Form 3160-3
(June 2015)

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FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM097896

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

7. If Unit or CA Agreement, Name and No.

8. Lease Name and Well No.
JADE 34-3 FED COM 2BS 8H (323001)

2. Name of Operator
CHISHOLM ENERGY OPERATING LLC (372137)

9. API Well No.
30-025-45410

3a. Address
801 Cherry St., Suite 1200 Unit 20 Fort Worth TX 76102

3b. Phone No. *(include area code)*
(817)469-1104

10. Field and Pool, or Exploratory
TEAS; / BONE SPRING (58960)

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface LOT A / 150 FNL / 750 FEL / LAT 32.623543 / LONG -103.644886
At proposed prod. zone LOT P / 330 FSL / 528 FEL / LAT 32.595814 / LONG -103.644286

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 34 / T19S / R33E / NMP

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
22 miles	LEA	NM

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
150 feet	320	319.86

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
60 feet	10140 feet / 20060 feet	FED: NMB001468

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
3579 feet	09/01/2018	30 days

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
(Electronic Submission)	Jennifer Elrod / Ph: (817)953-3728	01/31/2018

Title
Senior Regulatory Technician

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	11/21/2018

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

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.

GCP Rec 12/12/18

APPROVED WITH CONDITIONS

Approval Date: 11/21/2018

KZ 12/14/18

Double sided

(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 wen, 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 directionany 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 wen 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 win 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 conects this information to anow 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 Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

(Continued on page 3)

Additional Operator Remarks

Location of Well

1. SHL: LOT A / 150 FNL / 750 FEL / TWSP: 19S / RANGE: 33E / SECTION: 34 / LAT: 32.623543 / LONG: -103.644886 (TVD: 0 feet, MD: 0 feet)
   PPP: LOT A / 605 FNL / 528 FEL / TWSP: 19S / RANGE: 33E / SECTION: 34 / LAT: 32.622292 / LONG: -103.644169 (TVD: 9697 feet, MD: 9701 feet)
   BHL: LOT P / 330 FSL / 528 FEL / TWSP: 20S / RANGE: 33E / SECTION: 3 / LAT: 32.595814 / LONG: -103.644286 (TVD: 10140 feet, MD: 20060 feet)

BLM Point of Contact

Name: Priscilla Perez
Title: Legal Instruments Examiner
Phone: 5752345934
Email: pperez@blm.gov

Approval Date: 11/21/2018

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

AFMSS

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

Operator Certification Data Report

11/26/2018

Operator Certification

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: Jennifer Elrod **Signed on:** 01/31/2018

Title: Senior Regulatory Technician

Street Address: 801 CHERRY STREET, SUITE 1200-UNIT 20

City: Fort Worth **State:** TX **Zip:** 76102

Phone: (817)953-3728

Email address: jelrod@chisholmenergy.com

Field Representative

Representative Name:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

AFMSS

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

Application Data Report

11/26/2018

APD ID: 10400026504 **Submission Date:** 01/31/2018

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400026504 **Tie to previous NOS?** **Submission Date:** 01/31/2018

BLM Office: CARLSBAD **User:** Jennifer Elrod **Title:** Senior Regulatory Technician

Federal/Indian APD: FED **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMNM097896 **Lease Acres:** 320

Surface access agreement in place? **Allotted?** **Reservation:**

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? NO

Permitting Agent? NO **APD Operator:** CHISHOLM ENERGY OPERATING LLC

Operator letter of designation:

Operator Info

Operator Organization Name: CHISHOLM ENERGY OPERATING LLC

Operator Address: 801 Cherry St., Suite 1200 Unit 20 **Zip:** 76102

Operator PO Box:

Operator City: Fort Worth **State:** TX

Operator Phone: (817)469-1104

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO **Mater Development Plan name:**

Well in Master SUPO? EXISTING **Master SUPO name:** JE

Well in Master Drilling Plan? EXISTING **Master Drilling Plan name:** JADE

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** TEAS **Pool Name:** BONE SPRING

Is the proposed well in an area containing other mineral resources? USEABLE WATER,POTASH

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

Describe other minerals:

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** JADE DRILL ISLAND EAST **Number:** 7H & 8H

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: 22 Miles **Distance to nearest well:** 60 FT **Distance to lease line:** 150 FT

Reservoir well spacing assigned acres Measurement: 319.86 Acres

Well plat: JADE_34_3_FEDERAL_COM_2BS__8H_C102_11302017_20180620091851.pdf

Well work start Date: 09/01/2018 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 32912

	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
SHL Leg #1	150	FNL	750	FEL	19S	33E	34	Lot A	32.623543	-103.644886	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 097896	3579	0	0
KOP Leg #1	150	FNL	750	FEL	19S	33E	34	Lot A	32.623543	-103.644886	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 097896	-5941	9520	9520
PPP Leg #1	605	FNL	528	FEL	19S	33E	34	Lot A	32.622292	-103.644169	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 097896	-6118	9701	9697

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

	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
EXIT Leg #1	330	FSL	528	FEL	20S	33E	3	Lot P	32.595814	-103.644286	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 017238	-6561	20060	10140
BHL Leg #1	330	FSL	528	FEL	20S	33E	3	Lot P	32.595814	-103.644286	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 017238	-6561	20060	10140

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

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	26	20.0	NEW	API	N	0	1350	0	1350	3565	2265	1350	J-55	94	BUTT	1.29	3.49	DRY	12.72	DRY	13.43
2	INTERMEDIATE	17.5	13.375	NEW	API	N	0	3450	0	3450	3565	-1835	3450	HCL-80	54.5	BUTT	1.2	2.18	DRY	7.82	DRY	7.82
3	INTERMEDIATE	12.25	9.625	NEW	API	N	0	5450	0	5450			5450	J-55	40	LTC	1.46	1.5	DRY	2.78	DRY	2.83
4	PRODUCTION	8.75	5.5	NEW	API	N	0	20061	0	10140	3565	-6575	20061	P-110	20	BUTT	2.26	2.85	DRY	3.83	DRY	3.68

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Calculator____Jade_34_3_Fed_Com_2BS_8H_20181011124308.xlsx

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

Casing Attachments

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Calculator____Jade_34_3_Fed_Com_2BS_8H_20181011124316.xlsx

Casing ID: 3 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Calculator____Jade_34_3_Fed_Com_2BS_8H_20181011124325.xlsx

Casing ID: 4 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Calculator____Jade_34_3_Fed_Com_2BS_8H_20181011124333.xlsx

Section 4 - Cement

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	950	483	2.53	12	1221	65	Class C	Sodium Metasilicate, Defoamer, KCL
SURFACE	Tail		950	1800	341	1.32	14.8	450	65	Class C	none
INTERMEDIATE	Lead		0	2750	1915	2.25	11.5	4308	200	Class C	Sodium Metasilicate, Defoamer, KCL, Kol-Seal, Cellophane Flakes, ROF SealCheck
INTERMEDIATE	Tail		2750	3450	720	1.35	14.8	972	200	Class C	Fluid Loss, Retarder, Dispersant
INTERMEDIATE	Lead		0	4500	770	2.25	11.5	1732	100	Class C	Sodium Metasilicate, Defoamer, KCL, Kol-Seal, Cellophane Flakes, ROF SealCheck
INTERMEDIATE	Tail		4500	5450	340	1.33	14.8	452	100	Class C	Fluid Loss, Retarder, Dispersant
PRODUCTION	Lead		0	9500	890	2.93	11.3	2607	15	Class H	Bentonite, Compressive Strength Enhancer, Silica Fume Alternative, Fluid Loss, Defoamer, Sodium Metasilicate, Retarder
PRODUCTION	Tail		9500	20060	2785	1.2	14.5	3342	15	Class H	Fluid Loss, Suspension Agent, Retarder, Defoamer, Dispersant

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 Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

Describe the mud monitoring system utilized: Pason PVT system will be in place throughout the well as well as visual checks

Circulating Medium Table

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

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
0	1300	SPUD MUD	8.5	9.2							
5400	10140	WATER-BASED MUD	8.8	9.5							
1300	5400	SALT SATURATED	9.8	10.2							

Section 6 - Test, Logging, Coring

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

None

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

CBL,DS,GR,MWD

Coring operation description for the well:

None

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5070 **Anticipated Surface Pressure:** 2839.2

Anticipated Bottom Hole Temperature(F): 163

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Lea_County_H2S_plan_20180712113913.pdf

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Jade_34_3_Fed_Com_2BS_8H_Plan_Numbers_20180123135109.pdf

Jade_34_3_Fed_Com_2BS_8H_Plot_20180123135110.pdf

Chisholm_Energy___Jade_34_3_Fed_Com_2BS_8H___WBD_20181011125022.XLSX

Other proposed operations facets description:

Other proposed operations facets attachment:

Other Variance attachment:

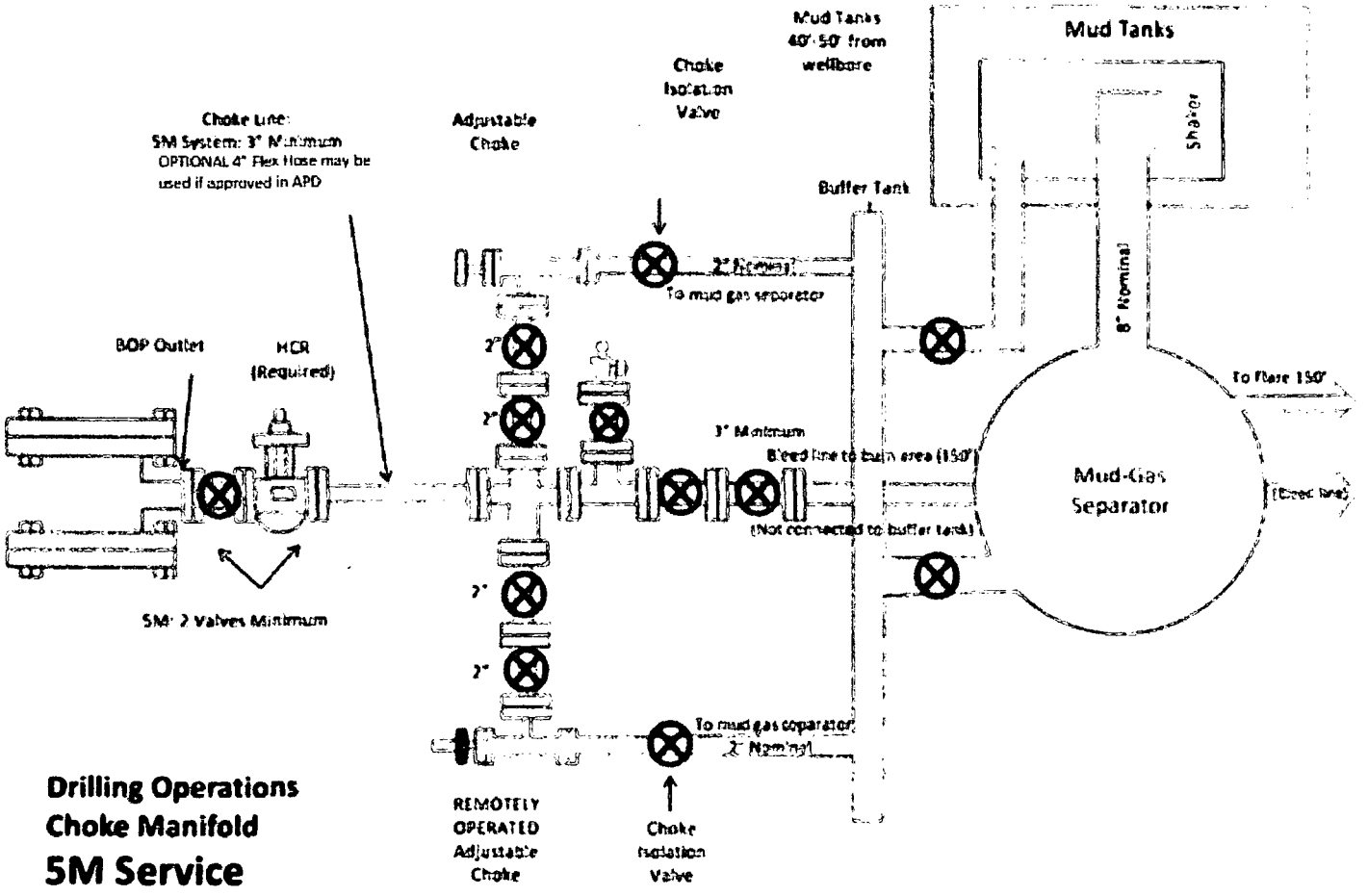
Cactus_Speed_Head_Installation_Procedure_20180712113943.pdf

Cactus_Speed_Head_Pressure_Testing_Statement_20180712113943.pdf

Cactus_Speedhead_Diagram_20180712113944.pdf

Choke_Hose_M55_1_07102017_145204_66_1225_04_14_2014__20180712113944.pdf

Choke_Hose_M55_2_07102017_145421_66_1042_05_03_2013__20180712113945.pdf



Drilling Operations
Choke Manifold
5M Service

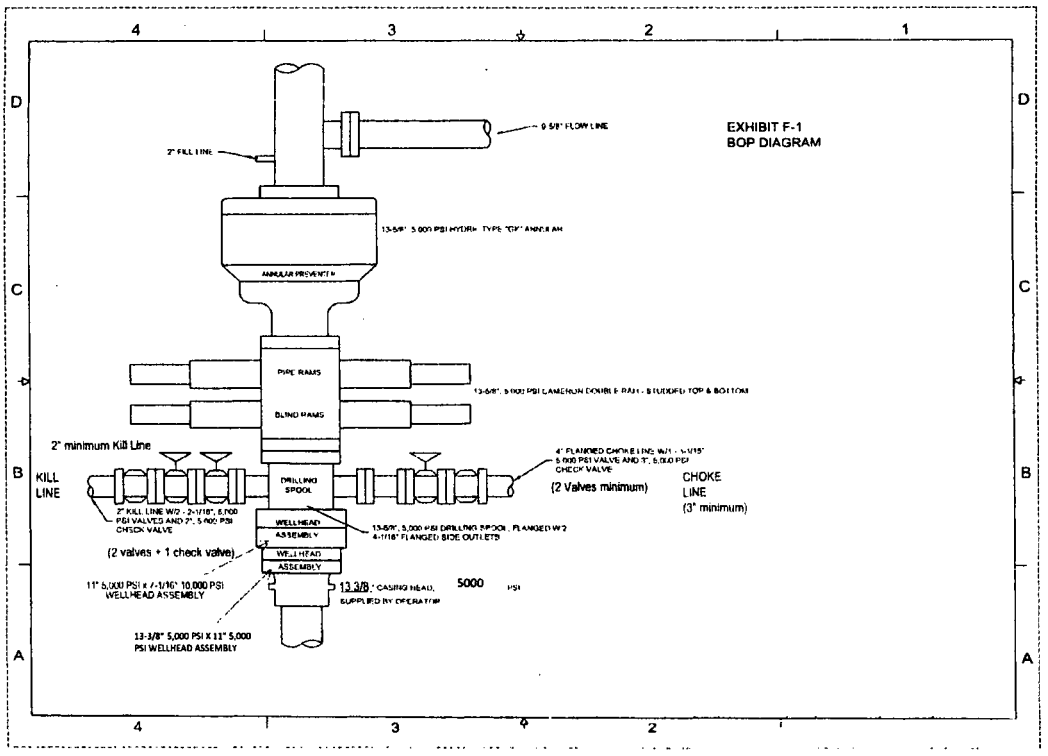


EXHIBIT F-1
BOP DIAGRAM
2" FILL LINE
PIPE RAMS
BLIND RAMS
2" minimum Kill Line
KILL LINE
DRILLING SPOOL
(2 Valves minimum)
CHOKE LINE
(3" minimum)
WELLHEAD ASSEMBLY
(2 valves + 1 check valve)
WELLHEAD ASSEMBLY
13-3/8" 5,000 PSI X 11" 5,000 PSI WELLHEAD ASSEMBLY
5000
PSI

Casing Program: Lea South 1BS/2BS/3BS/UWC (13 3/8" x 9 5/8" x 5 1/2")

Open Hole Size (Inches)	Casing Depth: From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Anticipated Mud Weight (ppg)	Burst (psi)	Burst SF (1.125)	Collapse (psi)	Collapse SF (1.125)	Tension (klbs)	Air Weight (lbs)	Bouyant Weight (lbs)	Tension SF (1.8)
Surface																	
17.5"	0'	1,850'	1,850'	13 3/8"	54.5	J-55	STC	New	8.4	2740	3.39	1130	1.40	514,000	100,825	87,883	5.85
Intermediate																	
12.25"	0'	5,350'	5,350'	9 5/8"	40	J-55	LTC	New	10.2	3950	1.39	2570	1.36	452,000	214,000	180,644	2.50
Production																	
8.75"	0'	16,030'	9,210'	5 1/2"	17	P-110	BTC	New	10.5	10640	2.12	7480	1.49	568,000	156,570	131,448	4.32

Casing Design Criteria and Casing Loading Assumptions:

Surface

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	8.4 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	8.4 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	8.4 ppg

Intermediate

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	10.2 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	10.2 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.2 ppg

Production

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	10.5 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	10.5 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.5 ppg

Casing Program: **Jade 34-3 Fed Com 2BS 8H**

Open Hole Size (Inches)	Casing Depth: From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Anticipated Mud Weight (ppg)	Burst (psi)	Burst SF (1.125)	Collapse (psi)	Collapse SF (1.125)	Pipe Body Tension (lbs)	Joint Tension (lbs)	Air Weight (lbs)	Bouyant Weight (lbs)	Pipe Body Tension SF (1.8)
Surface																		
20	0'	1,350'	1,350'	20	94.0	J-55	BTC	New	8.6	2,110	3.49	520	1.29	1,480,000	1,402,000	126,900	110,223	13.43
																0	0	
Intermediate 1																		
17.5	0'	3,450'	3,450'	13 3/8"	54.5	HCL80	BTC	New	10.2	3,980	2.18	1,460	1.20	1,241,000	1,241,000	188,025	158,718	7.82
Intermediate 2																		
12.25"	0'	5,450'	5,450'	9 5/8"	40	J-55	LTC	New	9.3	3,950	1.50	2,570	1.46	530,000	520,000	218,000	187,019	2.83
Production																		
8.75"	0'	20,061'	10,140'	5 1/2"	20	P110	BTC	New	9.3	12,640	2.58	11,100	2.26	641,000	667,000	202,800	173,979	3.68

Casing Design Criteria and Casing Loading Assumptions:

Surface

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	8.6 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	8.6 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	8.6 ppg

Intermediate 1

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	10.2 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	10.2 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.2 ppg

Intermediate 2

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	9.3 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	9.3 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	9.3 ppg

Production

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	9.3 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	9.3 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	9.3 ppg

Joint Tension SF (1.8)
12.72
7.82
2.78
3.83

Casing Program: Lea South 1BS/2BS/3BS/UWC (13 3/8" x 9 5/8" x 5 1/2")

Open Hole Size (Inches)	Casing Depth: From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Anticipated Mud Weight (ppg)	Burst (psi)	Burst SF (1.125)	Collapse (psi)	Collapse SF (1.125)	Tension (klbs)	Air Weight (lbs)	Bouyant Weight (lbs)	Tension SF (1.8)
Surface																	
17.5"	0'	1,850'	1,850'	13 3/8"	54.5	J-55	STC	New	8.4	2740	3.39	1130	1.40	514,000	100,825	87,883	5.85
Intermediate																	
12.25"	0'	5,350'	5,350'	9 5/8"	40	J-55	LTC	New	10.2	3950	1.39	2570	1.36	452,000	214,000	180,644	2.50
Production																	
8.75"	0'	16,030'	9,210'	5 1/2"	17	P-110	BTC	New	10.5	10640	2.12	7480	1.49	568,000	156,570	131,448	4.32

Casing Design Criteria and Casing Loading Assumptions:

Surface

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	8.4 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	8.4 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	8.4 ppg

Intermediate

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	10.2 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	10.2 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.2 ppg

Production

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	10.5 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	10.5 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.5 ppg

Casing Program: Jade 34-3 Fed Com 2BS 8H

Open Hole Size (Inches)	Casing Depth: From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Anticipated Mud Weight (ppg)	Burst (psi)	Burst SF (1.125)	Collapse (psi)	Collapse SF (1.125)	Pipe Body Tension (lbs)	Joint Tension (lbs)	Air Weight (lbs)	Bouyant Weight (lbs)	Pipe Body Tension SF (1.8)
Surface																		
20	0'	1,350'	1,350'	20	94.0	J-55	BTC	New	8.6	2,110	3.49	520	1.29	1,480,000	1,402,000	126,900	110,223	13.43
																0	0	
Intermediate 1																		
17.5	0'	3,450'	3,450'	13 3/8"	54.5	HCL80	BTC	New	10.2	3,980	2.18	1,460	1.20	1,241,000	1,241,000	188,025	158,718	7.82
Intermediate 2																		
12.25"	0'	5,450'	5,450'	9 5/8"	40	J-55	LTC	New	9.3	3,950	1.50	2,570	1.46	530,000	520,000	218,000	187,019	2.83
Production																		
8.75"	0'	20,061'	10,140'	5 1/2"	20	P110	BTC	New	9.3	12,640	2.58	11,100	2.26	641,000	667,000	202,800	173,979	3.68

Casing Design Criteria and Casing Loading Assumptions:

Surface

Tension	A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	8.6 ppg
Collapse	A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	8.6 ppg
Burst	A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	8.6 ppg

Intermediate 1

Tension	A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	10.2 ppg
Collapse	A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	10.2 ppg
Burst	A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.2 ppg

Intermediate 2

Tension	A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	9.3 ppg
Collapse	A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	9.3 ppg
Burst	A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	9.3 ppg

Production

Tension	A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	9.3 ppg
Collapse	A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	9.3 ppg
Burst	A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	9.3 ppg

Joint Tension SF (1.8)
12.72
7.82
2.78
3.83

Casing Program: Lea South 1BS/2BS/3BS/UWC (13 3/8" x 9 5/8" x 5 1/2")

Open Hole Size (Inches)	Casing Depth: From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Anticipated Mud Weight (ppg)	Burst (psi)	Burst SF (1.125)	Collapse (psi)	Collapse SF (1.125)	Tension (klbs)	Air Weight (lbs)	Bouyant Weight (lbs)	Tension SF (1.8)
Surface																	
17.5"	0'	1,850'	1,850'	13 3/8"	54.5	J-55	STC	New	8.4	2740	3.39	1130	1.40	514,000	100,825	87,883	5.85
Intermediate																	
12.25"	0'	5,350'	5,350'	9 5/8"	40	J-55	LTC	New	10.2	3950	1.39	2570	1.36	452,000	214,000	180,644	2.50
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8.75"	0'	16,030'	9,210'	5 1/2"	17	P-110	BTC	New	10.5	10640	2.12	7480	1.49	568,000	156,570	131,448	4.32

Casing Design Criteria and Casing Loading Assumptions:

Surface

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Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	8.4 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	8.4 ppg

Intermediate

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	10.2 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of:	10.2 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.2 ppg

Production

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	10.5 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	10.5 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.5 ppg

Casing Program: **Jade 34-3 Fed Com 2BS 8H**

Open Hole Size (Inches)	Casing Depth; From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Anticipated Mud Weight (ppg)	Burst (psi)	Burst SF (1.125)	Collapse (psi)	Collapse SF (1.125)	Pipe Body Tension (lbs)	Joint Tension (lbs)	Air Weight (lbs)	Bouyant Weight (lbs)	Pipe Body Tension SF (1.8)
Surface																		
20	0'	1,350'	1,350'	20	94.0	J-55	BTC	New	8.6	2,110	3.49	520	1.29	1,480,000	1,402,000	126,900	110,223	13.43
																0	0	
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17.5	0'	3,450'	3,450'	13 3/8"	54.5	HCL80	BTC	New	10.2	3,980	2.18	1,460	1.20	1,241,000	1,241,000	188,025	158,718	7.82
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12.25"	0'	5,450'	5,450'	9 5/8"	40	J-55	LTC	New	9.3	3,950	1.50	2,570	1.46	530,000	520,000	218,000	187,019	2.83
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Casing Design Criteria and Casing Loading Assumptions:

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Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: 8.6 ppg

Intermediate 1

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: 10.2 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of: 10.2 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: 10.2 ppg

Intermediate 2

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: 9.3 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of: 9.3 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: 9.3 ppg

Production

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: 9.3 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of: 9.3 ppg
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Casing Program: Lea South 1BS/2BS/3BS/UWC (13 3/8" x 9 5/8" x 5 1/2")

Open Hole Size (Inches)	Casing Depth: From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Anticipated Mud Weight (ppg)	Burst (psi)	Burst SF (1.125)	Collapse (psi)	Collapse SF (1.125)	Tension (klbs)	Air Weight (lbs)	Bouyant Weight (lbs)	Tension SF (1.8)
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Intermediate

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Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.2 ppg

Production

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of:	10.5 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of:	10.5 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of:	10.5 ppg

