INSTRUCTION TO SERVICE

ITS: 5018	
SECTION:	219 Engine and Transmission
WRITTEN BY:	Mike Pearson
SUBJECT:	Clean intake tubes and add secondary filter

ITS5018

PROCEDURE:

1. Turn the main battery disconnect switch to the “OFF” position.
2. Open the rear engine access and curbside fuse box access doors.
3. Loosen the two T-bolt clamps on the silicone air intake elbow at the base of the air inlet tube assembly. Remove the elbow and clamps and set aside for reuse later in the install. See Figure 1.
4. Cap/plug the engine air intake tube that leads to the engine to prevent tube damage/contamination. See Figure 1.

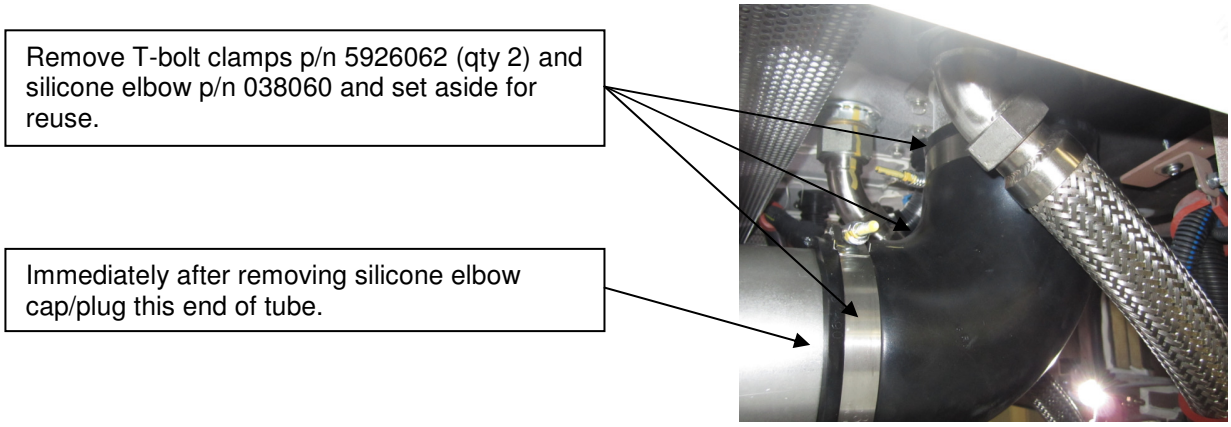

Figure 1: Elbow & Clamp Removal

5. Close the curbside fuse box access doors door.
6. Open the curbside corner pillar door.
7. Remove air filter cover by opening the 4 over center latches located on both sides near the center of the body and remove by pulling straight off. See Figure 2.
8. Using the plastic handle on the primary element gently lift up on the element to loosen the gasket seal, which will tilt the element to an approximate 5 degree angle and remove from housing. See Figure 2.

Figure 2: Primary Element Removal

9. If installed, remove the secondary filter by lifting up by the handle until free of seal and remove from the housing. See Figures 3.

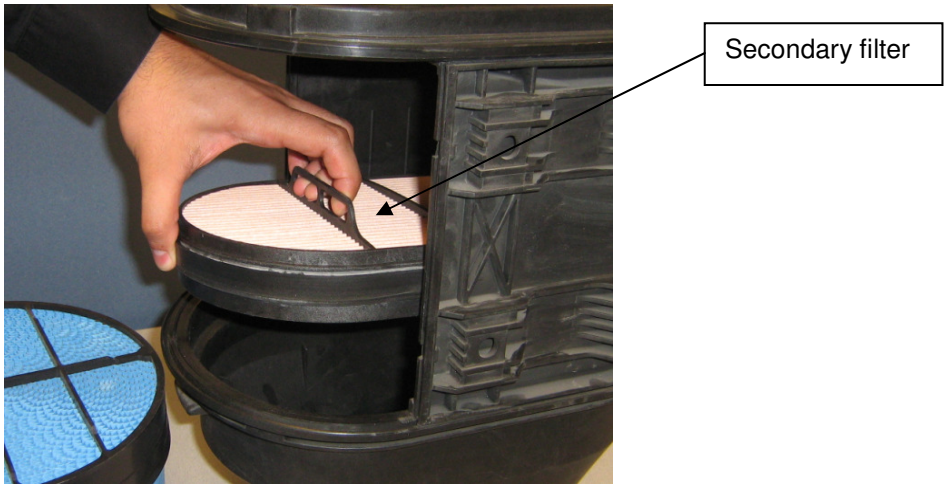

Figure 3: Secondary Filter Removal

10. Remove the bolt, washer, lock washer & U-nuts that attach the air cleaner housing to the air cleaner mounting brackets, typical two (2) places on either side of the housing, hardware is to be discarded. See Figure 4.
11. Loosen the 5.50" T-Bolt clamp located between the rubber hump and the rear shelf air tube. See Figure 4.
12. Remove the housing by lifting up on the housing and the rubber hump connected to the bottom of the housing. When the bottom of the housing is free of the rear shelf air intake tube tilt the top toward the curbside of the Bus and pull it through the corner pillar door opening. Set T-bolt clamp aside for reuse later in this install. See Figure 4.

