

REFERENCE:	Nova Bus Manuals
SECTION:	09: Engine and cooling
RS N°:	MQR 7621-346
EFFECTIVE IN PROD.:	L647 (2012MR)

APPLICATION DEADLINE:	–
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SUBJECT:	Radiator Assembly anchorage and surge tank cap
JUSTIFICATION:	New procedure for the radiator assembly anchorage levelling to optimize the filling of the coolant and surge tank cap N36242 replace by N65114

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	Leveling of the radiator assembly and replace surge tank cap with the new replacement cap N65114	Client	Client	5h45
2	–	–	–	–

MATERIAL

QTY	PART N°	REV.	DESCRIPTION	REPLACES PART N°
LEVEL 1				
1	N65114	–	Surge tank cap	N36242
1	N66783	–	Support LH Radiator Assembly	N43209-1
1	N66782	–	Support RH Radiator Assembly	N43209-2
4	N37749	–	Dual Clamp Tie	–
2	N66397	–	3/8" Spacer	–
8	N16891	–	Bolt	–
4	N66725	–	Thin Spacer	–
2 ⁽¹⁾	N36496	–	Washer	–
4	N43343	–	Radiator Mount	–
1 ⁽²⁾	–	–	Leveling Jig ⁽²⁾	–
1	N8899180	–	Right Lower Support	–
1	N8899181	–	Left Lower Support	–

⁽¹⁾ Quantity is an estimation. Quantity will be determined according to radiator support leveling requirements.

⁽²⁾ Contact your After-Sales Representative for part details and availability.

LEVEL 2				
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Materials will be available within 84 days. To order, please contact Prevost Parts by phone at 1-800-771-6682, by fax at 1-888-668-2555 or by email at prevostparts.commandes@volvo.com. Specify document number, quantity of parts required and shipping address.

REVISION HISTORY

REV.	DATE	CHANGE DESCRIPTION	WRITTEN BY
NR	2013MA17	Initial release	Luc Carignan

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
Belleville Transit - Ontario	L598	—	—	L82U5A3000581	L82U7A3000582	2
Calgary Transit - Alberta	L601	8101	8114	L82U5A4000099	L82U4A4000112	14
Calgary Transit - Alberta	L607	8115	8130	L82UXA3000477	L82U6A3000492	16
Calgary Transit - Alberta	L615	8131	8158	L82U1B4000019	L82U4B4000046	28
Connecticut Transit - Connecticut	L554	1041	1054	S92U1A4000139	S92U4A4000152	14
Connecticut Transit - Connecticut	L554	1055	1065	S92U8A4000154	S92U0A4000164	11
Guelph - Ontario	L579	221	224	L82UXA3000401	L82U5A3000404	4
Halifax - Nova Scotia	L558	717	731	S92UXA3000293	S92U6A3000307	15
Halifax - Nova Scotia	L613	732	741	S92UXB3000019	S92UXB3000028	10
Marketing Sales Demo - MSD 4	L568	—	—	S92U9B3000013	S92U9B3000013	1
New York City Transit - New York	L608	8000	8014	L82U6B4000047	L82U0B4000061	15
New York City Transit - New York	L620	8015	8029	L82U2B4000062	L82U2B4000076	15
New York City Transit - New York	L620	8030	8074	L82U8B4000079	L82U7B4000123	45
New York City Transit - New York	L643	8090	8090	S92U1B4000143	S92U1B4000143	1
New York City Transit - New York	L670	5771	5784	S92U9B4000147	S92U1B4000160	14
New York City Transit - New York	L670	5785	5857	S92U4B4000170	S92U3B4000242	73
New York City Transit - New York	L670	5858	5896	S92U9B4000147	S92U1B4000160	38
New York City Transit - New York	L681	5896	5896	S92U2C4500023	S92U2C4500023	1
Strathcona County Transit - Alberta	L580	2011	2023	L82U1A3000464	L82U8A3000476	13
Thunder Bay - Ontario	L614	—	—	L82UXB3000061	L82U3B3000063	3
York Regional Transit - Ontario	L562	1080	1082	S92U2A3000420	S92U6A3000422	3
York Regional Transit - Ontario	L572	1083	1094	S92U3A3000569	S92U2A3000580	12

**WARNING**

Follow your internal safety procedures.

PROCEDURE

- 1.1. Remove the radiator access door. Retain the hardware. See Figure 1.

