

Fiscal 2008 Project Commissioned by

Mugen Denko Co., Ltd:

Airbag jacket Deployment Test

August 2009

Japan Automobile Research Institute, Inc. (JARI)

Airbag jacket Deployment Test

1. Outline of test

The jacket has airbag function. The airbag of jacket is deployed the manual operation and the deployment situation of the air back is recorded by the high-speed camera.

2. Test methods and instruments

Figure 1 shows the dummy (Hybrid III 50th Male Dummy) used in the tests. The dummy puts on the airbag jacket. The airbag of jacket is deployed the manual operation and the motion of the airbag deployment is recorded by two high-speed cameras set in the rear and side direction of the dummy (see figure 2).

The frame rates of the high-speed cameras is 100 f.p.s.

A time zero of the high-speed camera is defined as the moment when the key ball (Trigger) is pulled off. To examine the release force of the key ball, the tension force (release force) of the key ball was measured by the force gauge (see figure 3).



Fig. 1 Dummy (Hybrid III 50th Male Dummy)



Fig. 2 HIGH SPEED CAMERA
NAC Image Technology, Inc. ,
Model : MEMRECAM Gx-5



Fig. 3 Mechanical force gauge
(dynamometer) Max: 500kg

3. Test condition

Conductor : Japan Automobile Research Institute
Date : 24/Aug./2009
Temperature : 24.6 ~ 26.5 degrees C Humidity : 53 ~ 64%
Number of tests : 20 (T-01~T-20)

4. Test Results

Table 1 shows the results of the test (Fully inflated time, Release force of the key ball).

Fully Inflated is defined the time that the airbag was deployed in the maximum. The maximum inflation of airbag were determined from the results of the high-speed camera.

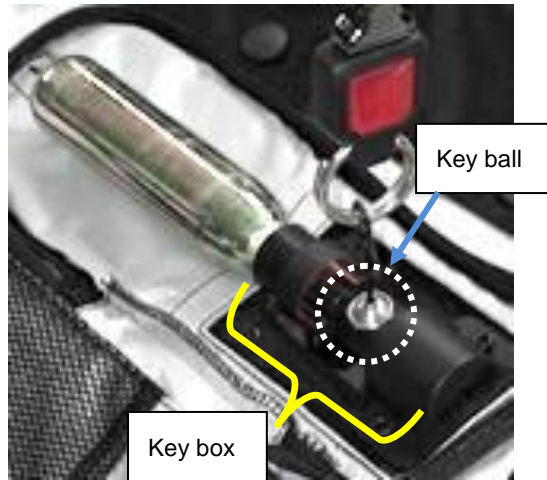
The release force of the key ball is the moment that the key ball works.

The release forces of the key ball were measured by the force gauge.

