



# GATES POWERGRIP® TIMING BELTS

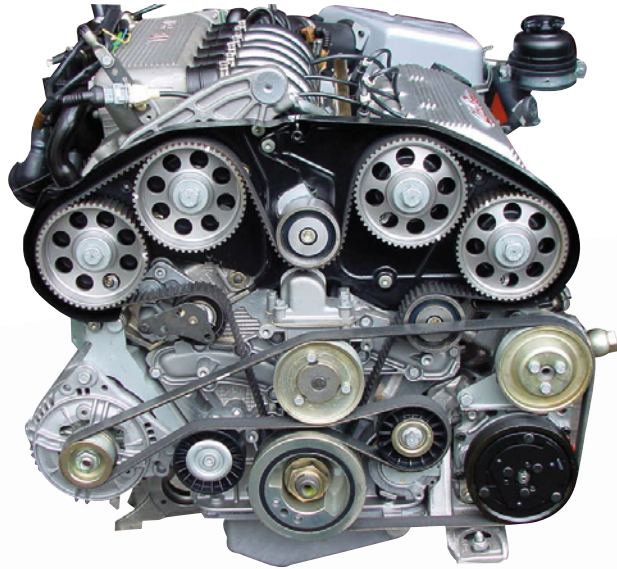
Your distributor:



## Gates PowerGrip® timing belts



*More than 100 million cars in Europe are equipped with a timing belt. Timing belts replaced chains on overhead camshaft engines because they are lighter, quieter, more efficient, more economical, and don't require lubrication. Moreover, they offer excellent resistance to corrosion and they do not stretch due to wear. Gates offers the automotive aftermarket a PowerGrip® timing belt for virtually every car on the road. And, what's more, Gates helps you sell PowerGrip® timing belts!*



### **Demanding applications put more stress on belts**

Today's highly sophisticated car engines operate at higher temperatures and higher speeds. Also, pulley diameters are smaller to save space under the bonnet and practically all engines now have overhead camshafts. These increasingly severe conditions put more stress on timing belts. A quality timing belt provides quiet, reliable, low maintenance performance kilometre after kilometre. For maximum durability, and to avoid premature engine failure, only OE equivalent belts should be used.

### **Gates timing belts are OE equivalent**

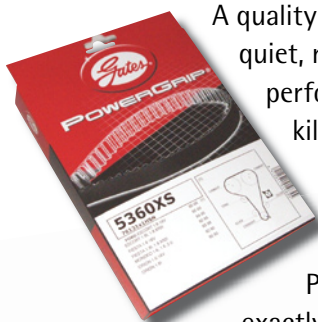
Gates timing belts are manufactured to the toughest OE requirements and are specified by car manufacturers around the world. We provide timing belts for new engines to major OEMs in Europe, America, Asia and Latin America. This worldwide customer base stems from Gates' engineering and manufacturing capability and its unique know-how on materials and design expertise.

### **Automotive manufacturers using Gates belts**

Alfa Romeo	Iveco	Peugeot
Audi	Jaguar	Porsche
Autovaz	Land Rover	Range Rover
Chrysler	MAN	Renault
Citroen	Mazda	Seat
Dacia	Mercedes	Skoda
Daewoo	Mini	Subaru
Fiat	Mitsubishi	Toyota
Ford	Nissan	Volkswagen
Honda	Opel	Volvo

# What's in a name?

## 1. Gates PowerGrip® timing belts



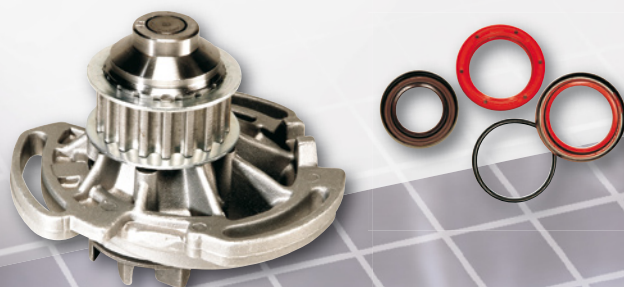
A quality timing belt provides quiet, reliable, low maintenance performance kilometre after kilometre. Thanks to the high-quality materials and the well-thought-out construction, Gates PowerGrip® belts provide exactly what you need.

