



Blower Briefs



Rotating Engineered Products, Inc. - Volume I No. 2

November 1990

SUTORBILT® CALIFORNIA SERIES BLOWERS RUGGED/RELIABLE/VERSATILE

The Sutorbilt® California Series of blowers and vacuum pumps dates back to the late 1950's. The California series was designed to meet those application needs for low to medium pressures and vacuums. The units are well known for their quality and durability.

The California series have taken many evolutionary steps since their original design. The engineers and designers have endeavored to include advancements in materials, manufacturing technologies and component technology to continue to update this series.

The California Series features cast iron impellers, cylinders and headplates. Alloy steel shafts are supported by ball or spherical ball bearings depending on the unit size. The impel-

lers are kept in synchronization by a matched pair of alloy steel spur gears. The gears are attached to the shaft by means of a tapered pin on the smaller units. The larger units (6"-8" gear size) utilize a hub which is attached to the shaft by means of a press fit and tapered pin and the gear is bolted and pinned to the hub. The timing gears operate in an oil bath which provides lubrication for the gears and gear end bearings. The drive end bearings are grease lubricated. Viton oil seals prevent oil leakage to the process area. Mechanical seals are also available as an option when minimum leakage of the process gas is desirable.

As the California Series has been upgraded over the years, the model designations have been changed to differentiate

the capabilities and design feature of the units.

Twenty different models have been available throughout the history of the California Series. During this time, the engineers and designers have done an admirable job of keeping the newest version compatible with the older versions. In nearly all cases, the newest version will mount in the same location, have the same pipe connections and provide the same performance as the older versions. In most cases the newer unit can go to higher differential pressures or vacuums and can operate at higher speeds than their older counterparts. Improved gear quality and better bearings make these increased ratings possible.

WE'VE MOVED!!

Due to our increased need of warehouse space, we have moved to larger facilities.

Our new address is:

Rotating Engineered Products, Inc.
Suite 112
5859 New Peachtree Rd.
Atlanta, Georgia 30340
Telephone: (404) 986-9933
Facsimile: (404) 986-9935

Thanks for your support!!

NI-TECH STEAM EJECTORS!!

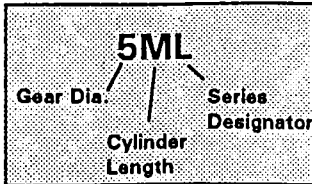
REP is proud to announce that we are now the Ni-tech representative in Georgia and Tennessee. Who is Ni-tech you ask? Ni-tech is the exclusive supplier of Worthington Ejectors, parts and accessories. The Ni-tech steam ejector is a simple, highly versatile type of compressor. Steam ejectors are usually applied to create and maintain a vacuum in process equipment and test chambers. Steam ejectors can be made of nearly any material that can be machined, which gives you maximum flexibility regarding your process requirements.

Continued on next page



Blower models are generally differentiated by their gear diameter and volumetric displacement. The California series uses a naming nomenclature which gives the user a general idea of the approximate gear diameter and displacement of the unit in that gear diameter.

The utilizes ven-places gear first



California series a naming con-tion which the nominal diameter as the place holder.

The second place holder utilizes three different letter designations: H for high pressure or short impeller length, M for medium pressure or mid-length impeller, and L for low pressure or the longest impeller. The letter designators are consistent for each gear diameter. All the gear diameters have each of the different impeller lengths with the exception of the 2.5" gear diameter which only has two. The next place holder typically indicates the series of the units.

If the unit is a vertical configuration, the series designator may be preceded by a V. For example a model would be designated as 5MVL.

Table 1 summarizes the maximum speeds of the different series versus their gear diameter. Table 2 summarizes the maximum allowable differential pressure of the different series. As can be seen in these tables, the newer versions can be operated at higher speeds and pressures.

