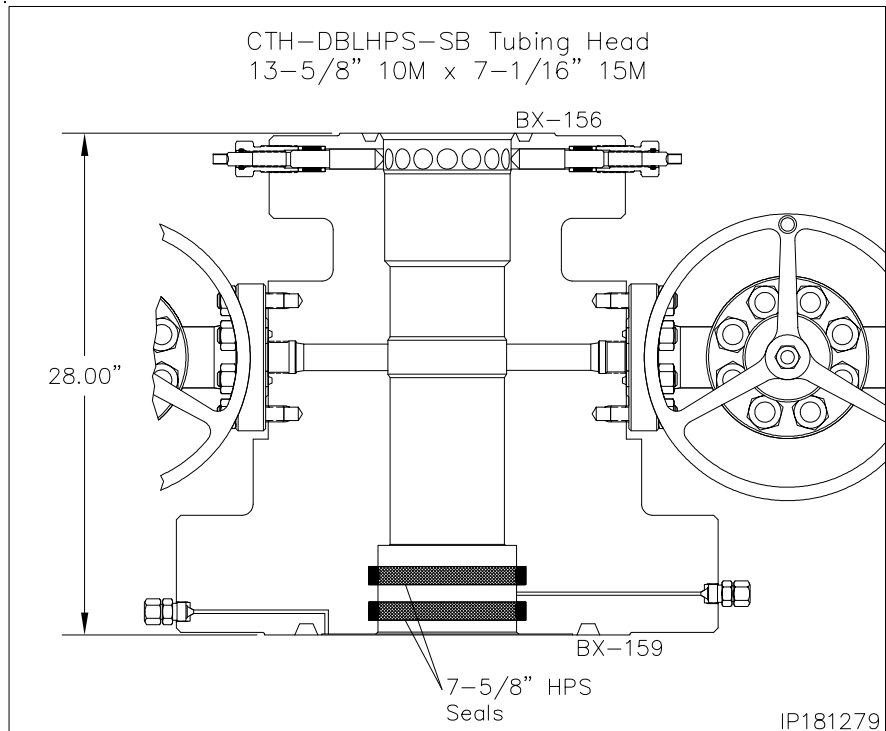
- Install a new **BX-159 Ring Gasket (Item C7)** in the ring groove of the housing.

WARNING: Keep body clear of all pinch points and suspended loads.

- Orient the tubing head so the outlets are in the proper position and then carefully lower the tubing head over the casing hanger or packoff neck and land it on the ring gasket.

CAUTION: Do Not damage the 'HPS' seal elements or their sealing ability will be impaired!

- Make up the flange connection using the appropriate size **Studs and Nuts (Item C8)**, tightening them in an alternating cross pattern.

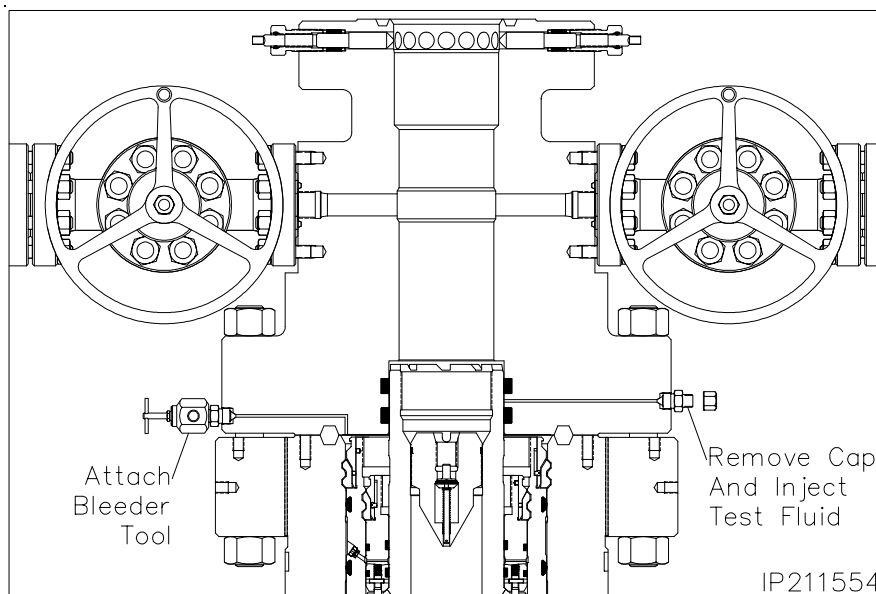


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Stage 19 — Install the Tubing Head

Seal Test

1. Locate the "SEAL TEST" fitting and one "FLG TEST" fitting on the tubing head lower flange and remove the dust cap from both fittings.
2. Attach a bleeder tool to one of the open "FLG TEST" fittings and open the tool.
3. Attach a test pump with test manifold to the "SEAL TEST" fitting and pump clean test fluid between the 'HPS' seals until a test pressure of **15,000 psi**.
4. Hold test pressure for 15 minutes or as required by drilling supervisor.
5. If pressure drops, a leak has developed. Bleed off test pressure and take the appropriate action in the adjacent table.
6. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold.
7. Reinstall the dust cap on the open fitting.



Seal Test	
Leak Location	Appropriate Action
Open bleeder tool - Lower 'HPS' seal is leaking	Remove tubing head and replace leaking seals.
From open tubing head outlet valve - Upper 'HPS' seal is leaking	Re-land and retest seals

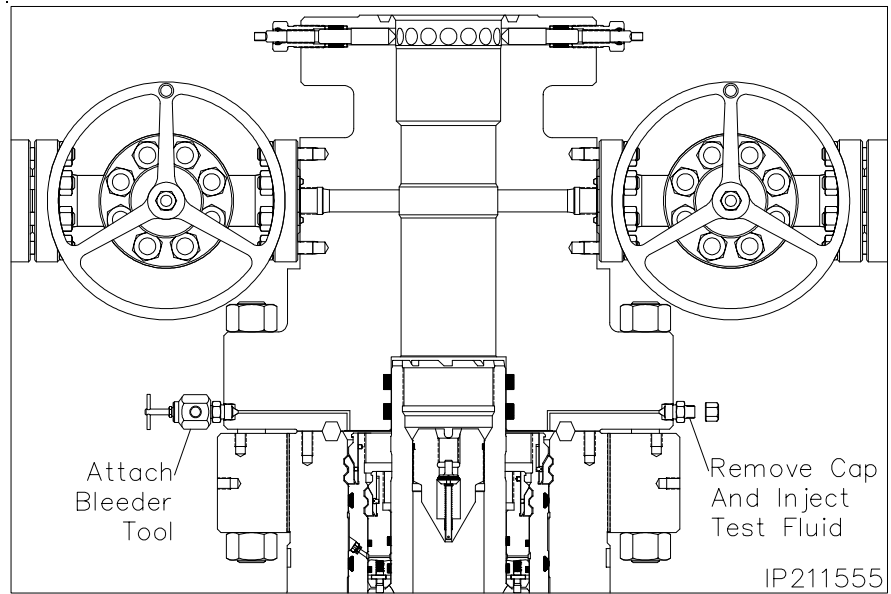


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Stage 19 — Install the Tubing Head

Flange Test

1. Locate the remaining "FLG TEST" fitting on the tubing head lower flange and remove the dust cap from the fitting.
2. Attach a test pump with test manifold to the open "FLG TEST" fitting and inject test fluid into the flange connection until a continuous stream flows from the opposite "FLG TEST" bleeder tool.
3. Close the bleeder tool and continue to pumping test fluid to **10,000 psi**.
4. Hold test pressure for 15 minutes or as required by drilling supervisor.
5. If pressure drops a leak has developed. Take the appropriate action from the adjacent chart.
6. Repeat steps 2 - 5 until a satisfactory test is achieved.
7. Once a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold and bleeder tool.
8. Reinstall the dust caps on the open fittings.
9. Remove the dust cap from the blind flange bleeder fitting. Attach a bleeder tool to the open fitting and open the tool.



Flange Test	
Leak Location	Appropriate Action
Between flanges - Ring gasket is leaking	Further tighten the flange connection



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SECTION 2: EMERGENCY EQUIPMENT



Generic
(24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
MBU-3T-CRC-DBLHPS Wellhead System

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Stage 5A — Hang Off the 10-3/4" Casing (Emergency)

NOTE: If the 10-3/4" casing was hung off using the fluted mandrel hanger, skip this stage.

1. Run the 10-3/4" casing to the required depth and cement casing as required.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

2. Drain the diverter through the casing head side outlet valve.
3. Fully retract all (8) anti-rotation screws.

CAUTION: There are (10) drive screws that are used to compress and release the 24" CRC locking. They must be engaged in a specific pattern to properly release the locking.

4. Locate the alignment notches on the **FRONT** of the casing head and BOP adapter.

5. Locate **#1 Drive Screw** to the right of the adapter alignment notch. Run the drive screw in to a positive stop.

6. Locate **#2 Drive Screw** to the left of the adapter alignment notch. Run the drive screw in to a positive stop.

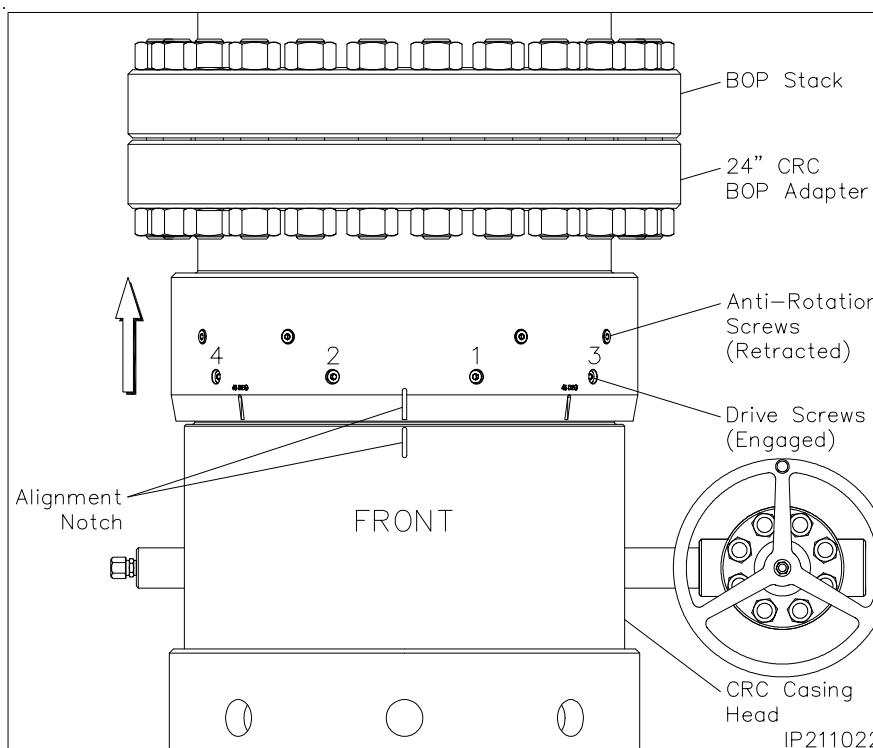
7. Continue around the adapter in an alternating **right to left pattern** until all (10) Drive Screws are **FULLY ENGAGED**.

WARNING: Keep body clear of all pinch points and suspended loads.

8. Separate the lower drilling adapter from the casing head and lift the diverter approximately 19.50" above the casing head. Secure diverter with safety slings.

9. Using a fresh water hose, thoroughly wash out the casing head.

NOTE: Side outlet valve to remain open while setting the casing hanger.



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Stage 5A — Hang Off the 10-3/4" Casing (Emergency)

10. Examine the **20" x 10-3/4" CRC-C1 Slip Casing Hanger (Item A9a)**.

Verify the following:

- slips and internal bore are clean and in good condition
- all screws are in place
- packoff rubber is in good condition

11. Remove the latch cap screws and open the hanger.

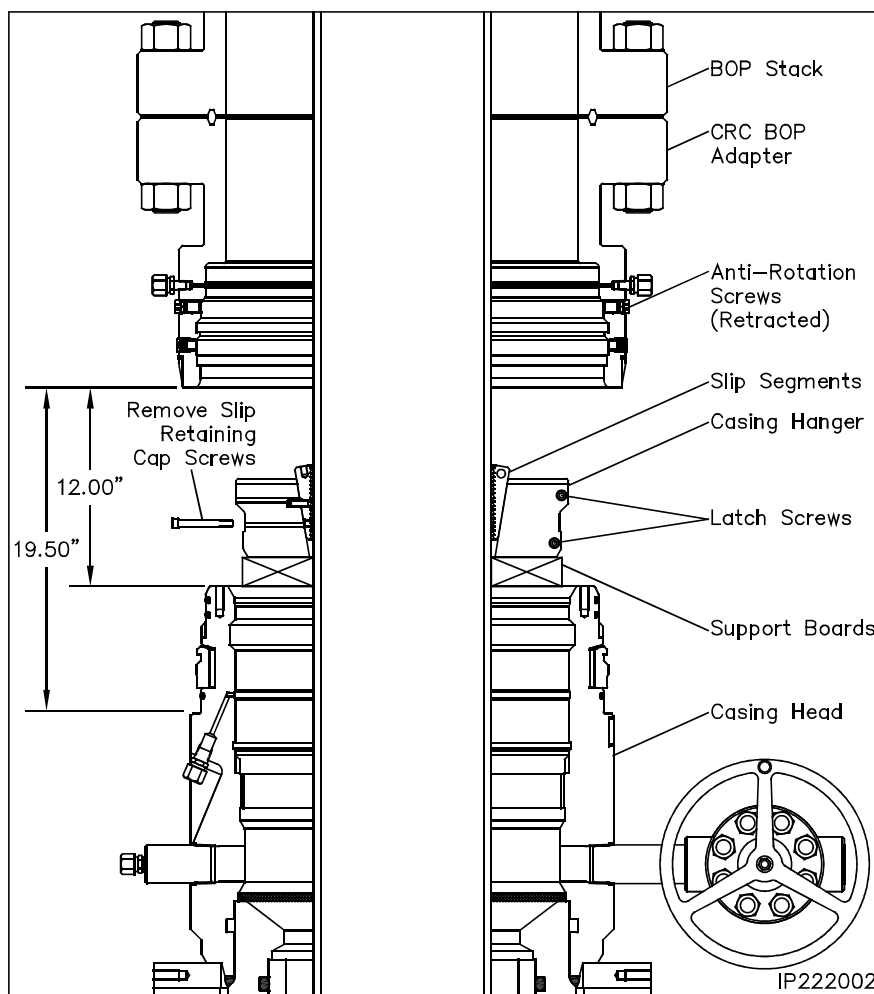
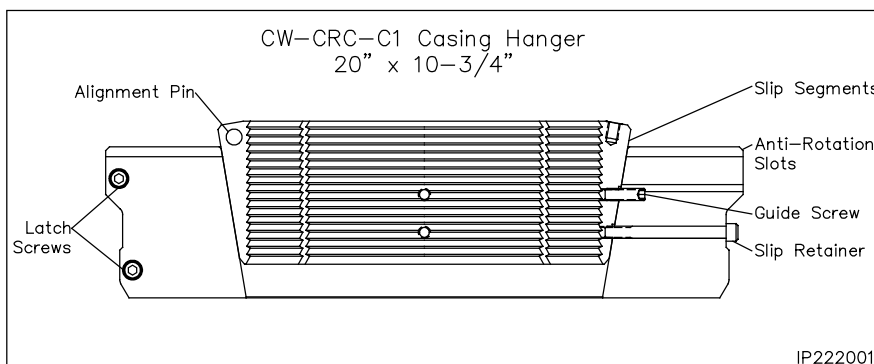
12. Place two boards on the housing flange against the casing to support the hanger.

13. Pick up the hanger and place it around the casing and on top of the support boards. Replace the latch screws.

14. Prepare to lower the hanger into the housing bowl.

CAUTION: Do Not drop the casing hanger!

15. Grease the casing hanger body and remove the slip retaining cap screws.



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Stage 5A — Hang Off the 10-3/4" Casing (Emergency)

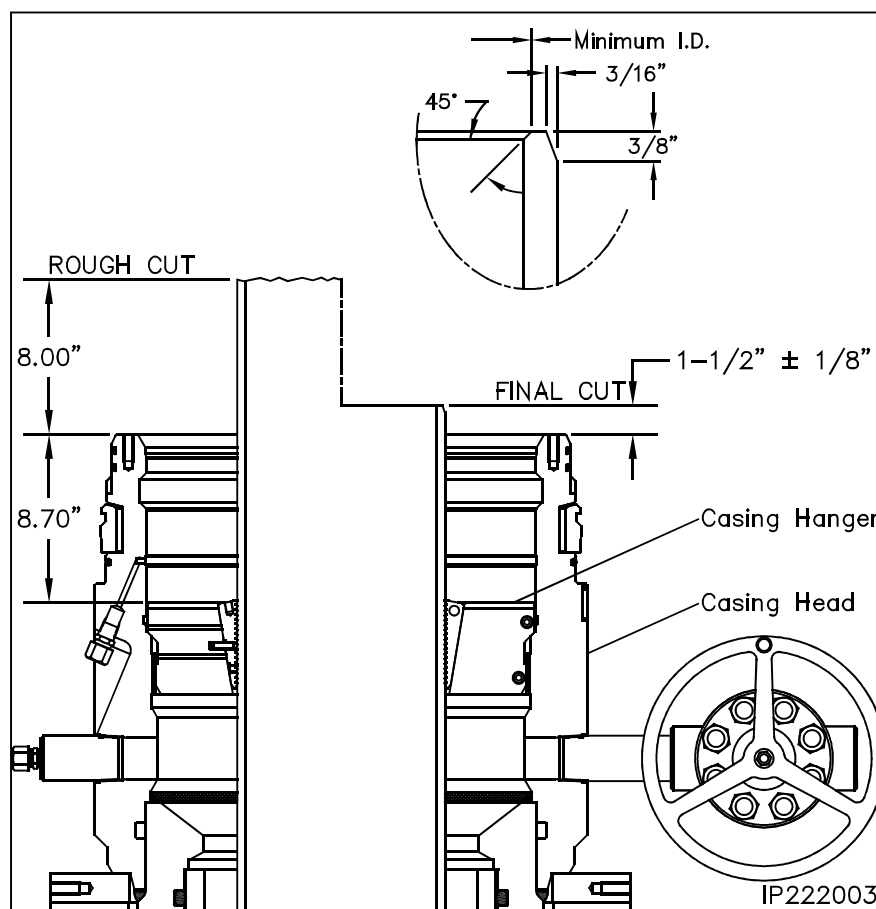
16. Remove the boards and allow the hanger to slide into the casing head. When the hanger is down, the top of the hanger body will be 8.70" below the top of the casing head.
17. Pull tension on the casing to the desired hanging weight and slack off.

NOTE: A sharp decrease on the weight indicator will signify that the hanger has taken weight. If this does not occur, pull tension again and slack off once more.

WARNING: Due to the potential fire hazard and the risk of loss of life and property, it is highly recommended to check the casing annulus and pipe bore for gases, with an approved sensing device, prior to cutting the casing. If gas is present, do not use an open flame torch to cut the casing. It will be necessary to use an air driven mechanical cutter which is spark free.

18. Rough cut the casing approximately 8" above the casing head flange and move the excess casing and BOP out of the way.
19. Final cut the casing at 1-1/2" ± 1/8" above the top of the casing head.
20. Grind the casing stub level, then place a 3/16" x 3/8" bevel on the O.D. and an I.D. chamfer to match the minimum bore of the upper housing to be installed.
21. Using a high pressure water hose, thoroughly clean the top of the casing head, casing hanger, and casing stub. Blow dry with compressed air. Ensure all cutting debris are removed.

CAUTION: Do Not reinstall the BOP stack. The emergency packoff is installed open hole and not through the BOP stack.



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Stage 6A — Install the CRC Emergency Packoff

NOTE: Only use this stage if the 10-3/4" casing becomes stuck and the mandrel casing hanger cannot be landed. If the mandrel hanger has been set then skip this stage.

1. Examine the **20" x 17.750" x 2 Stub Acme 2G LH Box Top CRC Emergency Packoff (Item A10a)**.

Verify the following:

- all elastomer seals are in place and undamaged
- internal bore and ports are clean and in good condition
- locking is fully retracted
- energizing ring is in its upper most position and retained with shear pins
- guide screws are in place and back off 1/4 turn
- anti-rotation plungers are in place, free to move

2. Inspect the I.D. and O.D. seals for any damage and replace as necessary.

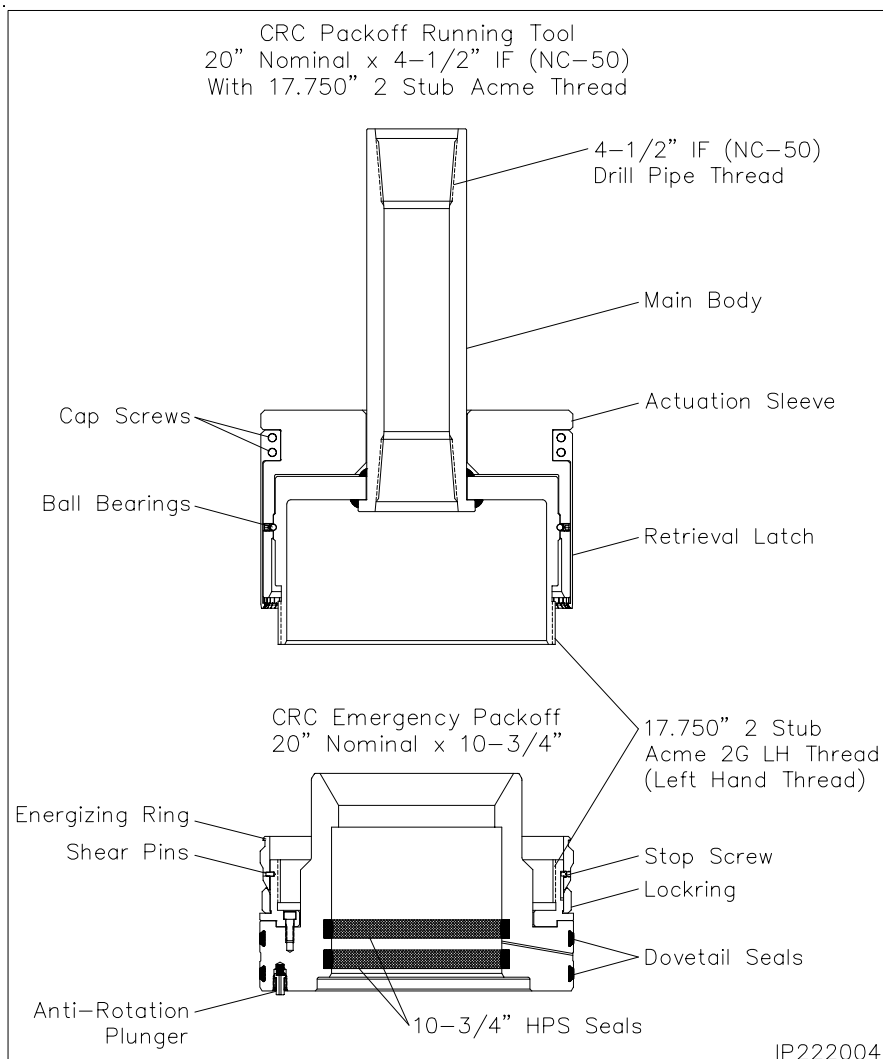
3. Examine the **20" Nominal x 17.750" 2 Stub Acme 2G LH, CRC Packoff Running Tool (Item ST7)**.

Verify the following:

- Acme threads are clean and in good condition
- retrieval latch is in position and retained with cap screws

4. Remove the retrieval latch and set aside.

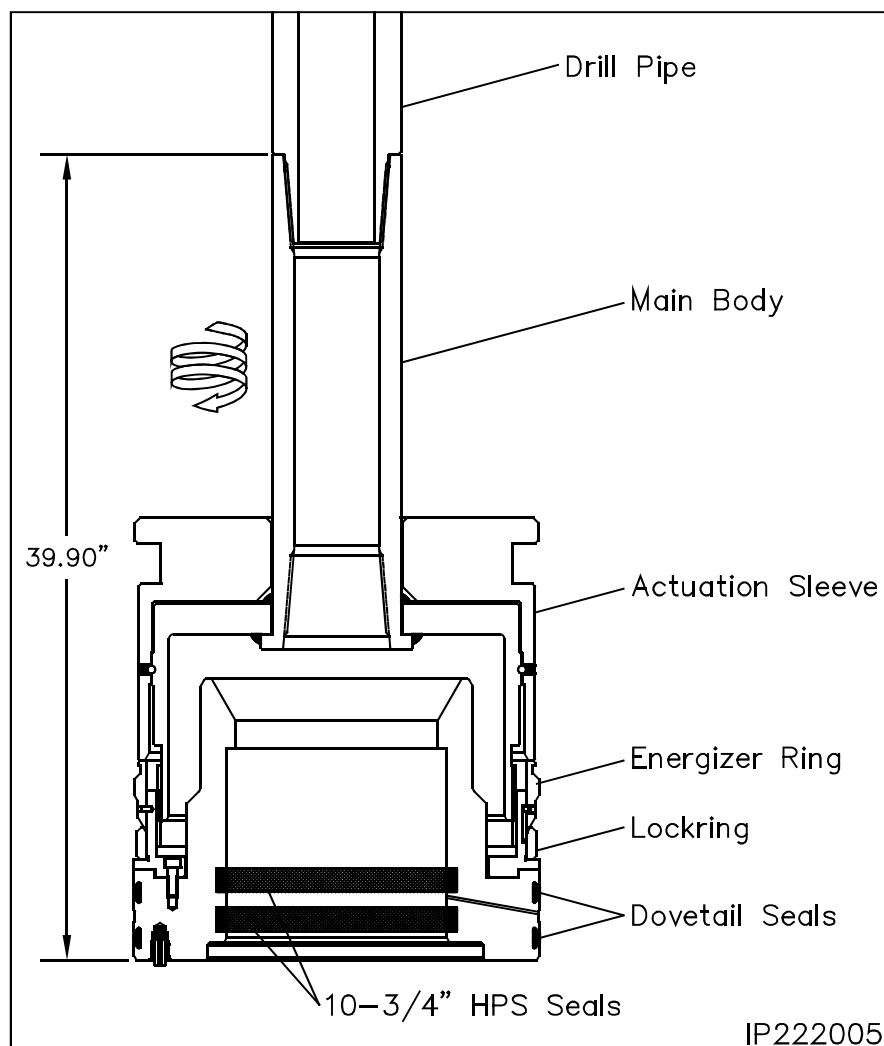
5. Make up the running tool to 4-1/2" IF (NC-50) drill pipe and torque the connection to optimum make up torque.



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Stage 6A — Install the CRC Emergency Packoff

6. Run in the hole with two stands of drill pipe and set in floor slips.
7. Pick up the packoff and carefully pass it over the drill pipe and set it on top of the floor slips.
8. Pick up the running tool with landing joint and make up the running tool to the drill pipe in the floor slips using the appropriate length pin x pin sub.
9. Pick up the packoff and thread it onto the running tool with clockwise (Right) rotation until the energizing ring makes contact with the lower body of the tool. (Approximately 3 turns).
10. Thoroughly clean and lightly lubricate the packoff I.D. 'HPS' seals and the O.D. dovetail seals with oil or light grease.
11. Locate the "SEAL TEST" fitting on the O.D. of the casing head and remove the dust cap from the fitting.
12. Attach a test pump to the fitting and pump clean test fluid through the port to dislodge any old grease and trapped debris.
13. Remove the test pump and reinstall the fitting dust cap.



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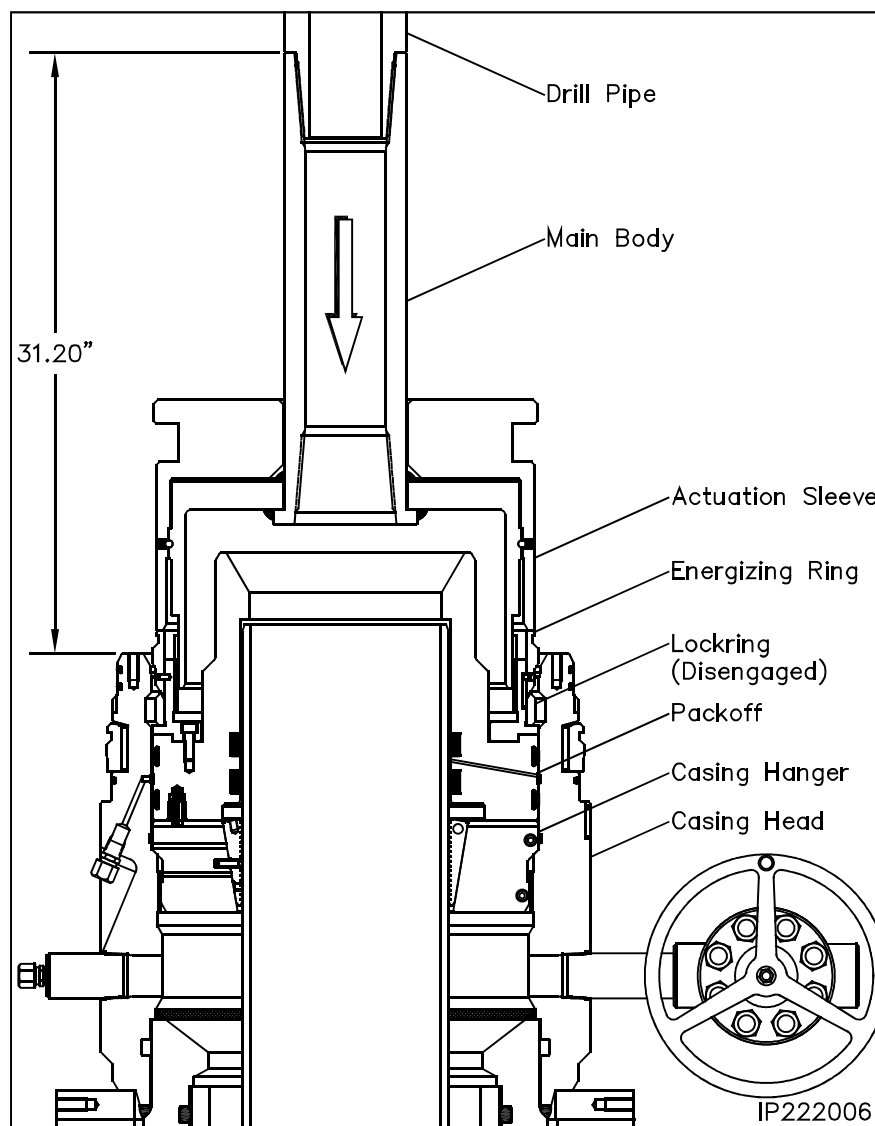
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Stage 6A — Install the CRC Emergency Packoff

Landing the Packoff

14. Pick up the drill string and remove the floor slips.
15. Carefully lower the packoff through the rig floor and position it just above the housing.
16. Carefully lower the packoff into the housing until it lands on top of the slip hanger.

i NOTE: When properly positioned the top of the running tool will be approximately 31.20" above the top of the CRC casing head.



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Stage 6A — Install the CRC Emergency Packoff

Seal Test

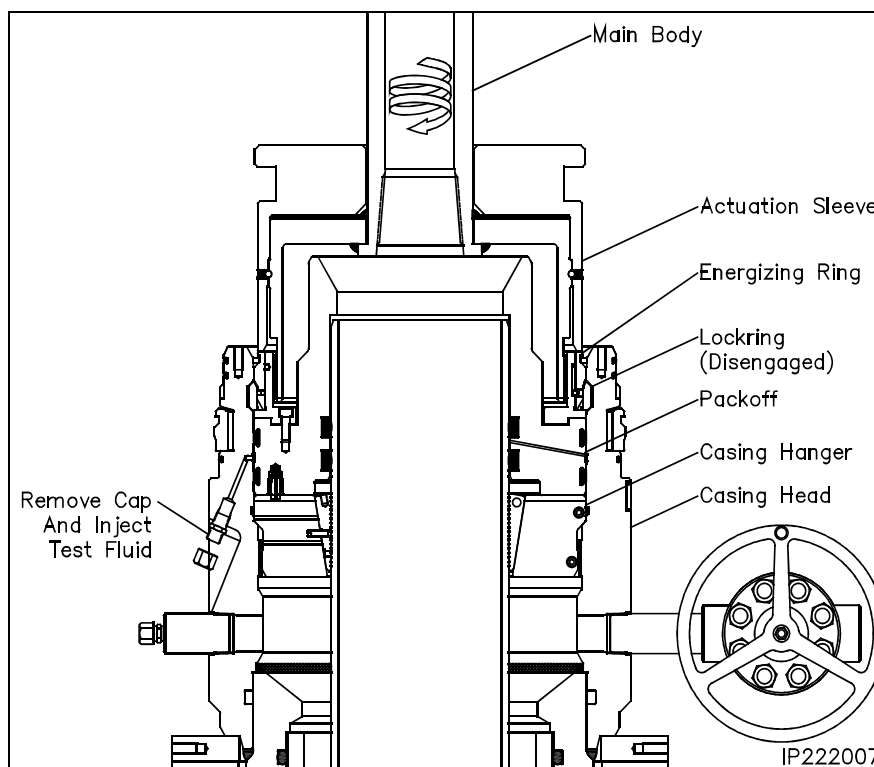
17. Locate the "SEAL TEST" fitting on the O.D. of the casing head and remove the dust cap from the fitting.
18. Attach a test pump to the open fitting and pump clean test fluid between the seals until a stable test pressure of **3,000 psi or 80% of casing collapse - whichever is less.**
19. Hold test pressure for 15 minutes or as required by drilling supervisor.
20. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
21. After satisfactory test is achieved, bleed off the test pressure but leave the test manifold in place.

