

REFERENCE:	Nova Bus Manuals
SECTION:	09: Engine and Cooling
RS N°:	MQR 7621-1695
EFFECTIVE IN PROD.:	LC32 (2019MR)
NHTSA RECALL N°:	19V274

APPLICATION DEADLINE: N/A
CLAIM REFERENCE NUMBER: SR-4603

SUBJECT:	Engine Door Fan Connector Replacement.
JUSTIFICATION:	Connectors, terminals and wiring damaged due to excessive heat.

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	Replacement of the connectors and terminals on the fan and bus wiring sides.	Nova Bus	Nova Bus	0.75 hr

MATERIAL

QTY	NOVA PN	REV.	PREVOST PN	DESCRIPTION	REPLACES PART N°
LEVEL 1					
1	N77235	-	N8910118	HDSCS Connector Plug - Power - Series 6.3	-
2	N97874-01	-	N8908509	HDSCS Terminal Socket	-
1	N77185	-	N8910119	HDSCS Connector Receptacle - Power - Series 6.3	-
2	N97874-02	-	N8908508	HDSCS Terminal Pin	-
2	N77238	-	993747	HDSCS Seal Green for 10 AWG	-
2	N77237	-	993749	HDSCS Seal Blue for 12 AWG	-
1	N57040	B	N57040	Stud-Mounted Hi-Heat Tie Mount	-
1	N38350	A	N38350	Anchor Heavy Duty Mount	-
2	N67755	-	N67755	TEFZEL Blue Cable Ties	-
7 in	N82227-04	-	N82227-04	Tubing Heat Shrink Dual Wall	-
3 in	N82227-13	-	N82227-13	Tubing Heat Shrink Dual Wall	-
20 in	N74787	A	N74787	Electrical Cloth Tape	-
LEVEL 2					
35%	N11690-30	-	N11690-30	Circuit Breaker 30A	-
5%	N91996	-	N91996	Fan Axial BLDC	-
SPECIAL TOOLING					
1	-	-	N8910120	HDSCS 6.3 Crimping Hand Tool	-
1	-	-	N8910121	HDSCS 6.3 Die Set	-

DISPOSAL OF PARTS

REMOVED PARTS ARE:	DISCARDED *	RETAINED	* Dispose of the unused parts and the defective parts in accordance with local environmental standards in effect.
	Yes	–	

REVISION HISTORY

REV.	DATE	CHANGE DESCRIPTION	WRITTEN BY
NR	2019-06-28	Initial release	Yuvaraj

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
New York City Transit - New York	LB29	5531	5566	S92J9J9776687	S92J6J9776873	36

**WARNING**

Follow your internal safety procedures.

PROCEDURE

VEHICLE PREPARATION

- 1.1. Park the vehicle on an even surface with transmission on neutral (N) and apply the parking brake.
- 1.2. Before starting any work on the vehicle, make sure that the vehicle is completely and securely stationary.

ENGINE FAN TEST

- 1.3. Open the interior back panel (see figure 1) and locate the circuit breaker of the engine fan. Refer to the table below to locate the circuit breaker position.

Order Number	Circuit Breaker Location
LB29	+IB-CB99AT2

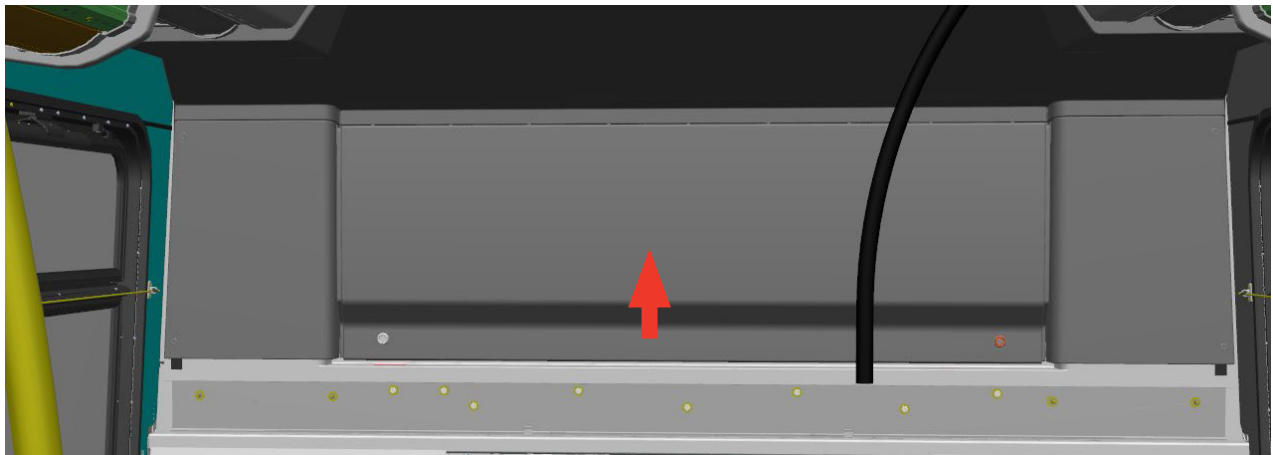


Figure 1 - Bus Interior Back Panel Location

- 1.4. Insert the circuit breaker PN N11690-30 into the engine fan circuit breaker socket.
- 1.5. Start the vehicle and confirm that the engine fan is working.
- 1.6. If the engine fan connector and/or terminals are too damaged to test the engine fan, replace the damaged fan with a spare known working fan PN N91996.

