ADJUSTMENT PROCEDURE
I/S-TURBO REV 1.X

The REV 1.x revisions of the I/S-TURBO software provide adjustment means to set the needle speed, the needle positioner's up and down positions, the needle return position of the regulated stitch and the constant speed range. The SELECTOR DIAL on the back of the machine is used to select the adjustment modes (NOTE that the front dial is disabled in adjustment mode).

REAR SELECTOR DIAL POSITION	ADJUSTMENT MODE
B1	needle speed
6 stitches per inch	high speed coasting
12 o' clock	needle positions
MAX.	precision stitch position, maximum constant speed

The DOWN pushbutton is used to select between increasing (light off) and decreasing (light on) the settings

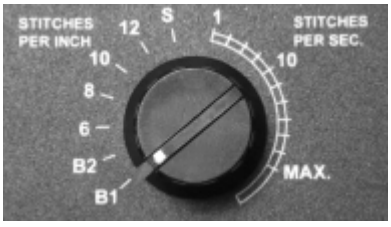
To enter the adjustment mode, hold the RED SINGLE STITCH BUTTON down while powering up the unit. The button should be held down until the machine stopped beeping.

A. NEEDLE SPEED ADJUSTMENTS

In this mode the needle speed for the needle positioner can be adjusted.

Note that the needle positioner speed adjustment will affect ALL of the other settings, so it should be performed first.

NEEDLE POSITIONER SPEED



1. Turn the SELECTOR DIAL to the B1 position.
2. Push and hold down the RED BUTTON. Instead of a full single stitch cycle, a needle positioning step (up or down) will be made.
3. Check the speed and strength of the needle movement. The speed should be low enough to notice the fine adjusting second phase when the needle is pulled up. Avoid setting the needle speed too high, for it may cause the needle to run over its top and bottom positions. On the other hand, a too low positioning speed may not be enough to pull out the needle from the fabric.
4. If the speed and strength are sufficient, release the RED BUTTON, the adjustment is completed.

5. If the speed and strength are not sufficient, while still holding the RED BUTTON down, turn on the DOWN light if the speed needs to be decreased, turn it off if increasing is necessary.

6. While still holding the RED BUTTON down, hit the BLACK BUTTON. A beep will indicate that the speed was increased/decreased and the new value was stored in the computer's memory. A missing beep indicates that a high/low limit was reached.

7. Release the RED BUTTON and repeat the procedure from Step 2 until the desired speed is reached.

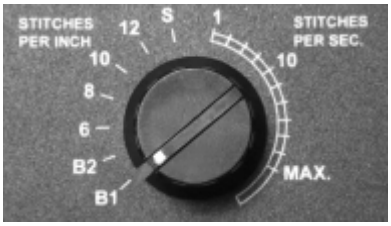
REGULATED STITCHING SPEED

The REGULATED STITCHING SPEED directly affects the quality of the stitch regulation. If you can "outrun" the machine, in other words, the stitches get longer when you move the machine faster, the REGULATED STITCHING SPEED is not high enough. On the other hand, if the stitches are shorter than the selected length, because double stitching occurs, the REGULATED STITCHING SPEED is too high. Too high speed can also cause motor overheating.

While most of the adjustments are "What You See Is What You Get", the REGULATED STITCHING SPEED setting requires testing outside the adjustment mode: After changing the speed, return to the normal operating mode by turning the power off and on again. Test the quality of the stitch regulation by moving the arm with your slowest and fastest speed and decide whether further adjustments are necessary. If yes, return to the adjustment mode and make the changes.

The optimum setting of the REGULATED STITCHING SPEED will be just high enough to provide accurate stitch length, but not too high to cause motor overheating or double stitching. Always start with a low speed setting and gradually increase it until acceptable regulation is reached.

To change the REGULATED STITCHING SPEED, follow the procedure below:



1. Based on the regulation quality test, decide if the speed needs to be increased or decreased.

2. Turn on the DOWN light if the speed needs to be decreased, turn it off if increasing is necessary.

3. With the SELECTOR DIAL still at the B1 position, push and hold down the BLACK BUTTON. A fast single stitch will be made.

