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Ram 5.9L Fuel Injector

Stock Replacement Fuel Injectors

1715503	2003-2004 Ram Pick Up	Standard
1725503	2003-2004 Ram Pick Up	Premium
1714503	2003-2004 Ram Pick Up Stock Plus	Standard
1724503	2003-2004 Ram Pick Up Stock Plus	Premium
1715505	2004.5-2007 Ram Pickup	Standard
1725505	2004.5-2007 Ram Pickup	Premium
1714505	2004.5-2007 Ram Pickup Stock Plus	Standard
1724505	2004.5-2007 Ram Pickup Stock Plus	Premium

Premium line injectors are built with new Bosch solenoids, nozzles and control valves

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION

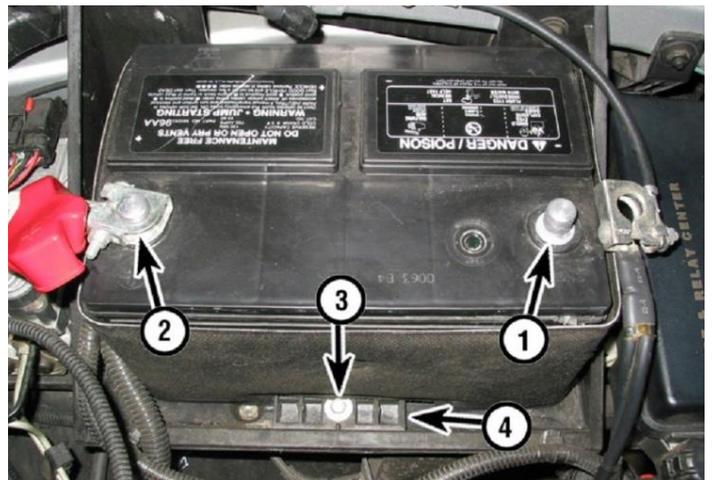
Suggested Items

1050155	2003-2005 Ram Pickup, Injector Install Kit
1050156	2006-2007 Ram Pickup, Injector Install Kit

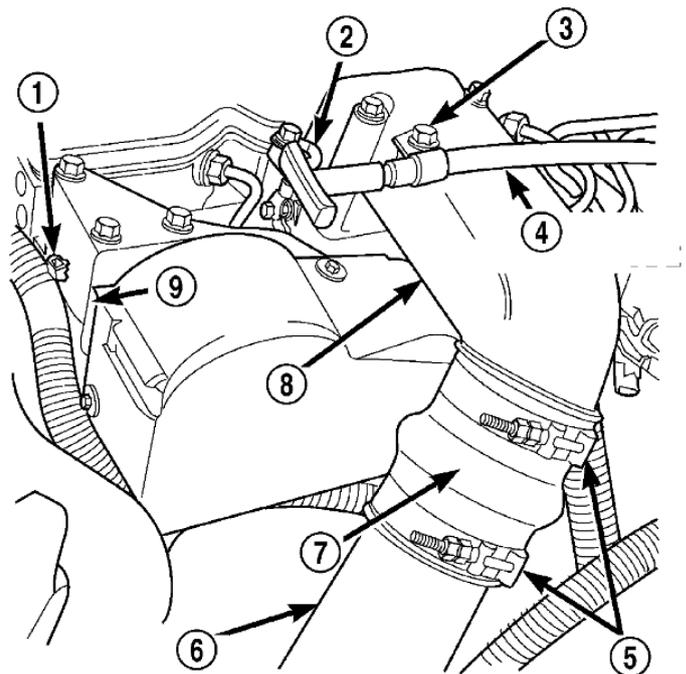
The kits above contain new high-pressure fuel lines, intake gaskets, valve cover gaskets, and supply tubes. While this kit is not necessary, it is strongly recommended to ensure optimal performance and longevity of your motor.