*A PowerGrip® Kit contains, depending on the application:*

- 1 or 2 timing belts
- the necessary idlers/tensioners
- metal support plates
- installation instructions
- other parts needed for a complete overhaul (bolts, springs, etc.)

*A PowerGrip® Kit Plus offers, in addition:*

- oil rings and seals and/or
- the application-specific OE quality water pump



## 2. Gates PowerGrip® Kits and PowerGrip® Kit Plus

A badly functioning timing belt drive system can cause serious problems, so a safe drive system that operates perfectly is no luxury. It is highly probable that the source of damage to one element in the drive will also have affected the other components of the system. The best way to guarantee a perfect and safe performance is to change timing belts, idlers and tensioners at the same time. Gates' range of PowerGrip® Kits offers the perfect solution.

Gates also offers special kits, called PowerGrip® Kit Plus, which contain either extra oil rings and seals or the water pump. With PowerGrip® Kit Plus, all critical elements of the timing belt drive are available for replacement.

All components are manufactured by OE suppliers, to ensure premium quality for all elements in the kit. They come in a practical carton, fit for the application.



### 3. Gates sonic belt tension tester STT-1

Proper belt installation tension is essential for optimum performance and reliability of timing belt drives. Experienced mechanics may feel they are able

to check belt tension by rule of thumb, but tension results vary from one operator to another. That is why Gates recommends using the new sonic belt tension tester STT-1: it measures belt installation tension accurately every time.



#### *Specifications*

- All tension values and drive characteristics are programmed in the device
- Belt frequency analysis
- Database covers all the most popular car models in Europe
- Reduced sensor size and high wire flexibility
- Suitable for Gates belts only
- Easy to use

### 4. Gates professional automotive tool range

Gates now also offers a line of 4 universal and 11 engine-specific tools for synchronous and accessory belt drive systems. These high-quality tools allow Gates to be a "one-stop-shop" supplier

for all products and services needed to provide a complete, professional and OE equivalent maintenance of belt drive systems. Gates new tool range covers the most popular car engines and is therefore the ideal solution for every professional automotive technician.

#### *Key benefits*

- All belt drive products and tools available from one supplier
- Professional tools
- State-of-the-art technology
- Instructions included