4. While still holding the BLACK BUTTON down, hit the RED BUTTON. A beep will indicate that the speed was increased/decreased and the new value was stored in the computer's memory. A missing beep indicates that a high/low limit was reached.

5. Release the BLACK BUTTON and repeat the procedure from Step 3, changing the speed by one or two steps at a time.

6. Set the machine in normal operating mode and test the results of the adjustment.

7. Repeat the procedure from Step 1, if necessary.

B. HIGH SPEED COASTING ADJUSTMENT

The I/S-TURBO software eliminates the long stitches at sudden speed or direction changes by keeping the motor coasting around these critical spots. The amount of coasting will affect the stitch quality at points: too much will cause stitch pile-up, too little will result in long stitches coming out of a point.

Similarly to the REGULATED STITCHING SPEED, the amount of coasting should be tested in normal operating mode. Test the stitch quality by sewing patterns with points (stars, feathers, etc.), and decide whether the coasting needs to be increased or decreased.

NOTE that the arm should be moved faster than 20 stitches per second to turn on the coasting effect.

If the coasting needs adjustment, follow the procedure below:

1. Set the SELECTOR DIAL to the 6 stitches per inch position.
2. Based on the stitch quality test, decide if the amount of coasting needs to be increased or decreased.
3. Turn on the DOWN light if the amount of coasting needs to be decreased, turn it off if increasing is necessary.
4. Push and hold down the BLACK BUTTON. A fast single stitch will be made.
5. While still holding the BLACK BUTTON down, hit the RED BUTTON. A beep will indicate that the amount of coasting was increased/decreased and the new value was stored in the computer's memory. A missing beep indicates that a high/low limit was reached.
6. Release the BLACK BUTTON and repeat the procedure from Step 4, changing the amount of coasting by one or two steps at a time.
7. Set the machine in normal operating mode and test the results of the adjustment.
8. Repeat the procedure from Step 1, if necessary.

C. NEEDLE POSITION ADJUSTMENTS

The needle position sensor's timing is set at the time of the installation, there is no need to re-time the sensor. It is recommended, however, to check the proper timing before the needle position adjustment takes place.

To check the sensor timing:

1. While watching the red FAIL light, turn the handwheel **very slowly** to the forward direction (counter-clockwise, if viewed from the rear) until the light comes on. If the light just flashes, turn the handwheel backward until the light is on again. With fine adjustments of the handwheel the red light can be constantly turned on.
2. If the red light stays on when the point of needle just touches the fabric on its way down, the timing is correct, you can proceed to the UP/DOWN POSITION ADJUSTMENT.
3. If the red light is turned on when the needle is not at the desired position, the SENSOR ALIGNMENT procedure should be followed (See APPENDIX I)

UP/DOWN POSITION ADJUSTMENT

1. Turn the SELECTOR DIAL to the 12 o'clock position.

2. Push and hold down the RED BUTTON. Instead of a full single stitch cycle, a needle positioning step (up or down) will be made.

To differentiate between the "up" and "down" positions a beep will sound when the needle is supposed to be at the "up" position.

3. Check the up or down position of the needle.

When adjusting the "up" position, the take-up lever should be high enough to release the thread from the hook.

When adjusting the "down" position, the needle should stop slightly before its lowest position.

4. If the up(down) position is correct, release the RED BUTTON, and go to Step 1 to check the other position.

5. If the up(down) position is not acceptable, while still holding the RED BUTTON down, test whether forward or backward adjustment is necessary:

   - Turn the handwheel slowly forward (counter-clockwise, if viewed from the rear)

   - If the take-up lever and the tip of the needle are going TOWARD the right positions, FORWARD ADJUSTMENT is necessary, so turn the DOWN light OFF.

   - If the take-up lever and the tip of the needle are going AWAY from the right positions, BACKWARD ADJUSTMENT is necessary, so turn the DOWN light ON.

6. While still holding the RED BUTTON down, hit the BLACK BUTTON. A beep will indicate that the new position was stored in the computer's memory.

