



READINESS OF TESTING FACILITY TOWARDS ASEAN MRA

Djoko W. Karmiadi

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**"Challenge of Future Vehicle Technology and
regulation"**

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MUTUAL RECOGNITION

- **Mutual Recognition Agreement**

- An MRA is one in which the respective regulatory authorities accept, in whole or in part, the regulatory authorizations obtained in the territory of the other party or parties to the agreement in granting their own authorization

- **To agree on the methodology for recognition**

- To verify the equivalence of the level of protection provided by the product under scrutiny.
- Collecting the necessary data
- Verification of the equivalence of level of protection
- Issuing the results of the assessment
- Communicating the results to the applicants.

* Sufian Jusoh, Universiti Kebangsaan Malaysia, Introduction to MRA in ASEAN
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HARMONIZATION AND STANDARDIZATION

- **Harmonization:**

- The process of making different domestic laws, regulations, principles and government policies substantially or effectively the same or similar
- Making the regulatory requirements or governmental policies of different jurisdictions identical or at least more similar
- A process of reducing divergence or fragmentation to increasing similarity or comparability

- **Standardization is focusing on a common standard, i.e. a generally accepted and followed system of nomenclature**

CONFORMITY ASSESSMENT

- Processes that are used to demonstrate that a product or a service or a management system or a person meets specified requirements.
- The specified requirements may be contained in a technical standard, a regulation or a contract
- Three levels:
 - First party (suppliers)
 - Second party (customers, e.g. private standards)
 - Third Party (independent certification body, governmental authorities)

COMPLIANCE MECHANISMS ON AUTOMOTIVE SECTOR.

Testing

- Labs
- Calibration
- SNI ISO/IEC 17025:2017

Certification

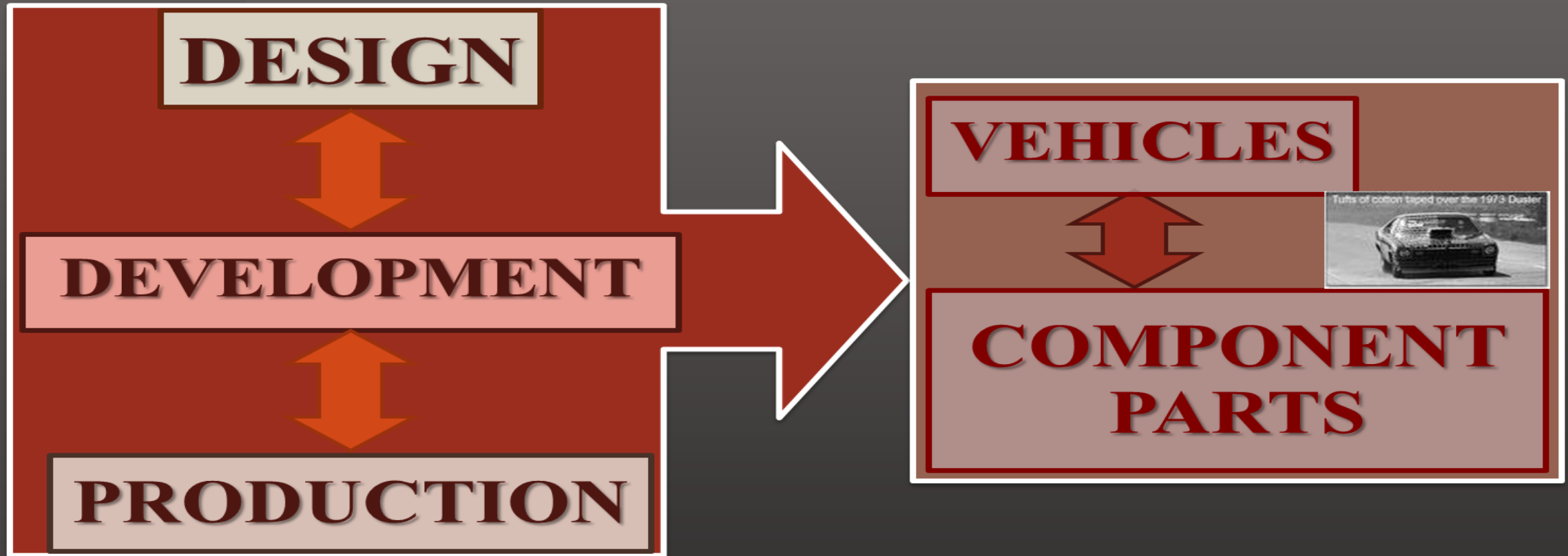
- Product
- Certification Bodies
- SNI ISO/IEC 17065:2012

Inspection

- Bodies
- SNI ISO/IEC 17020:2012

- Automotive products, materials, installations, plants, processes, work procedures and services, and report on such parameters as quality, fitness for use and continuing safety in operation.
- The overall aim is to reduce risk to the buyer, owner, user or consumer of the item being inspected.

AUTOMOTIVE ENGINEERING



AUTOMOTIVE ENGINEERS

SPECIALIZED AREAS:

- POWERTRAIN (body, chassis and engine systems),
- ELECTRONICS AND CONTROL SYSTEMS,
- FUEL TECHNOLOGY AND EMISSIONS,
- FLUID MECHANICS,
- AERODYNAMICS AND THERMODYNAMICS



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UNDERSTAND AND BE ABLE TO USE A RANGE OF NEW TECHNOLOGIES IN ORDER TO KEEP PACE WITHIN A FAST-MOVING AND FORWARD-THINKING INDUSTRY.

