

REFERENCE:	Nova Bus Manuals
SECTION:	16: Electrical System
RS N°:	MQR 7621-2357
EFFECTIVE IN PROD.:	N/A

APPLICATION DEADLINES: 2025JN01
CLAIM REFERENCE NUMBER: WB5409

SUBJECT:	Wiring Harness - Engine Compartment
JUSTIFICATION:	A bad connection at the ZF transmission connector may cause the transmission to jerk when shifting or show the fault code 188.

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	Inspection of the wiring harness connector +EN-MS64GA, the connector's terminals, the p-clamp and the harness.	Nova Bus	Nova Bus	30 min
2	Replacement of the wiring harness connector.	Nova Bus	Nova Bus	20 min

MATERIAL LIST ON PAGE 2

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	2023OC17	Initial release	Annie St-Jacques

APPROVED BY:

Irina

Negoescu

Signature
numérique de
Irina Negoescu
Date : 2023.10.20
07:25:48 -

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MATERIAL REQUIRED PER VEHICLE

QTY	PART N°	REV.	DESCRIPTION
LEVEL 1			
2	N56339	A	TIE TEFZEL CABLE TIES
1	N8951536	-	KOSTAL SLK 2.8 MALE TERMINAL (KOSTAL# 10124499150020)
1	N8951544	-	KOSTAL MLK 1.2 MALE TERMINAL (KOSTAL# 32124651823000)
LEVEL 2 (only if required**)			
1	N49091	-	CONNECTOR KOSTAL SLK
1	N49092-01	-	CLAMP CABLE FOR SLK LEFT
1	N49092-02	-	CLAMP CABLE FOR SLK RIGHT
4	N49094-02	-	TERMINAL SLK 2.8 16-14
7	N49094-03	-	TERMINAL SLK 1.2 18-16
4	N49096-02	-	SEAL WIRE SLK 2.8 16-14
5	N49096-03	-	SEAL WIRE SLK 1.2 20-16
14	N49098-02	-	CAVITY SEAL SLK 1.2
2	N84090-05	-	P-CLAMP ID 0.750"THK 0.030"M8

Materials will be available within 203 days once your order has been placed.

To order, please contact 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.

**The material identified in Level 2 is to be ordered only for vehicles that meet the criteria defined in Level 1.

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
New York City Transit - NYCT	L958	5439	5442	S92J9G97756	S92J9G97756	4
New York City Transit - NYCT	L959	5443	5443	S92J0H97761	S92J0H97761	1
New York City Transit - NYCT	LA23	5485	5530	S92J5J97763	S92J6J97765	46
New York City Transit - NYCT	LA73	8504	8507	L82J8J97764	L82J8J97764	4
New York City Transit - NYCT	LA76	8508	8633	L82J9J97769	L82J8K97771	125
New York City Transit - NYCT	LB29	5531	5566	S92J9J97766	S92J6J97768	36
New York City Transit - NYCT	LB59	5444	5484	S92J7H97761	S92J6H97763	41
New York City Transit - NYCT	LB78	8526	8526	L82J3K97769	L82J3K97769	1
New York City Transit - NYCT	LB99	5567	5602	S92J2J97769	S92J5K97770	36
New York City Transit - NYCT	LC32	8634	8754	L82JXK97771	L82J5K97772	121
New York City Transit - NYCT	LD06	8755	8758	L82J3L97777	L82J3L97777	4
New York City Transit - NYCT	LD08	8759	8931	L82J5M97781	L82J8N97785	205

**WARNING**

FOLLOW YOUR INTERNAL SAFETY PROCEDURES.

PROCEDURE

- 1.1. Park the vehicle on an even surface with the transmission on neutral.
- 1.2. Apply the parking brake and set the master control switch to the **stop** position.
- 1.3. Set the battery disconnect switch in the battery compartment to the **off** position.

LEVEL 1: INSPECTION

- 1.4. Proceed with the steps 1 to 8 (pages 4 to 10).
- 1.5. If the connector replacement is required, proceed with the Level 2. If not, continue with step 1.6.
- 1.6. The vehicle can return in service.

