

PART NUMBER:	PBO085-2001
NAME:	PW46
DESCRIPTION:	46MM EXTERNAL WASTEGATE

Thank you for purchasing our PW46 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 PW46 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. Our PW46 was designed to be a direct replacement for other existing 44mm wastegate flanges, but will work best with the flange provided. The PW46 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 PW46 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 (855)996-7832, our Sales Staff is here to help.



Installed springs vary based on configuration.

PART NUMBER:	PBO085-2001
NAME:	PW46
DESCRIPTION:	46MM EXTERNAL WASTEGATE



CONTENTS

Please verify that the following parts are included in the box.

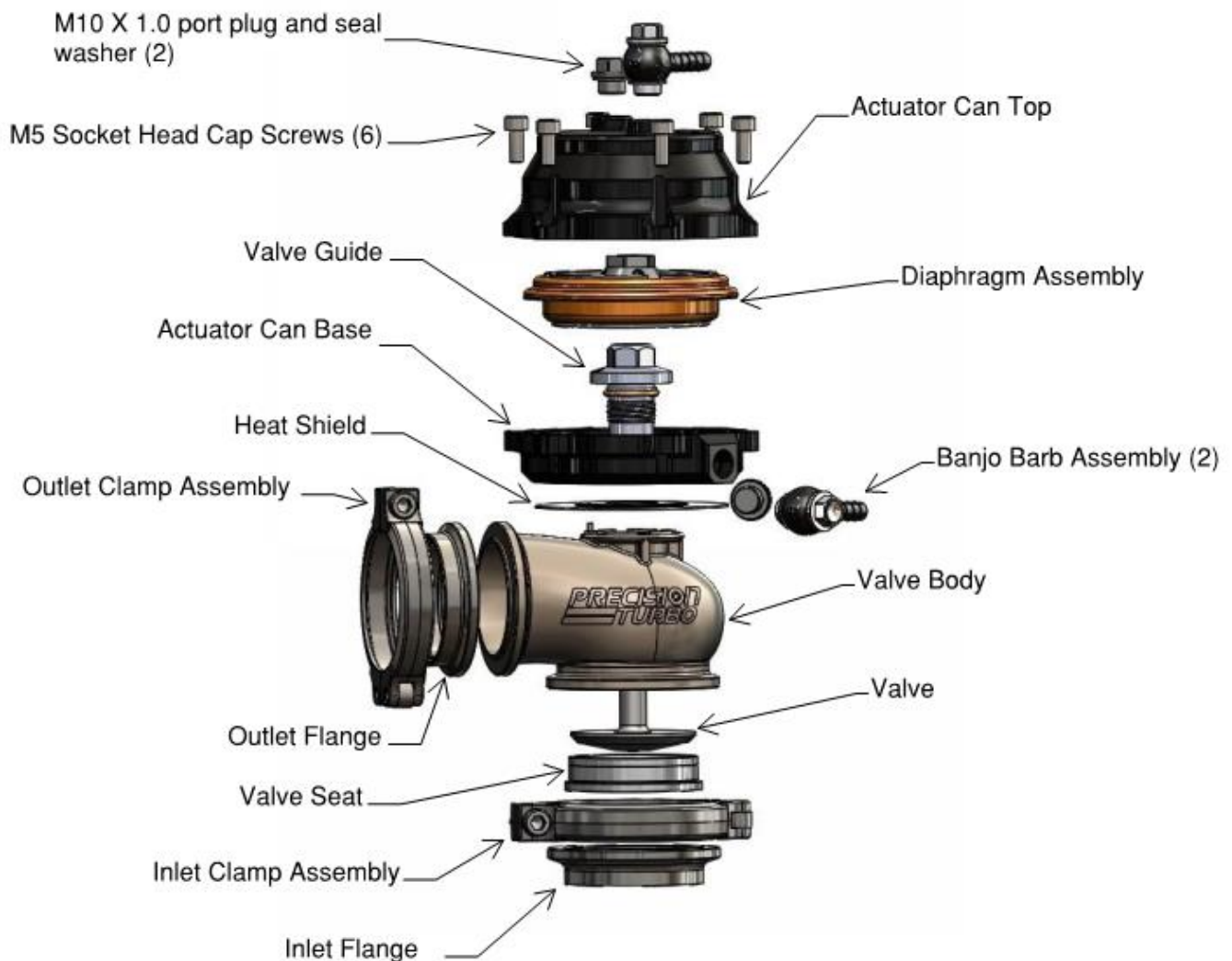
PART NUMBER	QTY	DESCRIPTION
WG002	1	EXTERNAL WASTEGATE ASSEMBLY
PBO085-3200	1	PTE WG SMALL NATURAL SPRING 1.5 PSI
PBO085-3202	1	PTE WG MEDIUM YELLOW SPRING 3 PSI
PBO085-3204	1	PTE WG MEDIUM RED SPRING 6 PSI
PBO085-3206	1	PTE WG LARGE GREEN SPRING 9 PSI
PBO085-3208	1	PTE WG LARGE BLUE SPRING 18 PSI
PBO085-2115	1	GEN 2 PTE 39/46/56MM WG BANJO FITTING KIT
PBO085-2112	1	PTE 46MM WG VALVE SEAT
PBO085-2100	1	PTE 46MM WG INLET CLAMP ASSEMBLY
PBO085-2102	1	PTE 46MM WG OUTLET CLAMP ASSEMBLY
PBO085-2104	1	PTE 46MM WG INLET FLANGE STAINLESS
PBO085-2108	1	PTE 46MM WG OUTLET FLANGE STAINLESS
PBO085-2110	1	PTE 39/46/56MM WG PISTON/DIAPHRAGM ASSEMBLY
PTE-WI-185	1	INSTRUCTION MANUAL

