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|---|---|
| PART NUMBER: | PBO085-3501 |
| NAME: | PW66 CO2 DUAL PORT TOP |
| DESCRIPTION: | 66MM EXTERNAL WASTEGATE |

Thank you for purchasing our PW66 external wastegate. With over 100 years of combined turbocharger development and racing experience, we at Precision Turbo take great pride in providing you with the best external wastegate on the market today. The PW66 is made from high grade, high temperature stainless steel and billet aluminum components. It features our own purpose designed Kevlar reinforced wastegate diaphragm and a 347 stainless investment cast valve body. Our investment cast valve body has a smooth internal surface, giving you better flow and more accurate boost control. The PW66 features a Nickel Chromium Alloy valve and 5 different 17-7 precipitation hardened springs. Also included are stainless steel inlet and outlet flanges with clamps. With a satin black anodized, 6061 aluminum billet wastegate cap you will have years of good looks and protection from the elements. The PW66 is generally compatible with most aftermarket manual and electronic boost controllers on the market today.  If you have any questions or need any technical support, our Technical Sales Staff is here to help.



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**Contents**

Please verify that the following parts are included in the box.
Note: Some components are already installed in the unit.

| PART NUMBER | QTY | DESCRIPTION |
|---|---|---|
| WG004 | | EXTERNAL WASTEGATE ASSEMBLY |
| PTP071-1027 | 1 | V-BAND CLAMP FOR 66MM WG OUTLET |
| PTP071-1028 | 1 | V-BAND CLAMP FOR 66MM WASTEGATE INLET |
| PBO085-2114 | 1 | BANJO FITTING KIT |
| PBO085-3104 | 1 | PTE 66MM WASTEGATE INLET FLANGE |
| PBO085-3108 | 1 | PTE 66MM WASTEGATE OUTLET FLANGE |
| PBO085-3122 | 1 | PTE 66MM WASTEGATE VALVE SEAT |
| PBO085-3200 | 1 | PTE WASTEGATE SMALL NATURAL SPRING 1.5 PSI |
| PBO085-3202 | 1 | PTE WASTEGATE MEDIUM YELLOW SPRING 3 PSI |
| PBO085-3204 | 1 | PTE WASTEGATE MEDIUM RED SPRING 6 PSI (installed in wastegate) |
| PBO085-3206 | 1 | PTE WASTEGATE LARGE GREEN SPRING 9 PSI (installed in wastegate) |
| PBO085-3208 | 1 | PTE WASTEGATE LARGE BLUE SPRING 18 PSI |
| PBO085-3610 | 1 | PTE GEN. 1 66MM CO2 WG PISTON/DIAPHRAGM ASSEMBLY (installed in wastegate) |
| PTE-WI-169 | 1 | INSTALLATION INSTRUCTIONS |

