

INSTALLATION INSTRUCTIONS

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June 2026
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SUBJECT: CHEETAH TURBOCHARGER FOR 2019-2024 6.7L CUMMINS

FITMENT: 2019-2024 RAM 2500/3500 with 6.7L Cummins

P/N: [FPE-351-1920](#)

ESTIMATED INSTALLATION TIME: 6 hours

KIT CONTENTS:

Item	Description	Qty
1	Turbocharger Assembly	1
2	Turbo Oil Drain Gasket	1
3	Coolant Line Sealing Washers	4
4	Exhaust Inlet Gasket	1
5	Mounting Studs	4
6	Mounting Nuts	4
7	CARB EO Label (Not pictured)	1



WARNINGS:

- For California customers: An E.O. identification label is required for Smog Check inspection. The E.O. identification label included with your turbocharger MUST be placed near the turbocharger in the engine compartment so that smog check technicians can verify the E.O. number.

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PROCEDURE:

STEP 1: Prior to installation of this product:

Review our [Installation Guidelines](#) located in the resources section of our website for turbocharger replacement general guidelines and a checklist.

To ensure your turbocharger performs at its best and to protect your warranty, please verify all steps on this checklist during installation.

NOTE: It is highly recommended to verify condition of the [oil feed line](#), [oil drain line](#), and [turbine shaft speed sensor](#) prior to starting this installation. This will allow for adjustments to be made prior to disassembly if needed.

CHEETAH® TURBOCHARGERS AND ACCESSORIES

P/N	INSTALLATION INSTRUCTION
ALL TURBOS	Turbocharger Installation Guidelines

STEP 2: Park the vehicle on an even and level surface. Disconnect Negative battery terminals.

Using a 10MM socket, remove each 10MM nut retaining the negative battery terminal on each battery. Isolate both terminals with a shop rag to prevent accidental arcing or sparks during service (Figure 1).



Figure 1: Negative battery terminal disconnected, isolated with a shop rag.

STEP 3: Remove the engine cover.

Using an 8MM socket, remove the four 8MM bolts that retain the engine cover. Lift the engine cover up and off the engine, then set the cover and hardware aside (*Figure 2*).

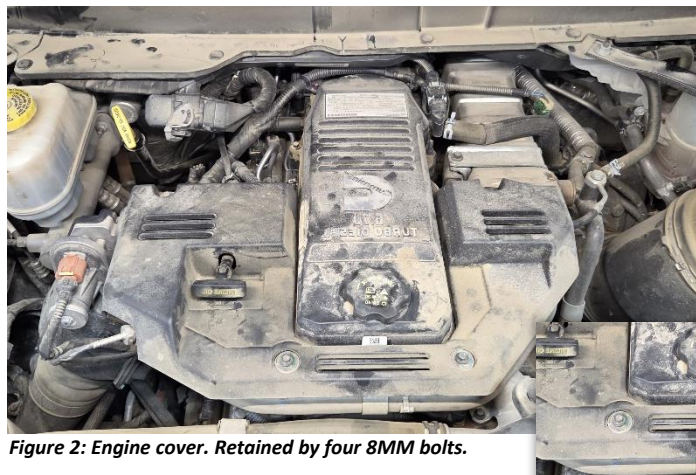


Figure 2: Engine cover. Retained by four 8MM bolts.

STEP 4: Remove the passenger side fender brace.

Using a 13MM socket, remove the two 13MM bolts retaining the fender brace (*Figure 3*), then set the brace and hardware aside.

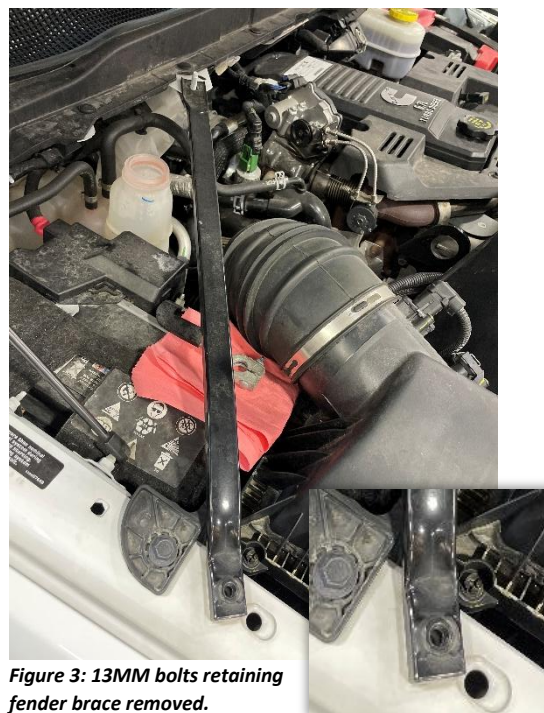


Figure 3: 13MM bolts retaining fender brace removed.

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STEP 5: Remove the air filter housing.

Starting with the intake tube, loosen the clamps that retain each side of the tube. Using an 8MM socket, loosen each clamp, then remove the intake tube from the air filter housing and turbocharger. Once the tube has been fully removed, set it aside (*Figure 4A*).

