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CVA
Cryogenic Vessel Alternatives
281-385-1204
www.cvatanks.com



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1645
 CRYOGENIC VESSEL ALTERNATIVES
 SERIAL NO. (NUMERO DE SERIE)
 YEAR (ANNEE) 20349
 2009
 310 (KPa) @ 100°F (37.8 °C)
 4.5 PSI
 MAX ALLOWABLE WORKING PRESSURE
 (PRESSION DE SERVICE MAXIMALE AUTORISEE)
 MINIMUM DESIGN TEMPERATURE
 (TEMPERATURE MINIMALE DE CALCUL)
 310 (KPa)

Cryogenic Vessel Alternatives
 2K-45-IM-4PT
 A6000 REV.1
 20349
 02 / 2009
 07 / 2009
 135/343
 135/343
 17865 / 8104
 19405 / 8802
 8820-12-012-001-001

LIQUID LEVEL CONVERSION CHART
(Imperial & Metric Units)

ENGLISH UNITS			METRIC UNITS		
IN. H ₂ O	GALLONS	POUNDS	IN. H ₂ O	LITERS	KG
2.0	16	111	2.0	62	60
4.0	46	322	4.0	151	146
6.0	89	602	6.0	227	223
8.0	138	902	8.0	305	298
10.0	195	1,214	10.0	384	376
12.0	257	1,514	12.0	463	454
14.0	325	1,734	14.0	542	532
16.0	393	2,102	16.0	621	610
18.0	461	2,469	18.0	700	688
20.0	529	2,837	20.0	779	767
22.0	597	3,205	22.0	858	846
24.0	665	3,573	24.0	937	925
26.0	733	3,941	26.0	1,016	1,004
28.0	801	4,309	28.0	1,095	1,083
30.0	869	4,677	30.0	1,174	1,162
32.0	937	5,045	32.0	1,253	1,241
34.0	1,005	5,413	34.0	1,332	1,320
36.0	1,073	5,781	36.0	1,411	1,399
38.0	1,141	6,149	38.0	1,490	1,478
40.0	1,209	6,517	40.0	1,569	1,557
42.0	1,277	6,885	42.0	1,648	1,636
44.0	1,345	7,253	44.0	1,727	1,715
46.0	1,413	7,621	46.0	1,806	1,794
48.0	1,481	7,989	48.0	1,885	1,873
50.0	1,549	8,357	50.0	1,964	1,952
52.0	1,617	8,725	52.0	2,043	2,031
54.0	1,685	9,093	54.0	2,122	2,110
56.0	1,753	9,461	56.0	2,201	2,189
58.0	1,821	9,829	58.0	2,280	2,268
60.0	1,889	10,197	60.0	2,359	2,347
62.0	1,957	10,565	62.0	2,438	2,426
64.0	2,025	10,933	64.0	2,517	2,505
66.0	2,093	11,301	66.0	2,596	2,584
68.0	2,161	11,669	68.0	2,675	2,663
70.0	2,229	12,037	70.0	2,754	2,742
72.0	2,297	12,405	72.0	2,833	2,821
74.0	2,365	12,773	74.0	2,912	2,900
76.0	2,433	13,141	76.0	3,000	2,989
78.0	2,501	13,509	78.0	3,079	3,068
80.0	2,569	13,877	80.0	3,158	3,147
82.0	2,637	14,245	82.0	3,237	3,226
84.0	2,705	14,613	84.0	3,316	3,305
86.0	2,773	14,981	86.0	3,395	3,384
88.0	2,841	15,349	88.0	3,474	3,463
90.0	2,909	15,717	90.0	3,553	3,542
92.0	2,977	16,085	92.0	3,632	3,621
94.0	3,045	16,453	94.0	3,711	3,700
96.0	3,113	16,821	96.0	3,790	3,779
98.0	3,181	17,189	98.0	3,869	3,858
100.0	3,249	17,557	100.0	3,948	3,937

MAXIMUM LADING: 13,731 LB / 6,228 KG

W
RT-2

45

MAX ALLOWABLE WORKING PRESSURE
(PRESSION DE SERVICE MAXIMALE)

-320°F
(-196°C)

MINIMUM DESIGN METAL TEMPERATURE
(TEMPERATURE MINIMALE DE CALCUL)

CERTIFIED BY (CERTIFIÉ PAR)
CRYOGENIC VESSEL ALTERNATIVES
SERIAL NO. (NUMÉRO DE SÉRIE)

1645

YEAR (ANNÉE)

2009

(37.8 °C)

PSI

310

(kPa)

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**CAUTION
HOT**

CVT
Cryogenic Vessel Alternatives
281-385-1204
www.cvatanks.com

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HYDRAULIC FLUID ONLY

ISUZU
DIESEL

CAUTION



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A close-up photograph of industrial machinery, likely part of an oil or gas rig. The image shows a complex arrangement of metal pipes, valves, and hoses. A large, thick, grey flexible hose with green text is prominent in the foreground. The text on the hose includes "MADE IN", "H", and "19". A red metal component is visible on the left, and a silver metal component is on the right. The background shows more of the rig structure under a clear blue sky.

