

1983 Husqvarna 510



THOR'S

It's ironic that Husky's revolutionary air cooled 510 four stroke failed to set the world alight when it made its debut in the early '80s.

That's not to say that the Husky was an outcast. In an era when two strokes still ruled the jungles, the 510's brilliance was overlooked and the glowing press reports it earned were soon forgotten. What remained were folk tales of a cantankerous and imperfect design that soon joined the urban myths of motorcycling.



Greg Ainsworth's '83 Husky 510TX near Dargle, NSW by Bill Forsyth



THUMPER

Big bore two strokes could do no evil and Husky's own CRs and WRs were as good as anything to come out of Japan in 1983.

By contrast, the 510 was expensive, exotic and an unknown quantity that was all too easily labelled as "a bloody European four stroke".

That could have spelled the end of the Husky 510 saga, however, in recent years the big Swede has made a comeback with the boom of twin shock racing. Liberated from the 1980s curse of four stroke blindness, the Husky is now being rediscovered and evaluated on its own merits by racers and restorers.

Twenty years later, the 1983 Husky 510 has not changed. Unlike its new breed of owners the Husky has not put on any weight, even if it might look a little pudgy lined up alongside a 2003 model Honda CRF450R. To this day, the 510 is exactly what Husqvarna's engineers had in mind - the lightest, toughest four stroke of its era.

Husqvarna's off road racing heritage was instantly apparent when Husky's new four stroke motor first saw the light of day. Unlike the cooking tune Honda XL/XR or Yamaha XT/TT engines, the air cooled Husqvarna 510 four stroke was a no frills race motor, devoid of aspirations to a more sedentary dual sport life. If you wanted a play bike to take down to the farm on the weekend, a 510 Husky would not have been on your shopping list.

Rather than play follow the leader with a bulky Japanese style SOHC air cooled four stroke, Husqvarna applied three key design criteria at the outset of their project. Their new engine had to be as light and slim as possible, with the lowest achievable centre of gravity.

Husky engineers focussed on low engine weight as the vital ingredient in creating a competitive off road four stroke.

Logically, they approached the new four stroke concept from a two stroke perspective, drawing on their own experience as well as the basic engine configuration of existing two stroke models. They had specified ultra narrow crankcases, so many existing two stroke

engine components were used, with some adapted to work within the alien environment of valves and camshafts. In essence, the Husky team adapted an existing two stroke design to accommodate the cam chain and valve gear drive needed for a four stroke. If that in itself was not lateral thinking, they then abandoned the idea of using a conventional oil pump and specified a two stroke-inspired mist lubrication system combined with a dry sump. Not only was the weight of an oil pump eliminated from the equation but the dry sump also allowed for a significant reduction in overall engine height.

Two stroke design principles also influenced the choice of transmission and the 510 gearbox was an existing Husky two stroke design. It was produced in two variants - a close ratio four speed for the 510TC Motocross model and a six speed cluster for the 510TE Enduro and 510TX Cross Country.

Such a compact powerplant also allowed Husky to use a slim two stroke style chassis in 4130 chrome moly. The curved upper frame backbone tube of the 510 was the only difference between it and the WR two stroke chassis. As a result, the 510 weighed just 8kg (17.6lbs) more than the two stroke Husky 500XC with which it shared most major components.

Absolute proof that "less is more", the 510 motor was pure simplicity.





Photo: Geoff Eldridge 1983 - VMX Library

1983 HUSQVARNA 510

Narrow powerplant and slim two stroke style chassis was a confidence-inspiring package

Available in two capacities (490cc & 503cc) and fitted to three models, its specifications read like an aftermarket tuning catalogue - four valve cylinder head, forged aluminium piston, chain driven OHC configuration with the camshaft running in bearings and rocker arms with roller bearing followers.

There was no engine oil pump. A specially designed steel clutch basket was used to deposit huge amounts of oil onto the cam chain which then delivered all top end lubrication. Bottom end lubrication was by an equally as ingenious method which Husky termed Reed Activated Lubrication (RAL). This system used the piston to function like an oil pump, so that when it moved upwards in the cylinder it created a partial vacuum in the engine crankcase. At a specified point, the

piston uncovered a port in the cylinder wall and oil mist was drawn into the cylinder. This oil mist lubricated the moving parts and also allowed surplus oil to collect at the bottom of the crankcase. When the piston moved downwards, pressure built up in the crankcase and the surplus oil was expelled via a reed valve to the gearbox. Without any need for an oil pump, Husky was able to deliver engine oil for heat transfer as well as lubrication.