Disconnect the barometric pressure sensor, which is the sensor closest to the front of the vehicle, by pressing the push tab down, and pulling the connector downward. Disconnect the MAF sensor, the sensor closest to the rear of the airbox, by pressing the push tab down, and pushing the connector backwards toward the firewall (*Figure 4B*).

Remove the plastic air inlet tube to the right side of the engine air filter housing by squeezing the top and bottom of the tube towards one another, then push the tube in the same direction as the airbox (*Figure 5*).

Following the removal of this tube, pull the airbox assembly upward to remove from the engine bay. Check to see if the mounting bracket for the engine air filter housing still has the rubber boot on it. Remove the boot and put back into the air filter housing for easier installation (*Figure 6*).

At this time, clean all air intake components and install a new air filter into the air filter housing. This will protect your new turbocharger from ingesting foreign debris. This type of damage is not a warrantable issue.



Figure 4A: Air intake tube before removal.



Figure 4B: Barometric pressure sensor and MAF sensor disconnected.



Figure 5: plastic air inlet tube to the right of the air filter housing.



Figure 6: Mounting location for air filter housing.

STEP 6: Remove the passenger side fender liner.

Using an 8MM socket, remove the eight 8MM bolts retaining the fender liner (*Figure 7A*).



Figure 7A: Bolt locations on fender liner.

In addition to the 8MM bolts, there are three pushpins located toward the center of the liner. Remove these with a clip puller. For organization, group the liner and all fasteners together and set them aside (*Figure 7B*).



Figure 7B: Push Pin locations circled.

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STEP 7: Remove the passenger side battery.

Remove the black plastic cover from the positive terminal and set it aside (*Figure 8*).

Remove each cable attached to the positive terminal cluster (*Figure 9*). Place a shop rag over the top of each post on positive terminal cluster and allow each cable to lay on top of rag.

Using a 10MM socket or wrench, loosen the 10MM nut retaining the positive battery terminal. Then, with a 13MM socket or wrench, remove the nut retaining the battery crossover cable (Rearmost). Set the nut aside and allow the cable to lay on top of the shop towel.

Using a 10MM socket or wrench, remove the 10MM nut retaining alternator cable (centermost cable). Set the nut aside then lift the cable up and off the terminal cluster. Allow for the cable to lay on top of the shop towel.

Remove the 10MM nut retaining the grid heater power supply line with 10MM socket. Set the nut aside then lift the cable up and off the terminal cluster. Allow for the cable to lay on top of the shop towel.

Lift each cable out of the way then pull the positive terminal cluster up and away from the battery. Install each nut removed from the terminal cluster back into its original spot to keep everything together then set aside (*Figure 10*).

With a 10MM socket, remove bolt retaining battery hold down then set both the hold down and bolt aside (*Figure 11*). Use caution during this step, this bolt is frequently dropped.

Once the hold down is removed, lift the battery up and out of the vehicle, then set aside.



Figure 8: Plastic terminal cover.



Figure 9: Removal of each auxiliary cable from the positive terminal.



Figure 10: Positive terminal cluster removed.



Figure 11: Battery hold down and 10MM retaining bolt.

STEP 8: Remove the passenger side battery tray.

Starting at the wiring harness that borders the battery tray, remove all six fir tree fasteners with clip puller (*Figure 12*). Next, remove the grid heater relay. Using an 8MM socket loosen each 8MM bolt retaining the relay. Lift the relay up and off the retaining tray (*Figure 13*).

The grid heater power cable will still be connected to the relay. Set both the relay and power supply cable aside. For organization, reinstall the two 8MM bolts into battery tray (*Figure 14*).

Using a 13MM socket, remove each of the six 13MM bolts retaining the battery tray. Four of the six bolts are located on the top portion of the battery tray (*circled in Figure 14*). The remaining two are located on the underside of the tray (*circled in Figure 14*).

Once all six bolts have been removed, lift the battery up and pull the tray out of the engine bay (*Figure 15*). For organization, keep all six 13MM bolts and the battery tray together, then set the parts aside.



Figure 12: Fir Tree fasteners retaining wiring harness to passenger side battery tray.



Figure 13: 8MM bolts retaining grid heater relay.

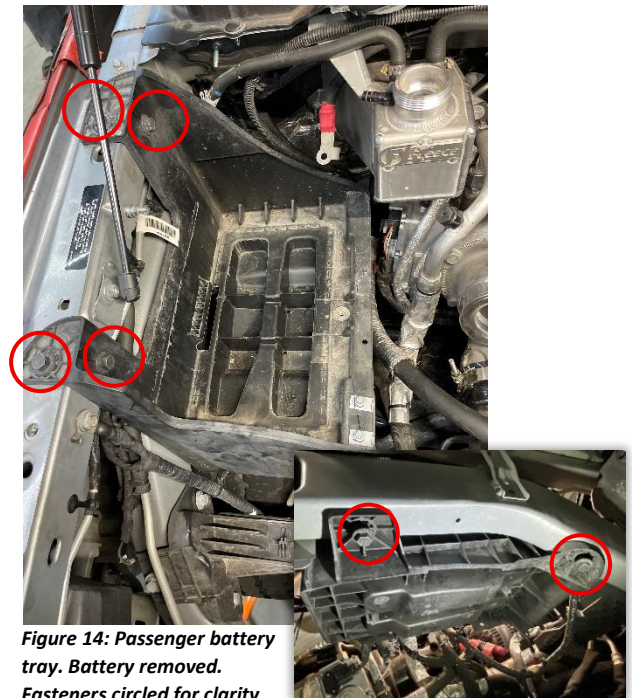


Figure 14: Passenger battery tray. Battery removed. Fasteners circled for clarity



Figure 15: Battery tray removed.

