NSW GOVERNMENT

TS 00088:1.0

Standard

Minimum Requirements for Contractor Vehicles

Issue date: 26 August 2024

Effective date: 26 August 2025

Disclaimer

This document has been prepared by Transport for NSW (TfNSW) specifically for its own use and is also available for use by NSW public transport agencies for transport assets.

Any third parties considering use of this document should obtain their own independent professional advice about the appropriateness of using this document and the accuracy of its contents. TfNSW disclaims all responsibility and liability arising whether directly or indirectly out of or in connection with the contents or use of this document.

TfNSW makes no warranty or representation in relation to the accuracy, currency or adequacy of this document or that the document is fit for purpose.

The inclusion of any third party material in this document, does not represent an endorsement by TfNSW of any third party product or service.

For queries regarding this document, please email Transport for NSW Asset Management Branch at standards@transport.nsw.gov.au or visit www.transport.nsw.gov.au

Document information

Owner:	Director Fleet Engineering Asset Management Safety, Environment and Regulation
Mode:	Road
Discipline:	Fleet

Document history

Revision	Effective date	Summary of changes
1.0	26/08/2025	First issue.

Preface

Vehicle safety is a critical component in reducing road trauma on NSW roads and in NSW workplaces. The NSW Government currently requires the safest fleet vehicles available on the market which provides a safe workplace for TfNSW employees and eventually second-hand buyers of government fleet vehicles. However, government fleet vehicles only make up a small proportion of the overall fleet whereby the private sector contributes to the majority of new fleet purchases in Australia.

The NSW Government is committed to improve the safety of the NSW vehicle fleet through new and proven vehicle technology. The introduction of minimum vehicle safety requirements for vehicles operated by contractors engaged by TfNSW contributes and aligns with the strategic direction set out in the 2026 NSW Road Safety Action Plan as part of the Future Transport Strategy 2056 which aims to have zero fatalities and serious injuries on NSW roads by 2056.

Increased vehicle movement generated from major transport, utility and social infrastructure projects in cities, towns, and urban areas present significant road safety risks to all road users, particularly vulnerable users including pedestrians and cyclists. Improving vehicle safety standards on major infrastructure projects is anticipated to provide road safety benefits to the industry and communities of NSW with the cause and effect of increasing the safety of the vehicle fleets overall.

Motor vehicles used for business purposes are considered to be a workplace. As such, TfNSW has an obligation in ensuring its contractor supply chain provides a safe workplace for their workers when on the road and travelling to and from worksites. This standard sets out the method of meeting this obligation SFAIRP.

As a result, TfNSW can have an active role in driving these changes through its existing government procurement processes, providing a safe workplace for contracted delivery partners, safer interactions between TfNSW delivery partners and other road users, and a safer vehicle for the community and secondary buyers following their use on TfNSW contracts.

Incorporating the minimum requirements for the vehicle fleet of TfNSW's major delivery partners will:

- provide significant safety improvements protecting TfNSW's contractor workforce and community road users who interact with TfNSW contractor vehicles
- provide long-term safety benefits to the community and secondary users of fleet vehicles
- demonstrate TfNSW's commitment to delivering key actions in its current and future Road Safety Action Plans.

This standard is a first issue.

Table of contents

1 Scope

This standard encompasses the requirements for all contractor vehicles, used for delivery of construction projects, including light vehicles, heavy vehicles, and plant. The standard requirements can then be referenced as part of the contractual agreements of the business units in TfNSW.

2 Application

This standard applies to the stakeholders involved in the procurement and delivery of construction projects. The standard is aimed to complement infrastructure construction contractual agreements by providing vehicle and plant requirements to contractors and project delivery partners.

The requirements mentioned hereafter are applicable to vehicles and plant that are used by contractors to deliver the construction project. This includes vehicles and plant travelling to and from worksites as well as vehicles and plants operating on worksites.

For practicality, the heavy vehicle safety requirements are presented in a multi-tiered approach to allow TfNSW contract managers to select a level of requirements suitable for the size of the project.

TfNSW contract managers select the highest tier of requirements available based on the cost, risk, and performance assessments to deliver preferred customer and community outcomes.

It is recommended that TfNSW contract managers comply with this standard from the date of issue. The standard will come into effect 12 months after the date of issue and TfNSW contract managers will be required to comply with this standard from that date.

This standard is not retrospective to existing construction projects.

