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SX-E TURBO KIT

2003-2007 5.9L CUMMINS

INSTALLATION INSTRUCTIONS

TROUBLESHOOTING:

Please read and understand all installation instructions before proceeding with the installation. If you have questions during the installation of this product, please email H&S Motorsports support at tech@hs-motorsports.com or call (855) 623-4450.

Included parts:

- 1 - BorgWarner SX-E Turbocharger
- 1 - SX-E 90-Degree Compressor Outlet Elbow
- 1 - HSM Cast Exhaust Manifold
- 1 - HSM Downpipe
- 1 - HSM Charge Pipe
- 1 - HSM Intake Pipe and Air Filter
- 1 - Hardware, Clamps, Fittings, Gaskets, etc.

Note: This kit will not work with the factory EGR system installed. Aftermarket engine tuning may be required to run this kit properly. Consult your tuning provider with any questions regarding engine tuning for this product.

STEP 1

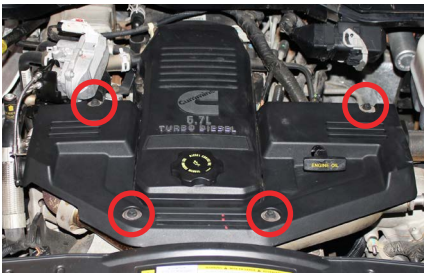


Disconnect the negative terminal from both batteries. Locate the coolant drain valve on the bottom of the radiator and drain the coolant system. Use a clean bucket so that the coolant may be re-used if it is in good condition.

STEP 2



Remove the four bolts holding the plastic engine cover and remove the plastic cover (can be re-installed later if desired). Spray all of the exhaust manifold hardware with penetrating oil as this will aide in removal later.



STEP 3



Disconnect all sensors from the factory air intake system and disconnect the factory breather hose from the valve cover. Remove the entire air intake assembly from the vehicle with the breather hose still attached to the intake.



STEP 4



Disconnect and remove the factory exhaust crossover tube and remove the exhaust valve from the intake horn. Take care not to drop anything inside the intake horn and if desired, stuff a rag inside the openings as an extra precaution.



STEP 5



Remove the clamps from the passenger side factory intercooler pipe and remove the pipe from the vehicle.



Note: The following steps may differ slightly depending on vehicle year. Please use your best judgement when performing these steps and consult a professional if you are unsure at any point.

STEP 6



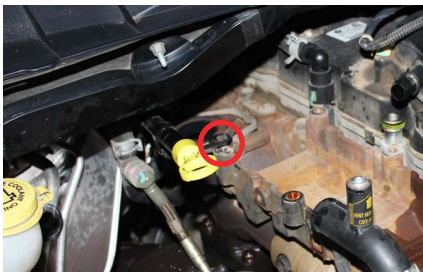
Remove all of the exhaust cooler components from the top of the factory exhaust manifold. It is easiest to remove the system in several separate pieces. During removal, keep in mind that some of the components may still contain coolant, so expect some spillage to occur.



STEP 7



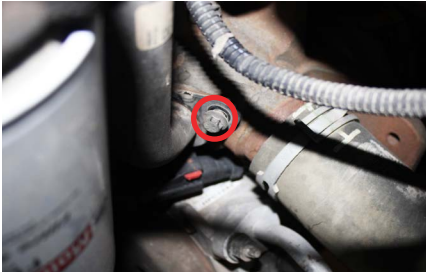
Disconnect the exhaust back-pressure tube from both the exhaust manifold and the sensor block and remove the tube. Remove the nuts holding the heat shield on the front of the exhaust manifold and remove the heat shield. Remove the bolt holding the transmission dipstick to the exhaust manifold.



STEP 8



Remove the lower bolt holding the vertical coolant tube to the thermostat housing. Carefully wiggle the tube while pulling it out of the thermostat housing.



STEP 9



Disconnect the factory VGT connectors. Disconnect the oil feed and top coolant feed line from the factory VGT. Disconnect the lower coolant line from the engine block. Using a pry bar or screwdriver, remove the locks from the exhaust manifold bolts and discard.



STEP 10



Remove the bolts holding the coolant pipe underneath the exhaust manifold. Locate the bolt holding the coolant pipe support that runs across the back of the engine to the transmission cooler on the driver side bell-housing area. Remove the bolt so the coolant pipe has enough movement for the coolant pipe mounting bracket to be disconnected from the rear exhaust manifold stud.

STEP 11



Remove the factory exhaust band clamp from the back side of the of the factory VGT. Spray penetrating oil down around the bottom of the factory VGT oil drain to aid in removal. Remove all of the factory exhaust manifold bolts and ensure that no wiring or coolant lines are still connected to the turbocharger or exhaust manifold. With the help of another person, remove the factory exhaust manifold/turbocharger assembly from the vehicle.

STEP 12



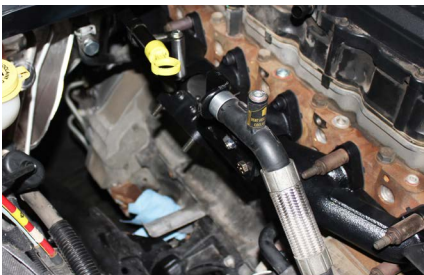
If the upper VGT coolant feed line is still in the vehicle, remove it at this time. Install the supplied o-ring gaskets and 12mm plugs into the previous VGT coolant line locations on the rear heater pipe and engine block. Tighten the plugs to 20 ft-lbs. Remove the coolant fitting from the top of the cylinder head and install the supplied 1/2" pipe plug.



