

IPAC-23 | Requirements for Design Approval Drawings

Audience: PBS Assessors

Effective Date: 5 September 2025

This IPAC provides guidance to PBS Assessors on the requirements for Design Approval drawings. It outlines the essential elements that must be included on the drawing while avoiding unnecessary information. The dimensions on Design Approval drawings must align with the inputs used in PBS assessments.

Scope

This IPAC applies to all design and bridge drawings submitted as part of a DA application. PBS Assessors must comply with this IPAC.

Design Drawing requirements

Drawing orientation

The front of the vehicle must be oriented towards the left of the page as such:



Drawing annotation

The drawings must clearly state if the dimensions shown are in the laden or unladen state. The only exceptions are payload heights and other payload properties, which can only be certified when laden.

- E.g. the deck height shown on the drawing is indicated to be no greater than 1400mm; however, it is unclear whether this measurement applies to the laden or unladen state. The vehicle must not exceed a deck height of 1400 mm under all load scenarios.

The drawings may include provisions to show dimensions for both laden and unladen states.

- E.g. the deck height on the drawing is shown to be no greater than 1400mm when laden. Annotation on the drawing also states that all heights, except for the overall height, may be up to 15mm higher when certified as unladen.

Drawing dimensions

Dimension landings shall be aligned as accurately as possible to the feature/object of measurement.

Where dimension landings do not clearly align with the vehicle feature and/or are not accompanied by annotation for clarification, assessors will be requested to amend the provided drawings.

i.e. Prime mover wheelbase measurements are between the centreline of the steer axle and drive axle group. Dimension landings shall reflect the measurement axes or include additional annotation. See following headings for clarification on placement requirements.

Front Overhang

The Front Overhang (FOH) must be shown for all vehicle units. The dimension must be measured from the centreline of the 1st steer axle to the front end of the vehicle. For trailers and dog trailers, an equivalent swing radius should be nominated from the front articulation point. For payload protrusions, a separate FOH dimension including the payload protrusion must also be shown. If applicable, special profiles and tapers must also be included.

Wheelbase for hauling units

The Wheelbase (WB) must be shown for all hauling units. The WB must be measured from the steer axle to the centre of the drive axle group. For a twin steer hauling unit, the dimension must be measured from the 1st axle of the twin steer axle group to the centre of the drive axle group.

Fifth Wheel Offset

The Fifth Wheel Offset (FWO) must be shown for all units fitted with a fifth wheel. The following FWO convention must be used on all drawings.

- E.g. for a FWO forward of the centre of an axle group must be clearly labelled as a 'lead'. E.g. a FWO that spans 200mm forward should be labelled 'lead 200'
- E.g. for a FWO rearward of the centre of an axle group must be clearly labelled as a 'lag'. E.g. a FWO that spans 100mm rearward should be labelled 'lag 100'
- E.g. for a FWO range forward and rearward of the centre of an axle group must be clearly labelled as both 'lead' and 'lag'. E.g. a FWO that spans 200mm forward and 100mm rearward should be labelled 'lead 200 – lag 100'

S-dimension for trailers

The S-dimension (S-DIM) must be shown for all trailers. The S-DIM must be measured from the king pin to the centre of the trailer axle group. For semitrailers with two axle groups and/or are fitted with steerable axles, the S-DIM convention must follow the example shown within Appendix A.

Note: Where a lead/lag is present for the Fifth Wheel Offset, the preference is to represent the offset upon the 2D profile. This will assist in differentiation between wheelbase measurements and S-DIM measurements.

Rear Overhang

The Rear Overhang (ROH) must be shown for all trailer units. The ROH must be measured from the centre of the axle group to the rear of the vehicle. For payload protrusions, a separate ROH dimension including the payload protrusion must also be shown. If applicable, special profiles and tapers must also be included. For semitrailers with two axle groups, the ROH convention must follow the example shown within Appendix A.

Drawbar Length for dollies

The Drawbar Length (DBL) must be shown for all trailers. The DBL must be measured from the centreline of the towing pivot to the centre of the leading axle group.

Tow Coupling Overhang

The Tow Coupling Overhang (TCOH) must be shown for all units fitted with A-type couplings. The TCOH must be measured from the centre of the axle group to the centreline of the towing pivot. For semitrailers with two axle groups, the TCOH convention must follow the example shown within Appendix A.

Tow Coupling Height

The Tow Coupling Height (TCH) must be shown for all units fitted with A-type couplings. The TCH must be measured from the ground to the centreline of the towing pivot.

Axle Spread for axle groups

The Axle Spread (AS) must be shown for all axle groups. Each AS must be measured from the centre of each axle. If layout space is constrained, consider providing an axle spacing table in lieu of individual dimensions.

Overall Length

The Overall Length (OAL) must be shown for the combination. The OAL must be measured from the front end of the combination to the rear end of the combination. The OAL must include all protrusions, tapers, and profiles.

Overall Height

The Overall Height (OAH) must be shown for the combination. Where required, separate OAHs can be shown for each vehicle unit if different height limits apply. The OAH must be measured from the ground to the highest point of reference.

Payload related dimensions

All payload related dimensions must be shown for all load carrying vehicles. These dimensions are dependent on the vehicle body type. These include but are not limited to:

- Payload heights, measured from the ground
 - o For all heaped loads, the base of the heap must also be shown.
- Body heights, measured from the ground
- Deck heights, measured from the ground
- Floor heights, measured from the ground
- Barrel heights, measured from the ground
- Twist-lock heights, measured from the ground
- For drop-deck/step-deck vehicles
 - o The load-carrying length for each deck must be shown.