STEP 9: Remove the Charge Air Cooler (CAC) Tube.

Using an 11MM socket, loosen the clamp retaining the intercooler boot. Once the clamp is loose, slide the boot backwards off the turbo (Figure 16).

Take the time to ensure the charge air cooler tube is free of oil and debris. Slight oil film in the cooler is normal, any amount of debris can indicate mechanical failure of the previous turbo. Please remove cooler and clean if any debris is present. Damage to the new turbo caused by foreign debris is not a warrantable issue.

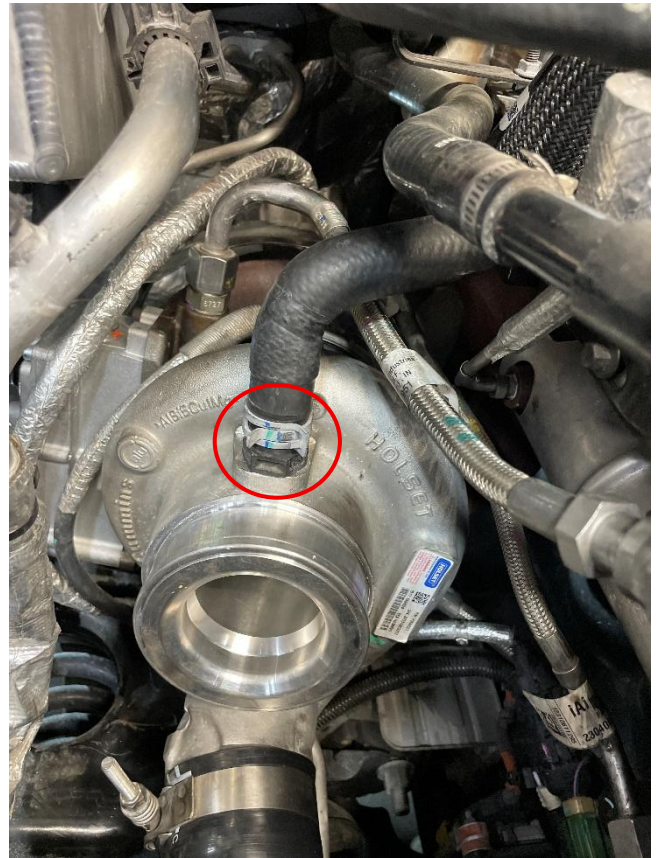


Figure 16: CAC boot and clamp still attached. Crankcase vent hose and clamp circled.

STEP 10: Remove crankcase vent hose and fitting.

Using a set of pliers, loosen the clamp retaining the hose onto the crankcase fitting. Slide the clamp upwards then pull the hose up and off the fitting (circled in Figure 16). Tuck the hose up and out of the way.

Using a 1-inch socket or wrench, remove the fitting from the top of the turbo, then set the fitting to aside (Figure 17).

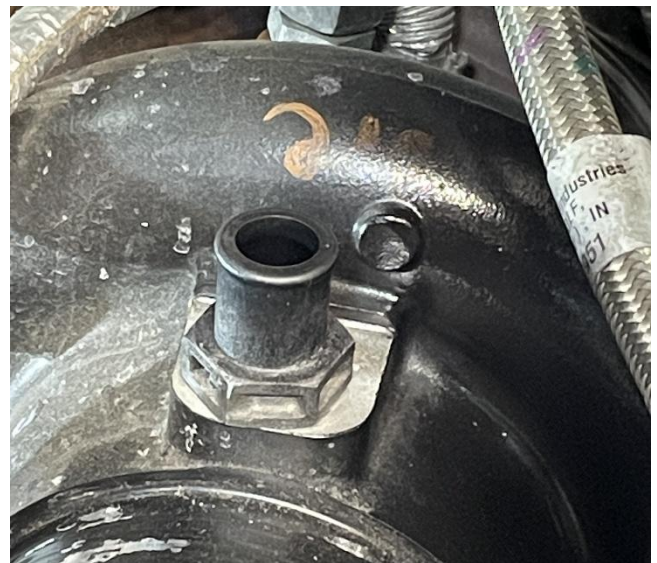


Figure 17: CCV hose and clamp removed. CCV fitting still installed in turbo.

STEP 11: Drain the coolant system.

Into a clean bucket, drain the coolant from the vehicle. Relieve pressure from the cooling system by placing a shop rag over the top of the coolant reservoir cap, then slowly twist the cap counterclockwise. The shop rag will provide a layer of protection from any heat or steam that may escape from the cooling reservoir during this process.

