

KES

ALLOY DISC WHEEL

KES D-B404

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1. Scope of Application

This standard shall be applied in case of developing or evaluating of alloy disc wheel for vehicle.

2. Purpose

This standard shall be for the purpose of assuring for the proper quality through standarding of demand for specification of alloy disc wheel.

Remark : This standard shall delivery the demand of condition with a drawing sheet of specification.

3. Report of Evaluated Result

The evaluated result at the each step from a development to a product is presented to Kia according to the direction of supplement sheet.

4. Definition of Terminology

(1) Effective surface

Effective surface shall mention the sight of range at the various angle from the hub bolt installed wheel tire and the tightened side of hub nut.

(2) Uneffective surface

Uneffective surface shall mention the range except the installed surface for effective surface and tire.

5. Specification Indicated in Speciflicated Sheet

(1) Width of basic dimension(design rim), dimension of rim, offset, PCD, number of hole

(2) Shape and tolerance of the central boss? parts

(3) Conditions of strength and durability

· Test for M_1 , M_2 turning bending

· Length L of moment arm

- The load of durability test in the radial direction and tire size
- (4) Color of paint, color of effective surface
- (5) Weight of products(target and maximum dimension)
- (6) Maximum clear dimension of break parts, standard of air valve
- (7) Shape of hub, hub cap and so on
- (8) The other special specifications(conformation mark etc.)

Remark : The quality rank is indicated through A, AR, B, C

The definition of quality rank conforms to KMS Q 410001(determination and procedure for quality rank)

Table 1

Evaluation item		Evaluation standard	Quality rank	Evaluation method
Specification	Indication	• To be dim a imprinting of manufacture Lot No AR • The mark according to JASO C 603 and DIN 7829 shall be easy for division with attached tire. • Free from mark with damage, layer or absurdity.	AR	Inspection by naked eye
	Rim outlines	• To conform to figure 1-attached sheet 2 • To be satisfied a withdrawing performance of	AR	Conform to figure1-anther rim and ADR No. 20.
Vehicle test	Driving test on dent & hump road condition	• Strain quantity of rim shall be within 10mm at the 2/3 air pressure, 60km/h.	AR	KES TH 216
	J-turn test	• Moving volume of tire bead shall be within 10mm at the 2/3 air pressure. R=8m, 35km/h.	AR	KES TH 270

Table 1 (Continued)

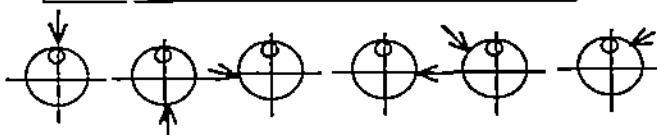
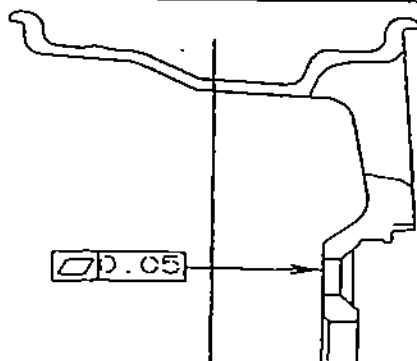
Evaluation item		Evaluation standard	Quality rank	Evaluation method														
Vehi-cle test	Rapid air loss test	- Free from removal of tire bead in the rim even the air pressure of tire would be reduced rapidly by the following. - tire & rim: use rim, tire satisfied with FMVSS 109. - tire deflation time : within 3 sec - vehicle deceleration : To reduce speed it with making a straight drive. - tire position : Enforce at the two place to the direction of the opposite angle.	AR	KES TH 251														
	Balance test	- Check the stepped cone of E/CTR. CAP - Check a color of wheel and E/Ctr. CAP - Operation for wheel wrench - Assemblity with wheel and tire	A	KES TG 038 KES TG 051														
Bench test	Impact test	<table border="1"> <tr> <td>RIM hard</td><td>12"</td><td>13"</td><td>14"</td><td>15"</td></tr> <tr> <td rowspan="2">High of standard</td><td>152</td><td>178</td><td>229</td><td>229</td></tr> <tr> <td>6"</td><td>7"</td><td>10"</td><td>10"</td></tr> </table>  - Damage of flange, strain is not an object of decision. Air leak must drop of 50% within 30 sec - Free from a damage & crack of parts and so on. - Residual torque of hub bolt shall be 75% or less.	RIM hard	12"	13"	14"	15"	High of standard	152	178	229	229	6"	7"	10"	10"	A	JASO C 603 6.13
RIM hard	12"	13"	14"	15"														
High of standard	152	178	229	229														
	6"	7"	10"	10"														

