



ELECTRONIC VALVE CONTROLLER EZ (EVC EZ) PART # 4503-RA008

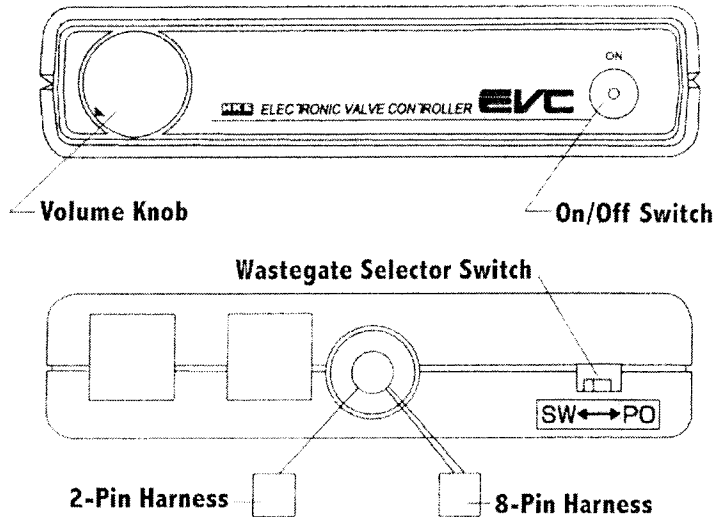
NOTICE

Read this entire manual to understand how the EVC EZ functions before beginning the installation process. Do not attempt to install or adjust the EVC EZ without thorough knowledge of how this unit works. This manual assumes that you have the knowledge in the operation of tools and equipment that are necessary to safely perform service operations on your vehicle. This manual also assumes that you are familiar with typical automotive systems and basic service and repair procedures. Always have access to a factory repair manual as some of the procedures and specifications required for the proper installation of this product may be referenced to the factory repair manual. To avoid the risk of personal injury, follow the lifting, supporting, and safety precautions contained in the factory repair manual.

USER NOTES

- 1. Do not rely on the factory boost meter when adjusting the maximum boost pressure. Install an HKS auxiliary boost meter to monitor manifold boost pressure levels.**
- 2. The utilization of an HKS exhaust gas temperature (EGT) meter is recommended to monitor engine conditions (rich or lean air/fuel ratios).**
3. The EVC EZ can be used on both internal and external wastegate type turbochargers.
4. The EVC EZ is not capable of reaching boost levels lower than OEM (stock) levels.
5. Serial numbers must match on both the controller unit and stepping motor in order for the unit to work correctly.
6. The EVC EZ is a sensitive electronic component and must be handled with care. Miswiring or shock will damage the unit. Do not place near extreme heat, water or areas prone to dirt and dust.
7. Most factory turbocharged vehicles come with a secondary boost limiting system (fuel cut system or pop-off valve) to safeguard against wastegate failure. Due to this, the EVC EZ alone will not be able to raise the boost pressure beyond the point of the factory limit. If this condition occurs, consult your HKS distributor for information regarding products that can assist in this situation (HKS Fuel Cut Defencer, HKS Vein Pressure Converter, HKS Programmed Fuel Computer etc.).
8. If the vehicle has a fuel cut defense system such as the HKS FCD, make certain that you do not excessively raise boost pressure, as this will lead to engine and/or turbocharger damage. HKS will not warranty any damage caused by excessive boost levels.
9. Make sure you have a proper fuel management system that can handle higher boost levels than OEM (stock) levels. HKS will not warranty damage caused by improper fuel management (Lean air/fuel ratios).
10. The EVC EZ cannot control boost pressure above the maximum efficiency point of the turbocharger. Boost pressure drop at high RPM may not be totally eliminated. The EVC EZ will not be able to compensate for pressure loss due to turbocharger sizing. Boost creep or boost spikes due to inadequate wastegate flow capacity, lean air/fuel ratio, poor compressor bypass design or excessive backpressure may not be fully alleviated.
11. Increasing the boost pressure will also increase the intake air temperature. If the intake air temperature exceeds 220 degrees Fahrenheit (100 deg. Celsius), performance increases may be minimal and detonation may occur.
12. For best performance and to safeguard against detonation, always use the highest octane gasoline available (92-octane minimum).
13. Mount the EVC EZ control unit and harness away from high power two-way radios, mobile phones and their respective antenna cables to prevent malfunction of the EVC EZ unit.

