Czech tractor maker Zetor took a step down the horsepower scale when the Stage II six-cyl SAMEpowered Forterra 11741 was given an emission legislation death sentence. Today, though, the company is climbing back up the ladder with its Forterra 135. Launched at the end of last year, the 135 now becomes the figurehead for the five-model Forterra line, whose members span 74kW/90hp to 95kW/129hp (ECE R24) and source their power from Zetor’s own 4.2-litre Stage IIIA four-cylinder engine. While it continues to be fuelled by the traditional, mechanical in-line injection pump, the key Forterra 135 difference is that it has four valves per pot.

We were keen to see just how effective this old/new combination could be, so handed our test subject over to the DLG. Rigged up to the dyno, the Forterra 135 managed to send 85 kW/116 hp to the shaft while the four-potter worked at its rated speed of 2,200 rpm. Then as the engine revs pulled back to 1,800rpm, it mustered a further 5 kW/7 hp. The perky Zetor motor produced a torque rise of 67% and a constant power range of nearly 30% – all very respectable figures. In fact the Forterra proved to be quite a blast, and it was only in the lower speed ranges where the engine started to struggle; culprit here was a 76% start-off torque.

Making up for any low-rev lethargy, the 16-valve motor scores on economy, building on its predecessors’ already fuel-frugal reputation. At rated speed the Forterra 135 worked through 279 g/kWh and 244 g/kWh at maximum pto output – both excellent stats. These results are further reinforced by our Powermix test, which looks at performance in typical applications (see page 12). Here the Zetor established itself as a leader, sipping 283 g/kWh to make it 5.7% more fuel efficient than the average tractor we’ve tested so far. So, the 180-litre fuel tank should certainly see most operators through a long working day.

On down the driveline, there’s nothing too-fancy about the transmission. This mechanical box provides two ranges and four main gears, supplemented by three powershift steps. The lever for the mechanical shuttle resides on the right-hand side, which is not ideal for loader work and would be much better placed on the left as on most other tractors. Only gears one to three can be used in reverse. In total the transmission offers 24 forward and 18 reverse speeds, with top gear pegged at 37.9 km/hr. In the main 4–12 km/hr work travel band the operator has a good choice of ten speeds, although these are spread across the low and high ranges. The slowest speed in high range at 8.5 km/hr is still a bit fast. Moreover, reverse gears are 5% faster in all 18 ratios, so operators could find themselves reaching for the small range lever to the left of the cab more often than they’d ideally like. Two buttons on the side of the main gearstick control the powershift steps, but they aren’t clearly marked: tortoise 1, tortoise 2 and no light. The same applies to the digital speed indicator, which is too small and has no decimal place. Going some way to making up for these shortcomings is a form of speed matching: once the operator has activated a button on the dash, the powershift transmission automatically shifts into the middle range each time a new mechanical gear is selected.

New tractors come with the choice of two pto speeds, either 540/1,000 rpm or 540E/1,000 rpm. Our Dutch test tractor required the operator to manually turn the stub shaft with a supplied spanner to change between the two pto speeds, whereas,
thankfully, UK/Irish spec tractors now give their driver the option of selecting the preferred pto speed from within the cab. The Dutch distributor had also added to the test model’s standard external linkage control buttons by specing a button for starting/stopping the pto, yet the main item on our pto control wish list would be to have the pto disengage/engage automatically when the rear linkage is raised and lowered at the end of a field pass.

As a unique feature, Zetor’s ground speed pto remains active when the range lever is in the neutral position, providing the operator with as many as nine to 12 speeds on a stationary tractor in either rotational direction – useful when, say, agitating the farm’s slurry store. Unfortunately with this feature the pto speed is not indicated at all, and that clearly isn’t ideal.

Further details from our field test

This is not a summary of overall assessments but a list of positive and less positive details.

### Positive

- High-capacity front linkage (hose routing needs improving)
- Toolbox inside the cab, no toolbox outside the cab
- Enclosed cubbyholes, bottle holder and electric sockets – good stuff.
- The steps are not protected from dirt
- It’s necessary to cut into the window seal to route cables into the cab (the seal leaks anyway)
- Hand throttle has no scale and no adjustable stop, and the throttle pedal is too high.
- Independent brake is prone to inadvertently unlock, a trait that’s soon to be addressed.