Engaging the Lockring

22. **Using chain tongs only**, rotate the landing joint approximately 3 turns counter clockwise to engage the packoff locking in its mating groove in the bore of the CRC casing head.

NOTE: Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the lockring out. A positive stop will be encountered when the lockring is fully engaged.

CAUTION: It is imperative that the landing joint remain concentric with the well bore when rotating to engage the lockring. This can be accomplished with the use of the air hoist.



CAUTION: If the required turns to engage the lockring are not achieved or excessive torque is encountered, remove the packoff and first call local branch and then Houston Engineering.

23. Back off the landing joint/running tool approximately 1 turn. Using the top drive, exert a 40,000 lbs pull on the landing joint. Hold test for 15 minutes or as required by drilling supervisor. After satisfactory test, slack off all weight.
24. Reattach the test pump to the open test manifold and retest the packoff seals as previously outlined. This will also verify that the packoff is in place.
25. After satisfactory test is achieved, bleed off test pressure. Remove the test pump and manifold and install the dust cap.
26. **Using chain tongs only**, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 5 turns), then retrieve the tool with a straight vertical lift.



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Stage 11A — Hang Off the 8-5/8" Casing (Emergency)

1. Cement the hole as required.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

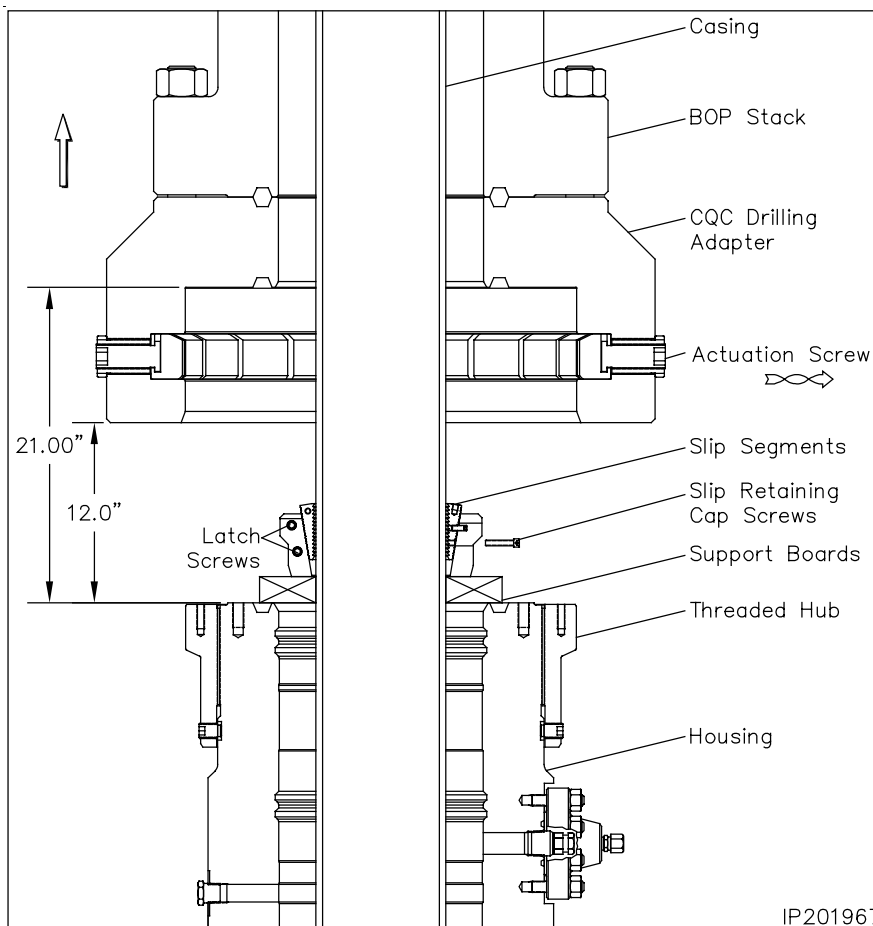
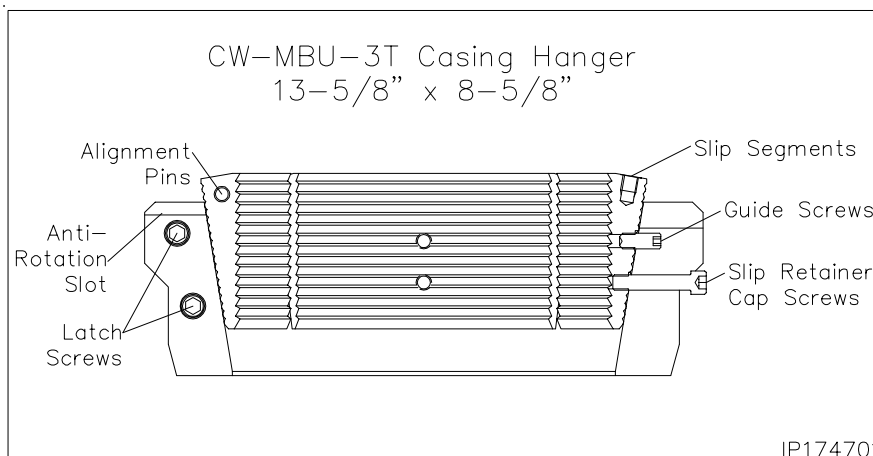
2. Drain the BOP stack through the housing lower side outlet valve.
3. Locate the actuation screw on the O.D. of the drilling adapter.
4. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the gland nuts.

WARNING: Keep body clear of all pinch points and suspended loads.

5. Pick up on the BOP stack a minimum of 12" above the housing and secure with safety slings.
6. Washout as required.
7. Examine the **13-5/8" x 8-5/8" MBU-3T Slip Casing Hanger (Item B19a)**. Verify the following:
 - slips and internal bore are clean and in good condition
 - all screws are in place
8. Remove the latch cap screws and open the hanger.
9. Place two boards on the housing flange against the casing to support the hanger.
10. Pick up the hanger and place it around the casing and on top of the support boards. Replace the latch screws.
11. Prepare to lower the hanger into the housing bowl.

CAUTION: Do Not drop the casing hanger!

12. Grease the casing hanger body and remove the slip retaining screws.



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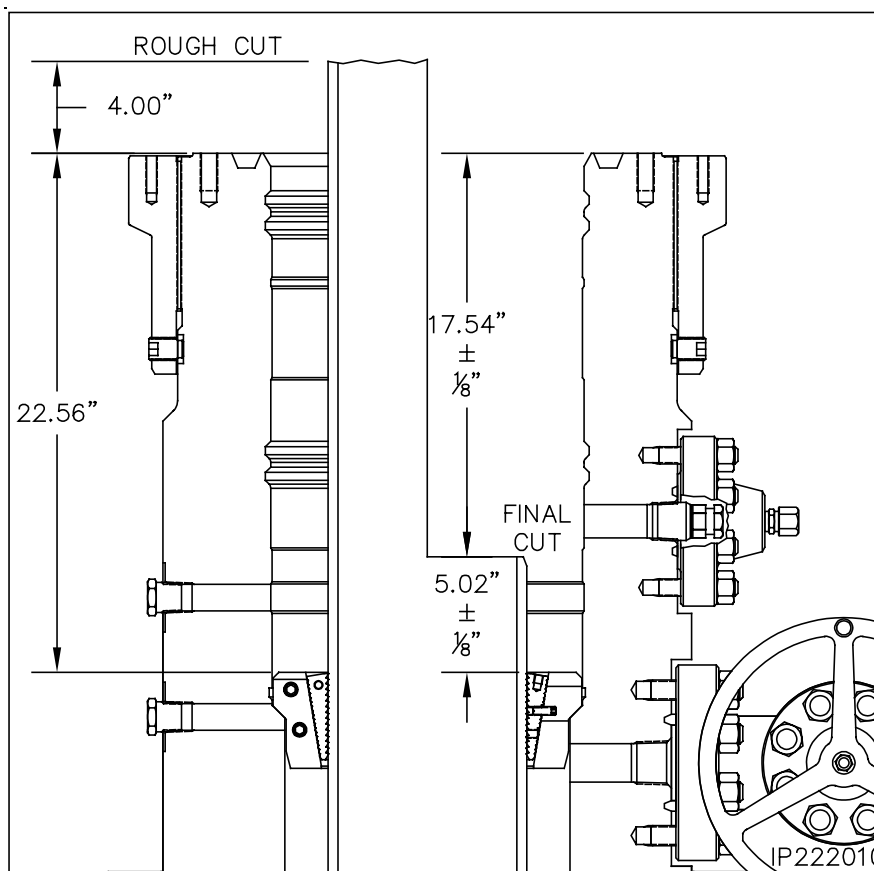
Stage 11A — Hang Off the 8-5/8" Casing (Emergency)

13. Remove the boards and allow the hanger to slide into the housing bowl. When properly positioned the top of the hanger will be approximately 22.56" below the top of the housing.
14. Pull tension on the casing to the desired hanging weight and then slack off.

NOTE: A sharp decrease on the weight indicator will signify that the hanger has taken weight. If this does not occur, pull tension again and slack off once more.

WARNING: Due to the potential fire hazard and the risk of loss of life and property, it is highly recommended to check the casing annulus and pipe bore for gases, with an approved sensing device, prior to cutting the casing. If gas is present, do not use an open flame torch to cut the casing. It will be necessary to use an air driven mechanical cutter which is spark free.

15. Rough cut the casing approximately 4" above the top of the housing and move the excess casing out of the way.
16. Using the internal casing cutter, final cut the casing at 17.54" \pm 1/8" below the top of the lower adapter or 5.02" \pm 1/8" above the hanger body.



17. Remove the internal casing cutter assembly and reconfigure the assembly to bevel the casing. Reinstall the cutter assembly, then place a 3/16" x 3/8" bevel on the O.D. and an I.D. chamfer to match the minimum bore of the packoff to be installed.

CAUTION: There must not be any rough edges on the casing or the seals of the packoff will be damaged.

18. Thoroughly clean the housing bowl, removing all cement and cutting debris.

CAUTION: Do Not reinstall the BOP stack. The emergency packoff is installed open hole and not through the BOP stack.



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Stage 12A — Install the MBU-3T Emergency Packoff

NOTE: Only use this stage if the 8-5/8" casing becomes stuck and the mandrel casing hanger cannot be landed. If the mandrel hanger has been set then skip this stage.

1. Examine the **13-5/8" 10M x 8-5/8" x 11.250" 4 Stub Acme 2G LH Box Top MBU-3T Emergency Nested Packoff Assembly (Item B20a)**.

Verify the following:

- all elastomer seals are in place and undamaged
- internal bore, and ports, are clean and in good condition
- locking is fully retracted
- rupture disk is in place and tightened securely
- energizing ring is in its upper most position and retained with shear pins
- guide screws are in place and back off 1/4 turn
- paint scribe line white and allow paint to dry

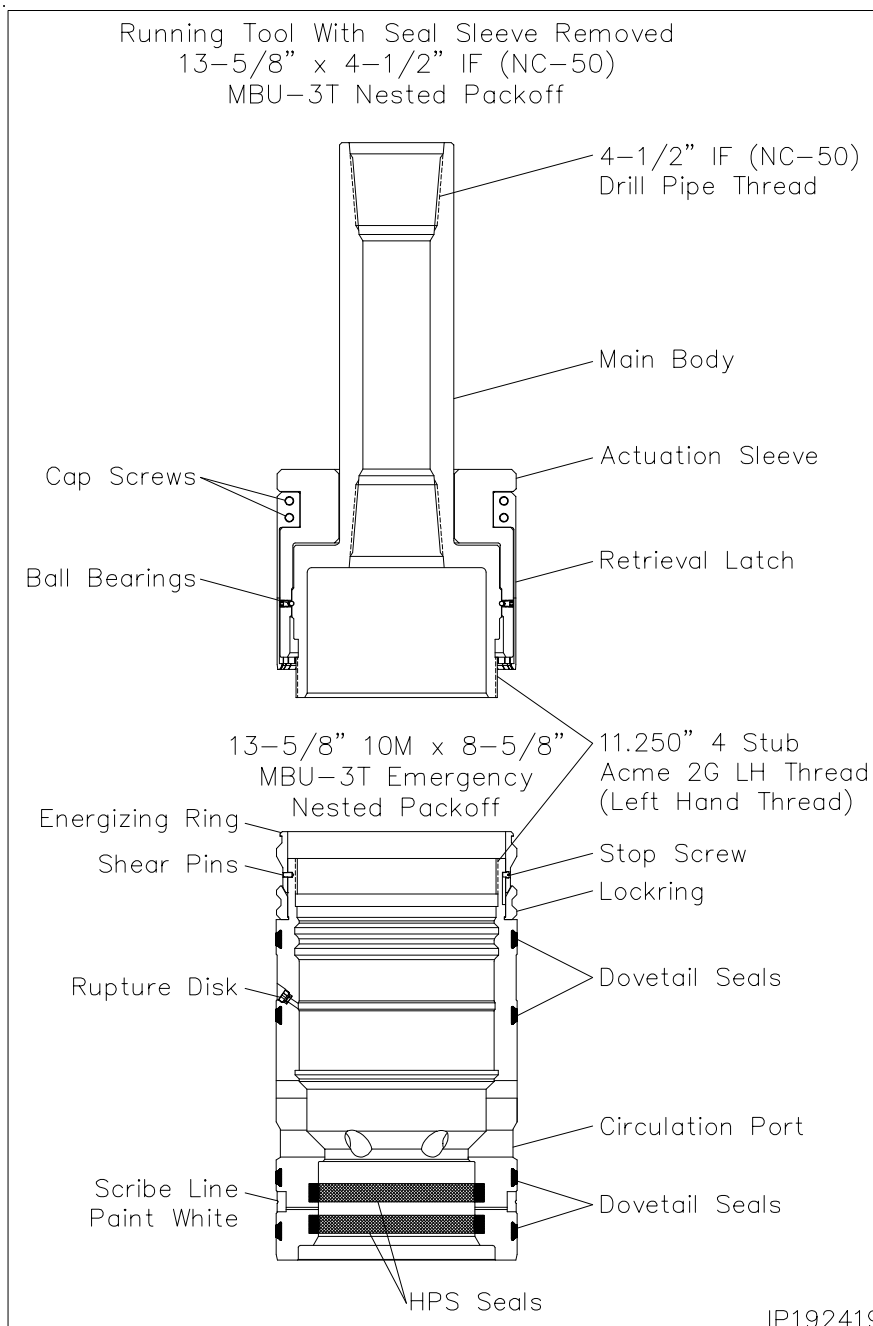
2. Inspect the I.D. and O.D. seals for any damage and replace as necessary.

3. Examine the **13-5/8" Nominal x 11.250" 4 Stub Acme 2G LH, MBU-3T Nested Packoff Running Tool (Item ST14)**. Verify the following:

- Acme threads are clean and in good condition
- retrieval latch is in position and retained with cap screws
- seal sleeve is removed

NOTE: Alternate tool may also be used.

4. Make up a joint 4-1/2" IF (NC-50) drill pipe to the top of the running tool and tighten connection to thread manufacturer's maximum make up torque.



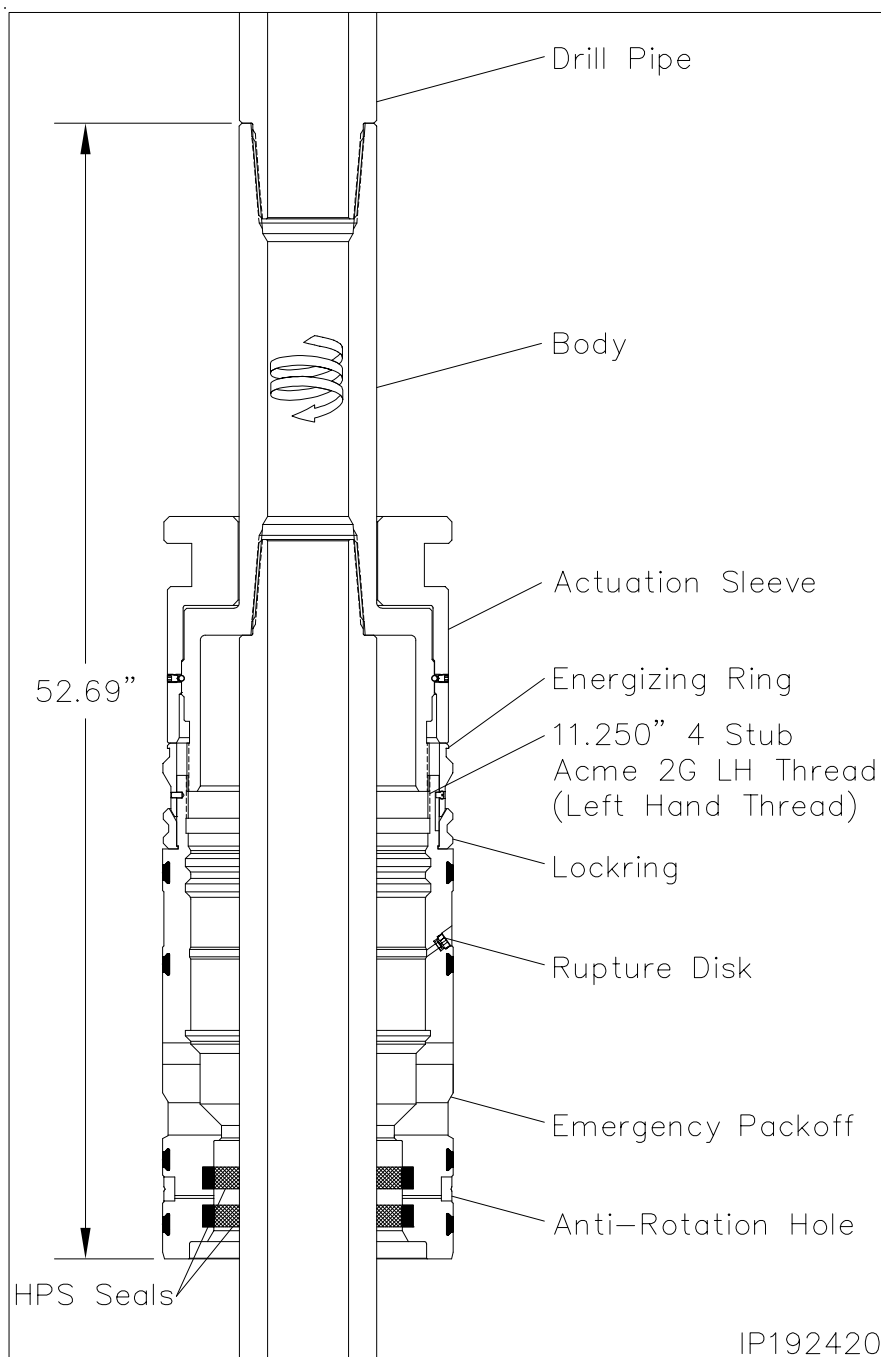
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Stage 12A — Install the MBU-3T Emergency Packoff

5. Run in the hole with two stands of drill pipe and set in floor slips.
6. Pick up the packoff and carefully pass it over the drill pipe and set it on top of the floor slips.
7. Pick up the running tool with landing joint and make up the running tool to the drill pipe in the floor slips using the appropriate length pin x pin sub.
8. Pick up the packoff and thread it onto the running tool with clockwise (Right) rotation until the energizing ring makes contact with the lower body of the tool. (Approximately 3 turns).

CAUTION: Ensure the rupture disc is in place and tightened securely.

9. Thoroughly clean and lightly lubricate the packoff I.D. 'HPS' seals and the O.D. dovetail seals with oil or light grease.
10. Locate the upper and lower "SEAL TEST" fittings on the O.D. of the housing and remove the dust cap from the fittings.
11. Attach a test pump to both fittings and pump clean test fluid through the ports to dislodge any old grease and trapped debris.
12. Remove the test pump and reinstall the fitting dust caps.



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Stage 12A — Install the MBU-3T Emergency Packoff

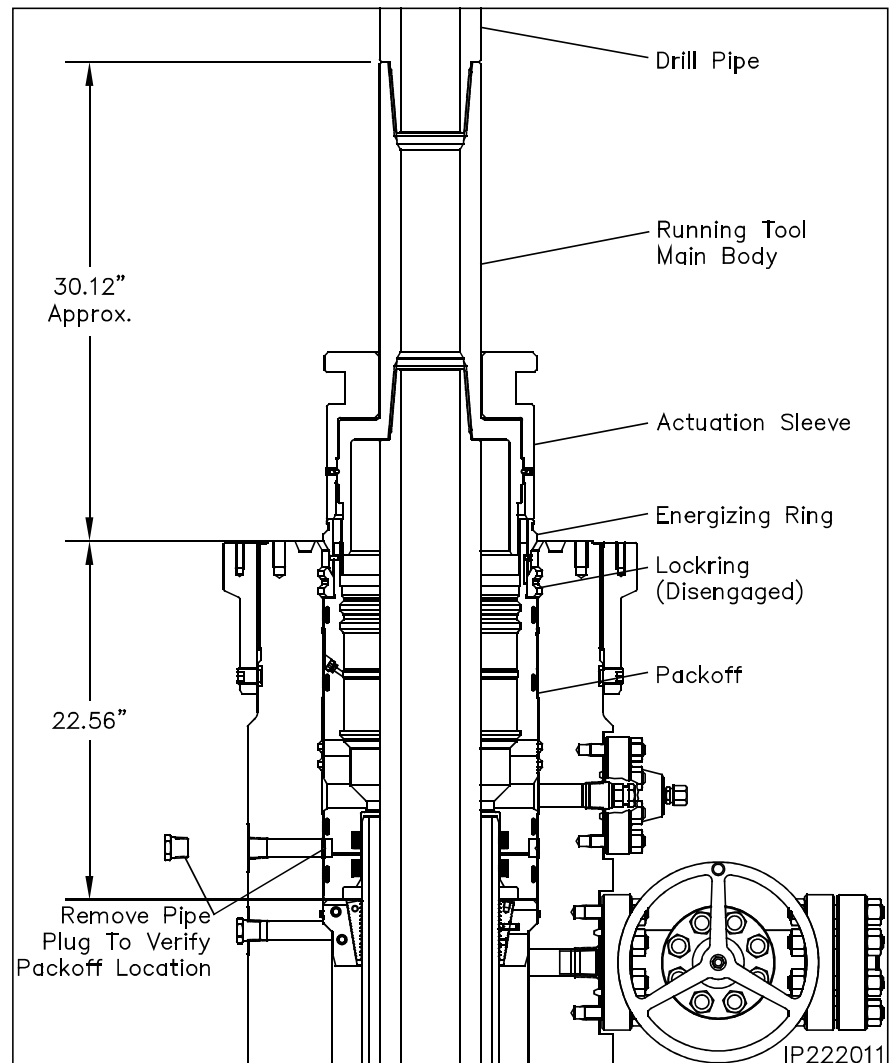
Landing the Packoff

13. Pick up the drill string and remove the floor slips.
14. Carefully lower the packoff through the rig floor and position it just above the housing.
15. Carefully lower the packoff into the housing until it lands on top of the slip hanger.

i NOTE: When properly positioned the top of the running tool will be approximately 30.12" above the top of the housing.

16. Remove the upper 1" LP pipe plug from the sight port to verify the packoff is properly landed. The 5/16" scribe line should be clearly visible in the center of the port.

17. With landing verified, reinstall the pipe plug and tighten securely.

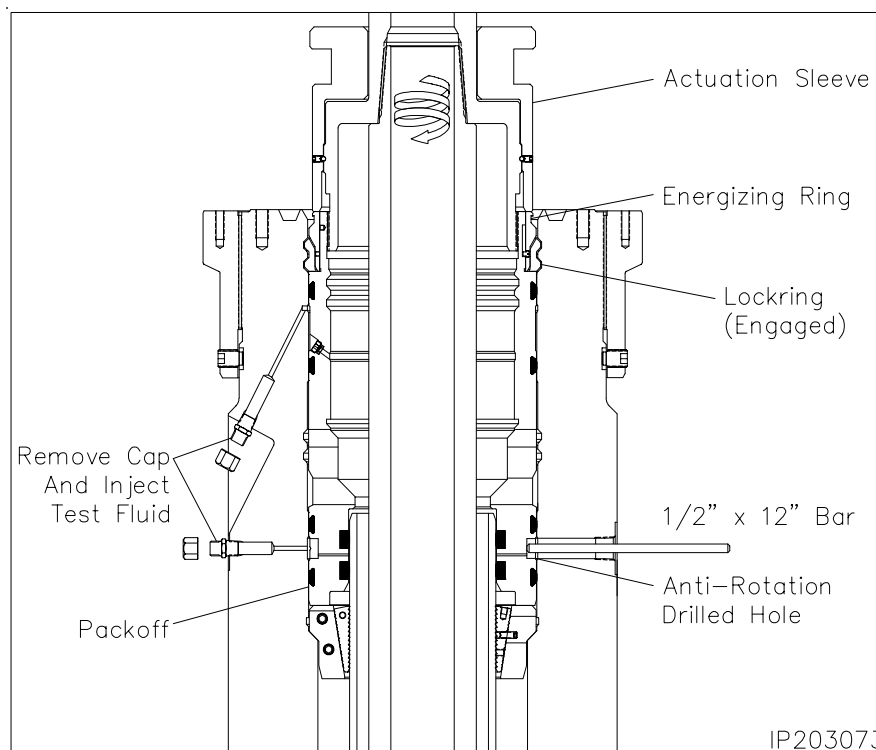


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Stage 12A — Install the MBU-3T Emergency Packoff

Seal Test

18. Locate the upper and lower "SEAL TEST" fittings on the O.D. of the housing and remove the dust cap from the fittings.
19. Attach a test pump to the open lower fitting and pump clean test fluid between the seals until a stable test pressure of **10,000 psi or 80% of casing collapse - whichever is less is achieved.**
20. Hold test pressure for 15 minutes or as required by the drilling supervisor.
21. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
22. Repeat steps 19 through 21 for the remaining upper test port. Test to **10,000 psi.**
23. After satisfactory test is achieved, bleed off the test pressure but leave the test manifold in place.



IP203073

CAUTION: It is imperative that the drill pipe landing joint remain concentric with the well bore when rotating to engage the locking. This can be accomplished with the use of the air hoist.

Engaging the Lockring

24. Remove the 1" sight port pipe plug and set aside.
 25. Pass a anti-rotation bar through the open port and hold inward pressure on the bar.
 26. **Using chain tongs only,** rotate the landing joint approximately 6 to 6-1/2 turns counter clockwise (Left) to engage the packoff locking in its mating groove in the bore of the housing.
- NOTE:** Approximately 800 to 900 ft-lbs of torque will be required to break over the shear pins in the packoff. The torque will drop off and then increase slightly when the energizing ring pushes the locking out. A positive stop will be encountered when the locking is fully engaged.
- CAUTION:** If the required turns to engage the locking are not met or excessive torque is encountered, remove the packoff. First call local branch. If further assistance is required then call Houston Engineering.
27. Back off the landing joint/running tool approximately three turns.
 28. Remove the anti-rotation bar from the sight port and reinstall the pipe plug in the port.
 29. Using the top drive, exert a 40,000 lbs pull on the landing joint. After satisfactory test. Hold test for 15 minutes or as required by drilling supervisor. After satisfactory test, slack off all weight.
 30. Reattach the test pump to the to the upper and lower test fittings and retest the seals as previously outlined.
 31. After a satisfactory tests are achieved, increase the injection pressure on the upper test fitting to **11,500 psi** to burst the rupture disc in the packoff. This will open the test port passage for the upper mandrel packoff.
 32. Remove test pump and attach a grease gun to the open upper fitting.
 33. Pump grease through the fitting and port until it flows into the I.D. of the packoff. Remove the grease gun and reinstall the dust cap on the open fittings.
 34. **Using chain tongs only,** rotate the landing joint clockwise until the tool comes free of the packoff (approximately 6 to 6-1/2 turns), then retrieve the tool with a straight vertical lift. Reinstall and nipple up the BOP stack.



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Stage 15A — Hang Off the 5-1/2” Casing (Emergency)

NOTE: The following stage should be followed **ONLY** if the 5-1/2” casing should become stuck in the hole. If the casing did not get stuck and is hung off with the mandrel casing hanger, skip this stage.

1. Cement the hole as required.

WARNING: Confirm with Drilling Supervisor that well bore conditions are safe.

2. Drain the BOP stack through the housing upper side outlet valve.

3. Locate the actuation screw on the O.D. of the drilling adapter.

4. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the gland nuts.

WARNING: Keep body clear of all pinch points and suspended loads.

5. Pick up on the BOP stack a minimum of 12” above the housing hub and secure with safety slings.

6. Using a fresh water hose, thoroughly wash out the packoff bowl.

7. Examine the 11” x 5-1/2” MBU-2LR Slip Casing Hanger (Item B21a). Verify the following:

- slips and internal bore are clean and in good condition
- all screws are in place

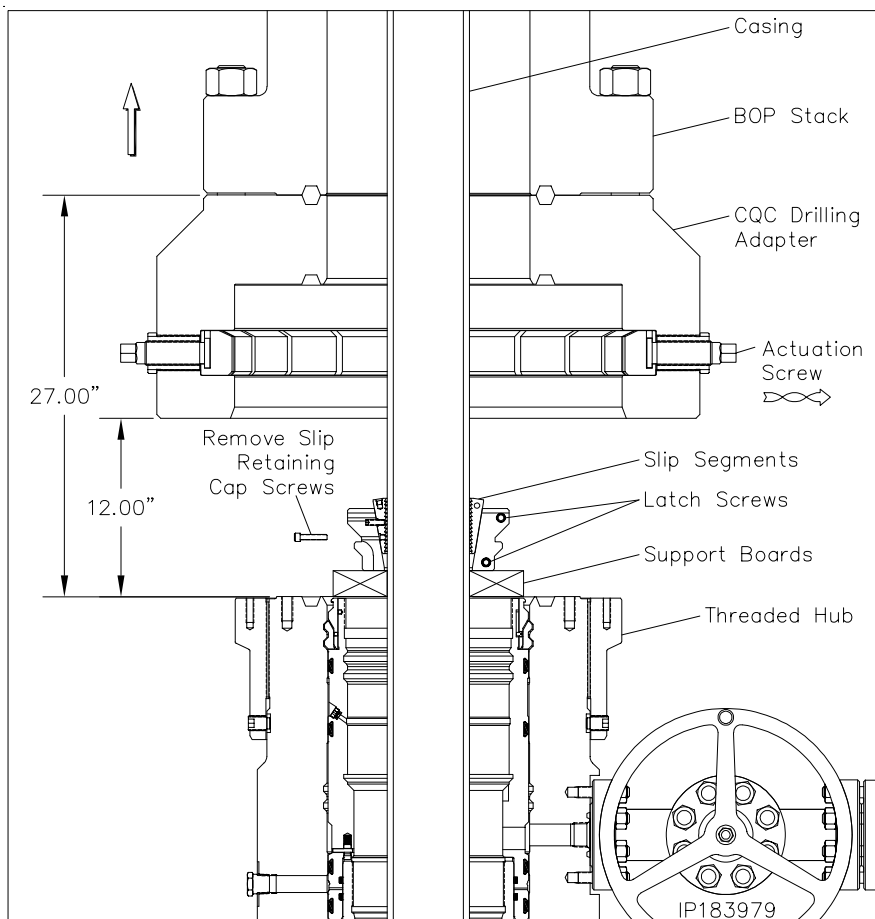
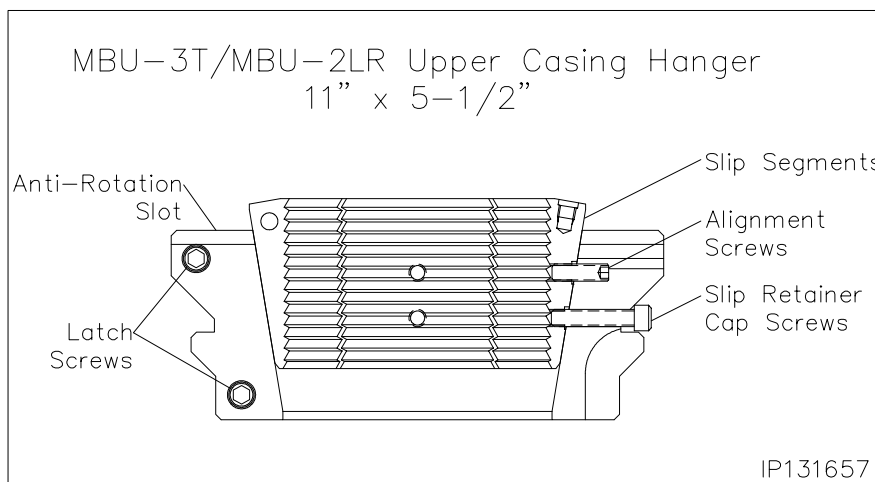
8. Remove the latch cap screws and open the hanger.

