नेपाल सरकार

भौतिक पूर्वाधार तथा यातायात मन्त्रालय

यातायात व्यवस्था विभाग

मझौला तथा साना सवारी निरीक्षण सम्बन्धी मापदण्ड, २०७४

(Medium and Light Motor Vehicles Inspection Manual, 2018)

मझौला तथा साना सवारी परीक्षण मापदण्ड, २०७४

(Medium and Small Vehicles Testing Manual, 2018)

सवारी प्रदूषण निर्देशिका

(Vehicle Emission Testing manual, 2018)

काठमाडौं

२०७४

मझौला तथा साना सवारी निरीक्षण मापदण्ड, २०७४

स्वीकृत मितिः २०७४/१२/१६

सवारी तथा यातायात व्यवस्था ऐन, २०४९ को दफा ८९ र १५३ मा भएको प्रावधान अनुसार सार्वजनिक सवारीको जांचपास तथा प्राविधिक निरीक्षण गर्ने कार्यलाई व्यवस्थित तथा एकरुपता ल्याई सार्वजनिक यातायात सेवालाई सुरक्षित, आरामदायी तथा भरपर्दो बनाउने उद्देश्यले सवारी तथा यातायात व्यवस्था नियामवली, २०५४ को नियम ६२ ले दिएको अधिकार प्रयोग गरी भौतिक पूर्वाधार तथा यातायात मन्त्रालयको मिति २०७४/१२/७ गतेको सैद्धान्तिक सहमति अनुसार यातायात व्यवस्था विभागले यो "मझौला तथा साना सवारी निरीक्षण मापदण्ड, २०७४" जारी गरेको छ।

१. यो मापदण्ड यातायात व्यवस्था विभागबाट स्वीकृत भएको मितिबाट लागु हुनेछ।

२. सार्वजनिक सवारीको जांचपास तथा प्राविधिक परिक्षण प्रयोजनका लागि मापदण्ड निम्न अनुसारको हुने छ।

Medium and Light Motor Vehicles Inspection Manual, 2018

The Department of Transport Management has framed this manual pursuant to the provision of sub-rule (1) of Rule 62 of Vehicles and Transport Management Rules, 1997. This manual has shall apply for medium vehicles (having weight more than 4 tons but less than 10 tons) and small vehicles (having weight less than 4 tons) as set forth in clause (b) and clause (c) respectively of the schedule (1) of Vehicle and Transport Management Act, 1993.

The purpose of this manual is to serve as a reference, both substantially and procedurally, for the technical staff of Transport Management Offices and Vehicle Fitness testing Offices, who

carry out road-test on vehicles, with visual inspection techniques, pursuant to Vehicles and Transport Management Act, 1993 and its associated rules.

This manual also serves as a reference for the vehicle owners to prepare their vehicles for scheduled road test at Transport Management Office. Vehicle owners should go through all the provisions made in this manual and keep their vehicle in suitable condition when they bring the vehicles for a road test. A technical staff performing the inspection may refuse to perform a routine road test if the vehicle is not presented in neat and clean condition.

This manual outlines various conditions under which a vehicle will fail the road test. In addition to the inspection according to this manual, a vehicle shall also be subjected to machine based testing or actual road performance test based on **Medium and Light Motor Vehicles Testing Manual, 2018** and **Vehicle Emission Testing Manual, 2018.**

An Inspector performing inspection pursuant to this manual shall conduct all the steps outlined in the manual and prepare an inspection report. If the vehicle passes the test, he/she shall make recommendation for award of a Road-Test-Certificate. If the vehicle fails the test, the inspector shall provide the owner of such vehicle, a written statement outlining all the identified reasons for failure.

Content

1. VEHICLE REGISTRATION PLATES:

Registration plate should be checked for security, location, format, legibility, visibility and correct colour. The plate should comply with the provisions of the VTMA 1993 and VTMR 1997.

Components	Reasons for Failure
Registration Number Plate	1. One or both plates missing, insecure or not clearly visible 2. Numbers or letters missing or illegible or of incorrect size 3. Numbers, letters or background of incorrect color 4. Marks other than prescribed
Registration Plate Light	5. Not working properly 6. Not White in color 7. Lens missing or broken 8. Showing direct (not reflected) light to the rear

2. SERVICE BRAKE AND MECHANICAL BRAKE:

2.1 Service Brake Pedal and Service Brake Operation:

For assessing the condition of service brake and its operation, in case of hydraulic system, the brake pedal should be fully depressed under a steady pressure and the tendency of the pedal to creep down should be noted. The extent of travel of the brake pedal and sponginess in motion, if any, should be noted.

To check the working of vacuum assisted braking system, the vacuum is first depleted by repeated application of service brake with the engine switched off. Then the service brake should be fully applied and next the engine should be started, if the vacuum-assist is working normally, a dip should be felt in the pedal.

Components	Reasons for Failure
Service Brake Pedal Anti-Slip Provision	1. Missing, excessively loose, worn to the extent that it is no longer effective.
Service Brake Pedal Mounting	2. Insecure, badly corroded in a way that the pedal can be moved from side to side. 3. Excessive wear in brake pedal mounting bush
Service Brake Pedal Travel	4. Pedal travel is obstructed
Service Brake Operation	5. In hydraulic systems, pedal tends to creep down or is spongy when held depressed. 6. Travel in the pedal indicates air in the brake system or brake in need of adjustment. 7. In vacuum assisted system, with the pedal depressed and the engine started, no dip is felt in the brake pedal.

2.2 Mechanical Brake, Hand Lever (where originally installed by the manufacturer):

Components	Reasons for Failure
Lever/Lever Mounting	1. Missing, fractured, badly worn, corroded,

	insecurely mounted. 2. Travel is excessive or movement is obstructed.
Ratchet and Pawl Mechanism (Where Fitted)	3. Missing, insecure, damaged or sticking 4. Definite and regular clicks are not heard, indicating worn mechanism

3. SEATS:

All seats and their mountings should be examined for firmness and security.