ENGINE FAN CONNECTORS REPLACEMENT

- 1.7. Set the Master Control Switch in the STOP position (see figure 2).

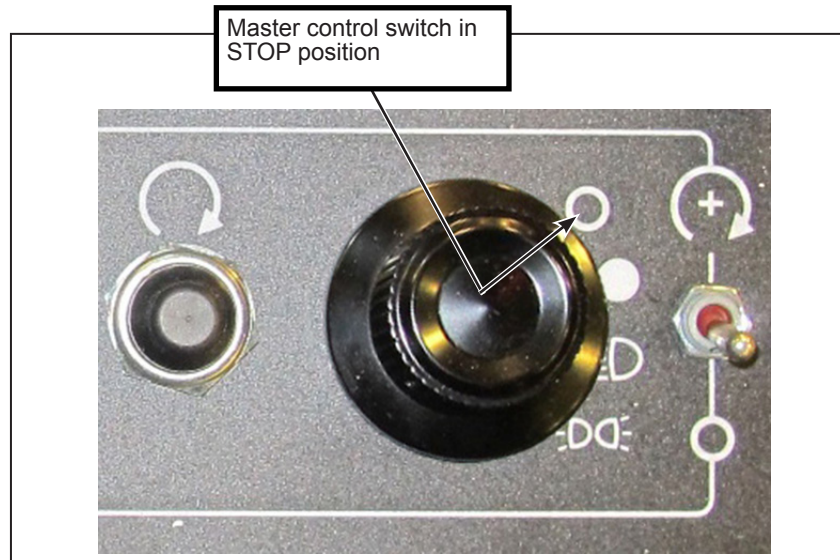


Figure 2 - Master Control Switch in STOP Position

- 1.8. Disconnect the starting circuit on the control box at the rear of the vehicle and place the battery disconnect switch in the OFF position.

**WARNING**

Follow your internal safety procedures.

Removal of Deutsch DTP Connectors

- 1.9. Open the engine compartment door and locate the engine fan Deutsch DTP power connectors (see figure 3).

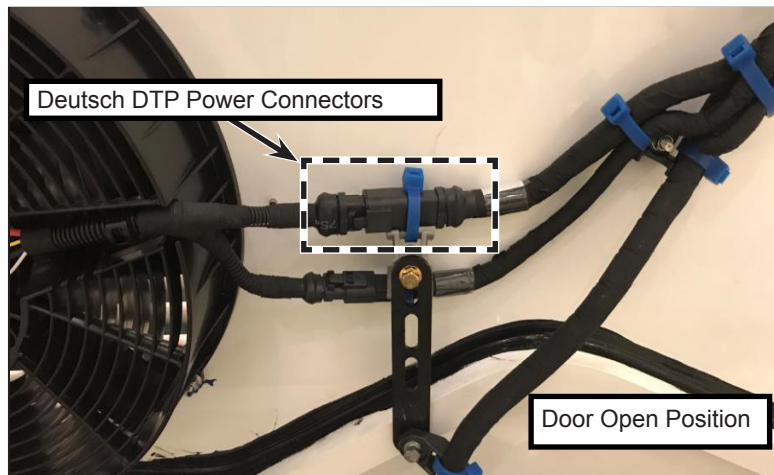


Figure 3 - Engine Fan Deutsch DTP Power Connectors Installation

- 1.10. Cut the two blue cable ties on the dual tie mount securing the Deutsch DTP (large) and DT (small) connectors (see figure 4).
- 1.11. Remove the heat shrink tubing and the Coroplast tape from the DTP power connectors (see figure 4) and then disconnect the DTP power connectors (**do not modify the DT signal connectors**). To help removing the heat shrink tubing, trace a shallow line on the heat shrink tubing with a sharp cutting blade (X-ACTO tool or equivalent) and then, using a heat gun, heat the tubing until it splits.

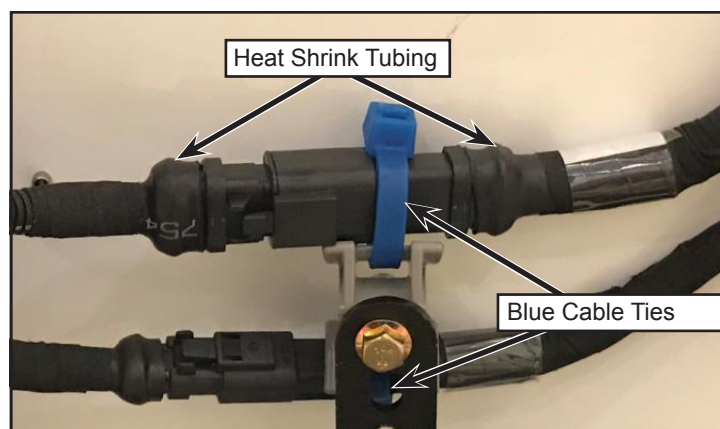


Figure 4 - Cut Cable Ties Securing DTP and DT Connectors and Remove Heat Shrink Tubing on DTP Connectors

- 1.12. On the fan side, extract the two wire terminals inside the DTP power connector using a Deutsch extraction tool or a small flat blade screwdriver. Then cut the terminals keeping the maximum wire length (see figure 5). Clean the wires with contact cleaner, if glue or dirt is present.