Cold starting was not a problem thanks to the pumper style 36mm Dell'Orto carb and a manual valve lifter, providing a strict discipline of zero throttle was followed religiously. Hot starts were a far different story. Riders soon learnt the drill of shutting off the fuel tap, kicking the motor through to clear away the remaining fuel and then holding their mouths just the right way.

In theory, if everything was done by the book, a dead 510 could be brought back to life, like Lazarus, with just one kick.

To anyone expecting massive down low grunt and a degree of docility, the 510 was an eye opener. Unlike the more mundane big Japanese four strokes, the 510 was a competition oriented powerhouse, capable of mixing it with real world two stroke race bikes. Although not many test reports appeared on the 510, those few which did make it to print unanimously ranked the Husky as the bullet train of the four stroke world.

Fortunately Husqvarna's design focus went well beyond the 510's brilliant engine. Other weight saving factors were also at work to keep the 510TX down to a svelte 120kg (264lbs).



Photo: Bill Forsyth

Husqvarna created the 510 four stroke using two stroke priorities - slim, compact and lightweight

They included dual mufflers which were not just a styling touch but also trimmed weight and minimised bulk. In order to meet exhaust noise requirements with its dual pipe exhaust system, Husky would have needed to install a single muffler that weighed nearly three times as much as their compact dual units.

In common with Husky's 1983 two stroke models, the 510 used the twin shock Ohlins ITC or Immediate Track Control, rear suspension system which was as good as, if not better than, the new breed single shock designs of the day. All three 510 models used the twin shock ITC rear layout and a 28 degree steering head angle which proved to be the best compromise for the 510's multi-faceted role as either motocrosser, desert racer or ISDE contender.

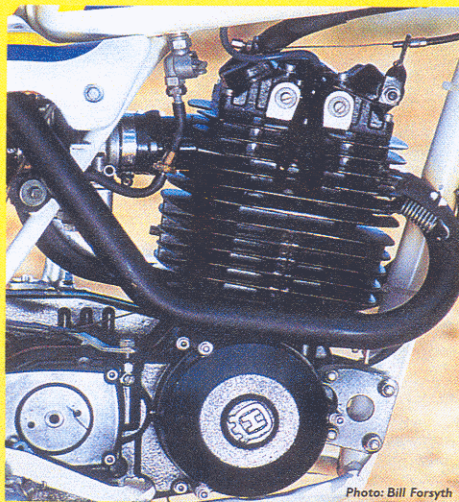


Photo: Bill Forsyth

Four stroke 510 weighed just 17.6lbs (8kg) more than the two stroke Husky 500XC

Also common to all three models were conventional 40mm forks and powerful 160mm (6.3") twin leading shoe front brakes. Front suspension travel ranged from 270mm (10.6") for the 503cc, six speed 510TE Enduro to 300mm (11.8") on the 490cc four speed 500TC Motocross and 503cc six speed 510TX Cross Country. Rear wheel travel was 300mm (11.8") and 345mm (13.5") respectively.

As potent as it was, the 510 proved to be less than perfect in its debut year and earned a reputation for burning pistons and melting ignitions. While Husky was unable to fully address the heating problems until they converted the 510 to liquid cooling in 1986, they did partially rectify the ignition meltdowns by relocating the ignition components to up under the fuel tank in 1984. Unfortunately throughout 1984 the air cooled

1983 Husqvarna 510



Photo: Geoff Eldridge, 1983c-VMX Library

Available in two capacities (490cc & 503cc) the four stroke motor was fitted to three models. Six speed TE Enduro was 503cc

510 engines continued to run hot and the ignition still lost at least half its efficiency through overheating.

The 1986 arrival of liquid cooling gave the 510 a new lease of life.

