"STEFAN DEVELOPED FASTER AND EASIER WAYS TO ATTACH AND REMOVE SOPHISTICATED POWERED ATTACHMENTS"

Forestry and snow clearance applications are key sectors for the Syn Trac tool carrier.

ADVANCED AUSTRIAN CARRIER

As Steven Vale reports, Austrian firm Syn Trac is developing what is described as the ultimate tool carrier with impressive hauling abilities

A decade ago Stefan Putz had a farm machinery dealership in Austria, today he runs Synex Tech, a specialist machinery design and construction company based at Bad Goisern, an hour's drive south-east of Salzburg.

Back in the day, a common request from his agricultural customers was for additional hydraulic services and mounting points, to enable the likes of timber cranes and other specialist attachments to be used with their tractors. Stefan developed faster and easier ways to attach and remove sophisticated powered attachments and in the years that followed he persevered with the concept of developing the ultimate tool carrier.

In 2013, with support from a private investor, his idea for a multi-purpose 10-tonne vehicle with a top speed of 80kph finally made it to a professional drawing board. Two years later the green light was given to develop the prototype, which was shown in public for the first time at the Agritechnica farm machinery show at the end of 2017.

Called the Syn Trac, the vehicle is designed to appeal to a wide range of users who perform specialist high-value jobs including snow clearance of airports, forestry →

➔ contractors looking for a large tool carrier that, with the appropriate trailer, can also double up as a timber forwarder, and as a high-mobility hauling tractor unit for the construction and quarrying sector.

Syn Trac is under no illusion that its design will compete with traditional ADTs on large-scale muck shifts, but what it does offer is a fast, highly manoeuvrable and extremely flexible option. One where a tipping trailer can quickly be swapped for a bowser, or the machine's hydraulics used to full advantage by using attachments such as a road grading blade, a drill rig, a telescopic loading arm and even a mobile crane.

The Syn Trac is one of the first vehicles to use Caterpillar's new 420hp C9.3B engine that is certified to the future Stage 5 of the European emissions regulations. It is mated to a stepless hydro-mechanical transmission in a U-shaped arrangement, positioned between the axles and below the tilting cab. The exhaust stack is neatly located behind the rear cab post.

The location of the power-pack results in a good weight distribution and a low centre of gravity for excellent stability on sloping ground. It also does away with the need for a bonnet, which together with a 180-degree rotating seat and integrated joysticks and controls, results in unrivalled visibility to both the front- and rear-mounted attachments.

IN THE CAB

We encountered the Agritechnia prototype machine near Syn Trac's HQ, working in a small quarry with a swan-necked trailer made by fellow Austrian firm Benzberg.

It is a steep climb up the five steps recessed into the side of the cab, at the top of which are the filler caps for the 420-litre diesel and 34-litre AdBlue tanks. We are informed the cab door on later pre-production models has been re-engineered to open a bit wider to provide for easier access.

The six-post cab was developed jointly with the Austrian firm Walter Mauser and provides a total glazed area of 8sq.m, the front screen measuring 1.62m wide x 1.16m tall. A multi-camera system provides 270 degrees of coverage around the machine, which also benefits from 10 LED work lights. It is understood that the current two display screens could change for a single 12in monitor in production versions.

The large multi-function joystick to the right of the operator controls the front and rear attachments. Outboard of the joystick is a smaller lever that controls the prime mover, including selecting forward/reverse, high/low ranges and is also used to activate cruise control and the PTO.

ATTACHMENT DOCKING

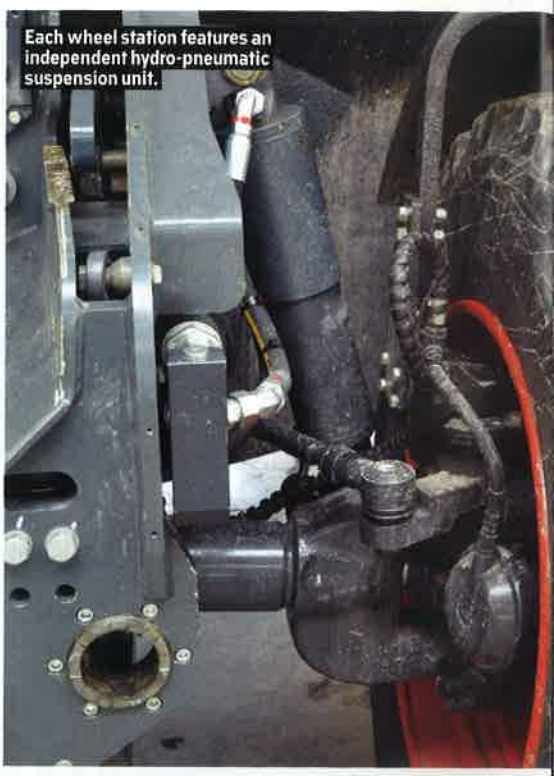
The Syn Trac's standard load sensing axial piston pump provides 180lit/min of hydraulic flow at 250bar, with the option of a 360lit/min high-flow hydraulic system. The vehicle comes as standard with six double-acting hydraulic services both at the front and rear attachment docking stations.

The docking system is one of the most interesting of the numerous patents filed for this vehicle. There is no need to leave the safety and convenience of the cab as a host of power transfer and control lines can be automatically connected at the same time as the physical connection of the attachment.