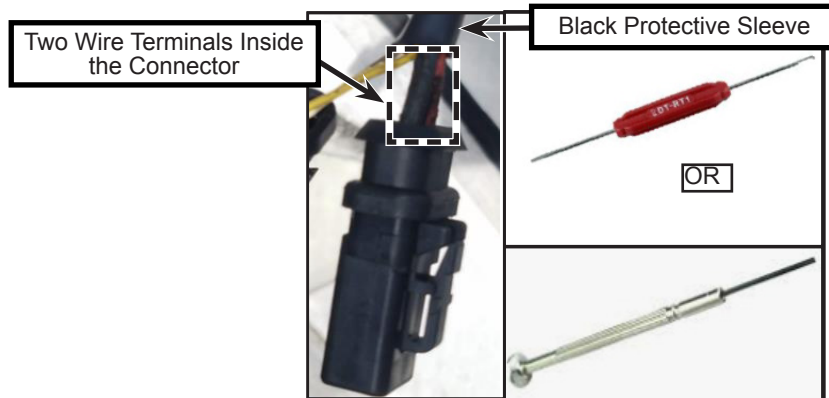


Figure 5 - Fan Side Connector Removal and Tool Options for Terminals Extraction from the Connector Housing

- 1.13. On the harness side, cut the DTP power connector with the terminals directly at the back end of the connector housing (see figure 6) and clean the wires with contact cleaner, if glue or dirt is present.

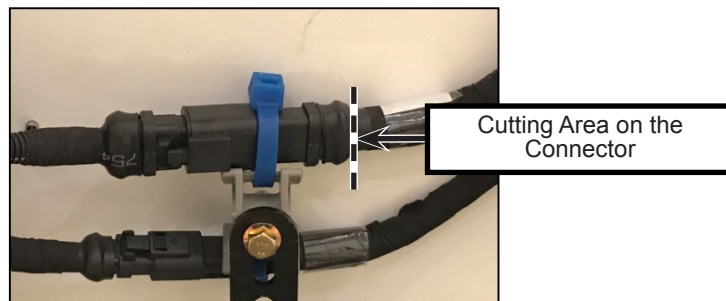


Figure 6 - Harness Side Connector Removal

Installation of HDSCS Connector at Fan Side

- 1.14. Using the HDSCS crimping tool (see figure 7), crimp the socket terminal PN N97874-01 with the blue seal PN N77237 on both RED and BLACK power wires (see figure 8). Refer to the figure below showing a typical HDSCS terminal crimp example and to Annex 1 for more information about the HDSCS connectors terminal crimping quality guidelines.



Figure 7 - TE Connectivity HDSCS Crimping Hand Tool

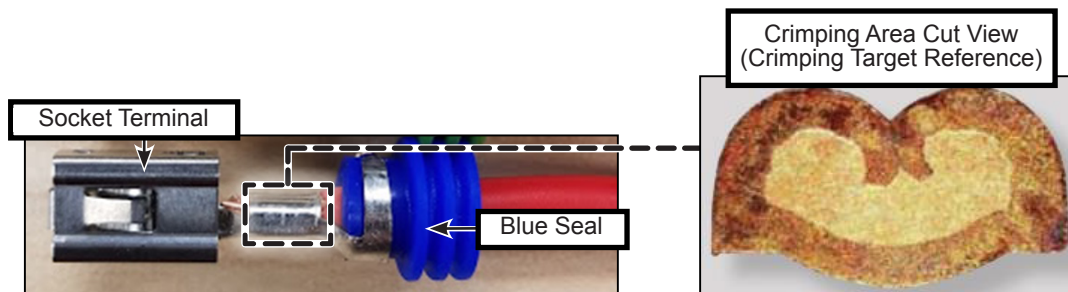


Figure 8 - TE Connectivity HDSCS Socket Terminal and Blue Seal

- 1.15. Insert 1.75 in (total of 3.5 in) of heat shrink tubing PN N82227-04 over both RED and BLACK power wires. Then, using a heat gun, apply the small heat shrink tubing PN N82227-04 over the power wires while leaving a 1/8 in gap with respect to each seal in order to avoid any interference with the terminal wire seals.
- 1.16. Insert 1.5 in of large heat shrink tubing PN N82227-13 over the power wires bundle but do not shrink immediately.
- 1.17. Insert the RED wire terminal into position 1 and the BLACK wire terminal into position 2 of the HDSCS plug connector PN N77235 (see figure 9). Make sure that the yellow secondary lock of the plug connector is completely pressed (to move it from the unlocked to the locked position) after inserting both terminals. Refer to Annex 2 for detailed instructions about terminals insertion and secondary lock.
- 1.18. Using a heat gun, apply the large heat shrink tubing PN N82227-13 starting from the boot adapter of HDSCS plug connector finishing directly over the smaller heat shrink tubes previously installed on the power wires (see figure 9). Make sure to fill any gap between the two power wires with the inner adhesive liner glue (do not apply heat shrink tubing over tape or loom).

