Introduction

This document is intended solely for the use of Pikotek PGE gasket users and is not intended to be distributed to any unauthorized parties without the express written consent of Pikotek. By receiving this copy, the user acknowledges and accepts these terms of confidentiality and understands that the products detailed in this document are both proprietary and have been designed exclusively for the use of the intended end-user (document recipient).

In this user's manual, the products are all listed by ANSI pressure class and have the relevant product type illustrated by engineering drawing for each product referenced under each respective pressure class. Behind each engineering drawing is a printout of the respective bolt stress and torque calculations with the proper makeup parameters for each ANSI B16.5 flange size. Included therein is also a printout of the ASME code calculations for each gasket per ASME Boiler and Pressure Code, Section 8, Division 2. Finally, recommendations for minimum and maximum bolt load are provided in accordance with the above.

This document is intended to be used as a reference manual showing detailed dimensions for each Pikotek gasket relative to gasket and seal location and the respective bolt stress and torque recommendations. Only through proper use of this manual can the performance of each gasket and sealing system be assured.

Any questions or problems should be referred to:

Pikotek
P.O. Box 260438
Lakewood, Colorado USA
Tel: 1-303-988-1242
1-800-232-8227 (only within USA)
Fax: 1-303-988-1922

The flange gaskets detailed in this document are designed to be used only in accordance with ANSI specification B16.5 and/or any other accepted standards covering flanges and flange gaskets for use in oil and gas field production/processing applications.

pikotek PGE Installation Instructions

1. The flange gasket (and isolation kit) found in the package should match the specifications listed on the package label.

2. Inspect all flange surfaces and insure that large pits or defects will not cause leakage when the system is pressurized. Wipe sealing surfaces clean prior to installing the gasket.

3. Align the flanges so that the bolt holes line up. Improper alignment could cause damage to the sleeves during installation by pinching the thread form through the sleeve material. When proper alignment has been achieved, install all of the sleeves into all of the bolts. All sleeves should slide easily into both mating flanges.

4. Install one nut onto one end of each stud. Be sure to lubricate the threads and nut surfaces with a suitable compound (i.e. Jet Lube 30). From the opposite end of the stud/nut assembly, install one steel washer and one composite washer in that order. Make sure all steel washers are butted against the nuts. DO NOT BUTT COMPOSITE WASHERS AGAINST NUTS. Remove the sleeves from the flange and slide them over the stud.

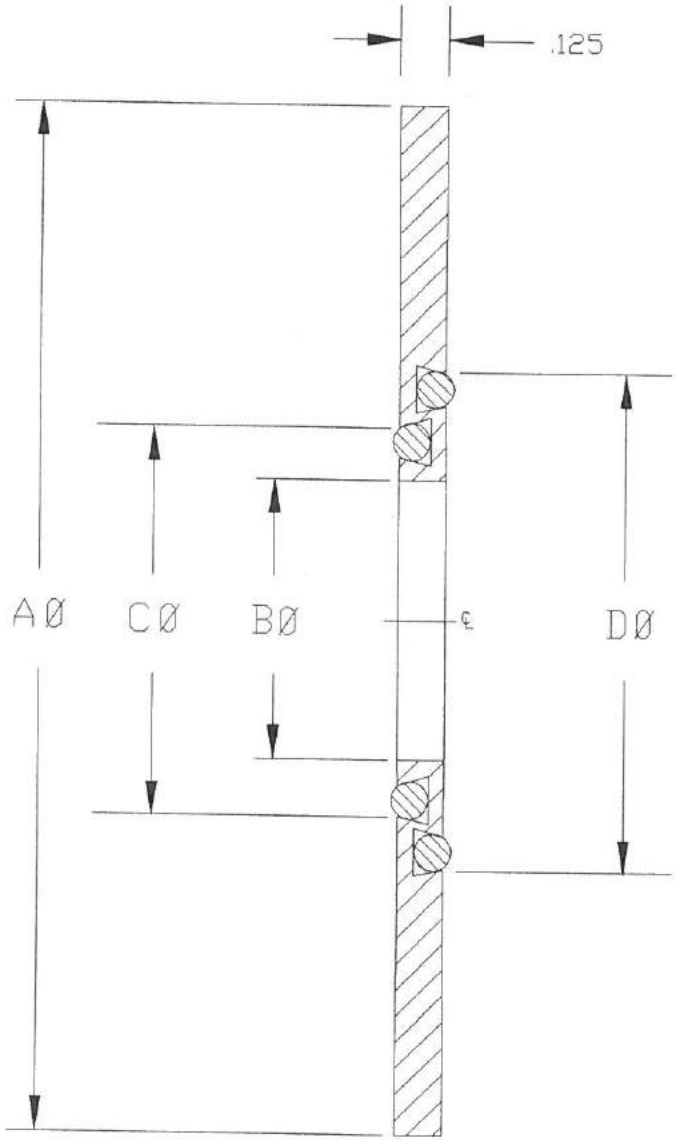
5. Insert the stud, nut, steel washer and composite washer assembly into the bolt holes around the lower half of the bolt pattern and install a composite washer, steel washer and nut onto the exposed end of the stud. Do not thread up studs to the point where the gasket cannot be installed. Be sure to leave enough space between the flanges to install the gasket. Lubricate the appropriate surfaces before final make-up.

6. Insert the gasket between the flanges and allow the gasket to rest on the sleeve and stud assemblies. Check the condition of the o-rings/Teflon seals making sure they are secure in each one's respective groove. Install the remaining stud, nut, composite washer and steel washer assemblies into the upper half of the bolt circle pattern.

7. If a device was used to spread the flanges then remove it at this time. Thread all nuts onto all the remaining studs, and in doing so, bring the flanges into contact with the gasket. If misalignment exists between the flanges and gasket, tighten the nuts in such a way as to minimize pinching or point loading of the flange against the gasket.

8. Make sure that a sufficient number of threads is within the nut of each stud prior to torque-up. Torque the assembly to one-half of the torque limit specified on the package label. Do this using an approved flange bolt tightening sequence pattern (i.e. star pattern). Repeat the sequence torquing to the maximum torque limit as specified.

9. Test for shorts across the flange and then pressure test assembly. For safety reasons, it is best to initiate the test pressures much lower than those normally encountered by the system. Increase pressure up to acceptable limits by stepping up pressure in 10% pressure increments.



SIZE	A	B	C	D
24"	28.125	24.000	24.668	25.398
20"	23.750	20.000	20.668	21.398
18"	21.500	18.000	18.668	19.398
16"	20.125	16.000	16.730	17.160
14"	17.625	14.000	14.602	15.032
12"	16.000	12.000	12.730	13.160
10"	13.250	10.000	10.730	11.160
8"	10.875	8.000	8.643	9.143
6"	8.625	6.000	6.643	7.143
5"	7.625	5.000	5.643	6.143
4"	6.750	4.000	4.413	5.143
3 1/2"	6.250	3.500	4.143	4.463
3"	5.250	3.000	3.643	4.143
2 1/2"	4.750	2.500	2.956	3.395
2"	4.000	2.000	2.456	2.831
1 1/2"	3.300	1.500	1.955	2.393
1 1/4"	2.920	1.250	1.705	2.081
1"	2.550	1.000	1.460	1.835
3/4"	2.175	.700	1.153	1.528
1/2"	1.800	.500	.913	1.288

DESCRIPTION:
PIKOTEK PGE FLANGE GASKET FOR FLANGE SPECIFICATION ANSI B16.5 WITH O-RING SEALS FOR 150# CLASS

SCALE: NONE | APPRV: | LIMITS ON DIMENSIONS UNLESS OTHERWISE NOTED .XX DECIMAL = .040 .XXX DECIMAL = .040

DATE: 3/13/95 | DRAWN BY: SCHIBBELHUT | REVISED:

pikotek
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Drawing Number:
PGE-150-O-I

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1/2-150 PGE				
Flange Bore, inches	B =	0.622	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.500	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	1.380			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	0.500	Gasket OD	KG =	1.800
Self Energized Seal OD	G1=	0.913	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	0.622 in
Selected effective OD of Gasket	=	1.380 in
Effective overall width of Gasket	=	0.264 in
Total Area between ID and OD	=	1.19 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.29 sq in
Net Area of Contact	=	0.90 sq in
Total Force for 7500 psi loading	=	6,777 lb
Force per Bolt, 7500 psi loading	=	1,694 lb
Force per Bolt, 40,000 psi loading	=	9,036 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.13 sq in
Force at 50,000 psi bolt stress	=	6,285 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	13,478 psi
Bolt Stress for 40,000 psi loading	=	71,882 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.264 in
Basic Gasket Seating Width bo=N/2	=	0.132 in
Effective Gasket Seating Width	b =	0.132 in
Location of Gasket Reaction	G =	1.116 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	5,785 lb
Seating Load Wm2 per bolt	=	1,446 lb
Bolt Stress for Wm2 Loading	=	11,505 psi
Area for Wm1 Loading	=	0.65 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	190 lb
Hydrostatic Load Wm1 per bolt	=	47 lb
Bolt Stress for Wm1 Loading	=	378 psi

BOLT TORQUES

Torque for	6,285 lb Bolt Load	=	60 ft lb - Do Not Exceed
Torque for	1,694 lb Bolt Load	=	16 ft lb - Minimum Preload
Torque for	1,446 lb Bolt Load	=	14 ft lb - Wm2 ref.
Torque for	47 lb Bolt Load	=	0 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 3/4-150 PGE				
Flange Bore, inches	B =	0.824	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.500	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	1.690			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	0.700	Gasket OD	KG =	2.175
Self Energized Seal OD	G1=	1.153	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	0.824 in
Selected effective OD of Gasket	=	1.690 in
Effective overall width of Gasket	=	0.318 in
Total Area between ID and OD	=	1.71 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.38 sq in
Net Area of Contact	=	1.33 sq in
Total Force for 7500 psi loading	=	10,012 lb
Force per Bolt, 7500 psi loading	=	2,503 lb
Force per Bolt, 40,000 psi loading	=	13,349 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.13 sq in
Force at 50,000 psi bolt stress	=	6,285 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	19,912 psi
Bolt Stress for 40,000 psi loading	=	106,197 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.318 in
Basic Gasket Seating Width bo=N/2	=	0.159 in
Effective Gasket Seating Width	b =	0.159 in
Location of Gasket Reaction	G =	1.372 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	8,567 lb
Seating Load Wm2 per bolt	=	2,142 lb
Bolt Stress for Wm2 Loading	=	17,038 psi
Area for Wm1 Loading	=	1.04 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	303 lb
Hydrostatic Load Wm1 per bolt	=	76 lb
Bolt Stress for Wm1 Loading	=	602 psi

BOLT TORQUES

Torque for	6,285 lb Bolt Load	=	60 ft lb - Do Not Exceed
Torque for	2,503 lb Bolt Load	=	24 ft lb - Minimum Preload
Torque for	2,142 lb Bolt Load	=	20 ft lb - Wm2 ref.
Torque for	76 lb Bolt Load	=	1 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1-150 PGE				
Flange Bore, inches	B =	1.049	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.500	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	2.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	1.000	Gasket OD	KG =	2.550
Self Energized Seal OD	G1=	1.460	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	1.049 in
Selected effective OD of Gasket	=	2.000 in
Effective overall width of Gasket	=	0.361 in
Total Area between ID and OD	=	2.28 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.49 sq in
Net Area of Contact	=	1.79 sq in
Total Force for 7500 psi loading	=	13,436 lb
Force per Bolt, 7500 psi loading	=	3,359 lb
Force per Bolt, 40,000 psi loading	=	17,914 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.13 sq in
Force at 50,000 psi bolt stress	=	6,285 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	26,722 psi
Bolt Stress for 40,000 psi loading	=	142,515 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.361 in
Basic Gasket Seating Width bo=N/2	=	0.180 in
Effective Gasket Seating Width	b =	0.180 in
Location of Gasket Reaction	G =	1.640 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	11,605 lb
Seating Load Wm2 per bolt	=	2,901 lb
Bolt Stress for Wm2 Loading	=	23,081 psi
Area for Wm1 Loading	=	1.67 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	486 lb
Hydrostatic Load Wm1 per bolt	=	121 lb
Bolt Stress for Wm1 Loading	=	966 psi

BOLT TORQUES

Torque for	6,285 lb Bolt Load	=	60 ft lb - Do Not Exceed
Torque for	3,359 lb Bolt Load	=	32 ft lb - Minimum Preload
Torque for	2,901 lb Bolt Load	=	28 ft lb - Wm2 ref.
Torque for	121 lb Bolt Load	=	1 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1 1/4-150 PGE				
Flange Bore, inches	B =	1.380	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.500	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	2.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	1.250	Gasket OD	KG =	2.920
Self Energized Seal OD	G1=	1.705	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	1.380 in
Selected effective OD of Gasket	=	2.500 in
Effective overall width of Gasket	=	0.445 in
Total Area between ID and OD	=	3.41 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.57 sq in
Net Area of Contact	=	2.84 sq in
Total Force for 7500 psi loading	=	21,289 lb
Force per Bolt, 7500 psi loading	=	5,322 lb
Force per Bolt, 40,000 psi loading	=	28,386 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.13 sq in
Force at 50,000 psi bolt stress	=	6,285 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	42,342 psi
Bolt Stress for 40,000 psi loading	=	225,823 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.445 in
Basic Gasket Seating Width bo=N/2	=	0.223 in
Effective Gasket Seating Width	b =	0.223 in
Location of Gasket Reaction	G =	2.055 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	17,956 lb
Seating Load Wm2 per bolt	=	4,489 lb
Bolt Stress for Wm2 Loading	=	35,711 psi
Area for Wm1 Loading	=	2.28 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	662 lb
Hydrostatic Load Wm1 per bolt	=	166 lb
Bolt Stress for Wm1 Loading	=	1,317 psi