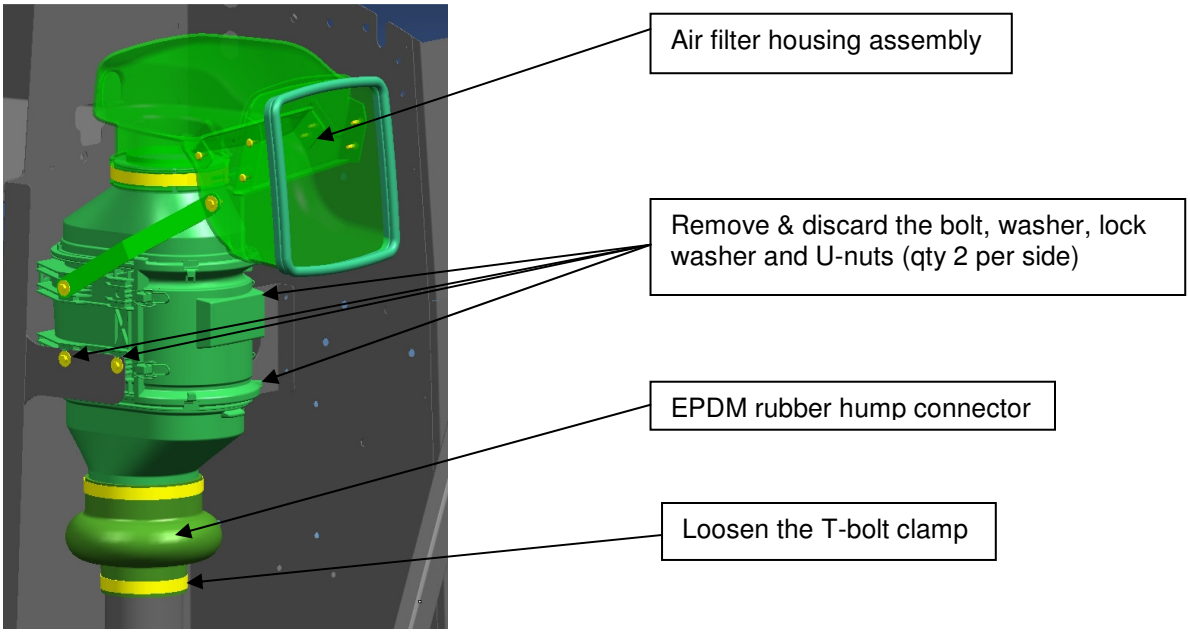

Figure 4: Air Filter Housing Removal

13. Remove the lower hood brace bolt, washer, lock washer and U-nut and loosen the 7.5” T-bolt clamp between the upper housing and the hood. Remove the T-bolt clamp and the hood and set aside to be reused later in this install, discard hardware. See figure 5.

☞ **NOTE: The air filter hood assembly may vary slightly in appearance and material .**

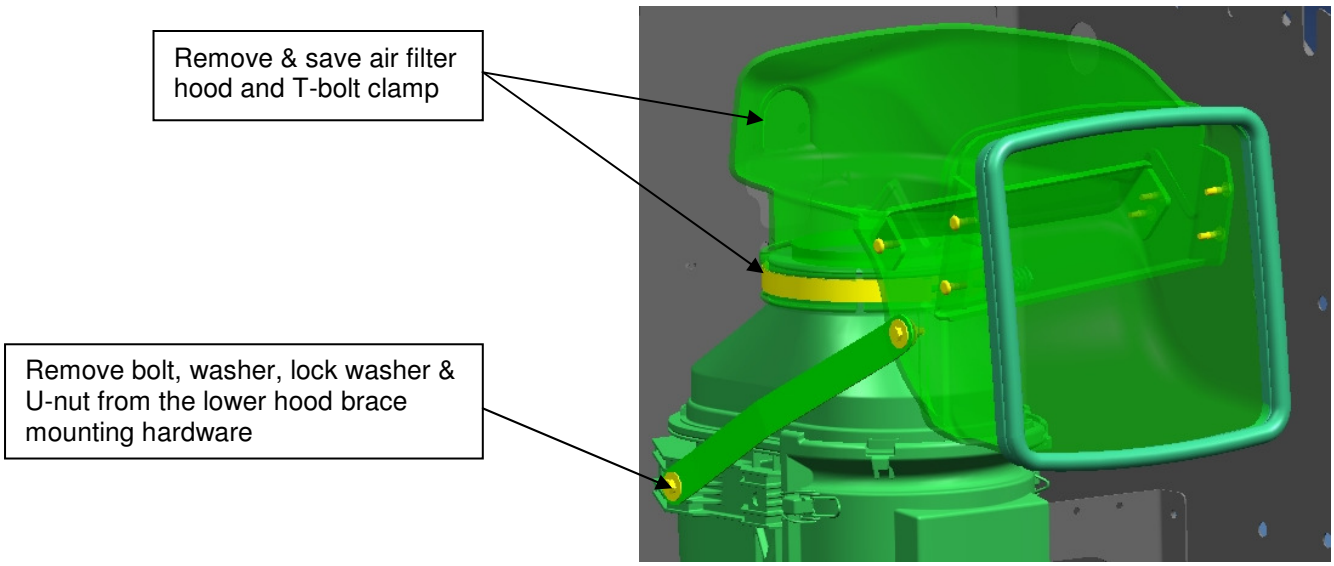

Figure 5: Air Filter Hood Removal

14. Loosen the 7.62” T-bolt clamp between the air filter housing and the reducer hump. Remove T-bolt clamp and reducer hump and set aside for reuse later in this install. See figure 6.

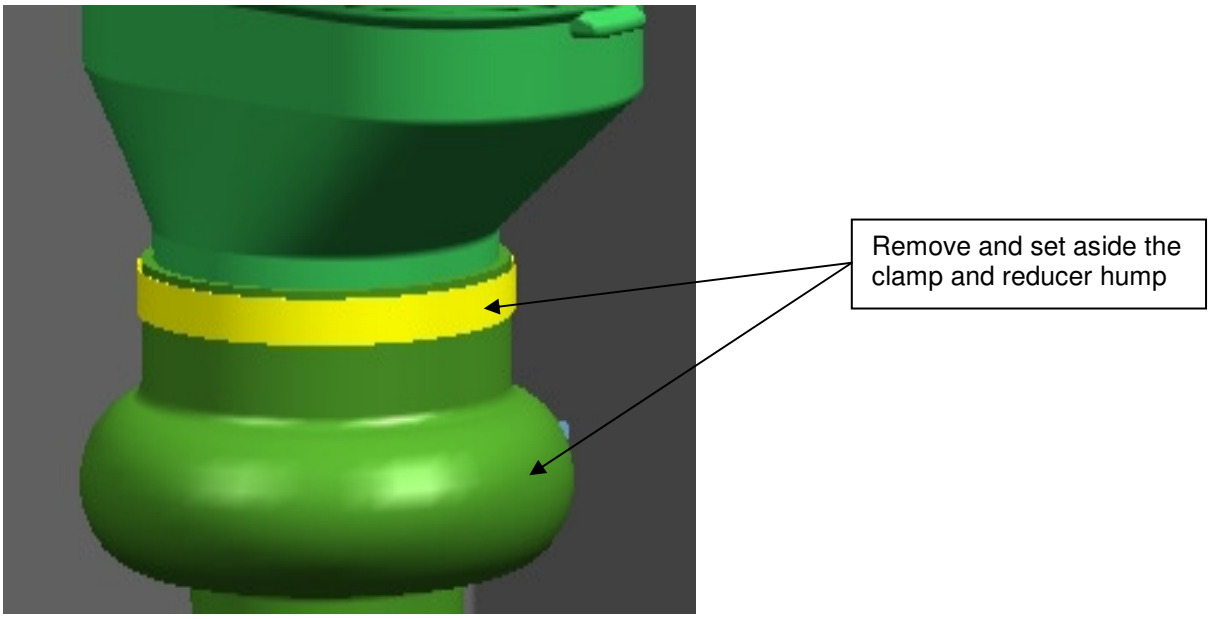

Figure 6: Silicone Hump Removal

15. Examine the air filter housing carefully. The housing is to be discarded and replaced with a new assembly p/n 477921 for any of the following issues:
    a. Possible bolt penetration done to the inside of the air filter housing from using bolts that are too long on the lower hood braces and the mounting U-nut locations. See Figure 7.

