



**Roots**

## 718 URAI

Part Number – 65122020



- Detachable steel mounting feet
- Rigid one-piece cast iron casing
- Connections in standard pipe sizes
- Straight, precision machined two-lobe impellers
- Splash oil lubricated gears
- Carburized and ground alloy steel spur timing gears
- Anti-Friction gears
- Ground steel shafts
- Center Timed for rotation in either direction

### Also Available in:

- URAI-Metric

### Equivalent to:

*Sutorbilt Model 7LP*

*Tuthill Model 7018*



816-741-0282



### Quick Specs

Flow Range	to 2316 CFM
Max ΔPressure	7 PSI
Max ΔVacuum	12" Hg
Maximum RPM	2050
Minimum RPM	545
Max ΔT	130°F
Connection Size	8" Flange
Shaft Dia.	1.562"
Min Sheave Dia.	9.5"
Drive End Lubrication	Grease
Gear End Lubrication	Oil
Oil Sump Gear End Horiz Config	~59.5 oz
Oil Sump Gear End Vert Config	~32.3 oz
Bare Unit Weight	650 lbs
Container	Wood Skid
Skid Size (L x W x H)	54" x 32" x 36"
Shipping Weight on Skid	~685 lbs
Recommended to Ship Via	Truck



816-741-0282

**Universal RAI Series Blowers Parts List  
6" & 7" Gear Diameter**

(Refer to drawing #64792023)

Item #	Part Name	Qty.
1	Headplate Gear End	1
2	Headplate Drive End	1
3	Gearbox	1
4	Timing Gears	2
5	Cover-Blind (Plug Opening)	1
7	Gasket, Gear Box	1
11	Cylinder	1
12	Impeller & Shaft Drive	1
13	Impeller & Shaft Driven	1
14	Bearing, Ball	3
15	Bearing, Roller	1
16	Pin, Dowel	4
17	Gear Nut	2
19	Key	1
21	Plug, Pipe	3
23	Screw Hex Nylock	8
25	Breather (Plug Vent)	1
26	Screw, Hex	*
27	Seal, Lip Bearing	4
29	Washer, Spring Wavy	2
31	Screw, Hex, Nylock	4
32	Screw, Hex	10
33	Seal Lip-Drive	1
34	Clamp Plate	2
35	Foot	2
37	Fitting, Grease	2
38	Fitting, Relief	2
39	Washer Mounting	4

\*Quantities vary by blower.

**Table 2 - Recommended Oil Grades**

Ambient* Temperature °F (°C)	ISO Viscosity No.
Above 90° (32°)	320
32° to 90° (0° to 32°)	220
0° to 32° (-18° to 0°)	150
Below 0° (-18°)	100

\*Ambient temperature is defined as the temperature of the space in which the blower and drive are located.

**Due to sludge build-up and seal leakage problems, Roots recommendation is DO NOT USE Mobil SHC synthetic oils in ROOTS blowers.**

- When servicing drive end bearings of a AIR (Non Gas) blower, use the specified and recommended Shell Darina SD 2 NLGI #2 product code 5067628.
- Lithium based greases are not compatible with the specified and recommended Shell Darina SD 2 grease used when assembling the blower. **Lithium based grease is not approved for any ROOTS blowers.**

**Repair Kits**

Repair kits are bundled with the parts you need to complete a standard repair. It is more cost effective to buy a repair kit than to purchase individual parts.

However, if you need parts not listed in the kit, it is recommended that you call Pathfinder Systems for parts pricing.

