

**Service Information System**[Previous Screen](#)

Welcome: lanets

◀ Product: NO EQUIPMENT SELECTED
 Model: NO EQUIPMENT SELECTED
 Configuration: NO EQUIPMENT SELECTED

Special Instruction**Replacement Procedure for High-Pressure Turbocharger Cartridge on CT11 and CT13 Engines {7000}**

Media Number -REHS9168-01

Publication Date -2014/04/22

Date Updated -2014/04/22

i05784339

Replacement Procedure for High-Pressure Turbocharger Cartridge on CT11 and CT13 Engines{7000}

SMCS - 7000

On Highway Truck:

CT660 (S/N: TGA1-UP; TGD1-UP; TJD1-UP; TEJ1-UP; TRK1-UP; TKL1-UP; TEM1-UP; TEP1-UP; TGR1-UP; TGS1-UP; TJS1-UP; TGT1-UP; TGW1-UP; TSW1-UP; TEY1-UP; TSY1-UP; TEZ1-UP; TGZ1-UP)

Introduction

This procedure provides instructions for replacing the High-Pressure (HP) turbocharger center section (cartridge).

Required Parts

Table 1

Required Parts			
Item	Qty	Part Number	Description
1	1	450-0395	Kit-Turbo CRTG
2	1	376-2649	Tube As
3	1	376-2510	O-Ring Seal

Removal

1. Bring truck into shop and park on flat surface.
2. Shift transmission to Park or Neutral, set parking brake, and install wheel chocks.
3. Unlatch and open hood.

4. Use a **372-5254** Coolant Tester Gp to drain coolant from system. Place suitable drain pan under truck to collect any remaining coolant throughout procedure.