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This image shows the interior of a Petro Rig truck cab. The view is from the driver's perspective, looking out through the windshield. The steering wheel is black with a silver center and a red Petro logo. The dashboard is black with various gauges and controls. The seats are black with a textured pattern. The floor is black. The windshield shows a parking lot filled with many other Petro Rig trucks. The sky is blue and clear. The text "www.PetroRigs.com" is overlaid in the center of the image.

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NOTES

- ① ALL HIGH PRESSURE COMPONENTS TESTED @ 22,500 PSI (1.5 X MAWP)
- ② RUPTURE DISK MUST BE ORIENTATED VERTICALLY
- ③ INSTALL ANTI VIBRATION ASSEMBLIES AT ALL AUTOCLAVE TUBING CONNECTIONS
- ④ ITEMS CONTROLLED IN PANEL EITHER ELECTRIC OR PNEUMATIC
- ⑤ ITEMS TO BE INSTALLED WITH EXTENDED STEN IN CASEN

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ZONE REV

DESCRIPTION

DATE APPROVED

37	-	1	TRIPLEX CRYOGENIC PUMP 180K		
36	-	1	STRAINER, 1/2" NPT, C/V 60/100 SCREEN		
35	-	1	STRAINER, 3", CONE, 40 MESH		
34	-	1	GASKET, HB PRESSURE, 0-15,000 PSI, 61" DIA. FACE, 6.375"		
33	-	1	VALVE, BALL, 1/2", MANUALLY OPERATED		
32	-	3	CLAMP, CGA 1-1/2"		
31	-	3	CONNECTOR, FIXED END, CGA 1-1/2" X 1-1/2" FNPT		
30	-	3	GASKET, CGA, 1-1/2"		
29	-	3	CAP, BUST ALUM, CGA 1-1/2"		
28	-	4	VALVE, GLOBE 2"		
27	-	1	PUMP, CENT. 2 X 3 X 6, HB BOOST		
26	-	1	VALVE, CHECK, 2"		
25	-	2	VALVE, RELIEF, 1/2" NPT, 200 PSI		
24	-	1	PRESSURE RILD COIL		
23	-	1	VALVE, 2 X 1 PLUG V/ HB ACTUATOR, 2" FN END 15,000 PSI		
22	-	1	DEBOOSTER, 40 15,000 PSI OPERATING PRESSURE		
21	-	3	VALVE, CHECK, 2"		
20	-	1			
19	-	1			
18	-	2			
17	-	1			
16	-	3			
15	-	1			
14	-	1			
13	-	1			
12	-	1			
11	-	1			
10	-	3			
9	-	1			
8	-	3			
7	-	3			
6	-	1			
5	-	1			
4	-	1			
3	-	1			
2	-	4			
1	-	1			

53	-	2	VALVE, BALL, 1-1/2" BRASS ELECTRIC ACTUATED V/V/RETRACTED
52	-	6	TUBE, U AUTOCLAVE, 1" DISCHARGE
51	-	1	TANK, N2, 2000 GAL, 45 PSI MAWP
50	-	6	HOSE, SS, FLEX, 1-1/4", JIC X FJIC SWIVEL
49	-	1	HOSE, SS, FLEX, 3", (JIC X RF 1500 FLG)
48	-	1	HOSE, SS, FLEX, 2", (JIC X FF 1500 FLG)
47	-	1	HOSE, SS, FLEX, 2", (RF 1500 FLG)
46	-	1	HOSE, SS, FLEX, 1-1/2", (FJIC X JIC)
45	-	1	SCREEN, 2" SS
44	-	1	SCREEN, 3" SS
43	-	1	ADAPTER, 1/4" HP MALE X 1/4" HP FEMALE
42	-	1	TRANSDUCER, 0-15,000 PSI, CYLINDRICAL, WELDED DIAPHRAM
41	-	3	HOSE, SS, FLEX, 1", (FJIC X JIC)
40	-	1	RING, SNAP 2" 1502
39	-	1	SEGMENT, 2" 1502 RETAINER
38	-	1	NUT, 2" 1502 UNION