Components	Reasons for Failure
Seats	1. Loosely or insecurely mounted, framework damaged
Driver's Seat	2. Damaged to such an extent that it cannot support the driver adequately. 3. Seat adjustment mechanism not working properly

4. HORN AND NOISE FROM EXHAUST SYSTEM:

Components	Reasons for Failure
Horn	1. Missing or not working properly 2. Insecurely mounted 3. Not under secure control
Exhaust Pipe, Silencer, Exhaust	4. Exhaust improperly mounted and likely to fall off

Assembly	5. Silencer improperly mounted or likely to fall off 6. Silencer not functioning properly 7. Silencer seriously leaking 8. Leaks in exhaust assembly, fumes entering passenger compartment

5. WINDSCREEN WIPERS AND WASHERS:

Components	Reasons for Failure
Wiper and Blades	1. Missing 2. Not cleaning windscreen effectively 3. Wiped area less than sufficient to give the driver and adequate view
Speed of Wipers	4. Speed not normal
Wiper Control	5. Insecurely mounted 6. Not working, defective or missing
Wiper Linkage	7. Broken, excessively worn or insecure
Washers (If fitted)	8. Not working or incorrectly aimed

6. GLASS:

The condition and security of the windscreen and all side and rear windows should be examined. The glass in the windscreen and side and rear windows should be safety glass. If any glazing material other than safety glass has been used, the injury potential of such material when it is fractured should be assessed. The view from driver's seat should be

adequate and should not be interfered by presence of any materials like stickers. The working of driver's window operating mechanism should also be examined. Degree of light transmission through the windscreen and front side windows is also important factor. The tint or color shade used in the windscreen and the front side windows should not create problem in enough view of the outside conditions.

Components	Reasons for Failure
Windscreen	1. Missing 2. Not marked as safety glass 3. Objects or stickers in driver's direct line of vision 4. Damaged beyond acceptable limits (Refer the details on the acceptable limits provided below) 5. Glass has a visible light transmission level of less than 66%
Side and Rear Windows	6. Not marked as safety glass 7. Glass in front side windows has a visible light transmission level of less than 66% 8. Damaged such that the driver's view is restricted.
Windscreen windows	9. Insecure 10. Opening mechanism of driver's window not operating
Non glass windscreens and Side or Rear Windows	11. Made of material likely, if fractured, to produce fragments capable of causing severe cuts

Acceptable Damage in the Windscreen-Zones:

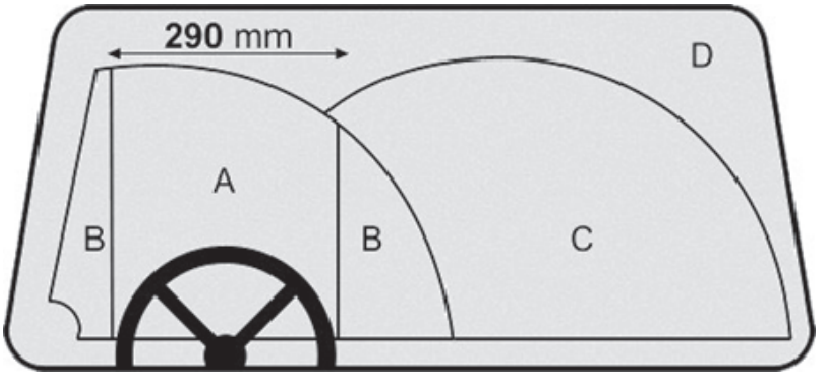


Fig 1: The zones of Windscreen

Zone A is a 290mm wide section centered at the steering column, the top and bottom borders of the zone are set by the windscreen wiper swept area. Zone B consists of remaining sections in the swept area. Zone C is the area, swept by the other wiper, excluding the portion that overlaps with zone A and zone B. Zone D is the remaining area of the windscreen.

- Zone A: Damage that can be contained within a 10mm diameter circle. Maximum of 2 defects provided they are more than 100 mm apart.
- Zone B: Damage that can be contained within a 30mm diameter circle or hairline crack up to 50 mm long. Maximum of 2 defects provided they are more than 90 mm apart.
- Zones C and D: Damage that can be contained within a 40mm diameter circle or hairline crack up to 100 mm long. Maximum of 3 defects provided they are more than 80 mm apart.

7. REAR VIEW MIRRORS:

Components	Reasons for Failure
Rear View Mirrors (Internal, if fitted by the manufacturer as an original equipment and External)	1. Missing 2. Reflecting surface deteriorated or broken so as to impair the driver's view. 3. Loosely mounted 4. Not adjustable

8. SPEEDOMETER:

Components	Reasons for Failure
Speedometer	1. Missing or not working 2. Cannot be seen from the driver's seat
Lighting of Speedometer	3. Not working

9. SAFETY BELTS:

Components	Reasons for Failure
Safety Belt-Type	1. A lap and diagonal type safety belt not provided for all outer forward facing seats, a lap and diagonal or lap safety belts not provided for all other forward facing seats.
Condition of safety belt	2. Belts cut, badly frayed, unsafely repaired and modified 3. Belts not operating properly
Structural continuity of load bearing part	4. Any load bearing member of the vehicle structure or paneling within 30cm of an

	anchorage point cracked, corroded or in otherwise weakened condition 5. Belt mounting unsatisfactory 6. Belt mounting unsafely repaired or modified

10. STEERING WHEEL PLAY:

First the road wheels should be brought to straight ahead position. The steering wheel should be fully turned to the right and to the left as far as possible, to note the free play of the steering. In case of power steering vehicle this test should be done with the engine running. To find out the degree of rotational play, the rim distance of play measured in mm should be multiplied by 360 and the result obtained should then be divided by 3.142 times the diameter of the steering wheel in mm.

It should be examined whether there is any movement in the steering column or the steering wheel when an attempt is made to lift the steering wheel in line with the steering column.

Also any movement of the steering column and its security when the steering wheel is pushed or pulled should be noted.

Components	Reasons for Failure
Steering Box	1. Excessive rotational play (more than 20^{o})
Rack and Pinion	2. Excessive rotational play (more than 5^{o})
Steering Wheel/Column/Shaft	3. Excessive endplay, insecure, broken or unsafely repaired or modified 4. Bushes/bearings/

	mounting brackets missing, worn, damaged or insecure 5. Shear pin in telescopic column broken
Universal joint/clamp	6. Damaged, worn, badly deteriorated, unsafely repaired or modified.
Retaining and Locking Devices	7. Missing or insecure.

11. DOORS/LOCKS:

Components	Reasons for Failure
Doors	1. A door missing 2. Door cannot be opened and closed easily or opens on its own 3. Insecure receivers or catch
Sliding Doors	4. Runners, track or actuating mechanism so defective that the door does not open or close properly 5. A door missing 6. Safety devices not working or defective
Steering Lock (If originally fitted)	7. Excessive wear or jamming of lock/barrel/key mechanism of a steering lock

12. LAMPS:

12.1 Head Lamps:

These lamps are mandatory and should be present in multiple of 2.

Components	Reasons for Failure
Head Lamps	1. Missing 2. Insecurely mounted 3. Contains water/moisture
Head Lamp Switch	4. Insecurely mounted or missing 5. Defective
High or Low Beams	6. High beams not working simultaneously 7. Low beams not working simultaneously 8. Not working 9. Head lamps dipping to the right 10. High beam warning light not working
Lens, Bulb and Reflecting Material	11. Intensity not acceptable 12. Lens badly cracked or missing 13. Reflecting material damaged or discolored 14. High Intensity Discharge bulb fitted in a non-HID Headlight.
Color	15. Not white or yellow
High Intensity Discharge Lamps	16. Headlight levelling device not operating 17. Headlight cleaning device (where required) not present or not operating.

