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For Comments Only

BUREAU OF INDIAN STANDARDS

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भारतीय मानक **मसौदा**

कुंडलाकार संपीड़न कमानियां

भाग 8 वृत्ताकार काट सरियों से बनी तप्त कुंडलित संपीडन कमानियों के निरीक्षण की पद्धति
(पहला पुनरीक्षण)

Draft *Indian Standard*

HELICAL COMPRESSION SPRINGS

PART 8 METHOD OF INSPECTION OF HOTCOILED COMPRESSION SPRINGS MADE FROM CIRCULAR SECTION BARS
(First Revision)

ICS 21.160

Springs and Suspension Systems Sectional Committee, TED 34	**Last date for receipt of comments is 25/03/2025**

FOREWORD
(Formal clauses will be added later)

This standard was originally published in 1989. This standard has been prepared to follow a uniform practice of inspection of hot coiled compression springs made from circular section bar.

This standard (Part 8) is one of a series dealing with Helical compression springs

Part 1 design and calculation for springs made from circular section wire and bar
Part 2 specification for cold coiled springs made from circular section wire an d bar
Part 3 data sheet for specifications for springs made from circular section wire and bar
Part 4 selection of standard cold coiled springs made from circular section wire and bar
Part 5 hot coiled springs made from circular section bars - Specification
Part 6 design and calculations for springs made from rectangular section bar - Steel
Part 7 quality requirements for cylindrical coil compression springs used mainly as vehicle suspension springs

The composition of the Committee responsible for the formulation of this standard is given at Annex A. (Will be added later)

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2: 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft *Indian Standard*

HELICAL COMPRESSION SPRINGS
PART 8 METHOD OF INSPECTION OF HOTCOILED COMPRESSION SPRINGS MADE FROM CIRCULAR SECTION BARS
(First Revision)

1 SCOPE

1.1 This standard (Part 8) recommends the methods to be used for dimensional inspection and testing of hot coiled helical compression springs conforming to IS 7906 (Part 5).

1.2 For carrying out certain tests this standard recommends the use of gauges. However, it is to be recommended that for very small quantities the use of suitable gauges may not be economical. In that case an alternative method may be agreed between the purchaser and the supplier.

2 REFERENCES

The standard given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent edition of this standard:

IS No.	*Title*
IS 7906 (Part 5) : 1989	Helical compression springs: Part 5 hot coiled springs made from circular section bars — Specification (*second revision*)

3 DIMENSIONAL AND GEOMETRICAL TESTS

3.1 Nominal Dimensions

These are marked for reference only in the spring drawing/data sheet and are not to be checked.

3.2 All dimensional tests specified herein shall be carried out after the spring has passed through the complete manufacturing process as specified in IS 7906 (Part 5) and the spring drawing. All these tests shall be conducted with the spring in the free state, that is unloaded condition.

3.3 Bar Diameter

This cannot be measured accurately after the bar has been coiled into spring due to the slight distortion of the bar occurring in this process. An indication of the diameter may be obtained with the use of ball-ended micrometer or Vernier caliper.

3.4 Outside Diameter

This cannot be measured directly as no two diametrically opposite points. occur at the bar surface. 'GO' 'NO GO' system of ring gauges has to be employed to determine whether the springs will work within the diameter specified. Where the diameter of the spring body is important the minimum gauge length should be 1.25 times the pitch and where the diameter of the end coil is important, the minimum gauge length should be 1.50 times the bar diameter. This method, however, cannot be used for springs having protruding tips.

NOTE
The tolerance specified in Table 1 of IS 7906 (Part 5) is applicable to only two-end coils. For the active coils these tolerances are not applicable and the spring drawing should specify the minimum diameter of the sleeve/ maximum diameter of the mandrel on which the spring works. Hence it may be necessary to make two different gauges - one for the end coils and the second for the active coils. The ring' gauge for active coils will have a larger inside diameter than the ring gauge for the end coils.

3.5 Inside Diameter

This cannot be measured as no two diametrically opposite points occur at the bar surface. 'GO' 'NO-GO'

system of plug gauges has to be used to determine whether the spring will work over the diameter specified. Where the diameter of the spring body is important, the minimum gauge length should be 1.25 times the pitch, and where the diameter of the end coil is important the minimum block gauge should be 1.50 times the bar diameter.

3.6 Mean Diameter

This cannot be measured but is a calculated value.

3.7 Total Number of Coils

Total number of coils are measured from tip of tine end coil to the other.

3.8 Number of Active Coils

This cannot be measured but can be calculated as explained in **4.4** of IS 7906 (Part 5).

