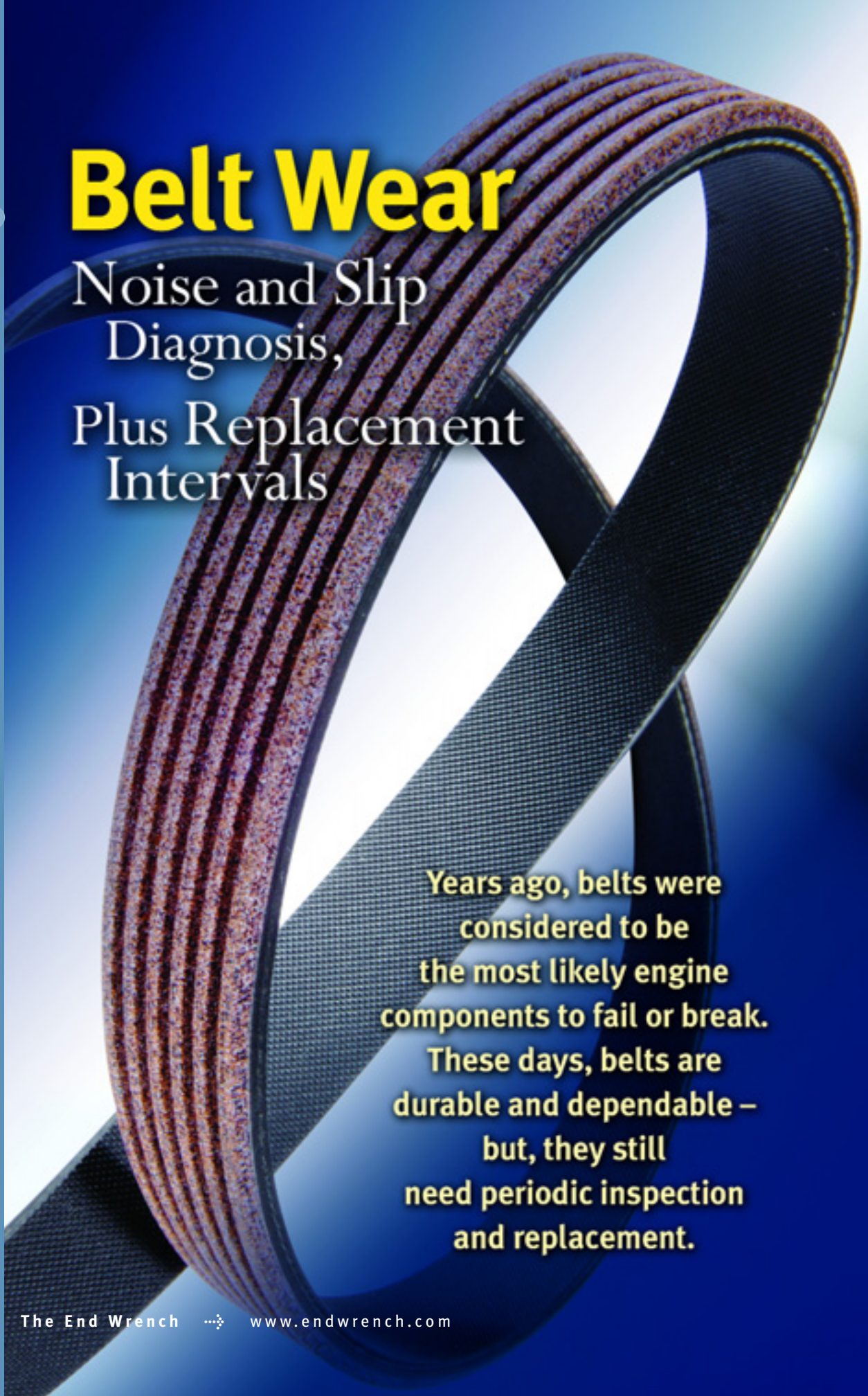

Belt Wear

Noise and Slip Diagnosis, Plus Replacement Intervals

Years ago, belts were considered to be the most likely engine components to fail or break. These days, belts are durable and dependable – but, they still need periodic inspection and replacement.

Nothing is quite as frustrating as finding that the replacement part you are trying to install is "not exactly" correct. When you use Genuine Subaru Parts to repair your customers' Subaru vehicles, you won't have to worry about quality and fit.

Not too many years ago, a close eye was kept on the timing and accessory drive belts. They were frequently inspected for any wear, weakness or damage that might fail and cause damage. The constant twisting, bending and applied torque always ended with cracked, stretched and worn belts. It was critical to inspect and replace them before the failure point.

Those days are long past. Technology and scientific compounding of belt materials has extended the life of accessory drive and timing belts to a point where we often forget to inspect them. However, belt inspection and replacement at indicated intervals is still a necessary ingredient in preventive maintenance.

Modern timing belts, once thought to be inferior to metal timing chains, have proven their strength and durability. These days, a timing belt can outlast the idlers, tensioners and pulleys, so you need to inspect the other components, as well as the belt.

