Service Bulletin

File in Section: -
Bulletin No.: 17-NA-091
Date: October, 2017

TECHNICAL

Subject: Vibration Felt Throughout Vehicle While in AWD Cruising at Highway Speeds

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Cadillac	XT5	2017	2017				
GMC	Acadia						

Involved Region or Country	North America, Europe, Middle East, Russia, Israel, Japan, Korea
Condition	Some customers may comment that a vibration is felt in the steering wheel, front or rear seats or cabin body boom while cruising at a steady state at highway speeds from 60-75 mph (96-120 km/h) in AWD mode.
Cause	This condition may be caused by the driveshaft being out of balance.

Correction

Perform a subjective vehicle evaluation. Refer to Diagnostic Information and Procedures in SI.

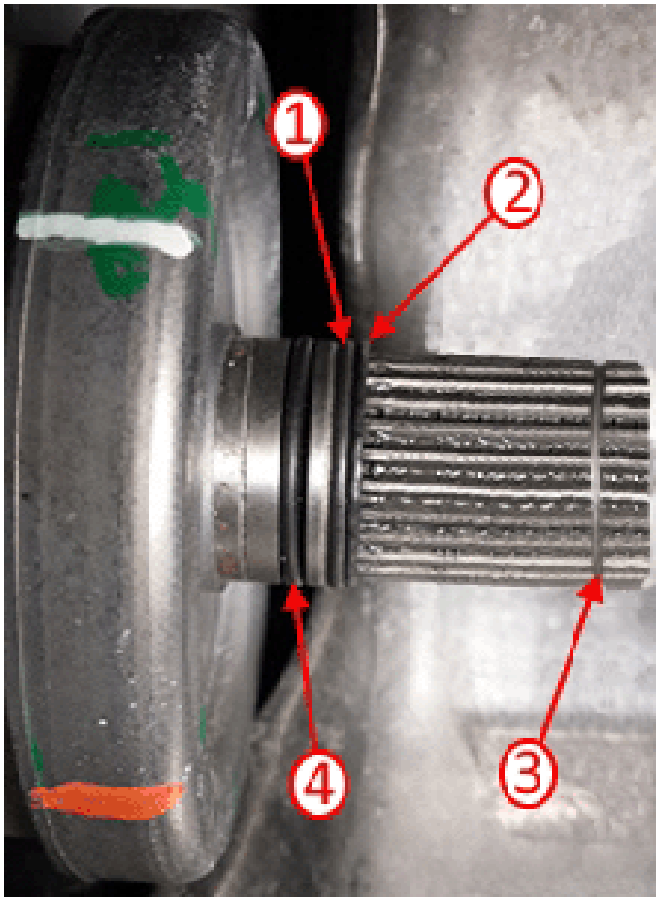
1. Identify a smooth highway road.
2. Drive slowly with light throttle input through the 60-70 mph (96-112 km/h speed range (or the maximum legal highway speed).
3. Maintain 70 mph (112 km/h) (or maximum legal highway speed) in cruise control for at least 15 seconds.
4. Assess vehicle vibration and/or boom levels at steady state.
   - Monitor the steering wheel, front seat, rear seat vibration and cabin boom.
5. Reduce speed, and enable AWD mode: 4WD mode for Acadia or AWD mode for XT5.
6. Drive slowly with light throttle input through the 60-70 mph (96-112 km/h) speed range (or the maximum legal highway speed).
7. Maintain 70 mph (112 km/h) (or maximum legal highway speed) in cruise control for at least 15 seconds.
8. Assess vehicle vibration and/or boom levels at steady state in comparison to FWD mode steady state.
   - Monitor the steering wheel, front seat, rear seat vibration and cabin boom.

If vibration level and/or cabin boom level is considered objectionable in both FWD and AWD modes, **Do Not** proceed with the procedure and refer to SI for further diagnostics.

If vibration level and/or cabin boom level is considered acceptable in FWD and is considered objectionable in AWD modes, shimming of the torque tube shaft splines and a PicoScope system balance are required.

