IMPORTANT Service INFORMATION

DeSoto

DATE	NUMBER
2-3-60	1118

GROUP: WHEELS AND TIRES

SUB-GROUP: VIBRATION

• SERVICE DEPARTMENT • DE SOTO DIVISION • CHRYSLER CORPORATION •

TO ALL DE SOTO DEALERS:

SUBJECT: SMOOTH ROAD VIBRATION OR CAR SHAKE

In recent years, more attention has been given to car vibration, shake and tire thump because smoother, faster roads and quieter operating cars have made such conditions more noticeable than in the past.

Smooth road vibration or car shake is evident to some degree in all cars. This is due to necessary allowable manufacturing tolerances of both wheel and tire balance and eccentricities. In some instances it is possible that an accumulation or "stack-up" of these tolerances may tend to exaggerate a vibration condition to a degree that is apparent to the occupants of the vehicle.

In order to properly diagnose and correct a vibration condition that is considered objectionable, it is essential that we understand and can identify the three basic conditions which can be interpreted as vibration or car shake.

Before outlining these basic conditions, we should first consider the following contributing factors which can intensify a vibration condition: These include malfunctioning shock absorbers, incorrect front wheel bearing adjustment, loose engine or body mounts, and particularly, loose front seat tracks or broken seat frames; also, on cars with swivel seats, looseness of the swivel seat in its track. Since any one of these items tend to magnify minor wheel and tire irregularities or road conditions, it is extremely important that they be checked and corrected, if necessary, before any further diagnosis and corrections are performed.

1. The first basic condition and one that is probably easiest to recognize is tire thump. This is most generally caused by improper spacing and overlapping of cord lamination in the tire. Tire thump results in a single pulsation that is synchronized with wheel rotation and can be either felt or heard, or both, at speeds from 25 to 45 mph. Occasionally it may become somewhat complicated because of more than one "thumper" on the car.

   The procedure for diagnosing tire thump is to road test the car over a smooth road where the thump is most pronounced. Then, inflate all tires to 50 pounds air pressure and re-test over the same road. If the thump has been noticeably reduced or eliminated, it can be assumed that at least one tire is at fault, and by alternately deflating the tires, one at a time, to 22 psi; then, road testing and re-inflating to 50 psi, the tire or tires which are causing the condition can be located and replaced as required. If this test procedure is carefully followed and does not eliminate the thump, the cause lies elsewhere, possibly in the wheel or axle bearings.

(Over)

(THIS BULLETIN IS SUPPLIED AS TECHNICAL INFORMATION ONLY AND IS NOT AN AUTHORIZATION FOR REPAIRS)

85-515-6[illegible] DESIGNED TO ENDURE

2. The second condition is general roughness or vibration which is felt mainly as a rapid shake or shudder, usually accompanied by a low pitched eccentric moan. As a rule, this condition is most pronounced at a particular point, covering a narrow range of approximately 5 mph at speeds between 40 to 70 mph, and the characteristic sound can be played in or out like an axle moise. The condition is mainly a combination of tire unbalance and excessive wheel and tire runout.

3. The third condition, which may be encountered more often than any other, is usually referred to as "High Speed Shake" or "65 MPH Car Shake". This condition is felt as more of a lateral or sideways movement, with no audible sound accompanying, which occurs between 50 and 80 mph. In most cases, the condition is more noticeable around 65 mph. "High Speed Shake" usually results from a combination of radical and lateral wheel and tire runouts and tire unbalance, particularly on the rear wheels. The condition can be considerably magnified by a loose seat.

It is very important to road test the car under the actual conditions where vibration or shake occurs. This eliminates guesswork and permits more rapid and accurate diagnosis.

When the particular type of condition has been recognized, the following step by step procedure is essential in order to properly check and correct the condition with a minimum of time and effort:

1. Correct any noticeable tire thump condition encountered. NOTE: Before condemning a tire for thump, the car should be driven at least five miles to warm up the tires and round out flat spots which result when the car is allowed to stand. This applies particularly to Nylon Cord tires.

2. Make sure that the items covered on page 1 which could intensify vibration are checked and corrected. Refer to De Soto Service Bulletin No. 1031 for correcting swivel seat looseness, if necessary.

3. Balance all four wheels carefully, preferably with an on the car wheel balancer. NOTE: This is one of the most important steps because improper wheel and tire balance probably accounts for more vibration conditions than any other single item. Even though wheels and tires may have been balanced at some previous time, they should always be re-checked to make sure that no unbalanced condition has developed due to loss of balance weights, etc.

Prior to wheel balancing, drive the car at least five miles to warm tires sufficiently to remove flat spots. The car weight should then be lifted immediately from the wheels to prevent a recurrence of flat spots. Balance the front wheels first, then set the front wheels on the floor and block while rear wheels are balanced. When balancing rear wheels, one brake should be locked rather than placing the weight of the car on the floor, thus avoiding the possibility of a flat spot on the tire. Balance rear wheels by spinning one wheel at a time. Do not exceed 35 MPH speedometer reading because, with one wheel locked, the other is spinning at 70 MPH. Go through the various speeds slowly to locate the peak vibration point. After weights are installed, recheck at various speeds to make certain that vibration has been eliminated.