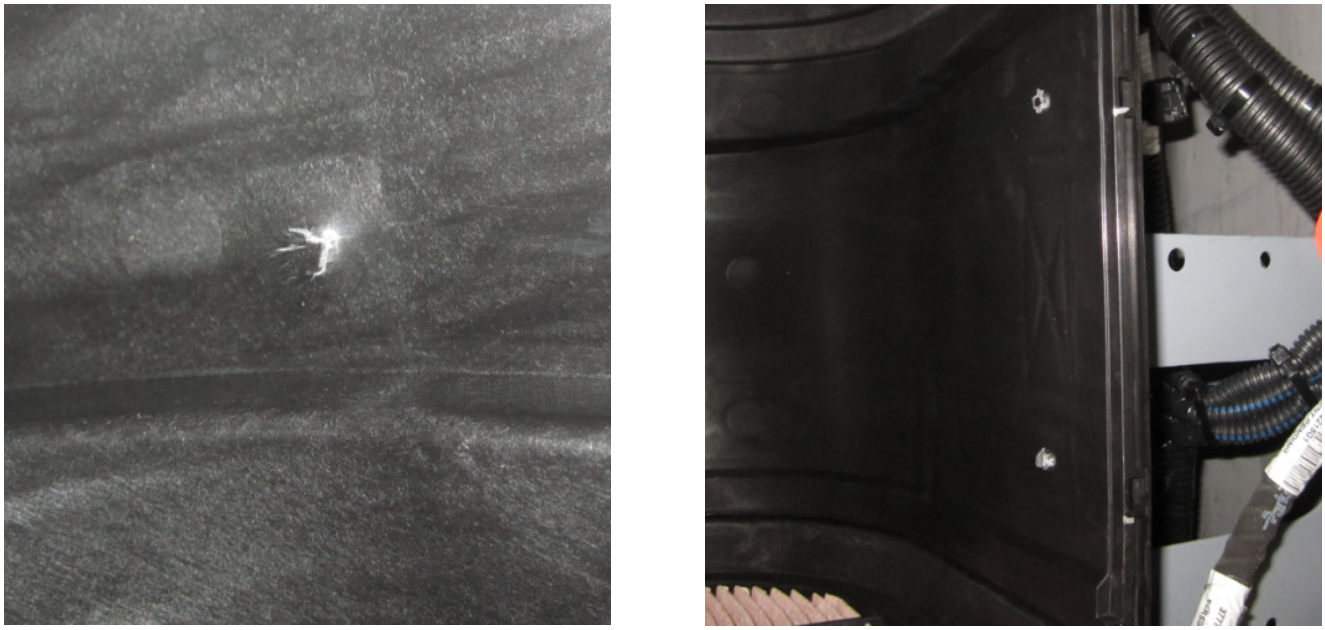

Figure 7: Air Filter Housing Bolt Damage

    b. Possible cracking of the four air filter housing plastic U-nut mounts. See Figure 8.

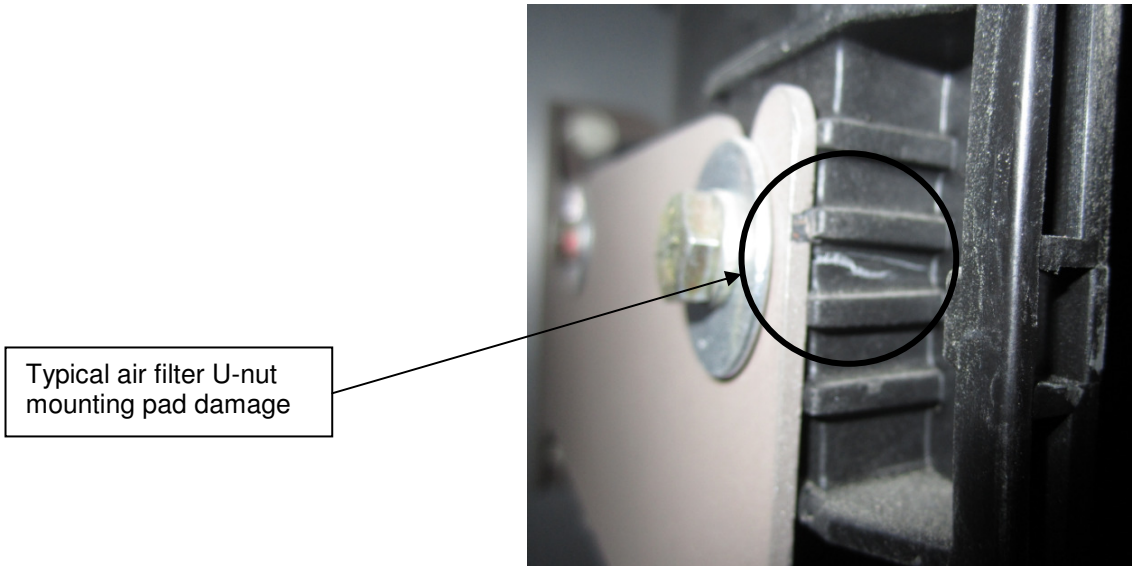

Figure 8: Mounting Pad Damage

c. Possible cracking and/or deformation of the air filter housing inlet and outlet flange due to too high of clamp torque being applied when originally installed. See Figure 9.

Figure 9: Air Filter Housing Inlet/Outlet Flange Damage

16. If a new air filter housing is needed proceed to Step 21.
17. If the air filter housing does not have any of the signs of damage stated in Step 15 use a lint-free damp cloth to clean the gasket sealing surfaces between the cover and the housing, between the filter element and cover, and between the filter element and the interior of the housing. Use a damp cloth to remove any hard ridges of dirt built up around the gasket sealing area. The entire inside surface of the housing must be free of any contaminants.
18. Install the secondary element into the air filter housing with the handle facing up and towards you. Insert the secondary element tab into positioning slot at rear of the housing before pushing the element down into place. Note the handle must be towards the service cover opening and completely seated to properly install the primary element. See Figure 10.

