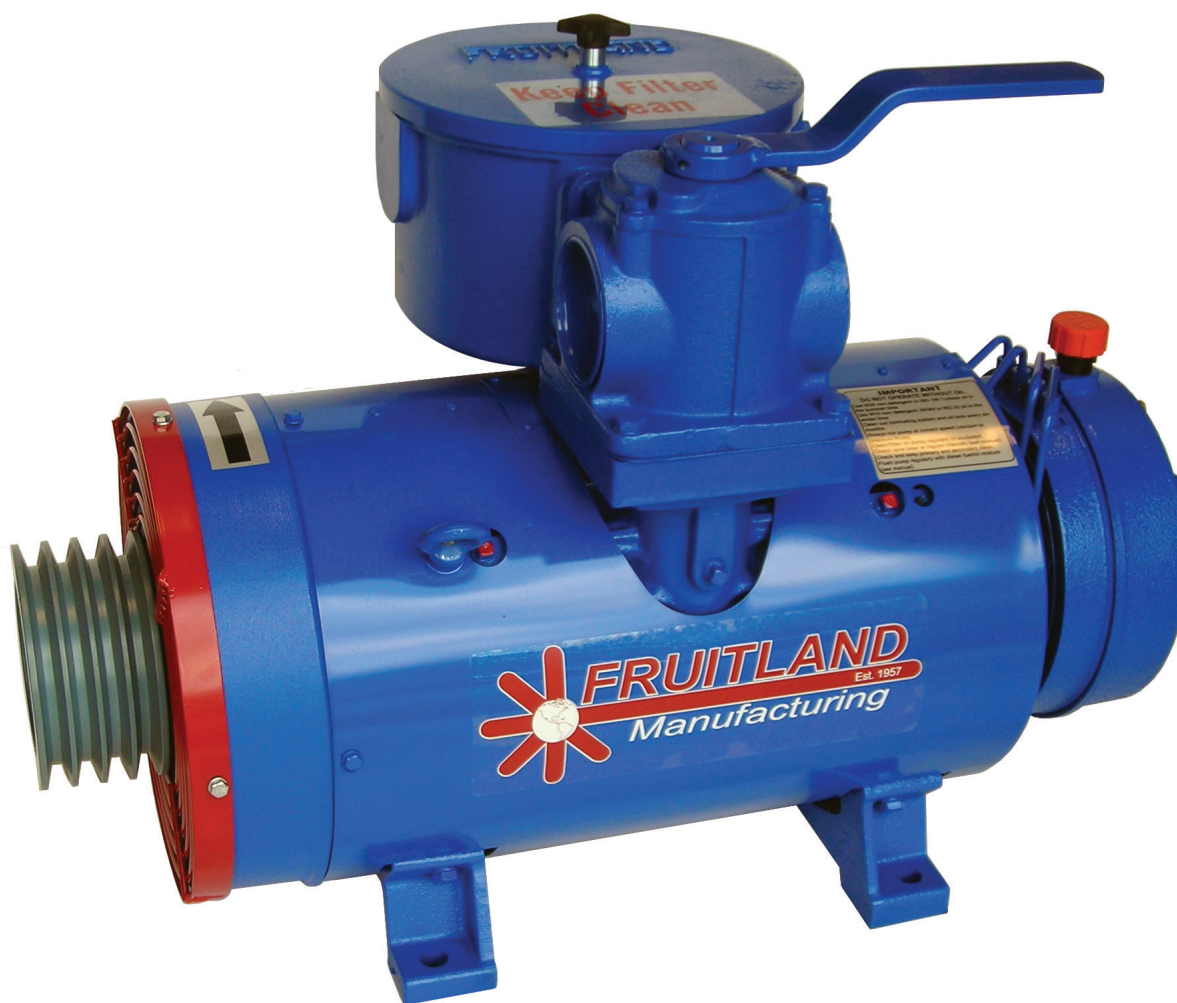


FRUITLAND VACUUM PUMP

Operation and Maintenance Manual

RCF 250, 370, 500, 870 and 1200* Models



Attention:

**Read owner's manual fully before operating pump.
Failure to do so can result in severe pump damage and may void warranty.**

This is the Serial Number of your Pump:

Preface

This Manual is given with your pump to help operators and owners understand the working and maintenance of your newly acquired unit.

Please familiarize yourself and any operator with the contents of this booklet, and keep a record of the serial number handy, should you need any parts or information in the future.

We at Fruitland are committed to quality, reliability and guaranteed performance.

Purchased From: (Dealer's Stamp)

Date:

.....

MM / DD / YY

Certificate of Guarantee and Inspection

Model Number

Thank you for purchasing a Fruitland Rotary Vane Vacuum Pump. Our quality control program has been developed to ensure this vacuum pump and its components are free from defects in materials and workmanship. With proper maintenance and operation your Fruitland pump should give many years of trouble free use.

Please read the owner's manual completely before operating your new Fruitland pump.



NOTICE - WARRANTY CLAIM

In the event of pump failure while the pump is still under warranty, pumps are to be returned to factory without dismantling or other alterations for warranty assessment. Violation of this condition will void warranty. All shipping costs are the customer's responsibility.

Our product is guaranteed for 2 years in accordance with the warranty provisions described.

PUMP WARRANTY

1. **WARRANTY POLICY — WHAT WE COVER:** Subject to the terms of this warranty (the “WARRANTY”), vacuum pumps (the “PRODUCT”) manufactured by R.T. Hamilton and Associates Ltd. (FRUITLAND MANUFACTURING) are warranted to be free from defects in material and workmanship for a maximum period of two (2) years from the date of shipment to Buyer. THIS IS THE SOLE AND EXCLUSIVE PRODUCT WARRANTY GIVEN BY FRUITLAND MANUFACTURING TO BUYER AND IS IN LIEU OF, AND EXCLUDES, ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. COMPONENTS WHICH MAY BE SUPPLIED AS PART OF AN ASSEMBLY, OR SPARE PART(S), AND NOT MANUFACTURED BY FRUITLAND MAUFACTURING ARE LIMITED ONLY TO THE WARRANTY EXTENDED BY THE MANUFACTURER(S) OF THE COMPONENT(S).
2. **WARRANTY CLAIMS — HOW WE RESPOND TO WARRANTY ISSUES:** In the event of a defect in a PRODUCT covered by this WARRANTY, FRUITLAND MANUFACTURING shall repair or replace the affected PRODUCT, or components of the affected PRODUCT, at its sole discretion. This is the BUYER'S sole and exclusive remedy. BUYER shall comply with FRUITLAND MANUFACTURING's WARRANTY Claims Process in order to enforce this WARRANTY.
3. **WARRANTY EXCLUSIONS — THINGS THAT WILL RESULT IN LOSS OF WARRANTY COVERAGE OR WHICH ARE NOT COVERED:**
 - a. This WARRANTY shall be void if:
 - i. BUYER fails to maintain the PRODUCT through proper care and maintenance procedures;
 - ii. BUYER fails to operate and/or use the PRODUCT in the manner in which it was intended, and in accordance with the PRODUCT manual(s), or otherwise misuses or abuses the PRODUCT;
 - iii. BUYER fails to notify FRUITLAND MANUFACTURING of a PRODUCT defect covered under this WARRANTY within 72 hours of discovery of the defect, or fails to cooperate with FRUITLAND MANUFACTURING in investigating the PRODUCT defect;
 - iv. Personnel who have not been approved by FRUITLAND MANUFACTURING make repairs or modifications to the PRODUCT;
 - v. Replacement parts that have not been approved by FRUITLAND MANUFACTURING are used in the PRODUCT; or
 - vi. BUYER fails to pay for the PRODUCT in full.
 - b. Damage to the PRODUCT arising from extreme weather conditions or affixing equipment or materials to the PRODUCT that have not been approved by FRUITLAND MANUFACTURING, is not covered by this WARRANTY. LIMITATION OF DAMAGES: FRUITLAND MANUFACTURING SHALL HAVE NO LIABILITY TO BUYER OR OTHERWISE ARISING FROM, OR IN ANY WAY CONNECTED TO, THE PRODUCT, INCLUDING ITS SALE, USE OR OPERATION, EXCEPT AS EXPRESSLY SET OUT HEREIN. IN NO EVENT SHALL FRUITLAND MANUFACTURING BE LIABLE FOR LOST PROFITS OR FOR SPECIAL, CONSEQUENTIAL, EXEMPLARY OR INCIDENTAL DAMAGES OF ANY KIND WHETHER ARISING IN, CONTRACT, TORT, PRODUCT LIABILITY, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, EVEN IF FRUITLAND MANUFACTURING WAS ADVISED OF THE POSSIBILITY OF SUCH LOST PROFITS OR DAMAGES. IN NO EVENT SHALL FRUITLAND MANUFACTURING BE LIABLE TO BUYER FOR ANY DAMAGES WHATSOEVER IN EXCESS OF THE TOTAL PRICE PAID BY BUYER FOR THE PRODUCT. BUYER HEREBY WAIVES ANY CLAIM THAT THE EXCLUSIONS OR LIMITATIONS IDENTIFIED HEREIN DEPRIVE IT OF AN ADEQUATE REMEDY OR CAUSE THIS OR ANY OTHER AGREEMENT WITH FRUITLAND MANUFACTURING TO FAIL OF ITS ESSENTIAL PURPOSE.

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INSTALLATION

Lifting

Lift pump by eyebolts, if provided, or with slings around body of pump close to legs.

Mounting

Secure pump unit to flat sturdy surface with four bolts, washers and lock washers, through holes in the legs.



ATTENTION

Severe Vacuum Pump damage is possible if special care is not taken when mounting your Fruitland vacuum pump.

For proper pump cooling, there should be no obstructions on either end of the vacuum pump to impede airflow entering or exiting the pump. If a large pulley is being used to drive the pump, special machining on the pulley may be required for directing airflow.

When installing a Fruitland vacuum pump that is to be driven by a hydraulic motor or angle gearbox, the coupling on the pump shaft should be properly aligned and have a sufficient gap clearance of .070" between two halves of coupling to allow the rotor to expand lengthwise due to heat. If sufficient clearance is not given, the rotor in the pump will not stay centered in the housing and severe pump damage may occur. Please consult your coupling manufacturer or Fruitland Manufacturing for more detailed information.

RPM

Fruitland Vacuum Pumps should never exceed the RPM stated on the plate tag (pump damage is possible). Pump may be run up to 20% slower than the stated RPM on the tag if required. If you have any questions, or require further information on the mounting or operation of a Fruitland Vacuum Pump, please contact Fruitland at 1-800-663-9003.

FRUITLAND VACUUM PUMP DESIGNATIONS

L	Left hand or Counter-clockwise, when looking at the pulley or drive shaft.
R	Right hand or Clockwise, when looking at the pulley or drive shaft.
U	Four-Way Valve is mounted on the top of the Pump, available for all models.
S	Four-Way Valve is mounted on the side of the Pump, available for all models.
F	Filter Option available only on the RCF370, 500 & 870 models.
H	Hydraulic Drive Adapter option available on RCF370, 500, 870 & 1200 models.
A	Right Angle Drive Adapter option, available for RCF370, 500 & 870.

