NEW FLYER

INSTRUCTION TO SERVICE

ITS:6402	
SECTION:	219 Engine and Transmission
WRITTEN BY:	Mike Pearson
SUBJECT:	Rework Heat Exchanger Coolant Line and Routings

ITS6402

PROCEDURE:

1. Turn the main battery disconnect switch to the “OFF” position.
2. Open the surge tank fill door.
3. Relieve the cooling system pressure by lifting the vent lever on the cabin heat and engine coolant surge tank pressure relief caps. See Figure 1.

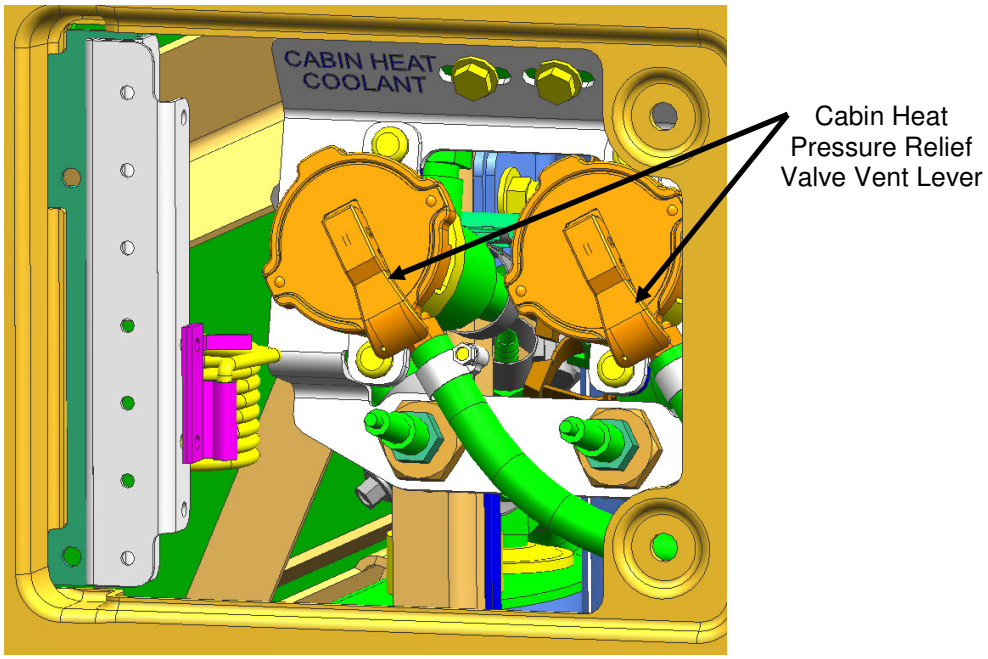

Figure 1: Cabin Heat Surge Tank Pressure Relief

☞ **NOTE:** **If coolant is to be recovered, make sure container is clean and chemical free. If not, used coolant must be recycled or disposed of in accordance with municipal, state and federal government regulations.**

4. Place a suitable container under the heat exchanger cabin loop drain plug. Remove and discard the existing drain plug and drain cabin heat coolant circuit. See Figure 2.
5. Place a suitable container under the radiator drain cock and drain the coolant until empty, tighten the drain cock.
6. If necessary, raise the coach in accordance with the New Flyer Service Manual.
7. Remove and save the existing tube clamp and mounting hardware supporting the heat exchanger cabin loop intake SST tube to the degas frame as shown in Figure 2.
8. Remove and discard the existing tube clamp, bracket and mounting hardware supporting the heat exchanger cabin loop intake SST tube to the auxiliary heater fuel filter bracket as shown in Figure 2. Clean and apply loctite p/n 081034 to the bolt threads prior to re-installing fuel filter housing bolts, see Figure 2.
9. Remove and save the existing hose clamp from the silicone elbow on the booster pump line to the SST cabin loop intake tube, see Figure 2.
10. Remove and save the existing hose clamps (x4) from the silicone hose connecting the heat exchanger 90° SST elbow to the SST tube to the booster pump, see Figure 2.
11. Remove and discard the existing silicone hose, 90° SST elbow at the heat exchanger and SST cabin loop coolant intake tube, see Figure 2.

