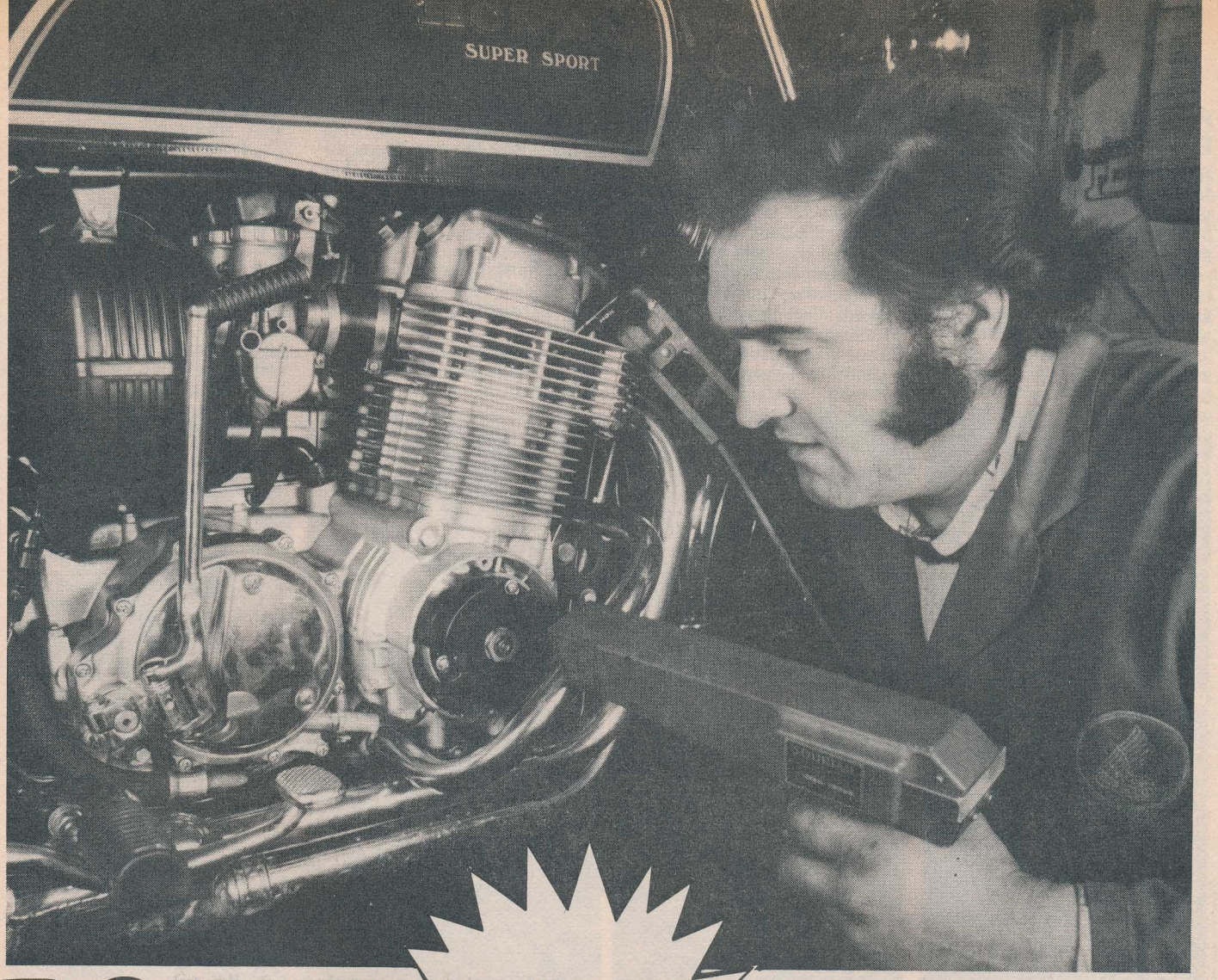


POINTLESS SPARKS

Contact breakers versus electronics . . . Charles Deane investigates and tests both ignition systems.

