Casa Performance Ducati 'FireFly' 12V 90W electronic ignition fitting instructions

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J RANGE MODELS : J50 - CENTO - J125 - STARSTREAM - SUPER STARSTREAM

The **Firefly** ignition by **Casa Performance** is a modern, 12 volt electronic ignition that gives a full 90 Watt output. It is a plug 'n' play kit designed to fit the following smallframe Lambretta scooters with no modification whatsoever to either the frame or engine:

Luna Line
Lui 50C & 50CL (50cc 3-speed)
Lui-Vega-Cometa (75cc 4-speed)
J Range
J50 (50cc 3-speed)
J50 Deluxe (50cc 3-speed)
J50 Special (50cc 3-speed)
Cento (100cc 3-speed)
J125 (125cc 3-speed)
J125 Starstream & Super Starstream (125cc 4-speed)

We have developed and manufactured this all-new 12V electronic ignition system with none less than **Ducati Energia** (who supplied the majority of original ignitions for Innocenti manufactured Lambrettas).

The advantages of this Ducati Energia system over points ignitions and other electronic ignitions are as follows:
- it has a genuine full 90W power output, so you have great lights even at low revs
- it has a single pick up, whereas most alternative systems have twin sparks with one being 'wasted'
- it has a full Ducati Energia guarantee
- both the regulator and CDI are commonly available as they are used on various ignitions
- the flywheel is balanced in the factory
- the fan is a Casa Performance HiFlow item studied to massively increase airflow but reduce drag
- the fan is CNC manufactured in aluminium and much more robust than plastic alternatives
- unlike other systems, this REALLY is a 'plug 'n' play' system with no "fettling" or "adjusting" required.

The complete Firefly electronic ignition kit contains the following parts:
1 x **stator plate assembly**
1 x flywheel
1 x HiFlow fan + screws
1 x **CDI 'HT' (high tension) coil**
1 x 12V regulator '81 20'
1 x **HT lead**
1 x **flywheel nut**
1 x **washer for the flywheel nut**
2 x **protective rubber covers for the CDI**
1 x earth lead for the regulator
1 x flywheel holding tool
2 x stainless steel brackets for mounting the CDI + regulator *(for Luna Line scooters only)*
+ Selection of electrical terminals + plastic protective covers

Optional extras:
Round electronic type junction box
Rubber cover for round electronic type junction box
Simplified wiring loom harness for Luna Line scooters (coming soon)
Simplified wiring loom harness for J Range scooters (coming soon)
Woodruff key

FITMENT OF THE FIREFLY ELECTRONIC KIT
1. Remove the current ignition system, HT coil and junction box (if applicable) from your scooter. The only parts required from your old ignition are the 3 x screws for fixing the stator plate assembly to the engine and the HT sparkplug cap.

2. Clean and degrease the area you intend to fit the parts to with a product such as 'brake cleaner'.

3. Check the condition of your crank taper, the recess where the woodruff key fits into and the actual thread for the flywheel nut. If there is any slack or play in the recess for the woodruff key **(see Pic 1),** then it must be repaired or the crank must be replaced. The same applies to the condition of the tapered section of the crankshaft where the flywheel is mounted. *The scooter is in the picture has a Casa Performance CNC flywheel magneto flange kit with Viton oilseal* **X803** *fitted*

4. Feed the low tension (LT) wiring up through the standard exit hole in the engine casing and fit the stator plate to your engine in the correct position **(see Pics 2 + 2a**) using the original 3 screws + washers.

5. Fix the stator in a position so that the 3 fixing screws are situated centrally within the elongated slots of the stator plate **(see Pic.3).**

6. Fit the gasket, lower metal plate, the rubber grommet and the upper metal plate (in that order) to the LT wiring **(see Pic.4**) and then fix the screws + washers **(see Pic.5**). *Applying a little silicon spray on the outer black sleeving of the LT wires will greatly assist the assembly.*

7. Fit the flywheel to the crank, taking care to not dislodge the woodruff key. If the woodruff key has remained in place, you will be able to see it in the aperture of its slot **(see Pic.6**). *The Firefly flywheel uses a standard type Lambretta flywheel extractor tool.*

