

Product Name: BOV Smart SP Supersonic 2015+ 2.7/3.5 F150/Raptor Ecoboost
 Product Description: 2015+ 2.7/3.5L Ford Ecoboost OEM replacement BOV
 Product Number: TS-0215-1371



IMPORTANT NOTES:

- Please thoroughly read and understand these instructions before commencing this installation.
- The thread on the cap for the vacuum source is AN#3. The standard swivel nipple can be changed to an AN#3 fitting if desired.
- Make sure that the engine is cold before installing this product.
- After fitting this product there may be an audible ticking noise emitting from the EVAP circuit lines, this is normal as the sound is no longer damped and not a cause for concern.

RECOMMENDATIONS

- **Turbosmart recommends that your Blow off valve (BOV) is fitted by an appropriately qualified technician**
- **Turbosmart recommends that a boost gauge be permanently fitted to the vehicle.**



KIT CONTENTS

Please check that the following items have been provided in your EM Series BOV packaging

Quantity	Description	Use
1	Model specific BOV	Replaces standard electronic bypass valve including V-band clamp
1	39.00 X 2.00 O-Ring	Sealing O-Ring (Intercooler adapter-BOV side)
1	32.92 X 3.53 O-Ring	Sealing O-Ring (Intercooler adapter-intercooler side)
1	12.00 X 2.00 O-Ring	Sealing O-Ring (MAP adapter)
1	Electronic plug	Blanking off OEM electronic by pass valve wiring loom
2	5mm Black vacuum hose	Connects BOV to pressure/vacuum source
14"	6.3mmID Reinforced hose	Connect Boost reference adapter to check valve
1	1/16th NPT Blank	Port blank for boost reference adapter
2	1/16th NPT nipples	Provides BOV and other devices such as boost gauges with vacuum/pressure source
1	F150 BOV adapter L Bracket	Bracket to mount BOV onto intercooler
1	Hose blank	Blanking plug for OEM plumb back hose
1	Boost reference adapter	Adapter between MAP sensor and manifold for boost/vacuum source.
1	M6x8 button head bolt	Bolt to hold L bracket onto intercooler adapter
1	M6x16 socket head bolt	Bolt to hold L bracket onto intercooler
1	M6 nut	Nut
2	M6 spring washers	M6 spring washers to use with M6 bolts
1	M5x20 button head bolt	Secures OEM MAP sensor on MAP adapter
2	6mm spring clamps	Secures pressure lines
2	250mm cable ties	Fixing pressure lines in position
2	100mm cable ties	Fixing pressure lines in position

HOW TO INSTALL YOUR BOV

1 Identify Diverter Valve Location



On the 13th Generation Ford F Series Truck (P552) the diverter valve is located on the intercooler on the twin turbo model. This is located at the front of the car in the lower grill portion. It is accessible from the bottom of the car.

2 Removing the Undertray

Remove the under-tray of the vehicle by removing all the plastic clips holding the tray in place. Once the under-tray is removed, the intercooler assembly can be accessed.



3 Removing Intercooler

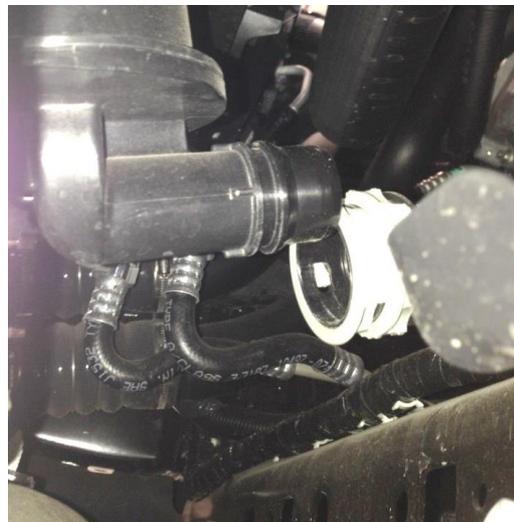
Unplug the OEM BOV plug. It will be held to the car with electrical tape. The intercooler piping will also need to be removed. There are 4 hose clamps on one side and one on another. This is the easiest way to remove them, as the pipe that is fastened together with a locating clip can be hard to separate in the car.

Undo the bolts securing the bracket to the cross member from the vehicle as well as the intercooler.



