GOST 12936 - 82	NUMBER I - 472
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	SUPERSEDES

STATE STANDARD, U S S R

AUTOMOBILE SPEEDOMETERS WITH ELECTRIC DRIVE

GENERAL TECHNICAL SPECIFICATIONS

GOST 12936 - 82

OFFICIAL PUBLICATION

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Hyderabad.

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Automobile Speedometers with Electric Drive. General Technical specifications
OKn 457381

GOST 12936 - 82
Supersedes GOST 12936 - 67

The present standard relates to automobile speedometers (here in after referred to as speedometers) with electric drive and getting supply from vehicle mains, which ~~is~~ consist of transducer and detector unit intended for measuring the speed of movement and also the distance covered.

1. Technical Requirements.

1.1. Speedometers must be manufactured in compliance with the requirements of the present standard, GOST 3940 - 71, as per technical specifications extended to particular type of speedometers and also working drawings approved in the established manner.

External appearance of speedometers must ~~comply~~ comply with the model approved in the established manner.

1.2. Speedometers should be manufactured to work at rated D C voltage 12 or 24 v.

1.3. Range for measuring the speed of speedometers should be (selected from the following series: 80, 100, 120, 140, 160, 180, km/h.

1.4. Speedometer should be manufactured with summing-up counter for covered distance, capacity of which should be 9999.9 km. The readings of summing-up counter of speedometer manufactured by manufacturing factory should not exceed 15 km.

1.5. Transmission ration of speedometer mechanism with respect to drive shaft should be 624:1

1.6. Torque required for putting the transducer shaft into action should not exceed 0.06 N.m (0.6 kgf.cm

1.7. At constant angular velocity of speedmeter drive, the velocity reading pointer, at velocity exceeding 20 km/h , should not have fluctuations above ± 2% of the measureing range.

1,8, Depending on the numerical marking of the scale to be checked, the basic error in counting the readings of speed indicator of speedometer at ambient temperature (20 ± 5)° C should not exceed the value specified in the Table .1 .

Table - 1

km/h

Numerical marking of scale	Basic error
Upto 60 (inclusively)	+ 4
80 + n 20 n = 0,1,2,3	+ (5+n)

1.9. Additional error of velocity indicator of the speedometer in the range of temperature from minus 20 to plus 40°C should not exceed ± 2 % of value of the velocity measured at (20 ±5) °C, at each 10°C change of ambient temperature.

1.10. Speedometers should be manufactured as per climatic modification of GOST 3940 - 71.

1.11. Speedometers should be ~~serviceable~~ serviceable within the ambient temperature specified below :

From minus 50 to plus 60°C - for detector unit, design yxl

From minus 20 to plus 60°C - for detector unit, design T,

from minus 50 to plus 80°C - for transducer, design yxl,

from minus 20 to plus 80°C - for transducer, design T.

for speedometers of climatic modification 0, the

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units of ambient temperature should be agreed upon with the ~~upon with the~~ customer.

1.12. Speedometers of design T and ~~,~~ must be serviceable at the effects of maximum relative humidity 98-3 % at temperature (35 +3)°c, for design y and ~~x~~ at the effects of maximum relative humidity 98-3% and temperature (25 ±3)°C.

1.13. Speedometers must be serviceable after being in nonworking condition at ambient temperature: minus 60 ± 3°c for design ~~x~~ and 0 and for y and T design, minus 4) + 3°C.

1.14. Speedometers must be vibration resistant at ~~mx~~ vibrations with frequency (50 +2 Hz and maximum acceleration 5 for detector units and 10 g for transducer.

1.15. Speedometers must be impact resistant at impact loads, with a frequency of 80 to 120 impacts per min. with acceleration of:
10 g - for detector units and 15 g for transducers
Error of acceleration of vibrations and impacts may be ± 20 %

1.16. Speedometers must be protected from dust and water as per GOST 1425(- 80 :
1 P5x - for detector unit
1 px7 - for transducer while ~~xxxx~~ sealing the exit of automobile driveshaft.

Remarks: Requirements of this clause do not pertain to detector units which are designed without body.

1.17. Glass as per GOST 10953-78 (or any other transparent material,) ptotecting the reading device of a detector unit should be free from faults effecting the reading.

1.18. Parts of the speedometer should be protected from corrsion as per GOST 3940 - 71. Type of varnish paint coating should be as per GOST 9032_74. Adhesion of varnish paint coating to the surfaces of external face parts should not be below 2 points as per GOST 15140 - 78.

1.19 Operating life of speedometer should correspond to the mileage till the first over hauling of automobile on which it is installed.

1.20. Speedometer design itself should allow sealing of cap screws, plug connections, and transducer with gear box.

The desig of speedometer body of heavy automobile (excluding those speedometers which are without body) should be nonseperable while in operation condition.