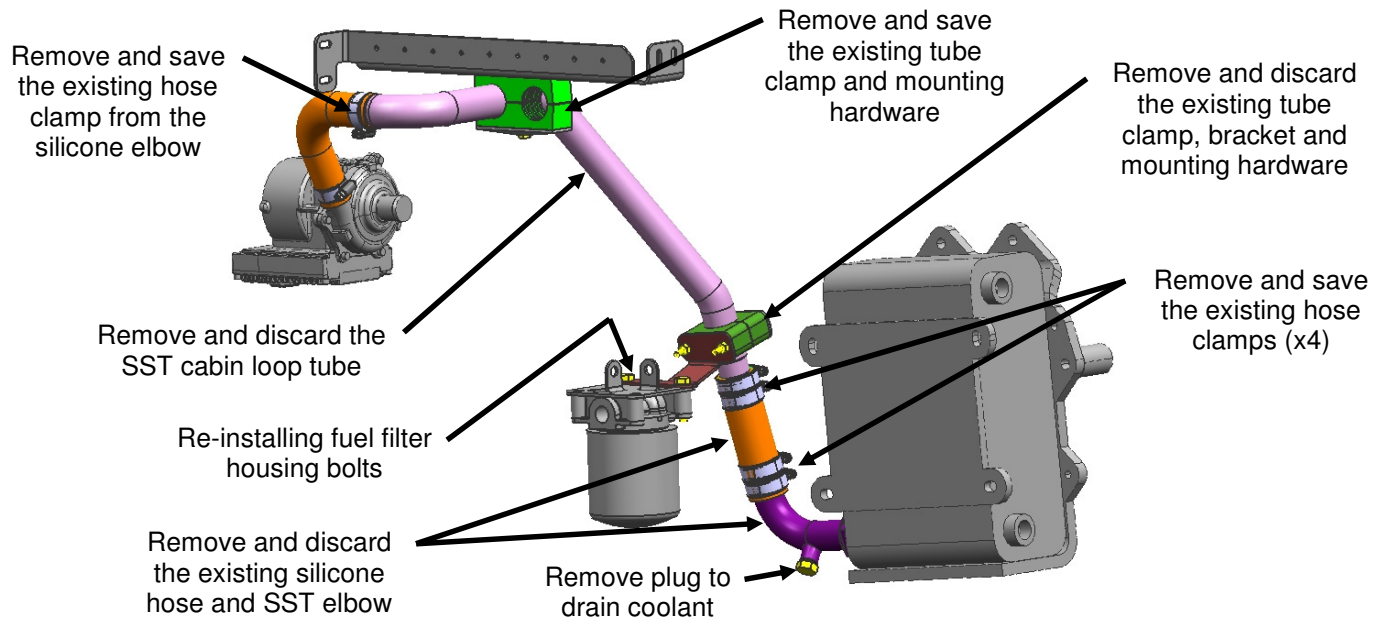

Figure 2: Cabin Heat Coolant Intake Tube Removal

12. Remove and save the existing hose clamp from the silicone elbow on the auxiliary heater to the SST cabin loop discharge tube, see Figure 3.
13. Remove and save the existing hose clamps (x4) from the silicone elbow connecting the heat exchanger 90° SST elbow to the SST tube to the auxiliary heater elbow, see Figure 3.
14. Remove and discard the existing silicone hose, 90° SST elbow at the heat exchanger and the SST cabin loop discharge coolant tube, see Figure 3.