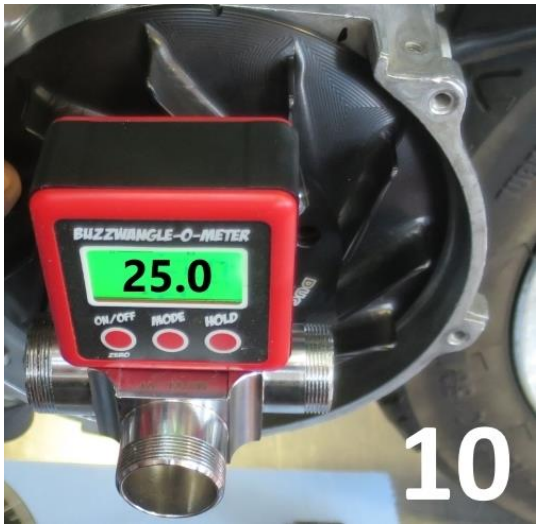
SETTING THE TIMING

8. Fit the supplied washer and flywheel nut. **REMEMBER; THIS HAS A LEFT-HAND THREAD!** This can be tightened by hand for now, to set the timing marks. Check the flywheel spins freely by hand. If you feel or hear any sign of rubbing or unwillingness to spin freely, remove the flywheel and find what is the cause. A probable cause could the 3 x studs and the nuts that retain the flywheel magneto flange rubbing on the underside of the flywheel, if they protrude from the engine casing too much.

To find the timing marks, we recommend the use of the **Buzzwangle** tool, but you could also use a timing disc combined with a piston-stop tool. *At the time of writing (June 2019) RLC is currently making some timing discs specifically for use with J Range and Lune Line scooters, as the diameter of all the timing discs currently on the market is too large as they are for LI series scooters.*

For full instructions and videos on using a Buzzwangle visit **www.buzzwangle.com**

Fit the Buzzwangle tool to the extractor thread of the actual flywheel and lock it into place with the supplied centre-screw **(see Pic.7)** and then place the Buzzwangle-o-meter onto the platform (this is attached magnetically). Remove the sparkplug if fitted and fit the piston-blocking tool supplied with the Buzzwangle kit **(see Pic.8).** Wind the centre screw of the piston-blocking tool inwards (towards the piston) until the flywheel no longer is unable to complete a full-circle when rotated by hand. Then lock the central screw into place with the wing-nut.



Now slowly turn the flywheel anti-clockwise by hand until it stops, as the piston comes into contact with the piston-blocking tool. Re-set the meter display to '0.0' by pressing the **ON/OFF/Zero** button twice **(see Pic.9)**. Now turn the flywheel in the opposite clockwise direction, again until it stops, as the piston comes into contact with the piston-blocking tool.

In our case, the number on the display was '25.0' **(see Pic.10)**. This means that the 'top dead centre' (TDC) position will be exactly halfway between the two points (i.e. '25.0' divided in half = '12.5').

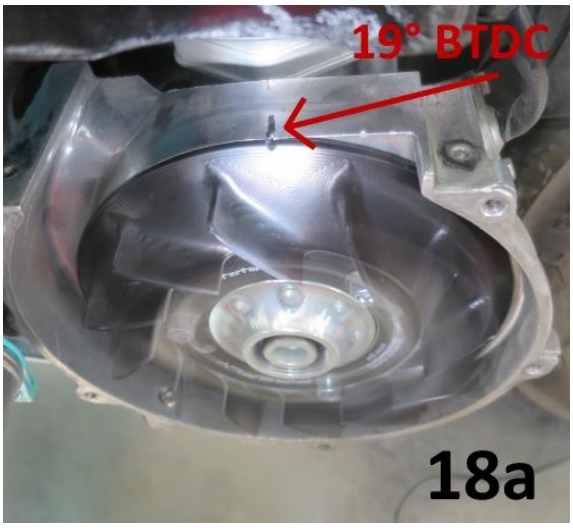
Remove the piston-blocking tool and continue to rotate the flywheel in a clockwise direction until the reading is '12.5' and mark the position of the small recess on the outer perimeter of the fan on the engine casing. **This is the exact position for TDC**. In this position, reset the display to '0.0' **(see Pic.12).**

