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SPECIFICATION FOR ELECTRICAL WIND SCREIN WIPERS

PART II WIPER MOTORS

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Indian Standard
SPECIFICATION FOR ELECTRICAL WIND SCREEN WIPERS
PART II WIPER MOTORS

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AMENDMENT NO. 1 SEPTEMBER 1978

TO

IS : 7827 (Part II)-1975 SPECIFICATION FOR ELECTRICAL WIND SCREEN WIPERS

PART II WIPER MOTORS

Alterations

[*Page* 6, *clause* **4.1.3**) — Substitute the following for the existing clause:

'**4.1.3** *Acceptance Tests* — Visual examination (*see* **4.2**), no-load test (*see* **4.3**), parking test (*set* **4.6**), continuous torque test (*see* **4.8**) and high voltage (flash) test (*see* **4.17**) shall be acceptance tests.'

(*Page* 7, *clause* **4.6.1,** *last line*) — Substitute ' off ' *for* 'park'.

(*Page* 7, *clause* **4.8.1**) — Substitute the following for the existing clause:

'**4.8.1** With an applied voltage of 6.75 ± 0.1, 13.5 ± 0.25 and 27 ± 0.5 V for 6, 12 and 24 V wiper motors respectively maintained at the motor terminals, the unit shall be allowed to run for a period of 30 minutes against a constant torque equal to that declared by the manufacturer as the continuous torque rating of the unit. At the end of the 30-minute period the current consumption of the motor shall not exceed and the speed shall not be less than values specified by the manufacturer as continuous rating of the unit. '

(*Page* 8, *clause* **4.14.5,** *line* 2) — Substitute ' water at the rate of not less than 10 ml/s, covering *' for '* water, covering '.

Addenda

[*Page* 5, *clause* **4.1.1** (r)] — Add the following new matter after **4.1.1** (r):

' **s)** High voltage (flash) test (*see* **4.17**). '

[*Page* 6, *clause* **4.1.4(e)**] — Add the following new matter after **4.1.4**(e):

' f) High voltage (flash) test (*see* **4.17**).'

(*Page* 9, *clause* **4.14.8**) — Add the following new clause after **4.14.8**:

' **4.14.9** The motor shall be subjected to high voltage (flash) test (*see* **4.17**) after this test. The test piece shall satisfactorily withstand this test without arcing or puncture. '

(*Page* 9, *clause* **4.16**) — Add the following new clause after **4.16:**

' **4.17 High Voltage (Flash) Test** — The motor shall be isolated from the internal ground and then shall be subjected to a flash test for a period of not more than 5 seconds, with an alternating current of 500 V rms at any convenient frequency between 40 and 60 Hz between any of the terminals and the ground. The motor shall satisfactorily withstand this test without arcing or puncture.'

Reprography Unit, BIS, New Delhi, India

(ETDC 14)

Indian Standard

SPECIFICATION FOR ELECTRICAL WIND SCREEN WIPERS

PART II WIPER MOTORS

0. FOREWORD

0.1 This Indian Standard (Part II) was adopted by the Indian Standards Institution on 23 October 1975, after the draft finalized by the Automobile Electrical Equipment Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 A wind screen wiper for an automobile consists of a motor, suitable driving mechanism, wheel box, arm and blade. This standard covers wind screen wipers and is divided into three parts, dealing with the drive, namely, wiper motors, driving mechanism, wheel box and the wiper system consisting of the arm and blade.

0.3 In preparing this standard, attention was paid to differing requirements of light and heavy duty vehicles. As such this standard covers two types of wiper motors, namely, light duty and heavy duty.

0.4 In preparing this standard assistance has been derived from SAE J 903b (1973) 'Passenger car wind shield wiper system' published by the Society of Automobile Engineers, USA.

0.5 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, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard (Part II) covers the basic mechanical and electrical requirements and methods of test for wind screen wiper motors for automobiles of the following types:

a) Single spindle (direct mounted),

b) Rack type, and

c) Link type.

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Type Tests — Tests carried out to prove conformity with the specification. These are intended to prove the general qualities and design of a given type.

2.2 Routine Tests — Tests carried out on each sample to check requirements which are likely to vary during production.

2.3 Acceptance Tests — Tests carried out on samples taken from a lot for the purpose of acceptance of the lot.

3. MARKING

3.1 The wind screen wiper motors shall be marked with the following information:

a) Manufacturer's name or trade-mark,

b) Rated voltage,

c) Marking of application/type identification number, and

d) Country of manufacture.