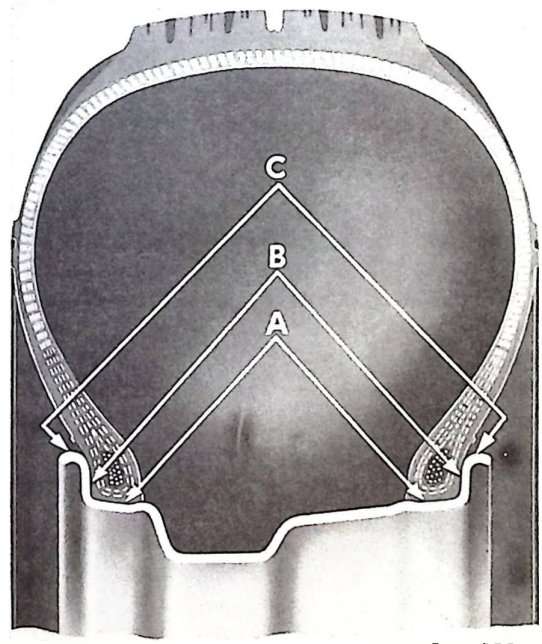
After carefully balancing all four wheels, again road test the car to determine if vibration has been eliminated or noticeably reduced. In most cases, you will find that the vibration condition has been eliminated or reduced to an acceptable level after the important initial steps outlined above have been thoroughly covered. However, if the condition has not been satisfactorily corrected, proceed by checking wheel, tire and brake drum runout as follows:

4. Again it is extremely important to drive the car sufficiently to warm up the tires and remove flat spots; then immediately lift the car weight from the wheels to prevent flat spots from recurring.

   Check each tire and wheel for radial and lateral runout, as follows: Raise the wheel and tire assembly so it can be rotated on its axle; then mount a dial indicator solidly, so that the anvil rides one of the center ribs of the tire. Coat the tire tread with a lubricant, such as soapy water, to prevent the indicator from jumping. Slowly rotate the tire and wheel. The maximum eccentricity or radial runout should not exceed .060 inch. On convertible models, even this could be excessive.

   If runout of wheel and tire assembly exceeds .060 inch, mark location of the high spot of eccentricity. Next, place the dial indicator at the side of the tire in a position to check the lateral runout, or wobble, of wheel and tire assembly while slowly rotating the wheel. If lateral runout exceeds .080 inch, mark the tire to show the high spot. NOTE: If the tire side walls are lumpy, it may create an unacceptable runout condition, and such tires should be replaced. If the radial runout exceeds .060 inch, or if lateral runout exceeds .080 inch, mark the relative location of the tire to the wheel and remove the tire.

   With the Wheel re-mounted on its original location on the brake drum, check the total radial runout of the wheel itself by locating the dial indicator anvil at points designated by "A" in illustration. Slowly rotate the wheel and read the total runout which should not exceed .050 inch. If runout is excessive, relocate the wheel 180° on the brake drum and re-check. If runout still exceeds .050 inch, the wheel should be replaced. Next, locate the dial indicator anvil at points designated "B" and check lateral runout of the wheel. This should not exceed .050 inch. If lateral runout is excessive, the wheel must either be straightened to bring it within standards or replaced. Note: Points designated by "C" in the illustration can not be used for checking since this is a sheared surface subject to irregularities.



54 x 395A

If it is found that both the radial and lateral runout of the wheel check within limits, and either the radial or lateral runout on the tire and wheel as an assembly are in excess of the limits, relocate the tire on the wheel by installing it at 180° from its original location. Then, re-check both radial and lateral tire runout. If either exceeds the specifications, (.060 inch radial and .080 inch lateral) replace the tire. If it is necessary to replace any tires, be sure that the new tires are within the specifications, outlined above, when installed on the car. Note: If for any reason it is necessary to re-locate or replace a tire or wheel, always be sure to re-balance the assembly on the car.

In some cases, the engine front support insulators may have a tendency to accentuate smooth road car shake. If this condition is encountered on a 1957, 1958 or 1959 De Soto car, inspect the bottom of the rubber support insulators for an identifying spot of yellow paint located near the part number moulded in the rubber. If the yellow paint mark is evident, remove the insulators and install new Engine Front Support Insulators, Part No. 1828247. The new insulators should be installed with the thick rubber section aligned towards the center of the engine.

Most vibration conditions are not as complex or difficult to diagnose and correct as they sometimes appear. Occasionally, the more detailed procedure for checking radial and lateral tire and wheel runout may be necessary, but this would be considered more the unusual than a general condition. In almost every instance, a condition involving excessive car shake or vibration can be reduced to an acceptable level by proper wheel balancing. It is for this reason that special emphasis has been placed on the importance of carefully balancing all wheels, preferably with an on the car wheel balancer, and also driving the car sufficiently to remove flat spots, then immediately raising the car weight off the tires to prevent flat spots from recurring, before any wheel balancing or testing operations are performed.

The part number shown in this bulletin is stock class code "P".

George J. Cutler

GEORGE J. CUTLER
Director of Service
PLYMOUTH-DE SOTO-VALIANT DIVISION