Ordering Information:

1. Choose Rotation L or R
2. Choose diverter valve location U or S
3. Choose filtered or nonfiltered model
4. Choose drive line option A or H; OR specify belt drive or pulley

Sample Product:

RCF500LUF – Rotary Compressor Fiber Vane Pump model 500 series pump with left hand rotation, four-way valve on top and filter option.

MAINTENANCE

Lubrication: If the suction temperature is >50°F (summer conditions), a SAE-40 non detergent motor oil or an ISO 150 compressor oil can be used. If the suction temperature is <50°F (Winter Conditions) a SAE-30 non detergent motor oil or an ISO 100 compressor oil is recommended. **Always check oil level before starting unit, top up if necessary.**



NEVER ALLOW OIL RESERVOIR TO GET LOW!!!

All Pump Models

Oil Tank:

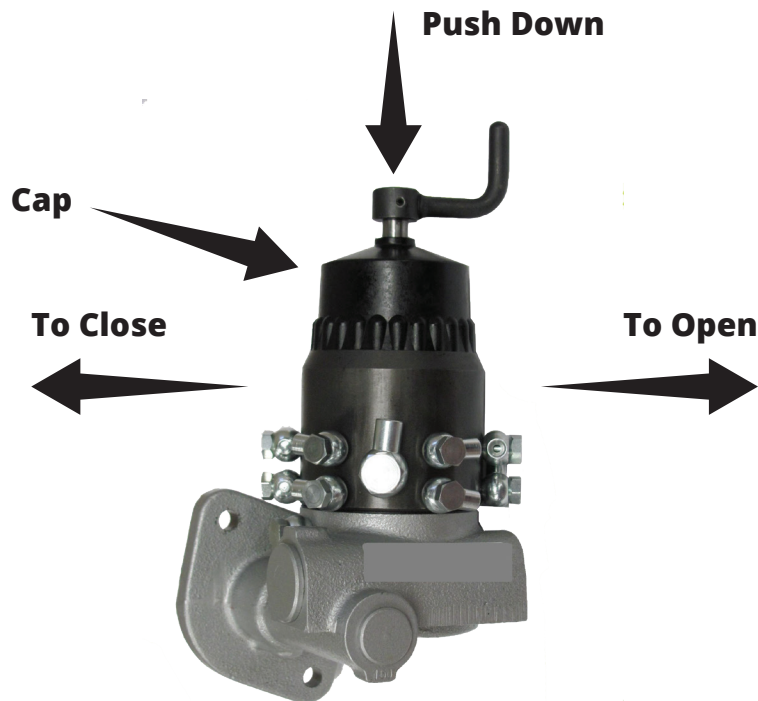
Important! During freezing weather, drain possible condensation build-up in bottom of oil tank.

Danger: If water gets into oil pump, it could freeze and damage gears in the pump. If you suspect water is present in the reservoir, drain and clean inside of oil tank with diesel fuel.

Oil Consumption (approximate)

	RCF250	RCF370	RCF500	RCF870	RCF1200
1 Litre	12 hr	4.4 hr	4.4 hr	4.4 hr	4.2 hr
1 Imp. Gal.	55 hr	20 hr	20 hr	20 hr	19 hr
1 US Gal.	45 hr	16.6 hr	16.6 hr	16.6 hr	15.8 hr

RCF 1200 Pump Models



When the pump has been inoperative for 48 hours or longer, push down and hold down the spring loaded crank on the oil pump, while rotating the handle about 20-30 turns either way, or until oil drops can be seen dripping in oil flow valve.

Oil Pump (external) for model RCF1200



SERVICE NOTE

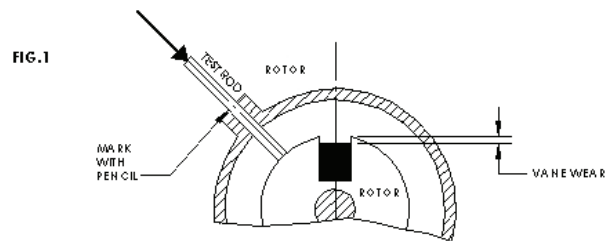
If you have any questions regarding service of your pump, contact your local Fruitland Dealer or 1-800-663-9003.

Important: Order spare parts from correct parts drawing, e.g. "Hydraulic Model" or "Standard Model" and provide serial number for your pump. To ensure proper operation, **USE GENUINE FRUITLAND PARTS ONLY.**

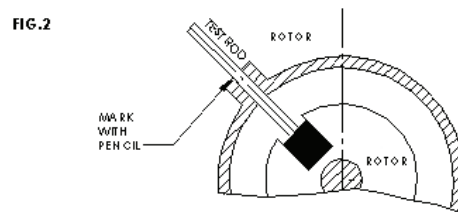
Cooling:

No Vacuum pump should run for a prolonged period of time without air passing through it (at maximum vacuum). Addition of a vacuum relief valve is highly recommended. The outside of the pump housing and the fan blades should be kept clean to allow proper cooling airflow. Do not allow buildup of dirt on the pump shroud and housing.

MEASURING VANE WEAR



Note: Be extra careful not to bend the checking rod.



Vane wear (see diagram above) should not exceed $\frac{3}{8}$ " in models RCF1200, and $\frac{1}{4}$ " in pump models 250, 370, 500 and 870. Fruitland pumps have at least two orifices for checking vane wear, some models have four. These orifices are located on the housing at both ends of the vacuum pump, and are marked with red. A $\frac{3}{16}$ " diameter test rod is supplied with the pump. We recommend checking the vanes on both ends, as they can wear in a tapered fashion because of excess heat or contamination.

To measure vane wear, remove the plug from the orifice and insert the test rod until the rod touches the rotor. Mark the rod with pencil as shown in diagram (fig.1). Turn the pump shaft until the rod drops into the vane slot in the rotor. Mark with pencil again (fig.2). Distance between the pencil marks is the amount of wear you have on the vane. If the vane is tapered from end to end, take the largest measurement as the amount the vane is worn.

Replace the complete set of vanes when worn to the maximum recommended amount for your pump model. Failure to replace the vanes at the recommended time can result in pump failure. Vane wear and subsequent damage are not covered under warranty. Instructions for replacing vanes are given on page 12.

The Recommended first check of vane wear is after approximately 10 hours of operation; next check after 50 hours of operation; thereafter, check every 200 hours or once a month if no significant wear has been detected on the 2 initial checks (see next paragraph below).

Type	RCF 250	RCF 370	RCF 500	RCF 870	RCF 1200
Size of Hoses	2"	3"	3"	4"	4"
Max. Operating Speed	1400 RPM	1400 RPM	1400 RPM	1400 RPM	1000 RPM
Lubrication (Oil Pump)	Automatic	Automatic	Automatic	Automatic	Automatic
Vanes	4 (fibre)	8 (fibre)	8 (fibre)	8 (fibre)	8 (fibre)
Fan Cooling Cont. Duty	YES	YES	YES	YES	YES
Approx. Net Pump Weight	255 lbs	385 lbs	450 lbs	525 lbs	1400 lbs
Free Air Flow	198 CFM	293 CFM	396 CFM	512 CFM	942 CFM

Vanes (Fiber)

Life expectancy of fiber vanes is hundreds of working hours. It greatly depends on the cleanliness of the intake air. Any contamination that enters your pump (e.g. sand, rust or soil particles) will shorten their life expectancy. It is the owner's responsibility to keep contamination out of the pump. Keep filters clean.

Vane Wear

Many factors can contribute to rapid or premature vane wear:

1. Overheating of the pump (check overheating in trouble shooting page 38)
2. Contamination entering the pump, or anything that can affect the action of the oil such as abrasives or chemicals.
3. Running the pump too fast (over speeding) (check governor settings)
4. Wrong oil or no oil.
5. Oil pump failure.
6. Pump housing damage.
7. Rotor slots worn. If contamination has gotten into the pump and has caused the rotor slots to wear unevenly, extra force is required to return the vanes into the slots as the rotor turns. This extra load can cause housing wear, vane wear and increase the pump temperature.

**Since there are many factors that cause rapid vane wear, we do not warranty vanes or any related damage from vanes worn beyond the recommended amount, unless a defect in material or workmanship caused the vanes to wear prematurely.*

* If you have any questions regarding the servicing of your pump, contact your Fruitland Dealer or **1-800-663-9003** or online at **www.fruitlandmanufacturing.com**

Vane Replacement: All RCF 250,370, 500 & 870 models

Refer to pump rebuild video at: www.fruitlandmanufacturing.com

- Disconnect drive source from pump.
- Drain oil from oil tank and remove oil tank cover by removing the four hex bolts and aluminum sealing washers.
- Disconnect all oil lines and remove oil pump. (Held on by two bolts and lock washers). **Do not lose the oil pump to rotor coupling.**
- Remove the seal housing by removing three hex bolts and aluminum sealing washers.
- Remove the eight hex bolts and lock washers from the housing end cap and then slide the end cap off the rotor shaft. The rotor bearing and two bevel springs should be kept in the end cap. **Note their positioning if you remove them for replacement.**
- Remove old vanes and replace with new vanes that have been dipped in oil.
- Inspect housing bore and bearings. We recommend replacing the seals and all related gaskets.
- Reassemble in reverse order.
- The eight housing end cap bolts should be tightened evenly to 20ft./lbs. torque.
- Hook up drive source to pump, fill oil tank with correct oil.
- Resume operation.

Note: Special attention is to be given that the oil pump coupling is engaging the roll pin in the rotor shaft. Turn rotor by hand, it should turn freely.

