

REBUILD PROCEDURE ON CPS TR21 and TRS21 SERIES COMPRESSORS

1. Remove the three 3/16" socket head bolts holding handle plate assembly to head, remove handle plate assembly



2. Remove the five #2 Phillips head screws on electrical box, remove e-box cover.
3. Remove the four 3/16" socket head bolts to remove the compressor head.



4. Remove two #2 Phillips head screws holding skirt onto top plate. Remove skirt to expose the cylinders.



5. Remove both cylinders and inspect cylinder walls for scoring or blemishes (if reused mark them so they go back to their respective location). **IMPORTANT: IF THE CYLINDERS ARE NOT ULTRA SMOOTH, THE NEW PISTON SEAL WILL WEAR OUT PREMATURELY.**
6. Remove the four 3/8" hex bolts holding cylinder plate to crankcase.



7. Remove the top plate from the compressor assembly. Be sure to mark the cylinder and cylinder openings #1 and #2 shown in picture

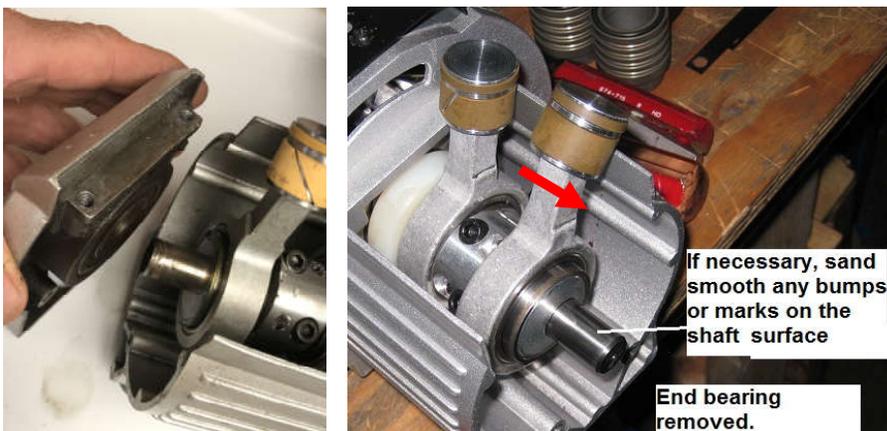
8. Carefully remove and save the shims located under the top plate. Check the back side of the top plate as the shims that may have stuck to it. Remember the number of shims on each end. The shims will need to be reused when reassembling the compressor.



9. Remove the two 4mm button socket head screws on crankcase front cover.
10. Remove the two #2 Phillips head screws on the fan shroud. Pull fan shroud off to the side. DO NOT DISCONNECT electrical wires. This will give rotational access to the fan/drive shaft.

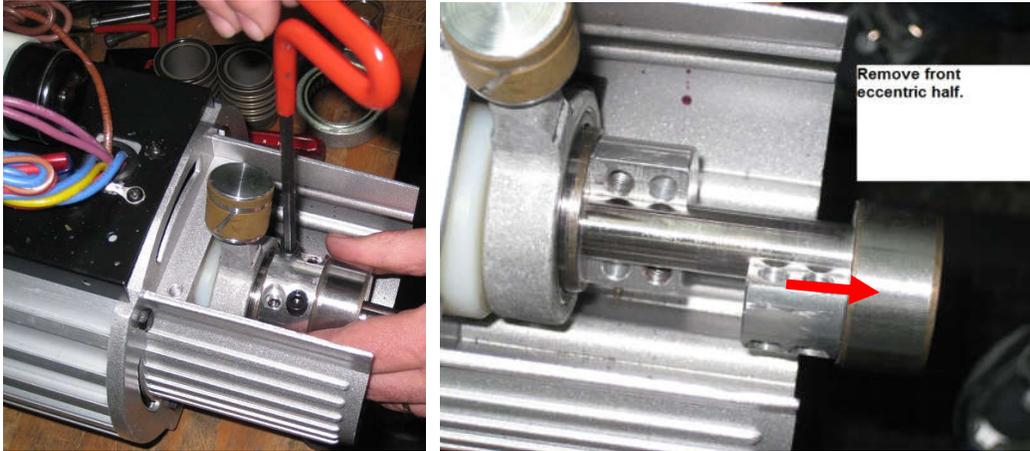


11. Find the bearing set screws by putting the unit on its side and rotating the fan. Use a flashlight to see the screws through the hole in the bottom of the crankcase front cover. Loosen the two 3/32" socket head set screws a few turns. Do not remove.
12. Pull on the crankcase front cover. It should slip off the drive shaft. If it does not, lightly tap the cover from the inside with a rubber mallet.

