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Replacing GB/T 4501-1998, GB/T 6327-1996, GB/T 7053-1993

Laboratory Test Methods for Truck and Bus Tyres Capabilities

载重汽车轮胎性能室内试验方法

**(ISO 10454:1993, Truck and bus tyres -
Verifying tyre capabilities - Laboratory test methods, MOD)**

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Foreword

This Standard modifies and adopts ISO 10454:1993 "Truck and bus tyres — Verifying tyre capabilities — Laboratory test methods" (English edition).

This Standard replaces GB/T 4501-1998 "Endurance test for truck and bus tyres — Drum method", GB/T 6327-1996 "Strength test method for truck and bus tyres" and GB/T 7035-1993 "High speed performance test for light truck tyres — Drum method".

This Standard is redrafted based on ISO 10454:1993 "Truck and bus tyres — Verifying tyre capabilities — Laboratory test methods". GB/T 4501-1998 "Endurance test for truck and bus tyres — Drum method", GB/T 6327-1996 "Strength test method for truck and bus tyres" and GB/T 7035-1993 "High speed performance test for light truck tyres — Drum method" are revised and integrated in this Standard.

Appendix A lists out the comparison table of chapter and article numbers between ISO 10454:1993 and this Standard for reference.

Relevant technical differences between ISO 10454:1993 and this Standard have been marked with vertical single line on the margin of relevant clauses; Appendix B lists out these technical differences and their reasons for reference.

For the convenience of use, the following editorial changes are made in this Standard:

a) Replace "this International Standard" with "this Standard";

b) ", " used as the decimal point in former international standard is replaced by the decimal point ".";

c) Delete the Foreword of the international standard;

d) Delete the Bibliography of the international standard.

The main differences between this Standard and GB/T 4501-1998 are as follows:

— The order of the clauses number is adjusted;

— Normative references are added and modified (Chapter 2 of GB/T 4501-1998 and Chapter 2 of this Standard);

— Test equipment and precision requirements are added and modified (Chapters 4 and 7 of GB/T 4501-1998 and Chapter 4 of this Standard);

— The requirements of test rim are modified (5.1.2 of GB/T 4501-1998 and 5.1.1.2 of this Standard);

— Tyre endurance and high speed testing conditions in the appendix of original

standard is deleted (Appendix A of GB/T 4501-1998);

— Test report is added and modified (Chapter 7 of this Standard).

The main differences between this Standard and GB/T 6327-1996 are as follows:

— Adjust the order of clauses in this Standard;

— Normative references are added and modified (Chapter 2 of GB/T 6327-1996 and this Standard);

— Test equipment and precision requirements are added and modified (Chapters 4 and 5.3 of GB/T 6327-1996 and Chapter 4 of this Standard);

— Appearance quality requirements of test tyre are added and modified (5.1.1 of GB/T 6327-1996 and 5.3.1.1 of this Standard);

— The requirements of test rim are modified (5.1.2 of GB/T 6327-1996 and 5.3.1.2 of this Standard);

— Breaking energy are listed in metric series and inch series respectively in this Standard, and the former national standard did not do so (GB/T 6327-1996 and 6.2 of this Standard);

— Minimum breaking energy classified on the base of tyre aspect ratio specified in the former national standard (Chapter 3 of GB/T 6327-1996) are deleted in this Standard;

— For the truck and bus tires with rim diameter ≥ 17.5, breaking energy test is classified into with/without inner tube, and the former national standard did not do so (Chapter 3 of GB/T 6327-1996 and 6.2 of this Standard);

— Test method of mean breaking energy specified in the former national standard is changed to test the minimum breaking energy at each point in this Standard (5.2.8 of GB/T 6327-1996 and 6.2 of this Standard);

— Test report is added and modified (Chapter 7 of this Standard).

The main differences between this Standard and GB/T 7035-1993 are as follows:

— Adjust the order of clauses in this Standard;

— Normative references are added and modified (Chapter 2 of GB/T 7035-1993 and Chapter 2 of this Standard);

— Test equipment and precision requirements are added and modified (Chapters 3 of GB/T 7035-1993 and Chapter 4 of this Standard);

Laboratory Test Methods for Truck and Bus Tyres Capabilities

1 Scope

This Standard specifies test methods for verifying the capabilities of tyres for truck and bus, including terms and definitions, test equipment and precision, test conditions, test procedure, judgment criterion and test report, etc. In the test methods given, only some may be required depending on the type of tyre to be tested.

This Standard includes:

(1) Endurance test — test the endurance capability of tyres by the travel distance under specified load and speed;

(2) High speed test — test the capability of the tyre according to its speed symbol;

(3) Strength test — test the capability of the tyre structure with respect to braking energy of tread cap.

The test methods presented in this Standard are suitable for grading of tyre capabilities or quality levels.

This Standard is applicable to new pneumatic tyres of truck and bus.

2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute the provisions of this Standard. For dated references, subsequent amendments or revisions of these publications do not apply. However, parties who enter into agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

GB/T 2977 Size designation, dimensions, inflation pressure and load capacity for truck tyres

GB/T 6326 Tyre terms and definitions (GB/T 6326-2005, ISO 4223-1:2002, Definitions of some terms used in tyre industry — Part 1: Pneumatic tyres, NEQ)

5.1.2.2 Mount the tyre and rim assembly on a test axle so that the tyre may be pressed radially against the outer face of the test drum.