Torque Tube Shaft Setup Procedure

Shim the torque tube shaft spline interface



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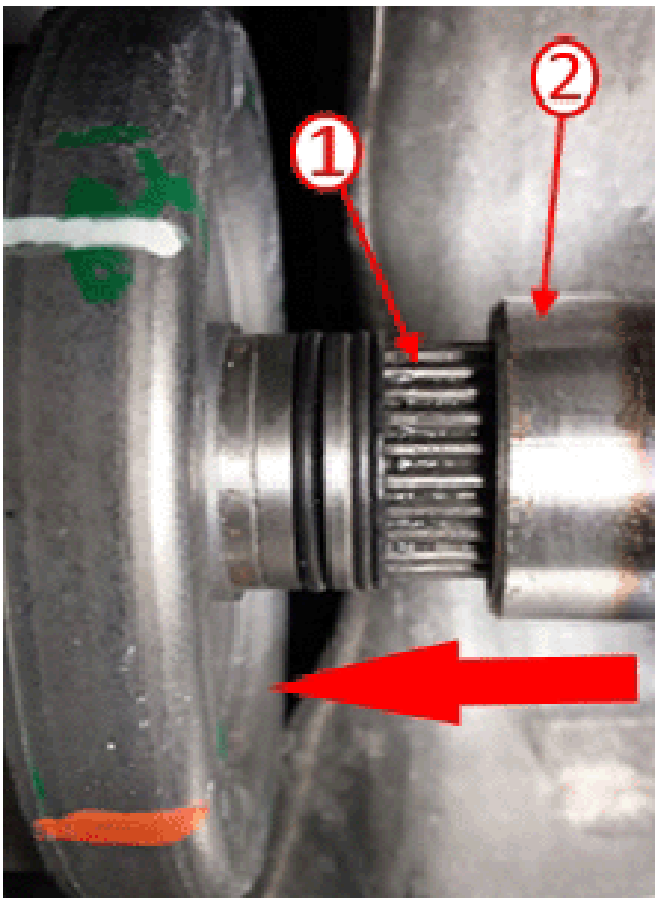
Note: Two different size O-rings will be required to properly shim the joint.

1. Disengage the propshaft from the torque tube output shaft. Refer to *Two-Piece Propeller Shaft Replacement* in SI.
2. Remove and discard the driveline torque tube shaft retaining ring (3).
3. Inspect the inner sealing O-ring (4) for damage and replace only as necessary.

Important: Positioning of the O-rings is critical for the effectiveness of the procedure.

4. Slide larger SAE #018 O-ring (7/8” O.D - 3/4” I.D.) (1) over the torque tube shaft so that it sits at the base of the splines.
5. Slide the smaller SAE #015 O-ring (11/16” O.D - 9/16” I.D.) (2) over the torque tube shaft so that it sits just in front of the larger O-ring.
6. Install new retaining ring (3).



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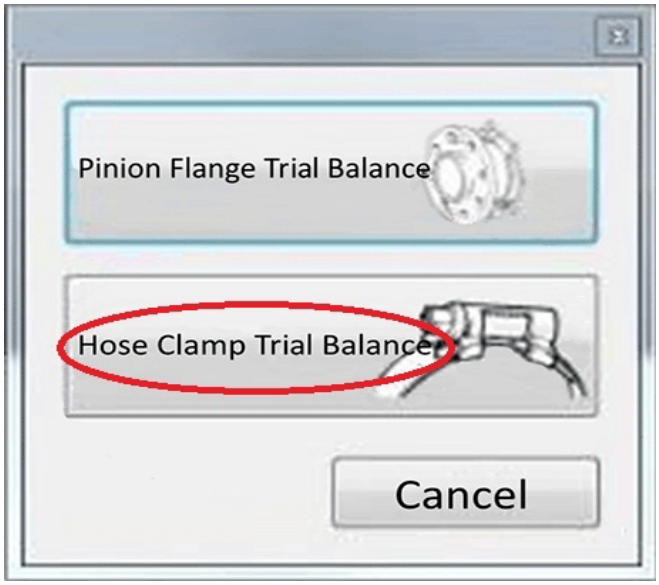
7. Using care not to damage or move the O-rings out of position, install the propshaft (2).
8. Verify the propshaft is fully installed and the retaining ring is engaged onto the torque tube drive shaft (1).
9. Perform a PicoScope system balance.

Propshaft Balancing and Data Capture Procedure

Propshaft Balancing Setup Procedure

1. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle* in SI.
2. For initial safety warnings and instructions for battery replacement, connections, magnet mounting, storage and troubleshooting the NVH Interface, refer to Quick Start Guide.
3. Install software on laptop to be used with the Pico tool:
   - Go to http://www.gmtoolsandequipment.com
   - Login with your dealer’s credentials.
   - Select “Download GM NVH r.1.7.25” (or later) from “NVH Downloads.”
4. Open the GM NVH program.
5. Follow setup wizard instructions to setup the PicoScope front end, interface boxes, accelerometer and tachometer.
6. Select the Balance button.



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7. Select the Hose Clamp Trial Balance button at left of the screen.

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8. Select Wizard button.
9. Click the Next button.
   - Follow the setup wizard instructions to setup the PicoScope tool.

