

6.0L DIESEL COOLING SYSTEM CONTAMINATION FLUSH PROCEDURE

TSB 08-23-1

FORD:
2003-2005 Excursion

2003-2007 F-Super Duty
2004-2008 E-Series

ISSUE

Some 2003-2005 Excursion, 2003-2007 F-Super Duty and 2004-2008 E-Series vehicles equipped with a 6.0L engine may experience engine oil, transmission fluid or diesel fuel contaminating the cooling system. This flushing procedure is to be performed after the source of the cooling system contamination has been identified and repaired.

ACTION

Follow the Service Procedure steps to correct the condition.

SERVICE PROCEDURE

Follow the steps in sequence to effectively repair the vehicle:

- Drain cooling system contaminants.
- Clean cooling system with Simple Green® Heavy Duty Cleaner and Degreaser.
- Clean cooling system with Motorcraft® Engine Cooling System Iron Cleaner.

NOTE

ALL STEPS MUST BE COMPLETED IN ORDER TO PROPERLY CLEAN THE COOLING SYSTEM. ANY DEVIATION FROM THE SERVICE PROCEDURE WILL RESULT IN SHORTENED COOLANT PROTECTION AGAINST CORROSION IN THE COOLING SYSTEM.

1. Determine cooling system condition. Is the contaminated coolant in a flowable, liquid or milky state?
 - a. No - Do not proceed as this procedure does not apply. (Non-Flushable Examples Figures 1-3)

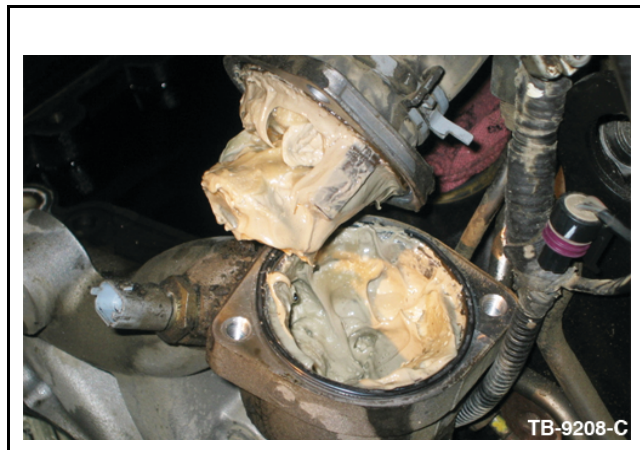


Figure 1 - Article 08-23-1

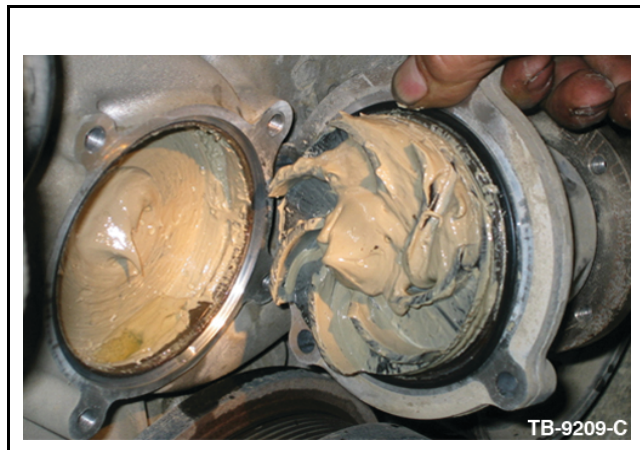


Figure 2 - Article 08-23-1

NOTE: The information in Technical Service Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers". Do not assume that a condition described affects your car or truck. Contact a Ford, Lincoln, or Mercury dealership to determine whether the Bulletin applies to your vehicle. Warranty Policy and Extended Service Plan documentation determine Warranty and/or Extended Service Plan coverage unless stated otherwise in the TSB article. The information in this Technical Service Bulletin (TSB) was current at the time of printing. Ford Motor Company reserves the right to supersede this information with updates. The most recent information is available through Ford Motor Company's on-line technical resources.