LEVEL 2: CONNECTOR REPLACEMENT

- 2.1. Proceed with the step 9 (pages 10 to 17).
- 2.2. The vehicle can return in service. ❖

DESCRIPTION / WORK INSTRUCTION**Step # 1: Remove the transmission hatch on the floor inside the bus**

Description: With a #3 Phillips screwdriver, remove screws securing transmission cover and remove the transmission cover.



Service Instruction
QJ2357 : ZF Transmission Code 188

Step # 2:P-Clamp Presence

Description: Look if there is a P-Clamp around 4 inches from the Transmission Control Unit connector to secure the transmission harness. If the P-Clamp is missing, add a P-Clamp and replace terminals and connector



Service Instruction
QJ2357 : ZF Transmission Code 188

Step # 3: Locking tab on the TCU connector

Description: Look if the locking tab on the TCU connector is broken. If it is broken, replace terminals and connector

**Step # 4: Harness test**

Description: You can shake the harness, run the bus and see on Vector if there is an error frame. If it is the case, replace terminals and connector

Service Instruction
QJ2357 : ZF Transmission Code 188

Step # 5: Connector

Description:

- Cut ty-raps
- Remove P-Clamp

Disconnect the cable from the ZF ECU connector

- Lift the connector lock (may have to pry up with tool) and raise lock up and push towards TCU
- Disconnect (pull outward) the cable from the ZF ECU connector.

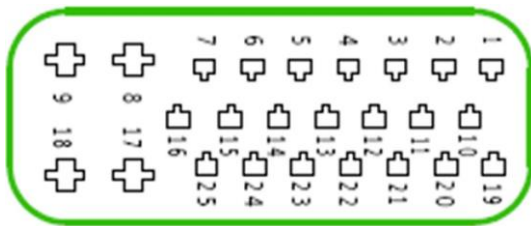


Service Instruction
QJ2357 : ZF Transmission Code 188

Step # 6: MLK 1.2 Terminals

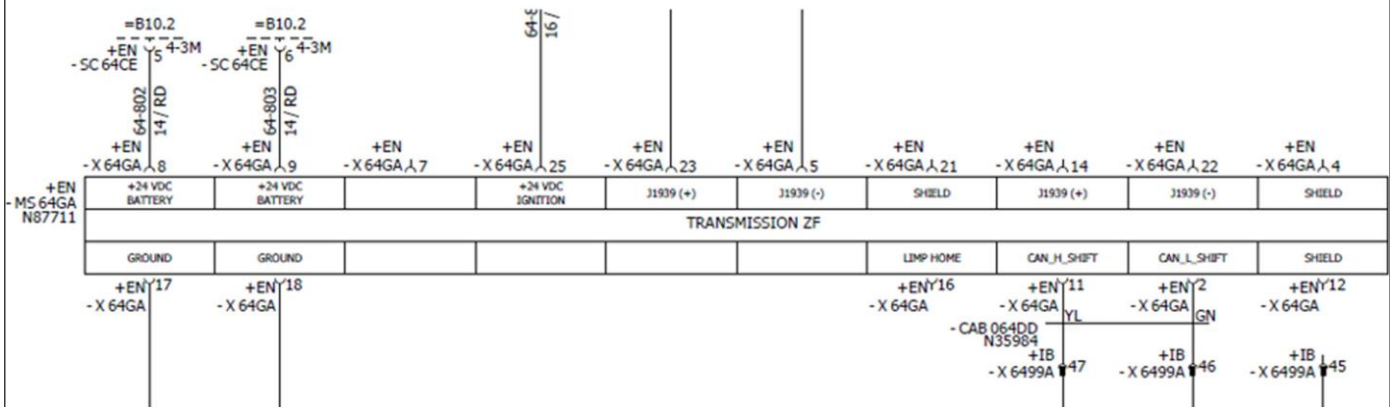
Description: Using a male terminal of the same size as the male connector of the ECU, check if the contact is well made and if there is no verdigris or oxidation on the pin. If it is the case, replace terminals.

