TKOSROD1277K 5TH GEN VIPER RACING DIFFERENTIAL COOLER

INSTALLATION INSTRUCTIONS
TKOMOTORSPORTS.COM

Prior to any work being done, it is recommended to use collision tape or some other protective cover in area where work will be performed to minimize possibility of damage.

STEP 1. Remove all of the parts from the shipping box or crate and inspect for any damage during transport.

STEP 2. It is recommended that you have professional mechanic install this product. Incorrect installation will result in damage to your vehicle

STEP 3. Use of a 2-post or 4-post vehicle lift is highly recommended. If jack stands or any other type of secure lifting and stand devices are used, please use all safety procedures and consult manufactures safety and proper setup information prior to any work performed.

STEP 4. You will need to remove the rear bumper cover. Collision tape, green and/or blue masking is highly recommended on all body seam areas to reduce the risk of any damage to the paint or body panels prior to removal and reinstallation.

STEP 5. Removal of the rear bumper cover. You will need to first remove the rear trunk lid weather seal from the area around the rear trunk latch. The weather seal is a simple push on fit, simply pull it off. Now you can remove the rear trunk area carpeted vertical panel. This panel is held on with spring clips. Gently pull the panel and the clips should release. Disconnect the trunk light connectors and completely remove the carpeted panel from your Viper.

STEP 6. Remove all the rear taillight plastic wing nuts from both right and left sides. The farthest outboard plastic wing nuts are difficult to see, you may have to feel with your hand to remove. See Fig. 1. There are (4) plastic wings nuts per side holding in the rear taillight assemblies. See Fig. 1.

Fig. 1

STEP 7. Remove the plastic pop-in rivets from the top of the rear bumper cover. These plastic pop-in rivets are reusable so do not discard. See Fig. 2A. To remove, use a plastic interior tool to pop up the middle pin and then slide the plastic interior tool under the head of the rivet and gently pry with the tool. You can also see the trunk weather seal in Fig 2B. The weather strip seat just pops off easily by hand.

Fig. 2A

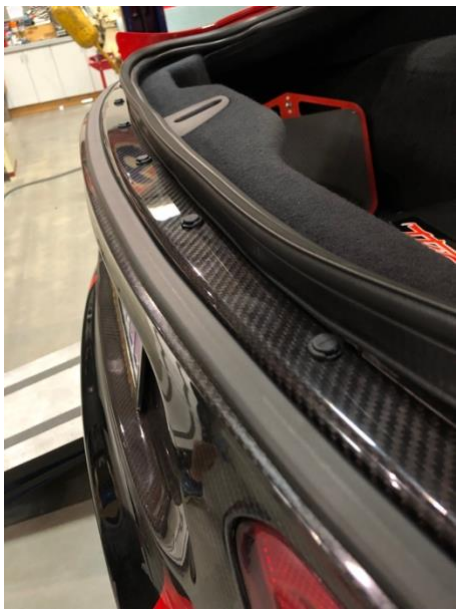

Fig. 2B

STEP 8. Rear inner fender well and belly pan fastener removal. You will need to remove the rear aluminum belly pan section under the rear differential. Fig. 3 shows the inner fender well fasteners. Fig. 4 shows the belly pan removed and the lower fasteners that will need to be removed. Some installers find it easier to completely remove the plastic inner fender well to gain access to the rear most bumper cover fasteners.

Fig. 3

Fig. 4

After removing the plastic fender well fasteners or, if you choose to, completely removing the plastic inner fender well, you will now gain access to the 2 per side rear bumper cover side fasteners. There is one fastener on both right and left sides that is closest to the wheel opening. This fastener is very easy to remove. The second fastener is aft of the wheel opening. This fastener is difficult to access and remove. Fig. 5 shows its approximate location on the outside of the rear bumper cover. This rear most bumper cover fastener is impossible to see, you will need to feel around to remove it. The rear most fastener should be a TORX T15 bolt but in some cases, it can be a 10mm hex head bolt.

