

Mitsubishi TD04-13T Turbo Rebuild

Tools Needed

- TD04-13T rebuild kit (info below)
- 10mm wrench
- 8mm socket
- 12mm socket
- 17mm socket
- Ratchet with 10"+ handle for torque
- Hammer
- Small flat-head screwdriver
- Large flat-head screwdriver (semi-optional, you'll find out why)
- Large-bore snap-ring pliers (3" bore minimum – you can get one from [McMaster-Carr](#) as part# 5415A64) or from [Amazon.com](#)). It has been reported by a reader that the pliers at that Amazon.com link are of low quality.
- Small/typical snap-ring pliers
- Regular pliers (needlenose or other)
- Penetrating lubricant like WD40, Liquid Wrench, etc.
- Touch-up paint, White Out, or similar painting tool with small brush (substitutions possible – read full page to understand what it is needed for)

Part 1: Preparation, Etc

When I work on projects like this, I like to take the time to clean off a good 3'x3' area on my work surface and get some rags and paper towels handy. Things really shouldn't get too messy, but there will be some lubricant spraying, oil drips, etc. I highly recommend that you also find a shoebox or like-sized container (ideally with a sealing lid) to place parts into as you pull them off the turbo.

During this project, there are really only two delicate parts you will encounter: the compressor wheel and the turbine wheel. Both of these are very sharp and can be damaged easily. Touch them like you would touch a baby animal egg. While these are the only 2 delicate parts, you should aim to keep your work area cleaned up every hour or so to keep small debris out of the way, especially once you get the center housing and rotating assembly pulled apart ('CHRA' from here on out).

I sourced my TD04-13T rebuild kit from [Deadbolt Enterprises](#) after getting a quote from another shop that was \$20 higher than theirs. The kit, which will cost you around \$110 with shipping, came with instructions (albeit vastly less thorough than these) and Jerry at Deadbolt even gave me tech support when I asked him a question about one of the steps. Given that he offers rebuild services as part of his company, he certainly did not have to do this just because he provided a rebuild kit to a customer. I thought that was cool. After I got Deadbolt's kit, I emailed the other company to get a parts list of their kit for comparison's sake. They never even responded.

Safety

I cannot stress this enough: When working with snap rings, **wear safety goggles**. They are fidgety to work with and are under high compressor while being installed or removed. For example, my snap ring pliers slipped out of the ring holes during the work on the compressor seal (you'll see later) and the ring shot across the room at *very high speed*. Had it gone toward my face, I would have been in trouble.

Part 2: Disassembly

1. Remove all hose clamps and hoses. There should be hoses going to the wastegate actuator and compressor housing. Put these in your parts container as they will be reused.
2. Remove the wastegate actuator (2 12mm bolts and 1 retaining “E” clip)



3. Remove the clamp around the CHRA (1 10mm bolt). I removed the bolt and nut completely from the clamp, then used a flat-head screwdriver and a hammer to gently tap the clamp loose as it was slightly siezed. Put these in your parts container as they will be reused.



4. Remove the 17mm banjo bolts and coolant line. You may need some penetrating lubricant for this. With the line removed, thread the bolts back in to keep debris out or plug the holes with something else and put the bolts and line in your parts container. Throw away all 4 copper washers.



5. Remove the 2 10mm bolts holding the oil return line to the CHRA. The flange may be kind of stuck to the turbo, but it does come off. Take note of all of the gasket material stuck to the surfaces. You will be cleaning this up later. Set the oil return line in your parts container, thread the bolts back into the CHRA, and plug the oil hole with something.



6. Use WD40 or other penetrating lubricant on the turbine housing to CHRA mating area (where the clamp was in step 3). Warning: You may have to repeat this step, then try the next step, across several days to get the turbine housing loose.



7. *Very carefully and patiently*, with a hard mallet or hammer, whack the turbine housing in a **uniform** manner around the circumference. The key point to remember here is to make sure the housing does not bind on or touch the turbine blades. Tapping did very little for me, but I tried that at first. Eventually, after a few days of lubricating, I started giving it good whacks while still checking every time to see if it had moved before giving another one.



