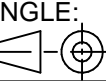
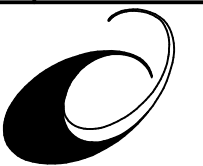
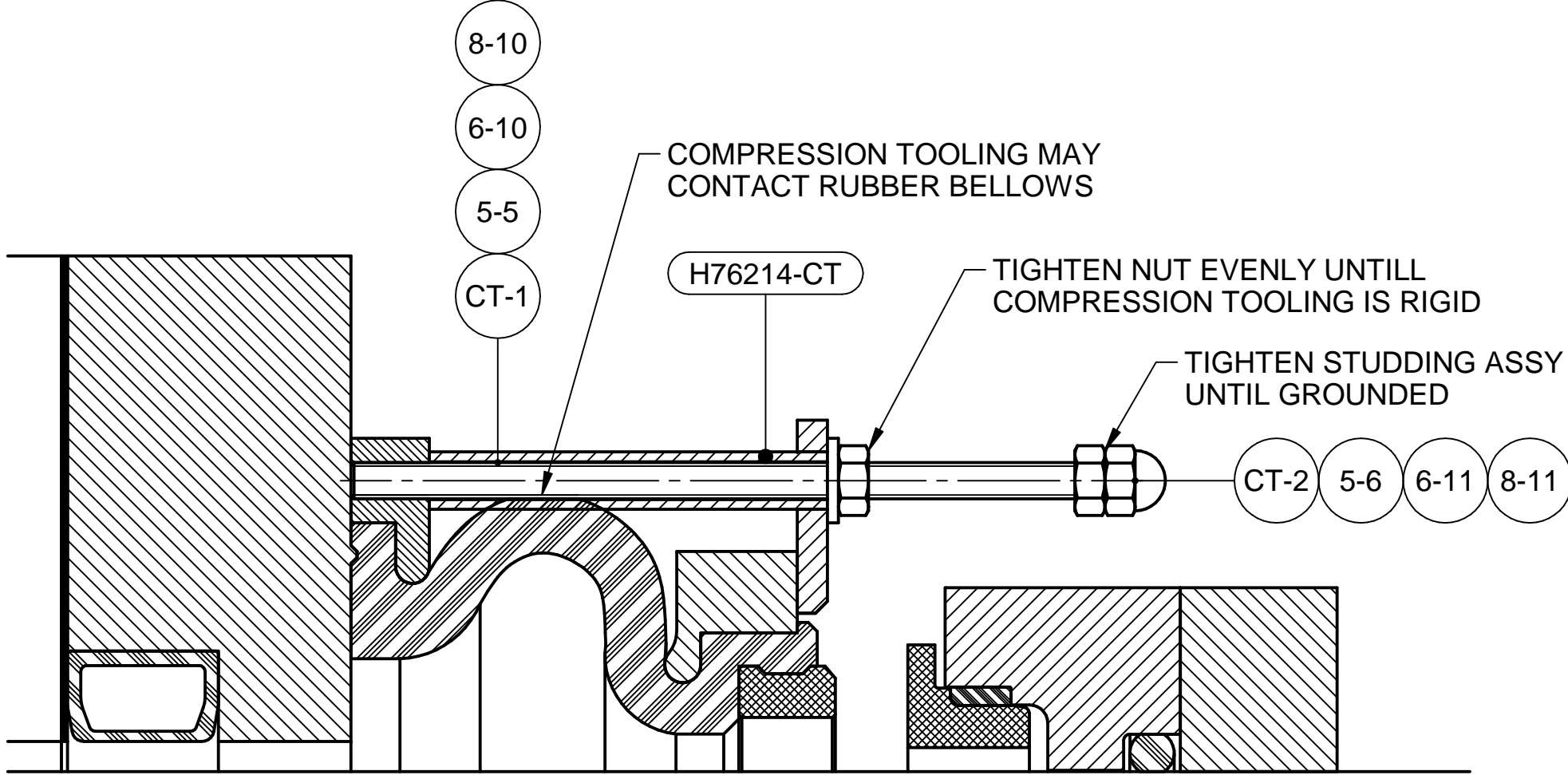
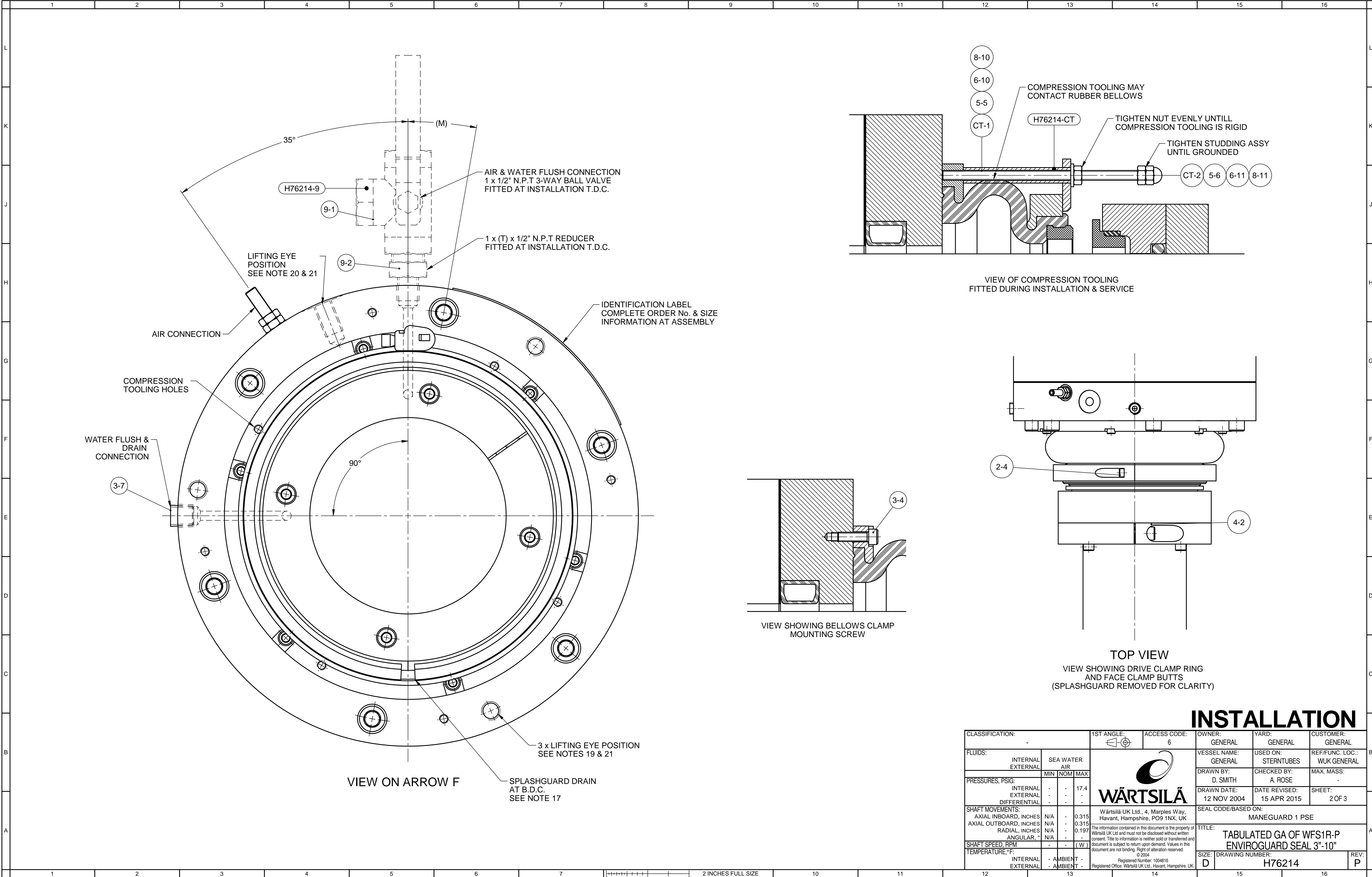


