

This material has already reported in TP-TF #4 by Japan.
We upload to share with IWG member. 2023/6/14

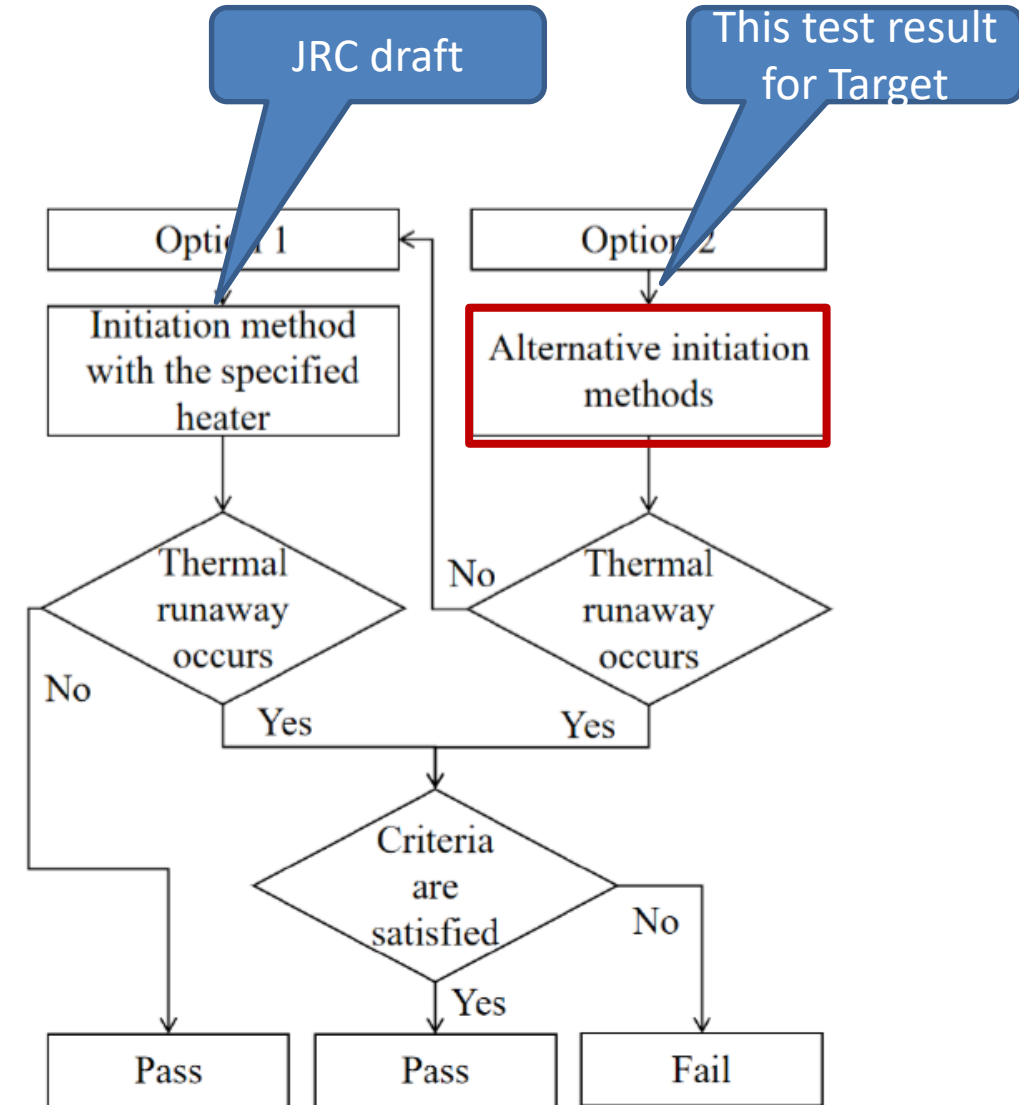
Thermal Propagation Test Flash report

EVS-GTR TP-TF
Feb. 2023

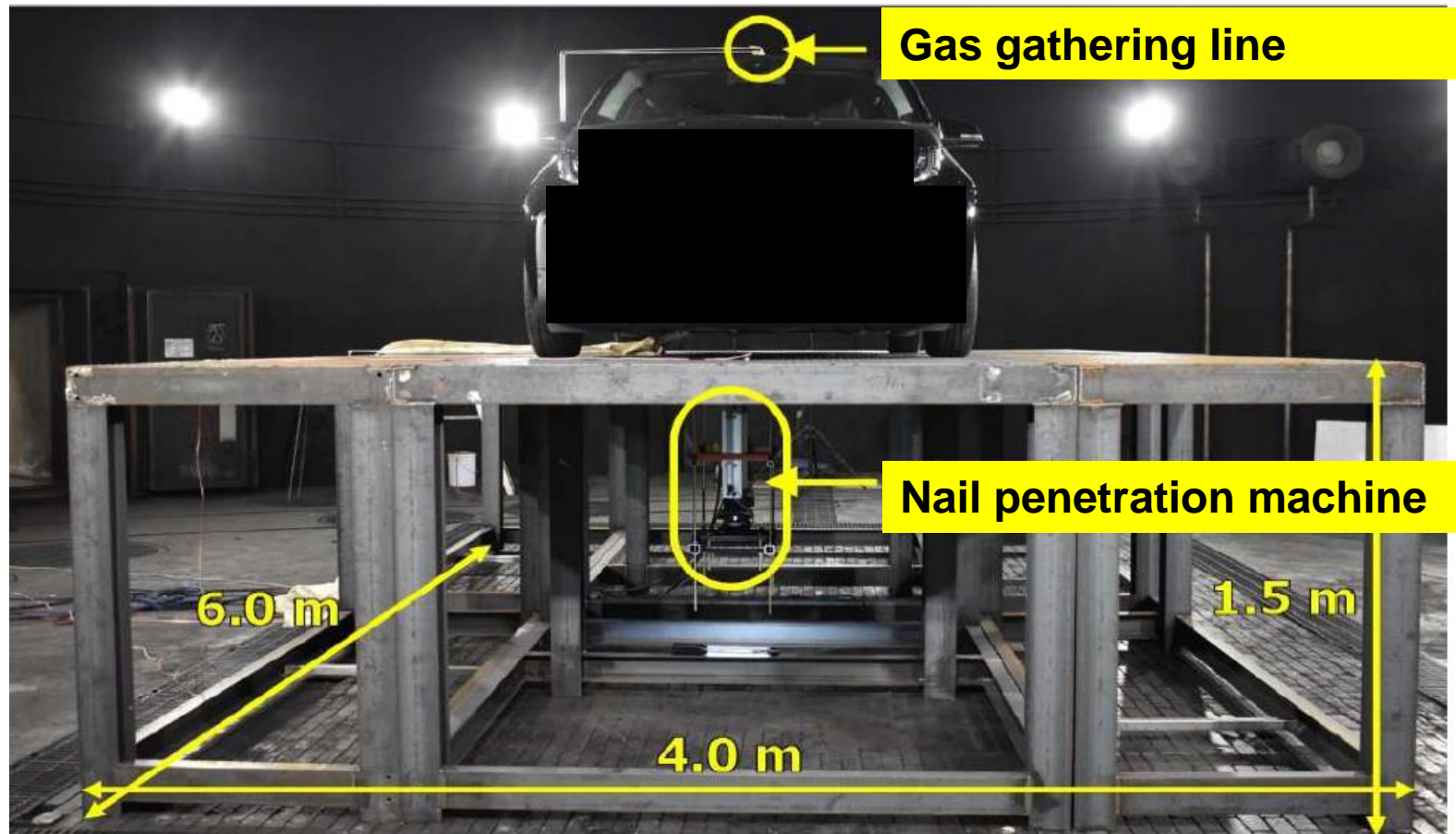


JAPAN AUTOMOBILE STANDARDS INTERNATIONALIZATION CENTER

- Alternative initiation methods should be defined due to ensure the feasibility and technology neutrality
- Nail penetration as one of alternative methods are useful for some REESS because it can simulate the realistic internal short circuit without additional energy input
- We share the flash report of vehicle penetration test

