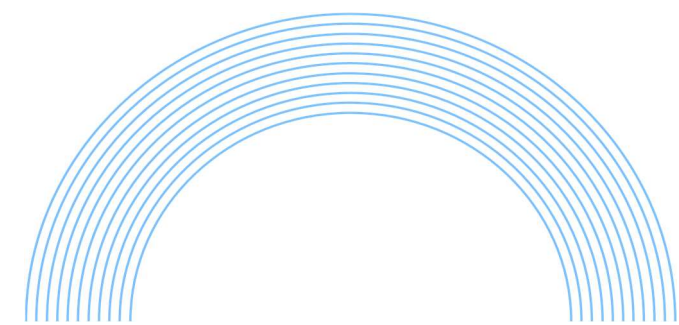


VEHICLE EVALUATION LAB (VEL)



Vehicle Evaluation Lab (VEL)

Vehicle Performance & Safety

- Braking & ABS performance testing (*IS 11852, ECE R13H, AIS 150, (IS 12061)*)
- Gradeability (slope climbing) test (*AIS 003*)
- Acceleration performance – 2W & other vehicles (*IS 10407, IS 11851*)
- Maximum speed measurement (*IS 11877*)
- Coast-down test (*AIS-137, AIS-175, IS 14785, ECE R83*)
- Steering effort measurement (*IS 11948, ECE R79*)
- Cooling performance trials (*IS 14557*)
- VIN compliance verification (*AIS 065*)
- Light Installation (*AIS 008, 009*)
- Mirror & Horn Installation (*AIS 002, (IS 15796: 2008)*)

Noise & NVH Testing

- Pass-by noise measurement (*IS 3028, ECE R51*)
- Exterior & stationary noise tests (*ISO 5130, (ISO 6393, ISO 6394, ISO 6395, ISO 6396)*)
- Interior noise level measurement (*AIS 020, IS 12832*)

Fuel & Energy Efficiency

- Fuel efficiency testing – City & Highway
- Constant speed fuel consumption
 - 2-Wheelers (*IS 10881*)
- Fuel consumption tests for LPG / CNG/ LNG vehicles (*IS 11921*)

Speedo Calibration & Tell-tale verification

- Speedometer calibration (*IS 11827, ECE R39*)
- Tell Tale verification (*AIS 071*)

Vehicle Dimensions & Measurements

- Vehicle dimensions (*IS 9435*)
- Vehicle weight (*IS 11825*)
- Turning circle diameter & clearance (*IS 12222*)
- Approach, departure & ramp angles (*IS 12218, AIS 053*)
- Wheel guard measurement (*IS 13943*)
- Hood latch test (*IS 14226*)

LPG / CNG

- LPG/CNG range test (*AIS 055*)
- LPG/CNG safety checks (*AIS 026, 027, 028*)
- CNG/LPG fuel system conformity

Structural & Design Compliance

- Temporary cabin requirement for drive-away chassis
- Run-flat tyres, spare wheel & TPMS compliance (*AIS 110, AIS 154*)

Special Vehicle Evaluation

- Buses (*AIS 052, AIS 153*)
- Ambulances (*AIS 125*)
- School buses (*AIS 063*)
- Sleeper coaches (*AIS 119*)
- Double-decker buses (*AIS 139*)

Trailer, Modular hydraulic trailers & Special purpose vehicles and Trailers, Armored Vehicles

- Automotive trailer testing (*AIS 113*)
- Modular hydraulic trailer testing (*AIS 158*)
- Extended length trailer (*GSR 414*)
- Special Purpose Vehicle (*AIS 163*)



Advanced Driver Assistance Systems (ADAS)

AIS-162	Type Approval of Motor Vehicles of categories M2, M3, N2 and N3 regarding the Advanced Emergency Braking Systems (AEBS).
AIS-184	Driver Drowsiness and Attention Warning Systems for M, N2 and N3 category vehicles.
AIS-185	Approval of vehicles about the Advanced Emergency Braking System (AEBS) for M1 and N1 vehicles.
AIS-186	Approval of motor vehicles regarding the Blind Spot Information System for the Detection of Bicycles.
AIS-187	Approval of motor vehicles regarding the Moving Off Information System for the Detection of Pedestrians and Cyclists.
AIS-188	Approval of Vehicles with regards to Lane Departure Warning Systems (LDWS).
AIS-191 (Part 1)	Approval of Vehicles regarding Emergency Lane Keeping System (ELKS).