13		14		15		16	
DRAWING POSn		DESCRIPTION		MATERIAL		QTY	
H76214 -1		SEAT HOUSING ASSY				1	
-1-1		SEAT (NON-SPLIT)		SILICON CARBIDE		1	
-1-2		SEAT HOUSING		PHOSPHOR BRONZE		1	
-1-3		SEALING STRIP		CHLOROPRENE (NEOPRENE)		1	
-1-4		"O" CORD		CHLOROPRENE (NEOPRENE)		1	
-1-5		SCREW		STAINLESS STEEL		4	
H76214 -2		BELLOWS ASSY				1	
-2-1		BELLOWS (NON SPLIT) (SEE NOTES 13 & 14)		CHLOROPRENE (NEOPRENE)		1	
-2-2		FACE (NON SPLIT)		SILICON CARBIDE		1	
-2-3		FACE CLAMP (SPLIT)		PHOSPHOR BRONZE		1	
-2-4		SCREW		STAINLESS STEEL		(P)	
-2-5		SPLASHGUARD		CHLOROPRENE (NEOPRENE)		1	
-2-6		SPLASHGUARD CLAMP		STAINLESS STEEL		1	
H76214 -3		MOUNTING RING ASSY				1	
-3-1		MOUNTING RING (NON-SPLIT)		PHOSPHOR BRONZE		1	
-3-2		BELLOWS CLAMP (NON-SPLIT)		PHOSPHOR BRONZE		1	
-3-3		SCREW		STAINLESS STEEL		(E)	
-3-4		SCREW		STAINLESS STEEL		(R)	
-3-5		INFLATABLE SEAL (SEE NOTES 13 & 14)		ELASTOMER		1	
-3-6		GASKET (NON-SPLIT)		COMPOSITE		1	
-3-7		PLUG		NICKEL ALUMINIUM BRONZE		1	
-3-8		BULKHEAD LABEL		ALUMINIUM		1	
-3-9		IDENTIFICATION LABEL		STAINLESS STEEL		1	
-3-10		SCREW		STAINLESS STEEL		2	
H76214 -4		DRIVE CLAMP RING ASSY				1	
-4-1		DRIVE CLAMP RING (NON-SPLIT)		PHOSPHOR BRONZE		1	
-4-2		SCREW		STAINLESS STEEL		1	
H76214 -7		REFERENCE MANUALS				1	
-7-1		INSTALLATION MANUAL		TM-PSE-04-PHASE I (I) INST		1	
H76214 -9		3 WAY BALL VALVE ASSY				1	
-9-1		3 WAY BALL VALVE		STAINLESS STEEL		1	
-9-2		REDUCER		STAINLESS STEEL		1	
H76214 -CT		COMPRESSION TOOL ASSY				1	
-CT-1		COMPRESSION TOOL		STAINLESS STEEL		4	
-CT-2		STUDDING ASSY		ALLOY STEEL		4	

