

LUCAS ELECTRICAL STATOR OR ROTOR INSTALL GUIDANCE

**PLEASE READ THESE IMPORTANT INSTRUCTIONS BEFORE
INSTALLING YOUR NEW LUCAS STATOR OR ROTOR.**

Working on a motorcycle can require skills not normally acquired during daily living. Installing this stator or rotor is one such skill. Please read and follow the following instructions. If you feel that you do not have the requisite skills please do not continue! Failure to install this product correctly can cause injury or death. Checking the clearance between a Lucas stator and rotor is more than sticking a .008" thick feeler gauge between them in a couple of places. There are numerous reasons why the rotor could rub the stator.

To be sure that you have checked for all possibilities you must rotate the rotor during the checking process. Turn the motor through its 360 degrees stopping every 60 degrees to check the clearance between the stator poles and the magnet. It is possible for the stator to be off center and further have the rotor mounted to a bent mainshaft (a fairly common condition). If the rotor mounted on a bent mainshaft is sitting in an offset position, which lines up with the stator's offset, you can have a false impression that the rotor has the required .008" clearance. In this condition when you rotate the motor 180 degrees the offset rotor can run right up against the stator on the other side or have less than the required clearance.

Other problems which will affect the clearance of the stator and rotor include:

- Excessive clearance in the crankshaft bearings.
- Cracked or bent crankshaft.
- Cracked or bent mainshafts.
- Loose or misaligned inner primary covers, as with non-unit Triumphs, BSA and Nortons.
- Rotors mounted on worn crankshaft keyways or mainshafts.
- Stators mounted on misaligned or bent studs.

It is also imperative that the motorcycle manufacturer's recommendations are followed when tightening the nut securing the rotor. Also, any and all securing devices must be in place and in good condition. The .008" clearance is minimum. If the rotor has less, it is possible for the crank to flex enough during normal operation to allow the stator and rotor to rub. In all cases the rubbing will leave "witness" marks on the rotor and stator. Failures related to the rotor rubbing on the stator are the fault of the installer and will void warranties. The heat generated by the rubbing can melt insulation off the stator and damage the rotor. In the most severe cases It can lock the motor, cause damage to other parts of the cycle or cause injury, death, or worse.

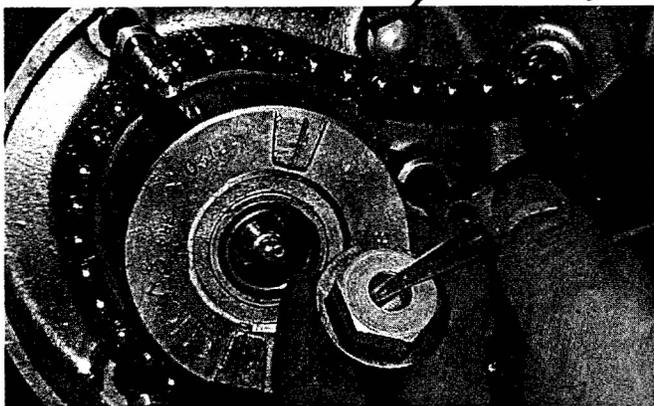
IMPORTANT! If it is found that you don't have sufficient clearance the problem has to be identified and corrected by a competent mechanic before the bike is operated.

After 30 Years of use and abuse there is more to installing a new Stator and Rotor than checking for the .008 inch minimum air gap!

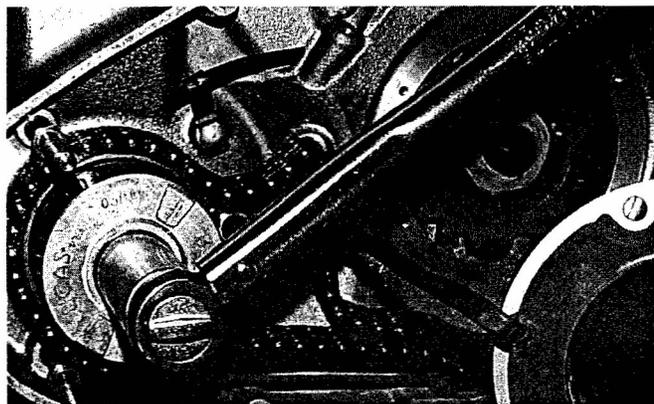
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After the locating key is offered and rotor slid on the crankshaft put a couple of drops of low strength loctite on the nut. Notice that the tab washer is on the nut. Be sure the "tit" on the tab engages the rotor key groove in the stator (some bike use a serrated lock washer).