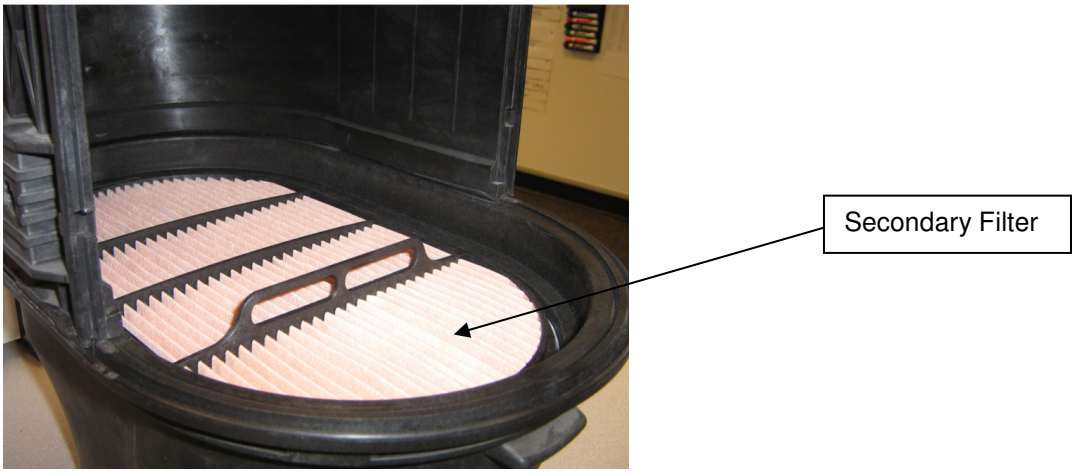

Figure 10: Secondary Filter Installation

19. Using the handle on the primary element insert it into the housing at the same angle it was removed (5 degrees) until it makes contact with the inside of the housing. Pull down on the handle to complete seal. Note the element must be properly seated to properly install the service cover. See Figure 11.

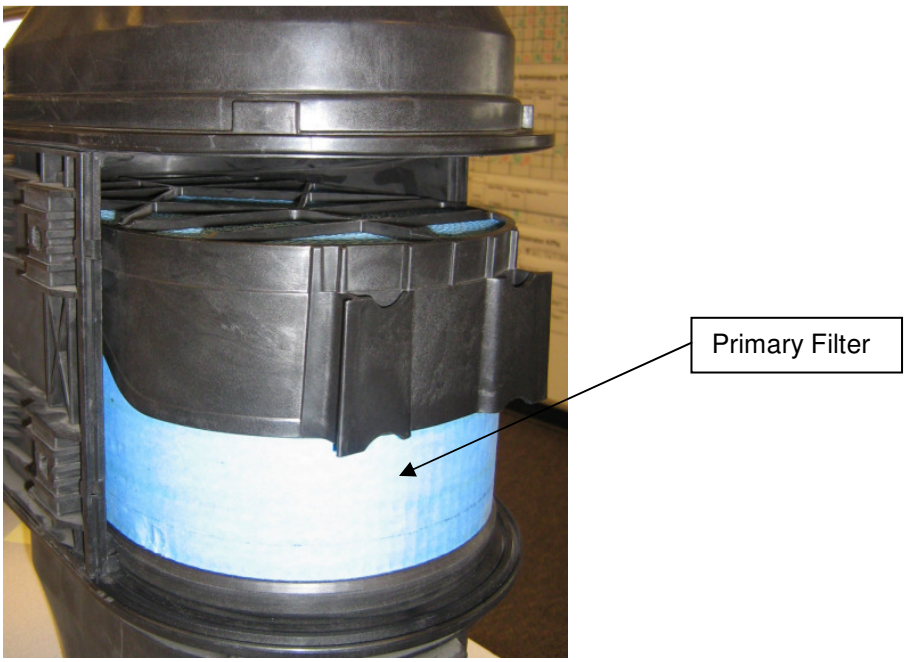

Figure 11: Primary Filter Installation

20. Install service cover with the indexed rib at the top and attach all 4 latches. If the cover doesn't seat, remove and re-check the filter position. Never use latches to force the element into place. See Figure 12.

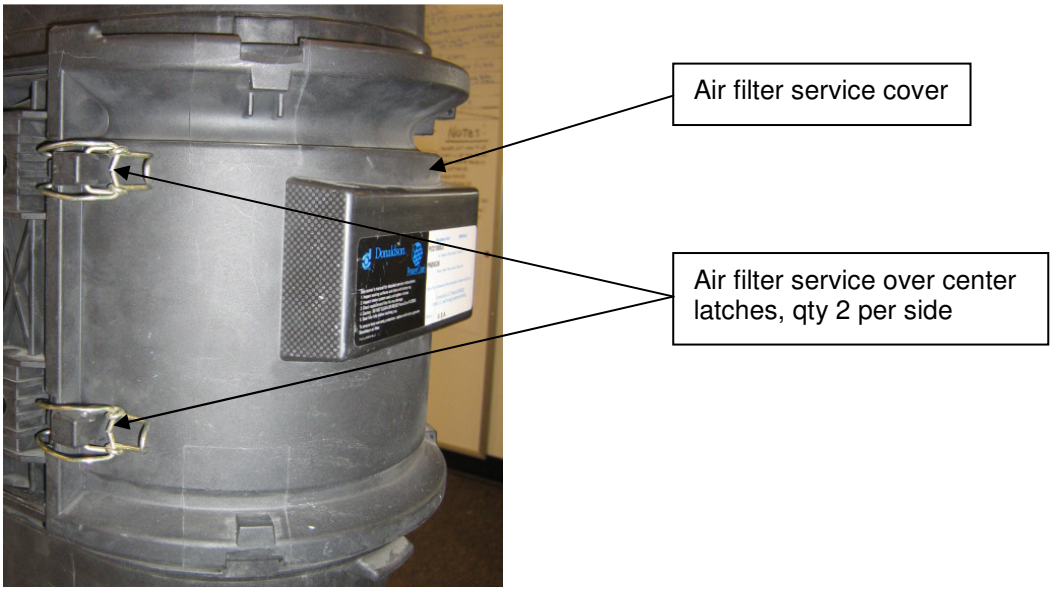

Figure 12: Air Filter Service Cover Installation

21. Insert the U-nuts p/n 362262 into the appropriate housing mounting pads (typical 5 places) on new air filter housing assembly p/n 477921 or cleaned existing housing assembly depending if the housing was damaged as per Step 15. See Figure 13.
22. Position the T-bolt clamp and hood removed in Step 13 onto the housing assembly. For proper clamp seating make sure the silicone reducer hood is pushed down the entire length of the housing flange. Torque T-bolt clamp to 40 in*lbs. Using a new ¼-UNC x ¾" long bolt p/n 10B04012, washer p/n 060771 and loctite p/n 8110442 to secure the lower hood brace. Torque bolt to 95-110 in*lbs. See Figure 13.

