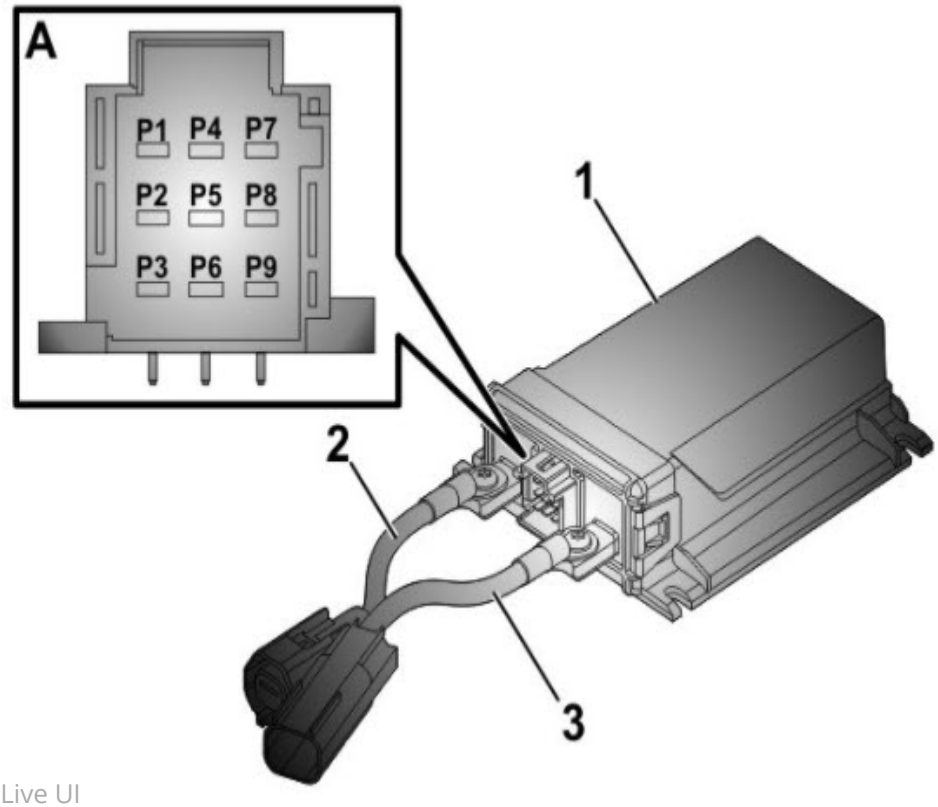
Low Voltage Disconnect (LVD), Function Description

Internal Content

The Low Voltage Disconnect unit is avaliable in 11.8 and 12.3 voltages. Before trouble shooting verify which unit is installed to the truck.

The LVD is an electronic unit that prevents the batteries from being excessively discharged by electrical accessory loads.
When the battery voltage drops to 11.8/12.3 volts for three seconds, the LVD automatically performs an alarm sequence and disconnects accessory loads from the battery. The LVD automatically reconnects accessory loads to the battery when battery voltage rises to 12.9 volts. Refer to the alarm signal and disconnect sequence below for more information about the operation of the LVD.
The LVD is an electronic unit designed to protect the batteries by disconnecting uncritical loads when the battery voltage drops below a preset limit. This ensures that the batteries have sufficient voltage to crank the engine. It automatically disconnects and reconnects the loads based on the battery voltage.
The LVD electronic unit also protects components from reverse voltage.

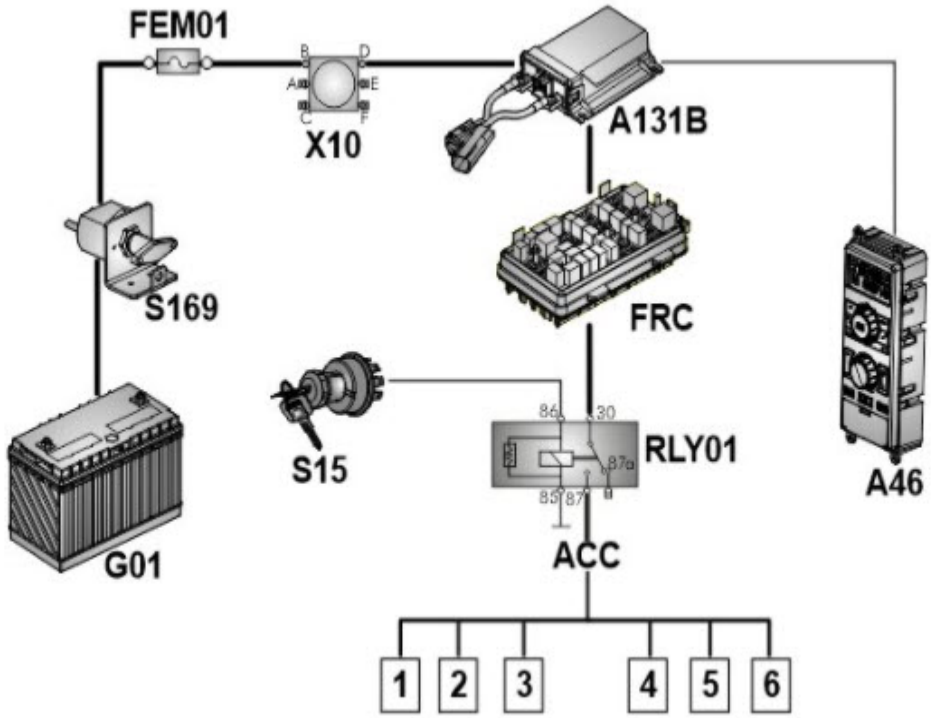


Live UI

A	Connector
P1	Pin, alarm signal
P4	Pin, voltage sensor
P5	Pin, ground
P7	Pin, override
1	LVD
2	Input power
3	Output power