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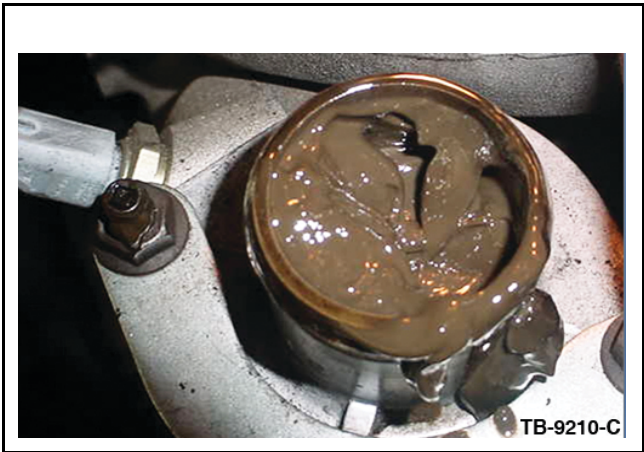


Figure 3 - Article 08-23-1

- b. Yes - Proceed to Step 2. (Flushable Examples Figures 4-5)



Figure 4 - Article 08-23-1



Figure 5 - Article 08-23-1

2. Fabrication - Prior to starting the flush procedure, obtain the following items.

Locally Obtained Supplies	
Quantity	Description
3 Gal.	Simple Green® Heavy-Duty Cleaner And Degreaser
2	Heater Hose 3/4" (19 mm) diameter hose by 24" (61 cm) long
1	Garden Hose 5/8" (16 mm) or 3/4" (19 mm) diameter
6	Hose Clamps Number 12
3	Hose Coupling Adaptors 3" (7.6 cm) to 4" (10 cm) in length
	* Using 5/8" (16 mm) garden hose - use 5/8" (16 mm) x 3/4" (19 mm) coupling adaptors
	* Using 3/4" (19 mm) garden hose - use 3/4" (19 mm) x 3/4" (19 mm) coupling adaptors

- a. Obtain two (2) hose coupling adapters and one (1) garden hose. The garden hose can be either a 5/8" or 3/4". The couplings can be 5/8" x 3/4" or 3/4" x 3/4" depending on the size garden hose used. On the vehicle the hose and thermostat ports are 3/4" in size. (Figure 6)

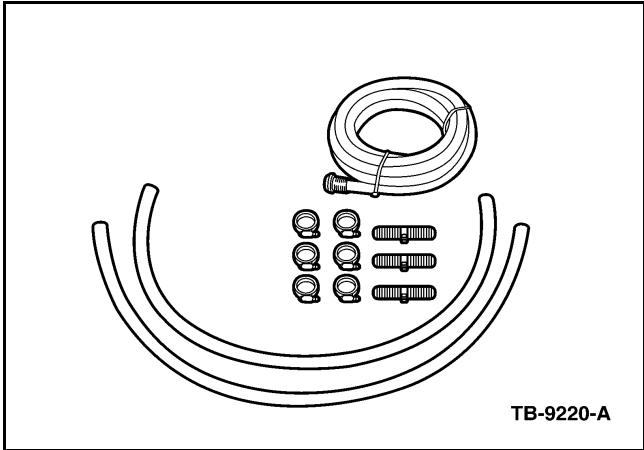


Figure 6 - Article 08-23-1

- b. Using a 3/4" coupling adapter and hose clamps, cut the garden hose to length (the hose must reach from the vehicle to a fresh water supply faucet). Attach a 2' (61 cm) length of heater hose to the garden hose to be used as the fresh water supply. (the heater hose will prevent kinking at the tight area of the engine compartment). (Figure 7)

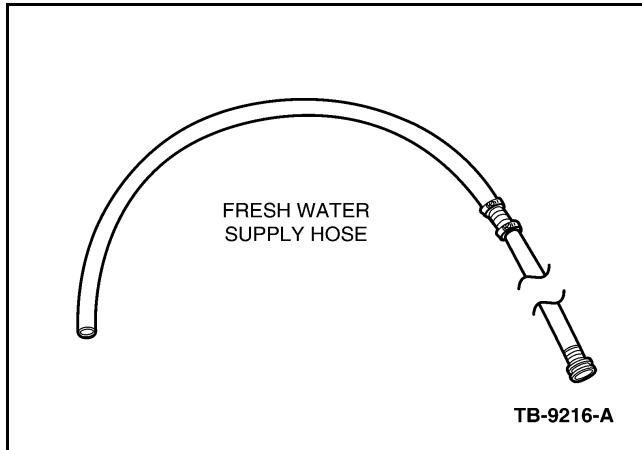


Figure 7 - Article 08-23-1

- c. Using a 3/4" coupling adapter and hose clamps, attach a 2' (61 cm) length of heater hose to the remaining section of garden hose to be used as the drain hose (the heater hose will prevent kinking at the tight area of the engine compartment). (Figure 8)

