

Mounting instructions

External coil system

Motobécane / Kaptein

MI\_202 Page 1 of 12

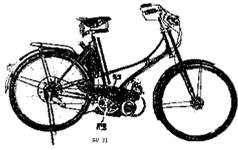
1<sup>e</sup> Release: May 2002

Changed: May 2016

# External Coil System 2015

For mobylette and other two wheelers equipped with  
flywheel magneto ignition





Mounting instructions

External coil system

Motobécane / Kaptein

MI\_202 Page 2 of 12

1<sup>e</sup> Release: May 2002

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## Introduction

Mopeds from the fifties and sixties are mostly equipped with a flywheel magneto ignition system. An alternating magnetic field generates within a double wound coil a very high electrical tension.

This combined coil exists of a primary coil with a few windings made of thick insulated wire and a secondary coil with many thin windings.

High tension coils tend to lose their quality after so many years, because of the lower insulation properties. To be more precise: sometimes a total deterioration of the insulating varnish appears. Even unused coils show the results of this process.

A possible solution is: applying an external coil of a recent moped. Mostly we use the old high tension coil's core to convert it to a feeding coil. Fitting problems are thus avoided, too.

## How to connect?

See enclosed schedule on page 6.

What are the consequences of this rebuilding?

- Ignition points and breaker points cam will remain unchanged.
- The old high tension coil will be replaced by a low tension supply coil (125470, 125475 or 126120). Nowadays, however mostly the old coil is converted to a feeding coil.
- The white or black tension pickup of the sparkplug cable will be replaced by a plug guiding the wire, which is connecting the ignition points with the external coil.
- The external coil has to get a suitable spot and must be electrically connected well at the frame. See hint 2.
- The capacitor could be fixed on its usual place on the ignition stator plate, but since 2015 we prefer an external capacitor fixed at the external coil.

## Adjusting data

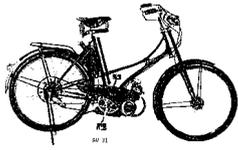
Pre-ignition will remain unchanged. See your moped's instruction manual.

Pre-ignition

Models till 1963: 2.8 mm. Later it became 2.5 mm and for variator and high compression models even 1.5 mm.

Opening gap: 0.4 mm.

Spark plug: 0.4 mm.



### Some fixing hints

#### Hint 1:

Engines till 1968 have an ignition coil at the top; sometimes it happens that holes inside of the new supply coil do not correspond with the applied bolts and nuts of the engine. Besides old ignition ground plates can be different. So nowadays we use the core of the same type of coil and convert it to a feeding coil.

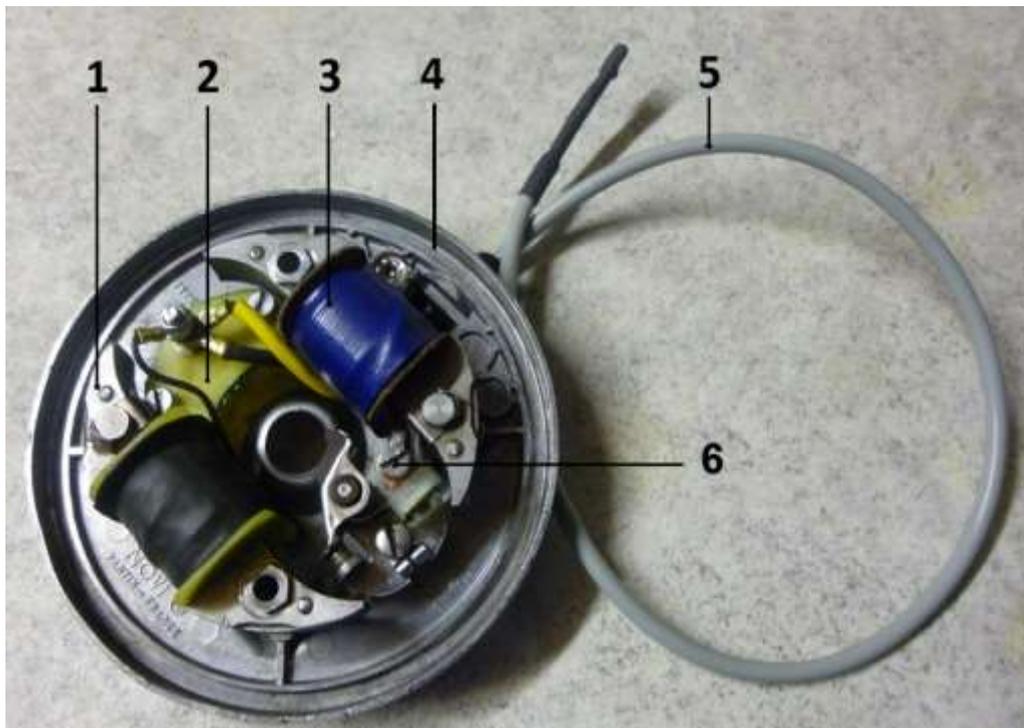
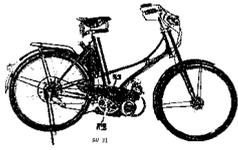


