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ENGINEERING DATA TRANSMITTAL



Page 1 of 1
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15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	RPP-5628		0	Formal Design Review-Foot Clamp Modification	SQ	1	1	1

16. KEY			
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)	
E, S, Q, D OR N/A (See WHC-CM-3-5, Sec. 12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment	4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)									
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature
1	1	Design Authority G. P. Janicek	<i>[Signature]</i>	1/24/00	S7-12	1	1	T. C. Oten	<i>[Signature]</i>
		Design Agent							
		Cog. Eng.							
1	1	Cog. Mgr. J. S. Schofield	<i>[Signature]</i>	1/24/00	S7-12				
1	1	QA M. L. McElroy	<i>[Signature]</i>	1-20-00	S7-07				
1	1	Safety C. D. Jackson	<i>[Signature]</i>	1/24/00	S7-34				
		Env.							

18. Signature of EDT Originator <i>[Signature]</i> Date: 1/24/00		19. Authorized Representative for Receiving Organization Date: _____		20. Design Authority/Cognizant Manager <i>[Signature]</i> Date: 1/24/00		21. DOE APPROVAL (if required) Ctrl No. _____ <input type="radio"/> Approved <input type="radio"/> Approved w/comments <input type="radio"/> Disapproved w/comments	
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Formal Design Review Foot Clamp Modification

Timothy C. Oten

CH2M Hill, Hanford Group, Inc.

Richland, WA 99352

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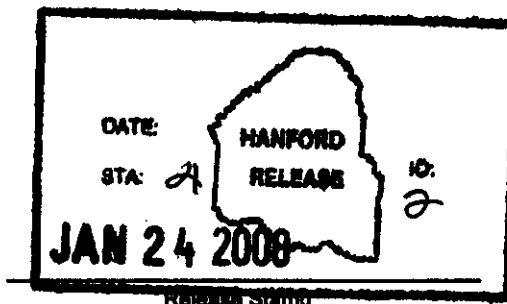
Key Words: Design Review, Foot Clamp

Abstract: This report documents the Design Review performed for the foot clamp modification. The report documents the acceptability of the design, identifies the documents that were reviewed, the scope of the review and the members of the review team.

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Release Approval Date



Approved For Public Release

RPP-5628

Rev. 0

**FORMAL DESIGN REVIEW
FOOT CLAMP MODIFICATION**

Timothy C. Oten

January 18, 2000

RPP-5628

FORMAL DESIGN REVIEW

FOOT CLAMP MODIFICATION

1.0 SCOPE

1.1 Overview

This report documents the formal design review of the foot clamp assembly for use with the Rotary Mode Core Sample (RMCS) trucks. The foot clamp assembly was originally designed for use with the Push Mode Sample (PMS) trucks, which are classified as General Service. The purpose of this design review was to determine whether the PMS foot clamp design is suitable for use on the RMCS trucks, which is a Safety Class application. The intent is to fabricate and test the RMCS and PMS foot clamp assemblies to satisfy Safety Class requirements so that they can be used in either application.

1.2 Foot Clamp Design

The foot clamp is designed to hold the drill string and prevent it from falling into the tank when the shielded receiver, quill rod or drill string hoist is disconnected, or in the event of a mechanical failure. The foot clamp assembly is made up of two pneumatically actuated pistons, a toggle style isolation valve and a three way isolation valve, a pressure gauge, a structural frame and miscellaneous tubing, nuts, bolts and fittings. The pistons are spring actuated to close and require air pressure to open; they fail closed on loss of air. The pistons are located opposite each other in the frame and extend toward each other to effectively clamp the drill string between them. Serrated jaws are attached at the end of each piston to ensure that the drill string does not slip when force is applied through the piston. The two valves are installed in series in the air supply line to the actuator to ensure that the foot clamp is not inadvertently opened. The foot clamp is designed for use with 2 1/2" fluted or 2 1/4" non-fluted drill string.

