

#21-H-004: Technical Service Bulletin – Vibration – Boom 90–100 km_h - (Apr 19, 2021)

Subject: 21-H-004 Technical Service Bulletin – Vibration – Boom 90–100 km/h



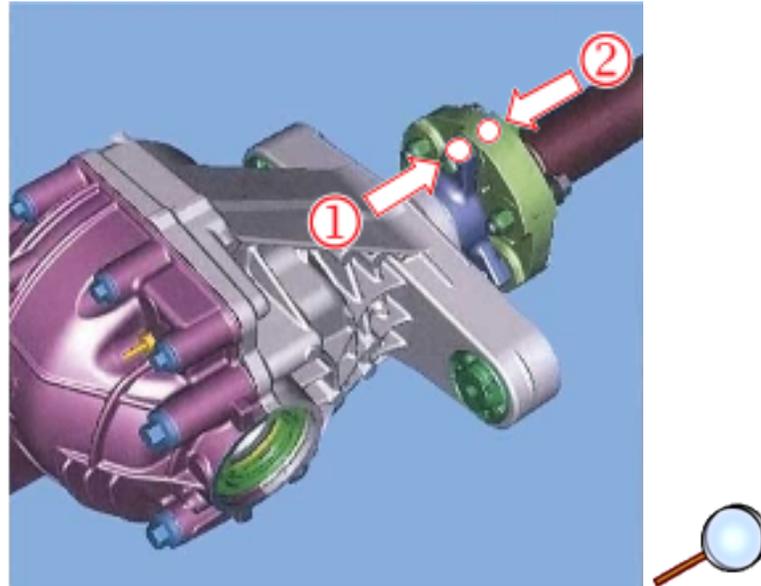
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Note: This bulletin replaces Techline TL2512-1409.

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Holden	VF Commodore	2014	2017	-	-	All	All
	WN Caprice						

Involved Region or Country	Australia / New Zealand
Additional Options (RPO)	
Condition	<p>A customer may present their VF/WN vehicle to the dealership with complaint of a vibration or boom that can be felt through the body and/or seat within the speed ranges of approximately 90-110 km/h.</p> <p>This vibration may be described by some customers as a cyclic type vibration or boom.</p>
Cause	

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The propeller shaft and differential pinion flange are marked with orientation marks (1,2) so that when they are assembled at the vehicle assembly plant any minor imbalances cancel each other out so as to achieve optimum balance. This is known as 'phase matching', Refer to illustration above.

In some instances however, the point of highest imbalance may fall in between two of the flange mounting bolt holes, in which case the closest mounting hole is marked/used. This condition can occur to both the propeller shaft and the differential flange.

As a result, although the balance markings are aligned during assembly, it may be possible that any imbalance points of the prop-shaft and differential flange may not be in their optimum positions.

Correction – Production	There is continuous improvement activities underway in both the component supplier and assembly plant to reduce any imbalance issues.
Correction – Service	After road-testing confirms a vibration or boom is only present between 90-110 km/h and unrelated to engine load & RPM, and tyres/wheels have been eliminated as a cause, then trial the propeller shaft mounting in alternate positions via the procedure detailed in this bulletin.

Diagnosis and Definition

Important: Any road testing is to be performed only where road speed limits allow for and when safe to do so.

Diagnosis Aid

Technicians Guild article No. 6 released August 2014 is devoted to Noise & Vibration and contains useful information and tips that will further aid the diagnosis of noise and vibration issues. As an example an extract of information from this article is presented further below to help aid diagnosis.

Where ever possible it is recommended to road-test the vehicle with the customer so as the technician can gain firsthand the necessary information to induce the customer complaint.

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This potential propeller shaft imbalance issue will appear between 90-110 km/h and would still be present whilst coasting in neutral (unrelated to engine load), and presents as boom or fast frequency vibration felt through the seat or body.

Below is an extract of information from Technicians Guild article # 6 Aug 2014 to help technicians understand the typical frequencies (Hertz) of road wheels and a propeller shaft at given speeds.

(Hertz (Hz) = Cycles per second)

Example Vehicle: VF SS V8 Sportwagon fitted with Tyres/wheels - 245/45 R18 and axle ratio 2.92.

From chart below.

Tyre size 245/45 R18 at 100 km/h are rotating at 13.0Hz (13 revolutions per second).

Multiplying the wheel rotational frequency by the axle ratio gives you the propeller shaft rotating frequency (wheel rotational frequency 13.0Hz multiplied by axle ratio 2.92 = 37.96Hz).

Conclusion: At 100 km/h whilst the road wheels are rotating 13.0 times per seconds (Hz), the propeller shaft is rotating 37.96 times per second (Hz).