This standard does not apply to road-rail vehicles.

3 Referenced documents

The following documents are cited in the text. For dated references, only the cited edition applies. For undated references, the latest edition of the referenced document applies.

International standards

ISO 3471 *Earth-moving machinery – Roll-over protective structures – Laboratory tests and performance requirements*

ISO 6683 *Earth-moving machinery – Seat belts and seat belt anchorages – Performance requirements and tests*

ISO 12117 (series) *Earth-moving machinery – Tip-over protection structure (TOPS) for compact excavators – Laboratory tests and performance requirements*

Australian standards

AS/NZS 1269.1 *Occupational noise management Part 1: Measurement and assessment of noise emission and exposure*

AS 1319 *Safety signs for the occupational environment*

AS 1636.1 *Tractors – Roll-over protective structures – Criteria and tests Part 1: Conventional tractors*

AS 1906.1 *Retroreflective materials and devices for road traffic control purposes Part 1: Retroreflective sheeting*

AS/NZS 2596 *Seat belt assemblies for motor vehicles*

AS 2664 (withdrawn) *Earthmoving machinery – Seat belts and seat belt anchorages*

AS 13031 *Earth moving machinery – Quick couplers – Safety*

Legislation

Heavy Vehicle National Law 2013 (NSW)

Heavy Vehicle (Vehicle Standards) National Regulation 2013 (NSW)

Road Transport (Vehicle Registration) Regulation 2017 (NSW)

Vehicle Standard 2011 (Australian Design Rule 79/04 – *Emission Control for Light Vehicles*)

Vehicle Standard 2023 (Australian Design Rule 108/00 – *Reversing Technologies)*

Work Health and Safety Act 2011 (NSW)

Other referenced documents

NHVR, 2020, *NHVR Code of Practice for the Approval of Heavy Vehicle Modifications Version 2.2*

NHVR, 2021, *National Heavy Vehicle Inspection Manual Version 3.0*

SAE J386 *Occupant Restraint System for Off-Road Work Machines*

TfNSW, 2022, Future Transport Strategy (TP266)

TfNSW Vehicle Standards Information *VSI. 03 Rev.3 1 July* 2003 *Windscreens and window tinting*

TfNSW Vehicle Standards Information *VSI. 06 Rev 3 8 Nov 2013 Light vehicle modifications*

TfNSW Vehicle Standards Information *VSI. 8 Rev 4.1 Nov 2010 Flashing Lights and Sirens*

4 Terms, definitions and abbreviations

The following terms, definitions and abbreviations apply in this document.

contractor vehicle vehicles and plant that are used by contractors to deliver the construction project

heavy vehicle defined as motor vehicles with a gross vehicle mass greater than 4.5 tonnes or trailers with an aggregate trailer mass greater than 4.5 tonnes

light vehicle defined as motor vehicles with a gross vehicle mass of 4.5 tonnes or less

NHVR national heavy vehicle regulator

OEM original equipment manufacturer

plant includes machinery, equipment, appliances, containers, implements and tools and components or anything fitted or connected to those things

road-rail vehicle a vehicle that has been modified to operate on railway lines

SFAIRP so far as is reasonably practicable

TfNSW Transport for NSW

WHS work health and safety

5 Registration requirements

Requirements for all vehicles are stated in the associated regulations, Commonwealth and other NSW legislation and relevant Australian Standards. This standard provides additional requirements.

5.1 Registration for public road and road related area use

All light road vehicles shall have full registration for the duration of the contract period. Other registration requirements are set out in the *Road Transport (Vehicle Registration) Regulation* 2017.

All heavy road vehicles shall have full registration for the duration of the contract period. Other requirements are set out in the *Heavy Vehicle National Law* and Regulations.

All road registerable plant shall have either full or conditional registration for the duration of the contract period. Vehicle sheets for conditional registration provide the minimum mandatory usage conditions and equipment requirements for non-standard vehicles. Only vehicles with vehicle sheets can apply for conditional registration. Vehicle sheets for conditional registration can be accessed at the Driving Boating and Transport website.

5.2 Roadworthiness

The roadworthiness requirements of light road vehicles and all their incorporated safety, operational systems and attachments are set out in Schedule 2 of the *Road Transport (Vehicle Registration) Regulation* 2017.

The roadworthiness requirements of heavy vehicles and all their incorporated safety, operational systems and attachments are set out in the *National Heavy Vehicle Inspection Manual*.