Fig. 5

STEP 9. Now you can remove the rear bumper cover. It's recommended to have two people for the removal of the rear bumper cover and a large area with a moving blanket or a sheet on the ground where you can place the rear bumper cover when it's removed. The sides of the rear bumper cover have clip-in tracks. If you have removed both rear bumper cover inner side fasteners from both the left and right side, the bumper cover sides should be loose. Gently pull on the sides of the rear bumper cover and they should pop out. Now you can pull on the rear bumper cover from the middle area near where the trunk lid latch is located. Gently pop the rear bumper cover off just slightly. Then you can disconnect the license light plug located in the middle of the rear bumper cover just above the inner plastic impact bumper. Also, disconnect the rear manual trunk lid latch cable. Now the rear bumper cover should slide right off.

STEP 10. With the rear trunk tub exposed, you can now start the installation of your 5th Gen Racing Differential Cooler assembly. During installation it's easier to leave the oil pump off of the cooler mounting assembly. The differential cooler assembly is very straightforward and easy to install. The cooler mounting bracket is cut to fit the trunk tub and can only be installed in one position. The oil lines should be facing the passenger side. The oil pump mounting should be on the driver side. Make sure, before you drill any holes in the trunk tub, that there is enough clearance between the oil pump and the rear sway bar when the pump is mounted into position. See Figs. 6A-6B and 7A-7B (*Pictures show optional dry sump oil system and cooler along with no bind sway bar pillow blocks installed*).