AUTOMOTIVE HARMONIZATION

- **Organization of WP29**
 - Established on June 1952 “Working party of experts on technical requirement of vehicle “
- **IN 2000 WP29 became the “world forum for Harmonization of Vehicle Regulations**
- **Main provisions**
 - *Increase vehicle’s safety
 - *Remove trade barriers through mutual recognition
- **Aimed of activities**
 - *Improving vehicle safety
 - *Protection of the environment
 - *Promoting energy efficiency
 - *Anti-theft performance

AGREEMENT UNDER WP29

World Forum for Harmonization of Vehicle Regulations (UN/ECE/WP29)			
	1958 Agreement	1998 Agreement	1997 Agreement
Administrative committee	WP29/AC1	WP29/AC3	WP29/AC4
Vote	Two-thirds majority	unanimous agreement	Two-thirds majority
Activity	Establish and develop Activity of ECE regulation	Establish and develop of gtr (global technical regulation)	Establish and develop of Inspection item
Contents	<ul style="list-style-type: none"> • Technical requirement • Certification process • COP 	•Technical requirement	
OUTPUT	ECE regulation	Global technical regulation (gtr)	Rule

ELEMENTS OF 1958 AGREEMENT














1. Application of the ECE Regulations under the type approval system (Article 1 paras.1, 7-8)
2. Development/Amendment of Regulation for wheeled vehicle, equipment or parts (Article 1 paras. 2-4, Article 6 paras. 1-2, Article 12 paras. 1-3, Appendix 1)
3. Technical Requirements and Test Methods (Article 1 para.2)
4. Conditions for granting type approval and their mutual recognition including approval markings and (Article 1, paras. 5-6, Article 2, Article 3, Article 4, Article 5)
5. Conditions for ensuring conformity of production (COP) (Appendix 2)

TECHNICAL REQUIREMENTS AND TEST METHODS

The Regulation shall cover the following:

- a) Wheeled vehicles, equipment or parts concerned;**
- b) Technical requirements, which if necessary may include alternatives;**
- c) Test methods by which any performance requirements are to be demonstrated;**
- d) Conditions for granting type approval and their reciprocal recognition including any approval markings and conditions for ensuring conformity of production.**
- e) The date(s) on which the Regulation enters into force.**

VEHICLE CATEGORY

L	Motor cycle	  
M1	Passenger vehicle	 
M2,M3	Bus	 
N1	Light duty truck	 
N2, N3	Heavy duty truck	 
O	Trailer	 

UNECE REGULATIONS FOR HARMONIZATION IN THE ASEAN

1. ECE R13 Heavy-vehicle braking
2. ECE R13H Braking of passenger cars
3. ECE R14 Safety-belt anchorages
4. ECE R16 Safety belts
5. ECE R17 Strength of seats, their anchorages, and head restraints
6. ECE R25 Head restraints (headrests)
7. ECE R28 Audible warning device
8. ECE R30 Tires for passenger cars and their trailers
9. ECE R39 Speedometer
10. ECE R40 Exhaust emission
11. ECE R41 Noise emission (L category)
12. ECE R43 Safety glass
13. ECE R46 Devices for indirect vision (rear-view mirror)
14. ECE R49 Diesel emission
15. ECE R51 Noise emission of M and N vehicle categories
16. ECE R54 Tires for commercial vehicles and their trailers
17. ECE R75 Tires for motorcycles and/or mopeds
18. ECE R79 Steering equipment
19. ECE R83 Exhaust emission of M1 and N1 vehicle

TESTING FACILITIES PROVIDING AUTOMOTIVE INDUSTRIES IN INDONESIA

Laboratory for Strength of Materials, Components and Structures
(Strength / Mechanical Aspects)

Laboratory for Energy Resources
(Efficiency Energy & Fuel Aspects)

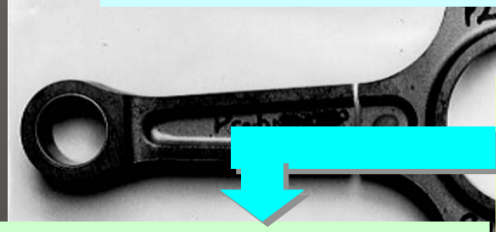


Laboratory for Aero-Gasdynamics and Vibration
(Aerodynamics Aspects)

Laboratory for Thermodynamics, Engine and Propulsion Systems
(Engines, Emission and Cooling Systems)

Laboratory for Instrumentation and Calibration
(Instrumentation Aspects)

Test and Engineering Analysis in Automotive Industries



Material

- Non-destructive Test
- Static and Dynamic Test
- Fatigue Test
- Metallography & Hardness Test

Joining (Bolt & Nut, Welding, Rivet)

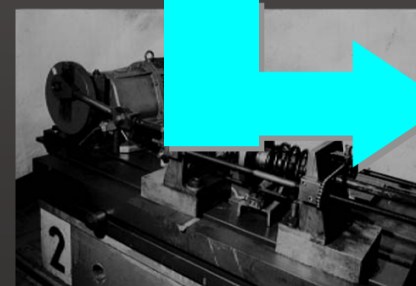
- Non-destructive Test
- Static and Dynamic Test
- Corrosion Test
- Metallography & Hardness Test
- Stress and Strain Analysis
- Failure Analysis