Once this process has been complete, the coolant can be safely drained from the radiator. At the bottom of the radiator is the radiator petcock (*Figure 18*). To drain the coolant from the cooling system, twist the petcock counterclockwise until the end of the threaded portion is met. Allow the coolant to drain entirely. This coolant maybe reused or can be properly discarded of if the coolant is going to be replaced.

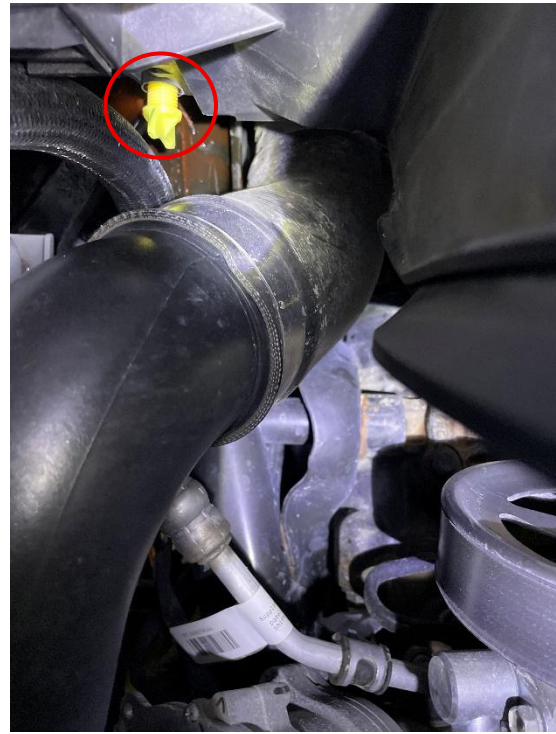


Figure 18: Radiator petcock in open position, cooling system draining.

STEP 12: Disconnect turbocharger actuator wiring harness.

To disconnect the actuator electrical connector from top of the actuator, press the push tab on the connector down and pull the connector to the right, away from the actuator. Tuck the harness up and out of the way.

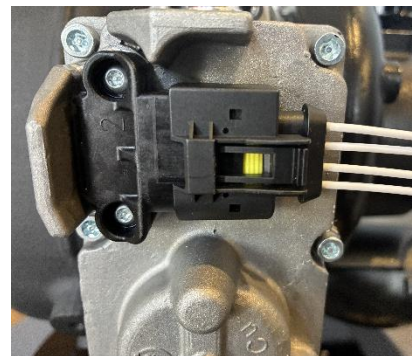


Figure 19: Actuator wiring connector.



Figure 20: Actuator wiring connector disconnected.

STEP 13: Remove the coolant feed line and oil feed line.

With a 15/16" wrench, remove the coolant feed line from the coolant standpipe and the turbo (Figure 21). Using 7/8" socket or wrench, remove the coolant feed fitting from the turbo charger and set aside.

Remove the oil feed line with a 13/16" wrench (Figure 22). Then remove oil feed fitting from turbo with 3/4" socket and set aside.



Figure 21: Coolant feed line ends circled.



Figure 22: Oil feed line ends circled.

STEP 14: Remove the turbocharger speed sensor.

Using an 8MM socket, loosen the 8MM bolt that retaining the speed sensor (Figure 23). Remove the bolt and set it aside, then remove the sensor from the turbo and inspect it. Verify the sensor is not showing evidence of burning, flattening, pinching, or any other signs of damage. If the sensor has been verified to be in good condition the sensor can be reused. If the sensor is showing signs of wear it is best to [replace the sensor at this time](#).

Once condition is verified, the speed sensor can be tucked out of the way or removed from the main engine harness. To remove the sensor from the main harness, press the push tab at the end of the sensor harness down and pull away from the main harness.

If the sensor has been deemed in good condition, verify the green O-ring from the sensor is still intact. If the O-ring is missing, inspect the original location of the speed sensor. Sometimes the O-ring will remain in the housing after removal. If this is the case, remove the O-ring and reinstall it onto the sensor



Figure 23: Turbine shaft speed sensor installed in turbocharger. 8MM bolt retaining the sensor circled.



Figure 24A: Turbine shaft speed sensor removed from turbo. Green O-ring intact stuck in mounting bore.



Figure 24B: Turbine shaft speed sensor removed from turbo. Green O-ring seated in its intended location.

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STEP 15: Remove the cast downpipe elbow.

Remove the V-band clamp that retains the cast elbow to the turbocharger with an 11MM socket. Remove the clamp that retains the cast elbow to the exhaust downpipe with a 13MM socket. Remove the cast elbow and leave the O2 sensor installed. Allow the cast elbow to rest on the passenger side control arm. Protect the O2 sensor and harness from damage and moisture.

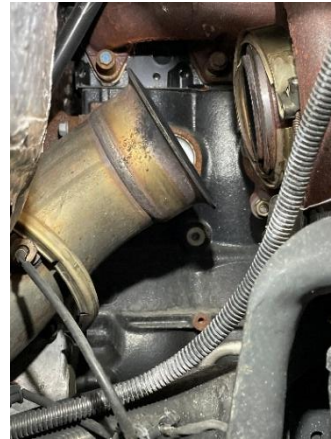


Figure 25: Down pipe elbow removed.

