



Roots

711 URAI

Part Number – 65121020



- 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 7MP

Tuthill Model 7011



816-741-0282



Quick Specs

Flow Range	to 1413 CFM
Max ΔPressure	10 PSI
Max ΔVacuum	16" Hg
Maximum RPM	2050
Minimum RPM	545
Max ΔT	225°F
Connection Size	6" 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	530 lbs
Container	Wood Skid
Skid Size (L x W x H)	54" x 32" x 36"
Shipping Weight on Skid	~580 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 in which the
0° to 32° (-18° to 0°)	150
Below 0° (-18°)	100

*Ambient temperature is defined as the temperature of the space 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 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

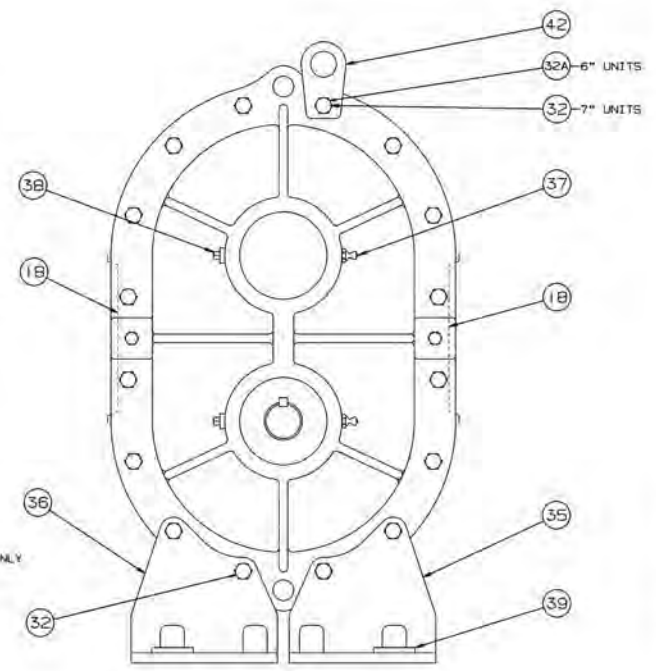
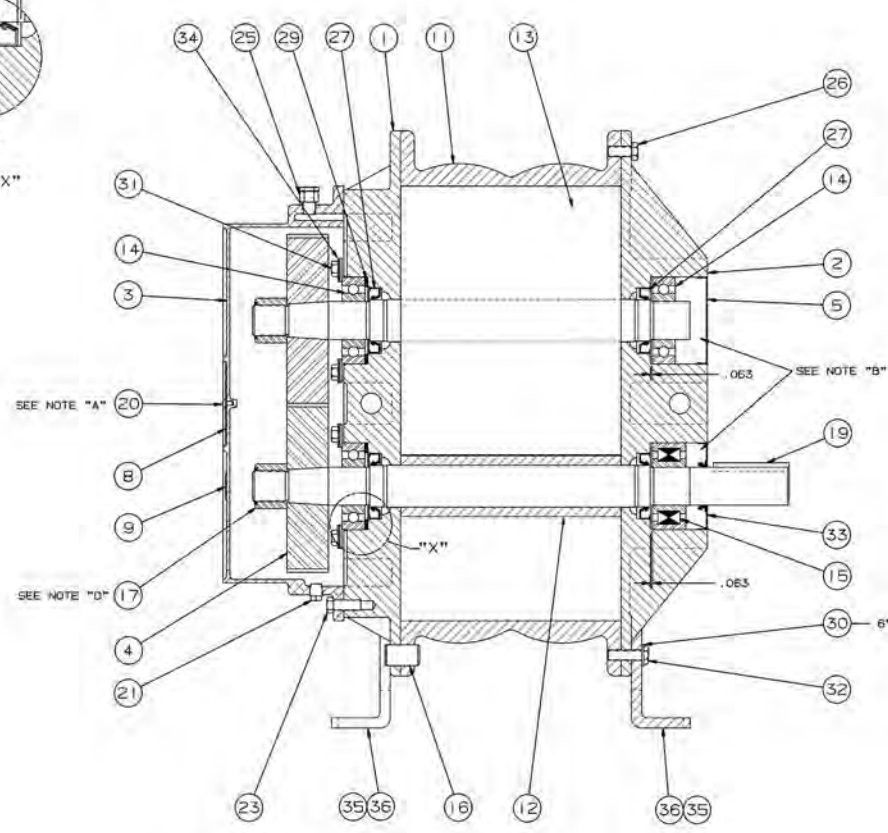
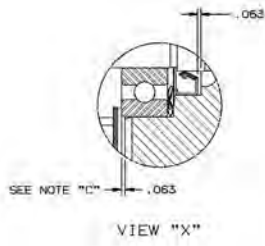
ROOTS® Synthetic Oil: ISO-VG-150 Grade

	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

REV.	DATE	BY	CHKD.	APP.	DATE	BY	CHKD.	APP.	DATE	BY	CHKD.	APP.
11	ADDED ITEM 32	AKP	2/10/83	7831V								
10	REMOVED ITEM 34	AKP	8/24/82	7522V								
9	ADDED ITEM 48	REP	3/4/82	7419V								

DO NOT SCALE FOR DIMENSIONS

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN INCHES

SECTIONAL ASSEMBLY

FOR 6" & 7" M-BALL BLOWERS

WITH TAPER SHAFT P.T.