12.2 Stop Lamps:

These lamps are mandatory.

These are also referred to as Brake Lamps. To examine the working of these lamps, service brake should be applied with the ignition on and the rear lamps switched on. Very often the function of rear lamp and stop lamp is combined into one lamp which discharges lights of different intensities, weaker one for rear lamp purpose and stronger one for stop lamp purpose.

Components	Reasons for Failure
Stop Lamps (Brake Lamps)	1. Missing, not clearly visible, not working 2. Stop Lights not brighter than the rear lights 3. Not red in color 4. Not of same dimensions and intensity 5. Not fitted symmetrically 6. Insecurely mounted 7. Lens missing or broken (crack separated or white light showing) 8. Contains water/moisture 9. Switch does not operate correctly

12.3 Rear Lamps or Tail Lamps:

(If Rear Lamps are not combined with Stop Lamps and are present separately).These lamps are mandatory.

Components	Reasons for Failure
	1. Missing, not clearly visible, not

Rear Lamps(Tail Lamps)	working 2. Not red in color 3. Not of same dimensions and intensity 4. Insecurely mounted 5. Not fitted symmetrically 6. Lens missing or broken (crack separated or white light showing) 7. Contains water/moisture 8. Switch does not operate correctly

12.4 Front Position Lamps (Front Side Lamps/Parking Lamps):

These lamps are mandatory. A front position lamp may be incorporated into a headlamp.

Components	Reasons for Failure
Front Position Lamps (Front side Lamps/Parking Lamps)	1. Missing or not clearly visible 2. Not working or faulty 3. Not white or not yellowish in color 4. Not fitted symmetrically 5. Not of same dimensions and intensity 6. Insecurely mounted 7. Lens missing or broken 8. Contains water/moisture 9. Switch not operating correctly

12.5 Fog Lamps:

These are not mandatory. These lamps shall, however be examined, If originally fitted by the manufacturer.

Components	Reasons for Failure
Fog Lamps (Front and Rear)	1. Lamps or switch not working or faulty 2. Missing or not clearly visible 3. Front fog lamps not white or yellow, Rear fog lamps not red in color 4. Lens broken or missing 5. Insecurely mounted 6. Fog lamp indicator not working properly

12.6 Spot Lamps (Long Range Lamps):

These are not mandatory. These lamps shall, however be examined, If originally fitted by the manufacturer.

Components	Reasons for Failure
Spot Lights (Long Range Lights)	1. Asymmetrically Positioned 2. Insecurely mounted 3. Switch defective 4. Not white or yellow in color 5. Light set in main beam position and does not go off when the low beam is operated

12.7 Reverse Lamps:

These are not mandatory. These lamps shall, however be examined, If originally fitted by the manufacturer.

Components	Reasons for Failure
Reverse Lamps	1. Missing or not clearly visible 2. Not working or faulty 3. Not white or amber in color 4. Lens broken or missing 5. Insecurely mounted 6. Reverse lamp remains illuminated after reverse gear has been disengaged

12.8 Reflectors:

Rear reflectors are mandatory while the side reflectors shall be examined if originally fitted by the manufacturer.

Components	Reasons for Failure
Rear reflectors	1. One or both missing or ineffective or seriously damaged 2. Not red in color 3. Not matching in size and appearance 4. Insecurely mounted 5. Asymmetrically fitted
Side reflectors (if fitted)	6. Not amber in color

13. DIRECTION INDICATORS

Tell Tales or malfunction indicators are those indicators, including lights and alarms, in the dashboard that indicate about the status of seat belt , air bag, oil level, washer fluid, engine operation, Antilock Braking System , coolant temperature, fuel

level, handbrake, alternator or other systems and equipment installed in the vehicle. A vehicle may not have all types of systems and equipments in it and therefore may not have all types of tell tales or malfunction indicators. If any such system is present in a vehicle, as originally installed by the manufacturer, the associated indicator should be in functional condition.

Components	Reasons for Failure
Direction Indicators/Turn Signals (Including those fitted in the rear view mirror assemblies) (Direction indicators are mandatory.)	1. Missing, not fitted symmetrically or not visible 2. Not working or faulty 3. If of flashing type, not flashing constantly between 60 and 120 flashes per minute 4. Insecurely mounted or broken 5. Lens broken or missing 6. Contains water/moisture 7. Not amber or red in color
Switch for Direction Indicators	8. Faulty

Malfunction Indicators for Supplemental Restraint System (SRS) Airbags Electronic Stability Control (ESC) Antilock Brake System (ABS) Electronic Braking System (EBS) Parking Brake Tire Pressure Monitoring System (TPMS) Electronic Power Steering (EPS) Brake Fluid Warning (These indicators shall be examined if they are originally fitted by the manufacturer. They are not mandatory for all vehicles)	9. Not working or indicate a defect in the relevant system 10. Apparent modification affecting correct operation

14. BODY/CHASSIS/UNDERBODY:

While inspecting the body, chassis and underbody of the vehicle, special attention should be given on detection of rust. Rust is caused by deposition of oxide of metal due to corrosion of the metal. Depending on the stage of development or expansion of the rust on the metal, rusts can be classified into three categories: surface rust, advanced rust and extensive rust.

Light, powdery corrosion on the surface of a section of metal is called surface rust. Surface rust can occur if protective coating is scratched or damaged. Surface rust is removable by rubbing. When cleaned, a smooth surface is revealed.

Surface rust, if left untreated, will develop into an advanced form of corrosion, which can be generally seen as an eruption of oxidized metal either on bare metal or under paint. The rust reaction causes increase in volume which causes pitting or bubbling of paint. Removal of this type of rust leaves pit marks on the metal.

Extensive rust occurs when the corrosion causes formation of heavy encrustation of oxidized metal which completely replaces the parent metal. This causes hole or series of hole in the metal when the rust is removed.

Extent and location of corrosion determine the effect on safety of vehicle. Even a small corrosion can disrupt the continuity of the load bearing structure. Even large corrosion on secondary structures may not pose problem in vehicle safety.

Primary Structural Components and Secondary Structural Components and Acceptable Stages of Corrosion

Primary structural components are the components which if collapsed will make the vehicle uncontrollable, or will considerably reduce occupant safety in the event of an accident. Only surface rust is acceptable in these components. Any part of load bearing member or load bearing paneling should be considered a reason for failure if it is weakened by corrosion to the extent that

- It doesn't feel rigid on application of pressure by thumb and finger
- It crumbles to leave a hole
- When assessed with correct method and using corrosion assessment tool the metal crumbles or disintegrates

Sub-frame and chassis rails, suspension mountings and parts, steering component mounting points, door sills and pillars, door hinges and latch mounting points, seat anchorage points, seat belt anchorage points, all floor panels, boot floor, bulkheads are the main primary structural components of a vehicle.