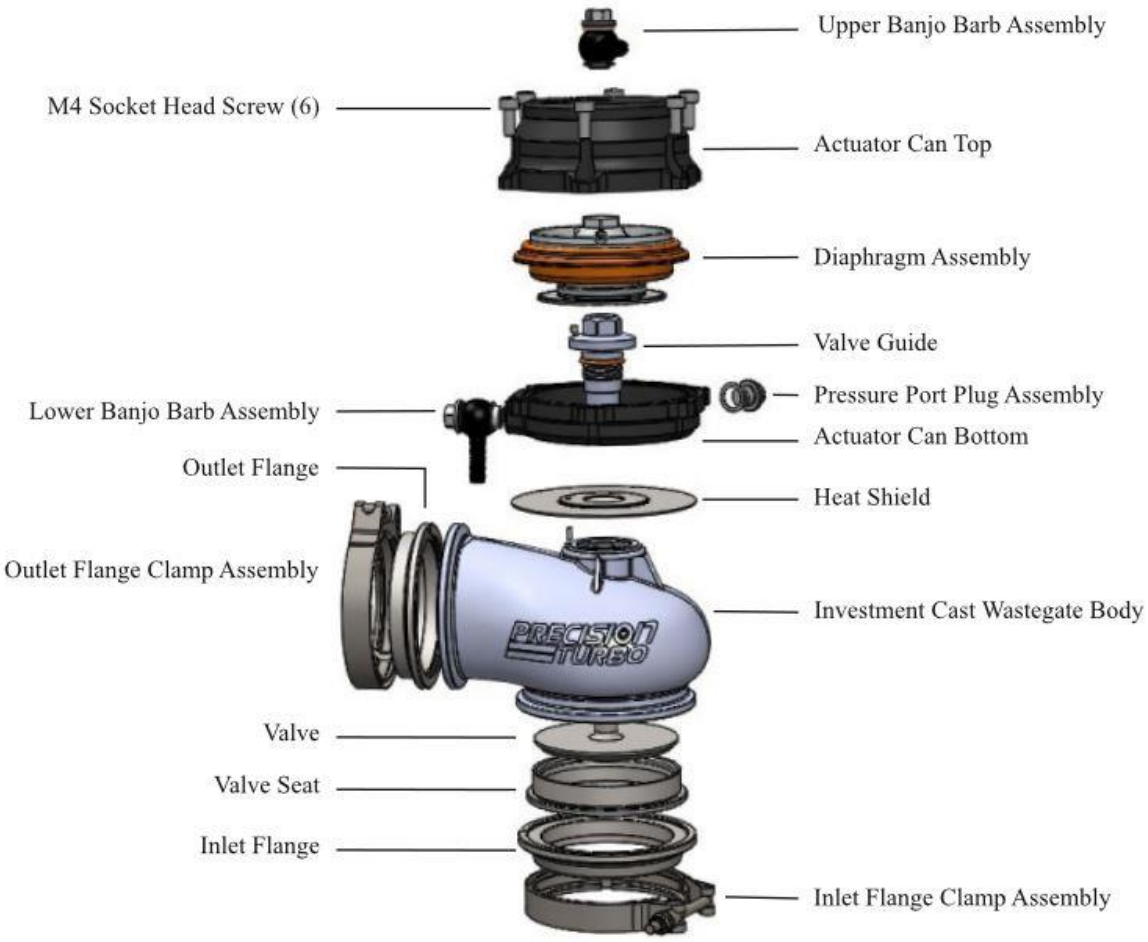
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## Operational overview

Your PW66 wastegate, controls turbocharger boost by bypassing turbine inlet exhaust gas via a spring-loaded valve diaphragm assembly. Spring rate, in conjunction with boost pressure signal, and back pressure, control the opening point of the wastegate valve. Once the spring rate has been over come, the valve will open. This causes exhaust flow to be diverted away from the turbine side of the turbocharger, effectively slowing and/or stabilizing the turbine wheels' speed. This stabilization results in a smooth and steady boost pressure level, created by the compressor wheel of the turbocharger. Open pressure of the valve can be controlled via spring rate and or a boost controller, such as a manual boost controller or an electronic boost controller.

See diagram below:



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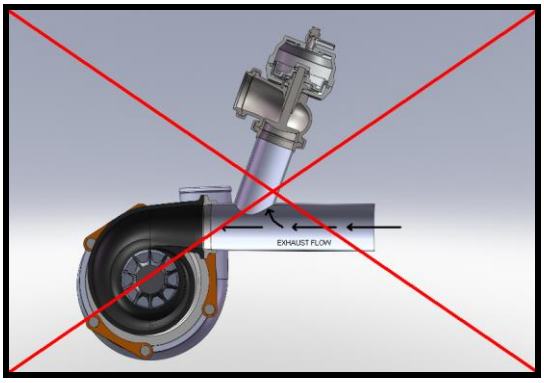
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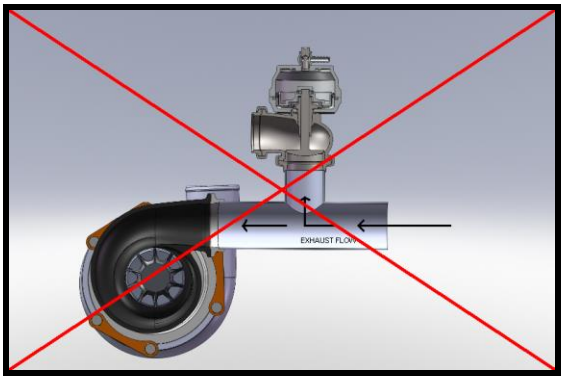
**Installation Instructions**

**Note:** The optimum mounting and placement of your new PW66 wastegate will be determined by your manifold and turbocharger configuration. These notes should be considered when installing your new wastegate.