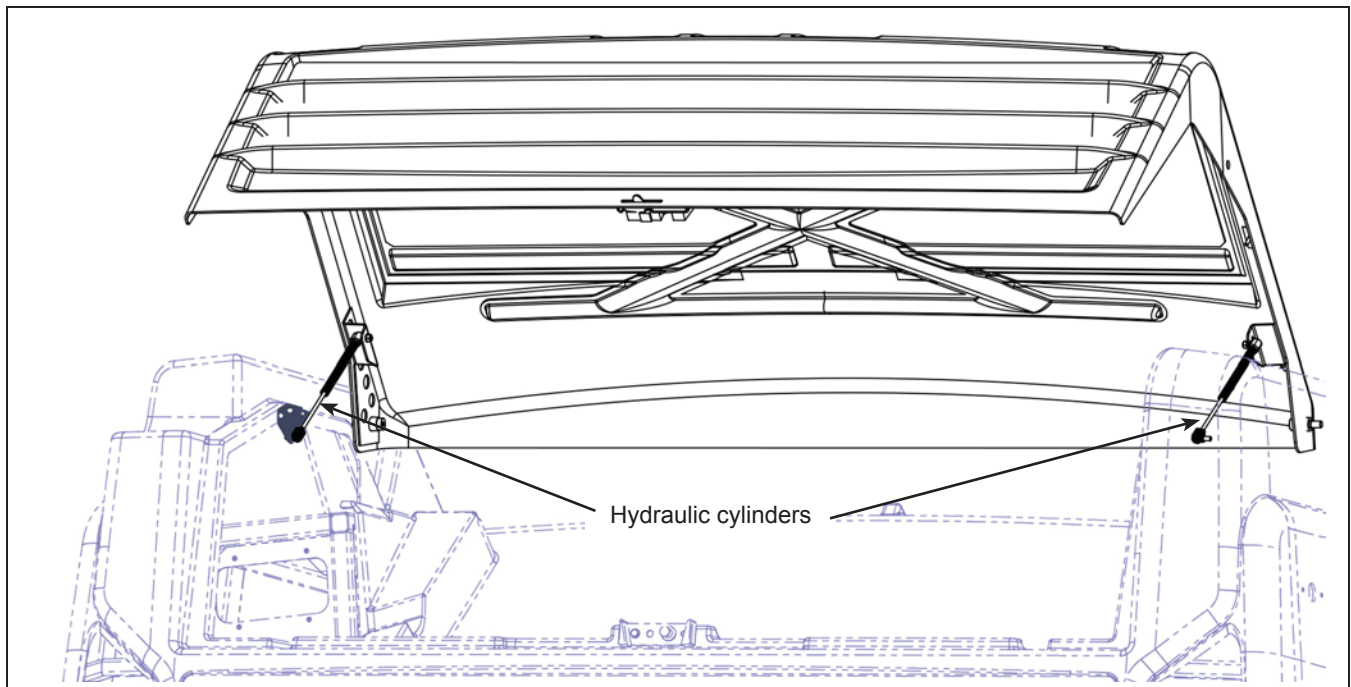


Figure 1 - Typical Anchorage for the Radiator Access Door

**WARNING**

Before starting any work on the radiator, make sure the vehicle is completely stationary. Isolate the engine starting circuit from the control box located at the rear of the vehicle.

Cleanliness is vital when working on the hydraulic system.

- 1.2. Remove the surge tank cap.
- 1.3. Install the new cap N65114 on the surge tank.
- 1.4. Open the engine access door.
- 1.5. Fill the cooling system according to filling procedure of section 09-302: **ENGINE COOLING** of the Nova Bus Maintenance Manual.
- 1.6. Close the stop valve to isolate the engine and heating cooling circuit.
- 1.7. Connect a regulator valve equipped with a pressure gauge on the quick connect fitting.

- 1.8. Adjust the pressure to 15 psi and close air pressure inlet. Make sure the pressure remains constant for 5 minutes.
- 1.9. If the pressure does not remain constant verify if liquid and/or air is leaking from the overflow hose.
 - 1.9.1. If liquid and/or air is leaking from the overflow hose, perform steps 1.35 to 1.38 for the replacement of the surge tank and order a new surge tank N56950.
 - 1.9.2. If there is no liquid and/or air leaking from the overflow hose, proceed with the proper correction to repair the engine cooling circuit.
- 1.10. Drain the various fluids from the hydraulic and cooling circuit, disconnect the piping to the radiator, and remove the radiator assembly according to the drain and removal procedures of sections 09-304: **HYDRAULIC SYSTEM** and 09-302: **ENGINE COOLING** of the Nova Bus Maintenance Manual.
- 1.11. Place the radiator assembly in a secure and accessible area.
- 1.12. Remove the isolators from the support. Retain the hardware. See Figure 2