Image: Ignition stator plate with some ignition components.

1. Feeding coil on a 1968 ground plate at the bottom.
2. Terminal plate.
3. Lighting coil.
4. Ground plate.
5. Connecting wire between connector plate and external coil.
6. Breaker points.

At the terminal plate three cables come together:

- Short cable (6) to the breaker points.
- Cable from the feeding coil (4).
- Wire (5) to the external coil.

**Hint 2:**

What will be the best spot for the external coil?

For the very oldies placing in front of the rear mud guard and between the engine guards is preferable. The coil won't be visible. Connection to frame will take place by way of the small screw on the rear mud guard. An additional (mass) cable from coil to engine is preferable, too.

For models like AV42, AV44 or BG the external coil can be attached at the frame above the engine or beneath the engine guards.

Then an additional hole in the frame is required.

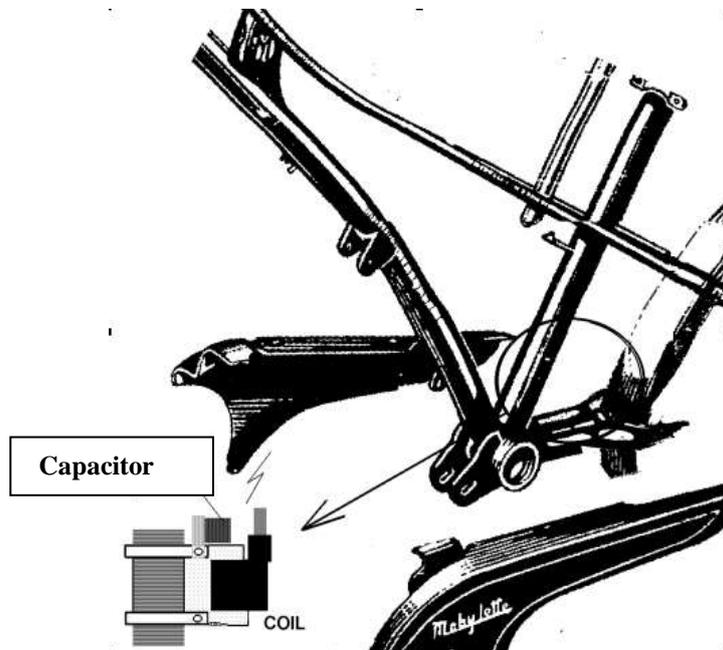
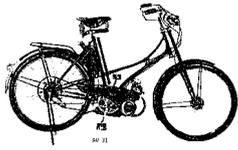


Image: Position of coil in front of the rear mud guard.