Single & Assembly Components

- Static and Dynamic Test
- Damage Analysis on Casting
- Corrosion Test
- Failure Analysis
- Stress and Strain Analysis
- Fracture Mechanic Analysis
- Crack Growth Analysis

Full Scale Structure

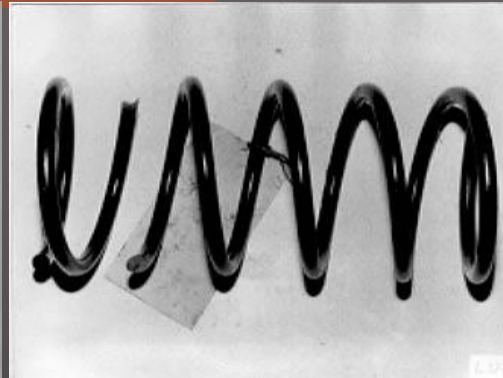
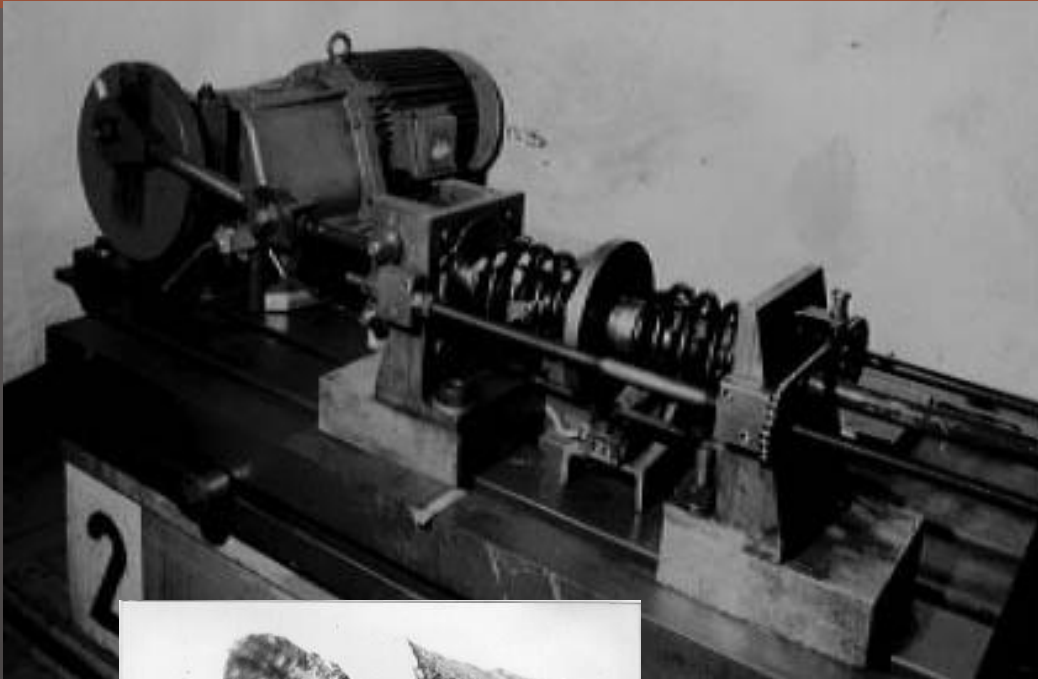
- Standard Load Test
- Road Simulation Test



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COIL SPRING TESTING (SAE J1121, JIS B 2702, JASO C 604)



Spring test system with load measurement platform



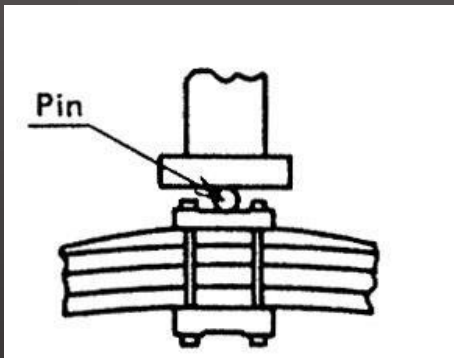
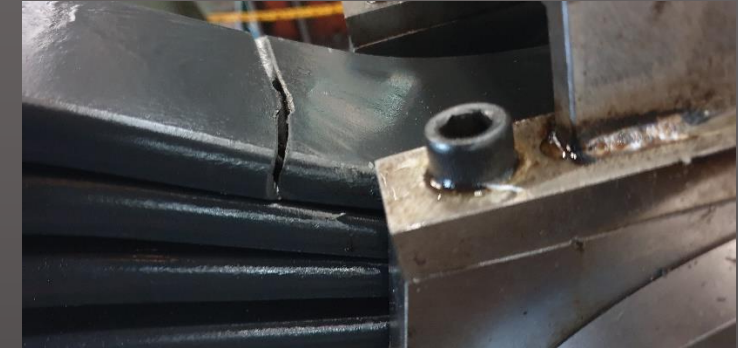
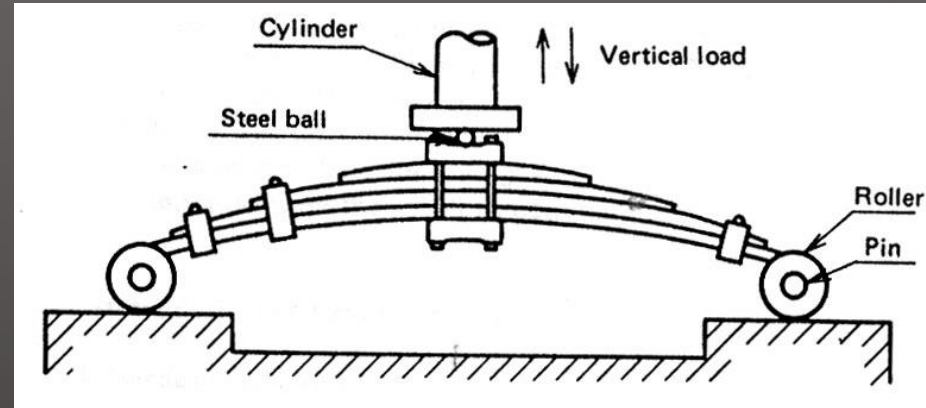
Precision spring test system