3.1.1 The wind screen wiper motors may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on. products covered by an Indian Standard conveys the assurance that they have been produqed to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

4. TESTS

4.1 Classification of Tests

4.1.1 *Type Tests* — The following shall constitute type tests:

a) Visual examination (*see* **4.2**),

b) No-load test *(see* **4.3**),

c) Low voltage (starting) test (*see* **4.4**),

d) Staling teat (cold) (*see* **4.5**),

e) Parking test (*see* **4.6**),

f) Short-circuit test (locked rotor test) (*see* **4.7**),

g) Continuous torque test (*see* **4.8**),

h) Test for low and high voltage operation (*see* **4.9**),

j) Damp heat (cycling) test (*see* **4.10**),

k) Cold test (*see* **4.11**),

m) Mould growth test (*see* **4.12**),

n) Vibration test (*see* **4.13**),

p) Endurance test *(see* **4.14**),

q) Salt spray test (*see* **4.15**), and

r) Noise level test (optional test) (*see* **4.16**).

4.1.2 *Criteria for Approval* — Nine samples shall be submitted for testing together with the relevant data. The testing authority shall issue a type approval certificate if the wind screen wiper motors are found to satisfy all the tests specified in **4.1.1**.

4.1.2.1 All samples shall be tested for:

a) Visual examination (*see* **4.2**),

b) No-load test (*see* **4.3**),

c) Low voltage (starting) test (*see* **4.4**),

d) Stalling test (cold) (*see* **4.5**),

e) Parking test (*see* **4.6**),

f) Continuous torque test (*see* **4.8**), and

g) Test for low and high voltage operation (*see* **4.9**).

They shall be divided into four groups and be subjected to tests in the following manner:

i) Short-circuit test (locked rotor test) *(see* **4.1**)	First group of two
ii) Damp heat (cycling) test (*see* **4.10**) Cold test (*see* **4.11**) Salt spray test (*see* **4.15**)	Second group of two
iii) Mould growth test (*see* **4.12**) Vibration test (*see* **4.13**)	Third group of two
iv) Endurance test (*see* **4.14**)	Fourth group of three

4.1.2.2 In case of failure in one or more type tests, the testing authority may call for test samples not exceeding twice the number of the original samples and subject them to the test(s) in which failure occurred. If in repeated test(s) no failure occurs, the tests may be considered to have been satisfied.

NOTE — Caution should be exercised in rejecting samples in tests (a), (b), (c), (d), (e) and (f) for deviations less than 2 percent of the stipulated values due to the likely difference in the accuracy of the instruments in different test locations.

4.1.3 *Acceptance Tests* — Visual examination (*see* **4.2**), no-load test (*see* **4.3**), parking test (*see* **4.6**) and continuous torque test (*see* **4.8**) shall be acceptance tests.

4.1.4 *Routine Tests* — The following shall constitute routine tests:

a) Visual examination test (*see* **4.2**),

b) No-load test (*see* **4.3**),

c) Low voltage (starting) test (*see* **4.4**),

d) Stalling test (cold) (*see* **4.5**), and

e) Parking test (*see* **4.6**).

4.2 Visual Examination — The wiper motors shall be examined for external finish and workmanship.

4.3 No-Load Test — After running without external load for 60 seconds with the terminal voltage equal to the rated value with a tolerance of ±0.1 V for 12 and 6 V and ±0 2 V in case of 24 V, the current shall not exceed the value declared by the supplier and the wiping cycles/minute measured over a period of one minute shall be within the range declared by the supplier.

NOTE — Minor fluctuation in current may be permitted.

4.4 Low Voltage (Starting) Test — The wiper motor shall be capable of starting without any external load at 75 percent of the rated voltage.

4.5 Stalling Test (Cold) — With the motor and gear box at ambient temperature, the rated voltage of the motor with a tolerance of ±0.1 V in case of 12 and 6 V and ±0.2 V in case of 24 V shall be applied to the motor terminals. After the motor has started to run, a torque as specified by the supplier shall be applied to the output shaft. The speed shall not drop below 20 rev/min. The current shall not exceed the value specified by the supplier. The readings shall be taken within two seconds of the loading.

4.6 Parking Test — This test is only applicable when a self-switching or self-parking device is incorporated in the wiper.

4.6.1 With the unit at ambient temperature and without external load it shall be connected to an external switch in accordance with the manufacturer's recommended circuit. With 125 percent of the rated voltage, the motor shall self-switch off or park when the panel switch is operated to the 'park' position.

4.7 Short-Circuit Test (Locked Rotor Test) — The procedure and the requirements shall be as agreed to between the supplier and the purchaser.

NOTE — This test is intended to check the thermal durability over a period of time.

4.8 Continuous Torque Test — This test shall be applied on motor with its speed reduction mechanism but without linkages, arms and blades.

4.8.1 The unit shall be allowed to run for a period of 30 minutes against a constant torque equal to that declared by the manufacturer as the continuous torque rating of the unit. At the end of the 30-minute period the current consumption of the motor shall not exceed and the speed shall not be less than values specified by the manufacturer as continuous rating of the unit.