1.3 Documents Reviewed

The following documents were reviewed:

- ECN 655611, dated 10/22/99. Modifications to PMS Foot Clamp Assembly.
- Site Fabrication Services Work Package. Testing results for foot clamp units 1, 2 and 3, Work Order 2H9903622/F.
- Foot Clamp Compliance Matrix.
- H-2-690138, Sheet 1 of 6, Rev. 0, Footclamp Assembly.
- H-2-690138, Sheet 2 of 6, Rev. 0, Footclamp Assembly.
- H-2-690138, Sheet 3 of 6, Rev. 0, Footclamp Details.
- H-2-690138, Sheet 4 of 6, Rev. 0, Footclamp Details.
- H-2-690138, Sheet 5 of 6, Rev. 0, Footclamp Details.
- H-2-690138, Sheet 6 of 6, Rev. 0, Footclamp Details.

2.0 SUMMARY

The formal design review identified a number of comments to be incorporated into the design of the foot clamp. Based on a review of the final ECN (ECN 655621), there are no outstanding action items. The design review is complete and the foot clamp design is acceptable for the RMCS safety class application.

3.0 DOCUMENTATION

3.1 Design Review Checklist

A design review checklist was prepared to document the overall assessment of the foot clamp design. The checklist addresses major design considerations rather than individual requirements. The checklist is attached as Appendix A of this report.

3.2 Design Review Committee

The design review committee was selected to provide an independent assessment and review of the foot clamp design. Members were selected by the chairman with the concurrence of their respective managers. Members are listed below:

- Chairman: Timothy C. Oten
- Design Authority: George P. Janicek
- Cognizant Engineer: Troy R. Farris
- Quality Assurance: Michael L. McElroy
- Quality Assurance: John J. Verderber
- Safety: Cary D. Jackson
- Engineering: Henry F. Shumake, Jr.
- Engineering: Galen W. Wilson

3.3 Meeting Minutes

Meeting minutes from the design review were prepared and are included in Appendix B.

3.4 Other Documents

The compliance matrix and a portion of the Site Fabrication Services Work Package reviewed during the design review meeting are included in Appendix C.

APPENDIX A
DESIGN REVIEW CHECKLIST
(2 pages including cover page)

DESIGN REVIEW CHECKLIST
FOOT CLAMP MODIFICATION

Documents/ECNs Reviewed: ECN 655611; Site Fabrication Work Package for Testing of Foot Clamp; Foot Clamp Compliance Matrix; ECN 655621

Affected Document(s) (Optional) _____

Yes No NA

- | | | | |
|-------------------------------------|--------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Were the design inputs correctly selected? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are assumptions necessary to perform the design activity adequately described and reasonable? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Was an appropriate design method used? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Were the design inputs correctly incorporated into the design? Is the design output reasonable compared to design inputs? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the necessary design input and verification requirements for interfacing organizations specified in the design documents or in supporting procedures or instructions? (Yes-testing of the foot clamp prior to use) |



Checklist Completed By

1/18/00

Date

APPENDIX B
MEETING MINUTES
(3 pages including cover page)

FORMAL DESIGN REVIEW - SAFETY CLASS FOOT CLAMP (ECN 655611)

MEETING MINUTES (Rev. 1)

Prepared by T.C. Oten

2704 HV/Conference Room C207

November 5, 1999

Design Review Team Members

T. R. Farris, Cognizant Engineer
C. D. Jackson, Safety
G. P. Janicek, Design Authority
M. L. McElroy, Quality Assurance
T. C. Oten, Design Review Chairman
H. F. Shumake, Engineering
J. J. Verderber, Quality Assurance
G. W. Wilson, Engineering

Design Review

ECN 655611 was prepared and released to make modifications to the drawings for the foot clamp assembly used with trucks 1 and 2. The foot clamp is classified as General Service for this application. The purpose of this design review was to determine whether the same foot clamp design is suitable for use on the Rotary Mode Core Sample trucks, which is a Safety Class application per HNF-SD-WM-SEL-044, Rev. 2. The intent is to fabricate and test all foot clamp assemblies to satisfy the requirements for the safety class application.

The foot clamp is designed for use with 2¹/₂" fluted or 2¹/₄" non-fluted drill string. The assembly weighs approximately 140 lbs as compared to the previous foot clamp design, which weighed approximately 90 lbs. In normal operation the foot clamp will have to be able to hold a maximum of approximately 250 lbs of drill string. Documented test results show that the foot clamp can hold 1000 lbs; undocumented test results show that the drill string does not start to slip through the foot clamp until approximately 2000 lbs is applied. The surface of the foot clamp that is in contact with the drill string is serrated to ensure that it grips the drill string tightly, even if the drill string is wet. The foot clamp is designed to fail closed on a loss of air. The combination of a toggle valve and a ball valve

in series is intended to prevent inadvertently opening a single valve and releasing the drill string.

