POLARIS RANGER DIESEL

TURBO KIT

Installation Guide

(6160100)
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24. Intake Adapter Hoses*
   *Cut Stock Intake Tube to produce these piece
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Legal in California only for racing vehicles which may never be used on the highway.
CUT TEMPLATE

POLARIS RANGER DIESEL - STOCK INTAKE TUBE

*NOTE - CUT STOCK INTAKE TUBE TO PRODUCE THESE PIECES

1

2

CUT

CUT
Polaris was inspired when they added a diesel-powered model to their line of Ranger UTV’s, and PPE was no less inspired when they engineered a complete turbocharger system for it. That’s right, for those Ranger owners, including the US military, who want the benefits of a diesel engine but want and need more power, PPE now offers their Polaris Diesel Turbo Kit. Adding the PPE Polaris Ranger Turbo Kit to the Ranger’s 904cc, 3-cylinder diesel engine will raise the horsepower rating by up to 9hp. That’s a 30+% increase over the stock Rangers 24hp output! At the heart of the PPE kit is a high-quality, water and oil-cooled Garrett GT1241 turbo that produces 8-10psi of power-giving pressure. The PPE Polaris Ranger Turbo Kit features 304 Stainless Steel, precision TIG-welded intake and exhaust tubes and all parts and instructions necessary for an easy install. The innovative PPE design retains the factory air box and muffler and has been fully dyno-tested for optimum reliability. As with all PPE products, you can depend on high-quality design and construction to get you to the fun and back again.

STEP 1

The first step in the installation process is to remove the bottom skid plate, drain the engine oil and coolant. Next you need to remove the stock exhaust and intake components. Note that the muffler, muffler mount and the muffler mounting bolts and locknuts will be reused.
STEP 2
To access the plunger adjustment screw, the “anti-tamper” cap covering it must be removed. This can be done using vice grips to squeeze the sleeve about 3/8-inches from the base and turn counterclockwise. This will allow the cap to be spun off. A cut-off wheel equipped die grinder can also be used to cut the sleeve, but care must be taken not to cut too deeply.

STEP 3
Once cap is unthreaded, the tamper device can be removed and plunger adjustment screw will be exposed.

STEP 4
Place a reference mark on the plunger adjustment screw (the flat end works well for this). A 17mm wrench is needed to loosen the jam nut at the base of adjustment screw. Next, use a 10mm wrench to turn screw out 1-1/4-turns from stock. Once that is done, tighten the jam nut back down to lock the plunger adjustment screw in place.
STEP 5
Reinstall cap back on and safety wire it into place.

STEP 6
The turbocharger support bracket (part# 4) is installed onto the engine and clutch mounting bolts.

SPECIAL NOTE:
The turbo mounting bracket installs on engine and clutch stock mounting bolts.
STEP 7
After applying Teflon tape to the threads on the 1/8-inch brass fittings, the fittings are installed into the crankcase breather adapter (part# 2) and the intake tube (part# 31 into part# 29). Note the direction that they are facing. They must point just like in the pictures to allow the breather hose (part# 1) to be routed correctly.

STEP 8
Remove the stock crankcase breather cap.

STEP 9
To ensure proper sealing, the inner and outer ring of the breather must be coated with RVT high-temp silicone or a high-temp gasket material. Allow material to become tacky before proceeding.
STEP 10
Install the breather adapter using the stock screws. Note the orientation of the installed unit.

STEP 11
Remove the brass water line fittings from the turbo housing and grind or file the threads down on the barrels, leaving the 4-5 threads at the tip. These threads will act as a stop for the hose clamp that will be used to affix the 3/8-inch hose (part# 14 and 15) to the fitting.

STEP 12
The turbocharger needs to be positioned or “clocked” correctly. To do so requires an 8mm wrench, a 10mm wrench and needle-nose pliers. Teflon tape and the socket wrench will be used on the modified water fitting. 9/16” socket.

STEP 13
The first step is to loosen the jam nut of the wastegate actuator rod.
STEP 14
Using a pair of needle nose pliers, carefully remove the C-clip holding the actuator rod onto the activation arm.

STEP 15
Loosen all bolts surrounding the turbo compression housing so that it can turn freely, but only remove the two holding the wastegate bracket onto the turbo housing.

STEP 16
Thread the clevis onto the wastegate rod as far as it can go.

STEP 17
Align turbo compression housing so that this mounting bolt is aligned with the edge of the flat section of the turbo housing. Tighten bolts so the housing can’t rotate any longer.
**STEP 18**
After making sure the activation rod is pointed straight, the mounting bracket for the wastegate assembly will now fit back onto the housing, but one hole over from where it was originally installed.

**STEP 19**
Fully tighten all of the housing bolts.

**STEP 20**
When installing the clevis end back onto the activation arm, make sure that there is tension on the arm. The clevis should slide back onto the arm and spring pressure should hold the wastegate valve closed. Note: some wastegates may need to have threaded rod shortened slightly for this to happen.

**STEP 21**
Apply Teflon tape to the threads of water line fittings and reinstall them into the turbocharger housing.
STEP 22

Apply Teflon tape to the threads of water line fittings and reinstall them into the turbocharger housing.

