



V8 XJ Series/XK

DATE 06/97
Amended 09/01

303-11

SERVICE

TECHNICAL BULLETIN

Poor Heater Performance – Coolant Specification Change – Repair Procedure

MODEL
1997-99 MY XK Range
1998-99 MY V8 XJ Series
VIN
001001-042635
812256-878274

Remove and destroy Bulletin 303-11, dated 6/97.
Replace with this Bulletin which supersedes
Service Action S813. The procedure has been
rewritten to include V8 XJ Series vehicles.

This Technical Bulletin supersedes Service Action S813 and no further claims will be accepted under S813. All Warranty Claims must now be made under this Technical Bulletin.

Issue:

On some vehicles within the above VIN ranges, the antifreeze solution in the cooling system may deteriorate, causing reduced circulation through the heater core, resulting in poor heater performance. The following procedure has been produced to eliminate this problem:

Action:

In case of a customer complaint of lack of heat from the heating system on a vehicle within the above VIN ranges, a Workshop Procedure has been produced to eliminate the problem.

Workshop Procedure

STEP 1: HEATER CORE COOLANT CIRCULATION TEST

Note: This procedure is required for all vehicles produced prior to the introduction of XLC Extended Life Coolant (introduced after VIN 042635 XK Range vehicles and VIN 878274 for V8 XJ Series vehicles), and have experienced low heater performance and where heater blocking is suspected.

1. Start and run the engine at approximately 2000 rpm until normal coolant temperature is reached.
2. Press heater auto switch to 'HI' setting and press the A/C switch, thus selecting maximum heater output temperature and maximum fan speed.

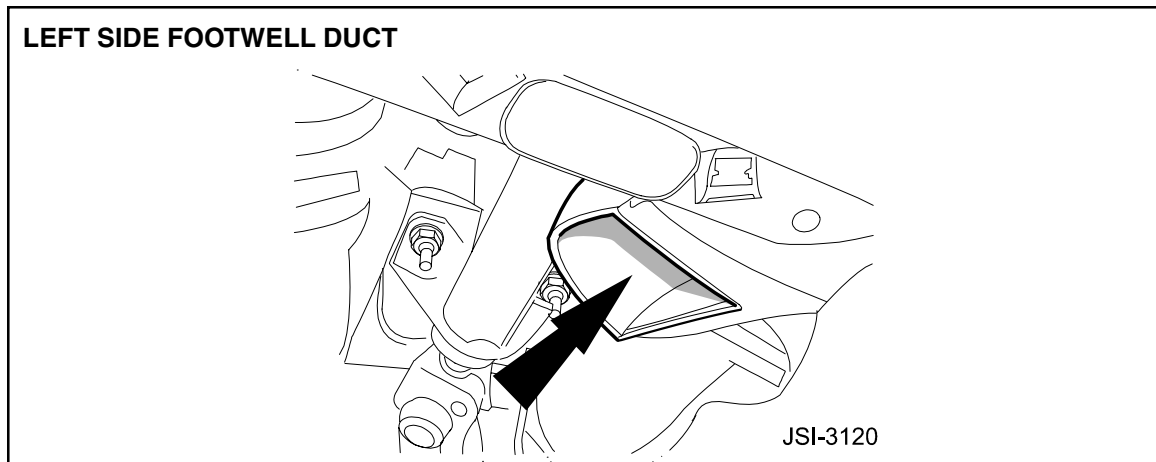


ILLUSTRATION 1

3. Power the left side seat fully rearward and place the probe of an electronic thermometer in the left side foot well outlet duct, ensuring the probe is in the hot air stream and not in contact with the duct (Illustration 1). Maintain the engine speed at 2000 rpm and allow the temperature reading to stabilize.
4. Switch off the engine and return the seat to its normal position.

Note: If a temperature reading of LESS than 40 °C (104 °F) is indicated, the coolant circulation rate through the heater core is unsatisfactory. In this event, proceed to Step 2 Chemical flushing procedure.

If a temperature reading of MORE than 40 °C (104 °F) has been indicated, the coolant circulation rate through the heater core is satisfactory. In this event, the heater system is working correctly and no further action is required.

STEP 2: CHEMICAL FLUSHING PROCEDURE

1. Release and open hood.
2. Place covers over the fenders.
3. Remove the pressure cap from the coolant header tank.

⚠ Warning: The cooling system may be pressurized and hot.

4. Raise the vehicle on lift.
5. On XK series vehicles only, remove the generator-cooling duct.
6. On all vehicles, position a suitable container under the radiator and remove the radiator drain plug.