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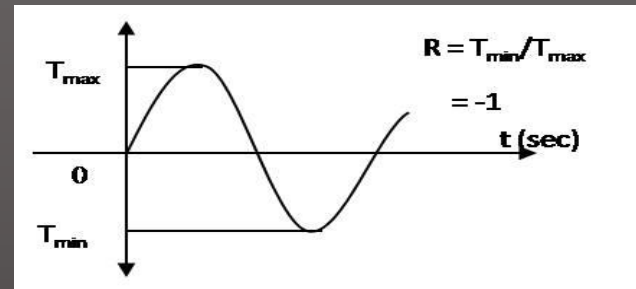
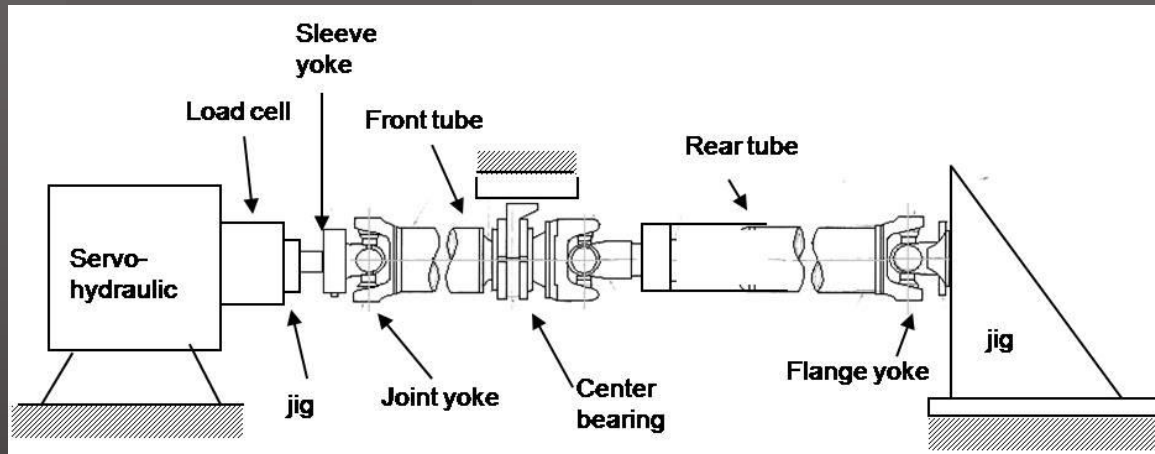
Precision Spring testing fixture for forces up to 500 N

LEAF SPRING TESTING (JASO C 604)



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PROPELLER SHAFT TESTING (MANUFACTURER STANDARD)



