
# FIRESTOPPER

**Fire appliances have very specific requirements, and much has to be taken into consideration by chassis manufacturers, bodybuilders and fleet managers to ensure the end vehicle meets demand, writes Dan Parton**

Lincolnshire Fire & Rescue Service (FRS) hailed the first of 33 new fire appliances delivered in 2019 (pictured above) as a major investment to provide a better service to people in the county. It also signalled a move to the Scania CrewCab chassis (CP31, to be precise; the largest model). The 33 identically specced fire appliances will be rolled out to stations across Lincolnshire over the next three years. They are all 316bhp, 18 tonnes gvw Scania P 320 4x2 chassis.

Meanwhile, the pumping appliance superstructure installed on the chassis was designed and manufactured by Yorkshire-based bodybuilder Angloco. It includes an 1,800-litre water tank, 100-litre foam tank and two power take-offs (PTOs), one driving the multi-pressure centrifugal main pump, rated up to 3,400 litres per minute at low pressure, the other powering an ultra-high pressure cutting extinguishing (UHPCE) system.

Installed equipment includes two 54m-long, 22mm-diameter high pressure water hose reels, plus a dedicated reel for the UHPCE system. In addition, there are four ladders, extensive stowage systems, and firefighting and rescue equipment.

Scania has also recently worked with Shropshire Fire & Rescue, with the appliances' bodywork built to the service's specification by Emergency One (UK), based in Cumnock in Scotland. In that case, due to the rural nature of the county, it was specified with a 3,000-litre water tank and ability to carry sufficient fire and rescue equipment to help make them self-sufficient until support pumps arrive.

## DIFFERING REQUIREMENTS

Lincolnshire and Shropshire FRS's requirements are typical of the industry. David Carter, specialist sales manager – fire and airside at Scania, outlines how a chassis for a fire appliance such as this differs from one destined for haulage.

"The crew cab is primarily designed around fire and rescue. For example, all the grab rails and anything to do with safety is coloured yellow," he says. "We also pre-wire certain things, such as light switches in the rear, so the bodybuilder can hook into the electronics and control specific things for blue light applications.

"We have specific fire brigade specs [which] means that the bodybuilder can supply signals to the trucks' CAN-Bus system and write their own programmes and instruct our truck to react to external inputs. For instance, if they install body locker door switches, the signal will [via CAN-Bus] illuminate a warning on the dashboard."

Scania also has an instrument cluster designed for FRSs, which may look the same as those produced for other sectors, but has symbols specific to their needs, Carter adds.

FRSs also have specific demands for gearboxes, too. Carter says that many specify an Allison fully automatic gearbox with a torque converter rather than a clutch (see also pp35-36). "In a life of 15 years it is more reliable, as they don't have to consider clutch life, and the gearbox rarely has to come out unless it has a major problem," he says. "The Allison gearbox can take much more torque through it and is good for driving direct-shaft PTOs."

Carter adds that FRSs usually specify rear air suspension; some take steel front, others air front. Engine specification can depend on the topography of the area: Lincolnshire, which is largely flat,

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Neil Corcoran


took a 316bhp engine, while others in hillier areas of the country have specified 355bhp engines, and Scania can go up to 532bhp, if required.

Meanwhile, cab size requirements are changing, Carter notes. As increasingly FRSs are taking breathing apparatus out of the cab and storing it elsewhere in the body, they can specify the CP28L cab. The CP28L, CP31L and recently launched CP31N [a higher roof cab to allow standing up inside] are all tested to ECE R29 crash test regulations and undergo Swedish test standards, which are more stringent.

## THE LAST DETAIL

Defence and aerospace company Babcock, which manages London Fire Brigade's (LFB) fleet of vehicles, among others, specifies what is included in a fire appliance down to the last detail.

"We specify the chassis, fire pump, how the driveline works, how it is powered and the construction of the body," says Neil Corcoran, Babcock's chief engineer on the LFB contract. "Currently the chassis goes to [bodybuilder] Emergency One in Scotland; they then construct the vehicle based on our specifications. We say we want a specific type of fire pump to pump X amount of water, the body has to be this size with shutters and lockers in these places, the maximum reach heights, the ladders and gantries that go on the roof.

"We even specify the shutter width on the body to ensure the kit is evenly distributed and fully accessible... [For instance] the tilt-and-slide shelving with all the bits of kit on has a maximum reach height of 1.85m. LFB no longer has minimum height restrictions [for recruits], so we have specified 1.85m as the maximum height to ensure everything is accessible from ground level without having to overreach or use a step. The fire pump is the main thing: it has to be able to shift 300 litres per minute with these at a certain pressure. All this is specified, even down to what the pump is made of – we minimise corrosion."

The body itself is made from plastic by Tamworth-based Strongs Plastic Products. That material was chosen because it is easy to repair. Previously, fibreglass was used, but repairs would have required technicians to use breathing masks and install dust extraction. Plastic is also more resilient than fibreglass, so can withstand greater impacts, meaning it spends less time off the road, Corcoran says.

## EVOLVING REQUIREMENTS

Corcoran adds that FRS requirements are changing, and they are increasingly looking towards enhancing technology, fuel efficiency and alternative power. "For example, until recently the hydraulic cutting gear that cuts people out of car accidents was powered by a petrol generator – it took four firefighters to lift the sledge with the kit on, and it was noisy and generated pollution.

"Over the past two years we have researched and are now rolling out a solution that is battery powered." It can be operated by one person, doesn't generate noxious gas and is quieter.

Other requirements are evolving, adds Samir Maha, technology director at Babcock. The company is researching asset tracking, which could have value to FRS. "We are also looking at information – how do you tie it into the advances in analytics to help with things like preventative maintenance? We have a lot of maintenance data due to the nature of our service activity and are always looking at ways of leveraging that to improve in-service life." TE

## TAKING TIME

**Building a fire appliance is no quick process. Babcock engineer Neil Cocoran reckons that build takes about 2,000 person-hours. Once built, it must go through a rigorous set of performance tests to ensure all regulations have been met or exceeded. "That covers things like acceleration times, stopping distances, tilt angles, weight distribution, noise generated, turning circles [and that] none of the systems are compromised by the stuff that has been bolted on to it," says Corcoran. "Only when all this has been done can it go to London Fire Brigade for the start of training on the new system."**