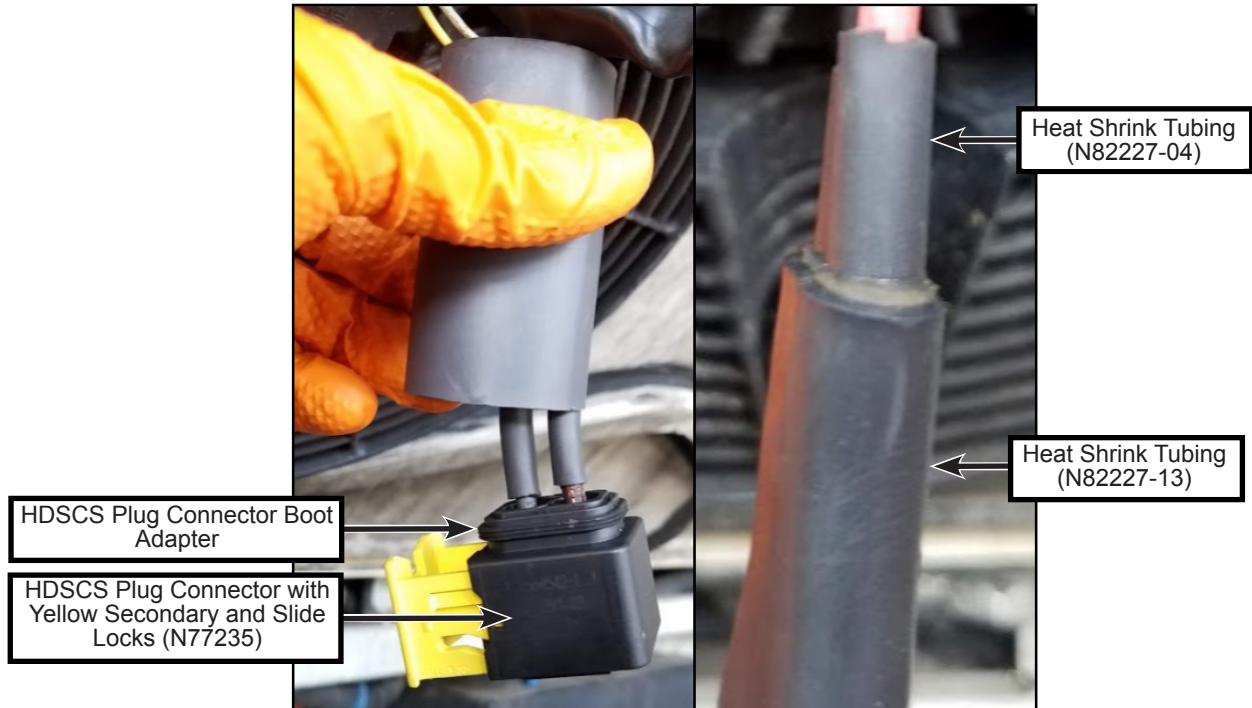


Figure 9 - Heat Shrink Tubing Installation on HDSCS Plug Connector Wiring at Fan Side

- 1.19. Apply Coroplast tape PN N74787 over the exposed wiring / heat shrink tubing on the fan side HDSCS plug.

Installation of HDSCS Connector at Harness Side

- 1.20. Using the HDSCS crimping tool (see figure 7), crimp the pin terminal PN N97874-02 with the green seal PN N77238 on both RED and BLACK power wires (see figure 10). Refer to the figure below showing a typical HDSCS terminal crimp example and to Annex 1 for more information about the HDSCS connectors terminal crimping quality guidelines.