Fatigue Test Result 1



Fatigue Test Result 2



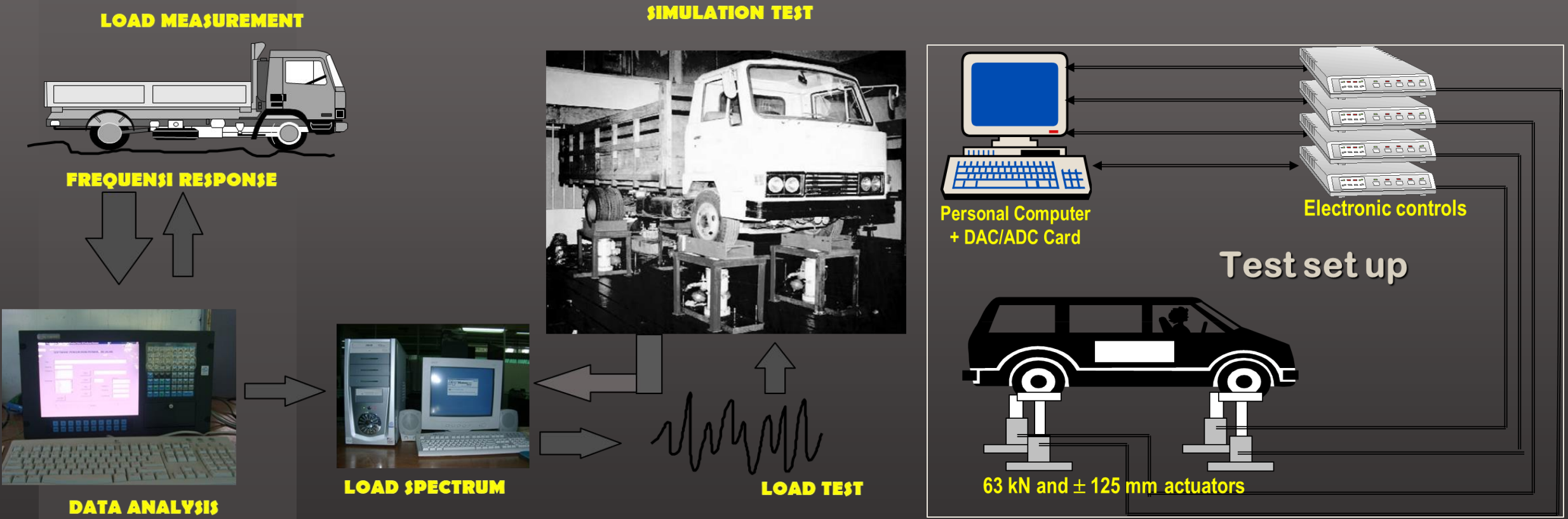
Fatigue Test Result 3



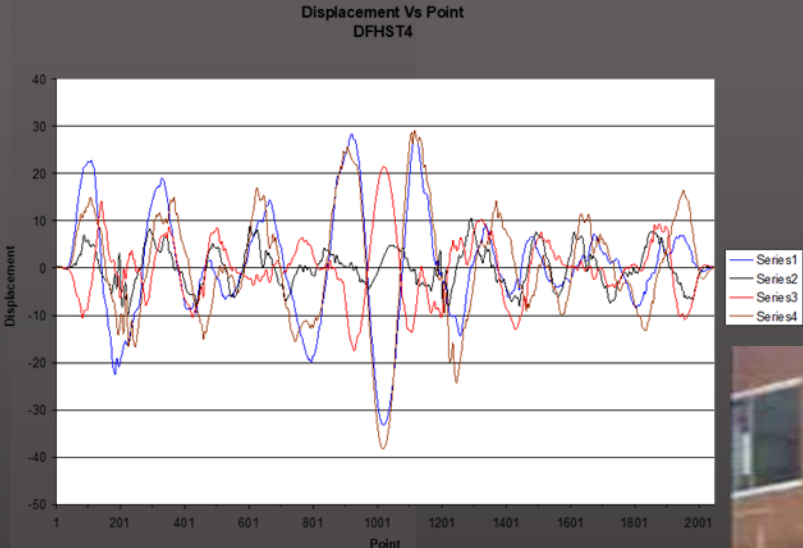
Fatigue Test Result 4



SHAKER / SIMULATION ROAD TESTING (MANUFACTURER STANDARD)



TEST EXECUTION OF SHAKER TESTING



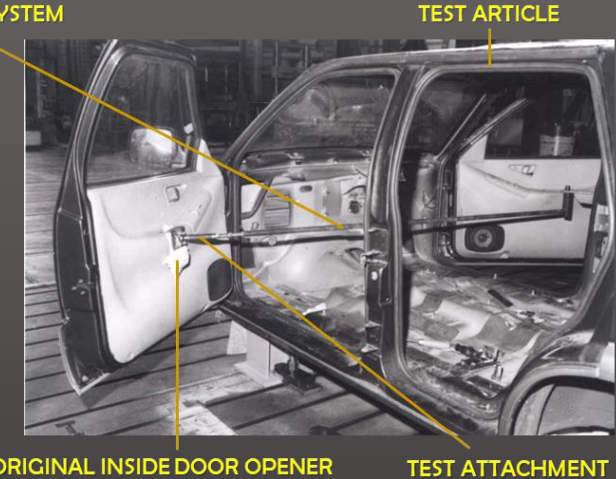
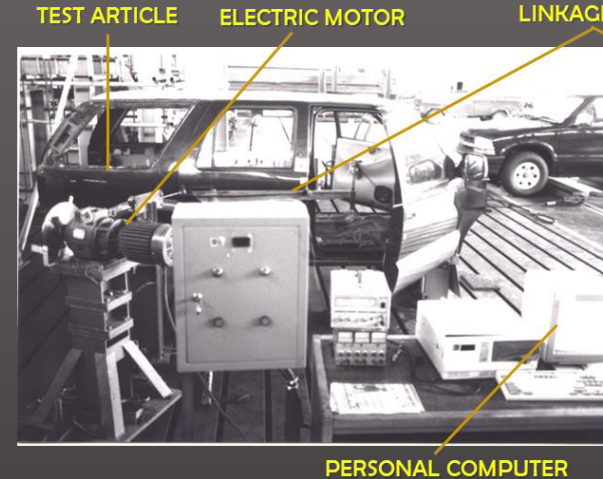
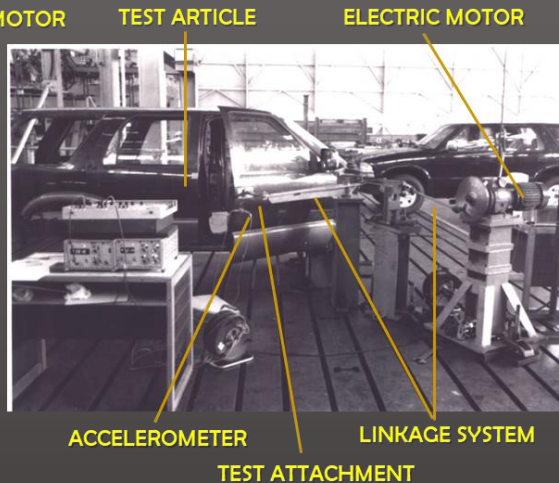
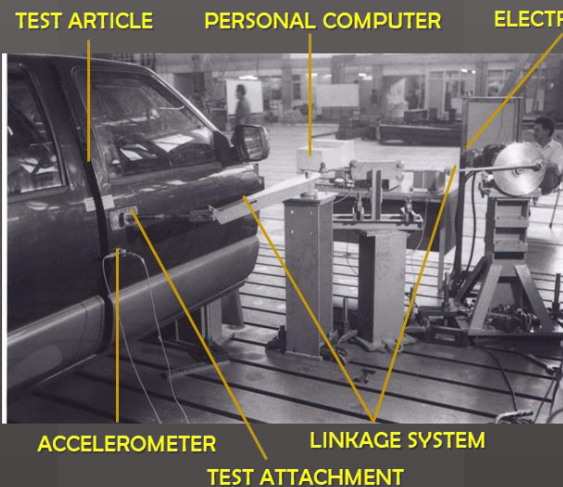
Sample load file