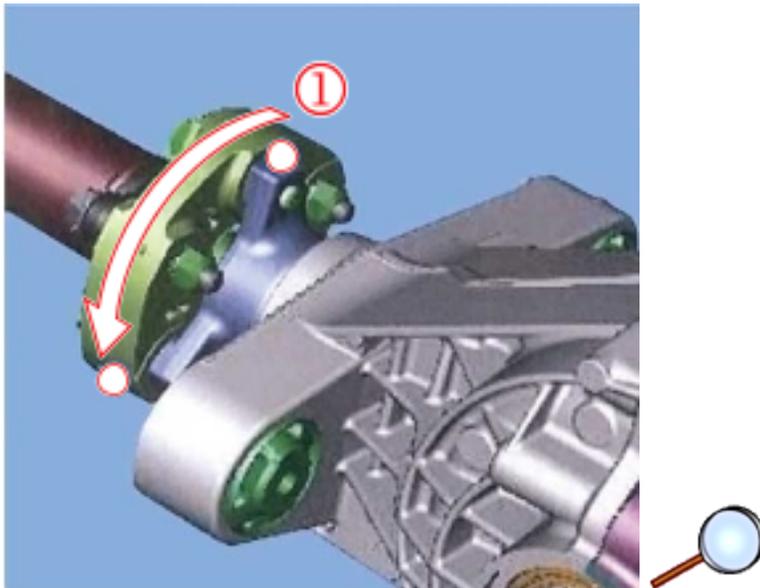
In this example a propeller shaft imbalance issue would typically produce a vibration nearly four times faster than that of wheels/tyres for the same speed. Technicians should assess if the vibration is consistent with tyre rotation speed or propeller shaft speed.

Examples — Tyre rotational speeds (more tyre size are listed in the Technician Guild article #6)

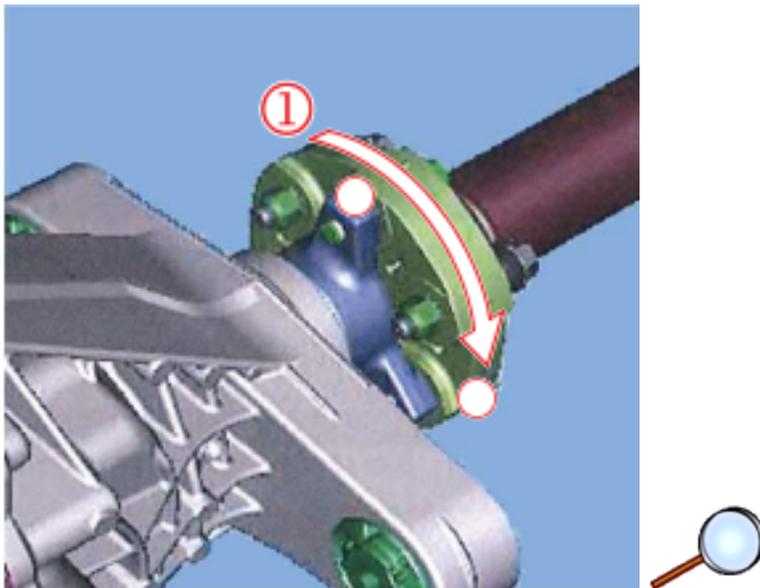
TYRE	Hz @ 20 km/h	Hz @ 40 km/h	Hz @ 60 km/h	Hz @ 80 km/h	Hz @ 100 km/h	Hz @ 120 km/h
225/55 R17	2.6	5.2	7.8	10.4	13.0	15.6
235/50 R18	2.6	5.1	7.7	12.8	12.8	15.3
245/45 R18	2.6	5.2	7.8	13.0	13.0	15.7
245/40 R19	2.6	5.2	7.8	13.0	13.0	15.6

Service Procedure

Note: If the customer complaint is outside of these speeds, then continue with normal diagnosis.



- Using a temporary marker, mark the propeller shaft to differential flange as shown in the illustration above.



- Unbolt the rubber coupling to differential joint, rotate the propshaft / coupling 1x bolt hole turn (1/3 of a turn) clockwise, refer illustration above, then reassemble using the existing bolts.
- Road-test vehicle again and evaluate vibration.
- If vibration concern is still present unbolt rubber coupling to differential joint again and rotate 1/3 turn counterclockwise from the original marked position, refer illustration above, and reassemble using the existing bolts.
- Road-test vehicle again and evaluate vibration
- Once the optimum propeller shaft to differential flange location is found, mark this new position with a permanent marker, **install new bolts** and torque to specification (90 Nm + 43 degrees).

Parts Information

Quantity	Part Name	Part No.
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Quantity	Part Name	Part No.
1	BOLT/SCREW KIT-PROP SHF	92267162*

Note: * Fastener kit consists of 3 bolts & 3 nuts.

Warranty Information

Labor Operation	Description	Base Time	Add Time
3083008*	Driveline/Axle Vibration	0.5 hr (1 x Propshaft rotation)	0.4 hr (2 x Propshaft rotations)
* Labour time correct at time of publication. Refer to Service Information (SI) for latest labour times			

Customer Complaint Category:	Customer Complaint Code:	Cause Code:
12	0144	3069

Version	01
Modified	20/04/2021 — Model Year extended to 2017.

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