Connector's pinout:



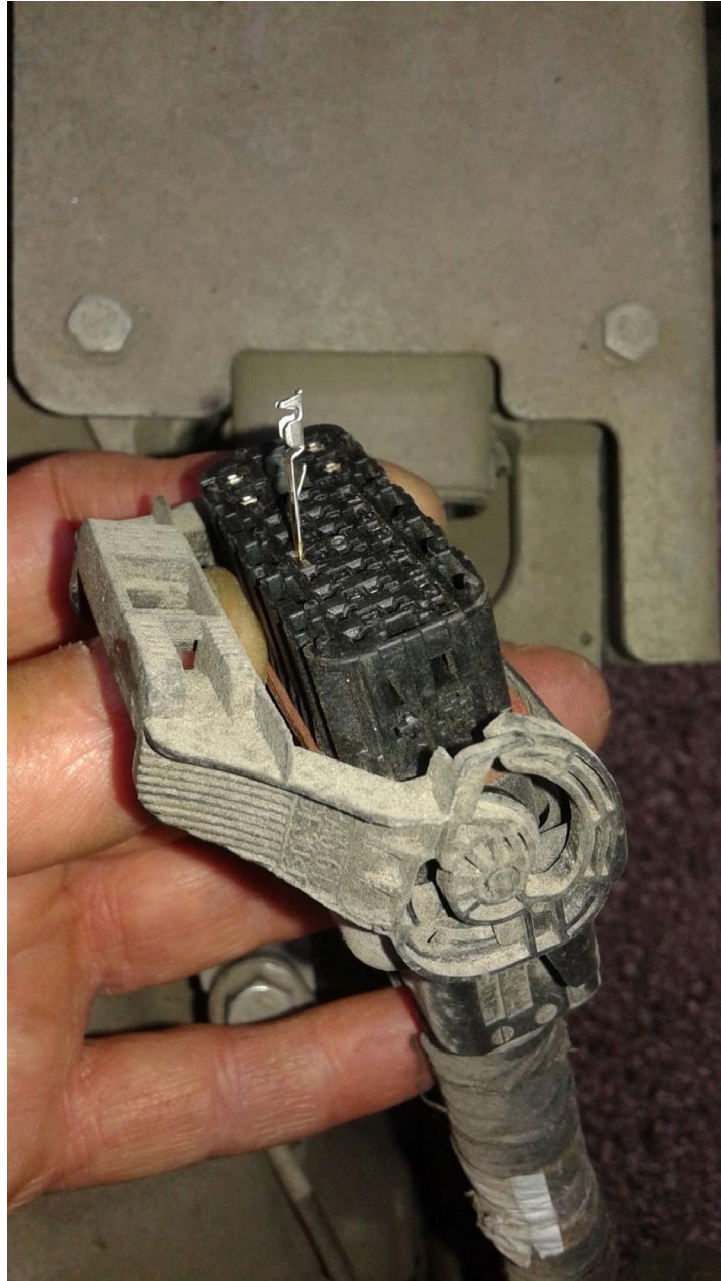
Used pins: SLK 2.8 terminals 8, 9, 17 & 18

Used pins: MLK 1.2 terminals 2, 5, 11, 23 & 25



Service Instruction
QJ2357 : ZF Transmission Code 188

One of the five smaller terminals to verify, MLK 1.2 terminals, pin 23

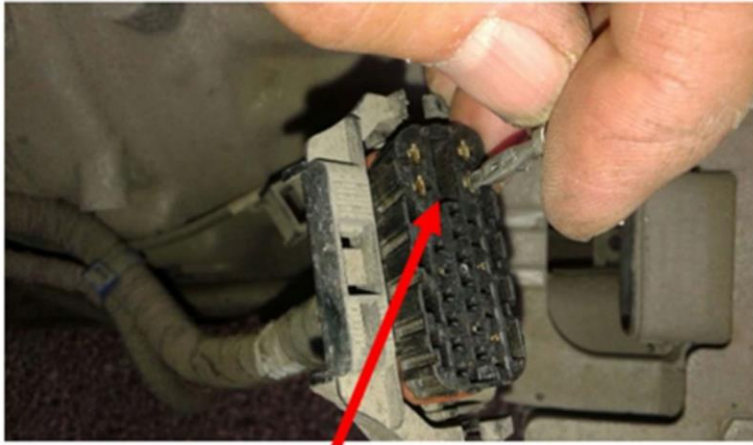


Service Instruction
QJ2357 : ZF Transmission Code 188

Step # 7: SLK 2.8 terminals

Description: Using a male terminal of the same size as the male connector of the ECU, check if the contact is well made and if there is no verdigris or oxidation on the pin. If it is the case, replace terminals.