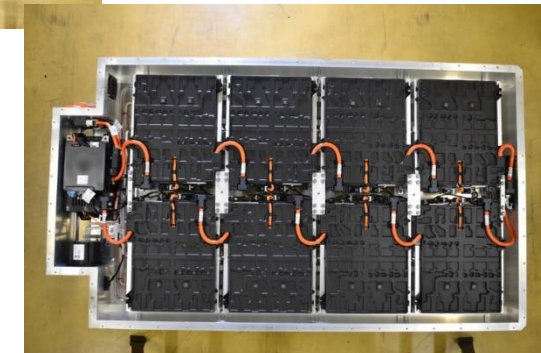


- Single cell thermal runaway was occurred by the penetration test on a vehicle



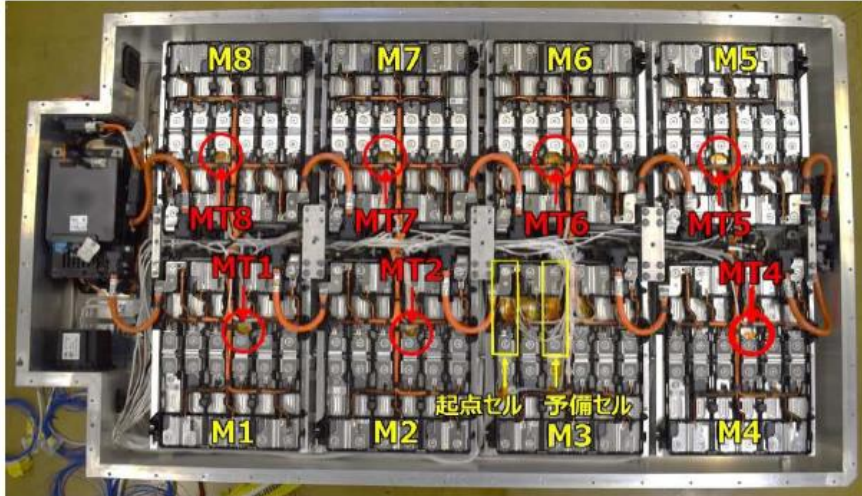
Sample			Remarks
	Vehicle type	PHEV	
	Battery energy	42.2 kWh	
	Cell type	Prismatic canned	
Test condition			
	Nail material	SUS440C	Steel*
	Nail diameter	5	>3*
	Nail angle	60	20-60*
	Penetration speed	0.1	0.1-10*
	Penetration position	Bottom of cell, Horizontal of electrode	Vertical of electrode*
	Stop condition	Full penetration or TR	TR*

* Described in GTR20 preamble

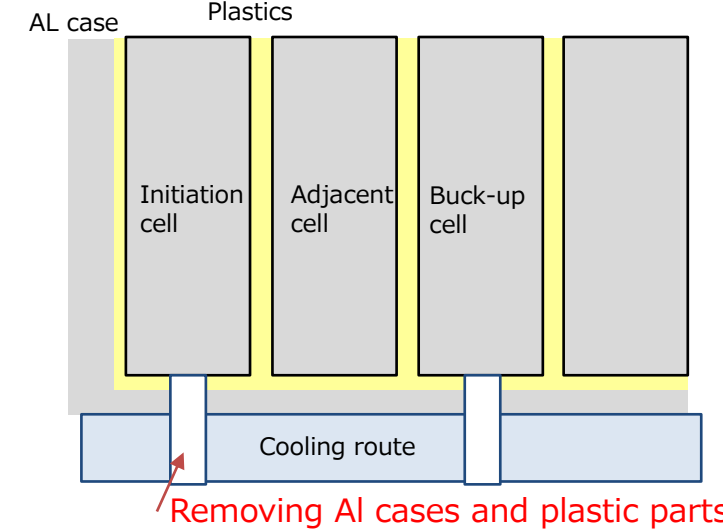


Battery prep. for vehicle penetration test

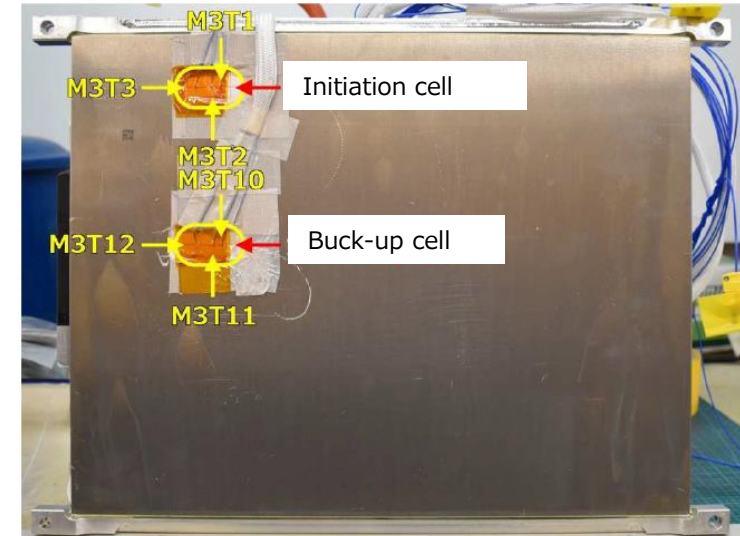
- The lower case of module and pack were drilled for nail prior to the test.



Module side view



Module bottom view



- Single cell thermal runaway was occurred by the penetration test on a vehicle



Before test



Smoke

0 sec. / at detection of TR



300 sec. / 5min after detection of TR

- We are preparing the result of thermal propagation test comparing to vehicles and components or heater and nail penetration
- Gas analysis are under research and we will report it.

Thank you