Table 1 (Continued)

Evaluation item		Evaluation standard	Quality rank	Evaluation method
B e n c h t e s t	Fatigue of turning bending	- Free from disc at the $(M_1 \times 30,000 + M_2 \times 30,000) \times 5$ times or more. (Test condition refers to drawing sheet of specification)	A	JASO C 603 6.1.1
	Test for air leakage	Free from air leakage	B	JASO C 603 6.1.4
	Run out	- Run out of perpendicular measures - Run out of horizontality measures through YX. - Run out shall be 0.25mm of rim parts inner & outer side.	B	RUN OUT measuring equipment
	Load for load durability test in the direction of radius?	- Free from the damage and strain rim & disc parts at the 106 times or more. (Test condition refers to drawing sheet of specification)	A	JASO C 603 6.1.2
	Bush pressing test	Free from a shaking and folling off of bush after pushing pressure of 3500kg/EA.	B	Oil pressure GAGE
	Salt water spraying test	To satisfy SST 720Hr.	B	KS D 9502
	Painting test	To satisfy TB2-CO8 We01	B	KES MN 600
	Loose rate of hub nut	Residual a tightened torque after testing shall be minimum 75% of the initial torque	A	Torque measuring equipment figure 2-attached sheet 2
	Distance between wheel and break	The distance between wheel and break indicated drawing sheet shall be 3mm.	B	GAGE measuring equipment
	Flatness of the hub attached surface		B	Flatness measuring equipment

6. Evaluation Method

Evaluation method conforms to the table 1 and report of evaluation result conforms to the attached sheet 1.

6.1 Durability of strength

Evaluation method of strength durability conforms to as follows.

- (1) A size of hub bolt shall be M12×1.5.
- (2) A tightened torque of hub nut shall be from 9 to 12kgf.m.
- (3) Appearance of contacted surface for wheel of hub nut shall be taper at the 60° except special case.
- (4) Check at the rotation(maximum) specified times or more in order to catch the limit strength.

6.1.1 Rotation bending test(A details refers to JASO C 603)

It shall test until specified rotation times through test machine of fatigue for rotation bending and measure a crack after testing a durability. Test device is JASO C 603 or conforms to figure 1.

Specified rotation times : $(M_1 \times 30,000 + M_2 \times 30,000) \times 5$ times

Remark 1. Test load is given at the figure 1 formula $W=M/L$.