As discussed earlier, the California Series is compatible throughout its evolutionary process, however, the units are also compatible with the Roots Universal RAI product line as well. Therefore, if you would like to replace your Roots

URAI with a Sutorbilt® California Legend Series, no problem. In most cases the units will mount in the same locations and

GEAR DIA.	MAX SPEED PER SERIES			
	CALIF.	B	F	L
2.5	2480	3610	4150	4164
3.5	1770	2835	3275	3275
4	1550	2490	2860	3050
5	1530	1900	2300	2440
6	1270	1750	2100	2100
7	1090	1500	1800	1800
8	950	1245	1575	1575

TABLE 1 have the

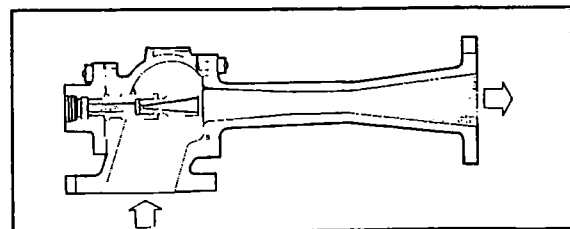
MODEL	MAX PRESSURE-PSI			
	L	F	B	CALIF
2L	6	5	4	3
2M	10	9	7	6
3H	13	12	10	10
3M	10	9	7	6
3L	6	5	4	3
4H	13	12	10	10
4M	10	9	7	6
4L	7	6	4	3
5H	13	12	12	10
5M	10	9	7	6
5L	7	6	4	3
6H	15	15	12	10
6M	11	10	7	6
6L	6	6	4	3
7H	15	15	12	10
7M	10	10	7	6
7L	6	6	4	3
8H	15	15	12	10
8M	10	10	7	6
8L	6	6	4	3

same pipe sizes and offer very similar performance. A few of the frame sizes have slightly different dimensions which may require minor modification to the installation. Please feel free to contact REP and we will send you the dimensional comparisons. Table 3 summarizes the compatibility of the California Series and the Roots URAI.

Sutorbilt® offers an excellent uncontested warranty of 18 months of operation or 24 months from date of shipment on the California Legend. If a unit should fail, then a replacement unit will be sent to you, while Sutorbilt® will pay for the freight.

Nitech (continued from page 1)

One through six stages can be assembled to provide vacuums to 2-microns Hg absolute. So if you have a tough process vacuum application, give us a call!!!



SUTORBILT CALIFORNIA SERIES				ROOTS URAI
2M	2MB	2MF	2ML	22
2L	2LB	2LF	2LL	24
3H	3HB	3HF	3HL	--
3M	3MB	3MF	3ML	33
3L	3LB	3LF	3LL	36
4H	4HB	4HF	4HL	42
4M	4MB	4MF	4ML	45
4L	4LB	4LF	4LL	47
5H	5HB	5HF	5HL	53
5M	5MB	5MF	5ML	56
5L	5LB	5LF	5LL	59
6H	6HB	6HF	6HL	65
6M	6MB	6MF	6ML	68
6L	6LB	6LF	6LL	615
7H	7HB	7HF	7HL	76
7M	7MB	7MF	7ML	711
7L	7LB	7LF	7LL	718
8H	8HB	8HF	8HL	--
8M	8MB	8MF	8ML	--
8L	8LB	8LF	8LL	--

TABLE 3

may have been the culprit. Blowers are heavy duty machines, however, you must follow the manufacturers recommendations to keep the overhung load within each machines design criteria.

Overhung load is the amount of force generated by the pull of the V-belt drive and how far out on the blower shaft this load is applied. In the example above, the shaft was broken. In all likelihood, it broke at the drive end bearing. This would be the worst kind of failure caused by excessive overhung load. Bearing failure and shorter bearing life are the most common results of this problem.

Excessive overhung load can be generated by:

1. Using a sheave with a smaller then recommended diameter
2. Belts that are too tight
3. Sheave is mounted too far out on the shaft (should be within 1/8" of the drive end cover)
4. Excessive horsepower at the blower shaft

Overhung load is calculated as follows:

Maintenance Corner

You have just installed a new sheave on your blower to increase the flow capacity of your system. The unit starts up fine and for a couple of days the performance meets all of your expectations. On the evening of the third day you receive a call from your graveyard shift in a panic because the blower has failed. It seems that the shaft is broken and your production has come to a screeching halt.

