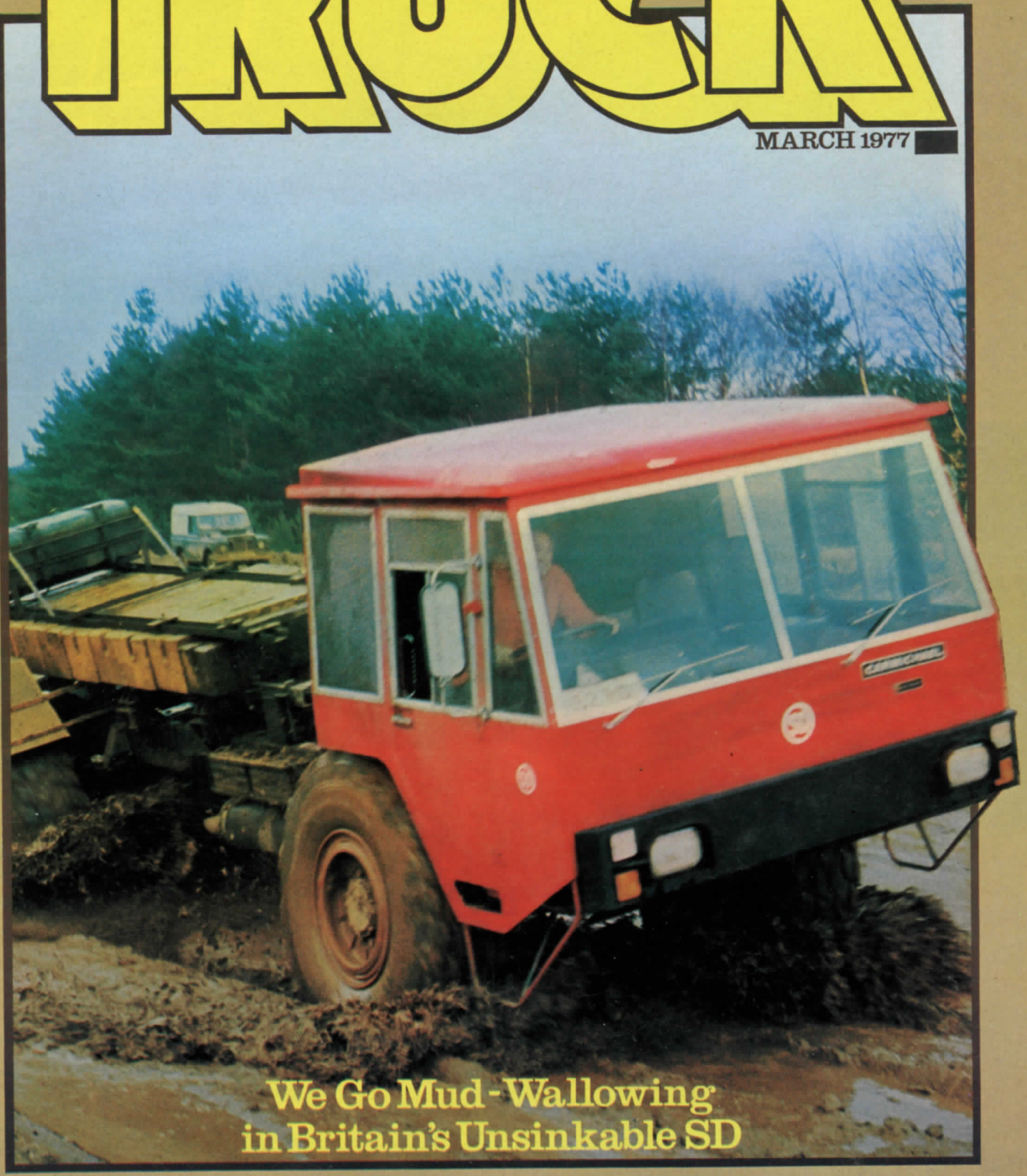
TRUCK

MARCH 1977



We Go Mud-Wallowing in Britain's Unsinkable SD


CARMICHAEL
SD
SD 4X4

We Go Mud-Wallowing in Britain's Unsinkable SD

Slime and slush, mud and slop . . . these are just the elements in which this unlikely duo from SD absolutely thrives. Pat Kennett, wellies awash, tells all