5.1.2.3 During the test, the ambient temperature shall be maintained at 38℃±3℃.

5.1.2.4 Conduct the test in accordance with those specified in Table3. Conduct test according to specified procedure. In each successive phase of the test, without interruption, re-adjust the pneumatic pressure and cool down tyre artificially, and the test loads shall be maintained constant.

5.1.2.5 After tyre is completed for 3 periods of test according to the specified procedures, stop the test immediately. Measure the pneumatic pressure and main dimensions of tyre. Dismantle the tyre after natural cooling for 1h. Carry out appearance inspection.

5.2 High speed test (mini, light truck and bus tyres)

5.2.1 Test conditions

5.2.1.1 Appearance quality of test tyre shall meet the requirements of GB 9744.

5.2.1.2 Mount the tyre on a test rim specified in GB/T 2977; inflate to the pressure corresponding to the maximum load rating.

5.2.1.3 Maintain the inflated tyre and rim assembly at ambient temperature of 38℃±3℃ for at least 3 h.

5.2.1.4 The test drum shall start at uniform acceleration to the initial test speed within 10 min.

5.2.1.5 Test conditions shall be in accordance with those specified in Table 4. For each period specified in Table 4, required time from speed-change to speed-steady shall be within 1 min (except period 1).

5.2.1.6 In each successive phase of the test, without interruptions, re-adjust pneumatic pressure; and the test loads shall be maintained constant.

5.2.1.7 In the test process, ambient temperature shall be within the range of 38℃±3℃.

5.2.2 Test procedure

5.2.2.1 Re-adjust the tyre pressure to the pneumatic pressure specified in 5.2.1.2.

5.2.2.2 Mount the tyre and rim assembly on a tester according to the aforesaid conditions; the test load of tyre may be pressed radially against the outer face of the test drum; test load shall be 90% of the maximum load of single tire.

5.2.2.3 Conduct successive test in accordance with those specified in Table 4.

f) Test air pressure and test load;

g) Test duration and test speed of all test phases;

h) Plunger acting force, stroke, energy and maximum breaking energy (if any) of each test point of tyre strength test;

i) The condition of each test point of tyres in bead unseating test: "seated", "unseated" or "touch rim seated";

j) Such conditions of tyre appearance ad air pressure maintenance after high speed and endurance capabilities test;

k) Record or instruction of circumstances in test procedure;

l) Conclusion: "pass" or "rejected".

Appendix B

(Informative)

Technical Differences between This Standard and ISO 10454:1993 and Their Reasons

Table B.1 lists out the comparison of technical differences between this Standard and ISO 10454:1993 (English edition) and their reasons.

Table B.1 Technical Differences between This Standard and ISO 10454:1993 and Their Reasons

Chapter and Article numbers of this Standard	Technical differences	Reasons
1	Different scope of this Standard	ISO 10454 specifies two laboratory test methods for truck and bus tires capabilities, while this Standard specifies three test methods.
2	GB/T 6326, GB/T 2977 and GB 9744 were quoted directly, and ISO 4223-1 quoted in ISO 10454 was deleted	Although GB/T 6326 is not equivalent to ISO 4223-1, it covers 410 terms in total and 52 of which are stemmed from the 53 terms of ISO 4223-1. Simultaneously, test methods are involved in test load, measuring rim and other requirements; according to the national conditions of China, GB/T 2977 and GB 9744 were added
3	The majority of specific provisions of the international standard were deleted, only one key term was reserved, and another term was added	The majority of terms and definitions of ISO 10454 already included in GB/T 6326. For the purpose of simplification, only necessary term and definitions were reserved and added
4.1.1	Only one of two test drum diameters specified in ISO 10454 was adopted, and the different tolerance was adopted	The requirements of test drum diameter of 1700 mm ± 17 mm specified in the former national standard was reserved
4.1.5, 4.1.6	The requirements of radial runout of test drum surface, and the recommendatory suggestion on installation position of temperature measuring device were added	To ensure the accuracy of test, which with stricter requirements on the accuracy of test device than ISO 10454
4.2.1	Table 2 was added, which specifies plunger diameters of truck and bus tyres (inch series)	Table 1 of ISO 10454 is only applicable to the tyres in metric size
5.1.1.1 5.3.1.1	The requirement of appearance quality of test tyres in accordance with GB 9744 was added	Tyres with undesirable appearance quality are unsuitable for the test
5.1.1.2	This Standard specifies test rim shall be	Application of test rims meet the requirements of

Appendix C

(Normative)

Corresponding Relationship between Tyre Speed Symbol and Speed

Table C.1 lists out the corresponding relationship between tyre speed symbol and speed.

Table C.1 Corresponding Relationship between Tyre Speed Symbol and Speed

Tyre speed symbol	Maximum driving speed (km/h)
C	60
D	65
E	70
F	80
G	90
J	100
K	110
L	120
M	130
N	140
P	150
Q	160
R	170
S	180
T	190
U	200
H	210

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