5.3 Vehicle modifications

Each vehicle shall comply with the vehicle standard requirements made for it as of its date of manufacture. A vehicle that is modified shall continue to comply with those standards or any later version of those standards that may apply as a result of a particular modification.

A modified vehicle is one that has been altered from its original manufacturer's specification by replacing, adding or upgrading components of its body, engine, brakes, drive train or chassis. This is usually to alter its appearance, handling or performance.

If a contractor vehicle has been modified, the vehicle shall meet the standards and guidelines that apply to the modification of vehicles for use on roads and/or road-related areas. This ensures modified vehicles are suitable for safe use and that passenger and road user safety is not compromised by the modifications.

If a compliance certificate is issued to certify a modification carried out on the vehicle, then a copy of the compliance certificate shall be carried in the vehicle while it is operating or travelling on worksites.

5.3.1 Light vehicle modifications

Requirements for modified light vehicles are set out in the *Australian Design Rules* and Schedule 2 of the *Road Transport (Vehicle Registration) Regulation* 2017.

VSI 6 is intended to help vehicle owners and modifiers determine what modifications to vehicles up to and including 4.5 tonnes gross vehicle mass require certification. The document also provides guidance on the process to be followed should a particular modification require certification.

5.3.2 Heavy vehicle modifications

Requirements for modified heavy vehicles are set out in the *Australian Design Rules* and Schedule 2 of the *Heavy Vehicle (Vehicle Standards) National Regulation* for heavy vehicles.

The *NHVR Code of Practice for the Approval of Heavy Vehicle Modifications* (the NHVR Code) sets out the NHVRs framework for the approval of modifications made to heavy vehicles. The

document also provides guidance on the process to be followed should a particular modification require certification.

5.4 Registration of plant

In addition to registration for road use, some plant shall be registered with SafeWork NSW or a state's corresponding Work Health and Safety regulator. Both the design of these plant and the individual plant item shall be registered for the duration of the contract period.

Information on plant design and item registration can be accessed at the NSW SafeWork website.

Registered plant or plant items that do not have a current registration certificate shall not be used by the contractor. The contractor shall not allow someone else to use it either.

6 General safety requirements

6.1 Reverse or travel alarm

All vehicles and plant travelling or operating on a worksite shall be fitted with a reverse alarm that is audible and automatically activated when reverse gear is selected.

Self-adjusting type alarms, that is, alarms which vary the output in response to changes in the surrounding noise level, for example, 'Smart Alarms', are preferred.

The alarm's noise level range shall be:

- 87 to 112 dB(A) for self-adjusting tonal (beeper) alarms at 1 metre distance from the alarm
- 87 to 107 dB(A) for self-adjusting broadband (squawker) alarms.

All self-adjusting tonal and broadband alarms shall be mounted with an unobstructed 'vision' to the rear of the vehicle.

All alarms shall be clearly audible above the noise level of the vehicle.

Fixed output reverse alarms shall have a minimum base noise level of 87 dB(A).

Truck and trailer combinations shall be fitted with a reverse alarm on the prime mover and on the rear-most trailer.

For plant rollers with an operating mass less than 4500 kg, an alarm may have a base noise level of 85 dB(A), provided the plant:

- has a noise level less than 80 dB(A)
- does not have an enclosed cab.

Excavators and plant with restricted operator vision in both forward and reverse directions shall be fitted with a travel alarm, which operates in both directions. Alternatively, two alarms may be fitted.

6.2 Amber beacon

All vehicles and plant travelling or operating on a worksite shall have at least one amber beacon that is active whenever they are travelling or operating on the work site.

The beacon shall be one of the following types:

- halogen rotating type, minimum 55 watts
- LED, minimum 25 watts.

The beacon (whether halogen, LED, or strobe) shall:

- flash between 120 to 200 times per minute
- be mounted as near as possible to the top of the vehicle
- be clearly visible in normal daylight up to a distance of 200 metres (and closing) in all directions.

For trucks operating under an NHVR issued Class 1 Oversize Overmass permit, the amber beacon shall be clearly visible at a distance of 500 metres and be halogen or LED (not strobe).

Truck-mounted plant may be fitted with a switch to turn the beacon off when travelling on roads outside the jobsite.

A flashing light displayed on a vehicle is intended to convey a specific warning to road users. To guard against incorrect use and to avoid possible detraction from the significance of a flashing light, their use and colour is limited to particular types of vehicles and in particular, circumstances as outlined in TfNSW vehicle standards information sheet VSI 8 *Flashing Lights and Sirens*.

