

## TE 150

All the latest innovations have been brought into the 2-stroke enduro competition platform and many parts of the TE 150 engine have been rearranged, modified, or developed from the ground up. With an overall weight of just 18.8 kg (incl. oil, gear lever, clutch slave cylinder), the new 150cc enduro engine sets the benchmark for youngsters, beginners and enduro riders looking for an ultra-lightweight, agile 2-stroke character.

### Engine

Engine weights (incl. oil, gear lever, clutch slave cylinder, kick start → old generation):

- 2024 TE 150 18.8 kg
- 2023 TE 150 18.9 kg

The lightweight engine is designed with a focus on torque, making it easy to use for many different riders and riding preferences. The significant advantage of the new power plant comes from the new injection technology. The improved top-end rev is the immediately noticeable and feelable result. Riders can rev the engine longer and higher now, without experiencing a sudden loss of performance as felt on the older TPI engine generation.

The engine is designed to centralize rotating mass for optimal operation with the chassis resulting in a light and agile handling feel. Together with the benefits of mass centralization and reduced weight the anti-squat behaviour of the chassis was significantly improved by changing the backbone of the steel frame concept while the engine is mounted symmetrically on both sides.

An all-new Throttle Body Injection (TBI) system (Keihin 39 mm throttle body in combination with Vitesco EMS) and an electronic exhaust control was implemented on the 150cc enduro engine, allowing for a more compact engine design and free definable values for engine speed and load. The result is a tailor-made power delivery for each gear and every situation.

Another focus in development was put on the serviceability of the new 150cc enduro engine. A new oil level indicator and added service markers on the engine (▲) clearly show where to use washers, making maintenance and service easier than in the past.

A new water pump concept includes a shaft featuring a drive wheel instead of the previous centrifugal regulator and is protected by the new aluminium diecast water pump cover. The new water pump concept is shared among all 2-stroke enduro engines, making it easy for dealers to supply spare parts in the rare case it's needed.

The durability of the FE 150 swingarm bolts were significantly improved by adding a flange bushing. This setup gives the swingarm architecture the life span it deserves without keeping much attention to it in terms of service.

The changes to the engine alone make it easier to go faster and improve their riding experience for everyone, from beginners, racers to seasoned professionals.

- Pinnacle of performance → high power output, 18.8 kg
- New era with 2-stroke EFI technology (TBI)
  - Map 1 / white: a leaner map for hardpack conditions
  - Map 2 / green: richer map for loose ground like sand
- Keihin Throttle body → massive step in quality and performance compared to older generation
- Mass-centralisation → significant benefits in handling and manoeuvrability
- Improved serviceability of engine internals → added service markers

### Cylinder head

The cylinder head cover now features an external water temperature sensor located within the tubing for a maximum level of accurate values. A "front" indication makes it close to impossible to mount the cylinder head the wrong way, which not only helps mechanics but also tech-savvy end customers servicing engines by themselves.

The redesigned combustion chamber inserts follow the same logic. Mixing up inserts from different models is now a thing of the past. All these details significantly improve the overall engine quality and the serviceability on dealer floors.

The 150cc specific cylinder timing and porting results in a new compression ratio for the entry-enduro model.

- "Front" indication on cylinder head → avoiding wrong installations

- Redesigned combustion chamber inserts → impossible to mix-up with insert of other models
- Enduro-specific cylinder timing and porting → enduro typical compression ratio without compromises

### Cylinder

The cylinder features a 58 mm bore. The highly innovative electronical exhaust control manages the opening of both, the main exhaust and lateral exhaust ports via newly developed kinematics, activated via an actuator. On the TE 150 both the lateral exhaust ports and the main exhaust port open at the same time. The lateral exhaust ports open faster while the main exhaust port takes longer to open completely and deliver the maximum power.

The results are a much better rideability, engine control and a larger adjustability range of the engine characteristics. The power valve can be controlled according to the throttle position and engine rpms (vs. only engine rpms on mechanical system). Additionally, its auto-calibrating, meaning there is no more hassle with wrong power valve adjustments.

The machined finish on the upper contour of the exhaust port ensures accurate port timing delivering unrivalled performance in every situation.

- Electronical exhaust control → tailor-made, linear and predictable power delivery
- Machined exhaust port → outstanding performance and controllability

### Crankshaft

The new crankshaft is designed with weight reduction in mind to increase the liveliness and response of the engine (approx. -300 g compared to previous generation and the same as on the TC 125 model).

The perfect balance of rotating masses is achieved by balancing the weights of the crankshaft flywheel and the new rotor. With this new weight combination, vibrations are kept to an absolute minimum. The component is also positioned to ensure that the rotational mass created has very little effect on the handling of the motorcycle.

- New lightweight crankshaft → responsive engine character
- Combination of crankshaft and rotor → very little vibration

### Crankcases

The new TE 150 engine is designed with mass centralisation and weight minimization as the main criteria. As a result, the crankcases have been designed to house the internal components of the engine in the perfect position to achieve the ideal centre of gravity while adding the least possible weight. The casings are manufactured using a high-pressure die cast production process, resulting in thin wall thickness while retaining exceptional reliability.

