



TECHNICAL SERVICE BULLETIN

Bulletin No.:	TSB-005-01	Description:	Fuel Level Sensor Procedures
Model(s):	All	Group:	Engine
Date:	August 3, 2001	Reference:	N/A
VIN Range:	N/A	Prod. Dates:	N/A

This bulletin supplements Technical Service Bulletin #TSB-004-01 "Fuel Level Sensor Availability" which identified specific customer concerns related to Lanos, Nubira and Leganza models that have experienced incorrect fuel gauge readings caused by a faulty Fuel Level Sensor unit in the Fuel Tank.

To simplify the repair, an improved Fuel Level Sensor is now available as a separate replacement part. It is no longer necessary to replace the complete Fuel Pump Module to replace a faulty Fuel Level Sensor.

Included in this bulletin is a procedure for diagnosing the Fuel Level Sensor (commonly referred to as a "Fuel Level Sending Unit") and the replacement procedure, if necessary, which involves the partial disassembly of the Fuel Pump Module.

Note: *Fuel Level Sensor units are not interchangeable between models.*

CAUTION: Removing components from a sealed fuel system exposes fuel vapors to outside oxygen and possible sources of combustion. The fuel system is under pressure which must first be relieved to avoid possible spillage or fire when removing system components. A fuel system should only be opened when absolutely necessary, and only in a properly ventilated area after the prescribed diagnostic procedures have determined that fuel system components must be removed. Special caution should be used when removing components from a fuel tank or fuel system. Removal of such components should only be done by an experienced, certified technician and away from open flame (torches, lit cigarettes, heater pilots or other flames however minor) or sparks (mechanical, electrical or otherwise) that could cause fuel vapors to ignite.

FUEL LEVEL SENSOR DIAGNOSTIC PROCEDURE:

Note: *Ensure that the Ignition Switch is in the "OFF" position.*

1. Remove the Rear Seat Cushion.

Lanos ONLY - Remove and retain the retaining bolt located at the front center of the Rear Seat Cushion, then lift up the front edge of the cushion to release the two (2) retaining latches.

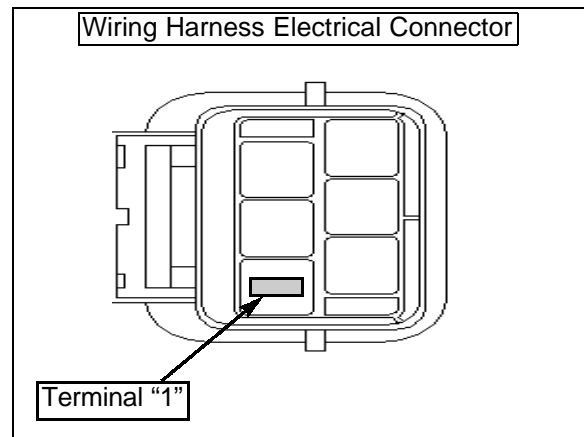
Nubira & Leganza - Lift up on the front edge of the Rear Seat Cushion to release the two (2) retaining latches.

2. Remove the Rear Seat Bottom Cushion to gain access to the Fuel Tank.

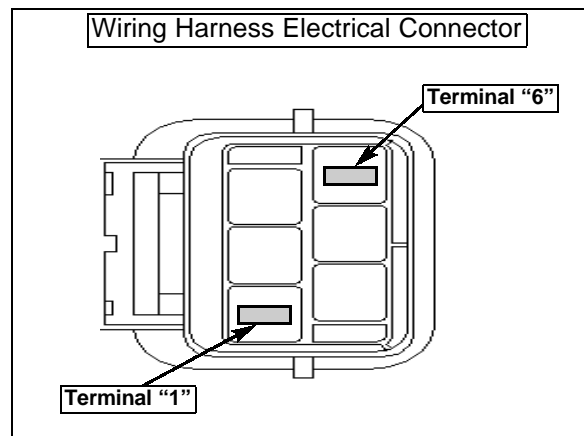
3. Remove the Fuel Pump Module Access Cover.