Casing Program: **Jade 34-3 Fed Com 2BS 8H**

Open Hole Size (Inches)	Casing Depth: From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Anticipated Mud Weight (ppg)	Burst (psi)	Burst SF (1.125)	Collapse (psi)	Collapse SF (1.125)	Pipe Body Tension (lbs)	Joint Tension (lbs)	Air Weight (lbs)	Bouyant Weight (lbs)	Pipe Body Tension SF (1.8)
Surface																		
20	0'	1,350'	1,350'	20	94.0	J-55	BTC	New	8.6	2,110	3.49	520	1.29	1,480,000	1,402,000	126,900	110,223	13.43
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Intermediate 1																		
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Casing Design Criteria and Casing Loading Assumptions:

Surface

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Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of: 8.6 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: 8.6 ppg

Intermediate 1

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: 10.2 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of: 10.2 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: 10.2 ppg

Intermediate 2

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: 9.3 ppg
Collapse A 1.125 design factor with 1/3 TVD internal evacuation and collapse force equal to a mud gradient of: 9.3 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: 9.3 ppg

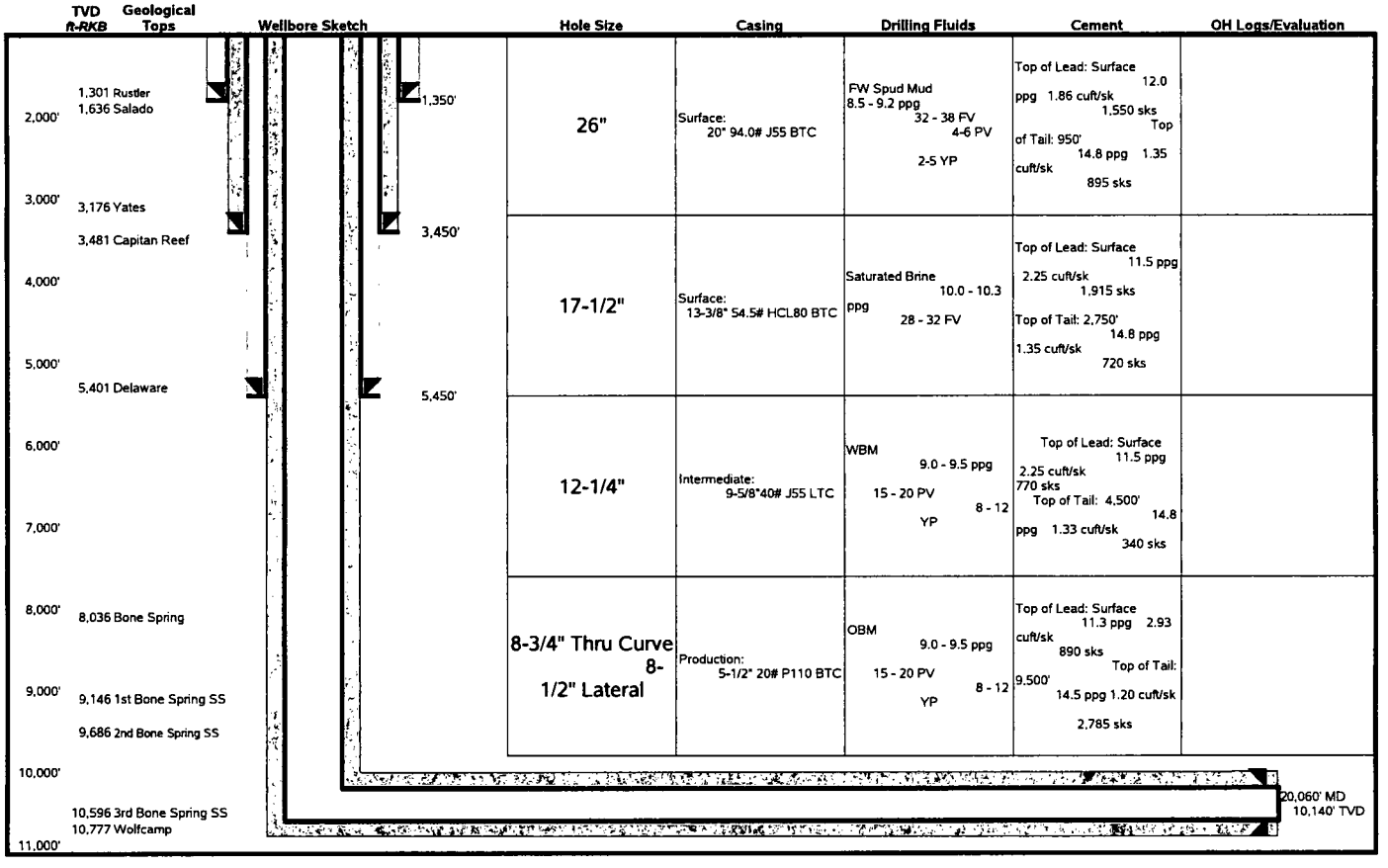
Production

Tension A 1.8 design factor with effects of buoyancy with a fluid equal to a mud weight of: 9.3 ppg
Collapse A 1.125 design factor with full internal evacuation and collapse force equal to a mud gradient of: 9.3 ppg
Burst A 1.125 design factor with full external evacuation and burst force equal to a mud gradient of: 9.3 ppg

NTG
NEW TECH GLOBAL

Jade 34-3 Fed Com 2BS 8H

API # 30-0xx-xxxxx



Cactus Wellhead

Installation Procedure Prepared For:

Chisholm Energy

13-3/8" x 9-5/8" x 5-1/2" 5/10M MBU-3T Wellhead System With CTH-HPS-F MOD Tubing Head

Publication # IP0571

May, 2017

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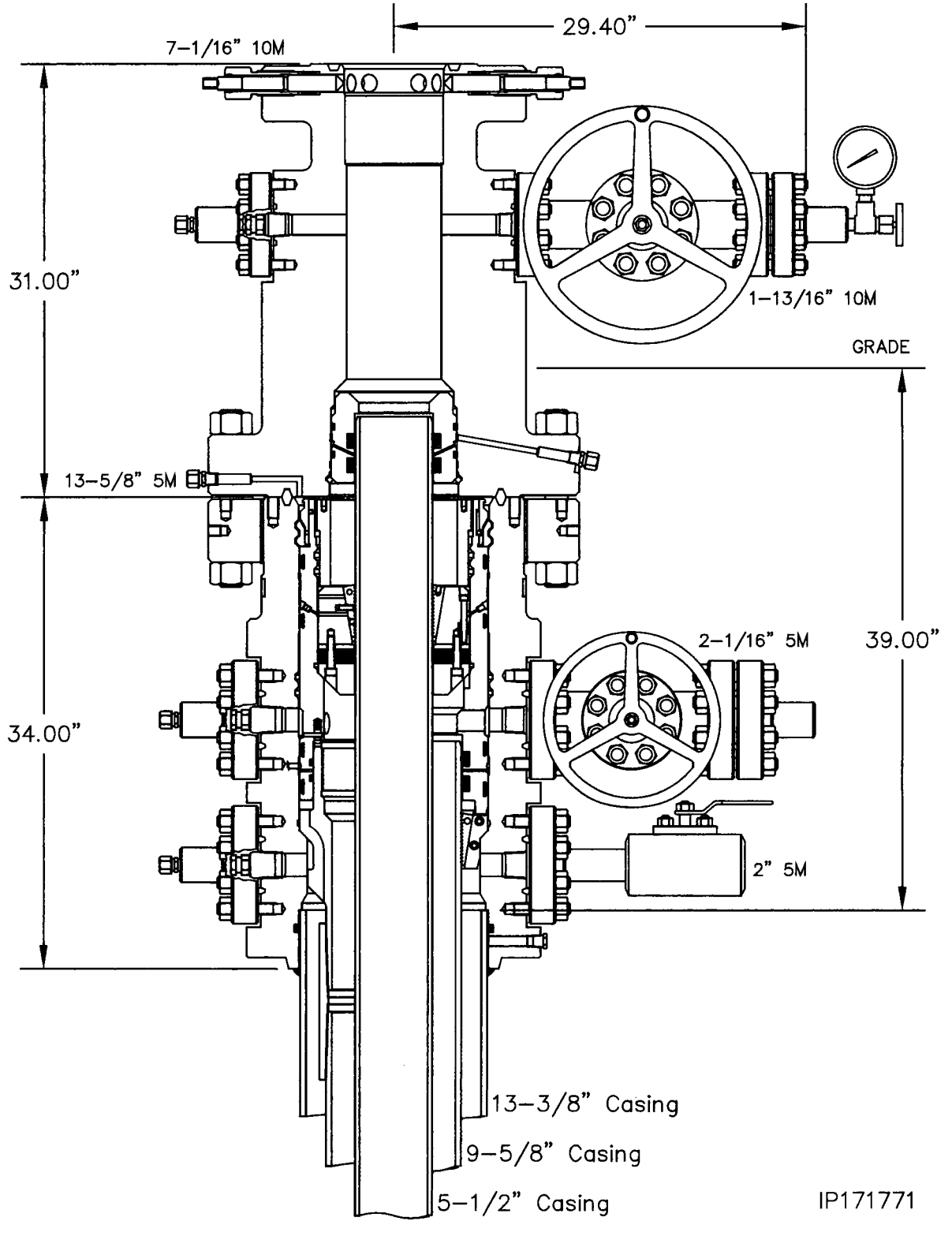
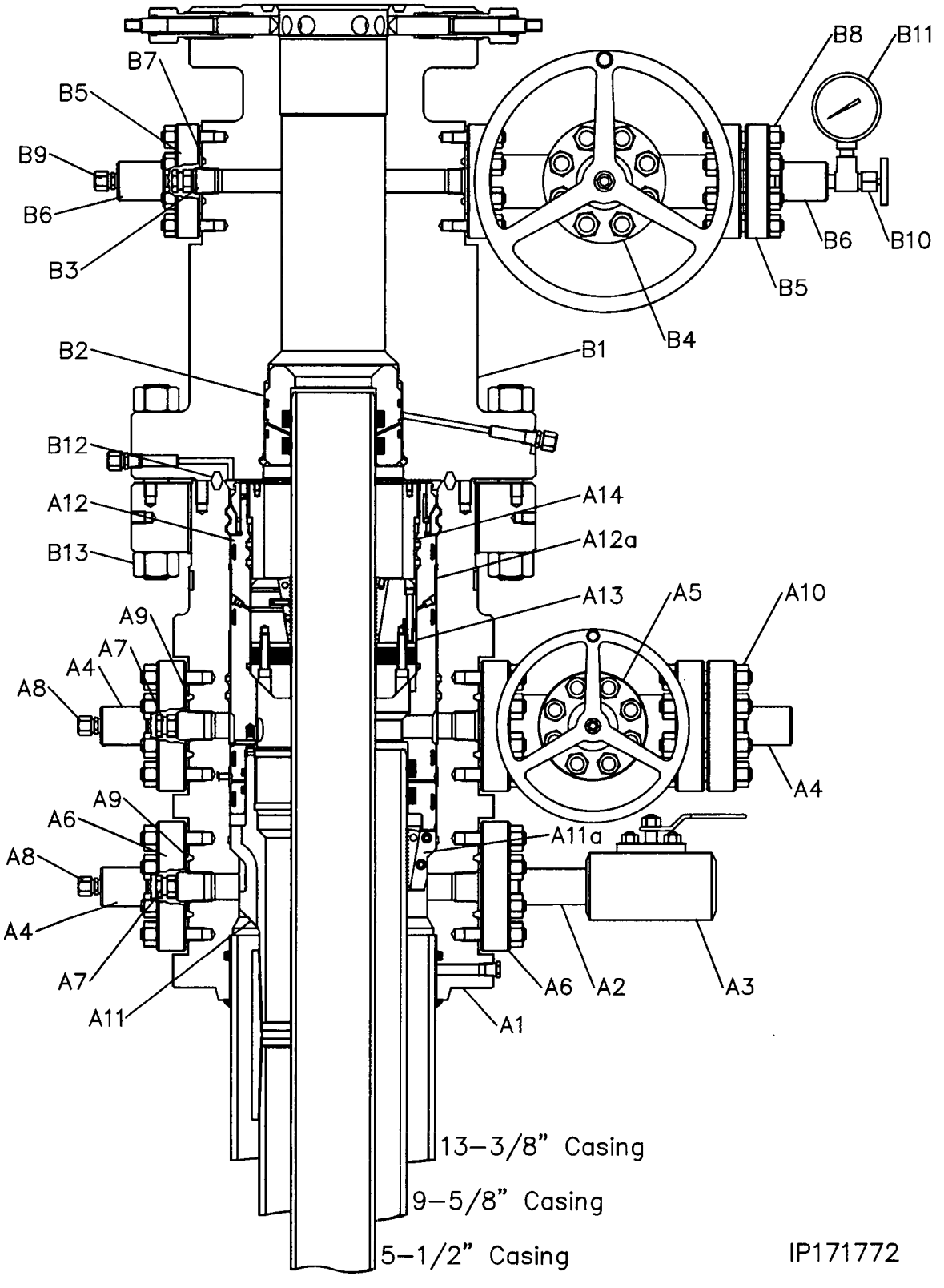
System Drawing



Bill of Materials



MBU-3T HOUSING ASSEMBLY

Item	Qty	Description
A1	1	Housing, CW, MBU-3T, 13.5/8" 5M x 13-3/8" SOW, with two 2-1/16" 5M studded upper and lower outlets with o-ring, 6A-PU-AA-1-2 Part # 117620
A2	1	Nipple, 2" line pipe x 6" long Part # NP6A
A3	1	Ball Valve, TV, 2" RP, 5M x 2" LP, WCB body SS trim, Delrin seats, HNBR seals, nace with locking handle Part # 115184
A4	3	Bull Plug, 2" line pipe x 1/2" line pipe, 4130 60K Part # BP2T
A5	1	Gate valve, CW1, 2-1/16" 3/5M, flanged end, handwheel operated, AA/DD-NL trim, (6A-LU-AA/DD-NL-1-2) Part # 610003
A6	4	Companion Flange, 2-1/16" 5M x 2" line pipe, 4130 CMS-102, CMS-002 Part # 200002
A7	2	VR Plug, 1-1/2" Sharp Vee x 1-1/4" hex Part # VR2
A8	2	Fitting, grease, vented cap, 1/2" NPT alloy non-nace Part # FTG1
A9	5	Ring Gasket, R-24, 2-1/16" 3/5M Part # R24
A10	8	Studs, all thread with two nuts, black, 7/8" x 6-1/2" long, B7/2H Part # 780067

MBU-3T HOUSING ASSEMBLY

Item	Qty	Description
A11	1	Casing Hanger, CW, MBU--3T-LWR-TP, fluted, 13-5/8" x 9-5/8" (40#) LC bottom x 10.250" 4 Stub Acme 2G RH box top, with 11-1/2" OD neck, 6A-U-AA-1-2 Part # 120251
A12	1	Packoff, CW, MBU-3T, Mandrel, 13-5/8" nested x 11" with 11.250" 4 Stub Acme 2G LH box top, 1/8" NPT test ports, 6A-U-AA-1-1 Part # 117152
A13	1	Casing Hanger, C2, 11" x 5-1/2" Part # 108067
A14	1	Hold Down Ring, for C2 hanger, 11" x 7 through 4-1/2", arranged for packoff MBU-3T, 13-5/8" with 11.250" 4 Stub Acme 2G LH pin x 9.06" ID x 6.25" long, with 2.12" thread length, 4140 110K Part # 117418

TUBING HEAD ASSEMBLY

Item	Qty	Description
B1	1	Tubing Head, CW, CTH-HPS-F, 9" (MOD), 13-5/8" 5M x 7-1/16" 10M, with two 1-13/16" 10M studded outlets, round bar, 17-4PH lockscrews, 6A-PU-EE-0,5-2-1 Part #
B2	1	Secondary Seal, CW, HPS-F, 9 MOD x 5-1/2", 6A-PU-DD-NL-1-2 Part # 110503
B3	1	VR Plug, 1-1/4" Sharp Vee x 1-1/4" hex Part # VR1
B4	1	Gate valve, AOZE, 1-13/16" 10M, flanged end, handwheel operated, EE-0,5 trim, (6A-LU-EE-0,5-3-1) Part # 103188
B5	2	Companion Flange, 1-13/16" 10M x 2" LP, 5000 psi max WP, 6A-KU-EE-NL-1 Part # 200010
B6	2	Bull Plug, 2" line pipe x 1/2" line pipe, 4130 60K Part # BP2T
B7	3	Ring Gasket, BX151, 1-13/16" 10M Part # BX-151
B8	8	Studs, all thread with two nuts, black, 3/4" x 5-1/2" long, B7/2H Part # 780080
B9	1	Fitting, grease, vented cap, 1/2" NPT alloy non-nace Part # FTG1
B10	1	Needle Valve, MFA, 1/2" NPT 10M service Part # NVA
B11	1	Pressure Gauge, 5M, 4-1/2" face, liquid filled, 1/2" NPT PG5M
B12	1	Ring Gasket, BX-160, 13-5/8" 15M Part # BX-160
B13	16	Studs, all thread with two nuts, black, 1-5/8" x 12-3/4" long, B7/2H Part # 780087

RECOMMENDED SERVICE TOOLS

Item	Qty	Description
ST1	1	Test Plug/Retrieving Tool, CW, 13-5/8" x 4-1/2" IF (NC-50), 1-1/4" LP bypass and spring loaded lift dogs Part # 104467
ST2	1	Wear Bushing, CW, MBU-3T-LWR, 13-5/8" x 12.31" ID x 27.0" long with 3/8" o-ring Part # 116974
ST3	1	Casing Hanger Running Tool, CW, MBU-3T-LR-TP, 13-5/8" x 9-5/8" LC box top x 10.250" 4 Stub Acme 2G RH pin bottom, max load capacity 1000K, max torque 18000 ft-lbs. spec for rotating casing Part # 105845
ST4	1	Torque Collar, CW, for use with running tool, TP, 10.250 4 stub Acme 2G RH pin bottom and arranged for 11.50" OD x 5.00" long box hanger neck, maximum torque 18,000 ft-lbs Part # 118906
ST5	1	Wash Tool, CW, Casing Hanger, MBU-LR/MBS2, fluted, 13-5/8" x 4-1/2" IF (NC-50) box top threads, with brushes Part # 106277
ST6	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 with seal sleeve Part # 117310
ST7	1	Test Plug, CW, MBU-2LR Inner, 11" x 4-1/2" IF, 1-1/4" LP bypass Part # 108848
ST8	1	Wear Bushing, MBU-3T-UPR, nested, 13-5/8" x 11" x 9.00" I.D. x 20.0" long, arranged for 13-5/8" tool Part # 117158

RENTAL EQUIPMENT

Item	Qty	Description
R1	1	Threaded Hub, CW, MBU-3T, 13-5/8" 5M With 19.000" 2 Stub Acme-2G Left Hand Box Thread Part # 117268
R2	1	Drilling Adapter, CW, MBU-3T, 13-5/8" 5M Quick Connect Bottom x 13-5/8" 5M Studded Top, Temp Rating PU Part # 117278
R3	1	TA Cap, CW, MBU-3T-HPS, 13-5/8" 5M quick connect, with one 2" LPO & 1/2" NPT port, with 1/2" NPT needle valve and 2" LP nipple and valve, 6A-U-AA-1-1 Part # 117317
	1	Secondary Seal Bushing, CW, HPS, 9" x 5-1/2 Part # 109026
R4	4	Lift Eyes, 3/4", side pull hoist ring Part # 115542

EMERGENCY EQUIPMENT

Item	Qty	Description
A11a	1	Casing Hanger, CW, MBU-3T, 13-5/8" x 9-5/8" 6A-PU-DD-3-1 Part # 116998
A12a	1	Packoff, CW, MBU-3T, Emergency, 13-5/8" nested x 11" with 11.250" 4 Stub Acme 2G LH box top, 1/8" NPT test ports, 6A-U-AA-1-1 Part # 117184

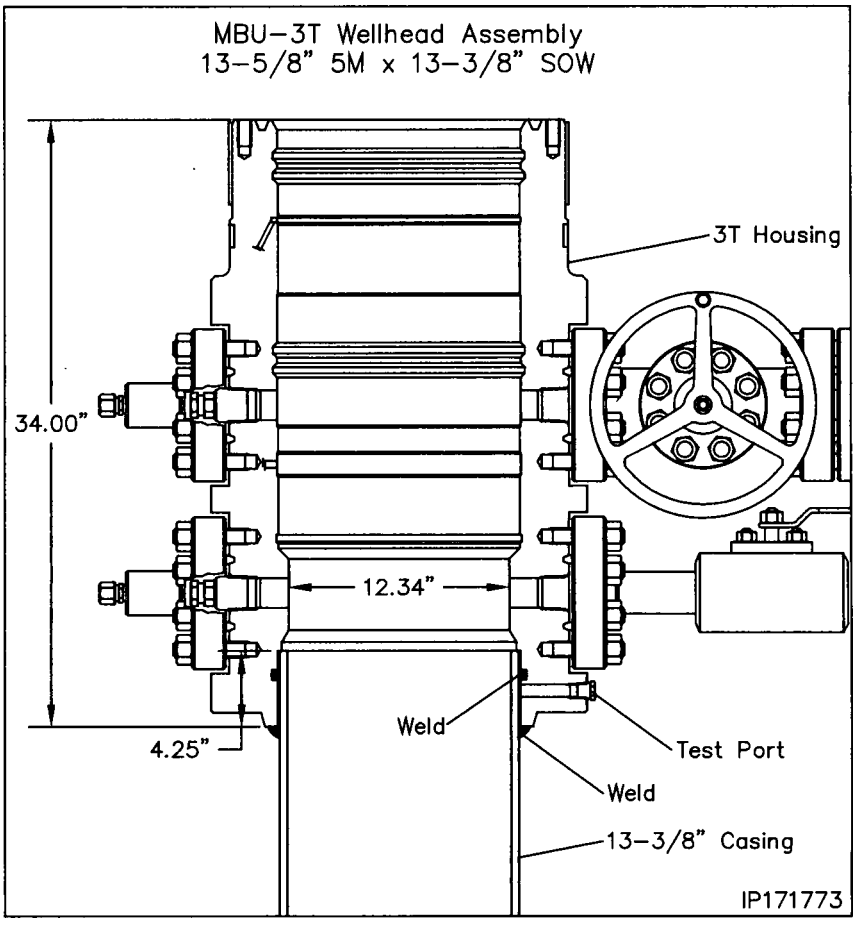
Stage 1 — Install the MBU-3T Housing

1. Run the conductor and 13-3/8" surface casing to the required depth and cement as required.
2. Cut the conductor pipe off level with the cellar floor.
3. Final cut the 13-3/8" surface casing at 39.00" below ground level (grade). Ensure the cut is level and square with the horizon.
4. Place an 3/16" x 3/8" bevel on the OD of the stub.

Note: The slip on and weld preparation is 4.25" in depth.

5. Examine the ***13-5/8" 5M x 13-3/8" SOW x 19.00" 2 Stub Acme LH (Left Hand Thread) MBU-3T Wellhead Housing (Item A1).*** Verify the following:
   - internal bore is clean and in good condition
   - external Acme thread is clean and in good condition
   - thread flange is in place and rotates freely

   valves are intact and in good condition
   - weld socket is clean and free of grease and debris and o-ring is in place and in good condition
6. Align and level the Wellhead Assembly over the casing stub, orienting the outlets so they will be compatible with the drilling equipment.
7. Remove the pipe plug from the port on the bottom of the Head.
8. Slowly and carefully lower the assembly over the casing stub, weld and test the MBU-3T wellhead to the surface casing.
9. Replace the pipe plug in the port on the bottom of the wellhead.



Note: The weld should be a fillet-type weld with legs no less than the wall thickness of the casing. Legs of 1/2" to 5/8" are adequate for most jobs.

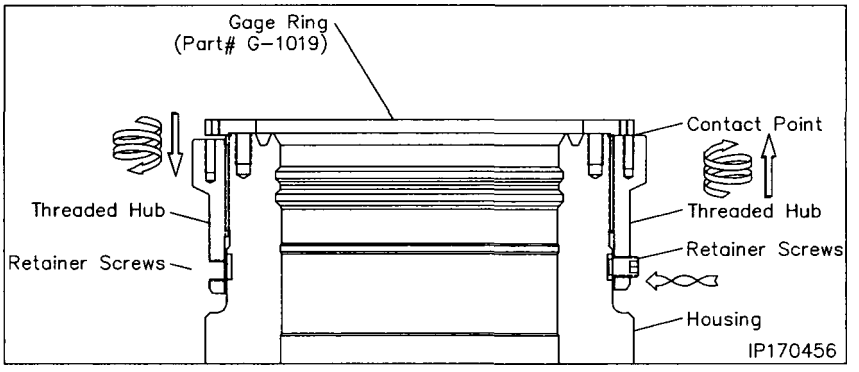
Refer to the back of this publication for the **Recommended Procedure for Field Welding Pipe to Wellhead Parts for Pressure Seal** and for field testing of the weld connection.