STEP 16: Remove the turbocharger oil drain tube.

Using a 10MM socket, remove the two 10MM bolts that retain the turbocharger drain tube from the turbocharger. Inspect the line and check condition. Leave the drain tube in the engine block or remove if replacing.

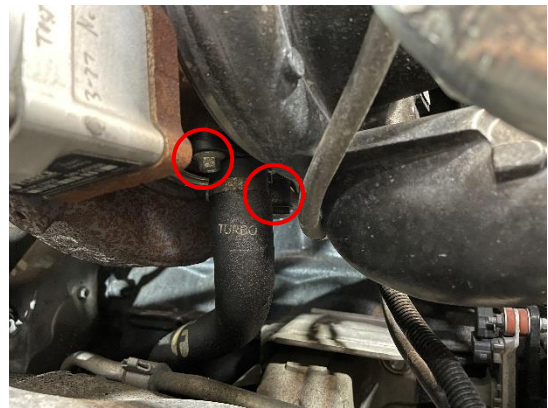


Figure 26: Turbo drain tube, 10MM bolts circled.

STEP 17: Remove the coolant banjo line.

Using a 7/8" wrench, remove the banjo bolt and coolant tube from the turbocharger, then set both aside. The two sealing washers on the banjo bolt can be discarded.



Figure 27: Turbo drain tube removed, coolant banjo line circled.

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STEP 18: Using 15MM socket or wrench, remove the mounting nuts from the turbocharger that mount it to the exhaust manifold. The stock nuts can be discarded.



Figure 28: Turbocharger mounting location, mounting nut circled.

STEP 19: Remove the turbocharger from the vehicle.

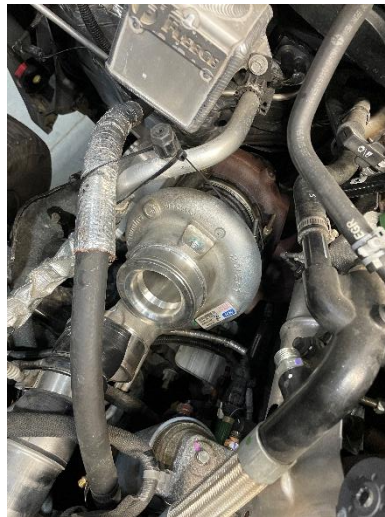


Figure 29: Stock turbocharger, everything removed.

STEP 20: Once the stock turbocharger has been removed, inspect the turbo drain line once more. Verify good condition. If the drain tube is going to be replaced, remove the old tube at this time, and install the [new drain tube](#) into the block.

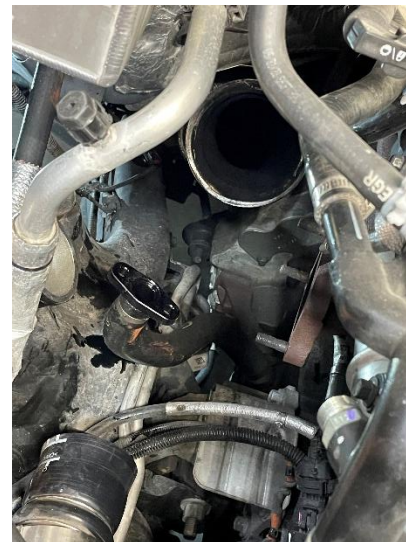


Figure 30: Stock turbocharger removed.

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STEP 21: Transfer all necessary hardware from the original turbo to the new cheetah turbo.

Clean all mating surfaces of the new turbo charger and mating components with brake clean and a shop rag.

Reinstall the original turbine shaft speed sensor or install a [new speed sensor](#) at this time. Push the new sensor into the mounting bore on the new cheetah turbo, this will produce a positive click once in place. Thread the 8MM retaining bolt into place, then torque the bolt to 89 INLBS with an 8MM socket (circled in Figure 31).

Thread the step 24 fitting into place and torque the fitting to 18FTLBS with a $\frac{3}{4}$ " socket (circled in Figure 32).

Thread the coolant feed fitting into place. Using a $\frac{7}{8}$ " socket torque the fitting to 18FTLBS (circled in Figure 32).

If present remove the heat shield on the stock turbo. Using an 8MM socket or wrench remove each of the 8MM bolts retaining the heat shield. Install the heat shield on to the new cheetah turbo. Tighten each bolt with an 8MM socket or wrench (Figure 33).

Prior to installation of the new Fleece turbocharger:

Review our [Installation Guidelines](#) located in the resources section of our website for turbocharger replacement general guidelines and a checklist.

WRITE DOWN THE S/N OF THE NEW FLEECE TURBOCHARGER FOR REFERENCE AND SERVICE.



Figure 31: Mounting bore for speed sensor circled.