6.3 Controls and switches

The controls and switches of all vehicles and plant shall perform as designed and be clearly and permanently labelled to indicate the direction of movement and/or function.

6.4 Tipping bodies

Vehicles and plant with hydraulic tipping bodies shall have a self-supporting safety prop permanently attached to the body or chassis for use when required.

Tip-over axle/body tippers are exempt from safety props.

Bodies shall be free of any defects that allow any loss of material.

6.5 Security

Parts of the vehicle or plant that are critical to their operation and are subject to vandalism shall be protected. Vehicle cabins shall be capable of being locked by appropriate locking devices. For plant equipment this includes engine covers, console covers and cabins.

6.6 Work attachments, tools, and tarping

All attachments shall be securely mounted, free from cracks, leaks or any defects and be in good working order.

There shall be secure tarping provided to cover any loads being carried. Tarping systems shall be operational from the ground.

6.7 Compulsory signs

Warning signs shall be used for conditions that may result in injury. The signs shall comply with design requirements of AS 1319.

Retro-reflective signs shall be made of Class 2 (or better) retro-reflective material complying with AS 1906.1 and the OEM.

6.7.1 General signs for all vehicles and plant

6.7.1.1 Electrical hazard warning

All vehicles and plant whose height can alter while working shall be fitted with an NSW electrical hazard warning notice that displays the minimum safe working distances.

6.7.1.2 Dual control and left hand drive

Dual control vehicles and plant shall be fitted with a sign that states ‘Dual Control Vehicle’.

Left hand drive vehicles and plant shall be fitted with a sign that states ‘Left Hand Drive’.

Each 'Left Hand Drive' sign or 'Dual Control Steering' sign shall:

- be displayed in a prominent position at the rear of the vehicle
- have a one-character width spacing before and after each word
- have characters that are each at least 75 mm high
- have:
    - red lettering on an amber background with a 4 mm black border, or
    - black lettering on a white background with a 4 mm black border.

6.7.1.3 Mobile elevating work platforms

All cranes and elevated working platforms fitted to vehicles or plant shall include all the safety and operational signs as fitted by the original equipment manufacturer.

6.7.2 Plant specific signs

6.7.2.1 Hearing protection

All plant with an external noise level above 85 dB(A) shall be fitted with two 225 mm hearing protection signs, one on each side, and if above 85 dB(A) at the operators position one 50 mm hearing protection sign fitted to the operator's console.

6.7.2.2 Safe working load

Safe working load signs shall be distinctively labelled on all backhoes, excavators and loaders that are fitted with an approved lifting point for lifting freely suspended loads.

6.7.2.3 Rollover hazard – seat belt warning

All plant fitted with a rollover protective structure canopy shall have a safety sign warning that a roll-over hazard exists, requiring the operator to wear the seat belt.

6.7.2.4 Articulation joint crush zone

All plant with crush zones shall have a safety sign warning alerting the operator.

6.7.2.5 Hydraulic steering

All plant with hydraulic steering shall have a sign warning of the importance of maintaining hydraulic fluid level as well as the maximum speed limit of the vehicle (as applicable).

This label to warn the operator shall:

1. have a minimum size of 100 mm x 50 mm
2. have red lettering on an amber background
3. be clearly visible to the driver from the normal driving position.

The label and its wording shall be identical to the sample shown in Figure 1.

Figure 1 – Hydraulic steering sign

6.7.2.6 Confined space

All plant with a confined space, for example, water tankers, sweepers, vacuum trucks shall have a sign fitted near the entry point to the confined space.

6.7.2.7 Water filled tyres

All plant with water-filled tyres shall have a warning sign adjacent to each tyre.

6.7.2.8 Lime/cement spreaders

Lime/cement spreaders shall be fitted with the following warning signs to advise the operator of the personal protective equipment to be worn:

- dust mask
- eye protection (goggles not glasses)
- gloves
- overalls.

6.8 Operating and safety information

The owner's/operator's manual and any other safety information provided for all vehicles and plant shall be readily available for the use of operator and other persons affected by the operation of the vehicle or plant.

A copy of plant risk assessment and safe work method statement for all high risk activities shall also be readily available for use by the vehicle operator.

