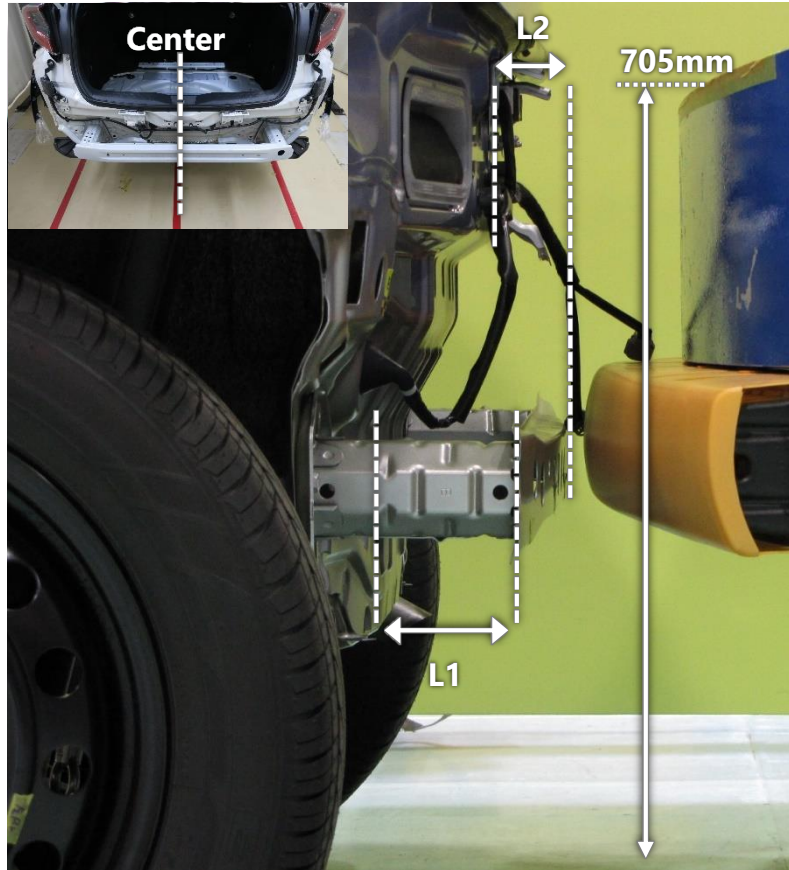


DET Supplemental Document

RB2-2 Rear Bumper Reinforcement

Condition



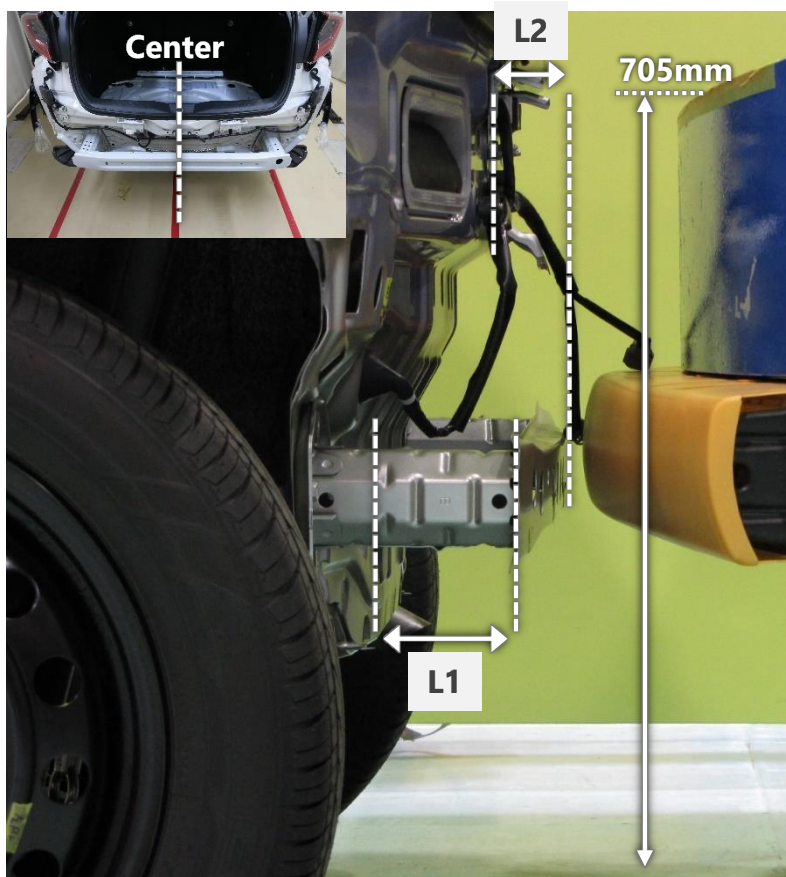
- Vehicle : All vehicles
- Part and Structure : Rear Bumper Reinforcement (RBR) and Back Panel