ECN 655611 will be revised to incorporate comments made by the design review team. The following are the comments on the ECN:

1. Add a note to Block 13a to state that the foot clamp must pass the test identified on H-2-690138, Sheet 1, Note 8 regarding close rate. The note will be revised to include testing of the toggle valve and verification that it does not leak. Testing must be completed without the needle valve installed to confirm the foot clamp meets the closure time requirements.
2. The SEL block should be checked in Block 19. Revised sections of the SEL should be included in the ECN.
3. Add the following documents to Block 20:
 - VI 22601
 - TO-080-518
 - TO-080-519
 - HNF-SD-WM-SEL-044
4. Revise Drawing H-2-690138, Sht. 3 to add a detail for a plate to cover the opening into the tank when the drill string is not in the riser.
5. Revise page 11, Detail 15 to show hidden lines and line up views (drafting error).
6. Verify that the Parts List on page 4 is consistent with the drawing revisions.
7. Revise the compliance matrix and add the affected sheets to the ECN. Incorporate the following comments (based on the preliminary matrix):
 - In the "F&R MET" column, describe how the requirement has been met.
 - Revise the second item to read: "Upon mechanical failure, FC restrains the drill string, preventing a drop."
 - In the fourth row, clarify that the foot clamp must be able to carry the load of the drill string and open wide enough to allow the drill string to pass through to be compatible.
 - The item that states that the foot clamp jaws must incorporate a wedge design is not a requirement.
 - Revise the seventh item to state that the foot clamp will be an enclosed assembly and have no inadvertent pinch points.

The review team members agreed that the changes could be closed by review of the modified ECNs by the chairman, with the chairman's signature on the ECN as record of acceptable closure. The meeting was adjourned.

APPENDIX C

OTHER DOCUMENTS

(11 pages including cover page)




FOOT CLAMP (FC) H-2-690134-38

REQUIREMENT/FUNCTION	SOURCE	F&R MET?
FC WILL RETAIN THE DRILL STRING WHEN SHIELDED RECEIVER, QUILL ROD OR DRILL STRING HOIST IS DISCONNECTED	HNF-SD-WM-SEL-044 REV 2	
UPON MECHANICAL FAILURE, FC RESTRAINS THE DRILL STRING, PREVENTING A DROP, AND POSSIBLE SPARK, RESULTING IN AN IGNITION OF POTENTIALLY FLAMMABLE GAS	HNF-SD-WM-SEL-044 REV 2	
FC TO FAIL CLOSED UPON LOSS OF SUPPLY AIR.	HNF-SD-WM-SEL-044 REV 2	
FC WILL BE COMPATIBLE WITH DRILL ROD.	HNF-SD-WM-SEL-044 REV 2	
FC JAW MUST INCORPORATE A WEDGE DESIGN	HNF-SD-WM-SEL-044 REV 2	
FC WILL PROVIDE TOTAL CONTAINMENT DURING TANK INTRUSIVE ACTIVITIES. <i>enclosed assembly</i>	HNF-4434	
FC WILL BE VOID OF "PINCH POINTS" <i>no</i>		
FC JAWS WILL CLOSE AT LESS THAN 1 FT/MIN	BIO	