8. Use your big-bore snap ring pliers to remove the compressor housing from the CHRA.

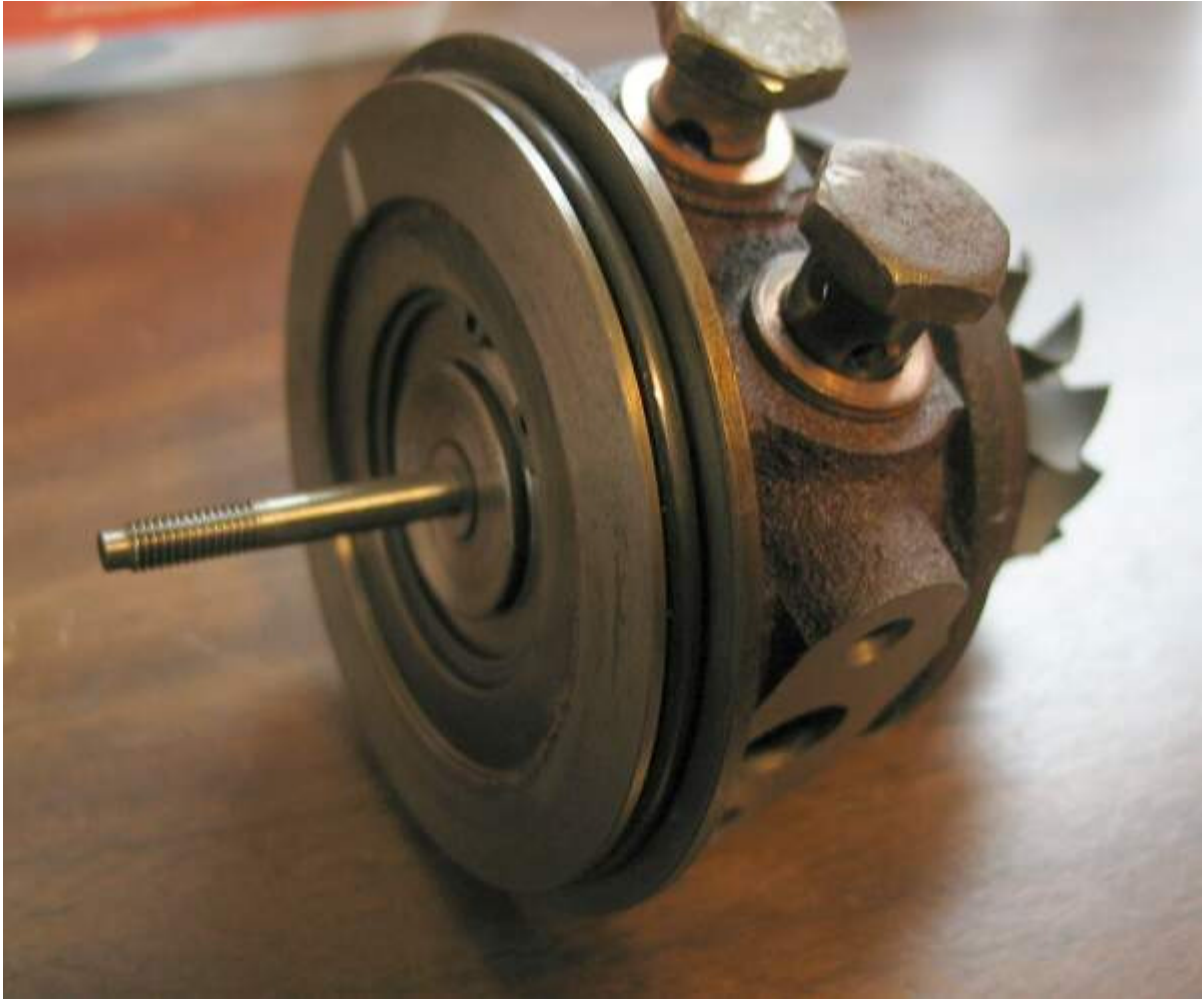
9. If, and only if, you are not sending your rebuild turbo to be checked for balance after your rebuild, you absolutely must mark both the compressor wheel and turbine relation to the center assembly with paint or White-Out. If you mark them and reassemble everything so that the marks line up, you should not need to send the turbo off for balancing. A reader has submitted his ideas on this topic which you can find as the last page in this article. You probably want to do a neater job of marking than I did.





10. Note the odd nut on the exhaust turbine wheel... it's my guess that it is this way because it was ground away to create balance in the assembly.
11. Using an 8mm socket for the compressor wheel nut and whatever you can use to hold the turbine end (I used a 12mm socket that fit well enough), remove the compressor wheel nut and put it in your parts container. **NOTE:** the TD04L-13G's compressor wheel nut is **reverse threaded**, so go clockwise.

12. Remove the compressor wheel. It should slide right off of the shaft. Set this aside where it will not get damaged as you will not need it for awhile.