9. Place two boards on the housing flange against the casing to support the hanger.

10. Pick up the hanger and place it around the casing and on top of the support boards. Replace the latch screws.

11. Prepare to lower the hanger into the housing bowl.

CAUTION: Do Not drop the casing hanger!



12. Grease the casing hanger body and remove the slip retaining screws.



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Stage 15A — Hang Off the 5-1/2" Casing (Emergency)

13. Remove the boards and allow the hanger to slide into the housing bowl. When properly positioned the top of the hanger will be approximately 11.58" below the top of the housing.
14. Pull tension on the casing to the desired hanging weight and then slack off.

NOTE: A sharp decrease on the weight indicator will signify that the hanger has taken weight. If this does not occur, pull tension again and slack off once more.

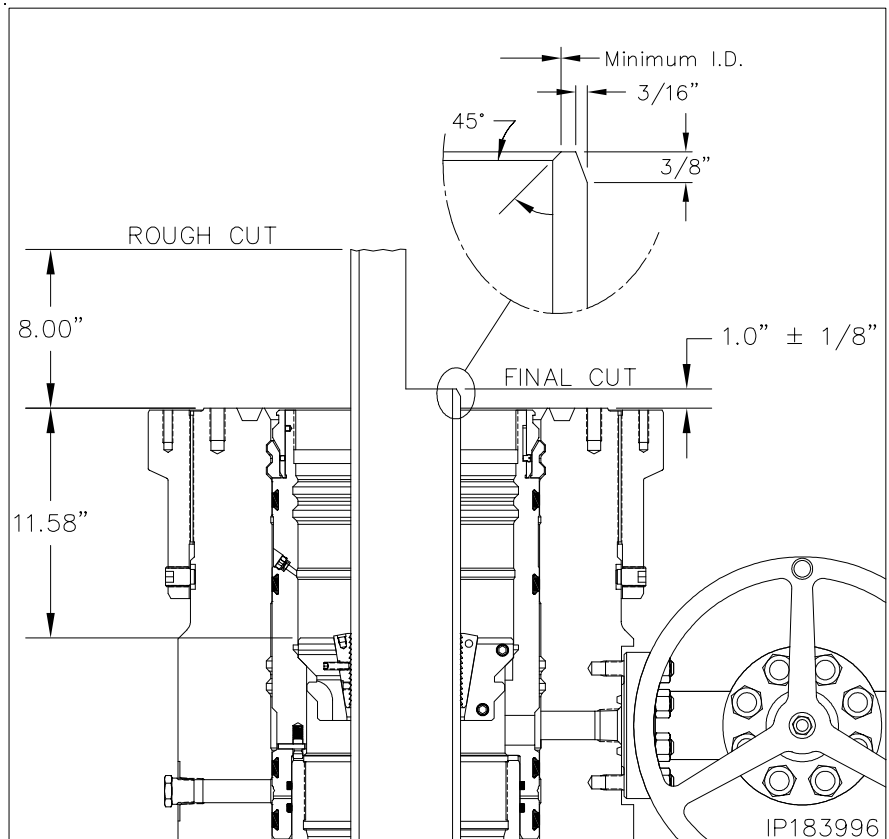
WARNING: Due to the potential fire hazard and the risk of loss of life and property, it is highly recommended to check the casing annulus and pipe bore for gases, with an approved sensing device, prior to cutting the casing. If gas is present, do not use an open flame torch to cut the casing. It will be necessary to use an air driven mechanical cutter which is spark free.

15. Rough cut the casing approximately 8" above the top flange and move the excess casing out of the way.
16. Final cut the casing at 1" \pm 1/8" above the top of the housing.
17. Grind the casing stub level and then place a 3/16" x 3/8" bevel on the O.D. and a I.D. chamfer to match the minimum bore of the packoff to be installed.

CAUTION: There must not be any rough edges on the casing or the seals of the packoff will be damaged.

18. Thoroughly clean the housing bowl, removing all cement and cutting debris.

CAUTION: Do Not reinstall the BOP stack. The emergency packoff is installed open hole and not through the BOP stack.



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Stage 16A — Install the MBU-3T Emergency Packoff

1. Examine the **11" x 5-1/2" x 5" H BPV Thread MBU-3T Inner Emergency Packoff (Item B22a)**.

Verify the following:

- bore and internal seal area are clean and in good condition
- I.D. and O.D. seals are in place and in good condition
- I.D. BPV threads are clean and in good condition

2. Thoroughly clean the I.D. and O.D. of the packoff removing all old grease and debris.

3. Carefully inspect the seals for and damage and replace if necessary.

4. Examine the **4-1/2" IF (NC-50) x 5" H BPV Thread MBU-3T Emergency Packoff Installation Tool (Item ST21)**. Verify the following:

- bore and threads are clean and in good condition

5. Make up the running tool to a joint of drill pipe.

6. Lightly lubricate the mating threads of the tool and the packoff with oil or a light grease.

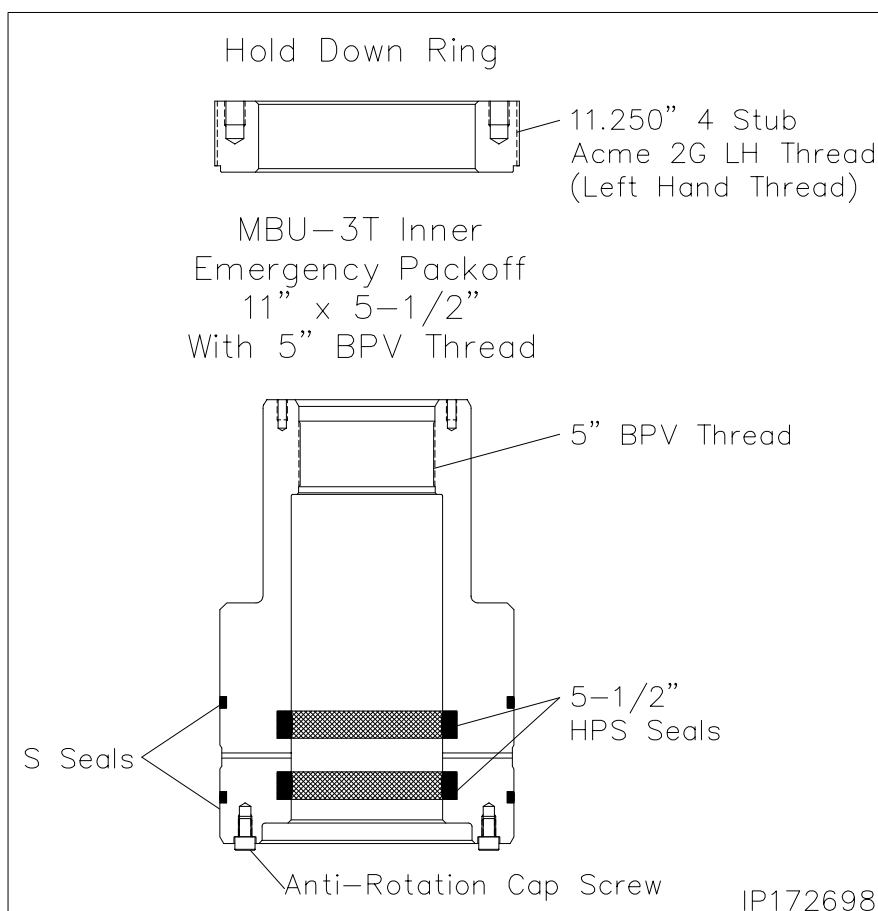
7. Thread the running tool into the top of the hanger with left hand rotation to a positive stop.

8. Thoroughly clean and lightly lubricate the I.D. and O.D. seals of the packoff with oil or light grease.

9. Locate the upper "SEAL TEST" fitting on the O.D. of the housing and remove the dust cap from the fitting.

10. Attach a test pump with test manifold to the open fitting and pump clean test fluid through the fitting and port to dislodge any old grease and trapped debris.

11. Remove the test pump with test manifold and reinstall the fitting dust caps.



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Stage 16A — Install the MBU-3T Emergency Packoff

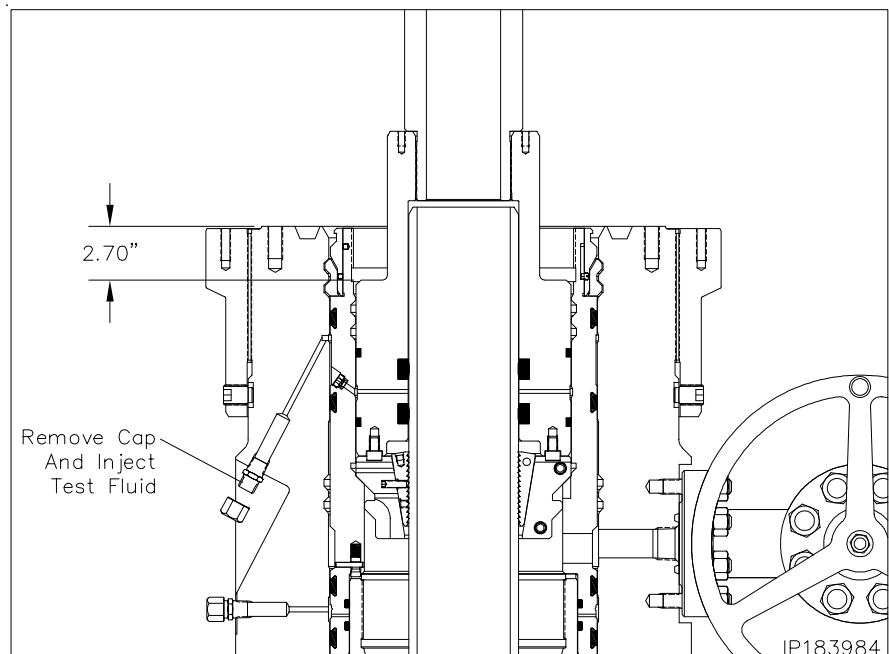
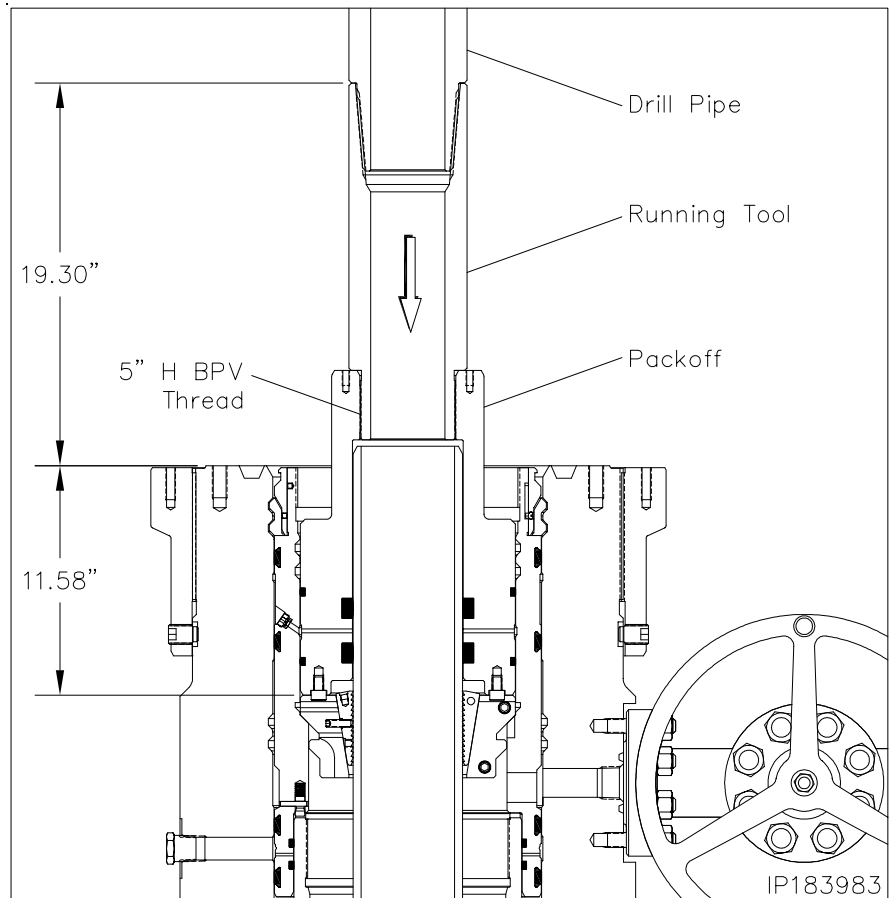
12. Pick up the packoff with running tool and position it over the casing stub.
13. Align the anti-rotation cap screws with the mating slots in the top of the slip bowl.
14. Carefully lower the packoff over the casing stub and push it into the 9-5/8" packoff until it bottoms out on the slip hanger body.

NOTE: When properly positioned the top of the running tool will be approximately 19.30" above the top of the housing.

NOTE: When properly positioned, the main body of the packoff will be 2.70" below the top of the housing flange as indicated.

Seal Test

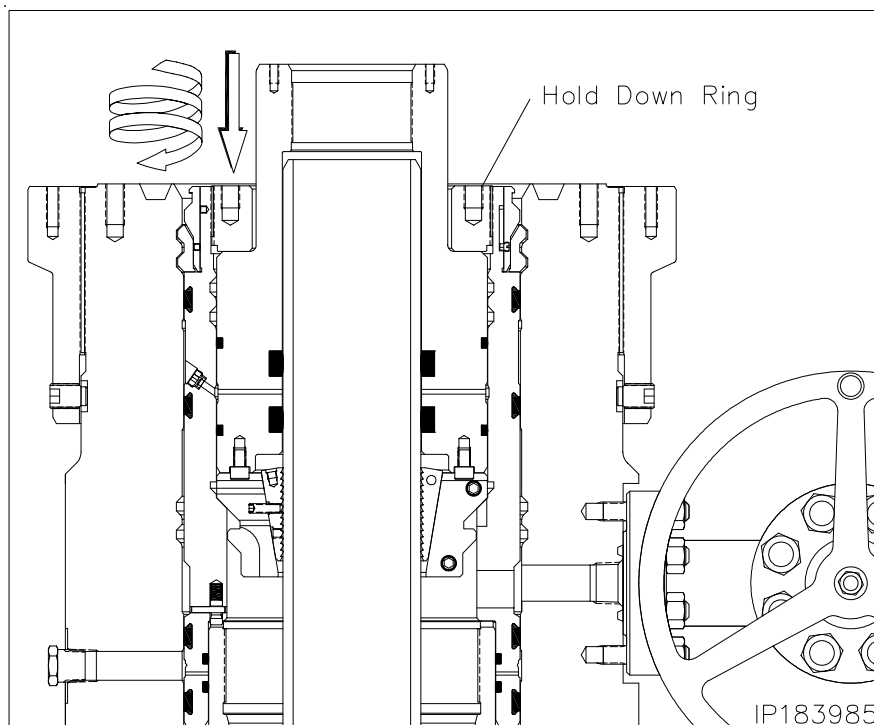
15. Locate the upper "SEAL TEST" fitting on the O.D. of the housing and remove the dust cap from the fitting.
16. Attach a test pump with test manifold to the open fitting and pump clean test fluid between the seals until a stable test pressure of **10,000 psi or 80% of casing collapse - whichever is less** is achieved.
17. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
18. After a satisfactory test is achieved, carefully bleed off all test pressure. Remove the test pump with test manifold.
19. Reinstall the dust cap on the open fitting.



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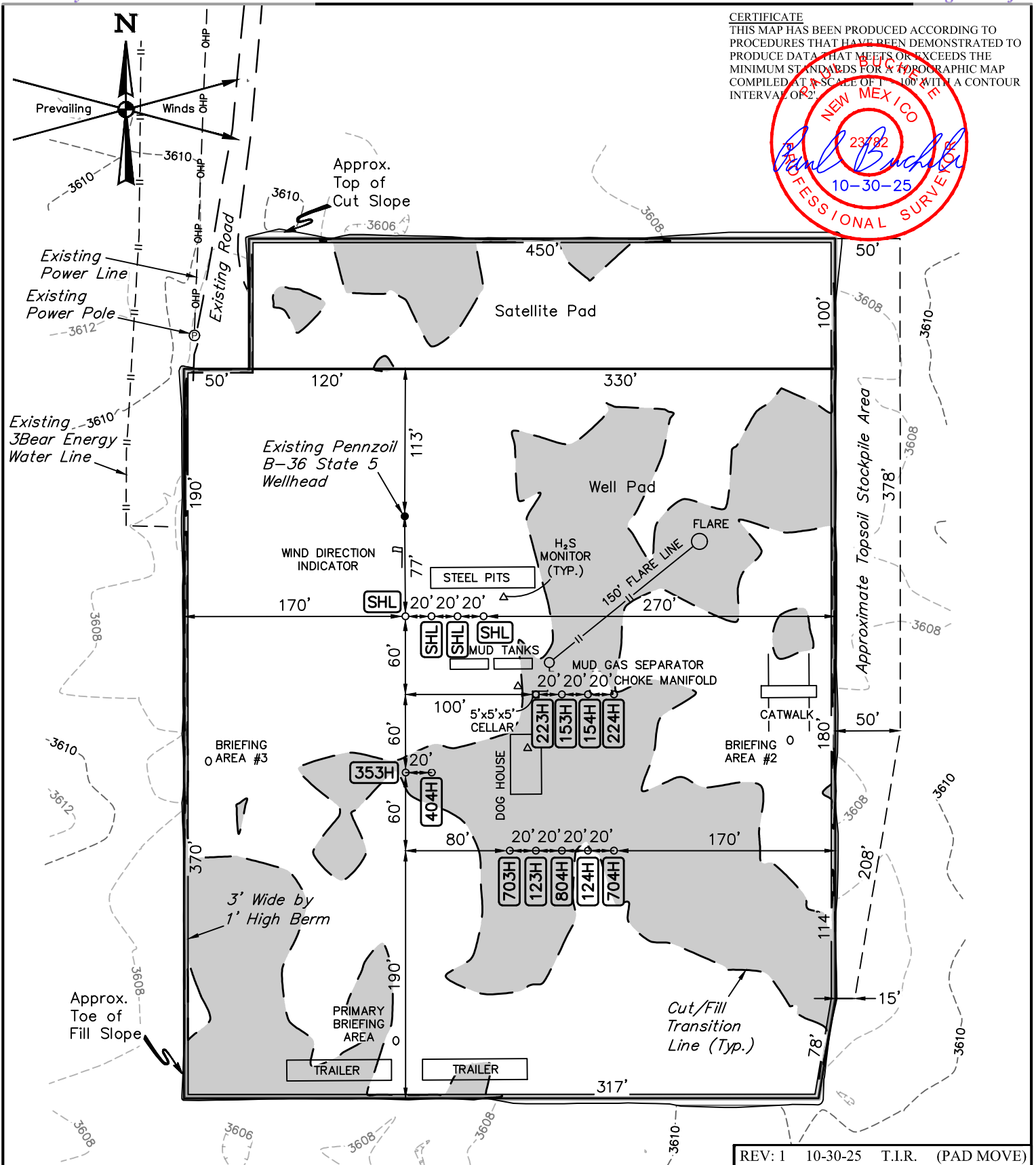
Stage 16A — Install the MBU-3T Emergency Packoff

20. Thoroughly clean and lightly lubricate the mating Acme threads of the MBU-3T packoff and the packoff **Hold Down Ring (Item B22b)**.
21. Thread the ring into the 9-5/8" packoff with counter clockwise rotation to a positive stop on top of the slip hanger.
22. Using a dry rod, set the **5" Type H One-Way BPV (Item ST22)** in the bore of the packoff. Ensure that the BPV makes a minimum of 6 turns before final make up and break out.



Generic
 (24" or 26") x 16" x 10-3/4" x 8-5/8" x 5-1/2" 5/15M
 MBU-3T-CRC-DBLHPS Wellhead System

IP1418-1
 Rev. 0
 Page 101



NOTES:
 • Contours shown at 2' intervals.

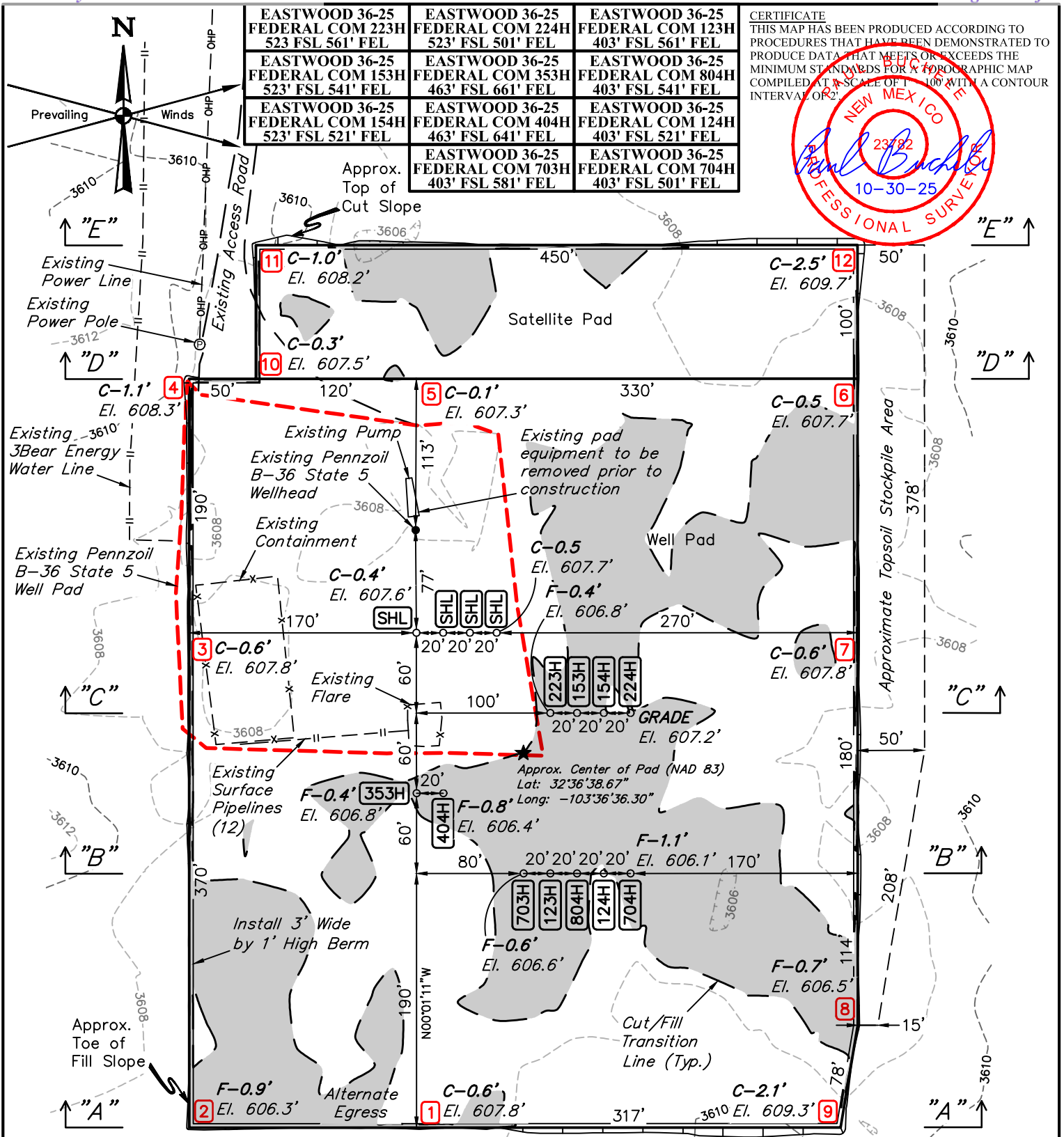
COTERRA ENERGY OPERATING CO.
EASTWOOD 36-25 FEDERAL COM E2E2
493' FSL 581' FEL (APPROX. CENTER OF PAD)
SE 1/4 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	L.T.T.	08-14-25	1" = 100'

TYPICAL RIG LAYOUT **EXHIBIT K**

UELS, LLC
 Corporate Office * 85 South 200 East
 Vernal, UT 84078 * (435) 789-1017

UINTAH
 ENGINEERING & LAND SURVEYING



REV: 1 10-30-25 T.I.R. (PAD MOVE)
FINISHED GRADE ELEVATION = 3,607.2'

NOTE: Earthwork Calculations Require Fill @ the Location Stakes For Balance. All Fill is to be Compacted to a Minimum of 95% of the Maximum Dry Density Obtained by AASHTO Method t-99.

- NOTES:**
- Flare stack is to be located a min. of 100' from the wellhead.
 - Contours shown at 2' intervals.
 - Cut/Fill slopes 2:1 (Typ. except berm)
 - Underground utilities shown on this sheet are for visualization purposes only, actual locations to be determined prior to construction.
 - Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of W103°53'00" (NAD 83)

COTERRA ENERGY OPERATING CO.
EASTWOOD 36-25 FEDERAL COM E2E2
493' FSL 581' FEL (APPROX. CENTER OF PAD)
SE 1/4 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO



UELS, LLC
 Corporate Office * 85 South 200 East
 Vernal, UT 84078 * (435) 789-1017

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	L.T.T.	08-14-25	1" = 100'
LOCATION LAYOUT		EXHIBIT J	

State of New Mexico
 Energy, Minerals and Natural Resources Department

Submit Electronically
 Via E-permitting

Oil Conservation Division
 1220 South St. Francis Dr.
 Santa Fe, NM 87505

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description Effective May 25, 2021

I. Operator: Coterra Energy Operating Co **OGRID:** 215099 **Date:** 11/17/2025

II. Type: Original Amendment due to 19.15.27.9.D(6)(a) NMAC 19.15.27.9.D(6)(b) NMAC Other.

If Other, please describe: _____

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Eastwood 25-36 Federal Com	404H	SESE Sec 36 T19S, R33E 463	FSL/641 FEL	700	715	1400

IV. Central Delivery Point Name: Eastwood CTB (New) _____ [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Eastwood 25-36 Federal Com	404H	1/20/26	2/20/26	3/20/26	4/1/26	4/1/26

VI. Separation Equipment: Attach a complete description of how Operator will size separation equipment to optimize gas capture.

VII. Operational Practices: Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

VIII. Best Management Practices: Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan
EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system will will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator does does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

Attach Operator’s plan to manage production in response to the increased line pressure.

XIV. Confidentiality: Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system.

If Operator checks this box, Operator will select one of the following:

Well Shut-In. Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- (a) power generation on lease;
- (b) power generation for grid;
- (c) compression on lease;
- (d) liquids removal on lease;
- (e) reinjection for underground storage;
- (f) reinjection for temporary storage;
- (g) reinjection for enhanced oil recovery;
- (h) fuel cell production; and
- (i) other alternative beneficial uses approved by the division.

Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

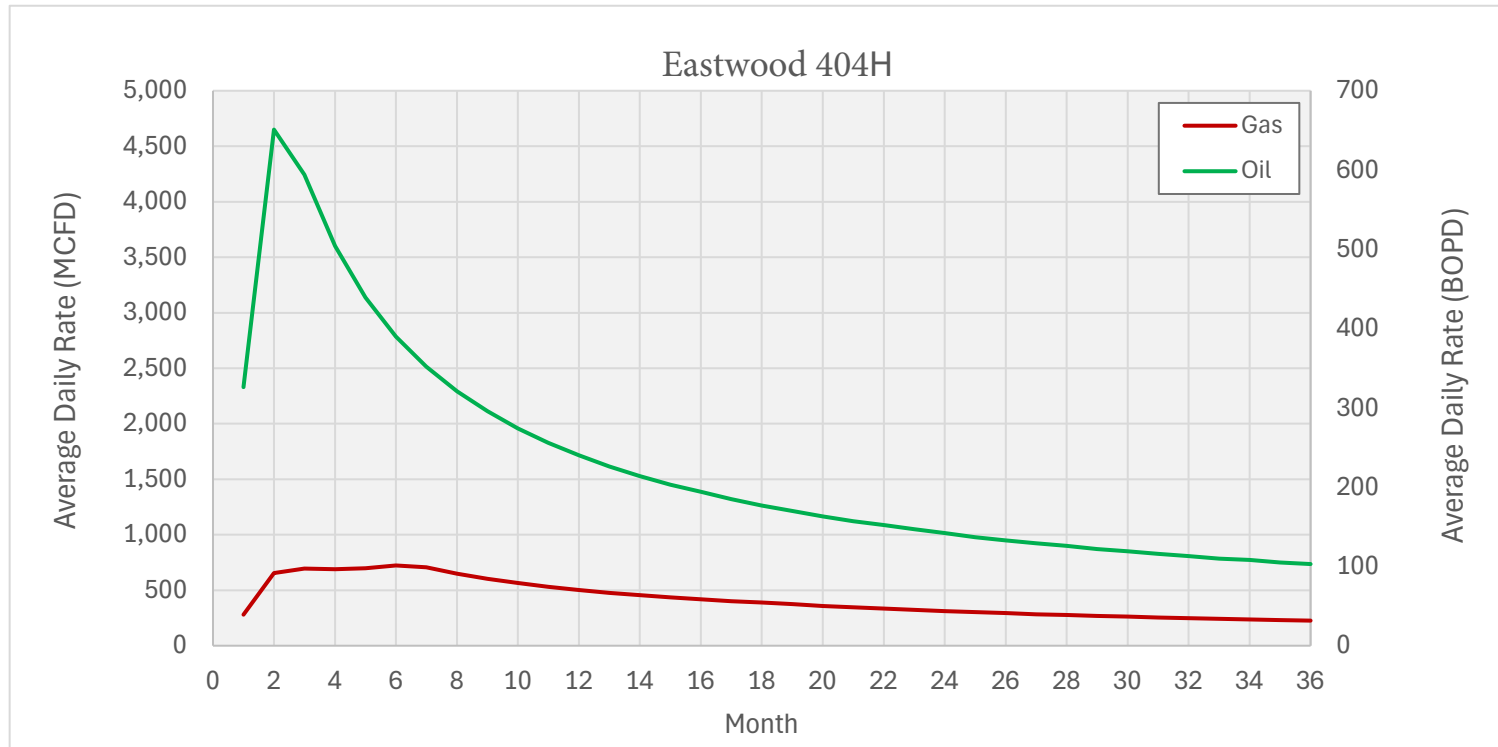
I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature:	<i>Shelly Bowen</i>
Printed Name:	<input type="text" value="Shelly Bowen"/>
Title:	<input type="text" value="Sr. Regulatory Analyst"/>
E-mail Address:	<input type="text" value="shelly.bowen@coterra.com"/>
Date:	11/17/25
Phone:	<input type="text" value="432/620-1644"/>

OIL CONSERVATION DIVISION
(Only applicable when submitted as a standalone form)

Approved By:
Title:
Approval Date:
Conditions of Approval:

Eastwood 404H 3rd Bone Spring		
Month	Eastwood 404H Gas MCFD	Eastwood 404H Oil BOPD
1	281	326
2	655	651
3	696	594
4	688	504
5	698	439
6	723	390
7	707	352
8	650	321
9	603	296
10	564	274
11	531	256
12	502	240
13	477	226
14	455	214
15	435	203
16	418	194
17	402	185
18	388	177
19	374	170
20	359	163
21	346	157
22	334	152
23	323	147
24	312	142
25	302	137
26	293	133
27	284	129
28	276	126
29	269	122
30	262	119
31	255	116
32	249	113
33	243	110
34	237	108
35	232	105
36	226	103



From State of New Mexico, Natural Gas Management Plan

VI. Separation Equipment: Attach a complete description of how Operator will size separation equipment to optimize gas capture.

XEC Standard Response

Standard facility gas process flow begins at the inlet separator. These vessels are designed based off of forecasted rates and residence times in accordance with, and often greater than, API 12J. The separated gas is then routed to an additional separation vessel (ie sales scrubber) in order to extract liquids that may have carried over or developed due to the decrease in pressure. The sales scrubber is sized based on API 521. From the sales scrubber, the gas leaves the facility and enters the gas midstream gathering network.

Cimarex

VII. Operational Practices

Cimarex values the sustainable development of New Mexico's natural resources. Venting and flaring of natural gas is a source of waste in the industry, and Cimarex will ensure that its values are aligned with those of NMOCD. As such, Cimarex plans to take pointed steps to ensure compliance with Subsection A through F of 19.15.27.8 NMAC.

Specifically, below are the steps Cimarex will plan to follow under routine well commissioning and operations.

1. Capture or combust natural gas during drilling operations where technically feasible, using the best industry practices and control technologies.
 - a. All flares during these operations will be a minimum of 100ft away from the nearest surface-hole location.
2. All gas present during post-completion drill-out and flow back will be routed through separation equipment, and, if technically feasible, flare unsellable vapors rather than vent. Lastly, formal sales separator commissioning to process well-stream fluids and send gas to a gas flow line/collection system or use the gas for on-site fuel or beneficial usage, gas as soon as is safe and technically feasible.
3. Cimarex will ensure the flare or combustion equipment is properly sized to handle expected flow rates, ensure this equipment is equipped with an automatic or continuous ignition source, and ensure this equipment is designed for proper combustion efficiency.
4. If Cimarex must flare because gas is not meeting pipeline specifications, Cimarex will limit flaring to <60 days, analyze gas composition at least twice per week, and route gas into a gathering pipeline as soon as pipeline specifications are met.
5. Under routine production operations, Cimarex will not flare/vent unless:
 - a. Venting or flaring occurs due to an emergency or equipment malfunction.
 - b. Venting or flaring occurs as a result of unloading practices, and an operator is onsite (or within 30 minutes of drive time and posts contact information at the wellsite) until the end of unloading practice.
 - c. The venting or flaring occurs during automated plungerlift operations, in which case the Cimarex operator will work to optimize the plungerlift system to minimize venting/flaring.
 - d. The venting or flaring occurs during downhole well maintenance, in which case Cimarex will work to minimize venting or flaring operations to the extent that it does not pose a risk to safe operations.
 - e. The well is an exploratory well, the division has approved the well as an exploratory well, venting or flaring is limited to 12 months, as approved by the division, and venting/flaring does not cause Cimarex to breach its State-wide 98% gas capture requirement.
 - f. Venting or flaring occurs because the stock tanks or other low-pressure vessels are being gauged, sampled, or liquids are being loaded out.
 - g. The venting or flaring occurs because pressurized vessels are being maintained and are being blown-down or depressurized.
 - h. Venting or flaring occurs as a result of normal dehydration unit operations.