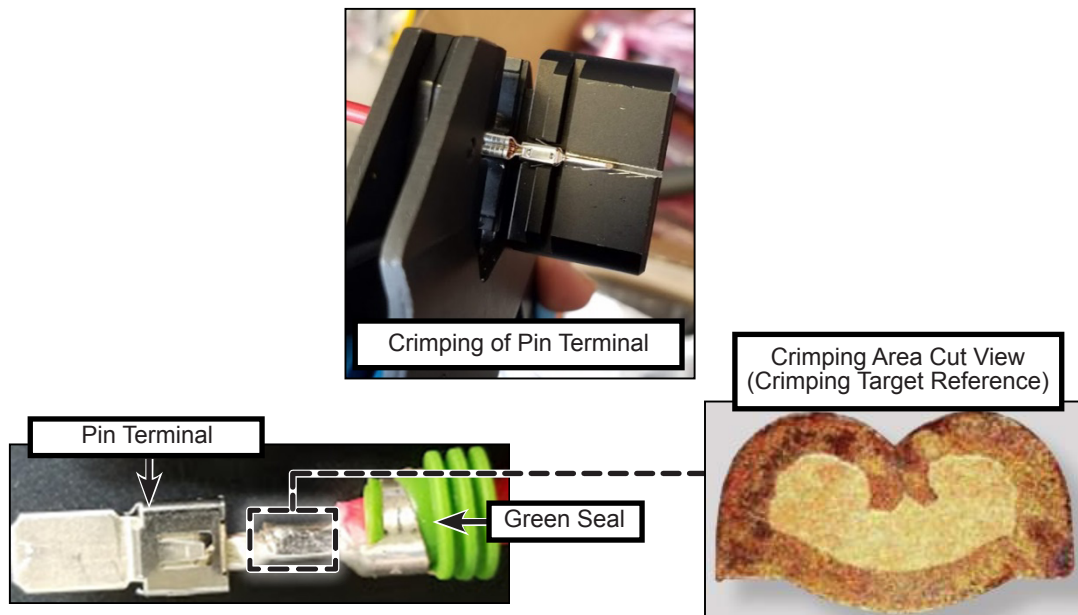


Figure 10 - TE Connectivity HDSCS Pin Terminal and Green Seal

- 1.21. Insert 1.75 in (total of 3.5 in) of heat shrink tubing PN N82227-04 over both RED and BLACK power wires. Then, using a heat gun, apply the small heat shrink tubing PN N82227-04 over the power wires while leaving a 1/8 in gap with respect to each seal in order to avoid any interference with the terminal wire seals.
- 1.22. Insert 1.5 in of large heat shrink tubing PN N82227-13 over the power wires bundle but do not shrink immediately.
- 1.23. Insert the RED wire into position 1 and the BLACK wire into position 2 of the HDSCS receptacle connector PN N77185. Make sure that the yellow secondary lock of the receptacle connector is completely pressed (to move it from the unlocked to the locked position) after inserting both terminals (see Figure 11). Refer to Annex 2 for detailed instructions about terminals insertion and secondary lock.

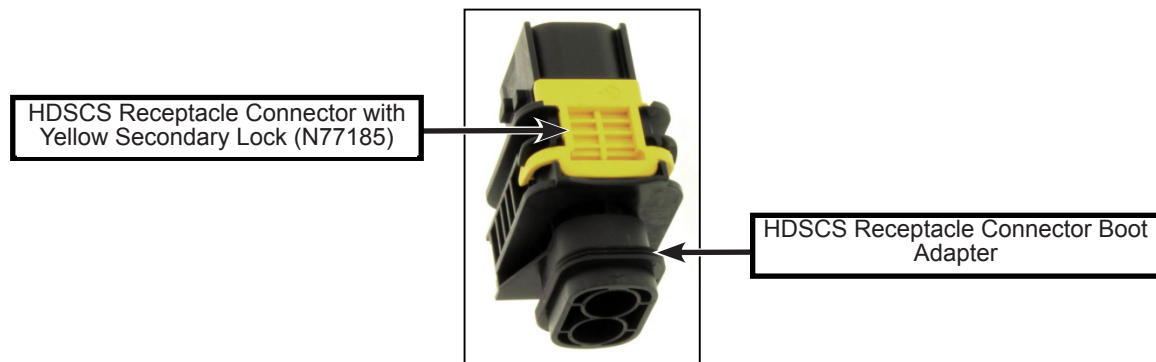


Figure 11 - TE Connectivity HDSCS Receptacle Connector

- 1.24. Using a heat gun, apply the large heat shrink tubing PN N82227-13 starting from the boot adapter of HDSCS receptacle connector finishing directly over the smaller heat shrink tubes previously installed on the power wires (see figure 9). Make sure to fill any gap between the two power wires with the inner adhesive liner glue (do not apply heat shrink tubing over tape or loom).
- 1.25. Apply Coroplast tape PN N74787 over the exposed wiring / heat shrink tubing on the harness side HDSCS receptacle.

Final Preparation

- 1.26. Remove and discard the dual tie-mount installed on the straight bracket and retain the mounting hardware (bolt and nut).
- 1.27. Install the two tie-mounts PN N57040 (1x) and PN N38350 (1x) on the straight bracket using the same mounting hardware (see figure 12).