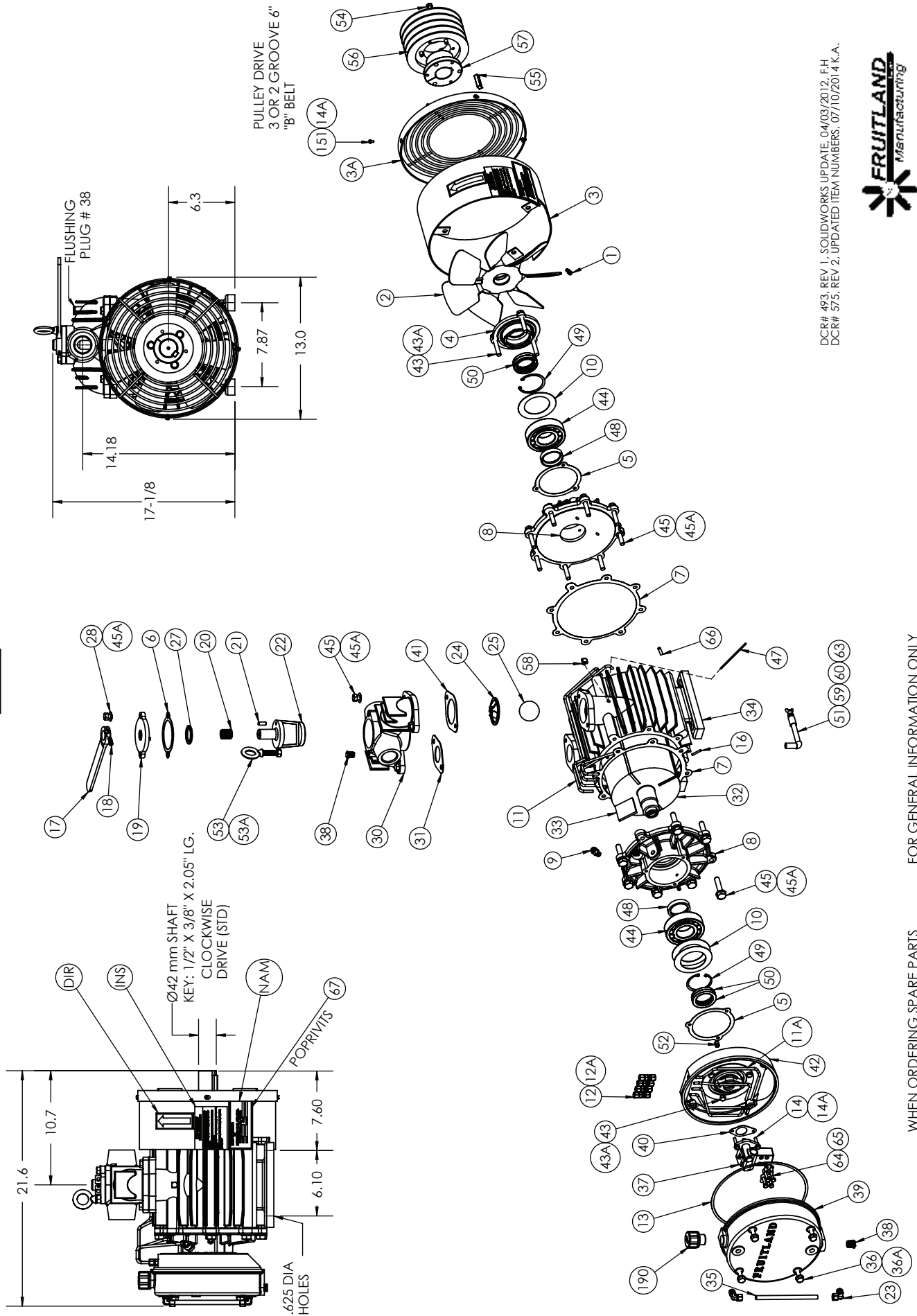
Vane Replacement: RCF1200 Models

- Disengage drive source to pump.
- Slightly loosen supply oil line connector #122 on oil tank, then remove the same line on the oil pump and swing the line up and secure to prevent draining of oil tank.
- Remove all other oil lines from the pump.
- Remove oil pump, two bolts #1.
- Remove outer end cover #4, eight hex bolts #99/25.
- Remove two taper pins #18 from the end cap #12. This can be done by screwing a slide hammer onto the threads of the M10x1.5 taper pins and banging out.
- Remove housing cap #12 by taking eight hex bolts #9/11 out and lightly tapping the end cover to break gasket seal between housing and end cap. Slide end cap off the rotor.
- Remove old vanes from the rotor.
- Inspect housing bore, roller bearing #19 and O-ring #93 in cup #94 while having the pump apart.
- Install new vanes that have been dipped in oil and replace related gaskets.
- Reassemble in reverse order.
- Tighten bolts evenly, -75 ft./lbs Torque. (On 8 hex bolts #9).

Vanes Checked

Year	20	20	20	20	20
Jan.					
Feb.					
March					
April					
May					
June					
July					
Aug.					
Sept.					
Oct.					
Nov.					
Dec.					
First 10 Hours Check:					
50 Hours Check:					

RCF 250



DCR# 493, REV 1, SOLIDWORKS UPDATE, 04/03/2012, F.H.
DCR# 575, REV 2, UPDATED ITEM NUMBERS, 07/10/2014 K.A.



FOR GENERAL INFORMATION ONLY
WE RESERVE THE RIGHT TO MAKE
CHANGES

WHEN ORDERING SPARE PARTS
ALWAYS STATE MODEL AND
SERIAL NUMBER OF PUMP.

RCF 250 Parts List

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
1	RF500-48B	S.H.C.SCREW - 5/16-16NF X 7/8	1
2	RF500-33 *	FAN ASSY	1
3	RF250-34 *	FAN SHROUD	1
3A	RF250-35	FAN GUARD - (MODIFIED RF500-35)	1
4	RF500-15	SEAL HOUSING DRIVE END	1
5	RF500-70	GASKET - SEAL HOUSING	2
6	RF250-248	GASKET DIVERTER CAP	1
7	RF500-140	GASKET HOUSING END CAP	2
8	RF250-3	HOUSING END CAP	2
9	RF500-50A	1/8" NPT - 1/4" TUBE COMPRESSION FITTING	4
10	RF500-20A	BELLEVILLE SPRING	4
11	RF250-51A *	SET OF OIL LINES - NO FITTINGS	1
11A	RF00-51S	OIL PUMP LINES SET	1
12	RF500-52A	BULKHEAD FITTING	4
12A	U-SEAL	U-SEAL WASHER FOR OILTANK BULKHEAD	4
13	RF500-26	OILPUMP COVER GASKET	1
14	RF500-28A	HEX BOLT M6 X 16	5
14A	RF500-280A	LOCKWASHER M6	5
16	RF500-72A	ROTOR SHAFT ROLL PIN - 5/32 X 1-1/4	1
17	RF250-250	DIVERTER VALVE LEVER	1
18	RF500-130A	S.H.C. SCREW 1/4" -28 X 3/4	1
19	RF250-241	DIVERTER VALVE CAP	1
20	RF250-246	DIVERTER VANE SPRING	1
21	RF250-247A	5/16 x 5/8 DIVERTER VANE SPRING PIN	1
22	RF250-243	DIVERTER VANE	1
23	RF500-32A	SIGHT TUBE ELBOW FITTING	2

RCF 250 Parts List Continued

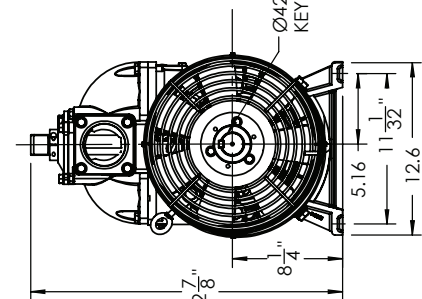
ITEM#	PART #	DESCRIPTION	QTY PER PUMP
24	RF250-249A	BALL RETAINER	1
25	RF250-252A	2" DIA. VALVE BALL	1
27	RF250-244A	DIVERTER OIL SEAL	1
28	RF500-59A	HEX BOLT M10 X 25 MM	1
30	RF250-240	DIVERTER HOUSING	1
31	RF250-238	DIVERTER INTAKE FLANGE GASKET	1
32	RF250-4	250 ROTOR ASSEMBLY	1
33	RF250-6A	VANES	1
34	RF250-1	HOUSING	1
35	RF500-25A	SIGHT TUBE CLEAR 3/8" O.D	1
36	RF500-24A	HEX BOLT M8 X 90	4
36A	RF500-221A	ALUM.WASHER M8	4
37	RF500-29 *	OIL PUMP *	1
38	RF500-69A	PIPE PLUG 1/4 NPT	1
39	RF500-23	OIL PUMP COVER	1
40	RF500-27	GASKET - OIL PUMP	1
41	RF250-251	DIVERTER EXHAUST FLANGE GASKET	1
42	RF500-22 *	SEAL HOUSING NON DRIVE END	1
43	RF500-48A	HEX BOLT M8 X 25	6
43A	RF120-96A	M8 LOCKWASHER	3
44	RF500-19A	ROLLER BEARING	2
45	RF500-67A	HEX BOLT M10 X 30	20
45A	RF120-94A	M10 LOCK WASHER	22
47	RF500-81	VANE WEAR TEST ROD	1
48	RF500-8	ROTOR COLLAR	2
49	RF500-35A	SNAP RING	2

RCF 250 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
50	RF500-225A	OIL SEAL	4
51	RF250-32A	90° STREET ELBOW 1/4" NPT BRASS	1
52	RF500-80A	OIL PUMP COUPLING (TDM)	1
53	RF500-37A	EYEBOLT	1
53A	RF500-137A	HEX NUT M-10	1
54	RF500-0	BOLT 5/16" NC X1-1/2 & LW incl. w. item 57	3
55	RF500-74	KEY 3/8 "x 1/2"x 2" incl. w. item 57	1
56	RF250-39A	SHEAVE 6",3 GROOVE (MACHINED FROM 4 GROOVE)	1
57	SK 42	TAPER BUSHING SK 42MM	1
58	RF250-69A	PIPE PLUG 1/8"	4
59	RF250-30A	NIPPLE 4 1/2" Length	1
60	RF250-73A	PIPE COUPLING -1/4"	1
63	RF500-82A	DRAIN COCK VALVE 1/4" NPT	1
64	250-6A	HOLLOW BOLT M 6	4
65	250-6	SOLDER FITTING (OUTLET)	4
66	RF500-72B	ROLL PIN 1/4 X 3 FOR OIL PUMP	1
151	RF120-102A	BOLT M 6 X 10MM	4
190	RF500-190P	BREATHER FILLER CAP FOR RESERVOIR	1
INS	RF500-INS	INSTRUCTION TAG	1
MAN	RF500-MAN	MANUAL	1
DIR	RF500-DIR	DIRECTION TAG	1
NAM	RF500-NAM	NAME PLATE	1

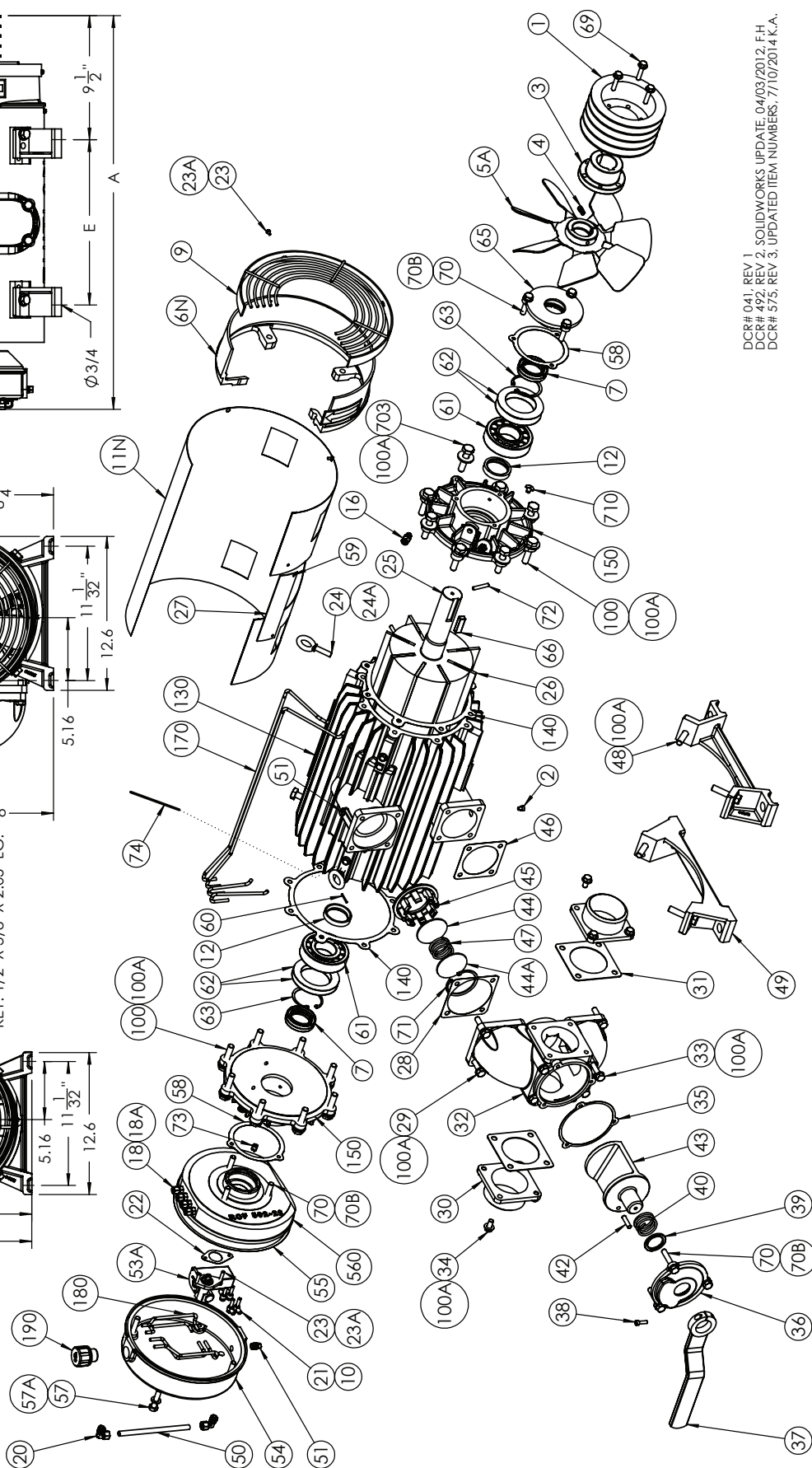
* SPECIFY PUMP ROTATION "L" OR "R" AND MOUNTING DIRECTION SIDE OR UPRIGHT.

