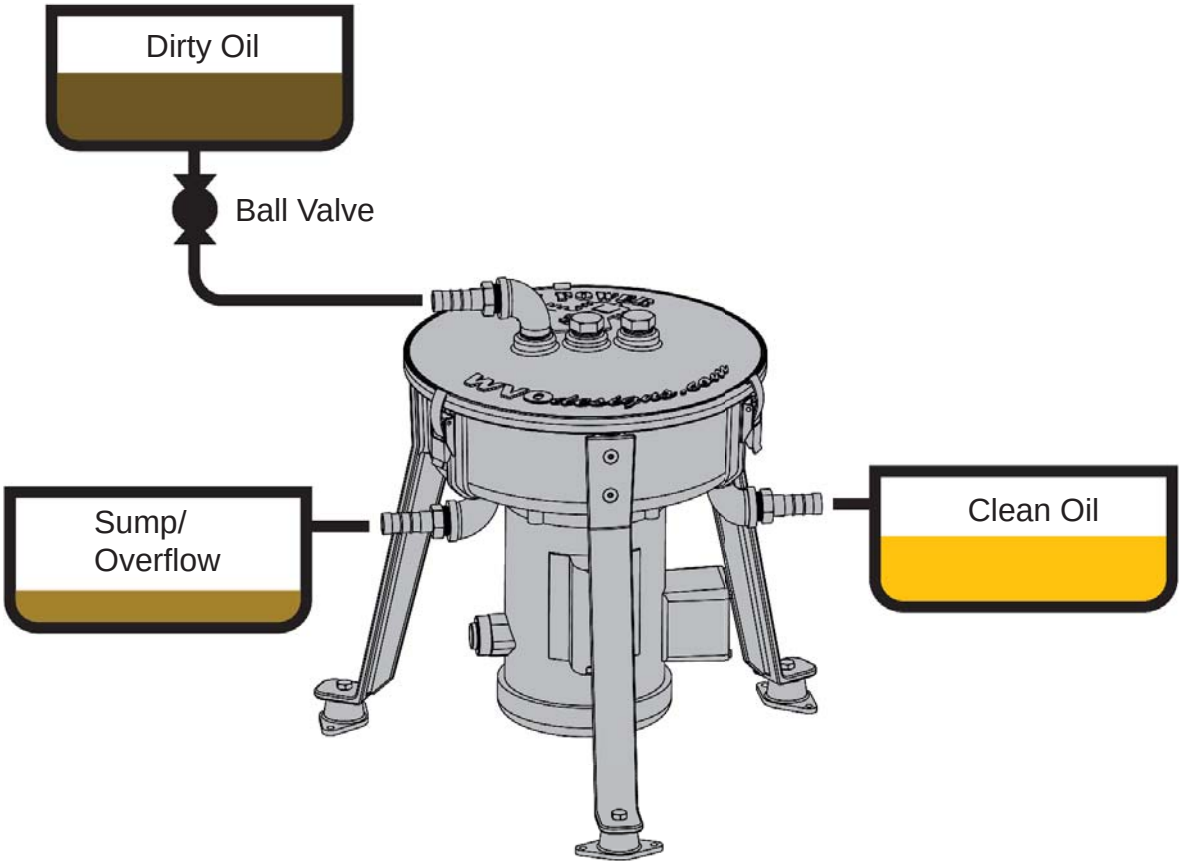
RAW POWER BASIC
AND
EXTREME CENTRIFUGE MANUAL

Thank you for purchasing the Raw Power Centrifuge from WVO Designs. This product is designed to remove contaminants (heavy solids and liquids) from waste oils such as waste vegetable oil in a continuous/batch process.

- Hose fittings are ¾" ID and threaded ports are ¾" NPT. It is recommended to use clear hose to monitor the flow.
- PVC hose from the hardware store will work. Polyethylene is better and will last longer, but is more expensive.
- Input to the centrifuge is designed to be gravity fed via a container placed higher than the centrifuge. You may use a low flow pump(15 gallons/hr) instead of gravity.
- Output flow of oil is processed by the centrifuge and then drains out the clean port by gravity. A container must be placed lower than the centrifuge.

Contents

Centrifuge Flow



- Flow should be 10–20 gallons/hour for fuel quality oil at 150˚F. Use a valve to control the flow, otherwise the centrifuge will flood. The restrictor on the lid is not enough to reduce the flow. Measure the flow by timing how long it takes to fill a 5 gallon bucket. Flow over 25 gallons/hour, the centrifuge will flood. Start at the lower flow rates, 10 gph, and work your way up.

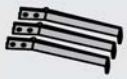
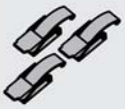
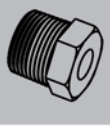
- Heaters should not run dry. When building your own, plumb in a low spot to prevent and include a thermostat. Oil is best cleaned when Hot, at least 150˚F.

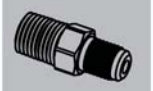
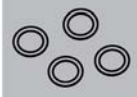
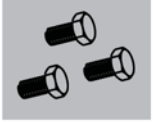
- Cleaning—For a finer clean, slow down the flow of oil into centrifuge. The centrifuge will not clean the dregs or really dirty/water logged oil. It is best used for a fine cleaning, producing a fuel quality oil. If you have lots of debris and water in your oil, let it settle and pull or pour off the top, then into the centrifuge.

- Water and debris will be trapped in the bowl. Stop the bowl to let the water drain every 40 gallons or so. Cleaning of the bowl itself can be done every 200+ gallons or so, when the wall of dirt on the inside of the bowl gets thicker than ¼”.

- Clean the bowl out with hot soapy water, a scraper and sponge.

