

Turbo removal Install, Removal and Exhaust Back Pressure Valve Removal

Part I: Refers to removing the Turbo/pedestal to check/fix oil leaks,

Part II: EBV gutting procedure is down at the bottom.

Item Part Number Description

1	6K682	Turbocharger
2	8287	Marmon Clamp
3	8287	Clamp
4	1820052C92	Air Inlet Duct
5	1813366C1	Breather Hose Elbow Clamp
6	181603022	Breather Hose Elbow
7	6K864	Air Inlet Bracket
8	9C681	Air Inlet Hose
9	6K854	Turbocharger Exhaust Inlet Manifold
10	6N653	Turbocharger Oil Supply O-Ring (2 Req'd)
11	6N653	Turbocharger Oil Drain O-Ring (2 Req'd)
12	6N639	Turbocharger Pedestal Assy
13	8287	Clamp
14	6C640	Intake Manifold Hose (2 Req'd)
15	6K889	Compressor Manifold
16.	9E436	Turbocharger Compressor Outlet Seal
17.	8287	Marmon Clamp

Turbocharger: REMOVAL AND INSTALLATION

Turbocharger (Removal)

1. Open the hood.
2. Remove the engine cover.
3. Disconnect the charge air cooler inlet and outlet pipes.
4. Label and disconnect the intake air heater element electrical leads, intake air temperature (IAT) sensor electrical connector, manifold absolute temperature (MAP) sensor electrical connector and the pressure hoses.
5. Loosen the clamps. Remove the compressor manifold.
6. Remove and discard the compressor manifold O-ring seal.
7. Disconnect the exhaust outlet pipe.
 1. Loosen the Marmon clamp.
 2. Disconnect the exhaust outlet pipe.
8. Disconnect the exhaust back pressure valve. **Vehicle with exhaust back pressure system only)**
 1. Slide the retaining clip away from the exhaust back pressure Valve actuator lever.
 2. Detach the exhaust back pressure valve actuator rod.
9. Label and disconnect the waste gate solenoid vacuum hose and the pressure hose. Loosen the clamps. Remove the air inlet tube.
10. NOTE: The Marmon clamp cannot be removed with the turbocharger installed. Loosen the Marmon clamp.
11. Remove the turbocharger.
 1. Remove the bolts.
 2. Remove the turbocharger.
12. Remove and discard the O-ring seals.

Turbocharger (Installation)

1. To install, reverse the removal procedure.

* The exhaust inlet Marmon clamp must be positioned on the exhaust inlet pipe before installing the turbocharger.

This is a write up I did for another member with a turbo pedestal oil leak, disregard the parts about pedestal removal if you are only removing the turbo.

Please excuse me if I sound a little too detailed, as far as I know, You could be a master mechanic or engineer but I will assume you are a Shade tree mechanic like me.

If you do not have a topside creeper, I would suggest you have some type of padding or heavy blanket to place on top of the engine to lie on. I used an old 2" foam rubber mattress pad folded in half to lay across the top of the front of the motor. It took me approx. 7 hours to do the removal and installation (not counting any breaks) but I also gutted the EBV valve and sealed up the EBV actuator in the pedestal which added about 2 hours. It's mostly a one man job but there are a few times an extra set of hands really helps.

Make sure you have the following:

- Metric socket set and combination wrenches.
- A torque wrench that will measure 18 lb/ft
- A torque wrench that will measure 71 in/lbs. (not absolutely Necessary but that's what the clamps on the intercooler boots call for)
- Two sets of o-rings to attach the turbo to the pedestal and for the pedestal to the engine.
- 2-F4TZ-6N653-A and 2-F4TZ-6N653-B
- A spray can of good penetrating oil (I use "Liquid Wrench")

Spray liberally the two Marmon clamps that attach the exhaust down pipe to the turbo and the Marmon clamp that attaches the exhaust up-pipe to the turbo. (Do this at least an hour, preferably over night, before starting removal to give the penetrant a chance to work).

Remove the plastic cover that's above the fuel filter.

Remove the intake hose that runs from the air filter to the Turbocharger inlet. Make sure and remove the small sensor tube plugged into the side of the intake hose. To make it easier to remove the hose, unbolt the "air Inlet bracket" (figure 7 in the above diagram).

Remove the waste gate actuating tubing from the waste gate actuator

Remove all the wire and hose connections located on the aluminum compressor manifold.

Loosen the clamps on the two boots that connect the intercooler pipes to the compressor manifold and push the boots back on the intercooler pipes.

Loosen the two orange intake manifold hose clamps on both hoses.

Loosen the Marmon clamp that connects the turbo to the compressor Manifold and push the clamp back on the turbo. Be careful and you can reuse the o-ring even though Ford says to replace.

Remove the compressor manifold.

Plug the two openings in the intake manifolds with rags to prevent anything from falling into the engine intake system.

Before proceeding, now is the time to determine if the turbo to pedestal joint or the pedestal to engine joint is actually leaking. With the compressor manifold removed, visually inspect and feel with your hand for any oil residue where the turbo joins the pedestal. If this is dry, reach under the pedestal and feel for any residue where the pedestal joins the engine. If you are lucky, these joints will be dry and the oil is coming from somewhere else. Mine was coming from the orange hoses that connect the compressor manifold to the intake manifolds. It was running down the intake manifold and pooling underneath the pedestal. If there is evidence of turbo/pedestal leakage than proceed as follows.