6.9 Daily inspection and service/maintenance records

Daily inspections shall be carried out and reports filled out by the vehicle operator prior to the commencement of each shift. These inspection reports shall be available in the vehicle for inspection.

Service records shall be readily available in the vehicle.

7 Light vehicle requirements

7.1 General

For a light vehicle to comply with this document it shall comply with Sections 5 and 6 of this document, as well as this Section of the document.

7.2 ANCAP Rating

7.2.1 New vehicles

Newly purchased light vehicles shall have a 5-star Australasian New Car Assessment Program (ANCAP) rating year date stamp of no more than three years old, subject to vehicle availability in the category of vehicle and the vehicle's suitability for its intended application. This ensures the safety, currency and inclusion of the latest available safety assist technologies.

7.2.2 Existing vehicles

Existing light vehicles shall have a current (year date stamp of no older than six years) 5-star Australasian New Car Assessment Program (ANCAP) rating, subject to vehicle availability in the category of vehicle and the vehicle's suitability for its intended application. This ensures the safety, currency and inclusion of the latest available safety assist technologies.

7.2.3 Unrated vehicles

Some vehicle manufacturer's offer variants of their vehicles with a GVM over 3.5 tonnes up to 4.5 tonnes (Medium Goods Vehicle NB1 ADR category). Such vehicles may not be eligible for testing under the ANCAP safety rating system.

As a minimum, such vehicles shall have the following safety features:

- Electronic Stability Control (ESC) system
- Brake Assist System (BAS)
- Autonomous Emergency Braking (AEB) system
- lane support systems such as Blind Spot Monitoring (BSM), Lane Departure Warning (LDW), or Lane Keep Assist (LKA)
- 3-point lap sash seatbelts in all outboard seating positions; inboard seating positions may be fitted with 2-point lap belts
- driver and front outboard seatbelts to incorporate pre-tensioners
- driver seatbelt reminder
- front airbags for driver and front passengers.

7.3 Emissions

Vehicles shall meet the requirements, scope, and applicability of Australian Design Rule 79/04 – *Emission Control for Light Vehicles*.

Preference shall be given to low-emission or electric vehicles.

High Performance Vehicles, as defined for NSW licence holders are not permitted.

7.4 Reverse collision avoidance

Vehicles shall be fitted with reverse collision avoidance systems such as reverse cameras and/or proximity sensors.

Preference shall be given to systems that meet the requirement of Australian Design Rule 108/00.

7.5 Transmission

Vehicles shall have automatic transmission.

7.6 Accessories

The inclusion of nonessential accessories on vehicles shall be banned. Accessories are deemed to be nonessential if their fitment is not directly related to the successful delivery of the project.

All vehicles with an internal cargo area shall have a cargo barrier separating the occupants from the cargo.

Genuine accessories shall always be preferred if available over aftermarket equivalents.

Any modifications to vehicles, including the fitment of aftermarket accessories or components shall be assessed and completed according to Section 5.3.1 of this standard.

8 Heavy vehicle requirements

The heavy vehicle safety specifications are aligned with the Construction Logistics and Community Safety – Australia (CLOCS-A) approach. CLOCS-A is a national road safety program targeting transport and logistics related risks from major infrastructure projects.

For a heavy vehicle or a heavy vehicle combination to comply with this document, it shall comply with Sections 5 and 6 of this document, as well as meet the applicable requirements in the accreditation level chosen by the TfNSW contract manager.

Table 1 – Accreditation level criteria

Accreditation level	Description	Criteria	Vehicle safety requirement
Bronze	The minimum mandatory specification for all heavy vehicles complying with this document. Includes measures and technologies that are relatively low cost and easy to implement.	Accreditation requires compliance with at least one of the requirements nominated as 'either/or' plus all other remaining requirements.	• no solid, clear, or coloured bug deflectors on bonneted trucks • no external engine air intakes above bonnet level (on bonneted trucks) • no large after-market bullbars that rise above the standard overall bumper height for the particular vehicle • no external sunvisors that protrude below the tinted band on the windscreen or the swept path of the wipers • no large lettering or decals attached to any part of the windscreen • no tinting of the windscreen or side windows that reduces light transmittance beyond legal levels, as stated in the *Road Transport (Vehicle Registration) Regulation* • no aftermarket accessories (such as screens or mobile phones) mounted inside the cab that create blind spots and/or obscures the driver's field of view • Class V (passenger side) and VI (front) blind spot mirrors • Fresnel lens fitted to the passenger side window or peeper window • either reversing cameras or reversing sensors • amber beacons complying with Section 6.2 fitted to roof of the cabin • conspicuity markings with retro-reflective tape • high visibility drawbar colour scheme • vulnerable road user warning signage • wheel-nut position indicators.