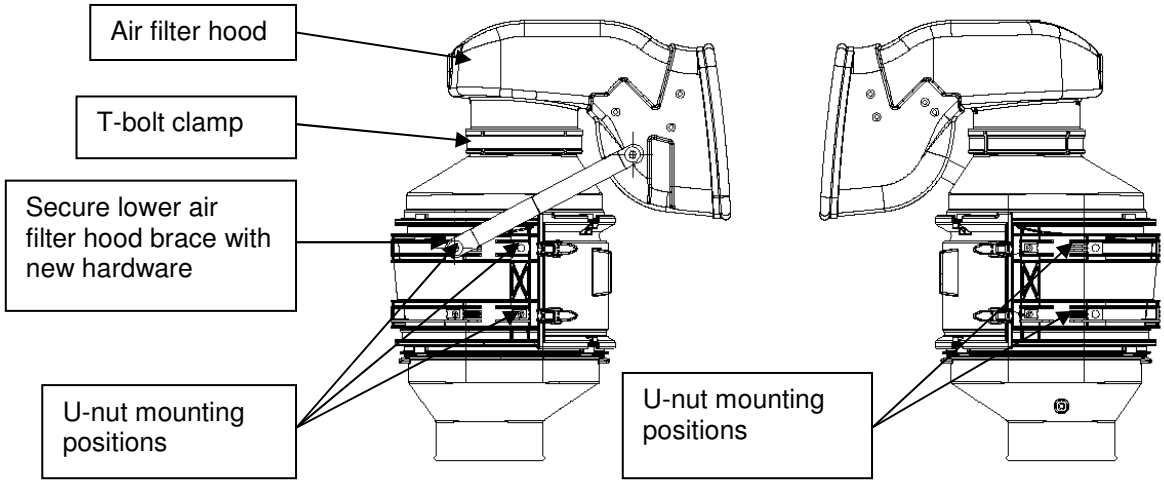

Figure 13: Air Filter Housing Preparation

23. Use a lint-free damp cloth to clean the reducer hump removed in Step 14. Examine to see if there is any damage or excess wear to the reducer hump. If not use as is, if there is damage replace with a new hump p/n 5926059. Install the hump and T-bolt clamp, completely over the bottom outlet flange of the housing. Leave clamp loose. The clamp should be approximately .5" and parallel with the edge of the hump and torque T-bolt clamp to 40 in*lbs. See Figure 14.
24. Cap/plug the inlet and outlet of the housing assembly and set aside for reuse later in this install.

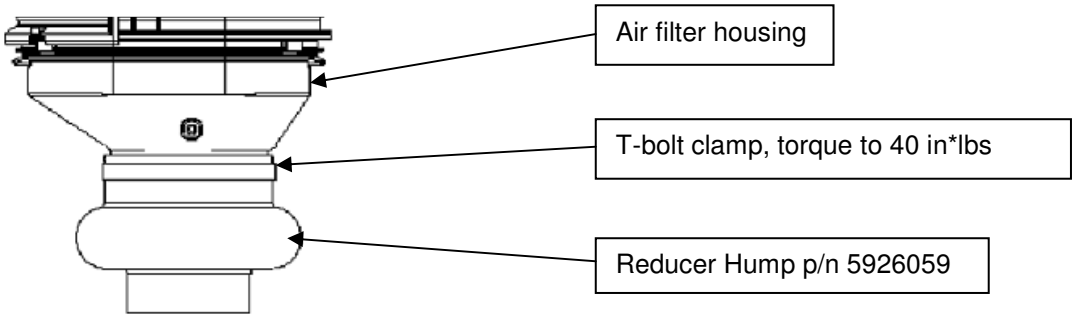

Figure 14: Reducer Hump Installation

25. Using a lint free damp cloth clean the interior of the air intake tube. Cap/plug the upper end of the tube if not immediately proceeding to the next step. See Figure 15.

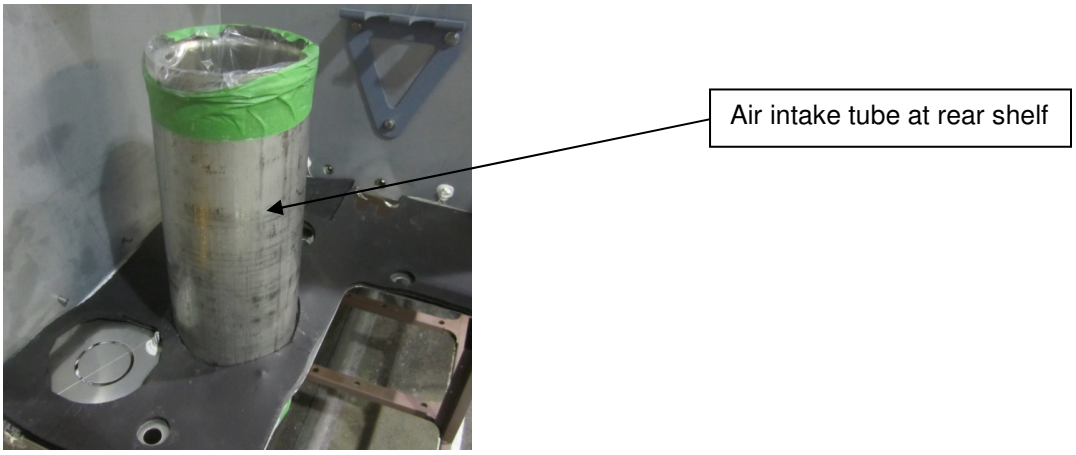

Figure 15: Rear Shelf Air Intake Tube

26. Remove the cap/plug installed on the air filter housing assembly in Step 24. Carefully position the reducer hump end of the housing assembly and the T-bolt clamp removed in Step 12 over the upper end of the intake tube in the rear shelf. Care is to be taken not to bind the hump on the tube. Use of a soap and water solution may be used to lubricate the hump to ease installation, if necessary. The reducer hump flange must slide a minimum of 1.5" past the tube edge. Torque T-bolt clamp to 80-90 in*lbs. See Figure 16.
27. Secure the housing to the frame support brackets using new bolt p/n 10B04012 , washer p/n 060771 and Loctite p/n 8110442, typical 4 places to replace the ones removed in Step 10. Torque bolts to 90-110 in*lbs. Care is to be taken to use 0.75" long bolts only. See Figure 16.