**P/N 651190RK Kit without Gears for 76, 711, 718 URAI, URAI-Metric**

Item	Qty	7" Kit Description	P/N
5	1	PLUG,OPENING FOR 4.331	12957007
7	2	GSKT,GRBX 7 URAI TS9003	64944021
14	3	BRG,BALL	10987044
15	1	BRG,ROLLER	10222039
17	2	NUT,HEX ESNA 1 1/4-12	10319019
27	4	SEAL,LIP(VITON) 1-5/8 S	10460037
29	2	WSHR,SPR WAVY 4.300 OD	10135006
31	4	SCR,CAP HEXH NYL 3/8-16X	10677012
33	1	SEAL,LIP for GREASE LUBE	10005174

**P/N 651180RK Kit with Gears for 76, 711, 718 URAI, URAI-Metric**

Item	Qty	7" Kit Description	P/N
4	1	GEAR, ASSY 7 URAI	64943021
5	1	PLUG,OPENING FOR 4.331	12957007
7	2	GSKT,GRBX 7 URAI TS9003	64944021
14	3	BRG,BALL	10987044
15	1	BRG,ROLLER	10222039
17	2	NUT,HEX ESNA 1 1/4-12	10319019
27	4	SEAL,LIP(VITON) 1-5/8 S	10460037
29	2	WSHR,SPR WAVY 4.300 OD	10135006
31	4	SCR,CAP HEXH NYL 3/8-16X	10677012
33	1	SEAL,LIP for GREASE LUBE	10005174

**ROOTS® Synthetic Oil: ISO-VG-320 Grade**

	Part Number
Quart	13106004
Gallon	13106005
Case (12 qts)	13106007

**ROOTS® Synthetic Oil: ISO-VG-220 Grade**

	Part Number
Quart	13106001
Gallon	13106002
Case (12 qts)	13106008

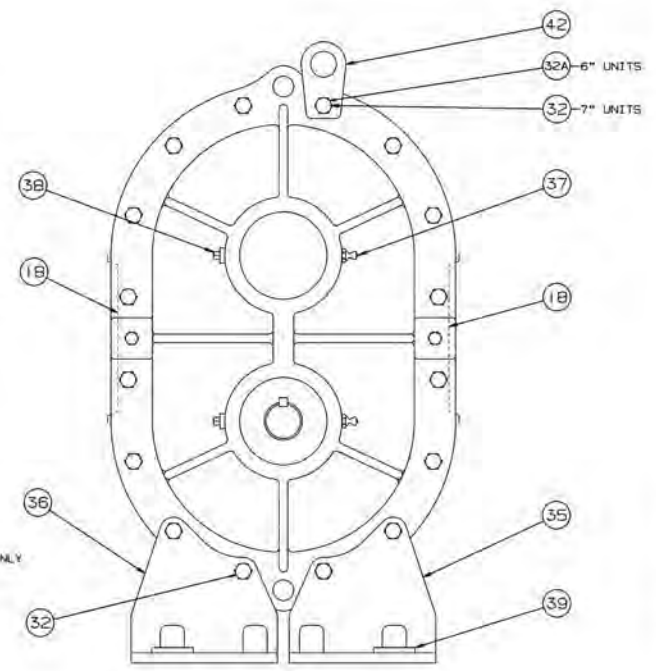
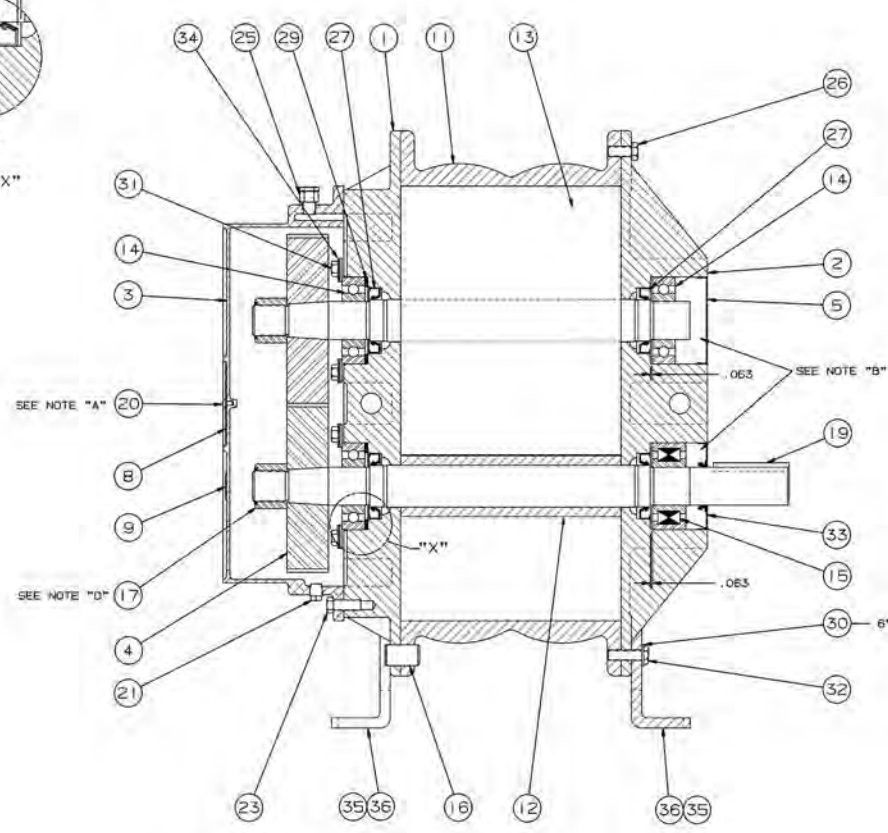
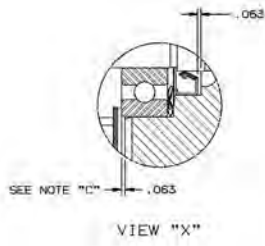
**ROOTS® Synthetic Oil: ISO-VG-150 Grade**

