Knowing and Tuning Tattoo Machines

The Machine Parts

Though the Rotary and Coil type Machines do not look anything like each other the process they use is virtually the same electrically.

The only real common parts among both these machines are the tube vice, armature pin and the point where you connect the power clip cord.

Over the next few pages I shall go through each part you see on the diagram above and I will give a description on what each part in turn does and any tips that you may use to affect the tuning of the machine!

Following the descriptions I will give you the Tricks on tuning the machine to run exactly how you need it to run. I.e. Liner/Shader/Colourer.

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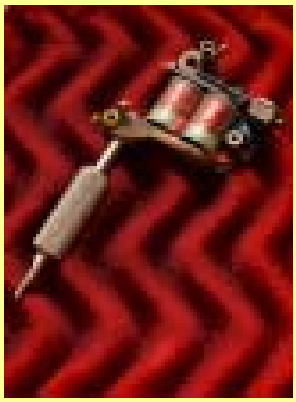
Please read and digest the information carefully because even the smallest part of the machine you use could have a BIG effect on its running.

Ladies and Gentlemen this is where you begin to use your tools as they should be!…



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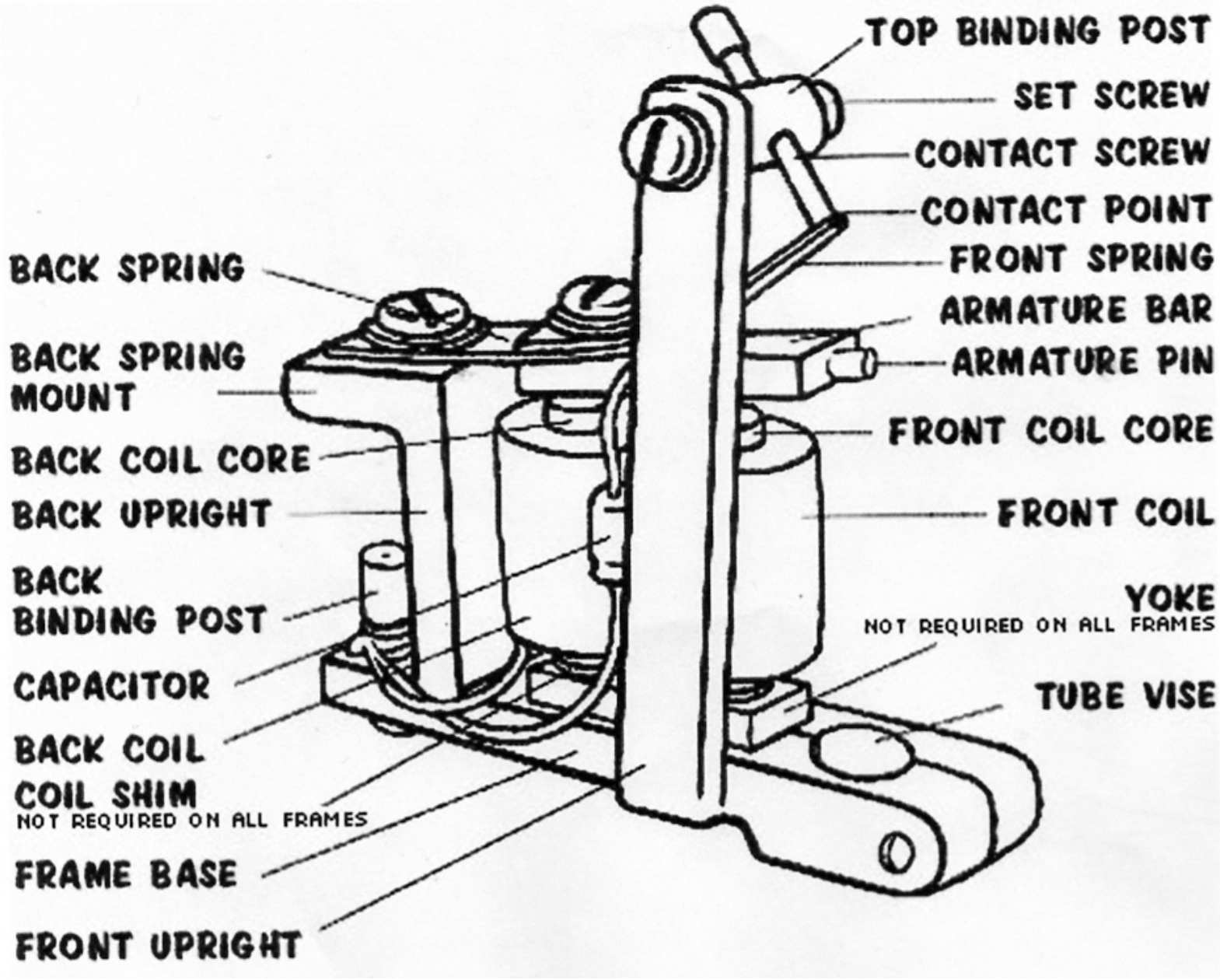

Parts Descriptions

Frame Base -
The Frame Base is the main part of the machine on to which everything else bolts on. Various designs are used as are various materials, i.e. Cast Iron, Steel, Brass, Aluminum and just about anything else including whalebone etc!…

The COILS, BACKSPRING & BINDING
POSTS are fitted to the frame at various points and the Tube Vice is at the front where you attach the Back Stem of you Grip. The most important thing to consider is that the frame is sturdy and will not flex.