L1 : Clearance between RBR and Back Panel

L2 : Minimum forward-backward distance from rear end of RMR to Back Panel in the range of 705 mm or less above ground level

☞ Both lengths measured in the vehicle center

Criteria

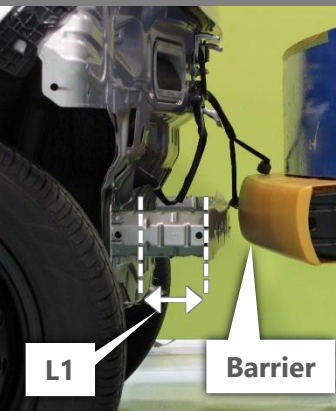


The Rear Bumper Reinforcement (RBR) should have a sufficient distance to the Back Panel according to its section modulus.

For the RBR whose section modulus at the center is
at least 7.5 times the vehicle weight;
L1 should be at least 60 mm, and L2 should be at least 50 mm

For the RBR whose section modulus at the center is
less than 7.5 times the vehicle weight;
L1 should be at least 80 mm, and L2 should be at least 70 mm

Reason



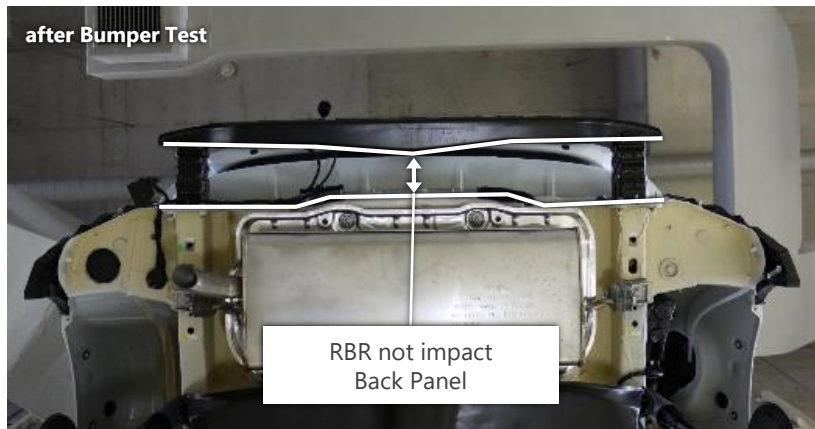
L1 : Minimum clearance between the Center of the RBR and Back Panel

Sufficient clearance^{*1} between the RBR and the Back Panel, depending on the section modulus of the RBR, prevents the RBR from impacting on the Back Panel, even if the RBR is pushed by the Bumper Barrier on the Bumper Test.

^{*1} 60 mm or more when section modulus is 7.5 times or more than vehicle weight,
80 mm or more when section modulus is less than 7.5 times vehicle weight

Example of a vehicle which has sufficient clearance (L1)

The RBR was pushed on the Bumper Test, but did not impact on the Back Panel.



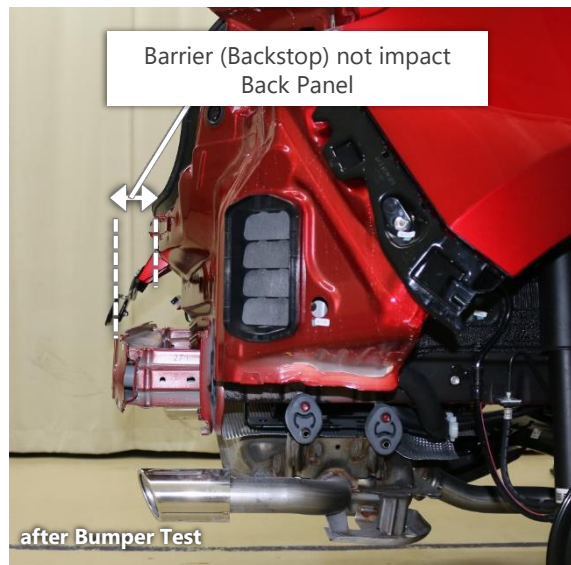
Reason



L2 : Minimum forward-backward distance from rear end of RMR to Back Panel in the range below the Backstop of the Bumper Barrier (705 mm above ground level)

A sufficient forward-backward distance^{*2} between the center rear end of the RBR and the back panel, depending on the section modulus of the RBR, prevents the bumper barrier from penetrating causing the backstop to impact on the back panel.

