

TROUBLESHOOTING BELT NOISE

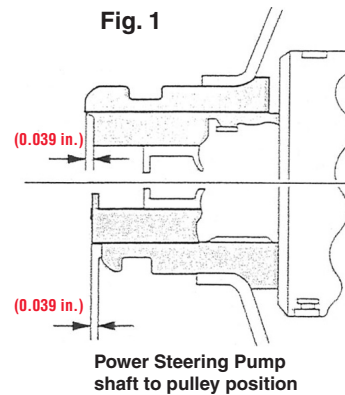
Installing a Second Belt Is Not the Solution

A customer brings a vehicle in for a routine service and a belt noise condition. Without diagnosing the symptom, the technician recommends and installs a new serpentine drive belt. All is quiet in the engine compartment. The customer pays the invoice and all seems well. Weeks later, the belt chirp noise returns and so does the customer. The technician warranties the belt, eliminating the belt noise condition. When the noise symptom repeats itself, the service manager is ready to change belt suppliers. The odds are the vehicle has some problems inherent by design, or something is out of alignment. Unless the technician takes the time to accurately diagnose the reason for the noise condition, the symptom will continue to plague the system. **Tension and alignment are critical, and this should always be the first check when diagnosing belt noise.**

Solving belt noises has been a major warranty expense for some vehicle manufacturers. We are seeing an increase in the service information available from the vehicle manufacturers regarding their solutions for belt noise conditions. Most of the factory service bulletins that address noise reflect pulley alignment issues. Failing to make the factory recommended modifications will result in a continued belt noise condition and a frustrated vehicle owner. Let's consider some factory solutions for belt noise conditions:

Noisy Duramax Diesel... Some may question why the owner of a rattling and compression knocking diesel truck would complain about a minor belt chirp or squeal. Accessory drive belt noises involving belt squeal, squeaks and chirps have plagued the 2004–2005 Chevrolet Silverado and GMC Sierra trucks fitted with the 6.6L Duramax diesel engine. The condition occurs during a cold start-up, and may continue until the engine reaches its normal operating temperature.

For a belt noise condition, the first check should involve a belt-to-pulley alignment check. Verify that the power steering pump pulley is pressed onto the pump shaft in the proper position. While the pulley should be flush with the end of the pump shaft, it can be repositioned on the shaft to achieve the proper belt alignment. The pulley to shaft position variance should not exceed 0.039 inch from the end of the pump shaft (see Fig. 1).

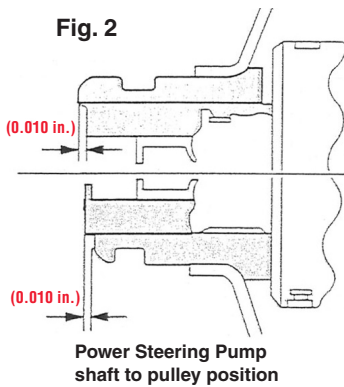


Some of the mentioned trucks produced prior to June 2004 may have an AC compressor/power steering pump mounting bracket and rear power steering mounting bracket machined slightly out of spec, resulting in a misaligned power steering pump. If this condition is present, the drive belt will be out of alignment with the fan pulley, resulting in a chirping noise. When the belt leaves the fan pulley, it will not be in alignment with the crankshaft pulley, creating the belt noise condition. A revised bracket is available from GM for those vehicles produced prior to June 2004.

Vehicles produced after June 2004 have the revised AC/power steering pump mounting bracket. The rear power steering mounting bracket on all vehicles prior to and after the mentioned production date may require a modification. This modification involves drilling larger holes into the rear mounting bracket to ensure proper alignment when installing the mounting bolts. GM TSB 05-06-01-018 illustrates the proper procedure and necessary mounting bracket part number, where applicable.

Be aware that a belt chirp noise may be present during engine shutdown on any diesel application, and this is a normal condition, with no repairs necessary. The noise condition occurs due to the high engine compression and rapid deceleration of the crankshaft and drive belt during engine shutdown, and this condition cannot be eliminated.

GM's Noisy Gas Burners... The position in which the power steering pump pulley is pressed onto the pump shaft has been an issue with GM applications. GM has acknowledged that 1996–98 Chevrolet and GMC trucks C/K, M/L, S/T, G and P Models, and 1996–1998 Olds Bravada with 4.3L, 5.0L, 5.7L and 7.4L engines may encounter drive belt noise due to the position in which the pump pulley is pressed onto the power steering pump shaft. Positioned incorrectly, the belt will be misaligned,

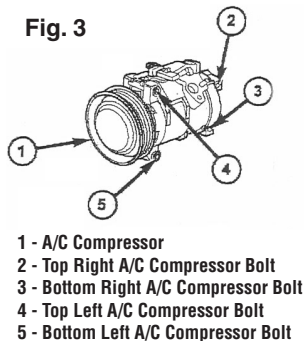


resulting in belt noises. The spec calls for the pulley to be flush with the end of the pump shaft. If the belt is not properly aligned with the pulley in this position, GM advises that the pulley should be repositioned on the pump shaft with a maximum variance of 0.010 inch from the end of the pump shaft (see Fig. 2). Notice how the pulley

to shaft position differs from the previously mentioned Duramax Diesel illustrated in Fig. 1.

