



INSTRUCTION TO SERVICE

ITS: 5481

SECTION:	231 Coolant System
WRITTEN BY:	Mike Pearson
SUBJECT:	Rework OK6 Transmission Cooler Wire Harness UV Damage

ITS5481

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Notes:

Rooftop OK6 units are subjected to large amounts of UV radiation by the sun. Over time the red wires in the harness can become brittle and the wire insulation can crack, exposing the bare wire. Red wire UV damage is occurring on roof mounted OK6 Allison Hybrid Oil Cooler fan wire and harnesses installed in New Flyer buses prior to the spring of 2011. Continued UV exposure can cause copper wire to be exposed which if not repaired will lead to an inoperable fan. An inoperable fan will lead to possible fan fault dash light, hybrid propulsion overheat, initial system overheat dash light and in extreme cases propulsion system shut down due to overheat.

After more in-depth analysis of new production and to improve the overall simplicity of the system, New Flyer and EMP have determined the cooling demand only requires 4 fans, versus the current 6 fan setup. As a result, starting in year 2014 New Flyer production will only have a 4 fan system.

To remove the risk of having inoperable fans, the OK6 main harness will be replaced on subject units; the existing 6 fans will be replaced with 4 new or reworked fan assemblies depending on the severity of damage, 2 cover plates and all necessary hardware for the rework.

Even though this issue is beyond the warranty period and years of operation have occurred, New Flyer and EMP will supply the parts required to do the rework. The labor is to be managed/supplied by the properties and is expected to take approximately 2 hours per bus.

The parts will be supplied as part of a swing campaign. The listed replacement parts will be provided and the property must return the 6 fans removed from the vehicle. The system harness is to be scrapped on site.

Included in this Instruction to Service:

1. Instructions on how to request parts.
2. Instructions on how to remove the 6 fans and replace with the 4 fans

As this is being put forward to the affected properties as an after-warranty rework this offer will be available only until **December 15th 2014**. In order to receive parts, properties must send a request for parts to EMP. Replacement parts will be provided in the order in which requests are received.

Thank you for your understanding and we look forward to your participation.

PROCEDURE:

1. To obtain parts, send the completed request form to EMP. (See page 8.)
2. Locate parts for rework. Be sure to save shipping packages for return shipments.
3. Park the vehicle on level ground.
4. Set the Battery Disconnect switch to the "OFF" position.
5. Using approved fall safety protection equipment rework the EMP transmission oil cooler as follows:
6. **Main Harness Removal:**
 - a. Disconnect the 16 pin Deutsch HD34 connector from the bulkhead connector on the driver's side of the bus. This requires a twisting motion in the counterclockwise direction.
 - b. Remove the two M10 fasteners attaching the main harness p-clips to the oil cooler frame. These are on the driver's side of the Kit. Reserve the fasteners for reassembly.
 - c. Disconnect each of the fans from the main wire harness by depressing the locking tab and pulling back on the harness connector body, pulling the connector body off the shroud.
 - d. Cut and remove the cable ties attaching the harness to the shroud in each of the two locations; between fans 1, 2 and 3 and between fans 3, 4 and 5.
 - e. Remove the main harness from each of the 8 J-clips by bending the J-clips away from the fan shrouds they are attached to. Discard the removed harness.