^{*2} 50 mm or more when section modulus is 7.5 times or more than vehicle weight,
70 mm or more when section modulus is less than 7.5 times vehicle weight

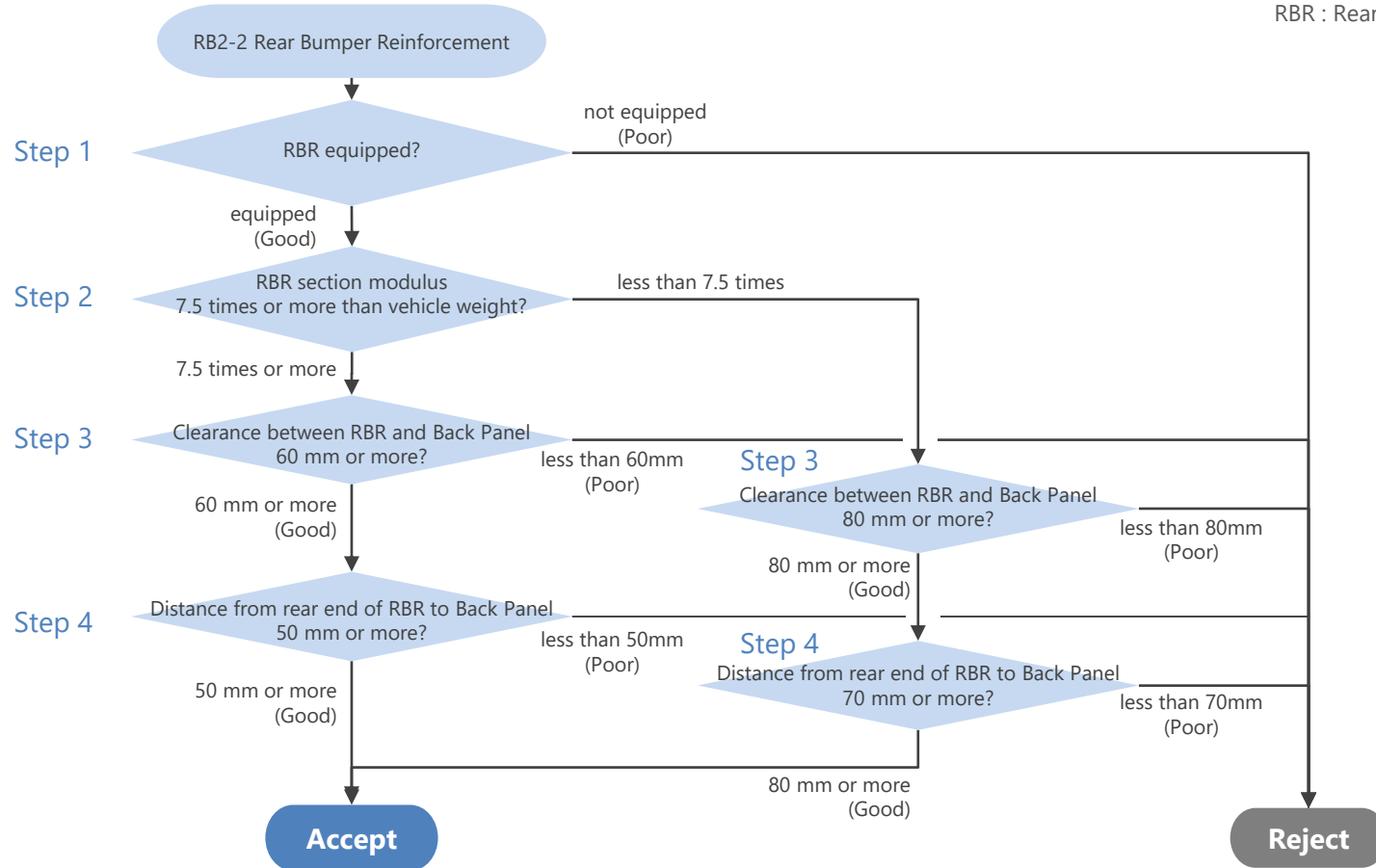


Example of a vehicle which has sufficient clearance (L2)