4 Removing BOV Chamber from Plumb back Hose

Unplug the BOV chamber from the OEM plumb back hose. Install the supplied plumb back hose blanking plug by pressing it into the plumb back hose plug. Please note that the blanking plug will only fit the plumb back hose in one way.



5 Remove the Diverter Valve from Intercooler.

Once the intercooler assembly is removed from the vehicle, the OEM BOV can be upgraded. Remove the OEM BOV by undoing the two bolts holding it onto the BOV chamber. Some models will have a mount on the canister as well.



6 Removing EVAP Hose from the intake

After Removing the engine cover, locate the OEM evap hose connecting the intake manifold to the check valve. Unclip the quick connect hose fitting by first pressing on the locking tab all the way.



7 Remove EVAP hose from check valve.

Carefully cut along the other end of the hose to free it from the check valve nipple. Being careful to not damage the barb underneath.



8 Fitting Boost Reference Adaptor

Using thread sealant, fit two supplied 1/16npt nipples to the boost reference adaptor, and fit blank into the third optional port.

Push the assembled reference adapter onto the intake manifold where the fitting was disconnected earlier, ensure the adapter is on all the way and fit retaining clip to secure boost reference adapter. **(Ensure O-Rings are not kinked or damaged during installation)**



9 Fitting up replacement Evap Hose

Lay out the supplied reinforced 6.3mm ID hose between the newly fitted boost reference adapter and the check valve and cut to length.

Using a hose clamp secure one end of the hose to the boost reference adapter and the other end to the check valve. Route the supplied vacuum hose from the nipple towards the front right-hand side of the vehicle (OEM BOV location). Use one of the supplied spring clamps to secure the vacuum hose onto the nipple.

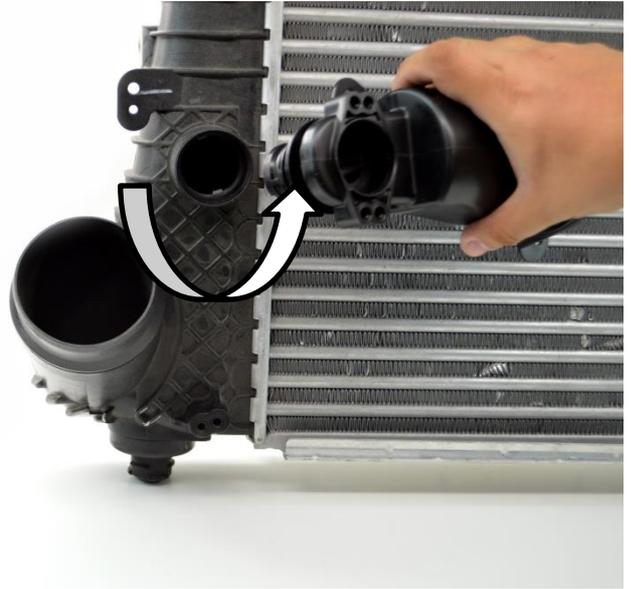


10 Removing BOV chamber from Intercooler

With the intercooler removed from the vehicle, the OEM BOV can be upgraded. Remove the OEM BOV by undoing the two bolts holding it onto the BOV chamber.



Remove the BOV chamber by turning it upwards. The BOV chamber should just unscrew.



11 Fitting up F150 BOV adaptor

Fit your new Turbosmart Blow off valve to the supplied intercooler adapter. Ensure that the O-ring (39.00x2.00) is installed on the adapter. Loosely tighten the V-Band clamp to allow the BOV to be rotated into the desired orientation.



12 Fastening Bov intercooler bracket

Install the supplied bracket on the BOV adapter. Use the supplied M6x8 Note.



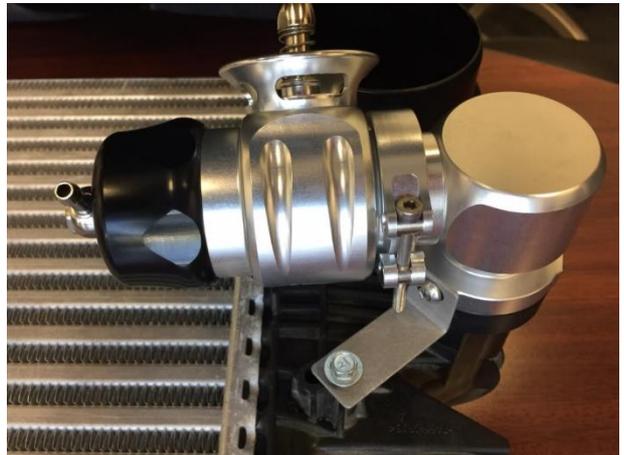
13 Fitting BOV to Intercooler

Screw the supplied intercooler adapter in place until it reaches home. Ensure that the O-ring (32.92x3.53) is installed on the adapter.



