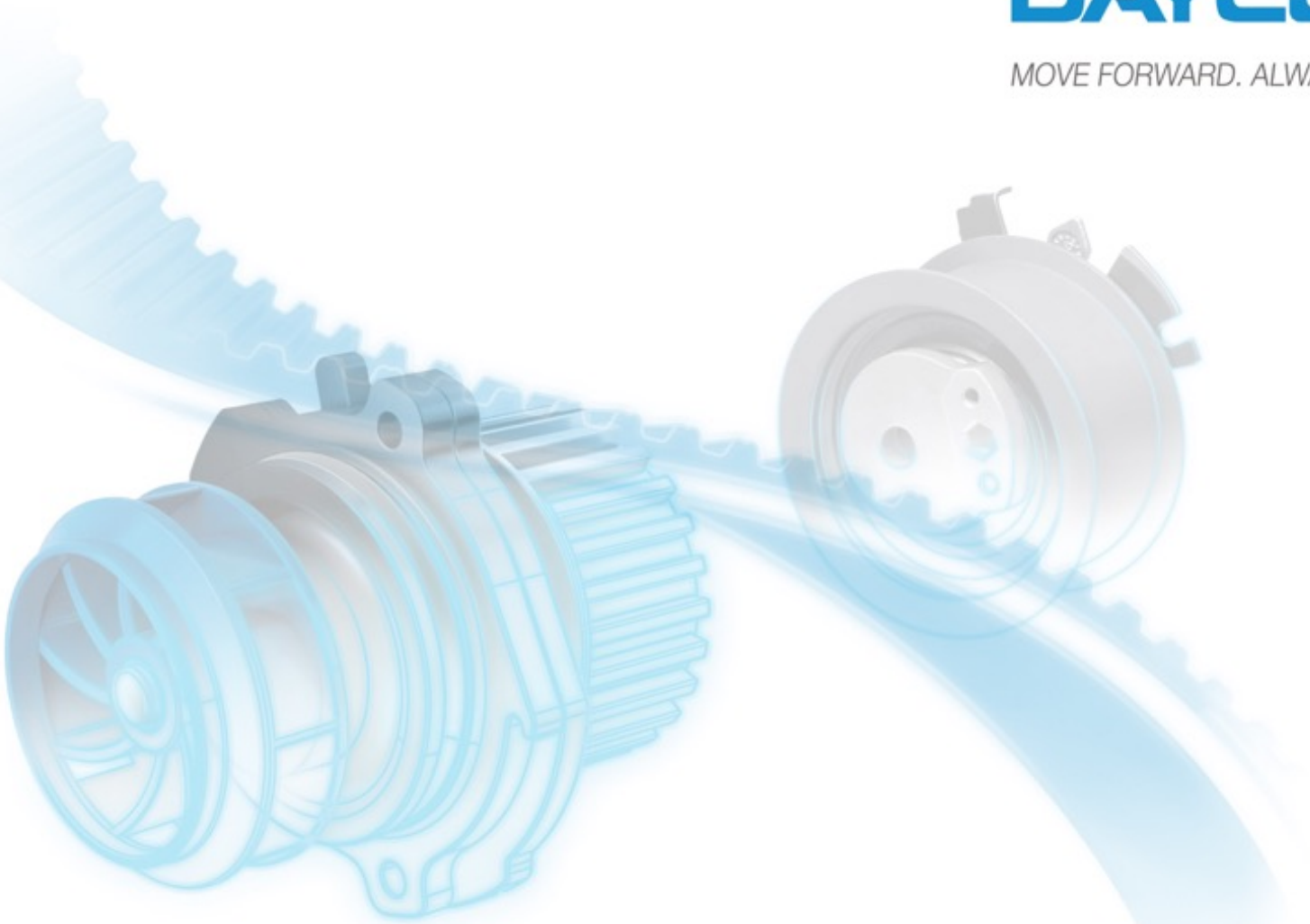
DAYCO

MOVE FORWARD. ALWAYS.™



Diagnosing Heavy Duty Belt Noise

TECHKNOW SERIES

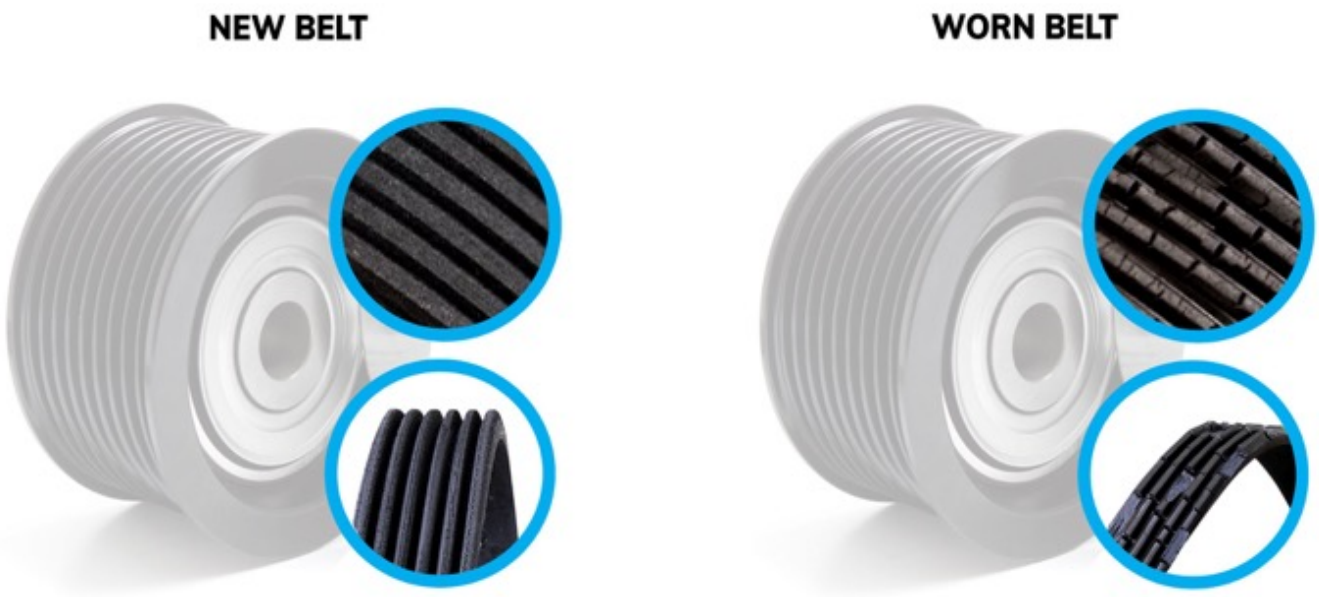
by DAYCO℠

The Need for Belt Maintenance

The belt works with the pulleys and tensioners to transmit torque from the crankshaft to the surrounding accessories. While front drive systems have