



On-board Weighscales for Heavy Vehicles



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Air-Weigh

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Compliance – CML, HML, CoR

- NTC Mass Limits

Mass limits, under different schemes				
	General Mass Limits (GML - default requirement)	Concessional mass limits (CML)	Higher mass limits (HML)	6.5 tonne steer axle concession
Axle type				
Steer axle	6.0	n/a	n/a	6.5
Tandem axle group (dual tyres)	16.5	17.0	17.0	n/a
Tri-axle group (dual tyres)	20.0	21.0	22.5	n/a
Gross combination mass limit				
Semi-trailer (6 axle)	42.5	43.5	45.5	n/a
B-double (9 axle)	62.5	64.5	68.0	n/a

<http://www.ntc.gov.au/filemedia/bulletins/HeavyVehicleAccessSchemesandArra.pdf>

Compliance – Adjusted Error

Measurement Adjustments (MA) for each weighing step (all masses are in tonnes)

Axle Group	Measurement Adjustment (MA)		
	Category 1 weighing	Category 2 weighing	Category 3 weighing
Single axle with single tyres	0.3	0.3	0.4
Tandem axle with single tyres (or combination of single and dual tyres)	0.3	0.4	0.5
Single axle with dual tyres	0.4	0.4	0.5
Tandem axle with dual tyres	0.5	0.5	1.0
Triaxle	0.5	0.5	1.0
Gross mass	0.25 per weighing step	0.5 per weighing step	1.0 per weighing step

<http://www.vicroads.vic.gov.au/NR/rdonlyres/CA39B121-6534-4BA8-8E18-E1EAB1D55D57/0/VRPIN01827.pdf>

Accuracy – Air Gauge

Price range \$50-\$500

- Typical gauge resolves 2-3 PSI, equivalent to 700kg's per axle group.
- No temperature or humidity compensation
- The needle width on a typical air gauge is up to “200 kg's wide”
- Parallax error – non digital
- Cannot be calibrated. Some gauges can be adjusted to a singular setpoint. All other weights will be increasingly inaccurate.



Accuracy – Scale

Price range \$1,200 - \$5,000+

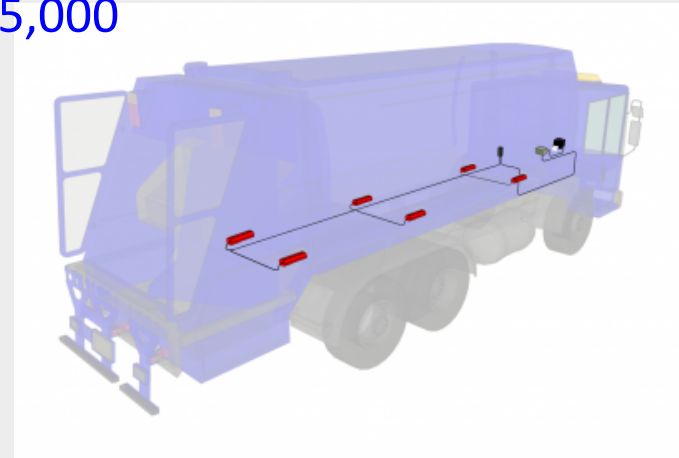
- Measures suspension pressure down to 1/27th of 1 PSI with digital electronic precision $\approx 20\text{kg}$
- Accurate to +/- 100kg per axle group
- Full digital compensation for temperature, humidity, altitude, barometric pressure
- True dual-point digital calibration using a certified in ground scale
- Needs level ground with brakes off



Accuracy – Load Cell

Price Range \$15,000 - \$45,000

- To +/- 10kg for the whole load
- Can compensate for road surface angles and uneven ground
- Potential “Legal for Trade”



Productivity - example

- In a bulk carrier application lost revenue can be \$60/kg* for life of truck (5-7years)
- If you can improve accuracy from average of 700kg under to 200kg under, that is an improvement of 500kg
- Over the life of truck this equals $500\text{kg} \times \$60/\text{kg} = \$30,000$ NET PROFIT (at margin- cost already considered)
- Do your own figures

*Source: Industry Average 2013



Productivity – IAPm What is it?

- Scale communicates weight to on-board CPU
- CPU combines GPS position with weight and other data and sends to telematics provider
- Telematics provider sends report to customer and official Govt. body (TCA)



Productivity - IAPm

- Increase payload up by 12% (HML) - increased revenue
- Access for vehicles with multiple trailers
- Access to routes previously disallowed
- All of the above combined can increase productivity by 50%
- One Example – 14000loads /month went to 12500loads /month requiring 3 less trucks – saving \$\$\$\$
- Requires accredited scale



<http://www.tca.gov.au/certified-services/iap/iap-whats-in-it-for-me>

Troubleshooting

Cause	Effect
Worn Height Control Valve or air leak	causes weight to move up and down periodically as much as 200kg+
Slow Height Control Valve	reading taken before full height is achieved giving false weights
Worn bushes or suspension	similar effect as worn valve
Trailer connections	In-cab gauge can not see trailer signal due to surface corrosion or worn plug
Loose electrical connections	Gauge shows 0 for a given weight

Troubleshooting

Cause	Effect
Low Voltage and Voltage drop between trailers	Trailer scales may turn on but turn off immediately showing no weight value
Alternator Noise	Scales show value when engine is off, but show only part or no values when engine is running
Uneven ground	Depends on severity of unevenness. Road camber can have a 100kg effect.
Foot on Brake	Artificially increases pressure in system showing false "high" reading on scale up to 500kg+

Maintenance

- Maintain suspension
- Check your electrical terminals, use water proof connectors
- Use electrical grease as much as possible
- Calibrate every 6 months





Thankyou