Removal

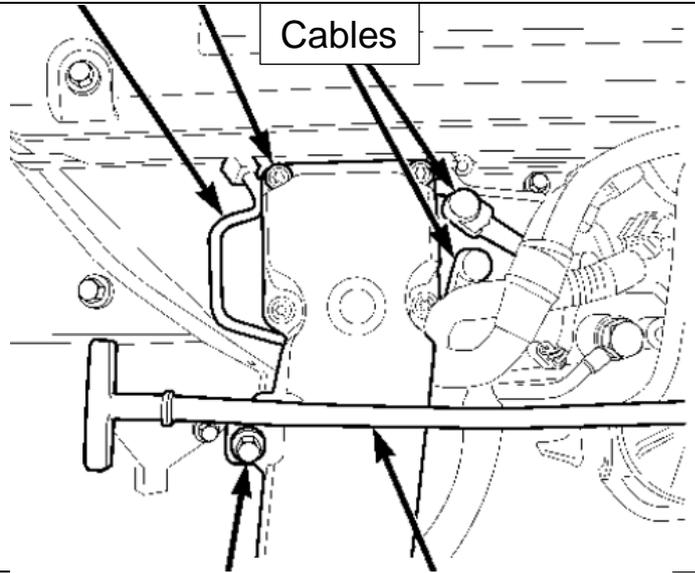
1. Disconnect both negative battery cables from both batteries. Cover and isolate ends of cables.



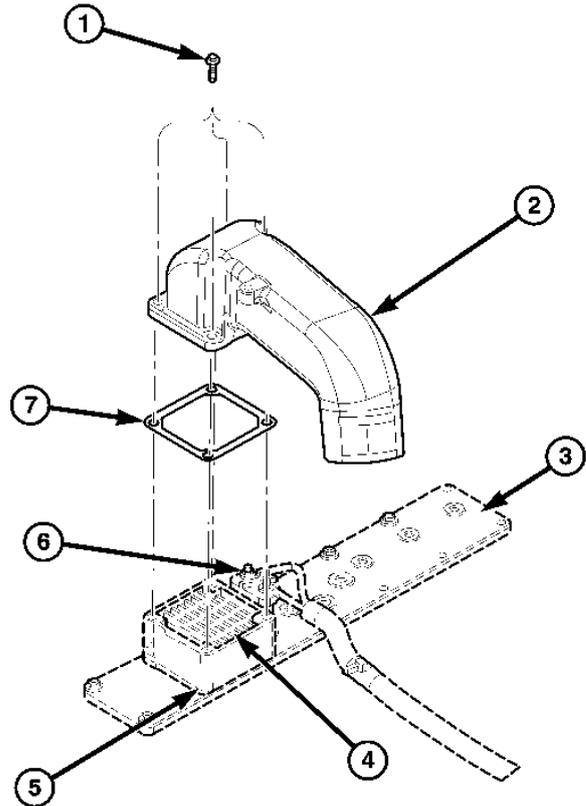
2. Remove the charge air cooler outlet tube (6) from the air inlet housing (8).



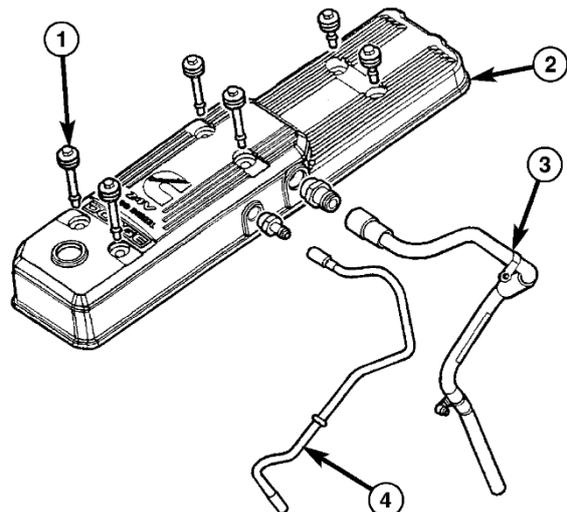
- 3. Remove the engine oil dipstick tube mounting bolt.
- 4. Remove dipstick support at fuel filter housing. Position dipstick tube to the side.
- 5. Disconnect the air grid heater power cables at the cable mounting studs.



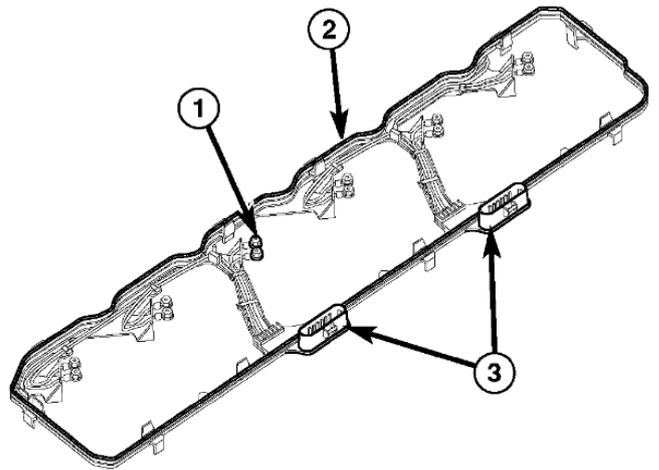
- 6. Remove wiring harness clips, engine oil dipstick tube bracket from air inlet connection and fuel filter housing, and the four housing mounting bolts (1).
- 7. Remove heater element assembly.



