

REFERENCE:	Nova Bus Manuals
SECTION:	09: Engine and Cooling
RS N°:	MQR 7621-2444
EFFECTIVE IN PROD.:	LE88 (2023FE)

APPLICATION DEADLINE: 2024FE10  
CLAIM REFERENCE NUMBER: WB5294

SUBJECT:	Powerex Electrical Air Compressor
JUSTIFICATION:	Upgrading NB04 junction box to prevent wire chafing and improve wire securement.

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	Inspect wires in NB04 junction box, add ferrules and heat shrink over wire if needed. Add bracket and clamp to secure cable.	Nova Bus	Nova Bus	3.5 h
2	—	—	—	—

**MATERIAL REQUIRED PER VEHICLE**

QTY	PART N°	REV.	DESCRIPTION
LEVEL 1			
1	N8951223-BS	—	Powerex Retrofit Kit (ST981196AJ)
LEVEL 2			
0.03	N8951224-BS	—	Electrical Tape (ST922032AV) 1 roll = 30 buses*
*WHEN YOU ORDER, SPECIFY THE NUMBER OF VEHICLES TO REPAIR.			

Materials will be available within 37 days once your order has been placed.

To order, please contact [novabus.parts@volvo.com](mailto:novabus.parts@volvo.com)

Or by phone for CANADA 1-800-771-6682, for USA 1-877-999-8808

Specify document number, quantity of parts required and shipping address.

**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	2023JA26	Initial release	Annie St-Jacques

APPROVED BY:

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CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
New York City Transit New York - NYCT	LC78	9620	—	L82L4L9777581	L82L6L9777582	2
New York City Transit New York - NYCT	LC79	9623	9784	L82L1M9777782	L82L4M9777954	162
New York City Transit New York - NYCT Demo	LD23	—	9621	L82XL9777634	L82L5L9777668	3
New York City Transit New York - NYCT	LD64	9785	9910	L82L0M9777871	L82L1M9778155	126

**WARNING**

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**FOLLOW YOUR INTERNAL SAFETY PROCEDURES.**

**WARNING**

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This vehicle has an electrochemical power storage device and high-voltage cables that can cause fatal electric shock and damage to the bus. It is the customer's responsibility to read and understand the risks associated with the maintenance, replacement, or repair of any particular system's components. See your maintenance manual section 16: *LFS-e High Voltage Electrical System*.

**WARNING**

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Decommissioning, locking out the vehicle and using signage is mandatory when working on the high voltage components. This prevents accidental reapplication of voltage and protects maintenance personnel who may be called upon to work on high-voltage electrical connections. See your maintenance manual section 16: *LFS-e High Voltage Electrical System*.

**WARNING**







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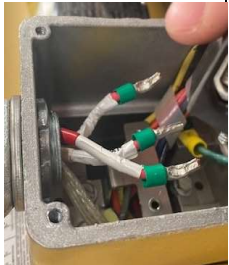

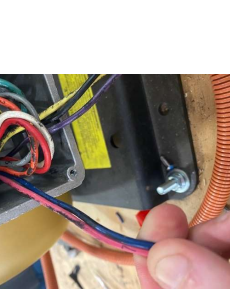

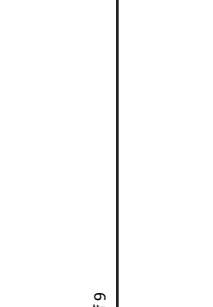

**Follow the *Commissioning* procedure from your maintenance manual section 16: *LFS-e High Voltage Electrical System*.**

**NOTE**

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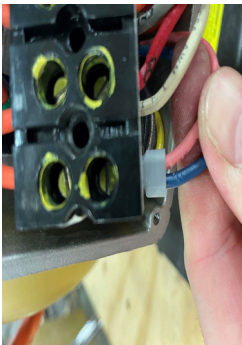



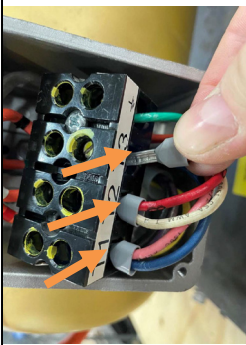
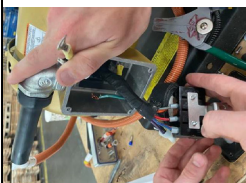

The following procedure is provided by Powerex. Nova Bus cannot be held responsible for its content.