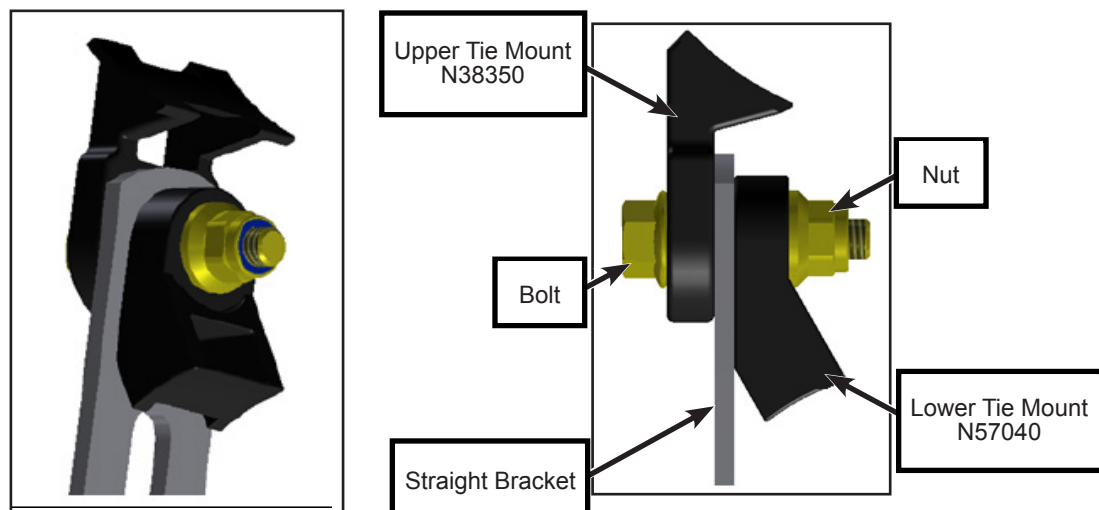


Figure 12 - Tie Mounts Installation

- 1.28. Secure the HDSCS receptacle connector on the harness side with the upper tie-mount (door open) using a blue cable tie PN N67755 (1x) (see figure 13 and 14) and then connect it to the HDSCS plug connector on the fan side. While mating both connectors, press the yellow slide lock of the plug connector to latch and lock both connectors together.
- 1.29. Secure the DT receptacle connector with the lower tie-mount (door open) using a blue cable tie PN N67755 (1x) (see figure 13 and 14).