### Negative

- The standard compressor is flanged in place. It’s a neat arrangement.
- Air conditioning, yes, but there’s no cooling box and the fan only has three speeds
- Separate pull switch for shutting off the engine
- Air couplers are positioned too close together
- It’s necessary to first remove the caps before coupling the short connectors. Couplers are marked in a logical fashion, but the decals are unlikely to last.
- We had to turn the stub on our Dutch supplied test tractor to alter the pto speed. Zetor UK says that, as an option, this job can now be done from the cab.
Moving on to the three-point linkage, the tractor’s lower link sensing set-up is controlled by the instantly recognisable Bosch ELC system. With its one assister ram, the linkage boasts a lift capacity of 5,000 daN, so it should be up to most hoisting challenges likely to come its way. The turnbuckles for the linkage stabilisers are very basic and have neither pins nor springs, though there is the welcome spec option to upgrade to Walterscheid links.

A gear pump supplies oil to the three standard double-acting spools at the rear at a rate of nearly 71 litres/min. All three spools have a float position, which is good. Nonetheless, at least one of the spool valves should have some form of flow control plus a notch for the lever, so the operator can leave the system pumping continuously when working a hydraulic motor. At the moment this isn’t possible due to the kick-out function, and, on top of that, the spool lever position by the right-hand B-post is awkward.

Zetors have never been short on cab space, and thankfully the Forterra does nothing to break this mould. Build quality is decent, too, with a snug-fitting carpet floor mat in our test tractor. In-cab noise level, sadly, remains at an ear thumping 80dB(A), and the reason for this soon becomes clear. As you look through the front window you can spot the poor insulation between engine and cab, which results in the ultimate double whammy – high noise levels and, in addition, extra heat for the air-con system to ward off to keep the operator cool.

The standard seat from Grammer merits a thumbs-up as do the cab storage facilities and toolbox behind the driver’s chair. Fourwheel drive and the diff lock are engaged pneumatically, indicated by a tiny LED in each rocker switch, but there are no automatic functions. As mentioned, the speedometer is too small and the pto display and hour meter are also used to show other info. If the reason for this restricted size is a lack of space on the dash, then we’d rather go without the large analogue speedometer. Zetor, please take note.

Machine manoeuvrability isn’t a problem for the Forterra 135, which managed to turn through an 11.0m circle; this stat increased to 11.6 m after we engaged the four-wheel drive.
Simple but not stupid

Red-handled lever operates the mechanical shuttle forward/reverser; the other tall lever shifts through the four main gears. Buttons control the three powershift steps.

and when turning left – still an excellent result that’s achieved without pivoting front mudguards.

Kerb weight is also low at 4,550 kg but, with the gross weight set at 8,000 kg, the payload of 3,450 kg isn’t really sufficient for this size of tractor. Proving the point, the brakes (the front axle brakes on the propshaft) would comfortably be able to cope with more mass, as the DLG measured a healthy deceleration rate of 5.8 m/s². One word of warning, though: operators need to watch for the locked independent brake pedals releasing accidentally.

Finally, maintenance. The 4.2-litre engine requires just 11 litres of oil every 500 hours, while 52 litres are shared between transmission and hydraulics and need dropping every 1,500 hours. To access the oil filler neck, the bonnet lifts up in an inviting arc. Summary: While the stock farmer-/loadercr friendly Proxima remains as the main bread winner over here for Zetor, the higher spec Forterra still accounts for a fair number of UK sales (210 Zetor tractors sold in 2010). There is no doubt that the four-valve engine in the Forterra 135 is a top performer, yet there is still room for improvement in other areas such as lowering cab noise, adding a clutchless powershuttle and stretching the top speed to 40 km/hr.