⚠ Warning: Coolant will be hot!

7. Allow the cooling system to drain as much as possible.

⚠ Caution: Immediately wash away any coolant spilled on the vehicle bodywork.

8. In place of the radiator drain plug, install and tighten the radiator flushing adaptor tool. (XK

Series vehicles Part Number 100-020, V8 XJ Series vehicles Part Number 100-022).

9. Connect a suitable hose to the adaptor using a worm drive clip to retain the hose.

Note: The hose must be long enough to enable coolant subsequently flushed from the system to be drained without any possibility of the flushing solution coming into contact with the vehicle bodywork.

Note: Suitably clamp the hose to prevent water flowing during the following operations:

10. Remove the container from under the vehicle and lower the lift.
11. Place a cloth below the coolant header tank.
12. Remove the clip on the hose from the header tank to recovery bottle and disconnect the hose.
13. For access on **XK series vehicles**, release and remove the air cleaner cover, mass air flow sensor and air intake hose assembly. For access on **V8 XJ series vehicles**, remove the engine compartment rear cover.

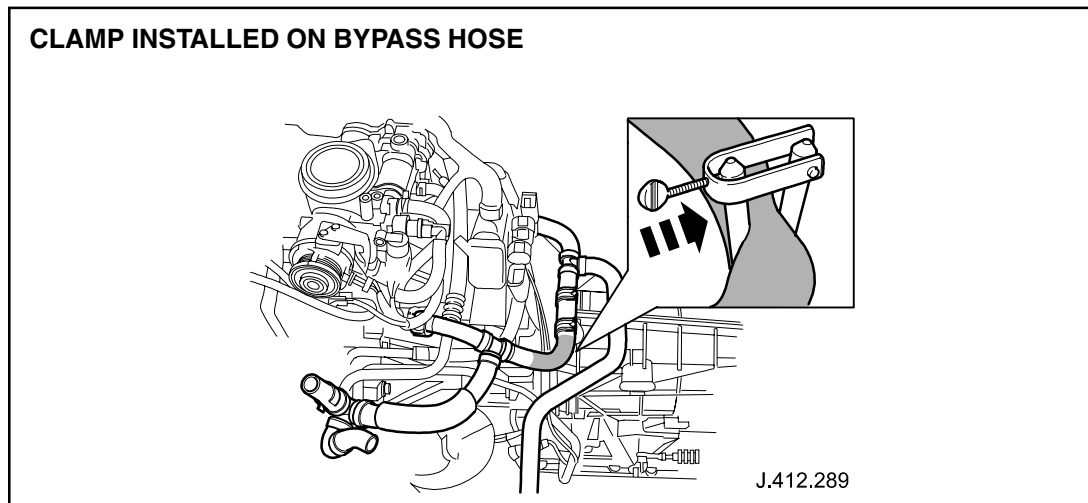



ILLUSTRATION 2

14. On all vehicles, install a suitable clamp on the heater bypass hose between the one-way valve and the T-piece (Illustration 2).
15. On XK series vehicles, reinstall the air cleaner cover, mass air flow sensor and air intake assembly.
16. On all vehicles, remove the air purge breather cap and refill the cooling system with clean plain water via the header tank, until the level stabilizes at the top of the breather neck.
17. Reinstall the air purge breather cap.
18. Fill up coolant header tank.
19. Install and tighten coolant pressure cap.
20. Start and run the engine at approximately 2000 rpm for 5 minutes with the climate controls set as previously.
21. Switch off the engine.

22. Remove the pressure cap from the coolant header tank.


 **Warning:** The cooling system will be pressurized and hot.

23. Raise the vehicle lift.
24. Release the clamp from the hose attached to the radiator-flushing adaptor and drain off the coolant.


 **Warning:** Coolant will be hot!

25. Reclamp the hose and lower the lift.

Note: Before beginning with the following procedure, carefully examine the contents of the Radiator Flushing Kits (Part Number JLM 20361). Each kit contains two bottles of flushing solution, part 1 (blue label) and part 2 (pink label). **Each box contains two kits to provide the required quantity for one vehicle.** Select the two bottles of part 1 flushing solution.

 **Warning:** It is important to wear protective clothing and goggles when working with chemical solutions.

26. Remove the air purge breather cap.
27. Use a funnel to ensure that no spillage occurs and pour the two (2) bottles of **part 1 solution** into the coolant reservoir. Continue to refill the cooling system with clean plain water until the level stabilizes at the top of the breather neck.
28. Reinstall the air purge breather cap.