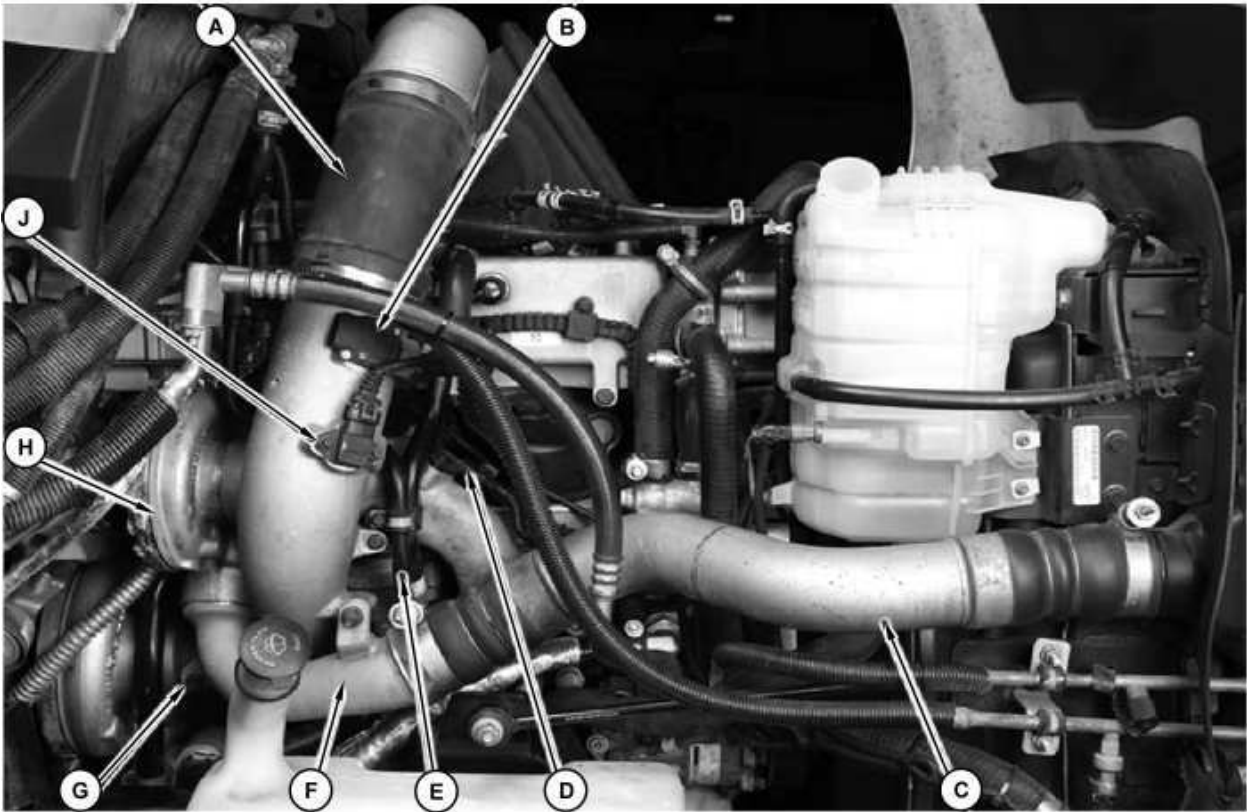


Illustration 1

g03617223

High-Pressure and Low-Pressure Turbochargers and Connections

- (A) Air inlet duct
- (B) MAF sensor
- (C) HPCAC pipe
- (D) TC2CIP sensor
- (E) Cab heater return and LPCAC coolant supply pipes
- (F) HP turbocharger outlet duct
- (G) LP turbocharger air inlet duct
- (H) HP turbocharger
- (J) AIT sensor

5. Remove air inlet duct (A). Refer to Illustration 1.

6. Remove High-Pressure Charge Air Cooler (HPCAC) pipe (C) from HPCAC and HP turbocharger outlet duct (F). Refer to Illustration 1.
7. Install cap on HPCAC.
8. Disconnect engine harness connectors at following locations:
 - Engine Oil Pressure (EOP) sensor
 - Turbocharger 2 Compressor Inlet Pressure (TC2CIP) sensor (D)
 - Air Inlet Temperature (AIT) sensor (J)
 - Mass Air Flow (MAF) sensor (B) (if equipped)
9. Remove engine harness nut, located on Coolant Control Valve (CCV) mounting bolt, and secure engine harness out of the way.
10. Remove HP turbocharger outlet duct (F). Discard HP turbocharger outlet duct O-ring.