13. Remove and discard the large rubber o-ring on the outskirts of the compressor end of the CHRA. This is visible in the picture above.

14. Carefully push or tap the shaft and turbine wheel out of the assembly while making sure the turbine end does not pop out and fall onto the work space or you may bend the fins. The bearing can go in the garbage. Set the turbine shaft assembly aside for now.



15. Using your smaller snap ring pliers, remove the snap ring visible on the compressor side of the CHRA. This ring holds the compressor seal in place. Set the snap ring aside in your parts container.

16. Gently remove the compressor seal from the CHRA. You may need to use 2 small flat-head screwdrivers, one at 3 o'clock and one at 9 o'clock, to carefully pry it out. It should not require much force.



17. You will notice at this point that the compressor seal has a metal insert. It may have fallen onto your work surface when you got the compressor seal removed. This is okay, so don't panic. This is what the insert looks like (the flange is under the screwdriver in the picture).



Here is a picture of the compressor seal and the compressor seal insert together for reference They are shown separated 2 pictures up.



18. Remove the bronze seal plate. It should just pop out but may need a little coaxing. It is not really secured by anything substantial. Put this in your parts container or the garbage (your rebuild kit should have a replacement for this).





19. Remove the interior o-ring from the compressor side and discard. Seen in picture above.

20. Remove the small spacer found underneath the bronze seal plate. Put this in your parts container or the garbage (your rebuild kit should have a replacement for this as well).



Taken from: <http://www.stage-infinity.com/2007/09/28/mitsubishi-td04-13t-turbo-rebuild/>