Nova Bus NB04 Junction Box Rework Work Instruction				
<b>POWEREX</b>	<b>Created By:</b>	Russell Winfree	<b>Operation:</b>	NB04 Rework
	<b>Implemented</b>	3/3/2022	<b>Supervisor</b>	
	<b>Revised Date:</b>	6/20/2022	<b>Signature:</b>	
<b>Document number:</b> EC#: PXEC0500		<b>Area:</b> Transportation		
<b>Document Location:</b> M:\QUALITY\Powerex Work Instructions\MTJ\Transportation\Nova Bus		<b>Model:</b> SDCHS050020NB04 / N99055		
<b>Comments:</b> Instructions for upgrading NB04 junction box to prevent wire chafing and improve wire securement. (** at the request of NYCT Authority) . ** Latest update to add in safety step for checking voltage once more at junction box.		<b>Location:</b> Mt. Juliet		
Reference Image	Step Number and Instruction	Reference Image	Step Number and Instruction	
	<b>1</b> Make sure bus battery and power have been disconnected and Lock out Tag out procedures are being used.		<b>2</b> Panel needs to be removed for access to junction box. Loosen bolts and unhook panel.	
	<b>3</b> Determine if harness is loose by moving cable back and forth. If loose, conduit nut will need to be tightened using 3/4 spanner wrench.		<b>4</b> Remove x4 junction box cover screws using a T-15 torx driver. *Retain 2 of these screws for re-install later*	
	<b>5</b> Remove the Junction box cover. Locate terminal block (ST198600AV) in middle of junction box.		<b>6</b> SAFETY NOTE: Before continuing, use electrical safety gloves and a voltmeter to verify that there is ZERO voltage in the junction box.	


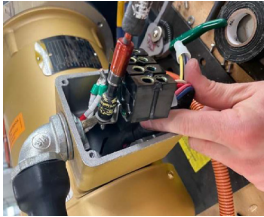


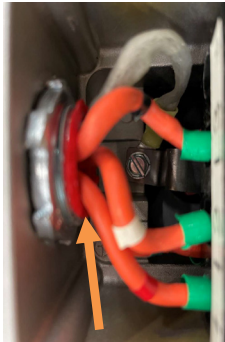



Rev #:		3	
Step Number and Instruction		Reference Image	
<b>8</b>			
Check incoming Power cable wiring for damage. If insulation damage is found, place heat shrink over damage (See steps 37-38 for further details). If the damage extends into the copper conductor, stop rework process until power cable is replaced.			
<b>10</b>			
Inspect green ground wire and torque ground wire bolt into back of junction box to 20-in-lbs.			
<b>12</b>			
Inspect motor wires for damage. If insulation damage is found, place heat shrink over damage (See steps 37-38 for further details). If the damage extends into the copper conductor, stop rework process and contact supervisor. Motor will need to be replaced.			
<b>14</b>			
Crimp ferrule connector to secure wires with Weidmuller PZ 10 Hex Crimp Pliers			

