

SmartValve™
Electronic Height Control

LINK®

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**QUESTIONS?
CALL CUSTOMER
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TROUBLESHOOTING PRODUCT GUIDE

SMARTVALVE

PETERBILT



1. INTRODUCTION

1.1

SmartValve is an electronic rear axle leveling system that maintains standard ride height while the vehicle is in operation while minimizing air consumption. In addition, by activating dash mounted switches, the driver can raise and lower the rear suspension, to simplify coupling and un-coupling of trailers. The system consists of two main components:

1.2

SmartValve: Mounted toward the rear of the driver's side frame rail. The SmartValve has a supply port that is connected to the secondary air reservoir and two suspension ports connected to the forward and rear axle air springs. The SmartValve also integrates the Electronic Control Unit (ECU) of the system.

1.3

Interface Module: The Interface Module is located behind the lower center panel of the dash and provides power and signals to the SmartValve

2. SMARTVALVE OPERATING INSTRUCTIONS

2.1

Lowering Rear Suspension

- The DUMP SUSPENSION switch will fully dump the rear suspension.
- To dump the rear suspension: Press and hold the DUMP SUSPENSION switch for approximately one second and then release.
- Once the suspension starts to lower, the Smart-Valve green LED will begin flashing. It will continue flashing indicating the vehicle is NOT at standard ride height.
- To return to standard ride height: Press and hold the DUMP SUSPENSION switch again for approximately one second and then release.
- When standard ride height is achieved, the green LED will stop flashing.
- When in the DUMP SUSPENSION mode, the vehicle will automatically return to standard ride height when vehicle speed exceeds 7 MPH¹.
- The DUMP SUSPENSION mode cannot be achieved when the vehicle is traveling faster than 7 MPH¹.

2.2

Raising Rear Suspension

- The RAISE SUSPENSION switch will raise the rear suspension about 2 inches above standard ride height, giving increased ground clearance during drop and hook operation.
- To raise the rear suspension: Press and hold the RAISE SUSPENSION switch for approximately one second and then release.
- Once the suspension starts to raise, the Smart-Valve green LED will begin flashing. It will continue flashing indicating the vehicle is NOT at standard ride height.
- To return to standard ride height: Press and hold the RAISE SUSPENSION switch for approximately one second and then release.
- When standard ride height is achieved, the green LED will stop flashing.
- When in the RAISE SUSPENSION mode, the vehicle will automatically return to standard ride height when vehicle speed exceeds 7 MPH¹.
- The RAISE SUSPENSION mode cannot be achieved when the vehicle is traveling faster than 7 MPH¹.