Now turn the flywheel in an anti-clockwise position until the display reads '19.0' (or to your required timing settings) and mark the position of the small recess on the outer perimeter of the fan on the engine casing. **THIS IS THE 19° 'BEFORE TOP DEAD CENTRE' (BTDC) IGNITION FIRING POINT**. We recommend that both the positions for TDC and the required timing point (19° in this case) are permanently marked with a suitable tool or centre-punched. The scooter in the pics has a Casa Performance **CP One35** cylinder fitted and the recommended timing for this kit is 19° BTDC. *RLC also recommends 19° BTDC for all standard J Range and Lui / Vega / Cometa engines, regardless of engine capacity.*

Now remove the Buzzwangle tool and then the fan (by unscrewing the 3 x 5mm Allen screws) from the actual flywheel **(see Pic.14**). Using the supplied flywheel holding tool, tighten the flywheel nut up to 37lbs/ft / 50Nm **(see Pic.15**).

Note: the flywheel holding tool can only be used with the fan removed!

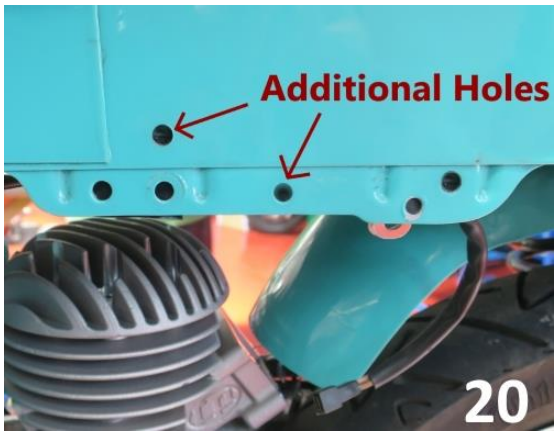
Now re-fit the fan onto the flywheel. Please note that it has a single mounting position which can be found by simply aligning all the various holes **(see Pic 16**). Now fix the fan to the flywheel using the 3 x 5mm Allen screws **(see Pic.17)**. *At this point, there is no need to apply Loctite or fully tighten the Allen screws, which will be done once the timing has been set.*

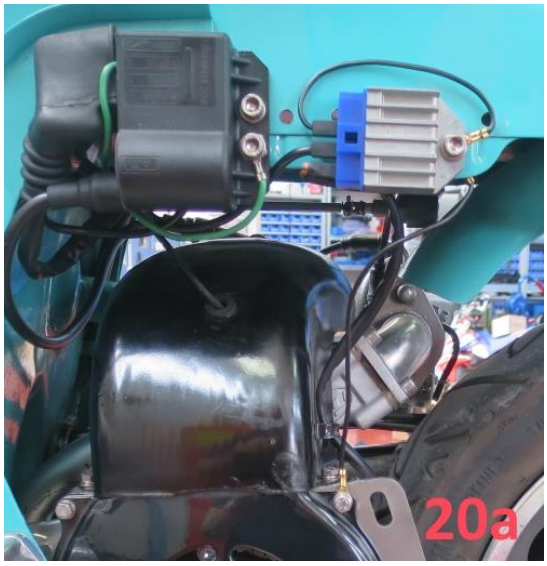


Start the scooter and using a **stroboscopic pistol**, check if the small recess on the outer edge of the fan aligns with the 19° timing mark on the actual casing. *Example:* if it is to the left, remove the flywheel and slacken off the 3 screws that hold the stator plate in position. Carefully rotate the stator plate slightly to the right and tighten everything back up again. Start the scooter and using the stroboscopic pistol check if the two marks now align perfectly. Repeat the operation until they align. If the mark on the fan is to the right of the timing mark on the casing when testing, carry out the same process described above, but turn the stator plate to the left. Again, repeat the operation(s) until the recess on the outer edge of the fan and timing mark on the casing perfectly align **(see Pics.18 + 18a).**

You have now set your timing to the desired 19° BTDC point.

