



Service Bulletin

Bulletin No.: 03-00-91-001I

Date: November, 2023

INFORMATION

Subject: Vibration Analysis Worksheet

Models: 2024 and Prior GM Passenger Cars and Trucks

This bulletin has been revised to add the 2023-2024 Model Years and first Important statement. Please discard Corporate Bulletin Number 03-00-91-001H.

Important: Service agents must comply with all International, Federal, State, Provincial, and/or Local laws applicable to the activities it performs under this bulletin, including but not limited to handling, deploying, preparing, classifying, packaging, marking, labeling, and shipping dangerous goods. In the event of a conflict between the procedures set forth in this bulletin and the laws that apply to your dealership, you must follow those applicable laws.

When diagnosing vibration concerns, use the following worksheet in conjunction with the appropriate Vibration Analysis-Road testing procedure in the Vibration Correction sub-section in SI. FILL OUT ONLY THE APPLICABLE PORTION OF THE WORKSHEET THAT APPLIES TO THE VIBRATION / NOISE.

Refer to the appropriate section of SI for specifications and repair procedures that are related to the vibration concern.

Vibration Analysis Worksheet
VIN _____
Procedure Performed By:
Date:
Model:
Year:
Gear Ratio:
Odometer:
TAC Case #, if applicable:
Conditions During Road Test Procedures
As condition occurs: Engine RPM _____
Vehicle Speed _____
Vibration/Noise detected during the following road test procedures:
Engine RPM _____ Vehicle Speed _____
Slow Acceleration Test: Yes _____ No _____
Neutral Coast-Down Test: Yes _____ No _____
Downshift Test: Yes _____ No _____
Neutral Run-Up Test: Yes _____ No _____

Vibration Analysis Worksheet

Brake Torque Test: Yes _____ No _____
 Steering Input Test: Yes _____ No _____
 Standing Start Acceleration (Launch Shudder) Test: Yes _____ No _____
 Vibration/Noise Eliminated with TCC Commanded On: Yes _____ No _____
 Vibration/Noise Eliminated with TCC Commanded Off: Yes _____ No _____
 Vibration/Noise Duplicated on Hoist: Yes _____ No _____

When using the Pico Scope, always save the file. This will allow for review and help determine which vibration shows up the most. Refer to *Vibration Analysis - Road Testing (CH-51450-NVH Oscilloscope)* in SI.

Pico Scope Readings

Refer to *Oscilloscope Diagnostic Kit Description and Operation* in SI for more detailed information.

Important: As a reminder, the CH-51450-TA183 Accelerometer incorporates a 3 m (9.8 ft) cord that allows the sensor to be placed on virtually any component of the vehicle where a vibration concern is felt. i.e.: if the vibration complaint is from the seat then place the sensor on the seat track, if the vibration complaint is from the steering wheel then attach the sensor to the steering column. Ensure the Accelerometer is properly orientated. The typical areas are the seat track, the steering column or the instrument panel. Locating the Accelerometer on additional areas (i.e. the right fender, left fender, right quarter panel, left quarter panel, rear seat track, etc.) may also assist in determining the component causing the vibration/noise. The key is to look for the same Hz reading with the greatest amplitude mg readings.

FILL OUT ONLY THE APPLICABLE PORTION OF THE WORKSHEET THAT APPLIES TO THE VIBRATION/NOISE:

Engine Readings:

Initial: E0.5: _____ E1: _____ E2: _____ E3: _____ E4: _____
 Current: E0.5: _____ E1: _____ E2: _____ E3: _____ E4: _____

Prop/Driveshaft Readings:

Initial: P1: _____ P2: _____
 Current: P1: _____ P2: _____

Driveshaft Runout:

Is runout within specification? Yes _____ No _____
 Initial: Frt: _____ Center: _____ Rear: _____ Stub Shaft: _____
 Current: Frt: _____ Center: _____ Rear: _____ Stub Shaft: _____

Pinion Flange Runout Reading: _____

Has a system balance been attempted: Yes _____ No _____ (If no, perform a System Balance)

Were the drums removed to system balance? Yes _____ No _____

Initial: HZ _____ Gs _____

Current: HZ _____ Gs _____

Hose clamps added: Yes _____ No _____

Prop shaft indexed? Yes _____ No _____

If a System Balance has been attempted but the vibration is still present or system balance was not able to be achieved, check the ring gear backlash at each tooth of the ring gear. Note that excessive ring gear runout may result in a first order tire speed or first order prop shaft speed concern.

Backlash at each tooth on the ring gear (readings should not vary more than 0.050 mm (0.002 in)):

Note: The Ring Gear teeth need to be dry.

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10 _____
 11 _____ 12 _____ 13 _____ 14 _____ 15 _____ 16 _____ 17 _____ 18 _____ 19 _____ 20 _____
 21 _____ 22 _____ 23 _____ 24 _____ 25 _____ 26 _____ 27 _____ 28 _____ 29 _____ 30 _____
 31 _____ 32 _____ 33 _____ 34 _____ 35 _____ 36 _____ 37 _____ 38 _____ 39 _____ 40 _____

Does the vehicle have any of the following components attached?

Pinion damper: Yes _____ No _____

Pinion flange damper: Yes _____ No _____

Exhaust damper: Yes _____ No _____

Initial: Front angle: _____ Center Angle: _____ Rear Angle: _____

Current: Front angle: _____ Center Angle: _____ Rear Angle: _____

Were shims added to the following?

Transmission/transfer case mount: Yes _____ No _____

Pinion nose (rear springs): Yes _____ No _____

Vibration Analysis Worksheet

Center Support Mount: Yes _____ No _____

Tire Size and Brand: _____

Wheel/Tire Readings:

Initial: T1: _____ T2: _____ T3: _____ T4: _____

Current: T1: _____ T2: _____ T3: _____ T4: _____

Record wheel balance information below if available record weight information prior to balance and after balance.

Wheel/Tire balance

Right rear: Inner Weight: _____ Outer Weight: _____

Left rear: Inner Weight: _____ Outer Weight: _____

Right front: Inner Weight: _____ Outer Weight: _____

Left front: Inner Weight: _____ Outer Weight: _____

Aluminum Wheel/Tire Runouts on vehicle (max. 0.030 in (.762 mm))

Refer to the latest version of Corporate Bulletin Number 00-03-10-006 for tire radial force variation information.

Right rear: Inner lateral: _____ Center radial: _____

Left rear: Inner lateral: _____ Center radial: _____

Right front: Inner lateral: _____ Center radial: _____

Left front: Inner lateral: _____ Center radial: _____

Hub Mounting surface runouts (max. 0.005 in (0.132 mm))

Flange, right rear: _____ Hub, right front: _____

Flange, left rear: _____ Hub, left front: _____

Wheel stud runouts (max. 0.010 in (0.254 mm))

Flange, right rear: _____ Hub, right front: _____

Flange, left rear: _____ Hub, left front: _____

Sensor at Steering Column:

Initial: MPH/KPH: _____ Source/HZ: _____ mgs: _____

Current: MPH/KPH: _____ Source/HZ: _____ mgs: _____

Sensor at Drivers Seat Rail:

Initial: MPH/KPH: _____ Source/HZ: _____ mgs: _____

Current: MPH/KPH: _____ Source/HZ: _____ mgs: _____

Sensor at Passenger Seat Rail:

Initial: MPH/KPH: _____ Source/HZ: _____ mgs: _____

Current: MPH/KPH: _____ Source/HZ: _____ mgs: _____