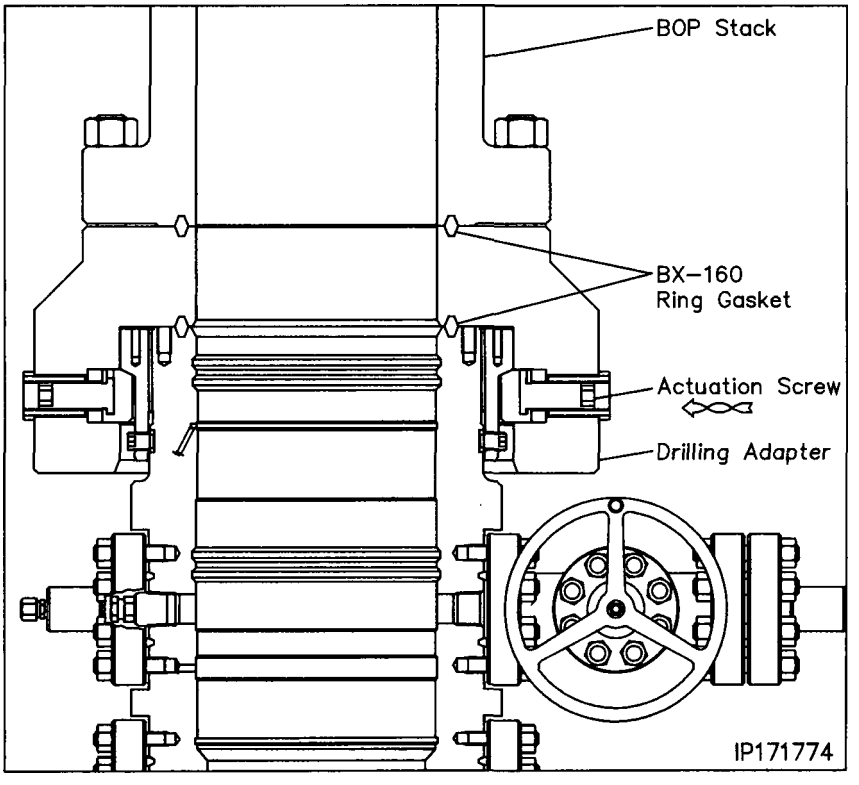
Stage 2 — Nipple Up The BOP Stack

1. Examine the ***13-5/8" 5M x 19.00" 4 Stub Acme Threaded Hub (Item R1)***. Verify the following:
   - Acme thread are clean and in good condition
   - remove the (4) retainer set screws an place them in a safe place
2. Thoroughly clean and lightly lubricate the mating threads of the housing and the Thread Hub with Copper Coat or Never Seize.
3. 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.
4. 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.
5. Rotate the Hub clockwise (UP) until it contacts the gage ring.

WARNING: Do not off seat the gage ring.

6. Locate the retainer screw holes in the threaded hub.
7. Rotate the Hub up or down to align the holes in the hub with the notches in the housing.
8. Install the set screws and tighten securely. Remove gage ring.
9. Make up the ***13-5/8" 5M Quick Connect x 13-5/8" 5M Studded Adapter (Item R2)*** to the bottom of the BOP stack using a new ***BX-160 Ring Gasket.***
10. Thoroughly clean the MBU-3T hub, ring groove and the mating clamp segments and ring groove of the Adapter attached to the BOP stack.
11. Install a new ***BX-160 Ring Gasket*** into the ring groove of the housing.
12. Pick up the BOP stack and carefully lower it over the top of the housing and land it on the ring gasket.





13. Ensure the BOP is level and then carefully run in all of the drive screws of the upper adapter to contact point.
14. Ensure the assembly remains level, run in one actuation and torque to 100 ft lbs.
15. Locate the screw 180° from the first and torque it to 100 ft lbs.
16. Locate the screws 90° to the right and left and torque them to 100 ft lbs.
17. Position the second 4 point sequence 90° from the first and torque each screw to 200 ft lbs.
18. Run in all remaining screws to contact and then torque each screw to 400 ft lbs.
19. Make one additional round until a stable torque of 400 ft lbs on all (16) screws is achieved.

Stage 3 — 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 (NC-50) CW Test Plug/ Retrieving Tool (Item ST1)***. 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

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.

WARNING: Ensure that 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.

4. Open the housing lower side outlet valve.

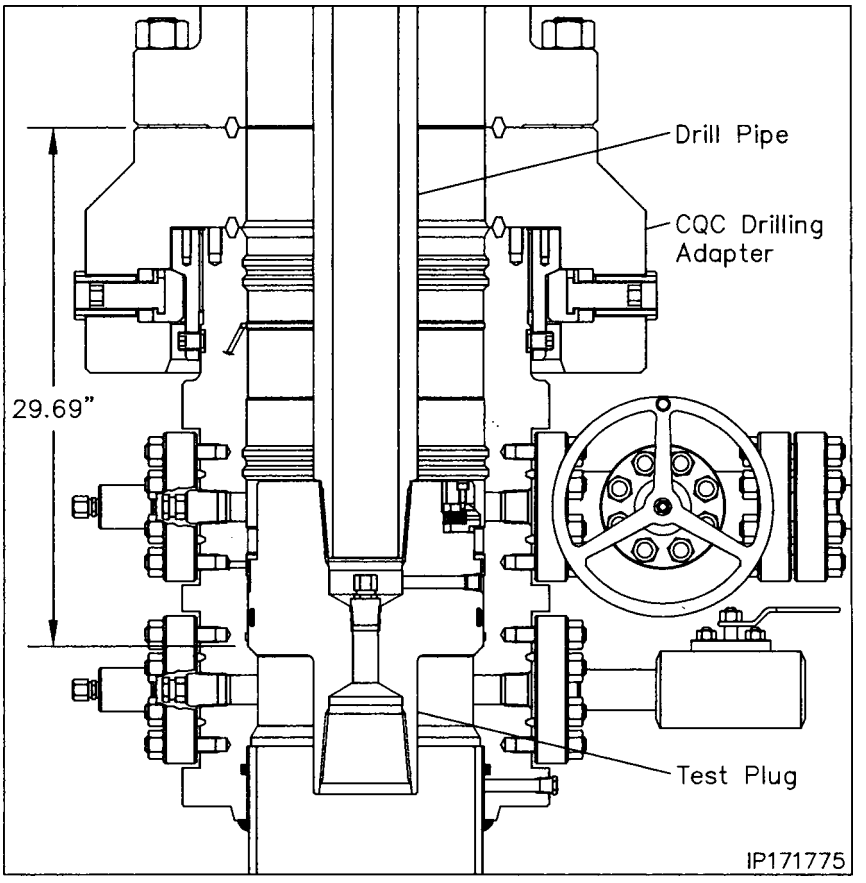
5. Lightly lubricate the test plug seal with oil or light grease.

6. Carefully lower the test plug through the BOP and land it on the load shoulder in the housing, 29.69" below the top of the drilling adapter.

7. Close the BOP rams on the pipe and test the BOP to 5000 psi or as required by site supervisor.

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

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 and the retrieve the test plug with a straight vertical lift.

Note: 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. Repeat this procedure as required during the drilling of the hole section.

Stage 4 — Run the Lower Wear Bushing

Note: 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" Nominal MBU-3T-LWR Wear Bushing (Item ST2).*** 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 ***13-5/8" Nominal x 4-1/2" IF (NC-50) CW Test Plug/Retrieving Tool (Item ST1)*** with drill pipe connection up.

3. Attach the Retrieving Tool to a joint of drill pipe.

WARNING: Ensure that the lift lugs are down and the elastomer seal is up

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.

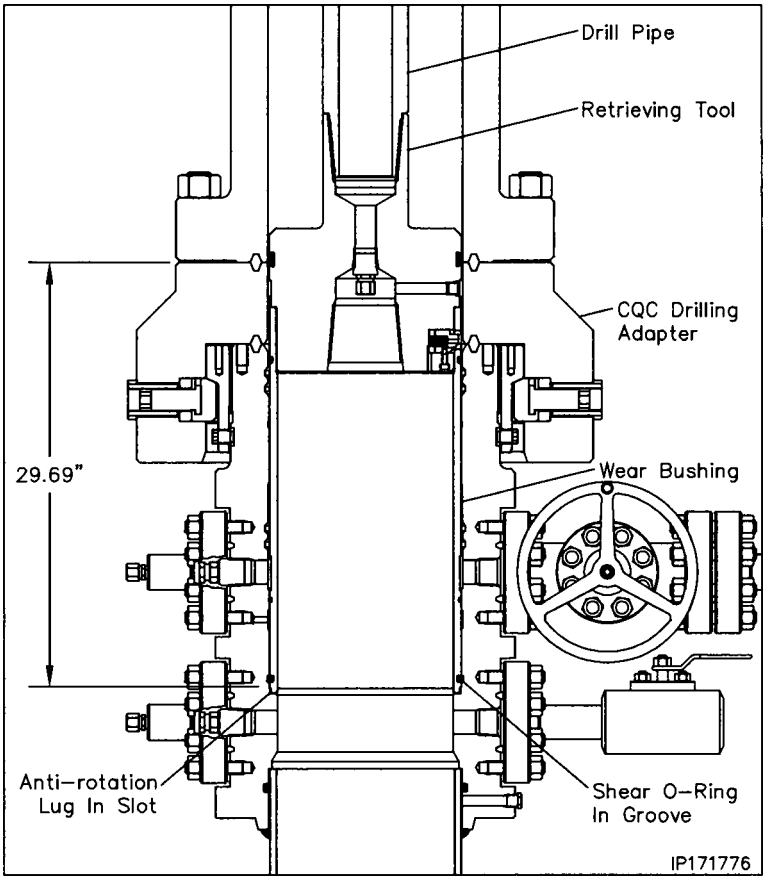
5. **Apply a heavy coat of grease, not dope, to the OD of the bushing.**

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, 29.69" below the top of the 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 up.

10. Drill as required.

Note: 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. Drain BOP stack and wash out if necessary.

13. Slowly lower the tool into the Wear Bushing.

14. Rotate the Retrieving Tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.

15. Using the top drive, slowly pick up on the landing joint in 1000 lbs increments until the busing starts to rise. This action should take a minimum of 3000 lbs pull. Do Not Exceed 60,000 lbs.

16. Retrieve the Wear Bushing, and remove it and the Retrieving Tool from the drill string.

Stage 5 — Hang Off the 9-5/8" Casing

1. Examine the ***13-5/8" x 9-5/8" CW-MBU-3T-TP4 Casing Hanger Running Tool (Item ST3).*** 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

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.

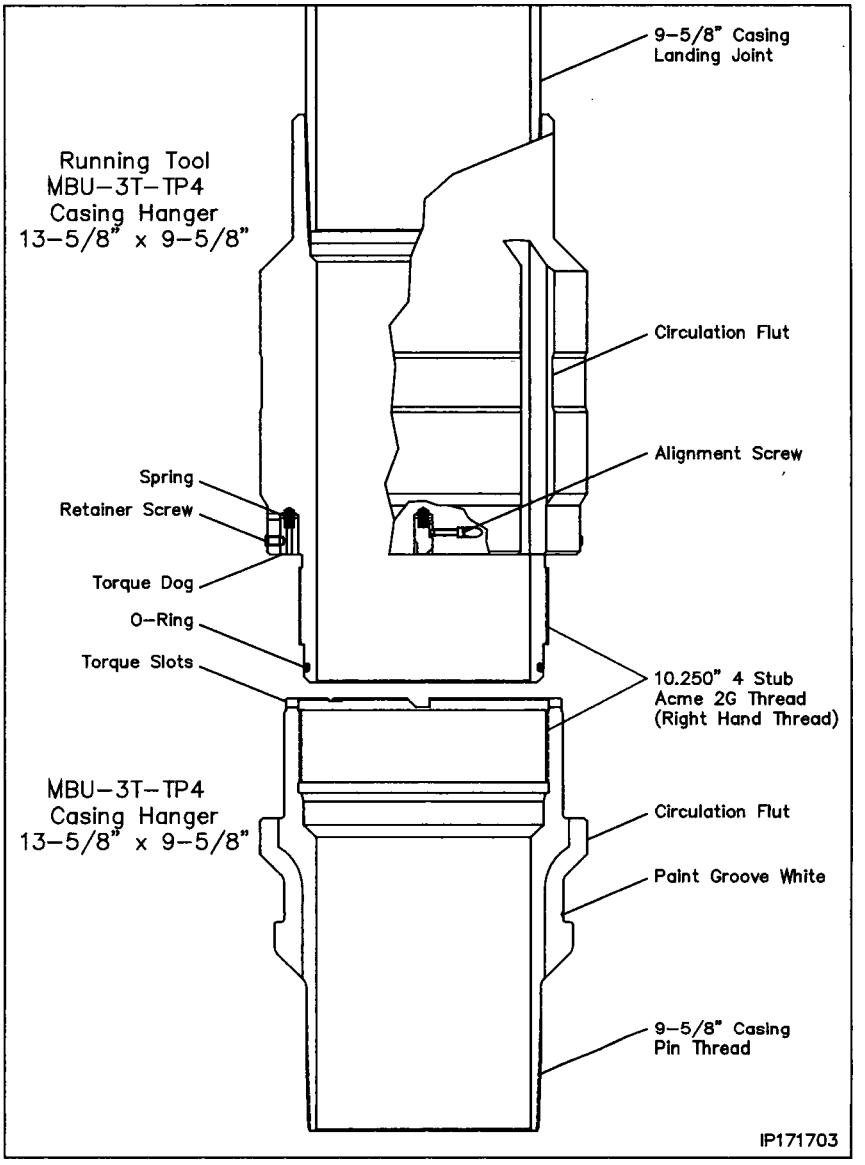
4. On the pipe rack, examine the ***13-5/8" x 9-5/8" CW-MBU-3T-TP4 Mandrel Casing Hanger (Item A11).*** Verify the following:
   - internal bore and threads are clean and in good condition
   - neck seal area is clean and undamaged
   - torque slots are clean and in good condition
   - pin threads are clean and in good condition. **Install thread protector**
   - paint indicator groove white as indicated and allow paint to dry

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.

WARNING: 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.



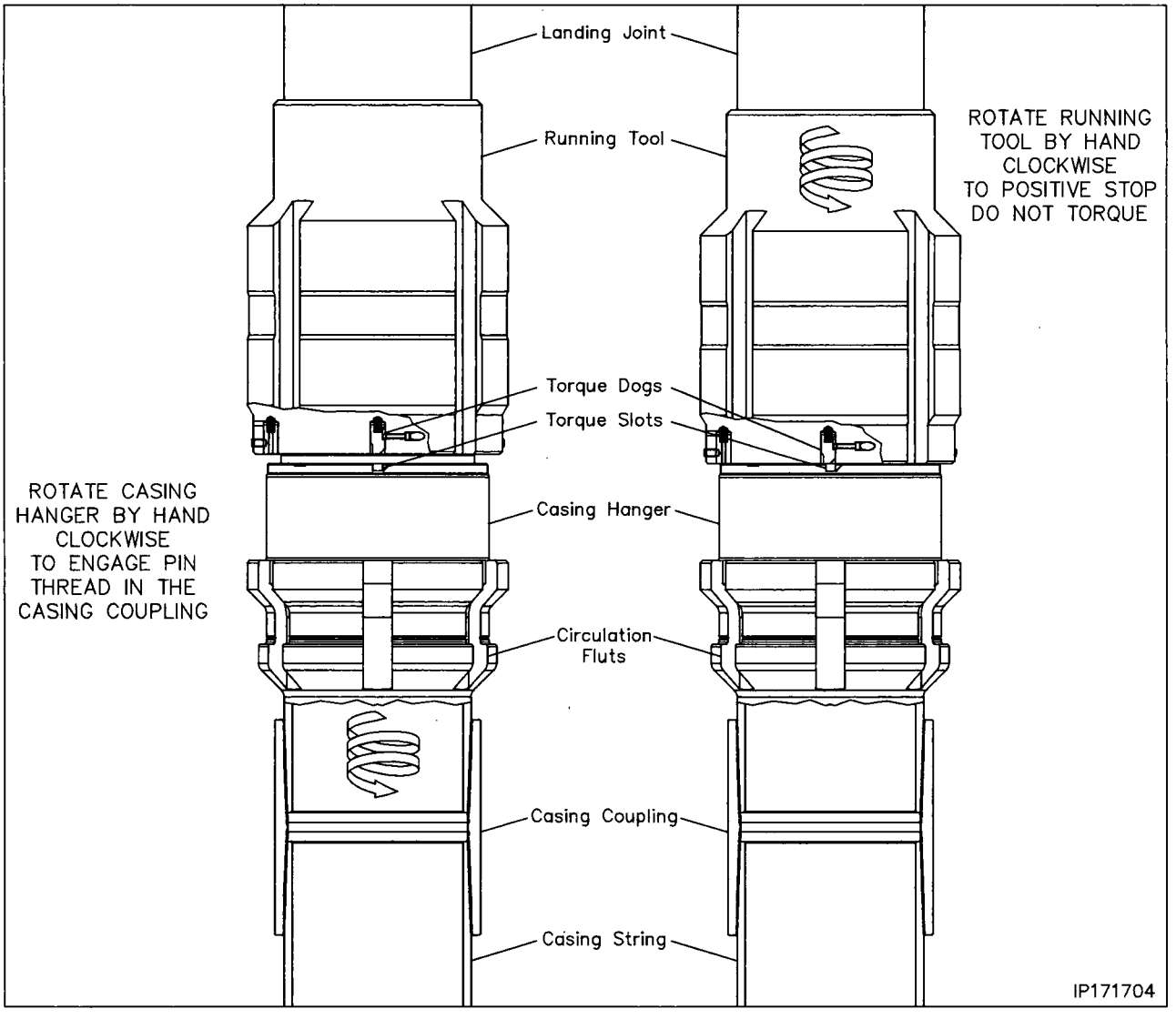
7. Calculate the total landing dimension by adding the previously determined RKB dimension and 29.69", the depth of the wellhead.

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 30" below the first and mark **STOP ROTATING**.

10. Run the 9-5/8" casing as required and space out appropriately for the mandrel casing hanger.

Stage 5 — Hang Off the 9-5/8" Casing



Note: If the 9-5/8" casing becomes stuck and the mandrel casing hanger cannot be landed, Refer to **Stage 5A** for the emergency slip casing hanger procedure.

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.

Stage 5 — Hang Off the 9-5/8" Casing

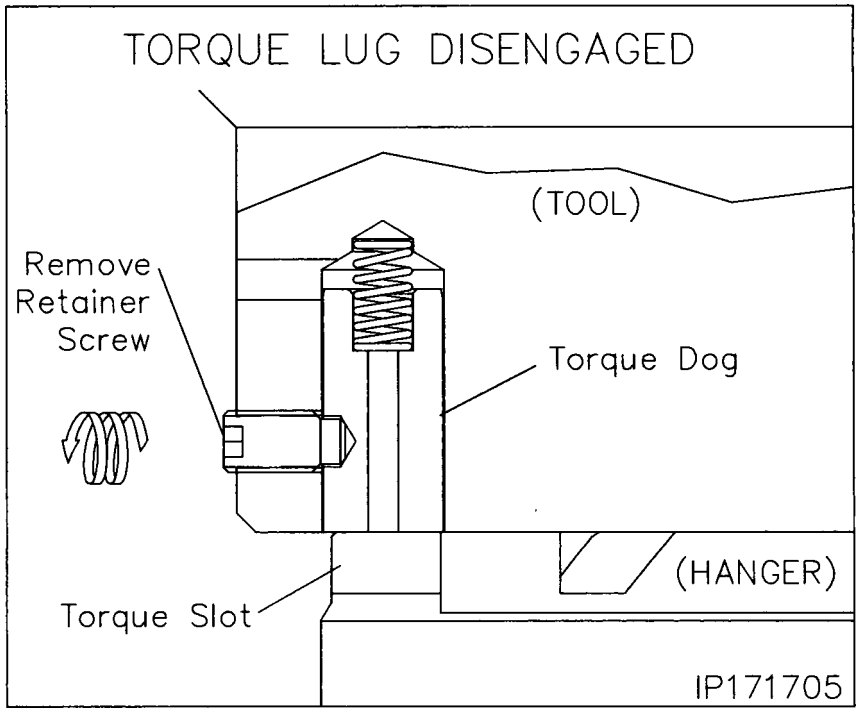
14. Locate the (4) 3/8" socket head set screws in the side of the hanger running tool and remove the screws.

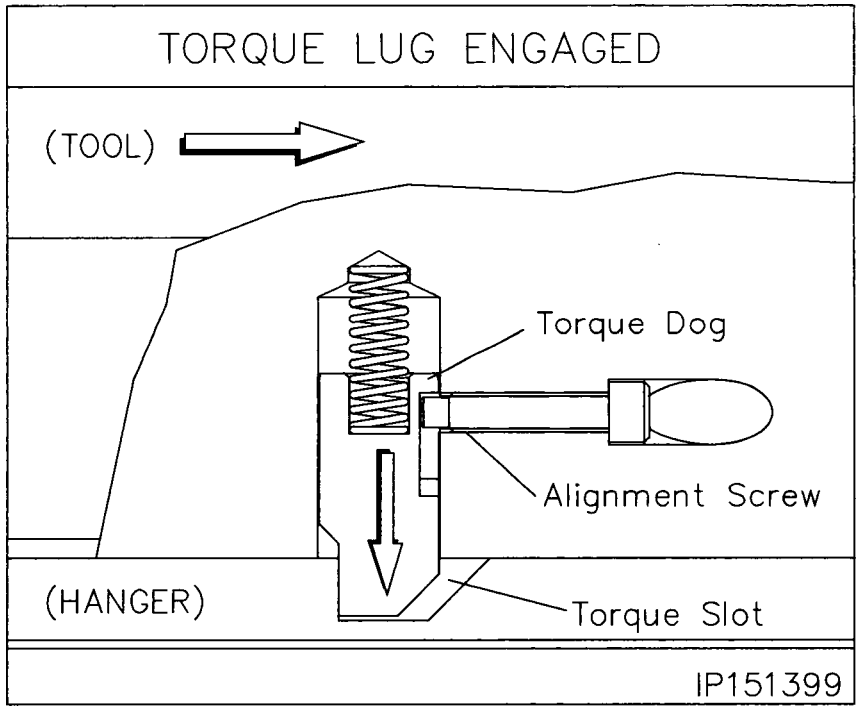
WARNING: Place the screws in a safe place to reinstall in the tool when the job is completed.

Note: This will release the running tool torque dogs allowing them to move downward.

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

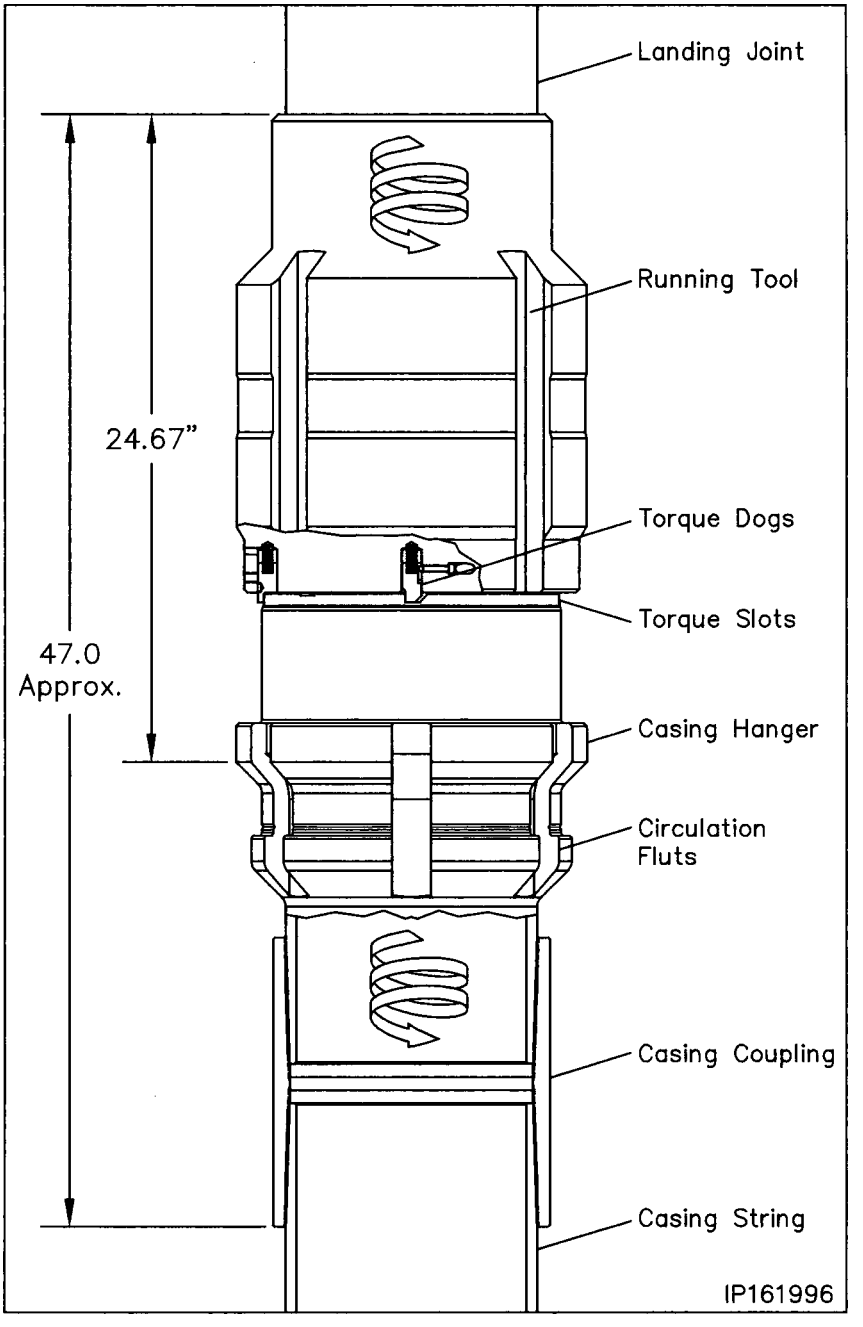
WARNING: Do not rotate the running tool more than 1/4 turn to the left. Doing so will decrease the torque dog engagement





Stage 5 — Hang Off the 9-5/8" 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.