'Whatever you do,' said the man from the military, 'do not get into the camel-hump section of the track. That's only for tanks, the mud's feet deep and you'll just sink. And our recovery crew won't want to fish you out, either. So be warned.' He glared at us to drive home his point, then looked a bit puzzled as ill-concealed grins broke onto our faces. What he didn't know was that the two 4x4 trucks we were testing had for the past hour been wallowing their way around that self-same section, like pigs in the proverbial, without the slightest difficulty. However, we didn't want to spoil his day by telling him, so we just went back for another wallow as the rain pelted down on the already slippery army test ground.

The machines we were testing came from Letchworth, the latest advanced-vehicle brain-children from the factory of Shelvoke and Drewry, who are better known for turning out more mundane conveyances like dustcarts and gulley emptiers. Visitors to Earls Court and the Public Works show at NEC, will have already seen one of our nimble duo. At those shows it was painted yellow, with a new Motor Panels steel cab structurally similar to the S90 Foden's and fitted with an all-wheel-drive transmission. It is simply a general-purpose on-off-road cargo vehicle for use by people like the Forestry Commission, and the folks who go laying cables and pipelines across country. It is a full 16tonner — unusual in 4x4s — but it is not supposed to be a spectacular high-performance machine. Its Leyland 410 engine (same as the Clydesdale) and Leyland-Albion six-speed, constant-mesh gearbox testify to that. Yet its ability on bad ground is out of all proportion to its modest specification.

The big brother to this SD is a different animal altogether. It is designed as a high-performance crash-tender chassis, for firefighting and rescue at aircraft mishaps which, of course, inevitably occur in poor ground conditions. For starters, it's powered by a new *turbocharged* (not mechanically supercharged) Detroit 8V.92T two-stroke engine developing an enthusiastic 430bhp and 1186lb/ft of torque. Coupled to that is an Allison HT750 five-speed automatic which drives through a ZF transfer box to both axles. Loaded to 22tons gross, this fearsome machine will reach 50mph in a fraction over half a minute and, despite the high axle loadings, is just as much at home in mud and water as it is on dry land. The chassis we tested was a prototype, with a provisional cab built by Carmichaels, no proper mudguards, temporary exhaust and so on, so there's no point in looking at that kind of detail. On the other hand, the cross-country abilities of the machine are very definitely worth looking at.

The dry-land performance adds up to reaching 40mph in 20sec, with 22 tons gross, and 50mph (80kph) in just 34sec. Very good going indeed by heavy truck standards. It will climb a one in three gradient on about three-quarters throttle in second gear, and romp along at an awe-inspiring 66mph (106kph), once you've got used to the handling characteristics of the huge flota-

tion tyres on which the CT4x4 runs. We did all that to get some figures on paper before venturing into the rough, the beast's natural habitat.

Meanwhile, the workaday NY4x4, with its constant-mesh box and a mere 144bhp to get it going, took 46sec to reach 40mph, and just a minute to reach 45mph, with a maximum of around 56mph. With the transfer box in low ratio it climbed Chobham's one in three test hill with ease — in fact, quite a bit quicker than the big 22 tonner with its torque converter in action. The spring park brake held comfortably on that gradient, too, facing either up or down.

With the dry-land figures out of the way, we took both SDs onto the cross-country dirt-road sections at Chobham. Both romped around so easily that there was clearly little that we would learn there. Consequently, we adjourned to the much more severe acreage at Long Valley where the War

Detroit V8 utilisers turbocharger

Office tests its fighting vehicles. After several days rain on top of recently melted snow and ice, the ground was at its glutinous worst (or best, depending on your point of view) and the combined TRUCK-SD team collected several wellies full of water before we even started with the driving!