THE PROCEDURES AND DEVICES FOR INSPECTION

Nr.	Item	Procedure	Device
1	Flushness and gap	Visual	Calipers
2	Cracks	Visual and dimensional	Lamp & loop
3	Welding condition and loose	Visual check	Lamp & loop
4	Latch system	Pull and push	-
5	Surface condition	Visual	Lamp & loop
6	Dent/Ding	Visual	Lamp & loop
7	Integrity and worn of door	Apply shake	-

DOOR SLAM CYCLE TESTING (MANUFACTURER STANDARD)



The repeatedly opening and closing cycles of the slamming tests were activated by rotation of the electric motor, which was converted to push-pull movement by the linkage system.

The test attachment of the linkage system was directly connected to the original inside door opener.

TYRE TESTING BASED ON SNI

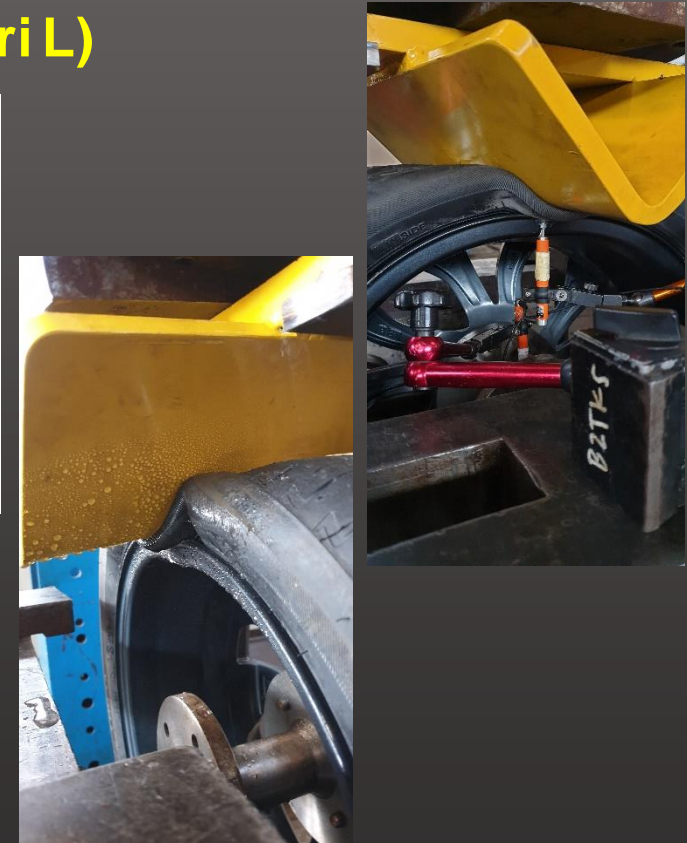
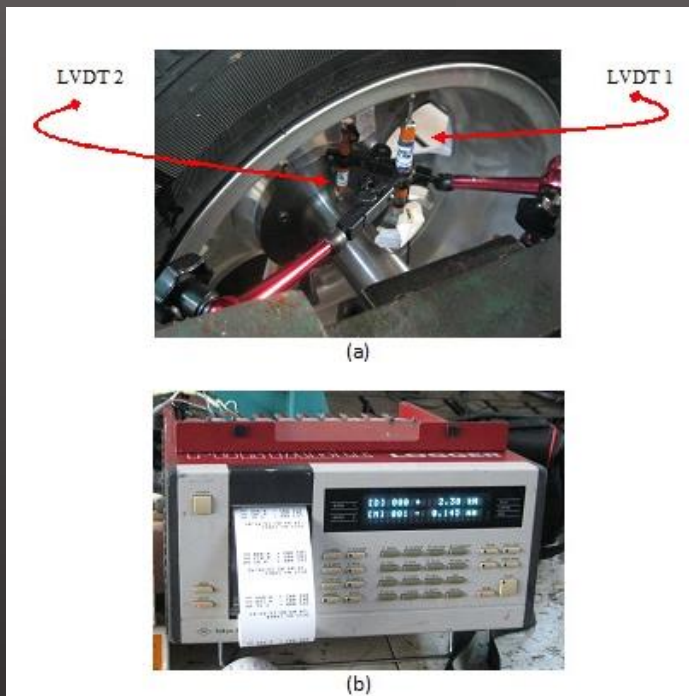
- SNI 06-0101-2002 Ban Sepeda Motor
- SNI 06-0098-2002 Ban Mobil Penumpang
- SNI 06-0100-2002 Ban Truk Ringan
- SNI 06-0099-2002 Ban Truk dan Bus