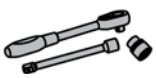
Parts List

QTY	IMAGE	PART NUMBER	DESCRIPTION
1		1000	RPC Rotor
1		1001	RPC Enclosure
1		1002	RPC Lid
3		1004	RPC Leg
3		64875K61	Vibration Dampener 50 LB Max Load
3		97-50-150-11	Over Center Draw Latch
1		RPC013/ RPC012	.33HP Motor 3450 RPM, 1PH, 60HZ
4		5350K45	Barbed Hose Fitting High Flow Male Barb ¾ Hose ID X ¾ MPT
3		4638K224	90° ¾ Pipe Elbow FPT X MPT
1		6202115	Trantorque Clamp Bushing for 5/8 Shaft
1		4638K639	Hex Bushing ¾ MPT X ¾ FPT

QTY	IMAGE	PART NUMBER	DESCRIPTION
1		50695K162	¼ MPT X ¼ Flare Adapter
2		7739K185	¾ MPT Hex Head Plug
1		1056	Aluminum Seal Bushing w/ 2 Set Screws
1		CR6152	Oil Seal
1		CR6139	Oil Seal
1		9464K645	12 X 3/16 Viton O-Ring
4		9464K18	7/16 X 1/16 Viton O-Ring
6		90272A193	8-32 X 7/16 PPHMS
6		92210A539	¼-20 X 5/8 FHSCS
4		91306A419	3/8-16 X 1 BHSCS
3		91309A580	5/16-18 X 5/8 HHCS

REQUIRED TOOLS & MATERIALS

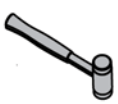
Allen Wrenches: 3/32, 5/32, 7/32



Socket Wrench with7/8 Socket and Extension or Deep Socket

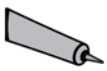
#2 Phillips Screw Driver

Crescent Wrench



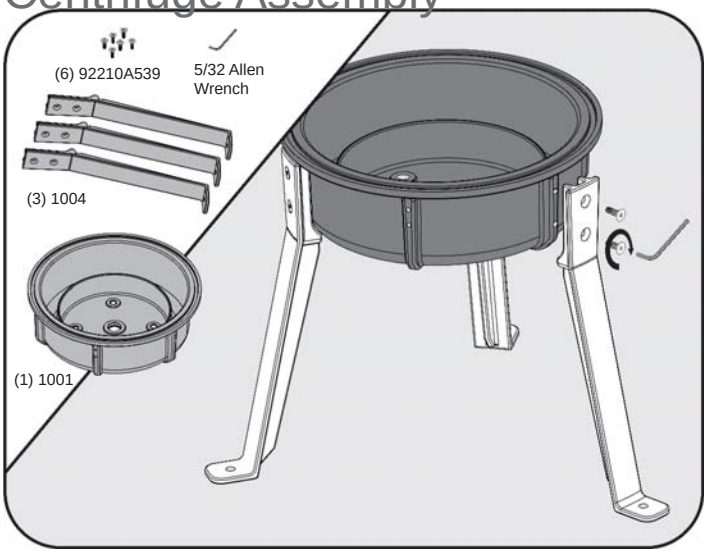
Rubber Mallet

Thread Tape or High Temp Pipe Sealant

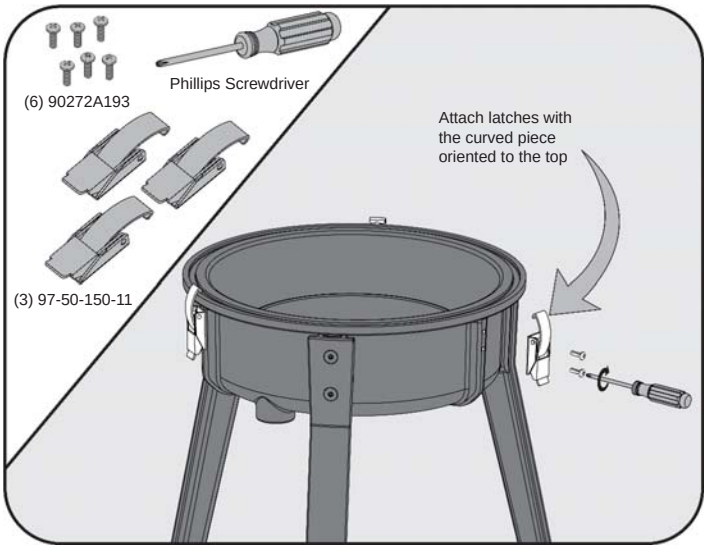


Standard Bearing Grease

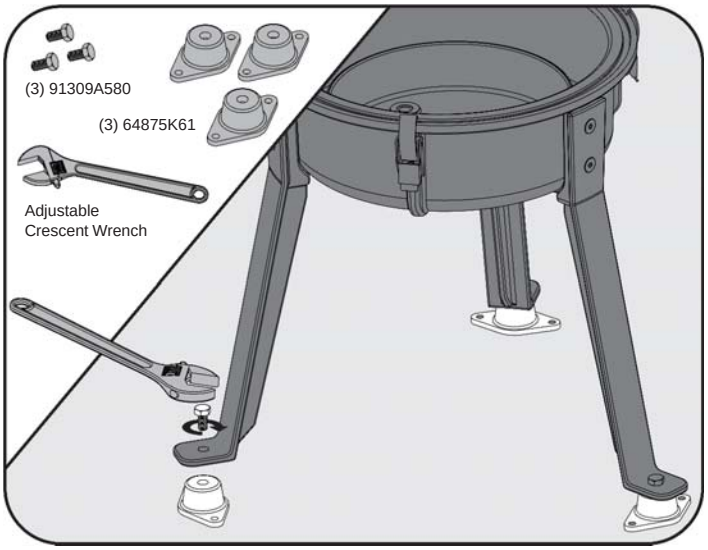
Centrifuge Assembly



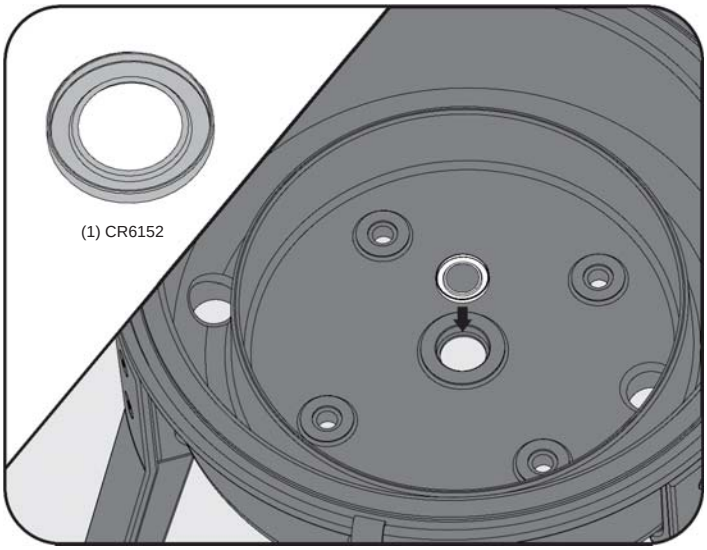
1. Bolt legs onto housing using (6) ¼-20 x 5/8" FHSCS using a 5/32" Allen Wrench.