advanced, they are still susceptible to cracks, wear and misalignment because of extreme driving conditions.

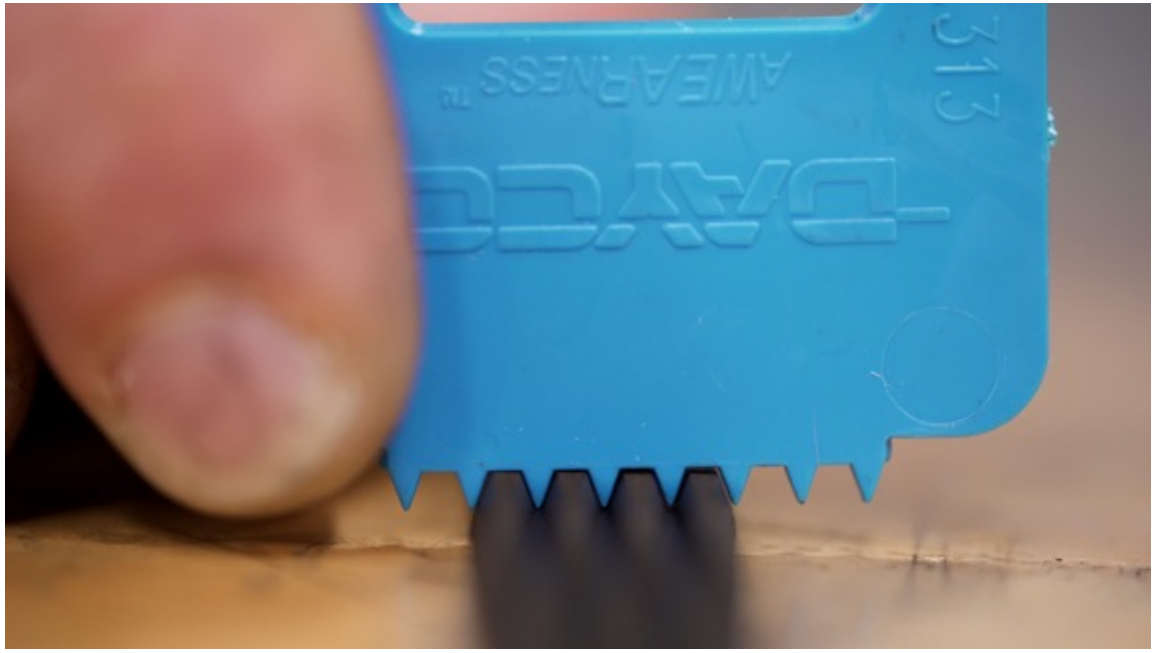
Identifying Belt Wear

- EPDM belts wear differently than the earlier neoprene constructed belts.
- A new EPDM belt wears similar to tire tread. It will have a traditional “V” profile in the grooves between the ribs.