Accreditation level	Description	Criteria	Vehicle safety requirement
Silver	A higher standard of equipment that is preferred for heavy vehicles complying with this standard.	Accreditation requires: • achievement of bronze level accreditation • compliance with at least one of the requirements nominated as 'either/or' plus all other remaining requirements.	• either left side blind spot cameras or left side proximity sensors • left turn audible warning • daytime running lights • front underrun protection • side underrun protection – trucks • side underrun protection – trailers • rear underrun protection • Euro V emissions standard compliant engine • ABS for trucks • ABS for trailers.
Gold	The highest standard of equipment that is being sought for heavy vehicles complying with this standard.	Accreditation requires: • achievement of silver level accreditation • fitment of telematics monitoring system • fitment of a minimum of four of the remaining vehicle technologies listed.	• roll stability control for trailers • electronic stability control for trucks • advanced emergency braking • lane departure warning • autonomous reverse braking • Euro VI emissions standards compliant engine or zero emission vehicle.

9 Plant requirements

Requirements for plant are set out in WHS legislation and relevant Australian Standards (or equivalent), Sections 5 and 6 of this document as well as the requirements set out below.

9.1 Operational safety requirements

9.1.1 Windscreen wipers

Plant with windscreens shall have an operative windscreen wiper, which effectively clears the screen directly in front of the operator. Wipers fitted to other windows shall also operate effectively.

9.1.2 Lights and reflectors

The requirements for lights and reflectors are detailed in the conditional registration requirements included in the vehicle sheets.

Plant for night work shall have suitable and efficient lights, including headlights or work lights to effectively light up the plant working area.

9.1.3 Reflective tape

Reflective tape shall:

- only be affixed to the sides and/or to the rear of the plant
- be affixed so that its lower edge is not less than 400 mm nor more than 1500 mm above the ground (where practical)
- have a flat surface area that is perpendicular to the ground when affixed
- have red stripes on a yellow or an amber background that is at least 50 mm high
- be made of Class 2 (or better) retro-reflective material complying with AS 1906.1.

Tape shall not be applied to the front of the plant.

If reflective tape is affixed to the side or to the rear of a plant, the tape shall either run the full length of the vehicle or be affixed in 200mm long strips.

If the reflective tape is affixed to the plant in strips:

- The strips shall be affixed in pairs (i.e., to the side or to the rear), arranged equidistant from the centre of the vehicle.
- The outermost edge of each strip shall be within 150 mm of the side/rear extremity of the plant (SFAIRP).
- There shall be one additional strip of tape affixed to the side of the plant at the middle if the plant is over 6000 mm in length.

Conspicuous marking tape is not a suitable substitute or replacement for red and yellow reflective tape.

9.1.4 Horn

All plant shall be equipped with a clearly audible horn. Exhaust whistles, compression whistles, sirens or alternating tone horns are not acceptable.

9.1.5 External rear view mirrors

External rear view mirrors shall be:

- fitted on the left and right-hand side of the plant
- at least 150 cm^2
- adjustable – either by the driver/operator or another person – while the driver/operator is in the dedicated driving/operating position, (both left- and right-hand side mirrors)
- provide the operator with a clear view of the road to the rear of the vehicle and of any approaching or overtaking vehicle
- mirrors may be substituted with cameras that provide the operator with a clear view of the road to the rear of the vehicle and of any approaching or overtaking vehicle.

9.1.6 Neutral start

Neutral start switches shall operate on all transmissions other than manual gearboxes fitted with a mechanical type of clutch.

Excavators and skid steer loaders are exempt from the normal type of neutral start switch.

Travel levers shall self-centre to the neutral position.

All OEM safety equipment/hydraulic locks shall operate as originally designed.

9.1.7 Service brakes

Brake components shall be free from leaks or defects and be securely mounted. Brake controls shall be fully operational and free from any defects. Air tanks shall be free of contamination.

Plant fitted with steel drums or a combination of steel drums/rubber tyres or tracks, while on the maximum operating gradient specified by the manufacturer, shall be capable of stopping within the distances shown in Table 2.