The secondary structural components are the components which if collapsed would not immediately affect a vehicle's controllability. Surface rust or advanced rust would not generally make the vehicle unsafe. Extensive rusts may produce sharp edges or exhaust fumes may escape into the vehicle.

Components	Reasons for Failure
Bodywork	1. Primary structural components broken, cracked, insecure, damaged or rusted to an advanced stage. 2. Secondary structural components missing, insecure, rusted or severely

Components	Reasons for Failure
	damaged 3. Body not sitting squarely due to distortion 4. Bonnet or boot catches defective or bonnet safety catch missing or defective 5. Bumper, bull guards, body strips insecure 6. Permitting the entry of fumes from engine or exhaust 7. Any unsafe repair or maintenance
Chassis/Sub frame/Underbody/Flitch Plates	8. Welds breaking away 9. Cracked, insecure or significantly misaligned 10. Loose rivets, bolts or bent members 11. Considerably weakened by holes 12. Advanced corrosion or other damage 13. Repairs and modifications not in accordance with manufacturer's recommendation

15. TIRES, WHEELS/ WHEEL BEARINGS

Examination of tires, wheel and the wheel bearings should be done keeping the axle of the vehicle is in raised condition, without necessarily disassembling the tires and wheels. Play in the bearings should be assessed by noting the movement of the wheel relative to axle or stub axle. Roughness of the bearings should be noted by listening to the sound produced when each wheel is spun.

15.1 Tires:

Components	Reasons for Failure
Tire Structure	1. Evidence of re-cutting of tread pattern where re-cutting is not suitable 2. Incorrectly seated on wheel rim 3. Any cut longer than 25 mm or 10% of section width (whichever is shorter) longer than deep enough to reach the ply or cords 4. Rupture in or exposure of ply or cord structure, tread lifting, lump or bulge caused by separation of rubber from cords or weakness in cord structure or tread distorted or damaged
Depth of tread	5. Depth of less than 1.6mm in the central three quarters of the tread pattern
Valve	6. Damage or distortion in the valve stem 7. Valve stem chafing against valve hole
Repairs	8. Repair plug fitted in the sidewall
Tire Fitment	9. Tires fitted to the same axle are not of the same type 10. Radial ply tires are fitted to the front wheels but not to the rear wheels 11. Tire protrudes beyond bodywork 12. Tire is not fit for purpose, i.e. marked “Not for High-way” 13. Directional tire is fitted in the

	incorrect direction or asymmetric tire is fitted with wrong side out

15.2 Wheels and Wheel Bearings:

Components	Reasons for Failure
Wheels	1. Any cracks or defective welds. 2. Askew or buckled (more than 13mm) 3. Incorrectly fitted. 4. Damaged 5. Different sizes fitted in same axle
Stud Holes	6. Elongated or damaged
Stud or Nuts	7. Damaged or threads stripped or crossed 8. Any stud or nut missing or loose 9. Any stud or nut is such a condition that there is risk that the wheel will come loose 10. Nuts incorrectly fitted 11. Incorrect nuts fitted
Wheel Bearings or Hub	12. Too much play apparent 13. Too tight 14. Bearings or hub worn or damaged (distinctive rumble or growl audible when the wheel is spun)

16. BRAKE FLUID:

Component	Reasons for Failure
Reservoir	1. Less than half full or less than manufacturer's minimum level 2. Leaking or cap missing 3. Fluid obviously dirty or contaminated

17. STEERING LINKAGE:

For inspection, the steering wheel should be turned clockwise and anticlockwise against the road resistance. The steering mechanism should be examined starting from the point where it is secured to the chassis to the point where the steering arms are secured to their fixings. The engine should be kept running for the vehicles with power steering. The components of linkage should be checked for presence of excessive wear at joints, fracture or damage and insecurity.

The wheels should be raised off the ground using jacking and the steering wheel should be turned in both directions completely, while the steering wheel is being rotated fouling of wheels, tires and components of the steering linkage with any other part of the vehicle should be examined. While the steering wheel is being rotated, the steering column shaft and steering box/rack should also be checked for stiffness and worn or damaged bearings.

Components	Reasons for Failure
Rack and Pinion Type Steering	1. Damaged or insecure 2. Splines worn or damaged 3. Bushes/bearings excessively worn

Components	Reasons for Failure
	4. Excessive end float in pinion 5. Apparent stiffness 6. Steering rack gaiter, insecure, split or missing
Steering Box	7. Apparent stiffness or bearings damaged or worn 8. Damaged, insecure or excessive float in steering box shaft 9. Axial or radial play, worn splines or shaft twisted
Drop Arm/Drag Link	10. Damaged or insecure
Drag link and track rod ends	11. Worn or insecure
Idler Assembly	12. Mounting loose or radial or axial play
Track Rod/Steering Arm	13. Obviously deformed, loose or cracked
Stub Axle	14. Damaged or bent
Retaining or Locking Devices (Split pin, nut, rivet or weld)	15. Absent, insecure, worn or broken
Components	16. Any steering component repaired by welding
Steering Box or Rack	17. Cracks or corrosion around attachment points
Power Steering Function	18. Power assistance not available consistently over full lock to lock range 19. Missing or disconnected where power steering is a standard fitment by

Components	Reasons for Failure
	manufacturer
Power Steering Fluid Pipes/leaks	20. Power steering fluid below minimum level 21. Fluid pipes fouling other components 22. Leaks in power steering system 23. Power steering pump worn, noisy, leaking or defective
Steering	24. Overlocking or underlocking or fouling any other component of the vehicle
Other leaks (other than power steering)	25. Continuous oil leak from steering box/rack or steering damper
Dust covers	26. Dust cover is missing or severely deteriorated
All Steering Components	27. Any apparently unsafe repair or modification

18. SUSPENSION SYSTEM

18.1 Springs

Components	Reasons for Failure
Springs (coil/leaf/torsion bar)	1. Worn or broken or repaired by welding 2. Springs fitted incorrectly 3. Spring clamps missing

Components	Reasons for Failure
	4. U bolt missing or loose 5. Unsafe modification
Spring/Torsion Bar Mounting	6. Loose or broken 7. Cracked or damaged
Spring Eye Bolt/Shackle Pins	8. Locking device missing or insecurely fitted 9. Worn, incorrectly positioned, incorrect type or missing 10. Apparently loose in bush
Spring or Shackle Bushes or Slipper Pads	11. Missing, worn or perished
Spring Center Bolt	12. Missing, damaged or broken
Bump Stop	13. Missing or ineffective
Air/Hydrostatic/Hydro gas suspension	14. Leaks 15. Linkage to levelling valve defective 16. Valves, insecure or defective 17. Suspension bellows giving inadequate movement 18. Bellows damaged or deteriorated 19. Pipe damaged 20. Vehicle sitting on bump stops
Bonded Suspension Units	21. Failure of rubber-

Components	Reasons for Failure
	metal attachment 22. Deterioration of suspension medium (soft and sticky)

18.2 Suspension Mechanism:

Keeping the vehicle in the lift or pit, the front or rear part of the vehicle should be raised using the suitable jacking points such that the suspension hangs freely. The components of the front and the rear suspension system should be examined. It is not necessary to raise both the front and rear part of the vehicle at the same time.