STEP 23

Install the oil feed/return fitting (part# 35) to the bottom of turbocharger housing using the supplied gasket and bolts. Clamp the wastegate with the wastegate cap. (Before installing the turbo you will need to prime it with oil through the small port on the bottom of the turbo itself. With oil primed in the turbo you will need to spin the blades to lubricate the bearing.)
STEP 24
Install the supplied muffler mount adapter (part# 30) plate onto rear cross member using the supplied hardware and then install the muffler.

STEP 25
Route axle breather hose so that it does not come in contact with muffler.

STEP 26
Using Teflon tape on threads, install the bleeder plug into the upper water line adapter (part# 20).

STEP 27
After cutting approximately a 1-inch section from the upper coolant hose, install the bleeder valve-equipped water line adapter (part# 20) into the upper coolant hose using the supplied hose clamps.

STEP 28
Install the non bleeder-valve equipped water line adaptor (part# 19) into the lower coolant hose, using the same cut-and-spike method as described above.
STEP 29

The oil feed line adapter fitting (part# 39) for the ¼-inch oil feed line (part# 37) to the turbocharger mounts between the stock oil pressure sensor and the block, thus requiring the removal of the sensor. After unplugging the lead wire, remove (unscrew) the oil pressure sensor from engine block.

SPECIAL NOTE: the sensor may be easier to access if the throttle cable bracket and dipstick have been removed.

STEP 30

The brass 45-degree fitting and brass “T” fitting (part# 39) are joined using Teflon tape to seal the threads. Note that the nipple has to be pointed upwards, away from the threaded end of the fitting.

STEP 31

Once the threads have been wrapped with Teflon tape, the oil feed line adapter is installed into the engine block. The oil feed line (part# 37) should be installed now as accessing the hose clamp later may be difficult. The oil pressure sensor is prepared with Teflon tape and threaded into the front of the “T” fitting. The lead wire is re-attached.

STEP 32

If not previously done, drain oil and remove oil pan, this is so no metal shavings get into the oil during the next step.
STEP 33
Remove oil pan. Drill out center hole using a 3/8-inch drill bit. **DO NOT drill hole with oil pan attached to the engine or metal shavings will contaminate oil.**

STEP 34
Prep oil return adapter (part# 31) with high temp RVT silicone or other high-temp gasket material. (Clean the surface of the metal to allow good adhesion of gasket material.) **Do not allow gasket material to block oil return hole.**

STEP 35
Install oil return adapter to engine block using supplied Allen head bolts.

STEP 36
Remove old sealant from oil pan and engine case. Prep surface of oil pan with RVT high temp silicone or other high-temp gasket material and install pan. (Clean the surface of the metal to allow good adhesion of gasket material.)
STEP 37
Mount turbocharger (part# 12) loosely into the turbo bracket.

STEP 38
Using supplied gaskets, connect bracket to exhaust manifold (part# 28) and manifold to turbocharger using M8 10.9 zinc-plated bolts. Torque bolts to 27ft. lbs.

STEP 39
Install one supplied short stud into the turbocharger flange.
STEP 40
Connect the 1/4-inch oil feed line (part# 37) coming from the oil pressure sensor adaptor to the lower fitting of the turbocharger. Connect the 3/8-inch oil return line (part# 38) from the upper fitting to oil return adapter mounted in block.

STEP 41
Connect the 3/8-inch water line hoses (part# 14 and 15) to the turbo from coolant line adapters. For safety’s sake, zip tie the water lines and oil line together making sure that they are away from potentially hot or moving parts.

STEP 42
Using the factory manifold clamp and triangle flange clamp supplied, install the upper turbo feed tube (part# 27) using the supplied M8 bolts (2). Hardware should be torqued to 27ft. lbs.

STEP 43
After modifying the manifold heat shield using the supplied cut template, reinstall heat shield.
STEP 44
After modifying the turbo tube heat shield using the supplied template, install the turbo heat shield using the stock 1/4-inch bolts and washers.

STEP 45
Connect muffler and exhaust tube (part# 28) using the stock springs.

STEP 46
For those utilizing the optional PPE EGT gauge, remove stock Allen head plug and install sending unit using anti-seize on threads.

STEP 47
Install lower tube that from air box to the turbocharger using supplied clamps (part# 5). Note that it bolts to dipstick mount (12mm wrench). Using supplied cut template for stock intake hose.
STEP 48
To install the upper turbocharger tubing, (part# 26) use the supplied PPE Silicone Hose.

STEP 49
Install upper tube using supplied clamps (part# 5). Connect breather hose to the fitting in the lower tube.

STEP 50
Replace engine oil with fresh oil. Turbo charged engines require clean particle free oil, particles in oil could cause turbo gasket failure. To break in a brand new turbo, change the oil before running your motor.

STEP 51
Loosen petcock on top of bleeder valve-equipped water line adapter. Start engine and fill radiator, with the engine running, until coolant comes out of breather screw in a steady stream. Close breather screw and top off radiator. After idling for 5 to 10 min, shut engine off and let the engine cool down. When the engine is cool, check coolant level and top off if necessary.

STEP 52
Zip tie all lines so they are not chaffing on metal or rubbing on hot surface. Zip tie battery cables away from turbocharger housing.
DISCLAIMER OF LIABILITY

This is a performance product which can be used with increased horsepower above and beyond factory specifications. Additional horsepower creates more stress on the drivetrain components, which could result in drivetrain failure. Note: Legal in California only for racing vehicles which may never be used on the highway.

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