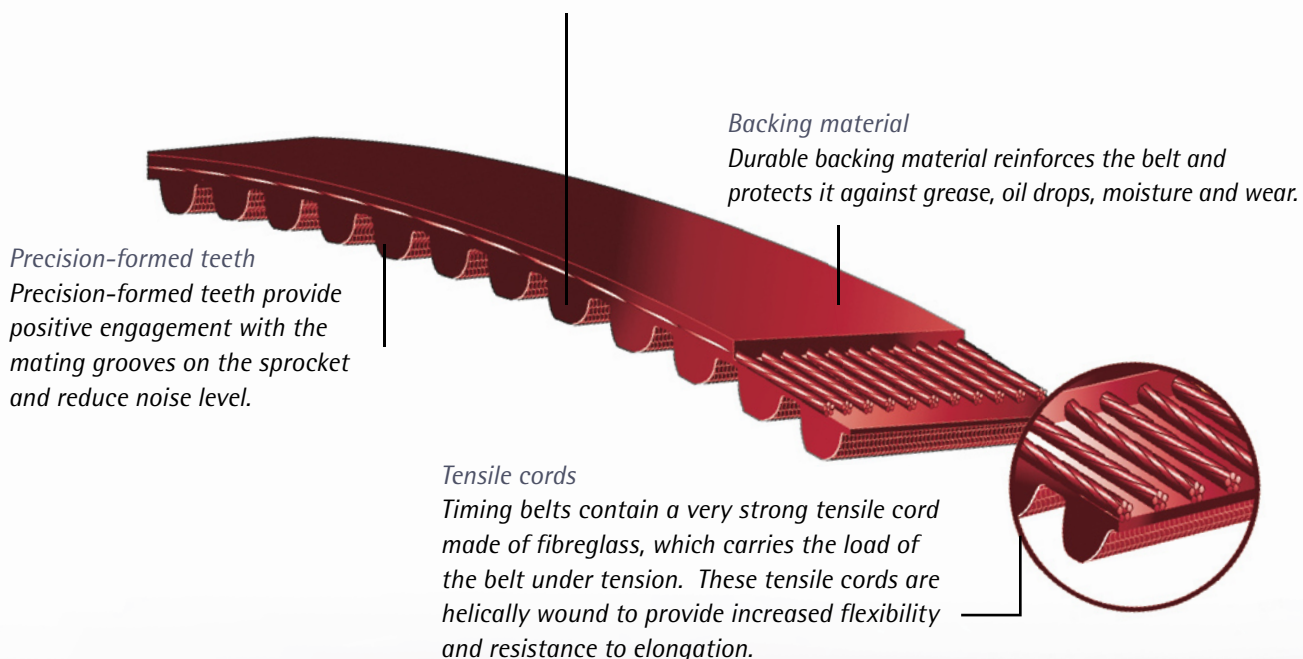


## PowerGrip® timing belt construction

### Belt compound

Gates PowerGrip® timing belts are manufactured with a durable rubber compound. Highly saturated nitrile (HSN) is the material of choice of most new engine timing belts. Until 1985, when Gates introduced the first belts made of HSN, polychloroprene was the standard material. An HSN-constructed belt appears no different from a polychloroprene belt, but significantly outperforms it in the high-temperature engine compartments of modern vehicles.

HSN belts are worth the price. They cost more than polychloroprene belts, but that is a small percentage of the total cost of replacing a belt and they are absolutely necessary for acceptable service life. As today's engines require high-performance belts, car manufacturers are using HSN in so many new engines, and so is Gates. Belts made of polychloroprene cannot always provide adequate durability on the sophisticated engines of today's car models. HSN, ACSM, high-temperature polychloroprene and polychloroprene belts are not interchangeable.



### Tooth profile

The timing belt's tooth profile, providing a constant, slip-proof transmission of power, varies in size, shape and spacing. The earliest timing belts had a trapezoidal profile. More demanding applications led to the development of curvilinear and modified curvilinear profiles.



MODIFIED CURVILINEAR



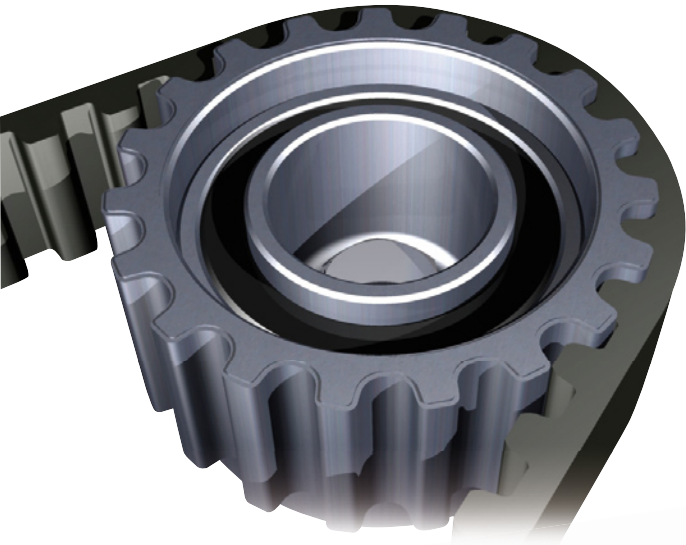
CURVILINEAR



TRAPEZOIDAL

Each tooth profile has its own characteristics and should exactly match the application. Tooth profiles are not interchangeable.