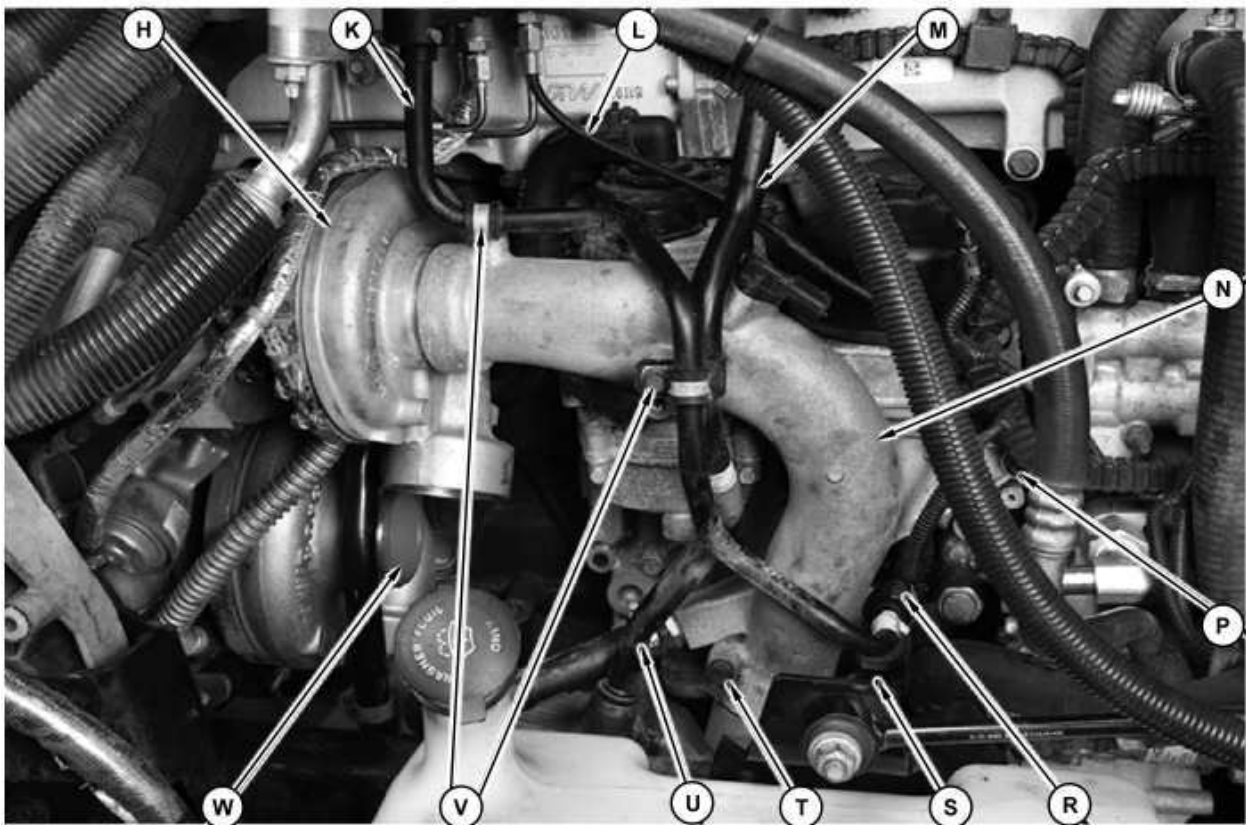


Illustration 2

g03617299

High-Pressure and Low-Pressure Turbochargers and Connections

(H) HP turbocharger

(K) Cab heater coolant return pipe

(L) Air supply line to ACV

(M) LPCAC coolant supply pipe

(N) HP turbocharger air inlet duct

(P) Bolt

(R) Cab heater coolant return pipe bolt

(S) Coolant return hose

(T) Bolt

(U) Coolant hose

(V) Bolt

(W) Cap

11. Remove Low-Pressure (LP) turbocharger air inlet duct (N) and cover LP turbocharger with Cap (W). Discard LP turbocharger air inlet duct O-ring. Refer to Illustration 2.
12. Disconnect air supply line (L) from Air Control Valve (ACV) and secure out of the way. Refer to Illustration 2.

Note: Disconnect coolant filter line from cab heater coolant return pipe (if equipped)

13. Remove two Bolts (V) securing cab heater coolant return pipe (K) and Low-Pressure Charge Air Cooler (LPCAC) coolant supply pipe (M). Refer to Illustration 2.
14. Remove Bolt (R) and position cab heater coolant return pipe (K) out of the way. Refer to Illustration 2.
15. Remove two clamps and LPCAC coolant supply pipe (M) from vehicle. Refer to Illustration 2.
16. Disconnect coolant return hose (S) from HP turbocharger air inlet duct (N). Refer to Illustration 2.
17. Disconnect coolant hose (U) from HP turbocharger air inlet duct (N) .

Note: Do not remove HP turbocharger air inlet duct from HP turbocharger (H) at this time