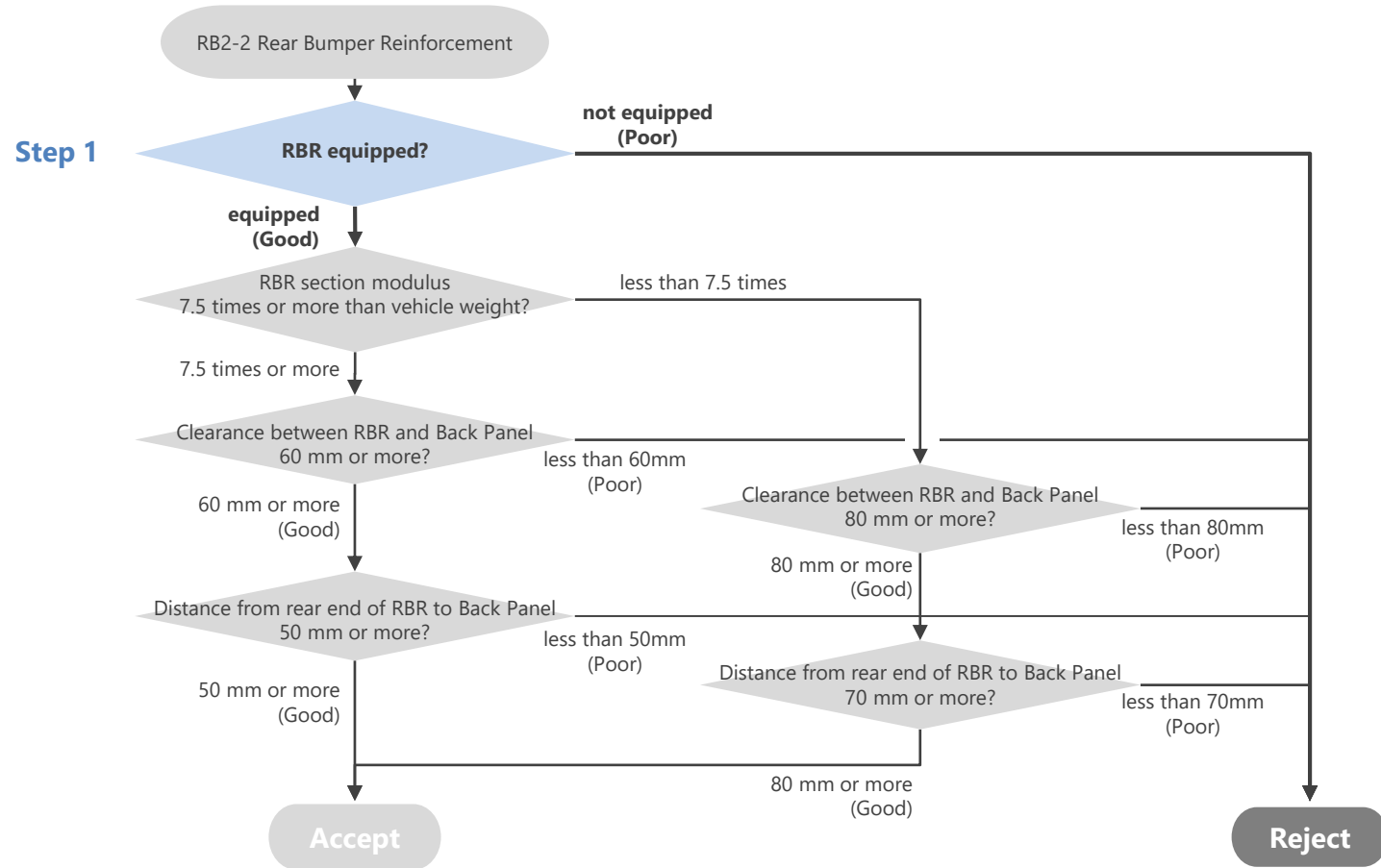
Bumper Barrier (Backstop) did not impact on and damage the Back Panel.

Check Flow

RBR : Rear Bumper Reinforcement



Check Flow – Step 1



Check – Step 1



Check if the RBR is equipped.