Table 2 – Braking performance for plant with steel drums or a combination of steel drums/rubber tyres or tracks

Plant operating mass	Stopping distance from 5 km/h
Less than 5400 kg	1.2 metres
5400 kg to 13,600 kg	1.5 metres
Greater than 13,600 kg	1.9 metres

Plant fitted with rubber tyres, while on the maximum operating gradient specified by the manufacturer, shall be capable of stopping within the distances shown in Table 3.

Table 3 – Braking performance for plant with rubber tyres only

Plant operating mass	Stopping distance from 30 km/h
Up to 2500 kg	9 metres
Greater than 2500 kg	14 metres

Where it is not possible to test the brakes of load-carrying plant in a loaded condition, e.g., water tankers and dump trucks, this plant may be subjected to a brake test in a loaded condition at a time agreed by TfNSW in an agreed protected area and before the plant is used for its purpose.

9.1.8 Park brake

On implement-type plant, the park brake shall be capable of holding the plant item on an incline of:

- 15%, i.e., approximately 1 in 7 or 9 degrees to the horizontal, for wheeled plant; or
- 25%, i.e., 1 in 4 or 14 degrees to the horizontal, for rollers.

9.1.9 Emergency stop devices

Emergency stops shall be prominently, clearly, and durably labelled and easily accessible to the operator. Handles, bars or push buttons shall be coloured red. These devices shall not be affected by any electrical or electronic malfunction.

9.1.10 Protective structures

Earthmoving machinery (designed to have a mass of 700 to 100,000 kg) shall be fitted with a protective structure conforming to ISO 3471.

Tractors designed to have a mass of more than 560 kg but less than 15,000 kg, shall be fitted with a protective structure conforming to AS 1636.1.

Excavators with a mass of up to 6 tonnes shall be fitted with a protective structure conforming to ISO 12117 or ISO 3471.

Excavators with a mass of over 6 tonnes and less than 50 tonnes shall be fitted with a protective structure conforming to ISO 12117-2 or ISO 3471.

There are exceptions to the rules about protective structures. To apply these exceptions, a risk assessment for falling objects or tip-over or roll-over shall be carried out and alternative control measures established.

The following types of earth-moving machinery may be excepted:

- power shovels
- draglines

- paving machines
- equipment designed to be operated by a person in a standing position.

9.1.11 Seatbelts

All earth-moving machinery fitted with a roll-over protective structure shall be fitted with seat belts conforming to one of the following standards:

- AS 2664
- SAE J386
- ISO 6683.

All tractors fitted with a roll-over protective structure shall be fitted with seat belts conforming to one of the following standards:

- AS/NZS 2596
- SAE J386 or equivalent.

Each seat belt assembly or part assembly shall be permanently and legibly marked with the following:

- manufacturer's name and trademark
- date of manufacture by month and year
- manufacturer's identification code (relevant standard).

Earthmoving equipment, which under Section 9.1.10 may not be required to have protective structures, shall be assessed individually for their requirement for seat belts, depending upon their safe operation and risk assessment outcomes; for example, earthmoving equipment, which has been designed for safe operation with the operator in a standing position.

The exclusions outlined above may be applied providing that the risks associated with not complying with the above requirements have been identified and assessed and other means are used to control them. The risk assessment shall be in writing and the controls form part of the Safe Work Method Statement.

9.1.12 Quick hitch attachments

All quick couplers shall comply with AS 13031.

Quick couplers shall be identified with:

- manufacturer's name and address
- type denomination (e.g., part number)
- serial number

- year of manufacture
- mass of quick-coupler, expressed in kilograms (kg)
- maximum and minimum quick coupler circuit pressures, expressed in MPa, if relevant
- lift point capacity in kg or tonnes which shall be clearly marked adjacent to the lifting point.

9.1.13 Machinery guards

All rotating, moving or hot components shall be fitted with a safety guard to prevent injury to any person.

9.2 Mechanical requirements

9.2.1 Leaks

The engine, transmission, driveline, hydraulics and fuel system shall not have any leaks which allow oil or fuel to drip on the road surface, or on exhaust systems or on brake components. Steering and brake systems shall be free from leaks. Catch trays or tanks to contain leaks shall not be used as a remedy.

9.2.2 Engine

The engine shall start easily. Jump starting the engine shall only be permitted once, at the start of each workday.

9.2.3 Cooling system

The cooling system shall provide efficient cooling for all conditions expected during operational period. All drive belts and hoses shall be free from deterioration and leaks.

