BELT DRIVE ALIGNMENT

With the calls for more “tech” articles I offer this contribution along with the caveat that I am a painter & decorator not an engineer. If you are not deterred by this admission read on.

This method is for diaphragm clutch systems although it would work on earlier clutches if a straight edge can be placed against the front faces of the clutch basket.

Firstly you must have a gearbox adjuster on the drive side or this system won’t work. I hope the drawings below make it clear, remember, painter not draftsman.

Step 1 Put the bike on the centre stand. If it’s a new belt assembly don’t fit the stator, if it’s assembled remove the stator. Loosen all gearbox adjusters , top and bottom mounting bolts and ensure the gearbox is free in the cradle.

Step 2 Slacken off the rear axle and dummy axle. Now tension the rear chain so it is dead tight. This will pull the gearbox back and tighten the belt. Move the drive side gearbox adjuster to lock the gearbox in this position. Now slacken the rear chain. Using the drive side adjuster, move the gearbox forward to obtain the manufacturers specified belt tension.

Step 3 Now get a steel ruler, I use a 600mm one and push it up against the clutch basket ( it will sit on the clutch diaphragm centre ) while at the same time resting it on the rotor, being magnetized this will hold the ruler fast. If you are doing this alone use your right knee to press the ruler against the clutch, this enables you to carry out the next step with both hands free.

Step 4 For this part you will need a calliper, I use a digital calliper as it’s easier to get quick readouts. Rest the depth end of the calliper against the ruler and slide it in until it contacts the pulley, taking measurements at the fore and aft ends. If they are identical the clutch basket and pulley are in alignment ( see fig 1 ). If the aft measurement is greater, this means that the main shaft is pointing inwards ( see fig 2 ). To correct this go to the adjuster on the other side and move the gearbox towards the motor until both measurement at the pulley are the same. If the measurement at the front of the pulley is greater ( see fig 3 ) use the same adjuster to move the gearbox away from the motor.

Step 5 Now hopefully the alignment is spot on. However before you lock everything up, consider this. In my instructions it was advised to have the main shaft slightly pointed aft in relation to the crankshaft; this is to allow for the take up in the main bearing in the gearbox under acceleration.

Step 6 To achieve this you need to have the forward measurement of the front pulley slightly greater. This can be achieved by moving the gearbox adjuster on the timing side so as to move the gearbox SLIGHTLY towards the motor. Recheck the two measurements at the pulley. I have mine set at .004” greater at the front of the pulley. This is a pure guess. Note that the distance between the reference points is only a few inches so a very small difference at the pulley translates to a bigger difference at the clutch; and so affects the main shafts relationship to the crank shaft. I don’t think this is critical otherwise the manufacturer would be more exact than just saying “slightly”.

In most cases the timing side adjuster will be the one you will use the most, however as belt tightness is part of the process you will have to use the drive side adjuster in concert with the timing side adjuster to achieve the best outcome.

Step 6 Tighten the adjusters and bolts to stabilize the gearbox and adjust the rear chain. Turn over the motor with the kick starter or select top gear and rotate the rear wheel so you can check the belt tension. Do this at several points to ensure it is to the manufactures specs. If all is correct, lock up the top and bottom gearbox bolts and refit stator. Double check the belt tension, you may find that you will have to go through the process several times before you get it exact. You will also find that very small movement on the adjusters will have a huge effect on belt tightness and alignment. Now go for a ride with the outer cover off and check to make sure the belt is tracking straight. This is safer with your Norton stationary with the motor going after the ride! Put the primary cover back on, job done, or is it?

After a few short rides remove the outer primary and inspect the belt. If you see a fine talcum powder which matches the colour of your belt there are two possibilities.

(a) The belt isn’t aligned and is rubbing on the pulley keepers or the inner or outer of the primary case. The latter is usually only an issue on pre commando’s.

(b) The belt is too loose and is skipping over the pulley and clutch outer.

Good luck and remember, never scrimp on preparation and always apply two coats!

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