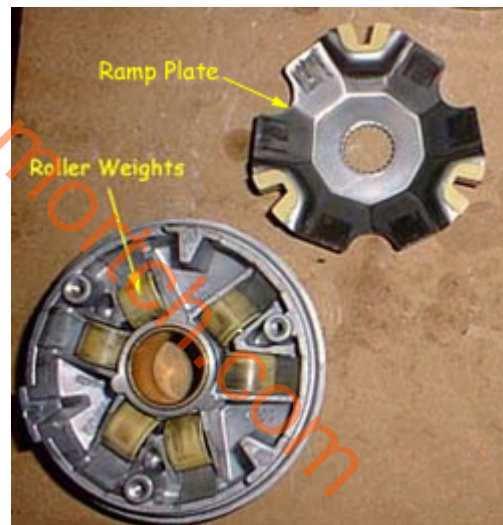
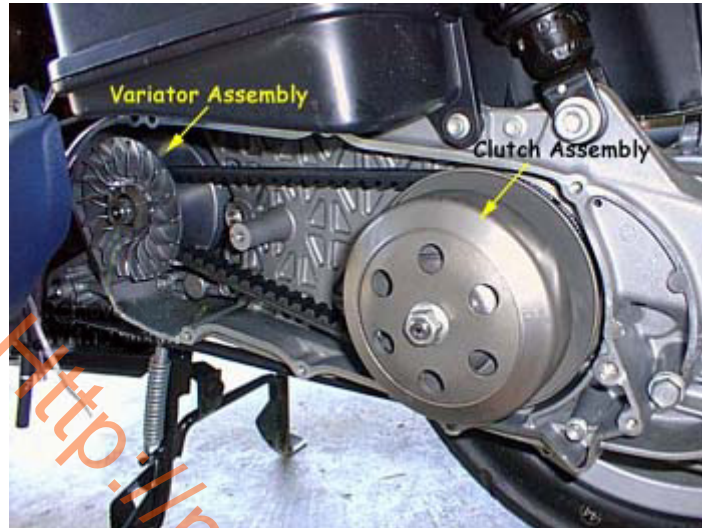




Transmission, Learn How the Variator, Roller Weights, Clutch, Clutch Springs, Contra Spring, and Torque Driver All Work Together

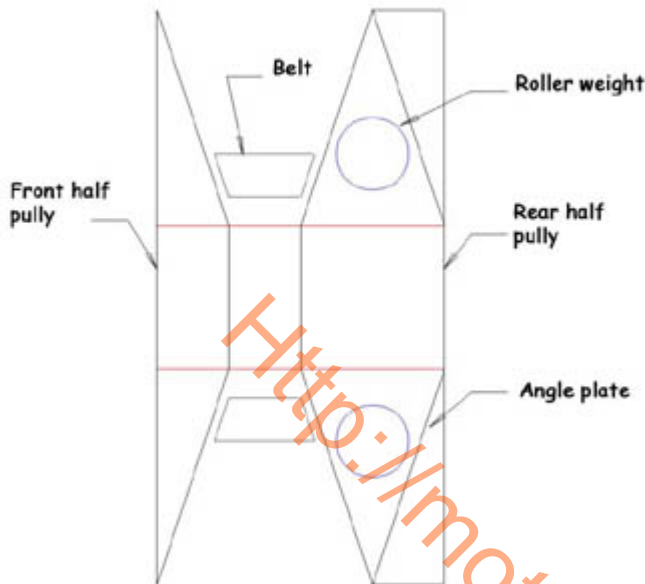
Front Pulley / Variator Assembly





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Variator Assembly



A variator is designed to adjust your rate of acceleration, at what RPM your motor runs while it is accelerating and at what speed the motor is revving when you reach the highest gear ratio available.

