

## Identification of compression stroke at 4-stroke engines with unit TCIP4 v96.

Ignitions on carburetor engines usually ignite every revolution. It is a system of so-called "lost sparks". This system is used mainly because it is simpler and does not require a cam position sensor. Especially for in-line 4-cylinders, the system is simplified by using ignition coils with two outputs. One outlet fires into the compression stroke and the other outlet fires into the exhaust stroke. However, a lost spark ignition system may not be desirable in some cases. E.g. if we use four in-line 4-cylinder four pipe-spools (COP spools, pencil-spools) from a modern motorcycle, then we have a choice of three variants of connection and setting of the unit:

- 1) connect coil 1 and 4 in series and coil 2 and 3 in series. This connection uses only 2 outputs. The excitation time of the coil can be relatively long (total excitation time approx. 3-4 ms).
- 2) use 4 outputs and connect the coils separately. The wake-up time should be relatively short (approx. 2 ms). Because the coils burn every revolution, they are more stressed than their original use on modern injection-molded motorcycles. There, the coils almost always burn only once every two revolutions (only to the compression stroke). The compression stroke is usually identified by a cam position sensor.
- 3) use 4 outputs and use the procedure to identify the compression stroke. Then the coils can burn once every two turns.

The elements of setting this procedure are in the software on the Motorcycle tab. The following options can be selected:

- a) No - the ignition will continue to operate in lost spark mode.
- b) Compression deceleration - the unit examines the deceleration of the engine in the compression stroke and its acceleration in the working stroke. The unit will start in lost spark mode. If the unit finds the desired cyclic alternation of deceleration and acceleration of individual cylinders - it switches off the ignition in the assumed exhaust cycle. This method cannot be used for so-called symmetrical motors. Symmetrical is generally an engine where the pistons go together to the top dead center. E.g. in-line 4-cylinder. Or an in-line 2-cylinder where the pistons go together to the top dead center. But, for example, an in-line three-cylinder is not symmetrical, so this method can be used with it.
- c) IAP - the unit examines the suction pressure of one cylinder. Based on the pressure drop in the suction stroke, it determines the speed at which the incriminated cylinder has a compression stroke and switches off the ignition in the assumed exhaust stroke. In software you can set if cylinder will firing in the same revolution as compression TDC of cylinder with pressure sensor or in opposite revolution (for each cylinder).

Finding a compression stroke and switching the unit to fully synchronous mode is indicated for each channel.

This procedure is also included in other units (DCCDIP1 race, DCCDIP2, DCCDIP2 race, DCCDIP4, Racing 3).

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