18. Remove two mounting bolts (P) and (T) from HP turbocharger air inlet duct (N). Refer to Illustration 2.
-

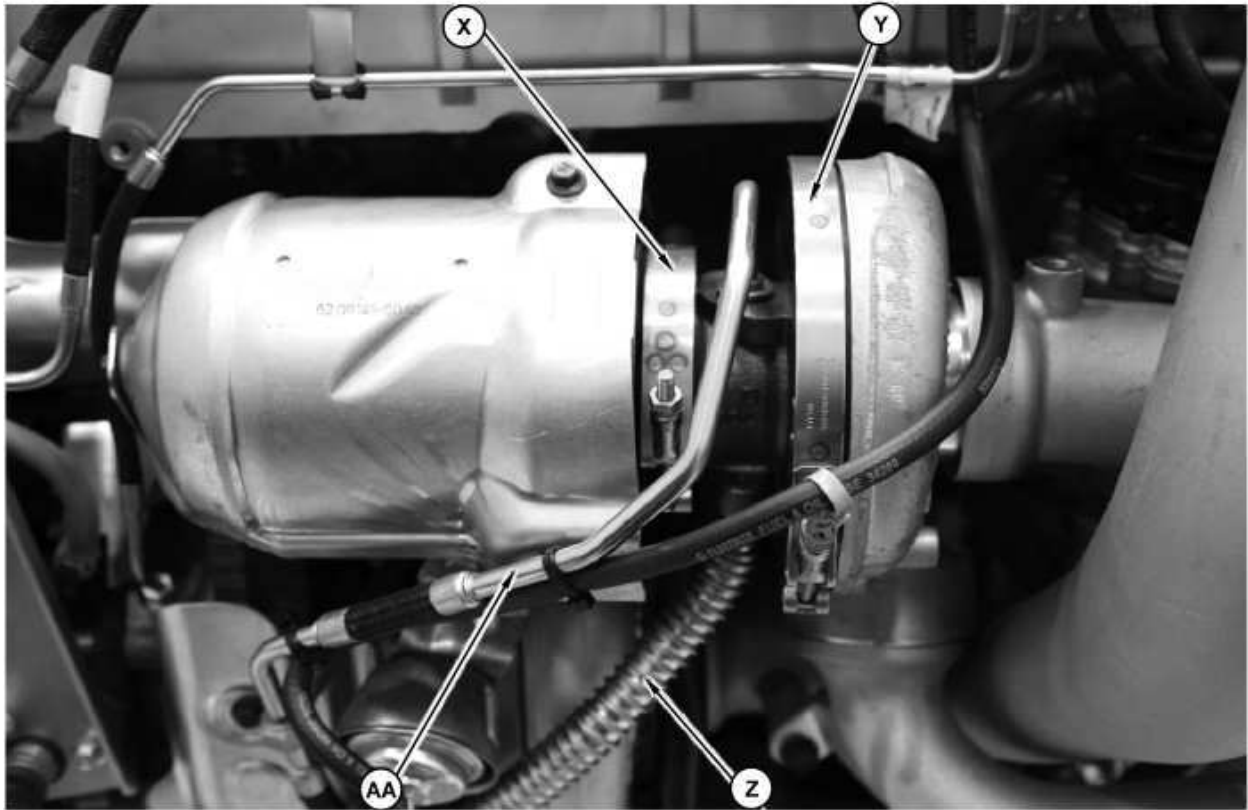


Illustration 3

g03617578

HP Turbocharger

- (X) V-band clamp (turbine housing)
- (Y) V-band clamp (compressor housing)
- (Z) HP turbocharger oil return line
- (AA) HP turbocharger oil supply line

Note: The oil supply line must not be reused or damage to equipment will occur. If oil supply line will not come out of the HP turbocharger due to seizure, cut the oil supply line into two pieces. Leave the line in the HP turbocharger for ease of removal, then discard oil supply line

19. Remove and discard oil supply line (AA) from vehicle. Refer to Illustration 3.
20. Disconnect oil return line (Z) from HP turbocharger only. Discard gasket. Refer to Illustration 3.

Note: Make sure that all coolant hoses and pipes are disconnected from HP turbocharger air inlet duct before removal

21. Remove HP turbocharger turbine housing V-band clamp (X). Discard V-band clamp. Refer to Illustration 3.
22. Using a soft-blow mallet, gently tap HP turbocharger until loose.