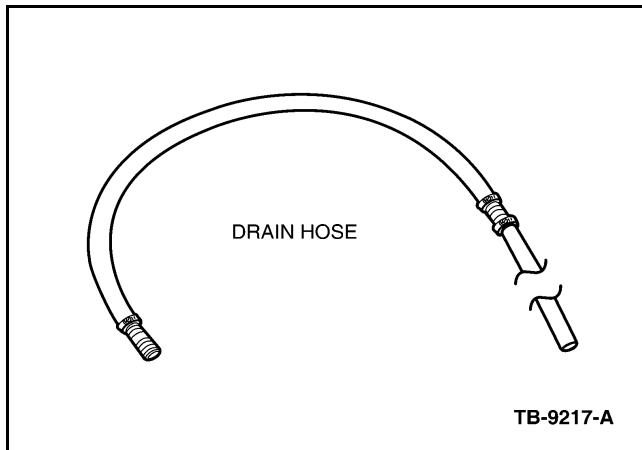


Figure 8 - Article 08-23-1

WARNING

ALWAYS ALLOW ENGINE TO COOL BEFORE OPENING THE COOLING SYSTEM. DO NOT UNSCREW THE COOLANT PRESSURE RELIEF CAP WHEN THE ENGINE IS OPERATING OR COOLING SYSTEM IS HOT. THE COOLING SYSTEM UNDER PRESSURE; STEAM AND HOT LIQUID CAN COME OUT FORCEFULLY WHEN THE CAP IS LOOSENEED SLIGHTLY.

NOTE

USE OF HOT WATER, DURING THIS PROCEDURE IF AVAILABLE, WILL IMPROVE REMOVAL OF PETROLEUM BASED COOLING SYSTEM CONTAMINATES.

3. Drain the cooling system. Refer to Workshop Manual (WSM), Section 303-03, Cooling System Draining, Filling and Bleeding . Leave the radiator draincock open.
4. Remove the thermostat. Refer to WSM, Section 303-03.
5. Position the thermostat housing assembly in the vise. Press down on the thermostat crossbar and rotate the thermostat to remove it from the thermostat housing assembly. (Figure 9)

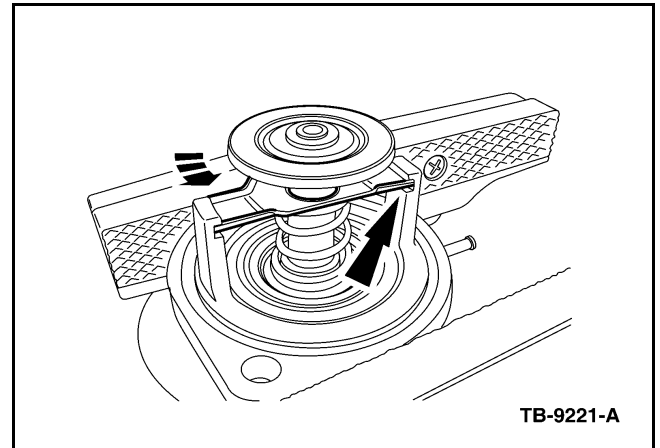


Figure 9 - Article 08-23-1

6. Reuse the old O-ring seal during the flushing procedure. Install the thermostat housing assembly without the thermostat. Install the bolts. Tighten to 17 lb-ft (23 N•m).

NOTE

E-SERIES ONLY - DO NOT INSTALL THE AIR DEFLECTOR AT THIS TIME.