Technical drawing of the 561 pump assembly. The drawing shows a side view of the pump with various components labeled. The main body is labeled 561. The pump head is labeled INS. The pump housing is labeled NAM. The pump shaft is labeled DIR. The pump housing is labeled 9 1/2". The pump housing is labeled E. The pump housing is labeled Ø 3/4". The pump housing is labeled A.



TYPE	A	E
RCF370	28-1/2"	10-1/2"
RCF500	31-1/2"	13-1/2"

SIDE MOUNT MODEL SHOWN
AVAILABLE IN CLOCKWISE R.H
OR COUNTERCLOCKWISE L.H



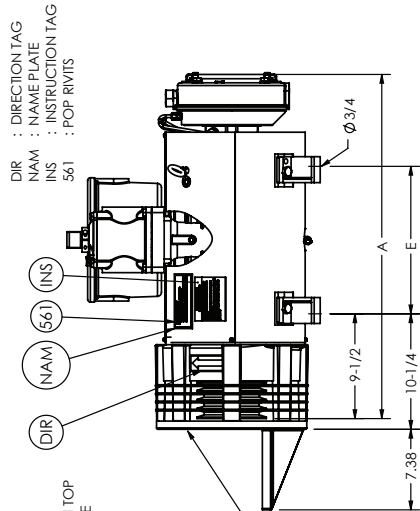
DCR# 041, REV 1
DCR# 492, REV 2, SOLIDWORKS UPDATE, 04/03/2012, F.H
DCR# 575, REV 3, UPDATED ITEM NUMBERS, 7/10/2014 K.A.

THIS LAY-OUT IS FOR GENERAL INFORMATION ONLY & MAY BE UPDATED BY FM AT ANYTIME WITHOUT NOTICE.

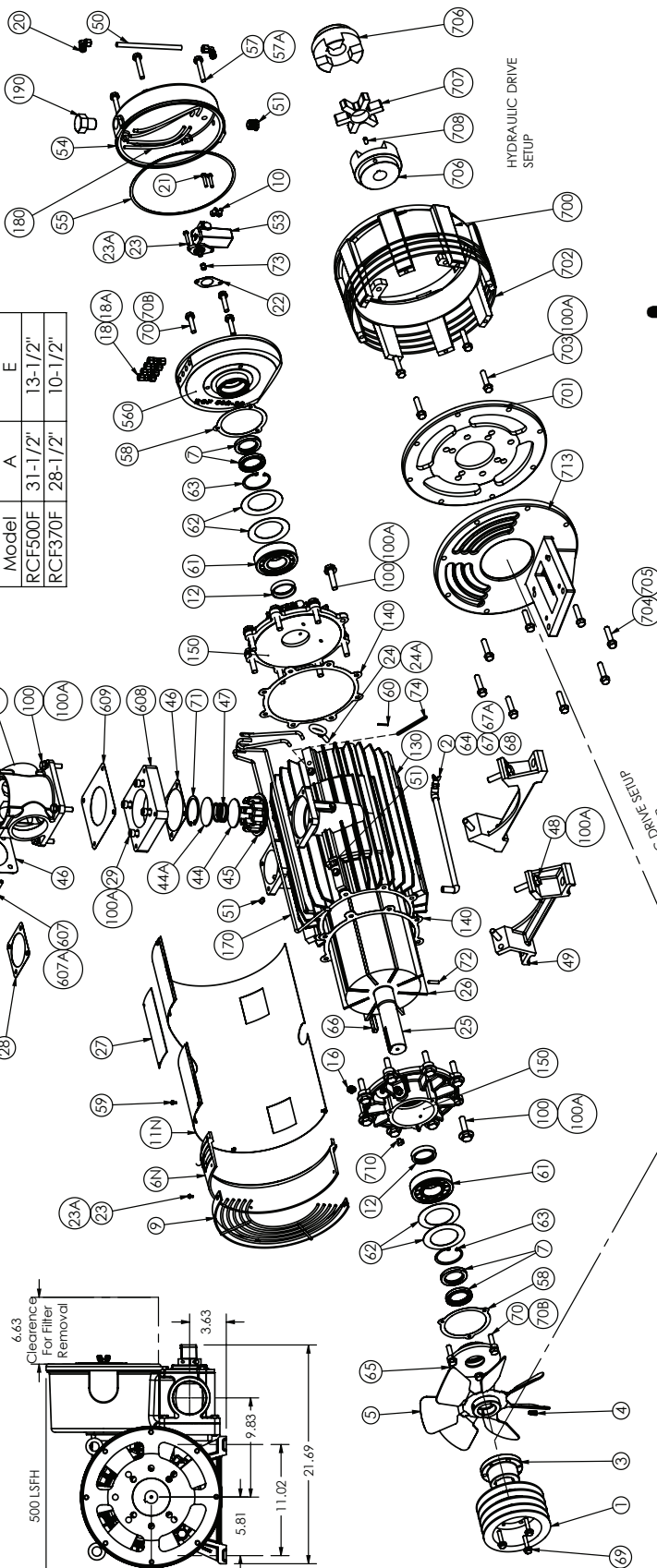
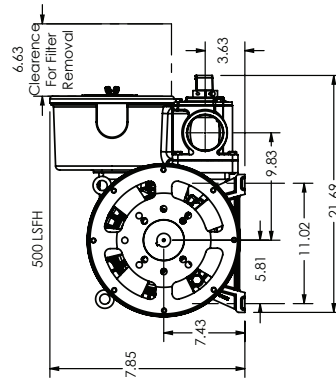
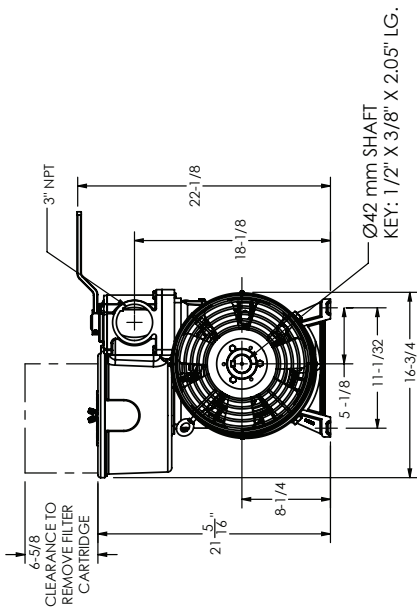
IMPORTANT : WHEN ORDERING SPARE PARTS ALWAYS SPECIFY MODEL AND SERIAL NUMBR OF PUMP.



RCF 370LUF & 500LUF (RCF 370LUFH & 500LUFH) (RCF 370LUFA & 500LUFA)



Model	A	E
RCF500F	31-1/2"	13-1/2"
RCF370F	28-1/2"	10-1/2"



RCF 370 & 500 Parts List

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
1	RF500-38	6" SHEAVE 4 GROOVE B SECTION	1
2	RF500-82A	DRAIN PLUG VALVE- 1/4" NPT	1
3	SK 42	SHEAVE BUSHING SK 42 MM	1
4	RF500-48B	5/16"NF X 7/8"LG.SHCS PLAIN	1
5	RF500-33L *	FAN ASSY - L.H.	1
5A	RF500-33R	FAN ASSY - R.H.	1
6N	RF500-34N	FAN SHROUD (NEW STYLE)	1
7	RF500-225A	SEAL (1 PC.)	4
9	RF500-30	FAN GUARD	1
10	250-6	SOLDER FITTING OIL PUMP OUTLET	4
11N	RF500-46U * RF370-46U *	HOUSING SHROUD - LUF	1
12	RF500-8	COLLAR (FINISH GRIND)	2
16	RF500-50A	1/8" NPT COMPRESSION FITTING	4
18	RF500-52A	BULKHEAD FITTING	4
18A	U-SEAL	U-SEAL WASHER (OILTANK BULKHEAD)	4
20	RF500-32A	SIGHT TUBE ELBOW FITTING	2
21	250-6A	HOLLOW BOLT M-6	4
22	RF500-27	GASKET - OIL PUMP	1
23	RF500-28A	HEX BOLT M6 X 16MM	6
23A	RF500-280A	LOCKWASHER M6	9
24	RF500-37A	EYEBOLT	2
24A	RF500-137A	M10 HEX NUT	2
25	RF500-4 RF370-4	ROTOR ASSEMBLY	1
26	RF500-6A RF370-6A	VANES	8
27	RF500-47	PLATE (7.5" X 3.4") SHROUD PLATE	1

RCF 370 & 500 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
28	RF500-55	GASKET PUMP INLET	1
29	RF500-56A	S.H.C.S. M10 X 30	4
30	RF500-18	END CAP	2
31	RF500-57	GASKET-END CAPS DIVERTER	2
32	RF500-11	DIVERTER HOUSING	1
33	RF500-58A	S.H.C. SCREW M10 X 150MM	4
34	RF500-59A	HEX BOLT M10 X 25MM - PLAIN	8
35	RF500-60	GASKET - VALVE CAP	1
36	RF500-12	DIVERTER VALVE CAP	1
37	RF500-13	DIVERTER LEVER ASSEMBLY	1
37B	RF500-13F	LEVER ASSEMBLY-FILTER PUMP	1
38	RF500-130A	S.C.H. SCREW 1/4"-28 X 3/4	1
39	RF500-62A	OIL SEAL	1
40	RF500-14A	DIVERTER VANE SPRING	1
42	RF500-64A	SPLIT PIN 5/16"X1-1/4"	1
43	RF500-10	DIVERTER VANE	1
44	RF500-17BP	BACK-UP VALVE BOTTOM PLATE	1
44A	RF500-44B	BACK-UP VALVE TOP PLATE	1
45	RF500-17C	BACK-UP VALVE SEAT	1
46	RF500-65	GASKET PUMP OUTLET	1
47	RF500-66A	BACK-UP VALVE SPRING	1
48	RF120-48A	HEX BOLT M10 X 40MM - PLAIN	4
49	RF500-9	BASE	2
50	RF500-25A	SIGHT HOSE	1
51	RF500-69A	PIPE PLUG 1/4" NPT BLACK SQ.HD.	7