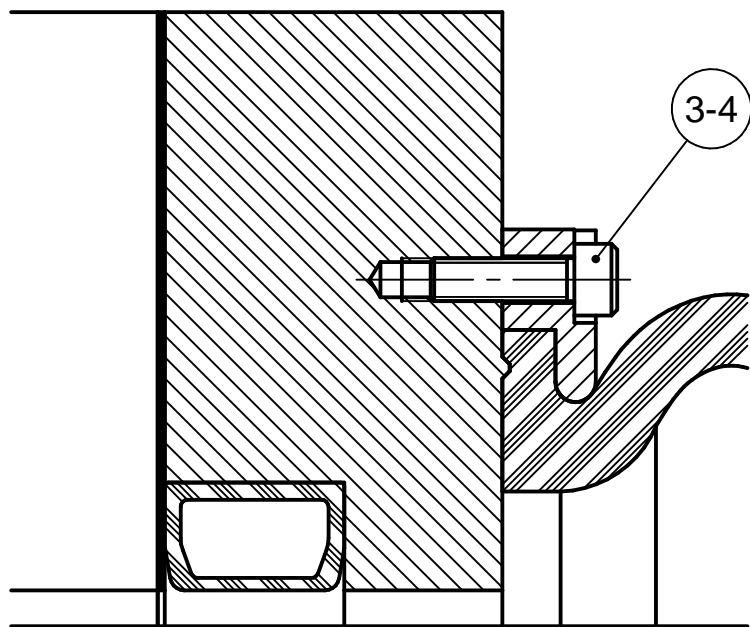
OPTIONAL ASSEMBLIES TABLE			
H76214 -5	SERVICE KIT A (SEE NOTE 22)	OPTIONAL	
-5-1	FACE (SPLIT)	SILICON CARBIDE	1
-5-2	SEAT (SPLIT)	SILICON CARBIDE	1
-5-3	SEALING STRIP	CHLOROPRENE (NEOPRENE)	1
-5-4	O CORD	CHLOROPRENE (NEOPRENE)	1
-5-5	COMPRESSION TOOL	MILD STEEL	4
-5-6	SCREW	ALLOY STEEL	4
H76214 -6	SERVICE KIT B (SEE NOTE 23)	OPTIONAL	
-6-1	FACE (NON-SPLIT)	SILICON CARBIDE	1
-6-2	SEAT (NON-SPLIT)	SILICON CARBIDE	1
-6-3	SEALING STRIP	CHLOROPRENE (NEOPRENE)	1
-6-4	O CORD	CHLOROPRENE (NEOPRENE)	1
-6-5	BELLOWS (NON SPLIT)	CHLOROPRENE (NEOPRENE)	1
-6-6	INFLATABLE SEAL	ELASTOMER	1
-6-7	GASKET (NON-SPLIT)	COMPOSITE	1
-6-8	SPLASHGUARD	CHLOROPRENE (NEOPRENE)	1
-6-9	SPLASHGUARD CLAMP	STAINLESS STEEL	1
-6-10	COMPRESSION TOOL	STAINLESS STEEL	4
-6-11	STUDDING ASSY	ALLOY STEEL	4
H76214 -8	SERVICE KIT C (SEE NOTES 12,13,14, & 24)	OPTIONAL	
-8-1	FACE (SPLIT)	SILICON CARBIDE	1
-8-2	SEAT (SPLIT)	SILICON CARBIDE	1
-8-3	SEALING STRIP	CHLOROPRENE (NEOPRENE)	1
-8-4	O CORD	CHLOROPRENE (NEOPRENE)	1
-8-5	BELLOWS (SPLIT)	CHLOROPRENE (NEOPRENE)	1
-8-6	INFLATABLE SEAL (SPLIT)	ELASTOMER	1
-8-7	GASKET (SPLIT)	COMPOSITE	1
-8-8	SPLASHGUARD	CHLOROPRENE (NEOPRENE)	1
-8-9	SPLASHGUARD CLAMP	STAINLESS STEEL	1
-8-10	COMPRESSION TOOL	STAINLESS STEEL	4
-8-11	STUDDING ASSY	ALLOY STEEL	4