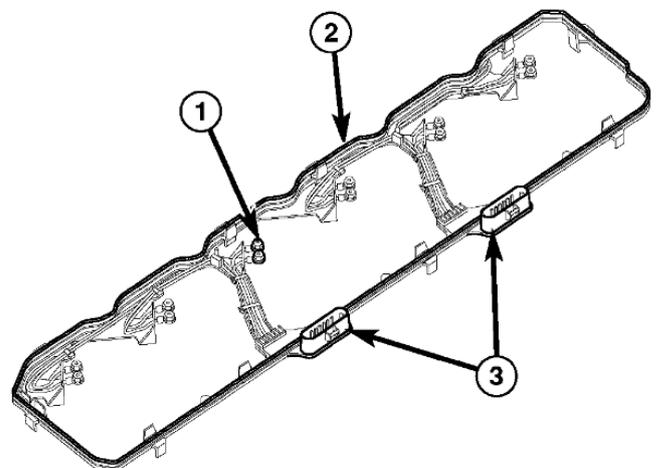
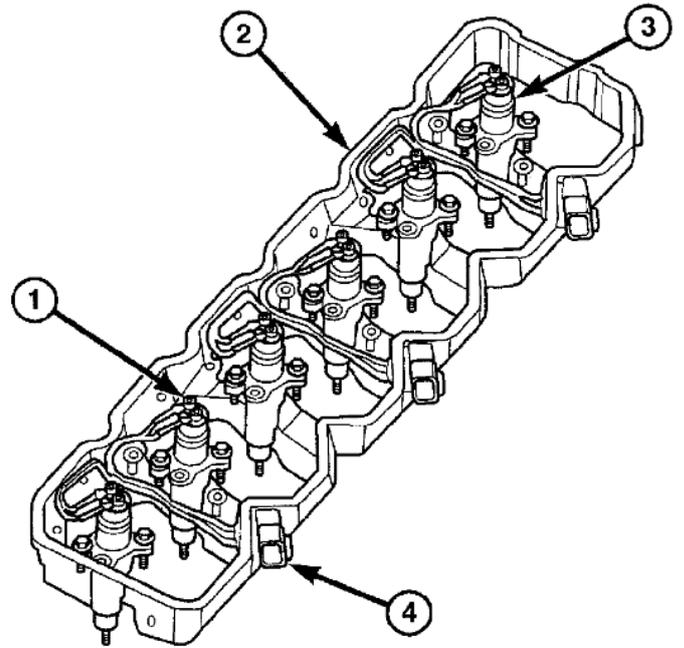
- 8. Remove breather assembly (3) and tubes (4).
- 9. Remove valve cover (2).



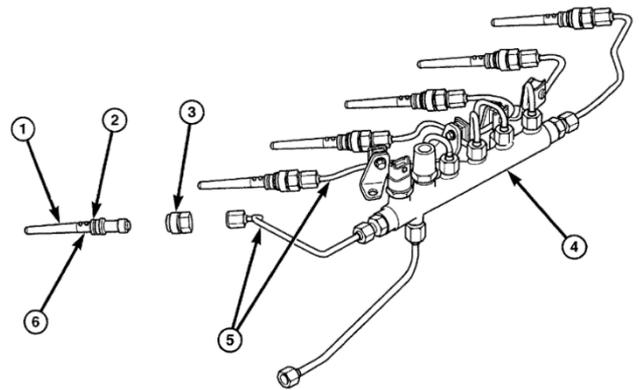
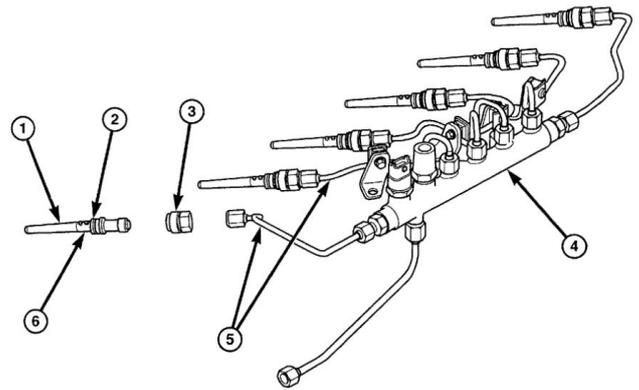
10. Remove all 12 fuel injector wire harness nuts (1) securing integrated wiring harness to all 6 fuel injectors. (2006-2007 MY gasket pictured)



11. Disconnect engine wiring harness at electrical connectors
(MY 2003-2005, top, item 4)
(MY 2006-2007, bottom, item 3)



12. Remove necessary high pressure fuel lines (5) connecting the necessary fuel injector rail to high pressure connector.