【Determination】

Good

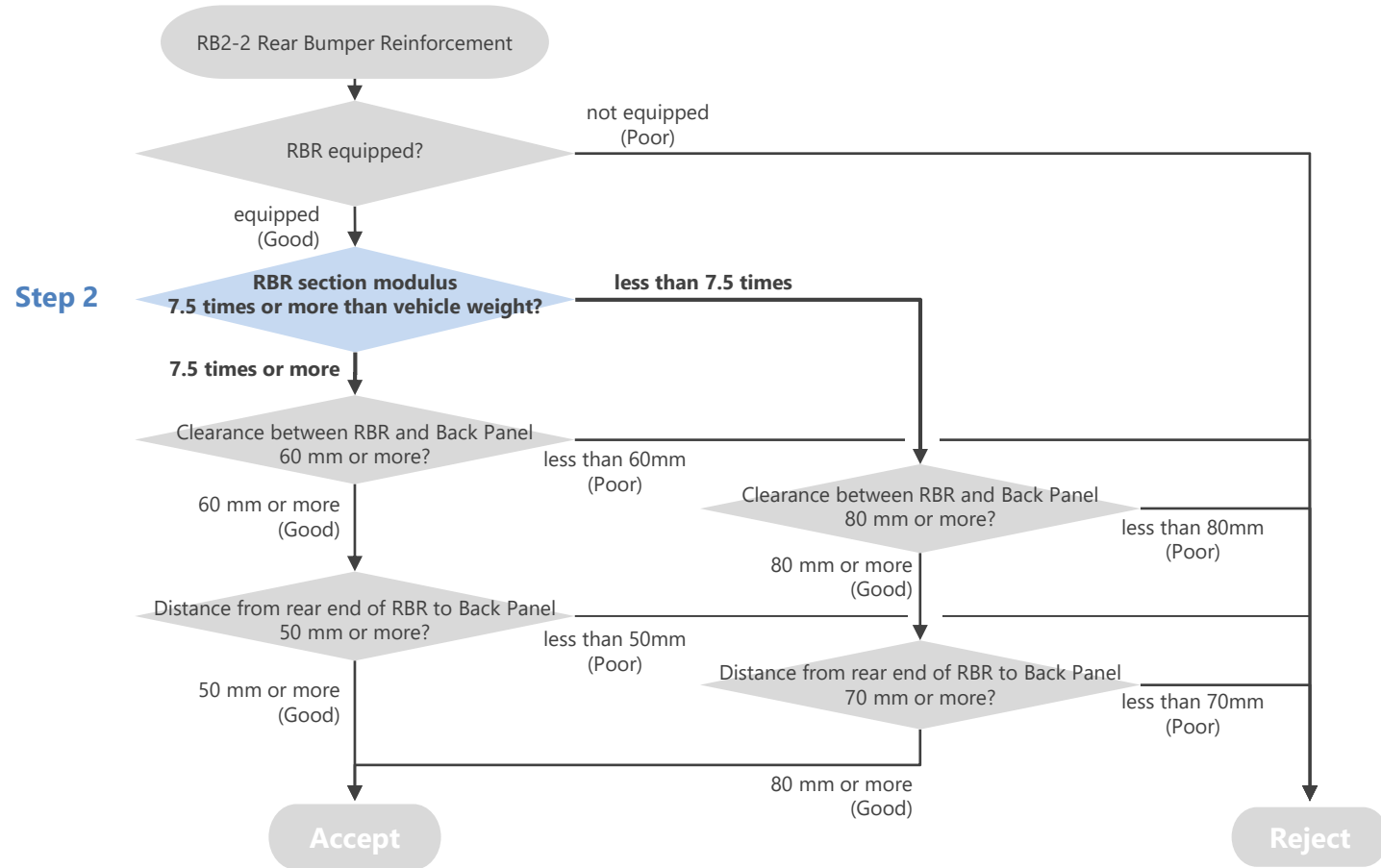
☞ When the RBR is equipped, it is determined as Good.



