TECH NOTE

AUTOMOTIVE – PASENGER CAR

CORRECT TIMING BELT CLEARANCE IS CRITICAL ON 2.0/2.5L MAUNUAL APPLICATIONS

BULLETIN: TSB002_AU

PART NUMBER:

- T172
- T254
- T277
- T277R
- T304
- T304R

KIT PART NUMBER:

- TCKH172
- TCKH254
- TCKH277
- TCKH277B
- TCKH277C
- TCKH304
- TCK254
- TCK277C
- TCKWP254

ENGINE:

- 2.0L SOHC/DOHC, Manual transmission
- 2.5L SOHC/DOHC, Manual Transmission

IMPORTANT:

- Incorrect clearance between the guide plate and timing belt in specific 2.0/2.5L engines (with manual transmission) causes extreme overheating, and engine seizure.
- There are over 200,000 vehicles on road across Australia and New Zealand that are impacted by this issue.
- Correct installation practice is critical (and getting it wrong can have very costly implications).
- Gates is the ONLY supplier of a specifically designed tool ('The Gates Spacer Tool') that assists the automotive technician to achieve correct and even clearance between the timing belt and guide plate, and helps resolve the issue.
- The 'Gates Spacer Tool' is automatically included in the Gates Timing Component Kits relating to affected applications.

IN THIS TECHNICAL SERVICE BULLETIN:

- What is occurring in 2.0/2.5L manual transmission engines?
- Why is this problem occurring?
- How to avoid the problem.

WHAT IS OCCURRING IN 2.0/2.5L MANUAL TRANSMISSION ENGINES?

There is a growing number of timing belt and component failures on popular engines. More specifically, the nature of the failure indicates an exposure of the tensioner unit and idlers to extreme heat. In some cases, the heat is so severe that it has melted the top cover of the timing belt. This extreme heat results in the failure of the automatic tensioner, influences the timing belt to 'jump teeth', and ultimately causes serious engine damage. Gates Australia has seen cases where the heat generated has been so severe that the bearings have disintegrated with the vehicle having travelled less the 50 kilometres.

TECH NOTE

The diagram below (Fig. 1) shows a typical result of the excessive heat generated from this issue:

The vehicles affected by this issue are mainly 2.0L/2.5L, SOHC/DOHC, manual transmission engines.

With over 200,000 vehicles on road across Australia and New Zealand, it is very important that all automotive technicians are aware of this issue, and are armed with the correct protocols to ensure they can avoid any unnecessary complications.

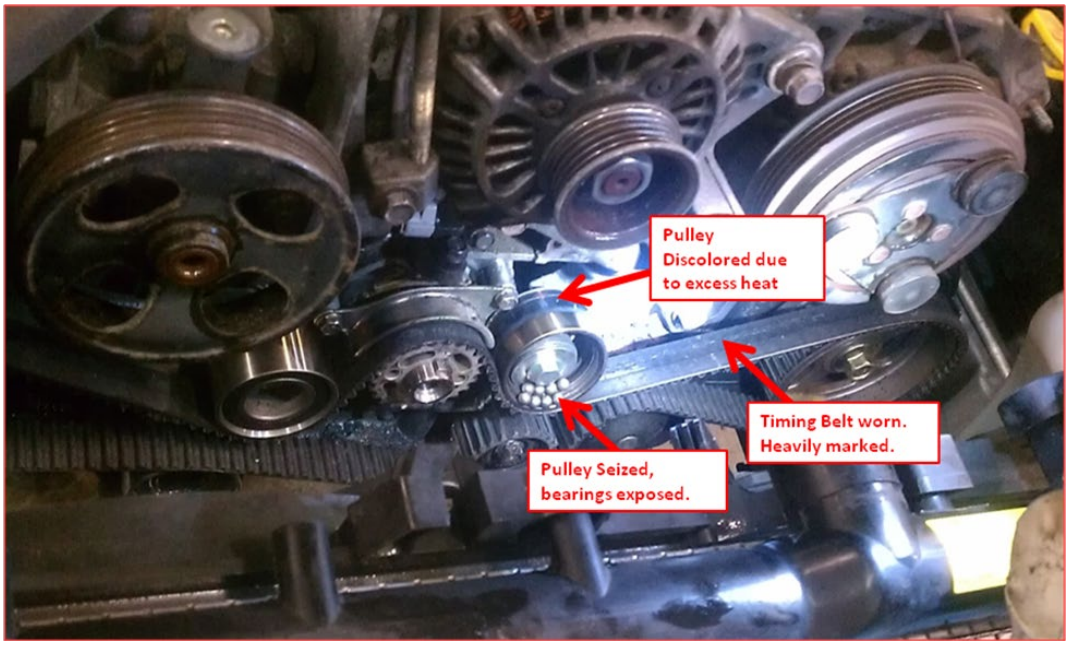

Fig. 1

WHY IS THIS PROBLEM OCCURRING?