The big 22ton CT is dead easy to drive. You simply select one of the drive ranges on the quadrant control for the Allison box, release the spring brake valve, apply a bit of right welly, and you're off. On the rough cross-country going you have to be careful, though. At the first deep trough, about two feet deep with a sharp rise up the other side, you discover that the big problem is staying at your post. Crew members in the four-seats-abreast cab are recommended to use the seat belts if they don't want to be slammed against the roof, and there are belts for the driver, too. However, we prefer the method learned in places like Sinai and the Andes of South America: driving in a semi-standing position, feet on the pedals or floor, knees propped up by the front edge of the seat, bum waving around in the air and hands on the wheel. It's just like riding a trials bike, except it doesn't fall over when you stop, and it's surprisingly comfortable even for quite long periods. Off we go onto the dreaded camel-hump section, aptly named for its endless series of gulleys up to six feet deep, with short sharp crests in between, often with only a wheelbase-length between the dips. It's more like a whole caravan than a mere camel or two. On this kind of going it is very easy to go plunging down into the dips under gravity, only to shudder to a standstill as the front axle meets the rising exit head on. The trick is to drop the box into a low gear hold, so that the descent becomes less precipitous and more dignified, as befits your editor but, more to the point, a lot smoother and easier for the machine. Done that way, progress over the appalling ground was effortless, smooth, almost as if the vehicle was floating across the solid clay 'waves' and feet-deep puddles. And, in a way, float is just what it does. Those big tyres are high-flotation sand tyres, with a very shallow block tread pattern and low ground pressure, intended for crossing soft sand rather than sticky earth. They are not supposed to be suited to this sort of stuff, but even with nine to 14tons on the axles, they float us over the worst that Long Valley has to offer with minimal wheelspin.

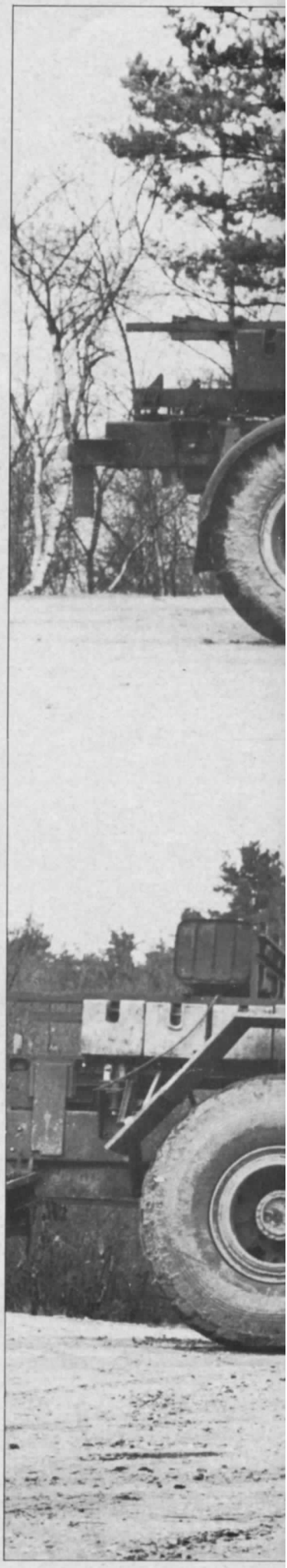
At that point, after a pause to salvage SD's Land Rover, which sank with all hands in an attempt to ferry our intrepid photographer a bit nearer the action, we decided that the big SD was the best thing since the Hovercraft, and congratulated ourselves on not getting stuck. Turning round for another go, we glanced back across the camel patch, and were astonished to see the little yellow Leyland-engined 4x4 bobbing up and down out there, for all the world like a fishing boat on a squally day off Scarborough. As we already pointed out, the 16tonner is supposed to be a general purpose load carrier, not a specialised high-mobility vehicle, but SD's intrepid test crew decided that it was time they found out what it really could do if it tried. Remember that this was the actual show machine, and it had not done any proper cross-country work in anger before. Almost disappearing from sight in the deeper troughs, it steadily ploughed its way through, emerging muddy but unscathed at the other end.