Also if you need a dual purpose liner/shader machine the top of the FRONT UPRIGHT must be slotted so the TOP BINDING POST can be moved back and forth. Also try to find a machine where the BACK SPRING MOUNT can be moved back and forth, this allows for a great deal of adjustment.

The YOKE is only needed on machine frames that will not magnetize the coils via the frame when running I.e. brass, aluminum etc… Most steel and all low carbon iron frames do not need the YOKE.

I consider brass frames to be a better standard than iron ones simply because iron frames magnetize over the session of a tattoo and the brass ones don't!… Magnetizing of the frame deteriorates the running of the machine slowly but gradually and takes a few hours to demagnetize when left unpowered.

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Coils -
The COILS are the motor of your machine, the main configurations are 8 wrap, 10 wrap and 12 wrap. This is the amount of layers of insulated wire wrapped over the COIL CORE.

Generally the higher the amount of wraps the more needles you can in turn use on the end of your needle bar. Various gauges of wire and core are used but the most important part is the core is low carbon steel.

This ensures a good magnetic flow for the machine and that means a stronger pull on the ARMATURE BAR, which in turn means more voltage adjustment is allowed while tuning.

The coils are joined in series and connected also with a CAPACITOR, this is used to smooth any rough voltage regulation from your power supply/clipcord and also reduces arcing between the CONTACT SCREW and the CONTACT POINT on the FRONT SPRING.

I can not emphasize the importance of **GOOD QUALITY COILS!...** They make or break your machine. Simple as that!… Make sure you buy the coils from the likes of Micky Sharpz, Pulse ,Time Machine or a REPUTABLE independent builder etc. Its worth the extra couple of pennies!…

Spring Sets -
Springs normally come in two parts, front and rear!… The rear spring controls the amount of movement of the ARMATURE BAR and the front spring acts as an electrical point and also acts to a degree as a shock absorber on the upward movement of the ARMATURE BAR.

Various thickness springs are used and they will be explained in the tuning section later on in this E-Book.

Armature Bar -
The armature bar affects the speed you can use your machine at, basically the lighter the bar , the faster you can run your machine but the weaker it will hit so this type of armature bar is really best for outlining with 3 needle outliners etc, also it will produce a lot less vibration through the frame while tattooing.

Now if you use a heavier bar the amount of needles that will actually puncture the skin and not cause the machine to start stalling is increased but the speed of the machine will be slower due to the extra weight of the armature bar.

This set-up is ideal for shading and coloring obviously because more needles on the end of your needle bar means you can shade with more precision and with coloring you can fill in more area with color quicker which also reduces trauma to the skin leading to reduced scabbing during healing and no scarring.

The use of Different Armature Bars with different gauge springs and different wind coils affects the way your machine runs immensely. Various set-ups will be described later in this E-Book.

Binding Posts/Capacitors -
The binding posts are the electrical points from which your machine runs in a nutshell!..

The TOP BINDING POST is basically an OPEN/SHUT set of points like on a car!… When the CONTACT SCREW is in contact with the FRONT SPRING CONTACT POINT and you have your foot on the foot pedal switch, the circuit is…

completed and electrical voltage is powered through the winds on the COILS which in turn causes the COIL CORES to become magnetized which in turn builds up to a point where the power of the magnetism in the COILS is stronger than the REAR SPRING tension and the ARMATURE BAR is pulled toward the top of the COIL CORES…

When this happens the electrical circuit is broken and the magnetism in the COILS reduces to a point where the REAR SPRING TENSION is once again stronger than the Magnetism in the COILS, therefore the ARMATURE BAR returns back to its original point and makes the electrical circuit once again, but due to the tension of the REAR SPRING springing backwards the ARMATURE BAR actually returns slightly further back than its final resting point and therefore the CONTACT SCREW and FRONT SPRING CONTACT POINT have a long enough time to recharge the COILS.

The process is then repeated again and again and again etc until power is cut to the machine when you take your foot away from the power foot switch… FRONT SPRINGS affect the amount of time the COILS have to charge up, a softer FRONT SPRING will give a longer Charge to the coils and a harder FRONT SPRING will reduce the time.

I tend to use soft FRONT SPRINGS on Liners and harder FRONT SPRINGS on Shaders/Colourers…

The BACK BINDING POST is generally a point to connect your + positive power connection while the frame is where to connect the - negative connection. Both BINDING POSTS must be electrically isolated from the actual FRAME BASE.

Also connecting a CAPACITOR between both BINDING POSTS reduces arcing at the contact points.