PART NUMBER:	PBO085-2001
NAME:	PW46
DESCRIPTION:	46MM EXTERNAL WASTEGATE

OPERATIONAL OVERVIEW

Your PW46 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, 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. Opening of the valve rate can be controlled via spring rate and or a boost controller, such as a boost regulating valve or an electronic boost controller.

See diagram below.



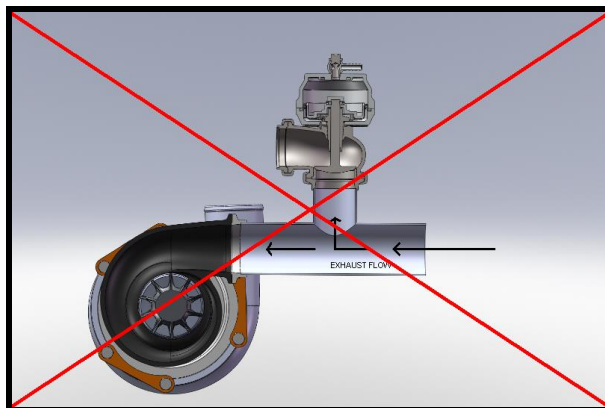
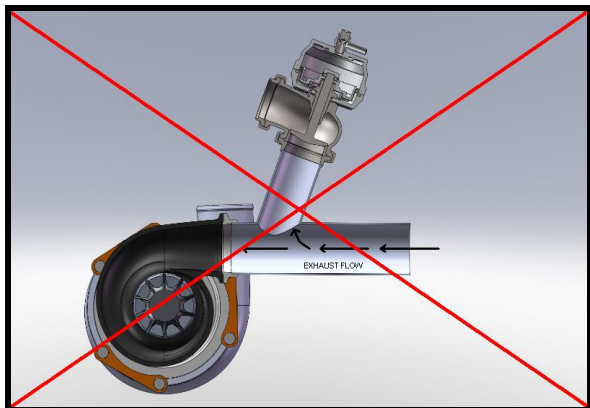
PART NUMBER:	PBO085-2001
NAME:	PW46
DESCRIPTION:	46MM EXTERNAL WASTEGATE

INSTALLATION INSTRUCTIONS:

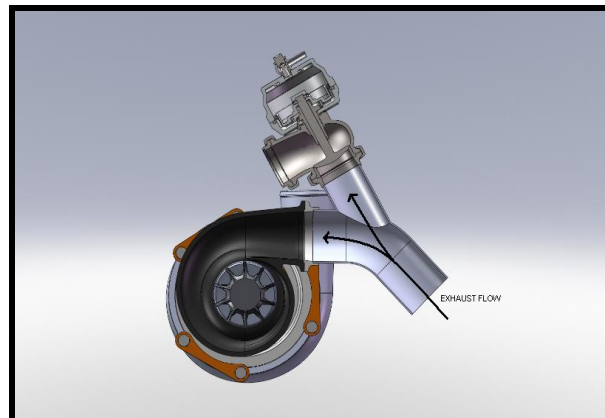
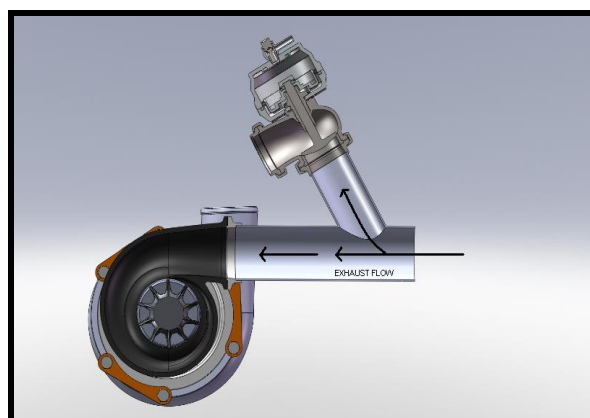
NOTE: The optimum mounting and placement of your new PW46 wastegate will be determined by your manifold and turbocharger configuration. These notes should be considered when installing your new wastegate.

- The PW46 wastegate is compatible with Tials WG4 wastegate weld flange, for a trouble-free bolt on replacement.
- Be sure to install the valve seat into the body of the wastegate before final installation.
- Tighten the supplied V-band clamp bolts to 85-90 in/lbs. (9.6 – 10.2 newton meters).
- In order to assure proper boost control, your PW46 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 PW46 wastegate includes two hose barb banjo assemblies and 2 M10 port plugs. 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 routing 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



PART NUMBER:	PBO085-2001
NAME:	PW46
DESCRIPTION:	46MM EXTERNAL WASTEGATE

WASTEGATE SPRING REMOVAL AND INSTALLATION

1. Remove the PW46 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. Use a cloth or microfiber rag to protect the surface finish from scratches, if using a press or vise for disassembly. Remove the cap slowly, using care to secure the spring/springs upon removal.



PART NUMBER:	PBO085-2001
NAME:	PW46
DESCRIPTION:	46MM EXTERNAL WASTEGATE

WASTEGATE SPRING REMOVAL AND INSTALLATION CONT.

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 to 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).



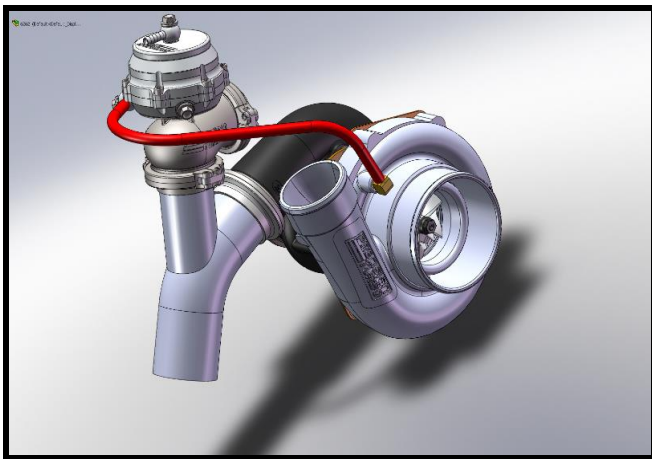
PART NUMBER:	PBO085-2001
NAME:	PW46
DESCRIPTION:	46MM EXTERNAL WASTEGATE