Has this ever happened to you? Then meet the "DESTROYER", your worst blower Gremlin nightmare.

What could have gone wrong with this installation? Overhung load

The factors for the Sutorbilt

California Legend

end and 4500 Series are as follows:

$$LOAD = \frac{2 \times HP \times 63025}{N \times R}$$

WHERE: N = RPM
R = SHEAVE RADIUS

Refer to the next page for a summary of calculations.

Steps that can be taken to minimize the effect of

the overhung load are as follows:

1. Utilize a sheave that meets or exceeds the minimum diameter requirements. The larger the sheave, the lower the overhung load.
2. Purchase an inexpensive belt tension

GEAR DIA.	DIMENSIONS (IN)			MAXIMUM LOAD (LBS)
	C	A	S	
2.5	.88	3.31	2.38	60
3	.56	3.38	2.44	114
4	.81	3.44	2.44	174
5	.75	4.00	2.75	336
6	.5	3.75	3.00	550
7	.56	4.90	3.50	680
8	.32	5.50	3.94	800

- tester so that the belts are adjusted to the correct tension.
- Adjust the belt tension at regular intervals. This is very important when new belts are put into service.
 - Use a jack shaft to carry the overhung load. This is more expensive, however you may use smaller diameter sheaves.

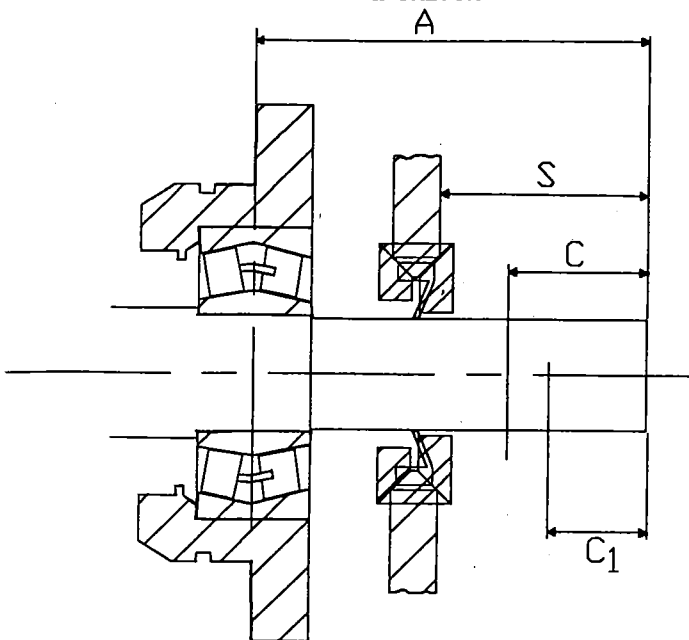
The moral of the story is to be sure that your drive is installed and maintained properly to minimize the chances of reduced equipment life or catastrophic failure.

Hey!! Did you know that it has been over 2000 hours since the last newsletter? *Have you changed the oil in the blowers lately?*

Remember, winter is almost upon us. If your blower or vacuum pump is installed outside, you may want to consider a lower viscosity oil. Refer to the chart with the lubrication recommendations in your Sutorbilt installation manual for the oil which is best suited to your application.

Check the air filter. If it's dirty clean it or replace it. Remember that a paper element can usually be cleaned once and then should be replaced. REP offers a wide variety of filter elements at very competitive prices. Give us a call at (404)986-9933!

OVERHUNG CALCULATION & SKETCH



If drive sheave center is located at other than "C" inches from drive shaft end, then revised maximum load can be calculated as follows:

$$\text{REVISED LOAD} = \text{MAX. LOAD} \times \frac{A - C}{A - C_1}$$

WHERE:

$$C_1 = S - \frac{\text{SHEAVE WIDTH}}{2} + K$$

WHERE
K = SHEAVE DISTANCE FROM COVER

DON'T FORGET ABOUT ARE SERVICE, PACKAGING AND REPAIR CAPABILITIES. WE HAVE NEW AND USED EQUIPMENT IN STOCK. CALL JIM HENE FOR MORE INFO!!

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