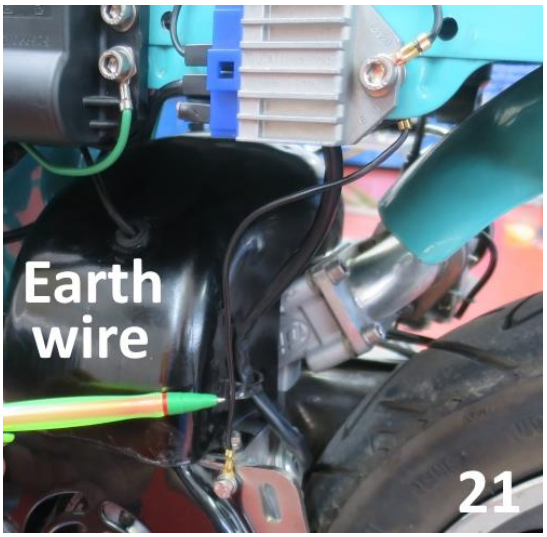
Remove the 3 x 5mm Allen screws that hold the fan. Apply a small dab of Loctite thread-lock **(see Pic.19)** to the screws and refit them along with their washers, tightening fully.

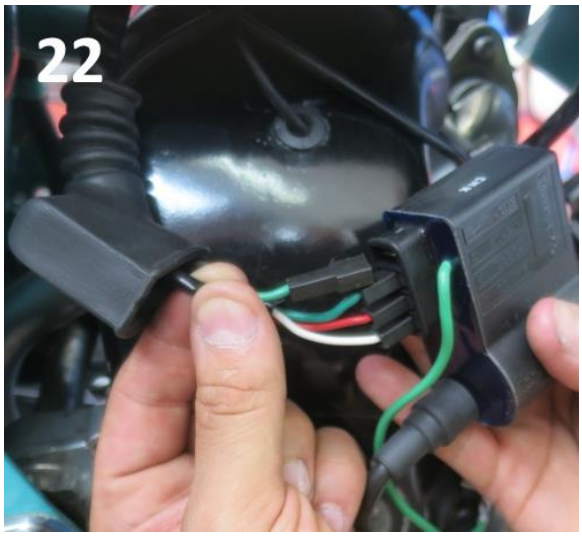




9. The routing of the LT wires and electrical components is down to personal choice but we have found that the CDI HT coil, the voltage regulator and the junction box can all be located quite easily on the section of the frame where the original coil was mounted. Although the original mounting holes already present on the frame can be used (with the electrical components effectively facing downwards), to enable all the components to be mounted here horizontally, you will need to drill one (for the CDI HT coil), or two additional 6mm holes (depending if you mount a round type junction box or not). The end result is both aesthetically clean and uncluttered **(see Pic.20 + 20a).** *The J Range scooter in the picture (above right) has a simplified wiring loom so no additional junction box was needed (see text below).*

10. RLC strongly advises the fitment of an earth wire (if not already fitted) between the frame and engine **(see Pic.21)**. This can be connected to rear of the junction box and the flywheel cowling. Paint may need to be removed to ensure a good earth on the frame and the quality of the connections can be checked with a multi-meter tool. Serrated ('toothed') washers will help to obtain good earth connections.