- i. Venting or flaring occurs as a result of bradenhead testing.
 - j. Venting or flaring occurs as a result of normal compressor operations, including general compressor operations, compressor engines and turbines.
 - k. Venting or flaring occurs as a result of a packer leakage test.
 - l. Venting or flaring occurs as a result of a production test lasting less than 24 hours unless otherwise approved by the division.
 - m. Venting or flaring occurs as a result of new equipment commissioning and is necessary to purge impurities from the pipeline or production equipment.
6. Cimarex will maintain its equipment in accordance with its Operations and Maintenance Program, to ensure venting or flaring events are minimized and that equipment is properly functioning.
7. Cimarex will install automatic tank gauging equipment on all production facilities constructed after May 25, 2021, to ensure minimal emissions from tank gauging practices.
8. By November 25, 2022, all Cimarex facilities equipped with flares or combustors will be equipped with continuous pilots or automatic igniters, and technology to ensure proper function, i.e. thermocouple, fire-eye, etc...
9. Cimarex will perform AVO (audio, visual, olfactory) facility inspections in accordance with NMOCD requirements. Specifically, Cimarex will:
 - a. Perform weekly inspections during the first year of production, and so long as production is greater than 60 MCFD.
 - b. If production is less than 60 MCFD, Cimarex will perform weekly AVO inspections when an operator is present on location, and inspections at least once per calendar month with at least 20 calendar days between inspections.
10. Cimarex will measure or estimate the volume of vented, flared or beneficially used natural gas, regardless of the reason or authorization for such venting or flaring.
11. On all facilities constructed after May 25, 2021, Cimarex will install metering where feasible and in accordance with available technology and best engineering practices, in an effort to measure how much gas could have been vented or flared.
 - a. In areas where metering is not technically feasible, such as low-pressure/low volume venting or flaring applications, engineering estimates will be used such that the methodology could be independently verified.
12. Cimarex will fulfill the division's requirements for reporting and filing of venting or flaring that exceeds 50 MCF in volume or last eight hours or more cumulatively within any 24-hour period.

VIII. Best Management Practices to minimize venting during active and planned maintenance

Cimarex strives to ensure minimal venting occurs during active and planned maintenance activities. Below is a description of common maintenance practices, and the steps Cimarex takes to limit venting exposure.

- **Workovers:**
 - Always strive to kill well when performing downhole maintenance.
 - If vapors or trapped pressure is present and must be relieved then:
 - Initial blowdown to production facility:
 - Route vapors to LP flare if possible/applicable
 - Blowdown to portable gas buster tank:
 - Vent to existing or portable flare if applicable.

- **Stock tank servicing:**
 - Minimize time spent with thief hatches open.
 - When cleaning or servicing via manway, suck tank bottoms to ensure minimal volatiles exposed to atmosphere.
 - Connect vacuum truck to low pressure flare while cleaning bottoms to limit venting.
 - Isolate the vent lines and overflows on the tank being serviced from other tanks.

- **Pressure vessel/compressor servicing and associated blowdowns:**
 - Route to flare where possible.
 - Blow vessel down to minimum available pressure via pipeline, prior to venting vessel.
 - Preemptively changing anodes to reduce failures and extended corrosion related servicing.
 - When cleaning or servicing via manway, suck vessel bottoms to ensure minimal volatiles exposed to atmosphere.

- **Flare/combustor maintenance:**
 - Minimize downtime by coordinating with vendor and Cimarex staff travel logistics.
 - Utilizing preventative and predictive maintenance programs to replace high wear components before failure.
 - Because the flare/combustor is the primary equipment used to limit venting practices, ensure flare/combustor is properly maintained and fully operational at all times via routine maintenance, temperature telemetry, onsite visual inspections.

The Cimarex expectation is to limit all venting exposure. Equipment that may not be listed on this document is still expected to be maintained and associated venting during such maintenance minimized.




CERTIFICATE OF QUALITY

LTYY/QR-5.7.1-19B

№: LT2024-156-001

Customer Name			
Product Name	Choke And Kill Hose		
Product Specification	3"×10000psi×35ft (10.67m)	Quantity	1PCS
Serial Number	VTC-7660257	FSL	FSL3
customer number	PO890145-001	Standard	API Spec 16C 3 rd edition
Temperature Range	-29℃ ~ +121℃	Inspection date	2024.09.03

Inspection Items	Inspection results
Appearance Checking	In accordance with API Spec 16C 3 rd edition
Size and Lengths	In accordance with API Spec 16C 3 rd edition
Dimensions and Tolerances	In accordance with API Spec 16C 3 rd edition
End Connections: 4-1/16"×10000psi Integral flange for sour gas service	In accordance with API Spec 6A 21 st edition
End Connections: 4-1/16"×10000psi Integral flange for sour gas service	In accordance with API Spec 17D 3 rd edition
Hydrostatic Testing	In accordance with API Spec 16C 3 rd edition
product Marking	In accordance with API Spec 16C 3 rd edition

Inspection conclusion	The inspected items meet standard requirements of API Spec 16C 3 rd edition				
Remarks	16C-0403 				
Approver	Jane C	Auditor	Alice D	Inspector	Leo W

LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD





HYDROSTATIC TESTING REPORT

LTYT/QR-5.7.1-28

No: 24090301

Product Name	Choke And Kill Hose	Standard	API Spec 16C 3 rd edition
Product Specification	3"×10000psi×35ft (10.67m)	Serial Number	VTC-7660257
Inspection Equipment	MTU-BS-1600-3200-E	Test medium	Water
customer number	PO890145-001	Inspection Date	2024.08.30

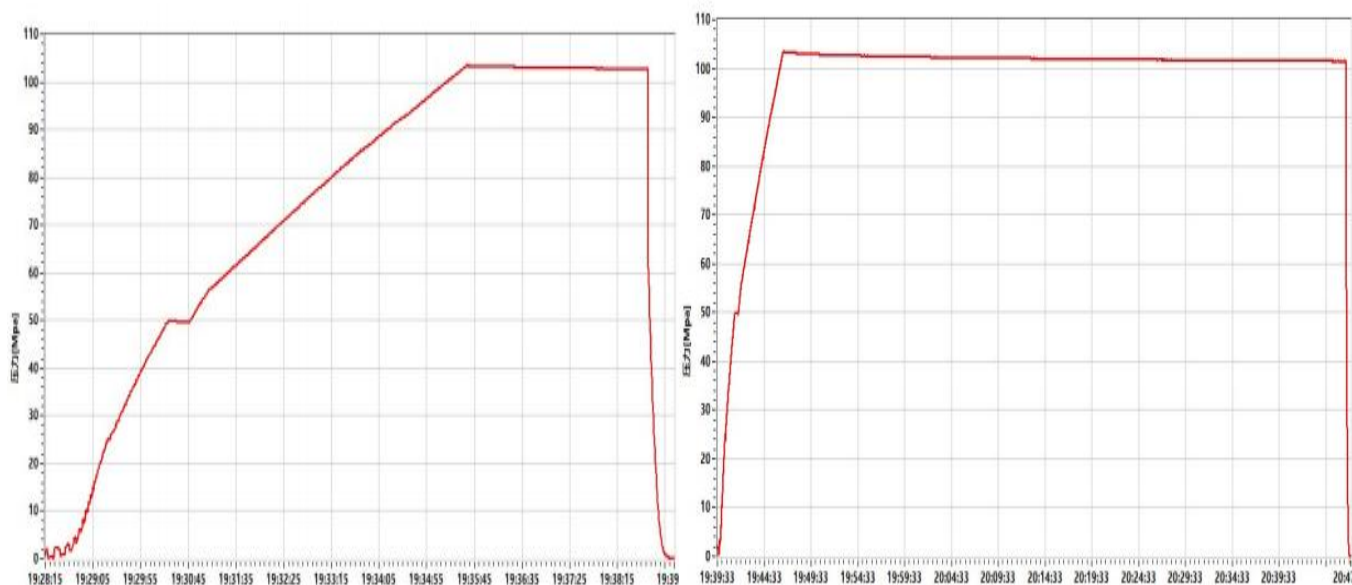
Rate of length change

Standard requirements	At working pressure ,the rate of length change should not more than ±2%
Testing result	10000psi (69.0MPa) ,Rate of length change 0.6%

Hydrostatic testing

Standard requirements	At 1.5 times working pressure, the initial pressure-holding period of not less than three minutes, the second pressure-holding period of not less than one hour, no leakage.
Testing result	15000psi (103.5MPa), 3 min for the first time, 60 min for the second time, no leakage

Graph of pressure testing:



Conclusion	The inspected items meet standard requirements of API Spec 16C 3 rd edition		16C-0403	
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Approver	Jane C	Auditor	Alice D	Inspector	Leo W
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LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD	
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CERTIFICATE OF CONFORMANCE

№:LT24090307

Product Name: Choke And Kill Hose

Product Specification: 3"×10000psi×35ft (10.67m)

Serial Number: VTC-7660257

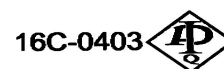
customer number: PO890145-001

End Connections: 4-1/16"×10000psi Integral flange for sour gas service

The Choke And Kill Hose assembly was produced by LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD.in Sep,2024, and inspected by LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD. according to API Spec 16C 3rd edition on Sep 3, 2024. The overall condition is good. This is to certify that the Choke And Kill Hose complies with all current standards and specifications for API Spec 16C 3rd edition .

QC Manager: Jane C

Date:Sep 3, 2024



LUOHE LETONE HYDRAULICS TECHNOLOGY CO.,LTD	
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API BTC

Coupling	Pipe Body
Grade: J55 (Casing)	Grade: J55 (Casing)
Body: Bright Green	1st Band: Bright Green
1st Band: White	2nd Band: -
2nd Band: -	3rd Band: -
3rd Band: -	4th Band: -

Outside Diameter	16.000 in.	Wall Thickness	0.375 in.	Grade	J55 (Casing)
Min. Wall Thickness	87.50 %	Pipe Body Drift	API Standard	Type	Casing
Connection OD Option	Regular				

Pipe Body Data

Geometry		Performance	
Nominal OD	16.000 in.	Drift	15.062 in.
Wall Thickness	0.375 in.	Plain End Weight	62.64 lb/ft
Nominal Weight	65 lb/ft	OD Tolerance	API
Nominal ID	15.250 in.		
		SMYS	55,000 psi
		Min UTS	75,000 psi
		Body Yield Strength	1012 x1000 lb
		Min. Internal Yield Pressure	2260 psi
		Collapse Pressure	630 psi
		Max. Allowed Bending	16 °/100 ft

Connection Data

Geometry		Performance	
Thread per In	5	Joint Strength	1031 x1000 lb
Connection OD	17 in.	Coupling Face Load	892 x1000 lb
Hand Tight Stand Off	0.875 in.	Internal Pressure Capacity	2260 psi

Notes

For products according to API Standards 5CT & 5B; Performance calculated considering API Technical Report 5C3 (Sections 9 & 10) equations. For geometrical and steel grades combinations not considered in the API Standards 5CT and/or 5B; Performance calculations indirectly derived from API Technical Report 5C3 (Sections 9 & 10) equations. Couplings OD are shown according to current API 5CT 10th Edition.

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SUPO Data Report

03/06/2026

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

APD ID: 10400108158	Submission Date: 11/18/2025	Highlighted data reflects the most recent changes Show Final Text
Operator Name: COTERRA ENERGY OPERATING CO		
Well Name: EASTWOOD 36-25 FEDERAL COM	Well Number: 404H	
Well Type: OIL WELL	Well Work Type: Drill	

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Eastwood_Existing_Road_Plats_20251117144529.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT

Row(s) Exist? NO

ROW ID(s)

ID:

Do the existing roads need to be improved? YES

Existing Road Improvement Description: Resurfacing of existing roads and upgrades will be completed to accommodate equipment and safe general access if needed.

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

EASTWOOD_36_FEDERAL_COM_CTB_PLAT_PACKAGE_new_access_roads_20251117144550.pdf

New road type: COLLECTOR,LOCAL

Length: 441 Feet **Width (ft.):** 30

Max slope (%): 1 **Max grade (%):** 1

Army Corp of Engineers (ACOE) permit required? N

ACOE Permit Number(s):

New road travel width: 20

New road access erosion control: Best management practices will be used for E&S controls.

New road access plan or profile prepared? N

New road access plan

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Access road engineering design? N

Access road engineering design

Turnout? N

Access surfacing type: GRAVEL

Access topsoil source: BOTH

Access surfacing type description:

Access onsite topsoil source depth: 4

Offsite topsoil source description: Both onsite and offsite if necessary.

Onsite topsoil removal process: The topsoil shall be stripped and salvaged to provide for sufficient quantities to be respread to a depth of 4" as determined in the onsite, as needed to disturbed areas needed reclamation. Topsoil shall be stockpiled separately from subsoil materials.

Access other construction information: NA

Access miscellaneous information: NA

Number of access turnouts:

Access turnout map:

Drainage Control

New road drainage crossing: CULVERT

Drainage Control comments: Best management practices will be used for E&S controls.

Road Drainage Control Structures (DCS) description: Drainage structures or drainage dips will be placed in natural drainage ways.

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Existing Well map Attachment:

Eastwood_1_mile_Radius_Map_20251117144947.pdf

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description:

Production Facilities map:

EASTWOOD_36_FEDERAL_COM_CTB_PLAT_PACKAGE_11_13_25_20260122083444.pdf

Eastwood_Bulk_Line_Plats_20260122083458.pdf

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Section 5 - Location and Types of Water Supply

Water Source Table

Water source type: OTHER

Describe type: Freshwater from Kenneth Smith ranch

Water source use type: SURFACE CASING
INTERMEDIATE/PRODUCTION CASING

Source latitude: **Source longitude:**

Source datum:

City:

Water source permit type: PRIVATE CONTRACT

Water source transport method: TRUCKING

Source land ownership: COMMERCIAL

Source transportation land ownership: FEDERAL

Water source volume (barrels): 5000 **Source volume (acre-feet):** 0.64446548

Source volume (gal): 210000

Water source and transportation

Hamon_Pond_to_Eastwood_Water_Route_20250826093626.pdf

Water source comments: Water will be sourced from the Coterra Hamon Pond 32.584004, -103.607159

New water well? N

New Water Well Info

Well latitude: **Well Longitude:** **Well datum:**

Well target aquifer:

Est. depth to top of aquifer(ft): **Est thickness of aquifer:**

Aquifer comments:

Aquifer documentation:

Well depth (ft): **Well casing type:**

Well casing outside diameter (in.): **Well casing inside diameter (in.):**

New water well casing? **Used casing source:**

Drilling method: **Drill material:**

Grout material: **Grout depth:**

Operator Name: COTERRA ENERGY OPERATING CO		
Well Name: EASTWOOD 36-25 FEDERAL COM	Well Number: 404H	

Casing length (ft.): **Casing top depth (ft.):**

Well Production type: **Completion Method:**

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Using any construction materials: YES

Construction Materials description: Caliche will be obtained from the actual well site if available. In the event that no caliche is found onsite, caliche will be hauled in from BLM-approved caliche pit in Sec 4 SWSW 19S, 34E

Construction Materials source location

Section 7 - Methods for Handling

Waste type: SEWAGE

Waste content description: Human waste

Amount of waste: 300 gallons

Waste disposal frequency : Weekly

Safe containment description: Waste will be properly contained and disposed of properly at a state approved disposal facility.

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** PRIVATE

Disposal type description:

Disposal location description: A licensed 3rd party contractor will be used to haul and dispose human waste to City of Toyah TX waste water facility.

Waste type: DRILLING

Waste content description: Drilling Fluids, drill cuttings, water and other waste produced from the well during drilling operations.

Amount of waste: 15000 barrels

Waste disposal frequency : Weekly

Safe containment description: Drilling waste will be contained in appropriate secondary containment.

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Haul to R360 Environmental Solutions, 4507 Carlsbad Hwy, Hobbs, NM 88240

Operator Name: COTERRA ENERGY OPERATING CO
Well Name: EASTWOOD 36-25 FEDERAL COM **Well Number:** 404H

Waste type: GARBAGE

Waste content description: Garbage and trash produced during drilling and completion operations.

Amount of waste: 32500 pounds

Waste disposal frequency : Weekly

Safe containment description: A waste will be stored in appropriate and approved containment prior to disposal.

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL **Disposal location ownership:** COMMERCIAL FACILITY

Disposal type description:

Disposal location description: A licensed 3rd party hauls trash to Lea County Landfill.

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit? NO

Reserve pit length (ft.) Reserve pit width (ft.)

Reserve pit depth (ft.) Reserve pit volume (cu. yd.)

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? N

Description of cuttings location

Cuttings area length (ft.) Cuttings area width (ft.)

Cuttings area depth (ft.) Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

Cuttings area liner

Cuttings area liner specifications and installation description

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Section 8 - Ancillary

Are you requesting any Ancillary Facilities?: N

Ancillary Facilities

Comments:

Section 9 - Well Site

Well Site Layout Diagram:

Eastwood_Location_Layout_Plats_20251117145110.pdf

Eastwood_Surface_Use_Plats_20251117145110.pdf

Eastwood_Reclamation_Plats_20251117145110.pdf

Comments: The location showing access roads onto the pad and orientation of the rig with respect to the pad and other facilities are shown on Typical Rig Layout, Exhibit K for each well.

Section 10 - Plans for Surface

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name: Eastwood 36-25 Federal Com

Multiple Well Pad Number: E2E2 Pad

Recontouring

Eastwood_Reclamation_Plats_20251117145129.pdf

Drainage/Erosion control construction: Pad construction will include drainage control by re-routing drainages around the pad and installing culverts or low water crossings where needed. Erosion control techniques will be used where needed to minimize wind and water erosion and sedimentation loading prior to vegetation establishment.

Drainage/Erosion control reclamation: Area wide drainage will be stabilized and restored so that surface runoff flows, and gradients are returned to the condition present prior to development. Drainage basins will have similar features found in nearby, properly functioning basins.

Well pad proposed disturbance (acres): 6.732	Well pad interim reclamation (acres): 2.572	Well pad long term disturbance (acres): 4.16
Road proposed disturbance (acres): 0.304	Road interim reclamation (acres): 0	Road long term disturbance (acres): 0.304
Powerline proposed disturbance (acres): 1.619	Powerline interim reclamation (acres): 1.619	Powerline long term disturbance (acres): 0
Pipeline proposed disturbance (acres): 1.389	Pipeline interim reclamation (acres): 1.389	Pipeline long term disturbance (acres): 0
Other proposed disturbance (acres): 6.28	Other interim reclamation (acres): 0	Other long term disturbance (acres): 6.28
Total proposed disturbance: 16.324	Total interim reclamation: 5.58	Total long term disturbance: 10.744

Disturbance Comments: BLM recommended seed mix will be used for reclamation purposes.

Reconstruction method: Areas to be reclaimed will be graded to approximate original contours and to blend in with adjacent topography. Graded surfaces will be suitable for the replacement of uniform depth of topsoil, will promote cohesion between subsoil and topsoil layers, will reduce wind erosion, and will facilitate moisture capture. Specialist grading techniques may be applied if warranted and could include slope

Operator Name: COTERRA ENERGY OPERATING CO	
Well Name: EASTWOOD 36-25 FEDERAL COM	Well Number: 404H

rounding, star-step grading/tracing and/or contour furrowing.

Topsoil redistribution: After compaction relief (ripping/discing) all topsoil will be redistributed on the reclaimed area to a predisturbance depth. Topsoil is typically redistributed with a scarper or front-end loader which leaves friable surface to work with. Waterbars and erosion control devices will be installed on reclaimed areas, as necessary, to control topsoil erosion.

Soil treatment: As needed

Existing Vegetation at the well pad: N/A

Existing Vegetation at the well pad

Existing Vegetation Community at the road: N/A

Existing Vegetation Community at the road

Existing Vegetation Community at the pipeline: N/A

Existing Vegetation Community at the pipeline

Existing Vegetation Community at other disturbances: N/A

Existing Vegetation Community at other disturbances

Non native seed used? N

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? N

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? N

Seed harvest description:

Seed harvest description attachment:

[Seed](#)

[Seed Table](#)

Seed Summary	
Seed Type	Pounds/Acre

Total pounds/Acre:

Seed reclamation

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Operator Contact/Responsible Official

First Name:

Last Name:

Phone:

Email:

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? N

Existing invasive species treatment description:

Existing invasive species treatment

Weed treatment plan description: Weed treatment as needed.

Weed treatment plan

Monitoring plan description: Monitoring will be done in accordance with BLM reclamation guidelines.

Monitoring plan

Success standards: Success standards will be done in accordance with BLM reclamation guidelines.

Pit closure description: n/a

Pit closure attachment:

Section 11 - Surface

Disturbance type: NEW ACCESS ROAD

Describe:

Surface Owner: STATE GOVERNMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office: SANTE FE

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Disturbance type: PIPELINE

Describe:

Surface Owner: STATE GOVERNMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office: SANTA FE

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Disturbance type: WELL PAD

Describe:

Surface Owner: STATE GOVERNMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office: SANTA FE

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Disturbance type: OTHER

Describe: Central Tank Battery

Surface Owner: STATE GOVERNMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office: SANTA FE

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Section 12 - Other

Right of Way needed? N

Use APD as ROW?

ROW Type(s):

ROW

SUPO Additional Information:

Use a previously conducted onsite? N

Previous Onsite information:

Other SUPO

BEGINNING AT THE INTERSECTION OF U.S. HIGHWAY 62/180 AND SMITH RANCH RD TO THE NORTHWEST (LOCATED AT NAD 83 LATITUDE 32.5971° AND LONGITUDE -103.6060°) PROCEED IN A NORTHWESTERLY DIRECTION APPROXIMATELY 1.6 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE EAST; TURN RIGHT AND PROCEED IN AN EASTERLY DIRECTION APPROXIMATELY 0.4 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE SOUTHEAST; TURN RIGHT AND PROCEED IN A SOUTHEASTERLY DIRECTION APPROXIMATELY 0.3 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE SOUTH; TURN RIGHT AND PROCEED IN A SOUTHERLY DIRECTION APPROXIMATELY 0.2 TO THE PROPOSED LOCATION.

TOTAL DISTANCE FROM THE INTERSECTION OF U.S. HIGHWAY 62/180 AND SMITH RANCH RD TO THE NORTHWEST (LOCATED AT NAD 83 LATITUDE 32.5971° AND LONGITUDE -103.6060°) TO THE PROPOSED WELL LOCATION IS APPROXIMATELY 2.5 MILES.

REV: 1 10-30-25 T.I.R. (PAD MOVE & PAD NAME CHANGE)

COTERRA ENERGY OPERATING CO.

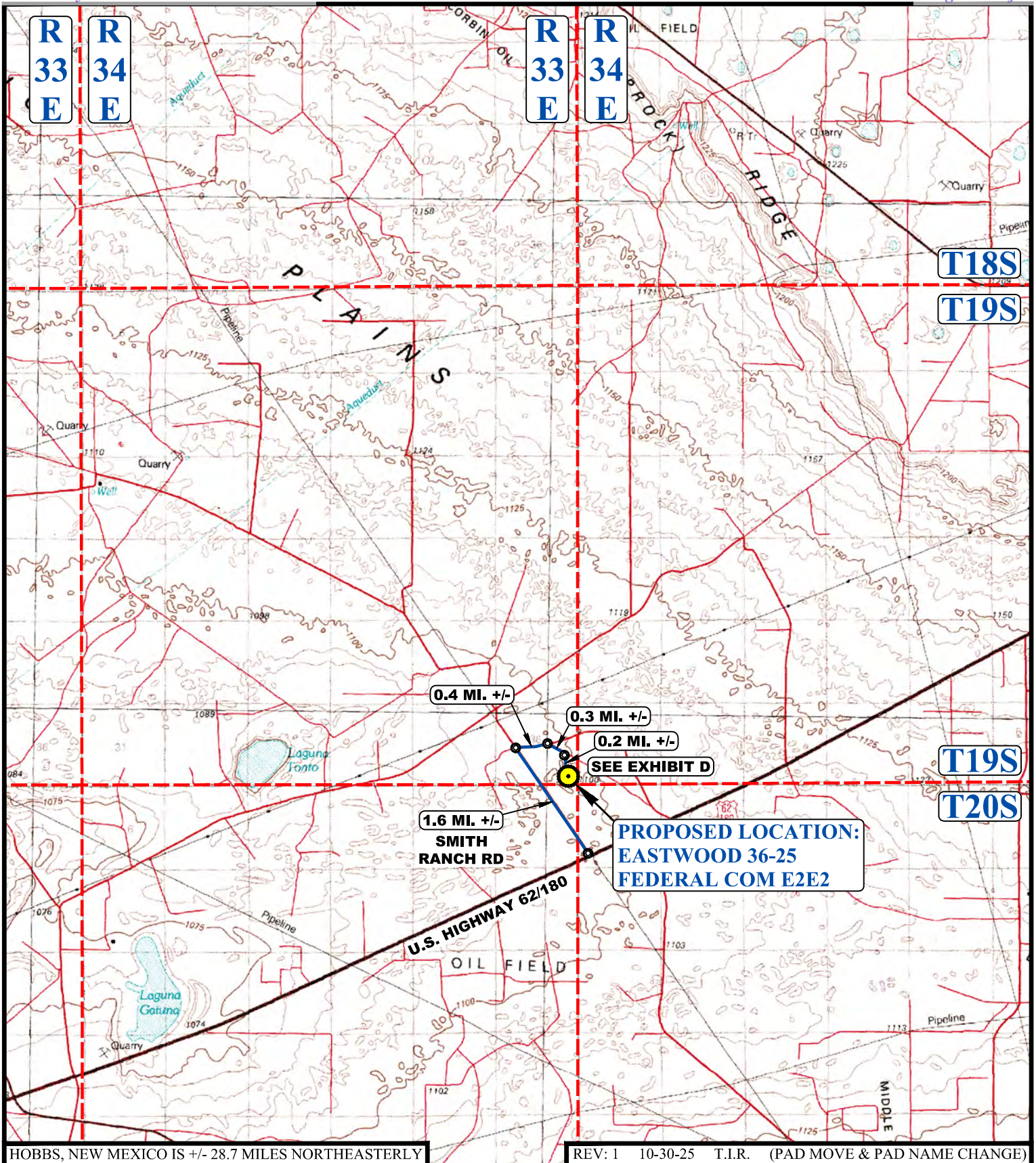
**EASTWOOD 36-25 FEDERAL COM E2E2
493' FSL 581' FEL (APPROX. CENTER OF PAD)
SE 1/4 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

SURVEYED BY	C.S., G.M.	10-24-25	
DRAWN BY	L.T.T.	08-14-25	
ROAD DESCRIPTION		EXHIBIT A	

UELS, LLC

Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017





HOBBS, NEW MEXICO IS +/- 28.7 MILES NORTHEASTERLY

REV: 1 10-30-25 T.I.R. (PAD MOVE & PAD NAME CHANGE)

LEGEND:

 PROPOSED LOCATION



COTERRA ENERGY OPERATING CO.

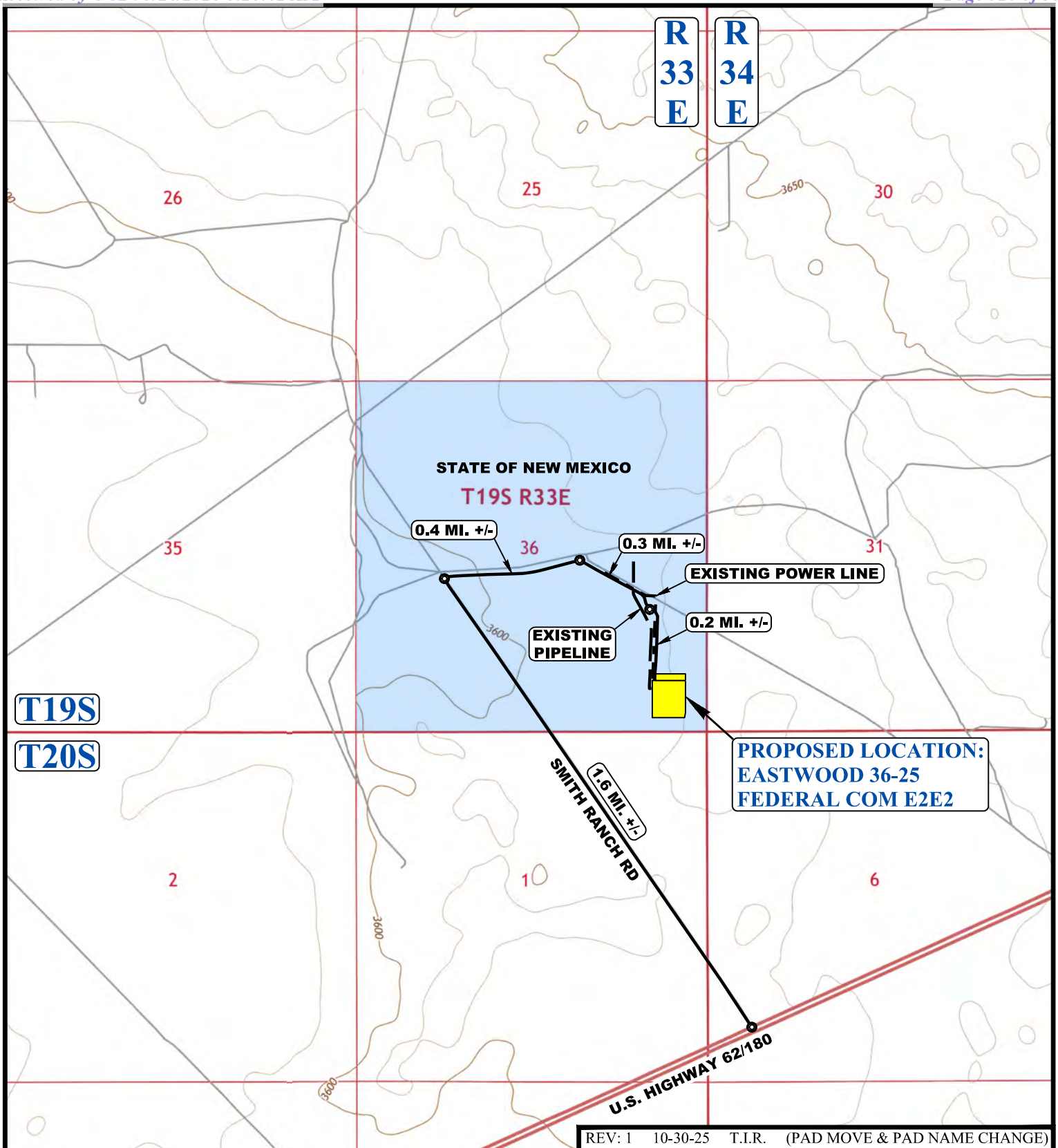
EASTWOOD 36-25 FEDERAL COM E2E2
493' FSL 581' FEL (APPROX. CENTER OF PAD)
SE 1/4 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	L.T.T.	08-14-25	1 : 100,000
PUBLIC ACCESS ROAD		EXHIBIT B	

UELS, LLC

Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017





REV: 1 10-30-25 T.I.R. (PAD MOVE & PAD NAME CHANGE)

NOTE: PARCEL DATA SHOWN HAS BEEN OBTAINED FROM VARIOUS SOURCES AND SHOULD BE USED FOR MAPPING, GRAPHIC AND PLANNING PURPOSES ONLY. NO WARRANTY IS MADE BY UINTAH ENGINEERING AND LAND SURVEYING (UELS) FOR ACCURACY OF THE PARCEL DATA.

LEGEND:

- EXISTING ROAD
- PROPOSED ROAD
- EXISTING PIPELINE
- EXISTING POWER LINE



COTERRA ENERGY OPERATING CO.

