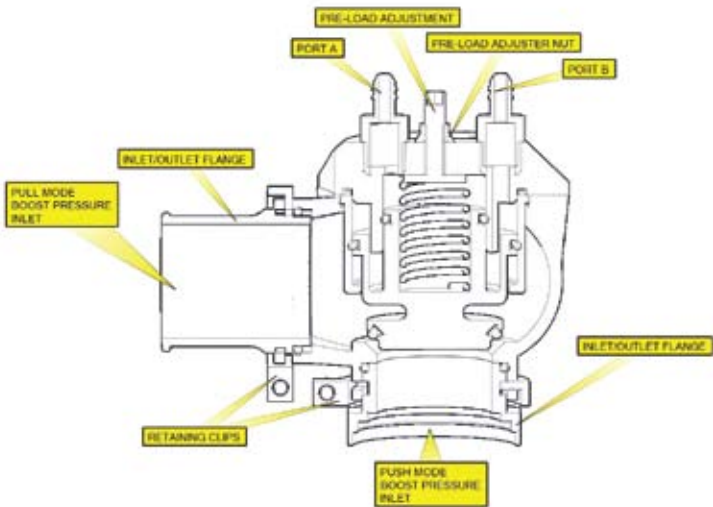




Synchronic Diverter Valve **TUNING MANUAL**



The purpose of a proper Diverter Valve (DV) is to actuate as fast as possible in response to changes in intake manifold pressure without leaking under boost. Speeding up the response time of a DV is the goal of any OE turbocharger engineer. Within that time, the ability of a DV to achieve maximum flow in the shortest amount of time is what determines its effectiveness. A high flow valve that does not respond quickly can be considered useless in having any positive effect on performance. Congratulations on purchasing Synchronic DV, a valve that outperforms nearly every valve before it by generating valve lift by 25 milliseconds & maximum flow within 100 milliseconds.

II. THE PROCESS FOR TUNING YOUR SYNCHRONIC DV IS AS FOLLOWS:

1. Decide on installation orientation

Push or Pull

2. Decide on which Port combination is best for your setup

A, B or A+B

3. Apply pre-load to fine tune

Clockwise/more or Counter Clock/less spring pre-load

Push vs. Pull – **Push** configuration is defined as having boost pressure act on the face of the valve to aid in opening the valve. **Pull** configuration is defined as using boost pressure to keep the valve closed by applying pressure against the back of the valve. Either configuration will adequately seal boost up to 60 psi and produce fast actuation times. However, you will notice a difference in sound character between the two variations. We recommend you try both configurations to determine which will work best for your setup. In some cases we have found the push configuration to be helpful when there is boost-onset turbo surge or very sensitive mass air flow systems.



Port Combinations – Each application is different, which is why the patented Synchronic geometry allows you to find the sweet spot for your setup. Choosing the port combination that works best for you is much like choosing your car, it is unique to your driving style. We have found that customers will sometimes have the exact same modifications on the same car and will choose their setup differently to accommodate their unique driving styles & personalities.

Pre-Load – Generally, we recommend using the least amount of pre-load as possible. If you find that your setup runs well with the adjuster fully counter clockwise, then simply leave it alone. The addition of

pre-load slows down the valve's reaction time. There are slight differences among applications that may require fine tuning of pre-load.

The chart below is a collection of installation and configuration combinations that have been tested. A check mark ✓ indicates our recommended port setting for the system type or characteristics you will find in a given system. **These are merely recommendations.** Because there is not a check mark ✓ does not mean that the particular configuration will not work.

Quick Decision Matrix:

INSTALLED CONFIGURATION	PUSH 			PULL 		
	BOOST/VACUUM TO PORT					
	A	B	A+B	A	B	A+B
MAF Vent-to-Atmosphere Discharge (Full pre-load required)		✓				
MAF Recirculated Discharge		✓	✓	✓	✓	✓
MAP Vent-to-Atmosphere Discharge		✓	✓	✓	✓	✓
MAP Recirculated Discharge		✓	✓	✓	✓	✓
High Boost Pressures			✓		✓	✓
Fast Spooling Turbo		✓	✓	✓	✓	
On-Boost Compressor Surge	✓	✓	✓			
High Lift Cams or Low Vacuum*	✓	✓		✓	✓	
Centrigual Supercharger		✓	✓			
Racing		✓			✓	

* When port not in use vent to atmosphere

III. VENT TO ATMOSPHERE DISCHARGE

Synchronic DV has the ability to vent to atmosphere for MAF vehicles by staying normally closed under operating vacuum. As you can see from the previous chart, there is only one recommended configuration that will allow this setup. You will have to apply nearly maximum spring pre-load adjustment (Clockwise) until the valve is closed under idle conditions. Although, you **CAN**, vent a MAF car to atmosphere, you **SHOULD** recirculate for maximum performance. It should also be noted that applying maximum pre-load, slows down the response of the valve. This setup is a mere compromise for customers that seek to maximize the audible discharge of their BOV, in exchange for maximum performance. *Use at your own discretion.*

IV. INSTALLING AND REMOVING MOUNTING FLANGES

- A.** Begin by removing the M4 bolts and nut holding the clamp together.
- B.** If you are switching to one of the other alternative mounting flanges, you will need to use the o-ring with the new flange if one is not already provided for you.
- C.** Upon reinstallation, you should **NOT** use grease or oil on the o-rings to reinstall. Use water instead (not alcohol) to aid in installation.
- D.** The latest flange design has a different installation order from the previous design. Begin by installing the o-ring in the DV. Next,

install the assembly onto the mounting flange. The o-ring is **NOT** installed onto the groove of the adapter flange. This new design eliminates all chances of damaging or cutting the o-ring seal.