Components	Reasons for Failure
Axle beam, wishbones, swinging arm, trailing arm, track control arm, suspension strut	1. Obviously out of line 2. Mounting obviously loose or worn 3. Cracked, damaged or deformed
Anti-roll bar, Torque Arm/Rod, Radius Rod/Link	4. Missing or broken 5. Mounting Loose 6. Cracked, damaged or deformed
Bushes, Ball Joints, Sliding Bushes or Swivel Joints	7. Excessive Wear 8. Insecure
Suspension Mounting Area	9. Deformed or corroded compromising the security and alignment of suspension system

Components	Reasons for Failure
Retaining or Locking Devices	10. Missing, insecure, worn or broken
Dust Cover	11. Missing or seriously deteriorated
Suspension System	12. Geometry apparently incorrect 13. Unsafe repair or modification

18.3 Shock Absorbers:

Component	Reasons for Failure
Shock Absorbers	1. Missing or damaged 2. Obvious Leak 3. Mounting bracket or bushes missing, loose or damaged

19. BRAKE SYSTEM COMPONENTS:

19.1 Brake Master Cylinder/Servo/Valves/Connections:

Components	Reasons for Failure
Master Cylinder/Reservoirs	1. Insecurely mounted 2. Leaking or defective
Servo	3. Insecure or defective 4. Damaged, badly corroded or leaking
Valves	5. Missing, insecurely mounted, leaking or defective
Load Sensing and Brake	6. Missing, bypassed,

Proportioning Valves	linkage sticking, damaged, leaking or inoperative or obviously incorrectly adjusted
Brake Master Cylinder/Servo/Valves/Connections	7. Any unsafe repair or modification

19.2 Brake Pipes/Flexible Hoses:

All accessible brake pipes should be examined for their condition with special attention to presence of chafing, external corrosion or damage. The pipes and hoses should be in properly secured condition and should not be fouled by any other moving parts. Leaks should be checked by applying brakes. Also the flexible pipes should be checked for weakness under pressure while the service brake is engaged fully. In case of vacuum servo or power operated brakes the engine should be kept idling during the inspection.

Component	Reasons for Failure
Brake Pipes/Flexible Hoses	1. Damaged, pitted 2. Insecurely mounted 3. Leaks 4. Fouling moving parts 5. Bulging under pressure 6. Unsuitable repairs

19.3 Mechanical Brake Components:

The mechanical components of the brake should be examined as much as accessible and possible, without dismantling the components.

Components	Reasons for Failure
Brake Rods/levers/cables/linkages/pivots	1. Missing, damaged, cracked, corroded, seized, obstructed or worn 2. Incorrectly fitted
Bracket, Mounting Bolts, Split Pins or Other Retaining Devices	3. Missing, loose, worn
Brake Linings	4. Brake linings contaminated 5. Incorrectly adjusted 6. Brake shoes or pads in need of replacement
Brake Drums/Discs/Backplates/Dirt Shield	7. Obviously damaged, askew or insecure
Actuating Levers	8. Damaged, insecure or in need of adjustment
Free Movement of Brake Rods/Levers/ Cables	9. Restricted

19.4 Brake Wheel Unit:

While checking the brake unit at the wheel, the parking brake should be released. The brake operating wheel unit should be

checked for security, leaks, corrosion or damage. For checking the leaks, the brake should be applied.

Component	Reasons for Failure
Hydraulic Brake Unit	1. Insecurely Mounted 2. Leaking 3. Sluggish in operation or seized

20. ELECTRICAL SYSTEM:

Components	Reasons for Failure
Ignition Switch	1. Ignition cannot be switched off 2. Ignition key cannot be removed
Wiring, Cables and Connections	3. Wiring condition interfering driver's control of the vehicle 4. Risk of fire including risk associated with a. Electrical wiring dislocated or insecure b. Electrical wiring damaged c. System indicators not wired through ignition switch or a fuse d. Use of unsuitable wiring for e.g. household wiring e. Unsuitable electrical connections
Battery	5. Insecure and improper mounting 6. Risk of short circuit 7. Leakages

21. FUEL SYSTEM:

Component	Reasons for Failure
Fuel Tank, Fuel Filter and Fuel Lines	1. Incorrectly or loosely mounted or damaged 2. Advanced rust in fuel tank 3. Leaks 4. Manual or solenoid valves not operating 5. Fuel lines in condition of probably getting crushed, chafed, ruptured or subjected to excessive vibration 6. No fuel cap or fuel cap seal damaged.
Throttle Control	7. Sticking, binding or excessively worn 8. Link pins, retaining devices or safety devices missing 9. Cracked or fractured mounting bracket or panel
Air Filter Assembly	10. Insecure or incomplete.

22. TRANSMISSION AND DRIVE TRAIN

While inspecting the transmission system, vehicle should be in neutral gear.

Components	Reasons for Failure
Clutch pedal anti	1. Missing, loose or worn to the

Components	Reasons for Failure
slip provision	extent that it is no longer effective
Propeller Shaft or Half Shaft Bearing /Bearing Housing/Housing Mounting	2. Liable to lock up or break away 3. Askew, damaged or worn
Propeller Shaft/Half Shaft couplings	4. Worn 5. Bolts, nuts or studs loose/missing 6. Grease boot missing or worn
Lubrication	7. Oil leaking and continuously dropping
Engine Mountings or Gearbox Mountings	8. Insecure, deteriorated or broken
Dust Covers	9. Dust cover is missing or severely deteriorated
Engine or Drive Train	10. Any unsafe repair or modification

नेपाल सरकार

भौतिक पूर्वाधार तथा यातायात मन्त्रालय

यातायात व्यवस्था विभाग

मझौला तथा साना सवारी परीक्षण सम्बन्धी मापदण्ड, २०७४

(Medium and Light Motor Vehicles Fitness Testing Manual, 2018)