4.9 Test for Low and High Voltage Operation — With the application of 80 and 120 percent of the rated voltage the frequency of the operation of the motor and the driving mechanism shall not vary more than ± 30 percent of the frequency at the rated voltage.

4.10 Damp Heat (Cycling) Test

4.10.1 The damp heat (cycling) test shall be carried out according to IS : 2106 (Part II) - 1962*. The number of conditioning cycles and the recovery period shall be 7 and 24 hours respectively.

4.10.2 After the test, the motor shall be in operating condition and shall pass the no-load test specified in **4.3**.

4.11 Cold Test

4.11.1 *Low Temperature Storage Test* — The sample shall be exposed to cold condition at 0°C for a period of 72 hours in accordance with IS : 2106 (Part III)-1963†. After recovery, for a period of two hours, the sample shall be subjected to the routine tests given in **4.1.4.**

NOTE — If called for by the purchaser the test may be carried out at 25°C.

4.11.2 *Low Temperature Usage Test* — The sample shall be exposed to cold condition at 0°C for a period of 16 hours. Immediately on removal from the chamber, the unit shall be operated with the nominal voltage with

*Environmental tests for electronic and electrical equipment: Part II Damp heat (cycling) test.

†Environmental tests for electronic and electrical equipment: Part III Cold test.

a tolerance of ±0.1 V in case of 12 V and 6 V and ±0.2 V in case of 24 V. The unit shall start to rotate within 30 seconds and shall reach 50 percent of its normal light running speed within 60 seconds.

NOTE — If called for by the purchaser the test may be carried out at –25°C.

4.12 Mould Growth Test — The mould growth test shall be carried out in accordance with IS : 2106 (Part XIII)-1973*. The period of exposure shall be 28 days. At the end of the specified period, the product shall show no sign of mould growth.

4.13 Vibration Test — The sample after being rigidly mounted on a suitable vibrating machine constructed to produce a simple harmonic motion shall be subjected to vibration (a total displacement of 1.5 mm) through a frequency range of 10-55-10 Hz in a period of one minute with continuously varying frequencies. The vibration shall be applied for not less than one hour in each of the three major axes of the sample. At the end of the test, the wiper motor shall pass through the tests given in **4.1.4**.

4.14 Endurance Test

4.14.1 *Test Conditions* — The ambient temperature shall not be more than 40°C.

4.14.2 The wind screen shall be of the form representative of the type to be used with the particular wiper unit under test. It shall be cleaned daily with an aqueous solution containing 10 percent of 0.880 ammonia, or an equivalent detergent followed by an adequate rinse with clean water.

4.14.3 The arms and blades shall be those specified by the supplier of the wiper motor as providing the maximum load for which the wiper is intended. In particular, the maximum blade friction level and arm pressure shall be specified.

Blades shall be replaced by new units after each 120 hours of operation.

4.14.4 The voltage at the motor terminals during the test shall be 6.75, 13.5 and 27 V ± 2 percent for the rated voltage of 6, 12 and 24 V respectively.

4.14.5 The screen shall be subjected intermittently to a spray of clean water, covering the swept area, according to the following cycle:

Water spray	5½ minutes
Drying	½ „
Parking	1 „ (*see* **4.14.6**)

*Environmental tests for electronic and electrical equipment: Part XIII Mould growth test (*first revision*).

4.14.6 During each 7 minutes of the test cycle the wiper motor shall be switched, by means of the in-built switch, to the 'park' position for a period of approximately 60 seconds. This test shall not be applied to wipers not having a self switching or self parking device incorporated in the unit.

4.14.7 In the case of single speed wipers, the test shall be continued for 500 hours for light duty and 750 hours for heavy duty type. In the case of two speed or variable speed units the test shall comprise 300/450 hours at low speed followed by 200/300 hours at the high or maximum speed for light duty and heavy duty respectively. There shall not be more than 2 adjustments during the test.

4.14.8 *Assessment of Results* — The result shall be considered satisfactory if the test is completed without mechanical or electrical failure of the motor and/or transmission and there should be no appreciable increase in the motor noise.

4.15 Salt Spray Test — The test for corrosion resistance of the wiper motor shall be carried out as specified in Appendix B of IS : 3105-1966*.

4.15.1 *Assessment of Results* — After removal from the salt spray, that is, within two hours after draining and again when 24 hours later subjected to routine tests specified in **4.1.4,** the wiper motor shall be able to meet with the minimum performance requirement. The appearance of the product should not prejudice the assessment of results.

4.16 Noise Level Test (Optional Test) — Under Consideration.

*General requirements for automobile lighting and signalling devices.

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