STEP 13



Locate the supplied HSM exhaust manifold, gaskets, and two allen-head bolts. The allen-head bolts will be installed in the two top center bolt locations where the factory bolts will not fit. Clean the previously removed factory exhaust manifold bolts and install the HSM exhaust manifold onto the engine. Torque all exhaust manifold bolts to 35 ft-lbs.



STEP 14



Remove the factory oil feed fitting from the oil filter housing. Locate the supplied ORB to -4AN fitting. Place a dab of grease on the supplied fitting o-ring and install into the oil filter housing where the factory fitting was removed. Torque the fitting to 20 ft-lbs. Loosen the battery cable on the solenoid located near the passenger side battery and re-clock the solenoid assembly as shown for intake clearance. Resecure the battery cable after the proper adjustment has been made.



STEP 15



Using the factory hardware, reinstall the factory coolant pipes that were removed in Steps 8 and 10. HSM has provided a plate for the factory intake horn along with a plug and bracket for the 2009+ vehicles. If you need to use these parts, see pictures below for installation examples. Locate the HSM dipstick tube spacer and 1/4" hardware. Install the spacer as shown on the bracket located on the top of the exhaust manifold and torque the hardware to 20 ft-lbs.



STEP 16



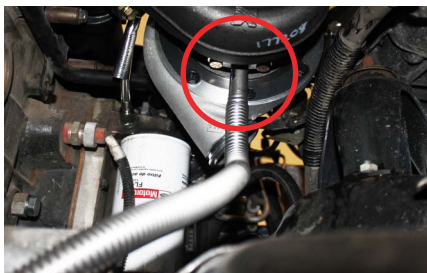
Locate the supplied 3/8" double-sided studs and install them into the threaded holes on the T4 mounting flange on the HSM exhaust manifold. Slide the supplied T4 gasket onto the previously installed studs and using the supplied 3/8" nuts, install the supplied SX-E turbocharger onto the HSM exhaust manifold. Torque the nuts to 35 ft-lbs.

Note: *The exhaust housing and center section of the supplied turbocharger should arrive pre-clocked in the correct position but the compressor housing may require some additional adjustment to achieve optimal positioning. To do this, carefully loosen the center section-to-compressor housing bolts and clock the housing in the correct position. After the correct orientation is achieved, retorque the bolts to 25 ft-lbs. DO NOT OVER-TIGHTEN!*

STEP 17



Locate the supplied HSM oil feed line. Ensure that the line is clean and clear of any debris before installing the line from the top of the turbocharger to the fitting previously installed on the oil filter housing as shown. Locate the supplied oil drain tube, gasket, and (2) 3/8" x 3/4" bolts. Place a small amount of grease on the oil drain tube o-rings before pressing the oil drain into the factory oil drain location on the engine block. Take extra care to not pinch or damage the o-rings in the process and ensure that the oil drain is fully seated in the engine block. The oil drain tube is flexible and must be bent into the correct position to the bottom side of the turbocharger. Using the supplied gasket and bolts, install the oil drain tube to the bottom of the turbocharger center section and torque the bolts to 20 ft-lbs.



STEP 18



Install the supplied 90-degree compressor outlet elbow and clamp onto the compressor housing as shown with the elbow slightly rotated towards the passenger side headlight. Once the proper alignment is achieved, tighten the clamp.

Note: *On some models, it may be required to slightly bend one of the aluminum A/C lines to achieve proper alignment of the elbow.*



STEP 19



Using the supplied 3" hump boot, 3" x 2.75" straight boot, and t-bolt clamps, install the supplied intercooler pipe between the compressor outlet and the factory intercooler.

Note: *The factory t-bolt clamp that was removed from the intercooler side of the factory pipe can be re-used in that location. Installation of piping and boots can be made much easier by spraying the inside of the boots with some glass cleaner. Start with the turbo side first and work your way to the intercooler side.*

STEP 20



Using the supplied large v-band clamp, loosely install the supplied HSM downpipe onto the exhaust housing of the turbocharger. Using the supplied exhaust adapter and band clamps, adapt the downpipe to the rest of the vehicle exhaust system before tightening all clamps. Ensure that the exhaust system has proper clearance to avoid touching other components.



STEP 21



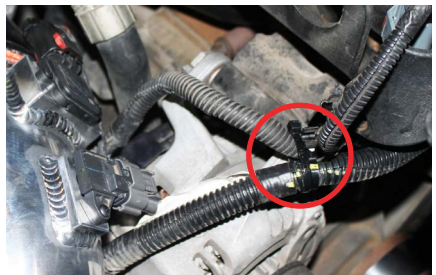
Remove the sensors from the factory air intake system and using the provided 6-32 button-head bolts, reinstall the sensors into the supplied HSM intake pipe. Tighten the bolts to 12 in-lbs.



STEP 22



Using the supplied 4" worm-gear clamps, install the supplied 20-degree 4" intake boot on the turbocharger compressor housing inlet and clock away from the engine as shown. Install the supplied HSM intake pipe and position the pipe so that it has proper clearance for surrounding components. Tighten the clamps after the proper orientation has been achieved. Reconnect the electrical connections to the sensors on the intake pipe and zip-tie the wiring as shown. Install the provided air filter onto the HSM intake pipe as shown while making sure that the filter will not rub on any other components.



STEP 23



Install the supplied 3/4" 90-degree elbow and small breather on the valve cover as shown.



STEP 24



Refill the cooling system and reconnect the vehicle batteries. Start the vehicle and verify that there are no leaks or other issues present. Bleed and top-off the cooling system as necessary before driving for any extended amount of time.

Enjoy your H&S Motorsports 5.9L Cummins SX-E Turbo Kit!



H & S Motorsports, LLC

4160 South River Road
St. George, UT 84790

WWW.HS-MOTORSPORTS.COM