DRAWBAR COUPLINGS
DESIGN AND MAINTENANCE

- Adam Taylor – towing eyes and pintle hooks
- Ian Thompson – automatic pin-type couplings
- Kel Baxter – the operator’s view
- Bob Woodward – the operator’s view
- Panel discussion – Q&A
Adam Taylor

Technical Services Officer

SAF-HOLLAND
# Drawbars and towing eyes

## DRAWDOR - Rigid Mount Bolt-On

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Maximum Vertical Load</th>
<th>Maximum Gross Trailer Weight</th>
<th>Length (mm)</th>
<th>Weight (kg)</th>
<th>D Rating (kN)</th>
<th>CRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB1385</td>
<td>6,804 kg</td>
<td>27,216 kg</td>
<td>173.4</td>
<td>8.6</td>
<td>165</td>
<td>24296</td>
</tr>
</tbody>
</table>

When used with hinged tongue trailers, where the maximum vertical load cannot exceed 227kg (500 lbs.), the maximum gross trailer weight is 40,824 kg (90,000 lbs.).

Not designed to be welded to a trailer tongue.

For off-road applications, reduce the stated capacities by 25% and use with a swivel-mount device.

## DRAWDOR - Sub Assembly (Swivel)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Maximum Vertical Load</th>
<th>Maximum Gross Trailer Weight</th>
<th>Length (mm)</th>
<th>Weight (kg)</th>
<th>D Rating (kN)</th>
<th>CRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB61030S</td>
<td>4,082 kg</td>
<td>20,412 kg</td>
<td>434.9</td>
<td>16.3</td>
<td>150</td>
<td>42325</td>
</tr>
</tbody>
</table>

When used with hinged tongue trailers, where the maximum vertical load cannot exceed 227kg (500 lbs.), the maximum gross trailer weight is 38,556 kg (85,000 lbs.).

## DRAWDOR - Sub Assembly (Fixed)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Maximum Vertical Load</th>
<th>Maximum Gross Trailer Weight</th>
<th>Length (mm)</th>
<th>Weight (kg)</th>
<th>D Rating (kN)</th>
<th>CRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB61030</td>
<td>4,082 kg</td>
<td>20,412 kg</td>
<td>434.9</td>
<td>16.3</td>
<td>150</td>
<td>42325</td>
</tr>
</tbody>
</table>

When used with hinged tongue trailers, where the maximum vertical load cannot exceed 227kg (500 lbs.), the maximum gross trailer weight is 38,556 kg (85,000 lbs.).
Weld-on and swivel drawbar

- **D-Value**: 150 kN
- **Rigid drawbar trailer:**
  - Max vertical load: 4,086 kg
  - Max GTW: 20,412 kg
- **Hinged drawbar trailer:**
  - Max vertical load: 227 kg
  - Max GTW: 38,500 kg
D-values and CRN numbers

- The various ratings that apply to a drawbar all come from ADR 62/02
- The manufacturer is required to obtain a specific approval for tow couplings, which is called a Component Registration Number (CRN).
- If the supplier cannot quote a coupling CRN, avoid it!
Rating of couplings under ADR 62

- D-value is simply a value that denotes dynamic capacity
- It does not refer to the weight that a piece of equipment can withstand
- Australian Standard AS4968.1-2003 outlines the process for calculating the minimum D-value

\[
D = \frac{4.9 \times 46.5 \left(76.5 + 0.08 \times 46.5\right)}{122.5 - 16.5} \approx 172 \text{ kN}
\]
Rating of couplings under ADR 62

• ADR 62/02 also defines ‘S-value’ and ‘V-value’

• Confusingly, these do refer to the actual physical capacity of a coupling:
  – S-value = maximum vertical load for hinged drawbars
  – V-value = maximum vertical load for rigid drawbars

• These are determined by physical testing to the requirements of the ADR
Continuous 10 mm welds, with a total minimum length of 610 mm are required to develop sufficient hitch strength.
Example installation (VSB6)
In-service maintenance

- Regularly inspect the towing eye for wear and damage
- If wear exceeds 1/8” (3.1 mm), replace the drawbar
- Check the mounting nut for proper torque.
- Lubricate the mounting block grease fitting every 50,000 kms or 3 months, whichever comes first.