काठमाडौँ

२०७४

मझौला तथा साना सवारी परीक्षण सम्बन्धी मापदण्ड, २०७४

स्वीकृत मिति: २०७४/१२/१६

सवारी तथा यातायात व्यवस्था ऐन, २०४९ को दफा ८९ र १५३ मा भएको व्यवस्था सार्वजनिक सवारीको जांचपास तथा प्राविधिक परीक्षण गर्ने कार्यलाई व्यवस्थित तथा एकरुपता ल्याई सार्वजनिक यातायात सेवालाई सुरक्षित, आरामदायी तथा भरपर्दो बनाउने उद्देश्यले सवारी तथा यातायात व्यवस्था नियामवली, २०५४ को नियम ६२ ले दिएको अधिकार प्रयोग गरी भौतिक पूर्वाधार तथा यातायात मन्त्रालयको मिति २०७४/१२/७ गतेको सैद्धान्तिक सहमति अनुसार यातायात व्यवस्था विभागले यो "मझौला तथा साना सवारी परीक्षण सम्बन्धी मापदण्ड, २०७४" जारी गरेको छ।

१. यो मापदण्ड यातायात व्यवस्था विभागबाट स्वीकृत भएको मितिबाट लागू हुनेछ।

२. सार्वजनिक सवारीको जांचपास तथा प्राविधिक परीक्षण प्रयोजनका लागि मापदण्ड निम्न अनुसारको हुने छ:

Medium and Light Motor Vehicles Fitness Testing Manual, 2018

The Department of Transport Management has framed this manual pursuant to the provision of sub-rule (1) of Rule 62 of Vehicle and Transport Management Rules, 1997.This manual shall apply for medium vehicles (with having weight of more than 4 metric tonne but less than 10 metric tonne) and small vehicles (with having weight of less than 4 metric tonne) as set forth in clause (b) and clause (c) respectively in the schedule (1) of Vehicle and Transport Management Act, 1993 (2049).

The purpose of this manual is to serve as a standard-reference, both substantially and procedurally, for the technical staff of Transport Management Offices and Vehicle Fitness Testing Offices who carry out road-test of vehicles, using testing equipment or conducting performance test, pursuant to Vehicles and Transport Management Act, 1993 and Rules, 1997.

This manual also serves as a reference for the vehicle owners to prepare their vehicles for scheduled performance test at a TMO. Vehicle owners should go through all the provisions mentioned in this manual and keep their vehicle in suitable condition when they bring the vehicles for performance test. Technical personnel carrying out the testing may refuse to perform a routine performance test if the vehicle is not presented in neat and clean condition.

This manual outlines the procedure for carrying out equipment based or road-based performance tests of motor vehicles. The tests may be complementary or supplementary to the motor vehicle inspection carried out as per **Medium and Light Motor Vehicles Inspection Manual, 2018.**

An Inspector performing test pursuant to this manual shall conduct all the tests outlined in the manual and prepare an inspection report. If the vehicle passes the tests and the inspection carried out as per the **Medium and Light Motor Vehicles Inspection Manual, 2018**, the inspector shall make recommendation for award of a Road-Test-Certificate.

विषयसुची (Contents)

1. SERVICE BRAKE PERFORMANCE:

1.1 Roller Brake Test

a) The vehicle should be positioned in such a way that wheels of each axle must be placed turn by turn on the brake test machine rollers.
b) The vehicle should be driven onto the brake test rollers. After the wheels of an axle are on the rollers, the service brake should be applied following the instructions of the testing program.
c) It should be checked that the brake can be applied slowly and the brake does not show any abnormal lag when released.
d) The roller brake tester will measure the braking force exerted by the service brake and compute the braking efficiency.

Axle-load measurement often precedes the roller brake testing procedure. When axle load tester is installed before a roller brake tester, weight of each axle needs to be noted by placing the axle-wheels over the axle load tester-plates, turn by turn. The testing system uses the total weight of the vehicle in computing the braking efficiency.

Following precautions should be taken before proceeding for the roller brake test:

a) Roller brake test is not appropriate for hybrid vehicle, permanently engaged four wheel drive vehicle, limited slip differential vehicle and belt-driven transmission vehicle.
b) The tires must be correctly inflated and the gear selector should be in neutral position.
c) The tires should not be damaged, should be free from mud, oil, water or stones embedded in the tread.
d) The brake tester-rollers should be in good condition to prevent premature wheel slip.
e) For vehicles with automatic transmission the gear selector should not be in the parking position during the test.
f) For vehicles with servo assisted or power braking systems, the engine must be idling even the service brake is tested.

1.2 Decelerometer Test

If a vehicle is of a type that cannot be tested on the roller tester it should be subjected to decelerometer test.

a) With the vehicle in a reasonably level and dry road condition, the decelerometer should be placed on the floor of the vehicle and set to zero position according to the manufacturer's instructions.

b) Having the vehicle driven at a speed of approximately 30 to 40 kmph, the service brake should be applied firmly and the reading in the decelerometer should be noted.

Components	Reasons for Failure
Service Brake Performance	1. The braking effort is less than 56% of the total weight of the vehicle. 2. Brake cannot be operated progressively 3. Brake shows abnormal lag when released 4. Braking effort on any wheel is less than 250N (When the test is done in roller brake tester)

2. SERVICE BRAKE IMBALANCE

2.1 Roller Brake Test:

Service brake imbalance test is carried out concurrently with service brake performance test with same general precautions. With the rollers of the brake tester driving, the wheels of each axle in turn, service brake is applied slowly. The braking effort on each wheel is noted.

2.2 Road Test:

This test is carried out if the vehicle cannot be tested on roller brake tester. This test should be carried out along the road free of traffic flow at the speed of 40 kmph. The service brake should be firmly applied and it should

be observed whether the vehicle pulls to one side or there is evidence of brake disc/drum ovality.

Components	Reasons for Failure
Service Brake Imbalance (Roller Test)	1. More than 30% imbalance in the braking efforts between wheels of an axle
Road Test	2. Obvious pull to one side when brake is applied

3. PARKING BRAKE PERFORMANCE:

3.1 Roller Brake Test

This test will follow the same steps as the service brake test and same general precautions will apply. When the rollers of testing machines are driving each road wheel, the parking brake is slowly applied until each road wheel is just at the point of slip relative to the rollers or until sufficient braking is achieved whichever occurs first. The braking effort from each wheel should be noted and total braking effort should be calculated

3.2 Decelerometer test:

If the vehicle is of a type that cannot be tested on the roller brake tester, it should be subjected to decelerometer test:
With the vehicle on a reasonably level road, the decelerometer should be placed on the floor of the vehicle, following the manufacturer's instructions and set in the zero position.
The vehicle should be driven at a speed of approximately 30 kmph and the parking brake should be applied. The reading on the decelerometer should be noted.