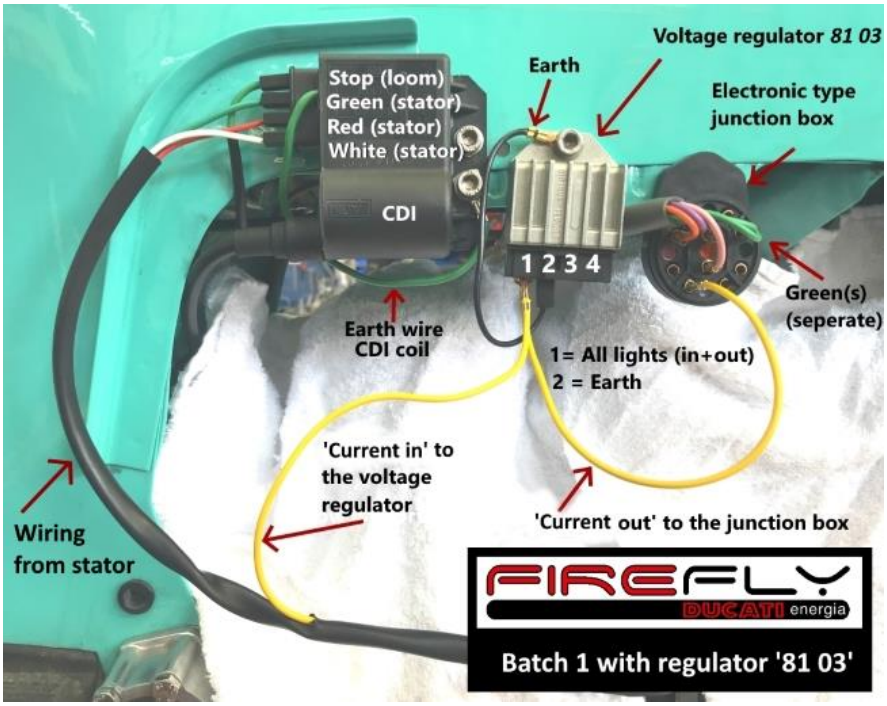


11. Fit the HT lead to the CDI HT coil and fit the rubber protection shroud. This is easier to do now before fitting the CDI HT coil to the scooter. There are 4 wires that exit from the stator plate. They need to be divided between the 3 wires for the CDI coil and the Yellow wire that provides all current for lighting. They need to be connected as follows:
Red = connected to the CDI HT coil in the 'Rosso' position
White = connected to the CDI HT coil in the 'Bianco' position
Green = connected to the CDI HT coil in the 'Verde' position
Yellow = connected to the voltage regulator

13. Separate the wires from the stator plate between the Red, White and Green which all go to the CDI HT coil and the Yellow wire which goes to the voltage regulator. Placing the wiring in the desired routing, check at which point the Yellow wire needs to exit, make a small hole and extract it from the sleeving. Feed the other 3 wires for the CDI HT coil through the large rubber protection cover attach their electrical terminals and then connect them as per the photo **(see Pic.22**). The 4th wire connection of the CDI HT coil *('Stop')* is to be used for the Green wire from the wiring loom harness, that in turn runs up to the handlebars for the 'kill' switch.

VOLTAGE REGUALTOR '81 03' BATCH 1
The first batch of **Firefly** ignition kits used a regulator with a black plastic section (the code on the regulator is **81 03**). For these, the yellow wire that exits from the stator plate must be connected in position **No.1** (see pic above). The 'power exit wire' must also be connected to this same wire in position **No.1** and that then takes regulated 12V current out to the wiring loom. An earth wire must be connected to position **No.2**.

The positions of the **81 03** voltage regulator are:
1. Current <u>in + out</u> for all lighting
2. Earth
3. Battery in (not needed)
4. Battery out (not needed)

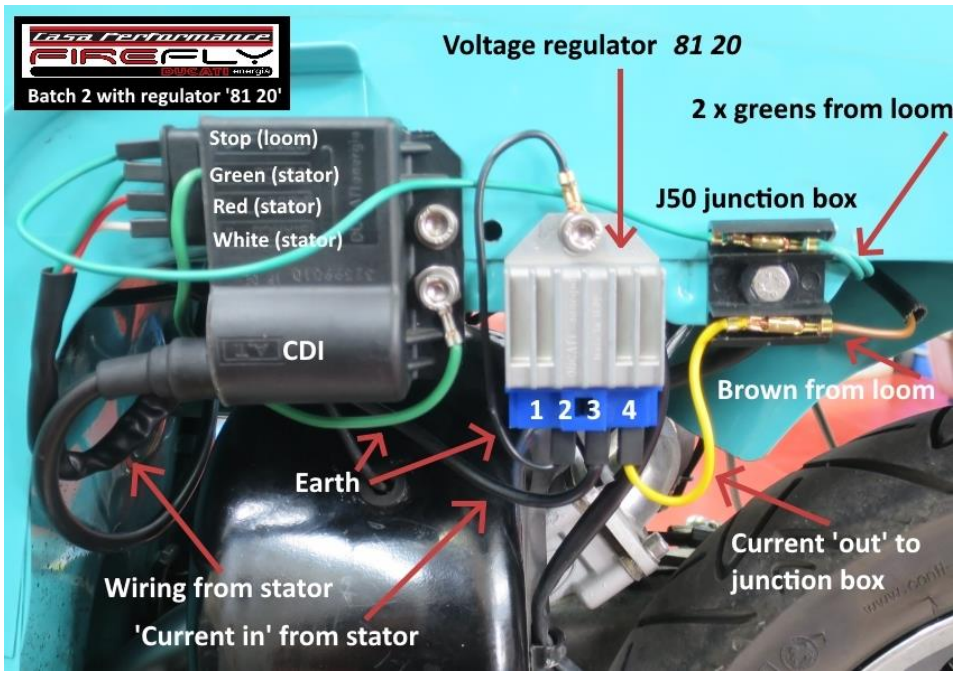


Please note that this photo is a 'simplified view' to show the colours of the various wires (therefore without sleeving etc.) and their relative connection points. The wiring loom is for a Cento / J125 / Starstream.