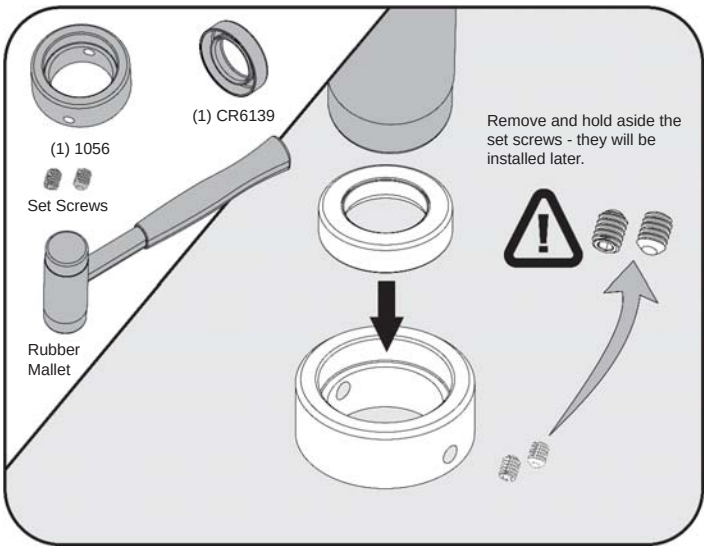
2. Attach (3) Over Center draw latches using (6) 8-32 x 7/16 PPHMS using a #2 Phillips Screwdriver.



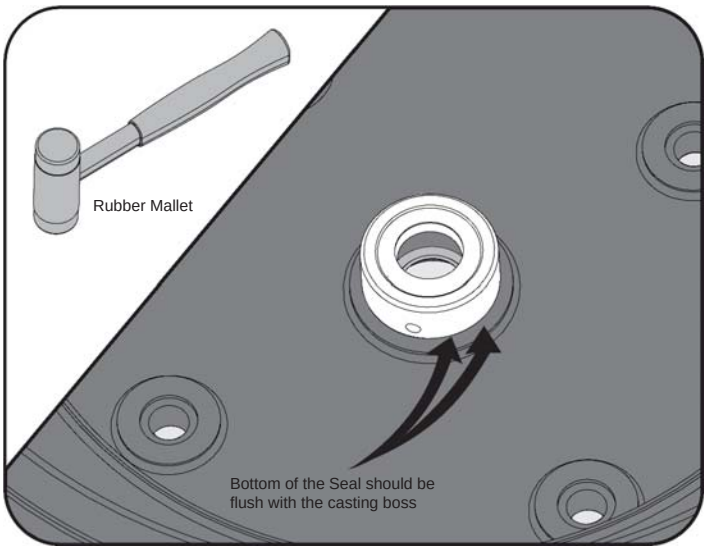
3. Attach (3) Vibration Dampeners to the feet of unit legs using (3) 5/16-18 X 5/8 HHCS using an adjustable Crescent Wrench.



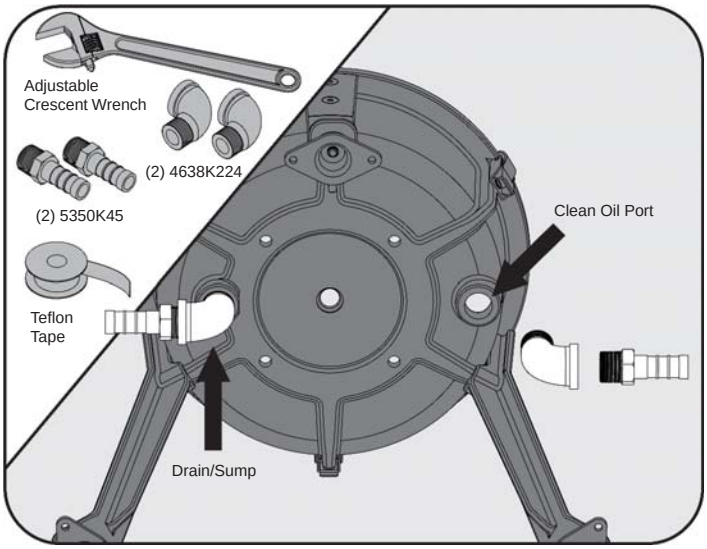
4. Press Oil Seal into the recess at the bottom of the centrifuge housing with the concave side facing up.



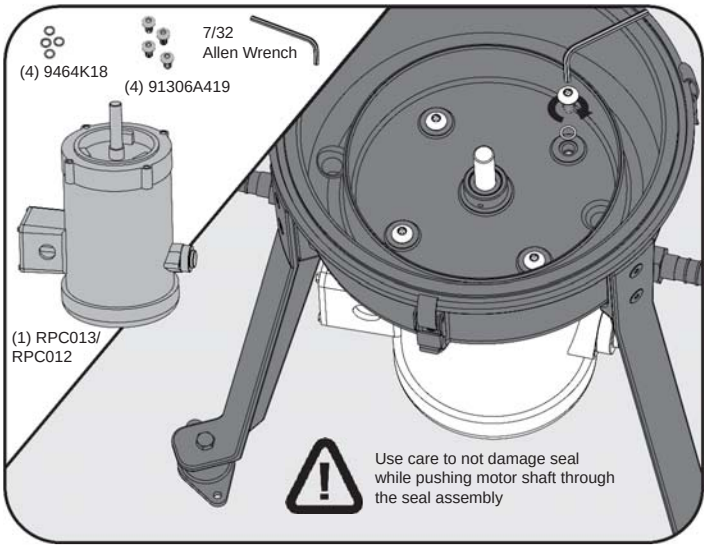
5. Tap the Oil Seal into the top of the Aluminum Seal Bushing until flush using a Rubber Mallet. Set aside the Set Screws for later use.



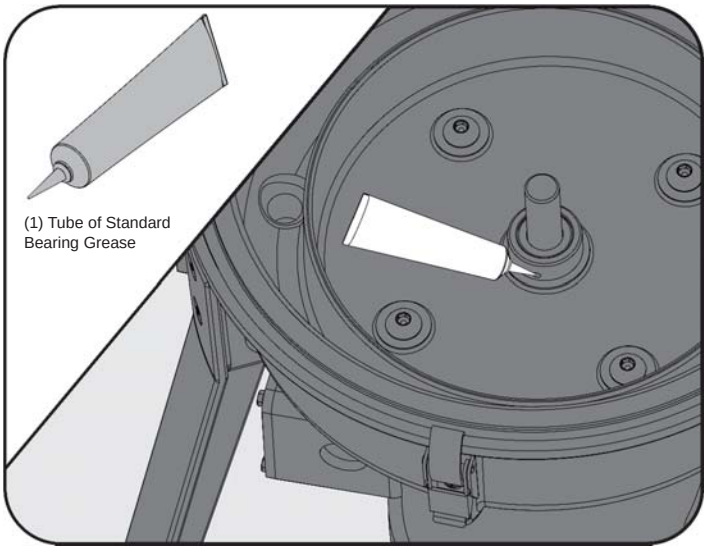
6. Using a rubber mallet, tap the Aluminum Seal into the Centrifuge Housing. Tap into place until the bottom of the Seal is flush with the casting boss.