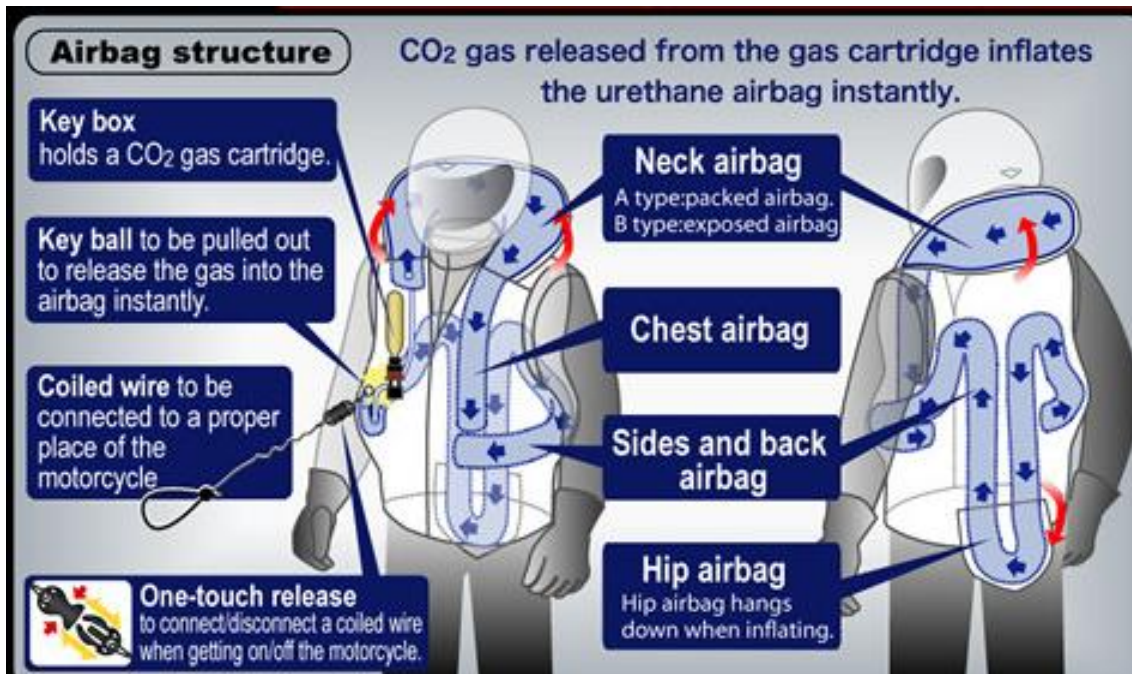
Table 1 Full Inflated Time and Release Force of Key Ball

Test	Fully Inflated(in Time: msec)	Release Force of Key Ball(kg)
T-01	160	41
T-02	275	33
T-03	180	29
T-04	220	38
T-05	270	35
T-06	260	36
T-07	320	34
T-08	200	25
T-09	120	21
T-10	230	26
T-11	140	33
T-12	225	37
T-13	150	24
T-14	230	30
T-15	270	38
T-16	170	25
T-17	220	23
T-18	270	40
T-19	355	18
T-20	150	27

* Key box and Key ball



When a force of approximately 25 - 30kg (55 - 65 lbs.) is applied to the "coiled wire", the "key ball" will be pulled from the "key box". Then a needle in the "key box" punctures the seal of the gas cartridge to inflate the "Hit Air" instantly. The "key ball" can be pulled out from any direction.



APPENDIX

T-01



Release Force : 41kg



Full Inflated Time : 160msec

T-02



Release Force : 33kg



Full Inflated Time : 275msec

T-03



Release Force : 29kg



Full Inflated Time : 180msec

T-04



Release Force : 38kg



Full Inflated Time : 220msec

T-05



Release Force : 35kg



Full Inflated Time : 270msec

T-06



Release Force : 36kg



Full Inflated Time : 260msec

T-07



Release Force : 34kg



Full Inflated Time : 320msec

T-08



Release Force : 25kg



Full Inflated Time : 200msec

T-09



Release Force : 21kg



Full Inflated Time : 120msec

T-10



Release Force : 26kg



Full Inflated Time : 230msec

T-11



Release Force : 33kg



Full Inflated Time : 140msec

T-12



Release Force : 37kg



Full Inflated Time : 225msec

T-13



Release Force : 24kg



Full Inflated Time : 150msec

T-14



Release Force : 30kg



Full Inflated Time : 230msec

T-15



Release Force : 38kg

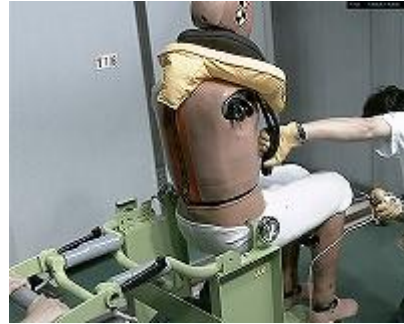


Full Inflated Time : 270msec

T-16



Release Force : 25kg



Full Inflated Time : 170msec

T-17



Release Force : 23kg



Full Inflated Time : 220msec

T-18



Release Force : 40kg



Full Inflated Time : 270msec

T-19



Release Force : 18kg



Full Inflated Time : 355msec

T-20



Release Force : 27kg



Full Inflated Time : 150msec