



NOTICE: The engine oil must be changed any time the turbocharger is removed from the engine. The passages in the block underneath the turbocharger are direct passages to the lubrication system. Debris and or coolant may enter lubrication system and engine damage may occur.

1. Disconnect the battery ground cable.
2. Drain the primary engine cooling system.
3. Remove the lower intake manifold.
4. Disconnect the heater core inlet hose from the heater inlet tube.
5. Remove 2 bolts and the heater core inlet tube.
Inspect O-ring seal for damage, replace if necessary .
6. Disconnect the turbocharger actuator electrical connector.
7. If equipped, disconnect the turbocharger wastegate actuator vacuum hose.
8. **NOTE:** Mark the position of the exhaust upper downpipe clamp for installation.
9. **Loosen the exhaust upper downpipe clamp.**
10. Remove the RH fender splash shield.
11. Remove the exhaust upper downpipe bracket bolt.
12. Remove the 2 exhaust lower downpipe-to-catalyst and particulate filter assembly bolts and remove the downpipe assembly.
Discard the exhaust upper downpipe clamp.
13. Loosen the RH turbocharger inlet pipe clamp and slide the clamp off the turbocharger.
Discard the clamp after turbocharger is removed.
14. Loosen the LH turbocharger inlet pipe clamp and slide the clamp off the turbocharger.
Discard the clamp after turbocharger is removed.
15. **NOTE:** Use a 3/8 inch Jiffy-tite quick line disconnect tool, such as Snap-on(R) LDTSP4 or equivalent, to disconnect the turbocharger coolant outlet tube.
16. Remove the four (4) turbo pedestal bolts.
17. **NOTE:** Lift the turbocharger off locating dowels before positioning forward for removal.
Discard the turbocharger gasket and bolts
18. Remove the turbo vane actuator from the turbo

Upper Intake Manifold Removal

1. Disconnect the Manifold Absolute Pressure (MAP) sensor electrical connector and wire harness retainers.
2. Disconnect the coolant hose retainer from the upper intake manifold.
3. Remove the transmission fluid level indicator tube bolt and the engine oil level indicator tube bolt.
4. If equipped, disconnect the vacuum hose retainer from the upper intake manifold.
5. Remove the 15 bolts and the upper intake manifold.

Cover or tape the opening on the valve covers and lower intake manifold.

Remove and discard the gaskets.

Installation All Upper Intake Manifolds

1. Remove the cover or tape from the valve covers and lower intake manifold prior to installing the upper intake manifold. Using new gaskets, install the upper intake manifold and the 15 bolts.
Tighten to 10 Nm (89 lb-in).
2. Install the engine oil level indicator tube bolt and the transmission fluid level indicator tube bolt.
Tighten the engine oil level indicator tube bolt to 10 Nm (89 lb-in).
Tighten the transmission fluid level indicator tube bolt to 11 Nm (97 lb-in).
3. Connect the coolant hose retainer to the upper intake manifold.
4. Connect the MAP sensor electrical connector and wire harness retainers.

Lower Intake Manifold Removal

1. Remove the upper intake manifold
2. Remove the air cleaner Air Cleaner (ACL) outlet tube.
3. Release the clip and disconnect the Charge Air Cooler (CAC) outlet tube from the Throttle Body (TB).
4. Disconnect the TB electrical connector.
5. Disconnect the Exhaust Gas Recirculation Temperature (EGRT) sensor electrical connector and the wire harness retainer.
6. Remove the 4 bolts and the EGR bypass outlet pipe. Discard the gaskets.
7. Release the clip and disconnect the CAC inlet tube from the turbocharger.
8. **NOTE:** Vehicles with over 14,000 pounds Gross Vehicle Weight Rating (GVWR), will only have the lower turbocharger inlet boot.
9. Loosen the turbocharger inlet hose clamps.
Loosen the 2 lower turbocharger inlet hose clamps.
If equipped, loosen the 2 upper turbocharger inlet hose clamps.
10. Disconnect the crankcase ventilation hose from the lower intake manifold.
11. Remove the 3 bolts and the lower intake manifold.
12. Remove the turbocharger inlet hose(s) as needed.