BOLT TORQUES

Torque for	6,285 lb Bolt Load	=	60 ft lb - Do Not Exceed
Torque for	5,322 lb Bolt Load	=	51 ft lb - Minimum Preload
Torque for	4,489 lb Bolt Load	=	43 ft lb - Wm2 ref.
Torque for	166 lb Bolt Load	=	2 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1 1/2-150 PGE				
Flange Bore, inches	B =	1.610	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.500	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	2.880			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	1.500	Gasket OD	KG =	3.300
Self Energized Seal OD	G1=	1.955	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	1.610 in
Selected effective OD of Gasket	=	2.880 in
Effective overall width of Gasket	=	0.520 in
Total Area between ID and OD	=	4.48 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.66 sq in
Net Area of Contact	=	3.81 sq in
Total Force for 7500 psi loading	=	28,604 lb
Force per Bolt, 7500 psi loading	=	7,151 lb
Force per Bolt, 40,000 psi loading	=	38,138 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.13 sq in
Force at 50,000 psi bolt stress	=	6,285 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	56,889 psi
Bolt Stress for 40,000 psi loading	=	303,407 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.520 in
Basic Gasket Seating Width bo=N/2	=	0.260 in
Effective Gasket Seating Width	b =	0.255 in
Location of Gasket Reaction	G =	2.370 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	23,729 lb
Seating Load Wm2 per bolt	=	5,932 lb
Bolt Stress for Wm2 Loading	=	47,194 psi
Area for Wm1 Loading	=	3.00 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	871 lb
Hydrostatic Load Wm1 per bolt	=	218 lb
Bolt Stress for Wm1 Loading	=	1,731 psi

BOLT TORQUES

Torque for	6,285 lb Bolt Load	=	60 ft lb - Do Not Exceed
Torque for	7,151 lb Bolt Load	=	68 ft lb - Minimum Preload
Torque for	5,932 lb Bolt Load	=	57 ft lb - Wm2 ref.
Torque for	218 lb Bolt Load	=	2 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 2-150 PGE				
Flange Bore, inches	B =	2.067	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	3.630			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	2.000	Gasket OD	KG =	4.000
Self Energized Seal OD	G1=	2.456	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	2.067 in
Selected effective OD of Gasket	=	3.630 in
Effective overall width of Gasket	=	0.666 in
Total Area between ID and OD	=	6.99 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.85 sq in
Net Area of Contact	=	6.15 sq in
Total Force for 7500 psi loading	=	46,108 lb
Force per Bolt, 7500 psi loading	=	11,527 lb
Force per Bolt, 40,000 psi loading	=	61,478 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	57,065 psi
Bolt Stress for 40,000 psi loading	=	304,345 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.666 in
Basic Gasket Seating Width bo=N/2	=	0.333 in
Effective Gasket Seating Width	b =	0.289 in
Location of Gasket Reaction	G =	3.053 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	34,602 lb
Seating Load Wm2 per bolt	=	8,651 lb
Bolt Stress for Wm2 Loading	=	42,824 psi
Area for Wm1 Loading	=	4.74 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	1,374 lb
Hydrostatic Load Wm1 per bolt	=	343 lb
Bolt Stress for Wm1 Loading	=	1,700 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load	=	118 ft lb - Do Not Exceed
Torque for	11,527 lb Bolt Load	=	134 ft lb - Minimum Preload
Torque for	8,651 lb Bolt Load	=	101 ft lb - Wm2 ref.
Torque for	343 lb Bolt Load	=	4 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 2 1/2-150 PGE				
Flange Bore, inches	B =	2.469	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	4.130			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	2.500	Gasket OD	KG =	4.750
Self Energized Seal OD	G1=	2.956	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	2.500 in
Selected effective OD of Gasket	=	4.130 in
Effective overall width of Gasket	=	0.700 in
Total Area between ID and OD	=	8.49 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.03 sq in
Net Area of Contact	=	7.46 sq in
Total Force for 7500 psi loading	=	55,960 lb
Force per Bolt, 7500 psi loading	=	13,990 lb
Force per Bolt, 40,000 psi loading	=	74,613 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	69,257 psi
Bolt Stress for 40,000 psi loading	=	369,373 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.700 in
Basic Gasket Seating Width bo=N/2	=	0.350 in
Effective Gasket Seating Width	b =	0.296 in
Location of Gasket Reaction	G =	3.538 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	41,103 lb
Seating Load Wm2 per bolt	=	10,276 lb
Bolt Stress for Wm2 Loading	=	50,870 psi
Area for Wm1 Loading	=	6.86 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	1,990 lb
Hydrostatic Load Wm1 per bolt	=	498 lb
Bolt Stress for Wm1 Loading	=	2,463 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load	=	118 ft lb - Do Not Exceed
Torque for	13,990 lb Bolt Load	=	163 ft lb - Minimum Preload
Torque for	10,276 lb Bolt Load	=	120 ft lb - Wm2 ref.
Torque for	498 lb Bolt Load	=	6 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 3-150 PGE				
Flange Bore, inches	B =	3.068	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	5.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	3.000	Gasket OD	KG =	5.250
Self Energized Seal OD	G1=	3.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	3.068 in
Selected effective OD of Gasket	=	5.000 in
Effective overall width of Gasket	=	0.851 in
Total Area between ID and OD	=	12.24 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.27 sq in
Net Area of Contact	=	10.97 sq in
Total Force for 7500 psi loading	=	82,258 lb
Force per Bolt, 7500 psi loading	=	20,564 lb
Force per Bolt, 40,000 psi loading	=	109,677 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	101,804 psi
Bolt Stress for 40,000 psi loading	=	542,956 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.851 in
Basic Gasket Seating Width	bo=N/2 =	0.426 in
Effective Gasket Seating Width	b =	0.326 in
Location of Gasket Reaction	G =	4.348 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	55,685 lb
Seating Load Wm2 per bolt	=	13,921 lb
Bolt Stress for Wm2 Loading	=	68,917 psi
Area for Wm1 Loading	=	10.42 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	3,023 lb
Hydrostatic Load Wm1 per bolt	=	756 lb
Bolt Stress for Wm1 Loading	=	3,741 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load =	118 ft lb	- Do Not Exceed
Torque for	20,564 lb Bolt Load =	240 ft lb	- Minimum Preload
Torque for	13,921 lb Bolt Load =	162 ft lb	- Wm2 ref.
Torque for	756 lb Bolt Load =	9 ft lb	- Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 3 1/2-150 PGE				
Flange Bore, inches	B =	3.548	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	5.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	3.500	Gasket OD	KG =	6.250
Self Energized Seal OD	G1=	4.143	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	3.548 in
Selected effective OD of Gasket	=	5.500 in
Effective overall width of Gasket	=	0.861 in
Total Area between ID and OD	=	13.87 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.46 sq in
Net Area of Contact	=	12.42 sq in
Total Force for 7500 psi loading	=	93,122 lb
Force per Bolt, 7500 psi loading	=	11,640 lb
Force per Bolt, 40,000 psi loading	=	62,081 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	57,625 psi
Bolt Stress for 40,000 psi loading	=	307,333 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.861 in
Basic Gasket Seating Width bo=N/2	=	0.431 in
Effective Gasket Seating Width	b =	0.328 in
Location of Gasket Reaction	G =	4.844 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	62,404 lb
Seating Load Wm2 per bolt	=	7,800 lb
Bolt Stress for Wm2 Loading	=	38,616 psi
Area for Wm1 Loading	=	13.48 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	3,909 lb
Hydrostatic Load Wm1 per bolt	=	489 lb
Bolt Stress for Wm1 Loading	=	2,419 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load =	118 ft lb	- Do Not Exceed
Torque for	11,640 lb Bolt Load =	136 ft lb	- Minimum Preload
Torque for	7,800 lb Bolt Load =	91 ft lb	- Wm2 ref.
Torque for	489 lb Bolt Load =	6 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 4-150 PGE				
Flange Bore, inches	B =	4.026	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	6.190			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	4.000	Gasket OD	KG =	6.750
Self Energized Seal OD	G1=	4.413	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	4.026 in
Selected effective OD of Gasket	=	6.190 in
Effective overall width of Gasket	=	0.967 in
Total Area between ID and OD	=	17.36 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.55 sq in
Net Area of Contact	=	15.81 sq in
Total Force for 7500 psi loading	=	118,578 lb
Force per Bolt, 7500 psi loading	=	14,822 lb
Force per Bolt, 40,000 psi loading	=	79,052 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	73,377 psi
Bolt Stress for 40,000 psi loading	=	391,346 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.967 in
Basic Gasket Seating Width bo=N/2	=	0.484 in
Effective Gasket Seating Width	b =	0.348 in
Location of Gasket Reaction	G =	5.495 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	75,019 lb
Seating Load Wm2 per bolt	=	9,377 lb
Bolt Stress for Wm2 Loading	=	46,422 psi
Area for Wm1 Loading	=	15.30 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	4,436 lb
Hydrostatic Load Wm1 per bolt	=	554 lb
Bolt Stress for Wm1 Loading	=	2,745 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load	=	118 ft lb - Do Not Exceed
Torque for	14,822 lb Bolt Load	=	173 ft lb - Minimum Preload
Torque for	9,377 lb Bolt Load	=	109 ft lb - Wm2 ref.
Torque for	554 lb Bolt Load	=	6 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 5-150 PGE				
Flange Bore, inches	B =	5.047	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	7.310			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	5.000	Gasket OD	KG =	7.625
Self Energized Seal OD	G1=	5.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	5.047 in
Selected effective OD of Gasket	=	7.310 in
Effective overall width of Gasket	=	1.017 in
Total Area between ID and OD	=	21.96 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	2.00 sq in
Net Area of Contact	=	19.97 sq in
Total Force for 7500 psi loading	=	149,743 lb
Force per Bolt, 7500 psi loading	=	18,718 lb
Force per Bolt, 40,000 psi loading	=	99,828 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	61,980 psi
Bolt Stress for 40,000 psi loading	=	330,557 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.017 in
Basic Gasket Seating Width bo=N/2	=	0.508 in
Effective Gasket Seating Width	b =	0.356 in
Location of Gasket Reaction	G =	6.597 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	92,346 lb
Seating Load Wm2 per bolt	=	11,543 lb
Bolt Stress for Wm2 Loading	=	38,223 psi
Area for Wm1 Loading	=	25.01 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	7,253 lb
Hydrostatic Load Wm1 per bolt	=	907 lb
Bolt Stress for Wm1 Loading	=	3,002 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load	=	207 ft lb - Do Not Exceed
Torque for	18,718 lb Bolt Load	=	257 ft lb - Minimum Preload
Torque for	11,543 lb Bolt Load	=	159 ft lb - Wm2 ref.
Torque for	907 lb Bolt Load	=	12 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 6-150 PGE				
Flange Bore, inches	B =	6.065	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	8.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	6.000	Gasket OD	KG =	8.625
Self Energized Seal OD	G1=	6.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	6.065 in
Selected effective OD of Gasket	=	8.500 in
Effective overall width of Gasket	=	1.103 in
Total Area between ID and OD	=	27.85 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	2.36 sq in
Net Area of Contact	=	25.50 sq in
Total Force for 7500 psi loading	=	191,223 lb
Force per Bolt, 7500 psi loading	=	23,903 lb
Force per Bolt, 40,000 psi loading	=	127,482 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	79,148 psi
Bolt Stress for 40,000 psi loading	=	422,125 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.103 in
Basic Gasket Seating Width bo=N/2	=	0.551 in
Effective Gasket Seating Width	b =	0.371 in
Location of Gasket Reaction	G =	7.758 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	113,091 lb
Seating Load Wm2 per bolt	=	14,136 lb
Bolt Stress for Wm2 Loading	=	46,809 psi
Area for Wm1 Loading	=	34.66 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	10,051 lb
Hydrostatic Load Wm1 per bolt	=	1,256 lb
Bolt Stress for Wm1 Loading	=	4,160 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load	=	207 ft lb - Do Not Exceed
Torque for	23,903 lb Bolt Load	=	328 ft lb - Minimum Preload
Torque for	14,136 lb Bolt Load	=	194 ft lb - Wm2 ref.
Torque for	1,256 lb Bolt Load	=	17 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 8-150 PGE				
Flange Bore, inches	B =	7.981	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	10.630			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	8.000	Gasket OD	KG =	10.875
Self Energized Seal OD	G1=	8.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	8.000 in	
Selected effective OD of Gasket	=	10.630 in	
Effective overall width of Gasket	=	1.200 in	
Total Area between ID and OD	=	38.48 sq in	
Area of Ring Groove @ Flange Face	=	0.00 sq in	
Self-Energized Seal Area	=	3.08 sq in	
Net Area of Contact	=	35.40 sq in	
Total Force for 7500 psi loading	=	265,509 lb	
Force per Bolt, 7500 psi loading	=	33,189 lb	
Force per Bolt, 40,000 psi loading	=	177,006 lb	- Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in	
Force at 50,000 psi bolt stress	=	15,100 lb	- Load based on Bolts
Bolt Stress for 7500 psi loading	=	109,896 psi	
Bolt Stress for 40,000 psi loading	=	586,112 psi	

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.200 in	
Basic Gasket Seating Width	bo=N/2 =	0.600 in	
Effective Gasket Seating Width	b =	0.387 in	
Location of Gasket Reaction	G =	9.855 in	
Design Seating Stress	y =	12,500 psi	
Seating Total Load Wm2 = 3.14bGy	=	149,892 lb	
Seating Load Wm2 per bolt	=	18,737 lb	
Bolt Stress for Wm2 Loading	=	62,042 psi	
Area for Wm1 Loading	=	58.67 sq in	
Pressure for Wm1 Loading	=	290	
Total Hydrostatic Loading Wm1	=	17,014 lb	
Hydrostatic Load Wm1 per bolt	=	2,127 lb	
Bolt Stress for Wm1 Loading	=	7,042 psi	