Fig. 6A

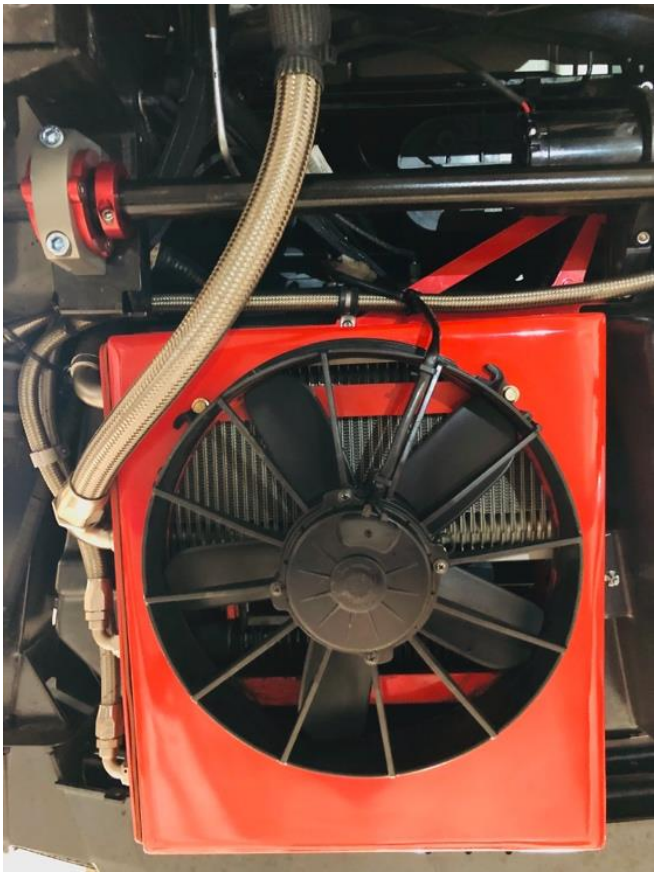

Fig. 6B

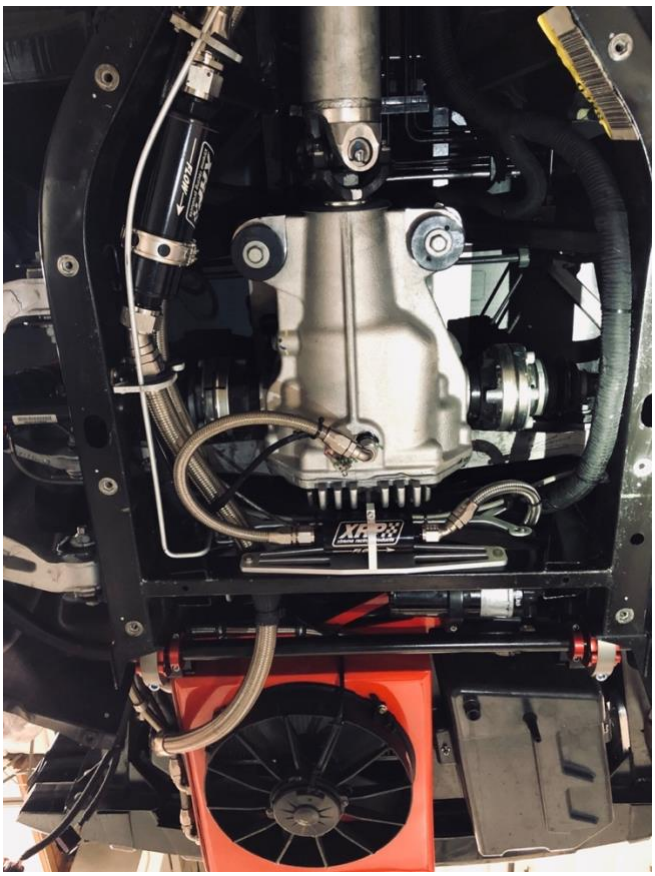

Fig. 7A

Fig. 7B

Prior to drilling any holes, it may be necessary to move any wires on the inside of the trunk tub out of the way, so you do not damage them while drilling the holes for the oil cooler mounting assembly.

STEP 11. Drilling the holes to mount the oil cooler mounting assembly. We suggest using masking tape on the bottom side of the truck tub where you will be drilling the holes to mount the oil cooler mounting assembly. Use the masking tape in the general area where the oil cooler mounting assembly studs will come in contact with the trunk tub. Now, position the oil cooler mounting assembly in the proper location and gently push up. The masking tape should show the imprint of the mounting studs which will give you a position to drill the mounting holes. Use a 21/64 drill bit to drill the mounting holes (for easier mounting, it is okay to use a 3/8 drill bit as needed).

STEP 12. Install the oil cooler mounting assembly. Two people are needed for an easier installation of the oil cooler mounting assembly. One person below, installing the oil cooler mounting assembly and the second person up top, installing washers and nuts and making sure the wires in the trunk tub clear all of the washers and nuts. Now you can install the oil pump on the mounting assembly and start connecting the lines. See Figs. 7A-7B for the oil pick up line routing. The oil pump can only be installed in one direction.

STEP 13. Drain the oil out of your differential. If you're unfamiliar with this operation, consult your Dodge Viper service manual. The bottom drain plug will now become the differential oil cooler pick up. In your hardware kit you will find a 3/8 NPT to -8 straight black AN fitting. The fitting will be ready to install with Teflon tape already on the fitting. This fitting simply screws into where you removed the differential drain plug. DO NOT OVER TIGHTEN THE NPT FITTINGS. Next, install the 3/8 NPT to -8 90º black AN fitting. This fitting will also be ready to install with the Teflon tape already installed onto the fitting. Install on the passenger side of the differential housing above the CV joint. There will be a plug you will need to remove for the installation. The 90º fitting should be facing towards the rear of the car and pointed up at approximately 45º angle. See Fig. 9 when correctly installed. DO NOT OVER TIGHTEN THE FITTING OR USE A SCREWDRIVER FOR THE INSTALLATION.

STEP 14. Installing the inline filter and the oil pickup lines to the oil pump. See Fig. 7 (**THE INLINE OIL FILTER ALREADY HAS A FILTER INSTALLED**). Install the lines as shown in Fig. 7. It may be necessary to rotate the oil pump to obtain a better line routing through the chassis bracing. See Fig. 8. With the lines installed, you can now position the inline filter on the lower chassis cross member below the differential as seen in Fig. 7. MAKE SURE THE INLINE FILTER DOES NOT COME IN CONTACT WITH THE DIFFERENATIAL HOUSING WHEN INSTALLED. Remove the mounting screws from the inline filter bracket and use masking tape on the lower chassis crossmember and a pencil to draw a position where the inline filter bracket will be mounted, make sure to mark out where the holes are also located (you *will need to remove the inline filter from the mounting bracket*). Using a 11/64 drill bit, drill through the lower chassis cross member on both sides. Remove the masking tape and install the inline filter mounting bracket and filter.