## Timing belt installation



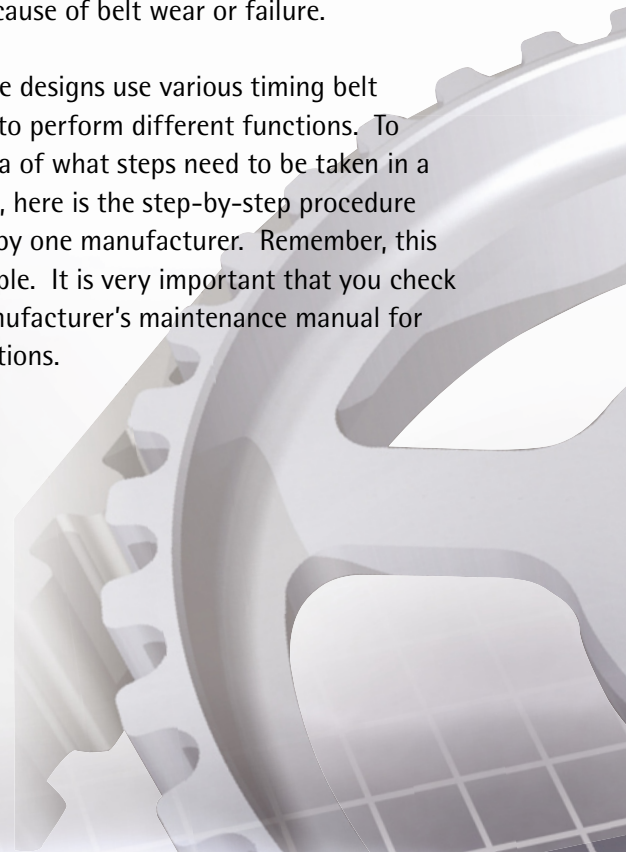
All Gates PowerGrip® timing belts will provide you with a long service if they are properly installed and maintained. Therefore, they have to be fitted in accordance with the car manufacturer's instructions to make sure that belt tension and engine timing are correct.

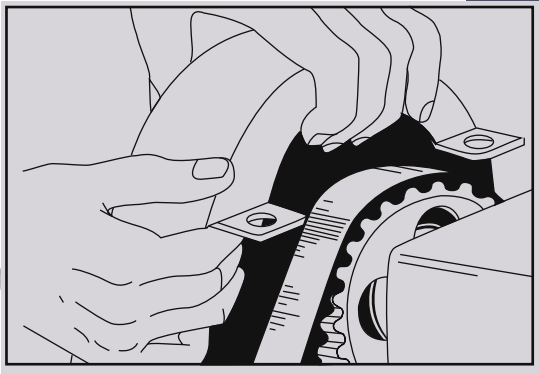
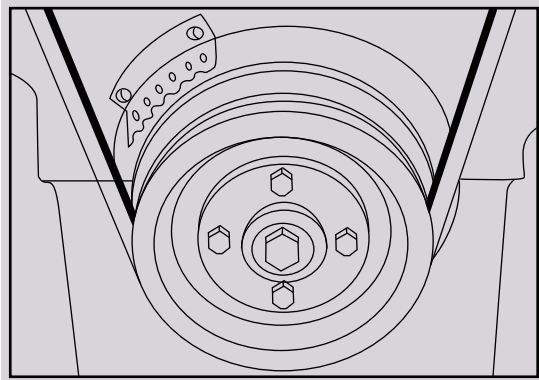
Before installing a new timing belt, read through this information and ask yourself the following questions:

- *Are you replacing the belt because the old timing belt broke, or is this a general maintenance procedure?*
- *If the old belt broke, is the engine operational?*
- *Have you previously installed a timing belt on this engine?*
- *Do you have the installation instructions and tension specifications from the car manufacturer's service manual?*
- *Do you have the required tools?*

How you answer these questions is very important. If the old belt broke, the engine of the vehicle may have sustained damage that must be repaired prior to the installation of a new belt. You can use the troubleshooting list further in this brochure to determine the cause of belt wear or failure.

Different engine designs use various timing belt configurations to perform different functions. To give you an idea of what steps need to be taken in a job of this type, here is the step-by-step procedure recommended by one manufacturer. Remember, this is just an example. It is very important that you check the vehicle manufacturer's maintenance manual for specific instructions.





## Belt removal

### Step 1

Disconnect the battery earth cable.\* **Make sure the engine is cold** before you start working on it.

### Step 2

Turn the crankshaft (in the direction of normal rotation) to TDC by aligning the "0" timing mark on the crankshaft damper. The distributor rotor should be lined up with the index mark on the distributor body.

### Step 3

Remove any belts, pulleys or hoses interfering with the removal of the timing belt cover.

### Step 4

Remove the timing belt cover.

### Step 5

Loosen the belt tensioner adjustment bolt.

### Step 6

Pry the tensioner away from the belt and retighten the tensioner adjustment bolt.

### Step 7

Remove the timing belt.