A large number of 2.0/2,5L models (particularly with manual transmission) are fitted with a timing belt guide plate which is located directly above the crank shaft pulley. The purpose of the guide plate is to prevent belt 'tooth jump', and as such, is positioned very close to the timing belt.

Having said this, upon installation, the rotation of the bolts which secure the guide plate to the engine naturally forces the guide plate down towards the belt (see Fig. 2 below). If the guide plate is installed too close to the belt or if the bolts on the guide plate aren't tightened correctly, the plate can make contact with the timing belt cover. Any contact between the guide plate and belt, and/or an incorrect clearance between the timing belt and guide plate, will cause friction and generate excessive heat. This extreme heat will compromise the bearing's lubricant and lead to bearing seizure/failure.

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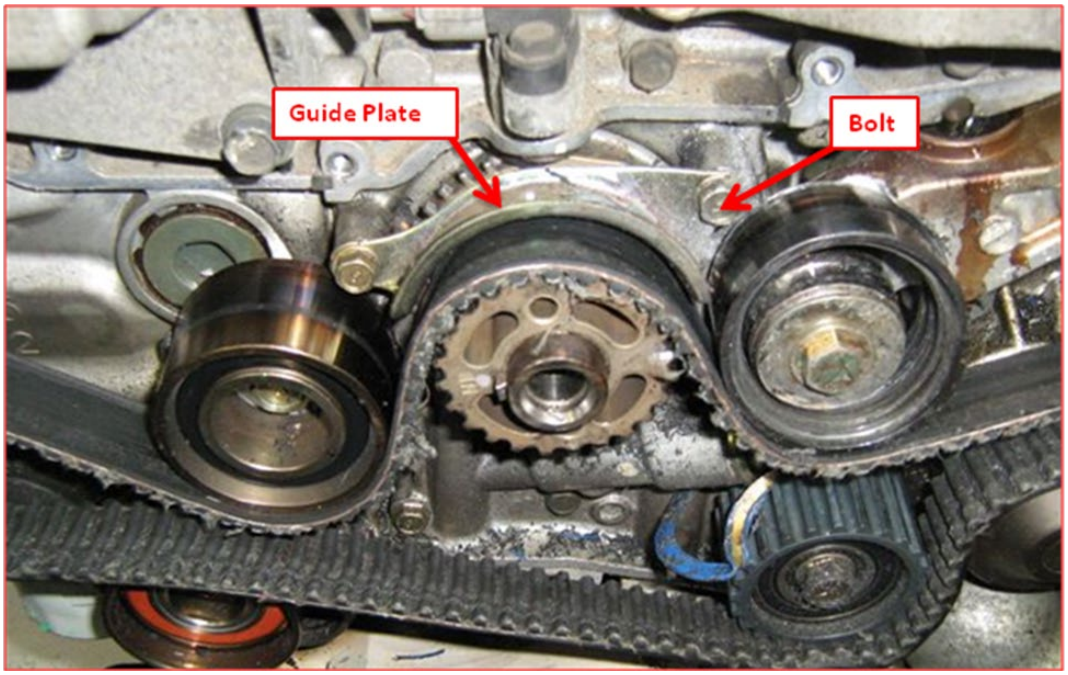

Fig. 2

Please note:

- Upon installation, the guide plate must have a clearance of 1mm +/- 0.5mm to the belt.
- Having said this, the mounting holes on the guide plate are larger than the bolt which fastens it, and this effectively makes the plate position adjustable. As the bolts are tightened to secure the plate, the rotation of the bolt naturally pushes the plate down towards the belt.
- Given the complexity and the limited space in the engine bay of these vehicles, it is almost impossible to achieve the correct clearance through visual inspection (unless the engine is removed from the vehicle).
- This is why the failure mode is becoming more prevalent.
- Also, clearance distance needs to be consistent across the full arc of the plate.
- As such, while there may be adequate clearance in one section of the guide plate, a fitter MUST ensure that the same applies to the other section. As pictured, the top of the guide has clearance however the left side doesn't (Fig 3.).
- This is a very common problem.