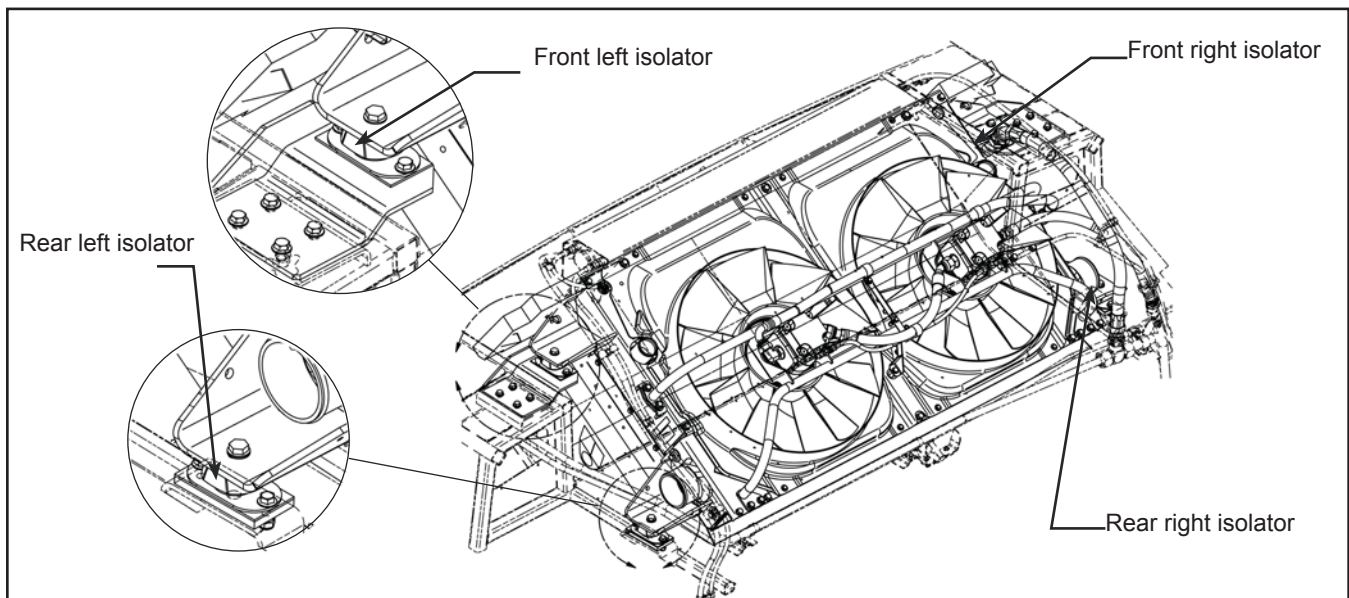


Figure 2 - Isolators Identification

- 1.13. Move the cooling fluid pipe located on the left side of the vehicle in order to avoid contact with the leveling jig. It is recommended to remove the rear light panels located on each side of the rear shell to gain access to the piping anchor points.

- 1.14. Replace the front supports with new upper supports N66783 (left support) and N66782 (right support) using the retained mounting bolts. Apply Loctite 242 thread locker or the equivalent to the bolts. See Figure 3.

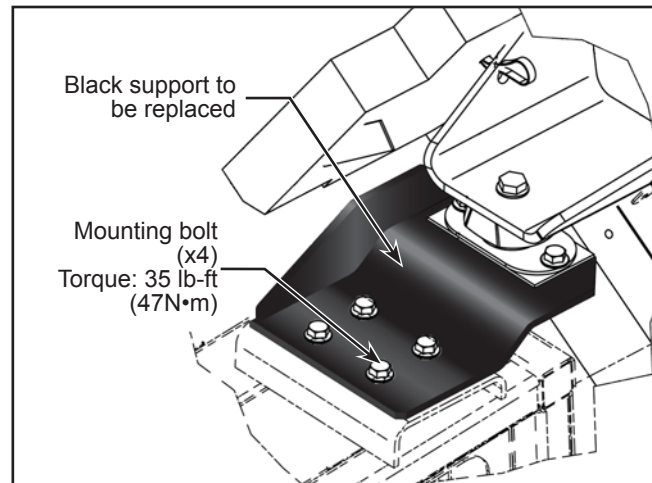


Figure 3 - Upper Black Support (Left Side Shown/ Right Side Similar)

- 1.15. Make sure that the hydraulic pipe brackets, located in rear portion of the radiator compartment, are still bonded to the rear shell. See Figure 4.