It is important to always refer to the manufacturer’s specifications for wear limits – the above is specific to this part only!
**Pintle hooks**

**PINTLE HOOK - Rigid Mount, 50mm diametre ball** *(Replaces PH16B)*

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Maximum Vertical Load</th>
<th>Maximum Gross Trailer Weight</th>
<th>Length mm</th>
<th>Weight kg</th>
<th>D Rating kN</th>
<th>CRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH50MMRN41</td>
<td>1,724 kg</td>
<td>8,618 kg</td>
<td>165.1</td>
<td>4.5</td>
<td>20</td>
<td>25767</td>
</tr>
</tbody>
</table>

*Maximum Gross Trailer Weight for the 50 mm Ball is 4,536 kg (10,000 lbs).*

Drawbar Eye Dimensions: 60.4 mm to 76.2 mm I.D. with 31.7 mm to 41.4 mm diameter section.

For off-road applications, reduce the stated capacities by 25% and use with a swivel-mount drawbar.

**PINTLE HOOK - Rigid Mount (With Air Cushioned Snubber)**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Maximum Vertical Load</th>
<th>Maximum Gross Trailer Weight</th>
<th>Length mm</th>
<th>Weight kg</th>
<th>D Rating kN</th>
<th>CRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH300</td>
<td>8,165 kg</td>
<td>32,659 kg</td>
<td>*184.1</td>
<td>19</td>
<td>165</td>
<td>24295</td>
</tr>
<tr>
<td>PH3001</td>
<td>8,165 kg</td>
<td>32,659 kg</td>
<td>184.1</td>
<td>13</td>
<td>165</td>
<td>24295</td>
</tr>
</tbody>
</table>

*Length Dimension is external to mounting structure. The added measurement is 146.3 mm.*

Drawbar Eye Dimensions: 60.4 mm to 76.2 mm I.D. with 31.7 mm to 41.4 mm diameter section.

The complete assembly includes a pintle body, plunger, air chamber, and mounting brackets.

For pintle hooks without an air chamber, bracket, or plunger, order PH3001.

The PH300 can be operated with or without the air chamber.

For off-road applications, reduce the stated capacities by 25% and use with a swivel-mount drawbar.

**PINTLE HOOK - Rigid Mount**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Maximum Vertical Load</th>
<th>Maximum Gross Trailer Weight</th>
<th>Length mm</th>
<th>Weight kg</th>
<th>D Rating kN</th>
<th>CRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHT60AOL8</td>
<td>2,722 kg</td>
<td>13,608 kg</td>
<td>159.7</td>
<td>5</td>
<td>35</td>
<td>26465</td>
</tr>
</tbody>
</table>

Drawbar Eye Dimensions: 50.8 mm to 76.2 mm I.D. with 31.7 mm to 41.4 mm diameter section.

For off-road applications, reduce the stated capacities by 25% and use with a swivel-mount drawbar.
In-service maintenance

- Clean and check for proper operation
- Inspect for worn, damaged or missing parts
- Inspect, in particular, the coupling contact areas. Replace when wear exceeds 3.2 mm from the original surface profile
- Lubricate latch and lock pivots with a light oil lubricant
- Check fasteners for proper torque
Ian Thompson

Engineering Manager,
Trailer equipment

BPW Transpec
Automatic pin type couplings

• Used for:
  – Rigid and Dog trailers
  – A Doubles
  – Road Trains
  – Pocket Doubles
  – Small plant equipment trailers
Automatic pin type couplings

• ADR 62 and AS 2213 sets out coupling requirements including D-value calculations
• Check with your coupling supplier or engineering consultant for specific requirements
• Generally couplings that are used for typical metropolitan dog trailers are often the same as those used for Road Train Application
Examples of worn parts
Ringfeder - wear limits

<table>
<thead>
<tr>
<th>Wear limits</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A outer diameter</td>
<td>min</td>
<td>51.0 mm</td>
</tr>
<tr>
<td>B inner diameter</td>
<td>max</td>
<td>54.0 mm</td>
</tr>
<tr>
<td>C inner diameter</td>
<td>max</td>
<td>36.5 mm</td>
</tr>
<tr>
<td>D outer diameter</td>
<td>min</td>
<td>33.5 mm</td>
</tr>
<tr>
<td>E outer diameter</td>
<td>min</td>
<td>46.5 mm</td>
</tr>
</tbody>
</table>

