

Australian/New Zealand Standard®

Restraint systems for motor vehicles— Performance tests

Method 3: Determination of fatigue resistance of a flexible member

METHOD

1 SCOPE This Standard sets out a method for determining the effects of fatigue on flexible load-bearing members designed to bend and flex other than webbing complying with AS/NZS 1753.

2 PRINCIPLE The member is held rigidly at the anchor fitting or at the end nearer to an anchor fitting, and the other end of the member is deflected to a specified angle from the rest position for a specified number of cycles and in a specified plane.

NOTE: This test is applied to a sample member of the design dimensions, except that design qualification may be established on the shortest flexible section length for a family of members of which all features of the flexible members other than length are identical.

3 REFERENCED DOCUMENT The following document is referred to in this Standard:

AS/NZS

1753 Webbing for restraining devices for occupants of motor vehicles

4 APPARATUS The following apparatus is required:

- (a) A test rig which provides a rigid clamp for the anchor fitting end of the member, and a mechanism to deflect the unclamped end to an angle of not less than 30 degrees from the initial at-rest axis of the member. This angle is to be between the longitudinal axis of the unclamped end and the at-rest axis as shown in Figure 1. The mechanism is not to apply any turning moment to the unclamped end other than may be necessary to maintain all motion in the selected plane. The mechanism is to be capable of applying 20 000 cycles to the member at a frequency within the range from 0.13 Hz up to and including 0.5 Hz.
- (b) A means to count 20 000 cycles.
- (c) A means to measure the tensile strength of a test specimen.

5 TEST SPECIMEN A test specimen shall be an unused and not previously tested seat belt member or subassembly. If any swaging operation is to be carried out on the member, the test specimen shall have that operation completed.

6 PROCEDURE The procedure shall be as follows:

- (a) Determine the at-rest longitudinal axis of the test specimen.

- (b) Determine the plane in which deflection is to be carried out. For a flexible member of circular cross-section, any plane passing through the longitudinal axis of the member may be used. For a flexible member of non-circular cross-sections, the plane shall pass through the longitudinal axis of the member and shall be that in which deflection imposes the greatest extreme fibre stress within the member, provided that the selected plane is also one in which the member is intended to deflect in normal use.
- (c) Clamp the test specimen to the test rig in the selected plane. The rigidly clamped end is to be the anchor fitting end, or the end nearest to an anchor fitting.
- (d) Attach the other end of the test specimen to the deflection mechanism, and set the mechanism to deflect to not less than 30 degrees from the initial at-rest axis, and return to the initial at-rest axis, except that where it is established that the installation in the vehicle limits the maximum deflection to less than 30 degrees not less than that lesser angle may apply.
- (e) Apply 20 000 cycles of deflection at a frequency from 0.13 Hz up to and including 0.5 Hz.
- (f) Remove the test specimen from the test rig and determine that the retained tensile strength is not less than the required strength for the test assembly (for a minimum of 30 s).

7 REPORT The report shall include the following:

- (a) Sufficient description to identify the design of flexible member.
- (b) If the flexible part of the member is of non-circular cross-section, a description of the plane of deflection.
- (c) The angle of deflection applied.
- (d) The number of cycles to which the test sample was subjected.
- (e) The tensile test load applied to the test specimen for not less than 30 s, or if breakage occurs under tensile test, the tensile load at which breakage occurred.
- (f) The number of this Australian/New Zealand Standard, i.e. AS/NZS 4475.3.

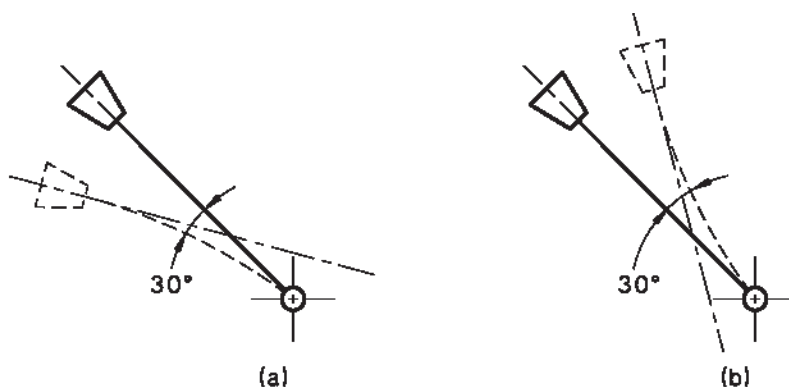


FIGURE 1 ALTERNATIVE PLANES OF DEFLECTION OF TYPICAL MEMBER