	Part Number
Quart	13106020
Gallon	13106021
Case (12 qts)	13106023
5 Gallon Pail	13106022
55 Gallon Drum	13106025

**ROOTS® Synthetic Oil: ISO-VG-100 Grade**

	Part Number
Quart	13106011
Gallon	13106012
Case (12 qts)	13106014
5 Gallon Pail	13106013
55 Gallon Drum	13106016

REV.	PART NAME	QTY.	MAT'L.



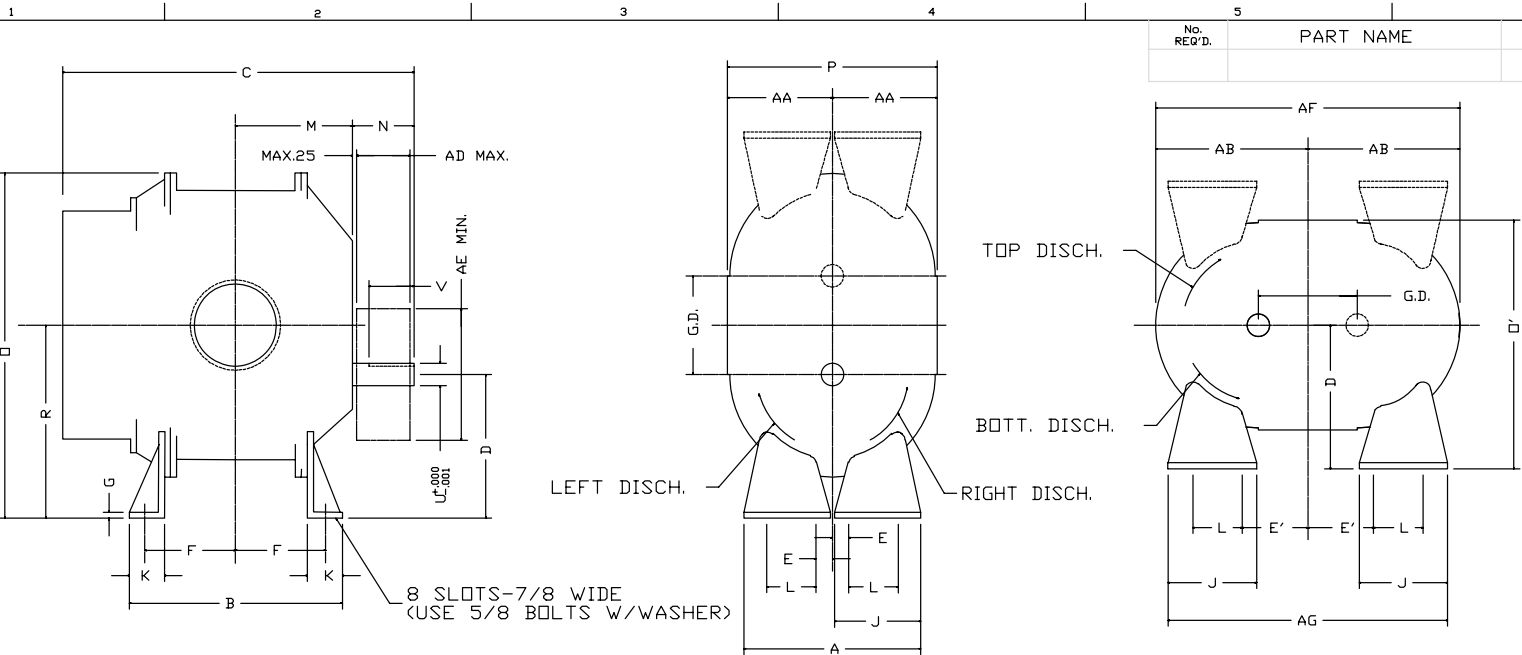
**NOTES**

- A INSTALL ITEM #20 (SCREW) IN ASSEMBLY
- B SEE OPERATING MANUAL IRB-103 FOR LUBRICATION INSTRUCTION
- C INSTALL BEARINGS AS SHOWN BEFORE SETTING END CLEARANCE
- D NUT TO BE TORQUED TO:  
6"---400 LB. FT.  
7"---550 LB. FT.

- ① 35779
- ② 33862V
- ③ 35500V

WFL NO. 6566285 CONFIDENTIAL THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION OF ROOTS DIVISION, DRESSER INDUSTRIES, INC. IT SHALL BE HELD IN STRICTEST CONFIDENCE, AND BE USED ONLY IN CONNECTION WITH ROOTS DIVISION BUSINESS.		DATE: 08/10/08 DESIGNED BY: J. L. HARRIS DRAWN BY: J. L. HARRIS CHECKED BY: J. L. HARRIS APPROVED BY: J. L. HARRIS		DO NOT SCALE FOR DIMENSIONS ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED PART: 64792023 <b>SECTIONAL ASSEMBLY</b> FOR 6" & 7" M-BALL BLOWER WITH TAPER SHAFT P.T.	