Vertical play
in the coupling pin max 5.0 mm
Pin coupling - wear limits

**Wear limits**
- **A** Coupling pin: min 46.5 mm, max 51.5 mm
- **B** Drawbar eye: min 46.5 mm, max 51.5 mm
- Vertical play in the coupling pin: max 5.0 mm
CLEARANCE AXIALLY OF COUPLING PIN, MAX. 4mm

CLEARANCE BETWEEN DRAWBAR BEARING BUSHES IN THE DRAWBAR GUIDE, MAX. 1mm

1. WEAR LIMIT OF COUPLING BOLT ø46.5mm MINIMUM.
2. WITH PIN LOCKED IN ENGAGED POSITION, MAXIMUM PLAY 5mm.
3. MAXIMUM DIAMETER OF GUIDE BUSH ø36.5mm. MAXIMUM CLEARANCE 2.5mm
4. MAXIMUM CLEARANCE 1mm.
5. MAXIMUM WEAR ON DRAWBAR PLATE 4mm.
6. WHEN ATTEMPTING TO MOVE COUPLING FORE AND AFT BY HAND NO PLAY ALLOWED.

CHECK FOR WEAR
The thickness of the drawbar eye must not be less than A mm. Exchange drawbar eye if maximum wear is exceeded. The inside diameter of the bush may be B mm maximum. Replace bush if this wear is exceeded.

Drawbar eyes which have been bent or which show cracks or any deflection should be replaced immediately.

| Ø40 | 28.0 | 41.5 |
| Ø50 | 42.5 | 51.5 |

REFER ALSO DOC AU5202_14066634
Tow coupling - lubrication points

**Lubrication**

Lubricate the coupling regularly with thin oil. For the maximum effect, the coupling must be open when it is being lubricated.

- Lubrication points (see drawing on the left)
Section 3
Couplings

Objective:
To ensure that all tow couplings and associated components are in a serviceable condition and that they provide the necessary load carrying capacity.

Australian Design Rules that are relevant to this section:
ADR 62 Mechanical connections between vehicles
ADR 63 Trailers designed for use in road trains

3.1 Check fifth wheels and turntables

In this section, the term ‘fifth wheel’ refers to the upper surface of the coupling that directly articulates with the slippage plate of a semitrailer. A ‘turntable’ is the rotating part of the coupling mount that allows the fifth wheel to rotate, for example a ballrace.

Reasons for rejection

a) Where ADR 62 applies, the fifth wheel does not display the manufacturer’s name/trademark, nominal size (e.g. 50mm) and the ‘D-value’ rating

b) The top and bottom mounting flanges have insufficient or ineffective fasteners

c) Fasteners either side of the mounting frame, plate or pivot bracket are insufficient or ineffective

d) Fifth wheel or turntable mounting plate or sub-frame assembly securing bolts are not ISO Class 8.8 (SAE Grade 5) or stronger

e) Fifth wheel or turntable mounting is not done in accordance with manufacturers’ specifications, Australian Standards or VSSG Section P2

f) There is movement between the fixed mounting components

g) There is more than 5mm horizontal movement between:
   • the pivot bracket pin and bracket, or
   • a slider bracket and slide base.

Note: This section should be read in conjunction with ADR 62, relevant Australian Standards and manufacturers’ specifications for minimum requirements.

Installation of an aftermarket coupling is a modification. Please refer to Appendix B – Vehicle Modifications.
3.2 Check pin couplings and pintle hooks

Reasons for rejection

a) Where ADR 62 applies, a 50mm pin type coupling does not display the manufacturer’s name/trademark, rated vertical load and the 'D-value rating'.

b) The tow ball or hook assembly (127mm or hook type) is not legibly and indelibly marked with the manufacturer’s name or trademark and the rated ‘D-value’.

c) Deformed or cracked fasteners including welds.

d) Any mounting bolts, fasteners or weld beads have advanced corrosion.

e) The area that the pin coupling or pintle hook is mounted on is loose or cracked or any locking mechanism is not fitted or is inoperative.

f) The pin coupling or pintle hook welds have cracks.

g) Pin couplings or pintle hooks are worn beyond the manufacturer’s limits. If the manufacturer’s limits are not known, any dimension on a wear surface of the horn of a pintle hook or pin coupling is worn more than 5% of the original diameter (see Figure 3.3).