Seeking for further amusement we set off in search of something else to conquer. Long Valley holds many terrors for the majority of vehicles, but it had to be something really nasty for these two. Eventually we found a long, slimy slope with a ditch at the bottom, and a good foot of sticky surface mud on top of a wet clay subsoil, all on a gradient of around one in six. On this type of going the CT's vast tyres were a bit too much of a good thing as far as flotation was concerned. Despite the weight the machine slithered around on top of the slime, the shallow tread unable to find a good grip. Nevertheless, we climbed the slope steadily, although the back wheels had no intention of following in the tracks of the front pair until we dropped in the difflocks near the top. The 16ton machine, with proper site tyres on its wheels, behaved better, biting down through the slime to the harder stuff below. It climbed the obstacle in a straight line, but with the combination of gradient and extreme rolling resistance of the mud, it needed all its power to make the top.

During all this, SD's project engineer kept a critical eye on the proceedings. He started the day rather less than enthusiastic about the whole affair, for not even the factory engineers had taken the prototypes into these conditions before. But as the day wore on his grin broadened, and ended up fully convinced that the vehicles were able to launch into full scale proving and development trials. As you read this, the SDs are in the middle of these development trials, aimed at making them even better and virtually indestructible. There's just one thing that worries us: if they ever do find anywhere that's sufficiently tough to get those things stuck, they'll have a hell of a job finding a recovery outfit that can get near enough to rescue them!

Driveline goes through ZF transfer box. Note excellent terrain clearance

Imposing line-up at Bagshot Transportel! Comparison with normal Atki gives scale with the two go-anywhere Letchworth-made products

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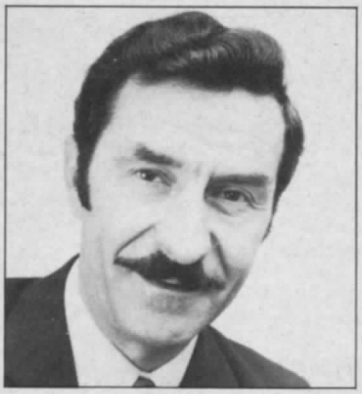
FUEL OIL

HOW SD DECIDED THAT MUD WAS

Shell-who and which? queried TRUCK's incredulous publisher when your editor announced he was going to do this story for the March issue. Clearly, the historic name of Shelvoke and Drewry Ltd did not mean very much in that quarter. Indeed, to many pure truck men the name may only have the vaguest connotations. However, the firm down at Letchworth that for the past 55years has been turning out vehicles and equipment to the highest mechanical standards — and still offers three years warranty on its products — is very much an integral part of the UK vehicle scene. Last year they had a £14 million-plus turnover and expect a significant increase this year.