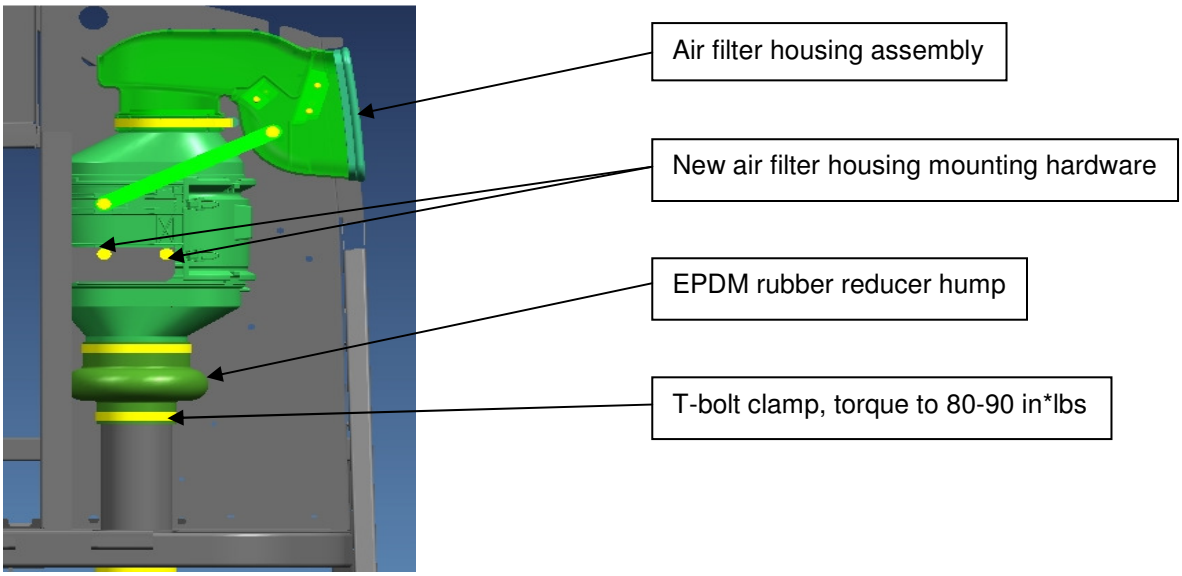

Figure 16: Air Housing Assembly Installation

28. Close curbside corner pillar access door.
29. Open the curbside fuse box access door.
30. If present, remove the air restriction indicator hose assembly from the air intake tube and set aside for re-connection later in the install. See Figure 17.

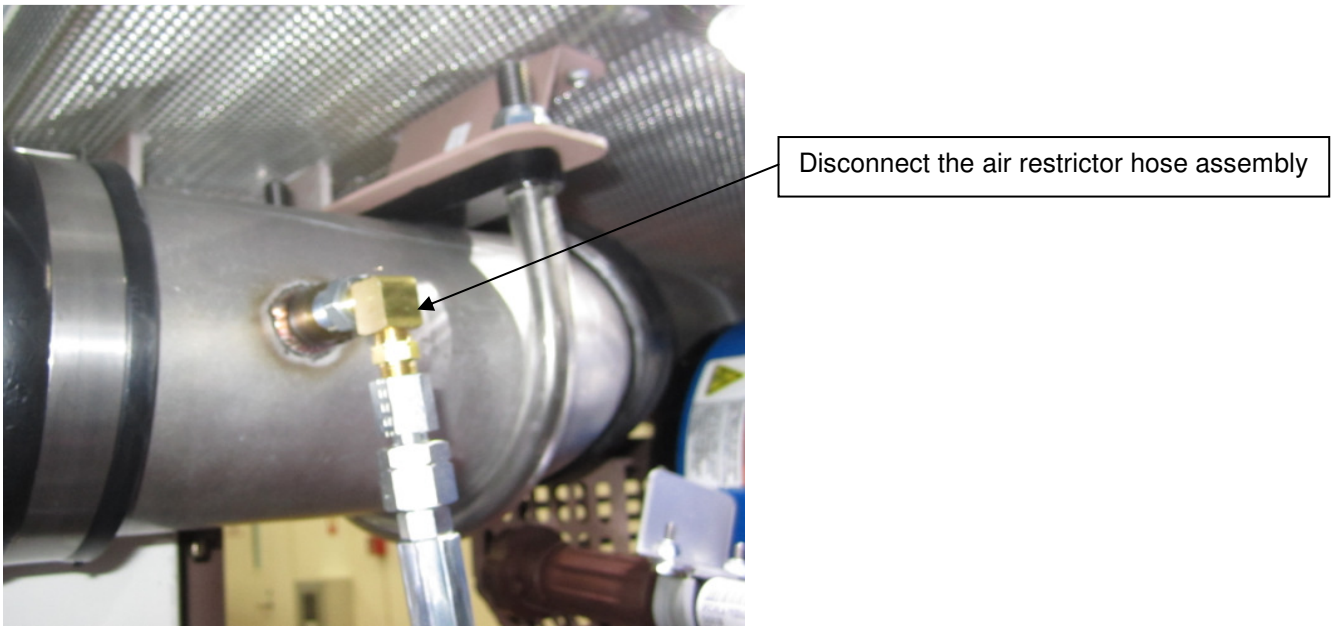

Figure 17: Restrictor Hose Assembly

31. If present, disconnect the TBAP sensor connector from the air intake tube and set aside for reuse later in this install. See Figure 18.