102250

Mech
QA
DA Janicek

STEP CRAFT	WORK INSTRUCTIONS
130	<p>FUNCTIONAL TESTING PER DWG. H-2-690138 GENERAL NOTE #8. TESTS 1 thru 3. THESE TESTS ARE FOR UNIT #1.</p> <p>NOTIFY HENRY SHUMAKE 376-3404 AND ERIC WALDO 373-9207 FOR THEIR SPECIAL INSTRUCTIONS AND INPUT IN THE FOLLOWING TEST. THE DRILL STRING WILL BE SUPPLIED BY CUSTOMER. "GO GAGE" IS LOCATED IN THE MACHINE SHOP TOOL CRIB.</p> <p>NOTE: FOR THE PURPOSE OF THIS DOCUMENT, SLIPPAGE IS DEFINED AS THE MOVEMENT OF THE DRILL STRING RELATIVE TO THE FOOTCLAMP JAWS >0.25 INCH.</p> <p>TESTING TO BE PERFORMED WITH 100 PSIG SUPPLY PRESSURE.</p> <p>FUNCTIONAL TESTS:</p>
V	<p>1. VERIFY THAT SUPPORT OF A MINIMUM VERTICAL LOAD OF 1000 POUNDS FORCE APPLIED TO 2 1/4", NON-FLUTED DRILL STRING HELD BY FOOTCLAMP WITHOUT SLIPPAGE.</p> <p>Craft Signature <u>Terry B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u>[Stamp: DYN 004]</u> Date <u>8-31-99</u></p>
V	<p>2. VERIFY THAT FOOTCLAMP DOES NOT OPEN UPON LOSS OF SUPPLY AIR. AIR IS TO BE REMOVED FOR THIS TEST.</p> <p>Craft Signature <u>Terry B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u>[Stamp: DYN 004]</u> Date <u>8-31-99</u></p>
V	<p>3. VERIFY THAT THE Ø1.895 x 12" "GO GAGE" PASSES THROUGH THE NON-FLUTED DRILL STRING PRIOR TO AND WHILE BEING CLAMPED IN THE FOOTCLAMP.</p> <p>Craft Signature <u>Terry B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u>[Stamp: DYN 004]</u> Date <u>8-31-99</u></p>

STEP CRAFT	WORK INSTRUCTIONS
140	<p>FUNCTIONAL TESTING PER DWG. H-2-690138 GENERAL NOTE #8. TESTS 4 thru 6. THESE TESTS ARE FOR UNIT #1.</p> <p>NOTIFY HENRY SHUMAKE 376-3404 AND ERIC WALDO 373-9207 FOR THEIR SPECIAL INSTRUCTIONS AND INPUT IN THE FOLLOWING TEST. THE DRILL STRING WILL BE SUPPLIED BY CUSTOMER.</p> <p>NOTE: FOR THE PURPOSE OF THIS DOCUMENT, SLIPPAGE IS DEFINED AS THE MOVEMENT OF THE DRILL STRING RELATIVE TO THE FOOTCLAMP JAWS >0.25 INCH.</p> <p>TESTING TO BE PERFORMED WITH 100 PSIG SUPPLY PRESSURE.</p> <p>FUNCTIONAL TESTS:</p>
V	<p>4. VERIFY THAT SUPPORT OF A MINIMUM VERTICAL LOAD OF 1000 POUNDS FORCE APPLIED TO 2 1/2", FLUTED DRILL STRING HELD BY FOOTCLAMP WITHOUT SLIPPAGE.</p> <p>Craft Signature <u>Terry J. B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u></u>  Date <u>8-31-99</u></p>
V	<p>5. VERIFY THAT FOOTCLAMP DOES NOT OPEN UPON LOSS OF SUPPLY AIR. AIR IS TO BE REMOVED FOR THIS TEST.</p> <p>Craft Signature <u>Terry J. B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u></u>  Date <u>8-31-99</u></p>
V	<p>6. VERIFY THAT THE Ø1.895 x 12" "GO GAGE" PASSES THROUGH THE FLUTED DRILL STRING PRIOR TO AND WHILE BEING CLAMPED IN THE FOOTCLAMP.</p> <p>Craft Signature <u>Terry J. B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u></u>  Date <u>8-31-99</u></p>

QC INSPECTION RECORD




STEP CRAFT	WORK INSTRUCTIONS
150	<p>FUNCTIONAL TESTING PER DWG. H-2-690138 GENERAL NOTE #8. TESTS 7 & 8. THESE TESTS ARE FOR UNIT #1.</p> <p>NOTIFY HENRY SHUMAKE 376-3404 AND ERIC WALDO 373-9207 FOR THEIR SPECIAL INSTRUCTIONS AND INPUT IN THE FOLLOWING TEST. THE DRILL STRING WILL BE SUPPLIED BY CUSTOMER.</p> <p>NOTE: <i>TESTING TO BE PERFORMED WITH 100 PSIG SUPPLY PRESSURE.</i></p> <p>FUNCTIONAL TESTS:</p> <p>7. VERIFY THAT THE DISTANCE BETWEEN THE CLOSED JAWS IS LESS THAN 2 1/4".</p> <p>V Craft Signature <u>Terry D.B.</u> Date <u>8-31-99</u></p> <p>X QC Signature <u>[Signature]</u> DYN 004 Date <u>8-31-99</u></p> <p>V 8. VERIFY BY USING A STOPWATCH AND RECORDING THE TIME PASSED FOR THE CLOSING OF THE JAWS ON THE FOOTCLAMP. JAW CLOSURE RATE NOT TO EXCEED ONE FOOT PER SECOND.</p> <p>CLOSURE RATE IS <u>.84</u> SECOND(S) FOR <u>3 1/4"</u> INCHES.</p> <p>Craft Signature <u>Terry D.B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u>[Signature]</u> DYN 004 Date <u>8-31-99</u></p> <p><i>QAB</i> <u>SECONDS</u> <u>INCHES</u> <i>8-31-99</i></p>