Setup Specific for the Cadillac XT5/GMC Acadia Application

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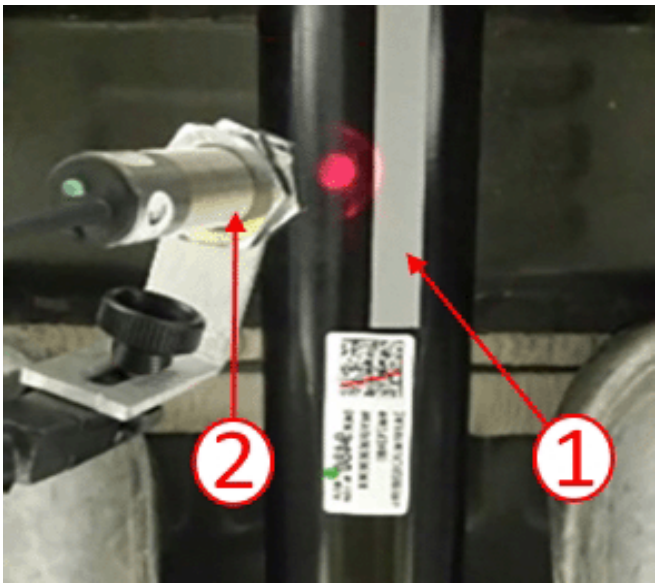
1. Place the magnetic base for the tachometer optical sensor on the gas tank shield near the prop shaft, or on the fuel tank strap.
   - Add a zip tie or tape to ensure magnetic base does not fall if bumped during installation or removal of balance weights.



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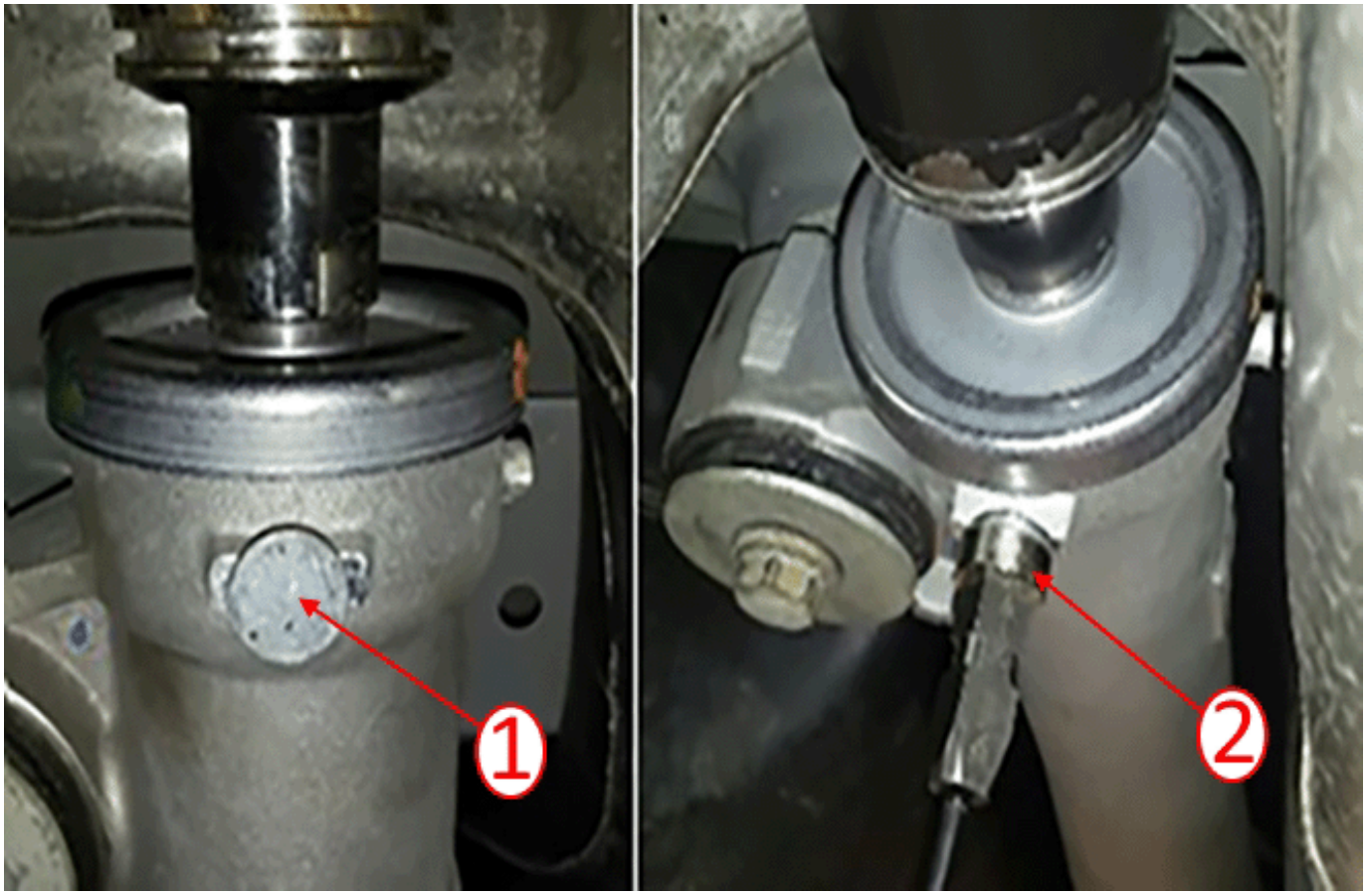
2. Adjust tachometer laser (2) to within a few inches of the propshaft.
3. Place a strip of reflective tape (1) lengthwise along the propshaft so the laser can sense when the propshaft is rotating.



