

ENGINEERING MODIFICATION INSTRUCTION - BUS

**BENDIX PP-1 VALVE BUTTON INSPECTION
AND REPLACEMENT**

**BENG ENGINEERING - BUS
WMATA EMI NO. 50L23
Sheet 1 of 4**

BENDIX

PP-1 VALVE BUTTON

INSPECTION &

REPLACEMENT ,

ALL BUS FLEETS

Checked By	Rev	Rev	Rev	Rev	Rev	Rev
Date Checked						
RCES Approved						
Date Approved						
Concurrence	Date					

ENGINEERING MODIFICATION INSTRUCTION - BUS

BENDIX PP-1 VALVE BUTTON INSPECTION
AND REPLACEMENT

BENG ENGINEERING - BUS
WMATA EMI NO. 50L23
Sheet 2 of 4

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
1.0	PURPOSE	3
2.0	BACKGROUND	3
3.0	APPLICABLE BUSES	3
4.0	APPLICABLE MAXIMO DATA	3
5.0	MATERIAL REQUIRED	3
6.0	TOOLS REQUIRED	4
7.0	PROCEDURE	4
8.0	MAINTENANCE	4
9.0	ATTACHMENTS	N/A
10.0	FIGURE #1	N/A
10.0	FIGURE #2	N/A

ENGINEERING MODIFICATION INSTRUCTION - BUS

BENDIX PP-1 VALVE BUTTON INSPECTION
AND REPLACEMENT

BENG ENGINEERING - BUS
WMATA EMI NO. 50L23
Sheet 4 of 4

7.0 PROCEDURE

7.1 Evaluate Existing PP-1 Valve Button

7.1.1 Visually inspect the PP-1 Valve Button. The plastic button is bright yellow with black lettering. The desired aluminum PP-1 Valve Button is anodized aluminum and has a yellow/olive color with a matte finish.

(There will be a number of buses which have had the new aluminum valve installed, as all old plastic stock has been replaced with the new aluminum buttons. Any replaced buttons prior to this EMI have not been accounted for.)

7.2 Install Aluminum PP-1 Valve Button

7.2.1 If the yellow plastic button is installed onto the PP-1 Valve, change the quantity of the two items listed on the Plans Tab on the Work Order in Maximo from zero to one each. Verify and correct the Storeroom to reflect your Division as required. After receiving the new parts, remove the existing roll pin and remove and replace the button with the desired aluminum button. Install a new roll pin and verify proper operation of the PP-1 Valve. Discard the old PP-1 button.

8.0 MAINTENANCE

N/A

9.0 ATTACHMENTS

N/A



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ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



New Flyer Xcelsior Compressed Natural Gas (CNG)
Haldex Air Dryer Retrofit
(2830-2993)

WMATA BUS ENGINEERING (BENG)
EMI No.: 22-AS-01-00
Page 1 of 18

**New Flyer Xcelsior Compressed Natural Gas (CNG)
Haldex Air Dryer Retrofit
SR1947; Fleet 55: (2830-2993)**

Revision History				
Revision No.	Revision Date	Reviser / Author	Document Section No. (if applicable) or N/A	Description of Changes
00	02/22/22	Wendell Bias		Initial Release



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ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



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Haldex Air Dryer Retrofit
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**WMATA BUS ENGINEERING (BENG)
EMI No.: 22-AS-01-00
Page 3 of 18**

1.0 PURPOSE

This modification is designed to improve reliability of the pneumatic system by eliminating an electronically controlled purge cycle, therefore reducing failure of the air dryer and pneumatic system components. Additionally, installation of Haldex air dryers with dual conseps provides standardization among past bus fleets with equipment being provided on new bus procurements.

2.0 BACKGROUND

The New Flyer Xcelsior Compressed Natural Gas (CNG) model transit buses came equipped with Graham White air dryer assemblies. The Graham White system used an electronic timer to perform purge cycles of the desiccant cartridges resulting in reliability concerns due to the mounting location of the component. Due to the complex operation of the air dryer assembly, maintenance and diagnostic labor times increased and additional training of technicians were required. The Haldex air dryer assembly has a more mechanical approach to purging the desiccant cartridges reducing the need for maintenance intervention between scheduled services. The installation of Haldex air dryers onto fleets at Mid-Life Overhaul provides fleet standardization with equipment being used on new bus procurements.

3.0 APPLICABLE BUSES

Fleet 55, Buses 2830-2993

4.0 Job Plan: Asset List:

5.0 MATERIAL REQUIRED

The kit below contains all required materials and hardware for installation, see Attachment A.

Note: Kits delivered earlier in the air dryer upgrade project, were delivered with harnesses that needed to be retrofitted by WMATA. Verify that newer kits come with harness already corrected (WMATA # 986720461, Item 11).

Note: Verification of stock is required prior to removal of the air dryer assembly.

<u>Description</u>	<u>WMATA#</u>	<u>Quantity per Bus</u>
KIT, RETROFIT: INCLUDES: AIR DRYER, CONSEPS, HARDWARE, MOUNTING BRACKETS, USED ON: 2830-2993 BUS FLEET; TYPE HALDEX GEMINI MDX AIR DRYER WITH DUAL CONSEPS DQR0004	986720462	1 Each
KIT, RETROFIT: INCLUDES: HARDWARE, MOUNTING BRACKETS, ELECTRICAL HARNESS WITH RELAY, USED ON: 2830-2993 BUS FLEET; TYPE: ADD-ON KIT FOR HALDEX GEMINI MDX AIR DRYER KIT DQR0005	986720461	1 Each
#10 Ring Terminal	Bench Stock	1 Each
16 Gauge Tan Wire	Bench Stock	3 ft
Male Pin Terminal	906390055	1 Each



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



New Flyer Xcelsior Compressed Natural Gas (CNG)
Haldex Air Dryer Retrofit
(2830-2993)

WMATA BUS ENGINEERING (BENG)
EMI No.: 22-AS-01-00
Page 5 of 18

remove fasteners to prevent the air dryer assembly from falling. Lift up and forward to remove the air dryer assembly from the mounting bracket, see Figure 1.

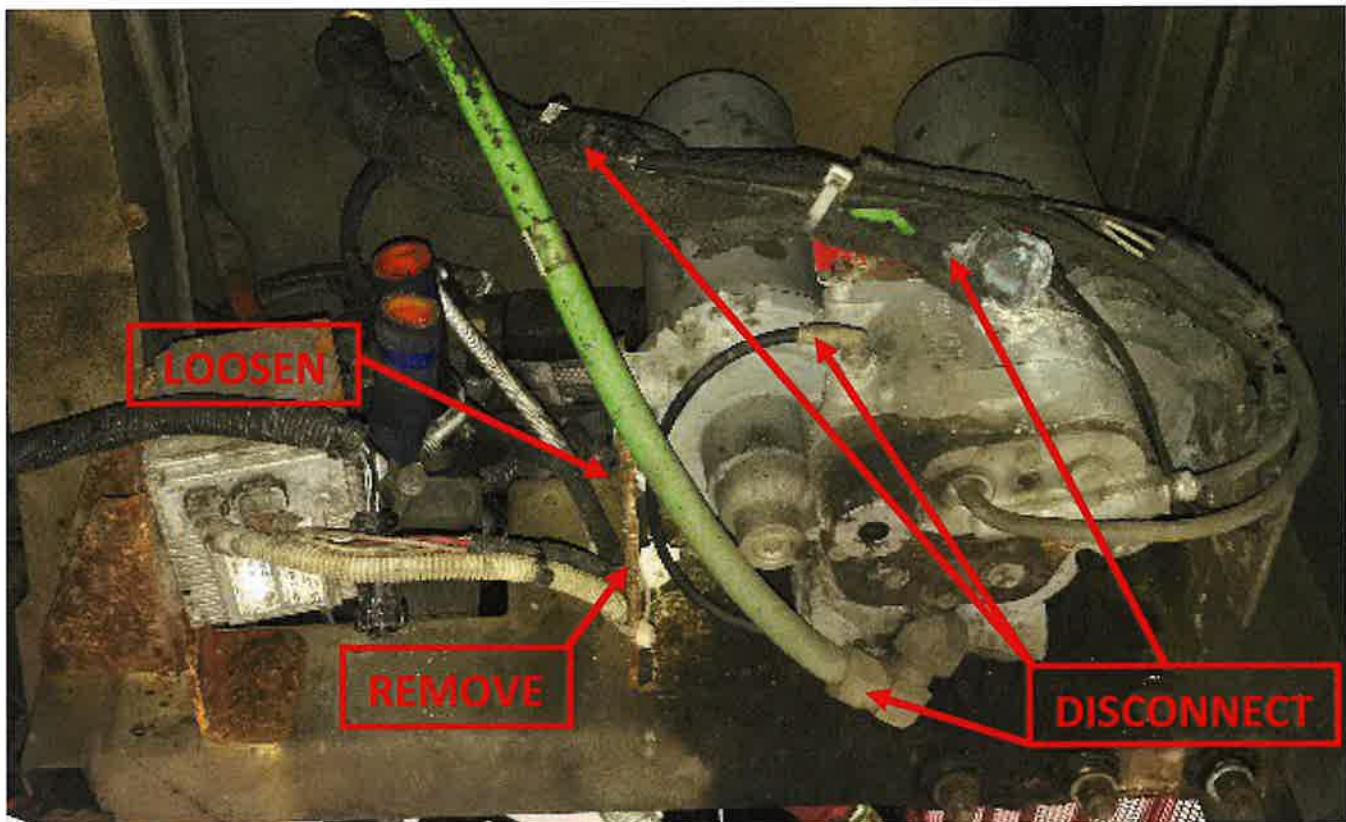


Figure 1: Graham White Air Dryer Removal

7.3 Haldex Air Dryer/ Conseps Installation

7.3.1 Retrieve Haldex Dual Dryer Bracket- Mounting Template from Engineering

7.3.2 Use a paint pin to mark a vertical line on the lower portion of the air dryer frame cross member at $9 - \frac{1}{4}$ " from the intersection of the vehicle frame and the air dryer cross member, see Figure 3.

7.3.3 Use a paint pin to mark a vertical line on the lower portion of the air dryer frame cross member at 7" from the intersection of the vertical body support and the air dryer cross member, see Figure 3.

7.3.4 Center the supplied Haldex air dryer mounting bracket between the two vertical lines and mark the four mounting holes, see Figure 2.



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



**New Flyer Xcelsior Compressed Natural Gas (CNG)
Haldex Air Dryer Retrofit
(2830-2993)**

**WMATA BUS ENGINEERING (BENG)
EMI No.: 22-AS-01-00
Page 7 of 18**

- 7.3.8 Install a 3/8" – 16 x 1.25" bolt, washer, and nylock nut in both lower air dryer mounting bracket holes.
Torque all four mounting bracket fasteners at 45-50 ft. lbs.

7.4 Roadside Purge Tank & Dual Consep Installation

- 7.4.1 Use the Dual Consep Mounting Plate, Figure 3 and Purge Tank Template, Figure 4, to mark the mounting hole locations on the roadside vertical and lower horizontal frame members forward of the air dryer assembly and adjacent to the rear aft air spring. Position the Dual Consep Mounting Plate to overlap the vertical and lower horizontal frame members. Align the edges of the plate with the frame members sides and clamp in place, see Figure 5. Position the Purge Tanks Template's tabs in the plate slot and above the plate, see figure 6.

7.4.2 Center punch the eleven [11] mounting hole locations on the vertical and horizontal frame members.

7.4.3 Drill the eleven [11] mounting holes using a 17/32" drill bit.

NOTE: Start with a smaller drill bit and slowly increment in size until the 17/32" hole is obtained.

7.4.4 Install 3/8" rivnuts in the eleven [11] holes using the manual 3/8" rivnut installation tool, see Figure 7 and Attachment B for the rivnut installation directions.

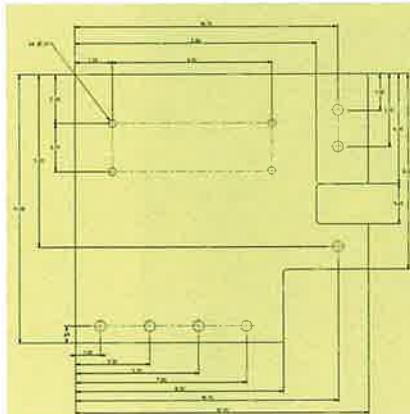


Figure 3: Dual Consep Mounting Plate



Figure 4: Purge Tank Template



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OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



**New Flyer Xcelsior Compressed Natural Gas (CNG)
Haldex Air Dryer Retrofit
(2830-2993)**

**WMATA BUS ENGINEERING (BENG)
EMI No.: 22-AS-01-00
Page 9 of 18**

in the mid-tank ports, and a 3/8" Compression x 3/8" NPT, 90° elbow fitting in the top port. Hand tighten all fittings then use a wrench to tighten an additional 1.5 to 2 turns.

- 7.4.6 Install the purge tank using 3/8" – 16 x 1-1/4" bolts with never-seize applied and washer at each rivnut location. Tighten each bolt to 20-25 ft.lb.
- 7.4.7 Install the Dual Consep onto the Dual Consep Mounting Plate using two U-bolts. Tighten the U-bolt nuts to 6-11 ft.lbs in a cross pattern. See Figure 8.

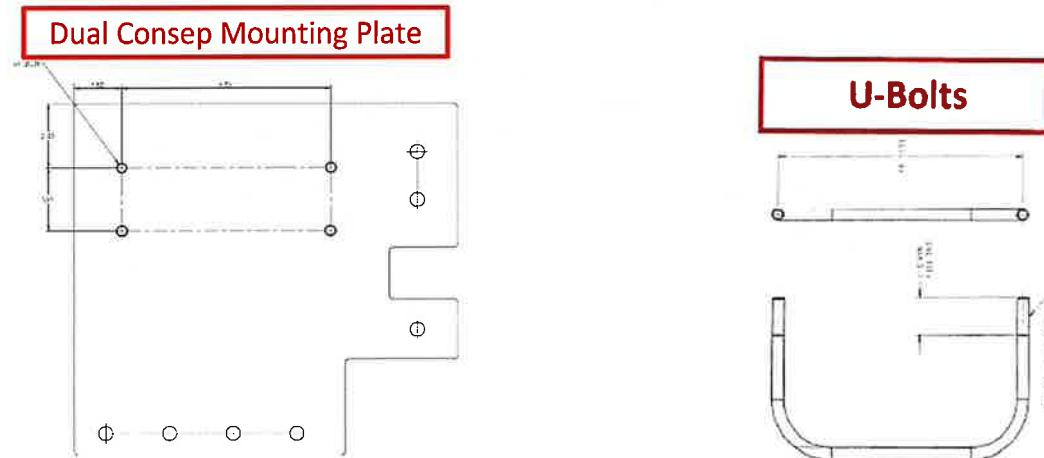


Figure 8: Dual Consep Mounting Plate & U-Bolts

- 7.4.8 Mount the Dual Consep / Plate Assembly onto the horizontal and vertical frame members using 3/16" x 1-1/4" bolt with never-seize applied and washer at each rivnut location. Tighten the bolts to 20-25 ft.lbs. See Figure 9.



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



New Flyer Xcelsior Compressed Natural Gas (CNG)
Haldex Air Dryer Retrofit
(2830-2993)

WMATA BUS ENGINEERING (BENG)
EMI No.: 22-AS-01-00
Page 11 of 18

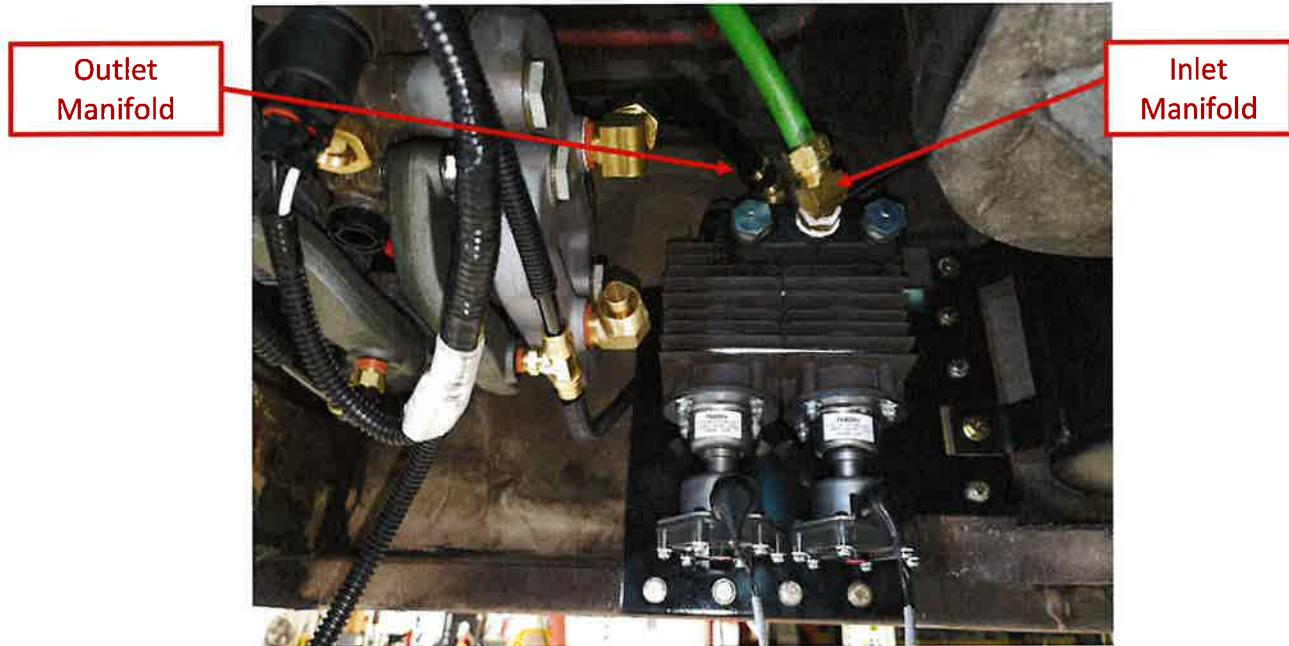


Figure 10: Dual Consep Fittings Installation

7.5 Curbside Purge Tank Installation

- 7.5.1 Secure the Purge Tank Template on the vertical frame supports adjacent to the rear aft air spring. Ensure the template is seated against the right gusset and 4" from the lower edge of the lower horizontal frame support, see Figure 11.



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



**New Flyer Xcelsior Compressed Natural Gas (CNG)
Haldex Air Dryer Retrofit
(2830-2993)**

**WMATA BUS ENGINEERING (BENG)
EMI No.: 22-AS-01-00
Page 13 of 18**

- 7.6.2 Apply thread sealer to $\frac{3}{4}$ " 90° elbow fitting and install in the outlet/delivery manifold port of the air dryer assembly, hand tighten then use a wrench to tighten an additional 1.5 to 2.5 turns.

NOTE: The 90° fitting should be aimed toward the wet tank supply line or approximately the 9 o'clock position when viewing from the front of the air dryer assembly, see Figure 12.

- 7.6.3 Apply thread sealer to the $\frac{1}{4}$ " pipe threads of the male swivel branch tee and install in the purge manifold port of the air dryer assembly, hand tighten then use a wrench to tighten an additional 1.5 to 2 turns., see Figure 12.

- 7.6.4 Apply thread sealer to the threads of the $\frac{1}{4}$ " 90° elbow fitting and install into governor manifold port of the air dryer assembly, hand tighten then use a wrench to tighten an additional 1.5 to 2 turns, see Figure 12.

- 7.6.5 Apply thread sealer to the threads of the $\frac{1}{8}$ " 90° elbow fitting and install into air governor delivery port, hand tighten then use a wrench to tighten an additional 1 to 1.5 turns.

- 7.6.6 Install 3/8" black tubing in the 90° upper fitting of the curbside purge tank. Route the black tubing along the bulkhead with all other tubing and harnesses over to the air dryer assembly.

NOTE: Secure tubing to existing harnesses and tubing with tie straps every 6-12".

- 7.6.7 Trim the tubing ensuring there is adequate tubing to connect into the purge tank manifold swivel branch tee on the curbside portion.

- 7.6.8 Install the remaining 3/8" black tubing in the 90° upper fitting of the roadside purge tank. Route the black tubing along the bulkhead with all other tubing and harnesses over to the air dryer assembly.

NOTE: Secure tubing to existing harnesses and tubing with tie straps every 6-12".

- 7.6.9 Trim the tubing ensuring there is adequate tubing to connect into the purge tank manifold swivel branch tee on the roadside portion.

- 7.6.10 Install $\frac{1}{4}$ " black tubing in the air governor 90° delivery fitting. Route the black tubing along the bulkhead with all other tubing and harnesses over to the air dryer assembly.