UNLESS OTHERWISE SPECIFIED
INTERPRET DIMENSIONS AND
TOLERANCE PER ANSI Y14.5 - 1987
DIMENSIONS ARE IN INCHES
(UNLESS OTHERWISE SPECIFIED)

DIMENSIONAL TOLERANCES

1 PLACE ± .1
2 PLACE ± .06
3 PLACE ± .010
HOLE ± .015

REMOVE BURRS
FILLETED AND RADIUS R1-R2
REF. DIM. LINES, JIC, JIC

AIR FIRST USED

ISSUED NAS 7/13/09
CHECK JIG 8/5/09

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ANYTHING WITHOUT THE
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ORIGINATED FROM: -

2

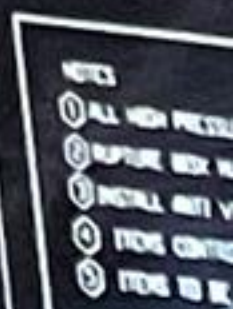


The image shows the interior of a control room on an offshore oil rig. A large window in the center provides a view of the rig's deck, featuring a yellow storage container and various industrial structures under a clear blue sky. To the left, a control panel is mounted on the wall with several small monitors and gauges. In the foreground, a control console with numerous buttons and knobs is visible, with a black office chair positioned in front of it. The room is dimly lit, with light coming from the window and a small overhead light fixture.

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53	-	
52	-	
51	-	
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40	-	
39	-	

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K-45-IM-4PT
A 6000 REVL
20349

02 / 2009

45 / 310
65 / 448

02 / 2009

45 / 310

65 / 448

45 / 310

65 / 448

45 / 310

65 / 448

45 / 310

65 / 448

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Design Service Temperature

Design Pressure

Design Weight of Loading

Design Capacity

Design Weight of Loading

Insulation for Oxygen Service
B820-08 Code Data File

IN. H2O
2.0
4.0
6.0
8.0
10
12
14
16
18
20

LIQUID LEVEL CONVERSION CHART

CVA-3X-45-TM w/0.0% Slope

Normal @ 60 psig

ENGLISH UNITS

IN. H2O	GALLONS	POUNDS	MSCF
2.0	16	111	1.5
4.0	48	322	4.5
6.0	89	602	8.3
8.0	139	935	12.9
10.0	195	1,314	18.1
12.0	257	1,734	23.9
14.0	325	2,188	30.2
16.0	397	2,673	36.9
18.0	473	3,184	43.9
20.0	552	3,718	51.3
22.0	634	4,272	59.0
24.0	719	4,842	66.8
26.0	805	5,425	74.9
28.0	893	6,015	83.0
30.0	984	6,615	91.5
32.0	1,071	7,217	99.6
34.0	1,161	7,819	107.9
36.0	1,249	8,418	116.2
38.0	1,337	9,011	124.4
40.0	1,424	9,565	132.4
42.0	1,509	10,166	140.3
44.0	1,591	10,721	148.0
46.0	1,671	11,257	155.4
48.0	1,747	11,770	162.5
50.0	1,819	12,257	169.2
52.0	1,887	12,714	175.5
54.0	1,950	13,136	181.3
56.0 *	2,006	13,519	186.6
58.0	2,057	13,856	191.3
60.0	2,099	14,140	195.2
62.0	2,131	14,358	198.2

METRIC UNITS

IN. H2O	LITERS	KGS	SCM
2.0	62	50	43
4.0	181	146	126
6.0	338	273	235
8.0	525	424	365
10.0	738	596	514
12.0	974	786	678
14.0	1,229	992	855
16.0	1,501	1,212	1,045
18.0	1,789	1,444	1,244
20.0	2,089	1,686	1,453
22.0	2,400	1,937	1,670
24.0	2,720	2,196	1,892
26.0	3,047	2,460	2,120
28.0	3,380	2,729	2,352
30.0	3,719	2,999	2,586
32.0	4,055	3,273	2,821
34.0	4,393	3,546	3,056
36.0	4,729	3,818	3,290
38.0	5,062	4,087	3,522
40.0	5,390	4,351	3,750
42.0	5,711	4,610	3,973
44.0	6,023	4,862	4,190
46.0	6,324	5,105	4,400
48.0	6,612	5,338	4,600
50.0	6,886	5,559	4,790
52.0	7,142	5,766	4,969
54.0	7,380	5,957	5,134
56.0 *	7,595	6,131	5,284
58.0	7,784	6,284	5,415
60.0	7,944	6,413	5,526
62.0	8,066	6,512	5,612

