Power to the people

Vans used in a range of industries are increasingly being transformed into mobile workshops with their very own power supplies, reports Chris Tindall

Convenience is key, and with the added pressure of constantly seeking out efficiencies, companies are increasingly choosing to convert their van fleets into mobile workshops. And it's not just about ensuring you have some solid racking and a full set of spanners; transport engineers are discovering the huge advantages of having on-board systems that rely on the engine as a power source for a host of applications. The range of industries relying on these systems is diverse: from mobile tyre repair to utility companies, fire service vehicles to ice cream vans.

"Customers are increasingly wanting a convenience service, such as replacing tyres on your car. We would all rather get this done while at work or at the gym! Gone are the days of sitting in a dirty tyre shop on a Saturday morning," states Leigh Sutton, director of On-Board Power (OBP), which provides and installs an array of power take-off (PTO) systems conveniently mounted under the vehicle to drive auxiliary equipment on vans.

He adds: "I think the rise in mobile service and maintenance vehicles has increased due to long lead times at dealerships. It seems virtually impossible to arrange a service or repair within a two-week period at a main agent, and then who knows how long it will be off the road. A mobile service will get the customer back up and running there and then with little downtime."

Winton Engineering supplies equipment that delivers compressed air, electric and hydraulic power, as well as pressurised water.

It says larger fleet operators are increasingly developing their own mobile tyre repair vans as a resource to handle daily wear and tear of commercial vehicles. Paul Smith, Winton commercial manager, says: "A technician can carry a separate compressor in the back of their van – but this takes up valuable space, and can be hazardous if it's not properly secured. They will also need to ensure a fuel or power source is available wherever the vehicle is located, which can be difficult if it's on the side of a road."

OBP's layshaft compressor system is driven from the vehicle's additional PTO point, rather than through the transmission prop shaft. By contrast, its driveline compressor can be fitted to rear-wheel drive vehicles, and power is delivered through the van's prop shaft. It is used to provide compressed air and electrical generator systems. Its most recent addition to the range is an aluminium screw compressor installed directly onto the vehicle engine. This drives power either through the vehicle auxiliary belt or through an additional drive belt through a high torque electromagnetic clutch.

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Leigh Sutton

Explains Sutton: "Engine mounted compressors can only produce [an air delivery output] from 40-60cfm due to restrictions from the drive through the crankshaft on the engine. Layshaft systems can be used for 40-80cfm, due to torque restrictions through the vehicle gearbox. Drivelines power the most, as this transmission is used to propel the vehicle."

Sutton argues that PTO systems have advantages over towable or 'donkey' engine-driven units, because there's more space in the load area, they make less noise, they weigh less and there's no need for additional fuel containers. As the entire system is installed under the vehicle (pictured, below right), the only limitation is the ground clearance. Weight varies from between 79kg-160kg, which should be compared to towing or carrying a compressor or generator.

These systems obviously take their toll on fuel, but Sutton says OBP can keep this to a minimum by installing fuel-saving technology, which reduces vehicle revs when the system is not in use. Installation times can be anything from one to three weeks.

CASE STUDY

One company that has benefited from on-vehicle power is South Wales's Carmarthenshire Tyre Services. Managing director Delme Owens says that he was hoping to avoid using diesel-powered compressors, as they are noisy and heavy. In the end, the company opted for Winton's on-vehicle power system, which includes a compressor and generator. It provides air to 175psi (12bar) pressure, said to be sufficient to remove, refit and inflate HGV tyres. Another benefit of the constant air supply is that it removes the need for additional air tanks that would require statutory testing.

Owens says: "We supply and fit tyres for everything from a wheelbarrow to a crane, so we need a system that is flexible enough to cope with a variety of jobs. Air delivery is clean and instant all the time."

Generators can also power on-board electrical equipment. Broadcast Networks installed a Fischer Panda PVMV-N silenced variable-speed genset with external radiator, Mastervolt battery management system and Dometic DuraSea 3.5kW air conditioner in a van conversion for two University of Southampton command and control vehicles for its Autonomous Systems Research Group.

Also supplying a range of inverters for vans is mobile test equipment installer Würth. Their capacity ranges from 300-600W for basic charging, to 2,000-4,000W for running power tools. The company also supplies compressors to work alongside its range of power tools.

A Würth spokesperson says: "All vehicle electrics must be fitted by automotive electrical specialists to make sure the correct components and systems are in place to power the van effectively and safely. When using an inverter in a van to power anything, we would always recommend using a split charger with a slave battery, so the customer does not drain the power on the main vehicle battery." TE

EYES ON THE ROAD

Cartwright Conversions recently helped Vision Express go mobile by creating a 'vision van'. The space inside has been transformed by Cartwright Conversions into a mobile eye testing facility designed to reflect the high street optician's layout and design.

The unit is divided into five areas, with a reception and five examination rooms; it has running water and heating. The single-axis semi-trailer uses a false ceiling to conceal electrical equipment which, linked to an on-board generator, powers the lighting, a temperature control unit and a satellite for internet access.

Steve Shaw, Cartwright Conversions' operations director, points out that the mobile facility was the result of a combined effort from two parts of the business: trailers and conversions.