- 7.6.11 Trim the tubing ensuring there is adequate tubing to prevent kinking and connect into the 90° fitting of the governor manifold of the air dryer assembly.

- 7.6.12 Trim the green air compressor discharge tubing to fit the conseps inlet/supply port fitting without causing kinks in the tubing. Hand tighten then use a wrench to tighten an additional 2.5 to 3 turns, see Figure 12.



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



**New Flyer Xcelsior Compressed Natural Gas (CNG)
Haldex Air Dryer Retrofit
(2830-2993)**

**WMATA BUS ENGINEERING (BENG)
EMI No.: 22-AS-01-00
Page 15 of 18**

7.7 Electrical Modification/ Installation

NOTE: See attachment C for revised electrical schematic of the air dryer circuit.

- 7.7.1 Connect the air dryer heater/ consep ADV harness to both heaters and Automatic drain valves (ADV).
- 7.7.2 Connect the OEM four-tower weather pack Graham White connector to the air dryer heater/ consep ADV harness connector.

NOTE: Secure air dryer heater/ consep ADV harness to other harnesses and tubing using tie straps to prevent interference with road hazards.

Steps:

1. Working in the Rear Rack electrical panel, locate terminal strip **XRR10** See **Fig. 13**
2. Remove the nut from **post #2** and remove wire **60CC08C**.
3. Move Wire **60CC08C** to **Post #4** of the same terminal strip **XRR10** See **Fig.13**
4. Reinstall the nut on **Post #2**.
5. Cut a piece of **#16 TAN** wire approximately 3 feet long and install a **#10 ring terminal** on one end.
6. Secure the **Unmarked TAN** wire on **Post #4** together with wire **60CC08C** with a 10-32 brass nut.
7. Route the other end of the **Unmarked TAN** wire to Vansco Node 13 Connector J4 (black). See **Figure 14**
8. Install a **906-39-0055** terminal onto the **Unmarked TAN** wire and insert it into **position J4-8**.
9. Secure all wiring

Note: Consult BENG for programming of the revised ladder logic. See **Attachment D**



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS



New Flyer Xcelsior Compressed Natural Gas (CNG)
Haldex Air Dryer Retrofit
(2830-2993)

WMATA BUS ENGINEERING (BENG)
EMI No.: 22-AS-01-00
Page 17 of 18

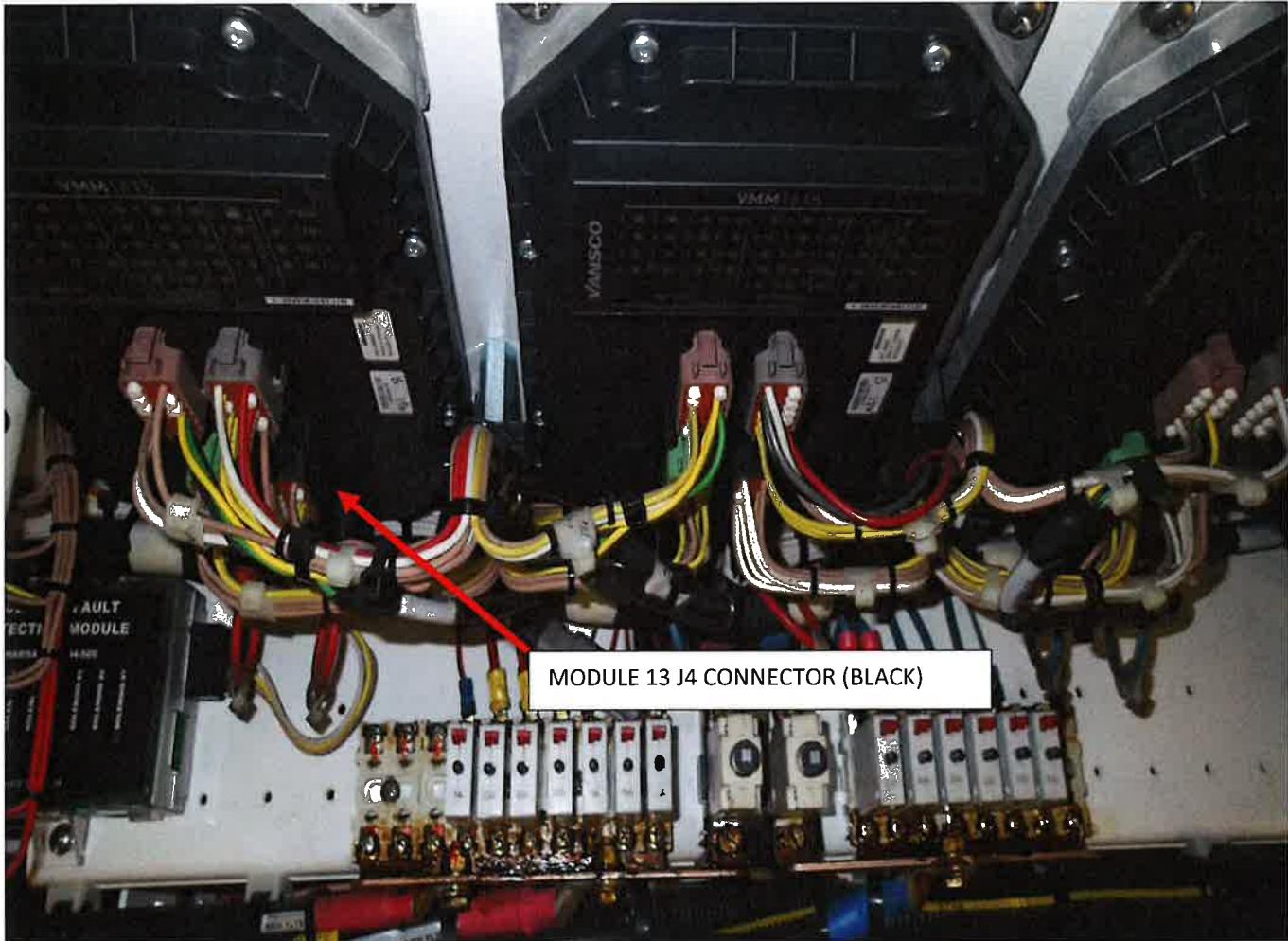


Figure 14: Vansco Module 13 J4 Connector Location at Rear Rack Electrical Panel

8.0 TEST PROCEDURES

8.1 Visual Checks

- 8.1.1 Ensure all cables, wiring harnesses, pipes, and hoses are secured and routed properly preventing chafing and other damage.

8.2 Functional Checks

Attachment A

WMATA # 986720462

Haldex Part No. DQR0004

SR 1947 CNG Bus 2830-2993				
Item	Description	Qty	UOM	Notes
1	Dual Dryer w/ muffler, Dual ConSep	1	EA	Dual Dryer-Dual Consep Assy
2	Bolt, 3/8"-16 x 1-1/4""	12	EA	Dryer [4], Purge Tanks [8]
3	Washer, 3/8" x .0812"	16	EA	Dryer [8], Purge Tanks [8]
4	Nut, 3/8" - 16, lock	4	EA	Dryer [4]
5	Fitting, 3/4" Comp x 3/4" NPT - 90°	2	EA	Dryer Inlet, Outlet
6	Fitting, 1/4" PTC x 1/4" NPT- 90°, swivel	1	EA	Dryer Control Port
7	Fitting, 1/4" PTC x 1/8" NPT - 90°, swivel	1	EA	Air Governor Unloader
8	Tubing, black, 1/4" O.D. x 240" [trim to fit]	20	FT	Air Gov. to Dryer Control
9	Reservoir, Air (300 cu.in)	2	EA	Purge Tank [2]
10	Template, air reservoir mount	2	EA	Purge Tank Template
11	Fitting, 3/8" Comp x 3/8" NPT - Elbow	2	EA	Purge Tank Top Port
12	Swivel branch tee, 3/8" PTC x 1/4" NPT	1	EA	Dryer Purge Port
13	Plug, 1/4" NPT, counter sunk hex head plug	4	EA	Purge Tanks Spare Port
14	Drain Valve, 1/4" NPT	2	EA	Purge Tanks Bottom Port
15	Tubing, Black nylon 3/8" O.D. x 240" [trim to fit]	20	FT	Purge Tanks to Dryer Purge Swivel Branch Tee
16	Rivet Nut, steel, 3/8"-16	8	EA	Purge Tanks Mounting
17	Harness, Heater Y cable	1	EA	Dryer Heaters
18	Harness, Consep Y Cable	1	EA	Dual Consep Electrical
19	Box, Gemini Bulk Pack Set	0.5	EA	

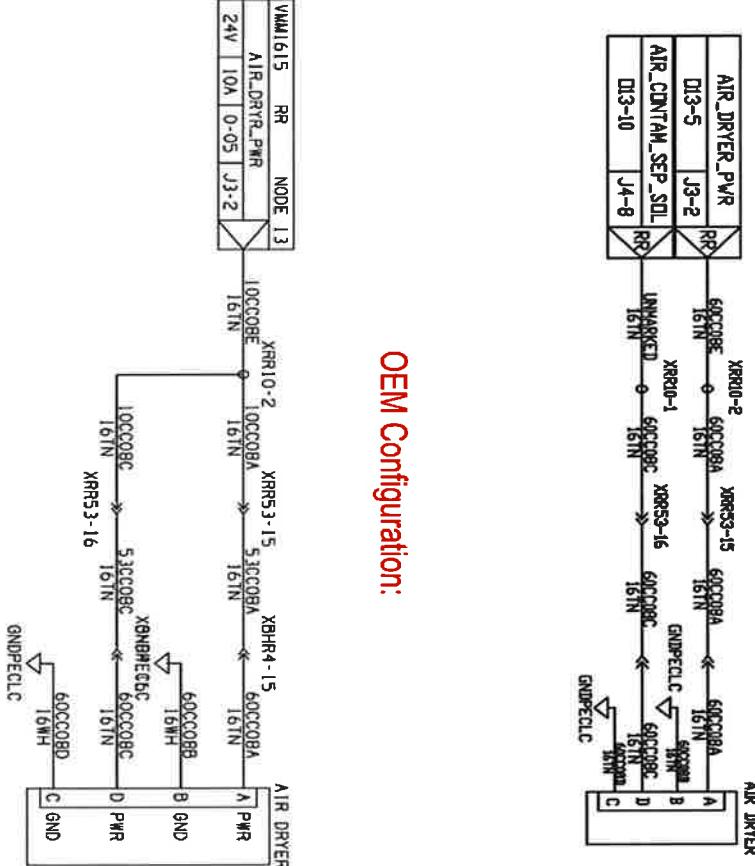
WMATA # 986720461

Haldex Part No. DQR0005

SR 1947 CNG Bus 2830-2993				
Item	Description	Qty	UOM	Notes
1	Dual Consep Mounting Plate	1	EA	Flat, 4 x Ø5/16" Dual Consep U-bolts, 8 x Ø7/16" Mounting
2	Rivet Nut, steel, 3/8"-16	7	EA	Dual Consep Plate Mounting
3	Bolt, 3/8"-16 x 1-1/4""	7	EA	Dual Consep Plate Mounting
4	Washer, 3/8" x .0812"	7	EA	Dual Consep Plate Mounting
5	U-bolt, 5/16"-18 x 6.3"W x 3.9"L	2	EA	Dual Consep Mounting
6	Nut, 5/16", Lock	4	EA	Dual Consep Mounting
7	Washer, 5/16" x .0875" OD	4	EA	Dual Consep Mounting
8	Bushing Reducer, 3/4"MNPT x 1/2" FNPT	1	EA	Dual Consep Inlet
9	Fitting, 3/4" Tube x 1/2" NPT - 45°	1	EA	Dual Consep Inlet
10	Tubing, black, 3/4"O.D. x 11" [trim to fit]	2	FT	Dual Consep Outlet to Dryer Inlet
11	Harness, Heater Y & Consep Y cable	1	EA	4 Terminal WP to 2x Dryer Heaters & 2x Consep Electrical
12	Box	1	EA	

Attachment C

REHAB Rework:



ENGINEERING MODIFICATION INSTRUCTION - BUS

**ZAFETY LUG LOCK INSTALLATION,
ALL BUS FLEETS**

**BENG ENGINEERING - BUS
WMATA EMI NO. B55L12
Sheet 1 of 6**

Zafety Lug Lock Installation, All Bus Fleets

Checked By	Rev	Rev	Rev	Rev	Rev
Date Checked					
RCES Approved					
Date Approved					
Concurrence	Date				

ENGINEERING MODIFICATION INSTRUCTION - BUS

SAFETY LUG LOCK INSTALLATION,
ALL BUS FLEETS

BENG ENGINEERING - BUS
WMATA EMI NO. B55L12
Sheet 2 of 6

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
1.0	PURPOSE	3
2.0	BACKGROUND	3
3.0	APPLICABLE BUSES	3
4.0	APPLICABLE MAXIMO DATA	3
5.0	MATERIAL REQUIRED	4
6.0	TOOLS REQUIRED	4
7.0	PROCEDURE	4
8.0	MAINTENANCE	5
9.0	ATTACHMENTS	N/A

ENGINEERING MODIFICATION INSTRUCTION - BUS

SAFETY LUG LOCK INSTALLATION,
ALL BUS FLEETS

BENG ENGINEERING - BUS
WMATA EMI NO. B55L12
Sheet 4 of 6

distributed to Divisions, only applicable for 33mm size Lug Locks.
See Note at end of installation procedure.)

5.0 MATERIAL

<u>DESCRIPTION</u> (Vendor/Mfr)	<u>PART NUMBER</u>	<u>QTY. Per Bus</u>
○ Zafety Lug Lock for 38MM (1-1/2" Hex) lug nuts	943-55-0010	20 (Std Bus)
○ Zafety Lug Lock for 38MM (1-1/2" Hex) lug nuts	943-55-0010	30 (Artic Bus)
○ Zafety Lug Lock for 33MM (1-5/16" Hex) lug nuts	943-55-0011	20 (Std Bus)
○ Zafety Lug Lock for 33MM (1-5/16" Hex) lug nuts	943-55-0011	30 (Artic Bus)
○ Zafety Lug Lock for 21MM (13/16" Hex) lug nuts	943-55-0012	20 (TAGs Bus)

7.0 PROCEDURE

7.1 Remove existing Torque Putty

7.1.1 CAREFULLY remove the existing Orange Torque Putty from the wheel surfaces and lug nuts using a (dull) metal scraper, plastic scraper or a piece of wood. (Take care not to damage the aluminum wheel.) There is no need to remove the lug nuts from the vehicle.

ENGINEERING MODIFICATION INSTRUCTION - BUS

ZAFETY LUG LOCK INSTALLATION,
ALL BUS FLEETS

BENG ENGINEERING - BUS
WMATA EMI NO. B55L12
Sheet 6 of 6



Figure #1, Close Up Installation View

Each Zafety Lug Lock device may install with the "accordion" section straight or uniform across the device, or the accordion section may be bent or distorted as shown on the right.

(Bending or bowing is normal and acceptable.)



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ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



LOW COOLANT INDICATORS

WMATA BUS ENGINEERING (BENG)
EMI Number: EMI-21-ENG-00-2
Page 1 of 14

OPERATOR INSTRUMENTATION UPDATE:

REMOVAL OF LOW COOLANT INDICATORS / ALARMS

Print Name & Initial	Date	Rev. 0	Rev. 1	Rev. 2	Rev. 3
Checked By					
Approved By					



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ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



LOW COOLANT INDICATORS

WMATA BUS ENGINEERING (BENG)
EMI Number: EMI-21-ENG-00-2
Page 3 of 14

1.0 PURPOSE

Remove indications of Low Coolant from operator instrumentation.

2.0 BACKGROUND

Portions of the WMATA bus fleet are equipped with instrument panel indications of low coolant level in one or more onboard systems. These indications vary by bus sub-fleet and installed equipment, generally having one or more amber dashboard indicators identifying low coolant level conditions in the respective systems – Engine or isolated cabin heating and are presented with accompanying audible alarms to the bus operator on several of these fleet groups.

Bus Maintenance and Engineering (BENG) has determined that these visual and audible indicators are redundant to other maintenance monitoring systems and activities and may potentially lead to unnecessary service interruptions. This instructional will modify the affected fleets to standardize indications by removing the activation of audible and visual indications of low coolant level from the operator instrument panel area.

3.0 APPLICABLE BUSES

This modification will be completed on the following WMATA bus fleets:

Fleet	Fleet Numbers	Manufacturer	Model	Number in Service
37	6101-6217	New Flyer	D40LFR	82
43	6301-6461	New Flyer	DE40LFA	160
45	6462-6609	New Flyer	DE40LFA	146
46	7001-7263	New Flyer	XDE40	209
47	7101-7152	New Flyer	XDE40	52
48	3036-3062	Orion	07.503	27
49	3063-3087	Orion	07.503	25
50	7264-7272	New Flyer	XDE40	9
52	8001-8095	NABI	BRT40	93
53	8096-8105	NABI	BRT40	10
54	5460-5480	New Flyer	XDE60	21
55	2830-2993	New Flyer	XN40	164
56	7300-7355	New Flyer	XDE40	56
57	7356-7409	New Flyer	XDE40	54
59	3100-3199	New Flyer	XN40	100
60	5481-5492	New Flyer	XDE60	12
61	3200-3274	New Flyer	XN40	75
Total Number of Applicable Buses:				1295



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ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



LOW COOLANT INDICATORS

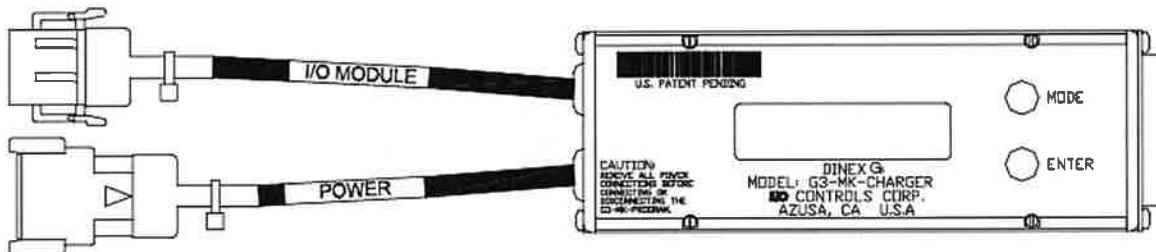
WMATA BUS ENGINEERING (BENG)
EMI Number: EMI-21-ENG-00-2
Page 5 of 14

7.1 Buses with IOControls Multiplexing.

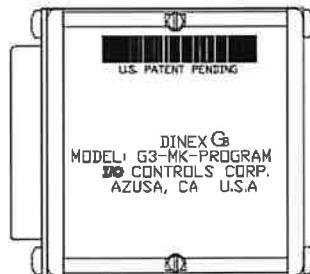
- 7.1.1 Secure the vehicle. Ensure that the parking brake is set and that wheel chocks, or equivalent, are used to prevent movement of the vehicle.
- 7.1.2 Set the following conditions:
 - 7.1.2.1 Bus batteries fully charged, and master disconnect 'ON'.
 - 7.1.2.2 If battery power unavailable, tool power adapter may be used.
 - 7.1.2.3 Bus master run switch 'OFF'.
 - 7.1.2.4 Bus 'Awake'. Set MBC SLEEP switch to "OFF" See section 7.1.6 for location illustration of this control.

Download Multiplex Program

- 7.1.3 Locate the DINEX T2-MK-CHARGER programming tool and power adapter.



- 7.1.4 Locate applicable Program Cube for the fleet number, consult BENG file list.



- 7.1.5 Connect the Program Cube to the Charger.
- 7.1.6 Locate the MBC module in the inside main electrical panel.



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



LOW COOLANT INDICATORS

WMATA BUS ENGINEERING (BENG)
EMI Number: EMI-21-ENG-00-2
Page 7 of 14

7.2 Buses with Vansco Multiplexing

7.2.1 Secure the vehicle. Ensure that the parking brake is set and that wheel chocks, or equivalent, are used to prevent movement of the vehicle.

7.2.2 Set the following conditions:

7.2.2.1 Bus batteries fully charged, and master disconnect 'ON'.

7.2.2.2 Bus master run switch 'OFF'.

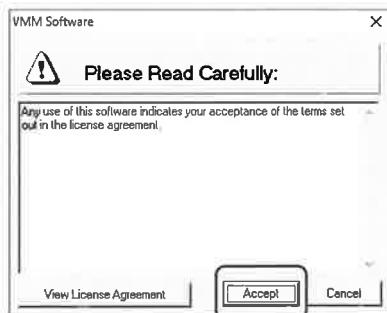
7.2.2.3 Bus 'Awake'. Set operator Hazard switch to ON to wake bus.