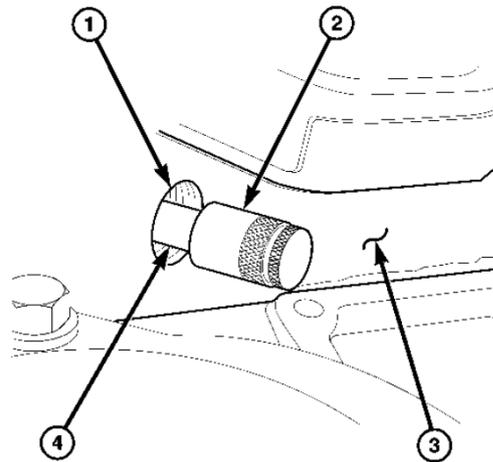
13. A connector retainer (nut, 3, outlined in red) is used on each connector tube. Remove this nut(s) by unthreading from cylinder head.





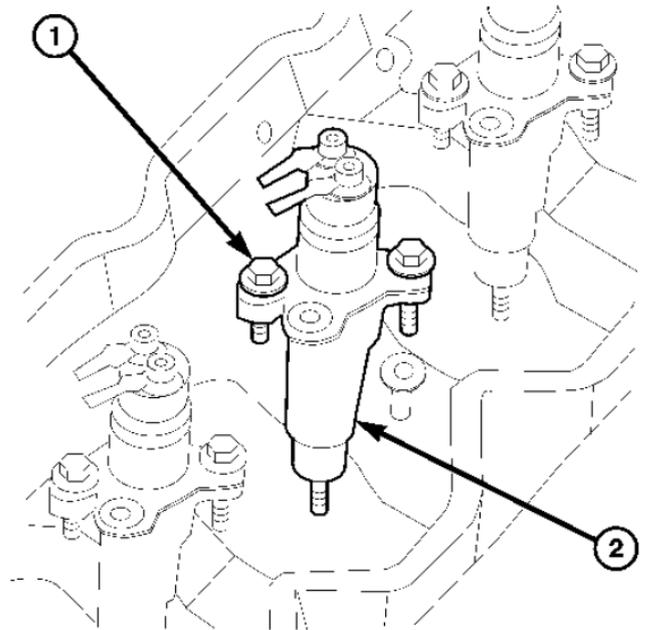
Cummins Tool #9015

14. Using special high-pressure connector removal tool #9015 remove necessary high-pressure connector(s) from cylinder head. Tool #9015 threads onto connector tube. Use tool to pry connector tube(s) from cylinder head.



15. Remove all exhaust rocker arm assembly(s).

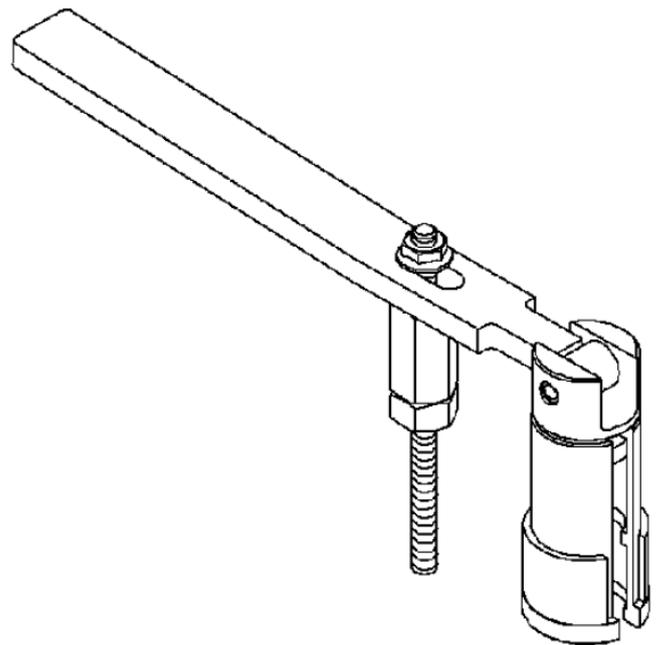
16. Remove 2 fuel injector hold down clamp bolts (1) at each injector being removed.