Testing a SLK 2.8 terminal on pin 8.



The four larger sockets, SLK 2.8

Step # 8: ECU connector

Description: Inspect the inside of the ECU connector.

If any terminals need replaced, all terminals should be replaced, otherwise the uncut/original length wires will put strain on onto terminations.

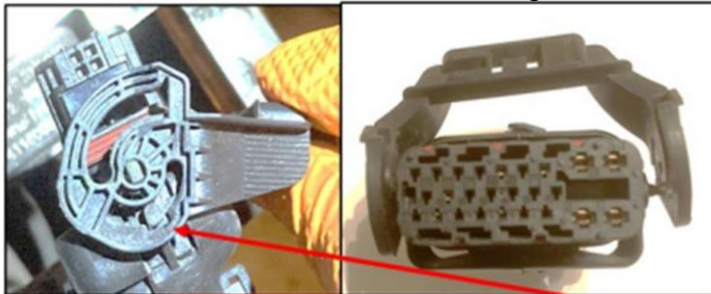
Step # 9: ZF terminal/connector replacement

Remove tape and loom from backshell



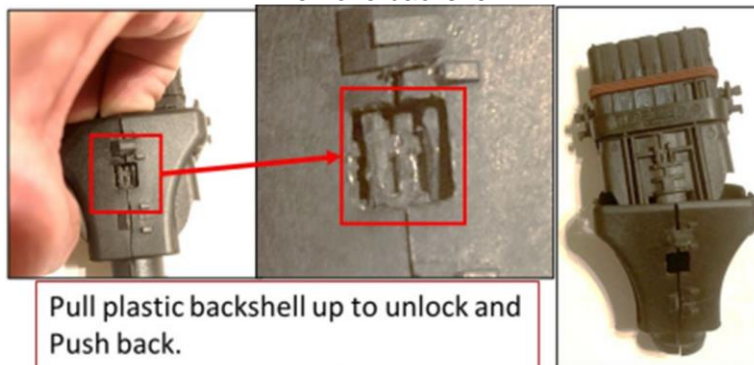
Service Instruction
QJ2357 : ZF Transmission Code 188

Remove locking handle



- 1-Rotate lock into removal position (notch)
- 2-Spread handle and remove.

Remove backshell



- Pull plastic backshell up to unlock and
Push back.
Grasp backshell and pull off.

Remove shroud by pulling, it will slide off

Note: Shroud locking tabs easily break



Install plugs into new connector



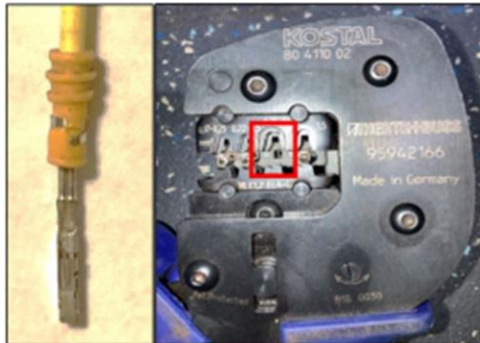
Install plugs into new connector.
Match plug locations with old connector

Cut wiring flush with connector to conserve length

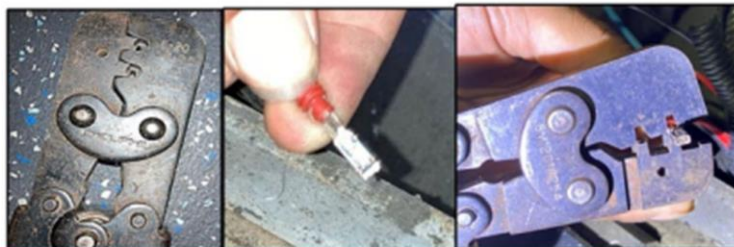


Service Instruction
QJ2357 : ZF Transmission Code 188

Insert seal (gasket) onto wire
Strip wire and crimp termination



Terminal MLK 1.2 18-16AWG
Kostal part number 32124734130
Seal-orange Kostal part number 10800507250
Use KOSTAL 80 4110 02 Crimping tool



Terminal SLK 2.8 16-14AWG
Kostal 22124492070
Install seal onto wire.
Red seal (gasket) Kostal 10800444523
Crimp terminal onto wire.
Use DELPHI GM12014254 Crimping tool

Service Instruction
QJ2357 : ZF Transmission Code 188

Insert terminated wire into connector

Large terminal Locks

Insert Large terminal Kostal 22124492070 Into connector.
Locks on both sides
Can be installed in any Position.