### Step 8

Carefully inspect the drive. Poor drive alignment, improper belt tension and worn pulleys all contribute to early belt failure. In case of excessive wear, replace the drive component immediately.

\* If the car radio has programmed broadcasting stations, write down the positions of the stations before you disconnect the battery. That way you can reset the radio when the replacement job is done.

## Belt installation

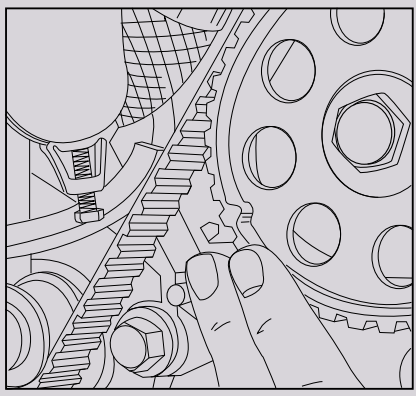
### Step 1

Make sure the timing marks are properly aligned.

- Crankshaft pointer at TDC.
- Distributor rotor aligned with timing mark on distributor housing.
- Camshaft pulley timing pointer aligned with mark on engine block.

### Step 2

Place the new belt over the pulleys, but be careful not to force it. **Never reinstall a used belt**, as tension values are calculated for new belts.



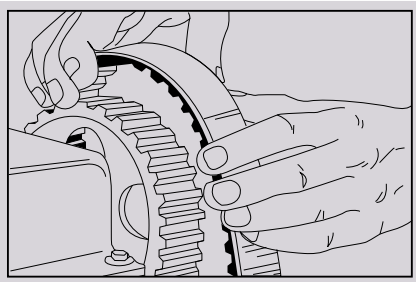
### Step 3

Loosen the tensioner adjustment bolt slowly, so that it can swing back against the belt. Be careful to ease the tensioner into position. Do not let it strike the belt a hard blow. Make sure the tensioner spring is engaged properly.

If there is no spring-loaded tensioner, tension the belt according to the vehicle manufacturer's recommendations.

### Step 4

Rotate crankshaft (in the direction of normal rotation) at least **two complete turns** to remove any slack in the belt and to allow the teeth of the belt to seat themselves perfectly in the pulley grooves.



### Step 5

**Loosen the tensioner** and retension the belt according to the vehicle manufacturer's recommendations. When the drive has a fixed tensioner, check the tension with Gates STT-1 sonic tension tester. Torque the tensioner adjustment and pivot bolts to the manufacturer's recommended torque setting.

### Step 6

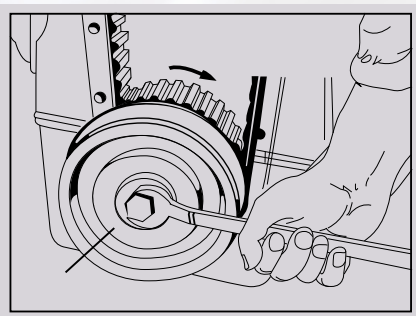
Reinstall the timing belt cover and all parts that have been removed. Torque all bolts to the manufacturer's recommended torque setting.

### Step 7

Reconnect the battery earth cable.

### Step 8

Start the engine, check the ignition timing and make any necessary adjustments. Reprogramme the radio stations.

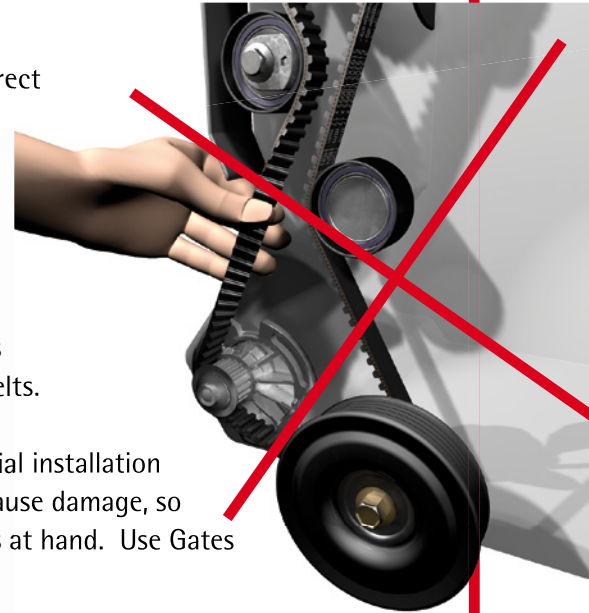


*As stated earlier, this is a procedure recommended by one manufacturer. These steps can differ significantly for the same job on another model or make of car.*



## Safety tips

- Timing belts are not interchangeable. Make sure you use the correct belt recommended in Gates catalogues.
- Handle the belt with care and store it in its protective box until installation. Never coil, crimp or twist timing belts, as this could damage the tensile cords.