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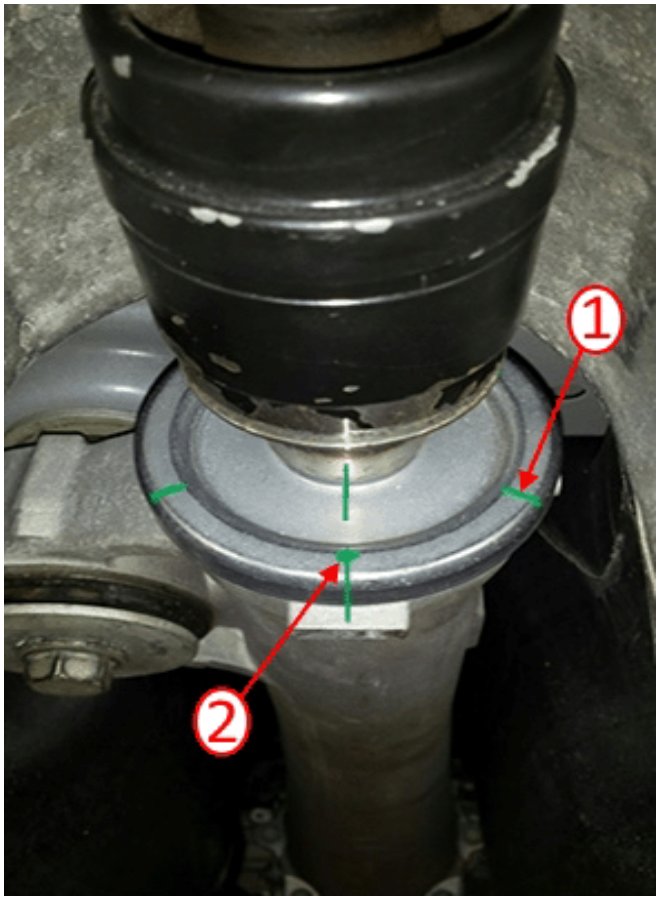
4. Glue the steel accelerometer base plate (1) to the flat spot at the front of the torque tube.
5. Place the accelerometer (2) on the base plate.
6. Type 16 grams when prompted for the hose clamp weight.

Note: The Diameter of the propshaft will be auto corrected during procedure.

7. Type 113 mm when prompted for the circumference of the shaft.
8. Check the “Edit Manually” box and type 1320 RPM when prompted to select the shaft speed.

Marking the Clamp Locations



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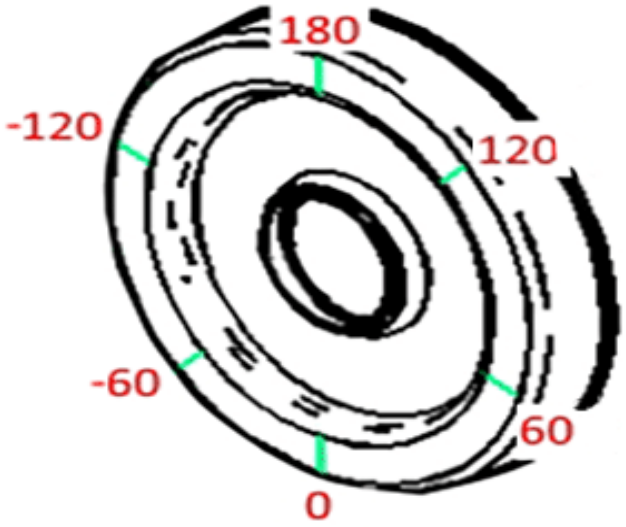
1. Using a paint marker or equivalent, create a mark in line with the leading edge of the reflective tape on to the torque tube oil slinger.
2. Mark the oil slinger with a **ZERO** (2).

Note: The positive direction is counterclockwise when facing the back of the vehicle.