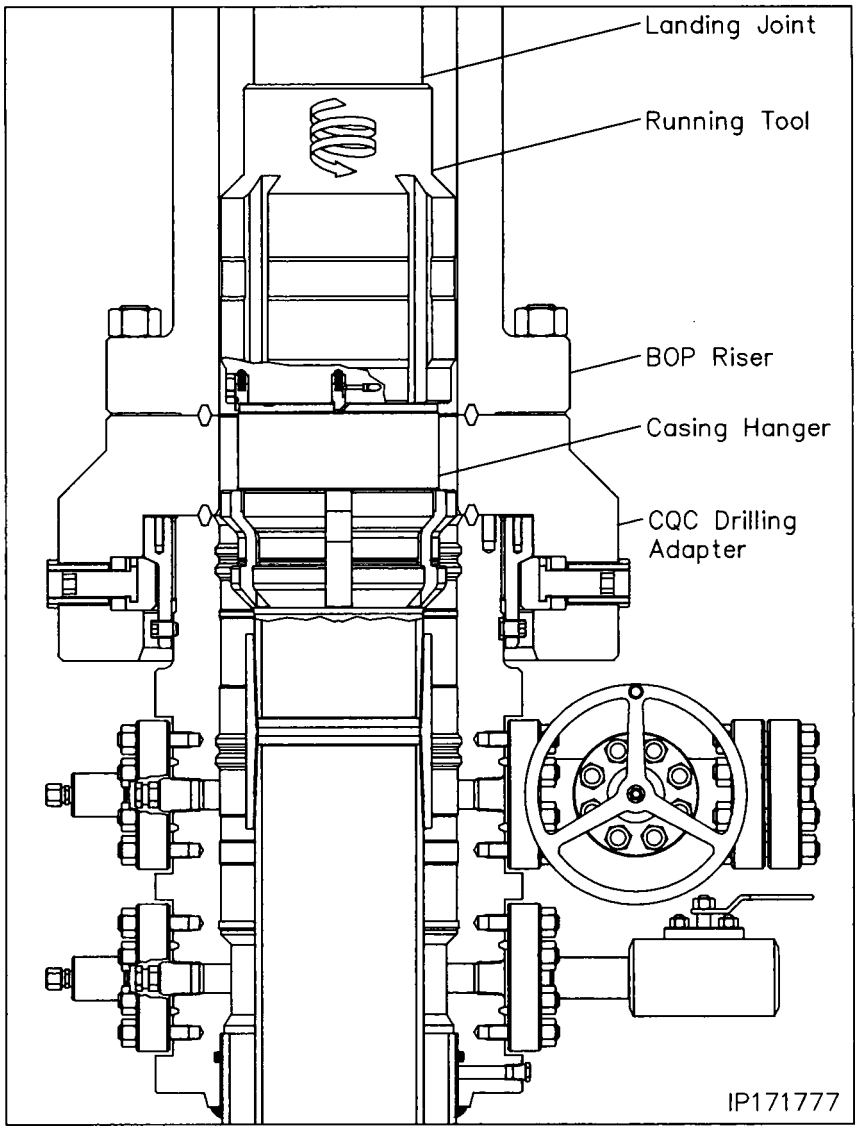
Stage 5 — Hang Off the 9-5/8" Casing

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 of 18,000 ft lbs.



Stage 5 — Hang Off the 9-5/8" Casing

WARNING: 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 housing, 29.69" 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. Open the MBU-3T 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.

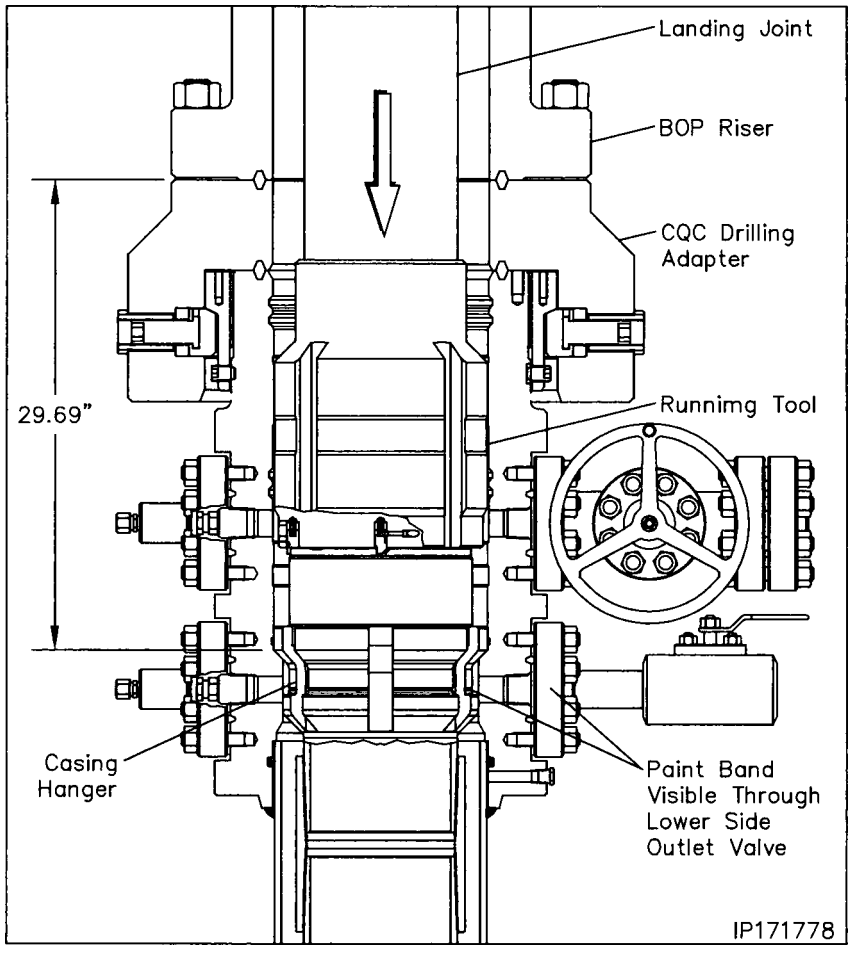
25. Cement the casing as required.

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.

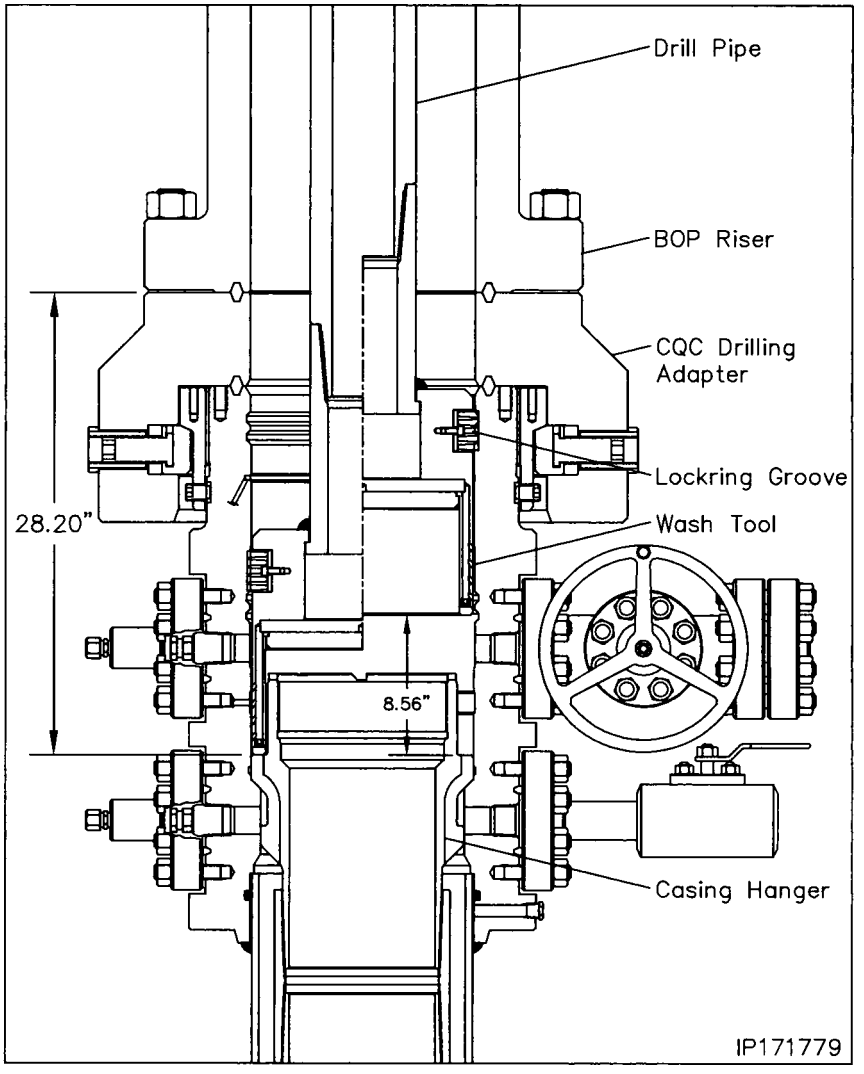
WARNING: The rig floor tong may be used to break the connection but **under no circumstances is the top drive to be used to rotate or remove the casing hanger running tool.**



Stage 5 — Hang Off the 9-5/8" Casing

Running the 13-5/8" Wash Tool

1. Examine the ***13-5/8" x 4-1/2" IF Wash Tool (Item ST5).*** 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 9-5/8" casing hanger, 28.20" below the top flange of the wellhead housing.
4. Place a paint mark on the drill pipe level with the rig floor.
5. Open the housing lower side outlet valve and drain the BOP stack.
6. Using chain tongs, rotate the tool clockwise approximately 6 turns to loosen any debris that may be on top of the hanger flutes.
7. Pick up on the tool approximately 1" and attach a high pressure water line or the top drive to the end of the drill pipe and pump water (at approximately 200 to 300 PSI on the rig pump) through the tool and up the BOP stack.
8. While flushing, raise and lower the tool the full length of the wellhead and BOP stack. The drill pipe should be slowly rotated (approximately 20 RPM) while raising and lowering to wash the inside of the housing and BOP stack to remove all caked on debris.
9. Once washing is complete, land the wash tool on the hanger flutes.
10. Shut down pumps and allow the BOP stack to drain.



11. 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 was tool resting on top of the hanger flutes.

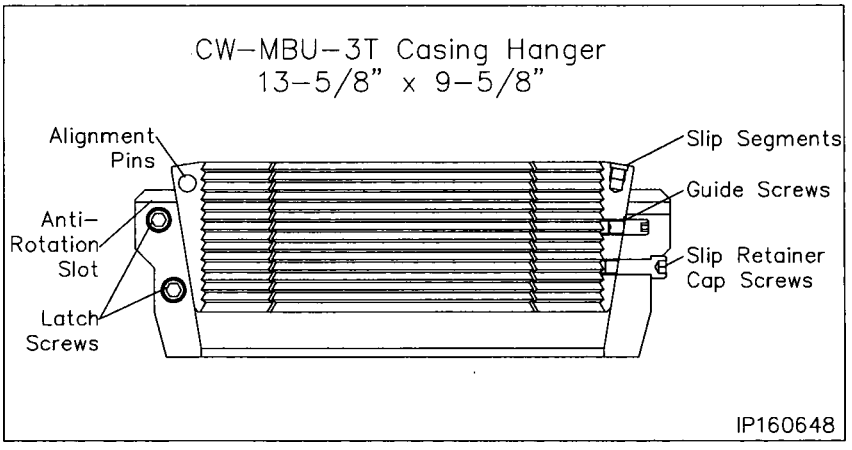
Note: Observe the returns at the open outlet valve. If returns are not clean, continue flushing until they are.

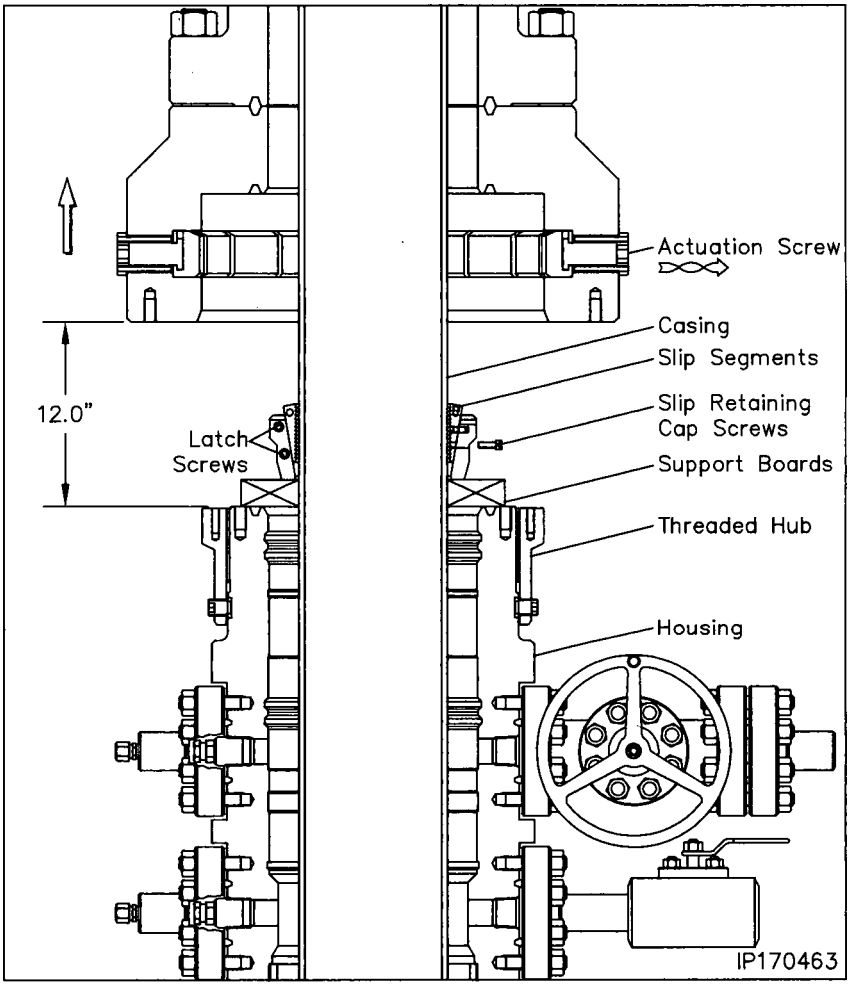
12. Once the returns are clean and free of debris, retrieve the tool to the rig floor.
13. Using a bright light, sight through the bore of the BOP stack and observe the top of the hanger neck and flutes. Ensure that there are no dark areas on top of the flutes of the hanger.

WARNING: Continue washing until all debris is removed.

Stage 5A — Hang Off the 9-5/8" Casing (Emergency)

1. Cement the hole as required.
2. Drain the BOP stack through the housing side outlet valve.
3. Locate the actuation screw on the OD of the drilling adapter.
4. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the glandnuts.
5. Pick up on the BOP stack a minimum of 12" above the housing hub and secure with safety slings.
6. Washout as required.
7. Examine the ***13-5/8" x 9-5/8" MBU-3T Slip Casing Hanger (Item A11a).*** Verify the following:
   - slips and internal bore are clean and in good condition
   - all screws are in place
8. There are two latch screws located in the top of the casing hanger. Using a 5/16" Allen wrench, remove the two latch screws located 180° apart and separate the hanger into two halves.
9. Place two boards on the lower adapter against the casing to support the Hanger.
10. Pick up one half of the hanger and place it around the casing and on top of the boards.
11. Pick up the second hanger half and place it around the casing adjacent the first half.
12. Slide the two hanger halves together ensuring the slip alignment pins properly engage the opposing hanger half.
13. Reinstall the latch screws and tighten securely.
14. Prepare to lower the hanger into the housing bowl.





Stage 5A — Hang Off the 9-5/8" Casing (Emergency)

WARNING: Do Not Drop the Casing Hanger!

15. Grease the Casing Hanger's body and remove the slip retaining screws.

16. 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.

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

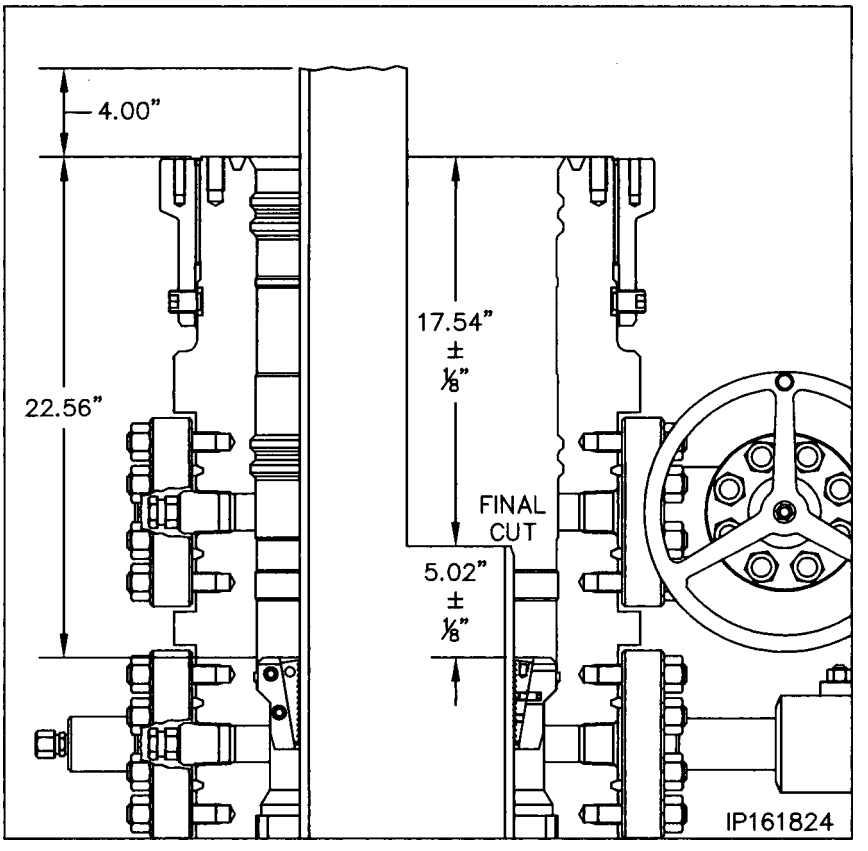
Note: A sharp decrease on the weight indicator will signify that the hanger has taken weight and at what point, If this does not occur, pull tension again and slack off once more.

WARNING: Because of 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 gas with an approved sensing device prior to cutting off the casing. If gas is present, do not use an open flame torch to cut the casing. It will be necessary to use a air driven mechanical cutter which is spark free.

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

19. Using the Wach's internal casing cutter, final cut the casing at 17.54" ± 1/8" below the top of the lower adapter or 5.02" ± 1/8" above the hanger body.

20. Remove the internal casing cutter assembly and reconfigure the assembly to bevel the casing. Reinstall the cutter assembly 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.



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

21. Thoroughly clean the housing bowl, removing all **CEMENT AND CUTTING DEBRIS.**

22. Locate the two anti-rotation notches in the top of the sip bowl.

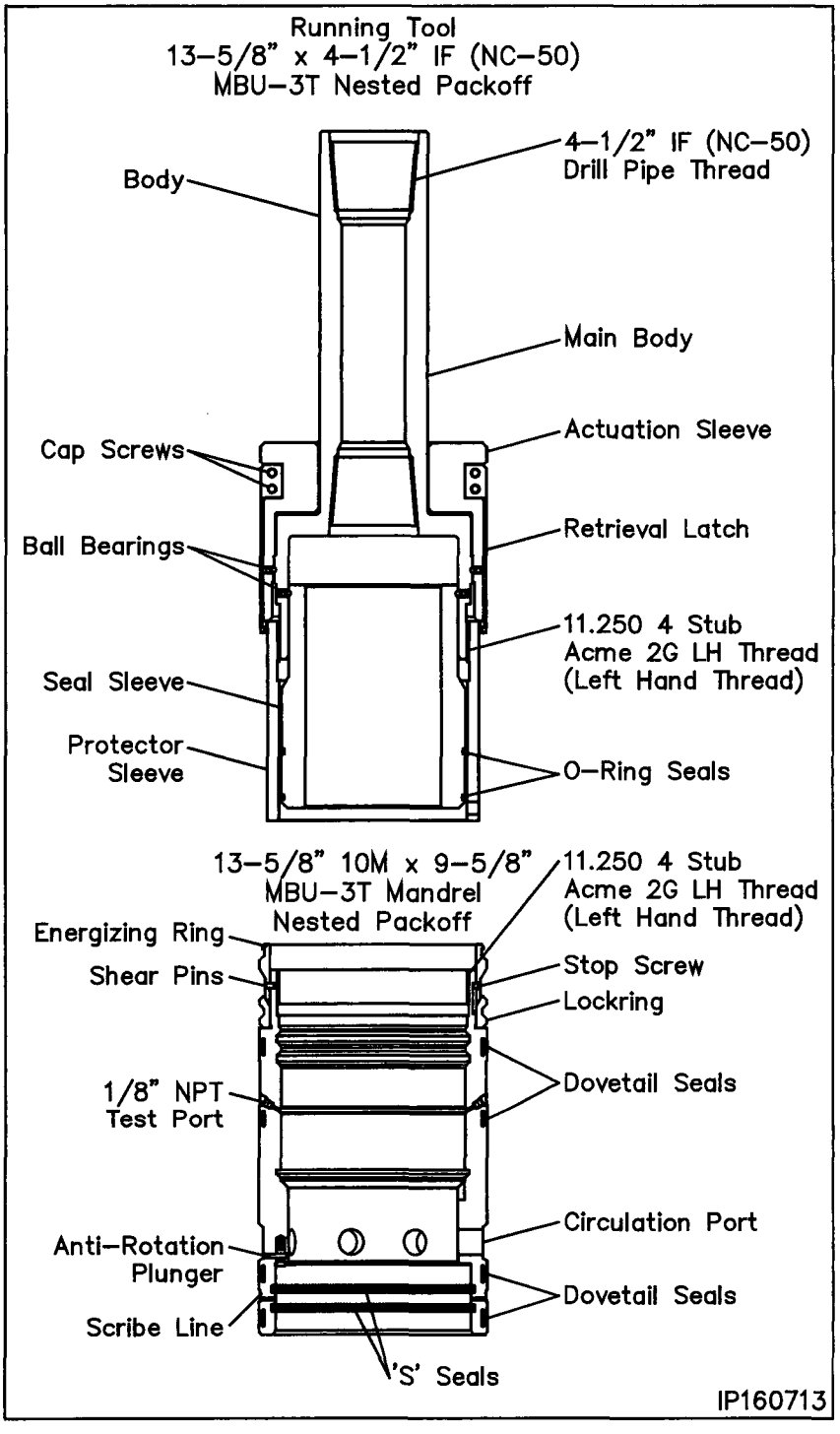
23. Place a straight edge on top of the slip bowl and in line with the center of one of the notches.

24. Ensure the straight edge is vertical and then place a paint mark on top of the housing in line with the notch in the slip bowl.

Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

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 step and proceed with Stage 6A for installing the emergency MBU-3T Nested packoff.

1. Examine the ***13-5/8" x 11.250" 4 Stub Acme 2G LH box top MBU-3T Mandrel Hanger Nested Packoff Assembly (Item A12).*** 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
   - energizer ring is in its upper most position and retained with *shear pins and stop screws are* loose
   - anti-rotation plungers are in place, free to move
2. Inspect the ID and OD 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 ST6).*** 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 sleeve
   - seal sleeve is in position and rotates freely
   - seal sleeve o-rings are in place and in good condition
   - reinstall seal sleeve protector
4. Remove the retrieval latch and set aside.