Inspect the timing belt closely for any cracks, wear or erosion of the teeth. Never reinstall a questionable timing belt.

It's not easy to inspect the timing belt – removing covers, tensioners, pulleys, idlers and belts – but, the damage that can be caused by a failed timing belt far outweighs any reason for not inspecting. While you're at it, you can inspect the other components too.

Thorough inspection of all belts, pulleys, tensioners and idlers at the same time is critical to optimum performance of the entire system.

Why Belts Fail

Timing and accessory drive belts fail for one of many reasons, or for a combination of reasons:

1. Normal wear. Belts wear out from constant turning and twisting over the years and miles. That's why there are recommended replacement intervals. If this happens sooner than the recommended replacement interval, there may be a problem causing the premature wear. Inspection of the entire belt system is required.

2. Poor belt construction or manufacture. This condition is rare these days due to high-quality material compounding and improved manufacturing methods. It is now mostly seen in low quality, low-priced belts from inferior manufacturers. Always use top-quality Genuine Subaru belts from your local Subaru N.E.W. Horizons Dealer. You know they'll be the highest quality, fit right and function properly.

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3. Poorly operating tensioner. The tensioner must turn freely and smoothly, while applying the correct amount of tension to the belt. Failure to turn smoothly will cause friction, resulting in damage to the belt. Failure of the tensioner to apply the correct tension may cause damage to the belt teeth or result in cracking or breakage of the reinforcement threads.

4. Misalignment. The side-to-side motion of a belt traveling at engine speed can cause a "scrubbing" effect that may result in premature breakdown or damage to the belt as it travels through and around pulleys and tensioners. Always double-check the alignment of the belt path when installing belts.

5. Stiff guide pulley or idler. Guide pulleys and idlers keep the belt aligned properly under tension and reduce the flapping that causes cracking and wear. If worn bushings, bad bearings, bent shafts or lack of lubrication causes stiffness or seizing of the pulleys, the belt will not roll over the pulley, but slide over them. The result will be glazing or friction burning of the belt. Be sure to inspect these components routinely, as you inspect the belts.

6. Damage or debris. Belts can be damaged by anything that comes into contact with them. Loose underhood parts or road hazards such as rocks and metal debris, can take out a chunck of the belt upon impact. The belt compound can also be affected by the wide variety of chemicals used in and around the vehicle: coolant, oil, power steering and transmission fluid. Tiny bits of dirt, grease or sludge can also lodge in the pulleys, causing damage to the belt.

7. Bent or damaged pulley. Although a bent or damaged pulley is rare, it still can occur. A bent pulley on a compressor, alternator or power steering pump can cause belt damage very quickly. Observation of these pulleys under operation usually reveals any abnormality. A damaged pulley, such as a broken casting wall will cause a chewed belt edge or fraying.

8. Improper belt installation. Always follow the instructions enclosed with the replacement belt or indicated in the appropriate Subaru shop manual. Belts are not designed to stretch, so never use pry bars or screwdrivers to stretch a belt into place. Instead, release the tension, fit the belt into place and return the proper tension. Always use the correct alignment and tensioning tools to make sure a timing belt is properly fit, aligned and tensioned, and that all components are rolling smoothly.

Subaru timing belt alignment tools are available from your Subaru N.E.W. Horizons Dealer or on the Subaru Tech Information System website at *http://techinfo.subaru.com*, where there is a link to the Subaru Special Tool website at *http://subaru.spx.com*.

The following table may help you diagnose belt problems:

Belt Inspection and Diagnosis

Condition	Causes
Cracks or Splits	• Improper alignment • Improper tension adjustment • Contamination or debris in pulley • Damaged or wobbly pulley • Deterioration from excessive heat or chemicals
Worn Belt Teeth	• Improper alignment • Contamination or debris in pulley teeth • Deterioration from excessive heat or chemicals
Worn Edges	• Damaged or wobbly pulley • Improper alignment
Glazing on Back of Belt	• Sticking or frozen pulley or idler
Damage to Back of Belt	• Damaged or wobbly pulley • Improper tension adjustment • Contamination or debris in pulley • Deterioration from excessive heat or chemicals
Excessive Noise	• Improper alignment • Improper tension adjustment • Damaged or wobbly pulley • Belt or pulley rubbing against object