INSTALLATION							
		1ST ANGLE: 	ACCESS CODE: 6	OWNER: GENERAL	YARD: GENERAL	CUSTOMER: GENERAL	
 WÄRTSILÄ Wärtsilä UK Ltd., 4, Marples Way, Havant, Hampshire, PO9 1NX, UK The information contained in this document is the property of Wärtsilä UK Ltd and must not be disclosed without written consent. Title to information is neither sold or transferred and document is subject to return upon demand. Values in this document are not binding. Right of alteration reserved. © 2004 Registered Number: 1004816 Registered Office: Wärtsilä UK Ltd, Havant, Hampshire, UK		VESSEL NAME: GENERAL		USED ON: STERNTUBES	REF/FUNC. LOC.: WUK GENERAL		
		DRAWN BY: D. SMITH		CHECKED BY: A. ROSE	MAX. MASS: -		
		DRAWN DATE: 12 NOV 2004		DATE REVISED: 15 APR 2015		SHEET: 1 OF 3	
		SEAL CODE/BASED ON: MANEGUARD 1 PSE		TITLE: TABULATED GA OF WFS1R-P ENVIROGUARD SEAL 3"-10"			
SIZE: D		DRAWING NUMBER: H76214				REV: P	

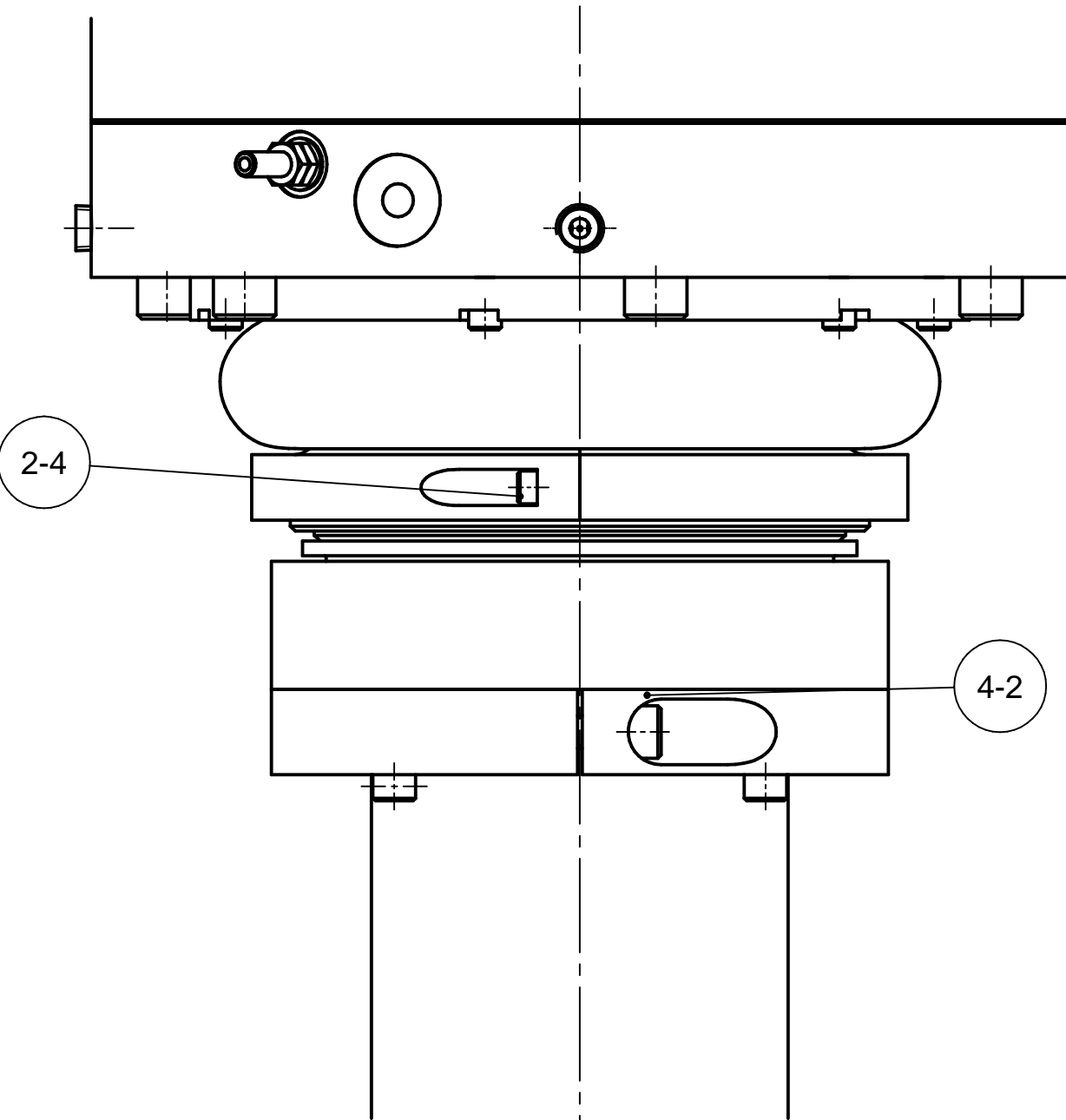
13	14	15	16
----	----	----	----



VIEW OF COMPRESSION TOOLING
FITTED DURING INSTALLATION & SERVICE

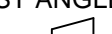
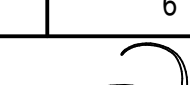


VIEW SHOWING BELLOWS CLAMP
MOUNTING SCREW



TOP VIEW
VIEW SHOWING DRIVE CLAMP RING
AND FACE CLAMP BUTTS
(SPASHGUARD REMOVED FOR CLARITY)