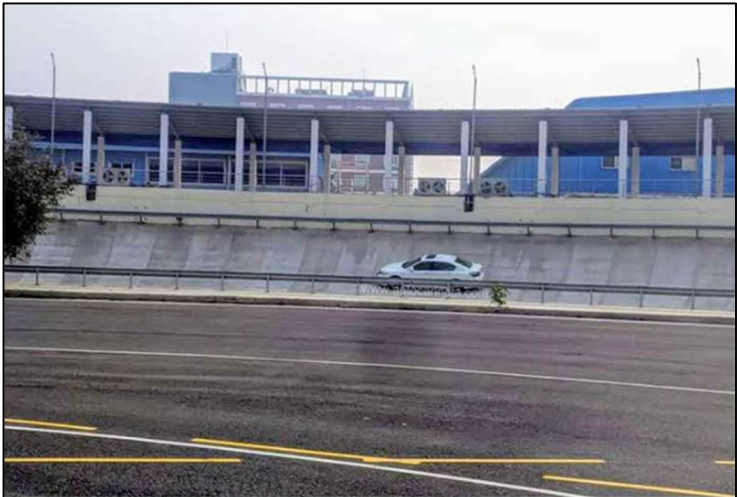
Vehicle Dynamics Testing

ISO 3888	Double lane change test method for obstacle avoidance behavior.
ISO 7401	Transient lateral response measurement for handling evaluation.
ISO 4138	Steady-state circular driving behavior for lateral dynamics.
AIS-133	Vehicle stability performance test procedure during dynamic maneuvers.
TR 8726	On-center steering weave test procedure for straight-line directional stability evaluation.
Protocol as per FMVSS and NHTSA.	



Vehicle Performance Testing for Safety and Regulatory Compliance

- Testing as per CMVR 1989
- ESC Testing AIS 133
- Fuel efficiency testing of Car/Bus/Truck
- Evaluation of fuel additives on vehicle performance
- Tyre Testing as per AIS 142 / R117
- Verification and testing of special purpose trailers
- Vehicle Cooling Performance



DETAILED FACILITY

- Steering Robot and Combined Brake and Acceleration Robot.
- Data acquisition system - BUSDAQ, µepc, V-Box
- Speed sensor - Optical Speed Sensor, L-350, 5-350, GPS based speed sensor.
- Steering torque Sensor
- Sound pressure level measurement equipment
- Pedal and hand force sensor
- Pressure sensors
- Wheel pulse transducer
- Zero-Zero surface.
- Digital height gauge up to 2000 mm
- Digital torque wrenches up to 0 to 1000 Nm
- Weighing Pads (1 ton, 5 ton and 10 ton capacity)
- Weighing Bridge up to 100 ton capacity



SPECIFIC FACILITIES

- Sound absorption measurement-impedance tube.
- Seat Pad & Hand Arm vibration measurement system.
- Fuel Flow Meter - Kistler & Onosoki
- Energy Meter
- RT3000, Gyro scope for Yaw, pitch and roll measurement.
- Coast by Noise Measurement System
- Siemens Pass by Noise Measurement System.
- Laser profilometer
- Tyre Traction Trailer
- RV-4 - **5-axis measurement**: x-movement, y-movement, z-movement (spring travel), camber, and steering angle.

KEY PROJECTS

- HCNG/CNG Fuel Consumption
- Fuel additive evaluation.
- Benchmarking of Tyres.
- Benchmarking of Brakes.
- PBC measurements of proving ground.
- High altitude test of Agriculture tractor.
- Benchmarking of EV vehicles Handling.
- Performance testing of four-wheeler



Test Tracks



ABS/BRAKE TEST TRACKS: Nominal PBC of 0.4 and 0.9, Length: 300 m & Width: 7 m

WET GRIP TEST TRACK: Nominal PBC of 0.7 & Length: 300 m

OVAL TEST TRACK: Total Length: 1.85 km, two straights: 735m, Two curved banking: ~220 m & Neutral Speed: 80 km/h

EXTERNAL NOISE TEST TRACK: ISO 10844, IS 3028:1998 & IS 3028:2018

HILL TEST TRACK: 3.4°, 5.7°, 7.0°, 10.2° & 15.6°.

STEERING PAD

VEHICLE EVALUATION LABORATORY (VEL)

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