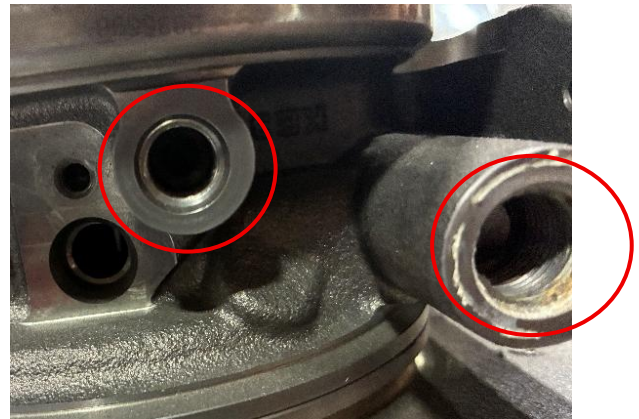


Figure 32: Location for oil feed and coolant feed fitting circled.



Figure 33: Heatshield on stock turbocharger. Transplant this over to the new Cheetah turbocharger.

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STEP 22: Using the included manifold studs, replace any broken or damaged studs at this time. Install the included mounting gasket onto the exhaust manifold (*Figure 34*).

STEP 23: Install the new cheetah turbo onto the exhaust manifold.

Using anti-seize on the studs, install the included mounting nuts onto the mounting studs. With a 15MM socket or wrench, torque each nut to 46 FTLBS.



Figure 34: Flange gasket installed onto the exhaust manifold. Installation kit at right.

STEP 24: Reinstall the coolant banjo line on the bottom of the turbo.

Using the original banjo bolt, install one of the included coolant sealing washers onto the bolt. Place the bolt through the banjo line, then install one more sealing washer on the other side of the bolt. The sealing washer will sit between the banjo line and the housing on the turbo. Tighten the banjo bolt with a 7/8" wrench or socket and torque to 18 FTLBS.

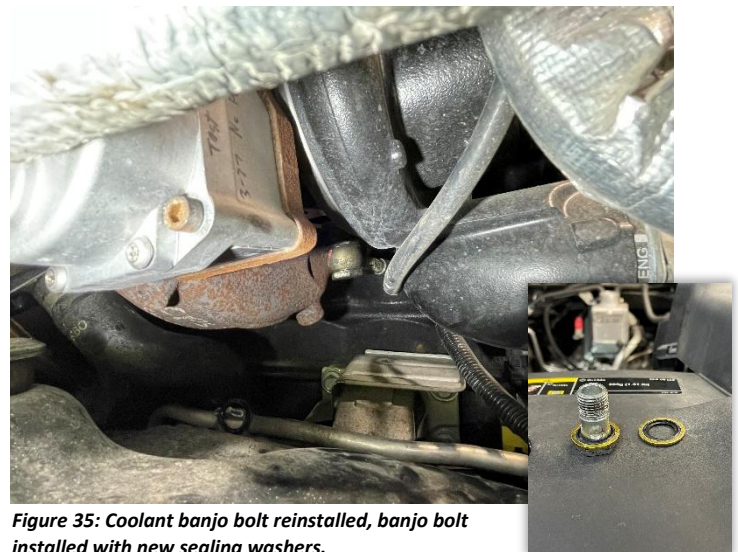


Figure 35: Coolant banjo bolt reinstalled, banjo bolt installed with new sealing washers.

STEP 25: Install a new [oil drain](#) line or reinstall the stock drain line.

If the stock drain line is being used, replace the paper gasket at this time. If using [the Fleece upgraded drain tube](#), do not use the paper gasket that is included in the turbo installation kit. Included in the drain tube kit is a square cut O-ring that will be placed into the 45-degree fitting on the drain. Line the drain up with the two mounting holes on the turbo, then thread each of the two 10MM mounting bolts into place. Using a 10MM socket, tighten each bolt to 18 FTLBS.

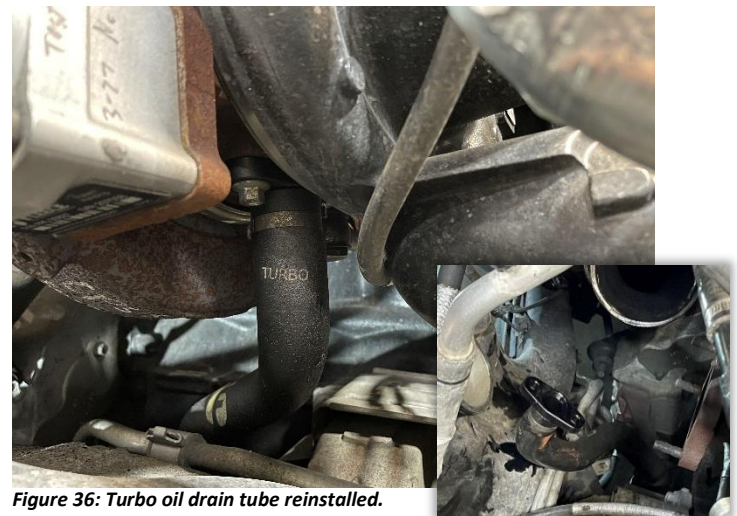


Figure 36: Turbo oil drain tube reinstalled.

STEP 26: Reinstall the cast elbow.