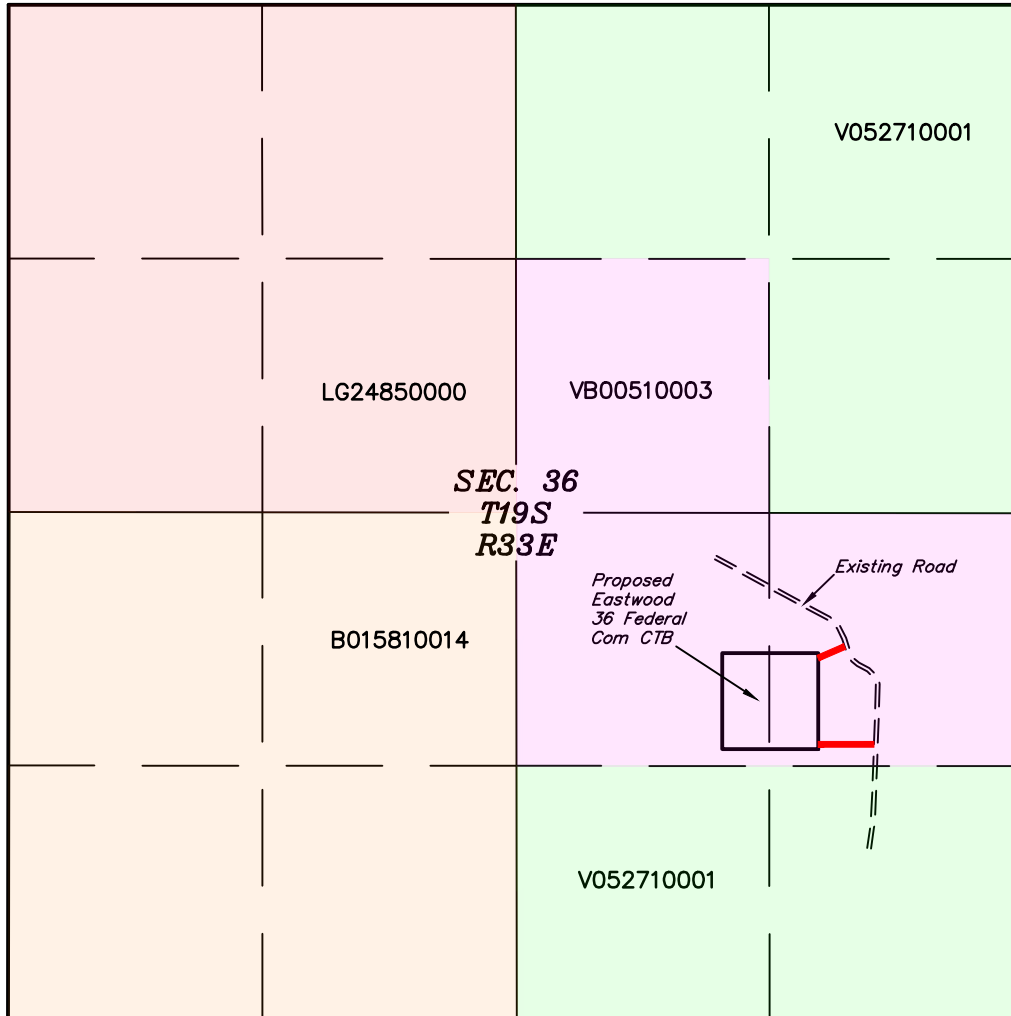
EASTWOOD 36-25 FEDERAL COM E2E2
 493' FSL 581' FEL (APPROX. CENTER OF PAD)
 SE 1/4 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
 LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	L.T.T.	08-14-25	1 : 24,000
NEW ROAD MAP			EXHIBIT D





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Vernal, UT 84078 * (435) 789-1017





LEGEND:

-  ACCESS ROAD CENTERLINE
-  SECTION LINE
-  1/4 SECTION LINE
-  1/16 SECTION LINE

NOTE:

- Colored areas represent State oil and gas leases.

NOTES:

- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)



COTERRA ENERGY OPERATING CO.

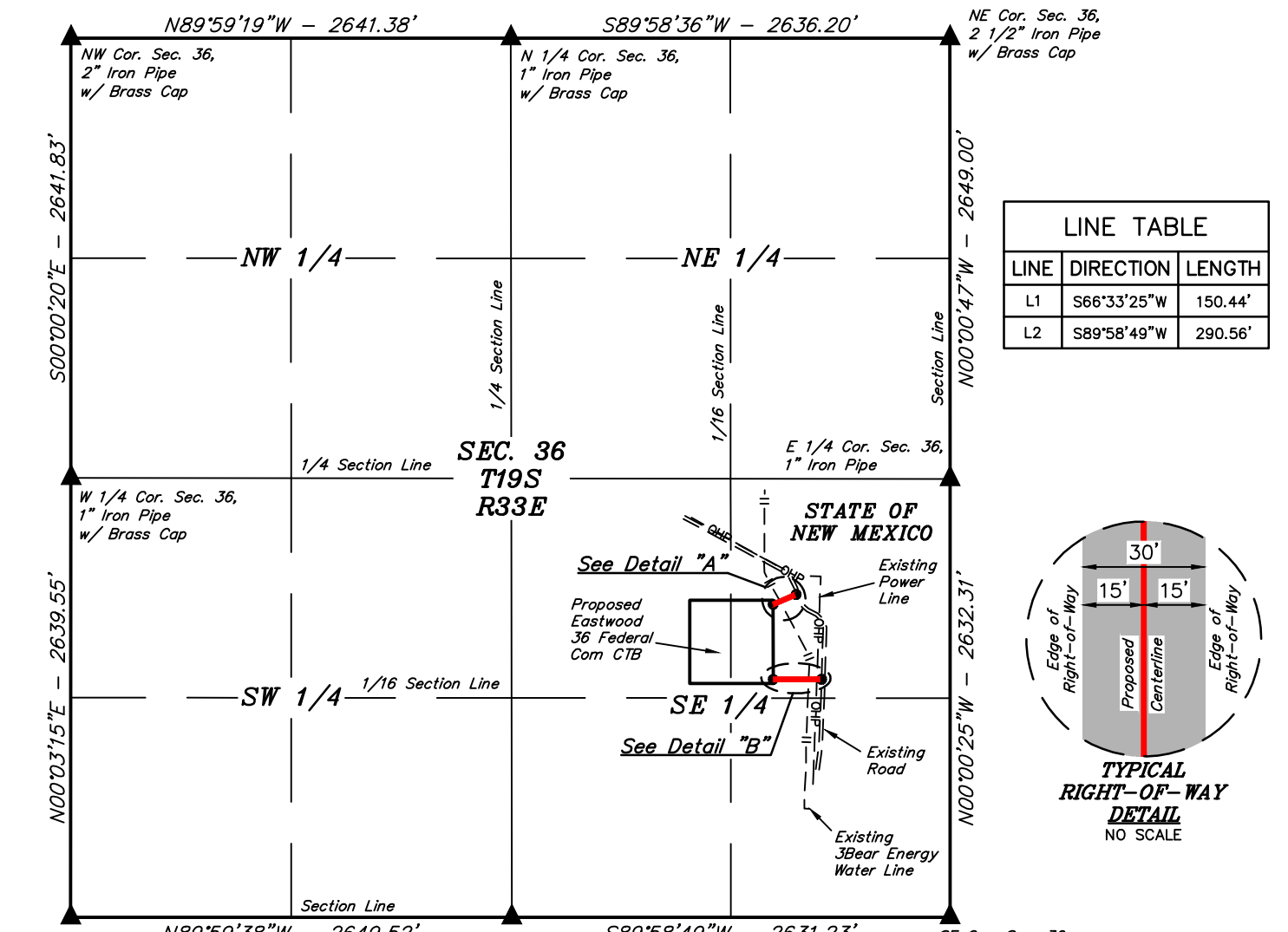
**EASTWOOD 36 FEDERAL COM CTB
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 1000'
FILE	COT01-25-0157		

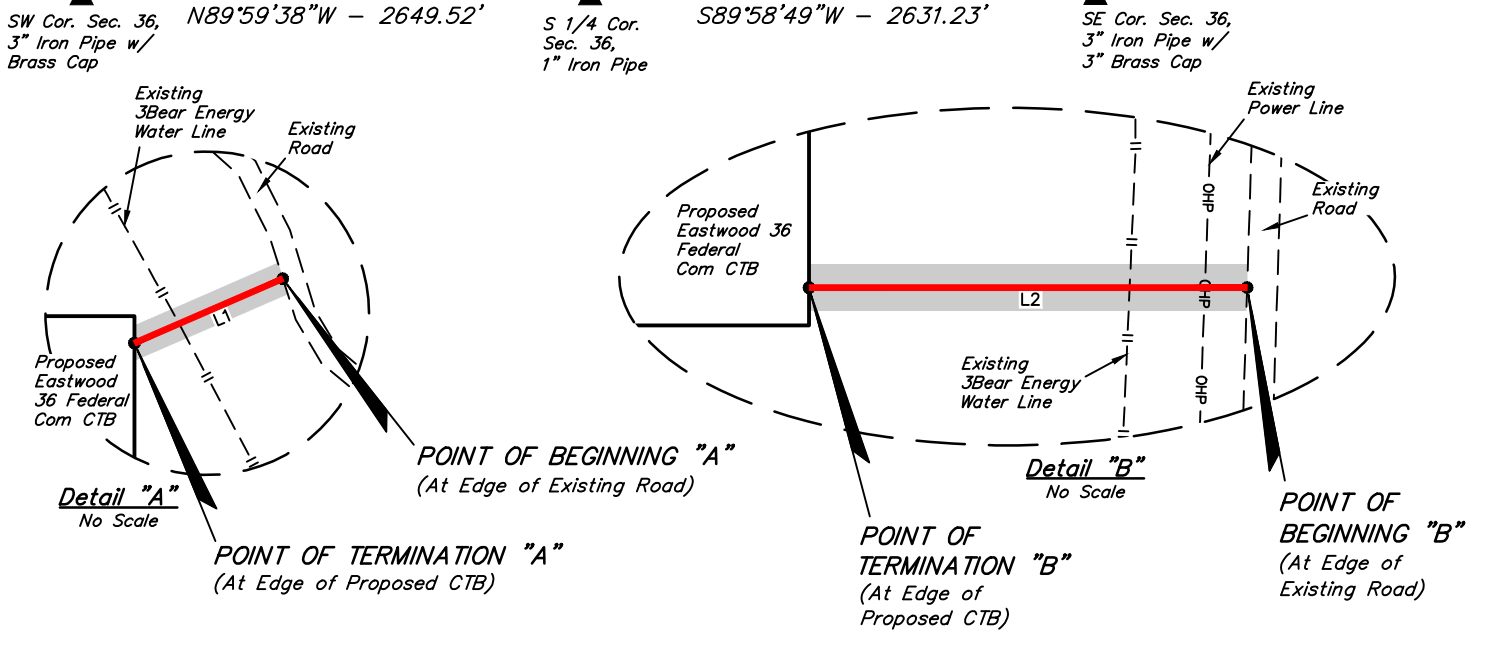
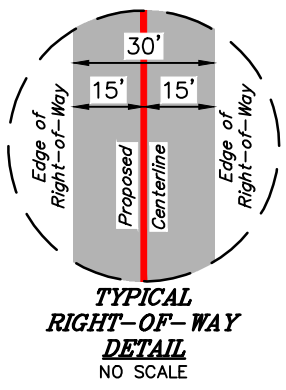
OVERALL ACCESS ROAD R-O-W



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Vernal, UT 84078 * (435) 789-1017



LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S66°33'25"W	150.44'
L2	S89°58'49"W	290.56'



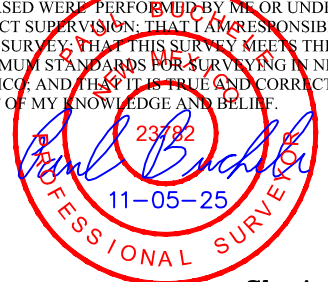
ACREAGE/LENGTH TABLE "A"			
LOCATION	FEET	RODS	ACRES
SEC. 36 (NE 1/4 SE 1/4)	150.44	9.12	0.104

ACREAGE/LENGTH TABLE "B"			
LOCATION	FEET	RODS	ACRES
SEC. 36 (NE 1/4 SE 1/4)	290.56	17.61	0.200



▲ = SECTION CORNERS LOCATED.

CERTIFICATE
THIS IS TO CERTIFY THAT THIS EASEMENT PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



Sheet 1 of 2

- NOTES:**
- The maximum grade of existing ground for the proposed access road "A" is ±0.53%.
 - The maximum grade of existing ground for the proposed access road "B" is ±0.93%.
 - Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)



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Vernal, UT 84078 * (435) 789-1017



COTERRA ENERGY OPERATING CO.
EASTWOOD 36 FEDERAL COM CTB
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	1" = 1000'
FILE	COT01-25-0157 - A1		

ACCESS ROAD R-O-W

EXHIBIT D

PROPOSED ROAD "A" RIGHT-OF-WAY DESCRIPTION

A 30' WIDE RIGHT-OF-WAY 15' ON EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE.

COMMENCING AT THE EAST 1/4 CORNER OF SECTION 36, T19S, R33E, N.M.P.M., FROM WHICH THE SOUTHEAST CORNER OF SAID SECTION 36 BEARS S00°00'25"E 2632.31', THENCE S53°06'39"W 1155.15' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF BEGINNING; THENCE S66°33'25"W 150.44' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF TERMINATION, WHICH BEARS S54°39'02"W 1301.93' FROM THE EAST 1/4 CORNER OF SAID SECTION 36. THE SIDE LINES OF SAID DESCRIBED RIGHT-OF-WAY BEING SHORTENED OR ELONGATED TO MEET THE GRANTOR'S PROPERTY LINES. CONTAINS 0.104 ACRES MORE OR LESS.

PROPOSED ROAD "B" RIGHT-OF-WAY DESCRIPTION

A 30' WIDE RIGHT-OF-WAY 15' ON EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE.

COMMENCING AT THE EAST 1/4 CORNER OF SECTION 36, T19S, R33E, N.M.P.M., FROM WHICH THE SOUTHEAST CORNER OF SAID SECTION 36 BEARS S00°00'25"E 2632.31', THENCE S32°39'32"W 1429.09' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF BEGINNING; THENCE S89°58'49"W 290.56' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF TERMINATION, WHICH BEARS S41°25'31"W 1604.72' FROM THE EAST 1/4 CORNER OF SAID SECTION 36. THE SIDE LINES OF SAID DESCRIBED RIGHT-OF-WAY BEING SHORTENED OR ELONGATED TO MEET THE GRANTOR'S PROPERTY LINES. CONTAINS 0.200 ACRES MORE OR LESS.

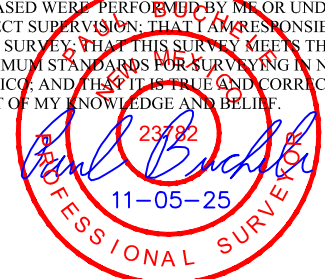
POINT OF BEGINNING ROAD "A" BEARS
S53°06'39"W 1155.15' FROM THE EAST 1/4
CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

POINT OF TERMINATION ROAD "A" BEARS
S54°39'02"W 1301.93' FROM THE EAST 1/4
CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

POINT OF BEGINNING ROAD "B" BEARS
S32°39'32"W 1429.09' FROM THE EAST 1/4
CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

POINT OF TERMINATION ROAD "B" BEARS
S41°25'31"W 1604.72' FROM THE EAST 1/4
CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

CERTIFICATE
THIS IS TO CERTIFY THAT THIS EASEMENT PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



Sheet 2 of 2

NOTES:

- The maximum grade of existing ground for the proposed access road "A" is ±0.53%.
- The maximum grade of existing ground for the proposed access road "B" is ±0.93%.
- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)

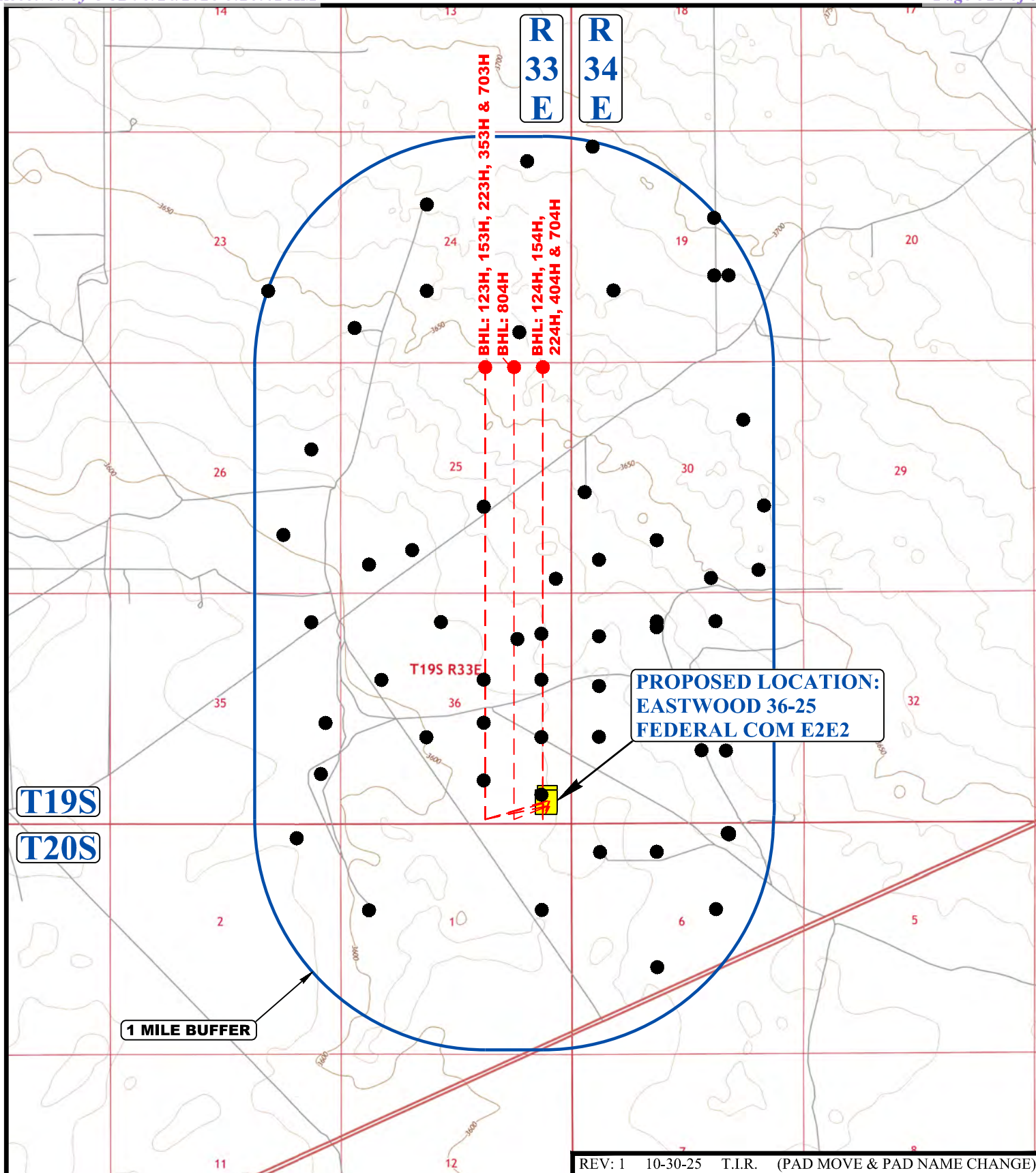
COTERRA ENERGY OPERATING CO.

**EASTWOOD 36 FEDERAL COM CTB
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	N/A
FILE	COT01-25-0157 - A2		
ACCESS ROAD R-O-W		EXHIBIT D	



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Vernal, UT 84078 * (435) 789-1017



REV: 1 10-30-25 T.I.R. (PAD MOVE & PAD NAME CHANGE)

LEGEND:

- EXISTING WELLS



COTERRA ENERGY OPERATING CO.

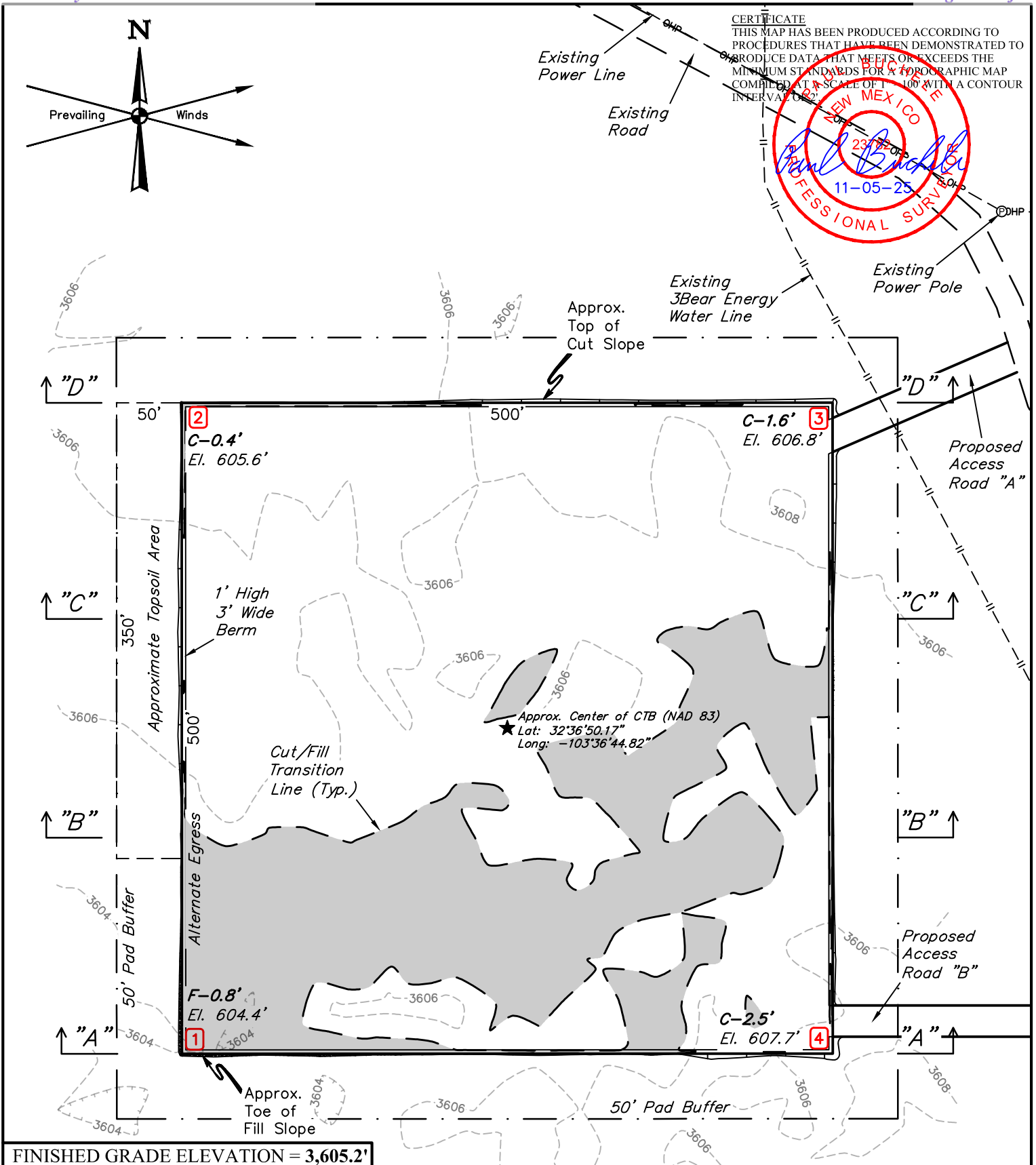
EASTWOOD 36-25 FEDERAL COM E2E2
 493' FSL 581' FEL (APPROX. CENTER OF PAD)
 SE 1/4 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
 LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	L.T.T.	08-14-25	1 : 36,000
1 MILE RADIUS MAP			EXHIBIT E

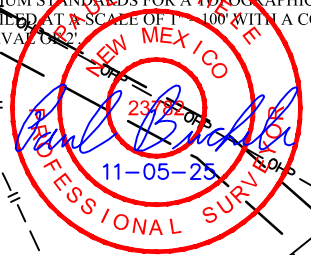
UELS, LLC

Corporate Office * 85 South 200 East
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CERTIFICATE
 THIS MAP HAS BEEN PRODUCED ACCORDING TO PROCEDURES THAT HAVE BEEN DEMONSTRATED TO PRODUCE DATA THAT MEETS OR EXCEEDS THE MINIMUM STANDARDS FOR A TOPOGRAPHIC MAP COMPILED AT A SCALE OF 1"=100' WITH A CONTOUR INTERVAL OF 2'



FINISHED GRADE ELEVATION = 3,605.2'

- NOTES:**
- Contours shown at 2' intervals.
 - Cut/Fill slopes 2:1 (Typ. except berm)
 - Underground utilities shown on this sheet are for visualization purposes only, actual locations to be determined prior to construction.
 - Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of W103°53'00" (NAD 83)

COTERRA ENERGY OPERATING CO.

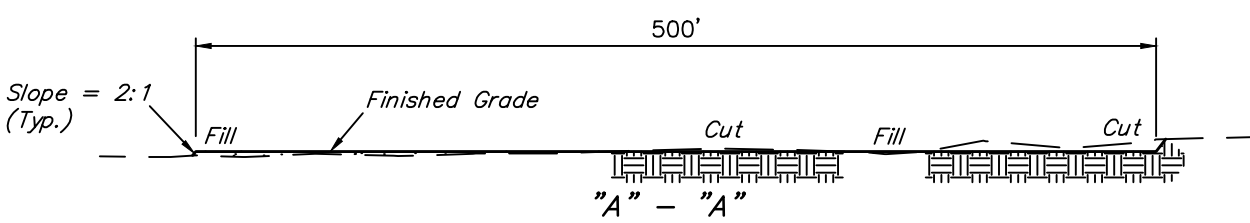
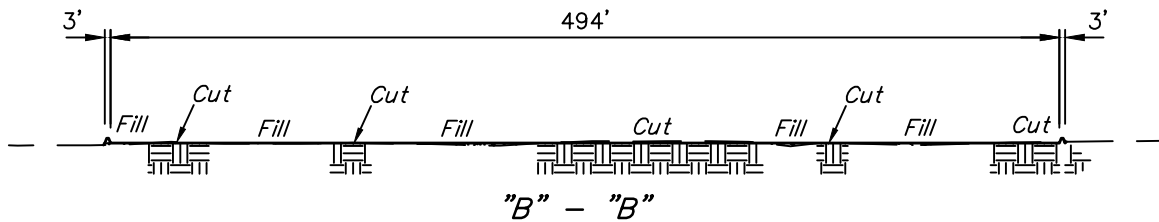
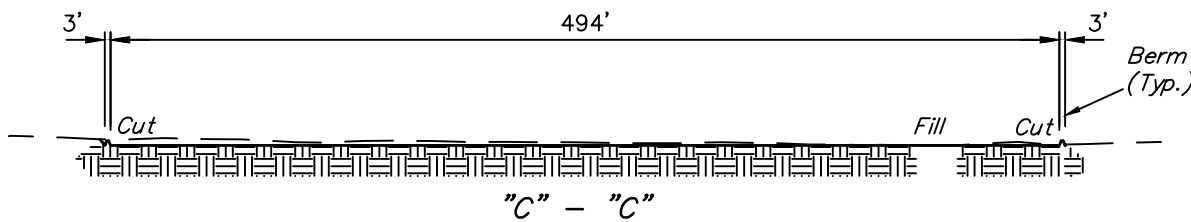
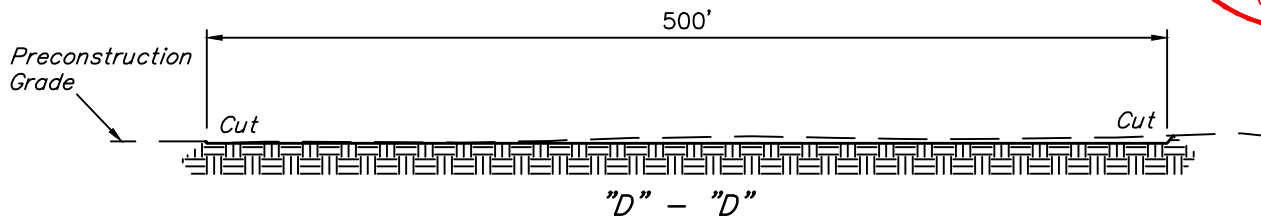
EASTWOOD 36 FEDERAL COM CTB
 1,654' FSL 1,312' FEL (APPROX. CENTER OF PAD)
 N 1/2 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
 LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	1" = 100'
LOCATION LAYOUT			EXHIBIT F



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1" = 40'
 X-Section Scale
 1" = 100'



APPROXIMATE EARTHWORK QUANTITIES	
(4") TOPSOIL STRIPPING	3,120 Cu. Yds.
REMAINING LOCATION	2,550 Cu. Yds.
TOTAL CUT	5,670 Cu. Yds.
FILL	2,550 Cu. Yds.
EXCESS MATERIAL	3,120 Cu. Yds.
TOPSOIL	3,120 Cu. Yds.
EXCESS UNBALANCE (After Interim Rehabilitation)	0 Cu. Yds.

APPROXIMATE SURFACE DISTURBANCE AREAS		
	DISTANCE	ACRES
PROPOSED PAD SURFACE USE AREA	NA	±6.280
30' WIDE ACCESS ROAD "A" R-O-W DISTURBANCE	±150.44'	±0.104
30' WIDE ACCESS ROAD "B" R-O-W DISTURBANCE	±290.56'	±0.200
TOTAL SURFACE USE AREA		±6.584

NOTES:

- Fill quantity includes 5% for compaction.
- Cut/Fill slopes 2:1 (Typ. except berm)

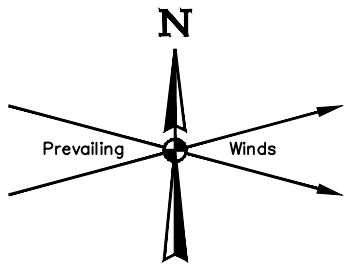
COTERRA ENERGY OPERATING CO.

EASTWOOD 36 FEDERAL COM CTB
 1,654' FSL 1,312' FEL (APPROX. CENTER OF PAD)
 N 1/2 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
 LEA COUNTY, NEW MEXICO

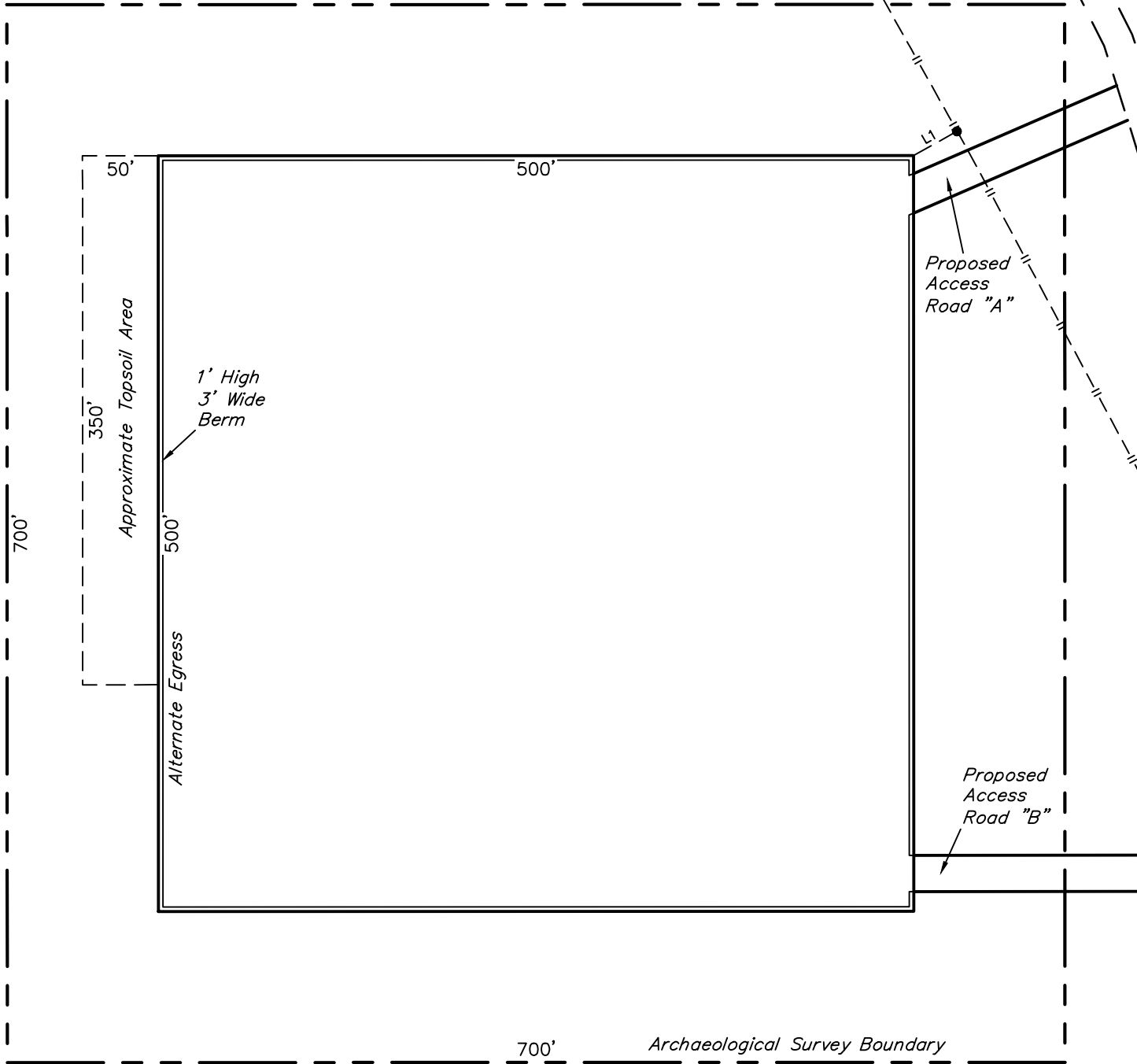
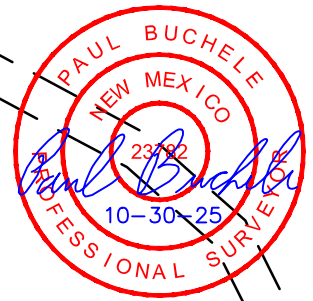
SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	AS SHOWN
TYPICAL CROSS SECTIONS			EXHIBIT F



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LINE TABLE		
LINE	DIRECTION	LENGTH
L1	N61°E	33'



NOTES:

- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of W103°53'00" (NAD 83)

COTERRA ENERGY OPERATING CO.