Cut-Back Liner

The Cut-Back Liner is generally the *most used but most difficult to set-up.*

The quality of your line work would be consistent and of equal thickness when used with a smooth constant hand speed!…

This really is the **Daddy of Set-ups**… Practice on getting this set-up running smooth first and all other set-ups will be a piece of cake!...

A few tips before I tell you the way to set-up the cut-back liner first!… *Always make sure the end of your CONTACT SCREW is clean!…* Give it a bit of a rub with very fine grade Emery cloth or very fine WET/DRY paper and rub the top of your FRONT SPRING where the CONTACT SCREW touches with an alcohol pad!…

If you have not got an alcohol pad you shouldn't be tattooing!!!.

NOTE:- I wont use a diagram of a machine during the set-up procedure due to the fact that the geometry of machines can differ, but if you follow my instructions to the letter you will not need diagrams from this point forward!…

Here we go then!…Set your Power Supply to exactly 6 volts Set adjustment point as far back as is possible and angle your CONTACT SCREW at 90 degrees to the angle of your FRONT SPRING.

If you do not have a CUTBACK FRONT SPRING fitted then you should have the CONTACT SCREW touching the FRONT SPRING about 1/2 way down the length of the spring.

Press down on ARMATURE BAR until it touches the COIL CORE and adjust the CONTACT SCREW so there is a 1mm gap.

Purchase a CUTBACK FRONT SPRING as soon as you can!...
Set your REAR SPRING MOUNT forward in its slot and move the ARMATURE BAR forward so the NEEDLE BAR will be forward of center of the GRIP BACKSTEM by about 2mm.

Adjust the REAR SPRING MOUNT so the gap between the rear of the ARMATURE BAR and the front of the REAR SPRING MOUNT is just enough to start running with 6 volts applied.

Adjust CONTACT SCREW for smoothest running at 6 volts… Fit Needle Bar and put a slight bend in the bar so it centralizes itself in the tube.

Fit two correct sized rubber bands and apply power. Adjust Voltage ONLY now for Smooth running!...

If you don't have an adjustable REAR SPRING MOUNT then just move you REAR SPRING back until the spring tension is just running at 6 volts as above.

If the ARMATURE BAR is behind the center of the GRIP BACKSTEM then either use a grade thicker REAR SPRING or use a slightly longer ARMATURE BAR!… *Adjust until the machine runs SILKY SMOOTH!…*

Regular Liner Set-up

The Set-up of the Regular Liner is very similar to that of the Cut-Back Liner but the Geometry is slightly different…

The point of the UPRIGHT BINDING POST is slightly more forward in is setting and the tip of the CONTACT SCREW is set about 1/3 to ¼ away from the front of the FRONT SPRING…

A SOFT FRONT SPRING is advisable in this set-up along with a power setting of between 6.5 - 7.5 volts from your supply.

A very slightly longer gap between the front of the REAR SPRING MOUNT and the rear of the ARMATURE BAR compared to a CUT-BACK setting on the same machine but this is usually only about 1mm longer…

This type of Regular Liner Set-up is great for outlining the *likes of Chinese Kanji Lettering* where as the Cutback Set-up is great for normal Tattoo lettering and the sharpness you need in Tribal Tattooing!

Shader/Colourer Set-Up

To Set-up as a Shader/Colourer the point of the UPRIGHT BINDING POST needs to be set back towards the rear of the adjustment point but the CONTACT SCREW angled so the tip is right on the tip of the FRONT SPRING.

This gives a smooth soft hit even when using large needle configurations.

A HARD FRONT SPRING is advised here and a Soft to Medium REAR SPRING with a larger gap between the REAR SPRING MOUNT and the ARMATURE BAR…

Voltage here can be anything between 6 volts for Grey Shading and blending Colors up to 8.5 - 9 volts for Large grouping Blackwork or Backpiece Tattoos.

Remember when putting in color and especially blending colors to *keep your needles at 45 degrees to the skin for smooth coverage*, Color Tattoos make or break you!…

I always set my front spring angle to between 20 and 25 degrees. Any more and the machine will run quite erratic and weak, any less and the same occurs…

A lot of tattooists use a rubber O-ring fitted from behind the armature-bar screw and under the front spring.

This gives a quieter running machine overall but the rubber can perish very quickly and change the running of a machine quite drastically even through an individual tattoo.

This can confuse some tattooists!… I prefer to use a bend in the front spring myself... I hope that this has helped you understand the way machines run.

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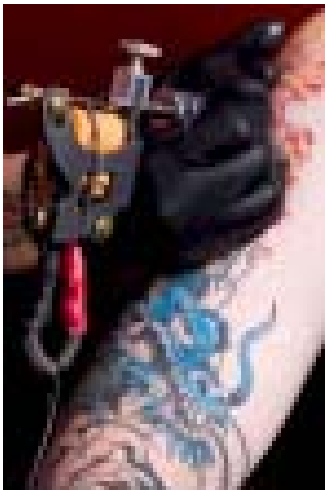
Best of Luck!

If you are a beginner tattooists and need some solid advice and tips from a veteran professional Check out Dotattoos.com...
How To Be A Tattoo Artist Guide



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