

#02-06-01-009C: Higher Than Expected Oil Consumption (Clean Piston Rings) - (Oct 23, 2003)



Higher than Expected Oil Consumption (Clean Piston Rings)

Subject:

Models: 1996-2000 Cadillac Concours
1996-2002 Cadillac Eldorado
1996-2003 Cadillac DeVille, Seville
with 4.6L Engine (VINs Y, 9 -- RPOs LD8, L37)

This bulletin is being revised to add parts information. Please discard Corporate Bulletin Number 02-06-01-009B (Section 06 - Engine).

VIN Breakpoints

Model Year	Model	VIN Breakpoint
1996-2002	All Above	All
2003	DeVille	Prior to 3U213641
2003	Seville	Prior to 3U215818

Condition

Some customers may comment on higher than expected oil consumption. The typical customer with this condition comments on consumption in the range of 0.946L (1 qt) of oil used in 1600-2250 km (1000-1400 mi) of operation. The oil consumption rate and possible oil consumption areas, as per Corporate Bulletin #01-06-01-011 dated March, 2001, should be verified prior to performing the ring cleaning procedure below. The standard for acceptable oil economy and the method for determining oil economy are outlined in Corporate Bulletin #01-06-01-011.

The following text is referenced from Corporate Bulletin #01-06-01-011 for your convenience.

Oil Consumption:

The accepted rate of oil consumption for engines used in the vehicles referenced is 0.946L (1 qt) in 3200 km (2000 mi). This rate only applies to personal use vehicles, under warranty, maintained in accordance with the appropriate maintenance schedule, with less than 58,000 km (36,000 mi), or 80,450 km (50,000 mi) for Cadillac, driven at legal speeds in an unloaded (for trucks) condition.

Cause

Although there are several reasons for less than expected oil economy described in Corporate Bulletin #01-06-01-011, one area not covered is reduced sealing ability of the rings. Through normal usage, combustion chamber deposits may build up to the point that the movement of the rings could become restricted and prevent the rings from wiping all of the oil off the cylinder walls and allowing it to be burned in the combustion process.

Correction

A new ring cleaning process has been developed to restore the function of the rings. Once the possible oil consumption areas in Corporate Bulletin #01-06-01-011 have been eliminated, this cleaning process should be performed. If the oil economy has not improved to 0.946L (1 qt) in 3200 km (2000 mi) after cleaning, it may be necessary to replace the piston rings. Be sure to install the second compression ring notch side down. If the vehicle is a 2000 to 2003 with an oil consumption concern with less than 25,000 miles on the vehicle, then skip the cleaning process and install the new rings.

Important: It is critical in this cleaning process that the piston and ring cleaner remain in the cylinders for a minimum of two hours to fully clean the components. The cleaner solution must be removed before three hours. Additional soak time does not increase the effectiveness of this process. If solution with the dissolved deposits remains in the cylinder too long, it will soak back into the rings and cause them to stick again. If this happens, the oil economy will be reduced even further.

An oil economy test should be performed after the cleaning process is completed. Before starting this test, the full oil level on the dip stick should be noted and shown to the customer. The correct oil fill is 7.1 L (7 ½ qts) with a filter. The dipstick should not be read for at least 15 minutes after the engine has been shut off for an accurate reading. Typically, the oil level shown on the dipstick is in the second or third section above the add mark. If the indicated oil level is at the MAX mark, there is approximately 0.47 L (½ qt) too much in the system and it will be scavenged by the PCV system quickly. When performing this test, the most accurate results may be obtained by having the customer drive the vehicle until the CHECK OIL LEVEL message appears and then returning the vehicle to the dealership to

determine the oil economy. No damage will be done to the engine by operating it until the Check Engine Oil Level message is displayed. There is 4.7 L (5 qts) of oil still in the system.

Field feedback has indicated that vehicles that have been operating at a high consumption rate (0.946L (1 quart) of oil in 1600 km (1000 mi) or less) for greater than 32,000 km (20,000 mi) may need a second application of the piston and ring cleaner to adequately clean the rings. If a second application of piston and ring cleaner is necessary, it can be done immediately after vacuuming out the first application.