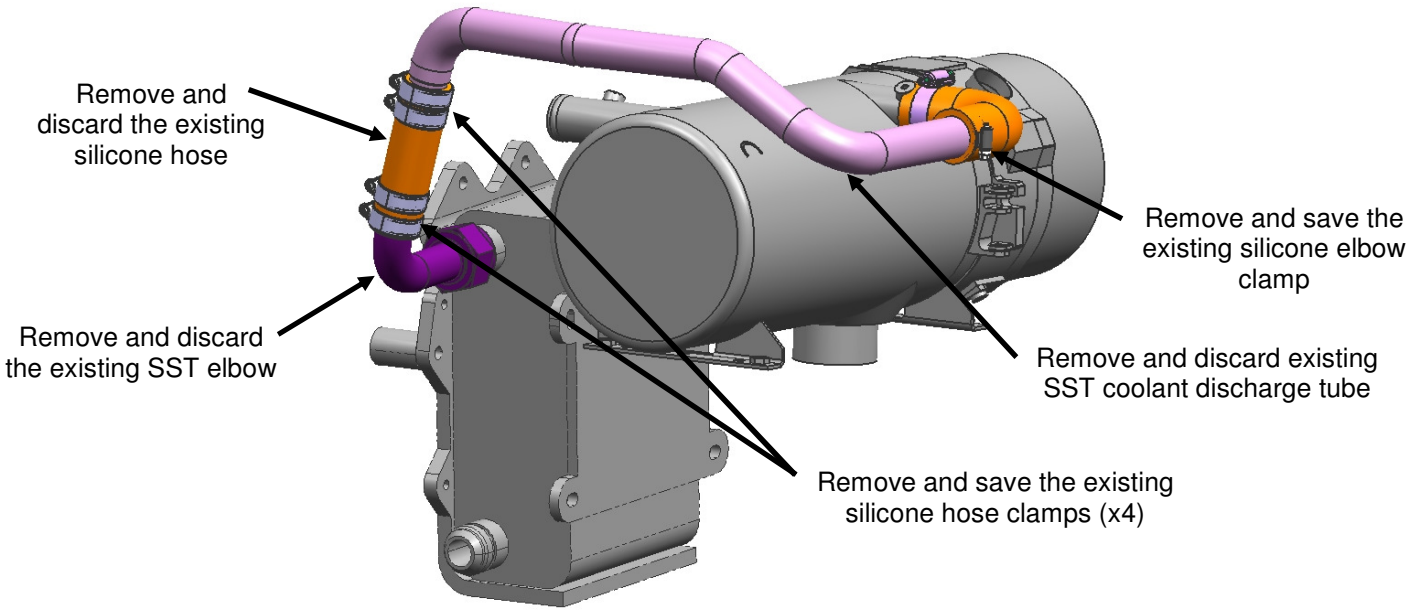

Figure 3: Cabin Heat Coolant Discharge Tube Removal

15. If the degas bracket has holes instead of slots to mount the tube support clamp to, the clamp and hardware from Step 7 is to be moved two (2) holes rearward and loosely re-installed, as per Figure 4.

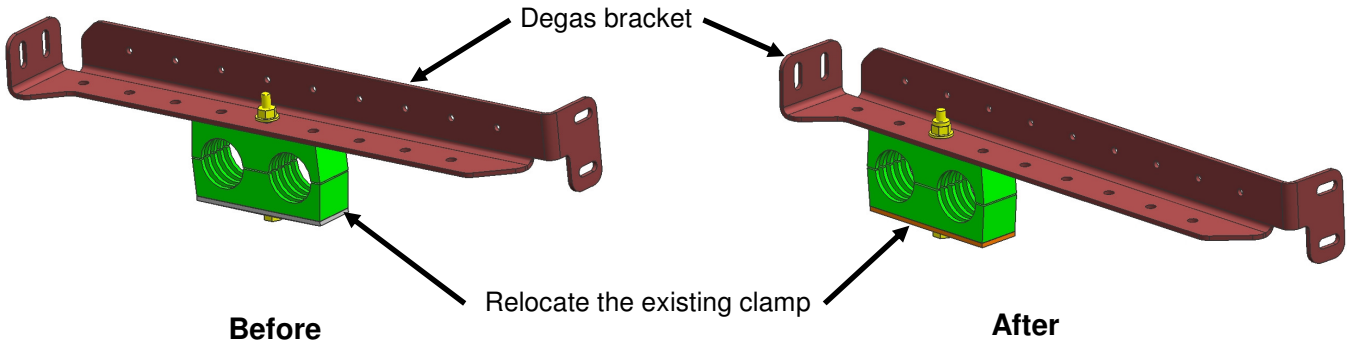

Figure 4: Tube Support Clamp Relocation

16. If the degas bracket has slots instead of holes to mount the tube support clamp to, the clamp and hardware from Step 7 is to be moved one (1) slot rearward and loosely re-installed, as per Figure 5.