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Rev 10/17/2017

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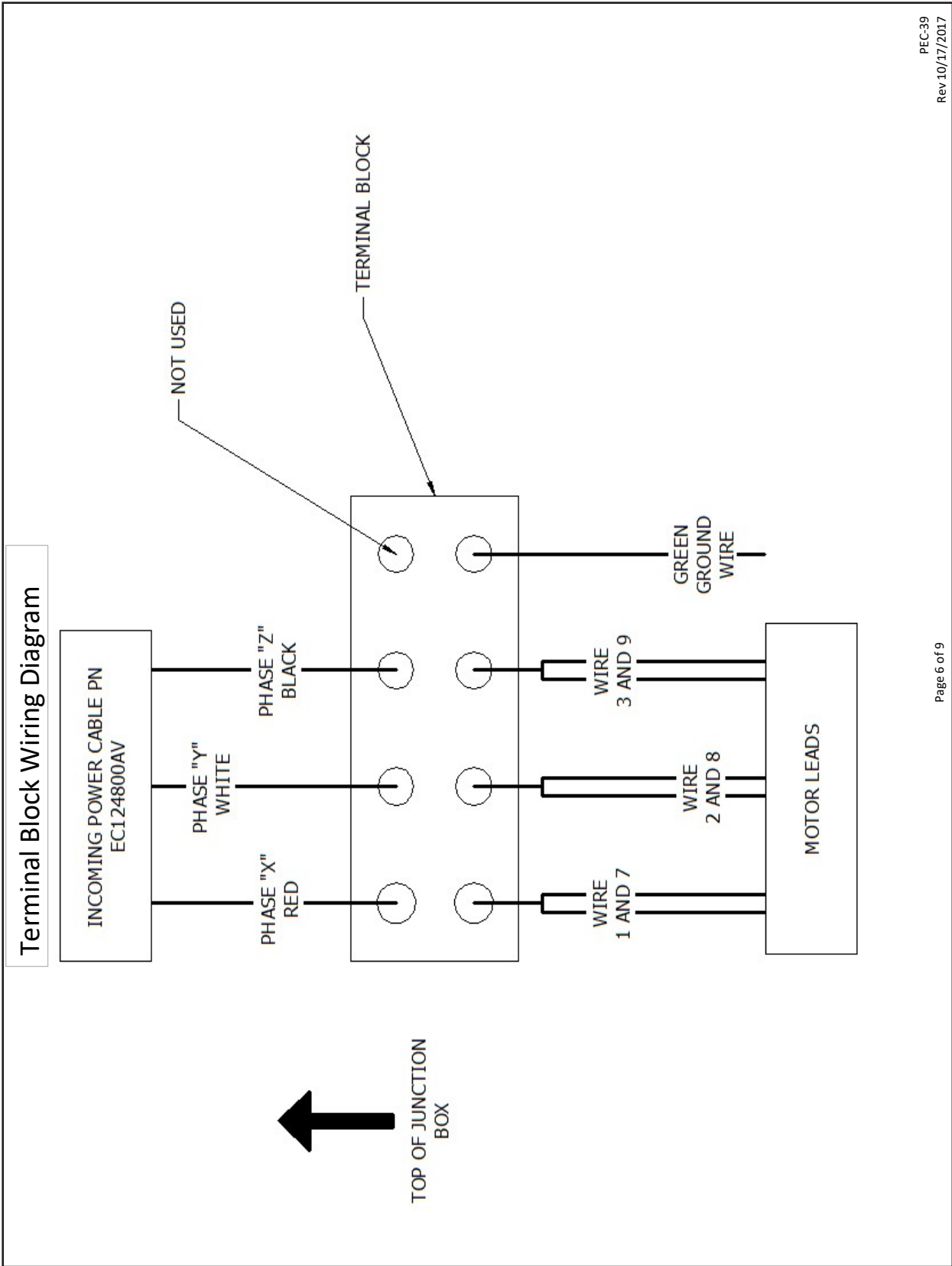
Rev #:		3	
Reference Image	Step Number and Instruction	Reference Image	Step Number and Instruction
	<b>15</b> Perform pull-test to ensure crimp was effective and wires are not loose		<b>16</b> In the event that pull-test failed, repeat Steps 13 & 14 with a new ferrule.
	<b>17</b> Insert metal end of ferrule into terminal block going back into same port of the block wires started from. See wiring diagram for reference.		<b>18</b> Apply Loctite 242 (Blue) to terminal set screws. * Loctite should not be dripping from screws when installed. Only the threads of the screws should be coated. When re-inserting the set screw be sure to keep bus bar in terminal block.
	<b>19</b> Tighten set screw in terminal block to (1.8 Nm / 16 in. lbs.)		<b>20</b> Pull on wires to confirm that they have been secured
	<b>21</b> Repeat Steps 11-19 for all additional dual wire sets needing ferrules (Should be x3 in all)	 	<b>22</b> Locate motor ground wire and remove wire lead from terminal block. With ground wire out of the way, pull terminal block outside of junction box and wrap all motor wires with cloth tape (ST922032AV)



Rev #:		3	
Reference Image	Step Number and Instruction	Reference Image	Step Number and Instruction
	<b>23</b> Repeat same procedure (Steps 11-19) for ground wire, except using single ferrule connector (PE980403AV)		<b>24</b> Reinstall terminal block with x1 bolt from Step 7. Apply Loctite 242 (Blue) and torque to 20 in. lbs. Make sure the ring terminal for the braided wire goes behind the bracket for the terminal block.
	<b>25</b> For each incoming power cable wire, remove the corresponding set screw, add Loctite 242 to the set screw (same as step 18), insert the wire into the terminal and re-install the set screw. (See wiring diagram on Page 6 for correct wire position on the terminal block.) Use torque wrench to tighten set screws in terminal block to 16 in-lbs.		<b>26</b> Install split bushing around incoming pigtail wires (EC124800AV) into conduit elbow (EC124800AV) at the top of junction box
	<b>27</b> Seat the bushing by pushing it upward all the way into the elbow (only tail-end of bushing should be visible as shown)		<b>28</b> Replace rubber gasket (ST804010AV). Reinstall junction box cover using x2 original screws (retained from step 4) on the RIGHT-SIDE of the junction box with Loctite 242 (Blue) (*Only thread the screws in by hand)
	<b>29</b> Line up Angled Pigtail Bracket holes with to x2 open holes on the LEFT-SIDE of the junction box		<b>30</b> Fasten bracket with x2 screws (ST981195AV) from rework kit on the LEFT-SIDE of the junction box with Loctite 242 (Blue).