E. Once you have the o-ring in the DV, followed by the flange, you will push down on the flange to seat the o-ring. This will allow you to close the clamp and hold the flange in place. Tighten the nut and bolt to secure the clamp.

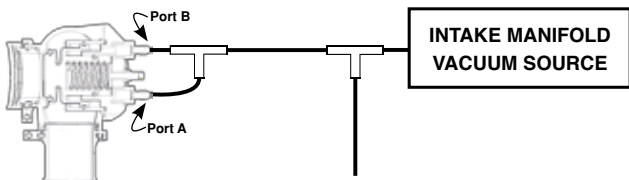
F. The fittings provided have to be threaded in place using a wrench. Even after installation, you should still have some threads visible. Tapered threaded fittings are not meant to be flush on installation. Be very careful not to block the ports when using silicone or thread sealant on threads.

V. CONNECTING TO A VACUUM SOURCE

a. You will need to locate a vacuum source that is directly connected to the intake manifold after the throttle body. It is preferable that the Synchronic DV have its own vacuum source. If you need to tee the vacuum source, please insure that the straight section of the tee is in direct communication with the Synchronic DV. *See diagram below.* You will also want to make sure that the vacuum source to the DV is not shared with other pneumatic actuators such as wastegates, EGR valves, etc.

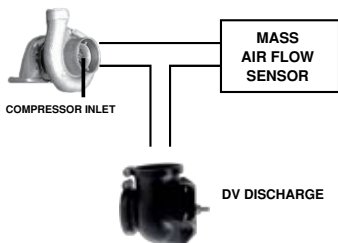
b. Once you have plumbed a vacuum signal source near the Synchronic DV, you will tee the connection and connect both Ports A and B. Depending on the placement of the source port on the intake manifold that you are using for vacuum, you may want to plumb the hoses that go to Ports A and B as close to the intake manifold as possible before connecting them together with a tee.

SIGNAL LINE ROUTING

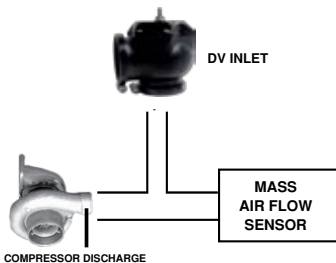


VI. RECIRCULATING THE DISCHARGE

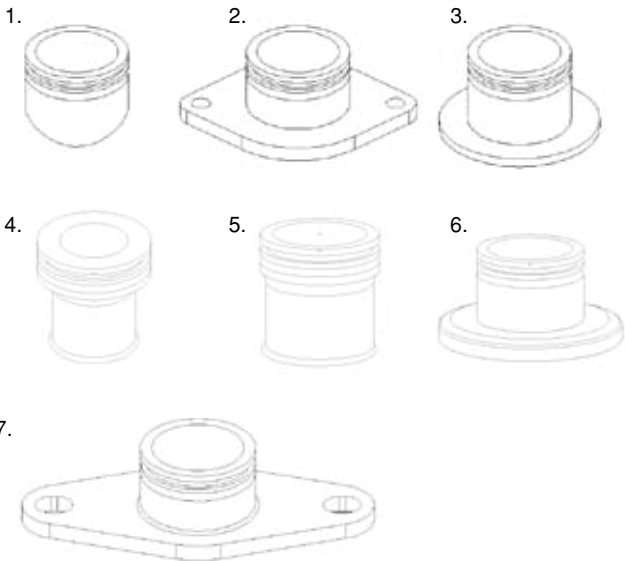
- a. The Synchronic DV comes complete with all of the components necessary to install it into a system with the discharge recirculated.
- b. In a speed density system (MAP sensor) you **CAN** recirculate the discharge of the DV between the air filter and compressor inlet.
- c. In a mass air flow metered system (MAF) you **SHOULD** recirculate the discharge of the DV between the MAF and the compressor inlet.



- d. In a mass air flow metered system (MAF), where the turbocharger is blowing through the MAF, you can install the Synchronic DV anywhere between the compressor discharge and the MAF. In this scenario you do not have to recirculate the discharge of the DV.



VIII. MOUNTING FLANGE OPTIONS



1. SB001.1A Aluminum Weld-On Mounting Flange, SB001.2A Stainless Steel Weld-On Adapter Flange
2. SB001.3A Aluminum Greddy Type S, Type R and HKS Racing Adapter Flange
3. SB001.4A Aluminum HKS SSQ Adapter Flange
4. SB001.10A 1 inch, VW, Audi, Porsche, Bosch Adapter Flange
5. SB001.9A 1.25 inch, Mitsubishi Adapter Flange
6. SB001.6A Tial Adapter Flange
7. SB001.7A Mazdaspeed, Gen 1 Mitsubishi Eclipse, Nissan GTR Adapter Flange



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