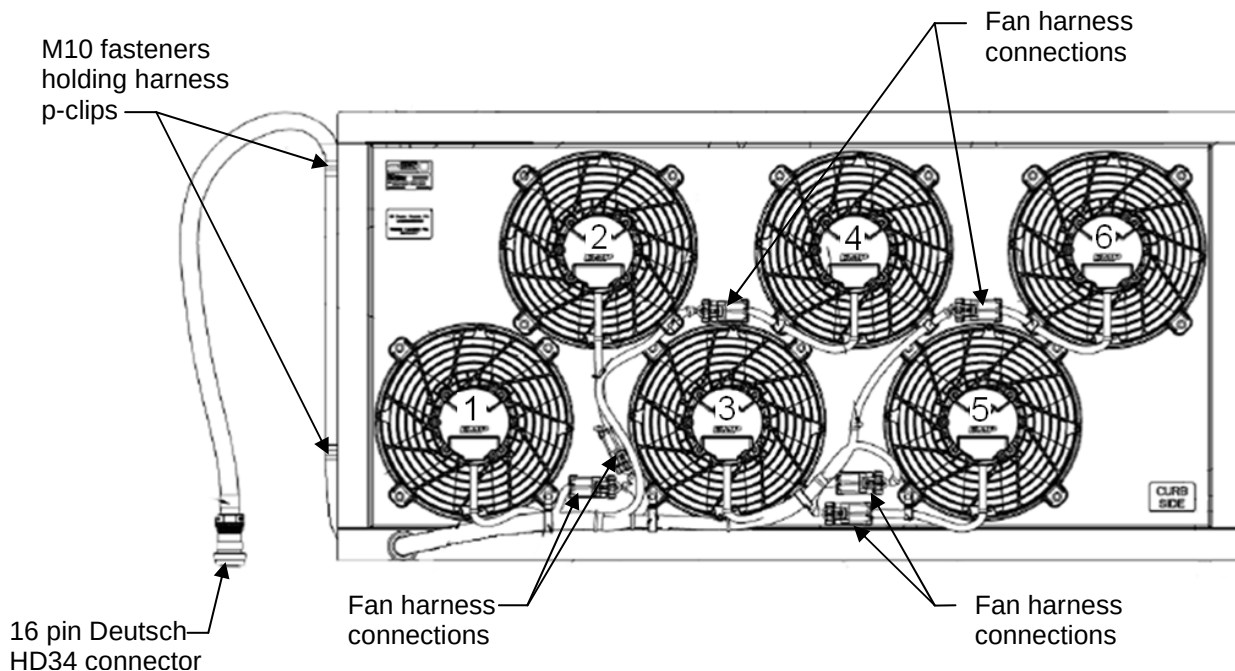


Figure 2: EMP Rooftop Transmission Oil Cooler Main Harness Layout

7. Fan Removal (6 places):

- a. Detach the fan's connector from the shroud by removing the connector and the mounting clip.
- b. Clip and remove any tie wraps that are attaching the fan wire harness to the shroud.



NOTE: Make note of the fan orientation (all fans are oriented in the same direction) and location of the tie straps attaching the fan harness to the shroud.

- c. Remove all (4) M6 x 16mm fan mount bolts and discard. New bolts are provided.

8. Parts Return Instructions:



NOTE: It is strongly suggested that the original packaging be reused. This includes the smaller white fan boxes and a larger brown box that hold six fan boxes.



NOTE: Your RMA will be issued upon receipt of parts request (see page 8). The RMA will include RMA number, shipping address and packaging instructions.

9. Close Off Plate Installation (2 places):

- a. Install the 2 closing plates at the locations shown in Figure 3 in place of fans 3 and 4.

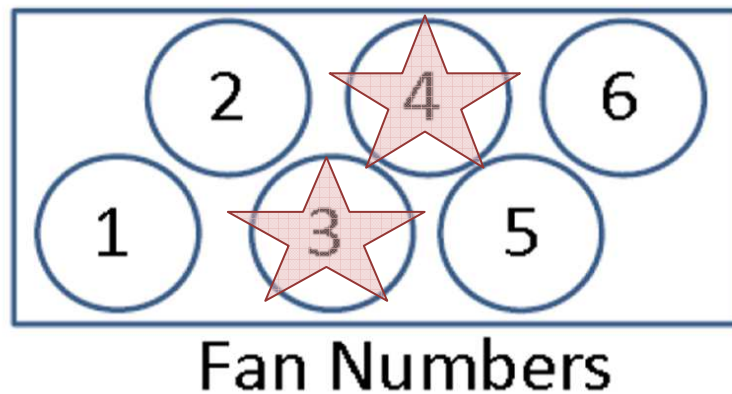


Figure 3: Close Off Plate Locations

10. Fan Installation (4 places):

- a. Place the replacement fan onto the fan shroud and orient the same way as noted.
- b. Torque the mounting bolts to 106±10 in*lbs using a criss-cross pattern for torque sequence.

11. Main Harness Installation:



NOTE: Inspect blue seal on the main harness to ensure it is oriented properly on the connector before installation and is not damaged. Rotate Seal as required. Applying a thin film of grease or lubricant to the seal will aid in the installation process (Figures 4a and 4b). If the seal is damaged or missing it will need to be replaced (EMP P/N EXP11110002 – or choose one from discarded harness).



Fig. 4a: Perfect Orientation



Fig. 4b: Improper Orientation

- a. Lay the new main harness assembly out across kit as shown in Figure 5.



Figure 5: Main Harness Layout

- b. Install grommet attached to harness into the slot to protect the harness from abrasion. Take care not to damage harness during grommet installation.
- c. Apply di-electric grease to all connectors by obtaining a small brush. Apply a small amount of di-electric onto brush and manually apply to the connector terminals on all harness connectors.



NOTE: When connecting Main Harness to Fan Harness, the connector is seated when you will hear or feel a “click”. Make sure the seal is not visible. If there is blue seal visible after the connector is seated then the connection will not be sealed and be compromised (Figures 6a and 6b).