Circulate To:	<input checked="" type="checkbox"/> General Manager	<input checked="" type="checkbox"/> Technician(s)	<input checked="" type="checkbox"/> Body Shop Manager	<input type="checkbox"/>
	<input checked="" type="checkbox"/> Service Manager	<input checked="" type="checkbox"/> Service Advisor	<input checked="" type="checkbox"/> Parts Manager	<input type="checkbox"/>

4. Disconnect the Wiring Harness Electrical Connector from the Fuel Pump Module.
5. Turn the ignition switch to the "ON" position.
6. Using a suitable DVOM, measure voltage at the Wiring Harness Electrical Connector between terminal 1 and chassis ground. If a 5-V reference voltage is **not** present, repair the open circuit between terminal B5 of the ECM/PCM and the Wiring Harness Electrical Connector. If a 5-V reference voltage is present, go to the next step.



7. Measure the voltage at the Wiring Harness Electrical Connector between terminals 1 and 6. If a 5-V reference voltage is **not** present, repair the open circuit between terminal 6 of the Wiring Harness Electrical Connector and terminal D8 of the ECM/PCM. If a 5-V reference voltage is present, go to the next step.
8. Turn the Ignition Switch to the "OFF" position.
9. Reconnect the Wiring Harness Electrical Connector to the Fuel Pump Module.
10. Remove the Fuel Pump Relay from the Engine Compartment Fuse/Relay Box.
11. Start the engine and allow it to idle until the engine stalls. Crank the engine an additional 10 seconds, then turn the Ignition Switch to the "OFF" position.



Note: *The engine should stall in less than 10 seconds once Fuel Pump Relay is removed.*

12. Remove the Fuel Filler Cap.
13. Disconnect the Fuel Outlet Hose from the Fuel Pump Module.
14. Disconnect the Fuel Tank Return Hose from the Fuel Pump Module.
15. Disconnect the Wiring Harness Electrical Connector.
16. Using a suitable hammer and brass drift, release the Fuel Pump Module Retaining Ring by rotating it counterclockwise.
17. After removing the Fuel Pump Module Retaining Ring, remove the Fuel Pump Module from the Fuel Tank.

CAUTION: Removing components from a sealed fuel system exposes fuel vapors to outside oxygen and possible sources of combustion. A fuel system should only be opened in a properly ventilated area. Special caution should be used when removing components from a fuel tank or fuel system. Removal of such components should only be done away from open flame (torches, lit cigarettes, heater pilots or other flames however minor) or sparks (mechanical, electrical or otherwise) that could cause fuel vapors to ignite.

18. Reconnect the Wiring Harness Electrical Connector to the Fuel Pump Module.
19. Turn the Ignition Switch to the "ON" position.
20. Connect the Scan 100 Scan Tool to the vehicle Data-Link Connector (DLC) and go to the EVAP Data Screen to view the Fuel Level Sensor voltage

Screen Navigation Order:

Select "Diagnostic" ►► Choose "model year" ►► Choose "vehicle type" ►► Select "Powertrain" ►► Choose "transmission type" ►► Select "Data Display" ►► Select "Engine Data" ►► Select "EVAP Data").