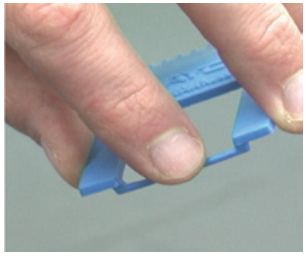


Measuring Wear

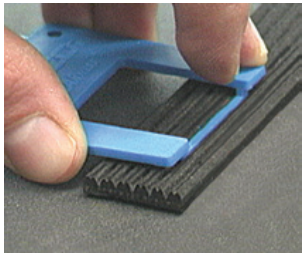
Dayco developed an innovative tool to help identify worn EPDM belts. The aWEARness™ gauge measures rib profile, rib depth and cracking.



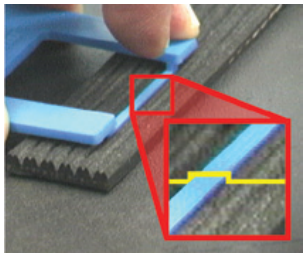
How to Use the aWEARness Gauge



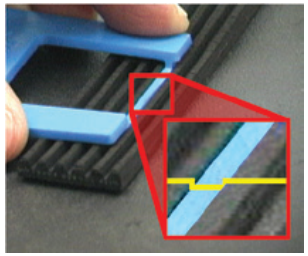
Grasp the tool like this when using the rib wear indicator bar.



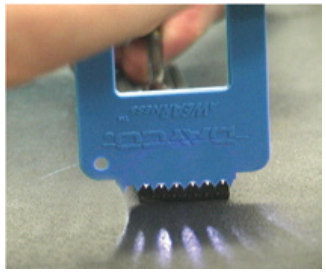
Keep the tool level – do not tilt it up or down across the belt.



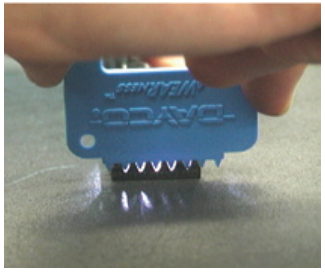
In a new belt, the top of the bar will be *higher* than the tops of the rib tips.



In a worn belt, the bar will be *lower* than the tops of the rib tips.



With the rib profile indicator on a *new* belt, there is neither side nor flank clearance on the ribs.

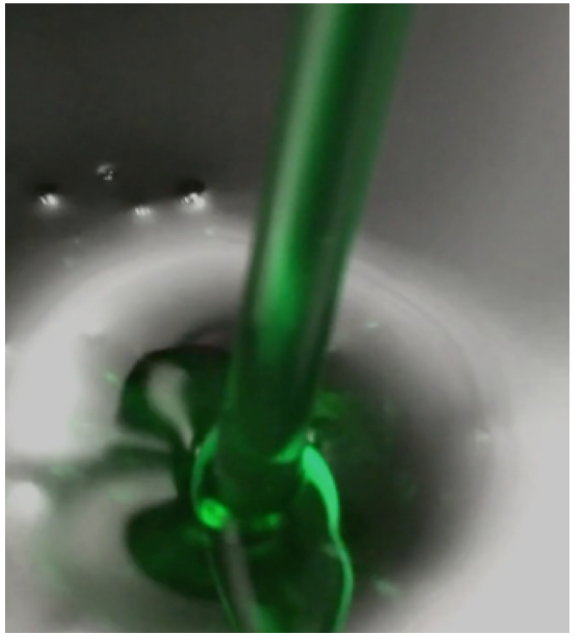


On a worn belt, the ribs “bottom out”, so voids appear on the flanks of the belts.

If there are four or more cracks in the window, we recommend replacement.

Contamination

- **Contamination can ruin a belt so take precaution and avoid the following:**
  - Oil
  - Solvents
  - Lubricants
  - Paint
  - Rust prevention products
  - Belt dressing
  - Cleaners
  - Engine fluids



- **Possible results of contamination:**
  - Belt/Rubber swell
  - Misalignment noise
  - Surface characteristics
  - Pilling

Troubleshooting Belt Noise

Most belt noise is due to misalignment issues or belt slip. The belt way to troubleshoot is to conduct a water test. While at idle, spray water on the rib surface of the belt.