Poor

☞ When the RBR is not equipped, it is determined as Poor
and **Reject**

Check Flow – Step 2



Check – Step 2

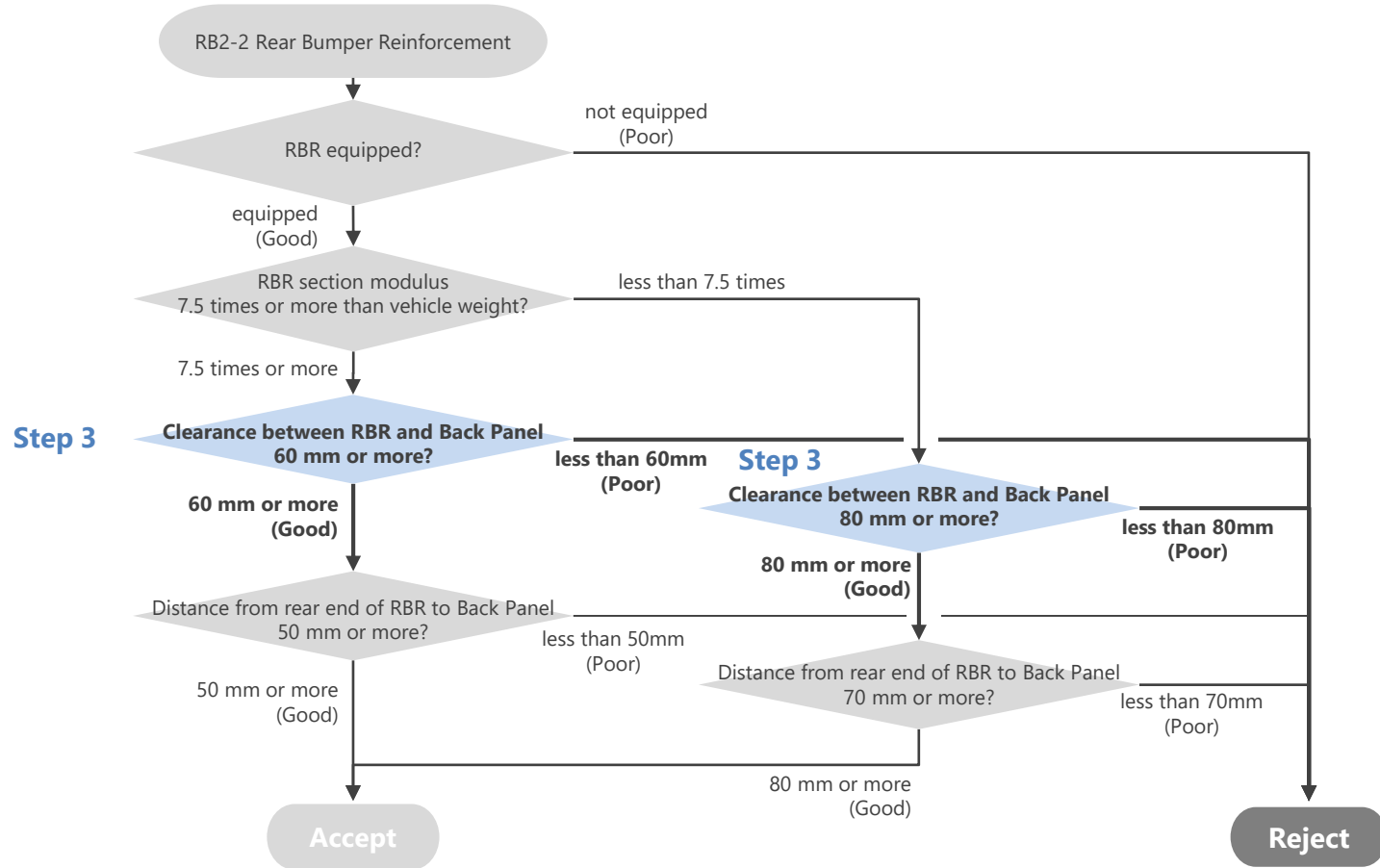


Calculate the section modulus in the center of RBR.

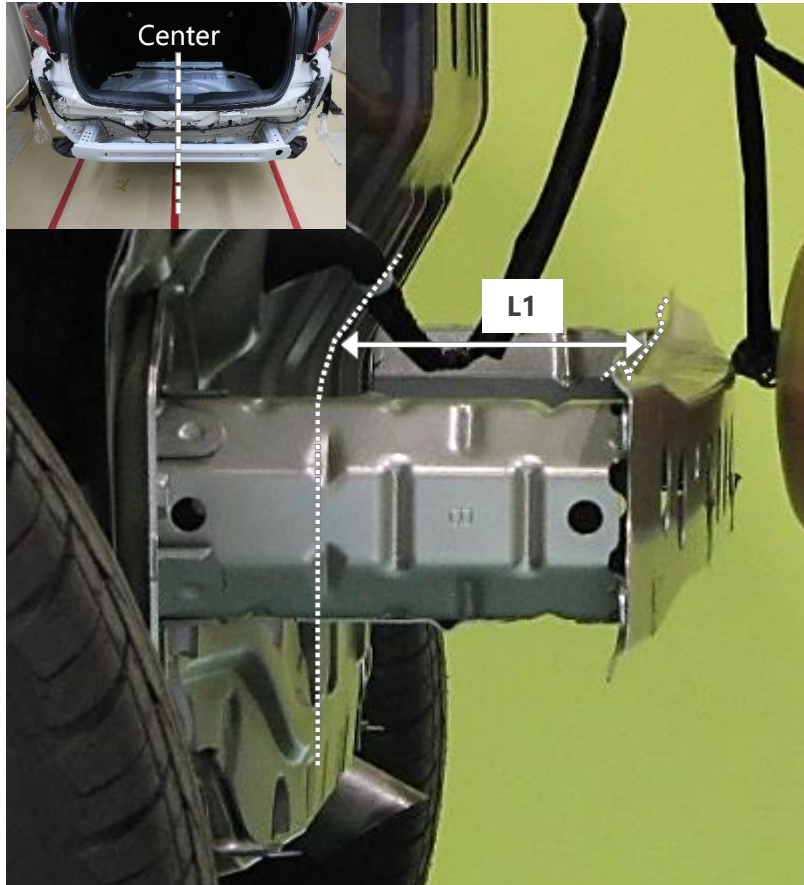
Check the vehicle weight.