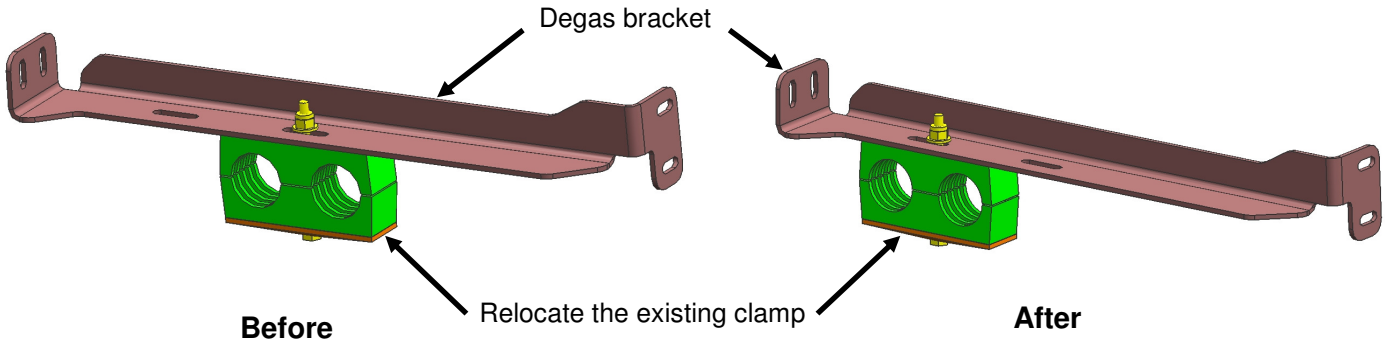

Figure 5: Tube Support Clamp Relocation

17. Insert the new SST intake coolant tube p/n 650024 thru the tube clamp forward hole from Step 15 or 16 and into the silicone elbow at the booster pump. Loosely install the hose clamp removed in Step 9. See Figure 6.
18. Install new elbow fitting p/n 648252 loosely to the heat exchanger intake cabin loop fitting. See Figure 6.
19. Loosely install approx. 16” of new silicone hose p/n 555447 (trim hose to fit) between new heat exchanger cabin heat elbow fitting installed in Step 18 and newly installed tube from Step 17 using existing hose clamps removed in Step 10, two (2) at each end of the hose.
20. Ensure the hose and tube is free of kinks and routed in a relaxed state and tighten clamps as follows.
    a. Torque elbow fitting (part of p/n 648252) installed in Step 20 to 127-133 ft*lbs as per NFIL specification 331883.
    b. Tighten the existing silicone elbow clamp from Step 9 to 80 in*lbs. Dry. Tighten at 75 rpm or less, re-torque to 80 in*lbs. at 75 rpm or less after 30 mins.
    c. Tighten the existing silicone hose clamps from Step 10 to 80 in*lbs. Dry. Tighten at 75 rpm or less, re-torque to 80 in*lbs. at 75 rpm or less after 30 mins.