Illustration 4

g03617636

HP Turbocharger Removal

23. Pull the HP turbocharger center cartridge on. Maneuver the HP turbocharger center cartridge straight out until turbine wheel is free from turbine housing. Refer to Illustration 4.
24. Separate HP turbocharger and HP turbocharger air inlet duct once free from turbine housing. Discard HP turbocharger air inlet duct tube seal.

Installation

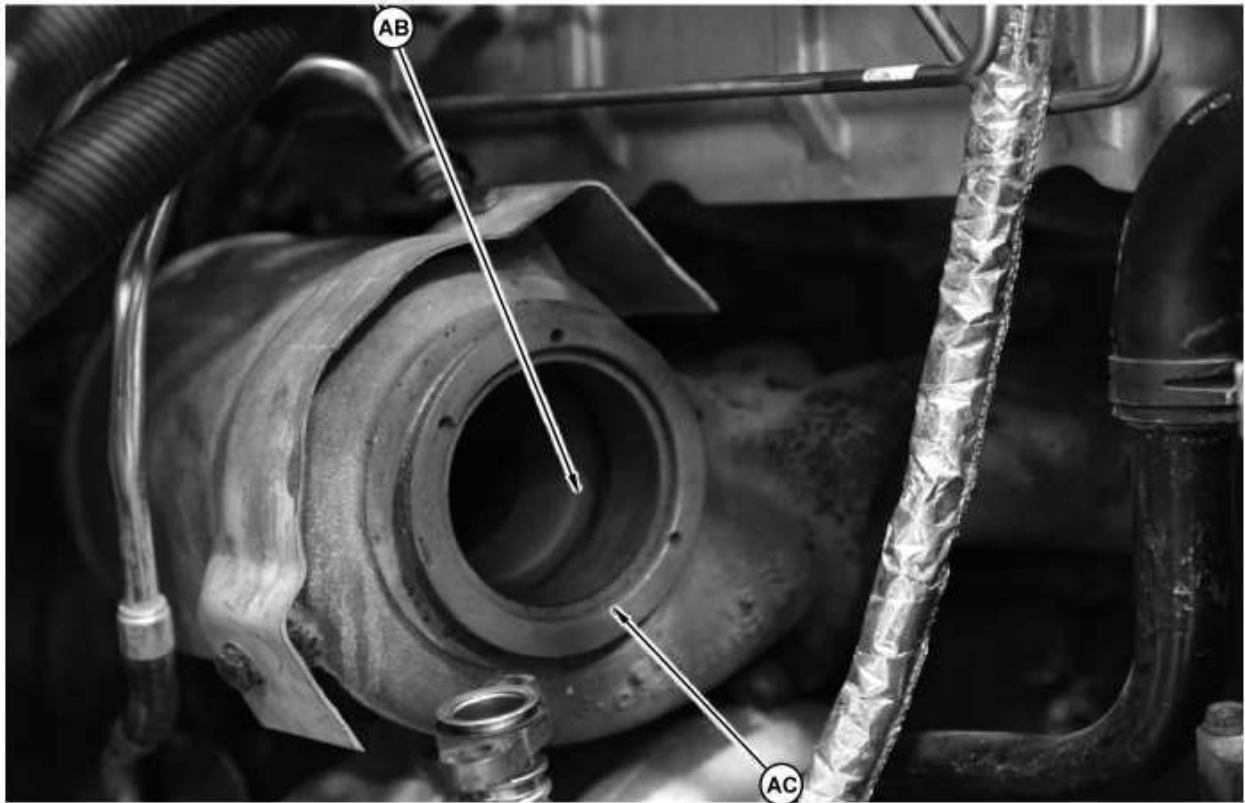


Illustration 5

g03617643

HP Turbocharger Turbine Housing

(AB) HP turbocharger turbine housing

(AC) HP turbocharger turbine housing flange (exterior)

1. Using suitable solvent and clean emery cloth, clean inside HP turbocharger turbine housing (AB) and exterior flange (AC). Refer to Illustration 5.