Cummins TOOL #9010

USING TOOL #9010:

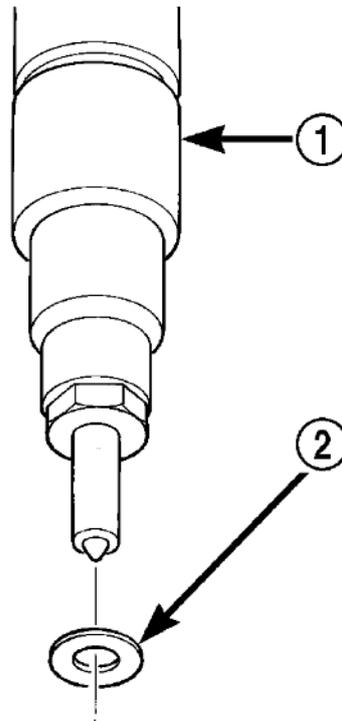
1. Special Tool #9010 is equipped with 2 clamshell clamps, a sliding retainer sleeve to retain the clamshell clamps, a 2-piece mounting stud, and a pivoting handle. **Do not attempt to remove the fuel injector with any other device. Damage to injector will occur.**
2. The rocker housing is bolted to the top of cylinder head. The mounting stud from tool #9010 was meant to temporarily replace a rocker housing mounting bolt. Remove the necessary rocker housing mounting bolt. These mounting bolts are located at the center of each of the 5 rocker housing support bridges.
3. Install and tighten 2-piece mounting stud to rocker housing. If removing the No. 6 fuel injector, separate the 2-piece mounting stud. Install lower half of mounting stud to center of rocker housing bridge. Install upper half of mounting stud to lower half.
4. Position tool handle to mounting stud and install handle nut. Leave handle nut loose to allow a pivoting action.



5. Position lower part of clamshell halves to sides of fuel injector (wider shoulder to bottom). The upper part of clamshell halves should also be positioned into machined shoulder on the handles pivoting head.
6. Slide the retainer sleeve over pivoting handle head to lock clamshell halves together.
7. Be sure handle pivot nut is loose.
8. Depress handle downward to remove fuel injector straight up from cylinder head bore.

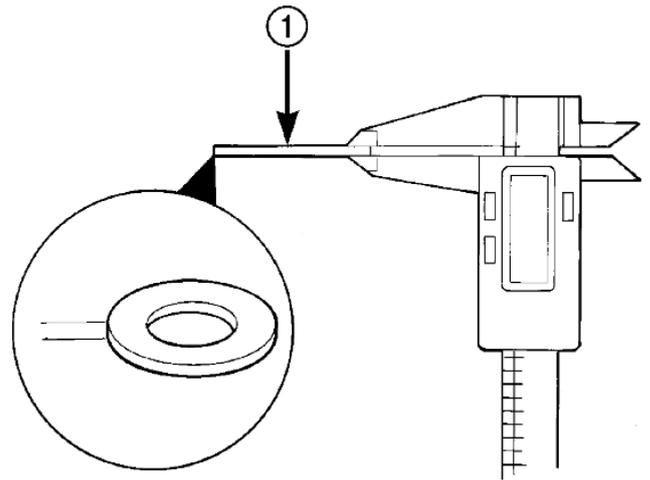
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17. Inspect to ensure the copper washer (2) did not remain inside the injector bore. Remove washer from bore if left behind.

NOTE: Ensure the injector bore is clean, and no residue is remaining in the bore prior to installation of the injector.



Installation

1. The bottom of fuel injector is sealed to cylinder head bore with a copper sealing washer (shim) (1) of a certain thickness. See Figure. A new shim (1) with correct thickness must always be reinstalled after removing injector. Measure thickness of injector shim (1). **See Figure. Shim Thickness: 1.5 mm (.060")**



2. Install new shim (1) (washer) to bottom of injector. Apply light coating of clean engine oil to washer. This will keep washer in place during installation.
3. Install new O-ring to fuel injector. Apply small amount of clean engine oil to O-ring and injector bore.