RCF 370 & 500 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
53	RF500-29 *	OIL PUMP	1
53A	RF500-29R*	OIL PUMP - R.H.	1
54	RF500-23SG	500 OIL PUMP COVER	1
55	RF500-26	GASKET - PUMP COVER	1
57	RF500-24A	HEX BOLT M8 X 90MM - PLAIN	4
57A	RF500-221A	ALUM. FLAT WASHER	4
58	RF500-70	GASKET - SEAL HOUSING	2
59	RF500-71A	SELF DRILLING SCREW	8
60	RF500-72A	ROLL PIN FOR OIL PUMP 5/32 X 1-1/4	1
61	RF500-19A	ROLLER BEARING	2
62	RF500-20A	BELLEVILLE SPRING	4
63	RF500-35A	SNAP - RING	2
64	ELBOW 45 DEG	45 DEGREE ELBOW	1
65	RF500-15	SMALL SEAL HOUSING	1
66	RF500-74	KEY 3/8" x 1/2" x 2"	1
67	NIPPLE 1/4" x 10"	NIPPLE 1/4" NPT 10" LONG FOR 500 PUMP ONLY	1
67A	NIPPLE 1/4" x 8"	NIPPLE 1/4" NPT 8" LONG FOR 370 PUMP ONLY	1
68	RF250-32A	1/4" NPT BRASS 90 DEGREE ELBOW	1
69	RF500-0	BOLT 5/16" NC X 1-1/2 & LW incld w item 3	3
70	RF500-48A	HEX BOLT M8 x 25	9
70B/607A	RF120-96A	M8 LOCKWASHER	9
71	RF500-78A	SNAP - RING	1
72	RF500-72B	ROLL PIN FOR ROTOR SHAFT 1/4 X 3	1
73	RF500-80A	OIL PUMP COUPLING	1
74	RF500-81	VANE WEAR TEST ROD	1
75	A270-5	1/4" NPT X 1-1/2 NIPPLE	1

RCF 370 & 500 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
100	RF500-67A	M10 X 30MM HEX BOLT	20
100A/705	RF120-94A	10MM LOCK WASHER	32
130	RF370-1 RF500-1	PUMP HOUSING	1
140	RF500-140	GASKET HOUSING CAP	2
150	RF250-3	HOUSING END CAP	2
170	RF500-51A *	OIL LINE SET FOR 500 PUMPS	1
180	RF500-51S	OIL PUMP LINES SET	1
190	RF500-190P	BREATHER FILLER	1
560	RF500-22 *	SEAL HOUSING - LARGE	1
600	RF500-F00	STAR KNOB FOR FILTER BOX LID	1
601	RF500-F01	COPPER WASHER	1
602	RF500-FL	FILTER BOX LID	1
603	RF500-FB	FILTER BOX	1
604	RF500-04	FILTER LID 'O' RING	1
605	RF500-FC	S.S MESH FILTER CARTRIDGE	1
607	RF500-F07	HEX BOLT M8 X 30MM	4
607A	RF120-96A	LOCK WASHER M8	4
608	RF502-TP	TRANSITION PLATE	1
609	RF500-65F	GASKET TRANS. PLATE	1
610	RF500-10F	DIVERTER VANE - FILTER	1
611	RF500-11F	DIVERTER HOUSING	1
700	RF500-BH	HYD. DRIVE BELL HOUSING	1
701	RF500-MP	MOUNTING PLATE	1
702	RF500-GR	GUARD RINGS (1 PCS.)	4
703	RF500-703	HEX BOLT M10 X 50MM ZINC PLATED	4

RCF 370 & 500 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
704	M8X35HEX	BOLT M8 X 35 MM	8
705	M8 F/W	M8 FLAT WASHER ZINC PLATED	8
706	F190-XXX	F190 FLANGES 42 MM & SPECIFY OTHER	2
707	F190-INS	F190 COUPLING INSERT	1
708	RF120-134	SET SCREW 1/8" NC x 1/2	2
710	RF250-69A	PIPE PLUG 1/8" NPT BLK SQ. HD	4
712	RF500-240	PIPE PLUG – 1-1/2 NPT	1
713	RF500-ADA2	ANGLE DRIVE ADAPTOR PLATE	1
INS	RF500-INS	INSTRUCTION TAG OIL	1
MAN	RF500-MAN	MANUAL	1
DIR	RF500-DIR	DIRECTION TAG	1
NAM	RF500-NAM	NAME PLATE	1

* SPECIFY PUMP ROTATION "L" OR "R" AND 4-WAY VALVE LOCATION — UP OR SIDE.

RCF 870 Parts List

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
1	RF500-38	6" SHEAVE 4 GROOVE B SECTION	1
2	RF500-82A	DRAIN PLUG /VALVE 1/4" NPT	1
3	SK 42	SHEAVE BUSHING SK 42 MM	1
4	RF500-48B	5/16"NF X 7/8"LG.SHCS PLAIN FOR FAN	1
5	RF500-33L *	FAN ASSY - L.H.	1
5A	RF500-33R	FAN ASSY - R.H.	1
6N	RF870-34N	FAN SHROUD (NEW STYLE)	1
7	RF500-225A	OIL SEAL	4
9	RF500-30	FAN GUARD	1
10	250-6	SOLDER FITTING OIL PUMP OUTLET	4
11N	RF870-46U *	HOUSING SHROUD - LUF	1
12	RF500-8	COLLAR (FINISH GRIND)	2
16	RF500-50A	COMPRESSION FITTING 1/8" NPT FOR 1/4" TUBE	4
17	RF870-72A	BRASS ELBOW COMPRESSION 1/8" NPT - 1/4" TUBE COMPRESSION	2
18	RF500-52A	BULKHEAD FITTING	4
18A	U-SEAL	U-SEAL WASHER (OIL TANK BULKHEAD)	4
20	RF500-32A	SIGHT TUBE ELBOW FITTING	2
21	250-6A	HOLLOW BOLT M-6 FOR OIL PUMP	4
22	RF500-27	GASKET - OIL PUMP	1
23	RF500-28A	HEX BOLT M6 X 16MM	7
23A	RF500-280A	LOCKWASHER M6	11
24	RF500-37A	EYEBOLT	2
24A	RF500-137A	M10 HEX NUT	2
25	RF870-4	870 ROTOR ASSEMBLY	1
26	RF870-6A	VANES	8

RCF 870 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
27	RF870-47	PLATE (10" X4") SHROUD PLATE	1
28	RF870-61	GASKET - PUMP (INTAKE FL. GASKET)	1
29	RF120-102A	HEX BOLT M6 X 10, FAN GUARD	4
30	RF870-4NPT	END CAP (DIVERTER 4" NPT FLANGES)	2
31	RF870-65	GASKET-DIVERTER FLANGE (4" NPT FL)	2
32	RF870-11F	DIVERTER HOUSING	1
35	RF120-127	GASKET - DIVERTER HOUSING CAP	1
36	RF120-12	DIVERTER HOUSING CAP	1
37	RF500-13F	LEVER ASSEMBLY-FILTER PUMP	1
38	RF500-130A	S.H.C. SCREW 1/4"-28 X 3/4	1
39	RF500-62A	OIL SEAL	1
40	RF500-14A	DIVERTER VANE SPRING	1
41	RF870-64	GASKET, DIVERTER-FILTER	1
42	RF500-64A	SPLIT PIN 5/16"X1-1/4"	1
43	RF870-10F	DIVERTER VALVE VANE	1
44	RF870-BUVD	BACK-UP VALVE PLATE (DISC)	1
45	RF870-BUVC	BACK-UP VALVE SEAT (CAGE)	1
46	RF870-62	GASKET, PUMP OUTLET (EXHAUST FLANGE GASKET)	1
47	RF870-66A	BACK-UP VALVE SPRING	1
48	RF120-48A	HEX BOLT M10 X 40MM - PLAIN	8
49	RF870-9	HOUSING BASE	2
50	RF800-25A	SIGHT HOSE	1
51	RF500-69A	PIPE PLUG 1/4" NPT BLACK SQ.HD.	7
52	RF500-25SG	GLASS SIGHT	3
53	RF500-29 *	OIL PUMP	1
54	RF800-189	800 OIL PUMP (RESERVOIR) COVER	1