Shelvoke and Drewry returned to the limelight after years in the back-



Stanley Quin, SD's managing director

ground, where they relied entirely on reputation for sales, with their spectacular entry into the high-mobility-vehicle business. The 16ton 4x4 chassis which many of you will have seen either at the Public Works Exhibition or the Earls Court CV show, is just one of a vast range of high-mobility chassis on two or three axles, ranging from around eight tons right up to 38tons gross vehicle weight. How come the traditionally self-effacing SD company got into this spectacular area? It's quite a long story, but we'll try to make it short. Way back in 1922, a certain Mr H Shelvoke and a colleague, Mr J S Drewry, put their skills together and produced a very advanced vehicle with transverse engine, semi-automatic transmission and low loading height (only 24in above the road). This was the famous SD freighter, made both as a commercial truck and a refuse vehicle, the selling strength being that any horse-driver could, with 30minutes practice, handle an SD. Although SD built chassis for brewers, bakers and other own-account users, plus a few hauliers, legislation in the '30s steadily pressured SD ideas towards municipal vehicles rather than straight commercials. It is in that area that SD's reputation has been established. During the war, they built all manner of highly technical devices, including four-man submarines, (there's a model in Greenwich Maritime Museum) and aircraft landing gears, and emerged from hostilities with a high degree of diverse expertise. Among other things, they also turned to the manufacture of industrial handling trucks and steadily built up their world markets, pioneering such features as the automatic compacting refuse truck and the fore-and-aft tipper type. Having become a member of the big Butterfield-Harvey group in 1966, SD continued to expand, exporting to 65 countries, but in 1974 the fork lift truck activity was sold off — to Rubery-Owen — to make room for their new Special Purpose Vehicle division.

The timing was good. The specialist all-wheel-drive chassis, with a wide variety of custom fittings demanded by buyers, was less and less a product that could be made successfully by the high-production giants of the industry. On the other hand, SD had a wealth of engineering and manufacturing ability in search of an outlet. So the SPV programme was mounted. Just how well that programme progressed can be judged from the fact that now, a little more than two years after the original decision to develop the SPV range, a dozen-plus smaller fire tenders have been produced, as well as half a dozen 13.5ton crash tenders in addition to the prototype 16 and 22ton 4x4 machines featured in this issue. Furthermore, all the design work on the whole range has now been completed. By the end of 1976, all the major builders of fire fighting equipment — Chubb, Carmichael, HCB Angus and the like — were quoting for machines on SD's chassis; enquiries were coming in from Europe, the Middle and Far East, and African states. In the current year, early days though they may be in terms of vehicle development time-spans, SD's SPV business is expected to be comfortably over the £2million mark.

We asked SD's managing director, Stanley Quin, what accounted for such a rapid development and acceptance of the machines, virtually straight off the drawing board? Mr Quin thought for a moment or two before answering: 'I suppose the main factor is our reputation. There are not many engineering firms — and even fewer vehicle builders — who give a three year warranty and back it with the best possible service support. In addition, we've got a balanced team here in the factory. We successfully combine the "age and experience" factor of men who have been with us for many, many years with the youthful energies of bright and forward thinking younger men. Having said that, the organisation required to obtain the right components needed to build these chassis on a tight schedule — remembering the extremely long lead times that most of the component builders work to — is a major undertaking. You can't just draw a vehicle on a sheet of paper then sit down and make it like our founders did 55years ago. All manner of specialised parts like axles, engines, transmission components and so on, have to be selected and specially ordered. Take the turbocharged 8V92T engine in the 22tonner for example. That's not an off-the-shelf item. However, we set out in the beginning to achieve a high degree of rationalisation right through the SPV range, and that has helped us immensely. The further we get into the programme, the better that serves us.'

But surely, we asked, this kind of production does not lend itself readily to line-production techniques. 'No, it doesn't', agreed Mr Quin, 'but we don't have a line as such anyway. A two-man team builds a vehicle, even a humble municiple vehicle, so the special requirements that make one machine dif-

SD chassis are basis for many crash tender

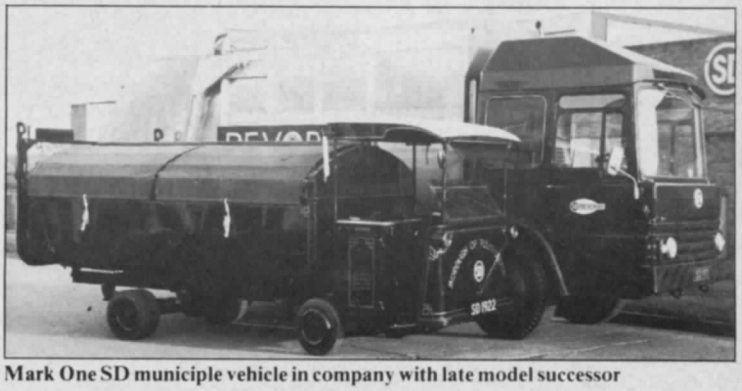
fer from the next don't drastically alter the flow. Furthermore, our facilities are very flexible. We have four branches — at Manchester, Birmingham, Exeter and Berkeley (Co Durham) — that not only act as service depots, but actually manufacture assemblies or complete units when the parent factory is overloaded. Rebuilds can also be done very conveniently at those branches and often we ship detail production work to one or other of them, where their labour skills are appropriate'.