BOLT TORQUES

Torque for	15,100 lb	Bolt Load =	207 ft lb	- Do Not Exceed
Torque for	33,189 lb	Bolt Load =	456 ft lb	- Minimum Preload
Torque for	18,737 lb	Bolt Load =	257 ft lb	- Wm2 ref.
Torque for	2,127 lb	Bolt Load =	29 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 10-150 PGE				
Flange Bore, inches	B =	10.020	Number of Bolts	Nb =	12.000
Bolt Size, inches	D =	0.875	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	12.750			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	10.000	Gasket OD	KG =	13.250
Self Energized Seal OD	G1=	10.730	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	10.020 in
Selected effective OD of Gasket	=	12.750 in
Effective overall width of Gasket	=	1.250 in
Total Area between ID and OD	=	48.82 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	3.84 sq in
Net Area of Contact	=	44.99 sq in
Total Force for 7500 psi loading	=	337,403 lb
Force per Bolt, 7500 psi loading	=	28,117 lb
Force per Bolt, 40,000 psi loading	=	149,957 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.42 sq in
Force at 50,000 psi bolt stress	=	20,950 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	67,105 psi
Bolt Stress for 40,000 psi loading	=	357,893 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.250 in
Basic Gasket Seating Width	bo=N/2 =	0.625 in
Effective Gasket Seating Width	b =	0.395 in
Location of Gasket Reaction	G =	11.959 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	185,644 lb
Seating Load Wm2 per bolt	=	15,470 lb
Bolt Stress for Wm2 Loading	=	36,922 psi
Area for Wm1 Loading	=	90.43 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	26,223 lb
Hydrostatic Load Wm1 per bolt	=	2,185 lb
Bolt Stress for Wm1 Loading	=	5,215 psi

BOLT TORQUES

Torque for	20,950 lb Bolt Load	=	332 ft lb - Do Not Exceed
Torque for	28,117 lb Bolt Load	=	445 ft lb - Minimum Preload
Torque for	15,470 lb Bolt Load	=	245 ft lb - Wm2 ref.
Torque for	2,185 lb Bolt Load	=	35 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 12-150 PGE				
Flange Bore, inches	B =	12.000	Number of Bolts	Nb =	12.000
Bolt Size, inches	D =	0.875	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	15.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	12.000	Gasket OD	KG =	16.000
Self Energized Seal OD	G1=	12.730	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	12.000 in
Selected effective OD of Gasket	=	15.000 in
Effective overall width of Gasket	=	1.385 in
Total Area between ID and OD	=	63.62 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	4.56 sq in
Net Area of Contact	=	59.06 sq in
Total Force for 7500 psi loading	=	442,949 lb
Force per Bolt, 7500 psi loading	=	36,912 lb
Force per Bolt, 40,000 psi loading	=	196,866 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.42 sq in
Force at 50,000 psi bolt stress	=	20,950 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	88,096 psi
Bolt Stress for 40,000 psi loading	=	469,847 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.385 in
Basic Gasket Seating Width	bo=N/2 =	0.693 in
Effective Gasket Seating Width	b =	0.416 in
Location of Gasket Reaction	G =	14.168 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	231,496 lb
Seating Load Wm2 per bolt	=	19,291 lb
Bolt Stress for Wm2 Loading	=	46,041 psi
Area for Wm1 Loading	=	127.28 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	36,910 lb
Hydrostatic Load Wm1 per bolt	=	3,076 lb
Bolt Stress for Wm1 Loading	=	7,341 psi

BOLT TORQUES

Torque for	20,950 lb Bolt Load =	332 ft lb	- Do Not Exceed
Torque for	36,912 lb Bolt Load =	585 ft lb	- Minimum Preload
Torque for	19,291 lb Bolt Load =	306 ft lb	- Wm2 ref.
Torque for	3,076 lb Bolt Load =	49 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 14-150 PGE				
Flange Bore, inches	B =	13.250	Number of Bolts	Nb =	12.000
Bolt Size, inches	D =	1.000	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	16.250			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	14.000	Gasket OD	KG =	17.625
Self Energized Seal OD	G1=	14.602	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	14.000 in
Selected effective OD of Gasket	=	16.250 in
Effective overall width of Gasket	=	1.010 in
Total Area between ID and OD	=	53.46 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	5.23 sq in
Net Area of Contact	=	48.22 sq in
Total Force for 7500 psi loading	=	361,668 lb
Force per Bolt, 7500 psi loading	=	30,139 lb
Force per Bolt, 40,000 psi loading	=	160,741 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.55 sq in
Force at 50,000 psi bolt stress	=	27,551 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	54,697 psi
Bolt Stress for 40,000 psi loading	=	291,718 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.010 in
Basic Gasket Seating Width bo=N/2	=	0.505 in
Effective Gasket Seating Width	b =	0.355 in
Location of Gasket Reaction	G =	15.539 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	216,825 lb
Seating Load Wm2 per bolt	=	18,069 lb
Bolt Stress for Wm2 Loading	=	32,792 psi
Area for Wm1 Loading	=	167.46 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	48,564 lb
Hydrostatic Load Wm1 per bolt	=	4,047 lb
Bolt Stress for Wm1 Loading	=	7,345 psi

BOLT TORQUES

Torque for	27,551 lb Bolt Load	=	495 ft lb - Do Not Exceed
Torque for	30,139 lb Bolt Load	=	542 ft lb - Minimum Preload
Torque for	18,069 lb Bolt Load	=	325 ft lb - Wm2 ref.
Torque for	4,047 lb Bolt Load	=	73 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 16-150 PGE				
Flange Bore, inches	B =	15.250	Number of Bolts	Nb =	16.000
Bolt Size, inches	D =	1.000	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	18.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	16.000	Gasket OD	KG =	20.125
Self Energized Seal OD	G1=	16.730	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	16.000 in
Selected effective OD of Gasket	=	18.500 in
Effective overall width of Gasket	=	1.135 in
Total Area between ID and OD	=	67.74 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	6.00 sq in
Net Area of Contact	=	61.74 sq in
Total Force for 7500 psi loading	=	463,035 lb
Force per Bolt, 7500 psi loading	=	28,940 lb
Force per Bolt, 40,000 psi loading	=	154,345 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.55 sq in
Force at 50,000 psi bolt stress	=	27,551 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	52,521 psi
Bolt Stress for 40,000 psi loading	=	280,110 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.135 in
Basic Gasket Seating Width bo=N/2	=	0.568 in
Effective Gasket Seating Width	b =	0.377 in
Location of Gasket Reaction	G =	17.747 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	262,500 lb
Seating Load Wm2 per bolt	=	16,406 lb
Bolt Stress for Wm2 Loading	=	29,775 psi
Area for Wm1 Loading	=	219.83 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	63,750 lb
Hydrostatic Load Wm1 per bolt	=	3,984 lb
Bolt Stress for Wm1 Loading	=	7,231 psi

BOLT TORQUES

Torque for	27,551 lb Bolt Load =	495 ft lb	- Do Not Exceed
Torque for	28,940 lb Bolt Load =	520 ft lb	- Minimum Preload
Torque for	16,406 lb Bolt Load =	295 ft lb	- Wm2 ref.
Torque for	3,984 lb Bolt Load =	72 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 18-150 PGE				
Flange Bore, inches	B =	17.250	Number of Bolts	Nb =	16.000
Bolt Size, inches	D =	1.125	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	21.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	18.000	Gasket OD	KG =	21.500
Self Energized Seal OD	G1=	18.668	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	18.000 in	
Selected effective OD of Gasket	=	21.000 in	
Effective overall width of Gasket	=	1.385 in	
Total Area between ID and OD	=	91.89 sq in	
Area of Ring Groove @ Flange Face	=	0.00 sq in	
Self-Energized Seal Area	=	6.70 sq in	
Net Area of Contact	=	85.19 sq in	
Total Force for 7500 psi loading	=	638,917 lb	
Force per Bolt, 7500 psi loading	=	39,932 lb	
Force per Bolt, 40,000 psi loading	=	212,972 lb	- Gasket Failure Load
Bolt Area at Minor Diameter	=	0.73 sq in	
Force at 50,000 psi bolt stress	=	36,388 lb	- Load based on Bolts
Bolt Stress for 7500 psi loading	=	54,871 psi	
Bolt Stress for 40,000 psi loading	=	292,645 psi	

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.385 in	
Basic Gasket Seating Width bo=N/2	=	0.693 in	
Effective Gasket Seating Width	b =	0.416 in	
Location of Gasket Reaction	G =	20.168 in	
Design Seating Stress	y =	12,500 psi	
Seating Total Load Wm2 = 3.14bGy	=	329,533 lb	
Seating Load Wm2 per bolt	=	20,596 lb	
Bolt Stress for Wm2 Loading	=	28,301 psi	
Area for Wm1 Loading	=	273.71 sq in	
Pressure for Wm1 Loading	=	290	
Total Hydrostatic Loading Wm1	=	79,375 lb	
Hydrostatic Load Wm1 per bolt	=	4,961 lb	
Bolt Stress for Wm1 Loading	=	6,817 psi	

BOLT TORQUES

Torque for	36,388 lb Bolt Load	=	727 ft lb	- Do Not Exceed
Torque for	39,932 lb Bolt Load	=	797 ft lb	- Minimum Preload
Torque for	20,596 lb Bolt Load	=	411 ft lb	- Wm2 ref.
Torque for	4,961 lb Bolt Load	=	99 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 20-150 PGE				
Flange Bore, inches	B =	19.250	Number of Bolts	Nb =	20.000
Bolt Size, inches	D =	1.125	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	23.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	20.000	Gasket OD	KG =	23.750
Self Energized Seal OD	G1=	20.668	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	20.000 in
Selected effective OD of Gasket	=	23.000 in
Effective overall width of Gasket	=	1.385 in
Total Area between ID and OD	=	101.32 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	7.43 sq in
Net Area of Contact	=	93.89 sq in
Total Force for 7500 psi loading	=	704,184 lb
Force per Bolt, 7500 psi loading	=	35,209 lb
Force per Bolt, 40,000 psi loading	=	187,782 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.73 sq in
Force at 50,000 psi bolt stress	=	36,388 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	48,381 psi
Bolt Stress for 40,000 psi loading	=	258,031 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.385 in
Basic Gasket Seating Width bo=N/2	=	0.693 in
Effective Gasket Seating Width	b =	0.416 in
Location of Gasket Reaction	G =	22.168 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	362,212 lb
Seating Load Wm2 per bolt	=	18,111 lb
Bolt Stress for Wm2 Loading	=	24,886 psi
Area for Wm1 Loading	=	335.50 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	97,294 lb
Hydrostatic Load Wm1 per bolt	=	4,865 lb
Bolt Stress for Wm1 Loading	=	6,685 psi

BOLT TORQUES

Torque for	36,388 lb Bolt Load =	727 ft lb	- Do Not Exceed
Torque for	35,209 lb Bolt Load =	703 ft lb	- Minimum Preload
Torque for	18,111 lb Bolt Load =	362 ft lb	- Wm2 ref.
Torque for	4,865 lb Bolt Load =	97 ft lb	- Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 24-150 PGE				
Flange Bore, inches	B =	23.250	Number of Bolts	Nb =	20.000
Bolt Size, inches	D =	1.250	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	27.250			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	24.000	Gasket OD	KG =	28.125
Self Energized Seal OD	G1=	24.668	Seal Groove Width	W1=	0.115
Working Pressure	P =	290	Bolt Friction Factor	f =	0.160

CALCULATIONS

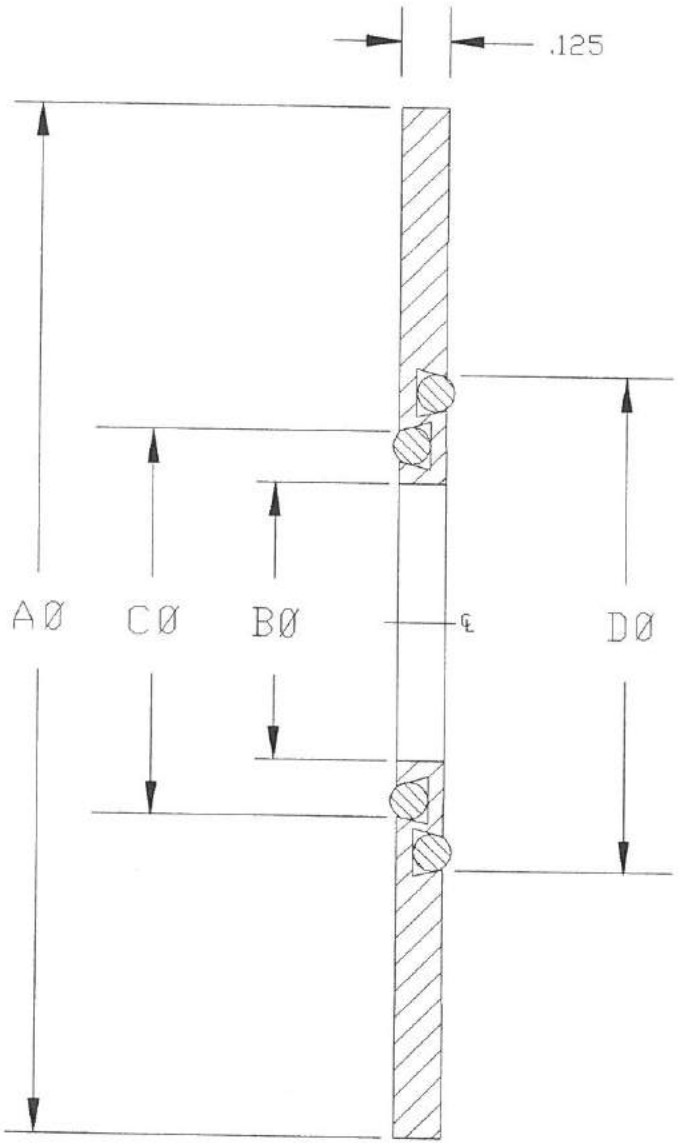
Selected effective ID of Gasket	=	24.000 in
Selected effective OD of Gasket	=	27.250 in
Effective overall width of Gasket	=	1.510 in
Total Area between ID and OD	=	130.82 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	8.87 sq in
Net Area of Contact	=	121.95 sq in
Total Force for 7500 psi loading	=	914,607 lb
Force per Bolt, 7500 psi loading	=	45,730 lb
Force per Bolt, 40,000 psi loading	=	243,895 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.93 sq in
Force at 50,000 psi bolt stress	=	46,451 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	49,224 psi
Bolt Stress for 40,000 psi loading	=	262,527 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.510 in
Basic Gasket Seating Width bo=N/2	=	0.755 in
Effective Gasket Seating Width	b =	0.434 in
Location of Gasket Reaction	G =	26.381 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	450,086 lb
Seating Load Wm2 per bolt	=	22,504 lb
Bolt Stress for Wm2 Loading	=	24,223 psi
Area for Wm1 Loading	=	477.92 sq in
Pressure for Wm1 Loading	=	290
Total Hydrostatic Loading Wm1	=	138,598 lb
Hydrostatic Load Wm1 per bolt	=	6,930 lb
Bolt Stress for Wm1 Loading	=	7,459 psi

BOLT TORQUES

Torque for	46,451 lb Bolt Load	=	1,021 ft lb - Do Not Exceed
Torque for	45,730 lb Bolt Load	=	1,005 ft lb - Minimum Preload
Torque for	22,504 lb Bolt Load	=	494 ft lb - Wm2 ref.
Torque for	6,930 lb Bolt Load	=	152 ft lb - Wm1 ref.