RCF 870 Parts List Continued

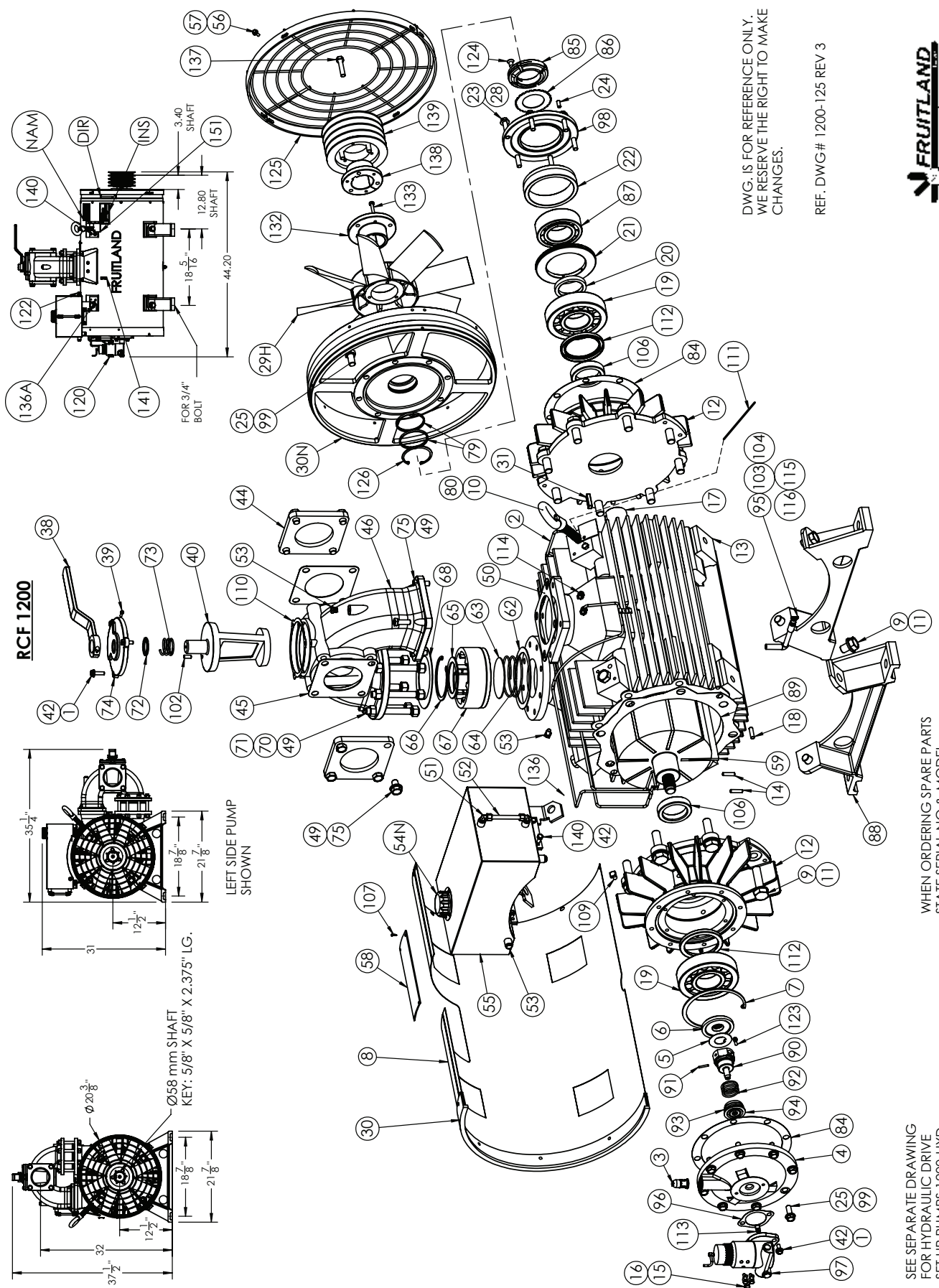
ITEM#	PART #	DESCRIPTION	QTY PER PUMP
55	RF800-191	GASKET- OIL RESERVOIR COVER	1
57	RF500-24A	HEX BOLT M8 X 90MM - PLAIN	6
57A	RF500-221A	ALUM. FLAT WASHER	6
58	RF870-22A	SEAL HOUSING O-RING	2
59	RF500-71A	SELF DRILLING SCREW	9
60	RF500-72A	ROLL PIN 5/32 X 1-1/4 FOR OIL PUMP	1
61	RF500-19A	ROLLER BEARING	2
62	RF870-20A	BEARING PRELOAD SPRING	2
63	ELBOW 45 DEG	45 DEGREE ELBOW 1/4" NPT	1
64	RF250-73A	BLK. MAL.PIPE COUPLING-1/4"	1
65	RF870-15	SEAL HOUSING DRIVE END	1
66	RF500-74	KEY 3/8" x 1/2" x 2"	1
67	NIPPLE 1/4" x 11"	NIPPLE 1/4" NPT x 11" STD. BLK	1
68	RF250-32A	1/4" NPT FEM.90 BLK MAL ELBOW	1
69	RF500-0	BOLT 5/16" NC X 1-1/2 & LW included with item 3	3
70	RF500-48A	HEX BOLT M8 x 25	7
71	RF870-BUVR	BACK-UP VALVE RING	1
72	RF870-32A	DOWEL PIN 3/8" X 2" Long	4
73	RF500-80A	OIL PUMP COUPLING	1
74	RF500-81	VANE WEAR TEST ROD	1
75	A270-5	1/4" NPT X 7/8" NIPPLE	1
80	RF870-21	BEARING SHIMS SET .003" X 3 .005" x 1	1
90	RF870-16	BALLAST AIR PORT COVER	1
91	RF870-63	GASKET-BALLAST COVER	1
92	AI-870-5A	1-1/4" NPT ELBOW FEMALE x FEMALE	1

RCF 870 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
92*	AI-870-71A	1-1/4" NPT STREET ELBOW	1
100	RF500-67A	M10 X 30MM HEX BOLT	24
100A	RF120-94A	10MM LOCK WASHER	36
130	RF870-1	870 HOUSING	1
140	RF870-60	GASKET HOUSING CAP	2
150	RF870-3	HOUSING END CAP	2
170	RF870-51A *	OIL LINE SET FOR 870 PUMPS	1
170A	RF870-51S	OIL PUMP LINES SET	1
190	RF500-190P	BREATHER FILLER	1
560	RF870-22	SEAL HOUSING NO DRIVE END	1
600	RF500-F00	STAR KNOB 55mm	1
601	RF500-F01	COPPER WASHER	1
602	RF500-FL	FILTER BOX LID	1
603	RF870-7-FB	FILTER BOX	1
604	RF500-04	'O' RING	1
605	RF500-FC	ST.ST. FILTER CARTRIDGE	1
607	RF500-F07	HEX BOLT M8 X 30MM	16
607A	RF120-96A	LOCK WASHER M8	23
700	RF870-BH	HYD. DRIVE BELL HOUSING	1
701	RF500-MP	MOUNTING PLATE	1
702	RF500-GR	GUARD RINGS (1 PCS.)	4
703	RF500-703	HEX BOLT M10 X 50MM ZINC PLATED	4
704	M8X35HEX	BOLT M8 X 35 MM	8
705	M8 F/W	M8 FLAT WASHER ZINC PLATED	8
706	F190-XXX	F190 FLANGES 42 MM & SPECIFY OTHER	2
707	F190-INS	190 COUPLING INSERT (FRUITLAND)	1

RCF 870 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
708	RF120-134	SET SCREW 3/8" NC	2
712	RF500-240	PIPE PLUG – 1-1/2 NPT	1
713	RF500-ADA2	ANGLE DRIVE ADAPTOR PLATE	1
INS	RF500-INS	INSTRUCTION TAG OIL	1
MAN	RF500-MAN	MANUAL	1
DIR	RF500-DIR	DIRECTION TAG	1
NAM	RF500-NAM	NAME PLATE	1
* SPECIFY PUMP ROTATION "L" OR "R" AND 4-WAY VALVE LOCATION — UP OR SIDE.			



DWG. IS FOR REFERENCE ONLY.
WE RESERVE THE RIGHT TO MAKE
CHANGES.

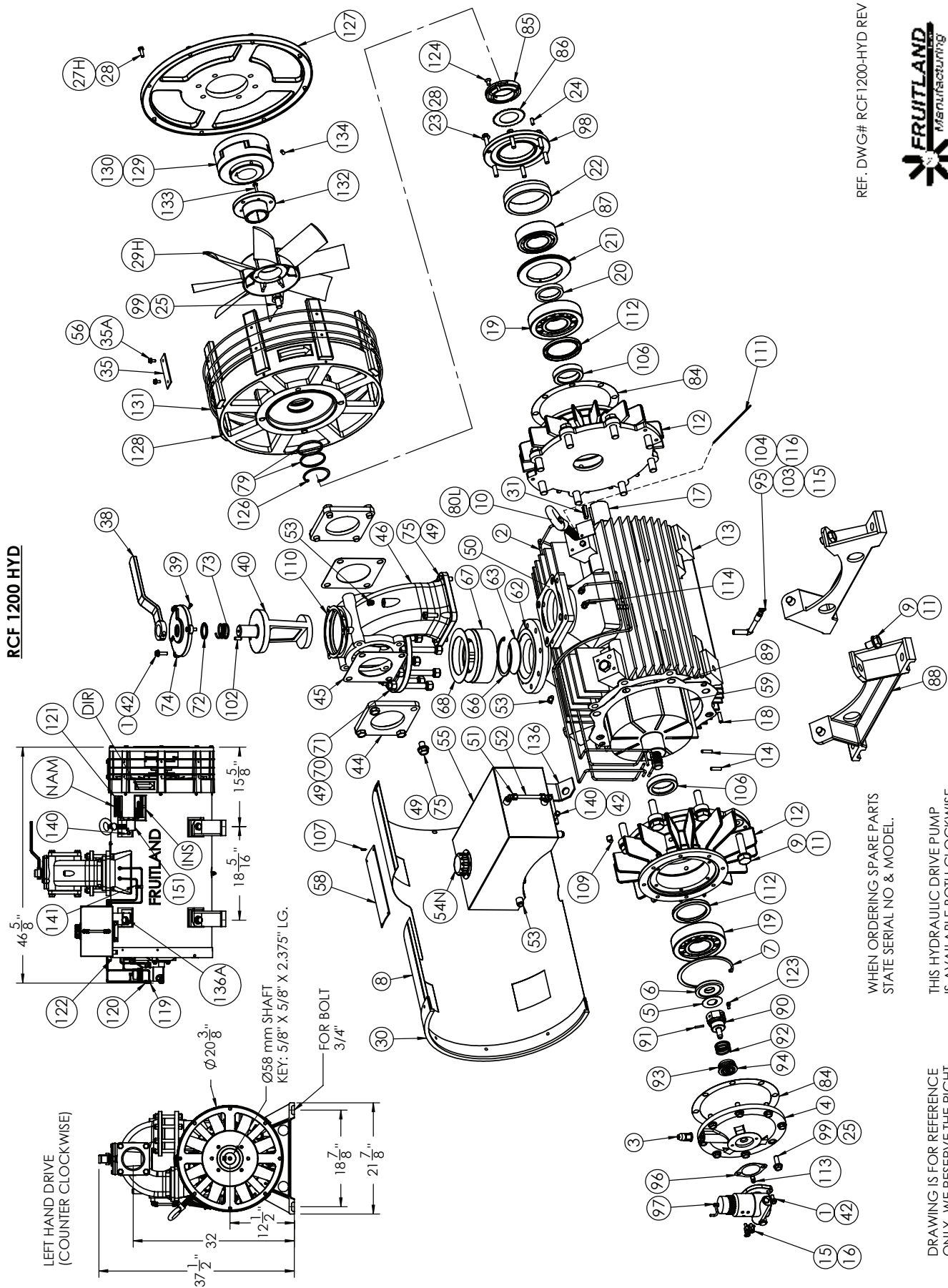
REF. DWG# 1200-125 REV 3



WHEN ORDERING SPARE PARTS
STATE SERIAL NO & MODEL.

SEE SEPARATE DRAWING
FOR HYDRAULIC DRIVE
SET UP PUMPS 1200-HYD.

RCF 1200 HYD



REF. DWG# RCF1200-HYD REV 6



WHEN ORDERING SPARE PARTS
STATE SERIAL NO & MODEL.

THIS HYDRAULIC DRIVE PUMP
IS AVAILABLE BOTH CLOCKWISE
AND COUNTERCLOCKWISE.

DRAWING IS FOR REFERENCE
ONLY. WE RESERVE THE RIGHT
TO MAKE CHANGES.

