

EXH-04, Wastegate - Fabricating and Installing Shims

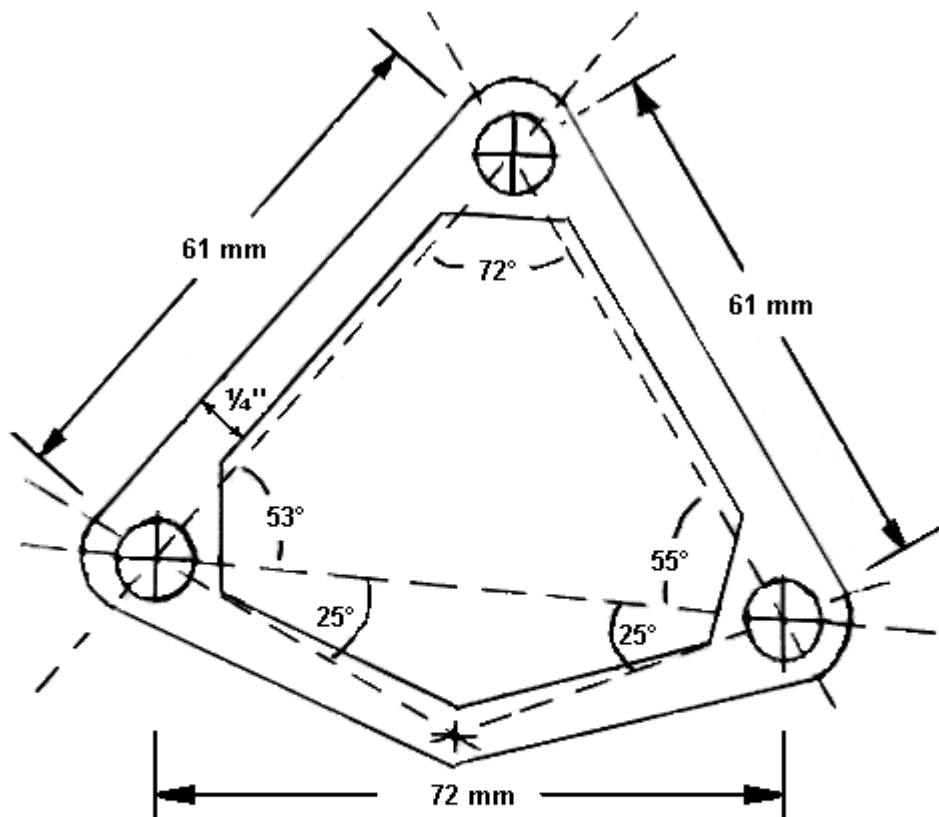
Introduction

During the installation of the 2.8L engine into my car, I decided that at some point I might wish to shim my factory wastegate. To prepare for that, I remove the wastegate from the car, removed the diaphragm from the valve body, and traced around the bottom flange of the diaphragm onto a piece of paper to make a template for further shim fabrication. Some months after I got the car back on the road, I realized that my wastegate would only hold about 17.5 psi boost. After talking to several 951 owners who were getting over 20 psi out the factory wastegate, I figured my spring must be a little weak and it was time I shimmed the wastegate.

For those who are unfamiliar with what shimming consists of, it is basically installing washers or gaskets between the wastegate diaphragm and wastegate valve body. This increases the pre-load on the wastegate spring and subsequently the maximum boost pressure the wastegate will hold.

Fabricating Shims

1. Shims may be fabricated by making a drawing based on the [Shim Template](#) (below) and transferring it to a piece of sheet metal.
2. Alternatively, the wastegate can be disassembled and a template made by tracing the bottom flange of the wastegate diaphragm onto a piece of paper for instruction on disassembling the wastegate refer to the Shim Installation section.



Specifications

- Bolt holes are 9 mm or 5/16"
- Constructed from 1/16" stainless or galvanized steel.
- Allow 1/8" clearance around outside of all bolt holes.

Shim Installation

Tools

- 6 mm hex key or 6 mm Allen head socket
- 8 mm hex key or 8 mm Allen head socket
- Source of pressurized air

Procedure

1. Using [EXH-03, Wastegate Removal and Installation](#), remove the wastegate from the car.
2. Remove the three Allen head bolts that hold the wastegate diaphragm to the wastegate body (6 mm).

NOTE

Two of the Allen head bolts hold the wastegate mounting bracket to the wastegate. Mark the orientation of the bracket on the wastegate body prior to remove the bolts.

3. Remove the wastegate valve. The valve has an Allen head insert in the bottom (8 mm).
4. Separate the wastegate diaphragm from the valve body and insert two shims between the valve body and the bottom flange of the wastegate diaphragm. Insert the Allen head retaining bolts. If the wastegate was removed with the mounting bracket left in the car only install the retaining bolt which threads into the nut which is tack welded onto the diaphragm flange. Before torquing the bolt (20 Nm (14 ft-lbs)), ensure the remaining two bolt holes in the shims are lined up with the holes in the wastegate body and diaphragm.
5. Using [EXH-03, Wastegate Removal and Installation](#), install the wastegate into the car.