Download Multiplex Program:

7.2.3 Locate the 9-pin diagnostic connector. This connector will be located either on the wall behind the operator seat or on the lower portion of the front aisle light panel on the right (curb) side of the bus. Use the 'Front' diagnostic connector, as the multiplex wiring is not populated in the engine compartment connector.

7.2.4 Connect the mating 9-pin connector from the diagnostic interface to this bus connector. Ensure the interface unit is also connected to a USB port on the laptop.

7.2.5 Launch the Vansco VMM software. The following message will be displayed:



7.2.6 Select the ACCEPT button.

7.2.7 From the main program ribbon, select the QUERY button:





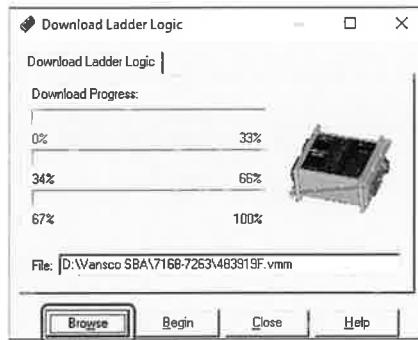
**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



LOW COOLANT INDICATORS

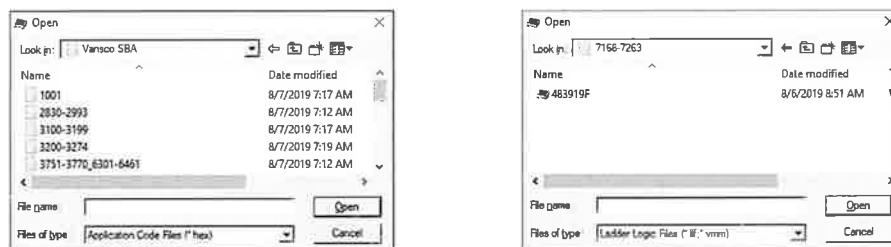
WMATA BUS ENGINEERING (BENG)
EMI Number: EMI-21-ENG-00-2
Page 9 of 14

7.2.12 The Download Ladder Logic screen will appear:



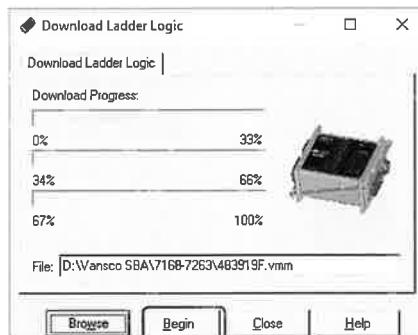
7.2.13 Select the Browse button from the Ladder Logic Download screen.

7.2.14 The File Open window will appear:



7.2.15 From the folder structure presented, select the CORRECT file for the bus you are modifying.

7.2.16 Once the file has been selected, select Begin from the Download Ladder Logic screen:





**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



LOW COOLANT INDICATORS

WMATA BUS ENGINEERING (BENG)
EMI Number: EMI-21-ENG-00-2
Page 11 of 14

- 7.2.21 Once the Logic Download has completed successfully, the Query window will automatically be displayed with updated values.

The screenshot shows a Windows application window titled "Query". At the top, it displays "Information" and "Modules in the System: 7". Below this is a table with the following data:

Status	Module	Logic Version	Application Version	Boot Version	Hardware Version	Serial Number
VMM1615 D2V4051DA	V2	V483919.6	V3.5 Build 103	V1.3	V7.5.3	8672
VMM1615 D2V4051DA	V9	V483919.6	V3.5 Build 103	V1.3	V7.5.3	8656
VMM1615 D2V4051DA	V11	V483919.6	V3.5 Build 103	V1.3	V7.5.3	8420
VMM1615 D2V4051DA	V13	V483919.6	V3.5 Build 103	V1.3	V7.5.3	7650
VMM1615 D2V4051DA	V14	V483919.6	V3.5 Build 103	V1.3	V7.5.3	8433
VMM1615 D2V4051DA	V15	V483919.6	V3.5 Build 103	V1.3	V7.5.3	7654
VMM1615 D2V4051DA	V22	V483919.6	V3.5 Build 103	V1.3	V7.5.3	7886

At the bottom of the window, there are buttons for "Download" (Logic, Application), "Upload" (Logic), "Query", "Close", and "Help".

- 7.2.22 Verify the updated Logic Version number matches the correct file name from the flash media folder for the bus number being updated.
7.2.23 Turn the Hazard Flasher switch to the OFF position.
7.2.24 Disconnect interface from bus diagnostic connector.

7.3 Update the Instrument Panel (Fleets 54 thru 60 only)

- 7.3.1 Turn the Master Run Switch to the Day Run position to wake the system.
7.3.2 Insert the Flash Media provided by BENG into the instrument panel communications port on the lower left underside of the operators dash panel.



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



LOW COOLANT INDICATORS

**WMATA BUS ENGINEERING (BENG)
EMI Number: EMI-21-ENG-00-2
Page 13 of 14**

- 7.3.5 Once the media has been read, an update file list will be presented:

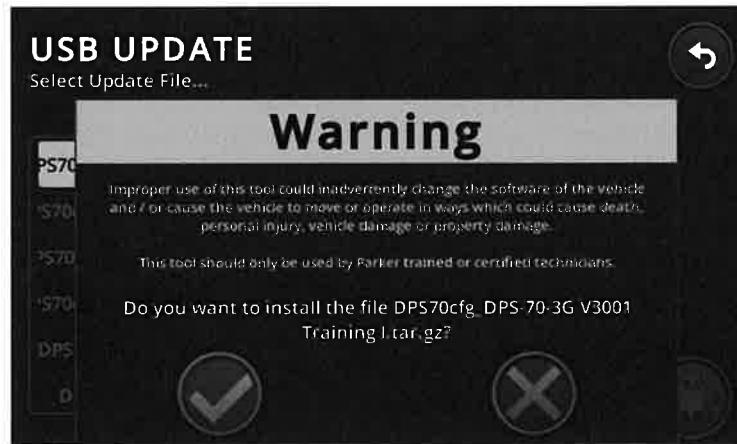


- 7.3.6 Referring to the application matrix document provided by BENG, select the correct update file from the list.

IMPORTANT!

It is important to verify the correct update file to the bus being updated. Loading an incorrect file will result in an inoperative bus and may require replacement of the instrument panel for factory reset.

- 7.3.7 Once the correct update has been selected, the Warning screen will be displayed:



- 7.3.8 Select the green checkmark to proceed.

ENGINEERING MODIFICATION INSTRUCTION - BUS

SAE J-1939 Throttle Conversion

BENG [ENGINEERING-BUS]
WMATA EMI NO. B00L27
Sheet 1 of 15

SAE J-1939 ENGINE THROTTLE CONVERSION

EMI # B00L27

Checked By	Rev	Rev	Rev	Rev	Rev	Rev
Date Checked						
BENG Approved						
Date Approved						
Concurrence	Date					

ENGINEERING MODIFICATION INSTRUCTION - BUS

SAE J-1939 Throttle Conversion

BENG [ENGINEERING-BUS]
WMATA EMI NO. B00L27
Sheet 3 of 15

1.0 PURPOSE

This modification will improve the safety and reliability of the engine throttle control.

2.0 BACKGROUND

WMATA Compressed Natural Gas fueled buses have experienced reliability issues with hard wired throttle control systems to the Cummins engine controller that have resulted in unnecessary service interruptions. This modification removes the direct-wired throttle connection and implements a data solution mirroring the configuration of WMATA Diesel Hybrid-Electric coaches.

3.0 APPLICABLE BUSES

WMATA Fleets 55 and 59; Buses bearing fleet numbers 2830- 2993 and 3100-3199, inclusive.

Job Plan: 8112

Asset List: 5747

4.0 MATERIAL REQUIRED

<u>DESCRIPTION</u>	<u>WMATA CLASS NUMBER</u>	<u>QTY. Per Bus*</u>
➤ Wiring Harness	BMNT Shop Product	1

5.0 TOOLS REQUIRED

- General Mechanics Tool Box.
- Deutsch Terminal Removal Tool 066-00-0881
- Cummins Insite® Service Tool
- Allison DOC® Service Tool
- Parker / Vansco VMM Software

ENGINEERING MODIFICATION INSTRUCTION - BUS

SAE J-1939 Throttle Conversion

BENG [ENGINEERING-BUS]
WMATA EMI NO. B00L27
Sheet 5 of 15

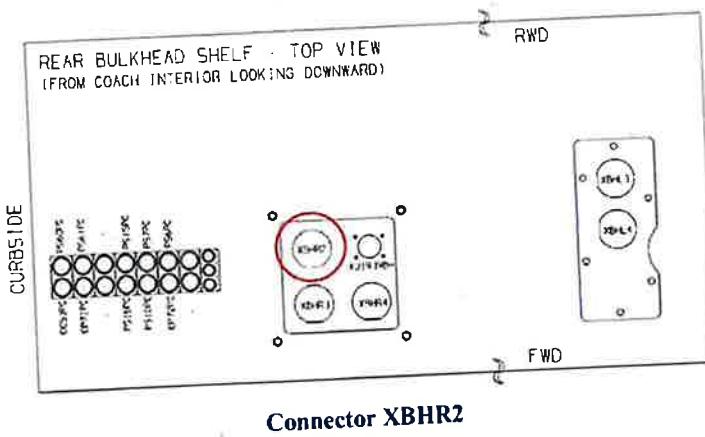
THIS MODIFICATION DOCUMENT AND ALL APPENDICES SHOULD BE RETAINED FOR REFERENCE UNTIL THE MAINTENANCE INFORMATION PERTAINING TO THE SUBJECT VEHICLES HAS BEEN UPDATED TO REFLECT THE MODIFICATION(S) MADE.

CAUTION: THIS PROCEDURE REQUIRES THAT THE BATTERIES BE DISCONNECTED AND LOCKED OUT AND ANY EXTERNAL POWER SOURCES BE LOCKED OUT OR REMOVED AND REMAIN LOCKED OUT PENDING COMPLETION OF THESE INSTRUCTIONS.

7.0 PROCEDURE

7.1 WIRING CHANGES

- 7.1.1 Verify bus is located in a safe workspace.
- 7.1.2 Set the following conditions:
 - 7.1.2.1 Secure the vehicle. Ensure that the parking brake is set and that wheel chocks or equivalent are used to prevent movement of the vehicle.
 - 7.1.2.2 Rotate the Battery Master Switch to the OFF position.
- 7.1.3 Working inside the bus, locate and remove the curbside rear interior access panel directly adjacent to the HVAC return grille.
- 7.1.4 Locate and disconnect the connector XBHR2 as shown in figure below.



Sheet 5 of 15

ENGINEERING MODIFICATION INSTRUCTION - BUS

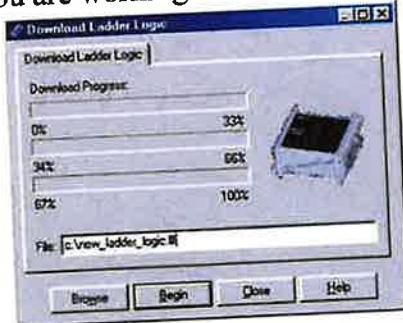
SAE J-1939 Throttle Conversion

BENG [ENGINEERING-BUS]
WMATA EMI NO. B00L27
Sheet 7 of 15

- 7.1.15 Route both **WHITE** wires to **GND BRR** and connect to position 5.
- 7.1.16 Route the **BLACK** and **GREY** wires to the area of Vansco Multiplex Module n0ode 14.
- 7.1.17 Remove Connector J2 (Grey) from VMM 14. Remove the terminal lock and set aside.
- 7.1.18 Insert the **BLACK** wire into cavity 4 of connector J2.
- 7.1.19 Insert the **GREY** wire into cavity 5 of connector J2.
- 7.1.20 Locate the single **RED** wire from the harness kit and insert it into cavity 11 of J2.
- 7.1.21 Reinstall the terminal lock into connector J2 and reconnect to VMM 14.
- 7.1.22 Route the single **RED** wire, along with the **RED** wire from the campaign harness to terminal strip **XRR10**.
- 7.1.23 Connect both **RED** wires to position 1 of **XRR10** and secure with #10 nylock nut.
- 7.1.24 Secure the campaign harness with cable ties.
- 7.1.25 Secure all removed panels.
- 7.1.26 Restore the Battery Master Switch to the ON position.

7.2 PROGRAMMING

- 7.2.1 Using the Parker / Vansco software, download the latest PLC program for the specific fleet you are working on. Contact BMNT/BENG for this file.



Sheet 7 of 15

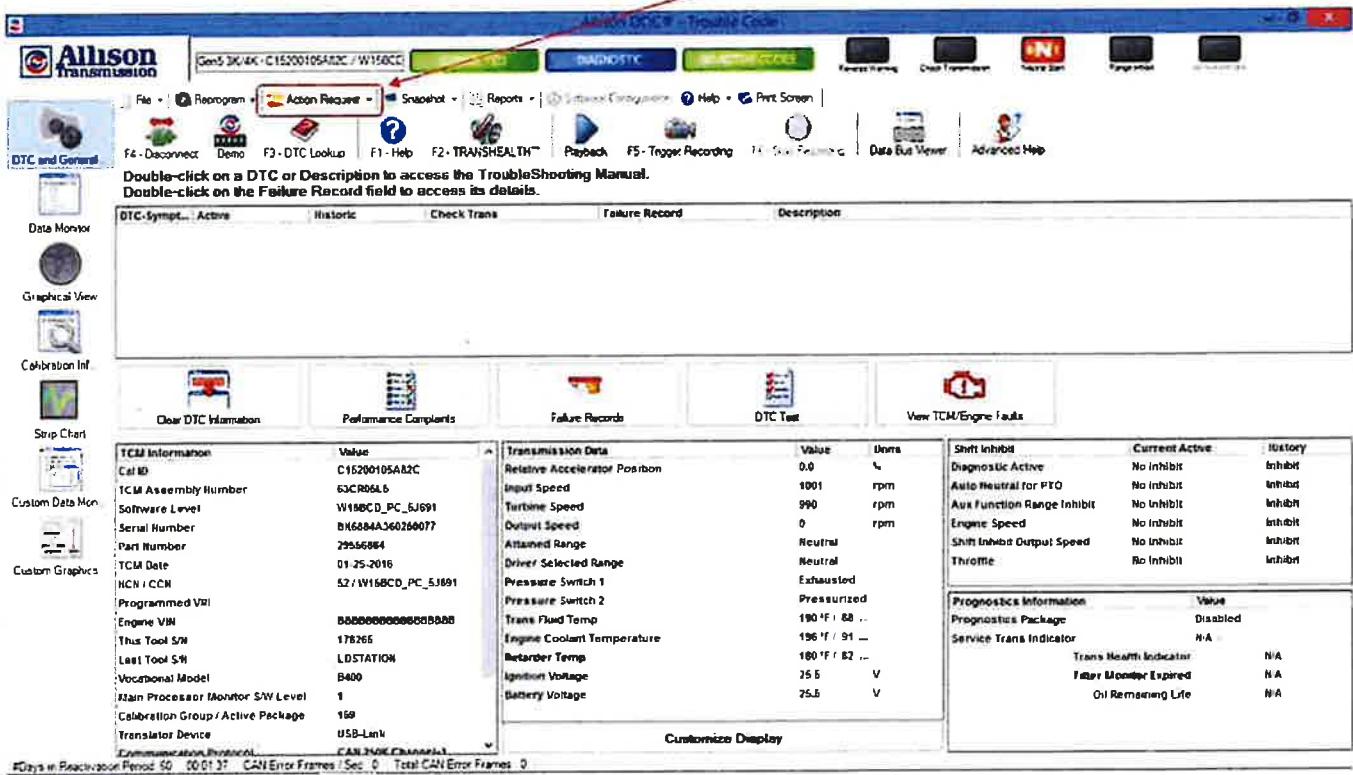
ENGINEERING MODIFICATION INSTRUCTION - BUS

SAE J-1939 Throttle Conversion

BENG [ENGINEERING-BUS]
WMATA EMI NO. B00L27
Sheet 9 of 15

- 7.2.3 Using the Allison DOC® Service Tool, reset the Accelerator Source Address using the following instructions:

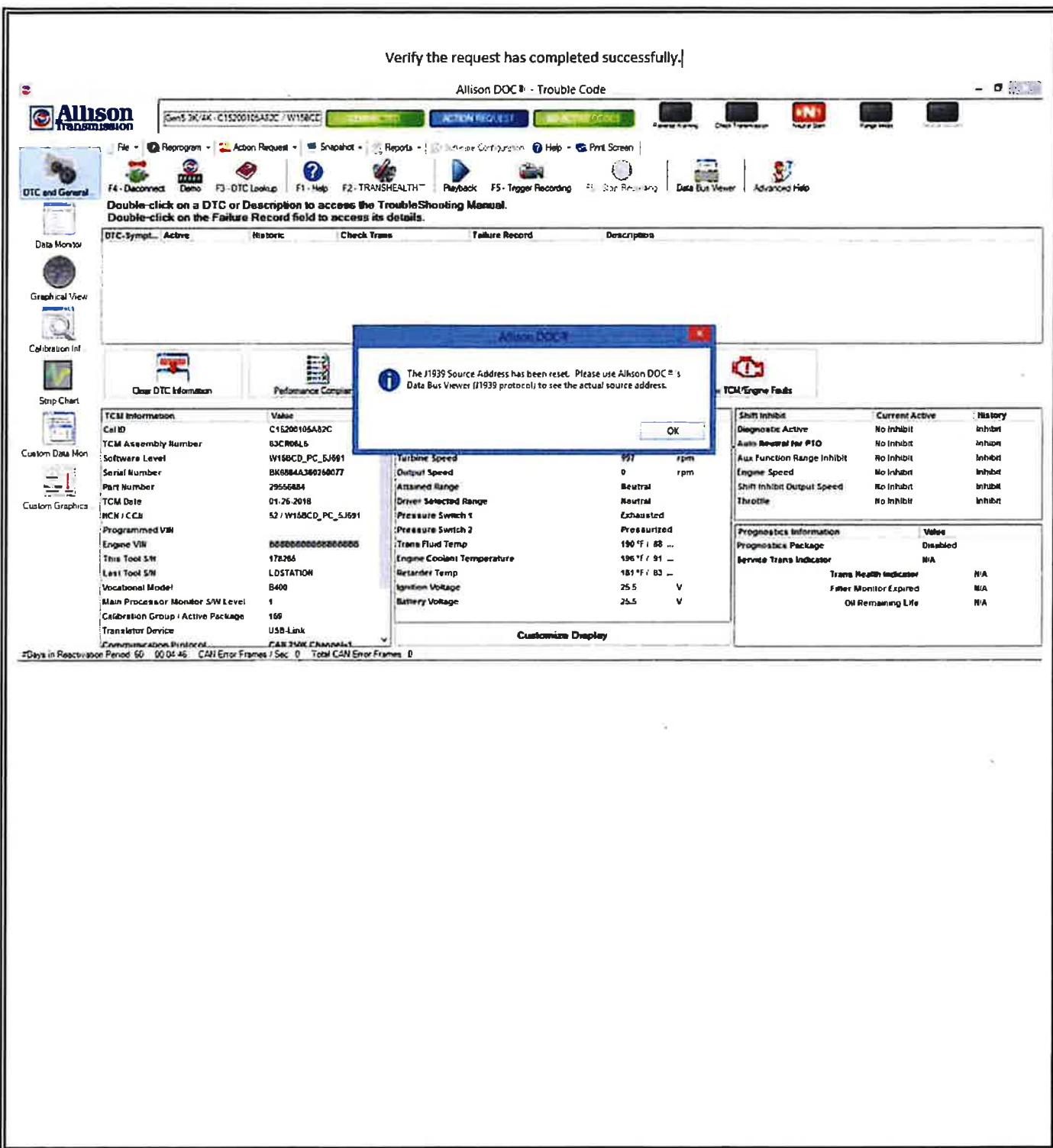
From the Allison DOC™ desktop, select the Action Request tab.