7. Remove the left hand (LH) cylinder block drain plug and drain the cylinder block. (Figure 10)

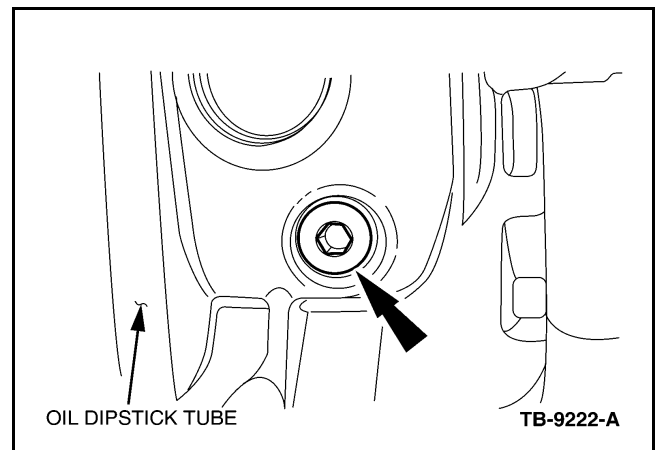


Figure 10 - Article 08-23-1

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8. Insert the fresh water supply hose into the degas bottle. Flush the left hand LH cylinder block with fresh water through the degas bottle to remove contaminants.
9. Lightly lubricate the O-ring seal on the cylinder block drain plug with clean engine oil before installing. Install the LH cylinder block drain plug. Tighten to 177 lb-in (20 N•m).
10. Remove the starter. Refer WSM, Section 303-06B.
11. Remove the right hand (RH) cylinder block drain plug and drain the cylinder block. (Figure 11)

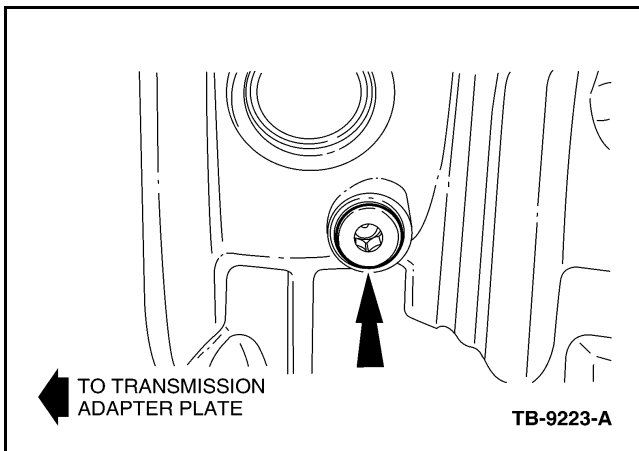


Figure 11 - Article 08-23-1

12. Insert the fresh water supply hose into the degas bottle. Flush the RH cylinder block with fresh water through the degas bottle to remove contaminants.
13. Lightly lubricate the O-ring seal on the cylinder block drain plug with clean engine oil before installing. Install the RH cylinder block drain plug. Tighten to 177 lb-in (20 N•m).
14. Install the starter. Refer to WSM, Section 303-06B.

NOTE

FIGURES SHOWN AND IDENTIFIED AS F-SERIES APPLY TO EXCURSION.

15. Disconnect the heater return hose at the heater return port below the coolant recovery tank. (Figures 12-13)

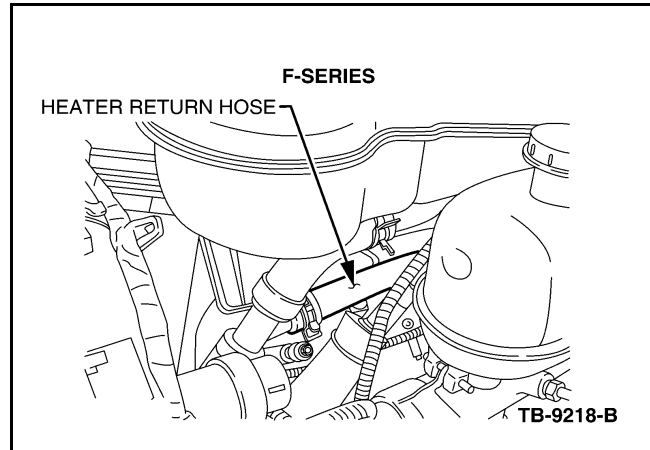


Figure 12 - Article 08-23-1

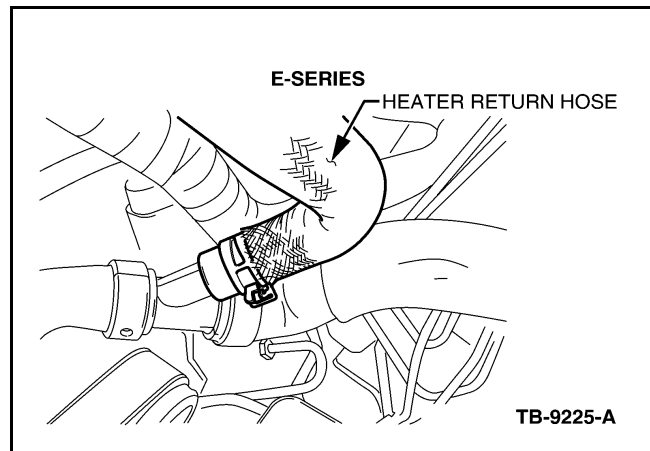


Figure 13 - Article 08-23-1

16. Connect the fabricated fresh water supply hose to the heater return port below the coolant recovery tank. (Figures 14-15)