Electrical Diagram

Diagram



G01	Battery
S169	Battery main switch
FEM01	Fuse, main power
X10	Cab pass-through stud
S15	Key switch
A131B	LVD
A46	LECM (Living Environment Control Module)
FRC	Fuse and relay center
RLY01	Relay, accessory power (located in the FRC (Fuse and Relay Center))
ACC	Accessories
1	Dash sockets
2	Interior aux fan
3	DCP (Door Control Panel)
4	Radio
5	HVAC (Heating, Ventilation and Air Conditioning)

6	Heated seats

Alarm signal, low voltage indicator LEDs (Light Emitting Diode), and audible alarm
When battery voltage drops to 11.8/12.3 volts for three seconds, the LVD allows one minute to elapse and then sends an alarm signal to the LECM. When the LECM receives the alarm signal, the low voltage indicator LED on the LECM flashes. The LED continues to flash until the LVD is overridden or battery voltage increases to 12.9 volts.
When the LED on the LECM is flashing, the LED on the fan speed control (on the dashboard) will also flash.
When the LED on the LECM flashes, the audible alarm (located in the LECM) will sound at the same frequency for one minute. Refer to the alarm signal and disconnect sequence below for more information about the audible alarm.
To turn the audible alarm on/off, perform the following:

1. Press the MENU button five times. The LVD icon is blinking on the display.
2. Use the ON/OFF button to set the audible alarm to on or off. The LVD icon is blinking in the display and On or Off is displayed.
3. Press and release the SET button to confirm the setting.

Refer to the alarm signal and disconnect sequence below for more information about the low voltage indicator LED and the audible alarm.

LVD override

The LVD can be overridden by pressing and releasing the fan speed control switch on the LECM or by pressing and releasing the fan speed control switch on the dash. The override has a duration of ten minutes. During the ten-minute time period, the LECM provides battery voltage to the LVD on the LVD override circuit. During the ten-minute time period, the LVD will not send the alarm signal to the LECM and the LVD will not disconnect battery power. When the ten-minute time period has elapsed, the LECM stops sending battery voltage to the LVD on the LVD override circuit. If battery voltage is below 12.9 volts when the LECM stops sending battery voltage to the LVD on the LVD override circuit, the LVD will begin the alarm signal and disconnect sequence again.

Parking heater (parking heater off with LVD feature)

The parking heater is controlled by the LECM. When the LECM receives the alarm signal from the LVD, the LECM turns off the parking heater unless this feature (parking heater off with LVD feature) has been turned off.
To turn the parking heater off with the LVD feature on/off, perform the following:

1. Press the MENU button five times. The LVD icon is blinking on the display.
2. Press and release the SET button. The LVD icon and the HEAT icon are

blinking in the display.

3. Rotate the increment/decrement knob (around the MENU button) to set this feature to On/Off. When the LECM display screen displays On, the LECM is set to turn off the parking heater when the LECM receives the alarm signal from the LVD. When the LECM display screen displays Off, the LECM is set to allow the parking heater to operate when the LECM receives the alarm signal from the LVD.
4. Press and release the SET button to confirm the setting.

Alarm signal and disconnect sequence

1. The LVD senses 11.8/12.3 volts for three seconds on the LVD input power circuit or on the LVD voltage sense circuit. The disconnect timer in the LVD begins a two-minutes countdown.
2. After one minute has elapsed (from the time that the LVD sensed 11.8/12.3 volts), if the LVD still senses the voltage less than 12.3 volts, the LVD sends an alarm signal (voltage signal - 1.0 Hertz, 50% duty cycle) to the LECM. The low voltage indicator LED on the LECM flashes at a frequency of one flash per second. An audible alarm is emitted from the LECM at the same frequency as the flashing LED. This occurs for thirty seconds.
3. After one minute and thirty seconds has elapsed (from the time that the LVD sensed 11.8/12.3 volts), the LVD sends an alarm signal (voltage signal - 2.5 Hertz, 50% duty cycle) to the LECM. The low voltage indicator LED on the LECM flashes at a frequency of approximately two flashes per second. An audible alarm is emitted from the LECM at the same frequency. This occurs for thirty seconds.
4. When two minutes have elapsed (from the time that the LVD sensed 11.8/12.3 volts), the LVD disconnects battery voltage from the relay (located in the FRC). After disconnection, the LVD sends an alarm signal (voltage signal - 0.5 Hertz, 50% duty cycle) to the LECM. The low voltage indicator LED on the LECM flashes at a frequency of one flash every two seconds, but the audible alarm emitted from the LECM is mute. The low voltage indicator LED continuous to flash at this frequency until the LVD is overridden or battery voltage increases to 12.9 volts.

Tags

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