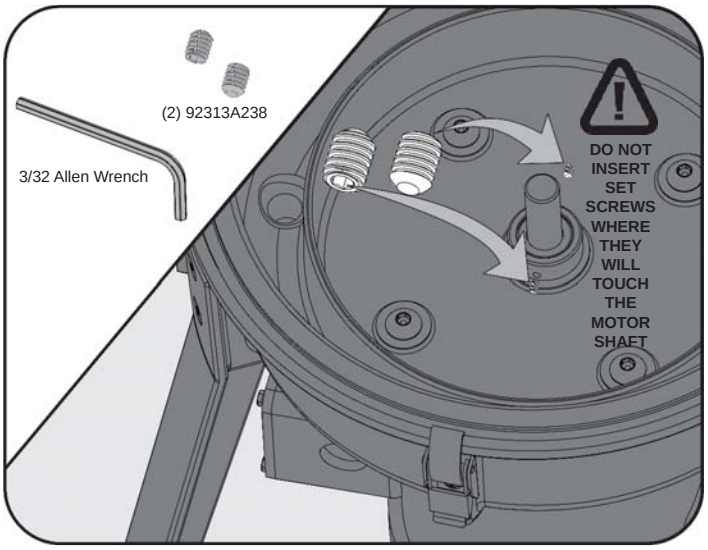
7. Wrap all male threads with Teflon Tape. Screw (2) Hose Barbs ¾ MPT X ¾ Hose into (2) 90° ¾ MPT X ¾ FPT Elbows and screw into Centrifuge Housing bottom.



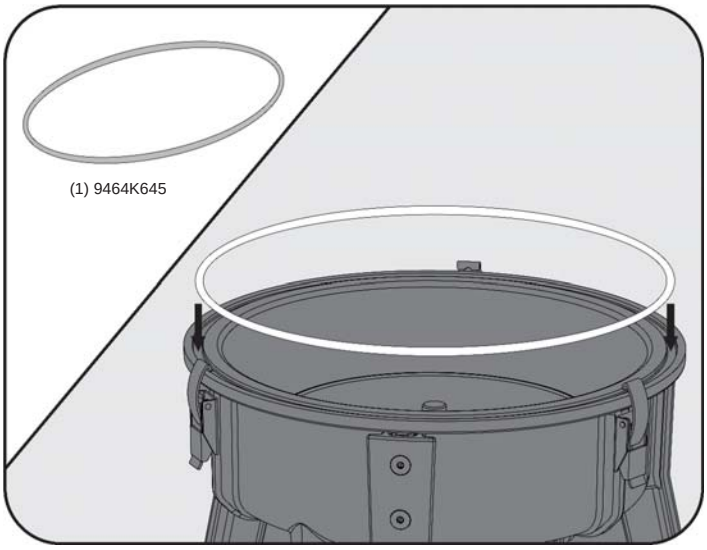
8. Place (4) 7/16 X 1/16 Viton O-Rings into the mount bosses in the bottom of the Housing. Push Motor Shaft up through Seal Assembly. Mount Motor with (4) 3/8 X 1 BHSCS.



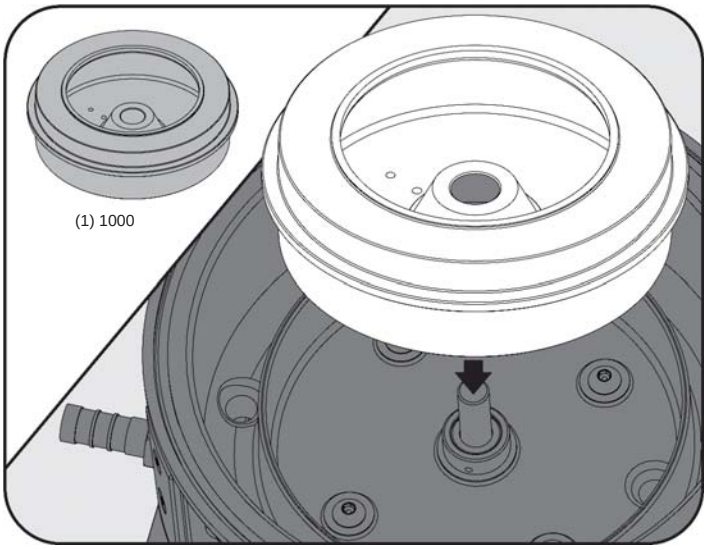
9. Fill the Seal assembly with standard bearing grease.



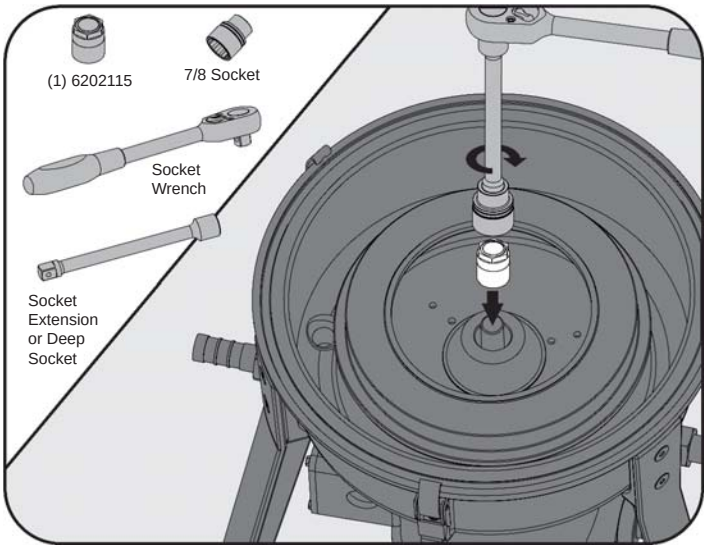
10. Using a 3/32 Allen Wrench, insert (2) Set Screws which were set aside earlier into the Seal assembly. Set Screws **MUST NOT** come in contact with the Motor Shaft.