Starting with the clamp on the exhaust side verify proper positioning of the clamp on the downpipe. Slide the clamp for the turbo charger over the end of the turbocharger housing. With the O2 sensor facing upward allow the cast elbow to fall into place and position each clamp properly in relation to the cast elbow. Tighten the clamp on the downpipe side with a 13MM socket and tighten the clamp on the turbo side with an 11MM socket (*Figure 37*). Torque each to 13 FTLBS.

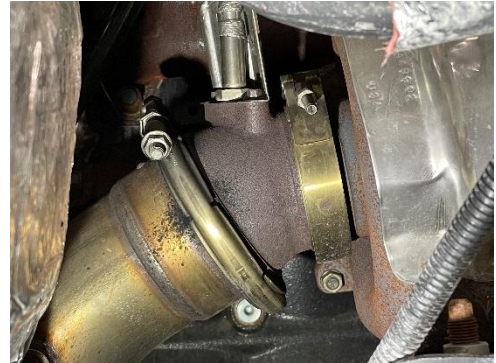


Figure 37: Cast down pipe elbow reinstalled.

STEP 27: Install a [new oil feed](#) line or reinstall the original oil feed line.

Tighten each end of the feed line with a 13/16" wrench (*Figure 38*).

STEP 28: Reinstall the turbocharger coolant feed line.

Tighten each end of the line with a 15/16" wrench (*Figure 38*).



Figure 38: Coolant feed line (top line) and oil feed line (bottom line) reinstalled.

STEP 29: Connect the turbocharger actuator wiring harness. Reconnect the turbocharger speed sensor wiring harness if it was replaced or removed.

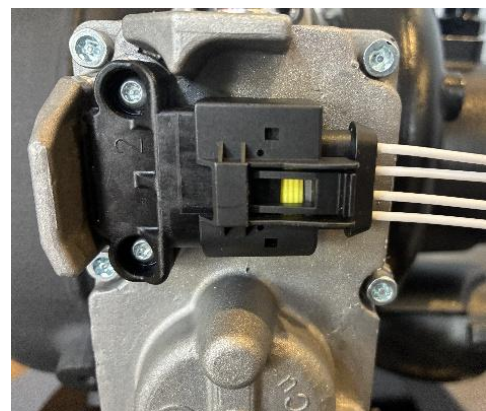


Figure 39: Actuator electrical connector reinstalled.

STEP 30: Reinstall the charge air cooler tube onto the turbocharger and tighten the clamp to 8 FTLBS.

STEP 31: PERFORM BOOST LEAK TEST.

Using a pipe plug, plug off the CCV fitting port. Install a boost leak tester onto the air inlet portion of the turbocharger (*Figure 40*).

Spray the intercooler pipes, boots, intake, and intercooler down with soapy water. Pressurize the system up to 15PSI.

Once up to pressure, disconnect the airline and pay attention to the pressure gauge on the boost leak tool. If the pressure displayed on the gauge drops dramatically this can be indicative of a boost leak. After inspecting the gauge on the tester, lookover all parts of the vehicle that were sprayed down with soapy water. Look for any air bubbles being formed and listen for any hissing noises.

Repeat this test as many times as necessary. *A boost leak can cause damage or even lead to failure of a turbocharger.*

STEP 32: Reinstall the CCV fitting into the turbocharger.

Tighten by hand only as the fitting is made from plastic (*Figure 41*).

STEP 33: Reinstall the breather hose onto the CCV fitting.

Using a set of pliers slide the clamp back into its original position (*Figure 42*).

STEP 34: Install the air intake tube to the turbocharger and tighten the clamp to 8 FTLBS.



Figure 40: Boost leak tester installed.



Figure 41: Crankcase Ventilation fitting installed in the new Cheetah turbo.



Figure 42: Crankcase Ventilation line and clamp installed onto the CCV fitting.

STEP 35: Reinstall the air filter assembly.

Set the engine air filter housing is sat in its factory mounting location and push the air box into place. Then, push the air intake tube back onto the air filter housing and tighten the clamp with an 8MM socket.

Reconnect the MAF sensor, the sensor closest to the rear of the airbox. Reconnect the barometric pressure sensor, which is the sensor closest to the front of the vehicle.

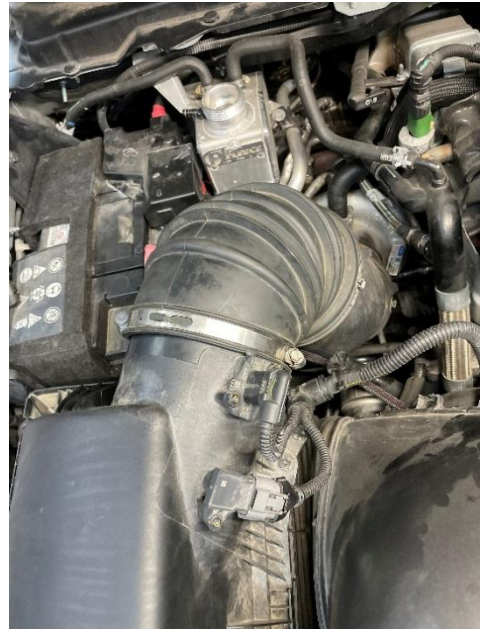


Figure 43: Engine air filter housing reinstalled. Map sensor and barometric pressure sensor reinstalled. Clamps on air intake tube tightened.

