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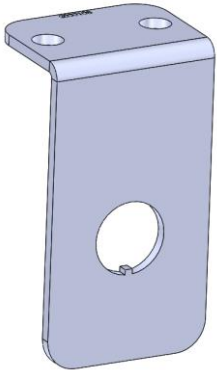




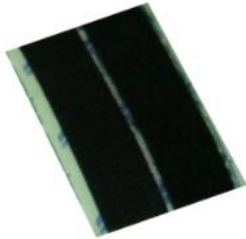

Heavy Duty Electronic Positive Air Shutdown



1036770	2017-2023 Cummins X15 & 2014-2020 Cummins ISX15 with Engine Intake Throttle Equipped
1036771	2008-2023 Detroit Diesel DD13/DD15/DD16
1036772	2017-2023 Volvo D13 & Mack MP8

Kit Contents

103677X Kit Contents	
1306732	1302378
	
Electronic Module Qty: 1	Switch Harness Qty: 1

1302251	1306790	1302250-RG	2000108
			
Switch Decal Qty: 1	Switch Guard Decal Qty: 1	Switch Guard Qty: 1	Switch Bracket Qty: 1

1330052	1300131	FT-10910-03116	1006701
			
Bracket Screws Qty: 2	Cable Tie Qty: 12	Velcro Strips (4") Qty: 2	Window Decal Qty: 1

1036772		1036771	
1302398		1302397	
			
Volvo D13 / Mack MP8 Harness Qty: 1		DD13 / DD15 / DD16 Harness Qty:1	

1036770		
1302396	1306792	FT- XM2530012A20000
		
Cummins ISX / X15 Harness Qty: 1	Throttle Plate Qty: 1	Screws Qty: 3

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Introduction

Most late model diesel engines incorporate an electronic throttle body into the intake manifold to partially restrict intake air to aid in EGR function and meet ever increasing emission standards. When controlled correctly, this valve can completely shut off the outside air supply to stop the engine. The BD Electronic Positive Air Shutdown kit connects to this valve to shut the engine down in emergency situations.

The BD Electronic PAS will automatically shut off the engine if it exceeds a preset engine RPM or if toggled manually with the supplied switch. The BD module also has an automatic reset feature which will reopen the valve once the engine has stopped. No longer does the operator need to open the hood to reset the valve after a system test.

The BD Electronic PAS is easier to install than previous PAS products as it is completely plug and play with existing parts on the vehicle – with the exception of the ISX/X15 kit which requires replacement of the stock throttle plate. The plate included with the ISX/X15 kit creates a better seal in the throttle body allowing for more consistent and reliable engine shutdown.

NOTE: Repeated shutoffs in a short amount of time may cause a check engine light to appear. This will often disappear after a few key cycles.

Operation

The BD Electronic PAS module constantly keeps track of engine speed and will automatically stop the engine if it exceeds the preset maximum RPM. The air valve can be shut at any time even if the engine is not running by toggling the switch on the dash manually.

When the engine is off, the BD E-PAS module will go into a low power consumption state and the toggle switch on the dash will not be lit. Once the engine is started, the module will automatically begin monitoring engine RPM and the toggle switch on the dash will light up to show the system is ready.

If the system is triggered automatically or manually by the switch, the intake air valve will close and remain closed until the engine RPM has dropped to zero and for an additional 5-20 seconds afterward. During this time the toggle switch will flash to indicate a closed valve position. When the toggle switch stops flashing, you may restart the engine. **DO NOT ATTEMPT TO RESTART ENGINE WHILE VALVE IS CLOSED.** The valve will automatically reset itself to the open position and the toggle switch light will turn off once shutdown process is complete.

Before you start

Ensure that the vehicle is equipped with an intake valve, and that it will connect to the harness supplied with your kit.

Tools Required for Installation

- Drill
- 1/8" Drill Bit
- 1/2" Unibit
- Battery Terminal Wrench
- ISX/X15 Throttle Plate Installation
 - Rotary tool (Dremel) with metal grinding attachment or Fine/Medium Tooth File
 - T20 Torx Driver
 - Phillips Driver
 - Vice Grips



An Information decal has been provided in this kit. This may allow safety personal and inspector's to quickly identify that your vehicle is equipped with a BD Positive Air Shut Down unit. Install this decal in a visible location on the inside glass of the vehicle.

Installation



VEHICLE SHOULD BE SAFELY SECURED BEFORE INSTALLATION.

1. Locate the intake air valve on the motor and connect the supplied BD PAS wiring harness inline by connecting the BD harness directly to the valve and to the vehicles original electrical connector. Do the same with the crankshaft position sensor connector. See **pages 14-15** for Cummins ISX/X15 locations, **16-18** for Detroit DD13/15/16 locations, and **18-20** for Volvo D13/Mack MP8 locations.

NOTE: If the vehicle has been re-tuned to no longer utilize the intake air valve and it is currently disconnected, connect the BD harness only to the intake valve and leave the OE connector disconnected.

IMPORTANT: The first steps for ISX/X15 installation would be installation of the included throttle plate in the throttle valve. Refer to page 10 for start of instructions.

2. Remove the toggle switch from the supplied switch harness. Route the end of the switch wiring harness from within the engine bay, through the driver's side of the firewall to below the dashboard. Suggested pass through location is through a slit in the existing grommet for the engine to instrument panel wiring harness, otherwise a new hole may be drilled and a new grommet installed if necessary.

3. Route the battery connection ring terminals to the driver side battery. Connect BLACK wire ring terminal to the driver side battery negative or to body ground if desired. Leave the RED positive wire disconnected until end of installation.

4. Locate suitable location for BD PAS module so that it will reach both wiring harnesses. Attach it with supplied adhesive hook and loop tape or wire ties. Suggested mounting location is on or near the plastic fuse box cover in the driver side of the engine bay. Any spot in the engine bay away from heat sources and moving parts will work, as long as the harnesses can reach their intended locations. If using hook and loop tape, thoroughly clean the mounting surface for good adhesion. Use cable ties to fasten loose parts of the harness to locations away from heat sources/moving parts—usually you can fasten to sections of the engine's wiring harness.

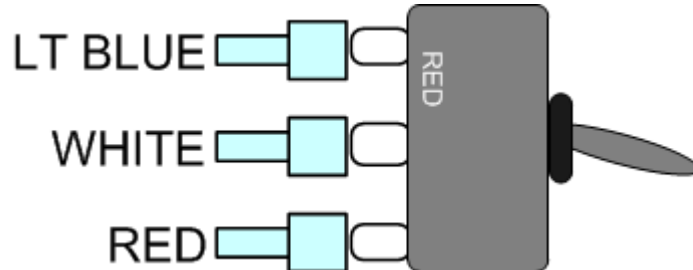
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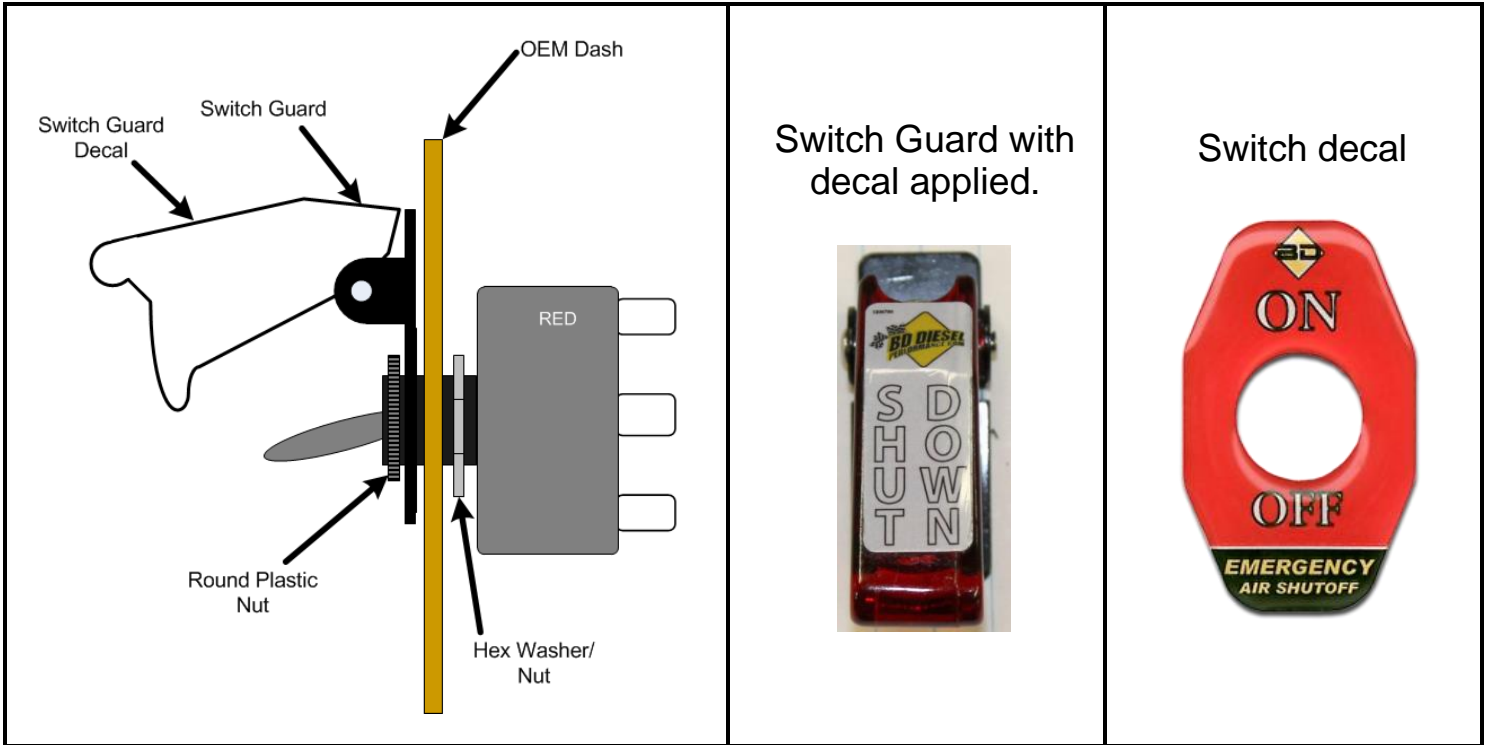
8. Carefully secure all wiring within the engine bay with supplied wire ties to that it is away from moving parts, chafe hazards and heat sources. Use extra care with the crankshaft position sensor wiring due to the close proximity to belts, fans and road debris and potential consequences of a short or break in this wire.

9. Inside the cab, reconnect the toggle switch to the switch wiring harness in the same way they were removed. See below for reference. Double check the connections here as wiring the toggle switch incorrectly may damage the module.



10. Locate suitable spot to mount switch on the dashboard within reach of the driver and in a highly visible location. Ensure there is sufficient space behind the dash to mount the switch. Drill a 1/8" pilot hole, then using a stepper bit (unibit) drill a 1/2" hole in the dashboard. Install switch with the groove in the thread boss facing down. Install with either the supplied switch decal or with the supplied switch guard and apply decal to the switch guard. Secure wire below the dashboard using supplied wire ties.

NOTE: A switch bracket has been supplied as an alternative for mounting the switch.

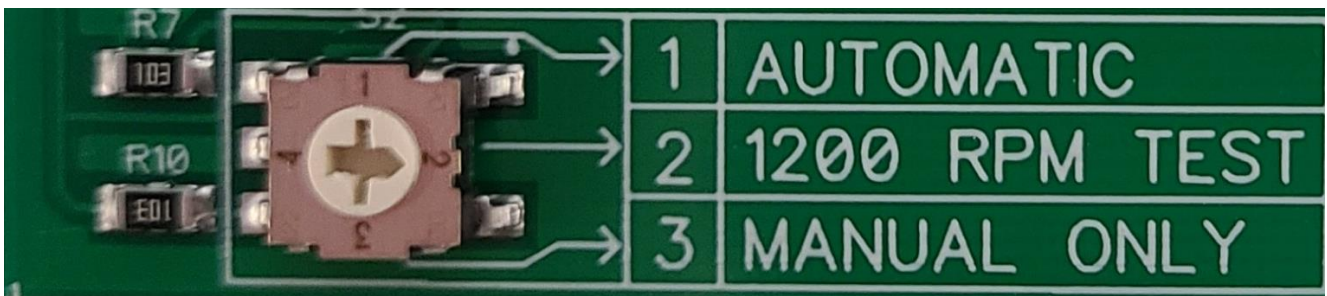


11. Connect RED positive feed wire to the battery or the positive stud at the fuse block.

12. Test and verify system functionality.

Manual Activation Test: With the engine running at idle, momentarily toggle the PAS switch on the dashboard. The engine should stop within a few seconds. Wait until the light on the toggle switch stops flashing (5-20 seconds) before restart.

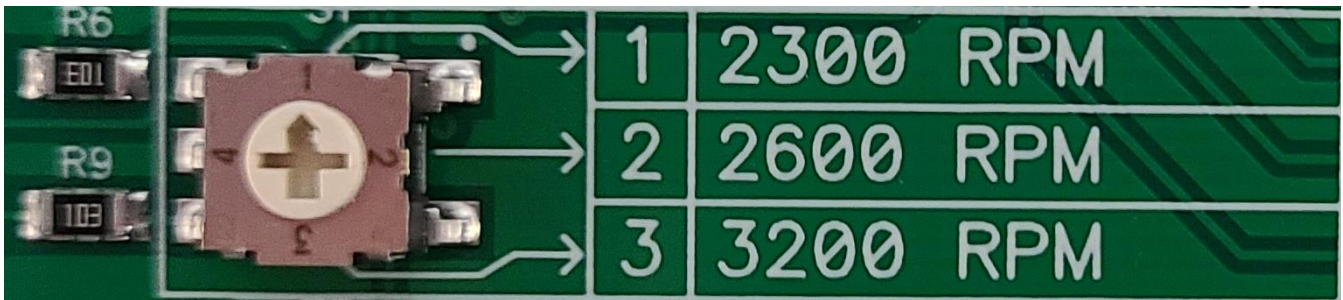
Automatic Activation Test: With engine not running, remove the cover from the module to access the circuit board. Keep away from metal objects that may cause a short circuit. Set the bottom switch to "1200 RPM TEST" mode. This will cause the module to shut the engine down if it exceeds 1200 RPM. Start the vehicle and slowly accelerate the engine, verify that it shuts down over 1200 RPM. Wait until the light on the toggle switch stops flashing (5-20 seconds) before restart.



NOTE: The BD E-PAS module is connected to constant battery power unless the harness fuse is removed. Use care when opening module to avoid short circuiting it against metal objects in engine bay.

IMPORTANT: Repeated tests may cause a check engine light to appear. This can usually be corrected by turning on and shutting off the engine normally 1-3 times.

13. Set the operation mode switch on the circuit board back to AUTOMATIC and Set the automatic RPM shutdown speed on the module according to the engine it is installed with. This must be above the normal engine redline to avoid accidentally setting it off during driving. Reinstall module cover and re-secure module.

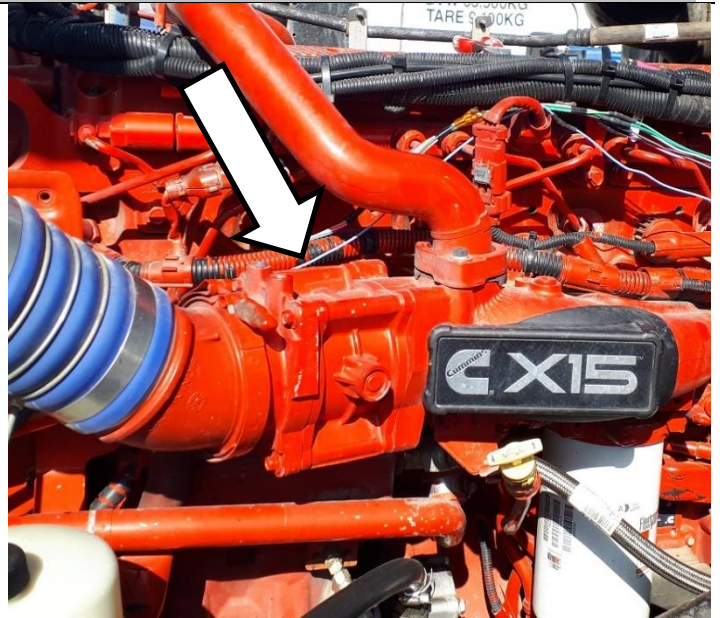


<i>Engine</i>	<i>RPM</i>
Cummins ISX15, Cummins X15 (Performance & Efficiency Series), Detroit Diesel DD13/15/16	2300 RPM
Cummins X15 (Productivity Series), Volvo D13/Mack MP8	2600 RPM
	3200 RPM

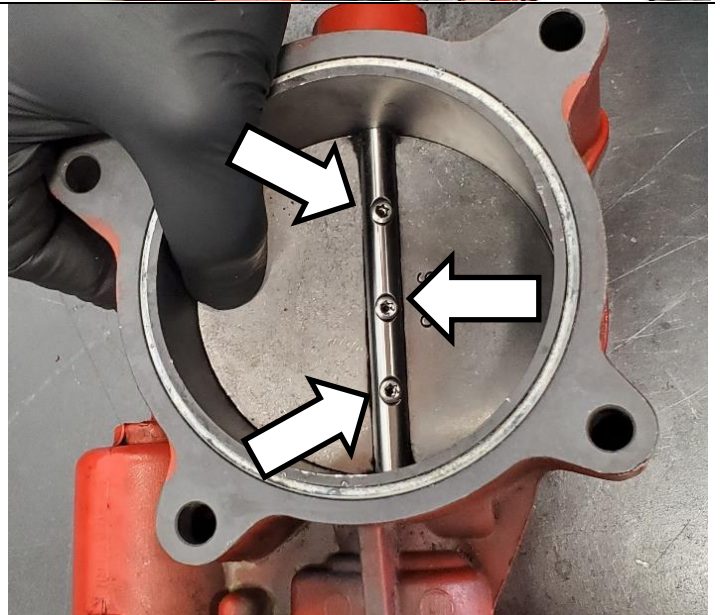
2014-2023 Cummins ISX/X15 Throttle Plate Installation

Removal of throttle body

- Disconnect both vehicle batteries
- Remove the charge air intake cooler piping by loosening the band clamps holding it
- Remove the 4 bolts mounting the throttle body to the intake
- Unclip the electrical connector on the back of the throttle body
- Inspect the sealing ring for damage and make sure not to lose it



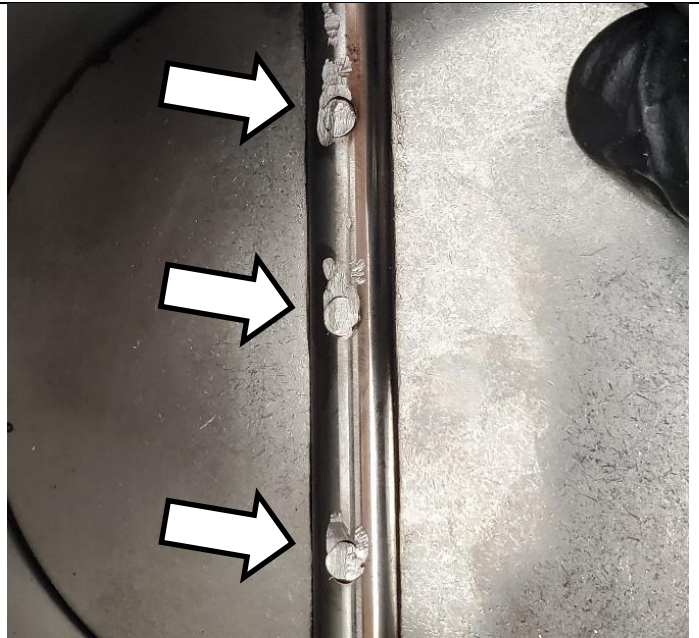
Locate the three screws securing the throttle body plate to the valve body.



The OEM screws have staked/deformed threads to prevent them from backing out from vibration. These need to be ground off with a rotary tool in order to be removed. A fine/medium tooth file can be used as well.



Grind/file the back of the screws down until they are flush with the shaft. Try to minimize damage to the shaft.



Remove the screws and the factory throttle plate using a T20 Torx tool. The screws can be discarded.

Important: Do not force the screws out. This can damage the threads on the shaft. Keep grinding until they spin out freely.



Insert the new throttle plate into the slot.

Note: The middle hole is offset so the plate will be correctly oriented when installed.

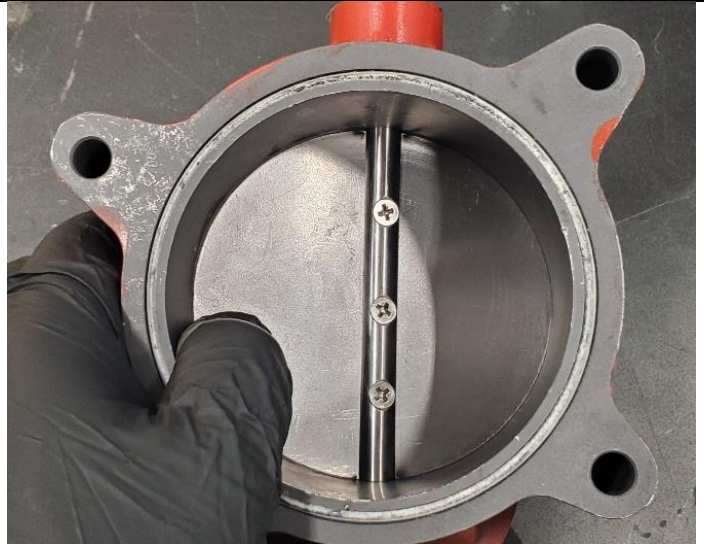


Install the 3 supplied screws so they are snug and then back out a ½ turn.



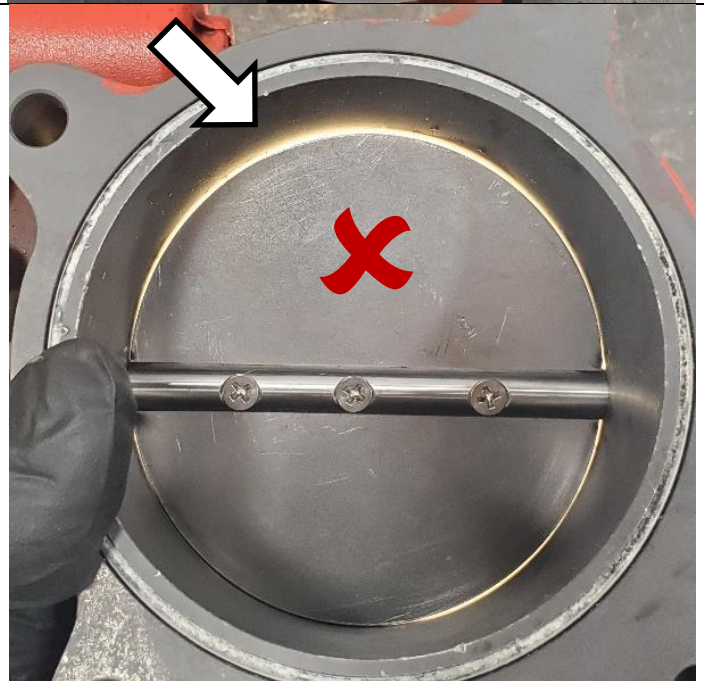
Open and close the plate several times by hand to seat the plate in the throttle bore. Check for binding.

Note: Closing it with sharp force several times helps align the plate.



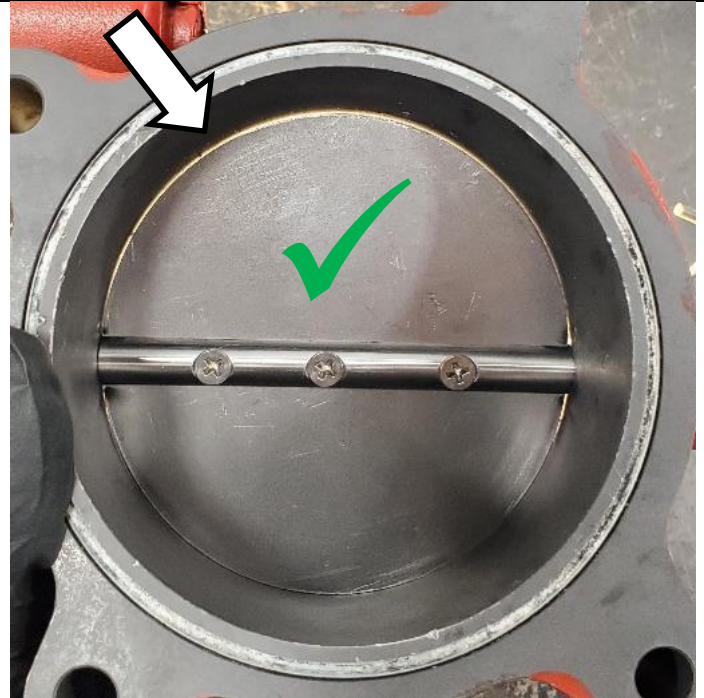
Shine a light through the back of the throttle body while holding it closed to check the gaps around the outer edge.

Bad Gap Shown: Uneven, large gap.



Keep adjusting the plate until the gaps are small and even. Once the fitment is satisfactory, recheck for binding when closed before tightening the screws.

Good Gap Shown: Even, small gap.
Torque Spec: 18 in lbs



Use a pair of Vice Grips to tightly clamp on to each protruding screw end in order to stake/deform the threads. This will prevent the screws from backing out.

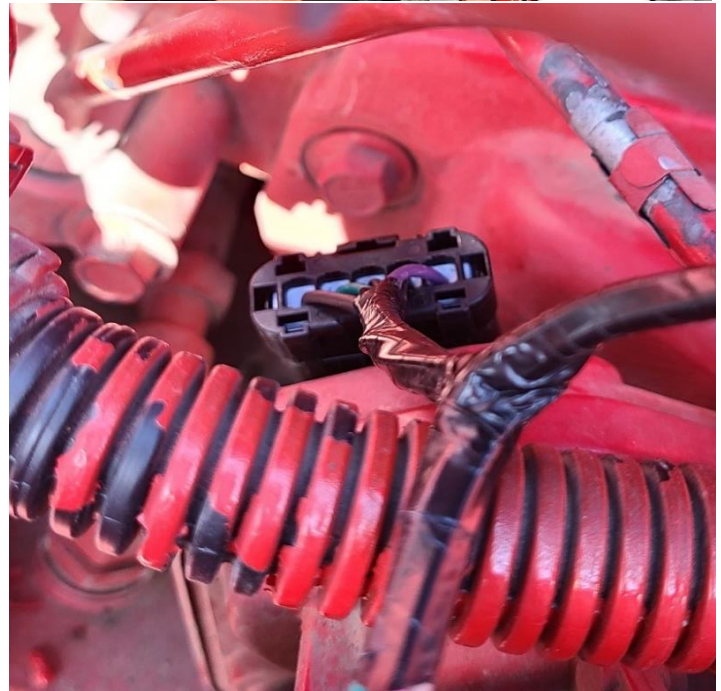
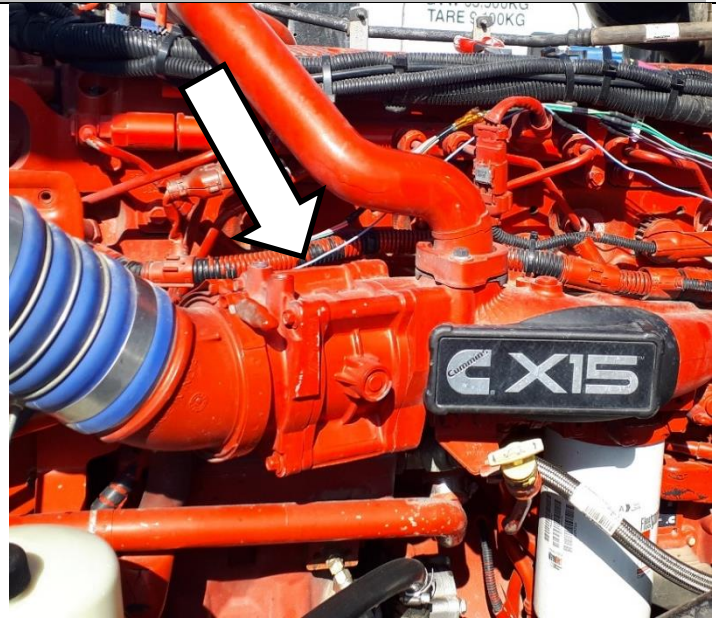


Reinstall the throttle body into the truck and continue the instructions for wiring and module installation.

2014-2023 Cummins ISX15/X15 Connector Locations

Intake Valve Connector

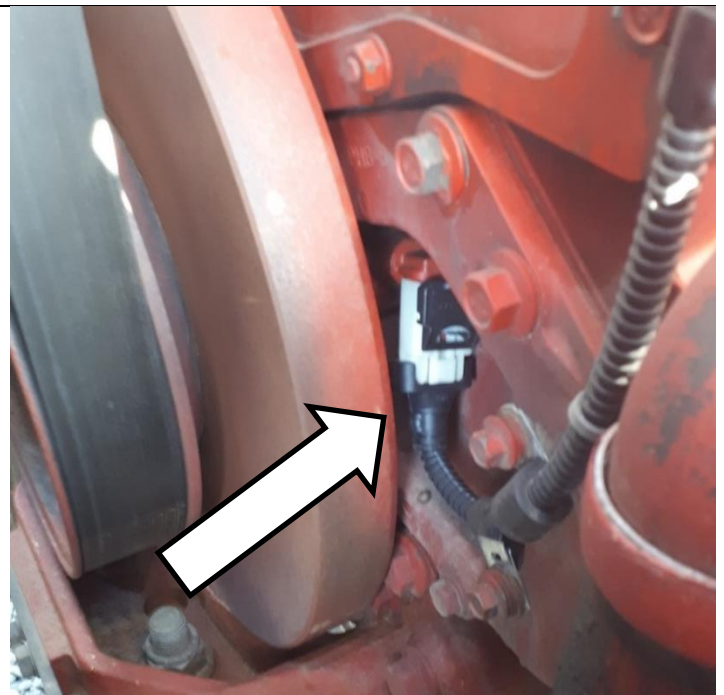
On the driver's side of the engine, located on the back side of the intake valve.



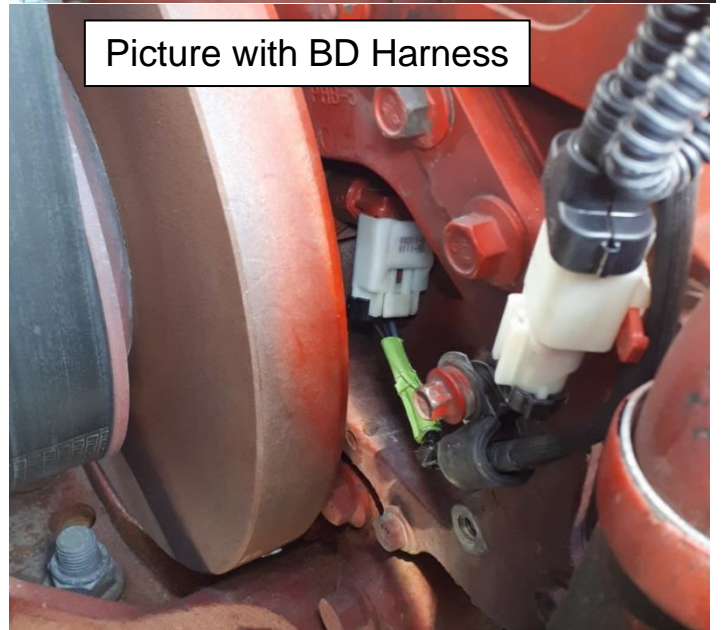
Crankshaft Position Sensor Connector

Driver side of engine just behind the crankshaft drive belt pulley.

Note: Do not mistake for the camshaft position sensor located above

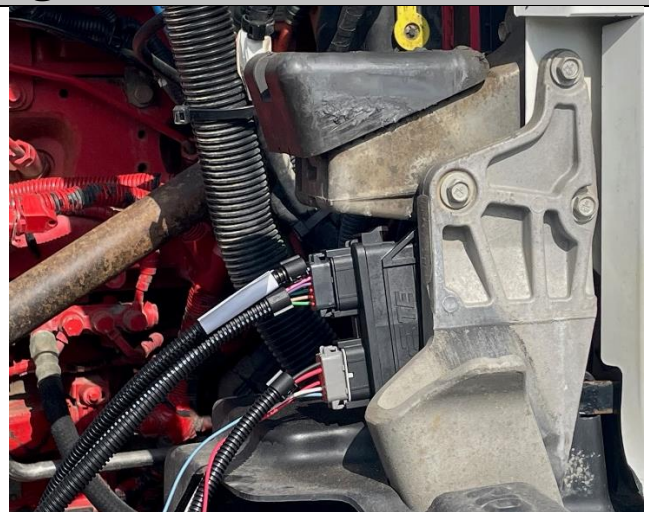


Picture with BD Harness



2014-2023 Cummins ISX15/X15 Suggested Module Mounting Location

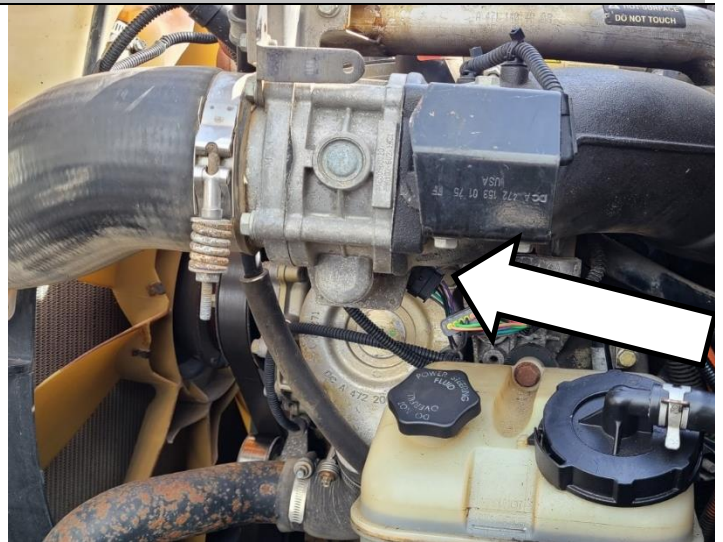
Near driver's side fuse box in any area away from heat sources/moving parts. May vary depending on make/model of truck.



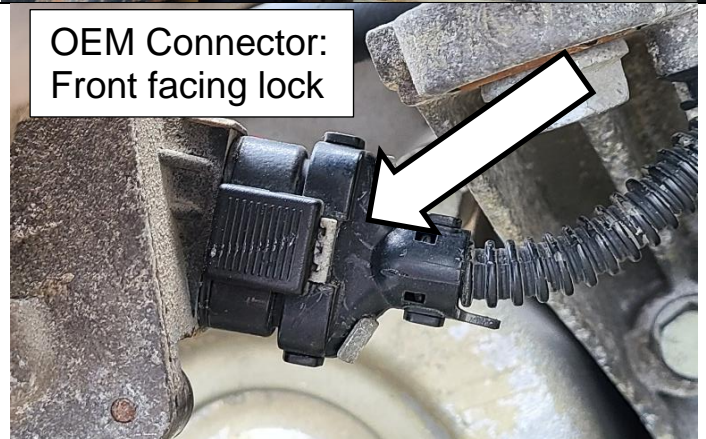
2008-2023 Detroit Diesel DD13/15/16 Connector Locations

Intake Valve Connector

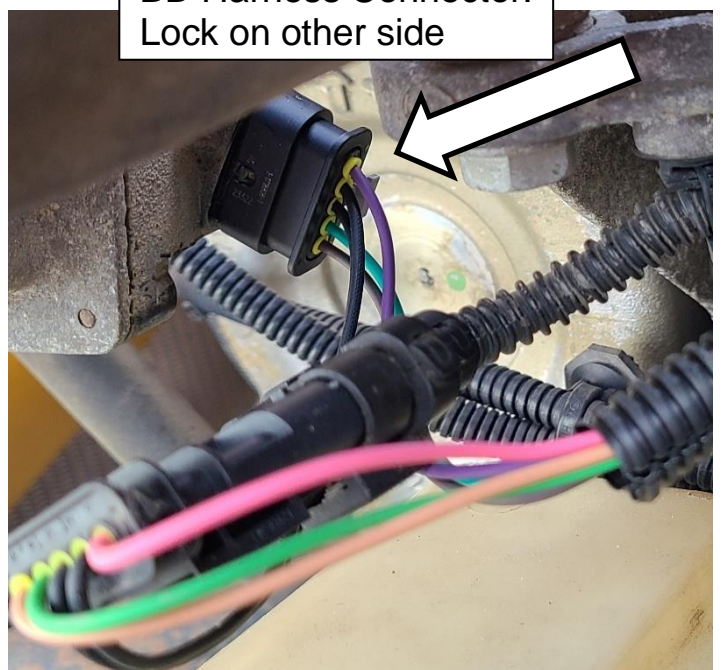
Located on the driver's side of the engine, on the underside of the intake valve.



OEM Connector:
Front facing lock

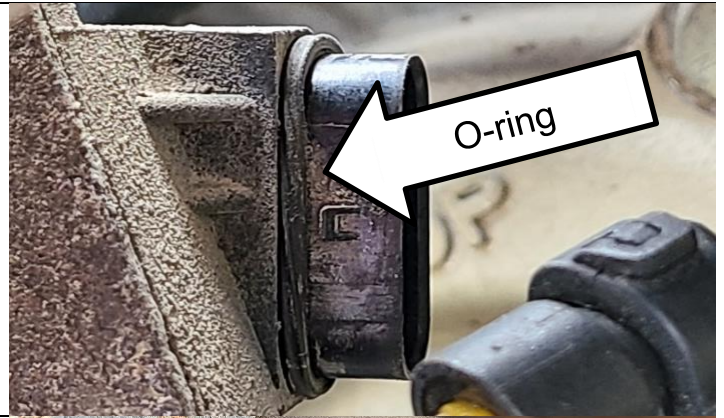


BD Harness Connector:
Lock on other side



The connector lock on the BD harness is on the opposite side compared to the OEM connector.

You may have to remove this O-ring around the valve connector in order for the BD harness's connector to "click" in.



Crankshaft Position Sensor Connector

Bottom rear of engine, on the driver's side. Accessible from the underside of the truck.



2008-2023 Detroit DD13/15/16 Suggested Module Mounting Location

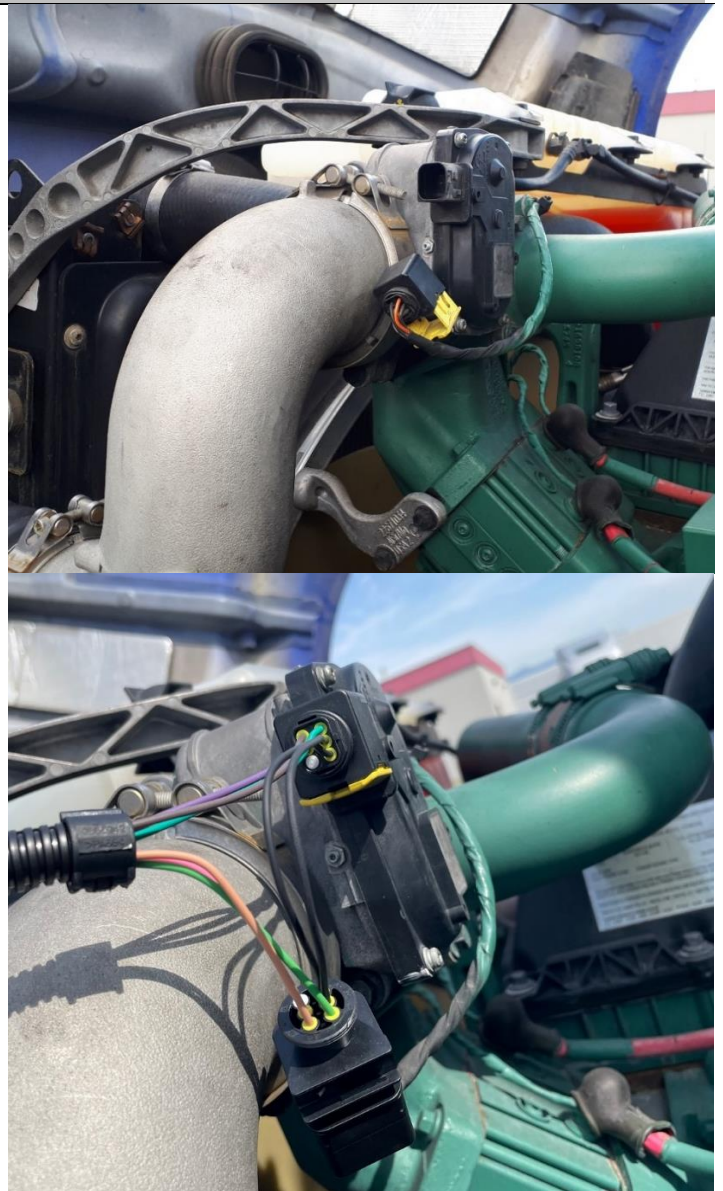
Fuse box on the driver side of the engine bay. May vary depending on make/model of truck.