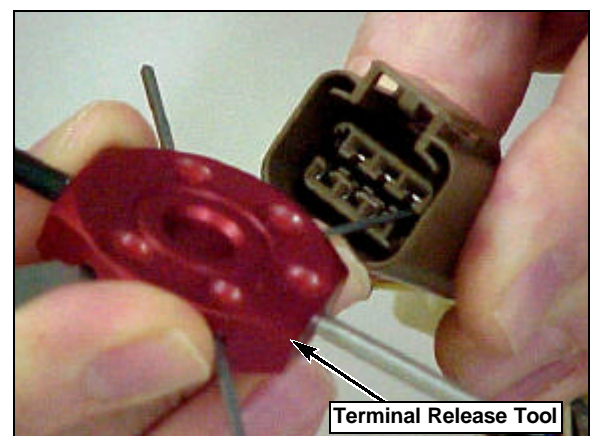
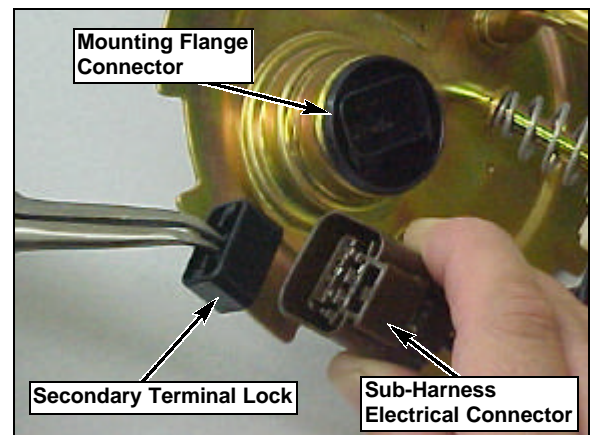
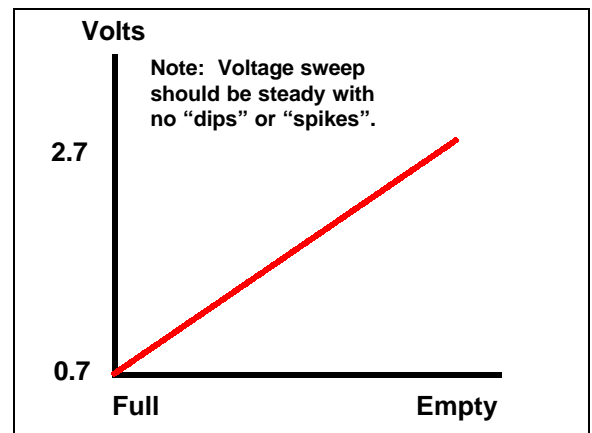
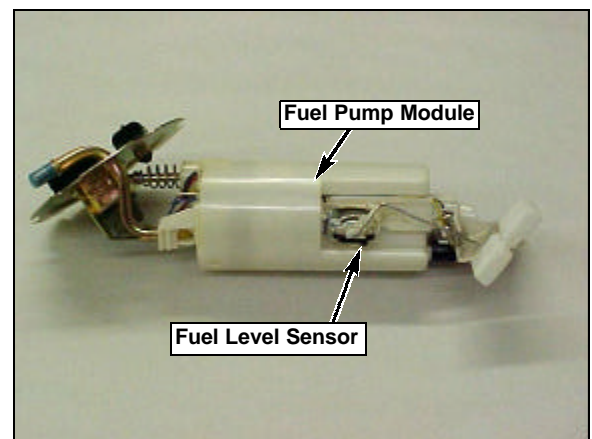
21. Slowly move the Fuel Level Sensor Float Arm from the "empty" position to the "full" position while observing the Fuel Level Sensor voltage indications on the Scan Tool EVAP Data Screen.
22. Confirm that the voltage makes a smooth transition from 0.7 to 2.7 volts.
23. If the voltage "dips" or "spikes," at any point throughout the voltage range, replace the Fuel Level Sensor.

FUEL LEVEL SENSOR REPLACEMENT PROCEDURE:

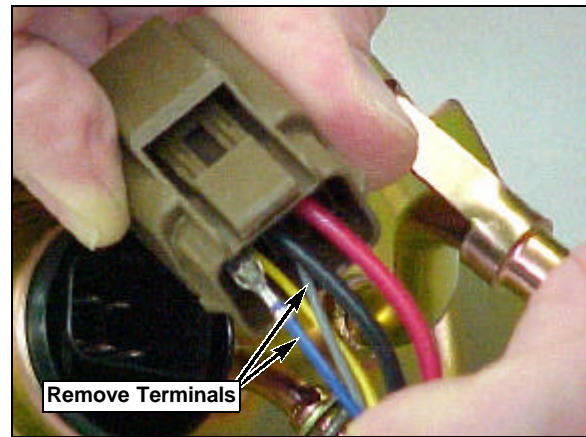
Removal

1. The Fuel Pump Module has a single (in-tank) sub-harness that must be disconnected from the Fuel Pump Module Mounting Flange Connector.
2. Using a small pair of needle-nosed pliers, remove and retain the secondary terminal lock from the sub-harness electrical connector.
3. Using a suitable terminal release tool (similar to Snap-on #YA500GM), depress the lock tang for terminals 1 and 6, then pull the terminals out through the back of the connector.