Figure 3.1 Fixed base fifth wheel assembly

Figure 3.3 Typical tow devices

Drawbar Eye

Pintle Hook

Towing Eye

* Typical wear surfaces
h) Any wear on the diameters of each of the coupling pin and the drawbar eye bush greater than 1.5mm.

Note: Wear should be checked by direct measurement, or by the use of a gauge. Allowable dimensions for worn components are as per manufacturers’ specifications. If manufacturers’ specifications are not available, allowable dimensions are given in Table 3.1.

Table 3.1 Allowable dimensions in millimetres for worn components

<table>
<thead>
<tr>
<th>Component</th>
<th>Standard dimension</th>
<th>Allowable wear limit*</th>
<th>Gauge Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupling pin</td>
<td>48.7 CD</td>
<td>47.2 min</td>
<td>47.1</td>
</tr>
<tr>
<td>Drawbar eye</td>
<td>0.0.0 L</td>
<td>1.5 mm</td>
<td>1.6</td>
</tr>
</tbody>
</table>

* when the wear of components is checked by direct measurement, it should be noted that an elliptical wear pattern is generated on the bore of the drawbar eye bush, and on the outside of the pin.

Figure 3.4 Measurement of coupling pin and drawbar eye bush wear

3.3 Check towbar

Reasons for rejection

a) The towbar is not securely mounted or is bent or cracked
b) Any mounting bolts, fasteners or weld beads have advanced corrosion or cracks
c) Where ADR 02 applies, the towbar and towing ring does not display the manufacturer’s name/trade mark, the rating and the make and model of the vehicle to which it is designed
d) Where any part of the towbar is removable (the bolts, studs, nuts etc.), fastening those parts do not have a locking device such as a U-dip, split pin, spring washer or nylon lock nut
e) Towbar assembly (except for vehicles designed for use in road trains) is not fitted with two safety chain attachments mounted one on each side of and adjacent to, the tow coupling
f) Safety chain attachments are not affixed to part of the tow assembly that is permanently attached to the vehicle.

Note: Always check the underside of drawbar and drawbar eye for excessive wear and cracks.

3.4 Check towing attachments

Reasons for rejection

a) Any towing attachment (such as a tow-ball or pintle hook), any mounting bolts, fasteners or weld beads are loose, cracked, broken or extensively corroded
b) Safety chains or cables (if required) are able to be connected or affixed in such a way that the safety chains or cables are liable to accidentally disconnect
c) Safety chain or cable retaining brackets are cracked, deformed or insecure
d) Safety chain or cable retaining brackets do not meet required standards
e) The tow coupling capacity does not equal or exceed the aggregate trailer mass (ATM) of any trailer being towed (if applicable).

Note: For further information on safety chains, refer to Additional information – Safety Chains.
Ringfeder Type 480 drawbar eye

Zugöse mit Typenschild nach oben montieren.
Fit drawbar eye with nameplate facing upward.

Tighten the 4 bolts in 2 stages: 75Nm then 180Nm
Safety chains
NHVIM – safety chains

- Manual gives the checks and sizing requirements for chains.
- Some vehicles require them as part of the regulations others don't.
- If they are fitted they must comply!!

Additional Information – Safety Chains

Safety chains for:
- Trailers in excess of 3.5 tonnes ATM
- Trailers in excess of 2.5 tonnes GTM
with fixed or rigid drawbars and automatic pin type couplings.

All fixed or rigid drawbar pig trailers (other than a converter dolly) and any other trailers without breakaway brakes, require safety chains to be fitted.

It is strongly recommended that all other trailers be fitted with safety chains, especially vehicles used in severe conditions, e.g. quarry vehicles which are jackknifed regularly for unloading.

Safety chains complement the safety features of the trailer’s breakaway braking system, allowing the driver to maintain control of the truck and trailer combination following a coupling failure or disconnection.

Safety chains **MUST** be supplied and fitted to comply with the following requirements:

**Type of chain**

Safety chains fitted to a trailer with an ATM over 3.5 tonnes, must be manufactured from alloy steel with a minimum breaking stress of 800MPa to conform with the mechanical properties of Grade T Chain as specified in Australian Standard AS 2921 Short-link chain for lifting purposes.

**Required number and size of chains**

Two separate chains must be used.