Loosen the Marmon clamp from the up-pipe to the turbo. It will more than likely be stubborn. I used an old broom stick handle and “persuaded” the clamp off.

Loosen the Marmon clamp from the exhaust downpipe to the turbo as above step.

Slide back the retaining clip on the EBV actuating shaft. It’s located underneath the exhaust portion of the turbo near the exhaust down pipe. It hard to see but you should be able to feel it with your hand. Push the clip toward the driver’s side of the engine compartment, and then pull the rod down to remove it from the EBV shaft.

Remove the two bolts that attach the turbo to the pedestal and pull the turbo off the pedestal and out of the engine compartment. An extra set of hands come in handy here because lying on your belly, that turbo assembly gets awful bulky and heavy.

Disconnect the electrical connector at the bottom of the pedestal (EBV solenoid). Look for leakage at the EBV actuating shaft where it exits the pedestal. If oil is found here, the pedestal will probably need to be replaced or, if you can live without the EBV, you can gut this and seal it with a pipe plug. I will not go into that now but if you are interested, let me know. Remove the 4 bolts attaching the pedestal to the engine and remove the pedestal. Remove the 2 o-rings and replace with the new o-rings using a little wheel bearing or chassis grease to keep the o-rings from moving. Carefully replace the pedestal and torque the 4 bolts to 18 lb/ft.

Remove the old o-rings on top of the pedestal and make sure the turbo mounting area is clean.

Install the two new o-rings on the pedestal using a little wheel bearing or chassis grease on the o-rings to keep them in place.

Very carefully (again a good time for an extra set of hands) set the turbo on the pedestal and insert the two hold down bolts and screw in the bolts but do not tighten.

Align the up-pipe with the turbo inlet {there are indexing grooves in each) and attach the Marmon clamp but do not tighten.

Do the same with the exhaust down pipe. It will help if a helper gets under the truck and pushes up on the down pipe to get it aligned.

After both clamps are on, tighten the two turbo hold down bolts to 18 lb.ft. and then tighten the Marmon clamps.

The hard part is done just reverse the removal procedures to finish. Make sure that before installing the compressor manifold and associated boots/hoses that you clean them in hot water using a dishwasher or Laundry detergent to remove any oily residue.

REMOVAL OF EBV AND GUTTING PEDESTAL:

People have different ways of deactivating the EBV and gutting the Pedestal and after much research; I decided this was the safest way and not take the chance of having to remove the turbo again for possible oil leaks. You will need to have on hand:

Die grinder or Dremel tool to grind down the rivets on the EBV shaft.

$\frac{3}{4}$ " freeze plug. Auto parts store should have an assortment of these.

Some people say a 20 mm will also work but the $\frac{3}{4}$ " worked for me.

$\frac{1}{4}$ X 18 NPT tap, be sure it's a pipe tap and not a regular tap.

$\frac{1}{4}$ " brass pipe plug.

The first thing I did was tackle the "flapper valve" in the turbine housing. I separated the EBV housing from the turbo housing by removing the attaching bolts. If I remember correctly, 5/16 12 point is what fits.. This should expose the flapper. Using a grinder (I used my Dremel tool); I ground down the rivets that held the flapper to the actuating shaft. Once the rivets were flush with the flapper, I put a cold chisel between the flapper and the shaft, and after a few goods blows, the flapper finally separated from The shaft. With the flapper removed, you can now pull the shaft out of the EBV housing. You should see a steel sleeve that the shaft rode on still in the housing. If it did not fall out, us a hammer and punch to remove it. Now you have a $\frac{3}{4}$ " hole in the housing to plug. Use your $\frac{3}{4}$ " freeze plug, and carefully plug the hole with the plug. You may think it's too big to go in, but with careful persuasion with a hammer it will start and hammer in flush with the housing.

Next comes the pedestal. Some people stop here and re-install the Pedestal and the turbo. If you do, you are taking a chance that the pedestal will start leaking where the rod exits the pedestal. To make sure that I did not have this problem, I unscrewed the rod end from the EBV actuating shaft, and then removed the snap ring on the back of the EBV rod actuator cylinder and removed the cylinder cover. I then pulled the actuating piston out and using my Dremel tool with a cut-off wheel, removed approx. 1 $\frac{1}{2}$ " of the rod. What I wanted to do was be able to replace the piston back into the cylinder but not have the rod sticking out of the pedestal. The reason for this is I will now plug the hole the rod originally passed thru. This way there is no chance of leaks. Use a $\frac{1}{4}$ X 18 NPT Tap (pipe tap, not a standard $\frac{1}{4}$ " tap) to tap this hole and then plug it with a $\frac{1}{4}$ " pipe plug.

Some people have removed the piston and shaft completely, but one of the members said that of the piston is removed, there is the possibility of oil flow to the turbo being reduced because of some oil ports in the pedestal cylinder become uncovered when the EBV solenoid is commanded by the PCM to close the EBV valve. I left the EBV solenoid electrical connector plugged in to prevent the possibility of the PCM throwing any codes. With the piston replaced, the correct ports are uncovered but the oil cannot bypass the turbo.