- If noise stops then resumes within a few seconds it is a misalignment chirp.
- If noise gets louder then returns to original level, it is a slip squeal.

The Chirp

- A sharp, high-pitched, repetitive noise of short duration
- Worse at low engine speeds (idle)
- May blend into one audible sound, but diminish in intensity

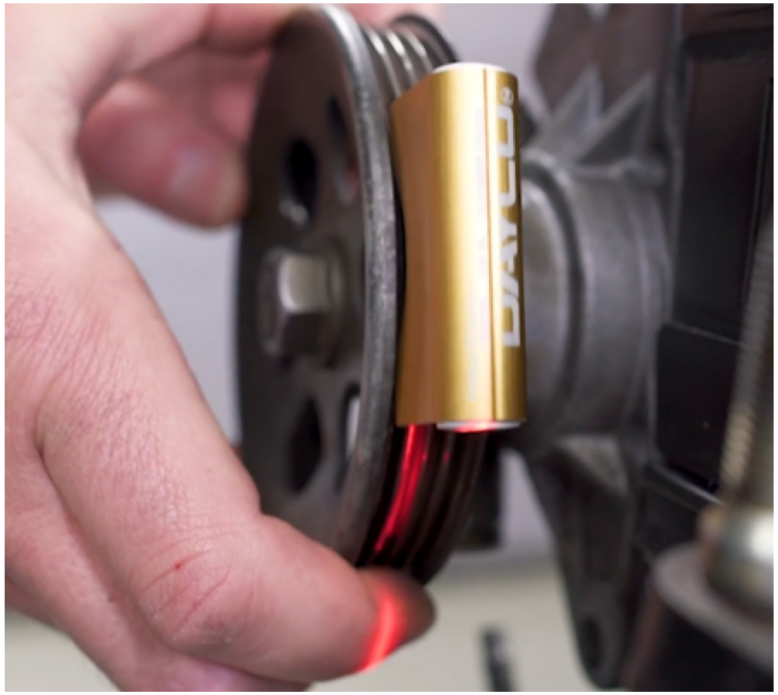
Top 5 Causes of Chirp:

1. Pulley misalignment
2. Worn belt ribs
3. Worn pulley bearings
4. Contamination
5. Low quality belt

Solutions for the Chirp:

- Check pulley alignment with a laser alignment tool.
- Tighten accessory pulleys and brackets to mounting surfaces.
- Inspect and replace all accessories and pulleys that are difficult to rotate.

DEGREES OF MISALIGNMENT	FAILURE MODE
0° to 1.0°	Very low potential for chirp noise
1.0° to 1.5°	Potential for chirp noise
1.5° to 2.5°	High probability of chirp noise
> 2.5°	Extreme chirp noise / Probability of belt jump



The Squeal

- A high-pitched noise, typically lasting several seconds
- Increases in volume as engine speed increases

Top 3 Squeal Causes:

1. Belt and pulley slip
2. Low belt tension
3. Contamination

Solutions for the Squeal

- **Manual tensioners** – Check that they are properly tensioned to allow the belt to seat in the pulleys.
- **Automatic tensioners** – Ensure it moves smoothly through its entire range of motion. Replace tensioners where the bearing feels rough or if the pulley has excessive run-out.
- With the belt removed, inspect all accessory pulleys and idlers to ensure free and smooth rotation.
- Replace any belt that has been contaminated.
- NEVER try to solve issues with belt dressing.

Finding the Right Part, the First Time

Use the Dayco Parts app or website to search for the right part.

- VIN lookup
- License plate parts lookup
- Product specifications
- Interchange search
    - Competitors
    - OEM

Test Your Knowledge

1. **A worn EPDM poly rib belt has**

    a) A sharply defined V profile
    b) A U-shaped profile
    c) Some cracks in the ribs

2. **The Dayco aWEARness gauge can measure**

    a) Belt wear
    b) Rib depth
    c) Cracks per inch
    d) All of the above

3. **Belt “chirping” noise is caused by**

    a) Belt misalignment
    b) Not enough belt tension
    c) New belt not broken in

Test Your Knowledge

4. **A squealing belt can be caused by**

   a) A worn belt
   b) A worn tensioner
   c) Belt contamination from chemicals
   d) All of the above

5. **What is the maximum misalignment allowed in a belt drive system?**

   a) 2.5°
   b) 1.0°
   c) 1.5° - 2.5°

Go to the next page for the correct answers.

Test Your Knowledge Answer Key

Question 1 - b) A U-shaped profile

Question 2 - d) All of the above

Question 3 - a) Belt misalignment

Question 4 - d) All of the above

Question 5 - b) 1.0°

Thank you

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