CONTROL UNIT DIAGRAM



INSTALLATION

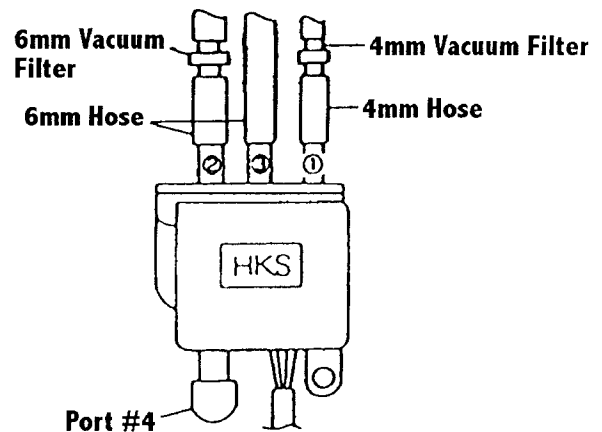
1. Disconnect the negative battery cable from the battery.
2. EVC stepping motor installation
 - A) Determine an ideal mounting location for the stepping motor.
 - Do not install the stepping motor close to the exhaust manifold or any area of high temperature.
 - Do not install the unit where it will be exposed to water or excessive moisture.
 - Ports 1, 2 and 3 must face upward with port number 4 facing downward.
 - Lengths on all hoses must be kept as short as possible.
 - B) Mount the stepping motor to the chassis using the M6 bolt, washer and nut or M6 self-tapping screw supplied with this kit.

3. EVC hose connections

USER NOTES: Vacuum filter installation

- Install the vacuum filters per diagram to the right. Make sure filters are within 10cm length from stepping motor.
 - Inspect the vacuum filters every 3000 miles.
 - Filters must be clean to be able to function properly.
 - If filter is contaminated or dirty, replace with a new one.
 - Do not attempt to clean the filter.
 - The EVC EZ cannot function properly with contaminated filters. Engine damage may occur.
 - If filters frequently need replacement due to contamination, (dirt, oil, water) relocate pressure source.
4. Connect the red wire (2-pin harness) from the EVC to a 12 volt ignition source. Utilizing a volt meter, find a wire that receives at least 12 volts with the key in the "IGNITION" position.
 5. Connect the black wire (2-pin harness) from the EVC to a chassis ground. Make sure there is no paint or rust on the ground surface. If there is, sand the surface until bare metal is exposed.