EASTWOOD 36 FEDERAL COM CTB
 1,654' FSL 1,312' FEL (APPROX. CENTER OF PAD)
 N 1/2 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
 LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	1" = 120'
ARCHAEOLOGICAL SURVEY BOUNDARY			EXHIBIT L



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BEGINNING AT THE INTERSECTION OF U.S. HIGHWAY 62/180 AND SMITH RANCH RD TO THE NORTHWEST (LOCATED AT NAD 83 LATITUDE 32.5971° AND LONGITUDE -103.6060°) PROCEED IN A NORTHWESTERLY DIRECTION APPROXIMATELY 1.6 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE EAST; TURN RIGHT AND PROCEED IN AN EASTERLY DIRECTION APPROXIMATELY 0.4 MILES TO THE JUNCTION OF THIS ROAD AND AN EXISTING ROAD TO THE SOUTHEAST; TURN RIGHT AND PROCEED IN A SOUTHEASTERLY DIRECTION APPROXIMATELY 0.2 MILES TO THE JUNCTION OF THIS ROAD AND THE PROPOSED ACCESS ROAD TO THE SOUTHWEST; TURN RIGHT AND FOLLOW ROAD FLAGS IN A SOUTHWESTERLY DIRECTION APPROXIMATELY 150' TO THE PROPOSED LOCATION.

TOTAL DISTANCE FROM THE INTERSECTION OF U.S. HIGHWAY 62/180 AND SMITH RANCH RD TO THE NORTHWEST (LOCATED AT NAD 83 LATITUDE 32.5971° AND LONGITUDE -103.6060°) TO THE PROPOSED CTB IS APPROXIMATELY 2.2 MILES.

COTERRA ENERGY OPERATING CO.

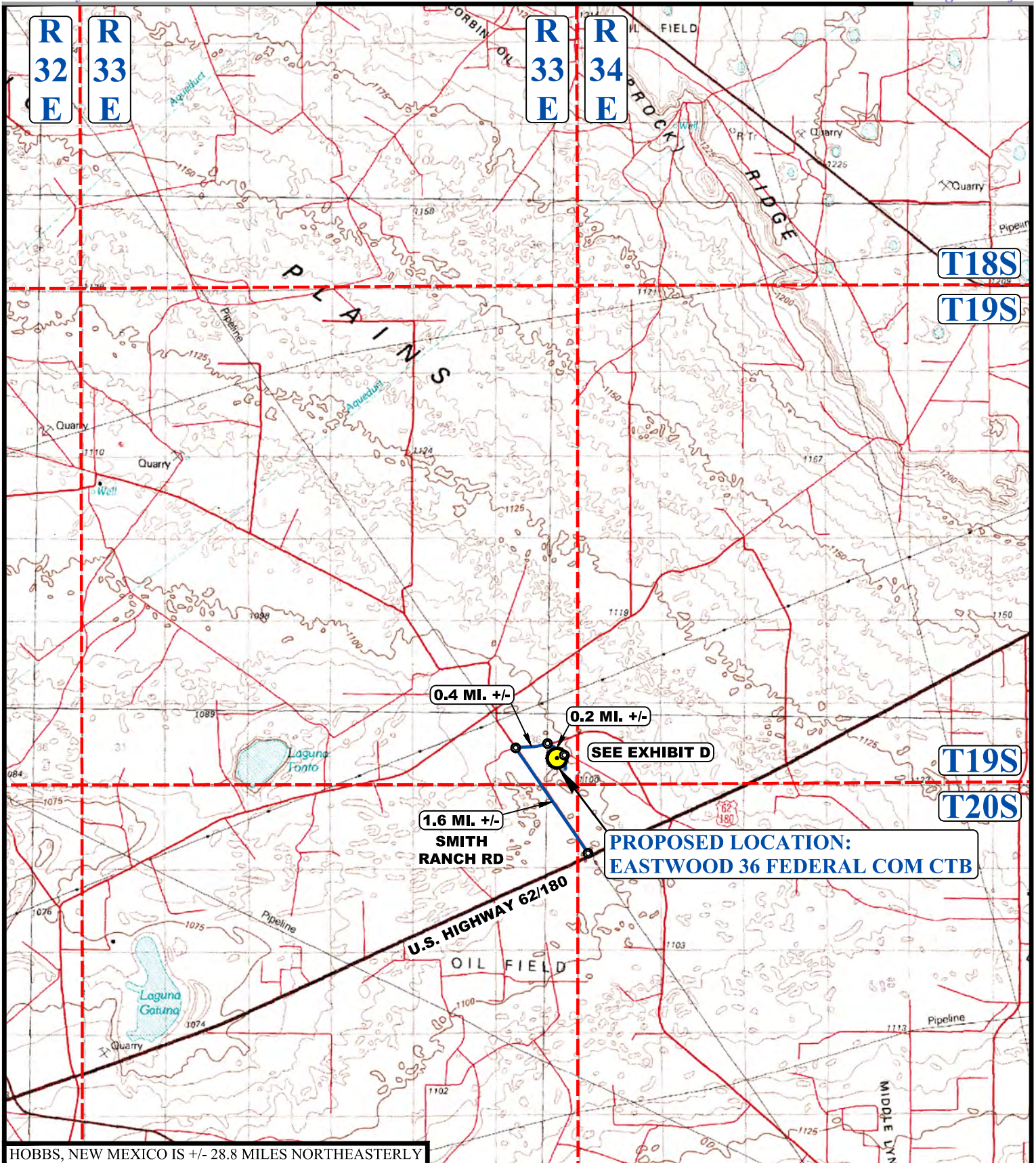
**EASTWOOD 36 FEDERAL COM CTB
1,654' FSL 1,312' FEL (APPROX. CENTER OF PAD)
N 1/2 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

SURVEYED BY	C.S., G.M.	10-24-25	
DRAWN BY	T.I.R.	11-05-25	
ROAD DESCRIPTION		EXHIBIT A	

UELS, LLC

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HOBBS, NEW MEXICO IS +/- 28.8 MILES NORTHEASTERLY

LEGEND:

 **PROPOSED LOCATION**



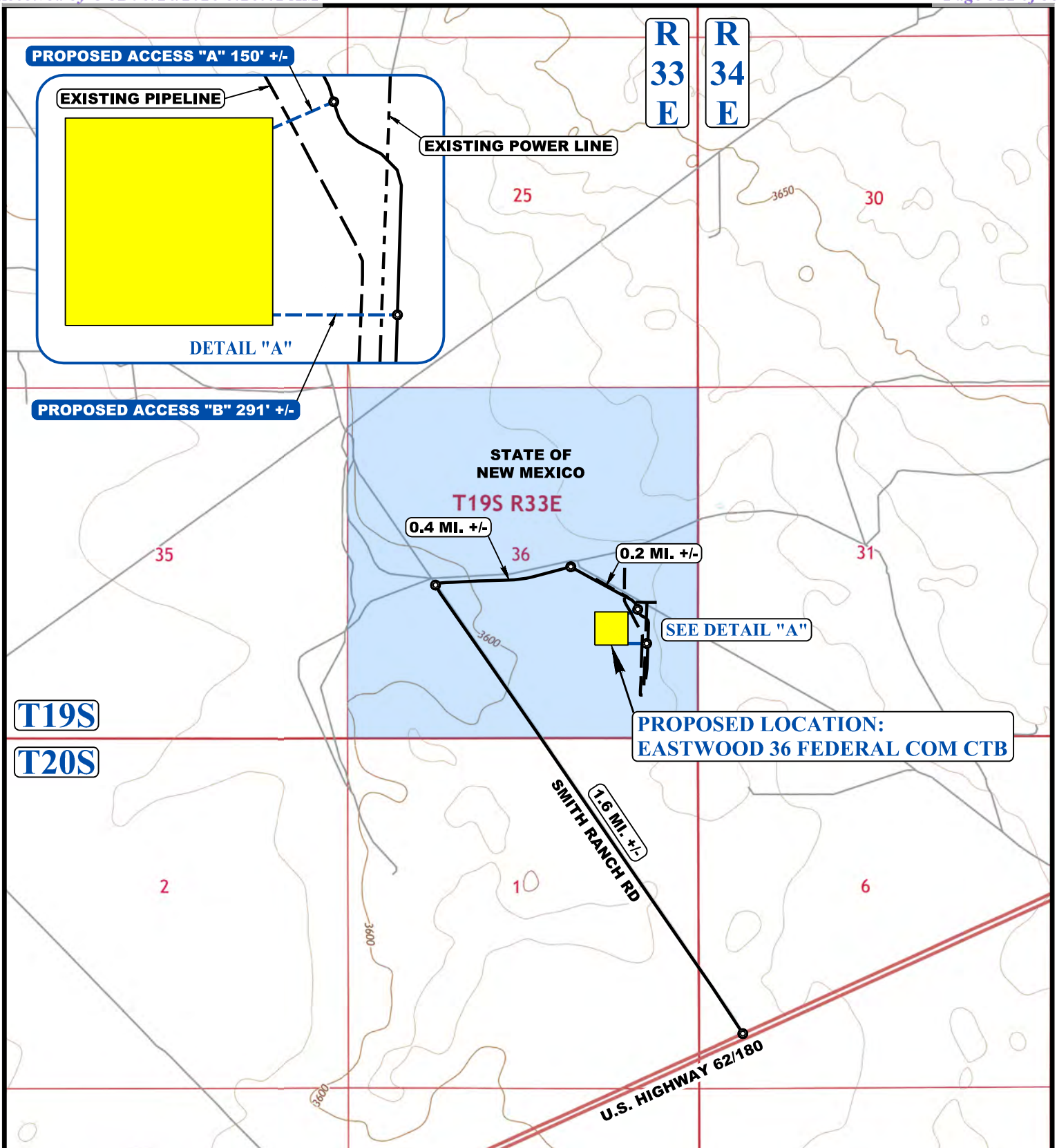
COTERRA ENERGY OPERATING CO.

EASTWOOD 36 FEDERAL COM CTB
1,654' FSL 1,312' FEL (APPROX. CENTER OF PAD)
N 1/2 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	1 : 100,000
PUBLIC ACCESS ROAD		EXHIBIT B	



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



NOTE: PARCEL DATA SHOWN HAS BEEN OBTAINED FROM VARIOUS SOURCES AND SHOULD BE USED FOR MAPPING, GRAPHIC AND PLANNING PURPOSES ONLY. NO WARRANTY IS MADE BY UINTAH ENGINEERING AND LAND SURVEYING (UELS) FOR ACCURACY OF THE PARCEL DATA.

LEGEND:

- EXISTING ROAD
- PROPOSED ROAD
- EXISTING PIPELINE
- EXISTING POWER LINE



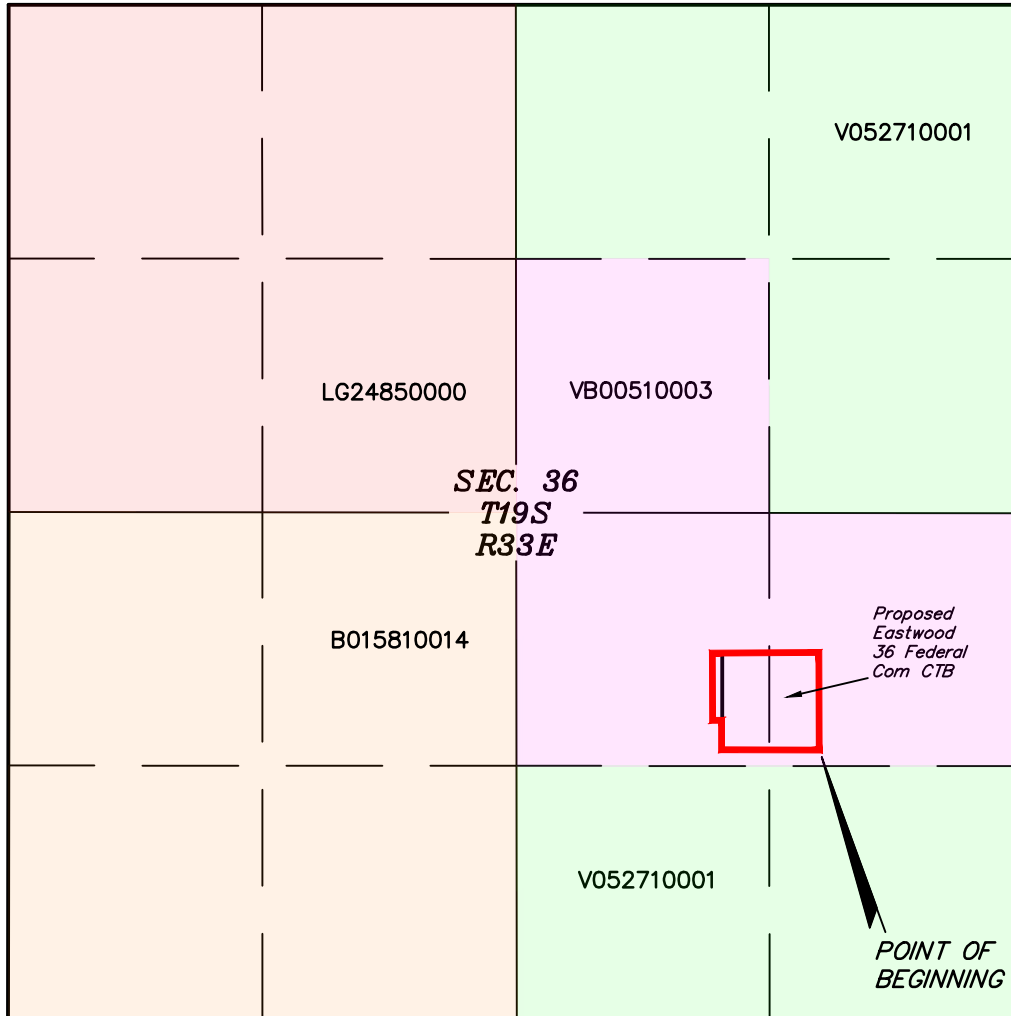
COTERRA ENERGY OPERATING CO.

EASTWOOD 36 FEDERAL COM CTB
 1,654' FSL 1,312' FEL (APPROX. CENTER OF PAD)
 N 1/2 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
 LEA COUNTY, NEW MEXICO





SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	1 : 24,000
NEW ROAD MAP			EXHIBIT D



UELS, LLC
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 Vernal, UT 84078 * (435) 789-1017



LEGEND:

-  SURFACE USE AREA
-  SECTION LINE
-  1/4 SECTION LINE
-  1/16 SECTION LINE

NOTE:

- Colored areas represent State oil and gas leases.

NOTES:

- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)



COTERRA ENERGY OPERATING CO.

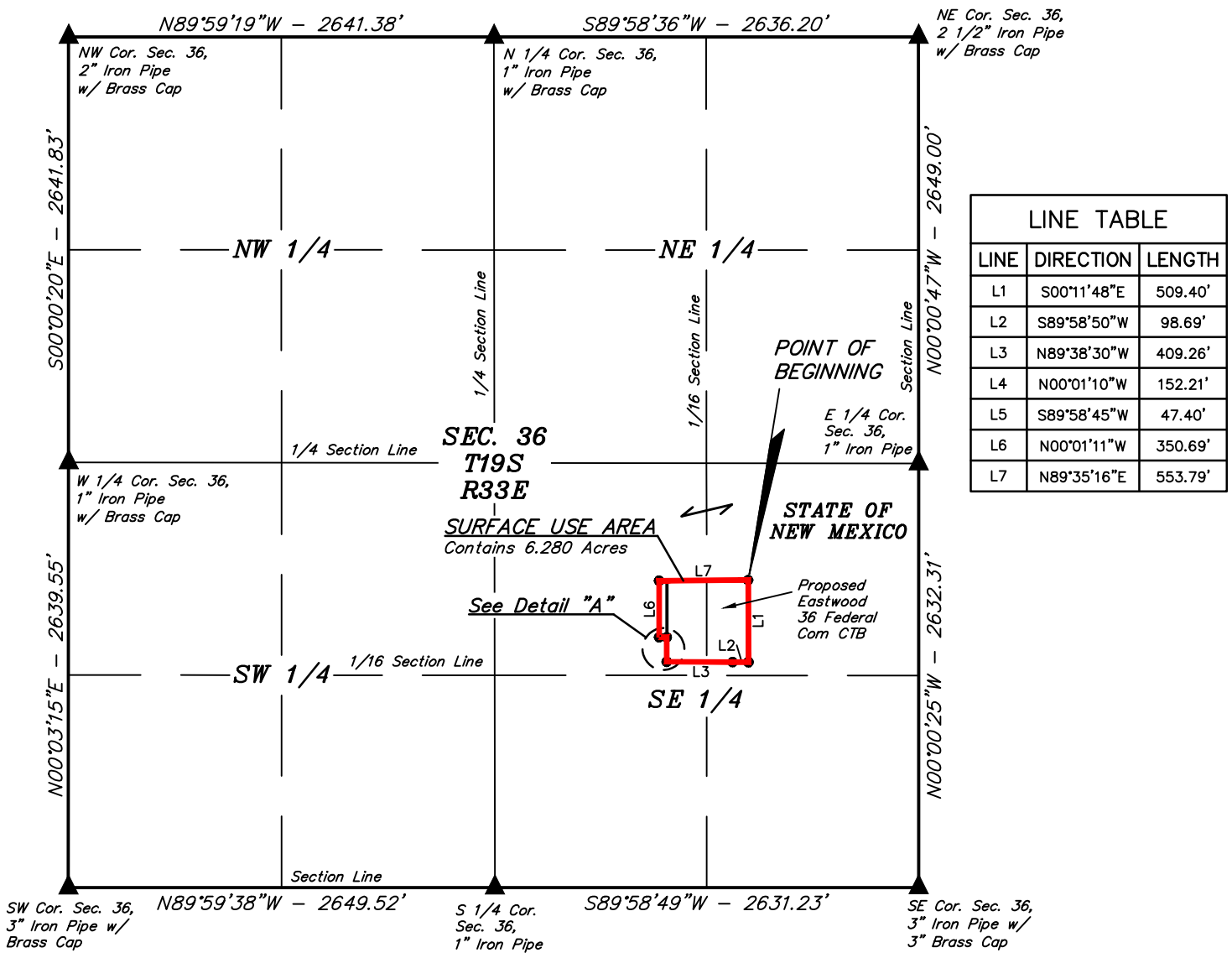
**EASTWOOD 36 FEDERAL COM CTB
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 1000'
FILE	COT01-25-0157		

OVERALL SURFACE USE AREA



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



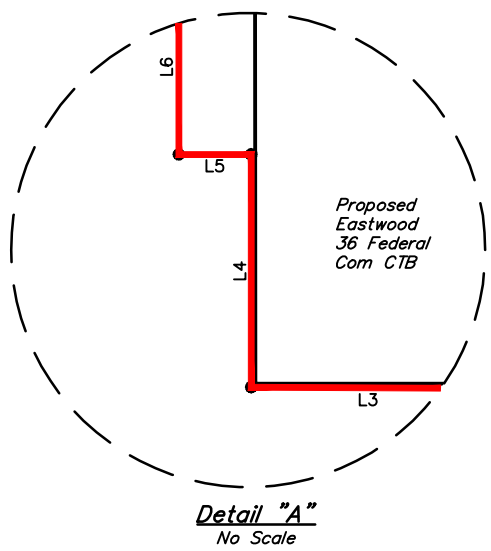
LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S00°11'48"E	509.40'
L2	S89°58'50"W	98.69'
L3	N89°38'30"W	409.26'
L4	N00°01'10"W	152.21'
L5	S89°58'45"W	47.40'
L6	N00°01'11"W	350.69'
L7	N89°35'16"E	553.79'

PROPOSED CTB SURFACE USE AREA DESCRIPTION

COMMENCING AT THE EAST 1/4 CORNER OF SECTION 36, T19S, R33E, N.M.P.M., FROM WHICH THE SOUTHEAST CORNER OF SAID SECTION 36 BEARS S00°00'25"E 2632.31', THENCE S55°37'41"W 1281.99' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF BEGINNING; THENCE S00°11'48"E 509.40'; THENCE S89°58'50"W 98.69'; THENCE N89°38'30"W 409.26'; THENCE N00°01'10"W 152.21'; THENCE S89°58'45"W 47.40'; THENCE N00°01'11"W 350.69'; THENCE N89°35'16"E 553.79' TO THE POINT OF BEGINNING. CONTAINS 6.280 ACRES MORE OR LESS.

POINT OF BEGINNING BEARS S55°37'41"W 1281.99' FROM THE EAST 1/4 CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

PROPOSED CTB ACREAGE TABLE	
LOCATION	ACRES
SEC. 36 (NE 1/4 SE 1/4)	3.258
SEC. 36 (NW 1/4 SE 1/4)	3.022
TOTAL	6.280



CERTIFICATE
 THIS IS TO CERTIFY THAT THIS SURFACE USE AREA PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Paul Buchler
 23782
 11-05-25
 PROFESSIONAL SURVEYOR



▲ = SECTION CORNERS LOCATED.

- NOTES:**
- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)
 - Water bars to be constructed along route every 6' of elevation change.

COTERRA ENERGY OPERATING CO.

**EASTWOOD 36 FEDERAL COM CTB
 ON STATE OF NEW MEXICO LANDS IN
 SECTION 36, T19S, R33E, N.M.P.M.
 LEA COUNTY, NEW MEXICO**

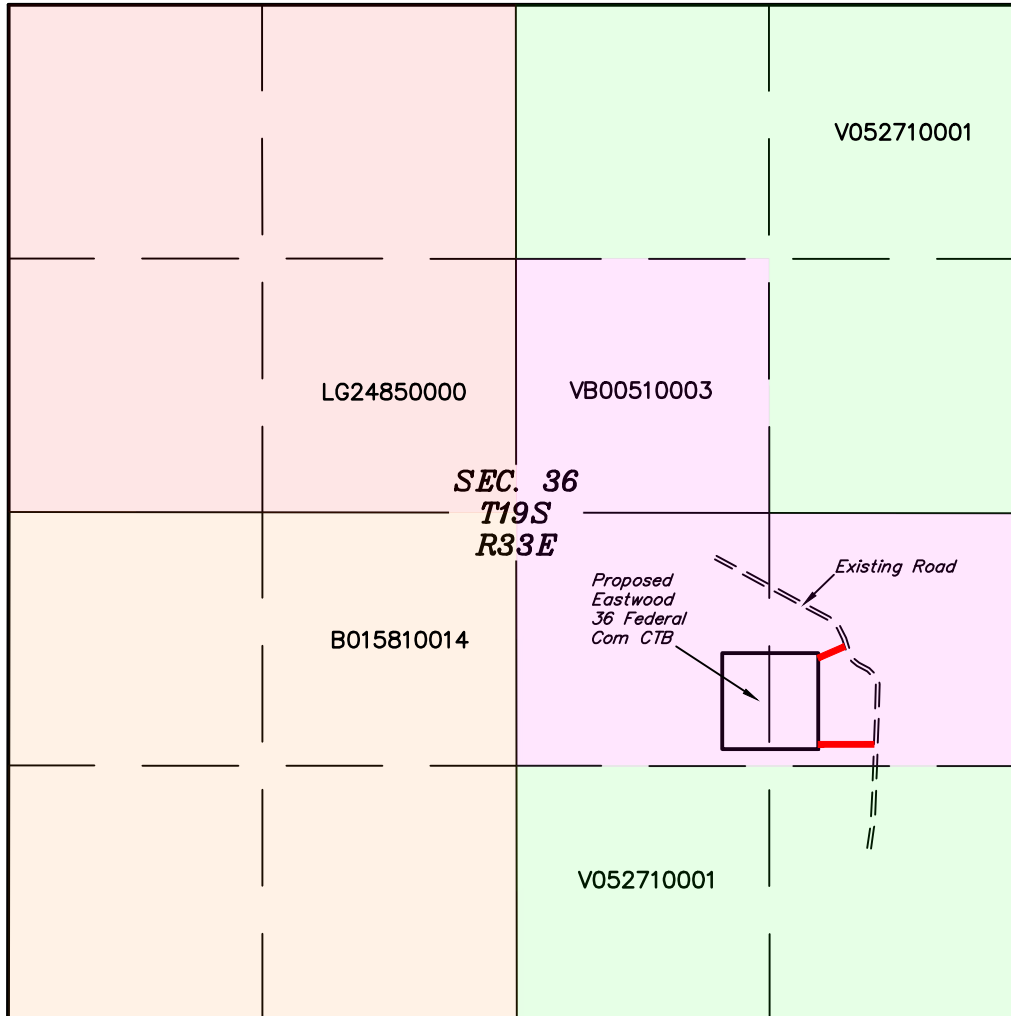
SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	1" = 1000'
FILE	COT01-25-0157 - A		

SURFACE USE AREA



UELS, LLC
 Corporate Office * 85 South 200 East
 Vernal, UT 84078 * (435) 789-1017





LEGEND:

- ACCESS ROAD CENTERLINE
- SECTION LINE
- 1/4 SECTION LINE
- 1/16 SECTION LINE

NOTE:

- Colored areas represent State oil and gas leases.

NOTES:

- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)



COTERRA ENERGY OPERATING CO.

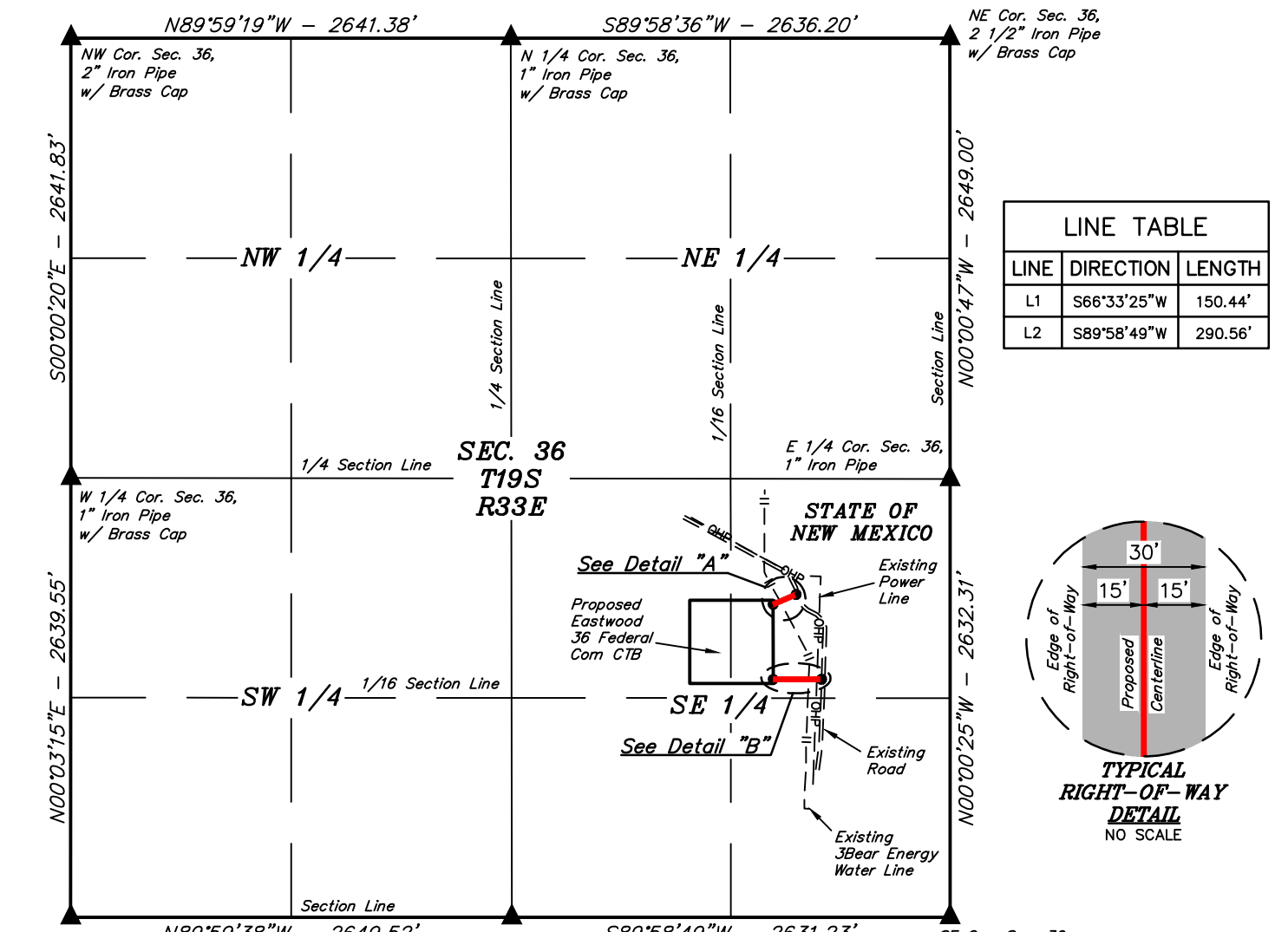
**EASTWOOD 36 FEDERAL COM CTB
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 1000'
FILE	COT01-25-0157		

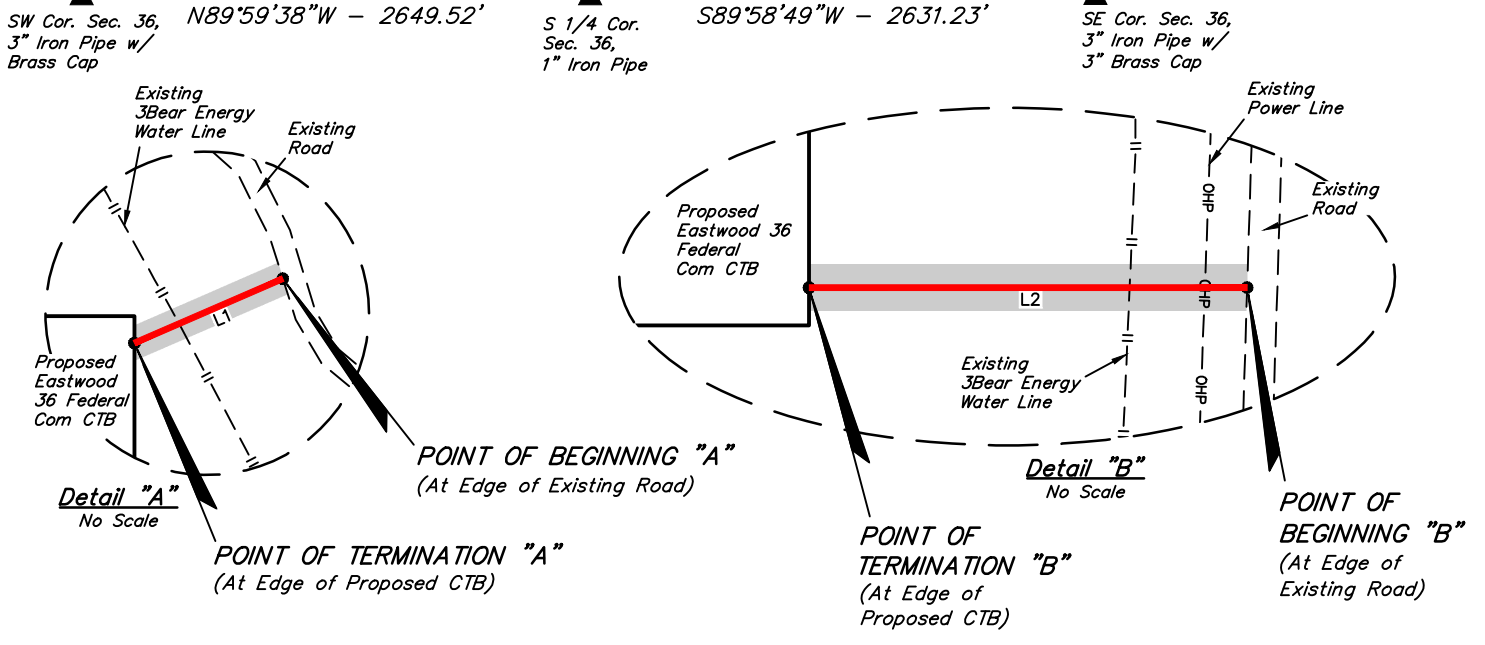
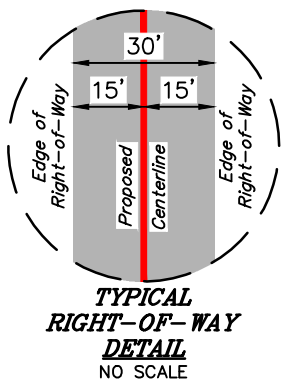
OVERALL ACCESS ROAD R-O-W



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S66°33'25"W	150.44'
L2	S89°58'49"W	290.56'



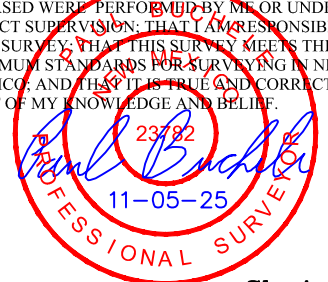
ACREAGE/LENGTH TABLE "A"			
LOCATION	FEET	RODS	ACRES
SEC. 36 (NE 1/4 SE 1/4)	150.44	9.12	0.104

ACREAGE/LENGTH TABLE "B"			
LOCATION	FEET	RODS	ACRES
SEC. 36 (NE 1/4 SE 1/4)	290.56	17.61	0.200



▲ = SECTION CORNERS LOCATED.