ENGINEERING MODIFICATION INSTRUCTION - BUS

SAE J-1939 Throttle Conversion

BENG [ENGINEERING-BUS]
WMATA EMI NO. B00L27
Sheet 11 of 15



Sheet 11 of 15

ENGINEERING MODIFICATION INSTRUCTION - BUS

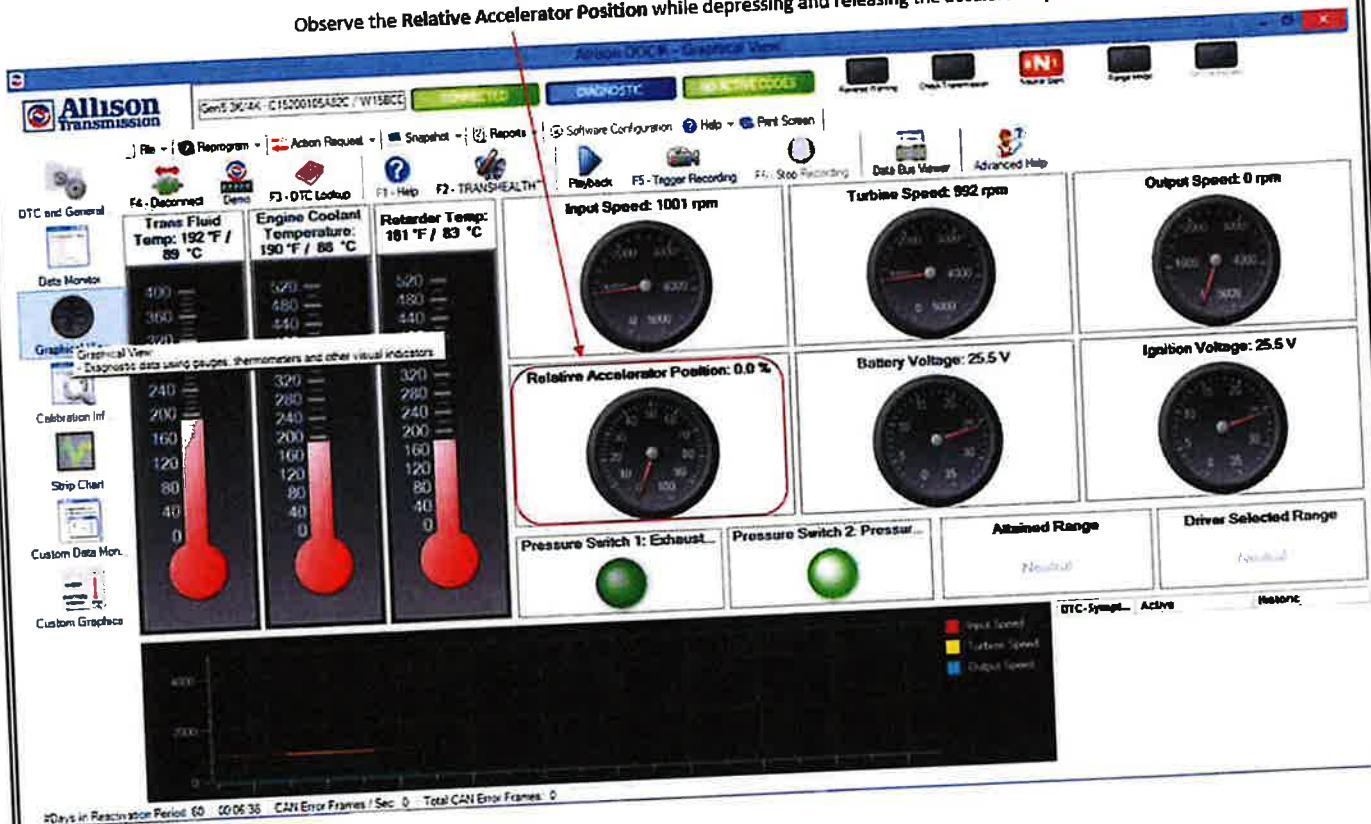
SAE J-1939 Throttle Conversion

BENG [ENGINEERING-BUS]
WMATA EMI NO. B00L27
Sheet 13 of 15

To verify correct operation, set the following conditions:

1. Bus running.
2. parking brake applied.
3. Transmission in neutral.

Observe the Relative Accelerator Position while depressing and releasing the accelerator pedal.



Sheet 13 of 15

ENGINEERING MODIFICATION INSTRUCTION - BUS

SAE J-1939 Throttle Conversion

BENG [ENGINEERING-BUS]
WMATA EMI NO. B00L27
Sheet 15 of 15

10.0 DRAWINGS

Refer to the following pages for related technical drawings and references.

Sheet 15 of 15



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS



BMNT EMI B00L26 Recaro AM80 Seatbelt Replacement

WMATA BUS ENGINEERING (BENG)
EMI No.: B00L26
Page 1 of 11

Recaro Seat Belt Buckle Replacement
Fleets 54, 55, 56, 57, and 58
Job Plan 7902
Asset List 5600

Print Name & Initial	Date	Rev. 0	Rev. 1	Rev. 2	Rev. 3
Checked By					
Approved By					



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



BMNT EMI B00L26 Recaro AM80 Seatbelt Replacement

WMATA BUS ENGINEERING (BENG)

EMI No.: B00L26

Page 3 of 11

1.0 PURPOSE

This Engineering Modification Instruction describes the scope of work necessary to replace the current seat belt buckle on the AM80 Recaro seat with an improved design. The old-style buckle uses a steel cable to attach the buckle to the seat frame. This steel cable was prone to breaking due to stress. The new buckle is attached to the seat frame with a nylon strap and should be less susceptible to stress. . This retrofit will replace the steel cable with a nylon strap that is more suitable for the application.

2.0 BACKGROUND

Starting in 2015, all new buses came equipped with a Recaro AM80 seat. This seat used a steel cable to attach the seat belt buckle to the seat frame. There was a high rate of failure in this cable causing the seat belt buckle to detach from the seat frame. Metal analysis concluded that the cable was too rigid for the application

3.0 APPLICABLE BUSES

Fleets 54, 55, 56, 57, 58

2830-2993, 7300-7409, 5460-5480, 1001

4.0 JOB PLAN: 7902 ASSET LIST: 5569

5.0 MATERIAL REQUIRED

To be supplied by BENG

<u>Description</u>	<u>Recaro Part Number</u>	<u>Quantity</u>
AM80 Web Mount 3 Wire Buckle Kit	7227565	1

6.0 TOOLS REQUIRED

1. Phillips #2 Screwdriver
2. Large flat head screwdriver
3. Side cutters
4. Small pick
5. 5/8" hex wrench/socket
6. Torque wrench

**CAUTION: ALL WORK MUST BE CONDUCTED IN A SAFE MANNER AND IN ACCORDANCE WITH THE
METROBUS SAFETY RULES AND PROCEDURES. ALL WORK SHOULD BE PERFORMED IN SUCH A
WAY THAT IT WOULD NOT INVOLVE ANY DANGER TO PERSONNEL OR DAMAGE TO PROPERTY.**



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



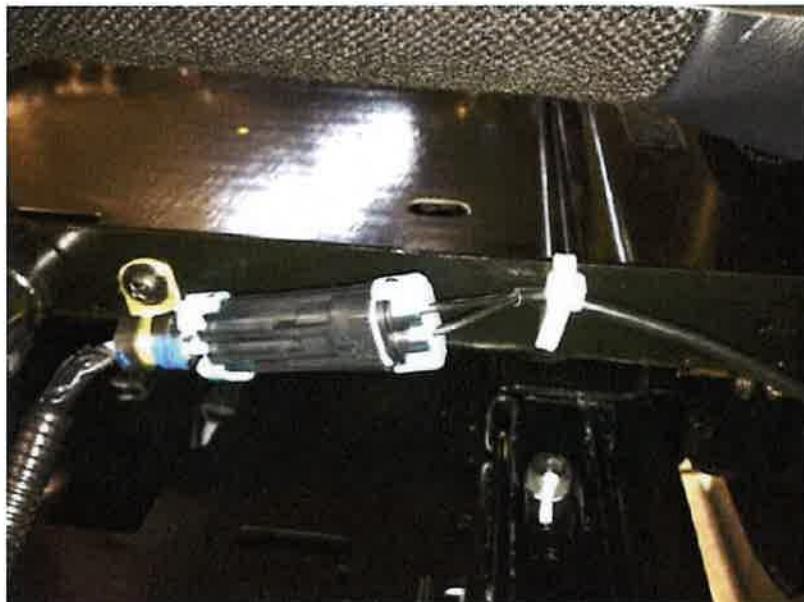
BMNT EMI B00L26 Recaro AM80 Seatbelt Replacement

WMATA BUS ENGINEERING (BENG)

EMI No.: B00L26

Page 5 of 11

- 7.7 Disconnect the electrical connector from the seat belt buckle to the jumper harness.
- 7.8 Cut the small zip tie with side cutters, ensuring the wire harness is not damaged.



Buckle on RH side of seat



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



BMNT EMI B00L26 Recaro AM80 Seatbelt Replacement

WMATA BUS ENGINEERING (BENG)

EMI No.: B00L26

Page 7 of 11

- 7.11 Locate the seat serial number on a white 4"x1" sticker located on the top rear plate of the seat suspension. Record the seat serial number, bus number, work order number and date on a blue warranty tag and attach it to the buckle. Set the buckle aside to return to Bus Engineering.



- 7.12 Obtain the new buckle kit and route the end of the buckle through the opening in the side rear trim panel.



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



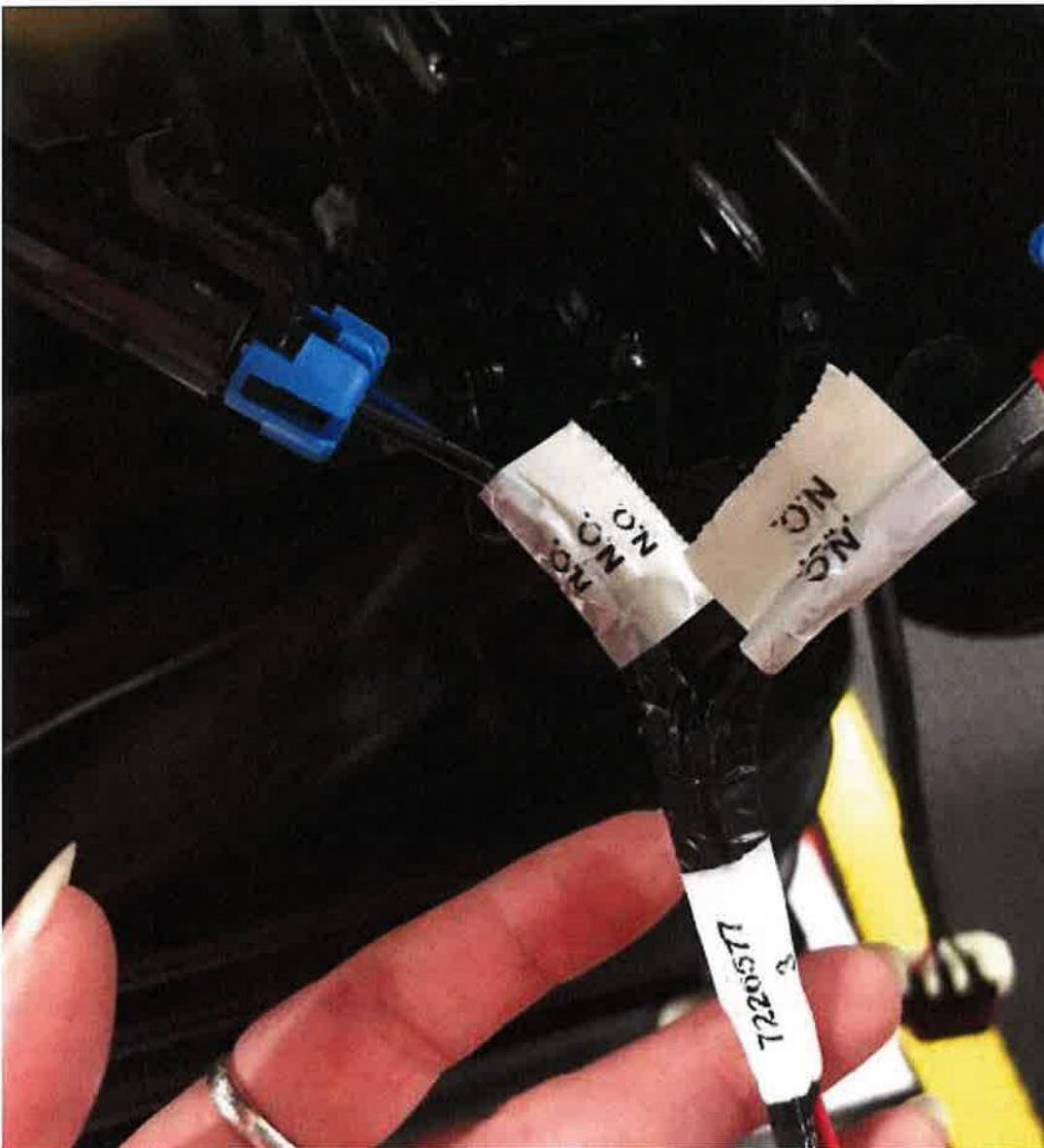
BMNT EMI B00L26 Recaro AM80 Seatbelt Replacement

WMATA BUS ENGINEERING (BENG)

EMI No.: B00L26

Page 9 of 11

- 7.15 Connect the end of the jumper harness labeled "Normally Open" or "N.O" to the harness located on the seat assembly.





**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
OFFICE OF BUS MAINTENANCE
ENGINEERING MODIFICATION INSTRUCTIONS - BUS**



BMNT EMI B00L26 Recaro AM80 Seatbelt Replacement

WMATA BUS ENGINEERING (BENG)

EMI No.: B00L26

Page 11 of 11

9.0 PERIODIC INSPECTION AND MAINTENANCE

All PM schedules remain the same.



Washington Metropolitan Area Transit Authority

PROCEDURE

Procedure Number: BUSV-BMNT-SOP-1.14-09

Wheel and Tire Maintenance Program

February 16, 2021

Table of Contents

1	Scope	4
2	Purpose	4
3	Definitions.....	4
4	Acronyms.....	4
5	Responsibilities.....	5
6	Safety Management	5
7	Policy	5
8	Wheel Maintenance Procedures	5
9	References	10
10	Records	10
11	Appendices, Attachments and/or Exhibits	10
12	Approvals.....	18

5 Responsibilities

- 5.1 The Vice President of Bus Maintenance (BMNT) has overall responsibility for the administration of this Standard Operating Procedure.
- 5.2 Directors, superintendents, managers, bus maintenance supervisors and lead persons (or designees) are responsible for dissemination and review of this SOP with all appropriate employees. Each is further responsible for appropriate oversight and quality control necessary to ensure full adherence to this SOP at all operating and support locations.

6 Safety Management

- 6.1 It is the responsibility of each supervisor and employee to ensure that all safety guidelines are followed when performing maintenance, or any activity, on Authority equipment or while on Authority property. This includes the use of Lockout /Tagout procedures and safety equipment such as but not limited to, safety vests, gloves, goggles, proper footwear, and bump caps. Employees shall also follow the Safety Data Sheet (SDS) guidelines when using products containing chemicals and adhere to the requirements of the Authority Electronic Device Policy.
- 6.2 This document has been created in compliance with WMATA's safety plan and safety policy. Any hazards and risks associated with the processes within this document have been evaluated for safety and have appropriate mitigation strategies established as part of WMATA's overall risk assessment management, where applicable and/or relevant. This document is also subject to monitoring for safety risk mitigation adherence and safety performance, and has effective communication practices in place, including adequate safety training to ensure competencies, and to solicit feedback from the affected employees, where applicable and/or relevant. For further guidance on WMATA's safety plan, visit the Department of Safety and Environmental Management's (SAFE) intranet homepage.

7 Policy

- 7.1 All buses within the WMATA fleet are equipped with hub-piloted wheels and appropriate hardware to ensure standardized practices and procedures are utilized. All wheels and tires will be maintained in strict adherence to this SOP.
- 7.2 When replacing tires on the front axle, both front tires **must** be changed at the same time. When replacing tires on the rear axle, both the inner and outer tire on that side I.E. curbside or street side **must** be replaced.

8 Wheel Maintenance Procedures

8.1 Wheel Installation Procedure

NOTE: When practical, the entire wheel installation process should be completed by the same mechanic to reduce the chance of a step being omitted.

- 8.1.1 The drum mounting face must be cleaned and surface kept flat. Clean the drum surface and pilots with a wire brush if rust or debris is present.
- 8.1.2 Using a wire brush clean the base of each stud as well as the threads to remove any rust or foreign material which could cause interference with the wheel nuts.

NOTE: To help with the installation of the rear dual wheels, the use of alignment dowels (942-55-0003) is recommended.

- 8.1.13 Make sure the outer wheel is pushed up fully against the inner wheel. Install the nuts finger-tight at the 12 o'clock and 6 o'clock positions. Install the remaining nuts finger-tight.
- 8.1.14 Snug the nuts to 100–200 ft-lbs. using a $\frac{1}{2}$ " (maximum) air impact gun following the sequence shown in Figure 1. Do not exceed 200 ft-lbs.
- 8.1.15 A standard calibrated torque wrench must be used to achieve a final torque of 450 ft lbs. Using Figure 1 as a reference for the proper wheel nut tightening sequence.

NOTE: When using a 1" drive torque wrench with a 1" drive extension (re: at rear wheels), the extension does not affect the torque output of the torque wrench to the wheel nut.

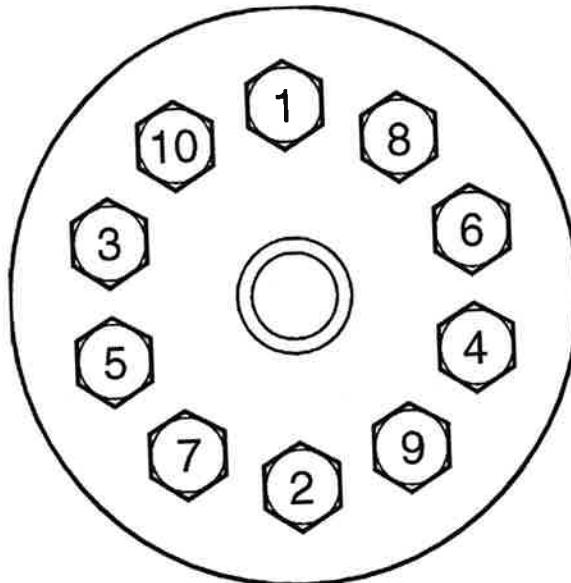


FIGURE 1 - WHEEL NUT TIGHTENING SEQUENCE

- 8.1.16 After the wheels are installed, visually check to see that both wheels are properly seated on the pilots and flat against the rotor or drum.
- 8.1.17 With wheel properly cleaned and mounted, all old torque seal must be removed.
- 8.1.18 Install the proper size Zafety Lug Locks in accordance with manufacturer's installation instructions (see attachment E).
- 8.1.19 All buses having wheels installed must be scheduled to have the Zafety lug locks inspected after 50 to 100 miles of operation since the installation.

NOTE: A Work Order must be created in Maximo for each bus needing to have the Zafety lug locks inspected. Job Plan 8580 has been created in Maximo for this purpose. The Work Order will remain open until the inspection has been performed. In addition, the bus number shall be placed on the Division Turn-over sheet as a reminder that the Zafety Lug Locks must be checked.

8.2.2 WMATA personnel are responsible for the following activities during each PM-A Service:

- 8.2.2.1 Gauge check tire inflation. Refer to the tire pressure label located on the wheel well of the bus for proper inflation pressures. Notify the tire contractor if found to be low.
- 8.2.2.2 Check for valve core leaks, loose valve stems, and valve caps.
- 8.2.2.3 Inspect tires for evidence of irregular wear that may occur as a result of mechanical adversities. Check the vehicle for mechanical defects and report to Division Lead person/ Supervision. Refer to Attachment D for examples of common abnormal wear patterns and their causes.
- 8.2.2.4 Perform tire checks for minimum tread depth (4/32" front - 2/32" rear). Replace all worn tires.

8.2.3 Tire Maintenance Procedures

- 8.2.3.1 Currently, WMATA leases its bus tires under a tire servicing contract. The following outlines contractual responsibilities:
 - 8.2.3.2 Provide monthly reports on tires to include:
 - Bus tire mileage for each bus
 - Beginning and ending balance of tire quantities on-hand
 - Rolling tires on equipment including spares
 - Tires removed from service
 - Provide tire mileage for each type of tire in the fleet
 - Monthly report on refurbished wheels
 - Monthly report on all tire misalignments and air pressure checks/adjustments.
 - 8.2.3.3 Furnish all labor, equipment, and materials to mount tires on wheels, balance tires and wheels, remove tires from wheels, and make necessary repairs to tires covered by this contract.
 - 8.2.3.4 Supply all labor and equipment necessary to load, unload and transport tires.
 - 8.2.3.5 Contractor personnel are required to follow all WMATA safe work practices and personal protective equipment (PPE) requirements while working on WMATA properties.
 - 8.2.3.6 All Tire Service Contractor personnel are required to attend Vendor Safety Training and obtain and display WMATA issued contractor passes while present on WMATA properties.
 - 8.2.3.7 Inspect all tires when mounted on bus including tread depth and bumping of inner duals within a maximum of fourteen (14) calendar day intervals.
 - 8.2.3.8 The contractor will supply new tires only. No retreads or blemished tires will be accepted as part of this contract.