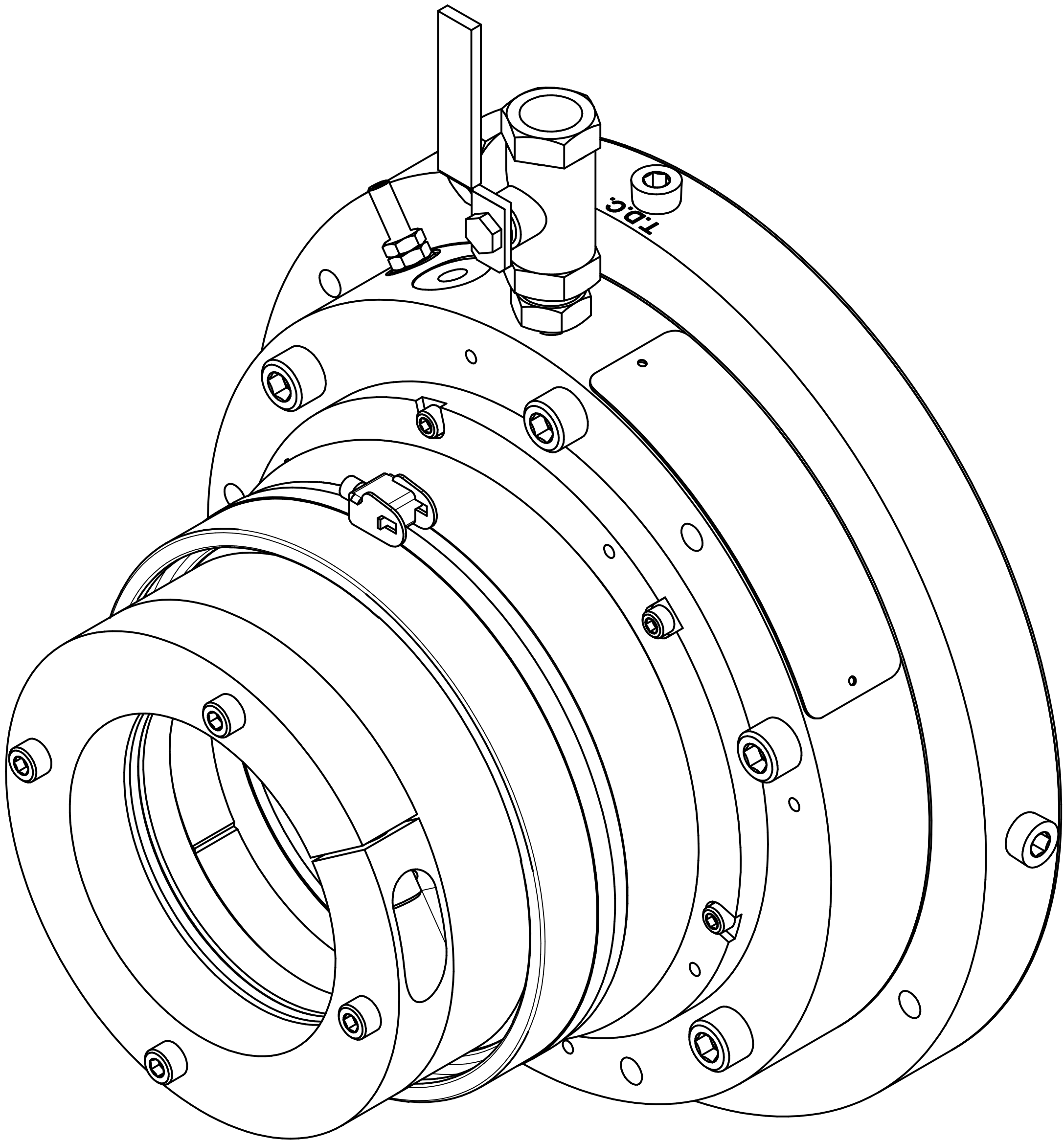
INSTALLATION

CLASSIFICATION: -				1ST ANGLE: 		ACCESS CODE: 6		OWNER: GENERAL		YARD: GENERAL		CUSTOMER: GENERAL					
FLUIDS:		INTERNAL EXTERNAL		SEA WATER AIR				VESSEL NAME: GENERAL		USED ON: STERN TUBES		REF/FUNC. LOC.: WUK GENERAL					
		MIN		NOM				DRAWN BY: D. SMITH		CHECKED BY: A. ROSE		MAX. MASS: -					
PRESSURES, PSIG:		INTERNAL EXTERNAL DIFFERENTIAL		- - -				17.4 - -		DRAWN DATE: 12 NOV 2004		DATE REVISED: 15 APR 2015		SHEET: 2 OF 3			
		INTERNAL EXTERNAL DIFFERENTIAL		- - -				17.4 - -									
SHAFT MOVEMENTS:				Wärtsilä UK Ltd., 4, Marples Way, Havant, Hampshire, PO9 1NX, UK				SEAL CODE/BASED ON: MANEGUARD 1 PSE									
AXIAL INBOARD, INCHES				N/A				The information contained in this document is the property of Wärtsilä UK Ltd and must not be disclosed without written consent. Title to information is neither sold or transferred and document is subject to return upon demand. Values in this document are not binding. Right of alteration reserved. © 2014 Registered Number: 1004816 Registered Office: Wärtsilä UK Ltd., Havant, Hampshire, UK									
AXIAL OUTBOARD, INCHES				N/A													
RADIAL, INCHES ANGULAR, °				N/A													
SHAFT SPEED, RPM				- (W)				TITLE: TABULATED GA OF WFS1R-P ENVIROGUARD SEAL 3"-10"									
TEMPERATURE, °F:				INTERNAL EXTERNAL				SIZE: D				DRAWING NUMBER: H76214				REV: P	