9.2.4 Exhaust system

The exhaust system shall be securely mounted and free from leaks.

9.2.5 Exhaust smoke

Plant shall not emit visible smoke for continuous periods of more than 10 seconds.

9.2.6 Transmission and final drive

The transmission and final drive shall operate to the manufacturer’s specifications and be free of leaks.

Manual transmissions coupled to a hydrostatic drive shall be locked in gear to prevent accidental gear selection when a separate effective service brake is not fitted.

9.2.7 Hydraulics

All hydraulic functions shall respond quickly and smoothly and be free from leaks and hydraulic creep. The time for the hydraulics to 'warm up' shall be within manufacturer's specifications.

Plant used as a crane with a safe working load greater than 1000 kg shall be fitted with hose burst protection commonly known as anti-drop valves.

9.3 Chassis requirements

9.3.1 Chassis and frame

The chassis and frame shall be free from cracks, advanced rust, missing or loose bolts, sharp edges or protrusions that could cause personal injury.

9.3.2 Body, cabin, steps, and handrails

The body, cabin, steps, and handrails shall be free from cracks, advanced rust, missing or loose bolts, sharp edges or protrusions that could cause injury.

All doors, door locks and latches shall be secure and functional.

Plant with fully enclosed cabins that have no opening windows shall have an operational air conditioner fitted.

Steps and handrails shall be in good condition as originally manufactured.

9.3.3 Windows

The windscreen and all other windows shall be free from defects or cracks.

Plant manufacturers that incorporate the windscreen and windows into the structural design of the plant shall provide any required special instructions for replacement of windows to not reduce the structural integrity and crashworthiness of the vehicle.

All windows shall be fitted with glass as per the original manufacturer's specification.

Requirements for window tints can be found in *VSI. 03 Rev.3*.

9.3.4 Suspension

Suspension components shall not be broken, loose, cracked, cut, missing, or modified. All nuts, bolts and locking devices shall be in place and secure. The maximum allowable wear in any suspension component is 3 mm.

9.3.5 Steering

Steering components shall not be broken, loose, cracked, cut, missing, or modified. All nuts, bolts and locking devices shall be in place and secure. The maximum allowable free play in any steering joint is 3 mm. Rotational free play at the steering wheel shall not exceed 100 mm.

The steering shall operate smoothly in both directions. The operation of the steering, from lock to lock, on plant with full hydraulic steering is to be checked at approximately half the maximum engine speed.

9.3.6 Tyres

Tyres shall be free from deep cuts, bulges, exposed cords, or other signs of carcass failure. Traction tyres shall provide grip. Tyres shall be of the correct type, load rating and size to suit the wheel rims.

9.3.7 Tracks

Tracks and related equipment shall be in good condition and shall provide traction.

9.4 Electrical requirements

Electrical wires in wiring looms shall be protected from mechanical damage by wrapping with tape or enclosing them in conduit, or other covering. Looms shall be supported on the plant at positions no more than 600 mm apart with allowance being made for the relative movement that can occur between the engine/transmission and the body/chassis.

Protection from excessive heat should be provided for all electrical harnesses (and other hose, rubber, and plastic components). All heat and noise insulation material as originally fitted should be retained.

The battery shall be securely fastened to the plant. Battery cables shall be shielded where necessary to prevent damage from road debris and be secured to the body at a maximum spacing of 600 mm. Rubber grommets shall be fitted where cables pass through holes in body panels and chassis sections.

9.5 Miscellaneous requirements

9.5.1 Seat

The operator’s seat shall be in good condition, secure and not affect the operator’s ability to operate the plant.

9.5.2 Articulation joints

Clearance in the articulation joint shall be within the manufacturer’s specifications. There shall also be a means of locking the articulation joint.

9.5.3 Noise level

The noise level at the operator's position shall be determined in accordance with AS/NZS 1269.1. The noise level of the plant shall be limited to 85 decibels.

The determined noise level as well as the controls that ensure people on the site are not exposed to noise levels which exceed a level equivalent to 85 decibels over an eight-hour day, shall be included in the information required by Section 6.8.

9.5.4 Lifting requirements

Plant that can be used as cranes, for example, backhoes, loaders, and excavators, having components used for lifting such as hooks and lugs, that do not have a manufacturer’s ID and SWL, shall have a structural engineer’s certificate for these components.