Transducers and detector units of one type should be interchangeable.

2. ACCEPTANCE RULES.

2.1. Acceptance rules pertaining to speedometers should comply with GOST 3940 - 71 and present standard.

2.2. To check the speedometer for conformity with the requirements of present standard, state, acceptance, periodical and inspection tests & reliability should be carried out.

2.3. The procedure of conducting state tests should be as per GOST - 8.001 - 80.

2.4. During acceptance tests, each speedometer should be checked for conformity with the requirements of subclause 1.1. (appenrance), 1.3, 1.4, 1.8, 1.17, and 4.1. 2 % of speedometers from the batch but not less than 3 in number should be checked for conformity with overall dimensions.

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2.5. At least 6 samples of speedometers base model should be taken from those which have undergone acceptance tests and then subjected to periodical tests to check for conformity with the requirement of clauses 1.1, 1.3 1.4, 1.6 to 1.8 and 1.17 and also with electric insulation strength and change of supply voltage (GOST 3940 - 71), from these 6 samples 3 should be subjected to further tests so as to check for compliance with sub clauses 1.9, 1.11 to 1.13, 1.16 and the remaining 3 for compliance with subclauses 1.14 and 1.15.

Parts of speedometers selected from the production line (3 pcs of each nomenclature) should be checked for compliance with the requirements of clause 1.18.

Periodical tests should be conducted at least once in a year.

2.6. Speedometers are checked for compliance with the requirements of clause 1.19 during inspection tests on reliability (Operation life tests) which are conducted not less than once in three years. During tests, the number of samples should be indicated in the technical specifications for particular type of speedometers.

2.7. The consumer has right to check speedometers at random as per acceptance test programme, excluding the checking of subclauses 1.1 (appearance), 1,3, 1.4, and 1.17, which should be performed by complete control.

Maximum 20% speedometers should be subjected to random inspection. To this end 5 % of speedometers from a batch but at least 3 pcs. should be selected.

3. METHODS OF TESTING.

3.1. Test methods should be as per GOST 3940 - 71 and present standard.

3.2. External appearance of speedometers should be checked visually without using optical devices. The contents

and quality of marking should be set while checking the external appearance. The serviceability of summing up counter (meter) should be checked while assembling speedometers.

3.3. Torque (clause 1.6) should be determined at ambient temperature (20 + 5)°C by devices with error + 0.002 N.m (20 g.cm).

3.4. Moisture proof test (clause 1.127) of speedometers should be conducted as per GOST 3940-71.

3.5. Basic error (clause 1.8) should be determined at increasing speed by using synchronized equipments which are having stepwise speed reading system or by equipments with gradual speed changing system using frequency meter or checking device. In this case checking should be carried out by placing the scale to horizontal base to an angle equal to 70° to, 90°.

Error of the synchronized equipments or the checking devices should be 4 times lesser than the basic error of speedometers to be checked. Readings should be carried out by lightly tapping the speedometers or during the effects of vibrations with an acceleration of 0.15 to 0.3 gm. and at frequency of 50 ± 2 Hz. After checking, the speed indicator (Pointer of speedometer should come back to its initial position and should not go beyond the limits of origin-making tin the formation of clearance.

Basic error should be determined on digited marks of the speedometer scale upto 80 km/hr inclusively. Speedometers should be checked at higher speeds if consumer requires so.

Basic error is not to be checked upto the first marking - inclusively.

3.6. Additional temperature error (cl. 1.9) should be determined by comparing the readings taken after holding the indicaters in nonoperation condition for 1hr. at a temperature of minus (20 +3)°C or at a temperature of plus 40 ± 3°C with the readings taken before the test at a temperature of 20 ± 5°C on the digital marks which is in the middle part of the acale.

After holding the indicators in heating and cooling chambers, readings should be taken either when the indicators are inside the chamber or within 5 min. after removing from there.

3.7. The effects of increased or decreased temperature (~~xxx~~ clause 1.11) should be determined by holding the non operating speedometers for 3 hrs at temperaturees specified in clause 1.11. After which when the speedometers are placed in cooling chamber or 5 min. after their removal from the chamber, they should come into operation mode by gradually changing the readings of speed from zero to the middle part of the scale not later than three min. after switching them to rated voltage. After removing from heating chamber, the speedometers must come into operation mode, immedietly after getting switched to rated voltage. In this case speedometers should perform their functions without changing the standardized parameters. Basic error after bringing the temperature of speedometers to 20 ± 5°C , should comply with the value specified in cl. 1.8.

3.8. To check the effects of decreased temperature on serviceability (clause 1.13) , of speedometers, they should be placed in cooling chamber where the temperature is set as per clause 1.13. They should be held in ~~their~~ this chamber for 3 hrs. without load.