Attachment A

Wheel Pilot Lubrication Points

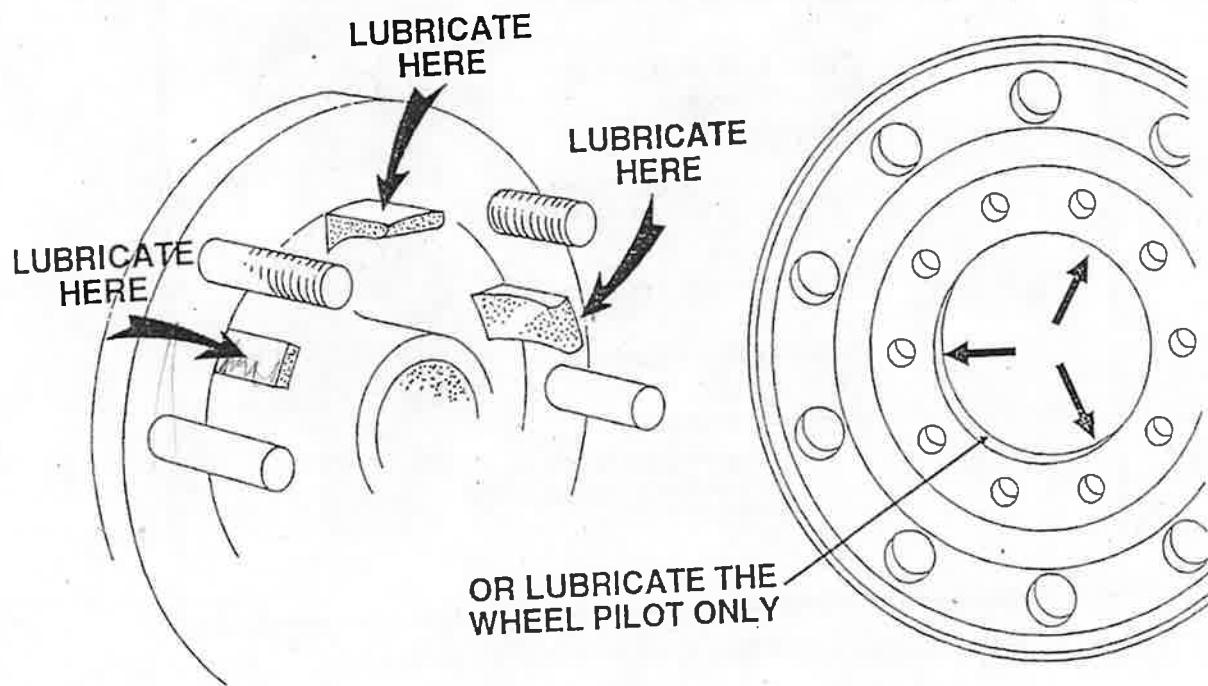


FIGURE 1 - WHEEL PILOT LUBRICATION POINTS

Attachment C

Aluminum Wheel Inspection for Heat Damage



WARNING: Excessive heat from fire, brake malfunction, wheel bearing failure, tire failure or other sources may weaken the metal and cause the wheel/tire assembly to separate explosively.

Exploding wheel/tire assembly can cause serious injury or death.

Immediately and permanently remove from service any wheel that has been exposed to excessive heat.

Inspect for exposure to excessive heat. A wheel that has been subjected to excessive heat may appear charred or burned. A wheel that has been exposed to excessive heat may appear to be in good condition if it has been cleaned. Do not use any wheel that has been overheated regardless of appearance. Even if a wheel does not appear to be obviously burned, inspect the labels, tire bead, brake drum and high temperature nylon spacer for evidence of charring, melting, blistering, or burning.

A wheel may discolor from excessive heat. It can appear a dull grayish color and will not polish to a bright finish as a typical wheel would.

Any wheel run with a flat tire longer than the time necessary to immediately pull off the road should be checked for excessive heat damage.

Note: After January 2009, the new Alcoa Logo may not show heat damage.

A blistered, charred, blackened or cracked-looking logo decal on an Alcoa wheel may indicate that the wheel has been exposed to excessive heat as shown in Figure 1, or discoloration as shown in Figure 2.

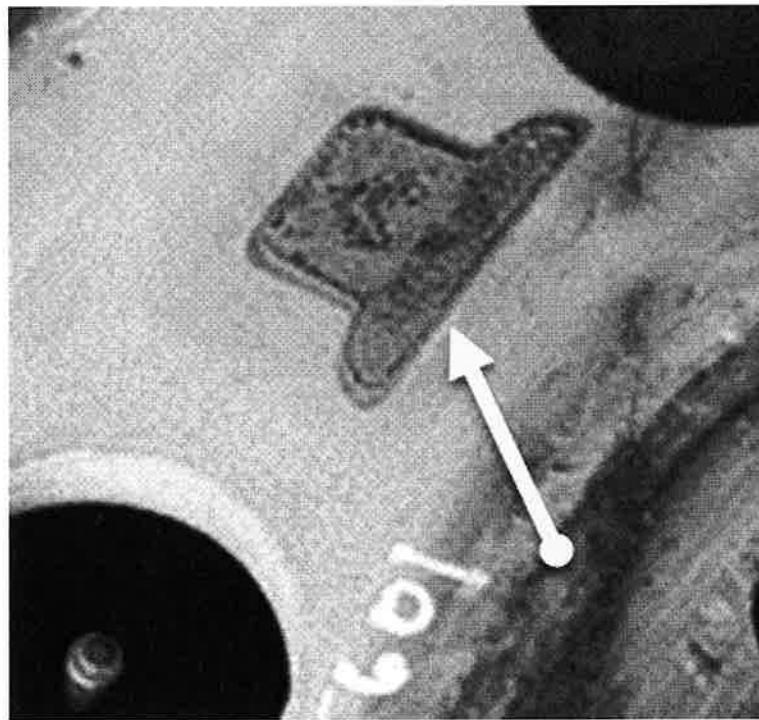


FIGURE 1 - CHARRED STICKER (PRIOR TO 2009)

Attachment C

Aluminum Wheel Inspection for Heat Damage

Wheels manufactured starting in January 2009 will have a 1-inch clear round heat indicator located next to the roll stamp on the inside as shown in Figure 4, along with the same 1-inch clear round heat indicator located on the tire side drop well as shown in Figure 5.

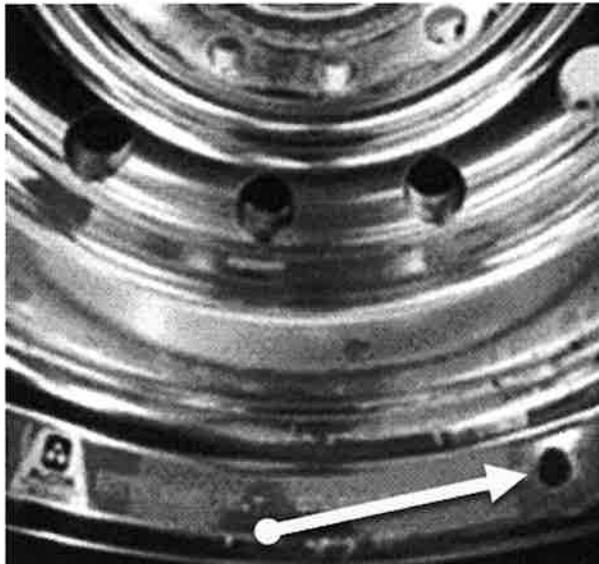


FIGURE 4 - CHARRED HEAT INDICATOR (2009 AND AFTER)

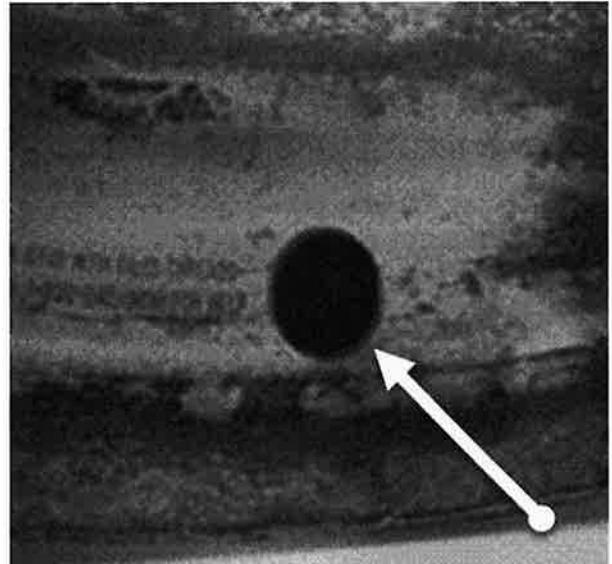


FIGURE 5 – CHARRED HEAT INDICATOR (2009 AND AFTER)

If either of these round labels show signs of blistering, or have a charred, blackened, or cracked look, this may indicate that wheel has been exposed to excessive heat.

IF ANY OF THE ABOVE CONDITIONS ARE SEEN, REMOVE THE WHEEL FROM SERVICE IMMEDIATELY. THIS INCLUDES ANY HEAT DAMAGE TO THE TIRE, DISCOLORATION TO THE WHEEL, AND OR BRAKE DRUM, AND ANY BURNT OR CHARRED LABELS.

Attachment E

Safety Lug Lock Application Chart

Stock #	Description	Fleets
943-55-0010	Zafety Lug Lock - 38mm	2101-2231 4200-4412
943-55-0011	Zafety Lug Lock - 33mm	All Low Floor Buses

Safety Lug Lock Installation Instructions

Orient the device with the words "Patent Pending", "Zafety Lug Lock" and the "Canadian leaf" logo facing you. Install one side of the Zafety Lug Lock device onto one lug nut while orienting the uninstalled part of the device closest to the center the adjacent lug nut. (You may need to remove and reinstall the first lug nut position in order to find the "best fit" position to line up the other half of the device.) Push the device onto the outer edge of the hex. Do not fully engage the lug nut until both lug nuts have the device on them. Install the other half of the device on the adjacent lug nut. The device may "twist" slightly if the hexes are not oriented exactly the same. (This is normal and acceptable. Sometimes the device will be installed with the accordion portion straight. At times the accordion portion will be slightly twisted. Do NOT loosen up or tighten the lug nut to get the hexes to "line up".) After the device has been installed onto both lug nuts, push them fully onto the lug nuts. Repeat for all lug nuts on each wheel and all wheels on bus.

Note: For 33mm lug nuts, the Zafety Lug Lock Tool #Z0001 may be helpful in installing the devices on low floor buses but will not fit the 38mm (1-1/2") and may be too big for the 21mm (13/16") lug nuts. A deep socket on a short extension may be helpful for these applications.



FIGURE 1 - PROPERLY INSTALLED LUG LOCKS

**BOSCH****HPT 500**

High Pressure Leak Tester

**OPERATION MANUAL FOR HD / MEDIUM DUTY APPLICATIONS**

Pair With HD / Medium Duty Accessory Kit BOSCH P/N 1699500001

OPERATION MANUAL FOR AUTOMOTIVE / LIGHT TRUCK APPLICATIONS

Pair With Automotive / Light Truck Accessory Kit BOSCH P/N 1699500002

Specifications	2
Reference Guide	3
Accessories Included	4
HPT 500 Set Up	5
Safety	6
Power INTAKE™ Adapter Installation	7
Testing for Leaks	8-9
HPT 500 HD / Medium Duty Accessory Kit P/N 169500001 (optional)	10
HPT 500 Automotive / Light Truck Accessory Kit P/N 169500002 (optional)	11
Optional / Replacement Accessories	12
Troubleshooting / Warranty	13

Product Support / Warranty

Telephone: 1-855-BoschTech (1-855-267-2483)

Fax: 1-800-955-8329

E-mail: techsupport.diagnostics@us.bosch.com

1. Flow Control Valve (Variable)

Releases vapor / pressure into the system
Close flow control valve to lock out system for pressure decay testing

2. Power Indicator

Green light indicates proper connection to electrical power

3. Vapor Test Switch

Begins 15-minute vapor cycle. Red light indicates vapor cycle. Push again to stop testing

4. Air Only Test

Begins 15-minute air only cycle. Blue light indicates air only cycle. Push again to stop testing

5. Reset Switch

Clears stored logic

6. System Pressure Gauge

Displays the back pressure of system under test

7. Flow Meter

Measures flow rate into system under test

8. Adjustable Pressure Regulator

Adjust test pressure from 2 to 20 PSI (0.14 to 1.4 BAR)

9. Test Pressure Gauge

Indicates test pressure set by regulator

10. Vapor Output Hose**11. Power Supply Selector Switch**

AC-OFF-DC

12. Compressed Air Inlet

Replace coupler fitting if necessary.
Female 1/4 in. NPT fitting

13. International AC Power Inlet (110-240V)**14. 12V DC Power Inlet****15. 12 Amp Circuit Breaker****16. Fluid Fill Port**

Remove fluid fill plug to fill machine with OEM- Approved Vapor Producing Fluid

FRONT VIEW**BACK VIEW**



1. FILL / ADD VAPOR PRODUCING FLUID

- a. Remove fluid fill plug with hex key.
- b. Pour OEM-Approved Vapor Producing Fluid into fluid fill port.
- c. Fill fluid fill port until fluid level is near top of port.
- d. Replace fluid fill plug.

⚠ 2 fl. oz. (60 ml) maximum to refill when empty

2. CONNECT TO POWER

- Use the power selector switch on rear of machine to select input power, AC or DC.
- If 12 Volt DC is preferred, connect the detachable battery cable to a fully charged 12 Volt battery. RED to positive, BLACK to chassis ground.
- If AC power is preferred, connect a properly rated power cord into the AC Power Port.
- Green Power Indicator lamp illuminates with proper connection and power source selected.

⚠ Never connect HPT 500 to a battery charger or jumper box.

⚠ Never connect HPT 500 to vehicle with engine running.

3. CONNECT TO AIR SUPPLY

- a. Connect compressed air supply to Air Inlet.

*Replace quick coupler fitting if necessary. 1/4 in. NPT male.

4. Adjust HPT 500 for testing

- a. Turn Flow Control Valve off.
- b. Set desired Test Pressure. (**PULL** to unlock, **TURN** to adjust pressure, **PUSH** to lock)
- c. Attach Vapor Hose to installed adapter of system being tested.
- d. Depress the Vapor start switch to begin 15-minute vapor cycle.
- e. Turn Flow Control Valve to release pressure / vapor.
- f. Use halogen inspection light provided to inspect for leaks.

POWER INTAKE™ ADAPTER INSTALLATION

Installing Power INTAKE™ Adapter:

1. Install Power INTAKE™ Adapter fully into intake system ductwork or exhaust tubing. Make sure there are no obstructions or sharp edges that might puncture bladder when inflated. Power INTAKE™ Adapter must insert completely inside ducting / tubing.
2. Install safety chain / cable to a secure location.
3. Inflate Power INTAKE™ Adapter to 30 PSI (2 BAR) maximum. If over inflated, pop off safety valve may release. If release occurs, reinflate to 30 PSI (2 BAR).
4. Firmly tug on safety chain to insure Power INTAKE™ Adapter is firmly installed and properly secure.
5. Attach vapor hose for testing.



Proper Installation



Improper Installation

Removal of Power INTAKE™ Adapter:

1. Remove vapor hose (or block off adapter) at quick coupler to deflate tested system
2. ONLY AFTER system under test is fully depressurized, release internal pressure of Power INTAKE™ slowly by depressing Schrader valve
3. Detach safety chain / cable
4. Remove Power INTAKE™ Adapter from ductwork, making sure not to rub across sharp edge

Power INTAKE™ Adapters are available in optional accessory kits (P/N 1699500001, 1699500002) or individual purchase

Coolant System Leak Testing

Cooling system leak testing can be performed two ways

Use Bosch HPT 500 to quickly and easily find cooling system leaks either with decay testing or using visible vapor. First, attach provided cooling system adapter to pressurized coolant bottle or radiator at cap. For decay testing, simply pressurize coolant system with air-only to manufacturers recommended test pressure, typically 15 PSI (1 BAR). Turn off flow control valve to lock out system and watch for decay. Inspect visually for leaking fluid. Alternatively, to perform leak test using vapor, first drain the cooling system of all fluid. Introduce pressurized vapor in to cooling system at no more than the manufacturers recommended test pressure and use inspection light to find leaks. Retest after repairs are performed to confirm proper repair and seal.



IMPORTANT NOTE

Many leaks in heavy duty systems are considered "normal" or "within tolerance." For example, a weep hole in a muffler is acceptable. DO NOT assume every wisp of vapor represents a failing component. Check with vehicle manufacturer before replacing suspected failed part.

OPTIONAL AUTOMOTIVE / LIGHT TRUCK ACCESSORY KIT (P/N 1699500002)

1. Accessory Storage Case [580915]

2. Power INTAKE™ Adapter 1.9 in. (5 cm) Diameter [95-0086]

Inflatable block off bladder with a pressurized vapor pass-through

3. Power INTAKE™ Adapter 2.9 in. (7 cm) Diameter [95-0081]

Inflatable block off bladder with a pressurized vapor pass-through

4. Halogen Inspection Light [580911]

12V DC with 20 ft. (6.1 m) cable. Always use to pinpoint leaks

5. Vapor Producing Fluid 8 fl. oz. (237 ml) [580904]

Vapor Producing Fluid will perform over 500+ typical tests per bottle

Important: Contains NO Dye / Contaminants

6. Ball-End Hex Point L Key 1/8 in x 6 in (0.3 cm x 15 cm) [580903]

To remove / replace fluid fill plug

7. Oxygen Sensor Port Adapter [580909]

Use to access exhaust system through oxygen sensor port

8. Temperature Sensor Port Adapter [580908]

Use to access intake or exhaust system through temp sensor port

9. Pressure Sensor Port Adapter [580907]

Use to access intake or exhaust system through pressure sensor port

10. Block Off Coupler [580906]

Used to block smoke hose to convert PowerSmoke™ Adapter into a block off bladder

11. Detachable 12V DC Power Cable [580905]

Detachable 12V DC power cable if preferred over AC. 15 ft (5 m)



TROUBLE SHOOTING / WARRANTY

PROBLEM

SOLUTION

No Green Light

- Check for proper battery voltage
- Align power supply switch with input (AC or DC)
- Check polarity if 12V DC is selected
- Check fuse if AC Power is selected

Red Light Flashing

- Open circuit / internal component
- Contact: **1-855-BoschTech (1-855-267-2483)**
- Fax: **1-800-955-8329**
- Email: **techsupport.diagnostics@us.bosch.com**

No Air Flow

- Check connection to compressed air
- Open the flow control valve
- Check hoses are not kinked or pushed into machine

Poor Vapor Density or Volume

- Insufficient Vapor Producing Fluid: Refill
- Flow Control Valve is partially closed
- Vapor Output Hose is kinked

High Test Pressure Reading

- Vapor Output Hose is kinked

WARRANTY

Bosch USA ("Bosch") warrants this product to be free from defects in workmanship and material under normal use and service for a period of one-year from the date of purchase. Bosch USA's liability under this warranty is limited to: (1) repair or replacement of any parts or product which are determined to be defective; or at Bosch USA's sole option (2) refund of the purchase price. In either event, product to be returned shipping prepaid within the one year warranty period. Additionally, the vapor chamber in any Bosch USA product has a lifetime warranty as to its structural integrity: Any Bosch USA vapor chamber that leaks, cracks, or separates in any way shall be repaired or replaced by Bosch USA at no charge. Products are only to be used by persons having skill and knowledge in the motor vehicle repair field, and improper use or maintenance may cause serious injury. In no event shall Bosch USA be liable beyond replacement of product or refund of the purchase price. This warranty shall void if a product is improperly maintained, altered, abused or otherwise misused in any way.

THE AFORESAID WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, AND THERE ARE NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER MADE BY BOSCH USA, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR APPLICATION.

THE PURCHASER'S SOLE REMEDY FOR ANY DEFECTIVE PRODUCT SHALL BE REPAIR, REPLACEMENT OR REFUND AS STATED ABOVE AND BOSCH USA SHALL NOT BE LIABLE TO ANYONE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT OR PUNITIVE DAMAGES ON ACCOUNT OF DEFECTIVE PRODUCTS, HOWEVER CAUSED, UNDER ANY THEORY OF LIABILITY.

PM-A FLUIDS / LUBRICATION CHART (For Contract CQ19195, 12/3/2019.)

(Use "BMNT (SVMT) Various Lubricants Contract Internal Order Form" on BMNT website to order items.)