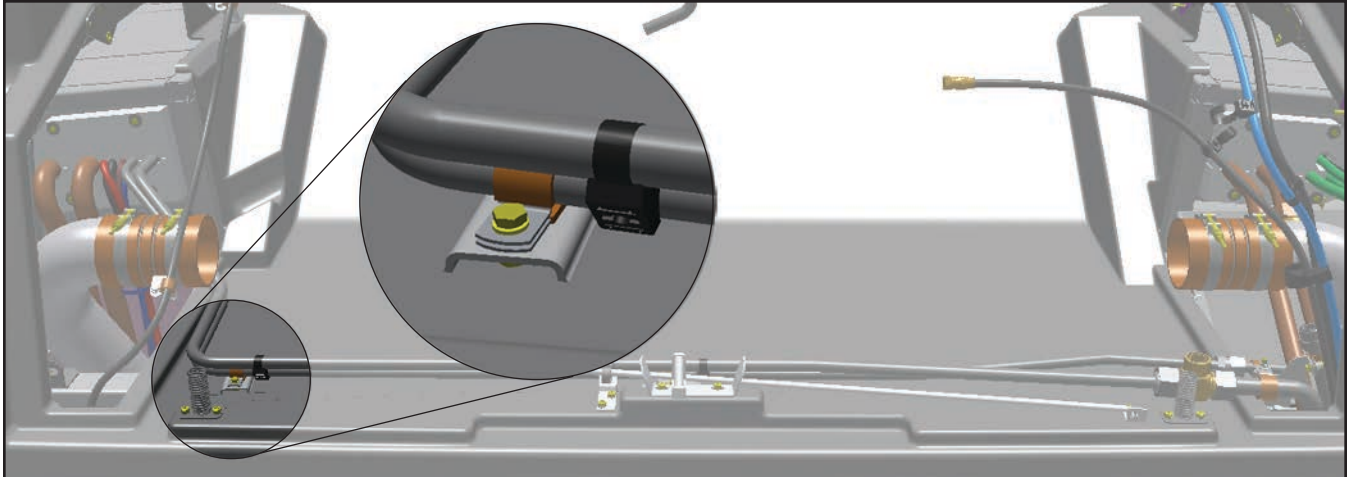


Figure 4 - Hydraulic Pipe Brackets

- 1.16. Wipe clean the fiberglass surface located beneath the radiator and if needed under the hydraulic pipe bracket, then inspect the surface for any wear or damage caused by the radiator rubber guard and the hydraulic piping support . The fiberglass or gelcoat surface might be damage, grooved or perforated.
 - 1.16.1. If the surface is lightly damaged apply epoxy resin to repair in such a way to obtain a smooth and uniform surface. Refer to section 01 : **BODY** of the Nova Bus LFS maintenance manual for fiberglass and gelcoat repair instructions. See Figure 5.
 - 1.16.2. If the surface is grooved or perforated, install a thin plate of stainless steel to cover the damaged fiberglass or gelcoat. Refer to section 01 : **BODY** of the Nova Bus LFS maintenance manual for the fiberglass and gelcoat repair instructions. See Figure 6.

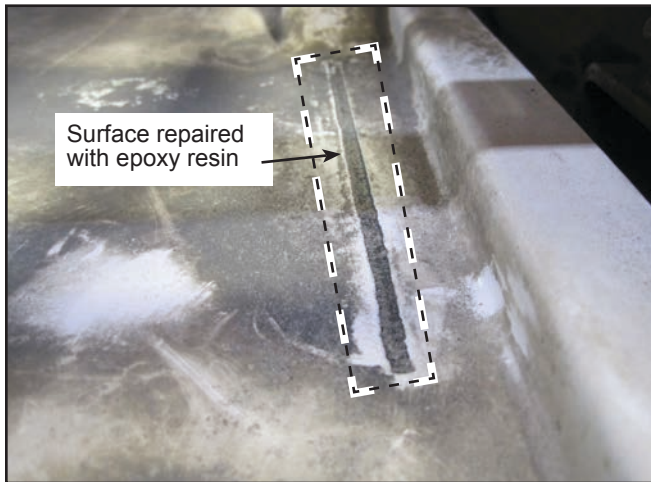


Figure 5 - Surface Damage Repaired with Epoxy Resin



Figure 6 - Severe Damage Repaired with a Stainless Steel Plate.

- 1.17. Using Sikaflex 252, bond the hydraulic pipe brackets to the fiberglass surface. If needed, apply a thicker coat of Sikaflex 252 to fill the gap between the bracket and repaired surface. Refer to section 01-000: **BODY** of the Nova Bus maintenance manual for fiberglass surface repair instructions.
- 1.18. Secure the hydraulic pipes to the brackets. If there is contact between the two pipes, separate them with double-ring tiewraps N37749.

- 1.19. Install a 3/8" spacer N66397 and new isolator N43343 using N16891 bolts and retained hardware on both rear supports of the structure. Apply Loctite 242 thread locker or the equivalent on the bolts. Do not tighten the bolts. See Figure 7.