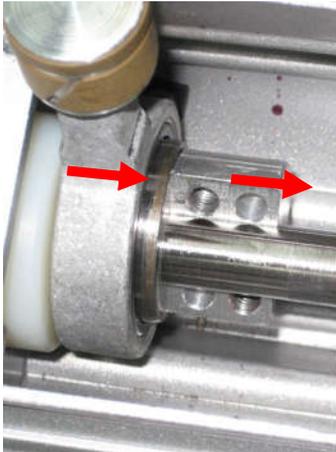


13. Remove outboard connecting rod/piston assembly. Mark a #1 on connection rod assembly if it is to be reused. In most cases this part is being replaced.

14. Check the motor shaft for blemishes and residue build up. These will need to be cleaned off in order to slide the eccentric assembly off the drive shaft. Excess Loctite may also have dried on the shaft. This can make the eccentric removal process more difficult.
15. Remove the four 3/16" socket head bolts on eccentric assembly. Note there are two bolts on each side.



16. Remove outboard eccentric by sliding it off the motor shaft. In most cases it will easily slide off. In cases where excess Loctite got on the shaft, a small pry bar may be needed. Mark a #1 on the eccentric.
17. Remove inboard connecting rod/piston assembly by slipping it over the eccentric. Mark a #2 on the connecting rod if it is to be re-used. In most cases this part is being replaced.



18. Remove the inboard eccentric by sliding it off the motor shaft. In most cases it will easily slide off. In cases where excess Loctite got on the shaft, a small pry bar may be needed. Mark a #2 on the eccentric.



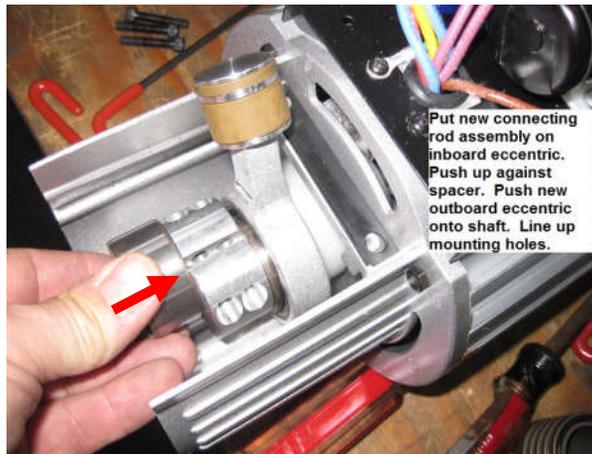
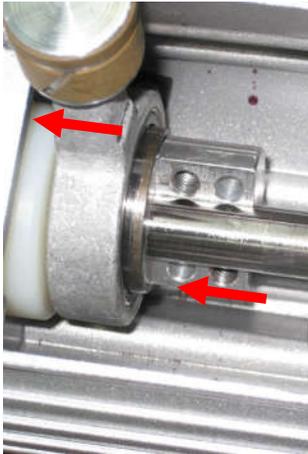
19. The only remaining part on the motor shaft is a nylon spacer. This can be removed at this time for inspection. Replace if worn or damaged.

IMPORTANT: Inspect all parts and assemblies that are to be reused in the re-assembly of the compressor. Pay particular attention to the follow:

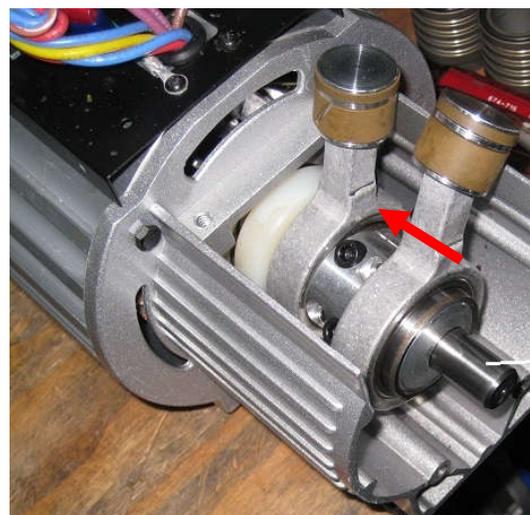
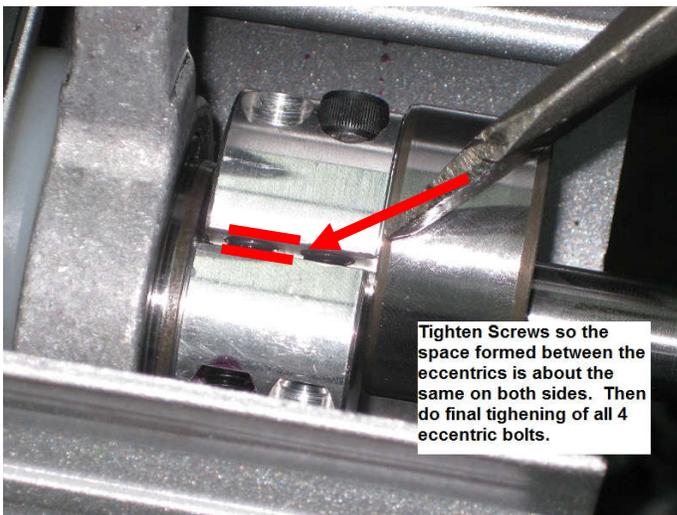
- A. Eccentric Race, check for excessive wear and galling.
- B. Piston Seals, in most cases a new set of piston seals are being installed. Otherwise check for excessive wear and fit with the cylinder.
- C. Cylinder, check cylinder wall for imbedded blemishes. Residue can normally be removed with alcohol or citrus terpene.
- D. Valves and Valve Springs in Compressor Head, check valve seats and spring compression.
- E. Compressor Head, clean surface around valves, check valve seats.

Re-Assembly Instruction

1. Slide the nylon spacer, connecting rod/piston assembly, and #2 eccentric onto the motor shaft.

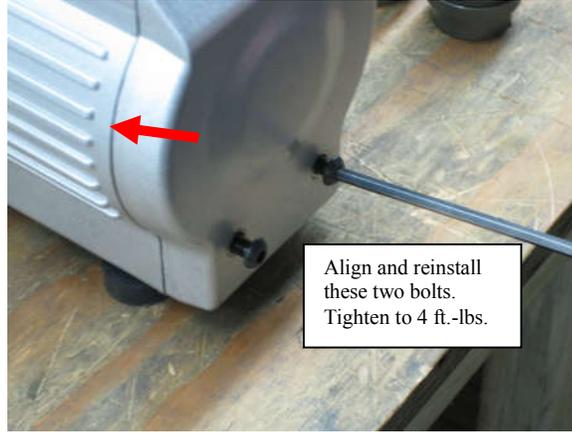


2. Then slide the #1eccentric onto the motor shaft so the two eccentrics overlap.
3. Push the entire eccentric assembly up against the nylon spacer. This properly aligns the center of the connecting rod/piston assemblies with the cylinders. Using a 3/16" Allen wrench, one bolt on each side until the gap on both sides of the eccentric are equal. Final tightening all 4 bolts to 10 ft.-lbs. This forms a compression type fit onto the motor shaft.



4. Install outboard connecting rod onto outboard eccentric.

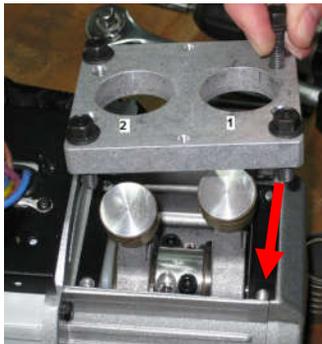
5. Make sure the motor shaft is properly aligned with bearing sleeve. Use hand pressure to push the bearing sleeve onto the motor shaft. If necessary, use a rubber mallet to complete the assembly. There should be no gap between the crankcase front cover and the crankcase housing.



6. Install and tighten the 2 button head bolts on endplate cover to 4 ft.-lbs.
7. Locate opening on bottom of the crankcase front cover. This is the access for the 2 set screw threaded holes on the collar of the bearing. It will be necessary to rotate the fan to help locate the set screw holes. Use a flashlight to help see the recessed set screws through the hole in the bottom of the crankcase front cover. Using 7/32" Allen wrench, hand tighten both set screws. The set screws are 90 Degrees apart.