Rev #:		0	
Reference Image	Step Number and Instruction	Reference Image	Step Number and Instruction
	<b>31</b> Torque all junction box cover screws to 20 in. lbs in a star pattern as illustrated. Add paint mark to screws once they are torqued.		<b>32</b> Cut 1" wide strip of heat shrink (ST922029AV). Cut slit across shrink, and then wrap heat shrink around pigtail, centering it with the bracket hole. (Be sure to wrap heat shrink until fully used up, and to where end does not uncoil when placing clamp.)
	<b>33</b> Rotate pigtail to Bracket, wrap Wire Clamp around pigtail, line-up clamp holes with bracket mount hole. It may be necessary to push down on the power cable to get the bolt through the bracket.		<b>34</b> Install bolt from top-side, spin on nut from under-side, and fasten wire, bracket, and clamp together.
	<b>35</b> Torque wire clamp bolt with 10mm Socket to 53 in.-lbs. (Spec. 0661_E18-061)		<b>36</b> Rework Completed
	<b>37</b> If wiring shows a small defect (small cut or strained insulation), take a 1" piece of heat shrink (ST922029AV) and slide over wire and center over defect area.		<b>38</b> Apply heat until heat shrink is tight on wire and adhesive is coming out from both ends





PROJECTED LABOR					
Process #	Operation	Number of Technician(s)	Est. Time Req. in Minutes	Labor Est. (# of Tech.'s) x (Min.)	
1	<b><u>NB04 Rework Procedure:</u></b> 1. Add ferrules to motor wires 2. Apply cloth tape to motor wires 3. Split bushing to pigtail wiring 3. Install Pigtail bracket & clamp to junction box exterior	1	30	30	

PARTS REQUIRED					
Item	Part Number	Description	Qty. per Job	Units	Notes
1	ST198600AV	Terminal Block	1	EA	Already on unit
2	ST207300AV	Twin Ferrule Connector	3	EA	NB04 Rework Kit ST981196AJ
3	PE980403AV	Blue 14 AWG Ferrule	1	EA	NB04 Rework Kit ST981196AJ
4	ST820063AV	CLAMP, LINE, PA, 25.4 mm ID	1	EA	NB04 Rework Kit ST981196AJ
5	SL380000AV	NOVA BUS CORD BRACKET NB#N82522	1	EA	NB04 Rework Kit ST981196AJ
6	ST981195AV	SCREW, PIN-IN-TORX, 8-32, SS, 1/2	2	EA	NB04 Rework Kit ST981196AJ
7	EC124800AV	CABLE, POWER, NOVA BUS N100840	1	EA	Already on unit
8	ST981191AV	SCREW, HEX FLANGE HEAD, M6 X 1.0 X 45mm, 18-8 SS	1	EA	NB04 Rework Kit ST981196AJ
9	ST981192AV	NUT, HEX FLANGE, NYLOCK, M6 x 1.0, 18-8 SS	1	EA	NB04 Rework Kit ST981196AJ
10	ST177700AV	GROMMET FOR FLEXIBLE METAL CONDUIT AND ARMORED CABLE, 1/2"	1	EA	NB04 Rework Kit ST981196AJ
11	ST820062AV	HEAT SHRINK, 2:1, PRE-SHRUNK ID 2", BLACK	1	in.	NB04 Rework Kit ST981196AJ
12	ST922029AV	HEAT-SHRINK TUBING, BLACK, PRESHRUNK: .293" ID	1	EA	NB04 Rework Kit ST981196AJ
13	ST804010AV	MOTOR JB COVER GSKT, BALDOR, 5HP IP54 MOTOR (MC304101AV), BALDOR PN: 37GS1003	1	EA	NB04 Rework Kit ST981196AJ

SPECIAL TOOLS REQUIRED					
Item	Part Number	Description	Qty.	Units	Notes
1	Weidmuller Crimp Pliers	PZ 10 HEX 1445070000	1	EA	Used to crimp ferrules
2	WIHA 2852 Torque Screwdriver	10-50 in. lbs.	1	EA	Torque screwdriver for various screws
3	PIN-IN-TORX T-15 Driver Bit	N/A	1	EA	For Junction box cover screws
4	Flathead Screwdriver Bit	N/A	1	EA	For Set Screws
5	5/16 Magnetic Nut Driver	N/A	1	EA	For screw holding terminal block bracket
6	Torque Wrench	Calibrated to 53 in.lb.	1	EA	For Wire Clamp Installation
7	10mm Socket	10mm Hex Head	1	EA	For Wire Clamp Installation
8	10mm Wrench	10mm Wrench	1	EA	For Wire Clamp Installation
9	LOCTITE 242	Removeable (Blue)	~0.25 (Total)	oz.	For thread locking
10	Heatgun (no open flame)	N/A	1	EA	Use if wire damage is found to apply heat shrink
11	ST922032AV	ELECTRICAL TAPE, COTTON FRICTION RESISTANT, 3/4" WIDE, 1200V	1	EA	For wrapping wires
12	Wire stripper	N/A	1	EA	Stripping wires
13	Spanner Wrench	3/4 Conduit Nut Wrench	1	EA	For tightening incoming power cable fitting
14	Paint Marker	N/A	1	EA	Marking torqued screws

BLANK