

System 770599900**Advantage over original system:**

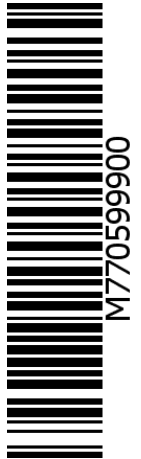
- all parts are new
- electronic pointless ignition with solid spark
- better starting and better fuel burning
- more light output
- no worry anymore about centrifugal governor or points

Generator / electronic ignition for Moto Guzzi Le Mans

- Only for models with BOSCH generator with 105 mm diameter!

- Magnet based generator with integrated pointless ignition. Replaces complete stock BOSCH generator (including regulator) and advance unit (governor) points and ignition coil. Output is 12V/180W DC. Solid state ignition with own power supply from within the system and electronic advance unit giving the same advance characteristics as the original system.

- Don't require changes on crankcase. You may drive without battery, if you want.



M770599900

Assembly instructions for system 770599900	8.7.2026
- If you can install and time a stock ignition and possess basic mechanical skills, you can install a VAPE! If you never have worked on your ignition, better have it done by someone who knows.	
- VAPE can not monitor the compliance to those instructions, nor the conditions and methods of installation, operation, usage and maintenance of the system. Improper installation may result in damage to property and possibly even bodily injury. Therefore we assume no responsibility for loss, damage or cost which result from, or are in any way related to, incorrect installation, improper operation, or incorrect use and maintenance. We reserve the right to make changes to the product, technical data or assembly and operating instructions without prior notice	
<u>IMPORTANT</u>	
- Please read these instructions fully and carefully before starting work on your motorcycle Please bear in mind that any modification of the material as well as own repair attempts which have not been agreed with VAPE may result in a loss of warranty. Do not cut off wires. This leads to a loss of reverse polarity protection and often results in damage to electronics. Also, please take note of the information provided on the information page for this system. Check that what you have bought really corresponds to the motorcycle you have. Wrong ignition settings may damage your engine and even hurt you during kickstart (violent kickbacks). Be careful during the first test runs. If needed change settings to safer values (less advance). During assembly check carefully that the rotor (flywheel) does not touch the stator coils or anything else, which may happen due to various circumstances and lead to severe damage.	
Designated use - This system is designated to replace stock dynamo/alternator & ignition systems in vintage and classic motorcycles whose engine characteristics have not been modified aftermarket. This system is not a tuning system and it will not bring significant increases in engine output. It does however significantly enhance roadworthiness and comfort by offering better lighting, better function of side indicators and horn and, compared with the aging stock systems, increased reliability. As our system does not tamper with engine characteristics it does not increase emission of gaseous pollutants and noise. In most cases emission of pollutants should even be reduced due to better combustion. If used as designated the system therefore will not normally infringe the existing legal status of the motorcycle. (Please check your local legal regulations!) This system is not suitable for use in competition events. If used other than the designated way, your warranty will be voided and it might well be that you do not obtain the desired results or, worst you loose legal roadworthiness.	
 - VAPE guarantees homologated products marked with the "E" mark in the ring (E8 specifically for the Czech Republic), thereby ensuring a consistent conformity of the product properties with the relevant ECE homologation regulations (especially ECE R10.05). Inspection is regularly carried out by the competent authority.	
- The charging system is only suitable for use with rechargeable 12V (6V systems 6V) lead-acid batteries with liquide electrolyte or sealed lead-acid batteries, AGM, Gel. It is not suitable for use with nickel-cadmium, nickel-metal-hydride, lithium-ion or any other types of recharchable or non rechargeable batteries.	
- This is a replacement system and not a copy of the stock material. The parts in this system therefore look different and might fit differently (notably ignition coil and regulator) requiring some adaptation by you.	
- During assembly imperatively start with assy of engine based parts to see that those really fit before you start fitting the external parts. In many cases customers assemble those first and thereby often modify them in breach of warranty which renders them unfit for renewed sale. Replacing old ignition systems is not a matter of taking something from a supermarket shelf as there have been very many types, versions and possibly unknown aftermarket modifications which harbour plenty of room for error.	
- Our systems are NOT tested for use with third party electronic devices (such as GPS, mobile phones, LED lighting etc) and may cause damage to such parts. Possibly existing electronic tachometers will not work with the new system. Possibly existing safety switches and electronic valve controls are not supported. It might be that your motorcycle was originally equipped with an ignition that did limit top speed for legal reasons. The new system does not have such a facility, so check your legal situation beforehand.	