<u>VOLTAGE REGUALTOR '81 20' BATCH 2 (CURRENT SUPPLY)</u>
To simplify the wiring, a modification was made and all subsequent **Firefly** ignition kits now use a new regulator with a <u>blue</u> plastic section (the code on the regulator is **81 20**). For these, the yellow wire that exits from the stator plate must be connected in position **No.3**. The 'current out' wire can be connected in either position **No.1** or position **No.4**. This wire takes regulated 12V current out to the wiring loom. An earth wire must be connected to position **No.2**. See the Pic below.

The positions of the **81 20** voltage regulator are:
1. Current out for all lighting (1)
2. Earth
3. Current in from stator plate
4. Current out for all lighting (2)

Please note that we have purposely left the wiring from the stator plate slightly longer than necessary so that you may shorten it to suit your personal needs. A selection of electrical terminals and their plastic covers is supplied with each **Firefly** ignition kit.



Please note that this photo is a 'simplified view' to show the colours of the various wires (therefore without sleeving etc.) and their relative connection points. The wiring loom is for a J50.

WIRING

J50cc WIRING LOOM

If you have a standard 50cc type Lambretta wiring loom then you will have just one Brown wire for the lights. The Yellow wire from the stator plate must be connected to the voltage regulator. The 'current out' wire from the voltage regulator must then be connected together with the Brown wire of the wiring loom **(see Pic above)** to receive regulated 12V current. The single Green wire from the wiring loom that was previously connected to the HT coil must be connected to the 'Stop' connection of the **Firefly** CDI HT coil.

100cc + 125cc MODELS WIRING LOOM

If you have a standard wiring loom for either Cento or the 125cc models (all these models use the same wiring loom), there are Orange, Brown, 2 x Green (connected together), Pink and Purple wires. The yellow wire from the stator plate is connected to the voltage regulator. Regulated 12V current then exits from the 'current out' wire from the voltage regulator. This wire effectively carries regulated 12V current destined for the Orange (horn), Brown (main lights), Pink (stop-light) and Purple (parking lights) wires.

You now have two choices for connecting the wires from the wiring loom:

1. you can connect the Orange, Brown, Pink and Purple wires from the loom all together along with the 'current out' wire that exits from the voltage regulator, or

2. use a round, standard-appearance Lambretta junction box that is especially designed for use with electronic ignitions. This special junction box has 2 holes for the Green wires, and these socket holes are NOT connected to all the other socket holes, whereas all the other bullet connector socket holes are connected together. The 'current out' wire exiting from the voltage regulator can be connected into any one of the connection point socket holes of the round junction box, along with the Brown, Orange, Pink and Purple wires from the wiring loom. The two (joined) Green wires from the wiring loom MUST only be placed into one of the two Green socket holes. The single Green wire from the wiring loom (that was previously connected to the HT coil) must be connected to the 'Stop' connection of the **Firefly** CDI HT coil.

SIMPLIFIED WIRING LOOM
We also produce a simplified wiring loom for all J Range models, irrespective of engine capacity. Instead of having the 4 Brown, Orange, Pink and Purple wires to receive current from the voltage regulator (as described above), there is a single, female spade type terminal to connect to the 'current out' wire that exits from the voltage regulator. With this simplified loom the aforementioned round Lambretta electronic-type junction box does NOT need to be used. The other single, Green wire from the wiring loom connects to the 'Stop' position of the **Firefly** CDI HT coil. If fitted to a J50 model, this simplified loom has the added advantage of a stop-light facility for these models that normally do not have this.

14. Once you have mounted all the electrical components, cut the HT lead to length and fit the sparkplug cap. Do not cut this too short or it can become taught under suspension movement. Conversely, do not leave it too long or it could drop down and touch the (hot) exhaust manifold.

15. Remember to fit 12V bulbs. If you have a J50 model with a single filament headlight bulb, the maximum possible wattage bulb currently available is 25 watt (12V/25w). If you have a 100cc or 125cc model with a high-low beam headlight, you can fit a 12V 40/45W bulb without a problem, as there is 90W of current available for lighting.

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