- ☞ Refer to the supplemental document of FB2-2, RB2-1 for calculating the section modulus.
- ☞ Check if the section modulus is 7.5 times or more than the vehicle weight.

Check Flow – Step 3



Check – Step 3



Measure L1 (the minimum clearance between the center of the RBR and Back Panel).

【Determination】

Good

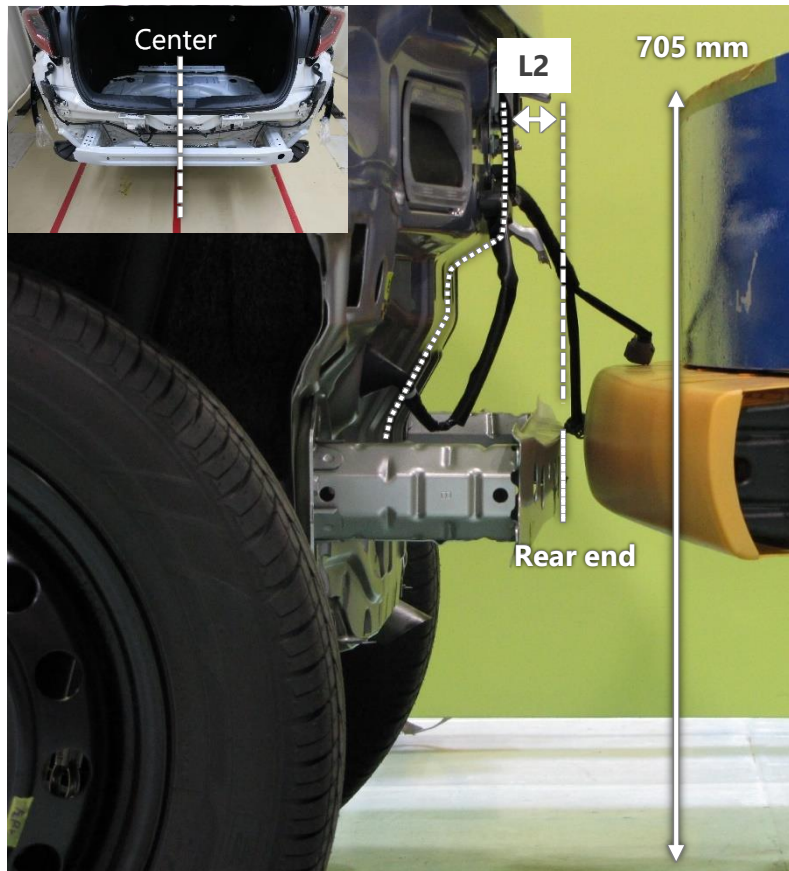
- ☞ When the section modulus is 7.5 times or more than vehicle weight, the clearance of 60 mm or more is determined as Good.
- ☞ When the section modulus is less than 7.5 times vehicle weight, the clearance of 80 mm or more is determined as Good.

Poor

- ☞ When the clearance is narrower than the above, it is determined as Poor and **Reject**

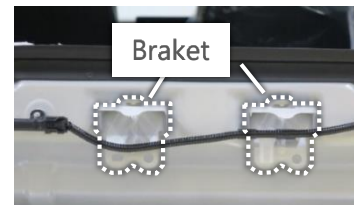


Check – Step 4



Measure L2 (Minimum forward-backward distance from the center rear end of the RMR to Back Panel in the range of 705 mm or less above ground level)

- ☞ Brackets on the Back Panel are not considered.