How much of a production project is the SPV range?

'If you mean standardised, the answer is: not very. Almost every customer in the business wants his own ideas and in any case you must accept that what is suitable for one specialised application is not, by definition, entirely suitable for another. So you can have a wide variety of engines — Rolls-Royce, Leyland, GM-Detroit — and an equally wide variety of transmissions. But we rationalise the detail hardware and the way the machines are put together. Although it could be said that every one is a special, it is not quite as difficult as that may sound'.

Presumably a large proportion of the SPV machines will be exported?

'That's true. Airfield crash tenders are in steady demand the world over. But other applications, such as drilling rigs, pipelaying work, overhead cable installations, all of which come within



Mark One SD municiple vehicle in company with late model successor

Big airport firefighters with variety of body types are now an important part of SD

AS GOOD AS GARBAGE

Shelvoke and Drewry, after 55years of comfortably enjoying the sidelines, are preparing to break-out into areas that many truck makers would put in the 'too hard' file

Here retired Viscount gets foam-dowsed in simulated emergency

the scope of our machines, have a large export emphasis. Up until now, no more than a quarter of our production went overseas, but that will change, largely due to the SPV impact. In fact, the SPV operation is run as an entirely separate entity from the municipal vehicles, with separate people, separate procedures and so on. However, a great deal of our expertise and know-how acquired over the years, particularly overseas, is very relevant to our new SPV division's development, so we use it wherever possible.'

SD aren't exactly renowned for blowing their trumpet. Why?

Mr Quin agreed:'For many years we relied solely on reputation to sell vehicles and equipment. We never attended the big shows or tried to fly the flag; it wasn't necessary. But with the advent of the SPV and the associated large investment stake, we took a flyer and booked a last-minute stand at Earls Court. That really paid off. And so did our appearance at the Public Works. That marks a new phase in our life.'

Any more big projects afoot?

A rare laugh from Stanley Quin. 'We've got quite enough on our plate with this project range. When you consider there are 11 basic types with nine gvw ratings, all available with front or rear engines to suit, it's going to take a long time to built one of every possible combination. Add to that all the different variants that we're going to be asked for, and that's a big task ahead. But that does not mean our eyes will be closed. We already see several spin-off areas from our main line of thought on SPVs, and we'll be investigating them. I think you'll be hearing quite a lot about us in the future.'