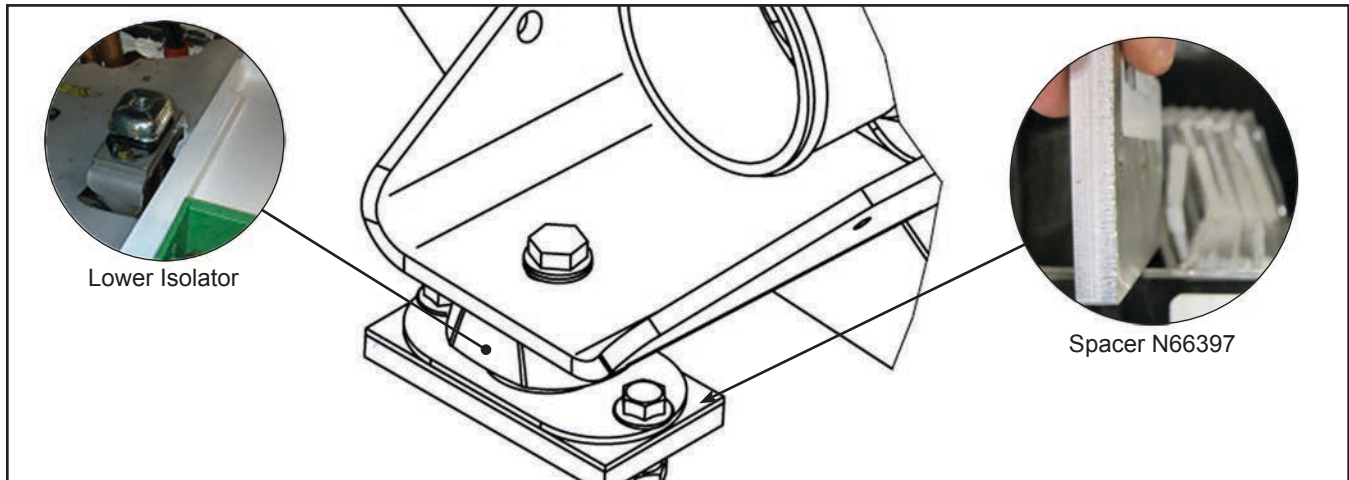


Figure 7 - Installation of Spacers N66397 on the Lower Supports

- 1.20. Install new isolator N43343 on the front support. Apply Loctite 242 thread locker or the equivalent on the bolts. Do not tighten the bolts.
- 1.21. Install the leveling jig onto the isolators. Secure the jig to the isolators with the centering pins. See Figure 8.



Figure 8 - Leveling Jig

- 1.22. Ensure the jig is level and sits properly on both lower isolators. If there is a gap between the jig and the upper isolators, insert one or a few thin spacers (N66725) or a combination of thin and thick spacers (N66397) in order to fill the gap.
- 1.23. Remove the leveling jig and place in a secure area.
- 1.24. Remove the bolts and isolators which require leveling.
- 1.25. Place the spacers measured with the leveling jig between the support and the isolator. The retained bolts might be too short due to the new spacer. If needed use N16891 bolts in a way to obtain two threads beyond the nuts.
- 1.26. Ensure proper installation by mounting the leveling jig onto the isolators. The jig should sit properly on all four isolators. If needed add or remove spacers to readjust.
- 1.27. Begin tightening the bolts according to the following sequence:
 - 1.27.1. Tighten the rear bolt of the upper left isolator.
 - 1.27.2. Tighten the rear bolt of the lower right isolator.
 - 1.27.3. Tighten the rear bolt of the lower left isolator.
 - 1.27.4. Tighten the rear bolt of the upper right isolator.
 - 1.27.5. Repeat the sequence for the front bolt of all four isolators.
- 1.28. Remove the levelling jig and set aside in a secure area.
- 1.29. Repeat the tightening sequence of step 1.26 by applying a tightening torque of 35 ft-lb (47N•m) on the isolator bolts. See Figure 12.
- 1.30. Remove the radiator spider assembly and the shroud from the radiator. See Figure 9.

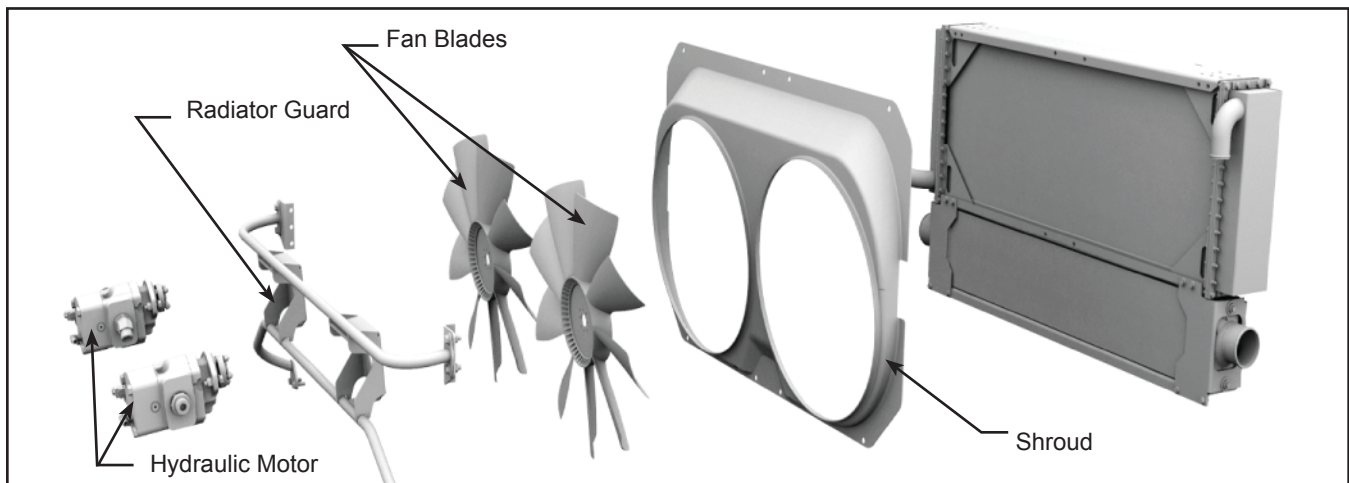


Figure 9 - Radiator Assembly

- 1.31. Replace the lower support of the radiator assembly with the new right support N8899180 and left N8899181. See Figure 10.