STEP CRAFT	WORK INSTRUCTIONS
160	<p>FUNCTIONAL TESTING PER DWG. H-2-690138 GENERAL NOTE #8. TESTS 1 thru 3. THESE TESTS ARE FOR UNIT #2.</p> <p>NOTIFY HENRY SHUMAKE 376-3404 AND ERIC WALDO 373-9207 FOR THEIR SPECIAL INSTRUCTIONS AND INPUT IN THE FOLLOWING TEST. THE DRILL STRING WILL BE SUPPLIED BY CUSTOMER. "GO GAGE" IS LOCATED IN THE MACHINE SHOP TOOL CRIB.</p> <p>NOTE: FOR THE PURPOSE OF THIS DOCUMENT, SLIPPAGE IS DEFINED AS THE MOVEMENT OF THE DRILL STRING RELATIVE TO THE FOOTCLAMP JAWS >0.25 INCH.</p> <p>TESTING TO BE PERFORMED WITH 100 PSIG SUPPLY PRESSURE.</p> <p>FUNCTIONAL TESTS:</p> <p>V 1. VERIFY THAT SUPPORT OF A MINIMUM VERTICAL LOAD OF 1000 POUNDS FORCE APPLIED TO 2 1/4", NON-FLUTED DRILL STRING HELD BY FOOTCLAMP WITHOUT SLIPPAGE.</p> <p>Craft Signature <u>Terry L B</u> Date <u>8-31-99</u></p> <p>f QC Signature <u>[DYN 004]</u> Date <u>8-31-99</u></p> <p>V 2. VERIFY THAT FOOTCLAMP DOES NOT OPEN UPON LOSS OF SUPPLY AIR. AIR IS TO BE REMOVED FOR THIS TEST.</p> <p>Craft Signature <u>Terry L B</u> Date <u>8-31-99</u></p> <p>f QC Signature <u>[DYN 004]</u> Date <u>8-31-99</u></p> <p>V 3. VERIFY THAT THE Ø1.895 x 12" "GO GAGE" PASSES THROUGH THE NON-FLUTED DRILL STRING PRIOR TO AND WHILE BEING CLAMPED IN THE FOOTCLAMP.</p> <p>Craft Signature <u>Terry L B</u> Date <u>8-31-99</u></p> <p>f QC Signature <u>[DYN 004]</u> Date <u>8-31-99</u></p>

STEP CRAFT	WORK INSTRUCTIONS
170	<p>FUNCTIONAL TESTING PER DWG. H-2-690138 GENERAL NOTE #8. TESTS 4 thru 6. THESE TESTS ARE FOR UNIT #2.</p> <p>NOTIFY HENRY SHUMAKE 376-3404 AND ERIC WALDO 373-9207 FOR THEIR SPECIAL INSTRUCTIONS AND INPUT IN THE FOLLOWING TEST. THE DRILL STRING WILL BE SUPPLIED BY CUSTOMER.</p> <p>NOTE: FOR THE PURPOSE OF THIS DOCUMENT, SLIPPAGE IS DEFINED AS THE MOVEMENT OF THE DRILL STRING RELATIVE TO THE FOOTCLAMP JAWS >0.25 INCH.</p> <p>TESTING TO BE PERFORMED WITH 100 PSIG SUPPLY PRESSURE.</p> <p>FUNCTIONAL TESTS:</p>
V	<p>4. VERIFY THAT SUPPORT OF A MINIMUM VERTICAL LOAD OF 1000 POUNDS FORCE APPLIED TO 2 1/2", FLUTED DRILL STRING HELD BY FOOTCLAMP WITHOUT SLIPPAGE.</p> <p>Craft Signature <u>Terry L. B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u>(DYN 004)</u> Date <u>8-31-99</u></p>
V	<p>5. VERIFY THAT FOOTCLAMP DOES NOT OPEN UPON LOSS OF SUPPLY AIR. AIR IS TO BE REMOVED FOR THIS TEST.</p> <p>Craft Signature <u>Terry L. B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u>(DYN 004)</u> Date <u>8-31-99</u></p>
V	<p>6. VERIFY THAT THE Ø1.895 x 12" "GO GAGE" PASSES THROUGH THE FLUTED DRILL STRING PRIOR TO AND WHILE BEING CLAMPED IN THE FOOTCLAMP.</p> <p>Craft Signature <u>Terry L. B.</u> Date <u>8-31-99</u></p> <p>QC Signature <u>(DYN 004)</u> Date <u>8-31-99</u></p>