The black powder coating provides additional durability and a premium look, while service markings and oil level markings improve the serviceability. Additionally, the engine is connected to the frame with symmetrical engine mounts (left and right side) resulting in an improved flex characteristic.

- Light and compact crankcase, optimised mass-centralisation
- Redesigned, symmetrical engine mounts
- Improved serviceability of engine internals with added service markers
- Optimized crank case pressure sensor: larger hose diameter, more robust against soiling with oil carbon particles, better signal quality and better engine load detection

### Gearbox

The 6-speed gearbox is manufactured exclusively by Pankl Racing Systems ensuring the highest level of durability and reliability. The gearbox features specific enduro gearing while the gear lever features an innovative tip design that prevents dirt build-up. The gear shifting has been significantly improved by redesigning the shift drum and shift fork. The shift shaft is moved ca. 30 mm backwards, which improves the overall leverage and results in a smoother and more precise shift feel. A new lever design and the new transmission ventilation concept rounds off the new shift mechanism.

- 6-speed gearbox → manufactured by Pankl Racing Systems
- Redesigned shift drum and shift fork → improved leverage, more smooth and precise shifting

- Improved shifting mechanism, friction optimized in every detail → less necessary lever force

### DS Clutch

The TE 150 features a Diaphragm Steel (DS) clutch. The exclusive characteristics of this system include a single diaphragm steel pressure plate instead of traditional coil springs. The clutch basket is a single-piece CNC machined steel component that allows the use of thin steel liners and contributes to the compact design of the engine. A new clutch slave cylinder brings the advantage to dealers of keeping less spare parts in stock. The new design is now used among all Husqvarna enduro models.

- DS clutch → lightweight with consistent action and exceptional durability
- New clutch slave cylinder → less spare parts stock for dealers

### EFI (TBI)

The Husqvarna 2-stroke enduro models come with an all-new electronics-controlled fuel injection. The Throttle Body Injection (TBI) was initially introduced with the 2023 2-stroke motocross range.

In cooperation with Keihin, we developed a 39 mm throttle body fulfilling the needs of an innovative and state of the art 2-stroke enduro injection. The ECU is supplied by Vitesco and works in harmony with the Keihin throttle body by always delivering the right amount of air-fuel mixture. Therefore, the ECU continuously analyses water temperature, air temperature, ambient pressure, pressure within the crankcase, rpm and Throttle Position (TPS) to calculate the perfect air-fuel mixture for any riding situation.

Additionally, the reed valve case received an important design update too. Newly added composite flaps on the outside of the reed valve case provide an improved sealing of the intake tract. This new design avoids fuel excess in extreme up or downhill sections, which could lead to overly rich engine settings while Boyesen Inc. continues to supply the carbon fibre reed petals inside the reed valve.

A beneficial side effect of the new electronic fuel injection and the ECU is the implementation of the innovative electronic exhaust control.

With all these innovative features it was also possible to introduce different engine maps on the 150cc enduro engine. Map 1 (white) is the standard, more lean map for hardpack conditions, while Map 2 (green) is the more rich map for added lubrication in deep soil environments. Both maps can be selected via the new 2-stroke Map Select Switch on the left side of the handlebar.

- New EFI by Keihin (39 mm throttle body) → optimal power delivery and performance in any condition
- Updated reed valve case design → guarantees right air-fuel mixture even in most extreme up or downhill sections
- New injectors with improved Sauter Mean Diameter (SMD) → smaller droplets

### Oil Injection

Additionally, the ECU controls the specific amount of oil injected into the throttle body. It's not consistently a mix of 1:60 but varies pending on the riding situation and can be leaner or richer.

The new TBI injection has the big benefit of a more homogeneous fuel/air mixture due to a later oil injection compared to the older TPI engine. Now (TBI), the injection point is at the membrane flange while in the past (TPI) the position was at the throttle body. The oscillation of membranes increases the oil/fuel mix further and leads to an unreached level of atomization. As a result, the engines have a lower risk of engine seizing, a better internal combustion and a better rideability in all conditions. The drawback is a higher fuel and oil consumption.

The engine character of the TPI engines was not known for being very lively. Actually, quite often in low revs with low engine loads, "oil nests" were common, which led to delayed and sluggish engine responses. This is now a thing of the past and the new engines are much more versatile, fulfilling the needs of different rider levels and use cases. From hard enduro to classic enduro.

## E-Start

The Husqvarna enduro range now comes with E-Start only. A kickstart is not in place any longer and cannot be retrofitted. The starter motor comes without any intermediate shaft, saving weight and allowing a compact engine design with perfect integration. A robust but also compact cover protects the starter motor from damages caused by roost or rocks. The 12.8V 2 Ah Lithium-Ion battery is placed under the rider's seat close to the centre of gravity. The engine can easily be put to life by pressing the new combined start/stop switch on the right side of the handlebar. A new high-quality stator and pickup is built into the TE 150 engine for improved reliability and an efficient power supply for the electronics.

- E-Start → less loss of time when stalling engine in races and improved user friendliness
- Li-Ion battery → lightweight, 1 kg lighter than a conventional battery
- High-quality stator and pickup → improved reliability / efficient power supply for electronics