1		2		3		4		5		6		7		8		9		10	
L	SHAFT Ø	OVERALL LENGTH	MOUNTING RING			G	H	K	L	M	P	R	NPT	MAX RPM	COOLING FLOW	SEAL MASS			
	O/D	P.C.D.	BOLTS																
	A	B	C	D	E x F														
K	3	8.17	9.764	8.5	6 - 1/2" x 13 UNC	0.532	1.3	0.875	5.125	10°	2	6	1/4"	1872	20	55			
	3.25	8.17	10.236	9	6 -1/2" x 13 UNC	0.532	1.3	0.875	5.125	10°	2	6	1/4"	1705	22	60			
	3.5	8.17	10.236	9	6 -1/2" x 13 UNC	0.532	1.3	0.875	5.125	10°	2	6	1/4"	1705	23.5	58			
	3.75	8.17	10.630	9.375	6 -1/2" x 13 UNC	0.532	1.3	0.875	5.125	10°	2	6	1/4"	1565	25	63			
	4	8.17	11.024	9.75	6 -1/2" x 13 UNC	0.532	1.3	0.875	5.125	10°	2	6	1/4"	1447	26.8	64			
J	4.25	8.17	11.024	9.75	6 -1/2" x 13 UNC	0.532	1.3	0.875	5.125	10°	2	6	1/4"	1447	28.5	63			
	4.5	8.17	11.378	10.125	6 -1/2" x 13 UNC	0.532	1.3	0.875	5.125	10°	2	6	1/4"	1345	30.2	70			
	4.75	8.17	11.732	10.5	6 -1/2" x 13 UNC	0.532	1.3	0.875	5.125	10°	2	6	1/4"	1256	32	72			
	5	8.17	11.732	10.5	6 -1/2" x 13 UNC	0.532	1.3	0.875	5.125	10°	2	6	1/4"	1256	33.5	70			
	5.25	8.84	12.441	11	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	1173	35.5	94			
H	5.5	8.84	12.441	11	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	1173	37	91			
	5.75	8.84	12.913	11.5	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	1105	39	98			
	6	8.84	13.425	12	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	1045	40.5	106			
	6.25	8.84	13.425	12	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	1045	42	103			
	6.5	8.84	13.661	12.25	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	991	44	107			
G	6.75	8.84	14.173	12.75	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	942	45.5	105			
	7	8.84	14.173	12.75	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	942	47	112			
	7.25	8.84	14.41	13	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	898	48.7	116			
	7.5	8.84	14.921	13.5	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	857	50.5	124			
	7.75	8.84	14.921	13.5	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	857	52	120			
F	8	8.84	15.197	13.75	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	820	54	125			
	8.25	8.84	15.197	13.75	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	820	55.4	121			
	8.5	8.84	15.669	14.25	6 -5/8" x 11 UNC	0.532	1.44	1.125	6	10°	4	9	3/8"	787	57	128			
	8.75	9.15	16.063	14.625	8 -5/8" x 11 UNC	0.532	1.44	1.125	6.3	17°	4	12	3/8"	753	58.7	137			
	9	9.15	16.063	14.625	8 -5/8" x 11 UNC	0.532	1.44	1.125	6.3	17°	4	12	3/8"	753	60.5	131			
F	9.25	9.15	16.378	14.96	8 -5/8" x 11 UNC	0.532	1.44	1.125	6.3	17°	4	12	3/8"	725	62.1	138			
	9.5	9.15	16.772	15.354	8 -5/8" x 11 UNC	0.532	1.44	1.125	6.3	17°	4	12	3/8"	698	63.7	144			
	9.75	9.15	16.772	15.354	8 -5/8" x 11 UNC	0.532	1.44	1.125	6.3	17°	4	12	3/8"	698	65.4	138			
	10	9.15	17.17	15.75	8 -5/8" x 11 UNC	0.532	1.44	1.125	6.3	17°	4	12	3/8"	674	67.1	146			