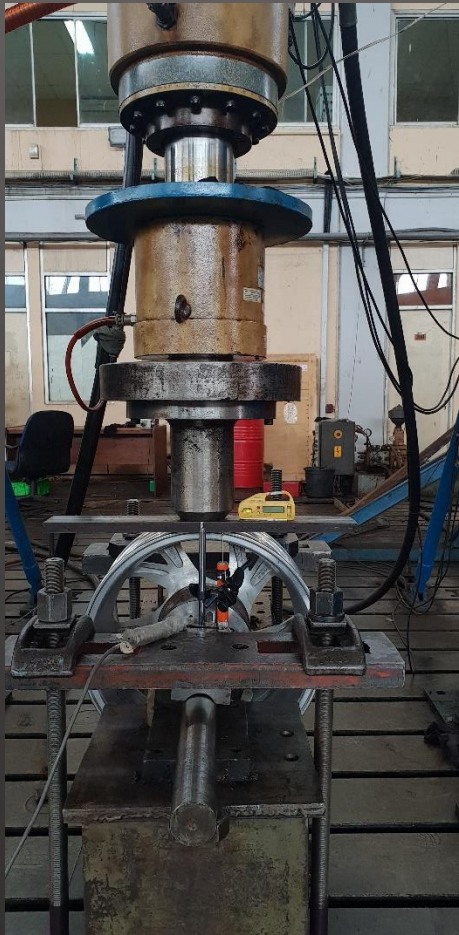
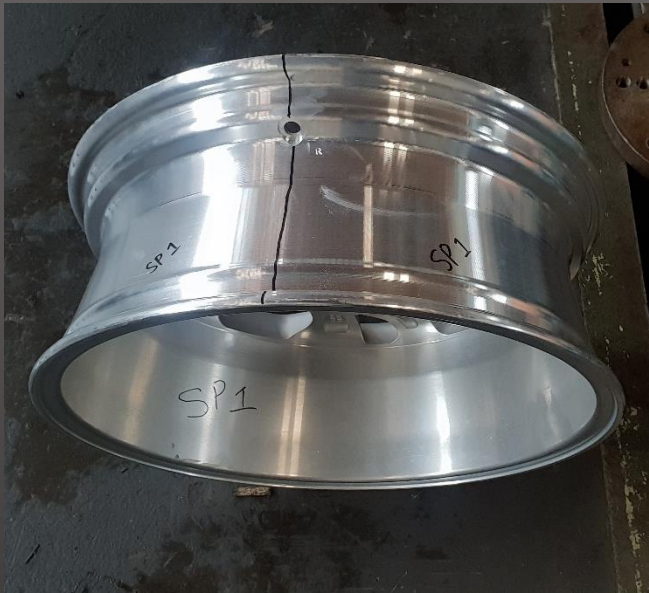
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WHEEL RIM TESTING BASED ON SNI

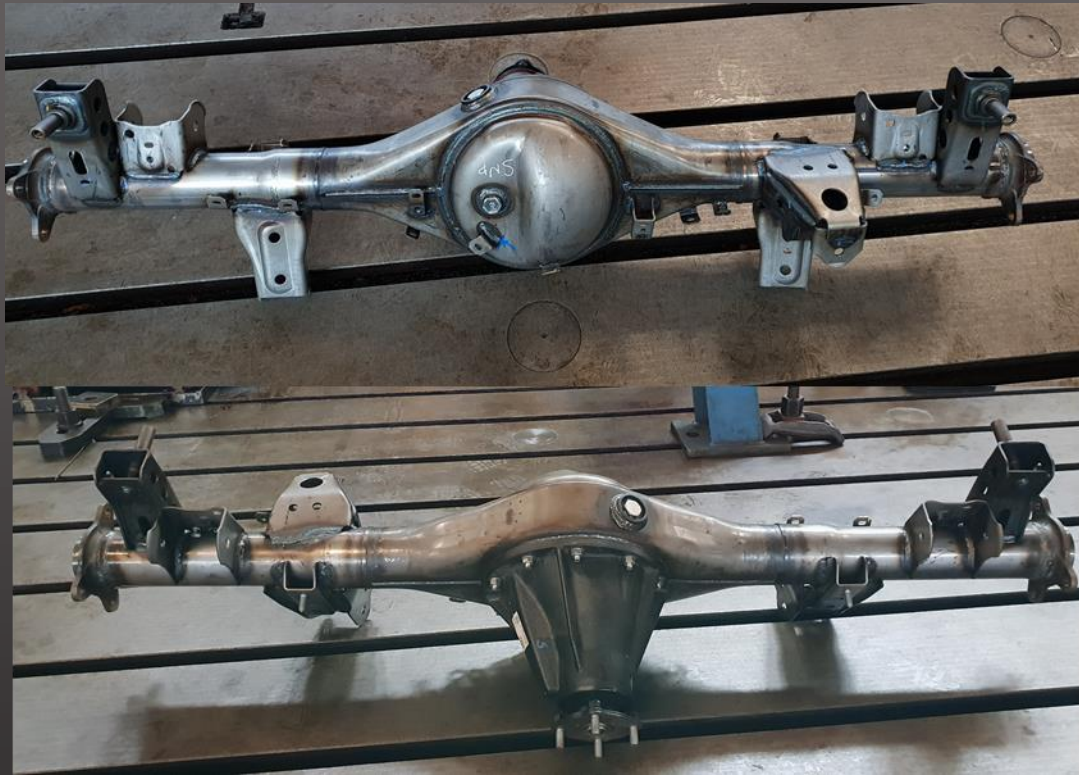
- SNI 1896-2008 Pelek Kendaraan Bermotor Roda Empat (Kategori M, N, dan O)
- SNI 4658-2008 Pelek Kendaraan Bermotor Roda Dua (Kategori L)



WHEEL RIM TESTING BASED ON MANUFACTURER STANDARD



AXLE HOUSE TESTING BASED ON MANUFACTURER STANDARD



CENTER OF GRAVITY MEASUREMENT



Gambar L1.1. Foto timbangan (load cell) pada posisi roda bagian depan kanan (P1F1) benda uji kendaraan bus.