REF. DIMS (1) DIMENSION (2) ANALYTI (3) PROFILE (4) DIA. POSITION (5) STRAIGHTNESS	Q CONSIDERED 1 HORIZONTAL 2 PROFILE OF LINE 3 PROFILE OF A SURFACE 4 DIAMETER 5 FINISH IN WORK (NONE)	11 ADDED ITEM 332 12 REMOVED ITEM 344 13 ADDED ITEM 418	AXP 02/08 7831V ALR 06/08 7502V REP 04/08 7419V	08/10/08 08/10/08 08/10/08	DRESSER ROOTS ROOTS DIVISION DRESSER EQUIPMENT GROUP A HALLIBURTON COMPANY HOUSTON, TX USA 64792023 REV H

Assembly of UNIVERSAL RAI Blowers, 6" and 7" Diameter



8 SLOTS-7/8 WIDE  
(USE 5/8 BOLTS W/WASHER)

No. REQ'D.	PART NAME	PATT. No. PART No.	MAT'L.
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W-INLET  
W'-DISCHARGE  
AD-SHEAVE WIDTH  
AE-SHEAVE DIA.  
ALL DIM. IN INCHES

	6"FLG	8"FLG		
OPENING	6.00	8.00		
BOLT CIRCLE	9.50	11.75		
FLANGE O.D.	11.00	13.50		
NO. TAPPED HOLES	8	8		
SIZE HOLES	3/4-10	3/4-10		
TAP DEPTH	1.13	1.13		