THE sales literature for most motorcycle accessories usually makes one wonder how we've ever managed to cope or ride without them. If you want a higher top speed, acceleration to blast your mates into the weeds, fuel consumption to make scrooge seem a spendthrift, less this and more of that . . . part with your money and they have the answers.

Trouble is, when we've parted with our money, it's too late. Suddenly our dreams are shattered and after a day or more in the workshop, we are still fitting that supertune goody that the manufacturers' said would take only twenty minutes to clip on and make us smile all the way to the bank.

So, how come we are showing the way to fit electronic ignition and looking into its vices and virtues? The answer was to find out if the claims were true and how difficult or easy the work of swapping systems.

We were presented with the latest electronic ignition system to come on to the market, the Martek 440 compliments of the importers, Trans-Am Cycle World of Christchurch, Dorset, while Powersport Motorcycles situated in the same south coast town offered a low mileage, never-raced-nor-rallied Honda CB750F1 in prime condition on which to test the gear.

Our first aim was to ensure that the Honda 750 was correctly set up with the standard contact breaker ignition and everything that mattered was in as near perfect running condition as possible.

Contact breaker points gap, cam dwell, carburation, etcetera were all checked by Ollie Kite on the Souriau test gear. We then ran the bike in perfectly standard trim to obtain fuel consumption, brake-horse-power at the rear wheel, as well as maximum speed and acceleration times.

Next stage was to return to Powersport Motorcycles in Bridge Street, Christchurch, where the Martek electronic ignition equipment was fitted. Workshop manager, Vic Hiscock, of grass track racing fame carried out the task and was pleasantly surprised at how simple the job worked out.

Without the trailing cables and lighting gear of our photographer, plus constant interruptions to 'hold it . . . watch the birdie!' Vic reckons that the complete ignition swap should take no more than twenty minutes, including timing, for the skilled mechanic and for the D-I-Y enthusiast with a strobe timing light, no more than half-an-hour.

The fitting instructions supplied with the Martek 440 are excellent with only one additional electrical connection (into the stoplight live supply) having to be made.

FITTING THE ELECTRONICS

The first step in fitting the Martek 440 ignition is to disconnect the two snap connectors to the wiring for the contact breaker points (colour coded blue and yellow) and the single black wire which is the live supply to the stoplight switch. **(1)**

Now undo the retaining screws to the c.b. points cover **(2)** and lift off.

Remove all three retaining screws to the c.b. points backplate **(3)** and undo the c.b. cam retaining nut **(4).**

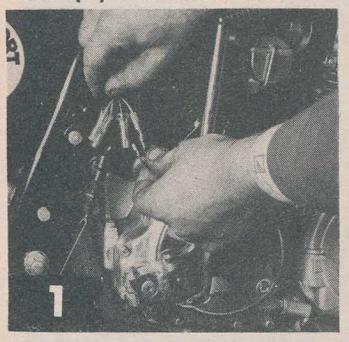
The complete backplate may now be lifted clear and the wiring to c.b. points threaded through the grommet in the housing. **(5)**

With the backplate removed, the contact breaker cam and automatic advance/retard unit simply slides from its spindle **(6)** and by partially opening the A/R unit bobweights, it is possible to remove the c.b. cam **(7)**.

Note that the cam is keyed on the A/R unit and that it is possible to have the ignition timing 180 degrees out of phase if the cam is fitted incorrectly.

Dismantling work is now completed and the electronic ignition system is ready to be fitted.