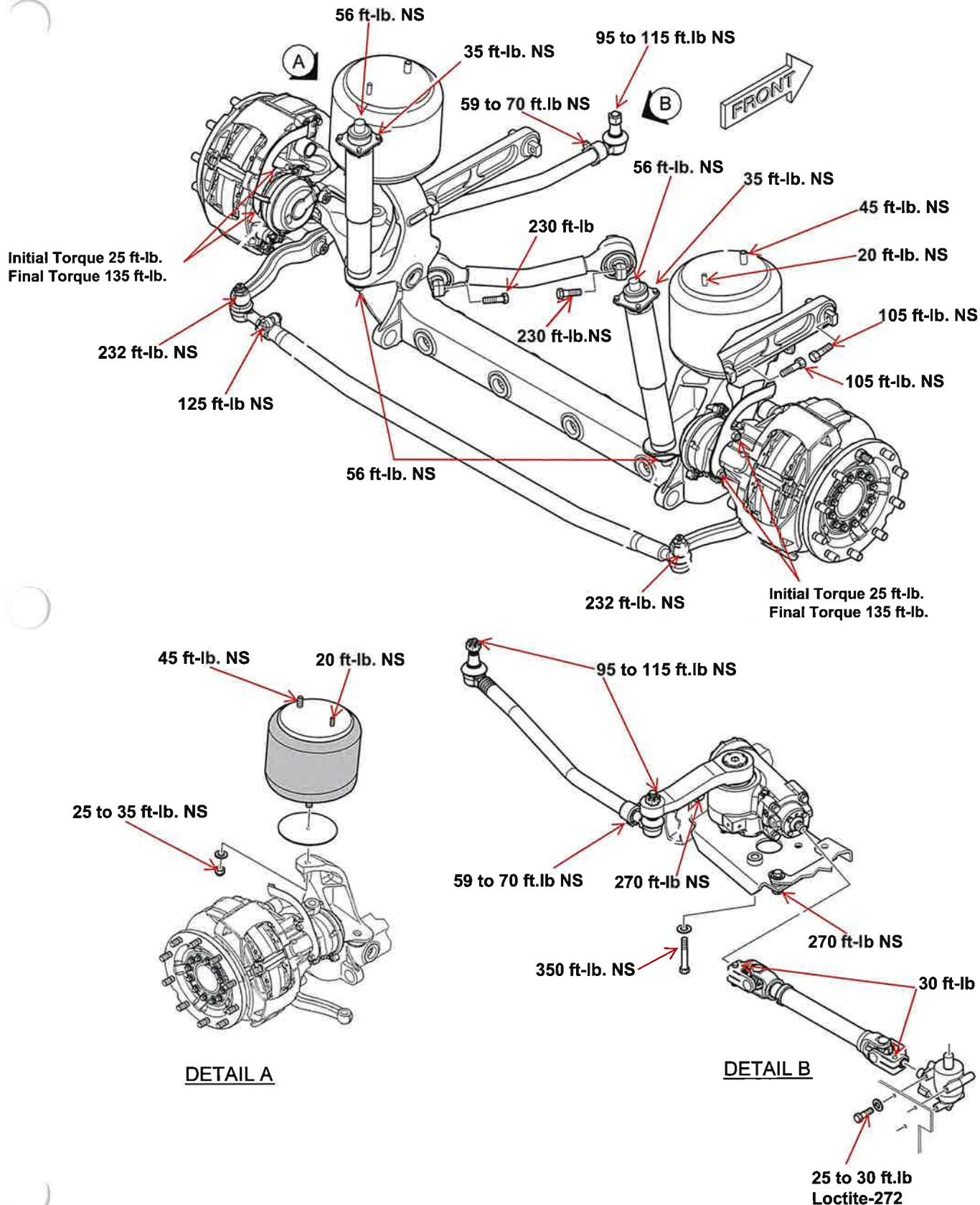
Component	Fluid Type	Applicable Buses	Brand Name
Engine (Diesel)	15W-40, CK-4/SN Engine Oil	3036-3087, 3751-3770, 4450-4598, 5460-5480, 5481-5492, 5500-5541, 6101-6217, 6301-6609, 7001-7272, 7300-7355, 7356-7409, 8001-8105	Mileguard HD Syn Blend 15W-40 Was: Warren Coastal Lubriguard Fleet 15W-40 Was: Chevron Ursa (Use Warren Coastal, Chevron Ursa or Mobil Fleet till depleted.)
Engine (CNG)	Low Ash 15W-40 Engine Oil	2801-2825, 2830-2993, 3001-3035, 3100-3199, 3200-3349	Warren GEO Low Ash 15W-40
Transmission / Hybrid Drive Units	Full Synthetic ATF	All Bus Fleets	Mobil Delvac 1 Synthetic ATF Was: Castrol TranSynd (Use Castrol till depleted.)
Steering and Hydraulic System	Full Synthetic ATF	All Bus Fleets	Mobil Delvac 1 Synthetic ATF Was: Castrol TranSynd (Use Castrol till depleted.)
Differential and Planetary Hubs	Mineral Base Gear Lube	2801-2825, 3751-3770, 6101-6217, 6301-6609	Mobilube HD Plus 80w90 Was: Petro Canada TRAXON 80W-90 Gear Oil (Use Petro till depleted.)
Differential	Full Synthetic Gear Lube	2830-2993, 3001-3035, 3036-3087, 3100-3199, 3200-3349, 4450-4598, 5460-5480, 5481-5492, 5500-5541, 7001-7272, 7300-7355, 7356-7409, 8001-8105	Mobil Delvac 75W-90 (Synthetic Gear Lube)
Wheel Chair Ramp	Full Synthetic ATF	2801-2825, 2830-2993, 3001-3035, 3100-3199, 3751-3770, 5460-5480, 5481-5492, 6101-6217, 6301-6609, 7001-7272, 7300-7355, 7356-7409	Mobil Delvac 1 Synthetic ATF Was: Castrol TranSynd (Use Castrol till depleted)
Articulated Joint Hydraulic Fluid	Hydraulic Fluid	5460-5480, 5481-5492, 5500-5541	Shell Tellus 15 (5 Gallon Pails Only)
Wheel Bearings	Grease, EP-2	All	Mobilux EP-2 Grease
Chassis	Grease, EP-2	All	Mobilux EP-2 Grease
King Pin Bushings	Grease, EP-2	All Meritor Front Axle Buses* (2801-2825, 3036-3087, 6101-6217 & 8001-8105) (Stock No. 932-55-0012, 35# Pail)	ECL #TEK-678 (Red Disp.) *Plus any 2005 Orion-VII CNG Buses still in Revenue Service.
King Pin Bushings	Grease, EP-2	All MAN Front Axle Buses (2830-2993, 3100-3199, 3200-3349, 3751-3770, 4450-4598, 5460-5480, 5481-5492, 6301-6609, 7001-7272, 7300-7409)	ECL #TEK-678 (Red Disp.)
Steering/Gear Box	Grease, EP-1	All (Stock No. 061-00-0505)	Castrol Pyroplex Red #1
Miter/Transfer Box	Grease, EP-2	All	Mobilux EP-2 Grease

Effective date: 2/2/2021/ epmBENG

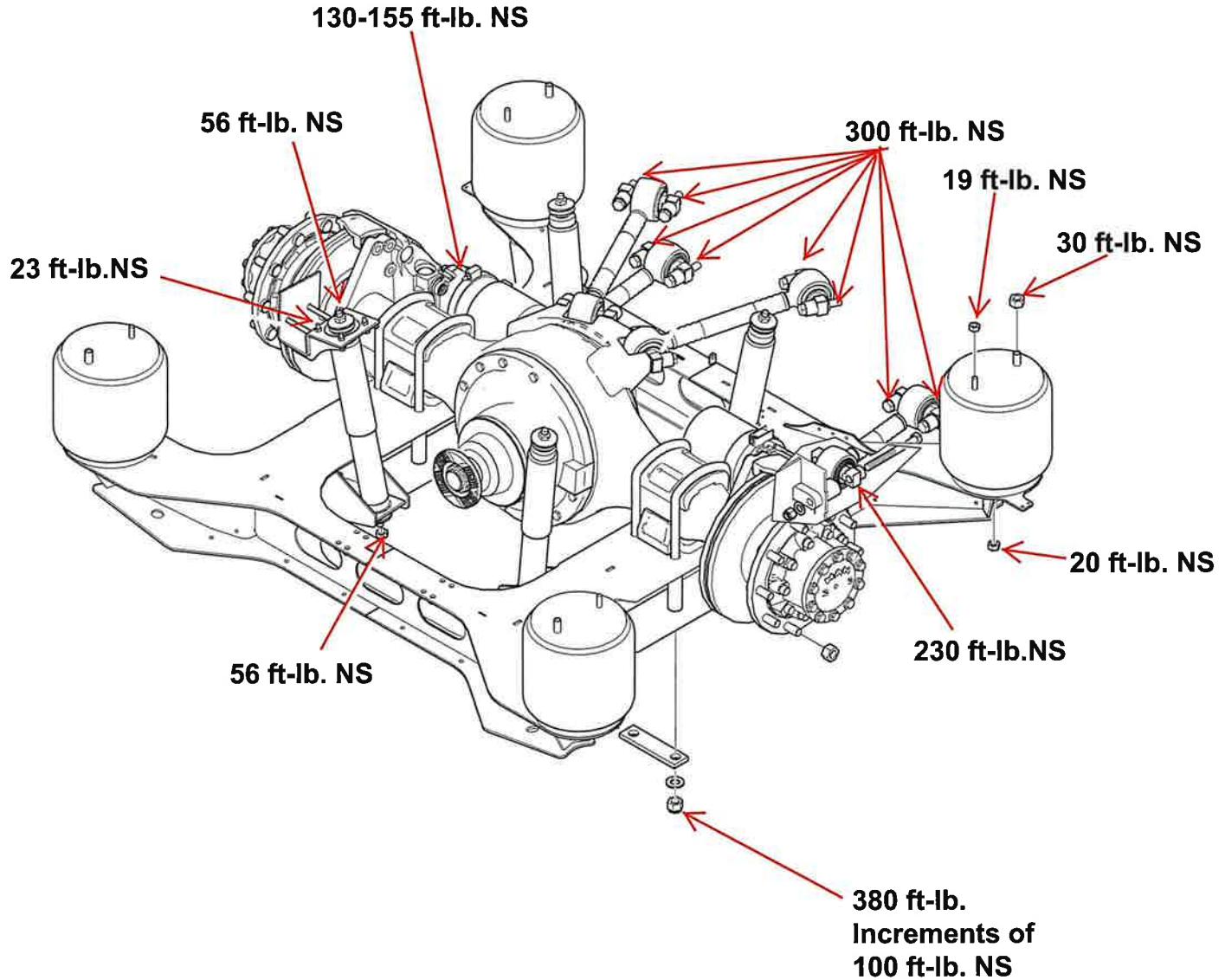
Component	Fluid Type	Applicable Buses	Brand Name
Brake Pad Lube (Use on Abutment Surfaces Only)	75ml Tube (Fastenal #12351-02162)	All New Flyer (MAN Axle) Disc Brakes (as required per NF SMB-152) Stock No. TBD, Fastenal Vending Mach, WMATA SDS #14554	Textar Cera Tec, Anti-Squeal Lubricant, Textar OEM #81000400

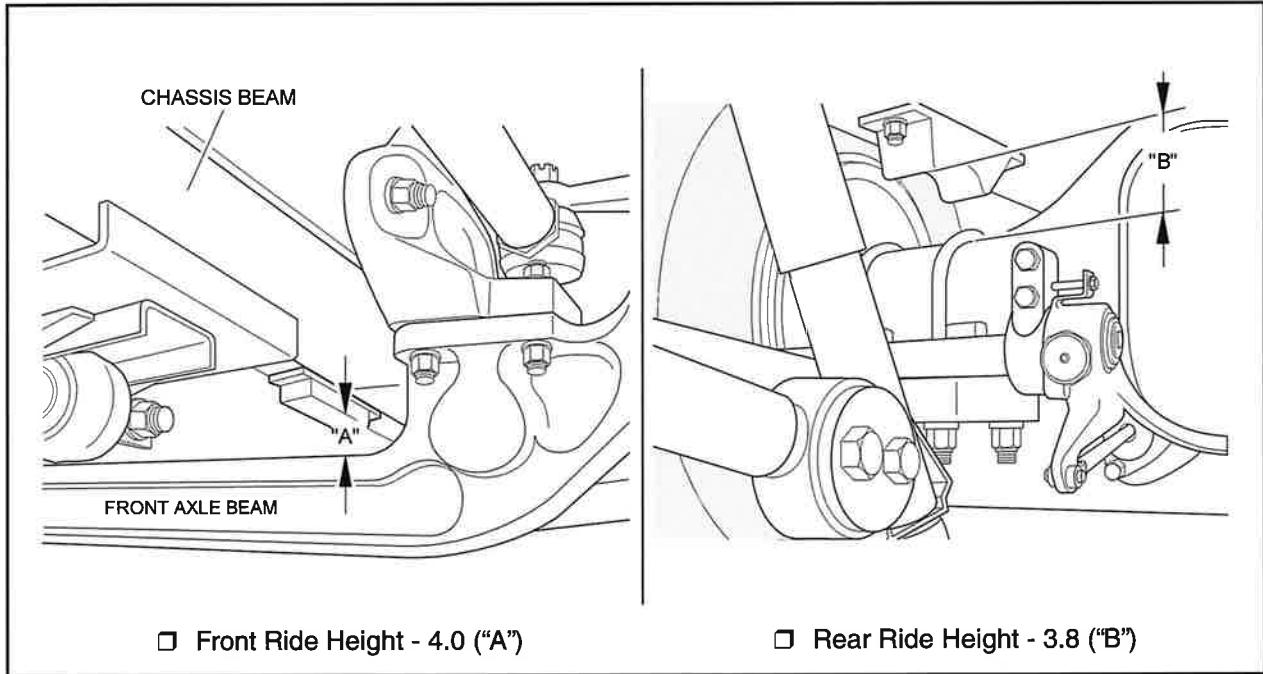
HVAC Compressor Oil: *(6101-6217 current (before) Mid Life Overhaul); **(6101-6217 after Mid Life Overhaul)

Ed Murawski / BENG / 2/26/2015; 5/27/2016; 6/10/2016; 10/7/2016; 3/2/2017; 3/10/2017; 3/29/18; 3/4/2019; 6/3/2019; 6/4/2019; 2/2/2021;

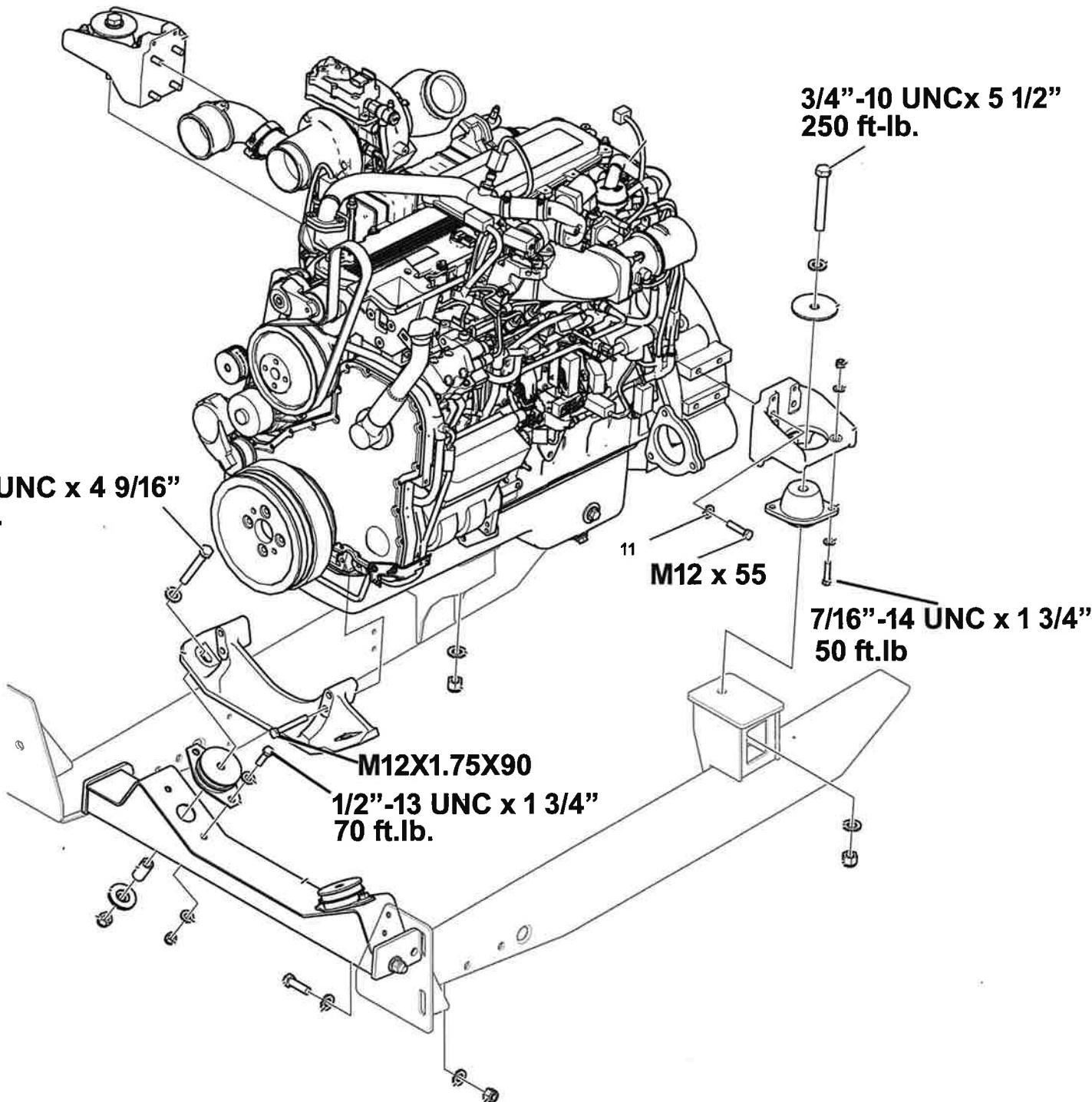


2830-2993
Never-Seez =NS





Ride Height Adjustment





THIS DOCUMENT AND ITS SUBJECT MATTER ARE DISCLOSED IN CONFIDENCE. IT MUST BE RETURNED UPON REQUEST AND SHALL NOT BE DISCLOSED TO OTHERS WITHOUT THE WRITTEN CONSENT OF NEW FLYER INDUSTRIES LTD.

INSTRUCTION TO SERVICE

ITS: 3453

SECTION: 219 Engine & Transmission	MODEL: <input type="checkbox"/> 30FT <input type="checkbox"/> 35FT <input checked="" type="checkbox"/> 40FT <input type="checkbox"/> 60FT <input checked="" type="checkbox"/> DSL <input type="checkbox"/> CNG <input type="checkbox"/> LNG <input checked="" type="checkbox"/> ELEC	TYPE: <input type="checkbox"/> HIGH FLOOR <input checked="" type="checkbox"/> LOW FLOOR	WRITTEN BY: Carlitos Cura
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OBJECTIVE/SUBJECT:

Inspection of exhaust tube installation and flex connector failure P/N 089572.

PROCEDURE:

1. Turn the main battery disconnect switch to the "OFF" position.
2. Open the rear engine access door.
3. Remove belt guard.
4. Inspect exhaust tubes installation for proper alignment specification. Refer to Appendix A.
5. Inspect Vibrant flex connector P/N 089572 for visible crack or signs of failure. See Fig. 1 below for common flex connector failure.