STEP 36: Reinstall the plastic air inlet tube to the right side of the engine air filter box by pushing the plastic tabs back into place (*Figure 44*).



Figure 44: Plastic air inlet tube to the right of the engine air filter housing reinstalled.

STEP 37: Refill the cooling system.

Turn the radiator petcock clockwise until it is verified to be in the closed position (*Figure 45*). Refill the cooling system with either the old coolant from when the system had been originally drained or with new coolant. Once filled, reinstall the cooling reservoir cap.



Figure 45: Radiator petcock in open position. Turn clockwise until it is in the closed position.

STEP 38: Install the engine cover and tighten the four bolts to 89 INLBS.



Figure 46: Engine cover reinstalled.

STEP 39: Install the passenger side battery tray.

Position the battery tray in its original mounting location. Reinstall each of the six 13MM bolts then torque each bolt to 96 INLBS with a 13MM socket (*Figure 47*).

Reinstall grid heater relay. Remove each of the 8MM bolts from the battery tray, then reinstall once the relay is in place. Tighten each of the bolts with 8MM socket (*Figure 47*). Push each of the fir tree fasteners for the wiring harness on the side of tray back into place.



Figure 47: Battery tray reinstalled; grid heater relay reinstalled.

STEP 40: Reinstall the battery.

Set battery into battery tray in the same orientation it came out in. Reinstall battery hold down and tighten 10MM bolt with 10MM socket. Place the positive terminal cluster back onto the positive terminal. Reinstall each of the three auxiliary cables in the same order they were removed in (*Figure 47*). Once all three cables have been reinstalled, push the plastic terminal cover back into place. Then reinstall negative terminal and tighten the 10MM retaining nut with 10MM socket.

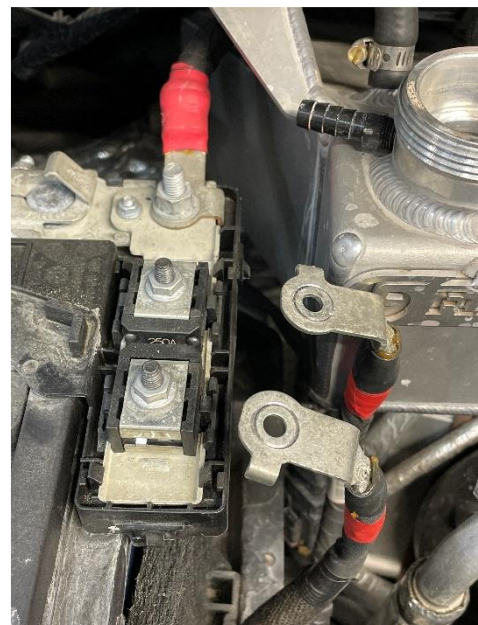


Figure 48: Reinstallation of each auxiliary cable to the positive terminal cluster.

STEP 41: Start the engine and check for any cooling or exhaust leaks.

Operate the engine at low idle for at least three minutes. This will prevent oil starvation damage to the bearing system and purge any residual contaminants from the bearing housing. After this process has been complete and the engine has been shut down perform hot retorquing of the turbocharger mounting nuts at 46 FTLBS. Once the engine is allowed to cool, recheck the coolant level and top off as needed.



Figure 49: Passenger fender brace reinstalled in factory location.

STEP 42: Reinstall the passenger fender brace.

Once it has been verified no coolant or exhaust leaks are present, reinstall Position brace in its original factory location. Then thread the two 13MM retaining bolts into place, tighten with a 13MM socket (Figure 49).

STEP 43: Reinstall the passenger fender well.

Position the fender well into its original location. Install all eight 8MM bolts then tighten each with an 8MM socket. Reinstall the three push pins into their appropriate location.

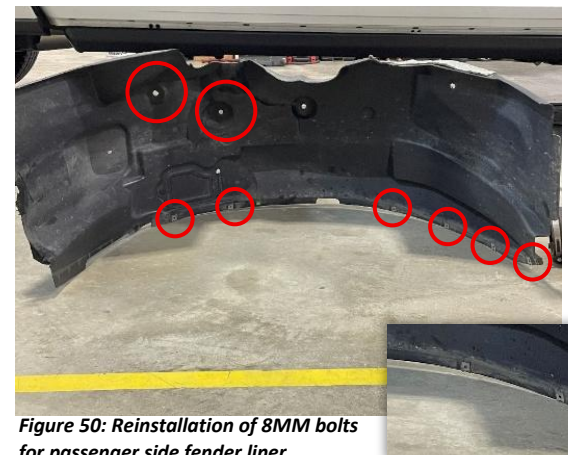


Figure 50: Reinstallation of 8MM bolts for passenger side fender liner.

STEP 44: IMPORTANT NOTICE FOR CALIFORNIA RESIDENTS.

For California customers: An E.O. identification label is required for Smog Check inspection. The E.O. identification label included with this kit MUST be placed in the engine compartment so that smog check technicians can verify the E.O. number.



Figure 51: Reinstallation of pushpins for passenger side fender liner.