Even though Husky had already upspec'd the 510 in its second model year with the inclusion of a Brembo front disc brake and their own 350mm travel Ohlins single shock rear suspension, overheating and fuel vaporisation problems were commonplace.

Dropping the operating temperature by around 30°C with the advent of liquid cooling instantly enhanced its reputation. The most powerful four stroke in the business was now also as reliable as a rock and could be hot started by mere mortals. Beyond that point the Husky needed very little help.

Unlike its Japanese four stroke counterparts, the 510 failed to stimulate the aftermarket with any great demand for engine tuning components apart from exhaust systems. Most 510 development work focussed on suspension refinements. It seems the Husky delivered exactly the horsepower that most riders wanted - just under 40 horsepower and with great gobs of muscle. Precisely what Husqvarna's engineers had in mind from Day One.



Photo: Bill Forsyth

Gearbox was an existing Husky two stroke design. Close ratio four speed for the 510TC Motocross or a six speed for the 510TE Enduro and 510TX Cross Country

SPECIFICATIONS 1983 HUSQVARNA 510

	510TE	510TX
Dimensions		
Wheelbase	1,480mm 58.3"	1,498mm 58.9"
Ground clearance	320mm 12.5"	385mm 15.2"
Seat height	960mm 37.7"	997mm 39.2"
Weight	120kg 264lbs	117kg 258lbs
Engine		
Type	Four stroke OHC single	
Bore x Stroke	91.5 x 76.4mm	
Capacity	503cc	
Power	38.6 hp @ 7,500 rpm	
Compression ratio	9.5:1	
Oil system	Reed Activated Lubrication	
Carburettor	Dell'Orto 36mm	
Induction	Four valve	
Ignition	SEM CDI	
Clutch	Wet, multi disc	
Transmission		
Type	Constant mesh, six speed	
Primary reduction	Gear	2.6:1
Secondary reduction	17T/48T	2.8:1
Ratios	1st	2.61
	2nd	1.81
	3rd	1.37
	4th	1.04
	5th	0.88
	6th	0.74
Chassis		
Front suspension - 510TE	Husqvarna forks - 270mm (10.6")	
510TX	Husqvarna forks - 300mm (11.8")	
Rear suspension 510TE	Ohlins ITC shocks - 300mm (11.8")	
510TX	Ohlins ITC shocks - 345mm (13.6")	
Front tyre	3.00 x 21 4 PR Trelleborg	
Front brake	TLS drum - 160mm (6.3") diam.	
Rear tyre	5.00 x 18 4PR Trelleborg	
Rear brake	SLS drum	
Capacities		
Fuel tank	10.0 litres	2.7 US galls



Photo: Chris Malam

Only a big Swede could lure Robin Packham away from his 490 Maicos

Having been riding 1981 Maico 490s for about eight to nine years, I used to think during a race, "This bike is supposed to be the dog's.....?" and "Motocross must be easier than this!". Often I just asked "Is it me?"

To be fair, the Maico is a good bike, but after ignition trouble at one race, I borrowed a friend's 510 Husky. By comparison the Husky was a dream to ride. Even though the suspension was too soft for me, it made up for

HOLY HUSKIES, ROBIN!

it by having masses of power.

It was the sort of bike that had real potential.

I could wring its neck out of a corner or down the start straight and the front wheel wouldn't keep coming up. The Husky 510 was so user friendly that I decided I had to have one. Six months later I had bought a 510 and had completed a ground upwards rebuild. I was ready to start racing after refining an already nice bike. It only took a few race meetings to reveal all of its shortcomings, which were mainly minor problems that could be overcome with a little development.

The first was that the Husky was a pig to start, so I fitted a brand new Dell'Orto carb and that made a world of difference - better throttle response, smoother tick over and around 5% more power. But there was still a starting problem. A little luck and in depth investigation confirmed my suspicions that the standard jets were too rich. Changing to slightly smaller sizes improved the starting and also provided a bit more power. Modifications to the kickstart operating cam also helped; by increasing the angle of swing of the kickstart lever to give

more crankshaft speed for starting.

I now had a 510 that started well and went like a train!

However, it still didn't turn or handle as well as it could, so we started by making new fork caps to allow the forks to be moved up through the steering yokes as far as possible. We also remade the internal fork valving to give proper damping as was originally intended. Next, we fitted the rear suspension with a decent twin spring setup with rates increased by around 30%, even though I'm only only 175 pounds straight after Christmas. This in itself helped to keep the back end up and improved turning. The standard shocks had their hydraulic bottoming out system removed and we fitted decent bump rubbers to the rods and replaced the damping system to work with the heavier springs.

My 510 now handled fantastically well and would turn inside another Husky with ease. Also as it's 30 pounds or so heavier than a Maico and has a wheelbase two inches longer, it's much more stable over rough ground. It is now a well sorted bike that I can just get on and enjoy riding. All I have to do now is sort the rider!

So do I like the 510 Husky? I've got two motocrossers and an enduro version for the road.

**Robin Packham
Dorset, England**

Robin Packham is the principal of Falcon Shock Absorbers. He told us "We market many of the parts necessary for any of these Husky 510 improvements and technical information is always available by phone or fax".



By 1986 Husqvarna had been taken over by Cagiva Commerciale S.p.A. Series production was kept in Sweden until 3 December 1987, but still in 1988 some bikes were manufactured in Sweden, in the R&D or Racing department of Husqvarna at Ödeshög.

According to Husqvarna Fabriksmuseum records, my 1988 model 510 TE is one of the very last ones assembled in Ödeshög and was delivered in September 1988. It is frame #ZHUTE 510XJS027688 (U.S specification) and engine #2222-0316 (European specification). One bike on show in the Husqvarna Museum is the last one of these and has frame #027693. These bikes were assembled "of parts" after the series production ceased, hence they have a mix of U.S and European specifications. These last bikes were intended for the ISDE in 1988 and only some participated. My bike was intended

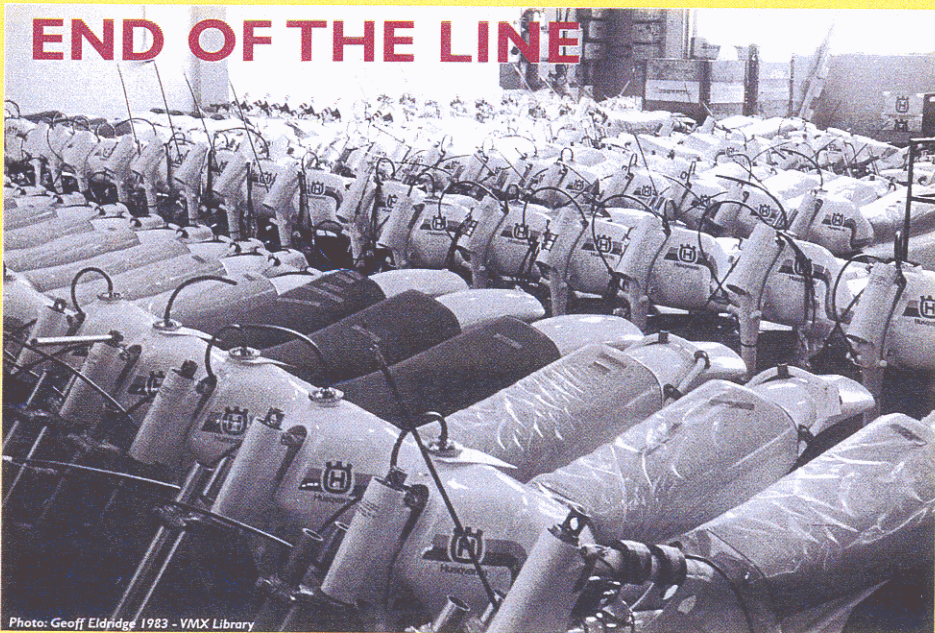


Photo: Geoff Eldridge 1983 - VMX Library

to be delivered to the Swedish Army Team, but the order for this bike was cancelled and the bike has been resting since then. The speedometer shows zero miles.

Unlike the one on show in the Museum, this bike has some factory modifications to make it ready for the Six Days. The most important one is the water pump mounted on

the head camshaft. This allows the pump to be located in a more protected position, unlike the series bikes which had the pump mounted on the left side engine case.

This bike is now part of my private collection in Montevarchi, Italy.

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