3. Using the provided measuring tape, measure the circumference of the oil slinger starting at the 0 degree mark.
   - Divide that distance by six and mark that distance around the oil slinger.
   - Each hash mark should be 60 degrees around the oil slinger to further identify the angles.



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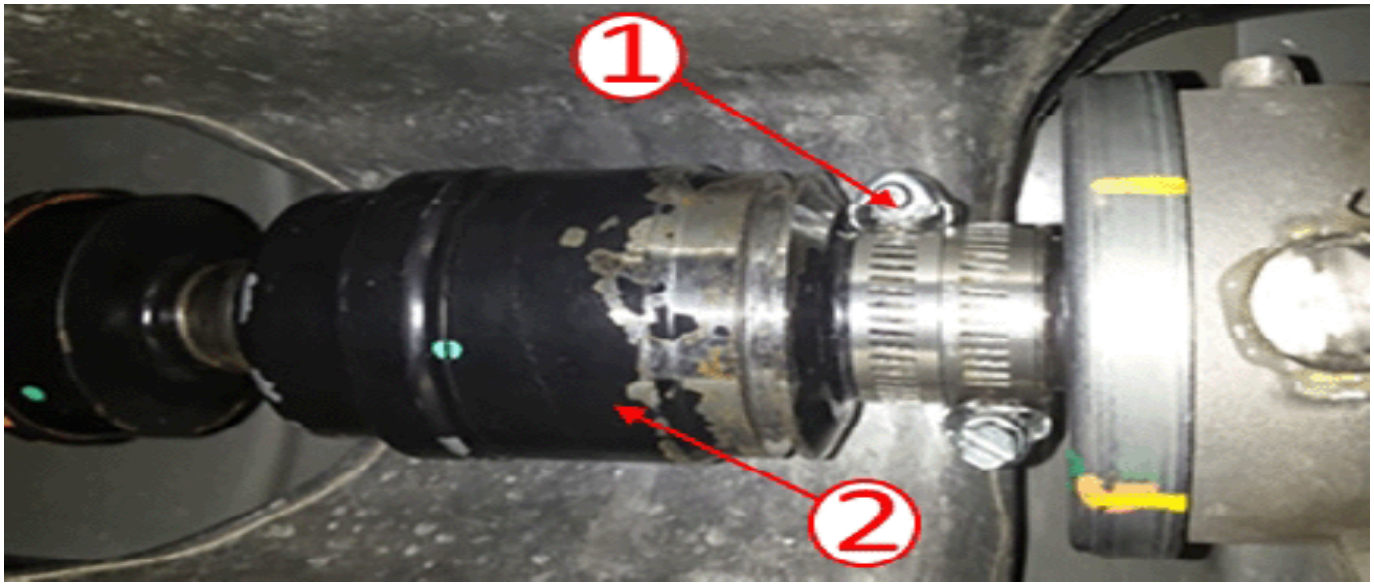
- In a counterclockwise fashion, the marks on the slinger should be at 0, 60, 120, 180, -120 and -60 positions.

Hose Clamp Placing Locations

Note: Two hose clamps 1.500 in diameter is required.



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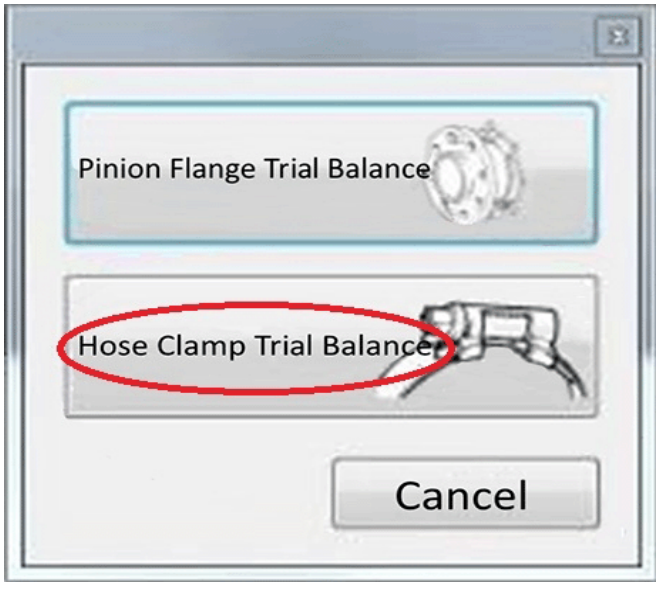
1. Place the hose clamps (1) on the small diameter end of the propshaft joint (2).
   - For the initial run, the hose clamps are positioned with the screws oriented opposite of each other at 0 and 180 degree hash marks.
2. Select the Tools menu.
3. Select Options.



