

SINGLES IN LOVE WITH CHIP?

STILL A MECHANICAL TRENCH?



Single cylinder, the last trench of mechanical resistance'. A title between the melodrama and the war de-enactments destined to fade. At Bauma, in April 2019, Hatz opened the electronic control season also on mono under the initials E1, available for both B and D series. Here we will deal with the 300 cc engines by Hatz, Kohler and Yanmar.

However, the path is shared by all 'singles' up to the half-liter top. As a statement issued by Richter-Schützeneder, Hatz Sales & Marketing Director, said: «We believe that the trend towards downsizing and hybridization will be rewarding. Take for example the Led Hybrid concept, a light tower, located here outside, which features the 1B30E, the smallest 4.5 kW mo-

Bauma. Monday, April 8th, 2019: the single-cylinder engines appeared at the Hatz booth in an unusual guise. They are equipped with E1 technology, which introduces electronic management also on the mono. We'll tell you the moves of the triad of the single-cylinder diesel aimed at updating this 'commodity', which still has much to say: Hatz, Kohler and Yanmar

tor. The light tower is able to benefit from E1 technology because, unlike compactors and other applications, it works without any operator. Before, we wouldn't be able to know the operating conditions of the engine, how external temperatures and altitude act, while the E1 is instead able to provide these information also thanks to remote connectivity».

Summing up the power range covered by the E1 technology used on the B series (1B50E, 1B30E and the brother with vertical shaft, the 1B30VE) we start from 6.7 and reach 8 kW. Faced with the electronic turning point Yanmar relies on its roots, which lie in the meticulous development of combustion.

An approach that prompted Osaka

What is CREIS?

CREIS has an open injector which allows partial fuel vaporization and pre-mixing. During the ascending phase of the three-diameter pumping element it uncovers the radial holes in the body, the fuel then flows due to the negative pressure between the larger and intermediate cylinder of the pumping element. By reversing the movement, due to the particular profile of the injection cams, when the pumping element is lowered the fluid is sent through a special duct followed by a non-return valve between the central and lower part of the pumping element. The amount of fuel is determined by the inclination of the pumping element.

to customize the injector (featuring a timing modeled around the Stannadyne rate shape nozzle).

But let's briefly take stock. The LN series is the silenced evolution of the LV, a development of the La platform which is ready for EPA standards. In meeting the limits on noise emissions (see directive 2005/88 EC onwards) which facilitates the work of genset manufacturers the mechanical injector by Yanmar itself plays a crucial role and is appreciated for pre-injection at low loads.

Among the various 'sound-absorbing' solutions are plastic covers, the intake manifold integrated into the air filter box and the increased mass of the crankshaft.

Since their Tier 4 final edition Yan-

BRAND MODEL	HATZ 1B30E	KOHLER KD15 350	YANMAR L70V
I. D.			
B x S mm - S/B	80 x 69 - 0,86	82 x 66 - 0,80	78 x 67 - 0,86
N. cil. - dm³	1 - 0,34	1 - 0,34	1 - 0,32
Maximum power kW - rpm	4,5 - 3.600	5,1 - 3.600	4,8 - 3.600
Mep at max power bar	4,4	5	5,1
Piston speed m/s	8,3	7,9	8
Maximum torque Nm - rpm	14 - 2.000	16,6 - 2.400	17 - 2.400
Mep at max torque bar	5,4	6,1	7,1
Torque at max power Nm	11	13	12,7
% power at max torque (kW)	68,5 (3)	81,90 (4)	92,20 (4)
DETAILS			
Specific power kW/dm³	12,9	14,5	14,9
Specific torque Nm/dm³	42,3	47,5	55
Areal spec. power kW/dm³	9	9,62	10
RULES AND BALANCE			
Dry weight kg	40	33	38
L x W x H mm	370x298x431	386x301x445	395x448x472
Volume m³	0,05	0,05	0,08
Weight/power kg/kW	8,9	6,5	7,9
Weight/displacement kg/dm³	115,3	94,6	118,8
Power density kW/m³	90	102	60
Total density t/m	0,80	0,66	0,48
Displacement/volume dm³/m³	6,94	6,98	4

Cummins and Stanadyne

Among the milestones of Cummins there's also the injector pump, which Cummins claims to be the inventor of. The hydraulic mechanical layout did not undergo relevant variations until the advent of electronics and the



appearance of the solenoid valve that manages the injection dosage and timing. Up to Tier 3 it was believed that the injector pump was the most technologically suitable solution and the mandatory way to manage emissions. Stanadyne instead invented the Rate shaping nozzle, a variable geometry injector which features several small spray holes, a constriction inside the sprayer and a needle with a larger diameter. In practice, it is a variable geometry injector which modulates the flow rate according to the lift (in the photo, Cummins and CREINS).

mar mono engines have both fixed and variable rpm, replicate the previous dimensions and feature the catalyst (this is the exclusive contribution of the Japanese to the evolution of single-cylinder engines). Since December 2014 they are in fact available with catalyst for unburnt hydrocarbons. DOC is not a one-shot experiment for Yanmar engineering, pioneering the exhaust gas recirculation in Stage III in under 56 kW range where TNV (leaving the mono segment for a while) have always been appreciated.

Kohler also thinks of applications such as light towers, which are suitable for hybridized solutions, including the use of solar panels.

To complete the picture let's dive into the past, in 2006, on the eve of the last annual edition of EIMA International, when we wrote «*The LD range has been enriched with the 's' version. The re-engineering involved the injection system, the combustion chamber and the injection pump, in particular the propeller and the delivery valves. The RSN Stanadyne injector (see box on the left) is strategic in converting the 350 to the silenced version able to modulate the flow according to the lift*».

BRAND MODEL	HATZ 1B30E	KOHLER KD15 350	YANMAR L70V
INDEX			
Torque	17,1	13,3	13,4
Performance	2,6	2,7	2,8
Stress	4,6	4,7	5
Lightness	11,7	10,5	12
Density	46,9	52,7	37,4
DIESEL INDEX	5	5,3	5,4

1 | YANMAR



2 | KOHLER



3 | HATZ