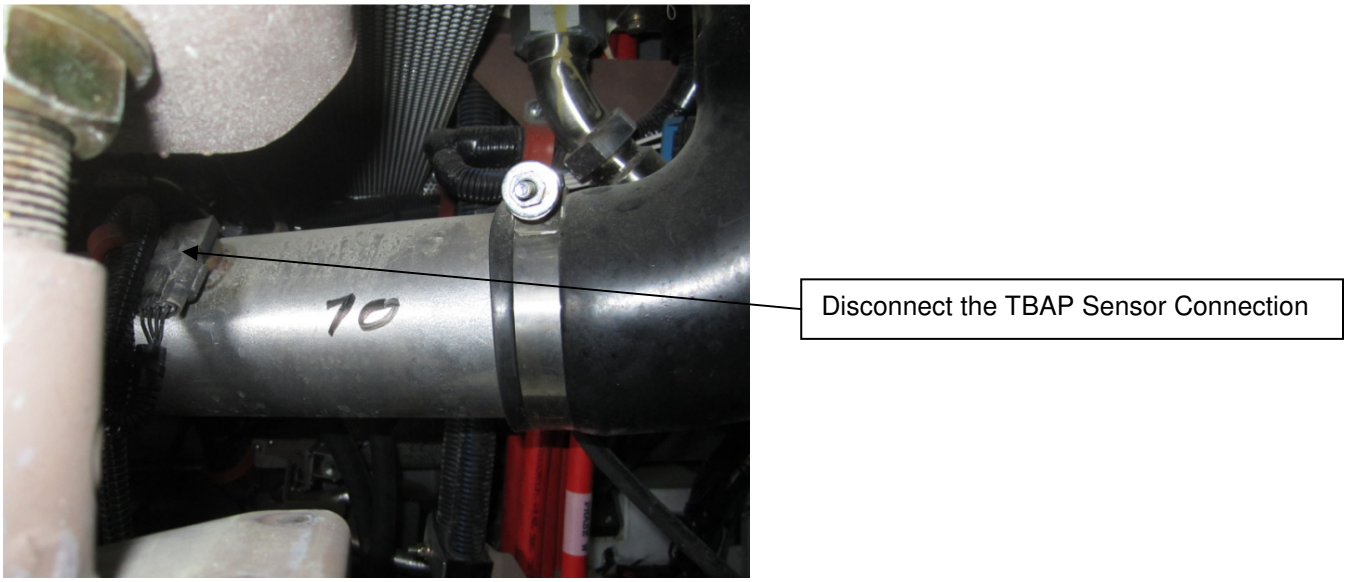

Figure 18: TBAP Sensor Connection

32. Loosen the air intake tube mounting clamps, typical 2 places. See Figure 19.
33. Loosen the T-bolt clamps on the 5.0” hose hump and the 4.0” elbow between the turbo and the air intake tube. Disassemble and remove the hump, air intake tubes, and elbow. Set aside for cleaning. See Figure 19. Go immediately to Step 34.

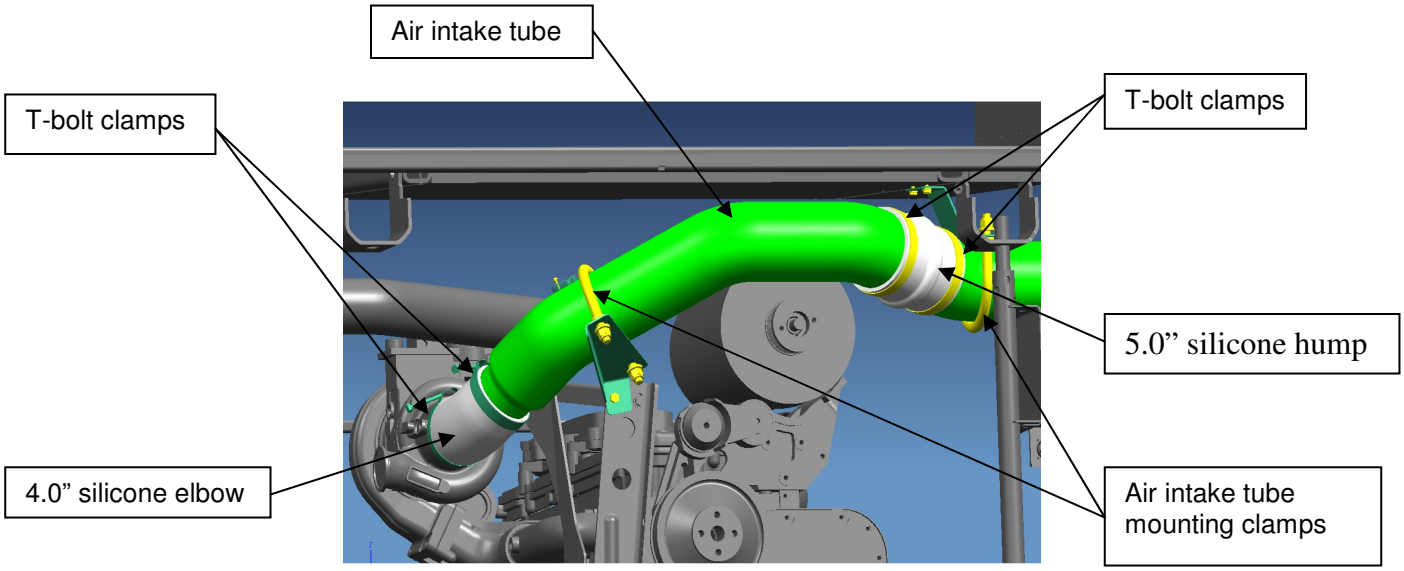

Figure 19: Air Intake Tube Removal

34. Immediately take a picture of the exposed turbo intake and then cover the turbo intake for cleanliness and protection. Submit the photo along with the completed Air Filter Checklist to the New Flyer RPSM. See Figure 20.