Fig 6a: No Seal Visible, Correct

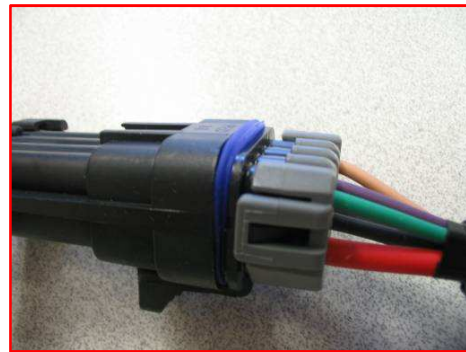


Fig. 6b: Seal Visible, Incorrect

- d. Connect fans 1, 2, 5 and 6 to their mating harness connector.
- e. Cap harness connector for absent fans (3 and 4) with supplied cap (EMP P/N 3250031023).
- f. Once each fan is connected properly, insert 11” zip tie (EMP P/N 3330036029) through the wire bundle on the fan side and then through the harness side. Tighten zip tie to secure connector and trim excess (Figures 6a and 6b).



Fig. 6a: Zip Tie Inserted



Fig. 6b: Zip Tie Secured and Trim

- g. Use fir tree zip ties (EMP P/N 3330010025) to secure each fan connector and each capped connector to existing holes in the shroud.
- h. Route the main wire harness through the j-clip on the upper LH fastener on fan #5 and lower LH fastener of fan #6. Attach the harness branch to fan #5.
- i. Attach the branch of the main harness that connects to fan #6 to shroud using a new fir tree tie wrap (EMP p/n 3330005012) in the hole located between fans #3, #4 and #5.
- j. Route the harness through the 1” J-clip on the lower RH fastener of fan #1.
- k. Route the harness through the J-clip on the lower LH fastener of fan #2.
- l. Route the capped branch of the harness for fan #4 and the lead coming off fan #2 through the fir tree tie wrap located in the center of fan locations #1, #2 and #3.



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- m. Attach the harness assembly to the oil cooler frame using the two P-clips that are pre-assembled onto the harness. The torque requirement for these fasteners is 25 ± 4 ft*lbs.



NOTE: Ensure there is no slack in the harness before securing the P-clips and ensure that the grommet is in place in the frame.

- n. Connect the 16 pin Deutsch HD34 connector to the bulkhead connector on the driver's side of the bus. This requires a twisting motion in the clockwise direction..

12. Turn the main battery disconnect switch to the "ON" position.



To Request Parts: Complete this form and scan/e-mail this document to: Warranty@emp-corp.com