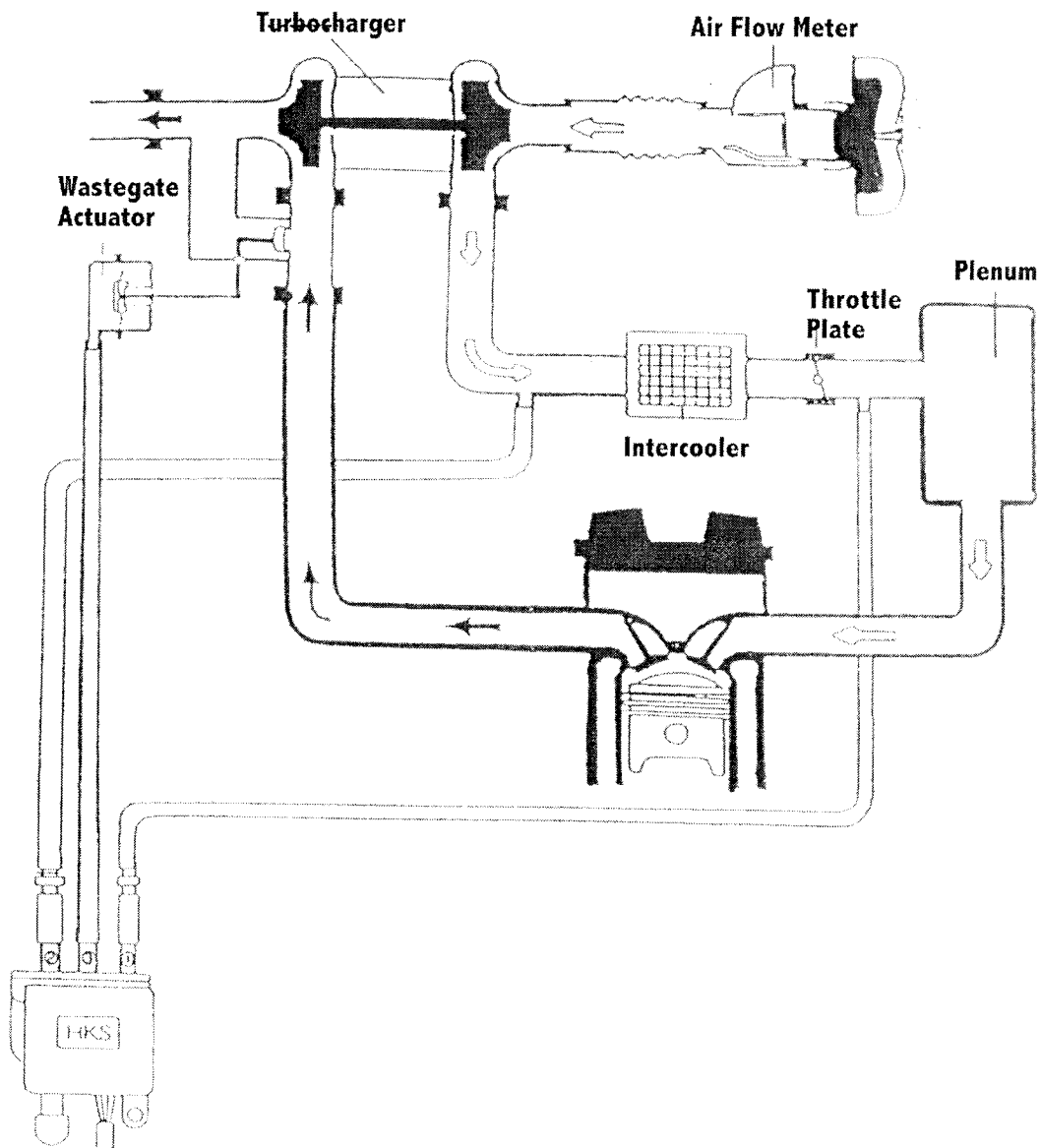
Stepping Motor



- **DETERMINE IF THE VEHICLE IS EQUIPPED WITH AN INTERNAL WASTEGATE (SINGLE PORT ACTUATOR) OR EXTERNAL WASTEGATE (DUAL PORT ACTUATOR), THEN PROCEED TO THE PROPER SECTION.**

INTERNAL WASTEGATE (SINGLE PORT ACTUATOR) INSTALLATION

- Port 1: Connect to an uninterrupted intake manifold pressure source after the throttle body such as a compressor bypass signal line using the 4mm hose.
- Do not connect port #1 to the line that operates the fuel pressure regulator unless the supplemental instructions specifically direct you to do so.
 - The hose should be as short as possible and should not exceed 1 meter (3ft. 4in.).
 - Install the 4mm vacuum filter within 10cm (3.9in.) of port #1 fitting.
- Port 2: Connect to a source of pressurized air such as a turbocharger compressor housing (discharge side) or compressor outlet pipe (before intercooler) using the 6mm hose.
- This hose should be as short as possible and must not exceed 1 meter (3ft. 4in.).
 - Install the 6mm vacuum filter within 10cm (3.9in.) of port #2 fitting.
- Port 3: Connect to the port on the wastegate actuator.
- This line should be as short as possible and should not exceed 1 meter (3ft. 4in.).



SETUP

NOTE:

With the vehicle's engine running and the EVC's power off, the EVC will illuminate green. In this position, the vehicle will only reach OEM (stock) boost pressure. With the EVC power button on, the unit will illuminate red and the dial arrow will light up green.

1. On the back of the EVC is a switch marked "SW< >PO". If you have a single port, swing valve or internal type wastegate, select "SW". If you have a dual port, poppet or external type wastegate, select "PO".
2. Start the engine and let it idle up to normal operating temperature. Verify that there are no vacuum leaks (high idle at normal operating temperature is one indication of a vacuum leak).
3. With the EVC power button off, drive the vehicle. While test driving the vehicle, bring it under full load (wide open throttle at 4000 rpm) and make sure that the boost pressure is at the same level it was before the EVC EZ was installed. If there is no boost pressure or the boost pressure is too high, refer to the troubleshooting section below.
4. To adjust the boost pressure, turn the volume knob completely counter-clockwise and turn the EVC power on. Slowly turn the volume knob clockwise to increase the boost. Adjust the boost in small increments and drive the vehicle under maximum load (wide open throttle at 4000 rpm) while noting the maximum boost pressure. Adjust until the desired safe boost pressure is achieved (refer to user notes on page 1). **If at any time the engine knocks or pings, release the throttle immediately. Failure to do so may result in engine damage. Always adjust the boost below the point of detonation occurrence.**

NOTE: When the EVC is on and the knob is turned completely counter-clockwise, the vehicle will be running approximately .05kg/cm2 over the OEM (stock) boost level.

TROUBLESHOOTING

EVC Control Unit Will Not Illuminate:

- Power Connection- There must be a constant 12 volt power source under all conditions with the ignition "ON".
- Ground connection- In some cases, paint, rust, or a loose bolt will cause a bad ground.
- Electronic Splice Connector- Visually from the outside, wire connections may look good. In some cases, the wires are not making contact inside the connector. Check both wires at the connector with a voltmeter to ensure continuity.