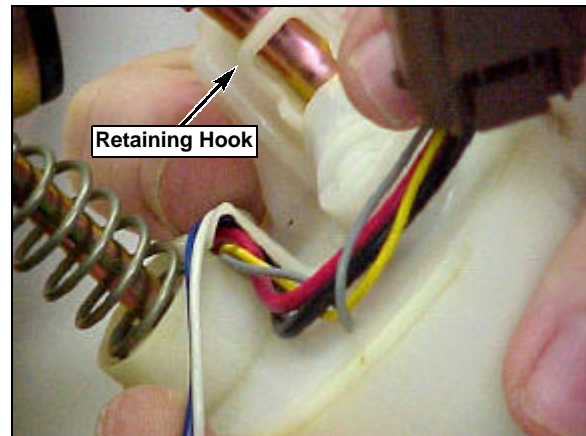
Note: *The Fuel Level Sensor Terminals have a beveled edge which requires proper orientation when reinstalling in the connector. Carefully note their location by wire color in the connector prior to removal.*



- Using a suitable pair of diagonal cutters, cut off the two (2) Fuel Level Sensor Terminals previously released/removed from the sub-harness connector, then discard those terminals.

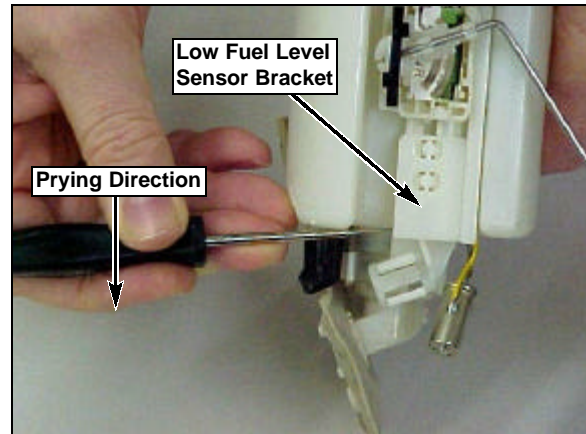


- Disengage the Fuel Level Sensor wires from the retaining hook at the top of the Fuel Pump Module Body, then pull the cut wire ends out of the fuel pump body through the built-in tube.

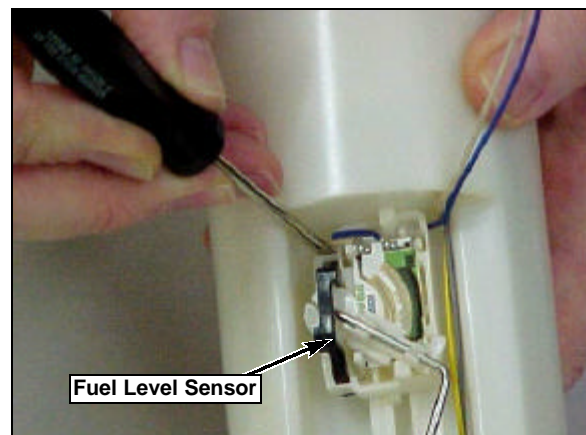


- Pull the Low Fuel Level Sensor from its bracket.
- Using a small flat-blade screwdriver, release the Low Fuel Level Sensor Bracket from the Fuel Pump Module Body by prying it in the direction shown. The bracket will slide through the retaining rail as you pull it free of the Fuel Pump Module Body.

Note: *Prying in the opposite direction may cause damage to the lock that retains the Low Fuel Sensor Bracket.*



- Remove the Fuel Level Sensor by prying it in the same direction from the same retaining rail that previously held the Low Fuel Sensor Bracket.



Installation

9. Temporarily wrap the new Fuel Level Sensor wire terminals with electrical tape.
10. Route the wire through the groove at the bottom of the Fuel Level Sensor as you route it around to the back of the Fuel Level Sensor Body.

Note: *Failure to properly route the wire in the groove may cause the wire to be damaged as the Fuel Level Sensor is installed.*

11. Guide the Fuel Level Sensor Body onto the retaining rail on the Fuel Pump Module Body. Slide it fully into place on the retaining rail. An audible "click" will be heard as it locks into its proper position.