【Determination】

Good

- ☞ When the section modulus is 7.5 times or more than vehicle weight, the distance of 50 mm or more is determined as Good and **Accept**
- ☞ When the section modulus is less than 7.5 times vehicle weight, the distance of 70 mm or more is determined as Good and **Accept**

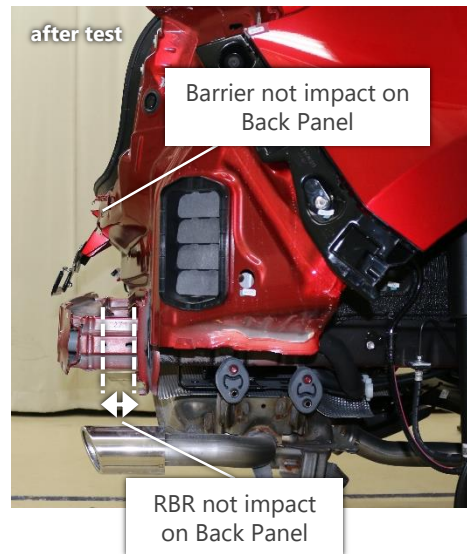
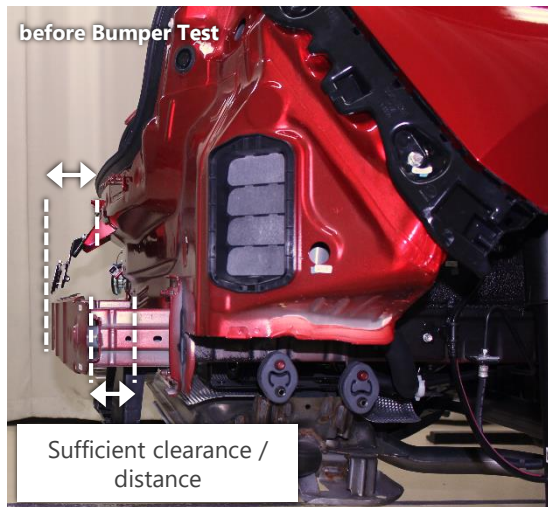
Poor

- ☞ When the distance is shorter than the above, it is determined as Poor and **Reject**

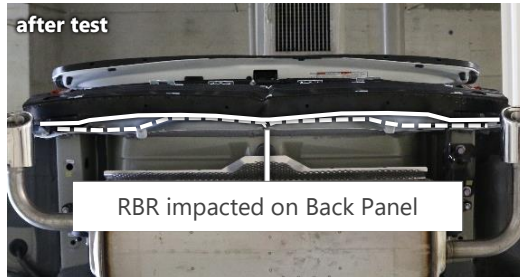
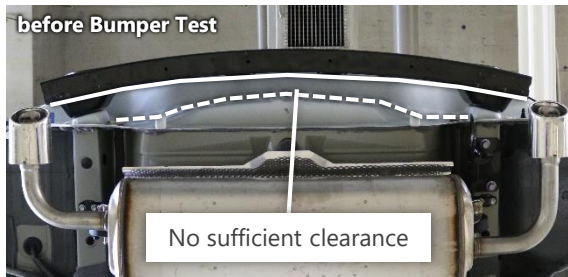
Example of Accept / Reject

Accept

- There was sufficient clearance / distance between the RBR and the Back panel.
Therefore the Back Panel was not damaged when the RBR was pushed on the Bumper Test.

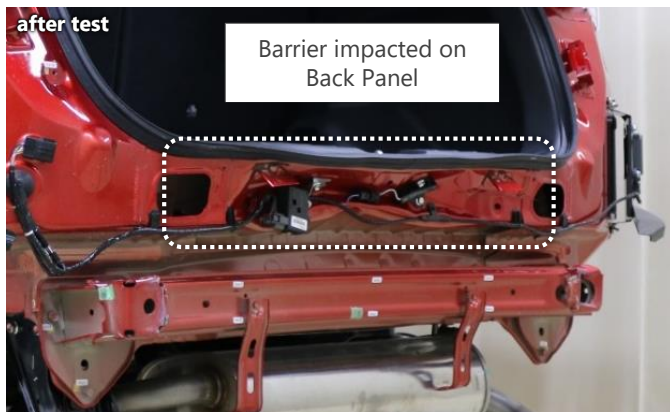
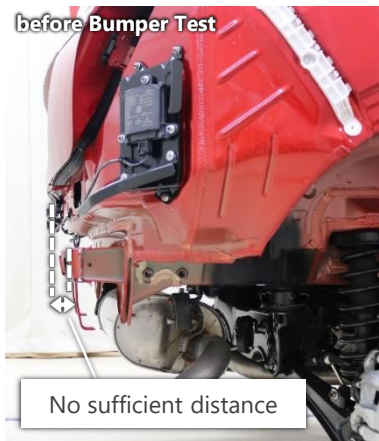


Example of Accept / Reject



Reject

- ☞ The clearance between the RBR and the Back Panel is narrow. Therefore the RBR impacted on the Back Panel due to being pushed by the Barrier.



- ☞ The minimum distance from the rear end of the RBR to the Back Panel was short. Therefore the Barrier (its Backstop) impacted on the Back Panel and damaged it.