EVC Will Not Control Boost:

- Make sure the SW< >PO switch on the back of the unit is in the correct position.
- Check the hose connections to ports 2 & 3 of the EVC stepping motor. EVC III, IV and EZ stepping motors differ from EVC I & II stepping motors (see installation diagrams).
- Check for continuity at each wire of the 8-pin harness for possible breaks in a wire. If the pins on the main harness were disconnected while running it through the firewall, make sure that the wire colors match the EVC control unit plug.

Vehicle Is Not Building Enough Boost (Underboosting):

- Make sure the stock boost solenoid is disconnected.
- The vacuum filters (4&6mm) may be clogged or dirty.

Vehicle Is Building Too Much Boost (Overboosting):

- Verify that there are no leaks in the hoses, and that all connections are tight. Check for hose damage such as pinholes or tears.
- Make sure the vacuum filters (4 & 6mm) are not cracked.
- Wastegate valve diameter may be too small or actuator may be too weak.
- Turbocharger capacity may be too small (In this case, the boost curve will drop off during high rpm compared to the factory boost curve).

PARTS LIST

| QUANTITY | DESCRIPTION | COMMENTS |
|----------|-------------------|-----------------------------|
| 1 | Head Unit | |
| 1 | Stepping Motor | |
| 1 | Harness | Head Unit to Stepping Motor |
| 1 | Harness | Power and Ground |
| 1 | Hose | 4mm |
| 1 | Hose | 6mm |
| 1 | Tee Fitting | 4x4x4mm |
| 1 | Air Filter | 4mm |
| 1 | Air Filter | 6mm |
| 2 | Spring Clamp | 6mm |
| 1 | Splice Connector | |
| 1 | Double-Sided Tape | |
| 1 | M6 Hardware Set | |
| 5 | Tie Wrap | L=100mm |
| 3 | Tie Wrap | L=200mm |

EXTERNAL WASTEGATE / DUAL PORT ACTUATOR INSTALLATION

Port 1: Connect to an uninterrupted intake manifold source after the throttle body such as a compressor bypass signal line using the 4mm hose.

- Do not connect port #1 to the line that operates the fuel pressure regulator unless the supplemental instructions specifically instruct you to do so.
- The hose should be as short as possible and should not exceed 1 meter (3ft. 4in.).
- Install the 4mm vacuum filter within 10cm (3.9in.) of port #1 fitting.

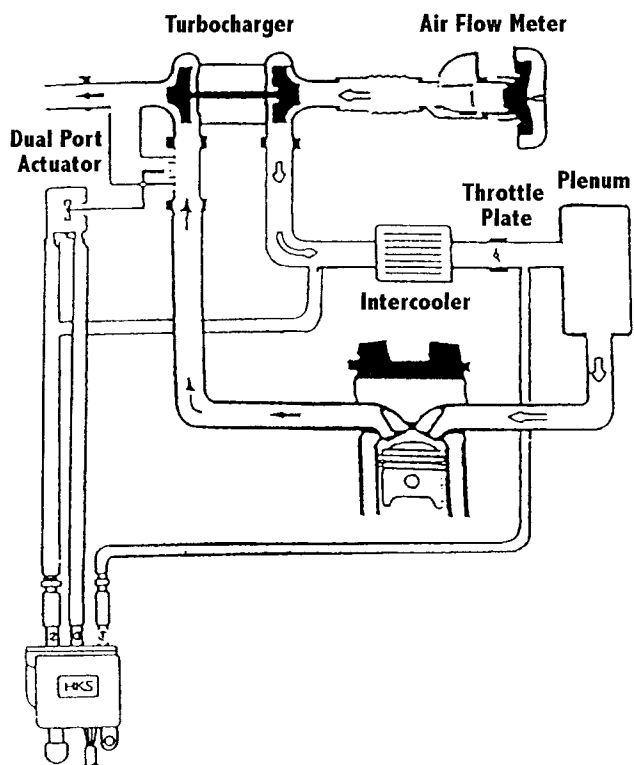
Port 2: Connect to a source of pressurized air such as the turbocharger compressor housing (discharge side) or compressor outlet pipe (before intercooler) using the 6mm hose. Use the T-fitting supplied with this kit to connect a pressure line to the secondary port on the wastegate actuator.

- Both lines should be as short as possible and must not exceed 1 meter (3ft. 4in.).
- Install the 6mm vacuum filter within 10cm (3.9in.) of port #2 with short side facing valve body.

Port 3: Connect to the port on the wastegate actuator.

- This line should be as short as possible and should not exceed 1 meter (3ft. 4in.).

Dual Port Actuator



External Wastegate