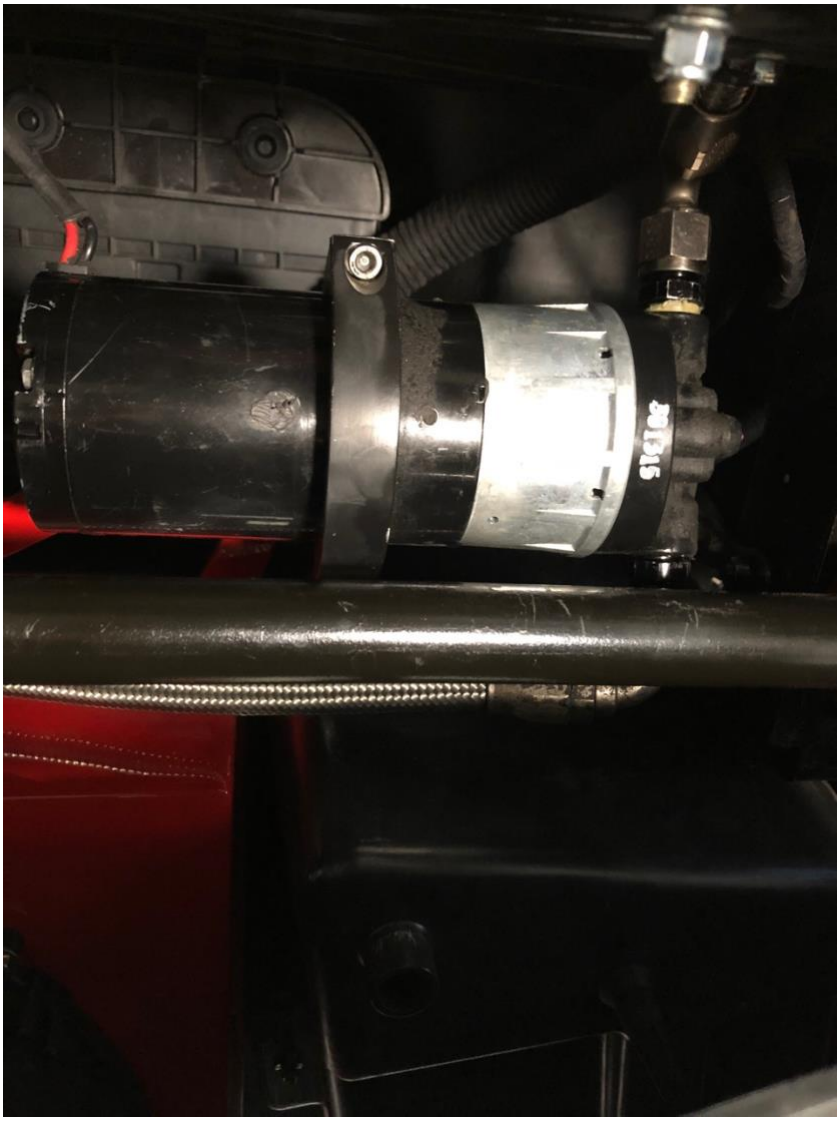

Fig. 8

STEP 15. Installing the return line from the oil cooler to the differential. 45-inch-long line -8 90º and -8 straight fittings on the hose. The 90º fitting installs onto the oil cooler forward fitting and will run to the 90º black fitting you installed on the differential above the cv joint. See Fig. 9. Make sure to route the line securely and take precautions to have it not rub on or come in contact with the electrical wiring harnesses. Use the black zip ties provided in your hardware kit to securely route the line.

Fig. 9

STEP 16. Installing the thermal switch and wiring. Figs. 10A-10B show the thermal switch installed into the bottom of the differential housing in the hole closer to the rear of the car and the differential housing cover. You will need to remove the factory plug to install the thermal switch. The thermal switch comes with the thread sealant already installed.

Fig. 10A

Fig. 10B

Figs. 11A-11B show the relay plate mounted just forward of the battery. The relay plate will mount directly onto the oil cooler mount plate assembly stud. The orange wires with the M6 copper lug will connect directly to your battery on the positive side. The brown wires with the M6 copper lug will connect to the negative side of the battery. You will need to install the 40-amp fuses that were supplied in your hardware kit into the fuse holders mounted on the relay plate once the installation is complete (**the fuse holders have orange wires coming out of them**). See Figs. 11A-11B.