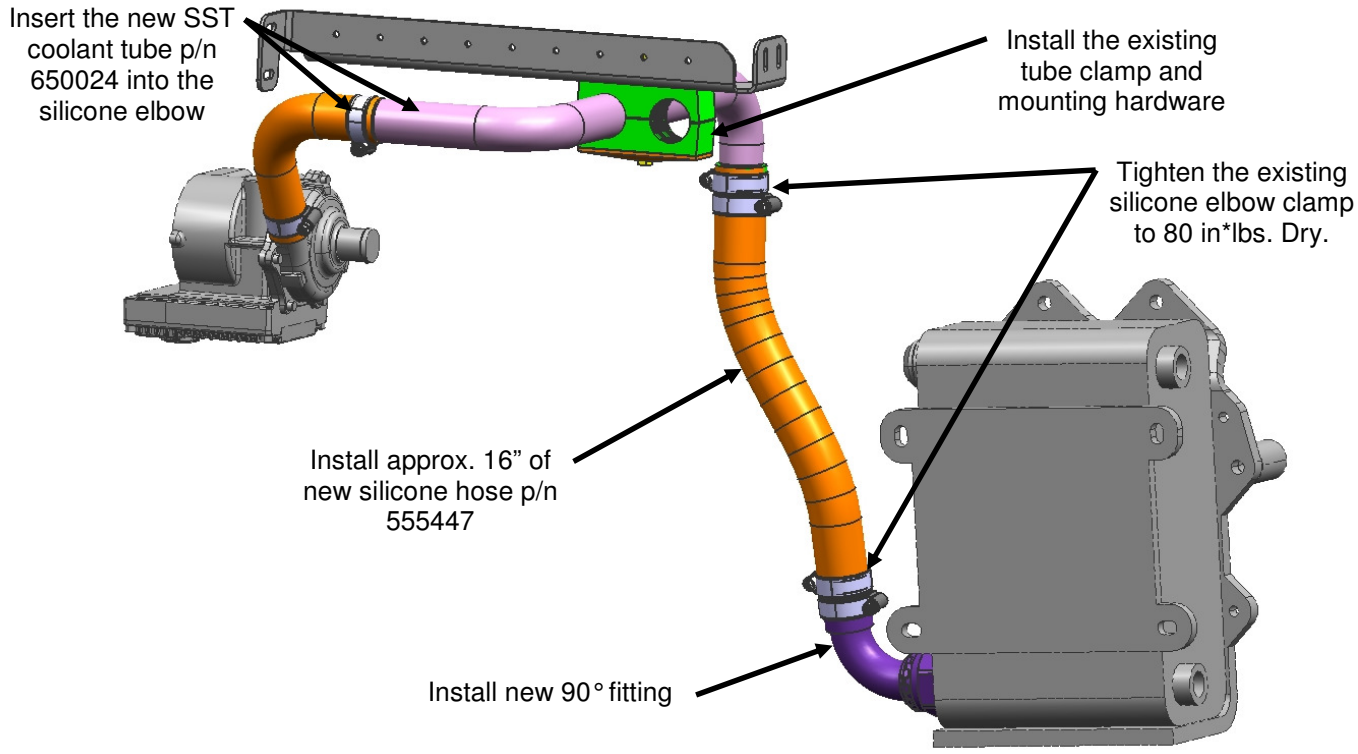

Figure 6: Cabin Heat Coolant Intake Tube Installation

21. Install new elbow fitting p/n 648252 loosely to the heat exchanger cabin loop discharge fitting. See Figure 7.
22. Insert the new SST coolant discharge tube p/n 650007 thru the tube clamp rearward hole from Step 15 or 16 and into the silicone elbow at the booster pump. Loosely install the hose clamp removed in Step 12, see Figure 7.
23. Loosely install the new silicone elbow p/n 617307 (trim elbow to fit) between existing heat exchanger cabin heat SST elbow from Step 21 and newly installed SST tube from Step 22 using existing hose clamps removed in Step 13, two (2) at each end of the elbow.
24. Ensure the elbows and tube are free of kinks and routed in a relaxed state and tighten clamps as follows.
    a. Torque elbow fitting (part of p/n 648252) installed in Step 20 to 127-133 ft*lbs as per NFIL specification 331883.
    b. Tighten existing tube clamp support hardware installed in Step 15 or 16. Use Loctite 243 p/n 081034 on threads of hardware.
    c. Tighten the existing silicone elbow clamp from Step 22 to 80 in*lbs. Dry. Tighten at 75 rpm or less, re-torque to 80 in*lbs. at 75 rpm or less after 30 mins.
    d. Tighten the existing silicone elbow clamps from Step 23 to 80 in*lbs. Dry. Tighten at 75 rpm or less, re-torque to 80 in*lbs. at 75 rpm or less after 30 mins.