The minimum breaking strength or size of each chain used on the trailer must meet or exceed the values listed for the maximum gross trailer mass or aggregate trailer mass as indicated in Table 3.2.

### Table 3.2 Safety chain size selection

<table>
<thead>
<tr>
<th>Gross trailer mass (tonnes)</th>
<th>Chain size (millimetres)</th>
<th>Minimum chain breaking load (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5–4.27</td>
<td>7.1</td>
<td>6.4</td>
</tr>
<tr>
<td>4.27–7.5</td>
<td>9.5</td>
<td>11.6</td>
</tr>
<tr>
<td>7.5–13.5</td>
<td>12.7</td>
<td>20.4</td>
</tr>
<tr>
<td>13.5–21.5</td>
<td>15.9</td>
<td>32.0</td>
</tr>
<tr>
<td>21.5–30.0</td>
<td>19.0</td>
<td>46.4</td>
</tr>
<tr>
<td>&gt;30.0</td>
<td>22.0</td>
<td>63.2</td>
</tr>
</tbody>
</table>

**Table 3.2**

<table>
<thead>
<tr>
<th>Gross trailer mass (tonnes)</th>
<th>Chain size (millimetres)</th>
<th>Minimum chain breaking load (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate trailer mass (tonnes)</td>
<td>Chain size (millimetres)</td>
<td>Minimum chain breaking load (tonnes)</td>
</tr>
<tr>
<td>Over 3.5 and up to 4.3</td>
<td>7.1</td>
<td>6.4</td>
</tr>
<tr>
<td>Over 4.3 and up to 7.5</td>
<td>9.5</td>
<td>11.6</td>
</tr>
<tr>
<td>Over 7.5 and up to 13.5</td>
<td>12.7</td>
<td>20.4</td>
</tr>
<tr>
<td>Over 13.5 and up to 21.5</td>
<td>15.9</td>
<td>32.0</td>
</tr>
<tr>
<td>Over 21.5 and up to 30.0</td>
<td>19.0</td>
<td>46.4</td>
</tr>
<tr>
<td>Over 30.0</td>
<td>22.0</td>
<td>63.2</td>
</tr>
</tbody>
</table>

**Table 3.2**

<table>
<thead>
<tr>
<th>Aggregate trailer mass (tonnes)</th>
<th>Chain size (millimetres)</th>
<th>Minimum chain breaking load (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 3.5 and up to 5.0</td>
<td>6</td>
<td>5.1</td>
</tr>
<tr>
<td>Over 5.0 and up</td>
<td>8</td>
<td>8.2</td>
</tr>
</tbody>
</table>
ATA – safety alert

The ATA put out a Safety Alert in December 2016. It outlines key points regarding Safety Chains when fitted.
5.3. Regulation of use and maintenance

5.3.1. Use of safety chains

Recent trailer separation incidents that had serious implications have involved rigid body trucks towing trailers with drawbars, such as pig and dog trailers, and where safety chains were not being used.

Under current regulations, safety chain attachment points must be fitted to every towbar that is fitted to a heavy vehicle, excluding vehicles designed for use in Road Trains. Additionally, safety chains must also be affixed to the drawbar of all rigid drawbar trailers (excluding converter colliers) and any other trailer that is not fitted with an emergency brake system. Despite these mandatory fitting requirements on individual vehicles, there are no in-service regulations that mandate that safety chains, when fitted, are used.

The intent of requiring safety chains to be fitted and used, is to provide a secondary method of attachment between a trailer and the towing vehicle that prevents separation of the trailer in the event the primary coupling fails. Historically, concerns have been raised over whether a combination would become unsafe to operate should the primary coupling fail and safety chains kept the trailer in tow.

Recently, research has been undertaken to investigate the performance of a combination in the event of a primary coupling failure. This research, which used a rigid body truck with an automatic pin coupling connected to a dog trailer with a hinged drawbar, demonstrated that a combination can be safely controlled and stopped in the event of a coupling failure when safety chains are used.

Because of the combination used in this research, the findings may not be able to be extended to other combinations that use different component vehicles and coupling types. If correctly configured, the coupling in the tested combination would not be subject to significant vertical loads as the dog trailer would support its own weight and the hinged drawbar should impose minimal vertical load on the connection.