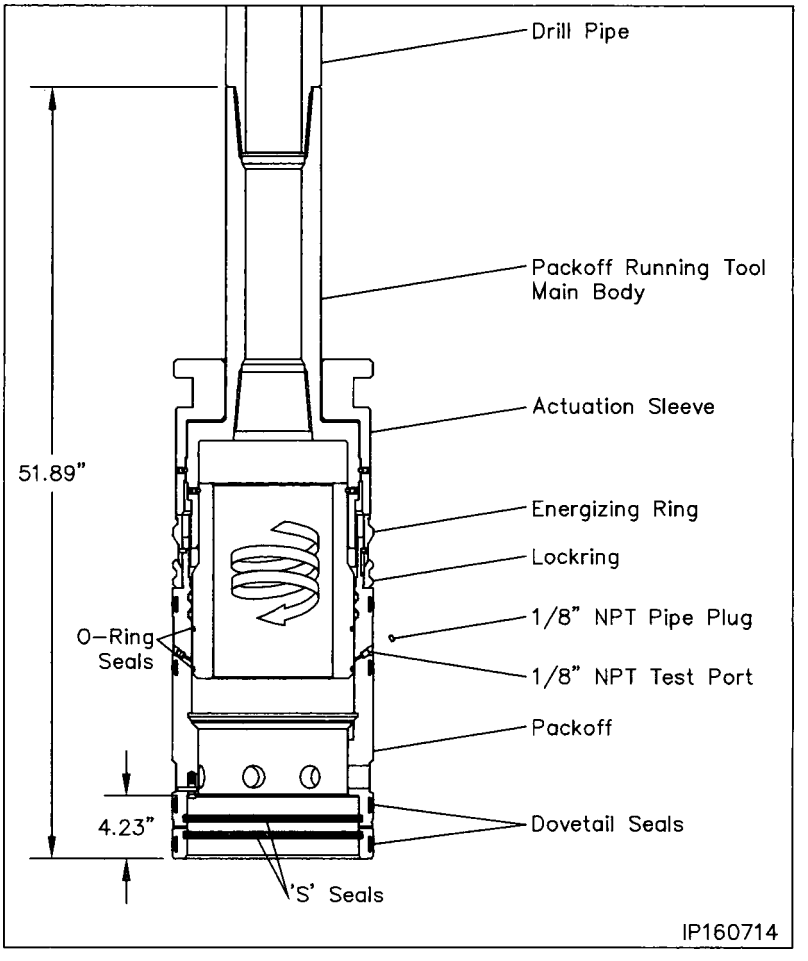


Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

5. Make up the running tool to 4-1/2" IF (NC-50) drill pipe and torque the connection to optimum make up torque.
6. Pick up the Running Tool with landing joint and suspend it above the packoff.
7. Remove the tool protector sleeve with counter clockwise rotation and set the sleeve aside.
8. Thoroughly clean and lightly lubricate the mating Acme threads of the running tool and packoff with oil or light grease.
9. Lightly lubricate the seal sleeve o-rings with oil or a light grease.
10. 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.
11. Install (1) 1/8" NPT pipe plug in the OD test port of the packoff and tighten securely.
12. Attach a test pump to the remaining open port and inject test fluid between the seal sleeve o-rings until a stable test pressure of 5000 psi is achieved.
13. If the test fails, remove the tool and replace the leaking o-rings.
14. After a satisfactory test is achieved remove the test pump and the 1/8" pipe plug from the opposite test port.

WARNING: All 1/8" pipe plugs must be removed prior to installing the packoff

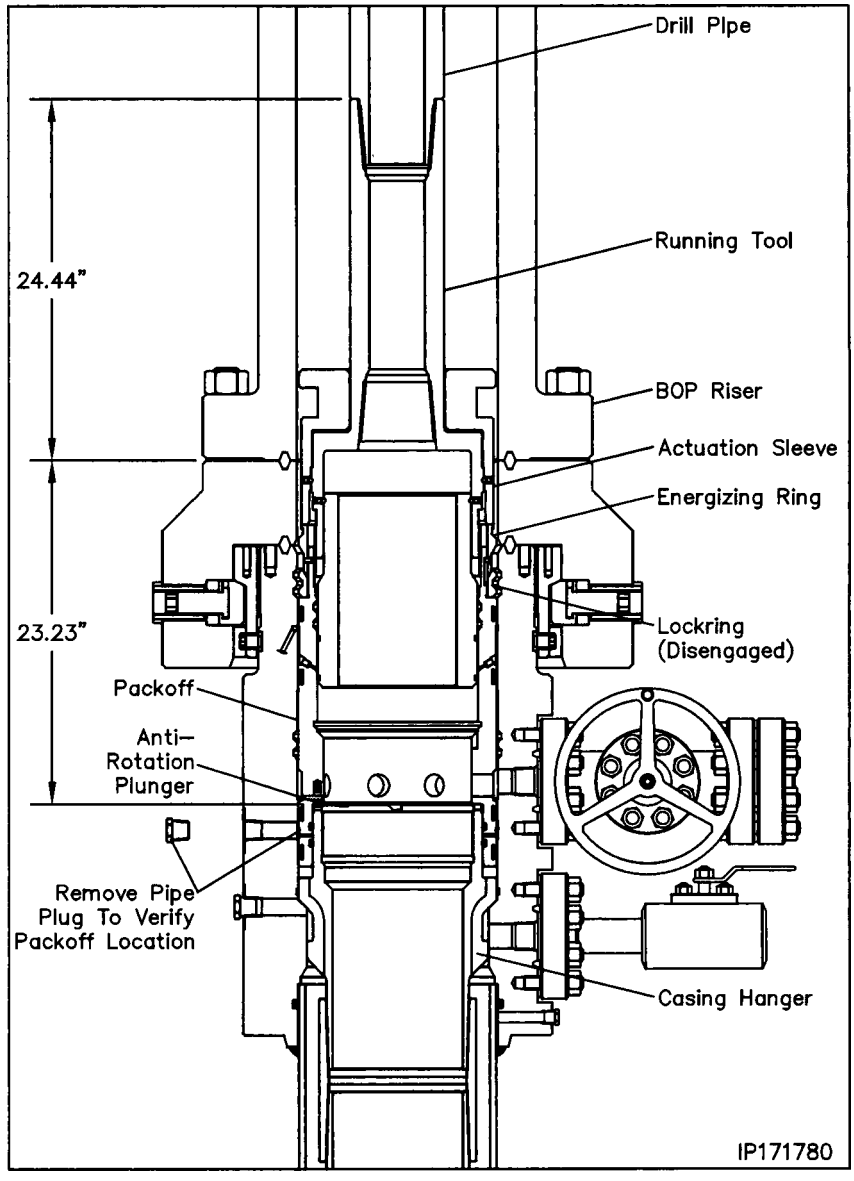
15. Pick up the assembly and thoroughly clean and lightly lubricate the packoff ID 'S' seals and the OD dovetail seals with oil or light grease.



Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

Landing the Packoff

16. Remove the hole cover.
17. Measure up 5 foot from the paint mark on the OD of the packoff and place a paint mark on the drill pipe.
18. 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.
19. Place a paint mark on the landing joint at that dimension and mark land off. Place an additional mark 1-1/2" above the first one and mark engaged.
20. Continue lowering the packoff until it passes over the neck of the hanger and lands on the casing hanger neck, 23.23" below the top of the drilling adapter.
21. Locate the upper 1" sight port pipe plug and remove the plug
22. Look through the port to verify that the packoff is properly landed. The white paint scribe line will be clearly visible in the center of the open port.
23. Reinstall the pipe plug and tighten securely.



Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

Seal Test

24. Locate the upper and lower seal test fittings on the O.D. of the housing and remove the dust cap from the fittings.

25. 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.

26. Hold test pressure for 5 minutes.

27. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.

28. Repeat steps 24 through 27 for the remaining seal test.

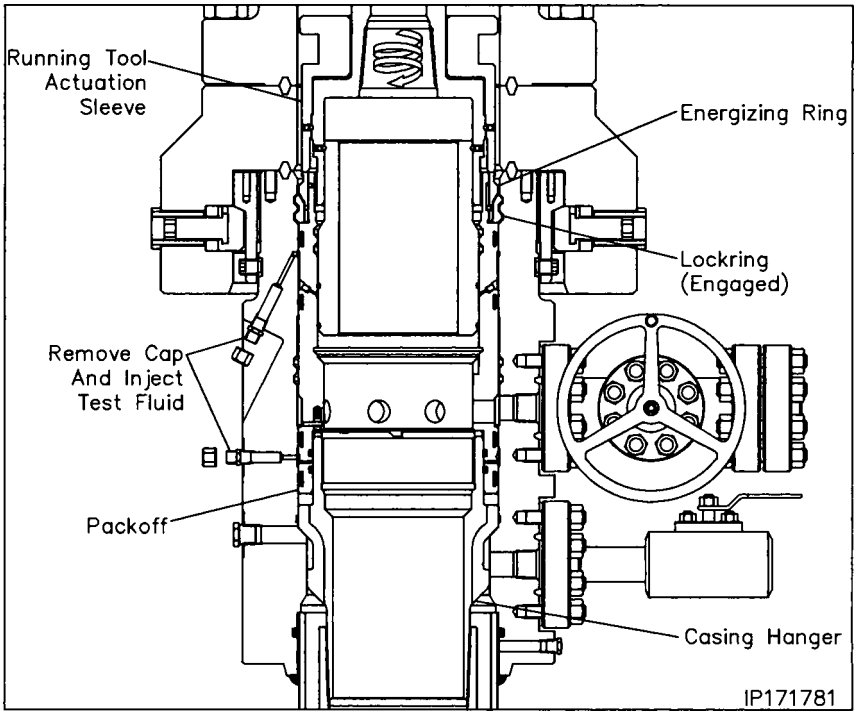
29. After satisfactory tests are achieved, bleed off the test pressure but leave the test manifolds in place.

Engaging the Lockring

30. 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.

31. Using only chain tongs, rotate the landing joint approximately 6 to 6-1/2 turns counter clockwise to engage the packoff lockring in its mating groove in the bore of the MBU-LR 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 lockring out. A positive stop will be encountered when the lockring is fully engaged.



Note: When properly engaged the second paint mark on the landing joint will align with the rig floor. VERIFY PAINT MARKS.

WARNING: 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.

WARNING: 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.

32. Back off the landing joint/running tool approximately three turns. Using the top drive, exert a 40,000 lbs. pull on the landing joint.

33. Reattach the test pump to the open test manifolds and retest the packoff seals to 5,000 psi for 15 minutes. This will also verify that the packoff is in place.

34. After satisfactory test is achieved, bleed off all test pressure, remove test pump and reinstall the dust cap on the open fittings.

35. Using only chain tongs, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 9 to 9-1/2 turns) and then retrieve the tool with a straight vertical lift.

Stage 6 — Install the MBU-3T Mandrel Hanger Packoff

In the event the packoff is required to be removed after the lockring is engaged the following procedure is to be followed.

Retrieving the Packoff

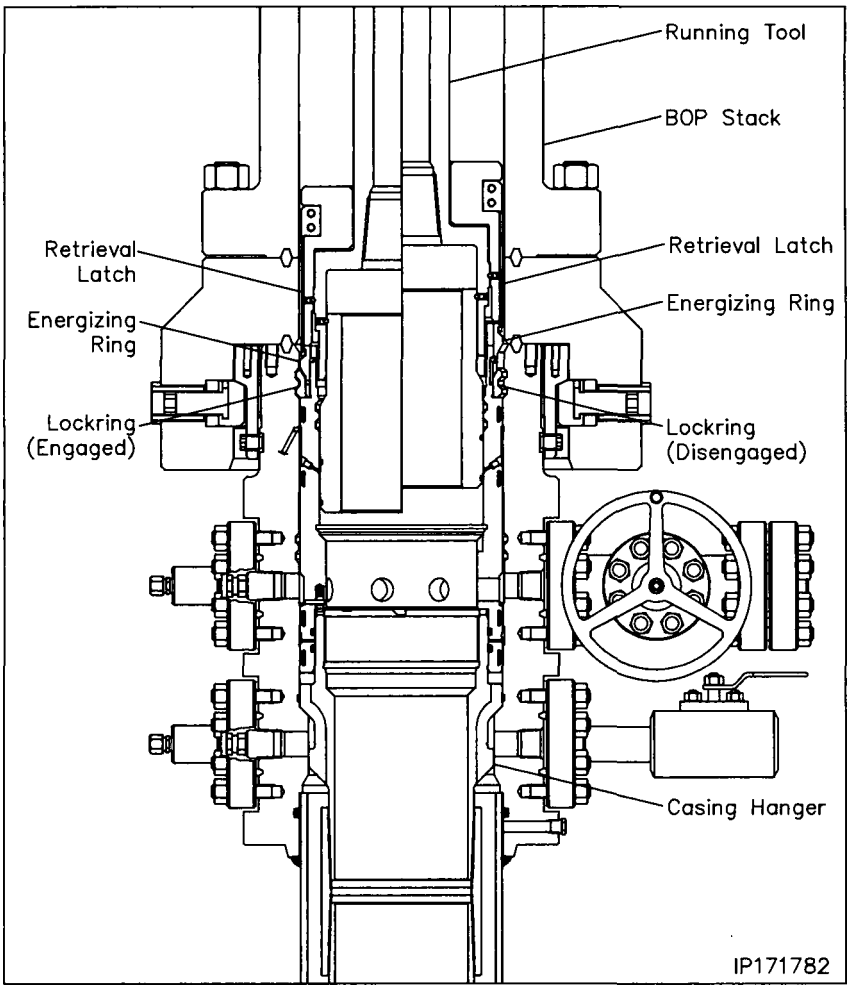
1. Position the retrieval latch so the latch finger extend from the bottom of the running tool body.
2. Reinstall the cap screws and tighten them securely.
3. Ensure the retrieval latch freely rotates on the running tool body.
4. Carefully lower the running tool through the BOP stack and into the packoff.
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".

Warning: 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 MBU-3T 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.

Stage 6A — Install the MBU-3T Emergency Packoff

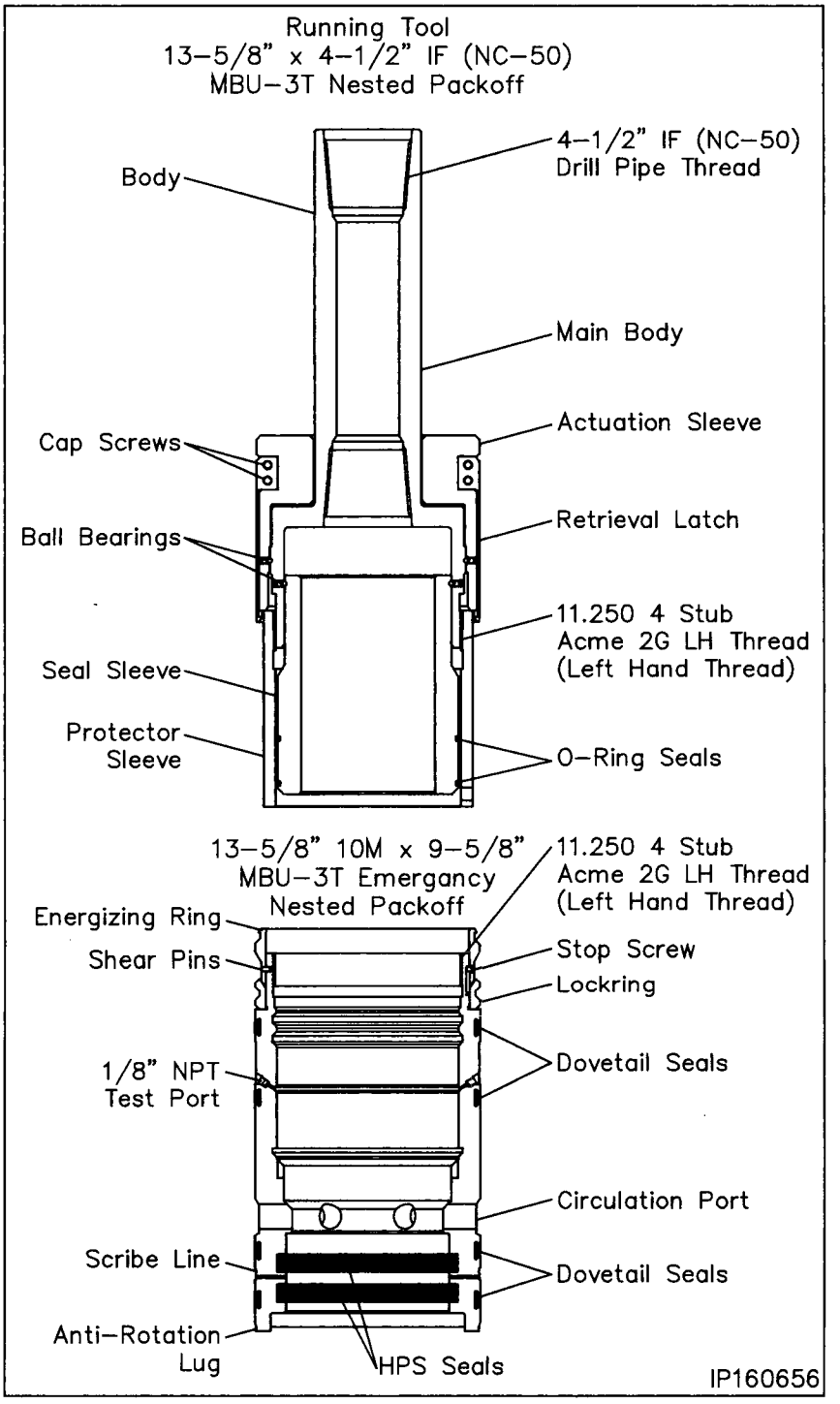
1. Examine the ***13-5/8" 10M x 9-5/8" x 11.250" 4 Stub Acme 2G LH box top MBU-3T Emergency Nested Packoff Assembly (Item A12a).*** Verify the following:
   - all elastomer seals are in place and undamaged
   - internal bore, and ports, are clean and in good condition
   - lockring is fully retracted
   - energizer ring is in its upper most position and retained with shear pins

2. Inspect the ID and OD 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 ST6).*** Verify the following:
   - Acme threads are clean and in good condition
   - retrieval latch is in position and retained with cap screws
   - seal sleeve is in position and rotates freely
   - seal sleeve o-rings are in place and in good condition
   - reinstall seal sleeve protector

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.

5. Run in the hole with two stands of drill pipe and set in floor slips.



Stage 6A — Install the MBU-2LR Emergency Packoff

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 remove the tool protector sleeve with counter clockwise rotation and set the sleeve aside.

8. Thoroughly clean and lightly lubricate the mating acme threads of the running tool and packoff with oil or light grease.

9. Lightly lubricate the seal sleeve o-rings with oil or a light grease.

10. Make up the running tool to the drill pipe in the floor slips using the appropriate length pip x pin sub.

11. 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 4 turns).

12. Install (1) 1/8" NPT pipe plug in the OD test port of the packoff and tighten securely

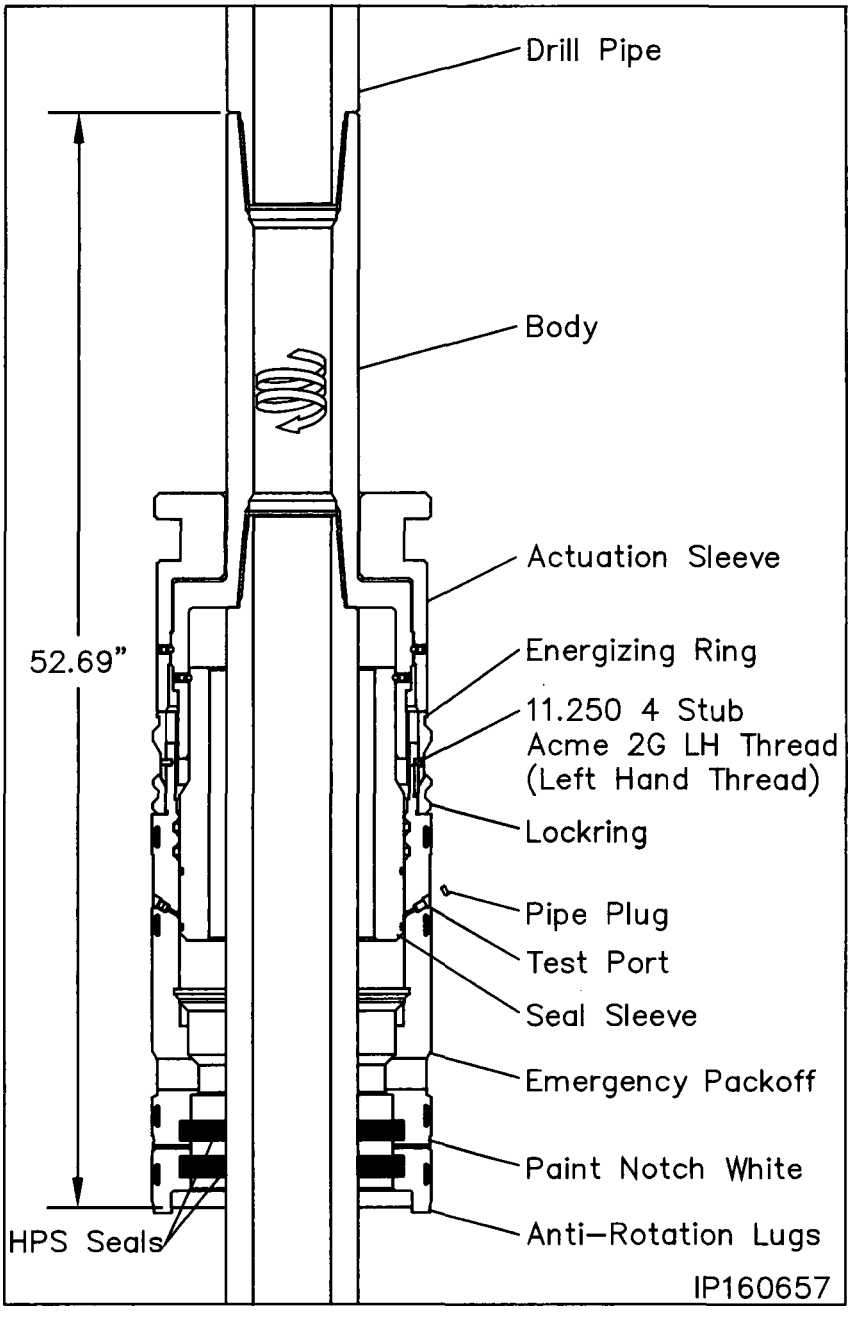
13. Attach a test pump to the remaining open port and inject test fluid between the seal sleeve o-rings until a stable test pressure of 5,000 psi is achieved.

14. If the test fails, remove the tool and replace the leaking o-rings.

15. After a satisfactory test is achieved remove the test pump and the 1/8" pipe plug from the opposite test port.

WARNING: All 1/8" pipe plugs must be removed prior to installing the packoff

16. Thoroughly clean and lightly lubricate the packoff ID 'HPS' seals and the OD dovetail seals with oil or light grease.



17. Using a straight edge positioned vertically and centered on the anti-rotation lug on the bottom of the packoff, place a white paint mark up the side of the packoff in line with the lug.

Note: The line will be used to guide the packoff anti-rotation lug into its mating notch in the slip bowl.

Stage 6A — Install the MBU-2LR Emergency Packoff

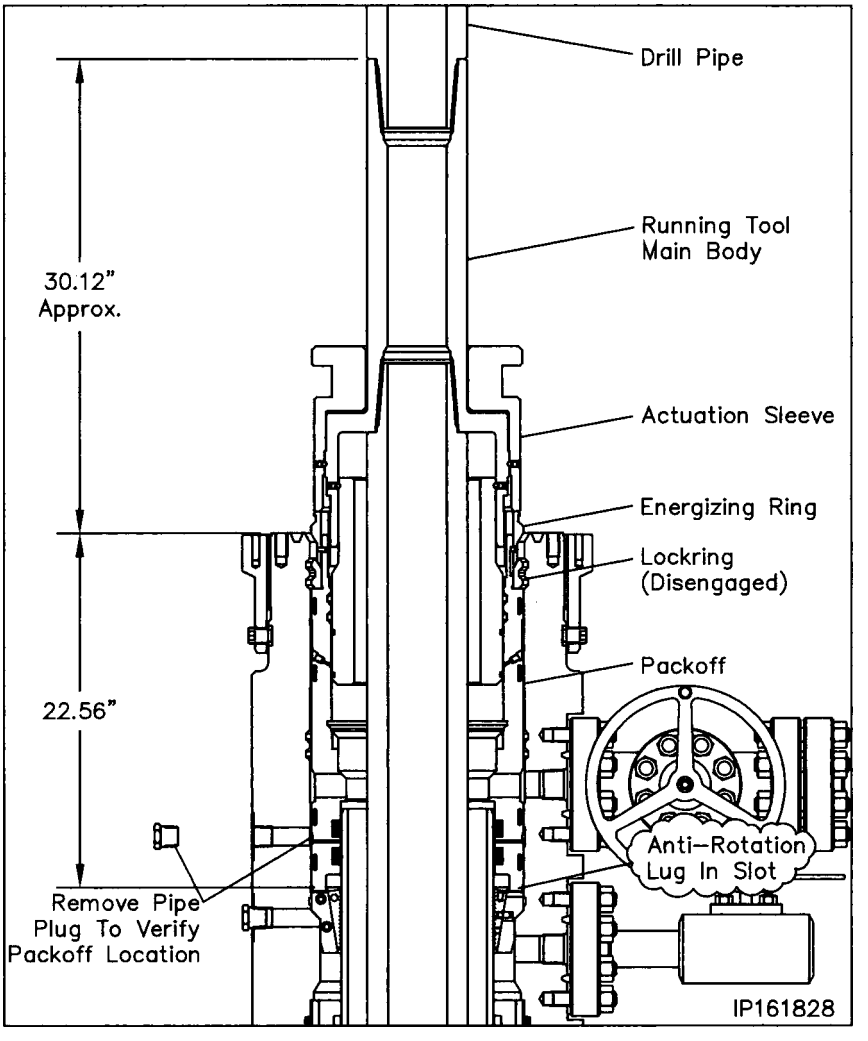
Landing the Packoff

18. Pick up the drill string and remove the floor slips.
19. Carefully lower the packoff through the rig floor and position it just above the housing.
20. Align the white paint line with the existing paint mark on top of the housing.
21. While holding the packoff to maintain alignment, carefully lower the packoff into the housing until it lands on top of the slip hanger.