RCF 1200 Parts List

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
1	RF500-48A	HEX BOLT M8 X 25	5
2	RF120-51A*	1200 SET OIL LINES-LESS FITTINGS	1
3	RF120-78A	OIL FLOW VALVE	1
4	RF120-5	OUTER END COVER	1
5	RF120-80A	SAFETY LOCKWASHER	1
6	RF120-81	ADAPTOR SPACER	1
7	RF120-35A	SNAP RING	1
8	RF120-46H*	HOUSING SHROUD - SHORT STYLE	1
9	RF120-67A	HEX BOLT M20 X 50MM	16
10	RF120-71A	HEX NUT M20	2
11	RF120-82A	M20 LOCKWASHER	22
12	RF120-3	HOUSING CAP	2
13	RF120-1	1200 HOUSING	1
14	RF120-14	ROLL PIN 1/4" DIA X 3-1/2" LONG	2
15	250-6A	HOLLOW BOLT M-6	4
16	250-6	SOLDER FITTING (OUTLET)	4
17	RF120-4	1200 ROTOR ASSEMBLY	1
18	RF120-86A	TAPERPIN	4
19	RF120-19A	ROLLER BEARING	2
20	RF120-87	RING SPACER	1
21	RF800-88	OUTER RING	1
22	RF120-89	BEARING RING	1
23	RF500-59A	HEX BOLT M10 X 25MM	6
24	RF120-91A	ROLL PIN 1/4 X 1-11/4	1
25	RF120-92A	M12 LOCKWASHER	16
27H	RF500-67A	HEX BOLT M10 X 30MM	16

RCF 1200 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
28	RF120-94A	10MM LOCK WASHER	14
29H	RF120-33 *	FAN - LEFT HAND TAPER (ALUM)	1
30	RF120-34 *	SHROUD RING	1
30N	RF120-34N	FAN SHROUD	1
31	RF120-74	KEY	1
35	RF120-02	CLAMP PLATE FOR GUARD RINGS	1
35A	RF500-28A	HEX BOLT M6 X 16MM	10
38	RF500-13	LEVER ASSEMBLY	1
39	RF500-130A	S.H.C SCREW 1/4" -28 X 3/4	1
40	RF120-10	DIVERTER VANE	1
42	RF120-96A	M8 LOCKWASHER	13
44	RF120-18	END CAP	2
45	RF120-57	GASKET - END PLATE	2
46	RF120-11	DIVERTER HOUSING	1
49	RF120-59A	M16 LOCKWASHER	20
50	RF120-55	GASKET - INLET	1
51	RF500-32A	ELBOW FITTING	2
52	RF120-25A	SIGHT HOSE	1
53	RF500-69A	PIPE PLUG 1/4" NPT BLK SQ.HD.	8
54N	RF120-100N	CAP\BREATHER ASSEMBLY	1
55	RF120-23	OIL TANK ASSEMBLY	1
56	RF500-280A	LOCKWASHER M6	10
57	RF120-102A	HEX BOLT M6 X 10 MM	10
58	RF120-124	PLATE	1
59	RF120-6A	1200 VANES	8
62	RF120-65	GASKET - OUTLET	1

RCF 1200 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
63	RF120-17	VALVE PLATE	1
64*	RF120-66A	VALVE SPRING (SIDE MOUNT)	1
65*	RF120-104	VALVE RING	1
66	RF120-105A	SNAP RING	1
67	RF120-106	VALVE HOUSING	1
68	RF120-65A	GASKET BACK-UP VALVE	1
70	RF120-97A	HEX NUT M16 - PLAIN	8
71	RF120-107A	STUD M16 X 120MM	8
72	RF500-62A	SEAL	1
73	RF500-14A	DIVERter VANE SPRING	1
74	RF120-12	DIVERter VALVE CAP	1
75	RF120-108A	HEX BOLT M16 X 40MM - PLAIN	12
79	RF120-16A	SEAL	2
80	RF120-00	EYE BOLT M20X50 MM SIDE MOUNT	2
80L	RF120-001	EYE BOLT M20 X 150MM UPRIGHT	2
84	RF120-58	GASKET-OUTER END COVERS	2
85	RF120-114 *	M65X2 ROTOR NUT	1
86	RF120-115A	STAR WASHER	1
87	RF120-116A	BALL BEARING	1
88	RF120-9	BASE	2
89	RF120-7	GASKET - HOUSING CAP	2
90	RF120-117	OIL PUMP ADAPTOR	1
91	RF120-72A	ROLL PIN 5/32 X 3/4	1
92	RF120-118A	SPRING	1
93	RF120-119A	"O" RING	1
94	RF120-120	CUP	1

RCF 1200 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
95	A270-3	NIPPLE 1/4" NPT 3-1/2"	2
96	RF120-27	OIL PUMP GASKET	1
97	RF120-29*	1200 OIL PUMP	1
98	RF120-122	BEARING PLATE	1
99	RF120-69A	HEX BOLT M12 X 33MM	16
102	RF500-64A	ROLL PIN 5/16"X1-1/4"	1
103	RF500-82A	DRAIN COCK - 1/4"	1
104	A270-40	ELBOW 1/4" NPT FEMALE	1
106	RF120-8	COLLAR	2
107	RF500-71A	SELF DRILLING SCREW	9
109	RF250-69A	PIPE PLUG 1/8" NPT BLK SQ.HD.	2
110	RF120-127	GASKET VALVE CAP	1
111	RF120-01	VANE WEAR TEST ROD	1
112	RF800-3A	SEAL - END COVER	2
113	RF120-30	OIL PUMP COUPLING (DFG)	1
114	RF500-50A	CONNECTOR (FOR 1/4" TUBE)	7
115	RF250-30A	NIPPLE 1/4" NPT X 4-1/2	1
116	RF250-73A	BLACK MALE PIPE COUPLING 1/4"	1
119	RF120-HBI	HOLLOW BOLT (INTAKE) M 11X1	1
120	RF120-SF	SOLDER FITTING (INTAKE)	1
122	RF120-50A	CONNECTOR FOR 5/16 TUBE	1
123	RF120-128A	S.H.C.S. M6 X 25MM	2
124	RF120-129A	FLAT HEAD SCREW 3/8 NC X 5/8	1
125	RF120-290	RCF1200 FAN GUARD	1
126	RF800-001	SNAP RING	1
127	RF120-MP	MOUNTING PLATE F. HYD.MOTOR	1

RCF 1200 Parts List Continued

ITEM#	PART #	DESCRIPTION	QTY PER PUMP
128	RF120-BH	BELL HOUSING	1
129	WT358H	COUPLING FALNGE SPECIFY BORE	1
130	IN-358	COUPLING INSERT	1
131	RF120-GR	GUARD RINGS	4
132	SK60	TAPER BUSHING SK 60MM NO KEY	1
133	RF120-0	BOLT 5/16" NC X 2" & LW	3
134	RF120-134	SET SCREW 3/8" NC X 1/2	2
136	RF120-136	OIL TANK MOUNTING BRACKET	2
136A	RF120-136A	BOLT M-20 X 30 MM LG	2
137	RF120-137	BOLT 1/2" NC X 2- 3/4" & LW	3
138	E 58	TAPER BUSHING E 58MM	1
139	4-5V8.0	SHEAVE 8" OD 4 GROOVE 5 V SECT	1
140	RF120-140	HEX BOLT M8 X 20MM	6
141	RF120-OLC	OIL LINE CLAMP (SET) W. SCREW	1
151	RF120-151	SHROUD BRACKET	1
DIR	RF500-DIR	DIRECTION TAG	1
INS	RF500-INS	INSTRUCTION TAG	1
NAM	RF500-NAM	NAME PLATE	1
MAN	RF250-MAN	MANUAL	1

* SPECIFY PUMP ROTATION "L" OR "R" AND 4-WAY VALVE LOCATION — UP OR SIDE.

PUMP FLUSHING PROCEDURE

For ease of operation, Fruitland recommends installing our Pump Flushing Kit (Part #FK500) to assist in this procedure.

Flushing Fluid: $\frac{3}{4}$ of diesel fuel mixed with $\frac{1}{4}$ of pump oil by volume.

PROCEDURE:

1. Stop the pump and remove $\frac{1}{4}$ " npt plug (See below for location):
 - On RCF250, it is located on the pump diverter valve. (#38 on exploded view drawing)
 - On RCF370, RCF500 and RCF870, it is located on the intake flange.
 - On RCF1200, it is located on the diverter valve housing.
2. Connect a brass fitting, rubber hose, ball valve and flushing fluid bottle to the port.
3. Run the Pump, switch to vacuum and slowly open the ball valve.
4. Pass approximately 2 to 3 liters of the flushing fluid through the pump while restricting/controlling the flushing fluid flow through the ball valve.
5. Close the ball valve and run the pump for an additional minute to remove all the flushing fluid from the pump.
6. Drain the oil catch muffler or oil separator
7. If you remove the Pump flushing fittings from the pump, make sure to re-install the $\frac{1}{4}$ " NPT plug back to the port.
8. Resume pumping operation.

For further assistance please call: 1-800-663-9003

Pump Out of Use for Prolonged Period(s):

If the pump is not operated for 2 or more months (before new installation or sitting idle), the above flushing procedure should be performed.

Troubleshooting

Lack of vacuum in the tank:

- Tank not closed or leaking.
- Collapsed Hose: Check and Replace.
- Automatic Shutoff Valve is stuck: Put pump on pressure for a moment.
- Pump running backwards after stopping: Stuck or Broken non-return valve (Back up valve)

Overheating:

- Lack of oil.
- Wrong type of oil (See FAQ below)
- Cooling fins of casing plugged with dirt.
- Pump was run too long without air passing through inside of pump (See cooling page 8)
- RPM too high.
- Broken oil pump.
- Clogged oil line.
- Collapsed hose.
- Clogged filter or muffler.

Pump not turning:

- Foreign material lodged in pump.
- Pump frozen (winter conditions).
- Vane or housing broken.
- Overheated.

On RCF370, RCF500, RCF870 and RCF1200 only

Note: A slight metallic noise at high vacuum (above) 23-24 Hg. is normal. The expanded air is too weak to hold the non-return valve (back-up valve) completely open and consequently causes the closing disk to flutter.

ACCESSORIES

Filters:

The vacuum system should have at least one filter between the vacuum tank and the pump so that only clean air is allowed to pass through the pump. These filters can be in the “primary shutoff” or “secondary shutoff”, in line (between secondary and pump) or at the pump. Fruitland’s secondary shutoff is equipped with a filter.

Shutoff Moisture Traps:

All vacuum tanks should be equipped with an adequate “primary shutoff” and a “secondary shutoff” moisture trap to prevent liquids or semi-solids from being drawn into the pump. Liquids or solid materials drawn into the pump can seriously damage the pump. Moisture traps should be drained often and always before shutting unit down when temperature is below freezing.

Pressure Relief Valves:

A PRESSURE RELIEF VALVE MUST BE INSTALLED IN THE VACUUM SYSTEM. Test periodically to ensure proper setting is maintained. The Fruitland secondary shutoff is equipped with a pressure relief valve.

Vacuum Relief Valves:

If pump is run for a long period of time at high vacuum, a vacuum relief valve is recommended to protect against overheating.

Pressure / Vacuum Gage:

Recommended.

Oil Trap Muffler:

Strongly recommended to reduce noise. Available at Fruitland Manufacturing for all pumps.

Intake Piping:

Pipes used must be free of corrosion or rust. Welding beads slag or spatter must be removed.

Non-Return Valve:

(Back-up valve) A standard installation in all our models. Its function is to close automatically when the pump is stopped to prevent air back flow and reverse running of the pump.

FAQS

Question: What type of Oil should I use in my Fruitland Vacuum Pump?

Answer: If the suction temperature is >50°F (summer conditions), a SAE-40 non detergent motor oil or an ISO 150 compressor oil can be used. If the suction temperature is <50°F (Winter Conditions) a SAE-30 non detergent motor oil or an ISO 100 compressor oil is recommended.



IMPORTANT NOTE

We had learned several years ago that some users of the Fruitland pumps had used a common motor oil for pump lubrication.

The oil most commonly used was 15w40 – detergent oil that has not been recommended by Fruitland Manufacturing in the past.

We have been examining the effects of using this common grade of motor oil and have determined that there have been no detrimental outcomes as a result of it being used. When operated properly, Fruitland pumps will run cooler, use less oil and provide much longer service than any other rotary vane vacuum pump. Although Fruitland Manufacturing still recommends using SAE-40 non-detergent motor oil, we can find no reason not to use 15w40 motor oil when the standard oil is not available.