Subaru Belt Replacement Intervals

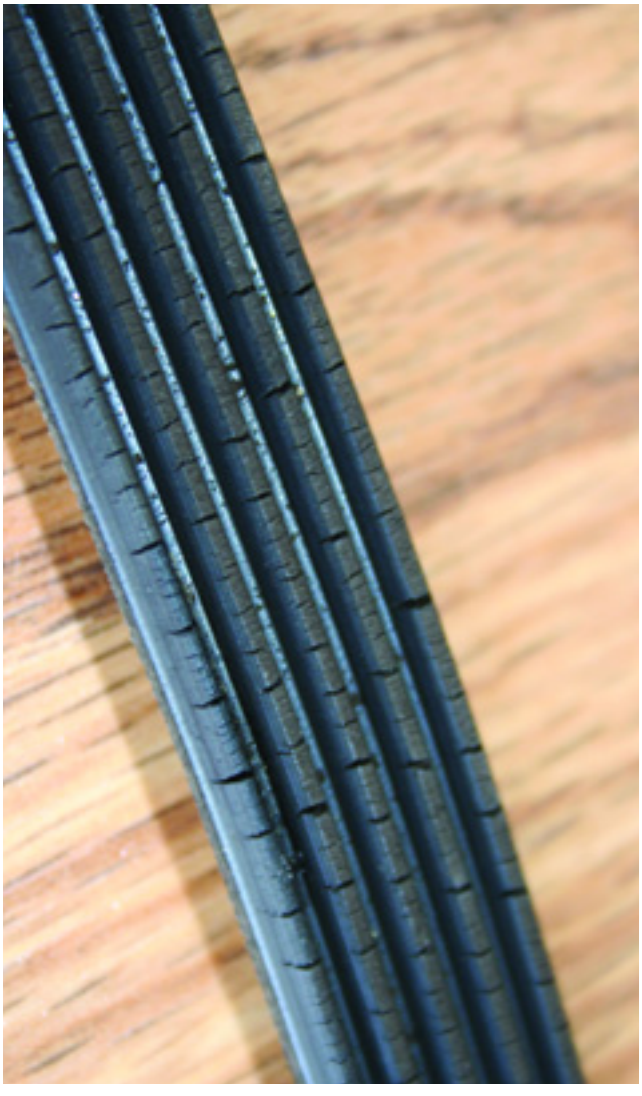
Subaru maintenance schedules called for belt inspection and replacement at various intervals. Due to improved accessory and camshaft drive systems, plus better quality belts, later models require replacement less frequently, although the inspection interval remains the same. The recommended intervals are detailed below, based on year and model.

1995 and Prior

All Models

Drive Belts: Inspect every 30,000 miles; replace every 105,000 miles on California vehicles; 60,000 miles on all others.

Camshaft Timing Belt: Inspect every 30,000 miles; replace every 105,000 miles on California vehicles; 60,000 miles on all others.



Inspection of accessory drive belts is required every 30,000 miles.

1996-1997

Impreza & SVX 1.8L, 2.2L and 3.3L

Drive Belts: Inspect every 30,000 miles; replace every 105,000 miles on California vehicles; 60,000 miles on all others.

Camshaft Timing Belt: Inspect every 30,000 miles; replace every 105,000 miles on California vehicles; 60,000 miles on all others.

Legacy, Outback & Outback Sport

Drive Belts: Inspect every 30,000 miles; replace every 105,000 miles on California vehicles; 60,000 miles on all others.

Camshaft Timing Belt: 2.2L: Inspect every 30,000 miles; replace every 105,000 miles on California vehicles; 60,000 miles on all others.

2.5L: Inspect every 30,000 miles; replace every 105,000 miles.

Belt Wear, Noise and Slip Diagnosis

1998
Impreza, Legacy, Outback & Outback Sport
Drive Belts: Inspect every 30,000 miles; replace every 105,000 miles on California vehicles; 60,000 miles on all others.
Camshaft Timing Belt
2.2L: Inspect every 30,000 miles; replace every 105,000 miles on California vehicles; 60,000 miles on all others.
2.5L: Inspect every 30,000 miles; replace every 105,000 miles.

Forester
Drive Belts: Inspect every 30,000 miles; replace every 105,000 miles on California vehicles; 60,000 miles on all others.
Camshaft Timing Belt: Inspect every 30,000 miles; replace every 105,000 miles.

1999 and Later
All Models
All Belts: Inspect every 30,000 miles; replace every 105,000 miles.

Be sure to check the warranty & maintenance book for specific details regarding belt inspection and replacement intervals for the vehicle you are servicing.

Information on periodic maintenance service schedules and belt replacement procedures can be obtained by visiting the Subaru Technical Information System website at: http://techinfo.subaru.com.

Your local Subaru N.E.W. Horizons Dealer can supply accessory drive and timing belts for all Subaru vehicles.

Timing Belt Component Inspection and Replacement

A major belt manufacturer estimates that half of all timing belt replacement jobs are due to not replacing faulty idlers or pulleys during a previous timing belt job. Be sure to inspect all timing belt system components and replace any you find to be questionable.

Right: Your local Subaru N.E.W. Horizons Dealer maintains a good supply of Genuine Subaru timing and accessory drive belts.

Left: It's always a good idea to replace the T-belt tensioner with a genuine Subaru part.

The possibility of a crushed valvetrain because a questionable pulley or idler wasn't replaced is lessened. In such a case, a damaged engine can quickly turn a profit into a huge loss.

Be sure to tell customers why you recommend replacing all the belt components. Thoroughly explain the consequences of leaving a questionable component in place and the possible results. Once customers realize the value of replacing all the timing system components at the same time, they'll know you have their best interests at heart. They will benefit from the peace of mind, knowing you've provided them better reliability and greatly reduced the chance of developing a serious problem. ■