Note: When properly positioned the top of the running tool will be approximately 30.12" above the top of the MBU-3T Housing.

22. 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.

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



Stage 6A — Install the MBU-2LR Emergency Packoff

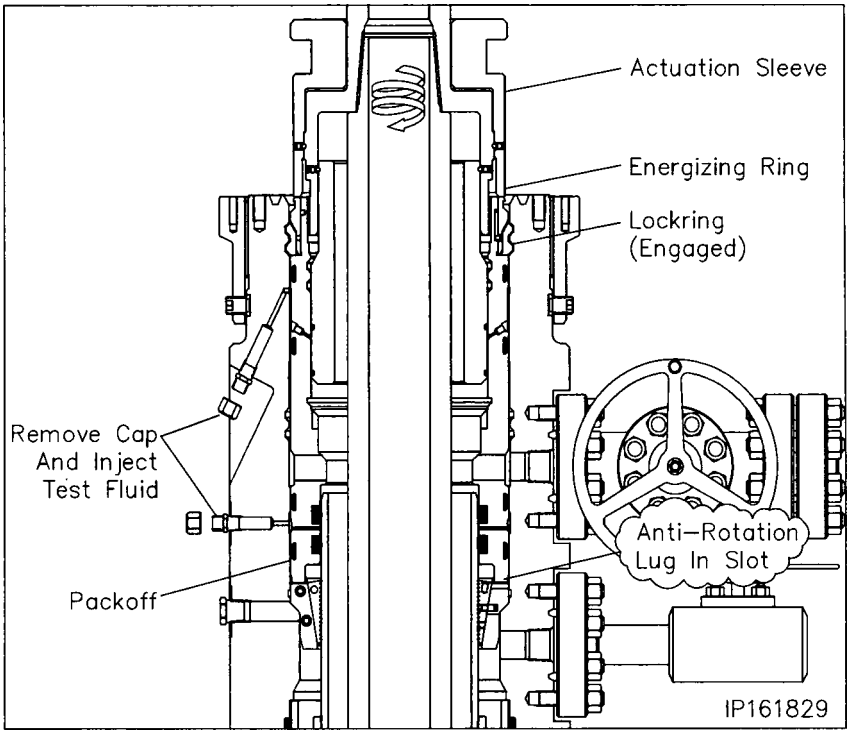
Seal Test

1. Locate the upper and lower seal test fittings on the O.D. of the housing and remove the dust cap from the fittings.
2. 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.
3. Hold test pressure for 5 minutes.
4. If a leak develops, bleed off test pressure, remove the packoff from the wellhead and replace the leaking seals.
5. After satisfactory test is achieved, bleed off the test pressure but leave the test manifold in place.
6. Repeat steps 1 through 5 for the upper seal test port.

Engaging the Lockring

7. Using only chain tongs, rotate the landing joint approximately 6 to 6-1/2 turns counter clockwise (Left) to engage the packoff lockring in its mating groove in the bore of the MBU-3T 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 lockring out. A positive stop will be encountered when the lockring is fully engaged.



WARNING: It is imperative that the drill pipe 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.

WARNING: 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.

8. Back off the landing joint/running tool approximately three turns. Using the top drive, exert a 40,000 lbs. pull on the landing joint.
9. Reattach the test pump to the open test manifolds and retest the packoff seals to 5,000 psi for 15 minutes. This will also verify that the packoff is in place.
10. After satisfactory test is achieved, bleed off all test pressure, remove test pump and reinstall the dust cap on the open fittings.
11. Using only chain tongs, rotate the landing joint clockwise until the tool comes free of the packoff (approximately 9 to 9-1/2 turns) and then retrieve the tool with a straight vertical lift.
12. Reinstall and nipple up the BOP stack.

Stage 7 — 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/ Retrieving Tool (Item ST7)***. 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

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.

WARNING: Ensure that the lift lugs are up and the elastomer seal is down

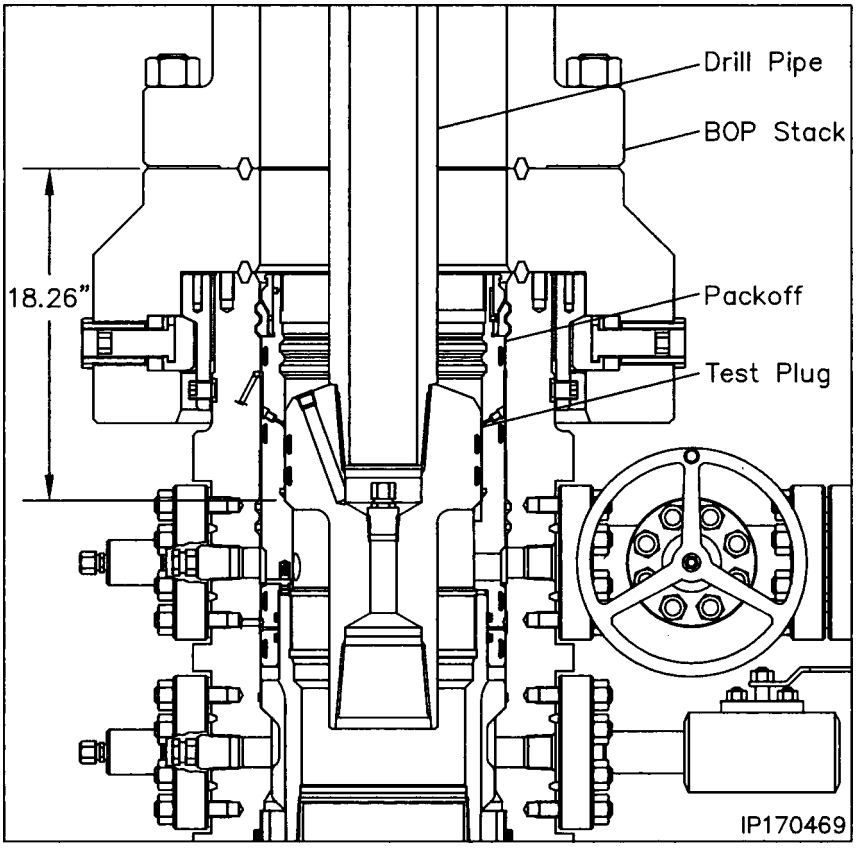
3. Remove the 1/2" NPT pipe plug from the weep hole if pressure is to be supplied through the drill pipe.

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, 18.26" below the top of the drilling adapter.

7. Close the BOP rams on the pipe and test the BOP to 5,000 psi.



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

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 and the retrieve the test plug with a straight vertical lift.

Note: 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.

10. Repeat this procedure as required during the drilling of the hole section.

Stage 8 — Run the Upper Wear Bushing

Note: 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" ID MBU-3T-UPR Wear Bushing (Item ST8).*** 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
   - paint anti-rotation lugs white and allow paint to dry

Run the Wear Bushing Before Drilling

2. Orient the ***13-5/8" Nominal x 4-1/2" IF (NC-50) CW Test Plug/ Retrieving Tool (Item ST1)*** with drill pipe connection up.

3. Attach the Retrieving Tool to a joint of drill pipe.

WARNING: Ensure that the lift lugs are down and the elastomer seal is up

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.

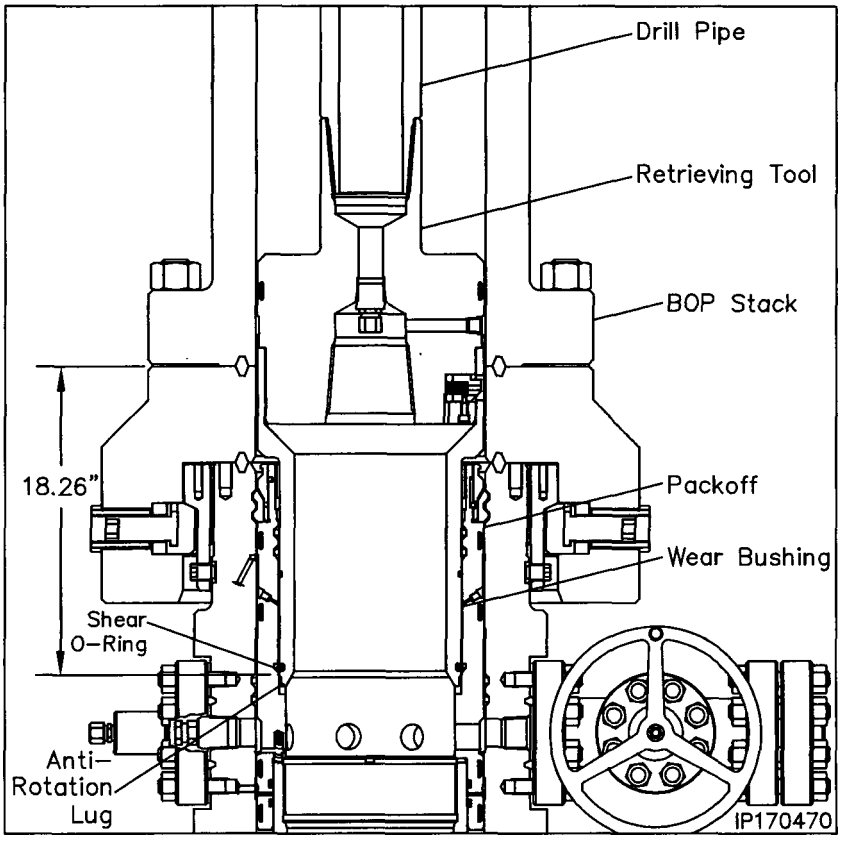
Note: If the lugs did not align with the holes, rotate the tool in either direction until they snap into place.

5. **Apply a heavy coat of grease, not dope, to the OD 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, 18.26" below the top of the 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 up.

10. Drill as required.

Note: 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. Drain BOP stack and wash out if necessary.

13. Slowly lower the tool into the Wear Bushing.

14. Rotate the Retrieving Tool clockwise until a positive stop is felt. This indicates the lugs have snapped into the holes in the bushing.

15. Using the top drive, slowly pick up on the landing joint in 1000 lbs increments until the busing starts to rise. This action should take a minimum of 3000 lbs pull. Do Not Exceed 60,000 lbs.

16. Retrieve the Wear Bushing, and remove it and the Retrieving Tool from the drill string.

Stage 9 — Hang Off the 5-1/2" Casing

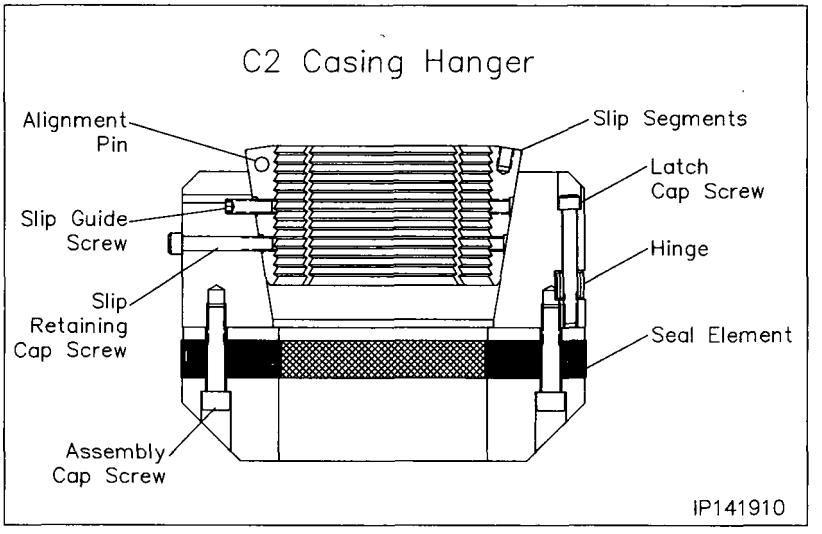
1. Run and cement the 5-1/2" casing string as required.
2. Open the housing upper side outlet valve to drain the BOP stack.
3. Clean the ID of the BOP stack and OD of the casing with a high pressure water hose until returns through the open side outlet valve are clean and free of debris.
4. Thoroughly inspect the BOP stack to ensure all rams are fully retracted into their respective ram bores, the annular rubber is fully relaxed, all drilling adapters/spools are full opening and there are no casing collars between the rig floor and the wellhead.

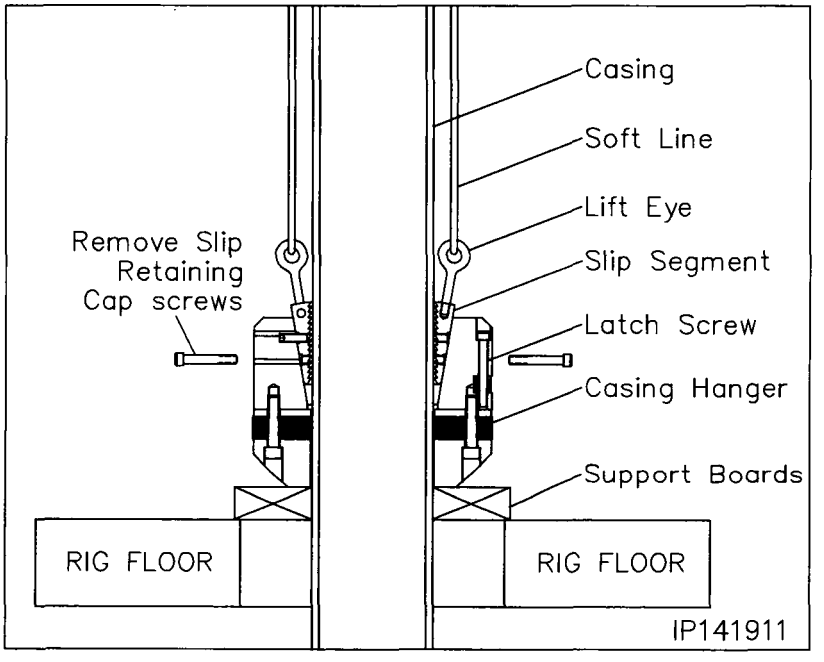
Note: Side outlet valve to remain open while setting the casing hanger.

5. Examine the ***11" x 5-1/2" C2 Slip Casing Hanger (Item A13).*** Verify the following:
   - slips and internal bore are clean and in good condition
   - all screws are in place
   - packoff rubber is in good condition

Note: Ensure that the packoff rubber does not protrude beyond the O.D. of the casing hanger body. If it does, loosen the cap screws in the bottom of the hanger.

6. Measure the distance from the rig floor to the top of the wellhead flange and record this measurement.
7. Pour a light oil through the BOP stack to thoroughly coat the OD of the casing.
8. Using a 5/16" Allen wrench, remove the two latch screws located 180° apart on top of the hanger and separate the hanger into two halves.
9. Place two boards on the housing flange against the casing to support the hanger.
10. Pick up one half of the hanger and place it around the casing and on top of the boards.
11. Pick up the second hanger half and place it around the casing adjacent the first half.





12. Slide the two hanger halves together ensuring the slip guide pins properly engage the opposing hanger half.
13. Reinstall the latch screws and tighten securely.
14. Using a 5/16" allen wrench, remove the slip retainer cap screws and discard them.
15. Lubricate the OD of the Casing Hanger liberally with a light grease or oil.
16. Prepare to lower the hanger through the BOP stack.

Stage 9 — Hang Off the 5-1/2" Casing

WARNING: Do not drop or allow the hanger to fall through the BOP stack.

One method commonly used is to loop or tie four lengths of soft line through the hanger eye bolts as shown. Tie a knot in the soft line at the measurement noted in step six (6).

Note: The soft line may stretch and give an imprecise indication of the Casing Hanger's location.

17. Remove the boards and allow the Casing Hanger to slide through the BOP and into the MBU-3T packoff bowl using the cat line to center that casing if necessary.

18. When the Casing Hanger is down as indicated by the knots in the soft line, pull tension to the desired hanging weight and slack off.

Note: A sharp decrease on the weight indicator will signify that the Hanger has taken weight and at what point.

19. Untie the soft lines and pull them back through the lift eyes or drop them inside the BOP stack.

20. Prior to nippling down the BOP the integrity of the slip hanger seal can be verified by closing the BOP annular on the casing string and applying customer specific pressure through the kill line.

21. Once a satisfactory test is achieved, bleed off all test pressure, and drain the BOP stack.

22. Locate the actuation screws on the OD of the lower drilling adapter.

23. Using a hex drive, fully retract the (16) actuation screws until they are slightly over flush with the glandnuts.

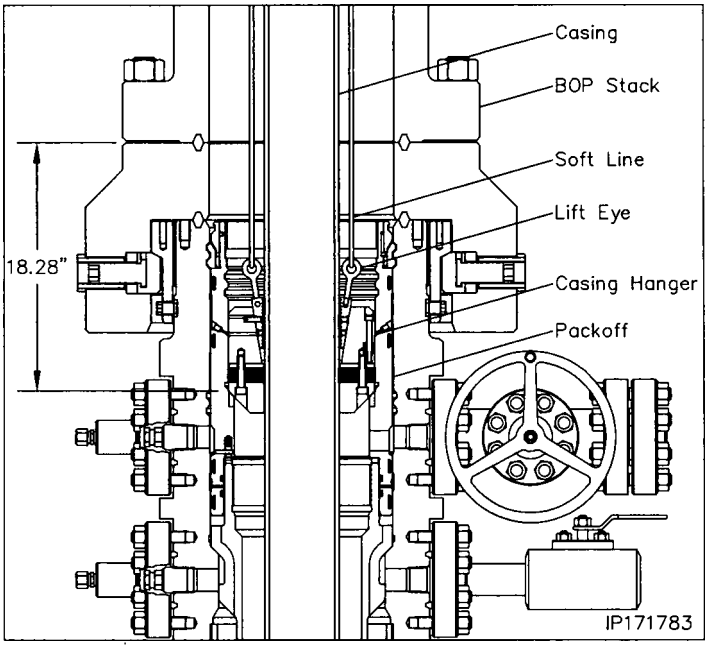
24. Pick up on the BOP stack a minimum of 12" above the housing and secure with safety slings.

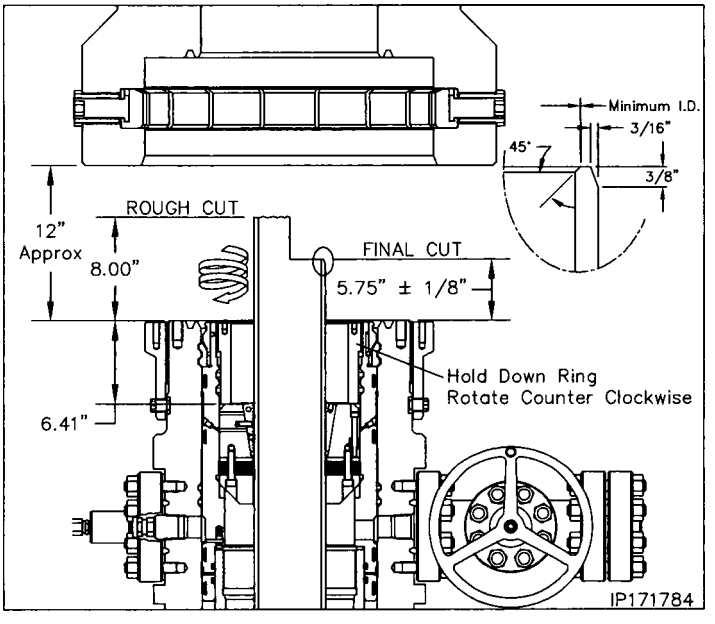
25. Remove the four lift eyes.

26. Rough cut the casing approximately 8" above the top of the housing and move the excess casing out of the way.

27. Final cut the casing at 5-3/4" ± 1/8" above the top flange of the housing.

28. 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 tubing head to be installed.





29. Thoroughly clean the top of the housing and Casing Hanger. Ensure all cutting debris are removed.

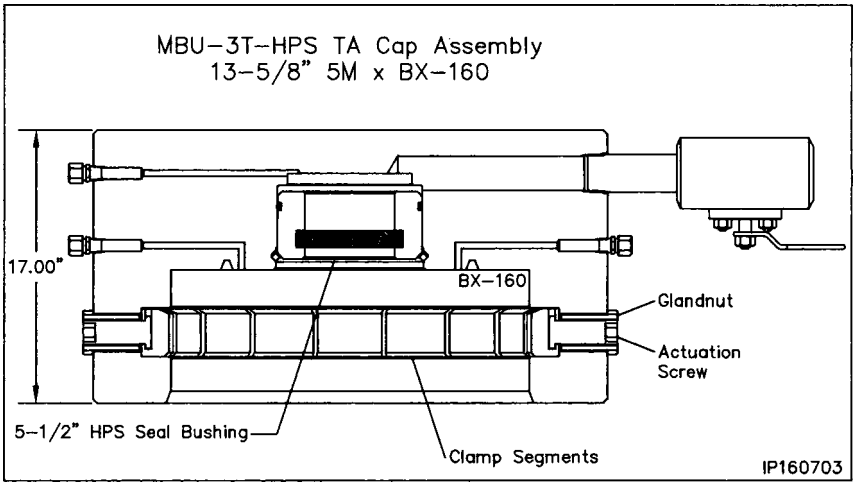
30. Thoroughly clean and lightly lubricate the mating acme threads of the MBU-3T packoff and the slip ***Hold Down Ring (Item A14)***.

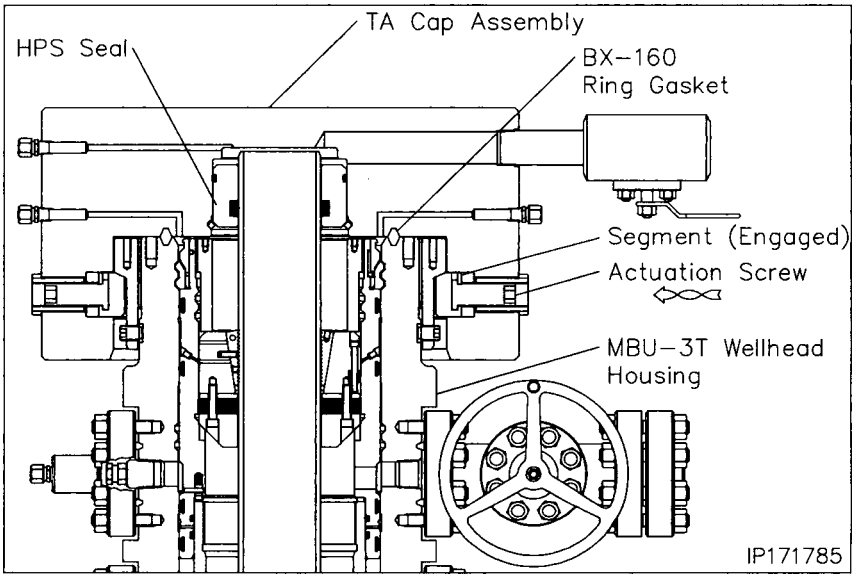
31. Thread the ring into the packoff with counter clockwise rotation to a positive stop on top of the slip hanger.

32. Re-land the BOP stack and prepare to remove the upper adapter with the BOP stack

Stage 10 — Install the 'Quick Connect' TA Cap Assembly

1. Examine the ***13-5/8" 5M 'Quick Connect' TA Cap Assembly (Item R3).*** 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
   - 5-1/2" HPS seal bushing is in place and properly retained with the square snap wire
2. Thoroughly clean the top of the MBU-3T housing, thread hub, and the mating seal surfaces of the TA Cap.
3. Install a new ***BX-160 Ring Gasket*** into the ring groove of the housing.
4. Using a suitable lifting devise with weight rated slings, pick up the TA Cap assembly and carefully lower it over the casing stub and land it on the ring gasket.
5. Ensure the TA Cap is level and then carefully run in all of the drive screws of the TA Cap to contact point.
6. Ensure the assembly remains level, run in one actuation and torque to 100 ft lbs.
7. Locate the screw 180° from the first and torque to 100 ft lbs.
8. Locate the screws 90° to the right and left and torque to 100 ft lbs.
9. Position the second 4 point sequence 90° from the first and torque each screw to 200 ft lbs
10. Run in all remaining screws to contact and then torque each screw to 400 ft lbs.
11. Make one additional round until a stable torque of 400 ft lbs on all (16) screws is achieved.