SIZE	A	B	C	D
24"	30.375	24.000	24.668	25.398
20"	25.625	20.000	20.668	21.398
18"	23.375	18.000	18.668	19.398
16"	21.125	16.000	16.730	17.160
14"	19.000	14.000	14.602	15.032
12"	16.500	12.000	12.730	13.160
10"	14.125	10.000	10.730	11.160
8"	12.000	8.000	8.643	9.143
6"	9.750	6.000	6.643	7.143
5"	8.375	5.000	5.643	6.143
4"	7.000	4.000	4.413	5.143
3 1/2"	6.375	3.500	4.143	4.463
3"	5.750	3.000	3.643	4.143
2 1/2"	5.000	2.500	2.956	3.395
2"	4.250	2.000	2.456	2.831
1 1/2"	3.675	1.500	1.955	2.393
1 1/4"	3.175	1.250	1.705	2.081
1"	2.800	1.000	1.460	1.835
3/4"	2.550	.700	1.153	1.528
1/2"	2.050	.500	.913	1.288

DESCRIPTION:
PIKOTEK PGE FLANGE GASKET FOR FLANGE SPECIFICATION ANSI B16.5 WITH O-RING SEALS FOR 300# CLASS

SCALE: NONE | APPRV: | LIMITS ON DIMENSIONS UNLESS OTHERWISE NOTED .XX DECIMAL = .040 .XXX DECIMAL = .040

DATE: 3/13/95 | DRAWN BY: SCHIBBELHUT | REVISED:

pikotek
engineering solutions today
for tomorrow's problems

Drawing Number: PGE-300-O-I

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1/2-300 PGE				
Flange Bore, inches	B =	0.622	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.500	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	1.380			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	0.500	Gasket OD	KG =	2.050
Self Energized Seal OD	G1=	0.913	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	0.622 in
Selected effective OD of Gasket	=	1.380 in
Effective overall width of Gasket	=	0.264 in
Total Area between ID and OD	=	1.19 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.29 sq in
Net Area of Contact	=	0.90 sq in
Total Force for 7500 psi loading	=	6,777 lb
Force per Bolt, 7500 psi loading	=	1,694 lb
Force per Bolt, 40,000 psi loading	=	9,036 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.13 sq in
Force at 50,000 psi bolt stress	=	6,285 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	13,478 psi
Bolt Stress for 40,000 psi loading	=	71,882 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.264 in
Basic Gasket Seating Width bo=N/2	=	0.132 in
Effective Gasket Seating Width	b =	0.132 in
Location of Gasket Reaction	G =	1.116 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	5,785 lb
Seating Load Wm2 per bolt	=	1,446 lb
Bolt Stress for Wm2 Loading	=	11,505 psi
Area for Wm1 Loading	=	0.65 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	491 lb
Hydrostatic Load Wm1 per bolt	=	123 lb
Bolt Stress for Wm1 Loading	=	977 psi

BOLT TORQUES

Torque for	6,285 lb Bolt Load	=	60 ft lb - Do Not Exceed
Torque for	1,694 lb Bolt Load	=	16 ft lb - Minimum Preload
Torque for	1,446 lb Bolt Load	=	14 ft lb - Wm2 ref.
Torque for	123 lb Bolt Load	=	1 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 3/4-300 PGE				
Flange Bore, inches	B =	0.824	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	1.690			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	0.700	Gasket OD	KG =	2.550
Self Energized Seal OD	G1=	1.153	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	0.824 in
Selected effective OD of Gasket	=	1.690 in
Effective overall width of Gasket	=	0.318 in
Total Area between ID and OD	=	1.71 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.38 sq in
Net Area of Contact	=	1.33 sq in
Total Force for 7500 psi loading	=	10,012 lb
Force per Bolt, 7500 psi loading	=	2,503 lb
Force per Bolt, 40,000 psi loading	=	13,349 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	12,391 psi
Bolt Stress for 40,000 psi loading	=	66,084 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.318 in
Basic Gasket Seating Width bo=N/2	=	0.159 in
Effective Gasket Seating Width	b =	0.159 in
Location of Gasket Reaction	G =	1.372 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	8,567 lb
Seating Load Wm2 per bolt	=	2,142 lb
Bolt Stress for Wm2 Loading	=	10,602 psi
Area for Wm1 Loading	=	1.04 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	783 lb
Hydrostatic Load Wm1 per bolt	=	196 lb
Bolt Stress for Wm1 Loading	=	969 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load =	118 ft lb	- Do Not Exceed
Torque for	2,503 lb Bolt Load =	29 ft lb	- Minimum Preload
Torque for	2,142 lb Bolt Load =	25 ft lb	- Wm2 ref.
Torque for	196 lb Bolt Load =	2 ft lb	- Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1-300 PGE				
Flange Bore, inches	B =	1.049	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	2.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	1.000	Gasket OD	KG =	2.800
Self Energized Seal OD	G1=	1.460	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	1.049 in
Selected effective OD of Gasket	=	2.000 in
Effective overall width of Gasket	=	0.361 in
Total Area between ID and OD	=	2.28 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.49 sq in
Net Area of Contact	=	1.79 sq in
Total Force for 7500 psi loading	=	13,436 lb
Force per Bolt, 7500 psi loading	=	3,359 lb
Force per Bolt, 40,000 psi loading	=	17,914 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	16,628 psi
Bolt Stress for 40,000 psi loading	=	88,684 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.361 in
Basic Gasket Seating Width bo=N/2	=	0.180 in
Effective Gasket Seating Width	b =	0.180 in
Location of Gasket Reaction	G =	1.640 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	11,605 lb
Seating Load Wm2 per bolt	=	2,901 lb
Bolt Stress for Wm2 Loading	=	14,363 psi
Area for Wm1 Loading	=	1.67 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	1,256 lb
Hydrostatic Load Wm1 per bolt	=	314 lb
Bolt Stress for Wm1 Loading	=	1,554 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load	=	118 ft lb - Do Not Exceed
Torque for	3,359 lb Bolt Load	=	39 ft lb - Minimum Preload
Torque for	2,901 lb Bolt Load	=	34 ft lb - Wm2 ref.
Torque for	314 lb Bolt Load	=	4 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1 1/4-300 PGE				
Flange Bore, inches	B =	1.380	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	2.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	1.250	Gasket OD	KG =	3.175
Self Energized Seal OD	G1=	1.705	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	1.380 in
Selected effective OD of Gasket	=	2.500 in
Effective overall width of Gasket	=	0.445 in
Total Area between ID and OD	=	3.41 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.57 sq in
Net Area of Contact	=	2.84 sq in
Total Force for 7500 psi loading	=	21,289 lb
Force per Bolt, 7500 psi loading	=	5,322 lb
Force per Bolt, 40,000 psi loading	=	28,386 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	26,348 psi
Bolt Stress for 40,000 psi loading	=	140,524 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.445 in
Basic Gasket Seating Width bo=N/2	=	0.223 in
Effective Gasket Seating Width	b =	0.223 in
Location of Gasket Reaction	G =	2.055 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	17,956 lb
Seating Load Wm2 per bolt	=	4,489 lb
Bolt Stress for Wm2 Loading	=	22,222 psi
Area for Wm1 Loading	=	2.28 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	1,712 lb
Hydrostatic Load Wm1 per bolt	=	428 lb
Bolt Stress for Wm1 Loading	=	2,119 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load =	118 ft lb	- Do Not Exceed
Torque for	5,322 lb Bolt Load =	62 ft lb	- Minimum Preload
Torque for	4,489 lb Bolt Load =	52 ft lb	- Wm2 ref.
Torque for	428 lb Bolt Load =	5 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1 1/2-300 PGE				
Flange Bore, inches	B =	1.610	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	2.880			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	1.500	Gasket OD	KG =	3.675
Self Energized Seal OD	G1=	1.955	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	1.610 in
Selected effective OD of Gasket	=	2.880 in
Effective overall width of Gasket	=	0.520 in
Total Area between ID and OD	=	4.48 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.66 sq in
Net Area of Contact	=	3.81 sq in
Total Force for 7500 psi loading	=	28,604 lb
Force per Bolt, 7500 psi loading	=	7,151 lb
Force per Bolt, 40,000 psi loading	=	38,138 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	23,679 psi
Bolt Stress for 40,000 psi loading	=	126,286 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.520 in
Basic Gasket Seating Width bo=N/2	=	0.260 in
Effective Gasket Seating Width	b =	0.255 in
Location of Gasket Reaction	G =	2.370 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	23,729 lb
Seating Load Wm2 per bolt	=	5,932 lb
Bolt Stress for Wm2 Loading	=	19,643 psi
Area for Wm1 Loading	=	3.00 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	2,251 lb
Hydrostatic Load Wm1 per bolt	=	563 lb
Bolt Stress for Wm1 Loading	=	1,864 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load =	207 ft lb	- Do Not Exceed
Torque for	7,151 lb Bolt Load =	98 ft lb	- Minimum Preload
Torque for	5,932 lb Bolt Load =	82 ft lb	- Wm2 ref.
Torque for	563 lb Bolt Load =	8 ft lb	- Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 2-300 PGE				
Flange Bore, inches	B =	2.067	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	3.630			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	2.000	Gasket OD	KG =	4.250
Self Energized Seal OD	G1=	2.456	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	2.067 in
Selected effective OD of Gasket	=	3.630 in
Effective overall width of Gasket	=	0.666 in
Total Area between ID and OD	=	6.99 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.85 sq in
Net Area of Contact	=	6.15 sq in
Total Force for 7500 psi loading	=	46,108 lb
Force per Bolt, 7500 psi loading	=	5,764 lb
Force per Bolt, 40,000 psi loading	=	30,739 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	28,532 psi
Bolt Stress for 40,000 psi loading	=	152,172 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.666 in
Basic Gasket Seating Width bo=N/2	=	0.333 in
Effective Gasket Seating Width	b =	0.289 in
Location of Gasket Reaction	G =	3.053 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	34,602 lb
Seating Load Wm2 per bolt	=	4,325 lb
Bolt Stress for Wm2 Loading	=	21,412 psi
Area for Wm1 Loading	=	4.74 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	3,553 lb
Hydrostatic Load Wm1 per bolt	=	444 lb
Bolt Stress for Wm1 Loading	=	2,199 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load =	118 ft lb	- Do Not Exceed
Torque for	5,764 lb Bolt Load =	67 ft lb	- Minimum Preload
Torque for	4,325 lb Bolt Load =	50 ft lb	- Wm2 ref.
Torque for	444 lb Bolt Load =	5 ft lb	- Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 2 1/2-300 PGE				
Flange Bore, inches	B =	2.469	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	4.130			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	2.500	Gasket OD	KG =	5.000
Self Energized Seal OD	G1=	2.956	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	2.500 in
Selected effective OD of Gasket	=	4.130 in
Effective overall width of Gasket	=	0.700 in
Total Area between ID and OD	=	8.49 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.03 sq in
Net Area of Contact	=	7.46 sq in
Total Force for 7500 psi loading	=	55,960 lb
Force per Bolt, 7500 psi loading	=	6,995 lb
Force per Bolt, 40,000 psi loading	=	37,307 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	23,162 psi
Bolt Stress for 40,000 psi loading	=	123,532 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.700 in
Basic Gasket Seating Width bo=N/2	=	0.350 in
Effective Gasket Seating Width	b =	0.296 in
Location of Gasket Reaction	G =	3.538 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	41,103 lb
Seating Load Wm2 per bolt	=	5,138 lb
Bolt Stress for Wm2 Loading	=	17,013 psi
Area for Wm1 Loading	=	6.86 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	5,147 lb
Hydrostatic Load Wm1 per bolt	=	643 lb
Bolt Stress for Wm1 Loading	=	2,130 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load =	207 ft lb	- Do Not Exceed
Torque for	6,995 lb Bolt Load =	96 ft lb	- Minimum Preload
Torque for	5,138 lb Bolt Load =	71 ft lb	- Wm2 ref.
Torque for	643 lb Bolt Load =	9 ft lb	- Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 3-300 PGE				
Flange Bore, inches	B =	3.068	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	5.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	3.000	Gasket OD	KG =	5.750
Self Energized Seal OD	G1=	3.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	3.068 in
Selected effective OD of Gasket	=	5.000 in
Effective overall width of Gasket	=	0.851 in
Total Area between ID and OD	=	12.24 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.27 sq in
Net Area of Contact	=	10.97 sq in
Total Force for 7500 psi loading	=	82,258 lb
Force per Bolt, 7500 psi loading	=	10,282 lb
Force per Bolt, 40,000 psi loading	=	54,839 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	34,047 psi
Bolt Stress for 40,000 psi loading	=	181,585 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.851 in
Basic Gasket Seating Width bo=N/2	=	0.426 in
Effective Gasket Seating Width	b =	0.326 in
Location of Gasket Reaction	G =	4.348 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	55,685 lb
Seating Load Wm2 per bolt	=	6,961 lb
Bolt Stress for Wm2 Loading	=	23,048 psi
Area for Wm1 Loading	=	10.42 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	7,818 lb
Hydrostatic Load Wm1 per bolt	=	977 lb
Bolt Stress for Wm1 Loading	=	3,236 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load	=	207 ft lb - Do Not Exceed
Torque for	10,282 lb Bolt Load	=	141 ft lb - Minimum Preload
Torque for	6,961 lb Bolt Load	=	96 ft lb - Wm2 ref.
Torque for	977 lb Bolt Load	=	13 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 3 1/2-300 PGE				
Flange Bore, inches	B =	3.548	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	5.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	3.500	Gasket OD	KG =	6.375
Self Energized Seal OD	G1=	4.143	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	3.548 in
Selected effective OD of Gasket	=	5.500 in
Effective overall width of Gasket	=	0.861 in
Total Area between ID and OD	=	13.87 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.46 sq in
Net Area of Contact	=	12.42 sq in
Total Force for 7500 psi loading	=	93,122 lb
Force per Bolt, 7500 psi loading	=	11,640 lb
Force per Bolt, 40,000 psi loading	=	62,081 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	38,544 psi
Bolt Stress for 40,000 psi loading	=	205,567 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.861 in
Basic Gasket Seating Width bo=N/2	=	0.431 in
Effective Gasket Seating Width	b =	0.328 in
Location of Gasket Reaction	G =	4.844 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	62,404 lb
Seating Load Wm2 per bolt	=	7,800 lb
Bolt Stress for Wm2 Loading	=	25,829 psi
Area for Wm1 Loading	=	13.48 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	10,111 lb
Hydrostatic Load Wm1 per bolt	=	1,264 lb
Bolt Stress for Wm1 Loading	=	4,185 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load =	207 ft lb	- Do Not Exceed
Torque for	11,640 lb Bolt Load =	160 ft lb	- Minimum Preload
Torque for	7,800 lb Bolt Load =	107 ft lb	- Wm2 ref.
Torque for	1,264 lb Bolt Load =	17 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 4-300 PGE				
Flange Bore, inches	B =	4.026	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	6.190			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	4.000	Gasket OD	KG =	7.000
Self Energized Seal OD	G1=	4.413	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	4.026 in
Selected effective OD of Gasket	=	6.190 in
Effective overall width of Gasket	=	0.967 in
Total Area between ID and OD	=	17.36 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.55 sq in
Net Area of Contact	=	15.81 sq in
Total Force for 7500 psi loading	=	118,578 lb
Force per Bolt, 7500 psi loading	=	14,822 lb
Force per Bolt, 40,000 psi loading	=	79,052 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	49,080 psi
Bolt Stress for 40,000 psi loading	=	261,761 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.967 in
Basic Gasket Seating Width bo=N/2	=	0.484 in
Effective Gasket Seating Width	b =	0.348 in
Location of Gasket Reaction	G =	5.495 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	75,019 lb
Seating Load Wm2 per bolt	=	9,377 lb
Bolt Stress for Wm2 Loading	=	31,051 psi
Area for Wm1 Loading	=	15.30 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	11,471 lb
Hydrostatic Load Wm1 per bolt	=	1,434 lb
Bolt Stress for Wm1 Loading	=	4,748 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load =	207 ft lb	- Do Not Exceed
Torque for	14,822 lb Bolt Load =	204 ft lb	- Minimum Preload
Torque for	9,377 lb Bolt Load =	129 ft lb	- Wm2 ref.
Torque for	1,434 lb Bolt Load =	20 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 5-300 PGE				
Flange Bore, inches	B =	5.047	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	7.310			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	5.000	Gasket OD	KG =	8.375
Self Energized Seal OD	G1=	5.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	5.047 in
Selected effective OD of Gasket	=	7.310 in
Effective overall width of Gasket	=	1.017 in
Total Area between ID and OD	=	21.96 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	2.00 sq in
Net Area of Contact	=	19.97 sq in
Total Force for 7500 psi loading	=	149,743 lb
Force per Bolt, 7500 psi loading	=	18,718 lb
Force per Bolt, 40,000 psi loading	=	99,828 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	61,980 psi
Bolt Stress for 40,000 psi loading	=	330,557 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.017 in
Basic Gasket Seating Width bo=N/2	=	0.508 in
Effective Gasket Seating Width	b =	0.356 in
Location of Gasket Reaction	G =	6.597 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	92,346 lb
Seating Load Wm2 per bolt	=	11,543 lb
Bolt Stress for Wm2 Loading	=	38,223 psi
Area for Wm1 Loading	=	25.01 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	18,757 lb
Hydrostatic Load Wm1 per bolt	=	2,345 lb
Bolt Stress for Wm1 Loading	=	7,764 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load	=	207 ft lb - Do Not Exceed
Torque for	18,718 lb Bolt Load	=	257 ft lb - Minimum Preload
Torque for	11,543 lb Bolt Load	=	159 ft lb - Wm2 ref.
Torque for	2,345 lb Bolt Load	=	32 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 6-300 PGE				
Flange Bore, inches	B =	6.065	Number of Bolts	Nb =	12.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	8.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	6.000	Gasket OD	KG =	9.750
Self Energized Seal OD	G1=	6.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	6.065 in
Selected effective OD of Gasket	=	8.500 in
Effective overall width of Gasket	=	1.103 in
Total Area between ID and OD	=	27.85 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	2.36 sq in
Net Area of Contact	=	25.50 sq in
Total Force for 7500 psi loading	=	191,223 lb
Force per Bolt, 7500 psi loading	=	15,935 lb
Force per Bolt, 40,000 psi loading	=	84,988 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	52,766 psi
Bolt Stress for 40,000 psi loading	=	281,417 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.103 in
Basic Gasket Seating Width bo=N/2	=	0.551 in
Effective Gasket Seating Width	b =	0.371 in
Location of Gasket Reaction	G =	7.758 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	113,091 lb
Seating Load Wm2 per bolt	=	9,424 lb
Bolt Stress for Wm2 Loading	=	31,206 psi
Area for Wm1 Loading	=	34.66 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	25,994 lb
Hydrostatic Load Wm1 per bolt	=	2,166 lb
Bolt Stress for Wm1 Loading	=	7,173 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load	=	207 ft lb - Do Not Exceed
Torque for	15,935 lb Bolt Load	=	219 ft lb - Minimum Preload
Torque for	9,424 lb Bolt Load	=	129 ft lb - Wm2 ref.
Torque for	2,166 lb Bolt Load	=	30 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 8-300 PGE				
Flange Bore, inches	B =	7.981	Number of Bolts	Nb =	12.000
Bolt Size, inches	D =	0.875	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	10.630			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	8.000	Gasket OD	KG =	12.000
Self Energized Seal OD	G1=	8.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	8.000 in
Selected effective OD of Gasket	=	10.630 in
Effective overall width of Gasket	=	1.200 in
Total Area between ID and OD	=	38.48 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	3.08 sq in
Net Area of Contact	=	35.40 sq in
Total Force for 7500 psi loading	=	265,509 lb
Force per Bolt, 7500 psi loading	=	22,126 lb
Force per Bolt, 40,000 psi loading	=	118,004 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.42 sq in
Force at 50,000 psi bolt stress	=	20,950 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	52,806 psi
Bolt Stress for 40,000 psi loading	=	281,632 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.200 in
Basic Gasket Seating Width bo=N/2	=	0.600 in
Effective Gasket Seating Width	b =	0.387 in
Location of Gasket Reaction	G =	9.855 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	149,892 lb
Seating Load Wm2 per bolt	=	12,491 lb
Bolt Stress for Wm2 Loading	=	29,812 psi
Area for Wm1 Loading	=	58.67 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	44,003 lb
Hydrostatic Load Wm1 per bolt	=	3,667 lb
Bolt Stress for Wm1 Loading	=	8,752 psi