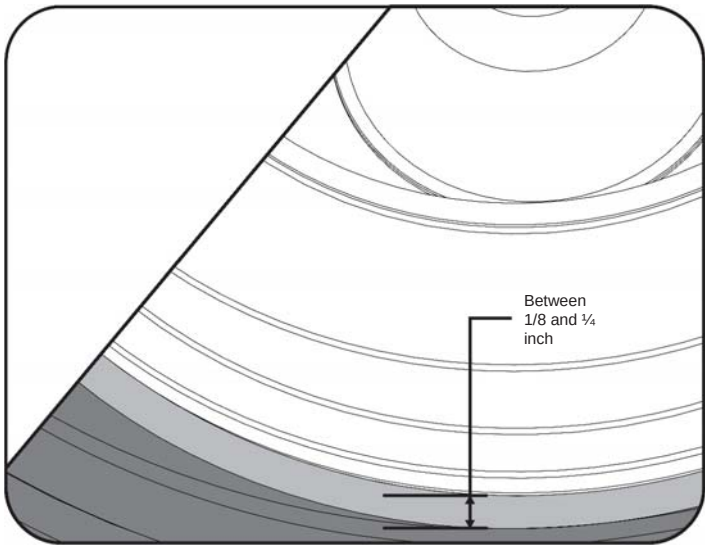
11. Set 12 X 3/16 Viton O-Ring in groove on top of the Centrifuge Housing.



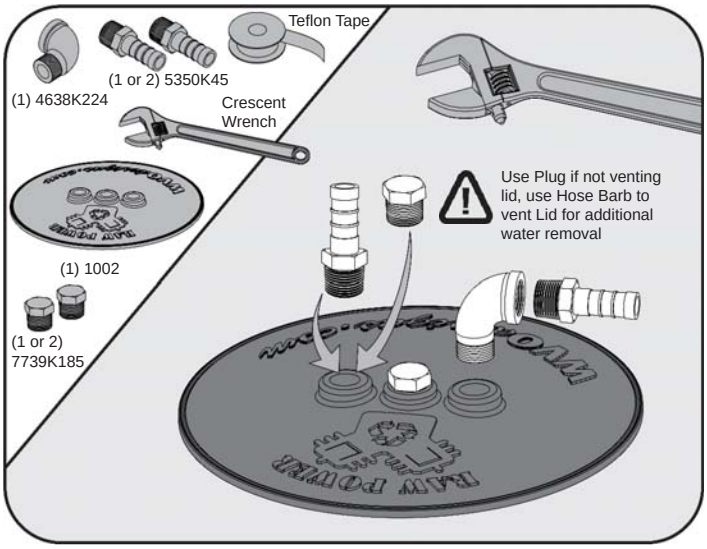
12. Place RPC Rotor over the Motor Shaft with cone facing up. If you have the Optional Booster Cone see “Booster Cone Assembly” instructions before completing this step.



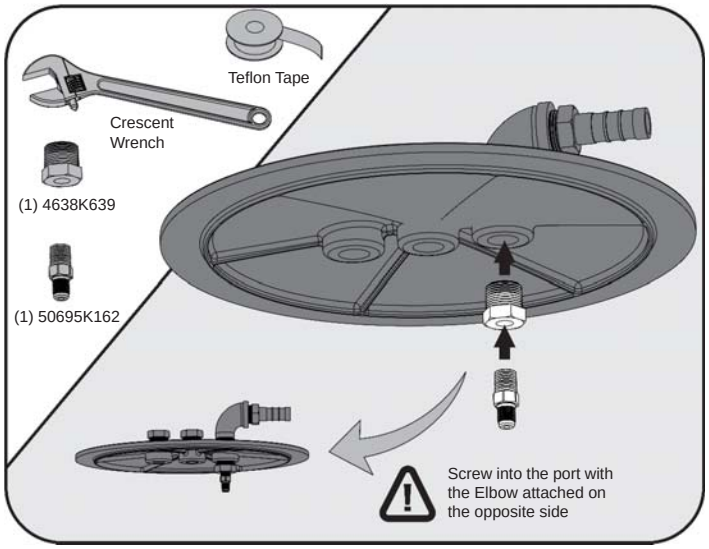
13. Insert Trantorque Clamp over Motor Shaft with the nut up. Tighten using 7/8 Socket.



14. Tighten Trantorque Clamp until the gap between the bottom of the RPC Rotor and the top of the casting ridge is between 1/8 and ¼ inch.



15. Wrap all male threads with Teflon Tape. Screw (1) Hose Barb into (1) 90° Elbow and (2) Plugs into Lid. Use (1) Hose Barb in place of (1) Plug if you are going to vent the Lid.



16. Wrap all male threads with Teflon Tape. Screw ¾ MPT X ¼ FPT Bushing into Lid. Screw ¼ MPT X ¼ Flare Adapter into Bushing.

Completed Assembly

Motor Wiring

Basic Centrifuge

Motor is pre-wired and ready to plug into a standard 120VAC outlet.

Extreme Centrifuge

The motor needs to be wired through an external AC Drive. You also need to program the drive to get the full 6000 RPM out of the motor.

Read the Entire Manual Carefully. Wiring for the Extreme Centrifuge must be completed by a licensed electrician.

CAUTION IMPROPER WIRING CAN DAMAGE THE UNIT OR RISK SERIOUS INJURY OR EVEN DEATH!

Your Extreme centrifuge includes an ABB Micro Drive Inverter to convert your standard power to run the 230V, 3 Phase Motor.

Your Extreme (6000 rpm) motor should be a 230VAC, 3 phase motor. The included ABB Drive converts the power from your region's standard voltage, listed on the controller to run the 230V 3 phase motor. So you can run your 120V or 230V single phase power into the ABB Drive.

Figure 1

Model:

- ACS55-01N-02A2-1 accepts 120V single-phase power
- ACS55-01N-02A2-2 accepts 230V single-phase power.

Wiring the Extreme Centrifuge

1. L/R, N/S and Ground symbol on the ABB Drive connect to your standard single phase power wiring. Connect the Black (HOT) line to the L/R connection. Connect the White (NEUT) line to the N/S connection. See Figure 1.

2. Use switched power to run the drive. An approved 14 AWG extension cord with an incorporated switch may be used for this purpose.

3. The T1, T2, T3 connections on the bottom of the ABB Drive connect to the orange, blue and white wires on the motor (order does not matter) using 14 AWG wire. Connect the ground on the drive to the green ground screw on the motor. 14-3 with ground Romex Cable is recommended. All wiring must be done in accordance with local code.