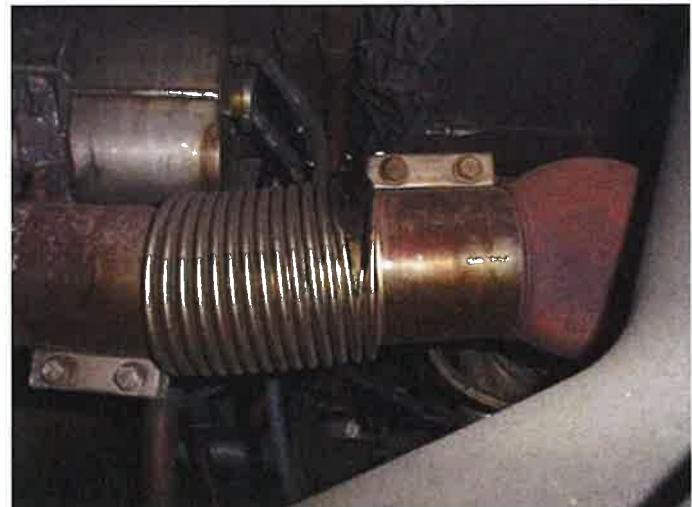
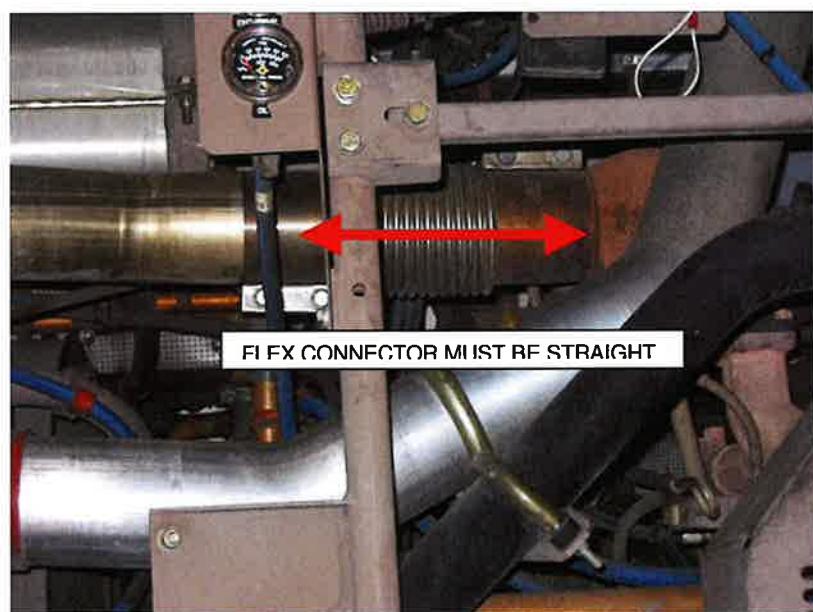


Fig.1: Failed Flex Connector

7. Reinstall hybrid exhaust tube using new seal clamp 5" P/N 053791. Leave clamp loose enough to be able to manipulate pieces into proper position.
8. Line-up the exhaust tubes making sure that the centerlines of the exhaust elbow and hybrid exhaust tube are aligned. This will ensure that the new flex connector can be installed without twisting or stretching it beyond its' limits.
9. Install a new Vibrant Exhaust Bellow P/N 089572 using new seal clamp 4" P/N 089572. Leave clamp loose enough to be able to manipulate the flex connector into proper position.
☞ **NOTE: Make sure the flex connector is not stretched or compressed when attached to the exhaust pipes.**

IF THE ALIGNMENT IS POOR:

10. Loosen the seal clamps, the U-clamp holding the E-brake/turbo elbow and the v-band clamps holding the exhaust (PAC) brake if not loosened already. See Fig. 2.
☞ **NOTE: If seal clamp P/N 053791 can not be reused. Use a new one if has not been replaced yet.**
11. Attempt to adjust the position of the pipes and the muffler (if required) to produce a good alignment for the exhaust flex connector. See Fig. 3 below.

**Fig. 3: Flex Connector**

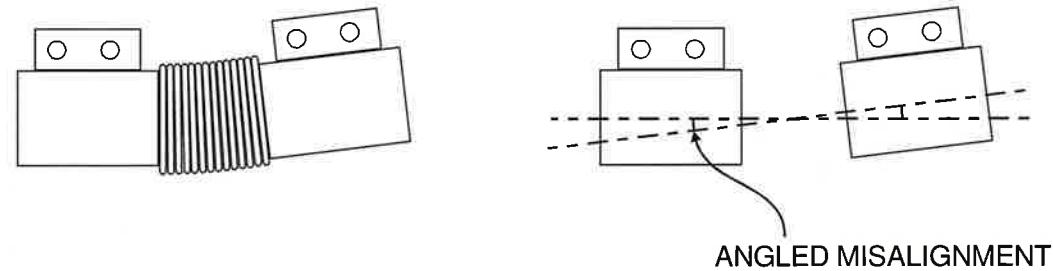
APPENDIX A – Alignment Specifications

⚠ WARNING: The exhaust flex connector is extremely sensitive to installation. A slight misalignment will result in premature failure. Careful inspection of the alignment is necessary.

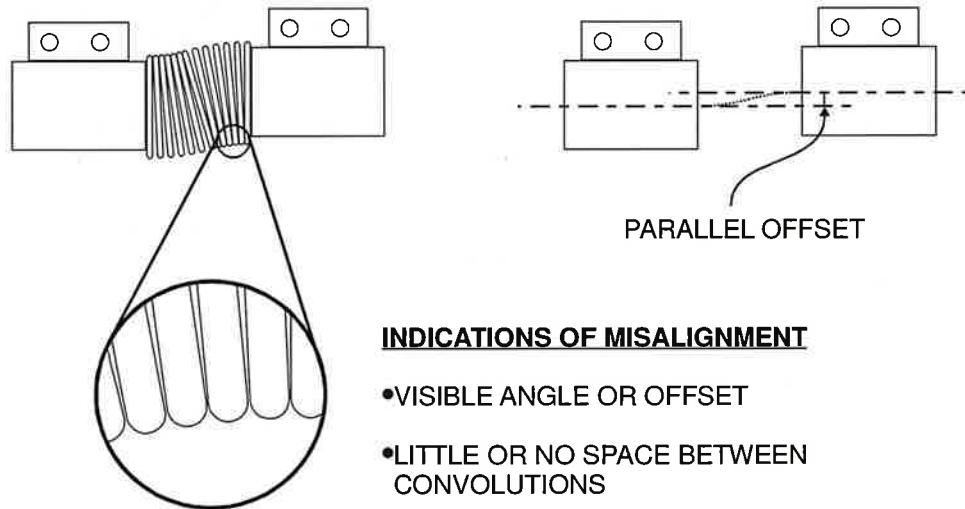
☞ NOTE: Drawings and pictures shown may not exactly look like the actual parts on the bus. The illustrations are shown for visibility purposes.

MODES OF MISALIGNMENT

If the tubes meet at a slight angle, this is **unacceptable**. The diagram below shows an exaggerated misalignment:



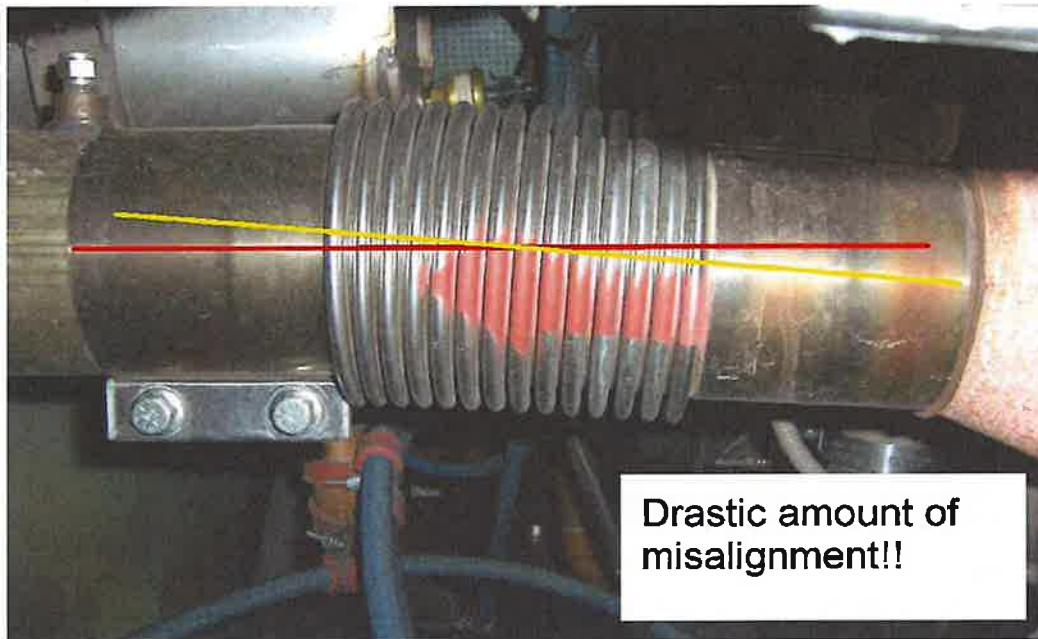
Even if the tubes are at the same angle they may still be offset. This is **unacceptable**. The diagram below shows an exaggerated offset:



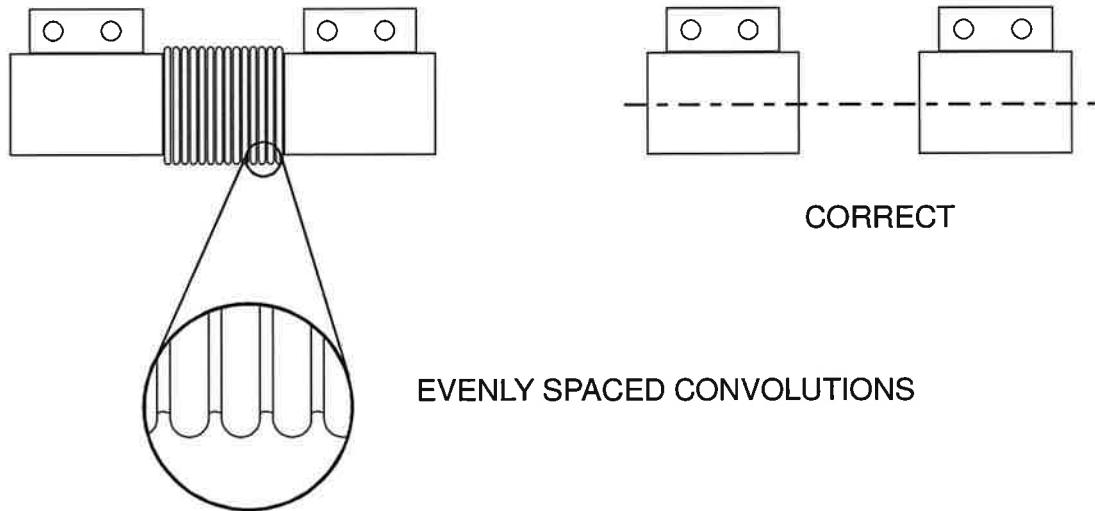
INDICATIONS OF MISALIGNMENT

- VISIBLE ANGLE OR OFFSET
- LITTLE OR NO SPACE BETWEEN CONVOLUTIONS
- UNEVENLY SPACED CONVOLUTIONS

Any combination of these two conditions can lead to a dramatic reduction in component lifetime.



A correct installation will be straight. The convolutions will be evenly spaced. This is **acceptable**:



Misalignment is detectable by eye, if examined carefully enough. Look for:

- A visible angle or offset between the two pipes.
- Little or no space between the convolutions. *There should be enough space for a quarter to pass liberally between convolutions or use spacing tool MT-757.*
- Unevenly spaced convolutions. *Often the only indication will be uneven spacing of the convolutions.*

If the flex connector passes these inspections, it is in good alignment.



MEMORANDUM



SUBJECT: Vibrant Power Inc. V-Band Exhaust Clamp

DATE: January 4, 2018

FROM: BMNT – Steve West
THRU: David B. Michels

TO: Distribution

This Bulletin Applies to all New Flyer Fleets

Bus Maintenance continues to experience a high number of reported service interruptions for fumes in the bus. The top cause of these service interruptions has been exhaust leaks, particularly on the New Flyer LFAs and Xcelsior fleets. These buses use several sizes of V-band exhaust clamps manufactured by Vibrant Power Inc. (see figure 1). When servicing systems with these types of clamps it is imperative to note the following:

1. Used clamps should never be reinstalled. These clamps are single use only and should be discarded after removal and replaced with a new clamp.
2. The lock nut should be torqued to 75 in-lbs. Under or over torqueing can lead to a poor seal and allow exhaust fumes to escape.



Figure 1 Vibrant Power Inc. V-Band Exhaust Clamp

Washington
Metropolitan Area
Transit Authority

DISTRIBUTION

BUS: Potts
BMNT: Michels
Singh
Directors
Superintendents
Bus Maintenance Supervisors
SAFE: Gilbert

**BMNT SERVICE BULLETIN 18-P-001
POST ON ALL BMNT BULLETIN BOARDS**



MEMORANDUM



SUBJECT: **Hose Clamp Torque Specifications**

DATE: July 25, 2016

FROM: BMNT – Barry Goldman

THRU: Phillip C. Wallace (Original signed)

This Service Bulletin applies to all revenue fleets

New Flyer recently released Service Manual Bulletin SMB-158 that provides a listing of the various types of hose clamps used in the cooling system and the applicable torque for the specific clamp.

IDEAL - TRIDON HOSE CLAMP TORQUE SPECIFICATIONS

Item	Clamp	Description	Width	Torque (in-lb.)
1		Ideal Smartseal Stainless Steel Clamp	0.625	125 in-lb.
2		Ideal Waveseal Stainless Steel Clamp	0.562	80 in-lb.
3		Ideal Flexgear Stainless Steel Clamp	0.562	50 in-lb.

Washington
Metropolitan Area
Transit Authority

NOTES:

1. Do not exceed 75 RPM when tightening Smartseal and Waveseal clamps
 2. Do not exceed 250 RPM when tightening Flexgear Clamps
 3. **RETORQUE ALL HOSE CLAMPS AFTER 30 MINUTES OF USE**
- Torque values are in inch – pound – be sure to use an inch pound torque wrench

**OVERTIGHTENING OF HOSE CLAMPS CAN BE JUST AS DETERIMENTAL
AS A LOOSE HOSE CLAMP – CAUSING THE CLAMP TO BREAK AND
DAMAGE TO THE HOSE**



Service Bulletin

SUBJECT: Dedicated Micros Back-up Battery Mounting Date: 6/27/2018

FROM: BMNT - Steve West
THRU - David B. Michels (original signed)

TO: Distribution

This Bulletin Applies to the New Flyer Xcelsior Fleet (Bus# 2830-2993, 5460-5480, 7301-7409)

Several back up battery enclosures for the camera systems were found with loose/missing mounting hardware and/or broken welds. This allowed the battery back-up unit to move around in the SDS box (electrical enclosure behind the driver's seat) causing damage to electrical cables and components. All of these units should be checked immediately to ensure that all mounting hardware is present and secure (see red and yellow circles in figure 1). The welds should also be examined for signs of cracking (see figure 2). The unit in question is a black metal enclosure located on the top tray of the equipment rack in the SDS box. For proper mounting configuration see figures 3 and 4 below. During the inspection, the screws that hold the battery enclosure to the SDS equipment tray (see item 21 in Figure 3) should be removed, have a light coating of blue Loctite applied to the threads, and then be reinstalled. Additional information can be located in the fleet-specific New Flyer Parts Manual in Section 9 Tray Assembly – Video Surveillance. Any loose/missing hardware should be tightened or replaced immediately. If any welds on the enclosure are broken, a CCTV service request should be submitted immediately per SOP 1.27 Bus Camera CCTV Surveillance System Maintenance Program. A check off sheet noting which buses were found to have missing/ damaged hardware or broken welds should be submitted to Steve West (SWest@wmata.com) as soon as possible.



Figure 1 Mounting Hardware Locations
BENG 3/2/2022 rev 00

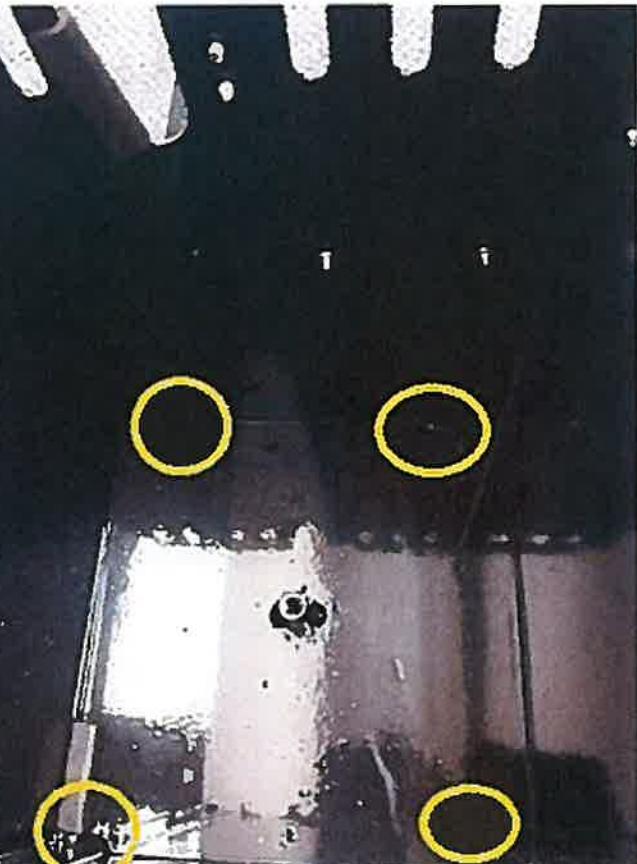
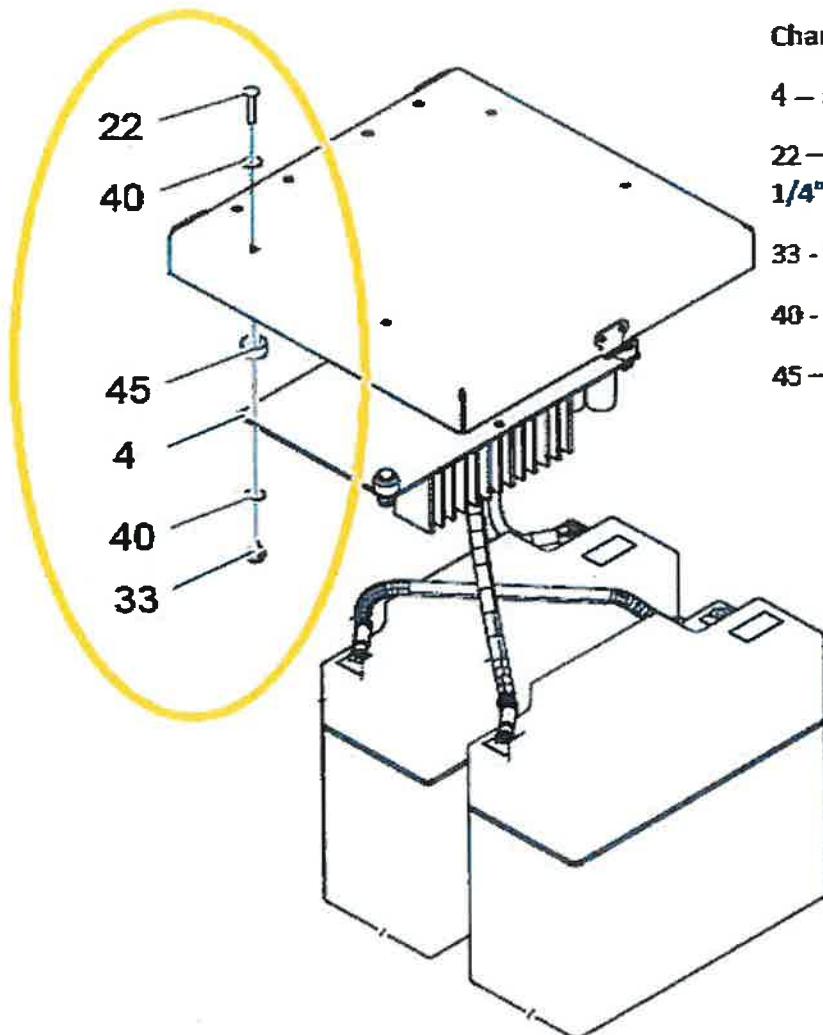


Figure 2 Weld Locations



Charging Module Mounting Hardware

- 4 - 586064 - Module, Power Supply Charger
- 22 - 14S96012 - Screw, PH Cross Recess SST
1/4" - 20 UNC x 1" lg.
- 33 - 40N96000 - Nut, Lock Nylon #6 - 32 UNC
- 40 - 50W96000 - Washer, Flat SST #6
- 45 - 053324 - Spacer, Nylon

Figure 4 Charging Module Mounting Hardware

DISTRIBUTION

BUS:	Potts
BMNT:	Michels
	Singh
	Goldman
	Directors
	Superintendents
	Bus Maintenance Supervisors
SAFE:	Gilbert

BMNT SERVICE BULLETIN 18-E-003 POST ON ALL BMNT BULLETIN BOARDS



M E M O R A N D U M



SUBJECT: Xcelsior Drivers Barrier Lower Hinge Bolt

DATE:: December 21, 2016

FROM: BMNT – Barry Goldman

THRU: Phillip C. Wallace (original signed)

TO: Distribution

This Bulletin Applies to all 2015 /2016 New Flyer Xcelsior Buses (5460-5480 / 7300-7409 / 2830-2993)

New Flyer has identified some instances of the driver's barrier door pivot hardware coming loose. Over time the lower hinge may loosen, eventually allowing the barrier door to drop. In order to prevent the lower barrier hinge bolt from coming loose the bolt must be removed and installed with Loctite 243 or approved equivalent Vibra –Tite 121 Medium Strength Removable Thread locker, available in the Fastenal vending machines

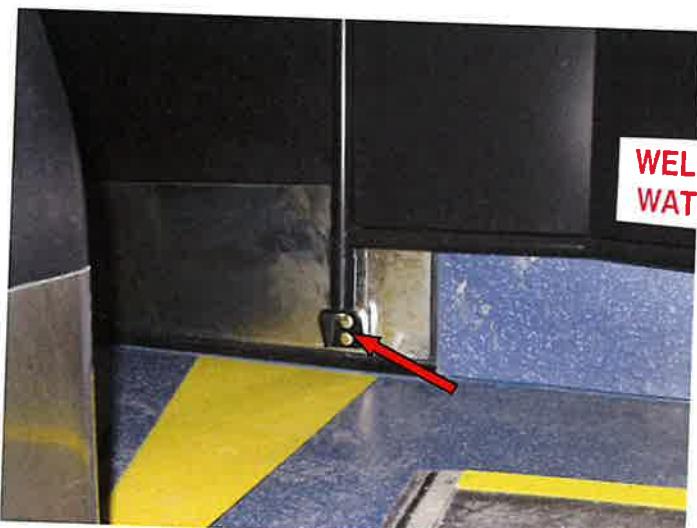


Figure 1 Hinge Bolt Location

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During the next PMA Service perform the steps detailed in the attached New Flyer Technical Service Information Bulletin (TSIB 16-03 rev. A) This will ensure the hinge bolt is installed properly and will remain secured.