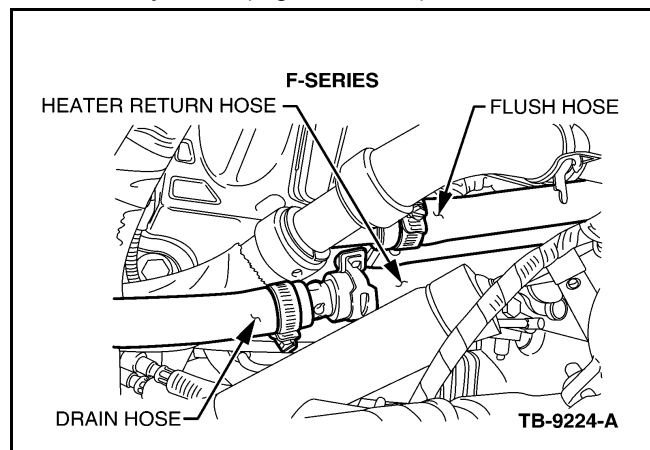


Figure 14 - Article 08-23-1

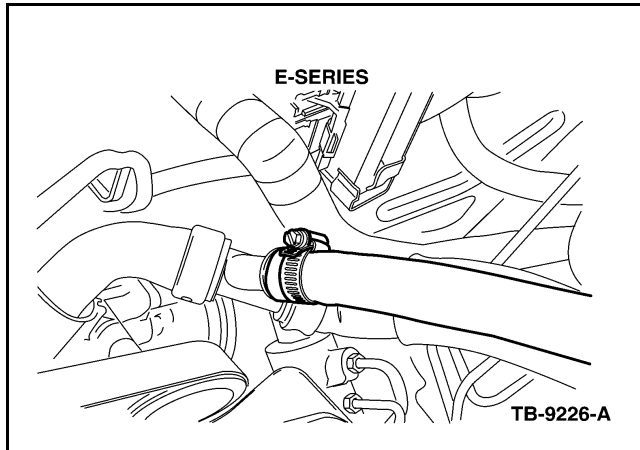


Figure 15 - Article 08-23-1

17. Using a 3/4" coupling adapter and clamps, attach the fabricated drain hose to the heater return hose. (Figures 14-16)

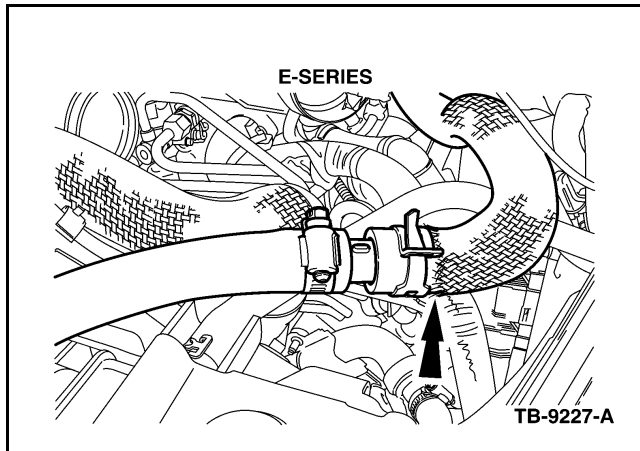


Figure 16 - Article 08-23-1

18. Turn on the fresh water supply and allow the water to flush the cooling system of contaminants.
 - a. E-Series vehicles, proceed to Step 19.
 - b. F-Series and Excursion vehicles,
 - (1) Vehicles with standard heater, disconnect the vacuum hose at the heater control valve to open the heater core flow.
 - (2) Vehicles with an Electronic Automatic Temperature Control (EATC) heater, turn the ignition key to the on position and adjust the heater control to the full hot position to allow coolant flow during the cooling system flush.

19. Disconnect the flush hoses from the heater return port and heater return hose. (Figures 14 through 16)
20. Connect the heater return hose to the heater return port.
21. Close the radiator draincock.
22. Fill the cooling system with an appropriate mixture of water and Simple Green® Heavy Duty Cleaner and Degreaser. Follow the manufacturer's direction for heavy cleaning.
23. Using a scan tool, select the active command and set the engine RPM to 1,175. Run the engine for one (1) hour.