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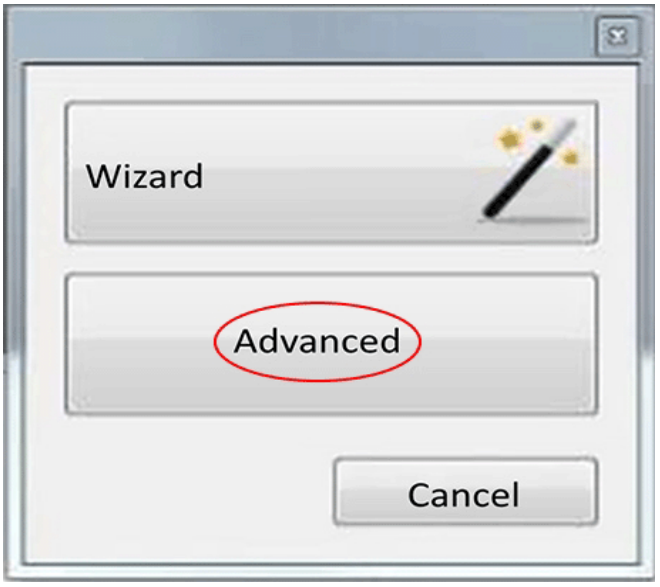
4. Select the Hose Clamp Trial Balance button.



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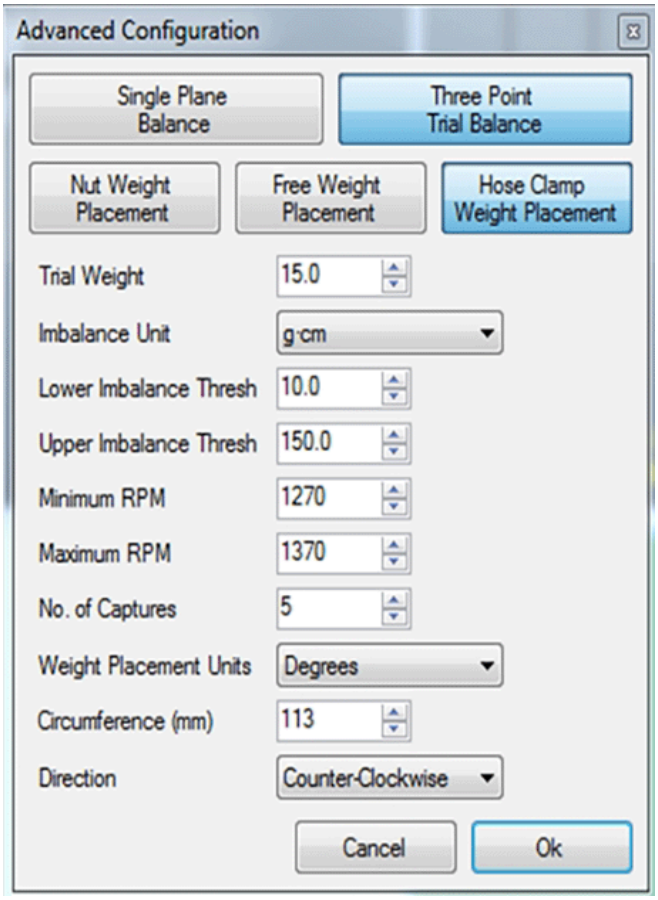
5. Select the Advance button.



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- Apply the parameters.
- Click OK button.

Trial weight may vary depending on the hose clamp, adjust accordingly.

Propshaft Balancing Procedure

Caution: Position and secure the cables from the accelerometer and tachometer to the ground to keep away from the wheels and to prevent a trip hazard!

1. Lower the vehicle to sit on the hoist locks at 6 to 12 inches (152 to 304 mm) above the ground.

Important: This is for safety, but also allows the driver to climb into the vehicle easily from the ground. This should also leave enough room for persons to place and remove balance weights on the propshaft under the vehicle between runs.

2. With aid from an assistant;

Note: Review the procedures for each person before proceeding with the measurements.

- One person must be at the computer to take the data.
- One person must drive the vehicle.

3. Verify the vehicle is stable on the hoist before entering the vehicle.
4. Put on seat belt.
5. Apply and hold the brake pedal.
6. Start the engine.
7. For **Acadia**:

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- Turn Mode select knob to x4 (1) until “AWD” illuminates.
- Turn off the traction control (2).
- Turn off the parking haptic warning.