NOTES

1. ALL DIMENSIONS IN INCHES.
2. ALL FASTENERS TO BE FITTED USING A SUITABLE THREADLOCK. (SUPPLIED)
3. VENT CONNECTION TO BE PLUGGED USING PLUG & VENTED ACCORDING TO TECHNICAL MANUAL.
4. ANY SHAFT DIAMETER BETWEEN 3" AND 10" CAN BE CATERED FOR.
5. MAXIMUM INFLATABLE SEAL AIR SUPPLY PRESSURE: 87PSIG
6. VENT INFLATABLE SEAL TO ATMOSPHERE WHEN NOT IN USE.
7. INFLATABLE SEAL TO BE USED FOR EMERGENCY/MAINTENANCE PURPOSES ONLY. SHAFT MUST NOT BE ROTATED WHEN INFLATABLE SEAL IS ACTIVATED.
8. SEAL COMPRESSION TO BE SET USING COMPRESSION TOOLING ITEM CT-1. COMPRESSION TOOLING MUST BE REMOVED AFTER INSTALLATION & BEFORE THE SHAFT IS ROTATED.
9. MIN COOLING FLOW REQUIRED BY SEAL:.....Y..... GAL/HR.
10. REFER TO T.D.S. 1/039 FOR MAXIMUM COOLING FLOW PERMISSIBLE
11. ON INITIAL SUPPLY BELLOWS AND INFLATABLE SEAL (ITEMS 2-1 & 3-5) ARE SUPPLIED NON-SPLIT
12. ON ORDERING `SERVICE KIT C BELLOWS AND INFLATABLE SEAL (ITEMS 8-5 AND 8-6) ARE SUPPLIED SPLIT.
13. FOR FULLY SPLIT INSTALLATIONS HOT BONDING EQUIPMENT & SUFFICIENT ACCESS/WORKING SPACE AROUND/ABOVE THE SHAFT IS REQUIRED. CONTACT WARTSILA UK LTD FOR DETAILS.
14. REFER TO T.D.S.19/002 FOR BELLOWS & INFLATABLE SEAL BONDING TOOL.
15. WATER FLUSH FILTRATION REQUIREMENTS : SEE T.D.S. 4/006
16. LOWER INFLATABLE SEAL NUT TORQUE MUST NOT EXCEED 0.74 FTLBS TO ENSURE CORRECT OPERATION. THE UPPER INFLATABLE SEAL NUT TO LOCK AGAINST FIRST.
17. SPLASH GUARD (ITEM 2-5) SHALL BE INSTALLED SO THAT THE WATER DRAIN POINT IS POSITIONED AT B.D.C. PROVISION FOR REMOVAL OF WATER IS CUSTOMER RESPONSIBILITY.
18. WEIGHTS SHOWN ARE NOT CONTRACTUALLY BINDING.
19. 3 X LIFTING EYE POSITIONS ARE LOCATED IN THE FRONT FACE OF THE MOUNTING RING TO ASSIST IN THE MOVEMENT OF THE SUPPLIED SEAL ASSEMBLY COMPRISING OF ASSEMBLIES 2 & 3. WARNING, UNDER NO CIRCUMSTANCES MUST LIFTING BE ATTEMPTED VIA THE SUPPLIED COMPRESSION TOOLING DUE TO RISK OF SERIOUS INJURY. EYEBOLTS SAFE WORKING LOAD MAY NEED TO BE DOWN RATED WHEN SIDE LOADING OCCURS.
20. 1 X LIFTING EYE POSITION IS LOCATED OFF T.D.C. IN THE O/D OF THE MOUNTING RING TO ASSIST IN THE INSTALLATION AND MOUNTING OF THE SEAL.
21. ALL LIFTING EYE TAPPINGS ARE M12 X 1.75 6H, WHICH ARE PROVIDED STRICTLY FOR THE USE OF M12 COLLAR EYEBOLTS THAT MUST COMPLY WITH BS4278:1984 OR ISO3266:1984 STANDARDS. (SUPPLIED IN TOOLKIT).
22. ORDER `SERVICE KIT A' FOR THE SUPPLY OF SPLIT WEARING COMPONENTS FOR IN-SITU REPLACEMENT.
23. ORDER `SERVICE KIT B' FOR THE SUPPLY OF NON-SPLIT WEARING AND WORKING COMPONENTS FOR REPLACEMENT WITH THE REMOVAL OR DE-COUPLING OF THE PROPELLER SHAFT.
24. ORDER `SERVICE KIT C' FOR THE SUPPLY OF SPLIT WEARING AND WORKING COMPONENTS FOR IN-SITU REPLACEMENT.
25. AN ADAPTOR PLATE IS REQUIRED FOR BEARING FLUSH CONNECTIONS & WHERE THE BORE OF THE STERNTUBE IS GREATER THAN THE MOUNTING RING BORE.



ISOMETRIC VIEW

INSTALLATION

CLASSIFICATION: -			1ST ANGLE: 		ACCESS CODE: 6		OWNER: GENERAL		YARD: GENERAL		CUSTOMER: GENERAL						
FLUIDS: INTERNAL EXTERNAL		SEA WATER AIR				VESSEL NAME: GENERAL		USED ON: STERNTUBES		REF/FUNC. LOC.: WUK GENERAL							
						DRAWN BY: D. SMITH		CHECKED BY: A. ROSE		MAX. MASS: -							
PRESSURES, PSIG: INTERNAL EXTERNAL DIFFERENTIAL		-				-		17.4		DRAWN DATE: 12 NOV 2004		DATE REVISED: 15 APR 2015		SHEET: 3 OF 3			
SHAFT MOVEMENTS: AXIAL INBOARD, INCHES AXIAL OUTBOARD, INCHES RADIAL, INCHES ANGULAR, °		N/A N/A N/A N/A				- - - -		0.315 0.315 0.197 -		<div>Wärtsilä UK Ltd., 4, Marples Way, Havant, Hampshire, PO9 1NX, UK</div> <div>The information contained in this document is the property of Wärtsilä UK Ltd and must not be disclosed without written consent. Title to information is neither sold or transferred and document is subject to return upon demand. Values in this document are not binding. Right of alteration reserved. © 2014 Registered Number: 1004816 Registered Office: Wärtsilä UK Ltd., Havant, Hampshire, UK</div>							
SHAFT SPEED, RPM TEMPERATURE, °F:		-				-		(W)									
INTERNAL EXTERNAL		- AMBIENT - AMBIENT		-		-		SEAL CODE/BASED ON: MANEGUARD 1 PSE									
TITLE: TABULATED GA OF WFS1R-P ENVIROGUARD SEAL 3"-10"												SIZE: D		DRAWING NUMBER: H76214		REV: P	