Illustration 6

g03617676

Turbocharger Prime

2. While rotating turbocharger turbine wheel, add oil to turbocharger oil supply port until oil comes out of oil drain port. Refer to Illustration 6.

Note: You must prime the new HP turbocharger center cartridge with oil prior to installation, or damage to equipment may occur



Illustration 7

g03617718

HP Turbocharger Center Cartridge and Air Inlet Duct

(AD) HP turbocharger center cartridge

(AE) HP turbocharger air inlet duct

(AF) 72.2 x 60 (DMR) tube seal (extension tube)

3. Install the new HP turbocharger center cartridge (AD) into turbine housing. Let the new cartridge rest freely. Refer to Illustration 7.

Note: Make sure to install lower HP turbocharger air inlet duct mounting bolt before installation is complete. This bolt may not be accessible later in the installation procedure, on some vehicles

Note: Make sure to lubricate rubber fittings and O-rings with P-80® or equivalent lubricant

4. Install new O-ring onto HP turbocharger housing.
5. Install new tube seal (extension tube) (AF) to HP turbocharger air inlet duct (AE). Refer to Illustration 7.
6. Position lower HP turbocharger air inlet duct bolt in place and install HP turbocharger air inlet duct with new tube seal into LPCAC.



Illustration 8

g03617776

HP Turbocharger and HP Turbocharger Air Inlet Duct

7. While pulling out on HP turbocharger, mate HP turbocharger air inlet duct to HP turbocharger air inlet, then insert HP turbocharger back into turbine housing. Refer to Illustration 8.
8. Align and fully seat HP turbocharger on dowels of turbine housing.
9. Install and torque new V-band clamp (X) to 12.4 N·m (110 lb in). Refer to Illustration 3.
10. Install and torque HP turbocharger air inlet duct mounting bolts (P) and (T) to 62 N·m (46 lb ft). Refer to Illustration 2.

Note: Make sure that new oil supply line does not bend. Failure to do so will result in damage to HP turbocharger. Damage or distortion will require replacement of oil supply line

Note: Some oil drain lines may have an O-ring seal. One will need to be ordered separately

11. Install new gasket onto oil return line and install into HP turbocharger.
12. Install new oil supply line on vehicle.