Question: What RPM should I run my Fruitland Rotary Vane Pump at?

Answer: For the RCF250, RCF370, RCF500 and RCF870 pumps we recommend 1300 RPM to a maximum of 1400 RPM. For RCF1200, 1000 RPM is recommended.

Question: What is a good working vacuum level?

Answer: Fruitland rotary vane vacuum pumps are capable of achieving very high vacuum levels, up to 95% or 28.5" Hg vacuum at sea level. Factors affecting the vacuum level of the pump are speed (R.P.M.), elevation (your location) and pump temperature. Please remember that at higher vacuum and speed and longer running time, more heat is generated. For good wear life, vacuum pumps are recommended to be operated below the maximum allowable speed (1400 RPM) and temperature (375°F Exhaust). Vacuum and pressure relief valves are generally set by the end-user based upon their own requirements and recommendations from the tank builders. However the following guidelines are also recommended.

For short intermittent duty (5 to 10 min), the pump can be operated at very high vacuum, up to 27" Hg, and pressure up to 25 PSI, while keeping a close eye at temperature rise of the exhaust air, not to exceed 375°F.

However there can be slight deviations from these limits based on your application, location and atmosphere. Please check the integrity (age) of your system and limitations from the tank builders before operating at higher rate. It is up to the operator of the pump to set the vacuum and pressure relief valves to suit the equipment and application. For continuous duty the relief valves can be set at 5" to 15" PSI * for pressure and 15" to 22" Hg for vacuum.



Important Note:

Pressure above 7 PSI is not recommended unless the tank and system has the appropriate certification.

Question: How much Horsepower will my Fruitland Vacuum Pump require to run properly?

Answer: Please see the HP measured at maximum recommended speed.

HP Requirements for Vacuum and Pressure													
Pressure (PSI)						Vacuum (inch Hg)							
Engine BHP	RPM	25	20	15	10	5	0	5	10	15	20	25	28
Pump Model													
RCF1200	1000	85.0	77.0	67.5	59.0	52.0	43.0	43.0	45.0	47.0	50.0	53.0	55.0
RCF870	1400	57.0	53.3	53.3	47.4	44.2	40.3	37.7	36.4	37.7*	39.0*	40.3*	41.6*
RCF500	1400	42.0	39.0	39.0	34.0	31.0	30.0	29.0	27.0	25.0	24.0	23.0	22.0
RCF370	1400	36.0	32.0	27.5	23.0	23.0	16.0	15.0	14.0	13.0	12.5	12.0	11.0
RCF250	1400	18.0	16.5	15.0	13.0	13.0	10.0	9.5	9.0	8.0	7.5	7.5	7.0
Electric Motor HP													
RCF1200	1000	65.4	59.2	51.9	45.4	40.0	33.1	33.1	34.6	36.2	38.5	40.8	42.3
RCF870	1400	44.0	41.0	39.0	36.5	34.0	31.0	29.0	28.0	29.0*	30.0*	31.0*	32.0*
RCF500	1400	32.3	30.0	27.7	26.2	23.8	23.1	22.3	20.8	19.2	18.5	17.7	16.9
RCF370	1400	27.7	24.6	21.2	17.7	15.4	12.3	11.5	10.8	10.0	9.6	9.2	8.5
RCF250	1400	13.8	12.7	11.5	10.0	9.2	7.7	7.3	6.9	6.2	5.8	5.8	5.4

*With air-injection

Question: How much will my Fruitland Vacuum Pump Weigh?

Answer: Please see chart weight chart below.

	L	W	H	Weight	L	W	H	Weight
RCF 250	25"	18"	25"	290 LBS	63.5 CM	46 CM	63.5 CM	131 KG
RCF 370	34"	24"	32"	425 LBS	87 CM	61 CM	81 CM	193 KG
RCF 370 F	34"	24"	32"	440 LBS	87 CM	61 CM	81 CM	200 KG
RCF 370 H	34"	24"	32"	440 LBS	87 CM	61 CM	81 CM	200 KG
RCF 370 FH	34"	24"	32"	450 LBS	87 CM	61 CM	81 CM	204 KG
RCF 500	34"	24"	32"	500 LBS	87 CM	61 CM	81 CM	227 KG
RCF 500 H	34"	24"	32"	510 LBS	87 CM	61 CM	81 CM	231 KG
RCF 500 F	34"	24"	32"	510 LBS	87 CM	61 CM	81 CM	231 KG
RCF 500 FH	34"	24"	32"	520 LBS	87 CM	61 CM	81 CM	236 KG
RCF 870	34"	24"	32"	575 LBS	130 CM	92 CM	109 CM	500 KG
RCF 1200	51"	36"	43"	1400 LBS	130 CM	92 CM	109 CM	635 KG
RCF 1200 H	51"	36"	43"	1430 LBS	130 CM	92 CM	109 CM	649 KG

Question: How often should I flush my Fruitland Pump?

Answer: We recommend flushing the vacuum pump every two months. An Operator who is using their pumps excessively may want to increase flushing frequency.

Question: How do I flush my Fruitland Vacuum Pump?

Answer: Please view our Pump Flushing Procedure on page 38 for full details.

Question: What do the letters in my serial number refer to?

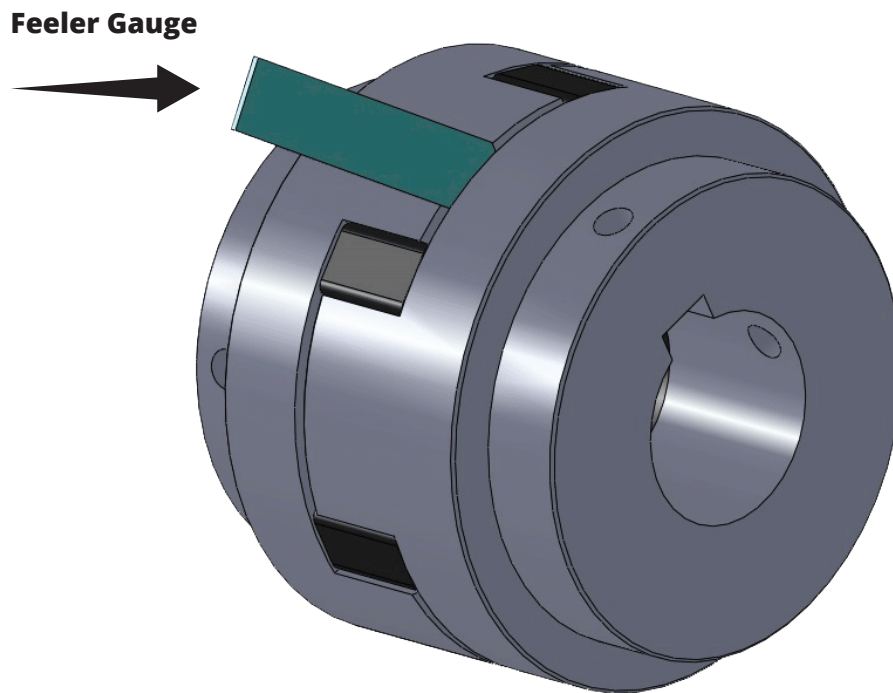
Answer:

- L or R – Denotes left or right hand rotation, Left being counter clockwise and Right being clockwise rotation.
- U or S – Refers to upright or side mounted 4-way valve.
- F - Refers to a vacuum pump that comes with an integral filter box.
- H or A – Refers to a Hydraulic drive bell housing or an Angle drive bell housing.

Question: Why is my Coupling wearing?

Answer: See coupling installation on the next page.

It is very important to maintain a gap of 0.070" to 0.100" between the two halves of the coupling to achieve proper pump operations and avoid any pump failures. Please use a feeler gauge as shown in the picture to maintain this gap.



Question: What Tools should I keep on hand for Rebuilding and Maintenance of my Vacuum Pump?

Answer: Here is a list of suggested Tools for rebuilding RCF250, RCF370, RCF500 and RCF870:

- 1) Compact Air Gun
- 1) Rubber Hammer
- 1) Screw Driver – Flat
- 1) Ball Peen Hammer
- 1) 6" Vice Grip
- 1) 6" Socket Extension 3/8 Drive
- 1) 6" Puller
- 1) Set of Screw Driver Tips
- 1) Air Tool Screw Driver
- 1) Angle Socket Driver 3/8"
- 1) Metric Set Allen Key
- 1) Standard Allen Key Set

- 1) Paint stick or felt marker
- 1) Internal –External Snap ring Pliers

Wrenches: 3/4", 10mm, 13mm, 17mm, 19mm, 9/16" Combination Wrenches

Sockets: 10mm, 13mm, 11mm, 17mm, 7/16", 5/16" Allen Key Socket, 1/4" Allen Key Socket- 3/8" Drive

- 1) 6" Adjustable

Vacuum Actuated Cooling System (VACS)

The Fruitland 870 series pump is a true 500 CFM machine with 4" porting. Although, dimensionally, it is only slightly larger than the Fruitland 500 series pump it works exactly the same with the exception of the VACS system.

Under high vacuum (vacuum above 20" Hg) very little air moves through a rotary vane vacuum pump. This may result in heat buildup which reduces the duty cycle and under extreme conditions can cause the pump and components to fail prematurely. The Fruitland VACS system allows the pump to remain cool under high vacuum through extended periods of operation. Here is how it works: We take a small pilot air line from the filter pod of the pump directly to the VACS valve. The VACS valve is controlled by the amount of vacuum created by the pump. The valve is factory set at 20" Hg but can be adjusted in the field. When the VACS valve starts to open under high vacuum it allows ambient air to enter the pump just ahead of the exhaust port. This will keep the pump operating at a safe temperature in normal operating environments. The VACS system consists of the air injection valve, 3/8" pilot control tube, 1.5" air injection hose, air filter (optional muffler) and mounting hardware. The valve can be remotely mounted and is quiet.

Air Injection Shut Off

The air injection system for the Fruitland 870 vacuum pump whether installed at the Fruitland factory or by one of our many rig up companies should be installed with an in-line ball valve shut off.

The ball valve should be installed between air injection muffler and the vacuum relief block. If a vacuum truck operator chooses to leave vacuum (negative pressure) or pressure in the vacuum tank (vessel) while dis-engaging the Power Take Off (PTO), the operator needs to shut the air injection ball valve off prior to dis-engaging the PTO. Failure to do so may cause the vacuum pump to spin backwards at very high RPM.

Air Injection System

1.5" I.D. Hose Attach to the Air Injection Connection on the Pump

3/8" OD Steel Tube

1/4" NPT- 3/8" OD Steel Tube Compression Fitting

1/4" NPT Ball Valve

1/4" NPT x 1.5" Long Pipe Nipple

1.25" NPT-1.5" Barb Hose Fitting 2 X

Use 1.5" I.D. Flexible Hose

1.25" NPT Pipe Plug

.25" NPT Pipe Plug

Air Injection Vacuum Adjustment. Factory set to open at 20 inHg Vacuum

Air Injection Valve

Air Filter

Air Injection Muffler (Optional)

Notes



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**Attention: Read owner's manual fully before operating pump.
Failure to do so can result in severe pump damage and may void warranty.**

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