2. Dimension of rotation bending and length of moment arm are specified in specification.

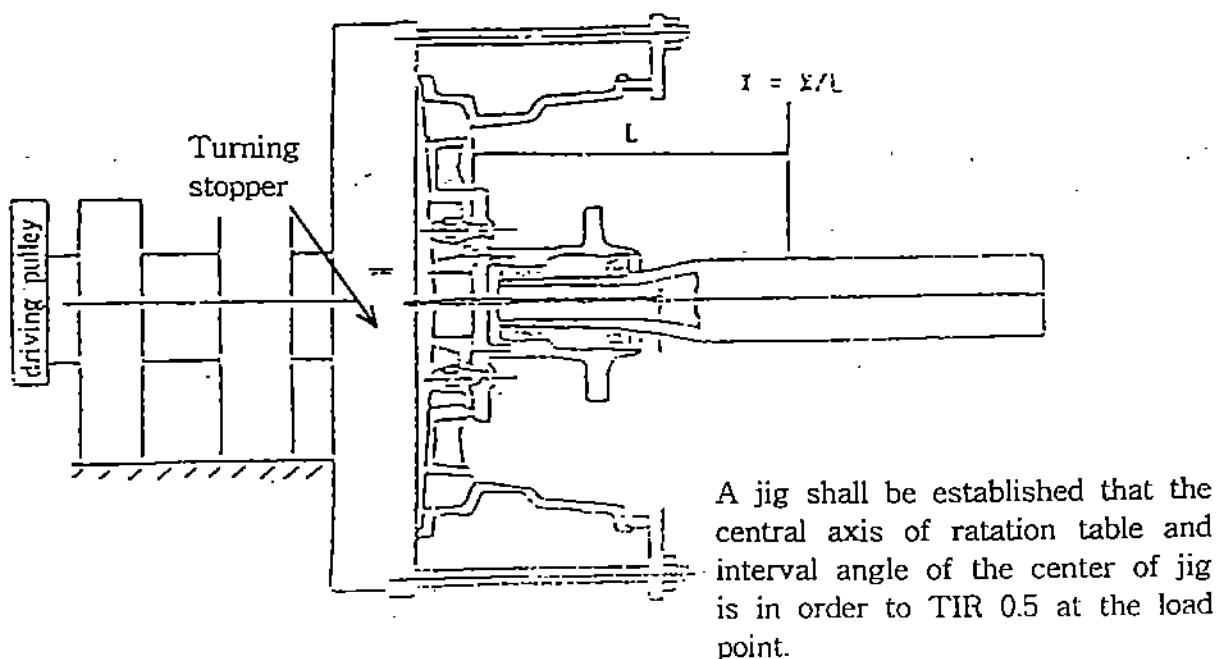


Figure 1

6.1.2 Load durability in the radial direction

The tire is attached and it shall apply a load through test machine for load durability test in the direction of radius?

After durability test, measure the existence of air leakage and crack.

Test device conforms to JASO C 603.

The specified rotation times are 106 rotation. Tire for test shall be for OEM.

Remark : Test load (W) and tire size shall record to the specification. -

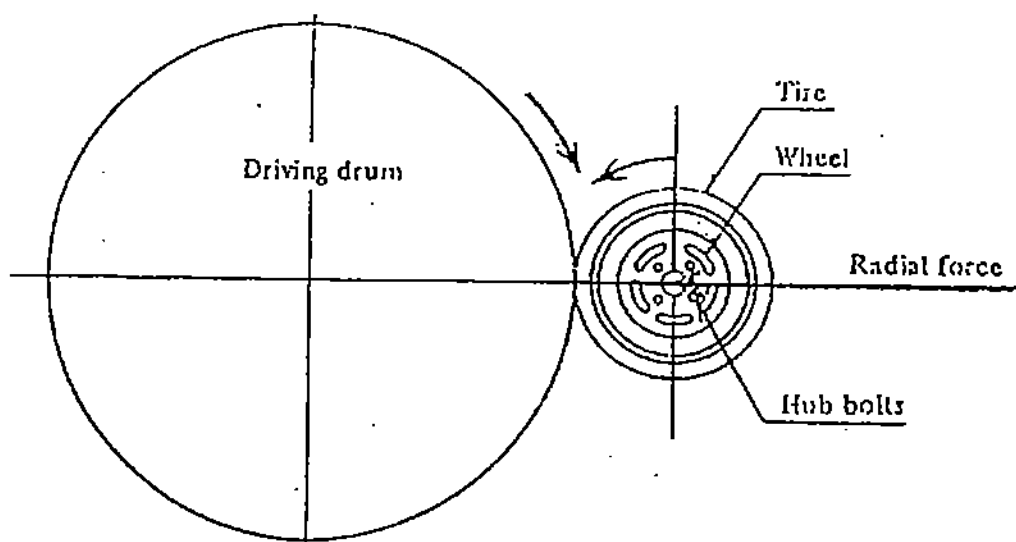


Figure 2

6.1.3 Impact test

The wheel attached a tire is fixed to the die where has a enough rigidity and strength leaned to the angle of 30° against perpendicular and then it shall make a plumb strike of free-fall.