21. Remove the compressor-side bearing and throw it away.



Part 3: Reassembly

1. Lube (with engine oil) a new bearing and insert it into the compressor side.

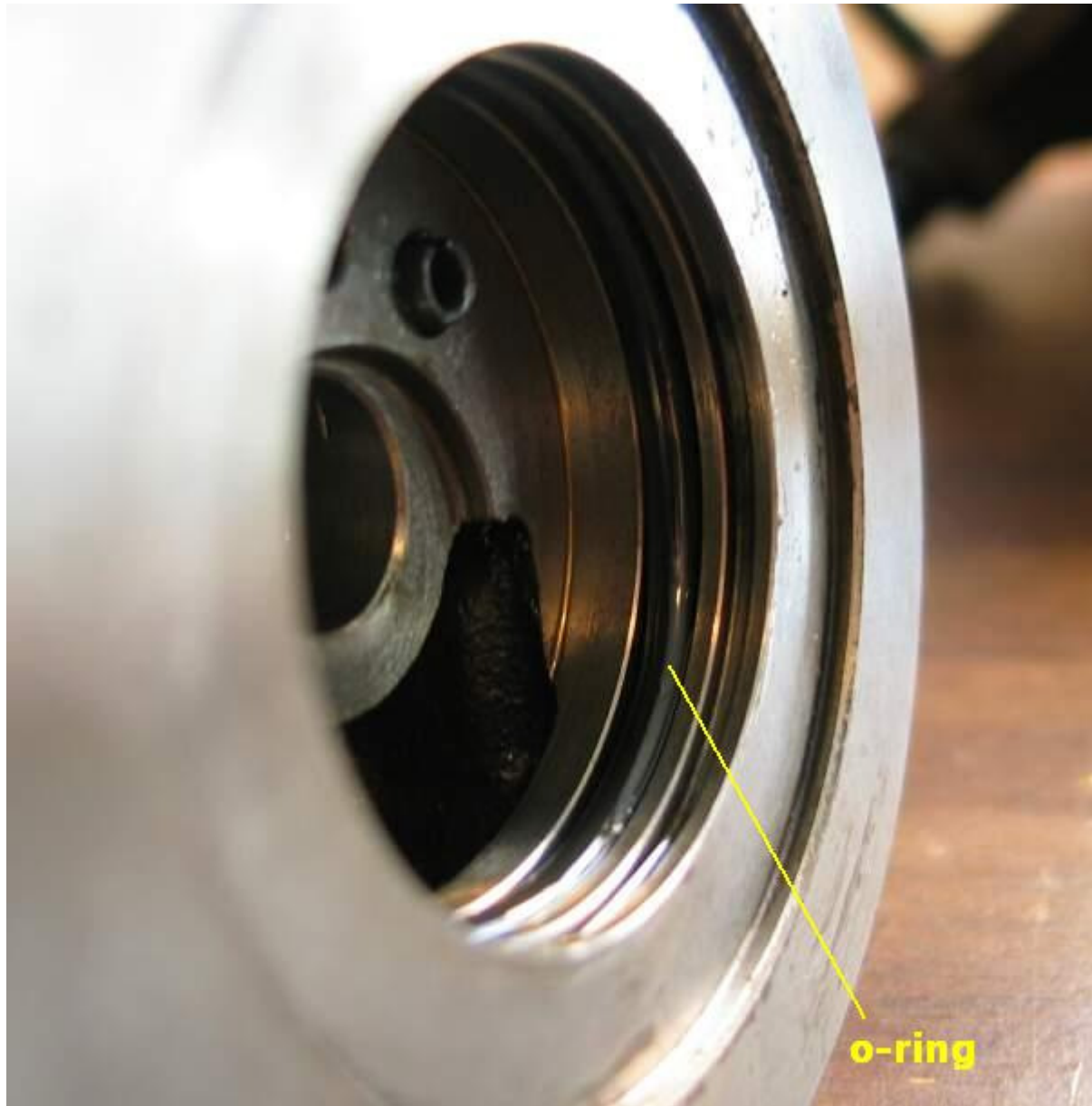


2. Place the new bronze seal plate spacer on top of the new bearing

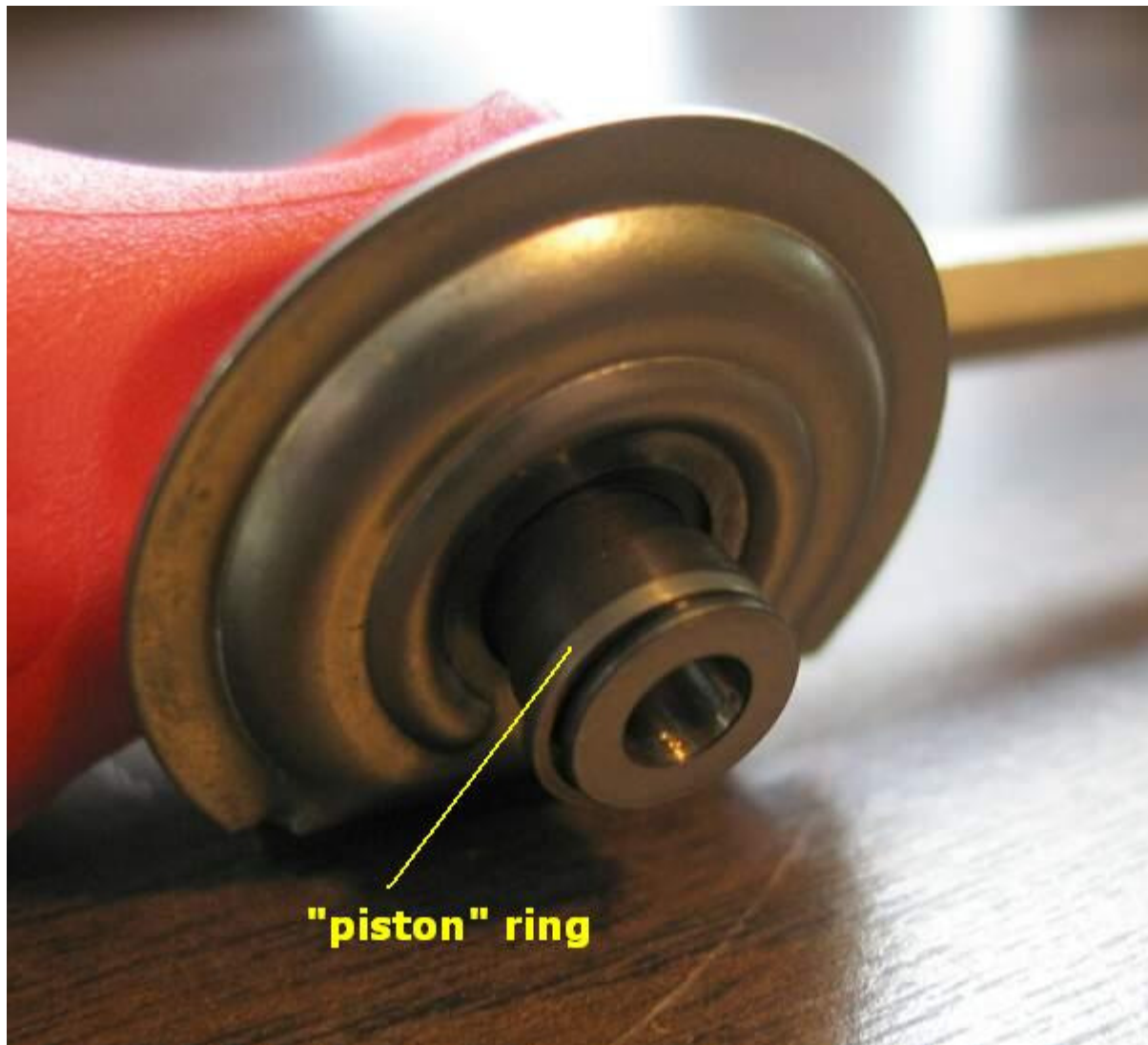
3. Install the new bronze seal plate. This should sort of snap into place. There's only one proper orientation.