Zetor Forterra 135: Lift power and lift requirement

Zetor Forterra 135: The red curve illustrates the recorded lift capacity (90% of maximum lift) as continuous lift power on the link ends, whereas the yellow curve shows lift capacity with lift arms shortened – more than 200 daN of extra lift capacity, nearly 3 cm smaller lift range. The front linkage is powerful. In contrast, the rear unit might start to struggle at the top of its arc.
ZETOR FORTERRA 135

<table>
<thead>
<tr>
<th>Width</th>
<th>222 cm</th>
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</thead>
<tbody>
<tr>
<td>Length</td>
<td>501 cm (incl. front linkage)</td>
</tr>
<tr>
<td>Height</td>
<td>279 cm (exhaust stack)</td>
</tr>
</tbody>
</table>

TECHNICAL DATA

**Engine** | 95kW/129 HP to ECE R24
at 2,200 rpm; watercooled four-cyl Zetor 1605 engine (Stage IIIA) with turbocharger, intercooler and four valves per cylinder; 4,156 cm³ displacement; 180-litre fuel tank.

**Transmission** | 24F/18R speeds, four main gears, two ranges, three powershift steps, synchronised shuttle, 40 km/hr.

**Brakes** | Wet disc brakes at rear, hydraulic engagement, front disc brake on propshaft; mechanical hand brake, air brake system supplied as standard.

**Electrics** | 12 V, 165 amps battery, 100 amps alternator, 3.2 kW/4 hp starter power.

**Linkage** | Category II, ELC with draft link control and shock absorption, standard slip control option. Optional front linkage and front pto package.

**Hydraulics** | Gear pumps with 70-litre/min flow for steering system, 190 bar; three double-acting spools with fixed position are standard; available oil for external use by trailed and mounted system, 190 bar; three double-acting spools

**Axles and running gear** | Planetary axle 1 3/8in, six splines.

**Transmission** | 24F/18R speeds, four main gears, two ranges, three powershift steps.

**Output and torque** | 45 kW, 60 Nm, 75 kW, 90 Nm.

**Fuel consumption** | Specific at max draft output 244 g/kWh Specific at rated speed 279 g/kWh Absolute max/rated speed 26.2/28.4 l/h

**Torque** | Max 544 Nm (1,400 rpm)
Torque rise 47.1 %
Engine speed drop 36.4 %
Start-off torque 96.3 %

**Transmission** | No. of gears in 4-12 km/hr range 10

**Rear lift capacities** | 100% max oil pressure, corrected: Bottom/middle/top 3,049/5,931/6,039 daN
Lift height under load 69.0 cm (20-89.0 cm)

**Hydraulic output** | Operating pressure 192.9 bar
Max flow 70.7 l/min
Max output 18.4 kW (62.1 l/min, 178 bar)

**Drawbar power** | Max (1,800 rpm) 78.9 kW (298 g/kWh)
At rated speed 78.9 kW

**Noise level** | Cab closed/open 80.0/84.0 dB(A)

**Braking** | Max mean deceleration 5.8 m/s²
Pedal force 27 daN

**Turning circle** | 4WD disengaged/engaged 10.7/11.4 m

**Test weight** | Front axle 2,045 kg
Rear axle 2,505 kg
Unladen weight 4,500 kg
GVWR 8,000 kg
Payload 3,450 kg
Power-weight ratio 48 kg/kW
Wheelbase 233 cm
Track width front/rear 172/174 cm
Ground clearance 38 cm

**Fuel consumption** | Absolute (l/hr) Relative (g/kWh)
1,000 1.911 291
2,000 1.911 291
3,000 1.911 291

**FUEL ECONOMY AT TYPICAL PERFORMANCE**

**Pto output** | Max (1,800 rpm) 85.8 kW
At rated speed 85.2 kW

**Engine** | Performance characteristics 2.1
Fuel economy 1.5

**Transmission** | Gearbox ratios/func 3.6
Shifting 2.8
Clutch, throttle 3.5
Pto 4.0

**Axles and running gear** | Steering 1.5
Four-wheel drive and diff lock 3.5
Hand/foot brake 2.0
Suspension 3.5

**Linkage/hydraulics** | Lift power and lift height 2.0
Operation 1.5
Hydraulic output 3.7
Spool valves 4.0
Hydraulic couplers 4.0

**Space and comfort** | 1.2
Visibility 2.5
Heating/ventilation 3.0
Noise level 4.0
Electric system 2.0
Build quality 2.0

**Grading system** | Excellent very good; good; average; below average; poor

The individual marks are extracts from our assessments and do not necessarily result in a mathematically conclusive overall mark.