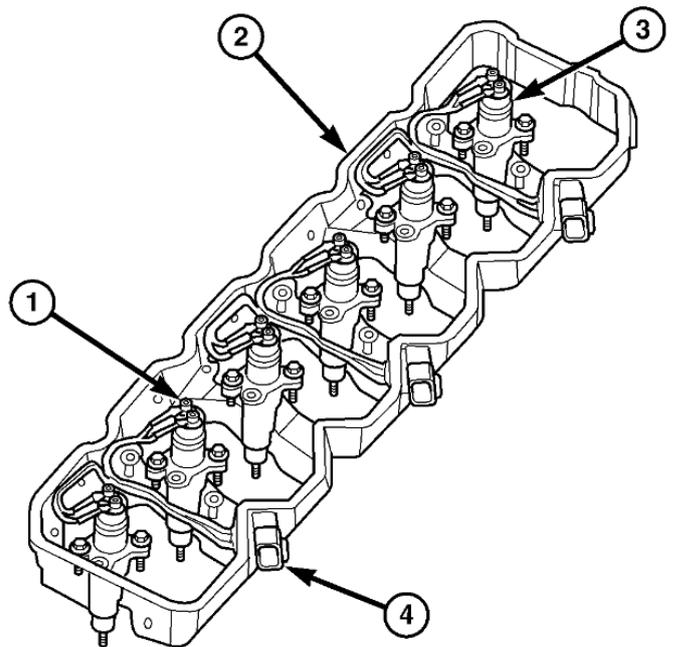
4. Install injector into cylinder head with male (high-pressure) connector port facing the intake manifold. Push down on fuel injector mounting flange to engage O-ring and seat injector.



Tightening Sequence

Please following the following tightening sequence closely. Failure to follow these instructions will result in engine damage.

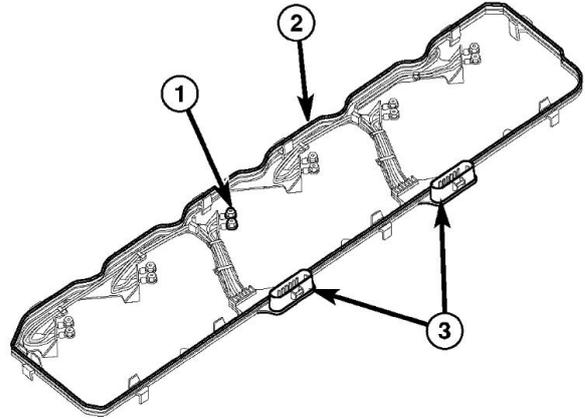
1. Install fuel injector hold down clamp (mounting flange) bolts. Be sure the clamp is perpendicular to the injector body. **Do a preliminary tightening of these bolts to 5 N.m (44 in. lbs.) torque. This preliminary tightening insures the fuel injector is seated and centered.**
2. After tightening, relieve bolt torque, but leave both bolts threaded in place.
3. Install high-pressure connector and retaining nut. Do a preliminary tightening to **15 N.m (11 ft. lbs.) torque.**
4. Alternately tighten injector holddown bolts to **10 N.m (89 in. lbs.) torque.**
5. Do a final tightening of the high-pressure connector and retaining nut. Tighten to **50 N.m (37 ft. lbs.) torque. Be sure to use a secondary back-up wrench on the connector nut (fitting) while torquing fuel line fitting.**



NOTE: If not replacing the connector tubes, replace the connector tube O-rings.

6. Install integrated gasket

7. Connect injector solenoid wires and nuts (1) to top of injectors. Tighten connector nuts to **1.25 N.m (11 in. lbs.) torque. Be very careful not to overtighten these nuts as damage to fuel injector will occur.**



8. Install exhaust rocker arm assemblies. **36 N.m (27 ft. lbs)**

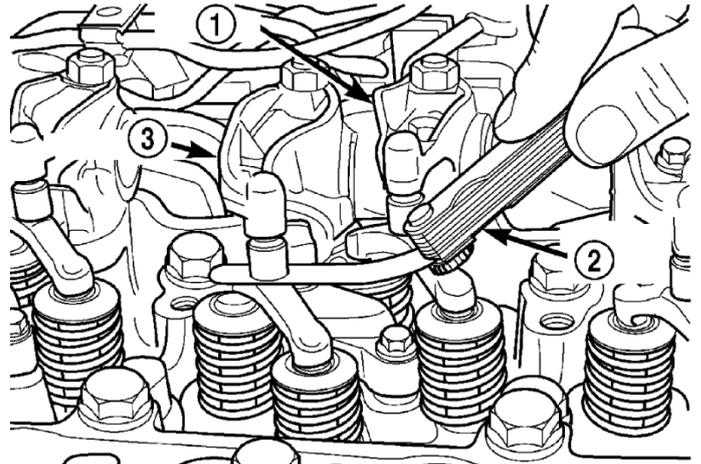
9. Set exhaust valve lash to tolerances:

2003-2004.5:

INTAKE	EXHAUST
0.006 in MIN	0.015 in MIN
0.015 in MAX	0.030 in MAX
0.010 in Optimal	0.020 in Optimal

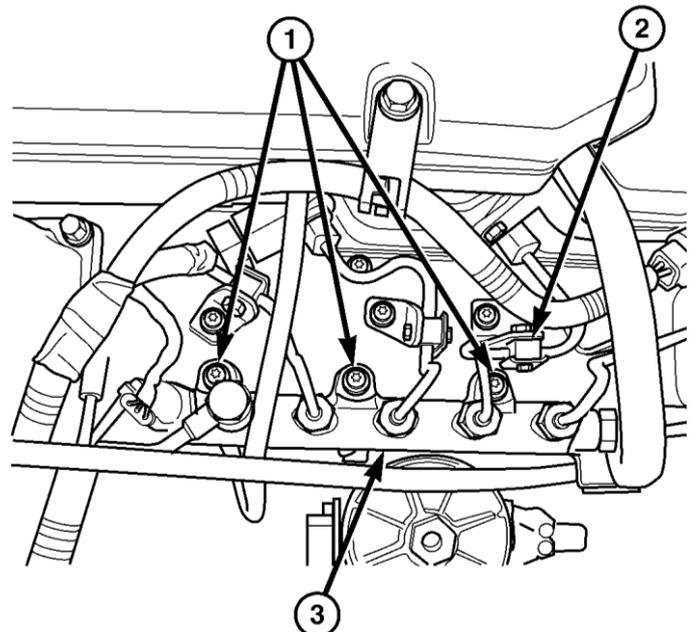
2005-2007:

INTAKE	EXHAUST
0.006 in MIN	0.021 in MIN
0.015 in MAX	0.034 in MAX
0.010 in Optimal	0.026 in Optimal

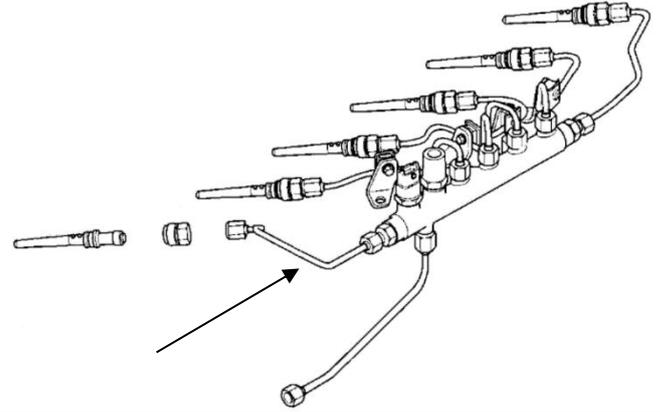


10. Install valve cover, tighten to **24 N.m (18 Ft. Lbs)**

11. Position and install fuel line support clamp (2) bolts or nut, tighten finger tight.



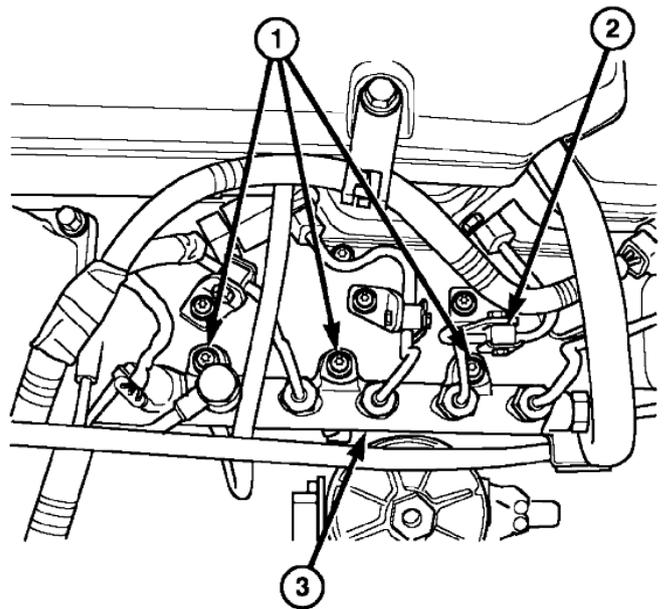
12. Position proper fuel line to proper injector on engine, tighten fittings hand tight at both ends of the line.