4. Install your replacement o-ring.



5. On the “snout” of the compressor seal insert there is a “piston ring” style ring. Remove the old one and replace it with a new one from your rebuild kit. I removed the old one forcefully by separating the ring at its gap until it came off. Installing the new ring is not that difficult when lubed; just push it down over the snout. You may have to seat a small portion of the ring at first and work around the circumference to get it seated. Here’s a picture of the ring replaced.



6. Reassemble the compressor seal insert and compressor seal.





7. Install the appropriate snap ring to hold the compressor seal in place.



8. Replace the piston ring on the turbine shaft. This is almost identical to the piston ring you replaced on the snout of the compressor seal insert. I removed the old one the same way — just pry it apart until it comes off and throw it in the trash. Installing this one is a little tricky due to the groove just above the ring. I got clever and filled that groove with thread, then oiled the thread to stop the ring from seating in that groove as I pushed it down to the proper groove.



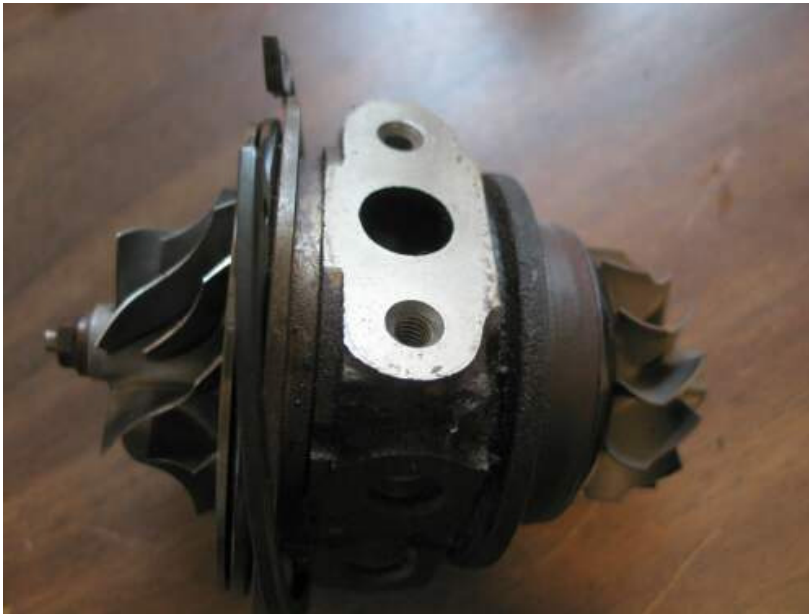


9. Reassemble the turbine side by lubing (oil) the outside perimeter of a new bearing, lubing (oil) the turbine shaft itself, sliding the bearing onto the turbine shaft, and inserting the turbine shaft with bearing into the turbine side of the CHRA until it snaps into place. You should be able to freely spin the turbine at this point.

10. Slide the compressor wheel back onto the shaft. Line up the marks you made on the compressor wheel and the CHRA (with paint or white-out) so that when the nut is tightened, everything is lined up properly. it took me 10 tries. Tighten the nut so that it stops, then give it a little snug tighten of no more than 1/4 turn. Ideally you'd have a precise torque wrench and I'd know the torque specs for you, but I don't. A reader has submitted his ideas for this step. They

can be found on the last page of this article.

11. Clean the oil return line's gasket surface well and remove all old gasket material. Clean the gasket surface on the CHRA in the same manner.



12. Reassemble the oil return line with the new gasket. Torque the bolts to 3-4 ft-lbs.
13. Reassemble the coolant line with the new copper washers (one between the pipe and the CHRA, another between the bolt head and the pipe). Torque the bolts to 22 ft-lbs.
14. Reattach the wastegate actuator/controller and vacuum hoses. Give the bolts a “good snug” but don’t overtighten them, as they are threaded into the semi-

soft aluminum compressor housing. Remember, it's just a bracket to hold the actuator in place. ∞