Test device conforms to JASO C 603.

Free from damage & crack of disc parts after test.

But, damage of flange, strain is not an object of decision. Air leak must drop 50% of air pressure within 30 sec.

Standard height of each rim size refers to the evaluation standard.

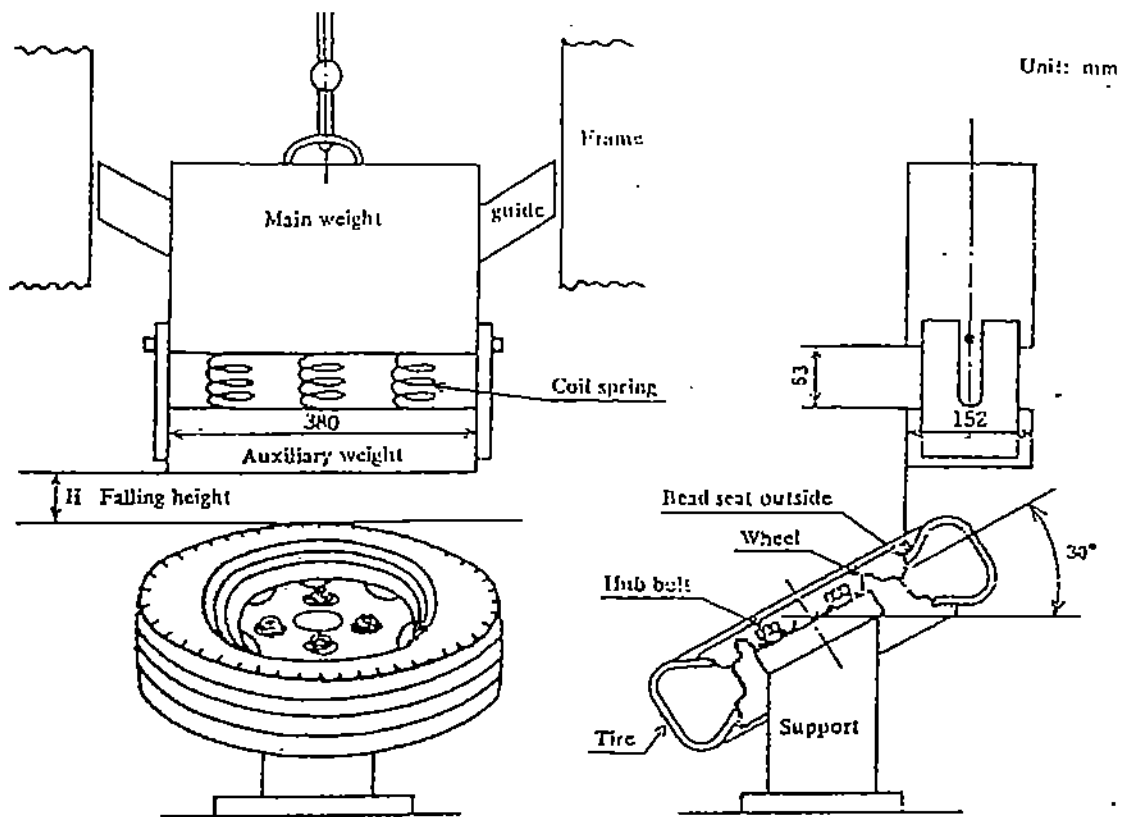


Figure 3

Main plumb (kg)	Assist plumb (kg)	Number of spring (piece)	Synthetic spring constant (kgf/cm)
910 ⁺¹⁸ ₀	100 ⁺⁴⁵ ₀	3	1070 ⁺¹⁸ ₀

6.1.4 Air leakage test of rim parts (A details refers to JASO C 603)

The both axes of flange are sealed through a push plate and it supplies pressured air into inside of light alloy wheel, confirm the air tightness of rim part.

Condition of air test air pressure : 2.5 ~ 3.5kgf/cm²

holding time for pressure : 45 sec