The first and probably the most fiddly job is attaching the centre rotor of the ignition system to the A/R unit. This rotor replaces the c.b. points cam and is keyed in exactly the same way and may also be fitted 180 degrees out of phase. The problem lies in that the A/R spindle has to pass through the electronic pick-up 'backplate' **(8)** while at the same time the rotor is slid onto the spindle with the bobweights held partially open to engage over a lip on the rotor sleeve.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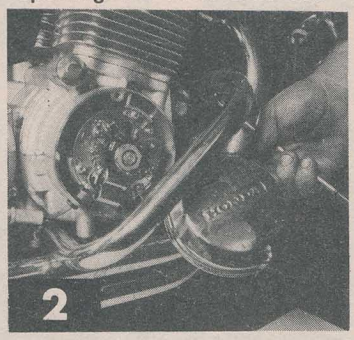
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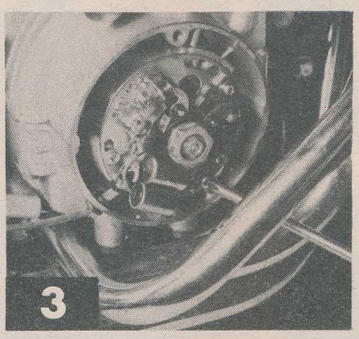
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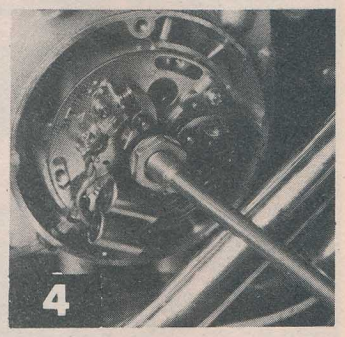
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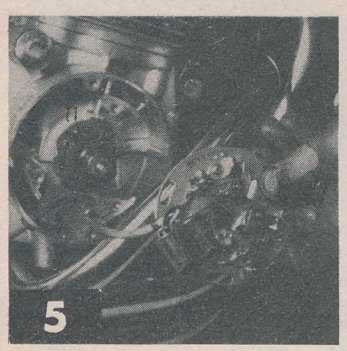
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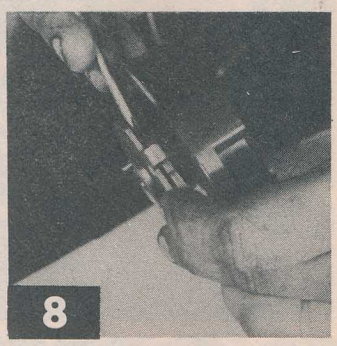
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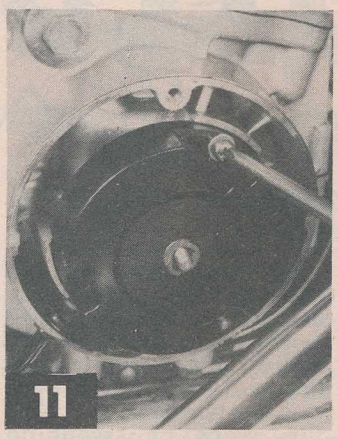
Before fitting the electronic ignition, it is essential that the three mounting points are clean and grease free as they act as an earth for the 'backplate'. Rub with fine emery cloth **(9)** to ensure good electrical contact.

After feeding the electrical leads through the grommet in the housing, the complete unit is slotted into place. **(10)**

Turn the centre rotor until the peg in the base of the A/R unit fits correctly and insert the three extra long retaining screws **(11)** supplied with the Martek 440 kit. They may be partially tightened at this stage.

Refit the rotor retaining nut **(12)** and the Martek is now ready to be hooked up electrically to the motorcycle.