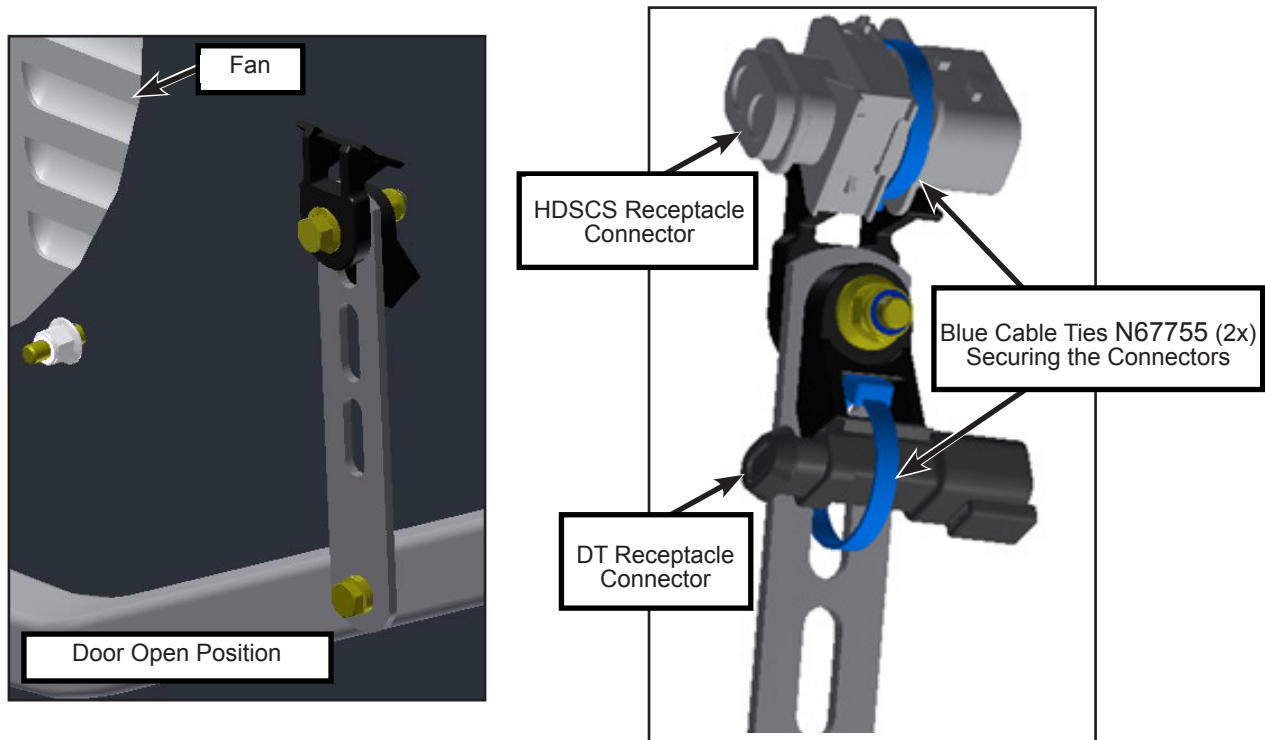


Figure 13 - Securing the HDSCS and DT Receptacle Connectors of the Harness Side

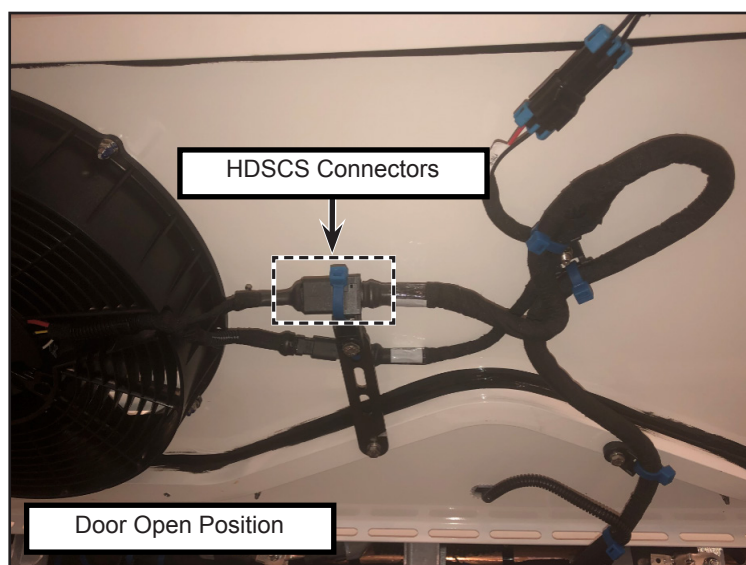


Figure 14 - Final Installation Showing HDSCS Connectors Replacing DTP Connectors

**NOTE**

The HDSCS and DT connectors should be both installed towards the door to avoid any interference with the belt guard.

- 1.30. Test the fan with the final configuration.
 - 1.30.1. Set the Master Control Switch in the START position.
 - 1.30.2. Reconnect the starting circuit on the control box at the rear of the vehicle and place the battery disconnect switch in the ON position.
 - 1.30.3. Start the vehicle and confirm that the engine fan is working.
- 1.31. If no issues are found, bus is ready for service.

Annex 1 - HDSCS Connectors Terminal Crimping Quality Guidelines



NOTE

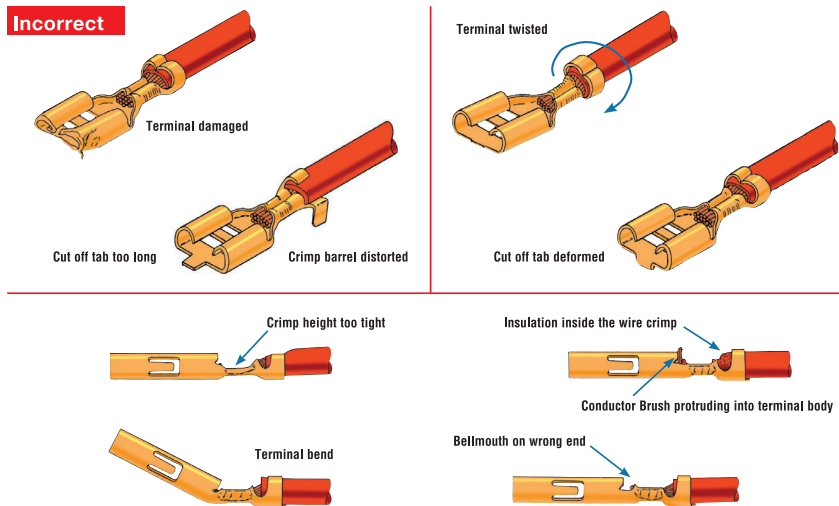
The following procedure is provided by (TE Connectivity). Nova Bus cannot be held responsible for its content.



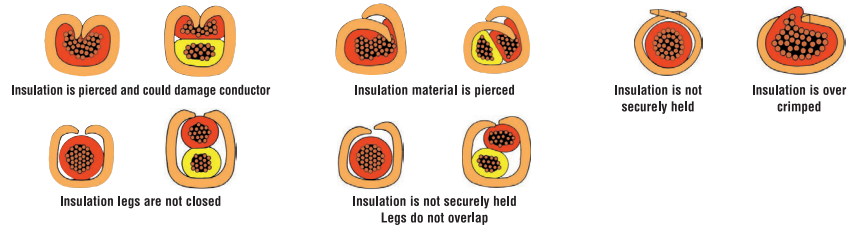
Heavy Duty Sealed Connector Series (HDSCS)