NOTE

FAILURE TO RUN THE ENGINE AT 1,175 RPM FOR ONE (1) HOUR WILL RESULT IN INSUFFICIENT CLEANING OF THE COOLING SYSTEM.

NOTE

ADJUST THE HEATER CONTROL TO THE FULL HOT POSITION TO ALLOW COOLANT FLOW DURING THE COOLING SYSTEM FLUSH. RECONNECT THE HEATER CONTROL VALVE VACUUM HOSE IF PREVIOUSLY DISCONNECTED.

24. Return the engine to idle speed, shut the engine off and allow the engine to cool before opening the cooling system. Do not unscrew coolant pressure relief cap when the cooling system is hot. Once pressure is released, remove the pressure relief cap and drain the cooling system. Refer to WSM, Section 303-03 Cooling System Draining, Filling and Bleeding. Leave the radiator draincock open.
25. Remove the LH cylinder block drain plug and drain the cylinder block.

NOTE

THE RH CYLINDER BLOCK DRAIN PLUG IS NOT REMOVED AT THIS TIME.

26. Disconnect the heater return hose at the heater return port below the coolant recovery tank. (Figures 12-13)
27. Connect the fabricated fresh water supply hose to the heater return port below the coolant recovery tank. (Figures 14-15)

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28. Using a 3/4" coupling adapter and clamps, attach the drain hose to the heater return hose. (Figures 14-16)
29. Turn on the fresh water supply and allow the water to rinse the cooling system until the water is clear of foam, bubbles or discoloration.
 - a. E-Series vehicles, proceed to Step 30.
 - b. F-Series and Excursion vehicles,
 - (1) Vehicles with standard heater, disconnect the vacuum hose at the heater control valve to open the heater core flow.
 - (2) Vehicles with an EATC heater, turn the ignition key to the on position and adjust the heater control to the full hot position to allow coolant flow during the cooling system flush.
30. Disconnect the flush hoses from the heater return port and heater return hose. (Figures 14 through 16)
31. Reconnect the heater return hose to the heater return port.
32. Lightly lubricate the O-ring seal on the cylinder block drain plug with clean engine oil before installing. Install the LH cylinder block drain plug and tighten to 177 lb-in (20 N•m).
33. Close the radiator draincock.
34. Fill the cooling system with water and two (2) quarts (1.89 L) of Motorcraft® Engine Cooling System Iron Cleaner.
 - a. For vehicles with auxiliary or aftermarket heaters, use three (3) quarts (2.83 L) of Motorcraft® Engine Cooling System Iron Cleaner.
35. Adjust heater controls to full hot position.
 - a. E-Series vehicles, proceed to Step 36.
 - b. F-Series and Excursion vehicles,
 - (1) Vehicles with standard heater, disconnect the vacuum hose at the heater control valve to open the heater core flow.

- (2) Vehicles with an EATC heater, turn the ignition key to the on position and adjust the heater control to the full hot position to allow coolant flow during the cooling system flush.

36. Using a scan tool, select the active command and set the engine RPM to 1,175. Run the engine for one (1) hour.

NOTE

FAILURE TO RUN THE ENGINE AT 1,175 RPM FOR ONE (1) HOUR WILL RESULT IN INSUFFICIENT CLEANING OF THE COOLING SYSTEM.

37. Return the engine to idle speed, shut the engine off and allow the engine to cool before opening the cooling system. Do not unscrew the coolant pressure relief cap when the cooling system is hot.
38. Once pressure is released, remove the pressure relief cap and drain the cooling system. Refer to WSM, Section 303-03. Leave the draincock open.
39. Remove the LH cylinder block drain plug and drain the cylinder block.
40. Remove the starter. Refer to WSM, Section 303-06B.
41. Remove the RH cylinder block drain plug and drain the cylinder block.
42. Flush the cooling system with clean water through the degas bottle to completely remove the Motorcraft® Engine Cooling System Iron Cleaner, until the water is free of foam, bubbles or discoloration.
 - a. E-Series vehicles, proceed to Step 43.
 - b. F-Series and Excursion vehicles,
 - (1) Vehicles with standard heater, disconnect the vacuum hose at the heater control valve to open the heater core flow.
 - (2) Vehicles with an EATC heater, turn the ignition key to the on position and adjust the heater control to the full hot position to allow coolant flow during the cooling system flush.