CERTIFICATE
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Sheet 1 of 2

- NOTES:**
- The maximum grade of existing ground for the proposed access road "A" is ±0.53%.
 - The maximum grade of existing ground for the proposed access road "B" is ±0.93%.
 - Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



COTERRA ENERGY OPERATING CO.
EASTWOOD 36 FEDERAL COM CTB
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	1" = 1000'
FILE	COT01-25-0157 - A1		

ACCESS ROAD R-O-W

EXHIBIT D

PROPOSED ROAD "A" RIGHT-OF-WAY DESCRIPTION

A 30' WIDE RIGHT-OF-WAY 15' ON EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE.

COMMENCING AT THE EAST 1/4 CORNER OF SECTION 36, T19S, R33E, N.M.P.M., FROM WHICH THE SOUTHEAST CORNER OF SAID SECTION 36 BEARS S00°00'25"E 2632.31', THENCE S53°06'39"W 1155.15' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF BEGINNING; THENCE S66°33'25"W 150.44' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF TERMINATION, WHICH BEARS S54°39'02"W 1301.93' FROM THE EAST 1/4 CORNER OF SAID SECTION 36. THE SIDE LINES OF SAID DESCRIBED RIGHT-OF-WAY BEING SHORTENED OR ELONGATED TO MEET THE GRANTOR'S PROPERTY LINES. CONTAINS 0.104 ACRES MORE OR LESS.

PROPOSED ROAD "B" RIGHT-OF-WAY DESCRIPTION

A 30' WIDE RIGHT-OF-WAY 15' ON EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE.

COMMENCING AT THE EAST 1/4 CORNER OF SECTION 36, T19S, R33E, N.M.P.M., FROM WHICH THE SOUTHEAST CORNER OF SAID SECTION 36 BEARS S00°00'25"E 2632.31', THENCE S32°39'32"W 1429.09' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF BEGINNING; THENCE S89°58'49"W 290.56' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF TERMINATION, WHICH BEARS S41°25'31"W 1604.72' FROM THE EAST 1/4 CORNER OF SAID SECTION 36. THE SIDE LINES OF SAID DESCRIBED RIGHT-OF-WAY BEING SHORTENED OR ELONGATED TO MEET THE GRANTOR'S PROPERTY LINES. CONTAINS 0.200 ACRES MORE OR LESS.

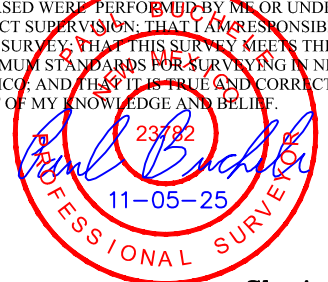
POINT OF BEGINNING ROAD "A" BEARS
S53°06'39"W 1155.15' FROM THE EAST 1/4
CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

POINT OF TERMINATION ROAD "A" BEARS
S54°39'02"W 1301.93' FROM THE EAST 1/4
CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

POINT OF BEGINNING ROAD "B" BEARS
S32°39'32"W 1429.09' FROM THE EAST 1/4
CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

POINT OF TERMINATION ROAD "B" BEARS
S41°25'31"W 1604.72' FROM THE EAST 1/4
CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

CERTIFICATE
THIS IS TO CERTIFY THAT THIS EASEMENT PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



Sheet 2 of 2

NOTES:

- The maximum grade of existing ground for the proposed access road "A" is ±0.53%.
- The maximum grade of existing ground for the proposed access road "B" is ±0.93%.
- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)

COTERRA ENERGY OPERATING CO.

**EASTWOOD 36 FEDERAL COM CTB
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

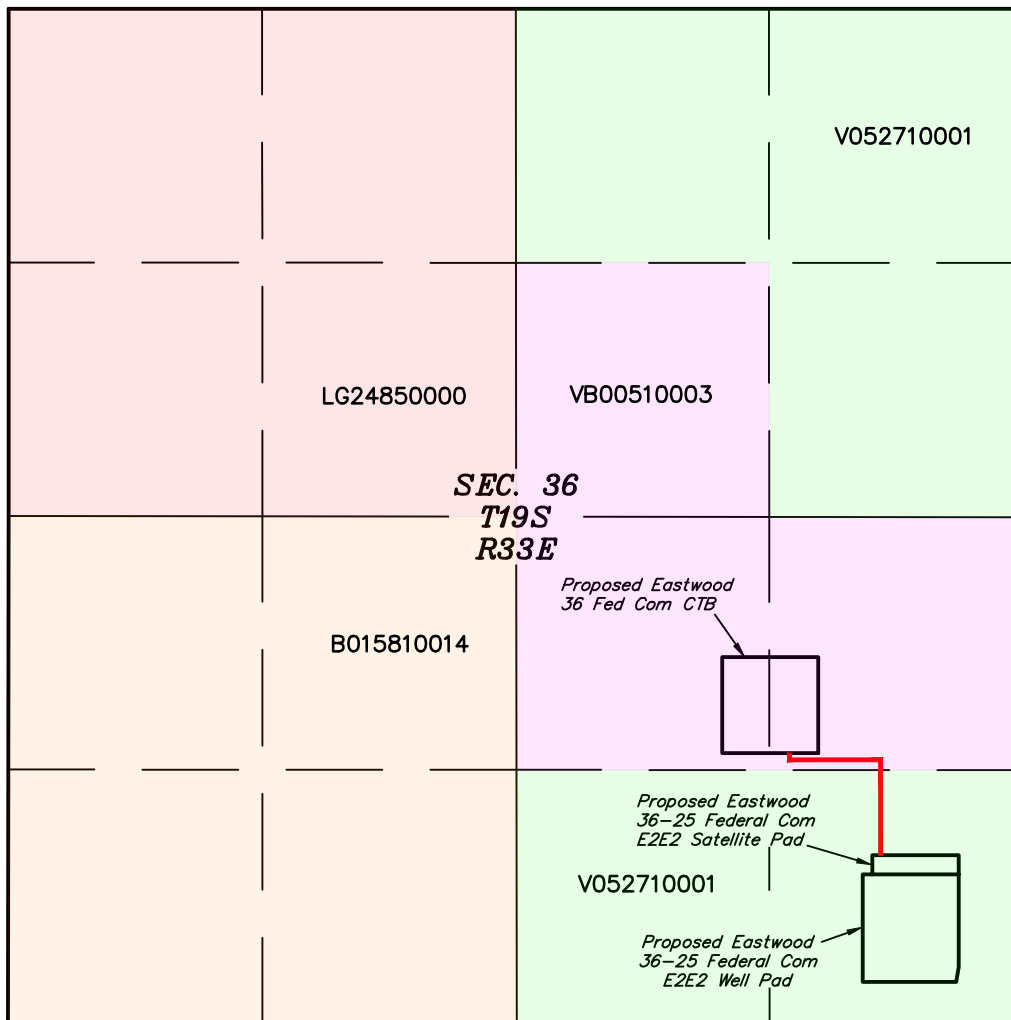
SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	11-05-25	N/A
FILE	COT01-25-0157 - A2		

ACCESS ROAD R-O-W





EXHIBIT D



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



LEGEND:

-  BULK LINE CENTERLINE
-  SECTION LINE
-  1/4 SECTION LINE
-  1/16 SECTION LINE

NOTE:

- Colored areas represent Federal oil and gas leases.

NOTES:

- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)



COTERRA ENERGY OPERATING CO.

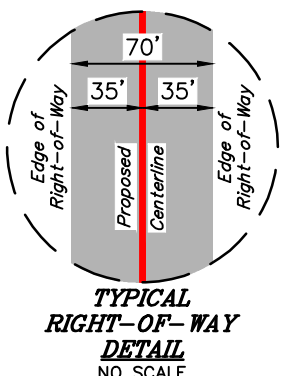
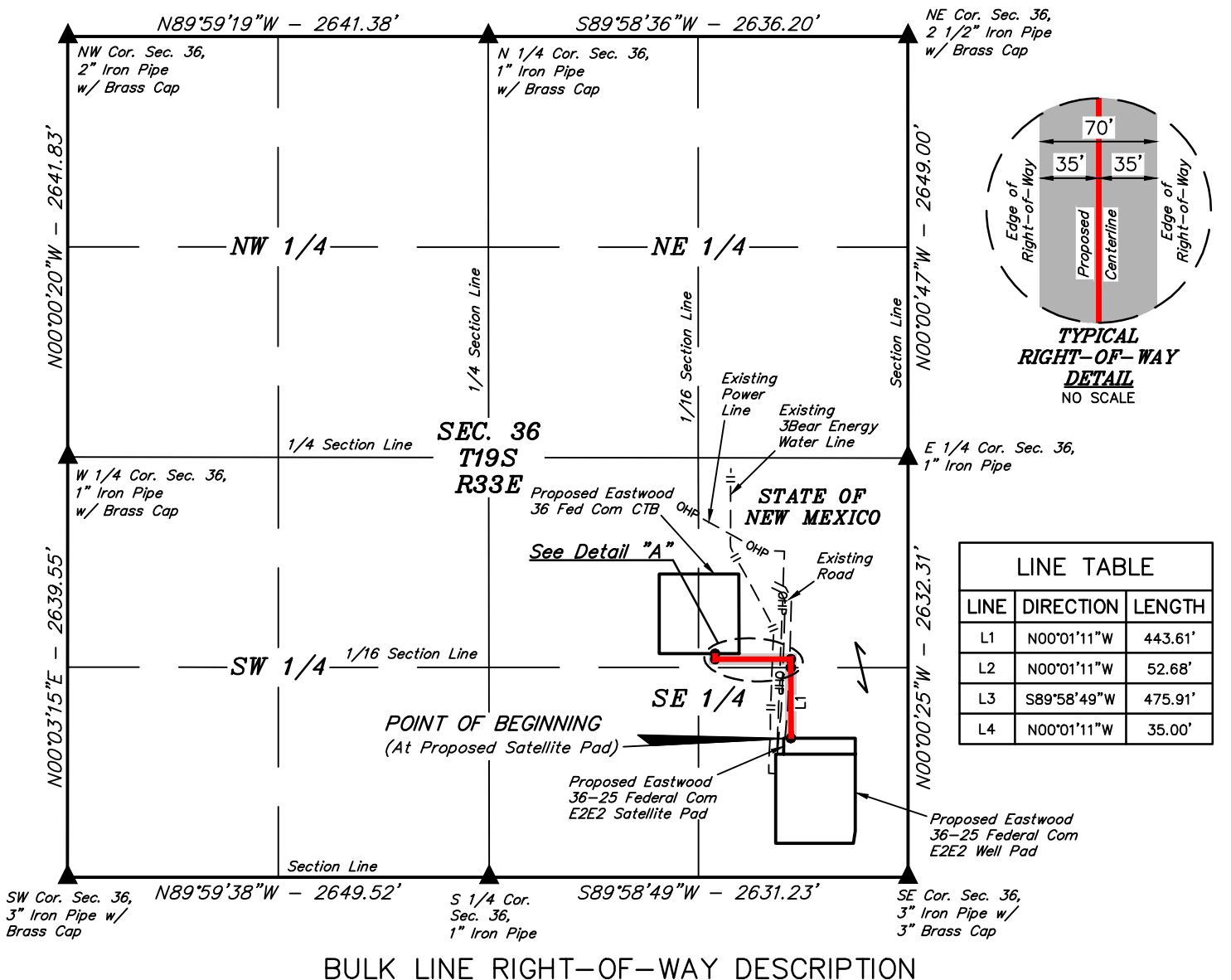
**EASTWOOD 36-25 FEDERAL COM E2E2
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 1000'
FILE	COT01-25-0078		

OVERALL BULK LINE



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017

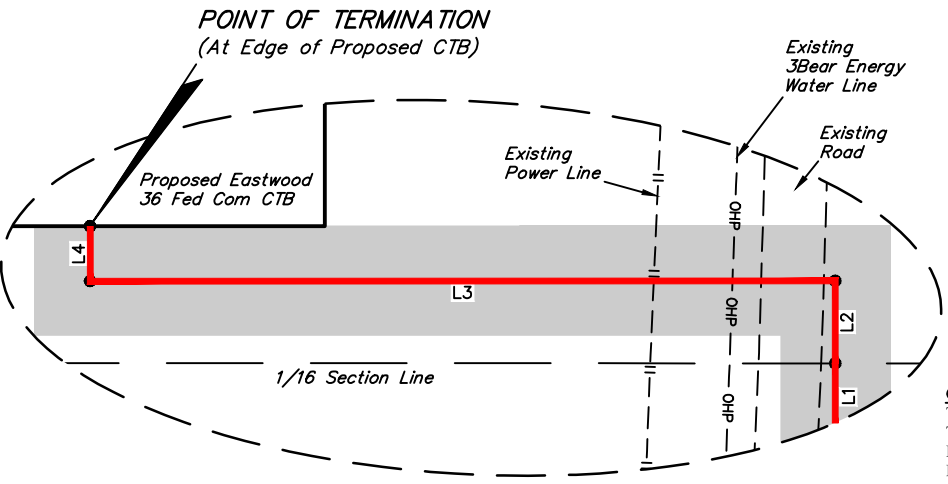


LINE TABLE		
LINE	DIRECTION	LENGTH
L1	N00°01'11"W	443.61'
L2	N00°01'11"W	52.68'
L3	S89°58'49"W	475.91'
L4	N00°01'11"W	35.00'

BULK LINE RIGHT-OF-WAY DESCRIPTION

A 70' WIDE RIGHT-OF-WAY 35' ON EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE.

COMMENCING AT THE SOUTHEAST CORNER OF SECTION 36, T19S, R33E, N.M.P.M., FROM WHICH THE EAST 1/4 CORNER OF SAID SECTION 36 BEARS N00°00'25"W 2632.31', THENCE N40°08'09"W 1141.74' TO A POINT IN THE SE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF BEGINNING; THENCE N00°01'11"W 443.61' TO A POINT ON THE NORTH LINE OF THE SE 1/4 SE 1/4 OF SAID SECTION 36; THENCE CONTINUING N00°01'11"W 52.68'; THENCE S89°58'49"W 475.91'; THENCE N00°01'11"W 35.00' TO A POINT IN THE NE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF TERMINATION, WHICH BEARS S44°36'40"W 1725.41' FROM THE EAST 1/4 CORNER OF SAID SECTION 36. THE SIDE LINES OF SAID DESCRIBED RIGHT-OF-WAY BEING SHORTENED OR ELONGATED TO MEET THE GRANTOR'S PROPERTY LINES. CONTAINS 1.619 ACRES MORE OR LESS.



POINT OF BEGINNING BEARS N40°08'09"W 1141.74' FROM THE SOUTHEAST CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

POINT OF TERMINATION BEARS S44°36'40"W 1725.41' FROM THE EAST 1/4 CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

CERTIFICATE
THIS IS TO CERTIFY THAT THIS EASEMENT PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Paul Bucher
23782
10-30-25
PROFESSIONAL SURVEYOR

ACREAGE / LENGTH TABLE			
LOCATION	FEET	RODS	ACRES
SEC. 36 (SE 1/4 SE 1/4)	443.61	26.89	0.713
SEC. 36 (NE 1/4 SE 1/4)	563.59	34.16	0.906
TOTAL	1,007.20	61.05	1.619



- NOTES:**
- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)
 - Water bars to be constructed along route every 6' of elevation change.

COTERRA ENERGY OPERATING CO.

EASTWOOD 36-25 FEDERAL COM E2E2 ON STATE OF NEW MEXICO LANDS IN SECTION 36, T19S, R33E, N.M.P.M. LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 1000'
FILE	COT01-25-0078		

BULK LINE R-O-W EXHIBIT M



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017

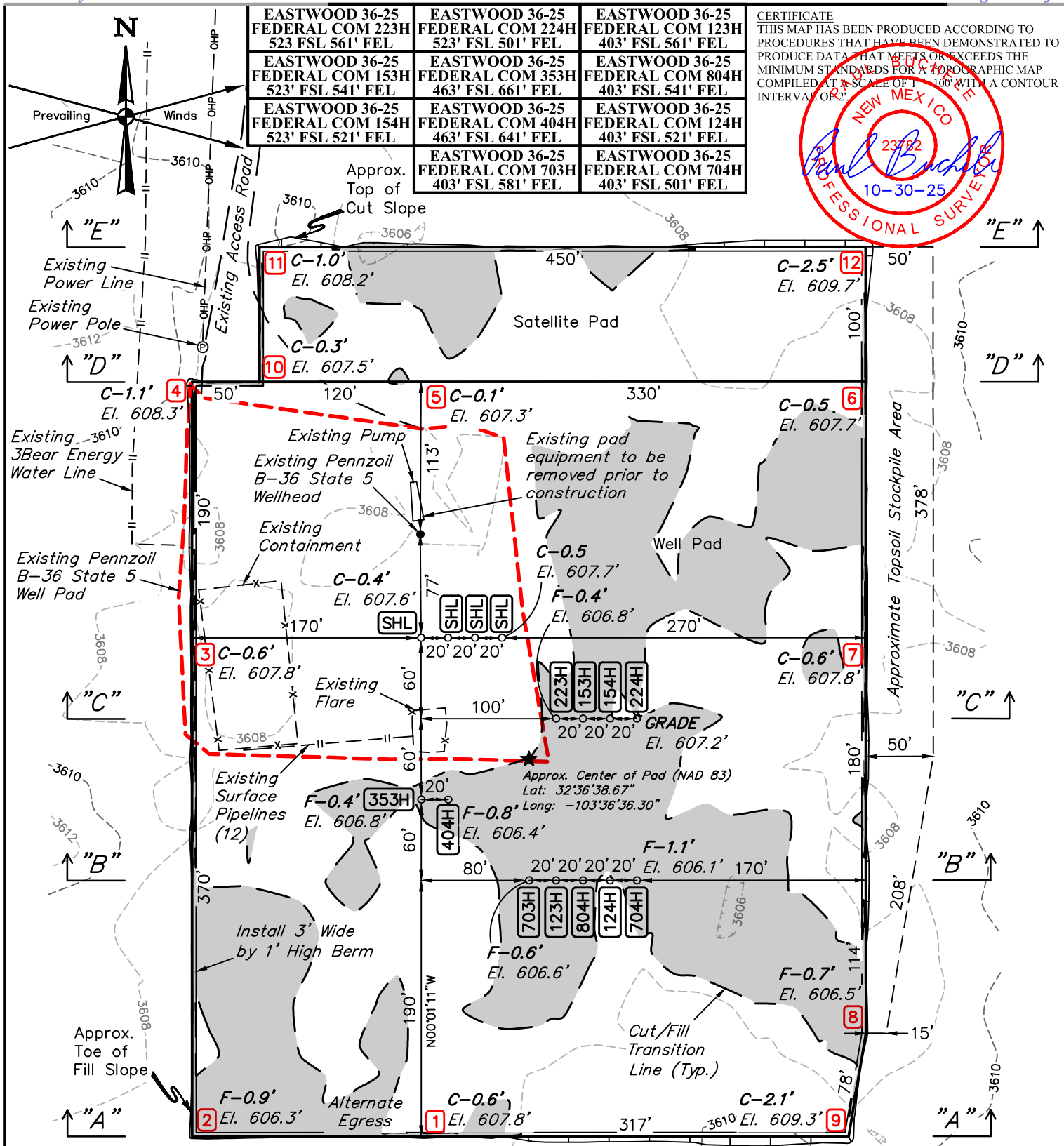


Hamon Pond to Eastwood Water Route

32.6258213, -103.6357064

32.638868, -103.610234





REV: 1 10-30-25 T.I.R. (PAD MOVE)
FINISHED GRADE ELEVATION = 3,607.2'

NOTE: Earthwork Calculations Require Fill @ the Location Stakes For Balance. All Fill is to be Compacted to a Minimum of 95% of the Maximum Dry Density Obtained by AASHTO Method t-99.

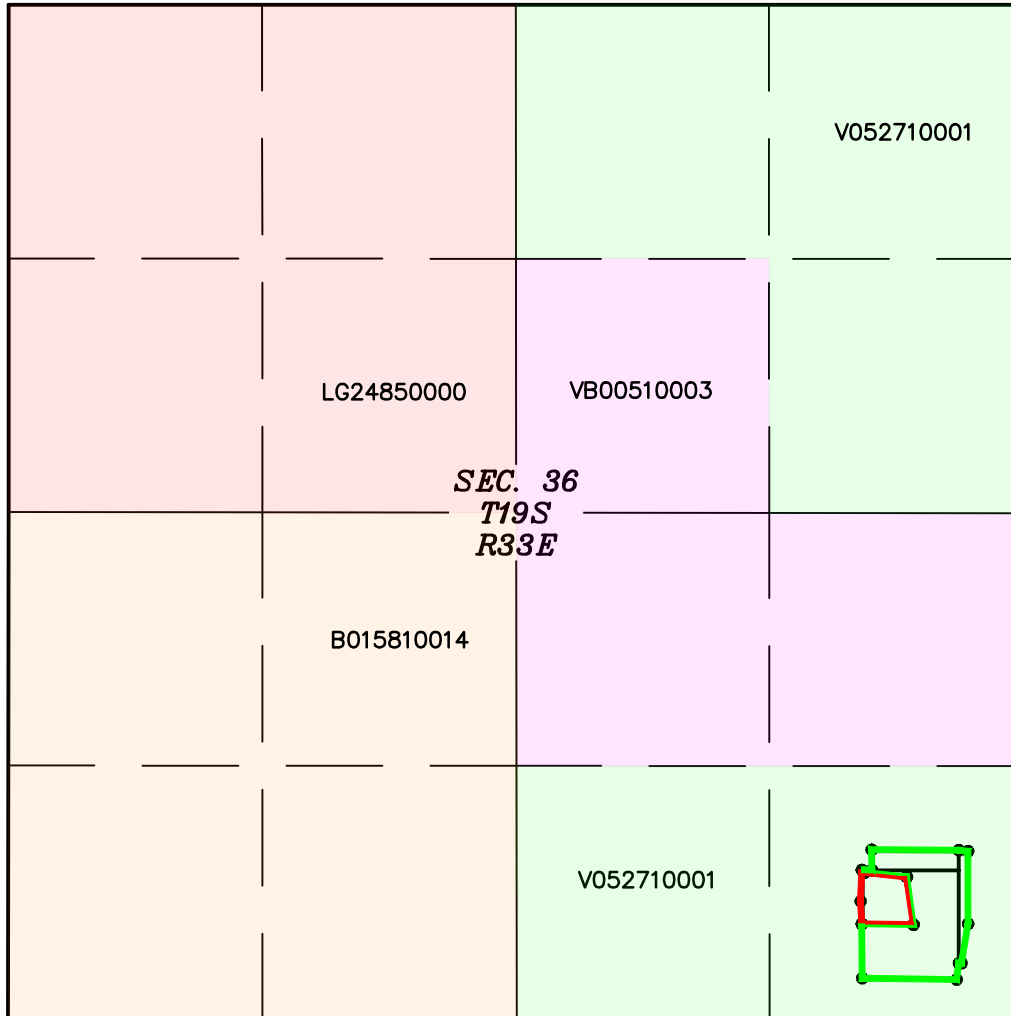
- NOTES:**
- Flare stack is to be located a min. of 100' from the wellhead.
 - Contours shown at 2' intervals.
 - Cut/Fill slopes 2:1 (Typ. except berm)
 - Underground utilities shown on this sheet are for visualization purposes only, actual locations to be determined prior to construction.
 - Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of W103°53'00" (NAD 83)

COTERRA ENERGY OPERATING CO.
EASTWOOD 36-25 FEDERAL COM E2E2
493' FSL 581' FEL (APPROX. CENTER OF PAD)
SE 1/4 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO

UINTEAH
ENGINEERING & LAND SURVEYING

UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	L.T.T.	08-14-25	1" = 100'
LOCATION LAYOUT		EXHIBIT J	



LEGEND:

- EXISTING DISTURBANCE SURFACE USE AREA
- PROPOSED PAD SURFACE USE AREA
- SECTION LINE
- 1/4 SECTION LINE
- 1/16 SECTION LINE

NOTE:

- Colored areas represent Federal oil and gas leases.

NOTES:

- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)



COTERRA ENERGY OPERATING CO.

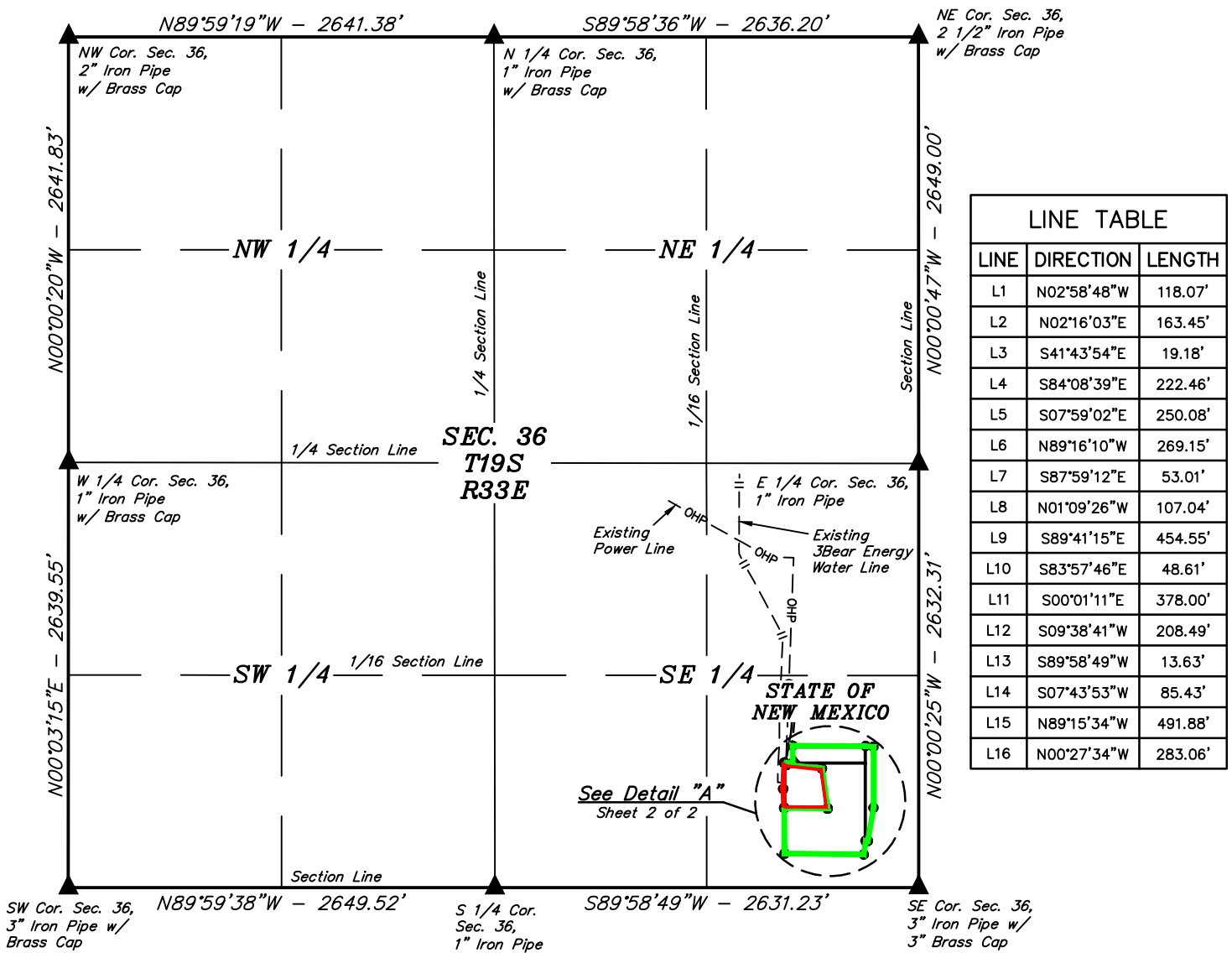
**EASTWOOD 36-25 FEDERAL COM E2E2
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 1000'
FILE	COT01-25-0078		

OVERALL SURFACE USE AREA



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



EXISTING PAD DISTURBANCE SURFACE USE AREA DESCRIPTION

COMMENCING AT THE SOUTHEAST CORNER OF SECTION 36, T19S, R33E, N.M.P.M., FROM WHICH THE SOUTH 1/4 CORNER OF SAID SECTION 36 BEARS S89°58'49"W 2631.23', THENCE N59°22'42"W 970.31' TO A POINT IN THE SE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF BEGINNING; THENCE N02°58'48"W 118.07'; THENCE N02°16'03"E 163.45'; THENCE S41°43'54"E 19.18'; THENCE S84°08'39"E 222.46'; THENCE S07°59'02"E 250.08'; THENCE N89°16'10"W 269.15' TO THE POINT OF BEGINNING. CONTAINS 1.507 ACRES MORE OR LESS.

PROPOSED PAD EXPANSION SURFACE USE AREA DESCRIPTION

COMMENCING AT THE SOUTHEAST CORNER OF SECTION 36, T19S, R33E, N.M.P.M., FROM WHICH THE SOUTH 1/4 CORNER OF SAID SECTION 36 BEARS S89°58'49"W 2631.23', THENCE N59°22'42"W 970.31' TO A POINT IN THE SE 1/4 SE 1/4 OF SAID SECTION 36 AND THE POINT OF BEGINNING; THENCE S89°16'10"E 269.15'; THENCE N07°59'02"W 250.08'; THENCE N84°08'39"W 222.46'; THENCE N41°43'54"W 19.18'; THENCE S87°59'12"E 53.01'; THENCE N01°09'26"W 107.04'; THENCE S89°41'15"E 454.55'; THENCE S83°57'46"E 48.61'; THENCE S00°01'11"E 378.00'; THENCE S09°38'41"W 208.49'; THENCE S89°58'49"W 13.63'; THENCE S07°43'53"W 85.43'; THENCE N89°15'34"W 491.88'; THENCE N00°27'34"W 283.06' TO THE POINT OF BEGINNING. CONTAINS 6.732 ACRES MORE OR LESS.

POINT OF BEGINNING EXISTING PAD DISTURBANCE & PROPOSED PAD EXPANSION DISTURBANCE BEARS N59°22'42"W 970.31' FROM THE SOUTHEAST CORNER OF SECTION 36, T19S, R33E, N.M.P.M.

EXISTING PAD DISTURBANCE ACREAGE TABLE	
LOCATION	ACRES
SEC. 36 (SE 1/4 SE 1/4)	1.507

PROPOSED PAD EXPANSION ACREAGE TABLE	
LOCATION	ACRES
SEC. 36 (SE 1/4 SE 1/4)	6.732

CERTIFICATE
 THIS IS TO CERTIFY THAT THIS SURFACE USE AREA PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT THIS IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Paul Bucher
 23782
 10-30-25
 PROFESSIONAL SURVEYOR



▲ = SECTION CORNERS LOCATED.