BOLT TORQUES

Torque for	20,950 lb Bolt Load	=	332 ft lb - Do Not Exceed
Torque for	22,126 lb Bolt Load	=	351 ft lb - Minimum Preload
Torque for	12,491 lb Bolt Load	=	198 ft lb - Wm2 ref.
Torque for	3,667 lb Bolt Load	=	58 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 10-300 PGE				
Flange Bore, inches	B =	10.020	Number of Bolts	Nb =	16.000
Bolt Size, inches	D =	1.000	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	12.750			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	10.000	Gasket OD	KG =	14.125
Self Energized Seal OD	G1=	10.730	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	10.020 in
Selected effective OD of Gasket	=	12.750 in
Effective overall width of Gasket	=	1.250 in
Total Area between ID and OD	=	48.82 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	3.84 sq in
Net Area of Contact	=	44.99 sq in
Total Force for 7500 psi loading	=	337,403 lb
Force per Bolt, 7500 psi loading	=	21,088 lb
Force per Bolt, 40,000 psi loading	=	112,468 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.55 sq in
Force at 50,000 psi bolt stress	=	27,551 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	38,271 psi
Bolt Stress for 40,000 psi loading	=	204,110 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.250 in
Basic Gasket Seating Width bo=N/2	=	0.625 in
Effective Gasket Seating Width	b =	0.395 in
Location of Gasket Reaction	G =	11.959 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	185,644 lb
Seating Load Wm2 per bolt	=	11,603 lb
Bolt Stress for Wm2 Loading	=	21,057 psi
Area for Wm1 Loading	=	90.43 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	67,819 lb
Hydrostatic Load Wm1 per bolt	=	4,239 lb
Bolt Stress for Wm1 Loading	=	7,692 psi

BOLT TORQUES

Torque for	27,551 lb Bolt Load	=	495 ft lb - Do Not Exceed
Torque for	21,088 lb Bolt Load	=	379 ft lb - Minimum Preload
Torque for	11,603 lb Bolt Load	=	208 ft lb - Wm2 ref.
Torque for	4,239 lb Bolt Load	=	76 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 12-300 PGE		
Flange Bore, inches	B = 12.000	Number of Bolts	Nb = 16.000
Bolt Size, inches	D = 1.125	Flange Type (RTJ/RF/6BX)	= RF
Raised Face OD	K = 15.000		

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG = 12.000	Gasket OD	KG = 16.500
Self Energized Seal OD	G1= 12.730	Seal Groove Width	W1= 0.115
Working Pressure	P = 750	Bolt Friction Factor	f = 0.160

CALCULATIONS

Selected effective ID of Gasket	= 12.000 in	
Selected effective OD of Gasket	= 15.000 in	
Effective overall width of Gasket	= 1.385 in	
Total Area between ID and OD	= 63.62 sq in	
Area of Ring Groove @ Flange Face	= 0.00 sq in	
Self-Energized Seal Area	= 4.56 sq in	
Net Area of Contact	= 59.06 sq in	
Total Force for 7500 psi loading	= 442,949 lb	
Force per Bolt, 7500 psi loading	= 27,684 lb	
Force per Bolt, 40,000 psi loading	= 147,650 lb	- Gasket Failure Load
Bolt Area at Minor Diameter	= 0.73 sq in	
Force at 50,000 psi bolt stress	= 36,388 lb	- Load based on Bolts
Bolt Stress for 7500 psi loading	= 38,041 psi	
Bolt Stress for 40,000 psi loading	= 202,885 psi	

ASME CODE CALCULATIONS

Net Gasket Width N	= 1.385 in	
Basic Gasket Seating Width bo=N/2	= 0.693 in	
Effective Gasket Seating Width b	= 0.416 in	
Location of Gasket Reaction G	= 14.168 in	
Design Seating Stress y	= 12,500 psi	
Seating Total Load Wm2 = 3.14bGy	= 231,496 lb	
Seating Load Wm2 per bolt	= 14,468 lb	
Bolt Stress for Wm2 Loading	= 19,881 psi	
Area for Wm1 Loading	= 127.28 sq in	
Pressure for Wm1 Loading	= 750	
Total Hydrostatic Loading Wm1	= 95,457 lb	
Hydrostatic Load Wm1 per bolt	= 5,966 lb	
Bolt Stress for Wm1 Loading	= 8,198 psi	

BOLT TORQUES

Torque for	36,388 lb Bolt Load	= 727 ft lb	- Do Not Exceed
Torque for	27,684 lb Bolt Load	= 553 ft lb	- Minimum Preload
Torque for	14,468 lb Bolt Load	= 289 ft lb	- Wm2 ref.
Torque for	5,966 lb Bolt Load	= 119 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 14-300 PGE		
Flange Bore, inches	B = 13.250	Number of Bolts	Nb = 20.000
Bolt Size, inches	D = 1.125	Flange Type (RTJ/RF/6BX)	= RF
Raised Face OD	K = 16.250		

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG = 14.000	Gasket OD	KG = 19.000
Self Energized Seal OD	G1= 14.602	Seal Groove Width	W1= 0.115
Working Pressure	P = 750	Bolt Friction Factor	f = 0.160

CALCULATIONS

Selected effective ID of Gasket	= 14.000 in	
Selected effective OD of Gasket	= 16.250 in	
Effective overall width of Gasket	= 1.010 in	
Total Area between ID and OD	= 53.46 sq in	
Area of Ring Groove @ Flange Face	= 0.00 sq in	
Self-Energized Seal Area	= 5.23 sq in	
Net Area of Contact	= 48.22 sq in	
Total Force for 7500 psi loading	= 361,668 lb	
Force per Bolt, 7500 psi loading	= 18,083 lb	
Force per Bolt, 40,000 psi loading	= 96,445 lb	- Gasket Failure Load
Bolt Area at Minor Diameter	= 0.73 sq in	
Force at 50,000 psi bolt stress	= 36,388 lb	- Load based on Bolts
Bolt Stress for 7500 psi loading	= 24,848 psi	
Bolt Stress for 40,000 psi loading	= 132,524 psi	

ASME CODE CALCULATIONS

Net Gasket Width N	= 1.010 in	
Basic Gasket Seating Width bo=N/2	= 0.505 in	
Effective Gasket Seating Width b	= 0.355 in	
Location of Gasket Reaction G	= 15.539 in	
Design Seating Stress y	= 12,500 psi	
Seating Total Load Wm2 = 3.14bGy	= 216,825 lb	
Seating Load Wm2 per bolt	= 10,841 lb	
Bolt Stress for Wm2 Loading	= 14,897 psi	
Area for Wm1 Loading	= 167.46 sq in	
Pressure for Wm1 Loading	= 750	
Total Hydrostatic Loading Wm1	= 125,596 lb	
Hydrostatic Load Wm1 per bolt	= 6,280 lb	
Bolt Stress for Wm1 Loading	= 8,629 psi	