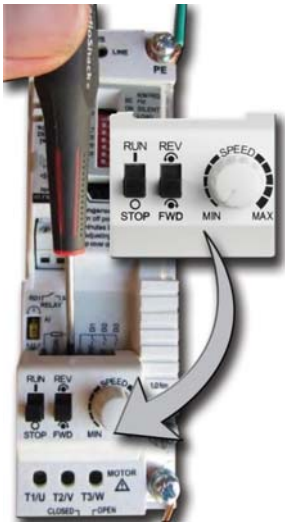


Figure 2

Programming the ABB Drive

1. De-energize the drive while programming.

2. Attach Speed Pod following instructions included with the Speed Pod. See Figure 2.

3. Set the ABB Drive using the settings shown in Figure3.

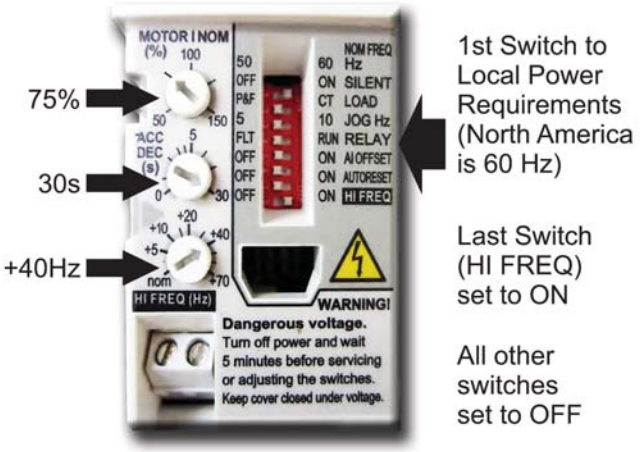


Figure 3

Trouble Shooting Guide

Oil will not flow or flow is too slow	Make sure there is not debris clogging your hose, tip of the inlet on the lid or flow valve. Make sure the outlet hose/pipe has a way to let air escape or vent.
Motor stops	Be sure you are not flooding the centrifuge. The centrifuge can handle 25 GPH (95 LPH) maximim. The restrictor tube is not enough to reduce the flow. Flow needs to be adjusted with a ball or gate valve before the centrifuge.
Oil is coming out the dirty port while running—slow down the flow	This only happens when the centrifuge is flooded.
Quality of the centrifuged oil is poor	The first thing to try is slowing down the flow of oil through the centrifuge. A slower flow will give the oil more time to be cleaned in the centrifuge. Also, make sure you do some preliminary settling of the oil. If you dump garbage or sludge in the centrifuge, the quality of the oil coming out may not be as good. Think of the centrifuge as a fine cleaner, not a garbage separator.
Centrifuge oil still has water	The centrifuge can remove all of the water from oil if the water content is 5% or less. If you have over 5% water in your oil(which is not normal), pre-settle the oil. You can also open up the vent in the lid and attach a short piece of hose for better water removal. The centrifuge cleaning ability is limited by the capacity of the bowl, so when the bowl is full of contaminants like dirt or water, it must be drained or cleaned. I stop my centrifuge and let it drain every 40-50 gallons processed.

For additional assistance, please contact us at the following:
Email: support@wvodesigns.com
Phone: 843-972-4211

Booster Cone Assembly(Optional)

The Raw Power Centrifuge Cleaning Power Booster Cone upgrade will allow for faster oil processing and/or finer cleaning. It reduces turbulence by spinning the oil before it enters the bowl. It also puts the new oil in at the very bottom of the bowl, so it has to work its way through then entire contents before leaving. The cone bolts right into the bowl, and the inlet needs to be modified on the centrifuge lid.

Booster Cone Parts List

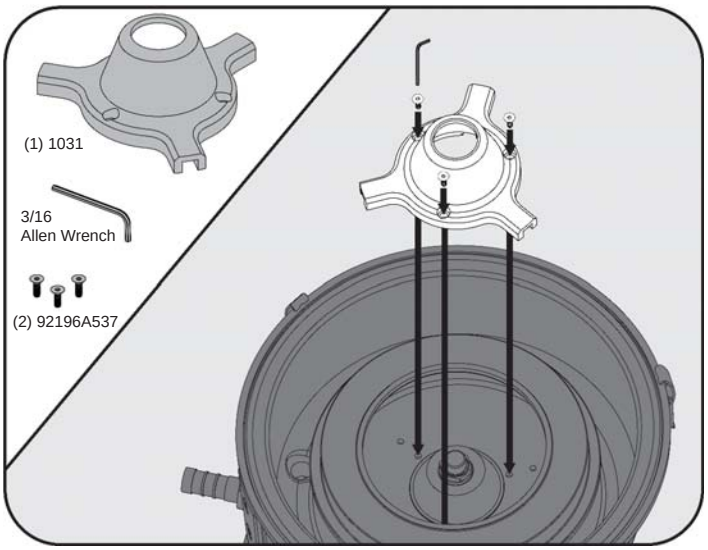
QTY	IMAGE	PART NUMBER	DESCRIPTION
1		1031	RPC Booster Cone
3		92196A537	¼-20 X ½ FHSCS