- If you have no expertise for the installation have it done by an expert or at a specialist's workshop. Improper installation may damage the new system and your motorcycle, possibly even lead to bodily harm.

- Before you order a system, please check whether a puller tool for the new rotor is included in the kit. If not, better order it at the same time. Never use anything other than the recommended puller tool to pull the new rotor again. Damage to the rotor as a result of use of other tools or methods is not covered by your warranty.

- The rotor is sensible to blows (including during transport). Before assembly, please always check for damage (on rotor without magnet plastification try to push the magnets aside with your fingers). After impact the glued in magnets might have broken loose, sticking to the rotor solely by magnetic force, so that one does not notice right away. During engine run the damage would be considerable. Before placing the rotor onto the engine, please make sure that its magnets have not collected any metal objects such as small screws, nuts and washers. That equally would lead to severe damage.

- **If you have access to the Internet, best view those instructions online.** You get larger and better pictures by clicking onto them and possibly updated information. System list at <http://www.powerdynamo.biz>



You should have received those parts:

- stator assembly
- rotor for generator
- rotor for hall sensor
- hall sensor
- advance unit (black box)
- ignition coils
- regulator/rectifier and relay
- high tension wire
- wires and wire binders



- To disengage your new rotor again, you will need a puller M27x1,25 (part-no.: 99 99 799 00 **-Not provided!-**).

- ATTENTION: Don't use a claw puller, otherwise you will loosen the magnets.

- Make sure your Guzzi rests securely on her centre stand, preferably on an elevated work bench and that you have good access to the generator side of the engine.

- Disconnect your battery and take it out of the motorcycle. Note that you will install a 12 volts system, so you will either need a 12 volt battery or you use the option of driving without a battery.



- Unscrew the stock BOSCH generator and take it off. Also remove the rotor.

(picture shows only the engine housing without crankshaft!)



- Put the preassembled stator unit onto the engine. Fasten it with the provided three M5x12 screws and washers.

- The wire harness should go straight up as shown in the picture. Then you can use the stock wire outlet later.

(picture shows a slightly different base plate!)



- Now put the new rotor onto the crankshaft. Fasten it with the provided M8x60 screw.

- To set the ignition timing it is necessary to bring the crankshaft to 50 degrees BTDC (before top death centre) of the first firing cylinder. This is the right cylinder at Moto Guzzis.
- You can easily do this with the help of the new rotor.
- 50 degrees calculated on the circumference of the rotor (which has a diameter of 112 mm) are 49 mm. Cut a piece of paper of 49 mm length, place it on the periphery of the rotor and mark both ends.
- Now put the piston of the first cylinder to TDC (top death centre) of the compression stroke (in this stroke both valves of the cylinder are closed). Hint: the engine can be turned easier when the spark plugs are removed! You may turn it with the new rotor.
- At the flywheel of your Moto Guzzi should be mark which is labeled with "D". This is the TDC of the first (right) cylinder.
- Now you put the rotor (with the two markings on it) onto the crankshaft and mark one marking on the engine housing. Then turn the engine against the rotation direction till the second marking is align with the marking at the housing. Now the engine should be 50 degrees BTDC.
- Keep the engine in this position until the timing of the hall sensor.



- ... and now you have to fit the ignition:

- Remove the distributor from the engine. Remove the plate with the points from it.





- Also remove the centrifugal governor from the distributor. The two pins on the bottom plate have to be removed. Therefore it may be necessary to remove the shaft from the distributor.

- Here are some photos to demonstrate:



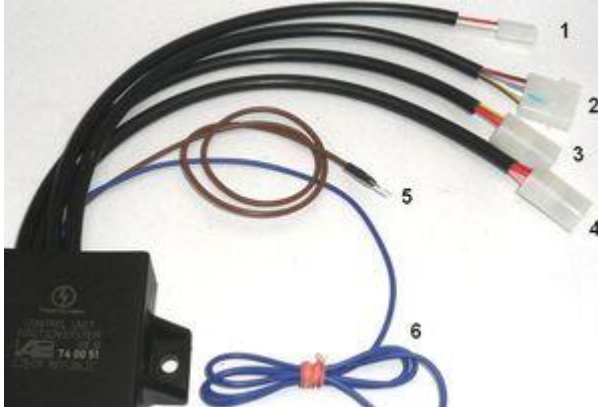
- Put the hall sensor into the distributor housing. Fasten it with the two provided M4 screws.