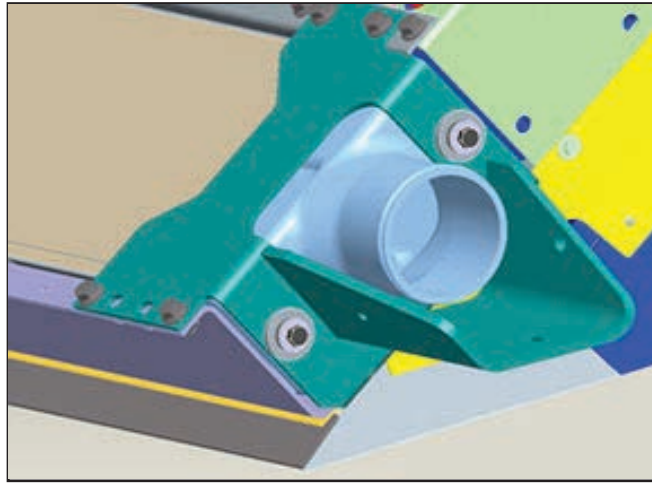


Figure 10 - Lower Supports to Replace



NOTE

Steps 1.32 to 1.35 should be performed only if the pressure test in step 1.9 shows a leak on the surge tank.

- 1.32. Remove the surge tank from the radiator. Retain the hardware and the new cap N65114.
- 1.33. Remove all the parts installed on the removed surge tank.
- 1.34. Install the parts removed from the old surge tank on the new surge tank. Respect the original orientation of the parts.
- 1.35. Install the new surge tank equipped with cap N65114 on the radiator using the retained hardware.

- 1.36. Install the spider and the shroud on the radiator. Adjust the spacing between the internal contour of the shroud and the fan blades in such a way to obtain 3/16 in. (5 mm) clearance. Tighten the shroud bolts once the spacing is adjusted and torque the spider anchor bolts. See Figure 11.

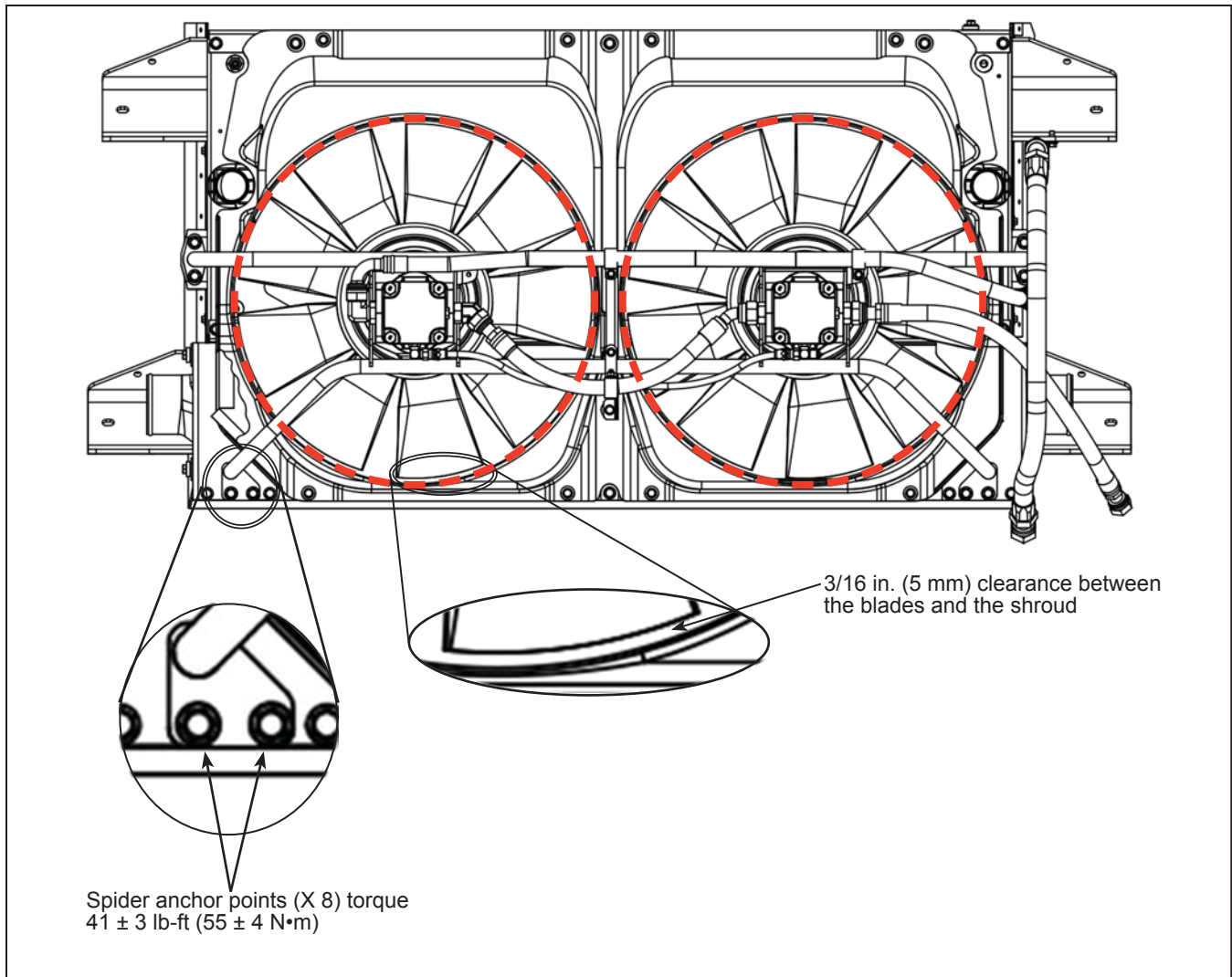


Figure 11 - Torque of the Spider and Spacing Between the Shroud and the Blades

- 1.37. Install the radiator on the new isolator.
- 1.38. Make sure the radiator support rest correctly on the new isolator. The radiator frame might be slightly twisted or the radiator support might be a bit uneven. If that is the case, fill the gap between the isolator and the radiator support with washers N36496.