Torque the rotor nut. Triumph's use 30 foot pounds while Norton recommends 70 to 80 foot pounds. Check with your workshop manual.

In attempts to make their electrical system perform better many people are replacing their stator and rotor. Whether it be a new rotor and 3 phase stator or just a new rotor installing them is not just tightening a couple of nuts. The air gap between them must be measured and adjusted if wrong.

If you read your manual it will tell you that .008" clearance is need for all to work properly. Less, and the natural flexing of the crankshaft can cause the face rotor to rub on the steel plates of the stator. If this happens the heat generated can roast the insulation on the stator and melt the metal holding the rotor together.

Few mechanics skip the warning to check the air gap, but many don't realize that it is just as important to rotate the rotor in 60° steps and do the checking six times. The stub holding the rotor could have been bent over the years. You start where you installed the rotor and with a .008" feeler gauge go around the rotor 360° confirming the clearance. Then turn the motor 60° and repeat. Do this until you are back to where you started.

Why is this important? Although you can check imperfections relating to bent studs, improperly machined cases (both engine and primary as with Triumph non-unit and Norton motors) etc by checking the clearance once, you cannot tell if the crank's mainshaft is bent.

There is more to installing a new rotor and stator than checking for the .008" minimum air gap. It is possible to have both the rotor off .004" in the same direction the stator is off .004" during initial assembly. You will measure the proper .008" minimum clearance, but when you rotate the motor 180° they will touch. If you failed to catch, and correct this, you could have a catastrophe in the making. It is important to realize that the cranks in these vertical twins flex, and as they do the clearance between the stator and rotor is compromised.

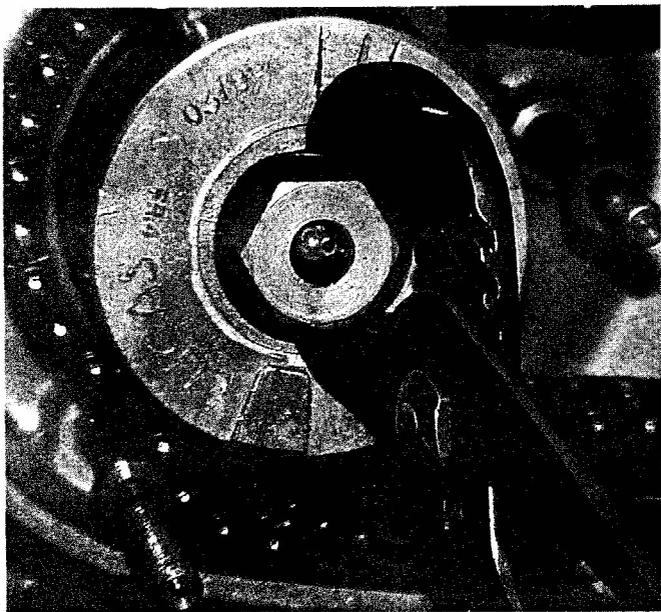
Beside the usual hand tools I would have available:

- Low strength loctite
- Water pump pliers
- Torque wrench
- Set of feeler gauges
- A 1/4 BS - 3/16W (a good quality 12 mm works) deep socket for early motors
- Or a 7/16 deep socket for late UNF motors

Offer the stator and rotor to the motorcycle following the manufacturers instructions. Use a

couple of drops of low strength loctite on the rotor nut and torque it to the recommended value.