14 Fastening Bov to Intercooler

Using the OEM screw, secure the L-bracket onto the intercooler. **Do not over tighten.**



15 Final Fitment before reinstallation

Orientate the BOV into position and tighten V-Band clamp. The finished intercooler assembly should look as shown below. Please ensure that all fasteners are secured prior to reinstalling the intercooler.



BOV Harness

15

Prior to re-installing the intercooler back onto the vehicle. The OEM BOV plug needs to be blanked off. Depending on the purchased kit, you may receive either a direct plug-in plug option or a plug utilising scotch lock connector. The direct plug-in blanking plug fits only one way. After blanking off the OEM BOV plug, secure it by using the supplied cable ties.

If the blanking plug has scotch lock connectors as shown in the picture below, Strip back 15mm of mesh covering the wires of the OEM solenoid plug. Clip a scotch lock connector onto each wire, polarity not important. Secure the scotch locks with a pair of pliers ensures that both halves are pressed together.



The scotch locks should look flat when installed correctly. Scotch locks are removable if the factory BOV is to be re-installed. Secure plug by using the supplied cable ties.

16 Reinstallation of Intercooler

The intercooler can now be held up onto the car while the bracket is attached with its fasteners back onto the car. This is much easier with a second set of hands.

With the intercooler fitted the intercooler pipes that were removed will need to be reattached to the car.



17 Routing the vacuum hose

Install the vacuum hose (routed from the MAP adapter) down onto the nipple. Secure the vacuum hose with one of the hose clamps supplied on both ends.

18 Installing the Undertray

Refit the under-tray of the vehicle by tightening all the plastic clips holding the tray in place.



Finally Start your vehicle and enjoy your new Turbosmart BOV.

ADJUSTING YOUR BOV

Traditionally every BOV needs to be adjusted to suit the vehicle it is being mounted on. The new SP Dual Port BOV technology eliminates the need to adjust the BOV after installation.

ANNUAL MAINTENANCE

Turbosmart recommends that the following maintenance procedure is carried out annually.

Regular maintenance will ensure that your BOV is operating at its peak performance and will extend the working life of the product.

- Remove the cap of the BOV by rotating in an anti-clockwise direction – CAUTION, the cap is under spring force, remove with care!
- Carefully remove the piston and thoroughly clean the piston and the bore of the BOV
- Inspect the surface of the piston and the bore of the BOV for scoring or excessive wear, silver coloured marks on the bore are an indication of excessive wear
- Check the Base O-ring and the Cap O-ring for any damage – replace if necessary
- Lubricate the bore and the piston with Uni-Glide™, hydraulic oil or sewing machine oil – DO NOT use grease or viscous oils
- Re-assemble the BOV in the reverse order

TROUBLE SHOOTING

The following points should be checked if you find that your engine is dipping below normal idle, stalling or if the BOV is functioning poorly. Please note: the following checks will cure 99% of problems experienced with a BOV.

- Check the vacuum hose for splits, cracks, loose connection, kinking or any obstruction – old or fatigued hose may collapse under vacuum causing an obstruction.
- With the engine running remove the vacuum / boost hose from the nipple in the cap of the BOV, there should a loud hissing sound. The engine should idle poorly, double check by covering the end of the hose with your finger – otherwise the hose is blocked.
- Check to see if the BOV is blocked or contaminated with dirt or debris.
- Ensure that the vacuum / boost source is not shared and that the vacuum source is directly from the inlet manifold.
- Check the seal between the compressor cover flange and the BOV. Make sure the supplied O-Rings are installed properly and the BOV Flange is secured on the compressor cover flange with the 3 supplied screws.
- Ensure the spring clamps are secured on silicon hoses and fittings.
- If the valve does not open properly or is slow to react, it could be due to the mapping of the drive by wire system from such things as aftermarket chips and engine tunes. Check with the tuner that the mapping of the throttle is the same as OEM.
- The valve may not open if the engine is just free revved. This is due to the drive by wire system. Check that the valve operates by driving the vehicle.