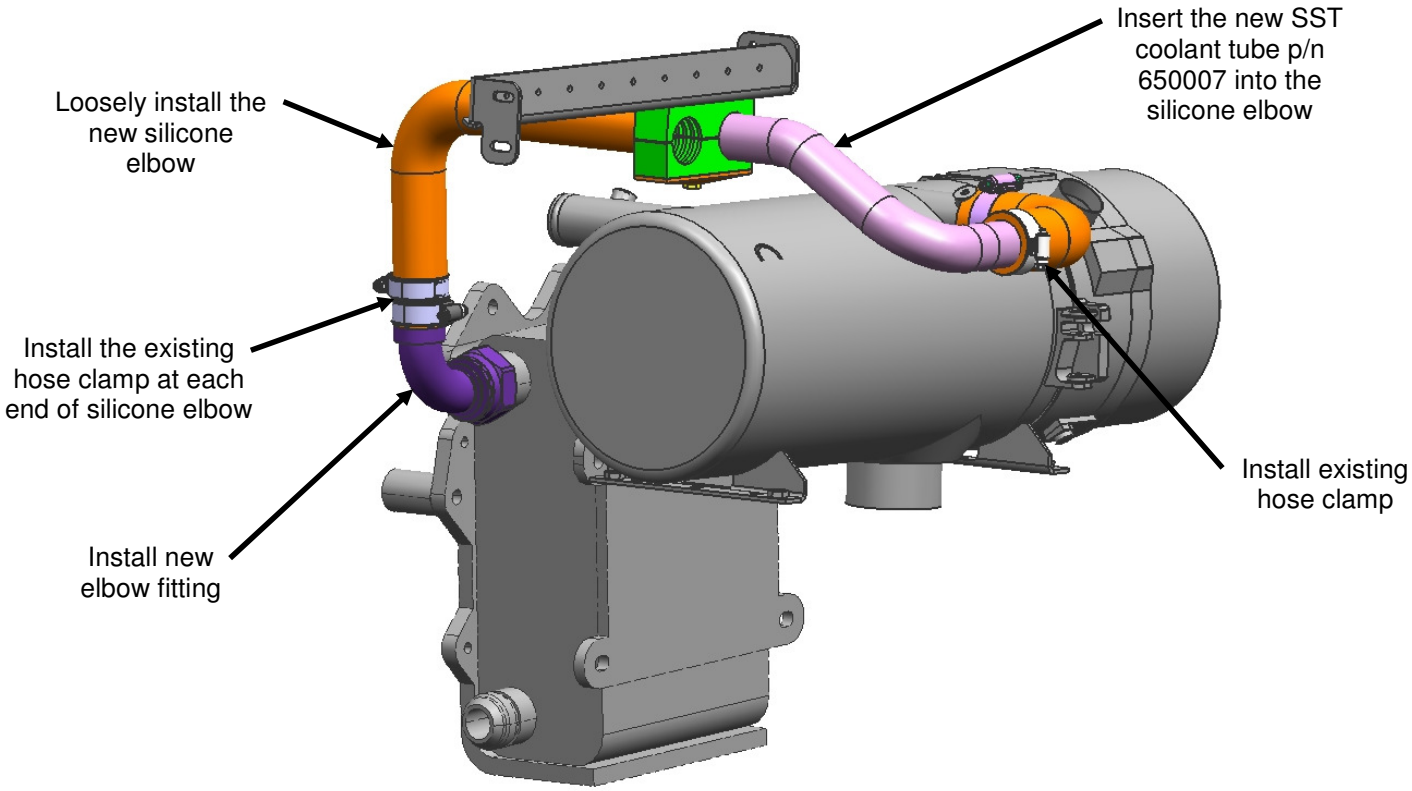

Figure 7: Cabin Heat Coolant Discharge Tube Installation

25. If necessary, lower coach in accordance with the New Flyer Service Manual.
26. Remove all tools and debris and return the bus to service condition.
27. Close the surge tank access door.
28. Turn the main battery disconnect switch to the “ON” position.

☞ **NOTE: It will be necessary to perform a cooling system deaeration procedure prior to starting the engine if any other maintenance activity is performed on the heating system that could have introduced a significant amount of air into the cooling system. Refer to New Flyer Drawing p/n 608544 “Cabin System Coolant Fill Procedure” and Section 2.4.4. Filling and Deaeration in the New Flyer Service Manual.**

NEW FLYER

LABOUR ESTIMATE

	Operation	Men	Hours	Labour Time M X HR
1	Rework Heat Exchanger Coolant Line and Routings	1	2.0	2.0

PARTS REQUIRED

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	650024	Tube-1.38 Dia SST	1	EA	
2	555447	Hose-Venair 31 mm ID	0.33	EA	
3	081034	Loctite 243-Medium 10 ml	0.01	EA	
4	648252	Elbow-90 Deg 37 Deg Swivel -20	2	EA	
5	650007	Tube-1.38 Dia SST	1	EA	
6	617307	Elbow-Silicone 90 Deg 31mm ID	1	EA	