

EXH-03, Wastegate Removal and Installation

Introduction

For those of you who've removed the wastegate from a 944 Turbo, I'm sure you'll agree that there is no easy way to get the wastegate out of the car. There are a number of different ways to approach getting the wastegate out but, none are simple. So, what I'll try to do here is explain just how the wastegate is mounted and how I approached getting it out. I'm certainly not claiming that my way is the best so, study the mounting arrangement and decide for yourself which way you think is easiest.

Wastegate Mounting Arrangement

The wastegate diaphragm is attached to the wastegate valve body by three Allen head bolts (6 mm hex). The bolts go up through the valve body and then through the bottom flange of the wastegate diaphragm. One of the bolts threads into a nut that is tack welded to the diaphragm flange. However, the other two bolt go through the diaphragm flange and thread into bolts that are tack welded to the wastegate mounting bracket. The other end of the mounting bracket is bolted to another bracket that is bolted around the torque tube (two bolts - 13 mm head).

The wastegate discharge pipe has a flange that is bolted to the valve body with four bolts (13 mm head) and to the bracket on the torque tube by a single bolt (13 mm head). The other end of the discharge pipe is attached to the rest of the exhaust system by a flange just prior to entering the main exhaust pipe (2 bolts - 10 mm).

The wastegate inlet pipe has a flange which is mounted on four studs on the valve body on the other end (just off the cross-over pipe) the inlet pipe is attach by a triangle flange (3 bolts - 10 mm).

Now let's list all the problems that make this job difficult:

1. On both flanged connections (inlet and outlet pipe), the pipe is inserted into the flange by at least an inch or two. So, even if you unbolt the wastegate from the torque tube mounting bracket, you still have to remove one of the pipes (inlet or outlet) to get the assembly out of the car.
2. Removing the inlet pipe with the assembly in the car appears to be impossible unless you remove the studs at the inlet flange. Because of the tight working conditions, I didn't consider this an option.
3. Removing the discharge pipe seems much easier at first glance until you realize that the heads on the mounting bolts are too close to the flange to get a STANDARD socket on them (hold that thought).
4. Again, with the discharge pipe inserted into the flange several inches, moving the discharge pipe around enough once it is unbolted is difficult.
5. The wastegate mounting bolts (at the torque tube) are extremely difficult to get to.

Removing the Wastegate

Tools

- Modified 13 mm socket (description of modification included later)
- Ratchet
- Universal joint for socket
- 6" socket extension
- 10 mm socket and 10 mm wrench or two 10 mm wrenches
- Pry bar
- Flat tip screwdriver
- 8 mm socket or wrench
- 17 mm wrench
- 6 mm hex key or long 6 mm hex head socket

Procedure

1. Place the car on ramps or jack stands.
2. Remove the 8 mm nut on the back of the starter heat shield. Loosen (don't have to remove) the two bolts on the side of the clutch housing that hold the starter heat shield. Slide the heat shield off the starter and put it aside.
3. Using the flat tip screwdriver, loosen the wastegate diaphragm hose clamp and disconnect the hose from the diaphragm.
4. Next, I chose to remove the wastegate discharge pipe. This requires that you modify a 13 mm socket to fit between the head of flange bolts and the recesses in the flange. I used a bench grinder to grind down the sides of the open end of the socket until I could get it onto the bolts. Once you get the proper fit, remove the four discharge flange bolts. You'll need the universal joint and socket extension to get to a couple of the bolts.
5. Using the 13 mm socket and ratchet, also remove the bolt (1) that attaches the discharge flange to the torque tube mounting bracket.
6. Next, remove the two flange bolts at the other end of the discharge pipe.
7. Using the pry bar, slide the discharge pipe in toward the torque tube and downward toward the starter. Once the flange on the discharge pipe clears the wastegate valve body, you should be able to remove the discharge pipe.
8. Disconnect the triangle shaped flange bolt on the inlet pipe (3 bolts - 10 mm).
9. Locate the two wastegate diaphragm bolts that hold the wastegate mounting bracket. Using a 6 mm hex key or long 6 mm hex head socket remove the two bolts.
10. This should allow you to slide the wastegate off the mounting bracket and out of the car with the inlet pipe still attached.

Installing the Wastegate

1. With the inlet pipe attached to the wastegate, slide the end of the inlet pipe into the cross-over pipe flange and attach the wastegate to the mounting bracket with the two Allen head bolts. Torque the bolts to 20 Nm (14 ft-lbs) using the 6 mm hex key or long 6 mm hex head socket. Torque the inlet pipe to cross-over pipe flange bolts to 8 Nm (6 ft-lbs) using a 10 mm socket and wrench or two 10 mm wrenches.
2. Install the wastegate discharge pipe. Torque the flange bolts (4) using the modified 13 mm socket and discharge pipe flange to torque tube bracket bolt (1) to 20 Nm (14 ft-lbs). Torque the discharge pipe to main exhaust pipe flange bolts to 8 Nm (6 ft-lbs) using a 10 mm socket and wrench or two 10 mm wrenches.
3. Connect the wastegate diaphragm hose and tighten hose clamp.

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