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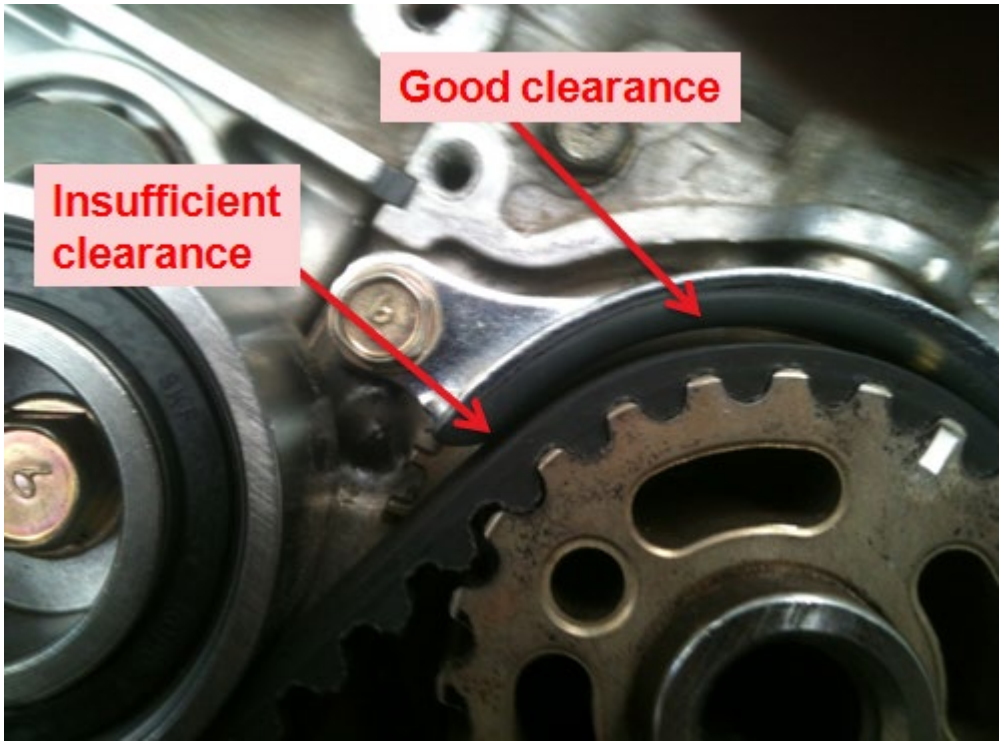

Fig. 3

HOW TO AVOID THE PROBLEM:

Unless special care is taken to ensure that the correct clearance is achieved between the timing belt and guide plate, this failure mode will occur. In addition to this, the correct clearance needs to be achieved consistently across the FULL arc of the guide plate.

Given the complexity and the limited space in the engine bay of these vehicles, it is extremely difficult to achieve the correct clearance through visual inspection (unless the engine is removed from the vehicle). As such, Gates has created an innovative and specifically designed gauge to help automotive technicians achieve the correct clearances required. This gauge is called 'The Gates Timing Belt Spacer Tool' (Fig 4.).

Fig. 4

The final step of replacing the timing belt is to mount the guide plate. After loosely tightening the guide plate bolts the Gates Spacer Tool is inserted between the belt and the plate. The bolts are then firmly tightened with the tool still in place. The tool is then removed leaving an ideal clearance between the plate and the belt.

THE GATES SPACER TOOL:

The Gates Spacer Tool is Australian Design Registered with a Patent Pending, and is specifically designed to assist the automotive technician achieve correct and even clearance between the timing belt and guide plate

in the affected applications (Fig. 5). Further, the tool is accurate, safe and easy to remove upon completion of the job.

Best yet, the Gates Spacer Tool is provided with the Gates Timing Component Kits that suit the affected engines. So, all you need to do is look up and order the correct part number for the vehicle. The tool will be automatically supplied within the kit. The letter 'T' has been added to the part number to indicate that the spacer tool is included; an example of this is shown below.

Current kit part number: TCKH304.

Same kit with spacer tool included: TCKHT304.

A complete list of relevant part numbers can be found on Gates website at www.GatesAustralia.com.au/spacertool.

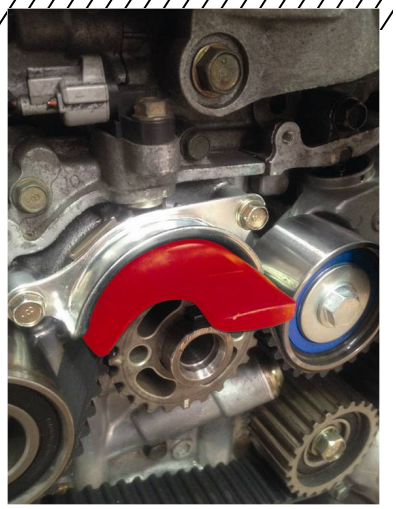

Fig. 5