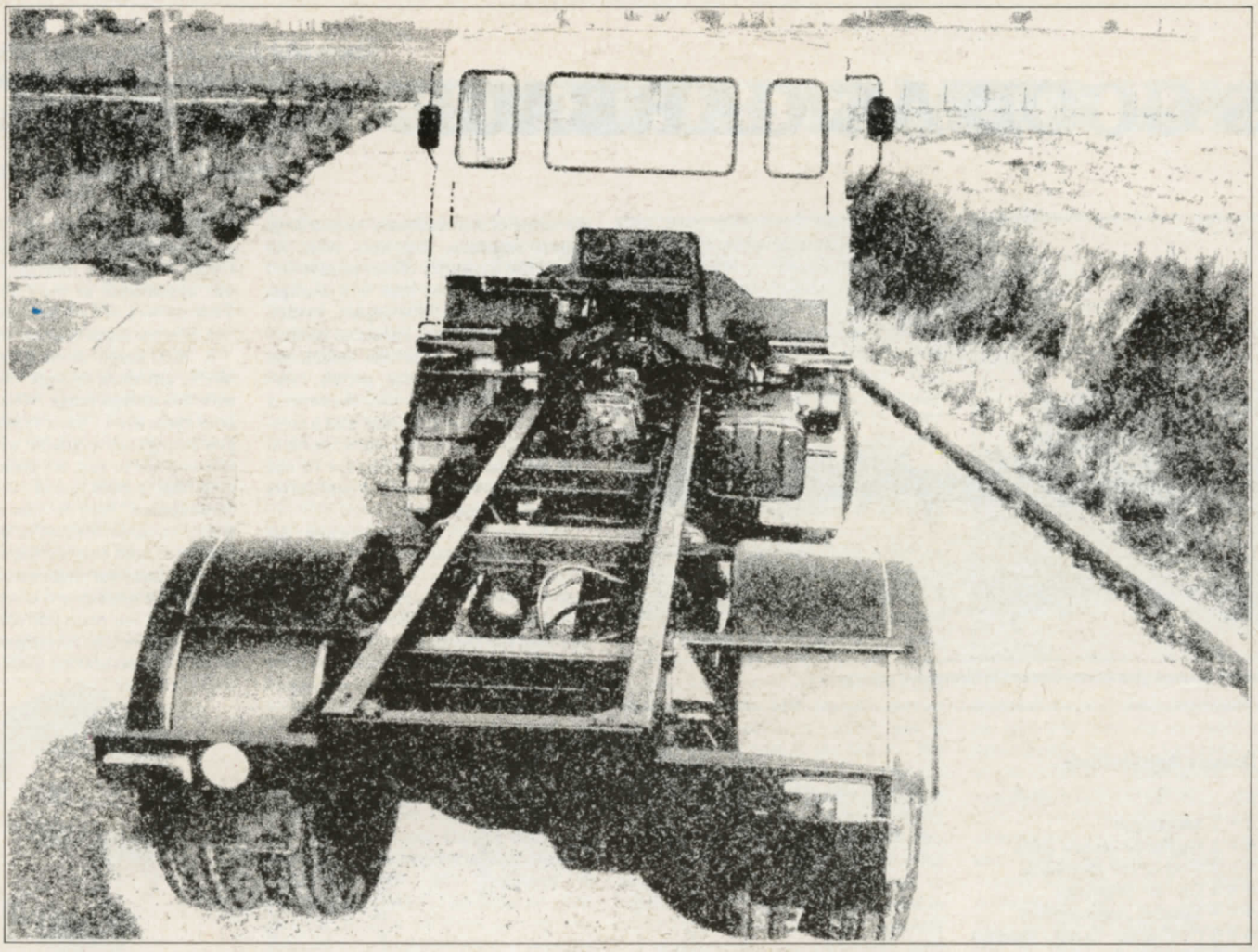
Chassis Applications	GVW class (in tons)								
	11.5	13.5	14	16	17	22	24	28	38
4 × 2 Municipal	✓		✓	✓					
4 × 2 Highway-Heavy Duty	✓		✓	✓					
4 × 2 Firefighter-Domestic	✓		✓	✓					
4 × 4 On/off Highway		✓		✓					
4 × 4 Special Applications		✓			✓	✓			
4 × 4 Firefighter-Crash/Rescue		✓			✓	✓			
6 × 4 Municipal						✓			
6 × 4 Highway-Heavy Duty						✓	✓		
6 × 6 On/off Highway							✓		
6 × 6 Special Applications								✓	
6 × 6 Firefighter-Crash/Rescue								✓	✓

Table shows range of SD SPV's available. Design work is complete on all of them, and those chassis up to 22tons exist in metal. 24-38tonners follow this year, and most have choice of front or rear engine.