Serviceability of speedometers should be checked after removing from the cooling chamber and when the temperature is brought to 20 ± 5°C. In this case, measurement error must comply with the values specified in cl. 1.8.

3.9. Vibration strength (clause 1.14) and impact strength (clause 1.15) tests should be carried out as follows:

- One by one in three mutually perpendicular directions on vibration stand generating harmonic sinusoidal vibrations in vertical direction Duration of the tests is 2 hrs, 40 min in each direction;

- On impact stand with vertical impacts. The position of scale surface should be vertical while conducting impact strength test. Number of impacts is 10000.

The detector units and the transducers should be tightly fastened on the table of test stand.

The indicators should be tested in operating condition with number of rotations providing positioning of the reading pointer in the middle part of scale.

Transducers are tested in non-working condition by setting the drive shaft in horzontal position.

After conducting vibration strength and impact strength tests, the speedometers should not have mechanical damages. Error of speedometers should not exceed 1.5 fold value of the basic error.

3.10. Dust proof and water-proof tests (clause 1.16) should be conducted as follows:

Dust-proof - as per GOST 3940-71;

water-proof - as per the following procedure.

For testing, the transducer should be immersed in water heated upto a temperature of $(65 \pm 5)^{\circ}C$ and should be kept for 1 min. while doing so, intensive discharge of air bubbles from transducer should not be observed. Appearance of 10 bubbles max. during the checking time is allowed.

While conducting water - proof test, the hole of outlet shaft of transducer should be closed with a plug.

Dust proof test on the indicators should be carried out by placing lamp holder inside the hole for panel light.

After dust - proof test, the error of speedometer readings should comply with the ones specified in clause 1.8.

3.11. Test protection of parts of speedometer (clause 1.18) from corrosion should be carried out as per GOST 9.302 - 79. Adhesion of vernish paint coating in points should be evaluated by the method of mesh type cutting as per GOST 15140 - 78.

3.12. Operation life of speedometers (clause 1.19) should be checked in operation conditions or on stand with confidence level $P^{*} = 0.8$ as per the quick method approved in the established mannor. Results should be evaluated as per the first catagory of operation conditions for central climatic zone in the areas with temperate climate, GOST 16350 - 80. After the tests, speedometers should conform to the requirements of cl. 1.9 and 1.15.

While conducting reliability test after the guarantee period, as well as after 3 years of operation or storage, increase in basic error should not exceed the value specified in the Table .2

Table - 2

Scale marking	Increase in basic error
Upto 60 inclusively	+ 2 - 1
80 + n 20 n = 0,1,2,3. . . .	+ (2+0,5.n) - 1

4. MARKING, PACKING, TRANSPORTATION AND STORAGE.

4.1. Each speedometer should be inscribed with on them;
- trade mark of manufacturing factory;
- conventional abbreviated designation of speedometer(indicator and transducer);
- year and month of manufacturing(conventional designation may be inscribed);
- Designation of the present standard..

Marking may differ from the above indicated one if consumer agrees, place,dimensions and method of marking should be indicated on working drawings and it should be preserved for the entire service life of the speedmeter.

4.2. Each detector unit should be wrapped in moisture proof paper as per GOST 515 - 77 and placed in indevidual box. Transdusers in few numbers should be placed in card board box.

Detector units and transdusers in card board boxes should be packed in wooden boxes as per GOST 16536 - 78 or other container. The wooden box should be covere from inside with mositure proof paper.

While shifting speedometers in containers or in vans, boxes with detector units should be packed in carrugated board box as per GOST 9142 - 77 and transducers in common card board box.

The method of placing the boxes in containers or vans should exclude the possibility of their displacement during trarsportation.

4.3. The gross weight of the box with speedometers should not exceed 50 kg.

4.4. Manipulating signs or inscriptions as per GOST 14192-77 should be marked on each box with durable paint.

4.5. Accompanying certificate indicsting name or trade mark of manufacturing factory, abreviated conventional

designation of detector unit and transducers of speedometer, number of packed speedometors designation of the present tandard, packer's Number, Packing date, TID stamp.

4.6. Conditions of preserving the speedometers in packing should be as per GOST 15150 - 69.

Speedometers should not be stored in a place along with the things which cause corrosion.

4.7. The speedometers may be transported by any means of closed transport as per the governing rules for the corresponding type of transport.

Transportation conditions for speedometers should be C as per GOST 15150 - 69.

5. MANUFACTURER 'S GUARANTEE.

5.1. The manufacturer guarantees conformity of the speedometers with the requirements of the present standard provided transportation, storage and operation, conditions are observed.

5.2. Guarantee period of speedometer operation shoul dbe equal to the guarantee period of automobile operation for which it is designed.