**Hint 3:**

After assembling of the coil you must check whether the flywheel does not touch the coil. A slant stator plate or an inaccurate mounting of the coil makes the flywheel touching the coil or other parts thus generating heat. The flywheel will become unpleasantly hot instead of hand warm (40-50 °C). There is a special calibre, but you can also check this with a permanent or white board marker and put some colour on the steel parts of the coils. The gap between coil and flywheel should be less than 0.5 mm.



Mounting instructions

External coil system

Motobécane / Kaptein

MI\_202 Page 5 of 12

1<sup>e</sup> Release: May 2002

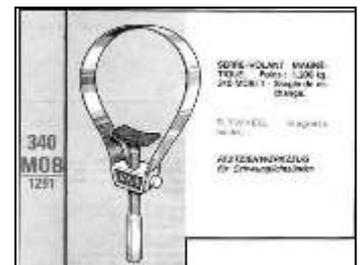
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### Contents of an ignition set

- Feeding coil.
- External capacitor .
- External coil.
- High tension cable to spark plug.
- Cable with plug for connecting external coil and connector plate.
- Mass cable for external.
- Terminal plate with small wire to the breaker points.

### Useful tools

- Square wrench size 10mm. For removal of flywheel.  
(Watch the direction of rotation: mostly left thread, except on models with a friction roller transmission (BG).
- Pulley extractor for adjusting the contact breaker cam.
- Gauge plates for the ignition points and coil position adjustment.
- Clamp for retaining the flywheel. See picture.



### Still having problems?

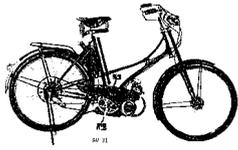
Whenever you meet problems while assembling and testing this ignition system, please contact us. Also when you notice some opacities in this manual, pose your questions and give your comments, please!

E-mail: [info@pantin.nl](mailto:info@pantin.nl)

