FORTERRA HD 150

The Forterra HD is the most advanced tractor series we ever built.
The objective was to introduce a high horsepower tractor with a four-cylinder engine offering fuel economy and low operating and maintenance costs that no six-cylinder tractor with the same power can match, and at the same time deliver the same durability and reliability Zetor Forterra tractors have been known for almost 20 years. All that at a very attractive price.
Among the new features:
- Larger, heavier transmission and rear axle
- Extended wheelbase by 4" over HSX series (12" over the original Forterra)
- Updates to shuttle and PTO clutch software to prevent wear in extreme conditions (operator "riding" the clutch, PTO implement blocked)
- Extra heavy duty front axle with optional spring suspension
- Increased hydraulic flow
- Remote outlets with flow control
- All-new integrated command center on the right side of the cab
- Reduced cab interior noise levels
- HD series is still using and will continue to use Zetor's own engine, known for durability, easy and inexpensive maintenance and low cost of spare parts

ENGINE

The 150 HP version is identical to our 140 HP engine which has shown great reliability in Forterra 140 series over the past several years. The only difference is electronic injection pump governor, which is the sole reason for the additional 10 HP. The injection pump itself is the same as before (since 2008).

Various misconceptions are associated with comparisons between common rail and inline pumps:

- **Unlike in on-road vehicles, off road engines work mostly at full speed and high loads. Common rail engines run quieter and softer at low loads and low speeds (especially low idle). However, at high speeds and loads, there is no difference between common rail and inline pump - all fuel in injected at once. So when you compare our engine with competition, compare the noise level and softness of run not at idle, but at high speed.**
- **Our system tolerates bad fuel (contamination, water), just like all our previous systems.**
- **There is no difference in fuel economy between common-rail and inline systems**
- **Our injector nozzle (TIER 3 or TIER 4) still costs $30 (and practically never needs replacement). Compare with common rail system injectors ($500+).**
- **We service our injection systems in Jacksonville, just like all previous pumps. Mechanical pumps and mechancial injectors cost a fraction in service cost, compared to common-rail systems. Ask our customers who had their injection pumps overhauled by Zetor for $200-$300 after 20-30 years in service.**

Why choose a 4-cylinder?

1. Durability Concerns? With today's technology and materials, there is no difference in life between 4 and 6 cylinders. Our engines use large capacity bearings and have dual oil coolers. Compare with car engines – midsize cars are now all 4-cylinders, they consume less fuel and last just as long as six-cylinders. The same is with tractors.

2. Smoothness of run
The difference between our 4 and any 6-cylinder these days is practically none: With two precision balancing shafts in six needle bearings, our 4-cylinder engine is practically vibration-free.

3. Fuel savings
10% fuel savings over the 6-cylinder represents $13,000 over just 6000 hours.

TIER 4
TIER 4 Final Zetor Forterra engines entered production in May, after several years of testing. The engine is practically identical to TIER 3 engine (minor changes in piston combustion chamber). Emission reductions are accomplished by aftertreatment installed in exhaust section (DPF and urea injection). During durability testing, system worked very reliably. IMPORTANT: Zetor TIER 4 engines have further inceased torque and reduced fuel consumption (approx. 5%). It will be one of the most fuel-efficient engines in the world.

TRANSMISSION

Forterra HD is using transmission components identical to the HSX series, but built into larger and heavier housings.

The standard four-speed PTO further enhances the HD extreme fuel efficiency (using ECONO speeds will reduce fuel consumption by 20% in most applications).

Forterra HSX series transmission has been in production for four years.
We use high precision componets (valves, etc.) and sophisticated software so clutch engagement is very smooth. [If it is not, it just needs to be calibrated - typically once or twice on a new tractor, later maybe once or twice a year.]