2.3

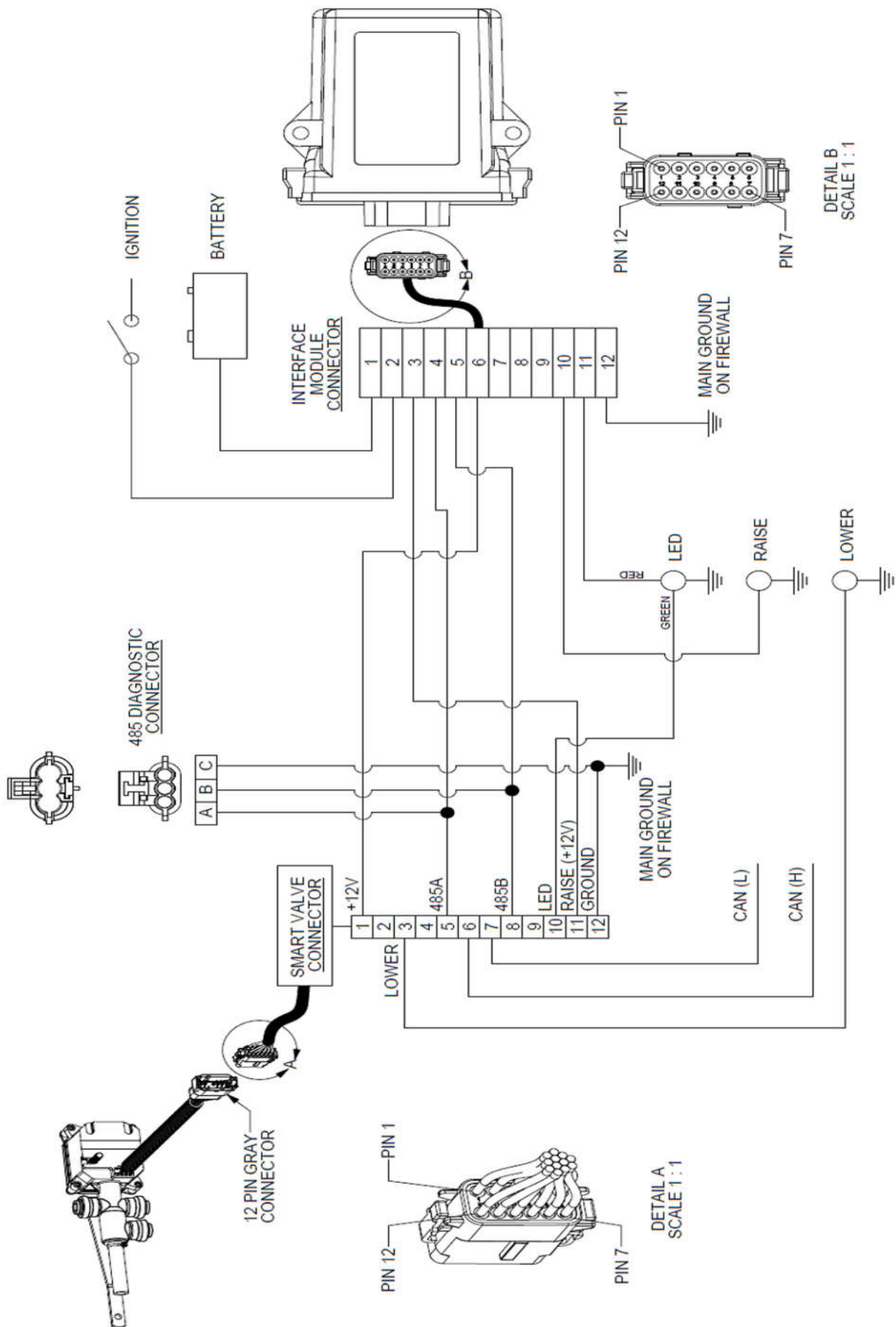
NOTE: If the ignition is turned "off" and the vehicle is left in either the dump or raised mode, the vehicle will remain in that mode until the ignition is turned back "on" and the appropriate switch is pressed.

NOTE: The RAISE SUSPENSION switch will not operate if the suspension is in the DUMP mode. The DUMP mode has priority.

3. OPERATION SUMMARY

Current Status	Desired Mode	Action Required
Normal	Dump	Press DUMP SUSPENSION Switch
Normal	Raise	Press RAISE SUSPENSION Switch
Dump	Normal	Press DUMP SUSPENSION Switch
Raise	Normal	Press RAISE SUSPENSION Switch
Raise	Dump	Press DUMP SUSPENSION Switch

4. BASIC SMARTVALVE WIRING DIAGRAM



Note: When the SUSPENSION RAISE switch in **NOT** pressed, 12 V is applied to pin 11 of the SmartValve connector. This voltage must be present for the system to activate when vehicle ignition is turned on.

5. LED INDICATIONS

5.1

A red and green LED are used to indicate the specific SmartValve operating mode (Dump or Raised) and system error codes. If the red LED is flashing or error codes are present, continue driving only after verifying the suspension is in a state to allow safe vehicle operation. Refer to the owner's manual for more information.

Flashing Red LED – Indicates the SmartValve is not operating normally or may not have power.

Green LED – Indicates the specific SmartValve operating mode using a repeating pattern. It will also display SmartValve error codes by flashing two groups of blinks for each error detected.

Steady On – SmartValve Initialization or Fault

The LED will activate shortly after the ignition is turned on. A steady light after a few seconds indicates a problem with the valve or wiring.

Long Blinks – Rear Suspension in Dump Mode (one second on, one second off)

Short Blinks – Rear Suspension in Raise Mode ($\frac{1}{4}$ second on every two seconds)

Two Groups of Blinks - Error Codes

The system identifies several fault conditions using two groups of 1-4 blinks for each condition detected. For example, one blink followed by two blinks indicates error code 12. All active error conditions are repeatedly shown in sequence.