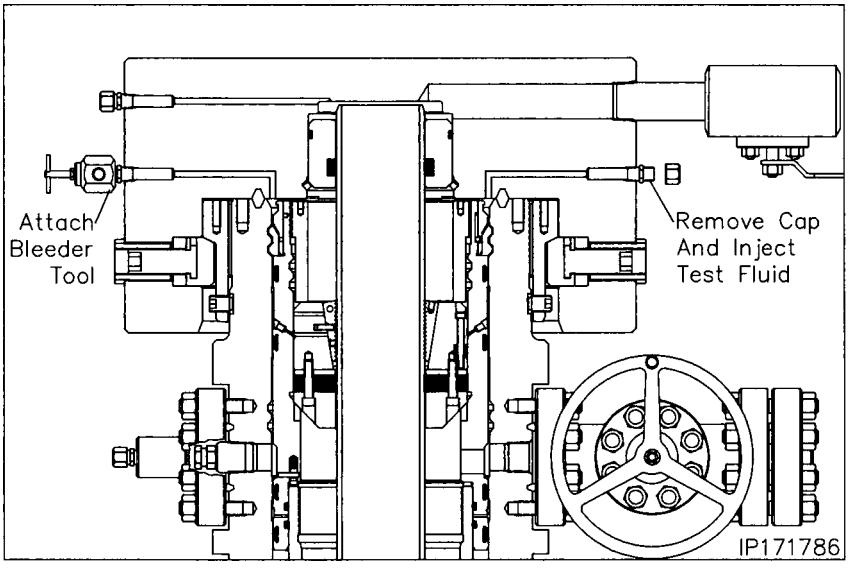




Stage 10 — Install the 'Quick Connect' TA Cap Assembly

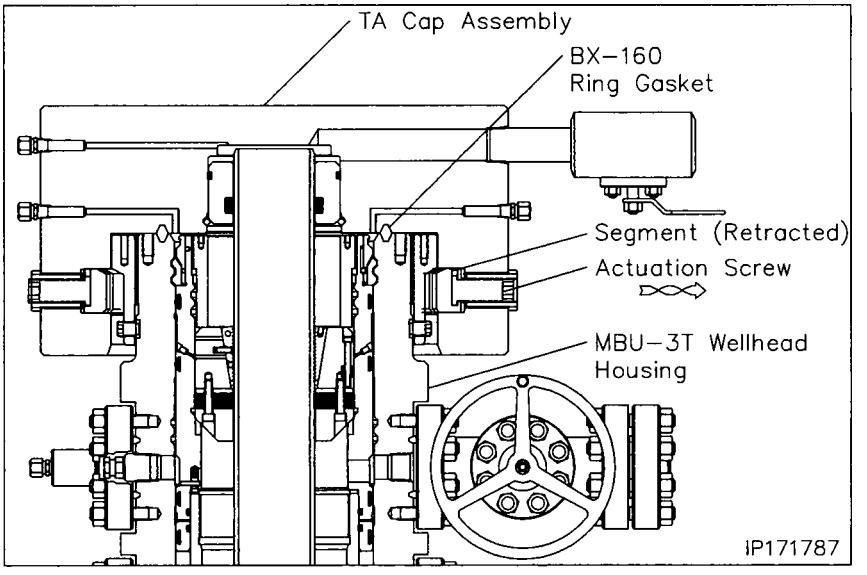
Connection Test

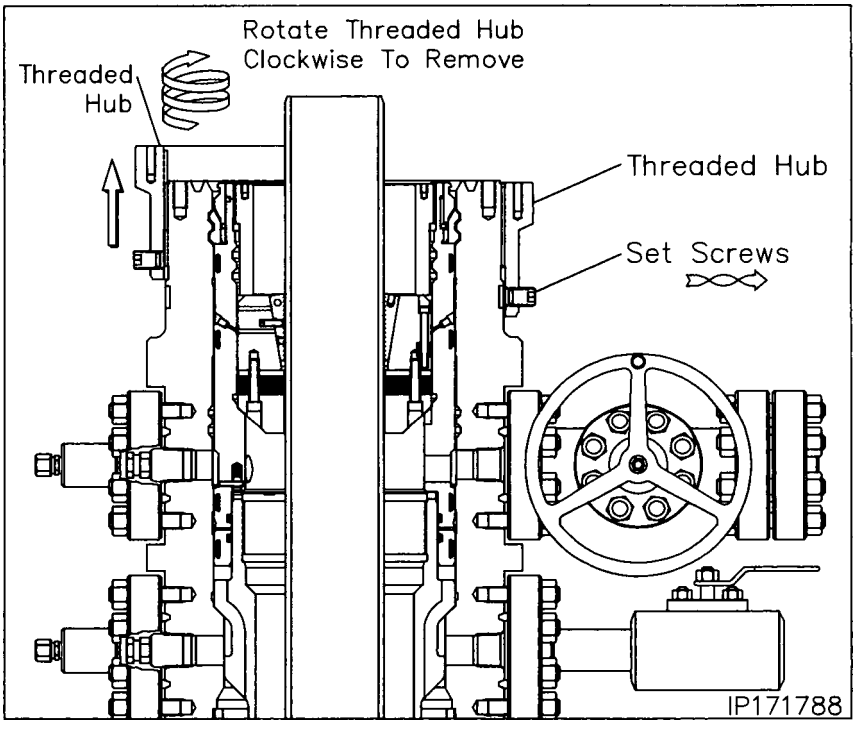
1. Open the TA Cap ball valve and the housing upper side outlet valve to monitor leakage.
2. Locate the two test fittings marked flange test and remove the dust caps from the fittings.
3. Attach a bleeder tool to one of the open fitting and open the tool.
4. Attach a test pump to the remaining open fitting 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 5,000 psi or 80% of casing collapse is achieved, whichever is less.
6. Hold test pressure for 15 minutes.
7. 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.
8. Close all open valves.



Stage 11 — Remove the TA Cap Assembly

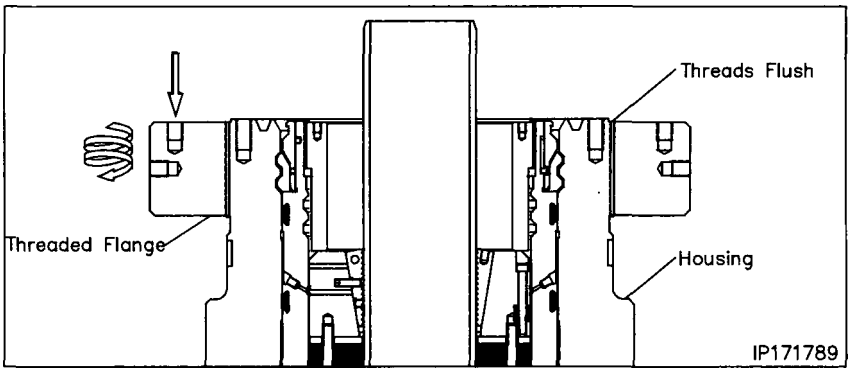
1. Open the ball valve on the TA cap to check for trapped pressure above the casing hanger.
2. Locate the actuation screws on the OD of the TA Cap Assembly.
3. Using a hex drive, fully retract the actuation screws until they are slightly over flush with the glandnuts.
4. Install a lift eye with pick up sling to the top of the TA Cap and lift the cap free of the wellhead.
5. Remove the thread hub set screws.
6. Remove the thread hub from the top of the housing with clockwise rotation.





Stage 11 — Remove the TA Cap Assembly

7. Examine the 13-5/8" 5M Thread Flange. 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 Thread 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.



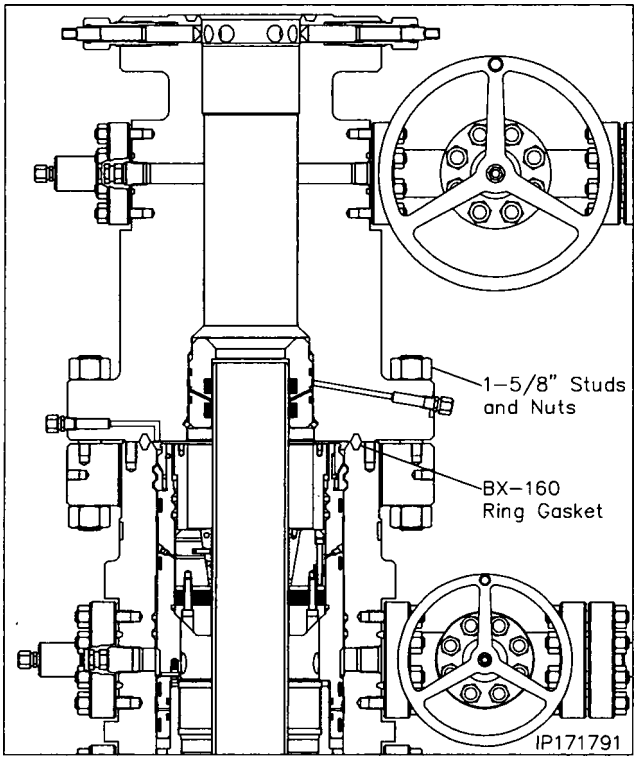
Stage 12 — Install the Tubing Head

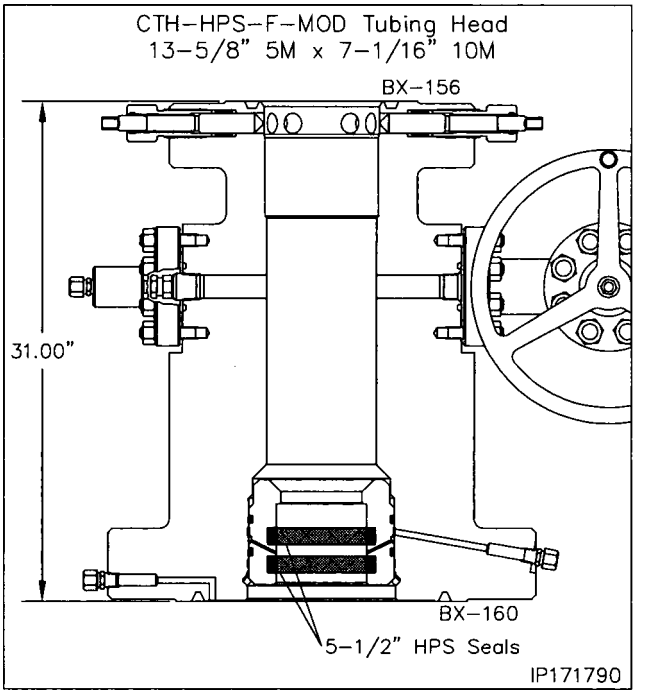
Note: The tubing head may be shipped to location with the lower frac valve pre installed and tested.

1. Examine the ***13-5/8" 5M x 7-1/16" 10M CW, CTH-HPS-F MOD Tubing Head With 5-1/2" DBLHPS Bottom (Item B1)*** Verify the following:
   - seal area and bore are clean and in good condition
   - ***HPS-F MOD Secondary Seal Bushing*** is in place and properly retained with a square snap wire
   - all peripheral equipment is intact and undamaged

2. Clean the mating ring grooves of the MBU-3T Housing and tubing head.

3. Lightly lubricate the I.D. of the tubing head 'HPS' seals and the casing stub with a light oil or grease.





Note: Excessive oil or grease may prevent a good seal from forming!

4. Install a new ***BX-160 Ring Gasket (Item B12)*** in the ring groove of the housing.

5. Pick up the tubing head and suspend it above the housing.

6. Orient the head so that the outlets properly align with the housing upper outlets and then carefully lower the head over the casing stub and then land it on the ring gasket.

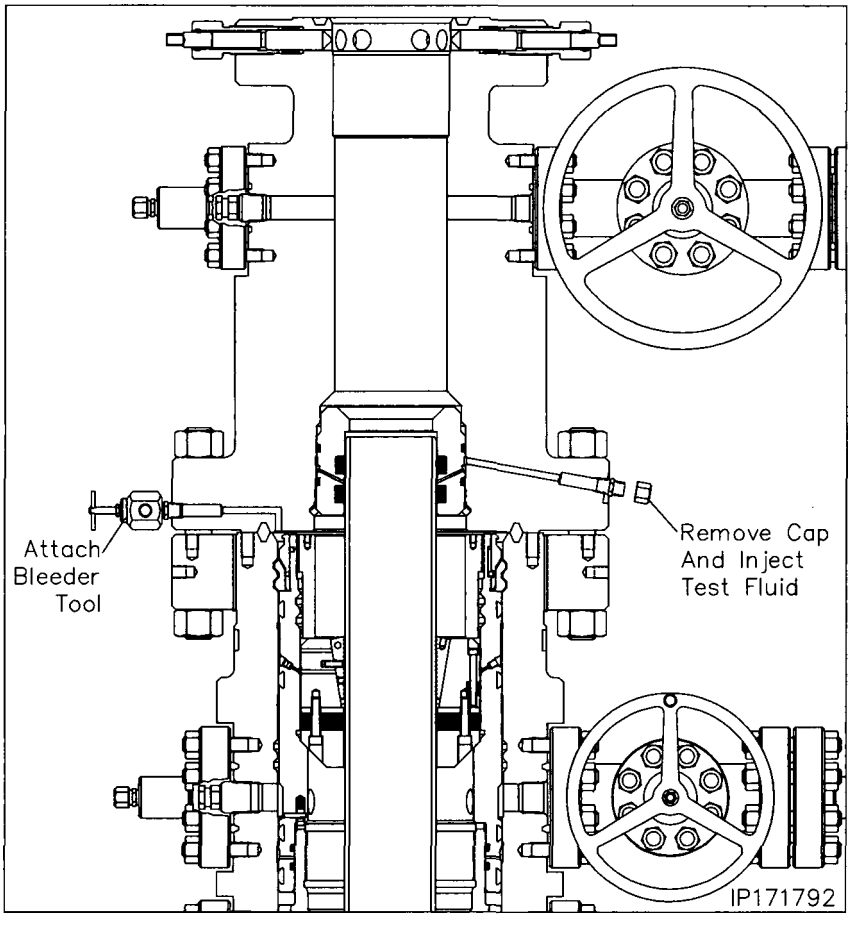
Warning: Do Not damage the 'HPS' seals or their sealing ability will be impaired!

7. Make up the flange connection using the appropriate size ***studs and nuts (Item B13)***, tightening them in an alternating cross pattern.

Stage 12 — Install the Tubing Head

Seal Test

1. Locate the seal test fitting and one flange 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 flange test fittings and open the Tool.
3. Attach a test pump to the seal test fitting and pump clean test fluid between the HPS Seals until a test pressure of ***10,000 psi or 80% of casing collapse - Whichever is less.***
4. Hold test pressure for 15 minutes.
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, remove the Test Pump, drain test fluid and reinstall the dust cap on the open seal test fitting.

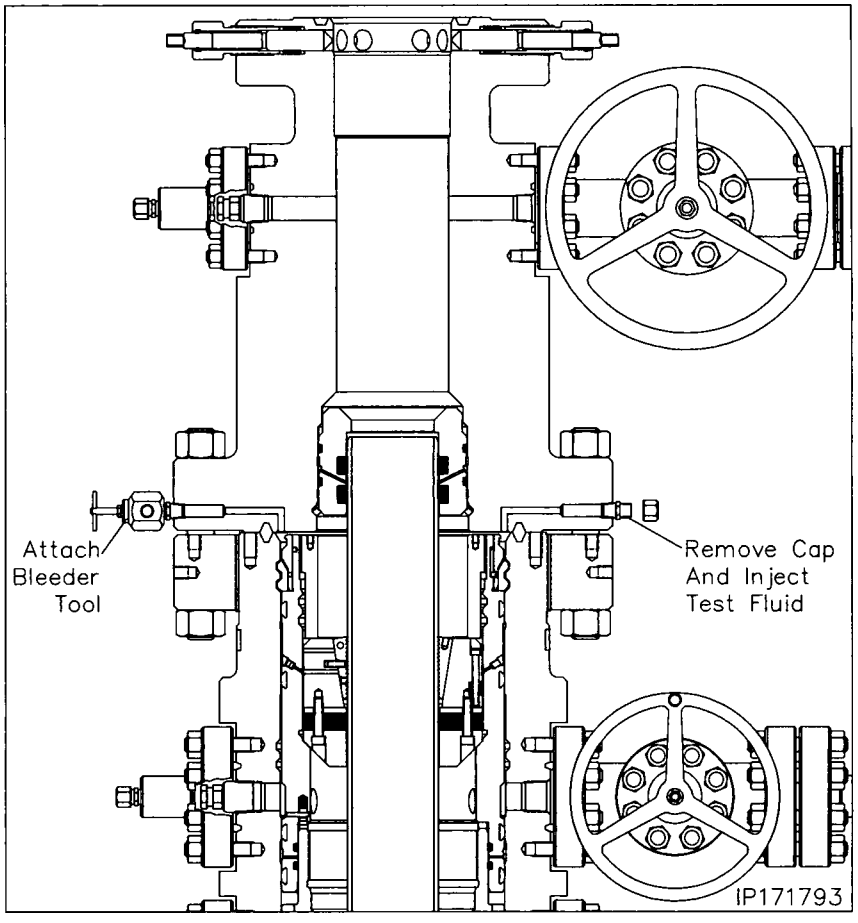


Seal Test	
Leak Location	**Appropriate Action**
Open bleeder tool - Lower HPS seal is leaking	Remove Tubing Head and replace leaking seals. Re land and retest seals
Into the tubing head bore - Upper HPS seal is leaking	

Stage 12 — Install the Tubing Head

Flange Test

1. Locate the remaining flange test fitting on the Tubing Head lower flange and remove the dust cap from the fitting.
2. Attach a test pump to the open flange test fitting and inject test fluid into the flange connection until a continuous stream flows from the opposite flange test bleeder tool.
3. Close the bleeder tool and continue to pumping test fluid to ***5,000 psi or 80% of casing collapse - Whichever is less..***
4. Hold test pressure for 15 minutes.
5. If pressure drops a leak has developed. Take the appropriate action from the adjacent chart.
6. Repeat this procedure until a satisfactory test is achieved.
7. Once a satisfactory test is achieved, remove the test pump and bleeder tool, drain all test fluid, and reinstall the dust caps.



Flange Test	
Leak Location	**Appropriate Action**
Between flanges - Ring gasket is leaking	Verify flange bolt torque. If correct, remove tubing head to clean, inspect and possibly replace damaged ring gasket.

Recommended Procedure for Field Welding Pipe to Wellhead Parts for Pressure Seal

1. **Introduction and Scope.** The following recommended procedure has been prepared with particular regard to attaining pressure-tight weld when attaching casing heads, flanges, etc., to casing. Although most of the high strength casing used (such as N-80) is not normally considered field weldable, some success may be obtained by using the following or similar procedures.

Caution: In some wellheads, the seal weld is also a structural weld and can be subjected to high tensile stresses. Consideration must therefore be given by competent authority to the mechanical properties of the weld and its heat affected zone.

---

   a. The steels used in wellhead parts and in casing are high strength steels that are susceptible to cracking when welded. It is imperative that the finished weld and adjacent metal be free from cracks. The heat from welding also affects the mechanical properties. This is especially serious if the weld is subjected to service tension stresses.

   b. This procedure is offered only as a recommendation. The responsibility for welding lies with the user and results are largely governed by the welder's skill. Weldability of the several makes and grades of casing varies widely, thus placing added responsibility on the welder. Transporting a qualified welder to the job, rather than using a less-skilled man who may be at hand, will, in most cases, prove economical. The responsible operating representative should ascertain the welder's qualifications and, if necessary, assure himself by instruction or demonstration, that the welder is able to perform the work satisfactorily.

2. **Welding Conditions.** Unfavorable welding conditions must be avoided or minimized in every way possible, as even the most skilled welder cannot successfully weld steels that are susceptible to cracking under adverse working conditions, or when the work is rushed. Work above the welder on the drilling floor should be avoided. The weld should be protected from dripping mud, water, and oil and from wind, rain, or other adverse weather conditions. The drilling mud, water, or other fluids must be lowered in the casing and kept at a low level until the weld has properly cooled. It is the responsibility of the user to provide supervision that will assure favorable working conditions, adequate time, and the necessary cooperation of the rig personnel.

3. **Welding.** The welding should be done by the shielded metal-arc or other approved process.

4. **Filler Metal.** Filler Metals. For root pass, it's recommended to use E6010, E6011 (AC), E6019 or equivalent electrodes. The E7018 or E7018-A1 electrodes may also be used for root pass operations but has the tendency to trap slag in tight grooves. The E6010, E6011 and E6019 offer good penetration and weld deposit ductility with relatively high intrinsic hydrogen content. Since the E7018 and E7018-A1 are less susceptible to hydrogen induced cracking, it is recommended for use as the filler metal for completion of the weld groove after the root pass is completed. The E6010, E6011 (AC), E6019, E7018 and E7018-A1 are classified under one of the following codes AWS A5.1 (latest edition): Mild Steel covered electrodes or the AWS A5.5 (latest edition): Low Alloy Steel Covered Arc-Welding Electrodes. The low hydrogen electrodes, E7018 and E7018-A1, should not be exposed to the atmosphere until ready for use. It's recommended that hydrogen electrodes remain in their sealed containers. When a job arises, the container shall be opened and all unused remaining electrodes to be stored in heat electrode storage ovens. Low hydrogen electrodes exposed to the atmosphere, except water, for more than two hours should be dried 1 to 2 hours at 600°F to 700 °F (316°C to 371 °C) just before use. It's recommended for any low hydrogen electrode containing water on the surface should be scrapped.

5. **Preparation of Base Metal.** The area to be welded should be dry and free of any paint, grease/oil and dirt. All rust and heat-treat surface scale shall be ground to bright metal before welding.

Recommended Procedure for Field Welding Pipe to Wellhead Parts for Pressure Seal

6. **Preheating.** Prior to any heating, the wellhead member shall be inspected for the presence of any o-rings or other polymeric seals. If any o-rings or seals are identified then preheating requires close monitoring as noted in paragraph 6a. Before applying preheat, the fluid should be bailed out of the casing to a point several inches (>6" or 150 mm) below the weld joint/location. Preheat both the casing and wellhead member for a minimum distance of three (3) inches on each side of the weld joint using a suitable preheating torch in accordance with the temperatures shown below in a and b. The preheat temperature should be checked by the use of heat sensitive crayons. Special attention must be given to preheating the thick sections of wellhead parts to be welded, to insure uniform heating and expansion with respect to the relatively thin casing.

   a. Wellhead members containing o-rings and other polymeric seals have tight limits on the preheat and interpass temperatures. Those temperatures must be controlled at 200°F to 325°F or 93 °C to 160°C and closely monitored to prevent damage to the o-ring or seals.
   b. Wellhead members not containing o-rings and other polymeric seals should be maintained at a preheat and interpass temperature of 400°F to 600°F or 200°C to 300°C.

7. **Welding Technique.** Use a 1/8 or 5/32-inch (3.2 or 4.0 mm) E6010 or E7018 electrode and step weld the first bead (root pass); that, weld approximately 2 to 4 inches (50 to 100 mm) and then move diametrically opposite this point and weld 2 to 4 inches (50 to 100 mm) halfway between the first two welds, move diametrically opposite this weld, and so on until the first pass is completed. This second pass should be made with a 5/32-inch (4.0 mm) low hydrogen electrode of the proper strength and may be continuous. The balance of the welding groove may then be filled with continuous passes without back stepping or lacing, using a 3/16-inch (4.8 mm) low hydrogen electrode. All beads should be stringer beads with good penetration. There should be no undercutting and weld shall be workmanlike in appearance.

   a. Test ports should be open when welding is performed to prevent pressure buildup within the test cavity.
   b. During welding the temperature of the base metal on either side of the weld should be maintained at 200 to 300°F (93 to 149°C).
   c. Care should be taken to insure that the welding cable is properly grounded to the casing, but ground wire should not be welded to the casing or the wellhead. Ground wire should be firmly clamped to the casing, the wellhead, or fixed in position between pipe slips. Bad contact may cause sparking, with resultant hard spots beneath which incipient cracks may develop. The welding cable should not be grounded to the steel derrick, nor to the rotary-table base.

8. **Cleaning.** All slag or flux remaining on any welding bead should be removed before laying the next bead. This also applies to the completed weld.

9. **Defects.** Any cracks or blow holes that appear on any bead should be removed to sound metal by chipping or grinding before depositing the next bead.

10. **Postheating.** Post-heating should be performed at the temperatures shown below and held at that temperature for no less than one hour followed by a slow cooling. The post-heating temperature should be in accordance with the following paragraphs.

    a. Wellhead members containing o-rings and other polymeric seals have tight limits on the post-heating temperatures. Those temperatures must be controlled at 250°F to 300°F or 120 °C to 150°C and closely monitored to prevent damage to the o-ring or seals.
    b. Wellhead members not containing o-rings and other polymeric seals should be post-heated at a temperature of 400°F to 600°F or 200°C to 300°C.