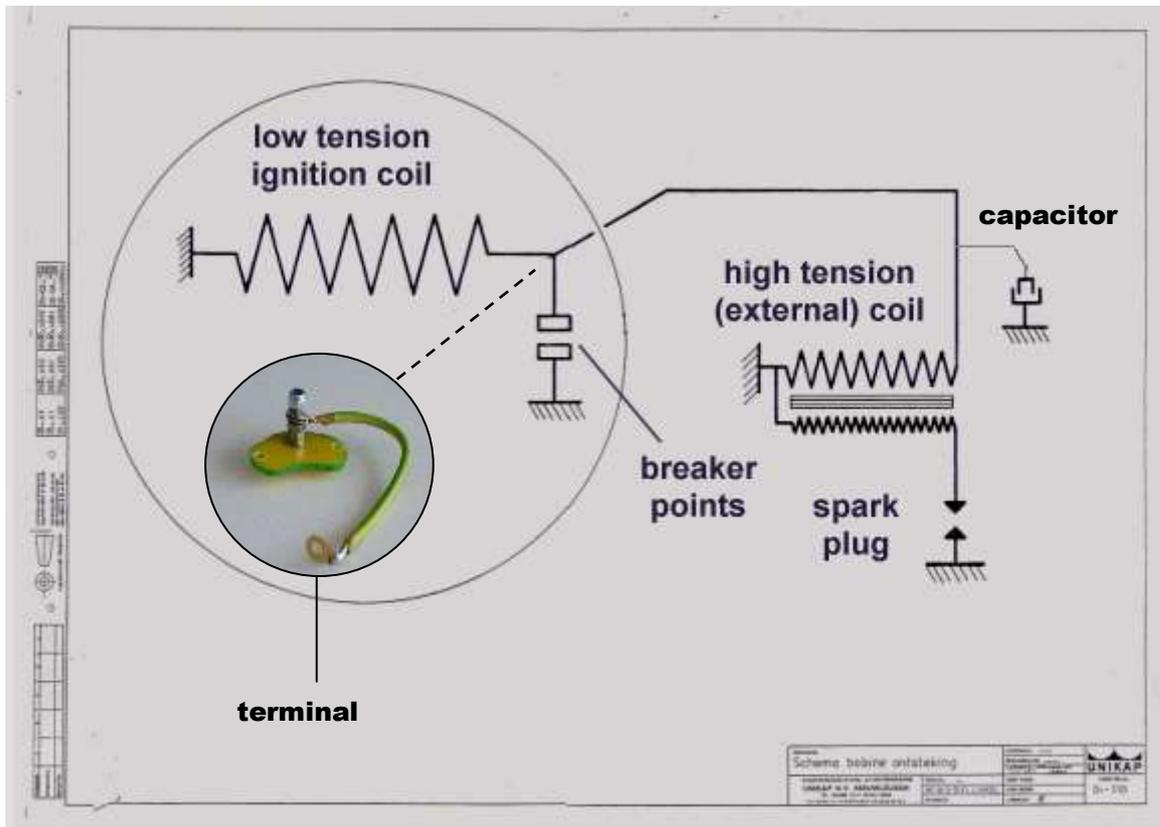
Web site: <http://www.pantin.nl>

### Examples of spots for an external coil





## Electrical schedule



In 2015 two important changes were introduced:

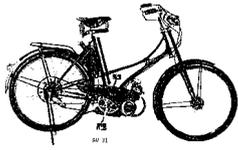
### External capacitor

The capacitor's new spot is at the external coil, outside the hot environment under the flywheel.

### Terminal plate

On the old spot of the capacitor a small plate takes its place.

This connector plate for three wires makes assembling much easier than at the previous spot on the breaker points, where it was sometimes really a struggle to get it fixed there.



## Questions

**1. I have connected everything according to schedule, but the system does not operate at all, what did I do wrong?**

Answer: probably your coil has no mass connection or the tiny side of the coil wire, that is pressed on the metal body makes poor contact.

**2. Why does my cold engine start quite well, but it will stop after 5 minutes?**

Answer: a hot engine has a higher end-pressure in its cylinder than a cold engine. So there will be more resistance for the generated spark.

The gas mixture will function as an insulator: the higher the pressure is, the higher the resistance will be for the spark. Outside the cylinder under normal conditions you will perhaps notice a fair spark, but inside the cylinder this spark won't show up. Secondly the windings become warm and the resistance for the current increases with internal leakages as result.

**3. Can a capacitor be the cause of this inconvenience?**

A leaking capacitor (resistance < 200.000k Ohm) can also influence the spark quality. A bad coil with a brand new capacitor however can (for a short while) make things going. We advise an external capacitor .

**4. I have connected all according to the wiring diagram, but still no response?**

Check your spark plug and cap, too. Even when they are brand new they could be malfunctioning.



**6. How reliable are those white external coils?**

Old external coils from the 60 and 70'ies are of less quality as before. Always check them on a special test machine.

**7. Is it possible to use a light coil as a feeding coil?**

Yes it is possible and it can bring you home.

**8. I don't want an external coil on my old moped! Are there still good working double coils for sale?**

NOS is offered frequently, but we advice is:” don't apply those.”

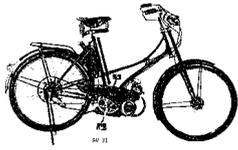
Of course you can let renew your windings by a specialist; however it is quite expensive and the results are often poor.

After a while people consider that functioning is more important than “original”.

**9. Why is the external coil so important?**

A well functioning ignition system has a large overcapacity.

Small leakages have little influence and you won't notice it at all.



Mounting instructions

External coil system

Motobécane / Kaptein

MI\_202 Page 8 of 12

1<sup>e</sup> Release: May 2002

Changed: May 2016

A worn system can be malfunctioning when the spark plug distance is at a normal rate. By making the gap narrower the problem can be solved for a while. Pretty solution, when you still have to ride a long way back home.

An other advantage is the location: the external coil is situated on a much cooler spot, whereas the internal coil is mounted against the hot engine.

#### ***10. What is the influence of breaker points?***

Breaker points must open on the right moment (timing) and not more than 0,35-0,4 mm. Adjustment should be carried out with help of feeler gauges.

