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# Oshkosh Dragon Wagon

To have a high-mobility truck with the ability to face any type of terrain, however adverse and broken it may be, has always been a top requirement in all Armies' Command specifications. This requirement derives from the necessity to transport payloads in tactical combat areas, in all situations, with high operative speeds, even following armoured units which have increasingly high power concentration and are capable of rapid course changes. These requirements are often hindered, not so much by lack of technical capability to produce such vehicles, as by the high costs involved. This could not be otherwise, due to the less wide diffusion and high cost of research and development of advanced techniques.

Less-widely diffused because they are costly and costly because they are less widely diffused, these vehicles suffer from a vicious circle which only the really big armies, and then only partially, are able to break. In fact the trucks in service with the various Armed Forces are of a classical type, that is, of obvious civil origin, although somewhat highly specialized. That is more or less the story of the DRAGON WAGON, although the utmost efforts have been made to reduce costs by seeking a thorough standardization of component parts plus maximum utilization of the equipment, adopting a basic front end and engine, and coupling these to a series of interchangeable rear-end configurations.

## DEVELOPMENT

In the early '60s Lockheed had developed a private venture, the TWISTER, a high-mobility 8x8 ultra-modern vehicle. But the original solutions adopted for the TWISTER never went beyond the prototype stage and the three vehicles intensively tested for the U.S. Army were not followed up. The firm then developed an Armoured Reconnaissance Scout Vehicle, based on the experience gained on the TWISTER. It was a 6x6 in competition with a tracked vehicle of the same class, but even this occasion was lost due to the cancellation of the programme. However, the experience gained was lost due to the cancellation of the programme. However, the experience gained was exploited in the development of a larger vehicle, precisely the DRAGON. It was originally meant for offer to civilian users with an eventual extension into the military field. After undergoing a long series of tests, from the torrid heat of the desert to the cold of the Artic Circle, the DRAGON went into the pre-series stage with a total of 15 vehicles. The subsequent series production was handed over to the Oshkosh Truck Corporation.

## TECHNICAL DESCRIPTION

The DRAGON is a high-mobility 8x8 truck. The chassis is of a high-resistance steel, with welded and bolted sections. The general design complex is based on eight driving wheels, divided in two interdependent modules articulated in such a way as to effect turning in respect to the longitudinal axis (rolling) and to the vertical axis (steering). A power transfer joint allowing total wheel travel between front and rear body sections of 28 inches; the power transfer joint also gives 11° rotation of rolling and

*The DRAGON WAGON on rough ground.*

*This photo taken from the rear permits the reader to appreciate the movement of the frame and the attitude angle on rough ground.*

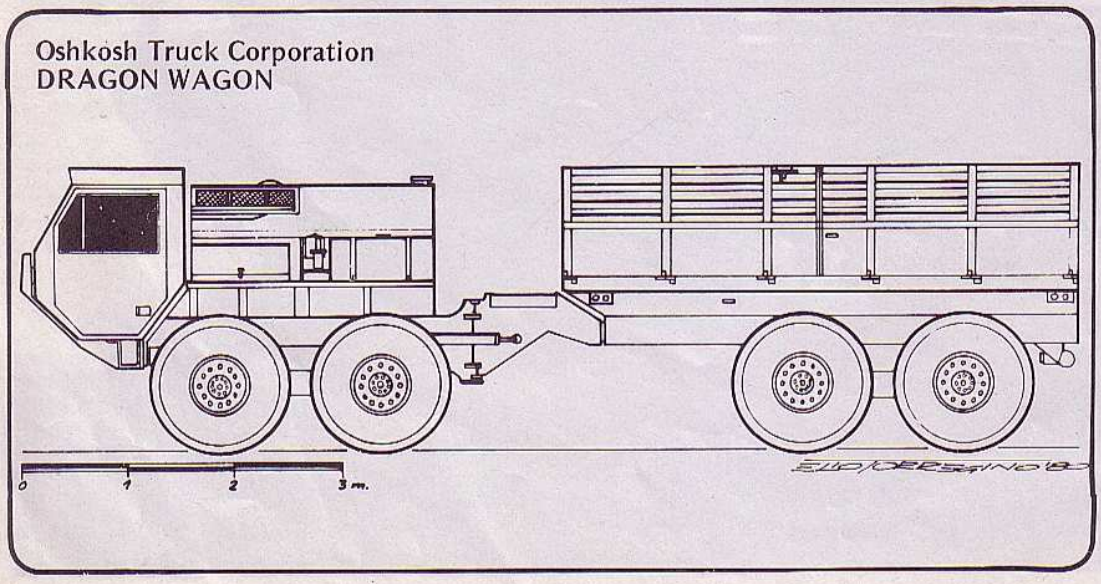
more or less 32° of steering.