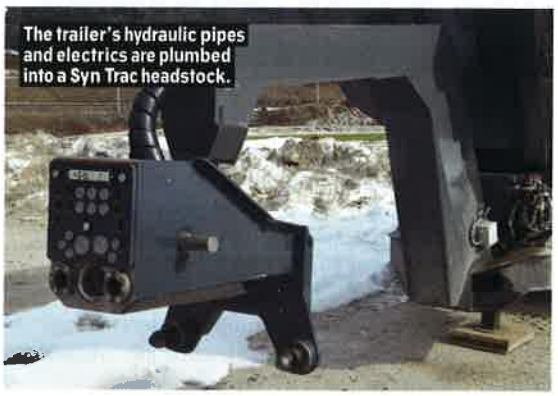
The docking sequence is controlled using four rocker switches in the seat's armrest. As I inched towards the trailer, its headstock was initially guided into place by side plates on the vehicle. Had the trailer's headstock been a bit too low, I could have opted to lower the Syn Trac's hydro-pneumatic suspension system. This provides a maximum underbelly clearance of a whopping 635mm, or a minimum clearance of 310mm for coupling such attachments.

As the trailer stood on a concrete yard, lowering the vehicle was not required in this instance. However, the terrain does not have to be perfectly level. Even when the axles of the trailer and Syn Trac are misaligned, the docking device has the flexibility to move the headstock into the correct position.

As the connectors slide together, two pins on each side of the trailer's headstock click into two fixing points on the prime mover. At the same time, the two sets of pins at the bottom of the trailer's headstock dock with the coupling plate. Pressing a rocker switch closes the hydraulic ➔


Each wheel station features an independent hydro-pneumatic suspension unit.


The Syn Trac is easy to drive and operate, with all the controls conveniently positioned close to the operator's right hand.


The trailer's hydraulic pipes and electrics are plumbed into a Syn Trac headstock.

A docking station for the headstock is provided at both end of the Syn Trac and can also be used to connect to PTO shafts.

As the vehicle reverses towards the trailer the guide rails on the docking stations slide into position.

"THE LOCATION OF THE POWER-PACK RESULTS IN A GOOD WEIGHT DISTRIBUTION AND A LOW CENTRE OF GRAVITY"

"THE THIRD AXLE LINE COULD ALSO CONTAIN A SEPARATE ENGINE, ANYTHING UP TO A 600HP CAT C9"

With a 3-mode steering system the Syn Trac offers plenty of versatility. Coupled with a steered trailer opens-up a number of possibilities.

6x6x6 VERSION

The rear docking station on the Syn Trac has been designed to connect to an optional third axle, which provides a load-carrying platform for the likes of road gritting kit.

But this is only part of the story, as the third axle line could also contain a separate engine, anything up to a 600hp Cat C9. This is intended for extreme duty applications, such as running a large wood chipper, or when working with a wide snow blower.

➔ hooks, the action of which pulls the vehicle and implement together.

At the same time the docking system automatically connects all hydraulic and electrical services and, if used, will even connect the shafts of a PTO-powered attachment. Another rocker switch raises the trailer's hydraulic support legs and the rig is ready for work.

Obviously this was not the most severe test of the Syn Trac's docking system, but the latest pre-production machine – complete with a two person cab – is heading for a spell with a municipal contractor. He is keen to find a powerful prime mover that will be used with both a snow plough and salt spreading kit during the winter months, with the ability to quickly and safely swap between the two. In the summer it will be used with a triple-gang verge mower, where its ability to travel quickly between job sites should come in handy.

What I can say is that visibility to the attachment points is great and everything is done from the safety of the cab. There's no need for the operator to work around heavy attachments in harsh conditions.

ON THE ROAD

The route to the quarry was along a bendy and steep single lane mountain road. After selecting the travel direction and depressing the combined throttle/drive pedal, the vehicle accelerated fast, was agile, nimble and easy to drive.

Developed by Austrian transmission maker VDS, the gearbox provides three driving modes: automatic, field and PTO. Ranges are shifted by dual clutches and a separate high-low box increases the top speed of the standard 60kph box to 80kph, where permitted by local laws and site rules. Nerves of steel would be needed to reach this speed on the steep mountain road, but on the flat in the transport mode the 9.3-litre engine will maintain the top speed at a fuel-conserving 1500rpm.

The prime mover without a trailer in all-wheel steer mode allows the 4.7m-long vehicle to turn through an outer wheel radius of just 4.5m, which came in handy during our spell in the quarry. Pivoting on a ball, the swan-neck of the trailer provides for tight 90-degree turns and an outer wheel turning circle of just 9m.

Off road ride comfort is good, courtesy of independent hydro-pneumatic suspension on all four wheels on the 10t-rated axles. There are numerous tyre options up to a maximum size of 500/80R30. On the standard 480/70R30 rubber, the suspension provides 430mm of ground clearance with plenty of travel.

THE FUTURE

During 2018 the firm and its potential users have spent considerable time evaluating the prototype in a number of applications, including with a timber trailer with an integrated loading crane. The crane is fully operated from the cab of the prime mover, with the added benefit that the operator can swivel the seat to face the action. This development period has also discovered uses for the Syn Trac that were not originally envisaged, for example with a heavy-duty cable plough.

The first production machines should be available in 2019. But in the meantime development work continues, for example fitted with a Palfinger crane and another with a large wood chipper.

This brings us to the all-important question of cost. As a rough guide the list price of a Syn Trac will start from around the €330k mark for the basic vehicle. This has to be put in context of its nearest rival, probably a Unimog. However, on paper the Syn Trac offers a lot more, particularly for those specialist applications that require frequent changes of power-hungry attachments. EM