8. Install the top plate back onto the compressor. Make sure the correct shims are reinstalled in the same count and position when disassembling. Also make sure the outboard end of the top plate is positioned as before disassembly. Tighten the four 3/8" Hex bolt to 10 ft. lbs.



9. Install cylinders over the pistons. The piston seals are new and will be very tight. Push the cylinders down all the way to the top plate.

10. Setting the PISTON TOP DEAD CENTER CLEARANCE (TDCC) Instructions

Once the installation of a new connecting rod assembly (RKMAC-1 or TR21X3) is complete it will be necessary to check the Top Dead Center Clearance (TDCC) between the piston and compressor head.

The following items will be needed:

- Top Dead Center Plate w/Bolts
- Depth Gauge
- 3/8" Wrench
- Cylinder Shims

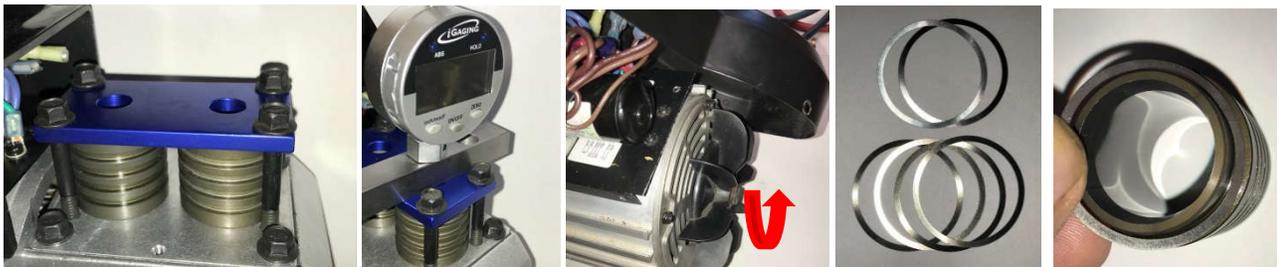


The Depth Gauge needs to be zeroed to the thickness of the TDCC Plate. A good flat surface such as a marble or stone countertop is needed to do this. See pictures below.



Remove the O-ring in the top groove of each cylinder. The TDCC plate should sit directly on top of the metal cylinders.

Using the provided four 3/8 Hex Head bolts, secure the RKMAC-TL2 TDCC plate onto the compressor cylinders as shown below. Snug each bolt until finger tight. Then use a 3/8" wrench for final tightening. Do not over tighten.



Place the Depth Gauge over the open hole in the plate. The pin of the Depth Gauge should be riding on top of the piston. Rotate the fan through top dead center for both cylinders. Measure the minimum TDCC of both pistons. The optimal TDCC spacing is between .008 and .012". If too low, remove the TDCC Plate and add additional shims to the bottom of the piston.

CAUTION: IF THE PISTON HITS THE COMPRESSOR HEAD DAMAGE WILL OCCUR TO THE BEARINGS IN THE CONNECTING ROD ASSEMBLY.

The RKMAC-6 cylinder kit comes with two .002" and four .004" circular shims or order extra shims under p/n RKMAC-SUP2. To add shims, remove the TDCC Plate and cylinder(s) to be adjusted. Add the shims to the bottom of cylinder(s) as shown in the picture above.

Repeat procedure to ensure the added shims made the correct adjustment of each cylinder.

Once adjustment has been confirmed, continue to reassemble the compressor.

11. Re-install cylinder O-rings.

12. Re-install the compressor head onto the top of the cylinders. Hand Tighten the four 3/16" Socket Head bolts. Once snug then use a final diagonal tightening pattern with the torque wrench set at 10 ft.-lbs.
13. Re-attach electrical leads to HP switch.
14. Re-install Electrical box cover.
15. Re-install handle/Top Plate Assembly back onto head.

Test the compressor assembly for operation and performance. With a manifold gauge set up can quickly check the pressure differential or compression ratio of the compressor. Build up a 300 PSIG head pressure then close off the suction port. The suction pressure should drop to at least 15" hg vacuum.

See Piston Seal Diagnostics for additional tests.