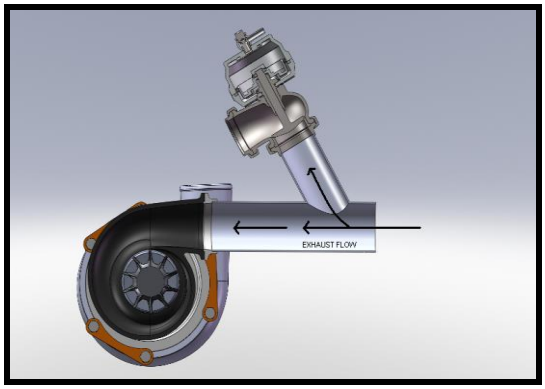
- Be sure to install the valve seat into the body of the wastegate before final installation.
- The valve seat relies on spring pressure to align the valve in the seat during installation. It is recommended to lubricate (anti-seize) the flanges during installation so that the V-band clamp may slide on the flange surface. This will help ensure the valve seat retains optimal alignment to the valve.
- Tighten the supplied V-band clamp bolts to 85-90 inch /lbs (9.6 – 10.2 Newton meters).
- To assure proper boost control, your PW66 wastegate needs to be mounted at a smooth transitional angle with the exhaust flow. 90° mounting onto exhaust tubing is not recommended. Refer to diagrams below.
- Inlet and Outlet flanges are constructed of, 304 stainless steel and are compatible with most stainless steel and mild steel welding rod material.
- It is recommended to secure all vacuum and or boost control hoses securely with zip ties or cushioned clamps. Route all vacuum hoses away from high heat sources such as the turbine housing and exhaust manifold.
- Your PW66 wastegate includes two hose barb banjo assemblies and one pressure port cap. Allowing you to install the lower hose barb banjo assembly in one of two locations, depending on your wastegate mounting position.
- Allow for cool airflow around the top billet wastegate cover.
- Use caution when working on a hot engine. Wastegate and turbocharger components are EXTREMELY HOT and can cause severe burns.
- Wastegate outlet can be routed back into the exhaust system or vented to atmosphere. Note that venting to atmosphere only applies to OFF ROAD VEHICLES. Venting wastegate exhaust to atmosphere may be ILLEGAL and considered to be emissions related tampering under applicable laws, rules and regulations.

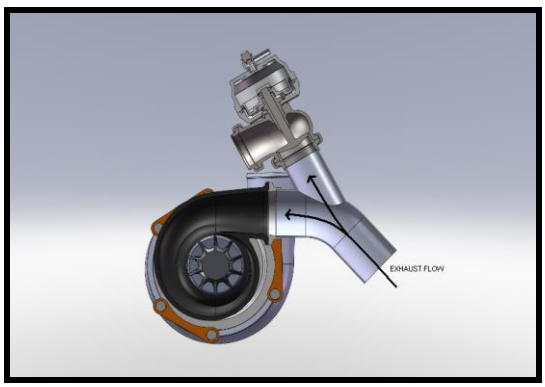
## NOT RECOMMENDED




## RECOMMENDED



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**Wastegate spring removal and installation**

1. Remove the PW66 WASTEGATE from the inlet pipe.

**USE CAUTION AS THE WASTEGATE MAY STILL BE VERY HOT!**



2. **WARNING! THE WASTEGATE CAN TOP IS UNDER HIGH SPRING TENSION. USE SAFETY GOGGLES AND REMOVE WITH CARE.** Using a 4mm hex key, remove the six hex keyed cap screws that secure the billet aluminum top to the wastegate. The use of a press or vise may be used to hold down the wastegate can top while loosening the bolts. If using a press or vise for disassembly, use a cloth or microfiber rag to protect the surface finish from scratches. Remove the cap slowly, using care to secure the spring/springs upon removal.



**Wastegate spring removal and installation continued**

3. Remove the spring/springs from the wastegate. Determine which spring/springs you will be installing using the Wastegate Spring Utilization Chart on page 8. Install the spring/springs into the wastegate, on top of the diaphragm. Use care to ensure that you do not tear or scratch the diaphragm.



