

APPENDIX A

RESULTS OF FIFTH WHEEL AND KINGPIN SURVEY

ANALYSIS OF FIFTH WHEEL AND KINGPIN DIMENSIONAL DATA

The data from the dimensional survey were analysed to determine: (i) the extent of compliance with the requirements of AS 1773 & 2175, (ii) the extent of dimensional mismatch between fifth wheel jaws and kingpins without the liner present and (iii) the extent of mismatch with a liner added. The data were also used to estimate the likely effect of controlling the critical dimensions of fifth wheels to which liners are fitted.

The analysis was carried out by setting up an Excel spreadsheet which could “simulate” the coupling of each fifth wheel in the survey sample to each kingpin in the sample. This resulted in $30 \times 26 = 780$ combinations. In the two cases where a plastic liner was fitted to the skid plate, an appropriate adjustment was made to the kingpin measurements.

Compliance with Australian Standards 1773 & 2175

The results show that the fifth wheel jaws relatively close to the top of the coupler plate, as compared to the requirements of AS 1773 :

- In 8/30 cases (27%), dimension JA (Fig 1) was less than AS minimum of 38.5 mm
- In 1/30 cases (3%), dimension JB was greater than the AS maximum of 66.5 mm

For kingpins, the results show that fitting to the skid plate tends to lead to greater kingpin protrusion than is allowed in AS 2175:

- In 17/26 cases (65%), dimension A (Fig 2) was greater than the AS maximum of 35 mm
- In 3/ 26 cases (12%), dimension H (Fig 2) was less than the AS minimum of 70 mm.

Mismatches without liner

Interference between the bottom of the fifth wheel jaws and the lower section of the kingpin would occur in 7/780 cases (1%).

Interference between the top of the fifth wheel jaws and the upper section of the kingpin would occur 176/780 cases (23%).

The total mismatch rate without a liner is 24%.

Mismatches with Liner

When allowance was made for a 6mm liner interposed between the top of the fifth wheel and the skid plate, it was found that:

- Interference between the bottom of the fifth wheel jaws and the lower section of the kingpin would occur in 85/780 cases (11%).
- If fifth wheels not complying with the lower jaw dimensions of AS 1773 are excluded from consideration, the mismatch rate becomes 61/754 (8%).
- If fifth wheels not complying with the lower jaw dimensions of AS 1773 and kingpins not complying with the lower section dimensions of AS 2175 are excluded from consideration, the mismatch rate becomes 24/667 (3.6%)
- Interference between the top of the fifth wheel jaws and the upper section of the kingpin would occur in 10/780 cases (1%).

The total mismatch rate with a liner is 12%. If liners are fitted only to fifth wheels complying with AS1773, the total mismatch rate with a liner becomes 9%.

Effect of Selective Fitting of Liners

Fitting liners only to fifth wheels with a JB (Fig 1) dimension of 66.5mm or less (the AS 1773 requirement) leads to a lower jaw mismatch of 8% and a total mismatch rate of 9%.

Fitting liners only to fifth wheels with a JB dimension of 64mm or less would lead to a lower jaw mismatch rate of 3% and a total mismatch rate of 45.