Component	Reason for Failure
Service Brake Performance	1. Braking effort less than 20% of the weight of the vehicle

4. PARKING BRAKE IMBALANCE

Roller brake test:

This test is carried out concurrently with parking brake performance test applying same general precautions. This test is not relevant to transmission type parking brakes.

With the rollers brake testing machine driving all wheels of each axle in turn, the parking brake is applied and the braking effort indicated from each of the road wheels is noted.

Component	Reason for Failure
Parking Brake Imbalance	1. More than 40% difference in braking efforts between wheels on same axle.

5. SIDE SLIP:

The vehicle should be slowly and straightly driven, without moving the steering wheel and without applying the brakes, such that the front wheels pass over the side slip plates. The reading should be noted.

The vehicle should be slowly and straightly driven, without moving the steering wheel and without applying the brakes, such that the rear wheels pass over the side slip plates. The reading should be noted.

Components	Reasons for Failure
Front Wheel Side Slip	1. More than ±14m/km
Rear Wheel Side Slip	2. More than ±18m/km

6. HEAD LAMP AIM:

There are two main types of headlight installed in vehicles, European type headlamps and British-American type headlamps. For testing the headlamp aim, the European type headlamps are tested in low beam while the British American Type Head Lamps are tested on low beam or high beam.

The type of headlight can be differentiated by the pattern of light it projects on the headlight aiming instrument. The low beam pattern of European headlight and the low beam and high beam patterns of British-American headlights are shown in following figures.

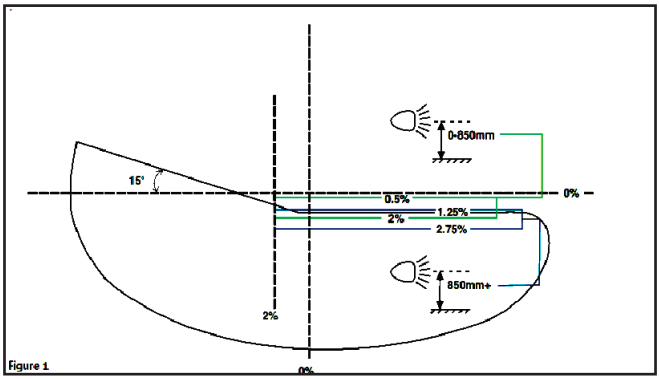


Fig 1: Pattern of Low Beam of European Type Headlamp

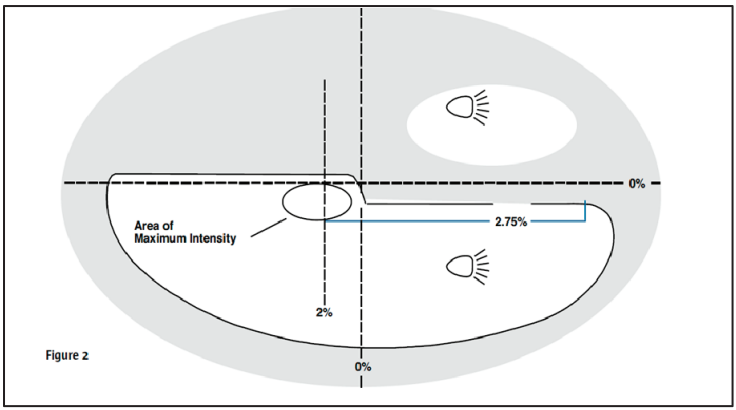


Fig 2: Pattern of Low Beam of British-American Type Headlamp

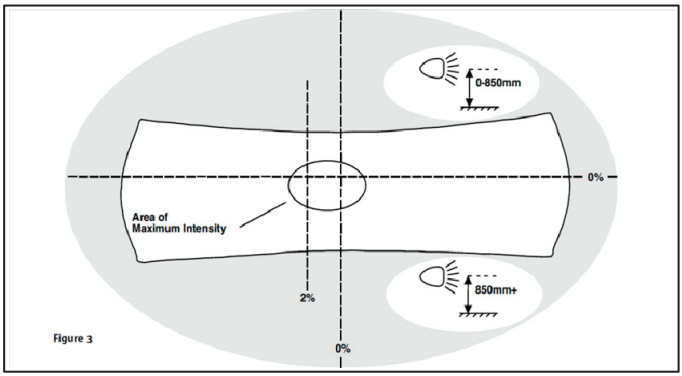


Fig 3: Pattern of High Beam of British-American Type Headlamp

The headlamp beam tester should be aligned in front of each headlamp in turn. Depending on the type of headlamp, the main beam or dipped beam should be used for the aim-measurement purpose. The percentage gradient of the highest intensity of the beam relative to the plane on which the vehicle is standing is to be measured. While testing the headlight aim, tire pressure should be checked and adjusted if necessary. The engine must be kept idling for vehicle with hydropneumatics suspension system. The test should be carried out with an occupant in the seat.

Components	Reasons for Failure
European Headlight (checked on low beam)	1. For Headlight whose center is not more than 850mm above the ground, the horizontal cut off line doesn't lie between 0.5% and 2% horizontal lines 2. For Headlight whose center is more than 850mm above the ground, the horizontal cut off line does not lie between 1.25% and 2.75% horizontal lines 3. The intersection of 15^{o} cut off

	line and horizontal cutoff line does not lie between 0% and 2% vertical lines.
British-American Headlight (checked on low beam)	4. The upper edge of hot spot does not lie between 0% and 2.75% of horizontal lines 5. The right hand edge of the hot spot does not lie between the 0% and 2% vertical lines.
British-American Headlight (Checked on high beam)	6. For headlight whose center is not more than 850mm above ground, the center of the hot spot does not lie between the 0% and 2% horizontal lines 7. For headlight whose center is more than 850mm above the ground the center of the hot spot does not lie between the 0% and 2.75% horizontal lines 8. The center of the hot spot does not lie between the 0% and 2% vertical lines.

7. HEAD LAMP INTENSITY:

Any beam, high or low can be tested for any type of headlamp for the purpose of measuring the luminous intensity of the headlamps. Usually the luminous intensity is measured concurrently by the headlamp tester while measuring the aim of the beam.

Components	Reasons for Failure
Low Beam (Dipped Beam) Luminous Intensity of Each Head Lamp	1. Less than 15000 candela or more than 30000 candela
High Beam Luminous Intensity of Each Head	2. More than 100,000 candela 3. In case of 4 headlamps, total

Lamp	luminous intensity of all headlamps exceeds 200,000 candela

8. SUSPENSION PERFORMANCE

The front wheels of the vehicle should be driven into the Suspension Tester and suspension performance measurement should be carried out as per the instructions of the tester manufacturer.