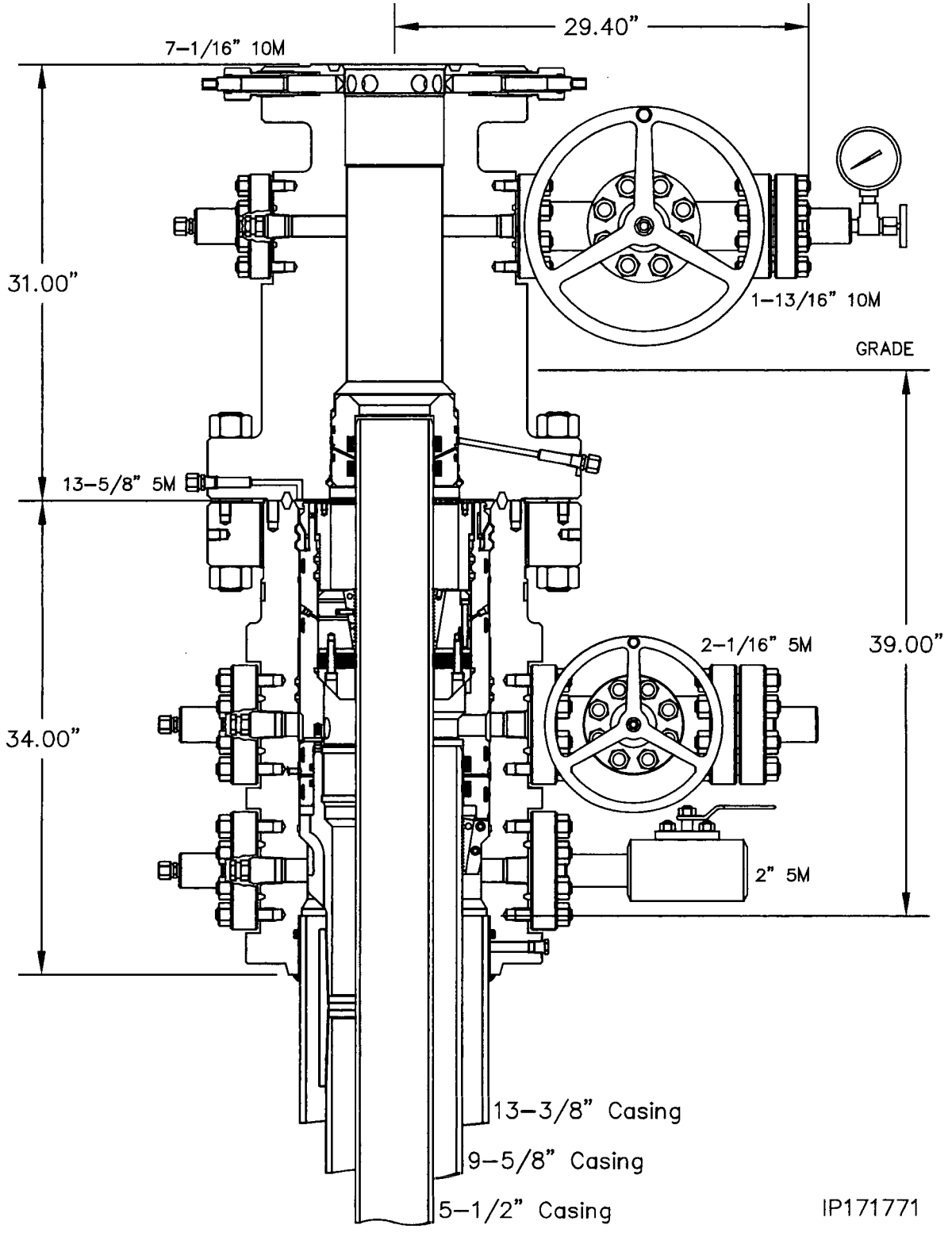
11. **Cooling.** ***Rapid cooling must be avoided.*** To assure slow cooling, welds should be protected from extreme weather conditions (cold, rain, high winds, etc.) by the use of suitable insulating material. (Specially designed insulating blankets are available at many welding supply stores.) Particular attention should be given to maintaining uniform cooling of the thick sections of the wellhead parts and the relatively thin casing, as the relatively thin casing will pull away from the head or hanger if allowed to cool more rapidly. The welds should cool in air to less than 200°F (93°C) (measured with a heat sensitive crayon) prior to permitting the mud to rise in the casing.

12. **Test the Weld.** After cooling, test the weld. The weld must be cool otherwise the test media will crack the weld. The test pressure should be no more than 80% of the casing collapse pressure.

Cactus Speed Head Pressure Testing Statement

Our procedure is to nipple up BOP's to the surface casing, pressure test the BOP's to 5000 psi high and 250 psi low. We do not anticipate breaking any seals on the BOP from that point until rig release, however if we do break any seal, the entire BOP will be retested to 5000 psi high and 250 psi low.

System Drawing



QUALITY CONTROL INSPECTION AND TEST CERTIFICATE					CERT. N°:	702
PURCHASER:	ContiTech Oil & Marine Corp.				P.O. N°:	4500421193
CONTITECH ORDER N°:	538448	HOSE TYPE:	3"	ID	Choke & Kill Hose	
HOSE SERIAL N°:	67554	NOMINAL / ACTUAL LENGTH:			10,67 m / 10,66 m	
W.P. 68,9 MPa	10000 psi	T.P. 103,4 MPa	15000 psi		Duration: 60 min.	

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 20 MPa

COUPLINGS Type	Serial N°		Quality	Heat N°
3" coupling with	1525	1519	AISI 4130	A0579N
4 1/16" 10K API Swivel Flange end			AISI 4130	035608
Hub			AISI 4130	A1126U

Not Designed For Well Testing **API Spec 16 C**

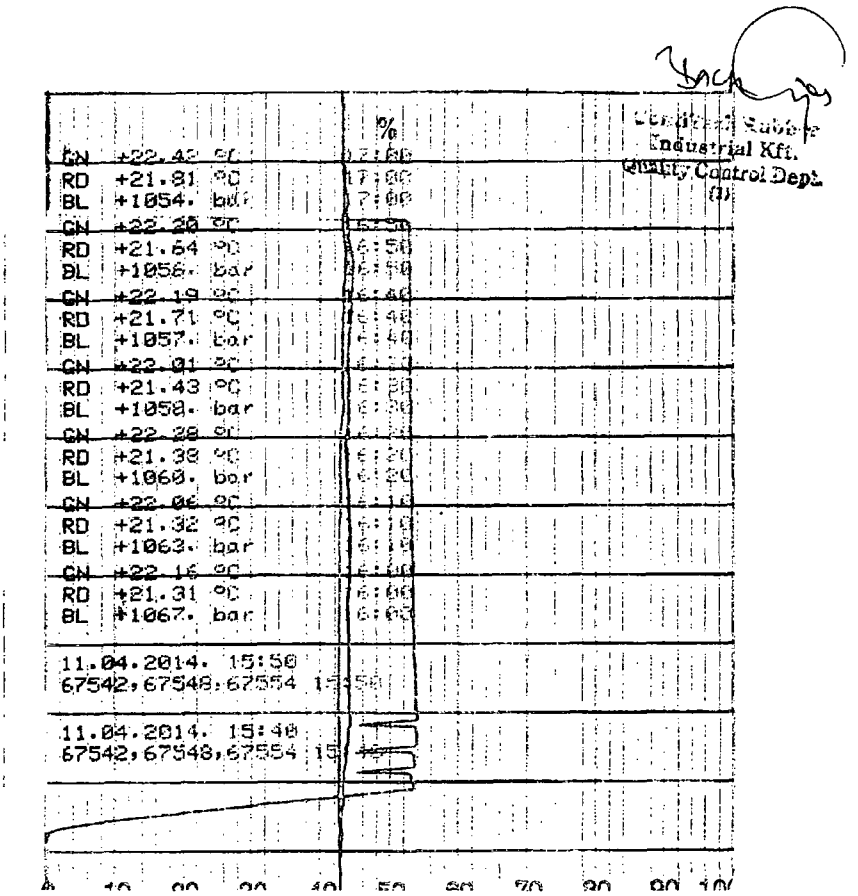
Tag No.: 66 – 1225 **Temperature rate:"B"**

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

Date:	Inspector	Quality Control
14. April 2014.		ContiTech Rubber Industrial Kft. Quality Control Dept. (1)


Industrial Kft.
Quality Control Dept.
(1)
%
GN +22.42 °C
RD +21.81 °C
BL +1054. bar
GN +22.20 °C
RD +21.64 °C
BL +1056. bar
GN +22.19 °C
RD +21.71 °C
BL +1057. bar
GN +22.01 °C
RD +21.43 °C
BL +1058. bar
GN +22.28 °C
RD +21.38 °C
BL +1060. bar
RD +21.32 °C
BL +1063. bar
RD +21.31 °C
BL +1067. bar
11.04.2014. 15:50
67542,67548,67554
11.04.2014. 15:40
67542,67548,67554

Hose Data Sheet

CRI Order No.	538448
Customer	ContiTech Oil & Marine Corp.
Customer Order No	CBC557116 4500421193
Item No.	1
Hose Type	Flexible Hose
Standard	**API SPEC 16 C**
Inside dia in inches	3
Length	35 ft
Type of coupling one end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE SOURC/W BX155 ST/ST INLAID R.GR.
Type of coupling other end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE SOUR C/W BX155 ST/ST INLAID R.GR.
H2S service NACE MR0175	Yes
Working Pressure	10 000 psi
Design Pressure	10 000 psi
Test Pressure	15 000 psi
Safety Factor	2,25
Marking	USUAL PHOENIX
Cover	NOT FIRE RESISTANT
Outside protection	St.steel outer wrap
Internal stripwound tube	No
Lining	OIL + GAS RESISTANT SOUR
Safety clamp	Yes
Lifting collar	Yes
Element C	Yes
Safety chain	Yes
Safety wire rope	No
Max.design temperature [°C]	100
Min.design temperature [°C]	-20
Min. Bend Radius operating [m]	0,90
Min. Bend Radius storage [m]	0,90
Electrical continuity	The Hose is electrically continuous
Type of packing	WOODEN CRATE ISPM-15

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE

CERT. N°: 731

PURCHASER:	ContiTech Oil & Marine Corp.	P.O. N°:	4500300249
CONTITECH RUBBER order N°:	536555	HOSE TYPE: 3" ID	Choke and Kill Hose
HOSE SERIAL N°:	65346	NOMINAL / ACTUAL LENGTH:	7,62 m / 7,66 m

W.P.	68,9	MPa	10000	psi	T.P. 103,4	MPa	15000	psi

Duration: 60 min.

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 20 MPa

COUPLINGS Type	Serial N°	Quality	Heat N°
3" coupling with	3428 3433	AISI 4130	A1031U
4 1/16" API 10K Swivel Flange end		AISI 4130	034435 54961
Hub		AISI 4130	A0462U

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

66 – 1042 NBRSN661042 **Temperature rate:"B"**

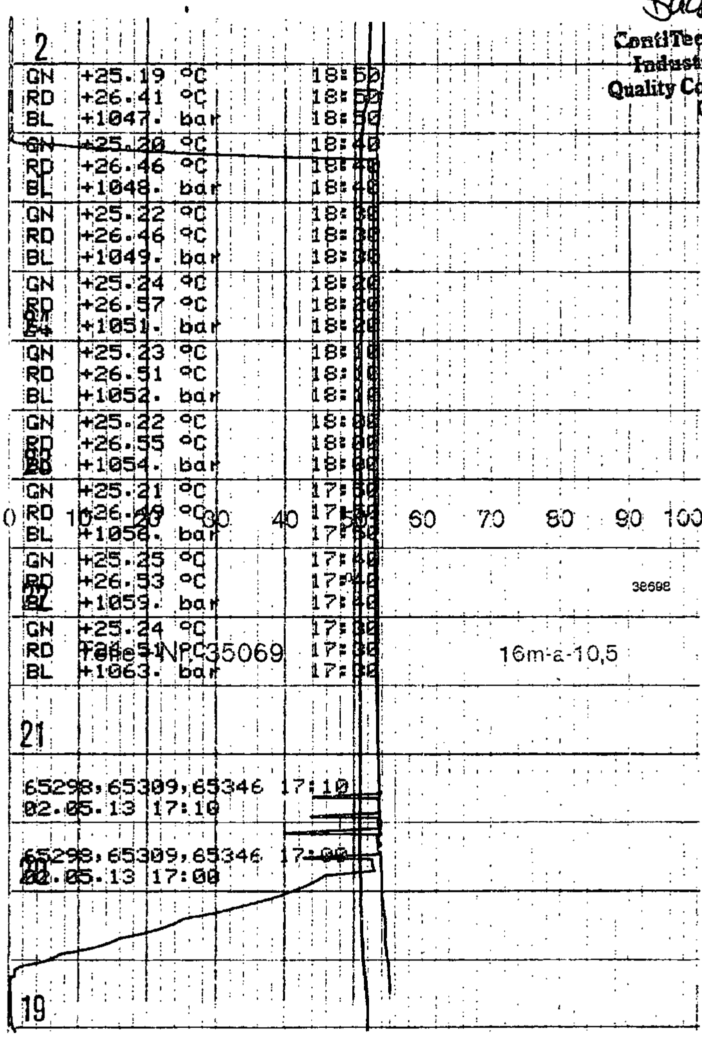
All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

Date:	Inspector	Quality Control
03. May 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept. (1)

ContiTech Rubber
Industrial Kft.
Quality Control Dept.
(1)



Hose Data Sheet

CRI Order No.	536555
Customer	ContiTech Oil & Marine Corp.
Customer Order No	4500300249 CBC384527
Item No.	1
Hose Type	Flexible Hose
Standard	**API SPEC 16 C**
Inside dia in inches	3
Length	25 ft
Type of coupling one end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGEC/W BX155 ST/ST INLAID RING GR
Type of coupling other end	FLANGE 4.1/16" 10KPSI API SPEC 17D SV SWIVEL FLANGE C/W BX155 ST/ST INLAID RING GR
H2S service NACE MR0175	Yes
Working Pressure	10 000 psi
Design Pressure	10 000 psi
Test Pressure	15 000 psi
Safety Factor	2,25
Marking	USUAL PHOENIX
Cover	NOT FIRE RESISTANT
Outside protection	St.steel outer wrap
Internal stripwound tube	No
Lining	OIL RESISTANT
Safety clamp	Yes
Lifting collar	Yes
Element C	Yes
Safety chain	Yes
Safety wire rope	No
Max.design temperature [°C]	100
Min.design temperature [°C]	-20
MBR operating [m]	1,60
MBR storage [m]	1,40
Type of packing	WOODEN CRATE ISPM-15

APD ID: 10400026504 **Submission Date:** 01/31/2018

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

JADE_34_3_FEDERAL_COM_2BS_8H_VICINITY_MAP_11292017_20180123135130.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT **Row(s) Exist?** NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

JADE_34_3_FEDERAL_COM_2BS_8H_PAD_PLAT_PROP_RD_11292017_20180123135150.pdf
JADE_34_3_FEDERAL_COM_2BS_8H_PAD_PLAT_PROP_RD2_11292017_20180123135150.pdf

New road type: RESOURCE

Length: 526 Feet **Width (ft.):** 30

Max slope (%): 2 **Max grade (%):** 1

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 15

New road access erosion control: Road will be crowned and ditched to prevent erosion

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: BOTH

Access surfacing type description: 6" rolled and compacted caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description: Surfacing material will consist of native caliche obtained from the well site if possible. Otherwise, caliche will be hauled from nearest caliche pit
Onsite topsoil removal process: Grading

Access other construction information:

Access miscellaneous information:

Number of access turnouts: **Access turnout map:**

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and be consistent with local drainage patterns.
Road Drainage Control Structures (DCS) description: No drainage control necessary

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

JADE_34_3_FEDERAL_COM_2BS_8H_MILE_RADIUS_MAP_11292017_20180123135212.pdf

Existing Wells description:

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? DEFER

Estimated Production Facilities description: If well is productive, a tank battery will be installed on well pad. Tank battery construction and instillation plans will be submitted via Sundry Notice.

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: INTERMEDIATE/PRODUCTION CASING, STIMULATION, SURFACE CASING
Water source type: GW WELL
Describe type:
Source latitude:
Source longitude:
Source datum:
Water source permit type: PRIVATE CONTRACT
Source land ownership: PRIVATE
Water source transport method: PIPELINE
Source transportation land ownership: PRIVATE
Water source volume (barrels): 120000
Source volume (acre-feet): 15.467172
Source volume (gal): 5040000

Water source and transportation map:

JADE_34_3_FEDERAL_COM_2BS_8H_VICINITY_MAP_11292017_20180123135237.pdf
JADE_34_3_FEDERAL_COM_Water_Source_Map_20180720104113.pdf

Water source comments: Chisholm Energy Operating, LLC at this time has not determined which water source it will use for operations. Attached is a map showing two possible options.
New water well? NO

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:**
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

Construction Materials description: Construction materials from the location will be used. No additional needs are anticipated.
Construction Materials source location attachment:

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drilling Fluids and Cuttings

Amount of waste: 6000 barrels

Waste disposal frequency : Daily

Safe containment description: Steel Tanks

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL
Disposal type description:

Disposal location description: Trucked to approved disposal facility

Waste type: COMPLETIONS/STIMULATION

Waste content description: Completions Fluids

Amount of waste: 2000 barrels

Waste disposal frequency : Daily

Safe containment description: Steel Tanks

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL
Disposal type description:

Disposal location description: Trucked to an approved disposal facility

Waste type: FLOWBACK

Waste content description: Oil

Amount of waste: 1000 barrels

Waste disposal frequency : One Time Only

Safe containment description: Frac Tanks

Safe containmant attachment:

Waste disposal type: OTHER **Disposal location ownership:** PRIVATE

Disposal type description: Private

Disposal location description: Haul to tank battery

Waste type: SEWAGE

Waste content description: Human Waste

Amount of waste: 50 pounds

Waste disposal frequency : Weekly

Safe containment description: Portable Toilets

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Serviced by toilet rental company

Waste type: GARBAGE

Waste content description: Trash and Debris

Amount of waste: 200 pounds

Waste disposal frequency : One Time Only

Safe containment description: roll off bin with netted top

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Truck to commercial waste facility

Waste type: PRODUCED WATER

Waste content description: Produced water

Amount of waste: 4000 barrels

Waste disposal frequency : One Time Only

Safe containment description: Steel Tanks

Safe containmant attachment:

Waste disposal type: OTHER **Disposal location ownership:** PRIVATE

Disposal type description: Private

Disposal location description: Trucked to tank battery

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

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? YES

Description of cuttings location Stored in steel bin and hauled to disposal site by truck

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?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

JADE_34_3_FEDERAL_COM_2BS_8H_PAD_PLAT_PROP_RD2_11292017_20180123135338.pdf

Comments:

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:** JADE DRILL ISLAND EAST

Multiple Well Pad Number: 7H & 8H

Recontouring attachment:

Drainage/Erosion control construction: Drainage systems, if an, will be reshaped to the original configuration with provisions made to alleviate erosion.

Drainage/Erosion control reclamation: Any portion of the site that is not needed for future operations will be reclaimed to the original state as much as possible.

Well pad proposed disturbance (acres): 0

Well pad interim reclamation (acres): 4.78

Well pad long term disturbance (acres): 4.78

Road proposed disturbance (acres): 0

Road interim reclamation (acres): 0.76

Road long term disturbance (acres): 0.76

Powerline proposed disturbance (acres): 0

Powerline interim reclamation (acres): 0

Powerline long term disturbance (acres): 0

Pipeline proposed disturbance (acres): 0

Pipeline interim reclamation (acres): 0

Pipeline long term disturbance (acres): 0

Other proposed disturbance (acres): 0

Other interim reclamation (acres): 0

Other long term disturbance (acres): 0

Total proposed disturbance: 0

Total interim reclamation: 5.54

Total long term disturbance: 5.54

Disturbance Comments:

Reconstruction method: No interim reclamation planned due to future development on this pad, as well as tank battery construction if the well is productive.

Topsoil redistribution: After the area has been reshaped and contoured, topsoil from the spoil pile will be placed over the disturbed area to the extent possible.

Soil treatment: No treatment necessary

Existing Vegetation at the well pad: mesquite, shinnery oak

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: mesquite, shinnery oak

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: mesquite, shinnery oak

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: no other disturbance

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type: PERENNIAL GRASS **Seed source:** COMMERCIAL

Seed name: LPC-Seed Mix 2

Source name: **Source address:**

Source phone:

Seed cultivar:

Seed use location: WELL PAD,WELL PAD

PLS pounds per acre: 5 **Proposed seeding season:** SPRING

Seed Summary

Total pounds/Acre: 5

Seed Type	Pounds/Acre
PERENNIAL GRASS	5

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: Tim **Last Name:** Green

Phone: (432)686-8235 **Email:** tgreen@chisholmenergy.com

Seedbed prep: Rip and add topsoil

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: All areas will be monitored, and weeds will be treated

Weed treatment plan attachment:

Monitoring plan description: Monitoring by lease operators during each visit

Monitoring plan attachment:

Success standards: N/A

Pit closure description: No pit, utilizing closed loop system

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Disturbance type: NEW ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Section 12 - Other Information

Right of Way needed? YES **Use APD as ROW?** YES

ROW Type(s): 281001 ROW - ROADS

ROW Applications

SUPO Additional Information: APD RECEIPT ATTACHED

Use a previously conducted onsite? YES

Previous Onsite information: Onsite was conducted during Drill Island Application onsite. Per BLM no other onsite needed.

Other SUPO Attachment

JADE_34_3_FEDERAL_COM_2BS_8H_LOC_VERIFICATION_MAP_11292017_20180123135407.pdf
JADE_APD_RECEIPT_20180131081623.pdf
JADE_34_3_FED_COM_2BS_8H_GCP_06202018_20180620092329.pdf

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

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 attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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 evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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 attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

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 attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

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:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

AFMSS

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

Bond Info Data Report

11/26/2018

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001468

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 number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

APD ID: 10400026504 **Submission Date:** 01/31/2018

Operator Name: CHISHOLM ENERGY OPERATING LLC

Well Name: JADE 34-3 FED COM 2BS **Well Number:** 8H

Well Type: OIL WELL **Well Work Type:** Drill

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	RUSTLER	3579	0	0	ANHYDRITE	USEABLE WATER	No
2	SALADO	1938	1640	1640	SALT	NONE	No
3	YATES	398	3180	3180	SHALE,SANDSTONE	NATURAL GAS,OIL	No
4	CAPITAN REEF	93	3485	3485	LIMESTONE,DOLOMITE	USEABLE WATER,POTASH	No
5	DELAWARE	-1787	5365	5365	SHALE,SANDSTONE,SILTSTONE	NATURAL GAS,OIL	No
6	BONE SPRING	-4462	8040	8040	LIMESTONE,SHALE	NATURAL GAS,OIL	No
7	BONE SPRING 1ST	-5572	9150	9150	SHALE,SANDSTONE,SILTSTONE	NATURAL GAS,OIL	No
8	BONE SPRING 2ND	-6132	9710	9710	SHALE,SANDSTONE,SILTSTONE	NATURAL GAS,OIL	Yes

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M **Rating Depth:** 12000

Equipment: Rotating Head, remote kill line, mud-gas sperator

Requesting Variance? YES

Variance request: WE PROPOSE UTILIZING A CACTUS SPEED HEAD MULTI-BOWL WELLHEAD FOR THIS WELL. PLEASE SEE ATTACHED DIAGRAM AND PRESSURE TESTING STATEMENT. ALSO WE REQUEST TO USE A FLEX CHOKE HOSE; PLEASE SEE ATTACHMENT.

Testing Procedure: BOP will be tested by an independent service company per onshore order 2. BOP testing procedure - N/U the rig's BOP. Use 3rd party testers to perform the following: -Test the pipe rams, blind rams, floor valves (IBOP and/or upper Kelly valve), choke lines and manifold to 250 psi/5,000 psi with a test plug and a test pump. -Test the Hydril annular to 250 psi/2,500 psi with same as above.

Choke Diagram Attachment:

5M_Choke_Manifold_Diagram_20180123134752.pdf

BOP Diagram Attachment:

5m_BOP_Diagram_20180123134801.pdf

Pay.gov®

Receipt

Your payment is submitted

Pay.gov Tracking ID: 267GB8N0
Agency Tracking ID: 75413956317
Form Name: Bureau of Land Management (BLM) Application for Permit to Drill (APD) Fee
Application Name: BLM Oil and Gas Online Payment

Payment Information

Payment Type: Bank account (ACH)
Payment Amount: $48,950.00
Transaction Date: 01/31/2018 09:57:57 AM EST
Payment Date: 02/01/2018
Company: CHISHOLM ENERGY OPERATING, LLC
APD IDs: 10400025081, 10400026457, 10400026500, 10400026502, 10400026504
Lease Numbers: NMNM97897, NMNM97897, NMNM97897, NMNM97896, NMNM97896
Well Numbers: 4H, 5H, 6H, 7H, 8H
Note: You will need your Pay.gov Tracking ID to complete your APD transaction in AFMSS II. Please ensure you write this number down upon completion of payment.

Account Information

Account Holder Name: CHISHOLM ENERGY OPERATING, LLC
Routing Number: 114000093
Account Number: **********4470

Email Confirmation Receipt

Confirmation Receipts have been emailed to:
jennifer_mosl20@hotmail.com
jennifer_mosl20@hotmail.com