SPECIFICATIONS and PERFORMANCE

Type CT 4x4, 22 tons gvw.	
Engine:	Detroit 8V92T two-stroke diesel
Power:	430bhp at 2100rpm
Torque:	1186lb/ft at 1400rpm
Transmission:	Main: Allison HT.750.DRD five-speed auto
	Aux: ZF A.600/3D, distributing 65percent rear axle, 35percent front axle, constant all-wheel-drive.
Front axle:	Kirkstall SD.65-11-1, nine ton capacity
Rear axle:	Kirkstall D.85-14-2, 14ton capacity
Tyres:	Michelin 18.00 x 25XS (Sahara)
Wheelbase:	16ft (4.88mm)
Length:	27ft (8.2m)
Turn circle:	Approx 90ft (27.4m)
Acceleration	
0-20mph	5.5sec
0-40mph	20.3sec
0-50mph	34.6sec
Gradability:	50percent (one in two) at max gvw
Max. speed:	66mph (66kph)
Chassis-cab weight:	6.72ton

TYPE NY 4x4, 16tons gvw.	
Engine:	Leyland 410 turbo, 6cyl.
Power:	144bhp at 2600rpm
Torque:	396lb/ft at 1350rpm
Transmission:	Main: Leyland six-speed constant mesh
	Aux: ZF, G350/3D, two-speed, distributing 65percent rear axle, 35percent front axle.
Front axle:	Rockwell FDS.700, 6.5ton capacity
Rear axle:	Rockwell R500, 11.5tonne capacity
Tyres:	12.00 x 20, single front twin rear
Wheelbase:	12ft 9in (3.89m) (option, 14ft)
Length:	Approx 22ft, according to body (6.7m)
Acceleration	
0.20mph	11.2sec
0-30mph	24.3sec
0-40mph	46.0sec
Gradability:	Approx 35percent (one in 2.85)
Max. speed:	Approx 56mph (90kph)
Chassis-cab weight:	5.63ton



The rest is up to you

We've done our bit. We did a comprehensive two year study of what was required in on/off highway and all terrain vehicles. We looked at some of the worst operating conditions imaginable and what was currently available from our competitors.

We decided we could do better. If that sounds a little on the over confident side it's worth bearing in mind we've been in the business long enough to know what we're doing and perhaps more important, we put our theories to the test before putting them into practice.

The end result is a new British integrated purpose built range of Special Purpose Vehicles – we call them SPVs – that are suitable for just about every job where virtues like rugged reliability and long life come top of the list.

Firefighters, Airfield Crash Rescue trucks, Refuellers, Snowploughs, Wreckers, Drill rigs, Dumpers – you name it. The rest is up to you.

Further details from:
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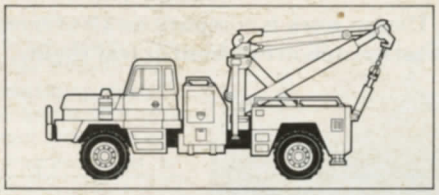
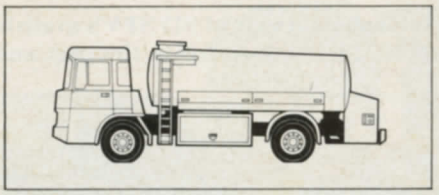
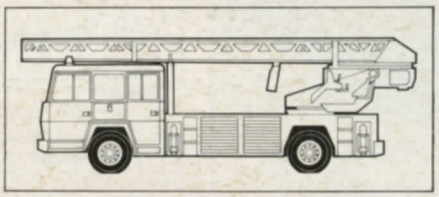
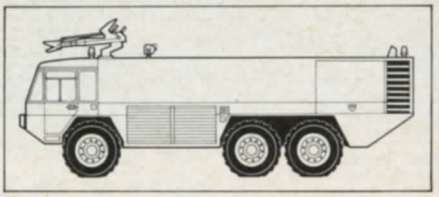
Tel: Letchworth 6555. Telex: 825556









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we've got the answer.