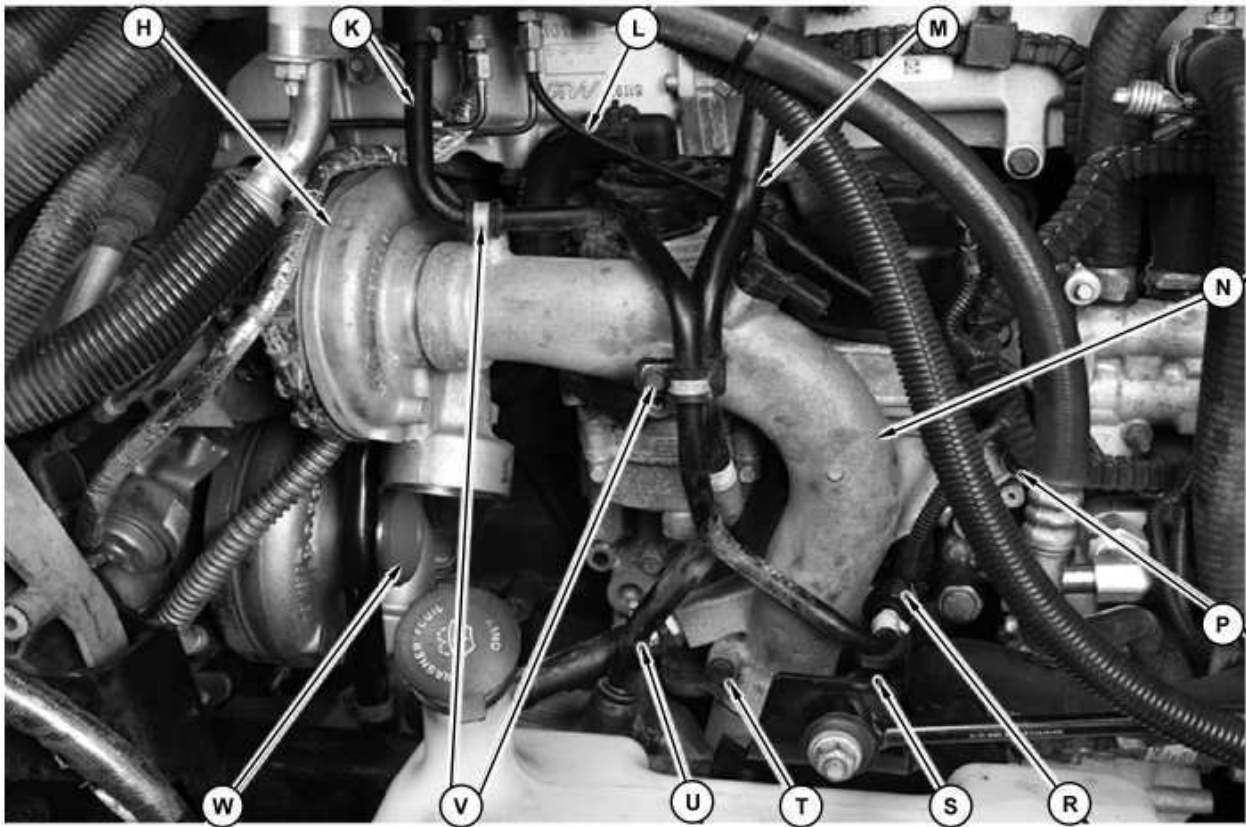


Illustration 9

g03617942

High-Pressure and Low-Pressure Turbochargers and Connections

- (H) HP turbocharger
- (K) Cab heater coolant return pipe
- (L) Air supply line to ACV
- (M) LPCAC coolant supply pipe
- (N) HP turbocharger air inlet duct
- (P) Bolt
- (R) Cab heater coolant return pipe bolt
- (S) Coolant return hose
- (T) Bolt
- (U) Coolant hose
- (V) Bolt
- (W) Cap

13. Connect coolant hose (U) to HP turbocharger air inlet duct (N). Refer to Illustration 9.

14. Connect coolant return hose (S) to HP turbocharger air inlet duct (N). Refer to Illustration 9.

15. Install LPCAC coolant supply pipe (M) to vehicle with two clamps. Refer to Illustration 9.
16. Position cab heater coolant return pipe (K) and secure with bolt (R). Refer to Illustration 9.
17. Install cab heater coolant return pipe (K) and LPCAC coolant supply pipe (M) on HP turbocharger air inlet duct (N) with two bolts (V). Refer to Illustration 9.

Note: Connect coolant filter line to cab heater coolant return pipe (if equipped)

18. Install air supply line (L) to ACV. Refer to Illustration 9.
19. Install new O-ring into LP turbocharger air inlet duct, remove cap (W) from LP turbocharger, and install LP turbocharger air inlet duct to LP turbocharger. Secure with two bolts. Refer to Illustration 9.
20. Install new O-ring into HP turbocharger outlet duct and install HP turbocharger outlet duct to HP turbocharger. Secure with two bolts.
21. Connect engine harness connectors at EOP sensor, TC2CIP sensor (D), AIT sensor (J), and MAF sensor (B) (if equipped). Refer to Illustration 1.
22. Secure engine harness to CCV stud with mounting nut.
23. Install HPCAC pipe to HP turbocharger outlet duct and HPCAC. Secure with two clamps.
24. Install upper portion of air inlet duct and secure with clamps.
25. Fill cooling system using **372-5254** Coolant Tester Gp .
26. Start vehicle to verify proper operation, no leaks, and no fault codes are present.
27. Close and latch hood.
28. Remove wheel chocks.