BOLT TORQUES

Torque for	36,388 lb Bolt Load	= 727 ft lb	- Do Not Exceed
Torque for	18,083 lb Bolt Load	= 361 ft lb	- Minimum Preload
Torque for	10,841 lb Bolt Load	= 217 ft lb	- Wm2 ref.
Torque for	6,280 lb Bolt Load	= 125 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 16-300 PGE				
Flange Bore, inches	B =	15.250	Number of Bolts	Nb =	20.000
Bolt Size, inches	D =	1.250	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	18.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	16.000	Gasket OD	KG =	21.125
Self Energized Seal OD	G1=	16.730	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	16.000 in
Selected effective OD of Gasket	=	18.500 in
Effective overall width of Gasket	=	1.135 in
Total Area between ID and OD	=	67.74 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	6.00 sq in
Net Area of Contact	=	61.74 sq in
Total Force for 7500 psi loading	=	463,035 lb
Force per Bolt, 7500 psi loading	=	23,152 lb
Force per Bolt, 40,000 psi loading	=	123,476 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.93 sq in
Force at 50,000 psi bolt stress	=	46,451 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	24,920 psi
Bolt Stress for 40,000 psi loading	=	132,909 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.135 in
Basic Gasket Seating Width bo=N/2	=	0.568 in
Effective Gasket Seating Width	b =	0.377 in
Location of Gasket Reaction	G =	17.747 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	262,500 lb
Seating Load Wm2 per bolt	=	13,125 lb
Bolt Stress for Wm2 Loading	=	14,128 psi
Area for Wm1 Loading	=	219.83 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	164,871 lb
Hydrostatic Load Wm1 per bolt	=	8,244 lb
Bolt Stress for Wm1 Loading	=	8,873 psi

BOLT TORQUES

Torque for	46,451 lb Bolt Load	=	1,021 ft lb - Do Not Exceed
Torque for	23,152 lb Bolt Load	=	509 ft lb - Minimum Preload
Torque for	13,125 lb Bolt Load	=	288 ft lb - Wm2 ref.
Torque for	8,244 lb Bolt Load	=	181 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 18-300 PGE				
Flange Bore, inches	B =	17.250	Number of Bolts	Nb =	24.000
Bolt Size, inches	D =	1.250	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	21.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	18.000	Gasket OD	KG =	23.375
Self Energized Seal OD	G1=	18.668	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	18.000 in
Selected effective OD of Gasket	=	21.000 in
Effective overall width of Gasket	=	1.385 in
Total Area between ID and OD	=	91.89 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	6.70 sq in
Net Area of Contact	=	85.19 sq in
Total Force for 7500 psi loading	=	638,917 lb
Force per Bolt, 7500 psi loading	=	26,622 lb
Force per Bolt, 40,000 psi loading	=	141,982 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.93 sq in
Force at 50,000 psi bolt stress	=	46,451 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	28,655 psi
Bolt Stress for 40,000 psi loading	=	152,828 psi

ASME CODE CALCULATIONS

Net Gasket Width N	=	1.385 in
Basic Gasket Seating Width bo=N/2	=	0.693 in
Effective Gasket Seating Width b	=	0.416 in
Location of Gasket Reaction G	=	20.168 in
Design Seating Stress y	=	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	329,533 lb
Seating Load Wm2 per bolt	=	13,731 lb
Bolt Stress for Wm2 Loading	=	14,779 psi
Area for Wm1 Loading	=	273.71 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	205,281 lb
Hydrostatic Load Wm1 per bolt	=	8,553 lb
Bolt Stress for Wm1 Loading	=	9,207 psi

BOLT TORQUES

Torque for	46,451 lb Bolt Load	=	1,021 ft lb - Do Not Exceed
Torque for	26,622 lb Bolt Load	=	585 ft lb - Minimum Preload
Torque for	13,731 lb Bolt Load	=	302 ft lb - Wm2 ref.
Torque for	8,553 lb Bolt Load	=	188 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 20-300 PGE				
Flange Bore, inches	B =	19.250	Number of Bolts	Nb =	24.000
Bolt Size, inches	D =	1.250	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	23.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	20.000	Gasket OD	KG =	25.625
Self Energized Seal OD	G1=	20.668	Seal Groove Width	W1=	0.115
Working Pressure	P =	750	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	20.000 in
Selected effective OD of Gasket	=	23.000 in
Effective overall width of Gasket	=	1.385 in
Total Area between ID and OD	=	101.32 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	7.43 sq in
Net Area of Contact	=	93.89 sq in
Total Force for 7500 psi loading	=	704,184 lb
Force per Bolt, 7500 psi loading	=	29,341 lb
Force per Bolt, 40,000 psi loading	=	156,485 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.93 sq in
Force at 50,000 psi bolt stress	=	46,451 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	31,582 psi
Bolt Stress for 40,000 psi loading	=	168,440 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.385 in
Basic Gasket Seating Width bo=N/2	=	0.693 in
Effective Gasket Seating Width	b =	0.416 in
Location of Gasket Reaction	G =	22.168 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	362,212 lb
Seating Load Wm2 per bolt	=	15,092 lb
Bolt Stress for Wm2 Loading	=	16,245 psi
Area for Wm1 Loading	=	335.50 sq in
Pressure for Wm1 Loading	=	750
Total Hydrostatic Loading Wm1	=	251,622 lb
Hydrostatic Load Wm1 per bolt	=	10,484 lb
Bolt Stress for Wm1 Loading	=	11,285 psi

BOLT TORQUES

Torque for	46,451 lb Bolt Load	=	1,021 ft lb - Do Not Exceed
Torque for	29,341 lb Bolt Load	=	645 ft lb - Minimum Preload
Torque for	15,092 lb Bolt Load	=	332 ft lb - Wm2 ref.
Torque for	10,484 lb Bolt Load	=	230 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 24-300 PGE		
Flange Bore, inches	B = 23.250	Number of Bolts	Nb = 24.000
Bolt Size, inches	D = 1.500	Flange Type (RTJ/RF/6BX)	= RF
Raised Face OD	K = 27.250		

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG = 24.000	Gasket OD	KG = 30.375
Self Energized Seal OD	G1= 24.668	Seal Groove Width	W1= 0.115
Working Pressure	P = 750	Bolt Friction Factor	f = 0.160

CALCULATIONS

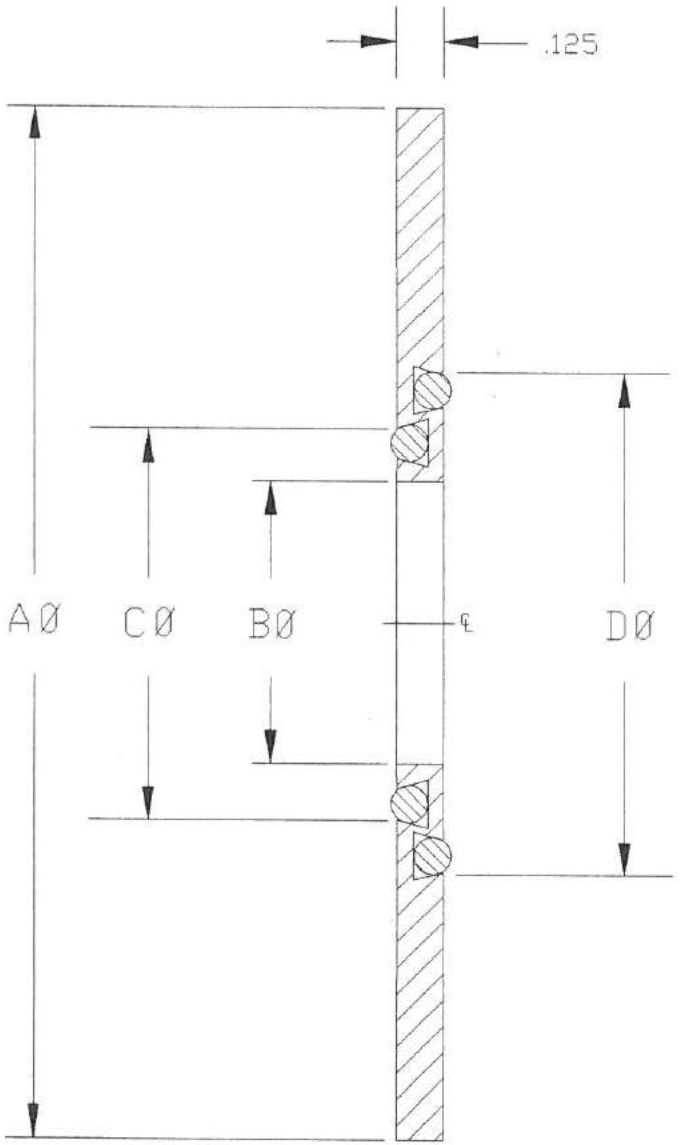
Selected effective ID of Gasket	= 24.000 in	
Selected effective OD of Gasket	= 27.250 in	
Effective overall width of Gasket	= 1.510 in	
Total Area between ID and OD	= 130.82 sq in	
Area of Ring Groove @ Flange Face	= 0.00 sq in	
Self-Energized Seal Area	= 8.87 sq in	
Net Area of Contact	= 121.95 sq in	
Total Force for 7500 psi loading	= 914,607 lb	
Force per Bolt, 7500 psi loading	= 38,109 lb	
Force per Bolt, 40,000 psi loading	= 203,246 lb	- Gasket Failure Load
Bolt Area at Minor Diameter	= 1.41 sq in	
Force at 50,000 psi bolt stress	= 70,261 lb	- Load based on Bolts
Bolt Stress for 7500 psi loading	= 27,119 psi	
Bolt Stress for 40,000 psi loading	= 144,637 psi	

ASME CODE CALCULATIONS

Net Gasket Width	N = 1.510 in	
Basic Gasket Seating Width	bo=N/2 = 0.755 in	
Effective Gasket Seating Width	b = 0.434 in	
Location of Gasket Reaction	G = 26.381 in	
Design Seating Stress	y = 12,500 psi	
Seating Total Load Wm2 = 3.14bGy	= 450,086 lb	
Seating Load Wm2 per bolt	= 18,754 lb	
Bolt Stress for Wm2 Loading	= 13,346 psi	
Area for Wm1 Loading	= 477.92 sq in	
Pressure for Wm1 Loading	= 750	
Total Hydrostatic Loading Wm1	= 358,443 lb	
Hydrostatic Load Wm1 per bolt	= 14,935 lb	
Bolt Stress for Wm1 Loading	= 10,628 psi	

BOLT TORQUES

Torque for	70,261 lb Bolt Load	= 1,825 ft lb	- Do Not Exceed
Torque for	38,109 lb Bolt Load	= 990 ft lb	- Minimum Preload
Torque for	18,754 lb Bolt Load	= 487 ft lb	- Wm2 ref.
Torque for	14,935 lb Bolt Load	= 388 ft lb	- Wm1 ref.



SIZE	A	B	C	D
24"	31.000	24.000	24.668	25.398
20"	26.750	20.000	20.668	21.398
18"	24.000	18.000	18.668	19.398
16"	22.125	16.000	16.730	17.160
14"	19.250	14.000	14.602	15.032
12"	17.875	12.000	12.730	13.160
10"	15.625	10.000	10.730	11.160
8"	12.500	8.000	8.643	9.143
6"	10.375	6.000	6.643	7.143
5"	9.375	5.000	5.643	6.143
4"	7.500	4.000	4.413	5.143
3 1/2"	6.250	3.500	4.143	4.463
3"	5.750	3.000	3.643	4.143
2 1/2"	5.000	2.500	2.956	3.395
2"	4.250	2.000	2.456	2.831
1 1/2"	3.675	1.500	1.955	2.393
1 1/4"	3.175	1.250	1.705	2.081
1"	2.800	1.000	1.460	1.835
3/4"	2.550	.700	1.153	1.528
1/2"	2.050	.500	.913	1.288

DESCRIPTION:
PIKOTEK PGE FLANGE GASKET FOR FLANGE SPECIFICATION ANSI B16.5 WITH O-RING SEALS FOR 600# CLASS

SCALE: NONE | APPRV: | LIMITS ON DIMENSIONS UNLESS OTHERWISE NOTED .XX DECIMAL = .040 .XXX DECIMAL = .040

DATE: 3/13/95 | DRAWN BY: SCHIBBELHUT | REVISED:

pikotek
engineering solutions today
for tomorrow's problems

Drawing Number:
PGE-600-0-I

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1/2-600 PGE				
Flange Bore, inches	B =	0.622	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.500	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	1.380			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	0.500	Gasket OD	KG =	2.050
Self Energized Seal OD	G1=	0.913	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	0.622 in
Selected effective OD of Gasket	=	1.380 in
Effective overall width of Gasket	=	0.264 in
Total Area between ID and OD	=	1.19 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.29 sq in
Net Area of Contact	=	0.90 sq in
Total Force for 7500 psi loading	=	6,777 lb
Force per Bolt, 7500 psi loading	=	1,694 lb
Force per Bolt, 40,000 psi loading	=	9,036 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.13 sq in
Force at 50,000 psi bolt stress	=	6,285 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	13,478 psi
Bolt Stress for 40,000 psi loading	=	71,882 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.264 in
Basic Gasket Seating Width bo=N/2	=	0.132 in
Effective Gasket Seating Width	b =	0.132 in
Location of Gasket Reaction	G =	1.116 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	5,785 lb
Seating Load Wm2 per bolt	=	1,446 lb
Bolt Stress for Wm2 Loading	=	11,505 psi
Area for Wm1 Loading	=	0.65 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	943 lb
Hydrostatic Load Wm1 per bolt	=	236 lb
Bolt Stress for Wm1 Loading	=	1,875 psi