- You should mount it in a position where you can easily lead out the wire harness. It may be necessary to rasp a little bit on the cover to get the harness through.



- Put the small hall rotor onto the shaft of the distributor. Check if it can be rotated without jamming.
- Don't fasten the rotor now, you have to do the timing first. After that you can fasten it with the provided allen key.

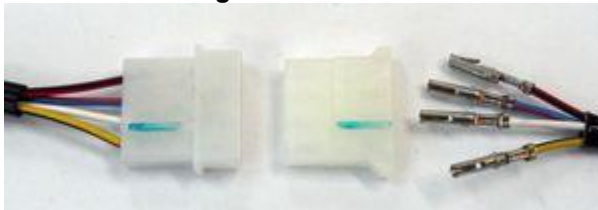
- The wiring of the ignition is described below, you can also view the wiring diagram **7451-2**
Here are the wires and plugs of the control unit:



- As there are:

- plug 1: 1 white and 1 white/red to be connected to VAPE alternator
- plug 2: yellow/black, red/black, red/blue and white to be connected to hall sensor
- plug 3: red, white and yellow/black to be connected to ignition coil 1
- plug 4: red, white and red/black and pink to be connected to ignition coil 2 (and for timing issues to battery wire)
- plug 5: brown wire to be connected to engine ground
- plug 6: blue wire for stopping the engine

- **Start connecting the hall sensor to the control unit:**



- First lead the wire of the hall sensor through eventually small holes at the enging housing. Then put the 4way connector sleeve on it. Be sure to put the equally coloured wires together (see photo!).

- Please double check if the wires are connected properly before the next steps!

- Identify the plug from the control unit (plug 4 at the picture above) which contains a pink wire. To this plug you connect the provided cable for timing (contains a red and a brown wire):

- pink to red of the timing cable
- white to brown of the timing cable

- During adjustment you have to connect a 6V up to 12V battery to this cable (easiest would be a 9 volts monobloc battery). This is to supply current to the timing light LED at the control unit.

- **ATTENTION:** Red is plus, white is negative current - never reverse polarity or the control unit may be damaged!



- If you turn the (loose) hall rotor on the shaft (with connected timing cable and battery) you'll see that one LED after the other turns on and off.
- The yellow LED means an ignition of the coil connected to plug 3 (contains a yellow/black wire), the red one means ignition of the coil connected to plug 4 (contains the pink wire).
- **Hint:** the hall sensor and rotor are lying on the table - yours are of course built in!



- Now it comes to the final adjustment: the crankshaft should be still 50 degrees BTDC of the first cylinder. The cable for timing is connected to the control unit and a battery.
- Then you twist the hall rotor (same direction as when the engine is running!) until the yellow LED lights up. Now you twist on (same direction as before) slowly until the LED turns off.
- Exactly in this position you have to fasten the hall rotor to the shaft. This is the basic setting of the ignition timing.



- At the control you see 4 little switches. With these you can choose the different advance curves which are shown below.

- Schalterstellung:

1.



2.



3.



- The adjustment of the different operating states (firing advance in dependence of engine speed) will be caused by the control unit. The characteristic of the curve can be changed with the four small switches at the unit:

- Please try these curves for your model:

1. 9° at idle and 38° up to 3000 U/min and higher (switch 1,2 and 4 "OFF" and 3 "ON")

2. 9° at idle and 38° up to 5000 U/min and higher (switch 1 and 3 "ON" and 2 and 4 "OFF")

3. 9° at idle and 34° up to 3000 U/min and higher (Schalter 1,2 "ON" und 3 und 4 "OFF")

- Remove the cable for timing. Connect the ignition coils with plug 3 and 4 (see above) and plug 1 with the cable from alternator. The brown wire has to be connected to (good!) ground. The blue wire has to be connected to a kill switch which switches to ground or you use the provided relay and your positive 12V mains switch.

- Hint: don't twist the hall rotor at the shaft because that will change your ignition timing! You can fine tune the ignition timing when you twist the complete distributor (as it was with the original points system).

- Lastly you have to mount the regulator, ignition coils and control unit at an appropriate place. None of the parts needs to be in airstream but higher temperatures from the engine are also not recommendable.

Important safety and operating information

- Safety first! Please observe the general health and safety regulations motor vehicle repair (MVR) as well as the safety information and obligations indicated by the manufacturer of your motorcycle. The timing marks on the material are for general guidance only during first installation. Please check after assembly by suitable means (stroboscope) that settings are correct to prevent damage to the engine or possibly even your health. You alone are responsible for the installation and the correctness of settings.