3.9 Squareness

This is applicable to spring with ground ends (see Fig. 1). Squareness shall be measured by standing the spring on a surface plate against a square and measuring the largest deviation from the top end coil and the square, using feeler gauges. While evaluation the results, due allowances must-be ma.de tn the following:

a) Error which can arise due to different outside diameters at the two ends and intermediate active coils; and
b) Error due to width of the top dead coil being less than the bar diameter

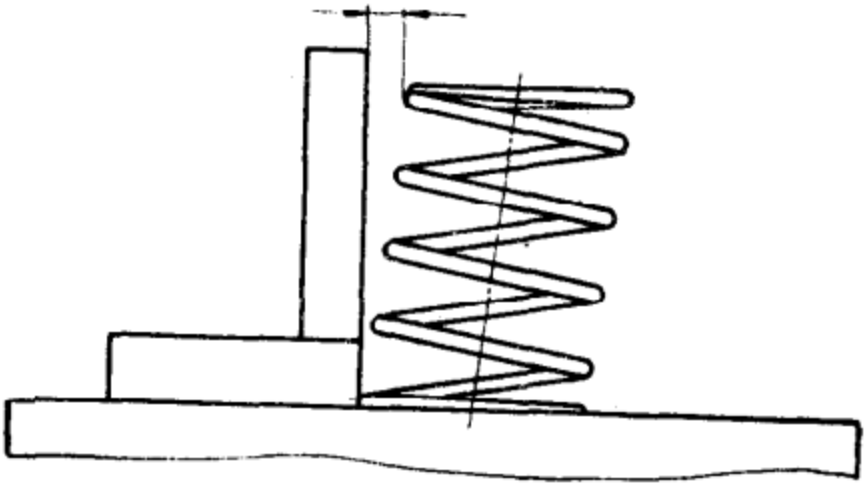

FIG. 1 SPRING WITH GROUND ENDS

3.10 Parallelism

This is applicable only to spring with ground ends. This can be measured by one of the two following methods:

a) The spring is placed on a surface plate and a second plate is lowered parallel to the surface plate on the spring until the first contact is made with any point of upper end coil. The maximum deviation between the upper end coil and the plate is measured with the use of feeler gauges over the ground ‘surface (*see* Fig. 2); and
b) Another method is to check the height of the spring at two diametrically opposite points and note the difference in the two heights. This checking at diametrically opposite points has to be done at a number of places to determine where the maximum difference in height occurs.

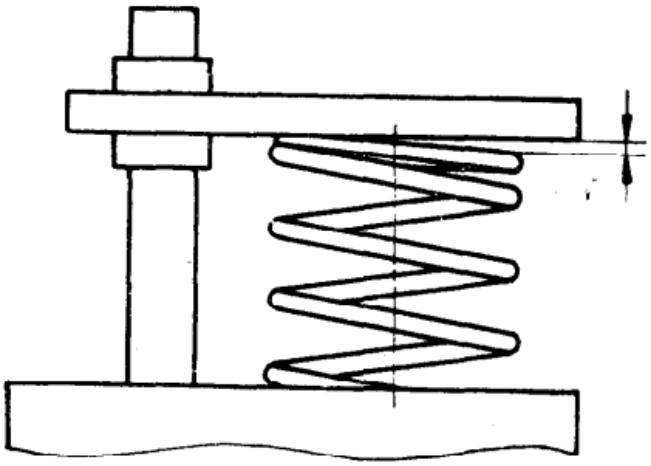

FIG. 2 FIRST CONTACT BETWEEN SURFACE PLATE AND UPPER END COIL

3.11 Bow

Bow shall be measured by placing the spring on a surface plate (*see* Fig. 3) and measuring with feeler gauges, the maximum deviation between any coil and the surface place.

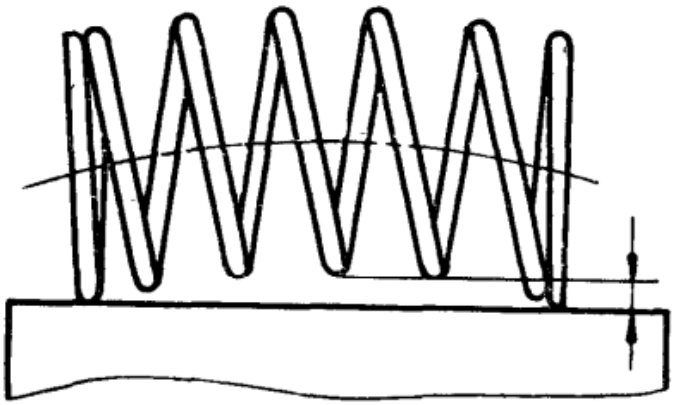

FIG. 3 SPRING ON A SURFACE PLATE

3.12 Free Length The method of checking free length described here is applicable for springs with ground ends. Before carrying out this test the springs should be scragged once as explained in **8.1** of IS 7906 (Part 5). This test should preferably be done when static load testing of the spring is bzing dKne so 3s to avoid duplication of testing.

The spring is placed on a surface plate with a straight edge across the top dead coil and the height is measured with 3 scale standing approximately in the centre of the spring and touching the straight edge.

4 LOAD TESTING

4.1 Before carrying out these tests the spring shall be scragged as explained under **8.1** Static load testing of IS 7906 (Part 5).

4.2 Load at Length or Length at Load Measurement

Load/Length measurement shall be carried out between parallel lateral constant plates and with reference to a calibrated load indicating device. The test is effected with the spring in the upright position in the direction of loading. Springs which are liable to buckle shall be tested over or in a guide. The method of testing shall be

agreed between the purchaser and the manufacturer.

4.3 Spring Rate

This test shall be carried out as explained in **8.2** of IS 7906 (Part 5).

ANNEX A
(*Foreword*)

COMMITTEE COMPOSITION

Springs and Suspension Systems Sectional Committee, TED 34

Will be added later