Catalog 1654326-1
Issued 11-2013

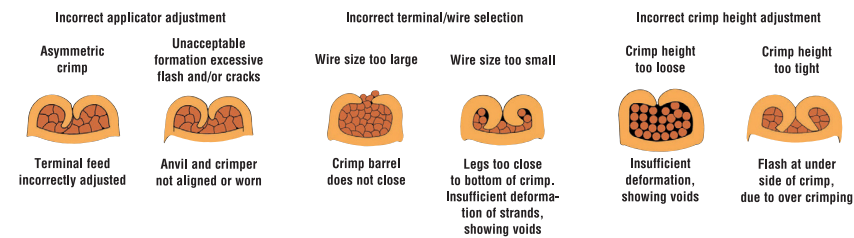
Quality Guidelines



INSULATION CRIMP



WIRE CRIMP



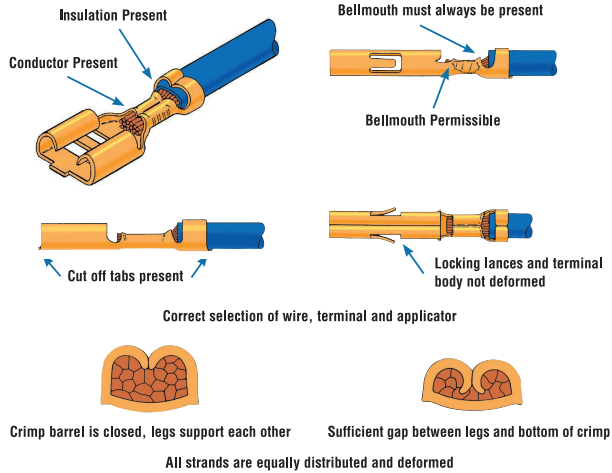


Heavy Duty Sealed Connector Series (HDSCS)

Catalog 1654326-1
Issued 11-2013

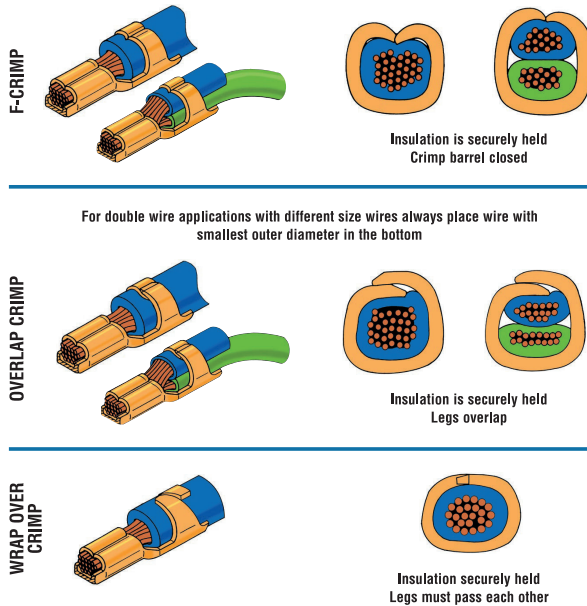
Quality Guidelines

Correct



INSULATION CRIMP

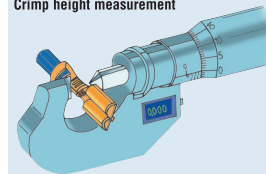
Correct Insulation Diameter, Applicator and Terminal



Test

WIRE CRIMP

Crimp height measurement



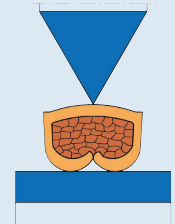
Crimp heights and tolerances

For crimp height tolerances for any given contact, please refer to the relevant application specification.

Examples:

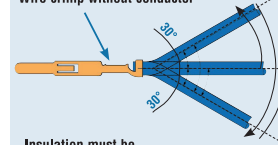
Contact	Part No.	Wire Range (mm ²)	Tolerance (mm)	Application Spec.
MQS	962885 962886	0.2-0.5	±0.03	114-18025
JPT	927775	0.5-1.0	±0.05	114-18050
JPT	927773	1.5-2.5	±0.05	114-18050

Digital Crimp Height Micrometer
(0.001 mm increments) acc. to DIN ISO 9001
Part No. 547203-1



INSULATION CRIMP

Wire crimp without conductor



Insulation must be securely held after bend test

Annex 2 - HDSCS Connectors How-To Instructions



HDSCS CONNECTORS

HOW-TO INSTRUCTIONS

CONTACT INSERTION



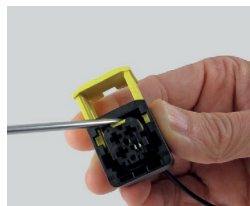
STEP 1:
Grasp crimped contact approximately one inch behind the contact barrel.



STEP 2:
Make sure the contact is in the correct orientation. Verify the integrated secondary lock is in the unlocked position.

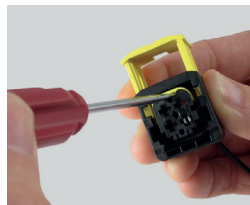


STEP 3:
Push contact straight into connector grommet until a click is felt. A slight tug will confirm that it is properly locked in place.

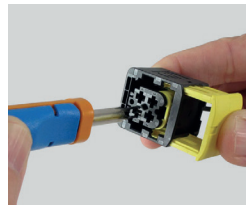


STEP 4:
Push the integrated secondary lock into the locked position with a DT-RT1 or a screwdriver.

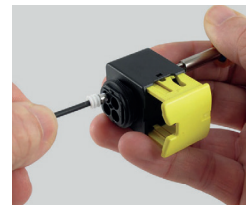
CONTACT REMOVAL



STEP 1:
Using a DT-RT1 or a screwdriver, unlock the integrated secondary lock.



STEP 2:
Using the appropriate extraction tool, insert the blades into the contact cavity until they stop.



STEP 3:
Pull contact wire assembly out of connector.

HDSCS CONNECTORS