Note that there are three leads from the Martek instead of two as with c.b. points. Two are colour coded as original and should be connected to the matching leads to the coils. The third (black) lead requires a 'live' supply to operate the Martek system and this is obtained by crimping a dual snap connector on to the existing black live lead to the stoplight switch **(13)** which is in the same cluster of cables as the ignition leads.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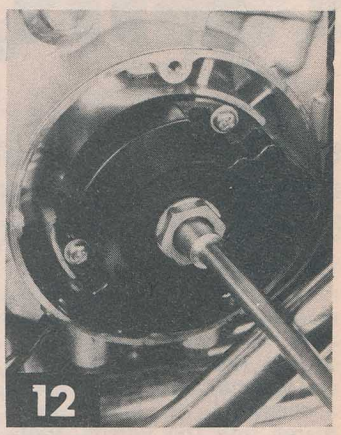
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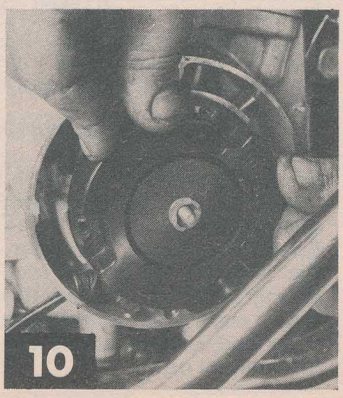
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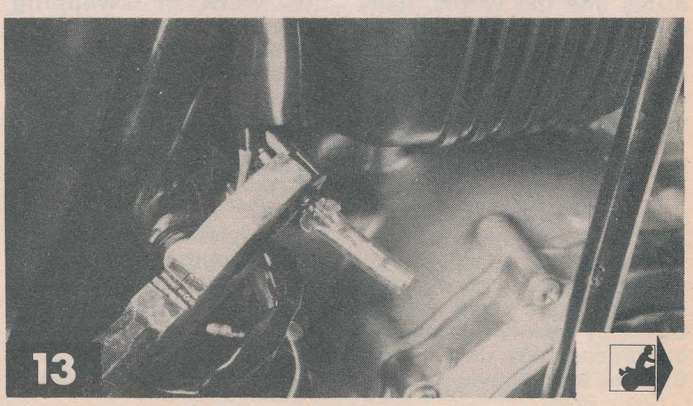
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Push all snap connectors firmly home to ensure good electrical contact **(14)**. If any are loose, a gentle squeeze with a pair of pliers on the female connector will cure the trouble.

A stroboscope is required for the next and final stage of the operation, which is ignition timing. With the motor running at 1200rpm (tickover), the strobe light **(15)** can be shone on to the standard timing marks set on the A/R unit.

These may be seen by peering closely between the Martek rotor and 'backplate'. If the 'FI' mark doesn't align correctly with its timing point when the strobe is connected to No. 1 HT lead, this may be adjusted by rotating the 'backplate' in either direction.

Once correct timing alignment has been achieved, retighten the backplate screws and give a final check with the strobe to ensure timing is correct at tickover and also at 5000rpm, at which point the timing mark should have advanced.

To test the Honda fitted with the Martek 440 system, we once again took it to Ollie Kite of K.M. Motorcycles, where we ran the machine on the Souriau rolling road dynamometer **(16)** under identical conditions to when fitted with contact breaker ignition.


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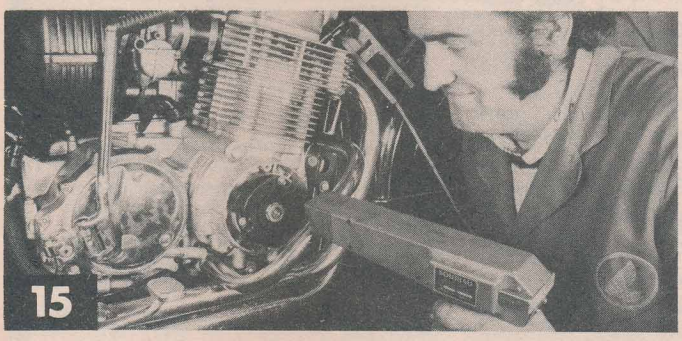
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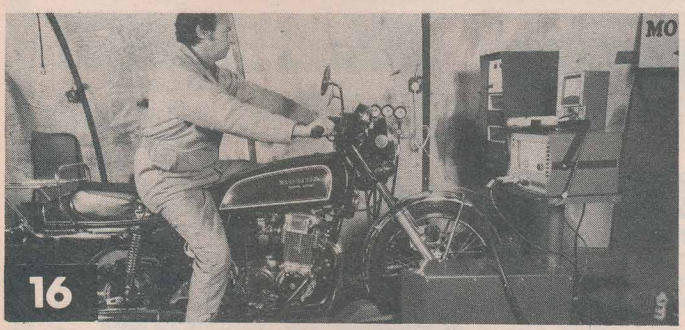
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CONCLUSIONS

It is said that the proof of the pudding is in the eating, and with hand on heart, we found it extremely difficult to find anything but a marginal gain in brake-horse-power at the back wheel for the Martek 440 over a *properly adjusted and timed* set of contact breaker points.