If using new cast intake (ATS Part# 2060163368): Remove throttle body from intake and install new intake.

Installation

1. Position the turbocharger inlet hose(s) as needed. Install the lower intake manifold and the 3 bolts.
Tighten to 24 Nm (18 lb-ft).
2. Connect the crankcase ventilation hose to the lower intake manifold.
3. NOTE: Vehicles with over 14,000 pounds GVWR, will only have the lower turbocharger inlet boot.
4. Tighten the turbocharger inlet hose clamps.
Tighten the 2 lower turbocharger inlet hose clamps.
If equipped, tighten the 2 upper turbocharger inlet hose clamps.
5. Connect the CAC inlet tube to the turbocharger and install the clip.
6. Using new gaskets, install the EGR bypass outlet pipe and 4 bolts.
Tighten to 10 Nm (89 lb-in).
7. Connect the EGRT sensor electrical connector and the wire harness retainer.
8. Connect the TB electrical connector.
9. Connect the CAC outlet tube to the TB and install the clip.
10. Install the air cleaner ACL outlet tube.
11. Install the upper intake manifold.

INSTALLATION

1. Wipe turbocharger valley clean of all oil and debris.
The turbocharger is a tight fit between cowl and injection pump fuel lines but can be installed without removing fuel lines.
Position the turbocharger on locating dowels when installing.
Using a new gasket, install the turbocharger, pedestal, oil line assembly, and the 4 new bolts finger tight.
2. Install the LH turbocharger inlet pipe and flange assembly to the turbocharger.
Do not tighten at this time.
3. Position the RH turbocharger inlet pipe to the up-pipe assembly with the supplied 40mm clamp.
Do not tighten at this time.
4. Tighten all up-pipe nuts, bolts, and clamps.
5. Disengage the new exhaust upper downpipe clamp T-bolt and loosely install the clamp on the turbocharger.
6. Position the exhaust downpipe assembly in the vehicle and hand tighten the exhaust upper downpipe bracket bolt
Do not tighten the exhaust upper downpipe bracket bolt at this time.
7. Install the 2 exhaust lower downpipe-to-catalyst and particulate filter assembly bolts and hand tighten.
Do not tighten the exhaust lower downpipe-to-catalyst and particulate filter assembly bolts at this time.
8. Tighten the exhaust upper downpipe bracket bolt.
9. Engage the new exhaust upper downpipe clamp T-bolt and position the clamp as marked during removal.
Tighten to 15 Nm (133 lb-in).
10. Tighten the 2 exhaust lower downpipe-to-catalyst and particulate filter assembly bolts to 40 Nm (30 lb-ft).
11. Install the RH fender splash shield. For additional information, refer to Front End Body Panels
12. Install the supplied cooling system cap to cap off the turbo coolant line from the thermostat housing.

INSTALLATION (cont.)

13. Locate the turbo wastegate solenoid near the front of the engine under cold side CAC tube. Remove vacuum feed line and 90° fitting from solenoid and install supplied vacuum cap on 90° fitting. (See diagram below)
14. Connect the turbocharger actuator electrical connector and secure VGT solenoid in valley.
15. **NOTE:** Lubricate the 0-ring seal with engine coolant. **Tighten to 10 Nm (89 lb-in).**
16. Connect the heater core inlet hose to the heater inlet tube.
17. Inspect the Charge Air Cooler (CAC) and CAC tubes for metal particles. Carry out the Charge Air Cooler (CAC) Cleaning.
18. Install the lower intake manifold.
19. Change the engine oil and filter.
20. Connect the battery ground cable.
21. Evaluate the primary cooling system.
22. Perform the cooling system pressure test.