Gambar L1.2. Foto timbangan (load cell) pada posisi roda bagian depan kiri (P2F2) benda uji kendaraan bus.

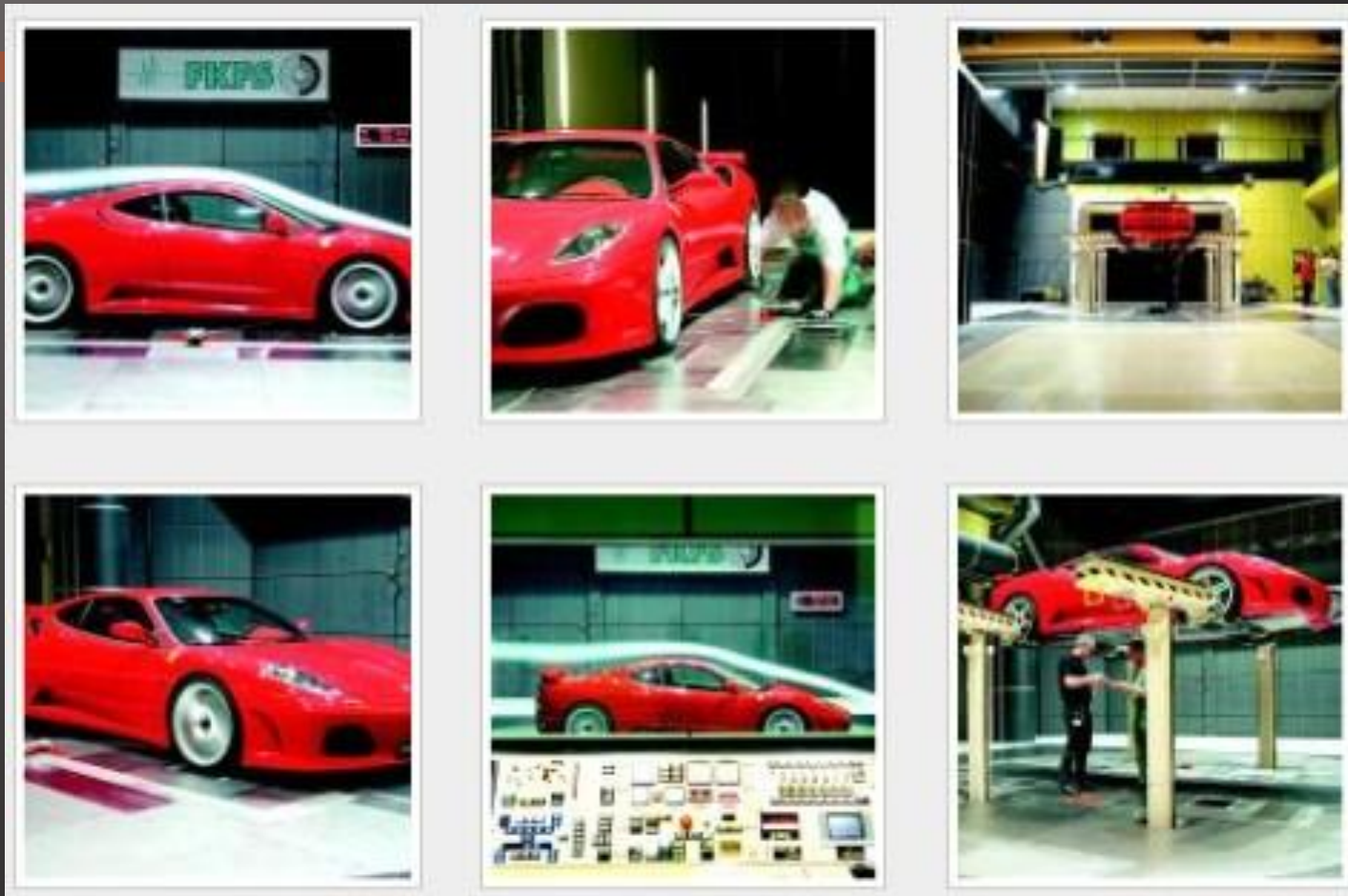


AUTOMOTIVE SIMULATION TESTING IN BPPT LAB.



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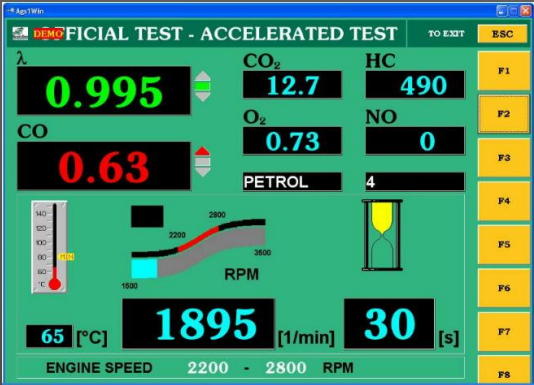
AERODYNAMICS TEST



(Novitec's Wind Tunnel Test)

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EMISSION TEST



COLLISION TEST



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THANK YOU FOR YOUR ATTENTION



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