4. Visually align the bolt holes of the top and bottom cans. Now compress the wastegate can top until it is seated with the wastegate can bottom. Use of a press or vice may be necessary depending on spring selection. Make sure that the bolt holes are aligned before tightening. It may be necessary to rotate the wastegate can top to align the bolt holes. If needed, relieve tension on top, rotate and recompress. Once bolt holes are aligned, install the six 4mm hex head cap screws. Tighten the cap screws in a criss cross pattern to 51-55 inch lbs or 5 ft lbs. (5.8 – 6.2 Newton Meters)



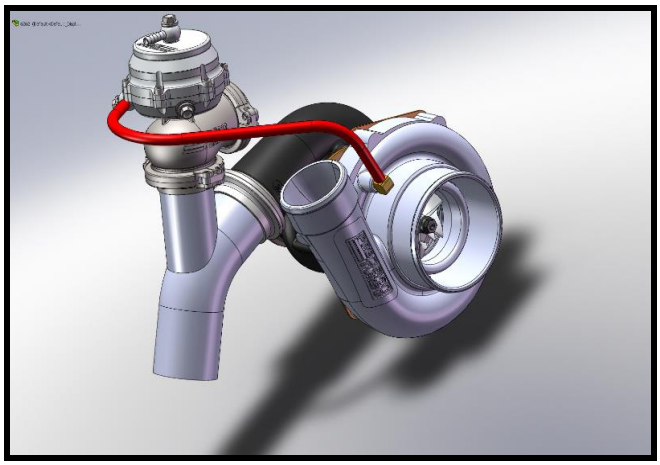
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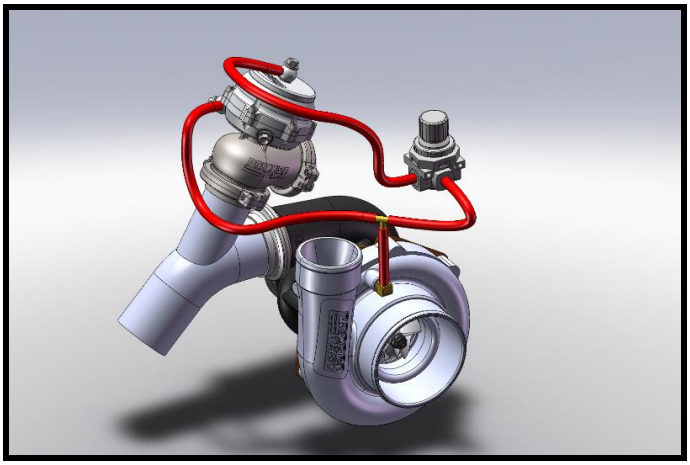
**Boost controller installation recommendations**

**A. Spring Rate Controlled Method**
If you want to use spring rate to control boost level, install boost signal hose from the compressor cover hose barb, to the bottom banjo barb port of the wastegate can. You will leave the top banjo barb port unused and vented to atmosphere. Secure the hose connections with either zip ties or hose clamps, making sure to route hose away from high heat sources. Using this method, your boost level will be determined by the spring/springs used and back pressure.

**A.**



**B.**



**B. Manual Boost Controller Method "bleeder valve"**
Install boost signal hose from the turbocharger compressor cover hose barb, to the bottom of a plastic Tee. Install one hose from one port of the Tee, to the bottom banjo barb port of the wastegate can. Install a second hose from the other side of the Tee, into the inlet of your manual boost controller. (Refer to your manual controllers instructions to determine which port is inlet port.) Install another hose from the outlet port of the manual boost controller, to the top banjo barb port of the wastegate. Secure all hose connections with zip ties or hose clamps. Make sure to route all hoses away from high heat sources.
With the manual boost controller closed, so that no boost signal pressure passes through it, the wastegates spring rate should control boost levels. Opening the manual boost controller applies pressure to the top of the wastegate, delaying the valve from opening, effectively raising your boost levels. Once you have achieved your desired boost level, no further adjustment of the manual boost controller is necessary.