Note: *Failure to properly lock the Fuel Level Sensor into place will affect its accuracy.*

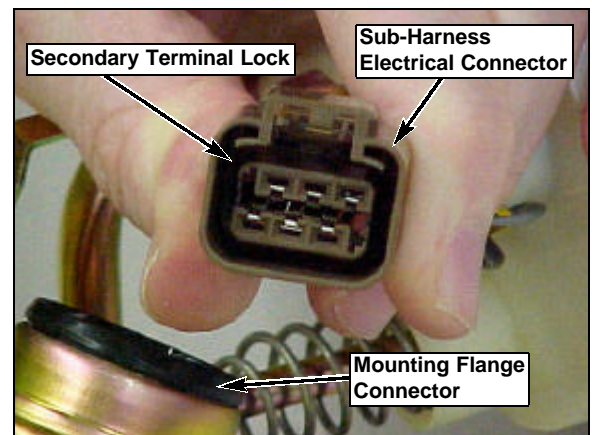
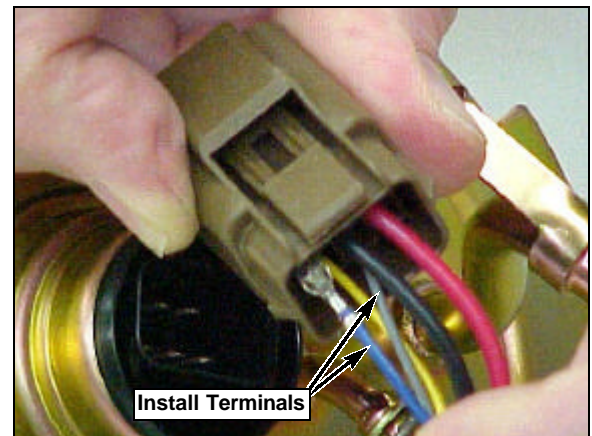
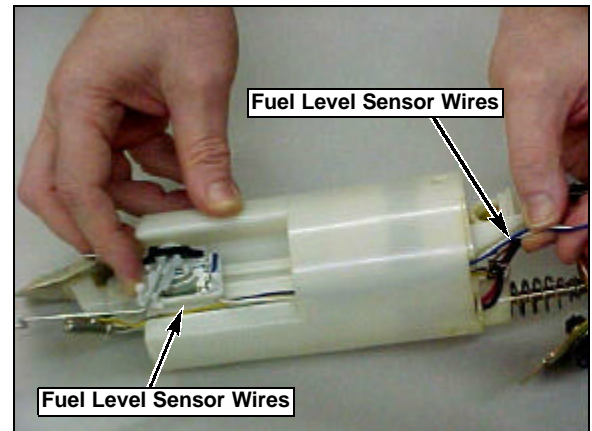
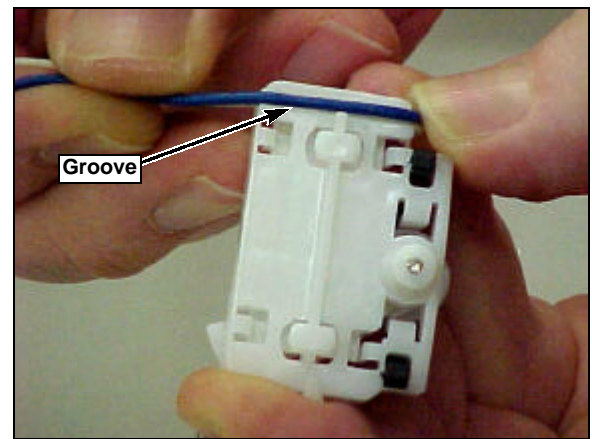
12. Route the Fuel Level Sensor wires through the built-in tube in the Fuel Pump Module Body.