UNIT SIZE	APPROX. OIL CAP.		
	VERT.	HORIZ.	G.D.
6"	28.3 FL OZ	52.1 FL OZ	6.00
7"	32.3 FL OZ	59.5 FL OZ	7.00

FRAME SIZE	A	B	C	D	E	E'	F	G	J	K	L	M	N	O	O'	P	R	U	V	KEYWAY	W	W'	AA	AB	AD	AE	AF	AG	APPROX WEIGHT
65	11.00	10.00	18.38	8.75	1.00	4.00	3.81	.38	5.38	2.13	3.00	5.63	3.56	21.63	15.13	12.75	11.75	1.375	2.75	.312x.156	3"NPT	3"NPT	6.38	9.88	3.44	8.00	19.75	17.00	245 LBS
68		13.00	21.38				5.81					7.13	3.69								5"NPT	5"NPT							285 LBS
615		20.00	28.38				8.81					10.63			16.25	15.00					6"FLG	6"FLG	7.50						425 LBS
76	14.00	11.75	19.94	11.00	2.00	5.50	4.88	.50	6.75	2.38	3.50	5.94	4.06	26.13	20.69	19.38	14.5	1.562	3.00	.375x.188	4"NPT	4"NPT	9.69	11.63	3.75	9.50	23.25	21.00	400 LBS
711		16.75	25.19				7.38					8.44	4.31		19.50	17.00					6"FLG	6"FLG	8.50						530 LBS
718		23.75	32.19				10.88					11.94									8"FLG	8"FLG							650 LBS

MFG. REF. CONFIDENTIAL

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REF: EP938  
 □ FLATNESS  
 / ANGULARITY  
 // PARALLELISM  
 ⊕ TRUE POSITION  
 — STRAIGHTNESS

⊙ CONCENTRICITY  
 ⊥ PERPENDICULARITY  
 ⌒ PROFILE OF LINE  
 ⌒ PROFILE OF A SURFACE  
 ∅ DIAMETER  
 ✓ FINISH IN MICRO INCHES

G REF 'F' DIM ON 68 RDR 6459V  
 F BOLTS CLARIFIED DB

REVISIONS BY DATE CHANGE NOTICE CHKD. APP

DATE

DO NOT SCALE FOR DIMENSIONS  
 ALL DIMENSIONS SHOWN IN BRACKETS ( ) ARE MILLIMETERS

UNIVERSAL RAI BLOWER

**DRESSER ROOTS**

ROOTS DIVISION  
 DRESSER EQUIPMENT GROUP  
 A HALLIBURTON COMPANY  
 HOUSTON, TX USA

DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED  
 FINISHED DIMENSIONS  
 TWO PLACE DECIMALS .000--.005 FRACTIONAL--11/64  
 THREE PLACE DECIMALS .000--0.005

ORDER No. 62753021

REV G

## ROOTS™ UNIVERSAL RAI® ROTARY POSITIVE BLOWERS

Frames 22 thru 718

### BASIC BLOWER DESCRIPTION

Universal RAI® blowers are heavy-duty rotary blowers designed with detachable rugged steel mounting feet that permit easy, in-field adaptability to vertical or horizontal installation requirements.

Because of the detachable mounting feet, these units can be easily adapted to any of four drive shaft positions: right, left, bottom, or top. The compact, sturdy design is engineered for continuous service when operated in accordance with speed and pressure ratings.

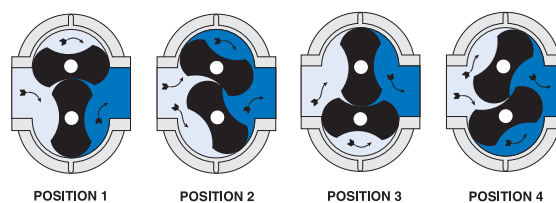
The basic model consists of a cast iron casing, carburized and ground alloy steel spur timing gears secured to steel shafts with a taper mounting and locknut, and cast iron involute impellers. Oversized antifriction bearings are used, with a cylindrical roller bearing at the drive shaft to withstand V-belt pull. The Universal RAI® features splash oil lube on the gear end and grease lube on the drive end. ROOTS'



exclusive "figure-eight" gearbox design improves oil distribution to maximize gear and bearing life. After testing, the unit is sprayed with a protective paint, and boxed or skid mounted for delivery.