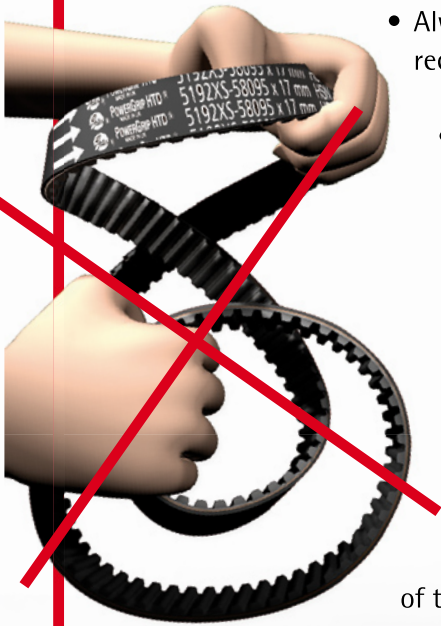
- Always follow the vehicle manufacturer's recommendations for replacing timing belts.

- Some car makers have designed special installation tools. Use of any other tool could cause damage, so make sure you have the right tools at hand. Use Gates professional automotive tools.

- Be careful not to force the belt.

- Never reinstall a used belt.

• If you have to replace one component of the drive, make sure you also replace the other components: it is highly probable that the source of damage to one element will also have affected the other components of the system. The best way to guarantee your customers a reliable drive system is to change belts and metal components at the same time. Gates range of PowerGrip® Kits and the PowerGrip® Kit Plus offers the perfect solution.

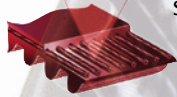


## Timing belt handling and storage



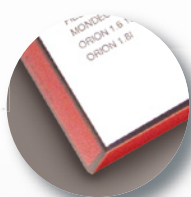
Timing belts contain a very strong tensile cord made of fibreglass.

Although these cords are very strong, they are also fragile. They have more tensile strength than the polyester cords found in V-belts, but they are not as flexible. Therefore, it is of utmost importance not to bend or crimp a timing belt. This could damage the tensile cords and thus shorten the belt's life.



Handle the belt with care and store it in its protective box until installation. The boxes should be suitably stacked to avoid crushing. Timing belts should be kept in a dry environment, out of direct sunlight and not subject to extreme temperatures.

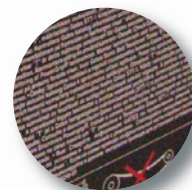
PowerGrip® timing belts are individually packed in boxes showing belt applications, drive layout, timing marks and installation tips; 10 boxes per carton. PowerGrip® Kits are handily packed in a sturdy cardboard box.



1. Sealed with hot melt glue



2. With mileage sticker



3. Information in your language



4. All the information you need




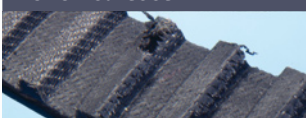







5. Anti-counterfeit holospot

## Troubleshooting guide

When a belt fails prematurely, it is important to determine why it failed, so that corrective action can be taken. In most cases, the cause of the failure is to be found in a problem with one of the drive components.

If the belt has to be removed for any reason, a new belt should be installed. Never refit a used belt. The following list, developed by Gates engineers, assists in spotting problems and correcting them.