QTY	IMAGE	PART NUMBER	DESCRIPTION
1		4638K651	Hex Bushing ¼ MPT X 1/8 FPT

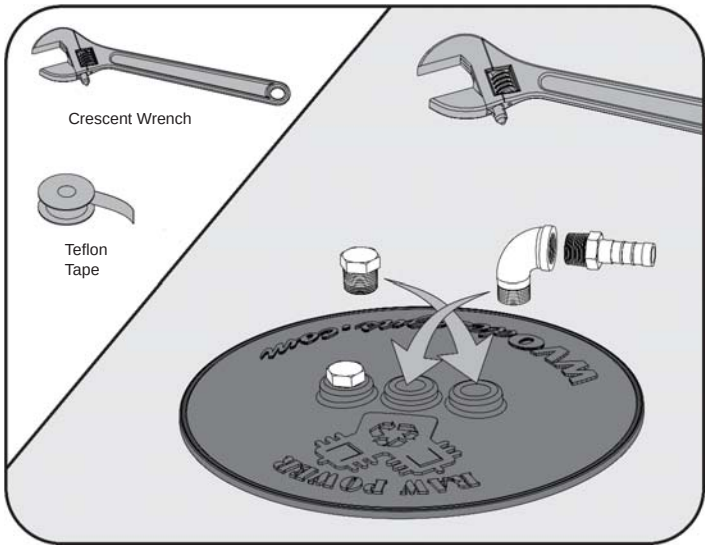
3/16 Allen Wrench

Thread Tape or High Temp Pipe Sealant

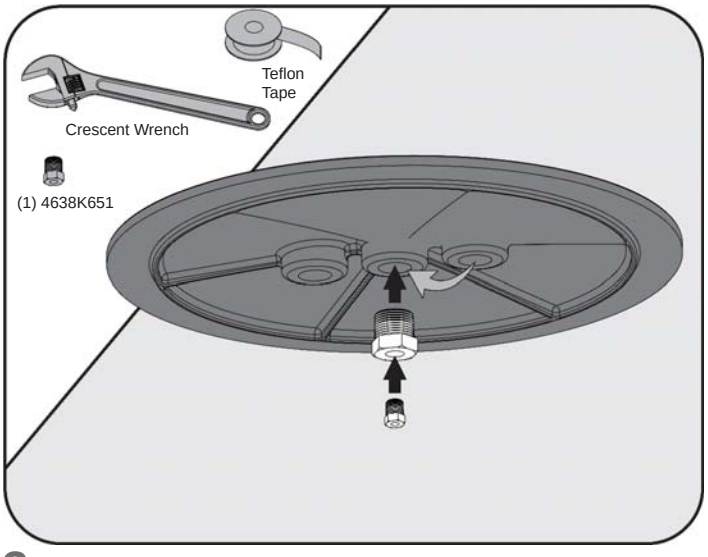
Crescent Wrench



1. Bolt down Booster Cone to centrifuge bowl with 3⁄16” Allen wrench using (3) ¼-20 X ½ FHSCS.



2. Move inlet to center of the Lid and replace with Plug or Vent. Apply Teflon Tape to all male threads.



3. Move inlet to center of Lid and use ¼ X 1/8 Hex Bushing in place of ¼ MPT X ¼ Flare Adapter. Apply Teflon Tape to all male threads.

Bolt-On Heater Assembly(Optional)

The Raw Power Centrifuge Cleaning Power Booster Cone upgrade will allow for faster oil processing and/or finer cleaning. It reduces turbulence by spinning the oil before it enters the bowl. It also puts the new oil in at the very bottom of the bowl, so it has to work its way through then entire contents before leaving. The cone bolts right into the bowl, and the inlet needs to be modified on the centrifuge lid.

Bolt-On Heater Parts List

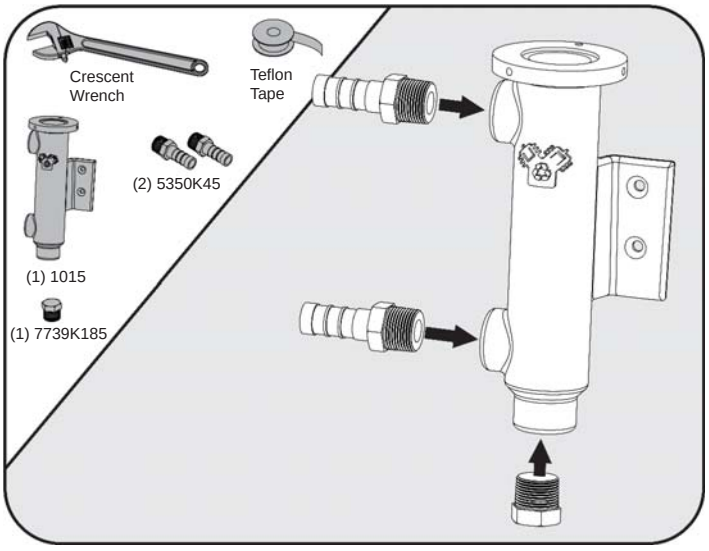
QTY	IMAGE	PART NUMBER	DESCRIPTION
1		1015	RPC Heater Manifold
1		TSP03333	1000W 120V/240V Heating Element
1		5133K15	High Temp Silicone Rubber Heater Hose
2		5415K14	Worm Drive Hose Clamp

QTY	IMAGE	PART NUMBER	DESCRIPTION
2		5350K45	Barbed Hose Fitting High Flow Male Barb ¾ Hose ID X ¾ MPT
1		7739K185	¾ MPT Hex Head Plug
2			¼-20 X ¾ FHSCS