Cleaning Procedure

1. Place the vehicle gear range selector in Park.
2. Start the engine. Raise the engine speed to 2000 RPM.
3. Warm the engine coolant temperature to a minimum of 93° C (200° F).
4. Shut the engine off.
5. Remove the ignition coils and module for access when using the evacuation tool.
6. Remove the spark plugs and ensure that none of the pistons are at TDC.
7. Install the induction hose manifold, J 45076-24, (4 hoses) into the front bank of spark plug holes. Press each hose into the spark plug opening to retain the hose.

Important: Remove the original hose from the canister and install the hose provided in the J 45076 kit.

8. Connect the CPF1 canister, J 35800, to the induction manifold.
9. Pour the first can of Piston and Ring Cleaner, P/N 12378549 (in Canada, P/N 88901334), included in kit P/N 12378545 (in Canada, P/N 88901333) into the canister, J 35800-A.
10. Pressurize the canister to 103 kPa (15 psi).

Important: If the hose pops out while inducing cleaner into the cylinder, simply reinsert the hose back into the hole.

11. Open the valve on the canister hose to induce the first can of Piston and Ring Cleaner into the front bank of cylinders.
12. Depressurize the canister (use the pressure regulator to release pressure, then close the canister valve) and remove it from the 4 hose manifold.
13. Move the 4 hose manifold to the rear bank of cylinders.
14. Pour the second can of Piston and Ring Cleaner into the canister and reconnect the canister to the manifold.
15. Pressurize the canister to 103 kPa (15 psi).
16. Open the valve on the canister hose to induce second can of Piston and Ring Cleaner into the back bank of cylinders.
17. When the canister is empty, depressurize it (use the pressure regulator to release the pressure, then close the canister valve) and disconnect the canister, J 5800-A, from the manifold. Remove the induction hose manifold assembly from the engine.

Important: The piston and ring cleaner solution must remain in the cylinder for a minimum of two hours. If the solution is removed in less than two hours, the cleaning process will not be 100% effective and may not correct the condition. Additionally, do not allow the cleaning solution to remain in the engine more than

three hours. If the dissolved solution is left in the cylinders more than three hours, it will soak back into the rings and cause the rings to stick again.

18. Allow the chemical to remain in the engine cylinders a minimum of two hours.

Important: While evacuating the cleaning solution from each cylinder, manipulate the hose around the circumference of the cylinder to ensure all fluid is removed.

19. After the two hour soak period, connect the evacuation pump assembly, J 45076-2, to shop air and evacuate the piston and ring cleaner solution from each cylinder through the spark plug hole.

20. Properly dispose of used cleaning solution by putting it into waste oil.

Important: If a second application of piston and ring cleaner is necessary (see Correction above), repeat Steps 7 through 20.

21. Change the engine oil. The filter will be changed after the road test.

22. Add 6.6 L (7 qts) of oil and inspect for visible oil leaks.

23. Place shop rags over all plug holes and intermittently bump over engine to ensure no hydraulic lock is present.

24. Crank the engine continuously for 20 seconds.

25. Remove the rags and reinstall the spark plugs.

26. Reinstall the ignition coil module.

27. Remove the mass air flow (MAF) sensor and the air cleaner for access to the throttle body.

28. Use the aerosol Throttle Body Cleaner, P/N 12378550 (in Canada, P/N 88901335), included in kit P/N 12378545 (in Canada, P/N 88901333) and manually clean the throttle body and the idle air control (IAC).

29. Remove the exhaust gas recirculation (EGR) valve.

30. Install EGR Cleaner adapter J 45076-45 and throttle body cleaner adapter. For 1996-1999 models use the J 45076-46 throttle body adapter. For 2000-2003 models use the J 45076-55 throttle body adapter. The J 45076-55 is held in place by the air intake duct.

