1 cylinder 2 strokes 4 strokes pickup on crankshaft pickup on crankshaft pickup on camshaft There is no camshaft on a 2 strokes. Each time the piston reach TDC, there is a spark. Each time the piston reaches TDC (Top Dead There is no wasted spark. Center) of the cylinder, there is a spark. So a useful spark happens at compression stroke and another wasted spark appends during exhaust There is a spark only when piston reaches TDC of the stroke. cylinder during compression stroke. pickup TDC TDC pickup TDC pickup at 45° at 45° at 45° BTDC BTDC BTDC 1 engine cycle 1 engine cycle 1 engine cycle cyl 1 exhaust compr. compr. compr. exhaust compr. compr. 360° 360° 360° 360° 720° CDI compatibility CDI compatibility **CDI** compatibility Yes Yes No as there are 1 pickup signal every 2 rotations, CDI believes that the engine is running at 5000 when it run at 10000rpm

	2 cylinde	ers	
Opposed pistons.		Synchronous pistons.	
Pistons are moving in the <u>opposite</u> direction.		Pistons are moving in the <u>same</u> direction.	
(one goes up while the other goes down)		(both go up and down at the same time)	
180° crankshaft		360° crankshaft	
Most Japanese Straight-twin		Old British Straight-twin	Some V-Twin engines
		180° crankshaft Flat/boxer engines	
pickup on crankshaft		pickup on crankshaft	
2 strokes	4 strokes	2 strokes	4 strokes
Each time one of the pistons comes to	Each time one of the pistons comes to	Each time the 2 pistons come to	Each time 2 pistons come to TDC, there
TDC, there is a spark.	TDC, there is a spark.	TDC, there is a spark.	is a spark.
So a useful spark happens at compression	So a useful spark happens at compression		So a useful spark happens at
for cyl1 and at the same time on exhaust	stroke and another wasted spark		compression stroke and another wasted
for cyl2.	appends during exhaust stroke.		spark appends during exhaust stroke.
There must be 1 trigger point per	There must be 2 trigger points per	There must be 1 trigger point per	There must be 1 trigger point per
crankshaft rotation.	crankshaft rotation. (1 for each piston)	crankshaft rotation.	crankshaft rotation.
Lengine cycle spark Cyl 1 Compression Intake Compression Intake Explosion Exhaust Explosion Exhaust 180° Spark Cyl 2 Intake Compression Intake Compression Exhaust Explosion Exhaust Explosion Exhaust Explosion Exhaust Explosion	1 engine cycle spark Cyl 1 Compression Explosion Exhaust Intake Compression 180°	1 engine cycle cyl cyl cyl 1+2 1+2 1+2 compr. exhaust compr. 360° 360°	1 engine cycle tyl cyl cyl cyl 1+2 1+2 1+2 compr. exhaust compr. 360° 360°
CDI compatibility	CDI compatibility	CDI compatibility	
Analog CDI: Yes	No	Yes	
Wasted spark	spark occurs at wrong time		
Digital CDI: No 5000rpm will be seen as 10000rpm			