Chrysler Pacifica... Chrysler acknowledges that a belt chirping or squeaking condition may be present on the 2004–2005 Pacifica with the 3.5L engine, due to misaligned pulleys. The noise may be present when first starting the engine, while idling after the warm-up, or while driving at higher engine speeds. The first step involves examining the power steering pump pulley to determine if it is flush with the end of the pump shaft. If not, it will be necessary to reposition the pulley. In order to attach a puller to the power steering pulley, it will be necessary to loosen and raise the engine a few inches from its mounted position. This requires attaching an engine support fixture to the left top side of the engine.

If the noise is still present, Chrysler recommends a specific A/C compressor alignment and tightening procedure. The first step involves loosening the A/C compressor bolts from the mounting bracket and pushing the A/C compressor toward the rear of the engine. While holding the compressor with one hand, tighten the bolts to 25 ft. lbs. in the sequence illustrated in Fig. 3 (top right, bottom right, top left, bottom left). Once this has been completed, start the engine and determine if the squeaking noise is still present. If so, with the engine off, loosen the A/C compressor bolts, push the compressor toward the front of the engine and tighten the bolts as previously illustrated.



- 1 - A/C Compressor
- 2 - Top Right A/C Compressor Bolt
- 3 - Bottom Right A/C Compressor Bolt
- 4 - Top Left A/C Compressor Bolt
- 5 - Bottom Left A/C Compressor Bolt

Torque compressor bolts to 25 ft. lbs. in sequence illustrated

Start the engine and inspect the drive belt and pulley assemblies for any evidence of misalignment. Check all pulleys and the tensioner for tightness and any evidence of wear. **Replacing the drive belt on an improperly aligned pulley system guarantees the customer will return with a belt noise complaint.**

PT Cruiser... Chrysler advises that 2003–2004 PT Cruisers equipped with the 2.4L engine may encounter a belt squeal or chirping sound. The noise condition is caused by the power steering pump pulley being pressed too far onto the pump shaft. If the pulley is more than 0.016 inch from the end of the pump shaft, the noise condition can exist. Chrysler recommends that the pulley end be flush with the pump shaft. To attach the puller to the pulley it will be necessary to remove the right front tire and wheel assembly, the splash shield forward of the suspension, and the right headlight assembly. This will allow the puller to be attached through the headlight opening.

Ford SUV A/C Belt Noise... 2002–2005 Ford Explorer, Mountaineer and 2003–2005 Lincoln Aviator vehicles may encounter a drive belt chirping noise during A/C compressor engagement. Ford has acknowledged the condition and recommends replacing the A/C compressor clutch pulley. The clutch air gap spacing should be .010 to .024 inches. Obviously, this procedure requires a refrigerant recovery and recharge.

Excursion, F-Super Duty and E-Series... The mentioned vehicles equipped with the 6.0L Turbo Diesel engine have had a history of belt related problems. In July 2004, Ford issued a TSB advising that 2003–2004 Excursion and F-Super Duty vehicles built prior to production date 6/1/2004 may encounter excessive drive belt noise, described as a squeak or squawk. At that time Ford recommended replacing the drive belt.

On 1/1/2005 Ford issued a second TSB involving 2003–2005 Excursion, F-Super Duty and E-Series vehicles equipped with the 6.0L Turbo Diesel built prior to 1/1/2005, advising that a new service water pump pulley was available to correct a belt fraying condition. In addition to noise, in extreme cases the belt would become shredded or broken.

When troubleshooting a belt noise condition, or abnormal wear such as frayed edges, the first step should involve a thorough belt and pulley alignment check. If an alignment condition exists, check all components for wear or damage. Examine the tensioner for any evidence of bushing wear or a tensioner that is not maintaining proper belt tension. Most automatic tensioners have indicator marks which reflect if the tensioner is operating in its normal range.

Trying to solve a belt noise condition or abnormal wear patterns is a challenge. Throwing a second new belt at the noise symptom is usually a temporary solution. Being aware of factory modifications can save you embarrassment and the customer a lot of frustration due to repeated comebacks.

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