**NOTE**

Radiator mounting support holes and isolators might not align correctly. To obtain proper alignment, loosen the isolator anchor bolts and move the isolator in such a way to line up with the mounting support holes. Torque the isolator anchor bolts to 35 ± 3 lb-ft (47 ± 4 N•m). See Figure 12.

- 1.39. Apply Loctite 242 thread locker type or the equivalent on the radiator anchor bolts.
- 1.40. Place the anchor bolts and pre-tighten.
- 1.41. Apply the torque specified in Figure 12.

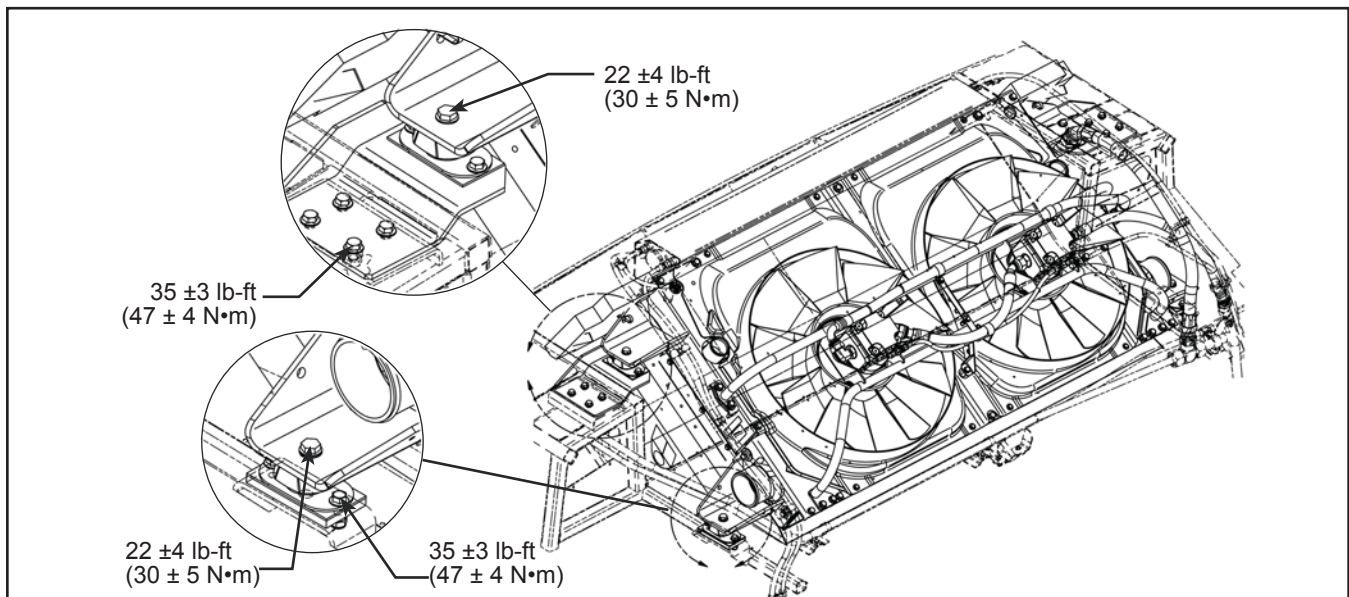


Figure 12 - Radiator Installation and Torque Value

- 1.42. Connect all the hoses and accessories on the radiator.

**NOTE**

Install and tighten the piping according to the procedure indicated in section 99 : GENERAL PRACTICES of the Nova Bus LFS maintenance manual and as indicated in Figures 13 to 15.