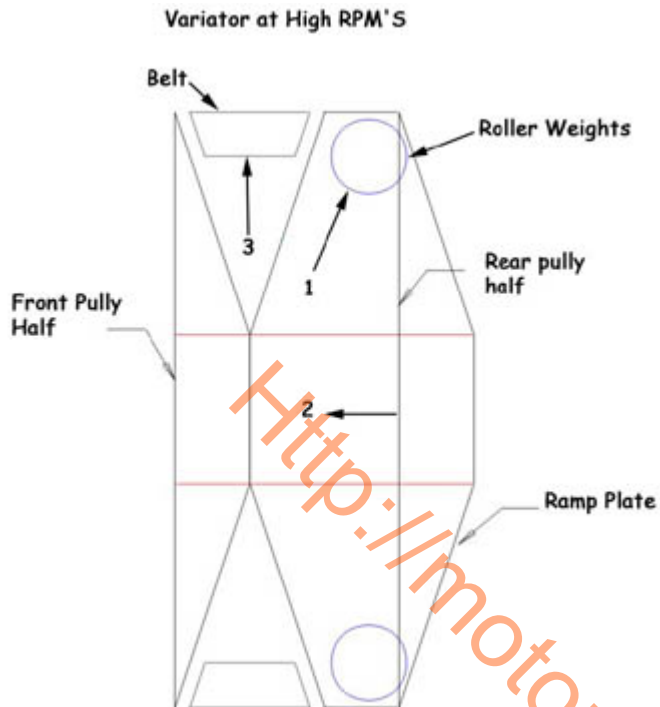
Now having said those things, the key is to have your motor running at about 8000-8500 rpm's consistently while accelerating. This is where your greatest horsepower is generated. If you are accelerating at 5000 rpm's or 9500 rpm's, this will decrease your acceleration because your horsepower is not at it's peak.

Optimal performance is only achieved through trial and error. Changing your contra spring, and then trying different roller weights is how this is achieved.

In order for you to understand which way you need to go with weights and springs, you must first understand how the entire drive train works.



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Lets start with the front pulley of the variator. This is where your roller weights and ramp plate are located.

Now as the rpm's of the motor increase, the centrifugal force pushes the roller weights out (Number 1 in picture).

The roller weights push out and onto the angle plates surface. This causes the rear half of the pulley to move toward the front half of the pulley (Number 2 in Picture).

When the rear half of the pulley pushes to the front pulley, it forces the belt out to a higher gear ratio. (Number 3 in picture).

If you are thinking about getting a new variator, Let me first start by telling you that it will probably not have any effect on your over all top speed. What it will do is give you a more steady acceleration. The distance that the rear half of the pulley can travel pretty much remains the same. Meaning that it will only push the belt out as far as the stock variator will which results in the same high gear ratio as the stock variator. The key difference between the stock and performance variators is the angle on which the roller weights travel and the angle on the angle plate in the rear of the variator. This will only help give you a smoother, more constant acceleration.

Now as for the different weights for the rollers. It is really rather simple. The heavier the weight, the more force will be applied to the angle plate forcing the rear pulley forward faster. If the roller weights are too heavy, it will force the gear into too high of a gear too fast.