 **Caution:** Immediately wash away any coolant spilled on the vehicle bodywork.

29. Fill up coolant header tank.
30. Install and tighten coolant pressure cap.
31. Start and run the engine at 2500 – 3000 rpm for 30 minutes, with the climate controls set as previously.
32. Switch off the engine.
33. Remove the pressure cap from the coolant header tank.


 **Warning:** The cooling system will be pressurized and hot.

34. Raise the vehicle lift.
35. Release the clamp from the hose attached to the radiator-flushing adaptor and drain off the coolant and flushing solution.

 **Warning:** Coolant will be hot!

36. Reclamp the hose and lower the lift.
37. Remove the air purge breather cap.


38. Via the header tank, refill the cooling system with clean plain water until the level stabilizes at the top of the breather neck.
39. Reinstall the air purge breather cap.
40. Fill up coolant header tank.
41. Install and tighten coolant pressure cap.
42. Start the engine and run at approximately 2000 rpm for 5 minutes with the climate controls set as previously.
43. Switch off the engine.
44. Remove the pressure cap from the coolant header tank.

 **Warning:** The cooling system will be pressurized and hot.


45. Raise the vehicle lift.
46. Release the clamp from the hose attached to the radiator-flushing adaptor and drain off the coolant.

 **Warning:** Coolant will be hot!

47. Reclamp the hose and lower the lift.
48. Remove the air purge breather cap.
49. Via the header tank, using a funnel, pour the contents of the **TWO** bottles of **SECOND** Flushing Solution into the cooling system. Continue to refill the cooling system with clean plain water via the header tank until the level stabilizes at the top of the breather neck.
50. Reinstall the air purge breather cap.

 **Caution:** Immediately wash away any coolant spilled on the vehicle bodywork.

51. Fill up coolant header tank.
52. Install and tighten coolant pressure cap.
53. Start and run the engine at 2500 – 3000 rpm for 15 minutes, with the climate controls set as previously.
54. Switch off the engine.
55. Remove the pressure cap from the coolant header tank.

 **Warning:** The cooling system will be pressurized and hot.

56. Raise the vehicle lift.
57. Release the clamp from the hose attached to the radiator-flushing adaptor and drain off the coolant and flushing solution.

 **Warning:** Coolant will be hot!

58. Reclamp the hose and lower the lift.
59. Remove the air purge breather cap.


60. Via the header tank, refill the cooling system with clean plain water until the level stabilizes at the top of the breather neck.
61. Reinstall the air purge breather cap.
62. Fill up coolant header tank.
63. Install and tighten coolant pressure cap.
64. Start the engine and run at approximately 1500 rpm for 5 minutes with the climate controls set as previously.
65. Switch off the engine.
66. Remove the pressure cap from the coolant header tank.

 **Warning:** The cooling system will be pressurized and hot.

67. Raise the vehicle lift.
68. Release the clamp from the hose attached to the radiator-flushing adaptor and drain off the coolant.

 **Warning:** Coolant will be hot!

69. Reclamp the hose and lower the lift.
70. Remove the air purge breather cap from the coolant header tank.
71. Via the header tank, refill the cooling system with clean plain water until the level stabilizes at the top of the breather neck.
72. Reinstall the air purge breather cap.
73. Fill up coolant header tank.
74. Install and tighten coolant pressure cap.
75. Start the engine and run at approximately 1500 rpm for 15 seconds with the climate controls set as previously.
76. Switch off the engine.
77. Remove the pressure cap from the coolant header tank.

 **Warning:** The cooling system will be pressurized and hot.

78. Raise the vehicle lift.
79. Release the clamp from the hose attached to the radiator-flushing adaptor and drain off the coolant.

 **Warning:** Coolant will be hot!

80. Disconnect the hose from the radiator flushing adaptor tool and remove.
81. Disconnect and remove the adaptor tool.
82. Remove and discard the existing o-ring from the radiator drain plug.
83. Install and seat a new o-ring seal.

84. Reinstall and tighten the drain plug.
85. On **XK series vehicles**, install the generator-cooling duct. (Torque the generator cooling duct securing bolt to 6 Nm)
86. For access, **XK series vehicles**, release and remove the air cleaner cover, mass air flow sensor and air intake hose assembly.
87. On all vehicles, reinstall the clip on the header tank to recovery bottle hose.

Note: If the header tank to recovery bottle hose clip is damaged in any way, a new one must be installed (Part Number JHC 501401).

88. Reconnect the recovery bottle hose to the header tank and crimp the clip securely.

Note: If difficulty is experienced in latching the clip, it may be necessary to install a new clip.