CAUTION: **Precision Turbo recommends that the air/fuel ratio be checked while setting the boost levels. Raising your boost levels will change the air/fuel ratio of your tune up and could cause engine detonation to occur.**

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## Wastegate spring utilization chart

The chart is based on 1:1 boost to backpressure. Due to the valve to diaphragm ratio on this C02 only wastegate, different boost to backpressure ratios will significantly change the "cracking pressure" of the valve.

| PSI | BAR | SPRINGS | | | | |
|---|---|---|---|---|---|---|
| | | *Natural* | *Yellow* | *Red* | *Green* | *Blue* |
| **1.5** | **0.1** | X | | | | |
| **3** | **0.21** | | X | | | |
| **4.5** | **0.31** | X | X | | | |
| **6** | **0.41** | | | X | | |
| **7.5** | **0.52** | X | | X | | |
| **9** | **0.62** | | | | X | |
| **10.5** | **0.72** | X | | | X | |
| **12** | **0.83** | | X | | X | |
| **13.5** | **0.93** | X | X | | X | |
| **15** | **1.03** | | | X | X | |
| **16.5** | **1.14** | X | | X | X | |
| **18** | **1.24** | | | | | X |
| **19.5** | **1.34** | X | | | | X |
| **21** | **1.45** | | X | | | X |
| **22.5** | **1.55** | X | X | | | X |
| **24** | **1.66** | | | X | | X |
| **25.5** | **1.76** | X | | X | | X |



NOTES:

The use of 2 or 3 springs in combination are required for higher boost levels. When selecting your spring rate, the total boost psi pressure is determined by adding the springs rates together. Use the chart above to determine your spring combination needed for your boost psi. Note: Each spring has a strip of colored paint on one side, except the natural colored small inner spring.

**Example: 1.5 psi Natural small spring + 6 psi Red medium spring + 18 psi Blue large spring = 25.5 psi.**

**WARNING: Installing higher spring rate springs into your PW66 wastegate, may cause higher than expected boost levels. It is recommended to reduce your boost controller back to its minimum setting and monitor your new minimum boost level with the new spring or springs, before increasing your boost pressure. Failure to do so can lead to severe detonation and engine damage. Any damage incurred, as a result of detonation from excessive high boost levels or improper installation is the customer's responsibility. Precision Turbo recommends that the air/fuel ratio be checked while setting the boost levels, as raising your boost levels will change your air/fuel ratio of your tune up and could cause engine detonation or damage.**

## WARRANTY

Each Precision Turbo PW66 wastegate is warranted to be free from manufacturer's defect for a period of 12 months or 12,000 miles, whichever occurs first from the date of the original invoice. Manufacturer's warranty otherwise applies. Seller expressly disclaims all implied warranties of merchantability and or fitness for a particular purpose.

Precision Turbo will repair or replace, at its discretion, any Precision Turbo branded product that proves defective in material or workmanship under normal installation, use and service. In the case of any warranty claim with regards to defects in material or workmanship, the product in question should be returned, freight prepaid to 9401 Georgia Street, Suite 2, Crown Point, IN 46307.

This warranty does not cover damage or failure of components due to normal wear and tear. There is no warranty on any parts used in race applications, or on products that have been physically altered, improperly installed or not maintained. Seller's warranty is in lieu of all other warranties, expressed or implied.

## RETURNS

Returns for credit or exchange are allowable only with a Returned Material Authorization (RMA) number for 30 days from date of shipment. RMA numbers can be obtained directly from Precision Turbo and Engine. Additionally, the Product Return Form (found on our website, www.precisionturbo.net) must be filled out in its entirety, and returned with the product being sent back for credit or exchange. Restocking fees may apply. Product must be new or in resalable condition and returned at the customers expense freight prepaid. All claims for shipping damage must be addressed with the carrier by the customer.

## DISCLAIMER

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Federal, State or provincial laws, rules and regulations in the US, Canada or elsewhere may prohibit the removal or modification of components that were installed on motor vehicles or engines by the original equipment manufacturer, in order to meet emissions requirements or to comply with safety regulations applicable to engines or vehicles manufactured for use on public roads or highways. Removal of such components and installation of Precision Turbo products may be illegal and considered to be emissions-related tampering under applicable laws, rules and regulations. Motor vehicles or engines equipped with Precision Turbo products may not be used on public roads or highways, as installation of such products could cause the vehicles engine to be non-compliant with applicable emissions and or safety standards.

Installation of Precision Turbo products (or similar products from other manufacturers) on a motor vehicle or engine, may void, reduce or otherwise adversely affect any warranties given by the manufacturer or seller of the vehicle, engine or other component parts.

⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov.