



Preliminary Information

PIT5432B Brake Shudder While Towing Gooseneck and Fifth Wheel Trailers with Electric Brakes

Models

Brand:	Model:	Model Years:	VIN:		Engine:	Transmissions:
			from	to		
Chevrolet	Silverado 2500/3500	2011 - 2019	All	All	All	All
GMC	Sierra 2500/3500	2011 - 2019	All	All	All	All

Supersession Statement

This PI was superseded to update Model Years. Please discard PIT5432A.

The following diagnosis might be helpful if the vehicle exhibits the symptom(s) described in this PI.

Condition / Concern

Some customers may comment on a Shudder, bounce, bucking from the rear of the truck while braking when towing a gooseneck or fifth wheel trailer. This concern is more predominant when towing a gooseneck trailer with a 3500 Dually crew cab long bed trucks.

The condition has been identified with gross combined weights usually exceeding 20,000Lb. The vehicle will not have any DTC's stored that are related to the Trailer Brake System or Electronic Brake Control Module (EBCM).

ABS will not be active during brake stop which can be verified with the scan tool.

Heavy gooseneck and fifth wheel trailers have the ability to impose a dynamic pulsing force on the tow vehicle when driving on smooth roads.

This pulsing force acts in a forward and reverse direction on the tow vehicle at a rate of 3 to 5 times per second and can be subtle to the driver.

As the combination decelerates, the trailer induced pulsing force is still present.

At times, this trailer induced pulsing force during braking is transmitted to the driver, who unintentionally begins to fluctuate the force on the brake pedal in response to the trailer's pulsing input force.

As the brake pedal force fluctuates, the resulting alternating deceleration forces the truck produces, magnifies the trailer impulse forces and results in a condition described as shudder, bounce, or bucking.

The following information is intended to be a tool to help verify the issue and may not resolve this condition.

Recommendations / Instructions

Measure the actual truck and trailer weights, with the trailer loaded to the point that exhibits the condition.

If any weight parameter is exceeded such as the Front Gross Axle Weight Rating (FGAWR), Rear Gross Axle Weight Rating (RGAWR), Gross Vehicle Weight Rating (GVWR) or Gross Combined Weight Rating (GCWR) the load must be reduced before investigating further.

Vehicle responses during braking

The pulsing force the trailer produces should be minimized. Trailer, trailer loading, and trailer hitch characteristics will influence the magnitude of a trailer's pulse force.

1. Play and lack of stiffness between the truck and trailer's hitch components will affect the trailer induced pulse forces. Gooseneck ball and fifth wheel kingpin sizes and load ratings must be correct for the trailer weight used. Trailer gooseneck extension set screws must be at the manufacturers specified torque value. Gooseneck ball and coupler parts showing indication of wear should be replaced. Fifth wheel pivot assemblies must be functioning as intended. A hitch with a narrow footprint can contribute to pulsing forces.

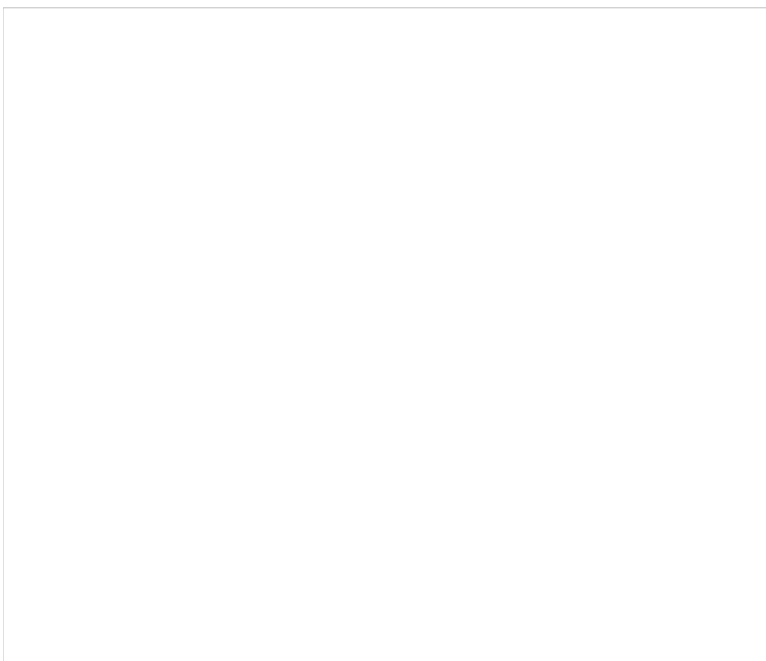
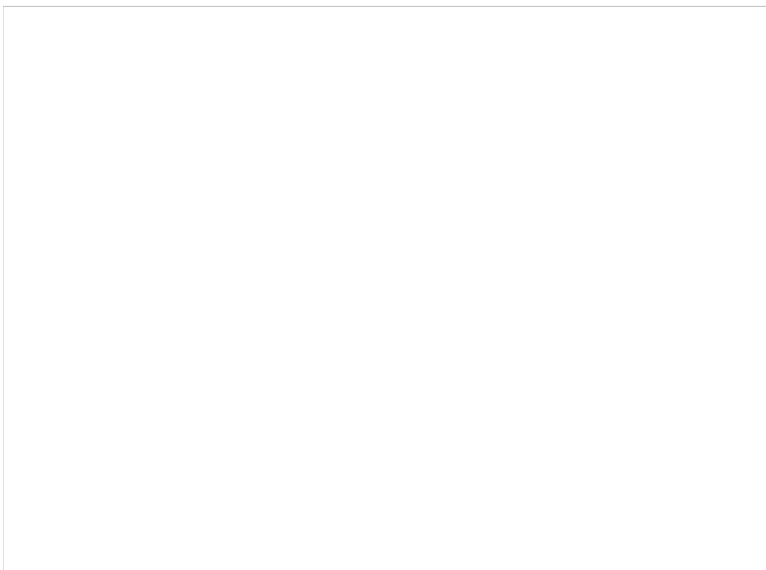
2. Observe the trailer hitch and trailer tongue during acceleration and deceleration events. If excessive movement is noted, a different style/brand of hitch may be required focusing on the weight rating and base structure. A hitch structure with a wider base that is mounted to the provisions on the frame for 5th wheel hitch is preferred. Also, verify the load rating of the installed hitch, making sure it is correct for the type and weight of trailer being pulled.