NOTE

FAILURE TO FLUSH ALL THE MOTORCRAFT® ENGINE COOLING SYSTEM IRON CLEANER FROM THE COOLING SYSTEM WILL RESULT IN SHORTENED COOLANT PROTECTION AGAINST CORROSION OF THE COOLING SYSTEM.

43. Disconnect the heater return hose at the heater return port below the coolant recovery tank. (Figures 12-13)
44. Connect the fabricated fresh water supply hose to the heater return port below the coolant recovery tank. (Figures 14-15)
45. Using a 3/4" coupling adapter and clamps, attach the drain hose to the heater return hose. (Figures 14 and 16)
46. Turn on the fresh water supply and allow the water to rinse the heater core system until the water is clear of foam, bubbles or discoloration.
47. Disconnect the flush hoses from the heater return port and heater return hose.
48. Reconnect the heater return hose to the heater return port.
49. Repeat flushing of the cooling system with clean water through the degas bottle to completely remove the Motorcraft® Engine Cooling System Iron Cleaner until the water is free of foam, bubbles or discoloration.

NOTE

FAILURE TO PERFORM STEP 49 WILL RESULT IN SHORTENED COOLANT PROTECTION AGAINST CORROSION OF THE COOLING SYSTEM.

50. F-Series and Excursion vehicles only, reconnect the vacuum hose to the heater control valve.

NOTE

IF VEHICLE IS EQUIPPED WITH AN AUXILIARY OR AFTERMARKET HEATER, BACKFLUSH THIS HEATER CORE. REFER TO WSM, SECTION 303-03.

51. Close the radiator draincock.
52. Remove the thermostat housing assembly. Refer to WSM, Section 303-03.
53. Remove and discard the O-ring seal.

54. Position the thermostat housing assembly in a suitable vise. Press down on the thermostat crossbar and rotate the thermostat to install it in the thermostat housing assembly. (Figure 9)
55. Install a new O-ring seal and install the thermostat housing assembly. Tighten to 177 lb-in (20 N•m). Refer to WSM, Section 303-03.
56. Lightly lubricate the O-ring seal on the cylinder block drain plug with clean engine oil and install the RH cylinder block drain plug. Tighten to 177 lb-in (20 N•m).
57. Install the starter. Refer to WSM, Section 303-06B.
58. Lightly lubricate the O-ring seal on the cylinder block drain plug with clean engine oil and install the LH cylinder block drain plug. Tighten to 177 lb-in (20 N•m).
59. Fill the cooling system. Refer to WSM, Section 303-03.

PART NUMBER	PART NAME
3C3Z-8255-AA	O-Ring
VC-9	Motorcraft® Engine Cooling System Iron Cleaner
VC-7-B	Motorcraft® Premium Gold Engine Coolant with Bittering Agent
Obtain Locally	Simple Green® Heavy Duty Cleaner and Degreaser (3 Gallons Required)
Obtain Locally	Garden Hose 5/8" (16 mm) or 3/4" (19 mm) diameter
Obtain Locally	Hose Clamps Number 12 (6 Required)
Obtain Locally	Hose Coupling Adaptors 5/8" (16 mm) by 3/4" (19 mm) or 3/4" (19 mm) by 3/4" (19 mm) depending on Garden Hose size (3 Required)
Obtain Locally	Heater Hose 3/4" (19 mm) diameter hose by 24" (61 cm) long

WARRANTY STATUS: Eligible Under Provisions Of New Vehicle Limited Warranty Coverage
IMPORTANT: Warranty coverage limits/policies are not altered by a TSB. Warranty coverage limits are determined by the identified causal part.

OPERATION	DESCRIPTION	TIME
082301A	2003-2007 F-Super Duty 6.0L: Flush The Engine Cooling System (Do Not Use With 8005B)	4.3 Hrs.

TSB 08-23-1 (Continued)

082301A	2004-2008 E-Series 6.0L: Flush The Engine Cooling System (Do Not Use With 8005B)	5.4 Hrs.
082301A	2003-2005 Excursion 4X2, 4X4: Flush the Engine Cooling System. Includes Time For Rear Heater Core If Necessary	4.5 Hrs.

DEALER CODING

BASIC PART NO.	CONDITION CODE
6A642	D1