Power output started to improve slightly at 5000rpm and with 6000rpm on the tachometer, we found one extra horse right through the rev range to maximum.

However, when it came to a top speed of 118 miles-an-hour. This was achieved using both electronic and c.b. ignition systems. There was no advantage in performance, nor improvement in fuel consumption as we discovered when we hooked up our petrometer and ran the bike at identical speeds over two miles on the rolling road.

Flying quarter and half miles were timed with neither ignition system showing a distinct advantage over the other.

So what did our tests prove? Quite conclusively that there is minimal advantage in terms of performance having electronic ignition compared with a *properly set up* contact breaker system.

But wait. Notice we have said 'properly set up' c.b. system and this is where the crunch comes, because most contact breaker systems are very rarely correctly adjusted.

From the moment an engine is started, a contact breaker system begins to wear. The points burn away, the c.b. heel operating on the cam wears and within 3000 miles the ignition timing can be totally up the creek. This means loss of performance, increased fuel consumption and a workshop job of re-adjustment is needed.

By 10,000 miles, possibly less, the contact breaker points will have burned out and need renewing. Two, three or even more pounds should cover the cost of parts if one can do the job oneself, but if not then labour charges are added to the bill.

So, the disadvantages of the good, old contact breaker ignition are plain to see. Regular maintenance is a must or fuel bills start to climb, starting becomes difficult and your once sprightly sportster gets seen off by the tourers. All right, so we exaggerate a little; but no doubt you see the point in having pointless ignition.

Once fitted and adjusted, it has no components to wear or burn and should, in theory, last the life of the motor without need for any further servicing . . . and all this time it will be giving precise ignition for the motor.

Whether the advantages of the electronic ignition justify an initial outlay of approximately £60 is for each individual to decide. The money will obviously be recouped in the long term due to better fuel economy, no need of replacement points or servicing, etcetera.

We were impressed by the simplicity of installation of the Martek 440 and the way in which the Honda fired up first press on the starter button after fitting the system.

We were possibly a little disappointed at the marginal increase in performance after reading the manufacturer's claim that 'the system is a remarkable breakthrough in achieving maximum performance for the Honda fours as the 440 almost doubles high RPM spark energy.' If double spark energy doesn't give fuel savings or extra performance, what does it do?

WHAT IS THE MARTEK 440?

Quite simply, it is an optically triggered fully transistorised, electronic ignition system, which is designed with special hybrid and integrated circuit techniques with triggering and amplification functions combined in a single unit. Wow!

In other words, an infra-red light beam shining on a light sensitive cell is used to control the low tension current to the ignition coils.

For a faily long period in the rotation of the crankshaft, the beam of light shining on the photosensitive cell is interrupted by the rotor, allowing a build up of low tension current in the ignition coils.

Then as the infra-red light beam is permitted to shine on the light-sensitive cell by an aperture in the rotor, the cell produces a minute amount of current which is then amplified by transistors to trigger or release the low tension current in the coils to earth. As a result, a high tension spark is produced by the ignition coil and bingo! . . . we have lift off!

SOURIAU TEST

REAR WHEEL BRAKE-HORSE-POWER

RPM	CB	ELEC-TRONIC
3000	1.1	1.1
4000	3.8	3.8
5000	8.1	8.3
6000	11.0	12.0
7000	22.0	23.0
8000	33.00	34.0
8500	42.0	43.0
Max. speed	118mph	118mph

FUEL CONSUMPTION

Fuel Con.	CB	Elec.
30mph	112mpg	112mpg
60mph	68.8mpg	68.8mpg
Flying ¼-mile	12.49 secs	12.38 secs
Flying ½-mile	20.15 secs	20.24 secs
0–60 mph	4.98 secs	4.92 secs
0–100 mph	13.68 secs	13.44 secs

Since testing the Martek 440 system we have been approach by other electronic ignition system manufacturers to test their products. So we hope to bring you these results, done under similar methods, in forthcoming issues.