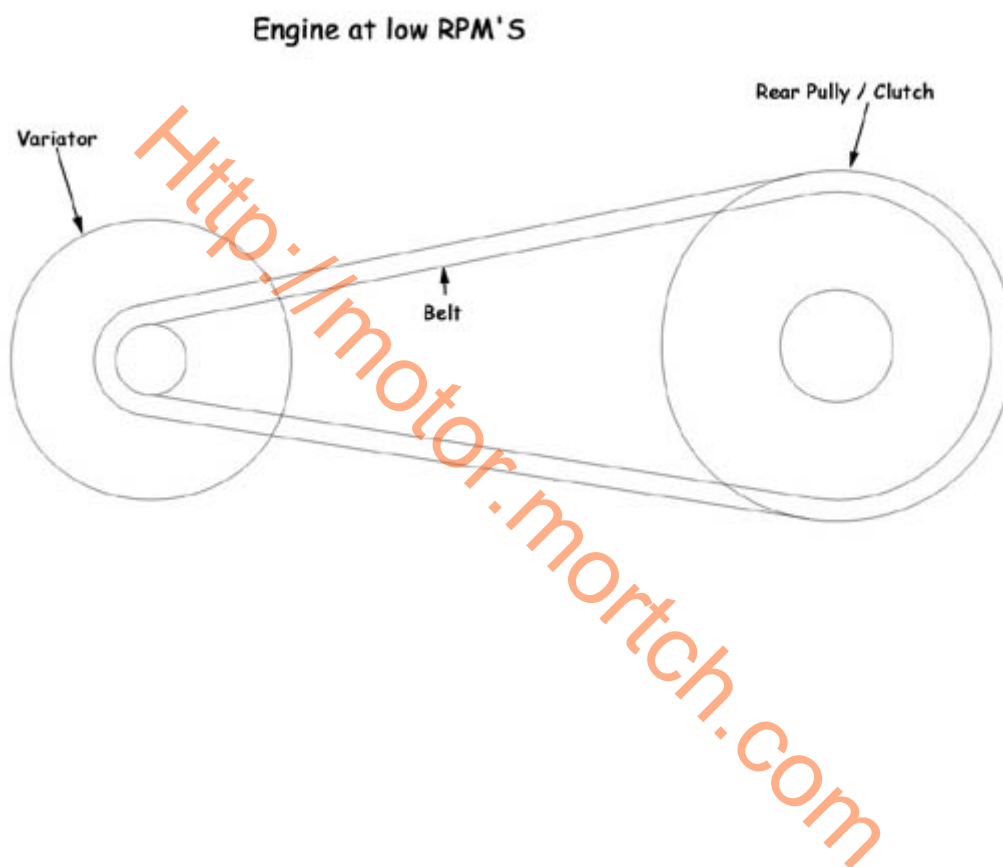
I like to use a 10 speed bicycle as a comparison. From a dead start, if you are in 10th gear, it is very difficult to get going. But if you are in first gear, it is very easy to get moving. the same principle applies here. You want the weights to keep you in first gear, and as the rpm's increase, it will gradually step the gears up until it reaches tenth gear.



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If your roller weights are too light, then there will not be enough force to push the ramp plate out and the rear half forward. This will result in good acceleration, but a low top end.

This is what the ratio looks like in low gear. You will see that the front pulley is small, and the rear pulley is large. This is like first gear of the 10 speed bike:

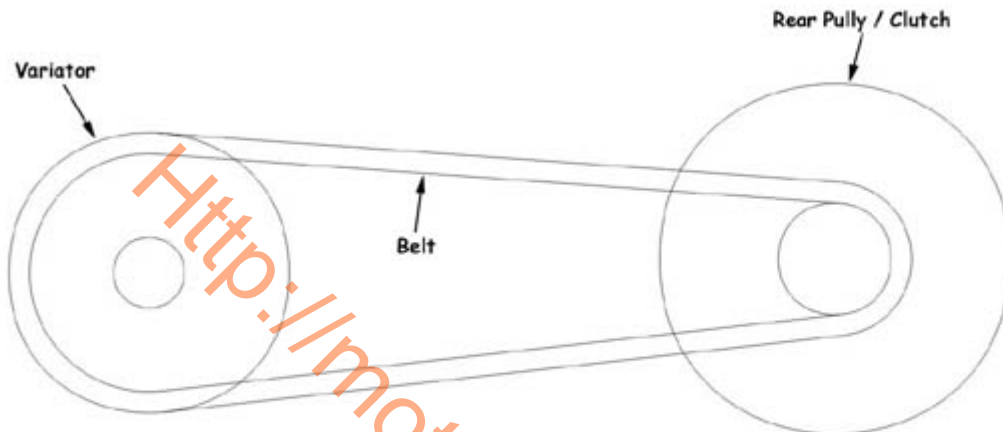




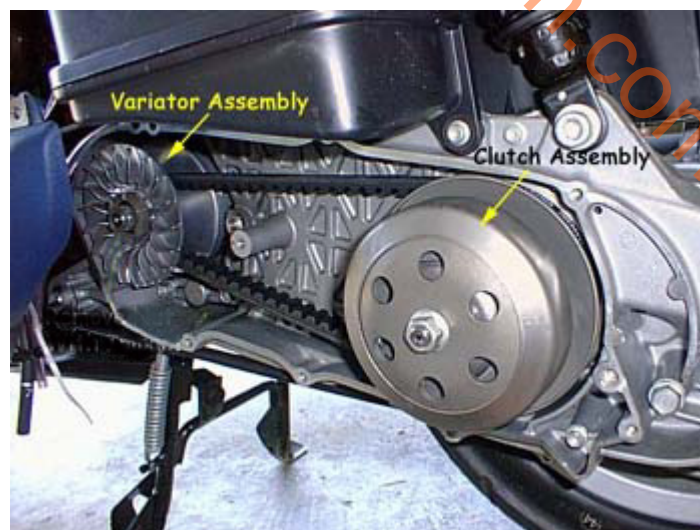
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This is what the gear ratio looks like when the roller weights are pushed out and the rear half of the pulley is forward. The belt is pushed out to a higher ratio. This is like tenth gear on the bicycle:

Variator at High RPM'S

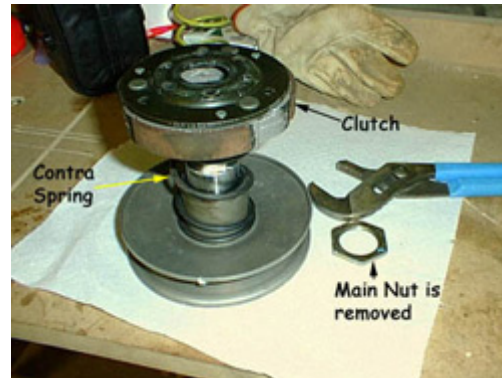
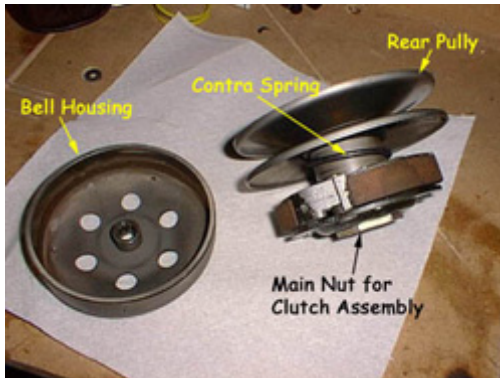


Rear Pulley / Clutch, Contra Spring Assembly





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<p>Rear Pulley Low Gear</p> <p>This diagram shows the rear pulley in low gear. The belt is positioned on the narrow part of the pulley. The clutch is on the left, and the rear pulley is on the right. The rear pulley is split into a front half and a back half, with a contra spring between them. The belt is shown on the narrow part of the pulley.</p>	<p>This is what the rear pulley looks like at low rpm's</p> <p>Now the other factor in this equation is the rear pulley. The rear pulley has a spring holding it together. This is your contra spring.</p> <p>The front half of your rear pulley is also torque controlled. There are angled grooves that the pulley travels on. As torque is applied, this limits the belt from traveling in too quickly. Likewise, as you go up a hill and torque is applied to the pulley, it is supposed to force the pulley together giving you a lower gear ratio.</p>
<p>Rear Pulley In High Gear</p> <p>This diagram shows the rear pulley in high gear. The belt is positioned on the wide part of the pulley. The clutch is on the left, and the rear pulley is on the right. The rear pulley is split into a front half and a back half, with a contra spring between them. The belt is shown on the wide part of the pulley.</p>	<p>This is what the rear pulley looks like at high rpm's</p>