31. Remove the position crankcase ventilation (PCV) valve. Inspect for proper operation and clean or replace as necessary.

32. Connect vehicle exhaust pipes to shop ventilation system.

33. Pour induction cleaner, P/N 12378552 (in Canada, P/N 88901336), included in kit P/N 12378545 (in Canada, P/N 88901333) into the CPFI canister, J 35800-A, and connect the canister to the EGR Cleaner Adapter and Throttle Body Cleaner Adapter, J 46076-46.

34. Pressurize the canister to 138 kPa (20 psi).

35. Start the engine. Connect the Tech 2® and raise the engine RPM to 1100 RPM with Tech 2® at F3- RPM Output.

36. Open the valve on the canister to induce the induction cleaner through the MAF and the EGR Adapter. Regulate the air pressure to obtain a good fan pattern of the solution into the throttle body, but not so much that the fluid overflows out of the throttle body.

37. When the canister has been emptied (use the pressure regulator to release pressure then close the canister valve), exit the Tech 2® F-3 function to reduce the engine RPM to normal idle speed.

38. Turn the ignition to Off.

39. Remove the EGR Cleaner Adapter and the Throttle Body Cleaner Adapter, J 45076-45 and J 45076-46.
40. Reinstall the EGR valve, MAF Sensor and air cleaner.
41. Use the Tech 2® to clear any DTCs set during the cleaning procedure. Disconnect Tech 2®.

Notice: Start the vehicle and gradually increase the RPM to 2000 RPM in park. Engine damage could result from any fluid left on top of the piston if RPM is increased too quickly.

42. Maintain the RPM at 2000 for 1-3 minutes. Then promptly road test the vehicle for a minimum of 20 minutes in the third gear range. Include several short, wide open throttle bursts.
43. After the road test, allow the engine to idle for one minute with the A/C off and the gear selector in the PARK position.
44. Connect the Tech 2® and inspect and clear any codes from the road test. An EGR pintle code may set from debris binding the valve. Clean the EGR valve, if necessary.
45. Turn the ignition to Off. Disconnect the Tech 2®.
46. Change the engine oil and filter.
47. Verify the oil level.
48. Reset the Engine Oil Life monitor.

Important: It is not necessary to deglaze the cylinder walls when installing the new rings. The new rings can be installed in the cylinder bore as they are. The bores should be inspected for any cracks or damage before reassembly.

If the post oil consumption test results for a 2000 to 2003 vehicle indicate the oil economy is still less than 0.946L (1 qt) in 3200 km (2000 mi) on vehicles still in the warranty period, then the piston rings should be replaced. The new part number for the piston rings is 89017413. Be sure to install the second compression ring notch side down. Rings with the increased tension and other improvements are now available for the 1996 to 1999 vehicles. That ring package is P/N 89017431.

Important: There is a new head bolt torque angle specification that should be used when installing the head bolts. The new spec is 175 degrees total torque angle (the previous specification was 190 total degrees). The 15 degree reduction should be subtracted from the final pass. The final pass would be 45 degrees instead of 60 degrees. This new specification will reduce the possibility of head bolt thread damage and localized stresses, but still provide the necessary clamp load.

Parts Information

Part Number	Description	Qty
12378545 (U.S.)	Kit, Engine Cleaner	1

88901333 (Canada)		
12378549 (U.S.) 88901334 (Canada)	Piston and Ring Cleaner (for second application)	1 (if req'd)
3522442	Gasket, EGR Mounting	1
6487532	Valve, PCV	1 as req'd
89017413	Piston Ring Kit 2000 to 2003 Model Years	8 as req'd
89017431	Piston Ring Kit 1996 to 1999 Model Years	8 as req'd

Parts are currently available from GMSPO.

Warranty Information

For vehicles repaired under warranty, use:

Labor Operation	Description	Labor Time
J1952	Engine Cylinder Cleaning	3.2 hrs
	Add for second application (if req'd)	0.7 hr
J1307	Piston, Rod And/Or Rings - One Cyl - Both Banks - Replace	Use published Time