Symptoms	Probable cause	Corrective action
 Tensile failure	Foreign body in drive	Ensure cover is correctly fitted
	Excessive installation tension	Install at correct tension
	Belt crimped due to improper handling	Observe handling instructions
 Tooth shear	Low tension	Install at correct tension
	Seizure of driven part	Eliminate cause
	Misalignment	Correct alignment
 Tooth wear	Incorrect tension	Install at correct tension
	Worn pulley(s)	Replace pulley(s)
 Hollowed teeth	Extremely low tension	Install at correct tension
	Loss of tension during running	Ensure tensioner screws are tight
 Back cracks	High temperature	Eliminate cause
	Low temperature	Eliminate cause
	Back idler is worn out	Replace back idler
 Land wear	Excessive tension	Install at correct tension
	Rough pulley(s)	Replace pulley(s)
 Oil contamination	Oil leak	Replace faulty oil seals
 Edge wear	Flange(s) damaged	Replace pulley(s)
	Misalignment	Correct alignment
 Noise	High tension	Install at correct tension
	Low tension	Install at correct tension
	Misalignment	Correct alignment
	Flange(s) damaged	Replace pulley(s)

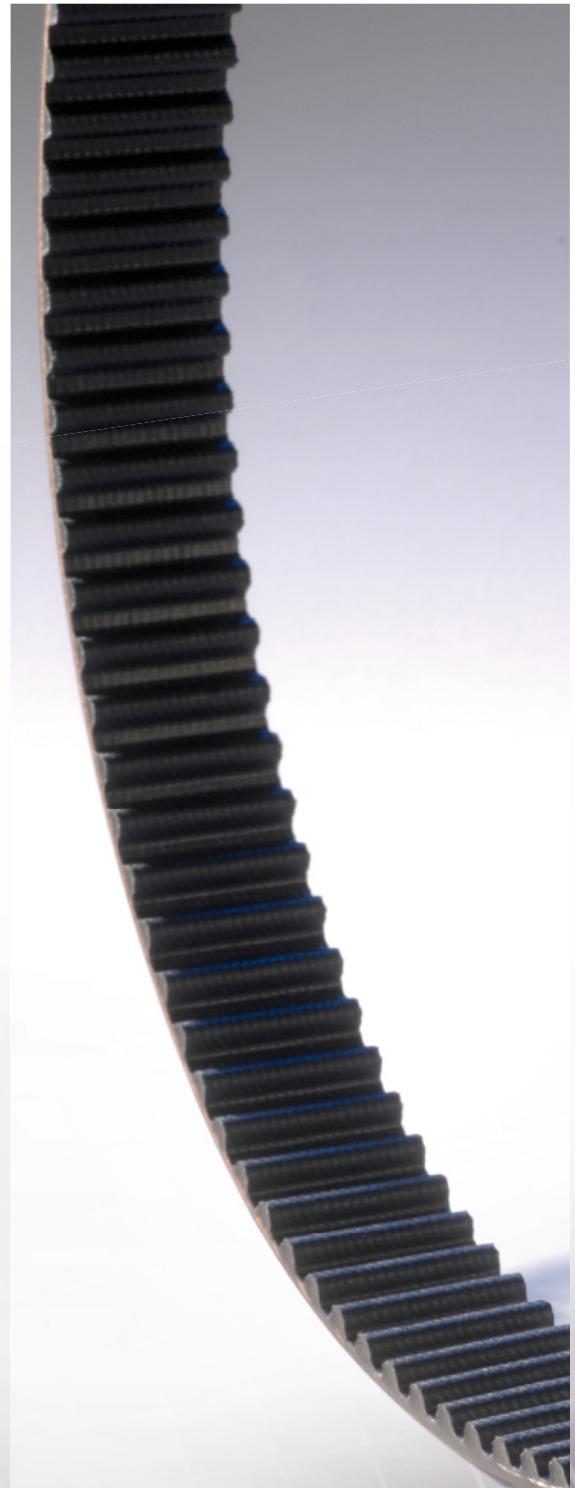
## Tools that help you sell Gates PowerGrip® timing belts

### PowerGrip® timing belt merchandiser

This handy and compact merchandiser has been specially designed to carry 15 timing belts. Out of the Gates timing belt range 15 belts can be selected to suit local market requirements. With this merchandiser, you will always have replacement belts readily available to ensure fast and perfect service.