Fault Codes		
11: 1 blink, 1 blink	Angle sensor error	Internal valve fault or a lever severely out of position
12: 1 blink, 2 blinks	Angle out of range	The lever is more than 65 degrees from center. May be a linkage failure.
21: 2 blinks, 1 blink	CAN data missing	No CAN bus signals are being received by SmartValve
22: 2 blinks, 2 blinks	Low supply voltage	Supply voltage is too low to operate valve. Poor ground connection(s)
23: 2 blinks, 3 blinks	Ignition signal missing	Low voltage on SmartValve pin 11
24: 2 blinks, 4 blinks	Extreme Board Temperature	Indicates extreme temperature
31: 3 blinks, 1 blink	Motor Feedback Fault	Internal valve fault
32: 3 blinks, 2 blinks	Motor driver fault	Internal valve fault
33: 3 blinks, 3 blinks	Motor not reaching target	Internal valve fault
34: 3 blinks, 4 blinks	Motor Centering out of range	Internal valve fault
41: 4 blinks, 1 blink	Suspension too high	Indicates the suspension is higher than expected. Valve is not able to correct.
42: 4 blinks, 2 blinks	Suspension not raising	Suspension is not rising due to low air pressure, leakage, or other issues.
43: 4 blinks, 3 blinks	Unable to close valve	Internal valve fault
44: 4 blinks, 4 blinks	Valve not responding	Internal valve fault

6. TROUBLESHOOTING GUIDE

SmartValve		
Symptom	Cause	Solution
SmartValve will not raise vehicle to "override height position"	Vehicle ignition is not switched "on"	Switch ignition to "ON"
	J1939 CAN bus wires not connected	Connect CAN bus to the vehicle. Refer to the SmartValve® manual for proper connection.
	J1939 CAN bus wires reversed	Refer to the SmartValve® manual for proper connection.
	J1939 CAN speed signal not available	Refer to the SmartValve® manual for proper connection.
	Suspension reservoir air pressure below 90 PSI	Start engine to raise air pressure to greater than 90 PSI
	Vehicle dump switch in "Dump position"	Press and hold Dump Switch for approx 1 second and then release
	If vehicle is moving, speed exceeds 7 mph	Reduce speed to below 7 MPH
	See " Power Issues " section at the end of this guide	
SmartValve constantly exhausts air	SmartValve air lines plumbed incorrectly	Verify all plumbing connections (refer to SmartValve manual for plumbing information)
	SmartValve is unable to center properly/ debris in SmartValve	Contact Link Support
Vehicle raises to maximum suspension height and stays at this level	SmartValve air lines plumbed incorrectly	Verify all plumbing connections (refer to SmartValve manual for plumbing information)

SmartValve		
Symptom	Cause	Solution
SmartValve will not lower vehicle to "Dumped position"	Vehicle ignition is not switched "on"	Switch ignition to "ON"
	Suspension reservoir air pressure below 90 PSI	Start engine to raise air pressure to greater than 90 PSI
	Vehicle dump switch not in "Dump position"	Press and hold Dump Switch for approx 1 second and then release
	SmartValve has active fault code	Inspect and correct cause of fault code
	See "Power Issues" section at the end of this guide	
Vehicle continually raises and lowers the suspension while near the ride height setting	One or more of the air lines or fittings are leaking air.	Verify that all plumbing connections are airtight. Spray a soap and water solution on the suspension fittings and air lines to detect leakage. Tighten or repair as necessary.

SmartValve		
Symptom	Cause	Solution
<u>Power Issues</u>		
LED is flashing RED	Battery voltage low or not present	Voltage reading on battery wire should be greater than 10 VDC. Measure voltage across SmartValve terminals 1 & 12 and 11 and 12
	Ignition voltage low or not present	Voltage reading on the ignition wire should be greater than 10 VDC continuous when the ignition is switched "on"
	Battery fuse not installed or "open"	Check fuse assembly, replace if necessary
	Ignition fuse not installed or "open"	Check fuse assembly, replace if necessary
	Connectors not attached	Check all harness connectors for proper attachment
	Connectors not fully inserted	Check all harness connectors for proper engagement. The connectors should lock together when properly installed.
	Improper grounding	Resistance must be less than 2 ohms from SmartValve ground wire to the negative battery terminal
	Intermittent battery or ignition voltage	Power may be connected to a "timed out" power source on vehicle panel (timeout intervals can be several minutes)