To make timing easier in the future, and fool proof your Boyer installation, I would put a bit of white or black finger nail polish in the top dead center (tdc) timing mark. Because there are two on the rotor you have to identify the correct tdc mark. You do this by checking that when the pistons are at tdc identifying the mark that will be opposite the pointer when the primary cover is fitted. To do this I put the bike on the center stand, spark plugs out and the gearbox in high gear. I then point a small flash light into the cylinder. Rotate the rear wheel until I see the piston is at tdc. You only need to be approximate. Put a small amount of paint in the correct timing groove on the rotor.

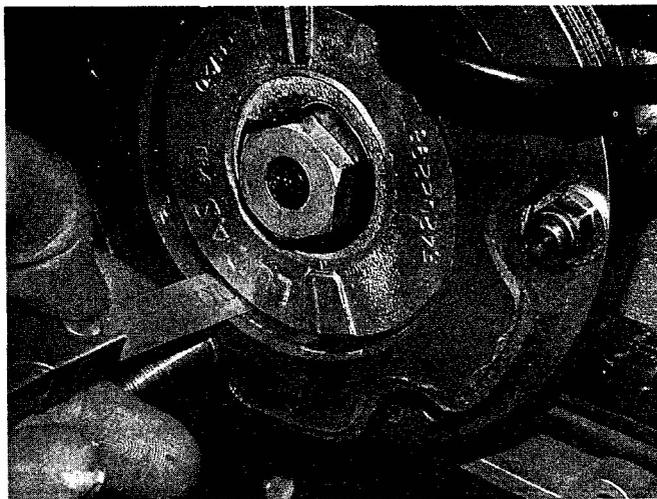


Start bending the tab washer with a screw driver. Finish it with a pair of water pump pliers.

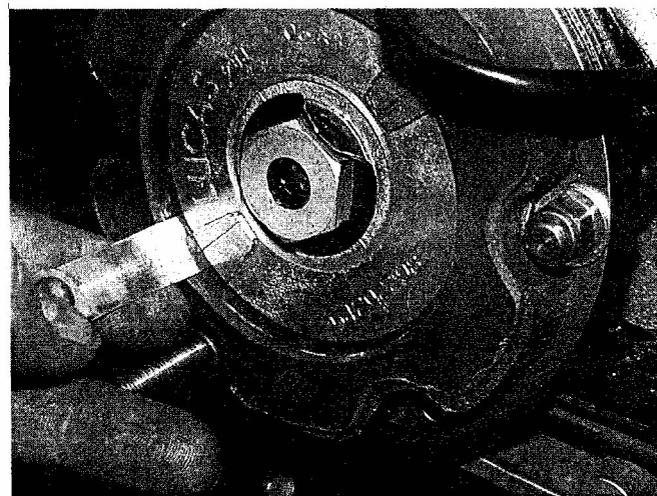
Now as stated in the Norton Workshop Manual: "Check the gap between the stator and rotor which must give a minimum air gap of 0.008" to 0.010". Any misalignment of the stator mounting studs would account for the reduced air gap at any one point and can only be corrected by very careful slight realignment of the studs."

When they say slight they mean it, as very little force is required to crack or break the studs. If the crank's mainshaft is bent further work by an expert is required. One can machine the outer diameter of the rotor, but you will loose some output from the stator.

John Healy



After offering and securing the stator check the rotor to stator clearance Insert a .008" feeler gauge between the rotor and the stator and slide it around checking all 360 degrees.



Because the mainshaft the rotor is mounted on could be bent rotate the rotor 60 degrees and check the clearance again. Do this each 60 degrees until you are back to where you started. If there is less than .008" clearance it must be corrected before the bike is used. Normal crank flexure can cause the rotor to hit the stator if there is less than .008" clearance.

The small print: Working on a motorcycle often requires skills not normally acquired during daily living. It is beyond the ability the writer and the scope of this article to give you all of the skills or knowledge that might be required to properly install a new rotor or stator. Please read and follow the instructions supplied by your motorcycle's manufacturer including clearance and torque specifications. When in doubt seek the help of a trained technician.