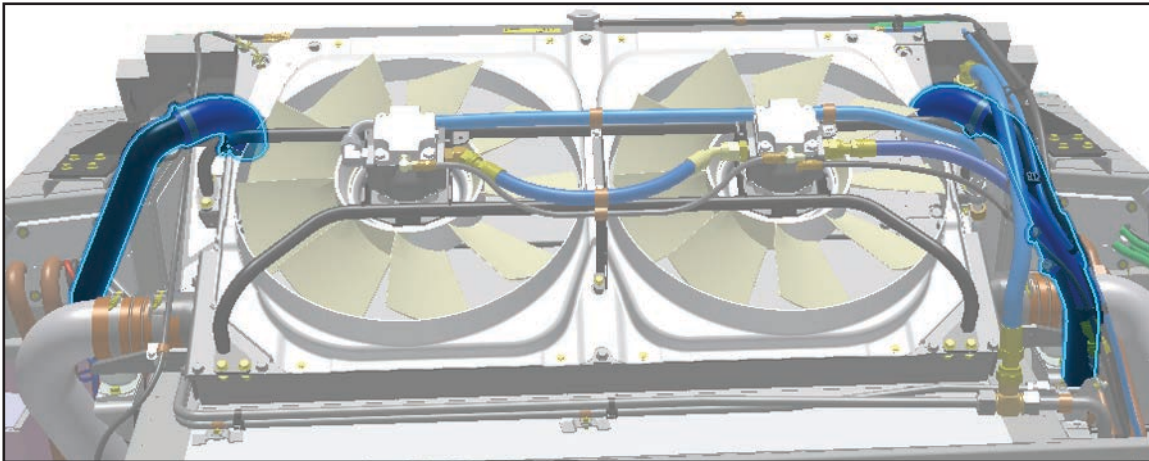


Figure 14 - Cooling System Piping

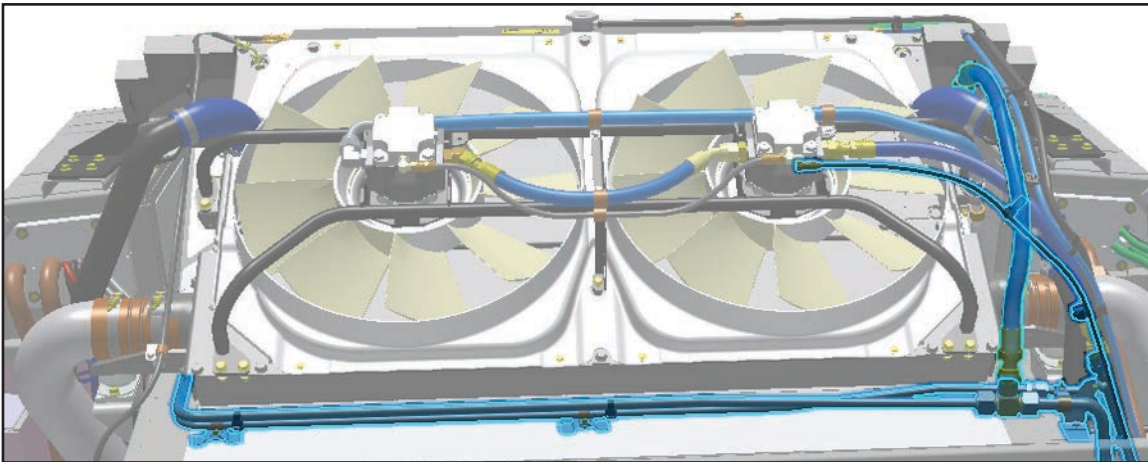


Figure 15 - Hydraulic System Lines

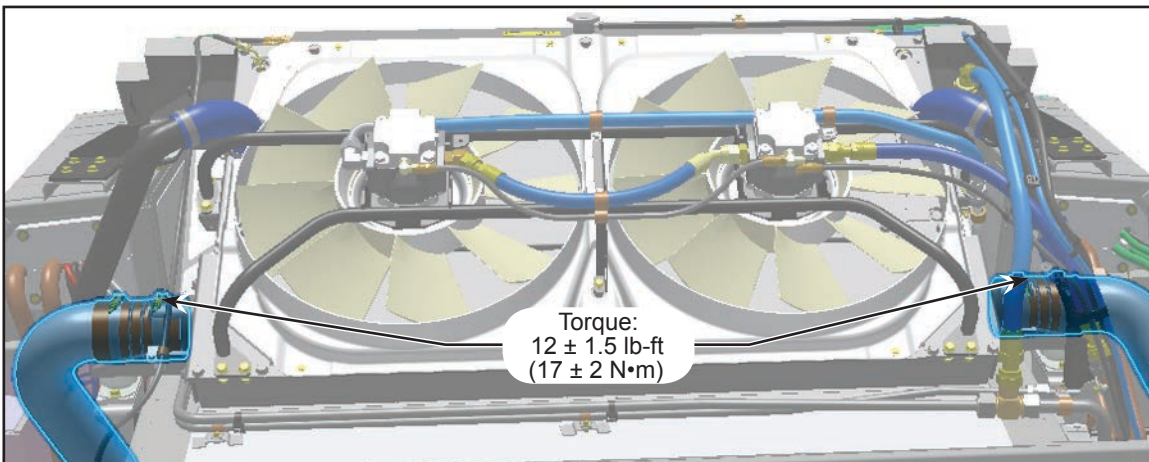


Figure 16 - Air Cooling System Lines

- 1.43. Fill the system affected by the removal of the radiator as indicated in section 09-302 : **ENGINE COOLING, T-DRIVE** and 09-304 **HYDRAULIC SYSTEM, T-DRIVE** of the Nova Bus LFS maintenance manual.
- 1.44. Check all connections for any potential leaks. Repair if necessary.
- 1.45. Open the stop valve of the engine and heating system.

**WARNING**

Failure to repair any leaking component of the cooling system, such as a pump, valve, tube or the motor could result in a fire.

- 1.46. Close the engine door.
- 1.47. Install the radiator access door using the retained hardware. See Figure 1. ❖