They must be clean, not showing traces of wearing and close nicely on each other.

Lately a lot of problems were caused by new breaker points right out of the sealed packing. Problem is a thin layer of oxide on the contacts. Grind the surfaces carefully with waterproof sandpaper (600). Don't forget to oil the small shaft in the middle and to grease the fibre cam follower.

#### ***11. How can I prevent that the cam will turn loose?***

The ignition can is fit on the conical axes of the crankshaft. Clean cam as well as shaft with a cloth and use for degreasing brake cleaner or thinner. You will be surprised to see the garbage on your cloth.

Next inspect both parts for small damages. Sometimes a little grinding with waterproof sandpaper no. 1000 is necessary.

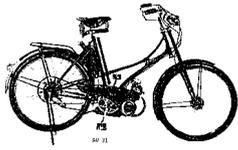
Mostly the problem is solved then.

#### ***12. Are users of this system satisfied?***

Yes in all case we get an email or a message that the problem is solved.

Mostly the engine runs better and has become more powerful. Sometimes extra information is needed. Wrong cam, poor earth or bad breaker points are often the cause of this trouble.





Mounting instructions

External coil system

Motobécane / Kaptein

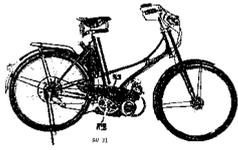
MI\_202 Page 9 of 12

1<sup>e</sup> Release: May 2002

Changed: May 2016

## Appendix 1: Components of ignition

			
<b>Flywheel with nut</b>	<b>Feeding coil</b>	<b>Ignition cam</b>	<b>Breaker points</b>
			
<b>Wire terminal</b>	<b>Wire from terminal to external coil</b>	<b>External coil with mass cable</b>	<b>External capacitor</b>
			
<b>Spark plug cable</b>	<b>Spark plug cap</b>	<b>Spark plug</b>	<b>Different clamps for external coil</b>



Mounting instructions

External coil system

Motobécane / Kaptein

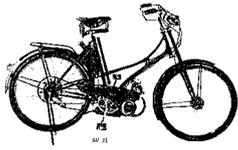
MI\_202 Page 10 of 12

1<sup>o</sup> Release: May 2002

Changed: May 2016

## Appendix 2: Special tools for ignition adjustment

<p><b>Clamp for flywheel</b></p>	<p><b>Square wrench 10 mm Model "Stan"</b></p>	<p><b>Extractor for cam as well as for Moby clutch</b></p>	<p><b>Feeler gauge metric</b></p>
<p><a href="http://www.jmpbonderdelen.nl/">www.jmpbonderdelen.nl/</a> <a href="http://www.midlock.nl">www.midlock.nl</a></p>	<p>Do it yourself Socket wrench 3/8 " <a href="mailto:info@pantin.nl">info@pantin.nl</a></p>	<p>Use your lathe <a href="http://www.leertouwer.com/">www.leertouwer.com/</a> <a href="mailto:info@pantin.nl">info@pantin.nl</a></p>	<p><a href="http://www.worldoftools.nl">www.worldoftools.nl</a> DIY-store Car accessories-shop.</p>
<p><b>Adjustment bolt for pre-ignition</b></p>	<p><b>Caliber ring "Stan"</b></p>	<p><b>Franky's tool for adjusting timing</b></p>	<p><b>M1/M3-extractor</b></p>
<p>Make it yourself from a M10 taper bolt. <a href="mailto:info@pantin.nl">info@pantin.nl</a></p>	<p>Use your own lathe <a href="http://www.eBay.fr">www.eBay.fr</a> <a href="http://www.leboncoin.fr">www.leboncoin.fr</a> <a href="mailto:info@pantin.nl">info@pantin.nl</a></p>	<p><a href="http://www.mobyletteforum.com">www.mobyletteforum.com</a></p>	<p>Use your own lathe <a href="http://www.eBay.fr">www.eBay.fr</a> <a href="http://www.leboncoin.fr">www.leboncoin.fr</a> <a href="mailto:info@pantin.nl">info@pantin.nl</a></p>