- Ignition systems generate high tension! With our material right up to 40,000 Volts! This may, if handled carelessly, not only be painful, but outrightly dangerous. Please do keep a safe distance to the electrode of your spark plug and open high tension cables. Should you need to test spark firing, hold the spark plug socket securely with some well insulating material and push it firmly to solid ground of the engine block. Never pull sparkplug caps when engine is running. Wash your vehicle only with engine at standstill and ignition off.

- You should have received the HT Cable with the fixed rubber cap (*which does not contain a resistor*) as a part of the kit, you should have to use a spark plug with an inbuilt resistor (*or replace the cap with the one containing a resistor*) to comply with your local laws (*Electromagnetic compatibility requirements*).

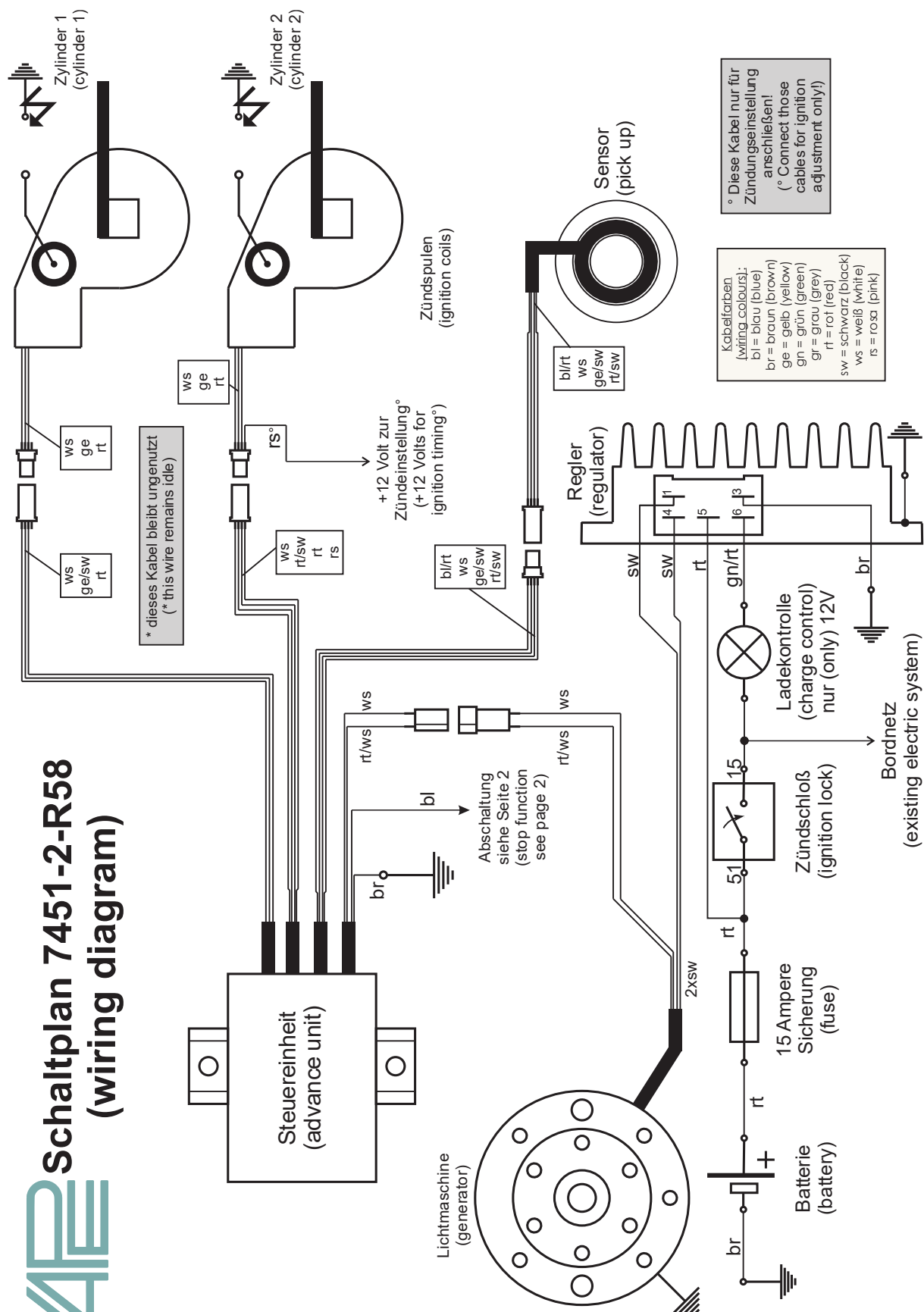
- Do not use a spark plug cap(s) containing a resistor **WITH** a spark plug(s) containing a resistor at the same time. It would cause problems, especially difficult engine starting. The total resistance of cap and spark plug combined should not exceed 5kOhm.