This is of course very sophisticated and therefore costly, but necessary for obtaining a double result, that is, maintaining a more positive wheel-to-ground contact and keeping good steering control. No other system, even with all independent drive wheels, has equal ground holding capability, except in a few rare examples such as the PAVESI tractor and the VOLVO BM. Correct steering also aids in making a shorter turning radius, and helps to maintain high mobility. The DRAGON steering system offers a further original characteristic; other than the standard chassis steering effected by two hydraulically-controlled operator-cylinders of 89mm and a compartment of 508mm actuated by two pumps taking their drive from the engine, the steering of the first shaft is effected by an Ackermann-type articulation, the driving gear of which is hydraulically servo-assisted. The front and rear suspensions are very simple, with rigid axles and leaf-type springs for both front and rear. Vertical range goes from plus 140mm to less 216mm.

Tyres are 16x21 tubeless on wheels with discs and rims of 21.00x10. The engine is located on the front module immediately beyond the driving cab. The original engine was a Caterpillar model 3208 developing 225 HP at 2,800 r.p.m. but the present version has a Detroit Diesel Allison 8V-12TA giving 435 HP at 2,100 r.p.m. and maximum torque of 1,400 r.p.m. It is water-cooled with a tube-and-fin radiator, (frontal surface is 12,904 cmq.) and a centrifugal pump actuated by gears. There is also a transmission oil-cooling radiator (converter). There is a dry air-filter, double-stage. Transmission is automatic with a lockable hydraulic torque conventer, Allison HT704 D with four forward gears plus reserve. The gear ratios are: 4th - 1:1, 3rd - 1.38:1, 2nd - 2.02:1, 1st - 3.69:1 and reverse - 6.03:1. Movement at gear outlet, through a half-shaft is transmitted to a gear-box with two speeds, with ratios of O.97 and 2.12. The differentials can be locked by the driver. Electric current is of 23V. and plant consists of a generator (alternator), starter, lights and 4 batteries.

The steel driving cab can comfortably accomodate two men. The driver's seat has its own suspension. Instrumentation consists of fuel level indicator, mileometer, clock, air pressure manometer, oil pressure manometer, rev counter, low air-pressure warning light, cooling-water high temperature warning light, headlights full beam warning light, transmission - oil high-temperature warning light and direction indicator. Two fuel tanks are mounted one on each side behind the cab, each of 208 litres capacity.

The vehicle is offered in three versions, denominated respectively D3838, D3848 and D3858, which vary essentially according to load carrying capacity. Ground weights vary from 27,216 kg to 37,195 kg. There is a wide range of optional extras to choose from, including an exhaust gas thermometer, outlet for electronic diagnostic data check, dimmed lights, passenger seat suspension, winch, small hydraulic crane, special 24.00 x 21 tyres, with radials for sandy terrain, low temperature kit, engine brake, automatic 5-gear transmission, air-conditioning, multi-ratio reducer, movable searchlight, spare wheel with tyre, special configurations for particular combat uses, bullet-proof glass for windows. There is also a wide range of suitable body applications, including general cargo with crane, tanker, wrecker, weapons transporter and weapons platform. Trailor towing application's include



*Side view of the DRAGON WAGON which permits one to appreciate the clean lines and the two semi-frames.*

full trailer, semi-trailer and drawbar trailer.

## CONCLUSIONS

A technically-advanced vehicle, with notable performance and special applications. The DRAGON does not seem to be destined for clamorous success, especially ad regards production. It is to be considered, however, as a possible substitute for the U.S. Army GOER 4x4, for the '80s.

**Oshkosh Truck Co.**
**DRAGON WAGON**

8x8 high-mobility truck, 8-seater cab. Dimensions: (with rear standard body 16ft. cargo version) length 10.008 metres, width 2.438 metres, height 2.591 metres, wheel track 2.007 metres, distance between front and rear axles 1.524 metres, front and rear body angles 45° and 48°, articulated chassis, steering angle more or less 32°, roll angle more less 11°. Engine: Detroit Diesel Allison 8V—92TA water-cooled, 435 HP at 2.100 r.p.m. max. torque 1,694 Nm at 1,400 r.p.m.; Allison HT740D transmission, 4 forward gears and reverse, Oshkosh two-speed separator-reducer, wheels 21.00 x 10, tyres 16.00 x 21, electric current 24V. Performance: max. road speed 88 k.p.h. (55mph) 48 kph off-road, with reducer inserted 43 kph. Max gradient 60% lateral cant 40%, fording depth 1.143 metres, turning radius 8.454 metres.

*Detail of the articulation joint. Note one of the steering cylinders in the note foreground the transmission shaft and the electrical and pneutatic cables.*