DRESSER ROOTS

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

64792023

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REF: 09088
Q: QUALITY
R: RADIATION
S: SHAFT POSITION
T: TOLERANCES

CONFIDENCE: 1: HORIZONTAL ASSEMBLY
2: PROFILE OF LINE
3: PROFILE OF A SURFACE
4: DIAMETER
5: FINISH IN WORK (NONE)

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

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.

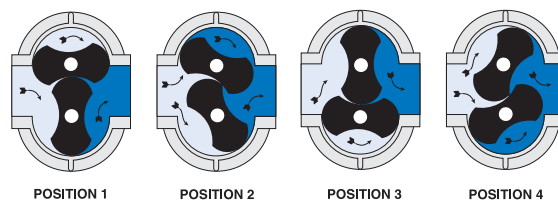
The basic model consists of a cast iron casing, carburized and ground alloy steel spur timing gears secured to steel shafts with a taper mounting and locknut, and cast iron involute impellers. Oversized antifriction bearings are used, with a cylindrical roller bearing at the drive shaft to withstand 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.

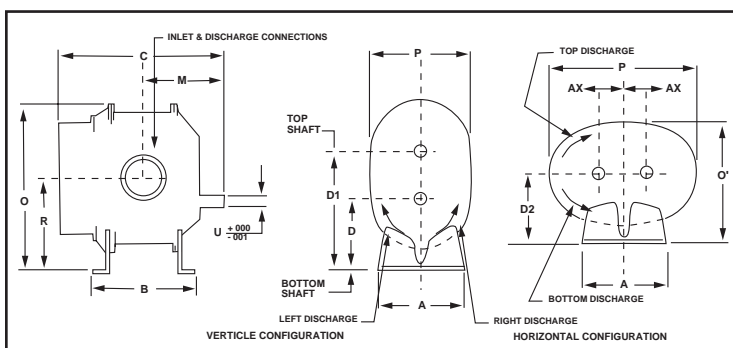
OPERATING PRINCIPLE



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

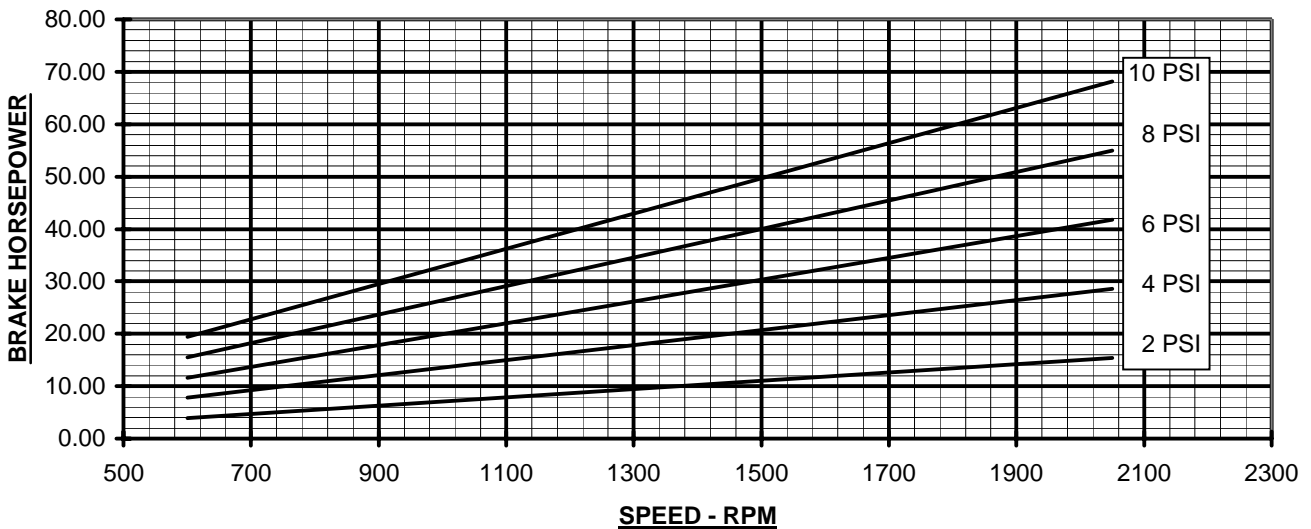
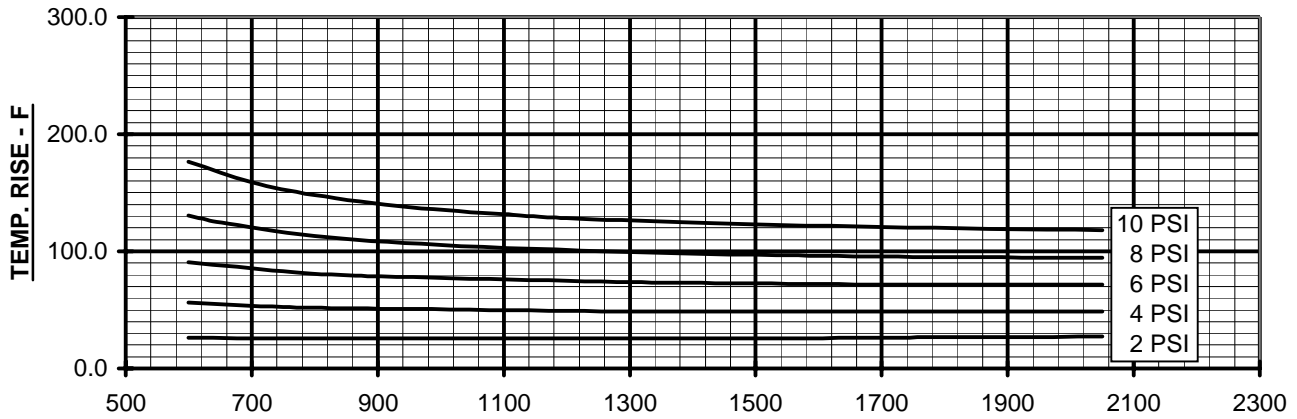
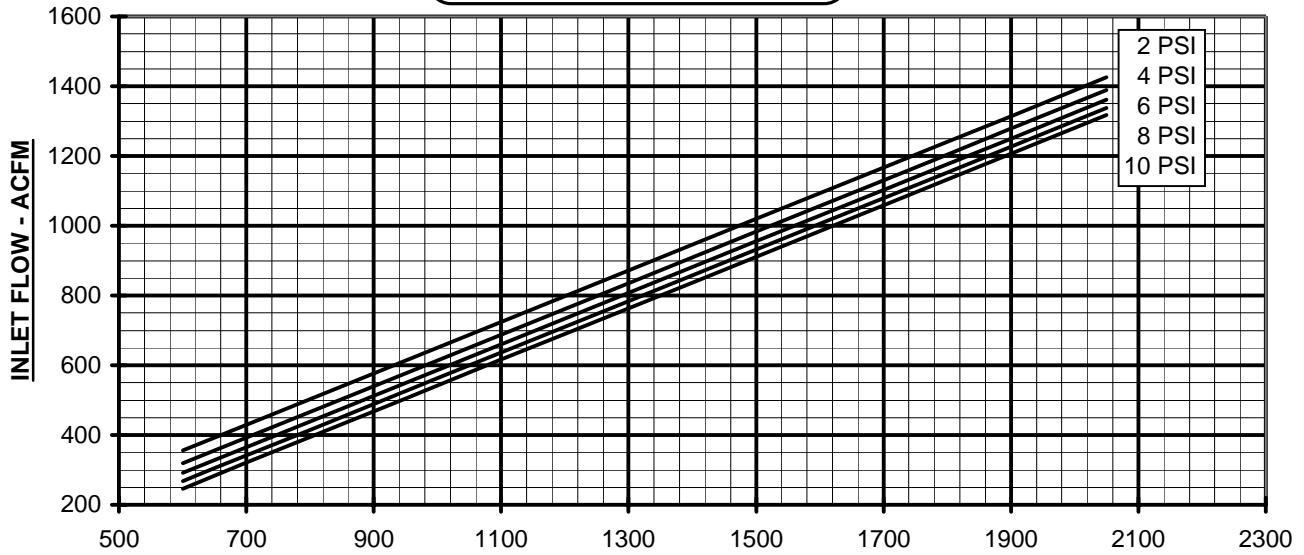


Roots



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

PRESSURE PERFORMANCE
FRAME 711 U-RAI
 MAX. PRESSURE RISE = 10 PSI
 MAX. SPEED = 2050 RPM





VACUUM PERFORMANCE
FRAME 711 U-RAI
 MAX. VACUUM = 16" HG
 MAX. SPEED = 2050 RPM

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