7. Release the RED BUTTON and repeat the procedure until the desired needle positions are reached.

Note that in some cases excessive overrun and occasional double stitching may occur during the up/down position adjustment. This may be due to unnecessary high needle positioner speed. In such cases a repeated needle positioner speed adjustment is necessary to eliminate the effect.

When the adjustment is completed, take note of the "up" position of the take-up lever. When adjusting the needle return position and the precision needle return position, your take-up lever should match this position as closely as possible.

NEEDLE RETURN POSITION ADJUSTMENT

1. With the SELECTOR DIAL still at the 12 o'clock position push and hold down the BLACK BUTTON. A fast single stitch will be made.

2. Check the needle return position.

The needle should return to the top position with the take-up lever high enough to release the thread from the hook..

3. If the needle return position is correct, release the BLACK BUTTON, the adjustment is completed.

4. If the position is not acceptable, while still holding the BLACK BUTTON down, test whether forward or backward adjustment is necessary:

   - Turn the handwheel slowly forward (counter-clockwise, if viewed from the rear)

   - If the take-up lever is going TOWARD the right position, FORWARD ADJUSTMENT is necessary, so turn the DOWN light OFF.

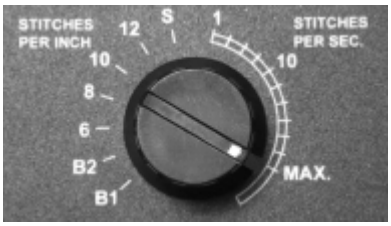
   - If the take-up lever is going AWAY from the right position, BACKWARD ADJUSTMENT is necessary, so turn the DOWN light ON.

5. While still holding the BLACK BUTTON down, hit the RED BUTTON. A beep will indicate that the new position was stored in the computer's memory.

6. Release the BLACK BUTTON and repeat the procedure until the desired needle return position is reached.

Note that in some cases double stitching may occur during the needle return position adjustment. This may indicate that the sensor is out of alignment. In such cases a repeated sensor alignment is necessary to eliminate the effect.

PRECISION NEEDLE RETURN POSITION ADJUSTMENT



1. Turn the SELECTOR DIAL to the MAX. position.

2. Push and hold down the BLACK BUTTON. A reduced speed (precision) single stitch will be made.

3. Check the needle return position.

The needle should return to the top position with the take-up lever high enough to release the thread from the hook..

4. If the needle return position is correct, release the BLACK BUTTON, the adjustment is completed.

5. If the position is not acceptable, while still holding the BLACK BUTTON down, test whether forward or backward adjustment is necessary:

   - Turn the handwheel slowly forward (counter-clockwise, if viewed from the rear)

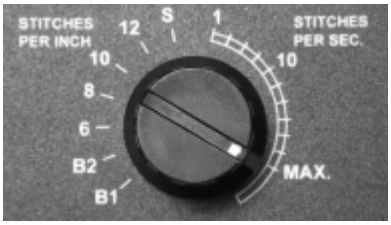
   - If the take-up lever is going TOWARD the right position, FORWARD ADJUSTMENT is necessary, so turn the DOWN light OFF.

   - If the take-up lever is going AWAY from the right position, BACKWARD ADJUSTMENT is necessary, so turn the DOWN light ON.

6. While still holding the BLACK BUTTON down, hit the RED BUTTON. A beep will indicate that the new position was stored in the computer's memory.

7. Release the BLACK BUTTON and repeat the procedure until the desired needle return position is reached.

D. MAXIMUM CONSTANT SPEED ADJUSTMENT



1. With the SELECTOR DIAL still at the MAX. position, push and hold down the RED BUTTON. The motor will start running continuously with the fastest constant speed.

   Note that the RED BUTTON should be held down continuously during the whole procedure.

2. If the maximum speed needs adjustment, while still holding the RED BUTTON down, turn on the DOWN light if the speed needs to be decreased, turn it off if increasing is necessary.

3. While still holding the RED BUTTON down, hit the BLACK BUTTON. A beep will indicate that the speed was increased/decreased. Repeat the procedure from Step 2 until the desired maximum speed is reached.

4. Release the RED BUTTON to save the adjusted maximum speed in the computer's memory.

After the adjustments are made the power should be turned off and on again to start the unit in normal operating mode.