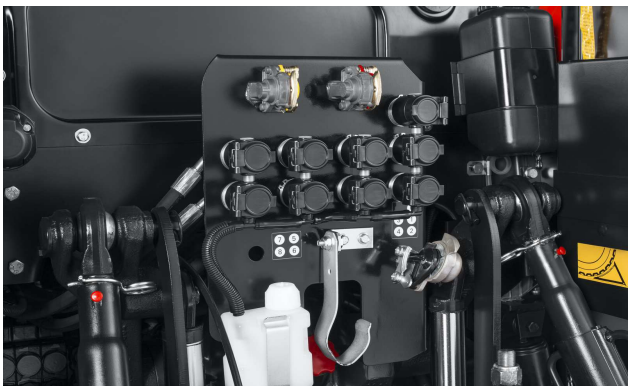
Forterra HSX generally worked well, but developed certain issues in some specific applications:

- **PTO clutch could have been damaged if it was engaged repeatedly at full engine speed with blocked (frozen) implement. The problem was solved 100% with new software. This software is standard on all Forterra HD. It is also on all HSX starting January 2015 and can be installed on any older HSX just by replacing the ECU (about 15- minute task).**
- **Sometimes, the PTO failure was accompanied by powershift band disintegration. Powershift as such is a proven Zetor unit used for 25 years. On the HSX the failure was strictly consequence of oil contamination caused by lining from PTO clutch.**
- **The shuttle clutch, although it is a high capacity wet clutch, showed about 5% failure rate by customers riding the clutch or engaging it at high engine speed and high load at high gear using the clutch pedal (clutch can never be damaged by using the automatic engagement by the switch at the steering wheel or in the gear shift knob).**
  The HD series is using a different cooling flow through the clutch, increasing flow by 100%. The exact same clutch and technology is used on the 165HP six-cylinder Crystal series.
- **The shuttle switch (made by COBO) showed at times very high failure rate. This has nothing to do with Zetor (switch is used by many other manufacturers). According to the latest information, COBO's production problem was fixed.**
- **Several cases of broken differential housings (8 total) were recorded during the past 3 years. The problem is caused by an error in the software supplied by Bosch for the 3-point control system. The problem occurs in one of several millions cycles, but you only need one cycle to break the housing. Staring 2015, Zetor applied internal protection (pressure relief) in all Forterra, HSX and HD tractors. With this modification, housing damage cannot happen.**

HYDRAULIC SYSTEM

Three point controls are the same as in HSX series. The three-point hitch as such is heavier.

The remote outlets are controlled by Bosch-Rexroth electronically controlled valve.
So far, no service issues were reported from our or other markets (HD is in use for 24 months now).
The controls are electronic, but we use knobs and switches rather that touch screen controls. Touch screen looks good, but is less accurate and reliable.



AXLES & WHEELS

HD is normally supplied exclusively on welded wheels (although rear axle has the same flanges as HSX so bolted wheels could be used). Welded wheels eliminate problems with loose bolts between rim and disc.
On the other hand, welded wheels have limited choices of wheel spacings.

Wheel settings with welded wheels (center-to-center):

Front: 73" at ground level (with tires 480/65R24)
Minimum front wheel spacing can be 66" with bolted wheels 14.9R24.

Rear: 73" or 66" by reversing the wheels (with tires 520/70R38)
Spacers for rear axle are available to accommodate any other wheel spacing from 66" up (cost $600 per set of spacers).

To obtain rear wheel spacing 60", bolted wheels 18.4R38 have to be used.

Extra wide rear wheels are available with low pressure flotation tires (26" wide) as alternative to much more expensive dual wheels.

Front axle with computer-controlled suspension is optional - complex, but proven Carraro component.

LODERS & LOADER CONTROLS

Heavy duty ZX 4.1 loader is the same as used on HSX.
Loader can have cable control or digital control (with Zetor electronic joystick or dedicated electronic loader joystick attached to the seat).
Both electronic options are reasonably priced.

CAB

Compared to Forterra HSX, the cab brings these improvements:

- **New headliner (no more brown stains)**
- **Cable controls for remotes replaced by electronic controls**
- **Mechanical throttle replaced with electronic controls**
- **New instrument cluster**
- **Most controls now in the command center on the right side**
- **Lower noise by 3 dbA (very noticeable) in TIER 3 and additional 2 dbA in TIER 4. Our dbA numbers AT FULL LOAD AND FULL SPEED on the HD series are not much different from most common rail tractors.**
- **Tier 4 tractors will have upgraded interior in tan/brown color**