BOLT TORQUES

Torque for	6,285 lb Bolt Load	=	60 ft lb - Do Not Exceed
Torque for	1,694 lb Bolt Load	=	16 ft lb - Minimum Preload
Torque for	1,446 lb Bolt Load	=	14 ft lb - Wm2 ref.
Torque for	236 lb Bolt Load	=	2 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1-600 PGE				
Flange Bore, inches	B =	1.049	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	2.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	1.000	Gasket OD	KG =	2.800
Self Energized Seal OD	G1=	1.460	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	1.049 in
Selected effective OD of Gasket	=	2.000 in
Effective overall width of Gasket	=	0.361 in
Total Area between ID and OD	=	2.28 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.49 sq in
Net Area of Contact	=	1.79 sq in
Total Force for 7500 psi loading	=	13,436 lb
Force per Bolt, 7500 psi loading	=	3,359 lb
Force per Bolt, 40,000 psi loading	=	17,914 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	16,628 psi
Bolt Stress for 40,000 psi loading	=	88,684 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.361 in
Basic Gasket Seating Width bo=N/2	=	0.180 in
Effective Gasket Seating Width	b =	0.180 in
Location of Gasket Reaction	G =	1.640 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	11,605 lb
Seating Load Wm2 per bolt	=	2,901 lb
Bolt Stress for Wm2 Loading	=	14,363 psi
Area for Wm1 Loading	=	1.67 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	2,411 lb
Hydrostatic Load Wm1 per bolt	=	603 lb
Bolt Stress for Wm1 Loading	=	2,984 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load =	118 ft lb	- Do Not Exceed
Torque for	3,359 lb Bolt Load =	39 ft lb	- Minimum Preload
Torque for	2,901 lb Bolt Load =	34 ft lb	- Wm2 ref.
Torque for	603 lb Bolt Load =	7 ft lb	- Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1 1/4-600 PGE				
Flange Bore, inches	B =	1.380	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	2.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	1.250	Gasket OD	KG =	3.175
Self Energized Seal OD	G1=	1.705	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	1.380 in
Selected effective OD of Gasket	=	2.500 in
Effective overall width of Gasket	=	0.445 in
Total Area between ID and OD	=	3.41 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.57 sq in
Net Area of Contact	=	2.84 sq in
Total Force for 7500 psi loading	=	21,289 lb
Force per Bolt, 7500 psi loading	=	5,322 lb
Force per Bolt, 40,000 psi loading	=	28,386 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	26,348 psi
Bolt Stress for 40,000 psi loading	=	140,524 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.445 in
Basic Gasket Seating Width bo=N/2	=	0.223 in
Effective Gasket Seating Width	b =	0.223 in
Location of Gasket Reaction	G =	2.055 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	17,956 lb
Seating Load Wm2 per bolt	=	4,489 lb
Bolt Stress for Wm2 Loading	=	22,222 psi
Area for Wm1 Loading	=	2.28 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	3,288 lb
Hydrostatic Load Wm1 per bolt	=	822 lb
Bolt Stress for Wm1 Loading	=	4,069 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load	=	118 ft lb - Do Not Exceed
Torque for	5,322 lb Bolt Load	=	62 ft lb - Minimum Preload
Torque for	4,489 lb Bolt Load	=	52 ft lb - Wm2 ref.
Torque for	822 lb Bolt Load	=	10 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 1 1/2-600 PGE				
Flange Bore, inches	B =	1.610	Number of Bolts	Nb =	4.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	2.880			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	1.500	Gasket OD	KG =	3.675
Self Energized Seal OD	G1=	1.955	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	1.610 in
Selected effective OD of Gasket	=	2.880 in
Effective overall width of Gasket	=	0.520 in
Total Area between ID and OD	=	4.48 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.66 sq in
Net Area of Contact	=	3.81 sq in
Total Force for 7500 psi loading	=	28,604 lb
Force per Bolt, 7500 psi loading	=	7,151 lb
Force per Bolt, 40,000 psi loading	=	38,138 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	23,679 psi
Bolt Stress for 40,000 psi loading	=	126,286 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.520 in
Basic Gasket Seating Width bo=N/2	=	0.260 in
Effective Gasket Seating Width	b =	0.255 in
Location of Gasket Reaction	G =	2.370 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	23,729 lb
Seating Load Wm2 per bolt	=	5,932 lb
Bolt Stress for Wm2 Loading	=	19,643 psi
Area for Wm1 Loading	=	3.00 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	4,323 lb
Hydrostatic Load Wm1 per bolt	=	1,081 lb
Bolt Stress for Wm1 Loading	=	3,578 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load =	207 ft lb	- Do Not Exceed
Torque for	7,151 lb Bolt Load =	98 ft lb	- Minimum Preload
Torque for	5,932 lb Bolt Load =	82 ft lb	- Wm2 ref.
Torque for	1,081 lb Bolt Load =	15 ft lb	- Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 2-600 PGE				
Flange Bore, inches	B =	2.067	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.625	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	3.630			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	2.000	Gasket OD	KG =	4.250
Self Energized Seal OD	G1=	2.456	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	2.067 in
Selected effective OD of Gasket	=	3.630 in
Effective overall width of Gasket	=	0.666 in
Total Area between ID and OD	=	6.99 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	0.85 sq in
Net Area of Contact	=	6.15 sq in
Total Force for 7500 psi loading	=	46,108 lb
Force per Bolt, 7500 psi loading	=	5,764 lb
Force per Bolt, 40,000 psi loading	=	30,739 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.20 sq in
Force at 50,000 psi bolt stress	=	10,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	28,532 psi
Bolt Stress for 40,000 psi loading	=	152,172 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.666 in
Basic Gasket Seating Width bo=N/2	=	0.333 in
Effective Gasket Seating Width	b =	0.289 in
Location of Gasket Reaction	G =	3.053 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	34,602 lb
Seating Load Wm2 per bolt	=	4,325 lb
Bolt Stress for Wm2 Loading	=	21,412 psi
Area for Wm1 Loading	=	4.74 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	6,822 lb
Hydrostatic Load Wm1 per bolt	=	853 lb
Bolt Stress for Wm1 Loading	=	4,222 psi

BOLT TORQUES

Torque for	10,100 lb Bolt Load	=	118 ft lb - Do Not Exceed
Torque for	5,764 lb Bolt Load	=	67 ft lb - Minimum Preload
Torque for	4,325 lb Bolt Load	=	50 ft lb - Wm2 ref.
Torque for	853 lb Bolt Load	=	10 ft lb - Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 2 1/2-600 PGE				
Flange Bore, inches	B =	2.469	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	4.130			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	2.500	Gasket OD	KG =	5.000
Self Energized Seal OD	G1=	2.956	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	2.500 in
Selected effective OD of Gasket	=	4.130 in
Effective overall width of Gasket	=	0.700 in
Total Area between ID and OD	=	8.49 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.03 sq in
Net Area of Contact	=	7.46 sq in
Total Force for 7500 psi loading	=	55,960 lb
Force per Bolt, 7500 psi loading	=	6,995 lb
Force per Bolt, 40,000 psi loading	=	37,307 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	23,162 psi
Bolt Stress for 40,000 psi loading	=	123,532 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.700 in
Basic Gasket Seating Width bo=N/2	=	0.350 in
Effective Gasket Seating Width	b =	0.296 in
Location of Gasket Reaction	G =	3.538 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	41,103 lb
Seating Load Wm2 per bolt	=	5,138 lb
Bolt Stress for Wm2 Loading	=	17,013 psi
Area for Wm1 Loading	=	6.86 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	9,882 lb
Hydrostatic Load Wm1 per bolt	=	1,235 lb
Bolt Stress for Wm1 Loading	=	4,090 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load =	207 ft lb	- Do Not Exceed
Torque for	6,995 lb Bolt Load =	96 ft lb	- Minimum Preload
Torque for	5,138 lb Bolt Load =	71 ft lb	- Wm2 ref.
Torque for	1,235 lb Bolt Load =	17 ft lb	- Wm1 ref.

02-28-1995

PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 3-600 PGE				
Flange Bore, inches	B =	3.068	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.750	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	5.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	3.000	Gasket OD	KG =	5.750
Self Energized Seal OD	G1=	3.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	3.068 in
Selected effective OD of Gasket	=	5.000 in
Effective overall width of Gasket	=	0.851 in
Total Area between ID and OD	=	12.24 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.27 sq in
Net Area of Contact	=	10.97 sq in
Total Force for 7500 psi loading	=	82,258 lb
Force per Bolt, 7500 psi loading	=	10,282 lb
Force per Bolt, 40,000 psi loading	=	54,839 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.30 sq in
Force at 50,000 psi bolt stress	=	15,100 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	34,047 psi
Bolt Stress for 40,000 psi loading	=	181,585 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.851 in
Basic Gasket Seating Width bo=N/2	=	0.426 in
Effective Gasket Seating Width	b =	0.326 in
Location of Gasket Reaction	G =	4.348 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	55,685 lb
Seating Load Wm2 per bolt	=	6,961 lb
Bolt Stress for Wm2 Loading	=	23,048 psi
Area for Wm1 Loading	=	10.42 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	15,010 lb
Hydrostatic Load Wm1 per bolt	=	1,876 lb
Bolt Stress for Wm1 Loading	=	6,213 psi

BOLT TORQUES

Torque for	15,100 lb Bolt Load =	207 ft lb	- Do Not Exceed
Torque for	10,282 lb Bolt Load =	141 ft lb	- Minimum Preload
Torque for	6,961 lb Bolt Load =	96 ft lb	- Wm2 ref.
Torque for	1,876 lb Bolt Load =	26 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 3 1/2-600 PGE				
Flange Bore, inches	B =	3.548	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.875	Flange Type (RTJ/RF/6BX) =		RF
Raised Face OD	K =	5.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	3.500	Gasket OD	KG =	6.250
Self Energized Seal OD	G1=	4.143	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	3.548 in
Selected effective OD of Gasket	=	5.500 in
Effective overall width of Gasket	=	0.861 in
Total Area between ID and OD	=	13.87 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.46 sq in
Net Area of Contact	=	12.42 sq in
Total Force for 7500 psi loading	=	93,122 lb
Force per Bolt, 7500 psi loading	=	11,640 lb
Force per Bolt, 40,000 psi loading	=	62,081 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.42 sq in
Force at 50,000 psi bolt stress	=	20,950 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	27,781 psi
Bolt Stress for 40,000 psi loading	=	148,165 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.861 in
Basic Gasket Seating Width bo=N/2	=	0.431 in
Effective Gasket Seating Width	b =	0.328 in
Location of Gasket Reaction	G =	4.844 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	62,404 lb
Seating Load Wm2 per bolt	=	7,800 lb
Bolt Stress for Wm2 Loading	=	18,617 psi
Area for Wm1 Loading	=	13.48 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	19,413 lb
Hydrostatic Load Wm1 per bolt	=	2,427 lb
Bolt Stress for Wm1 Loading	=	5,791 psi

BOLT TORQUES

Torque for	20,950 lb Bolt Load =	332 ft lb	- Do Not Exceed
Torque for	11,640 lb Bolt Load =	184 ft lb	- Minimum Preload
Torque for	7,800 lb Bolt Load =	124 ft lb	- Wm2 ref.
Torque for	2,427 lb Bolt Load =	38 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 4-600 PGE				
Flange Bore, inches	B =	4.026	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	0.875	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	6.190			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	4.000	Gasket OD	KG =	7.500
Self Energized Seal OD	G1=	4.413	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	4.026 in
Selected effective OD of Gasket	=	6.190 in
Effective overall width of Gasket	=	0.967 in
Total Area between ID and OD	=	17.36 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	1.55 sq in
Net Area of Contact	=	15.81 sq in
Total Force for 7500 psi loading	=	118,578 lb
Force per Bolt, 7500 psi loading	=	14,822 lb
Force per Bolt, 40,000 psi loading	=	79,052 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.42 sq in
Force at 50,000 psi bolt stress	=	20,950 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	35,375 psi
Bolt Stress for 40,000 psi loading	=	188,668 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	0.967 in
Basic Gasket Seating Width bo=N/2	=	0.484 in
Effective Gasket Seating Width	b =	0.348 in
Location of Gasket Reaction	G =	5.495 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	75,019 lb
Seating Load Wm2 per bolt	=	9,377 lb
Bolt Stress for Wm2 Loading	=	22,380 psi
Area for Wm1 Loading	=	15.30 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	22,025 lb
Hydrostatic Load Wm1 per bolt	=	2,753 lb
Bolt Stress for Wm1 Loading	=	6,571 psi

BOLT TORQUES

Torque for	20,950 lb Bolt Load	=	332 ft lb - Do Not Exceed
Torque for	14,822 lb Bolt Load	=	235 ft lb - Minimum Preload
Torque for	9,377 lb Bolt Load	=	149 ft lb - Wm2 ref.
Torque for	2,753 lb Bolt Load	=	44 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 5-600 PGE				
Flange Bore, inches	B =	5.047	Number of Bolts	Nb =	8.000
Bolt Size, inches	D =	1.000	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	7.310			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	5.000	Gasket OD	KG =	9.375
Self Energized Seal OD	G1=	5.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	5.047 in
Selected effective OD of Gasket	=	7.310 in
Effective overall width of Gasket	=	1.017 in
Total Area between ID and OD	=	21.96 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	2.00 sq in
Net Area of Contact	=	19.97 sq in
Total Force for 7500 psi loading	=	149,743 lb
Force per Bolt, 7500 psi loading	=	18,718 lb
Force per Bolt, 40,000 psi loading	=	99,828 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.55 sq in
Force at 50,000 psi bolt stress	=	27,551 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	33,970 psi
Bolt Stress for 40,000 psi loading	=	181,171 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.017 in
Basic Gasket Seating Width bo=N/2	=	0.508 in
Effective Gasket Seating Width	b =	0.356 in
Location of Gasket Reaction	G =	6.597 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	92,346 lb
Seating Load Wm2 per bolt	=	11,543 lb
Bolt Stress for Wm2 Loading	=	20,949 psi
Area for Wm1 Loading	=	25.01 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	36,014 lb
Hydrostatic Load Wm1 per bolt	=	4,502 lb
Bolt Stress for Wm1 Loading	=	8,170 psi