Note: Starting in 2016 Model Year the Silverado/Sierra HD truck is available with RPO Z6A Gooseneck / 5th Wheel Prep Package which was designed to reduce oscillation driven by hitch mobility. Some brands of hitch may have too much flexibility in their structure or attachment to the truck and this may cause the trailer to oscillate depending on load and brake input.

3. The trailer should be level from front to rear when connected to the truck. Height difference between the front of the trailer and rear of the trailer have shown to be a contributor to the magnitude of pulsing force the trailer can produce. Trailers which have a tandem axle assembly using a load equalizer beam, as a component in the trailer's suspension, can produce more pulsing force when the front of the trailer is higher than the rear of trailer. If the front of the trailer is high, and the trailer's load equalizer beams are not

parallel when compared to the trailer's frame (see photo 1 of an unparallel beam and photo 2 for a parallel beam), the height of the gooseneck, or fifth wheel kingpin should be adjusted to bring the front of the trailer down, see photo 3.

NOTE IMPORTANT: If the truck is equipped with a bed/box, verify there is still enough clearance between the top of the bedrails/tailgate to the trailer, if not bed/trailer damage will occur. The bed height to ground is higher on 2011 and later Silverado/Sierra HD trucks when compared to prior years of the same model. The trailer height may require adjustment if the trailer was previously set up for a different model truck.



4. The trailer's tires must be properly inflated. The trailer's suspension must be functioning as intended by trailer manufacturer. The trailer's mechanical system performance should be inspected and deficiencies corrected by a capable service organization for the type of trailer used.

5. The trailer's tongue weight must be within the range of 15% to 30% of total trailer weight not exceeding the truck's Rear Axle Gross Weight Rating, Gross Vehicle Weight Rating or Gross Combined Weight Rating, and likewise the trailer must not exceed its weight ratings. Trailer cargo must be properly restrained to prevent movement of the cargo relative to the trailer. Vehicle operators should always perform a pre trip inspection to make sure restraints are tight and also check often during a trip.

6. Trailers which place cargo closer to ground level, and/or trailers that have longer distances between the trailer tongue and trailer axles will reduce the trailer's forward and reverse pulse forces.

Brake Apply Technique

The sensitivity and capability of brake system stopping force relative to the amount of brake pedal apply force is increased in the 2011 and later model year Silverado/Sierra HD trucks when compared to prior years of the same model. This enables larger cargo payloads and trailer sizes, while meeting applicable Federal Motor Vehicle Safety Standards and other accepted motor vehicle industry practices.

1. Stabilizing the driver's brake apply foot with heel on cab floor while braking will increase the driver's resistance to unintended fluctuation of the brake pedal in response to trailer pulse forces.
2. When equipped with optional power adjustable pedals, RPO JF4, the pedals and driver's seat location may need to be moved to help stabilize the braking foot's heel on cab floor.



Evaluate Trailer Brake

Verify the trailer's braking ability when the trailer is loaded to the weight where the condition is exhibited

Note: During the investigation please provide a snapshot of brake pressure using the scan tool for the following events:

- A braking event when the shudder occurred while towing the trailer
- A same speed braking event without the trailer

1. The trailer's braking system should have equal, or greater, capability to stop the truck/trailer combination when compared to the truck's service brake.
 - From speeds of 20 to 25mph on level paved roads free from traffic perform a full manual apply of the trailer brake controller, with the controller set to maximum gain, and no apply of truck's service brake.
 - Compare deceleration from the above step to the truck's capability for stopping the combination from the same speed on paved roads during an aggressive brake pedal apply with brake controller set to minimum gain.
2. If evaluation of the trailer's brakes indicates trailer brake capability is adequate per comparison described in step A, adjust brake controller per the Trailer Gain Adjustment Procedure described in the Driving and Operating section of the Owner's Manual and evaluate truck and trailer combination for braking shudder.
3. If evaluation of the trailer's brakes as described in the comparison from step A indicates trailer brakes are not functional or adequate, the trailer or trailer brake apply system may have an electrical malfunction, mechanical malfunction, incorrect trailer brake components, or incorrect trailer axle size. The source of inadequate trailer braking must be investigated and repaired.

Aftermarket brake controllers which consist of an inertia reaction mechanism to apply current to the trailer's brake system proportional to the truck and trailer's deceleration rate, may have an internal failure which results in pulsing of the trailer's electric brakes. If using an aftermarket brake controller of this type, verify electrical connections are to controller manufacturer's specification for correct model year General Motors trucks, and controller is adjusted correctly. Have the brake controller tested for proper function, or replace if in doubt.

Warranty Information

If the root cause is identified as a trailer hitch/trailer setup issue, a warranty claim should NOT be filed against the repair. If the root cause is identified as a truck issue, please use the appropriate warranty labor operation based on the actual cause and repair. Please follow this diagnostic or repair process thoroughly and complete each step. If the condition exhibited is resolved without completing every step, the remaining steps do not need to be performed.



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