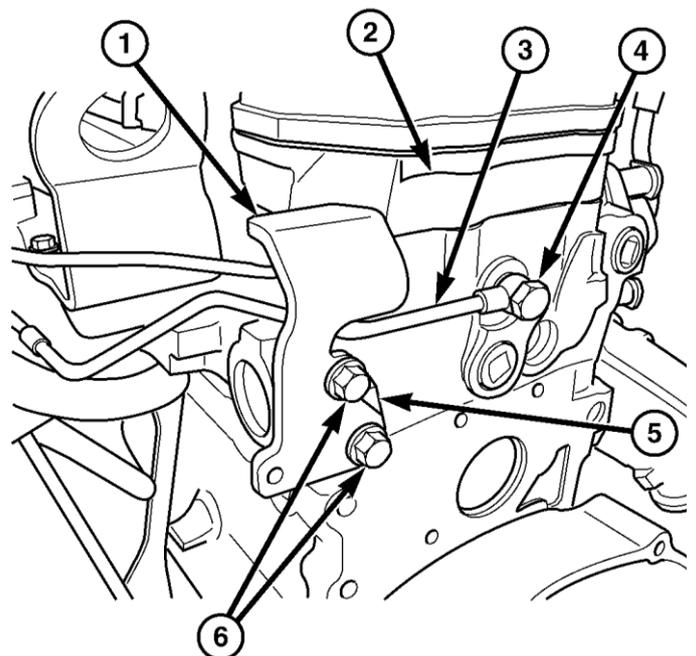
13. Tighten fuel line at cylinder head. Torque nut to **30 N.m. (22 ft. lbs.)**

14. Tighten fuel lines at fuel rail. Torque nut to **37 N.m. (27 ft. lbs.)**

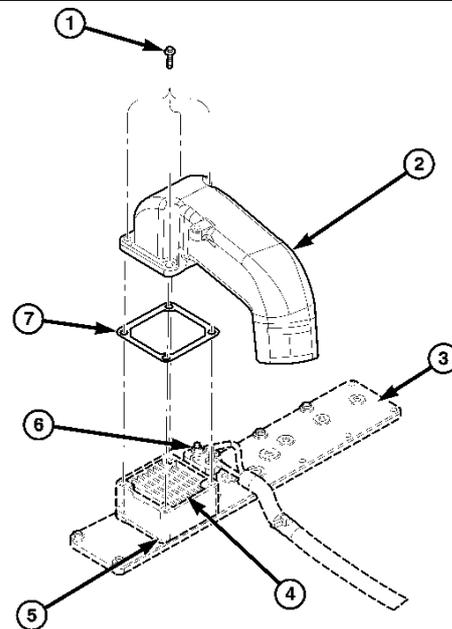
15. Tighten clamp support to intake manifold cover (2). Torque nut to **24 N.m (18 ft. lbs.)**



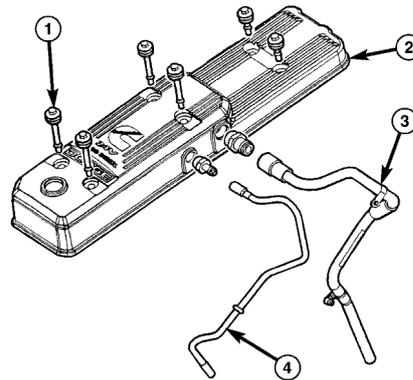
16. Tilt metal bracket upwards and tighten 2 bolts at the rear of cylinder head to **43 N.m. (32 ft. lbs.)**



17. Install the air intake using 2 new gaskets for the heater element (7) (Cummins Part number: 3969988) and tighten 4 housing bolts (1) to **24 N.m. (18 ft. lbs.)**



18. Install breather assembly.
19. Connect rubber connector hose and intake tube to air intake housing. Tighten clamp bolts to 11 N.m. (100 in. lbs.)



20. Replace fuel filter(s).
21. Connect both negative battery terminals to both batteries.



22. Prime fuel system by turning the key to CRANK position and quickly releasing the key to ON position before engine starts. This will allow the fuel transfer pump to run for approximately 25 seconds. Repeat 3 more times to fill the fuel filter.

23. Crank engine, if the engine does not start after 25 seconds, turn key to OFF position and leave for at least 5 seconds. Repeat previous step.



Once all components have been reinstalled, be sure to check all connection points are tight and inspect for leaks.