8. For **XT5**:

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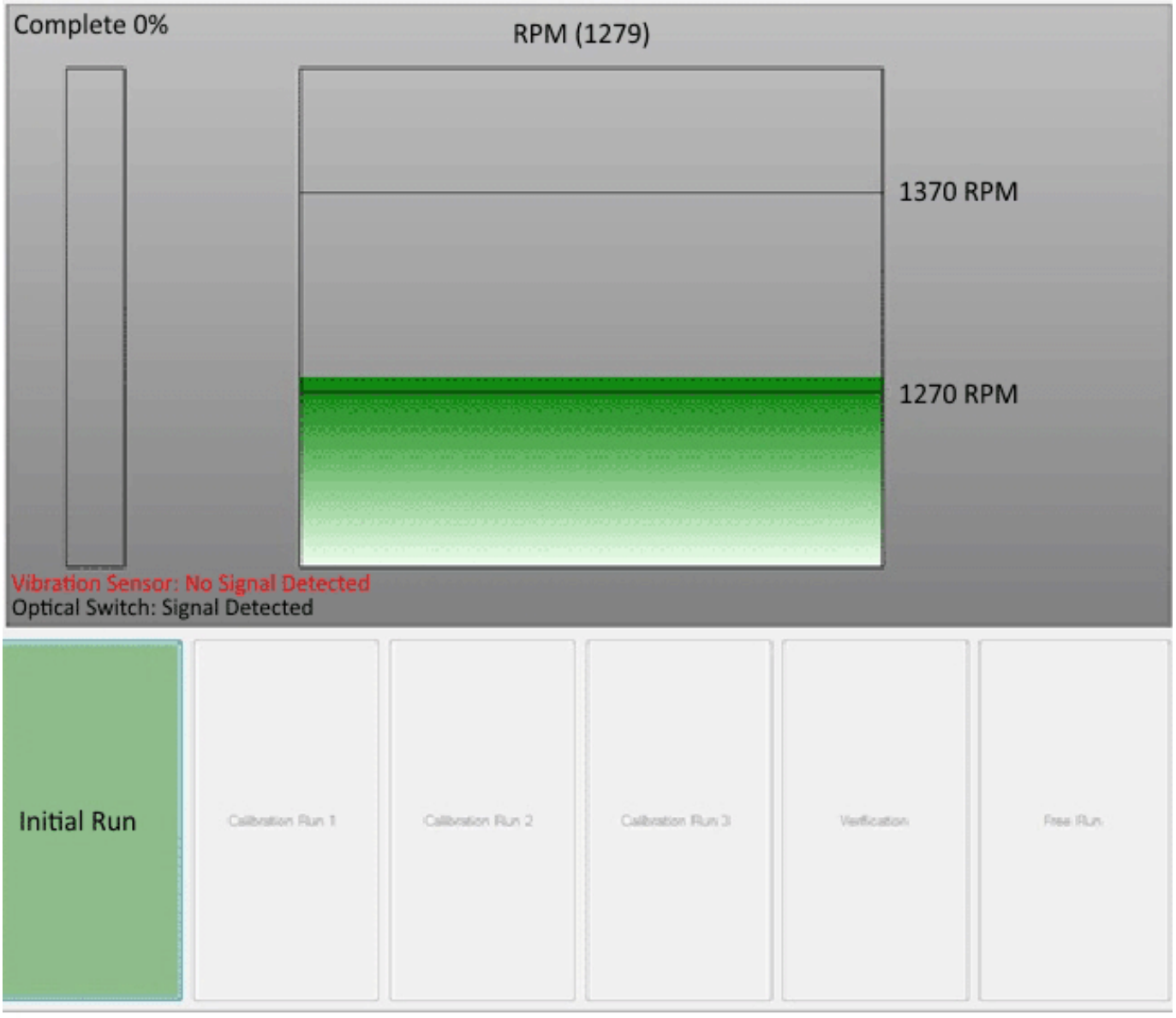
- Press the AWD “Mode” button (1) and select “All-Wheel Drive” from the Instrument Panel display.
- Turn off the traction control (2).
- Turn off the parking haptic warning.

9. Wait for the computer operator stating it is safe to Begin the Run.
10. The Driver will Shift vehicle to Drive.
11. Release Brake.

12. Accelerate vehicle carefully up to 67 km/h (42 mph) and keep steady at speed:
    - Keep the vehicle drivetrain at a stable speed. Very small throttle inputs can cause the speed to easily fluctuate without load.
    - The vehicle may brake intermittently, flash red LED HUD lights, and/or buzz the seat if there is a close wall or moving objects near the front of the vehicle.
    - The vehicle may throw a code for the parking brake. This will not affect the measurement and will clear when the vehicle is driven on the road again after measurements.
    - If the vehicle throws a code for Traction Control, Stabilitrak, ABS Brakes and/or transmission service, the AWD function may be disabled. The vehicle will require codes to be cleared before another run can be performed.