The rear wheels of the vehicle should be driven into the Suspension Tester and suspension performance measurement should be carried out as per the instructions of the tester manufacturer.

Components	Reasons for Failure
Front Suspension Performance	4. More than 35% imbalance in right and left suspension.
Rear Wheel Suspension Performance	5. More than 35% imbalance in right and left suspension.

9. HORN INTENSITY

Method of testing:

a) The sound level meter should be placed at a height of 1 m from the ground level facing the center of the vehicle's front part, at a distance of 7.5m from the front end of the vehicle.
b) The horn should be pressed fully for about 30 seconds.
c) The maximum reading of the sound level meter should be noted.

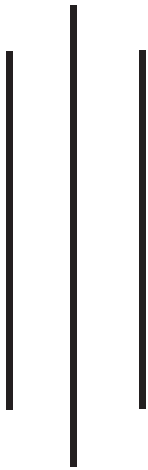
Component	Reasons for Failure
Horn intensity	1. The horn intensity is below 90 dB or above 112 dB

नेपाल सरकार

भौतिक पूर्वाधार तथा यातायात मन्त्रालय

यातायात व्यवस्था विभाग

सवारी प्रदूषण परीक्षण निर्देशिका, २०७४



काठमाडौँ

२०७४

सवारी प्रदूषण परीक्षण निर्देशिका, २०७४

स्वीकृत मिति: २०७४/१२/१६

सवारी तथा यातायात व्यवस्था ऐन, २०४९ को दफा १५३ (छ) मा भएको व्यवस्था बमोजिम सवारीको यान्त्रिक स्थिति संग सम्बन्धित उत्सर्जनलाइ नियन्त्रण गर्ने उद्देश्यले सवारीको जांचपास तथा प्राविधिक परीक्षण गर्ने कार्यलाई व्यवस्थित तथा एकरुपता ल्याउन सवारी तथा यातायात व्यवस्था नियामवली, २०५४ को नियम ६२ (१) ले दिएको अधिकार प्रयोग गरी यातायात व्यवस्था विभागले " सवारी उत्सर्जन परीक्षण निर्देशिका, २०७४" जारी गरेको छ । यो निर्देशिका सबै प्रकारका इन्धन (पेट्रोल, डिजेल, सी. एन. जी., एल. पी. जी.) बाट चल्ने सवारी साधनको परीक्षणको लागि हुने छ।

१. यो निर्देशिका यातायात व्यवस्था विभागबाट स्वीकृत भएको मितिबाट लागु हुनेछ।

२. सार्वजनिक तथा निजी सवारीको प्रदूषण परीक्षण तथा अनुगमन गर्ने प्रयोजनका लागि मापदण्ड निम्न अनुसारको हुने छ:

1. Diesel Emission:

Before performing the proper emission test by connecting the smoke meter to the vehicle, it should be ensured through visual inspection that the emission control system is complete and properly connected and there are no leaks in the exhaust system.

1.1 Visual Pre-Test Checks:

I. With the engine off condition: engine oil level, water coolant level, condition of cam shaft belt should be checked.

II. With the engine running: engine warning light, engine oil pressure, engine temperature and any obvious engine defects should be checked.

III. The engine should be warmed before smoke test by normal driving and not by idling or half throttling.

IV. The emission test should not be performed when the oil level is well over the dipstick "Full" mark or the oil level is below the minimum level and engine purge is necessary.

V. When the vehicle is producing excessively black smoke such that it is liable to damage the smoke meter, the vehicle should be failed without carrying out the normal smoke test.

1.2 Emission Test:

Before starting the emission test it should be made sure that the emission control system is complete and properly connected and there are no leaks in the exhaust system.

I. With the engine at normal operating temperature, the engine speed should be raised slowly to 2500 rpm or half the engine manufacturer's recommended governed speed whichever is less and held for 20 seconds to purge the exhaust system. If the engine emits any unusual noises, the test should be abandoned. The engine rpm should be slowly raised to its maximum. If the governor does not operate within the manufacturer's recommended rpm setting, the test should be discontinued.

II. The smoke meter should be connected to the vehicle as per the smoke meter manufacturer's instructions. The accelerometer should be depressed firmly from

the idling position to the maximum fuel delivery position. The first reading is to be ignored. The operation should be repeated for the second time and if the second reading is less than 70% of the acceptable limit, the test is ended. If the second reading is more than 70% of the acceptable limit the operation should be repeated for the third time. The average of the second and third reading should be tested against the acceptable limit. If the average so found is not within the limit the test can be repeated for maximum of three more times and the average of the last two readings should be compared against the acceptable limit.

III. When the engine is at correct operating temperature and is correctly purged but the first three readings are above 95% HSU, the emission test may be aborted.

IV. Where the engine speed of a vehicle is limited when it is stationary the smoke test may be carried out at the restricted rpm.

Components	Reasons for Failure
Preliminary Inspection	1. Engine oil level too high or too low, coolant level too low 2. Apparent engine defects 3. The maximum attainable engine speed is less than 90% of the maximum speed specified by the manufacturer. 4. The Emission Control System is leaking, incomplete or incorrectly assembled 5. The exhaust smoke is excessively black and is likely to cause

	nuisance to other road users
Exhaust Smoke	6. Smoke meter reading in HSU of k-coefficient is not in accordance with that prescribed in the emission standard.

2. Emission from Spark Ignition Engines:

I. It should be ensured by visual inspection that the emission control system is complete and properly connected and there are no leaks in the exhaust system.

II. Emission test is not carried out if the oil warning light is on when the engine is running or oil level is below the minimum level or the oil level is above the maximum level.

III. With the engine at normal operating temperature, the gas analyzer should be connected as per the manufacturer's instructions.

2.1 For Vehicles with Mechanical Air Fuel Mixing System:

The exhaust analyzer should be connected to the vehicle with the engine at normal operating temperature and the engine speed at normal idling. The readings for HC and CO should be noted.

2.2 For Vehicles with Electronic Air Fuel Mixing System:

The exhaust analyzer should be connected to the vehicle with the engine at normal operating temperature. The engine speed should be raised to approximately 2500 rpm and maintained there for 180 seconds. The readings for HC and CO should be noted.

For LPG operated vehicles: The HC reading should be divided by Propane/Hexane equivalent factor (PEF) marked on the test equipment.

Components	Reasons for Failure
Preliminary Checks	1. Exhaust system is leaking 2. The Emission Control System is leaking, incomplete or incorrectly assembled 3. Engine Idle Speed incorrect (not within ±100 rpm or ±10% of manufacture's specified idling speed whichever is greater)
Exhaust Smoke	4. The carbon monoxide (CO) or hydrocarbon (HC) volumetric level is higher than the maximum permissible limit prescribed in the standard.