STEP	WORK INSTRUCTIONS
CRAFT	
180	<p>FUNCTIONAL TESTING PER DWG. H-2-690138 GENERAL NOTE #8. TESTS 7 & 8. THESE TESTS ARE FOR UNIT #2.</p> <p>NOTIFY HENRY SHUMAKE 376-3404 AND ERIC WALDO 373-9207 FOR THEIR SPECIAL INSTRUCTIONS AND INPUT IN THE FOLLOWING TEST. THE DRILL STRING WILL BE SUPPLIED BY CUSTOMER.</p> <p>NOTE: TESTING TO BE PERFORMED WITH 100 PSIG SUPPLY PRESSURE.</p> <p>FUNCTIONAL TESTS:</p> <p>V 7. VERIFY THAT THE DISTANCE BETWEEN THE CLOSED JAWS IS LESS THAN 2 1/4".</p> <p>Craft Signature <u>Terry D. B...</u> Date <u>8-31-99</u></p> <p>QC Signature <u></u> Date <u>8-31-99</u></p> <p>V 8. VERIFY BY USING A STOPWATCH AND RECORDING THE TIME PASSED FOR THE CLOSING OF THE JAWS ON THE FOOTCLAMP. JAW CLOSURE RATE NOT TO EXCEED ONE FOOT PER SECOND.</p> <p>CLOSURE RATE IS <u>.81</u> SECOND(S) FOR <u>3 1/4"</u> INCHES.</p> <p>Craft Signature <u>Terry D. B...</u> Date <u>8-31-99</u></p> <p>QC Signature <u></u> Date <u>8-31-99</u></p>

STEP CRAFT	WORK INSTRUCTIONS
190	<p>FUNCTIONAL TESTING PER DWG. H-2-690138 GENERAL NOTE #8. TESTS 1 thru 3. THESE TESTS ARE FOR UNIT #3.</p> <p>NOTIFY HENRY SHUMAKE 376-3404 AND ERIC WALDO 373-9207 FOR THEIR SPECIAL INSTRUCTIONS AND INPUT IN THE FOLLOWING TEST. THE DRILL STRING WILL BE SUPPLIED BY CUSTOMER. "GO GAGE" IS LOCATED IN THE MACHINE SHOP TOOL CRIB.</p> <p>NOTE: FOR THE PURPOSE OF THIS DOCUMENT, SLIPPAGE IS DEFINED AS THE MOVEMENT OF THE DRILL STRING RELATIVE TO THE FOOTCLAMP JAWS >0.25 INCH.</p> <p>TESTING TO BE PERFORMED WITH 100 PSIG SUPPLY PRESSURE.</p> <p>FUNCTIONAL TESTS:</p> <p>V 1. VERIFY THAT SUPPORT OF A MINIMUM VERTICAL LOAD OF 1000 POUNDS FORCE APPLIED TO 2 1/4", NON-FLUTED DRILL STRING HELD BY FOOTCLAMP WITHOUT SLIPPAGE.</p> <p>Craft Signature <u>Terry J. Brown</u> Date <u>8-31-99</u></p> <p>QC Signature <u>[DYN 004]</u> Date <u>8-31-99</u></p> <p>V 2. VERIFY THAT FOOTCLAMP DOES NOT OPEN UPON LOSS OF SUPPLY AIR. AIR IS TO BE REMOVED FOR THIS TEST.</p> <p>Craft Signature <u>Terry J. Brown</u> Date <u>8-31-99</u></p> <p>X QC Signature <u>[DYN 004]</u> Date <u>8-31-99</u></p> <p>V 3. VERIFY THAT THE Ø1.895 x 12" "GO GAGE" PASSES THROUGH THE NON-FLUTED DRILL STRING PRIOR TO AND WHILE BEING CLAMPED IN THE FOOTCLAMP.</p> <p>Craft Signature <u>Terry J. Brown</u> Date <u>8-31-99</u></p> <p>QC Signature <u>[DYN 004]</u> Date <u>8-31-99</u></p>