Available accessories include driver, relief valve, inlet and discharge silencers, inlet filter, check valve, extended base, V-belt or flexible coupling and drive guards.

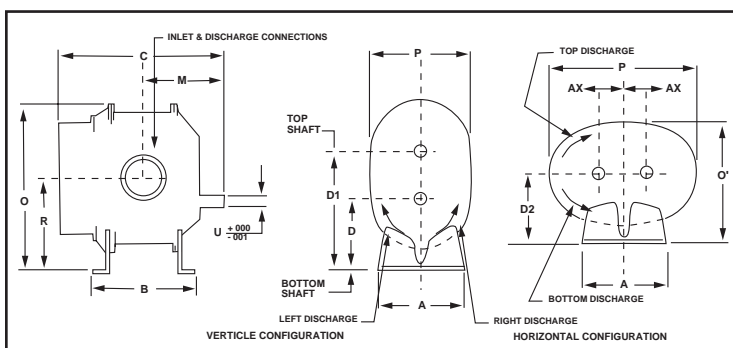
### OPERATING PRINCIPLE



POSITION 1      POSITION 2      POSITION 3      POSITION 4

Two figure-eight lobe impellers mounted on parallel shafts rotate in opposite directions. As each impeller passes the blower inlet, it traps a definite volume of air and carries it around the case to the blower outlet, where the air is discharged. With constant speed operation, the displaced volume is essentially the same regardless of pressure or temperature.

Timing gears control the impellers relative positions and maintain small but definite clearances. This allows operation without lubrication requirements inside the unit casing.



Frame	A	A'	B	C	D	D1	D2	M	O	O'	P	P'	R	U	INLET DISCH.	AX	WGT
22U	5.13	5.13	5.00	9.75	3.75	6.25	3.75	5.13	9.63	6.88	6.25	9.25	5.00	.625	1.0 NPT	1.25	32
24U	5.13	5.13	7.00	11.75	3.75	6.25	3.75	6.13	9.63	6.88	6.25	9.25	5.00	.625	2.0 NPT	1.25	43
32U	7.25	7.25	6.75	11.25	5.00	8.50	5.00	5.81	12.81	8.88	7.75	12.13	6.75	.750	1.25 NPT	1.75	69
33U	7.25	7.25	7.63	12.13	5.00	8.50	5.00	6.25	12.81	8.88	7.75	12.13	6.75	.750	2.0 NPT	1.75	74
36U	7.25	7.25	10.00	14.63	5.00	8.50	5.00	7.56	12.81	8.88	7.75	12.13	6.75	.750	2.5 NPT	1.75	102
42U	8.00	8.00	7.25	13.00	6.25	10.25	6.25	6.86	15.06	10.63	8.75	13.63	8.25	.875	1.5 NPT	2.00	88
45U	8.00	8.00	10.00	15.50	6.25	10.25	6.25	8.00	15.06	10.63	8.75	13.63	8.25	.875	2.5 NPT	2.00	109
47U	8.00	8.00	11.75	17.63	6.25	10.25	6.25	9.25	15.06	10.50	8.50	13.63	8.25	.875	3.0 NPT	2.00	128
53U	10.50	10.50	8.38	15.38	6.25	11.25	6.75	8.18	17.38	11.88	10.25	17.25	8.75	1.125	2.5 NPT	2.50	143
56U	10.50	10.50	11.00	18.00	6.25	11.25	6.75	9.19	17.38	12.25	11.00	17.25	8.75	1.125	4.0 NPT	2.50	170
59U	10.50	10.50	14.00	21.18	6.25	11.25	6.75	11.19	17.38	12.25	11.00	17.25	8.75	1.125	4.0 NPT	2.50	204
65U	11.00	11.00	10.00	18.38	8.75	14.75	8.75	9.19	21.63	15.13	12.75	19.75	11.75	1.375	3.0 NPT	3.00	245
68U	11.00	11.00	13.00	21.38	8.75	14.75	8.75	10.82	21.63	15.13	12.75	19.75	11.75	1.375	5.0 NPT	3.00	285
615U	11.00	11.00	20.00	28.38	8.75	14.75	8.75	14.32	21.63	16.25	15.00	19.75	11.75	1.375	6.0 FLG	3.00	425
76U	14.00	21.00	11.75	19.94	11.00	18.00	11.00	10.00	26.13	20.69	19.38	23.25	14.50	1.562	4.0 NPT	3.50	400
711U	14.00	21.00	16.75	25.19	11.00	18.00	11.00	12.75	26.13	19.50	17.00	23.25	14.50	1.562	6.0 FLG	3.50	530
718U	14.00	21.00	23.75	32.19	11.00	18.00	11.00	16.25	26.13	19.50	17.00	23.25	14.50	1.562	8.0 FLG	3.50	650