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13. Hold speed at 67 km/h (42 mph) until measurement is complete.
14. The computer operator will announce when the RPM display reaches the acceptable range, the bar on the screen will turn green.
15. The computer operator will click the run (Initial Run, Calibration Run, Verification, etc.) to start measuring.
    - Once the progress bar reaches 100% the next run button will be highlighted green.

Important: Do Not apply the brake until the speed has reached 0 mph.

    - The driver then can be informed to shift the vehicle to Neutral and allow the MPH to gradually slow down on its own till 0 has been reached.
    - In the case that the driver did not maintain a constant speed during the measurement and you would like to redo the run;

⇒ Click the Run that you would like to repeat.

⇒ A dialog box states the data will be overwritten.

⇒ Click OK.

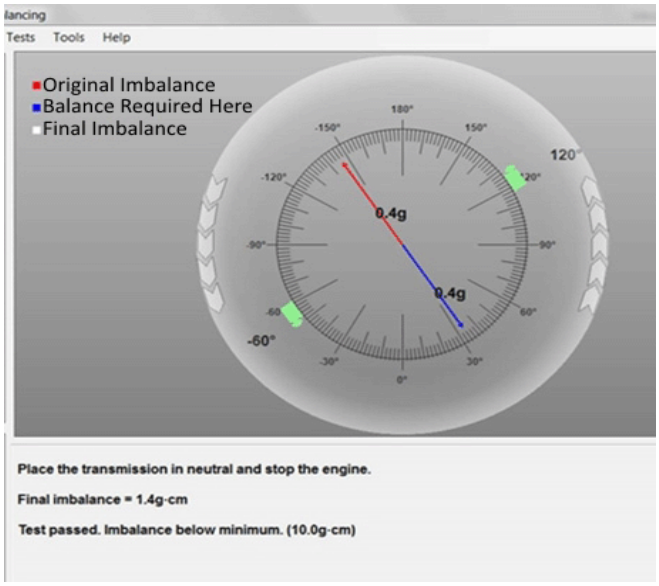
⇒ Immediately after the OK button is clicked a new measurement will be taken.

16. For **Acadia**:
    - Press AWD “Mode” button and select “Tour” in the IP display.
17. For **XT5**:
    - Turn Mode select knob to x2 until “AWD” turns off.
18. Turn the engine off.

Propshaft Calibration Measurement Order

Balancing Run Order:

1. Tighten hose clamps opposing side-by-side at 0 and 180 degrees.
2. Run initial baseline measurements.
3. Tighten hose clamps side-by-side at 0 degrees on propshaft.
4. Run first calibration measurements.
5. Tighten hose clamps side-by-side at 120 degrees on propshaft.
6. Run second calibration measurements.
7. Tighten hose clamps side-by-side at -120 degrees on propshaft.
8. Run third calibration measurements.



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9. Position hose clamps at location specified by the program:

Note: The graphic may not display the final locations of the final clamps accurately (green clamp screws displayed on screen depicts shaft representation).

- The balanced shaft hose clamp locations will be displayed in the graphic displayed.

10. Run verification measurement.

If testing has passed using the hose clamps;

1. Remove all the tooling leaving the clamps in place.
2. Take vehicle on test drive to the concerned speed in FWD mode.
3. Take vehicle on test drive to the concerned speed in AWD mode.
4. Validate if the vibration has been eliminated.

If testing has not passed using hose clamps;

1. Remove the hose clamps from the propshaft.
2. Replace the RDM. Refer to *Driveline Torque Tube Replacement* in SI.
3. Take vehicle on test drive to the concerned speed in FWD mode.
4. Take vehicle on test drive to the concerned speed in AWD mode.
5. Validate if the vibration has been eliminated.

Parts Information

Description	Part Number	Qty	Material Allowance
Large O-Ring (7/8” O.D - 3/4” I.D.)*	SAE #018	1	$0.30
Small O-Ring (11/16” O.D - 9/16” I.D.)*	SAE #015	1	$0.30
RETAINER, PROP SHF TO DIFF CARR INTERFACE	23432713	1	-
*Obtain Locally			

Warranty Information

For vehicles repaired under the Bumper-to-Bumper coverage (Canada Base Warranty coverage), use the following labor operation. Reference the Applicable Warranties section of Investigate Vehicle History (IVH) for coverage information.:

Labor Operation	Description	Vehicle	Labor Time
3080178*	Install O-rings on Propshaft and Perform PICO Balance Test	All	1.5 hrs
*This is a unique Labor Operation for Bulletin use only.			

Version	3
Modified	Aug 3, 2017 - Revised O-ring specifications under Torque Tube Shaft Setup Procedure and Parts Information sections. October 03, 2017 - Update Propshaft Calibration Measurement Order section.