BOLT TORQUES

Torque for	27,551 lb Bolt Load	=	495 ft lb - Do Not Exceed
Torque for	18,718 lb Bolt Load	=	336 ft lb - Minimum Preload
Torque for	11,543 lb Bolt Load	=	207 ft lb - Wm2 ref.
Torque for	4,502 lb Bolt Load	=	81 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 6-600 PGE				
Flange Bore, inches	B =	6.065	Number of Bolts	Nb =	12.000
Bolt Size, inches	D =	1.000	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	8.500			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	6.000	Gasket OD	KG =	10.375
Self Energized Seal OD	G1=	6.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	6.065 in
Selected effective OD of Gasket	=	8.500 in
Effective overall width of Gasket	=	1.103 in
Total Area between ID and OD	=	27.85 sq in
Area of Ring Groove @ Flange Face	=	0.00 sq in
Self-Energized Seal Area	=	2.36 sq in
Net Area of Contact	=	25.50 sq in
Total Force for 7500 psi loading	=	191,223 lb
Force per Bolt, 7500 psi loading	=	15,935 lb
Force per Bolt, 40,000 psi loading	=	84,988 lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.55 sq in
Force at 50,000 psi bolt stress	=	27,551 lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	28,920 psi
Bolt Stress for 40,000 psi loading	=	154,238 psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.103 in
Basic Gasket Seating Width bo=N/2	=	0.551 in
Effective Gasket Seating Width	b =	0.371 in
Location of Gasket Reaction	G =	7.758 in
Design Seating Stress	y =	12,500 psi
Seating Total Load Wm2 = 3.14bGy	=	113,091 lb
Seating Load Wm2 per bolt	=	9,424 lb
Bolt Stress for Wm2 Loading	=	17,103 psi
Area for Wm1 Loading	=	34.66 sq in
Pressure for Wm1 Loading	=	1,440
Total Hydrostatic Loading Wm1	=	49,909 lb
Hydrostatic Load Wm1 per bolt	=	4,159 lb
Bolt Stress for Wm1 Loading	=	7,548 psi

BOLT TORQUES

Torque for	27,551 lb Bolt Load	=	495 ft lb - Do Not Exceed
Torque for	15,935 lb Bolt Load	=	286 ft lb - Minimum Preload
Torque for	9,424 lb Bolt Load	=	169 ft lb - Wm2 ref.
Torque for	4,159 lb Bolt Load	=	75 ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 8-600 PGE				
Flange Bore, inches	B =	7.981	Number of Bolts	Nb =	12.000
Bolt Size, inches	D =	1.125	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	10.630			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	8.000	Gasket OD	KG =	12.500
Self Energized Seal OD	G1=	8.643	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	8.000 in	
Selected effective OD of Gasket	=	10.630 in	
Effective overall width of Gasket	=	1.200 in	
Total Area between ID and OD	=	38.48 sq in	
Area of Ring Groove @ Flange Face	=	0.00 sq in	
Self-Energized Seal Area	=	3.08 sq in	
Net Area of Contact	=	35.40 sq in	
Total Force for 7500 psi loading	=	265,509 lb	
Force per Bolt, 7500 psi loading	=	22,126 lb	
Force per Bolt, 40,000 psi loading	=	118,004 lb	- Gasket Failure Load
Bolt Area at Minor Diameter	=	0.73 sq in	
Force at 50,000 psi bolt stress	=	36,388 lb	- Load based on Bolts
Bolt Stress for 7500 psi loading	=	30,403 psi	
Bolt Stress for 40,000 psi loading	=	162,149 psi	

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.200 in	
Basic Gasket Seating Width bo=N/2	=	0.600 in	
Effective Gasket Seating Width	b =	0.387 in	
Location of Gasket Reaction	G =	9.855 in	
Design Seating Stress	y =	12,500 psi	
Seating Total Load Wm2 = 3.14bGy	=	149,892 lb	
Seating Load Wm2 per bolt	=	12,491 lb	
Bolt Stress for Wm2 Loading	=	17,164 psi	
Area for Wm1 Loading	=	58.67 sq in	
Pressure for Wm1 Loading	=	1,440	
Total Hydrostatic Loading Wm1	=	84,486 lb	
Hydrostatic Load Wm1 per bolt	=	7,040 lb	
Bolt Stress for Wm1 Loading	=	9,674 psi	

BOLT TORQUES

Torque for	36,388 lb Bolt Load	=	727 ft lb	- Do Not Exceed
Torque for	22,126 lb Bolt Load	=	442 ft lb	- Minimum Preload
Torque for	12,491 lb Bolt Load	=	249 ft lb	- Wm2 ref.
Torque for	7,040 lb Bolt Load	=	141 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 10-600 PGE				
Flange Bore, inches	B =	10.020	Number of Bolts	Nb =	16.000
Bolt Size, inches	D =	1.250	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	12.750			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	10.000	Gasket OD	KG =	15.625
Self Energized Seal OD	G1=	10.730	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	10.020	in
Selected effective OD of Gasket	=	12.750	in
Effective overall width of Gasket	=	1.250	in
Total Area between ID and OD	=	48.82	sq in
Area of Ring Groove @ Flange Face	=	0.00	sq in
Self-Energized Seal Area	=	3.84	sq in
Net Area of Contact	=	44.99	sq in
Total Force for 7500 psi loading	=	337,403	lb
Force per Bolt, 7500 psi loading	=	21,088	lb
Force per Bolt, 40,000 psi loading	=	112,468	lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.93	sq in
Force at 50,000 psi bolt stress	=	46,451	lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	22,699	psi
Bolt Stress for 40,000 psi loading	=	121,059	psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.250	in
Basic Gasket Seating Width bo=N/2	=	0.625	in
Effective Gasket Seating Width	b =	0.395	in
Location of Gasket Reaction	G =	11.959	in
Design Seating Stress	y =	12,500	psi
Seating Total Load Wm2 = 3.14bGy	=	185,644	lb
Seating Load Wm2 per bolt	=	11,603	lb
Bolt Stress for Wm2 Loading	=	12,489	psi
Area for Wm1 Loading	=	90.43	sq in
Pressure for Wm1 Loading	=	1,440	
Total Hydrostatic Loading Wm1	=	130,213	lb
Hydrostatic Load Wm1 per bolt	=	8,138	lb
Bolt Stress for Wm1 Loading	=	8,760	psi

BOLT TORQUES

Torque for	46,451 lb Bolt Load	=	1,021 ft lb	- Do Not Exceed
Torque for	21,088 lb Bolt Load	=	463 ft lb	- Minimum Preload
Torque for	11,603 lb Bolt Load	=	255 ft lb	- Wm2 ref.
Torque for	8,138 lb Bolt Load	=	179 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 12-600 PGE				
Flange Bore, inches	B =	12.000	Number of Bolts	Nb =	20.000
Bolt Size, inches	D =	1.250	Flange Type (RTJ/RF/6BX)	=	RF
Raised Face OD	K =	15.000			

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG =	12.000	Gasket OD	KG =	17.875
Self Energized Seal OD	G1=	12.730	Seal Groove Width	W1=	0.115
Working Pressure	P =	1,440	Bolt Friction Factor	f =	0.160

CALCULATIONS

Selected effective ID of Gasket	=	12.000	in
Selected effective OD of Gasket	=	15.000	in
Effective overall width of Gasket	=	1.385	in
Total Area between ID and OD	=	63.62	sq in
Area of Ring Groove @ Flange Face	=	0.00	sq in
Self-Energized Seal Area	=	4.56	sq in
Net Area of Contact	=	59.06	sq in
Total Force for 7500 psi loading	=	442,949	lb
Force per Bolt, 7500 psi loading	=	22,147	lb
Force per Bolt, 40,000 psi loading	=	118,120	lb - Gasket Failure Load
Bolt Area at Minor Diameter	=	0.93	sq in
Force at 50,000 psi bolt stress	=	46,451	lb - Load based on Bolts
Bolt Stress for 7500 psi loading	=	23,839	psi
Bolt Stress for 40,000 psi loading	=	127,143	psi

ASME CODE CALCULATIONS

Net Gasket Width	N =	1.385	in
Basic Gasket Seating Width bo=N/2	=	0.693	in
Effective Gasket Seating Width	b =	0.416	in
Location of Gasket Reaction	G =	14.168	in
Design Seating Stress	y =	12,500	psi
Seating Total Load Wm2 = 3.14bGy	=	231,496	lb
Seating Load Wm2 per bolt	=	11,575	lb
Bolt Stress for Wm2 Loading	=	12,459	psi
Area for Wm1 Loading	=	127.28	sq in
Pressure for Wm1 Loading	=	1,440	
Total Hydrostatic Loading Wm1	=	183,278	lb
Hydrostatic Load Wm1 per bolt	=	9,164	lb
Bolt Stress for Wm1 Loading	=	9,864	psi

BOLT TORQUES

Torque for	46,451 lb Bolt Load	=	1,021	ft lb - Do Not Exceed
Torque for	22,147 lb Bolt Load	=	487	ft lb - Minimum Preload
Torque for	11,575 lb Bolt Load	=	254	ft lb - Wm2 ref.
Torque for	9,164 lb Bolt Load	=	201	ft lb - Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 20-600 PGE		
Flange Bore, inches	B = 19.250	Number of Bolts	Nb = 24.000
Bolt Size, inches	D = 1.625	Flange Type (RTJ/RF/6BX)	= RF
Raised Face OD	K = 23.000		

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG = 20.000	Gasket OD	KG = 26.747
Self Energized Seal OD	G1= 20.668	Seal Groove Width	W1= 0.115
Working Pressure	P = 1,440	Bolt Friction Factor	f = 0.160

CALCULATIONS

Selected effective ID of Gasket	= 20.000 in	
Selected effective OD of Gasket	= 23.000 in	
Effective overall width of Gasket	= 1.385 in	
Total Area between ID and OD	= 101.32 sq in	
Area of Ring Groove @ Flange Face	= 0.00 sq in	
Self-Energized Seal Area	= 7.43 sq in	
Net Area of Contact	= 93.89 sq in	
Total Force for 7500 psi loading	= 704,184 lb	
Force per Bolt, 7500 psi loading	= 29,341 lb	
Force per Bolt, 40,000 psi loading	= 156,485 lb	- Gasket Failure Load
Bolt Area at Minor Diameter	= 1.68 sq in	
Force at 50,000 psi bolt stress	= 84,006 lb	- Load based on Bolts
Bolt Stress for 7500 psi loading	= 17,464 psi	
Bolt Stress for 40,000 psi loading	= 93,139 psi	

ASME CODE CALCULATIONS

Net Gasket Width	N = 1.385 in	
Basic Gasket Seating Width bo=N/2	= 0.693 in	
Effective Gasket Seating Width	b = 0.416 in	
Location of Gasket Reaction	G = 22.168 in	
Design Seating Stress	y = 12,500 psi	
Seating Total Load Wm2 = 3.14bGy	= 362,212 lb	
Seating Load Wm2 per bolt	= 15,092 lb	
Bolt Stress for Wm2 Loading	= 8,983 psi	
Area for Wm1 Loading	= 335.50 sq in	
Pressure for Wm1 Loading	= 1,440	
Total Hydrostatic Loading Wm1	= 483,115 lb	
Hydrostatic Load Wm1 per bolt	= 20,130 lb	
Bolt Stress for Wm1 Loading	= 11,981 psi	

BOLT TORQUES

Torque for	84,006 lb Bolt Load =	2,351 ft lb	- Do Not Exceed
Torque for	29,341 lb Bolt Load =	821 ft lb	- Minimum Preload
Torque for	15,092 lb Bolt Load =	422 ft lb	- Wm2 ref.
Torque for	20,130 lb Bolt Load =	563 ft lb	- Wm1 ref.

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PIKOTEK FLANGE ANALYSIS SYSTEM
BASIC FLANGE DIMENSIONS

Flange Description:	ANSI 24-600 PGE		
Flange Bore, inches	B = 23.250	Number of Bolts	Nb = 24.000
Bolt Size, inches	D = 1.875	Flange Type (RTJ/RF/6BX)	= RF
Raised Face OD	K = 27.250		

PIKOTEK GASKET AND LOADING DATA

Gasket ID	BG = 24.000	Gasket OD	KG = 31.000
Self Energized Seal OD	G1= 24.668	Seal Groove Width	W1= 0.115
Working Pressure	P = 1,440	Bolt Friction Factor	f = 0.160

CALCULATIONS

Selected effective ID of Gasket	= 24.000 in	
Selected effective OD of Gasket	= 27.250 in	
Effective overall width of Gasket	= 1.510 in	
Total Area between ID and OD	= 130.82 sq in	
Area of Ring Groove @ Flange Face	= 0.00 sq in	
Self-Energized Seal Area	= 8.87 sq in	
Net Area of Contact	= 121.95 sq in	
Total Force for 7500 psi loading	= 914,607 lb	
Force per Bolt, 7500 psi loading	= 38,109 lb	
Force per Bolt, 40,000 psi loading	= 203,246 lb	- Gasket Failure Load
Bolt Area at Minor Diameter	= 2.30 sq in	
Force at 50,000 psi bolt stress	= 115,179 lb	- Load based on Bolts
Bolt Stress for 7500 psi loading	= 16,543 psi	
Bolt Stress for 40,000 psi loading	= 88,231 psi	

ASME CODE CALCULATIONS

Net Gasket Width	N = 1.510 in	
Basic Gasket Seating Width bo=N/2	= 0.755 in	
Effective Gasket Seating Width	b = 0.434 in	
Location of Gasket Reaction	G = 26.381 in	
Design Seating Stress	y = 12,500 psi	
Seating Total Load Wm2 = 3.14bGy	= 450,086 lb	
Seating Load Wm2 per bolt	= 18,754 lb	
Bolt Stress for Wm2 Loading	= 8,141 psi	
Area for Wm1 Loading	= 477.92 sq in	
Pressure for Wm1 Loading	= 1,440	
Total Hydrostatic Loading Wm1	= 688,210 lb	
Hydrostatic Load Wm1 per bolt	= 28,675 lb	
Bolt Stress for Wm1 Loading	= 12,448 psi	

BOLT TORQUES

Torque for	115,179 lb Bolt Load	= 3,684 ft lb	- Do Not Exceed
Torque for	38,109 lb Bolt Load	= 1,219 ft lb	- Minimum Preload
Torque for	18,754 lb Bolt Load	= 600 ft lb	- Wm2 ref.
Torque for	28,675 lb Bolt Load	= 917 ft lb	- Wm1 ref.