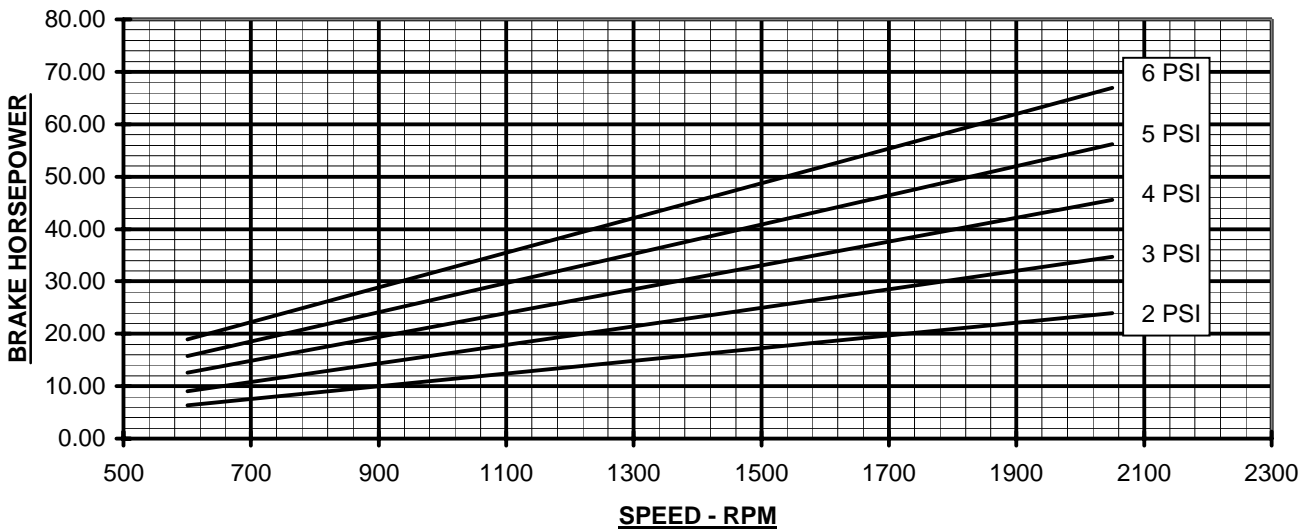
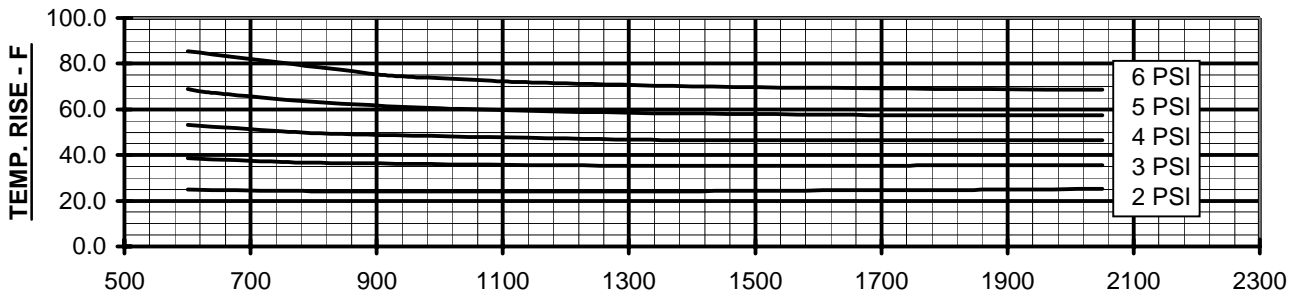
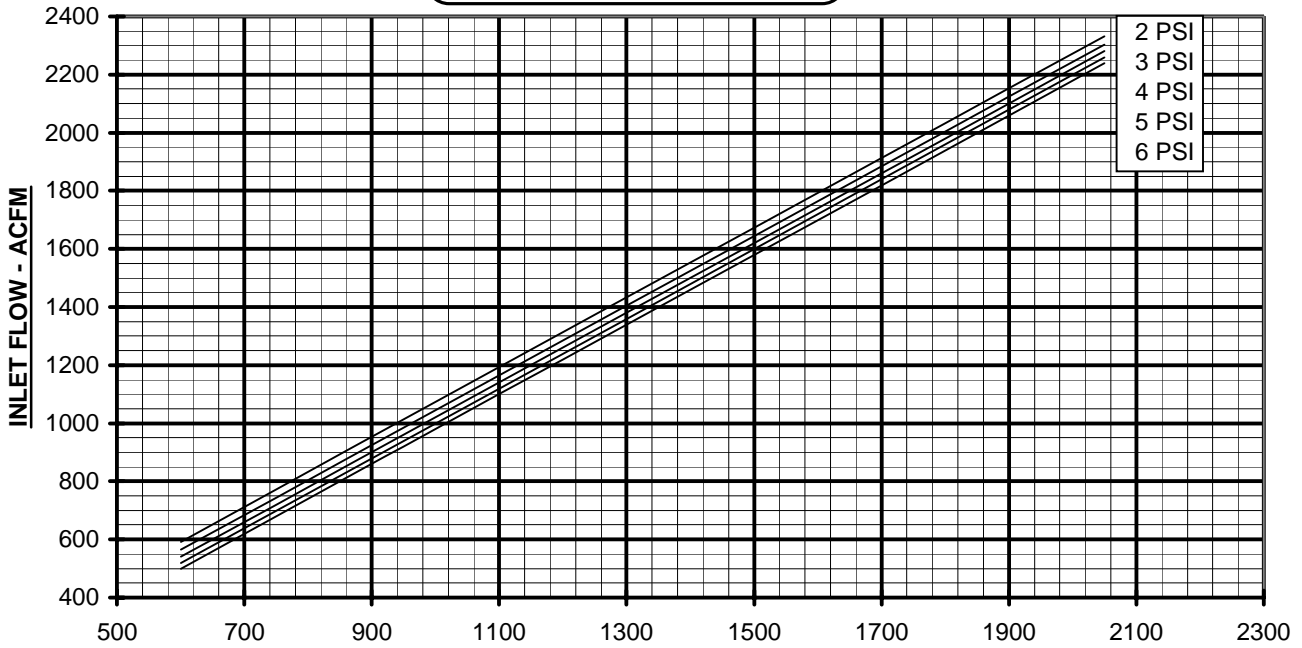
Roots





PERFORMANCE BASED ON AIR,  
 INLET AT 14.7 PSIA & 68°F  
 DECEMBER 2004

**PRESSURE PERFORMANCE**  
**FRAME 718 U-RAI**  
 MAX. PRESSURE RISE = 6 PSI  
 MAX. SPEED = 2050 RPM





**VACUUM PERFORMANCE**  
**FRAME 718 U-RAI**  
 MAX. VACUUM = 12" HG  
 MAX. SPEED = 2050 RPM

PERFORMANCE BASED ON AIR,  
 INLET AT 68°F  
 DISCHARGE PRESSURE = 30" HG ABS.  
 DECEMBER 2004