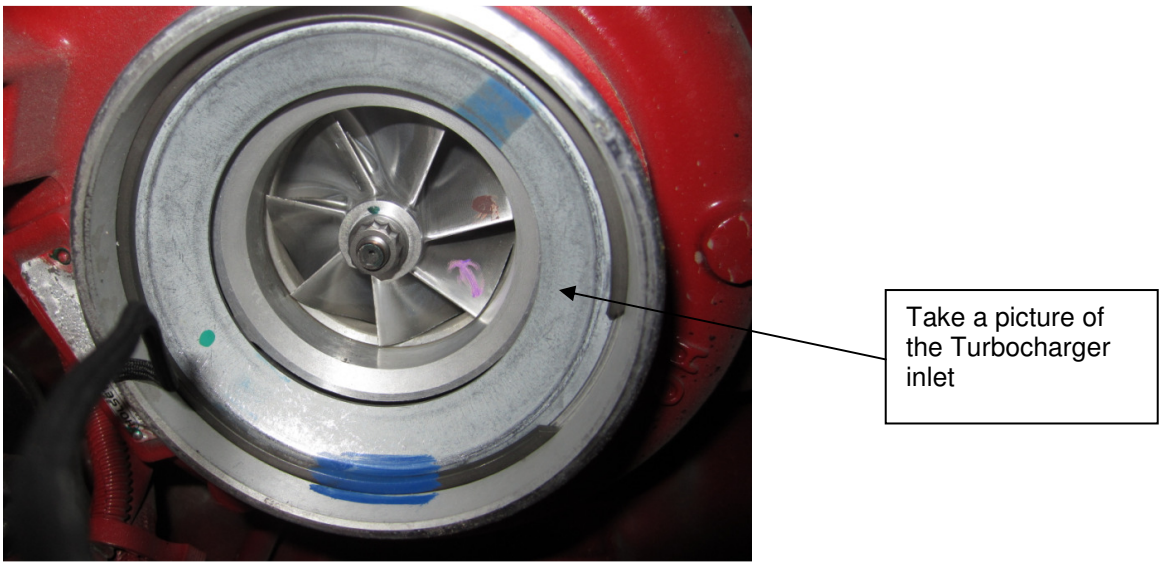

Figure 20: Turbocharger Inlet

35. Inspect the removed air intake tubes, 4.0” silicone elbow and 5.0” EPDM rubber hump connector hose for damage and/or corrosion. If damage and/or corrosion are present replace with new components. If no noticeable damage and/or corrosion are observed, parts are to be cleaned using a lint-free damp cloth. Use a damp cloth to remove any hard ridges of dirt built up. The entire interior surface and the first 3” from the ends of the exterior surface of the tubes must be free of any contaminants and/or part labels.
36. Remove the protective cap/plug covering the turbo intake and re-assemble the air intake tubes, 5.0” hose hump, 4.0” elbow and T-bolt clamps loosely per specifications on Figure 21. Torque all the T-bolt clamps to 80-90 in*lbs. Torque the tube support clamps loosened in Step 32 to 120-145 in*lbs.
37. Re-connect the air restrictor hose assembly disconnected in Step 30. Add loctite sparingly to threads only.
38. Re-connect the TBAP sensor connector disconnected in Step 31.

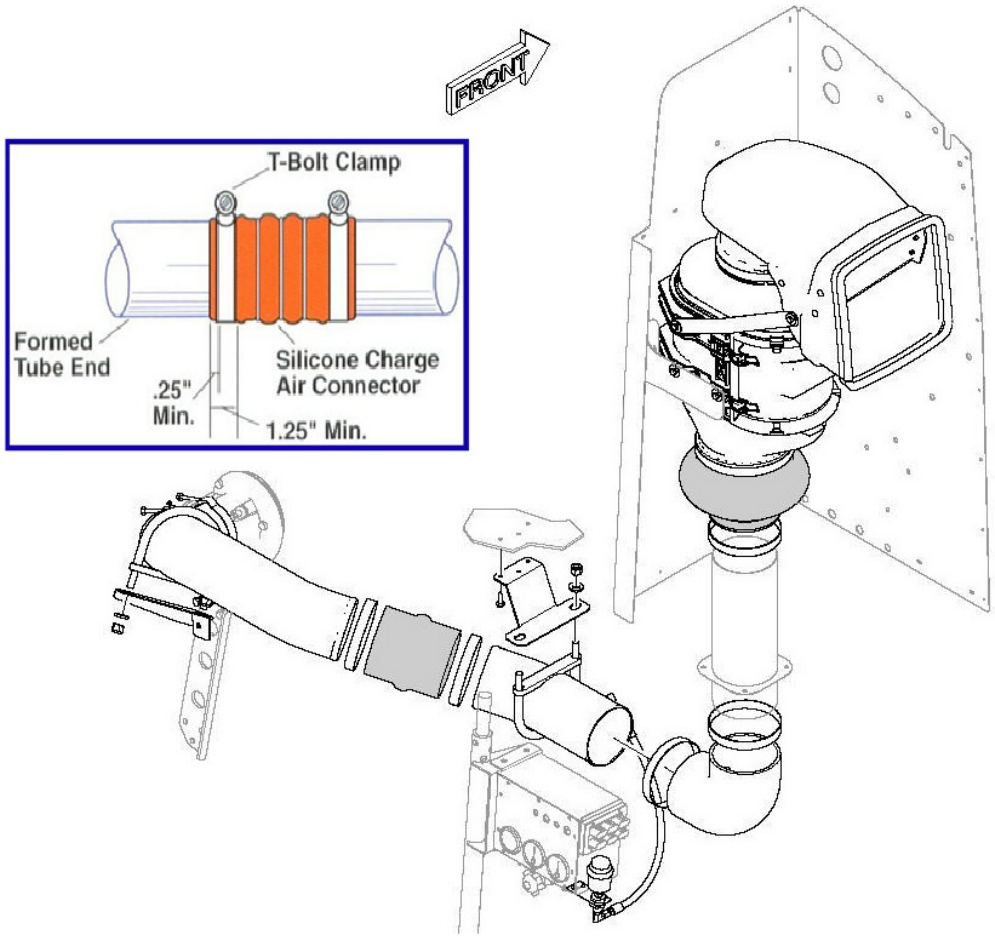

Figure 21: Air Filter Tube Routing

39. All connections to be inspected for proper torque and engagement.
40. Close the curbside fuse box access and rear engine doors.
41. Turn the main battery disconnect switch to the “ON” position.

NEW FLYER

LABOUR ESTIMATE

	Operation	Men	Hours	Labour Time M X HR
1	Clean intake tubes and add secondary filter	2	2.5	5.0

PARTS REQUIRED

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	362262	U-Nuts	5	EA	
2	477921	Assy – Air Cleaner W/Secondary Element	1	EA	
3	10B04012	Bolt – Hex ¼” 20UNC x ¾” LG	5	EA	
4	060771	Washer – ¼ x 1 x .63 SST	5	EA	
5	6389969	Air Filter – Donaldson Primary	1	EA	
6	477007	Filter – Safety Element Donaldson	1	EA	
7	8110442	Loctite 567 – Thread Sealant	.05	EA	

SPECIAL TOOLS REQUIRED

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	N/A	Torque wrench – 3/8” drive	1	EA	Total qty 5

Air Filter Checklist

Name -
Sr # -
Property -
Mileage -
Unit # -
Turbo Photo –
Oil Sample sent for Analyses –