NOTES:
 Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)



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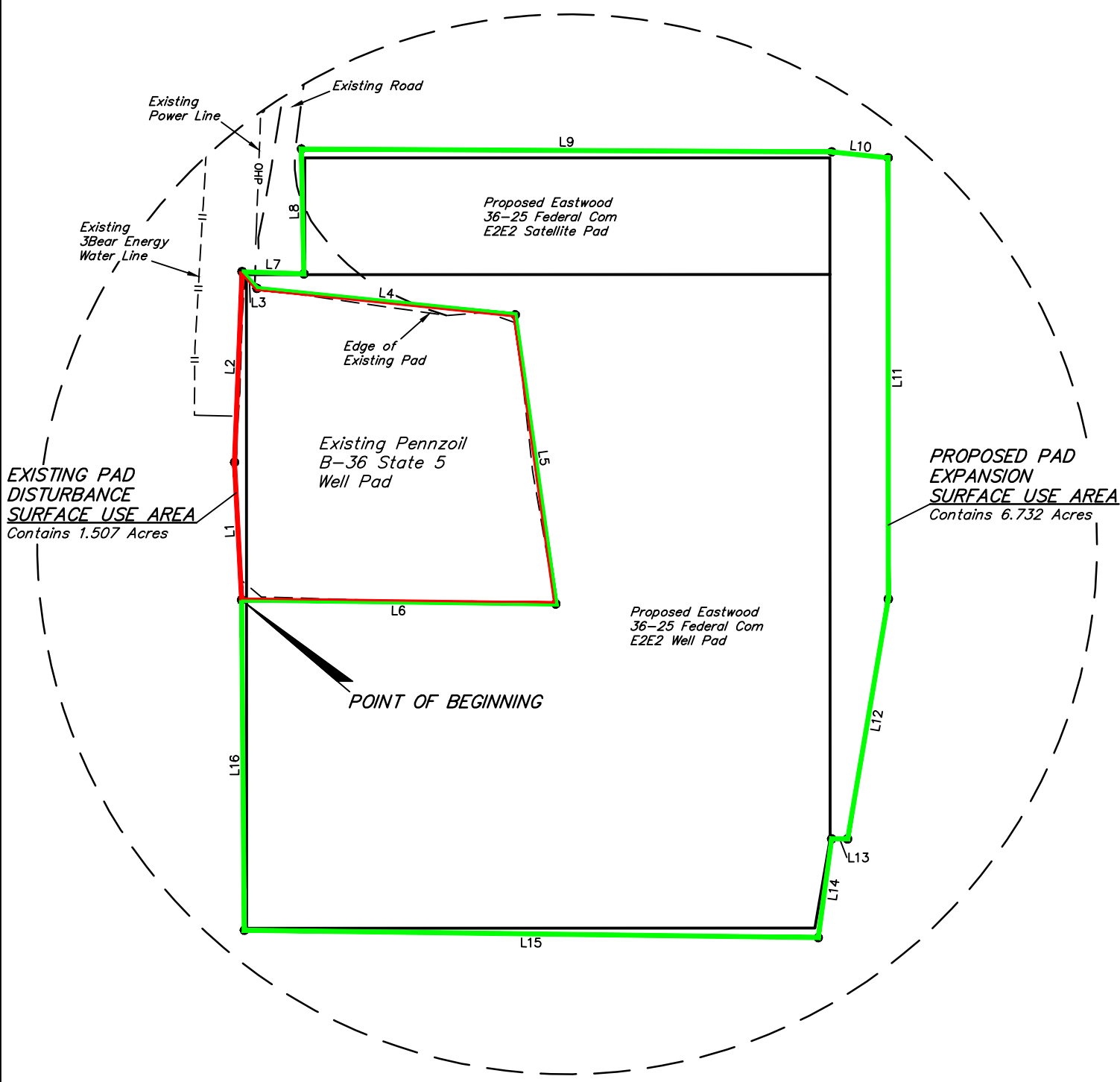


COTERRA ENERGY OPERATING CO.

EASTWOOD 36-25 FEDERAL COM E2E2 ON STATE OF NEW MEXICO LANDS IN SECTION 36, T19S, R33E, N.M.P.M. LEA COUNTY, NEW MEXICO

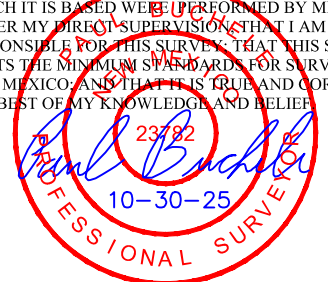
SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 1000'
FILE	COT01-25-0078 - A		

SURFACE USE AREA



Detail "A"
No Scale

CERTIFICATE
 THIS IS TO CERTIFY THAT THIS SURFACE USE AREA PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION, THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



Sheet 2 of 2

- NOTES:**
- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)
 - Water bars to be constructed along route every 6' of elevation change.

COTERRA ENERGY OPERATING CO.

**EASTWOOD 36-25 FEDERAL COM E2E2
 ON STATE OF NEW MEXICO LANDS IN
 SECTION 36, T19S, R33E, N.M.P.M.
 LEA COUNTY, NEW MEXICO**

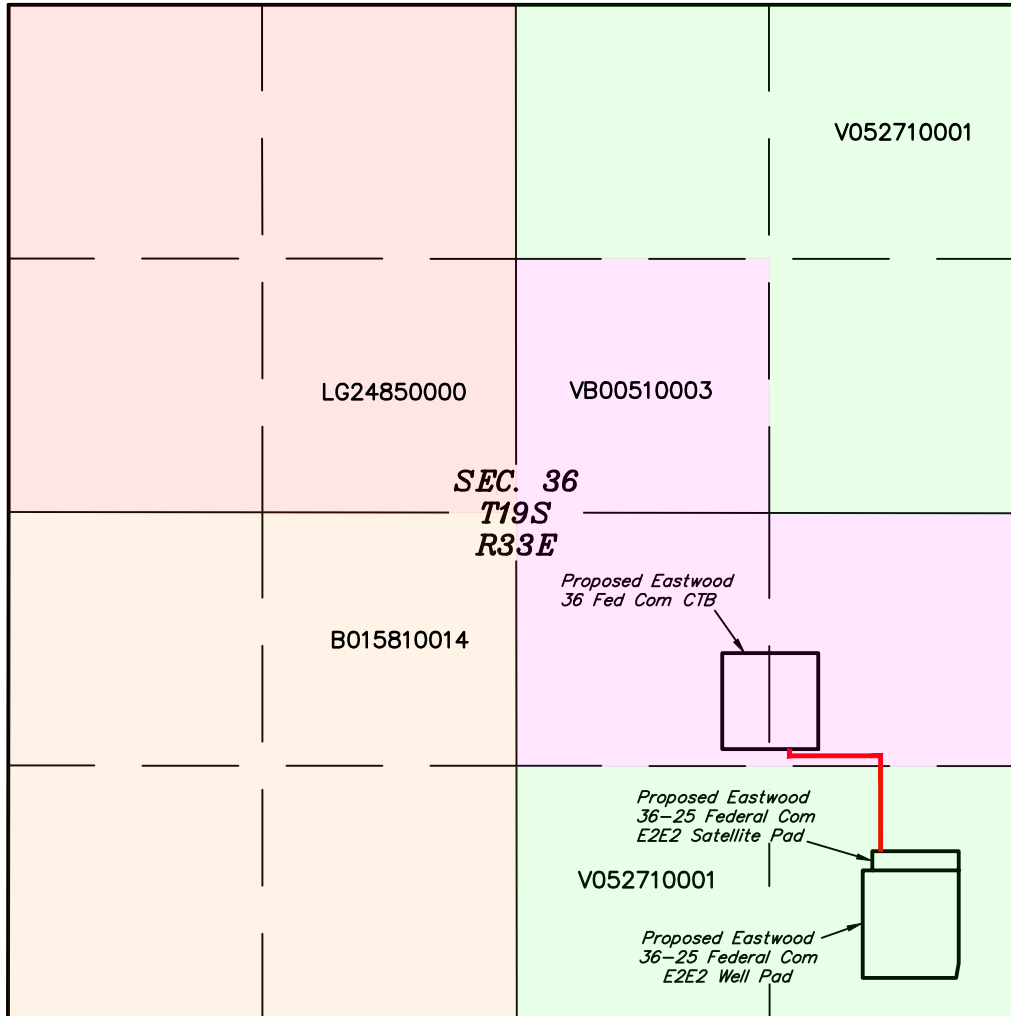
SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	N/A
FILE	COT01-25-0078 - A		

SURFACE USE AREA







UELS, LLC
 Corporate Office * 85 South 200 East
 Vernal, UT 84078 * (435) 789-1017





LEGEND:

-  BULK LINE CENTERLINE
-  SECTION LINE
-  1/4 SECTION LINE
-  1/16 SECTION LINE

NOTE:

- Colored areas represent Federal oil and gas leases.

NOTES:

- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of 103°53'00" (NAD 83)



COTERRA ENERGY OPERATING CO.

**EASTWOOD 36-25 FEDERAL COM E2E2
ON STATE OF NEW MEXICO LANDS IN
SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO**

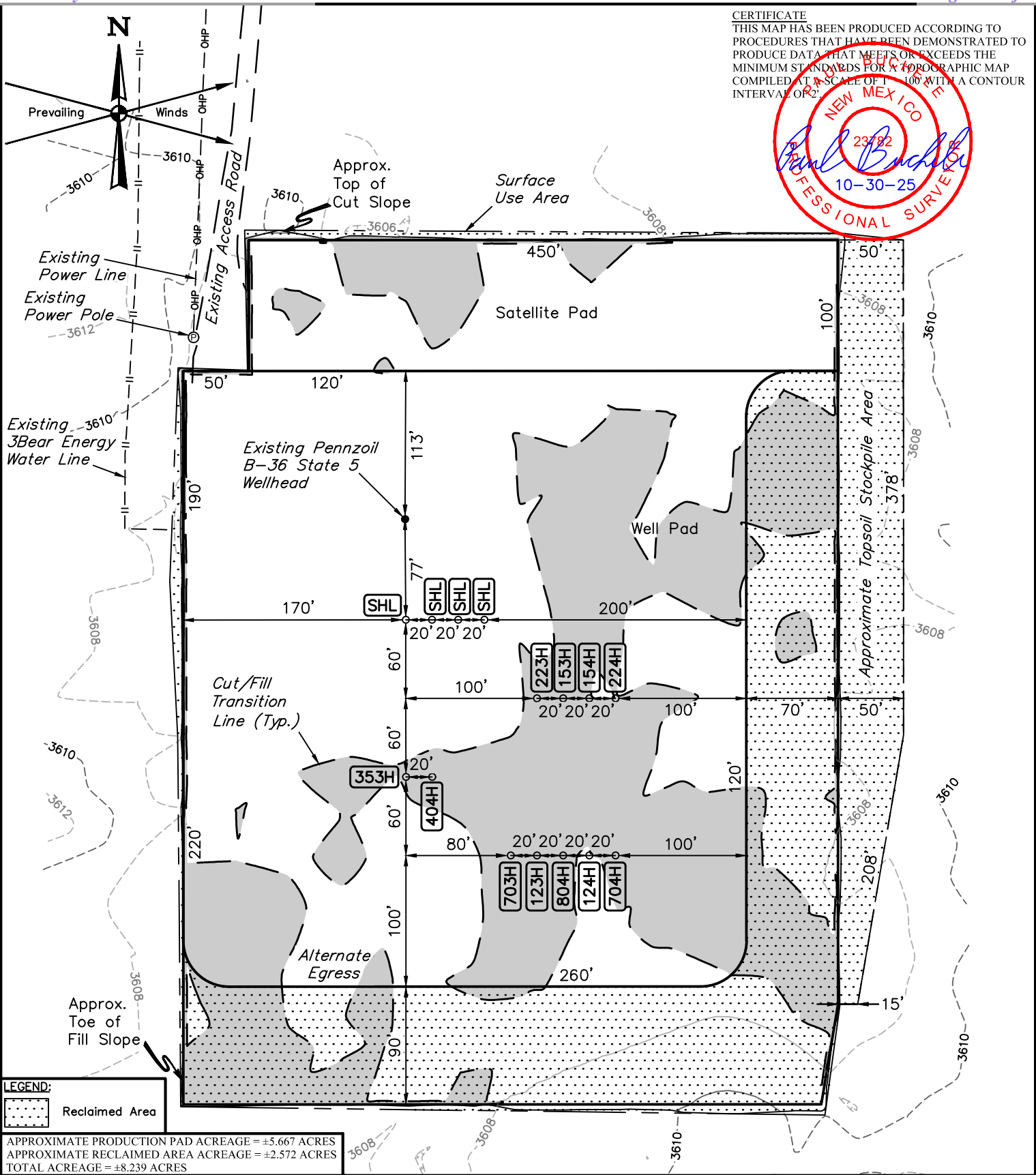
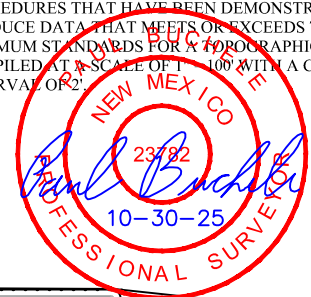
SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 1000'
FILE	COT01-25-0078		

OVERALL BULK LINE



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017

CERTIFICATE
THIS MAP HAS BEEN PRODUCED ACCORDING TO PROCEDURES THAT HAVE BEEN DEMONSTRATED TO PRODUCE DATA THAT MEETS OR EXCEEDS THE MINIMUM STANDARDS FOR A TOPOGRAPHIC MAP COMPILED AT A SCALE OF 1" = 100' WITH A CONTOUR INTERVAL OF 2'



LEGEND:
[Dotted pattern] Reclaimed Area

APPROXIMATE PRODUCTION PAD ACREAGE = ±5.667 ACRES
APPROXIMATE RECLAIMED AREA ACREAGE = ±2.572 ACRES
TOTAL ACREAGE = ±8.239 ACRES

NOTES:
• Contours shown at 2' intervals.

COTERRA ENERGY OPERATING CO.
EASTWOOD 36-25 FEDERAL COM E2E2
493' FSL 581' FEL (APPROX. CENTER OF PAD)
SE 1/4 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO

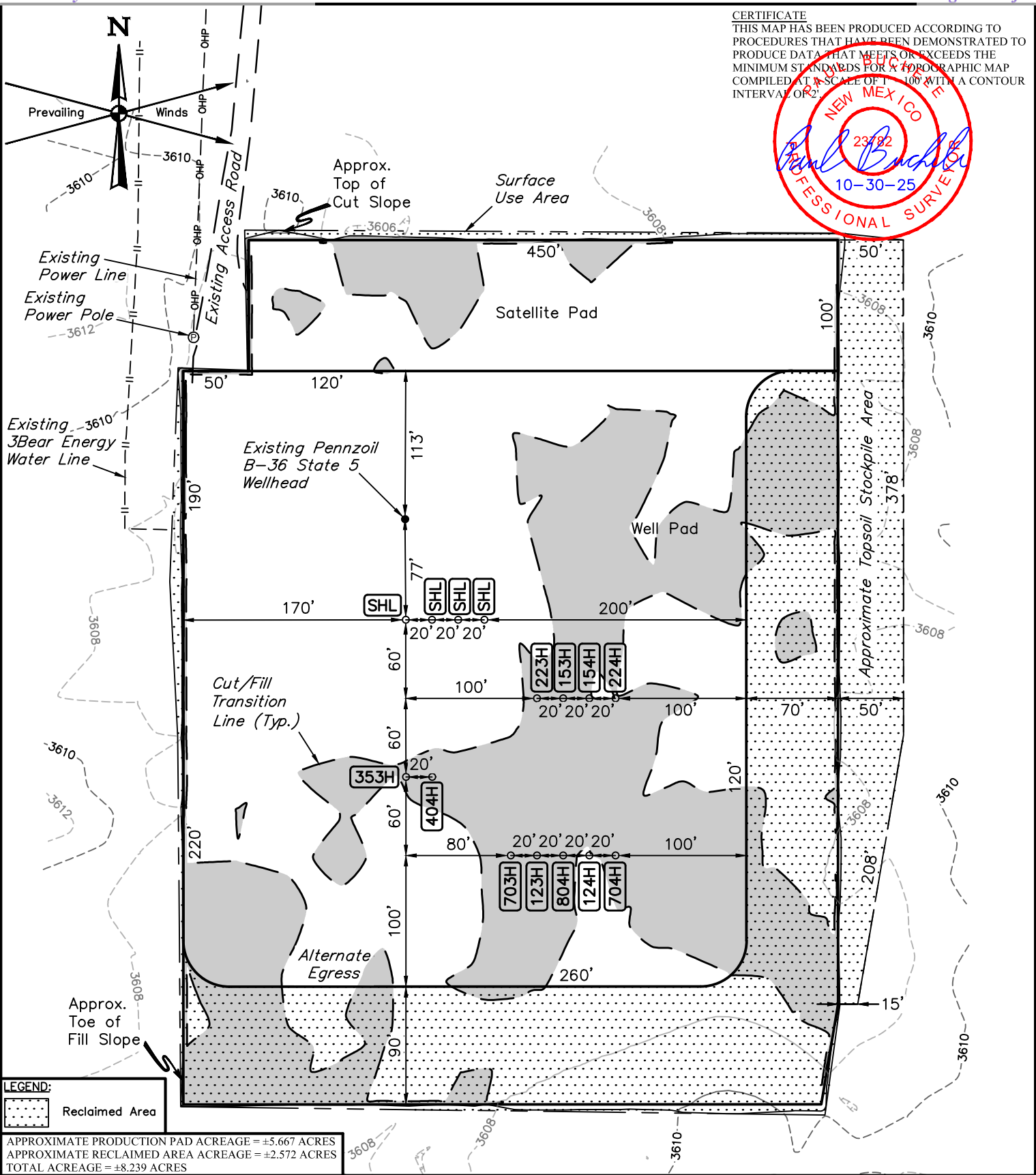
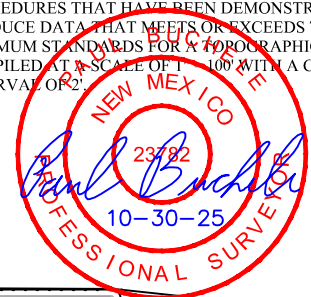
SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 100'

RECLAMATION DIAGRAM



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017

CERTIFICATE
THIS MAP HAS BEEN PRODUCED ACCORDING TO PROCEDURES THAT HAVE BEEN DEMONSTRATED TO PRODUCE DATA THAT MEETS OR EXCEEDS THE MINIMUM STANDARDS FOR A TOPOGRAPHIC MAP COMPILED AT A SCALE OF 1" = 100' WITH A CONTOUR INTERVAL OF 2'



LEGEND:
Reclaimed Area

APPROXIMATE PRODUCTION PAD ACREAGE = ±5.667 ACRES
APPROXIMATE RECLAIMED AREA ACREAGE = ±2.572 ACRES
TOTAL ACREAGE = ±8.239 ACRES

NOTES:
• Contours shown at 2' intervals.

COTERRA ENERGY OPERATING CO.
EASTWOOD 36-25 FEDERAL COM E2E2
493' FSL 581' FEL (APPROX. CENTER OF PAD)
SE 1/4 SE 1/4, SECTION 36, T19S, R33E, N.M.P.M.
LEA COUNTY, NEW MEXICO

SURVEYED BY	C.S., G.M.	10-24-25	SCALE
DRAWN BY	T.I.R.	10-30-25	1" = 100'

RECLAMATION DIAGRAM



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

PWD Data Report

03/06/2026

APD ID: 10400108158

Submission Date: 11/18/2025

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined

Would you like to utilize Lined Pit PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD Surface Owner Description:

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit

Pit liner description:

Pit liner manufacturers

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule

Lined pit reclamation description:

Lined pit reclamation

Leak detection system description:

Leak detection system

Operator Name: COTERRA ENERGY OPERATING CO	
Well Name: EASTWOOD 36-25 FEDERAL COM	Well Number: 404H

Lined pit Monitor description:

Lined pit Monitor

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information

Section 3 - Unlined

Would you like to utilize Unlined Pit PWD options? N

Produced Water Disposal (PWD) Location:

PWD disturbance (acres): PWD surface owner:

Other PWD Surface Owner Description:

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule

Unlined pit reclamation description:

Unlined pit reclamation

Unlined pit Monitor description:

Unlined pit Monitor

Do you propose to put the produced water to beneficial use?

Beneficial use user

Estimated depth of the shallowest aquifer (feet):

Precipitated Solids Permit

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

State

Unlined Produced Water Pit Estimated

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information

Section 4 -

Would you like to utilize Injection PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD Surface Owner Description:

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number:

Injection well name:

Assigned injection well API number?

Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection

Underground Injection Control (UIC) Permit?

UIC Permit

Section 5 - Surface

Would you like to utilize Surface Discharge PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD Surface Owner Description :

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Section 6 -

Would you like to utilize Other PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

PWD Surface Owner Description:

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type

Have other regulatory requirements been met?

Other regulatory requirements

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Well Name: EASTWOOD 36-25 FEDERAL COM	Well Location: T19S / R33E / SEC 36 / SESE / 32.610659 / -103.610279	County or Parish/State: LEA / NM
Well Number: 404H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM135249	Unit or CA Name:	Unit or CA Number:
US Well Number:	Operator: COTERRA ENERGY OPERATING CO	

Notice of Intent

Sundry ID: 2901422

Type of Submission: Notice of Intent

Type of Action: APD Change

Date Sundry Submitted: 03/19/2026

Time Sundry Submitted: 12:07

Date proposed operation will begin: 03/19/2026

Procedure Description: Coterra Energy Operating Co. requests the following change to the Eastwood Federal Com 404H APD ID 10400108158: Update pool and pool code from Apache Ridge;Bone Spring (2260) to Tonto;Wolfcamp (59500) Please see attached C102.

NOI Attachments

Procedure Description

EASTWOOD_36_25_FEDERAL_COM_E2E2_404H_C102_11132025_20260319120551.pdf

Well Name: EASTWOOD 36-25
FEDERAL COM

Well Location: T19S / R33E / SEC 36 /
SESE / 32.610659 / -103.610279

County or Parish/State: LEA /
NM

Well Number: 404H

Type of Well: OIL WELL

Allottee or Tribe Name:

Lease Number: NMNM135249

Unit or CA Name:

Unit or CA Number:

US Well Number:

Operator: COTERRA ENERGY
OPERATING CO

Operator

I certify that the foregoing is true and correct. Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: SHELLY BOWEN

Signed on: MAR 19, 2026 12:05 PM

Name: COTERRA ENERGY OPERATING CO

Title: Regulatory Analyst

Street Address: 6001 DEAUVILLE BLVD STE 300N

City: MIDLAND

State: TX

Phone: (432) 620-1644

Email address: DL_PBUREGULATORY@COTERRA.COM

Field

Representative Name:

Street Address:

City:

State:

Zip:

Phone:

Email address:

BLM Point of Contact

BLM POC Name: LONG VO

BLM POC Title: Petroleum Engineer

BLM POC Phone: 5759885402

BLM POC Email Address: LVO@BLM.GOV

Disposition: Accepted

Disposition Date: 03/20/2026

Signature: Long Vo

Form 3160-5
(October 2024)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0220
Expires: October 31, 2027

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2		5. Lease Serial No.
1. Type of Well <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
2. Name of Operator		7. If Unit of CA/Agreement, Name and/or No.
3a. Address	3b. Phone No. (include area code)	8. Well Name and No.
4. Location of Well (Footage, Sec., T.,R.,M., or Survey Description)		9. API Well No.
		10. Field and Pool or Exploratory Area
		11. Country or Parish, State

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)	Title
Signature	Date

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by	Title	Date
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office	

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations and reports of such operations when completed as indicated on Federal and Indian lands pursuant to applicable Federal law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local area or regional procedures and practices, are either shown below, will be issued by or may be obtained from the local Federal office.

SPECIFIC INSTRUCTIONS

Item 4 - Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult the local Federal office for specific instructions.

Item 13: Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by the local Federal office. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to the top of any tubing left in the hole; method of closing top of well and date well site conditioned for final inspection looking for approval of the abandonment. If the proposal will involve **hydraulic fracturing operations**, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq., 25 U.S.C. 396; 43 CFR 3160.

PRINCIPAL PURPOSE: The information is used to: (1) Evaluate, when appropriate, approve applications, and report completion of subsequent well operations, on a Federal or Indian lease; and (2) document for administrative use, information for the management, disposal and use of National Resource lands and resources, such as: (a) evaluating the equipment and procedures to be used during a proposed subsequent well operation and reviewing the completed well operations for compliance with the approved plan; (b) requesting and granting approval to perform those actions covered by 43 CFR 3162.3-2, 3162.3-3, and 3162.3-4; (c) reporting the beginning or resumption of production, as required by 43 CFR 3162.4-1(c) and (d) analyzing future applications to drill or modify operations in light of data obtained and methods used.

ROUTINE USES: Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions in connection with congressional inquiries or to consumer reporting agencies to facilitate collection of debts owed the Government.

EFFECT OF NOT PROVIDING THE INFORMATION: Filing of this notice and report and disclosure of the information is mandatory for those subsequent well operations specified in 43 CFR 3162.3-2, 3162.3-3, 3162.3-4.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.

Response to this request is mandatory.

The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C St., N.W., Mail Stop 401 LS, Washington, D.C. 20240

Additional Information

Location of Well

0. SHL: SESE / 463 FSL / 641 FEL / TWSP: 19S / RANGE: 33E / SECTION: 36 / LAT: 32.610659 / LONG: -103.610279 (TVD: 0 feet, MD: 0 feet)

PPP: SWSE / 100 FSL / 660 FEL / TWSP: 19S / RANGE: 33E / SECTION: 36 / LAT: 32.609662 / LONG: -103.610344 (TVD: 8771 feet, MD: 8950 feet)

PPP: SENE / 2640 FNL / 659 FEL / TWSP: 19S / RANGE: 33E / SECTION: 25 / LAT: 32.631155 / LONG: -103.610279 (TVD: 9370 feet, MD: 11957 feet)

BHL: NENE / 100 FNL / 660 FEL / TWSP: 19S / RANGE: 33E / SECTION: 25 / LAT: 32.638134 / LONG: -103.610257 (TVD: 9370 feet, MD: 19807 feet)

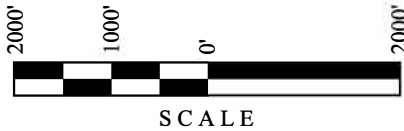
CONFIDENTIAL

Property Name EASTWOOD 36-25 FEDERAL COM	Well Number 404H	Drawn By T.I.R. 10-30-25	Revised By
---------------------------------------------	---------------------	-----------------------------	------------

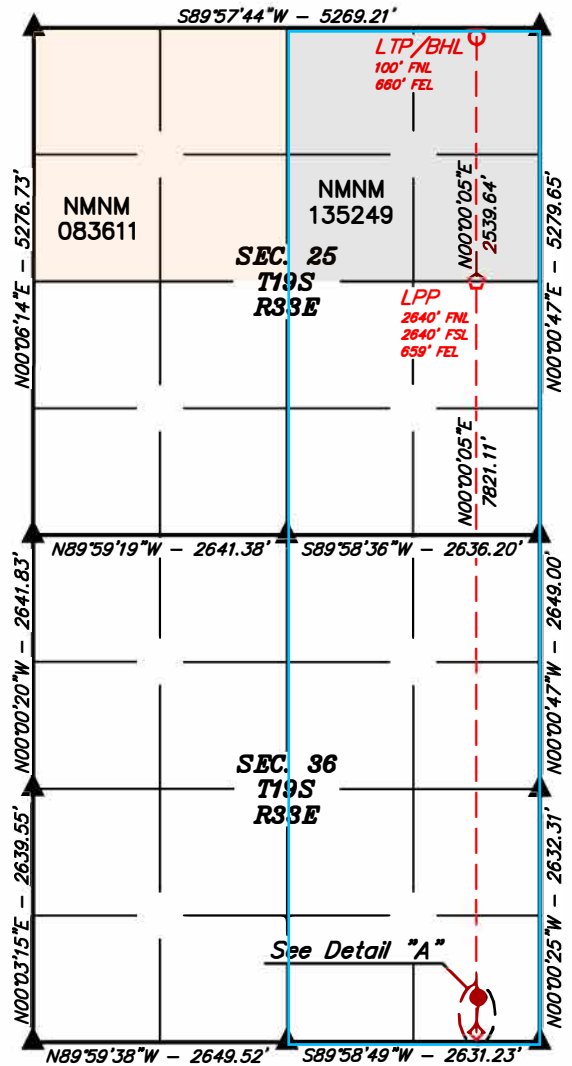
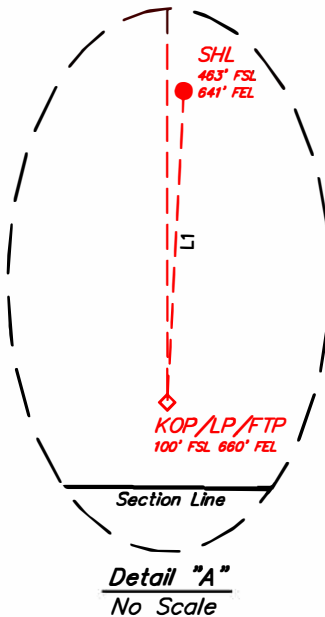
- = SURFACE HOLE LOCATION
- ◇ = KICK OFF POINT/LANDING POINT/FIRST TAKE POINT
- ◇ = LEASE PENETRATION POINT
- = LAST TAKE POINT/BOTTOM HOLE LOCATION
- ▲ = SECTION CORNER LOCATED

NOTE:

- Distances referenced on plat to section lines are perpendicular.
- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of W103°53'00" (NAD 83)
- Colored areas represent Federal oil and gas leases.



LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S03°01'25"W	363.65'



NAD 83 (SURFACE HOLE LOCATION)	LATITUDE = 32°36'38.37" (32.610659°)	LONGITUDE = -103°36'37.01" (-103.610279°)
NAD 27 (SURFACE HOLE LOCATION)	LATITUDE = 32°36'37.93" (32.610537°)	LONGITUDE = -103°36'35.23" (-103.609786°)
STATE PLANE NAD 83 (N.M. EAST)	N: 586645.83' E: 763979.91'	
STATE PLANE NAD 27 (N.M. EAST)	N: 586582.95' E: 722799.50'	

NAD 83 (KOP/LP/FTP)	LATITUDE = 32°36'34.78" (32.609662°)	LONGITUDE = -103°36'37.24" (-103.610344°)
NAD 27 (KOP/LP/FTP)	LATITUDE = 32°36'34.34" (32.609539°)	LONGITUDE = -103°36'35.46" (-103.609851°)
STATE PLANE NAD 83 (N.M. EAST)	N: 586282.67' E: 763962.27'	
STATE PLANE NAD 27 (N.M. EAST)	N: 586219.80' E: 722781.85'	

NAD 83 (LPP 1)	LATITUDE = 32°37'52.16" (32.631155°)	LONGITUDE = -103°36'37.00" (-103.610279°)
NAD 27 (LPP 1)	LATITUDE = 32°37'51.72" (32.631032°)	LONGITUDE = -103°36'35.22" (-103.609784°)
STATE PLANE NAD 83 (N.M. EAST)	N: 594102.35' E: 763929.36'	
STATE PLANE NAD 27 (N.M. EAST)	N: 594039.25' E: 722749.16'	

NAD 83 (LTP/BHL)	LATITUDE = 32°38'17.28" (32.638134°)	LONGITUDE = -103°36'36.93" (-103.610257°)
NAD 27 (LTP/BHL)	LATITUDE = 32°38'16.84" (32.638011°)	LONGITUDE = -103°36'35.15" (-103.609763°)
STATE PLANE NAD 83 (N.M. EAST)	N: 596641.52' E: 763918.66'	
STATE PLANE NAD 27 (N.M. EAST)	N: 596578.35' E: 722738.54'	



Bond Info Data

03/06/2026

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

APD ID: 10400108158

Submission Date: 11/18/2025

Highlighted data reflects the most recent changes
[Show Final Text](#)

Operator Name: COTERRA ENERGY OPERATING CO

Well Name: EASTWOOD 36-25 FEDERAL COM

Well Number: 404H

Well Type: OIL WELL

Well Work Type: Drill

Bond

Federal/Indian APD: FED

BLM Bond number: NMB001187

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
<https://www.emnrd.nm.gov/ocd/contact-us>

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

ACKNOWLEDGMENTS

Action 565879

ACKNOWLEDGMENTS

Operator: Coterra Energy Operating Co. 6001 Deauville Blvd Midland, TX 79706	OGRID: 215099
	Action Number: 565879
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

ACKNOWLEDGMENTS

<input checked="" type="checkbox"/>	I hereby certify that no additives containing PFAS chemicals will be added to the completion or recompletion of this well.
-------------------------------------	----------------------------------------------------------------------------------------------------------------------------

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
<https://www.emnrd.nm.gov/ocd/contact-us>

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

COMMENTS

Action 565879

COMMENTS

Operator: Coterra Energy Operating Co. 6001 Deauville Blvd Midland, TX 79706	OGRID: 215099
	Action Number: 565879
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

COMMENTS

Created By	Comment	Comment Date
matthew.gomez	Change of Plans included within submission.	3/24/2026

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
<https://www.emnrd.nm.gov/ocd/contact-us>

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 565879

CONDITIONS

Operator: Coterra Energy Operating Co. 6001 Deauville Blvd Midland, TX 79706	OGRID: 215099
	Action Number: 565879
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
sbowen00	Cement is required to circulate on both surface and intermediate1 strings of casing.	3/24/2026
matthew.gomez	If cement does not circulate to surface on any string, a Cement Bond Log (CBL) is required for that string of casing. If strata isolation is not achieved, remediation will be required before further operations may commence.	3/24/2026
matthew.gomez	All conducted logs must be submitted to the OCD.	3/24/2026
matthew.gomez	Cement must be in place for at least eight hours AND achieve a minimum compressive strength of 500 PSI before performing any further operations on the well.	3/24/2026
matthew.gomez	Administrative order required for non-standard spacing unit prior to production.	3/24/2026
matthew.gomez	If production is desired to occur outside of the Wolfcamp formation, a second pool must be added and a DHC must be approved prior to producing the well.	3/25/2026
matthew.gomez	Notify the OCD 24 hours prior to casing & cement.	3/25/2026
matthew.gomez	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string.	3/25/2026
matthew.gomez	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.	3/25/2026
matthew.gomez	File As Drilled C-102 and a directional Survey with C-104 completion packet.	3/25/2026
matthew.gomez	This well is within the Capitan Reef. The first intermediate casing string shall be sat and cemented back to surface immediately above the Capitan Reef. The second intermediate string shall be set and cemented back to surface immediately below the base of the Capitan Reef.	3/25/2026
matthew.gomez	Only freshwater based mud shall be utilized across the Capitan interval.	3/25/2026
matthew.gomez	This well is proposed to be within the R-111-Q defined boundary. Operator must follow all procedures and requirements listed within the order.	3/25/2026