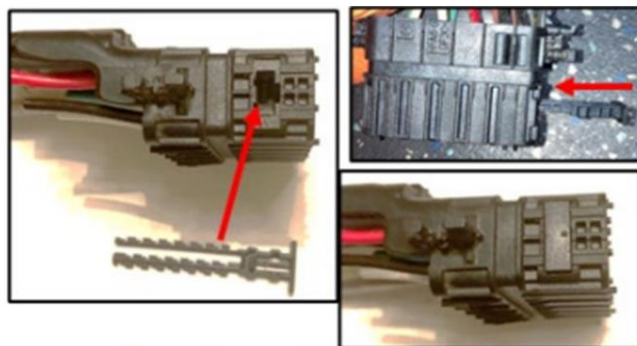
small terminal Lock

Insert small terminal Kostal 32124734130 Into connector.
Locks on one side
Insert terminal with lock Toward release cavity.

Release cavity

Install lock into connector

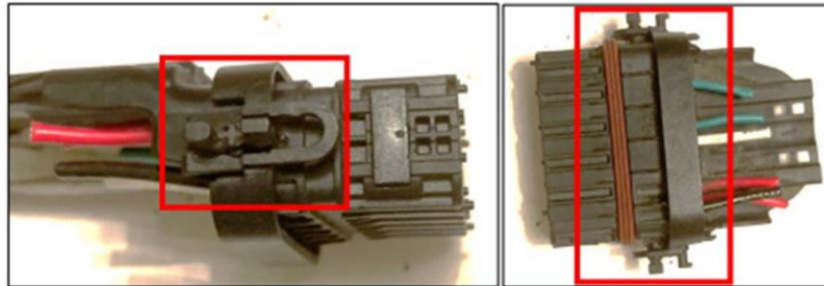
Once all terminations are installed into connector, lock blade is installed into side of connector



Insert lock flush

Service Instruction
QJ2357 : ZF Transmission Code 188

Reassemble connector
Install shroud and seal onto connector



Install tie wrap wiring onto connector

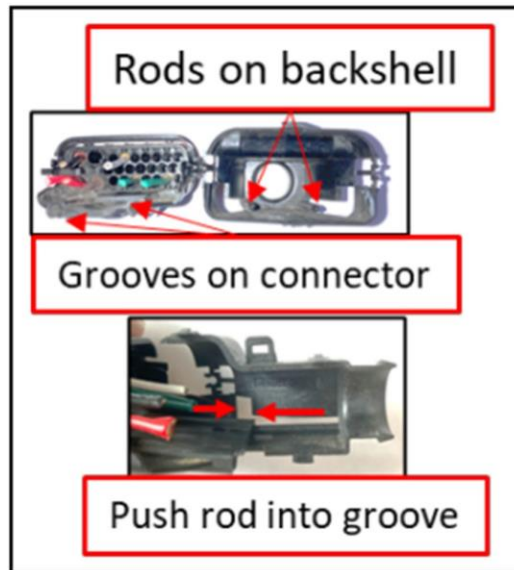


Install backshell onto connector
Connect two pieces of backshell together onto cable



Service Instruction
QJ2357 : ZF Transmission Code 188

Align backshell rods into connector grooves



Push backshell toward front of connector until backshell locks into place



Service Instruction
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- Install handle lock onto connector
- Replace any loom and tape that was removed
- Install and lock connector onto TCU module
- Replace any routing anchors (cable ties and P-clamps)
- Start bus and test

If the problem is still there and you have not found anything wrong in the previous steps, you must check all the connectors related to the ZF network as well as the front shifter.

Service Instruction
QJ2357 : ZF Transmission Code 188