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MAXIMUM LADING: 13,731 LB / 6,228 KG



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1645
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 310 (KPa)

Cryogenic Vessel Alternatives
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 8820-12-012-001-110

LIQUID LEVEL CONVERSION CHART
(Imperial & Metric Units)

ENGLISH UNITS			METRIC UNITS		
IN. H ₂ O	GALLONS	POUNDS	IN. H ₂ O	LITERS	KG
2.0	16	111	2.0	62	60
4.0	46	322	4.0	159	146
6.0	89	602	6.0	227	209
8.0	138	902	8.0	298	273
10.0	185	1,214	10.0	374	344
12.0	257	1,734	12.0	494	454
14.0	325	2,184	14.0	598	548
16.0	389	2,594	16.0	698	638
18.0	457	2,984	18.0	794	724
20.0	529	3,374	20.0	894	814
22.0	597	3,764	22.0	994	904
24.0	634	3,718	24.0	1,094	994
26.0	719	4,272	26.0	1,229	1,114
28.0	805	4,842	28.0	1,301	1,194
30.0	893	5,425	30.0	1,399	1,274
32.0	982	6,017	32.0	1,499	1,354
34.0	1,071	6,615	34.0	1,598	1,434
36.0	1,161	7,217	36.0	1,698	1,514
38.0	1,249	7,819	38.0	1,798	1,594
40.0	1,337	8,418	40.0	1,898	1,674
42.0	1,424	9,011	42.0	1,998	1,754
44.0	1,509	9,595	44.0	2,098	1,834
46.0	1,591	10,168	46.0	2,198	1,914
48.0	1,671	10,721	48.0	2,298	2,094
50.0	1,747	11,257	50.0	2,398	2,174
52.0	1,819	11,770	52.0	2,498	2,254
54.0	1,887	12,257	54.0	2,598	2,334
56.0	1,950	12,714	56.0	2,698	2,414
58.0	2,008	13,138	58.0	2,798	2,494
60.0	2,057	13,519	60.0	2,898	2,574
62.0	2,099	13,856	62.0	2,998	2,654
	2,131	14,140			
		14,358			
		148.2			

MAXIMUM LADING: 13,731 LB / 6,228 KG

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SUITABLE TIRE SIZE		RIM CHOICE		KPA COLD		PSI	
425/65R22.5	22.5X12.25	720	105				
295/75R22.5	22.5X8.25	620	90				
295/75R22.5	22.5X8.25	620	90				
295/75R22.5	22.5X8.25	620	90				

LABEL 22-01470

CHASSIS-CAB MFD BY
PETERBILT MOTORS CO.
DIVISION OF PACCAR INC.

DATE	11/2008
VIN	1NP-TX4EX-1-9D789490
	LABEL 22-01469: REV C

CONFORMITY TO THE OTHER
SAFETY STANDARDS
APPLICABLE TO THIS VEHICLE
WHEN COMPLIANCE IS NOT
SUBSTANTIALLY AFFECTED BY
THE DESIGN OF THE CHASSIS CAB

THIS VEHICLE WILL CONFORM TO
EPA EMISSIONS AND FUEL ECONOMY
RATINGS IF COMPLETED IN ACCORDANCE
WITH THE INSTRUCTIONS
CONTAINED IN THE INCOMPLETE
VEHICLE DOCUMENT FURNISHED.
PLS. SUBMIT TO 49 CFR PART 568