13. Route the Fuel Level Sensor wires through the retaining hook on top of the Fuel Pump Module Body.

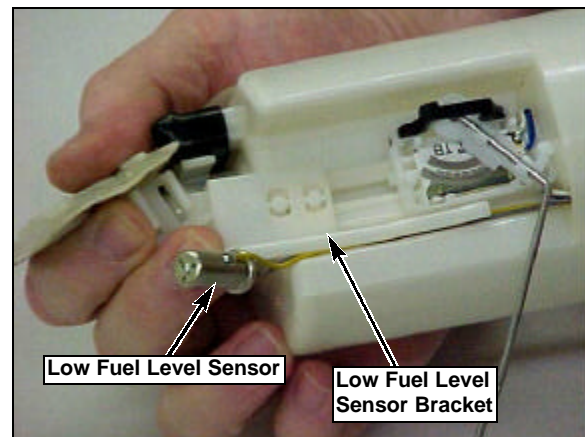
14. Remove the electrical tape, then insert the Fuel Level Sensor Terminals into the Fuel Pump Module Sub-harness Electrical Connector. Ensure that the terminals are properly reinstalled (as noted previously) and that the correct wire colors are in their proper connector location. Also, verify that the terminals are locked into position by gently tugging on the wires after installation.

Note: *The forward-most edge of the beveled terminal face should be oriented towards the "outboard" edges of the terminal housing.*

15. Once the terminals are properly positioned, reinstall the secondary terminal lock into the connector. Reconnect the sub-harness connector to the Fuel Pump Module Mounting Flange Connector.



16. Guide the Low Fuel Level Sensor Bracket onto the retaining rail on the Fuel Pump Module Body. An audible "click" will be heard as it locks into its proper position.
17. Reinsert the Low Fuel Level Sensor onto its bracket.
18. Test the new Fuel Level Sensor by using the procedure described in steps 18 through 23 of the Fuel Level Sensor Diagnostic Procedure before reinstalling the Fuel Pump Module into the Fuel Tank.



19. Using a new O-ring, carefully reinstall the Fuel Pump Module into the Fuel Tank. Take care not to damage the O-ring or bend the Fuel Level Sensor Float Arm.

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20. Using a suitable hammer and brass drift, reinstall the Fuel Pump Module Retaining Ring by rotating it clockwise until it reaches its stops.
21. Reconnect the Wiring Harness Connector to the Mounting Flange Connector on the Fuel Pump Module.
22. Reinstall the Fuel Pump Outlet Hose by pushing it firmly into place. An audible "click" will be heard when the hose is properly connected.
23. Reinstall the Fuel Tank Return Hose by pushing it firmly into place. An audible "click" will be heard when the hose is properly connected.
24. Reinstall the Fuel Pump Relay into the Engine Compartment Fuel/Relay Box.
25. Turn the Ignition Switch to the "ON" position and verify that the Fuel Pump operates for approximately 3 seconds by listening for pump motor operation, then check the Fuel Pump Module for leaks.
26. Road test the vehicle, then recheck the area around the Fuel Pump Module for fuel leaks.
27. Reinstall the Fuel Pump Module Access Cover by pressing it into place.
28. Reinstall the rear seat cushion.

Lanos ONLY - Reinstall the Rear Seat Cushion retaining bolt removed previously.

Parts Information:

<u>Vehicle</u>	<u>Part Name</u>	<u>Part Number</u>	<u>Qty. Required</u>	<u>Remarks</u>
Lanos	Fuel Level Sensor	96388929	1	White & Blue wires
Nubira	Fuel Level Sensor	96388676	1	Gray & Blue wires
Leganza	Fuel Level Sensor	96405140	1	White & Blue wires
All	Fuel Tank O-ring	96183170	1	

Warranty Claim Information:

<u>Operation Code</u>	<u>Operation Description</u>	<u>Labor Time</u>
1711700	Fuel Level Sensor, Replace	0.5 hr. / veh.

Claim Type: 11 - In-Service Vehicles

Field Fix Number: TSB-004-01

Nature Code: N62

Cause Code: R18

Causal Part Number: Lanos - 96388929
 Nubira - 96388676
 Leganza - 96405140

If additional information is needed regarding this procedure, please contact your District Parts & Service Manager or the Daewoo Technical Assistance Center toll free at (877) 362-1234, selection 1.