The hinge bolt should be checked periodically during PM level inspections to ensure it has not loosened.

New Flyer Service Technical Bulletin 16-03 rev. A as well as other TSIB's can be found on the BMNT Website > Main Menu > Maintenance Information > Bus Manufacturer Manuals > New Flyer > Technical Service Bulletins



MEMORANDUM



SUBJECT: AGM ODYSSEY 31-PC2150 BATTERY
NEW VERSION & BATTERY CLEANING DATE: October 4, 2016

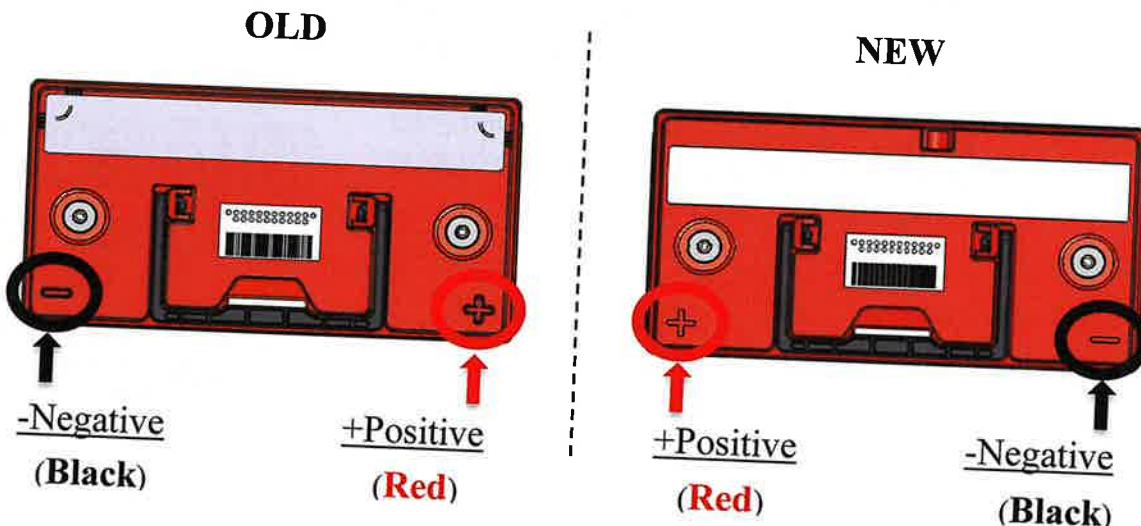
FROM: BMNT – Frances Jallu
THRU: Phillip C. Wallace (original signed)
TO: Distribution

This Bulletin Applies to the All Fleets using AGM batteries

ODYSSEY BATTERY- NEW VERSION

Beginning in late August 2016, a new version of the Odyssey 31-PC2150 battery was released. There are four feature changes that should be noted:

- 1. Polarity Change** – The terminal orientation has been changed to follow BCI specifications for a G31 battery. The new design has the positive terminal on the left and the negative terminal on the right.



- 2. Pad Height Increase** – The pad height on the stud terminal base was increased to allow for better cable seating.
- 3. Single Vent** – Multiple vent areas were consolidated to one single vent.
- 4. Part No.** – The part number for the newly designed 31-PC2150S will be changing to 0790-2520 (from 0790-2420).

The most important change affecting BMNT is the Polarity Change. When replacing previously installed 31-2150's with the new design, pay careful attention to the terminal polarity. Only positive (+) and negative (-) terminal reference should be used. Do not reference any other features of the battery such as handles or front decal. Major damage to electrical system may occur as a result of reverse (backwards) installation.

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M E M O R A N D U M



Battery and Charging Systems

DATE: October 11, 2013

FROM: BMNT – Larry Skelton
THRU: Phillip C. Wallace (Original signed)

TO: Distribution

This Bulletin Applies to all Revenue Fleets

The bus fleet is converting from lead-acid type batteries to the new Absorbed Glass Mat (AGM) batteries to improve battery and charging system performance and reliability. NorthStar Brand AGM batteries are being provided for our Revenue Fleet. These batteries have a 48 month full replacement warranty. **See BMNT Service Bulletin 12-E-003 for AGM Battery Warranty Procedures.**

All buses equipped with Group 31 lead acid batteries are currently being converted to the NorthStar AGM batteries with the exception of the 1997 Orion V fleet. Work order instructions are included in Maximo Campaign #9677187, Job Plan #4433.

All new buses received by BMNT are provided with NorthStar AGM Batteries. Buses that are currently equipped with other brand AGM Batteries (Odyssey or Trojan) will continue to use those batteries until such time as inventory levels are depleted. **Note: When replacing a partial set of batteries, do not mix batteries of different brands.**

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After a thorough review of our AGM battery issues with the battery manufacturer it has been determined we have been overcharging them on the bus. To address the overcharging issue the following has been implemented;

All batteries should be charged using position 2 on the Niehoff voltage regulator.

Position 2	28.0 V & 29.0 V	Group 31 Maintenance Free / Lead Acid Batteries & AGM (NorthStar – Odyssey-Trojan) Batteries
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**BMNT SERVICE BULLETIN 13-E-003
POST ON ALL BMNT BULLETIN BOARDS**



Service Bulletin

SUBJECT: **Transmission Bulkhead Connector** Date: 01/22/2020

FROM: BMNT – Robert French
THRU - David B. Michels

(RF)
(JPM)

TO: Distribution

This Bulletin Applies to the New Flyer Xcelsior CNG Fleet (Bus# 2830-2993)
Note: This Service Bulletin supersedes 18-E-002 06/22/2018

Bulkhead connectors XBHL3 and XBHL4 on this fleet are known to have water intrusion causing corrosion on the connector pins resulting in transmission faults.

The connectors are located under the road side HVAC blower housing. The top half of the connectors can be accessed by removing the access cover on the roadside of the bus above the rear seats (see Figure 1). The bottom half of the connectors can be accessed through the rear engine compartment access door. It is located above and forward of the exhaust flex pipe (see Figure 2).

In order to prevent water intrusion, the following actions should be taken immediately:

1. Check the connectors to ensure the presence of cavity plugs in all holes where there are no wires present (see Figure 3). The wire loom retainer must be removed in order to inspect these items. Missing cavity plugs or damaged grommets should be replaced immediately.
2. Disconnect both XBHL3 and XBHL4 connectors by turning the top portion of the connector counter clockwise and check for the presence of water or corrosion. If present, thoroughly dry the connectors and clean or replace the pins. A light coating of Krown KL73 Rust Inhibitor/Lubricant should then be applied to the inside face (where the pins are located) and the outside face (where the wires go through the orange grommet) of each half of the connectors (See attached directions for use). Once the connectors have been coated, they should be reassembled ensuring the two halves are locked in place securely and all wire looms are held securely in place by the wire loom retainers on either end of each connector.

Krown KL73 is now an inventory item the Metro number is 061000041



M E M O R A N D U M



SUBJECT: **Stoneridge Low Coolant Sensor Test** DATE: October 27, 2017

FROM: BMNT – Steve West
THRU: David B. Michels

TO: Distribution

This Bulletin Applies to Bus #'s 2830-2993, 5460-5480, 7264-7272, and 7300-7409

Bus Maintenance continues to experience a high failure rate of the Stoneridge low coolant sensors supplied on the Cummins CM2350 engines, even after updates were performed per Service Bulletin SB 16-P-001. Although these updates have minimized the issue of coolant wicking through the sensor and corroding internal components, these sensors are still prone to failing in the “open” position. This failure mode will result in the engine setting fault code(s) 197 and /or 235 as well as the check engine / stop engine light and engine shut down. The following test procedure must be utilized prior to replacing the sensor to validate if the sensor has failed. If the sensor passes the ohms test, inspect the wiring for corrosion, or damaged pins and the integrity of connectors and connections.

Step 1 Connect multi-meter leads to sensor using pigtail 881-55-0436 (see fig 1). It does not matter which wires the multi-meter leads are connected to so long as it is a good connection. Set the multi-meter to measure ohms.

Step 2 Locate the metal dowel recessed in to the sensor float (see fig 2). Hold or position the sensor so that the metal dowel in the sensor float is not touching the center stem of the sensor. This will simulate a low coolant condition. Measure the resistance of the sensor. **A properly functioning sensor will read in the 2.7 kOhm range.**

Step 3 Push the float up so that the metal dowel makes contact with the center stem of the sensor to simulate a full coolant condition. **A good sensor should read in the 140 Ohm range**

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Service Bulletin

SUBJECT: **Front Engine Mounts**

Date: 01/16/2020

FROM: BMNT – Frederick L. Miller Jr.

THRU - David B. Michels (Original signed)

TO: Distribution

This Bulletin Applies to the New Flyer Xcelsior Fleets (Bus# 7001-7100; 7101-7152; 7153-7167; 7168-7263; 7264-7272; 5460-5480; 2830-2993; 7300-7409; 3100-3199; 5481-5492; 3200-3274; 4450-4474)

The New Flyer Xcelsior fleets feature two different front engine mounts (802-60-0003 and 811-70-0002). Although they are the same dimensionally, they have different temperature ratings therefore not interchangeable.

The front engine mounts are located on the bottom front of the engine behind the rear bumper assembly (see Figure 1).

The following part numbers should be used as per application chart below to prevent installation of incorrect component and possible premature failure:

WMATA #	New Flyer #	Applicable Bus Fleets
802-60-0003	109982	7001-7100; 7101-7152; 7153-7167; 7168-7263 7264-7272; 5460-5480; 2830-2993; 7300-7409; 3100-3199; 3200-3274; 4450-4474
811-70-0002	499546	



Figure 1 (Engine Mounts)



SERVICE BULLETIN



SUBJECT: Kidde Fire Systems

DATE: February 14, 2018

FROM: BMNT – Robert French
THRU: David B. Michels

(Handwritten signatures: RF and DM)

TO: Distribution

This Bulletin Applies to New Flyer CNG buses 2830 -2993 and future buses 3100-3199 with Kidde Dual Spectrum Fire and Gas Detection Systems

Recently we have had a large number of unnecessary service calls for the Fire Suppression and Gas Detection Systems that has impacted bus availability on this fleet of buses.

If both the yellow fire and gas trouble lights are blinking simultaneously on the protection panel, this is only an indication that the System is running off the back-up battery system (see figure 1)

Start the bus and observe the lights. If both lights go out within one (1) minute and the System OK green light illuminates the system is working properly. The bus may be used for revenue service. There is no need to request service from Fireline.

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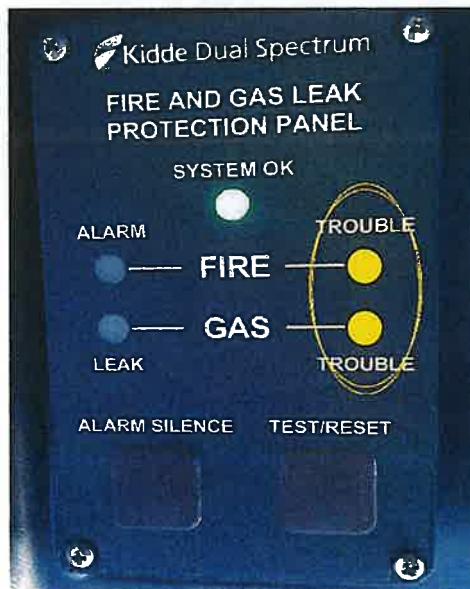


Figure 1 Yellow Trouble Lights Blinking



Service Bulletin



SUBJECT: Xcelsior High Temperature Air Governor Update Date: 8/13/19

FROM: BMNT – Steve West

THRU: David B. Michels

SW
DBM

TO: Distribution

This Bulletin Applies to the 2015 and newer New Flyer Xcelsior Fleet (Bus# 2830-2993, 3100-3274, 4450-4474, 5460-5481, 7300-7409)

In 2015 New Flyer began using a narrow-band air governor on their buses to help the air system keep up with additional air pressure demands. The new governor has a higher cut-in point than previous versions (117psi vs 105-110psi). This new narrow-band air governor came equipped with standard temperature O-rings instead of the high-temperature O-rings used in previous builds. As a result, this new governor has experienced a high rate of failure on the CNG buses that came equipped with it. Effective immediately, all governors with standard temperature (WMATA # 842-55-0041) O-rings will be pulled from the store rooms and sent to the main shop to be rebuilt with high-temperature O-rings. These rebuilt governors will be sent to the division store rooms as WMATA # 842-70-0041. Additionally, a campaign will be created to replace the governors on the CNG fleets currently equipped with the standard-temperature air governor under **Job Plan 8151**. The remainder of the buses covered by this bulletin can have the high-temperature governor installed on a fix-as-fail basis.

DISTRIBUTION

BUS: Potts

BMNT: Michels, Singh, Stumpf, Goldman, Directors, Superintendents, Bus Maintenance

Supervisors

SAFE: Gilbert

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**BMNT SERVICE BULLETIN 19-A-001
POST ON ALL BMNT BULLETIN BOARDS**



MEMORANDUM



SUBJECT: Xcelsoir Instrument Cluster
Replacement Process

DATE: May 19, 2017

FROM: BMNT – Barry Goldman
THRU: David B. Michels (Original signed)

This Service Bulletin applies to all Xcelsoir Fleets (7001-7272 / 5460-5480 / 7300-7409 / 2830-2993)

Due to the power management system on some of these buses, it is imperative that programming and configurations of replacement instrument clusters be done in a bench environment.

If programming is attempted on the bus and the battery management system were to activate and cut power, the new replacement cluster would be damaged beyond repair.

Therefore, effective immediately prior to installing a replacement instrument cluster contact BENG-Don Rich to have it bench programmed and configured.

Part Name	Part Number	Application
Instrument Cluster	385755	SR1513 (7001-7052) SR1514 (7053-7090) SR1554 (7101-7152) SR1585 (7091-7100) SR1684 (7153-7167) SR1680 (7168-7263)
Instrument Cluster	507992	SR1751(7264-7272)
Instrument Cluster	517431	SR1913 (5460-5480) SR1946 (7300-7355) SR1947 (2830-2993) SR1976 (7356-7409)

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BMNT SERVICE BULLETIN 17-E-001 POST ON ALL BMNT BULLETIN BOARDS

DISTRIBUTION

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BMNT: Michels
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Singh
Directors
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Bus Maintenance Supervisors
SAFE: Gilbert



Service Bulletin

SUBJECT: LED Headlight Assembly Replacement Date: 02/05/2020

FROM: BMNT – Frederick L. Miller Jr.
THRU - David B. Michels (Original signed)

TO: Distribution

This Bulletin Applies to the New Flyer Xcelsior Fleets (Bus# 7001-7272; 7300-7409; 5460-5480; 2830-2993; 1001)

Note: This is to be performed when a failure of the headlight assembly (ONLY) occurs. If the headlight module is the only failure, replace using Metro #882700076.

The headlight assemblies (#881550380 and #881550381) on these buses are controlled by a separate remotely mounted headlight module (see Figure 1 and 2).

The new headlight assembly is fully LED and incorporates the headlight module providing the same form, fit and function as the previous assembly (see Figure 3).

When installing the new headlight assembly connect the OEM wire harness connector directly into the new headlight assembly wire harness connector (see Figure 4). The high beam connector for the original assembly is unused, insulate open connection with electrical tape and secure with other harnesses. Mount headlight assembly per the service manual procedure and secure the excess wiring harness.



Figure 1 (Original Curbside Headlight Assembly and Module)



Figure 2 (Original Roadside Headlight Assembly and Module)



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BMNT SERVICE BULLETIN

**Subject:** Surge Tank Cooling Hoses Supersession**Date:** 1/19/2022**SB #:** 22-PT-02-00**FROM:** BMNT – Frances Jallu**THRU:** BMNT – David B.Michels

Dave Michels (Jan 25, 2022 11:57 EST)

TO: Distribution**APPLIES TO:**

Bus No.	Fleet No.	Build No.
2830-2993	55	SR1947

BMNT is experiencing a high failure rate of Manuli surge tank coolant hoses leading to service interruptions. Manuli surge tank hoses are composed of rubber and have been found leaking, cracked, and degraded from the interior. Failure of these hoses has resulted in service interruptions due to low coolant warnings, leading to engine overheating and eventually shutting down.

Manuli hoses have been superseded to Eaton Aeroquip Stainless Steel hoses by New Flyer. BMNT has stocked Eaton stainless steel hoses to cover a replacement campaign starting with Fleet 55. Campaign work will be completed during the overhaul program.

Remaining stock of Manuli hoses will be obsoleted once all replacement campaigns have been completed.

Hose Description	Manuli Rubber Hoses		Eaton Aeroquip Stainless Steel Hoses	
	New Flyer Part No.	WMATA Part No.	Superseded New Flyer Part No.	New WMATA Part No.
Transmission Cooler to Surge Tank Hose Manifold	602164	824700101	6488446	824720842
Radiator to Surge Tank Manifold	454111	824700102	54061	824720846
Heat Exchanger to Surge Tank Manifold	421360	824700103	6488447	824720847
Surge Tank to Surge Tank Manifold	521567	824700142	638705	824700142
Surge Tank to Surge Tank Manifold	601784	824700144	6488448	824720848
Heat Exchanger to Surge Tank Manifold	427187	824700145	6474961	824720849
Radiator to Surge Tank Manifold	602178	824700146	6488449	824720850

Campaign No.	Job Plan	Service Crew
168838539	8844	HOMT



Service Bulletin



SUBJECT: **Transmission Cooler Line Replacement** Date: 6/13/2019

FROM: BMNT – Steve West

THRU: David B. Michels

TO: Distribution

This Bulletin Applies to the New Flyer Xcelsior CNG Fleet (Bus# 2830-2993)

The transmission fluid lines that run to/from the transmission to the transmission cooler are deteriorating (see Figure 1) due to the increased temperatures in the engine compartment of CNG buses. The current hoses are made of a black Manulli material (see Figure 2). Upgraded hoses have been identified and placed in stock. The upgraded hoses are made of a blue Aeroquip material (see Figure 3). The stock number for these new hoses are WMATA # 906-70-0101 (New Flyer # 6366943) and 906-70-0121 (New Flyer # 6366944). A campaign to replace the Manulli lines with the upgraded Aeroquip lines has been generated under Job Plan 8091. Any deteriorated lines should be replaced as soon as practicable. Replacement instructions can be found in the Attachments section of the campaign work orders



Fig. 1 Deteriorated Transmission Line Figure 2 Manulli Transmission Fluid Line

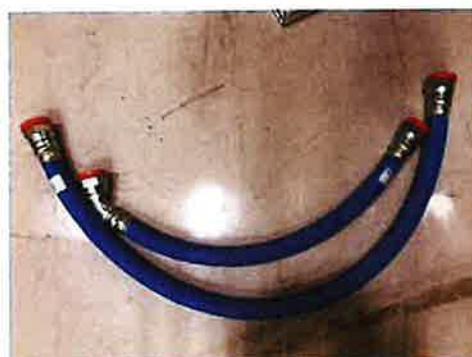


Figure 3 Aeroquip Transmission Fluid Lines

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DISTRIBUTION

BUS: Potts

BMNT: Michels, Singh, Stumpf, Goldman, Directors, Superintendents, Bus Maintenance

Supervisors

SAFE: Gilbert

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