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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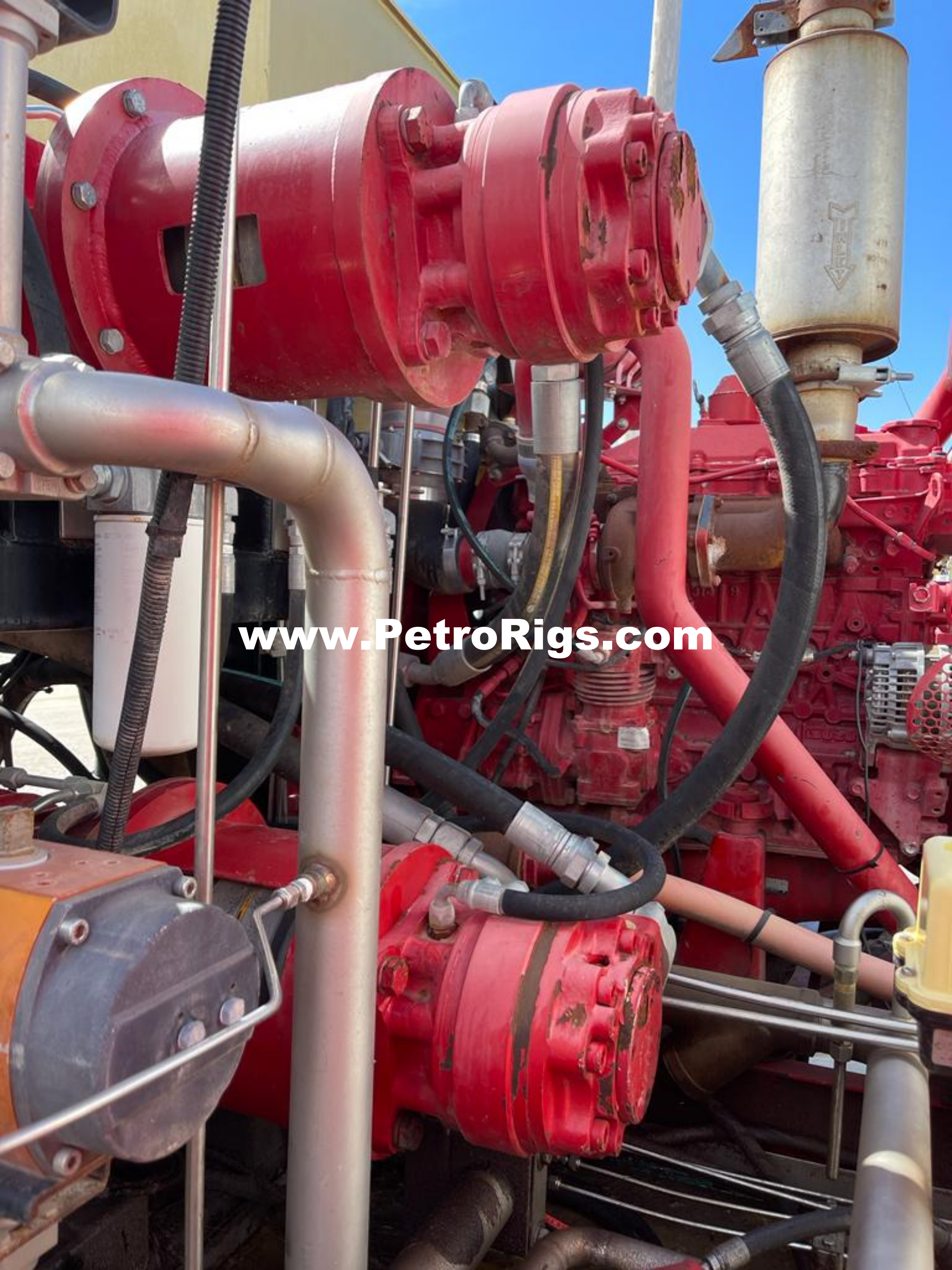
www.PetroRigs.com



The image shows a close-up of industrial equipment. A large, red, circular flange or cover is bolted onto a dark metal frame. A thick, black, flexible hose is connected to the top of the red component. A metal bracket is attached to the center of the red flange. Below the red component, a red pipe with a 90-degree elbow is visible. A yellow warning label with the text 'CAUTION! HOT' is affixed to the side of the red component. The background shows more industrial structures and a gravel surface.

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CAUTION! HOT



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A close-up photograph of a red industrial engine, likely a diesel engine, with various hoses and components. A yellow Flowserve actuator is visible in the foreground. The background is a clear blue sky. The text "www.PetroRigs.com" is overlaid in the center.

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This image shows a close-up view of industrial machinery, likely part of an oil rig. The structure is primarily composed of red-painted metal beams. Several black hoses are visible, some with green labels that include the text "GH781-4" and "E PLUS 00". A white cylindrical component is also present. The machinery appears to be in a state of operation or maintenance.

A close-up photograph of industrial hydraulic equipment. The image shows a complex arrangement of metal pipes, valves, and hoses. In the foreground, a large black flexible hose is connected to a metal fitting. Behind it, several red hydraulic cylinders or actuators are visible, each with multiple ports. These are connected to a network of silver-colored metal pipes and fittings. The entire assembly is mounted on a dark metal frame. The background is a clear blue sky. A watermark is visible across the center of the image.

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180K

LUBE OIL

90K

LUBE OIL

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