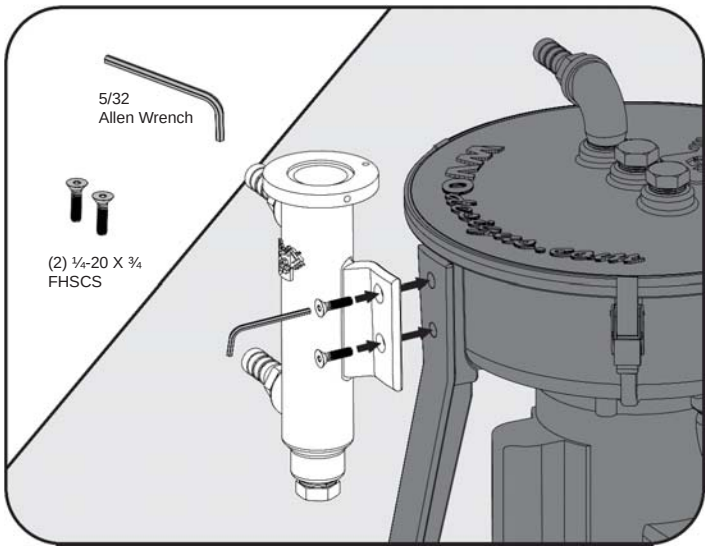
5/32 Allen Wrench

Thread Tape or High Temp Pipe Sealant

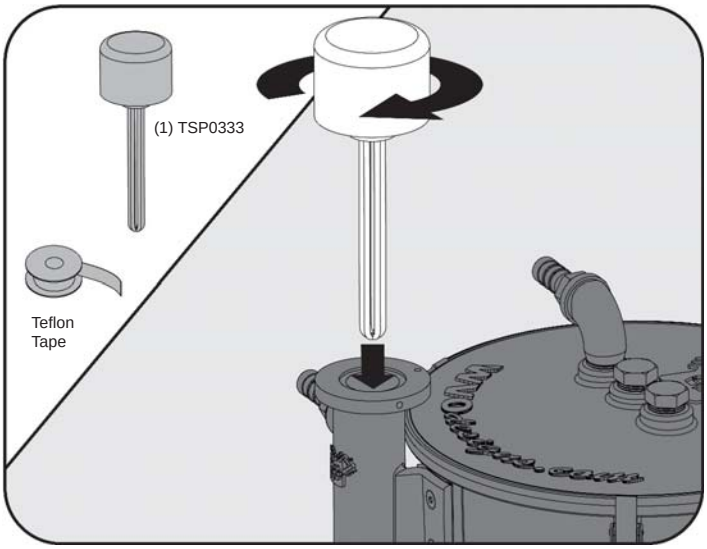
Crescent Wrench



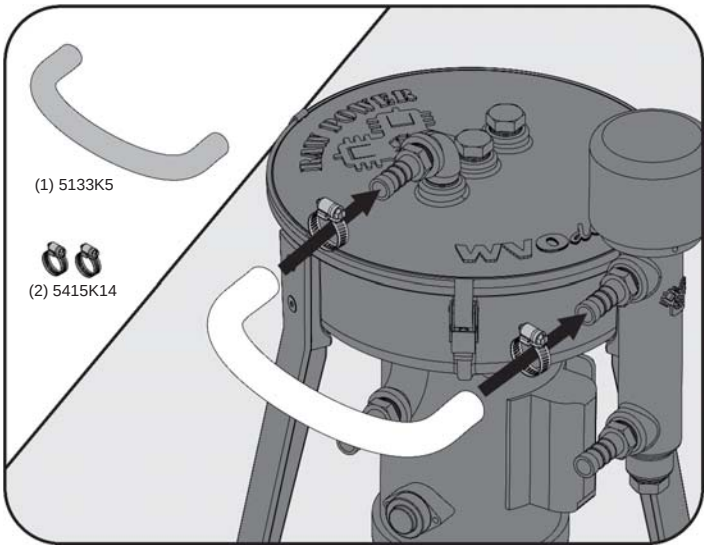
1. Apply Teflon Tape to all male threads. Screw (2) ¾ MPT X ¾ Hose Barbs and (1) ¾ MPT Hex Head Plug into RPC Heater Manifold.



2. Bolt RPC Heater Manifold through Leg and to Centrifuge replacing one set of Leg screws with (2) ¼-20 x ¾ FHSCS using a 5/32" Allen Wrench.



3. Apply Teflon Tape to male threads. Screw (1) Heater Element into Heater Manifold.



4. Attach Hogh Temperature Hose to ¾ MPT X ¾ Hose Barbs using (2) Hose Clamps.

Bolt-On Heater Wiring

Read the Entire Manual Carefully. Wiring for the Extreme Centrifuge must be completed by a licensed electrician.

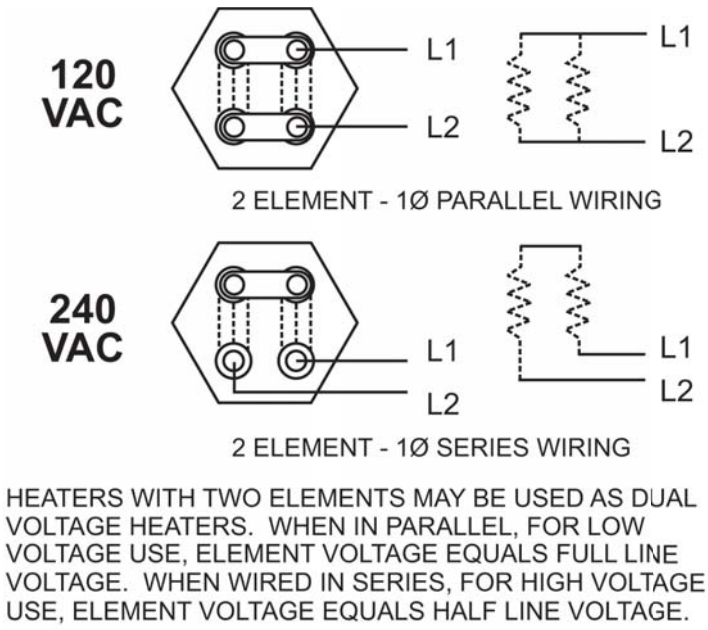
CAUTION IMPROPER WIRING CAN DAMAGE THE UNIT OR RISK SERIOUS INJURY OR EVEN DEATH!

120 VAC Configuration

Two jumper plates and wired in parallel. The spare jumper plate may be taped to the bottom of the orange cap. See Figure 4.

240 VAC Configuation

The element is wired in series. See Figure 5.



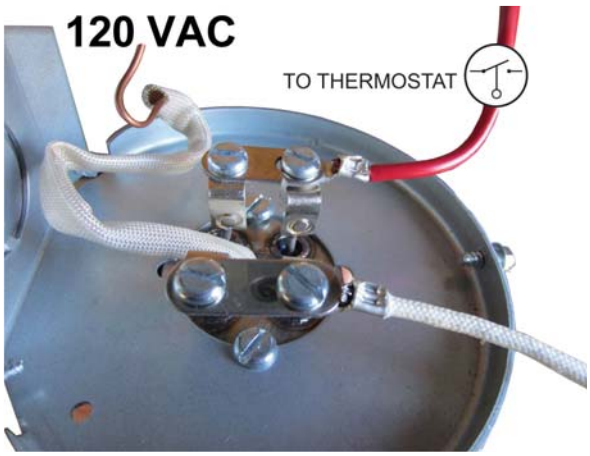


Figure 4

Figure 5

Conversion Components for Raw Power Line

Checkout our Raw Power line of WVO specific Conversion Components, Centrifuges, and Transfer Pumps. We constantly refine our products and are adding new products to our website. Ideas and feedback are more than welcome.

RAW Power Centrifuge

Clean waste oils with ease with this high power, high capacity centrifuge. Comes in 120V and 230V power. Easy to setup and use. Durable and effective.

RAW Power Beast Centrifuge

High Capacity, Auto-cleaning Industrial Centrifuge. Produce fuel quality oil at a rate of 50-150 gallons per hour. Includes Auto-purge for self-cleaning. Continuous duty.

Oil Transfer Pump

Move oil reliably and fast with our oil pump. Stop wasting time and money on inferior pumps. Comes in 10, 15 or 25 gph.

RAW Power Heated Filter Combo

Onboard filtration for veggie systems in vehicles. Has a 12V heater wrap, heated head and high quality 10 micron filter.

RAW Power Veggie Fuel Pump

Reliable fuel pump for vegetable oil. Engineered specifically for Vegetable Oil. Custom pressures to suit your specific vehicle. 5 year warranty.