- Remember that candle plugs age, increasing resistance. If an engine only starts when it is cold, it is very likely that a defective spark plug connector or faulty spark plug is the cause. Do not use so-called ignition-reinforcing cables (e.g. Nology).

- After installation, please <u>check tightness of all screws, even those preinstalled</u>. If parts get loose during run, there will be inevitably damage to the material. We pre-assemble screws only loosely.
- Give the newly installed system a chance to work, before you start to check and test values, or what is worse apply changes to it. Our parts have been checked before delivery to you. You will not be able to check much anyway. At any rate do refrain from measuring the electronic components (such as ignition coil, regulator and advance unit). You risk severe damage to the inner electronics there. You will not get any tangible results from the operation anyway. Bear in mind that also your carburetor, your spark plugs and spark plug sockets (even if completely new) might be the reason for malfunction. The general experience with our systems is that the carburetor will have to be re-adjusted to lower settings. Should the system not start after assembly, first disconnect the blue (or blue/white) cut-off wire directly at the ignition coil (or in some cases advance unit) to eliminate any malfunction in the cut-off circuitry. Check ground connections carefully, make sure there is a good electrical connection between frame and engine block. In case of troubles, please consult our Knowledge Base first before you send off the material to us for checking.
- The spark of classic, points based ignition systems has with about 10,000 Volts comparatively little energy and looks therefore yellow and fat (which however makes it highly visible). The spark from our system is a high energy spark with up to 40,000 Volts and therefore is needle thin focused in form, and blue in colour, which makes it not so visible. Furthermore you get spark only at kick-start operated speeds and not by pushing the kick-lever down slowly with your hand (as you might get with battery based ignitions).
- Systems using a <u>twin outlet ignition coils</u> have a few peculiarities. Please observe that during tests on one side, the other has either to be connected to an fitted spark plug or securely earthed/grounded. Otherwise there will be no spark on either side. Also with such open exits long and dangerous sparks may fly all over the coil.
- Never do electric arc welding on the bike without completely disconnecting all parts containing semiconductors (ignition coil, regulator, advance) stator and rotor need not be taken off. The same is true for soldering. Before touching electronics disconnect the soldering iron from mains! Never use copper putty on spark plugs.
- Electronics are very sensitive to wrong polarity. After work on the system, do check correct polarity of the battery and the regulator. Wrong polarity creates short circuits and will destroy the regulator, the ignition coil and the advance unit. As a rule, wiring will always be colour to colour. Instances, where colour jumps between wires are expressly mentioned in our instructions.
- When you handle the new rotor, take care not to damage its magnets. Refrain from direct blows to the circumference of the rotor. When transporting never put the rotor over the stator. Observe our information relative to transport of the material.
- Do not use spark plug sockets with a resistance of more than 5kOhm. Better use 1 or 2kOhm ones. Bear in mind that spark plug sockets do age and thereby increase their internal resistance. Should an engine start up only when cold, a defective spark plug socket and/or spark plug is very probably the cause. In case of problems check high tension cables too. Never use carbon fibre HT-cables, never use so called "hot wires" which promise to increase spark.
- It is a good idea to cover the rotor in a thin layer of oil to reduce the risk of corrosion.
- Never use a claw puller or a hammer to disengage the rotor. Its magnets might become loose in the event. We offer a special puller for disengaging the new rotor again (see assembly instruction)!
- Should the motorcycle not be in use for some longer period, please disconnect the battery (so existing) to prevent current bleeding through the diodes of the regulator. Though, even a disconnected battery will empty itself after a while.
- Please do observe these remarks, but at the same time, don't be afraid of the installation process. Remember, that before you, thousands of other customers have successfully installed the system. <i>Enjoy driving your bike with its new electric heart!</i>

NAE

Schaltplan 7451-2-R58 (wiring diagram)



Schaltplan 7451-2 (wiring diagram)

