well designed and built, however, they are not great at reducing and flipping voltages over distance. Additionally, the gauge of 24 volt wiring is smaller, so integrating a voltage reducer into a 24 volt harness can lead to voltage issues by default.

In summary, if a truck fleet is 24 volt then it is most definitely best served by 24 volt trailer EBS. This will ensure reliability and reduced purchase cost. If a fleet uses 12 volt based vehicles, 12 volt hybrid brake systems will probably be best, remembering that 12 volt computers are not full EBS devices. Avoid data interfaces with voltages that step down or up.

SENSORS

The next decision to make is how many wheel speed sensors are needed. Semi-trailers performing predominantly highway work need only one axle sensed. However, the same configuration operating in difficult environs should have two axles sensed. If a trailer is air suspended, the rearmost wheels should be sensed as they are most likely to lock first. Conversely if a trailer is mechanically suspended, then sense the forward axle.

Reducing the amount of sensors on a trailer reduces initial acquisition and ongoing maintenance costs while still offering acceptable performance. Conversing with drivers or maintenance staff to find out which axle locks up most readily is an effective way to determine which axle is best to sense.

AIR RESERVOIRS

While generic air tanks commonly used on trailers with conventional braking systems were designed to support the dead weight of the various brake valves hanging off them, EBS hardware is designed for remote mounting. Therefore, there is no point jamming the reservoirs and hardware into a confined space. Remote mounted reservoirs are a little more expensive and slightly more complicated to install, but provide far superior accessibility for maintenance and repairs down the track.

Reservoirs made from alternative materials such as aluminium or composites offer better air retention properties along with substantial weight savings. Metric thread forms and enhanced sealing technologies allow for reduced running costs in the long term, as they do not rely on thread tapes or liquid sealants to stop air leaks.

TUBING

A system comprising metric tubing to interlink reservoirs, as opposed to imperial tube and rubber hose, is usually less prone to leakage due to the superior quality of the fittings and smoother outer circumference of the tube. It is best to avoid using rubber hose except for chassis to axle connections.

DATA DISPLAY

A data display panel is another item well worth considering. Mounted on the truck's dash, the panel provides data on the EBS system and its related components, along with user data such as load weights including split weights on dog trailers. Additionally, if the trailer is fitted with electronic suspension control, the panel enables the operation of lift axles as well as tipper hoist raising and lowering. Data displays can be also used to identify faults by numeric code reference.

ELECTRONICALLY CONTROLLED AIR SUSPENSION

A valuable upgrade to TEBS braking is electronic suspension control (ECAS) where the suspension is managed by the EBS computer using data provided by an electronic level device regulated by software programmed at the point of trailer manufacture.

While it may seem overkill to incorporate electronics into the suspension system, ECAS does much more than simply maintain a preset ride height. The system improves trailer stability by intelligently responding to load and ride height changes ensuring that suspension hardware remains at the desired level at all times. This includes sealing air inside the air springs during situations where weight transfer could cause instability. The electronics also prohibit over-stroking of the shock absorbers and axles reaching travel limit straps during normal raising and lowering of a tip-over-axle semi.

ECAS systems are also able to control single or multiple lift axles, by presetting the software to the desired load as well as road speed and axle parking modes. Using axle lift through the EBS reduces both the complicated nature of regular pneumatics as well as the risk of operator override in the wrong situation. The EBS computer also offsets the load-sensed brake pressures when the axle or axles are lifted and also prevents the axle from being lowered when in motion.

POST DELIVERY SUPPORT

Prior to a new trailer entering service it is highly recommended that the software is calibrated. Unfortunately, factory estimated software settings are more often a hindrance than a help and can result in less than optimum brake performance. Taking the time to get the calibration right will result in the EBS delivering performance exceeding most expectations.

This is best achieved by obtaining a weighbridge ticket for the trailer in both laden and unladen conditions, noting the air suspension pressures, and programming the weights and exact pressures into the EBS software.

Another important element to load into the software is the pressure modulation envelope. This is particularly important for applications where the towing vehicle has no load sensing and if not carried out could lead to severe brake imbalance between prime mover and trailer.

SERVICING

The only service procedures that need to be undertaken for EBS-equipped trailers relate to cleaning and repositioning of sensors at each brake or bearing service. This requires a technician to remove the sensors, wipe them clean, lubricate with grease and reinstall. A quick clean of the exciter (pole) rings with a wire brush is also recommended. Occasional checks of the power contacts in the coupling plugs, including spraying with chemical contact cleaners, is also advisable.

CONCLUSION

The operation of most trailers is enhanced by the integration of EBS. A well specified system is cost effective, reliable, and will provide managed braking and reporting if desired, as well as increased road safety, compliance to OH&S, and reduced costs of trailer wear and tear over the life of the trailer.

Have no doubt though, trailer EBS – TEBS – is here to stay, and will be incorporated in the next few years into Australian Design Rules as mandatory equipment. Fleet operators would be wise to now start investigating options as to which level of system and combination would best suit their fleet; smart decisions today will ensure your fleet is ahead and ready when mandate comes into effect.

Doing the research in advance by talking directly to the brake vendors will enable informed decisions to be made, allowing the system of choice to be specified in the trailer build, thereby optimising the significant benefits the technology offers and enhancing commercial returns in the future.

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