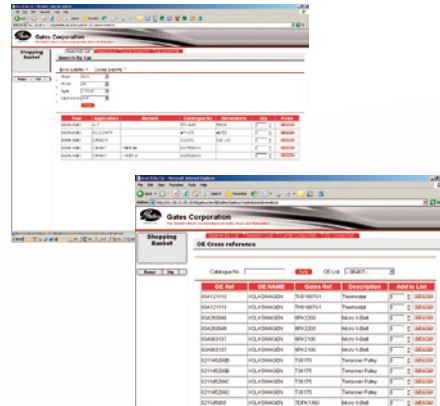
### Training video tape

This training tape gives information on how to install and maintain V-belts, Micro-V® XF multi-ribbed belts and PowerGrip® timing belts. The segment on timing belts covers the belt's basic function, construction and handling, inspection of belt and drive and general guidelines on proper installation.



## In-depth technical training

Gates has created a new Pan-European team responsible for Technical Support and Training. The brief is to develop training initiatives and technical service concepts that will support product development and sales. One of the objectives is to increase awareness about the benefits of thorough drive system inspections and complete system overhauls as part of every scheduled accessory or synchronous belt change.

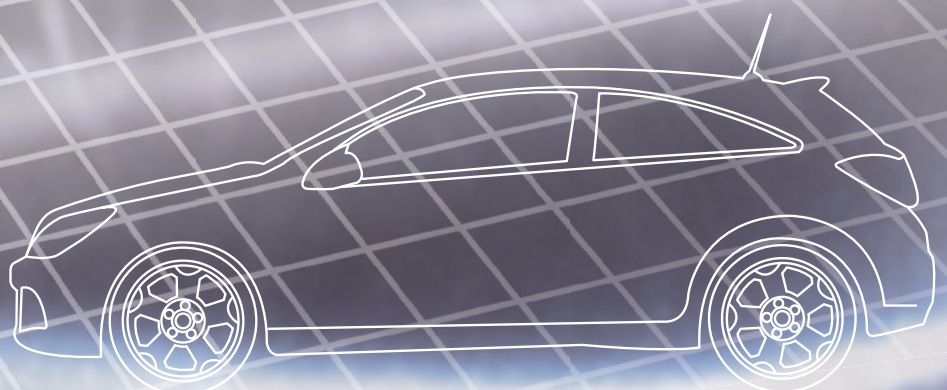


## Cataloguing

Complete information on timing belt references can be found in the passenger car belt catalogue or in our online catalogue, at [www.gatesautocat.com](http://www.gatesautocat.com).

With this new and handy electronic catalogue, one mouse click is enough to find the timing belt you need, with the most up-to-date information.

Gates' application lists, giving application information for the most popular cars, are especially meant for garages and service stations. Next to a special numerical listing for PowerGrip® belts and kits, there is also a Manufacturers' part numbers list and a Competitive changeover listing, to help you find the right replacement belt.



## Let's recap

- Today's highly sophisticated engines, operating at higher temperatures, higher speeds with smaller sprocket diameters and with greater horsepower loads demand tougher, more durable timing belts, usually made of HSN.
- Although HSN is expensive and difficult to engineer, HSN belts significantly outperform polychloroprene belts in today's high-temperature engines.
- Even though belts may look alike, they are not interchangeable. Attempts to save money with a belt that is not OE equivalent may result in early engine failure.
- The heart of the timing belt is the tensile cord made of fibreglass and carrying the load of the belt under tension. Fibreglass cords have more tensile strength than polyester cords, and assure a constant length.
- Only with the correct belt, optimum performance and vehicle life can be achieved.



## Why choose Gates PowerGrip® timing belts?

- Gates has the most complete line of OE equivalent timing belts of any manufacturer.
- Gates sells more belts to OEMs than any other belt manufacturer.
- Gates leads the way in timing belt technology, introducing design changes in materials and tooth profiles.
- Gates helps you sell timing belts, by providing technical support and marketing programmes.
- Gates keeps investing in quality, research and development in order to meet customers' existing and future requirements. As recognition for its commitment to innovation and quality, Gates has acquired – in addition to the ISO 9001 and QS-9000 quality registrations – major quality awards from its key customers. Thanks to this quality programme, Gates has the potential to remain at the leading edge of innovation in the 21st century.

### Caution!

Use Gates PowerGrip® timing belts and kits only on applications specified in Gates literature. Install and maintain the belts/kits according to the vehicle manufacturer's recommended procedures and with recommended tools. Failure to follow these instructions could result in injury or property damage. Gates disclaims all liability due to failure to follow these instructions.