OK6 – ITS 5481 Parts Request

Transit Name: _____

City/State: _____

Contact name: _____

E-mail: _____

Phone: _____

SR#(s): _____

Total Quantity of Buses to be reworked: _____

Anticipated rework pace (# of buses to be completed per MONTH): _____

Shipping Address for parts: _____

Open Hours for Receiving Dock: _____

Any special instructions for shipping of parts: _____

Received: _____

EMP USE ONLY

SO# _____

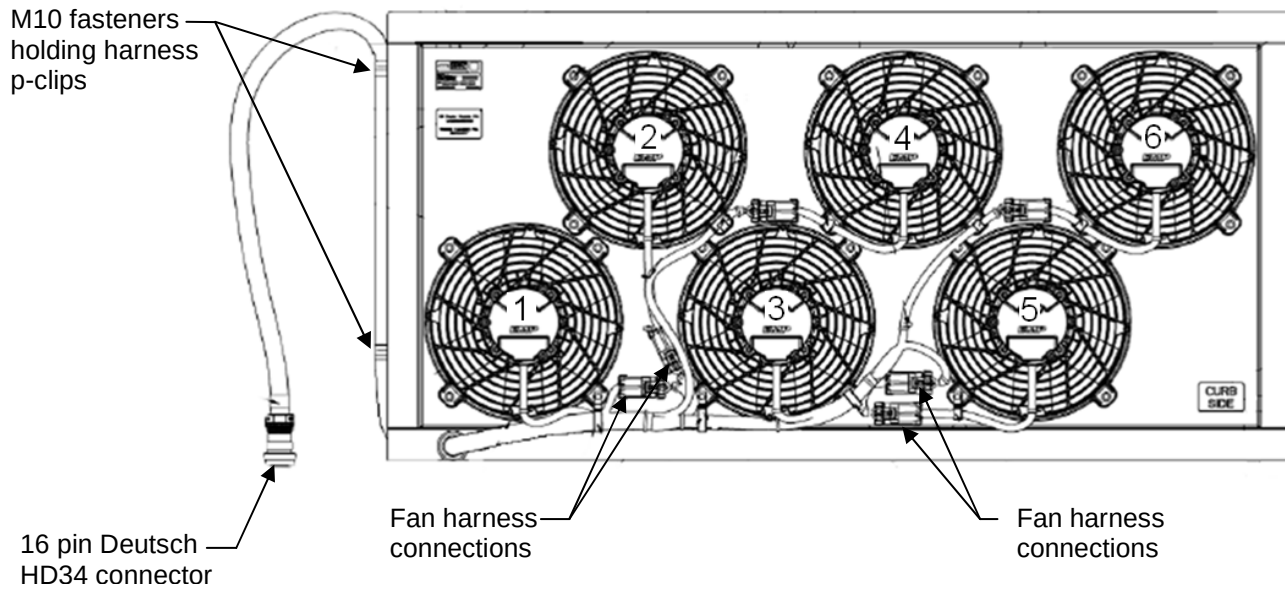
RMA# _____

First Shipment QTY: _____

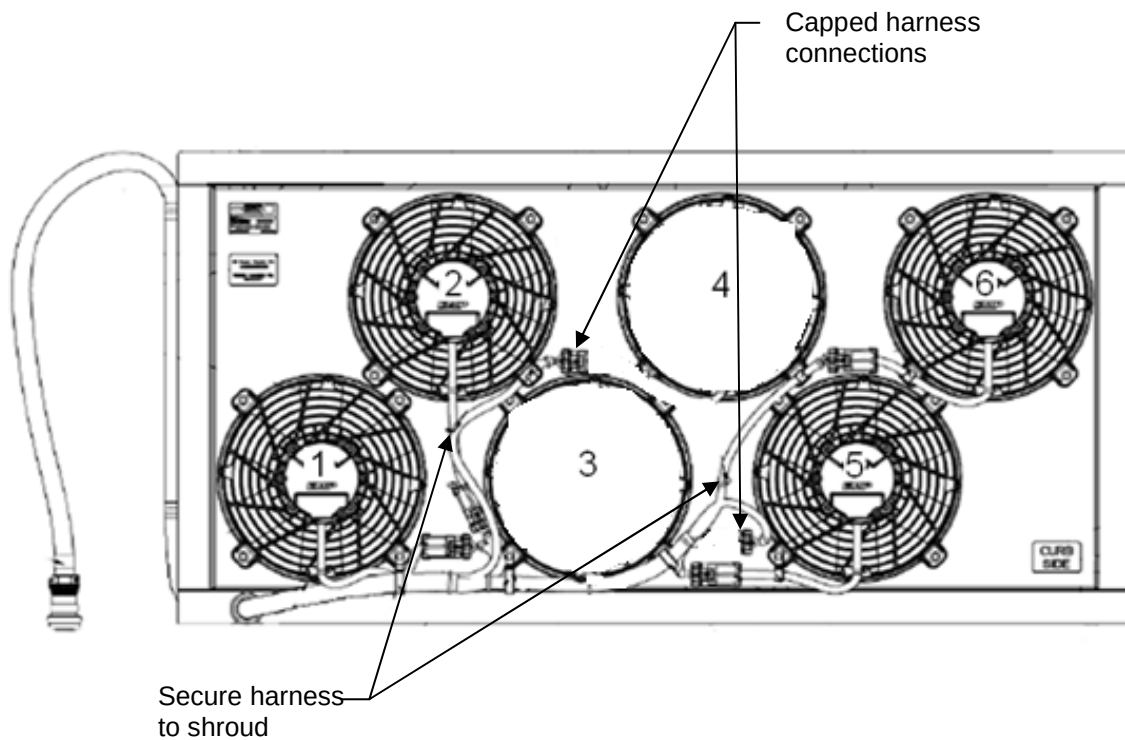
First Shipment Date: _____

SUMMARY IMAGES:

BEFORE:



AFTER:



LABOUR ESTIMATE

	Operation	Men	Hours	Labour Time M X HR
1	Rework OK6 Transmission Cooler Wire Harness UV Damage	1	1.5	1.5

PARTS REQUIRED

Item	Part Number	Description	Qty. per Coach	Unit	Notes
1	6406658 (EMP 1050016062)	Fan – Reworked FI	4	EA	Any combination of these p/n's making up 4 fans
2	6435430 (EMP 1050036016PA05)	Fan-New FIL			
3	6390681 (EMP 3170025006)	Harness-Main	1	EA	
4	6435431 (EMP 3250031023)	Fan-Connector Cap	2	EA	
5	6435432 (EMP 1400031015)	Plate-Block Off	2	EA	
6	6389766 (EMP 5079010003)	Bolt-M6x1.0x16	24	EA	
7	6406191 (EMP 3330022090)	Zip Tie- 8"	10	EA	
8	6406889 (EMP 3330010025)	Zip Tie-8" w/ Fir Tree	10	EA	
9	6406664 (EMP 3330036029)	Zip Tie-11"	6	EA	

SPECIAL TOOLS REQUIRED

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	N/A	N/A	N/A	N/A	