89. Remove the hose clamp from the heater bypass hose.
90. On **XK series vehicles**, install the air cleaner cover, mass air flow sensor and air intake assembly. On **V8 XJ series vehicles**, install the engine compartment rear cover.

The cooling system should now be filled with XLC Extended Life Coolant. See the following Workshop Procedure for refilling process.

STEP 3: REFILLING OF COOLING SYSTEM WITH XLC EXTENDED LIFE COOLANT

⚠ Caution: Before the use of Havoline XLC Extended Life Coolant is permitted on Jaguar vehicles (prior to VIN 042636 XK Series vehicles and vin 878274 V8 XJ series vehicles), the flushing procedure in steps 1 and 2 must be carried out.

Note: As the cooling system cannot be fully drained, it will contain residual water at this stage. It is therefore necessary to introduce a measured quantity of undiluted Jaguar XLC antifreeze into the cooling system and Fill up with plain water.

1. Remove the air purge breather cap.
2. Carefully pour 4.25 liters of Jaguar XLC antifreeze into the header tank.

Note: Only Jaguar antifreeze Havoline XLC Extended Life Coolant (specification: WSS M 97B44-D) should be used on XK series and V8 XJ series vehicles. Antifreeze to this specification has been used in all 2000 Model Year XK Series and V8 XJ Series vehicles and may be recognized by its orange color.

3. Continue to add clean plain water into the header tank until the level stabilizes at the top of the breather neck.

4. Reinstall the air purge breather cap.

⚠ Caution: Immediately wash away any antifreeze spilled on the vehicle bodywork.

5. Fill up coolant header tank.
6. Install and tighten coolant pressure cap.
7. Start and run the engine at approximately 2000 rpm for 2 minutes, with the climate controls set as previously, to circulate and mix the coolant.
8. Switch off the engine.
9. Remove the pressure cap from the coolant header tank.

⚠ Warning: Take care! The cooling system will be pressurized and hot.

10. Using a pipette or hydrometer, take a sample of coolant from the header tank.
11. Using a temperature-compensated coolant tester, check that the concentration of the coolant now corresponds to: 50% ($\pm 5\%$) Antifreeze by volume **or** provides protection for circulation at $-35\text{ }^{\circ}\text{C}$ ($-31\text{ }^{\circ}\text{F}$)

Note: If necessary, drain off a quantity of coolant and add antifreeze to the system to adjust the concentration.

12. Before reinstalling the pressure cap, apply header tank label (part number MNF 7699AA) onto the engine bay cover, adjacent to the filler neck.

Note: To test that the chemical flushing procedure has worked, once again, run through the heater core circulation test procedure in Step 1. Where a temperature reading of more than $40\text{ }^{\circ}\text{C}$ ($104\text{ }^{\circ}\text{F}$) has been indicated, the coolant circulation rate is satisfactory and no further action is required.

Where a temperature reading of less than $40\text{ }^{\circ}\text{C}$ ($104\text{ }^{\circ}\text{F}$) has been indicated, the coolant circulation rate through the heater core is unsatisfactory. In this event, contact Dealer Technical Support for further information.

⚠ Caution: Do not permit the vehicle to stand over night with:

- The cooling system drained.
- The cooling system filled with either one of the two flushing solutions.
- Without having completed the draining of the second flushing solution followed by at least one refill with clean plain water, followed by draining and refilling once again with clean plain water.

⚠ Warning: It should be noted that all displaced oils and fluids should be disposed of locally, ensuring compliance with local legislation and health and safety guidelines.

Parts Information:

<u>DESCRIPTION</u>	<u>PART NUMBER</u>	<u>QTY</u>
Radiator flushing kit	JLM 20361	2 *
O-ring – Drain plug - XK Series	JLM 20622	1
O-ring – Drain plug - V8 XJ Series	JLM 20628	1
Hose clip	JHC 501401	1
Header tank label	MNF 7699AA	1
XLC Extended Life Coolant – 5 Liter*	JLM 20972/3	1

*** Part no. JLM 20361 is listed as a radiator flushing solution kit. A kit consists of 1 bottle of part 1 solution and 1 bottle of part 2 solution. Part no. JLM 20361 will only be supplied as a boxed quantity of 2 kits (2 bottles of part 1 and 2 bottles of part 2.) Use the entire contents for this service operation.**

Warranty Information:

<u>FAULT CODE</u>	<u>R.O. NUMBER</u>	<u>DESCRIPTION</u>	<u>TIME ALLOWANCE</u>
JB GB 49	26.91.03	Heater core test and chemical/ water flush procedure	
		V8 XJ Series	3.2 hrs.
		XK Series	3.5 hrs.