BOOST CONTROLLER INSTALLATION RECOMMENDATIONS

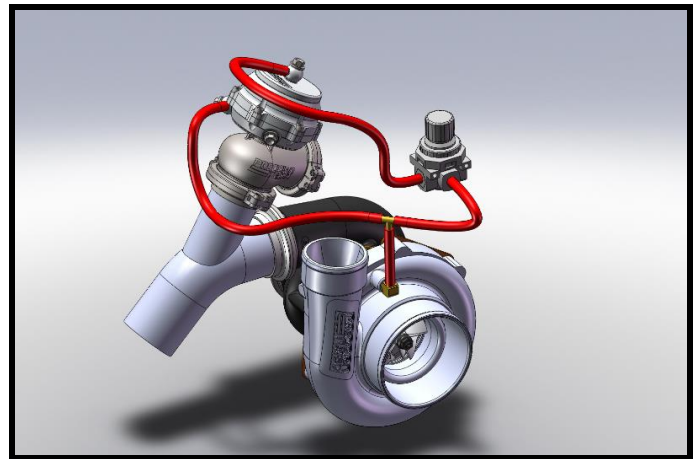
A. Spring Rate Controlled Method

If you want to use spring rate to control boost level, install boost signal hose from the compressor cover hose barb, to one of the bottom banjo barb ports of the wastegate can. You will leave one of the top ports unused and vented to atmosphere. Use the provided port plugs and washers to plug the additional ports on top and bottom. 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. Boost Regulating Valve

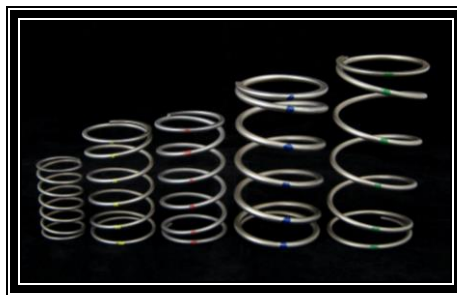
Install boost signal hose from the turbocharger compressor cover hose barb, to the bottom of a plastic Tee. Install one hose from one port of the Tee, to one of the bottom banjo barb ports of the wastegate can. Install a second hose from the other side of the Tee, into the inlet of your boost regulating valve. (Refer to your boost regulating valve instructions to determine which port is inlet port.) Install another hose from the outlet port of the boost regulating valve, to one of the top banjo barb ports of the wastegate. Use the provided port plugs and washers to plug the additional ports on top and bottom. Secure all hose connections with zip ties or hose clamps. Make sure to route all hoses away from high heat sources.

With the boost regulating valve closed, so that no boost signal pressure passes through it, the wastegates spring rate should control boost levels. Opening the boost regulating valve 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 boost regulating valve 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.**

WASTEGATE SPRING UTILIZATION CHART

PSI	BAR	SPRINGS				
		<i>Natural</i>	<i>Yellow</i>	<i>Red</i>	<i>Green</i>	<i>Blue</i>
1.5	0.10	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

PSI	COLOR	SIZE
1.5	NATURAL	SMALL INNER
3	YELLOW	MEDIUM OUTER
6	RED	MEDIUM OUTER
9	GREEN	LARGE OUTER
18	BLUE	LARGE OUTER



NOTES:

The use of 2 or 3 springs in combination is 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 PW46 wastegate, may cause higher than expected boost levels. It is recommended to reduce your boost regulator 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.

PART NUMBER:	PBO085-2001
NAME:	PW46
DESCRIPTION:	46MM EXTERNAL WASTEGATE

WARRANTY

Each Precision Turbo PW46 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 the 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

Precision Turbo does not warrant the accuracy or completeness of the information contained in the manual. Any information and specifics contained in the manual are provided "as is" without any representation or warranty, expressed or implied, of any kind, including, but not limited to, warranties of merchantability, non-infringement, or fitness for any particular purpose. Some jurisdictions do not allow for the exclusion of implied warranties, so the above exclusions may not apply to you.

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.