Mounting instructions

External coil system

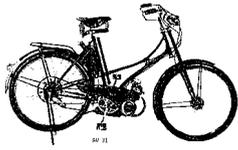
Motobécane / Kaptein

MI\_202 Page 11 of 12

1<sup>e</sup> Release: May 2002

Changed: May 2016

			
<p><b>Locking plug</b></p>	<p><b>Spark plug wrench</b></p>	<p><b>Spark plug for testing</b></p>	
<p>Make it yourself from an old spark plug.  <a href="http://www.eBay.fr">www.eBay.fr</a>  <a href="http://www.leboncoin.fr">www.leboncoin.fr</a></p>	<p><a href="http://www.tuin-tools.nl">http://www.tuin-tools.nl</a>            en vele anderen.</p>	<p>Make it yourself from an old spark plug.  <i>The opening is set to maximum. In open air it should generate a spark.</i></p>	



### Appendix 3: Summary of malfunctions of the ignition system.

Part	physical characteristic	Sound
Fly wheel	<ul style="list-style-type: none"> <li>&gt; Fly wheel nut is loose.</li> <li>&gt; Magnetos are moved /disjointed</li> </ul>	<p>Strange rumble.</p> <p>Engines runs poorly or not at all (this happens very rarely).</p>
Spark plug cap	<ul style="list-style-type: none"> <li>&gt; Damaged and burnt-in.</li> </ul>	<p>Engine runs irregularly; sometimes a bang.</p>
Spark plug	<ul style="list-style-type: none"> <li>&gt; Damaged (even when new!)</li> <li>&gt; Has become loose.</li> </ul>	<p>Engine runs badly or not at all.</p> <p>Less power, because of compression loss.</p>
Connecting wire	<ul style="list-style-type: none"> <li>&gt; Wire from engine to external coil is damaged and there is sometimes a short circuit with the mass.</li> </ul>	<p>Once full power and then again irregular run of the engine or slow down.</p>
Feeding coil	<ul style="list-style-type: none"> <li>&gt; Broken wire or connector from the wire that leads to the terminal (breaker points).</li> <li>&gt; Mass contact is getting loose during run.</li> </ul>	<p>Suddenly it stops completely.</p>
External coil	<ul style="list-style-type: none"> <li>&gt; Internal short circuit due to ageing.</li> <li>&gt; Poor connection to mass.</li> </ul>	<p>Un-pretty and irregular sound; several strokes will be missed. Cold start is mostly good. After 10 minutes the engine will stop and won't start again. By reducing the opening of the spark plug to 0,2mm, it may bring you home.</p>
External capacitor	<ul style="list-style-type: none"> <li>&gt; Bad insulation</li> <li>&gt; Broken wire or connector .</li> <li>The capacitor doesn't function and breaker point will be burnt-in.</li> </ul>	<p>Bangs and irregular run.</p> <p>Top performance is not achieved. Engine doesn't run smoothly.</p>
Breaker points	<ul style="list-style-type: none"> <li>&gt; Crooked or dirty contact surfaces, sometimes heavily burnt-in or a weak spring gives insufficient pressure.</li> <li>&gt; Opening is too small.</li> <li>&gt; The rivet doesn't clamp the spring well .</li> <li>&gt; Screw is not tighten well.</li> <li>&gt; Short-circuit of breaker points</li> </ul>	<p>Engine doesn't start or top performance will not be achieved. When lights are switch on: engines stops. Sound is irregular and trying the engine run at idling speed is almost impossible.</p> <p><i>When a very low idling speed is possible. It means that the quality of your ignition is all right.</i></p>
Cam	<ul style="list-style-type: none"> <li>&gt; Moved on cam shaft.</li> </ul>	<p>Performance is poor and engine becomes too hot.</p>