For dimensions that allow a weighted-average value, this must also be indicated on the drawing or provided within annotation.

Other features affecting vehicle performance

All other features affecting vehicle performance must be included on the drawing.

These include but are not limited to:

- Position of steerable and lift axles
- Axle group/single axle mass limits
- Axle configurations that deviate from the norm e.g. mix of driven and undriven axles in the drive group, drive steer axles, etc.
- Tyre configurations that deviate from the norm e.g. single tyre arrangement, mixed tyre arrangement, etc.
- Position of any innovative features e.g. i-Corner, self-tracking axles, etc.

Interrelationships of parameters on drawings

Interrelationships that apply to parameters shown on drawings must be clearly shown on the drawings. These interrelationships must also be included in the Part B.

Any interrelationships, regardless of them being on a drawing, must be in the Part B in the 'special requirements' section for certification purposes.

For example, when the front overhang of the prime mover is limited by the wheelbase of the prime mover.

Tolerances

Dimensional tolerances only apply for the purposes of certification, and all dimensions shown on the drawings must align with the PBS assessments and simulations conducted. If a tolerance is applied to a dimension during the PBS assessment stage, it must be reflected in the drawings. For certification purposes, the allowable tolerance is the lesser of 1% or 20mm for a given dimension.

Grandfathering

Previously accepted drawings not conforming to this protocol will continue to be accepted – Assessors are not required to amend existing drawings.

When modifying previously accepted drawings, these drawings are considered new and therefore must conform to this IPAC.

Contact

This IPAC was produced by the PBS Design Team, for queries please email pbsdesigns@nhvr.gov.au.

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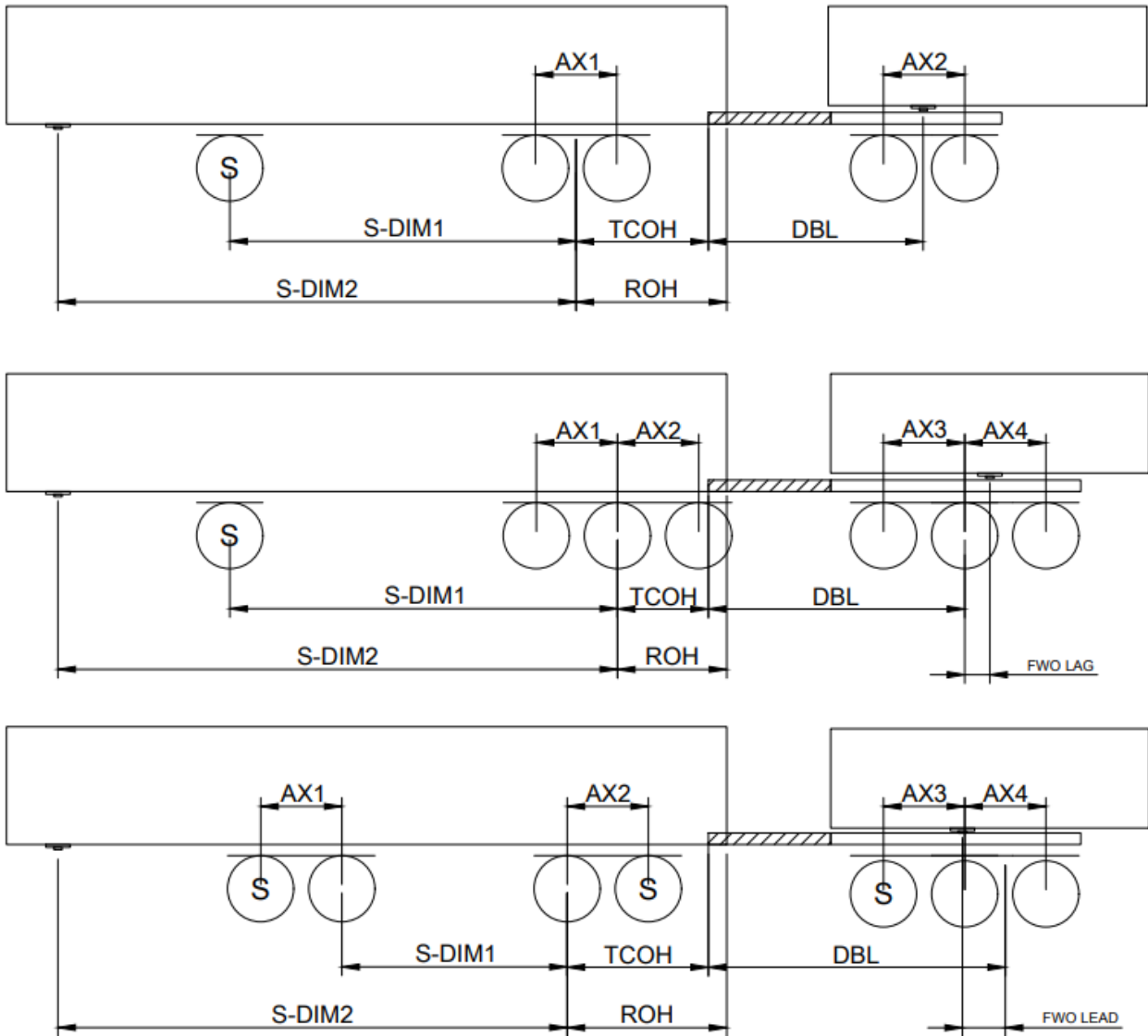
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Appendix A – Drawing Dimensions



Note: Dimension layout is indicative for informative purposes only.