Fig. 11A

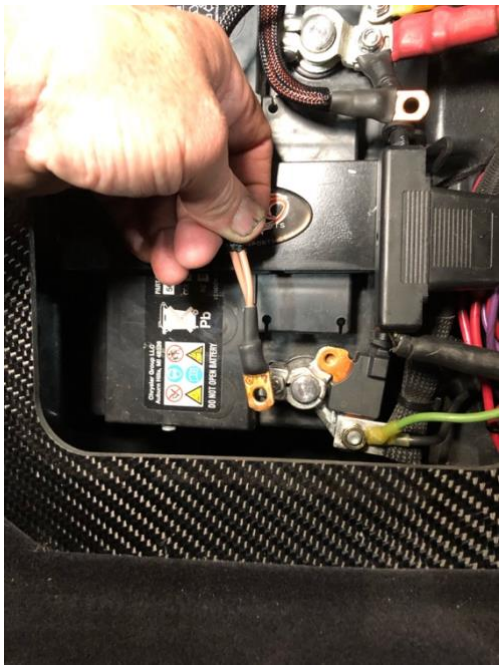

Fig. 11B

The red wires marked "pump 12v power" and "fan 12v power" can be routed directly through the main wiring harness wire boot in the trunk area and pop out just behind the differential. Route the wires as needed and keep the wires clear of any moving parts that could cause damage to the wiring harness. Connect the "pump 12v power" to the oil pump red wire connector. The black wire with the ring connector on the pump will go directly to the chassis ground. Connect the "fan 12v power" to the red wire on the fan. The fan wire with the ring connector will connect direct to the chassis ground.

Now, route the second set of wires coming off of the relay plate marked "C thermal switch" and "NO thermal switch" These wires can also route through the factory main harness wire boot. Route the wires out of the way of all moving parts. It's recommended to route these wires together with the oil pick up line you installed earlier since they will be going to the thermal switch, which is next to the oil pick line. Use the zip ties provided in your hardware kit to secure the wire harness to the oil line. Now, connect the wires to the thermal switch pink wire to the "NO" on the thermal switch and the red wire to the "C" on the thermal switch.

STEP 17. Dash override switch installation. The dash override switch allows you to turn on your differential cooler at any time. This is helpful when servicing your differential fluid and on longer or more technical races and track days that require more cooling. The Viper's driver compartment is very confined and almost every inch is used. We recommend mounting the override switch in the trim plate that surrounds the shifter. Mount the switch off to the passenger side behind the shifter, there is a small area to do this. You do not have to mount it in the trim plate around the shifter, this is simply a recommendation that allows easy mounting and driver access. The wiring harness provided is longer than needed to allow you to mount the override switch in the area you prefer. You will need a direct chassis ground for the override switch blinking red on light. The wiring harness for the override switch can simply run through the transmission tunnel back to the thermal switch on the differential. Use the zip ties provided to secure the wire harness. Connecting the override switch to the thermal switch is simple. The RED wire to the "C" on the thermal switch and the pink wire to the "NO" on the thermal switch.

STEP 18. Check that all of the oil fittings are tight and routed correctly. Make sure the oil cooler mounting assembly is securely mounted and all fasteners are torqued to the correct specifications. Check that all of the electrical connections are correct, and all grounds are clean and secure. Consult with your Viper owner's manual for the correct differential fluid and differential oil filling procedure. Once you have filled the differential until it starts to weep out of the fill hole, install the 40-amp fuses in the fuse holders on the relay plate. Your differential cooler is now functional. Use the dash override switch to test (5 -10 seconds) the function of the differential cooler pump and fan, as well as to fill the oil cooler and all of the lines. Now, you can add more differential fluid until the fluid starts weeping out of the fill hole again. The differential cooler, lines and pump hold approximately one extra quart of fluid.

OPERATING INFORMATION

1. Heavy track use cooler run times will be between 2-3 mins with the car at idle. Torque bias differential cooler run times are 3-6 minutes at idle, slightly less if vehicle is moving.

2. For street courses, technical tracks, hill climbs and long autocross courses it is recommended that you turn on your differential cooler and run it during your session or race. This will ensure lower oil temperatures and increase the service life of your differential.

3. The inline filter is good for the life of the vehicle, unless you have a differential failure. Replacement elements are available at www.tkomotorsports.com

4. The TKO Motorsports Differential Cooler was designed and engineered for continuous use in the most demanding endurance and sprint racing environments.