2017-2023 Volvo D13 / Mack MP8 Connector Locations

Intake Valve Connector

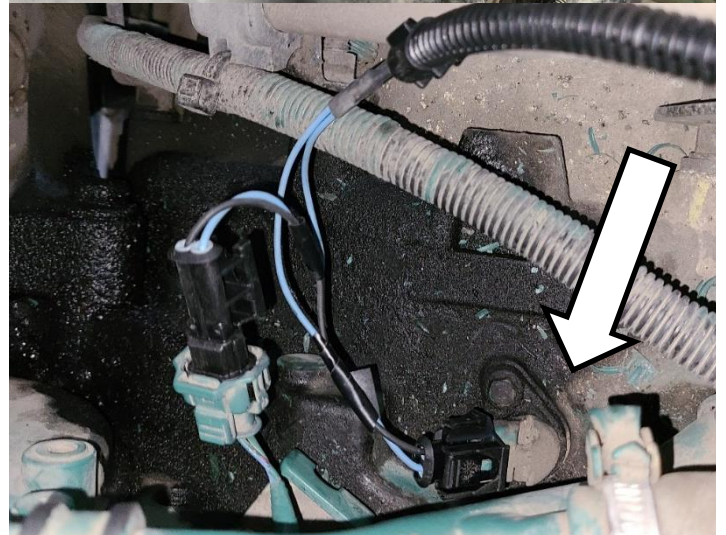
Driver's side of the engine, easily accessible from the side as shown.





Past the cylinder head cover of the engine, above the flywheel housing, slightly on the driver's side.

Note: To access this point, you can either lay on top of the cylinder head cover as shown, or remove plastic from inside the cabin.



2017-2023 Volvo D13/Mack MP8 Suggested Module Mounting Location

Driver's side of the engine bay, on the fuse box.

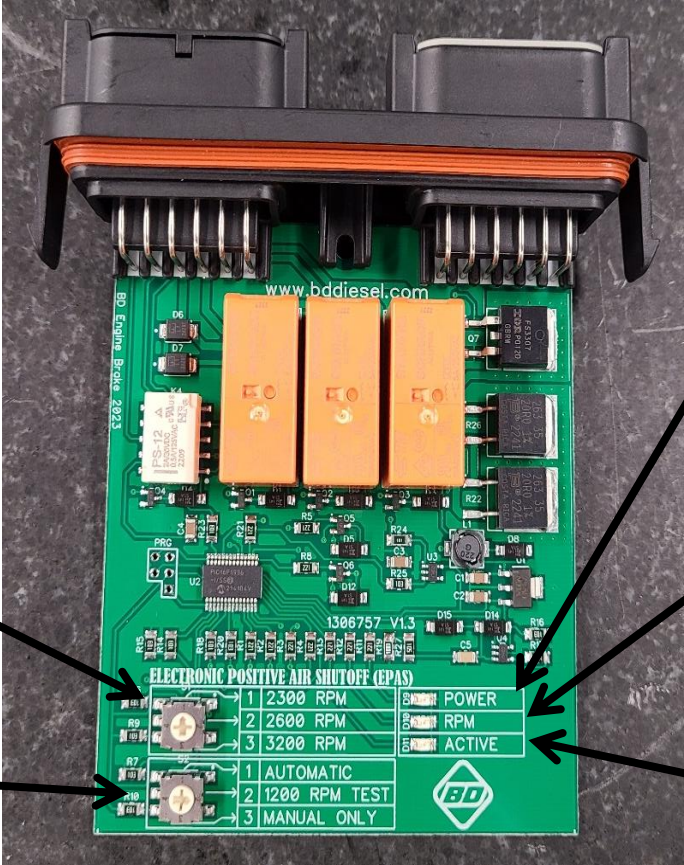


Troubleshooting

<p>Valve does not close by manual toggle switch activation</p>	<p>No power to module. Check fuse at battery. If fuse is blown, inspect harnesses for short circuits or other problems. Remove cover from module and check that the POWER lamp is flashing every two seconds with engine off indicating it is powered and in standby.</p> <p>Incorrect switch wiring. Carefully check the toggle switch wire connection is correct, incorrect connection may damage the module.</p> <p>Intake air valve connectors not fully seated. An audible click should be heard when the connector is fully mated together. Tug on connector to ensure it does not come apart.</p>
<p>Valve closes by manual toggle, not automatically</p>	<p>Incorrect module mode setting. If conducting low speed system test, verify that the lower switch on the module circuit board is set to the middle position, "1200 RPM TEST". For normal automatic operation, the switch should be pointed upwards to "AUTOMATIC" and the RPM selector switch should be set to the correct speed.</p>

	<p>Harness connected to camshaft position sensor rather than crankshaft position sensor. Verify against pictures in installation section of this manual.</p> <p>No RPM signal to module. Open module cover and start engine. Verify that RPM light is flashing when engine is running and POWER light is on solid. If it is not on or is intermittent, carefully check that the blue wire going from the module's black connector (pin 7) to the crankshaft position sensor is not severed.</p>
Engine light on / fault codes set	<p>Code set during installation. If the ignition switch was on or ECM had not powered down during installation, fault codes may be set by disconnecting air valve. Clear codes and recheck.</p> <p>Intake air valve connectors not fully seated. An audible click should be heard when the connector is fully mated together. Tug on connector to ensure it does not come apart.</p> <p>Black connector disconnected from BD E-PAS module. If the module is not currently being used, the black connector must still be plugged into the module or the valve connected back to stock configuration.</p>
Engine does not start	<p>Connectors not mated. Inspect crankshaft position sensor connector is correctly installed; an audible click should be heard when connected. Tug on connectors to verify they are correctly mated.</p> <p>Shorted crankshaft position sensor wire. Inspect the blue wire from the modules black connector (pin 7) to the crankshaft position sensor; if this wire is chaffed or broken it may short out the crankshaft position sensor signal.</p> <p>Intake air valve jammed shut or defective. Toggle the system manually while listening for valve movement. If suspect, remove the intake air tube from the valve and visually verify the intake air flap is not closed.</p>

Circuit board switch and LED functions



Maximum engine RPM for automatic mode

Operation Mode: Automatic, test, or manual only.

Power light on when engine running. Flashes every 2 seconds when in standby.

RPM light flashes when the engine is running

Active light on when the valve is controlled by the module.

If you have any technical difficulties please phone our Technical Support hotline at (800) 887-5030 between 8:30am-5:00pm PST (Pacific Standard Time) Monday to Friday

Wiring Diagram (OR) Kit Layout