STEP CRAFT	WORK INSTRUCTIONS
200	<p>FUNCTIONAL TESTING PER DWG. H-2-690138 GENERAL NOTE #8. TESTS 4 thru 6. THESE TESTS ARE FOR UNIT #3.</p> <p>NOTIFY HENRY SHUMAKE 376-3404 AND ERIC WALDO 373-9207 FOR THEIR SPECIAL INSTRUCTIONS AND INPUT IN THE FOLLOWING TEST. THE DRILL STRING WILL BE SUPPLIED BY CUSTOMER.</p> <p>NOTE: FOR THE PURPOSE OF THIS DOCUMENT, SLIPPAGE IS DEFINED AS THE MOVEMENT OF THE DRILL STRING RELATIVE TO THE FOOTCLAMP JAWS >0.25 INCH.</p> <p>TESTING TO BE PERFORMED WITH 100 PSIG SUPPLY PRESSURE.</p> <p>FUNCTIONAL TESTS:</p>
V	<p>4. VERIFY THAT SUPPORT OF A MINIMUM VERTICAL LOAD OF 1000 POUNDS FORCE APPLIED TO 2 1/2", FLUTED DRILL STRING HELD BY FOOTCLAMP WITHOUT SLIPPAGE.</p> <p>Craft Signature <u>Terry J. Brown</u> Date <u>8-31-99</u></p> <p>f QC Signature <u>[Signature]</u>  Date <u>8-31-99</u></p>
V	<p>5. VERIFY THAT FOOTCLAMP DOES NOT OPEN UPON LOSS OF SUPPLY AIR. AIR IS TO BE REMOVED FOR THIS TEST.</p> <p>Craft Signature <u>Terry J. Brown</u> Date <u>8-31-99</u></p> <p>f QC Signature <u>[Signature]</u>  Date <u>8-31-99</u></p>
V	<p>6. VERIFY THAT THE Ø1.895 x 12" "GO GAGE" PASSES THROUGH THE FLUTED DRILL STRING PRIOR TO AND WHILE BEING CLAMPED IN THE FOOTCLAMP.</p> <p>Craft Signature <u>Terry J. Brown</u> Date <u>8-31-99</u></p> <p>f QC Signature <u>[Signature]</u>  Date <u>8-31-99</u></p>

STEP CRAFT	WORK INSTRUCTIONS
210	<p>FUNCTIONAL TESTING PER DWG. H-2-690138 GENERAL NOTE #8. TESTS 7 & 8. THESE TESTS ARE FOR UNIT #3.</p> <p>NOTIFY HENRY SHUMAKE 376-3404 AND ERIC WALDO 373-9207 FOR THEIR SPECIAL INSTRUCTIONS AND INPUT IN THE FOLLOWING TEST. THE DRILL STRING WILL BE SUPPLIED BY CUSTOMER.</p> <p>NOTE: <i>TESTING TO BE PERFORMED WITH 100 PSIG SUPPLY PRESSURE.</i></p> <p>FUNCTIONAL TESTS:</p> <p>V 7. VERIFY THAT THE DISTANCE BETWEEN THE CLOSED JAWS IS LESS THAN 2 1/4".</p> <p>Craft Signature <u><i>Temp B</i></u> Date <u>8-31-99</u></p> <p>QC Signature <u></u> Date <u>8-31-99</u></p> <p>V 8. VERIFY BY USING A STOPWATCH AND RECORDING THE TIME PASSED FOR THE CLOSING OF THE JAWS ON THE FOOTCLAMP. JAW CLOSURE RATE NOT TO EXCEED ONE FOOT PER SECOND.</p> <p>CLOSURE RATE IS <u>1.06</u> SECOND(S) FOR <u>3 1/4"</u> INCHES.</p> <p>Craft Signature <u><i>Temp B</i></u> Date <u>8-31-99</u></p> <p>QC Signature <u></u> Date <u>8-31-99</u></p>

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