The majority of SWG members considered that it was not likely that a regulatory case for mandating the use of safety chains could be established, instead they were of the opinion that their use should remain voluntary. The majority of members also sighted harmonisation

- Not mandated on all vehicles.
- No in service mandate that they be used?
- Attachment points must be fitted to all towbars except...
- Not required for Road Trains.
- An A-Double is a Road Train.
- Not required in Europe.
Safety chains ???

- From the SIWG recommendation was for further investigation by NHVR including CBA and RIA.

- Consider all risks!
Kel Baxter
Kelvin Baxter Transport

Bob Woodward
Ron Finemore Transport
Design

The design must consider in-service issues and must be suitable for maintenance:

- **Drawbar styles** – hinged and rigid
  - Hinged drawbar with ball-race (a ball-race stabilises the interaction between the dolly and the trailer chassis)
  - Hinge drawbar – blocked fifth wheel
  - Rigid drawbar
  - Drawbar – horizontal, longitudinal, and vertical forces (ADR 62)
Longitudinal Tension and Compression

- For trailers up to 23.5 tonnes ‘ATM’ other than ‘Converter Dollies’, (N) $1.5 \times 9.81 \times \text{‘ATM’} \text{ (kg)}$

- For trailers over 23.5 tonnes ‘ATM’ and all ‘Converter Dollies’, the lesser of 350 kN or $2.25 \times \text{‘Coupling’ ‘D-value’} \text{ (kN)}$ for the ‘Coupling’ ‘D-value’ at which the ‘Drawbar’ is rated
For trailers over 4.5 tonnes ‘ATM’ without dolly locking devices, 120 kN. Alternatively, the following may be used:

- ‘Single Axle’ trailer or a ‘Dog Trailer’ with a ‘Single Axle’ front “Axle Group’, (N) 11 x M/(D\text{L})
- ‘Tandem Axle Group’ trailer or a ‘Dog Trailer’ with a ‘Tandem Axle Group’ front “Axle Group’, (N) 18 x M/(D\text{L}-1)
- ‘Triaxle Group’ trailer or a ‘Dog Trailer’ with a ‘Triaxle Group’ front “Axle Group’, (N) 24 x M/(D\text{L}-1.6)…..

where: M is the ‘GGALR’ (kg) for the front ‘Axle Group’ of ‘Dog Trailers’ or the ‘GTM’ (kg) for other trailers. D\text{L} is the ‘Drawbar Length’ (m)

- For trailers over 4.5 tonnes ‘ATM’ with dolly locking devices, (N) 0.5 x 9.81 x ‘ATM’ (kg)
Vertical Tension and Compression

For trailers over 4.5 tonnes ‘ATM’, 120 kN. Alternatively, the following may be used:

- Rigid ‘Drawbar’ trailers, (kN) $2.25 \times \text{‘V-value’ (kN)}$, where the ‘V-value’ is as calculated in AS 2213.1:2001 using the equations in clause 7 of the standard with ‘a’ = 2.4

- Hinged ‘Drawbar’ trailers, +/- 10 kN
• Consider efficient use of materials in drawbar design

• Typically automatic pin type couplings
  • Alternatives

• Must meet tow coupling (kingpin) manufacturer’s installation specifications

The DESIGN MUST consider access for maintenance, inspection
• Tow coupling types - Static vertical load; and, dynamic vertical load (e.g. ADR 62)
• Backing plates for mounting safety chains
• Impact of Dolly Locks – seldom seen in road train equipment; but frequent in truck and dog applications
• Drawbar configuration for special applications tippers, car carriers

• Rigid drawbars in dog trailers can be an issue when left parked and the suspension goes flat
• In road train tandems demonstrated ▲ 20% better tyre life
Tow eye sleeve

relatively cheap and easy to replace: better than rebuilding the pin coupling. Silica dust just grinds these away!

- Towing eyes DO GET BENT in operations
- Bent towing eyes – need to be replaced (as a priority)
- Welded type can be a big job
- Bolt-in should be simple – but can be a huge task
- Flanged are simple to change but bolts need to be prepped and torqued (exactly to manufacturers specifications)
- Collar type (my favourite) higher up front cost – but simple!

PANEL DISCUSSION

- Adam Taylor – towing eyes and pintle hooks
- Ian Thompson – automatic pin-type couplings
- Kel Baxter – the operator’s view
- Bob Woodward – the operator’s view